Department of Biology
University of Fribourg (Switzerland)

Interactions of *Sarracenia purpurea* and its inquilines; comparing Europe and North America

THESIS

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Zusammenfassung:

Sarracenia purpurea ist eine fleischfressende Pflanze aus Nordamerika und gilt als Modellsystem für aquatische Lebensgemeinschaften. Nachdem die Kannenblätter sich mit Regenwasser gefüllt haben, entwickelt sich ein Nahrungsnetz in diesen auf Detritus basierenden Ökosystemen welches von Bakterien bis zu Insektenlarven reicht und den Top-Prädator *Wyeomyia smithii* einschliesst. Zwei Wochen nach dem Öffnen der Kannen bestehen diese Nahrungsnetze nur aus einer Handvoll kleiner Arten, die zudem schnell neue Lebensräume besiedeln können (frühes Sukzessionsstadium). Nach vier Wochen sind bereits mehr Arten, die auch größer und konkurrenzfähiger sind vorhanden (späteres Sukzessionsstadium). Zu diesem Zeitpunkt sind fast alle funktionellen Ebenen des Nahrungsnetzes vorhanden. In Nordamerika umfasst dieses einige einheimische Insektenlarven und eine Milbe. Nach Europa wurde *S. purpurea* aber als Samen eingeführt. Dadurch wurde das ursprüngliche Nahrungsnetz (und auch der Top-Prädator) nicht importiert. Allen trophischen Ebenen des Nahrungsnetzes, mit Ausnahme der Nische der Insekten, sind daher durch lokale Arten besetzt. Aus diesem Grund hatten die europäischen *Sarracenia*-bewohnenden Gesellschaften kürzere evolutionäre Entwicklungszeiten mit der Pflanze als die amerikanischen und sind zudem nicht an die Präsenz eines Top-Prädators gewöhnt.
Auch in der Schweiz wurde die Pflanze in mehrere Mooren eingeführt. Die meisten von ihnen befinden sich im Jura und den Alpen in über 1000 Meter Höhe. Im zweiten Kapitel wurde die Interaktion von *S. purpurea* mit den europäischen Spinnengattungen *Agelena* und *Dolomedes* untersucht. *Dolomedes* nutzt die Kannen als Jagdrevier und Versteck. Die Verteilung der Netze von *Agelena* folgt interessanterweise proportional dem Muster der Insektenanlockung von *S. purpurea*, und erreicht ca. 4 Wochen nach der Öffnung der Kannenblätter ihren Höchststand.

In Kapitel drei wurde die Wirkung der Top-Prädatorenpräsenz auf das frühe und spätere Sukzessionsstadium der Protisten-Gesellschaften untersucht. Diese waren entweder an Prädatoren gewöhnt oder eben nicht. Frühe und spätere Sukzessionsstadien von vier klimatisch ähnlichen *Sarracenia*-Standorten wurden gesammelt. Zwei dieser Standorte befanden sich in Nordamerika (an Prädatoren gewöhnt) und zwei weitere in Europa (nicht an Prädatoren gewöhnt). In einem „common garden” Experiment wurden die Änderungen in der Zusammensetzung der

Protistengesellschaften sowie in der Bakterienanzahl, mit und ohne die Anwesenheit eines Top-Prädators über mehrere Tage verfolgt. Zusätzlich wurde am Ende des Experiments die Atmung der gesamten Lebensgemeinschaft gemessen.

In Kapitel vier wurden die Auswirkungen des Klimawandels (erhöhte Temperaturschwankungen) auf frühe und spätere Sukzessionsstadium der Gesellschaften aus beiden Kontinenten getestet. Dazu wurde ein weiteres „common garden" Experiment durchgeführt, bei dem die täglichen Temperaturschwankungen in einer Gruppe auf Extremwerte (4-35 °C) erhöht wurden, während die Kontrollgruppe lediglich durchschnittlichen Temperaturschwankungen von 10 bis 21 °C ausgesetzt wurde. Die Durchschnittstemperatur für beiden Versuchsgruppen war mit (15,5 ° C) genau gleich. Auch in diesem Experiment wurden die Änderungen in der Zusammensetzung der Protistengesellschaften sowie die Anzahl der Bakterien über mehrere Tage hinweg beobachtet. Interessanterweise konnten Auswirkungen der Temperaturschwankungen auf die Bakterien und Protisten (erste und zweite Trophieebene) jedoch nicht auf dem Moskito-Larven (dritte Trophieebene) nachgewiesen werden.

Die Bakteriendichte in der Versuchsgruppe der hohen Temperaturschwankungen zeigte einen anfänglichen Wachstumsschub, fiel dann aber stark ab. Bei den Protisten in der gleichen Gruppe verringerte sich die Alpha-Diversität schneller als in der normalen Versuchsgruppe. Die Beta-Diversität erhöhte sich allerdings nur in den europäischen Standorten, was zeigt, dass nur diese Gemeinschaften ihre Zusammensetzung veränderten. Im Allgemeinen neigten die Protisten Gesellschaften beider Kontinente dazu in der Zusammensetzung ihrer späten Sukzessionsstadien stärker zu divergieren.

Summary:

Sarracenia purpurea is a carnivorous pitcher plant from North America and a model system for aquatic communities. After the pitchers fill up with rainwater, a food web forms in these detritus-fueled ecosystems ranging from bacteria to insect larvae, including the top predator *Wyeomyia smithii*. Two weeks after opening this food webs consists only of a handful of small and fast dispersing species (early succession). After four weeks more species that are larger and more competitive have arrived (late succession). At this time point all functional levels of the food webs are present. In North America this includes several endemic insect larvae and a mite. In Europe, *S. purpurea* was introduced by seed, however the native food web (and its top predator) were not imported, resulting in all levels of the food web being filled by local species with exception to the insect niche. Thus the European *Sarracenia* inquiline communities share shorter evolutionary trajectories with the plant and are also top predator naive.

Also in Switzerland the plant was introduced in several bogs and fens, most of them situated in the Jura and Alps above 1000m. In chapter two the interaction of *S. purpurea* with the European spider-genera *Agelena* and *Dolomedes* was examined. *Dolomedes* uses the pitchers as hunting ground and a hiding place. *Agelena* distribution curiously follows the insect-attraction pattern of *S. purpurea*, which peaks ca. 4 weeks after pitcher opening.

In chapter three the effect of top predator presence on early and late succession protist communities that were either naive or non-naive to the top predator was tested. Early and late succession communities from four climatically similar sites were collected. Two of these sites were from North America (non-naive) and two sites were from Europe (naive). Finally a common garden experiment was conducted in which the changes in the protist community composition, as well as bacterial numbers, with and without the presence of the top predator were followed through time. Additionally the respiration of the whole communities at the end of the experiment was measured.

In chapter four, the effects of climate change related increased temperature variations on early and late succession communities from both continents were tested. Once again conducted a common garden experiment was conducted, in which we increased the daily temperature variations in one group to extreme values (4-35°C) while the control group was treated with average temperature variations ranging from 10 to 21°C. However the average temperature among treatments for both experimental groups was equal (15.5°C). Also in this experiment the changes in protist community composition, as well as bacterial numbers were followed through time. Interestingly an impact of temperature variation on the bacteria and the protists (first and second trophic level) could be detected, however not on the mosquito-larvae (third trophic level). Bacterial density in the high variation treatment showed an initial boost in growth but then decreased quickly through time. For protists in the high variation treatment, alpha-diversity decreased faster than in the normal variation treatment, however beta-diversity increased only in the European sites showing that these communities changed their composition. In general protist community composition tended to diverge more in the late successional stage of both continents.

Chapter 1: General Introduction

***Sarracenia* system**

The rainwater filled leaves of *Sarracenia purpurea* are model systems for aquatic communities and show the dynamics of larger aquatic food webs (e.g., Heard 1994, Kneitel and Miller 2002, Gray et al. 2006). After the pitchers fill up with rainwater, a food web forms in these detritus-fueled ecosystems ranging from bacteria to insect larvae. First bacteria and yeasts colonize the system, start to decompose the insects, and liberate nutrients for the plant. A variety of rotifers, protists, watermites and even nematodes colonize this community and consume the bacteria. The highest trophic level is filled by insect larvae, all of them Diptera. Of especial importance for the shape of the food web (and also this thesis) is the “top predator” *Wyeomyia smithii*, which feeds mainly on protists and rotifers (Kneitel and Miller 2002, Peterson et al. 2008, Gray 2012, Gray et al. 2012). Another insect larvae that often inhabits the pitchers is *Metrocnemus knabi* (Chironomidae), which feeds on dead insects on the bottom of the pitcher and is thus facilitating the release of nutrients (Gray et al. 2012). Furthermore in the literature there are also nine species of Sarcophagidae described (Dahlem and Naczi 2006), among which *Fletcherimyia fletcheri* and *Sarcophaga sarraceniae* are the most common in the pitchers.

Using the *Sarracenia* system has several advantages. First the system is simple (not many different protist inhabitants), but naturally occurring and small (Hoekman 2007). It can be brought to the lab, and is thus easily replicable and accessible during the whole time of the experiments. Furthermore, it offers unique opportunities in testing different successional stages in parallel and also with a high replication number (Hoekman 2007). Finally, because *S. purpurea* plants were introduced as seeds to Europe and the original inquiline community was replaced by species native to Europe, both communities can be compared in transcontinental experiments.

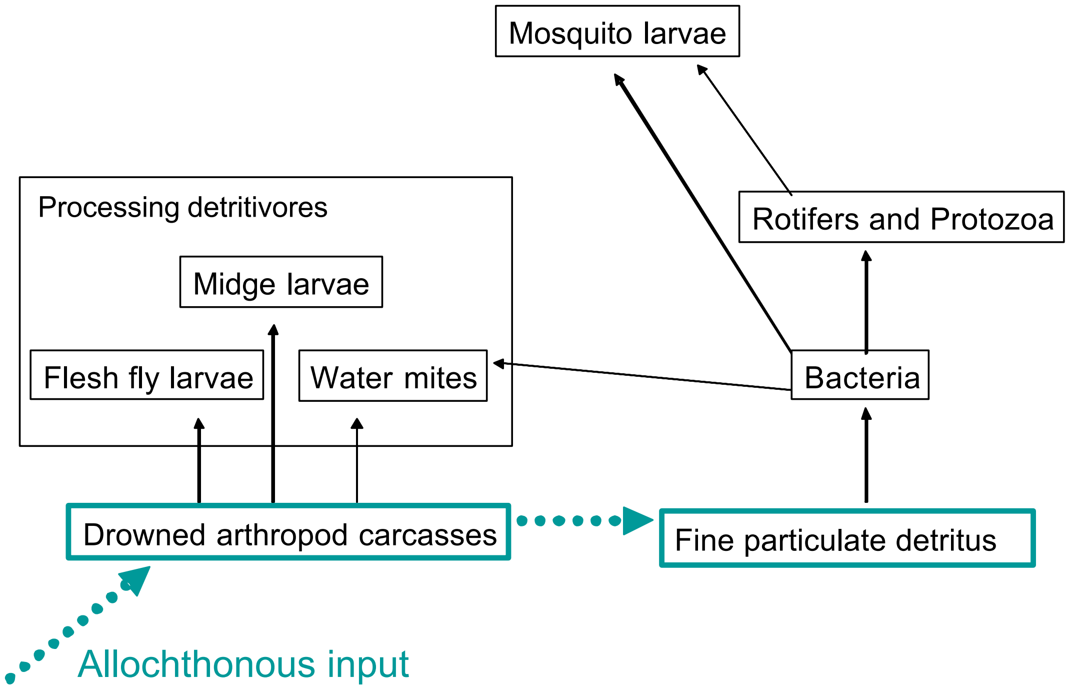


Fig. 1: Inquiline food web of *S. purpurea* (after Hoekman 2007) in the natural range of the plant. In Switzerland no permanent insect inhabitants were observed so far. Dotted arrows show resource pathways, solid arrows stand for feeding relationships.

Sterility of pitchers before opening

In the generally accepted opinion *Sarracenia*-pitchers are believed to be sterile inside before opening (Hepburn et al. 1927, Plummer and Jackson 1963, Peterson et al. 2008). Yet, plant- and animal body cavities are rarely completely sterile and even from human stomachs (pH 1-4) Warren and Marshall (1983) could isolate *Helicobacter pylori*, thus plant tissue inhabiting bacteria could be present before pitchers open. However it is not the aim of this thesis to break this sterility-dogma. We do not know if the pre-opening community of the pitchers will have a large influence on later successional stages. Peterson et al. (2008) clearly showed that unopened pitchers are impenetrable for bacteria from outside, thus the pre community can only enter through i.e. the phloem or intercellulars in the plant tissue. Yet like other plants, *S. purpurea* might be able to control to a certain extent “who” is allowed to be there or not before pitcher opening.

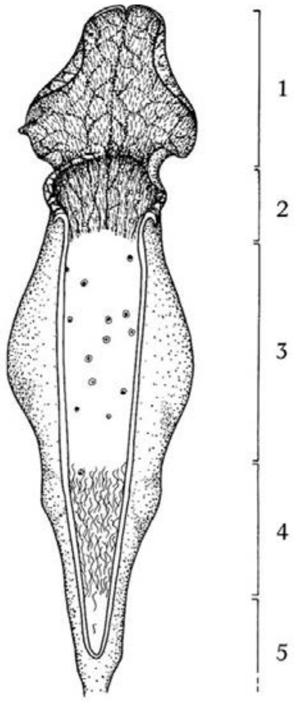
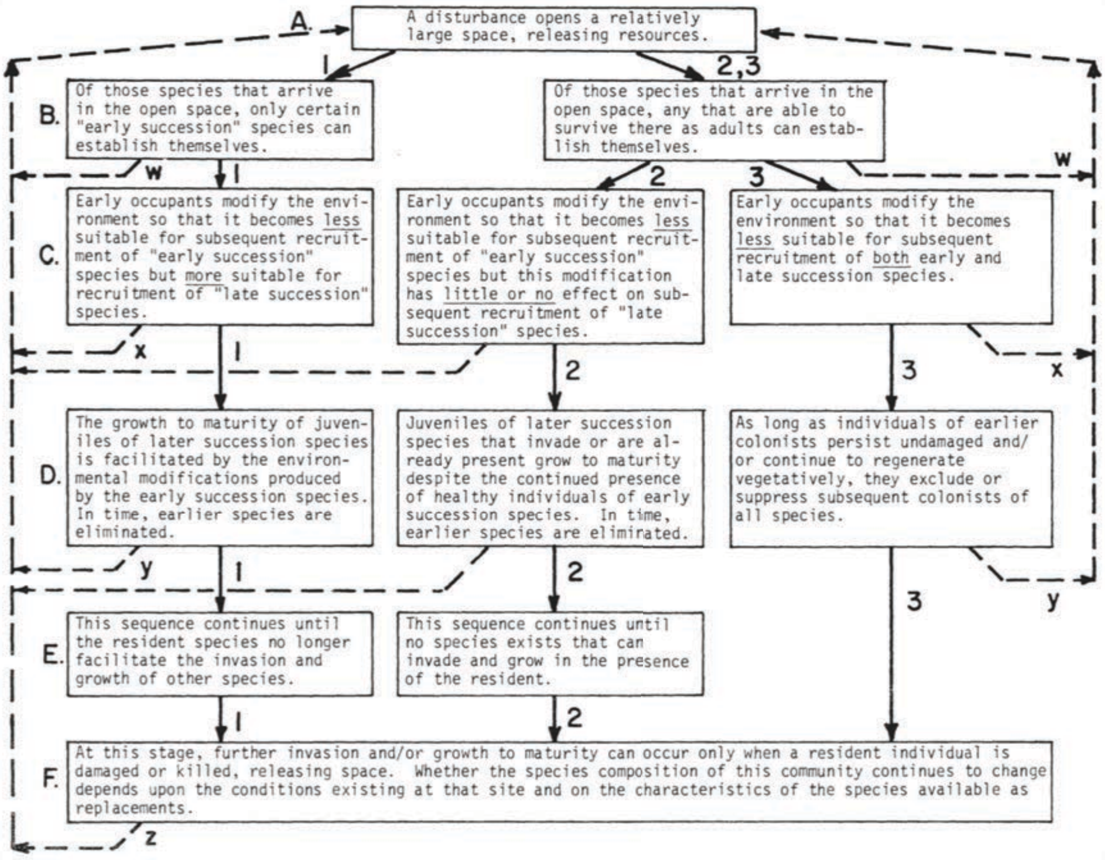


Fig. 2: after Braem 2000. Zone 1 and 2 attraction of prey. The lid and the pitcher opening are studded with nectar glands, down pointing hairs and flamboyantly colored. Zone 3 is a smooth, almost vertical surface making it impossible for insects to gain a foothold. Zone 4 contains long pointed bristles, which are sometimes missing. Together with zone 5 nutrients are absorbed here by the plant.

In each leaf, a new round of evolutionary arms race starts after opening, beginning a new round of succession. Organisms who arrive first can shape the environment in positive and negative ways for those who follow later. According to Connell and Slatyer (1977) there exist three models how this can happen.

The first model is the facilitation model where pioneer species (early succession species) pave the way for later arriving species (late succession species), which in the end become dominant (i.e. like in a forest). The second model, known as the tolerance model, is when early succession and late succession species continue to coexist. This is, for example, the case in temperate lakes where the dominance of early and late succession species changes with the seasons of the year. In winter most of the proceedings are erased and in spring starts a new cycle (Sommer et al. 1986). Finally, in the inhibition model, the early succession species will stay dominant and prevent a further development of the system. This system is mostly comparable with Savannas where the grassland-plants themselves (with the aid of some grazers) prevent bush and tree encroachment. For a detailed summary of these models see Fig. 3.



A disturbance opens a relatively large space, releasing resources.

Of those species that arrive in the open space, only certain "early succession" species can establish themselves.

Of those species that arrive in the open space, any that are able to survive there as adults can establish themselves.

Early occupants modify the environment so that it becomes less suitable for subsequent recruitment of "early succession" species but more suitable for recruitment of "late succession" species.

Early occupants modify the environment so that it becomes less suitable for subsequent recruitment of "early succession" species but this modification has little or no effect on subsequent recruitment of "late succession" species.

Early occupants modify the environment so that it becomes less suitable for subsequent recruitment of both early and late succession species.

The growth to maturity of juveniles of later succession species is facilitated by the environmental modifications produced by the early succession species. In time, earlier species are eliminated.

Juveniles of later succession species that invade or are already present grow to maturity despite the continued presence of healthy individuals of early succession species. In time, earlier species are elimirated.

As long as individuals of earlier colonists persist undamaged and/or continue to regenerate vegetatively, they exclude or suppress subsequent colonists of all species.

This sequence continues until the resident species no longer facilitate the invasion and growth of other species.

This sequence continues until no species exists that can invade and grow in the presence of the resident.

At this stage, further invasion and/or growth to maturity can occur only when a resident individual is damaged or killed, releasing space. Whether the species composition of this community continues to change depends upon the conditions existing at that site and on the characteristics of the species available as replacements.

Fig. 3: After Connel and Slatyer (1977): Three models of the mechanisms producing the sequence of species in succession. The dashed lines represent interruptions of the process in the decreasing frequency in the order w, x, y and z.

Founder effect and selective factors in *Sarracenia* pitchers.

After opening of *Sarracenia*-pitchers, chance determines which types of organisms arrive first (either by wind or in the guts of / attached to some prey insects). Due to this founder effect, neighbouring pitchers can differ greatly in the genetic community structure (Gray et al. 2012). But founder effects can be overlaid by selective factors (Benedetti-Cecchi and Cinelli 1996). In *Sarracenia* for example this would be the ability to tolerate the extreme temperature variations within the *Sarracenia* pitchers from quite cool night temperatures up to 42°C during a sunny day (Bradshaw 1980), in subtropical zones temperatures even up to 60°C have been measured (terHorst personal communication). These extreme daily temperature changes only happen once or twice a month (see chapter four), but nonetheless represent a strong environmental filter and are uncommon for communities in bigger aquatic systems, like ponds, lakes and rivers. For example, small streams do not vary more than 6°C daily even in summer (Hynes 1970). In bigger streams and lakes only the surface temperature is affected by daily changes, giving organisms the possibility to stay in their preferred temperature range by adjusting depth. However for small water bodies like Phytotelmata, leaf axils and to a lesser extent small tree-holes, big changes in temperature are common. With climate change, desiccation (at least in the pitchers) will become more likely, in such a scenario organisms able to produce resting stages will gain in fitness (Burton and Swisher 1984). Even *Wyeomyia smithii*, the only Mosquito species living in the pitchers and top predator in the *Sarracenia* system is adapted to these drought conditions; being able to enter diapause (aestivation) not only in winter, but also due to low water levels, (Bradshaw, 1980, Lounibos et al. 1982, Hard et al. 1993)

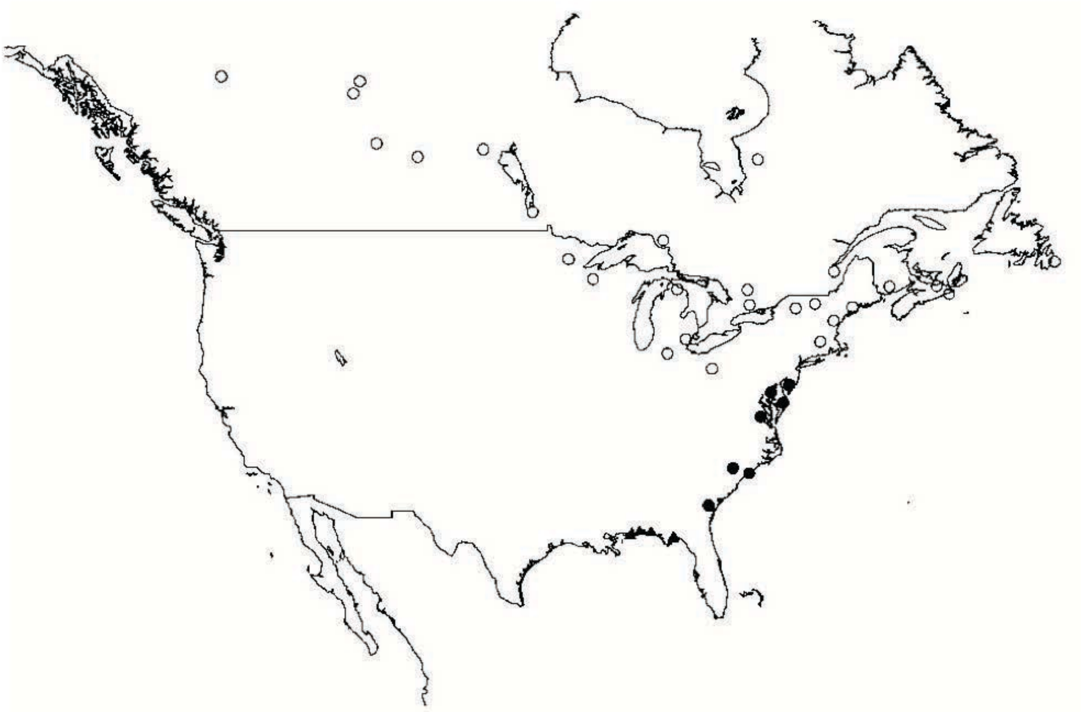


Fig. 4: Distribution of S.purpurea in North America. The different symbols belong to different subspecies (open circles: *S. purpurea* subsp. *purpurea*; solid circles: *S. purpurea* subsp. *venosa* and *S. purpurea* subsp. *venosa* var. *burkii,* solid triangles. After Ellison et al. (2004)

***Sarracenia* in Switzerland**

S. purpurea was introduced to Europe and Switzerland by seed, therefore lacking its native resident aquatic community. Introduction in bogs in the Jura Mountains and the western Pre-Alps (1000-1500m) was quite commonplace in the late 19th century (Correvon 1947, Parisod et al. 2005), but it was also introduced at lower elevations (500-600m) in the 1950's (Parisod et al. 2005). Many introductions resulted in stable populations in the bogs (see also Info-Flora). To date, few experiments using the *S. purpurea* model system have been done in Europe, the non-native range of the plant (Gebühr et al. 2006, Adlassnig et al. 2010).

Aquatic pitcher plant inquiline communities in North America (local bacteria, protozoans and the top predator *Wyeomyia smithii*)*,* most likely co-evolved with *S. purpurea* for ~10,000 years, following the last glaciation (Ellison et al. 2004). The time period for European species to adapt to *S. purpurea* pitchers was much shorter, and as *Wyeomyia* is not present in Europe, Swiss inquiline communities share no evolutionary trajectories with a top predator and thus can be seen as top predator naive. Furthermore there are no native carnivorous pitchers plants in the European Flora, thus no pitcher plant adapted inquiline fauna existed before *S. purpurea* was introduced.

Alternative successions in Europe and North America

It is known that mosquito larvae can affect numbers and the general structure of phytotelmata communities (Kurihara 1959, Maguire et al. 1968, Addicott 1974, Walker et al. 1991). In Europe *Sarracenia* inquiline communities adapted to their new pitcher habitat without the presence of a top predator for the last 100 years. Today, with the exception of insects, all ecological niches have been taken. Bacteria, protozoans, rotifers (also *Habrotrocha;* Fontaneto personal communication), nematodes and mites can be found in the Swiss pitchers and Gebühr et al. (2006) reported a high variety of protists including many micro-algae living inside the pitchers in Germany, completely different than the ones known from North America (i.e. Addicott 1974, Buckley et al. 2003).

Fig. 5: All field sites in this study, Quebec (Canada) and the Cantons Vaud and Jura (Switzerland) had similar day length due to similar latitudes. Also the climatic conditions at all sites were similar, only the site of Champ Buet was considerably warmer, due to lower elevation and the lake Geneva microclimate. Picture-source: Google Earth

Metacommunity

So far in Europe, no insect species has been able to make the move of permanently living inside the pitchers in Europe. Mosquito larvae (*Culex pipiens* s.l.) placed artificially inside the pitcher-liquid could in some cases finish their development. However most of them died before doing so (unpublished data). Springtails (*Podura* *aquatica*) and small water-beetles however have been recorded by our group as temporal visitors, which can survive for several weeks inside the pitchers (unpublished data) and given the chance (high water levels due to heavy rain, or leaf-decay) they could probably leave the pitchers again. Temporal insect visitors are found only in small numbers (less than 1%) of pitchers and no reproduction inside the pitchers was observed so far. Yet, *Dolomedes fimbriatus* (the European raft spider; see also chapter 2), and also Springtails (*Podura*) most likely play an important role in the dispersal of protist inquiline species and thus also in homogenizing the inquiline meta-community.

Many species of *S. purpurea* inquilines have resistant stages that can be transported directly by the wind inside the pitchers. Others will only reach the pitchers via above-mentioned transport by insects, either being attached to the body or even inside the prey-insects intestines. The digestive environment inside the pitchers might suit these organisms very well. Chance determines which genotype arrives first, due to the founder effect, neighboring pitchers can at first differ greatly in the genetic community structure.

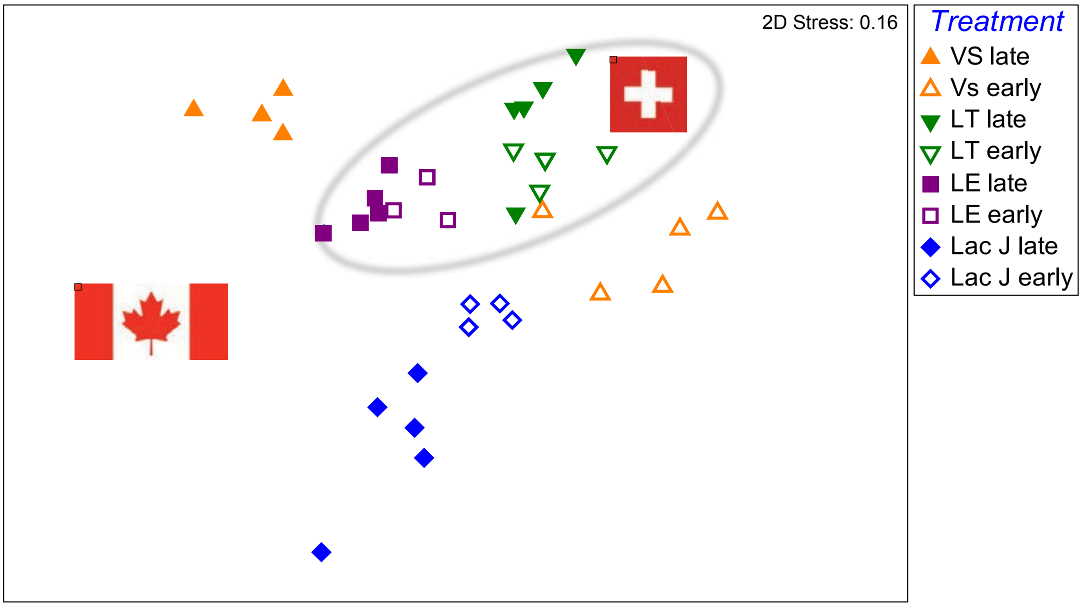


Fig. 6: Non metric multi dimensional scaling (NMDS) plot of the community composition before the start of the experiments in Chapter 3 and 4. Shown is the "Jaccard Similarity" of communities according to presence/absence data of species. Note that the variety (of protist morpho-species) is much bigger in Canadian communities and that the Swiss communities differ distinctly from their North-American counterparts.

In North America another selective factor and distributor for inquilines might be the females of *Wyeomyia smithii*. Eggs are placed in the pitchers right after opening. Bacteria and protists attached to the eggs or the legs off the mosquito will be among the first to arrive and widely spread in the metacommunity. Thus the new pitcher communities will be quickly invaded by species that already inhabit adjacent pitchers and are adapted to the system. Furthermore, as the young larvae start feeding immediately after hatching, feeding resistant protist species will have an evolutionary benefit.

In Switzerland (Europe) all the inquiline species at one point must have made the transition from the bog habitat to the pitchers. And no *Wyeomyia*-mosquitoes are present for early distribution of protist species. Among other factors this most likely leads to the evolution of parallel aquatic communities in Europe and North America offering an amazing opportunity to test general patterns of ecosystem dynamics and food web development. In North-America the identity of the *S. purpurea* intermediate and top trophic level inquiline species are highly similar throughout all the native geographic range and seem at least partly to have co-evolved with the plant (Gray et al. 2012). Note that in chapter three one of the reviewers had issues with the term co-evolution. I accepted his verdict in that chapter, but used the term in the other chapter.

Top down - bottom up in *Sarracenia* communities

During the development of a stable community (one that is in compositional equilibrium) numerous variables play a role. The first colonizers can shape the ecosystem in one way or another that might suit some future colonizers more than others, leading to different final assembly of the community. This infers that at different *Sarracenia* sites (and even within a single site), multiple stable states are possible, depending on the serendipity of dispersal, of all occurring species (Young et al. 2001)

Two other factors affecting the community are top down and bottom up control. Both are linked and can be seen as antagonists (Elton 2001). In North-American *Sarracenia* communities both factors play an important role, but according to Kneitel and Miller (2002) resource availability (bottom up) is more important than top trophic level predation (top down control) for the inquiline community. One reason for this is that predation is not acting directly over several trophic levels but only to the next one, while resource availability indirectly affects all trophic levels. For instance, bacterial species richness is even increasing when more predators are present (Kneitel and Miller 2002).

General Predator naivety

Strategies and behavior to avoid predators are inheritable. Even after 500 generations in captivity, the smell of fox feces cause rats to show signs of fear and induces flight behavior, however this response is phenotypically plastic and also dosage dependent (Endres et al. 2005). When a predator arrives in an new area, the development of defense mechanisms in prey species or the adaptation of existing defenses to this novel predator will take time thus novel predators can have detrimental effects on these communities (see i.e. Freeman and Byers 2006, Fisk et al. 2007, Hooks and Padilla 2014). Also throughout the community the developed response will be phenotypically plastic (Anson and Dickman 2013). Species or individuals who can adapt faster than others have an evolutionary benefit. In general however, once developed, flight responses against one kind of predator provide additional protection against similar types of predators. Anson and Dickman (2013) illustrate this point by showing that adverse responses to various predators are very similar, suggesting that one genetically inherited flight behavior stays unchanged and is used against many kinds of predatory threats.

However, new arriving species have to adapt to their novel environment. Thus, in general, there is a time lag between the arrival of a new species and the occurrence of detrimental effect caused by it. Simberloff and Gibbons (2004) give several examples for such a time lag.

Predation naivety in freshwater ecosystems and the role of *Wyeomyia smithii.*

Isolated fish-less lakes and streams above waterfalls as well as ephemeral systems where water is only present for certain times can be seen as freshwater islands free of fish predators. In these systems the evolution of predator naive communities is possible. Invasions of fish into these systems can have devastating effects for the species in such habitats (Knapp et al. 2001). In the *S. purpurea* system early succession species, which are very good in colonizing small temporary water bodies, are first to arrive in the pitchers.

Because their usual environment (like leaf axils of small puddles) are in general predator-free, these species might be very susceptible to filter feeding arthropod-predators. In Europe no top predators are present in the leaves. In North America however the *Sarracenia* pitcher-biotopes are not even shortly predator free, as *Wyeomyia smithii* lays eggs in them right after pitcher opening, either directly on the water surface or on the moist inner pitcher walls (Istock et al. 1975).

Wyeomyia, like other mosquito larvae and many other aquatic arthropods (Cladocerans, Copepods etc.), is a filter feeder. Many different filter feeder species occur in the surrounding bog-waters of the *Sarracenia* sites. Thus, in theory, all defense responses developed against other filter feeders (i.e. mosquito-larvae or daphnia) will be at least partially effective against *Wyeomyia*. Therefore most aquatic organisms occurring in bigger and stable water bodies will possess defense responses against filter feeders (like edgy body surfaces or flight behavior). Yet filter feeders can still have a big influence on the community structure of microbial food webs (Jürgens and Güde 1994).

In North America the abundance of predators per pitcher decreases from south to north (Buckley et al. 2003), curiously this goes hand in hand with an increased total eukaryotic inquiline species richness (Buckley et al. 2010), suggesting that effects of top predators on the *S. purpurea* inquilines are dosage dependent. Throughout the whole range of the plant the species identities of the top trophic and the intermediate level are similar (Gray et al. 2012). To a certain degree, mosquito larvae have the ability to affect protists numbers and can even change the overall structure of communities inhabiting phytotelmata (Kurihara 1959, Maguire et al. 1968, Addicott 1974, Walker et al. 1991). Consequently, it is likely that at least parts of the inquiline food web co-evolved with *Wyeomyia smithii* and the plant (Gray et al. 2012). In Europe (no top predator present) Gebühr and al. (2006) showed that, compared to

North-America, an even bigger number of protozoan and microalgae species are present in the pitchers of *Sarracenia*, suggesting that the presence of *Wyeomyia smithii* is driving the pitcher inquilline-community in a certain direction (note however that at the sites and in the successional stages used in this study we found a higher biodiversity in American than European communities).

Possible effects of *Wyeomyia* include not only predation on protists and bacteria. An example of such an effect is the mixing of the waterbody by constantly raising to the surface (to breeze) and sinking again back (to feed), a factor which should not be underestimated for shaping the community. This mixing results in a more gentle oxygen gradient from top to bottom of the pitchers when inquiline insects are present, leading to better conditions for aerobic protist and bacteria species and thus an increased digestion rate of the prey. However the nitrogen uptake efficiency of the plant is not affected by the presence or absence of macro-invertebrates. It is more the microbial component of the food web that is determining nitrogen availability (Butler et al. 2008). In terms of resource availability, the absence of a top predator seems to not play a crucial role.

A very brief history of climate change

Although the possible effects of climate change on *S. purpurea* are discussed in this thesis, climate change itself is not the emphasis of this current study. Causes and consequences of climate change are general knowledge, however for a good overview see the “IPCC The Physical Science Basis” (2013). There is only one point I would like to stress. Apart from damages due to slow and steady sea level raise, the most detrimental effects of climate change will be due to extreme events, which are predicted to become more frequent (IPCC 2013). For practical reasons the extreme events addressed in this thesis are extreme temperature variations.

Aim of this study

First aim of this study was to show the positive and negative impacts of S. purpurea on the local fauna in Switzerland (Chapter 2). Then I seized the opportunity to study the effects of novel predators (Chapter 3) and climate change (Chapter 4) to natural inquiline communities from *S. purpurea* that had developed independently from each other with different evolutionary trajectories in two different continents, but were in terms of environmental conditions (temperature, latitude and day length) very similar.

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Chapter 2: "The American Friend": Distribution of native European spiders follows the prey attraction pattern of introduced carnivorous pitcher plants

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Abstract

Carnivorous plants and spiders are known to compete for resources. In North America, spiders of the genus *Agelenopsis* are known to build funnel-webs, using *Sarracenia purpurea* pitchers as a base, retreat and storage room. They also very likely profit from the insect attraction of *S. purpurea*. In a fen in Europe , *S. purpurea* was introduced ~65 years ago and co-occurs with native insect predators. Despite the absence of common evolutionary history, we observed native funnels-spiders (genus *Agelena*) building funnel webs on top of *S. purpurea* in similar ways as *Agelelopsis.* Furthermore, we observed specimen of the raft-spider (*Dolmedes fimbriatus*) and the pygmy-shrew (*Sorex minutus*) stealing prey-items out of the pitchers. We conducted an observational study, comparing plots with and without *S. purpurea*, to test if *Agelena* were attracted by *S. purpurea*, and found that their presence indeed increases *Agelena* abundance. Additionally, we tested if this facilitation was due to the structure provided for building webs or enhanced prey availability. Since the number of webs matched the temporal pattern of insect attraction by the plant, we conclude that the gain in food is likely the key factor for web installation. Our results provide an interesting case of facilitation by an introduced plant for a local predator, which has developed in a very short time scale.

Keywords: facilitation, invasive plant, native predator, *Agelena*, *Sarracenia purpurea, Dolomedes fimbriatus*

Introduction

Introduced species, especially predators, are known to have many negative effects on local fauna (e.g. Gurevitch and Padilla 2004; Salo et al. 2007; Paolucci et al. 2013; Zander et al. 2015). Studies reporting positive effects (e.g. facilitation or mutualism) of an introduced species for one or more native species are rarer (e.g. Bially and Macisaac 2000; Castilla et al. 2004; Müller-Schärer et al. 2014). In her review, Rodriguez (2006) identified several pathways by which novel species can facilitate native species. Among these are novel habitat creation (e.g. Schwindt et al. 2001) and trophic subsidy, like nutrient enrichment (e.g. Quinos et al. 1998), increase of prey availability (e.g. Ortega et al. 2004), or the possible usage of new host plants (e.g. Graves and Shapiro 2003). Furthermore the release of competition and predation (e.g. Knapp et al. 2001; Grosholz 2005) play an important role for facilitation of native species by introduced ones. The replacement of existing species is especially important when considering the potential value of alien species for conservation (e.g. Angradi et al.; Schlaepfer et al. 2011). In case the species that is replaced by the introduced species has become rare and only the new species can provide the facilities, like nesting places (e.g. Zavaleta et al. 2001) or simply shadow and shelter (Van Riel et al. 2000), some other native species will depend on the introduced species in order to survive.

In Europe, despite their differing phylogenetic backgrounds, the shrew *Sorex minutus*, the funnel web spiders of the genus *Agelena* (either *Agelena labyrinthica or Agelena gracilens* (*syn.: Allagelena gracilens*)), and the raft spider *Dolomedes fimbriatus* have similar food spectra, preying mostly on insects (Pernetta 1976; Nyffeler and Benz 1978; Poppe and Holl 1995). While *Agelena sp.* and *Sorex minutus* are found in many habitats, *Dolomedes fimbriatus* is specialized in semiaquatic habitats, e.g. bogs and fens (Nyffeler and Benz 1978). *Sarracenia purpurea* is a carnivorous plant species originating from North America, and has been introduced to European bogs and fens (Zander et al. 2015). This could create direct competition for prey, but also the possibility for predation facilitation, for example through kleptoparasitism by the above mentioned species.

Prey abundance and availability of web building sites are factors limiting growth and survival of spiders (e.g., Colebourn 1974; Wise 1979; Whitney et al. 2014; Takada and Miyashita 2014). Competition for web building sites is common and well described (Riechert, 1978, 1981; Wenseleers et al. 2013; Opatovsky et al. 2016). Locally higher prey abundance is known to affect individual spider fitness (Wise 1975, 1979), and may cause spiders to build their webs closer to each other. However a minimal distance will be maintained, probably to reduce the exploitative competition between spider-individuals. In Europe, an average minimum distance between webs of ca. 60 cm was observed for *Agelena labyrinthica* (Fasola and Mogavero 1995).

Prey availability can be increased by the presence of carnivorous plants (Wolfe 1981; Zamora 1995). Furthermore spiders can be facilitated by the provided structure to build their webs (Milne 2012). However carnivorous plants and spiders can also act as antagonistic resource competitors i.e. through kleptoparasitism (robbing of already caught prey from the plant; (Zamora 1995; Jennings et al. 2010). Cresswell (1993) gives a further example for resource parasitism between linyphiid spiders and the carnivorous pitcher plant *Sarracenia purpurea.* Here the spiders build their webs directly over the pitcher openings, as such preventing insect to fall in the traps. Furthermore in North America, the native range of the *S. purpurea* plants, funnel-webs spiders of the genus *Agelenopsis* are known to build their webs in the way that the funnels end in the pitchers of *S. purpurea,* not only blocking the entrance for possible prey, but also using pitchers as a base, storage room and retreat (Milne 2012). Both linyphiid and *Agelenopsis* spiders profit very likely from the insect attraction of *S. purpurea* and are thus facilitated by the plant.

Prey attraction by *S. purpurea* is a locally and also a temporally limited event. *S. purpurea* produces nectar at the opening of the pitcher leaves to attract insects (Deppe et al. 2000; Bennett and Ellison 2009). Nectar production starts early after pitcher opening, and ceases a few weeks later. Consequently, pitchers catch most of their prey in the first few weeks after opening (Fish and Hall 1978; Wolfe 1981; Heard 1998). Capture rates raise very fast after pitcher opening and peak after 3-4 weeks, then decrease also quite fast to reach a low level plateau around 35-40 days after opening (Fish and Hall 1978; Heard 1998).

The funnel-web spider genus *Agelena* has a similar ecology than the American *Agelenopsis*. Despite the short evolutionary history between *Agelena* and *S. purpurea,* we observed webs built on the plant in Champ Buet. *Agelena*-spiders are generalist predators (Tanaka 1991). For example, the diet of *Agelena labyrinthica* consists of insects from 12 orders, mainly Orthopthera, Coleoptera, Hymenoptera, Lepidoptera and Diptera (Nyffeler and Benz 1978). *Agelena* species build their funnel-shaped webs close to the ground and are thus catching both flying and walking insects (Nyffeler and Benz 1978). For this reason, compared to orb-web spiders, their diet is likely more similar to that of *S. purpurea*, which consists mainly of Diptera, Hymenoptera, Coleoptera, Hemiptera, and Aranea (Judd 1959; Cresswell 1991; Heard 1998; Newell and Nastase 1998).

Here, we explore the possible interactions between *S. purpurea* and *Agelena* spiders. We conducted a study in the Champ Buet site, where we compared six 25 m^2 plots with and without *S. purpurea* plants. We first analyse if the presence of *S. purpurea* increases the local abundance of *Agelena* spiders. Furthermore, we asked whether spiders use *S. purpurea* because they offer suitable structure and shelter, or because of the increased prey availability provided by insect attraction. If the latter proposition is correct, we expect the abundance of *Agelena* spiders to match the temporal pattern of insect attraction of *S. purpurea*. Specifically, we tested the following hypotheses: 1) at the local scale, *Agelena* spiders are more abundant in plots with *S. purpurea*; 2) spider numbers change proportionally to insect attraction patterns of *S. purpurea*; 3) during insect attraction period, spider webs are not randomly distributed within *Sarracenia* plots, but are aggregated close to or on the *S. purpurea* plants.

Materials and Methods

Study site

All field experiments were done in Champ Buet (46°36'46.35"N / 6°34'42.75"E ca. 600m above sea level, see Fig. Sb 4b). We obtained authorisation from the Canton of Vaud to conduct research. The site, which is partly dominated by *Eriophorum latifolium* and partly by *Phragmites australis*, is mowed once a year to prevent shrub encroachment. Around 65 years ago, *S. purpurea* was introduced to Champ Buet from Les Tenasses (ca. 1250 m), where the population was already well established and in a growing state (Parisod et al. 2005). Although the pitchers tips are mowed off once a year, plants cope quite well with the local conditions.

Study system

Sarracenia purpurea was introduced in Europe and Switzerland during the 19th Century. *S. purpurea* was planted in various bogs and fens located in the Jura mountains and in the Alps in the late nineteenth century (Correvon 1947). *S. purpurea* is a carnivorous pitcher plant, naturally occurring in swamps and peat bogs in North America. Often, plants reproduce vegetatively and form clumps of several individuals. In Champ Buet, the largest clumps reached a diameter of approximately 1 m. To provide some extra nutrients, the leaves of *S. purpurea* are pitcher shaped and serve as traps mostly for arthropods. To attract prey, *S. purpurea* secrete an extra-floral nectar in the upper part of the pitchers (Deppe et al. 2000; Bennett and Ellison 2009). This secretion stops after some weeks. Thus, after this time, pitchers become less attractive for potential prey organisms. Capture rates raise very fast after pitcher opening, peak after 3-4 weeks, then decrease also quite rapidly to reach a low level around 35-40 days after opening (Fish and Hall 1978; Heard 1998, see inset of Fig. Sa 1-5).

The funnel-web spiders in the present study were determined by Gilles Blandenier to be juveniles of the Genus *Agelena*. In Switzerland, two *Agelena* species occur, the more common *Aglena labyrinthica* and *Agelena gracilens* (syn. *Allagelena gracilens*) (Info Fauna 2016), which cannot be distinguished in the juvenile stage (Blandenier personal communication). The study was performed in early summer, thus only juveniles occur (Fasola and Mogavero 1995). Both species build a flat net that extends into a funnel shaped tube (Fig. 1 and Fig. Sb 1-3). In this tube, the spider hides and waits for prey.

Since both species have similar ecology in terms of web construction and diet, we consider individuals at the genus level in our study.

Two other species interacting with *S. purpurea* occurred in our sites, for which we report our observations in the Result section. The raft spider *Dolomedes fimbriatus* (Pisauridae) is a big semi-aquatic spider that is found near many types of freshwater habitats, like streams, lakes and fens (Carico 1973). Although these spiders feed occasionally on aquatic vertebrates and invertebrates (Bleckmann and Lotz 1987), the main prey of *Dolomedes fimbriatus* are terrestrial invertebrates (Poppe and Holl 1995). Females can reach up to 23mm in body length and are thus able to catch quite big prey items, like dragonflies. *Sorex minutus*, the smallest mammal of central Europe, is a quite common and widely distributed insectivore, mainly feeding on various arthropods and mollusks (Pernetta 1976). In the Swiss Alps, it inhabits a wide array of habitats (wet meadows, marshes and mixed forests) as well as altitudinal belts up to 2496m (Marchesi et al. 2014). We observed it in the site of Les Tenasses (ca. 1250m *46°29'28.51''N, 6°55'16.04''E)*, where *S. purpurea* has become invasive in the ombrotrophic zone of the bog (Feldmeyer 1985).

Experimental set-up:

We randomly chose six 5x5 m plots, with the constraint that three contained *S. purpurea* plants, three had no *S. purpurea* and, to prevent interference between plots, that the minimum distance between them was 10 m. Plots were marked with a plastic stripe that did not affect arthropod movements. All plots were further divided in twenty-five 1 m^2 quadrants (subplots). The presence/absence of *S. purpurea* plant was recorded for each subplot (see Fig. Sa 1-5), and the number of clumps inside each 25 m^2 plot was counted. Subplots without *S. purpurea* were additionally separated in two classes: subplots neighbouring a subplot with *S. purpurea* ("close"), or subplots further away ("away").

When the majority of the pitchers began to open, we recorded the numbers and distribution in each subplot of all *Agelena* webs and followed the changes over time. Sampling occurred at least biweekly, with some variability, from the 19th of May till 14th of July (5 sampling sessions). Note that webs of other spider species were present, but their number was low and negligible compared to *Agelena* webs, and they were not considered.

Measured variables:

At each sampling session, we determined the total number of webs in each 1 m^2 subplot and in the 25 m^2 plots, accordingly. These abundances were used as response variables. We also noted if webs were built directly on clumps of *Sarracenia* or not (substrate). The attribute of the plots (with or without *S. purpurea*) and of the subplots (with or without *S. purpurea*; close and away), and the substrate for the webs were used as explanatory variables.

Additionally, we collected prey in pitchers and determined the specimens under dissecting microscope at the highest possible taxonomic level. Sampling was performed by removing all material from 35 randomly selected pitchers of the same age, at days 14, 22, and 36 after opening.

Statistical analyses

When analysing the relationships between the dependent variable "number of webs" (log-transformed) and 1) the types of experimental plots (with or without *Sarracenia*), 2) the type of substrate (on *Sarracenia* plants or on other structures), and 3) the number of *Sarracenia* clumps (only for plots with *Sarracenia*). To account for repeated measures (5 sampling sessions), we used a first-order auto-regressive (AR1) autocorrelation structure in the residuals (Zuur et al. 2009). All model residuals were checked for normality with QQ plots. Analyses were performed with the gls function of the nlme package (Pinheiro et al. 2011) in R (R Core Team 2013).

When comparing observed and expected frequencies of webs built 1) in subplots close to vs. away from subplots with *Sarracenia* for all sampling sessions, and 2) on Sarracenia vs. not on Sarracenia for each sampling session, we used log-likelihood ratio tests with Williams correction (Sokal and Rohlf 1995). We applied a sequential Bonferroni correction of p-values for the latter test (Holm 1979).

Results:

Number of Agelena webs in plots with and without Sarracenia

The presence of *Sarracenia* attracted more *Agelena* spiders than are usually found in 25m^2 plots without *Sarracenia* in the Champ Buet field side. Over all sampling sessions, there were significantly more webs present in plots with *Sarracenia* compared to those without (Fig. 2, Table Sa 1). The numbers of webs inside the Sarracenia plots increased with time (except for the last sampling day; see Fig. 3), and peaked at 3-4 weeks after leaf opening, which corresponds to the time point when pitchers catch the most insects (Fish and Hall 1978; Heard 1998, see Fig. Sa 1 to 5, and Fig. Sa 6). In contrast, the number of webs in the plots without *Sarracenia* slightly decreased (Fig. 3). This interaction over time of webs in plots with Sarracenia and webs in plots without was significant (Bonferroni corrected p-value = 0.026; see also Fig. Sa 7).

Number and distribution of Agelena webs in plots with Sarracenia

Inside the *Sarracenia* plots, the abundance and distribution of *Agelena* webs were not random. First, according with the findings of Fasola and Mogavero (1995) the minimum distance between two webs of *Agelena* was always bigger than 59 cm, resulting in the fact that no *S. purpurea* clump was occupied by the webs of two spiders at a time.

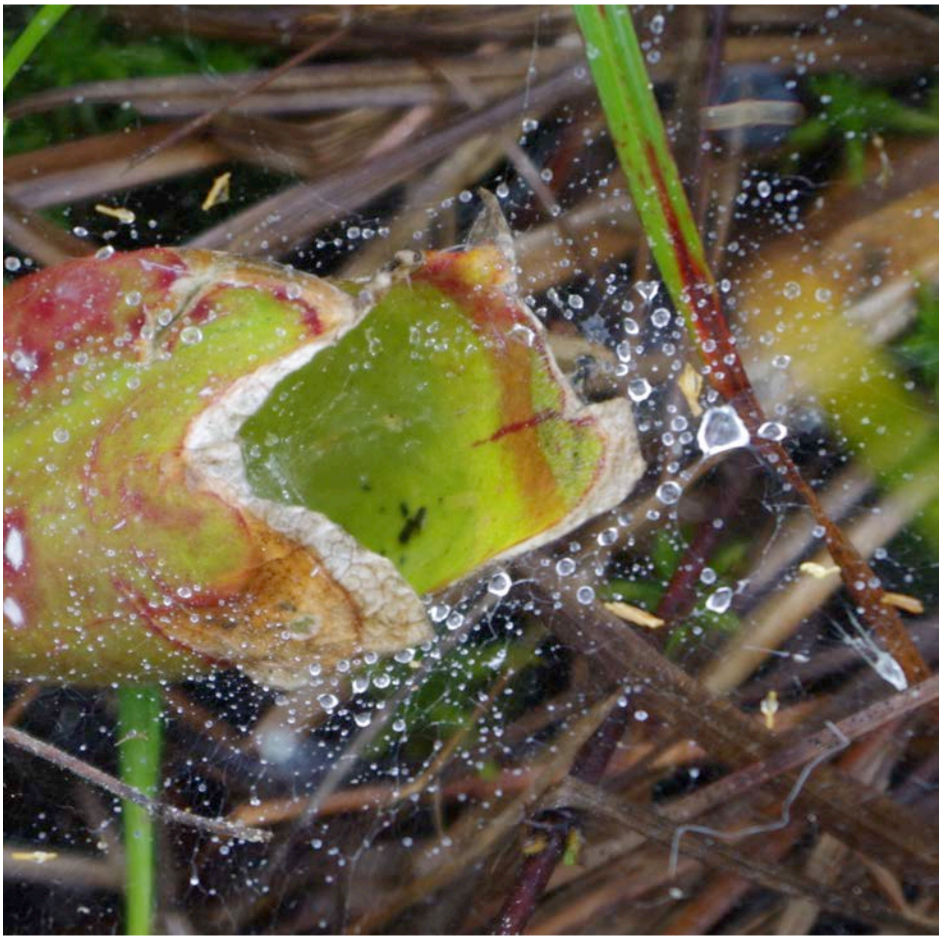

Fig. 1: *Agelena* sp. web funnelling directly into a *S. purpurea* pitcher (tip mowed off).

Second, the number of webs were positively correlated with the number of *Sarracenia* clumps inside a plot (generalized least-square model with AR1 correlation structure for repeated measures; p-value < 0.001, see Fig. Sa 8,). Third, *Agelena* spiders build their webs either directly in 1m^2 subplots with *Sarracenia* plants, or in neighboring subplots (see Fig. Sa 1-5). Consequently, there were no webs in subplots more than one meter away from a *Sarracenia* clump (Fig. 4; likelihood-ratio test for the expected number of webs in subplots neighbouring *Sarracenia* clumps vs. in subplots at least one meter away from *Sarracenia* clumps; p-value = 0.004; see Table Sa 3).

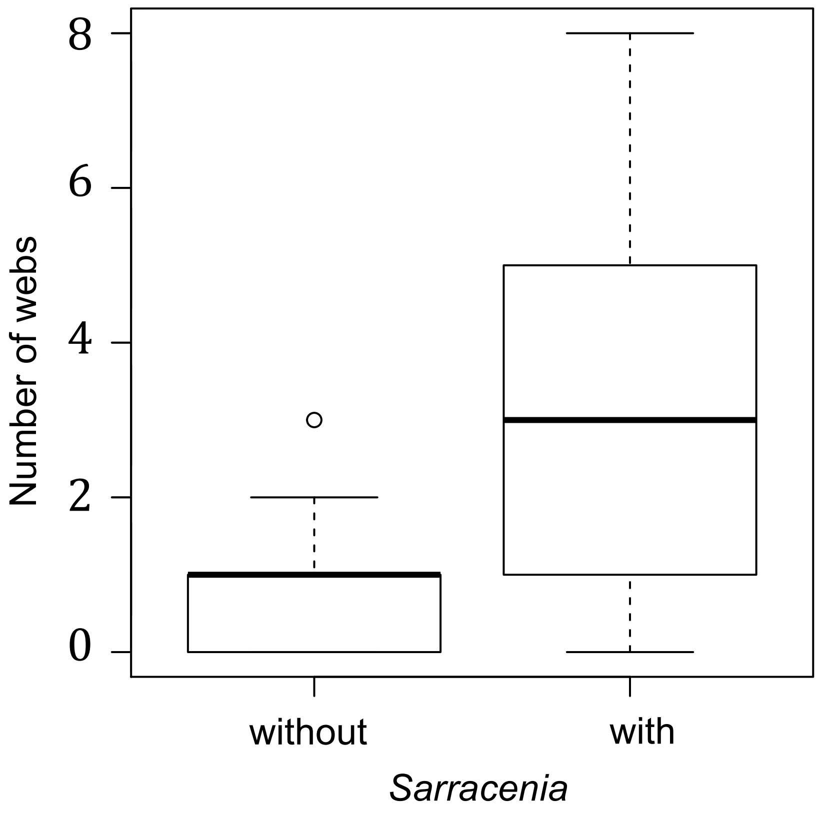

Fig. 2: Comparison of numbers of webs in plots with and without *Sarracenia*. In *Sarracenia* plots there were significantly more webs than in the plots without *Sarracenia* (generalized least squares model with AR1 correlation structure for repeated measures; p-value < 0.001, see Table S1a for details).

Fourth, when considering all measured time points, we recorded a significantly higher number of cobwebs built directly on *Sarracenia* clumps compared to the rest of the plot (Fig. Sa 9). This effect is particularly strong given that the actual number of subplots covered with *Sarracenia* plants is much smaller than the number that is not (global ratio: 1 : 3.7; see Table Sa 4 for results of generalized least square model).

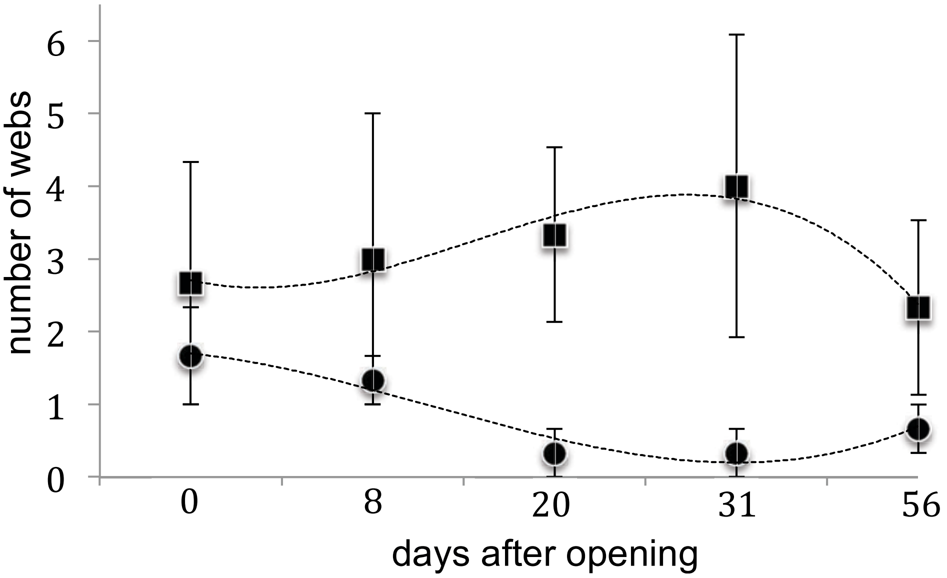

Fig. 3: Average number (with standard error) of webs in 25 m^2 plots with *Sarracenia* (squares) and without *Sarracenia* (circles) over time (days after average date of pitcher opening). During the peak of insect attraction (day 20-31) the differences in plots with and without *Sarracenia* were highest. Dotted lines (third order polynomial regressions) are added to guide the eye. The numbers of webs in both types of plots (a and b) are negatively correlated (Spearman rank correlation (for data without “day 56”); rho = -0.95, p-value = 0.05).

Number and distribution of Agelena webs over time.

At start of the experiment the ratio of webs directly on *Sarracenia* compared to the webs in the rest of the plots was 50:50. However, during the peak of insect attraction (sampling sessions 3 and 4), over 80% of the webs were found on the plants. This number fell again to 70% after insect-attraction decreased (Fig. 5a). Except for day 0, all days showed a significantly higher proportion of webs directly on *Sarracenia* (Bonferroni corrected p-values: day 0, 0.42; day 8, 0.022; day 20, < 0.001; day 31, < 0.001; day 56, 0.031; see also Table Sa 5). Even when the actual number of webs is considered without correcting for the availability of space for building webs (Fig. 5b), there were from day 8 on more webs on *Sarracenia* than in the rest of the plot. This effect became less strong at the end of the experiment, when insect attraction by *Sarracenia* is decreased (Fig. Sa 6; see also Fish and Hall 1978; Heard 1998).

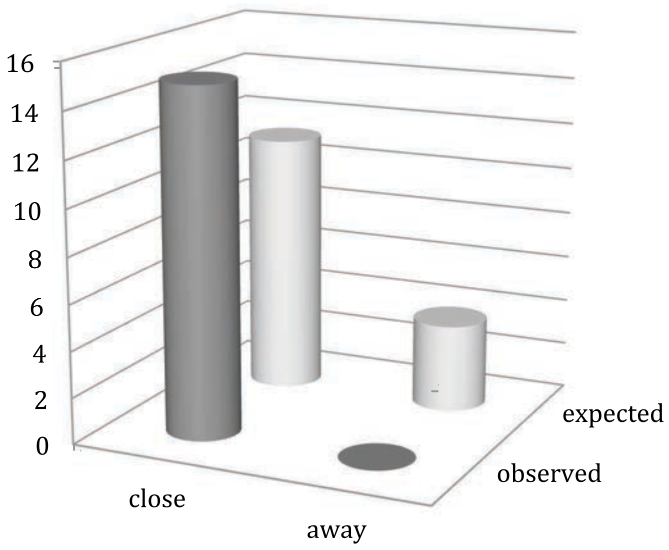

Fig. 4: Contrary to expectations of random distribution, webs in subplots without *Sarracenia* are always located close to subplots with *Sarracenia* (consequently, there were no webs in subplots more than one meter away from a *Sarracenia* clump; likelihood-ratio test, p-value = 0.004, see Table S3 for details).

Kleptoparasitism by Dolomedes and Sorex

Dolomedes fimbriatus were found regularly luring next or even inside *S. purpurea* pitchers for prey (see Fig. Sb 5-9). Adult *Dolomedes* spiders can climb in and out of the pitchers with ease, even when the pitchers are water filled. We observed some spiders removing big insect prey items from the pitchers. We observed only one adult *Dolomedes* spider drowned in a pitcher (see Fig. Sb 10), and one juvenile individual (Supplemental Material c), although their nests were sometimes located surrounded by *S. purpurea* clumps (Fig. Sb 11).

In the Site of Les Tenasses, the shrew *Sorex minutus* was observed diving headfirst into *S. purpurea* pitchers and feeding on prey items directly in the pitcher (Zander, personal observation).

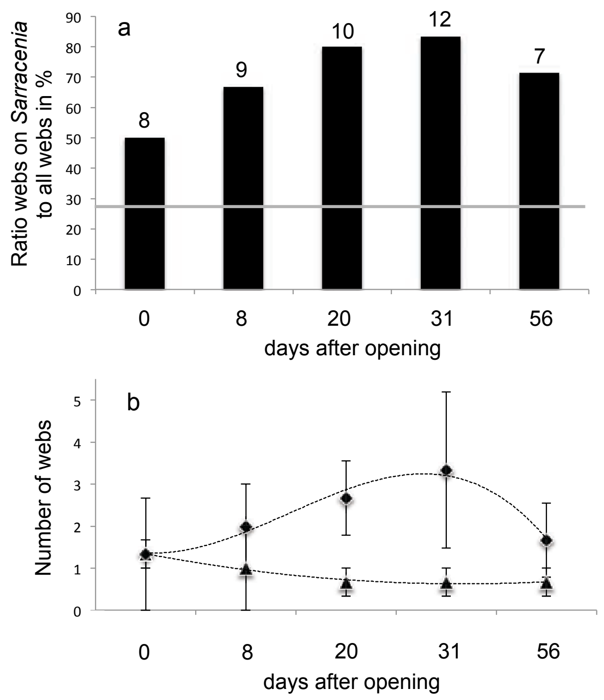

Fig. 5a: Ratio of webs directly on *Sarracenia* plants over webs not on *Sarracenia* (measured for plots with Sarracenia only), followed over time since the estimated date of leaf opening. Total number of webs in the plots at that day is given on top of the bars. The line shows the expected ratio assuming a random distribution of the webs. Likelihood ratio tests for each sampling day showed significantly more webs in Sarracenia subplots, except for day 0 (sequential Bonferroni corrected p-values: day 0, 0.42; day 8, 0.022; day 20, < 0.001; day 31, < 0.001; day 56, 0.031; see Table S 5 for details on statistics). **b:** Average number of webs on *Sarracenia* plants (diamond) compared to average number of webs elsewhere in the plots (triangles), over time (average and standard error). We observe an increase for webs on *Sarracenia*, except for the last sampling date, and a steady decrease for webs not on *Sarracenia*. Dotted lines (third order polynomial regressions) are added to guide the eye.

Prey of Sarracenia

During our prey survey in 2012 we found 229 prey items in the 35 sampled pitchers of the Champ Buet field site. More than 95% of them were insects (See Fig. 6 and Supplemental Material c, Table S6); only 6 spiders from the families Salticidae, Pimoidae (*Pimoa*), Thomisidae (*Xysticus*) and Lycosidae (*Pardosa*), 2 mites and one mollusc were found in the pitchers. Note that no *Agelena* spider was found as prey of *S. purpurea.* The prey-numbers caught over time follow closely the distribution described by Heard (1998) (Fig. Sa 6, see also Fig. Sa 1-5). We collected 39 prey items two weeks after pitcher opening, 114 after three weeks, and 76 after five weeks.

Diptera were by far the most abundant prey order (135 individuals; see also Fig. 6) followed by Coleptera and Hymenoptera.

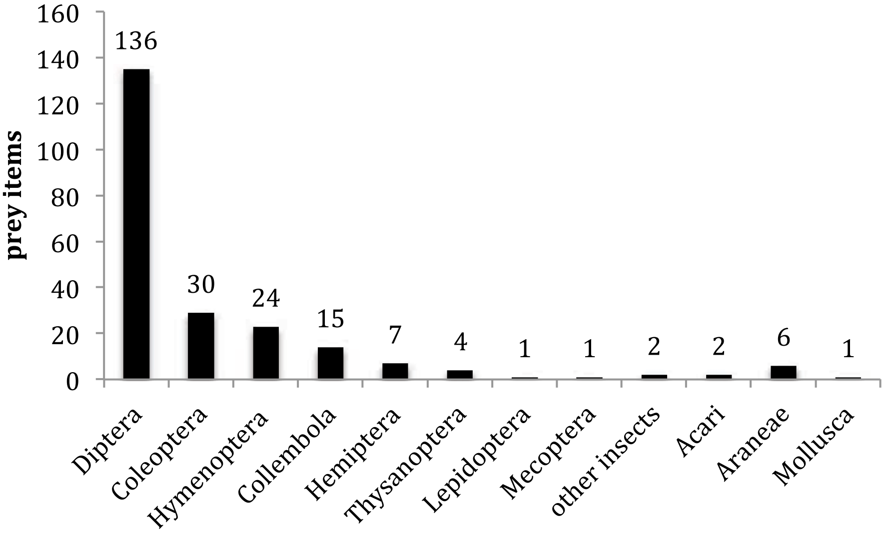

Fig. 6: *S. purpurea* prey of 35 pitchers in Champ Buet for the first 6 weeks after opening. Insects from the order Diptera are by far the most abundant prey items.

These result are consistent with studies from the natural range (Judd 1959; Cresswell 1991; Heard 1998; Newell and Nastase 1998; Wallen 2008) and show that insect-prey attraction mechanisms work worldwide. Also, for Europe, our data match the observations of Hartmeyer (1996), Adlassnig et al. (2010) and Fragnière (2012). Note that although the 35 pitchers had the same age, we observed a high variability in prey capture rates: 9 pitchers caught no prey, 15 up to ten, and the maximum was 26 prey items.

Discussion:

While the functional role of *S. purpurea* is that of a predator (Fig. 6; also see Supplemental Material c), it acts more as a facilitator than as a competitor for other predatory species. Our results indicate that individuals of *Agelena* are facilitated by the *S. purpurea* presence in terms of habitat modification (creating structure for building webs) and increased prey availability. It is commonly observed that introduced species can be beneficial to some types of local organisms while harming another ones. For example, the invasive zebra mussel *Dreissena polymorpha* is detrimental to several native species, but is also facilitating local arthropods through habitat creation by forming dense colonies, and acting as refuge (Bially and Macisaac 2000). Refuge creation by *S. purpurea* might also be important for *Dolomedes fimbriatus.* Furthermore, during the limited period of insect attraction by the plant's nectar production (Heard 1998, Deppe et al. 2000, Bennett and Ellison 2009), *Agelena*, *Dolomedes* and *Sorex* are facilitated by increased prey availability (trophic subsidy, see Rodriguez 2006). Since these species were never or rarely (2 specimens of *Dolomedes*) found as prey in pitchers, our results confirm the facilitative role of *S. purpurea* for *Agelena* spiders, and to a lower extent for *Dolomedes* spiders.

In the *Agelena* experiment, we found the facilitation effect to act at different spatial scales. More webs were found in plots with *S. purpurea*; inside plots with *S. purpurea*, we observe a positive relationship between plant and spider abundances; finally, webs were not randomly distributed, but placed either directly on or in close vicinity of the plants. This positive effect on *Agelena* densities did not change the territorial behaviour of the spiders, and we never found two webs on the same *S. purpurea* clump (see also Fasola and Mogavero 1995). Although *S. purpurea* facilitates *Agelena* spiders in two ways, firstly by providing suitable structure for web building, and secondly by increasing prey availability, our results show that the latter factor is of key importance. The increased prey availability is due to nectar induced insect attraction of *S. purpurea* (Deppe et al. 2000; see also Fig. Sb 14), which occurs only during a short time frame (Heard 1998). We found the abundance of *Agelena*-webs rising and falling proportionally to the magnitude of the observed insect attraction pattern of *S. purpurea* over time, giving support to the increased prey availability being the main factor for the facilitative effect. Our results also provide indication of a global rearrangement of spider web distribution in the field site driven by *S. purpurea* pitcher phenology. *Agelena* spiders are attracted from the surrounding environment towards the *S. purpurea* clumps when insect attraction levels are high, and disperse back to the bog after insect attraction ceased.

To our knowledge this is the first time that this behaviour of *Agelena* was shown in Europe. Note that we found no other sites in Switzerland where funnel spiders co-occur with *S. purpurea*; this is because the other locations all are at higher altitudes, where climatic conditions are unfavourable for *Agelena* spiders, which occur only in warm habitats. Most interestingly however, the genus *Agelena* occurs only in the Old World, while the genus of *Sarracenia* originates from North America. The very similar spider genus of *Agelenopsis* occurs in North America, and these spiders were already observed building funnel-webs that use *S. purpurea* pitchers as retreat and even storage room for prey (Milne 2012). Yet, these American species coexisted at least since the last glaciation, while the interaction of *Agelena* sp. with *S. purpurea*, including the described behavioural change in the hunting activities, can only have had developed during the last 65 years in Champ Buet. From the literature, other spider-pitcher interactions are known. For example, in South East Asia, the spider *Misumenopsis nepenthicola* is known to capture prey inside the pitcher leaves of *Nepenthes gracilis* (Chua and Lim 2012), a behaviour similar to our observations of *Dolomedes fimbriatus*. Common garden experiments with *Agelena* and *Dolemedes* individuals from different sites could reveal if these behaviours are local adaptions.

Our prey survey indicates that *S. purpurea* has a negative impact on the local arthropod community in the bog of Champ Buet. When we extrapolate the number of prey items caught by 35 pitchers to the total amount of pitchers in the site, as a gross estimate 7000 prey items are captured within six weeks. While the main strategy of insect attraction is by nectar production, we observed some pitchers to develop a fetid smell due to a large amount of decaying insects. This lead to the conspicuous attraction of a large number of necrotroph insects like Calliphoridae sp. and *Necrophorus vespilloides* (Adlassnig et al. 2010). However, if too numerous, the decaying prey can even be detrimental to the plant (Adlassnig et al. 2010): we also observed some pitcher leaves full of insects decaying with their prey (personal observation).

Our study describes a remarkable case of facilitation by an introduced plant for a local predator. This result raises interesting ecological questions about the possible benefits for *S. purpurea*. For example, spiders may protect the plant against herbivore attacks from orthopterans or even Stylommatophora (Bruggisser et al.

2012), or prevent overfilling of the leaves and their subsequent negative effects. Also, as mentioned above, the described behaviour between spiders and *S. purpurea* might lead to inherited changes, as is likely the case in the native range of the plant. Finally, such novel interactions with introduced plants may be of conservation importance for endangered species, like *Dolomedes fimbriatus* in our study site. These questions should be examined in further experiments evaluating the fitness consequences of these interactions.

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Chapter 2: Supplemental Material a

Title: "The American Friend": Distribution of native European spiders follows the prey attraction pattern of introduced carnivorous pitcher plants.

Authors: Axel Zander, Marie-Amélie Girardet and Louis-Félix Bersier

Content:

Supplemental Figure Sa1-Sa5	Time Series of special distribution of *Agelena* webs in plots with and without *Sarracenia purpurea*
Supplemental Figure Sa6.	Time Series of prey items captured by 35 *S. purpurea* pitchers at the site of Champ Buet
Supplemental Figure Sa7.	Interaction plot for the number of webs in plots with without *S. purpurea*
Supplemental Figure Sa8.	Correlation of *Agelena* webs with number of *S. purpurea* clumps.
Supplemental Figure Sa9.	Number of webs built directly on or not on *S. purpurea*
Supplemental Table S1a.	Results of generalized least square model for number of webs with respect to *S. purpurea* presence

Supplemental Table S1b.	Results of generalized least square model for number of webs with respect to *S. purpurea* presence for the two time frames D0-D8 and D20-D31
Supplemental Table S2.	Results of generalized least square model for number of webs with respect to to No. of *S. purpurea* clumps
Supplemental Table S3.	Results of likelihood ratio test for distribution of webs in subplots without *S. purpurea*
Supplemental Table S4.	Results of generalized least square model for number of webs directly “on” or “not on” *S. purpurea*
Supplemental Table S5.	Results of likelihood ratio test for No. of webs directly on or not on *S. purpurea* plants

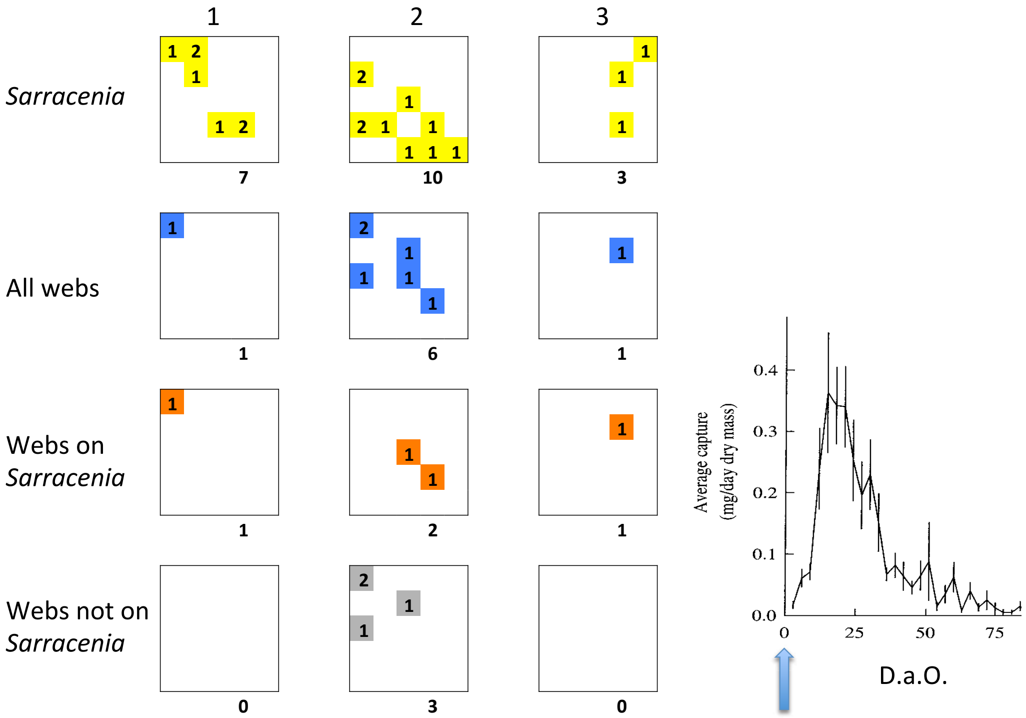

Fig. Sa 1: Spatial distribution of webs on 19th of May (day 0 of average date of pitcher opening) for plots with *S. purpurea.* The right panel shows the attractiveness of *Sarracenia* for arthropod prey as a function of days after opening [D.a.O](adapted from Heard 1998).

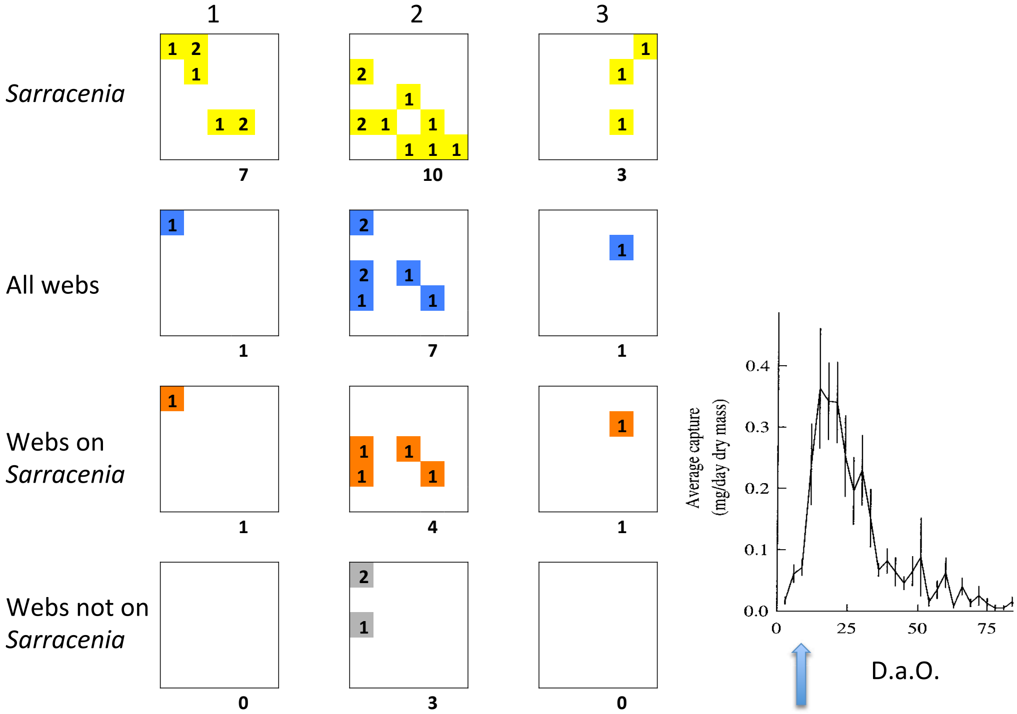

Fig. Sa 2: Spatial distribution of webs on 27th of May (day 8 of average pitcher opening) in plots with *S. purpurea*.

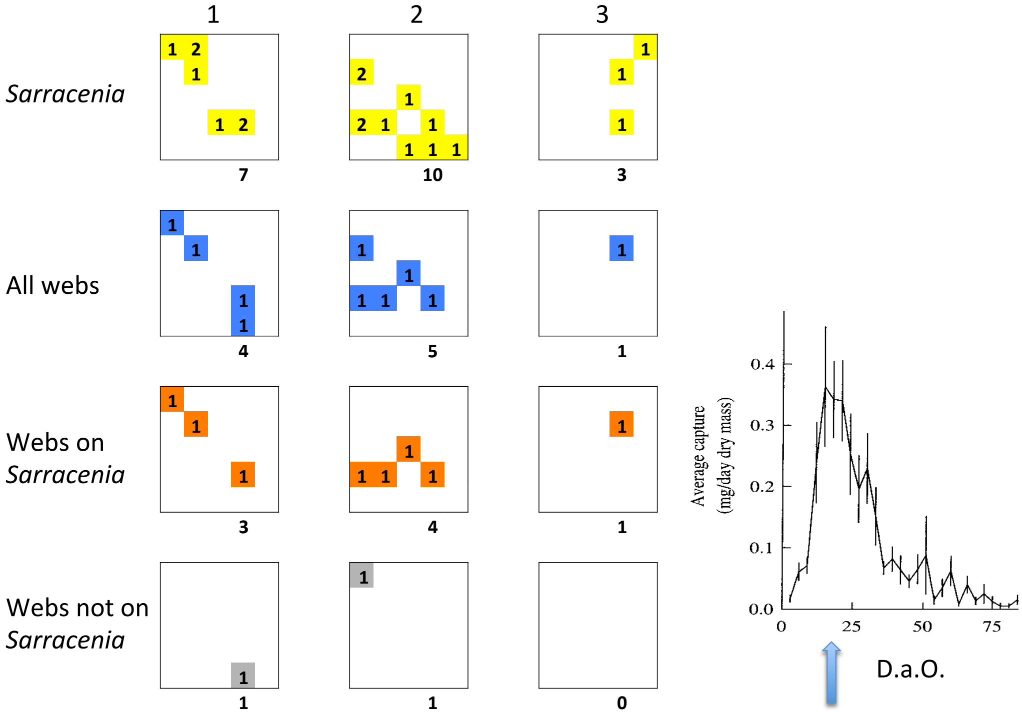

Fig. Sa 3: Spatial distribution of webs on 8th of June (day 20 of average pitcher opening) in plots with *S. purpurea*.

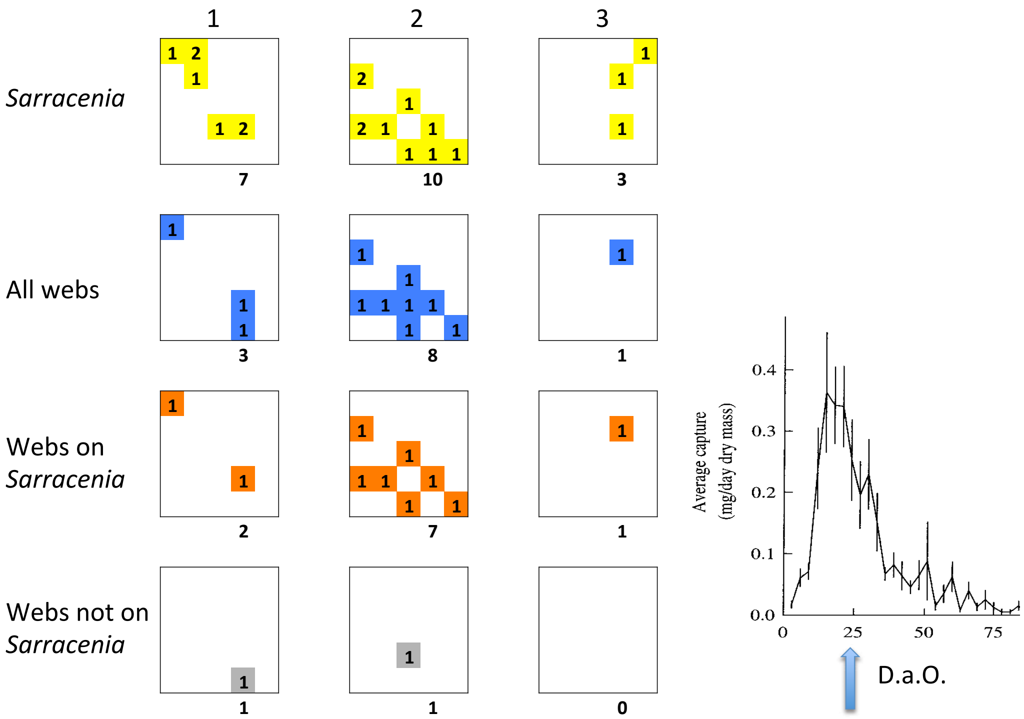

Fig. Sa 4: Spatial distribution of webs on 15th of June (day 27 of average pitcher opening) in plots with *S. purpurea*.

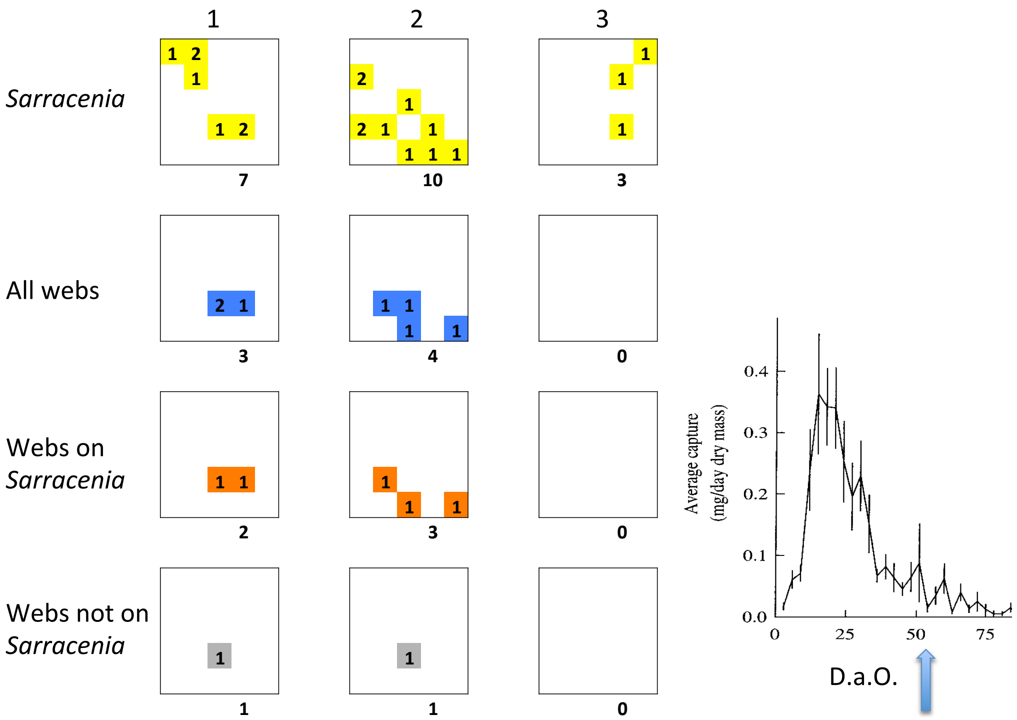

Fig. Sa 5: Spatial distribution of webs on 14th of July (day 56 of average pitcher opening) in plots with *S. purpurea*.

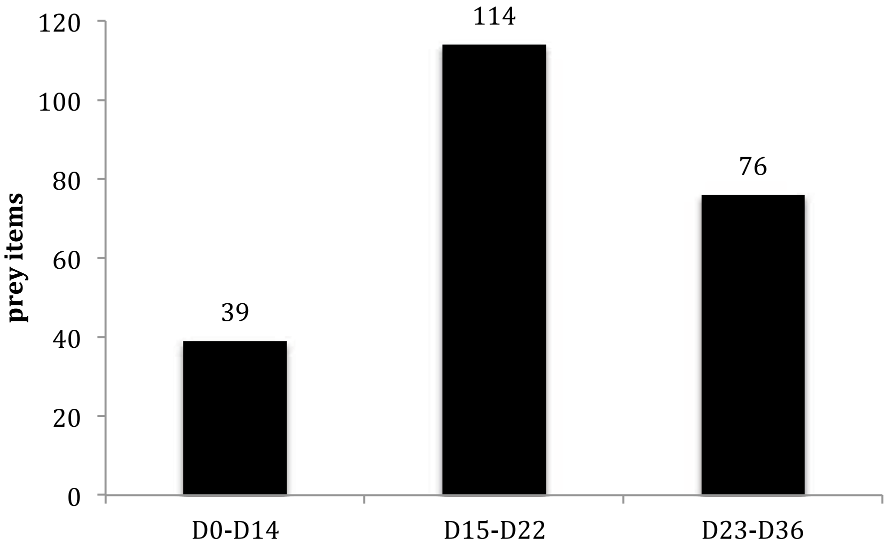

Fig. Sa 6: Number of prey items captured by 35 *S. purpurea* pitchers at the site of Champ Buet in the days 0-14, 15-22, and 23-36 after pitcher opening. Note that the middle bar represents a time range of only one week, while both others represent approximately two weeks.

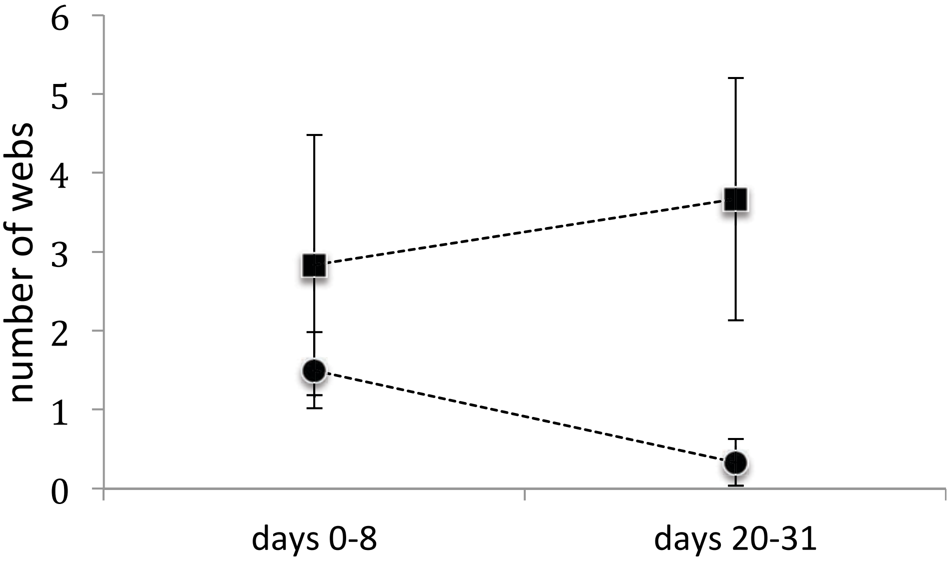

Fig. Sa 7: Interaction plot for the number of webs (average with standard error) in 25 m^2 plots with *S. purpurea* (squares) and without *S. purpurea* (circles), for day 0 and day 8 combined (days 0-8) and day 20 and day 31 combined (days 20-31); day 0 is the average date of pitcher opening. While in *S. purpurea* plots numbers of webs are raising over time, numbers of webs in non-*Sarracenia* plots decrease in the same time frame. For the late measurement period (day 20-31), numbers of webs are significantly different between Sarracenia and non-Sarracenia plots (Bonferroni corrected p-value = 0.026/ uncorrected = 0.01), while in the first measurement period (day0-8) no significant differences between the two categories can be detected (uncorrected p-value = 0.30). See table S1b for details.

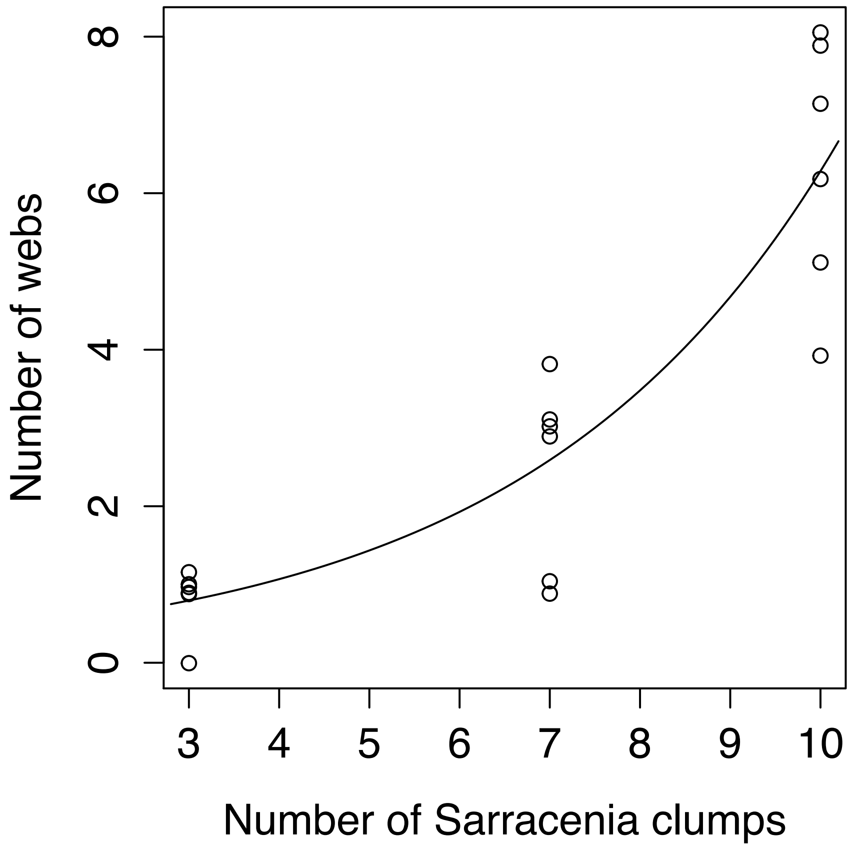

Fig. Sa 8: Number of webs (all time points combined) is positively correlated with number of *S. purpurea* clumps over time in the three plots with *S. purpurea* (generalized least squares model correcting for repeated measures with log-transformed number of webs; p-value < 0.001). See table S2 for details.

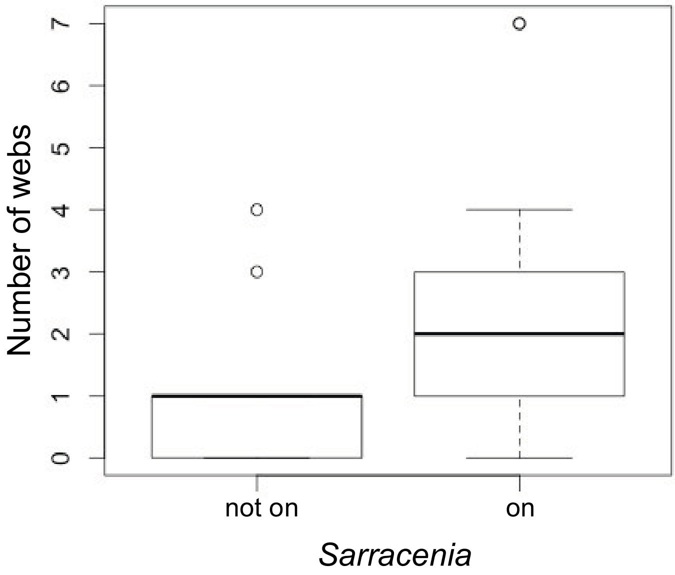

Fig. Sa 9: Number of webs built directly on *Sarracenia* plants compared to those in the same plots, but not built on *Sarracenia* plants. Data combined over all time points. There were significantly more webs on *Sarracenia* ("on") plants compared to webs elsewhere ("not on") in the plots (generalized least squares model with an auto-regressive correlation structure of order 1 for repeated measures; p-value < 0.001; see Table S4 for details of the analysis).

Table S1a: Results of generalized least square model (gls with AR1 correlation structure for repeated measures) for number of webs (log(No. of webs +1) with respect to *S. purpurea* presence (*S. pur* pres).

Coefficients	Value	Std. Error	t-value	p-value
(Intercept)	0.43	0.10	4.39	< 0.001
S. pur present	0.88	0.15	5.87	< 0.001

Table S1b: Results of generalized least square model for number of webs (No. webs) with respect to *S. purpurea* presence (*S. pur* pres) for the two time frames D0-D8 and D20-D31.

Coefficients	Value	Std. Error	t-value	p-value	Bonferroni corr. p-value
(Intercept)	1.5	0.34	4.39	0.014	
S. pur pres D0+D8	1.3	1.22	1.1	0.3	0.6
(Intercept)	0.3	0.21	1.58	0.14	
S. pur pres D20+D31	3.3	1.11	3.02	0.013	0.026

Table S2: Results of generalized least square model (gls with AR1 correlation structure for repeated measures) for number of webs (log(No. of webs +1) with respect to No. of *S. purpurea* clumps.

Coefficients	value	Std. Error	t-value	p-value
Intercept	-0.09	0.17	-0.05	0.62
No. of Sarr	0.2	0.02	8.45	< 0.001

Table S3: Likelihood ratio test for distribution of webs in subplots without S. *purpurea*. See also Fig. 4.

	close	away	G	Williams' correction	G_adj	p-value
observed	15	0	6.53	1.031	6.340	0.004
expected	11.21	3.79				

Table S4: Results of generalized least square model (gls with AR1 correlation structure for repeated measures) for number of webs "on" and "not on" *S. purpurea* (log(Nets on / off Sarr + 1) with respect to *S. purpurea* presence in the subplots.

Coefficients	Value	Std. Error	t-value	p-value
Intercept	0.49	0.09	5.69	0.001
On Sarracenia	0.64	0.13	5.09	0.006

Table S5: Likelihood ratio test for No. of webs directly on *S. purpurea* plants compared to No. of webs not on *S. purpurea* (f * ln (f / f expected) for each sampling day. See also Fig. 5a.

day	$f*\ln(f/f_{expected})$		G	Williams' correction	G_adj	Uncorrected p-value
0	3.407	-1.813	3.188	1.063	3.001	0.08
8	6.837	-2.576	8.521	1.056	8.073	0.004
20	10.574	-2.739	15.670	1.050	14.924	< 0.001
31	13.626	-3.104	21.044	1.042	20.203	< 0.001
56	6.042	-2.026	8.033	1.071	7.497	0.006

Note: Corrected p-values for multiple tests are given in the legend of Fig. 5a.

Chapter 2: Supplemental Material b

Title: “The American Friend”: Distribution of native European spiders follows the prey attraction pattern of introduced carnivorous pitcher plants.

Authors: Axel Zander, Marie-Amélie Girardet and Louis-Félix Bersier

Fig. Sb 1: *Agelena* web with funnel in between the pitchers of *S. purpurea*.

Fig. Sb 2a: *Agelena* web funneling inside a pitcher (tip mowed of)

Fig. Sb 2b: *Agelena* spider retreating deeper in the same pitcher.

Fig. Sb 3a: Specimen of *Agelena sp.*

Fig. Sb 3b: Specimen of *Agelena sp.* in its web.

Fig. Sb 4a: 5x5m plot without Sarracenia.

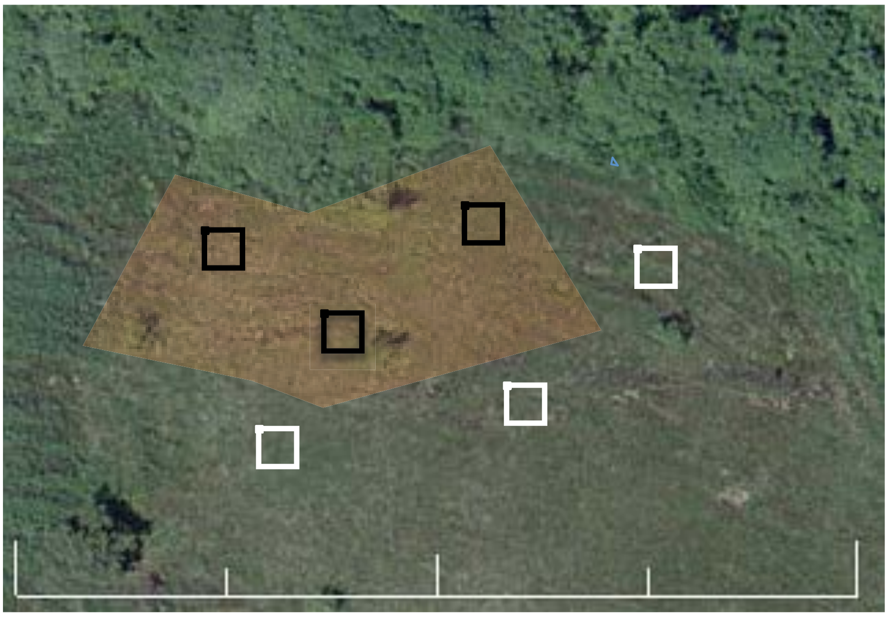

Fig. Sb 4b: Satellite image of distribution of the 5x5m plots in Champ Buet: Black squares represent plots with *S. purpurea*. White squares represent plots without. Minimum distance between the plots was at least 10m. Orange highlighted zone is where *S. purpurea* plants are present. On top of the picture one can see the forest that marks the border of the bog. Scale represents a total of 100m. Image-Source: Swisstopo.

Fig. Sb 5: *Dolomedes fimbriatus* in mowed pitcher.

Fig. Sb 6: *Dolomedes fimbriatus* retreating into a pitcher.

Fig. Sb 7: *Dolomedes fimbriatus* with egg sack hiding in a pitcher.

Fig. Sb 8: *Dolomedes fimbriatus* hiding in pitcher, luring for prey.

Fig. Sb 9: Size comparison of adult *Dolomedes fimbriatus* with a pencil.

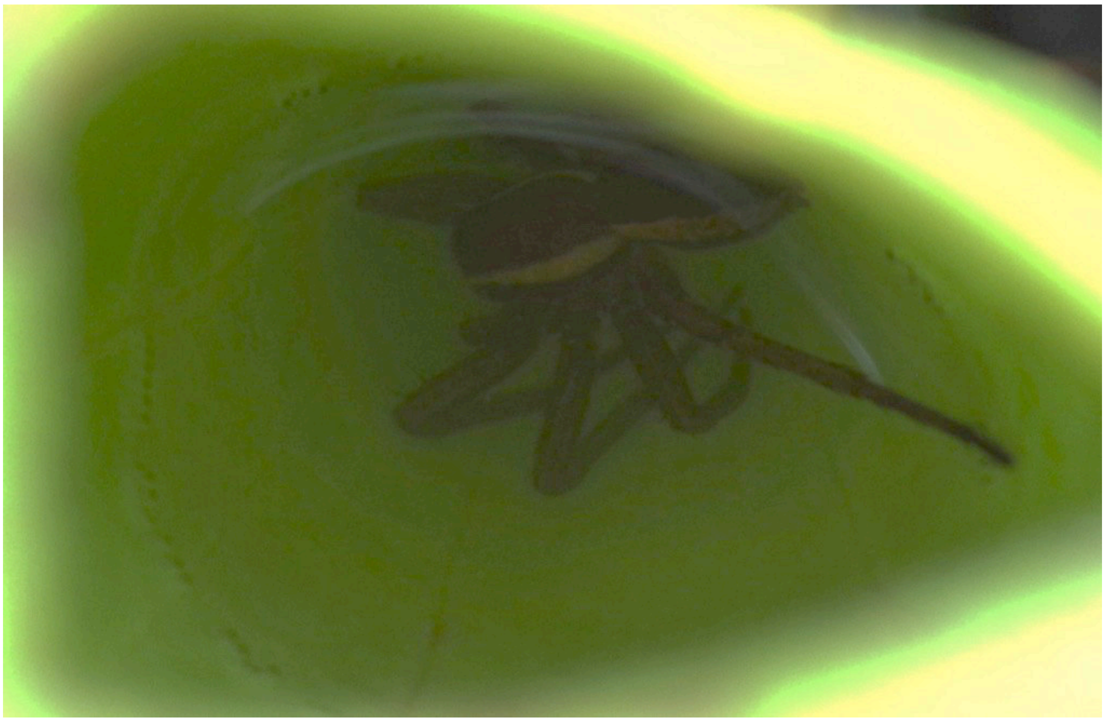

Fig. Sb 10: Drowned *Dolomedes fimbriatus* in *S. purpurea* pitcher. In our study we found only two dead *D. fimbriatus* spiders in the pitchers.

Fig. Sb 11: Nest of *Dolomedes fimbriatus* in a *S. purpurea* clump. Although the larvae are possible prey for the plant, they rarely seem to fall inside or can at least free themselves again. We observed only two drowned specimen of *D. fimbriatus* in the all examined pitchers.

Fig. Sb 12a: Sketch of the hunting technique of *Sorex minutus* like observed on the site of Les Tenasses. Note that this picture may not reflect reality in all details, as the scene was observed from a distance of ca. 3m (esp. the shrew). We observed *Sorex minutus* looking into several pitchers if suitable prey items had been caught and if so, it would dive headfirst in the pitcher fishing out the prey.

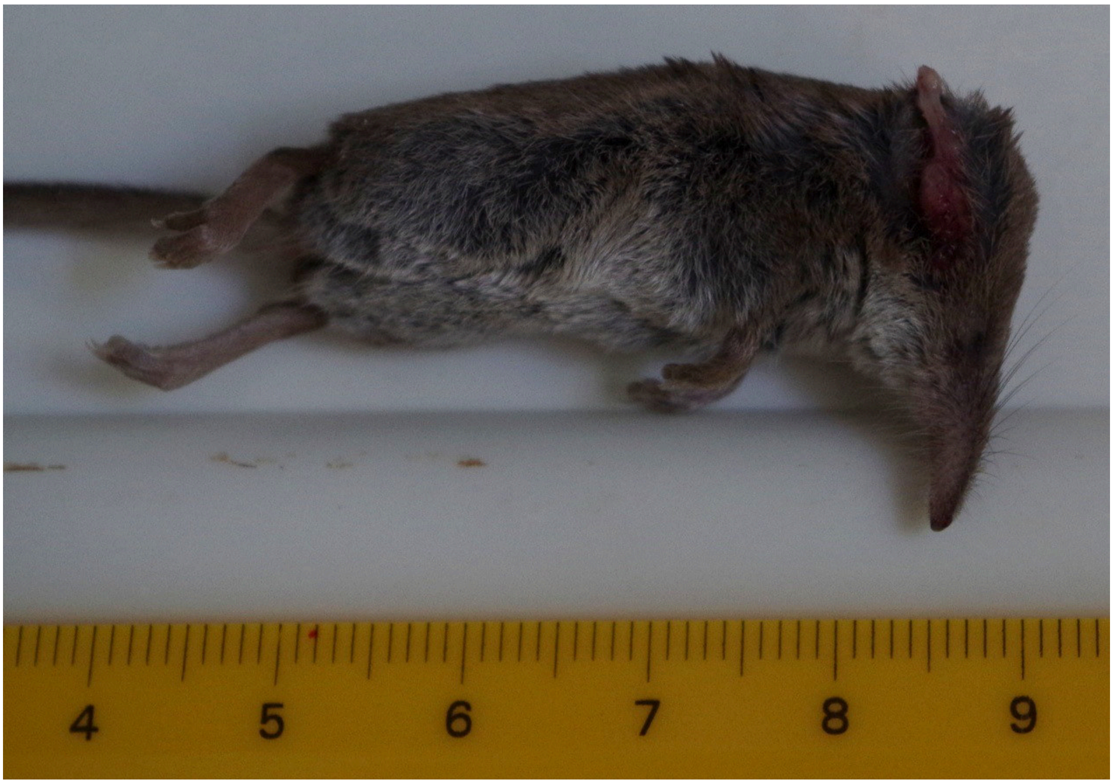

Fig. Sb 13a: Size comparison of a *Sorex minutus* specimen found dead at the site of Les Tenasses (Scale in cm).

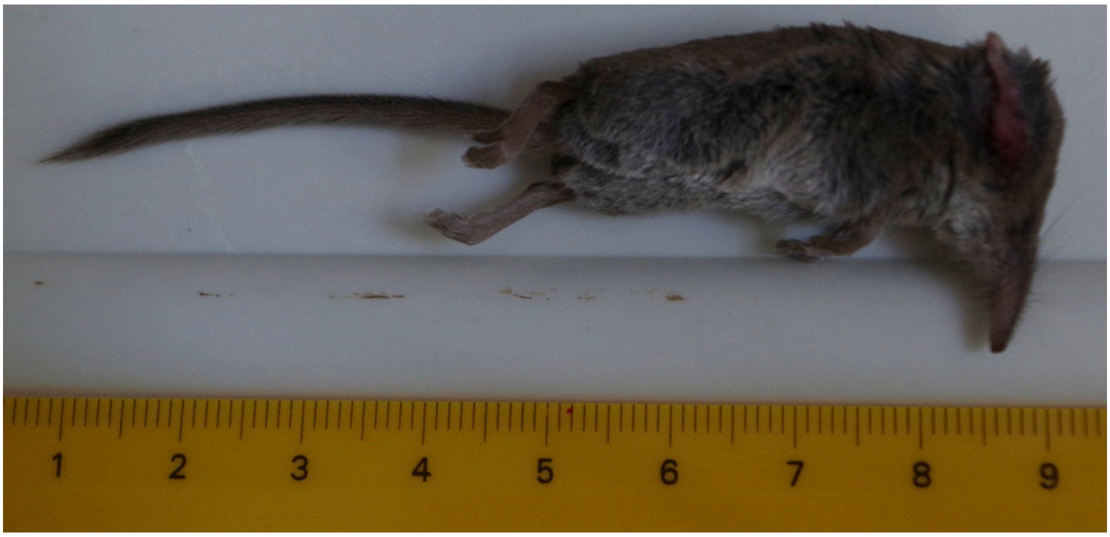

Fig. Sb 13b: Specimen of *Sorex minutus* snout to tail (Scale in cm).

Fig. Sb 14: Fly feeding on the nectar of a *S. purpurea* pitcher.

Chapter 2: Supplemental Material c Table S6

Axel Zander, Marie-Amélie Girardet and Louis-Félix Bersier

"The American friend": Distribution of native European spiders follows the prey attraction pattern of introduced carnivorous pitcher plants.

date	days		Prey			
of collection	after opening	pitcher ID	order	family	genus	Species or remarks
26.07.12	14	CB1	Diptera	Dolichopodidae	cf. *Dolichopoda*	
26.07.12	14	CB1	Diptera	Scatophagidae	?	
26.07.12	14	CB2	Hymenoptera	Ichneumonidae	?	
26.07.12	14	CB2	Diptera	cf. Phoridae	?	
26.07.12	14	CB2	Diptera	?	?	
26.07.12	14	CB2	Hymenoptera	?	?	
26.07.12	14	CB2	Hemiptera	?	?	larva
26.07.12	14	CB2	Lepidoptera	?	?	larva
26.07.12	14	CB2	Coleoptera	cf. Meloidae	?	
26.07.12	14	CB2	Diptera	?	?	
26.07.12	14	CB3	Coleoptera	?	?	just pieces
26.07.12	14	CB3	Coleoptera	Staphylinidae	?	
26.07.12	14	CB3	Coleoptera	?	?	just pieces
26.07.12	14	CB3	Diptera	Sciaridae	?	
26.07.12	14	CB3	Diptera	Sciaridae	?	
26.07.12	14	CB3	Diptera	Chironomidae	?	
26.07.12	14	CB5	Araneida	?	?	
26.07.12	14	CB15	Diptera	?	?	
26.07.12	14	CB15	Diptera	Ceratopogonida	?	
26.07.12	14	CB15	Diptera	Ceratopogonida	?	
26.07.12	14	CB21	Hymenoptera	Formicidae	*Formica*	
26.07.12	14	CB21	Diptera	Sciaridae	?	
26.07.12	14	CB26	Diptera	?	?	
26.07.12	14	CB26	Diptera	cf. Syrphidae	?	
26.07.12	14	CB29	Coleoptera	Coccinellidae	*Propylaea*	*quatuordecimpunctata*
26.07.12	14	CB29	Coleoptera	Chrysomelidae	*Lythraria*	
26.07.12	14	CB29	Diptera	Acroceridae	?	
26.07.12	14	CB29	Hymenoptera	Formicidae	?	just pieces
26.07.12	14	CB29	Diptera	Sciaridae	?	
26.07.12	14	CB30	Araneida	Lycosidae	*Pardosa*	cf. female
26.07.12	14	CB31	Diptera	Sciaridae	?	
26.07.12	14	CB31	Hymenoptera	Formicidae	*Formica*	
26.07.12	14	CB31	Hymenoptera	Formicidae	*Formica*	
26.07.12	14	CB31	Hymenoptera	Formicidae	*Formica*	
26.07.12	14	CB31	Coleoptera	Staphylinidae	?	
26.07.12	14	CB32	Hemiptera	?	?	larva
26.07.12	14	CB32	Diptera	Sciaridae	?	
26.07.12	14	CB34	Coleoptera	Staphylinidae	?	
26.07.12	14	CB34	Coleoptera	Chrysomelidae	*Lythraria*	
3.8.2012	22	CB2	Diptera	Syrphidae	*Helophilus*	cf. *pendulos*
3.8.2012	22	CB2	Diptera	Sepsidae	*Sepsis*	
3.8.2012	22	CB2	Coleoptera	Coccinellidae	*Propylaea*	
3.8.2012	22	CB2	Diptera	?	?	
3.8.2012	22	CB2	Coleoptera	?	?	just pieces
3.8.2012	22	CB4	Diptera	Sciaridae	*Sciara*	
3.8.2012	22	CB4	Diptera	Culicidae	?	
3.8.2012	22	CB4	Diptera	Sciaridae	*Sciara*	
3.8.2012	22	CB4	Coleoptera	Chrysomelidae	*Lythraria*	

3.8.2012	22	CB4	Hymenoptera	?	*?*	
3.8.2012	22	CB4	Diptera	Ephydridae	*?*	
3.8.2012	22	CB4	Diptera	Ephydridae	*?*	
3.8.2012	22	CB4	Diptera	Sepsidae	*?*	
3.8.2012	22	CB4	Diptera	Sepsidae	*?*	
3.8.2012	22	CB6	Diptera	Calliphoridae	*Lucilia*	ampullacea
3.8.2012	22	CB8	Diptera	Syrphidae	*Sericomyia*	
3.8.2012	22	CB8	Diptera	Calliphoridae	*Lucilia*	
3.8.2012	22	CB8	Diptera	Sarcophagidae	*Sarcophaga*	*rudis*
3.8.2012	22	CB8	Diptera	Ephydridae	*Scatella* sp.	
3.8.2012	22	CB11	Diptera	Cecidomyiidae	*?*	
3.8.2012	22	CB11	Diptera	Calliphoridae	*Lucilia*	
3.8.2012	22	CB11	Diptera	Sciaridae	*Sciara*	
3.8.2012	22	CB14	Diptera	Sciaridae	*Sciara*	
3.8.2012	22	CB14	Coleoptera	Chrysomelidae	*Lythraria*	
3.8.2012	22	CB14	Diptera	Calliphoridae	*?*	
3.8.2012	22	CB14	Diptera	Ephydridae	*Scatella sp.*	
3.8.2012	22	CB15	Diptera	Muscidae	*Mesembrina*	
3.8.2012	22	CB15	Diptera	Muscidae	*Mesembrina*	just pieces
3.8.2012	22	CB15	Diptera	Muscidae	*Mesembrina*	
3.8.2012	22	CB15	Diptera	Scatophagidae	*Scatophagia*	cf. *steroria*
3.8.2012	22	CB15	Diptera	Lonchaeidae	*?*	
3.8.2012	22	CB15	Diptera	Sciaridae	*Sciara*	
3.8.2012	22	CB15	Diptera	Sciaridae	*Sciara*	
3.8.2012	22	CB15	Diptera	Scatophagidae	*Reichertella*	
3.8.2012	22	CB15	Diptera	?	*?*	just pieces
3.8.2012	22	CB17	Diptera	Calliphoridae	*Lucilia*	
3.8.2012	22	CB17	Coleoptera	Silphidae	*Necrophorus*	
3.8.2012	22	CB17	Coleoptera	Silphidae	*Necrophorus*	
3.8.2012	22	CB17	Acaridae	?	*?*	
3.8.2012	22	CB17	Diptera	Calliphoridae	*Lucilia*	*ampullacea*
3.8.2012	22	CB17	Diptera	Syrphidae	*?*	
3.8.2012	22	CB17	Diptera	Sarcophagidae	*Sarcophaga*	
3.8.2012	22	CB17	Diptera	Fannidae	*?*	
3.8.2012	22	CB17	Diptera	Fannidae	*?*	just pieces
3.8.2012	22	CB17	Diptera	?	*?*	just pieces
3.8.2012	22	CB19	Diptera	Scatophagidae	*?*	
3.8.2012	22	CB21	Diptera	Cecidomyiidae	*?*	
3.8.2012	22	CB21	Diptera	Sarcophagidae	*Sarcophaga*	
3.8.2012	22	CB21	Heteroptera	Nabidae	*Himacerus*	
3.8.2012	22	CB21	Heteroptera	Nabidae	*Himacerus*	
3.8.2012	22	CB21	Hymenoptera	Formicidae	*Formica*	
3.8.2012	22	CB21	Hymenoptera	Formicidae	*Formica*	
3.8.2012	22	CB21	Hymenoptera	Formicidae	*Formica*	
3.8.2012	22	CB21	Coleoptera	?	*?*	
3.8.2012	22	CB21	Collembola	Poduridae	*Podura*	
3.8.2012	22	CB21	Diptera	Sciaridae	*Sciara*	
3.8.2012	22	CB21	Collembola	Sminthuridae	*Bourletiella ?*	
3.8.2012	22	CB21	Coleoptera	Chrysomelidae	*Lythraria*	
3.8.2012	22	CB21	Collembola	Tomoceridae	*Tomocerus*	
3.8.2012	22	CB21	Collembola	?	*?*	exuvia
3.8.2012	22	CB26	Coleoptera	Coccinellidae	*Anatis*	*ocellata*
3.8.2012	22	CB26	diptera	Sarcophagidae	*?*	
3.8.2012	22	CB26	Diptera	Sarcophagidae	*?*	

3.8.2012	22	CB26	Diptera	Phoridae	*Citrago*	
3.8.2012	22	CB26	Hymenoptera	Chrisidae	*?*	
3.8.2012	22	CB26	Diptera	Ephydridae	*?*	
3.8.2012	22	CB29	Coleoptera	Silphidae	*Necrophorus*	
3.8.2012	22	CB29	Diptera	Anisopodidae	*?*	only wings
3.8.2012	22	CB29	Diptera	?	*?*	larva
3.8.2012	22	CB29	Diptera	cf. Helomyzidae	*?*	just pieces
3.8.2012	22	CB30	Hymenoptera	Thenthrédoidae	*?*	
3.8.2012	22	CB30	Hymenoptera	Thenthrédoidae	*?*	
3.8.2012	22	CB30	Diptera	Calliphoridae	*Lucilia*	*ampullacea*
3.8.2012	22	CB30	Diptera	Sarcophagidae	*Sarcophaga*	
3.8.2012	22	CB30	Coleoptera	Carabidae	*Oodes*	*hilopioides*
3.8.2012	22	CB30	Diptera	Sarcophagidae	*Sarcophaga*	
3.8.2012	22	CB30	Coleoptera	Carabidae	*Oodes*	
3.8.2012	22	CB30	Diptera	Sciaridae	*Sciara*	
3.8.2012	22	CB30	Collembola	Sminthuridae	cf. *Bourletiella*	
3.8.2012	22	CB30	Coleoptera	Chrysomelidae	*Lythraria*	
3.8.2012	22	CB31	Diptera	Sciaridae	*Sciara*	
3.8.2012	22	CB31	Hymenoptera	Formicidae	*Formica*	
3.8.2012	22	CB31	Hymenoptera	Formicidae	*Formica*	
3.8.2012	22	CB31	Hymenoptera	Formicidae	*Formica*	
3.8.2012	22	CB31	Collembola	Poduridae	cf. *Podura*	
3.8.2012	22	CB31	Collembola	Poduridae	cf. *Podura*	
3.8.2012	22	CB31	Diptera	Chironomidae		
3.8.2012	22	CB31	Diptera	Sciaridae	*Sciara*	
3.8.2012	22	CB31	Coleoptera	Staphylinidae	*?*	
3.8.2012	22	CB33	Coleoptera	Chrysomelidae	*Lythraria*	just pieces
3.8.2012	22	CB33	Diptera	?	*?*	
3.8.2012	22	CB33	Diptera	Sciaridae	*?*	
3.8.2012	22	CB33	Diptera	Dixidae	*?*	
3.8.2012	22	CB34	Diptera	Chironomidae	*?*	
3.8.2012	22	CB34	Diptera	Tipulidae	*Nephrotoma*	
3.8.2012	22	CB34	Hymenoptera	Formicidae	*Myrmica*	
3.8.2012	22	CB34	Diptera	Bibionidae	*Bibio marci*	
3.8.2012	22	CB34	Coleoptera	Chrysomelidae	*Lythraria*	
3.8.2012	22	CB34	Diptera	Chironomidae	*?*	male
3.8.2012	22	CB34	Hymenoptera	Chalcidoidea	*?*	
3.8.2012	22	CB34	Collembola	Sminthuridae	cf. *Deuterosminthurus*	*bicindus*
3.8.2012	22	CB34	Diptera	cf. Sciaridae	*?*	
3.8.2012	22	CB34	cf. Diptera	?	*?*	
3.8.2012	22	CB35	Diptera	Calliphoridae	*Lucilia*	*ampullacea*
3.8.2012	22	CB35	Diptera	Sciaridae	*Sciara*	
3.8.2012	22	CB35	Diptera	Sarcophagidae	*Sarcophaga*	
3.8.2012	22	CB35	Heteroptera	Hymenoptera	*Ichneumonidae*	
3.8.2012	22	CB35	Diptera	?	*?*	just pieces
3.8.2012	22	CB35	Diptera	Sciaridae	*Sciara*	
3.8.2012	22	CB35	Diptera	Sciaridae	*Sciara*	
3.8.2012	22	CB35	Diptera	?	*?*	just pieces
3.8.2012	22	CB35	Diptera	?	*?*	just pieces
3.8.2012	22	CB35	Diptera	Chloropidae	*?*	
3.8.2012	22	CB35	Mecoptera	Panorpidae	*Panorpa*	
17.08.2012	36	CB6	Diptera	Sarcophagidae	*Sarcophaga*	male
17.08.2012	36	CB6	Diptera	?		larva
17.08.2012	36	CB7	Diptera	Calliphoridae	*Lucilia*	

17.08.2012	36	CB7	Diptera	cf. Sarcophagidae	*?*	just pieces
17.08.2012	36	CB7	Diptera	?	*?*	just pieces
17.08.2012	36	CB8	Diptera	Sarcophagidae	*?*	just pieces
17.08.2012	36	CB8	Diptera	Calliphoridae	*Lucilia*	just pieces
17.08.2012	36	CB8	Diptera	cf. Tipulidae	*Nephrotoma*	just pieces
17.08.2012	36	CB8	Collembola	Sminthuridae	cf. *Bourletiella*	
17.08.2012	36	CB8	Diptera	?	*?*	just pieces
17.08.2012	36	CB8	Insecta	?	*?*	just pieces
17.08.2012	36	CB8	Diptera	cf. Phoridae	*?*	wings only
17.08.2012	36	CB10	Heteroptera	Nabidae	*Nabis*	*rugosa*
17.08.2012	36	CB12	Diptera	Sciaridae	*Sciara*	
17.08.2012	36	CB12	Diptera	Sciaridae	*Sciara*	
17.08.2012	36	CB12	Thysanoptera	?	*?*	
17.08.2012	36	CB12	Diptera	Sciaridae	*Sciara*	
17.08.2012	36	CB12	Diptera	Scatopsidae	*Reichertella*	
17.08.2012	36	CB12	Diptera	Sciaridae	*Sciara*	
17.08.2012	36	CB12	Diptera	Sciaridae	*Sciara*	
17.08.2012	36	CB12	Diptera	Sciaridae	*Sciara*	
17.08.2012	36	CB12	Diptera	Sciaridae	*Sciara*	
17.08.2012	36	CB12	Diptera	Sciaridae	*Sciara*	
17.08.2012	36	CB12	Diptera	Sciaridae	*Sciara*	
17.08.2012	36	CB12	Diptera	Phoridae	*?*	
17.08.2012	36	CB12	Collembola	Isotomidae	*?*	
17.08.2012	36	CB12	Diptera	Scatopsidae	*Reichertella*	
17.08.2012	36	CB12	Diptera	Scatopsidae	*Reichertella*	
17.08.2012	36	CB12	Diptera	Scatopsidae	*Reichertella*	
17.08.2012	36	CB12	Diptera	Scatopsidae	*Reichertella*	
17.08.2012	36	CB12	Diptera	Scatopsidae	*Reichertella*	
17.08.2012	36	CB12	Diptera	Scatopsidae	*Reichertella*	
17.08.2012	36	CB12	Diptera	Scatopsidae	*Reichertella*	
17.08.2012	36	CB12	Thysanoptera	?	*?*	
17.08.2012	36	CB12	Diptera	Chironomidae	cf. *Ablablesmyia*	
17.08.2012	36	CB12	Diptera	?	*?*	
17.08.2012	36	CB12	Hemiptera	?	*?*	larva
17.08.2012	36	CB12	Thysanoptera	?	*?*	
17.08.2012	36	CB12	Thysanoptera	?	*?*	
17.08.2012	36	CB13	Diptera	cf. Cecidomyiidae	*?*	just pieces
17.08.2012	36	CB14	Diptera	Sarcophagidae	*Sarcophaga*	
17.08.2012	36	CB14	Diptera	Lauxaniidae	*?*	
17.08.2012	36	CB15	Diptera	Cécidomyiidae	*?*	
17.08.2012	36	CB17	Coleoptera	Histeridae	*Pachylister*	
17.08.2012	36	CB21	Mollusca	Zonitidae	cf. *Zonit*	
17.08.2012	36	CB21	Insecta	?	*?*	just pieces
17.08.2012	36	CB24	Collembola	Sminthuridae	cf. *Bourletiella*	
17.08.2012	36	CB24	Araneae	Thomisidae	*Xysticus*	
17.08.2012	36	CB24	Diptera	Heleomyzidae	*?*	
17.08.2012	36	CB29	Acari	?	*?*	
17.08.2012	36	CB29	Diptera	Sciaridae	*Sciara*	
17.08.2012	36	CB29	Diptera	Sciaridae	*Sciara*	
17.08.2012	36	CB29	Collembola	Sminthuridae	cf. *Bourletiella*	
17.08.2012	36	CB29	Collembola	Sminthuridae	cf. *Bourletiella*	
17.08.2012	36	CB29	Diptera	?	*?*	just pieces
17.08.2012	36	CB30	Collembola	Sminthuridae	cf. *Bourletiella*	just pieces
17.08.2012	36	CB30	Coleoptera	Histeridae	Margaronidae	

17.08.2012	36	CB30	Araneae	Pimoidae	*Pimoa*	male
17.08.2012	36	CB30	Diptera	?	*?*	just pieces
17.08.2012	36	CB30	Diptera	Heleomyzidae	*?*	wings only
17.08.2012	36	CB30	Diptera	Scatopsidae	*Reichertella*	
17.08.2012	36	CB30	Diptera	?	*?*	
17.08.2012	36	CB32	Hymenoptera	Formicidae	*Myrmica*	
17.08.2012	36	CB32	Coleoptera	Lampyridae	*Lampyris*	*noctiluca*, female
17.08.2012	36	CB32	Coleoptera larvae	Lampyridae	*Lampyris*	*noctiluca*, female
17.08.2012	36	CB32	Araneae	?	*?*	
17.08.2012	36	CB32	Hymenoptera	Formicidae	*?*	
17.08.2012	36	CB32	Hymenoptera	Formicidae	*?*	
17.08.2012	36	CB33	Coleoptera larvae	Lampyridae	*Lampyris*	*noctiluca*
17.08.2012	36	CB34	Araneae	cf. Salticidae	*?*	
17.08.2012	36	CB34	Hymenoptera	Formicidae	*?*	
17.08.2012	36	CB34	Diptera	cf. Culicidae	*?*	
17.08.2012	36	CB35	Diptera	cf. Asilidae		
17.08.2012	36	CB35	Hymenoptera	Scelionidae	*cf. Trimorus*	
17.08.2012	36	CB35	Diptera	?	*?*	just pieces
17.08.2012	36	CB35	Collembola	cf. Poduridae	*?*	

Top predators affect the composition of naive protist communities, but only in their early-successional stage

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Abstract Introduced top predators have the potential to disrupt community dynamics when prey species are naive to predation. The impact of introduced predators may also vary depending on the stage of community development. Early-succession communities are likely to have small-bodied and fast-growing species, but are not necessarily good at defending against predators. In contrast, late-succession communities are typically composed of larger-bodied species that are more predator resistant relative to small-bodied species. Yet, these aspects are greatly neglected in invasion studies. We therefore tested the effect of top predator presence on early- and late-succession communities that were either naive or non-naive to top predators. We used the aquatic community held within the leaves of *Sarracenia purpurea.* In North America, communities have experienced the *S. purpurea* top predator and are therefore non-naive. In Europe, this predator is not present and its niche has not been filled, making these communities top-predator naive. We collected early- and late-succession communities from two non-naive and two naive sites, which are climatically similar. We then conducted a common-garden experiment, with and without the presence of the top predator, in which we recorded changes in community composition, body size spectra, bacterial density, and respiration. We found that the top predator had no statistical effect on global measures of community structure and functioning. However, it significantly altered protist composition, but only in naive, early-succession communities, highlighting that the state of community development is important for understanding the impact of invasion.

Keywords Aquatic top predators · Naive prey · Succession · Invasion · *Sarracenia purpurea*

Introduction

Top predators are known to have major impacts on community structure in both aquatic and terrestrial systems (Gurevitch and Padilla 2004; Salo et al. 2007; Estes et al. 2011) and are important for community dynamics (e.g., Hunter and Price 1992; Kneitel and Miller 2002) and ecosystem functioning (Hairston et al. 1960; Carpenter et al. 1985). Recently, with the increase in the movement of species around the world due to human transport, predators are being introduced to novel communities and are having a major effect (Gurevitch and Padilla 2004; Salo et al. 2007). This phenomenon has opened a new research path that tests whether novel predators have larger effects on invaded communities than on their native community. This prediction is based on the absence of shared evolutionary history between the predator and prey in the invaded communities [naive prey hypothesis (Elton 1958; Diamond and Case 1986; Cox and Lima 2006; Freeman and Byers 2006)] and support for this hypothesis has been demonstrated recently by Paolucci et al. (2013). In Paolucci et al.'s (2013) meta-analysis, alien predators had a 2.4 times stronger negative effect on prey compared to native predators, with similar effect sizes for herbivores and carnivores and for terrestrial and aquatic ecosystems (Paolucci et al. 2013; but see also Salo et al. 2007). The strong effects found by Paolucci et al. (2013) are illustrated by the well-known introduction of the brown tree snake (*Boiga irregularis*) to Guam (Savidge 1984, 1987; Wiles et al. 2003; Sih et al. 2010), where 90 % of the local bird species were exterminated. Of the six bird species that were least affected by the snake, four were introduced to Guam and had co-evolved with snake predators, and the other two occupy different habitats than the snake (Wiles et al. 2003).

The differential effect of introduced predators on naive vs. non-naive (i.e., co-evolved with a predator type similar to the introduced predator) communities has also been found in Australia, where introduced predators have a larger effect on communities than native predators (Salo et al. 2007). For island communities in general, the effects of novel predators are found to be particularly severe compared to on the mainland (Courchamp et al. 2003, but see Paolucci et al. 2013). This island concept can also apply to enclosed freshwater ecosystems, which are typically limited in size and isolated from other aquatic habitats. It is of little surprise then that examples exist where introduced aquatic predators strongly impact local communities [e.g., the Nile perch *Lates* spp. (Goldschmidt et al. 1993), the rainbow trout *Oncorhynchus mykiss* (Baxter et al. 2004), or the zander *Sander lucioperca* (Manchester and Bullock 2000)].

Despite the potentially large impact of novel predators on naive communities, few studies have addressed this question (Dickman 1996; Bruno et al. 2005; Cox and Lima 2006; Rodriguez 2006). Lowry et al. (2013) showed that less than 10 % of the research conducted on invasive species has focused on top predator invaders, and a majority of this research was conducted in terrestrial systems. Additionally, most of these studies used field observations and not experiments. Consequently, there is a major need to experimentally test the effect that top predators have on naive prey communities. This question is particularly relevant in freshwater systems (e.g., lakes, ponds), because barriers for the expansion of predators (e.g., waterfalls, terrestrial environment) occur more often in such systems and increase the likelihood that if novel predators are introduced, they will encounter naive prey communities (Moyle 1986; Cox and Lima 2006). Further, these systems are usually top-down controlled (e.g., Shurin et al. 2002), thus an invasion by a top predator is likely to have strong negative effects.

Aside from the naivety status, another aspect known to affect invasion success of a species is the successional stage of the host community (Connell and Slatyer 1977; Fabian et al. 2012; Oakley and Knox 2013). The organization of early-succession communities is difficult to predict due to idiosyncratic immigration events, but they are typically composed of small-bodied species with high dispersal and reproduction abilities (e.g., Odum 1969; del Moral and Wood 1993; Foster and Tilman 2000; Catford et al. 2012). Community structure changes through time because of the subsequent immigration of species with lower dispersal potential (Lortie et al. 2004), the addition of multiple trophic levels, and the biotic interactions within trophic levels (e.g., Odum 1969; Belyea and Lancaster 1999). This could lead to more predictable and stable communities, typical of late-succession (Clements 1916; but see Gleason 1926). Such communities are characterized by the presence of competitive large-bodied species (Sommer et al. 1986) that allocate more energy to exploit resources and for defense (Pianka 1970; Foster and Tilman 2000; Pomati et al. 2013). The transition between these states can be explained by the displacement of small-bodied species by larger and more competitive ones (e.g., Wootton 1993; Foster and Tilman 2000), and the preferential predation of abundant small-bodied species during early-succession (Sousa 1979; Wootton 1993; Hansson et al. 1998). Non-equilibrium dynamics are typically prevalent in early-succession compared to late-succession communities (Hutchinson 1961; Connell and Slatyer 1977; Rees et al. 2001) because of higher reproductive rates of early-succession species (Jiang et al. 2011) and stronger top-down control by predators (e.g., Schmitz et al. 2006). For predatory invaders, it is expected that they should benefit from the prevalence of small and fast-growing species that allocate more energy to reproductive output (offspring that are themselves easy prey) than to defense mechanisms (Pianka 1970; Walls et al. 1990). Thus, we hypothesize the impact of predation to be stronger in early- than in late-succession communities. In all, to understand the factors affecting the impact of an invasive predator, it is important to consider the possible combined effects between naivety status and successional stage of a community.

One reason for the lack of experiments addressing the effect of top predator invasion is that large-scale communities are complex, making the control of confounding factors challenging. Model systems of microorganisms can provide the tractability and high statistical power that is often difficult to obtain in larger-scale systems (Srivastava et al. 2004). The rainwater-filled leaves of *Sarracenia purpurea* is one such model system for aquatic communities (e.g., Miller and Kneitel 2005). This system shows the typical dynamics of larger aquatic food webs, but on small spatial and short time scales (e.g., Addicott 1974; Heard

1994; Kneitel and Miller 2002; Gotelli and Ellison 2006; Gray et al. 2006; Hoekman 2007). Whole communities can be easily sampled and used in experiments both in the field and in the laboratory. In *S. purpurea*'s native range in North America, insects fall and drown in the trapped rainwater. Bacteria and yeast colonize the system, decompose the insects, and liberate nutrients for the plant. A variety of protists and a rotifer species also colonize this community and consume the bacteria. These species come from a larger pool of species that are present in the local habitat (e.g., Bledzki and Ellison 2003). The highest trophic level is composed of the larvae of the endemic pitcher plant mosquito, *Wyeomyia smithii*, which feed on the protists and rotifers. Numerous studies using the *S. purpurea* model system have been conducted in the native range of North America (e.g., Addicott 1974; Bradshaw and Holzapfel 2001; Kneitel and Miller 2002; Gotelli and Ellison 2006; Miller and terHorst 2012).

S. purpurea has been introduced by seed into Europe and therefore lacks its native resident aquatic community. In Switzerland, it was planted in several locations in the Jura Mountains and Alpine regions in the late nineteenth century (Correvon 1947), and in several sites at lower elevations in the 1950s (Parisod et al. 2005). This introduction has allowed for the development of parallel aquatic communities in North America and Europe, but with different evolutionary histories. In Europe, where the inquiline communities have had a shorter time period to adapt to the environment of the *S. purpurea* leaves and develop shared evolutionary trajectories, evidence has shown that there may be a larger number of protist species present than in North America [51 protist morphospecies plus 17 species of coccal green algae inside *S. purpurea* leaves in a single site in Germany (Gebühr et al. 2006) versus 48 morphospecies found across North America by Buckley et al. (2010)]. The species composition of the inquiline *S. purpurea* community across Europe may also be more heterogeneous than in North America since we found little overlap in composition with Gebühr et al. (2006) in our study involving only first-year pitchers. Most importantly, the *W. smithii* larvae of the *S. purpurea* system have experienced the inquiline prey community in North America for at least 10,000 years. On the contrary, the communities that developed in Europe have never experienced *W. smithii* as a top predator, and very likely have never experienced any insect top predator in the leaf (Gebühr et al. 2006; Fragnière 2012), making them top-predator-naive communities. This island-like freshwater system is therefore ideal for addressing questions about the effects of novel predators on natural, naive aquatic communities.

Here, we conducted a full-factorial common-garden experiment where we manipulated the presence/absence of the *W. smithii* top predator in natural communities (protists and bacteria) that did or did not share a habitat with the top predator and thus did or did not adapt avoidance or tolerance mechanisms against *W. smithii*. The non-naive communities come from two sites in Québec (Canada) and the naive ones come from two sites in Switzerland. Sites were chosen to match in climatic conditions and day length (similar latitude). Additionally, we tested the effect of the predator on early- and late-successional communities. First, we hypothesized that the predator-induced change in protist species composition should be stronger for naive communities because the species within *S. purpurea* leaves have not experienced *W. smithii* predation [naive prey hypothesis (Elton 1958; Diamond and Case 1986; Cox and Lima 2006; Freeman and Byers 2006)]. Second, early-succession communities, whose composition is typically dominated by small-bodied species allocating more energy to reproduction, should be more affected than late-succession communities that have been structured by predation and competition events (Clements 1916; Odum 1969; Kuno 1987; Louette et al. 2008; Kadowaki et al. 2012). Third, independent of community origin, the distribution of body size within a community should change due to preferential predation (Sommer et al. 1986; Wootton 1993; Hansson et al. 1998). Fourth, the effect of the top predator should cascade down to the bacterial trophic level because the bacteria will be released from the predation pressure of the protists (Kneitel and Miller 2002), an effect predicted to be strongest in early-succession and naive communities. Fifth, as a corollary, ecosystem functioning—measured as global respiration—should be highest in naive, early-succession communities because of a trophic cascade in the presence of a top predator [assuming that bacteria dominate in respiration (e.g., Simon et al. 1992; Gebühr et al. 2006)].

Materials and methods

We conducted a common-garden full-factorial experiment using communities from four sites, two successional stages per site, and two predator treatments (present = two third-instar mosquito larvae, or absent = no mosquito larvae). Each treatment was replicated four times for a total of 64 samples. We selected four climatically similar sites with regard to average July temperatures (averaged across 50 years, Worldclim data; www.worldclim.org). The sites also matched in day length due to their similar latitudes. Two of these sites were in the native range of *S. purpurea* in Québec (Lac des Joncs, 48°29′61.00″N, 68°77′15.55″W; Lac Rimouski, 48°18′32.71″N, 68°28′14.68″W), where the species were not naive to the top predator. The other two sites were in Switzerland (Les Embreux, 47°15′45.82″N, 7°6′57.79″E; Les Tenasses, 46°29′28.51″N, 6°55′16.04″E), where the species were naive to the top predator. At each site, we marked randomly-selected leaves that were likely to open within several days. We returned to the sites 2 weeks later and marked a different set of leaves that were about to open. After 1 month since the first leaf markings, we returned to the field sites and collected water (the aquatic community) from all marked leaves. The aquatic communities that were collected from the 4-week-old leaves were designated as “late-succession communities” and the aquatic communities that were from 2-week-old leaves were designated as “early-succession communities". A 1-month duration is a reasonable interval for this community to reach late-succession because the community consists of bacteria and protists, which have fast generation times (Gray 2012). Note that early- and late-succession communities from Québec already experienced *W. smithii* predation at the time of sampling [*W. smithii* lay their eggs immediately after pitcher opening (Smith 1902)]. At each site, the communities of each successional time period were pooled and placed into sterilized containers. The samples were then cooled on ice packs and brought back to the laboratory, where they were sieved in order to remove large detritus pieces and, for Québec, invertebrate larvae in both early- and late-succession communities. Larvae were also removed by pipetting after careful visual inspection of each sample. Note that no Diptera larvae were found in the Swiss communities. All samples were chilled on ice to slow community dynamics until the start of the experiment (approximately 72 h later). The Swiss communities were transferred to North America under these constant conditions. Every visit to the four sites occurred on the same day, using a detailed protocol for marking, collecting, and storing samples.

On the same day that the experiment was started, fresh mosquito larvae were collected from *S. purpurea* water at the Lac de Joncs site. These larvae were brought back to the laboratory and placed into four replicate water baths for 30 min each. We measured bacterial cell density of each pooled community with a flow cytometer, standardized via dilution with sterilized deionized water. We then set up eight tubes for each successional stage at each site. We used 50-mL sterilized macrocentrifuge tubes containing 2-mL autoclaved glass beads to mimic the insect exoskeletons and detritus naturally found at the bottom of *S. purpurea* pitchers (Gray et al. 2014). Each tube was wrapped with opaque paper until the 25-mL mark to mimic the light availability present inside *S. purpurea* leaves. Using a sterilized pipette (one per treatment community), we transferred 20-mL of *S. purpurea* water containing standardized bacterial density into each macrocentrifuge tube. We then allocated the eight tubes for each site and successional stage into two predator treatments, allowing for four replicates in the no-top-predator and four in the top-predator treatment. In the top-predator treatment, we placed two third-instar larvae of *W. smithii*, which corresponds approximately to average observed larval densities in mature leaves in northern latitudes (Nastase et al. 1995; Buckley et al. 2003; Hoekman 2007). One milliliter of sterilized fish food solution (5.4 g/L) was added to all samples as a feeding source for the community to standardize the nutrient content. All tubes were placed in a randomized block design for 7 days in an incubator (Sanyo MIR-154), which was programmed to the 50-year average July temperatures of the four sites (Worldclim Data), varying from 10 to 21 °C over 24 h (average temperature 15.5 °C), and natural light conditions. On every day of the experiment, we checked if the mosquito larvae had died or pupated. In such cases, we replaced the dead or pupating mosquito with a new third-instar larva that was collected at the same time and from the same site as the original mosquito. The spare larvae were stored under experimental conditions.

Measurements took place on days 0 and 6 (end). For day 0 (before the initiation of the experiment), we measured the initial protist composition and size spectra, and community respiration across all sites and successional stages. The same measurements, including changes in bacterial density, were taken on day 6. Bacterial density for each treatment was measured with a flow cytometer. Respiration of a 1-mL sample of each community was measured using the MicroResp TM system (James Hutton Institute, Scotland) according to the manufacturer’s protocol (Carmen 2007). For the determination of protist community structure, an aliquot of 80 µL of each community was used. Observations of presence/absence and size spectra for all protist species were obtained using a compound microscope, with magnification ranging between × 100 and × 400. Furthermore, pictures and videos of the protists were taken to facilitate recognition and determination of the morphospecies and their classification into size spectra. For all morphospecies encountered, we used the reference of Lee et al. (2000) for identification. Cell sizes ranging from ca. 3–5 µm for the smallest species up to 150 µm for the largest species were measured using the pixel-counting feature of the program ImageJ (Rasband 2012). We assigned minimum and maximum cell size to each morphospecies according to Streble and Krauter (2002). Morphospecies were then classified into three size classes: small, <8 µm; medium, 8–40 µm; large, 40–150 µm. When dealing with colonies of protists, the size of a single cell was measured and the species were grouped into one of the three size classes accordingly. Note that we concentrated on species composition because it is already known that *W. smithii* has a strong effect on the abundance of protists (Addicott 1974; Hoekman 2007, 2010; Gray et al. 2014). Our choice was further motivated by the current interest in the impact of invaders on the diversity and species composition of resident communities (e.g., Hector et al. 2002; Fargione and Tilman 2005).

Statistical analyses

The difference in protist community composition when a top predator was present or absent (hypotheses 1 and 2) was determined with non-metric multidimensional scaling for early- and late-succession among each of the four sites on days 0 and 6 (Legendre and Legendre 1998); non-metric multidimensional scaling analyses were based on Jaccard distance matrices and performed using Primer 6.1 [version 6.1.6; Primer E 2006 (Clarke and Gorley 2006)]. We used two dimensions, which always resulted in stress values smaller than 0.08. We also conducted an analysis of similarity and a multivariate dispersion analysis for these treatments. Analysis of similarity was used to measure the compositional distance between replicate communities with and without predators; the output of the method is a global *R*-value, which indicates significantly different communities when $R > 0.5$. Multivariate dispersion provides an estimation of the dispersion of the replicates within each treatment; it computes an index of multivariate dispersion, a measure of the difference in dispersion between two treatments, where negative values indicate lower dispersion of communities with predators compared to communities without predators.

The effects of the top predator, successional stage, and naive/non-naive status of the community were evaluated with Gaussian generalized linear models on the following response variables: (1) the change between the start and the end of the experiment in protist species richness and body-size distribution of three body-size classes (hypothesis 3); (2) bacterial density (hypothesis 4); and (3) respiration (hypothesis 5) at the end of the experiment. All model residuals were checked for normality with quantile–quantile plots; no data transformation was necessary. For each analysis, we performed a model selection and we present the results for the model that yielded the lowest Akaike information criterion value. Due to small sample size, we further checked our results with the corrected Akaike information criterion; we found no difference in model selection based on both criteria. Analyses were performed in R (R Core Team 2013).

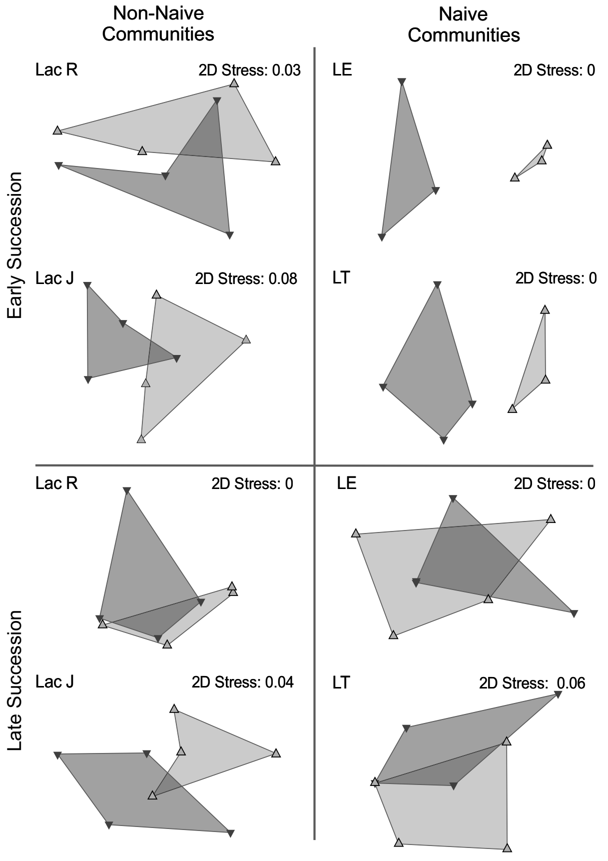

Fig. 1 Change in protist community composition. Each *triangle* represents one community in a two-dimensional (*2D*) non-metric multidimensional scaling plot [predator present (*gray triangle* and *light-gray shading* ($n = 8$ for each sampling site/$n = 32$ in total); predator absent (*black inverted triangle* and *dark-gray shading* ($n = 8$ for each sampling site/$n = 32$ in total)]. Nearby *triangles* have similar species composition [in the case of identical community composition, the symbols representing these communities completely *overlap*; see Les Embreux (*LE*) and Les Tenasses (*LT*) early-succession]. The *shaded envelopes* were added to help visualize: (1) the amount of community composition overlap that occurred between the predator/no predator treatments, and (2) how similar community composition was within a treatment (the *smaller* the *shaded area*, the more similar the communities are to each other). The presence of the top predator only significantly changed protist composition in naive, early communities (see Table 1). *LacR* Lac Rimouski, *LacJ* Lac des Joncs, *LE* Les Embreux, *LT* Les Tenasses

Results

Protist community composition

The presence of the top predator significantly affected protist community composition at the end of the experiment, but only when the community was naive to top predators and at an early stage of succession (Fig. 1; Table 1). Dispersion tests yielded significant values for these naive, early-succession communities (early Les Embreux and early Les Tenasses; see Table 1). Interestingly, when the predator was present, the four replicated early-succession communities were very similar in composition within the two naive sites. It therefore appears that the presence of a top predator results in the composition of naive, early-succession communities converging in similarity (strongly negative values for index of multivariate dispersion in both groups; see Table 1). The composition of the non-naive communities and of all late-succession communities was not affected by the presence of a top predator.

Table 1 Results of analyses of similarity (ANOSIM) and multivariate dispersion (*MVDISP*) for the naive and non-naive communities, in early- and late-succession

Succession	Site	Global *R*	*p*-value	MVDISP with predator	MVDISP without predator	IMD value
Early	Non-naive (LacR)	−0.302	0.943	1.051	0.949	0.111
Early	Non-naive (LacJ)	−0.089	0.629	1.231	0.769	0.5
Early[a]	Naive (LT)[a]	**0.474**	**0.029**	**0.782**	**1.218**	**−0.472**
Early[a]	Naive (LE)[a]	**0.854**	**0.029**	**0.769**	**1.231**	**−0.5**
Late	Non-naive (LacR)	−0.036	0.686	0.923	1.077	−0.167
Late	Non-naive (LacJ)	0.177	0.171	0.859	1.141	−0.306
Late	Naive (LT)	−0.115	0.857	1.013	0.987	0.028
Late	Naive (LE)	−0.214	0.971	1.128	0.872	0.278

ANOSIM measures the compositional distance between communities with and without predators. A global *R*-value >0.5 indicates biologically significantly different communities. MVDISP provides an estimation of the dispersion of the replicates within each treatment; index of multivariate dispersion (*IMD*) is a measure of the difference in dispersion between the two predation treatments; *negative values* indicate lower dispersion of communities with predators compared to the communities without predator

Non-naive Québec sites [Lac Rimouski (*LacR*) and Lac de Joncs *(LacJ)*], *Naive* Swiss sites [Les Tenasses (*LT*) and Les Embreux (*LE*)]

[a] Early naive sites with boldface type indicating a global *R* value approximately equal or larger than 0.5

Change through time of protist community structure

The change in protist morphospecies richness from the beginning to the end of the experiment (Δ species richness) was independent of the presence of the top predator (Fig. S1a Supplemental Material). However, the change in species composition, measured as Jaccard distance over time, was affected by the presence of top predators. This change was particularly strong in early-succession (Fig. 2a) and in naive (Fig. 2b) communities, where communities containing a top predator became significantly different in protist composition compared to communities with no top predator. Globally, the top-predator-induced change in species composition was driven by nine out of 36 morphospecies, all of which belonged to the small- and medium-size classes. Four morphospecies were negatively affected, but interestingly this number was counterbalanced by five species that increased in occurrence in the treatments that contained top predators (see Fig. S2).

Species composition differed among sites and successional stage at the start of the experiment (Fig. S3). Although the compositions were different, there was generally an equal number of small- and medium-sized protists within early- and late-succession communities (naive and non-naive communities pooled); however, there were less large-sized protists in early-successional than late-successional communities (see legend of Fig. S3; Table S1 for details). At the end of experiment, the presence/absence of the predator had no statistically significant effect on the total number of morphospecies (Fig. S1a), or on the number of morphospecies in the three different size classes (all *p*-values >0.33). Only naivety status had a detectable influence for the medium-size class (Fig. S1b), in which there was a net loss of medium-sized species during the experiment for communities originating from Switzerland (naive), and a small gain in medium-sized species for communities originating from Québec (non-naive). There was also a marginally significant effect of succession and of

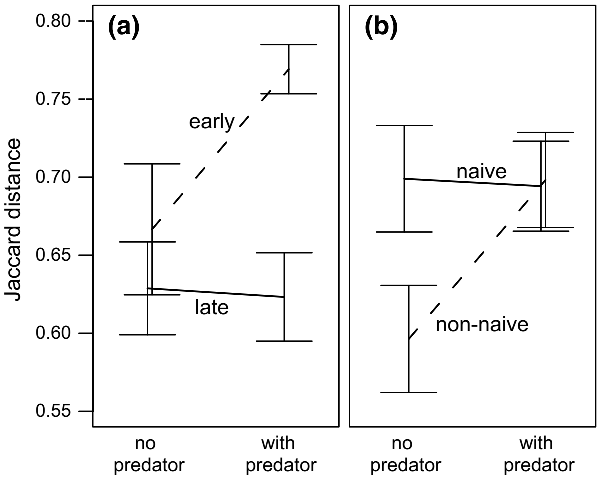

Fig. 2 Effect of succession, naivety status and top predator on protist community composition. Interaction plots for the distance in community composition (measured by Jaccard index comparing communities at the beginning and at the end of the experiment) for **a** early- (*dashed line*; $n = 32$) and late-succession (*solid line*; $n = 32$) communities, and **b** for naive (*dashed line*; $n = 32$) and non-naive (*solid line*; $n = 32$) communities, with and without the top predator. *Error bars* represent ±1 SE. Results of a Gaussian generalized linear model yield a significant effect for the presence of the top predator (parameter = 0.16, *p*-value = 0.003), and naivety status (parameter = 0.10, *p*-value = 0.017), but not of the successional stage (parameter = −0.04, *p*-value = 0.367)

the interaction between origin and succession for medium-sized species.

Trophic regulation and ecosystem functioning

The effect of the top predator did not propagate to the bottom trophic level. There, the top-predator effect on bacterial density was statistically insignificant in both naive and non-naive communities (p-value $= 0.119$) and in early- and late-succession (p-value $= 0.547$; see Table S2 for details). This lack of a statistically significant effect on bacterial density was consistent with the results for bacterial respiration: we found that the top predator had no impact on respiration rate in naive and non-naive (p-value $= 0.32$) and in early and late communities (p-value $= 0.61$; see Table S4 for details). Instead, the only significant result was that non-naive communities respire less than naive ones ($p = 0.038$; Fig. S4a and see Table S3 for details). We also found a significant interaction between succession and naivety, in which respiration increases when communities transition from early- to late-succession in naive communities, but decreases in non-naive communities ($p = 0.041$; Fig. S4b and Table S3).

Discussion

We found that the composition of early-succession Swiss (naive) protist communities diverged significantly from communities with no top predator present. This result supports our first (naivety status) and second (successional stage) hypotheses, but only in the naive, early-succession treatment, where we had expected the strongest effect. Indeed, there was no evidence of a difference in protist composition induced by the predator between early- and late-succession for non-naive communities. This result can be explained simply by the fact that early-successional communities in Québec had already experienced the presence of *W. smithii*, and thus went through the biotic filter imposed by the predator. Indeed, *W. smithii* lay eggs in pitchers directly after they open (Smith 1902; Istock et al. 1975), so that protists experience predation early during community development. In the non-naive range, only species tolerant to *W. smithii* were likely to survive in the pitchers until sampling for the experiment took place.

Interestingly, we also found no evidence of a change for late-succession communities in the naive sites, suggesting that the filtering process of succession in the *S. purpurea* leaves selects species that are not only competitively superior, but also resistant to predation. We further found that the presence of a top predator did not change the size distribution of protist species, as was predicted. Surprisingly, the effect on species composition did not propagate to the bottom trophic level, as found for freshwater systems (e.g., Shurin et al. 2002), nor did it affect ecosystem functioning. Overall, our results highlight the importance of considering the successional stage of communities, which is rarely discussed as having a large impact on invasion at the multi-trophic level. For example, in the extensive review on invasion research by Lowry et al. (2013), successional stage was not used as a criterion to classify the surveyed studies.

In Europe, where *S. purpurea* was recently introduced, the inquiline species had to make a transition from the bog habitat to that of leaves. Only a subset of species has made this transition (Gebühr et al. 2006; Fragnière 2012), and these species had neither co-evolved with the plant, nor had they experienced *W. smithii* predation. Every year when new leaves open, pioneer species randomly colonize and pass through the environmental filter imposed by the leaf habitat (e.g., air barrier to other aquatic habitats, high variability in temperature, pH and nutrients inside the leaf). Priority effects imposed by the already established inquiline species can then limit those arriving later (e.g., Kadowaki et al. 2012). These “neutral” factors are probably paramount for the organization of these early communities. Interestingly, in these naive, early-succession communities, in addition to the compositional change induced by the predator, we observed a strong convergence in morphospecies identity. This suggests the importance of predators in constraining the trajectories of community assembly in systems that are naive to predation.

We also hypothesized that the European late-succession communities should be affected by insect predation because they did not have time to develop strategies to cope with consumers, and thus vary in their response to predation. However, our results do not support this hypothesis, suggesting that protist species were equally tolerant to *W. smithii* in this successional stage. Since we did not observe a change in respiration and bacterial density between European and Canadian late-succession communities when a predator was present, naive communities appear to be as resistant to predation as non-naive ones. This result underlies the hypothesis that mechanisms of avoidance/tolerance against one predator are also effective against other similar types of filter-feeding predators (Anson and Dickman 2013).

Our results are consistent with other *S. purpurea* studies conducted in northern latitudes. From field experiments performed in Michigan (non-naive, native range, with a similar temperature range as our experiment), Hoekman (2007, 2010) found that, although protozoan biovolume greatly decreased in the presence of the mosquito top predator, bacterial density was unaffected. Further, Hoekman (2007) found that the species richness of non-naive prey communities was affected, but only when 20 mosquito larvae were added to the system, which corresponds to high mosquito density in a natural setting (Nastase et al. 1995). It is likely the top predator would have affected the species richness of the non-naive communities in our study if more larvae had been added to the system (20 larvae vs. two larvae per community). Our results imply that the addition of only two mosquito larvae is sufficient to affect naive, early-succession communities. In this respect, the changes in the occurrence of species can be directly caused by predation, but also indirectly by a competition/predation trade-off favoring less-competitive species (Kneitel 2012).

We used a whole community (bacteria and protists) microcosm system to answer a question of general importance for conservation biology that is especially relevant at the ecosystem level. Simplified versions of larger-scale communities can provide tractability and high statistical power (Srivastava et al. 2004), allowing us to better understand what mechanisms may drive dynamics in more complex systems (Jessup et al. 2004). In this respect, we want to emphasize the importance of working with natural communities, where species have adapted to each other, so that they are more likely to epitomize larger-scale systems. Furthermore, our system is microbial, species of which are likely to evolve quite rapidly (Jessup et al. 2004). This characteristic of microbial systems makes it possible that the naive, early-successional communities in our study could have become more tolerant of the top predator if the experiment had been longer. The fact that the protist species were still vulnerable after 6 days suggests that larger-scale systems may take a long time to adjust to environmental changes. Our results also point to the importance of working with different successional stages. The observed effects of the top predator are subtle in our case, affecting only early-succession communities. Human activities such as deforestation and intensive agriculture reset many habitats worldwide to an early-successional stage. Since the effects of novel predators appear to be dependent on the successional stage (e.g., Estes et al. 2011), it is therefore necessary that conservation research consider information about the succession of the ecosystem.

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Author contribution statement All authors designed the research; A. Z. and S. M. G. conducted the research; A. Z., L. F. B. and S. M. G. wrote the manuscript; all authors edited the manuscript; D. G., L. F. B. and S. M. G. funded the project.

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Chapter 3: Supplemental Material

Title: Top predators affect the composition of naive protist communities, but only in their early-successional stage

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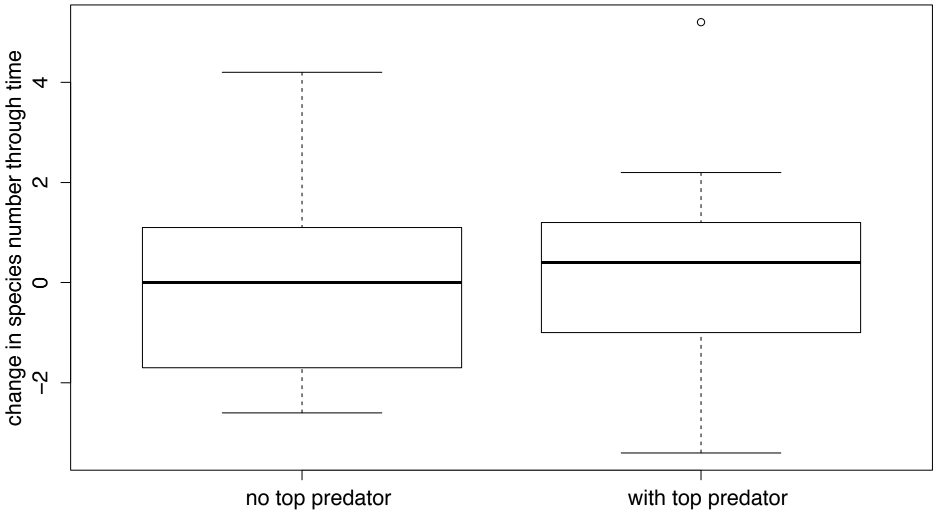
Content:

Supplemental Figure S1	Change in protist species number from the beginning to the end of the experiment.
Supplemental Figure S2	Effect of top predator on occurrence of the prey species in the three size classes.
Supplemental Figure S3	Protist Community composition at day 0 (start of experiment) according to presence/absence data.
Supplemental Figure S4	Results of community respiration.
Supplemental Table S1	Morpho-species (Msp.) list.
Supplemental Table S2	Results from the linear model for bacterial abundance
Supplemental Table S3	Results from the linear model for respiration
Supplemental Table S4	Results from the full linear model for respiration

Fig. S1: Change in protist species number from the beginning to the end of the experiment. a) the predator is present or absent, and **b)** in naive and non-naive communities (as shown as change in protist size classes). The top predator did not change the size distribution of the protists. Instead, community origin was significantly important, but only for the medium-size class species (p-value <<0.001). For communities originating from Switzerland (naive), there was a net loss of medium-sized species during the experiment, while communities originating from Québec (non naive) gained medium-sized species during the experiment

a)



b)

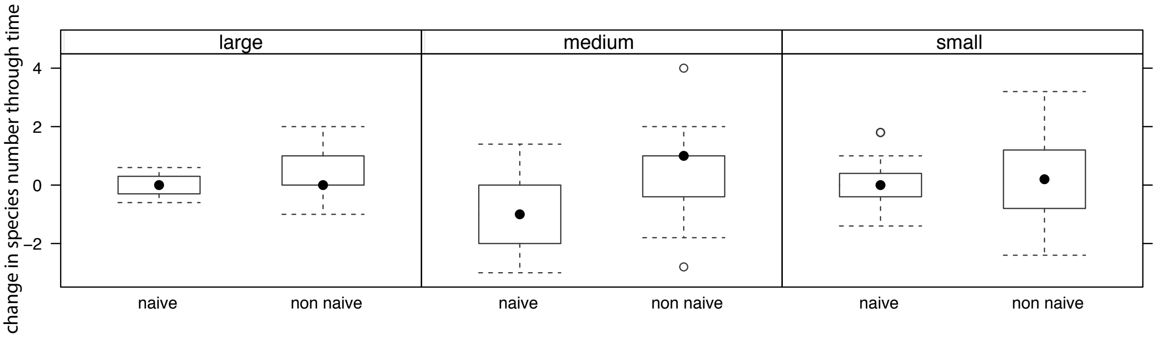
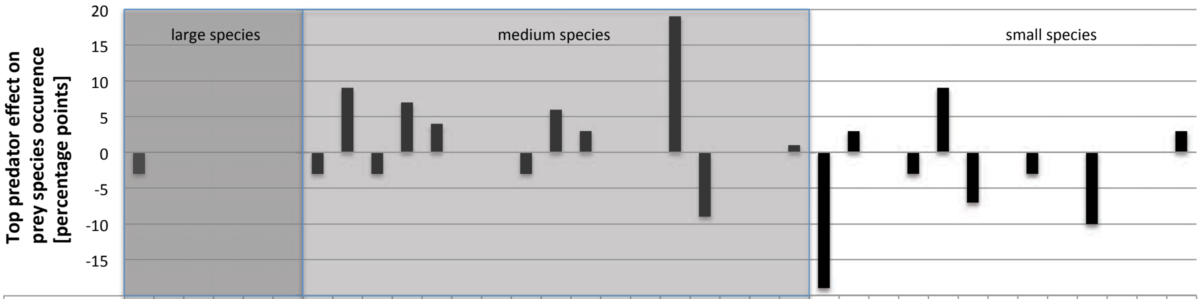


Fig. S2: Effect of top predator on occurrence of the prey species in the three size classes. X-axis: First line = morpho-species identity according to Msp. Nr in table S1; second line = gain or loss of occurrence on day 6 (in percentage points) when mosquitoes were present/absent. Most species were not affected (we considered gain/loss smaller than 5 percentage points as chance events). Morpho-species 20, 24, 29, and 33 were the most negatively affected by the presence of the top predator. In contrast, morpho-species 8, 10, 15, 19 and 28 were positively affected by mosquito presence. It is likely that these morpho-species profited from the predation on competing species (see also Kneitel 2012). Note that four of these benefitting species were medium-sized, while there is only one from the group of small-sized species. Additionally three (23%) small-sized species and only one (6%) medium-sized species were negatively affected, while the occurrence of large bodied species seemed not to be affected by the mosquitoes



Msp .Nr.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
■ gain/loss [pp]	-3	0	0	0	0	0	-3	9	-3	7	4	0	0	-3	6	3	0	0	19	-9	0	0	1	-19	3	0	-3	9	-7	0	-3	0	-10	0	0	3

Fig. S3: Protist Community composition at day 0 (start of experiment) according to presence/absence data.

Each triangle represents one community in a 2D NMDS plot (sites: VS, orange triangle; LT, green inverted triangle; LE, purple square; Lac R, blue diamond). Symbols for late succession are filled and early succession are unfilled. Similarity was measured with Jaccard index. Nearby triangles have similar species composition. Note that predators were not yet added. Note that there was generally an equal number of small and medium-sized protists, but not of large protists, within early and late succession communities (data pooled for naive and non-naive communities): 1) For small-sized protists: a total of 8 and 9 morpho-species with an average per tube of 1.85 and 1.50 morpho-species in early and late succession communities, respectively; 2) for medium-sized protists: a total of 10 and 10 morpho-species with an average per tube of 2.95 and 2.95 morpho-species in early and late succession communities, respectively; 3) for large-sized protists: a total of 1 and 5 morpho-species with an average per tube of 0.10 and 1.15 morpho-species in early and late succession communities, respectively; see Table S1 for details)

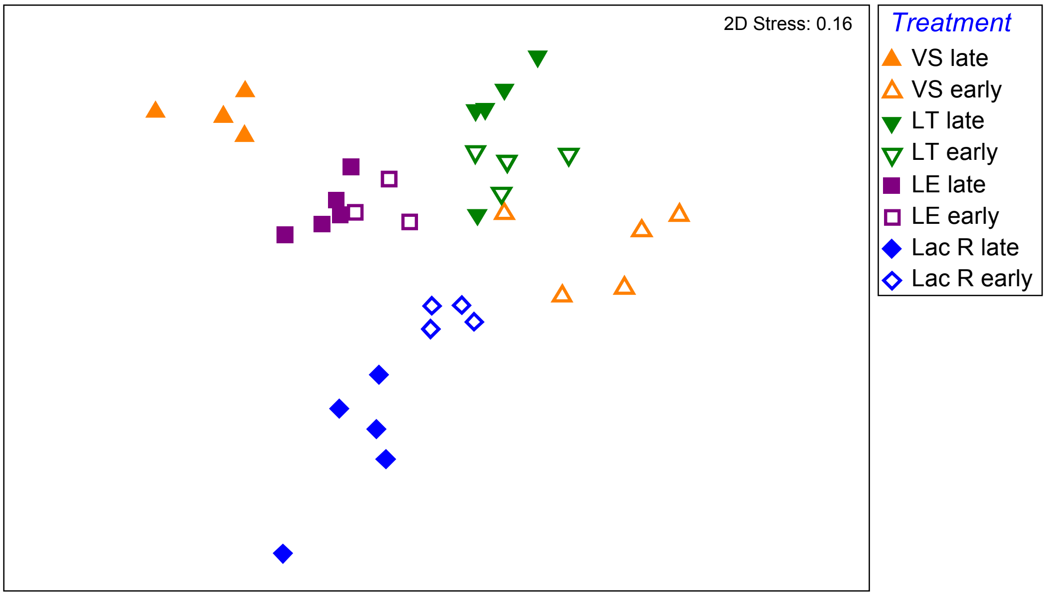


Fig. S4: Results of community respiration.
The Y-axis gives a measure of respiration during 6 hours at the end of the experiment. **a**) The respiration was significantly higher in naive than in non-naive communities (p = 0.038). **b**) Interaction plot of respiration with respect to succession stage and naivety status. Respiration was higher in late than in early succession for naive communities, and the opposite for non-naive communities (interaction term: p-value = 0.041). The top predator had no statistically significant effect on community respiration

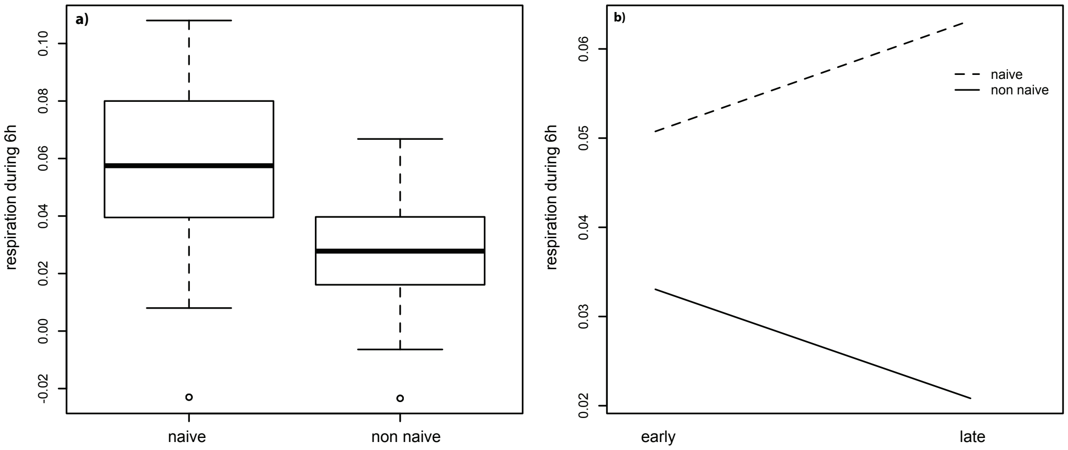


Table S1 **Morpho-species (Msp) list.** List of all protist detected in the *Sarracenia* samples of the four sites used in the experiment (LT, LE, VS, Lac R) and the total percentage of occurrence in the various treatments (early = early succession; late = late succession), at the beginning (d0) and end of the experiment (d6), with and without top mosquitoes (mosq). The last column gives the mosquito effect on occurrence in percentage points [pp] measured on day 6. The list is organized by size classes: size class *l* (large species, 40µm-150µm); size class *m* (medium species, 8µm-40µm); size class *s* (small species < 8µm). Legend: LT = Les Tennasses; LE = Les Embreux; VS = Vallée des Sources; Lac R = Lac Rimouski

Msp. Nr.	species-name	size	systematics	total	early	late	LT	LE	VS	Lac R	d0	d0 early	d0 late	d6 with mosq	d6 no mosq	mosq effect in [pp] on occurrence
msp1	unknown Ciliate sp. A	*l*	Ciliophora	5	8	2	0	0	4	15	0	0	0	6	9	-3
msp2	cf. *Pleuronema* sp. A	*l*	Ciliophora	13	0	25	0	0	50	0	13	0	25	13	13	0
msp3	cf. *Euplotes* sp.	*l*	Ciliophora	37	23	50	0	89	58	0	30	10	50	41	41	0
msp4	*Tetrahymena* cf. *pyriformis*	*l*	Ciliophora	7	0	14	0	0	0	27	3	0	5	9	9	0
msp5	unknown Ciliate sp. C	*l*	Ciliophora	10	0	19	0	0	0	39	10	0	20	9	9	0
msp6	cf. *Pleuronema* sp. B	*l*	Ciliophora	3	0	6	12	0	0	0	8	0	15	0	0	0
msp7	*Bodo* sp. A	*m*	"Flagellata"	72	81	64	50	96	50	92	85	85	85	63	66	-3
msp8	*Bodo* cf. *saltans*	*m*	"Flagellata"	25	25	25	4	50	19	27	38	25	50	22	13	9
msp9	Chrysomonadida sp. A	*m*	"Flagellata"	47	73	21	58	62	27	42	70	95	45	31	34	-3
msp10	cf *Bodo* sp. C	*m*	"Flagellata"	38	46	29	31	54	31	35	3	5	0	63	56	7
msp11	*Chilomonas* sp.	*m*	"Flagellata"	12	0	23	0	0	46	0	13	0	25	13	9	4
msp12	Chrysomonadina sp. C	*m*	"Flagellata"	4	4	4	8	0	8	0	10	10	10	0	0	0
msp13	unknown flagellate sp. B	*m*	"Flagellata"	<1	2	0	0	0	4	0	3	5	0	0	0	0
msp14	Chrysomonadina sp. D	*m*	"Flagellata"	25	21	29	73	8	8	12	28	25	30	22	25	-3
msp15	Chrysomonadina sp. E	*m*	"Flagellata"	3	0	6	4	0	8	0	3	0	5	6	0	6
msp16	cf. *Chlamydomonas* sp.	*m*	"Flagellata"	17	0	35	0	42	15	12	8	0	15	25	22	3

Table S1 continued

Msp. Nr.	species-name	size	systematics	total	early	late	LT	LE	VS	Lac R	d0	d0 early	d0 late	d6 with mosq	d6 no mosq	mosq effect in [pp] on occurence
msp17	unknown Ciliate sp. B	*m*	Ciliophora	13	0	25	50	0	0	0	13	0	25	13	13	0
msp18	*Cyclidium* sp.	*m*	Ciliophora	5	10	0	19	0	0	0	13	25	0	0	0	0
msp19	unknown flagellate sp. E	*m*	"Flagellata"	6	10	2	0	15	0	8	0	0	0	19	0	19
msp20	*Cercomonas* sp.	*m*	"Flagellata"	13	25	0	0	0	19	31	5	10	0	13	22	-9
msp21	*Euglena* cf. *gracilis*	*m*	"Flagellata"	2	4	0	0	0	0	8	5	10	0	0	0	0
msp22	Euglenoidina sp.	*m*	"Flagellata"	<1	0	2	0	0	0	4	3	0	5	0	0	0
msp23	unknown flagellate sp. D	*m*	"Flagellata"	<1	0	2	0	0	0	4	0	0	0	1	0	1
msp24	HNF sp. A	*s*	"Flagellata"	12	14	10	8	4	15	19	15	25	5	0	19	-19
msp25	HNF sp. B	*s*	"Flagellata"	46	50	42	19	58	23	85	43	40	45	50	47	3
msp26	HNF sp. C	*s*	"Flagellata"	5	6	4	0	0	12	8	8	5	10	3	3	0
msp27	cf. *Chrysocococcus* sp.	*s*	"Flagellata"	38	54	21	46	4	46	54	25	45	5	44	47	-3
msp28	cf. *Notosolenus* sp.	*s*	"Flagellata"	18	27	10	23	0	15	35	10	0	20	28	19	9
msp29	HNF sp. D	*s*	"Flagellata"	10	15	4	0	0	19	19	10	20	0	6	13	-7
msp30	cf. *Chlorella* sp.	*s*	"Algae"	11	0	21	0	0	42	<1	8	0	15	13	13	0
msp31	HNF sp. E	*s*	"Flagellata"	9	10	8	0	12	0	23	10	0	20	6	9	-3
msp32	HNF sp. F	*s*	"Flagellata"	4	8	0	0	0	0	15	10	20	0	0	0	0
msp33	HNF sp. G	*s*	"Flagellata"	15	21	10	0	0	12	50	23	25	20	6	16	-10
msp34	HNF sp. H	*s*	"Flagellata"	2	0	4	0	0	0	8	5	0	10	0	0	0
msp35	HNF sp. I	*s*	"Flagellata"	<1	2	0	0	0	0	4	3	5	0	0	0	0
msp36	*Microspora* cf. *abbreviata*	*s*	"Algae"	5	0	10	0	0	19	0	0	0	0	9	6	3

Table S2: Results from the linear model for bacterial abundance with respect to mosquito presence, successional state (early; late) and naivety (naive; non naive)

Variable	Parameter	SE	t	p-value
Intercept	3145.4	560.5	5.612	<0.001
Mosquito	314.5	733.8	0.429	0.670
Succession	452.6	733.8	0.617	0.540
Naivety	-102.5	733.8	-0.140	0.889
Succession:Mosquito	**219.9**	**847.4**	**0.26**	**0.796**
Naivety:Mosquito	**-478.5**	**847.4**	**-0.5650**	**0.574**
Succession:Naivety	623.7	847.4	-0.736	0.465

Table S3: Results from the linear model for respiration with respect to successional state (early; late) and naivety (naive; non naive). See also Figure S4.This is the best model according to AIC, where the factor Mosquito was removed

Variable	Parameter	SE	t	p-value
Intercept	0.05	0.005	8.6	<0.001
Succession	0.012	0.008	1.49	0.1413
Naivety	**-0.017**	**0.008**	**-2.12**	**0.038**
Succession:Naivety	**-0.024**	**0.011**	**-2.09**	**0.041**

Table S4: Results from the full linear model for respiration with respect to mosquito presence, successional state and naivety (note that the 3-way interaction was not included)

Variable	Parameter	SE	t	p-value
Intercept	0.045	0.007	5.795	<0.001
Mosquito	0.011	0.01	1.100	0.27
Succession	0.009	0.01	0.928	0.357
Naivety	-0.011	0.01	-1.16	0.249
Succession:Mosquito	**0.0059**	**0.011**	**0.504**	**0.61**
Naivety:Mosquito	**-0.0116**	**0.011**	**-0.99**	**0.32**
Succession:Naivety	-0.024	0.0110	-2.09	0.04

Chapter 4: Effects of temperature variability on community structure in a natural microbial food web

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Abstract:

Climate change research has demonstrated that changing temperatures will have an effect on community-level dynamics by altering species' survival rates, shifting species' distributions, and ultimately, creating mismatches in community interactions. However, most of this work has focused on increasing temperature, and still little is known about how the variation in temperature extremes will affect community dynamics. We used the model aquatic community held within the leaves of the carnivorous plant, *Sarracenia purpurea*, to test how food-web dynamics will be affected by high temperature variation. We tested the community response of the first (bacterial density), second (protist diversity and composition), and third trophic level (predator mortality), and measured community respiration. We collected early and late successional stage inquiline communities from *S. purpurea* from two North American and two European sites with similar average July temperature. We then created a common garden experiment in which replicates of these communities underwent either high or normal daily temperature variation, with the average temperature equal among treatments. We found an impact of temperature variation on the first two, but not on the third trophic level. For bacteria in the high variation treatment, density experienced an initial boost in growth but then decreased quickly through time. For protists in the high variation treatment, alpha-diversity decreased faster than in the normal variation treatment, beta-diversity increased only in the European sites, and protist community composition tended to diverge more in the late successional stage. The mortality of the predatory mosquito larvae was unaffected by temperature variation. Community respiration was lower in the high variation treatment, indicating a lower ecosystem functioning. Our results highlight clear impacts of temperature variation. A more mechanistic understanding of the effects that temperature, and especially temperature variation, will have on community dynamics is still greatly needed.

Introduction

Increased mean temperatures due to climate change are having an effect on community-level dynamics in a majority of ecosystems worldwide (Traill *et al.*, 2010). Research has already demonstrated that species distributions are being shifted (e.g., Walther *et al.*, 2002; Parmesan, 2006), thus impacting community interactions (e.g., Gilman *et al.*, 2010), mutualistic dynamics (e.g., Nakazawa & Doi, 2012), and the functioning of whole ecosystems (e.g., Yvon-Durocher *et al.*, 2012). In tropical ecosystems, this increase in temperature is thought to be especially problematic because tropical species already live near their upper thermal limits (Nguyen *et al.*, 2011; Laurance *et al.*, 2011). In temperate and boreal regions, a 1-4°C increase in temperature is, in regards to performance, possibly more beneficial than detrimental for the existing species (Vasseur *et al.*, 2014; Tuck & Romanuk, 2012) because ecosystem processes can be accelerated (Maracchi *et al.*, 2005; Lindner *et al.*, 2010). However, recent climate models have also predicted that climate change will not only involve an increase in mean temperature, but also an increase in temperature variation and a higher probability of extreme events (e.g., drought and extreme maximum and minimum temperatures; IPCC 2013). With this increased temperature variability, species from both temperate and tropical environments are likely to be exposed to conditions beyond their maximum temperature limit (Deutsch *et al.*, 2008). Extreme temperature events may therefore be the most important driving forces for determining climate change-induced community dynamics in many ecological systems (Gutschick & BassiriRad, 2003). Increased temperature variability could thus have a larger impact on species than an increase in the mean temperature alone (Vasseur *et al.*, 2014).

However, to date, the majority of climate change experiments have increased temperature according to IPCC predictions (increase of 2-4°C, IPCC 2013), while either reducing or keeping the natural temperature variance at the status quo (see Thompson *et al.*, 2013). As a result, the effect of increasing temperature variability on community dynamics remains unclear. It is therefore essential to start to include temperature variation as a treatment in climate change research in order to more fully address the effect that climate change will have on ecosystems. In addition, many studies have been conducted at the population- and species- level, while information about the impact of climate change on higher organization-levels, like whole communities or food webs, is lagging behind (O'Gorman *et al.*, 2014).

Food webs in freshwater enclosed habitats (i.e., shallow lakes and ponds), in particular, may be especially vulnerable to climate change because these habitats are usually more isolated than terrestrial ecosystems, resulting in species having fewer options for dispersal when water temperature exceeds their temperature limit (Woodward & Hildrew, 2002; Deutsch *et al.*, 2008; Vasseur *et al.*, 2014). Furthermore, with increasing heat and drought levels due to climate change-induced extreme events, the habitable areas (waterbodies) can reduce in size and possibly disappear (Salerno *et al.*, 2014), resulting in the local extinction of species. Despite their apparent vulnerability to climate change, only one out of 21 studies mentioned in the review by Thompson *et al.* (2013) experimentally addressed the implications of extreme events on the communities in these enclosed freshwater systems.

From the experiments that have been published, predictions can be made with regards to the effect of increased mean temperature on community dynamics in enclosed freshwater systems. There will likely be a reduction in trophic levels (Beisner *et al.*, 1997), a shift in body-size towards smaller species (e.g., Moore *et al.*, 1996), an increase in bacterial densities (e.g., Elliott *et al.*, 2006), and the abundance and composition of species in different levels in a food web will be disproportionately affected (e.g., Strecker *et al.*, 2004). However, it is more difficult to assess the effect of increased temperature variation on communities because its effect is expected to be non-linear. In terms of diversity, this non-linear effect can be compared to the intermediate disturbance hypothesis, in which an intermediate level of temperature variation could provide optimal diversity levels, while a low or high level of this variation could reduce diversity (Burgmer & Hillebrand, 2011). However, the effect of temperature variation on food-web dynamics will also depend on the thermal range of the species, which may be difficult to predict based only on body size or trophic-level position (Stevenson, 1985; Liu *et al.*, 1995; Stewart *et al.*, 2013).

Furthermore, the successional stage of these communities may also be important for buffering the effect of increased temperature variation. It can be hypothesized that communities in an early successional stage are more likely to be resistant against environmental changes than communities in late succession, as they contain a high proportion of pioneer species (del Moral & Wood, 1993; Foster & Tilman, 2000) that can prosper under a wide spectrum of environmental conditions (Bazzaz, 1979; Pineda-Garcia *et al.*, 2013). These early succession communities also usually harbour more small species compared to later successional stages (e.g., Odum, 1969; del Moral & Wood, 1993; Foster & Tilman, 2000). These small species can adapt quickly to environmental changes due to higher metabolic rates and fast generation times (Sommer *et al.*, 1986; Jiang *et al.*, 2011), making them less likely to be affected by environmental change. Late succession communities, on the other hand, are composed of species that have been selected via biotic and abiotic environmental filters (Lortie *et al.*, 2004). The species that successfully pass through these filters are the ones that are able to survive in the current temperature regime of the habitat. These species are usually larger in body size and devote more of their energy to competition (e.g. Sommer *et al.*, 1986; Wootton, 1993; Foster & Tilman, 2000) than early succession species, which may make them less likely to cope with higher variation in environmental conditions.

In order to better understand how temperature variation will impact enclosed freshwater food webs, and how the successional stage of a community will influence the results, we conducted an experiment using the *Sarracenia purpurea* aquatic model system. This food web is typically tri-trophic and is composed of bacteria, protists, and arthropod larvae. In this system, as well as in larger-scale enclosed freshwater systems, early succession communities consist of a pool of small-bodied, fast-growing pioneer species which may be physiologically better adapted to rapid temperature changes than the slower-growing, larger-bodied species found in later succession (e.g., Sommer *et al.*, 1986; Gray, 2012; Miller & terHorst, 2012).

To address the importance of temperature variation on food-web dynamics, we increased temperature variation while keeping mean temperatures (thermal sums) constant. We accomplished this by manipulating temperature variance as repeated and alternating extreme hot and cold events. These temperatures were within the observed temperature range measured inside *Sarracenia* leaves in the field and have thus been already experienced by the aquatic community (Fig. S2; Fig. S9-S12; Supplemental material_B). We then measured the impact that increased temperature variation had on the three trophic levels – bacteria, protists and mosquito larvae – at two different successional stages.

We are aware that climate change-related effects of mean and variance interact (see Bozinovic *et al.*, 2011), but the purpose of this experiment was to determine the magnitude of influence temperature variation could have on food-web dynamics. We explored five hypotheses. 1) Extreme temperature variation events will increase the density of bottom trophic level organisms. The reasoning is, when temperature increases, due to the small-body size of these species their metabolic rate will increase faster than those of larger species (Brown *et al.*, 2004), also allowing them to adapt more quickly to environmental changes (Daufresne *et al.*, 2009). We explored this question by measuring bacterial density. 2) Increased temperature variation will reduce species diversity in the intermediate trophic level to only the species that can tolerate large temperature extremes. This point was addressed by determining changes in the diversity and composition of the protists. 3) Due to the large body size and slow generation time of species in the top trophic level, increased temperature variation is expected to cause high mortality of predators (Petchey *et al.*, 1999; Vasseur *et al.*, 2014). This was determined by measuring the change in mortality rate of the mosquito larvae. 4) In the aquatic community of the *S. purpurea* system and also in larger-scale enclosed freshwater systems, we expect the general impact of temperature variation to be stronger in late-successional communities compared to early-successional communities, as the latter species (fast-growing pioneer species) can adapt more quickly to rapid temperature changes due to faster generation times, than the slower growing, larger-bodied species found in later succession (e.g., Sommer *et al.*, 1986; Gray, 2012; Miller & terHorst, 2012). 5) In addition, we hypothesize that community respiration will not be markedly affected by increased temperature variation. Our reasoning is that species will respire more as temperature increases (e.g., Ratkowsky *et al.*, 1983; Lloyd & Taylor, 1994), however these species will also experience low temperature extremes. These low temperatures will stimulate periods of inactivity, thus reducing respiration and counterbalancing the amount of respiration acquired during periods of increased temperature.

Materials and Methods

Study system

Usage of bacteria and protists microcosm as model systems for larger, more complex ecosystems is a common practice and helps accelerating studies that would otherwise take much more time (for a good overview see Altermatt *et al.,* 2015). *Sarracenia purpurea* is a carnivorous pitcher plant whose leaves fill with rainwater after opening into their characteristic pitcher-shape during the summer months. These leaves capture insects, which drown in the rainwater. Bacteria form the bottom trophic level of the aquatic community, and decompose the drowned insects, providing the nutrients for the higher trophic levels of the aquatic community. Protist species form the intermediate trophic level and consume the bacteria. In the plant's native range of North America, a third trophic level also exists, which is composed of the mosquito larvae *Wyeomyia smithii*. In Europe, where the plant has been introduced, the food web consists mostly of bacteria and protists and no Culicidae larvae have been observed (Fragnière, 2012; Zander *et al.*, 2016). Nematodes, rotifers, mites, and flesh fly larvae can also inhabit the aquatic community in both the introduced and native range (Adlassnig *et al.*, 2010; Zander *et al.*, 2016), but are rarer in occurrence and numbers of individuals compared to the single cellular organisms (Baiser *et al.*, 2012). The leaves that open during the growing season in year 1 will over-winter and, along with their aquatic community, will be present in year 2 (Heard, 1998). This characteristic makes this model system more physically stable than ephemeral systems (e.g., puddles), and therefore more comparable to larger-scale enclosed freshwater systems (e.g., tree holes and rock pools).

Although the inquiline communities in the native and introduced range are quite different in species composition (see Gebühr *et al.*, 2006 and Buckley *et al.*, 2010), the successional stages are similar in pattern (Gray, 2012; Fragnière, 2012; Zander *et al.*, 2016). Shortly after the leaf opens into its pitcher-shape, random immigration events lead to the establishment of the first early-succession species (ca. 2 Weeks). After 4 weeks, most elements of the food web are present (late succession) (Miller & terHorst, 2012; Gray, 2012). These similarities between the native and introduced range suggest that even with differing species composition, broader ecological rules can be generalizable across the large geographic range of this species. This characteristic of the *S. purpurea* system makes it feasible to conduct experiments where multiple field sites can be used as replicates. In addition, another advantage of using these inquiline communities is the ability to access and manipulate several successional stages of an entire natural ecosystem during a single field season.

Experimental set-up

We collected early- and late succession communities from four climatically-similar sites. Two of these sites were from North America and two sites were from Europe. The site selection allowed us to determine if origin (native and introduced range) would have an effect on the results, even when other climatic features where controlled for across all four sites. Note that inquiline communities of *S. purpurea* in Europe have experienced only a short co-evolutionary history with the plant. We then conducted a common garden experiment using the two successional stages of the *Sarracenia* pitcher inquiline communities from the 4 sites. We placed each of these communities into two temperature treatments: normal temperature variation and high temperature variation. We followed the changes in bacterial (prey) density, protist (predator) composition and diversity, and mosquito larvae (top predator) presence through time. Additionally, we measured and compared the respiration of the communities at the end of the experiment, as a proxy for ecosystem functioning. Each treatment was replicated 4 times, resulting in 64 samples (2 temperature variations x 2 successional stages x 4 origins x 4 repetitions).

Field collection

The four sites used in the experiment were similar in terms of the July mean, maximum, and minimum temperature (temperature averaged across 50 years, Worldclim data, www.worldclim.org, Fig S1a, b) and day length, due to similar northern latitudes. The two North American sites were from Québec (Lac des Joncs (LacJ), 48°29'61.00"N, 68°77'15.55"W; Lac Rimouski (LacR), 48°18’32.71"N, 68°28’14.68"W) and the two European sites were from Switzerland (Les Embreux (LE), 47°15'45.82"N, 7° 6'57.79"E; Les Tenasses (LT), 46°29'28.51"N, 6°55'16.04"E). At all four sites, unopened leaves that were about to open into the characteristic pitcher-shape were randomly selected and marked at the beginning of July. Two weeks later, another subset of unopened leaves were selected and marked. After one month, the aquatic inquiline communities were collected from all marked leaves. The water collected from leaves that had been marked during the first time period (1 month old) were designated as ‘Late Succession’ communities and the water collected from leaves marked during the second time period (2 weeks old) were designated as ‘Early Succession’ communities. The early and late succession communities used in the experiment were collected simultaneously at all four sites on 30 July 2013, with one person designated to sample at one field site. The same protocol for marking the leaves and the sterile collection and storage of samples was followed by all people involved. Collecting the water from the marked leaves involved mixing the contents inside each leaf by gently pipetting. The water from each leaf was then pooled together under sterile conditions into a common container, with early and late succession communities placed in separate containers.

After field collection, the samples were sieved in order to remove large insect detritus pieces and invertebrate larvae. The removal of large detritus was done so that the amount of food available during the experiment was homogenized across replicates and treatments. For the Québec samples, all water was double checked for the presence of mosquito and other insect larvae, and these larvae were subsequently removed. All samples were then stored in cool conditions until the experiment started (approximately 72 hours after collection). During this time, Swiss samples were transported under the same cold conditions to the University of Québec in Rimouski, where the experiment took place.

Experimental preparation:

On the starting day of the experiment, the bacterial density of all communities (the pooled early- and pooled late- succession community within each site) were measured by flow cytometry and then standardized by diluting with sterile deionized water. Fresh third-instar *Wyeomyia smithii* larvae were also collected during this time from *S. purpurea* leaves present at the Lac de Rimouski site in Québec. After bringing the mosquito larvae back to the laboratory, they were placed into autoclaved, deionized water for 30 minutes. This procedure was repeated 4 times in order to rid the larvae of contaminating microorganisms as much as possible. Note that while bacterial density was standardized, the protist community composition varied among the four sites and the two successional stages.

Experimental procedure:

Twenty ml of the homogenized starting culture was then transferred to sterile 50ml macro-centrifuge tubes. There were in total eight replicate communities per successional stage for every site. All 64 tubes had 2 ml of autoclaved glass beads at the bottom in order to mimic the insect exoskeletons and detritus naturally found at the bottom of *Sarracenia* pitchers (Gray *et al.*, 2015) and were wrapped with opaque paper until the 25mL mark to mimic light conditions present inside *Sarracenia* leaves. A 1mL solution of autoclaved fish food (Tetramin, 5.4g/l) was added as resources to all microcosms. Fish food was chosen because it is an effective way to provide standardized nutrient levels across all treatments. Also, this food is commonly used in *Sarracenia* research (e.g., Cochran-Stafira & von Ende, 1998; terHorst *et al.*, 2010; Kadowaki *et al.*, 2012; Gray *et al.*, 2015; Zander *et al.*, 2016) because it has been shown to provide similar results as to when insects are used as the resource in experiments (e.g., terHorst *et al.*, 2010). Two third-instar larvae of *Wyeomyia smithii* were then placed in every community, corresponding on average to the observed larval densities in *Sarracenia* leaves in northern latitudes of the North American range (Nastase *et al.*, 1995; Buckley *et al.*, 2003; Hoekman, 2007). The larvae were checked daily for pupation rate and survival, and were immediately replaced if they had died or reached the fifth-instar, non-feeding stage. The replacement larvae were stored in incubators programmed to the normal temperature variation conditions.

Temperature Treatments

For the communities from each site, we divided the 8 tubes per successional stage into two temperature treatments: ‘Normal Temperature Variation’ and ‘High Temperature Variation’. The Normal Temperature Variation treatment corresponded to the average daily variability of the four sites in July temperatures (data from worldclim.org, Fig. S1a; Fig. S2a,

c) and varied from 10 to 21 °C over 24 h. July temperatures were used because this was the month in which the communities were collected from all 4 field sites. The 'High Temperature Variation' Treatment corresponded to daily high variation events that are experienced within the leaves of *S. purpurea* by the aquatic community during the month of July (Fig. S2a-c; Fig. S9-S11; Supplemental material B, incubator temperatures varied from 4 to 35°C over 24 h). For both treatments, the mean temperature remained constant at 15.4°C, which is the averaged mean temperature of the 4 sites used in the experiment. By holding the mean temperature constant, we were able to test the effect of increased temperature variation on food-web dynamics.

Two incubators (Sanyo MIR-154) were programmed either to "High Temperature Variation" or "Normal Temperature Variation". In both incubators, temperatures changed in a stepwise process every two hours, with the temperature cycle repeating every 24 hours (see Fig. S2c). The experimental tubes were arranged in a randomized block design and placed according to their designated temperature treatment into the incubators. Note that both treatments received the same amount of energy; however, the high-variation treatment received more energy that could be used by metabolism than the normal-variation treatment (concept of growing degree day; e.g., Neuheimer & Taggart, 2007).

Measured variables:

On Day 0 (beginning), 2, 4, and 6 (end) of the experiment, we determined the bacterial densities, protist community composition and diversity, and mosquito mortality. For each community, a flow cytometer was used to determine bacterial density, an aliquot of 80µl was used to determine the presence/absence of all protist species with a compound microscope (100 and 400x fold magnification). For identification of protist morpho-species we used Streble & Krauter (2002). Mosquito mortality was visually inspected daily. Note that alpha-diversity of the protist can increase with time when very rare species become more abundant. Additionally, on Day 6, respiration of a 1ml sample of each community was measured using the MicroResp TM system (The James Hutton Institute, Scotland). The protocol used was adapted from the manufacturers (Carmen, 2007) and is described in detail in Zander *et al.*, (2016). For data presentation, the lowest measured value of respiration was set to 0 and all others were changed accordingly.

Statistical analyses

The effect of temperature variability through time on the bacterial density, presence or absence of protist morpho-species (measured by alpha- and beta-diversity), mosquito mortality, and respiration were evaluated with linear mixed effect models (lme). The explanatory fixed factors were the variability of the temperature, the successional stage, and the community origin status. The random factor was time since the start of the experiment (Days 2, 4, and 6). Temporal beta-diversity was measured for each protist community as the average Jaccard distance between sampling days 2-4, and 4-6. All model residuals were checked for normality with QQ plots and no data transformation was necessary for the lme-analysis. The analyses were performed in R (R Core Team 2013) with the function lme (package nlme; Pinheiro *et al.,* 2011). For each analyses, a model selection was made and only the results of the model yielding the lowest AIC value are presented.

Using Jaccard distance matrices (Legendre & Legendre, 1998), the differences in protist community composition due to the temperature treatments were determined. This analysis was done in order to determine the difference in protist community composition among each of the four sites and for early and late succession at Day 2, 4 and 6. For this calculation, the program Primer (Primer 6, Version 6.1.6, Primer E-Ltd., Clarke and Gorley 2006) was used. Community structure was visualized with NMDS plots. We used two dimensions since the stress-values were always smaller than 0.2. We also conducted Multivariate dispersion (MVDISP) analysis and Analysis of Similarity (ANOSIM) for these treatments. MVDISP provides an estimate of the dispersion among replicates within each community. This value is obtained by computing an Index of Multivariate Dispersion (IMD), in which negative values indicate lower dispersion of groups with high temperature variation compared to the groups with normal temperature variation. For the ANOSIM analysis, the output is a global R value, which is used to measure the compositional distance between groups of high and normal temperature variation. Communities are considered significantly different when $R > 0.5$.

Results

Lowest trophic level - Bacteria

For the lowest trophic level, temperature variation had a strong effect on bacterial density when this density was considered in its interaction with sampling day (p-value < 0.001, Fig. 1a and 1b; see Table S1 for full results), but was not significant as a main effect over the whole course of the experiment (Fig. 1c; p-value = 0.91). While on Day 2 there were more bacteria in the high-variation treatment than in the normal-variation treatment, this difference decreased for Day 4 and 6, indicating a stronger decline through time when the bacteria were exposed to higher variation. Irrespective of temperature variation, the bacteria of early-succession communities had a higher density than late-succession bacteria (Fig. 1c; p-value < 0.001); this difference was weaker on the last sampling day (Fig. S3), which resulted in a significant interaction with sampling day (p-value = 0.002).

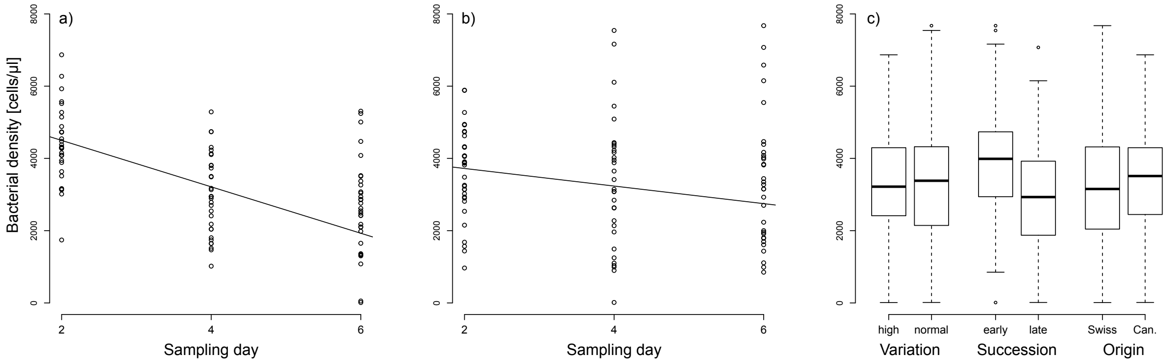

Fig. 1. Effect of temperature variation over time on bacterial density [cells per µl] in **a)** high-variation and **b)** normal-variation treatments. The regression lines in **a)** and **b)** are from univariate analyses. Note that initial bacterial density on day 0 was 1000 cells/µl for both temperature treatments. Overall effects of temperature variation, succession, and origin are shown as box-plots in **c)**: only Succession has a statistically significant main effect; Origin was never significant; Temperature variation was significant through its interaction with sampling day (see panels **a** and **b**). See Table S1 for full results and Fig S3 for additional graphs.

Intermediate trophic level - Protists

The effect of temperature variation on community structure was evaluated firstly on alpha diversity, secondly on its effect on species composition through time (temporal beta-diversity) for each community, and thirdly on species composition between the treatments at the three sampling days.

The temperature treatments changed the number of protist species, and thus alpha-diversity over time, when all days except the initial start day (Day 0) were considered (interaction of temp var. with days; p-value 0.045; Fig. 2; Table S3). On Day 2 and Day 4, there were fewer species present in the high temperature variation treatment than the normal temperature variation treatment. However, this effect disappeared by the end of the experiment (Day 6). When only the factor 'temperature-variation' was considered, this difference in alpha-diversity between the high- and the normal-variation treatment became even more significant (p-value = 0.012; Table S3). Note also that late-successional and Canadian communities were more species rich from the outset (see Fig. S4 and Table S3). Finally, the number of protist morpho-species was positively related to bacterial density (p-value = 0.021; Fig. S5).

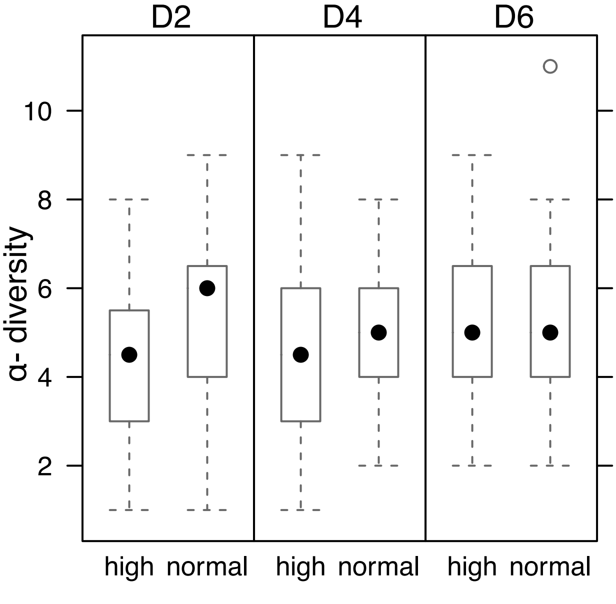

Fig. 2. Protist species numbers (Alpha-Diversity) on the 3 sampling days (D2 to D6) as a function of temperature variation (high and normal), in which the main effect was statistically significant (data from all days combined; p-value = 0.01), as well as its interaction with sampling day (p-value = 0.04); see Table S3 for full results. The effect is very strong on day 2 but decreases over time to finally vanish.

The change in protist species beta-diversity through time was affected by temperature variation (Fig. 3a; p-value = 0.001) and community origin (Fig. 3b; p-value = 0.038), but was independent of successional stage. Interestingly, the Swiss communities changed more over time and were more affected by high temperature variations than the Canadian ones, resulting in a significant interaction between both factors (Fig. 3c; p-value = 0.042; see Table S4 for full results).

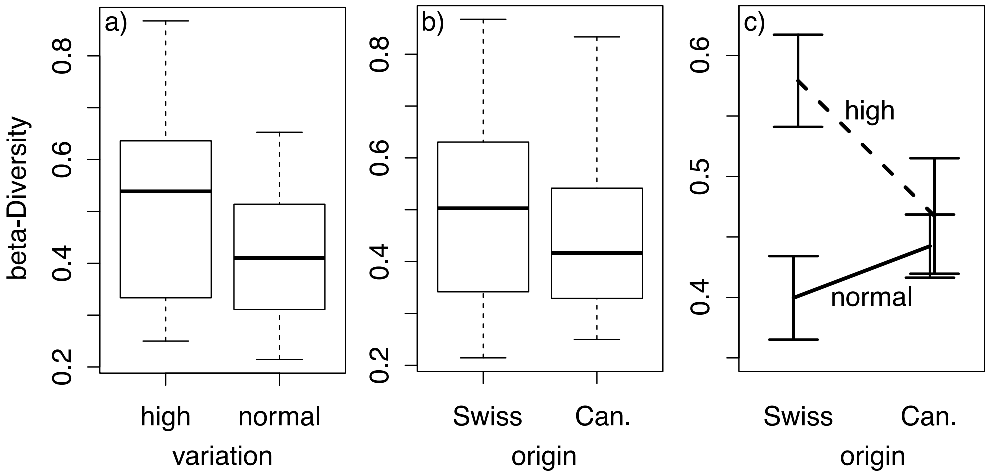

Fig. 3. Effects on temporal protist beta-diversity for **a)** temperature variation (box plot), **b**) community origin (box plot; Can. = Canada) and **c**) both factors (interaction plot of variation and origin). Beta-diversity changes significantly more in high variation compared to normal variation treatments (a), as well as in Swiss compared to Canadian treatments (b). Swiss communities exposed to high variation treatments changed much more than the control communities exposed to normal variation, while Canadian communities changed in a similar way in high and normal treatments. See Table S4 for full results.

The high temperature variation treatment significantly affected protist community composition at each sampling day; however, the effects depended on the successional stage of the community. No trend was visible for early successional communities (Fig. 4a). For the late successional communities, the R-values, which measure the differences between community composition in high and normal temperature variation, tended to increase over time (Fig. 4b). This increase in R-values through time means that the community composition in the high-variation treatment became increasingly different over the time course of the experiment when compared to the community composition in the normal-variation treatment (see also Fig. S6).

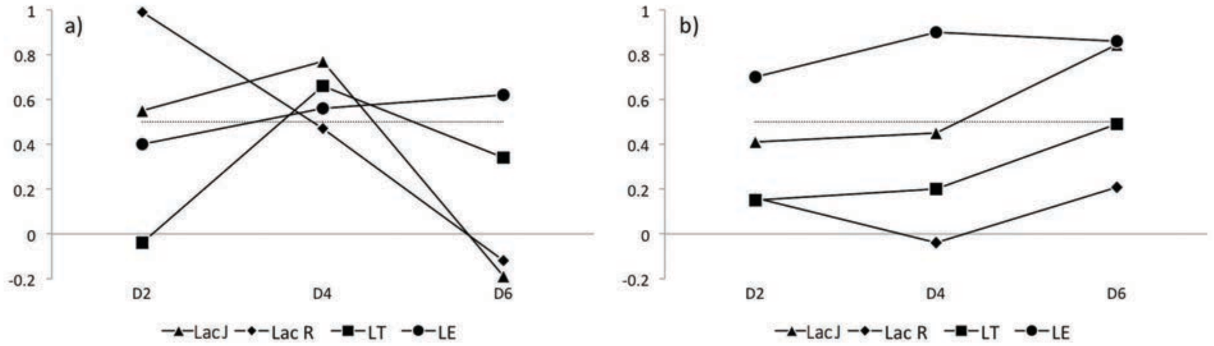

Fig 4. **R-values of the pair-wise tests between high and normal variation treatments** for the three sampling days (D2 to D6). R-values describe divergence in composition due to temperature variation, and are considered significant when higher than 0.5 (dotted line). **a)** Early-succession communities; **b**) Late-succession communities. Legend: LacJ, Lac des Joncs; LacR, Lac Rimouski; LT, Les Tenasses; LE, Les Embreux.

The changes in protist species composition between the treatments on the three sampling days were mostly due to several species that drastically changed their relative abundance. The morpho-species cf. *Euplotes* sp. (Msp. 9) and Msp 11 (*Tetrahymena* cf. *pyriformis*) as well as *Chlamydomonas* sp. (Msp. 23) and Msp. 37 (unknown flagellate sp. D) were no longer detectable in the high variation treatments, while they stayed abundant in the normal variation treatment (see Table S6 and Fig. S7). Two other morpho-species also suffered severely from high temperature variation but were not pushed near to extinction. The Msp. 10 (heterotrophic-nano-flagellate (HNF) sp. B) and 18 (Chrysomonadina sp. D) lost 16 and 9 percentage points of relative occurrence, respectively, compared to their occurrence in the normal temperature variation treatment. All other morpho-species either did not change or slightly gained in relative occurrence throughout the time course of the experiment, independent of temperature treatment (see Table S6 and Fig. S7).

Mosquito mortality

We used Poisson-family glm to relate the number of dead mosquitoes to the three factors of the study. Neither temperature variation, successional stage, nor community origin had a significant effect on mosquito mortality (see Table S5 for detailed results).

Community Respiration

The results of community respiration at Day 6 showed that high temperature variation negatively affected this global measure of ecosystem functioning (Fig. 5, Table S2 for details on the results). Communities that experienced the normal temperature variation treatment respired significantly more than communities in the high temperature variation treatment (p-value < 0.001; Fig 5). These results could appear consistent with the bacterial densities, in which more bacteria were present in normal temperature variation than in high temperature variation on Day 6 (Fig. 1a,b). However, we found no relationship between respiration and bacterial density in our experiment (linear model, p-value = 0.29). Globally, early succession communities are more productive (p-value =0.002; Fig. S8), but there was no difference in respiration between the early communities of different origins; however, late succession communities from Switzerland were less productive than late succession communities from Canada, irrespective of temperature variation, resulting in a significant interaction of the factors succession and origin (p-value = 0.018; Fig. S8, Table S2 for full details on results).

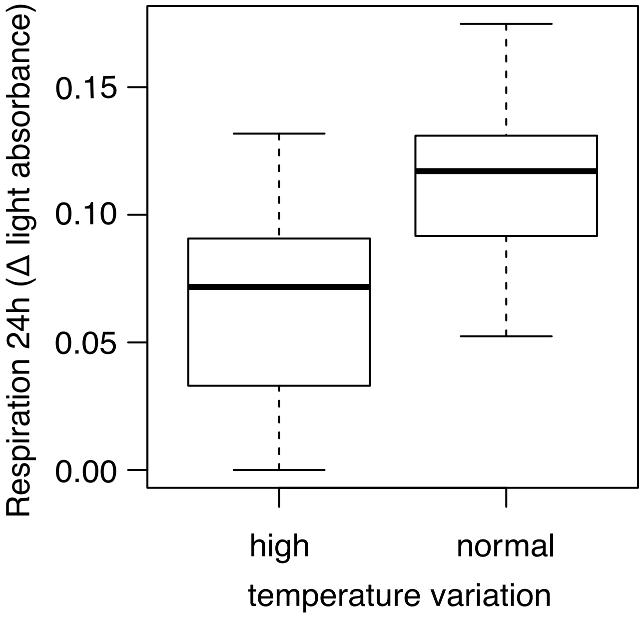

Fig. 5: Effects of temperature variation on productivity. Communities in the normal variation environment respired more than the ones in the high variation environment. The respiration measurements were conducted on day 6. See Table S2 for full results.

Discussion

Increased temperature variation affected food-web dynamics and community respiration differently than was hypothesized. The successional stage of the communities only played a significant role in altering the effect of temperature variation for the intermediate trophic level. Interestingly, although there were some significant differences in the food webs from Canada and Switzerland, the impact of increased temperature variation was similar in all food webs, irrespective of origin. The only exception was for protist beta-diversity. These results highlight that predicting the effects of global change on community dynamics will be challenging, and more work is necessary to tease apart the various effects of temperature increase and temperature variation among and within trophic levels.

For the bottom trophic level, we found that the bacteria initially had a higher density in the increased temperature variation treatment than in normal temperature variation, as was hypothesized. However, after this initial boost in growth (Day 0-Day 2), the bacteria decreased their density markedly and reached smaller densities than the bacteria in normal temperature variation by the end of the experiment (see Fig. 1a and b). This indicates a faster response due to higher usable energy input in the high temperature variation treatment, with bacteria growing faster until their "carrying capacity" is reached, but then severely declining - a result consistent with other studies (e.g., Ratkowsky *et al.*, 1982; Ratkowsky *et al.*, 1983; Iyer-Biswas *et al.*, 2014). This decline is likely due to the combined effects of stronger predation by protists and increased inter- and intraspecific competition.

We observed a general positive relationship between bacterial density and the number of protist species. This relationship is expected because higher density of prey leads to higher protist densities, and thus higher detectability of rare protist species. However, we observe a lower alpha-diversity of protists in the high temperature variation treatment, indicating that the potential benefit of higher bacterial densities was offset by the detrimental effect of temperature variation on the non-tolerant protist morpho-species. Accordingly, we found that four morpho-species severely declined in the high temperature variation treatment. These results suggest that the ability of species to persist depends on their range of thermal tolerance. However, the difference in alpha-diversity between the two temperature treatments became weaker over time, suggesting an adaptation of some species.

The change in protist composition through time (beta diversity) was greater in the high temperature variation treatment, and also in the Swiss origin. Furthermore, the interaction of both factors is significant (see Fig 3c). One reason for this pattern is that protist diversity in the Swiss sites is typically lower than in the Canadian sites (see also Zander *et al.*, 2016), which may render communities more susceptible to environmental changes. Another reason could be that Swiss protists are less adapted to the *Sarracenia*-pitcher habitat because they have shared a shorter evolutionary history with the plant than the protist species associated with the plant in North America. However, as hypothesized, species composition in early succession communities was less affected by high temperature variation than late succession communities, for which we observed increasing divergence in composition with time (Fig. 4). The environmental filtering that occurs with higher temperature variation thus appears to be stronger for these late stage communities, which are typically composed of larger and more competitive species, while the early succession communities harbour more pioneer species (e.g. lakes: Sommer *et al.*, 1986, *S. purpurea* system: Gray, 2012; Miller & terHorst, 2012; Zander *et al.*, 2016).

Contrary to our hypothesis, we did not observe a significant change in mosquito mortality in the high temperature variation treatment. Our argument was based on the allometric relationship where body-size is larger in higher trophic levels (Woodward *et al.*, 2005) and was supported in experimental studies (e.g., Petchey *et al.*, 1999). In our case, the absence of an effect may be due to the fact that *Wyeomyia* larvae regularly experience high temperature variation inside the pitchers of *S. purpurea*, and that our experimental thermal range never transgressed the physiological limits of the species. Note that *Wyeomyia* larvae are strictly endemic to pitchers and probably have co-evolved with *S. purpurea* since the Wisconsin glaciation (Heard, 1994; Gray, 2012).

Community respiration, which was measured at the end of the experiment, significantly decreased with high temperature variation. We hypothesized that increased variation would not affect respiration, because higher respiration rates in high temperature would be compensated by lower rates in low temperature. Since we found no significant relationship between respiration and bacterial density in our experiment, this result suggests a metabolic effect, and indicates that, in the long run, ecosystem functioning will be negatively affected by increased temperature variability. This result may be general, as high temperature variation is forcing organisms to spend more time in physiologically stressful conditions.

Studies on temperature variability are important as they explore the effects of a relatively poorly studied component of climate change research, especially at the community and food-web levels. The *S. purpurea* system provides an excellent first step in answering this essential research question. This system is small enough to be kept in incubators and has been widely used experimentally due to the short generation time of the species, its replicability, and its wide distribution across North America and Western Europe (e.g., Kneitel & Miller, 2002 & 2003 ; Miller *et al.*, 2002; Gray *et al.*, 2006; Gebühr *et al.*, 2006; Buckley *et al.*, 2010; Baiser *et al.*, 2012; Krieger & Kourtev, 2012). The inquiline communities are composed of naturally co-occurring species (with the exception of *Wyeomyia* in the Swiss communities) and exist for nearly two years before their leaves die, which is much longer than ephermal systems. We thus expect our results to be more relevant to large-scale freshwater systems than if randomly assembled systems were used.

However, this system also has its limitations. Notably, because different taxa with highly variable densities and generation time are found across the different trophic levels, it was difficult to assess the effects of treatments with the same methodology for all levels. In our case, we concentrated on global densities for bacteria, on community composition for protists, on mortality rates for the mosquitoes, and on respiration as a global ecosystem functioning measurement of the whole system. For the mosquitoes, we could only use mortality as a readout because the generation time was too long to allow the inclusion of population growth/decline in our study. Also, this measurement would be technically challenging for any species that does not complete its life cycle inside the boundaries of an aquatic system. These decisions allowed for the experiment to be conducted with a large number of treatments, but limited our ability to test hypotheses that are designed for the whole food web and to have a high level of replication. Note that, because species in higher trophic levels are typically larger and have a longer generation time, any research on food-web structure and dynamics will face similar difficulties. A second limitation is that this system lacks the complexity of larger aquatic systems, as it mainly contains species with very fast generation times and non-sexual life cycles. These fast life cycles, especially of the bacteria and protist in this system, allowed the species to quickly respond, and possibly to adapt, to temperature perturbations. Therefore, it will be difficult to generalize our results to larger species of higher taxonomic orders because, when considering the adaptability of species, the interaction between generation time and the amount and speed of temperature-variability change is pivotal. It is important to stress, however, that the short generation time of the species in the *Sarracenia* system makes the results from this six day experiment "equivalent" to results of higher order species after they have undergone ~20-40 generations or more (depending on the trophic level).

The effect of temperature variation has been tackled experimentally in several studies (Descamps-Julien & Gonzalez, 2005; Jiang & Morin, 2007; Burgmer & Hillebrand, 2011; Shurin et al., 2010; Tuck & Romanuk, 2012) and in general, was found to be positive, notably for the coexistence of two competing protist species (Jiang & Morin, 2007). These results can be interpreted within the concept of the intermediate-disturbance hypothesis, where moderate variability will be generally beneficial to the community by increasing the range of environmental conditions, allowing more species to persist. This result led Burgmer & Hillebrand (2011) to hypothesize that higher temperature variation should foster species coexistence in a species-rich phytoplankton system. Contrary to their hypothesis, they found the opposite, which is in line with our results. This finding highlights the sensitivity of the responses to the range in temperature variation. Here, we set our experiment to match extreme variation measured in our natural system (4 to 35° in one week, with 27° daily variation; Fig. S2; Fig. S10-S12; Supplemental material_B, see also Bradshaw, 1980). Our result thus shows that current levels of variation do lead these natural systems beyond the positive effect phase of increased temperature variation, contrary to the above studies. It is likely that the predicted increase in climatic extreme events will put natural communities like the one studied here in an even greater threat of disruption.

Globally, our results highlight that the effects of increased temperature variability can be different across trophic levels. This variability is in part attributable to experimental constraints imposed by the varying life-cycles, particularly the generation time, of the species in a food web. Moreover, building a general theory regarding the effects of high temperature variability at the food-web level remains challenging. This theory could be possible if the thermal limits of species would change predictably with body size, as the latter is known to increase with trophic levels (e.g., Cohen *et al.*, 2003). However, data about such a relationship are scant and do not reveal any clear pattern (Stevenson, 1985; Liu *et al.*, 1995; Stewart *et al.*, 2013). The effects of temperature variability at the community level may then be idiosyncratic. Future research should concentrate on obtaining more information about thermal ranges for species spanning a wide range of body size in various taxonomic groups. Such data are a prerequisite for the formulation of mechanistic models for natural large-scale communities, going beyond the scope of small-system experiments, like in the present one and in others (e.g., Tuck & Romanuk, 2012; Sentis *et al.*, 2014). Mitigating the effects of global changes can only be achieved by a consideration of the effects of increased average temperature and thermal variability.

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Chapter 4: Supplemental Material A

Title: Effects of temperature variability on community structure in a natural microbial food web

Axel Zander, Sarah M. Gray and Louis-Félix Bersier

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Supplemental Figure S5	Scatter plot of number of protist species against bacterial density.
Supplemental Figure S6	NMDS plots of all sites.
Supplemental Figure S7	Effect of temperature variation on protist species occurrence.
Supplemental Figure S8	Effects of succession and origin on community respiration.
Supplemental Figure S9	Daily maxima temperatures at the LT site for the month of June, July and August 2012.
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Supplemental Table S2	Results from the linear model for respiration.

Supplemental Table S3	Results from the generalized linear model for protist α-diversity.
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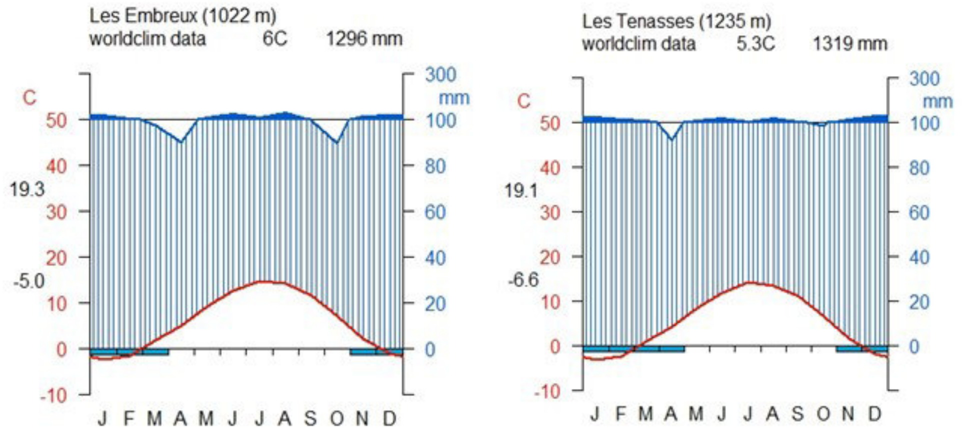
Supplemental Table S5	Results from the generalized linear model with Poisson regression for mosquito mortality.
Supplemental Table S6	Relative occurrence of protist morpho-species.

Fig. S1 a):

Origin	**Field Sites**	**Average minimum July Temperature (°C)**	**Average mean July Temperature (°C)**	**Average maximum July Temperature (°C)**	**Temperature range between maximum and minimum (°C)**
Switzerland	Les Embreux (LE)	9.9	14.6	19.3	9.4
	Les Tenasses (LT)	9.2	14.3	19.3	10.1
Canada	Lac des Joncs (LacJ)	11.5	17	22.4	10.9
	Lac Rimouski (LacR)	10.7	16.3	21.8	11.1

Fig. S1 b):

Switzerland



Canada

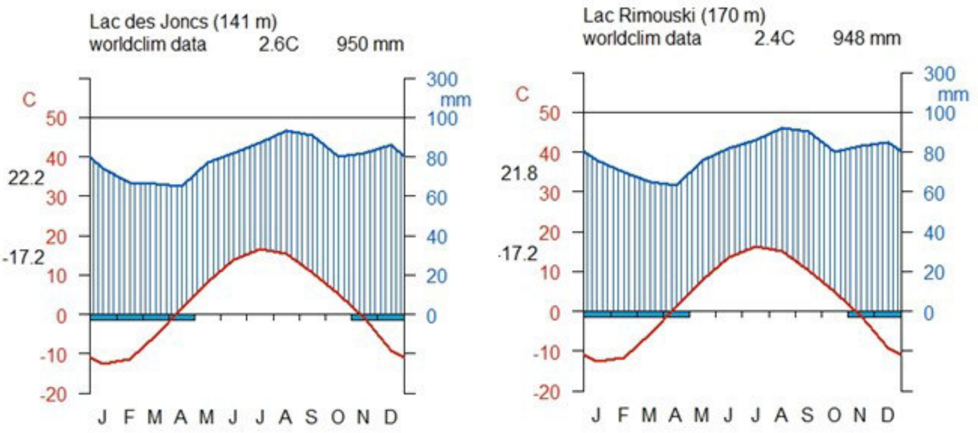
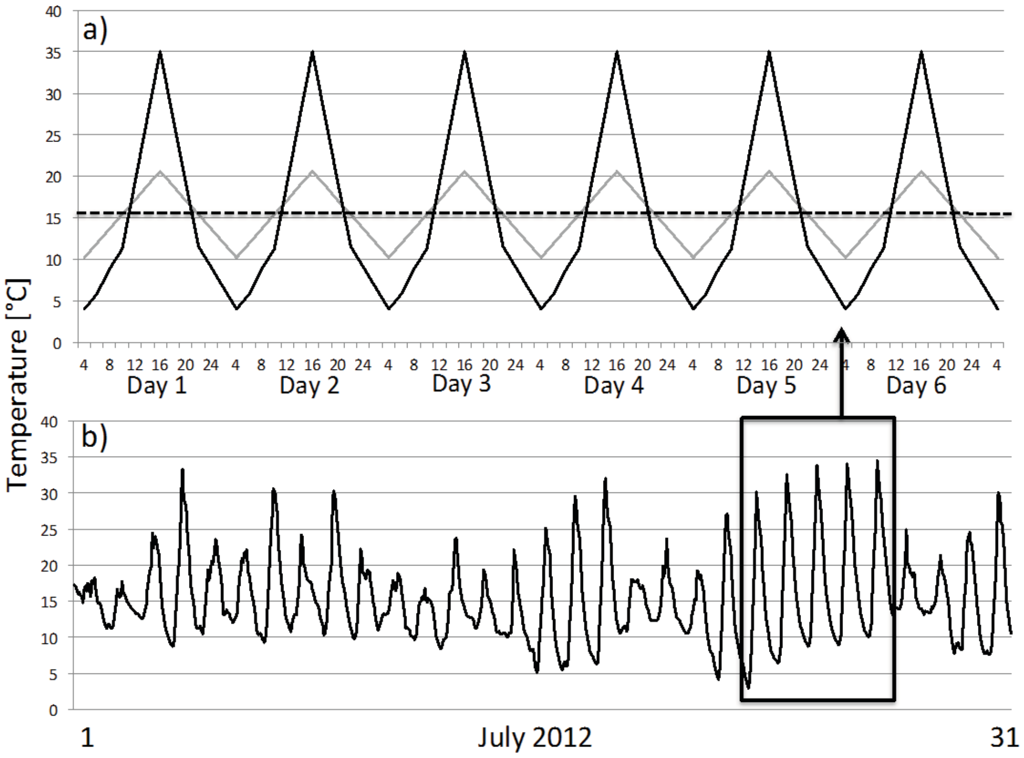


Fig. S1: a) The average July minimum, mean, and maximum temperatures of the four field sites according to 50 years of Worldclim data (Years 1950 – 2000; www.worldclim.org). These data determined the temperatures to be used in the 'Normal Temperature Variation' Treatment. July temperatures were used because the *Sarracenia* communities established in the leaf during this month at all four sites. The average precipitation at these sites during July according to 50 years of Worldclim data were: LE: 109mm, LT: 101mm, LacJ = 87mm, LacR = 86mm. **b) Climatic Diagrams of the average monthly temperature and precipitation of the four sites according to 50 years of Worldclim data (Years 1950 – 2000; www.worldclim.org).** Headers in black identify the site, altitude of the site, average yearly temperature (Celsius) and average yearly precipitation (mm). Left Y-axis = temperature, with the maximum and minimum yearly temperature identified in black. Right Y-axis = precipitation. X-axis = month. Blue bars identify the months with snowfall. It is important to note that although there is variation throughout the year between the sites, the months in which the *Sarracenia* community is active (July – September) are similar in temperature.

Fig. S2:



c)	Normal variation	High variation	
Hour in the Day	temp (°C)	temp (°C)	light
6	11.9	5.82	1
8	13.7	8.9	1
10	15.4	11.3	1
12	17.1	19.2	1
14	18.9	27.1	1
16	20.6	35	1
18	18.9	27.2	0
20	17.1	19.4	0
22	15.4	11.6	0
24	13.7	9	0
2	11.9	6.5	0
4	10.2	4	0
Mean Temperature	15.4	15.4	

Fig. S2 a): The temperature treatments of the experiment: High variation (black), temperature cycling in 24h from 4 to 35 °C. Normal variation (gray), temperature cycling over 24 h from 10 to 21°C. Average temperature of both curves is 15.4°C. Thermal sums are identical. **b): Measured temperature variation in a leaf of *S. purpurea* during July 2012 in Les Tenasses (LT).** Each peak represents one day. Measurements were taken hourly. Note that the box highlights a good weather period of 5 days, where daily changes up to 26°C were recorded. The minimum temperature of this period was 4°C and the maximum temperature 35°C. This range served as a proxy for the high variation treatment. Note that the temperatures in the high variation treatment do not exceed the temperature range measured in the leaves, as in mid-June 2012 an inside leaf temperature of only 2°C was measured (three days later it reached again 34°C, see also Fig. S12). The variation applied in the experiment is extreme, but can occur under natural conditions. Measures were taken once per hour. See supplemental Material B for full results. **c): Detailed incubator program for the 'Normal Variation Temperature' and 'High Variation Temperature' treatments.** 'Normal Temperature Variation' (varying from 10 to 21°C over 24 h, with an incremental increase or decrease in temperature every 2 hours. The temperatures of this treatment correspond to the average daily variability of the four sites in July temperatures (data from worldclim.org, Table S1; average temperature 15.4°C). 'High Temperature Variation' (varying from 4 to 35°C over 24 h, with an incremental increase or decrease in temperature every 2 hours. These data correspond to high-variation daily events that the *Sarracenia purpurea* community experience inside the leaves (see Fig S1b). The average temperatures for both treatments were held constant at 15.4°C. Light within the incubator was programmed for a 12h light/dark cycle with 1 = light on; 0 = light off.

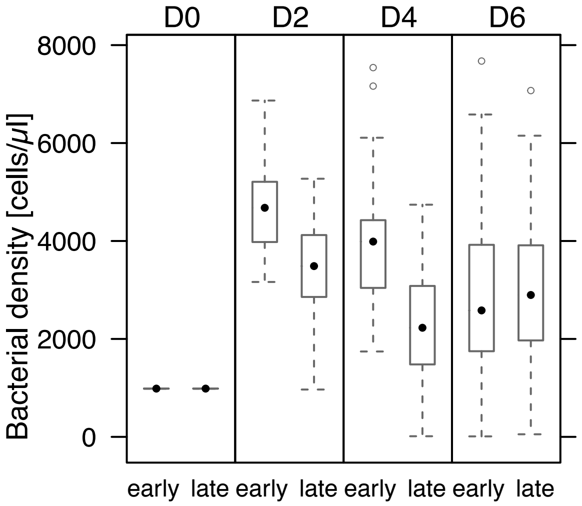


Fig. S3: Bacteria Density [cells per µl] for early and late succession communities on the three sampling days. The effect of temperature variation on bacterial density is significant over time (p-value = 0.0024). On day 2 and 4 there were significantly more bacteria in early compared to late succession. This effect vanished on day 6. Note that on day 0 (D0) the communities were diluted to a density of ca. 1000 cells per µl.

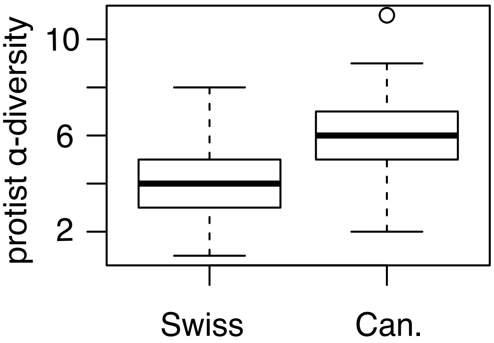


Fig. S4: Protist α-diversity in the European (left) and North American (right) *S. purpurea* communities. From the beginning and throughout all days of the experiment the α-diversity was lower in the Swiss compared to the Canadian protist communities.

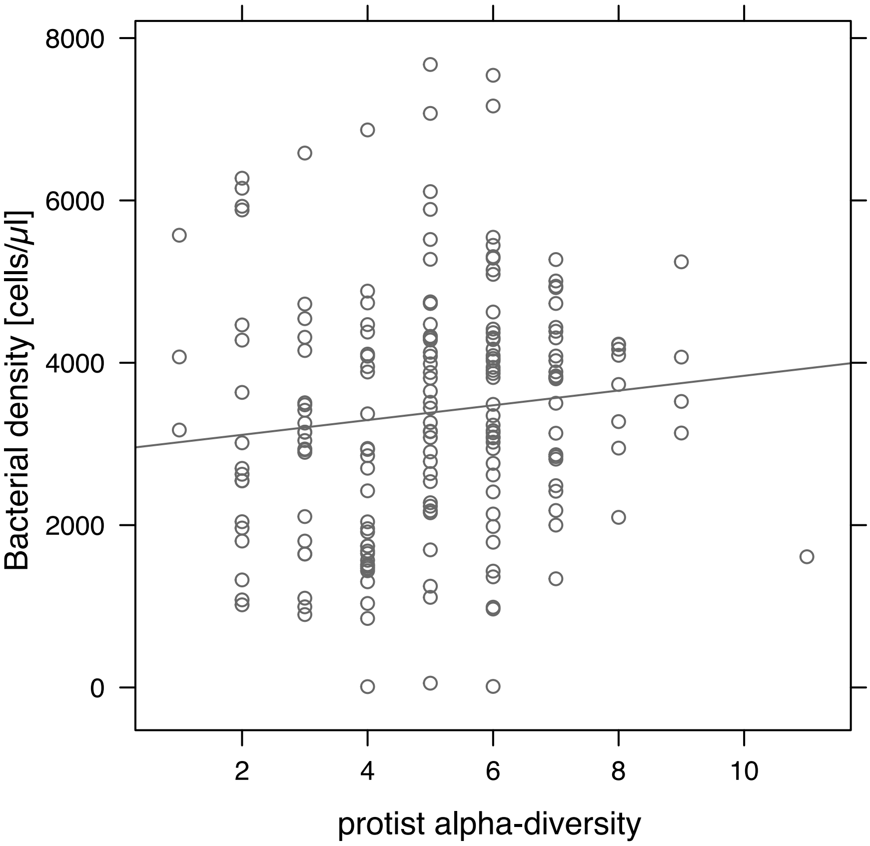


Fig. S5: Scatter plot of number of protist species against bacterial density [cells/µl]. There was a weak positive correlation between bacterial density and protist species number.

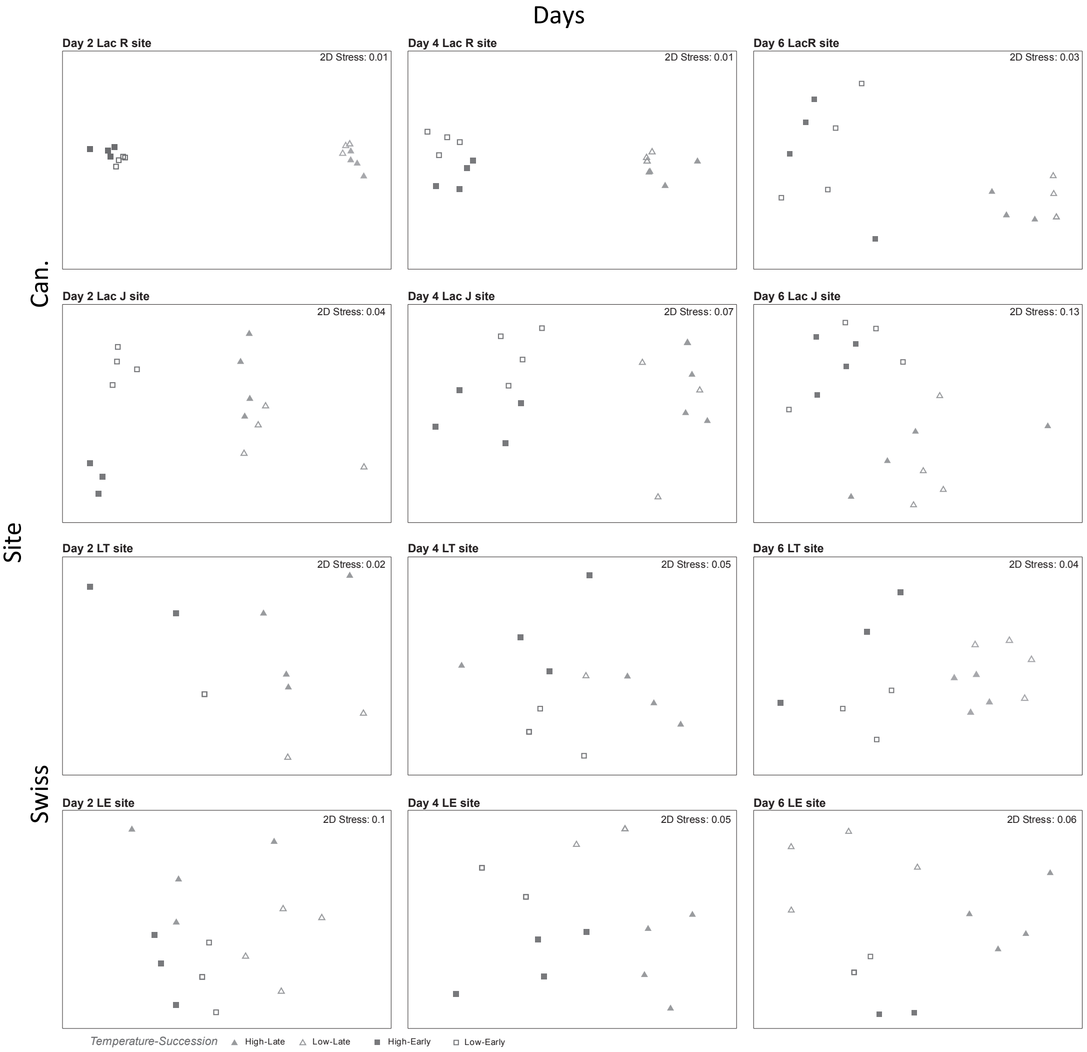


Fig. S6: NMDS plots of all sites (top to bottom: Lac R = Lac Rimouski (Can.); Lac J = Lac de Joncs (Can.); LT = Les Tenasses (Swiss); LE = Les Embreux (Swiss)) over time (day 2, 4, 6 from left to right). Each triangle represents one community in a 2D NMDS plot (High temperature variation: filled gray square/triangle; Normal temperature variation: unfilled square/triangle; Late Succession: triangle; Early Succession: Square). Nearby objects have similar species composition (in case of identical community composition, the symbols representing these communities completely overlap; i.e., LE and LT early succession).

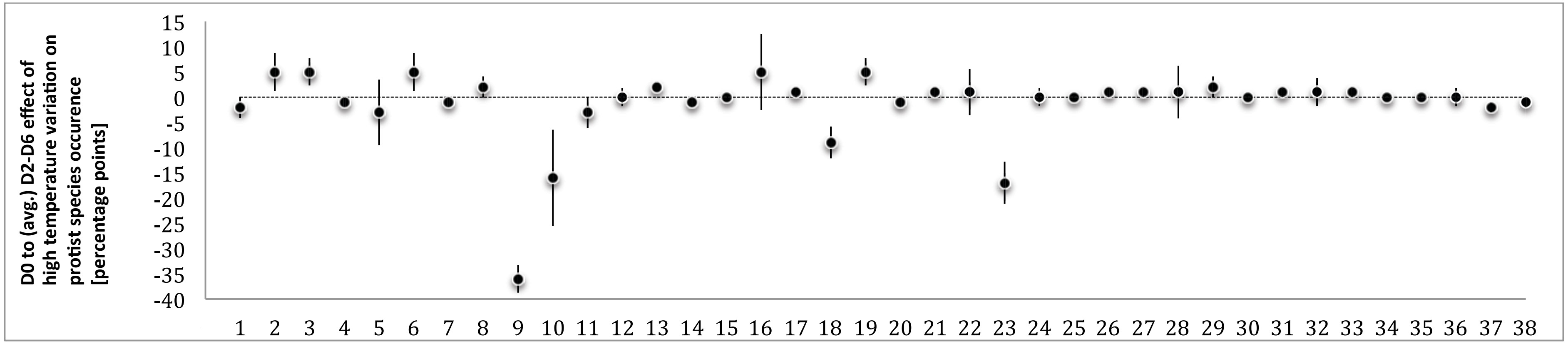


Fig. S7: Effect of temperature variation on protist species occurrence. Most protist morpho-species (x-axis) were not or only marginally affected by temperature variation. The Msp. 2, 3, 6, 16 and 19 were slightly positively affected, however the Msp. 9, 10, 11, 18, 23 and 37 were severely negatively affected. Note that Msp. 9 (cf. *Euplotes* sp.), Msp 11 (*Tetrahymena* cf. *pyriformis*), Msp. 23 (*Chlamydomonas* sp.) and Msp. 37 (unknown flagellate sp. D) were not anymore detectable in any of the replicates in the high variation treatments at the end of the experiment and might have gone extinct, see also Table S6.

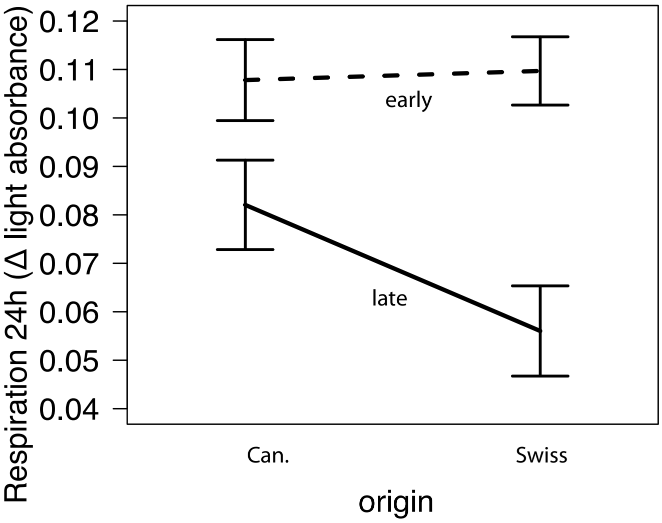
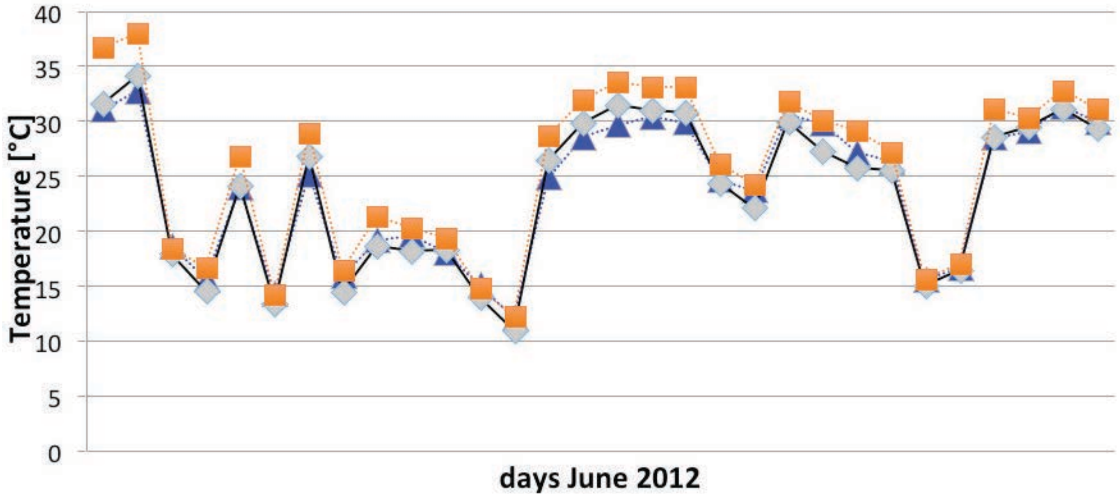


Fig. S8: Effects of succession and origin on community respiration. Globally early succession communities are more productive than those of late succession. There are no differences in respiration of early succession communities between Switzerland and Canada, however Swiss late succession communities are much less productive than Canadian (Can.) ones. Error bars correspond to 1 standard error. See Table S2 for full results.

Fig. S9:


40
35
30
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10
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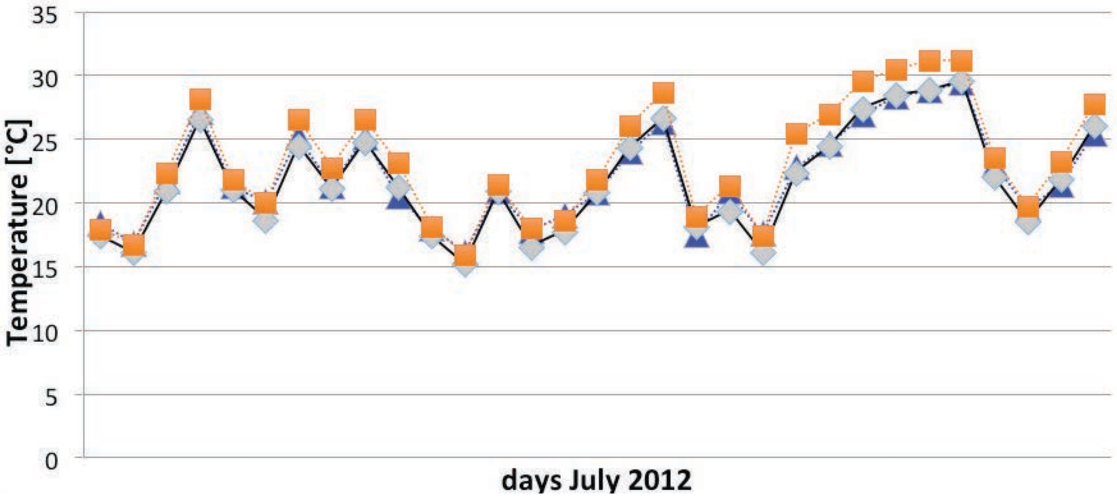
0
Temperature [°C]
days June 2012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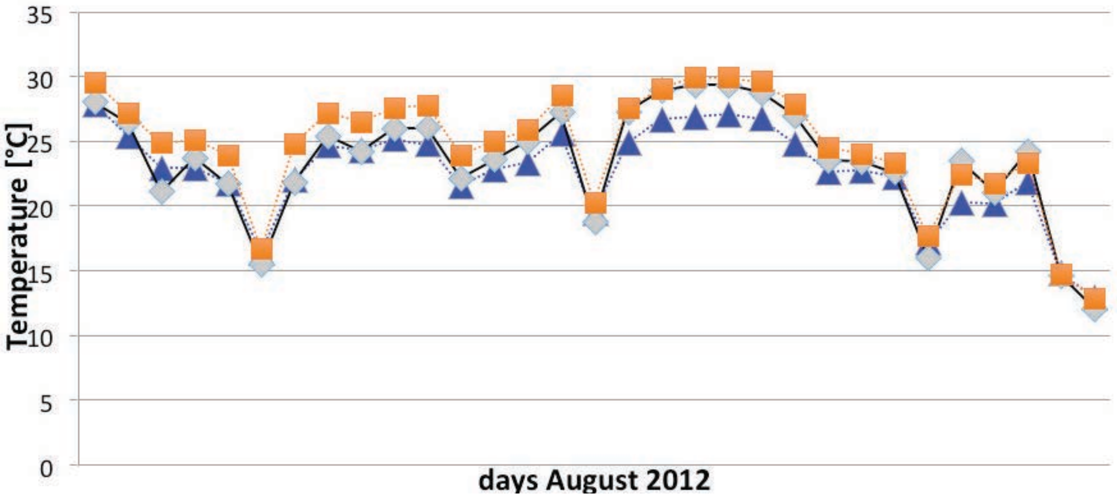
Temperature [°C]
days July 2012


35
30
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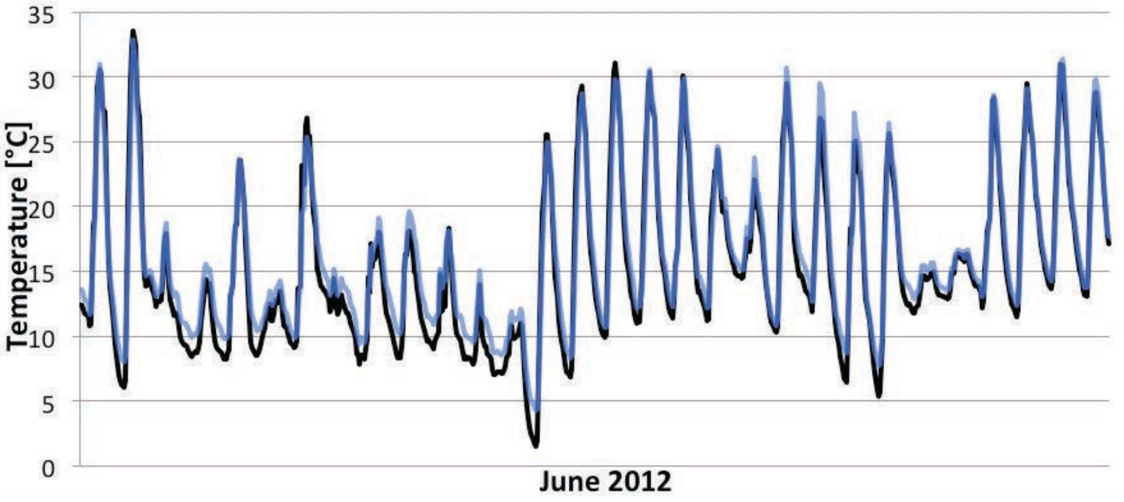
10
5
0
Temperature [°C]
days August 2012

Fig. S9: Daily maxima temperatures at the LT site for the month June, July and August 2012 (values are averaged from 2-3 data loggers for each category): inside pitchers (grey), bog water (blue) and outside air temperature close to the pitchers (orange). For most of the recorded days, the temperature inside the pitchers exceeded the maximal bog water temperature. See Supplemental Material B for full results.



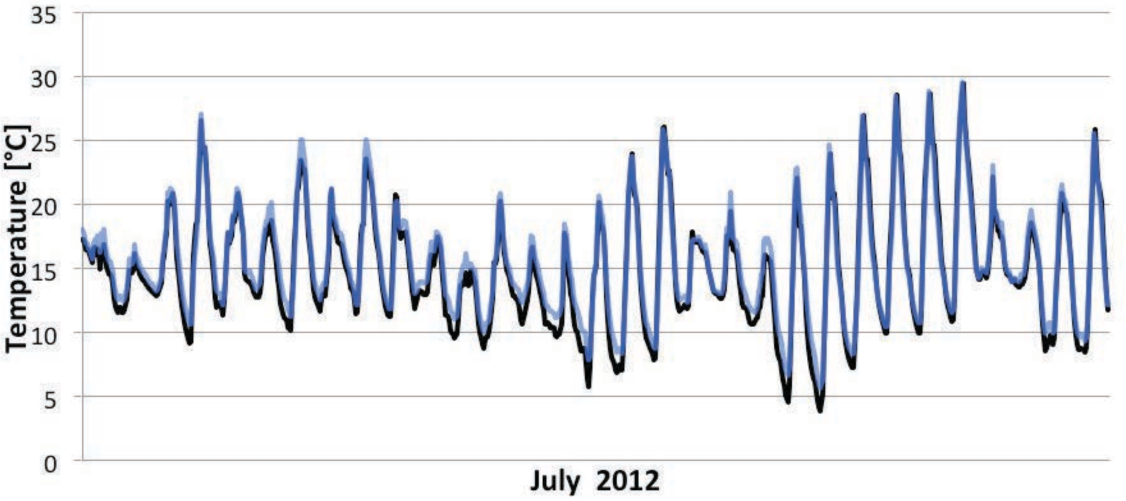


Fig. S10: Temperature history of June and July 2012 at the LT site for inside pitcher liquid (black) and bog water (blue) for the month June and July 2012. During good weather periods, the daily temperature variations are higher than during cloudy/rainy days (see also Fig. S11). Furthermore, the daily temperature variations inside the pitchers are more extreme than in the bog water. This result is because pitchers hold a small volume of water compared to a bog habitat, which allows the water to heat up and cool down fast. Measures were taken once per hour. See Supplemental Material B for full results.

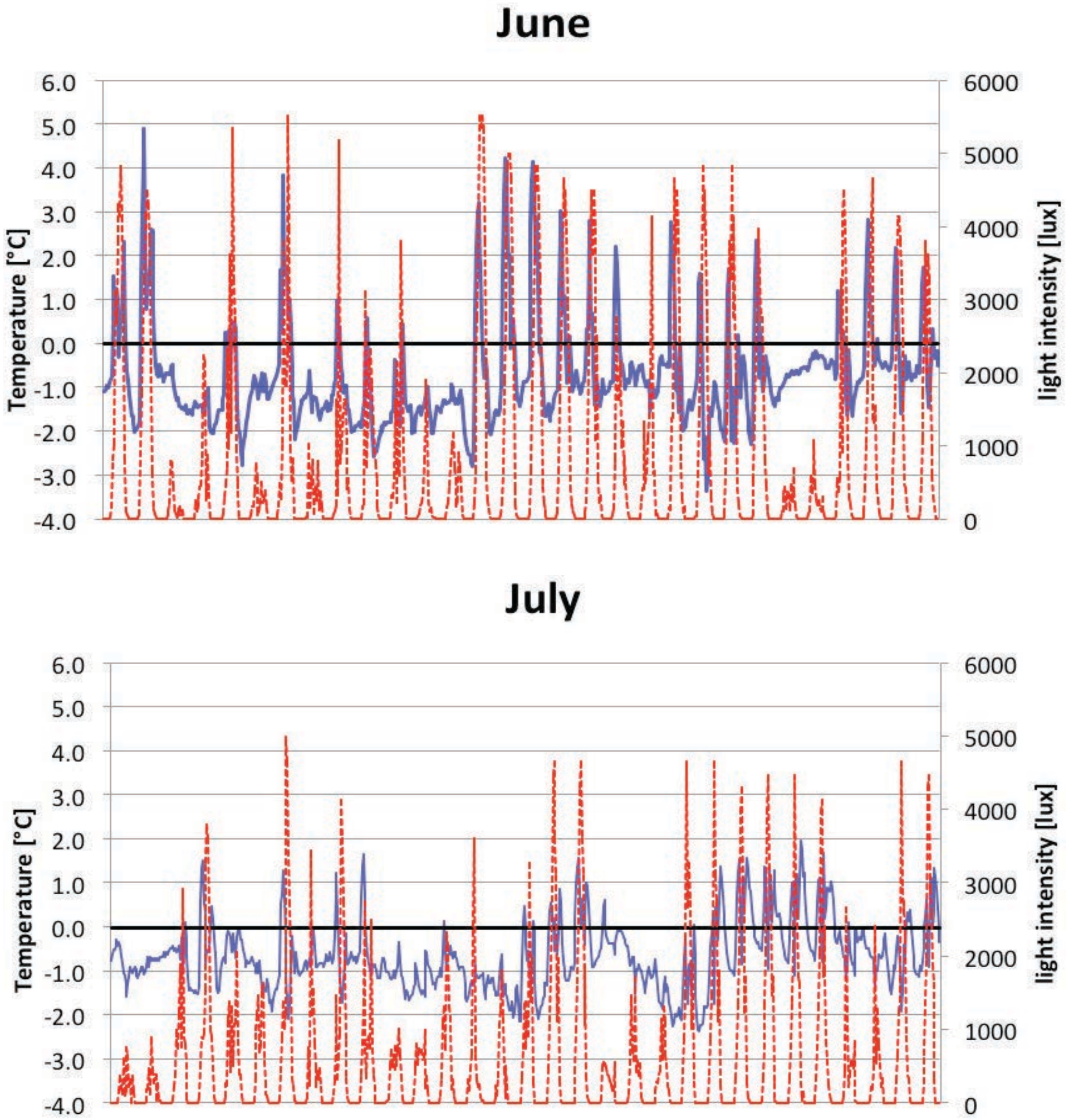


Fig. S11: Influence of light intensity measured in lux (right scale; red dashed line) on temperature difference between inside the pitchers and the bog water (left scale; blue line) for the month of June (above) and July (below) 2012 at the LT site. Each light intensity peak represents one day. During sunny periods (high light intensity), the inside pitcher temperature is higher than in the bog water due to the small liquid volumes heating up faster. However decrease in temperature is also quicker (after sunset or during bad weather conditions) compared to the bog water (→ more extreme temperature variations inside the pitchers). Note that light intensities reaching the data-logger decreased over time due to increasing amounts of shade caused by growth of other pitchers and surrounding vegetation on the site. See Supplemental Material B for full results.

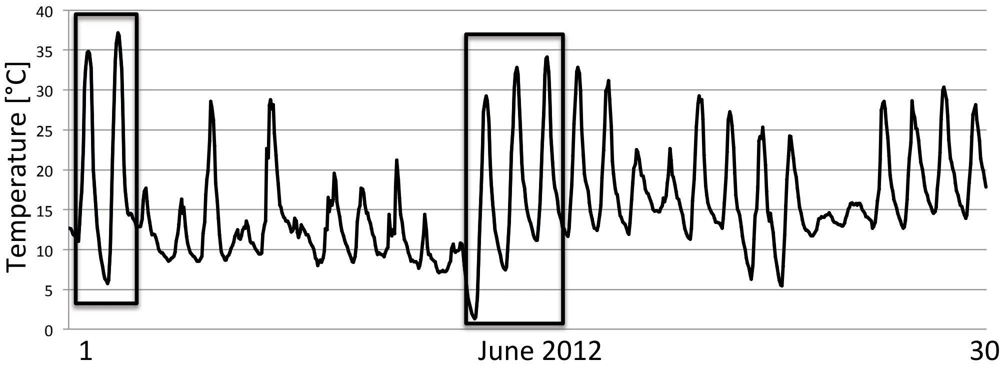


Fig. S12: Measured temperature variation in one leaf of *S. purpurea* during June 2012 in Les Tenasses (LT). Each peak represents one day. Measurements were taken hourly. Note that the boxes highlight good weather periods, leading to extreme temperature variations, in which daily changes of over 30°C were recorded (left box). The minimum temperature in June 2012 was 2°C (mid June) and the maximum temperature 37°C (beginning of June)..

Table S1: Results from the generalized linear model for bacterial density with respect to temperature variation (high, normal), number of days (2, 4, 6), origin (Swiss, Can.), successional stage (early, late), protist alpha diversity, the interaction of the factors 'days' with 'temperature variation' and 'days' with 'successional stage'.

Variable	Parameter	SE	t	p-value
Intercept	3213.4	311.21	10.325	<0.001
Temp. variation	21.4	190.27	0.11	0.91
Days	-642.43	100.18	-6.41	<0.001
Origin	-313.9	229.7	-1.37	0.17
Succession	-889.4	188.7	-4.71	<0.001
Protist alpha-diversity	152.9	64.49	2.37	0.019
Temp. variation:days	399.1	115.31	3.46	<0.001
Succession:days	352.97	114.69	3.08	0.002

Table S2: Results from the linear model for respiration with respect to temperature variation (high, normal), successional stage (early, late), origin (Swiss, Can.), and the interaction of 'successional stage' and 'origin'. The intercept is for high variation, early succession, and Swiss communities.

Variable	Parameter	SE	t	p-value
Intercept	0.083	0.006	12.94	<0.001
Temp. variation	0.05	0.006	8.54	<0.001
Succession	-0.026	0.008	-3.16	0.002
Origin	0.002	0.008	0.23	0.81
Succession:origin	-0.028	0.012	-2.43	0.02

Table S3: Results from the generalized linear model for protist α-diversity with respect to origin (Swiss, Can.), temperature variation (high, normal), successional stage (early, late), days (2, 4, 6), bacteria density, and the interaction of 'successional stage' and 'origin', as well as the interaction of 'temperature variation' and 'days'. The intercept is for Swiss, high variation and early communities.

Variable	Parameter	SE	t	p-value
Intercept	2.7	0.36	7.5	<0.001
Origin	3.03	0.28	10.78	<0.001
Temp. variation	0.50	0.199	2.53	0.012
Succession	0.78	0.29	2.7	0.008
Days	0.27	0.09	2.95	0.004
Bacteria	0.0002	0.00008	2.33	0.02
Succession:origin	-1.93	0.4	-4.88	<0.001
Temp. variation:days	-0.25	0.12	-2.02	0.04

Table S4: Results from the linear model for temporal beta-diversity with respect to origin (Swiss, Can.), temperature variation (high, normal), successional stage (early, late), and the interaction of 'temperature variation' and 'origin'.

Variable	Parameter	SE	t	p-value
Intercept	0.56	0.04	13.3	<0.001
Origin	-0.11	0.053	-2.13	0.038
Temp. variation	-0.18	0.05	-3.4	0.001
Succession	0.05	0.037	1.36	0.178
Temp. variation:origin	0.15	0.074	2.08	0.042

Table S5: Results from the generalized linear model with Poisson regression for mosquito mortality with respect to temperature variation (high, normal), successional stage (early, late), and origin (Swiss, Can.)

Variable	Parameter	SE	z	Pr(>|z|)
Intercept	0.0377	0.44	0.086	0.932
Temp. variation	0.154	0.39	0.392	0.695
Succession	-1.36E-16	0.39	0	1
Origin	0.636	0.41	1.543	0.123

Chapter 4: Supplemental Material B Axel Zander, Sarah M. Gray and Louis-Félix Bersier

Title : Effects of temperature variability on community structure in a natural microbial food web

Number	Date	Time		LT number 20 inside pitcher Temp. °C	LT number 13 inside pitcher Temp. °C	inside pitcher avg temperature	LT number 8 bogwater Temp. °C	LT number 25 bogwater Temp. °C	bogwater avg temperature	Difference inside pitcher minus bogwater	Light intensity (lux)
1	29.05.12	12:00:00	AM	8.2	7.6	7.9	7.4	12.6	10.0	-2.1	0
2	29.05.12	01:00:00	AM	7.2	6.9	7.0	6.3	11.9	9.1	-2.1	0
3	29.05.12	02:00:00	AM	6.3	6.3	6.3	5.3	11.3	8.3	-2.1	0
4	29.05.12	03:00:00	AM	5.6	5.9	5.7	4.7	10.8	7.8	-2.1	0
5	29.05.12	04:00:00	AM	5.0	5.5	5.2	4.0	10.5	7.2	-2.0	0
6	29.05.12	05:00:00	AM	4.4	5.0	4.7	3.5	10.0	6.7	-2.0	0
7	29.05.12	06:00:00	AM	4.0	4.8	4.4	3.2	9.6	6.4	-1.9	0
8	29.05.12	07:00:00	AM	4.4	5.3	4.9	3.8	9.6	6.7	-1.8	75.3
9	29.05.12	08:00:00	AM	8.1	14.3	11.2	8.7	11.3	10.0	1.2	1033.3
10	29.05.12	09:00:00	AM	13.2	22.6	17.9	16.5	13.8	15.1	2.8	2152.8
11	29.05.12	10:00:00	AM	19.7	27.3	23.5	21.4	16.8	19.1	4.4	2583.4
12	29.05.12	11:00:00	AM	26.1	28.9	27.5	25.9	20.2	23.1	4.4	3616.7
13	29.05.12	12:00:00	PM	25.9	25.3	25.6	26.2	21.9	24.0	1.6	3788.9
14	29.05.12	01:00:00	PM	28.4	26.0	27.2	29.6	23.9	26.7	0.5	5338.9
15	29.05.12	02:00:00	PM	28.1	24.4	26.3	28.7	23.2	25.9	0.3	2669.5
16	29.05.12	03:00:00	PM	25.9	21.0	23.4	26.0	21.0	23.5	0.0	5511.1
17	29.05.12	04:00:00	PM	28.0	20.6	24.3	27.1	20.5	23.8	0.5	1636.1
18	29.05.12	05:00:00	PM	29.3	21.8	25.5	27.6	21.2	24.4	1.1	4133.4
19	29.05.12	06:00:00	PM	26.4	19.8	23.1	23.0	19.7	21.3	1.7	990.3
20	29.05.12	07:00:00	PM	18.8	17.0	17.9	18.2	18.0	18.1	-0.2	139.9
21	29.05.12	08:00:00	PM	15.0	14.0	14.5	14.9	16.7	15.8	-1.3	86.1
22	29.05.12	09:00:00	PM	13.2	11.9	12.5	12.6	15.5	14.0	-1.5	21.5
23	29.05.12	10:00:00	PM	11.3	10.0	10.6	10.3	14.3	12.3	-1.6	0
24	29.05.12	11:00:00	PM	9.9	8.9	9.4	8.8	13.5	11.1	-1.7	0
25	30.05.12	12:00:00	AM	8.7	8.2	8.4	7.6	12.8	10.2	-1.8	0
26	30.05.12	01:00:00	AM	7.1	7.4	7.2	6.5	12.0	9.2	-2.0	0
27	30.05.12	02:00:00	AM	6.2	6.6	6.4	5.5	11.4	8.4	-2.1	0
28	30.05.12	03:00:00	AM	5.6	6.0	5.8	4.6	10.9	7.8	-2.0	0
29	30.05.12	04:00:00	AM	4.9	5.5	5.2	4.1	10.5	7.3	-2.1	0
30	30.05.12	05:00:00	AM	4.5	5.1	4.8	3.5	10.0	6.7	-1.9	0
31	30.05.12	06:00:00	AM	4.1	4.9	4.5	3.3	9.7	6.5	-1.9	0
32	30.05.12	07:00:00	AM	4.6	5.6	5.1	3.9	9.7	6.8	-1.7	64.6
33	30.05.12	08:00:00	AM	8.5	15.0	11.7	8.8	11.9	10.3	1.4	968.8
34	30.05.12	09:00:00	AM	13.8	24.0	18.9	16.9	14.6	15.8	3.1	2152.8
35	30.05.12	10:00:00	AM	20.6	28.4	24.5	22.0	17.5	19.7	4.8	2583.4
36	30.05.12	11:00:00	AM	27.1	29.6	28.3	26.3	20.9	23.6	4.7	3272.2
37	30.05.12	12:00:00	PM	29.4	27.8	28.6	28.9	23.7	26.3	2.3	3961.1
38	30.05.12	01:00:00	PM	34.1	29.2	31.6	34.5	28.0	31.2	0.4	4477.8
39	30.05.12	02:00:00	PM	35.4	26.4	30.9	34.4	25.1	29.7	1.2	4477.8
40	30.05.12	03:00:00	PM	35.6	19.9	27.8	32.0	20.1	26.1	1.7	4305.6
41	30.05.12	04:00:00	PM	34.7	18.7	26.7	29.4	19.3	24.3	2.4	4822.3
42	30.05.12	05:00:00	PM	33.4	20.6	27.0	27.5	19.8	23.6	3.4	3100
43	30.05.12	06:00:00	PM	28.1	18.7	23.4	22.0	18.2	20.1	3.2	1011.8
44	30.05.12	07:00:00	PM	20.7	17.4	19.0	19.4	17.8	18.6	0.5	462.9
45	30.05.12	08:00:00	PM	17.4	15.4	16.4	16.8	16.6	16.7	-0.3	193.8
46	30.05.12	09:00:00	PM	14.7	12.7	13.7	13.7	15.4	14.5	-0.8	43.1
47	30.05.12	10:00:00	PM	12.3	10.8	11.6	11.2	14.2	12.7	-1.2	0
48	30.05.12	11:00:00	PM	10.4	9.6	10.0	9.7	13.5	11.6	-1.6	0
49	31.05.12	12:00:00	AM	9.1	9.0	9.0	8.8	13.0	10.9	-1.9	0
50	31.05.12	01:00:00	AM	8.2	8.5	8.3	8.1	12.4	10.2	-1.9	0
51	31.05.12	02:00:00	AM	7.1	7.7	7.4	7.2	11.8	9.5	-2.1	0
52	31.05.12	03:00:00	AM	7.1	7.8	7.4	7.0	11.6	9.3	-1.9	0
53	31.05.12	04:00:00	AM	8.8	9.4	9.1	8.9	12.0	10.4	-1.4	0
54	31.05.12	05:00:00	AM	9.3	9.5	9.4	9.4	11.8	10.6	-1.2	0
55	31.05.12	06:00:00	AM	9.1	9.2	9.1	9.1	11.8	10.4	-1.3	0
56	31.05.12	07:00:00	AM	9.3	9.6	9.4	9.5	11.9	10.7	-1.3	161.5
57	31.05.12	08:00:00	AM	10.5	10.8	10.7	11.2	12.4	11.8	-1.2	204.5
58	31.05.12	09:00:00	AM	11.7	12.2	12.0	13.2	13.2	13.2	-1.2	968.8
59	31.05.12	10:00:00	AM	14.2	14.9	14.6	16.5	14.5	15.5	-1.0	1722.2
60	31.05.12	11:00:00	AM	21.8	23.1	22.4	24.0	18.2	21.1	1.3	2927.8
61	31.05.12	12:00:00	PM	27.7	25.1	26.4	28.4	22.0	25.2	1.2	4133.4
62	31.05.12	01:00:00	PM	31.8	27.0	29.4	32.5	25.8	29.2	0.2	4133.4
63	31.05.12	02:00:00	PM	28.9	24.7	26.8	29.0	23.5	26.2	0.6	2583.4
64	31.05.12	03:00:00	PM	29.1	21.4	25.2	28.3	21.4	24.8	0.4	3961.1
65	31.05.12	04:00:00	PM	27.1	21.3	24.2	27.0	21.2	24.1	0.1	2755.6
66	31.05.12	05:00:00	PM	22.6	20.2	21.4	23.8	20.5	22.1	-0.7	1636.1
67	31.05.12	06:00:00	PM	22.1	19.3	20.7	22.0	19.3	20.6	0.1	710.4
68	31.05.12	07:00:00	PM	18.4	16.9	17.7	19.0	18.0	18.5	-0.9	559.7
69	31.05.12	08:00:00	PM	16.6	15.6	16.1	17.2	17.2	17.2	-1.1	301.4
70	31.05.12	09:00:00	PM	14.6	13.5	14.0	14.4	15.9	15.1	-1.1	10.8
71	31.05.12	10:00:00	PM	13.2	11.8	12.5	12.4	15.0	13.7	-1.2	0
72	31.05.12	11:00:00	PM	12.7	11.9	12.3	12.1	14.7	13.4	-1.1	0
73	01.06.12	12:00:00	AM	12.7	12.2	12.4	12.4	14.7	13.6	-1.1	0
74	01.06.12	01:00:00	AM	12.6	12.2	12.4	12.6	14.4	13.5	-1.1	0
75	01.06.12	02:00:00	AM	12.3	12.0	12.2	12.3	14.1	13.2	-1.1	0
76	01.06.12	03:00:00	AM	11.9	11.7	11.8	11.7	13.8	12.8	-1.0	0
77	01.06.12	04:00:00	AM	11.7	11.8	11.8	11.8	13.8	12.8	-1.0	0
78	01.06.12	05:00:00	AM	11.7	11.6	11.7	11.6	13.6	12.6	-0.9	0
79	01.06.12	06:00:00	AM	11.0	10.7	10.8	10.5	12.9	11.7	-0.8	21.5
80	01.06.12	07:00:00	AM	11.0	10.8	10.9	10.5	13.0	11.7	-0.8	150.7
81	01.06.12	08:00:00	AM	13.2	16.4	14.8	13.8	14.7	14.3	0.5	807.3
82	01.06.12	09:00:00	AM	15.7	21.5	18.6	17.9	16.2	17.0	1.5	1022.6
83	01.06.12	10:00:00	AM	17.4	20.9	19.1	19.8	17.4	18.6	0.6	3100
84	01.06.12	11:00:00	AM	22.9	25.3	24.1	24.8	20.9	22.9	1.2	2669.5
85	01.06.12	12:00:00	PM	30.4	28.2	29.3	31.1	25.3	28.2	1.1	3788.9
86	01.06.12	01:00:00	PM	32.7	28.5	30.6	33.5	28.3	30.9	-0.3	4305.6
87	01.06.12	02:00:00	PM	34.7	25.7	30.2	34.1	25.6	29.8	0.4	4133.4
88	01.06.12	03:00:00	PM	34.8	20.9	27.8	32.7	22.0	27.3	0.5	4822.3
89	01.06.12	04:00:00	PM	34.6	20.3	27.5	31.0	21.5	26.2	1.2	4133.4
90	01.06.12	05:00:00	PM	32.8	22.0	27.4	28.7	21.5	25.1	2.3	2755.6
91	01.06.12	06:00:00	PM	27.0	19.3	23.1	22.9	19.3	21.1	2.0	828.8
92	01.06.12	07:00:00	PM	20.0	17.6	18.8	19.1	18.1	18.6	0.2	107.6
93	01.06.12	08:00:00	PM	17.0	14.7	15.9	16.0	16.9	16.5	-0.6	43.1

94	01.06.12	09:00:00	PM	15.0	12.7	13.8	13.7	15.7	14.7	-0.8	10.8
95	01.06.12	10:00:00	PM	12.9	10.9	11.9	11.5	14.6	13.1	-1.2	0
96	01.06.12	11:00:00	PM	11.3	10.1	10.7	10.3	13.9	12.1	-1.4	0
97	02.06.12	12:00:00	AM	9.9	9.0	9.4	9.0	13.2	11.1	-1.7	0
98	02.06.12	01:00:00	AM	8.9	8.2	8.5	7.9	12.5	10.2	-1.7	0
99	02.06.12	02:00:00	AM	7.9	7.6	7.7	7.1	12.0	9.5	-1.8	0
100	02.06.12	03:00:00	AM	7.0	7.1	7.0	6.6	11.5	9.1	-2.0	0
101	02.06.12	04:00:00	AM	6.4	6.8	6.6	6.0	11.1	8.6	-2.0	0
102	02.06.12	05:00:00	AM	6.1	6.6	6.3	5.7	10.8	8.3	-1.9	0
103	02.06.12	06:00:00	AM	5.8	6.5	6.1	5.3	10.7	8.0	-1.9	21.5
104	02.06.12	07:00:00	AM	6.2	7.1	6.6	6.0	10.7	8.4	-1.7	53.8
105	02.06.12	08:00:00	AM	10.0	16.5	13.2	10.3	13.5	11.9	1.4	850.4
106	02.06.12	09:00:00	AM	15.5	24.5	20.0	17.8	16.3	17.0	3.0	1722.2
107	02.06.12	10:00:00	AM	21.4	28.3	24.8	22.2	19.0	20.6	4.2	2669.5
108	02.06.12	11:00:00	AM	28.7	30.6	29.6	26.8	22.6	24.7	4.9	3272.2
109	02.06.12	12:00:00	PM	33.5	31.0	32.2	32.4	26.8	29.6	2.7	4133.4
110	02.06.12	01:00:00	PM	35.9	31.3	33.6	35.8	29.9	32.8	0.8	4477.8
111	02.06.12	02:00:00	PM	37.2	27.8	32.5	35.9	26.2	31.0	1.4	4305.6
112	02.06.12	03:00:00	PM	36.8	21.1	29.0	34.2	21.1	27.6	1.3	4305.6
113	02.06.12	04:00:00	PM	35.2	20.0	27.6	30.9	20.9	25.9	1.8	3788.9
114	02.06.12	05:00:00	PM	32.4	21.5	26.9	28.3	20.4	24.3	2.6	2066.7
115	02.06.12	06:00:00	PM	26.9	20.2	23.6	23.0	19.0	21.0	2.6	635.1
116	02.06.12	07:00:00	PM	20.5	18.6	19.6	19.5	18.0	18.7	0.9	129.2
117	02.06.12	08:00:00	PM	17.6	15.9	16.7	16.6	16.8	16.7	0.0	75.3
118	02.06.12	09:00:00	PM	15.6	13.7	14.6	14.4	15.9	15.1	-0.5	21.5
119	02.06.12	10:00:00	PM	14.5	13.4	13.9	13.8	15.6	14.7	-0.7	0
120	02.06.12	11:00:00	PM	14.3	13.8	14.0	14.0	15.6	14.8	-0.8	0
121	03.06.12	12:00:00	AM	14.5	14.6	14.6	14.4	15.7	15.0	-0.5	0
122	03.06.12	01:00:00	AM	14.4	14.2	14.3	14.4	15.4	14.9	-0.6	0
123	03.06.12	02:00:00	AM	13.9	13.4	13.7	13.8	15.0	14.4	-0.8	0
124	03.06.12	03:00:00	AM	13.7	13.1	13.4	13.5	14.8	14.1	-0.8	0
125	03.06.12	04:00:00	AM	13.3	12.7	13.0	13.2	14.5	13.8	-0.9	0
126	03.06.12	05:00:00	AM	12.7	11.9	12.3	12.2	13.9	13.1	-0.8	0
127	03.06.12	06:00:00	AM	12.9	12.5	12.7	12.6	14.1	13.4	-0.7	0
128	03.06.12	07:00:00	AM	12.9	12.6	12.7	12.7	14.1	13.4	-0.7	53.8
129	03.06.12	08:00:00	AM	12.9	12.8	12.8	13.0	14.1	13.6	-0.7	107.6
130	03.06.12	09:00:00	AM	13.8	14.2	14.0	14.6	14.8	14.7	-0.7	193.8
131	03.06.12	10:00:00	AM	16.1	17.1	16.6	18.0	16.3	17.1	-0.5	796.5
132	03.06.12	11:00:00	AM	17.3	18.0	17.7	19.4	16.9	18.1	-0.5	775
133	03.06.12	12:00:00	PM	17.7	18.2	18.0	20.0	17.4	18.7	-0.8	452.1
134	03.06.12	01:00:00	PM	16.0	15.6	15.8	17.4	16.2	16.8	-1.0	118.4
135	03.06.12	02:00:00	PM	14.6	13.5	14.0	15.1	15.3	15.2	-1.1	64.6
136	03.06.12	03:00:00	PM	13.4	12.3	12.8	13.6	14.7	14.1	-1.3	10.8
137	03.06.12	04:00:00	PM	12.5	11.7	12.1	12.6	14.1	13.4	-1.3	53.8
138	03.06.12	05:00:00	PM	11.8	11.4	11.6	12.2	13.9	13.1	-1.4	139.9
139	03.06.12	06:00:00	PM	11.9	11.8	11.9	12.7	13.9	13.3	-1.4	161.5
140	03.06.12	07:00:00	PM	11.8	11.7	11.8	12.7	13.8	13.3	-1.5	53.8
141	03.06.12	08:00:00	PM	11.5	11.3	11.4	12.3	13.6	12.9	-1.5	118.4
142	03.06.12	09:00:00	PM	10.7	10.5	10.6	11.0	13.1	12.1	-1.5	0
143	03.06.12	10:00:00	PM	10.1	9.8	9.9	10.3	12.6	11.4	-1.5	0
144	03.06.12	11:00:00	PM	9.8	9.5	9.6	9.8	12.3	11.0	-1.4	0
145	04.06.12	12:00:00	AM	9.6	9.2	9.4	9.8	12.2	11.0	-1.6	0
146	04.06.12	01:00:00	AM	9.6	9.1	9.3	9.9	12.0	10.9	-1.6	0
147	04.06.12	02:00:00	AM	9.4	9.1	9.2	9.7	11.8	10.7	-1.5	0
148	04.06.12	03:00:00	AM	9.2	8.8	9.0	9.4	11.7	10.5	-1.6	0
149	04.06.12	04:00:00	AM	9.0	8.6	8.8	9.3	11.5	10.4	-1.6	0
150	04.06.12	05:00:00	AM	8.8	8.4	8.6	8.9	11.3	10.1	-1.5	0
151	04.06.12	06:00:00	AM	8.6	8.3	8.4	8.7	11.1	9.9	-1.5	0
152	04.06.12	07:00:00	AM	8.7	8.6	8.6	8.8	11.1	10.0	-1.3	247.6
153	04.06.12	08:00:00	AM	8.9	8.8	8.8	9.4	11.0	10.2	-1.4	107.6
154	04.06.12	09:00:00	AM	9.0	8.5	8.7	9.4	11.0	10.2	-1.5	161.5
155	04.06.12	10:00:00	AM	9.2	8.9	9.0	9.9	11.0	10.5	-1.4	269.1
156	04.06.12	11:00:00	AM	9.7	9.4	9.5	10.7	11.2	10.9	-1.4	430.6
157	04.06.12	12:00:00	PM	11.0	10.7	10.9	12.8	11.8	12.3	-1.4	452.1
158	04.06.12	01:00:00	PM	12.0	11.7	11.9	14.2	12.5	13.4	-1.5	839.6
159	04.06.12	02:00:00	PM	13.2	12.3	12.7	15.5	13.2	14.3	-1.6	2238.9
160	04.06.12	03:00:00	PM	14.9	12.4	13.7	16.9	13.6	15.2	-1.6	2152.8
161	04.06.12	04:00:00	PM	16.3	12.4	14.4	17.3	13.8	15.5	-1.2	247.6
162	04.06.12	05:00:00	PM	14.5	12.5	13.5	15.9	13.9	14.9	-1.4	861.1
163	04.06.12	06:00:00	PM	15.3	12.9	14.1	16.0	14.1	15.1	-1.0	871.9
164	04.06.12	07:00:00	PM	12.9	12.0	12.4	14.7	14.0	14.4	-1.9	344.4
165	04.06.12	08:00:00	PM	11.6	11.0	11.3	13.1	13.7	13.4	-2.0	21.5
166	04.06.12	09:00:00	PM	10.7	10.1	10.4	11.7	13.2	12.4	-2.0	0
167	04.06.12	10:00:00	PM	10.0	9.3	9.6	10.7	12.6	11.7	-2.1	0
168	04.06.12	11:00:00	PM	9.6	9.0	9.3	10.3	12.3	11.3	-2.0	0
169	05.06.12	12:00:00	AM	9.5	8.7	9.1	10.0	11.9	10.9	-1.9	0
170	05.06.12	01:00:00	AM	9.2	8.6	8.9	9.7	11.7	10.7	-1.8	0
171	05.06.12	02:00:00	AM	9.1	8.4	8.7	9.4	11.4	10.4	-1.7	0
172	05.06.12	03:00:00	AM	8.9	8.3	8.6	9.0	11.2	10.1	-1.5	0
173	05.06.12	04:00:00	AM	8.6	8.0	8.3	8.6	11.0	9.8	-1.5	0
174	05.06.12	05:00:00	AM	8.6	7.9	8.2	8.7	10.8	9.8	-1.5	0
175	05.06.12	06:00:00	AM	8.6	8.0	8.3	8.9	10.7	9.8	-1.5	0
176	05.06.12	07:00:00	AM	8.9	8.6	8.7	9.4	10.7	10.0	-1.3	64.6
177	05.06.12	08:00:00	AM	9.2	8.8	9.0	9.6	10.7	10.2	-1.2	301.4
178	05.06.12	09:00:00	AM	12.0	13.9	13.0	13.8	11.7	12.7	0.2	473.6
179	05.06.12	10:00:00	AM	13.5	14.5	14.0	15.5	12.7	14.1	-0.1	699.7
180	05.06.12	11:00:00	AM	16.9	17.0	17.0	19.1	14.3	16.7	0.2	2325
181	05.06.12	12:00:00	PM	18.8	18.2	18.5	20.5	16.0	18.2	0.3	958
182	05.06.12	01:00:00	PM	19.9	17.4	18.6	21.1	17.3	19.2	-0.6	3616.7
183	05.06.12	02:00:00	PM	23.6	19.8	21.7	24.6	18.4	21.5	0.1	1184
184	05.06.12	03:00:00	PM	28.6	18.5	23.5	28.9	18.3	23.6	-0.1	5338.9
185	05.06.12	04:00:00	PM	27.9	19.3	23.6	27.4	19.2	23.3	0.3	3272.2
186	05.06.12	05:00:00	PM	26.2	19.0	22.6	25.3	18.9	22.1	0.5	2755.6
187	05.06.12	06:00:00	PM	23.0	17.3	20.1	21.2	18.4	19.8	0.3	979.5
188	05.06.12	07:00:00	PM	18.3	16.0	17.1	19.2	17.9	18.5	-1.4	484.4
189	05.06.12	08:00:00	PM	16.0	14.8	15.4	17.6	17.2	17.4	-2.0	366
190	05.06.12	09:00:00	PM	13.9	13.1	13.5	14.8	16.3	15.6	-2.1	0
191	05.06.12	10:00:00	PM	11.8	10.9	11.4	12.2	15.5	13.8	-2.5	0

192	05.06.12	11:00:00	PM	9.8	9.3	9.5	10.1	14.5	12.3	-2.8	0
193	06.06.12	12:00:00	AM	9.4	9.0	9.2	9.5	13.8	11.7	-2.5	0
194	06.06.12	01:00:00	AM	9.2	8.8	9.0	9.2	13.3	11.2	-2.2	0
195	06.06.12	02:00:00	AM	8.7	8.4	8.5	8.5	12.8	10.6	-2.1	0
196	06.06.12	03:00:00	AM	8.7	8.5	8.6	8.4	12.4	10.4	-1.8	0
197	06.06.12	04:00:00	AM	9.1	8.5	8.8	8.8	12.1	10.4	-1.7	0
198	06.06.12	05:00:00	AM	9.3	8.8	9.0	9.0	11.9	10.4	-1.4	0
199	06.06.12	06:00:00	AM	9.7	9.2	9.4	9.5	11.8	10.6	-1.2	0
200	06.06.12	07:00:00	AM	10.2	9.7	9.9	10.3	11.8	11.0	-1.1	53.8
201	06.06.12	08:00:00	AM	10.6	10.1	10.3	10.7	11.9	11.3	-1.0	172.2
202	06.06.12	09:00:00	AM	10.9	10.4	10.7	11.2	11.9	11.6	-0.9	172.2
203	06.06.12	10:00:00	AM	11.6	11.3	11.5	12.3	12.1	12.2	-0.7	387.5
204	06.06.12	11:00:00	AM	12.1	11.8	12.0	13.1	12.5	12.8	-0.8	764.2
205	06.06.12	12:00:00	PM	12.5	12.5	12.5	14.0	12.9	13.5	-1.0	549
206	06.06.12	01:00:00	PM	11.4	11.1	11.3	12.4	12.7	12.5	-1.3	53.8
207	06.06.12	02:00:00	PM	11.3	11.1	11.2	12.1	12.6	12.4	-1.1	96.9
208	06.06.12	03:00:00	PM	11.7	11.8	11.8	12.7	12.6	12.6	-0.9	193.8
209	06.06.12	04:00:00	PM	12.4	12.5	12.4	13.5	12.8	13.1	-0.7	505.9
210	06.06.12	05:00:00	PM	12.8	12.9	12.8	14.1	13.1	13.6	-0.8	226
211	06.06.12	06:00:00	PM	12.7	12.5	12.6	14.1	13.3	13.7	-1.1	258.3
212	06.06.12	07:00:00	PM	13.6	13.4	13.5	14.9	13.5	14.2	-0.7	387.5
213	06.06.12	08:00:00	PM	12.9	12.7	12.8	13.9	13.5	13.7	-0.9	150.7
214	06.06.12	09:00:00	PM	11.8	11.5	11.7	12.7	13.2	12.9	-1.3	21.5
215	06.06.12	10:00:00	PM	11.0	10.7	10.8	11.3	12.9	12.1	-1.3	0
216	06.06.12	11:00:00	PM	10.8	10.6	10.7	11.1	12.6	11.9	-1.2	0
217	07.06.12	12:00:00	AM	10.8	10.6	10.7	11.1	12.4	11.8	-1.1	0
218	07.06.12	01:00:00	AM	10.5	10.1	10.3	10.3	12.2	11.2	-1.0	0
219	07.06.12	02:00:00	AM	10.2	9.7	9.9	9.9	11.9	10.9	-1.0	0
220	07.06.12	03:00:00	AM	9.9	9.3	9.6	9.2	11.7	10.4	-0.9	0
221	07.06.12	04:00:00	AM	9.7	9.1	9.4	8.9	11.5	10.2	-0.8	0
222	07.06.12	05:00:00	AM	9.5	8.8	9.1	8.5	11.2	9.9	-0.7	0
223	07.06.12	06:00:00	AM	9.5	9.0	9.2	8.6	11.1	9.9	-0.6	53.8
224	07.06.12	07:00:00	AM	9.6	9.7	9.6	9.1	11.1	10.1	-0.5	172.2
225	07.06.12	08:00:00	AM	11.9	15.5	13.7	12.3	11.7	12.0	1.7	484.4
226	07.06.12	09:00:00	AM	13.1	14.6	13.8	14.2	12.3	13.3	0.6	269.1
227	07.06.12	10:00:00	AM	13.6	14.3	13.9	14.7	12.7	13.7	0.2	1033.3
228	07.06.12	11:00:00	AM	22.6	23.7	23.1	23.2	15.5	19.3	3.8	3788.9
229	07.06.12	12:00:00	PM	21.5	22.0	21.7	23.3	16.7	20.0	1.7	1808.3
230	07.06.12	01:00:00	PM	28.1	24.4	26.2	29.2	19.8	24.5	1.8	1808.3
231	07.06.12	02:00:00	PM	28.8	24.9	26.8	29.7	20.9	25.3	1.6	2325
232	07.06.12	03:00:00	PM	27.6	22.8	25.2	28.7	20.6	24.6	0.6	5511.1
233	07.06.12	04:00:00	PM	28.2	22.8	25.5	28.4	20.6	24.5	1.0	3961.1
234	07.06.12	05:00:00	PM	24.5	22.2	23.4	25.6	20.3	23.0	0.4	968.8
235	07.06.12	06:00:00	PM	21.9	20.9	21.4	23.9	20.0	22.0	-0.6	516.7
236	07.06.12	07:00:00	PM	19.8	19.5	19.6	22.0	19.6	20.8	-1.1	828.8
237	07.06.12	08:00:00	PM	18.2	18.0	18.1	19.9	19.0	19.5	-1.3	0
238	07.06.12	09:00:00	PM	15.6	14.7	15.1	16.6	18.0	17.3	-2.2	0
239	07.06.12	10:00:00	PM	15.3	14.5	14.9	16.3	17.5	16.9	-2.0	0
240	07.06.12	11:00:00	PM	14.6	14.0	14.3	15.6	16.9	16.2	-1.9	0
241	08.06.12	12:00:00	AM	14.0	13.8	13.9	14.8	16.4	15.6	-1.7	0
242	08.06.12	01:00:00	AM	13.9	13.8	13.8	14.6	16.0	15.3	-1.5	0
243	08.06.12	02:00:00	AM	13.6	13.7	13.6	14.2	15.8	15.0	-1.4	0
244	08.06.12	03:00:00	AM	13.6	13.6	13.6	14.2	15.5	14.9	-1.3	0
245	08.06.12	04:00:00	AM	13.3	13.3	13.3	13.9	15.2	14.6	-1.3	0
246	08.06.12	05:00:00	AM	13.0	12.9	12.9	13.4	14.9	14.1	-1.2	0
247	08.06.12	06:00:00	AM	12.2	11.6	11.9	11.7	14.6	13.2	-1.3	10.8
248	08.06.12	07:00:00	AM	12.3	12.1	12.2	12.4	14.3	13.4	-1.2	53.8
249	08.06.12	08:00:00	AM	12.6	12.5	12.5	13.1	14.2	13.7	-1.1	10.8
250	08.06.12	09:00:00	AM	13.9	15.0	14.5	15.6	14.6	15.1	-0.6	1022.6
251	08.06.12	10:00:00	AM	13.6	13.7	13.6	14.8	14.6	14.7	-1.1	150.7
252	08.06.12	11:00:00	AM	12.1	12.3	12.2	13.1	14.5	13.8	-1.6	527.4
253	08.06.12	12:00:00	PM	11.5	12.0	11.8	12.1	14.1	13.1	-1.4	807.3
254	08.06.12	01:00:00	PM	12.2	12.4	12.3	13.1	13.9	13.5	-1.2	75.3
255	08.06.12	02:00:00	PM	13.1	13.3	13.2	14.7	14.1	14.4	-1.2	430.6
256	08.06.12	03:00:00	PM	12.8	12.6	12.7	13.8	14.0	13.9	-1.3	258.3
257	08.06.12	04:00:00	PM	12.5	12.3	12.4	13.6	14.0	13.8	-1.4	269.1
258	08.06.12	05:00:00	PM	12.2	12.0	12.1	13.5	14.0	13.7	-1.6	785.8
259	08.06.12	06:00:00	PM	11.8	11.8	11.8	13.2	13.9	13.6	-1.7	118.4
260	08.06.12	07:00:00	PM	11.8	11.8	11.8	13.0	13.8	13.4	-1.6	376.7
261	08.06.12	08:00:00	PM	11.5	11.6	11.6	12.5	13.7	13.1	-1.5	161.5
262	08.06.12	09:00:00	PM	10.9	11.0	11.0	11.5	13.5	12.5	-1.5	0
263	08.06.12	10:00:00	PM	10.6	10.5	10.5	10.8	13.2	12.0	-1.5	0
264	08.06.12	11:00:00	PM	10.4	10.2	10.3	10.5	12.9	11.7	-1.4	0
265	09.06.12	12:00:00	AM	10.0	9.7	9.8	9.7	12.6	11.1	-1.3	0
266	09.06.12	01:00:00	AM	8.9	8.4	8.6	8.1	12.3	10.2	-1.6	0
267	09.06.12	02:00:00	AM	8.8	8.5	8.6	8.1	11.9	10.0	-1.4	0
268	09.06.12	03:00:00	AM	8.0	7.7	7.8	7.1	11.6	9.4	-1.5	0
269	09.06.12	04:00:00	AM	8.6	8.5	8.5	8.4	11.3	9.9	-1.3	0
270	09.06.12	05:00:00	AM	8.7	8.5	8.6	8.3	11.2	9.8	-1.2	0
271	09.06.12	06:00:00	AM	8.4	8.2	8.3	7.9	11.0	9.5	-1.2	64.6
272	09.06.12	07:00:00	AM	9.0	9.1	9.0	8.9	11.0	10.0	-0.9	96.9
273	09.06.12	08:00:00	AM	9.8	9.8	9.8	10.1	11.1	10.6	-0.8	183
274	09.06.12	09:00:00	AM	12.6	16.6	14.6	15.1	12.2	13.6	1.0	1636.1
275	09.06.12	10:00:00	AM	12.5	14.2	13.4	14.7	12.7	13.7	-0.3	322.9
276	09.06.12	11:00:00	AM	16.5	17.9	17.2	19.5	14.1	16.8	0.4	5166.7
277	09.06.12	12:00:00	PM	14.7	16.0	15.4	17.3	14.5	15.9	-0.5	753.5
278	09.06.12	01:00:00	PM	16.1	16.4	16.3	18.8	15.2	17.0	-0.7	990.3
279	09.06.12	02:00:00	PM	15.6	16.3	16.0	18.5	15.6	17.0	-1.1	1377.8
280	09.06.12	03:00:00	PM	16.2	16.7	16.5	19.2	16.0	17.6	-1.1	1636.1
281	09.06.12	04:00:00	PM	19.6	16.6	18.1	21.8	16.3	19.0	-1.0	1636.1
282	09.06.12	05:00:00	PM	18.6	17.3	18.0	21.1	16.7	18.9	-1.0	1087.2
283	09.06.12	06:00:00	PM	16.0	15.5	15.7	18.0	16.3	17.2	-1.5	398.3
284	09.06.12	07:00:00	PM	15.2	14.8	15.0	16.9	16.1	16.5	-1.5	549
285	09.06.12	08:00:00	PM	14.1	13.4	13.7	15.4	15.7	15.5	-1.8	129.2
286	09.06.12	09:00:00	PM	13.1	12.1	12.6	13.9	15.2	14.6	-2.0	21.5
287	09.06.12	10:00:00	PM	12.3	11.3	11.8	13.0	14.7	13.8	-2.0	0
288	09.06.12	11:00:00	PM	11.7	10.7	11.2	12.2	14.2	13.2	-2.0	0
289	10.06.12	12:00:00	AM	11.1	10.5	10.8	11.7	13.8	12.8	-2.0	0

290	10.06.12	01:00:00	AM	10.7	10.2	10.5	11.2	13.5	12.3	-1.9	0
291	10.06.12	02:00:00	AM	10.4	9.8	10.1	10.7	13.2	12.0	-1.9	0
292	10.06.12	03:00:00	AM	9.8	9.3	9.5	10.0	12.8	11.4	-1.9	0
293	10.06.12	04:00:00	AM	9.5	8.9	9.2	9.6	12.4	11.0	-1.8	0
294	10.06.12	05:00:00	AM	8.9	8.4	8.6	9.0	12.1	10.5	-1.9	0
295	10.06.12	06:00:00	AM	8.5	8.2	8.3	8.7	11.8	10.2	-1.9	0
296	10.06.12	07:00:00	AM	8.4	8.4	8.4	8.7	11.6	10.2	-1.8	172.2
297	10.06.12	08:00:00	AM	9.1	9.2	9.1	9.7	11.6	10.6	-1.5	204.5
298	10.06.12	09:00:00	AM	10.4	10.9	10.7	11.9	11.9	11.9	-1.3	3100
299	10.06.12	10:00:00	AM	13.5	16.5	15.0	15.9	13.3	14.6	0.4	1722.2
300	10.06.12	11:00:00	AM	15.1	17.6	16.3	16.8	14.7	15.8	0.6	710.4
301	10.06.12	12:00:00	PM	15.5	17.0	16.2	18.7	15.5	17.1	-0.9	1377.8
302	10.06.12	01:00:00	PM	17.7	18.5	18.1	21.4	16.6	19.0	-0.9	2152.8
303	10.06.12	02:00:00	PM	17.6	18.8	18.2	21.9	17.3	19.6	-1.4	2325
304	10.06.12	03:00:00	PM	17.0	18.3	17.7	21.2	17.6	19.4	-1.7	1808.3
305	10.06.12	04:00:00	PM	15.7	17.1	16.4	19.6	17.5	18.5	-2.1	1356.3
306	10.06.12	05:00:00	PM	14.5	15.4	14.9	17.9	17.2	17.5	-2.6	947.2
307	10.06.12	06:00:00	PM	14.6	15.1	14.9	17.6	17.0	17.3	-2.4	764.2
308	10.06.12	07:00:00	PM	13.8	13.8	13.8	16.0	16.6	16.3	-2.5	516.7
309	10.06.12	08:00:00	PM	13.3	13.0	13.1	14.8	16.0	15.4	-2.3	172.2
310	10.06.12	09:00:00	PM	12.6	12.0	12.3	13.5	15.5	14.5	-2.2	53.8
311	10.06.12	10:00:00	PM	11.9	11.2	11.6	12.4	14.9	13.7	-2.1	0
312	10.06.12	11:00:00	PM	11.5	10.7	11.1	11.6	14.4	13.0	-1.9	0
313	11.06.12	12:00:00	AM	10.6	10.4	10.5	10.9	14.0	12.5	-2.0	0
314	11.06.12	01:00:00	AM	9.9	10.3	10.1	10.3	13.7	12.0	-1.9	0
315	11.06.12	02:00:00	AM	9.4	10.0	9.7	9.7	13.3	11.5	-1.8	0
316	11.06.12	03:00:00	AM	9.6	9.9	9.7	10.2	13.0	11.6	-1.9	0
317	11.06.12	04:00:00	AM	9.5	9.7	9.6	10.1	12.7	11.4	-1.8	0
318	11.06.12	05:00:00	AM	9.4	9.6	9.5	10.1	12.5	11.3	-1.8	0
319	11.06.12	06:00:00	AM	9.3	9.3	9.3	9.9	12.3	11.1	-1.8	0
320	11.06.12	07:00:00	AM	9.1	9.1	9.1	9.7	12.1	10.9	-1.8	21.5
321	11.06.12	08:00:00	AM	9.6	9.7	9.6	10.5	12.0	11.2	-1.6	312.2
322	11.06.12	09:00:00	AM	10.1	10.2	10.1	11.2	12.1	11.7	-1.6	279.9
323	11.06.12	10:00:00	AM	10.3	10.4	10.3	11.5	12.2	11.9	-1.6	570.5
324	11.06.12	11:00:00	AM	14.4	15.1	14.8	16.8	13.5	15.1	-0.4	1636.1
325	11.06.12	12:00:00	PM	12.0	11.9	12.0	13.6	13.8	13.7	-1.7	215.3
326	11.06.12	01:00:00	PM	11.7	12.4	12.1	13.7	13.8	13.7	-1.6	2152.8
327	11.06.12	02:00:00	PM	12.5	13.2	12.8	15.1	14.0	14.6	-1.7	742.7
328	11.06.12	03:00:00	PM	12.0	12.7	12.4	14.4	14.1	14.3	-1.9	581.3
329	11.06.12	04:00:00	PM	18.1	15.1	16.6	20.1	14.6	17.4	-0.8	3788.9
330	11.06.12	05:00:00	PM	21.2	15.5	18.3	21.3	14.9	18.1	0.2	2583.4
331	11.06.12	06:00:00	PM	18.7	14.8	16.8	17.8	14.9	16.3	0.4	979.5
332	11.06.12	07:00:00	PM	16.4	14.3	15.4	17.0	15.0	16.0	-0.6	462.9
333	11.06.12	08:00:00	PM	14.4	12.8	13.6	15.2	14.8	15.0	-1.4	129.2
334	11.06.12	09:00:00	PM	13.4	11.5	12.4	13.4	14.4	13.9	-1.4	10.8
335	11.06.12	10:00:00	PM	12.1	9.8	10.9	10.9	14.0	12.5	-1.6	0
336	11.06.12	11:00:00	PM	11.2	9.2	10.2	10.0	13.5	11.7	-1.5	0
337	12.06.12	12:00:00	AM	10.8	9.3	10.1	9.9	13.1	11.5	-1.4	0
338	12.06.12	01:00:00	AM	10.4	9.1	9.7	10.4	12.7	11.5	-1.8	0
339	12.06.12	02:00:00	AM	9.7	8.8	9.2	10.2	12.4	11.3	-2.1	0
340	12.06.12	03:00:00	AM	9.1	8.4	8.7	9.4	12.1	10.7	-2.0	0
341	12.06.12	04:00:00	AM	8.6	8.0	8.3	8.8	11.8	10.3	-2.0	0
342	12.06.12	05:00:00	AM	8.7	8.2	8.4	8.6	11.5	10.1	-1.6	0
343	12.06.12	06:00:00	AM	8.5	8.1	8.3	8.5	11.2	9.9	-1.6	0
344	12.06.12	07:00:00	AM	8.5	8.3	8.4	8.6	11.1	9.9	-1.5	32.3
345	12.06.12	08:00:00	AM	8.5	8.3	8.4	8.7	10.9	9.8	-1.4	75.3
346	12.06.12	09:00:00	AM	8.2	8.3	8.2	8.7	10.9	9.8	-1.6	183
347	12.06.12	10:00:00	AM	7.7	8.0	7.8	8.2	10.7	9.5	-1.6	215.3
348	12.06.12	11:00:00	AM	8.0	8.3	8.1	8.6	10.7	9.7	-1.5	344.4
349	12.06.12	12:00:00	PM	8.8	9.2	9.0	10.0	10.8	10.4	-1.4	796.5
350	12.06.12	01:00:00	PM	10.7	11.3	11.0	13.3	11.3	12.3	-1.3	1377.8
351	12.06.12	02:00:00	PM	12.0	12.2	12.1	14.5	11.9	13.2	-1.1	1894.5
352	12.06.12	03:00:00	PM	14.4	13.6	14.0	17.3	12.7	15.0	-1.0	1463.9
353	12.06.12	04:00:00	PM	12.5	12.0	12.3	14.5	12.9	13.7	-1.4	258.3
354	12.06.12	05:00:00	PM	10.3	9.8	10.0	10.7	12.6	11.7	-1.7	107.6
355	12.06.12	06:00:00	PM	9.4	9.1	9.2	10.2	12.4	11.3	-2.1	150.7
356	12.06.12	07:00:00	PM	9.4	9.1	9.2	10.2	12.1	11.1	-1.9	32.3
357	12.06.12	08:00:00	PM	8.9	8.5	8.7	9.6	11.9	10.7	-2.1	10.8
358	12.06.12	09:00:00	PM	8.8	8.4	8.6	9.2	11.6	10.4	-1.8	21.5
359	12.06.12	10:00:00	PM	8.6	8.3	8.4	8.8	11.3	10.1	-1.6	0
360	12.06.12	11:00:00	PM	8.5	8.0	8.2	8.2	11.1	9.7	-1.4	0
361	13.06.12	12:00:00	AM	7.9	7.1	7.5	7.0	10.9	9.0	-1.5	0
362	13.06.12	01:00:00	AM	7.3	7.0	7.1	6.8	10.6	8.7	-1.5	0
363	13.06.12	02:00:00	AM	7.1	7.1	7.1	7.0	10.4	8.7	-1.6	0
364	13.06.12	03:00:00	AM	7.3	7.3	7.3	7.4	10.2	8.8	-1.5	0
365	13.06.12	04:00:00	AM	7.3	7.3	7.3	7.5	10.0	8.7	-1.4	0
366	13.06.12	05:00:00	AM	7.4	7.3	7.3	7.4	9.9	8.6	-1.3	0
367	13.06.12	06:00:00	AM	7.3	7.2	7.2	7.3	9.8	8.5	-1.3	0
368	13.06.12	07:00:00	AM	7.3	7.1	7.2	7.5	9.7	8.6	-1.4	21.5
369	13.06.12	08:00:00	AM	7.4	7.4	7.4	7.8	9.7	8.7	-1.3	150.7
370	13.06.12	09:00:00	AM	7.7	7.6	7.6	8.3	9.7	9.0	-1.3	226
371	13.06.12	10:00:00	AM	8.3	8.5	8.4	9.5	9.9	9.7	-1.3	452.1
372	13.06.12	11:00:00	AM	8.6	8.7	8.6	9.9	10.0	9.9	-1.3	764.2
373	13.06.12	12:00:00	PM	10.2	10.8	10.5	12.4	10.5	11.4	-0.9	990.3
374	13.06.12	01:00:00	PM	10.7	10.9	10.8	12.7	10.9	11.8	-1.0	1184
375	13.06.12	02:00:00	PM	9.9	10.0	9.9	11.2	11.1	11.2	-1.3	688.9
376	13.06.12	03:00:00	PM	9.7	10.0	9.8	11.1	11.2	11.2	-1.4	538.2
377	13.06.12	04:00:00	PM	9.9	10.1	10.0	11.1	11.3	11.2	-1.3	172.2
378	13.06.12	05:00:00	PM	9.9	10.2	10.0	11.3	11.4	11.4	-1.4	236.8
379	13.06.12	06:00:00	PM	10.0	10.3	10.1	11.1	11.4	11.3	-1.2	914.9
380	13.06.12	07:00:00	PM	10.8	11.1	11.0	12.4	11.7	12.1	-1.1	710.4
381	13.06.12	08:00:00	PM	10.7	10.7	10.7	11.9	11.7	11.8	-1.1	430.6
382	13.06.12	09:00:00	PM	9.6	9.2	9.4	9.8	11.5	10.6	-1.3	53.8
383	13.06.12	10:00:00	PM	8.1	6.9	7.5	7.1	11.1	9.1	-1.6	0
384	13.06.12	11:00:00	PM	6.4	5.2	5.8	5.0	10.7	7.8	-2.0	0
385	14.06.12	12:00:00	AM	4.9	4.3	4.6	3.7	10.1	6.9	-2.3	0
386	14.06.12	01:00:00	AM	3.9	3.5	3.7	2.6	9.6	6.1	-2.4	0
387	14.06.12	02:00:00	AM	3.0	2.9	3.0	2.0	9.1	5.5	-2.5	0

388	14.06.12	03:00:00	AM	2.5	2.5	2.5	1.5	8.6	5.1	-2.5	0
389	14.06.12	04:00:00	AM	2.0	2.2	2.1	1.1	8.2	4.6	-2.6	0
390	14.06.12	05:00:00	AM	1.5	1.9	1.7	1.0	7.9	4.4	-2.7	0
391	14.06.12	06:00:00	AM	1.3	1.7	1.5	1.0	7.6	4.3	-2.8	0
392	14.06.12	07:00:00	AM	1.5	2.3	1.9	1.2	7.4	4.3	-2.4	215.3
393	14.06.12	08:00:00	AM	4.0	9.1	6.5	4.0	7.7	5.8	0.7	656.6
394	14.06.12	09:00:00	AM	8.1	14.2	11.2	9.5	8.5	9.0	2.2	2152.8
395	14.06.12	10:00:00	AM	12.4	18.0	15.2	14.4	10.1	12.2	3.0	2755.6
396	14.06.12	11:00:00	AM	17.8	21.4	19.6	20.2	12.5	16.4	3.2	3961.1
397	14.06.12	12:00:00	PM	21.9	22.1	22.0	26.0	15.2	20.6	1.4	5511.1
398	14.06.12	01:00:00	PM	27.3	23.8	25.5	29.6	17.8	23.7	1.9	5338.9
399	14.06.12	02:00:00	PM	28.7	22.4	25.5	31.3	18.6	24.9	0.6	5511.1
400	14.06.12	03:00:00	PM	29.3	19.5	24.4	31.1	18.3	24.7	-0.3	5338.9
401	14.06.12	04:00:00	PM	28.7	17.4	23.0	29.7	18.0	23.8	-0.8	3788.9
402	14.06.12	05:00:00	PM	26.0	18.5	22.3	27.4	17.9	22.6	-0.4	1980.6
403	14.06.12	06:00:00	PM	21.4	16.9	19.1	22.1	17.4	19.8	-0.6	592
404	14.06.12	07:00:00	PM	18.4	15.8	17.1	19.9	17.0	18.4	-1.3	258.3
405	14.06.12	08:00:00	PM	15.7	13.5	14.6	16.9	16.3	16.6	-2.1	139.9
406	14.06.12	09:00:00	PM	14.2	11.7	13.0	14.5	15.6	15.0	-2.1	10.8
407	14.06.12	10:00:00	PM	12.5	10.0	11.2	12.0	14.6	13.3	-2.1	0
408	14.06.12	11:00:00	PM	11.5	9.2	10.4	10.8	13.8	12.3	-1.9	0
409	15.06.12	12:00:00	AM	10.7	8.5	9.6	9.7	13.2	11.4	-1.8	0
410	15.06.12	01:00:00	AM	10.1	8.4	9.2	9.1	12.5	10.8	-1.6	0
411	15.06.12	02:00:00	AM	9.3	7.8	8.5	8.1	12.0	10.0	-1.5	0
412	15.06.12	03:00:00	AM	8.5	7.1	7.8	7.3	11.5	9.4	-1.6	0
413	15.06.12	04:00:00	AM	8.0	6.6	7.3	6.7	11.1	8.9	-1.6	0
414	15.06.12	05:00:00	AM	7.7	6.5	7.1	6.4	10.7	8.6	-1.5	0
415	15.06.12	06:00:00	AM	7.5	6.3	6.9	6.1	10.5	8.3	-1.4	53.8
416	15.06.12	07:00:00	AM	7.8	7.3	7.5	6.7	10.4	8.5	-1.0	226
417	15.06.12	08:00:00	AM	9.9	13.7	11.8	9.7	10.7	10.2	1.6	624.3
418	15.06.12	09:00:00	AM	13.5	20.2	16.8	15.0	11.9	13.5	3.4	1894.5
419	15.06.12	10:00:00	AM	17.7	24.4	21.0	19.9	13.8	16.8	4.2	2755.6
420	15.06.12	11:00:00	AM	22.1	26.3	24.2	24.4	16.0	20.2	4.0	3788.9
421	15.06.12	12:00:00	PM	25.4	25.5	25.5	28.6	18.5	23.5	1.9	4822.3
422	15.06.12	01:00:00	PM	30.0	27.0	28.5	32.0	20.9	26.4	2.0	4994.5
423	15.06.12	02:00:00	PM	32.0	26.6	29.3	35.8	21.6	28.7	0.6	4994.5
424	15.06.12	03:00:00	PM	32.8	22.8	27.8	34.6	21.3	27.9	-0.1	4650
425	15.06.12	04:00:00	PM	32.0	21.4	26.7	32.1	20.7	26.4	0.3	3272.2
426	15.06.12	05:00:00	PM	28.8	22.4	25.6	29.6	20.5	25.0	0.6	2238.9
427	15.06.12	06:00:00	PM	24.3	20.9	22.6	24.9	20.1	22.5	0.0	409
428	15.06.12	07:00:00	PM	20.8	19.6	20.2	22.2	19.6	20.9	-0.7	193.8
429	15.06.12	08:00:00	PM	18.7	17.2	18.0	19.6	18.9	19.2	-1.3	43.1
430	15.06.12	09:00:00	PM	17.7	15.2	16.4	17.4	18.0	17.7	-1.3	21.5
431	15.06.12	10:00:00	PM	16.1	13.7	14.9	15.5	17.2	16.3	-1.4	0
432	15.06.12	11:00:00	PM	15.1	12.4	13.7	13.8	16.3	15.0	-1.3	0
433	16.06.12	12:00:00	AM	14.1	11.4	12.8	12.5	15.6	14.0	-1.3	0
434	16.06.12	01:00:00	AM	13.7	10.8	12.3	11.7	14.9	13.3	-1.1	0
435	16.06.12	02:00:00	AM	13.3	10.4	11.8	10.9	14.4	12.7	-0.9	0
436	16.06.12	03:00:00	AM	12.5	9.8	11.1	10.2	13.8	12.0	-0.9	0
437	16.06.12	04:00:00	AM	11.8	9.3	10.5	9.5	13.4	11.4	-0.9	0
438	16.06.12	05:00:00	AM	11.4	9.0	10.2	9.1	13.0	11.0	-0.8	0
439	16.06.12	06:00:00	AM	11.1	8.7	9.9	8.8	12.6	10.7	-0.8	0
440	16.06.12	07:00:00	AM	11.1	9.2	10.2	9.0	12.4	10.7	-0.5	64.6
441	16.06.12	08:00:00	AM	12.7	17.3	15.0	11.6	13.0	12.3	2.7	678.1
442	16.06.12	09:00:00	AM	15.7	22.8	19.2	16.7	14.3	15.5	3.7	1808.3
443	16.06.12	10:00:00	AM	19.1	26.7	22.9	21.2	16.3	18.8	4.1	2669.5
444	16.06.12	11:00:00	AM	22.9	28.1	25.5	25.0	18.7	21.9	3.6	3788.9
445	16.06.12	12:00:00	PM	27.2	28.1	27.6	30.3	21.2	25.7	1.9	4822.3
446	16.06.12	01:00:00	PM	31.9	29.0	30.4	31.7	23.4	27.5	2.9	4477.8
447	16.06.12	02:00:00	PM	34.0	28.3	31.1	35.6	23.9	29.8	1.3	4822.3
448	16.06.12	03:00:00	PM	34.2	24.1	29.1	35.4	23.2	29.3	-0.2	4305.6
449	16.06.12	04:00:00	PM	32.2	22.8	27.5	33.1	22.4	27.8	-0.3	3272.2
450	16.06.12	05:00:00	PM	29.0	23.8	26.4	30.7	22.2	26.4	-0.1	2152.8
451	16.06.12	06:00:00	PM	24.1	21.8	22.9	25.4	21.7	23.5	-0.6	430.6
452	16.06.12	07:00:00	PM	20.9	20.4	20.7	22.8	20.9	21.9	-1.2	215.3
453	16.06.12	08:00:00	PM	18.9	18.4	18.7	20.5	20.1	20.3	-1.7	118.4
454	16.06.12	09:00:00	PM	17.8	16.4	17.1	18.3	19.2	18.8	-1.7	32.3
455	16.06.12	10:00:00	PM	17.0	14.8	15.9	16.6	18.3	17.5	-1.6	0
456	16.06.12	11:00:00	PM	16.1	13.5	14.8	15.0	17.4	16.2	-1.4	0
457	17.06.12	12:00:00	AM	14.7	12.4	13.6	14.0	16.6	15.3	-1.8	0
458	17.06.12	01:00:00	AM	14.0	12.0	13.0	13.5	16.0	14.7	-1.7	0
459	17.06.12	02:00:00	AM	13.7	11.7	12.7	12.9	15.6	14.2	-1.5	0
460	17.06.12	03:00:00	AM	12.8	10.7	11.8	11.6	14.9	13.3	-1.5	0
461	17.06.12	04:00:00	AM	12.6	10.1	11.3	10.7	14.4	12.6	-1.3	0
462	17.06.12	05:00:00	AM	12.1	10.0	11.0	10.5	13.9	12.2	-1.2	0
463	17.06.12	06:00:00	AM	11.9	10.6	11.2	10.9	13.8	12.3	-1.1	21.5
464	17.06.12	07:00:00	AM	11.6	10.7	11.2	10.8	13.7	12.3	-1.1	86.1
465	17.06.12	08:00:00	AM	12.6	16.5	14.6	12.7	14.1	13.4	1.1	635.1
466	17.06.12	09:00:00	AM	15.0	21.9	18.4	16.4	15.4	15.9	2.5	1636.1
467	17.06.12	10:00:00	AM	18.1	25.6	21.9	20.3	17.4	18.9	3.0	2497.2
468	17.06.12	11:00:00	AM	21.8	27.7	24.7	24.4	19.7	22.1	2.7	3444.5
469	17.06.12	12:00:00	PM	25.7	28.5	27.1	30.4	22.4	26.4	0.7	4650
470	17.06.12	01:00:00	PM	29.6	29.4	29.5	32.0	24.7	28.4	1.1	4133.4
471	17.06.12	02:00:00	PM	32.3	28.5	30.4	36.2	24.8	30.5	-0.1	4477.8
472	17.06.12	03:00:00	PM	32.8	23.6	28.2	34.7	23.5	29.1	-0.9	3961.1
473	17.06.12	04:00:00	PM	32.1	22.4	27.3	33.1	22.4	27.8	-0.5	2927.8
474	17.06.12	05:00:00	PM	29.9	23.8	26.8	31.1	22.2	26.7	0.2	2066.7
475	17.06.12	06:00:00	PM	25.1	22.5	23.8	25.7	21.8	23.7	0.1	430.6
476	17.06.12	07:00:00	PM	21.9	21.0	21.4	22.6	21.1	21.9	-0.4	204.5
477	17.06.12	08:00:00	PM	19.5	18.7	19.1	20.1	20.2	20.2	-1.1	107.6
478	17.06.12	09:00:00	PM	18.6	17.6	18.1	18.7	19.5	19.1	-1.0	43.1
479	17.06.12	10:00:00	PM	17.9	15.6	16.7	16.5	18.5	17.5	-0.8	0
480	17.06.12	11:00:00	PM	17.3	14.1	15.7	15.0	17.7	16.3	-0.6	0
481	18.06.12	12:00:00	AM	15.9	13.5	14.7	14.0	16.9	15.5	-0.8	0
482	18.06.12	01:00:00	AM	14.7	12.5	13.6	13.0	16.2	14.6	-1.0	0
483	18.06.12	02:00:00	AM	13.8	11.9	12.9	12.3	15.7	14.0	-1.1	0
484	18.06.12	03:00:00	AM	13.2	11.3	12.3	11.6	15.2	13.4	-1.2	0
485	18.06.12	04:00:00	AM	12.7	11.0	11.9	11.1	14.8	13.0	-1.1	0

486	18.06.12	05:00:00	AM	12.6	10.7	11.7	10.7	14.4	12.6	-0.9	0
487	18.06.12	06:00:00	AM	12.4	10.5	11.4	10.5	14.1	12.3	-0.9	0
488	18.06.12	07:00:00	AM	13.0	12.5	12.7	12.2	14.3	13.3	-0.5	86.1
489	18.06.12	08:00:00	AM	14.4	16.3	15.4	15.1	15.0	15.0	0.3	215.3
490	18.06.12	09:00:00	AM	15.6	18.3	17.0	17.5	15.9	16.7	0.3	753.5
491	18.06.12	10:00:00	AM	19.0	24.4	21.7	21.0	17.7	19.3	2.3	2325
492	18.06.12	11:00:00	AM	22.4	27.7	25.0	24.3	20.2	22.2	2.8	3272.2
493	18.06.12	12:00:00	PM	25.6	29.2	27.4	30.4	23.2	26.8	0.6	4477.8
494	18.06.12	01:00:00	PM	29.9	30.5	30.2	32.9	26.0	29.5	0.7	3616.7
495	18.06.12	02:00:00	PM	30.4	28.3	29.3	34.0	25.8	29.9	-0.6	4477.8
496	18.06.12	03:00:00	PM	31.2	22.9	27.0	33.2	23.7	28.4	-1.4	3961.1
497	18.06.12	04:00:00	PM	28.9	22.6	25.7	30.3	22.7	26.5	-0.7	1076.4
498	18.06.12	05:00:00	PM	25.4	22.0	23.7	27.1	22.3	24.7	-1.0	2497.2
499	18.06.12	06:00:00	PM	21.1	20.2	20.7	22.5	21.5	22.0	-1.3	549
500	18.06.12	07:00:00	PM	19.5	19.9	19.7	20.7	20.8	20.8	-1.1	226
501	18.06.12	08:00:00	PM	17.7	17.9	17.8	18.6	19.8	19.2	-1.4	322.9
502	18.06.12	09:00:00	PM	17.0	16.8	16.9	17.3	19.0	18.1	-1.2	32.3
503	18.06.12	10:00:00	PM	16.9	14.7	15.8	15.3	18.0	16.6	-0.8	0
504	18.06.12	11:00:00	PM	15.3	12.9	14.1	13.5	16.8	15.1	-1.1	0
505	19.06.12	12:00:00	AM	14.2	12.6	13.4	12.9	16.2	14.6	-1.1	0
506	19.06.12	01:00:00	AM	14.0	13.1	13.6	13.3	16.0	14.7	-1.1	0
507	19.06.12	02:00:00	AM	13.5	12.2	12.8	12.3	15.6	13.9	-1.1	0
508	19.06.12	03:00:00	AM	13.3	11.8	12.5	12.0	15.2	13.6	-1.1	0
509	19.06.12	04:00:00	AM	13.2	11.3	12.3	11.4	14.8	13.1	-0.9	0
510	19.06.12	05:00:00	AM	12.6	10.8	11.7	10.8	14.3	12.6	-0.9	0
511	19.06.12	06:00:00	AM	12.1	10.4	11.2	10.4	13.9	12.1	-0.9	53.8
512	19.06.12	07:00:00	AM	11.9	10.8	11.4	10.6	13.9	12.2	-0.9	129.2
513	19.06.12	08:00:00	AM	13.3	16.7	15.0	13.2	14.7	13.9	1.1	775
514	19.06.12	09:00:00	AM	16.2	22.1	19.2	17.8	16.2	17.0	2.2	818.1
515	19.06.12	10:00:00	AM	18.3	24.5	21.4	21.1	18.2	19.7	1.8	2755.6
516	19.06.12	11:00:00	AM	20.1	25.4	22.8	23.6	19.9	21.8	1.0	1636.1
517	19.06.12	12:00:00	PM	20.7	24.6	22.7	24.6	20.7	22.7	0.0	1636.1
518	19.06.12	01:00:00	PM	22.5	26.3	24.4	27.2	22.0	24.6	-0.2	2152.8
519	19.06.12	02:00:00	PM	22.2	25.5	23.9	26.4	22.2	24.3	-0.4	968.8
520	19.06.12	03:00:00	PM	21.3	23.3	22.3	24.0	21.6	22.8	-0.5	1324
521	19.06.12	04:00:00	PM	20.1	21.5	20.8	22.0	21.0	21.5	-0.7	473.6
522	19.06.12	05:00:00	PM	19.3	19.9	19.6	20.9	20.4	20.7	-1.0	861.1
523	19.06.12	06:00:00	PM	19.2	20.1	19.7	20.9	20.2	20.6	-0.9	473.6
524	19.06.12	07:00:00	PM	18.6	18.8	18.7	19.5	19.6	19.5	-0.8	215.3
525	19.06.12	08:00:00	PM	17.6	17.6	17.6	18.0	18.9	18.5	-0.9	86.1
526	19.06.12	09:00:00	PM	17.1	16.8	17.0	17.1	18.3	17.7	-0.8	0
527	19.06.12	10:00:00	PM	17.0	16.1	16.6	16.2	17.9	17.0	-0.5	0
528	19.06.12	11:00:00	PM	16.6	15.7	16.1	15.8	17.4	16.6	-0.4	0
529	20.06.12	12:00:00	AM	16.0	15.4	15.7	15.5	17.1	16.3	-0.6	0
530	20.06.12	01:00:00	AM	15.7	15.2	15.4	15.3	16.9	16.1	-0.7	0
531	20.06.12	02:00:00	AM	15.0	14.7	14.9	15.0	16.6	15.8	-1.0	0
532	20.06.12	03:00:00	AM	14.8	14.6	14.7	14.6	16.4	15.5	-0.8	0
533	20.06.12	04:00:00	AM	14.9	14.4	14.7	14.4	16.1	15.3	-0.6	0
534	20.06.12	05:00:00	AM	14.9	14.4	14.7	14.3	16.0	15.2	-0.5	0
535	20.06.12	06:00:00	AM	14.7	14.2	14.5	14.3	15.9	15.1	-0.6	0
536	20.06.12	07:00:00	AM	14.7	14.4	14.6	14.5	15.8	15.1	-0.6	258.3
537	20.06.12	08:00:00	AM	15.2	16.0	15.6	16.0	16.1	16.1	-0.5	419.8
538	20.06.12	09:00:00	AM	15.5	16.8	16.1	17.2	16.6	16.9	-0.8	398.3
539	20.06.12	10:00:00	AM	16.4	18.7	17.6	19.3	17.6	18.4	-0.9	1324
540	20.06.12	11:00:00	AM	16.0	17.2	16.6	17.7	17.5	17.6	-1.0	484.4
541	20.06.12	12:00:00	PM	16.7	18.0	17.4	18.9	17.9	18.4	-1.0	613.5
542	20.06.12	01:00:00	PM	18.3	20.7	19.5	21.9	18.9	20.4	-0.9	1108.7
543	20.06.12	02:00:00	PM	19.4	21.2	20.3	23.5	19.6	21.5	-1.2	1377.8
544	20.06.12	03:00:00	PM	22.6	21.7	22.1	27.3	20.1	23.7	-1.6	1980.6
545	20.06.12	04:00:00	PM	21.2	21.6	21.4	24.6	20.3	22.5	-1.1	4133.4
546	20.06.12	05:00:00	PM	19.4	20.5	19.9	22.2	20.1	21.2	-1.2	613.5
547	20.06.12	06:00:00	PM	19.1	20.7	19.9	21.8	20.1	20.9	-1.0	656.6
548	20.06.12	07:00:00	PM	18.1	19.4	18.8	20.3	19.7	20.0	-1.2	516.7
549	20.06.12	08:00:00	PM	17.3	18.1	17.7	18.8	19.0	18.9	-1.2	53.8
550	20.06.12	09:00:00	PM	16.4	16.0	16.2	16.6	18.0	17.3	-1.1	75.3
551	20.06.12	10:00:00	PM	16.2	14.0	15.1	14.7	17.0	15.9	-0.7	0
552	20.06.12	11:00:00	PM	15.7	12.3	14.0	13.0	16.0	14.5	-0.5	0
553	21.06.12	12:00:00	AM	15.0	11.4	13.2	11.8	15.3	13.6	-0.3	0
554	21.06.12	01:00:00	AM	14.3	10.7	12.5	10.9	14.6	12.8	-0.3	0
555	21.06.12	02:00:00	AM	13.4	10.2	11.8	10.4	14.1	12.2	-0.5	0
556	21.06.12	03:00:00	AM	12.6	9.8	11.2	9.7	13.7	11.7	-0.5	0
557	21.06.12	04:00:00	AM	12.0	9.5	10.7	9.2	13.3	11.2	-0.5	0
558	21.06.12	05:00:00	AM	11.6	9.2	10.4	8.9	13.0	10.9	-0.5	0
559	21.06.12	06:00:00	AM	11.4	9.2	10.3	8.7	12.8	10.7	-0.4	0
560	21.06.12	07:00:00	AM	11.3	10.2	10.7	9.7	12.9	11.3	-0.5	150.7
561	21.06.12	08:00:00	AM	12.6	15.5	14.0	12.5	13.8	13.1	0.9	118.4
562	21.06.12	09:00:00	AM	16.1	22.6	19.4	17.6	15.7	16.6	2.8	1377.8
563	21.06.12	10:00:00	AM	18.8	24.6	21.7	21.6	17.9	19.7	2.0	1377.8
564	21.06.12	11:00:00	AM	22.0	28.4	25.2	25.3	20.7	23.0	2.2	3272.2
565	21.06.12	12:00:00	PM	25.4	29.5	27.4	30.4	23.6	27.0	0.5	4650
566	21.06.12	01:00:00	PM	28.3	30.9	29.6	34.3	27.0	30.6	-1.1	3616.7
567	21.06.12	02:00:00	PM	29.3	28.6	28.9	34.3	25.4	29.8	-0.9	4477.8
568	21.06.12	03:00:00	PM	28.6	24.4	26.5	32.5	23.7	28.1	-1.6	3961.1
569	21.06.12	04:00:00	PM	28.8	22.7	25.7	30.9	22.6	26.7	-1.0	2755.6
570	21.06.12	05:00:00	PM	26.4	23.4	24.9	27.7	22.2	25.0	-0.1	753.5
571	21.06.12	06:00:00	PM	21.9	21.0	21.4	23.1	21.4	22.2	-0.8	279.9
572	21.06.12	07:00:00	PM	18.0	16.9	17.4	18.9	19.9	19.4	-2.0	86.1
573	21.06.12	08:00:00	PM	16.8	16.3	16.6	18.0	19.1	18.5	-2.0	172.2
574	21.06.12	09:00:00	PM	15.9	14.6	15.2	16.2	18.0	17.1	-1.9	0
575	21.06.12	10:00:00	PM	15.2	14.2	14.7	15.3	17.5	16.4	-1.7	0
576	21.06.12	11:00:00	PM	14.9	14.6	14.8	15.3	17.2	16.2	-1.5	0
577	22.06.12	12:00:00	AM	14.6	14.5	14.6	14.9	16.8	15.9	-1.3	0
578	22.06.12	01:00:00	AM	14.3	14.3	14.3	14.6	16.6	15.6	-1.3	0
579	22.06.12	02:00:00	AM	13.9	13.8	13.9	14.4	16.3	15.4	-1.5	0
580	22.06.12	03:00:00	AM	13.5	13.7	13.6	14.1	16.0	15.1	-1.5	0
581	22.06.12	04:00:00	AM	13.5	13.3	13.4	13.8	15.7	14.7	-1.3	0
582	22.06.12	05:00:00	AM	13.4	12.9	13.1	13.3	15.3	14.3	-1.2	0
583	22.06.12	06:00:00	AM	13.3	11.9	12.6	12.5	14.7	13.6	-1.0	32.3

584	22.06.12	07:00:00	AM	13.1	10.8	12.0	11.2	14.1	12.7	-0.7	32.3
585	22.06.12	08:00:00	AM	12.7	15.1	13.9	11.9	14.7	13.3	0.6	592
586	22.06.12	09:00:00	AM	13.9	19.8	16.9	15.0	16.0	15.5	1.4	1463.9
587	22.06.12	10:00:00	AM	15.9	22.9	19.4	17.9	17.8	17.8	1.6	2325
588	22.06.12	11:00:00	AM	19.0	24.4	21.7	20.9	19.9	20.4	1.3	3272.2
589	22.06.12	12:00:00	PM	22.2	26.0	24.1	27.3	22.8	25.0	-0.9	4822.3
590	22.06.12	01:00:00	PM	26.2	27.5	26.8	32.3	26.7	29.5	-2.7	3961.1
591	22.06.12	02:00:00	PM	27.3	25.9	26.6	33.1	24.4	28.7	-2.1	4477.8
592	22.06.12	03:00:00	PM	26.7	19.9	23.3	32.0	21.4	26.7	-3.4	3788.9
593	22.06.12	04:00:00	PM	25.5	17.7	21.6	29.2	20.3	24.7	-3.2	2755.6
594	22.06.12	05:00:00	PM	22.8	18.2	20.5	25.5	19.9	22.7	-2.2	624.3
595	22.06.12	06:00:00	PM	19.6	19.0	19.3	22.1	19.9	21.0	-1.7	1065.6
596	22.06.12	07:00:00	PM	16.8	17.3	17.0	18.4	18.6	18.5	-1.5	301.4
597	22.06.12	08:00:00	PM	15.0	15.4	15.2	16.1	17.6	16.9	-1.7	64.6
598	22.06.12	09:00:00	PM	14.7	13.1	13.9	14.1	16.4	15.3	-1.4	21.5
599	22.06.12	10:00:00	PM	14.2	11.2	12.7	12.1	15.1	13.6	-0.9	0
600	22.06.12	11:00:00	PM	12.8	9.8	11.3	10.4	14.1	12.2	-1.0	0
601	23.06.12	12:00:00	AM	11.6	9.0	10.3	9.6	13.6	11.6	-1.3	0
602	23.06.12	01:00:00	AM	10.8	8.8	9.8	9.4	13.2	11.3	-1.5	0
603	23.06.12	02:00:00	AM	10.0	8.7	9.3	9.0	12.8	10.9	-1.6	0
604	23.06.12	03:00:00	AM	9.0	8.0	8.5	8.2	12.2	10.2	-1.7	0
605	23.06.12	04:00:00	AM	8.3	7.6	7.9	7.9	11.9	9.9	-2.0	0
606	23.06.12	05:00:00	AM	7.7	7.3	7.5	7.4	11.5	9.5	-2.0	0
607	23.06.12	06:00:00	AM	6.9	6.8	6.8	6.8	11.1	9.0	-2.1	10.8
608	23.06.12	07:00:00	AM	6.3	6.7	6.5	6.5	10.9	8.7	-2.2	75.3
609	23.06.12	08:00:00	AM	8.0	12.4	10.2	8.9	12.4	10.6	-0.4	613.5
610	23.06.12	09:00:00	AM	11.3	18.1	14.7	13.0	14.1	13.6	1.2	1377.8
611	23.06.12	10:00:00	AM	14.2	22.5	18.4	17.0	16.3	16.7	1.7	2411.1
612	23.06.12	11:00:00	AM	15.1	20.6	17.9	17.5	16.6	17.0	0.8	3788.9
613	23.06.12	12:00:00	PM	17.9	22.6	20.2	22.8	19.2	21.0	-0.8	3272.2
614	23.06.12	01:00:00	PM	23.6	26.4	25.0	30.3	24.2	27.2	-2.2	4822.3
615	23.06.12	02:00:00	PM	24.2	25.9	25.0	30.0	22.1	26.0	-1.0	2755.6
616	23.06.12	03:00:00	PM	24.0	21.4	22.7	29.5	20.4	24.9	-2.3	4133.4
617	23.06.12	04:00:00	PM	25.3	20.1	22.7	29.7	20.0	24.8	-2.1	2927.8
618	23.06.12	05:00:00	PM	23.7	20.0	21.9	26.5	19.6	23.0	-1.2	1894.5
619	23.06.12	06:00:00	PM	20.6	19.0	19.8	20.9	18.3	19.6	0.2	419.8
620	23.06.12	07:00:00	PM	17.3	17.0	17.1	17.8	17.5	17.6	-0.5	193.8
621	23.06.12	08:00:00	PM	14.7	14.2	14.5	15.2	16.1	15.7	-1.2	32.3
622	23.06.12	09:00:00	PM	13.6	12.0	12.8	13.1	15.0	14.0	-1.3	10.8
623	23.06.12	10:00:00	PM	14.5	10.2	12.3	11.2	14.1	12.7	-0.3	0
624	23.06.12	11:00:00	PM	13.5	9.0	11.2	9.9	13.2	11.5	-0.3	0
625	24.06.12	12:00:00	AM	12.1	8.3	10.2	8.9	12.5	10.7	-0.5	0
626	24.06.12	01:00:00	AM	10.6	7.7	9.1	8.1	12.0	10.0	-0.9	0
627	24.06.12	02:00:00	AM	9.1	7.1	8.1	7.5	11.5	9.5	-1.4	0
628	24.06.12	03:00:00	AM	7.9	6.5	7.2	6.8	11.0	8.9	-1.7	0
629	24.06.12	04:00:00	AM	7.0	6.0	6.5	6.3	10.7	8.5	-2.0	0
630	24.06.12	05:00:00	AM	6.2	5.7	5.9	5.8	10.4	8.1	-2.1	0
631	24.06.12	06:00:00	AM	5.6	5.3	5.4	5.5	10.1	7.8	-2.3	0
632	24.06.12	07:00:00	AM	5.5	5.9	5.7	5.6	10.1	7.8	-2.2	53.8
633	24.06.12	08:00:00	AM	7.9	11.8	9.9	8.5	11.8	10.2	-0.3	538.2
634	24.06.12	09:00:00	AM	11.8	18.5	15.2	13.4	13.9	13.7	1.5	1345.5
635	24.06.12	10:00:00	AM	15.5	23.3	19.4	17.6	16.5	17.0	2.3	2152.8
636	24.06.12	11:00:00	AM	18.8	25.7	22.3	21.1	19.0	20.0	2.2	2755.6
637	24.06.12	12:00:00	PM	21.8	27.0	24.4	26.0	21.7	23.8	0.5	3961.1
638	24.06.12	01:00:00	PM	24.3	27.0	25.6	28.6	24.3	26.4	-0.8	3272.2
639	24.06.12	02:00:00	PM	24.2	26.3	25.2	27.6	22.4	25.0	0.2	2755.6
640	24.06.12	03:00:00	PM	22.4	24.1	23.2	26.3	21.6	23.9	-0.7	2755.6
641	24.06.12	04:00:00	PM	21.4	22.1	21.8	25.0	20.7	22.9	-1.1	1808.3
642	24.06.12	05:00:00	PM	20.0	21.6	20.8	22.9	20.4	21.7	-0.9	1808.3
643	24.06.12	06:00:00	PM	19.1	20.2	19.7	20.5	19.4	19.9	-0.3	807.3
644	24.06.12	07:00:00	PM	17.7	18.8	18.2	18.8	18.6	18.7	-0.5	452.1
645	24.06.12	08:00:00	PM	16.5	17.1	16.8	17.1	17.7	17.4	-0.6	86.1
646	24.06.12	09:00:00	PM	15.3	15.4	15.3	15.3	16.8	16.0	-0.7	0
647	24.06.12	10:00:00	PM	14.5	14.2	14.4	14.2	16.1	15.2	-0.8	0
648	24.06.12	11:00:00	PM	13.8	13.4	13.6	13.6	15.8	14.7	-1.1	0
649	25.06.12	12:00:00	AM	13.2	13.0	13.1	13.2	15.5	14.3	-1.2	0
650	25.06.12	01:00:00	AM	12.6	12.5	12.5	12.9	15.0	13.9	-1.4	0
651	25.06.12	02:00:00	AM	12.4	12.5	12.4	12.9	14.9	13.9	-1.4	0
652	25.06.12	03:00:00	AM	12.4	12.6	12.5	12.7	14.8	13.7	-1.2	0
653	25.06.12	04:00:00	AM	12.2	12.4	12.3	12.6	14.5	13.6	-1.3	0
654	25.06.12	05:00:00	AM	11.9	12.1	12.0	12.4	14.2	13.3	-1.3	0
655	25.06.12	06:00:00	AM	11.7	11.9	11.8	11.9	14.0	13.0	-1.2	0
656	25.06.12	07:00:00	AM	11.7	12.0	11.9	11.9	13.8	12.9	-1.0	0
657	25.06.12	08:00:00	AM	11.9	12.5	12.2	12.6	13.8	13.2	-1.0	107.6
658	25.06.12	09:00:00	AM	12.1	12.8	12.4	12.9	13.9	13.4	-1.0	96.9
659	25.06.12	10:00:00	AM	12.5	13.6	13.0	13.7	14.2	13.9	-0.9	333.7
660	25.06.12	11:00:00	AM	13.2	14.5	13.8	14.8	14.5	14.7	-0.8	441.3
661	25.06.12	12:00:00	PM	13.8	15.5	14.7	15.8	15.0	15.4	-0.7	139.9
662	25.06.12	01:00:00	PM	13.9	15.0	14.5	15.4	15.1	15.2	-0.8	376.7
663	25.06.12	02:00:00	PM	14.1	15.2	14.7	15.6	15.3	15.4	-0.8	344.4
664	25.06.12	03:00:00	PM	14.0	14.8	14.4	15.1	15.3	15.2	-0.8	118.4
665	25.06.12	04:00:00	PM	14.0	14.7	14.4	14.9	15.2	15.0	-0.7	473.6
666	25.06.12	05:00:00	PM	14.2	15.0	14.6	15.2	15.3	15.2	-0.6	236.8
667	25.06.12	06:00:00	PM	14.3	15.4	14.9	15.8	15.4	15.6	-0.7	688.9
668	25.06.12	07:00:00	PM	14.4	15.3	14.9	15.7	15.5	15.6	-0.7	376.7
669	25.06.12	08:00:00	PM	14.6	15.4	15.0	15.8	15.5	15.6	-0.6	183
670	25.06.12	09:00:00	PM	14.3	14.5	14.4	14.8	15.3	15.0	-0.6	32.3
671	25.06.12	10:00:00	PM	14.0	13.7	13.8	14.0	15.0	14.5	-0.7	0
672	25.06.12	11:00:00	PM	13.7	13.2	13.4	13.6	14.7	14.1	-0.7	0
673	26.06.12	12:00:00	AM	13.5	13.0	13.2	13.3	14.5	13.9	-0.7	0
674	26.06.12	01:00:00	AM	13.4	13.1	13.2	13.2	14.4	13.8	-0.6	0
675	26.06.12	02:00:00	AM	13.3	13.0	13.1	13.1	14.3	13.7	-0.6	0
676	26.06.12	03:00:00	AM	13.2	13.1	13.1	13.1	14.2	13.7	-0.5	0
677	26.06.12	04:00:00	AM	13.1	13.0	13.0	13.1	14.1	13.6	-0.6	0
678	26.06.12	05:00:00	AM	13.1	13.0	13.0	13.1	14.0	13.6	-0.5	0
679	26.06.12	06:00:00	AM	13.0	12.9	12.9	13.1	14.0	13.6	-0.6	0
680	26.06.12	07:00:00	AM	13.0	13.1	13.0	13.3	14.0	13.7	-0.6	75.3
681	26.06.12	08:00:00	AM	13.3	13.9	13.6	14.1	14.1	14.1	-0.5	96.9

682	26.06.12	09:00:00	AM	13.9	15.8	14.9	15.9	14.6	15.2	-0.4	581.3
683	26.06.12	10:00:00	AM	14.2	15.5	14.9	15.7	14.8	15.2	-0.4	344.4
684	26.06.12	11:00:00	AM	15.1	17.1	16.1	17.3	15.4	16.3	-0.2	667.4
685	26.06.12	12:00:00	PM	15.3	16.8	16.0	17.1	15.7	16.4	-0.3	1076.4
686	26.06.12	01:00:00	PM	15.8	17.0	16.4	17.2	16.0	16.6	-0.2	473.6
687	26.06.12	02:00:00	PM	15.9	16.8	16.3	17.1	16.0	16.6	-0.2	247.6
688	26.06.12	03:00:00	PM	15.7	16.4	16.0	16.7	16.0	16.4	-0.3	183
689	26.06.12	04:00:00	PM	15.7	16.3	16.0	16.6	16.0	16.3	-0.3	258.3
690	26.06.12	05:00:00	PM	15.8	16.7	16.2	16.9	16.1	16.5	-0.3	139.9
691	26.06.12	06:00:00	PM	15.6	16.0	15.8	16.0	16.0	16.0	-0.3	107.6
692	26.06.12	07:00:00	PM	15.8	16.9	16.3	17.1	16.1	16.6	-0.3	301.4
693	26.06.12	08:00:00	PM	15.8	16.7	16.2	17.0	16.1	16.6	-0.3	129.2
694	26.06.12	09:00:00	PM	15.5	15.7	15.6	15.9	16.0	16.0	-0.4	43.1
695	26.06.12	10:00:00	PM	15.0	14.9	14.9	15.3	15.8	15.5	-0.6	0
696	26.06.12	11:00:00	PM	14.7	14.5	14.6	14.8	15.6	15.2	-0.6	0
697	27.06.12	12:00:00	AM	14.5	14.3	14.4	14.5	15.4	14.9	-0.5	0
698	27.06.12	01:00:00	AM	14.1	13.8	14.0	13.9	15.2	14.6	-0.6	0
699	27.06.12	02:00:00	AM	14.0	13.8	13.9	13.8	15.0	14.4	-0.5	0
700	27.06.12	03:00:00	AM	13.9	13.8	13.9	13.7	14.9	14.3	-0.4	0
701	27.06.12	04:00:00	AM	13.8	13.5	13.6	13.4	14.7	14.0	-0.4	0
702	27.06.12	05:00:00	AM	13.6	13.2	13.4	13.0	14.6	13.8	-0.4	0
703	27.06.12	06:00:00	AM	12.7	11.7	12.2	11.8	14.2	13.0	-0.8	0
704	27.06.12	07:00:00	AM	12.9	12.5	12.7	12.5	14.2	13.4	-0.7	32.3
705	27.06.12	08:00:00	AM	13.5	17.0	15.2	13.7	14.4	14.0	1.2	559.7
706	27.06.12	09:00:00	AM	14.7	17.9	16.3	15.6	15.1	15.3	1.0	376.7
707	27.06.12	10:00:00	AM	16.1	20.2	18.2	18.6	16.1	17.4	0.8	570.5
708	27.06.12	11:00:00	AM	17.6	20.8	19.2	21.0	16.9	18.9	0.2	3272.2
709	27.06.12	12:00:00	PM	21.3	24.7	23.0	26.8	18.6	22.7	0.3	914.9
710	27.06.12	01:00:00	PM	27.5	28.8	28.1	33.7	22.0	27.8	0.3	4133.4
711	27.06.12	02:00:00	PM	28.4	28.6	28.5	34.5	22.6	28.6	-0.1	4477.8
712	27.06.12	03:00:00	PM	28.6	25.2	26.9	33.5	22.7	28.1	-1.2	3961.1
713	27.06.12	04:00:00	PM	27.7	24.0	25.8	32.3	22.6	27.5	-1.6	2755.6
714	27.06.12	05:00:00	PM	25.9	24.1	25.0	29.5	22.3	25.9	-0.9	871.9
715	27.06.12	06:00:00	PM	24.0	23.2	23.6	25.5	22.0	23.7	-0.2	290.6
716	27.06.12	07:00:00	PM	21.8	21.3	21.5	22.9	21.4	22.1	-0.6	193.8
717	27.06.12	08:00:00	PM	19.4	18.4	18.9	20.2	20.4	20.3	-1.4	43.1
718	27.06.12	09:00:00	PM	17.9	16.4	17.1	18.2	19.4	18.8	-1.7	10.8
719	27.06.12	10:00:00	PM	17.3	14.8	16.0	16.2	18.4	17.3	-1.3	0
720	27.06.12	11:00:00	PM	16.2	13.8	15.0	14.8	17.6	16.2	-1.2	0
721	28.06.12	12:00:00	AM	15.7	12.9	14.3	13.8	16.8	15.3	-1.0	0
722	28.06.12	01:00:00	AM	15.2	12.3	13.7	13.1	16.2	14.7	-0.9	0
723	28.06.12	02:00:00	AM	14.5	11.6	13.1	12.2	15.7	13.9	-0.9	0
724	28.06.12	03:00:00	AM	13.9	11.0	12.5	11.6	15.2	13.4	-0.9	0
725	28.06.12	04:00:00	AM	13.6	10.7	12.2	11.2	14.7	13.0	-0.8	0
726	28.06.12	05:00:00	AM	13.1	10.6	11.8	10.8	14.4	12.6	-0.8	0
727	28.06.12	06:00:00	AM	12.7	10.5	11.6	10.7	14.0	12.3	-0.8	10.8
728	28.06.12	07:00:00	AM	12.8	11.3	12.1	11.2	13.9	12.6	-0.5	96.9
729	28.06.12	08:00:00	AM	13.7	16.4	15.0	13.4	14.4	13.9	1.1	398.3
730	28.06.12	09:00:00	AM	16.2	21.5	18.9	17.9	15.7	16.8	2.1	1033.3
731	28.06.12	10:00:00	AM	19.2	25.7	22.4	21.8	17.5	19.6	2.8	1808.3
732	28.06.12	11:00:00	AM	21.4	27.0	24.2	24.4	19.6	22.0	2.2	2755.6
733	28.06.12	12:00:00	PM	23.4	27.5	25.4	27.2	21.4	24.3	1.2	3444.5
734	28.06.12	01:00:00	PM	28.7	30.4	29.5	34.0	24.1	29.0	0.5	4133.4
735	28.06.12	02:00:00	PM	27.3	29.9	28.6	31.9	24.4	28.1	0.4	4650
736	28.06.12	03:00:00	PM	26.5	27.8	27.1	30.9	24.2	27.5	-0.4	1377.8
737	28.06.12	04:00:00	PM	25.2	26.5	25.9	29.0	23.8	26.4	-0.5	1302.4
738	28.06.12	05:00:00	PM	25.1	25.8	25.5	28.1	23.4	25.7	-0.3	1550
739	28.06.12	06:00:00	PM	23.7	24.4	24.1	24.9	23.0	24.0	0.1	419.8
740	28.06.12	07:00:00	PM	22.2	23.0	22.6	22.9	22.3	22.6	0.0	269.1
741	28.06.12	08:00:00	PM	20.9	20.8	20.9	20.9	21.5	21.2	-0.3	86.1
742	28.06.12	09:00:00	PM	20.0	18.9	19.5	19.2	20.6	19.9	-0.4	0
743	28.06.12	10:00:00	PM	19.1	17.3	18.2	17.7	19.7	18.7	-0.5	0
744	28.06.12	11:00:00	PM	18.0	16.2	17.1	16.4	18.9	17.7	-0.6	0
745	29.06.12	12:00:00	AM	17.3	15.7	16.5	15.7	18.3	17.0	-0.5	0
746	29.06.12	01:00:00	AM	16.8	15.3	16.0	15.1	17.9	16.5	-0.4	0
747	29.06.12	02:00:00	AM	16.1	14.5	15.3	14.4	17.3	15.9	-0.5	0
748	29.06.12	03:00:00	AM	15.8	14.0	14.9	14.0	16.9	15.5	-0.6	0
749	29.06.12	04:00:00	AM	15.3	13.8	14.5	13.7	16.5	15.1	-0.6	0
750	29.06.12	05:00:00	AM	14.8	13.3	14.0	13.2	16.1	14.7	-0.6	0
751	29.06.12	06:00:00	AM	14.5	12.9	13.7	12.8	15.8	14.3	-0.6	0
752	29.06.12	07:00:00	AM	14.7	13.9	14.3	13.7	15.8	14.7	-0.4	193.8
753	29.06.12	08:00:00	AM	15.3	17.8	16.5	15.6	16.3	16.0	0.6	484.4
754	29.06.12	09:00:00	AM	17.6	22.2	19.9	19.1	17.6	18.3	1.6	1108.7
755	29.06.12	10:00:00	AM	19.7	26.2	22.9	22.2	19.3	20.8	2.2	1636.1
756	29.06.12	11:00:00	AM	22.1	28.8	25.4	25.9	21.5	23.7	1.8	2669.5
757	29.06.12	12:00:00	PM	26.3	30.5	28.4	30.6	24.0	27.3	1.1	4133.4
758	29.06.12	01:00:00	PM	30.0	32.1	31.0	35.2	26.7	31.0	0.1	4133.4
759	29.06.12	02:00:00	PM	30.4	31.5	30.9	36.2	26.5	31.3	-0.4	3788.9
760	29.06.12	03:00:00	PM	29.8	27.0	28.4	34.8	25.1	30.0	-1.6	3272.2
761	29.06.12	04:00:00	PM	28.8	25.0	26.9	32.6	24.3	28.4	-1.5	2411.1
762	29.06.12	05:00:00	PM	26.7	24.9	25.8	29.2	23.8	26.5	-0.7	1550
763	29.06.12	06:00:00	PM	23.8	23.7	23.7	24.8	23.2	24.0	-0.3	473.6
764	29.06.12	07:00:00	PM	21.4	22.3	21.9	22.8	22.5	22.7	-0.8	419.8
765	29.06.12	08:00:00	PM	20.9	21.5	21.2	21.6	21.9	21.7	-0.5	161.5
766	29.06.12	09:00:00	PM	20.1	19.7	19.9	19.9	21.0	20.4	-0.5	32.3
767	29.06.12	10:00:00	PM	19.5	17.9	18.7	18.1	20.0	19.1	-0.4	0
768	29.06.12	11:00:00	PM	18.3	16.7	17.5	17.2	19.4	18.3	-0.8	0
769	30.06.12	12:00:00	AM	17.4	16.0	16.7	16.2	18.8	17.5	-0.9	0
770	30.06.12	01:00:00	AM	16.8	15.1	15.9	15.3	18.0	16.7	-0.7	0
771	30.06.12	02:00:00	AM	16.1	14.3	15.2	14.5	17.5	16.0	-0.8	0
772	30.06.12	03:00:00	AM	15.6	14.1	14.9	14.1	17.1	15.6	-0.8	0
773	30.06.12	04:00:00	AM	15.4	13.4	14.4	13.3	16.5	14.9	-0.5	0
774	30.06.12	05:00:00	AM	14.8	12.5	13.7	12.4	16.0	14.2	-0.6	0
775	30.06.12	06:00:00	AM	14.4	11.9	13.2	11.8	15.6	13.7	-0.5	0
776	30.06.12	07:00:00	AM	13.9	12.2	13.1	12.1	15.4	13.7	-0.7	107.6
777	30.06.12	08:00:00	AM	14.3	16.7	15.5	14.4	16.1	15.3	0.2	495.1
778	30.06.12	09:00:00	AM	16.3	22.0	19.1	18.0	17.6	17.8	1.3	1108.7
779	30.06.12	10:00:00	AM	18.3	25.9	22.1	21.3	19.5	20.4	1.7	1722.2

780	30.06.12	11:00:00	AM	20.8	28.3	24.5	24.8	21.6	23.2	1.3	2583.4
781	30.06.12	12:00:00	PM	24.2	29.7	26.9	29.9	23.8	26.8	0.1	3788.9
782	30.06.12	01:00:00	PM	26.9	30.7	28.8	33.1	26.1	29.6	-0.8	1980.6
783	30.06.12	02:00:00	PM	27.7	30.0	28.8	34.0	25.6	29.8	-1.0	3616.7
784	30.06.12	03:00:00	PM	28.2	26.1	27.1	33.0	24.2	28.6	-1.5	3272.2
785	30.06.12	04:00:00	PM	26.3	25.2	25.8	29.8	23.9	26.8	-1.1	1808.3
786	30.06.12	05:00:00	PM	24.8	25.0	24.9	27.2	23.5	25.3	-0.4	947.2
787	30.06.12	06:00:00	PM	23.6	23.7	23.6	24.0	22.6	23.3	0.3	592
788	30.06.12	07:00:00	PM	21.4	22.0	21.7	21.9	21.9	21.9	-0.1	301.4
789	30.06.12	08:00:00	PM	20.3	20.3	20.3	20.3	21.0	20.7	-0.3	161.5
790	30.06.12	09:00:00	PM	19.9	18.6	19.2	18.8	20.0	19.4	-0.2	0
791	30.06.12	10:00:00	PM	18.9	16.7	17.8	17.0	19.0	18.0	-0.2	0
792	30.06.12	11:00:00	PM	17.9	16.4	17.1	16.6	18.7	17.7	-0.5	0
793	01.07.12	12:00:00	AM	17.3	17.3	17.3	17.3	18.8	18.0	-0.8	0
794	01.07.12	01:00:00	AM	17.1	17.4	17.2	17.1	18.6	17.9	-0.6	0
795	01.07.12	02:00:00	AM	17.0	16.9	17.0	16.7	18.2	17.5	-0.5	0
796	01.07.12	03:00:00	AM	16.8	16.0	16.4	16.0	17.9	17.0	-0.5	0
797	01.07.12	04:00:00	AM	16.8	16.3	16.6	16.2	17.8	17.0	-0.4	0
798	01.07.12	05:00:00	AM	16.7	16.0	16.3	15.8	17.5	16.6	-0.3	0
799	01.07.12	06:00:00	AM	16.4	15.7	16.0	15.7	17.3	16.5	-0.4	0
800	01.07.12	07:00:00	AM	16.0	14.9	15.5	14.8	16.8	15.8	-0.3	150.7
801	01.07.12	08:00:00	AM	16.4	16.7	16.6	16.6	17.4	17.0	-0.4	366
802	01.07.12	09:00:00	AM	16.3	17.0	16.7	17.1	17.6	17.3	-0.7	226
803	01.07.12	10:00:00	AM	15.9	16.2	16.0	16.4	17.3	16.9	-0.8	129.2
804	01.07.12	11:00:00	AM	16.0	17.0	16.5	17.5	17.7	17.6	-1.0	613.5
805	01.07.12	12:00:00	PM	15.9	16.4	16.1	17.0	17.5	17.2	-1.1	107.6
806	01.07.12	01:00:00	PM	15.1	14.9	15.0	15.7	16.9	16.3	-1.3	172.2
807	01.07.12	02:00:00	PM	15.4	17.0	16.2	17.9	17.7	17.8	-1.6	764.2
808	01.07.12	03:00:00	PM	15.5	16.9	16.2	17.5	17.5	17.5	-1.3	667.4
809	01.07.12	04:00:00	PM	16.1	17.7	16.9	18.2	17.9	18.0	-1.1	226
810	01.07.12	05:00:00	PM	16.0	16.2	16.1	16.7	17.3	17.0	-0.9	322.9
811	01.07.12	06:00:00	PM	15.2	15.1	15.1	15.6	16.7	16.1	-1.0	10.8
812	01.07.12	07:00:00	PM	14.7	14.3	14.5	14.7	16.4	15.6	-1.1	366
813	01.07.12	08:00:00	PM	14.9	14.3	14.6	14.8	16.3	15.6	-1.0	150.7
814	01.07.12	09:00:00	PM	14.6	14.0	14.3	14.4	16.0	15.2	-0.9	10.8
815	01.07.12	10:00:00	PM	14.2	13.4	13.8	13.8	15.7	14.8	-1.0	0
816	01.07.12	11:00:00	PM	13.3	12.1	12.7	12.5	15.1	13.8	-1.1	0
817	02.07.12	12:00:00	AM	12.8	11.4	12.1	11.9	14.6	13.3	-1.2	0
818	02.07.12	01:00:00	AM	12.6	10.9	11.8	11.4	14.2	12.8	-1.1	0
819	02.07.12	02:00:00	AM	12.4	10.7	11.6	11.2	13.9	12.6	-1.0	0
820	02.07.12	03:00:00	AM	12.5	11.5	12.0	11.8	14.0	12.9	-0.9	0
821	02.07.12	04:00:00	AM	12.1	11.8	12.0	11.7	14.0	12.9	-0.9	0
822	02.07.12	05:00:00	AM	11.9	11.2	11.6	11.3	13.9	12.6	-1.1	0
823	02.07.12	06:00:00	AM	11.8	11.2	11.5	11.3	13.8	12.5	-1.0	0
824	02.07.12	07:00:00	AM	12.0	11.5	11.8	11.6	13.8	12.7	-0.9	21.5
825	02.07.12	08:00:00	AM	12.4	12.7	12.5	13.0	13.9	13.5	-0.9	193.8
826	02.07.12	09:00:00	AM	13.1	14.5	13.8	14.6	14.3	14.5	-0.7	183
827	02.07.12	10:00:00	AM	13.8	16.0	14.9	16.6	15.0	15.8	-0.9	473.6
828	02.07.12	11:00:00	AM	14.2	15.4	14.8	15.8	15.2	15.5	-0.7	118.4
829	02.07.12	12:00:00	PM	14.2	15.1	14.7	15.6	15.3	15.4	-0.8	893.4
830	02.07.12	01:00:00	PM	14.4	15.4	14.9	15.8	15.5	15.6	-0.7	452.1
831	02.07.12	02:00:00	PM	15.1	17.2	16.1	17.8	16.0	16.9	-0.8	279.9
832	02.07.12	03:00:00	PM	15.0	15.8	15.4	16.2	16.0	16.1	-0.7	398.3
833	02.07.12	04:00:00	PM	14.9	15.3	15.1	15.8	16.0	15.9	-0.8	387.5
834	02.07.12	05:00:00	PM	14.9	15.0	14.9	15.6	15.9	15.7	-0.8	43.1
835	02.07.12	06:00:00	PM	14.6	14.4	14.5	14.9	15.6	15.2	-0.7	269.1
836	02.07.12	07:00:00	PM	14.3	14.3	14.3	14.7	15.5	15.1	-0.8	43.1
837	02.07.12	08:00:00	PM	14.3	14.0	14.2	14.4	15.3	14.9	-0.7	32.3
838	02.07.12	09:00:00	PM	14.1	13.8	13.9	14.1	15.1	14.6	-0.7	0
839	02.07.12	10:00:00	PM	14.0	13.6	13.8	13.9	15.0	14.5	-0.7	0
840	02.07.12	11:00:00	PM	13.9	13.5	13.7	13.8	14.8	14.3	-0.6	0
841	03.07.12	12:00:00	AM	13.7	13.3	13.5	13.6	14.7	14.1	-0.7	0
842	03.07.12	01:00:00	AM	13.6	13.2	13.4	13.3	14.6	13.9	-0.6	0
843	03.07.12	02:00:00	AM	13.6	13.0	13.3	13.3	14.5	13.9	-0.6	0
844	03.07.12	03:00:00	AM	13.6	12.7	13.1	13.2	14.3	13.7	-0.6	0
845	03.07.12	04:00:00	AM	13.5	12.6	13.0	12.9	14.2	13.6	-0.5	0
846	03.07.12	05:00:00	AM	13.5	12.4	12.9	12.7	14.1	13.4	-0.5	0
847	03.07.12	06:00:00	AM	13.3	12.4	12.8	12.6	14.0	13.3	-0.5	0
848	03.07.12	07:00:00	AM	13.4	12.6	13.0	12.9	13.9	13.4	-0.4	32.3
849	03.07.12	08:00:00	AM	13.4	13.1	13.2	13.5	14.0	13.7	-0.5	226
850	03.07.12	09:00:00	AM	13.7	14.1	13.9	14.5	14.2	14.4	-0.5	366
851	03.07.12	10:00:00	AM	14.4	16.4	15.4	17.1	14.9	16.0	-0.6	1001
852	03.07.12	11:00:00	AM	15.0	16.9	15.9	17.7	15.4	16.5	-0.6	796.5
853	03.07.12	12:00:00	PM	15.9	18.3	17.1	19.2	16.0	17.6	-0.5	753.5
854	03.07.12	01:00:00	PM	16.5	18.9	17.7	19.8	16.5	18.1	-0.4	1227.1
855	03.07.12	02:00:00	PM	18.7	21.9	20.3	24.4	17.6	21.0	-0.7	1894.5
856	03.07.12	03:00:00	PM	18.7	21.3	20.0	22.3	18.1	20.2	-0.2	764.2
857	03.07.12	04:00:00	PM	19.6	20.9	20.2	24.0	18.5	21.2	-1.0	2927.8
858	03.07.12	05:00:00	PM	19.7	21.4	20.5	23.5	18.8	21.1	-0.6	893.4
859	03.07.12	06:00:00	PM	20.0	21.7	20.9	22.4	19.1	20.8	0.1	807.3
860	03.07.12	07:00:00	PM	19.1	20.9	20.0	21.5	19.1	20.3	-0.3	549
861	03.07.12	08:00:00	PM	17.7	18.6	18.1	18.9	18.6	18.8	-0.6	53.8
862	03.07.12	09:00:00	PM	16.0	15.8	15.9	16.3	17.8	17.0	-1.1	10.8
863	03.07.12	10:00:00	PM	14.6	13.6	14.1	14.2	16.8	15.5	-1.4	0
864	03.07.12	11:00:00	PM	13.8	12.1	13.0	12.7	16.0	14.4	-1.4	0
865	04.07.12	12:00:00	AM	13.1	11.1	12.1	11.7	15.4	13.6	-1.4	0
866	04.07.12	01:00:00	AM	12.3	10.6	11.4	10.9	14.8	12.9	-1.4	0
867	04.07.12	02:00:00	AM	11.6	10.0	10.8	10.4	14.2	12.3	-1.5	0
868	04.07.12	03:00:00	AM	11.0	9.6	10.3	9.8	13.8	11.8	-1.5	0
869	04.07.12	04:00:00	AM	10.6	9.2	9.9	9.4	13.4	11.4	-1.5	0
870	04.07.12	05:00:00	AM	10.2	8.8	9.5	9.0	13.0	11.0	-1.5	0
871	04.07.12	06:00:00	AM	9.8	8.6	9.2	8.8	12.6	10.7	-1.5	0
872	04.07.12	07:00:00	AM	9.7	9.0	9.3	8.9	12.5	10.7	-1.4	75.3
873	04.07.12	08:00:00	AM	10.8	14.4	12.6	11.2	13.0	12.1	0.5	495.1
874	04.07.12	09:00:00	AM	13.4	18.6	16.0	15.2	14.1	14.7	1.3	904.2
875	04.07.12	10:00:00	AM	15.9	21.1	18.5	18.3	15.6	17.0	1.5	871.9
876	04.07.12	11:00:00	AM	16.8	20.5	18.7	19.8	16.5	18.1	0.5	947.2
877	04.07.12	12:00:00	PM	18.8	23.6	21.2	23.9	17.9	20.9	0.3	1550

878	04.07.12	01:00:00	PM	22.1	26.1	24.1	30.3	19.9	25.1	-0.9	3272.2
879	04.07.12	02:00:00	PM	25.9	27.3	26.6	33.2	21.0	27.1	-0.5	3788.9
880	04.07.12	03:00:00	PM	25.5	23.4	24.5	29.3	20.8	25.0	-0.6	3616.7
881	04.07.12	04:00:00	PM	25.2	22.8	24.0	28.5	20.6	24.5	-0.5	2669.5
882	04.07.12	05:00:00	PM	24.0	24.8	24.4	27.6	21.1	24.3	0.1	1001
883	04.07.12	06:00:00	PM	22.4	23.5	23.0	24.0	21.0	22.5	0.5	914.9
884	04.07.12	07:00:00	PM	20.7	22.0	21.3	21.7	20.6	21.1	0.2	505.9
885	04.07.12	08:00:00	PM	19.2	18.4	18.8	18.5	19.6	19.0	-0.2	86.1
886	04.07.12	09:00:00	PM	17.6	16.2	16.9	16.5	18.6	17.6	-0.7	0
887	04.07.12	10:00:00	PM	17.1	15.5	16.3	15.8	18.0	16.9	-0.6	0
888	04.07.12	11:00:00	PM	15.0	13.7	14.3	14.2	17.2	15.7	-1.4	0
889	05.07.12	12:00:00	AM	13.8	11.8	12.8	12.3	16.2	14.3	-1.5	0
890	05.07.12	01:00:00	AM	13.0	10.9	12.0	11.3	15.5	13.4	-1.4	0
891	05.07.12	02:00:00	AM	13.2	11.2	12.2	11.2	15.2	13.2	-1.0	0
892	05.07.12	03:00:00	AM	13.2	11.4	12.3	11.3	14.9	13.1	-0.8	0
893	05.07.12	04:00:00	AM	13.2	11.6	12.4	11.5	14.7	13.1	-0.7	0
894	05.07.12	05:00:00	AM	12.9	10.8	11.9	10.7	14.3	12.5	-0.7	0
895	05.07.12	06:00:00	AM	12.4	10.4	11.4	10.5	13.9	12.2	-0.8	86.1
896	05.07.12	07:00:00	AM	12.7	12.0	12.4	11.9	14.0	13.0	-0.6	279.9
897	05.07.12	08:00:00	AM	13.2	15.0	14.1	13.9	14.6	14.3	-0.2	247.6
898	05.07.12	09:00:00	AM	14.5	17.5	16.0	16.8	15.4	16.1	-0.1	1141
899	05.07.12	10:00:00	AM	16.0	19.6	17.8	19.4	16.4	17.9	-0.1	1377.8
900	05.07.12	11:00:00	AM	16.1	17.9	17.0	17.9	16.6	17.2	-0.2	419.8
901	05.07.12	12:00:00	PM	16.5	18.6	17.6	19.2	17.1	18.1	-0.6	1313.2
902	05.07.12	01:00:00	PM	17.8	20.4	19.1	20.6	17.9	19.2	-0.1	516.7
903	05.07.12	02:00:00	PM	17.7	19.6	18.6	20.1	18.1	19.1	-0.5	1076.4
904	05.07.12	03:00:00	PM	18.0	20.2	19.1	21.1	18.4	19.8	-0.6	1087.2
905	05.07.12	04:00:00	PM	19.5	21.7	20.6	23.6	19.0	21.3	-0.7	1194.8
906	05.07.12	05:00:00	PM	20.4	21.3	20.9	23.1	19.1	21.1	-0.2	2066.7
907	05.07.12	06:00:00	PM	19.9	20.5	20.2	21.5	19.1	20.3	0.0	861.1
908	05.07.12	07:00:00	PM	19.3	19.5	19.4	19.9	18.8	19.4	0.0	398.3
909	05.07.12	08:00:00	PM	18.3	18.5	18.4	18.9	18.5	18.7	-0.3	398.3
910	05.07.12	09:00:00	PM	17.7	17.4	17.5	17.6	18.0	17.8	-0.3	107.6
911	05.07.12	10:00:00	PM	15.4	13.8	14.6	13.2	17.0	15.1	-0.5	0
912	05.07.12	11:00:00	PM	14.6	13.8	14.2	13.2	16.4	14.8	-0.6	0
913	06.07.12	12:00:00	AM	14.2	13.7	13.9	13.3	16.1	14.7	-0.8	0
914	06.07.12	01:00:00	AM	14.0	13.8	13.9	13.8	16.0	14.9	-0.9	0
915	06.07.12	02:00:00	AM	13.8	13.7	13.8	13.4	15.7	14.5	-0.8	0
916	06.07.12	03:00:00	AM	13.7	13.5	13.6	13.3	15.5	14.4	-0.8	0
917	06.07.12	04:00:00	AM	13.4	13.0	13.2	12.7	15.3	14.0	-0.8	0
918	06.07.12	05:00:00	AM	13.0	12.9	12.9	12.3	15.1	13.7	-0.8	0
919	06.07.12	06:00:00	AM	12.6	12.9	12.7	12.0	14.8	13.4	-0.7	0
920	06.07.12	07:00:00	AM	12.7	13.0	12.8	12.5	14.7	13.6	-0.8	0
921	06.07.12	08:00:00	AM	12.7	12.9	12.8	12.7	14.6	13.7	-0.9	21.5
922	06.07.12	09:00:00	AM	12.7	13.5	13.1	13.3	14.6	13.9	-0.9	333.7
923	06.07.12	10:00:00	AM	13.1	14.9	14.0	15.3	14.8	15.0	-1.1	990.3
924	06.07.12	11:00:00	AM	14.5	17.3	15.9	18.0	15.4	16.7	-0.8	1194.8
925	06.07.12	12:00:00	PM	15.3	17.9	16.6	19.2	16.0	17.6	-1.0	1463.9
926	06.07.12	01:00:00	PM	16.7	19.4	18.0	20.9	16.7	18.8	-0.8	699.7
927	06.07.12	02:00:00	PM	16.3	19.0	17.7	20.3	17.2	18.8	-1.1	775
928	06.07.12	03:00:00	PM	17.2	19.6	18.4	21.9	17.7	19.8	-1.4	1550
929	06.07.12	04:00:00	PM	16.9	19.4	18.1	21.3	17.9	19.6	-1.4	1636.1
930	06.07.12	05:00:00	PM	17.5	19.9	18.7	22.1	18.1	20.1	-1.4	581.3
931	06.07.12	06:00:00	PM	16.8	17.6	17.2	19.2	18.1	18.7	-1.5	290.6
932	06.07.12	07:00:00	PM	16.6	16.8	16.7	18.3	17.9	18.1	-1.4	118.4
933	06.07.12	08:00:00	PM	16.4	15.9	16.1	17.1	17.6	17.3	-1.2	96.9
934	06.07.12	09:00:00	PM	15.4	15.1	15.2	16.0	17.2	16.6	-1.3	21.5
935	06.07.12	10:00:00	PM	14.2	14.0	14.1	14.9	16.8	15.9	-1.7	0
936	06.07.12	11:00:00	PM	13.8	13.3	13.5	14.0	16.3	15.2	-1.7	0
937	07.07.12	12:00:00	AM	12.9	11.7	12.3	12.5	16.0	14.2	-1.9	0
938	07.07.12	01:00:00	AM	12.7	10.3	11.5	10.8	15.4	13.1	-1.6	0
939	07.07.12	02:00:00	AM	12.2	10.1	11.1	10.4	14.9	12.6	-1.5	0
940	07.07.12	03:00:00	AM	11.7	10.5	11.1	10.5	14.5	12.5	-1.4	0
941	07.07.12	04:00:00	AM	11.5	10.5	11.0	10.6	14.2	12.4	-1.4	0
942	07.07.12	05:00:00	AM	11.2	9.6	10.4	9.8	13.8	11.8	-1.4	0
943	07.07.12	06:00:00	AM	11.2	9.5	10.4	9.6	13.6	11.6	-1.2	0
944	07.07.12	07:00:00	AM	11.1	9.3	10.2	9.3	13.4	11.3	-1.1	43.1
945	07.07.12	08:00:00	AM	11.5	13.3	12.4	10.4	13.4	11.9	0.5	419.8
946	07.07.12	09:00:00	AM	12.5	16.1	14.3	13.3	13.9	13.6	0.7	893.4
947	07.07.12	10:00:00	AM	14.3	19.7	17.0	16.5	14.9	15.7	1.3	1377.8
948	07.07.12	11:00:00	AM	16.3	21.0	18.7	19.8	16.2	18.0	0.7	1011.8
949	07.07.12	12:00:00	PM	18.4	23.4	20.9	24.7	17.7	21.2	-0.3	1227.1
950	07.07.12	01:00:00	PM	19.4	23.3	21.3	26.2	18.7	22.5	-1.1	4994.5
951	07.07.12	02:00:00	PM	22.2	24.7	23.5	30.6	19.6	25.1	-1.6	4650
952	07.07.12	03:00:00	PM	24.0	22.0	23.0	30.3	19.9	25.1	-2.1	3444.5
953	07.07.12	04:00:00	PM	24.4	20.6	22.5	28.7	19.9	24.3	-1.8	2755.6
954	07.07.12	05:00:00	PM	23.6	22.0	22.8	27.5	19.8	23.6	-0.8	1980.6
955	07.07.12	06:00:00	PM	21.6	21.0	21.3	23.2	19.8	21.5	-0.2	344.4
956	07.07.12	07:00:00	PM	19.4	19.3	19.3	20.6	19.3	19.9	-0.6	236.8
957	07.07.12	08:00:00	PM	18.2	16.9	17.6	18.5	18.7	18.6	-1.0	32.3
958	07.07.12	09:00:00	PM	18.0	15.6	16.8	16.9	18.0	17.5	-0.7	21.5
959	07.07.12	10:00:00	PM	17.4	14.3	15.9	15.4	17.5	16.4	-0.6	0
960	07.07.12	11:00:00	PM	16.0	13.0	14.5	13.8	16.8	15.3	-0.8	0
961	08.07.12	12:00:00	AM	14.7	12.0	13.4	12.7	16.1	14.4	-1.1	0
962	08.07.12	01:00:00	AM	13.8	11.8	12.8	12.1	15.7	13.9	-1.1	0
963	08.07.12	02:00:00	AM	13.3	11.6	12.4	11.7	15.3	13.5	-1.1	0
964	08.07.12	03:00:00	AM	12.9	11.1	12.0	11.1	14.9	13.0	-1.0	0
965	08.07.12	04:00:00	AM	12.5	10.8	11.7	10.7	14.5	12.6	-1.0	0
966	08.07.12	05:00:00	AM	12.9	12.2	12.5	12.3	14.4	13.4	-0.8	0
967	08.07.12	06:00:00	AM	13.2	12.7	12.9	12.9	14.5	13.7	-0.8	0
968	08.07.12	07:00:00	AM	13.3	12.9	13.1	13.2	14.5	13.8	-0.8	21.5
969	08.07.12	08:00:00	AM	13.1	12.6	12.8	13.1	14.5	13.8	-1.0	64.6
970	08.07.12	09:00:00	AM	13.4	14.5	13.9	14.8	14.7	14.8	-0.8	764.2
971	08.07.12	10:00:00	AM	14.1	15.8	14.9	16.1	15.2	15.7	-0.7	236.8
972	08.07.12	11:00:00	AM	14.8	17.9	16.3	18.8	15.7	17.2	-0.9	3444.5
973	08.07.12	12:00:00	PM	18.0	22.8	20.4	24.3	17.2	20.7	-0.3	1205.6
974	08.07.12	01:00:00	PM	19.3	23.1	21.2	24.0	18.5	21.2	-0.1	1550
975	08.07.12	02:00:00	PM	18.0	19.9	18.9	20.2	18.5	19.4	-0.4	818.1

976	08.07.12	03:00:00	PM	17.3	19.1	18.2	19.5	18.5	19.0	-0.8	495.1
977	08.07.12	04:00:00	PM	16.7	18.3	17.5	18.5	18.3	18.4	-0.9	215.3
978	08.07.12	05:00:00	PM	16.4	17.8	17.1	18.0	18.0	18.0	-0.9	441.3
979	08.07.12	06:00:00	PM	16.2	17.7	17.0	17.8	17.9	17.8	-0.9	322.9
980	08.07.12	07:00:00	PM	16.2	17.7	17.0	17.8	17.8	17.8	-0.8	473.6
981	08.07.12	08:00:00	PM	16.2	17.4	16.8	17.6	17.7	17.6	-0.8	226
982	08.07.12	09:00:00	PM	16.0	16.4	16.2	16.6	17.4	17.0	-0.8	10.8
983	08.07.12	10:00:00	PM	15.6	15.6	15.6	15.9	17.1	16.5	-0.9	0
984	08.07.12	11:00:00	PM	15.4	15.0	15.2	15.3	16.7	16.0	-0.8	0
985	09.07.12	12:00:00	AM	15.4	14.4	14.9	14.8	16.3	15.6	-0.7	0
986	09.07.12	01:00:00	AM	15.1	14.1	14.6	14.4	16.0	15.2	-0.6	0
987	09.07.12	02:00:00	AM	14.6	13.8	14.2	14.1	15.8	14.9	-0.8	0
988	09.07.12	03:00:00	AM	14.2	12.7	13.5	13.0	15.5	14.2	-0.8	0
989	09.07.12	04:00:00	AM	13.9	12.3	13.1	12.3	15.1	13.7	-0.6	0
990	09.07.12	05:00:00	AM	13.4	11.6	12.5	11.6	14.8	13.2	-0.7	0
991	09.07.12	06:00:00	AM	12.6	10.4	11.5	10.4	14.2	12.3	-0.8	0
992	09.07.12	07:00:00	AM	12.4	10.7	11.5	10.6	13.9	12.2	-0.7	129.2
993	09.07.12	08:00:00	AM	12.6	13.1	12.8	12.0	14.0	13.0	-0.2	312.2
994	09.07.12	09:00:00	AM	13.2	17.1	15.1	14.2	14.7	14.5	0.7	828.8
995	09.07.12	10:00:00	AM	14.5	20.8	17.7	17.0	15.9	16.4	1.2	1463.9
996	09.07.12	11:00:00	AM	16.0	20.7	18.4	19.1	16.9	18.0	0.4	322.9
997	09.07.12	12:00:00	PM	16.6	20.3	18.5	20.1	17.5	18.8	-0.3	613.5
998	09.07.12	01:00:00	PM	20.3	25.3	22.8	28.9	19.2	24.0	-1.2	968.8
999	09.07.12	02:00:00	PM	22.2	24.9	23.6	30.4	19.9	25.1	-1.5	4133.4
1000	09.07.12	03:00:00	PM	24.3	21.5	22.9	29.2	20.0	24.6	-1.7	3616.7
1001	09.07.12	04:00:00	PM	24.4	19.8	22.1	27.0	19.6	23.3	-1.2	2755.6
1002	09.07.12	05:00:00	PM	22.2	21.3	21.8	25.4	19.6	22.5	-0.7	1894.5
1003	09.07.12	06:00:00	PM	20.5	21.3	20.9	22.3	19.8	21.0	-0.1	839.6
1004	09.07.12	07:00:00	PM	18.8	20.5	19.7	20.7	19.7	20.2	-0.5	344.4
1005	09.07.12	08:00:00	PM	18.0	18.5	18.2	19.0	19.2	19.1	-0.9	86.1
1006	09.07.12	09:00:00	PM	17.5	17.1	17.3	17.6	18.6	18.1	-0.8	21.5
1007	09.07.12	10:00:00	PM	17.2	16.1	16.7	16.6	18.1	17.4	-0.7	0
1008	09.07.12	11:00:00	PM	17.0	15.3	16.1	15.8	17.7	16.7	-0.6	0
1009	10.07.12	12:00:00	AM	16.3	13.9	15.1	14.5	17.1	15.8	-0.7	0
1010	10.07.12	01:00:00	AM	15.6	12.7	14.1	13.3	16.5	14.9	-0.8	0
1011	10.07.12	02:00:00	AM	15.0	11.8	13.4	12.3	15.9	14.1	-0.7	0
1012	10.07.12	03:00:00	AM	14.3	11.1	12.7	11.5	15.3	13.4	-0.7	0
1013	10.07.12	04:00:00	AM	13.6	10.6	12.1	10.8	14.9	12.9	-0.8	0
1014	10.07.12	05:00:00	AM	13.1	9.8	11.4	10.1	14.3	12.2	-0.8	0
1015	10.07.12	06:00:00	AM	12.8	9.7	11.2	9.8	13.9	11.9	-0.6	0
1016	10.07.12	07:00:00	AM	12.5	10.1	11.3	10.0	13.8	11.9	-0.6	21.5
1017	10.07.12	08:00:00	AM	12.5	13.7	13.1	11.0	13.8	12.4	0.6	387.5
1018	10.07.12	09:00:00	AM	13.4	18.2	15.8	14.1	14.7	14.4	1.4	796.5
1019	10.07.12	10:00:00	AM	15.0	21.9	18.4	17.5	16.0	16.8	1.7	1356.3
1020	10.07.12	11:00:00	AM	17.2	24.4	20.8	22.2	17.9	20.0	0.7	2755.6
1021	10.07.12	12:00:00	PM	18.2	22.8	20.5	21.7	18.9	20.3	0.2	753.5
1022	10.07.12	01:00:00	PM	17.7	19.3	18.5	18.9	18.6	18.8	-0.3	333.7
1023	10.07.12	02:00:00	PM	17.2	18.8	18.0	18.9	18.4	18.7	-0.7	861.1
1024	10.07.12	03:00:00	PM	16.8	18.0	17.4	18.1	18.2	18.2	-0.8	914.9
1025	10.07.12	04:00:00	PM	16.7	18.3	17.5	18.7	18.3	18.5	-1.0	742.7
1026	10.07.12	05:00:00	PM	16.6	18.8	17.7	19.4	18.2	18.8	-1.1	2497.2
1027	10.07.12	06:00:00	PM	16.8	18.9	17.9	19.1	18.3	18.7	-0.9	753.5
1028	10.07.12	07:00:00	PM	16.3	17.9	17.1	17.8	18.2	18.0	-0.9	376.7
1029	10.07.12	08:00:00	PM	16.0	16.7	16.4	16.7	17.8	17.2	-0.9	236.8
1030	10.07.12	09:00:00	PM	15.5	14.9	15.2	14.9	17.3	16.1	-0.9	0
1031	10.07.12	10:00:00	PM	15.0	13.9	14.5	14.1	16.7	15.4	-1.0	0
1032	10.07.12	11:00:00	PM	13.9	12.6	13.3	12.7	16.1	14.4	-1.1	0
1033	11.07.12	12:00:00	AM	13.1	12.2	12.6	11.9	15.7	13.8	-1.1	0
1034	11.07.12	01:00:00	AM	12.6	11.2	11.9	11.0	15.1	13.1	-1.2	0
1035	11.07.12	02:00:00	AM	12.8	11.8	12.3	11.5	14.9	13.2	-0.9	0
1036	11.07.12	03:00:00	AM	12.9	12.5	12.7	12.0	14.8	13.4	-0.7	0
1037	11.07.12	04:00:00	AM	13.1	13.1	13.1	12.8	14.8	13.8	-0.7	0
1038	11.07.12	05:00:00	AM	13.1	13.4	13.2	13.3	14.8	14.0	-0.8	0
1039	11.07.12	06:00:00	AM	13.1	13.2	13.1	13.3	14.8	14.0	-0.9	0
1040	11.07.12	07:00:00	AM	12.9	13.0	12.9	13.2	14.7	13.9	-1.0	21.5
1041	11.07.12	08:00:00	AM	12.9	13.0	12.9	13.3	14.6	13.9	-1.0	32.3
1042	11.07.12	09:00:00	AM	12.8	13.1	12.9	13.4	14.6	14.0	-1.1	53.8
1043	11.07.12	10:00:00	AM	12.8	13.5	13.1	13.9	14.6	14.3	-1.2	516.7
1044	11.07.12	11:00:00	AM	13.3	15.5	14.4	16.0	15.1	15.6	-1.2	721.2
1045	11.07.12	12:00:00	PM	13.7	16.5	15.1	16.8	15.7	16.2	-1.1	484.4
1046	11.07.12	01:00:00	PM	14.3	17.9	16.1	17.9	16.3	17.1	-1.0	656.6
1047	11.07.12	02:00:00	PM	14.2	16.8	15.5	16.9	16.4	16.7	-1.1	462.9
1048	11.07.12	03:00:00	PM	14.2	16.3	15.3	16.5	16.3	16.4	-1.1	775
1049	11.07.12	04:00:00	PM	14.6	17.3	15.9	17.3	16.6	17.0	-1.0	505.9
1050	11.07.12	05:00:00	PM	15.4	18.6	17.0	18.9	16.9	17.9	-0.9	731.9
1051	11.07.12	06:00:00	PM	16.2	18.7	17.5	18.3	17.3	17.8	-0.3	1022.6
1052	11.07.12	07:00:00	PM	15.7	17.7	16.7	17.6	17.3	17.4	-0.8	656.6
1053	11.07.12	08:00:00	PM	14.8	16.0	15.4	16.1	16.9	16.5	-1.1	376.7
1054	11.07.12	09:00:00	PM	14.0	14.3	14.2	14.3	16.3	15.3	-1.1	53.8
1055	11.07.12	10:00:00	PM	13.3	12.9	13.1	13.2	15.7	14.4	-1.3	0
1056	11.07.12	11:00:00	PM	12.0	10.7	11.4	11.2	14.8	13.0	-1.6	0
1057	12.07.12	12:00:00	AM	11.7	10.9	11.3	11.4	14.4	12.9	-1.6	0
1058	12.07.12	01:00:00	AM	11.4	11.0	11.2	11.2	14.1	12.7	-1.4	0
1059	12.07.12	02:00:00	AM	11.2	10.7	10.9	11.0	13.8	12.4	-1.5	0
1060	12.07.12	03:00:00	AM	10.6	9.8	10.2	10.3	13.4	11.8	-1.7	0
1061	12.07.12	04:00:00	AM	10.3	9.7	10.0	10.1	13.1	11.6	-1.6	0
1062	12.07.12	05:00:00	AM	10.2	9.6	9.9	10.0	12.9	11.4	-1.6	0
1063	12.07.12	06:00:00	AM	10.1	9.2	9.6	9.7	12.6	11.1	-1.5	0
1064	12.07.12	07:00:00	AM	10.1	9.8	9.9	10.1	12.5	11.3	-1.4	129.2
1065	12.07.12	08:00:00	AM	10.1	11.9	11.0	11.7	12.9	12.3	-1.3	419.8
1066	12.07.12	09:00:00	AM	10.8	14.8	12.8	13.7	13.7	13.7	-0.8	516.7
1067	12.07.12	10:00:00	AM	11.5	15.8	13.6	14.9	14.3	14.6	-1.0	818.1
1068	12.07.12	11:00:00	AM	12.1	15.3	13.7	15.1	14.6	14.9	-1.2	527.4
1069	12.07.12	12:00:00	PM	12.3	15.6	13.9	15.6	15.0	15.3	-1.3	753.5
1070	12.07.12	01:00:00	PM	12.3	15.2	13.7	15.3	15.1	15.2	-1.4	699.7
1071	12.07.12	02:00:00	PM	12.8	16.5	14.7	16.7	15.7	16.2	-1.5	731.9
1072	12.07.12	03:00:00	PM	12.7	15.2	13.9	15.3	15.5	15.4	-1.4	592
1073	12.07.12	04:00:00	PM	12.6	14.7	13.7	14.9	15.4	15.1	-1.5	602.8

1074	12.07.12	05:00:00	PM	12.6	15.0	13.8	15.4	15.4	15.4	-1.6	1001
1075	12.07.12	06:00:00	PM	13.9	15.8	14.9	15.2	15.6	15.4	-0.5	204.5
1076	12.07.12	07:00:00	PM	13.8	15.4	14.6	14.9	15.4	15.1	-0.6	376.7
1077	12.07.12	08:00:00	PM	13.5	14.5	14.0	14.5	15.2	14.9	-0.9	172.2
1078	12.07.12	09:00:00	PM	13.1	13.1	13.1	13.3	14.7	14.0	-0.9	0
1079	12.07.12	10:00:00	PM	12.3	11.5	11.9	11.7	14.0	12.9	-1.0	0
1080	12.07.12	11:00:00	PM	11.1	10.3	10.7	10.3	13.4	11.8	-1.1	0
1081	13.07.12	12:00:00	AM	10.4	9.6	10.0	9.6	13.0	11.3	-1.3	0
1082	13.07.12	01:00:00	AM	9.9	9.3	9.6	9.1	12.6	10.8	-1.3	0
1083	13.07.12	02:00:00	AM	9.5	8.8	9.1	8.6	12.2	10.4	-1.3	0
1084	13.07.12	03:00:00	AM	9.0	8.5	8.7	8.4	11.9	10.1	-1.4	0
1085	13.07.12	04:00:00	AM	9.4	9.4	9.4	9.2	11.9	10.5	-1.2	0
1086	13.07.12	05:00:00	AM	9.8	9.7	9.7	9.7	12.0	10.8	-1.1	0
1087	13.07.12	06:00:00	AM	9.9	9.6	9.7	9.8	11.9	10.8	-1.1	0
1088	13.07.12	07:00:00	AM	10.0	10.2	10.1	10.1	11.9	11.0	-0.9	96.9
1089	13.07.12	08:00:00	AM	10.2	11.3	10.7	11.4	12.3	11.9	-1.1	344.4
1090	13.07.12	09:00:00	AM	10.8	14.5	12.7	13.5	13.1	13.3	-0.6	1097.9
1091	13.07.12	10:00:00	AM	12.7	18.2	15.5	16.2	14.4	15.3	0.1	1313.2
1092	13.07.12	11:00:00	AM	13.5	17.3	15.4	16.4	15.1	15.8	-0.4	807.3
1093	13.07.12	12:00:00	PM	13.8	17.6	15.7	16.8	15.7	16.2	-0.5	731.9
1094	13.07.12	01:00:00	PM	14.7	19.7	17.2	19.8	16.6	18.2	-1.0	2325
1095	13.07.12	02:00:00	PM	17.7	22.3	20.0	23.6	17.7	20.6	-0.6	2152.8
1096	13.07.12	03:00:00	PM	19.7	20.8	20.2	23.8	18.0	20.9	-0.6	1324
1097	13.07.12	04:00:00	PM	18.4	20.2	19.3	21.4	18.1	19.8	-0.4	1184
1098	13.07.12	05:00:00	PM	16.8	18.0	17.4	18.4	17.7	18.0	-0.6	193.8
1099	13.07.12	06:00:00	PM	16.0	16.3	16.2	16.8	17.0	16.9	-0.7	322.9
1100	13.07.12	07:00:00	PM	15.7	15.6	15.6	16.0	16.4	16.2	-0.6	86.1
1101	13.07.12	08:00:00	PM	15.1	14.7	14.9	15.0	16.0	15.5	-0.6	21.5
1102	13.07.12	09:00:00	PM	14.6	14.1	14.4	14.4	15.7	15.0	-0.7	0
1103	13.07.12	10:00:00	PM	14.0	13.6	13.8	13.8	15.3	14.5	-0.7	0
1104	13.07.12	11:00:00	PM	13.4	13.1	13.2	13.2	15.0	14.1	-0.9	0
1105	14.07.12	12:00:00	AM	13.0	12.8	12.9	12.9	14.8	13.8	-1.0	0
1106	14.07.12	01:00:00	AM	12.8	12.9	12.8	12.9	14.6	13.7	-0.9	0
1107	14.07.12	02:00:00	AM	12.6	12.8	12.7	12.8	14.4	13.6	-0.9	0
1108	14.07.12	03:00:00	AM	12.5	12.7	12.6	12.7	14.3	13.5	-0.9	0
1109	14.07.12	04:00:00	AM	12.3	12.5	12.4	12.6	14.2	13.4	-1.0	0
1110	14.07.12	05:00:00	AM	11.8	11.7	11.8	12.1	14.0	13.1	-1.3	0
1111	14.07.12	06:00:00	AM	11.1	10.7	10.9	11.3	13.8	12.5	-1.6	0
1112	14.07.12	07:00:00	AM	10.7	10.7	10.7	11.2	13.5	12.3	-1.7	0
1113	14.07.12	08:00:00	AM	10.6	11.6	11.1	11.9	13.5	12.7	-1.6	322.9
1114	14.07.12	09:00:00	AM	10.8	12.1	11.5	12.3	13.7	13.0	-1.5	172.2
1115	14.07.12	10:00:00	AM	11.3	13.6	12.4	13.7	13.8	13.8	-1.3	462.9
1116	14.07.12	11:00:00	AM	12.0	14.2	13.1	14.4	14.2	14.3	-1.2	667.4
1117	14.07.12	12:00:00	PM	12.9	16.4	14.7	16.9	14.9	15.9	-1.2	2411.1
1118	14.07.12	01:00:00	PM	14.0	18.4	16.2	19.4	15.8	17.6	-1.3	3616.7
1119	14.07.12	02:00:00	PM	14.8	18.4	16.6	18.6	16.3	17.5	-0.9	904.2
1120	14.07.12	03:00:00	PM	14.4	17.1	15.8	17.2	16.4	16.8	-1.1	667.4
1121	14.07.12	04:00:00	PM	14.1	15.7	14.9	15.8	16.2	16.0	-1.1	322.9
1122	14.07.12	05:00:00	PM	13.8	15.1	14.5	15.3	16.0	15.6	-1.1	226
1123	14.07.12	06:00:00	PM	13.7	14.6	14.1	14.9	15.7	15.3	-1.1	258.3
1124	14.07.12	07:00:00	PM	13.5	14.0	13.7	14.2	15.5	14.9	-1.1	86.1
1125	14.07.12	08:00:00	PM	13.2	13.2	13.2	13.5	15.1	14.3	-1.1	43.1
1126	14.07.12	09:00:00	PM	13.0	12.6	12.8	12.9	14.8	13.8	-1.1	43.1
1127	14.07.12	10:00:00	PM	12.0	11.3	11.7	11.8	14.4	13.1	-1.4	0
1128	14.07.12	11:00:00	PM	11.1	10.2	10.7	10.7	13.8	12.3	-1.6	0
1129	15.07.12	12:00:00	AM	11.0	10.3	10.7	10.7	13.5	12.1	-1.5	0
1130	15.07.12	01:00:00	AM	11.0	10.6	10.8	10.8	13.3	12.1	-1.3	0
1131	15.07.12	02:00:00	AM	11.0	10.3	10.7	10.5	13.1	11.8	-1.1	0
1132	15.07.12	03:00:00	AM	10.7	10.2	10.4	10.5	12.9	11.7	-1.3	0
1133	15.07.12	04:00:00	AM	10.7	10.3	10.5	10.7	12.8	11.7	-1.3	0
1134	15.07.12	05:00:00	AM	10.7	10.2	10.4	10.6	12.6	11.6	-1.2	0
1135	15.07.12	06:00:00	AM	10.6	10.2	10.4	10.6	12.5	11.5	-1.2	0
1136	15.07.12	07:00:00	AM	10.1	9.6	9.8	10.1	12.4	11.2	-1.4	0
1137	15.07.12	08:00:00	AM	9.9	9.6	9.7	10.1	12.3	11.2	-1.5	64.6
1138	15.07.12	09:00:00	AM	9.7	10.2	9.9	10.7	12.3	11.5	-1.6	236.8
1139	15.07.12	10:00:00	AM	9.6	10.2	9.9	10.6	12.3	11.4	-1.6	96.9
1140	15.07.12	11:00:00	AM	9.9	11.4	10.6	11.9	12.5	12.2	-1.6	355.2
1141	15.07.12	12:00:00	PM	11.5	15.2	13.4	15.8	13.3	14.5	-1.2	1044.1
1142	15.07.12	01:00:00	PM	15.7	19.8	17.7	22.1	14.9	18.5	-0.8	1280.9
1143	15.07.12	02:00:00	PM	15.9	19.0	17.4	20.3	15.8	18.0	-0.6	1808.3
1144	15.07.12	03:00:00	PM	15.9	16.2	16.0	19.2	16.0	17.6	-1.6	1162.5
1145	15.07.12	04:00:00	PM	15.3	14.3	14.8	16.3	15.9	16.1	-1.3	462.9
1146	15.07.12	05:00:00	PM	14.3	13.8	14.1	15.2	15.6	15.4	-1.3	64.6
1147	15.07.12	06:00:00	PM	13.3	12.7	13.0	13.8	15.2	14.5	-1.5	516.7
1148	15.07.12	07:00:00	PM	12.6	12.7	12.6	13.5	15.0	14.2	-1.6	258.3
1149	15.07.12	08:00:00	PM	11.6	11.1	11.4	11.6	14.6	13.1	-1.7	0
1150	15.07.12	09:00:00	PM	10.7	10.4	10.6	10.7	14.1	12.4	-1.9	0
1151	15.07.12	10:00:00	PM	10.4	10.0	10.2	10.5	13.7	12.1	-1.9	0
1152	15.07.12	11:00:00	PM	10.4	9.8	10.1	10.2	13.4	11.8	-1.7	0
1153	16.07.12	12:00:00	AM	9.5	8.7	9.1	9.3	13.0	11.1	-2.1	0
1154	16.07.12	01:00:00	AM	8.9	8.2	8.5	8.5	12.5	10.5	-2.0	0
1155	16.07.12	02:00:00	AM	8.6	8.5	8.5	8.2	12.2	10.2	-1.7	0
1156	16.07.12	03:00:00	AM	8.7	8.8	8.7	8.3	12.0	10.1	-1.4	0
1157	16.07.12	04:00:00	AM	9.1	8.5	8.8	8.3	11.9	10.1	-1.3	0
1158	16.07.12	05:00:00	AM	8.3	7.0	7.6	7.0	11.6	9.3	-1.7	0
1159	16.07.12	06:00:00	AM	7.2	5.6	6.4	5.8	11.2	8.5	-2.1	0
1160	16.07.12	07:00:00	AM	6.6	5.0	5.8	5.1	10.7	7.9	-2.1	0
1161	16.07.12	08:00:00	AM	6.9	7.8	7.3	5.8	10.6	8.2	-0.8	355.2
1162	16.07.12	09:00:00	AM	8.1	12.4	10.2	9.3	11.0	10.2	0.1	753.5
1163	16.07.12	10:00:00	AM	9.9	15.6	12.7	12.5	12.0	12.3	0.5	1356.3
1164	16.07.12	11:00:00	AM	11.7	17.0	14.4	15.4	13.4	14.4	0.0	1377.8
1165	16.07.12	12:00:00	PM	13.3	17.2	15.2	16.9	14.3	15.6	-0.4	742.7
1166	16.07.12	01:00:00	PM	15.8	20.2	18.0	22.1	15.4	18.8	-0.8	1248.6
1167	16.07.12	02:00:00	PM	18.4	22.0	20.2	25.1	16.3	20.7	-0.5	914.9
1168	16.07.12	03:00:00	PM	19.8	18.3	19.0	23.8	16.6	20.2	-1.2	3272.2
1169	16.07.12	04:00:00	PM	19.7	16.7	18.2	22.4	16.4	19.4	-1.2	1377.8
1170	16.07.12	05:00:00	PM	19.4	17.2	18.3	21.8	16.4	19.1	-0.8	1980.6
1171	16.07.12	06:00:00	PM	18.0	16.9	17.4	18.0	16.5	17.3	0.1	290.6

1172	16.07.12	07:00:00	PM	16.1	15.0	15.6	15.2	16.1	15.7	-0.1	32.3
1173	16.07.12	08:00:00	PM	13.5	12.2	12.8	12.7	15.5	14.1	-1.2	0
1174	16.07.12	09:00:00	PM	11.6	10.5	11.0	10.7	14.8	12.8	-1.7	0
1175	16.07.12	10:00:00	PM	10.4	9.1	9.7	9.2	14.0	11.6	-1.9	0
1176	16.07.12	11:00:00	PM	9.5	8.0	8.7	8.2	13.5	10.8	-2.1	0
1177	17.07.12	12:00:00	AM	8.9	7.4	8.1	7.3	12.9	10.1	-2.0	0
1178	17.07.12	01:00:00	AM	8.5	6.8	7.6	6.6	12.3	9.4	-1.8	0
1179	17.07.12	02:00:00	AM	8.0	6.3	7.1	6.0	11.8	8.9	-1.8	0
1180	17.07.12	03:00:00	AM	7.7	6.1	6.9	5.6	11.4	8.5	-1.6	0
1181	17.07.12	04:00:00	AM	7.5	6.6	7.0	6.1	11.1	8.6	-1.6	0
1182	17.07.12	05:00:00	AM	7.6	7.5	7.5	6.6	11.0	8.8	-1.3	0
1183	17.07.12	06:00:00	AM	7.6	6.9	7.2	6.1	10.9	8.5	-1.3	0
1184	17.07.12	07:00:00	AM	7.4	6.8	7.1	6.1	10.7	8.4	-1.3	0
1185	17.07.12	08:00:00	AM	8.0	9.6	8.8	7.4	10.7	9.1	-0.3	452.1
1186	17.07.12	09:00:00	AM	9.4	14.4	11.9	11.6	11.4	11.5	0.4	1119.5
1187	17.07.12	10:00:00	AM	11.1	17.8	14.4	15.2	12.6	13.9	0.6	1808.3
1188	17.07.12	11:00:00	AM	13.6	20.6	17.1	19.4	14.1	16.8	0.3	2755.6
1189	17.07.12	12:00:00	PM	17.1	23.8	20.4	24.9	15.9	20.4	0.0	4477.8
1190	17.07.12	01:00:00	PM	20.3	25.8	23.1	29.6	17.7	23.6	-0.5	4650
1191	17.07.12	02:00:00	PM	22.3	25.5	23.9	28.9	18.6	23.7	0.2	3616.7
1192	17.07.12	03:00:00	PM	22.7	20.7	21.7	25.9	18.4	22.2	-0.5	3100
1193	17.07.12	04:00:00	PM	23.0	18.4	20.7	24.7	18.0	21.3	-0.6	1119.5
1194	17.07.12	05:00:00	PM	21.7	19.3	20.5	23.4	18.0	20.7	-0.2	1980.6
1195	17.07.12	06:00:00	PM	20.1	19.2	19.7	19.6	18.0	18.8	0.9	312.2
1196	17.07.12	07:00:00	PM	18.0	17.1	17.5	16.4	17.5	17.0	0.6	32.3
1197	17.07.12	08:00:00	PM	15.8	14.4	15.1	14.1	16.8	15.5	-0.4	0
1198	17.07.12	09:00:00	PM	14.4	12.6	13.5	12.5	16.0	14.3	-0.8	0
1199	17.07.12	10:00:00	PM	13.3	11.1	12.2	11.0	15.3	13.2	-1.0	0
1200	17.07.12	11:00:00	PM	12.2	10.1	11.1	9.9	14.6	12.2	-1.1	0
1201	18.07.12	12:00:00	AM	11.2	9.3	10.3	9.0	13.9	11.5	-1.2	0
1202	18.07.12	01:00:00	AM	10.6	8.6	9.6	8.2	13.4	10.8	-1.2	0
1203	18.07.12	02:00:00	AM	10.1	8.1	9.1	7.7	12.9	10.3	-1.2	0
1204	18.07.12	03:00:00	AM	9.9	7.8	8.8	7.4	12.5	9.9	-1.1	0
1205	18.07.12	04:00:00	AM	9.8	7.5	8.6	7.0	12.1	9.5	-0.9	0
1206	18.07.12	05:00:00	AM	9.4	7.2	8.3	6.6	11.8	9.2	-0.9	0
1207	18.07.12	06:00:00	AM	9.0	6.9	7.9	6.3	11.5	8.9	-1.0	0
1208	18.07.12	07:00:00	AM	8.9	7.1	8.0	6.4	11.2	8.8	-0.8	0
1209	18.07.12	08:00:00	AM	9.3	10.7	10.0	8.3	11.4	9.9	0.2	430.6
1210	18.07.12	09:00:00	AM	10.8	16.2	13.5	12.8	12.4	12.6	0.9	979.5
1211	18.07.12	10:00:00	AM	13.4	20.4	16.9	17.3	13.8	15.6	1.3	1636.1
1212	18.07.12	11:00:00	AM	16.4	23.9	20.1	21.5	15.7	18.6	1.6	2583.4
1213	18.07.12	12:00:00	PM	19.9	26.9	23.4	27.5	17.8	22.6	0.8	4305.6
1214	18.07.12	01:00:00	PM	22.7	29.2	25.9	32.0	19.8	25.9	0.1	4650
1215	18.07.12	02:00:00	PM	23.9	28.3	26.1	30.0	20.9	25.4	0.6	3616.7
1216	18.07.12	03:00:00	PM	24.2	23.2	23.7	27.0	20.3	23.7	0.0	3100
1217	18.07.12	04:00:00	PM	24.0	20.8	22.4	25.9	19.7	22.8	-0.4	1065.6
1218	18.07.12	05:00:00	PM	23.3	22.0	22.7	25.3	19.7	22.5	0.2	1894.5
1219	18.07.12	06:00:00	PM	21.9	21.2	21.5	21.5	19.6	20.5	1.0	366
1220	18.07.12	07:00:00	PM	20.1	19.2	19.7	18.5	18.9	18.7	1.0	86.1
1221	18.07.12	08:00:00	PM	18.6	16.7	17.7	16.2	18.0	17.1	0.5	43.1
1222	18.07.12	09:00:00	PM	16.9	14.7	15.8	14.4	17.2	15.8	0.0	10.8
1223	18.07.12	10:00:00	PM	14.8	13.0	13.9	12.6	16.2	14.4	-0.5	0
1224	18.07.12	11:00:00	PM	13.3	11.9	12.6	11.5	15.5	13.5	-0.9	0
1225	19.07.12	12:00:00	AM	12.5	11.5	12.0	10.8	15.0	12.9	-0.9	0
1226	19.07.12	01:00:00	AM	12.1	11.3	11.7	10.6	14.6	12.6	-0.9	0
1227	19.07.12	02:00:00	AM	12.0	11.5	11.8	10.7	14.4	12.6	-0.8	0
1228	19.07.12	03:00:00	AM	12.0	12.0	12.0	11.2	14.3	12.8	-0.8	0
1229	19.07.12	04:00:00	AM	12.1	12.2	12.2	11.5	14.2	12.9	-0.7	0
1230	19.07.12	05:00:00	AM	12.1	12.2	12.2	11.5	14.1	12.8	-0.7	0
1231	19.07.12	06:00:00	AM	12.0	11.7	11.9	10.8	13.9	12.4	-0.5	0
1232	19.07.12	07:00:00	AM	12.1	12.0	12.1	11.3	13.8	12.5	-0.5	43.1
1233	19.07.12	08:00:00	AM	12.6	15.3	13.9	13.8	14.2	14.0	-0.1	516.7
1234	19.07.12	09:00:00	AM	13.8	18.8	16.3	16.4	15.3	15.9	0.5	559.7
1235	19.07.12	10:00:00	AM	15.4	20.3	17.9	18.0	16.4	17.2	0.6	505.9
1236	19.07.12	11:00:00	AM	15.8	19.0	17.4	18.0	16.7	17.3	0.0	538.2
1237	19.07.12	12:00:00	PM	15.8	18.4	17.1	17.8	16.8	17.3	-0.2	495.1
1238	19.07.12	01:00:00	PM	15.8	18.3	17.0	17.8	16.9	17.3	-0.3	398.3
1239	19.07.12	02:00:00	PM	15.9	18.2	17.0	17.9	17.0	17.4	-0.4	366
1240	19.07.12	03:00:00	PM	16.0	18.3	17.1	18.0	17.1	17.5	-0.4	301.4
1241	19.07.12	04:00:00	PM	15.9	17.4	16.6	17.1	16.9	17.0	-0.4	258.3
1242	19.07.12	05:00:00	PM	15.8	17.0	16.4	16.8	16.7	16.8	-0.4	172.2
1243	19.07.12	06:00:00	PM	15.8	16.8	16.3	16.7	16.6	16.7	-0.4	172.2
1244	19.07.12	07:00:00	PM	15.6	17.0	16.3	17.2	16.6	16.9	-0.6	559.7
1245	19.07.12	08:00:00	PM	15.6	16.4	16.0	16.3	16.4	16.4	-0.4	43.1
1246	19.07.12	09:00:00	PM	15.5	15.4	15.4	15.3	16.0	15.7	-0.2	0
1247	19.07.12	10:00:00	PM	15.2	14.4	14.8	14.2	15.6	14.9	-0.1	0
1248	19.07.12	11:00:00	PM	14.9	13.9	14.4	13.8	15.3	14.5	-0.1	0
1249	20.07.12	12:00:00	AM	14.6	13.4	14.0	13.2	15.0	14.1	-0.1	0
1250	20.07.12	01:00:00	AM	14.2	12.7	13.5	12.5	14.6	13.6	-0.1	0
1251	20.07.12	02:00:00	AM	13.8	12.5	13.2	12.3	14.3	13.3	-0.1	0
1252	20.07.12	03:00:00	AM	13.7	12.5	13.1	12.4	14.2	13.3	-0.2	0
1253	20.07.12	04:00:00	AM	13.4	12.5	12.9	12.4	14.0	13.2	-0.3	0
1254	20.07.12	05:00:00	AM	13.1	12.5	12.8	12.3	13.9	13.1	-0.3	0
1255	20.07.12	06:00:00	AM	13.0	12.4	12.7	12.4	13.8	13.1	-0.4	0
1256	20.07.12	07:00:00	AM	12.9	12.5	12.7	12.5	13.8	13.1	-0.4	21.5
1257	20.07.12	08:00:00	AM	12.8	12.9	12.8	13.1	13.8	13.5	-0.6	129.2
1258	20.07.12	09:00:00	AM	12.9	13.9	13.4	14.4	14.1	14.3	-0.9	527.4
1259	20.07.12	10:00:00	AM	13.4	16.4	14.9	16.5	14.9	15.7	-0.8	1463.9
1260	20.07.12	11:00:00	AM	14.8	20.2	17.5	19.9	16.5	18.2	-0.7	753.5
1261	20.07.12	12:00:00	PM	15.1	18.6	16.9	18.4	16.6	17.5	-0.7	570.5
1262	20.07.12	01:00:00	PM	15.4	19.9	17.7	20.5	17.3	18.9	-1.2	1227.1
1263	20.07.12	02:00:00	PM	16.6	22.2	19.4	23.7	18.2	21.0	-1.5	1722.2
1264	20.07.12	03:00:00	PM	16.4	19.6	18.0	19.9	18.0	18.9	-1.0	419.8
1265	20.07.12	04:00:00	PM	15.8	17.2	16.5	17.6	17.3	17.4	-1.0	581.3
1266	20.07.12	05:00:00	PM	15.6	17.1	16.3	17.3	17.1	17.2	-0.9	366
1267	20.07.12	06:00:00	PM	15.3	16.6	16.0	17.0	16.8	16.9	-1.0	538.2
1268	20.07.12	07:00:00	PM	14.8	15.4	15.1	15.9	16.3	16.1	-1.0	86.1
1269	20.07.12	08:00:00	PM	13.8	13.9	13.9	14.4	15.7	15.0	-1.1	21.5

1270	20.07.12	09:00:00	PM	13.2	13.1	13.1	13.6	15.2	14.4	-1.2	0
1271	20.07.12	10:00:00	PM	12.3	12.3	12.3	12.8	14.8	13.8	-1.5	0
1272	20.07.12	11:00:00	PM	12.0	12.0	12.0	12.5	14.4	13.5	-1.4	0
1273	21.07.12	12:00:00	AM	12.1	11.8	12.0	12.3	14.1	13.2	-1.3	0
1274	21.07.12	01:00:00	AM	12.3	11.4	11.9	11.9	13.8	12.9	-1.0	0
1275	21.07.12	02:00:00	AM	12.1	11.1	11.6	11.5	13.6	12.5	-0.9	0
1276	21.07.12	03:00:00	AM	11.5	10.7	11.1	11.1	13.3	12.2	-1.1	0
1277	21.07.12	04:00:00	AM	10.9	10.7	10.8	10.8	13.1	12.0	-1.2	0
1278	21.07.12	05:00:00	AM	10.7	10.6	10.7	10.7	12.9	11.8	-1.1	0
1279	21.07.12	06:00:00	AM	10.9	10.4	10.7	10.6	12.8	11.7	-1.0	0
1280	21.07.12	07:00:00	AM	11.2	10.6	10.9	10.7	12.6	11.6	-0.7	0
1281	21.07.12	08:00:00	AM	11.3	10.8	11.1	11.0	12.6	11.8	-0.7	161.5
1282	21.07.12	09:00:00	AM	11.1	11.2	11.2	11.7	12.7	12.2	-1.0	290.6
1283	21.07.12	10:00:00	AM	11.1	12.6	11.9	13.3	13.2	13.2	-1.4	279.9
1284	21.07.12	11:00:00	AM	11.0	12.9	12.0	13.8	13.5	13.7	-1.7	387.5
1285	21.07.12	12:00:00	PM	11.6	14.1	12.9	15.3	13.9	14.6	-1.7	441.3
1286	21.07.12	01:00:00	PM	11.7	14.0	12.9	15.2	14.1	14.7	-1.8	1151.7
1287	21.07.12	02:00:00	PM	13.4	17.4	15.4	19.2	15.3	17.2	-1.9	592
1288	21.07.12	03:00:00	PM	14.9	17.3	16.1	19.2	15.7	17.4	-1.3	1324
1289	21.07.12	04:00:00	PM	14.9	16.7	15.8	18.0	15.9	17.0	-1.1	1119.5
1290	21.07.12	05:00:00	PM	14.8	17.0	15.9	18.6	16.1	17.4	-1.5	667.4
1291	21.07.12	06:00:00	PM	14.5	16.5	15.5	17.5	16.1	16.8	-1.3	538.2
1292	21.07.12	07:00:00	PM	13.8	15.6	14.7	16.2	16.0	16.1	-1.4	247.6
1293	21.07.12	08:00:00	PM	12.6	13.6	13.1	14.3	15.3	14.8	-1.7	172.2
1294	21.07.12	09:00:00	PM	11.6	12.2	11.9	12.8	14.7	13.7	-1.8	21.5
1295	21.07.12	10:00:00	PM	10.3	10.5	10.4	10.8	13.9	12.4	-2.0	0
1296	21.07.12	11:00:00	PM	9.0	8.9	8.9	9.3	13.1	11.2	-2.2	0
1297	22.07.12	12:00:00	AM	8.4	8.1	8.2	8.4	12.4	10.4	-2.2	0
1298	22.07.12	01:00:00	AM	8.2	7.8	8.0	7.9	12.0	9.9	-2.0	0
1299	22.07.12	02:00:00	AM	7.9	7.6	7.7	7.8	11.6	9.7	-2.0	0
1300	22.07.12	03:00:00	AM	7.2	6.9	7.0	7.0	11.1	9.1	-2.0	0
1301	22.07.12	04:00:00	AM	6.6	6.1	6.3	6.0	10.7	8.3	-2.0	0
1302	22.07.12	05:00:00	AM	6.2	5.7	5.9	5.2	10.3	7.8	-1.8	0
1303	22.07.12	06:00:00	AM	5.3	4.8	5.1	4.5	9.8	7.1	-2.1	0
1304	22.07.12	07:00:00	AM	4.9	4.3	4.6	4.1	9.4	6.7	-2.1	0
1305	22.07.12	08:00:00	AM	5.0	6.6	5.8	5.2	9.5	7.4	-1.6	409
1306	22.07.12	09:00:00	AM	6.5	12.4	9.4	9.6	10.7	10.2	-0.7	882.6
1307	22.07.12	10:00:00	AM	9.5	16.3	12.9	13.9	12.4	13.2	-0.3	1463.9
1308	22.07.12	11:00:00	AM	12.3	19.3	15.8	17.7	14.5	16.1	-0.3	2238.9
1309	22.07.12	12:00:00	PM	15.8	23.0	19.4	24.4	17.0	20.7	-1.3	4650
1310	22.07.12	01:00:00	PM	18.1	23.9	21.0	27.0	18.5	22.7	-1.7	2669.5
1311	22.07.12	02:00:00	PM	19.9	24.2	22.0	27.2	18.5	22.8	-0.8	3272.2
1312	22.07.12	03:00:00	PM	20.7	19.7	20.2	24.4	17.6	21.0	-0.8	2755.6
1313	22.07.12	04:00:00	PM	20.3	16.2	18.3	22.9	16.6	19.8	-1.5	1022.6
1314	22.07.12	05:00:00	PM	19.3	17.4	18.3	21.4	16.6	19.0	-0.7	1894.5
1315	22.07.12	06:00:00	PM	17.3	16.3	16.8	17.0	16.5	16.8	0.0	290.6
1316	22.07.12	07:00:00	PM	14.4	13.7	14.0	13.8	15.5	14.7	-0.6	10.8
1317	22.07.12	08:00:00	PM	11.8	11.3	11.6	11.7	14.5	13.1	-1.5	0
1318	22.07.12	09:00:00	PM	10.0	10.0	10.0	10.4	13.7	12.0	-2.0	0
1319	22.07.12	10:00:00	PM	8.7	8.8	8.7	9.2	13.0	11.1	-2.3	0
1320	22.07.12	11:00:00	PM	7.8	8.1	7.9	8.3	12.3	10.3	-2.4	0
1321	23.07.12	12:00:00	AM	7.3	7.4	7.3	7.4	11.7	9.6	-2.2	0
1322	23.07.12	01:00:00	AM	7.0	6.6	6.8	6.9	11.1	9.0	-2.2	0
1323	23.07.12	02:00:00	AM	6.7	6.2	6.4	6.5	10.7	8.6	-2.2	0
1324	23.07.12	03:00:00	AM	6.6	5.8	6.2	5.9	10.3	8.1	-1.9	0
1325	23.07.12	04:00:00	AM	6.0	4.8	5.4	4.7	9.7	7.2	-1.8	0
1326	23.07.12	05:00:00	AM	5.6	3.9	4.7	3.9	9.2	6.5	-1.8	0
1327	23.07.12	06:00:00	AM	5.0	3.3	4.1	3.3	8.7	6.0	-1.8	0
1328	23.07.12	07:00:00	AM	4.7	3.0	3.9	2.9	8.4	5.7	-1.8	0
1329	23.07.12	08:00:00	AM	4.7	5.6	5.1	4.1	8.6	6.3	-1.2	387.5
1330	23.07.12	09:00:00	AM	5.9	12.0	8.9	8.5	10.3	9.4	-0.4	882.6
1331	23.07.12	10:00:00	AM	8.5	16.1	12.3	12.9	12.1	12.5	-0.2	1463.9
1332	23.07.12	11:00:00	AM	11.7	19.9	15.8	16.9	14.2	15.6	0.2	2152.8
1333	23.07.12	12:00:00	PM	15.8	23.3	19.5	23.8	16.9	20.3	-0.8	4305.6
1334	23.07.12	01:00:00	PM	19.7	26.2	22.9	30.2	19.2	24.7	-1.7	4650
1335	23.07.12	02:00:00	PM	21.9	26.1	24.0	28.4	18.7	23.5	0.4	3100
1336	23.07.12	03:00:00	PM	22.8	21.4	22.1	25.6	17.6	21.6	0.5	2755.6
1337	23.07.12	04:00:00	PM	22.8	18.1	20.5	24.6	16.9	20.8	-0.3	1119.5
1338	23.07.12	05:00:00	PM	21.9	19.9	20.9	23.4	17.2	20.3	0.6	1808.3
1339	23.07.12	06:00:00	PM	20.2	19.0	19.6	19.4	17.1	18.2	1.4	258.3
1340	23.07.12	07:00:00	PM	18.3	16.7	17.5	16.5	16.3	16.4	1.1	21.5
1341	23.07.12	08:00:00	PM	16.6	14.2	15.4	14.1	15.3	14.7	0.7	0
1342	23.07.12	09:00:00	PM	15.0	12.4	13.7	12.4	14.4	13.4	0.3	0
1343	23.07.12	10:00:00	PM	13.9	11.1	12.5	11.1	13.8	12.4	0.1	0
1344	23.07.12	11:00:00	PM	12.4	10.0	11.2	9.8	13.0	11.4	-0.2	0
1345	24.07.12	12:00:00	AM	10.9	9.0	10.0	8.8	12.3	10.5	-0.6	0
1346	24.07.12	01:00:00	AM	10.1	8.3	9.2	8.1	11.8	10.0	-0.8	0
1347	24.07.12	02:00:00	AM	9.4	7.8	8.6	7.6	11.4	9.5	-0.9	0
1348	24.07.12	03:00:00	AM	8.9	7.4	8.1	7.2	11.0	9.1	-1.0	0
1349	24.07.12	04:00:00	AM	8.5	7.2	7.8	6.9	10.7	8.8	-1.0	0
1350	24.07.12	05:00:00	AM	8.2	6.9	7.5	6.7	10.5	8.6	-1.0	0
1351	24.07.12	06:00:00	AM	7.9	6.7	7.3	6.5	10.3	8.4	-1.1	0
1352	24.07.12	07:00:00	AM	7.8	6.8	7.3	6.6	10.2	8.4	-1.1	10.8
1353	24.07.12	08:00:00	AM	8.3	9.6	8.9	8.3	10.7	9.5	-0.6	344.4
1354	24.07.12	09:00:00	AM	10.4	16.1	13.2	12.8	12.4	12.6	0.7	753.5
1355	24.07.12	10:00:00	AM	13.9	20.2	17.1	17.3	14.4	15.9	1.2	1356.3
1356	24.07.12	11:00:00	AM	16.8	24.0	20.4	21.1	16.6	18.9	1.5	2066.7
1357	24.07.12	12:00:00	PM	19.8	27.3	23.5	27.3	19.4	23.3	0.2	3961.1
1358	24.07.12	01:00:00	PM	22.7	29.6	26.1	32.6	21.4	27.0	-0.9	4305.6
1359	24.07.12	02:00:00	PM	24.6	29.3	26.9	31.0	20.7	25.8	1.1	2927.8
1360	24.07.12	03:00:00	PM	25.3	24.9	25.1	28.6	19.7	24.1	1.0	2669.5
1361	24.07.12	04:00:00	PM	25.1	21.8	23.4	27.2	19.1	23.1	0.3	1227.1
1362	24.07.12	05:00:00	PM	24.1	23.1	23.6	25.8	19.3	22.5	1.0	1722.2
1363	24.07.12	06:00:00	PM	22.2	21.8	22.0	21.9	19.0	20.4	1.6	290.6
1364	24.07.12	07:00:00	PM	20.6	19.4	20.0	19.2	18.1	18.7	1.3	64.6
1365	24.07.12	08:00:00	PM	19.0	17.3	18.1	17.2	17.3	17.2	0.9	32.3
1366	24.07.12	09:00:00	PM	17.9	15.7	16.8	15.5	16.4	16.0	0.8	0
1367	24.07.12	10:00:00	PM	16.3	13.8	15.1	13.8	15.6	14.7	0.4	0

1368	24.07.12	11:00:00	PM	15.0	12.6	13.8	12.5	14.8	13.7	0.1	0
1369	25.07.12	12:00:00	AM	13.9	11.7	12.8	11.5	14.2	12.9	0.0	0
1370	25.07.12	01:00:00	AM	13.2	11.1	12.2	10.9	13.8	12.4	-0.2	0
1371	25.07.12	02:00:00	AM	12.6	10.7	11.7	10.5	13.5	12.0	-0.3	0
1372	25.07.12	03:00:00	AM	12.1	10.3	11.2	10.0	13.2	11.6	-0.4	0
1373	25.07.12	04:00:00	AM	11.6	10.0	10.8	9.5	12.8	11.1	-0.3	0
1374	25.07.12	05:00:00	AM	11.1	9.6	10.4	9.2	12.5	10.8	-0.5	0
1375	25.07.12	06:00:00	AM	10.7	9.3	10.0	8.8	12.2	10.5	-0.5	0
1376	25.07.12	07:00:00	AM	10.7	9.3	10.0	8.9	12.1	10.5	-0.5	21.5
1377	25.07.12	08:00:00	AM	11.0	12.2	11.6	10.5	12.8	11.6	0.0	344.4
1378	25.07.12	09:00:00	AM	13.1	18.1	15.6	15.0	14.5	14.8	0.9	742.7
1379	25.07.12	10:00:00	AM	16.0	22.0	19.0	19.0	16.3	17.7	1.4	1334.7
1380	25.07.12	11:00:00	AM	18.0	25.3	21.6	22.3	18.4	20.4	1.3	2066.7
1381	25.07.12	12:00:00	PM	21.2	28.6	24.9	28.7	21.2	24.9	0.0	3961.1
1382	25.07.12	01:00:00	PM	24.3	30.7	27.5	33.8	23.0	28.4	-1.0	4477.8
1383	25.07.12	02:00:00	PM	26.1	31.0	28.5	32.0	22.3	27.2	1.4	3100
1384	25.07.12	03:00:00	PM	25.9	26.4	26.1	29.4	21.3	25.3	0.8	3100
1385	25.07.12	04:00:00	PM	25.6	23.0	24.3	28.0	20.4	24.2	0.1	1463.9
1386	25.07.12	05:00:00	PM	24.1	23.2	23.6	25.7	20.2	23.0	0.7	1722.2
1387	25.07.12	06:00:00	PM	22.3	21.8	22.0	21.9	19.7	20.8	1.3	279.9
1388	25.07.12	07:00:00	PM	20.3	19.3	19.8	19.0	18.7	18.9	1.0	43.1
1389	25.07.12	08:00:00	PM	18.5	17.3	17.9	17.1	17.9	17.5	0.4	21.5
1390	25.07.12	09:00:00	PM	17.3	15.8	16.5	15.6	17.0	16.3	0.2	0
1391	25.07.12	10:00:00	PM	16.3	14.2	15.3	13.9	16.1	15.0	0.2	0
1392	25.07.12	11:00:00	PM	15.6	13.3	14.4	12.8	15.5	14.1	0.3	0
1393	26.07.12	12:00:00	AM	14.5	12.3	13.4	11.8	14.8	13.3	0.1	0
1394	26.07.12	01:00:00	AM	13.4	11.4	12.4	11.0	14.2	12.6	-0.2	0
1395	26.07.12	02:00:00	AM	12.6	10.8	11.7	10.5	13.8	12.2	-0.4	0
1396	26.07.12	03:00:00	AM	11.9	10.4	11.1	10.0	13.5	11.7	-0.6	0
1397	26.07.12	04:00:00	AM	11.4	10.0	10.7	9.6	13.1	11.3	-0.6	0
1398	26.07.12	05:00:00	AM	11.0	9.6	10.3	9.3	12.8	11.0	-0.7	0
1399	26.07.12	06:00:00	AM	10.7	9.4	10.0	9.0	12.6	10.8	-0.8	0
1400	26.07.12	07:00:00	AM	10.6	9.4	10.0	9.1	12.5	10.8	-0.8	10.8
1401	26.07.12	08:00:00	AM	11.0	11.9	11.5	10.4	13.2	11.8	-0.3	333.7
1402	26.07.12	09:00:00	AM	12.7	18.2	15.5	14.9	15.1	15.0	0.5	753.5
1403	26.07.12	10:00:00	AM	15.8	22.4	19.1	19.1	17.1	18.1	1.0	1377.8
1404	26.07.12	11:00:00	AM	18.0	25.6	21.8	22.5	19.1	20.8	1.0	2152.8
1405	26.07.12	12:00:00	PM	21.2	28.9	25.0	28.4	21.9	25.1	-0.1	4305.6
1406	26.07.12	01:00:00	PM	24.4	31.2	27.8	34.1	23.7	28.9	-1.1	4477.8
1407	26.07.12	02:00:00	PM	26.1	31.2	28.6	32.6	22.3	27.5	1.2	2927.8
1408	26.07.12	03:00:00	PM	26.6	26.6	26.6	29.8	21.0	25.4	1.2	2583.4
1409	26.07.12	04:00:00	PM	26.3	23.1	24.7	28.7	20.3	24.5	0.2	1722.2
1410	26.07.12	05:00:00	PM	25.3	24.1	24.7	26.8	20.6	23.7	1.0	1636.1
1411	26.07.12	06:00:00	PM	23.9	23.0	23.4	22.9	20.0	21.5	2.0	290.6
1412	26.07.12	07:00:00	PM	22.2	20.5	21.4	20.1	19.1	19.6	1.8	43.1
1413	26.07.12	08:00:00	PM	21.0	18.9	19.9	19.0	18.6	18.8	1.1	150.7
1414	26.07.12	09:00:00	PM	20.1	17.8	18.9	17.7	17.8	17.7	1.2	0
1415	26.07.12	10:00:00	PM	18.2	15.7	17.0	15.5	16.7	16.1	0.9	0
1416	26.07.12	11:00:00	PM	16.7	14.3	15.5	14.2	16.0	15.1	0.4	0
1417	27.07.12	12:00:00	AM	15.3	13.2	14.2	13.1	15.4	14.2	0.0	0
1418	27.07.12	01:00:00	AM	14.1	12.4	13.3	12.2	14.9	13.6	-0.3	0
1419	27.07.12	02:00:00	AM	13.3	11.7	12.5	11.4	14.4	12.9	-0.4	0
1420	27.07.12	03:00:00	AM	12.6	11.3	12.0	10.9	14.0	12.5	-0.5	0
1421	27.07.12	04:00:00	AM	12.1	11.1	11.6	10.6	13.8	12.2	-0.5	0
1422	27.07.12	05:00:00	AM	11.7	10.7	11.2	10.2	13.5	11.8	-0.6	0
1423	27.07.12	06:00:00	AM	11.3	10.5	10.9	10.0	13.3	11.6	-0.7	0
1424	27.07.12	07:00:00	AM	11.3	10.7	11.0	10.3	13.3	11.8	-0.8	32.3
1425	27.07.12	08:00:00	AM	11.8	13.6	12.7	11.8	14.2	13.0	-0.3	322.9
1426	27.07.12	09:00:00	AM	14.3	19.4	16.9	16.4	16.2	16.3	0.5	731.9
1427	27.07.12	10:00:00	AM	17.5	23.4	20.4	20.5	18.2	19.4	1.1	1302.4
1428	27.07.12	11:00:00	AM	19.8	26.9	23.3	24.2	20.2	22.2	1.1	2066.7
1429	27.07.12	12:00:00	PM	22.0	30.3	26.2	29.9	23.0	26.4	-0.3	3961.1
1430	27.07.12	01:00:00	PM	25.1	32.4	28.8	34.5	24.6	29.6	-0.8	4133.4
1431	27.07.12	02:00:00	PM	26.8	32.1	29.4	32.4	23.1	27.7	1.7	1722.2
1432	27.07.12	03:00:00	PM	26.0	27.2	26.6	30.0	21.8	25.9	0.7	2411.1
1433	27.07.12	04:00:00	PM	26.1	24.5	25.3	29.0	21.3	25.1	0.2	1808.3
1434	27.07.12	05:00:00	PM	24.2	24.0	24.1	25.9	21.4	23.6	0.4	850.4
1435	27.07.12	06:00:00	PM	22.9	23.4	23.1	23.7	20.8	22.2	0.9	592
1436	27.07.12	07:00:00	PM	22.0	22.0	22.0	22.0	20.2	21.1	0.9	258.3
1437	27.07.12	08:00:00	PM	21.2	20.6	20.9	20.6	19.6	20.1	0.8	129.2
1438	27.07.12	09:00:00	PM	20.4	18.3	19.4	18.2	18.4	18.3	1.0	32.3
1439	27.07.12	10:00:00	PM	19.4	16.8	18.1	16.7	17.7	17.2	0.9	0
1440	27.07.12	11:00:00	PM	17.6	15.4	16.5	15.1	16.7	15.9	0.6	0
1441	28.07.12	12:00:00	AM	15.9	14.1	15.0	13.8	16.0	14.9	0.0	0
1442	28.07.12	01:00:00	AM	14.8	13.5	14.1	13.1	15.6	14.3	-0.2	0
1443	28.07.12	02:00:00	AM	14.7	13.7	14.2	13.4	15.7	14.5	-0.3	0
1444	28.07.12	03:00:00	AM	14.9	14.4	14.7	14.1	16.0	15.0	-0.4	0
1445	28.07.12	04:00:00	AM	15.0	14.6	14.8	14.1	15.9	15.0	-0.2	0
1446	28.07.12	05:00:00	AM	15.0	14.5	14.8	14.0	15.7	14.9	-0.1	0
1447	28.07.12	06:00:00	AM	14.7	14.2	14.5	14.0	15.6	14.8	-0.3	0
1448	28.07.12	07:00:00	AM	14.3	14.1	14.2	13.9	15.5	14.7	-0.5	10.8
1449	28.07.12	08:00:00	AM	14.5	14.8	14.7	14.8	15.9	15.3	-0.7	86.1
1450	28.07.12	09:00:00	AM	14.9	16.6	15.8	16.4	16.5	16.5	-0.7	430.6
1451	28.07.12	10:00:00	AM	15.7	18.0	16.9	18.1	17.3	17.7	-0.9	462.9
1452	28.07.12	11:00:00	AM	16.4	20.0	18.2	20.4	18.3	19.4	-1.1	2669.5
1453	28.07.12	12:00:00	PM	18.9	25.3	22.1	24.9	21.3	23.1	-1.0	1184
1454	28.07.12	01:00:00	PM	18.2	21.3	19.8	20.2	19.1	19.7	0.1	226
1455	28.07.12	02:00:00	PM	17.6	20.1	18.9	19.8	18.9	19.3	-0.5	366
1456	28.07.12	03:00:00	PM	17.1	18.9	18.0	19.0	18.4	18.7	-0.7	570.5
1457	28.07.12	04:00:00	PM	16.9	18.8	17.9	19.0	18.4	18.7	-0.9	570.5
1458	28.07.12	05:00:00	PM	16.8	18.0	17.4	18.4	18.0	18.2	-0.8	473.6
1459	28.07.12	06:00:00	PM	16.8	18.1	17.5	19.0	18.1	18.6	-1.1	839.6
1460	28.07.12	07:00:00	PM	16.8	17.1	17.0	16.8	17.1	17.0	0.0	32.3
1461	28.07.12	08:00:00	PM	16.1	15.3	15.7	15.3	16.2	15.8	0.0	21.5
1462	28.07.12	09:00:00	PM	15.4	14.6	15.0	14.7	16.0	15.3	-0.3	0
1463	28.07.12	10:00:00	PM	15.0	14.1	14.6	14.1	15.6	14.9	-0.3	0
1464	28.07.12	11:00:00	PM	14.8	14.1	14.5	13.9	15.5	14.7	-0.2	0
1465	29.07.12	12:00:00	AM	14.7	14.2	14.5	14.0	15.5	14.8	-0.3	0

1466	29.07.12	01:00:00	AM	14.6	13.8	14.2	13.5	15.0	14.2	0.0	0
1467	29.07.12	02:00:00	AM	14.5	13.5	14.0	13.2	14.9	14.0	0.0	0
1468	29.07.12	03:00:00	AM	14.5	13.8	14.1	13.7	14.9	14.3	-0.1	0
1469	29.07.12	04:00:00	AM	14.0	13.6	13.8	13.5	14.8	14.1	-0.3	0
1470	29.07.12	05:00:00	AM	13.8	13.6	13.7	13.6	14.8	14.2	-0.5	0
1471	29.07.12	06:00:00	AM	13.8	13.4	13.6	13.4	14.7	14.0	-0.5	0
1472	29.07.12	07:00:00	AM	13.8	13.5	13.6	13.5	14.7	14.1	-0.5	0
1473	29.07.12	08:00:00	AM	13.8	14.1	13.9	14.2	14.9	14.6	-0.6	43.1
1474	29.07.12	09:00:00	AM	13.6	14.0	13.8	14.0	14.9	14.5	-0.7	215.3
1475	29.07.12	10:00:00	AM	13.7	14.2	13.9	14.3	14.9	14.6	-0.7	183
1476	29.07.12	11:00:00	AM	13.8	14.7	14.3	15.0	15.1	15.0	-0.8	452.1
1477	29.07.12	12:00:00	PM	14.2	15.8	15.0	16.2	15.5	15.9	-0.9	559.7
1478	29.07.12	01:00:00	PM	14.7	17.0	15.9	18.3	16.0	17.2	-1.3	2411.1
1479	29.07.12	02:00:00	PM	15.8	18.9	17.3	19.7	16.9	18.3	-1.0	538.2
1480	29.07.12	03:00:00	PM	17.0	20.1	18.6	21.4	17.8	19.6	-1.0	1291.7
1481	29.07.12	04:00:00	PM	17.0	19.3	18.1	19.7	17.9	18.8	-0.6	796.5
1482	29.07.12	05:00:00	PM	16.8	18.5	17.7	18.9	17.8	18.3	-0.7	549
1483	29.07.12	06:00:00	PM	16.5	17.8	17.1	18.2	17.5	17.9	-0.7	215.3
1484	29.07.12	07:00:00	PM	16.3	17.1	16.7	17.6	17.2	17.4	-0.7	344.4
1485	29.07.12	08:00:00	PM	16.1	16.2	16.2	16.4	16.8	16.6	-0.4	43.1
1486	29.07.12	09:00:00	PM	15.8	15.1	15.4	15.2	16.2	15.7	-0.3	0
1487	29.07.12	10:00:00	PM	14.9	13.5	14.2	13.3	15.4	14.3	-0.1	0
1488	29.07.12	11:00:00	PM	13.0	11.3	12.2	11.0	14.4	12.7	-0.6	0
1489	30.07.12	12:00:00	AM	11.4	10.0	10.7	9.5	13.6	11.5	-0.8	0
1490	30.07.12	01:00:00	AM	10.2	9.0	9.6	8.5	12.9	10.7	-1.1	0
1491	30.07.12	02:00:00	AM	9.1	8.2	8.6	7.8	12.3	10.0	-1.4	0
1492	30.07.12	03:00:00	AM	8.9	8.8	8.8	8.5	12.2	10.3	-1.5	0
1493	30.07.12	04:00:00	AM	9.4	9.7	9.5	9.2	12.4	10.8	-1.3	0
1494	30.07.12	05:00:00	AM	9.7	9.9	9.8	9.3	12.3	10.8	-1.0	0
1495	30.07.12	06:00:00	AM	9.6	9.3	9.4	8.6	12.0	10.3	-0.9	0
1496	30.07.12	07:00:00	AM	9.3	8.9	9.1	8.3	11.8	10.1	-1.0	10.8
1497	30.07.12	08:00:00	AM	9.2	10.1	9.6	8.4	11.9	10.1	-0.5	301.4
1498	30.07.12	09:00:00	AM	10.1	14.4	12.2	11.7	13.2	12.4	-0.2	667.4
1499	30.07.12	10:00:00	AM	11.8	16.7	14.3	15.0	14.4	14.7	-0.4	1248.6
1500	30.07.12	11:00:00	AM	13.2	18.0	15.6	17.5	15.5	16.5	-0.9	1377.8
1501	30.07.12	12:00:00	PM	14.9	21.2	18.0	22.7	17.2	20.0	-1.9	4650
1502	30.07.12	01:00:00	PM	16.9	22.1	19.5	23.9	18.1	21.0	-1.5	2927.8
1503	30.07.12	02:00:00	PM	18.5	23.2	20.9	24.5	18.5	21.5	-0.7	2583.4
1504	30.07.12	03:00:00	PM	19.5	21.1	20.3	23.0	18.3	20.7	-0.4	2755.6
1505	30.07.12	04:00:00	PM	20.5	18.4	19.5	22.9	17.4	20.1	-0.7	2238.9
1506	30.07.12	05:00:00	PM	19.9	18.6	19.2	20.5	17.7	19.1	0.1	914.9
1507	30.07.12	06:00:00	PM	18.6	17.5	18.0	18.2	17.2	17.7	0.3	366
1508	30.07.12	07:00:00	PM	17.6	16.2	16.9	16.9	16.6	16.8	0.1	344.4
1509	30.07.12	08:00:00	PM	16.5	14.8	15.7	14.8	15.8	15.3	0.4	43.1
1510	30.07.12	09:00:00	PM	14.7	13.0	13.8	12.9	14.9	13.9	0.0	0
1511	30.07.12	10:00:00	PM	13.1	11.3	12.2	11.0	14.0	12.5	-0.3	0
1512	30.07.12	11:00:00	PM	11.5	10.1	10.8	9.7	13.3	11.5	-0.7	0
1513	31.07.12	12:00:00	AM	10.4	9.2	9.8	8.7	12.7	10.7	-0.9	0
1514	31.07.12	01:00:00	AM	9.7	8.6	9.1	8.1	12.2	10.1	-1.0	0
1515	31.07.12	02:00:00	AM	9.2	8.3	8.7	7.8	11.8	9.8	-1.1	0
1516	31.07.12	03:00:00	AM	9.1	8.3	8.7	7.8	11.7	9.8	-1.1	0
1517	31.07.12	04:00:00	AM	9.1	8.6	8.8	8.2	11.7	10.0	-1.1	0
1518	31.07.12	05:00:00	AM	9.1	8.3	8.7	7.7	11.4	9.6	-0.9	0
1519	31.07.12	06:00:00	AM	8.8	8.1	8.4	7.6	11.2	9.4	-1.0	0
1520	31.07.12	07:00:00	AM	9.1	8.6	8.8	8.0	11.2	9.6	-0.8	0
1521	31.07.12	08:00:00	AM	9.5	11.4	10.5	9.9	12.0	10.9	-0.5	269.1
1522	31.07.12	09:00:00	AM	10.7	15.8	13.2	12.9	13.5	13.2	0.0	667.4
1523	31.07.12	10:00:00	AM	12.6	19.2	15.9	16.3	15.0	15.7	0.2	1334.7
1524	31.07.12	11:00:00	AM	15.1	22.6	18.9	19.6	16.9	18.2	0.6	1980.6
1525	31.07.12	12:00:00	PM	18.0	25.6	21.8	25.6	19.3	22.4	-0.7	4305.6
1526	31.07.12	01:00:00	PM	21.8	27.5	24.6	30.1	21.0	25.5	-0.9	4477.8
1527	31.07.12	02:00:00	PM	23.3	28.4	25.8	29.4	20.1	24.7	1.1	2927.8
1528	31.07.12	03:00:00	PM	23.8	23.7	23.7	26.0	19.2	22.6	1.1	2583.4
1529	31.07.12	04:00:00	PM	23.7	20.2	22.0	25.6	18.3	22.0	0.0	1894.5
1530	31.07.12	05:00:00	PM	22.3	20.6	21.5	23.4	18.9	21.1	0.3	1636.1
1531	31.07.12	06:00:00	PM	21.1	19.4	20.2	19.8	18.0	18.9	1.3	344.4
1532	31.07.12	07:00:00	PM	19.1	16.9	18.0	16.7	17.0	16.9	1.1	10.8
1533	31.07.12	08:00:00	PM	17.5	14.7	16.1	14.4	16.0	15.2	0.9	0
1534	31.07.12	09:00:00	PM	15.7	13.1	14.4	12.8	15.1	13.9	0.4	0
1535	31.07.12	10:00:00	PM	14.1	11.7	12.9	11.5	14.3	12.9	0.0	0
1536	31.07.12	11:00:00	PM	12.9	10.7	11.8	10.6	13.8	12.2	-0.3	0
1537	01.08.12	12:00:00	AM	11.8	10.0	10.9	9.7	13.2	11.4	-0.5	0
1538	01.08.12	01:00:00	AM	10.9	9.4	10.2	9.0	12.7	10.8	-0.7	0
1539	01.08.12	02:00:00	AM	10.3	8.9	9.6	8.5	12.3	10.4	-0.8	0
1540	01.08.12	03:00:00	AM	9.9	8.6	9.2	8.1	12.0	10.0	-0.8	0
1541	01.08.12	04:00:00	AM	9.6	8.3	8.9	7.8	11.7	9.8	-0.8	0
1542	01.08.12	05:00:00	AM	9.3	8.0	8.6	7.5	11.4	9.5	-0.8	0
1543	01.08.12	06:00:00	AM	9.1	7.7	8.4	7.2	11.1	9.2	-0.8	0
1544	01.08.12	07:00:00	AM	9.1	7.6	8.3	7.1	10.9	9.0	-0.7	0
1545	01.08.12	08:00:00	AM	9.5	10.0	9.7	8.0	11.7	9.9	-0.1	172.2
1546	01.08.12	09:00:00	AM	11.1	16.5	13.8	13.0	13.8	13.4	0.4	699.7
1547	01.08.12	10:00:00	AM	14.6	20.6	17.6	17.6	15.8	16.7	0.9	1377.8
1548	01.08.12	11:00:00	AM	17.4	24.8	21.1	21.3	18.0	19.6	1.5	2066.7
1549	01.08.12	12:00:00	PM	20.2	28.5	24.3	27.8	20.8	24.3	0.1	4477.8
1550	01.08.12	01:00:00	PM	24.1	30.9	27.5	33.2	22.7	28.0	-0.5	4822.3
1551	01.08.12	02:00:00	PM	25.3	30.8	28.0	30.8	21.3	26.0	2.0	2927.8
1552	01.08.12	03:00:00	PM	24.6	27.2	25.9	26.7	21.3	24.0	1.9	1463.9
1553	01.08.12	04:00:00	PM	22.9	25.5	24.2	27.6	21.6	24.6	-0.4	3444.5
1554	01.08.12	05:00:00	PM	22.9	25.9	24.4	27.0	22.0	24.5	-0.1	1722.2
1555	01.08.12	06:00:00	PM	22.1	22.9	22.5	22.8	20.2	21.5	1.0	322.9
1556	01.08.12	07:00:00	PM	20.1	19.6	19.9	19.1	18.9	19.0	0.9	43.1
1557	01.08.12	08:00:00	PM	19.2	17.6	18.4	17.4	18.0	17.7	0.7	64.6
1558	01.08.12	09:00:00	PM	17.9	16.0	17.0	15.8	17.2	16.5	0.5	0
1559	01.08.12	10:00:00	PM	16.7	15.4	16.0	15.4	16.5	16.0	0.1	0
1560	01.08.12	11:00:00	PM	15.7	14.6	15.1	14.4	16.0	15.2	0.0	0
1561	02.08.12	12:00:00	AM	15.3	14.5	14.9	14.1	16.0	15.1	-0.2	0
1562	02.08.12	01:00:00	AM	14.8	13.5	14.1	12.9	15.5	14.2	0.0	0
1563	02.08.12	02:00:00	AM	14.5	13.8	14.1	13.3	15.4	14.3	-0.2	0

1564	02.08.12	03:00:00	AM	14.6	13.5	14.0	12.9	15.2	14.0	0.0	0
1565	02.08.12	04:00:00	AM	14.5	13.4	13.9	12.7	15.0	13.8	0.1	0
1566	02.08.12	05:00:00	AM	14.1	12.6	13.4	11.9	14.6	13.3	0.1	0
1567	02.08.12	06:00:00	AM	13.3	11.5	12.4	10.8	14.0	12.4	0.0	0
1568	02.08.12	07:00:00	AM	12.5	11.1	11.8	10.6	13.8	12.2	-0.3	32.3
1569	02.08.12	08:00:00	AM	12.6	12.6	12.6	11.6	14.0	12.8	-0.2	236.8
1570	02.08.12	09:00:00	AM	13.6	16.9	15.2	15.4	15.2	15.3	-0.1	753.5
1571	02.08.12	10:00:00	AM	15.6	20.3	17.9	18.5	16.6	17.6	0.4	1280.9
1572	02.08.12	11:00:00	AM	18.0	23.4	20.7	21.9	18.5	20.2	0.5	2066.7
1573	02.08.12	12:00:00	PM	20.1	26.3	23.2	26.8	20.7	23.7	-0.5	2583.4
1574	02.08.12	01:00:00	PM	21.5	26.3	23.9	27.9	21.2	24.5	-0.6	2755.6
1575	02.08.12	02:00:00	PM	24.0	28.5	26.2	29.3	21.8	25.5	0.7	3272.2
1576	02.08.12	03:00:00	PM	24.4	25.8	25.1	27.3	21.5	24.4	0.8	2325
1577	02.08.12	04:00:00	PM	24.5	23.7	24.1	27.5	21.2	24.3	-0.2	2927.8
1578	02.08.12	05:00:00	PM	23.3	23.8	23.5	25.7	21.6	23.6	-0.1	1980.6
1579	02.08.12	06:00:00	PM	22.3	22.1	22.2	22.2	20.7	21.5	0.8	118.4
1580	02.08.12	07:00:00	PM	20.8	20.6	20.7	21.1	20.1	20.6	0.1	624.3
1581	02.08.12	08:00:00	PM	19.6	19.0	19.3	19.2	19.3	19.2	0.0	86.1
1582	02.08.12	09:00:00	PM	18.5	17.1	17.8	17.1	18.2	17.7	0.1	0
1583	02.08.12	10:00:00	PM	17.7	16.0	16.8	16.0	17.7	16.9	0.0	0
1584	02.08.12	11:00:00	PM	17.2	15.9	16.5	15.9	17.3	16.6	0.0	0
1585	03.08.12	12:00:00	AM	17.1	15.5	16.3	15.2	16.9	16.0	0.2	0
1586	03.08.12	01:00:00	AM	16.0	13.9	15.0	13.4	16.0	14.7	0.3	0
1587	03.08.12	02:00:00	AM	15.5	13.5	14.5	13.3	15.8	14.5	0.0	0
1588	03.08.12	03:00:00	AM	15.4	13.8	14.6	13.3	15.6	14.4	0.1	0
1589	03.08.12	04:00:00	AM	15.1	13.7	14.4	13.2	15.4	14.3	0.1	0
1590	03.08.12	05:00:00	AM	14.8	13.7	14.2	13.3	15.3	14.3	0.0	0
1591	03.08.12	06:00:00	AM	14.6	13.7	14.1	13.2	15.1	14.1	0.0	0
1592	03.08.12	07:00:00	AM	14.3	13.8	14.0	13.4	15.1	14.2	-0.2	107.6
1593	03.08.12	08:00:00	AM	14.3	14.6	14.5	14.8	15.5	15.1	-0.7	290.6
1594	03.08.12	09:00:00	AM	14.6	16.7	15.7	17.1	16.3	16.7	-1.1	409
1595	03.08.12	10:00:00	AM	14.7	16.7	15.7	16.9	16.4	16.7	-1.0	462.9
1596	03.08.12	11:00:00	AM	15.1	17.9	16.5	18.3	17.0	17.7	-1.2	1108.7
1597	03.08.12	12:00:00	PM	16.0	19.7	17.8	19.7	17.9	18.8	-1.0	602.8
1598	03.08.12	01:00:00	PM	17.5	22.5	20.0	26.4	19.5	22.9	-2.9	5511.1
1599	03.08.12	02:00:00	PM	18.9	22.9	20.9	23.0	19.5	21.2	-0.3	721.2
1600	03.08.12	03:00:00	PM	18.9	21.6	20.2	21.6	19.4	20.5	-0.2	635.1
1601	03.08.12	04:00:00	PM	19.3	21.5	20.4	24.3	19.6	21.9	-1.5	2755.6
1602	03.08.12	05:00:00	PM	19.5	21.5	20.5	22.4	19.7	21.0	-0.6	1894.5
1603	03.08.12	06:00:00	PM	18.9	20.3	19.6	21.0	19.2	20.1	-0.5	699.7
1604	03.08.12	07:00:00	PM	18.0	18.9	18.5	19.3	18.6	18.9	-0.5	516.7
1605	03.08.12	08:00:00	PM	17.9	18.3	18.1	18.3	18.1	18.2	-0.1	172.2
1606	03.08.12	09:00:00	PM	17.3	16.4	16.9	16.0	17.1	16.6	0.3	0
1607	03.08.12	10:00:00	PM	15.8	14.3	15.0	13.8	16.0	14.9	0.1	0
1608	03.08.12	11:00:00	PM	14.2	12.6	13.4	12.3	15.2	13.7	-0.3	0
1609	04.08.12	12:00:00	AM	13.0	11.6	12.3	11.1	14.5	12.8	-0.5	0
1610	04.08.12	01:00:00	AM	11.8	10.6	11.2	10.2	13.8	12.0	-0.8	0
1611	04.08.12	02:00:00	AM	10.8	9.9	10.4	9.4	13.3	11.3	-1.0	0
1612	04.08.12	03:00:00	AM	10.2	9.3	9.7	8.8	12.9	10.8	-1.1	0
1613	04.08.12	04:00:00	AM	9.5	8.8	9.1	8.4	12.4	10.4	-1.3	0
1614	04.08.12	05:00:00	AM	8.9	8.4	8.6	8.0	12.0	10.0	-1.4	0
1615	04.08.12	06:00:00	AM	8.4	8.0	8.2	7.6	11.6	9.6	-1.4	0
1616	04.08.12	07:00:00	AM	8.0	7.9	7.9	7.5	11.5	9.5	-1.6	10.8
1617	04.08.12	08:00:00	AM	8.6	10.7	9.6	9.8	12.6	11.2	-1.6	516.7
1618	04.08.12	09:00:00	AM	10.5	15.7	13.1	13.3	14.2	13.7	-0.7	688.9
1619	04.08.12	10:00:00	AM	13.2	19.3	16.2	17.0	16.0	16.5	-0.2	1463.9
1620	04.08.12	11:00:00	AM	15.9	23.2	19.5	21.7	18.2	20.0	-0.4	1550
1621	04.08.12	12:00:00	PM	17.9	24.5	21.2	24.8	19.7	22.2	-1.0	4650
1622	04.08.12	01:00:00	PM	19.7	24.9	22.3	24.9	19.9	22.4	-0.1	1722.2
1623	04.08.12	02:00:00	PM	20.0	24.8	22.4	25.8	20.2	23.0	-0.6	3961.1
1624	04.08.12	03:00:00	PM	22.7	23.6	23.1	24.4	19.4	21.9	1.2	3100
1625	04.08.12	04:00:00	PM	22.6	22.6	22.6	25.1	19.9	22.5	0.1	1550
1626	04.08.12	05:00:00	PM	21.5	22.3	21.9	24.0	20.0	22.0	-0.1	796.5
1627	04.08.12	06:00:00	PM	20.3	21.0	20.7	22.0	19.4	20.7	0.0	484.4
1628	04.08.12	07:00:00	PM	19.1	18.5	18.8	18.7	18.0	18.4	0.4	107.6
1629	04.08.12	08:00:00	PM	18.0	16.7	17.4	16.8	17.2	17.0	0.4	107.6
1630	04.08.12	09:00:00	PM	17.5	15.8	16.6	15.8	16.7	16.2	0.4	0
1631	04.08.12	10:00:00	PM	16.8	15.1	15.9	15.2	16.3	15.8	0.2	0
1632	04.08.12	11:00:00	PM	16.4	14.7	15.6	14.8	16.0	15.4	0.1	0
1633	05.08.12	12:00:00	AM	15.9	13.8	14.9	13.8	15.5	14.7	0.2	0
1634	05.08.12	01:00:00	AM	14.7	13.6	14.1	13.3	14.9	14.1	0.0	0
1635	05.08.12	02:00:00	AM	13.7	13.1	13.4	12.9	14.8	13.8	-0.5	0
1636	05.08.12	03:00:00	AM	13.4	13.1	13.2	12.7	14.7	13.7	-0.5	0
1637	05.08.12	04:00:00	AM	13.1	13.0	13.0	12.4	14.5	13.5	-0.4	0
1638	05.08.12	05:00:00	AM	13.1	12.7	12.9	12.4	14.4	13.4	-0.5	0
1639	05.08.12	06:00:00	AM	13.2	12.9	13.0	12.6	14.3	13.5	-0.4	0
1640	05.08.12	07:00:00	AM	13.3	13.5	13.4	13.3	14.3	13.8	-0.4	0
1641	05.08.12	08:00:00	AM	13.5	13.9	13.7	13.8	14.4	14.1	-0.4	129.2
1642	05.08.12	09:00:00	AM	13.7	13.8	13.7	13.8	14.5	14.1	-0.4	32.3
1643	05.08.12	10:00:00	AM	13.7	14.1	13.9	14.3	14.6	14.5	-0.6	247.6
1644	05.08.12	11:00:00	AM	13.8	14.5	14.2	14.7	14.7	14.7	-0.5	516.7
1645	05.08.12	12:00:00	PM	15.8	20.3	18.0	21.9	15.7	18.8	-0.7	4133.4
1646	05.08.12	01:00:00	PM	19.1	22.2	20.7	24.7	17.2	21.0	-0.3	1227.1
1647	05.08.12	02:00:00	PM	19.4	20.7	20.0	22.2	18.0	20.1	-0.1	484.4
1648	05.08.12	03:00:00	PM	19.3	20.3	19.8	21.7	18.5	20.1	-0.3	990.3
1649	05.08.12	04:00:00	PM	20.0	20.0	20.0	24.3	18.6	21.4	-1.4	2583.4
1650	05.08.12	05:00:00	PM	21.1	20.8	20.9	23.6	18.9	21.2	-0.3	1205.6
1651	05.08.12	06:00:00	PM	21.3	19.7	20.5	21.6	18.8	20.2	0.3	301.4
1652	05.08.12	07:00:00	PM	21.0	18.6	19.8	20.2	18.6	19.4	0.4	258.3
1653	05.08.12	08:00:00	PM	19.3	16.8	18.0	17.8	18.1	18.0	0.1	75.3
1654	05.08.12	09:00:00	PM	17.6	15.7	16.6	16.7	17.6	17.1	-0.5	0
1655	05.08.12	10:00:00	PM	17.1	15.3	16.2	16.3	17.2	16.8	-0.6	0
1656	05.08.12	11:00:00	PM	15.9	14.3	15.1	14.4	16.6	15.5	-0.4	0
1657	06.08.12	12:00:00	AM	15.2	14.0	14.6	13.7	16.1	14.9	-0.3	0
1658	06.08.12	01:00:00	AM	14.5	13.8	14.2	13.3	15.9	14.6	-0.4	0
1659	06.08.12	02:00:00	AM	14.2	13.9	14.1	13.2	15.6	14.4	-0.3	0
1660	06.08.12	03:00:00	AM	14.5	14.0	14.3	13.5	15.5	14.5	-0.2	0
1661	06.08.12	04:00:00	AM	14.4	13.8	14.1	13.5	15.4	14.4	-0.3	0

1662	06.08.12	05:00:00	AM	14.3	13.8	14.1	13.4	15.2	14.3	-0.2	0
1663	06.08.12	06:00:00	AM	14.4	13.8	14.1	13.7	15.1	14.4	-0.2	0
1664	06.08.12	07:00:00	AM	14.4	13.8	14.1	13.7	15.0	14.3	-0.2	0
1665	06.08.12	08:00:00	AM	14.2	13.8	14.0	14.0	15.0	14.5	-0.5	312.2
1666	06.08.12	09:00:00	AM	14.4	14.6	14.5	15.1	15.1	15.1	-0.6	226
1667	06.08.12	10:00:00	AM	14.6	14.9	14.8	15.5	15.3	15.4	-0.6	215.3
1668	06.08.12	11:00:00	AM	14.8	15.9	15.3	16.9	15.6	16.2	-0.9	1205.6
1669	06.08.12	12:00:00	PM	14.7	14.7	14.7	15.1	15.6	15.3	-0.6	258.3
1670	06.08.12	01:00:00	PM	14.7	16.0	15.3	16.8	15.8	16.3	-1.0	312.2
1671	06.08.12	02:00:00	PM	14.3	14.4	14.4	15.0	15.6	15.3	-0.9	43.1
1672	06.08.12	03:00:00	PM	13.8	13.9	13.8	14.3	15.4	14.9	-1.0	64.6
1673	06.08.12	04:00:00	PM	13.1	13.2	13.1	13.4	15.1	14.2	-1.1	150.7
1674	06.08.12	05:00:00	PM	12.9	13.3	13.1	13.5	14.8	14.1	-1.1	258.3
1675	06.08.12	06:00:00	PM	13.3	14.5	13.9	15.6	15.0	15.3	-1.4	839.6
1676	06.08.12	07:00:00	PM	13.8	14.8	14.3	15.8	15.2	15.5	-1.1	215.3
1677	06.08.12	08:00:00	PM	13.9	13.9	13.9	14.7	15.1	14.9	-1.0	118.4
1678	06.08.12	09:00:00	PM	13.7	13.2	13.4	13.8	14.9	14.3	-0.9	0
1679	06.08.12	10:00:00	PM	13.2	12.1	12.6	12.4	14.6	13.5	-0.9	0
1680	06.08.12	11:00:00	PM	12.2	11.3	11.8	11.1	14.2	12.7	-0.9	0
1681	07.08.12	12:00:00	AM	11.0	10.0	10.5	9.6	13.8	11.7	-1.2	0
1682	07.08.12	01:00:00	AM	10.4	9.9	10.1	9.3	13.4	11.3	-1.2	0
1683	07.08.12	02:00:00	AM	10.2	9.5	9.8	8.7	13.1	10.9	-1.1	0
1684	07.08.12	03:00:00	AM	9.6	8.8	9.2	7.9	12.7	10.3	-1.1	0
1685	07.08.12	04:00:00	AM	9.1	8.3	8.7	7.3	12.3	9.8	-1.1	0
1686	07.08.12	05:00:00	AM	8.5	7.7	8.1	6.7	11.9	9.3	-1.2	0
1687	07.08.12	06:00:00	AM	8.1	7.3	7.7	6.3	11.5	8.9	-1.2	0
1688	07.08.12	07:00:00	AM	7.7	7.1	7.4	6.1	11.2	8.7	-1.3	0
1689	07.08.12	08:00:00	AM	7.6	7.8	7.7	6.3	11.0	8.7	-1.0	279.9
1690	07.08.12	09:00:00	AM	8.2	12.7	10.4	9.5	11.6	10.5	-0.1	613.5
1691	07.08.12	10:00:00	AM	10.4	16.0	13.2	13.8	12.6	13.2	0.0	1151.7
1692	07.08.12	11:00:00	AM	13.0	18.7	15.8	17.1	14.0	15.6	0.3	2066.7
1693	07.08.12	12:00:00	PM	15.3	21.2	18.2	22.0	15.4	18.7	-0.4	4305.6
1694	07.08.12	01:00:00	PM	18.6	23.4	21.0	25.8	17.0	21.4	-0.4	3100
1695	07.08.12	02:00:00	PM	18.8	22.0	20.4	22.8	18.0	20.4	0.0	1377.8
1696	07.08.12	03:00:00	PM	19.3	21.0	20.1	22.1	18.4	20.3	-0.1	1087.2
1697	07.08.12	04:00:00	PM	20.4	19.0	19.7	24.6	18.3	21.5	-1.8	1894.5
1698	07.08.12	05:00:00	PM	20.0	19.6	19.8	23.1	18.4	20.8	-1.0	1980.6
1699	07.08.12	06:00:00	PM	19.2	18.8	19.0	21.8	18.2	20.0	-1.0	764.2
1700	07.08.12	07:00:00	PM	18.9	17.9	18.4	19.8	18.0	18.9	-0.5	376.7
1701	07.08.12	08:00:00	PM	18.9	16.5	17.7	17.8	17.6	17.7	0.0	118.4
1702	07.08.12	09:00:00	PM	18.0	14.7	16.4	15.4	16.9	16.1	0.2	0
1703	07.08.12	10:00:00	PM	16.6	12.9	14.8	13.1	16.1	14.6	0.1	0
1704	07.08.12	11:00:00	PM	15.5	11.7	13.6	11.6	15.4	13.5	0.1	0
1705	08.08.12	12:00:00	AM	14.4	11.0	12.7	10.8	14.8	12.8	-0.1	0
1706	08.08.12	01:00:00	AM	13.6	10.2	11.9	9.9	14.3	12.1	-0.2	0
1707	08.08.12	02:00:00	AM	12.6	9.3	10.9	9.0	13.8	11.4	-0.4	0
1708	08.08.12	03:00:00	AM	11.7	8.6	10.2	8.3	13.2	10.7	-0.6	0
1709	08.08.12	04:00:00	AM	10.9	8.0	9.5	7.7	12.6	10.1	-0.7	0
1710	08.08.12	05:00:00	AM	10.3	7.6	8.9	7.2	12.2	9.7	-0.8	0
1711	08.08.12	06:00:00	AM	9.7	7.4	8.5	6.9	11.8	9.3	-0.8	0
1712	08.08.12	07:00:00	AM	9.2	7.2	8.2	6.7	11.4	9.1	-0.9	0
1713	08.08.12	08:00:00	AM	8.8	7.9	8.3	7.0	11.2	9.1	-0.8	258.3
1714	08.08.12	09:00:00	AM	9.1	13.4	11.2	10.4	11.9	11.1	0.1	549
1715	08.08.12	10:00:00	AM	10.9	16.8	13.9	14.3	13.1	13.7	0.2	1130.2
1716	08.08.12	11:00:00	AM	13.8	20.1	17.0	18.0	14.7	16.4	0.6	1808.3
1717	08.08.12	12:00:00	PM	17.6	23.3	20.4	23.9	16.4	20.1	0.3	4133.4
1718	08.08.12	01:00:00	PM	20.9	26.1	23.5	29.3	18.3	23.8	-0.3	3961.1
1719	08.08.12	02:00:00	PM	22.8	27.8	25.3	28.1	20.2	24.1	1.1	2669.5
1720	08.08.12	03:00:00	PM	23.2	23.3	23.2	22.7	20.1	21.4	1.8	2411.1
1721	08.08.12	04:00:00	PM	22.9	21.0	22.0	25.6	19.8	22.7	-0.7	1980.6
1722	08.08.12	05:00:00	PM	21.9	21.1	21.5	23.9	19.6	21.7	-0.2	1076.4
1723	08.08.12	06:00:00	PM	20.9	19.4	20.1	21.3	19.3	20.3	-0.1	183
1724	08.08.12	07:00:00	PM	18.8	17.2	18.0	17.9	18.5	18.2	-0.2	21.5
1725	08.08.12	08:00:00	PM	17.8	15.6	16.7	15.8	17.8	16.8	-0.1	0
1726	08.08.12	09:00:00	PM	16.8	14.1	15.5	14.0	17.0	15.5	0.0	0
1727	08.08.12	10:00:00	PM	16.0	12.9	14.4	12.4	16.2	14.3	0.1	0
1728	08.08.12	11:00:00	PM	15.2	11.9	13.6	11.4	15.6	13.5	0.1	0
1729	09.08.12	12:00:00	AM	14.4	11.0	12.7	10.7	15.0	12.8	-0.1	0
1730	09.08.12	01:00:00	AM	13.8	10.4	12.1	10.0	14.4	12.2	-0.1	0
1731	09.08.12	02:00:00	AM	13.3	9.9	11.6	9.5	13.9	11.7	-0.1	0
1732	09.08.12	03:00:00	AM	12.6	9.5	11.0	9.0	13.5	11.2	-0.2	0
1733	09.08.12	04:00:00	AM	12.1	9.1	10.6	8.6	13.1	10.8	-0.2	0
1734	09.08.12	05:00:00	AM	11.6	8.7	10.2	8.3	12.7	10.5	-0.3	0
1735	09.08.12	06:00:00	AM	11.1	8.4	9.8	7.9	12.3	10.1	-0.3	0
1736	09.08.12	07:00:00	AM	10.7	8.1	9.4	7.7	12.0	9.8	-0.4	0
1737	09.08.12	08:00:00	AM	10.3	8.8	9.5	8.1	11.9	10.0	-0.5	226
1738	09.08.12	09:00:00	AM	10.2	14.2	12.2	11.5	12.7	12.1	0.1	581.3
1739	09.08.12	10:00:00	AM	12.0	17.9	14.9	15.5	13.9	14.7	0.2	1141
1740	09.08.12	11:00:00	AM	15.1	21.3	18.2	19.4	15.6	17.5	0.7	1550
1741	09.08.12	12:00:00	PM	18.0	23.8	20.9	23.6	17.1	20.3	0.6	3616.7
1742	09.08.12	01:00:00	PM	21.0	26.3	23.6	28.7	18.7	23.7	0.0	3616.7
1743	09.08.12	02:00:00	PM	22.0	26.5	24.3	26.5	20.1	23.3	1.0	2066.7
1744	09.08.12	03:00:00	PM	21.8	23.9	22.8	23.7	20.1	21.9	0.9	1722.2
1745	09.08.12	04:00:00	PM	21.7	21.3	21.5	24.8	19.8	22.3	-0.8	2152.8
1746	09.08.12	05:00:00	PM	21.6	21.2	21.4	23.4	19.6	21.5	-0.1	775
1747	09.08.12	06:00:00	PM	20.6	19.3	19.9	20.8	19.3	20.0	-0.1	183
1748	09.08.12	07:00:00	PM	19.0	17.3	18.1	17.4	18.5	18.0	0.2	10.8
1749	09.08.12	08:00:00	PM	18.0	15.6	16.8	15.5	17.7	16.6	0.2	0
1750	09.08.12	09:00:00	PM	16.9	14.2	15.6	13.8	17.0	15.4	0.1	0
1751	09.08.12	10:00:00	PM	15.9	13.1	14.5	12.5	16.2	14.4	0.1	0
1752	09.08.12	11:00:00	PM	15.0	12.0	13.5	11.2	15.6	13.4	0.1	0
1753	10.08.12	12:00:00	AM	14.1	11.1	12.6	10.4	14.8	12.6	0.1	0
1754	10.08.12	01:00:00	AM	13.6	10.5	12.0	9.8	14.3	12.0	0.0	0
1755	10.08.12	02:00:00	AM	13.1	10.0	11.5	9.2	13.8	11.5	0.1	0
1756	10.08.12	03:00:00	AM	12.5	9.5	11.0	8.7	13.3	11.0	0.0	0
1757	10.08.12	04:00:00	AM	12.1	9.1	10.6	8.3	12.9	10.6	0.0	0
1758	10.08.12	05:00:00	AM	11.6	8.7	10.2	7.9	12.5	10.2	0.0	0
1759	10.08.12	06:00:00	AM	11.1	8.4	9.8	7.5	12.2	9.8	-0.1	0

1760	10.08.12	07:00:00	AM	10.7	8.1	9.4	7.3	11.8	9.5	-0.2	0
1761	10.08.12	08:00:00	AM	10.2	8.4	9.3	7.6	11.7	9.7	-0.4	269.1
1762	10.08.12	09:00:00	AM	10.3	14.4	12.3	11.3	12.7	12.0	0.3	581.3
1763	10.08.12	10:00:00	AM	12.0	18.2	15.1	15.4	14.1	14.8	0.4	1141
1764	10.08.12	11:00:00	AM	15.2	21.7	18.4	18.9	15.9	17.4	1.0	1808.3
1765	10.08.12	12:00:00	PM	18.3	24.7	21.5	24.4	17.6	21.0	0.6	4305.6
1766	10.08.12	01:00:00	PM	21.5	26.9	24.2	29.5	19.4	24.4	-0.2	4133.4
1767	10.08.12	02:00:00	PM	23.2	28.4	25.8	27.9	21.0	24.4	1.3	2583.4
1768	10.08.12	03:00:00	PM	23.8	23.2	23.5	21.4	20.3	20.9	2.6	1550
1769	10.08.12	04:00:00	PM	23.3	20.2	21.8	24.9	19.5	22.2	-0.4	2238.9
1770	10.08.12	05:00:00	PM	22.1	20.4	21.3	23.2	19.4	21.3	0.0	581.3
1771	10.08.12	06:00:00	PM	20.6	18.4	19.5	20.3	18.9	19.6	-0.1	172.2
1772	10.08.12	07:00:00	PM	18.7	16.2	17.5	16.6	18.0	17.3	0.2	10.8
1773	10.08.12	08:00:00	PM	17.4	14.6	16.0	14.6	17.0	15.8	0.2	0
1774	10.08.12	09:00:00	PM	16.2	13.4	14.8	13.1	16.2	14.7	0.1	0
1775	10.08.12	10:00:00	PM	15.4	12.3	13.8	11.7	15.6	13.6	0.2	0
1776	10.08.12	11:00:00	PM	14.6	11.4	13.0	10.8	14.9	12.9	0.1	0
1777	11.08.12	12:00:00	AM	13.8	10.7	12.2	10.0	14.2	12.1	0.2	0
1778	11.08.12	01:00:00	AM	13.0	9.9	11.4	9.3	13.6	11.4	0.0	0
1779	11.08.12	02:00:00	AM	12.4	9.4	10.9	8.7	13.1	10.9	0.0	0
1780	11.08.12	03:00:00	AM	11.9	8.9	10.4	8.2	12.6	10.4	0.0	0
1781	11.08.12	04:00:00	AM	11.4	8.4	9.9	7.7	12.2	9.9	0.0	0
1782	11.08.12	05:00:00	AM	11.0	8.0	9.5	7.2	11.8	9.5	0.0	0
1783	11.08.12	06:00:00	AM	10.6	7.6	9.1	6.8	11.4	9.1	0.0	0
1784	11.08.12	07:00:00	AM	10.1	7.3	8.7	6.5	11.1	8.8	-0.1	0
1785	11.08.12	08:00:00	AM	10.1	7.6	8.8	6.8	11.1	9.0	-0.1	279.9
1786	11.08.12	09:00:00	AM	10.3	13.9	12.1	10.7	12.3	11.5	0.6	581.3
1787	11.08.12	10:00:00	AM	12.4	17.9	15.1	14.8	13.9	14.4	0.8	1237.9
1788	11.08.12	11:00:00	AM	15.2	21.7	18.4	18.0	15.8	16.9	1.5	1722.2
1789	11.08.12	12:00:00	PM	18.2	24.7	21.5	23.7	17.5	20.6	0.9	4650
1790	11.08.12	01:00:00	PM	21.2	27.1	24.1	28.8	19.4	24.1	0.1	4477.8
1791	11.08.12	02:00:00	PM	23.1	28.5	25.8	27.4	20.9	24.1	1.6	3100
1792	11.08.12	03:00:00	PM	23.8	23.2	23.5	20.9	19.9	20.4	3.1	1463.9
1793	11.08.12	04:00:00	PM	23.8	20.4	22.1	25.2	19.2	22.2	-0.1	2755.6
1794	11.08.12	05:00:00	PM	22.8	20.9	21.9	23.6	19.2	21.4	0.5	645.8
1795	11.08.12	06:00:00	PM	21.8	18.8	20.3	20.7	18.6	19.7	0.6	258.3
1796	11.08.12	07:00:00	PM	19.7	16.5	18.1	16.7	17.6	17.1	1.0	21.5
1797	11.08.12	08:00:00	PM	18.5	14.6	16.6	14.4	16.6	15.5	1.0	0
1798	11.08.12	09:00:00	PM	16.8	13.1	14.9	12.6	15.7	14.1	0.8	0
1799	11.08.12	10:00:00	PM	15.2	11.7	13.5	11.1	14.8	13.0	0.5	0
1800	11.08.12	11:00:00	PM	13.7	10.7	12.2	10.2	14.0	12.1	0.1	0
1801	12.08.12	12:00:00	AM	12.5	10.1	11.3	9.4	13.6	11.5	-0.2	0
1802	12.08.12	01:00:00	AM	11.7	9.4	10.5	8.9	13.0	10.9	-0.4	0
1803	12.08.12	02:00:00	AM	11.0	8.9	10.0	8.4	12.5	10.4	-0.5	0
1804	12.08.12	03:00:00	AM	10.5	8.5	9.5	8.0	12.1	10.0	-0.6	0
1805	12.08.12	04:00:00	AM	10.0	8.1	9.0	7.7	11.8	9.8	-0.7	0
1806	12.08.12	05:00:00	AM	9.8	8.0	8.9	7.6	11.6	9.6	-0.7	0
1807	12.08.12	06:00:00	AM	9.6	7.7	8.6	7.3	11.3	9.3	-0.7	0
1808	12.08.12	07:00:00	AM	9.4	7.6	8.5	7.1	11.1	9.1	-0.6	0
1809	12.08.12	08:00:00	AM	9.4	8.9	9.1	8.3	11.4	9.9	-0.7	258.3
1810	12.08.12	09:00:00	AM	9.9	13.8	11.9	11.8	12.6	12.2	-0.4	731.9
1811	12.08.12	10:00:00	AM	12.2	17.9	15.0	16.4	14.2	15.3	-0.3	1237.9
1812	12.08.12	11:00:00	AM	13.8	18.8	16.3	18.0	15.2	16.6	-0.3	1216.3
1813	12.08.12	12:00:00	PM	16.1	22.7	19.4	21.9	16.9	19.4	0.1	1377.8
1814	12.08.12	01:00:00	PM	18.2	22.9	20.6	22.6	17.9	20.2	0.3	1894.5
1815	12.08.12	02:00:00	PM	19.5	23.7	21.6	23.2	18.6	20.9	0.7	2755.6
1816	12.08.12	03:00:00	PM	19.7	22.7	21.2	22.2	19.0	20.6	0.6	1980.6
1817	12.08.12	04:00:00	PM	20.2	21.3	20.8	24.3	18.8	21.5	-0.8	2927.8
1818	12.08.12	05:00:00	PM	20.8	21.8	21.3	23.3	19.0	21.1	0.1	1377.8
1819	12.08.12	06:00:00	PM	20.2	20.6	20.4	21.9	18.8	20.3	0.1	581.3
1820	12.08.12	07:00:00	PM	19.2	18.2	18.7	18.3	17.9	18.1	0.6	150.7
1821	12.08.12	08:00:00	PM	18.2	16.5	17.4	16.4	17.1	16.8	0.6	96.9
1822	12.08.12	09:00:00	PM	17.7	15.3	16.5	15.0	16.4	15.7	0.8	0
1823	12.08.12	10:00:00	PM	17.2	14.4	15.8	14.1	16.0	15.0	0.8	0
1824	12.08.12	11:00:00	PM	16.6	13.8	15.2	13.2	15.5	14.3	0.9	0
1825	13.08.12	12:00:00	AM	16.0	13.3	14.6	12.7	15.1	13.9	0.7	0
1826	13.08.12	01:00:00	AM	15.5	12.6	14.0	12.0	14.6	13.3	0.7	0
1827	13.08.12	02:00:00	AM	15.0	12.2	13.6	11.6	14.3	13.0	0.6	0
1828	13.08.12	03:00:00	AM	14.5	12.2	13.4	11.9	14.2	13.1	0.3	0
1829	13.08.12	04:00:00	AM	14.3	12.1	13.2	11.5	14.0	12.8	0.4	0
1830	13.08.12	05:00:00	AM	14.1	11.5	12.8	10.7	13.7	12.2	0.6	0
1831	13.08.12	06:00:00	AM	13.4	10.4	11.9	9.6	13.0	11.3	0.6	0
1832	13.08.12	07:00:00	AM	12.5	9.6	11.0	9.1	12.6	10.8	0.2	53.8
1833	13.08.12	08:00:00	AM	12.3	10.7	11.5	10.3	12.8	11.5	0.0	139.9
1834	13.08.12	09:00:00	AM	12.7	14.7	13.7	14.4	13.9	14.2	-0.5	688.9
1835	13.08.12	10:00:00	AM	13.8	18.1	15.9	17.1	15.3	16.2	-0.2	699.7
1836	13.08.12	11:00:00	AM	15.3	19.9	17.6	18.8	16.4	17.6	0.0	914.9
1837	13.08.12	12:00:00	PM	16.6	20.3	18.5	20.0	17.0	18.5	0.0	807.3
1838	13.08.12	01:00:00	PM	19.2	24.6	21.9	26.0	18.9	22.5	-0.5	3444.5
1839	13.08.12	02:00:00	PM	21.0	26.3	23.6	25.9	19.9	22.9	0.8	1076.4
1840	13.08.12	03:00:00	PM	20.5	22.8	21.7	22.6	19.3	21.0	0.7	1162.5
1841	13.08.12	04:00:00	PM	20.8	22.0	21.4	24.7	19.4	22.1	-0.6	3272.2
1842	13.08.12	05:00:00	PM	20.9	22.2	21.6	23.7	19.5	21.6	0.0	1550
1843	13.08.12	06:00:00	PM	20.1	20.3	20.2	20.8	18.8	19.8	0.4	473.6
1844	13.08.12	07:00:00	PM	19.3	19.1	19.2	19.6	18.3	18.9	0.2	258.3
1845	13.08.12	08:00:00	PM	18.8	17.5	18.1	17.5	17.5	17.5	0.7	118.4
1846	13.08.12	09:00:00	PM	18.0	15.5	16.8	15.2	16.5	15.9	0.9	0
1847	13.08.12	10:00:00	PM	17.3	14.2	15.8	13.8	15.9	14.8	1.0	0
1848	13.08.12	11:00:00	PM	16.3	13.0	14.7	12.4	15.2	13.8	0.9	0
1849	14.08.12	12:00:00	AM	15.3	11.8	13.6	11.2	14.4	12.8	0.7	0
1850	14.08.12	01:00:00	AM	14.4	11.1	12.8	10.7	13.9	12.3	0.5	0
1851	14.08.12	02:00:00	AM	13.7	10.5	12.1	10.1	13.5	11.8	0.3	0
1852	14.08.12	03:00:00	AM	13.1	10.1	11.6	9.7	13.2	11.4	0.1	0
1853	14.08.12	04:00:00	AM	12.6	9.6	11.1	9.3	12.8	11.0	0.1	0
1854	14.08.12	05:00:00	AM	12.1	9.3	10.7	9.0	12.5	10.7	0.0	0
1855	14.08.12	06:00:00	AM	11.6	9.0	10.3	8.7	12.2	10.4	-0.1	0
1856	14.08.12	07:00:00	AM	11.2	8.8	10.0	8.5	12.0	10.2	-0.2	43.1
1857	14.08.12	08:00:00	AM	11.2	9.4	10.3	9.1	12.1	10.6	-0.3	236.8

1858	14.08.12	09:00:00	AM	11.3	15.2	13.3	12.4	13.8	13.1	0.1	667.4
1859	14.08.12	10:00:00	AM	13.4	19.0	16.2	16.4	15.4	15.9	0.3	1280.9
1860	14.08.12	11:00:00	AM	16.2	22.3	19.3	19.8	17.2	18.5	0.8	861.1
1861	14.08.12	12:00:00	PM	18.5	24.5	21.5	23.7	18.3	21.0	0.5	5166.7
1862	14.08.12	01:00:00	PM	20.1	24.9	22.5	24.6	19.3	22.0	0.6	2669.5
1863	14.08.12	02:00:00	PM	21.7	27.5	24.6	26.6	20.2	23.4	1.2	2755.6
1864	14.08.12	03:00:00	PM	22.7	22.6	22.7	20.3	19.0	19.7	3.0	1001
1865	14.08.12	04:00:00	PM	22.7	20.0	21.4	23.5	18.5	21.0	0.4	2669.5
1866	14.08.12	05:00:00	PM	22.0	20.7	21.3	22.9	18.7	20.8	0.5	1808.3
1867	14.08.12	06:00:00	PM	21.0	19.2	20.1	20.8	18.1	19.5	0.6	570.5
1868	14.08.12	07:00:00	PM	19.7	17.0	18.3	17.1	17.0	17.0	1.3	32.3
1869	14.08.12	08:00:00	PM	18.0	14.9	16.5	14.7	16.0	15.4	1.1	0
1870	14.08.12	09:00:00	PM	16.1	13.3	14.7	12.9	15.2	14.0	0.7	0
1871	14.08.12	10:00:00	PM	15.0	12.1	13.6	11.5	14.5	13.0	0.5	0
1872	14.08.12	11:00:00	PM	14.0	11.3	12.7	10.7	14.0	12.4	0.3	0
1873	15.08.12	12:00:00	AM	13.5	10.7	12.1	10.2	13.7	11.9	0.2	0
1874	15.08.12	01:00:00	AM	13.3	10.9	12.1	10.5	13.7	12.1	0.1	0
1875	15.08.12	02:00:00	AM	13.0	10.7	11.8	9.9	13.3	11.6	0.2	0
1876	15.08.12	03:00:00	AM	12.7	10.2	11.4	9.4	12.9	11.1	0.3	0
1877	15.08.12	04:00:00	AM	12.5	9.8	11.1	9.1	12.7	10.9	0.2	0
1878	15.08.12	05:00:00	AM	12.2	9.6	10.9	8.9	12.4	10.6	0.2	0
1879	15.08.12	06:00:00	AM	12.0	9.5	10.7	8.7	12.3	10.5	0.3	0
1880	15.08.12	07:00:00	AM	11.8	9.4	10.6	8.8	12.1	10.4	0.2	0
1881	15.08.12	08:00:00	AM	11.6	10.2	10.9	9.6	12.4	11.0	-0.1	344.4
1882	15.08.12	09:00:00	AM	11.8	15.4	13.6	12.7	14.0	13.4	0.2	624.3
1883	15.08.12	10:00:00	AM	14.2	19.5	16.9	16.7	15.9	16.3	0.6	1173.3
1884	15.08.12	11:00:00	AM	16.9	23.8	20.3	20.0	17.7	18.9	1.5	1722.2
1885	15.08.12	12:00:00	PM	20.0	27.4	23.7	25.1	19.3	22.2	1.5	4650
1886	15.08.12	01:00:00	PM	23.0	29.7	26.3	30.0	21.3	25.6	0.7	3961.1
1887	15.08.12	02:00:00	PM	24.2	30.2	27.2	28.1	21.3	24.7	2.5	3272.2
1888	15.08.12	03:00:00	PM	24.4	24.4	24.4	21.1	19.7	20.4	4.0	1302.4
1889	15.08.12	04:00:00	PM	23.9	21.1	22.5	24.8	19.1	22.0	0.5	2583.4
1890	15.08.12	05:00:00	PM	23.3	22.0	22.6	24.1	19.3	21.7	0.9	1636.1
1891	15.08.12	06:00:00	PM	21.8	20.8	21.3	22.3	18.9	20.6	0.7	818.1
1892	15.08.12	07:00:00	PM	21.1	20.1	20.6	20.6	18.6	19.6	1.0	290.6
1893	15.08.12	08:00:00	PM	20.5	19.2	19.9	19.1	18.1	18.6	1.2	96.9
1894	15.08.12	09:00:00	PM	19.6	17.8	18.7	17.5	17.6	17.5	1.1	0
1895	15.08.12	10:00:00	PM	19.0	16.9	17.9	16.7	17.2	17.0	1.0	0
1896	15.08.12	11:00:00	PM	18.3	16.1	17.2	15.8	16.7	16.2	1.0	0
1897	16.08.12	12:00:00	AM	17.8	15.9	16.8	15.7	16.6	16.1	0.7	0
1898	16.08.12	01:00:00	AM	17.5	16.0	16.7	15.8	16.6	16.2	0.5	0
1899	16.08.12	02:00:00	AM	17.1	15.8	16.4	15.7	16.4	16.0	0.4	0
1900	16.08.12	03:00:00	AM	15.4	14.0	14.7	14.3	15.7	15.0	-0.3	0
1901	16.08.12	04:00:00	AM	14.7	13.5	14.1	13.5	15.4	14.4	-0.3	0
1902	16.08.12	05:00:00	AM	14.3	13.5	13.9	13.2	15.2	14.2	-0.3	0
1903	16.08.12	06:00:00	AM	13.9	13.2	13.6	12.7	15.0	13.8	-0.3	0
1904	16.08.12	07:00:00	AM	13.7	13.2	13.4	12.7	14.8	13.7	-0.3	0
1905	16.08.12	08:00:00	AM	13.7	13.3	13.5	12.9	14.7	13.8	-0.3	183
1906	16.08.12	09:00:00	AM	13.8	14.3	14.1	14.3	14.9	14.6	-0.5	430.6
1907	16.08.12	10:00:00	AM	14.1	16.0	15.0	16.2	15.3	15.8	-0.7	1334.7
1908	16.08.12	11:00:00	AM	15.1	17.7	16.4	18.2	16.0	17.1	-0.8	688.9
1909	16.08.12	12:00:00	PM	15.5	17.5	16.5	18.3	16.3	17.3	-0.9	1237.9
1910	16.08.12	01:00:00	PM	15.8	18.1	17.0	19.1	16.7	17.9	-1.0	947.2
1911	16.08.12	02:00:00	PM	16.0	18.3	17.2	18.9	17.1	18.0	-0.8	592
1912	16.08.12	03:00:00	PM	16.5	19.9	18.2	21.2	17.6	19.4	-1.1	1248.6
1913	16.08.12	04:00:00	PM	16.9	19.9	18.4	20.7	17.9	19.3	-0.9	731.9
1914	16.08.12	05:00:00	PM	17.1	18.9	18.0	19.4	17.9	18.6	-0.6	602.8
1915	16.08.12	06:00:00	PM	17.1	18.7	17.9	19.7	17.9	18.8	-0.9	624.3
1916	16.08.12	07:00:00	PM	17.2	18.1	17.7	18.6	17.7	18.1	-0.5	322.9
1917	16.08.12	08:00:00	PM	17.1	16.3	16.7	16.3	17.1	16.7	0.0	96.9
1918	16.08.12	09:00:00	PM	16.5	14.4	15.5	14.0	16.4	15.2	0.2	0
1919	16.08.12	10:00:00	PM	15.0	12.6	13.8	12.1	15.6	13.8	0.0	0
1920	16.08.12	11:00:00	PM	13.8	11.3	12.6	10.9	14.8	12.9	-0.3	0
1921	17.08.12	12:00:00	AM	13.0	10.5	11.7	10.0	14.1	12.0	-0.3	0
1922	17.08.12	01:00:00	AM	12.4	9.8	11.1	9.4	13.6	11.5	-0.4	0
1923	17.08.12	02:00:00	AM	12.0	9.3	10.6	8.9	13.1	11.0	-0.3	0
1924	17.08.12	03:00:00	AM	11.7	8.9	10.3	8.5	12.6	10.5	-0.2	0
1925	17.08.12	04:00:00	AM	11.4	8.6	10.0	8.1	12.3	10.2	-0.2	0
1926	17.08.12	05:00:00	AM	11.2	8.4	9.8	7.8	12.0	9.9	-0.1	0
1927	17.08.12	06:00:00	AM	11.0	8.1	9.6	7.6	11.7	9.7	-0.1	0
1928	17.08.12	07:00:00	AM	10.7	8.0	9.4	7.5	11.5	9.5	-0.1	0
1929	17.08.12	08:00:00	AM	10.7	8.3	9.5	7.8	11.4	9.6	-0.1	43.1
1930	17.08.12	09:00:00	AM	10.9	13.7	12.3	10.7	12.3	11.5	0.8	624.3
1931	17.08.12	10:00:00	AM	12.2	17.8	15.0	14.9	13.8	14.3	0.7	1119.5
1932	17.08.12	11:00:00	AM	15.1	21.6	18.3	18.6	15.4	17.0	1.3	1894.5
1933	17.08.12	12:00:00	PM	18.5	24.6	21.6	23.4	17.1	20.2	1.3	4650
1934	17.08.12	01:00:00	PM	21.9	27.5	24.7	29.0	19.4	24.2	0.5	4822.3
1935	17.08.12	02:00:00	PM	24.1	29.6	26.8	28.2	20.8	24.5	2.3	2927.8
1936	17.08.12	03:00:00	PM	25.0	24.0	24.5	20.6	20.9	20.8	3.7	968.8
1937	17.08.12	04:00:00	PM	25.1	21.1	23.1	24.9	20.0	22.5	0.6	3788.9
1938	17.08.12	05:00:00	PM	24.3	21.6	22.9	24.5	19.8	22.2	0.8	3272.2
1939	17.08.12	06:00:00	PM	23.2	19.7	21.4	21.1	19.3	20.2	1.2	635.1
1940	17.08.12	07:00:00	PM	21.1	17.5	19.3	17.1	18.4	17.8	1.5	10.8
1941	17.08.12	08:00:00	PM	19.1	15.6	17.3	14.8	17.5	16.1	1.2	0
1942	17.08.12	09:00:00	PM	17.3	14.0	15.7	13.1	16.5	14.8	0.9	0
1943	17.08.12	10:00:00	PM	16.2	13.1	14.7	11.9	15.9	13.9	0.8	0
1944	17.08.12	11:00:00	PM	15.3	12.3	13.8	11.2	15.3	13.3	0.5	0
1945	18.08.12	12:00:00	AM	14.5	11.7	13.1	10.7	14.7	12.7	0.4	0
1946	18.08.12	01:00:00	AM	13.8	11.3	12.6	10.4	14.3	12.3	0.2	0
1947	18.08.12	02:00:00	AM	13.3	10.9	12.1	10.0	13.8	11.9	0.2	0
1948	18.08.12	03:00:00	AM	12.8	10.7	11.8	9.7	13.6	11.6	0.2	0
1949	18.08.12	04:00:00	AM	12.3	10.5	11.4	9.5	13.3	11.4	0.0	0
1950	18.08.12	05:00:00	AM	11.9	10.3	11.1	9.2	13.1	11.1	0.0	0
1951	18.08.12	06:00:00	AM	11.5	10.1	10.8	8.9	12.9	10.9	-0.1	0
1952	18.08.12	07:00:00	AM	11.1	9.9	10.5	8.8	12.6	10.7	-0.2	0
1953	18.08.12	08:00:00	AM	10.8	10.1	10.5	9.1	12.5	10.8	-0.3	43.1
1954	18.08.12	09:00:00	AM	11.9	17.1	14.5	12.8	13.8	13.3	1.2	893.4
1955	18.08.12	10:00:00	AM	14.9	20.6	17.8	17.1	15.7	16.4	1.4	1550

1956	18.08.12	11:00:00	AM	18.0	24.4	21.2	20.8	17.7	19.2	2.0	2497.2
1957	18.08.12	12:00:00	PM	21.1	27.3	24.2	26.5	19.6	23.0	1.2	5511.1
1958	18.08.12	01:00:00	PM	24.1	30.3	27.2	31.0	21.4	26.2	1.0	5166.7
1959	18.08.12	02:00:00	PM	25.9	32.0	28.9	29.5	22.5	26.0	3.0	3444.5
1960	18.08.12	03:00:00	PM	26.0	25.6	25.8	21.7	21.5	21.6	4.2	796.5
1961	18.08.12	04:00:00	PM	25.5	22.1	23.8	26.0	20.3	23.2	0.7	3616.7
1962	18.08.12	05:00:00	PM	24.4	22.9	23.7	25.3	20.2	22.8	0.9	3100
1963	18.08.12	06:00:00	PM	23.8	21.1	22.4	22.2	19.7	21.0	1.5	516.7
1964	18.08.12	07:00:00	PM	22.2	19.0	20.6	18.8	18.9	18.9	1.8	21.5
1965	18.08.12	08:00:00	PM	20.6	17.3	18.9	16.8	18.1	17.5	1.5	0
1966	18.08.12	09:00:00	PM	19.3	15.9	17.6	15.2	17.5	16.3	1.2	0
1967	18.08.12	10:00:00	PM	18.0	14.6	16.3	13.8	16.7	15.3	1.0	0
1968	18.08.12	11:00:00	PM	16.9	13.8	15.3	12.9	16.0	14.5	0.9	0
1969	19.08.12	12:00:00	AM	16.0	13.2	14.6	12.1	15.6	13.8	0.8	0
1970	19.08.12	01:00:00	AM	15.5	12.7	14.1	11.6	15.2	13.4	0.7	0
1971	19.08.12	02:00:00	AM	14.9	12.3	13.6	11.2	14.8	13.0	0.6	0
1972	19.08.12	03:00:00	AM	14.5	12.0	13.3	10.9	14.5	12.7	0.5	0
1973	19.08.12	04:00:00	AM	14.0	11.7	12.9	10.7	14.3	12.5	0.4	0
1974	19.08.12	05:00:00	AM	13.8	11.5	12.6	10.4	14.0	12.2	0.4	0
1975	19.08.12	06:00:00	AM	13.4	11.3	12.3	10.2	13.8	12.0	0.3	0
1976	19.08.12	07:00:00	AM	13.0	11.1	12.1	10.0	13.7	11.8	0.3	32.3
1977	19.08.12	08:00:00	AM	12.7	11.7	12.2	10.7	13.8	12.2	0.0	150.7
1978	19.08.12	09:00:00	AM	13.3	17.8	15.5	14.2	15.0	14.6	0.9	925.7
1979	19.08.12	10:00:00	AM	16.0	21.9	19.0	18.5	16.9	17.7	1.2	1550
1980	19.08.12	11:00:00	AM	19.3	25.5	22.4	22.1	18.6	20.4	2.0	2497.2
1981	19.08.12	12:00:00	PM	22.1	28.7	25.4	27.6	20.4	24.0	1.4	5338.9
1982	19.08.12	01:00:00	PM	24.3	31.0	27.6	31.2	22.0	26.6	1.0	5166.7
1983	19.08.12	02:00:00	PM	25.7	32.4	29.1	30.0	22.7	26.3	2.7	3444.5
1984	19.08.12	03:00:00	PM	26.4	26.7	26.5	23.4	21.7	22.5	4.0	1087.2
1985	19.08.12	04:00:00	PM	26.4	24.0	25.2	27.3	21.0	24.1	1.0	3444.5
1986	19.08.12	05:00:00	PM	25.9	24.5	25.2	26.4	21.0	23.7	1.5	2755.6
1987	19.08.12	06:00:00	PM	25.3	22.9	24.1	23.8	20.5	22.1	2.0	516.7
1988	19.08.12	07:00:00	PM	23.8	20.9	22.3	20.8	19.9	20.3	2.0	150.7
1989	19.08.12	08:00:00	PM	22.4	19.1	20.8	18.6	19.1	18.9	1.9	64.6
1990	19.08.12	09:00:00	PM	20.7	17.3	19.0	16.6	18.2	17.4	1.6	0
1991	19.08.12	10:00:00	PM	19.4	16.1	17.8	15.4	17.7	16.5	1.2	0
1992	19.08.12	11:00:00	PM	18.7	15.5	17.1	14.6	17.2	15.9	1.2	0
1993	20.08.12	12:00:00	AM	18.0	15.0	16.5	14.0	16.8	15.4	1.1	0
1994	20.08.12	01:00:00	AM	17.6	14.5	16.0	13.6	16.4	15.0	1.1	0
1995	20.08.12	02:00:00	AM	17.2	14.2	15.7	13.3	16.1	14.7	1.0	0
1996	20.08.12	03:00:00	AM	16.8	13.9	15.4	13.1	15.9	14.5	0.9	0
1997	20.08.12	04:00:00	AM	16.4	13.8	15.1	12.9	15.7	14.3	0.9	0
1998	20.08.12	05:00:00	AM	16.0	13.6	14.8	12.6	15.5	14.0	0.8	0
1999	20.08.12	06:00:00	AM	15.8	13.3	14.5	12.2	15.2	13.7	0.8	0
2000	20.08.12	07:00:00	AM	15.4	13.1	14.2	12.1	15.0	13.6	0.7	32.3
2001	20.08.12	08:00:00	AM	15.1	13.8	14.4	13.0	15.2	14.1	0.3	172.2
2002	20.08.12	09:00:00	AM	15.7	19.3	17.5	16.3	16.5	16.4	1.0	882.6
2003	20.08.12	10:00:00	AM	17.9	23.1	20.5	20.1	18.3	19.2	1.2	1463.9
2004	20.08.12	11:00:00	AM	20.7	26.6	23.6	23.4	19.9	21.7	2.0	2325
2005	20.08.12	12:00:00	PM	22.6	29.0	25.8	27.9	21.6	24.7	1.1	4994.5
2006	20.08.12	01:00:00	PM	24.7	31.1	27.9	31.0	23.1	27.0	0.9	4822.3
2007	20.08.12	02:00:00	PM	25.9	32.4	29.1	30.5	23.4	26.9	2.2	3272.2
2008	20.08.12	03:00:00	PM	26.5	27.3	26.9	24.6	22.3	23.5	3.4	1151.7
2009	20.08.12	04:00:00	PM	26.0	24.6	25.3	27.1	21.7	24.4	1.0	2755.6
2010	20.08.12	05:00:00	PM	24.8	24.7	24.8	26.1	21.7	23.9	0.9	2411.1
2011	20.08.12	06:00:00	PM	23.6	24.0	23.8	24.8	21.5	23.2	0.6	1162.5
2012	20.08.12	07:00:00	PM	22.4	22.1	22.3	22.0	20.7	21.3	1.0	279.9
2013	20.08.12	08:00:00	PM	21.5	20.3	20.9	19.9	19.9	19.9	1.0	43.1
2014	20.08.12	09:00:00	PM	20.9	18.9	19.9	18.0	19.2	18.6	1.3	0
2015	20.08.12	10:00:00	PM	19.9	17.4	18.7	16.5	18.4	17.5	1.2	0
2016	20.08.12	11:00:00	PM	19.1	16.5	17.8	15.8	17.9	16.8	1.0	0
2017	21.08.12	12:00:00	AM	18.4	15.9	17.1	15.0	17.5	16.2	0.9	0
2018	21.08.12	01:00:00	AM	17.7	15.5	16.6	14.8	17.1	15.9	0.6	0
2019	21.08.12	02:00:00	AM	17.2	15.2	16.2	14.3	16.9	15.6	0.6	0
2020	21.08.12	03:00:00	AM	16.8	15.3	16.0	14.7	16.8	15.8	0.3	0
2021	21.08.12	04:00:00	AM	16.6	15.6	16.1	15.0	16.8	15.9	0.2	0
2022	21.08.12	05:00:00	AM	16.4	15.2	15.8	14.3	16.5	15.4	0.4	0
2023	21.08.12	06:00:00	AM	16.1	14.5	15.3	13.5	16.0	14.8	0.6	0
2024	21.08.12	07:00:00	AM	15.8	14.0	14.9	13.2	15.8	14.5	0.4	53.8
2025	21.08.12	08:00:00	AM	15.7	14.7	15.2	13.8	16.0	14.9	0.2	226
2026	21.08.12	09:00:00	AM	16.1	18.9	17.5	16.6	17.3	17.0	0.6	904.2
2027	21.08.12	10:00:00	AM	17.8	22.4	20.1	19.9	18.9	19.4	0.7	1463.9
2028	21.08.12	11:00:00	AM	20.5	26.4	23.5	23.3	20.6	22.0	1.5	2325
2029	21.08.12	12:00:00	PM	22.9	28.7	25.8	26.4	21.9	24.1	1.7	4650
2030	21.08.12	01:00:00	PM	24.6	30.8	27.7	30.3	23.4	26.8	0.9	4822.3
2031	21.08.12	02:00:00	PM	25.3	31.7	28.5	29.9	23.4	26.6	1.9	3100
2032	21.08.12	03:00:00	PM	26.0	27.4	26.7	25.1	22.4	23.8	2.9	1345.5
2033	21.08.12	04:00:00	PM	25.7	24.6	25.2	27.5	21.9	24.7	0.5	2927.8
2034	21.08.12	05:00:00	PM	25.3	24.5	24.9	25.2	21.8	23.5	1.4	1259.4
2035	21.08.12	06:00:00	PM	24.4	23.6	24.0	24.2	21.4	22.8	1.2	1022.6
2036	21.08.12	07:00:00	PM	23.1	21.9	22.5	21.8	20.5	21.1	1.3	398.3
2037	21.08.12	08:00:00	PM	21.9	19.7	20.8	19.0	19.5	19.2	1.5	10.8
2038	21.08.12	09:00:00	PM	20.0	18.0	19.0	17.3	18.7	18.0	1.0	0
2039	21.08.12	10:00:00	PM	19.4	17.3	18.3	16.5	18.3	17.4	0.9	0
2040	21.08.12	11:00:00	PM	18.9	17.0	18.0	16.2	18.0	17.1	0.8	0
2041	22.08.12	12:00:00	AM	18.3	17.2	17.8	16.8	18.1	17.5	0.3	0
2042	22.08.12	01:00:00	AM	18.0	16.4	17.2	16.0	17.7	16.8	0.4	0
2043	22.08.12	02:00:00	AM	17.6	16.0	16.8	15.9	17.4	16.6	0.1	0
2044	22.08.12	03:00:00	AM	17.3	14.8	16.0	14.5	16.7	15.6	0.4	0
2045	22.08.12	04:00:00	AM	16.5	14.2	15.4	14.1	16.4	15.3	0.1	0
2046	22.08.12	05:00:00	AM	15.9	14.0	14.9	13.5	16.2	14.8	0.1	0
2047	22.08.12	06:00:00	AM	15.6	13.8	14.7	12.8	15.9	14.3	0.3	0
2048	22.08.12	07:00:00	AM	15.2	14.0	14.6	13.3	16.0	14.6	0.0	10.8
2049	22.08.12	08:00:00	AM	15.4	15.0	15.2	14.4	16.2	15.3	-0.1	43.1
2050	22.08.12	09:00:00	AM	15.8	17.6	16.7	17.2	17.1	17.1	-0.5	1173.3
2051	22.08.12	10:00:00	AM	16.7	20.5	18.6	20.3	18.2	19.3	-0.7	828.8
2052	22.08.12	11:00:00	AM	18.7	23.2	21.0	22.2	19.9	21.0	-0.1	559.7
2053	22.08.12	12:00:00	PM	20.1	23.5	21.8	23.5	20.1	21.8	0.0	2066.7

2054	22.08.12	01:00:00	PM	22.0	26.1	24.0	27.9	21.7	24.8	-0.7	4822.3
2055	22.08.12	02:00:00	PM	23.7	28.5	26.1	28.0	21.9	24.9	1.2	3272.2
2056	22.08.12	03:00:00	PM	25.6	24.9	25.3	23.0	21.1	22.0	3.2	785.8
2057	22.08.12	04:00:00	PM	25.6	22.7	24.2	25.7	20.6	23.2	1.0	2927.8
2058	22.08.12	05:00:00	PM	24.8	23.2	24.0	23.8	20.8	22.3	1.7	882.6
2059	22.08.12	06:00:00	PM	24.0	22.3	23.1	23.3	20.5	21.9	1.2	968.8
2060	22.08.12	07:00:00	PM	23.1	21.0	22.0	20.9	19.8	20.3	1.7	172.2
2061	22.08.12	08:00:00	PM	21.6	19.1	20.3	18.7	18.9	18.8	1.5	32.3
2062	22.08.12	09:00:00	PM	19.9	17.5	18.7	16.9	18.1	17.5	1.2	0
2063	22.08.12	10:00:00	PM	18.9	16.8	17.9	16.3	17.9	17.1	0.8	0
2064	22.08.12	11:00:00	PM	18.4	16.1	17.3	15.3	17.4	16.3	1.0	0
2065	23.08.12	12:00:00	AM	17.9	15.7	16.8	14.7	17.0	15.9	0.9	0
2066	23.08.12	01:00:00	AM	17.1	14.7	15.9	13.8	16.5	15.2	0.7	0
2067	23.08.12	02:00:00	AM	16.3	13.9	15.1	13.2	16.0	14.6	0.5	0
2068	23.08.12	03:00:00	AM	16.0	13.5	14.7	12.7	15.8	14.2	0.5	0
2069	23.08.12	04:00:00	AM	15.6	13.2	14.4	12.4	15.5	13.9	0.4	0
2070	23.08.12	05:00:00	AM	15.6	13.4	14.5	12.9	15.5	14.2	0.3	0
2071	23.08.12	06:00:00	AM	15.6	13.1	14.3	12.3	15.2	13.7	0.6	0
2072	23.08.12	07:00:00	AM	15.4	12.8	14.1	12.0	15.0	13.5	0.6	10.8
2073	23.08.12	08:00:00	AM	15.3	13.3	14.3	12.5	15.2	13.8	0.4	150.7
2074	23.08.12	09:00:00	AM	15.3	18.4	16.9	15.6	16.7	16.1	0.7	828.8
2075	23.08.12	10:00:00	AM	16.8	21.9	19.3	18.6	18.5	18.6	0.8	1377.8
2076	23.08.12	11:00:00	AM	19.1	24.4	21.8	21.7	19.9	20.8	1.0	2497.2
2077	23.08.12	12:00:00	PM	21.0	26.2	23.6	24.5	20.9	22.7	0.9	2755.6
2078	23.08.12	01:00:00	PM	20.3	22.1	21.2	21.6	19.8	20.7	0.6	721.2
2079	23.08.12	02:00:00	PM	19.1	19.0	19.0	18.6	18.4	18.5	0.5	96.9
2080	23.08.12	03:00:00	PM	19.4	18.6	19.0	18.9	18.5	18.7	0.3	904.2
2081	23.08.12	04:00:00	PM	19.2	19.9	19.5	21.7	19.2	20.4	-0.9	1550
2082	23.08.12	05:00:00	PM	20.3	21.0	20.7	21.5	19.6	20.5	0.1	818.1
2083	23.08.12	06:00:00	PM	20.6	19.8	20.2	20.1	18.9	19.5	0.7	398.3
2084	23.08.12	07:00:00	PM	19.9	18.7	19.3	18.5	18.4	18.5	0.8	183
2085	23.08.12	08:00:00	PM	19.3	17.1	18.2	16.4	17.6	17.0	1.2	32.3
2086	23.08.12	09:00:00	PM	18.1	15.6	16.9	14.9	16.9	15.9	1.0	0
2087	23.08.12	10:00:00	PM	17.0	14.8	15.9	14.2	16.6	15.4	0.5	0
2088	23.08.12	11:00:00	PM	16.9	15.5	16.2	15.1	16.8	15.9	0.2	0
2089	24.08.12	12:00:00	AM	16.6	15.3	16.0	14.6	16.5	15.6	0.4	0
2090	24.08.12	01:00:00	AM	16.4	15.5	16.0	15.1	16.6	15.9	0.1	0
2091	24.08.12	02:00:00	AM	16.4	15.5	16.0	15.0	16.5	15.8	0.2	0
2092	24.08.12	03:00:00	AM	16.4	15.4	15.9	14.8	16.4	15.6	0.3	0
2093	24.08.12	04:00:00	AM	16.4	14.8	15.6	14.4	16.1	15.3	0.3	0
2094	24.08.12	05:00:00	AM	15.9	14.6	15.2	14.4	16.0	15.2	0.0	0
2095	24.08.12	06:00:00	AM	15.8	14.5	15.1	14.0	16.0	15.0	0.1	0
2096	24.08.12	07:00:00	AM	15.7	14.6	15.1	14.1	15.9	15.0	0.1	0
2097	24.08.12	08:00:00	AM	15.7	15.0	15.3	14.6	16.0	15.3	0.0	150.7
2098	24.08.12	09:00:00	AM	15.8	15.7	15.7	15.6	16.1	15.9	-0.1	398.3
2099	24.08.12	10:00:00	AM	16.0	16.1	16.0	16.4	16.3	16.4	-0.3	1076.4
2100	24.08.12	11:00:00	AM	16.3	18.2	17.3	18.7	17.1	17.9	-0.6	958
2101	24.08.12	12:00:00	PM	17.0	19.5	18.2	20.7	17.8	19.2	-1.0	1808.3
2102	24.08.12	01:00:00	PM	18.7	22.1	20.4	23.1	19.1	21.1	-0.7	1808.3
2103	24.08.12	02:00:00	PM	21.3	25.0	23.2	25.4	20.2	22.8	0.3	2325
2104	24.08.12	03:00:00	PM	22.0	23.4	22.7	23.9	20.1	22.0	0.7	2238.9
2105	24.08.12	04:00:00	PM	21.3	22.0	21.7	22.7	19.9	21.3	0.3	947.2
2106	24.08.12	05:00:00	PM	20.8	21.0	20.9	21.8	19.5	20.6	0.3	893.4
2107	24.08.12	06:00:00	PM	20.1	20.2	20.2	20.7	19.3	20.0	0.2	462.9
2108	24.08.12	07:00:00	PM	19.6	19.2	19.4	19.1	18.7	18.9	0.5	43.1
2109	24.08.12	08:00:00	PM	19.1	18.0	18.5	17.9	18.2	18.0	0.5	0
2110	24.08.12	09:00:00	PM	18.3	17.2	17.8	17.3	17.9	17.6	0.2	0
2111	24.08.12	10:00:00	PM	17.9	16.7	17.3	16.7	17.6	17.1	0.1	0
2112	24.08.12	11:00:00	PM	17.8	16.5	17.1	16.6	17.4	17.0	0.1	0
2113	25.08.12	12:00:00	AM	17.3	16.2	16.8	16.2	17.2	16.7	0.0	0
2114	25.08.12	01:00:00	AM	17.1	16.0	16.5	16.1	17.1	16.6	-0.1	0
2115	25.08.12	02:00:00	AM	16.9	15.5	16.2	15.7	16.8	16.2	0.0	0
2116	25.08.12	03:00:00	AM	16.6	15.1	15.9	15.2	16.5	15.9	0.0	0
2117	25.08.12	04:00:00	AM	16.2	14.9	15.6	15.0	16.3	15.7	-0.1	0
2118	25.08.12	05:00:00	AM	15.9	14.6	15.2	14.8	16.1	15.5	-0.2	0
2119	25.08.12	06:00:00	AM	15.6	14.2	14.9	14.2	16.0	15.1	-0.2	0
2120	25.08.12	07:00:00	AM	15.1	13.8	14.4	13.9	15.7	14.8	-0.4	86.1
2121	25.08.12	08:00:00	AM	15.0	14.0	14.5	14.5	15.7	15.1	-0.6	118.4
2122	25.08.12	09:00:00	AM	15.1	16.2	15.7	15.0	16.0	15.5	0.1	839.6
2123	25.08.12	10:00:00	AM	15.5	17.6	16.5	17.4	16.6	17.0	-0.5	1636.1
2124	25.08.12	11:00:00	AM	16.0	18.2	17.1	18.6	17.1	17.9	-0.7	1377.8
2125	25.08.12	12:00:00	PM	18.0	21.8	19.9	21.9	18.4	20.1	-0.3	1808.3
2126	25.08.12	01:00:00	PM	20.7	24.6	22.7	24.5	19.9	22.2	0.4	1980.6
2127	25.08.12	02:00:00	PM	20.7	24.0	22.3	23.9	20.1	22.0	0.3	2411.1
2128	25.08.12	03:00:00	PM	20.3	22.2	21.3	22.6	20.0	21.3	0.0	688.9
2129	25.08.12	04:00:00	PM	19.9	20.1	20.0	21.8	19.5	20.6	-0.6	1184
2130	25.08.12	05:00:00	PM	19.7	20.0	19.9	20.8	19.4	20.1	-0.2	559.7
2131	25.08.12	06:00:00	PM	19.1	18.2	18.7	18.5	18.6	18.6	0.1	516.7
2132	25.08.12	07:00:00	PM	17.0	16.0	16.5	15.4	17.6	16.5	0.0	0
2133	25.08.12	08:00:00	PM	14.4	13.2	13.8	12.9	16.3	14.6	-0.8	0
2134	25.08.12	09:00:00	PM	14.7	13.3	14.0	12.8	16.0	14.4	-0.4	0
2135	25.08.12	10:00:00	PM	14.7	13.3	14.0	12.7	15.7	14.2	-0.2	0
2136	25.08.12	11:00:00	PM	14.6	13.1	13.8	12.7	15.4	14.0	-0.2	0
2137	26.08.12	12:00:00	AM	14.6	13.1	13.8	12.7	15.2	13.9	-0.1	0
2138	26.08.12	01:00:00	AM	14.5	13.0	13.7	12.8	15.1	13.9	-0.2	0
2139	26.08.12	02:00:00	AM	14.3	12.8	13.6	12.5	14.9	13.7	-0.1	0
2140	26.08.12	03:00:00	AM	14.2	12.7	13.5	12.4	14.7	13.6	-0.1	0
2141	26.08.12	04:00:00	AM	13.8	12.2	13.0	12.7	14.5	13.6	-0.6	0
2142	26.08.12	05:00:00	AM	13.7	12.0	12.8	12.3	14.4	13.4	-0.5	0
2143	26.08.12	06:00:00	AM	13.7	11.9	12.8	12.1	14.2	13.2	-0.4	0
2144	26.08.12	07:00:00	AM	13.6	11.8	12.7	11.9	14.0	13.0	-0.3	0
2145	26.08.12	08:00:00	AM	13.5	11.8	12.6	11.9	13.9	12.9	-0.3	86.1
2146	26.08.12	09:00:00	AM	13.2	11.7	12.4	12.3	13.8	13.1	-0.6	301.4
2147	26.08.12	10:00:00	AM	13.0	12.1	12.5	13.2	13.8	13.5	-1.0	710.4
2148	26.08.12	11:00:00	AM	13.1	12.9	13.0	14.1	14.0	14.1	-1.1	1184
2149	26.08.12	12:00:00	PM	13.8	15.5	14.7	16.4	14.7	15.6	-0.9	1108.7
2150	26.08.12	01:00:00	PM	14.0	14.4	14.2	15.2	14.9	15.0	-0.8	753.5
2151	26.08.12	02:00:00	PM	14.2	15.1	14.7	16.5	15.0	15.8	-1.1	1377.8

2152	26.08.12	03:00:00	PM	15.0	15.5	15.2	16.2	15.4	15.8	-0.6	678.1
2153	26.08.12	04:00:00	PM	16.3	14.6	15.5	19.0	15.3	17.1	-1.7	3616.7
2154	26.08.12	05:00:00	PM	16.7	15.1	15.9	17.1	15.5	16.3	-0.4	1636.1
2155	26.08.12	06:00:00	PM	16.4	14.3	15.4	15.3	15.4	15.3	0.0	688.9
2156	26.08.12	07:00:00	PM	15.9	13.3	14.6	13.7	15.2	14.4	0.1	43.1
2157	26.08.12	08:00:00	PM	15.2	11.7	13.5	11.5	14.5	13.0	0.4	0
2158	26.08.12	09:00:00	PM	14.4	10.4	12.4	9.7	13.8	11.8	0.6	0
2159	26.08.12	10:00:00	PM	13.2	9.4	11.3	8.4	13.2	10.8	0.5	0
2160	26.08.12	11:00:00	PM	11.8	8.6	10.2	7.4	12.7	10.0	0.2	0
2161	27.08.12	12:00:00	AM	10.6	7.8	9.2	6.5	12.1	9.3	-0.1	0
2162	27.08.12	01:00:00	AM	9.4	7.1	8.2	5.9	11.4	8.6	-0.4	0
2163	27.08.12	02:00:00	AM	8.3	6.8	7.5	5.5	11.1	8.3	-0.8	0
2164	27.08.12	03:00:00	AM	7.8	6.4	7.1	4.9	10.7	7.8	-0.7	0
2165	27.08.12	04:00:00	AM	7.3	5.9	6.6	4.5	10.3	7.4	-0.8	0
2166	27.08.12	05:00:00	AM	6.7	5.5	6.1	4.2	9.9	7.0	-1.0	0
2167	27.08.12	06:00:00	AM	6.2	5.2	5.7	4.1	9.6	6.8	-1.1	0
2168	27.08.12	07:00:00	AM	5.8	5.2	5.5	4.0	9.4	6.7	-1.2	0
2169	27.08.12	08:00:00	AM	5.6	5.2	5.4	4.1	9.2	6.6	-1.2	0
2170	27.08.12	09:00:00	AM	6.1	10.1	8.1	6.3	9.7	8.0	0.1	753.5
2171	27.08.12	10:00:00	AM	8.5	14.1	11.3	10.3	11.1	10.7	0.6	1162.5
2172	27.08.12	11:00:00	AM	11.5	16.7	14.1	13.8	12.6	13.2	0.9	1808.3
2173	27.08.12	12:00:00	PM	15.0	19.9	17.4	17.7	13.9	15.8	1.6	3444.5
2174	27.08.12	01:00:00	PM	18.2	22.9	20.6	22.8	16.0	19.4	1.2	4305.6
2175	27.08.12	02:00:00	PM	20.4	25.1	22.8	23.2	17.4	20.3	2.5	2755.6
2176	27.08.12	03:00:00	PM	21.9	19.9	20.9	16.8	17.5	17.1	3.7	699.7
2177	27.08.12	04:00:00	PM	22.0	17.3	19.6	20.5	16.9	18.7	0.9	2583.4
2178	27.08.12	05:00:00	PM	20.5	17.0	18.8	16.9	16.6	16.8	2.0	430.6
2179	27.08.12	06:00:00	PM	19.3	15.8	17.5	15.2	16.2	15.7	1.8	96.9
2180	27.08.12	07:00:00	PM	17.7	13.8	15.8	12.5	15.6	14.0	1.7	96.9
2181	27.08.12	08:00:00	PM	16.0	12.4	14.2	11.1	14.8	13.0	1.2	0
2182	27.08.12	09:00:00	PM	14.1	10.8	12.5	9.4	14.0	11.7	0.8	0
2183	27.08.12	10:00:00	PM	13.0	10.1	11.5	8.4	13.4	10.9	0.6	0
2184	27.08.12	11:00:00	PM	12.2	9.6	10.9	8.0	13.0	10.5	0.4	0
2185	28.08.12	12:00:00	AM	11.8	9.4	10.6	7.6	12.5	10.0	0.6	0
2186	28.08.12	01:00:00	AM	11.4	9.0	10.2	7.2	12.2	9.7	0.5	0
2187	28.08.12	02:00:00	AM	11.1	8.7	9.9	6.9	11.9	9.4	0.5	0
2188	28.08.12	03:00:00	AM	10.9	8.5	9.7	6.7	11.6	9.1	0.6	0
2189	28.08.12	04:00:00	AM	10.8	8.3	9.6	6.5	11.4	9.0	0.6	0
2190	28.08.12	05:00:00	AM	10.7	8.1	9.4	6.3	11.2	8.8	0.6	0
2191	28.08.12	06:00:00	AM	10.6	8.0	9.3	6.2	11.0	8.6	0.7	0
2192	28.08.12	07:00:00	AM	10.4	8.3	9.3	6.9	10.9	8.9	0.4	0
2193	28.08.12	08:00:00	AM	10.3	10.6	10.4	9.6	11.3	10.5	0.0	344.4
2194	28.08.12	09:00:00	AM	10.7	13.9	12.3	11.0	12.0	11.5	0.8	796.5
2195	28.08.12	10:00:00	AM	12.4	17.9	15.1	14.2	13.5	13.8	1.3	1205.6
2196	28.08.12	11:00:00	AM	15.1	20.1	17.6	17.1	14.9	16.0	1.6	1636.1
2197	28.08.12	12:00:00	PM	16.2	20.7	18.5	19.8	15.8	17.8	0.7	3788.9
2198	28.08.12	01:00:00	PM	18.5	23.1	20.8	22.6	17.2	19.9	0.9	2066.7
2199	28.08.12	02:00:00	PM	19.2	22.5	20.9	22.2	17.9	20.0	0.8	2325
2200	28.08.12	03:00:00	PM	18.4	19.9	19.1	20.1	17.7	18.9	0.2	1205.6
2201	28.08.12	04:00:00	PM	18.0	19.8	18.9	20.5	17.6	19.0	-0.1	1463.9
2202	28.08.12	05:00:00	PM	17.5	19.4	18.4	19.7	17.6	18.6	-0.2	861.1
2203	28.08.12	06:00:00	PM	17.3	18.5	17.9	18.3	17.3	17.8	0.1	409
2204	28.08.12	07:00:00	PM	17.0	17.7	17.3	17.6	17.0	17.3	0.0	473.6
2205	28.08.12	08:00:00	PM	16.7	16.6	16.7	16.0	16.6	16.3	0.4	10.8
2206	28.08.12	09:00:00	PM	16.0	14.0	15.0	12.7	15.7	14.2	0.8	0
2207	28.08.12	10:00:00	PM	14.7	12.2	13.5	10.8	14.8	12.8	0.6	0
2208	28.08.12	11:00:00	PM	13.4	11.0	12.2	9.7	14.1	11.9	0.3	0
2209	29.08.12	12:00:00	AM	12.5	10.4	11.4	9.0	13.6	11.3	0.2	0
2210	29.08.12	01:00:00	AM	11.9	10.0	10.9	8.5	13.2	10.8	0.1	0
2211	29.08.12	02:00:00	AM	11.4	9.6	10.5	8.2	12.7	10.4	0.1	0
2212	29.08.12	03:00:00	AM	11.1	9.5	10.3	8.0	12.5	10.2	0.1	0
2213	29.08.12	04:00:00	AM	10.9	9.4	10.2	7.8	12.3	10.0	0.1	0
2214	29.08.12	05:00:00	AM	10.8	9.4	10.1	7.7	12.1	9.9	0.2	0
2215	29.08.12	06:00:00	AM	10.8	9.9	10.4	8.6	12.1	10.3	0.0	0
2216	29.08.12	07:00:00	AM	10.7	9.5	10.1	7.8	11.9	9.8	0.3	0
2217	29.08.12	08:00:00	AM	10.7	9.7	10.2	8.0	11.8	9.9	0.3	64.6
2218	29.08.12	09:00:00	AM	11.1	14.2	12.7	11.1	12.6	11.9	0.8	904.2
2219	29.08.12	10:00:00	AM	12.7	17.7	15.2	14.7	13.9	14.3	0.9	1184
2220	29.08.12	11:00:00	AM	15.0	20.1	17.6	18.7	15.4	17.0	0.5	1550
2221	29.08.12	12:00:00	PM	17.4	22.8	20.1	21.1	16.4	18.8	1.3	3788.9
2222	29.08.12	01:00:00	PM	20.0	25.1	22.6	24.9	18.1	21.5	1.0	3961.1
2223	29.08.12	02:00:00	PM	21.8	26.5	24.1	25.1	18.7	21.9	2.2	2755.6
2224	29.08.12	03:00:00	PM	22.0	21.7	21.9	20.1	18.3	19.2	2.6	1313.2
2225	29.08.12	04:00:00	PM	21.8	20.2	21.0	22.7	18.2	20.5	0.5	2497.2
2226	29.08.12	05:00:00	PM	20.4	19.1	19.8	19.9	17.9	18.9	0.9	914.9
2227	29.08.12	06:00:00	PM	19.0	17.1	18.0	17.5	17.3	17.4	0.7	516.7
2228	29.08.12	07:00:00	PM	17.8	15.8	16.8	16.0	16.7	16.3	0.4	107.6
2229	29.08.12	08:00:00	PM	17.0	14.7	15.9	15.0	16.1	15.6	0.3	10.8
2230	29.08.12	09:00:00	PM	16.3	13.7	15.0	13.8	15.7	14.7	0.3	0
2231	29.08.12	10:00:00	PM	15.8	13.0	14.4	12.7	15.2	13.9	0.4	0
2232	29.08.12	11:00:00	PM	15.2	13.2	14.2	12.9	15.0	13.9	0.2	0
2233	30.08.12	12:00:00	AM	15.0	13.0	14.0	12.1	14.8	13.5	0.5	0
2234	30.08.12	01:00:00	AM	14.2	13.1	13.7	12.6	14.6	13.6	0.0	0
2235	30.08.12	02:00:00	AM	14.2	13.1	13.7	12.2	14.5	13.4	0.3	0
2236	30.08.12	03:00:00	AM	14.1	13.1	13.6	12.4	14.4	13.4	0.2	0
2237	30.08.12	04:00:00	AM	13.8	12.9	13.4	12.3	14.3	13.3	0.1	0
2238	30.08.12	05:00:00	AM	13.8	12.4	13.1	12.0	14.1	13.1	0.0	0
2239	30.08.12	06:00:00	AM	13.5	11.9	12.7	11.3	13.9	12.6	0.1	0
2240	30.08.12	07:00:00	AM	13.5	11.6	12.5	10.8	13.8	12.3	0.2	0
2241	30.08.12	08:00:00	AM	13.4	11.7	12.5	10.9	13.6	12.3	0.3	172.2
2242	30.08.12	09:00:00	AM	13.4	12.9	13.1	12.4	13.7	13.0	0.1	226
2243	30.08.12	10:00:00	AM	13.3	13.4	13.3	12.9	13.8	13.4	0.0	0
2244	30.08.12	11:00:00	AM	12.6	12.9	12.7	12.7	13.7	13.2	-0.4	279.9
2245	30.08.12	12:00:00	PM	12.7	13.7	13.2	13.9	13.8	13.9	-0.7	538.2
2246	30.08.12	01:00:00	PM	13.1	14.2	13.7	14.7	14.0	14.4	-0.7	592
2247	30.08.12	02:00:00	PM	13.5	14.4	13.9	14.9	14.1	14.5	-0.6	193.8
2248	30.08.12	03:00:00	PM	13.6	13.8	13.7	14.2	14.2	14.2	-0.6	667.4
2249	30.08.12	04:00:00	PM	13.8	14.1	13.9	14.6	14.3	14.5	-0.5	0

2250	30.08.12	05:00:00	PM	13.5	13.5	13.5	13.2	14.2	13.7	-0.2	21.5
2251	30.08.12	06:00:00	PM	12.8	12.7	12.7	12.5	14.0	13.3	-0.5	0
2252	30.08.12	07:00:00	PM	12.6	12.4	12.5	11.9	13.8	12.9	-0.4	0
2253	30.08.12	08:00:00	PM	12.7	12.6	12.6	11.9	13.8	12.8	-0.2	0
2254	30.08.12	09:00:00	PM	12.9	12.4	12.6	11.6	13.6	12.6	0.1	0
2255	30.08.12	10:00:00	PM	12.7	12.1	12.4	11.3	13.5	12.4	0.0	0
2256	30.08.12	11:00:00	PM	12.5	11.9	12.2	11.1	13.3	12.2	0.0	0
2257	31.08.12	12:00:00	AM	12.4	11.8	12.1	11.0	13.2	12.1	0.0	0
2258	31.08.12	01:00:00	AM	12.3	11.6	12.0	11.0	13.1	12.1	-0.1	0
2259	31.08.12	02:00:00	AM	12.1	11.5	11.8	11.0	13.0	12.0	-0.2	0
2260	31.08.12	03:00:00	AM	12.0	11.4	11.7	10.9	12.9	11.9	-0.2	0
2261	31.08.12	04:00:00	AM	11.8	11.2	11.5	10.7	12.7	11.7	-0.2	0
2262	31.08.12	05:00:00	AM	7.6	8.3	7.9	4.2	11.5	7.9	0.1	0
2263	31.08.12	06:00:00	AM	8.1	9.1	8.6	5.6	11.3	8.4	0.1	0
2264	31.08.12	07:00:00	AM	8.9	9.1	9.0	6.2	11.1	8.7	0.3	0
2265	31.08.12	08:00:00	AM	8.6	8.9	8.7	7.3	11.0	9.2	-0.4	0
2266	31.08.12	09:00:00	AM	8.3	8.9	8.6	7.8	10.8	9.3	-0.7	258.3
2267	31.08.12	10:00:00	AM	8.5	9.2	8.8	8.6	10.8	9.7	-0.9	441.3
2268	31.08.12	11:00:00	AM	8.7	9.3	9.0	8.9	10.8	9.9	-0.9	258.3
2269	31.08.12	12:00:00	PM	9.0	11.1	10.1	12.9	11.1	12.0	-2.0	1248.6
2270	31.08.12	01:00:00	PM	9.4	10.9	10.2	12.1	11.4	11.8	-1.6	839.6
2271	31.08.12	02:00:00	PM	9.6	10.1	9.8	10.6	11.4	11.0	-1.2	1033.3
2272	31.08.12	03:00:00	PM	9.6	10.1	9.8	11.1	11.5	11.3	-1.5	473.6
2273	31.08.12	04:00:00	PM	9.6	10.5	10.0	11.8	11.6	11.7	-1.7	1076.4
2274	31.08.12	05:00:00	PM	9.8	11.0	10.4	12.6	11.8	12.2	-1.8	516.7
2275	31.08.12	06:00:00	PM	10.0	10.4	10.2	11.2	11.8	11.5	-1.4	473.6
2276	31.08.12	07:00:00	PM	9.6	9.6	9.6	10.0	11.7	10.8	-1.3	43.1
2277	31.08.12	08:00:00	PM	9.5	9.4	9.4	9.5	11.5	10.5	-1.1	0
2278	31.08.12	09:00:00	PM	9.3	9.1	9.2	9.0	11.4	10.2	-1.0	0
2279	31.08.12	10:00:00	PM	8.5	8.5	8.5	8.1	11.1	9.6	-1.1	0
2280	31.08.12	11:00:00	PM	8.0	8.5	8.2	7.9	10.9	9.4	-1.2	0
2281	01.09.12	12:00:00	AM	8.1	8.6	8.3	8.2	10.8	9.5	-1.2	0
2282	01.09.12	01:00:00	AM	8.0	8.4	8.2	8.2	10.7	9.4	-1.2	0
2283	01.09.12	02:00:00	AM	7.8	8.1	7.9	8.0	10.6	9.3	-1.3	0
2284	01.09.12	03:00:00	AM	7.5	7.9	7.7	7.8	10.4	9.1	-1.4	0
2285	01.09.12	04:00:00	AM	7.0	7.6	7.3	7.5	10.3	8.9	-1.6	0
2286	01.09.12	05:00:00	AM	6.8	7.5	7.1	7.3	10.1	8.7	-1.5	0
2287	01.09.12	06:00:00	AM	6.7	7.5	7.1	7.1	10.0	8.5	-1.4	0
2288	01.09.12	07:00:00	AM	6.7	7.6	7.1	7.0	9.9	8.4	-1.3	0
2289	01.09.12	08:00:00	AM	6.6	7.8	7.2	7.4	9.8	8.6	-1.4	387.5
2290	01.09.12	09:00:00	AM	6.6	7.9	7.2	8.0	9.8	8.9	-1.6	226
2291	01.09.12	10:00:00	AM	6.9	8.9	7.9	9.7	9.9	9.8	-1.9	925.7
2292	01.09.12	11:00:00	AM	7.4	9.6	8.5	10.9	10.2	10.6	-2.1	882.6
2293	01.09.12	12:00:00	PM	8.0	10.7	9.4	13.1	10.6	11.8	-2.4	1808.3
2294	01.09.12	01:00:00	PM	8.8	10.9	9.9	13.0	10.9	12.0	-2.1	1302.4
2295	01.09.12	02:00:00	PM	9.1	10.5	9.8	11.8	11.1	11.5	-1.7	387.5
2296	01.09.12	03:00:00	PM	9.2	10.7	10.0	12.2	11.3	11.8	-1.8	613.5
2297	01.09.12	04:00:00	PM	9.3	10.7	10.0	11.8	11.4	11.6	-1.7	1141
2298	01.09.12	05:00:00	PM	9.6	11.4	10.5	13.0	11.6	12.3	-1.8	990.3
2299	01.09.12	06:00:00	PM	10.1	11.5	10.8	13.0	11.8	12.4	-1.6	914.9
2300	01.09.12	07:00:00	PM	10.0	10.6	10.3	11.2	11.8	11.5	-1.3	10.8
2301	01.09.12	08:00:00	PM	9.7	9.3	9.5	9.0	11.6	10.3	-0.8	0
2302	01.09.12	09:00:00	PM	9.5	8.8	9.1	7.9	11.2	9.6	-0.4	0
2303	01.09.12	10:00:00	PM	9.2	8.5	8.8	7.5	11.0	9.3	-0.4	0
2304	01.09.12	11:00:00	PM	9.1	7.7	8.4	6.2	10.7	8.5	-0.1	0
2305	02.09.12	12:00:00	AM	8.9	7.0	7.9	5.2	10.4	7.8	0.1	0
2306	02.09.12	01:00:00	AM	8.4	6.2	7.3	4.4	10.0	7.2	0.1	0
2307	02.09.12	02:00:00	AM	7.8	5.8	6.8	3.9	9.7	6.8	0.0	0
2308	02.09.12	03:00:00	AM	7.3	5.6	6.4	3.6	9.4	6.5	-0.1	0
2309	02.09.12	04:00:00	AM	7.0	5.5	6.2	3.4	9.1	6.2	0.0	0
2310	02.09.12	05:00:00	AM	6.8	5.1	6.0	3.0	8.8	5.9	0.0	0
2311	02.09.12	06:00:00	AM	6.4	4.6	5.5	2.7	8.6	5.7	-0.2	0
2312	02.09.12	07:00:00	AM	5.9	4.4	5.1	2.6	8.3	5.5	-0.3	0
2313	02.09.12	08:00:00	AM	5.7	5.6	5.6	4.2	8.2	6.2	-0.6	581.3
2314	02.09.12	09:00:00	AM	5.8	7.1	6.4	6.0	8.4	7.2	-0.8	452.1
2315	02.09.12	10:00:00	AM	6.3	10.4	8.3	10.1	8.9	9.5	-1.2	1463.9
2316	02.09.12	11:00:00	AM	7.8	12.5	10.1	13.3	9.6	11.4	-1.3	1377.8
2317	02.09.12	12:00:00	PM	10.6	14.4	12.5	13.8	10.5	12.2	0.3	2927.8
2318	02.09.12	01:00:00	PM	13.3	16.3	14.8	17.0	11.8	14.4	0.4	1808.3
2319	02.09.12	02:00:00	PM	14.7	18.5	16.6	19.8	13.1	16.4	0.2	2411.1
2320	02.09.12	03:00:00	PM	15.4	17.1	16.2	18.5	13.9	16.2	0.0	1894.5
2321	02.09.12	04:00:00	PM	14.8	16.0	15.4	16.8	14.2	15.5	-0.1	861.1
2322	02.09.12	05:00:00	PM	14.3	15.7	15.0	16.7	14.3	15.5	-0.5	807.3
2323	02.09.12	06:00:00	PM	14.1	15.1	14.6	15.8	14.3	15.0	-0.4	775
2324	02.09.12	07:00:00	PM	13.9	14.4	14.2	14.7	14.2	14.5	-0.3	322.9
2325	02.09.12	08:00:00	PM	13.6	12.7	13.1	11.6	13.8	12.7	0.4	0
2326	02.09.12	09:00:00	PM	13.1	10.7	11.9	9.3	13.3	11.3	0.6	0
2327	02.09.12	10:00:00	PM	12.3	9.8	11.0	7.9	12.8	10.3	0.7	0
2328	02.09.12	11:00:00	PM	11.6	9.0	10.3	7.0	12.2	9.6	0.7	0
2329	03.09.12	12:00:00	AM	10.7	8.3	9.5	6.2	11.7	8.9	0.6	0
2330	03.09.12	01:00:00	AM	9.9	7.7	8.8	5.6	11.3	8.4	0.3	0
2331	03.09.12	02:00:00	AM	9.1	7.3	8.2	5.1	10.9	8.0	0.1	0
2332	03.09.12	03:00:00	AM	8.7	7.2	7.9	5.0	10.6	7.8	0.1	0
2333	03.09.12	04:00:00	AM	8.4	6.8	7.6	4.5	10.3	7.4	0.2	0
2334	03.09.12	05:00:00	AM	8.0	6.4	7.2	4.2	10.0	7.1	0.1	0
2335	03.09.12	06:00:00	AM	7.8	6.2	7.0	4.1	9.7	6.9	0.1	0
2336	03.09.12	07:00:00	AM	7.5	6.1	6.8	4.0	9.4	6.7	0.1	0
2337	03.09.12	08:00:00	AM	7.2	6.3	6.7	4.2	9.2	6.7	0.0	150.7
2338	03.09.12	09:00:00	AM	7.1	8.8	7.9	7.5	9.4	8.4	-0.5	1054.9
2339	03.09.12	10:00:00	AM	8.0	12.6	10.3	11.1	10.0	10.6	-0.3	1162.5
2340	03.09.12	11:00:00	AM	10.4	15.9	13.1	14.3	10.8	12.6	0.5	1377.8
2341	03.09.12	12:00:00	PM	13.2	17.6	15.4	17.5	11.9	14.7	0.7	2755.6
2342	03.09.12	01:00:00	PM	16.5	18.5	17.5	18.8	13.4	16.1	1.4	1980.6
2343	03.09.12	02:00:00	PM	16.4	18.4	17.4	18.9	14.3	16.6	0.8	1550
2344	03.09.12	03:00:00	PM	16.3	18.1	17.2	18.8	14.9	16.9	0.4	1980.6
2345	03.09.12	04:00:00	PM	15.9	17.5	16.7	18.5	15.2	16.9	-0.2	2583.4
2346	03.09.12	05:00:00	PM	15.5	16.8	16.1	17.7	15.2	16.4	-0.3	1377.8
2347	03.09.12	06:00:00	PM	15.2	15.8	15.5	16.3	15.1	15.7	-0.2	656.6

2348	03.09.12	07:00:00	PM	14.6	15.0	14.8	15.1	14.9	15.0	-0.2	236.8
2349	03.09.12	08:00:00	PM	13.8	14.0	13.9	13.5	14.6	14.0	-0.1	10.8
2350	03.09.12	09:00:00	PM	13.4	13.5	13.4	12.6	14.3	13.5	0.0	0
2351	03.09.12	10:00:00	PM	13.2	12.4	12.8	10.9	14.0	12.5	0.3	0
2352	03.09.12	11:00:00	PM	13.0	11.2	12.1	9.5	13.6	11.5	0.6	0
2353	04.09.12	12:00:00	AM	12.5	10.5	11.5	8.7	13.1	10.9	0.6	0
2354	04.09.12	01:00:00	AM	12.1	9.9	11.0	8.0	12.7	10.3	0.7	0
2355	04.09.12	02:00:00	AM	11.6	9.4	10.5	7.5	12.3	9.9	0.6	0
2356	04.09.12	03:00:00	AM	10.9	8.9	9.9	7.0	11.9	9.4	0.5	0
2357	04.09.12	04:00:00	AM	10.3	8.4	9.3	6.4	11.5	8.9	0.4	0
2358	04.09.12	05:00:00	AM	9.6	7.9	8.7	6.0	11.2	8.6	0.1	0
2359	04.09.12	06:00:00	AM	9.1	7.6	8.3	5.6	10.8	8.2	0.1	0
2360	04.09.12	07:00:00	AM	8.8	7.4	8.1	5.5	10.6	8.0	0.1	0
2361	04.09.12	08:00:00	AM	8.7	7.5	8.1	5.8	10.4	8.1	0.0	86.1
2362	04.09.12	09:00:00	AM	8.7	10.2	9.4	7.8	10.5	9.1	0.3	667.4
2363	04.09.12	10:00:00	AM	9.8	15.0	12.4	11.9	11.2	11.6	0.8	1205.6
2364	04.09.12	11:00:00	AM	12.9	18.0	15.5	15.5	12.2	13.8	1.6	1722.2
2365	04.09.12	12:00:00	PM	16.0	20.4	18.2	19.1	13.4	16.2	2.0	2755.6
2366	04.09.12	01:00:00	PM	16.6	18.9	17.8	18.7	14.3	16.5	1.2	1377.8
2367	04.09.12	02:00:00	PM	18.7	22.0	20.3	22.3	15.3	18.8	1.5	2152.8
2368	04.09.12	03:00:00	PM	19.9	19.2	19.6	19.1	15.7	17.4	2.2	1808.3
2369	04.09.12	04:00:00	PM	18.8	18.4	18.6	19.6	15.9	17.7	0.9	1550
2370	04.09.12	05:00:00	PM	17.7	18.1	17.9	19.3	16.0	17.6	0.3	2066.7
2371	04.09.12	06:00:00	PM	16.9	17.6	17.2	17.7	16.0	16.9	0.4	645.8
2372	04.09.12	07:00:00	PM	16.0	16.3	16.1	16.2	15.9	16.0	0.1	129.2
2373	04.09.12	08:00:00	PM	15.5	15.4	15.4	14.5	15.6	15.0	0.4	0
2374	04.09.12	09:00:00	PM	15.1	13.7	14.4	12.2	15.1	13.6	0.7	0
2375	04.09.12	10:00:00	PM	14.4	12.4	13.4	10.8	14.5	12.7	0.7	0
2376	04.09.12	11:00:00	PM	13.9	11.4	12.7	9.8	13.8	11.8	0.9	0
2377	05.09.12	12:00:00	AM	13.3	10.7	12.0	8.9	13.4	11.1	0.8	0
2378	05.09.12	01:00:00	AM	12.5	10.0	11.2	8.2	12.9	10.5	0.7	0
2379	05.09.12	02:00:00	AM	11.6	9.4	10.5	7.5	12.4	9.9	0.6	0
2380	05.09.12	03:00:00	AM	10.9	8.9	9.9	7.0	12.0	9.5	0.4	0
2381	05.09.12	04:00:00	AM	10.5	8.6	9.5	6.6	11.6	9.1	0.4	0
2382	05.09.12	05:00:00	AM	10.1	8.3	9.2	6.4	11.3	8.9	0.3	0
2383	05.09.12	06:00:00	AM	9.8	8.0	8.9	6.1	11.0	8.6	0.3	0
2384	05.09.12	07:00:00	AM	9.5	7.8	8.6	5.9	10.8	8.4	0.3	0
2385	05.09.12	08:00:00	AM	9.4	8.0	8.7	6.3	10.7	8.5	0.2	86.1
2386	05.09.12	09:00:00	AM	9.4	11.3	10.4	10.0	11.0	10.5	-0.1	818.1
2387	05.09.12	10:00:00	AM	10.6	15.1	12.8	13.7	11.7	12.7	0.1	1377.8
2388	05.09.12	11:00:00	AM	12.3	15.6	13.9	14.9	12.5	13.7	0.2	1270.1
2389	05.09.12	12:00:00	PM	13.8	17.0	15.4	17.1	13.3	15.2	0.2	1205.6
2390	05.09.12	01:00:00	PM	14.9	18.2	16.6	19.4	14.0	16.7	-0.1	2325
2391	05.09.12	02:00:00	PM	16.8	19.4	18.1	20.2	14.7	17.5	0.6	1894.5
2392	05.09.12	03:00:00	PM	17.6	19.3	18.4	20.0	15.4	17.7	0.7	2152.8
2393	05.09.12	04:00:00	PM	17.0	18.0	17.5	18.4	15.6	17.0	0.5	581.3
2394	05.09.12	05:00:00	PM	16.5	17.8	17.1	18.8	15.7	17.2	-0.1	1033.3
2395	05.09.12	06:00:00	PM	16.2	17.1	16.7	17.5	15.8	16.6	0.0	322.9
2396	05.09.12	07:00:00	PM	15.4	15.7	15.5	15.7	15.5	15.6	0.0	107.6
2397	05.09.12	08:00:00	PM	14.8	14.6	14.7	14.1	15.2	14.7	0.0	0
2398	05.09.12	09:00:00	PM	14.4	13.2	13.8	12.1	14.8	13.5	0.3	0
2399	05.09.12	10:00:00	PM	13.8	12.0	12.9	11.0	14.2	12.6	0.2	0
2400	05.09.12	11:00:00	PM	13.4	11.3	12.3	10.1	13.8	11.9	0.4	0
2401	06.09.12	12:00:00	AM	12.9	10.7	11.8	9.5	13.4	11.4	0.4	0
2402	06.09.12	01:00:00	AM	12.5	10.5	11.5	9.2	13.0	11.1	0.4	0
2403	06.09.12	02:00:00	AM	12.2	10.0	11.1	8.4	12.7	10.5	0.6	0
2404	06.09.12	03:00:00	AM	11.8	9.4	10.6	7.7	12.2	9.9	0.7	0
2405	06.09.12	04:00:00	AM	11.1	8.8	10.0	7.1	11.8	9.4	0.5	0
2406	06.09.12	05:00:00	AM	10.6	8.3	9.4	6.5	11.4	9.0	0.5	0
2407	06.09.12	06:00:00	AM	10.0	7.8	8.9	6.0	11.1	8.6	0.3	0
2408	06.09.12	07:00:00	AM	9.7	7.5	8.6	5.7	10.8	8.3	0.3	0
2409	06.09.12	08:00:00	AM	9.6	7.7	8.6	6.1	10.7	8.4	0.3	107.6
2410	06.09.12	09:00:00	AM	9.6	10.5	10.0	8.2	10.9	9.6	0.4	624.3
2411	06.09.12	10:00:00	AM	10.4	15.5	12.9	12.2	11.8	12.0	0.9	1194.8
2412	06.09.12	11:00:00	AM	12.4	17.3	14.8	15.8	12.8	14.3	0.6	1097.9
2413	06.09.12	12:00:00	PM	14.0	17.1	15.6	16.8	13.6	15.2	0.4	4477.8
2414	06.09.12	01:00:00	PM	15.8	19.1	17.4	19.9	14.5	17.2	0.2	2755.6
2415	06.09.12	02:00:00	PM	17.8	21.1	19.4	21.8	15.3	18.5	0.9	1377.8
2416	06.09.12	03:00:00	PM	19.9	19.3	19.6	19.6	15.8	17.7	1.9	1248.6
2417	06.09.12	04:00:00	PM	20.0	18.0	19.0	20.0	15.9	17.9	1.1	1980.6
2418	06.09.12	05:00:00	PM	18.6	16.9	17.8	18.3	15.8	17.0	0.7	1141
2419	06.09.12	06:00:00	PM	17.4	15.7	16.5	16.1	15.6	15.9	0.7	366
2420	06.09.12	07:00:00	PM	17.0	14.9	15.9	14.9	15.3	15.1	0.9	150.7
2421	06.09.12	08:00:00	PM	16.1	13.4	14.8	12.6	14.8	13.7	1.1	0
2422	06.09.12	09:00:00	PM	15.2	11.7	13.5	10.8	14.1	12.5	1.0	0
2423	06.09.12	10:00:00	PM	14.0	10.7	12.3	9.6	13.5	11.5	0.8	0
2424	06.09.12	11:00:00	PM	12.9	9.8	11.3	8.5	12.9	10.7	0.6	0
2425	07.09.12	12:00:00	AM	11.9	9.2	10.5	7.8	12.4	10.1	0.5	0
2426	07.09.12	01:00:00	AM	11.1	8.6	9.9	7.0	11.9	9.4	0.4	0
2427	07.09.12	02:00:00	AM	10.4	8.1	9.2	6.4	11.4	8.9	0.3	0
2428	07.09.12	03:00:00	AM	9.8	7.7	8.7	5.9	11.1	8.5	0.2	0
2429	07.09.12	04:00:00	AM	9.5	7.6	8.5	5.9	10.8	8.4	0.2	0
2430	07.09.12	05:00:00	AM	9.5	7.5	8.5	5.6	10.7	8.1	0.4	0
2431	07.09.12	06:00:00	AM	9.2	7.2	8.2	5.1	10.4	7.7	0.4	0
2432	07.09.12	07:00:00	AM	8.9	7.6	8.2	6.3	10.3	8.3	0.0	0
2433	07.09.12	08:00:00	AM	9.0	8.1	8.5	6.5	10.4	8.4	0.1	107.6
2434	07.09.12	09:00:00	AM	9.2	10.6	9.9	8.0	10.7	9.3	0.5	602.8
2435	07.09.12	10:00:00	AM	10.4	16.0	13.2	12.1	11.7	11.9	1.3	1162.5
2436	07.09.12	11:00:00	AM	13.0	18.8	15.9	15.5	13.0	14.2	1.7	1076.4
2437	07.09.12	12:00:00	PM	16.1	21.0	18.6	18.3	14.0	16.2	2.4	2238.9
2438	07.09.12	01:00:00	PM	19.3	20.3	19.8	22.4	15.0	18.7	1.1	3272.2
2439	07.09.12	02:00:00	PM	21.4	22.0	21.7	22.1	15.6	18.9	2.8	904.2
2440	07.09.12	03:00:00	PM	22.2	18.5	20.4	17.4	15.8	16.6	3.8	441.3
2441	07.09.12	04:00:00	PM	22.0	16.8	19.4	19.7	15.5	17.6	1.8	1550
2442	07.09.12	05:00:00	PM	20.3	16.9	18.6	17.5	15.5	16.5	2.1	538.2
2443	07.09.12	06:00:00	PM	19.2	15.7	17.4	15.7	15.3	15.5	2.0	96.9
2444	07.09.12	07:00:00	PM	17.8	13.9	15.9	13.4	14.7	14.0	1.8	43.1
2445	07.09.12	08:00:00	PM	16.5	12.4	14.5	11.4	14.1	12.8	1.7	0

2446	07.09.12	09:00:00	PM	15.4	11.1	13.3	10.0	13.5	11.7	1.5	0
2447	07.09.12	10:00:00	PM	14.2	10.2	12.2	8.9	12.9	10.9	1.3	0
2448	07.09.12	11:00:00	PM	13.0	9.5	11.2	8.0	12.4	10.2	1.0	0
2449	08.09.12	12:00:00	AM	12.1	9.0	10.5	7.4	11.9	9.6	0.9	0
2450	08.09.12	01:00:00	AM	11.4	8.6	10.0	7.0	11.6	9.3	0.7	0
2451	08.09.12	02:00:00	AM	10.9	8.3	9.6	6.6	11.2	8.9	0.7	0
2452	08.09.12	03:00:00	AM	10.6	8.0	9.3	6.3	10.9	8.6	0.7	0
2453	08.09.12	04:00:00	AM	10.2	7.8	9.0	6.0	10.7	8.3	0.7	0
2454	08.09.12	05:00:00	AM	9.8	7.5	8.6	5.7	10.5	8.1	0.6	0
2455	08.09.12	06:00:00	AM	9.5	7.2	8.3	5.3	10.2	7.8	0.6	0
2456	08.09.12	07:00:00	AM	9.2	6.9	8.0	5.0	10.0	7.5	0.5	0
2457	08.09.12	08:00:00	AM	8.9	7.0	7.9	5.3	9.9	7.6	0.3	21.5
2458	08.09.12	09:00:00	AM	8.8	9.8	9.3	7.3	10.1	8.7	0.6	592
2459	08.09.12	10:00:00	AM	9.9	16.1	13.0	12.0	11.4	11.7	1.3	1141
2460	08.09.12	11:00:00	AM	13.0	19.1	16.0	15.3	12.9	14.1	2.0	1377.8
2461	08.09.12	12:00:00	PM	16.7	21.5	19.1	18.4	14.0	16.2	2.9	2411.1
2462	08.09.12	01:00:00	PM	20.1	20.7	20.4	23.1	15.1	19.1	1.3	3272.2
2463	08.09.12	02:00:00	PM	22.2	22.4	22.3	22.9	15.6	19.2	3.1	1130.2
2464	08.09.12	03:00:00	PM	23.4	19.4	21.4	18.2	15.8	17.0	4.4	419.8
2465	08.09.12	04:00:00	PM	22.9	17.9	20.4	20.4	15.6	18.0	2.4	1377.8
2466	08.09.12	05:00:00	PM	21.5	17.9	19.7	18.2	15.6	16.9	2.8	473.6
2467	08.09.12	06:00:00	PM	20.3	16.6	18.5	16.6	15.4	16.0	2.5	96.9
2468	08.09.12	07:00:00	PM	19.2	14.8	17.0	14.4	14.9	14.7	2.3	64.6
2469	08.09.12	08:00:00	PM	17.9	13.3	15.6	12.5	14.3	13.4	2.2	0
2470	08.09.12	09:00:00	PM	16.3	11.8	14.1	10.9	13.8	12.3	1.7	0
2471	08.09.12	10:00:00	PM	15.0	11.0	13.0	10.0	13.3	11.6	1.4	0
2472	08.09.12	11:00:00	PM	13.9	10.4	12.1	9.1	12.8	10.9	1.2	0
2473	09.09.12	12:00:00	AM	13.1	9.8	11.4	8.5	12.3	10.4	1.0	0
2474	09.09.12	01:00:00	AM	12.7	10.1	11.4	9.0	12.2	10.6	0.8	0
2475	09.09.12	02:00:00	AM	12.5	10.3	11.4	8.9	12.1	10.5	0.9	0
2476	09.09.12	03:00:00	AM	12.2	10.1	11.1	9.0	11.9	10.4	0.7	0
2477	09.09.12	04:00:00	AM	12.1	10.3	11.2	9.3	11.9	10.6	0.6	0
2478	09.09.12	05:00:00	AM	12.1	10.9	11.5	10.0	12.0	11.0	0.5	0
2479	09.09.12	06:00:00	AM	12.1	11.0	11.6	10.0	12.1	11.0	0.5	0
2480	09.09.12	07:00:00	AM	12.1	11.1	11.6	10.2	12.1	11.1	0.5	0
2481	09.09.12	08:00:00	AM	12.1	11.3	11.7	10.3	12.1	11.2	0.5	183
2482	09.09.12	09:00:00	AM	12.2	13.8	13.0	11.9	12.4	12.2	0.8	968.8
2483	09.09.12	10:00:00	AM	13.6	17.9	15.7	15.0	13.5	14.2	1.5	1097.9
2484	09.09.12	11:00:00	AM	15.9	20.8	18.3	17.4	14.6	16.0	2.3	1377.8
2485	09.09.12	12:00:00	PM	18.0	22.2	20.1	19.3	15.5	17.4	2.8	2238.9
2486	09.09.12	01:00:00	PM	19.9	21.1	20.5	22.8	16.1	19.5	1.0	3100
2487	09.09.12	02:00:00	PM	21.3	22.2	21.8	22.5	16.5	19.5	2.2	1097.9
2488	09.09.12	03:00:00	PM	22.0	19.2	20.6	18.2	16.4	17.3	3.2	527.4
2489	09.09.12	04:00:00	PM	21.7	17.6	19.6	19.8	16.1	17.9	1.7	1722.2
2490	09.09.12	05:00:00	PM	20.2	17.3	18.8	18.0	16.0	17.0	1.8	1291.7
2491	09.09.12	06:00:00	PM	19.6	17.8	18.7	18.5	16.2	17.4	1.3	559.7
2492	09.09.12	07:00:00	PM	18.8	16.8	17.8	16.7	16.0	16.3	1.5	172.2
2493	09.09.12	08:00:00	PM	18.1	16.0	17.0	16.0	15.7	15.8	1.2	0
2494	09.09.12	09:00:00	PM	17.3	14.2	15.8	13.7	15.1	14.4	1.4	0
2495	09.09.12	10:00:00	PM	16.3	12.9	14.6	12.1	14.4	13.3	1.3	0
2496	09.09.12	11:00:00	PM	15.5	12.5	14.0	11.6	14.1	12.9	1.1	0
2497	10.09.12	12:00:00	AM	15.0	12.2	13.6	11.2	13.8	12.5	1.1	0
2498	10.09.12	01:00:00	AM	14.6	12.0	13.3	10.9	13.6	12.3	1.1	0
2499	10.09.12	02:00:00	AM	14.4	11.6	13.0	10.4	13.4	11.9	1.2	0
2500	10.09.12	03:00:00	AM	13.9	10.5	12.2	9.0	12.7	10.8	1.4	0
2501	10.09.12	04:00:00	AM	13.4	9.6	11.5	8.2	12.2	10.2	1.3	0
2502	10.09.12	05:00:00	AM	12.6	9.1	10.8	7.7	11.8	9.8	1.1	0
2503	10.09.12	06:00:00	AM	11.9	8.7	10.3	7.3	11.5	9.4	0.9	0
2504	10.09.12	07:00:00	AM	11.3	8.3	9.8	7.0	11.2	9.1	0.7	0
2505	10.09.12	08:00:00	AM	11.0	8.4	9.7	7.2	11.0	9.1	0.6	64.6
2506	10.09.12	09:00:00	AM	10.9	11.4	11.2	9.5	11.5	10.5	0.7	764.2
2507	10.09.12	10:00:00	AM	11.7	16.9	14.3	13.8	12.9	13.4	0.9	1248.6
2508	10.09.12	11:00:00	AM	14.3	19.8	17.0	16.5	14.1	15.3	1.7	1377.8
2509	10.09.12	12:00:00	PM	16.8	21.4	19.1	18.5	15.2	16.9	2.2	2152.8
2510	10.09.12	01:00:00	PM	19.6	20.8	20.2	22.8	15.9	19.3	0.9	3100
2511	10.09.12	02:00:00	PM	21.3	22.6	22.0	22.9	16.4	19.7	2.3	1722.2
2512	10.09.12	03:00:00	PM	21.7	19.5	20.6	18.7	16.3	17.5	3.0	731.9
2513	10.09.12	04:00:00	PM	21.2	17.6	19.4	19.9	16.0	17.9	1.4	1227.1
2514	10.09.12	05:00:00	PM	19.9	17.8	18.9	18.9	16.1	17.5	1.3	1011.8
2515	10.09.12	06:00:00	PM	19.2	17.2	18.2	17.6	16.0	16.8	1.4	430.6
2516	10.09.12	07:00:00	PM	18.3	15.7	17.0	15.6	15.4	15.5	1.5	183
2517	10.09.12	08:00:00	PM	17.3	13.7	15.5	12.9	14.6	13.7	1.7	0
2518	10.09.12	09:00:00	PM	16.0	11.9	14.0	11.1	13.8	12.5	1.5	0
2519	10.09.12	10:00:00	PM	14.8	11.0	12.9	10.0	13.3	11.6	1.3	0
2520	10.09.12	11:00:00	PM	14.2	10.9	12.6	10.1	13.1	11.6	1.0	0
2521	11.09.12	12:00:00	AM	13.8	10.7	12.2	9.4	12.8	11.1	1.2	0
2522	11.09.12	01:00:00	AM	13.3	9.9	11.6	8.5	12.2	10.3	1.2	0
2523	11.09.12	02:00:00	AM	12.6	9.4	11.0	8.1	11.9	10.0	1.0	0
2524	11.09.12	03:00:00	AM	12.1	9.2	10.6	8.0	11.7	9.9	0.8	0
2525	11.09.12	04:00:00	AM	11.7	9.1	10.4	7.9	11.5	9.7	0.7	0
2526	11.09.12	05:00:00	AM	11.4	9.1	10.3	7.8	11.3	9.6	0.7	0
2527	11.09.12	06:00:00	AM	11.2	9.5	10.4	8.3	11.4	9.9	0.5	0
2528	11.09.12	07:00:00	AM	10.9	9.3	10.1	7.9	11.3	9.6	0.5	0
2529	11.09.12	08:00:00	AM	10.9	9.2	10.1	7.9	11.2	9.6	0.5	215.3
2530	11.09.12	09:00:00	AM	10.8	11.0	10.9	9.6	11.7	10.6	0.3	473.6
2531	11.09.12	10:00:00	AM	12.0	16.5	14.3	13.8	13.0	13.4	0.9	1097.9
2532	11.09.12	11:00:00	AM	14.2	19.4	16.8	16.5	14.2	15.4	1.4	1636.1
2533	11.09.12	12:00:00	PM	16.6	21.0	18.8	17.7	15.2	16.4	2.4	1722.2
2534	11.09.12	01:00:00	PM	19.4	20.3	19.9	21.6	15.8	18.7	1.2	3100
2535	11.09.12	02:00:00	PM	19.8	19.9	19.9	20.9	16.1	18.5	1.3	2755.6
2536	11.09.12	03:00:00	PM	19.3	19.8	19.5	21.1	16.8	18.9	0.6	1980.6
2537	11.09.12	04:00:00	PM	19.1	19.6	19.3	20.9	16.9	18.9	0.4	1184
2538	11.09.12	05:00:00	PM	18.3	17.9	18.1	18.4	16.4	17.4	0.7	699.7
2539	11.09.12	06:00:00	PM	17.8	16.7	17.2	17.0	16.0	16.5	0.7	215.3
2540	11.09.12	07:00:00	PM	17.2	15.9	16.5	15.9	15.7	15.8	0.8	118.4
2541	11.09.12	08:00:00	PM	16.6	15.2	15.9	15.0	15.4	15.2	0.7	0
2542	11.09.12	09:00:00	PM	16.0	14.2	15.1	13.9	14.9	14.4	0.7	0
2543	11.09.12	10:00:00	PM	15.7	13.6	14.6	13.1	14.5	13.8	0.8	0

2544	11.09.12	11:00:00	PM	15.1	12.7	13.9	12.2	14.1	13.2	0.7	0
2545	12.09.12	12:00:00	AM	14.6	12.7	13.7	12.1	14.0	13.1	0.6	0
2546	12.09.12	01:00:00	AM	14.3	13.1	13.7	12.6	14.0	13.3	0.4	0
2547	12.09.12	02:00:00	AM	14.2	13.2	13.7	12.7	13.9	13.3	0.4	0
2548	12.09.12	03:00:00	AM	14.0	13.3	13.7	12.9	13.9	13.4	0.2	0
2549	12.09.12	04:00:00	AM	13.7	13.2	13.4	13.1	13.8	13.5	0.0	0
2550	12.09.12	05:00:00	AM	13.6	13.1	13.3	12.9	13.8	13.3	0.0	0
2551	12.09.12	06:00:00	AM	13.5	12.7	13.1	12.7	13.7	13.2	-0.1	0
2552	12.09.12	07:00:00	AM	12.7	11.8	12.3	11.7	13.5	12.6	-0.3	0
2553	12.09.12	08:00:00	AM	11.6	10.7	11.2	10.5	12.9	11.7	-0.5	0
2554	12.09.12	09:00:00	AM	11.1	10.5	10.8	9.9	12.6	11.2	-0.4	21.5
2555	12.09.12	10:00:00	AM	10.4	10.1	10.2	9.6	12.3	10.9	-0.7	53.8
2556	12.09.12	11:00:00	AM	10.3	9.9	10.1	9.2	12.2	10.7	-0.6	150.7
2557	12.09.12	12:00:00	PM	10.5	9.8	10.1	9.3	12.0	10.6	-0.5	301.4
2558	12.09.12	01:00:00	PM	10.2	9.5	9.8	8.8	11.7	10.3	-0.4	236.8
2559	12.09.12	02:00:00	PM	10.3	9.8	10.0	9.1	11.6	10.4	-0.3	344.4
2560	12.09.12	03:00:00	PM	10.2	10.2	10.2	10.2	11.5	10.8	-0.7	828.8
2561	12.09.12	04:00:00	PM	10.1	10.6	10.3	11.0	11.6	11.3	-1.0	1076.4
2562	12.09.12	05:00:00	PM	10.2	10.5	10.3	10.8	11.7	11.3	-1.0	527.4
2563	12.09.12	06:00:00	PM	10.3	10.1	10.2	10.4	11.6	11.0	-0.8	549
2564	12.09.12	07:00:00	PM	10.2	9.6	9.9	9.4	11.5	10.5	-0.6	21.5
2565	12.09.12	08:00:00	PM	10.0	8.8	9.4	8.1	11.2	9.7	-0.3	0
2566	12.09.12	09:00:00	PM	9.7	8.3	9.0	7.2	10.8	9.0	0.0	0
2567	12.09.12	10:00:00	PM	9.2	8.1	8.6	7.3	10.7	9.0	-0.3	0
2568	12.09.12	11:00:00	PM	8.7	7.9	8.3	7.1	10.5	8.8	-0.5	0
2569	13.09.12	12:00:00	AM	8.6	7.8	8.2	6.7	10.2	8.4	-0.2	0
2570	13.09.12	01:00:00	AM	8.4	7.7	8.0	6.6	10.1	8.3	-0.3	0
2571	13.09.12	02:00:00	AM	8.1	7.5	7.8	6.5	9.9	8.2	-0.4	0
2572	13.09.12	03:00:00	AM	7.7	7.5	7.6	6.7	9.8	8.2	-0.6	0
2573	13.09.12	04:00:00	AM	7.6	7.2	7.4	6.4	9.6	8.0	-0.6	0
2574	13.09.12	05:00:00	AM	7.5	7.1	7.3	6.3	9.5	7.9	-0.6	0
2575	13.09.12	06:00:00	AM	7.2	6.8	7.0	6.0	9.3	7.6	-0.6	0
2576	13.09.12	07:00:00	AM	6.8	6.5	6.6	5.5	9.1	7.3	-0.6	0
2577	13.09.12	08:00:00	AM	6.4	6.4	6.4	5.5	9.0	7.2	-0.8	172.2
2578	13.09.12	09:00:00	AM	6.4	6.5	6.4	5.0	8.9	7.0	-0.5	753.5
2579	13.09.12	10:00:00	AM	6.6	8.5	7.5	9.1	9.1	9.1	-1.6	1334.7
2580	13.09.12	11:00:00	AM	7.3	10.3	8.8	11.9	9.7	10.8	-2.0	1722.2
2581	13.09.12	12:00:00	PM	8.3	11.5	9.9	13.8	10.3	12.1	-2.1	2238.9
2582	13.09.12	01:00:00	PM	10.4	12.4	11.4	16.4	11.0	13.7	-2.4	1270.1
2583	13.09.12	02:00:00	PM	12.2	13.8	13.0	17.0	11.9	14.5	-1.4	2583.4
2584	13.09.12	03:00:00	PM	12.9	13.6	13.2	16.0	12.6	14.3	-1.1	1636.1
2585	13.09.12	04:00:00	PM	13.3	12.4	12.8	15.5	12.8	14.1	-1.3	742.7
2586	13.09.12	05:00:00	PM	12.7	11.6	12.2	13.5	12.7	13.1	-0.9	968.8
2587	13.09.12	06:00:00	PM	11.5	10.3	10.9	10.6	12.3	11.4	-0.5	21.5
2588	13.09.12	07:00:00	PM	10.5	9.2	9.8	9.2	11.8	10.5	-0.7	139.9
2589	13.09.12	08:00:00	PM	9.7	8.6	9.1	8.1	11.4	9.8	-0.6	0
2590	13.09.12	09:00:00	PM	9.5	7.4	8.4	6.4	10.8	8.6	-0.2	0
2591	13.09.12	10:00:00	PM	9.2	6.5	7.8	5.2	10.4	7.8	0.0	0
2592	13.09.12	11:00:00	PM	8.7	5.7	7.2	4.4	9.8	7.1	0.1	0
2593	14.09.12	12:00:00	AM	8.0	5.0	6.5	3.8	9.3	6.5	0.0	0
2594	14.09.12	01:00:00	AM	7.5	4.7	6.1	3.4	9.0	6.2	-0.1	0
2595	14.09.12	02:00:00	AM	7.2	4.3	5.7	2.7	8.6	5.7	0.1	0
2596	14.09.12	03:00:00	AM	6.6	3.7	5.1	2.4	8.2	5.3	-0.2	0
2597	14.09.12	04:00:00	AM	5.8	3.2	4.5	2.2	7.8	5.0	-0.5	0
2598	14.09.12	05:00:00	AM	4.7	2.9	3.8	2.0	7.5	4.7	-0.9	0
2599	14.09.12	06:00:00	AM	3.9	2.7	3.3	1.8	7.2	4.5	-1.2	0
2600	14.09.12	07:00:00	AM	3.3	2.5	2.9	1.5	6.9	4.2	-1.3	0
2601	14.09.12	08:00:00	AM	3.3	2.5	2.9	1.4	6.7	4.1	-1.2	43.1
2602	14.09.12	09:00:00	AM	3.5	4.5	4.0	2.0	6.7	4.3	-0.3	495.1
2603	14.09.12	10:00:00	AM	4.6	9.0	6.8	3.7	7.4	5.5	1.3	1065.6
2604	14.09.12	11:00:00	AM	6.7	12.4	9.5	7.5	8.3	7.9	1.7	1313.2
2605	14.09.12	12:00:00	PM	10.0	14.3	12.1	8.8	9.5	9.1	3.0	871.9
2606	14.09.12	01:00:00	PM	13.0	13.3	13.1	14.8	10.7	12.8	0.3	2755.6
2607	14.09.12	02:00:00	PM	15.2	15.2	15.2	15.5	11.4	13.5	1.7	1550
2608	14.09.12	03:00:00	PM	16.3	13.1	14.7	11.4	11.9	11.7	3.0	279.9
2609	14.09.12	04:00:00	PM	16.1	11.1	13.6	12.1	11.9	12.0	1.6	193.8
2610	14.09.12	05:00:00	PM	14.7	11.0	12.9	10.3	11.7	11.0	1.9	226
2611	14.09.12	06:00:00	PM	13.5	10.1	11.8	8.8	11.4	10.1	1.7	0
2612	14.09.12	07:00:00	PM	12.5	8.5	10.5	7.1	10.9	9.0	1.5	86.1
2613	14.09.12	08:00:00	PM	11.3	7.8	9.6	6.3	10.5	8.4	1.2	0
2614	14.09.12	09:00:00	PM	10.4	6.6	8.5	4.9	10.0	7.4	1.0	0
2615	14.09.12	10:00:00	PM	9.3	5.8	7.5	4.1	9.6	6.8	0.7	0
2616	14.09.12	11:00:00	PM	8.3	5.2	6.8	3.5	9.1	6.3	0.5	0
2617	15.09.12	12:00:00	AM	7.5	4.8	6.2	3.0	8.6	5.8	0.3	0
2618	15.09.12	01:00:00	AM	6.8	4.5	5.6	2.6	8.3	5.5	0.2	0
2619	15.09.12	02:00:00	AM	6.2	4.2	5.2	2.3	8.0	5.1	0.0	0
2620	15.09.12	03:00:00	AM	5.7	3.8	4.7	2.0	7.7	4.8	-0.1	0
2621	15.09.12	04:00:00	AM	5.1	3.5	4.3	1.8	7.4	4.6	-0.3	0
2622	15.09.12	05:00:00	AM	4.7	3.3	4.0	1.4	7.2	4.3	-0.3	0
2623	15.09.12	06:00:00	AM	4.3	2.9	3.6	1.2	6.9	4.0	-0.4	0
2624	15.09.12	07:00:00	AM	4.0	2.7	3.4	1.3	6.7	4.0	-0.6	0
2625	15.09.12	08:00:00	AM	3.7	2.8	3.3	1.5	6.6	4.1	-0.8	0
2626	15.09.12	09:00:00	AM	3.5	5.3	4.4	2.4	6.7	4.5	-0.1	473.6
2627	15.09.12	10:00:00	AM	5.6	10.9	8.2	7.3	7.6	7.4	0.8	1334.7
2628	15.09.12	11:00:00	AM	8.7	13.9	11.3	11.0	8.7	9.9	1.5	602.8
2629	15.09.12	12:00:00	PM	11.1	14.5	12.8	11.1	9.5	10.3	2.5	409
2630	15.09.12	01:00:00	PM	14.1	14.4	14.3	16.3	10.4	13.3	0.9	2755.6
2631	15.09.12	02:00:00	PM	16.2	16.0	16.1	17.7	11.1	14.4	1.7	3100
2632	15.09.12	03:00:00	PM	15.7	15.1	15.4	16.1	11.7	13.9	1.4	1463.9
2633	15.09.12	04:00:00	PM	15.2	14.5	14.9	16.0	12.0	14.0	0.9	1044.1
2634	15.09.12	05:00:00	PM	14.7	14.2	14.5	15.7	12.3	14.0	0.5	1054.9
2635	15.09.12	06:00:00	PM	14.1	13.8	14.0	14.4	12.4	13.4	0.6	473.6
2636	15.09.12	07:00:00	PM	13.5	12.7	13.1	12.7	12.2	12.4	0.6	129.2
2637	15.09.12	08:00:00	PM	13.0	11.0	12.0	10.1	11.9	11.0	1.0	0
2638	15.09.12	09:00:00	PM	12.2	9.0	10.6	7.7	11.3	9.5	1.1	0
2639	15.09.12	10:00:00	PM	11.3	7.6	9.5	6.2	10.7	8.4	1.0	0
2640	15.09.12	11:00:00	PM	10.3	6.7	8.5	5.0	10.1	7.6	0.9	0
2641	16.09.12	12:00:00	AM	9.3	6.0	7.6	4.3	9.6	6.9	0.7	0

2642	16.09.12	01:00:00	AM	8.5	5.5	7.0	3.7	9.1	6.4	0.6	0
2643	16.09.12	02:00:00	AM	7.9	5.0	6.5	3.2	8.8	6.0	0.5	0
2644	16.09.12	03:00:00	AM	7.3	4.7	6.0	2.7	8.4	5.6	0.4	0
2645	16.09.12	04:00:00	AM	6.9	4.4	5.6	2.5	8.1	5.3	0.3	0
2646	16.09.12	05:00:00	AM	6.5	4.2	5.3	2.2	7.8	5.0	0.4	0
2647	16.09.12	06:00:00	AM	6.1	4.0	5.0	2.0	7.6	4.8	0.3	0
2648	16.09.12	07:00:00	AM	5.8	3.7	4.7	1.8	7.3	4.5	0.2	0
2649	16.09.12	08:00:00	AM	5.5	3.7	4.6	1.9	7.2	4.5	0.0	0
2650	16.09.12	09:00:00	AM	5.2	6.1	5.7	3.2	7.3	5.2	0.4	452.1
2651	16.09.12	10:00:00	AM	6.3	12.2	9.2	7.6	8.2	7.9	1.4	1001
2652	16.09.12	11:00:00	AM	9.3	15.9	12.6	11.1	9.4	10.3	2.3	1054.9
2653	16.09.12	12:00:00	PM	13.2	18.3	15.8	12.2	10.5	11.3	4.4	581.3
2654	16.09.12	01:00:00	PM	16.1	16.4	16.3	17.4	11.4	14.4	1.9	2755.6
2655	16.09.12	02:00:00	PM	17.7	17.7	17.7	17.5	11.9	14.7	3.0	1550
2656	16.09.12	03:00:00	PM	18.3	15.2	16.8	13.7	12.3	13.0	3.8	387.5
2657	16.09.12	04:00:00	PM	18.4	13.6	16.0	14.1	12.1	13.1	2.9	129.2
2658	16.09.12	05:00:00	PM	17.0	13.4	15.2	12.6	12.1	12.4	2.8	236.8
2659	16.09.12	06:00:00	PM	16.0	12.1	14.1	11.0	11.9	11.5	2.6	21.5
2660	16.09.12	07:00:00	PM	14.6	10.5	12.5	9.4	11.5	10.5	2.1	0
2661	16.09.12	08:00:00	PM	13.5	9.1	11.3	7.8	11.0	9.4	1.9	0
2662	16.09.12	09:00:00	PM	12.5	8.0	10.2	6.6	10.6	8.6	1.7	0
2663	16.09.12	10:00:00	PM	11.5	7.5	9.5	6.0	10.2	8.1	1.4	0
2664	16.09.12	11:00:00	PM	10.9	7.4	9.2	5.9	10.0	7.9	1.3	0
2665	17.09.12	12:00:00	AM	10.7	7.3	9.0	5.6	9.8	7.7	1.3	0
2666	17.09.12	01:00:00	AM	10.5	6.8	8.6	4.9	9.5	7.2	1.4	0
2667	17.09.12	02:00:00	AM	10.0	6.4	8.2	4.6	9.2	6.9	1.3	0
2668	17.09.12	03:00:00	AM	9.4	6.3	7.8	4.7	9.0	6.9	1.0	0
2669	17.09.12	04:00:00	AM	9.1	6.3	7.7	4.4	8.8	6.6	1.1	0
2670	17.09.12	05:00:00	AM	8.9	6.0	7.4	4.1	8.7	6.4	1.0	0
2671	17.09.12	06:00:00	AM	8.6	5.7	7.1	3.8	8.4	6.1	1.0	0
2672	17.09.12	07:00:00	AM	8.3	5.6	6.9	3.8	8.3	6.0	0.9	0
2673	17.09.12	08:00:00	AM	8.1	5.6	6.8	3.8	8.1	5.9	0.9	21.5
2674	17.09.12	09:00:00	AM	7.9	7.5	7.7	5.0	8.2	6.6	1.1	193.8
2675	17.09.12	10:00:00	AM	8.9	14.3	11.6	10.0	9.3	9.6	2.0	452.1
2676	17.09.12	11:00:00	AM	11.5	16.5	14.0	12.5	10.3	11.4	2.6	688.9
2677	17.09.12	12:00:00	PM	13.7	17.6	15.6	16.2	11.3	13.8	1.8	1894.5
2678	17.09.12	01:00:00	PM	16.0	17.6	16.8	19.8	12.3	16.0	0.7	2755.6
2679	17.09.12	02:00:00	PM	18.4	18.8	18.6	19.7	12.8	16.2	2.4	1722.2
2680	17.09.12	03:00:00	PM	18.8	16.7	17.8	16.4	13.2	14.8	3.0	1011.8
2681	17.09.12	04:00:00	PM	18.5	16.5	17.5	18.0	13.5	15.8	1.8	1237.9
2682	17.09.12	05:00:00	PM	17.7	16.8	17.2	17.9	13.8	15.8	1.4	1119.5
2683	17.09.12	06:00:00	PM	17.0	16.0	16.5	16.5	13.8	15.1	1.3	602.8
2684	17.09.12	07:00:00	PM	16.2	14.4	15.3	14.2	13.5	13.8	1.5	129.2
2685	17.09.12	08:00:00	PM	15.1	11.6	13.4	10.8	12.8	11.8	1.5	0
2686	17.09.12	09:00:00	PM	13.8	9.8	11.8	8.8	12.0	10.4	1.4	0
2687	17.09.12	10:00:00	PM	12.8	8.7	10.7	7.5	11.4	9.5	1.3	0
2688	17.09.12	11:00:00	PM	11.9	8.1	10.0	6.8	10.9	8.9	1.1	0
2689	18.09.12	12:00:00	AM	11.1	7.7	9.4	6.1	10.6	8.3	1.1	0
2690	18.09.12	01:00:00	AM	10.5	7.2	8.8	5.5	10.1	7.8	1.1	0
2691	18.09.12	02:00:00	AM	9.9	6.7	8.3	4.9	9.8	7.4	0.9	0
2692	18.09.12	03:00:00	AM	9.5	6.4	7.9	4.5	9.4	6.9	1.0	0
2693	18.09.12	04:00:00	AM	9.1	6.0	7.5	4.2	9.1	6.6	0.9	0
2694	18.09.12	05:00:00	AM	8.8	5.8	7.3	3.9	8.9	6.4	0.9	0
2695	18.09.12	06:00:00	AM	8.6	5.6	7.1	3.6	8.6	6.1	1.0	0
2696	18.09.12	07:00:00	AM	8.3	5.5	6.9	3.6	8.4	6.0	0.9	0
2697	18.09.12	08:00:00	AM	8.2	5.7	6.9	3.8	8.4	6.1	0.8	0
2698	18.09.12	09:00:00	AM	8.1	7.8	7.9	5.2	8.5	6.9	1.1	516.7
2699	18.09.12	10:00:00	AM	8.8	13.4	11.1	9.7	9.6	9.6	1.5	818.1
2700	18.09.12	11:00:00	AM	11.3	16.9	14.1	13.1	10.7	11.9	2.2	1141
2701	18.09.12	12:00:00	PM	14.1	18.7	16.4	14.2	11.8	13.0	3.4	1033.3
2702	18.09.12	01:00:00	PM	15.8	18.2	17.0	17.9	12.9	15.4	1.6	1980.6
2703	18.09.12	02:00:00	PM	15.9	17.8	16.8	18.2	13.5	15.8	1.0	1722.2
2704	18.09.12	03:00:00	PM	15.8	17.5	16.6	18.0	14.0	16.0	0.6	1377.8
2705	18.09.12	04:00:00	PM	15.5	16.1	15.8	16.0	13.9	15.0	0.8	452.1
2706	18.09.12	05:00:00	PM	15.1	15.1	15.1	14.9	13.7	14.3	0.8	193.8
2707	18.09.12	06:00:00	PM	14.6	13.9	14.3	13.7	13.5	13.6	0.7	86.1
2708	18.09.12	07:00:00	PM	14.1	13.1	13.6	12.6	13.2	12.9	0.7	0
2709	18.09.12	08:00:00	PM	13.8	12.3	13.0	11.6	12.8	12.2	0.8	0
2710	18.09.12	09:00:00	PM	13.4	11.7	12.5	10.8	12.5	11.7	0.9	0
2711	18.09.12	10:00:00	PM	13.0	11.3	12.2	10.6	12.3	11.4	0.7	0
2712	18.09.12	11:00:00	PM	12.7	11.1	11.9	10.4	12.1	11.2	0.7	0
2713	19.09.12	12:00:00	AM	12.3	11.1	11.7	10.5	12.0	11.2	0.5	0
2714	19.09.12	01:00:00	AM	11.3	10.7	11.0	10.2	11.8	11.0	0.0	0
2715	19.09.12	02:00:00	AM	10.8	10.3	10.6	9.8	11.6	10.7	-0.1	0
2716	19.09.12	03:00:00	AM	10.8	10.3	10.6	9.7	11.5	10.6	0.0	0
2717	19.09.12	04:00:00	AM	10.7	10.2	10.4	9.9	11.4	10.6	-0.2	0
2718	19.09.12	05:00:00	AM	10.5	10.2	10.3	9.8	11.3	10.6	-0.2	0
2719	19.09.12	06:00:00	AM	10.2	10.0	10.1	9.6	11.2	10.4	-0.3	0
2720	19.09.12	07:00:00	AM	10.3	10.0	10.1	9.4	11.1	10.3	-0.1	0
2721	19.09.12	08:00:00	AM	10.4	9.9	10.1	9.3	11.0	10.2	0.0	0
2722	19.09.12	09:00:00	AM	9.8	9.1	9.4	8.8	10.9	9.9	-0.4	139.9
2723	19.09.12	10:00:00	AM	9.7	9.4	9.5	9.4	10.8	10.1	-0.6	387.5
2724	19.09.12	11:00:00	AM	9.7	9.7	9.7	10.0	10.8	10.4	-0.7	828.8
2725	19.09.12	12:00:00	PM	9.7	10.5	10.1	11.3	10.9	11.1	-1.1	1151.7
2726	19.09.12	01:00:00	PM	10.0	11.4	10.7	13.0	11.3	12.2	-1.5	1377.8
2727	19.09.12	02:00:00	PM	10.3	12.1	11.2	14.1	11.6	12.9	-1.7	1463.9
2728	19.09.12	03:00:00	PM	10.7	12.1	11.4	14.1	11.9	13.0	-1.6	1377.8
2729	19.09.12	04:00:00	PM	11.1	11.7	11.4	13.6	12.1	12.8	-1.4	1313.2
2730	19.09.12	05:00:00	PM	11.4	11.9	11.7	13.5	12.2	12.8	-1.2	1248.6
2731	19.09.12	06:00:00	PM	11.1	11.0	11.1	12.4	12.2	12.3	-1.2	699.7
2732	19.09.12	07:00:00	PM	10.9	9.4	10.2	9.5	11.8	10.6	-0.5	0
2733	19.09.12	08:00:00	PM	10.8	7.8	9.3	7.0	11.2	9.1	0.2	0
2734	19.09.12	09:00:00	PM	9.7	6.5	8.1	5.3	10.7	8.0	0.1	0
2735	19.09.12	10:00:00	PM	8.2	5.9	7.0	4.4	10.1	7.2	-0.2	0
2736	19.09.12	11:00:00	PM	7.2	5.5	6.3	3.7	9.6	6.6	-0.3	0
2737	20.09.12	12:00:00	AM	6.6	4.8	5.7	2.8	9.2	6.0	-0.3	0
2738	20.09.12	01:00:00	AM	6.0	4.3	5.1	2.2	8.7	5.4	-0.3	0
2739	20.09.12	02:00:00	AM	5.2	3.7	4.5	2.0	8.3	5.1	-0.7	0

2740	20.09.12	03:00:00	AM	4.5	3.4	3.9	1.9	8.0	4.9	-1.0	0
2741	20.09.12	04:00:00	AM	4.1	3.0	3.6	1.5	7.6	4.6	-1.0	0
2742	20.09.12	05:00:00	AM	3.8	2.7	3.3	1.2	7.3	4.3	-1.0	0
2743	20.09.12	06:00:00	AM	3.7	2.3	3.0	1.0	7.0	4.0	-1.0	0
2744	20.09.12	07:00:00	AM	3.6	2.0	2.8	0.8	6.8	3.8	-1.0	0
2745	20.09.12	08:00:00	AM	3.6	1.8	2.7	0.7	6.6	3.6	-1.0	0
2746	20.09.12	09:00:00	AM	3.7	2.6	3.2	1.0	6.5	3.7	-0.6	785.8
2747	20.09.12	10:00:00	AM	3.8	6.8	5.3	2.7	6.7	4.7	0.6	1205.6
2748	20.09.12	11:00:00	AM	11.3	23.3	17.3	4.5	18.7	11.6	5.7	516.7
2749	20.09.12	12:00:00	PM	9.9	10.7	10.3	10.6	10.7	10.7	-0.4	0
2750	20.09.12	01:00:00	PM	10.7	12.0	11.3	11.8	10.9	11.4	0.0	0
2751	20.09.12	02:00:00	PM	17.3	17.7	17.5	17.9	17.7	17.8	-0.3	0
2752	20.09.12	03:00:00	PM	20.9	20.7	20.8	20.9	20.5	20.7	0.1	0
2753	20.09.12	04:00:00	PM	21.9	21.8	21.8	21.7	21.7	21.7	0.1	0
2754	20.09.12	05:00:00	PM	22.3	22.8	22.6	23.2	22.7	23.0	-0.4	10.8
2755	20.09.12	06:00:00	PM	22.4	23.0	22.7	23.1	22.9	23.0	-0.3	10.8
2756	20.09.12	07:00:00	PM	22.4	22.8	22.6	22.8	22.7	22.8	-0.1	0
2757	20.09.12	08:00:00	PM	22.2	22.6	22.4	22.2	22.5	22.4	0.0	0
2758	20.09.12	09:00:00	PM	21.9	21.9	21.9	21.6	21.7	21.6	0.2	0
2759	20.09.12	10:00:00	PM	21.9	21.8	21.8	21.7	21.6	21.6	0.2	0
2760	20.09.12	11:00:00	PM	21.8	21.7	21.7	21.7	21.6	21.6	0.1	0
2761	21.09.12	12:00:00	AM	21.7	21.7	21.7	21.7	21.6	21.6	0.0	0
2762	21.09.12	01:00:00	AM	21.7	21.6	21.6	21.7	21.6	21.6	0.0	0
2763	21.09.12	02:00:00	AM	21.6	21.5	21.5	21.6	21.5	21.5	0.0	0
2764	21.09.12	03:00:00	AM	21.5	21.5	21.5	21.6	21.5	21.5	0.0	0
2765	21.09.12	04:00:00	AM	21.4	21.4	21.4	21.6	21.4	21.5	-0.1	0
2766	21.09.12	05:00:00	AM	21.4	21.3	21.3	21.5	21.4	21.4	-0.1	0
2767	21.09.12	06:00:00	AM	21.3	21.3	21.3	21.5	21.4	21.4	-0.1	0
2768	21.09.12	07:00:00	AM	21.4	21.4	21.4	21.6	21.5	21.5	-0.1	0
2769	21.09.12	08:00:00	AM	21.4	21.4	21.4	21.6	21.5	21.5	-0.1	0
2770	21.09.12	09:00:00	AM	21.5	21.5	21.5	21.7	21.6	21.6	-0.1	53.8
2771	21.09.12	10:00:00	AM	25.2	25.4	25.3	24.8	25.9	25.4	0.0	1054.9

Chapter 5: Conclusion

Dispersal of spiders and protists (Chapter 2)

Regarding the second chapter, the high prey availability during the period of high insect attraction explains the increased abundance of *Agelena* spiders on top of and close to the clumps of pitchers. Also the behaviour of *Dolomedes fimbriatus* luring in or close to the pitchers for prey can be explained by the attraction pattern of *S. purpurea.* A similar behaviour like the one of *Dolomedes* with S. purpurea was already reported from the spider *Misumenopsis nepenthicola,* with *Nepenthes gracilis* (Chua and Lim 2012). The development of the prey stealing behaviour of *Sorex minutus* and *Dolomedes fimbriatus* might even have developed due to the mass abundance of *S. pupurea* in the European bogs.

By frequently entering and leaving various pitchers, *Agelena*, *Dolomedes* and *Sorex* add and disperse bacteria and protists throughout the meta-community of *S. purpurea* and thus are able to alter the inquiline community considerably. Also by delivering the important catabolising organisms for prey-digestion inside the pitchers the plant might profit from their presence, too.

Impact of *S. purpurea* invasion in Europe and future work

When really abundant in a site, *S. purpurea* might have a considerable impact to the whole bog ecosystem by competing with native plants for space, and catching big numbers of insects. For example in Les Tenasses, more than 500 plants (Fragnière 2012) can be found in the bog. Considering in this site an equal number of prey capture like in Champ Buet, the impact of *S. purpurea* might be truly detrimental for the whole ecosystem. Not only will it affect local arthropod biodiversity due to prey catching, it will also lead to a high additional nutrient input into a nutrient limited raised-bog. In her study, de Sena Costa (2015) found decreasing amounts of insect species diversity proportional to altitude. Yet, consequences for the environment cannot be neglected and might increase the growth of non-bog species leading to a species shift and in the worst case to the overgrowing of the whole bog in the long run. This would affect many protected local species like *Drosera rotundifolia*, *Pinguicula vulgaris*, *Pinus uncinata* and many other insect and plant species specialized to a bog habitat (see also Feldmeyer 1985). Consequently further studies investigating the impact of *S. pupurea* on European bog system's are highly needed. These should involve further analysis of *S. pupurea* prey and following nutrient inputs. Also the possibility of removing the plants should be considered and effects for the bog environment should be examined.

Effects of Predation on different size classes of protists and bacteria (Chapter 3)

In general the addition of a new predator can cause size shifts in the prey community (Hrbacek et al. 1961). Brooks and Dodson (1965), investigated the impacts of the invasion of a filter feeding fish, *Alosa pseudoharengus*, into some Connecticut lakes. Plankton size eaten by a certain kind of fish depends on the distance between the gill projections. For that reason the introduction of the fish caused a size-shift of zooplankton in the lake towards smaller sizes. The larger zooplankton had all been filtered out by the invading predator. The original invertebrate predator in the lake *Epischnura leptodora* was shifting the zooplankton size towards bigger species of plankton (Dodson 1974).

In this study *Wyeomyia* did not cause the protist community to shift in size. However, as the feeding apparatus of *Wyeomyia,* like in most mosquitos is probably specialized on average size protist-species, bacteria and heterotrophic nano-flagellates might benefit indirectly from the presence of a top predator, because these species are close to the lower boundary at which particles can still be ingested by the filter apparatus of the mosquito (Jürgens and Güde 1994). Small bacterial will even slip though at a rate close to 100%. Thus *Wyeomyia* will mainly feed on and affect prey of medium size range (Ciliates and bigger flagellates). For this reason the medium size class of protists was most affected (see Fig S.1, Chapter 3). In the non-naive and late succession communities a moderate predation pressure by two larvae per tube probably only decreased the numbers of bigger protist-species, without eliminating them. However even these slight releases of predation pressure will be beneficial for bacteria and smaller protist species, permitting the coexistence of both larger and smaller protist species in the communities. In the naive early succession treatments the small predation pressure was however enough to cause the predator naive community to shift in composition, yet still not in size.

Predation on bacteria

The main bacterial predators in aquatic communities are protists. The most abundant and so most important ones are smaller forms, like *Bodo* and so called heterotrophic nano-flaggellates HNFs (Jürgens and Güde 1994). Grazing from Protozoa on Bacteria, can lead to shifts in the size structure of bacterial populations (Bird and Kalff 1993). Like when Metazoa feed on plankton, forms that have spines or weird shapes will become more abundant. Also in bacteria grazing resistant forms like i.e. aggregates or filaments of Bacteria or even toxic forms are developing when the protists predators are abundant (Jürgens and Güde 1994). So the Bacteria might become resistant to grazing by protozoa, but probably not to *Wyeomyia*, giving the protists/HNFs key roles in structuring microbial food webs (Bird and Kalff 1993).

Chemical warfare

Looking at bacteria, another factor that has been neglected so far, but which should not be underestimated is competition by "chemical weapons" like, i.e. toxic compounds as protections against predators or antibiotics to keep other bacterial competitors/fungi at bay. In small compartments (like pitcher-plants) this chemical warfare might be much more effective than in bigger water bodies, as diffusion over small distances is very fast, the concentration of toxic compounds (like alcohol and antibiotics) is more likely to reach a lethal dose within the pitcher. Strategies like this work only in closed compartments but can be very effective, i.e. yeast in a bottle of wine. The concentration of toxic compounds will add up in the food chain and thus might even affect higher trophic levels. In future experiments this aspect should be taken into account.

Increased Temperature variations (Chapter 4)

The increased temperature variations had diverse effects on the different levels of the food-web. While the mortality of the top-predators was not at all affected no clear effects could be detected for the protist levels. While alpha-diversity decreased faster in the high variation treatments, beta-diversity changed more in the European communities and community composition changed without a clear pattern. Most interesting was the effect for bacteria, where in the high variation treatment, bacterial densities experienced an initial boost but then decreased quickly through time so that on the last day of the experiment the density in the high variation treatment was lower than compared to the normal variations treatment. As mentioned above the bacterial density will be affected by nutrient concentration (bottom up) and predation by protists (top down). Bacteria can adapt faster to the changing temperatures, while protists will need some more time to do so. This could be a possible explanation of the initial bacterial boost in the high variation treatments. After also the protists adapted to the new conditions (day 4-6) they might have become more successful in maintaining a top down control on the bacteria compared to normal variation treatments. Additionally the higher energy levels in the high variation treatments leads to a faster metabolism of the inquiline community, so that the amounts of nutrients, given to the system in the beginning of the experiment, probably declined faster than in high compared to normal variation treatments. Thus probably the raise and fall of the bacterial rates are due to a combination of both effects, higher metabolism (day2) and caused by this a stronger nutrient limitation and higher protist predation pressure (day 4 and 6).

Future work and Outlook

One of the biggest problems in the description of natural microbial food webs (like the ones in this thesis) is the reliable identification of the various species of Bacteria and protists. Given sufficient time and money, the best approach would be next generation sequencing (preferably metabarcoding with 16s for Bacteria and 18s for protist). But also Sanger sequencing like in Gray et al. (2012) can give some insight in the main groups of Bacteria inhabiting this system (in case they are cultivable). To my knowledge a more detailed view (also considering the protist identification) is not possible with the genetic methods available today.

In future, automatizing the readout might facilitate experiments with several different morpho-species of protists. For this automatized readout a help could be to use the red fluorescence to distinguish algae from heterotrophic organisms. But even the best methodologies are not yet as able in distinguishing species as the human eye (Narwani personal communication). Yet by using automatized readouts in the future, Especially result-gathering will speed up and also error rates could be probably decreased considerably, if a reliable detection of morpho-species by the computer can be maintained. Also the changes in bacterial communities should be evaluated more closely. Not only cell-numbers but also types of various aggregates and their frequency should be taken into account. In this way changes not only of the protist- but also the bacterial community could be examined and help to improve the insight of how microbial food webs really work.

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