Modulation of African Lightning and Rainfall

by the Global Five Day Wave

by

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ABSTRACT

Using a field station in Rhode Island, we record electromagnetic transients caused by global mesoscale lightning activity in the Schumann resonance band (3Hz-50Hz). For this thesis, mesoscale lightning flashes originating in Africa were analyzed and compared to the phase and amplitude of a five day global pressure wave and African easterly waves. Evidence was also presented for the mesoscale lightning to be correlated with African rainfall and kinetic energy. The five day global pressure wave was located in terms of phase and amplitude for every day of the years 1989, 1996, and 1998. This global pressure wave seems to have a certain phase relationship with African convection and could possibly be modulating rainfall and lightning by a factor of two. Evidence is also presented for the possible modulation of African easterly waves by the five day wave.

Thesis Supervisor: Earle R. Williams
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Acknowledgments

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Chapter 1

Introduction

The motivation for this thesis was the discovery of a continental scale lightning/rainfall correlation in Africa on a 4-5 day time scale (Castro, 2000). This 5-day period indicates a possible link to the global 5-day pressure wave (Madden et. al., 1975) or to African easterly waves, which have a period of 3 days to 4 days. If either link is valid, there are several important implications.

The first implication is if Africa is causing the 5-day global pressure wave, it would help solidify the "3 Chimney theory", the idea that Africa, the Americas, and the Maritime continent are major sources of convection and energy to the earth's atmosphere. The second implication is if the global pressure wave is causing African convection, then a powerful forecasting tool can be created for African weather, by tracking the movement of the pressure wave. African easterly waves are responsible for about half the Atlantic tropical storms (Frank, 1970). These storms can develop into hurricanes that cause billions of dollars worth of damage to the US. Knowing the originating intensity of these storms is an important factor to predicting hurricanes (Emanuel, 1999). The final possible implication is the African lightning variation could provide an important early indicator to the intensity of these easterly wave storms.

The first goal of this thesis was to explore the role of the global 5-day pressure wave and the 5-day African lightning/rainfall correlation. The second goal was to explore the role of easterly waves and the lightning/rainfall correlation. To do this, we tried to analyze as much continuous daily lightning data as possible with as many overlapping pressure, rainfall, and easterly wave data sets as possible.

1.1 Schumann Resonances and Global Lightning Detection
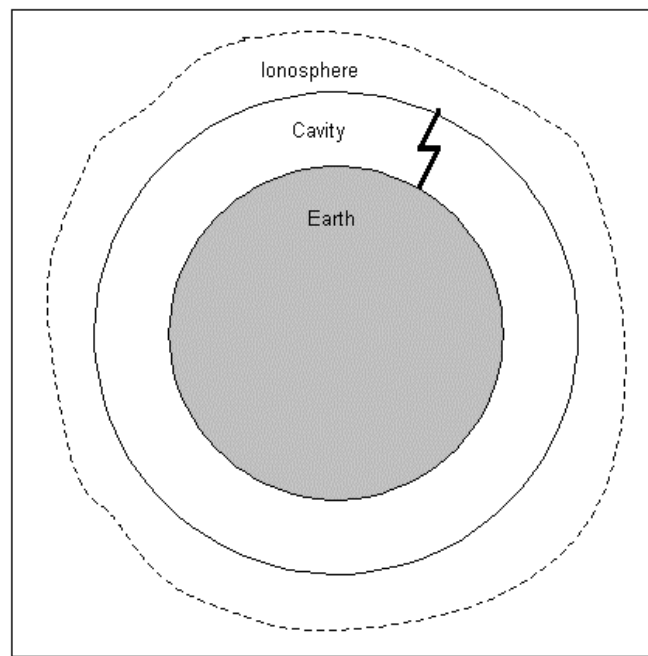
Figure 1-1: Spherical cavity formed between Earth and Ionosphere

We currently have a detector in remote West Greenwich, Rhode Island that can detect major positive and negative lightning around the world. This detection is made possible by the natural spherical cavity formed by the Earth and the ionosphere (Sentman 1995). Several resonant modes of extremely low frequency waves, called Schumann Resonances are formed (Schumann, 1952). These resonances are maintained by global lightning activity, which occurs at a rate of 100 flashes per second (Brooks, 1925; Orville and Spencer, 1979). Sporadically, a major positive or negative lightning will excite these

Schumann resonances single-handedly and the Rhode Island site will detect the electromagnetic waves formed from this event.
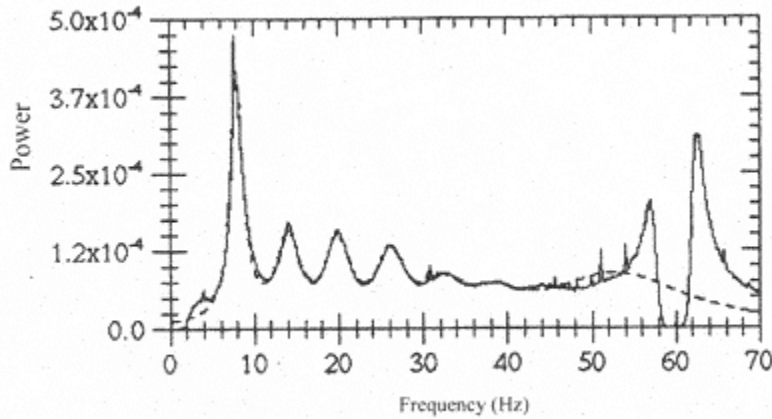
Figure 1-2: A sample ELF background spectrum showing the fundamental
(8 Hz) and higher order modes

The Rhode Island site records electromagnetic signals in the range of 3 Hz to 120 Hz and sees a continuous "background" signal which is sustained by the overlapping effects of global lightning (Huang, 1997; Huang et al., 1999). The fundamental Schumann resonance modes are at 8 Hz, 14 Hz, 20 Hz, and 26 Hz as shown by Figure 1-2. These modes are associated with electromagnetic signals traveling at nearly the speed of light around the world. It takes 1/(8Hz) or 125 msec for light to travel around the world. The peak in the spectrum at 60 Hz is caused by power lines, and a notch filter is used to block it.

The transients are recorded along with the background signal and stored in Jaz data cartridges in Rhode Island. Every 2 weeks the tapes are brought back to MIT and processed. Algorithms developed by Earle Williams, Bob Boldi, and Everest Huang are able to pick out transient events from spurious events and locate their latitude and

longitude on the globe, determine if they were positive or negative, and evaluate the vertical charge moment of the transient (Huang et al., 1999).
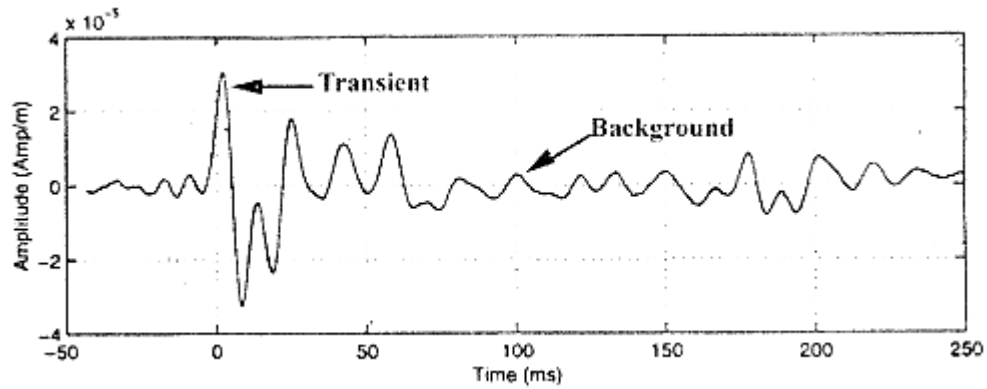
Figure 1-3: A sample Electric Transient

Occasionally, a large positive or negative lightning will excite Schumann resonance modes as shown in Figure 1-3. These events are called transient Q bursts (Ogawa et al, 1967), because of the strong 8 Hz components in the electric and magnetic fields
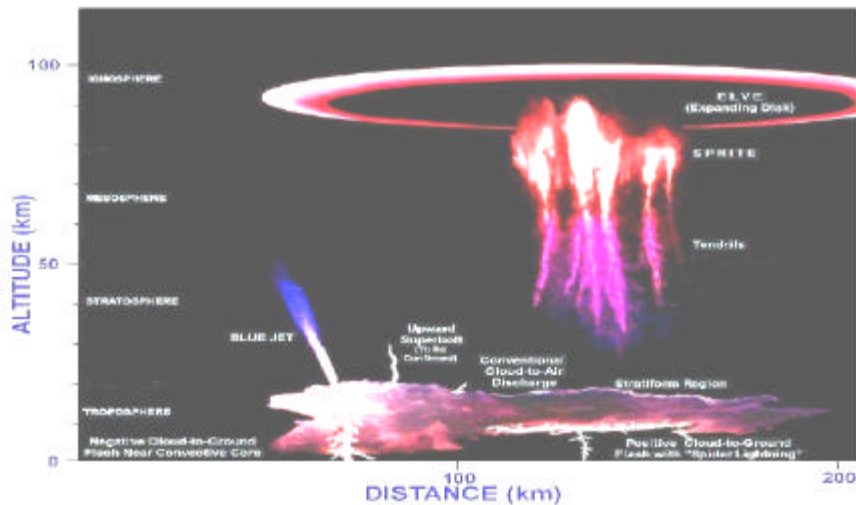
Figure 1-4: Lightning prevalent in mesoscale convective systems
(from Lyons et al., 2000)

The detected lightnings are caused by specific cloud systems. Most thunderstorms worldwide are generally in the form of isolated cells. In such storms, the negative charge area is in the middle and lower part of the cloud and the positive charge is at higher altitudes (Williams 1998). Isolated thunderstorms can sometimes aggregate and form mesoscale convective systems (MCS's) that exhibit deep convective towers and larger adjacent areas of stratiform rainfall as show in Figure 1-4. The charge configuration in the stratiform region is often reversed from that in isolated thunderstorms (Williams, 1998). MCS's are very large and have large reservoirs of charge and can launch positive cloud-to-ground (CG) lightning, also illustrated in the right hand side of Figure 1-4. These larger mesoscale lightning flashes are the lightning transients that are being tracked from Rhode Island.
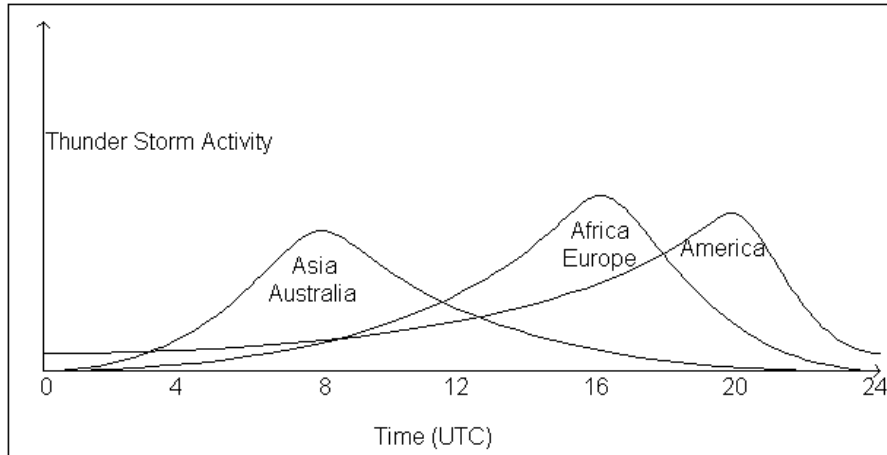
Figure 1-5: Whipple Curve: The Three Major Tropical Convective Zones
and their UT diurnal variations

The three major tropical areas of thunderstorm activity in the world are the

regions of South America, Africa, and the Maritime Continent (which includes Indonesia,

Philippines, Malaysia, and Australia), as shown in Figure 1-5. These curves represent

ordinary thunderstorms that are peaking in activity around 3 to 4 PM in the afternoon

(Chalmers, 1967). The ordinary storms will then occasionally aggregate into much larger

mesoscale convective systems. Figure 1-6 on the next page shows the background

Schumann resonance intensity and the transient lightning events detected for Africa for a

typical day. The key point that Figure 1-6 shows is that as expected the ordinary

lightning from the individual thunderstorms is peaking at 16 UT (approximately 4 PM

local time for important regions in Africa) thus the background Schumann resonance

intensity is peaking in Africa and is consistent with Figure 1-5. The transient lightning

activity, however, is peaking a four hours later, when the small thunderstorms have

aggregated into mesoscale convective systems (MCS's). Then, the larger, positive

mesoscale lightning flashes associated with MCS's appear (Fig 1-4) and are recorded by

the Rhode Island detector.
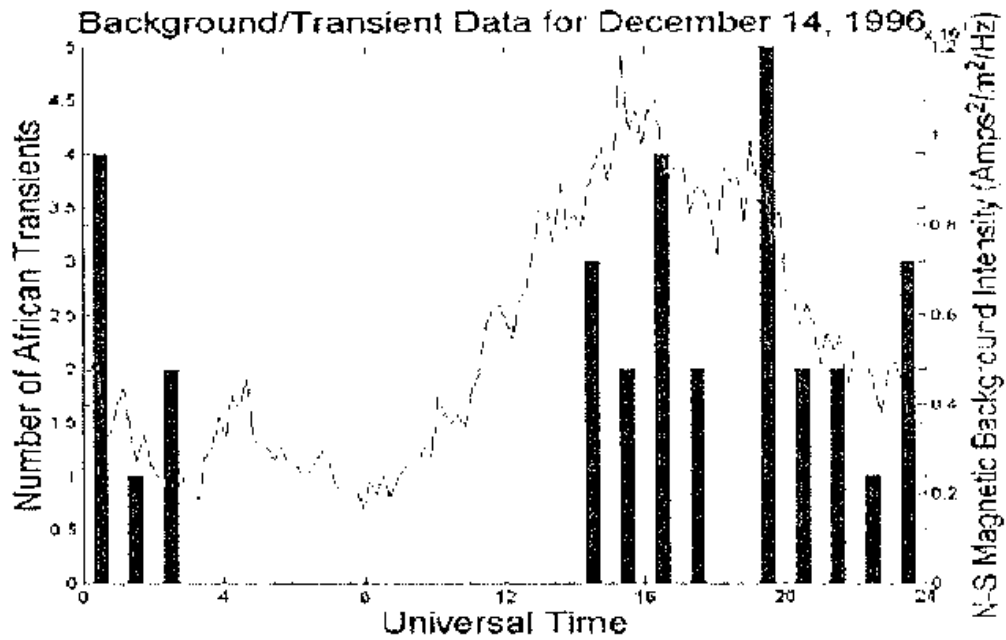
Figure 1-6: Background Schumann Resonance and
Transient Lightning for one sample day

The importance of tracking transient lightning is that they are events in the tail of
the lightning energy spectrum. If the atmosphere gets more energetic, its average energy
state moves little compared to how the tail end of the energy spectrum moves. Figure 1-7
shows that a small increase in energy in the atmosphere translates to a large change in the
spectral tail.
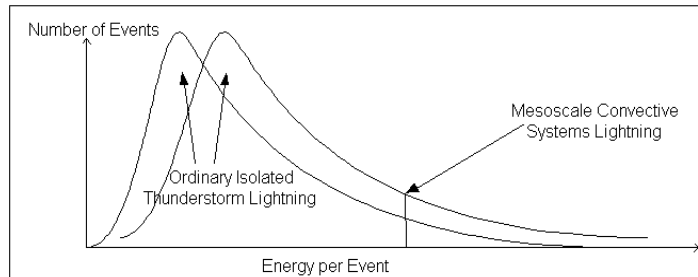
Figure 1-7: Lightning Energy Spectrum (Schematic)

1.1.1 Data Acquisition from Rhode Island Site
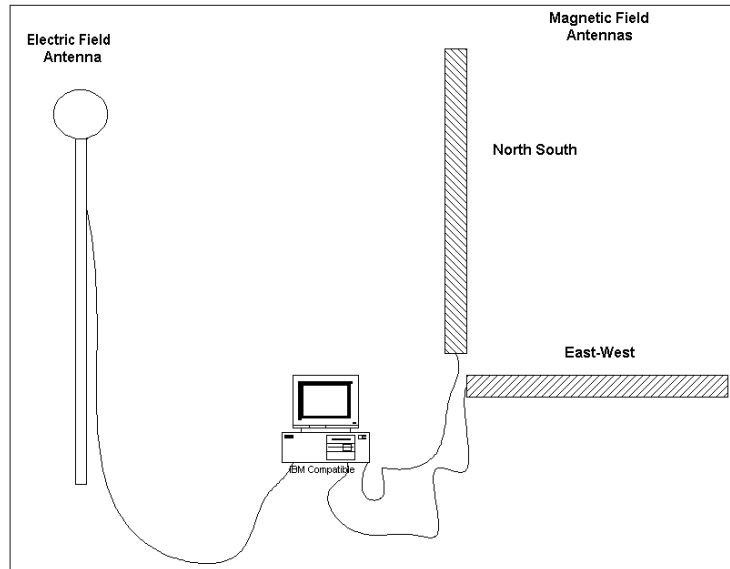
Figure 1-8: Data Acquisition Apparatus at Rhode Island Site

Figure 1-8 describes the current apparatus for mesoscale lightning detection in Rhode Island. The magnetic field's two perpendicular components and the electric field, filtered for 3 Hz to 120 Hz, are continuously being recorded by two 486 personal computers. One computer handles the power spectral calculations for the background resonances (See Fig 1-2) and the second computer is dedicated to recording transient events in the time domain (See Fig 1-3). The two data streams are recorded on Jaz drives.
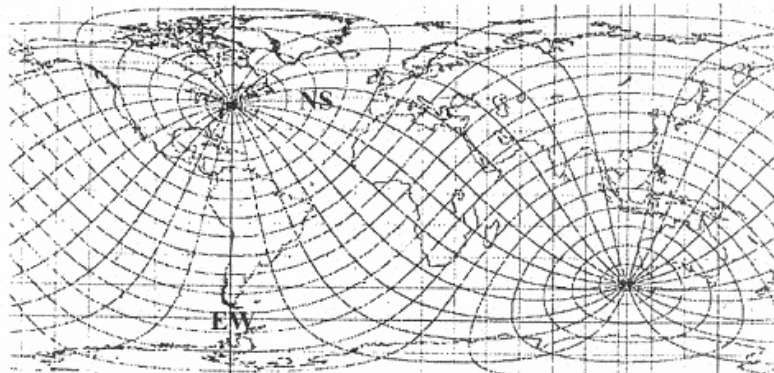
Figure 1-9: Great Circle Paths and Iso-distance contours for the Schumann resonance station in West Greenwich, RI.

The exact location of the field detector site is West Greenwich, Rhode Island (41.62N latitude, 71.73W longitude). The importance of the location is first that it is remote from large noisy electromagnetic signals and its location also makes the great circle direction to Africa and South America perpendicular to each other as shown by Figure 1-9. This condition assumes that lightning from Africa and South America have different dominant magnetic field components in Rhode Island and helps to identify the location of background and transient signals.

1.1.2 Normal Mode Equations and Triggering of Events

Theoretical frequency spectra, for the electric and magnetic field components of transient events, are calculated using frequency-dependent normal mode equations obtained from the Wait and Jones model (Wait, 1996; Jones, 1967; Ishaq and Jones, 1977). The natural spherical cavity formed by the Earth and the ionosphere is the basis of the Wait and Jones model. The equations for the electric and magnetic fields in the frequency domain are given by

$$E_z(f) = i \frac{I(f)ds\nu(f)(\nu(f)+1)P_{\nu(f)}^0(-\cos\theta)}{4a^2\epsilon_0 2\pi f h \sin(\pi\nu(f))} \frac{[volt]}{[meter][Hz]}$$

$$H_\phi(f) = (-\frac{I(f)dsP_{\nu(f)}^1(-\cos\theta)}{4ah\sin(\pi\nu(f))}) \frac{[ampere]}{[meter][Hz]}$$

The Earth's radius and the ionosphere's height are described by a and h, respectively I(f)dS defines the current moment, where I(f) is the current in amperes and dS is the vertical distance that this current flows. The complex eigenvalue ν describes the

propagation and dissipative characteristic of the atmosphere. $P_{v(f)}^{0,1}(x)$ are Legendre

functions with complex subscripts. θ is the great circle distance between the lightning

source and the receiver.

It is important to note that this model is not perfect. The main problem is that the

background signal is not taken into account when calculating transients. Therefore

transient events that are the same magnitude in power as the background signal will not

be detected. This is an important problem and if solved will make the detector in Rhode

Island much more effective in detecting more lightning. A second shortcoming of the

model is that it pertains to a uniform waveguide. In reality, the Earth-ionosphere cavity

has pronounced day-night asymmetry (not shown in Figure 1-1).

Another important part of the data acquisition system is the triggering of events.

Not all transient events are triggered. This would take up too much memory, thus a

triggering threshold is set and governed by the following equation

$$A = \sqrt{\frac{1}{2}(H_{ns}^2 + H_{ew}^2)}$$

The magnetic power component is used to set the trigger threshold. If A is beyond

11.6μA/m, the event is recorded for 100 milliseconds before and 400 milliseconds after

the lightning event. A more through discussion is given for all of these issues in Castro

(2000) and Huang et al. (1999).

1.2 Easterly Waves

Easterly waves are the most actively discussed waves from Africa. The reason for this is that they are the source of about half the Atlantic tropical storms (Frank, 1970). These Atlantic storms can eventually become hurricanes and for this reason they are heavily studied. This section will be a brief introduction to easterly waves. For a more detailed discussion the reader should see the classical analyses of Burpee (1972), Burpee (1974), and Reed et al. (1977).
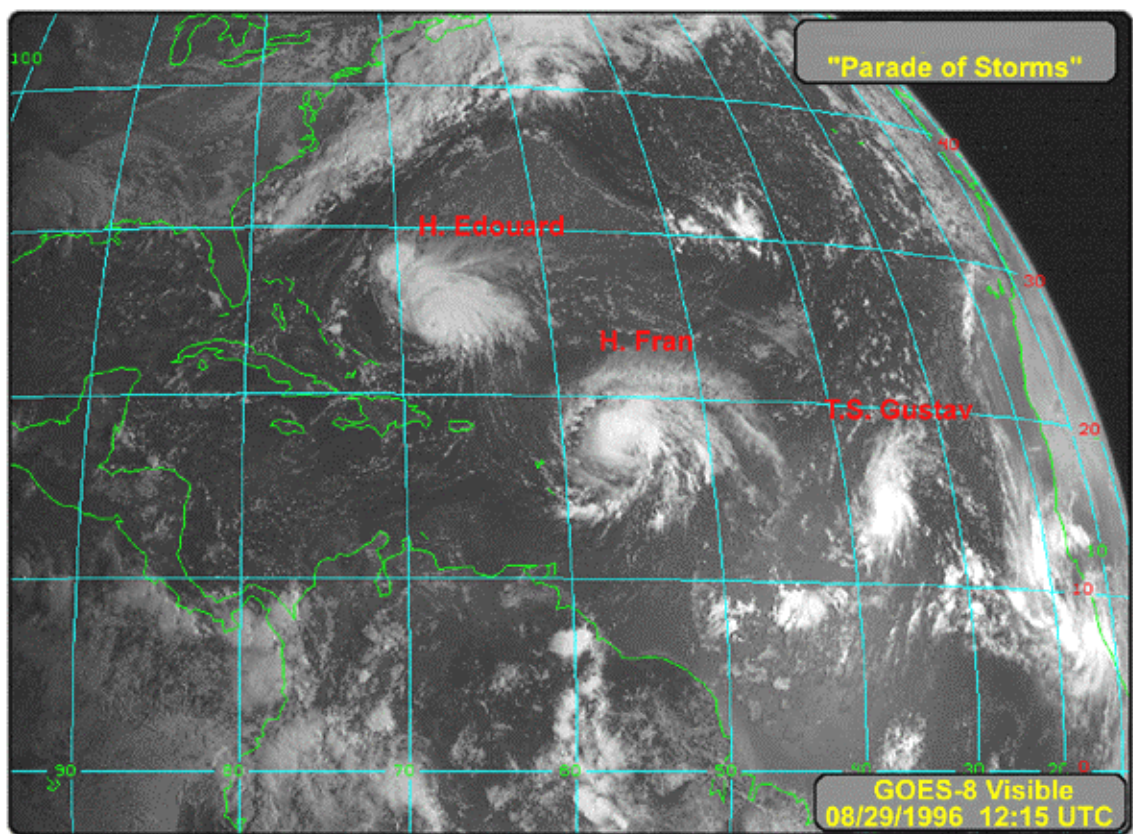
Figure 1-10: 1996 Parade of Storms originating in Africa and subsequently traversing the Atlantic Ocean

Easterly waves are westward propagating African wave disturbances of a synoptic scale. They typically have a 2000 km to 2500 km wavelength with a mean period of 3.5 days (Reed et al., 1977). The typical westward speed of the wave disturbance is 8 m/s. The wave disturbances can be found generally above the equator to 20 N latitude. They start in early June and continue (intermittently) till mid October. The source for the waves is thought to be somewhere west of Khartoum, Sudan and east of Ft. Lamy, Chad (Burpee, 1972). These wave disturbances are significant enough that they can be identified through satellite imagery.

Figure 1-10 is a typical example of easterly waves in August of 1996. These are four Atlantic storms that originated in easterly waves. As one can see the storms are separated by 20 degrees to 25 degrees longitude. One degree is typically 100 km and the wavelengths shown are classic easterly wave wavelengths. All the above Atlantic storms originated from the west coast of Africa. When they originated from Africa, they were forming every 2 to 3 days. A major goal of this thesis was to examine the connection between African mesoscale lightning observed from Rhode Island and the easterly wave activity.

1.3 Global Pressure Wave

A 5-day westward propagating global scale pressure wave with an amplitude of 1 mbar (100 Pascal) was discovered by Madden and Julian (1972) and further confirmed in Madden et Stokes (1975). These waves have a zonal wavelength equal to the circumference of the earth and hence 10-20 times greater than the wavelength for the easterly waves. The peak amplitudes of 1 mbar are at 40 S latitude and 40 N latitude,

with somewhat reduced amplitude (about 0.5 mbar) at the equator. This pressure wave

exists in stratosphere height pressure records (Rodgers, 1976) to 1000 mbar, or surface

pressure records (Madden and Julian, 1972).   The other important aspect is the

seasonality of the 5 day wave. It is found throughout the year both in summer and winter

records though there is greater variance in winter records (Madden and Stokes, 1975).

The theoretical classification of this wave is that it is the gravest free oscillation of

the Rossby-Haurwitz type (Ahlquist, 1982). Essentially it is a free mode solution to the

Laplace tidal equation or an eigenvalue solution. This means it's a natural resonant

solution, like its electromagnetic counterpart: Schumann resonances. The 5-day global

pressure wave theoretical solution is discussed in detail with the other free mode

solutions in Ahlquist (1982), Salby et al. (1987), and Madden (1979).

The excitation of this wave is a much-debated question (Lindzen et al, 1985) and

possible theories vary from Antarctica exciting it (Cheong, et al., 1997) to convection

being an important factor in the Global Convection Model (Miyoshi, et al., 1999). Salby,

et al.(1987) claims another possible excitation of the pressure wave could be stochastic

forcing through tropical "fast" heating. Essentially randomly placed fast tropical heating

could feed energy into the resonanct modes, thus increasing the amplitude of the 5-day

global pressure wave.

Interestingly with the exception of Burpee (1976), the hurricane or easterly wave

experts have not studied the global 5-day pressure wave. Burpee (1976), found that the 5

day global pressure wave had a 10% modulation on African rainfall though this thesis

provides evidence for modulation by as much as a factor of two. In the years since

Burpee's paper, the global 5-day pressure wave has been largely ignored by the easterly wave researchers.

A major goal of this thesis was to isolate the 5-day global pressure wave through gridded global pressure data. It was essential to find the phase and amplitude relationship of the wave relative to African mesoscale lightning and possibly rainfall activity. With this information, it would be possible to tell if the global pressure wave was having a significant impact on African weather or possibly if African weather was modulating the pressure wave.

Chapter 2

Methods

The purpose of this chapter is to give a detailed description of the methods and tools created for this thesis. The motivation and hope is that this documentation will enable future students to quickly reproduce results or reuse the tools for their own purposes. The tools created were programs to help analyze lightning data, satellite images, rainfall data from the National Oceanic and Atmospheric Administration (NOAA), and wind speed and pressure data from the NCEP/NCAR 40 year reanalysis project (Kalnay et al., 1996) .

2.1 Transient Lightning

Transient lightning events were handled primarily in the form of Q burst files. Lightning events are recorded at the Rhode Island detector site as raw events. The raw events are then processed at MIT and events consistent with Schumann resonance theory are classified as lightning events. Algorithms created by Earle Williams, Bob Boldi, Everest Huang and Charles Wong calculate the latitude and longitude of this event with a 5 degree (500 km) error range (Wong, 1996; Huang, 1997; Huang et al., 1999). One of

the files created at the end of this processing is a Q burst file with several pieces of information about a lightning event.

Each row of a Q burst file represents one lightning event. The first six numbers correspond to time in the format of Universal Time. These are namely year, month, day, hour, minute, and seconds. Columns 7 and 8 correspond to bearing and standard deviation of bearing. Columns 9 and 10 correspond to range and standard deviation of range. Column 11 is the correlation coefficient between theoretical and experimental wave impedance (Z) coefficient. For this thesis all events had a z-theory correlation of .65 or higher. The Z-theory correlation is a non-linear estimate of how good the event was to an actual lightning event and is further discussed in Huang (1997). Column 12 is power or root mean square of the electrical and magnetic amplitude of the detected event. Column 13 and 14 are the signed root mean squared of the electrical and magnetic amplitude signals respectively. A positive number in column 13 indicates a lightning event lowering negative charge and negative number indicates a lightning event lowering positive charge. Column 15 and 16 indicates the latitude (-90 to 90) and the longitude (-180 to 180) of the event. Columns 17 and 18 are their respective standard deviations. For this thesis, we are primarily interested in the time of the event, whether it was a positive or negative lightning and the latitude and longitude of the event therefore most of the other columns are ignored. A sample of a Q burst file is given:

1996 1 2 05 14 49.007 222.464593168868 1.02 1.803 0.171 0.688 3.728 -86.017 -0.363 28.9330219102923 -84.0873811428597 1.08 0.77

1996 1 2 05 15 45.061 222.958638077206 0.84 1.533 0.088 0.724 6.495 -163.589 -0.698 30.9765230720468 -82.5663448544465 0.55 0.43

1996 1 2 05 16 09.878 222.299064723295 0.93 1.983 0.166 0.769 3.166 82.321 0.325 27.5776098513924 -85.0936949048636 1.06 0.72

1996 1 2 05 18 20.780 222.049972369115 0.82 1.613 0.140 0.744 2.099 54.641 0.218 30.263706658403 -82.8481200567476 0.88 0.63

1996 1 2 05 20 25.223 220.789933998616 0.86 1.526 0.092 0.678 2.939 78.699 -0.320 30.7280387286814 -82.0349815729044 0.59 0.43

1996 1 2 05 23 07.749 220.364448000947 0.90 1.588 0.123 0.702 2.151 54.602 0.227 30.2095942761868 -82.301342049778 0.79 0.54

Because we are dealing primarily with Africa, bearing error is an important problem. Since Africa is located half way around the world from the Rhode Island detector any small bearing error will lead to the maximum possible longitude and latitude error. Everest Huang noticed that corresponding lightning detected by the National Lightning Detection Network (NLDN) had a systematic bearing error (Huang, 1997). He developed a bearing error correction program (See Appendix 5.0). After the Q burst files are bearing error corrected, they are ready for analysis. Matlab programs were created to analyze the Q burst files for information on Africa. The significant Matlab scripts are located in Appendix 6.0. For this thesis, 1996 Q burst files and May 7, 1998 to June 20, 1998 Q burst files were processed. Currently, all raw transient lightning events up to May 2001 recorded on Jaz drives are being processed by the MIT facility to create Q burst files.

2.1.1 Locating a Lightning Flash Location in a Polygon
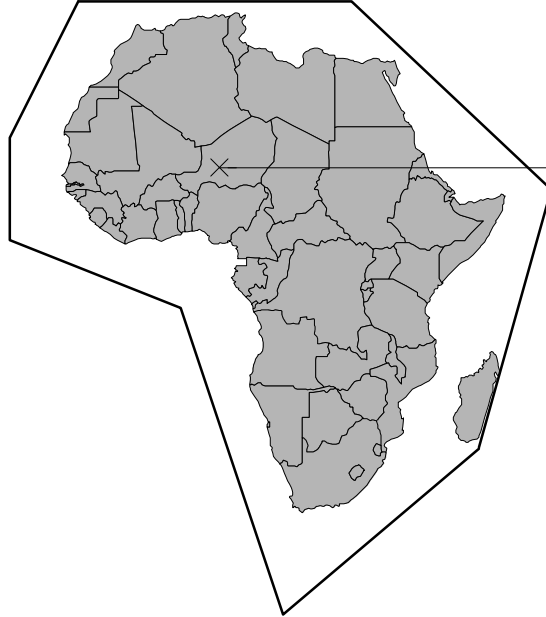
Figure 2-1: Non-Convex Polygon
Around Africa

Locating a point in a non-convex polygon is a simple concept but very important in mapping. Since we are only interested in the lightning events around Africa, a rough polygon can take its shape with the vertices defined by different latitude and longitude points. The algorithm to find whether a point is in the polygon is as follows. Set a counter to 0. First, place the point and then draw a horizontal line in one direction say east as in the Figure 2-1. Check if the latitude number lies between latitudes of consecutive vertices. If it does and if the east horizontal line connects, then increase the counter by 1. Keep doing this until you have gone around the polygon. For points within the non-convex polygon the counter will be odd. For points outside the polygon the

counter will be even. The Matlab script for this algorithm is given in Appendix 6.0 under africasort.m.

This is not a perfect algorithm because there are special cases if the horizontal line hits a vertex. We will ignore this in our case. Fortunately, after the great circle bearings from Rhode Island in the Q burst file are corrected (using corrections.pl Appendix 5.0), the latitude and longitude numbers are irrational with 11 digit rounding error. This is because a factor of π is used in the correction conversion. Thus, it is highly improbable our corrected latitude and longitude numbers will be perfect integers. So if we pick integers as vertices of our polygon, the algorithm should work fine and the horizontal line will not intersect with a vertex.

Note we can define the polygon as finely as possible. It just means adding more vertices. There are problems associated with this. For example a typical Q burst file might be as large as a year. There are roughly 300,000 lightning events recorded in the year 1996. Eleven points are currently used to define Africa. Currently it takes about 3 hours to go process the1996 Q burst file (using a Sun Sparc station). If we increased to 20 points defining Africa, running time would take 6 hours. This is another critical reason why this simple yet imperfect algorithm was used. It is possible to have higher resolution and reliability in defining Africa, if we are willing to wait several hours to days for the results. Given the possible 500 km location errors for events, this is not really needed.

2.1.2 Separating Lightning into Different Time Bins

Once the African subset of the lightning events was determined, the next step was to separate the events into different time bins. The motivation for this was to be able to

count the number of lightnings per ¼ day to 1 day or even 2 days. With this information one could see the natural diurnal variation expected and then see if the 5-day African lightning wave disturbance consistently existed as was reported by Castro (2000). An important note is that events in the Qburst files are **not** in sequential time. This is important in the design of the time sorting algorithm. Some lightning events that happened after another event are recorded first because of the time it takes for the signal to go around the world.

An algorithm to perform a reliable counting of events is as follows. First, determine the time increment (for example a half a day) you want to separate the events into and set time to be Julian time or the number of days since the year 0. Take the latest time in the Q burst file and subtract it from the oldest time and divide this by the increment and round. This is the size of the array you need and each part of the array is a separate counter initialized at 0. Using the floor function, subtract the event time with the earliest event time and divide by the increment. Now take the integer you get and go to that position in the array and increase the counter by one. The events will be counted into their specified bin. The programs for this procedure are located in Appendix 6.0 under daysort2.m and negdaysort.m.

2.1.3 A Digital Map of Africa

The ability to map the lightning is an important tool. The motivation for this was to see how the lightning acted, and if it was influenced by easterly waves. A major need was to have accurate latitude and longitude points to map Africa. Fortunately, the National Geophysical Data Center has a useful website to provide this information and is

located at http://rimmer.ngdc.noaa.gov/coast/ . This website lets you pick any part of the world and provides highly accurate latitude and longitude numbers for precise mapping. There is an option to download a Matlab formatted file or if you are using another mapping software, it has several options there too. Typically you get a numerical ASCI file of numbers separated by tabs. This file was then used to create maps of lightning events in Africa and these were then turned into jpeg images. The code for this is located in Appendix 6.0 under test2.m.

2.2 Locating Satellite Images

Satellite images are currently being taken every thirty minutes by METEOSAT, a geostationary satellite over Africa. Meteosat has a website at http://www.eumetsat.de where satellite images are being archived every six hours. The kinds of images processed are namely, a visible image, an infrared image, and a water vapor image. Analyzing satellite images was critical for the study of easterly waves. Easterly waves can be viewed and tracked from these satellite images. Infrared images are the best to analyze because the cloud structures can be seen at night. The Meteosat FTP server was not working so Microsoft Front Page was used to download the website. Front Page automatically organizes all images in the original directory structure and creates a copy. The next need was to create a movie player for these images.

2.2.1 Jpeg Viewer

The movie player needs to have certain functions. First, it needs the normal functions: play, stop, rewind, fast forward, and loop. Secondly, it needs to take a file of jpeg images and play them in order. Third, when the player stops, the file name of the jpeg needs to be displayed. The file name indicates the exact time and hour of the jpeg. Finally it needs to be portable, meaning any computer could use it. After an extensive search, this specific software didn't exist but one did come close, and that is a Javascript code written by Martin Hecko called jsImagePlayer. Originally the software didn't display filenames and instead the creator of the movie needs to change the files names of the images to sequential numbers. The software is modified for this feature, the refresh rate is slowed down for better quality movies and display characteristics are changed to display file names. The main problem with the code is that the user must know how to increase his browser cache settings to enable the download of a year's worth of images. The code is found in Appendix 7.0.

2.3 Rainfall Data
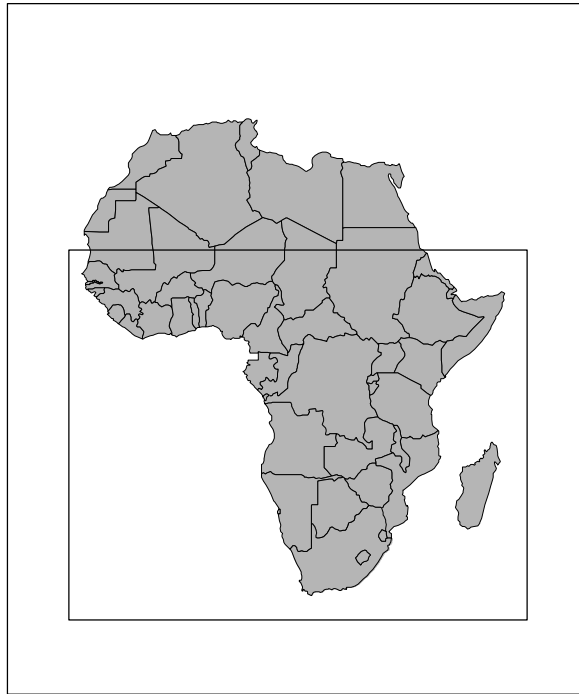
Figure 2-2: African Rainfall coverage with NOAA data set.

Comprehensive rainfall data for Africa are in short supply. Rainfall is an excellent way of telling how much latent heat is being released and constrains the integrated mass flux associated with moist convection. Africa, however, does not have enough rain gages to keep accurate track and satellite infrared images are incomplete determinants for rainfall. The NOAA (National Oceanic and Atmospheric Administration) dataset tries to incorporate satellite images, rain gages, and model analysis of wind, humidity and orographic conditions to get daily estimates (See Castro (2000) and Herman et al. (1997)). The resolution of the African rainfall data set is 0.1 degree by 0.1 degree. The area covered is a box from -40 latitude, -20 longitude to 20 latitude, 55 Longitude as shown in Figure 2-2. Notice we are only missing rainfall data for the Sahara desert where

rainfall is known to be sparse; consequently, this is still a useful data set. The data set of

rainfall is located currently at ftp://ftp.noaa.ncep.gov/pub/cpc/fews/archive_daily . The

years of 1998, 1999, and 2000 were downloaded. The NOAA is currently trying to create

a new and more accurate data set that will incorporate microwave imagery and cover all

of Africa, but only the years of 2000 and 2001 have been processed. Because the

transient lightning have not been processed for these years in our data set, this new

rainfall data set was not used.

2.3.1 Decoding .Bil files

The NOAA encoded these daily rainfall estimates in a ".bil" format, short for

"Binary In Line" format. Essentially, this is one long string of 16 bit binary numbers.

Each binary number represents the amount of rainfall in millimeters for a particular 0.1

degree by 0.1 degree pixel. The first number in the string represents the pixel of -40

latitude, –20 longitude and the last number represent 20 latitude, 55 longitude. In the

newer version of the NOAA data set, the area covered is from -40 latitude, –20 longitude

to 40 latitude, 55 longitude. The files need to be first read in binary, converted to ASCI

integers and then reshaped into an array of 600 by 750. Newer versions of the NOAA

data set incorporate more observational data and cover all of Africa. The newer version

will translate into an array of 800 by 750 integers. A Matlab script was written to make

the conversion for either version of ".bil" files. The script is located in Appendix 6.0

under bintoint.m

2.3.2 Converting 0.1 deg. by 0.1 deg. pixels to km by km pixels

One important need was to get a total daily estimate of rainfall for the entire continent of Africa. This is an indicator of the latent heat production for the African "chimney". To do this, simply adding all pixel numbers in the array of rainfall data will not work. Each pixel number is in degree format and needs to be converted to km format. The reason for this is that longitude lines get converge with increasing latitude. Latitude are separated by fixed distances. The distance between a 0.1 degree latitude lines is 11.13 km. The distance between 0.1 degree longitude lines is given by the following formula:

$$Longitude\_Dist = 2 \times 6375km \times \arcsin(\cos(Latitude) \times \sin(\frac{0.1^0}{2}))$$

Using this, a multiplication array could be created to convert degree pixels to km pixels and then the rainfall data could be accurately added to get a total km^3 number of rainfall per day for Africa. Typical values of total rainfall for Africa are between 30 km^3 to 250 km^3. The script to create the array is located in Appendix 6.0 under rainarray.m.

2.3.3 Creating rainfall maps

Rainfall maps are needed to see the relation to the lightning. They can be used to see where the latent heat production and convection are occurring. The maps could also be used to understand the lightning/rainfall relationship. This was done by using Matlab to create color contour maps of the ".bil" arrays and plotting contour maps on top of

Africa. Every day of the year was plotted, and each plot was made into a jpeg. The jpeg files could then be turned into movies. The code for this is located in Appendix 6.0 under rainplot.m

2.4 Wind Analysis

Wind speeds were analyzed at the 600 mbar and 700 mbar level. These are the regions where mesoscale cloud systems form and, according to Avissar et al. (1993), mesoscale cloud system activity can be measured in terms of kinetic energy. By looking at the horizontal wind components and squaring them we can get a rough measure of kinetic energy. Note the vertical component is omitted and in general this term is difficult to measure or approximate (Williams et al., 1993).

The data for wind speeds was obtained from the NCAR/NCEP (The National Center for Atmospheric Research / National Centers for Environmental Prediction) reanalysis project and the website for downloading that information is

http://wesley.wwb.noaa.gov/ncep_data/d_cdas_png_sgi62.html

This is a very useful website and provides daily information about the horizontal wind speed components over any desired area of the world with a resolution of 2.5 degrees by 2.5 degrees (Kalnay et al., 1996) and is classified as a "good" data variable, meaning it is observational quality data. Exceed software was very useful in viewing this website, because the website needs access to the display of the computer you are using.

The wind speed components were downloaded for Africa and then using Excel converted to a kinetic energy term. These average kinetic energy numbers could then be compared to our lightning data.

2.5 Surface Pressure Data

 The global 5-day pressure wave was first hypothesized to have a relation with the lightning data by Castro (2000). Surface pressure data needed to be analyzed to find the 5-day global pressure wave discussed by Madden and Julian. (1972). Pressure needs to be analyzed in the same way as Madden et al. (1972) and then the pressure wave could be tracked globally and compared with the lightning behavior.

 Global gridded pressure data can be obtained by NCAR/NCEP reanalysis project (Kalnay et al., 1996). The website is

http://wesley.wwb.noaa.gov/ncep_data/d_cdas_png_sgi62.html The resolution of the data is 2.5 degrees by 2.5 degrees, the pressure numbers are taken at 0 UT time, and pressure is classified as observational quality data (their best data). A time series plot of any region of the world can be obtained and this was then downloaded onto Excel.
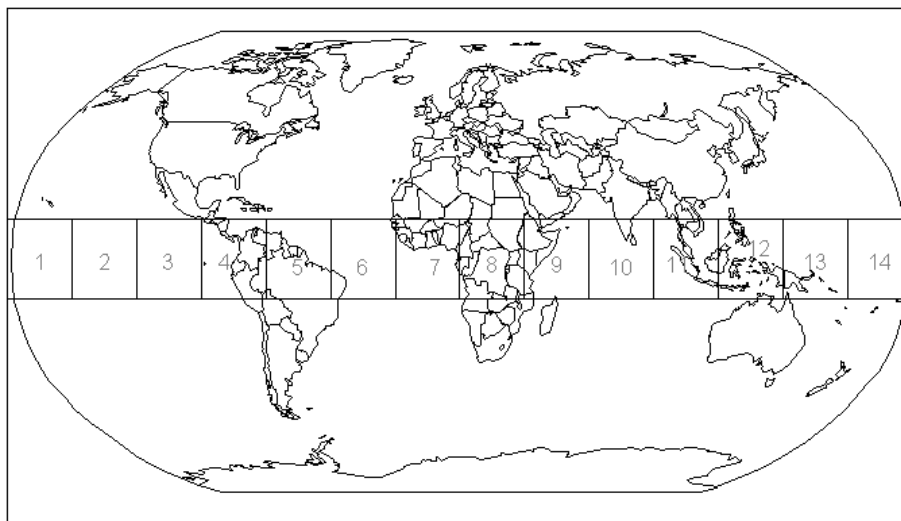
Figure 2-3: The zonal belt in which surface pressure
observations are analyzed

 A region of boxes around the world was created and the average pressure of this region was downloaded. The size of the boxes was chosen for the following reasons.

First the latitude region was from –15 to 15 degrees. Next regions of longitude were chosen to be 25.7 degrees wide, starting from –180 degrees and ending at 180 degrees. The reason for this is easterly waves typically have a period of 25 degrees. By choosing this large a region the effects of the positive and negative portions of the easterly waves would be integrated out. Secondly, this created an even number of regions (14) and the antipode of regions (the zonal block diametrically opposite) could be analyzed.

Average regional pressure values were first downloaded and put in Excel. Following Madden et al. (1972), the data were filtered in the time domain to eliminate very low frequency signal. Thus each region's pressure number was subtracted from a running five day average of the particular region. This new data were color coded for positive (blue) and negative (red) numbers in Excel. This new filtered data were then filtered in the space domain to obtain just wavenumber 1 information or, the wave with one wavelength around the world. Matlab was used for this space domain filtering and wavenumber 1 could then be reconstructed with the amplitude and phase information of the Fourier transform.

2.5.1 Fourier Transforms for Zonal Analysis of Surface Pressure

The definition of Fourier transforms in Matlab is a commonly used one and a script to make Fourier transform plots is in Appendix 6.0 under fftplot.m. The definition is as follows: x is the array of zonal pressure values that are being Fourier transformed, X is the transformed array of numbers in the wavenumber domain and N is the length of the array or the number of pressure values. In this case, N=14. The units of the transformed numbers are units of the original number divided by the units of the domain. In our specific case we are Fourier transforming into zonal wavenumber thus the units of the Fourier transformed numbers are Pressure/wavenumber or Pascals/wavenumber. The equations used by Matlab are,

$$X(k) = \sum_{j=1}^{N} x(j) W_N^{(j-1)(k-1)}$$

$$x(j) = \frac{1}{N} \sum_{k=1}^{N} X(k) W_N^{-(j-1)(k-1)}$$

where,

$$W_N = e^{-(2\pi i)/N}$$

To get the real part of the signal back one must understand that conjugates add up to be the real part of the equation. Thus the following equation is useful

$$2\cos(x) = e^{ix} + e^{-ix}$$

Another thing to understand is that the Matlab index always starts at 1 instead of 0. Thus when meteorologists are talking about zonal wavenumber 1 it means the wavenumber 2 in Matlab terminology. To get the real signal part of zonal wave number 1, just use the 2nd number in the Fourier transform and its conjugate, which is the 2nd to last number in the transformed array. Since we are going to use 14 regions in this analysis N will be set to 14. Using the above equations we get the following for the reconstructed zonal wave number 1

$$x(j) = \frac{1}{14} X(2) e^{\frac{-2pi}{14}(j-1)\times 2} + \frac{1}{14} X(13) e^{\frac{-2pi}{14}(j-1)\times 13}$$

where X(2) is the amplitude of zonal wave number 1, j is the pressure region, and x(j) is the pressure of region j.

The above conjugates in the equation cancel the imaginary parts out and leave just the real signal. In the end, the amplitude of the above equation is just 1/7 of X(2). To give a more intuitive sense of the transformed numbers from now on the amplitude results of Fourier transforms will be 1/7 of the result given by Matlab. Thus with any given phase and amplitude results one can quickly construct zonal wavenumber 1 pressure wave.

To truly understand phase one must understand that box 1 starts at –180 degrees longitude and ends at 154.3 degrees longitude. Box 2 starts 154.3 and so on until finally box 14 ends at 180 degrees longitude, thus encircling the globe, thus the reconstructed wave starts at –180 degrees. So there is a fixed relationship with the phase and actual longitudinal degrees. Phase and longitude are both in degrees and their relationship is as

follows: the negative of the phase is the longitude of the trough (minimum pressure) of the pressure wave.

If the amplitude: (A) and phase: (Phi) is given for zonal wavenumber one, the following equation tells the pressure: (P) of the global wave at a particular Longitude: (Long),

$$P = A\cos(Long + 180 + Phi)$$

The units for P are Pascals, the units of A are Pascals/wavenumber1, the units of Long are in longitudinal degree from –180 degrees to 180 degrees, and the units of Phi is also in degrees.

2.5.2 Analysis of Pressure Data

Once zonal wave number 1 could be reconstructed from the Fourier transform results, it was outputted per region and a space-time, color-coded diagram was created otherwise known as an x-t plot or a hovmoller diagram. Positive values were colored blue and negative values were colored red using Excel's conditional formatting scheme. The 5-day global pressure wave could then be viewed traveling around the regions of the world. This is the same classical technique used by Madden et al. (1972). The wave could then be analyzed with respect to the lightning activity in Africa.

Other analysis included looking at the antipode for Africa and seeing if its pressure behaved in opposite manner to the pressure of Africa, as is expected for a wavenumber 1. This was done by downloading information off the NCAR/NCEP website. Finally, full spectral results were obtained from the time filtered pressure to see the evidence and power of other waves with shorter wavelengths.

Chapter 3

Results

The goal of this thesis was to analyze the effects of the African lightning, the global 5-day pressure wave, rainfall, wind speed, and any other data sets of Schumann resonances pertaining to Africa. It should be noted that not all data sets overlap. In each episode, all available variables are investigated.

First, our lightning dataset begins in 1996 and continuous through present but only 1996 and parts of 1998 were processed for this thesis. The total lightning data set is not completely continuous because the Rhode Island site can experience of technical difficulties (power outages, local storms, hardware failure etc.) and stop recording events for periods of days to weeks. NOAA daily estimates of rainfall for Africa begin in 1998. The global 5-day pressure wave is analyzed for all periods. Global equatorial pressure for the years of 1989, 1996, and 1998 was examined and the analysis of the 5-day pressure wave and pressure's wavenumber spectral components can be found in the Appendix 9.0. Beyond our data set of lightning activity, several groups monitor

Schumann resonances. The time periods of their data that indicated a 5-day periodicity in lightning were also analyzed.

The episodes analyzed were a forty day period in the spring/summer of 1998 with good continuous lightning detection and previously explored by Castro (2000), a winter period in 1996 to show the existence of the lightning disturbance in the winter, the period of September 17th 1989 to October 31st 1989 in which Sentman et al. (1996) found 5 day periodicity in global background Schumann Resonances, the period of February 19th 1998 to March 25th 1998, where Price et. al. (1999) found 5 day periodicity in lightning, and finally the "Parade of Storms" in August 1996 to investigate the role of easterly waves.

3.1 May 8th 1998 to June 18th 1998

The time period of 5/8/98 to 6/18/98 was originally investigated for transient lightning activity by Castro (2000). Transient lightning or lightning associated with mesoscale convective systems was found to have a 5-day periodicity in Africa and was strongly correlated with total African rainfall. It was hypothesized that there could be relation to the 5-day global pressure wave. This thesis adds to that previous study by examining the behavior of the 5-day global pressure wave and demonstrating phase coherence with the African lightning/rainfall correlation.
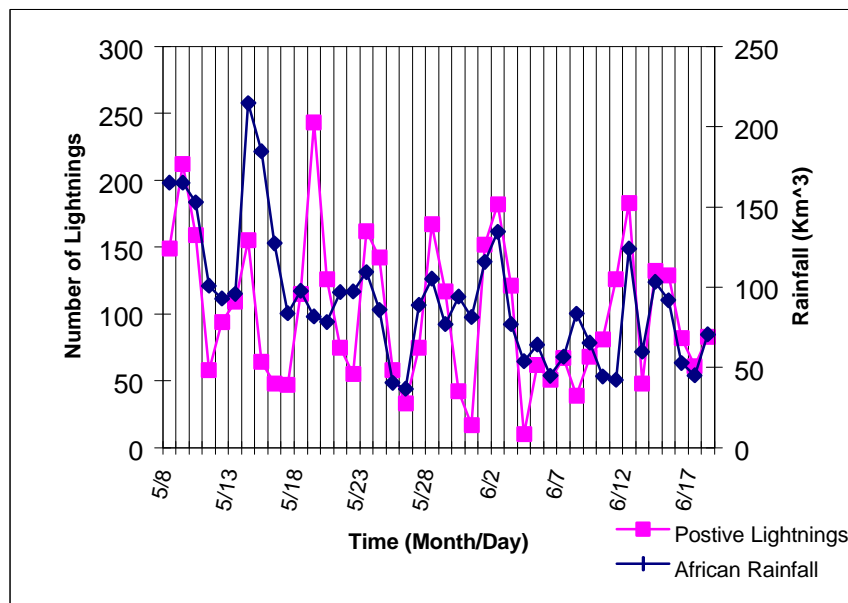
Figure 3-1: 5-Day African Lightning/Rainfall correlation for 5/8/98 to 6/18/98

First, Q burst files and rainfall data were reprocessed to investigate the correlation. The results are slightly different than Castro (2000) because only lightning transients with a high correlation to Schumann resonance theory were used (Z-theory correlation of greater than 0.65). Rainfall is exactly the same as Castro (2000) reported. Figure 3-1 clearly shows that there is 5-day periodicity in lightning and a correlation between the positive transient lightning detected and the rainfall for Africa. This

correlation is best illustrated when the rainfall data are plotted against the lightning data

as shown in Figure 3-2.
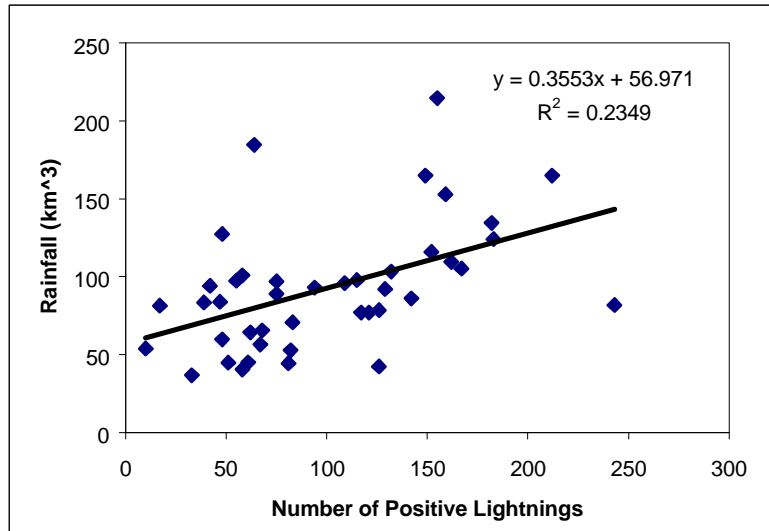
Figure 3-2:Rainfall vs Lightning for 5/8/98-6/18/98

The first obvious analysis for the global pressure wave was to look at Africa and its antipode (diametrically opposite region). Figure 3-3 shows a strong out of phase behavior in raw surface integrated pressure for Africa and its antipode.
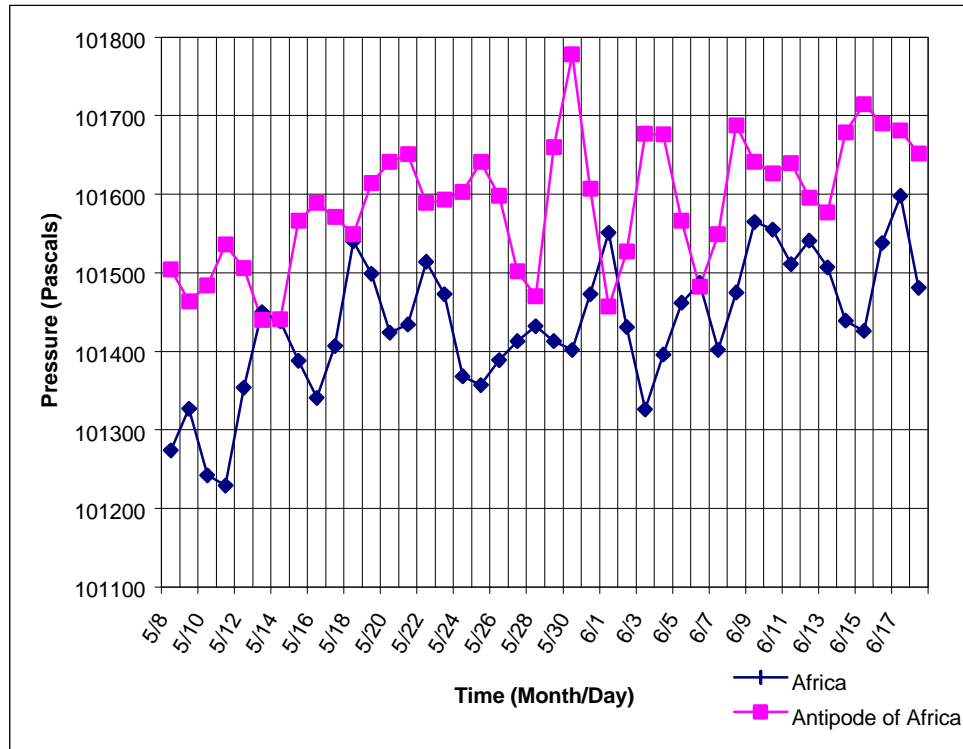
Figure 3-3: Surface Pressure for Africa and its antipode

The figure shows evidence for a strong wavenumber 1 component with approximately 5 day periodicity. Following the procedure in Madden and Julian (1972), pressure was taken for 14 regions and time filtered and then filtered for zonal wavenumber 1. The resulting filtered pressure was then color-coded with negative pressure in red and positive pressure in blue. As can be seen on the next page in Figure 3-4, a clear 5 day global pressure wave is occurring with rightward sloping bands indicative of a westward propagation.
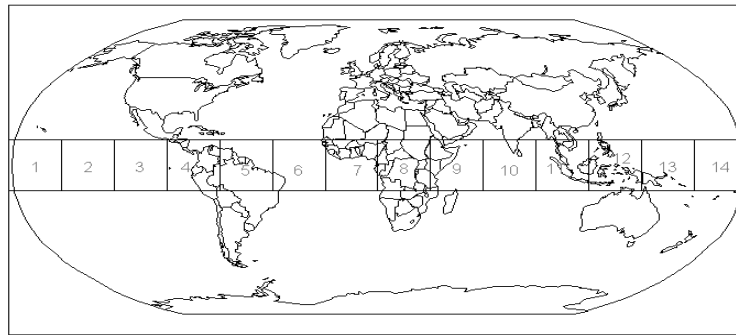
Time	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Lightning
5/8	-29.1	-40.1	-43.1	-37.6	-24.6	-6.8	12.4	29.1	40.1	43.1	37.6	24.6	6.8	-12.4	149
5/9	-86.1	-62.7	-27.0	14.2	52.5	80.4	92.4	86.1	62.7	27.0	-14.2	-52.5	-80.4	-92.4	212
5/10	-16.5	6.5	28.1	44.2	51.6	48.7	36.2	16.5	-6.5	-28.1	-44.2	-51.6	-48.7	-36.2	159
5/11	40.8	39.6	30.4	15.3	-2.9	-20.5	-34.0	-40.8	-39.6	-30.4	-15.3	2.9	20.5	34.0	58
5/12	32.5	21.9	7.0	-9.3	-23.8	-33.5	-36.6	-32.5	-21.9	-7.0	9.3	23.8	33.5	36.6	94
5/13	-41.3	-38.1	-27.3	-11.1	7.3	24.2	36.3	41.3	38.1	27.3	11.1	-7.2	-24.2	-36.3	109
5/14	-34.2	-11.6	13.2	35.4	50.6	55.8	50.0	34.2	11.6	-13.2	-35.4	-50.6	-55.8	-50.0	155
5/15	21.0	26.6	26.9	21.9	12.6	0.8	-11.2	-21.0	-26.6	-26.9	-21.9	-12.6	-0.8	11.2	64
5/16	59.4	34.5	2.7	-29.6	-56.0	-71.3	-72.6	-59.4	-34.5	-2.7	29.6	56.0	71.3	72.6	48
5/17	5.5	-16.5	-35.2	-47.0	-49.4	-42.1	-26.4	-5.5	16.5	35.2	46.9	49.4	42.1	26.4	47
5/18	-73.1	-77.5	-66.5	-42.4	-9.9	24.6	54.2	73.1	77.5	66.5	42.4	9.9	-24.6	-54.2	115
5/19	-16.8	-3.2	11.0	23.1	30.5	32.0	27.1	16.8	3.2	-11.0	-23.0	-30.5	-32.0	-27.1	243
5/20	20.3	35.6	43.8	43.4	34.4	18.6	-0.9	-20.2	-35.6	-43.8	-43.4	-34.4	-18.6	0.9	126
5/21	16.1	13.5	8.2	1.3	-5.8	-11.8	-15.5	-16.1	-13.5	-8.2	-1.3	5.8	11.8	15.5	75
5/22	-36.6	-49.3	-52.2	-44.8	-28.5	-6.6	16.7	36.6	49.3	52.2	44.8	28.5	6.6	-16.7	55
5/23	-11.6	-11.0	-8.1	-3.7	1.5	6.3	10.0	11.6	11.0	8.1	3.7	-1.5	-6.3	-10.0	162
5/24	27.0	43.1	50.6	48.1	36.1	16.9	-5.6	-27.0	-43.1	-50.6	-48.1	-36.1	-16.9	5.6	142
5/25	25.3	42.2	50.7	49.1	37.9	19.1	-3.4	-25.3	-42.2	-50.7	-49.1	-37.9	-19.1	3.4	58
5/26	18.4	3.9	-11.5	-24.6	-32.8	-34.5	-29.4	-18.4	-3.9	11.5	24.6	32.8	34.5	29.4	33
5/27	-14.1	-45.7	-68.2	-77.3	-71.0	-50.7	-20.3	14.1	45.7	68.2	77.3	71.0	50.7	20.3	75
5/28	-48.7	-46.8	-35.6	-17.4	4.3	25.1	41.0	48.7	46.8	35.6	17.4	-4.3	-25.1	-41.0	167
5/29	26.7	51.9	66.9	68.6	56.7	33.6	3.8	-26.7	-51.9	-66.8	-68.6	-56.7	-33.6	-3.8	117
5/30	80.3	74.6	54.1	22.8	-12.9	-46.1	-70.2	-80.3	-74.6	-54.1	-22.8	12.9	46.1	70.2	42
5/31	17.3	-17.7	-49.3	-71.0	-78.7	-70.8	-48.9	-17.3	17.7	49.2	71.0	78.7	70.8	48.9	17
6/1	-80.1	-83.7	-70.7	-43.7	-8.1	29.2	60.6	80.1	83.7	70.7	43.7	8.1	-29.1	-60.6	152
6/2	-43.5	-7.3	30.4	62.0	81.4	84.6	71.1	43.5	7.3	-30.4	-62.0	-81.4	-84.6	-71.1	182
6/3	57.6	70.1	68.6	53.6	27.9	-3.2	-33.8	-57.6	-70.1	-68.6	-53.6	-28.0	3.2	33.8	121
6/4	21.3	16.9	9.2	-0.4	-9.9	-17.4	-21.5	-21.3	-16.9	-9.2	0.4	9.9	17.4	21.5	10
6/5	-13.5	-26.0	-33.4	-34.2	-28.2	-16.6	-1.7	13.5	26.0	33.4	34.2	28.2	16.6	1.7	62
6/6	-48.0	-34.1	-13.4	9.9	31.3	46.4	52.4	48.0	34.1	13.4	-9.9	-31.3	-46.4	-52.4	51
6/7	15.0	24.0	28.2	26.9	20.2	9.6	-3.0	-15.0	-24.0	-28.2	-26.9	-20.2	-9.6	3.0	67
6/8	35.9	25.4	10.0	-7.5	-23.4	-34.7	-39.2	-35.9	-25.4	-10.0	7.5	23.4	34.7	39.2	39
6/9	-19.4	-21.8	-19.8	-14.0	-5.3	4.4	13.2	19.4	21.8	19.8	14.0	5.3	-4.4	-13.2	68
6/10	-1.0	-6.5	-10.6	-12.7	-12.2	-9.3	-4.6	1.0	6.5	10.6	12.7	12.2	9.3	4.6	81
6/11	-6.8	-17.9	-25.5	-28.0	-25.0	-17.0	-5.7	6.8	17.9	25.5	28.0	25.0	17.0	5.7	126
6/12	-31.1	-24.6	-13.3	0.7	14.5	25.5	31.4	31.1	24.6	13.3	-0.7	-14.5	-25.5	-31.4	183
6/13	-6.9	3.7	13.6	20.9	24.0	22.3	16.2	7.0	-3.7	-13.6	-20.9	-24.0	-22.3	-16.2	48
6/14	24.8	25.5	21.2	12.6	1.6	-9.8	-19.2	-24.8	-25.5	-21.2	-12.6	-1.6	9.8	19.2	132
6/15	14.7	4.0	-7.6	-17.6	-24.2	-25.9	-22.5	-14.7	-4.0	7.6	17.6	24.2	25.9	22.5	129
6/16	-11.9	-16.6	-18.1	-16.0	-10.7	-3.3	4.7	11.9	16.6	18.1	16.0	10.7	3.3	-4.7	82
6/17	-1.3	14.9	28.1	35.8	36.4	29.7	17.2	1.3	-14.9	-28.1	-35.8	-36.4	-29.7	-17.2	61
6/18	33.1	38.7	36.7	27.4	12.6	-4.6	-20.9	-33.1	-38.7	-36.7	-27.4	-12.7	4.6	20.9	83

Figure 3-4: X-T Plot of Wavenumber 1 Traveling around the World.

The next analysis carried out was to see the phase relationship of the global 5-day wave and the African mesoscale lightning. Figure 3-5 shows that there seems to be fairly consistent phase relationship with lightning and how the phase is circumnavigating the globe every five days or so.
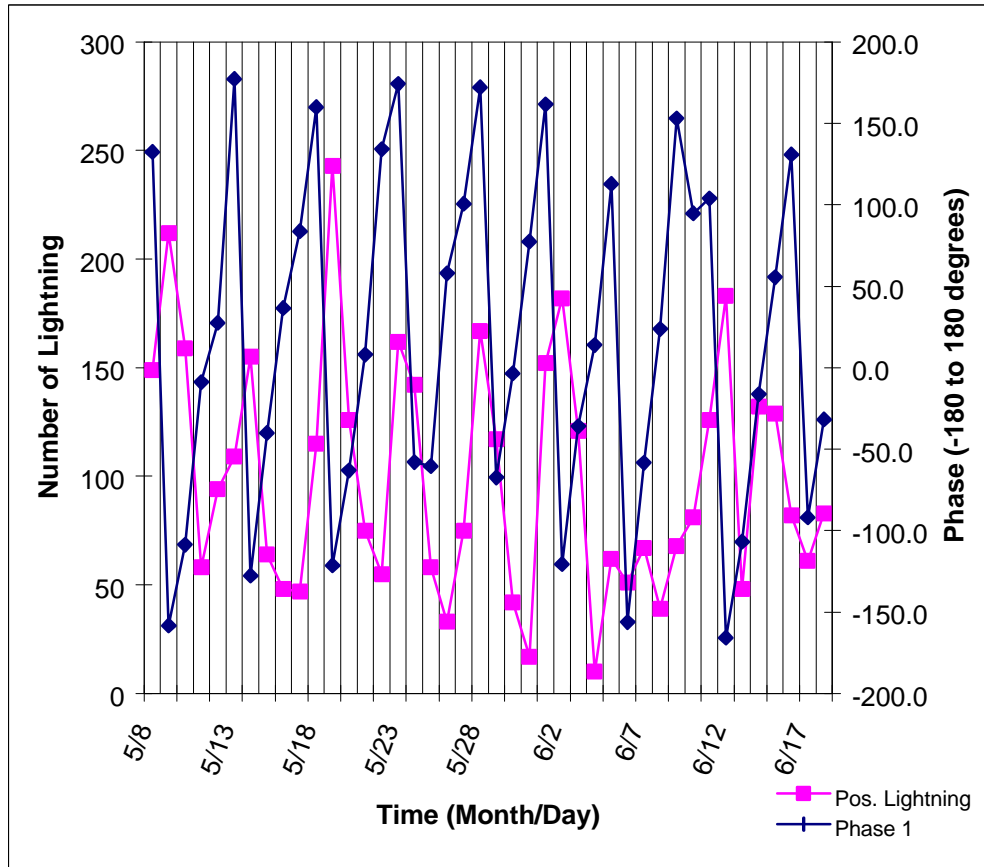
Figure 3-5: African Lightning vs. Phase of Wavenumber 1 for 5/8/98-6/18/98

The relationship between the phase of the wave and the peak of the lightning is the trough or minimum of the pressure wave is always 60 to 100 longitude degrees to the east of Africa. When the trough of the wave is on Africa, there seems to be a minimum in lightning activity. Figure 3-6 on the following page shows a six day example of the global pressure wave going around the world and the corresponding lightning activity. Spectral plots of the wave numbers of the time filtered pressure data are also shown. It is

interesting to note that there are occasionally days where wavenumber 1 is not the

dominant wave and wavenumber 2 becomes dominant.
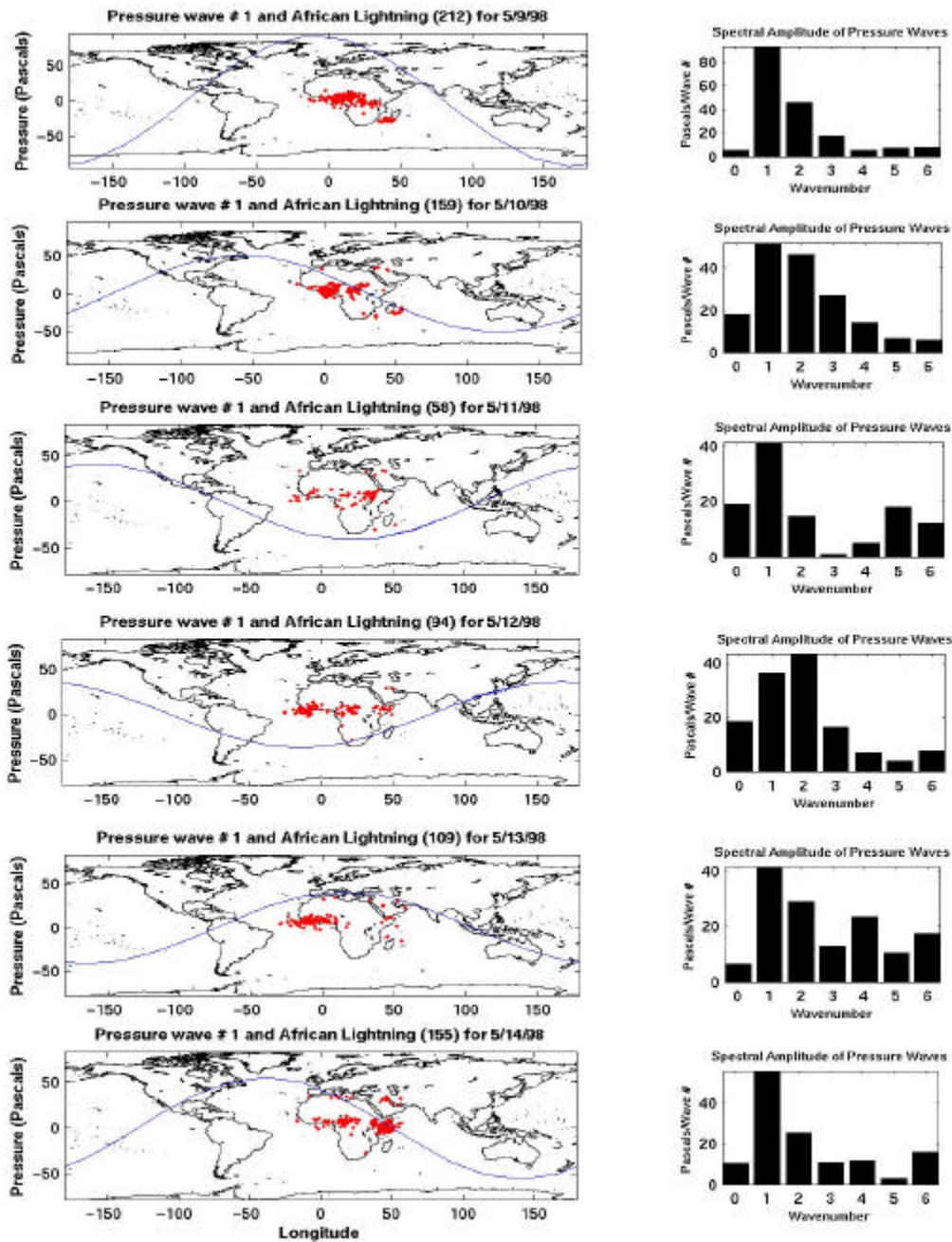
Figure 3-6: 5-day global pressure wave traveling around the world with Spectal Plots of
Time Filtered Pressure and African Lightning

Next, wind was analyzed in relation to lightning. Avissar et al. (1993) claim that kinetic energy or wind is a good measure of where mesoscale convective systems are forming. Integrated horizontal wind components were taken for the region from –5 latitude to 20 latitude and –20 longitude to 40 longitude. The wind components were taken at the 700 mbar level. Figure 3-7 does show that there is a positive correlation between the transient lightning and horizontal wind energy. Note vertical wind is difficult to measure or approximate (Williams et. al, 1993) and is omitted in the present analysis.
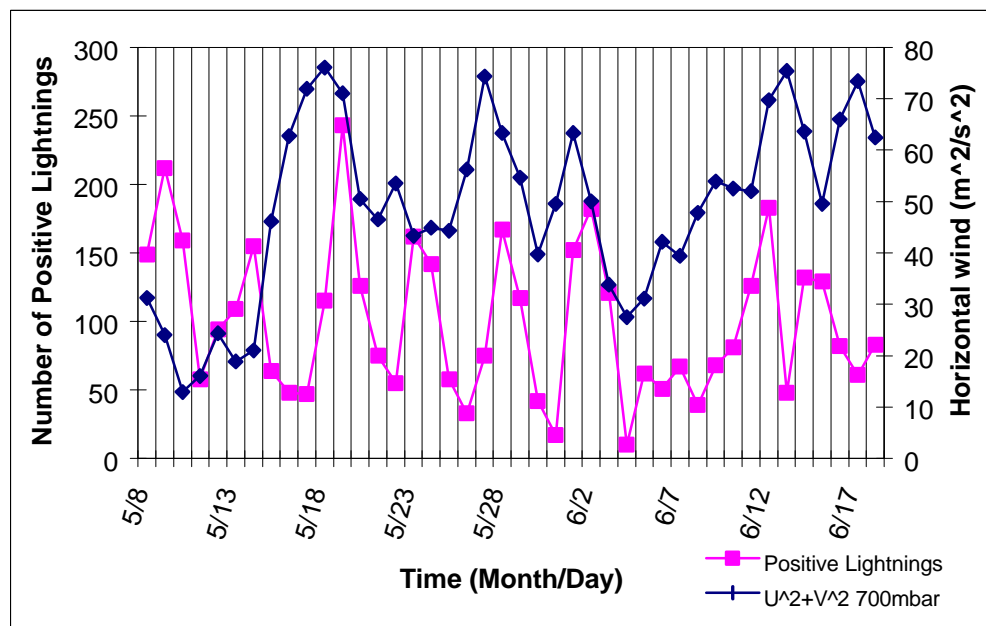
Figure 3-7: African Lightning and Horizontal Wind Correlation for 5/8/98-6/18/98 at 700mbar

Finally the remaining analysis carried out was spectral analysis of wind, lightning, and rain for this period. In Figure 3-8 , lightning clearly shows a five day spectral peak, rainfall shows both a four day and six day peak, and horizontal wind shows a five day peak.
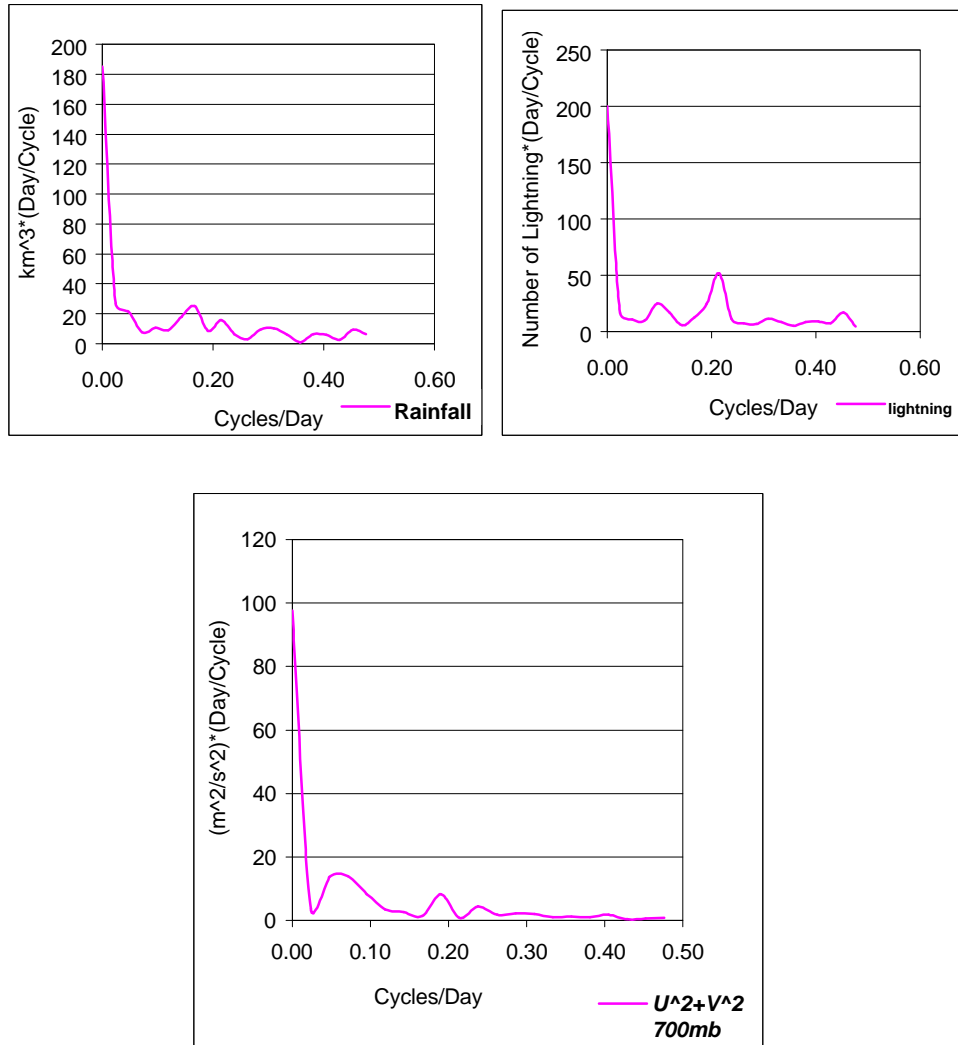
Figure 3-8: Spectral analysis of lightning, wind and rainfall
for 5/8/98-6/18/98

Finally it is important to note that all of these variables were investigated with Meteosat imagery, lightning maps and movies of the maps, and what was seen in the movies bore a clear connection with where mesoscale clouds were forming and where lightning and rainfall activity were occurring. To give the reader a flavor of these maps, a typical day of maps is given. Castro (2000) documents all the daily lightning and rainfall maps for this interval.
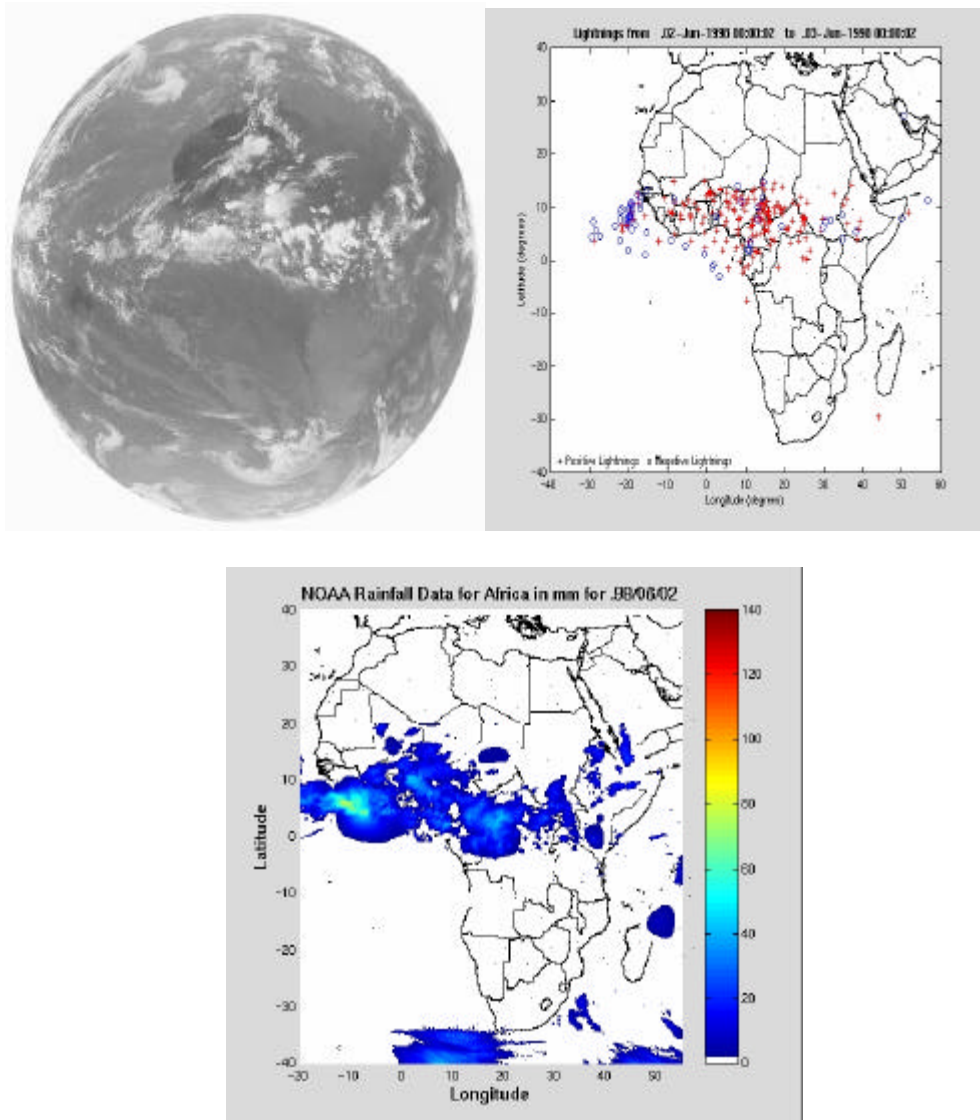
Figure 3-9: Satellite IR imagery, Lightning Map and Rainfall Map

3.2 December 10th 1996 to December 28th 1996

To differentiate the pressure wave from easterly waves a winter record needs to be examined. Easterly waves are a summer phenomenon and finding the 5-day African lightning disturbance in the winter with the 5-day global pressure wave would help separate the two phenomenon. Unfortunately, our lightning data has a lot of discontinuity meaning it can stop taking lightning for hours to days. A winter record similar to forty day period found in 1998 was not found but a smaller period (19 days) of continuous lightning data was found in December of 1996. Unfortunately NOAA does not have daily rainfall data for this interval and only the pressure wave and lightning were examined. Figure 3-10 shows the lightning record with the phase of the pressure wave.
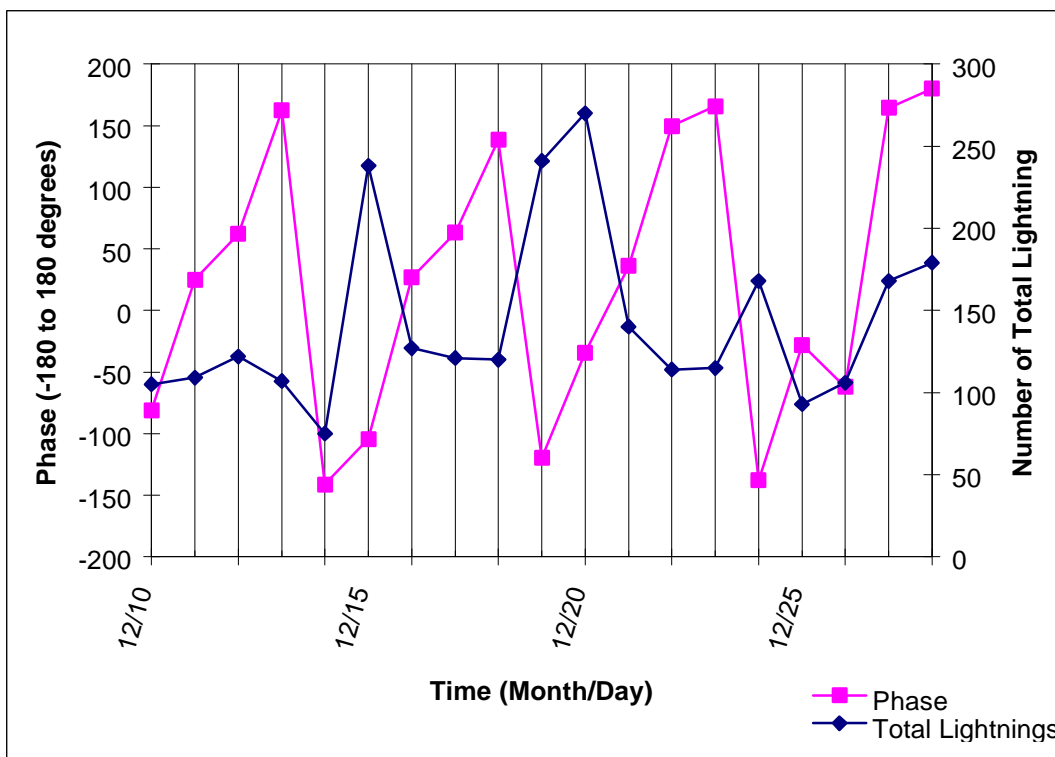
Figure 3-10: African Lightnings vs. 5-day Global Pressure Wave Phase

Again the same phase relationship to African lightning is found as in the May to June 1998 period. Figure 3-10 also shows a 5 day periodicity in African Lightning. Figure 3-11 is a color coded x-t plot of the global pressure wave with African lightning. The X-T plot again clearly shows a westward progressing 5 day wave. As the mesoscale lightning is peaking the pressure wave is at a particular location. Namely the trough is east of Africa by about 60 degrees longitude.
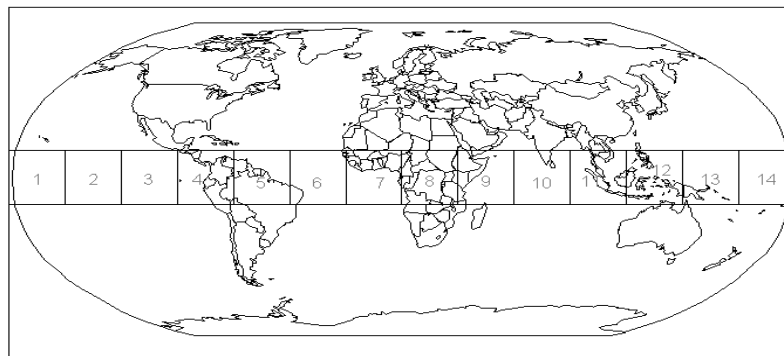
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Lightning
Time															
12/10	8	29	45	51	48	35	15	-8	-29	-45	-51	-48	-35	-15	105
12/11	42	29	11	-10	-28	-41	-46	-42	-29	-11	10	28	41	46	109
12/12	16	1	-14	-27	-34	-35	-28	-16	-1	14	27	34	35	28	122
12/13	-40	-41	-35	-21	-4	15	30	40	41	35	21	4	-15	-30	107
12/14	-42	-23	0	24	43	53	53	42	23	0	-24	-43	-53	-53	75
12/15	-11	9	28	41	46	42	30	11	-9	-28	-41	-46	-42	-30	238
12/16	40	27	9	-11	-28	-40	-44	-40	-27	-9	11	28	40	44	127
12/17	25	1	-23	-43	-55	-55	-45	-25	-1	23	43	55	55	45	121
12/18	-15	-20	-20	-17	-10	-1	8	15	20	20	17	10	1	-8	120
12/19	-23	-3	17	34	45	46	38	23	3	-17	-34	-45	-46	-38	241
12/20	46	55	53	41	20	-4	-28	-46	-55	-53	-41	-20	4	28	270
12/21	32	19	2	-16	-30	-38	-39	-32	-19	-2	16	30	38	39	140
12/22	-51	-59	-55	-41	-18	8	33	51	59	55	41	18	-8	-33	114
12/23	-56	-56	-46	-26	-1	24	44	56	56	46	26	1	-24	-44	115
12/24	-20	-10	2	13	22	27	26	20	10	-2	-13	-22	-27	-26	168
12/25	17	19	18	13	5	-3	-11	-17	-19	-18	-13	-5	3	11	93
12/26	2	3	4	4	3	1	0	-2	-3	-4	-4	-3	-1	0	106
12/27	-27	-28	-23	-14	-1	11	21	27	28	23	14	1	-11	-21	168

Figure 3-11: X-T plot of 5 day global pressure wave

3.3 September 17th 1989 to October 31st 1989

This period was examined because Sentman et. al (1996) found clear evidence of 5 day periodicity in global background Schumann rsonance as shown in Figure 3-12. Unfortunately, we do not have the electromagnetic components so we cannot determine the origin of the lightning activity but it is likely that Africa, approximately equidistant from the two observing stations is the dominant source. The zonal pressure as analyzed for this period and the phase relationship is consistent. The minimum of the wave is 60 to 100 degrees longitude east of Africa.
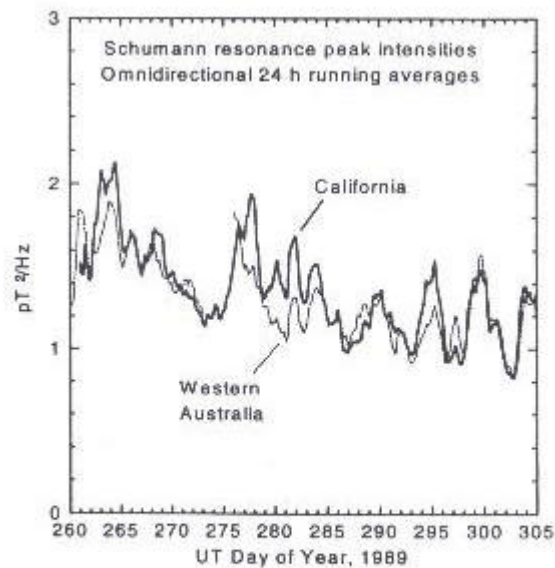
24 hr running averages of the peak intensities of the lowest 3 Schumann modes.

Figure 3-12: Sentman Record of Global Schumann Resonance 5-Day Periodicity

This record starts September 17th 1989 and ends October 31st 1989. The peaks are at Sept 17th, Sept 21st, Sept 25th, Sept 29th, Oct 5th, Oct 9th, Oct 11th, Oct 13th, Oct 17th, Oct 22nd, Oct 27th, Oct 31st.

Figure 3-13 examines the phase relationship of the 5 day pressure wave with respect to this time period. If Africa was the source of the periodicity in the global background Schumann resonances, then the same phase relationship would exist between African lightning and the phase of the pressure wave.
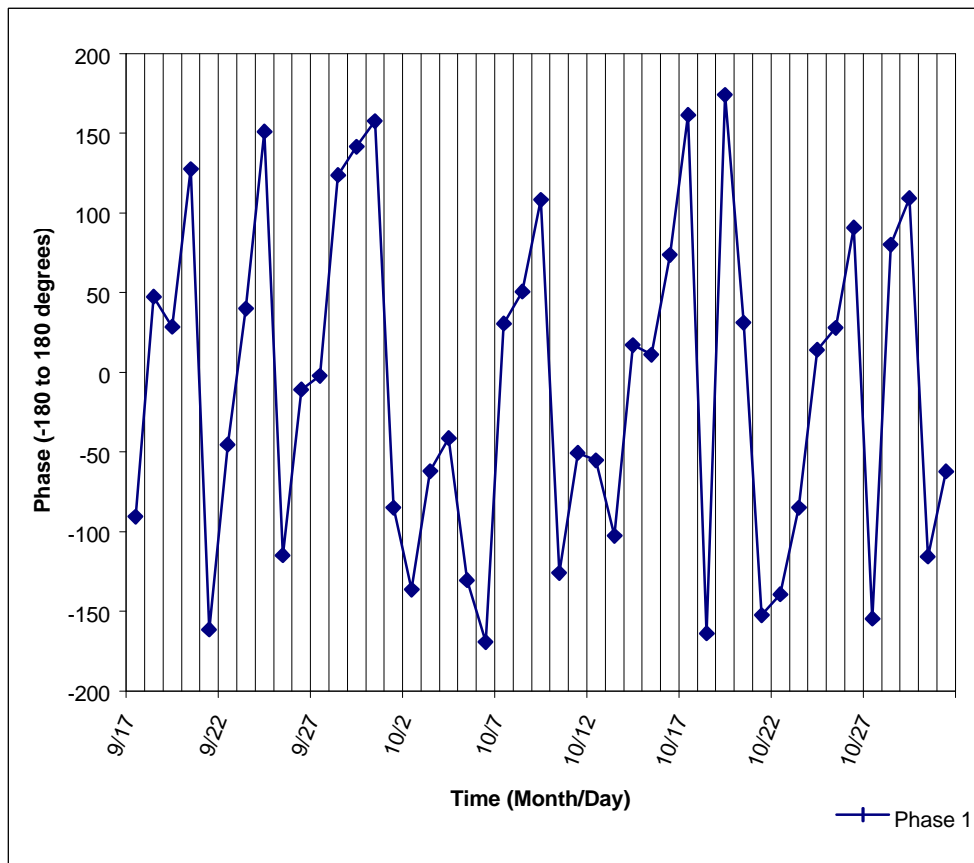
Figure 3-13: Phase of Wavenumber 1 for 9/17/89-10/31/89

The next graph (Figure 3-14) examines where the peaks of the global background Schumann resonance and the pressure wave location in the world . Again if Africa was causing this peaking in the background Schumann resonance, another clear case of the pressure phase relationship to African lightning would be documented.

Figure 3-14: X-T Plot vs Global background Schumann Resonance Peaks
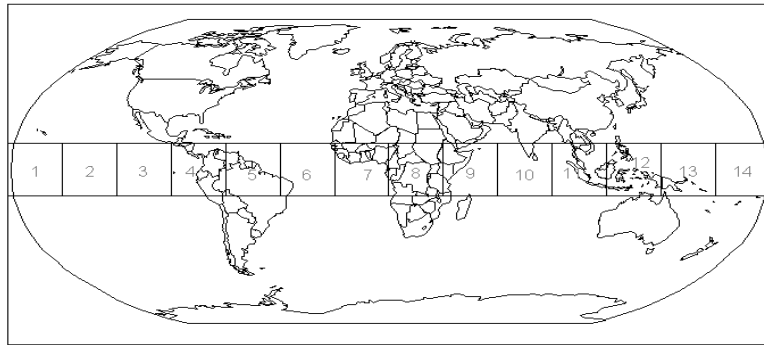
Time	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Lightning
9/17	0	9	16	20	20	16	9	0	-9	-16	-20	-20	-16	-9	peak
9/18	11	5	-3	-9	-14	-17	-15	-11	-5	3	9	14	17	15	
9/19	22	15	4	-7	-16	-23	-25	-22	-15	-4	7	16	23	25	
9/20	-12	-17	-19	-18	-12	-5	4	12	17	19	18	12	5	-4	
9/21	-28	-21	-10	3	16	25	30	28	21	10	-3	-16	-25	-30	peak
9/22	24	32	34	29	19	4	-11	-24	-32	-34	-29	-19	-4	11	
9/23	21	11	-1	-12	-21	-26	-26	-21	-11	1	12	21	26	26	
9/24	-37	-42	-39	-28	-12	7	24	37	42	39	28	12	-7	-24	
9/25	-12	0	12	22	27	27	21	12	0	-12	-22	-27	-27	-21	peak
9/26	56	55	43	23	-2	-26	-46	-56	-55	-43	-23	2	26	46	
9/27	52	48	34	14	-10	-31	-46	-52	-48	-34	-14	10	31	46	
9/28	-19	-29	-34	-32	-23	-10	5	19	29	34	32	23	10	-5	
9/29	-49	-61	-61	-49	-27	0	27	49	61	61	49	27	0	-27	peak
9/30	-22	-24	-21	-14	-4	7	16	22	24	21	14	4	-7	-16	
10/1	2	9	15	17	17	13	6	-2	-9	-15	-17	-17	-13	-6	
10/2	-17	-8	2	12	19	23	22	17	8	-2	-12	-19	-23	-22	
10/3	9	16	19	19	15	8	-1	-9	-16	-19	-19	-15	-8	1	
10/4	12	15	16	13	8	1	-6	-12	-15	-16	-13	-8	-1	6	
10/5	-19	-7	5	17	25	28	26	19	7	-5	-17	-25	-28	-26	peak
10/6	-21	-17	-10	-1	9	16	21	21	17	10	1	-9	-16	-21	
10/7	28	18	5	-10	-23	-31	-33	-28	-18	-5	10	23	31	33	
10/8	30	11	-10	-29	-42	-47	-43	-30	-11	10	29	42	47	43	
10/9	-6	-13	-18	-19	-16	-11	-3	6	13	18	19	16	11	3	peak
10/10	-21	-6	10	24	33	36	31	21	6	-10	-24	-33	-36	-31	
10/11	12	18	19	17	12	4	-5	-12	-18	-19	-17	-12	-4	5	peak
10/12	3	5	6	5	4	2	-1	-3	-5	-6	-5	-4	-2	1	
10/13	-6	6	17	24	27	24	17	6	-6	-17	-24	-27	-24	-17	peak
10/14	15	12	6	-1	-8	-13	-16	-15	-12	-6	1	8	13	16	
10/15	49	40	23	2	-20	-38	-48	-49	-40	-23	-2	20	38	48	
10/16	9	-5	-19	-28	-32	-30	-22	-9	5	19	28	32	30	22	
10/17	-45	-47	-40	-25	-5	16	34	45	47	40	25	5	-16	-34	peak
10/18	-32	-25	-13	2	16	27	33	32	25	13	-2	-16	-27	-33	
10/19	-14	-13	-10	-4	2	8	12	14	13	10	4	-2	-8	-12	
10/20	14	9	2	-5	-12	-16	-17	-14	-9	-2	5	12	16	17	
10/21	-11	-7	-2	3	8	11	12	11	7	2	-3	-8	-11	-12	
10/22	-29	-15	1	18	30	37	37	29	15	-1	-18	-30	-37	-37	peak
10/23	3	16	27	32	30	23	11	-3	-16	-27	-32	-30	-23	-11	
10/24	41	32	17	-1	-19	-33	-41	-41	-32	-17	1	19	33	41	
10/25	32	22	7	-9	-24	-33	-36	-32	-22	-7	9	24	33	36	
10/26	0	-4	-7	-9	-9	-7	-4	0	4	7	9	9	7	4	
10/27	-35	-24	-9	8	24	34	38	35	24	9	-8	-24	-34	-38	peak
10/28	4	-7	-16	-22	-24	-21	-14	-4	7	16	22	24	21	14	
10/29	-11	-24	-32	-34	-29	-18	-4	11	24	32	34	29	18	4	
10/30	-17	0	17	31	39	39	31	17	0	-17	-31	-39	-39	-31	
10/31	24	41	50	49	38	20	-2	-24	-41	-50	-49	-38	-20	2	peak

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3.4 February 19th 1998 to March 25th 1998

This period is being examined because Price et. al. (1998) found evidence for 5 day periodicity in lightning originating in Africa. The record starts form February 19th and ends on March 25th. Figure 3-15 shows lightning peaking on March 2nd, March 7th, March 12th, March 18th. Pressure and rainfall was analyzed for this period.
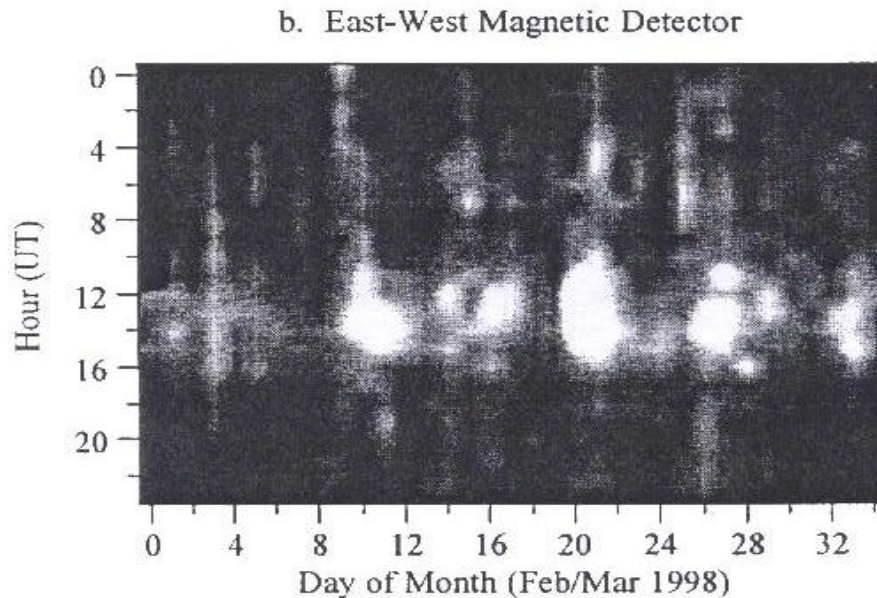
Figure 3-15: Background Schumann Resonance for Africa 2/19/98-3/25/98

This graph is taken from Price et al. (1998) and shows the background Schumann resonance intensity in the east-west coil magnetic coil which should be most receptive to African lightning from a receiving site in Israel. As one can see, Africa is peaking diurnally at 14 to 16 UT or 2 to 4 PM locally in the afternoon in Africa. This is the classical time when ordinary thunderstorms are active and when the background should be peaking. Even though these lightnings are not from mesoscale convective systems, we

still find five day periodicity in the lightning activity. Figure 3-16 shows that total African rainfall is also following a 4 day period in activity and is correlated to the background Schumann resonance. Again the phase of the pressure wave is same. Namely, the trough is east of Africa and approaching Africa. Figure 3-17 is a spectral plot of rainfall to find the strong frequency components.
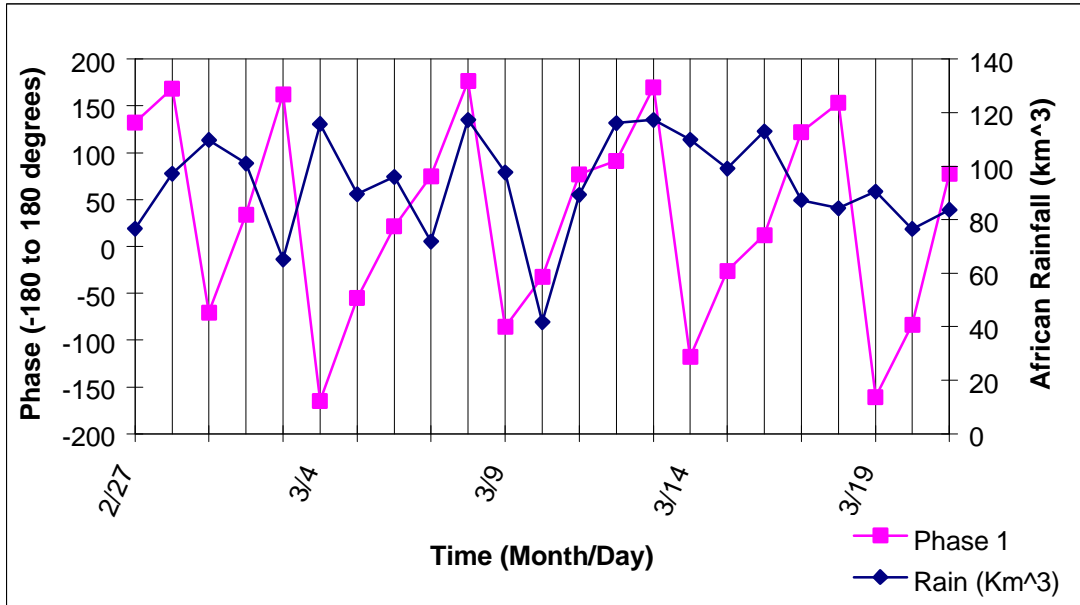
Figure 3-16: Phase of Pressure Wave and Total African Rainfall for 2/27/98-3/21/98
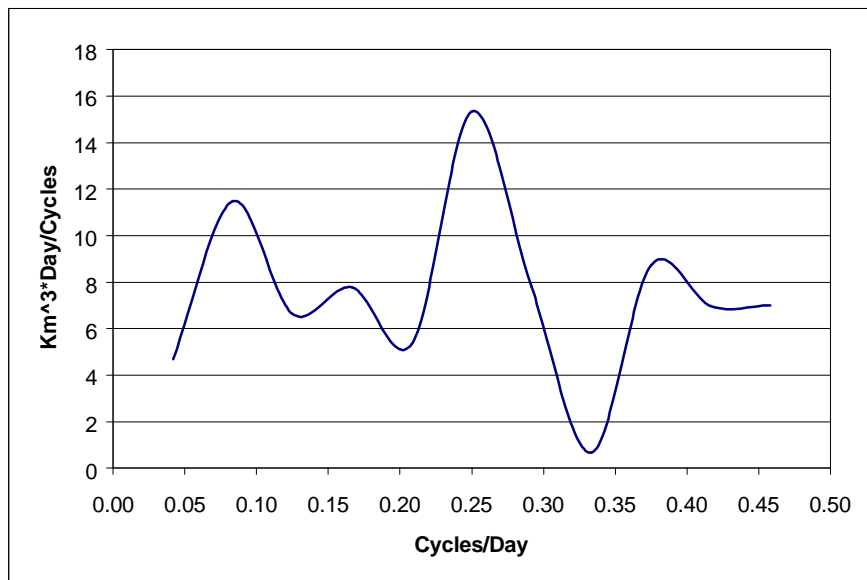
Figure 3-17: Spectral Analysis of Total African Rain for 2/27/98-3/21/98

The following is the x-t plot of the pressure wave traveling around the world and the peak lightning days for this period.
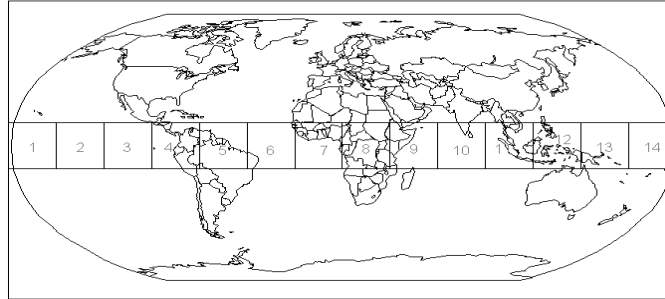
Time	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Lightning
2/27	-18	-25	-27	-24	-16	-4	8	18	25	27	24	16	4	-8	
2/28	-28	-27	-22	-12	1	13	23	28	27	22	12	-1	-13	-23	
3/1	5	10	14	14	12	8	2	-5	-10	-14	-14	-12	-8	-2	
3/2	29	18	3	-13	-26	-33	-35	-29	-18	-3	13	26	33	35	Peak
3/3	-38	-39	-33	-20	-3	14	29	38	39	33	20	3	-14	-29	
3/4	-31	-24	-13	1	15	26	31	31	24	13	-1	-15	-26	-31	
3/5	21	32	36	34	25	10	-6	-21	-32	-36	-34	-25	-10	6	
3/6	23	17	7	-4	-14	-21	-24	-23	-17	-7	4	14	21	24	
3/7	4	-3	-10	-15	-17	-16	-11	-4	3	10	15	17	16	11	Peak
3/8	-52	-48	-35	-15	8	30	45	52	48	35	15	-8	-30	-45	
3/9	2	15	25	30	29	22	11	-2	-15	-25	-30	-29	-22	-11	
3/10	55	65	62	47	22	-7	-34	-55	-65	-62	-47	-22	7	34	
3/11	8	-8	-22	-32	-36	-32	-22	-8	8	22	32	36	32	22	
3/12	-1	-10	-17	-21	-21	-16	-9	1	10	17	21	21	16	9	Peak
3/13	-55	-54	-42	-22	3	27	45	55	54	42	22	-3	-27	-45	
3/14	-21	-2	18	35	44	45	37	21	2	-18	-35	-44	-45	-37	
3/15	89	99	89	62	23	-21	-61	-89	-99	-89	-62	-23	21	61	
3/16	108	87	49	2	-47	-86	-108	-108	-87	-49	-2	47	86	108	
3/17	-27	-43	-50	-48	-36	-17	5	27	43	50	48	36	17	-5	
3/18	-107	-120	-109	-77	-29	24	73	107	120	109	77	29	-24	-73	Peak
3/19	-52	-39	-18	6	29	46	54	52	39	18	-6	-29	-46	-54	
3/20	10	46	72	85	81	60	28	-10	-46	-72	-85	-81	-60	-28	

Figure 3-18: X-T Plot vs African background Schumann Resonance Peaks

Again we see a strong 5 day westward propagating pressure wave. The phase relationship is different for this period, but there is still some consistantcy. One must remember that this is a fast moving wave and we are averaging numbers over a day. The phase lightning relationship will therefore will have some variability.

3.5 Parade of Storms in 1996

The "Parade of Storms" was analyzed for easterly waves. The importance of this Parade of Storms is that they all originated from Africa. This means the time period of 8/12/96 to 8/26/96 was clearly a time period, easterly waves were forming in Africa.
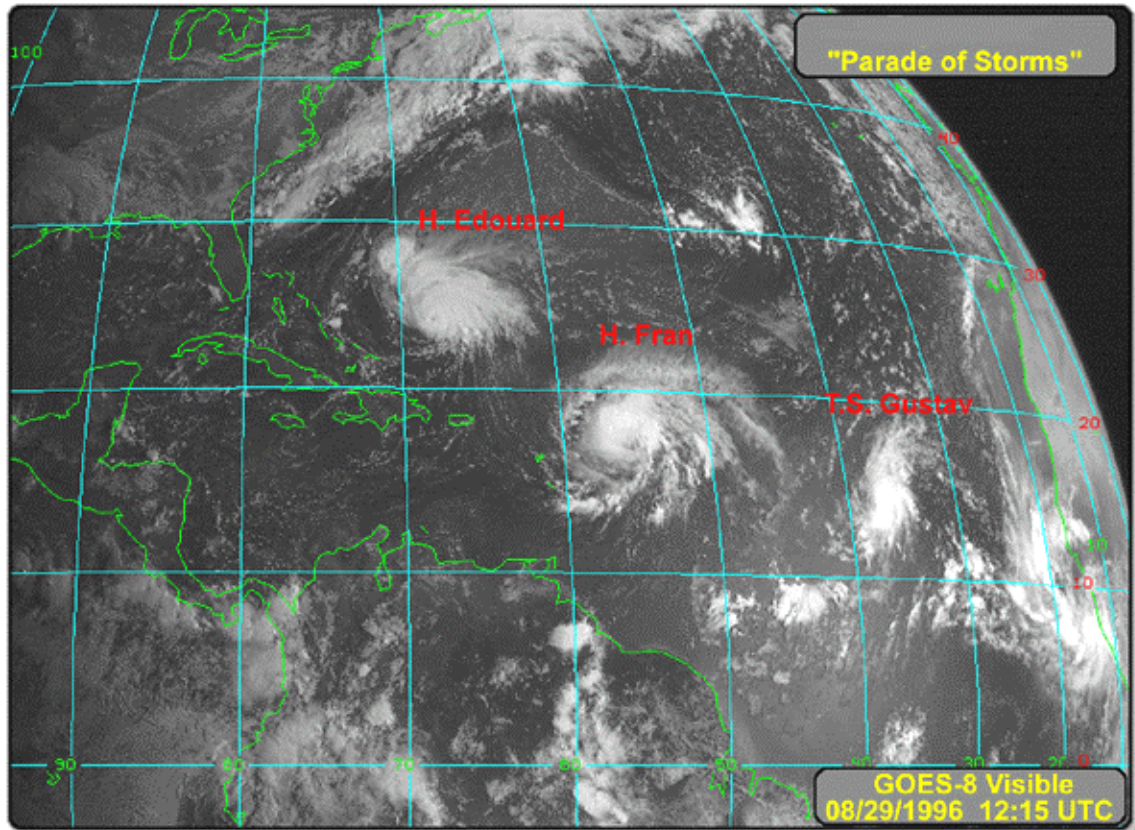
Figure 3-19: Parade of Storms 1996

So if we look at Africa during this time period, we can learn quite a bit about what easterly waves look like and how lightning and the global pressure wave play a role in interacting with the easterly waves. The first thing analyzed is the 5 day periodicity in lightning. Second, we notice that lightning has a strong correlation to horizontal wind. Horizontal wind is a key factor in strengthening easterly waves because these are storms with very strong horizontal wind components that eventually become hurricanes. Figure

3-20 shows both that 4 to 5 day periodicity exists in lightning and that lightning has a strong positive correlation with horizontal wind.

Kinetic Energy at 600mb vs Positive Lightnings in Africa for 6/27/96-8/26/96
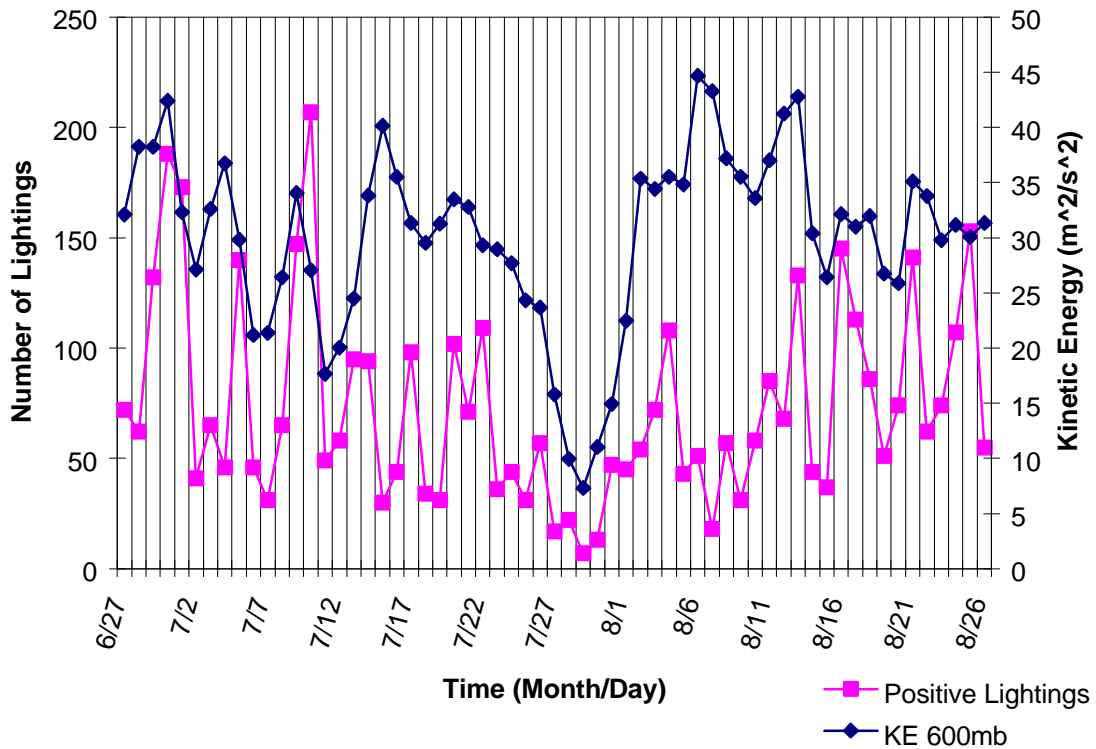
Figure 3-20: Horizontal Kinetic Energy correlation to 4-5 day lightning disturbance

What is important to notice here is that there is a strong 4 to 5 day lightning disturbance occurring and that this is all of Africa. Also notice that wind intensity picks up when these lightning events are occurring. Easterly waves on the other hand are forming every 2 to 3 days during this period and can be observed forming with satellite imagery with a wavelength of 20 to 25 degrees longitude, but every four to five days you can see these mesoscale convective systems light up in terms of lightning and by Figure 3-20, also in terms of wind speed.

Next we analyzed lightning and the phase relationship with the five day pressure wave. Figure 3-21 is x-t plot of the pressure wave with lightning next to it. Though there are clear signs of periodicity in lightning and the 5 day wave is strong, the phase relationship is different. One explanation for this could be that since easterly waves are strong during this period and have a pressure amplitude similar to the 5 day global wave we end up with an interference and the phase relationship changes.
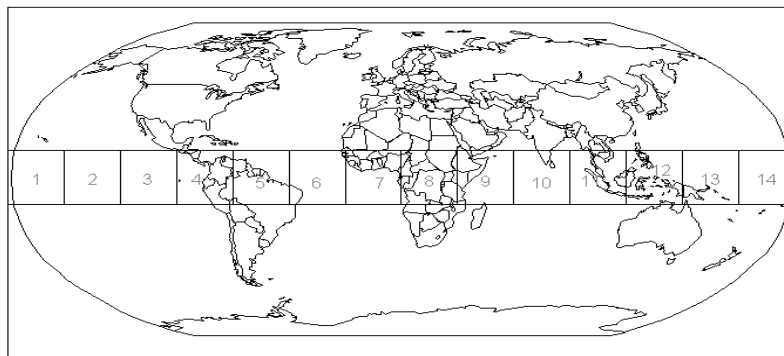
Time	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Lightning
8/12	-30.67133	-34.08892	-30.75518	-21.33035	-7.681028	7.489527	21.17678	30.66995	34.08891	30.75654	21.33281	7.684105	-7.486446	-21.1743	128
8/13	-0.555732	9.484285	17.64593	22.31279	22.56058	18.34023	10.48759	0.557865	-9.482341	-17.64456	-22.31226	-22.561	-18.34152	-10.48948	210
8/14	48.18626	55.02121	50.95917	36.80463	15.3609	-9.125066	-31.80381	-48.18378	-55.02091	-50.96112	-36.80843	-15.3658	9.12003	31.79964	93
8/15	16.24235	8.341591	-1.211227	-10.52416	-17.75278	-21.46544	-20.92686	-16.24369	-8.343454	1.209213	10.52239	17.75161	21.4651	20.92741	86
8/16	1.566085	-10.3133	-20.15014	-25.99622	-26.69373	-22.10452	-13.1375	-1.568589	10.31099	20.14846	25.99552	26.69414	22.10597	13.1397	225
8/17	-38.4657	-36.18332	-26.73479	-11.99142	5.126856	21.22976	33.12809	38.46538	36.18457	26.73738	11.99483	-5.123308	-21.22677	-33.12625	268
8/18	-45.45941	-30.51945	-9.535097	13.33769	33.56894	47.15184	51.39628	45.46164	30.52329	9.53978	-13.33309	-33.56533	-47.14994	-51.39646	170
8/19	6.155483	28.99879	46.09887	54.06903	51.33077	38.42642	17.91168	-6.150474	-28.99453	-46.09619	-54.06847	-51.33244	-38.42999	-17.91644	105
8/20	48.00762	54.80383	50.74609	36.63806	15.27383	-9.115398	-31.69931	-48.00515	-54.80353	-50.74803	-36.64185	-15.27871	9.110382	31.69516	137
8/21	9.169708	-14.71587	-35.68695	-49.59021	-53.67209	-47.12416	-31.24327	-9.174615	14.71108	35.68323	49.58829	53.67235	47.12656	31.24732	239
8/22	-29.64042	-51.9229	-63.922	-63.26131	-50.07166	-26.96528	1.481589	29.63503	51.91924	63.92079	63.26279	50.07554	26.97079	-1.475546	149
8/23	-38.81702	-26.39066	-8.737604	10.64594	27.92105	39.66637	43.55574	38.81886	26.39387	8.741558	-10.64203	-27.91795	-39.6647	-43.55583	137
8/24	27.36364	49.60851	62.02837	62.16347	49.98704	27.91064	0.306519	-27.35831	-49.6048	-62.02703	-62.16475	-49.9907	-27.91595	-0.312421	156
8/25	49.89357	43.60649	28.68311	8.079021	-14.12513	-33.53178	-46.29744	-49.89385	-43.60875	-28.6869	-8.083592	14.12068	33.52834	46.29569	224
8/26	36.18319	4.165914	-28.67643	-55.83938	-71.9433	-73.79879	-61.03838	-36.18926	-4.172839	28.67002	55.83476	71.94138	73.79996	61.04239	105

Figure 3-21: X-T plot of 5 day global pressure wave for 8/12/96-8/26/96

Figure 3-22, 3-23, 3-24 shows the lightning maps, satellite images, and wind maps for 8/12/96-8/26/96. What is seen by these pictures is clear signs of easterly waves and all of Africa having lightning. The main point is that during the setup of the Parade of Storms, the easterly waves cloud structures were forming every two to three days yet what is witnessed in terms of lightning is a four to five day lightning disturbance. This lightning by the time periods investigated in 1998 has a strong correlation to rainfall. So rainfall, lightning, and wind are all being modulated on a four to five day period. This indicates that if the pressure wave is responsible for African convection then it is also responsible for modulation of easterly waves.
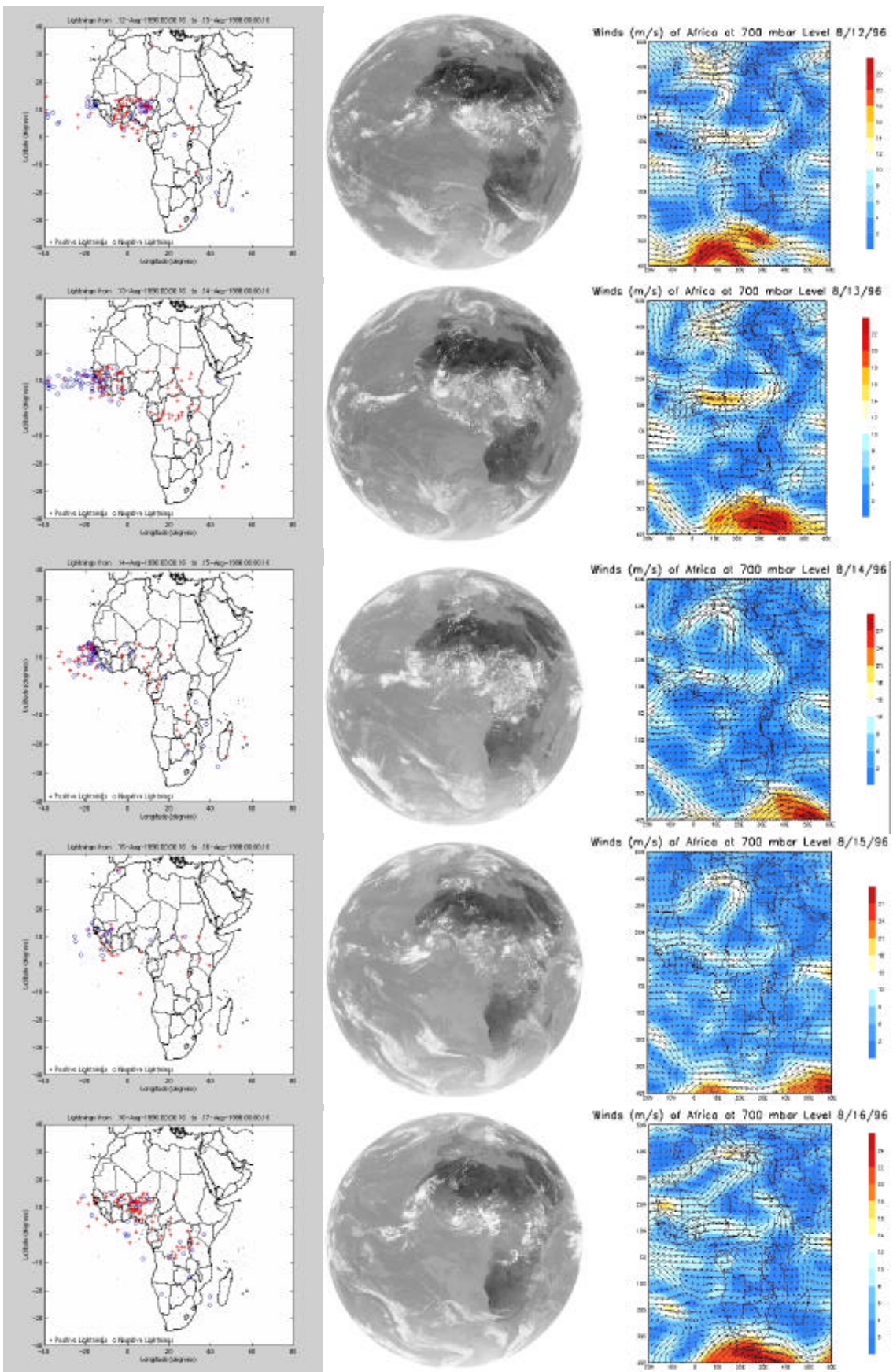
Figure 3-22: African Lightning, 12 UT Satellite image, Wind Maps for 8/12/96-8/16/96
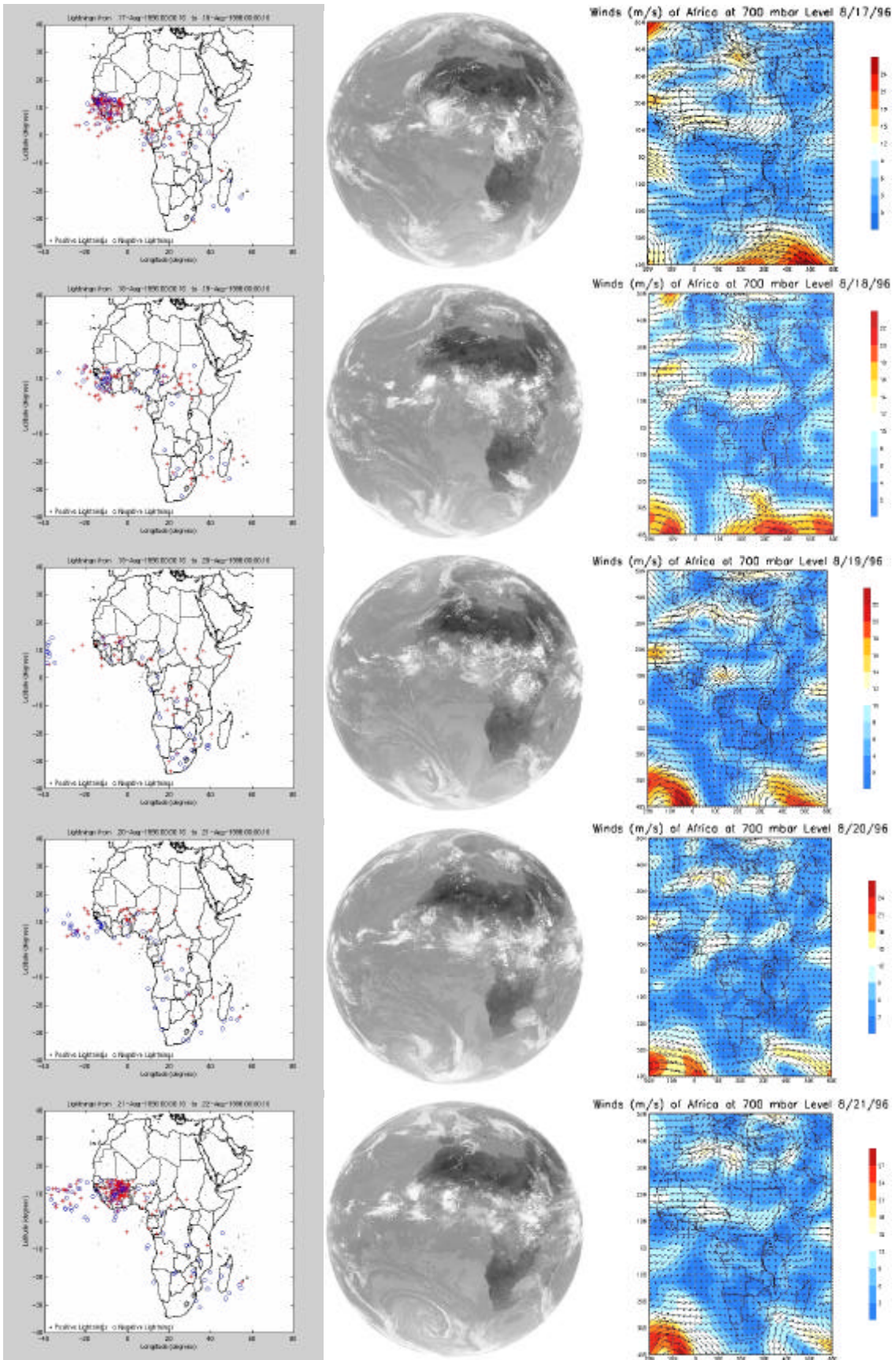
Figure 3-23:African Lightning, 12 UT Satellite image, Wind Maps for 8/17/96-8/21/96
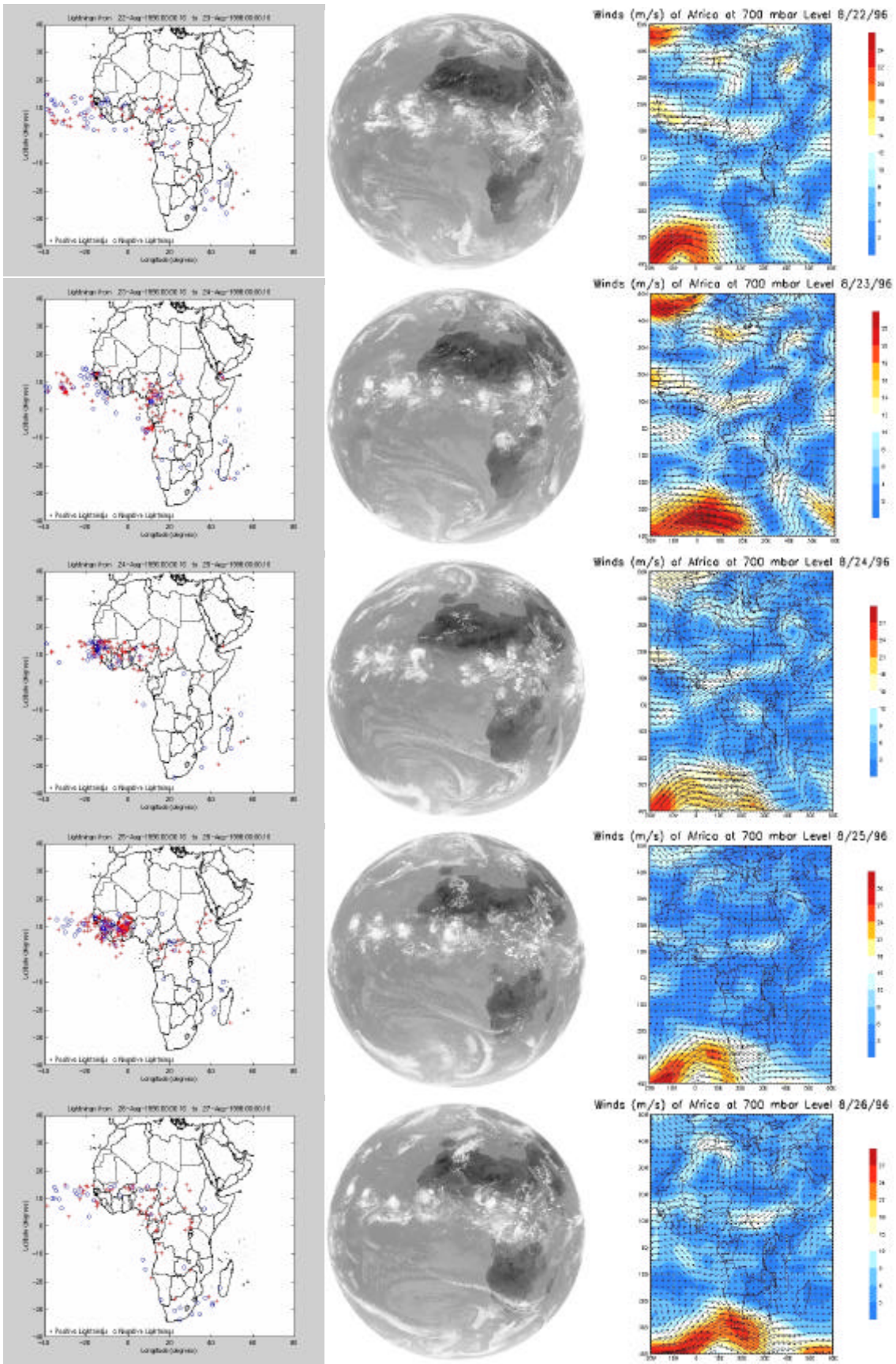
Figure 3-24: African Lightning, 12 UT Satellite image, Wind Maps for 8/22/96-8/26/96

Chapter 4

Discussion

The main objective of this thesis was to investigate the origin of the 5-day periodicity of African mesoscale lightning and rainfall. What is clearly shown by the time intervals investigated in the previous chapter is that the 5-day periodicity in lightning activity exists both in summer and winter. The lightning periodicity has also been documented in independent Schumann resonance data sets (Sentman et al, 1996; Price et al, 1999). The 5-day global pressure wave has been completely analyzed for the years of 1989, 1996, and 1998 and the location of the wave and its wavenumber counterparts are analyzed and documented in Appendix (A.8). The results demonstrate that the 5 day wave is a robust and systematic phenomenon throughout the year and not only when African Easterly waves are present. Easterly waves were investigated for their relationship to the 5 day lightning disturbance and evidence indicates that the two phenomenon are related because clearly easterly waves are mesoscale convective systems in which the mesoscale lightning originates.

First because easterly waves do not exist in the winter (Burpee, 1972), and because this thesis has confirmed the existence of the 5 day lightning activity in winter intervals (Sections 3.2 and 3.4), we can confirm that the five day lightning activity is not

caused by easterly waves. The principal evidence for this result was the December period of 1996 (Section 3.2) that was documented and the Price et. al (1998) period in early March 1998 (Section 3.4).

Second, using the lightning data from Rhode Island and independent data sources (Price et al., 1998), we can confirm that lightning activity from Africa is positively correlated to rainfall and thus convection. Such a correlation has been found frequently at the storm scale (Piepgrass et. al., 1982) but not on a continental scale. This is important because now we have another source of information on the latent heat release in the African "chimney" via Schumann resonances.

Third, we also know that lightning is positively correlated to kinetic energy increase through the wind analysis for the periods documented. This should make sense because this type of lightning originates in mesoscale convective systems and an increase in kinetic energy is known to accompany mesoscale convective systems (Avissar, et. al, 1993).

Fourth, we now know that the lightning activity has a certain phase relationship to the 5-day global pressure wave. Namely the wave trough is east of Africa and approaching it when the rainfall and lightning in Africa are maximum. This was originally documented for the 5 day wave by Burpee (1976), though the location (i.e. the phase) of the pressure wave relative to peak lightning is found to be slightly different. He found the trough location was 45 degrees away from the location of maximum thunderstorm activity and in the present study, we are documenting around 60 to 100 degrees away from maximum transient lightning activity. This is an imprecise calculation because we are dealing with an extremely fast moving wave and it is hard to

pinpoint the exact location when thunderstorm activity is peaking. Further studies of the global pressure wave must be conducted with global pressure data. A daily pressure average for locations around the world is not sufficient, when one considers that the nominal wave progression in one day is 360/5=72 degrees longitude.

The most interesting question to come from this thesis is still up for debate. Namely is the global pressure wave causing the 5 day periodicity in African convection or is the variation in African convection contributing to the maintenance 5 day global pressure wave? First, this thesis clearly shows that both the wave and the convection are occurring both in the summer and in the winter. Salby et al. (1987) argue that the 5 day global pressure wave could be caused by stochastic forcing, namely "fast" heating or convection could help force the wave. Essentially the 5-day wave is the gravest normal mode pressure wave and thus major disturbance like African convection would cause it to get amplified.
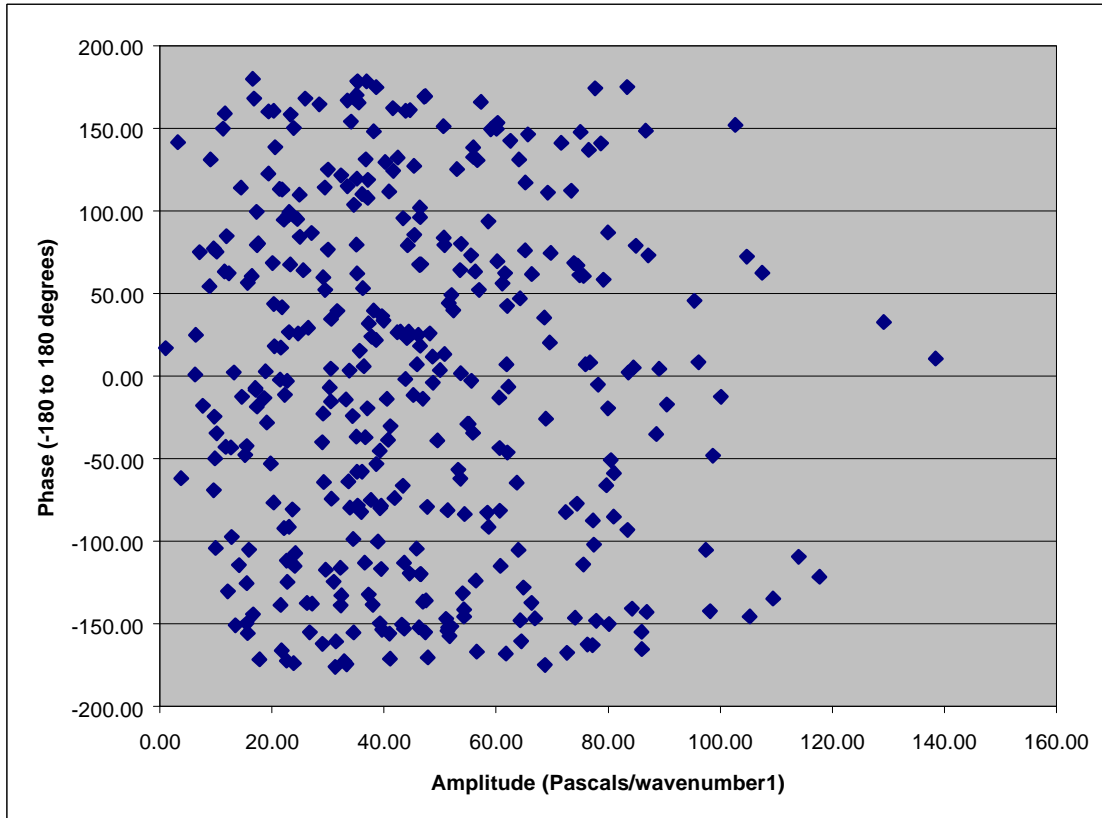
Figure 4-1: Amplitude vs. Phase for Wavenumber 1 for the Year 1996

A simple analysis of amplitude of the wave vs. phase does not support the stochastic forcing theory. Figure 4-1 indicates that the wave amplitude has no particular dependence on phase and hence on the position of the wave with respect to the hypothesized source of Africa.

Yet if Africa is highly conditionally unstable as documented by Williams et al. (1993), the 5 day wave could initiate deep African convection to occur by providing the necessary vertical displacement of boundary layer air. There doesn't seem to be any other reason why the entire continent of Africa would be going through a five day periodicity in convection. To affect that large an area, it needs to be a global phenomenon. An important sidebar discussion is that the famous Madden Julian Oscillation (a 40-50 day pressure wave also with dominant wavenumber 1 structure) has been thought to modulate

convection for some time now (Anyamba, et. al., 2000 (and the references therein)). It does not seem completely illogical for the 5-day pressure wave to be responsible for a modulation in convection.

The other important factor in this discussion is that there are clearly periods when the 5 day wave is strong and yet African 5 day lightning activity seems to disappear. This is further evidence in favor of the pressure wave modulating the convection. If conditions in Africa are not favorable to conditional instability, the passage of the 5 day wave may not initiate deep electrical convection. Obviously this is an important and puzzling question that deserves much further investigation.

The other interesting topic is easterly waves because they are the birth place for a large number of hurricanes that hit the United States. What can be seen from the evidence presented in this thesis (Section 3.5) is that the 5 day modulation of African convection is also modulating mesoscale activity embodied in easterly wave storms. The period investigated showed easterly waves forming every three days in central Africa and progressing westward, yet total African lightning, rainfall, and kinetic energy were intensifying on a five day cycle. Since the storms are mesoscale convective systems, they too must be modulated on a 4 to 5 day period, and this expectation is supported by the lightning maps, satellite pictures and wind maps provided. Since we know that kinetic energy increases with lightning activity, the storms must be intensifying. This is important because knowing the originating intensity of these easterly wave storms is a key factor to predicting if they will develop into hurricanes.

Chapter 5

Conclusion and Suggestions for Further Work

This thesis investigated African mesoscale lightning periodicity on a 4 to 5 day time scale. The main goals were to explore the relationships between this lightning periodicity, the 5 day wave, and easterly waves, which have a period of approximately three and a half days. The 5 day pressure wave was filtered and located from raw global gridded surface pressure data and now the amplitude and phase are known for the years of 1989, 1996, and 1998. The 5 day wave was then compared to the 4 to 5 day periodicity in lightning, rainfall and kinetic energy. What is now known is that the 5 day wave has a phase relationship to African mesoscale convection and is modulating it by as much as a factor of two. What is also shown by this thesis is that the 5 day wave is modulating easterly waves and thus must be considered for its effect on the genesis of Atlantic hurricanes.

As with any research, this thesis brings further research topics. First this work should be confirmed with exploration of greater time intervals. Better rainfall data is being produced from the NOAA on Africa and more current transient lightning is still being processed. Easterly waves were only explored with one time interval in this thesis

and more time intervals with easterly waves could provide further insight. The exact nature of the modulation of easterly waves by the 5 day wave is not known in a quantitative sense. Also, how does the modulation by the five day wave help turn easterly waves into hurricanes should be explored. A much further study of the data are required. For example the filtering process for pressure described by Madden and Julian (1972) should be extended to the wind components and any other good observational quality data. This would provide further evidence of the five day wave. Transient lightning data should be spectrally filtered and only the 5 day component should be looked at in relation to the five day wave.

Transient lightning detection can still be improved in terms of better resolution to the location of the lightning. Transient lightning detection incorporating the background Schumann resonance could possibly enable greater global lightning detection.   Another interesting and big puzzle is the origin of transient lightning of negative polarity. The importance of this lightning is that it seems to occur mainly over the oceans and also right where the easterly waves are developing into Atlantic tropical storms. Knowing the nature and physics of these negative lightnings could prove useful in understanding easterly waves and therefore, hurricanes.

A key tool for the analysis conducted in this thesis is Fourier transforms. It is used in virtually every part of this research from transient detection, to filtering pressure data. Essentially Fourier transforms are taking data and breaking the data into a series of sine waves that super-positioned together will account for the original data. The sine wave is the basis function or key building block of the decomposed data. The key being if you are looking for some kind of sine wave looking signal it will help you produce one,

but if your signal doesn't look like a sine wave and is something more complex, then

Fourier transforms are not the most efficient way to produce the said signal.   A more

advanced version of Fourier transforms is wavelets where the basis function can be any

number of different functions or equations, thus you can specify the basis function to the

signal you are trying to find. You can do this by making sure the basis function looks

very similar to it. Wavelets should be explored further in relation to the work conducted

for this thesis.

The final key suggestion for future work is to have a global focus on the lightning

data. It is important to note that the research done here is through global analysis of

Schumann resonance and global analysis of pressure yet only Africa was focused on in

terms of rainfall, lightning and wind. What should be further looked at is how the rest of

the world is affected by the global 5 day wave and how the lightning, rainfall, and other

parameters globally respond.

Appendix

This Appendix is created to document the software programs and information created for this thesis. The motivation is that the information tools built for the thesis will be reused and will be understandable. The Appendix is divided into the following sections:

1.0 Website created for this project.

2.0 Computer Systems and Software Used

3.0 Data Websites on Meteorology

4.0 Essential Unix Commands

5.0 Bearing Correction Perlscript Program

6.0 Matlab Scripts

7.0 Jpeg Animator

8.0 Pressure Data (1989,1996,1998)

Appendix 1.0: Website Created for this Thesis

The hope for this project is that all the information analyzed and created will be made available publicly. This will save some time in terms of recreating tools to analyze data. The main parts of the website will have movies of lightning maps of Africa, movies of Satellite imagery of Africa, and rainfall maps of Africa. Each individual image will also be downloadable. As more Transient lightning data is processed, Q burst files of lightning events will also be available. All related theses and published papers to this lightning detection system will be downloadable in PDF format. The website is currently located at http://ultrapbe.mit.edu/home.html

Appendix 2.0: Computer Systems and Software Used

Six computers were used for this thesis. Two linux based computers were constantly processing tapes from the Rhode Island Detector site and then using algorithms, created by Earle Williams, Everest Huang, and Bob Boldi, to locate good transient lightning events and create Q burst files (Huang, 97). One 486 personal computer is located at Rhode Island. Two personal computers were used to do data research and download information from websites. One Sun unix station maintained the website and ran matlab programs for data sorting. Since the files are extremely large, matlab can take several hours to process data. It is important to run the matlab scripts on a fast computer with lots of free space. The Sun unix station had approximately 7 Gbytes of free memory.

Several software programs were used. The most important is matlab through which most of the large qburst files were sorted. Excel was quite useful in final data assembly and analysis of pressure data and kinetic energy data. Files were constantly being transferred from one computer to another and the ftp command in unix and ftp95pro were essential for this. Exceed is a great program for remote computing and enables one to control several computers while sitting at one personal computer. It also enhanced several websites. Microsoft Front Page was used to grab websites and download it onto our computers when Ftp would not work for certain websites. This was done to grab satellite imagery from Meteosat. Apache was used to create the web server. Microsoft word and Visio 2000 are used to write this. This list of software programs is the beginning point in helping tackle the problems associated with this thesis.

Appendix 3.0: Data Websites on Meteorology

Throughout this thesis the internet was used heavily to get data and information. The following is a list of useful websites and a description of their information.

1. http://libraries.mit.edu/vera This is the vera database and has free link to almost every online journal or database. Almost every technical journal is online and free to MIT students and faculty.

2. http://wesley.wwb.noaa.gov/ncep_data/index_sgi62_png.html This is the NCAR/NCEP Reanalysis 40 year project that tries to analyze data globally. Several observational parameters, such as pressure and wind speed, are stored here and additional parameters are derived through the use of models. Global gridded pressure and zonal wind speed data was obtained from here (Kalnay et al., 1996).

3. http://ghrc.msfc.nasa.gov/ghrc/list.html This is a great site that has links to data sets of most meteorological parameters.

4. http://ams.allenpress.com/amsonline/?request=index-html This is American Meteorological Society online with all of its journals online to view. Some journals date back as far as1940.

5. ftp://ftp.noaa.ncep.gov/pub/cpc/fews/ This is where the daily rainfall estimates of Africa are kept by the NOAA. The estimates incorporates rain gages and satellite imagery. A newer rainfall estimate is being created using rain gages, satellite imagery and microwaves.

6. http://www.eumetsat.de/ Satellite images of Africa every 6 hours but will eventually store images every 3 hours.

7. http://rimmer.ngdc.noaa.gov/coast/ This is a great mapping website. One can download the exact latitude and longitude mapping points of any region of the world with very high resolution.

8. http://www.google.com The best search engine on the web. If a website goes offline, it doesn't matter because google stores it in its cache.

Appendix 4.0: Essential Unix Commands

User friendliness is not a great characteristic of unix operating systems, however, reliability and speed are. Throughout the thesis, one of the big obstacles was doing tasks in unix. The purpose of this section is to high-light some very useful and non-common commands.

1. "FTP" is for file transferring from one computer to another. The command is simple type "ftp" at a unix xterm prompt. Typing the "open" and the address of the computer you wish to connect to will connect you to the correct computer. Most public sites allow users access with "anonymous" as the user name and an email address as the password. Private sites need a personal user name and password. "mput" will put multiple files from one location to another. "mget" will get multiple files from the computer you have connected to. "help" will get you the list of commands.

2. "MAN" is the command to bring up the manual page for a command. Typically one would type "man ftp" and get the manual page on "ftp". The problem is usually figuring out which command will help you solve your current problem. Experienced unix user say that useful manual pages will reference other useful commands. So one must go hunting around for the appropriate command.

3. "foreach" is very useful command to do multiple things. The biggest need was to create lists of files in directories. This was achieved using foreach and being able to select certain files that fit a certain criteria and then being able to manipulate all those selected files.

4. "echo" is a command to help print things into another file. This was essential in creating lists of files in directories or appending one file to another.

5. "chmod" is a command to give different privileges of files to different users.

Appendix 5.0: Bearing Correction Program in Perl

It has been noticed that a systematic error is being created in bearing when lightning events are taken from the National Lightning Detection Network and corresponded to events detected in Rhode Island. A bearing error correction program written in perl was created to help correct the Latitude and Longitude of lightning transient events. This was created by Everest Huang (Huang, 1997). Perl needs to be installed on the computer running the program.

The program name is "corrections.pl" and needs to be run in the following manner "corrections.pl name_of_uncorrect_qburst_file name_of_correct_qburst_file" The code for corrections.pl is as follows:

```perl
#!/usr/athena/bin/perl -w
# Time-stamp: <08/19/97 23:15:26 EDT everest@w20-575-48.MIT.EDU>

require "/var/usr/acpatel/perlscripts/myfuncs.pl";

if (@ARGV == 0) {
  print <<END;

USAGE: corrections.pl inputfile outputfile

  this reads in a boldi file, extracts the bearing/range data, applies
  the correction to the bearings according to the data fits, then
  calculates the lat/lon of the source, and rewrites the other
  relevant information about the strike to the output file

END
  exit;
}

# make the longitude table
@range_east =
make_bearing_table($RECEIVER_LATITUDE,$RECEIVER_LONGITUDE);

open(BOLDI,&zfile($ARGV[0]));
open(OUTPUT,">$ARGV[1]");
while ($boldi=<BOLDI>) {
```

```perl
  if ($boldi !~ "^#") {            # if not a commented line
    @boldi = split(' ',$boldi);    # put the data into an array

    $bearing_old = &boldi_bearing(@boldi);

    # apply the bearing correction
    $bearing = &correct_bearing($bearing_old);

    # replace the old bearing with the new one
    $boldi[6] = $bearing;

    # if the bearing is > 180, then subtract 360
    if ($bearing > 180) {
      $bearing -= 360;
    }

    $range = &boldi_range(@boldi);

    ($slat_calc, $slon_calc) = &calc_latlon($bearing, $range, *range_east);

    # replace old latitude with new and improved version
    $boldi[14] = $slat_calc;

    # replace old longitude with corrected version
    $boldi[15] = $slon_calc;

    print OUTPUT "@boldi\n";
  }
}

close(BOLDI);
close(OUTPUT);
```

Appendix 6.0: Matlab Scripts

Several matlab scripts were written to analyze qburst files, read .bil files of rainfall data, create maps of lightning and rainfall, and analyze fourier transforms of data. An excellent text on how to use matlab is written by Hanselman et. al., (1998). The scripts described and listed are:

1. africasort.m – This script determines if a Latitude, Longitude point is in a polygon of determining Africa.

2. fftplot.m – Takes a time series of lighting events and you can analyze the fft of any part of the time series. Created this because we are missing days from lightning data and we tried to analyze as many continuous days as possible

3. daysort2.m – Takes a qburst file and a time increment (units are days) and sorts it to returns a position array of all the positive lightning events in Africa and an array of time, and time increment totals of positive lightning for the length of the qburst file.

4. negdaysort.m - Takes a qburst file and a time increment (units are days) and sorts it to returns a position array of all the negative lightning events in Africa and an array of time, and time increment totals of negative lightning for the length of the qburst file

5. test2.m – Takes a qburst file and a time increment (units are days) and sorts it to returns a position array of all the lightning events in Africa and an array of time, and time increment totals of positive and negative lightning for the length of the qburst file. Finally this creates maps of lightning events for each time increment.

6. bintoint.m – Reads rainfall data in ".bil" format and converts it into an appropriate array of integers.

7. pixeltokm.m – The resolution of the rainfall data is 0.1 deg. by 0.1 deg., and this needs to be converted to km by km resolution. Since longitudinal lines get closer together as they approach the poles, pixeltokm.m creates the multiplication matrix to convert deg resolution to km resolution.

8. rainplot.m – Takes a quoted list of ".bil" files and plots colored contour maps of African rainfall.

9. waveall.m – Takes filtered gridded global temperature or pressure data and fourier transforms it in the space domain to obtain the fourier transform amplitude and phase relation for different zonal wave numbers.

africasort.m

The following is code for africasort.m. It returns 1 if the Latitude, Longitude point is in

Africa and returns 0 if it is not.

```
function y=africasort(lat,long)
    %this function determines if a point is in a polygon,make sure no lat numbers are
repeated
    cord=[35 -25; 30 35; 9 60; -5 50; -10 60; -25 55; -30 45; -35 20; -4 0; 5 -40; 15 -45];
    crossings=0;
    [r,c]=size(cord);
    n=r-1;

    for i=1:n
    if (((cord(i,1) <= lat) & (lat < cord(i+1,1))) | ((cord(i,1) >= lat) & (lat > cord(i+1,1))))
        t=(lat-cord(i+1,1))/(cord(i,1)-cord(i+1,1));
        clong=t*cord(i,2)+(1-t)*cord(i+1,2);
          if (long > clong)
        crossings=crossings+1;
        end
      end
    end

    y=mod(crossings,2);.
```

fftplot.m

The following is code for fftplot.m It creates fftplots of time series data of lightning events and you need to chose a beginning and ending point in the time series

Typically you would write "fftplot('lightningtimeseries','fftseries',20,50,1);"

after the matlab prompt.

```
function fftplot(infile,outfile,first,last,inc)
    A=dlmread(infile,'\t');
    t=A(:,1);
    l=A(:,2);

    for j=first:last
    k=j-first+1;
    time(k)=t(j);
    light(k)=l(j);
display(time);
display(light);
    end

len=last-first+1;
h=nextpow2(len);
n=2^(h);
half=n/2;
freq=1/(inc*86400);
L=fft(light,n);
Pyy=abs(L)/n;
f=freq*(0:(half-1))/n;
B=[f  Pyy(1:half))];
plot(f,Pyy(1:half));
dlmwrite(outfile,B,'\t');
```

daysort2.m

The following is code for daysort2.m. An example qburst file is 'corrected.1996' and if

for example, we wanted to sort this in half a day, time increments. We would run the

following command at the matlab prompt

"[lightningpositions,time,positives]=daysort2('corrected.1996',1/2)"

```
function [Africa,time,lightnings]=daysort2(filename,increment)

    QB=load(filename);
    k=0;

    for i=1:size(QB,1)
    if (QB(i,13)<0) & (africasort(QB(i,15),QB(i,16)))
            k=k+1;
            Africa(k,:)=[datenum(QB(i,1),QB(i,2),QB(i,3),QB(i,4),QB(i,5),QB(i,6))
QB(i,13) QB(i,14) QB(i,15) QB(i,16)];

        end
    end

            display(Africa);

m=((floor((Africa(k,1)-Africa(1,1))/increment))+1);
display(m);
for f=1:m
        time(f)=f;
        lightnings(f)=0;
      end

      for g=1:k
        lightnings(floor((Africa(g,1)-
Africa(1,1))/increment)+1)=lightnings(floor((Africa(g,1)-Africa(1,1))/increment)+1)+1;
      end
```

negdaysort.m

The following is code for negdaysort.m. An example qburst file is 'corrected.1996' and say we wanted to sort this in two day time increments. We would run the following command at the matlab prompt

"[lightningpositions,time,negatives]=daysort2('corrected.1996',2)"

```
function [Africa,time,lightnings]=negdaysort(filename,increment)

    QB=load(filename);
    k=0;

    for i=1:size(QB,1)
    if (QB(i,13)>0) & (africasort(QB(i,15),QB(i,16)))
            k=k+1;
            Africa(k,:)=[datenum(QB(i,1),QB(i,2),QB(i,3),QB(i,4),QB(i,5),QB(i,6))
QB(i,13) QB(i,14) QB(i,15) QB(i,16)];

        end
    end

            display(Africa);

m=((floor((Africa(k,1)-Africa(1,1))/increment))+1);
display(m);
for f=1:m
        time(f)=f;
        lightnings(f)=0;
      end

      for g=1:k
        lightnings(floor((Africa(g,1)-
Africa(1,1))/increment)+1)=lightnings(floor((Africa(g,1)-Africa(1,1))/increment)+1)+1;
      end
```

test2.m

The following is code for test.m. Takes in qburst file name and time increment and produces an array containing the positions of lightning in Africa , time, number of positive and negative lightning for each time increment. It also makes maps of each time increment and plots the lightning and produces jpegs of these maps in a specified directory. Typically, you would type at the matlab prompt

"[position,time, positive,negative]=test2('corrected.1996',1);"

```
function [positionarray,time,poslightnings,neglightnings]=test2(filename,increment)

    QB=load(filename);
    k=0;

    for z=1:280
    mostlight(z,:)=[nan nan];
    end




    for i=1:size(QB,1)
    if  ((QB(i,16) < 70) & (QB(i,16) > -40) & (QB(i,15) < 40) & (QB(i,15) > -35) &
africasort(QB(i,15),QB(i,16)) )
            k=k+1;
            Africa(k,:)=[datenum(QB(i,1),QB(i,2),QB(i,3),QB(i,4),QB(i,5),QB(i,6))
QB(i,11) QB(i,13) QB(i,15) QB(i,16)];

        end
    end



m=((floor((Africa(k,1)-Africa(1,1))/increment))+1);
display(m);

for z=1:m
positionarray(:,:,z,1)=mostlight;
positionarray(:,:,z,2)=mostlight;
end
```

```matlab
for f=1:m
        time(f)=f;
      poslightnings(f)=0;
      neglightnings(f)=0;
end

    for g=1:k
       position=floor((Africa(g,1)-Africa(1,1))/increment)+1;

if  (Africa(g,3) < 0)

poslightnings(position)=poslightnings(position)+1;
positionarray(poslightnings(position),:,position,1)=[Africa(g,4) Africa(g,5)];

else

neglightnings(position)=neglightnings(position)+1;
positionarray(neglightnings(position),:,position,2)=[Africa(g,4) Africa(g,5)];

 end

    end

hold off;
x=dlmread('africa.txt','\t');
clf reset;
for z=1:m

plot(x(:,1),x(:,2),'k');
hold on;
plot(positionarray(:,2,z,1),positionarray(:,1,z,1),'r+');
plot(positionarray(:,2,z,2),positionarray(:,1,z,2),'bo');
xlabel('Longitude (degrees)');
ylabel('Latitude (degrees)');
T= datenum(QB(1,1),QB(1,2),QB(1,3),QB(1,4),QB(1,5),QB(1,6)) +(z-1)*increment;
S=datestr(T,0);
E=datestr(T+increment,0);
tit=strcat('Lightnings from   . ',S,'  to  . ',E);
title(tit);
text(-38,-38,'+ Positive Lightnings   o Negative Lightnings');
[X,map]=getframe(gcf);
yeartime=datestr(T,2);
daytime=datestr(T,13);
yeartime=strrep(yeartime,'/','-');
daytime=strrep(daytime,':','-');
```

```
name=strcat(yeartime,'-',daytime,'.jpg');
display(name);
cd www/96dailylightnings;
imwrite(X,map,name,'jpg','Quality',100);
cd /var/usr/acpatel;
hold off;

end
clf reset;
```

bintoint.m

The following is code for bintoint.m and is used for reading NOAA rainfall data that is in

".bil" format. Typically you would type at the matlab prompt

"y=bintoint('rain980102.bil');"

```
function y=bintoint(binaryfile)

    fid=fopen(binaryfile,'r');
    display(fid);
    [A,count]=fread(fid,inf,'int16');
    status=fclose(fid)

    if count==451351

    B=reshape(A,751,601);

      for i=602:801
        B(:,i)=0;
      end

    else

    B=reshape(A,751,801);

    end

    y=transpose(B);
```

pixeltokm.m

The following is code for pixeltokm.m and used to create a multiplication matrix to convert degree pixels to km pixels. It just creates an array that you store on which ever directory all the ".bil" files exist.

```
function out=pixeltokm(outputfile)

    x=-20:0.1:55;
    y=-40:0.1:40;


  for a=1:length(y)
   for b=1:length(x)

   lat_dist=11.13;
   long_dist=2*6375*asin(cos(2*pi*y(a)/360)*sin(0.05*2*pi/360));
   out(a,b)=lat_dist*long_dist;

    end
  end

    dlmwrite(outputfile,out,'\t');
```

rainplot.m

The following is code for rainplot.m and it is used for creating contour color plots of NOAA rain data on Africa. It takes in a quoted list of ".bil" files to read from the current directory and then it makes contour maps of them. The maps are then made into jpegs and put in a specified directory.

```
function rainplot(quotedlist)
    clf;
    b=textread(quotedlist,'%s','delimiter','\n');
    map=jet(68);
    map(1,:)=[1 1 1];
    colormap(map);

    whitebg('wh');
    cd .. ;
    cd .. ;
    Africa=dlmread('africamap','\t');
    cd /var/usr/acpatel/rainfalldata/Castrointerval;
    x=-20:0.1:55;
    y=-40:0.1:40;


    for i=1:length(b)
    hold on;
    z=bintoint(char(b(i)));
    mesh(x,y,z);
    view(2);
    axis([-20 55 -40 40]);
    plot(Africa(:,1),Africa(:,2),'k-');


    xlabel('Longitude','Fontsize',12,'Fontweight','bold');
    ylabel('Latitude','Fontsize',12,'Fontweight','bold');


    s2 = strrep(char(b(i)),'_','/');
    s2=strrep(s2,'.bil','');
    s3=char(s2);
    s3(7:8)=s3(6:7);
```

```
    s3(6)='_';
    s2=char(s3);
    s=strcat(s2,'.jpg');
    s=strrep(s,'/','_');
    display(s);
    caxis([0 140]);
    colorbar;
    title(strcat('NOAA Rainfall Data for Africa in mm for
.',strrep(s2,'_','/')),'Fontsize',12,'Fontweight','bold');
    [A,map2]=getframe(gcf);
    cd /var/usr/acpatel/www/castrorain;
    imwrite(A,map2,s,'jpg','Quality',100);
    cd /var/usr/acpatel/rainfalldata/Castrointerval;
    clf;
    hold off;
    end
```

waveall.m

The following is code for waveall.m. It takes in a gridded filtered pressure data and applies the fourier transform on the pressure data in the space domain and records all wavenumber amplitudes and phases. This is then outputted to a desired file.

```
function y=waveall(input,output)

   x=dlmread(input,'\t');
   L=length(x);

   for i=1:L
    z=fft(x(i,:));
    L=length(z)/2;

    for k=1:(length(z)/2)

     radangle=atan2(imag(z(k)),real(z(k)));
     angle=(radangle/(2*pi))*360;

      y(i,(2*k-1))=abs(z(k))/L;
      y(i,(2*k))=angle;

    end
   end

    dlmwrite(output,y,'\t');
```

Appendix 7.0: Jpeg Animator

This is the modified code of JsImagePlayer originally created by Martin Holecko.

Specifically the display has been modified. The refresh rate has been slowed down and

now when you stop at an image you can tell the image's file name. Also how the image

files are read into the program has been changed.

Here is the code and it is written in Javascript.

```
<BASE HREF="http://ultrapbe.mit.edu/">
<HTML>

<SCRIPT language="javascript">

<!-- hide the script from old browsers


//THIS WAS MODIFIED BY AKASH PATEL FOR THESIS USE
//==============================================================
//              >> jsImagePlayer 1.0 <<
//          for Netscape3.0+, September 1996
//==============================================================
//              by (c)Martin Holecko 1996-98
//          and et netera s.r.o. (www.etnetera.cz)
//           Praha, Czech Republic, Europe
//
// feel free to copy and use as long as the credits are given
//        by having this header in the code
//
//            contact: martin@etnetera.cz
//          http://sgi.felk.cvut.cz/~xholecko
//
//==============================================================
// Thanx to Karel & Martin for beta testing and suggestions!
//==============================================================

// DESCRIPTION: preloads number of images named in format
//   "imagename#.ext" (where "#" stands for number and "ext"
//   for file extension of given filetype (gif, jpg, ...))
//   into cache and then provides usual movie player controls
```

```
//   for managing these images (i.e. frames). A picture
//   (loading.gif) is displayed while loading the movie.
//   To make it work just set up the variables below.
//   An image "loading.gif" is expected in the directory
//   where this page is located (it asks user to wait while
//   the animation is being downloaded).
//   Enjoy! BASTaRT. (it's spelled with a "T" ! :)
//  KNOWN BUG:  when page is located on a WWW Server that
//   cannot handle the POST form submit method, pressing Enter
//   after changing the frame number in the little input field
//   causes the page to reload and an alert window to appear.
//   This can be avoided by clicking with the mouse somewhere
//   outside the input field rather than hitting the Enter to
//   jump to the desired frame.
//
//*************************************************************************
****
//********* SET UP THESE VARIABLES - MUST BE
CORRECT!!!********************
image_name = "96dailylightnings/";  //the base "path/name" of the image set without the
numbers
image_type = "jpg";            //"gif" or "jpg" or whatever your browser can display

namesarray = new Array (
"01-01-96-00-00-16.jpg",
"01-02-96-00-00-16.jpg",
"01-03-96-00-00-16.jpg",
"01-04-96-00-00-16.jpg",
"01-05-96-00-00-16.jpg",
"01-06-96-00-00-16.jpg",
"01-07-96-00-00-16.jpg",
"01-08-96-00-00-16.jpg",
"01-09-96-00-00-16.jpg",
"01-10-96-00-00-16.jpg",
"01-11-96-00-00-16.jpg",
"01-12-96-00-00-16.jpg",
"01-13-96-00-00-16.jpg",
"01-14-96-00-00-16.jpg",
"01-15-96-00-00-16.jpg",
"01-16-96-00-00-16.jpg",
"01-17-96-00-00-16.jpg",
)

irst_image = 0;              //first image number
last_image = namesarray.length-1;          //last image number
```

```
  //!!! the size is very important - if incorrect, browser tries to
  //!!! resize the images and slows down significantly
animation_height = 455;          //height of the images in the animation
animation_width = 538;           //width of the images in the animation
//**************************************************************************
****
//**************************************************************************
****



//=== THE CODE STARTS HERE - no need to change anything below ===
//=== global variables ====
theImages = new Array();
normal_delay = 200;
delay = normal_delay;  //delay between frames in 1/100 seconds
delay_step = 100;
delay_max = 40000;
delay_min = 100;
current_image = first_image;     //number of the current image
timeID = null;
status = 0;            // 0-stopped, 1-playing
play_mode = 0;         // 0-normal, 1-loop, 2-swing
size_valid = 0;

//===> makes sure the first image number is not bigger than the last image number
if (first_image > last_image)
{
  var help = last_image;
  last_image = first_image;
  first_image = help;
};

//===> preload the images - gets executed first, while downloading the page
for (var i = first_image; i <= last_image; i++)
{
  theImages[i] = new Image();
  //theImages[i].onerror = my_alert("\nError loading ",image_name,i,image_type,"!");
  //theImages[i].onabort  =  my_alert("\nLoading  of  ",image_name,i,image_type,"
aborted!");
  theImages[i].src = image_name + namesarray[i];
};


//===> displays image depending on the play mode in forward direction
function animate_fwd()
```

```
{
  current_image++;
  if(current_image > last_image)
  {
    if (play_mode == 0)
    {
      current_image = last_image;
      status=0;
      return;
    };                    //NORMAL
    if (play_mode == 1)
    {
      current_image = first_image; //LOOP
    };
    if (play_mode == 2)
    {
      current_image = last_image;
      animate_rev();
      return;
    };
  };
  document.animation.src = theImages[current_image].src;
  document.control_form.frame_nr.value = namesarray[current_image];
  timeID = setTimeout("animate_fwd()", delay);
}

//===> displays image depending on the play mode in reverse direction
function animate_rev()
{
  current_image--;
  if(current_image < first_image)
  {
    if (play_mode == 0)
    {
      current_image = first_image;
      status=0;
      return;
    };                    //NORMAL
    if (play_mode == 1)
    {
      current_image = last_image; //LOOP
    };
    if (play_mode == 2)
    {
      current_image = first_image;
      animate_fwd();
```

```
      return;
    };
  };
  document.animation.src = theImages[current_image].src;
  document.control_form.frame_nr.value = namesarray[current_image];
  timeID = setTimeout("animate_rev()", delay);
}


//===> changes playing speed by adding to or substracting from the delay between
frames
function change_speed(dv)
{
  delay+=dv;
  if(delay > delay_max) delay = delay_max;
  if(delay < delay_min) delay = delay_min;
}


//===> stop the movie
function stop()
{
  if (status == 1) clearTimeout (timeID);
  status = 0;
}


//===> "play forward"
function fwd()
{
  stop();
  status = 1;
  animate_fwd();
}


//===> jumps to a given image number
function go2image(number)
{
  stop();
  if (number > last_image) number = last_image;
  if (number < first_image) number = first_image;
  current_image = number;
  document.animation.src = theImages[current_image].src;
  document.control_form.frame_nr.value = namesarray[current_image];
}


//===> "play reverse"
function rev()
{
```

```
    stop();
    status = 1;
    animate_rev();
}


//===> changes play mode (normal, loop, swing)
function change_mode(mode)
{
    play_mode = mode;
}


//===> sets everything once the whole page and the images are loaded (onLoad handler
in <body>)
function launch()
{
    stop();
    current_image = first_image;
    document.animation.src = theImages[current_image].src;
    document.control_form.frame_nr.value = current_image;
    // this is trying to set the text (Value property) on the START and END buttons
    // to S(first_image number), E(last_image number). It's supposed (according to
    // JavaScrtipt Authoring Guide) to be a read only value but for some reason
    // it works on win3.11 (on IRIX it doesn't).
    document.control_form.start_but.value = " S(" + first_image + ") ";
    document.control_form.end_but.value = " E(" + last_image + ") ";
    // this needs to be done to set the right mode when the page is manualy reloaded
    change_mode (document.control_form.play_mode_selection.selectedIndex);
}


//===> writes the interface into the code where you want it
function animation()
{
    document.write("       <P><IMG      NAME=\"animation\"       SRC=\"loading.gif\"
HEIGHT=",animation_height,        "       WIDTH=",       animation_width,        "\"
ALT=\"[jsMoviePlayer]\">");
    document.write(" <FORM Method=POST Name=\"control_form\"> ");
    document.write("    <INPUT TYPE=\"button\" Name=\"start_but\" Value=\"  START
\" onClick=\"go2image(first_image)\"> ");
    document.write("     <INPUT TYPE=\"button\" Value=\" -1 \" onClick=\"go2image(--
current_image)\"> ");
    document.write("    <INPUT TYPE=\"button\" Value=\" < \" onClick=\"rev()\"> ");
    document.write("    <INPUT TYPE=\"button\" Value=\" [ ] \" onClick=\"stop()\"> ");
    document.write("    <INPUT TYPE=\"button\" Value=\" > \" onClick=\"fwd()\"> ");
    document.write("                    <INPUT     TYPE=\"button\"     Value=\"     +1     \"
onClick=\"go2image(++current_image)\"> ");
```

```
    document.write("   <INPUT TYPE=\"button\" Name=\"end_but\" Value=\"  END  \"
onClick=\"go2image(last_image)\"> ");
  document.write(" <BR> ");
  document.write("                           <SELECT        NAME=\"play_mode_selection\"
onChange=\"change_mode(this.selectedIndex)\"> ");
  document.write("     <OPTION SELECTED VALUE=0>play once ");
  document.write("     <OPTION VALUE=1>loop ");
  document.write("     <OPTION VALUE=2>swing ");
  document.write("   </SELECT> ");
  document.write("       <INPUT  TYPE=\"text\"  NAME=\"frame_nr\"  VALUE=\"0\"
SIZE=\"18\" ");
  document.write("   onFocus=\"this.select()\" onChange=\"go2image(this.value)\"> ");
  document.write("             <INPUT   TYPE=\"button\"   Value=\"  -  \"
onClick=\"change_speed(delay_step)\"> speed ");
  document.write("            <INPUT    TYPE=\"submit\"   Value=\"   +   \"
onClick=\"change_speed(-delay_step)\;return false\"> ");
  document.write(" </FORM> ");
  document.write(" </P> ");
};

//=== THE CODE ENDS HERE - no need to change anything above === -->

</SCRIPT>
<br>
<center><B>
These are Daily Lightnings Plots of Africa from Jan 01 1996 to Dec 31 1996. <BR>
 <BR>
 (Please remember to increase the size of your cache)<BR>
 (Loading takes some time you are downloading 40 megs)




</B>
</center>

<br>
<center>
<!-- *********** HERE STARTS THE jsMoviePlayer(TM) PART
**************** --> <P><IMG NAME="animation" SRC="loading.gif"
HEIGHT=455 WIDTH=538" ALT="[LOADING TAKES A WHILE]"> <FORM
Method=POST Name="control_form">     <INPUT TYPE="button" Name="start_but"
Value="  START  " onClick="go2image(first_image)">       <INPUT TYPE="button"
Value=" -1 " onClick="go2image(--current_image)">       <INPUT TYPE="button"
Value=" < " onClick="rev()">          <INPUT TYPE="button" Value=" [ ] "
onClick="stop()">       <INPUT TYPE="button" Value=" > " onClick="fwd()">
<INPUT TYPE="button" Value=" +1 " onClick="go2image(++current_image)">
```

```
<INPUT    TYPE="button"    Name="end_but"    Value="         END          "
onClick="go2image(last_image)"> <BR>    <SELECT NAME="play_mode_selection"
onChange="change_mode(this.selectedIndex)">              <OPTION  SELECTED
VALUE=0>play  once              <OPTION  VALUE=1>loop             <OPTION
VALUE=2>swing       </SELECT>        <INPUT  TYPE="text"  NAME="frame_nr"
VALUE="0" SIZE="18"      onFocus="this.select()" onChange="go2image(this.value)">
<INPUT  TYPE="button"  Value=" - "  onClick="change_speed(delay_step)">  speed
<INPUT  TYPE="submit"  Value=" + "  onClick="change_speed(-delay_step);return
false"> </FORM> </P>
</center>
```


```
</HTML>
```

1989 Time Filtered Broadband Pressure Data
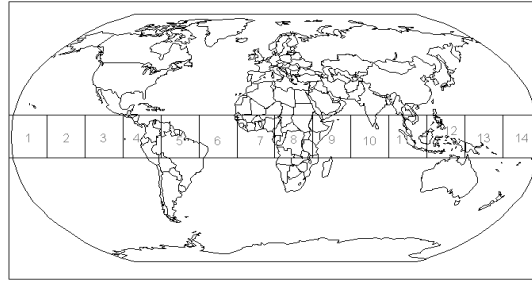
This is 1989 worldwide time filtered broad band pressure data. Lat -15 to 15, Long: 25.7 blocks around the world
5 day running average is subtracted from Raw surface Pressure
and color coded for Positive (Black Lettering) and Negative (White Lettering)

Units for colored numbers are Pascals

Day (0 UT)	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1/1														
1/2														
1/3	40.2	-50.8	-56.8	-32.8	-24	-63.8	11.4	-14.4	22	30.4	10.4	16.8	7.2	21.4
1/4	-42.8	-109.2	-16.4	23.6	-30.8	9.2	49	115.6	120	80.4	67.4	33	-37.6	-16.8
1/5	-21.2	49.6	77.8	64	34.6	84.2	83.2	96.2	47	8.4	19.8	1.4	-51.8	-65.4
1/6	-30.6	91.2	56	28.8	57.6	72.8	27	-57.4	-43.6	-42	-96.2	-58.2	-12.4	-21.4
1/7	50.8	33.6	-41.6	-22.8	34.4	-31.8	-84	-116.8	-49.8	-52.6	-70.2	-16.8	53.4	72.8
1/8	97.8	-2	-10.8	-47.8	-79.6	-126	-60.2	-16.8	-41.6	-23.6	43.2	53	63.8	81.2
1/9	-31	-31.4	27.2	-20	-100.6	-47.8	22	6.4	-26.2	10.4	30.6	-31	-21.6	-38.2
1/10	-83.2	-72.2	-55	2	29.2	50.8	-4.4	7.8	36.2	27.4	-17.2	-38.6	-50	-69.8
1/11	32.2	6.2	-18.4	6.4	68	14	-53.2	-28.6	10.6	-36.6	-70.6	-39.4	-19.2	9.8
1/12	41.4	48.2	22.8	-2.8	0	-18	-12.6	-19.6	-34.8	-32	12.4	29.6	8.8	27.2
1/13	-26.4	3.4	18.6	32.2	-12.2	2.6	38	14.6	-12.8	53.8	73.4	59.6	36.8	12
1/14	-17.2	-14.2	-6.8	42.4	13	25.4	50.8	73.6	43.2	37.4	-2.8	4.4	33	2.2
1/15	13	3.4	-26.2	-8.6	45.2	26	5.4	-8.8	-0.4	-29.8	0.6	11	11	15.2
1/16	20.2	48.4	65	3	-24.6	5.2	-8.4	-26.8	3.6	13.2	40.2	27.4	8.8	19.6
1/17	-16.4	-16.2	40.8	11	8	23.2	49	35	0.2	22.2	26.6	4.2	-15	-40.4
1/18	11.8	-35	-38.4	8.8	62.8	13.6	0.4	18	2.8	-15.8	-19	-3.2	-30.6	-32.8
1/19	-18.6	-11	-3.8	-12.2	-22	-21.4	-37.2	-7.8	25.4	-3.4	-57.2	-36.2	-8	-9.6
1/20	-18.2	23.2	-44.2	-67.6	-77.4	-30.2	-9.6	-13	-16.8	-24	-45.8	-24.6	-7	-13
1/21	-4.2	-22.8	-7.4	-31	-44.8	-17.8	13	-2.6	-32.2	2.8	12.8	-32.4	-42.6	6.8
1/22	-22.6	-52.6	-38.2	12.6	36	33.6	7.6	25.2	13.2	5	5	-27	-23.2	-12.4
1/23	-28.4	-0.2	22.4	33	26.8	16.4	-26	-9	2.8	-40.8	-52.2	-1.6	29.6	-5.2
1/24	3.6	36	27.8	6.2	-5.8	-25.8	-36	-3.8	23.8	-23.2	3.6	0.2	-23.8	-43.2
1/25	46.4	-0.4	-28.8	-16	-20.2	-45	4	-19.2	-39.2	-19.8	42.6	-29	-16.4	11.2
1/26	9.6	-14.8	-17.4	-31.4	0	15	22.4	-19.8	-38	-4.6	-29.2	18	44.2	49.8
1/27	-21.6	13	45.2	54	26.8	20.2	37.6	25.8	69.2	65.4	23.2	40.6	7.6	-2.8
1/28	27.2	42	35.8	19.4	-17	16.4	16.2	15.2	24.2	21.8	0.4	26.2	-5	14.8
1/29	32.6	16.4	-14.2	-62.6	-21.4	-6.2	-38.8	-21.4	-34.8	-24.2	-4.2	26.4	23.8	70.8
1/30	-11	-21.6	-52.2	-45.4	-11	-42.2	-58.2	-22.8	-14.4	41.2	55	21.4	50.6	0.8
1/31	-54	-31	1.4	50	-9.4	-29.4	-12.4	-14	30.6	22	14.2	-3.2	-4.8	-71.8
2/1	-14	-38.8	-51.2	-15.2	14.8	63.6	51	4.8	-7.4	-18.2	-11.2	-24.8	-62.2	-31.4
2/2	52.2	-21.4	-12	-13.8	31	19.6	24.4	-13	-82.2	-58.2	-28.6	-14	-23.2	34
2/3	-3.2	25	70.6	40	-26.6	-76.4	-57	13.6	27	20.4	2.6	-33.4	-46.6	-0.4
2/4	-75.8	10.6	79.6	33.4	2.4	17.6	28.6	75.6	97.2	56.4	26.8	3.2	9	-46
2/5	-4.8	44.6	12.8	46	46	61.8	80.6	-17.2	-50	-61.2	-43.8	3.8	37.2	14.2
2/6	41.6	27.4	-70.8	-32	24	-3.6	-65.8	-92.6	-92.6	-38.4	-30	-32	-10	42.8
2/7	64.8	-10.4	-31.8	-72.4	-45.4	-27.2	-97.4	5.4	29.4	8.2	3.2	-14.8	15.8	0.4
2/8	28	-12.8	-18.6	-1.2	-16.6	-41	32.6	42.2	51.4	4.8	2	1.4	26.2	18.2
2/9	-20.8	-7.2	20.8	6.6	15.8	12.6	70.4	5	11	20	1.2	12	9.8	-0.4
2/10	-27.6	9.4	56.6	44	-13	55.4	64.4	21.8	17.2	55.2	67	52.8	-16.4	-20.2

2/11	-32	-36.6	32.8	53.4	32.4	18.2	-22.6	25.6	32	32	71.8	66.8	40.8	18.6
2/12	15	28.4	-21	1.6	29	57.8	-28.8	15.6	7.4	-4.4	-39.8	-13.4	15	25.2
2/13	-1.4	3	-52.2	-59.8	20.6	16.8	24.8	25.4	0.2	-36	-32.2	-27.8	-45.6	-51.8
2/14	34.2	25.8	-3.2	-7.8	23.2	-80.4	17.6	6.2	-16.6	-27.8	-16.2	-21.2	-23.6	-28
2/15	-37.6	-67	-3.4	13	-60.8	-80.8	-12.6	-67	-56.8	-14	-26.2	-13.6	17.4	2
2/16	-47.2	-35	6.8	10.4	-80	-0.4	-82.2	-99	-63.6	-14.2	8	5	10.6	8.2
2/17	47	67	26.6	-23.8	-11.2	-3.2	-108.4	-53.8	39.2	5.4	-3.2	-22.8	-35.2	21.2
2/18	50.4	59.2	2.6	-37	3.4	-20.6	24.2	40.6	36	7.4	-25.4	15.6	-1.6	34.8
2/19	46.8	27.8	-19.8	12.4	28.6	9.2	92.8	53.8	-22.4	40.4	61.6	61.2	70.4	34.4
2/20	-30	-56.4	8	26.6	52.8	52.2	49.8	29.8	-3.2	34.4	62.6	36.2	24.4	-22
2/21	-58.6	-59.6	4.6	5.2	13.8	54	15.6	15.2	-8	-44.6	-26.2	-32.6	-27	-18
2/22	-43.4	-3.8	-20.8	-54.4	-38.8	0.2	-5.4	33.6	39.4	-46.2	-75.2	-22	-27.8	-19.6
2/23	-19	44	11.2	9	-51.2	-32	-26.4	2.4	26.8	33.2	-9	-58.8	-63.8	-87
2/24	99.8	15.2	-25.4	62	74.2	6.6	-6.8	-13.4	1	17.8	-12.2	-87	-55.4	10.4
2/25	74	1.8	9	65.6	35.2	-45.6	-27	2.4	12	-34.2	-46.6	27.8	80.2	124.8
2/26	-11.4	47.4	106.2	28.2	-78.2	-55.8	-2.4	-18.6	-7.2	-4.2	93.8	117	108	52.8
2/27	-67.8	16.4	3	-101.4	-40.6	81.4	89.8	8.2	-43.4	-4.4	49.6	52.4	-2.4	-72
2/28	-8.2	-58.2	-82	-19.4	83.6	84.4	2	31	52.4	50.6	1.4	-7.8	-33	-42.6
3/1	-36.8	-75.4	-56.4	75.2	83.4	-23	-71	-2	35	34.4	7.6	-22.8	14.8	25.2
3/2	-38.2	-13	37.4	-19.6	-58.4	-84.2	9.2	-25.2	-32	12.4	5.8	-40.2	-13.8	-18.8
3/3	-3.4	6.4	-30	-94.4	-59.6	63.2	94	22.8	10.6	42.4	-5.6	-6.6	-29.8	-32.2
3/4	-8.6	-5.4	-4.4	-10.2	50	80.6	-11	7.8	11	-35.6	-73.2	-58.6	-75.4	-28
3/5	-23	30.6	80.2	77.6	13	-44	-68.2	-32.2	-74	-108.6	-85.8	-58.8	-43.6	-50.8
3/6	43.4	64.8	41.2	-10.6	-52.6	-88.4	-33.8	-35.4	-62.8	-62	-45.6	55.4	66.8	52
3/7	91	10.8	-116.4	-86.6	-65.2	-70	-54.2	-61.2	9.2	51.4	92.6	91.4	44.6	65.2
3/8	-16.6	-78	-71.2	-38.6	17.6	28.4	5.6	18	1	40.4	47.2	1.2	-23.8	1.8
3/9	-56.2	-73.4	46.8	73.2	57.6	41.6	56.4	44	26	-48.8	-7.8	-13	-1.8	16
3/10	-26.6	-2.2	8.6	4.4	-25	-1.6	31	6.4	-3	-32.2	-18.4	24	19.8	-13.8
3/11	-5.4	65.8	-0.6	-13.4	-28.4	2.6	-47.2	-48.2	34.4	99.2	49.4	1.2	-3.8	-43.2
3/12	11.4	46.2	14.6	21.4	26.6	26.4	-18.8	40.4	24.2	41.4	22	-56	-21.2	-32.2
3/13	20.2	15.6	75.2	77.6	41.6	7	84.2	71.6	-8.4	-47	-32	-31.6	-34.4	-13.4
3/14	46.2	1.2	53.4	32	19.8	12	26.8	-11.2	-0.2	11	-5.2	27.6	40.4	80.8
3/15	66.2	26.4	-41.2	-69.6	-9.4	-22.6	-72	-68.4	-5	6.8	3.2	12.8	38.8	58.6
3/16	-13.6	-2.4	-45	-29.4	-50.2	-36	-37.4	-14	-29.4	-14.6	20	50.4	31.2	-11.6
3/17	-58.2	-30.6	1.4	30.4	-5.2	22	36	60.6	28.2	22.6	18.8	22.2	4	-20.4
3/18	-54	-46.8	-22.4	-6.6	21.8	11.4	16.2	15.6	8.2	-17	-43.6	-76.8	-44.8	-22
3/19	-28.6	-47.6	-19.4	-21	6.4	0.8	6.8	-13.8	16.4	-52.4	-41	-31.4	-53.6	-45.8
3/20	-11.2	10.6	12	17.8	-19.4	-0.4	11.4	-27.2	-12.4	2.4	-6.4	-17	-53.2	-56
3/21	40.6	65.2	39.6	-8.4	10.4	-25.2	-47.6	-47.6	-58.2	55	56	23.4	38.8	54.2
3/22	78.6	20	-27.4	-23.2	-30	-25.4	-30.6	24.8	19.8	7.4	13	11.2	51	81.2
3/23	22.8	-34.8	-55	-18.6	13.6	28.2	24.4	24.8	22.6	-41.2	-43.6	-19.2	15.2	-13
3/24	-45.6	5	50.4	52.6	51.2	-2	3	-45.8	-28.8	-28.6	-21	23.8	13.8	-37.2
3/25	-23.6	-11	8	-1.2	-37.6	-23.6	-20.4	-40	4.6	27.4	44.6	26.8	-6.6	16.8
3/26	7.8	7.4	-11.2	-31	-58.8	-12.6	12.8	21.2	-5.4	28	-14.4	-7.2	-27.4	-3.4
3/27	-44.2	-5.8	10.4	-2	59.4	62.8	89.6	101.6	22.6	33.2	15.2	9.8	2.6	-25.2
3/28	17.6	23	44.6	69.6	52.6	20.2	18.6	43.4	38.4	-2.8	-2.6	-24.2	-16.4	15.4
3/29	46	5.8	-11.4	16.2	-15.2	13.2	-46	-41.6	-58.6	-130.8	-77.4	-43.4	49	70.6
3/30	2.2	20.6	5.6	-44.4	-31	-45.4	-74.8	-93.4	-72.4	-38.2	-5.2	55.6	64.8	19.8
3/31	36	28	27.6	-19.2	-11.8	-35.8	-30.8	-8.6	17.4	121.2	98.4	41.6	-28.8	-32.4
4/1	-4	2.6	-43.2	14.8	30.4	39	51.6	54.6	91.4	58.8	33	-36	-54.2	-57.8
4/2	9.6	15	35.8	69.6	61.8	49.4	33.4	38.8	18.8	-53	-29.8	-1	5.6	9
4/3	-2.8	-14.8	34.8	27.2	-32.6	-21.4	-4.6	-5.2	-0.2	-8	27.6	56	30	29.4
4/4	-5.6	3.6	-33	-102.4	-104.2	-66.2	-14.4	-62.6	-0.8	101.2	27.4	-8.8	-12.2	31.8
4/5	-19.8	-60.2	-71.6	-54.8	-8.2	14.4	24.2	44.6	8	-36.6	-83.4	-63	-26.6	-6
4/6	-37.8	-40	-16	59.6	87.4	52.4	5.4	21.4	-38.2	-90.4	-46.4	-32.2	-19	-30.2
4/7	-38.6	15.4	41.8	40	50.2	-8.8	-36.8	-37.4	-81	-10	15.8	25.8	-1.6	-56.4
4/8	38.2	21.8	1.2	-33.6	-46.4	-53.8	3.4	19.6	30.2	18.2	43.6	30.8	22.4	10
4/9	-4.6	-24.2	-29.8	-44.4	-50.4	22.8	39.2	24.2	56.6	-3.8	19.2	-18.6	5.6	-2.2
4/10	-89	2.4	33	17.8	10.6	52.6	14.6	-43	7.4	-4.4	-13.6	-46.4	-44.2	-71
4/11	48.8	37.6	32	36.8	34	-1.2	4.8	24.8	7.6	5.8	-41.8	-10.6	-30	16

Date														
4/12	75.4	-32.8	-59.2	0	-4.8	-19.2	-34.8	9.2	-43.6	-12.6	-2	17	44.8	71.6
4/13	36	-5.4	-24.8	-46.6	-11.8	-19.6	-47.6	-50	-35.6	-22.4	15.6	62.8	88.2	56.4
4/14	-33.8	22	41.6	-5.4	-27.4	-47.4	-12.2	4.6	48.4	73.6	35.2	58.4	31.4	24.8
4/15	-27	21.4	10	10.4	-21.6	-1.4	47	27.8	66.6	95.8	25.4	-24.2	-75.2	-67.8
4/16	-5.4	-12.2	-4.4	35	27	92.8	47.4	11.8	-7.2	-34.2	-44.4	-48.6	-56	-41.4
4/17	5.4	-18.4	-7	30	85.4	33.4	-45	-53.8	-37.2	-58	-47.4	24.8	29.6	17.2
4/18	11.8	36	73.6	1.6	-18.8	-90.2	-89	-15.2	-37.8	-32.2	20.4	28	40.2	20.4
4/19	9.4	23.4	-10	-35.8	-62	-23.2	41.2	34.4	-6.2	-15.6	3.8	0.8	9	29.8
4/20	-62.6	-82.2	-90.8	-19.8	-2.8	1	60.2	-23.2	22.6	41.8	36.8	-37	-56.4	-42.8
4/21	-21.6	-54.6	-47.6	-36.6	-38.4	-33.8	-33.6	5.2	29.6	33	14.2	-80.6	-79.8	-49.8
4/22	-12	38.4	11.4	-11.4	28.8	64.8	39	61.6	13	-52.4	-60.8	-66.4	-3	-21
4/23	16.4	17.8	15.6	-2	37.2	37.2	12.4	-23.4	-78.2	-77.8	-60.2	41.8	47	13.6
4/24	45.8	15	24.8	45.8	8	-16.8	-48.8	-18.6	-13.4	7.2	2	43.4	15.4	18.4
4/25	43.4	15.4	52	27.6	-21.4	-32	3.8	27.6	60.6	21	48.8	-6.2	-37.2	40.8
4/26	-9	21.8	-9.2	-18.6	44.8	29.8	18.6	11	1.8	-0.8	14.2	-3.6	5.6	32.8
4/27	-35.2	-44	-44.6	-7.4	-7.8	-25.6	3	-23.8	-23.8	53	66.4	76.6	58.4	11.4
4/28	-31	-38.2	-4	-4.8	-87.4	-40.4	-10.8	-25	13.2	80	74.6	47.6	5.8	-32.4
4/29	6.6	18.8	-10.6	-37.4	-8	23.2	-18.2	-6	36	2.2	-64.8	-68.8	-35.8	-35.8
4/30	26.4	21.2	-30.4	-43.2	26.8	36.2	-20.4	12.4	-7.2	-68.2	-79.6	-19.2	30.8	21.4
5/1	12.4	9	55	50.4	15.4	5.2	12.4	59.6	39	3	25.6	8.4	21	27.8
5/2	-33.6	0	55.6	84.8	50.2	18.8	79.2	1	-21.6	13.4	24.4	21.6	10.8	-8.8
5/3	18.8	52.6	32.2	39.4	11.6	4	5	-65.4	-88	-44.4	-15.4	-1.4	-3	-16.2
5/4	67.6	14.4	-28.6	-50.8	-80.4	-88	-124	-81	-42.6	-0.4	-12.4	-19.8	-14.4	26.4
5/5	38.6	-38	-82.2	-74.2	-67.8	-38.4	-26.8	-4	31.8	11	-12.6	0.2	15.2	44.6
5/6	-80.8	-59.2	-38.4	-24.2	27.6	57	51.2	80.6	62.8	-3.4	14	13.6	0.6	-45.2
5/7	-82.6	-8	64.6	55.4	52.2	33.8	33.8	4.6	-2.8	13.8	48.6	31.6	-14	-56.8
5/8	22	38.6	53.4	44.2	26.8	-24.2	-8.8	-11.4	12.2	44.4	51	-29.2	-40.4	-19.6
5/9	19.6	23	-22.4	15.6	13.2	-31.8	1.2	-2.8	-25	-15.8	-52.6	-36.2	20	19.2
5/10	-9.4	-37.4	-40.6	-26.4	-5.8	9.8	6.4	17.6	17.6	-57.4	-98.6	10.2	11.6	25.2
5/11	79.4	20	-6.6	-21	20	49.6	17.6	0.2	-27.8	-29	-28.6	13.8	13.6	41.8
5/12	33.6	69.2	51.4	-4.2	-17.8	19.6	10.2	4.8	-48	2.8	45.6	-15	-6.6	10
5/13	2.8	-8.8	10.2	-17	-20.6	-39.4	-37.4	-3.8	-2	27	51.6	23.8	13.8	8.8
5/14	-25	-60.4	-29.2	23	-1.2	-19.2	-12.4	-3.4	33.8	24	2.2	35	19.2	31.2
5/15	-51.4	-9.2	2.6	45.8	-16.6	-1.6	-8.8	-3.8	21.2	12.4	-11	-15.4	-28.2	-14.6
5/16	-7.4	18.8	24.4	-3.6	13.2	29.6	30	35.6	0.4	-3.2	-10	-14.4	-17	-33
5/17	10.8	57.2	8	-39.4	19.6	24.6	25.4	-16	-43.2	-42	10.8	-11	-49.6	-69.4
5/18	-18	-14.8	17.6	11.2	19.8	2.4	-8.8	-27	-4.2	23.2	34	-18.4	-30.6	-50.6
5/19	-48.4	-58.6	-34.4	-0.4	-39.4	-68.6	-41.8	-2.2	56.8	44	3.6	9.8	41.2	11.8
5/20	-60.8	-122.6	-86.8	-9.4	16.8	5	18.8	59.6	50.4	12.2	-21	19.2	40.6	15.4
5/21	37.8	28.2	-35.4	-49	12.2	77	73.2	35	9.4	-35.8	-17.8	15.2	-10	-7.8
5/22	115	126.2	72.4	-24.2	21.8	61.4	37.4	2	-30.6	-40.2	-40.2	-67.2	-60.4	44.8
5/23	10.6	16.4	47.6	41.2	-22.8	-45.6	-74.6	-58	-15.8	-3.8	-3	-23.4	21	39.8
5/24	-50	-36.6	-2	34	-25.6	-58.6	-61	-46.6	21.4	38.8	34.2	39.4	66.2	20.6
5/25	19	-2.2	-22.2	-42.4	-21.4	5.2	32.8	65	42.8	46.2	10.8	12.8	-7.2	-17.6
5/26	31.6	7.6	-28.2	-29.4	25.4	-2	21.2	25.4	-64	-47.6	-51.6	-43.4	-17.4	-4.8
5/27	-42.2	6.8	12	58.2	35.6	-15.6	-32.8	-68	-80.2	-55	-20.6	25.8	-23.4	-23.8
5/28	-76.6	-55	36	59.8	21.2	11.4	-14.2	-31.8	12.4	22.8	37.2	24	-11.8	-31.6
5/29	25.8	-7.2	21.2	-9.2	-30.6	8.4	16.4	10.2	52.6	25	-10	-13.4	38.2	-5.2
5/30	8.8	20.4	-33.6	-46.6	-24.8	-13.2	9.2	15.2	32.8	17.4	49.8	18	15.4	10.6
5/31	36.6	-10.4	-63.6	-70.2	-15	-1.4	18.2	29.4	21.8	0.8	30	37.6	-6.8	32.2
6/1	15.4	19	-16.4	8	3.4	42.2	22	36.8	-6.8	-17	-10.8	-14.4	10.4	4.4
6/2	-9.6	38.2	88.8	83.4	19.2	13.8	17.2	13.2	-11	-12.2	-37.6	-30.6	-4.4	2.8
6/3	12.2	17	21	24.4	-9.6	-50.8	-33	-17.4	5.4	12	-26	-24.2	-5.8	13.8
6/4	22.4	13.8	-3.8	-15.8	-3.2	-20.6	-46	-26.4	6.6	40.2	30.4	25.2	1.2	13.8
6/5	24.2	1	13.4	0	42.2	47.4	11.2	-18.4	-77.8	-25.6	7.8	47.8	9.8	7.4
6/6	25.8	11.2	22	17.2	20.2	9.2	11.6	-16	-44.8	-33.6	-12	1.8	17.8	16.6
6/7	-56.6	-54	-34.6	-3	-43.2	-46	-26.6	-48.8	-20.2	-17	25	-6	-15.4	-1.2
6/8	-97.4	-53.4	-58.8	-64.8	-31.2	-11.2	-11	-9.2	61.4	68.2	38	-61.4	-58.2	-88.6
6/9	1	4.4	-19.8	-36.8	-15.4	19.6	11.2	9.2	20.8	21.8	-44.2	-84.4	-53	-70.6
6/10	45.2	43.4	25.6	25.2	-16.6	-16	27.4	56.4	-7.8	-82.6	-87.6	-18.6	3.4	5

6/11	-20.2	-54.2	12.4	57.2	8	10.2	11.2	40	-24.6	-45.4	-26	87.2	75.8	68.8
6/12	-40.2	-7.6	11.2	13.8	34.8	13.8	23.2	-17	-14.6	12.8	16.2	54.6	39.6	40
6/13	37	34.6	-20.2	-23	16.4	-16.8	-6	-17.4	59.4	42.8	40.2	-24	-24.2	4.4
6/14	65.6	8	-28.8	-34.6	27.6	-9.8	-44.4	-58.2	21.8	14	18.8	-17.2	9.4	-5
6/15	-4.6	1	23.6	-28	-49.8	-18.4	-36	-3	-18.6	-33	5.4	11.2	-4	-3.4
6/16	-21.4	-9.4	20	-2	-9.8	46.4	34.8	96.6	20.6	-6	0.6	2	-36.4	-7.8
6/17	3	9.6	2.4	50.8	50.6	71.2	33.4	50	-13.4	6.4	-3.2	-6.8	-7.4	-11.4
6/18	37.2	48.6	2	43.8	41.6	-35	-9.8	-79.6	-48.6	30.6	39	30.2	49	22.8
6/19	7.6	34.4	32	-2.8	-39.2	-58.6	-10	-37.4	32	43.4	49.2	33.8	26.2	0.2
6/20	-39.8	-5	24.8	-22.8	-15.6	23.6	41.6	73.8	78	8.8	-21	0.8	-37.6	-36.8
6/21	1.8	-47	-21	-5.4	32.2	42.4	8	3.4	-20	-31.8	-50.2	-13.8	-1.8	28.4
6/22	-30.4	-41.8	-63.2	-26.4	-20	-35.2	-44	-1.4	5.4	9	28.4	-13.6	-5.8	9.6
6/23	23.2	-1	-32.8	-28.6	-84.6	-42.4	-9.2	1.8	18.6	13.2	21.8	-12.6	-12.4	11
6/24	15.8	0.2	1.6	-2.4	18	47	31.2	-25.8	-53	-13.2	-12	-12.4	-0.4	0
6/25	10.2	20.8	41.4	14.2	57.6	35.4	-23.8	-44	-48.8	-2	-7.2	-18	20.2	-7
6/26	9.8	15.2	59.2	39.8	24.2	-48.8	-21.4	0	-3.8	4.6	-21.4	-3.6	48	46.4
6/27	-18.6	-5.8	-18.4	7.2	-36.6	-43	-3.6	6	24.8	4	-12.4	56.4	30.8	-7.2
6/28	-12.4	6.4	-41.6	-36.8	-51.2	-7.4	13.8	-4	6.6	15.6	32.2	42.6	-3	-32.2
6/29	-10.6	10.2	37.6	29.4	47	28	-5	3.2	28	12.8	30.4	-16	-53	-12
6/30	3.2	-11.2	18.2	1.2	-19.6	50.6	27.6	13.8	19	-42.4	-34.8	-78	-77.2	-54.8
7/1	0.2	-32.8	-38	-13.4	-22.4	8.6	22.8	62.6	-20	-63.4	-40.8	-30.6	-18	-9.2
7/2	1.8	5.2	-10	28.6	24	-25.6	0.2	-27.2	-61.2	-22	1.8	17.2	21.2	35.8
7/3	17.6	38.4	14.6	5.4	36.6	-24.6	-32.4	-65.2	-9.6	41.6	30.4	30	45	19
7/4	1	34.4	13.2	-38.2	-83.2	-40.4	-52	-6.2	41.8	22	-22	4.6	34.8	26.8
7/5	-10.6	-31	0	-33.2	-47.6	16.8	2.2	23	6.4	-3	6.6	30.8	1.4	-20.4
7/6	-29.4	-77	-65.8	-20.4	88.4	44	59.8	43.2	-23.2	14.4	33.6	3.8	-12.4	-21.2
7/7	24.8	0.4	3	49.2	84.2	12	39.4	16	-3.2	-7.6	-0.8	-36.4	-2	43
7/8	33.4	57.4	59.2	41	-19.6	-22.2	-1.6	-32.6	31.4	-6.6	8.8	9.2	10	40
7/9	6.6	72.6	25.2	-16	-41.8	-29.6	-74.2	-23.6	23.4	19	16.6	34.2	2.6	-16.2
7/10	3	-20	-11.4	-7.6	-4.2	-13.8	-11.8	4.4	7	36.8	-15.2	-23.8	-23.2	-46.4
7/11	-24	-63.2	-17.6	16.8	28.4	32	15.2	3.4	-7.8	-4	-21.2	-26.6	4	-6.6
7/12	-3.8	26.2	12	31	-4.2	17	-8.8	-80.6	-99.2	-67.4	-42.4	-5	-28.2	-31
7/13	-8.8	62.4	14.8	-13.4	1.6	-38.6	-34.4	-7.8	-60.8	-48.4	-25.6	8.8	22.2	-0.2
7/14	-55	-71.4	-23.6	-43	-13.4	6.4	25.4	70.8	35.8	29.4	18.4	36.2	26.8	61
7/15	-30.8	-104.4	-71	-7.4	45.4	51.8	52	82.6	135.4	90.2	23.4	9.6	-17.8	-22.6
7/16	44.8	-11.4	-16.2	13	45.6	55.2	50	35	86	20.2	11.2	-40	-32.8	-11.8
7/17	103.2	82.2	6.2	-46.2	-58.4	-8.6	39.6	-14.4	-1	-25	3.6	-25.6	-34.8	23.8
7/18	-18.8	31.4	36	-4.8	-16	-32	-45.2	-27	-107.8	-55.6	-38.6	-20.8	-11.4	-34.2
7/19	-126	-29.8	76.2	82.4	9.2	-30.8	-77.2	-73.2	-121.8	2	17	39.4	28.6	-35.4
7/20	9	25.8	-6.4	-22.2	-75.8	-47.4	-44.6	-41.2	-16.4	25.6	26.2	36.8	0.2	-13.8
7/21	-17	-35.6	-52.2	-61.4	28	69.2	59.6	65.6	121.2	55.6	39.4	-39.2	-27.8	-27.2
7/22	8.4	-34	-22.8	35.4	111.6	72.8	113.6	83.8	104	-23.8	-65.6	-106.2	-16	18.6
7/23	64.6	48.4	51.2	51.8	1.6	-31.2	-22.4	-26	-50.4	-83.4	-83.4	24.6	67.4	72.6
7/24	36.8	17	15.8	-24.2	-126.8	-92.8	-80	-53	-77.2	-27.6	30.6	91	57.6	53.4
7/25	-8.2	-6.8	-40.6	-50.8	-24	11.6	-19.4	6.6	28.4	47.2	40	-2	-37.8	-49.4
7/26	-30.6	-9.6	-15.6	15.2	60.6	42.4	37.4	7.6	10.4	-25.6	-58.8	-34.6	-3.4	-25
7/27	6	20.2	26.6	28.6	10	-22.6	-27.6	-30.8	-70	-29.8	3.4	43	4.6	10
7/28	35.4	36.8	20.8	-24.4	-24.6	-46.6	-45.2	-13.8	-0.4	30	71.8	22.4	-2.6	31
7/29	11.4	3.8	11.2	13.8	-4.4	-16.4	4.2	16	53.6	10.4	40.8	-3.4	35.2	47
7/30	-19.2	-93.2	-47.6	43.8	-19	-11	43	28.4	26.8	18.2	12	32	12.8	-23.8
7/31	-13.4	29.4	-13	0.8	45.2	61.2	19.8	4.8	4.8	33	-8.2	-0.8	-67	-77.4
8/1	29.4	94.8	28.4	-71.4	-2.8	10.2	-4.2	-16.8	-33.6	-20.6	-20.4	-51.6	-34.4	28.6
8/2	44.4	22	28.8	-8.6	-28	0.8	2.8	-34.2	-40.6	-18.8	27.2	-1.8	91	78.4
8/3	-35.4	-67.4	1.2	36.4	-22.4	-38	-1.6	-17.2	36.8	90.2	56.8	54.2	51.4	-8.4
8/4	-80.6	-48.8	-49.6	-3.6	-9.4	6	15.4	62.8	55	28.4	-61.2	-32	-82.2	-82.8
8/5	-22.8	-31.4	-14.6	21.4	84.6	94	-5.6	18.4	-32.8	-86.2	-90	-79.2	-63.8	-8.6
8/6	24.4	15.8	44.8	33	62.2	-22.4	-21.6	-5.2	-38.4	-47.8	12.4	17.6	35.6	38
8/7	8.8	31.4	41.8	9.2	-54	-65.6	1	-26.6	19.4	38.6	81	86.6	44.8	-39.6
8/8	22.8	17.2	-45.2	-47.2	-78.6	16	43.6	15.6	45	4.6	12.4	-30.4	-50.2	-2.2
8/9	45.6	-14.4	-45.8	-29.4	3.6	77.8	-5.4	-34.4	-30.8	-29.4	-58.2	-84.2	-25.4	51.4

8/10	-34.4	-3.6	47.8	10.8	30.8	-16	-61.4	-9.8	-30	0.8	0.4	7.8	47.6	23.2
8/11	-21	16.6	44.2	28.8	11.4	-92.4	-51.4	31	44.4	39.6	2.6	37	17.4	-53.4
8/12	40.8	62.4	-3.6	-9	5.2	-8.8	8.8	-3.4	-9.2	-4.6	-29.2	21.2	26.6	22
8/13	-24.2	-54.8	-55.2	-30.2	-13	26	47	-3.6	-43.8	-21.8	32	14.6	-7.2	11.6
8/14	-8.2	-61.8	-43.2	2.2	10.4	37.2	53.2	16.2	44.6	40	38.2	2.4	-64.8	-28.8
8/15	32.4	71.4	60.2	61.4	23.8	6.4	0.6	10.4	-14.6	-9.6	-54.6	-51.8	-45.8	-15.4
8/16	-7.4	3.8	12.4	-20.8	-13.8	-16.8	-25.6	-29.2	-59.2	-30.4	-26.8	-4.8	29	6.2
8/17	-80.4	-64.6	-22.4	-49.8	-43.4	-33.8	-30.8	6.8	39	42	47.2	44	30.8	-15.2
8/18	-47	-69.4	-56.4	13.4	70.2	31.2	62.2	39.4	81.6	4	-16.8	13.4	-6.4	-0.8
8/19	52	28.2	25.2	15.2	16.2	18.8	15.2	-2	-18.8	-51.2	-22.2	-18.2	-17	0.2
8/20	62.8	77	16.2	-35.8	-68.4	-20.4	-44.6	-57	-89	-39.4	39.4	24	35.8	39
8/21	61.4	30	-22.2	-7	-69.4	-31	-36.2	-21	-18.2	24.8	46.4	8.4	21.6	26.6
8/22	-17.8	-25	-24.6	5.6	31.4	13.4	7	25	85.2	72.2	12.4	-15.4	-5.6	-62.2
8/23	-104.2	-48.8	72.4	71.4	74.4	83.4	5.2	18.2	43.4	30.6	-27.8	-26.4	-17.6	-33.2
8/24	36	48.8	64.6	16.8	-0.6	-25	-1.8	30.8	-11.6	-48.2	-54.4	-38.6	-25.6	67.4
8/25	77.6	36.6	-52.2	-50.6	-21.2	-55.8	-5.6	-14.2	-47.8	-45.8	10.8	27	80.6	83
8/26	0.6	-25.6	-46.4	-13.4	-31.8	-36.8	3.6	-32.2	24.2	26.8	48.2	57.6	23.4	-13.2
8/27	-70.6	-20.8	19.2	13.4	-4.6	30.4	28.8	44.4	18.4	11	-16	-33.4	-66.4	-86
8/28	-26.8	11.2	27.2	-8	57.2	45.2	32.2	12	-7.8	5.2	-33	-40.4	-24.4	-14.8
8/29	24.2	6	35.4	25.8	1.8	22.8	25.8	18	31.2	13.6	23.8	49.8	2.8	3.6
8/30	15	0	-7.4	32.8	-4.6	38.6	13.6	2.6	-17	-9.8	-3.4	21.2	-11	-9.4
8/31	21.4	40.6	-22.6	4.6	4	-22.6	-24.2	-10.8	-34	-49	-55.8	-64.2	4.2	25.4
9/1	-13.4	-41.2	-41	-27	24.4	-10.4	-17.8	-36.4	-49	-48.6	-5.2	-5.4	37.6	30
9/2	-21.4	-57.8	-11.4	-6.6	35.4	-21.6	-30	-32	-16.8	25.2	34.4	26.4	5.6	16
9/3	71.4	41.4	25.4	-19.2	-29.4	-54	-43	-11.2	26.4	42.2	22.4	36	10.8	25.4
9/4	5.8	40	22	-24.8	-63.4	-2	15.2	26.8	46.4	30.2	-2.6	29.2	29.6	21.8
9/5	-63	-10.8	21	27.6	-13.2	23.4	22	-15.4	-15.6	13	23.6	23.6	15.8	-28.8
9/6	-47.8	-45.6	-24.2	8.6	-31.2	-45.6	-6.6	-8.8	-61.8	-17.2	18	-14.8	-55.8	-80.4
9/7	-21.2	-33	-37.4	-32.8	-5.4	-28.8	5.2	29	-23.2	-15.4	-17	-72.4	-63.4	-70.8
9/8	48	54	23	-5	19.2	48	18	-4	13.2	-55.6	-66.8	-46.6	-41.6	10.6
9/9	29.8	8.2	6	10.4	33.8	66.6	4.2	-15	37.2	-18.4	-18	-6	1.4	42.4
9/10	-27	-25.4	-5	13.4	-4.8	-7	-20.4	23.2	25.6	73.8	78.4	51	58	31.4
9/11	6.4	0.2	-38.2	-12.6	7.6	-23.6	-32.6	19.4	-22	31.4	20.4	20.4	27.4	20
9/12	3	-1.6	-31.4	-7.4	-18	-15.2	-6.4	-48.8	4.4	-13	-25.4	-22.6	-46.2	2.4
9/13	-22	1.4	13.4	6.6	-49.6	-29.6	-20.8	-28	29.4	-9.2	5.2	4.4	14	-25.4
9/14	1.2	6.2	34.6	-4.2	-43.4	-55.4	-7.6	29.4	29.6	7.2	12.4	18.4	1.2	-33
9/15	13.2	-37.4	-17.8	-21.6	41.8	37.6	32.6	4.8	-3.2	-14	-34.8	-43.4	-0.2	15
9/16	-38.8	-22.4	-6.2	12	73.6	32.6	26	-10.6	-50.4	-42.4	-35	-33.2	12.4	-8.4
9/17	7.4	28	31	46.4	76.2	-0.4	29	32.6	1.6	8.6	-2.8	20.4	-6.6	19.4
9/18	44.2	40.6	24.2	-15	-77.4	-6.8	-6.6	11.6	44.4	24.8	-21.2	-10.4	9.4	19.6
9/19	24.2	11	-17.6	-28.6	-37.8	38.2	-28.4	-43	-52.4	-11.8	11.8	26	20.8	13.6
9/20	-10.4	-10.4	-16.2	15.6	67.8	18.4	-3.2	-14.8	25.2	59.4	65.8	55.2	5.2	12.8
9/21	-29.6	-2.8	3.8	39.8	9.6	-37.6	9.2	81	63.4	21.8	-32.4	-28.8	-16.6	-32.6
9/22	11.6	13.2	17.4	-15	-45.2	23.6	20.8	-5.4	-82.8	-96.6	-64.8	-27.2	23	-1
9/23	43.2	26.8	9.8	-20.6	-36.2	6.4	-1.6	-44.8	-26.8	1.6	54.8	43.4	3	3
9/24	-23	-40	-19.4	-45.6	12.6	9.2	8.4	20	71	55.4	41.2	10.8	-43.8	-6.6
9/25	-50.4	-42.8	-32	18.2	30	8.2	18	16.6	-42.8	-57.2	-49.4	-33.8	-18.2	2.4
9/26	20.4	37.8	34.2	49.2	-47.2	-52.6	-53.6	-58.2	-84.2	-84.4	-10	-4.6	22.2	11
9/27	74.2	85.4	59.6	14.8	-7	-69.2	-66.6	-45.6	-13.4	-0.8	1.4	-7.6	1	14.6
9/28	-14	-49.4	-21	-35.2	-10.4	-6.6	23	23.4	45	46.4	14.2	-0.8	46.4	32.6
9/29	-46.6	-64.8	-53.6	-20	1.2	64.2	39.2	45.4	74	79.4	45.6	75.6	57	-8
9/30	-3.2	28.8	-3.4	-20.8	64.4	41.2	14.6	8.6	45.2	50.8	68.8	43.2	5	-39.2
10/1	24.6	21	19	16.8	46.6	-32.6	11	30.2	-3.8	-18.4	12.4	-16.6	-51.2	6
10/2	-18	-54.2	-51.2	6.4	-43	24.6	53	-0.6	-44.4	-28	-30	-65.6	-53.4	20.4
10/3	-33	0	32.2	7.8	-19.6	24	-46.8	-61.8	-38.2	1.6	-23.8	-24.2	-44.2	-26.6
10/4	14.6	82.4	63.6	25.8	-11.6	-16.6	-48.4	4.2	44.2	43.4	-28.4	-10.4	-7	-40.2
10/5	4.4	-7.6	-9.8	9	21.2	23.8	50.2	54.4	6.8	-27.2	-45.2	-29.8	16.4	-31.4
10/6	-45.4	-84.2	-32	27	76.2	11	27.2	18.2	3	-40.6	15	18.8	30.2	12.8
10/7	33.4	41.2	-3.4	-15.2	-11.8	-28.2	-45.8	-14.2	-6	-3.8	13.8	28	13.4	43.2
10/8	102	7.8	-28.6	-41.4	-56.2	0.2	15.6	-15.2	6.6	15.2	5	55	35	106.2

10/9	-25	-43	-27.4	-41.8	-27.8	3	14.4	-18	-22.8	14	-0.2	7.2	16.6	16.8
10/10	-132.6	24.8	68.6	24	1	-18.6	-19.6	16.2	-26.4	-1.2	-3.8	-57.4	-25.4	-104.6
10/11	29.8	70.6	54	40.8	-16	-18.4	-9.6	-14	12.4	5.2	17.4	-12	-18.8	-61.2
10/12	98	-3.8	-20.8	-0.8	14.8	3.2	9.8	-3.2	23.2	4.2	-4.8	-14.8	-29.2	-4.2
10/13	3.6	-3.8	4.6	38.8	56.2	4.4	26.4	42	3.8	-23.4	-34.6	-20.8	-22.4	31.2
10/14	-30.6	-15.8	28.6	18	20.2	3.8	-17.8	-30	-4.2	-3.2	-6.8	38	38.4	58.2
10/15	34.8	19.2	-32.2	-27.4	-43.4	-26	-66.4	-87.6	-67.6	-49.4	-25.8	-0.4	6.6	47.6
10/16	7.4	-24	-53.8	-71.8	-92	-28.4	-43	-30.4	-19.6	-19.4	10	-20	0	-3.4
10/17	-55.2	-47.2	-26	-32.2	-28.4	25.2	41.2	53.8	46.6	24	12.2	4	6.6	-41
10/18	-73	-39.8	-23.8	-27.8	70	24.8	52	46.2	-9	-25	-17.4	2.6	38.8	-22.8
10/19	-13	-19.8	-42	23.6	64	-4	-23.2	-9.2	-7.8	17	43	20.6	-10.4	-53.4
10/20	43.8	37.2	26.8	48.4	-12	-45.2	-54.8	-39	30	55.8	51.8	5	-27	-37.4
10/21	34.2	30.4	35.2	0	-18.4	5.2	74.8	51.2	36.6	41.4	-14.4	-8	-30	38.6
10/22	-36	-16.2	35.4	-1.6	35.4	79	60.8	65.8	14.2	2.8	-40	-4.2	-4	16.2
10/23	-19.6	1	37	51.6	24	37.4	10.2	-0.6	-26.4	-39	-34	-5	2.4	-17
10/24	63	70	34.4	-5.8	-28.8	-33.6	-59.8	-9.2	13	-14.4	-1.6	18.8	18.2	39.6
10/25	56	55.6	-5.6	-4.6	-14.6	-43.8	-16	-8.8	17.4	-23.8	24.6	23	18.8	65
10/26	-43.2	-62.4	-21.2	5.4	-49.6	-15.4	-13.4	-59.4	-48.2	-27.4	27.8	6.4	-26.4	-23
10/27	-47.8	-42.6	-42.2	1.8	48.8	64	34.6	-14	-29.8	47.4	11.2	-50.2	-34	-27.6
10/28	20.6	-0.2	-30.4	-8.8	-23.4	-57.6	-29.6	-1.6	27	45.8	-4.2	-15.6	38.2	-9.2
10/29	-23	-2.8	0.2	-46.6	-53.4	-50.4	1.4	28.2	33.2	23	7	44.8	27	-41.4
10/30	13.4	6.8	8.8	-5.2	50.8	77.8	48	11.8	-2.4	-52.8	-24	-1	-32	-56.4
10/31	50.4	24	42.2	21.8	59.2	79.6	-4	-39.6	-48.8	-48	-27.8	-32.4	-36	34
11/1	51.2	-27.2	-13.4	54.8	38.6	2.8	-22.2	27.8	12.2	29.2	13.2	-6.6	11.2	101
11/2	-15.2	9.8	-3.2	-23	-51	-78	10.2	54.8	35.6	30.4	55.4	33.2	59.6	62.2
11/3	-70.6	-0.2	20.8	-51.4	-77.6	-12.2	46.4	13.4	6.2	18.8	36.6	41.8	33.8	-14.8
11/4	-66.2	-21	-5.6	0.2	70	76.8	27.2	28.6	7.8	18.8	-40	-2.2	4	-55
11/5	11.2	2.4	-25.4	29.4	70.4	26.4	-11.4	-12.2	42.6	24.6	-26	-27	-32.6	-39.6
11/6	55.8	46	25	59.2	-3.4	-76.4	-37.4	-19.6	-1.8	-45.8	-9.8	-32.6	-37.4	-35.8
11/7	34.2	0.6	41.6	10.8	-103.8	-114	-63.6	-16.2	-37	-23	41	12.4	28.4	29.6
11/8	27.4	-19.8	-51.4	-72.2	-47.4	5.8	-43	-93.6	-13.4	31.4	48.6	52.2	55.6	74.4
11/9	-31.4	-10.2	-29.2	-47	35.2	110.8	58	-11.6	-0.6	29.4	-3.2	1.6	-20.4	-16.4
11/10	-11.4	10	3.8	-12.6	23.6	48.8	49.6	41.6	-20	-19.6	-71.2	-39.4	-32.6	-5.6
11/11	-15	-2.2	19.8	31.8	-13.4	-44.8	-1.6	47.4	-13.6	-99.8	-129.8	-43.6	-14.6	-15.2
11/12	-59	6.6	39.8	58	-4.4	-40.4	-81	-11.6	-15.6	-24.2	2.8	7.8	0.6	-42.6
11/13	21.4	-0.8	-3.6	22.8	15.8	-34.6	-44.6	-49.8	15.6	31.6	77.2	-17.4	-40.6	-31
11/14	63.8	42.6	0.8	-22.2	-4.8	3.2	53.4	0.6	7.4	25.4	13	-14	-19.2	48
11/15	10.8	-18.6	-31.6	-44.8	-44.2	-22.4	27.2	-30.6	-81	-56.8	-8.6	28	61.6	60.6
11/16	0	-15.4	-6.8	-16.6	2.2	21	-54.4	-56.8	-71.6	-26.6	19.8	56	45.4	3.6
11/17	-37.2	-17.4	39.4	8.6	3.8	6.6	-19.8	37.6	83.4	42.6	-7.4	-13.6	-48	-46.2
11/18	9.2	4.4	-52.8	17	34.8	-14	9.8	79.8	83.8	11.6	-46.6	-78.4	-70.4	-42.6
11/19	4.2	6.4	-61.2	2.4	50.2	9	20.4	13.6	-1	12	-10.2	-11.8	-0.6	24.6
11/20	-6.2	-39.2	-1.6	-22.2	-66.8	-5.8	21.4	-19.6	-46	13.6	50	77.4	57.2	2.6
11/21	-57.6	-96	37.4	-9	-90.2	13.6	70.8	25.6	1.8	30.8	69.6	-2.8	31.2	-11.2
11/22	-69.8	-17.8	-11.8	-26	83.4	74.4	31.8	-13.2	39.2	24	16.6	-18.8	-31.2	-19.6
11/23	1.2	96.6	19	35.2	55.4	26.2	-34.2	29	68.6	-15.8	-80.4	-34.8	-37.2	-58.2
11/24	94.2	104	64.2	49.2	13.4	-47	-73.8	-12.6	-25.2	-56.2	-95	-19.6	27.4	53.8
11/25	40.2	-51.4	-20.8	-6.4	-43.4	-89	-28	-22	-20.8	42.4	80.6	75.4	80.2	44.6
11/26	-76.4	-70.2	-20.8	5.2	-30.2	-7.8	85.6	29.8	12.4	51.4	106.6	33.6	-49.2	-61.6
11/27	-66	-30.4	-16.6	-29.2	29.4	98.8	62.8	13.6	-30.8	-46.6	-31.8	-52.2	-109.8	-67.4
11/28	29	-9.4	-26.4	-20.4	50.4	81.8	-36.8	-71.6	-56.4	-34.6	-96.4	-55	-38.2	-1.6
11/29	75.6	47.2	4	12.4	-7.4	-56.6	-78.2	-20.6	4.8	-6.4	-15.4	14	67.4	114
11/30	33.4	54	6.6	-39.4	-61	-104	-20.6	68.4	62	9.4	44	51.6	81.6	48.8
12/1	8.6	63.2	61.6	-14.8	-9.6	3.4	0.2	-0.4	15.2	45.4	61.8	43.6	4.2	-44.2
12/2	39.2	34.4	14.8	63.2	62.2	67	14.6	-57.8	-46.4	-14	-9.8	-2.2	-19.2	-7.2
12/3	98.2	35.2	18	42.4	-12	-25.4	20.8	-9.6	-20.6	-53	-19.6	-35.6	21.8	63.6
12/4	12.2	-45.4	11	15.2	-41.2	-38	18.8	42.4	-4.4	26	4.2	36	108.8	88.6
12/5	-98.4	-76	-6.2	28.4	29.8	63.4	41.2	39.6	3	2.2	-0.4	17.4	-12	-29.8
12/6	-109.6	-46.6	-45.8	-32.4	47.4	14.6	-38.4	-23.2	40.6	38.2	9	-21.6	-79	-116.4
12/7	-48.4	3.2	-55.2	-77	-31.4	-35.6	-16.4	-5.6	36	12.6	-17.8	-44	-71	-69.8

12/8	45.8	31.8	10.2	-31.4	-14.8	-3.8	-2.2	48.8	9.4	-25.4	13.2	1.2	-35.8	6.8
12/9	64	7.2	7.8	35.8	-35.2	-23	-20.6	-13.8	-17.8	20.6	18	25.8	17.2	54.2
12/10	-14	-28.4	6	52.4	20.2	32.6	50.4	-25	-26.4	-4.4	11.6	14.8	39.2	19.2
12/11	-37	-15.6	42.2	10.4	26	18.4	16.6	0	11.6	7.2	-31.2	-15.8	23.8	-11
12/12	50	48.4	26	-49.6	-38.4	-22	-31.2	-39.4	-39.4	-32.2	-47.6	-34.6	-13	20.6
12/13	50.4	69.6	-12.6	-18.2	-14.8	-9.6	-22.8	5.4	21	10.4	23.2	-24.4	-13.4	8.4
12/14	-50.4	-105	-61	7.2	18.4	23.6	15.6	19.4	24.8	-0.8	32.6	23.6	26.4	7.2
12/15	-75.8	-74.6	-0.4	32.4	43	11	24.8	14.2	10	-16.2	-41.6	14.8	-23	-25.8
12/16	-2.4	41.2	-5.2	-2.8	-18.8	-49.6	-4.8	-22.8	-64.8	-21	-11.6	-6.8	-13.8	6.2
12/17	4.6	63.2	6.4	-49.4	-49	12.6	-43.6	-25.2	-64	-12.2	33.6	10.2	-11.2	-29
12/18	-23.2	-23.6	22.4	-3.6	-45.8	-4	1.6	20.4	86.8	57.4	54.8	53.6	16.6	-25.6
12/19	10.6	-28.4	-17.2	18.8	0.2	-48.4	-15.2	47	99.4	75	-7	-3.4	8.2	-18.8
12/20	14.6	13.4	-18.4	-4.6	53.2	-10.2	14	-1.2	0.8	-18.4	1.2	-13.8	26.2	13
12/21	-18.8	6.2	5.6	-12.2	24	11.2	-14.8	-19.4	-40.4	-18.4	29.8	-11.2	-0.2	-13.2
12/22	49.6	29	-0.4	-24.2	10.6	56.6	-15.6	-35	-41.2	0.4	-62.4	-54.4	-54.2	9
12/23	20.6	-33.4	-21	0.8	35.4	71.6	45.4	-34.4	-63.4	-91.6	-66.8	-7.4	38.6	46.8
12/24	-8	17	55	100	7.6	-26.2	10.4	-21.8	-53.2	-27.6	14.2	43.2	46	43.6
12/25	-22.6	13.6	29.6	-3.6	-26.6	-85	36.8	111.6	61	69.6	47.8	26.6	-12.8	-32.4
12/26	17.4	4.2	-27.2	-13.6	52.8	102.4	89.6	122.6	104.8	-12.6	-24.8	-42.8	-76.6	-38.6
12/27	57	34	39.8	62.4	48.4	65.8	-31.8	-85.8	-13.6	-62.8	-70.4	-45.6	-8.4	22.2
12/28	31.6	61.2	72.8	28.8	-65.2	-112	-163.4	-137.8	-60.6	0.4	23.2	25.6	67.4	85.2
12/29	-23.4	-45.6	-37.2	-62.8	-100.4	-102	-76.6	42.6	33.6	83.2	140.2	97.6	41	13.8
12/30														
12/31														

1989 Spectral Results for Time Filtered Pressure

This is 1989 spectra of time filtered pressure data. The time filtered pressure is fourier transformed in the space domain
Amplitude 1 and Phase 1 are the amplitude and phase of zonal wave number 1
Units of Amplitudes are Pascals/Wavenumber and Phase is degrees where 0 Phase degrees translates to -180 Longitude

Day	Amplitude 0	Phase 0	Amplitude 1	Phase 1	Amplitude 2	Phase 2	Amplitude 3	Phase 3	Amplitude 4	Phase 4	Amplitude 5	Phase 5	Amplitude 6	Phase 6
1/1														
1/2														
1/3	11.8	180.0	34.5	93.0	11.1	19.0	14.4	55.9	14.5	37.0	15.6	-29.1	9.9	109.4
1/4	34.9		79.0	157.1	16.0	-86.1	20.6	137.9	22.6	55.6	20.9	59.0	5.1	-8.1
1/5	61.1		59.6	-133.7	19.3	-84.9	28.7	-118.8	3.4	-42.8	6.9	91.9	6.2	-63.6
1/6	4.1	180.0	67.4	-75.9	6.1	103.7	10.8	-67.6	34.0	-151.6	10.3	-107.4	10.7	171.9
1/7	34.5	180.0	63.3	-0.8	23.5	89.7	32.4	52.9	19.7	-107.5	8.3	-96.9	10.4	164.4
1/8	9.9	180.0	82.2	44.1	16.8	6.8	7.7	178.7	25.6	31.0	1.0	145.4	8.0	30.5
1/9	35.9	180.0	17.1	123.0	20.2	-71.2	25.2	-125.5	29.4	105.5	1.6	-0.1	8.8	-37.1
1/10	33.9	180.0	54.5	-167.8	16.6	179.8	17.3	57.2	9.8	-127.9	2.8	43.9	5.1	-69.1
1/11	17.0	180.0	30.6	-62.9	7.6	52.1	30.8	60.5	22.6	-74.8	3.3	89.5	3.6	94.6
1/12	10.1		32.2	0.8	1.8	50.1	12.8	-86.3	8.3	-14.3	3.5	148.0	4.4	139.7
1/13	41.9		21.8	106.6	21.4	-175.8	16.7	-121.7	17.2	102.5	7.4	-97.8	2.0	-157.9
1/14	40.6		28.7	-177.7	7.3	44.9	18.2	145.0	4.2	102.8	9.8	-76.2	5.9	-52.5
1/15	8.1		5.7	-64.5	19.1	98.7	9.2	15.6	12.4	-57.9	3.7	152.7	5.7	-176.4
1/16	27.8		22.3	15.6	16.5	-104.6	15.3	-87.8	11.1	165.3	10.4	87.9	2.5	-157.1
1/17	18.9		25.1	-158.4	9.3	-135.9	16.3	-113.3	9.8	100.8	0.5	67.1	9.3	26.1
1/18	8.1	180.0	22.9	-138.5	11.0	120.5	13.2	47.8	22.3	-27.0	3.5	-40.9	7.2	50.0
1/19	31.9	180.0	2.8	-101.1	14.3	-40.2	17.5	110.9	12.6	-138.2	3.2	29.1	1.2	11.6
1/20	52.6	180.0	13.6	67.4	25.2	4.1	12.0	-103.1	12.0	-142.9	6.3	-91.0	6.1	-143.2
1/21	28.9	180.0	6.5	126.9	10.7	-16.7	11.8	-52.5	20.5	90.0	5.1	132.4	2.8	73.2
1/22	5.4	180.0	29.8	-163.4	11.3	123.7	15.8	58.4	7.7	23.5	4.1	140.0	5.1	-50.9
1/23	4.6	180.0	21.5	-67.8	12.4	140.2	21.4	143.0	15.6	-118.6	2.6	78.5	3.2	-79.0
1/24	8.6	180.0	9.1	-42.8	24.0	-92.1	8.8	-136.2	15.8	-64.7	4.9	89.6	5.0	-109.6
1/25	18.5	180.0	17.5	31.6	8.1	-2.5	16.2	-28.1	23.8	45.1	7.0	-125.3	6.1	-109.7
1/26	0.5		14.9	31.5	30.5	81.4	2.5	22.1	11.2	161.3	4.3	-73.7	9.7	85.8
1/27	57.7		20.7	-178.5	21.2	-124.5	10.6	154.5	8.1	-177.3	8.6	-2.3	8.4	143.7
1/28	33.9		5.4	-19.0	14.1	-51.4	7.9	-107.3	3.4	-165.6	9.5	26.8	1.9	129.3
1/29	8.3	180.0	37.8	33.1	21.2	57.4	9.0	-16.1	4.8	-110.4	13.9	131.9	6.9	90.3
1/30	15.7	180.0	43.8	81.9	15.6	178.7	11.2	32.1	4.3	-86.6	15.6	-138.5	7.2	-28.1
1/31	16.0	180.0	19.6	176.9	32.3	-136.8	15.2	155.1	1.1	155.3	13.0	-37.3	9.6	-98.6
2/1	20.0	180.0	37.7	-150.6	18.5	80.2	20.1	-26.2	5.8	30.3	8.5	36.1	3.2	-151.0
2/2	15.0	180.0	27.8	-50.4	31.9	77.0	15.0	-23.4	18.5	39.6	3.1	107.8	12.3	62.5
2/3	6.3	180.0	13.6	-20.7	48.6	-85.0	18.1	139.2	10.4	66.0	8.9	131.4	2.8	92.4
2/4	45.5		41.0	-174.9	33.1	-99.8	29.3	179.3	18.5	-165.8	8.7	141.4	3.2	-77.0
2/5	24.3		41.0	-74.0	34.8	95.7	15.9	-119.9	7.9	-176.4	13.0	-72.9	12.3	-162.9
2/6	47.4	180.0	43.6	-7.0	21.5	96.0	37.1	9.4	7.9	-50.1	11.1	-132.0	4.7	-173.4
2/7	24.6	180.0	35.8	65.6	23.4	-27.2	18.7	41.7	18.7	-73.0	10.7	103.9	22.3	-19.1
2/8	16.7		17.9	115.7	20.8	0.6	15.3	138.4	10.2	20.3	7.9	-46.3	3.8	-159.1
2/9	22.4		16.0	-162.1	6.5	110.5	9.1	-134.5	12.6	139.7	7.5	-52.8	11.5	129.1
2/10	52.4		23.9	-178.6	22.6	-146.1	25.6	-100.7	17.5	121.3	11.4	38.6	1.5	-151.9
2/11	47.6		19.0	118.9	34.6	-176.1	17.3	141.6	4.8	44.4	13.3	109.7	5.0	-35.7
2/12	12.5		13.3	-71.3	15.3	55.6	15.9	50.9	18.2	-105.2	5.4	156.9	7.9	-48.9
2/13	30.9	180.0	26.2	-150.3	20.5	29.7	15.8	-47.3	20.2	-59.1	5.9	-140.6	3.4	103.2
2/14	16.8	180.0	13.4	-43.5	16.7	-40.0	5.5	-127.7	21.3	-3.0	17.8	-99.5	11.9	117.1
2/15	58.2	180.0	21.2	35.9	13.3	169.4	19.1	155.3	26.7	107.6	14.5	-37.9	4.2	119.5
2/16	53.2	180.0	31.7	26.6	29.1	-178.8	1.4	-120.2	24.4	148.5	15.1	62.3	13.9	-75.9
2/17	7.9	180.0	32.7	2.8	33.0	-74.6	25.6	22.7	22.7	-105.8	19.6	100.0	5.5	-111.9
2/18	27.1		8.7	36.4	32.9	-6.1	3.0	-78.6	13.5	-64.4	3.8	-121.4	14.3	117.3
2/19	71.0		18.4	97.8	22.9	85.2	16.7	-89.7	16.5	44.2	24.1	-95.8	3.3	72.1
2/20	37.9		31.2	177.4	32.9	153.9	4.9	-100.0	10.2	81.3	2.5	-164.5	9.1	9.9
2/21	23.7	180.0	34.7	-135.6	18.1	112.4	8.4	158.2	7.5	141.3	15.8	104.2	4.3	-47.1
2/22	40.6	180.0	18.1	-164.8	27.2	6.3	15.9	175.8	19.7	-109.3	10.5	95.3	5.3	164.5
2/23	31.5	180.0	16.2	-144.1	47.9	-78.4	8.7	-79.7	6.3	-131.9	9.7	-66.6	11.3	-79.6
2/24	12.4		35.6	-76.9	15.7	-44.7	46.2	33.6	23.6	19.3	12.9	-64.6	6.1	-53.7
2/25	39.9		46.9	3.2	22.8	63.9	44.2	111.7	13.8	12.9	5.8	-8.2	7.0	138.3
2/26	53.7		60.8	44.1	24.4	-153.3	49.5	-148.7	18.7	132.6	8.8	95.1	9.1	-143.6
2/27	4.5	180.0	34.2	162.9	21.2	108.3	63.8	-89.2	22.5	-165.0	7.5	155.7	2.8	72.2
2/28	7.7		51.6	-175.5	16.2	123.6	36.4	29.7	21.7	-70.3	1.9	26.9	9.3	10.3
3/1	1.7	180.0	13.1	166.9	30.7	-179.9	56.4	85.1	13.9	3.6	9.0	-141.3	5.2	-108.9
3/2	39.8	180.0	9.8	57.5	22.0	-84.6	16.2	-148.0	26.1	115.3	10.2	-119.5	7.4	111.8
3/3	3.2	180.0	37.7	164.8	31.4	18.6	37.9	-64.1	20.5	176.7	8.7	-13.0	5.5	68.8
3/4	23.0	180.0	48.8	-113.2	11.5	31.1	18.3	24.1	17.6	-99.1	15.4	94.7	4.8	33.0
3/5	55.4	180.0	69.7	-58.1	22.3	-121.6	27.4	174.9	7.9	-19.8	4.2	153.0	5.5	-37.0
3/6	9.7	180.0	67.6	11.4	12.4	25.6	30.0	-159.0	4.4	-74.3	7.8	-71.7	10.0	110.8

Date														
3/7	0.4		91.3	69.6	8.1	45.1	34.6	-6.0	18.7	-18.5	11.1	-28.8	9.1	-166.2
3/8	9.6	180.0	39.5	147.9	17.3	120.1	23.5	15.8	11.8	45.7	7.1	141.2	6.5	24.4
3/9	22.9		42.8	-129.6	23.3	129.7	31.2	147.9	16.6	81.7	16.7	97.5	5.1	-178.4
3/10	4.1	180.0	2.9	-152.3	9.1	88.2	23.0	-152.9	4.0	-166.7	6.5	-6.8	4.7	-161.7
3/11	8.9		21.6	89.6	40.6	-105.7	25.3	-19.3	23.8	-146.0	10.5	-78.7	9.5	-93.2
3/12	20.9		20.1	-127.7	25.7	-77.9	13.4	12.6	5.6	-88.4	14.6	-155.1	15.6	-50.4
3/13	32.3		52.0	-99.4	13.2	-12.5	24.3	-164.1	22.5	46.4	2.5	-58.0	5.4	75.1
3/14	47.8		23.2	-5.9	11.6	83.0	10.2	108.0	15.0	117.4	9.1	41.4	10.9	94.9
3/15	10.8	180.0	50.7	38.5	11.8	39.5	28.9	20.2	16.2	-103.7	2.8	141.0	2.1	116.7
3/16	26.0	180.0	33.8	69.7	10.1	141.4	13.2	-124.8	9.2	-48.4	4.5	-80.1	5.9	-80.2
3/17	18.8		34.2	175.5	8.6	178.0	19.1	-176.3	6.0	95.9	0.9	119.0	3.7	-74.5
3/18	37.3	180.0	37.6	-141.3	7.7	33.2	14.3	88.0	6.2	130.7	7.6	175.9	3.0	166.6
3/19	46.3	180.0	26.0	-138.9	5.0	55.0	3.0	119.4	7.8	-55.1	11.9	56.0	5.9	154.6
3/20	21.3	180.0	16.9	-112.4	18.0	-106.7	14.6	-73.8	3.8	108.4	11.4	-14.0	2.8	-142.2
3/21	28.0		47.9	22.5	18.3	-138.4	19.3	-20.4	10.4	141.3	17.9	-151.0	8.3	58.8
3/22	24.3		39.8	49.2	27.3	14.9	14.8	68.4	8.6	-2.4	3.5	149.1	7.2	-51.0
3/23	10.5	180.0	16.5	-156.0	30.8	56.2	9.3	84.8	13.9	-57.0	8.1	-10.3	7.6	-55.1
3/24	1.3	180.0	27.3	-70.5	33.0	179.8	16.8	-169.9	8.3	-136.8	6.7	-58.3	8.9	132.6
3/25	5.1	180.0	23.3	76.4	18.8	-139.6	3.2	-58.1	12.4	121.9	8.2	69.3	8.4	-179.7
3/26	13.5	180.0	12.1	120.1	21.9	-22.5	10.3	-79.9	7.5	114.7	5.2	-27.6	5.7	43.5
3/27	47.1		50.8	-163.9	11.9	83.4	13.8	-129.2	1.4	-137.7	15.4	-155.3	9.6	59.8
3/28	42.5		29.8	-100.2	11.3	-72.0	14.1	111.8	8.8	18.9	4.8	127.8	3.8	-131.9
3/29	31.9	180.0	56.6	-24.0	40.6	66.7	17.4	115.6	2.5	-62.2	9.9	90.7	17.7	-87.0
3/30	33.7	180.0	58.6	25.3	22.1	148.7	10.7	-114.5	15.7	-130.4	2.2	-145.5	4.3	85.6
3/31	29.0		34.4	93.7	47.2	-107.8	27.7	-31.8	4.9	47.2	4.8	-89.3	14.5	45.0
4/1	25.9		54.4	-172.6	21.1	-62.9	18.2	9.7	10.2	-36.8	8.0	-54.8	11.5	-117.8
4/2	37.6		38.8	-93.9	12.3	92.1	15.8	153.5	10.3	-33.2	6.3	75.2	5.4	-120.6
4/3	16.5		21.6	49.4	11.5	-179.8	19.2	-172.1	10.2	84.6	12.0	54.4	1.7	175.8
4/4	35.2	180.0	55.3	83.3	26.9	-51.9	24.4	-18.3	30.0	149.2	7.8	-77.0	14.0	121.3
4/5	48.4	180.0	31.1	-161.4	40.3	39.0	14.2	90.9	3.9	-68.0	1.4	-176.3	4.9	37.7
4/6	17.7	180.0	51.6	-105.1	33.3	122.7	14.5	127.6	17.5	-19.8	7.4	159.9	6.8	-70.9
4/7	11.7	180.0	24.1	-51.7	43.3	-169.8	14.5	-111.5	4.7	-47.7	13.2	-132.4	9.3	38.6
4/8	15.1		33.7	76.8	20.0	-40.5	10.6	-118.2	7.3	5.0	2.0	-61.7	1.1	-164.9
4/9	1.5	180.0	29.8	145.9	22.2	16.8	4.6	-85.1	7.3	166.7	9.9	66.0	13.2	-105.8
4/10	24.7	180.0	40.4	-127.0	23.8	-147.8	9.7	-87.2	25.2	-172.0	4.2	88.8	11.3	-139.1
4/11	23.5		26.3	-68.6	17.4	-37.4	8.0	75.2	9.5	-14.0	4.7	-26.2	10.3	78.7
4/12	1.3		34.1	38.1	28.5	72.2	20.0	63.8	21.8	22.0	3.8	-66.4	12.9	-8.4
4/13	0.7	180.0	53.3	42.4	28.0	106.9	2.6	44.2	9.6	-101.7	2.0	136.0	3.8	24.7
4/14	30.5		33.9	87.5	25.8	-107.5	14.5	174.1	14.2	-179.8	2.2	-166.2	13.8	125.3
4/15	12.5		43.2	-178.3	43.1	-81.4	13.8	-48.3	8.5	141.7	12.7	-43.2	6.1	158.0
4/16	5.7	180.0	53.0	-118.2	13.1	73.3	11.0	-29.6	1.2	169.2	11.8	30.2	9.2	-67.9
4/17	5.9	180.0	32.7	-43.8	39.0	132.3	18.4	79.2	18.8	-76.9	4.4	64.1	5.2	82.4
4/18	7.3	180.0	51.3	15.9	23.5	-116.6	23.2	-177.9	6.1	-21.4	17.0	164.2	8.1	32.2
4/19	0.1	180.0	15.0	78.9	28.0	11.9	18.4	-122.6	10.1	88.4	3.9	-150.4	6.0	-160.5
4/20	36.5	180.0	53.5	167.4	10.6	156.8	20.5	6.8	17.5	88.4	11.5	-50.8	15.6	-171.1
4/21	56.3	180.0	32.3	163.3	28.2	-68.7	20.5	31.3	10.1	60.3	4.4	130.6	7.6	-52.1
4/22	4.3		43.5	-112.7	29.6	25.5	8.0	-150.9	16.7	-117.0	13.2	-179.3	9.4	-68.2
4/23	0.4	180.0	37.1	-37.7	39.4	100.1	16.0	-129.2	12.9	-95.5	2.9	-51.1	9.9	60.8
4/24	18.3		28.6	5.8	14.8	-147.2	7.3	99.6	10.1	-16.0	9.5	10.8	7.5	17.4
4/25	34.9		7.0	61.6	33.1	-64.0	5.2	98.7	19.0	57.7	16.5	85.2	6.6	-175.2
4/26	19.9		5.8	-132.5	12.3	83.4	9.7	-0.3	4.5	-117.4	15.3	177.8	8.8	160.1
4/27	8.1		44.3	95.2	33.6	156.9	2.7	-116.2	8.9	94.2	12.4	-84.3	4.2	117.6
4/28	7.5	180.0	47.7	104.4	30.9	-128.5	12.2	-105.6	18.6	117.1	14.1	-6.2	5.4	-49.0
4/29	28.4	180.0	20.2	-120.1	26.3	-25.1	14.7	28.2	22.1	-126.6	3.0	17.8	4.7	-35.7
4/30	13.3	180.0	20.6	-48.6	37.4	52.6	8.4	83.8	26.7	-92.4	6.9	159.7	4.6	-14.3
5/1	49.2		6.0	-109.6	8.9	-72.9	19.1	156.5	8.7	50.5	9.7	123.1	5.3	-52.2
5/2	42.3		26.5	-110.8	26.9	174.7	16.6	-149.4	19.6	98.1	11.5	-69.7	9.3	148.3
5/3	10.0	180.0	45.3	-39.5	15.3	166.1	20.4	-81.1	4.2	99.5	11.6	-66.8	3.3	-145.4
5/4	62.0	180.0	61.1	30.4	23.6	-59.2	21.6	22.4	4.6	-12.5	4.8	29.8	7.9	-9.2
5/5	28.9	180.0	43.3	86.1	30.7	20.1	17.8	53.3	3.5	-30.9	8.7	22.7	1.2	-92.4
5/6	8.0		61.0	177.6	17.7	102.0	13.6	-178.0	11.6	-88.1	10.4	135.3	3.9	-102.5
5/7	24.9		32.1	-141.1	42.8	-165.4	20.9	-134.4	7.3	145.0	6.3	156.7	5.0	143.5
5/8	22.7		12.7	-70.9	38.7	-104.2	11.9	-6.0	11.0	64.2	5.8	-140.4	1.4	-165.0
5/9	10.7	180.0	20.1	-35.7	15.1	27.8	12.8	99.9	2.9	-1.6	18.9	-95.2	2.5	171.2
5/10	25.3	180.0	6.4	-129.5	36.5	56.4	21.8	134.3	14.7	-90.3	12.2	34.1	8.6	113.0
5/11	20.4		21.8	-27.0	31.5	57.1	16.1	-19.4	7.7	-51.9	7.2	40.1	9.0	31.7
5/12	22.2		21.4	-22.9	12.0	-60.4	28.4	-71.2	11.3	109.1	13.1	177.5	8.2	-44.6
5/13	1.3		28.2	72.5	15.5	-125.0	1.0	-110.4	5.8	58.8	7.5	155.1	5.0	17.9
5/14	2.5		22.8	113.5	13.7	152.5	24.4	108.8	5.5	67.2	9.9	21.2	6.4	147.5
5/15	11.2	180.0	15.2	-147.8	16.8	-121.5	12.0	134.5	7.5	135.3	5.3	18.0	10.2	-140.3
5/16	9.1		23.0	-128.3	6.9	-24.8	12.6	-104.9	4.5	-118.7	4.4	-168.6	5.6	13.6
5/17	16.3	180.0	23.2	-90.4	3.1	-70.5	39.7	-68.9	14.1	-64.8	7.1	-152.4	1.6	158.8
5/18	9.2	180.0	13.0	-146.6	26.0	-139.6	10.9	-23.3	3.8	111.7	0.9	-137.1	3.4	-15.2
5/19	18.1	180.0	40.3	104.9	12.0	-120.5	33.7	119.6	6.6	162.1	5.5	-47.3	4.5	-150.6
5/20	8.9	180.0	51.2	151.7	32.9	95.9	36.6	115.7	5.3	-0.5	2.4	-9.1	3.1	51.0
5/21	18.9		19.7	-145.4	37.5	48.7	26.1	-62.4	15.8	-74.7	6.0	31.9	2.1	-163.3
5/22	31.2		60.6	-55.7	45.9	-5.8	37.4	-39.1	3.6	-145.5	12.1	128.8	5.3	87.0
5/23	10.1		40.6	0.8	20.9	-116.7	18.0	104.8	12.4	135.4	4.5	108.0	6.3	-93.7
5/24	3.7	180.0	38.2	71.5	32.4	-161.5	27.7	126.0	11.3	157.3	4.6	-48.1	7.9	-132.0
5/25	17.4		32.2	145.8	22.0	-13.2	7.5	-70.5	5.9	-49.7	3.6	-55.5	9.2	29.4

Date														
5/26	25.3	180.0	23.3	-76.0	28.5	44.3	8.2	-43.1	12.9	-1.8	14.9	-128.5	10.6	41.3
5/27	31.9	180.0	34.7	-47.4	37.7	174.0	9.0	-141.4	7.8	-4.2	4.3	-60.6	10.2	157.6
5/28	0.5		17.8	-167.9	45.1	-164.8	12.2	145.5	11.7	129.9	10.6	63.3	3.5	-166.8
5/29	17.5		10.0	122.5	16.3	-19.0	7.7	133.6	14.4	-171.9	11.0	3.1	9.9	-34.6
5/30	11.3		29.8	101.7	11.0	-9.4	10.8	-53.7	5.3	-61.0	6.2	-171.5	9.0	-142.1
5/31	5.6		32.0	106.4	25.1	39.2	15.3	-27.0	15.8	-18.3	6.5	101.1	6.6	130.3
6/1	13.7		12.4	-112.6	17.8	47.3	4.1	-74.1	3.5	-43.9	3.7	-135.7	10.9	-64.8
6/2	24.5		42.5	-75.2	13.9	-100.1	19.4	171.6	13.1	133.3	1.1	-80.9	1.4	-42.1
6/3	8.7	180.0	17.9	-9.2	19.7	-75.8	15.0	105.7	3.5	106.0	5.5	-69.4	3.6	125.9
6/4	5.4		24.7	58.1	14.9	-117.5	13.9	12.8	4.8	-79.4	1.5	113.5	4.2	72.0
6/5	12.9		19.7	-36.8	31.4	125.9	19.7	-64.4	5.6	-2.0	2.5	112.1	13.3	46.2
6/6	6.7		24.9	-37.1	13.7	103.0	4.9	-105.6	4.8	65.1	2.1	-93.1	3.2	35.5
6/7	49.7	180.0	18.1	92.4	17.1	-178.0	5.5	134.4	15.0	88.8	4.0	84.1	12.6	-151.9
6/8	53.9	180.0	61.0	159.5	27.8	-102.7	15.7	7.5	15.5	-169.8	7.5	-160.6	8.6	-125.3
6/9	33.7	180.0	31.7	-145.0	27.5	-34.4	16.1	-8.9	12.1	-141.8	8.4	-67.0	9.6	-23.9
6/10	0.3		34.9	-60.8	36.1	12.0	27.1	-173.8	14.1	-26.3	6.7	-26.2	3.0	-27.2
6/11	28.6		12.5	27.1	41.1	111.4	40.2	161.0	10.5	46.4	10.3	55.0	6.4	58.3
6/12	25.8		7.2	70.0	28.3	142.2	7.2	175.4	9.4	158.7	4.2	-161.3	14.6	135.2
6/13	14.7		12.1	107.5	23.5	-63.8	26.3	12.8	7.3	-64.9	3.2	-130.4	11.3	-168.3
6/14	4.7	180.0	19.5	35.9	5.2	-84.6	32.0	18.8	15.2	-78.0	4.1	-31.6	3.7	-50.1
6/15	22.5	180.0	16.5	34.0	5.9	-62.5	15.2	-131.9	0.8	-144.9	13.7	105.2	5.8	-21.6
6/16	18.3		32.8	-160.6	3.2	16.2		-141.4	6.4	29.4	16.4	116.8	8.3	3.7
6/17	33.6		32.8	-121.2	11.4	115.3	3.9	-24.7	5.8	6.0	4.8	-122.3	10.1	-30.0
6/18	24.5		38.6	9.4	26.3	-176.0	14.3	-0.8	4.4	72.7	24.0	-84.0	8.6	171.0
6/19	15.8		32.4	62.0	27.4	-102.4	8.2	-123.0	8.2	166.9	7.4	-40.1	9.0	179.3
6/20	10.4		41.0	-171.9	22.5	-33.6	17.9	-159.9	11.2	-118.7	12.5	83.3	5.4	106.8
6/21	10.7	180.0	16.4	-104.5	29.3	83.7	13.9	73.4	0.3	94.5	7.4	80.2	7.9	52.8
6/22	32.8	180.0	27.5	108.4	3.8	-177.8	14.7	66.5	7.9	25.7	9.6	174.6	6.9	-114.7
6/23	19.1	180.0	28.1	85.1	24.4	-30.2	4.7	-46.8	10.6	72.0	6.5	13.0	9.9	-103.1
6/24	0.8	180.0	18.5	-73.6	19.0	100.1	16.9	-41.3	8.4	135.8	4.0	-54.2	5.0	17.4
6/25	7.0		30.5	-49.9	19.5	168.3	11.7	-0.7	12.1	-155.5	8.7	-154.4	10.1	14.7
6/26	21.2		27.5	-9.7	7.7	-108.0	26.6	133.4	7.2	127.8	9.1	-139.0	8.4	82.6
6/27	2.3	180.0	22.6	89.4	2.6	-145.0	21.3	175.9	7.6	-69.4	13.7	-25.2	5.9	166.3
6/28	10.2	180.0	28.9	112.5	1.6	-88.8	20.8	-84.7	5.1	-74.7	8.6	-24.8	6.2	-136.5
6/29	18.6		23.2	-121.7	21.8	-122.3	10.3	10.4	3.1	3.7	13.6	117.2	4.5	167.4
6/30	26.3	180.0	43.8	-121.2	20.9	-23.2	10.1	-56.6	3.2	131.0	16.5	61.9	11.7	-67.1
7/1	27.8	180.0	18.5	-139.9	30.5	41.7	12.0	-170.8	15.3	12.9	3.8	129.9	9.6	-38.4
7/2	1.5	180.0	23.3	-6.7	20.0	132.3	2.5	140.5	12.8	50.8	11.2	-112.2	7.8	147.9
7/3	21.0		30.6	26.3	22.4	-159.7	13.1	19.7	10.7	-138.5	12.2	-101.6	7.7	132.6
7/4	9.1	180.0	34.5	57.8	27.5	-41.2	12.9	154.3	20.8	-152.8	4.7	67.9	4.3	-93.4
7/5	8.4	180.0	19.7	129.0	5.3	54.4	15.0	-124.8	3.1	-150.6	13.0	62.9	10.0	-3.5
7/6	5.4		44.4	-175.8	35.9	117.2	15.3	4.1	16.7	18.7	14.4	-145.2	11.4	65.2
7/7	31.7		26.5	-90.8	11.5	88.2	19.4	64.9	15.7	44.6	11.0	-139.5	7.9	153.0
7/8	29.7		29.0	-6.5	19.1	-74.5	6.5	175.8	6.7	146.5	10.0	37.3	14.6	-162.9
7/9	0.2	180.0	29.5	39.0	31.3	-92.9	9.4	-96.7	21.3	-104.8	4.2	102.0	4.9	-106.4
7/10	18.0	180.0	13.6	179.7	14.2	-83.4	7.7	34.7	1.9	-81.1	9.7	-54.9	11.3	17.7
7/11	10.2	180.0	22.0	-145.4	19.3	116.5	14.2	88.0	7.5	114.0	2.1	-0.2	6.5	-5.6
7/12	40.6	180.0	44.6	-48.4	20.0	150.0	20.3	-80.4	2.4	136.6	10.7	-20.4	3.8	-137.6
7/13	18.3	180.0	32.4	-11.5	1.4	91.6	17.6	-136.9	11.9	-77.6	18.5	-147.6	3.2	121.6
7/14	14.8		44.6	133.1	21.2	74.2	19.2	141.2	11.0	114.4	17.5	133.8	11.1	93.9
7/15	33.8		81.8	166.0	4.7	65.6	30.7	72.1	7.4	-48.0	11.9	27.0	4.2	60.2
7/16	35.5		36.4	-154.4	17.0	-9.0	22.9	30.2	8.2	-30.3	10.5	33.3	7.1	-103.9
7/17	6.4		25.4	-2.4	44.6	-10.3	33.1	-53.3	6.1	37.3	8.7	13.7	8.5	-151.0
7/18	49.3	180.0	37.9	-34.1	8.7	-158.2	21.1	-121.7	0.7	152.9	13.8	-150.5	11.0	18.0
7/19	34.2	180.0	26.4	-21.4	74.1	-172.3	29.3	-172.2	23.2	136.0	12.8	-153.3	8.8	29.6
7/20	20.6	180.0	36.6	56.8	19.8	-100.4	14.7	-83.1	2.6	-168.4	8.8	-15.8	2.8	-83.3
7/21	25.5		67.5	171.3	20.3	0.1	22.8	17.0	12.3	-116.8	9.9	121.8	6.8	-117.9
7/22	40.0		73.6	-135.3	41.4	34.7	36.2	84.4	3.7	-28.1	3.3	-132.7	11.5	-166.2
7/23	12.2		66.7	-17.3	21.6	61.3	26.8	158.7	4.5	-48.9	8.9	-15.3	3.6	92.5
7/24	25.6	180.0	83.1	39.0	5.2	-156.0	26.7	-136.6	11.5	70.3	9.7	40.8	5.7	-11.9
7/25	15.0	180.0	32.2	140.8	15.6	-86.6	21.8	-25.8	8.9	-86.7	2.4	109.8	6.7	-37.6
7/26	4.2	180.0	38.1	-121.6	16.8	89.2	9.7	99.4	12.2	-114.1	7.5	-87.8	4.8	162.5
7/27	4.1	180.0	31.5	-9.9	20.0	171.9	12.0	-123.5	9.4	19.0	1.9	-134.3	6.6	85.3
7/28	12.9		36.6	50.7	22.7	-92.0	12.8	-34.6	7.8	37.1	12.0	151.0	1.5	133.5
7/29	31.9		15.5	81.5	8.0	-38.2	14.0	112.3	6.3	95.2	7.1	135.2	11.8	-132.2
7/30	0.5		35.7	153.4	15.6	134.0	18.3	143.7	19.3	49.8	22.5	-13.8	5.0	-56.5
7/31	2.7		37.6	-139.6	13.6	-128.7	26.2	-37.4	17.0	-86.7	7.2	-50.2	4.8	67.0
8/1	9.2	180.0	29.4	-33.2	29.4	-12.3	27.9	-44.0	13.9	-148.3	20.9	173.1	8.9	132.8
8/2	23.3		43.4	19.1	20.2	75.0	2.8	-117.0	20.4	135.8	6.7	-174.6	10.1	-73.8
8/3	19.5		42.2	110.9	33.0	-158.0	17.8	129.0	16.9	120.5	16.5	-28.7	3.4	25.1
8/4	40.4	180.0	61.4	-168.8	16.9	-58.7	12.5	133.5	9.8	-75.3	7.9	-21.9	4.8	89.6
8/5	30.9	180.0	66.1	-103.5	28.6	84.4	18.7	58.3	10.8	-60.5	17.4	124.1	5.3	-13.3
8/6	21.2		34.0	-21.8	16.7	148.5	11.1	147.9	12.8	2.6	13.9	174.3	5.4	85.0
8/7	25.3		40.7	70.3	33.6	-124.7	29.5	-124.2	0.4	37.2	14.9	-30.7	3.5	-140.1
8/8	10.9	180.0	22.6	147.8	36.1	-9.6	21.4	-46.8	5.1	101.2	12.0	35.4	15.8	-128.9
8/9	25.6	180.0	24.9	-70.4	37.2	49.7	36.9	21.1	11.2	159.0	9.4	83.2	9.0	-57.7
8/10	2.0		20.2	2.3	21.7	-176.9	18.4	135.5	10.3	-165.1	18.7	173.5	10.1	32.6
8/11	7.8		13.3	87.5	41.7	-108.2	29.5	159.8	17.5	-59.9	11.9	-98.4	11.2	61.6
8/12	17.0		21.6	-1.0	14.9	20.1	5.6	-78.7	12.0	-88.1	11.8	-78.9	6.3	132.0
8/13	17.5	180.0	19.4	145.4	31.5	101.2	15.2	-61.7	16.8	72.3	3.0	112.2	4.2	-166.6

Date														
8/14	5.4		45.7	175.8	4.1	-173.5	18.3	-2.8	14.2	47.2	15.3	27.6	4.5	160.9
8/15	10.7		49.0	-72.2	25.8	-61.7	0.6	-143.4	1.5	-19.3	6.5	-76.1	2.5	17.9
8/16	26.2	180.0	23.7	-2.9	10.5	107.6	8.0	-145.8	8.0	-179.3	7.2	-149.1	6.7	25.8
8/17	18.7	180.0	53.2	116.9	17.9	-163.1	15.0	164.5	10.7	-170.3	9.0	130.9	1.7	81.9
8/18	16.9		49.6	-175.2	22.0	100.4	23.8	100.1	10.6	-46.5	6.5	11.1	16.9	157.2
8/19	5.9		30.6	-59.5	12.3	23.3	8.2	-66.8	8.8	-9.5	5.8	47.0	2.9	-44.4
8/20	8.6	180.0	62.5	17.0	5.7	33.2	31.5	-73.2	4.1	107.8	6.6	170.3	11.2	-70.8
8/21	2.0		40.8	47.9	13.6	-48.9	14.0	-27.5	10.1	62.6	6.4	-40.3	15.0	-68.3
8/22	14.5		41.6	172.2	19.1	-104.4	16.9	62.3	13.8	-103.6	11.0	-52.7	5.2	-35.2
8/23	20.1		56.6	-134.4	33.3	-167.1	25.2	123.5	24.8	-176.9	14.1	107.2	5.3	39.1
8/24	8.4		39.5	-43.8	30.3	-11.9	14.1	153.0	9.1	65.2	14.2	135.2	10.0	115.5
8/25	3.2		56.2	34.1	36.9	54.0	4.1	-42.5	13.4	-1.6	15.0	-122.8	5.2	-159.1
8/26	2.1	180.0	38.2	96.3	12.3	-177.1	4.4	-66.2	5.5	-5.4	15.6	-20.7	8.3	-162.9
8/27	18.9	180.0	50.5	-150.9	17.9	-101.7	14.5	-133.4	4.7	174.9	2.6	86.0	4.8	-11.2
8/28	5.0		35.1	-116.6	3.7	71.8	6.3	-10.8	12.4	-162.2	11.1	-168.5	10.2	86.0
8/29	40.7		4.0	151.0	5.3	-130.6	9.0	-126.0	3.3	2.4	14.6	38.1	2.6	69.8
8/30	8.7		9.8	-97.2	9.2	122.0	7.9	-74.4	5.9	15.8	12.0	10.2	6.6	-56.5
8/31	26.1	180.0	31.7	-37.7	20.4	17.8	11.2	77.6	4.2	-46.1	14.2	-130.2	8.5	-117.8
9/1	29.1	180.0	15.0	23.1	32.6	108.6	9.3	74.5	2.6	30.4	10.2	-170.7	2.3	168.9
9/2	7.8	180.0	17.0	90.9	27.4	170.1	14.5	59.6	7.4	62.0	5.8	151.0	11.8	86.5
9/3	20.7		38.8	44.7	27.1	-66.0	6.2	5.1	7.2	-48.8	6.0	11.8	8.5	62.1
9/4	24.9		21.3	86.4	23.0	-24.0	15.0	-145.2	15.7	-163.0	6.1	29.7	2.5	-149.7
9/5	3.3		11.4	-176.9	24.4	179.1	17.2	-134.0	15.7	153.7	3.2	-38.3	5.6	-115.1
9/6	59.0	180.0	14.5	-170.7	21.2	-150.1	16.7	-110.4	20.8	44.9	8.1	-82.8	5.3	-23.9
9/7	55.2	180.0	28.8	-154.0	14.0	-36.2	6.4	-42.0	13.0	19.1	12.2	-133.6	7.9	-0.6
9/8	2.1		40.9	-75.0	28.7	7.8	10.7	-15.7	12.9	-99.9	11.0	67.1	5.3	-173.8
9/9	26.1		15.8	-76.8	14.8	66.3	17.3	41.4	10.7	-125.1	16.7	71.1	6.7	-143.7
9/10	37.9		40.2	102.3	21.5	-169.0	10.7	115.0	8.7	117.6	8.1	-172.5	5.7	-40.7
9/11	3.5		22.4	75.9	5.4	136.0	8.1	54.4	8.5	-11.1	14.9	-134.9	7.1	18.2
9/12	32.3	180.0	5.3	-43.9	7.1	-30.4	13.2	16.7	1.1	59.5	10.6	10.9	13.5	178.3
9/13	15.7	180.0	11.9	68.8	15.4	-104.5	13.7	-174.5	8.7	-159.0	9.3	18.6	11.7	-116.0
9/14	0.5	180.0	14.1	95.7	24.8	-74.8	21.7	-160.5	4.7	-12.0	3.5	9.3	4.6	17.1
9/15	3.9	180.0	20.1	-124.8	25.2	65.4	15.9	44.7	4.0	152.1	2.2	167.0	6.7	53.2
9/16	13.0	180.0	32.0	-99.6	30.5	117.5	5.1	100.9	3.3	-174.9	14.5	-143.4	4.1	101.7
9/17	41.5		20.1	-90.6	6.5	-170.2	6.7	132.7	11.5	-2.1	9.2	-134.6	15.0	113.1
9/18	11.6		16.6	47.3	35.7	-29.7	3.5	-153.6	12.9	-173.8	12.5	22.4	7.5	-58.9
9/19	10.6	180.0	24.9	28.6	16.4	107.6	20.7	-47.9	7.6	-162.2	6.9	55.1	11.1	-42.9
9/20	38.6		19.4	127.5	29.9	-178.6	18.4	21.9	6.7	-38.5	2.9	-168.3	10.6	133.6
9/21	6.9		29.9	-161.4	25.7	-59.4	29.0	141.2	9.6	-23.3	9.8	-101.4	0.4	0.2
9/22	32.6	180.0	34.5	-45.3	32.8	58.6	25.5	-128.5	7.9	151.0	1.3	41.5	11.9	-39.0
9/23	8.9		26.9	39.9	6.4	-163.6	28.3	-61.6	3.4	77.5	9.7	36.5	3.5	-87.9
9/24	7.2		41.8	151.1	11.4	-90.0	15.1	20.2	2.8	-89.2	13.2	99.9	11.2	117.3
9/25	33.3	180.0	27.6	-114.8	24.7	96.9	13.8	137.8	9.7	44.6	8.1	-160.6	4.4	159.7
9/26	31.4	180.0	56.7	-10.9	9.5	-165.0	19.0	-152.2	11.6	54.8	2.1	-40.6	14.7	-92.8
9/27	5.8		52.4	-2.1	34.0	-79.9	4.9	-3.3	7.7	-51.1	4.4	-108.7	2.3	74.2
9/28	13.4		33.8	123.8	12.3	49.4	15.6	99.8	13.2	151.1	2.9	-148.6	3.8	65.5
9/29	41.2		63.0	141.5	23.8	127.3	5.2	110.0	14.1	-142.7	9.1	8.8	5.0	-25.8
9/30	43.4		24.1	157.5	19.3	-157.2	21.1	-33.7	20.3	-87.1	7.2	-160.3	3.2	133.4
10/1	9.3		17.6	-84.9	13.1	-63.3	2.6	-1.5	23.3	12.7	10.7	178.5	11.2	121.6
10/2	40.6	180.0	22.8	-136.4	26.1	53.4	8.0	0.1	30.3	89.5	6.4	12.8	8.3	-125.4
10/3	36.1	180.0	19.5	-62.0	20.9	-140.9	9.6	-28.6	17.1	174.8	10.2	69.3	3.9	-0.3
10/4	16.5		15.8	-41.3	43.9	-81.4	5.9	169.4	22.8	-120.1	6.3	-55.6	6.2	-13.6
10/5	5.0		28.4	-130.6	21.5	43.1	11.8	175.9	6.2	-56.3	10.7	-81.9	8.6	-24.6
10/6	5.3		21.5	-169.4	40.7	126.5	22.0	122.6	14.2	16.0	7.2	160.8	6.1	159.2
10/7	6.4		33.0	30.6	6.1	-43.3	4.8	8.3	8.9	-49.1	6.2	148.8	4.0	166.2
10/8	29.6		47.0	50.6	35.5	36.1	15.1	-1.1	8.2	76.6	19.3	27.1	6.4	108.0
10/9	19.1	180.0	19.2	108.2	16.8	94.7	3.3	-37.5	14.6	141.5	0.7	-32.1	5.4	80.9
10/10	36.4	180.0	35.8	-125.9	41.5	-125.2	31.1	-153.1	18.9	-175.1	26.1	-157.8	6.5	-64.3
10/11	11.5		19.4	-50.7	36.0	-92.0	16.3	-97.8	6.1	-73.5	10.1	-40.8	10.9	-81.1
10/12	10.2		5.7	-55.3	18.0	-8.0	23.4	12.6	17.8	-6.3	16.6	1.4	6.8	8.3
10/13	15.1		26.9	-102.5	11.5	47.7	16.1	109.7	13.7	19.1	5.7	-177.0	9.5	124.8
10/14	13.8		16.2	17.1	21.6	146.2	16.8	128.3	12.0	169.8	9.3	105.3	11.2	131.6
10/15	45.4	180.0	50.0	11.1	12.7	80.2	13.8	-1.0	1.3	-143.2	5.0	47.5	6.1	-141.6
10/16	55.5	180.0	32.5	73.7	14.6	11.1	10.9	-41.2	3.7	139.2	5.8	78.2	13.1	-68.6
10/17	2.3	180.0	47.1	161.5	6.4	45.0	12.3	-156.0	8.1	-169.4	1.8	66.2	5.8	-47.9
10/18	0.6	180.0	33.1	-163.8	33.1	106.8	15.4	176.2	9.6	-106.1	20.8	-150.6	8.7	95.6
10/19	2.1	180.0	13.9	174.2	30.8	-174.6	12.6	15.7	21.0	-26.9	11.2	-104.4	2.6	-41.7
10/20	11.9		16.9	31.2	48.1	-106.8	13.0	9.2	8.5	-4.3	12.5	-19.6	7.7	-76.1
10/21	39.5		12.2	-152.3	33.3	-16.9	5.6	-96.8	14.6	105.2	5.9	4.3	13.5	112.2
10/22	29.7		37.9	-139.4	20.4	64.8	10.3	-177.6	13.6	177.5	11.6	123.5	12.0	65.3
10/23	3.1		31.9	-85.0	14.1	145.6	13.1	-172.6	3.5	-177.4	4.0	34.8	4.8	-43.8
10/24	14.8		42.0	14.0	22.6	-47.2	1.6	168.7	12.4	-73.4	7.6	99.3	2.9	-78.6
10/25	20.5		36.3	27.8	15.9	-10.1	2.3	33.4	12.6	-10.6	3.9	136.1	15.1	-166.3
10/26	50.0	180.0	9.3	90.7	24.0	169.2	9.2	-95.1	18.5	87.6	11.8	41.1	7.6	-117.0
10/27	11.5	180.0	38.4	-154.6	20.7	146.5	26.7	5.6	15.1	132.6	11.6	-121.8	2.4	3.5
10/28	7.0	180.0	24.2	80.2	16.2	-58.4	15.9	89.5	4.2	-104.1	18.2	-78.7	6.7	-34.4
10/29	7.5	180.0	33.8	109.3	13.8	-63.9	23.9	-150.7	10.9	-107.2	6.5	-55.0	6.2	55.9
10/30	6.2		40.0	-115.7	16.0	88.1	19.6	-71.1	17.0	-71.8	9.1	48.6	3.6	2.8
10/31	10.7		50.6	-62.3	15.2	97.1	23.5	-4.5	1.9	151.0	16.1	95.7	4.3	34.4
11/1	38.9		11.6	18.6	8.6	68.5	37.1	73.2	22.4	50.2	6.7	121.6	2.7	21.4

Date														
11/2	25.8		46.7	86.5	15.4	-24.7	23.3	171.9	12.4	80.3	15.7	-161.2	9.2	-178.6
11/3	1.3	180.0	34.1	116.9	1.0	-105.0	36.4	-129.5	22.9	162.1	3.5	170.1	6.0	173.6
11/4	6.2		44.7	-147.0	21.3	137.2	2.7	128.9	22.8	-126.9	7.8	-127.1	9.9	41.5
11/5	4.7		27.1	-127.5	11.1	-125.8	26.3	43.8	18.2	-73.7	10.2	-42.5	1.5	171.4
11/6	16.3	180.0	34.6	-35.5	31.8	-80.7	5.9	154.3	24.6	-2.4	10.5	-40.4	9.5	-111.8
11/7	22.7	180.0	55.7	35.7	23.4	-81.3	23.2	-170.6	24.8	66.5	4.5	89.4	10.7	-49.7
11/8	6.5	180.0	60.1	62.3	22.0	112.7	27.0	1.8	16.4	177.3	10.7	57.6	5.1	-167.1
11/9	9.3		34.7	-162.0	24.2	100.8	29.7	-29.6	21.5	-158.2	3.6	78.3	5.5	106.9
11/10	5.0	180.0	37.6	-115.4	24.9	36.1	4.8	-96.2	6.1	-160.1	4.7	-148.8	9.8	71.2
11/11	42.1	180.0	39.1	-77.7	26.6	11.5	41.8	162.8	11.5	-31.5	4.1	-33.0	3.6	68.3
11/12	23.3	180.0	14.6	-31.1	38.0	-140.7	25.0	167.0	6.8	-64.2	7.2	161.0	9.3	-72.6
11/13	5.4	180.0	8.7	67.4	37.0	-123.9	23.5	8.9	13.7	22.1	0.8	52.7	9.0	-113.4
11/14	28.3		7.4	10.5	26.0	-1.6	21.7	-22.9	10.9	86.9	3.9	-56.3	10.7	142.3
11/15	21.5	180.0	35.2	34.3	41.5	80.8	15.0	-123.6	14.2	99.4	4.9	-107.2	4.3	143.8
11/16	14.3	180.0	30.3	25.8	36.3	144.0	10.5	-64.7	7.7	-109.0	5.3	103.4	10.7	-6.7
11/17	4.6		32.8	-169.8	32.6	-90.2	13.0	123.3	11.2	-122.0	13.6	80.3	5.7	45.9
11/18	7.8	180.0	45.1	-150.8	37.2	-33.3	24.7	76.7	24.2	-31.5	9.1	-95.6	5.7	-125.3
11/19	8.3		9.5	-158.4	15.9	74.0	18.4	40.0	9.5	-19.8	15.1	-113.8	8.9	164.0
11/20	2.1		37.9	79.5	23.1	134.1	25.4	-115.7	16.1	113.8	10.7	-1.8	8.6	-0.2
11/21	2.0		41.3	142.1	8.3	148.1	26.6	-143.9	45.2	117.6	11.4	66.9	14.4	-40.1
11/22	8.7		42.3	-158.1	19.4	156.0	19.8	9.0	19.0	-142.9	14.2	152.1	14.4	154.2
11/23	10.1		43.2	-96.9	30.2	-61.9	10.0	104.1	42.4	-88.9	4.9	-91.8	7.2	-133.6
11/24	11.0		75.4	-23.4	27.0	-27.4	20.3	124.7	17.8	-68.0	4.8	-83.9	5.3	27.7
11/25	11.7		65.8	67.9	16.7	169.4	8.5	137.2	22.5	57.3	10.0	-54.0	8.1	21.9
11/26	1.2		60.4	158.2	25.6	-157.5	25.9	-100.0	30.0	74.4	4.3	-17.3	8.3	-178.3
11/27	39.5	180.0	65.7	-135.0	16.0	90.7	27.7	-58.4	3.3	173.4	14.1	107.8	4.2	134.6
11/28	40.8	180.0	42.7	-70.8	24.6	88.1	35.6	17.4	19.0	-126.7	8.6	37.8	11.2	30.4
11/29	22.1		61.2	20.1	15.0	2.4	28.6	91.0	6.0	-43.9	5.1	174.3	3.0	-157.9
11/30	33.5		56.8	69.3	32.5	-29.6	29.2	178.9	13.3	-38.6	13.7	-156.4	5.4	-145.3
12/1	34.0		10.9	76.7	30.0	-109.1	28.4	-87.4	12.0	-128.3	2.6	-177.1	4.7	21.3
12/2	19.8		41.8	-66.6	21.3	154.6	23.2	-15.2	1.6	-35.4	12.2	-18.9	3.4	-113.2
12/3	17.7		42.7	-21.1	27.0	16.8	6.3	90.9	19.9	51.9	8.5	-23.8	9.4	-106.9
12/4	33.5		36.9	67.8	22.1	69.7	33.5	147.4	23.5	106.4	6.1	-87.3	9.9	14.9
12/5	0.3		47.7	-164.5	31.1	143.8	15.2	174.1	8.5	133.4	7.8	101.6	2.2	51.6
12/6	51.9	180.0	53.1	-175.3	38.0	-145.6	15.6	14.0	23.1	-100.9	6.2	174.0	6.2	140.2
12/7	60.1	180.0	30.0	162.9	26.3	-55.8	12.4	-29.3	15.8	-97.9	5.9	-138.2	9.8	167.7
12/8	7.7		3.0	1.1	24.5	-17.1	13.1	-78.3	16.8	-14.1	13.6	121.0	3.9	16.3
12/9	20.0		32.6	27.5	4.7	-53.3	6.6	55.3	17.1	64.0	11.5	4.3	5.3	-25.0
12/10	21.2		8.7	-90.4	29.2	131.5	4.9	169.9	17.5	112.4	10.2	-33.2	5.8	-134.4
12/11	6.5		17.3	-120.3	7.0	163.4	14.3	148.7	18.1	-174.7	2.0	-147.5	6.5	62.3
12/12	28.9	180.0	37.4	-10.7	25.0	-10.8	12.1	-46.0	9.1	-156.3	3.6	116.2	6.4	57.2
12/13	10.4		13.8	23.4	26.5	-41.0	17.6	-15.8	10.2	-55.6	6.9	-157.5	10.8	-106.1
12/14	2.6	180.0	38.4	150.7	33.6	125.9	18.1	106.6	9.5	49.1	6.9	76.8	5.8	-96.8
12/15	15.3	180.0	35.2	-149.8	23.3	149.2	23.0	145.3	1.7	40.1	7.2	37.9	13.5	109.2
12/16	25.3	180.0	23.5	-7.9	3.9	-51.9	12.5	-98.6	8.7	54.2	14.7	-116.1	8.5	150.9
12/17	21.9	180.0	22.8	20.8	8.8	-105.3	36.1	-71.3	9.3	-121.9	11.5	169.2	11.5	-47.1
12/18	26.8		41.0	125.7	23.0	-108.9	12.7	-168.2	8.9	-159.3	16.3	43.9	4.0	-77.0
12/19	17.3		31.8	140.6	28.1	-69.5	30.6	102.8	8.8	-51.1	13.6	-39.6	5.3	26.3
12/20	10.0		7.1	-48.6	11.5	82.0	8.4	58.4	9.0	-44.0	13.9	-131.9	6.4	172.4
12/21	10.3	180.0	7.6	-49.5	15.3	166.0	11.5	-53.3	0.5	-172.0	14.5	178.7	3.3	-64.2
12/22	18.9	180.0	32.4	-65.4	17.5	11.9	31.9	-3.0	10.1	-155.8	5.4	45.7	10.7	34.3
12/23	8.4	180.0	32.9	-60.8	58.0	87.4	2.6	46.8	5.3	157.7	8.3	31.9	0.4	-168.6
12/24	28.6		34.5	-17.6	25.9	168.7	25.5	-179.6	20.5	79.3	6.8	-59.1	8.0	-162.5
12/25	30.5		40.5	140.5	40.5	-69.8	28.3	-164.1	15.8	27.8	15.0	-129.6	11.6	83.7
12/26	36.8		73.3	-151.5	38.8	8.4	10.4	-11.7	22.6	-51.1	13.2	87.2	4.3	-102.6
12/27	1.6		63.1	-53.8	9.2	112.8	22.5	42.7	14.0	-132.0	19.1	36.2	9.6	-103.7
12/28	20.4	180.0	102.4	18.0	39.5	-128.5	15.6	108.8	16.6	156.8	6.3	134.0	5.4	-124.0
12/29	0.5		96.0	93.7	28.7	-117.0	12.5	-157.3	16.2	31.9	13.8	149.0	9.0	-15.2
12/30														
12/31														

1989 Pressure Wavenumber 1
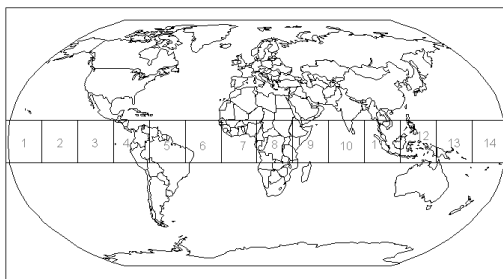
This sheet is for pressure analysis for around the world to find the 5 day pressure wave described by Madden.
This is 1989 ground pressure data filtered spacially and then filtered for wave 1 for Lat: -15 to 15 long: around
the world in 25.7 degree blocks <u>This is only wave number 1 as best as it can be reproduced from the pressure data</u>
Units of colored numbers are Pascals. Negative (White Lettering) Postive (Black Lettering)

Day (0 UT)	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1/1														
1/2														
1/3	-1.8	-16.6	-28.1	-34.0	-33.2	-25.9	-13.3	1.8	16.6	28.1	34.0	33.2	25.9	13.4
1/4	-72.8	-78.9	-69.4	-46.1	-13.8	21.3	52.2	72.7	78.9	69.4	46.1	13.8	-21.3	-52.2
1/5	-41.1	-18.4	8.0	32.9	51.2	59.3	55.8	41.1	18.4	-8.0	-32.9	-51.2	-59.3	-55.8
1/6	16.4	43.1	61.3	67.4	60.1	40.9	13.6	-16.4	-43.1	-61.3	-67.4	-60.1	-40.9	-13.6
1/7	63.3	57.4	40.2	15.0	-13.2	-38.8	-56.6	-63.3	-57.4	-40.2	-15.0	13.2	38.8	56.6
1/8	59.0	28.4	-7.9	-42.6	-68.9	-81.5	-78.0	-59.0	-28.4	7.9	42.6	68.9	81.5	78.0
1/9	-9.3	-14.6	-17.1	-16.1	-11.9	-5.4	2.2	9.3	14.6	17.1	16.1	11.9	5.4	-2.2
1/10	-53.2	-43.0	-24.2	-0.6	23.1	42.2	53.0	53.2	43.0	24.2	0.6	-23.1	-42.2	-53.0
1/11	13.9	24.4	30.0	29.7	23.5	12.6	-0.7	-13.9	-24.4	-30.0	-29.7	-23.5	-12.6	0.7
1/12	32.2	28.9	19.8	6.8	-7.6	-20.4	-29.2	-32.2	-28.9	-19.8	-6.8	7.6	20.4	29.2
1/13	-6.2	-14.7	-20.2	-21.7	-19.0	-12.4	-3.4	6.2	14.7	20.2	21.7	19.0	12.4	3.4
1/14	-28.7	-25.4	-17.0	-5.3	7.5	18.8	26.4	28.7	25.4	17.0	5.3	-7.5	-18.8	-26.4
1/15	2.5	4.5	5.6	5.6	4.5	2.5	0.0	-2.5	-4.5	-5.6	-5.6	-4.5	-2.5	0.0
1/16	21.5	16.8	8.7	-1.1	-10.6	-18.1	-22.0	-21.5	-16.8	-8.7	1.1	10.6	18.1	22.0
1/17	-23.3	-17.0	-7.3	3.8	14.2	21.8	25.0	23.3	17.0	7.3	-3.8	-14.2	-21.8	-25.0
1/18	-17.2	-8.9	1.2	11.0	18.6	22.6	22.1	17.2	8.9	-1.2	-11.0	-18.6	-22.6	-22.1
1/19	-0.5	0.7	1.8	2.5	2.8	2.5	1.7	0.5	-0.7	-1.8	-2.5	-2.8	-2.5	-1.7
1/20	5.2	-0.7	-6.6	-11.1	-13.4	-13.1	-10.1	-5.2	0.7	6.6	11.1	13.4	13.1	10.1
1/21	-3.9	-5.8	-6.5	-6.0	-4.2	-1.6	1.3	3.9	5.8	6.5	6.0	4.2	1.6	-1.3
1/22	-28.5	-22.0	-11.1	2.0	14.7	24.5	29.4	28.5	22.0	11.1	-1.9	-14.6	-24.4	-29.4
1/23	8.1	16.0	20.7	21.2	17.6	10.5	1.3	-8.1	-16.0	-20.7	-21.2	-17.6	-10.5	-1.3
1/24	6.7	8.7	9.0	7.5	4.6	0.7	-3.3	-6.7	-8.7	-9.0	-7.5	-4.6	-0.7	3.3
1/25	14.9	9.4	2.1	-5.6	-12.3	-16.5	-17.4	-14.9	-9.4	-2.1	5.6	12.3	16.5	17.4
1/26	12.7	8.1	1.8	-4.7	-10.4	-14.0	-14.8	-12.7	-8.1	-1.8	4.7	10.4	14.0	14.8
1/27	-20.7	-18.4	-12.5	-4.1	5.1	13.3	18.9	20.7	18.4	12.5	4.1	-5.1	-13.3	-18.9
1/28	5.1	5.4	4.6	2.9	0.6	-1.8	-3.9	-5.1	-5.4	-4.6	-2.9	-0.6	1.8	3.9
1/29	31.6	19.5	3.6	-13.1	-27.2	-35.9	-37.5	-31.6	-19.6	-3.6	13.1	27.2	35.9	37.5
1/30	6.1	-13.3	-30.1	-40.9	-43.7	-37.8	-24.4	-6.1	13.3	30.1	40.9	43.7	37.8	24.4
1/31	-19.6	-18.1	-13.1	-5.4	3.3	11.4	17.2	19.6	18.1	13.1	5.4	-3.3	-11.4	-17.2
2/1	-32.9	-21.6	-6.0	10.7	25.3	34.9	37.6	32.9	21.6	6.0	-10.7	-25.3	-34.9	-37.6
2/2	17.7	25.3	27.8	24.8	17.0	5.7	-6.7	-17.7	-25.3	-27.8	-24.8	-17.0	-5.7	6.7
2/3	12.7	13.5	11.7	7.5	1.9	-4.2	-9.4	-12.7	-13.5	-11.7	-7.5	-1.9	4.2	9.4
2/4	-40.8	-35.2	-22.6	-5.6	12.6	28.3	38.4	40.8	35.2	22.6	5.6	-12.6	-28.3	-38.4
2/5	11.3	27.3	37.8	40.9	35.9	23.7	6.9	-11.3	-27.3	-37.8	-40.9	-35.9	-23.7	-6.9
2/6	43.3	41.3	31.2	14.8	-4.4	-22.8	-36.7	-43.3	-41.3	-31.2	-14.8	4.4	22.8	36.7
2/7	14.8	-0.8	-16.3	-28.5	-35.1	-34.7	-27.5	-14.8	0.8	16.3	28.5	35.1	34.7	27.5
2/8	-7.8	-14.0	-17.5	-17.5	-14.0	-7.8	0.0	7.8	14.0	17.5	17.5	14.0	7.8	0.0
2/9	-15.3	-11.6	-5.7	1.4	8.2	13.4	15.9	15.3	11.6	5.7	-1.4	-8.2	-13.4	-15.9
2/10	-23.9	-21.2	-14.4	-4.8	5.9	15.3	21.7	23.9	21.3	14.4	4.8	-5.9	-15.3	-21.7
2/11	-9.2	-15.5	-18.7	-18.2	-14.1	-7.3	1.1	9.2	15.5	18.7	18.2	14.1	7.3	-1.1
2/12	4.2	9.3	12.5	13.2	11.3	7.2	1.6	-4.2	-9.3	-12.5	-13.2	-11.3	-7.2	-1.6
2/13	-22.7	-14.9	-4.0	7.6	17.7	24.3	26.1	22.7	14.9	4.0	-7.6	-17.7	-24.3	-26.1
2/14	9.7	12.7	13.2	11.1	6.8	1.2	-4.7	-9.7	-12.7	-13.2	-11.1	-6.8	-1.2	4.7
2/15	17.2	10.1	1.0	-8.3	-16.0	-20.4	-20.9	-17.2	-10.1	-1.0	8.3	15.9	20.4	20.9

2/16	28.3	19.4	6.6	-7.6	-20.2	-28.8	-31.7	-28.3	-19.4	-6.6	7.5	20.2	28.8	31.7
2/17	32.7	28.7	19.1	5.7	-8.8	-21.6	-30.1	-32.7	-28.7	-19.1	-5.7	8.8	21.6	30.1
2/18	7.0	4.1	0.3	-3.5	-6.6	-8.4	-8.6	-7.0	-4.1	-0.3	3.5	6.6	8.4	8.6
2/19	-2.5	-10.2	-15.8	-18.3	-17.2	-12.7	-5.7	2.5	10.2	15.8	18.3	17.2	12.7	5.7
2/20	-31.1	-28.7	-20.5	-8.3	5.6	18.3	27.4	31.1	28.7	20.5	8.3	-5.6	-18.3	-27.4
2/21	-24.8	-11.8	3.5	18.1	29.2	34.4	32.9	24.8	11.8	-3.5	-18.1	-29.2	-34.4	-32.9
2/22	-17.4	-13.6	-7.2	0.7	8.5	14.6	17.7	17.4	13.6	7.2	-0.7	-8.5	-14.6	-17.7
2/23	-13.1	-7.7	-0.8	6.3	12.2	15.6	15.9	13.1	7.7	0.8	-6.3	-12.2	-15.6	-15.9
2/24	8.1	22.3	32.2	35.6	32.0	22.1	7.8	-8.1	-22.3	-32.2	-35.6	-32.0	-22.1	-7.8
2/25	46.8	41.1	27.2	7.9	-13.0	-31.2	-43.3	-46.8	-41.1	-27.2	-7.9	13.0	31.2	43.3
2/26	43.7	21.0	-5.8	-31.5	-51.0	-60.3	-57.7	-43.7	-21.0	5.8	31.5	51.0	60.3	57.7
2/27	-32.6	-33.8	-28.2	-17.1	-2.6	12.5	25.0	32.6	33.8	28.2	17.1	2.6	-12.5	-25.0
2/28	-51.4	-44.6	-28.9	-7.5	15.4	35.2	48.1	51.4	44.6	28.9	7.5	-15.4	-35.2	-48.1
3/1	-12.7	-12.8	-10.3	-5.7	-0.1	5.6	10.2	12.7	12.8	10.3	5.7	0.1	-5.6	-10.2
3/2	5.3	1.2	-3.2	-6.9	-9.2	-9.7	-8.3	-5.3	-1.2	3.2	6.9	9.2	9.7	8.3
3/3	-36.4	-37.1	-30.4	-17.7	-1.5	15.0	28.5	36.4	37.1	30.4	17.7	1.5	-15.0	-28.5
3/4	-19.2	2.2	23.1	39.4	48.0	47.0	36.8	19.2	-2.2	-23.1	-39.4	-48.0	-47.0	-36.8
3/5	36.8	58.8	69.2	65.9	49.5	23.4	-7.4	-36.8	-58.8	-69.2	-65.9	-49.5	-23.4	7.4
3/6	66.3	53.9	30.9	1.7	-27.8	-51.8	-65.5	-66.3	-53.9	-30.9	-1.7	27.8	51.8	65.5
3/7	31.9	-8.4	-47.1	-76.4	-90.6	-86.8	-65.9	-31.9	8.4	47.1	76.4	90.6	86.8	65.9
3/8	-33.4	-39.2	-37.2	-27.9	-13.0	4.5	21.0	33.4	39.2	37.2	27.9	13.0	-4.5	-21.0
3/9	-27.3	-10.3	8.7	26.1	38.2	42.8	38.9	27.3	10.3	-8.7	-26.1	-38.2	-42.8	-38.9
3/10	-2.6	-1.7	-0.5	0.7	1.9	2.6	2.9	2.6	1.7	0.5	-0.7	-1.9	-2.6	-2.9
3/11	0.2	-9.2	-16.8	-21.0	-21.1	-17.0	-9.5	-0.2	9.2	16.8	21.0	21.1	17.0	9.5
3/12	-12.3	-4.2	4.8	12.8	18.3	20.1	18.0	12.3	4.2	-4.8	-12.8	-18.3	-20.1	-18.0
3/13	-8.5	14.6	34.8	48.1	51.9	45.4	29.9	8.5	-14.6	-34.8	-48.1	-51.9	-45.4	-29.9
3/14	23.1	21.8	16.3	7.5	-2.8	-12.5	-19.7	-23.1	-21.8	-16.3	-7.5	2.8	12.5	19.7
3/15	39.7	22.0	0.0	-22.0	-39.6	-49.4	-49.4	-39.7	-22.0	0.0	22.0	39.6	49.4	49.4
3/16	11.8	-3.2	-17.5	-28.3	-33.5	-32.1	-24.4	-11.8	3.2	17.5	28.3	33.5	32.1	24.4
3/17	-34.1	-31.9	-23.3	-10.2	4.9	19.1	29.5	34.1	31.9	23.4	10.2	-4.9	-19.1	-29.5
3/18	-29.4	-16.3	0.1	16.4	29.5	36.7	36.7	29.4	16.3	-0.1	-16.4	-29.5	-36.7	-36.7
3/19	-19.6	-10.2	1.2	12.3	21.0	25.6	25.1	19.6	10.2	-1.2	-12.3	-21.0	-25.6	-25.1
3/20	-6.4	1.0	8.2	13.8	16.6	16.2	12.6	6.4	-1.0	-8.2	-13.8	-16.6	-16.2	-12.6
3/21	44.3	32.0	13.3	-8.0	-27.7	-41.9	-47.8	-44.3	-32.0	-13.3	8.0	27.7	41.9	47.8
3/22	26.0	10.3	-7.4	-23.6	-35.1	-39.7	-36.5	-26.0	-10.3	7.4	23.6	35.1	39.7	36.5
3/23	-15.1	-10.7	-4.2	3.2	9.9	14.7	16.5	15.1	10.7	4.2	-3.2	-9.9	-14.7	-16.5
3/24	9.1	19.4	25.8	27.1	23.0	14.4	2.9	-9.1	-19.4	-25.8	-27.1	-23.0	-14.4	-2.9
3/25	5.5	-4.9	-14.3	-20.9	-23.3	-21.2	-14.8	-5.5	4.9	14.3	20.9	23.3	21.2	14.8
3/26	-6.0	-10.0	-11.9	-11.5	-8.8	-4.4	0.9	6.0	10.0	11.9	11.5	8.8	4.4	-0.9
3/27	-48.8	-37.8	-19.4	2.8	24.5	41.4	50.0	48.8	37.9	19.4	-2.8	-24.5	-41.4	-50.0
3/28	-5.3	8.0	19.7	27.5	29.8	26.3	17.5	5.3	-8.0	-19.7	-27.5	-29.8	-26.3	-17.5
3/29	51.7	56.6	50.3	34.0	11.0	-14.2	-36.6	-51.7	-56.6	-50.3	-34.0	-11.0	14.2	36.6
3/30	53.0	36.9	13.5	-12.6	-36.2	-52.6	-58.6	-53.0	-36.9	-13.5	12.6	36.2	52.6	58.6
3/31	-2.2	-16.9	-28.2	-33.9	-32.9	-25.4	-12.9	2.2	16.9	28.2	33.9	32.9	25.4	12.9
4/1	-54.0	-45.6	-28.2	-5.2	18.8	39.1	51.7	54.0	45.6	28.2	5.2	-18.8	-39.1	-51.7
4/2	-2.6	14.4	28.6	37.1	38.3	31.9	19.2	2.6	-14.4	-28.6	-37.1	-38.3	-31.9	-19.2
4/3	14.0	5.5	-4.0	-12.8	-19.1	-21.5	-19.7	-14.0	-5.5	4.0	12.8	19.1	21.5	19.7
4/4	6.4	-18.1	-39.0	-52.2	-55.0	-47.0	-29.6	-6.4	18.1	39.0	52.2	55.0	47.0	29.6
4/5	-29.5	-22.2	-10.6	3.1	16.2	26.1	30.9	29.5	22.2	10.6	-3.1	-16.2	-26.1	-30.9
4/6	-13.4	9.5	30.6	45.6	51.5	47.3	33.7	13.4	-9.5	-30.6	-45.6	-51.5	-47.3	-33.7
4/7	15.0	21.7	24.1	21.8	15.1	5.5	-5.3	-15.0	-21.7	-24.1	-21.8	-15.1	-5.5	5.3
4/8	7.7	-7.3	-20.9	-30.3	-33.7	-30.5	-21.2	-7.7	7.3	20.9	30.3	33.7	30.5	21.2
4/9	-24.7	-29.5	-28.5	-21.8	-10.8	2.3	15.0	24.7	29.5	28.5	21.8	10.8	-2.3	-15.0
4/10	-24.3	-7.9	10.1	26.1	36.9	40.4	35.9	24.3	7.9	-10.1	-26.1	-36.9	-40.4	-35.9
4/11	9.6	19.2	25.1	26.0	21.7	13.2	2.0	-9.6	-19.2	-25.1	-26.0	-21.7	-13.2	-2.0
4/12	26.8	15.1	0.3	-14.5	-26.5	-33.2	-33.3	-26.9	-15.1	-0.3	14.5	26.5	33.2	33.3
4/13	39.3	19.9	-3.6	-26.3	-43.8	-52.6	-51.0	-39.3	-19.9	3.6	26.3	43.8	52.6	51.0
4/14	1.5	-13.4	-25.6	-32.7	-33.4	-27.4	-16.1	-1.5	13.4	25.6	32.7	33.4	27.4	16.1
4/15	-43.2	-38.4	-26.0	-8.4	10.8	27.9	39.5	43.2	38.4	26.0	8.4	-10.8	-27.9	-39.5
4/16	-25.0	-2.3	20.9	40.0	51.1	52.1	42.8	25.0	2.3	-20.9	-40.0	-51.1	-52.1	-42.8
4/17	23.6	31.1	32.4	27.3	16.8	3.0	-11.5	-23.6	-31.1	-32.4	-27.3	-16.8	-3.0	11.4
4/18	49.4	38.4	19.8	-2.8	-24.7	-41.8	-50.6	-49.4	-38.4	-19.8	2.7	24.7	41.8	50.6
4/19	2.9	-3.8	-9.7	-13.7	-15.0	-13.3	-9.0	-2.9	3.8	9.7	13.7	15.0	13.3	9.0
4/20	-52.2	-52.1	-41.6	-23.0	0.3	23.4	42.0	52.2	52.1	41.6	23.0	-0.3	-23.4	-42.0

4/21	-31.0	-31.9	-26.6	-15.9	-2.2	12.1	23.9	31.0	31.9	26.6	15.9	2.2	-12.1	-23.9
4/22	-16.8	2.3	20.9	35.4	42.9	41.8	32.5	16.8	-2.3	-20.9	-35.4	-42.9	-41.8	-32.5
4/23	29.4	36.3	36.1	28.6	15.6	-0.6	-16.6	-29.4	-36.3	-36.1	-28.7	-15.6	0.6	16.6
4/24	28.5	24.4	15.5	3.5	-9.1	-20.0	-26.9	-28.5	-24.4	-15.5	-3.5	9.1	20.0	26.9
4/25	3.3	0.3	-2.7	-5.2	-6.7	-6.8	-5.6	-3.3	-0.3	2.7	5.2	6.7	6.8	5.6
4/26	-3.9	-1.7	0.9	3.3	5.1	5.8	5.4	3.9	1.7	-0.9	-3.3	-5.1	-5.8	-5.4
4/27	-4.0	-22.8	-37.0	-43.9	-42.1	-32.0	-15.5	4.0	22.7	37.0	43.9	42.1	32.0	15.5
4/28	-11.8	-30.7	-43.5	-47.7	-42.5	-28.8	-9.4	11.8	30.7	43.5	47.7	42.5	28.8	9.4
4/29	-10.1	-1.6	7.3	14.8	19.3	20.0	16.7	10.1	1.6	-7.3	-14.8	-19.3	-20.0	-16.7
4/30	13.6	19.0	20.6	18.1	12.1	3.6	-5.6	-13.6	-19.0	-20.6	-18.1	-12.1	-3.6	5.6
5/1	-2.0	0.6	3.2	5.1	6.0	5.7	4.3	2.0	-0.6	-3.2	-5.1	-6.0	-5.7	-4.3
5/2	-9.4	2.3	13.5	22.1	26.3	25.3	19.3	9.4	-2.3	-13.5	-22.1	-26.3	-25.3	-19.3
5/3	34.9	44.0	44.3	35.9	20.3	0.8	-19.0	-34.9	-44.0	-44.3	-35.9	-20.3	-0.8	19.0
5/4	52.7	34.0	8.6	-18.4	-41.9	-57.0	-60.9	-52.7	-34.0	-8.7	18.4	41.9	57.0	60.9
5/5	3.0	-16.1	-31.9	-41.5	-42.8	-35.6	-21.4	-3.0	16.1	31.9	41.5	42.8	35.6	21.4
5/6	-61.0	-56.0	-40.0	-16.1	11.1	36.0	53.8	61.0	56.0	40.0	16.1	-11.0	-36.0	-53.8
5/7	-25.0	-13.8	0.2	14.1	25.2	31.3	31.2	25.0	13.8	-0.2	-14.1	-25.2	-31.3	-31.2
5/8	4.1	8.9	11.9	12.6	10.8	6.8	1.5	-4.1	-8.9	-11.9	-12.6	-10.8	-6.8	-1.5
5/9	16.3	19.8	19.3	15.1	7.8	-1.0	-9.6	-16.3	-19.8	-19.3	-15.1	-7.8	1.0	9.6
5/10	-4.1	-1.5	1.3	3.9	5.7	6.4	5.8	4.1	1.5	-1.3	-3.9	-5.7	-6.4	-5.8
5/11	19.4	21.8	19.9	14.0	5.3	-4.4	-13.2	-19.4	-21.8	-19.9	-14.0	-5.3	4.4	13.2
5/12	19.7	21.3	18.8	12.5	3.7	-5.8	-14.1	-19.7	-21.3	-18.8	-12.5	-3.7	5.8	14.1
5/13	8.5	-4.0	-15.7	-24.3	-28.1	-26.3	-19.3	-8.5	4.0	15.7	24.3	28.1	26.3	19.3
5/14	-9.1	-17.3	-22.0	-22.4	-18.4	-10.7	-0.9	9.1	17.3	22.0	22.4	18.4	10.7	0.9
5/15	-12.9	-8.1	-1.7	5.0	10.8	14.3	15.1	12.9	8.1	1.7	-5.0	-10.8	-14.3	-15.1
5/16	-14.2	-5.0	5.2	14.4	20.8	23.0	20.7	14.3	5.0	-5.2	-14.4	-20.8	-23.0	-20.7
5/17	-0.2	9.9	18.1	22.6	22.7	18.3	10.2	0.2	-9.9	-18.1	-22.6	-22.7	-18.3	-10.2
5/18	-10.8	-6.7	-1.2	4.5	9.4	12.3	12.9	10.8	6.7	1.2	-4.5	-9.4	-12.3	-12.9
5/19	-10.3	-26.2	-36.9	-40.2	-35.6	-24.0	-7.6	10.3	26.2	36.8	40.2	35.6	24.0	7.6
5/20	-45.1	-51.2	-47.1	-33.7	-13.6	9.1	30.1	45.1	51.2	47.1	33.7	13.6	-9.1	-30.1
5/21	-16.2	-9.8	-1.4	7.3	14.5	18.9	19.5	16.2	9.8	1.4	-7.3	-14.5	-18.9	-19.5
5/22	34.1	52.5	60.4	56.4	41.2	17.9	-9.0	-34.1	-52.5	-60.4	-56.4	-41.2	-17.9	9.0
5/23	40.6	36.3	24.9	8.5	-9.6	-25.7	-36.8	-40.6	-36.3	-24.9	-8.5	9.6	25.7	36.8
5/24	12.1	-4.8	-20.8	-32.6	-38.0	-35.9	-26.6	-12.1	4.8	20.8	32.6	38.0	35.9	26.6
5/25	-26.6	-31.9	-30.8	-23.6	-11.7	2.5	16.2	26.6	31.9	30.8	23.6	11.7	-2.5	-16.2
5/26	5.6	14.9	21.2	23.3	20.8	14.2	4.7	-5.6	-14.9	-21.2	-23.3	-20.8	-14.2	-4.7
5/27	23.5	32.3	34.6	30.1	19.7	5.3	-10.1	-23.5	-32.3	-34.6	-30.1	-19.7	-5.3	10.1
5/28	-17.4	-14.1	-7.9	-0.2	7.5	13.8	17.3	17.4	14.1	7.9	0.2	-7.5	-13.8	-17.3
5/29	-5.4	-8.5	-9.9	-9.4	-7.0	-3.2	1.2	5.4	8.5	9.9	9.4	7.0	3.2	-1.2
5/30	-6.0	-18.1	-26.5	-29.7	-27.1	-19.0	-7.2	6.0	18.1	26.5	29.7	27.1	19.0	7.2
5/31	-9.0	-21.5	-29.7	-32.0	-28.0	-18.4	-5.2	9.0	21.5	29.7	32.0	28.0	18.4	5.2
6/1	-4.7	0.7	6.0	10.1	12.2	11.9	9.2	4.7	-0.7	-6.0	-10.1	-12.2	-11.9	-9.2
6/2	10.9	27.6	38.9	42.4	37.6	25.3	8.0	-10.9	-27.6	-38.9	-42.4	-37.6	-25.3	-8.0
6/3	17.7	17.2	13.3	6.7	-1.2	-8.8	-14.7	-17.7	-17.2	-13.3	-6.7	1.2	8.8	14.7
6/4	13.1	2.6	-8.3	-17.6	-23.4	-24.6	-20.9	-13.1	-2.7	8.3	17.6	23.4	24.6	20.9
6/5	15.8	19.4	19.1	15.0	8.0	-0.6	-9.1	-15.8	-19.4	-19.1	-15.0	-8.0	0.6	9.1
6/6	19.9	24.4	24.2	19.1	10.2	-0.6	-11.4	-19.9	-24.4	-24.2	-19.1	-10.2	0.6	11.4
6/7	-0.7	-8.5	-14.6	-17.8	-17.5	-13.7	-7.2	0.7	8.5	14.6	17.8	17.5	13.7	7.2
6/8	-57.1	-60.7	-52.3	-33.5	-8.1	18.9	42.2	57.1	60.7	52.3	33.5	8.1	-18.9	-42.2
6/9	-25.9	-15.5	-2.0	11.9	23.5	30.4	31.2	25.9	15.5	2.0	-11.9	-23.5	-30.4	-31.3
6/10	17.0	28.5	34.4	33.5	25.9	13.2	-2.1	-17.0	-28.5	-34.4	-33.5	-25.9	-13.2	2.1
6/11	11.2	7.6	2.5	-3.1	-8.1	-11.4	-12.5	-11.2	-7.6	-2.5	3.1	8.1	11.4	12.5
6/12	2.5	-0.7	-3.8	-6.0	-7.1	-6.8	-5.1	-2.5	0.7	3.8	6.0	7.1	6.8	5.1
6/13	-3.6	-8.3	-11.3	-12.1	-10.5	-6.8	-1.7	3.6	8.3	11.3	12.1	10.5	6.8	1.7
6/14	15.8	9.2	0.9	-7.6	-14.6	-18.8	-19.2	-15.8	-9.2	-0.9	7.6	14.6	18.8	19.2
6/15	13.7	8.3	1.3	-6.0	-12.1	-15.8	-16.3	-13.7	-8.3	-1.3	6.0	12.1	15.8	16.3
6/16	-31.0	-23.2	-10.8	3.8	17.5	27.9	32.6	31.0	23.2	10.8	-3.8	-17.5	-27.9	-32.6
6/17	-17.0	-3.1	11.3	23.6	31.1	32.5	27.5	17.0	3.1	-11.3	-23.6	-31.1	-32.5	-27.5
6/18	38.1	31.6	18.8	2.3	-14.6	-28.7	-37.1	-38.1	-31.6	-18.8	-2.3	14.6	28.7	37.1
6/19	15.3	1.3	-12.9	-24.5	-31.3	-31.9	-26.2	-15.3	-1.3	12.9	24.5	31.3	31.9	26.2
6/20	-40.6	-34.0	-20.8	-3.4	14.7	29.8	39.1	40.6	34.0	20.8	3.4	-14.7	-29.8	-39.1
6/21	-4.1	3.2	9.8	14.5	16.4	14.9	10.6	4.1	-3.2	-9.8	-14.5	-16.4	-14.9	-10.6
6/22	-8.7	-19.1	-25.8	-27.4	-23.5	-15.0	-3.5	8.7	19.1	25.8	27.4	23.5	15.0	3.5
6/23	2.4	-10.0	-20.4	-26.8	-27.8	-23.4	-14.3	-2.4	10.0	20.4	26.8	27.8	23.4	14.3

6/24	5.2	12.4	17.1	18.5	16.1	10.6	3.0	-5.2	-12.4	-17.1	-18.5	-16.1	-10.6	-3.0
6/25	19.7	27.8	30.5	27.1	18.4	6.0	-7.6	-19.7	-27.8	-30.5	-27.1	-18.4	-6.0	7.6
6/26	27.1	26.5	20.6	10.6	-1.5	-13.3	-22.4	-27.1	-26.5	-20.6	-10.6	1.5	13.3	22.4
6/27	0.2	-9.6	-17.5	-22.0	-22.1	-17.9	-10.0	-0.2	9.6	17.5	22.0	22.1	17.9	10.0
6/28	-11.1	-21.6	-27.8	-28.5	-23.6	-14.0	-1.6	11.1	21.6	27.8	28.5	23.6	14.0	1.6
6/29	-12.2	-2.4	7.9	16.6	22.0	23.1	19.6	12.2	2.4	-7.9	-16.6	-22.0	-23.1	-19.6
6/30	-22.7	-4.2	15.1	31.4	41.5	43.4	36.7	22.7	4.2	-15.1	-31.4	-41.5	-43.4	-36.7
7/1	-14.2	-7.6	0.5	8.5	14.8	18.2	18.0	14.2	7.6	-0.5	-8.5	-14.8	-18.2	-18.0
7/2	23.1	22.0	16.5	7.8	-2.5	-12.3	-19.7	-23.1	-22.0	-16.5	-7.8	2.5	12.3	19.7
7/3	27.4	18.8	6.5	-7.1	-19.3	-27.7	-30.6	-27.4	-18.8	-6.5	7.1	19.3	27.7	30.6
7/4	18.4	3.9	-11.4	-24.4	-32.6	-34.3	-29.3	-18.4	-3.9	11.4	24.4	32.6	34.3	29.3
7/5	-12.4	-17.8	-19.7	-17.7	-12.2	-4.3	4.5	12.4	17.8	19.7	17.7	12.2	4.3	-4.5
7/6	-44.3	-38.5	-25.0	-6.6	13.1	30.2	41.3	44.3	38.5	25.0	6.7	-13.1	-30.2	-41.3
7/7	-0.4	11.2	20.5	25.8	25.9	21.0	11.8	0.4	-11.2	-20.5	-25.8	-25.9	-21.0	-11.8
7/8	28.8	27.4	20.5	9.6	-3.2	-15.4	-24.5	-28.8	-27.4	-20.5	-9.6	3.2	15.4	24.5
7/9	22.9	12.6	-0.2	-13.0	-23.2	-28.8	-28.7	-22.9	-12.6	0.2	13.0	23.2	28.8	28.7
7/10	-13.6	-12.3	-8.6	-3.1	3.0	8.4	12.3	13.6	12.3	8.6	3.1	-3.0	-8.4	-12.3
7/11	-18.1	-10.9	-1.5	8.1	16.2	21.0	21.7	18.1	10.9	1.5	-8.1	-16.2	-21.0	-21.7
7/12	29.6	41.2	44.6	39.2	26.0	7.7	-12.2	-29.6	-41.2	-44.6	-39.2	-26.0	-7.7	12.2
7/13	31.8	31.4	24.9	13.4	-0.8	-14.7	-25.8	-31.8	-31.4	-24.9	-13.4	0.7	14.7	25.8
7/14	-30.5	-41.6	-44.4	-38.5	-24.9	-6.4	13.3	30.5	41.6	44.4	38.5	24.9	6.4	-13.3
7/15	-79.3	-80.1	-64.9	-36.9	-1.6	34.0	62.9	79.3	80.1	64.9	36.9	1.6	-34.0	-62.9
7/16	-32.8	-22.8	-8.2	8.0	22.6	32.8	36.4	32.8	22.8	8.2	-8.0	-22.6	-32.8	-36.4
7/17	25.4	23.3	16.6	6.7	-4.6	-15.0	-22.4	-25.4	-23.3	-16.6	-6.7	4.6	15.0	22.4
7/18	31.4	37.5	36.2	27.7	13.7	-3.0	-19.1	-31.4	-37.5	-36.2	-27.7	-13.7	3.0	19.1
7/19	24.6	26.4	22.9	14.9	3.9	-7.8	-18.0	-24.6	-26.4	-22.9	-14.9	-4.0	7.8	18.0
7/20	20.0	4.7	-11.5	-25.4	-34.3	-36.4	-31.3	-20.0	-4.7	11.5	25.4	34.3	36.4	31.3
7/21	-66.7	-64.6	-49.6	-24.8	4.9	33.6	55.7	66.7	64.6	49.6	24.8	-4.9	-33.6	-55.7
7/22	-52.3	-24.7	7.9	38.8	62.1	73.1	69.6	52.3	24.7	-7.9	-38.8	-62.1	-73.1	-69.6
7/23	63.7	66.0	55.3	33.6	5.2	-24.2	-48.7	-63.7	-66.0	-55.3	-33.6	-5.2	24.2	48.7
7/24	64.6	35.5	-0.7	-36.7	-65.4	-81.2	-80.9	-64.6	-35.5	0.7	36.7	65.4	81.2	80.9
7/25	-24.9	-31.3	-31.4	-25.4	-14.3	-0.4	13.6	24.9	31.3	31.4	25.4	14.3	0.4	-13.6
7/26	-19.9	-3.9	12.9	27.2	36.0	37.8	32.0	19.9	3.9	-12.9	-27.2	-36.0	-37.8	-32.0
7/27	31.0	30.3	23.6	12.2	-1.6	-15.1	-25.6	-31.0	-30.3	-23.6	-12.2	1.6	15.1	25.6
7/28	23.2	8.6	-7.7	-22.4	-32.7	-36.6	-33.1	-23.2	-8.6	7.7	22.4	32.7	36.6	33.1
7/29	2.3	-4.6	-10.5	-14.4	-15.4	-13.4	-8.7	-2.3	4.6	10.5	14.4	15.4	13.4	8.7
7/30	-32.0	-35.7	-32.4	-22.7	-8.5	7.4	21.9	31.9	35.7	32.4	22.7	8.5	-7.4	-21.8
7/31	-28.6	-15.2	1.2	17.4	30.2	36.9	36.4	28.6	15.2	-1.2	-17.4	-30.1	-36.9	-36.4
8/1	24.6	29.1	27.9	21.1	10.2	-2.7	-15.2	-24.6	-29.1	-27.9	-21.1	-10.2	2.7	15.2
8/2	41.0	30.8	14.5	-4.7	-23.0	-36.7	-43.1	-41.0	-30.8	-14.5	4.7	23.0	36.7	43.1
8/3	-15.1	-30.7	-40.3	-41.8	-35.1	-21.5	-3.6	15.1	30.7	40.3	41.8	35.1	21.5	3.6
8/4	-60.2	-49.0	-28.2	-1.7	25.1	46.9	59.4	60.2	49.0	28.2	1.7	-25.0	-46.9	-59.4
8/5	-15.4	14.0	40.6	59.2	66.0	59.8	41.8	15.4	-14.0	-40.6	-59.2	-66.0	-59.8	-41.8
8/6	31.5	33.9	29.5	19.3	5.3	-9.8	-22.9	-31.5	-33.9	-29.5	-19.3	-5.3	9.8	22.9
8/7	13.7	-4.3	-21.4	-34.3	-40.4	-38.5	-28.9	-13.7	4.3	21.4	34.3	40.4	38.5	28.9
8/8	-19.1	-22.5	-21.4	-16.0	-7.5	2.5	12.0	19.1	22.5	21.4	16.0	7.5	-2.5	-12.0
8/9	8.3	17.7	23.5	24.7	21.0	13.1	2.7	-8.3	-17.7	-23.5	-24.7	-21.0	-13.1	-2.7
8/10	20.2	17.9	12.0	3.7	-5.3	-13.2	-18.6	-20.2	-17.9	-12.0	-3.7	5.3	13.2	18.6
8/11	0.6	-5.2	-10.0	-12.8	-13.1	-10.7	-6.3	-0.6	5.2	10.0	12.8	13.1	10.7	6.3
8/12	21.6	19.6	13.8	5.2	-4.5	-13.2	-19.3	-21.6	-19.6	-13.8	-5.2	4.5	13.2	19.3
8/13	-15.9	-19.1	-18.6	-14.3	-7.2	1.3	9.6	15.9	19.1	18.6	14.3	7.2	-1.3	-9.6
8/14	-45.6	-42.5	-31.0	-13.4	6.9	25.9	39.7	45.6	42.6	31.0	13.4	-6.9	-25.9	-39.7
8/15	15.0	33.8	45.8	48.8	42.1	27.1	6.7	-15.0	-33.7	-45.8	-48.8	-42.1	-27.1	-6.7
8/16	23.7	21.9	15.7	6.4	-4.1	-13.8	-20.8	-23.7	-21.9	-15.7	-6.4	4.1	13.8	20.8
8/17	-24.1	-42.3	-52.1	-51.6	-40.9	-22.1	1.1	24.1	42.3	52.1	51.6	40.9	22.1	-1.1
8/18	-49.5	-42.8	-27.6	-7.0	15.0	34.1	46.3	49.5	42.8	27.6	7.0	-15.0	-34.1	-46.3
8/19	15.5	25.4	30.3	29.2	22.3	10.9	-2.6	-15.5	-25.4	-30.3	-29.2	-22.3	-10.9	2.6
8/20	59.7	45.9	22.9	-4.5	-31.1	-51.6	-61.8	-59.7	-45.9	-22.9	4.5	31.1	51.6	61.8
8/21	27.3	11.5	-6.6	-23.5	-35.6	-40.7	-37.8	-27.3	-11.5	6.6	23.5	35.6	40.7	37.8
8/22	-41.2	-39.6	-30.1	-14.7	3.6	21.3	34.7	41.2	39.6	30.1	14.7	-3.6	-21.3	-34.7
8/23	-39.6	-18.1	6.9	30.6	48.3	56.3	53.3	39.6	18.1	-6.9	-30.6	-48.3	-56.3	-53.3
8/24	28.5	37.5	39.1	33.0	20.3	3.6	-13.8	-28.5	-37.5	-39.1	-33.0	-20.3	-3.6	13.8
8/25	46.5	28.3	4.4	-20.3	-41.0	-53.6	-55.6	-46.5	-28.3	-4.4	20.3	41.0	53.6	55.6
8/26	-4.2	-20.2	-32.3	-37.9	-36.1	-27.1	-12.7	4.2	20.2	32.3	37.9	36.1	27.1	12.7

Date													
8/27	-44.1	-29.1	-8.3	14.1	33.7	46.7	50.4	44.1	29.1	8.3	-14.1	-33.7	-46.7	-50.4
8/28	-15.7	-0.5	14.8	27.1	34.1	34.3	27.8	15.7	0.5	-14.8	-27.1	-34.1	-34.3	-27.8
8/29	-3.5	-4.0	-3.7	-2.6	-1.1	0.7	2.3	3.5	4.0	3.7	2.6	1.1	-0.7	-2.3
8/30	-1.2	3.1	6.8	9.2	9.8	8.4	5.3	1.2	-3.1	-6.8	-9.2	-9.8	-8.4	-5.3
8/31	25.1	31.0	30.8	24.5	13.3	-0.5	-14.2	-25.1	-31.0	-30.8	-24.5	-13.4	0.5	14.2
9/1	13.8	9.8	4.0	-2.7	-8.8	-13.2	-14.9	-13.8	-9.8	-4.0	2.7	8.8	13.2	14.9
9/2	-0.3	-7.6	-13.4	-16.6	-16.5	-13.1	-7.1	0.3	7.6	13.4	16.6	16.5	13.1	7.1
9/3	27.6	13.0	-4.2	-20.5	-32.8	-38.6	-36.7	-27.6	-13.0	4.2	20.5	32.8	38.6	36.7
9/4	1.3	-8.0	-15.8	-20.4	-21.0	-17.4	-10.4	-1.4	8.0	15.8	20.4	21.0	17.4	10.4
9/5	-11.4	-10.0	-6.6	-1.9	3.1	7.6	10.5	11.4	10.0	6.6	1.9	-3.1	-7.6	-10.5
9/6	-14.3	-11.9	-7.1	-0.9	5.5	10.7	13.9	14.3	11.9	7.1	0.9	-5.5	-10.7	-13.9
9/7	-25.9	-17.8	-6.3	6.6	18.1	26.0	28.8	25.9	17.8	6.3	-6.6	-18.1	-26.0	-28.8
9/8	10.6	26.7	37.5	40.9	36.2	24.3	7.6	-10.6	-26.7	-37.5	-40.9	-36.2	-24.3	-7.6
9/9	3.6	9.9	14.2	15.8	14.2	9.8	3.4	-3.6	-9.9	-14.2	-15.8	-14.2	-9.8	-3.4
9/10	-8.6	-24.8	-36.0	-40.2	-36.4	-25.3	-9.3	8.6	24.8	36.0	40.2	36.4	25.3	9.3
9/11	5.5	-4.5	-13.6	-20.0	-22.4	-20.4	-14.4	-5.5	4.5	13.6	20.0	22.4	20.4	14.4
9/12	3.8	5.0	5.2	4.4	2.7	0.5	-1.8	-3.8	-5.0	-5.2	-4.4	-2.7	-0.5	1.8
9/13	4.3	-0.9	-6.0	-9.9	-11.8	-11.4	-8.7	-4.3	0.9	6.0	9.9	11.8	11.4	8.7
9/14	-1.4	-7.4	-11.9	-14.0	-13.4	-10.1	-4.8	1.4	7.4	11.9	14.0	13.4	10.1	4.8
9/15	-11.5	-3.2	5.7	13.5	18.6	20.0	17.5	11.5	3.2	-5.7	-13.5	-18.6	-20.0	-17.5
9/16	-5.3	8.9	21.4	29.6	32.0	28.0	18.5	5.3	-8.9	-21.4	-29.6	-32.0	-28.0	-18.5
9/17	-0.2	8.5	15.5	19.5	19.6	15.8	8.9	0.2	-8.5	-15.5	-19.5	-19.6	-15.8	-8.9
9/18	11.3	4.8	-2.5	-9.4	-14.4	-16.6	-15.4	-11.3	-4.8	2.5	9.4	14.4	16.6	15.4
9/19	21.8	14.5	4.3	-6.7	-16.5	-22.9	-24.8	-21.8	-14.5	-4.3	6.7	16.4	22.9	24.8
9/20	-11.8	-17.3	-19.4	-17.6	-12.4	-4.7	3.9	11.8	17.3	19.4	17.6	12.4	4.7	-3.9
9/21	-28.4	-21.4	-10.2	3.0	15.6	25.1	29.7	28.4	21.4	10.2	-3.0	-15.6	-25.1	-29.7
9/22	24.2	32.5	34.3	29.3	18.5	4.1	-11.2	-24.2	-32.5	-34.3	-29.3	-18.5	-4.1	11.2
9/23	20.6	11.1	-0.6	-12.2	-21.4	-26.3	-26.1	-20.6	-11.1	0.6	12.2	21.4	26.3	26.1
9/24	-36.6	-41.7	-38.6	-27.9	-11.6	7.0	24.2	36.6	41.7	38.6	27.9	11.6	-7.0	-24.2
9/25	-11.6	0.4	12.4	21.8	27.0	26.8	21.3	11.6	-0.4	-12.4	-21.8	-27.0	-26.8	-21.3
9/26	55.7	54.9	43.1	22.9	-1.9	-26.3	-45.5	-55.7	-54.9	-43.2	-22.9	1.9	26.3	45.5
9/27	52.3	48.0	34.1	13.5	-9.7	-31.1	-46.3	-52.3	-48.0	-34.1	-13.5	9.7	31.1	46.3
9/28	-18.8	-29.1	-33.7	-31.6	-23.2	-10.3	4.7	18.8	29.1	33.7	31.6	23.2	10.3	-4.7
9/29	-49.3	-61.4	-61.4	-49.2	-27.3	0.1	27.4	49.3	61.4	61.4	49.2	27.3	0.0	-27.4
9/30	-22.3	-24.1	-21.1	-14.0	-4.0	6.7	16.1	22.3	24.1	21.1	14.0	4.0	-6.7	-16.1
10/1	1.6	9.0	14.7	17.4	16.7	12.7	6.2	-1.6	-9.0	-14.7	-17.4	-16.7	-12.7	-6.2
10/2	-16.5	-8.0	2.0	11.7	19.0	22.6	21.7	16.5	8.0	-2.0	-11.7	-19.0	-22.6	-21.7
10/3	9.1	15.7	19.1	18.8	14.7	7.7	-0.8	-9.1	-15.7	-19.1	-18.8	-14.7	-7.7	0.8
10/4	11.9	15.2	15.6	12.8	7.5	0.7	-6.2	-11.9	-15.2	-15.6	-12.8	-7.5	-0.7	6.2
10/5	-18.5	-7.3	5.3	16.9	25.2	28.4	26.0	18.5	7.3	-5.3	-16.9	-25.2	-28.4	-26.0
10/6	-21.1	-17.3	-10.1	-0.8	8.6	16.3	20.8	21.1	17.3	10.1	0.8	-8.6	-16.3	-20.8
10/7	28.4	18.3	4.6	-10.0	-22.7	-30.8	-32.9	-28.4	-18.3	-4.6	10.0	22.7	30.8	32.9
10/8	29.8	11.1	-9.8	-28.7	-42.0	-46.9	-42.6	-29.8	-11.1	9.8	28.7	42.0	46.9	42.6
10/9	-6.0	-13.3	-18.0	-19.1	-16.4	-10.5	-2.5	6.0	13.3	18.0	19.1	16.4	10.5	2.5
10/10	-21.0	-6.3	9.6	23.6	32.9	35.7	31.5	21.0	6.3	-9.6	-23.6	-32.9	-35.7	-31.5
10/11	12.3	17.6	19.4	17.4	11.9	4.1	-4.6	-12.3	-17.6	-19.4	-17.4	-11.9	-4.1	4.6
10/12	3.3	5.0	5.7	5.3	3.9	1.6	-0.9	-3.3	-5.0	-5.7	-5.3	-3.9	-1.6	0.9
10/13	-5.9	6.1	16.9	24.3	26.9	24.2	16.7	5.9	-6.1	-16.9	-24.3	-26.9	-24.2	-16.7
10/14	15.5	11.9	5.9	-1.2	-8.1	-13.4	-16.0	-15.5	-11.9	-5.9	1.2	8.1	13.4	16.0
10/15	49.1	40.0	23.1	1.5	-20.3	-38.1	-48.4	-49.1	-40.1	-23.1	-1.6	20.3	38.1	48.4
10/16	9.1	-5.3	-18.7	-28.4	-32.4	-30.0	-21.7	-9.1	5.3	18.7	28.4	32.4	30.0	21.7
10/17	-44.7	-46.8	-39.5	-24.5	-4.6	16.2	33.8	44.7	46.8	39.6	24.5	4.6	-16.2	-33.8
10/18	-31.7	-24.6	-12.6	1.9	16.1	27.0	32.6	31.7	24.6	12.6	-1.9	-16.1	-27.0	-32.6
10/19	-13.8	-13.0	-9.7	-4.4	1.7	7.5	11.8	13.8	13.0	9.7	4.4	-1.7	-7.5	-11.8
10/20	14.5	9.2	2.2	-5.3	-11.7	-15.9	-16.8	-14.5	-9.2	-2.2	5.3	11.7	15.9	16.8
10/21	-10.8	-7.3	-2.3	3.1	7.9	11.1	12.2	10.8	7.3	2.3	-3.1	-7.9	-11.1	-12.2
10/22	-28.7	-15.2	1.4	17.6	30.4	37.2	36.6	28.7	15.2	-1.4	-17.6	-30.4	-37.2	-36.6
10/23	2.8	16.3	26.5	31.6	30.3	23.1	11.3	-2.8	-16.3	-26.5	-31.6	-30.3	-23.1	-11.3
10/24	40.8	32.3	17.5	-0.8	-19.0	-33.4	-41.2	-40.8	-32.3	-17.5	0.8	19.0	33.4	41.2
10/25	32.1	21.5	6.8	-9.4	-23.6	-33.2	-36.2	-32.1	-21.6	-6.8	9.4	23.6	33.2	36.2
10/26	-0.1	-4.1	-7.3	-9.1	-9.0	-7.2	-3.9	0.1	4.1	7.3	9.1	9.0	7.2	3.9
10/27	-34.6	-24.1	-8.7	8.4	23.8	34.5	38.4	34.6	24.1	8.7	-8.4	-23.8	-34.5	-38.4
10/28	4.1	-6.6	-16.1	-22.4	-24.2	-21.3	-14.1	-4.1	6.6	16.1	22.4	24.2	21.3	14.1
10/29	-11.2	-23.9	-31.9	-33.6	-28.6	-18.0	-3.8	11.2	23.9	31.9	33.6	28.6	18.0	3.8

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10/30	-17.4	0.0	17.3	31.3	39.0	39.0	31.3	17.4	0.0	-17.3	-31.2	-39.0	-39.0	-31.3
10/31	23.5	40.6	49.7	48.9	38.5	20.4	-1.7	-23.5	-40.6	-49.7	-48.9	-38.5	-20.4	1.7
11/1	11.0	8.3	4.0	-1.2	-6.0	-9.7	-11.5	-11.0	-8.3	-4.0	1.2	6.0	9.7	11.5
11/2	2.8	-17.7	-34.7	-44.8	-46.0	-38.2	-22.8	-2.8	17.7	34.7	44.8	46.1	38.2	22.8
11/3	-15.4	-27.1	-33.4	-33.1	-26.2	-14.2	0.7	15.4	27.1	33.4	33.1	26.2	14.2	-0.7
11/4	-37.5	-23.2	-4.3	15.4	32.1	42.4	44.4	37.5	23.2	4.3	-15.4	-32.1	-42.4	-44.4
11/5	-16.5	-5.5	6.6	17.3	24.7	27.1	24.2	16.5	5.5	-6.6	-17.3	-24.7	-27.1	-24.2
11/6	28.2	34.1	33.3	25.9	13.3	-1.9	-16.7	-28.2	-34.1	-33.3	-25.9	-13.3	1.9	16.7
11/7	45.2	26.6	2.8	-21.6	-41.7	-53.6	-54.8	-45.2	-26.6	-2.8	21.6	41.7	53.6	54.8
11/8	28.0	2.1	-24.1	-45.6	-58.1	-59.0	-48.3	-28.0	-2.1	24.1	45.6	58.1	59.0	48.3
11/9	-33.0	-25.1	-12.2	3.1	17.8	28.9	34.4	33.0	25.1	12.2	-3.1	-17.8	-28.9	-34.4
11/10	-16.1	0.2	16.5	29.5	36.7	36.6	29.2	16.1	-0.2	-16.5	-29.5	-36.7	-36.6	-29.2
11/11	8.3	24.1	35.1	39.1	35.4	24.7	9.1	-8.3	-24.1	-35.1	-39.1	-35.4	-24.7	-9.1
11/12	12.5	14.6	13.7	10.2	4.6	-1.9	-8.0	-12.5	-14.6	-13.7	-10.2	-4.6	1.9	8.0
11/13	3.4	-0.5	-4.2	-7.1	-8.6	-8.4	-6.5	-3.4	0.5	4.2	7.1	8.6	8.4	6.5
11/14	7.3	6.0	3.5	0.3	-2.9	-5.6	-7.1	-7.3	-6.0	-3.5	-0.3	2.9	5.6	7.1
11/15	29.1	17.6	2.6	-12.9	-25.8	-33.7	-34.9	-29.1	-17.6	-2.6	12.9	25.8	33.7	34.9
11/16	27.3	18.9	6.7	-6.8	-18.9	-27.3	-30.3	-27.3	-18.9	-6.7	6.8	18.9	27.3	30.3
11/17	-32.2	-26.5	-15.6	-1.5	12.8	24.6	31.6	32.3	26.5	15.6	1.5	-12.8	-24.6	-31.6
11/18	-39.4	-25.9	-7.3	12.7	30.3	41.8	45.1	39.4	25.9	7.3	-12.7	-30.3	-41.8	-45.1
11/19	-8.8	-6.4	-2.8	1.4	5.4	8.2	9.4	8.8	6.4	2.8	-1.4	-5.4	-8.2	-9.4
11/20	6.9	-9.9	-24.8	-34.8	-37.9	-33.5	-22.4	-6.9	9.9	24.8	34.8	37.9	33.5	22.4
11/21	-32.6	-40.4	-40.1	-31.9	-17.4	0.5	18.4	32.6	40.4	40.1	32.0	17.4	-0.5	-18.4
11/22	-39.2	-28.5	-12.1	6.6	24.1	36.8	42.2	39.2	28.5	12.2	-6.6	-24.1	-36.8	-42.2
11/23	-5.2	13.9	30.3	40.6	42.9	36.7	23.3	5.2	-13.9	-30.3	-40.6	-42.9	-36.7	-23.3
11/24	69.2	75.3	66.5	44.6	13.8	-19.7	-49.4	-69.2	-75.3	-66.5	-44.6	-13.8	19.7	49.4
11/25	24.7	-4.2	-32.3	-54.0	-65.0	-63.1	-48.8	-24.8	4.2	32.3	54.0	65.0	63.1	48.8
11/26	-56.1	-60.2	-52.5	-34.4	-9.4	17.4	40.8	56.1	60.2	52.5	34.4	9.4	-17.4	-40.8
11/27	-46.5	-21.7	7.3	35.0	55.7	65.3	62.1	46.5	21.7	-7.3	-35.0	-55.7	-65.3	-62.1
11/28	14.1	30.2	40.3	42.4	36.2	22.8	4.8	-14.1	-30.2	-40.3	-42.4	-36.2	-22.8	-4.8
11/29	57.5	42.6	19.4	-7.8	-33.3	-52.3	-60.9	-57.5	-42.6	-19.4	7.8	33.3	52.3	60.9
11/30	20.1	-4.9	-29.0	-47.3	-56.3	-54.1	-41.2	-20.1	4.9	29.0	47.3	56.3	54.1	41.2
12/1	2.5	-2.3	-6.7	-9.8	-10.9	-9.9	-6.9	-2.5	2.3	6.7	9.8	10.9	9.9	6.9
12/2	16.6	31.6	40.3	41.1	33.7	19.6	1.7	-16.6	-31.6	-40.3	-41.1	-33.7	-19.6	-1.7
12/3	39.8	42.6	36.9	23.9	6.1	-12.8	-29.2	-39.8	-42.6	-36.9	-23.9	-6.1	12.8	29.2
12/4	13.9	-2.3	-18.0	-30.2	-36.4	-35.4	-27.4	-13.9	2.3	18.0	30.2	36.4	35.4	27.4
12/5	-46.0	-35.9	-18.7	2.2	22.6	38.6	46.9	46.0	35.9	18.7	-2.2	-22.6	-38.6	-46.9
12/6	-52.9	-45.8	-29.6	-7.5	16.0	36.4	49.6	52.9	45.8	29.6	7.5	-16.0	-36.4	-49.6
12/7	-28.7	-29.7	-24.8	-15.0	-2.2	11.0	22.0	28.7	29.7	24.8	15.0	2.2	-11.0	-22.0
12/8	3.0	2.7	1.8	0.6	-0.7	-1.9	-2.8	-3.0	-2.7	-1.8	-0.6	0.7	1.9	2.8
12/9	28.9	19.5	6.3	-8.2	-21.1	-29.8	-32.6	-28.9	-19.5	-6.3	8.2	21.1	29.8	32.6
12/10	-0.1	3.7	6.7	8.4	8.5	6.8	3.8	0.1	-3.7	-6.7	-8.4	-8.5	-6.8	-3.8
12/11	-8.7	-1.4	6.2	12.6	16.5	17.1	14.4	8.7	1.4	-6.2	-12.6	-16.5	-17.1	-14.4
12/12	36.8	36.1	28.3	14.9	-1.4	-17.5	-30.1	-36.8	-36.1	-28.3	-14.9	1.4	17.5	30.1
12/13	12.7	9.1	3.6	-2.5	-8.2	-12.2	-13.8	-12.7	-9.1	-3.6	2.5	8.2	12.2	13.8
12/14	-33.5	-38.4	-35.6	-25.8	-10.9	6.2	22.0	33.5	38.4	35.6	25.8	10.9	-6.2	-22.0
12/15	-30.4	-19.7	-5.1	10.5	24.0	32.8	35.1	30.4	19.7	5.1	-10.5	-24.0	-32.8	-35.1
12/16	23.2	22.3	17.0	8.3	-2.0	-12.0	-19.5	-23.2	-22.3	-17.0	-8.3	2.0	12.0	19.5
12/17	21.3	15.7	6.9	-3.1	-12.6	-19.6	-22.7	-21.3	-15.7	-7.0	3.1	12.6	19.6	22.7
12/18	-23.9	-36.0	-41.0	-37.8	-27.2	-11.2	7.1	23.9	36.0	41.0	37.8	27.2	11.2	-7.1
12/19	-24.6	-30.9	-31.1	-25.2	-14.3	-0.5	13.4	24.6	30.9	31.1	25.2	14.3	0.5	-13.4
12/20	4.7	6.5	7.1	6.2	4.1	1.2	-1.9	-4.7	-6.5	-7.1	-6.2	-4.1	-1.2	1.9
12/21	5.0	7.0	7.6	6.8	4.5	1.4	-2.0	-5.0	-7.0	-7.6	-6.8	-4.5	-1.4	2.0
12/22	13.5	25.0	31.5	31.7	25.7	14.6	0.6	-13.5	-25.0	-31.5	-31.7	-25.7	-14.6	-0.6
12/23	16.0	26.9	32.5	31.6	24.4	12.5	-2.0	-16.0	-26.9	-32.5	-31.6	-24.4	-12.5	2.0
12/24	32.9	34.2	28.7	17.5	2.9	-12.4	-25.1	-32.9	-34.2	-28.7	-17.5	-2.9	12.4	25.1
12/25	-31.3	-39.3	-39.6	-32.1	-18.2	-0.7	17.0	31.2	39.3	39.6	32.1	18.2	0.7	-17.0
12/26	-64.4	-42.9	-12.8	19.7	48.4	67.5	73.2	64.4	42.9	12.8	-19.7	-48.4	-67.5	-73.2
12/27	37.2	55.7	63.0	57.9	41.4	16.6	-11.4	-37.2	-55.7	-63.0	-57.9	-41.4	-16.6	11.4
12/28	97.4	74.0	35.9	-9.2	-52.5	-85.5	-101.5	-97.4	-74.0	-36.0	9.2	52.5	85.5	101.5
12/29	-6.1	-47.1	-78.7	-94.8	-92.0	-71.1	-36.1	6.1	47.1	78.7	94.8	92.0	71.1	36.1
12/30														
12/31														

1996 Time Filtered Broadband Pressure Data
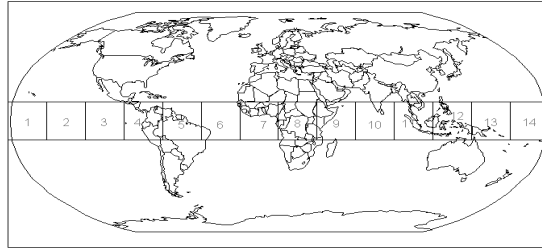
This is 1996 worldwide time filtered broad band pressure data. Lat -15 to 15, Long: 25.7 blocks around the world
5 day running average is subtracted from Raw surface Pressure
and color coded for Positive (Black Lettering) and Negative (White Lettering)

Units for colored numbers are Pascals

Day (0 UT)	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1/1														
1/2														
1/3	-55.6	-63.2	-28.2	0	20	17	36.2	37.4	50.8	65.8	88.8	63.2	0.6	-77
1/4	-50.2	-44	32.2	62.4	45.2	58.6	46.6	8.6	-64	-58.6	-37.4	-76.4	-106.2	-89.6
1/5	-19.8	19.4	50.2	77.8	50.6	0.6	-58.4	-90	-99.4	-83	-93.2	-81.4	-78.4	-52
1/6	35	57.6	22.8	-40.6	-30.4	-90.8	-86	-22.6	-9.8	-51.2	-30.4	-8.4	15.6	39
1/7	32.6	48.2	-24.4	-109	-76.2	-66.2	-37.8	4.6	30.4	0	50.2	45	34.4	33.8
1/8	-9.2	-13.4	-5.6	34	2.2	52	56.4	33.2	47.6	69.4	25.4	19.6	-21.8	-12.6
1/9	-13.8	-24.6	17.8	109.8	81.4	111.4	92.4	76	63.8	88.4	12.8	-14.8	-21.2	-2.4
1/10	7.8	-7	-5.8	24.2	50	32.4	52.2	68.4	41	27.4	-11	-14.4	12.2	23
1/11	10.8	5.8	-17.8	-71.8	-12.6	-50.2	-25.4	-35	-69.4	-85.6	-54.8	-8.4	38.2	24.8
1/12	-14.4	-7	-10.8	-52.6	-53.4	-23.2	-62.6	-95	-110.6	-75.4	22	43.8	11.2	-14
1/13	-48.8	13.6	26.6	19.8	-63.6	-43.2	-11	-15.6	44.6	39.2	35	5.8	-9.2	-52.4
1/14	-43.2	-58	-37.6	19	28.8	42	42.6	31.6	39.8	-10.8	-54.2	-50.6	-7.8	-14.2
1/15	46.2	48.8	11.6	48.2	114.4	58.2	-27.6	-34.2	-57.2	-57.4	-33.4	7	10.8	-3.6
1/16	142.2	58	20.2	9	-10.8	-30.8	-36.8	35.8	-30.6	0	14.6	27.8	8.4	77.6
1/17	60.2	-17.8	-28.2	-88.6	-92.4	-27.2	8.8	-2.6	32	48.2	36	40.6	63	100.2
1/18	-112	-68.8	-30	-39.6	-35	-20.6	21.6	-47.8	-4	38.2	50	24.4	-7	-19
1/19	-71.6	3.4	31.2	56.2	22.6	7	60.4	86.2	64.8	19.2	2.8	-76	-102.8	-103
1/20	-3.6	41.8	69.2	23.6	2.4	14.6	-30	-2.4	-16	-23.8	-60.2	-66.8	-26.2	-35.8
1/21	-25.2	12.2	5.4	44	69.6	22.8	-77.8	-77.4	-29.8	-43	-25.6	-1.6	41.8	-5.6
1/22	48.2	0.6	-22	37.8	-6	-72.6	-33.8	-19.6	-16	-6.4	35.8	54.4	33.4	24.8
1/23	108.8	23.2	-55	-112	-93.8	-88.6	10	2.4	-14.8	52.8	53	49.4	25	66.2
1/24	-34.2	-23.4	1.8	-43	-23.8	84	82.6	37.6	12	37	2.4	3	-7	3
1/25	-132	-79.4	15.8	58.8	84.2	132.2	80.8	46.2	66.8	6.8	-34	-58	-81.2	-96.2
1/26	-29	11.6	-17.4	5.2	65.4	19.8	-20.8	46	33	-57	-60.6	-59.6	-56	-55.8
1/27	50.8	27.4	5.8	38.4	-33.8	-87.6	-90.4	-48.2	-54.4	-16	-7.2	45.6	59	77.8
1/28	78	24	41.6	5.8	-71	-78.4	-30.6	-43.6	-30	7.4	47.6	61.2	69	67.6
1/29	19.2	13	-14.2	-52	-41.8	-31.4	36.6	40.8	55.6	33.4	36	-17.2	-1	-3
1/30	-64	-49.8	-29.4	-3.2	18.6	41.8	22.6	-28.6	-7.6	13.8	-18.4	-44.4	-10.4	-61.8
1/31	-54.4	-62.2	-41	-28.6	14	7.4	-41.6	-40.8	-29.4	-5.4	-13.8	37.8	11.6	-20
2/1	31	34.8	-1.6	-29.6	-15.8	9.2	-11	29	12.2	-27.6	-9.4	15.6	-34.2	22.4
2/2	-11.8	13.8	-5.6	7.4	46.8	28.8	34	4	-17.4	-9	-2.2	-38.6	-34.6	-24.8
2/3	-3.2	-35	-12.2	-8.2	43.6	9.2	32.8	20	-11.4	-9.2	-4.6	-40	-14.8	-3.2
2/4	-6.8	3	27.4	40.4	8.8	18.4	-24	5	32.4	0.2	-7.2	-25	-11.2	-15.4
2/5	-0.6	65.2	124.2	111.8	7.8	-26.4	-52.2	-39	-39.8	-59.4	-17.2	12.4	-18.4	-23.6
2/6	79.4	81.2	61.8	11	-21.4	-28.2	7.2	-2.4	-72	-27.2	-9.8	36	45.8	62.4
2/7	22.4	-19	-107.8	-65.2	-65.8	21.4	47.4	-3.8	-1.2	44.6	23	-10.2	33.2	24
2/8	-20.2	-37.6	-73	-73	-20.4	16	-6	-9	65.2	39.6	34.6	-1	6.6	2.6
2/9	-5.4	10.2	42.8	51	28.4	-37.2	-36.4	21.4	46.4	-7.6	-35	45	6	4
2/10	-14.8	-5.4	43.2	47.4	8	-24.6	0.6	17.4	-2	40.4	23.2	49	10.8	11.4
2/11	16	-39.4	-25.8	-35	-8.4	11.8	51.6	19.6	12.6	47.8	69.4	6.6	6.8	52.4

2/12	26.4	3.2	-56.4	-41	14.6	54.8	71.6	38.2	-3.8	-4.8	2.8	-1.6	36.4	13.2
2/13	15.8	40.2	58.6	41	42.6	10.6	-49.6	-41.2	-4	-7.6	-42.4	-31.6	19	4
2/14	-30.2	-35	-24	1.8	-9	-27.6	-76	-68.2	34	28.8	-12.6	-16.6	-46.4	-47.2
2/15	-101	-45.8	-50.4	-46.8	-23.4	7.4	45.2	50.2	46.4	-28	-2	-14.2	-89.8	-135.2
2/16	-14.2	23.8	73	46.4	62.4	51	25.4	48.6	-65.4	-85.8	-77.2	-114.8	-76.4	-37.8
2/17	74	48.4	56.2	63.4	6.8	-34.6	-68.4	-115.2	-154	-60.6	-45.4	-12.6	62.2	108.8
2/18	38.2	3.2	-57.4	-82.4	-73.6	-57	-7	-29	-22.4	20.6	65.4	70	81.2	80
2/19	-63.4	-41.6	-90.6	-75.8	-24.4	24.2	44.2	121.4	137.4	64.8	23.4	32.2	19	-24.2
2/20	1.8	-50.8	30	77.6	62.4	35.4	-10.8	7	42.8	13.8	-21.2	-5	-7.4	-37.4
2/21	45	89	76.2	56.2	7.2	-45	-25	-33.8	6.4	-25.8	-19.6	31.6	-12	-37.4
2/22	36.8	61.4	34.6	-33.4	-57	-27	41.6	-0.6	-76.6	-35.2	22.6	36	18.6	40.4
2/23	-3.4	-50.4	-52.4	-47.6	-78.6	4.8	-9.6	-11.2	-77.4	-16.4	51	-3.4	-1.4	43.6
2/24	-94.2	-109.6	-71.8	-3.4	47.6	39.2	-6.4	41.4	112.4	56	6.6	-19	-31.6	-78
2/25	-52.4	-1.2	10.4	20.8	72.2	19.8	28	51.2	104.4	41.6	-54	-15.8	-19.6	-57.8
2/26	53.6	63.6	21.4	11	38.2	29.2	41.4	-23	-49.6	3	4.8	2	4.2	27.6
2/27	87.6	43.2	4.6	-12.6	-7	11.8	-22.4	-72.8	-88.6	-37.2	29.6	21.2	4.4	64.4
2/28	43	-20	-8.8	-12.8	-48.8	-49.2	-61.6	-69.8	-42	-38.4	18.2	-1.2	15.6	58.4
2/29	-53	-12.4	51.6	19.8	-44.2	-55	-51.4	27.2	24.6	16	7.6	25.4	10.4	7.6
3/1	-41.2	44.6	27.2	-9.2	-27	-11.8	52.4	87.2	78.4	57.4	11.8	-1.2	7.2	-31.6
3/2	4	12.4	-41.2	-35.8	17.8	47.8	54	-0.2	23.4	-12	-54.4	-86.6	-29.6	-38.8
3/3	-41.2	-136	-82.2	10.4	61.8	51	-26.4	-44.4	-89.8	-59	-19	1.8	13.6	5
3/4	-36.4	-16.6	6	50.2	23	-55.6	-70.8	-12.4	20.4	29.8	38.6	48.6	4.6	-16.6
3/5	-4.4	72.6	65.8	31	-1	-27.8	50.2	42	31.8	35	20	-18.4	-56.6	-39.6
3/6	41	13.4	12.6	-58.4	-45.2	38.2	84.4	16.6	-25.8	-45.2	-29.2	-26.8	-8.6	0.6
3/7	32.8	-36	-65.8	-71.4	-44.6	-35.6	-78.8	-48.8	-57.2	-23.8	-27.4	13.6	51	61.6
3/8	5	-30	-58.8	-50.4	-48.4	-65.6	-115	-9.4	48.4	86	37.4	34.4	11.2	-33.2
3/9	-109	-22.6	2.6	13	32.2	49.2	94.4	58.2	91.4	21.8	45.6	-12.4	-93.6	-121.6
3/10	-83.4	-32.4	65	91.4	130.2	147.2	126.2	42.6	2.8	-43.6	-57.4	-88.4	-96.8	-66.4
3/11	92	72.6	62.6	103.8	49.4	10.4	-63.6	-80.6	-55.4	-30.4	-24	9.6	67	77.6
3/12	199.6	135.2	32.2	-22.2	-68.8	-102.8	-67.6	-41	-43.2	44.6	85	112.8	116.8	169.8
3/13	22.2	11.8	-16.4	-52.4	-60	-23.6	25.6	16	9.6	35.6	-2.4	27	57.4	36.8
3/14	-66.8	-67.8	0.2	15.6	14.2	69.8	48.4	16.4	24	-35.8	-21.2	4.6	-7	-21.6
3/15	41.8	46.2	51.8	68.2	45.6	32.2	-12.4	2.2	-6.2	-17	6	-9	-5.4	12.6
3/16	20.2	32.4	-7.8	8.4	-18.8	-65.4	-8.8	41.6	-4.6	-18.2	-35	-45.4	30.4	46.4
3/17	-61.6	-42.6	-59.8	-63.2	-64.2	-78.4	-11.2	19.6	-18.4	14.6	8.2	34	18.8	6.2
3/18	-24.8	-21	-20.6	-39.8	4.6	-1.4	-15	-45	21	24.6	18.2	1.8	-52	-62.6
3/19	-22.2	-26.6	-13.6	-8.8	59	77.6	19	-12.6	13.8	-27.6	-48.6	-90.2	-76.2	-50.2
3/20	-5.2	7.6	35.4	21.2	13.2	26.8	-18.8	-5.6	-14	-58.6	-40.6	-52.2	-18.6	-17.8
3/21	20.4	26.2	56.6	47.8	-46	-66.4	-32	-17.4	-30.8	25.6	14	31	37.8	26.2
3/22	-10	-12.2	-15.4	-16.2	-27	-3.6	0.4	-64.4	-40.4	14.6	40.2	55	15.8	-0.4
3/23	5.4	-22.6	-81.2	-36.8	22	29.6	8	-9.4	-38	-13.6	44.6	40.6	36.6	20
3/24	-28.4	-48.2	-30	15	61.2	41.2	38.2	72.4	20.2	20.4	35.2	40.6	25.6	5.6
3/25	0.6	-4.8	41.6	15	-35	-53.6	22.6	42	57.2	23	-13	-13.8	-4.2	-12.6
3/26	4	45.4	17.8	-32.6	-62	-68.2	-36.8	24.6	15.4	-24.2	-71.4	-57.2	-37.4	-38.6
3/27	26.4	13.4	-31.6	-44	3.8	32.8	-39.6	-8.8	-8.8	-25.6	-35	-23	-31.6	-16.6
3/28	2	0.2	-19.6	31.8	84.6	76.8	25.8	-9.6	52.4	68	84	28.4	-31.4	-15.2
3/29	-13.4	15.4	47.4	41.4	42.8	43.4	59.4	20.4	68.6	23.6	-0.2	28.4	39.4	25.2
3/30	-14	-30.8	48.2	43.4	-42.8	-56.2	-32.6	-28.6	-30.2	-22.4	-26.2	-17.4	49	42.8
3/31	-16.8	-54.6	-67.4	-66.6	-53.6	-37.6	-3.6	-9.8	-56.2	-27.6	-12.4	-37.6	-14.2	1.2
4/1	-5	25	-41.4	-53.4	17	58.2	62.2	26.4	-27.6	-13.8	-36.4	-35.2	-52.6	-63.2
4/2	25.6	62.4	37.4	12.6	18.2	28.2	-8.2	-16	-34	-20.4	-28.8	-0.8	-42.4	-32.2
4/3	-7.6	-31.6	46.4	47.6	-26.8	-54.2	-88.8	-0.4	48	-2.8	-0.8	39.2	-2.8	15
4/4	-74.6	-56.4	-23.2	19.6	3	-29.8	23.8	41.8	80.2	8.6	35.8	9.4	-9.2	-21.4
4/5	26.8	60.4	29	44	47.2	24.8	46.8	15.4	-45.4	-27	-6.8	-10.6	-25.4	1.6
4/6	83.6	105.6	31.6	-41	-36.6	-41.8	-73.2	-100.8	-123.2	-51.2	-14.6	42.8	76.8	79.6
4/7	48.6	-52.4	-92.4	-120	-61.6	-16.2	-43.8	-22.2	-1.6	31.2	78	64	111.4	70.2
4/8	-53	-159.2	-106	-32.2	-5.4	24.2	57.6	51	132.4	115.8	74.2	1.4	-17.6	-32.4
4/9	-84.8	-46	32.2	47.4	4.2	34.2	53.8	45	45.4	36.8	-56.2	-127	-118.6	-102.4
4/10	-57.4	38.8	67.6	40	45.2	56.4	41.2	22.6	-39	-42.8	-84.4	-103.4	-77.8	-49.4
4/11	21.8	63.6	21	51	60	16	-15.6	-34	-71.6	-108.8	-66.6	17.6	-3.6	26.4
4/12	104.4	76.6	43.8	72.2	20.8	-75	-90	-95	-56.6	-36	24.2	58	62	74.6

Date														
4/13	79.6	16	-19.4	-47.8	-17.2	-35.6	-46.2	-8	27	48.8	75.4	81.4	120.2	102.6
4/14	-52.8	-55	-36	-82	-68.4	-1.8	14.8	47	39.8	48.8	74.2	89.2	84.2	2.8
4/15	-60.6	-22	23	-2.6	-26.4	38.2	68.6	44.4	39.6	55	-3.4	-50	-92	-108
4/16	44	55.8	4.2	14.8	16.4	16.4	38.4	-13.8	-38.4	-58.8	-71.4	-111.8	-85.2	-23.8
4/17	40	35.4	-5.6	-17.4	-23.4	-16	-49	22.6	15.6	-38.2	-20.8	50.2	73.8	66.6
4/18	-64.2	-66.8	1.2	54.2	25.8	-4	-11	-6.2	24.4	26.4	46	48.2	12.6	-18
4/19	-13.4	-21.2	15.6	34.2	22.2	-25.4	44.4	-3.6	-54.2	-6.2	2.6	-65.2	-87.6	-46.6
4/20	23.8	16.4	-18.4	-1.2	16	-23	-53	-57.6	-52.8	-15	-59	-47.4	-4.6	22.2
4/21	60	39.8	-23	-53.2	-24.4	-10	-46.8	-39.2	21.2	41	-0.6	43.6	70.8	74
4/22	-11.2	-13.4	-22.8	-59.2	-14.4	16	1.2	39	38	7.4	52.8	57.6	22	-4
4/23	-56.2	-11.2	44.6	21.4	18.2	44	68.6	46.4	21.6	-1.2	24.6	11.2	-37	-75.6
4/24	-4.6	11.8	61.6	106.8	40.6	39.4	49	16.8	23	37.6	13.8	-12.2	-32.6	-30.6
4/25	24	-7	-19.2	40	0.8	5	-17.2	-36	-34.2	-16.8	-11.6	-9.2	25.6	35.8
4/26	23	5.8	-26	-30.8	21.6	-28	-42.8	-6.4	-14.8	-20.2	-3.4	14.2	53.8	55.2
4/27	9.6	1	-10.8	-48.6	-45.8	-38.4	-9	36.6	24.2	6	-13.2	11.4	16.6	31.2
4/28	-37	-20.2	-28.4	-71.4	-60	-9	17.4	21.4	-13.2	-33	-20.8	-20	-32.4	-36.4
4/29	-32.4	-19.8	-18	-35.4	-19.4	26	31.8	-12.4	9.2	-17.4	5.2	-31.4	-53.8	-62.8
4/30	-17.2	-46.8	-2.8	67.2	53.2	16.8	-16.6	-4.6	35.8	44.6	-0.8	-51.8	-47.4	-22.4
5/1	-2	56.8	74.2	65	47.2	-9.6	-19.2	11	33.2	20	-18.4	-34.8	5.4	22.4
5/2	36	48	29.2	6.2	-16.4	9.4	16	-27.8	-39.2	-38	4.6	43.2	14.8	26.4
5/3	55.2	-9.2	-62.2	-26.6	-5.4	-5.4	-22	-12.2	-45.4	-14.4	35.2	68.6	10.8	-0.4
5/4	-29.8	-56.4	-48.2	-16.2	21.6	-24	19.8	28.6	37.4	32.6	-15.2	-16.2	-28	-6.4
5/5	-16.4	1.2	35.6	-12.4	-11.4	-2.2	11.6	1.4	-22.2	-48.2	-134.6	-91.8	13	-10.2
5/6	-29.2	49.2	62.8	-0.8	-34	13	-27.6	-86.6	-91.6	-47.6	-21.6	29.6	63.4	-19.8
5/7	-36	-23.8	-13.6	-9	-31.2	-34	-56.2	-20.2	15.2	51.6	84.8	72.8	-6.8	-9
5/8	-24.6	-35	-48.4	-0.4	14.6	35.2	9.6	58	78.2	36.6	46.6	-10.6	-49.6	-11.6
5/9	50	-14.4	-47.2	21	39.8	37.4	70	44.2	31	-45.4	-59.2	-58.4	-6	34.2
5/10	64.6	28.8	15	-5.6	30	-11.8	10	-9.6	-43.8	-38.8	-2	12	15.6	32.6
5/11	-0.6	27.2	28	-51.6	-15.6	-73.8	-84	-10.8	-23.4	21	71.4	102.2	52.2	28.8
5/12	-69	-46.6	-8.4	-3	-55.2	14.2	49.8	39.8	59.8	73.6	60.6	54.2	21.6	-8
5/13	-40.4	-2.6	-4.2	26.6	7.6	98	107.8	62.6	51.2	33.8	-16.4	-82	-64	-88
5/14	43.8	54.6	60	40.6	79	49.4	-2.4	-41.8	-37.4	-40.6	-72.6	-106.2	-56	-39.8
5/15	119.8	38.4	29.2	20.8	3.8	-62.4	-100	-88.2	-75.2	-25.6	-6.2	12.2	38.6	92.8
5/16	14	-13.2	-39.2	-19	-104.4	-147.2	-101	-36.8	-27.2	44.6	103.4	116.8	103.2	76
5/17	-98	-52.4	-65.8	-64.4	-41.4	-13.8	28.2	39.2	56	25.6	42.8	36.8	-22.8	-59.6
5/18	-77.6	-33	4.4	-4.6	108.2	149	99.6	47	38.8	-24	-75.4	-94	-107	-99.6
5/19	74.2	68.6	84.8	97.4	29.8	17.2	-21	-56.2	-53.4	-52.2	-66	-74.4	-32.8	32
5/20	57	5.2	-21	-10.6	-62.6	-74.2	-21.4	-19	6.2	32.4	14.2	24.2	78.8	81.8
5/21	-62.8	-74.2	-68.2	-48.8	-20.6	-12.8	37.2	49.8	39.8	23	23.4	39.4	57.6	-0.4
5/22	-32.2	-20.6	7.2	-14.2	-23.8	36.4	36.4	60.8	30.8	-15.6	-1.8	14.8	-28.2	-40
5/23	61	114.2	69.2	27.2	53.6	44.4	-30.8	-13.4	-3.4	-22	-29.2	-21.4	-67.6	-16.4
5/24	52.4	58	25.4	40.2	35	-50.6	-77.4	-76.4	-74	-16.4	6.4	-5.8	23.4	49.6
5/25	-33.8	-82.4	-46.8	-6.4	-59.6	-72.2	-36.8	-2.2	-47	-1.8	29.4	63.8	87.8	57.6
5/26	-72.8	-71.2	-47.2	-58.2	-42.6	6.6	53.2	37.2	72.8	89.4	71.2	48	27.6	-25.6
5/27	-7.8	-2.8	-13.2	-42.6	57.6	92.8	73.8	24	81	74.8	37	-31.2	-70.6	-60.6
5/28	54	19.8	4.8	49.8	77	38.6	12.2	7.8	-20.2	-16.4	-72.6	-88.2	-66.4	-20.6
5/29	46.6	76	62.6	66.8	-17.2	-37.6	-46.8	-79.6	-88.4	-131	-117.8	-36.4	20.4	-3.2
5/30	-42.8	43.2	74.4	5.8	-53.6	-46.8	-45.2	-32	-31.6	-51.4	-13.8	87.6	53.8	38
5/31	-3.6	-34	-24.4	-34	-24	-0.8	52	97.6	76.2	48	75	61.2	21.6	28.6
6/1	17.4	-28.8	-51.8	-17	-12.2	47.2	35	46.4	33.4	16.8	12.6	-66.4	-31.4	-5.4
6/2	-12.2	-21.6	10	8.6	26.8	1.2	-36.6	-85.2	-108.8	-43	-10.6	-47.4	0.6	-0.2
6/3	18.6	29	18.6	-19.2	-33.2	-77.8	-57.4	-49.2	-21.8	-2.2	3.2	5.8	21.6	26.6
6/4	15	0.2	-42.4	-9.2	-3.6	-42.6	-26.8	43.2	37.8	17.8	1	31.8	9.4	24.8
6/5	-52.8	-50	-10.8	45.8	74.2	66.2	38.2	45.4	43.2	8.4	6.8	22.6	-16.2	-57.2
6/6	-12.2	34.4	11.4	1.4	13.8	44	11	-29.6	-19	3.6	13	29.4	-2.4	-54.8
6/7	31.2	12.2	13.2	-18.8	-51.6	-36.8	5.2	3.6	25.4	60	46.6	0.8	-22.2	-15.6
6/8	15.2	-42.2	-34.4	-20.8	21.2	0.4	50.2	27.8	35.6	29.2	-21.6	-70.2	-15.6	45.2
6/9	-49.4	-62.6	-26.4	3	48	45.6	18	-2.8	-28.8	-81.6	-29.6	-38.2	5.4	50.8
6/10	-3.8	53.4	15.6	9.6	9.8	16.8	-34.4	-27.4	-11.4	-40.6	36.6	49.6	1.4	-25.8
6/11	58.8	84.2	70.2	5.8	-44	-23.6	-20	12.6	18.8	40.2	21.4	31.4	-15.4	-17.4
6/12	-5.4	-20.4	-10	-20	-1.6	8	31.6	24.4	-0.4	40.6	-33.6	-38.6	-2.6	-31

6/13	-95.2	-80.4	-44.2	28.6	62.6	35.2	23.8	3.2	5.4	8.4	-48.2	-24.2	3.2	-53.6
6/14	-28.6	22.8	28	49.2	11	9.2	-14.4	-9.6	-19.8	3.4	-25.6	5.6	-20	-13.2
6/15	59.6	22	20.6	-23.4	-43.2	1.6	-0.4	15	11.8	-8	-39.8	-21.4	-28.2	62.4
6/16	56.6	-20.4	-35.6	-61	-44.6	-6.4	-4.4	-0.2	-15	-50.4	0.8	15	39.2	37.2
6/17	11.6	23.6	-5.6	-2.8	-39	-63.2	-30.2	-35.8	-33.8	-52.4	14.2	17.2	34	18.8
6/18	6.6	34	3.8	0.2	-26.2	-44.2	15	-5.2	-44	-26	-1.6	-32.8	-44.2	-16
6/19	-41.4	-4.8	17.2	23	-1.6	-34	-13.8	10.6	2.2	2.2	-11.2	-3.6	13	7.8
6/20	-39.4	-36	39.2	34.4	10.4	-6.6	-55.2	-45.6	23.8	29.2	32	42.4	26.6	-32.2
6/21	-21.2	-15.2	-38.6	-54.4	9	15.2	-41.2	-17.6	28.6	37.8	59.2	43.2	9.6	-51.2
6/22	24	-24	-65.6	-39	11.4	23.8	25.2	50.6	31.6	-8	-4.6	-7.2	-20.4	-3
6/23	4	-31.2	-63	4	33.8	65	88.8	31.8	6.8	12.2	-29.2	-59.4	-64.4	-18.2
6/24	-48	-45	30	13	52.8	48.6	68.8	39.4	28.4	36.8	4.4	-31.8	2.6	4.2
6/25	-4.8	54.2	72.6	26.4	-8.4	17	6.8	-22	-34.6	-46	-51.2	3.8	20.4	39.6
6/26	37	65	43.4	27.2	-19.2	-29.4	-51.2	-47.8	-30.8	-52.8	-11.2	46.6	23.2	7.8
6/27	58.2	33.4	-23	-8.2	-77.4	-80.8	-97.4	-35.2	-41.8	13	52	31	24.8	18.8
6/28	61.4	2.8	-18.2	-47	-80.8	-98.6	-77	-23.4	-7.8	16.4	14.2	-12	41.4	84.2
6/29	14.4	-36.2	-55.2	5.4	22.6	1	39.4	16.6	69.2	75	59.4	22.4	25.2	35.6
6/30	-41.2	-7.6	39.8	29.4	106.4	126.2	119.4	95.6	91.8	27.8	7.2	10.4	-35.2	-47.4
7/1	-8.8	58.6	112.8	40.2	96.6	106	62.8	29	-31.8	-76.4	-78.8	-29.6	4.8	-17.8
7/2	49.6	54.6	2	0.4	-18.6	-54.6	-87.8	-108.4	-111.2	-40	-11.6	31.2	61.6	36.8
7/3	31.8	-12	-49	-16.8	-85.2	-98	-73.4	-52.8	1.8	98.6	116.8	87.8	53	31.2
7/4	-61.4	-78.8	-59.4	-39.2	-14	-37.4	35.4	67	104.2	93.2	78.6	19.2	-13.4	-3.8
7/5	-79.2	-63.8	-8	-0.6	63.2	86.8	109.6	98.2	30.2	-36.4	-54	-104.6	-104.2	-61.8
7/6	-4.2	-6.4	33.8	59.2	58.2	103.2	38.6	38.2	-58	-72.8	-114.8	-109	-100.2	-100.6
7/7	57.6	88.4	40	37	-8.4	-65.8	-80.8	-98.6	-72.6	-56.6	-23.4	20.4	34.6	31.4
7/8	24	57	-16.8	-57.4	-113.8	-120	-113	-93	-42	-6.8	72.6	73	48	53
7/9	-71.6	-91.4	-37.6	-37.4	-85	1	5.2	-3.6	67.4	67	73.8	16.8	-24	4.2
7/10	-59	-79.8	-24.8	15	54	88.6	74.4	67	73.8	50	-25	-54.2	-21.8	-52.4
7/11	31.6	35.8	42.8	49.4	88.4	49.8	29.4	13	-53.6	-81	-122.8	-77.6	-27.4	-60.8
7/12	77.4	82.2	50.6	19.6	18	-45.6	-42.6	-25.8	-56	-71.8	-109.8	14.4	7	33.8
7/13	58.4	28.8	-15.6	-56.6	-58.8	-64.8	-43.6	7.6	39	38.4	23.6	71.2	60	93.8
7/14	-81.4	-84.6	-76.2	-53.2	-60	4	54.8	29.4	66.4	62.8	47.2	5.8	8.4	-3
7/15	-58.4	-30	13.4	46	58.2	24	10.6	14	-35.8	-20.6	49.4	-17	-25.6	-55.2
7/16	38.2	53	46.4	40.4	30.6	0.2	1.8	-27.6	-99.2	-57.4	6.8	-7.6	-5.4	8.4
7/17	31.8	29.4	-9.4	-40	-3.2	3	3.2	-51.8	-16.4	-8.6	-4.6	26.8	34.4	17.4
7/18	-16.6	-35.8	-9	-4.6	18.2	35.4	-22.6	22.4	79.6	64.2	36.2	48	-1	-36.8
7/19	-13.8	20.6	-13	3.6	-40.2	27.6	23.2	38.8	41.4	12.6	-2.8	-10	-31.2	-32.8
7/20	20.2	10.8	-20.2	-32.6	-83.8	-37.2	30.6	17.4	1	-27.4	-23	-27	-11	23.2
7/21	-33	-70.4	-19.6	-14.8	32.6	-23.2	-25.2	22.4	-5.4	38	7.6	-0.2	28.2	53.6
7/22	-14.8	-52.4	-5.2	32.8	117.4	8.6	-3.2	-25	-31	6.6	2.6	-5.2	-4.4	-18
7/23	-7	16.8	-3.6	25.4	30.6	16.4	-0.6	-48	-24	-31.6	3.6	-27.2	-19.4	-42.8
7/24	44	67.6	13	-13.6	-42.8	11.4	-33	-1.8	26.4	-41.6	-58	-47.4	10.2	37
7/25	71.2	60	53.8	2.8	-3.4	-1	8	42.8	53.4	-13.4	-25	22	12.2	28.8
7/26	6.4	18.4	27.4	21.2	-50.4	-50.2	-3.4	-8.4	6.8	39.4	91.4	92.6	46.8	28.8
7/27	-77	-66.6	1.2	2.2	-99.8	-15.8	6.4	-32.6	-28.2	30.4	64.8	43	-0.8	-3.6
7/28	-73	-55.8	-21.6	-17	28.6	41.6	16.8	25	-43.8	-30.4	-64.8	-88.6	-77.2	-47.4
7/29	13.2	0.4	-55.2	-45.4	83.4	23	-20.8	20.6	9.8	-28.6	-94.4	-82.6	-63.4	-65.8
7/30	8.4	40	6.4	-4	4.8	-18.8	-17	-15.2	29.4	16	4.8	7.4	46	-50.4
7/31	-13	8	16	63.4	26	-0.8	2.6	-51.6	-21.4	-5.6	66	73.4	54	26.4
8/1	64.6	-1.2	16.6	8	-0.4	-28.8	-13.6	-3.8	4.8	38.8	70.2	57.8	2.8	79.8
8/2	54	4.6	-18	-15	-28.2	-4	8.4	58	75.2	79.6	0.6	-60.2	-55.8	30.4
8/3	-34.8	15.6	17.6	-2.4	28	71	76.6	21.6	-28	-15	-50.4	-73	-7.2	7.4
8/4	-25.2	23	31.6	12.4	12	38.2	41.2	9.2	-87	-115.8	-73.8	6.6	38	-17
8/5	40.6	21	10	26	-2.2	-18.6	-31.2	2	19	-34.8	19.6	63.2	46	10.2
8/6	53.8	-1.8	-17.8	-24	-45.2	-54.8	-35	3.8	4.4	35.4	48.8	50.8	23.6	31.8
8/7	-47	-78.8	-68.8	-81	-40.4	-6.6	18.6	-13.6	-6.6	32	61.6	38.2	-15	-18.2
8/8	-89.4	-49	-13	10.4	22.2	23.2	-24	-25.2	17.4	41.6	-12.2	-54.2	-37.8	-23.6
8/9	-3.8	38.2	39.8	63	19.4	-35.4	-36.8	-27.8	34.6	18.4	-64.4	-78.4	-22.2	-51
8/10	19.4	37.6	19.4	-24.2	-40.2	-7.6	30.4	18.4	-35.4	-48.4	-20.8	19.4	16.4	-10.2
8/11	22	-4.8	1.2	-13.4	-8.8	-18	9.8	20.4	-11.8	8.8	39.2	45.2	13	53.8
8/12	3	-34.2	-20.2	35.4	60.4	27.4	-7.6	0	83	93.8	86.8	1.4	-15.2	3.6

8/13	23.8	24.4	9.4	22.4	27.2	40.2	22.4	-3.6	6.4	-8.6	-22	-21.4	-2.8	-12
8/14	25	60.2	27.6	-34	-50.4	-8.6	-2.8	7.4	-96.4	-127.8	-117.2	-11.8	31.6	30
8/15	33.6	-14	-26.8	-19.2	6.6	-5	-41.4	-6.2	21.6	-25.6	-16.4	17.8	38.6	44.8
8/16	-2	-10.4	22.8	10.8	-5	-64.2	-22	-12.6	60.4	47.6	57.4	8	16.8	18.6
8/17	-56.6	-46.6	-12	19.8	-9.2	13.8	58.4	-1.4	-0.2	59	46.6	9	-57.2	-32.4
8/18	-40.6	-10.2	-41	16.8	19.8	66	58.4	22	-5	12.8	0.2	-12.6	-62.6	-90
8/19	-28.8	13.8	32	24.4	42.6	48	-43	-29	-56.4	-57.6	-81	-50.6	-48	-64.2
8/20	45.2	29.4	62.6	10.8	12.6	-5.4	-45.4	-26.4	-52.8	-63.4	-77.6	-21	33.6	38.2
8/21	-33.2	-15.6	-31.4	-63.4	-37	-62.4	-36.8	35.2	19.6	-5.8	27.4	52.6	88.4	59.2
8/22	-29	-57.2	-51	-74.6	-40.4	-21.8	-2.6	32.8	29	61.6	95.6	59.8	-2.6	3.8
8/23	52.8	0	-46.4	6.4	57	44.4	85.2	31	38.6	26.8	28.8	-27.2	-82.2	-37.4
8/24	60.2	77.4	47.8	56.2	52.4	25	3.6	-52.2	-17	-50.2	-43.6	-82.8	-32	-22.6
8/25	8.4	54.2	49.8	32.8	-57.8	-43.8	-33.6	-50.6	-25.6	-12.6	-32.4	-16.2	66.6	62.8
8/26	11.4	8	22.6	-2.8	-88.2	-52.6	-57.2	19.8	19.2	44.4	26.6	123.2	122.2	93.6
8/27	-35	-49	-23.4	5.8	-6.4	-18.8	9	15.8	20.8	25.2	59.8	65.8	15	-47
8/28	-71.4	-54.6	-31.8	15.4	70.6	46.2	76.2	41	-13	4.6	-22.8	-88.6	-129.4	-118.4
8/29	41.8	39.4	33.6	0.6	37.2	44.8	10.2	-4.2	21.4	-13.6	-52.2	-87.6	-38	37.4
8/30	81.6	34	39	0.8	-4.4	14	-37	-52.2	-20.8	-39.8	-5.4	21	73	133.4
8/31	7	-38.6	-76.4	-24.2	-27	-30.8	-16.2	-23.2	-19.4	15	63.6	88.6	46.8	15.2
9/1	-33.8	-3	-63.4	-54.6	3.2	-1.6	0.4	61	22.8	63.8	47.6	25.2	-33.6	-83.2
9/2	-49.2	14	52.6	15.4	28.8	59.8	79.4	80.6	35.6	-4.8	-30	-46	-57.2	-84.4
9/3	-19.6	16.6	74.8	70.6	8.4	-33	25	-9	-6	-30.2	-45.4	-45	12	44
9/4	-5.2	-28.4	7.6	14.8	-63.8	-67.4	-50	-74.6	-29.2	0.4	1	44.8	60.8	60.8
9/5	34.2	-21.6	-29	-34.6	-17.8	42.4	-37.4	-36.6	-37.6	-18	15.2	50.4	11.6	-40.4
9/6	-0.6	-0.2	-32	-12.8	88.6	19	-45.4	24.4	53.6	6.4	16.4	10	-28.4	-14.4
9/7	-2.4	44.8	29.8	1	-15.2	-61.2	-19.2	-0.4	10.2	22.4	-7.6	-25.8	10	45.6
9/8	32	8.4	-20	-25.4	-134.2	-81.8	-10.6	-32.4	-71.6	-25.2	-16.2	-31.2	-3.8	3.2
9/9	-20.6	14.2	-11.8	-26.8	-59.4	-11	-25	-27.8	-42.8	-58.6	-18.8	-18.2	-41.4	-60.4
9/10	-57.8	-50.2	-15.4	15.6	73.6	84.6	24.6	-60.8	21	-2	-11.2	-32.2	-49.2	-51.4
9/11	-17.2	-90	-38.4	23	94	53.2	71.2	71.6	53.8	20.2	2.6	-0.6	-11.4	-10.6
9/12	1.6	-2.4	13.4	-0.6	5.4	-6.4	50.8	92.6	36	30.8	37	5.4	-26.6	-48.8
9/13	0.4	14.4	-12.6	1.2	11.4	5.8	-11.4	-22.6	-28.4	31.4	-12.8	-11.2	-5.6	17.2
9/14	17.6	31.4	-1.6	-29	-25.2	-9	-91.6	-66.4	-51	-33	-76	-68.6	-2.8	59.8
9/15	39.6	44.8	64.2	-11.8	-42.4	-22.2	-80	-86.2	-59.8	-65.2	-21.6	25.2	90.4	75.2
9/16	39	16.2	8.6	-26.4	-10.6	-7.4	68.8	60.8	27.2	36.6	73.8	78.6	48.6	23.8
9/17	-16.8	3.6	-46.2	11.4	27.6	-12	94.2	144.6	45	-6.4	-3.2	-11	-20.6	-12
9/18	-17.4	-12.8	0.8	59.6	4.8	-5.4	12	-9.6	-23.4	-12.6	-7	-55	-23	5.2
9/19	-22.6	-27.2	20.4	41.2	8.2	50.8	-12	-79.6	6.2	34	-1.2	-5.6	-8.6	-43.6
9/20	-17.2	-9.2	-2.8	-52.6	-16	5	-7.4	16.2	61.6	25.8	2	77.8	28.4	-15.2
9/21	-9.6	12.4	-10.8	-37.6	9.8	-15.6	-20	23.6	37.4	32.6	42	59.4	15.2	-36
9/22	7	-8.4	11.4	25.2	9.8	42.4	-1.8	-5.4	-9.4	6	-2.4	-33.6	-36.8	-40.6
9/23	5.6	-19.6	7.2	45.6	38	-2.8	1.6	11.4	7	-81	-57.2	-46.2	-26.4	22.6
9/24	-27.2	2.6	26.2	30.4	0.8	-24.2	4.4	-17.2	-55.2	-42.6	20.6	31.2	3	22
9/25	20	17.8	-33.4	-76.4	-77	6.6	37.6	-1.6	-9.2	74.2	84	21.4	3.2	40
9/26	57	-16.8	-64.6	-54.8	20.2	26	2.2	-11.8	-5.4	19.6	-18.2	-35.8	21.8	65.8
9/27	10	13.6	56.4	51.4	15.2	-72.2	-81.2	-26.4	-13.8	-16.6	-45	-22.8	39.2	-20
9/28	-17	64.8	76.8	50	-31.4	-82	-71.4	-31	21.6	14.2	28.4	4	-27	-59.4
9/29	-7.8	50.6	-2.4	-39	-12	56.4	58.4	22	14.8	-2.4	-10.2	-57.4	-132.6	-60.2
9/30	-8.4	-35.2	-43	-3	87.2	118.4	95.8	33.6	0.8	-35.8	-87.8	-56.2	-21.4	-15
10/1	-11.4	-102	-39.8	41.6	55.8	14.2	4.6	39	17.8	9.8	-20.2	59.6	119.4	102.8
10/2	25.2	-14.8	-22.6	16.6	-33.2	-83	-87.2	-18.4	19.8	44.8	52.8	69.6	71.4	45.2
10/3	39.2	91.2	55.4	-46.8	-87.6	-51	14.4	17.2	0	-19	41.4	40.2	-4.6	-4.6
10/4	-14.6	44.8	26	-8	-2.6	47	100	42.4	-10.6	-24.4	33.6	-1.6	-15.4	-23.6
10/5	-16.2	-29.4	-17.2	44.4	39	57.6	-22	-63	-62.4	-27	-21.8	-45.2	-0.4	-4.8
10/6	23.6	-14	13.2	-7	-0.8	-44.4	-108	-76.4	-35.4	-20.8	-64.6	-25.8	19	24.2
10/7	9.4	-45.8	-25	-66.8	-25.2	-53.2	-39.2	7.6	25.2	15.4	21.4	50.4	28.6	32.2
10/8	-80.8	-68.6	-79.6	-63.6	-6	28.2	73.6	36.2	32.8	63.4	65.6	67.6	12	-63.6
10/9	-84.2	15	-23.6	41.4	60.4	82.4	84.2	66	42.8	50.8	39	-24	-114	-118.4
10/10	17.4	73.6	110.4	110.2	56.4	15	-4	23.2	9.2	-26	-43.4	-76.4	-94.8	-10.8
10/11	135.2	57.6	68.4	44.4	-40	-34.2	-56.2	-65.6	-50.4	-90.2	-83.6	-55	39	96.4
10/12	17.4	-44.6	-83.8	-68.4	-87.4	-69.4	-41.2	-89	-60.2	-7.2	19	60.2	120.8	53.8

Date														
10/13	-42.8	-32.8	-13.6	-44.8	-77.8	-57.8	-32	25.8	61.8	116.4	72.6	58.4	15	-19.6
10/14	-18	9.6	20	-13.2	-4.8	18.8	28.2	81.4	75.4	36.2	12.2	-29	-57.8	-34.6
10/15	31.4	0.6	-3.2	23	100	58	50.4	18.8	-67.4	-101.4	-66.2	-60.6	-31.4	49.4
10/16	29.6	15.8	-13.4	7.8	74.4	19.4	10.6	-67	-63.8	-49.4	-15	21	72	75.6
10/17	-65.4	-6.6	13	-24.4	-19.8	-17.4	-42.4	-17	38.6	50.8	43.6	68.4	35.6	-55.2
10/18	1.6	57	60.2	40.4	-20.8	-24.8	-29.4	25.8	70.8	70.8	-0.8	8.6	-52.4	-90.4
10/19	69	21	-7	37.8	-55.8	-28.6	14.8	35	15.4	-13.8	-25.2	-48.6	-32	23.6
10/20	0.6	-88.6	-71.6	-44.8	-4.2	45.6	43.6	-0.6	-44.4	-75.6	-21	-50.6	-6.6	45.8
10/21	-123	-71.6	-20	-5.2	42	51.8	26	-13.2	-22	-37.6	-20.6	-27.2	0.8	-29.6
10/22	-31.6	31.4	29.8	17.2	8.2	-8.6	-21.4	-39	-49.8	-1.2	5.4	12.6	2	-54.6
10/23	120.8	81.6	37	0.6	7	-44.2	-34	-19	-6.6	4.4	23.4	33.6	-8.8	28.4
10/24	34.2	-2.4	-3.6	-20.2	-38.6	-41.4	-49.2	5	24.4	42.4	34.2	60.8	34.2	50.6
10/25	-29.6	-49.2	-53.4	-30.8	-0.2	30.4	41	51.8	81.6	84.8	80	22.4	13.6	5.6
10/26	-92.4	-26.8	-34	-14.2	37.2	79.4	104	79.8	63.2	21.2	-23.6	-41.8	-28.8	-58.2
10/27	3.8	38.6	84.2	78	40.8	10.8	5	-46.4	-92.2	-109.2	-91.2	-57.8	-12.8	10.6
10/28	110	95	73	47.8	-44.4	-46.8	-68.4	-84.8	-72.8	-34.6	29.6	43	37	38.2
10/29	59	19.8	-20.2	-52.8	-43	-57	-18.8	34	61	58.8	37	28.2	46	55.2
10/30	-38.2	-102.8	-83	-29.8	42.6	32	13.8	33.8	64.8	26.8	-33.8	-5.2	12.6	33.6
10/31	-55.2	-26.8	-4.2	34.6	37	50.6	0	-6.8	-30.4	-33.2	24.6	25.8	-3.8	-1.8
11/1	19.4	83.8	39.4	-4.2	-14.2	-2.6	-2.8	-10	-45.6	-5.6	49.8	-36.4	-32.6	-64.2
11/2	-21.4	-0.6	-3.2	-21.8	-52.2	-84.2	-52	-32.6	-57.4	-26.8	-59.8	-64.2	13.4	-35.8
11/3	-38	-81.8	20.2	20.2	-48.2	-20	-4	15.8	3.6	4.8	-60.2	21.2	13.2	-5.2
11/4	-45.6	-35.4	-16.6	-27.2	11.8	23	38.4	9.8	59.2	62.4	7.8	32.6	-43	-61.8
11/5	25.4	17.8	-61.4	-38.4	66.8	60.4	59.8	37.2	53.8	17.2	-36.8	-11.4	-96.6	-63.4
11/6	3.4	8.8	-9	45.4	59	56.2	-16.4	-12.4	-39.6	-68.2	-55	-45.6	-38	13
11/7	-8.4	7.2	49.2	32.6	24.8	-6	-47.4	-25	-12.4	-46.8	8.2	-12.6	39.6	69.6
11/8	-25.6	-10.4	-12.4	-40	-60.8	-83.2	-11.4	21.8	-19.8	-18	85.8	29.4	25.8	26.6
11/9	-2.4	-2.2	14.8	-30.2	-112.2	-68.2	24.6	-19.2	-64.8	-6.2	19.4	30.4	-39.6	-56.4
11/10	53	-0.2	-65	-56.6	-44	54.8	10	-25.8	18.2	39	-12.2	7.6	25.8	-34.4
11/11	-34.2	-43.6	-77	-33.4	54.6	28.2	5.2	25.8	114.2	77.6	60.6	11	8.6	-18.4
11/12	-42	-13.2	17.8	35.8	106.4	31.2	24	92.2	112.2	56	-22.4	-75.4	-100	11.6
11/13	85.8	65.2	107.4	115.2	74.8	37.6	5.8	-13.8	-87	-86.4	-96	-63.6	41.4	99.8
11/14	121.8	104.4	83	30	-73.8	-55.8	-71.6	-134.2	-174	-69.6	27.4	91.2	166.6	122.6
11/15	-6.8	-37	-64.6	-82.8	-96.6	-64.4	-23.8	-33	-2.6	59.2	81.8	79.4	65	8.6
11/16	-88.2	-96.4	-81	-44.2	-6	14	65	67.6	99.2	31.6	-14.8	-39.6	-66.2	-62.8
11/17	-66.8	1.8	62.4	99.2	98	38.2	-7.8	28.4	-10.4	-44.4	-24.8	-24.6	-74.2	-42.2
11/18	11.4	61.4	64	38.8	5.2	-18.8	-60.4	-40.4	-2.8	13.2	24.6	37.6	28.8	0.8
11/19	63.6	39.4	-18.6	-73	-65.2	-0.2	-3.2	-20.4	21	42	40	39.8	75.6	58
11/20	28.4	4.8	-12.8	-37.4	-35	4.2	42	14.8	33.2	39	11	23.2	36.2	1
11/21	-23	-11.8	-16.4	-6	9.2	8	57.2	61.4	11.6	2.4	-43	-65.4	-75.2	-94
11/22	-36.2	-32.4	2	74	0.8	-38.4	-17.6	24.6	-62.2	-75.2	-24.2	-18.2	-76.8	-66.8
11/23	-16.4	-23.8	21.4	46.2	1.6	-14.2	-57.6	-26.4	-10.8	-2.6	20.8	-0.4	-33	3.4
11/24	-4.8	-10.6	-35	-36.2	37.2	45.2	14.8	-44.4	26.8	14	-20.2	-9.6	1.8	68.4
11/25	20.6	-22	-42.8	-54.8	43.8	31.2	7.4	-31.8	-16	-11.6	13.6	9.2	62.8	43
11/26	-19	27.2	-2.4	-24	-6.8	-29	-17.8	-7.8	-34	7.2	36	9.6	8.6	-55.2
11/27	-32.6	27.4	53.2	13	-40	-47	8	61.4	25	0.6	-20	0	-36.4	-55.8
11/28	34.4	-13.4	40.4	67.6	6.4	33.6	37	74.8	48	-44.4	-92.8	-28.2	-11.6	30.8
11/29	30.2	-6.2	-6.2	21.4	-5.8	8.6	-14.4	-22.6	10.2	1.2	-5	-22.6	20.2	40.4
11/30	7.4	-0.8	-34.2	-39.8	14.2	35.2	-0.2	-51.8	-30.8	16.6	45	-4.2	-2	7
12/1	56	53.4	26.2	-17	48.2	32.4	24.2	5.2	15.6	53.6	37.4	28.6	1.4	33.8
12/2	30.4	28.2	-8.8	-7.4	-13.6	-56.4	-2.2	5.2	-19.4	-35.6	-27.4	42.4	66.4	95
12/3	-36.6	-48	-77.2	-88.6	-112.6	-86	-63	-27.2	-38.6	-24.8	29.6	44.8	67.4	22
12/4	-109	-76.6	-10.2	21	-36.8	35	28.6	-0.4	31.4	42	27.8	-56.2	-97.4	-160.4
12/5	-23.6	50.2	110.8	120	113.6	113.4	45	30.2	62.4	-38.2	-64.4	-105.8	-119	-109.2
12/6	70.4	65.6	23.2	15.4	55.8	0.6	-44.4	-53.8	-63.2	-52.6	-19.6	28.2	43.6	63.4
12/7	42.6	-83	-100.8	-94	-55.8	-99.6	-53.4	-24	-54.2	73.2	78.4	86.4	107.8	133.6
12/8	-33.6	-48.2	-43.6	-33.4	-57.2	-42.6	17.8	49.4	2.2	42.4	22.6	2.4	21.8	-7.6
12/9	-16.6	54.6	30.2	28.4	10.2	79.2	69	23.2	24.8	-22	-79.6	-44	-69.4	-63.2
12/10	12.8	42.2	79.6	67.2	72.4	71.4	1.6	-51.2	6.6	1.2	-38.4	-1.2	-46.4	-25
12/11	30	40.2	34	31	1.2	-73.4	-76.8	-16	17.6	12.2	15	30.4	35.6	72.6
12/12	5.8	17.8	24.4	-5.8	-77.6	-88.6	-14.6	64.2	20.2	-9.8	4	35.2	36.6	45

12/13	-31.6	-34	-42.8	-10.8	18.2	33.6	77.4	32.4	33.4	12.2	41.6	33.8	40.2	-49.4
12/14	-62	-34	-8.2	2.6	70	75.8	29.8	-11	2.4	-7.8	6.4	-50.4	-30.6	-101.4
12/15	18.8	-34	-30.4	-9.6	35.6	49.2	-1.8	-16.4	-25.4	-59.6	-75.6	-78.2	-77	-42
12/16	76.4	33	-27.6	-18	-52.6	-57.2	-29.2	-8.8	-29.6	-31	12.4	0.4	-1	74.6
12/17	32	27	-13.4	-69.8	-87.4	-73.2	-19.4	20.6	-13.2	21.6	43	11.8	52.4	65.4
12/18	-55.2	-52.2	4.4	-72.4	5.6	15	-10.8	-5.4	1.4	13.8	-9.4	-0.4	22.4	-3.2
12/19	-77	-49.4	28.2	69.4	73.8	62.4	11	-39	-3	-25.2	-32.8	7.4	-15.8	-71.6
12/20	68.4	75	58.8	109	15.6	-13.4	-20	-32.2	-15	-36.2	-24.2	1	7.2	27.6
12/21	93.6	29.2	-78.6	-10	-39	-41.4	-18.4	-4.8	-42	-19	20.8	8.4	13.4	48.8
12/22	-61.4	-76.8	-63.6	-57	3.4	41	31.8	55	31.4	59	43.2	12.4	5	6
12/23	-141	-79.2	54.4	9	10.6	27.8	70.8	58.2	57.6	63	38	32.2	50.8	-10.4
12/24	-51.6	34.6	76	1.6	6.4	14.6	10.2	16.4	21.4	43	-9	-4.4	-36	-71.6
12/25	78.8	124.6	-25.8	-27.4	-3.4	-25	-49.2	-37	8	12.6	15.4	-15.2	-108.6	-65.8
12/26	72.2	-19	-98	-34.4	-22.4	12.2	-4.2	0	4.4	-58	-39.2	-36	-73.2	41.8
12/27	-46.8	-144.2	-45.4	28.6	32.2	-11.2	18.6	16	-13.4	-7	4.6	4.2	10.8	18.6
12/28	-33	-28	67	24.6	-13	-37.4	0.4	30.4	13.2	45.4	24.4	-10.6	-14	-48.6
12/29	43	112.8	58.2	0	2.6	63	1.2	-52.4	5.4	-14.8	-20.2	-17.4	-13.8	-30
12/30														
12/31														

1996 Spectral Results for Time Filtered Pressure

This is 1996 spectra of time filtered pressure data. The time filtered pressure is fourier transformed in the space domain
Amplitude 1 and Phase 1 are the amplitude and phase of zonal wave number 1
Units of Amplitudes are Pascals/Wavenumber and Phase is degrees where 0 Phase degrees translates to -180 Longitude

Day	Amplitude 0	Phase 0	Amplitude 1	Phase 1	Amplitude 2	Phase 2	Amplitude 3	Phase 3	Amplitude 4	Phase 4	Amplitude 5	Phase 5	Amplitude 6	Phase 6
1/1														
1/2														
1/3	22.3		60.3	153.3	31.9	-168.6	10.1	-102.8	7.6	-16.0	5.2	-28.9	3.7	-4.7
1/4	39.0	180.0	75.6	-113.9	16.3	177.1	12.9	-92.8	18.4	64.8	4.7	71.3	7.2	-11.4
1/5	65.3	180.0	79.7	-66.2	25.5	-155.4	6.2	54.7	0.6	29.5	2.8	-39.3	1.1	66.3
1/6	28.6	180.0	50.8	13.3	24.5	-38.1	11.8	147.0	14.9	-69.1	13.7	163.4	5.6	136.7
1/7	4.9	180.0	60.2	69.5	26.8	-18.6	16.1	-88.4	14.3	-81.4	12.8	152.1	6.4	-176.2
1/8	39.6		35.2	178.6	6.7	-117.3	6.9	-16.9	8.6	117.2	13.6	-2.2	1.2	-132.7
1/9	82.4		64.3	-147.9	10.2	-179.9	18.4	66.2	14.8	104.3	10.8	-22.0	4.7	-37.5
1/10	42.9		26.8	-155.1	15.3	36.9	14.6	96.4	3.7	29.2	7.0	-123.1	3.3	69.3
1/11	50.2	180.0	36.4	5.8	29.6	62.9	9.6	-151.5	8.7	-88.1	12.1	-158.9	8.4	95.3
1/12	63.1	180.0	44.1	22.9	29.5	146.6	28.8	-86.8	1.3	-107.8	9.0	104.7	3.4	-56.1
1/13	8.5	180.0	19.4	122.6	38.3	-104.7	16.7	-151.3	11.4	164.9	8.4	-16.7	12.4	-125.9
1/14	10.4	180.0	43.2	-150.5	18.9	68.1	22.0	103.7	5.2	-178.6	5.0	-19.5	5.1	-118.5
1/15	18.8		53.2	-56.6	28.4	135.0	15.3	9.3	25.3	-61.4	6.2	-131.3	4.6	7.7
1/16	40.7		48.7	11.7	26.8	-10.4	11.1	-0.9	27.7	10.9	3.0	100.0	15.9	17.1
1/17	18.9		65.2	76.0	33.4	22.6	7.9	8.9	17.2	135.1	10.4	55.3	4.3	81.1
1/18	35.7	180.0	42.4	132.3	28.5	175.7	8.7	-108.9	23.6	140.3	2.0	164.2	16.5	159.7
1/19	0.1		74.1	-146.3	40.0	-82.7	13.9	-159.9	9.8	39.1	6.5	-143.6	8.2	-131.2
1/20	16.2	180.0	41.8	-73.9	21.3	-69.3	6.5	-179.5	14.3	-154.7	5.0	155.9	11.0	-16.8
1/21	12.9	180.0	35.1	-36.8	37.0	164.4	18.3	82.0	22.2	-109.0	5.2	-166.0	8.8	-103.1
1/22	8.4		38.2	39.6	11.9	-168.6	8.6	126.7	24.8	10.2	11.9	-46.6	3.3	-144.5
1/23	3.9		73.9	68.4	38.8	-0.1	26.5	-43.1	17.1	43.0	10.5	-68.3	13.3	79.5
1/24	18.9		36.9	178.3	20.7	56.9	18.1	-77.3	24.0	158.1	7.5	77.6	5.5	54.6
1/25	1.5		105.3	-145.6	24.0	171.1	9.6	121.7	16.5	-172.0	13.4	75.1	4.9	-139.9
1/26	25.0	180.0	46.4	-119.8	10.5	-25.0	12.5	101.9	29.3	-63.0	12.5	167.4	3.7	-117.9
1/27	4.7	180.0	69.6	20.2	7.8	-163.9	19.3	123.8	11.7	26.9	6.2	-65.1	0.7	20.8
1/28	21.2		68.6	35.3	7.3	-83.7	11.1	-145.8	16.9	80.7	9.7	-0.3	3.1	7.2
1/29	10.6		30.0	125.0	31.0	-26.4	7.6	-73.6	3.1	83.8	4.9	-133.6	4.1	-144.6
1/30	31.5	180.0	34.6	-155.2	18.2	152.9	7.8	17.1	16.4	179.7	8.9	-69.5	5.2	-65.8
1/31	38.1	180.0	14.5	114.1	33.1	146.4	5.8	80.7	11.3	-112.8	3.2	67.5	8.4	66.2
2/1	3.6		6.3	1.0	20.6	-2.7	9.2	-68.9	14.0	-43.1	14.3	100.9	3.7	132.8
2/2	1.3	180.0	29.6	-117.3	3.3	120.8	12.9	-28.1	2.7	19.6	10.1	-139.0	4.1	176.8
2/3	5.2	180.0	21.6	-138.6	12.1	75.9	8.4	44.4	9.6	54.3	9.0	-157.8	5.8	64.9
2/4	6.6		15.9	-105.1	14.8	-105.3	11.3	106.7	4.8	-130.4	7.4	74.1	9.7	-73.0
2/5	6.4		60.6	-43.4	40.3	-129.3	27.9	-164.1	3.7	15.7	9.5	60.3	4.5	-103.3
2/6	32.0		55.6	-2.7	15.2	20.0	21.0	-117.3	8.6	68.2	6.9	-106.8	9.0	56.3
2/7	8.1	180.0	40.9	111.7	33.4	47.2	24.4	-15.9	12.5	132.3	16.5	-62.2	12.2	-94.4
2/8	10.8	180.0	45.3	127.2	8.1	41.8	20.5	22.2	13.1	-132.5	6.0	96.6	8.6	-137.5
2/9	19.1		10.1	-34.5	17.2	-114.7	30.7	144.2	17.2	-58.6	8.0	41.1	10.4	108.5
2/10	29.2		7.1	75.1	21.7	-145.6	15.2	172.0	10.6	75.7	2.7	-44.9	10.4	79.2
2/11	26.6		32.4	121.6	13.5	61.4	16.0	-6.2	22.5	89.2	6.2	143.0	4.1	123.4
2/12	21.9		16.8	168.0	38.9	60.7	15.0	-42.6	3.3	-82.2	10.5	-104.3	5.0	-67.9
2/13	7.9		39.2	-45.2	14.0	-126.1	15.4	86.9	17.2	-138.3	1.9	-159.2	4.6	-12.1
2/14	46.9	180.0	9.0	131.0	31.4	-125.5	22.2	54.9	11.4	-113.0	13.1	21.6	3.2	-164.8
2/15	55.3	180.0	68.7	-174.7	10.0	-84.0	25.7	-117.0	16.1	-57.7	4.4	63.8	8.1	-153.7
2/16	20.1	180.0	83.4	-93.1	12.0	0.8	9.2	-144.1	8.4	60.3	19.6	167.7	11.1	1.1
2/17	10.1	180.0	100.1	-12.5	23.8	126.0	10.2	69.2	21.8	105.2	8.2	-104.5	4.7	27.3
2/18	4.3		74.5	66.8	21.7	65.0	12.1	-61.3	7.6	94.6	5.9	-119.0	6.1	172.8
2/19	20.9		86.7	148.5	24.3	11.6	12.2	143.3	21.6	-94.3	4.9	167.0	5.4	-132.2
2/20	19.7		31.0	-124.5	21.7	-162.2	24.6	99.2	6.2	-50.2	15.8	20.0	11.3	-3.0
2/21	16.1		41.1	-30.3	32.8	-98.7	17.4	-137.4	17.6	-62.5	14.2	-17.1	6.2	155.9
2/22	8.9		35.7	15.3	18.0	30.5	38.5	-102.7	15.2	84.8	6.5	-152.9	6.4	120.4
2/23	36.1	180.0	30.0	76.6	22.9	85.6	17.9	-51.2	27.7	85.2	12.3	128.9	12.0	-56.1
2/24	15.8	180.0	77.7	174.2	19.3	-165.3	31.0	83.2	16.5	-93.7	6.3	58.9	4.6	-74.8
2/25	21.1		51.3	-154.1	16.6	-84.1	23.0	117.5	26.3	-105.8	7.3	-67.5	11.5	119.7
2/26	32.5		29.0	-40.0	9.3	73.0	23.6	-41.6	4.4	99.3	10.9	-98.3	6.5	116.9
2/27	3.7		53.7	1.6	16.5	95.9	31.7	-32.8	11.8	53.1	6.2	84.9	0.4	-76.8
2/28	31.1	180.0	48.1	25.8	5.2	104.8	9.9	45.2	14.3	71.0	11.2	76.6	5.7	-102.3
2/29	3.7	180.0	17.5	80.2	26.1	-108.6	32.3	164.2	6.5	138.5	11.8	121.1	3.4	50.6
3/1	34.9		35.5	165.5	32.7	-52.0	23.0	-156.5	11.8	-153.5	11.8	-125.7	4.1	-170.6
3/2	19.9	180.0	37.2	-132.2	28.1	18.6	18.7	-2.0	14.5	-137.9	10.3	-77.7	7.5	-123.1
3/3	50.6	180.0	12.1	-130.3	68.2	124.8	22.5	62.2	12.9	36.4	5.1	92.7	11.0	-1.4
3/4	1.8		17.3	79.3	41.7	-146.0	19.6	123.7	13.1	-24.4	1.5	-154.1	3.1	148.3
3/5	28.7		22.8	-124.7	42.1	-74.8	20.3	-112.8	6.7	68.9	8.6	-111.4	10.3	150.6
3/6	4.6	180.0	12.8	-97.3	40.9	30.1	29.0	-86.8	11.2	134.8	6.9	33.5	3.9	18.9
3/7	47.2	180.0	51.5	44.3	28.2	75.7	16.4	53.4	3.6	-102.7	2.9	143.3	9.7	14.4
3/8	27.0	180.0	58.6	93.6	31.1	-104.7	20.5	56.3	18.7	-75.7	4.0	-36.0	14.6	-5.4

Date														
3/9	7.1		86.0	-165.3	26.2	-119.7	21.6	-107.9	4.9	-78.1	5.1	81.6	17.3	-167.7
3/10	19.6		117.7	-121.6	21.0	136.3	3.2	-120.2	13.5	133.5	9.1	105.3	6.7	149.4
3/11	41.6		80.0	-19.4	17.6	164.7	19.3	71.5	1.4	-140.1	8.2	-27.9	8.7	-70.0
3/12	78.6		129.2	32.7	24.9	-20.6	17.3	-34.0	16.1	27.4	7.8	-87.6	5.6	64.9
3/13	12.5		35.1	79.5	23.9	19.5	8.1	-134.6	12.1	168.7	9.7	-68.6	4.5	61.1
3/14	3.9	180.0	39.7	-153.5	25.7	116.0	14.3	175.1	9.0	173.6	16.9	64.4	4.4	-133.1
3/15	36.7		35.2	-58.0	10.1	-128.8	4.3	37.6	7.0	-7.0	4.7	105.5	7.5	-65.7
3/16	3.5	180.0	18.8	2.8	28.4	-5.0	21.9	134.3	8.9	43.2	18.9	-131.3	4.2	-120.5
3/17	42.6	180.0	46.4	101.9	6.3	67.3	17.3	-171.7	6.3	71.4	12.0	-133.4	9.5	115.8
3/18	30.3	180.0	20.3	160.6	20.0	-131.8	19.2	-22.3	10.7	-103.5	7.0	30.2	6.7	125.3
3/19	29.6	180.0	56.4	-123.8	6.7	55.5	23.8	16.3	10.3	-128.0	8.5	98.4	2.2	-90.9
3/20	18.2	180.0	35.3	-78.3	2.6	-4.7	5.8	152.4	5.3	-131.0	10.0	113.2	9.3	-60.9
3/21	13.3		38.5	21.7	21.9	-112.0	18.2	-179.6	15.4	97.4	9.0	-55.4	5.3	17.6
3/22	9.1	180.0	25.6	64.1	23.7	160.5	18.2	-64.8	8.4	133.6	9.1	-9.8	5.1	152.3
3/23	0.7		22.1	94.5	37.6	108.0	17.8	-23.2	11.1	-19.8	7.9	-144.8	5.0	-103.4
3/24	38.4		35.1	170.1	25.8	122.1	9.0	127.3	12.0	-2.4	8.6	-174.2	5.5	34.5
3/25	9.3		11.6	159.0	30.4	-55.0	23.0	163.9	7.4	97.3	7.1	-14.0	4.0	87.9
3/26	45.9	180.0	11.7	-42.9	46.1	-40.5	15.4	-175.0	11.2	-94.7	4.6	-117.8	3.1	9.6
3/27	26.9	180.0	9.6	-69.0	13.3	22.3	18.8	-4.6	18.9	-82.1	7.2	100.9	7.5	-15.1
3/28	54.0		31.3	-176.0	28.4	-169.3	33.6	1.2	7.5	-45.8	4.5	60.1	8.6	-161.9
3/29	63.1		16.6	-144.1	4.9	133.1	14.5	150.3	14.7	-164.2	6.4	23.4	11.0	164.7
3/30	16.8	180.0	30.5	4.6	5.8	-165.7	32.0	146.4	23.2	117.4	2.3	24.3	4.4	-37.6
3/31	65.3	180.0	17.3	99.5	21.5	53.8	5.9	-36.4	14.2	75.6	7.2	-145.5	3.1	3.6
4/1	20.0	180.0	38.0	-138.4	22.4	35.7	31.2	-56.6	11.5	-90.3	10.8	-103.5	4.1	52.3
4/2	0.2		33.7	-63.9	9.9	-89.7	19.6	-66.3	11.5	-82.5	2.9	14.0	5.0	51.3
4/3	2.8	180.0	20.3	43.8	29.5	-117.2	33.3	134.6	8.1	-17.9	22.8	68.6	3.3	15.1
4/4	1.1		43.9	160.5	12.6	-138.0	24.2	146.2	8.1	24.2	4.5	107.3	15.7	-163.0
4/5	25.8		37.6	-75.0	4.0	57.4	15.9	-77.5	11.5	25.1	10.1	-118.9	4.9	152.4
4/6	8.9	180.0	96.1	8.4	14.3	80.3	21.6	-68.8	11.0	-140.7	10.0	-136.3	4.4	64.3
4/7	1.0	180.0	84.9	78.9	34.0	80.9	18.2	7.4	4.8	-133.3	6.1	145.0	13.2	-28.4
4/8	7.3		102.7	151.9	6.4	156.7	30.9	59.3	12.6	85.3	15.4	16.9	2.8	-86.5
4/9	33.7	180.0	84.3	-140.8	34.6	-77.7	8.8	114.8	20.8	131.7	5.1	-13.1	3.9	-26.4
4/10	20.3	180.0	77.4	-101.9	11.0	-48.0	10.5	-129.2	14.7	167.0	12.8	-172.5	2.8	96.8
4/11	3.3	180.0	62.0	-46.2	23.0	108.0	8.5	-149.0	19.4	-46.3	1.7	163.6	11.2	164.7
4/12	26.3		89.1	4.4	22.1	-158.9	9.5	74.9	17.6	-5.5	7.9	-40.4	5.8	-156.3
4/13	53.8		75.6	60.5	12.0	72.4	13.8	55.5	5.7	-84.2	5.7	176.0	4.7	-2.9
4/14	15.0		73.4	112.3	16.0	109.4	22.1	-144.2	12.4	-166.2	6.7	133.1	7.1	-14.2
4/15	13.7	180.0	64.5	-160.5	29.6	-79.1	19.4	-89.0	14.5	146.2	8.5	-4.6	7.2	14.7
4/16	30.5	180.0	58.4	-82.5	31.0	-8.7	19.7	-24.1	7.4	40.5	7.9	-81.1	7.2	-146.2
4/17	19.1		39.9	33.6	21.6	41.9	18.2	150.2	18.6	-77.8	7.9	116.6	4.7	-68.5
4/18	9.8		23.9	150.2	40.1	-176.0	18.2	135.7	6.7	62.8	6.5	43.7	3.3	-167.7
4/19	29.2	180.0	36.5	-112.9	14.8	-110.8	11.5	-53.0	29.6	64.3	9.8	-102.6	7.2	101.7
4/20	36.2	180.0	34.4	-24.2	4.3	47.8	21.6	46.8	4.1	-137.0	10.2	-103.8	3.9	70.7
4/21	21.9		52.0	49.1	14.4	27.7	17.9	32.9	20.3	-130.1	3.4	-21.7	3.3	94.6
4/22	15.6		37.1	118.8	7.5	86.5	12.1	-100.9	13.2	-73.9	13.2	119.5	2.1	-20.6
4/23	17.1		46.3	-152.2	14.8	-147.0	27.3	-122.9	2.1	127.2	5.1	79.6	0.7	69.3
4/24	45.8		39.5	-116.7	26.0	-128.2	3.4	166.4	13.7	91.3	12.2	-15.7	3.6	-96.4
4/25	2.9	180.0	22.3	-11.4	15.0	114.1	12.9	66.9	8.4	79.9	7.5	-33.7	8.9	-89.5
4/26	0.2		30.5	34.7	17.0	79.5	14.0	84.7	10.6	-61.6	13.5	-170.1	3.0	88.8
4/27	4.2	180.0	25.0	84.4	24.1	-2.4	10.6	163.9	2.4	-91.2	4.7	143.3	5.7	77.9
4/28	49.0	180.0	19.3	160.1	19.2	15.5	19.6	-110.6	2.7	-167.4	5.7	130.7	0.9	23.2
4/29	32.9	180.0	29.0	-162.1	3.4	-47.0	19.1	-64.4	4.3	-166.3	6.7	54.3	6.5	-129.5
4/30	1.0		32.3	-138.9	24.0	-134.0	31.8	65.8	8.4	68.6	4.9	2.3	3.5	-51.3
5/1	35.9		29.2	-64.1	25.5	-91.9	20.5	115.4	8.3	-164.8	10.1	-164.0	4.6	169.5
5/2	16.1		30.3	-6.8	9.3	87.5	21.2	-97.0	1.2	42.9	7.0	31.2	5.3	173.2
5/3	4.8	180.0	29.1	59.8	19.9	112.7	19.6	-42.5	25.1	-15.5	7.4	-16.8	7.4	3.4
5/4	14.3	180.0	33.5	166.8	4.9	9.8	18.4	83.1	6.9	22.6	5.4	-89.5	12.1	112.5
5/5	40.9	180.0	39.5	-78.6	29.6	16.6	22.5	147.5	23.8	-172.2	8.1	-93.2	9.5	30.8
5/6	20.1	180.0	45.2	-11.5	25.7	159.3	31.0	-119.5	28.6	-166.9	3.9	-79.5	6.1	-49.0
5/7	2.2	180.0	43.4	95.6	35.4	-146.8	4.8	-65.5	5.2	9.1	9.0	93.0	2.6	168.1
5/8	14.1		47.3	169.3	8.5	-70.7	16.0	40.4	11.4	-7.2	12.2	107.8	9.5	-118.0
5/9	13.9		32.2	-116.2	43.8	40.2	19.5	73.1	12.7	10.6	8.3	-30.3	8.1	-135.2
5/10	13.9		30.5	-15.3	14.9	64.0	8.7	-53.9	12.6	3.5	4.3	-139.2	7.5	79.1
5/11	10.1		61.1	56.0	24.1	-149.4	14.8	-132.7	12.8	-62.2	18.8	163.6	14.1	73.4
5/12	26.2		55.9	138.5	10.8	-155.1	16.8	-155.3	18.6	138.3	8.2	26.7	5.1	-142.5
5/13	12.9		77.9	-148.1	17.4	-26.8	14.6	-60.2	13.9	158.2	10.4	-40.8	14.2	-81.6
5/14	9.9	180.0	74.4	-77.2	11.3	-62.1	21.1	6.9	9.3	-129.1	4.6	-112.3	6.5	-1.0
5/15	0.3	180.0	84.5	5.1	2.8	-170.3	22.8	44.6	12.6	26.5	2.4	33.2	9.0	34.2
5/16	4.2	180.0	107.5	62.4	22.4	-154.7	17.6	163.6	18.2	47.0	7.5	-108.0	3.8	-111.7
5/17	27.1	180.0	65.7	146.4	5.6	-155.1	16.4	-129.1	7.0	-89.7	3.5	139.0	10.8	-178.9
5/18	9.7	180.0	109.5	-134.8	14.3	74.2	15.4	-18.5	20.2	-131.3	9.1	111.5	6.0	99.9
5/19	6.9		80.5	-50.9	13.3	-63.0	11.6	48.4	11.0	98.5	8.1	12.5	5.6	-78.3
5/20	13.0		57.0	52.3	15.9	6.9	15.4	105.9	12.1	99.6	12.1	-57.2	2.4	-122.0
5/21	2.5	180.0	55.9	132.6	23.2	91.9	18.1	161.0	2.5	-166.4	6.8	-121.1	2.1	165.4
5/22	1.4		32.9	-172.7	8.0	8.7	20.4	-134.4	4.1	-65.8	12.9	77.4	4.4	-23.4
5/23	23.6		53.7	-62.0	26.5	-72.9	22.8	-32.7	21.9	-78.5	9.1	108.3	2.8	94.2
5/24	1.5	180.0	62.2	-6.6	18.1	-155.7	15.7	37.9	7.5	19.8	13.4	-133.7	2.0	154.0
5/25	21.5	180.0	55.5	73.1	30.0	125.1	28.4	152.7	19.7	75.3	4.7	-117.2	5.1	-5.4
5/26	12.6		76.6	136.9	7.4	169.7	7.3	-127.9	15.1	160.7	3.0	-20.1	3.0	151.1
5/27	30.3		61.7	-168.0	11.9	-64.6	37.4	-16.6	13.9	-133.1	4.4	74.2	5.5	118.7
5/28	2.9	180.0	58.7	-91.3	13.9	-10.1	25.7	33.5	11.2	-7.2	8.9	-69.6	8.1	21.2
5/29	40.8	180.0	88.6	-35.1	6.5	25.1	22.6	-173.7	8.2	-97.2	14.7	-29.5	8.5	-96.7
5/30	2.1	180.0	46.4	18.4	14.7	-173.3	42.4	-160.7	13.9	-152.9	12.2	100.0	11.4	145.5
5/31	48.5		56.7	130.6	13.4	15.9	10.8	-159.8	12.3	28.9	9.4	115.3	2.3	112.8

Date														
6/1	**0.6**	180.0	**33.3**	-174.5	**24.0**	12.7	**19.7**	15.2	**9.2**	70.2	**2.6**	115.8	**15.5**	-68.7
6/2	**45.5**	180.0	**36.7**	-37.1	**28.6**	150.4	**12.5**	0.2	**14.5**	117.0	**10.1**	-156.8	**5.6**	-6.9
6/3	**19.6**	180.0	**42.9**	26.9	**15.1**	-88.6	**4.0**	138.5	**2.4**	168.5	**5.3**	-139.4	**5.4**	130.0
6/4	**8.1**		**24.5**	95.0	**11.3**	-17.5	**15.1**	108.5	**18.7**	-29.0	**3.3**	-122.0	**4.1**	120.6
6/5	**23.4**		**51.7**	-157.5	**25.6**	160.2	**8.3**	134.7	**12.1**	-54.9	**5.3**	33.9	**1.8**	-14.5
6/6	**6.3**		**10.0**	-104.1	**17.7**	-176.4	**24.0**	-73.8	**15.0**	-118.9	**6.7**	-37.4	**2.8**	-71.2
6/7	**7.6**		**23.1**	99.3	**30.3**	-70.9	**13.2**	-51.9	**10.3**	88.7	**6.7**	-18.4	**3.6**	13.7
6/8	**2.9**		**22.6**	-172.4	**28.1**	19.9	**27.2**	59.3	**15.7**	98.0	**5.5**	-130.2	**7.8**	122.8
6/9	**21.2**	180.0	**24.2**	-107.2	**42.6**	97.4	**17.1**	103.0	**8.4**	96.1	**19.3**	136.2	**9.5**	-163.1
6/10	**7.1**		**17.0**	-7.4	**20.0**	-166.8	**19.7**	-92.0	**19.5**	-70.8	**8.3**	109.8	**11.1**	-123.1
6/11	**31.9**		**21.6**	17.1	**40.7**	-73.0	**20.3**	-94.2	**5.9**	-87.8	**7.2**	13.3	**8.0**	17.7
6/12	**8.4**	180.0	**21.7**	-166.1	**11.8**	-1.4	**3.8**	35.5	**10.1**	162.5	**13.6**	-81.4	**13.0**	27.6
6/13	**25.1**	180.0	**47.3**	-155.1	**31.4**	142.8	**22.0**	109.8	**9.7**	-150.6	**12.2**	-81.1	**2.6**	90.4
6/14	**0.3**	180.0	**20.3**	-76.6	**16.6**	-144.2	**6.9**	-178.8	**3.8**	-167.0	**3.2**	-40.5	**2.5**	133.3
6/15	**4.1**		**17.1**	-8.5	**36.2**	-3.8	**6.3**	29.7	**6.8**	106.8	**15.1**	71.4	**6.0**	79.1
6/16	**12.7**	180.0	**29.5**	52.1	**33.5**	51.0	**5.4**	-71.7	**7.1**	-10.4	**8.9**	72.4	**8.1**	-36.3
6/17	**20.5**	180.0	**37.8**	23.9	**2.2**	124.9	**13.4**	-152.3	**7.7**	13.1	**4.1**	-123.2	**11.3**	-135.7
6/18	**25.8**	180.0	**15.2**	-47.7	**15.8**	-48.3	**16.1**	-90.8	**15.1**	51.4	**9.5**	-115.4	**6.3**	-179.4
6/19	**4.9**	180.0	**1.0**	17.0	**9.2**	-130.2	**20.4**	150.7	**5.2**	130.3	**7.4**	-151.9	**4.1**	152.1
6/20	**3.3**		**11.9**	84.7	**42.3**	-157.8	**13.1**	132.7	**11.4**	-148.6	**10.7**	47.4	**4.9**	-13.6
6/21	**5.3**	180.0	**35.1**	119.4	**21.4**	-165.6	**17.1**	-25.7	**21.6**	-92.8	**4.5**	137.3	**5.7**	-29.6
6/22	**0.7**	180.0	**25.9**	168.0	**25.7**	36.6	**11.7**	14.2	**17.2**	-27.9	**2.2**	87.9	**2.1**	-29.7
6/23	**2.7**	180.0	**51.1**	-146.8	**24.8**	45.6	**23.1**	2.8	**11.5**	61.0	**11.1**	-46.0	**3.7**	178.6
6/24	**29.2**		**41.0**	-155.8	**9.4**	121.3	**9.8**	109.8	**19.7**	138.6	**8.3**	175.4	**7.8**	84.1
6/25	**10.5**		**40.8**	-38.6	**6.9**	56.5	**19.0**	-156.3	**16.8**	177.2	**5.8**	96.9	**6.6**	150.1
6/26	**1.1**		**48.7**	-3.9	**10.6**	-134.8	**15.8**	-136.3	**13.1**	-69.4	**7.9**	27.6	**4.8**	-131.1
6/27	**18.9**	180.0	**62.0**	42.5	**19.9**	-95.8	**7.6**	-35.1	**14.7**	12.4	**4.7**	-86.5	**14.6**	-53.6
6/28	**20.6**	180.0	**64.2**	46.9	**25.7**	-23.1	**17.6**	79.1	**12.0**	81.5	**5.6**	174.2	**4.1**	-20.0
6/29	**42.1**		**40.2**	129.4	**4.6**	109.6	**23.0**	50.3	**9.1**	57.6	**9.0**	-49.6	**8.9**	-174.4
6/30	**74.7**		**80.2**	-150.1	**7.5**	114.3	**7.3**	-107.6	**12.7**	-108.0	**9.3**	93.6	**8.4**	111.6
7/1	**38.2**		**77.3**	-87.4	**19.0**	87.1	**21.4**	-137.5	**21.0**	-138.7	**11.7**	148.4	**9.5**	52.1
7/2	**28.0**	180.0	**76.8**	8.2	**19.1**	154.0	**8.0**	-42.1	**4.7**	-100.5	**12.6**	-91.7	**3.0**	-27.3
7/3	**4.8**		**87.2**	73.1	**31.0**	-132.7	**11.1**	3.9	**14.2**	59.6	**13.0**	-46.2	**5.1**	-79.8
7/4	**12.9**		**78.7**	140.9	**13.2**	-87.1	**14.2**	95.3	**11.2**	62.6	**5.4**	171.2	**10.7**	151.8
7/5	**17.8**	180.0	**98.2**	-142.2	**22.8**	36.8	**2.7**	173.0	**8.4**	78.5	**13.9**	143.9	**4.2**	112.0
7/6	**33.5**	180.0	**97.4**	-105.3	**10.6**	37.2	**8.2**	-68.6	**4.9**	-34.8	**5.7**	7.2	**21.7**	-10.3
7/7	**13.8**	180.0	**78.2**	-5.1	**14.2**	-138.5	**3.8**	-127.2	**8.8**	-65.5	**8.6**	-68.1	**7.1**	-158.3
7/8	**33.7**	180.0	**95.4**	45.6	**20.1**	-112.1	**15.0**	-90.9	**2.0**	-37.7	**5.2**	152.9	**13.7**	-148.9
7/9	**16.5**	180.0	**64.1**	131.1	**12.9**	-129.1	**4.1**	48.9	**24.0**	125.4	**21.1**	69.4	**9.9**	-137.6
7/10	**15.1**		**76.3**	-162.5	**9.6**	84.3	**18.3**	80.6	**12.1**	178.9	**4.3**	-16.8	**7.8**	-11.5
7/11	**11.9**	180.0	**81.0**	-85.1	**16.1**	49.0	**3.9**	175.6	**15.7**	-73.7	**13.2**	-81.1	**13.9**	17.2
7/12	**6.9**	180.0	**68.9**	-26.0	**18.3**	4.0	**12.3**	171.0	**19.8**	-61.8	**8.3**	-40.9	**16.9**	84.4
7/13	**25.9**		**66.4**	61.6	**22.2**	-7.7	**8.5**	105.4	**6.0**	-75.3	**4.6**	88.9	**9.0**	112.8
7/14	**11.4**	180.0	**71.6**	141.1	**9.1**	68.3	**3.9**	121.9	**19.3**	135.4	**2.7**	15.9	**11.2**	-152.1
7/15	**3.9**	180.0	**32.4**	-132.7	**33.5**	-179.6	**7.8**	-114.4	**13.6**	39.6	**14.6**	-176.9	**7.4**	-68.2
7/16	**4.1**		**49.5**	-39.1	**11.7**	151.2	**19.2**	-83.4	**15.0**	42.8	**10.1**	-147.1	**2.5**	-11.9
7/17	**1.7**		**24.7**	25.8	**13.0**	80.1	**14.2**	-43.1	**13.0**	-129.7	**6.3**	-38.8	**6.1**	141.7
7/18	**25.4**		**38.2**	148.0	**20.2**	-142.5	**10.1**	57.6	**17.0**	-95.0	**13.3**	52.7	**7.7**	5.5
7/19	**3.4**		**23.9**	-173.8	**18.7**	-38.2	**9.9**	-103.7	**4.5**	-115.9	**7.1**	17.9	**11.4**	-99.9
7/20	**22.7**	180.0	**11.5**	63.3	**35.7**	1.9	**11.8**	-132.9	**12.1**	86.2	**5.2**	-5.0	**8.1**	-141.5
7/21	**1.3**	180.0	**21.4**	113.3	**15.6**	128.5	**28.0**	93.6	**10.9**	94.1	**16.1**	179.2	**14.7**	66.5
7/22	**1.3**		**22.6**	-111.7	**36.3**	160.5	**21.4**	56.8	**10.1**	-0.5	**10.7**	-126.9	**14.7**	75.9
7/23	**15.9**	180.0	**23.7**	-80.7	**15.4**	-175.7	**12.0**	-33.5	**4.5**	-69.6	**5.6**	-73.3	**11.0**	-121.6
7/24	**4.1**	180.0	**29.1**	-22.8	**36.1**	-6.7	**6.0**	93.2	**17.2**	-128.0	**8.0**	89.5	**13.9**	-98.5
7/25	**44.6**		**17.3**	-18.5	**30.2**	-19.5	**10.2**	-173.8	**14.2**	-71.3	**10.7**	56.6	**4.5**	68.4
7/26	**38.1**		**46.6**	67.8	**22.7**	-141.5	**19.9**	-134.5	**12.8**	73.0	**4.9**	3.9	**6.4**	-162.2
7/27	**25.2**	180.0	**37.1**	107.7	**25.9**	-172.3	**20.9**	-129.1	**33.4**	114.3	**13.1**	48.1	**6.5**	-115.8
7/28	**58.2**	180.0	**54.0**	-131.5	**11.6**	77.2	**5.1**	39.7	**7.4**	123.5	**12.8**	172.3	**8.6**	39.7
7/29	**43.7**	180.0	**44.6**	-119.4	**20.3**	11.2	**27.0**	34.7	**33.7**	-71.2	**11.8**	-130.6	**11.9**	47.4
7/30	**8.3**		**8.8**	54.3	**14.5**	-106.2	**4.8**	-144.5	**21.6**	-106.9	**14.8**	-78.9	**7.9**	-69.5
7/31	**34.8**		**23.0**	26.6	**40.3**	167.3	**7.9**	-146.9	**7.0**	69.5	**4.6**	-27.6	**14.3**	-153.8
8/1	**42.2**		**36.2**	53.1	**6.6**	-121.7	**12.3**	17.7	**21.8**	47.5	**11.1**	84.0	**10.3**	101.2
8/2	**18.5**		**23.3**	158.4	**47.5**	-33.3	**27.7**	39.4	**10.5**	74.3	**3.8**	51.1	**4.2**	9.7
8/3	**3.9**		**43.6**	-113.1	**24.8**	52.9	**6.2**	-73.9	**23.1**	157.8	**12.9**	-150.1	**2.1**	173.8
8/4	**15.2**	180.0	**43.3**	-66.3	**37.1**	90.1	**36.9**	-142.8	**7.6**	-120.0	**5.5**	-134.3	**3.7**	-20.5
8/5	**24.4**		**26.5**	29.1	**6.2**	166.8	**13.6**	179.5	**19.9**	-42.6	**9.1**	35.6	**7.5**	-86.3
8/6	**10.5**		**46.3**	67.2	**9.8**	-61.5	**3.8**	-8.0	**13.4**	18.9	**3.9**	4.2	**6.6**	21.5
8/7	**32.2**	180.0	**53.0**	125.2	**17.2**	132.2	**18.2**	-50.6	**9.1**	92.3	**4.8**	88.0	**6.4**	110.4
8/8	**30.5**	180.0	**31.4**	-160.7	**21.8**	-153.6	**21.7**	67.2	**19.1**	168.4	**6.9**	161.3	**3.9**	-174.5
8/9	**15.2**	180.0	**33.9**	-79.7	**37.7**	-87.1	**22.5**	100.2	**12.9**	-137.3	**16.4**	-64.4	**5.1**	-96.9
8/10	**3.7**	180.0	**14.6**	-12.5	**18.7**	28.0	**30.0**	-121.5	**2.9**	-60.7	**3.1**	-59.6	**2.8**	5.4
8/11	**22.4**		**23.2**	67.4	**7.8**	74.6	**4.5**	-106.4	**14.4**	49.1	**7.3**	132.3	**8.3**	100.6
8/12	**45.4**		**34.1**	154.1	**28.5**	-140.4	**35.6**	40.6	**5.4**	36.3	**4.0**	80.8	**6.0**	-126.3
8/13	**15.1**		**23.0**	-91.4	**5.5**	34.8	**7.0**	-5.7	**6.4**	-116.0	**6.4**	-29.0	**4.7**	-80.3
8/14	**38.2**	180.0	**55.1**	-29.0	**45.0**	41.4	**33.6**	-144.8	**9.7**	-115.4	**4.9**	-173.6	**6.2**	24.2
8/15	**1.2**		**21.8**	41.8	**16.7**	65.5	**18.2**	86.6	**13.6**	-68.4	**8.3**	83.7	**1.9**	-52.0
8/16	**18.0**		**27.1**	86.7	**27.5**	-106.5	**15.9**	103.4	**7.1**	91.5	**2.4**	143.7	**8.3**	174.7
8/17	**1.3**	180.0	**38.6**	174.8	**20.6**	-155.4	**13.1**	-58.8	**23.3**	95.4	**8.0**	-15.7	**9.1**	144.2
8/18	**9.4**	180.0	**51.4**	-152.1	**9.4**	167.9	**22.1**	-59.9	**5.2**	-37.0	**12.1**	-45.4	**5.9**	-86.2
8/19	**42.5**	180.0	**54.4**	-83.5	**12.5**	-177.1	**2.4**	-57.2	**17.1**	-110.4	**4.2**	127.6	**10.8**	-0.5
8/20	**8.5**	180.0	**54.9**	-29.0	**12.9**	47.2	**13.6**	141.6	**8.9**	-137.3	**5.4**	120.1	**12.9**	27.2
8/21	**0.5**	180.0	**53.7**	80.2	**15.1**	68.2	**25.5**	159.2	**7.2**	-97.4	**19.4**	176.2	**3.7**	159.9
8/22	**0.5**		**65.2**	117.0	**6.8**	-165.7	**11.4**	-53.0	**9.3**	43.6	**11.7**	131.6	**5.7**	74.7
8/23	**25.4**		**43.6**	-153.0	**13.3**	-8.0	**34.2**	-13.7	**22.6**	7.7	**11.6**	-29.8	**6.6**	163.7

Date														
8/24	3.2		63.7	-64.6	14.3	-58.6	16.1	-0.6	6.0	-95.3	7.7	-57.4	11.3	-113.2
8/25	0.3		50.0	3.6	9.4	-44.4	19.4	155.9	24.0	157.2	6.4	-81.1	10.5	-123.6
8/26	41.5		74.9	61.1	2.7	130.6	33.6	166.5	9.9	-179.2	7.5	48.8	6.8	15.6
8/27	5.4		36.7	131.2	24.8	-174.8	13.1	-147.2	10.8	-1.7	7.1	-17.4	1.8	-27.5
8/28	39.4	180.0	86.9	-142.8	9.2	-142.6	16.5	-28.6	13.8	36.4	10.7	-111.2	6.4	83.1
8/29	10.1		39.3	-79.8	27.5	-6.8	23.1	34.5	10.7	-173.8	9.9	124.5	3.1	164.4
8/30	33.9		61.9	7.1	24.8	67.0	14.0	65.8	10.0	157.9	16.9	94.3	3.1	-147.0
8/31	2.8	180.0	50.6	83.7	26.6	135.9	6.6	-52.4	14.4	2.6	9.0	-36.1	2.8	-134.4
9/1	7.0	180.0	50.6	151.2	14.6	-103.3	19.2	-56.5	20.2	-52.6	15.0	-127.0	8.6	17.2
9/2	13.5		66.3	-137.2	16.7	-48.9	22.3	-129.5	7.7	-144.2	4.0	166.3	4.4	17.1
9/3	9.0		36.1	-57.8	7.4	-60.0	29.1	149.6	21.9	119.2	3.2	-127.2	12.1	168.8
9/4	18.3	180.0	52.4	39.8	15.6	167.2	19.3	140.6	17.7	125.9	11.5	6.5	5.3	168.8
9/5	17.0	180.0	15.7	56.5	21.0	133.6	22.2	-50.1	15.3	-73.7	14.9	32.1	18.2	-16.5
9/6	12.1		17.8	-171.5	10.3	-154.0	23.4	45.7	32.3	-57.8	14.8	148.9	4.9	115.9
9/7	4.6		20.4	18.0	23.6	-56.7	12.5	124.4	9.7	139.6	13.7	-150.6	10.5	151.7
9/8	58.4	180.0	37.3	31.8	25.5	-16.1	18.6	-111.8	24.1	88.6	14.7	-45.8	10.1	-66.9
9/9	58.3	180.0	9.8	-49.8	6.4	-65.2	23.4	-98.2	5.7	-74.2	4.5	50.6	10.0	-85.8
9/10	15.8	180.0	46.9	-136.7	30.1	160.8	22.7	17.1	15.2	-152.2	11.4	44.9	9.6	-176.4
9/11	31.6		56.5	-166.9	24.2	104.7	21.3	83.0	14.7	8.6	1.9	19.6	9.2	71.4
9/12	26.9		35.3	178.2	18.9	-57.3	15.8	-125.5	15.4	12.1	6.0	-136.6	8.9	20.3
9/13	3.3	180.0	7.6	-17.8	3.1	173.4	14.1	17.1	6.9	157.9	8.7	-106.1	4.9	90.7
9/14	49.3	180.0	46.9	-13.7	15.7	9.2	23.1	51.8	17.6	-165.7	11.1	149.6	2.5	-43.6
9/15	7.1	180.0	76.0	7.0	12.5	108.9	11.8	-177.8	19.7	-166.1	11.9	104.1	6.0	-54.2
9/16	62.5		34.6	103.7	10.7	35.3	22.0	-110.0	10.3	27.8	3.8	-96.6	6.4	83.0
9/17	28.3		47.8	-170.4	30.3	13.5	19.4	-176.6	27.4	5.2	18.8	-127.6	7.0	171.7
9/18	12.0	180.0	22.2	-92.0	5.3	-149.3	9.8	96.2	20.1	83.9	5.5	-94.6	10.5	-119.0
9/19	5.7	180.0	14.1	-114.4	31.0	-165.3	13.4	15.9	20.8	179.7	20.2	8.8	6.5	-67.3
9/20	13.8		33.5	114.9	0.7	176.9	11.1	-155.6	24.8	-107.3	11.7	50.4	9.9	86.0
9/21	14.7		29.4	114.3	13.9	-128.6	8.8	-101.5	21.5	-73.8	4.7	-163.8	5.5	64.5
9/22	5.2	180.0	24.1	-115.0	9.3	-128.2	11.8	-14.0	2.7	109.9	6.2	28.3	12.1	-33.7
9/23	13.5	180.0	35.9	-82.3	14.0	48.6	23.3	118.1	13.7	8.3	9.3	89.9	7.9	-163.7
9/24	3.6	180.0	18.6	-13.3	19.5	159.0	18.3	-145.0	15.0	63.4	6.6	156.8	9.4	162.7
9/25	15.3		46.4	96.2	14.9	-2.0	35.2	-47.4	21.6	120.4	4.2	-163.0	2.7	-156.4
9/26	0.7		12.3	62.2	34.4	50.6	35.7	29.5	3.3	173.0	5.6	-134.7	4.9	41.6
9/27	16.0	180.0	37.0	-19.5	25.1	-117.2	30.4	133.4	8.0	-90.7	10.0	-96.0	11.4	-0.4
9/28	8.5	180.0	21.4	-2.3	61.0	-106.0	17.6	-158.9	6.2	-76.8	1.7	-66.5	7.3	-126.7
9/29	17.4	180.0	47.5	-136.0	31.6	-36.2	39.5	-52.5	2.7	-92.8	8.1	93.0	9.7	174.1
9/30	4.3		64.9	-127.9	47.3	71.7	15.1	27.0	10.1	-123.2	5.8	-43.8	4.6	75.6
10/1	41.6		22.9	97.4	52.2	106.6	50.9	114.2	6.4	71.2	1.6	-29.9	8.9	48.9
10/2	12.3		61.6	62.2	20.2	-143.6	22.9	109.9	10.2	-4.3	4.9	-47.5	5.0	-48.4
10/3	12.2		31.7	39.5	34.6	-45.1	43.4	-108.3	2.8	-19.8	5.4	112.2	5.0	-172.9
10/4	27.6		26.2	-137.3	12.2	35.1	37.0	-98.0	7.6	104.6	7.1	-166.6	9.4	-148.5
10/5	24.1	180.0	30.6	-74.3	31.3	141.2	19.2	32.9	9.8	142.3	2.2	-49.0	12.2	-67.9
10/6	45.3	180.0	43.8	-1.8	6.7	-148.3	26.7	82.0	11.7	-131.9	3.6	61.7	11.5	32.0
10/7	9.3	180.0	45.4	85.5	5.3	46.1	9.9	113.4	7.8	-40.6	9.4	106.7	12.9	73.8
10/8	2.5		75.0	147.6	24.3	136.6	19.8	-86.7	4.8	-128.3	9.4	-75.0	5.7	121.2
10/9	16.8		86.0	-154.8	26.2	-126.0	25.9	-58.9	8.7	-29.2	8.4	-110.0	11.1	-151.6
10/10	22.9		72.4	-82.4	39.6	-81.7	8.0	122.1	9.6	41.0	9.5	115.7	4.0	177.1
10/11	4.9	180.0	90.5	-17.2	32.2	7.0	17.1	99.8	9.3	98.2	15.0	32.3	10.9	-52.8
10/12	40.0	180.0	79.2	58.4	35.1	102.0	1.9	133.2	10.3	150.8	16.7	-55.3	5.6	-84.4
10/13	4.1		69.2	111.1	33.1	-103.0	6.8	-172.8	9.2	160.5	1.9	-18.1	7.3	40.2
10/14	17.8		41.1	-171.1	32.4	-51.9	4.0	-119.1	3.4	-68.5	10.8	125.0	1.6	14.2
10/15	0.2		60.7	-81.5	44.0	72.7	11.3	36.0	16.9	20.3	14.0	167.8	8.2	118.5
10/16	16.8		40.5	-13.8	45.1	108.3	12.3	37.7	3.3	-135.7	10.4	-124.0	11.8	152.9
10/17	0.3		36.1	110.1	34.6	-146.7	14.5	-149.7	23.3	-127.5	0.8	60.6	2.2	32.4
10/18	16.7		15.6	-155.6	59.9	-90.6	9.6	-138.8	15.8	-93.0	14.0	-15.1	6.8	5.8
10/19	0.8		12.7	-43.3	38.1	-19.3	6.2	102.8	21.6	46.9	12.6	-7.7	11.8	-85.6
10/20	38.9	180.0	13.5	-150.9	53.6	73.7	12.6	26.0	18.8	75.9	12.2	107.2	5.5	-92.0
10/21	35.6	180.0	39.3	-149.7	38.5	133.5	10.8	156.2	16.7	176.0	12.7	163.3	7.1	-171.3
10/22	14.2	180.0	15.5	-42.2	27.3	-155.2	16.9	-104.4	8.3	-137.0	10.7	-103.3	2.6	2.4
10/23	32.0		45.9	7.0	24.7	-58.8	18.0	-29.7	20.9	-20.3	4.9	-2.5	8.3	72.2
10/24	18.6		46.3	67.6	8.4	-76.2	8.1	99.4	4.1	-13.1	7.2	69.5	6.6	49.6
10/25	35.4		62.5	142.5	2.2	129.6	12.4	28.5	5.0	122.5	3.8	148.2	5.0	-120.7
10/26	9.3		77.2	-162.9	15.4	50.7	6.4	-147.2	14.5	-154.1	8.5	-133.8	7.9	-166.3
10/27	19.7	180.0	81.1	-58.7	11.7	113.8	16.7	-176.6	9.6	115.4	1.3	-164.4	2.9	155.7
10/28	17.4		83.6	2.2	19.1	-114.1	17.9	-81.9	8.3	32.9	10.9	4.0	10.0	-61.7
10/29	29.6		50.8	79.4	29.3	-23.8	9.9	71.2	4.6	-44.5	3.5	-135.1	3.4	60.9
10/30	4.7	180.0	44.6	161.0	30.1	82.5	37.9	81.6	5.9	-107.4	5.3	75.3	8.4	104.1
10/31	1.5		15.5	-125.5	35.2	148.9	5.0	-134.4	3.4	38.1	11.6	123.5	7.0	-128.2
11/1	3.7	180.0	19.7	-53.0	27.3	-91.1	36.5	-72.1	2.0	10.5	15.1	-143.8	13.2	-67.4
11/2	71.2	180.0	22.7	-3.1	13.7	-54.4	14.7	162.1	8.1	163.7	18.7	-106.8	8.6	-14.3
11/3	22.6	180.0	11.3	149.8	5.0	125.5	33.2	154.9	13.4	130.7	18.8	19.4	15.3	39.2
11/4	2.2		47.2	169.2	13.9	-131.0	8.5	-46.8	11.5	-122.9	12.3	4.8	13.8	105.4
11/5	4.3		52.0	-151.5	20.1	2.3	31.8	-15.4	29.8	-59.0	10.3	-20.2	14.1	116.7
11/6	14.1	180.0	47.7	-79.1	18.0	99.4	14.4	48.2	9.0	-31.1	7.7	122.1	6.2	-111.4
11/7	10.4		33.2	-14.3	12.6	153.3	20.2	120.8	7.3	135.8	21.3	138.6	7.9	-133.3
11/8	13.2	180.0	44.2	79.0	3.6	-105.2	21.7	-140.8	20.8	53.0	19.3	173.5	8.5	-144.5
11/9	44.6	180.0	20.1	68.4	17.0	-79.2	43.0	-107.4	20.6	77.1	15.3	-19.8	6.5	54.8
11/10	4.3	180.0	21.8	112.7	19.4	38.7	27.5	-20.6	20.3	-127.3	23.2	-18.6	16.3	-37.8
11/11	25.6		60.1	149.6	9.4	-168.1	29.5	46.5	18.2	-88.7	4.6	-171.5	9.1	-154.6
11/12	33.5		67.0	-146.6	29.1	-62.8	37.9	75.9	6.5	-17.5	20.4	148.4	18.2	127.6
11/13	40.9		98.7	-48.2	24.3	64.0	21.6	117.2	15.3	99.6	4.9	-159.7	7.4	2.3
11/14	24.0		138.4	10.5	29.9	124.7	28.0	-114.4	18.5	124.6	10.0	-65.5	12.9	-44.0
11/15	16.8	180.0	80.0	86.9	8.5	162.4	13.2	-81.5	6.9	135.7	8.5	-52.1	2.1	-43.0

Date														
11/16	31.7	180.0	83.4	175.0	14.2	1.5	12.1	100.0	1.6	-64.9	5.4	31.5	9.6	167.0
11/17	4.7		64.0	-105.3	31.6	-157.3	15.6	151.4	12.1	-11.0	15.1	138.3	5.4	141.9
11/18	23.3		33.8	3.4	31.6	-130.9	6.0	-154.0	11.6	-120.4	1.5	126.0	2.7	-82.0
11/19	28.4		53.6	64.2	22.0	18.8	16.6	-36.8	16.2	-162.5	3.5	-11.7	5.5	-68.6
11/20	21.8		24.9	109.8	16.5	12.0	8.6	-80.5	8.6	-167.8	11.9	-32.9	3.0	14.7
11/21	26.4	180.0	54.3	-145.6	21.9	-33.1	9.4	-96.9	7.8	-7.3	12.4	-81.2	6.9	22.8
11/22	49.5	180.0	34.5	-98.7	18.1	-150.6	21.9	-166.6	33.2	20.3	2.0	0.4	5.4	-48.5
11/23	13.1	180.0	9.7	-24.5	26.8	-144.8	10.7	88.9	10.8	53.5	12.5	90.0	3.1	-78.4
11/24	6.8		3.2	141.5	22.7	78.0	28.8	34.8	16.7	-165.2	7.5	97.1	18.5	153.5
11/25	7.5		16.4	60.6	36.5	95.1	18.5	18.6	9.6	-129.2	8.7	-166.6	2.0	91.2
11/26	15.3	180.0	10.1	75.3	16.9	-137.1	19.3	-91.7	6.9	-72.9	16.4	-128.5	5.3	-29.3
11/27	6.2	180.0	15.5	-149.7	34.3	-70.4	32.6	-157.2	4.0	-26.2	1.2	-117.3	5.1	62.2
11/28	26.1		38.9	-100.3	31.1	14.0	32.3	138.5	6.4	24.3	19.5	38.7	5.5	-3.9
11/29	7.1		13.2	2.3	6.3	44.0	17.5	65.2	7.2	123.8	5.8	26.7	8.7	-91.8
11/30	5.5	180.0	9.6	77.2	16.0	133.3	31.7	-17.9	6.4	165.0	5.4	-176.5	3.5	-130.5
12/1	57.0		6.4	24.9	5.7	-46.5	24.2	-19.4	5.1	-104.2	4.7	-173.9	12.3	92.7
12/2	13.8		42.4	26.3	26.3	52.6	19.9	153.6	5.9	12.0	7.0	-127.3	13.5	143.7
12/3	62.7	180.0	69.8	74.5	16.2	91.2	16.2	-162.5	2.3	111.0	6.3	-170.6	7.7	-85.6
12/4	51.5	180.0	72.7	-167.5	40.1	-128.0	14.9	-85.4	13.8	136.0	13.6	5.7	15.7	-68.0
12/5	26.5		114.0	-109.3	34.0	-98.5	1.9	62.5	14.9	-103.9	13.3	66.6	9.0	-98.5
12/6	18.9		60.6	-13.1	18.7	110.2	9.5	12.3	13.9	-60.3	6.4	-164.9	5.3	107.5
12/7	6.1	180.0	104.8	72.3	32.3	96.6	22.6	55.1	24.4	70.1	13.5	-135.0	17.7	63.9
12/8	15.4	180.0	41.7	124.2	8.3	5.7	11.8	-179.5	14.0	88.4	11.7	-109.8	7.0	-3.7
12/9	3.5		60.8	-115.1	20.1	-20.1	16.9	-94.5	16.9	-133.5	13.4	-0.8	6.2	-157.9
12/10	27.5		51.3	-81.2	23.5	-145.8	11.7	-4.0	15.8	-134.2	16.6	34.1	8.1	108.1
12/11	21.9		46.1	24.9	19.8	-100.1	23.3	112.2	6.4	-16.5	7.6	158.2	7.5	151.9
12/12	8.1		35.2	62.1	26.2	-28.8	36.2	179.1	11.6	41.1	5.6	160.6	1.5	119.1
12/13	22.0		41.6	162.3	21.3	116.4	13.4	-115.7	5.0	-77.7	12.1	-65.7	7.3	-107.6
12/14	16.9	180.0	54.3	-141.3	24.7	169.0	13.9	-29.0	13.5	-128.4	5.8	-148.3	9.1	-59.9
12/15	49.5	180.0	45.8	-104.4	17.3	49.0	21.1	16.7	9.8	-41.0	9.4	47.9	7.2	-0.4
12/16	8.3	180.0	44.4	26.9	25.2	4.2	7.8	-2.2	21.1	31.5	2.9	124.1	6.5	-142.9
12/17	0.4	180.0	56.3	63.2	26.6	-7.5	8.9	-122.8	11.9	99.1	14.8	-163.3	2.5	-38.7
12/18	20.9	180.0	20.6	138.5	13.7	117.5	3.9	124.2	21.4	-164.3	14.3	145.8	14.1	60.0
12/19	8.8	180.0	46.6	-119.7	44.1	169.7	11.1	149.4	12.5	-135.1	12.1	18.5	1.6	148.4
12/20	31.7		55.9	-34.3	14.3	-99.6	9.0	138.2	10.2	11.9	14.2	-14.5	10.9	-119.0
12/21	5.6	180.0	39.6	36.2	24.0	29.9	17.7	-7.1	27.3	13.4	12.2	-70.8	10.9	-90.7
12/22	4.2		59.1	149.5	18.4	99.9	8.9	31.3	7.8	138.5	12.0	161.1	5.2	44.5
12/23	34.5		57.3	165.8	26.5	172.4	36.9	173.7	33.5	154.8	11.6	154.8	9.1	104.5
12/24	7.4		27.1	-137.9	33.0	-103.9	18.7	-121.0	19.9	-154.1	3.1	-174.5	10.7	65.0
12/25	16.9	180.0	19.1	-28.1	47.7	-70.2	47.3	-31.6	34.0	-50.6	8.0	-56.0	8.9	-161.4
12/26	36.3	180.0	3.8	-62.0	41.4	28.9	29.3	17.7	25.8	-0.7	17.1	49.2	9.4	-145.9
12/27	19.2	180.0	28.4	164.5	36.8	127.5	29.7	111.0	26.6	62.2	4.0	47.9	7.9	58.1
12/28	3.0		16.6	179.9	33.0	-109.8	18.0	-176.1	14.2	106.2	2.3	-155.1	13.8	26.3
12/29	19.7		38.6	-53.2	17.3	-61.8	29.2	-55.6	28.8	-131.9	7.6	22.5	9.7	-111.2
12/30														
12/31														

1996 Pressure Wavenumber 1
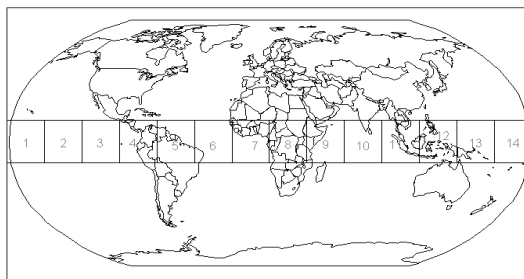
This sheet is for pressure analysis for around the world to find the 5 day pressure wave described by Madden.
This is 1996 ground pressure data filtered spacially and then filtered for wave 1 for Lat: -15 to 15 long: around
 the world in 25.7 degree blocks   This is only wave number 1 as best as it can be reproduced from the pressure data
Units of colored numbers are Pascals. Negative (White Lettering) Postive (Black Lettering)

Day (0 UT)	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1/1														
1/2														
1/3	-53.8	-60.2	-54.7	-38.4	-14.5	12.4	36.7	53.8	60.2	54.7	38.4	14.5	-12.3	-36.7
1/4	-30.6	2.4	34.9	60.5	74.2	73.1	57.6	30.6	-2.4	-34.9	-60.5	-74.2	-73.1	-57.6
1/5	32.2	60.6	77.1	78.2	63.9	36.9	2.6	-32.2	-60.6	-77.1	-78.2	-63.9	-36.9	-2.6
1/6	49.4	39.5	21.7	-0.4	-22.4	-39.9	-49.6	-49.4	-39.5	-21.7	0.4	22.4	39.9	49.6
1/7	21.1	-5.5	-30.9	-50.3	-59.7	-57.2	-43.5	-21.1	5.5	30.9	50.3	59.7	57.2	43.5
1/8	-35.2	-32.1	-22.6	-8.7	7.0	21.3	31.4	35.2	32.1	22.6	8.7	-7.0	-21.3	-31.3
1/9	-54.5	-34.2	-7.2	21.3	45.5	60.7	63.9	54.5	34.2	7.2	-21.2	-45.5	-60.7	-63.9
1/10	-24.3	-17.0	-6.3	5.6	16.4	23.9	26.8	24.3	17.0	6.3	-5.6	-16.4	-23.9	-26.8
1/11	36.2	31.0	19.7	4.4	-11.7	-25.5	-34.2	-36.2	-31.0	-19.7	-4.4	11.7	25.5	34.2
1/12	40.6	29.2	11.9	-7.7	-25.8	-38.7	-44.1	-40.6	-29.2	-11.9	7.7	25.8	38.7	44.1
1/13	-10.4	-16.5	-19.3	-18.3	-13.6	-6.3	2.3	10.4	16.5	19.3	18.3	13.6	6.3	-2.3
1/14	-37.6	-24.6	-6.8	12.4	29.1	40.1	43.1	37.6	24.6	6.8	-12.4	-29.1	-40.1	-43.1
1/15	29.3	45.7	53.0	49.8	36.8	16.4	-7.1	-29.3	-45.7	-53.0	-49.8	-36.8	-16.4	7.1
1/16	47.7	38.7	22.0	1.0	-20.2	-37.4	-47.2	-47.7	-38.7	-22.0	-1.0	20.2	37.4	47.2
1/17	15.8	-13.2	-39.6	-58.1	-65.2	-59.3	-41.7	-15.8	13.2	39.6	58.1	65.2	59.3	41.7
1/18	-28.6	-39.3	-42.3	-37.0	-24.3	-6.7	12.1	28.6	39.3	42.3	37.0	24.3	6.7	-12.1
1/19	-61.6	-37.7	-6.3	26.4	53.8	70.6	73.4	61.6	37.7	6.3	-26.3	-53.8	-70.6	-73.4
1/20	11.6	27.9	38.7	41.8	36.6	24.2	7.0	-11.6	-27.9	-38.7	-41.8	-36.6	-24.2	-7.0
1/21	28.1	34.4	34.0	26.7	14.2	-1.1	-16.2	-28.1	-34.4	-34.0	-26.8	-14.2	1.1	16.2
1/22	29.4	15.9	-0.7	-17.2	-30.2	-37.3	-37.0	-29.4	-15.9	0.7	17.2	30.2	37.3	37.0
1/23	27.2	-5.3	-36.8	-61.0	-73.0	-70.7	-54.3	-27.2	5.3	36.8	61.0	73.0	70.7	54.3
1/24	-36.9	-33.7	-23.9	-9.3	7.1	22.1	32.8	36.9	33.7	23.9	9.3	-7.1	-22.1	-32.8
1/25	-86.9	-52.4	-7.6	38.7	77.3	100.7	104.1	86.9	52.5	7.7	-38.7	-77.3	-100.7	-104.1
1/26	-23.1	-3.3	17.1	34.2	44.4	45.9	38.3	23.1	3.3	-17.1	-34.2	-44.4	-45.9	-38.3
1/27	65.3	48.4	21.9	-8.9	-37.9	-59.5	-69.2	-65.3	-48.4	-22.0	8.9	37.9	59.5	69.2
1/28	56.0	33.3	4.0	-26.2	-51.1	-65.9	-67.7	-56.0	-33.3	-4.0	26.2	51.1	65.9	67.7
1/29	-17.2	-26.2	-29.9	-27.8	-20.1	-8.5	4.8	17.2	26.2	29.9	27.8	20.1	8.5	-4.8
1/30	-31.4	-22.0	-8.2	7.2	21.1	30.9	34.6	31.4	22.0	8.2	-7.2	-21.1	-30.9	-34.6
1/31	-5.9	-11.0	-14.0	-14.2	-11.6	-6.6	-0.4	5.9	11.0	14.0	14.2	11.6	6.6	0.4
2/1	6.3	5.6	3.8	1.3	-1.5	-4.0	-5.7	-6.3	-5.6	-3.8	-1.3	1.5	4.0	5.7
2/2	-13.6	-0.8	12.1	22.6	28.6	29.0	23.6	13.6	0.8	-12.1	-22.6	-28.6	-29.0	-23.6
2/3	-16.2	-8.4	1.1	10.3	17.5	21.2	20.7	16.2	8.4	-1.1	-10.3	-17.5	-21.2	-20.7
2/4	-4.1	2.9	9.4	14.0	15.9	14.6	10.4	4.1	-2.9	-9.4	-14.0	-15.9	-14.6	-10.4
2/5	44.0	57.7	60.0	50.4	30.8	5.2	-21.6	-44.0	-57.7	-60.0	-50.4	-30.8	-5.2	21.5
2/6	55.5	51.2	36.7	14.9	-9.8	-32.5	-48.9	-55.5	-51.2	-36.7	-14.9	9.8	32.5	48.9
2/7	-15.1	-30.1	-39.2	-40.4	-33.7	-20.3	-2.9	15.1	30.1	39.2	40.4	33.7	20.3	2.9
2/8	-27.4	-40.4	-45.3	-41.3	-29.1	-11.2	9.0	27.4	40.3	45.3	41.3	29.1	11.2	-9.0
2/9	8.3	10.0	9.7	7.4	3.7	-0.7	-5.0	-8.3	-10.0	-9.7	-7.4	-3.7	0.7	5.0
2/10	1.8	-1.3	-4.2	-6.3	-7.1	-6.5	-4.6	-1.8	1.3	4.2	6.3	7.1	6.5	4.6
2/11	-16.9	-27.2	-32.1	-30.6	-23.1	-11.0	3.3	16.9	27.2	32.1	30.6	23.1	11.0	-3.3
2/12	-16.4	-16.3	-13.0	-7.1	0.2	7.5	13.3	16.4	16.3	13.0	7.1	-0.2	-7.5	-13.3
2/13	27.7	37.0	39.0	33.3	21.0	4.5	-12.9	-27.7	-37.0	-39.0	-33.3	-21.0	-4.5	12.9
2/14	-5.9	-8.3	-9.0	-7.9	-5.3	-1.6	2.4	5.9	8.3	9.0	7.9	5.3	1.6	-2.4
2/15	-68.4	-58.9	-37.7	-9.1	21.4	47.6	64.4	68.4	58.9	37.7	9.1	-21.4	-47.6	-64.4

2/16	-4.5	32.1	62.3	80.2	82.2	68.0	40.2	4.5	-32.1	-62.3	-80.2	-82.2	-68.0	-40.2
2/17	97.8	97.5	77.9	42.9	-0.6	-44.0	-78.7	-97.8	-97.5	-77.9	-42.9	0.6	44.0	78.7
2/18	29.3	-3.3	-35.3	-60.3	-73.3	-71.9	-56.2	-29.3	3.3	35.3	60.3	73.3	71.9	56.2
2/19	-73.9	-86.3	-81.5	-60.6	-27.8	10.6	46.9	73.9	86.2	81.5	60.7	27.8	-10.6	-46.9
2/20	-17.6	-4.7	9.0	21.0	28.9	31.0	26.9	17.6	4.7	-9.0	-21.0	-28.9	-31.0	-26.9
2/21	35.5	41.0	38.4	28.1	12.3	-5.9	-23.0	-35.5	-41.0	-38.4	-28.1	-12.3	5.9	23.0
2/22	34.4	26.9	14.1	-1.5	-16.8	-28.8	-35.1	-34.4	-26.9	-14.1	1.5	16.8	28.8	35.1
2/23	6.9	-6.4	-18.5	-26.9	-30.0	-27.1	-18.9	-6.9	6.4	18.5	26.9	30.0	27.1	18.9
2/24	-77.3	-73.0	-54.3	-24.8	9.6	42.1	66.2	77.3	73.0	54.3	24.8	-9.6	-42.1	-66.2
2/25	-46.1	-31.9	-11.3	11.5	32.1	46.3	51.3	46.1	31.9	11.3	-11.5	-32.1	-46.3	-51.3
2/26	22.2	28.1	28.4	23.1	13.2	0.7	-11.9	-22.2	-28.1	-28.4	-23.1	-13.2	-0.7	11.9
2/27	53.7	47.7	32.3	10.5	-13.4	-34.6	-49.0	-53.7	-47.7	-32.3	-10.5	13.4	34.6	49.0
2/28	43.3	29.9	10.6	-10.8	-30.1	-43.4	-48.1	-43.3	-29.9	-10.6	10.8	30.1	43.4	48.1
2/29	3.0	-4.8	-11.7	-16.2	-17.5	-15.4	-10.2	-3.0	4.8	11.7	16.2	17.5	15.4	10.2
3/1	-34.3	-34.8	-28.4	-16.3	-1.0	14.5	27.1	34.3	34.8	28.4	16.3	1.0	-14.4	-27.1
3/2	-25.0	-10.5	6.0	21.3	32.5	37.1	34.5	25.0	10.5	-6.0	-21.3	-32.5	-37.1	-34.5
3/3	-7.8	-3.0	2.3	7.3	10.7	12.1	11.0	7.8	3.0	-2.3	-7.3	-10.7	-12.1	-11.0
3/4	3.2	-4.5	-11.3	-15.8	-17.3	-15.3	-10.3	-3.2	4.5	11.3	15.8	17.3	15.3	10.3
3/5	-13.0	-3.6	6.5	15.4	21.1	22.7	19.8	13.0	3.6	-6.5	-15.4	-21.1	-22.7	-19.8
3/6	-1.6	4.0	8.9	12.0	12.7	10.9	7.0	1.6	-4.0	-8.9	-12.0	-12.7	-10.9	-7.0
3/7	36.9	17.6	-5.1	-26.9	-43.3	-51.1	-48.8	-36.9	-17.6	5.1	26.9	43.3	51.1	48.8
3/8	-3.7	-28.7	-48.0	-57.8	-56.2	-43.4	-22.1	3.7	28.7	48.0	57.8	56.2	43.4	22.1
3/9	-83.2	-65.5	-34.8	2.7	39.8	68.9	84.4	83.2	65.5	34.8	-2.7	-39.8	-68.9	-84.4
3/10	-61.6	-12.0	40.0	84.1	111.5	116.8	99.0	61.6	12.0	-40.0	-84.1	-111.5	-116.8	-99.0
3/11	75.4	79.5	67.8	42.7	9.1	-26.2	-56.4	-75.4	-79.5	-67.8	-42.7	-9.1	26.2	56.4
3/12	108.7	67.7	13.2	-43.8	-92.2	-122.3	-128.2	-108.7	-67.7	-13.2	43.8	92.2	122.3	128.2
3/13	6.4	-9.2	-23.0	-32.2	-35.0	-30.9	-20.7	-6.4	9.2	23.0	32.2	35.0	30.9	20.7
3/14	-35.5	-24.3	-8.3	9.4	25.2	36.0	39.7	35.5	24.3	8.3	-9.4	-25.2	-36.0	-39.7
3/15	18.6	29.7	35.0	33.2	25.0	11.7	-3.8	-18.6	-29.7	-35.0	-33.3	-25.0	-11.7	3.8
3/16	18.8	16.5	11.0	3.3	-5.1	-12.4	-17.3	-18.8	-16.5	-11.0	-3.3	5.1	12.4	17.3
3/17	-9.6	-28.3	-41.4	-46.4	-42.1	-29.5	-11.0	9.6	28.3	41.4	46.4	42.1	29.5	11.1
3/18	-19.1	-20.1	-17.2	-10.8	-2.3	6.6	14.3	19.1	20.1	17.2	10.8	2.3	-6.6	-14.3
3/19	-31.4	-8.0	17.0	38.7	52.7	56.2	48.6	31.4	8.0	-17.0	-38.7	-52.7	-56.2	-48.6
3/20	7.2	21.5	31.5	35.3	32.1	22.5	8.5	-7.2	-21.5	-31.5	-35.3	-32.1	-22.5	-8.5
3/21	35.8	26.1	11.2	-5.9	-21.9	-33.5	-38.4	-35.8	-26.1	-11.2	5.9	21.9	33.5	38.4
3/22	11.2	0.1	-11.0	-19.9	-24.9	-24.9	-20.0	-11.2	-0.1	11.0	19.9	24.9	24.9	20.0
3/23	-1.8	-11.1	-18.3	-21.9	-21.1	-16.1	-8.0	1.7	11.1	18.3	21.9	21.1	16.1	8.0
3/24	-34.6	-33.8	-26.3	-13.6	1.8	16.8	28.5	34.6	33.8	26.3	13.6	-1.8	-16.8	-28.5
3/25	-10.8	-11.5	-10.0	-6.5	-1.6	3.5	7.9	10.8	11.5	10.0	6.5	1.6	-3.5	-7.9
3/26	8.6	11.2	11.6	9.7	5.9	0.9	-4.3	-8.6	-11.2	-11.6	-9.7	-5.9	-0.9	4.3
3/27	3.4	7.0	9.1	9.5	8.0	4.9	0.8	-3.4	-7.0	-9.1	-9.5	-8.0	-4.9	-0.8
3/28	-31.2	-27.2	-17.8	-4.8	9.1	21.2	29.1	31.2	27.2	17.8	4.8	-9.1	-21.2	-29.1
3/29	-13.4	-7.9	-0.8	6.5	12.5	16.0	16.3	13.4	7.9	0.8	-6.5	-12.5	-16.0	-16.3
3/30	30.4	26.3	17.1	4.4	-9.1	-20.8	-28.4	-30.4	-26.3	-17.1	-4.4	9.1	20.8	28.4
3/31	-2.9	-10.0	-15.1	-17.2	-16.0	-11.5	-4.8	2.8	10.0	15.1	17.2	16.0	11.5	4.8
4/1	-28.4	-14.6	2.0	18.3	30.9	37.4	36.5	28.4	14.6	-2.0	-18.3	-30.9	-37.4	-36.5
4/2	14.8	26.5	32.9	32.8	26.2	14.4	-0.3	-14.8	-26.5	-32.9	-32.8	-26.2	-14.4	0.2
4/3	14.7	7.1	-1.8	-10.4	-17.0	-20.2	-19.3	-14.7	-7.1	1.8	10.4	17.0	20.2	19.3
4/4	-41.3	-43.6	-37.2	-23.5	-5.1	14.3	30.9	41.3	43.6	37.2	23.5	5.1	-14.3	-30.9
4/5	9.7	24.5	34.5	37.6	33.3	22.4	7.0	-9.7	-24.5	-34.5	-37.6	-33.3	-22.4	-7.0
4/6	95.1	79.6	48.3	7.5	-34.8	-70.2	-91.7	-95.1	-79.6	-48.3	-7.5	34.8	70.2	91.7
4/7	16.3	-21.5	-55.0	-77.6	-84.9	-75.3	-50.9	-16.3	21.5	55.0	77.6	84.9	75.3	50.9
4/8	-90.6	-102.6	-94.3	-67.3	-27.0	18.7	60.6	90.6	102.6	94.3	67.3	27.0	-18.7	-60.6
4/9	-65.3	-35.7	0.9	37.4	66.5	82.4	82.0	65.3	35.7	-0.9	-37.4	-66.5	-82.4	-82.0
4/10	-16.0	18.5	49.3	70.3	77.4	69.2	47.3	16.0	-18.5	-49.3	-70.3	-77.4	-69.2	-47.3
4/11	43.0	58.1	61.8	53.2	34.1	8.2	-19.3	-43.0	-58.1	-61.8	-53.2	-34.1	-8.2	19.3
4/12	88.8	77.1	50.0	13.1	-26.4	-60.7	-83.0	-88.8	-77.1	-50.1	-13.1	26.4	60.7	83.0
4/13	37.3	5.0	-28.2	-55.9	-72.5	-74.7	-62.1	-37.3	-5.0	28.2	55.9	72.5	74.7	62.1
4/14	-27.8	-54.6	-70.5	-72.4	-60.0	-35.7	-4.4	27.8	54.6	70.5	72.4	60.0	35.7	4.4
4/15	-60.8	-45.5	-21.1	7.4	34.5	54.7	64.1	60.8	45.5	21.1	-7.4	-34.5	-54.7	-64.1
4/16	7.6	32.0	50.0	58.2	54.8	40.6	18.3	-7.6	-32.0	-50.0	-58.2	-54.8	-40.6	-18.3
4/17	33.3	20.4	3.5	-14.1	-28.9	-38.0	-39.6	-33.3	-20.4	-3.5	14.1	28.9	38.0	39.6
4/18	-20.7	-23.8	-22.2	-16.2	-7.0	3.6	13.5	20.7	23.8	22.2	16.2	7.0	-3.6	-13.5
4/19	-14.2	1.8	17.4	29.6	36.0	35.2	27.4	14.2	-1.8	-17.4	-29.6	-36.0	-35.2	-27.4

4/20	31.4	34.4	30.6	20.7	6.7	-8.6	-22.2	-31.4	-34.4	-30.6	-20.7	-6.7	8.6	22.2
4/21	34.1	13.7	-9.5	-30.7	-45.9	-52.0	-47.8	-34.1	-13.7	9.5	30.7	45.9	52.0	47.8
4/22	-17.9	-30.2	-36.6	-35.7	-27.7	-14.3	2.0	17.9	30.2	36.6	35.7	27.7	14.3	-2.0
4/23	-40.9	-27.5	-8.6	12.0	30.2	42.4	46.2	40.9	27.5	8.6	-12.0	-30.2	-42.4	-46.2
4/24	-17.7	-0.7	16.5	30.4	38.3	38.6	31.3	17.7	0.7	-16.5	-30.4	-38.3	-38.6	-31.3
4/25	21.8	21.6	17.1	9.2	-0.6	-10.2	-17.8	-21.8	-21.6	-17.1	-9.2	0.6	10.2	17.8
4/26	25.1	15.1	2.1	-11.3	-22.5	-29.2	-30.2	-25.1	-15.1	-2.1	11.3	22.5	29.2	30.2
4/27	2.4	-8.6	-17.9	-23.7	-24.8	-20.9	-13.0	-2.4	8.6	17.9	23.7	24.8	20.9	13.0
4/28	-18.2	-19.2	-16.5	-10.5	-2.4	6.2	13.5	18.2	19.2	16.5	10.5	2.4	-6.2	-13.5
4/29	-27.6	-21.0	-10.2	2.6	14.8	24.2	28.7	27.6	21.0	10.2	-2.6	-14.8	-24.2	-28.7
4/30	-24.3	-12.7	1.4	15.3	26.1	31.7	31.1	24.3	12.7	-1.4	-15.3	-26.1	-31.7	-31.1
5/1	12.7	22.9	28.5	28.5	22.8	12.6	-0.1	-12.7	-22.9	-28.5	-28.5	-22.8	-12.6	0.1
5/2	30.1	28.7	21.6	10.2	-3.2	-16.0	-25.6	-30.1	-28.7	-21.6	-10.2	3.2	16.0	25.6
5/3	14.6	2.3	-10.5	-21.3	-27.8	-28.8	-24.1	-14.6	-2.3	10.5	21.3	27.8	28.8	24.1
5/4	-32.6	-32.7	-26.3	-14.7	-0.2	14.3	26.0	32.6	32.7	26.3	14.7	0.2	-14.3	-26.0
5/5	7.8	23.8	35.1	39.4	36.0	25.4	9.7	-7.8	-23.8	-35.1	-39.4	-36.0	-25.4	-9.8
5/6	44.3	43.8	34.7	18.6	-1.1	-20.6	-36.0	-44.3	-43.8	-34.7	-18.6	1.1	20.6	36.0
5/7	-4.3	-22.6	-36.4	-43.1	-41.2	-31.1	-14.9	4.3	22.6	36.4	43.1	41.2	31.1	14.9
5/8	-46.5	-45.7	-35.9	-18.9	1.8	22.1	38.1	46.5	45.7	35.9	18.9	-1.8	-22.1	-38.1
5/9	-14.2	-0.3	13.7	25.0	31.3	31.5	25.4	14.2	0.3	-13.7	-25.0	-31.3	-31.5	-25.4
5/10	29.4	30.0	24.6	14.4	1.3	-12.0	-23.0	-29.4	-30.0	-24.6	-14.4	-1.3	12.0	23.0
5/11	34.2	8.8	-18.3	-41.8	-57.0	-60.9	-52.8	-34.2	-8.8	18.3	41.8	57.0	60.9	52.8
5/12	-41.9	-53.8	-55.1	-45.5	-26.9	-2.9	21.6	41.9	53.8	55.1	45.5	26.9	2.9	-21.6
5/13	-66.1	-41.7	-9.1	25.4	54.8	73.4	77.4	66.1	41.7	9.1	-25.4	-54.8	-73.4	-77.4
5/14	16.5	46.4	67.1	74.4	67.1	46.4	16.6	-16.5	-46.4	-67.1	-74.4	-67.1	-46.4	-16.6
5/15	84.2	72.6	46.6	11.4	-26.0	-58.4	-79.1	-84.2	-72.6	-46.6	-11.4	26.0	58.4	79.1
5/16	49.8	3.5	-43.4	-81.8	-103.9	-105.5	-86.2	-49.8	-3.5	43.4	81.8	103.9	105.5	86.2
5/17	-54.7	-65.0	-62.5	-47.6	-23.2	5.7	33.5	54.7	65.0	62.5	47.6	23.2	-5.7	-33.5
5/18	-77.1	-35.8	12.7	58.6	92.9	108.8	103.2	77.1	35.8	-12.6	-58.6	-92.9	-108.8	-103.2
5/19	50.8	72.8	80.5	72.2	49.6	17.2	-18.7	-50.8	-72.8	-80.5	-72.2	-49.6	-17.2	18.7
5/20	34.9	11.9	-13.5	-36.2	-51.7	-57.0	-51.0	-34.9	-11.9	13.5	36.2	51.7	57.0	51.0
5/21	-37.8	-52.0	-55.8	-48.6	-31.7	-8.6	16.2	37.8	52.0	55.8	48.6	31.8	8.6	-16.2
5/22	-32.6	-27.6	-17.0	-3.2	11.4	23.6	31.2	32.6	27.6	17.1	3.2	-11.4	-23.6	-31.2
5/23	25.2	43.2	52.7	51.8	40.6	21.4	-2.1	-25.2	-43.2	-52.7	-51.8	-40.6	-21.4	2.1
5/24	61.8	58.8	44.1	20.7	-6.8	-33.0	-52.6	-61.8	-58.8	-44.1	-20.7	6.8	33.0	52.6
5/25	16.1	-8.5	-31.5	-48.2	-55.4	-51.6	-37.6	-16.1	8.5	31.5	48.2	55.4	51.6	37.6
5/26	-55.9	-73.1	-75.7	-63.4	-38.5	-6.0	27.7	55.9	73.1	75.7	63.4	38.5	6.0	-27.7
5/27	-60.4	-48.8	-27.6	-0.9	26.0	47.7	60.0	60.4	48.8	27.6	0.9	-25.9	-47.7	-60.0
5/28	-1.3	24.3	45.1	56.9	57.5	46.7	26.6	1.3	-24.3	-45.1	-56.9	-57.5	-46.7	-26.6
5/29	72.5	87.4	85.1	65.9	33.6	-5.3	-43.2	-72.5	-87.4	-85.1	-65.9	-33.6	5.3	43.1
5/30	44.1	33.4	16.0	-4.5	-24.1	-38.9	-46.1	-44.1	-33.4	-16.0	4.5	24.1	38.9	46.1
5/31	-36.9	-51.9	-56.6	-50.1	-33.7	-10.7	14.5	36.9	51.9	56.6	50.1	33.7	10.7	-14.5
6/1	-33.1	-28.5	-18.2	-4.3	10.5	23.1	31.2	33.1	28.5	18.2	4.3	-10.5	-23.1	-31.2
6/2	29.3	36.0	35.6	28.1	15.1	-0.9	-16.7	-29.3	-36.0	-35.6	-28.1	-15.1	0.9	16.7
6/3	38.3	26.1	8.7	-10.4	-27.4	-39.0	-42.9	-38.3	-26.1	-8.7	10.4	27.4	39.0	42.9
6/4	-2.2	-12.5	-20.4	-24.3	-23.3	-17.7	-8.7	2.2	12.5	20.4	24.3	23.3	17.7	8.7
6/5	-47.8	-34.4	-14.3	8.7	29.9	45.3	51.6	47.8	34.4	14.3	-8.7	-29.9	-45.3	-51.6
6/6	-2.4	2.0	6.0	8.9	10.0	9.1	6.4	2.4	-2.0	-6.0	-8.9	-10.0	-9.1	-6.4
6/7	-3.7	-13.2	-20.1	-23.0	-21.4	-15.5	-6.5	3.7	13.2	20.1	23.0	21.4	15.5	6.5
6/8	-22.4	-18.9	-11.6	-2.1	7.9	16.3	21.5	22.4	18.9	11.6	2.1	-7.9	-16.3	-21.5
6/9	-7.2	3.6	13.6	20.9	24.1	22.5	16.5	7.2	-3.6	-13.6	-20.9	-24.1	-22.5	-16.5
6/10	16.9	16.1	12.2	5.9	-1.6	-8.8	-14.2	-16.9	-16.1	-12.2	-5.9	1.6	8.8	14.2
6/11	20.7	15.9	7.9	-1.6	-10.8	-17.8	-21.4	-20.7	-15.9	-7.9	1.6	10.8	17.8	21.4
6/12	-21.1	-16.7	-9.1	0.4	9.8	17.2	21.3	21.1	16.7	9.1	-0.4	-9.8	-17.2	-21.3
6/13	-42.9	-30.0	-11.1	9.9	29.0	42.4	47.3	42.9	30.0	11.2	-9.9	-29.0	-42.4	-47.3
6/14	4.7	12.8	18.4	20.3	18.2	12.5	4.3	-4.7	-12.8	-18.4	-20.3	-18.2	-12.5	-4.3
6/15	16.9	16.3	12.5	6.2	-1.3	-8.6	-14.1	-16.9	-16.3	-12.5	-6.2	1.3	8.6	14.1
6/16	18.1	6.2	-6.9	-18.7	-26.7	-29.5	-26.4	-18.1	-6.2	6.9	18.7	26.7	29.5	26.4
6/17	34.5	24.5	9.6	-7.2	-22.6	-33.5	-37.8	-34.5	-24.5	-9.6	7.2	22.6	33.5	37.8
6/18	10.2	14.1	15.2	13.3	8.7	2.4	-4.3	-10.2	-14.1	-15.2	-13.3	-8.7	-2.4	4.3
6/19	1.0	0.8	0.4	-0.1	-0.5	-0.9	-1.0	-1.0	-0.8	-0.4	0.1	0.5	0.9	1.0
6/20	1.1	-4.2	-8.6	-11.3	-11.8	-9.9	-6.1	-1.1	4.2	8.6	11.3	11.8	9.9	6.1
6/21	-17.3	-28.8	-34.7	-33.7	-26.0	-13.2	2.3	17.3	28.8	34.7	33.7	26.0	13.2	-2.3
6/22	-25.3	-25.2	-20.0	-10.9	0.4	11.6	20.5	25.3	25.2	20.0	10.9	-0.4	-11.6	-20.5

6/23	-42.8	-26.4	-4.8	17.7	36.8	48.5	50.7	42.8	26.4	4.8	-17.7	-36.7	-48.5	-50.7
6/24	-37.4	-26.4	-10.2	8.1	24.7	36.4	41.0	37.4	26.4	10.2	-8.1	-24.7	-36.4	-41.0
6/25	31.8	39.7	39.7	31.9	17.7	0.1	-17.6	-31.8	-39.7	-39.7	-31.9	-17.7	-0.1	17.6
6/26	48.6	45.2	32.9	14.1	-7.6	-27.7	-42.3	-48.6	-45.2	-32.9	-14.1	7.6	27.7	42.3
6/27	45.7	23.0	-4.2	-30.6	-51.0	-61.2	-59.3	-45.7	-23.0	4.2	30.6	51.0	61.2	59.3
6/28	43.9	19.1	-9.4	-36.0	-55.5	-64.0	-59.9	-43.9	-19.2	9.3	36.0	55.5	64.0	59.9
6/29	-25.5	-36.5	-40.2	-35.9	-24.6	-8.3	9.5	25.5	36.5	40.2	35.9	24.6	8.4	-9.5
6/30	-69.5	-45.2	-12.0	23.6	54.5	74.6	79.9	69.5	45.2	12.0	-23.5	-54.5	-74.6	-79.9
7/1	3.5	36.6	62.5	76.0	74.5	58.2	30.4	-3.5	-36.6	-62.5	-76.0	-74.5	-58.2	-30.4
7/2	76.0	63.7	38.8	6.2	-27.6	-56.0	-73.2	-76.0	-63.7	-38.8	-6.2	27.6	56.0	73.2
7/3	25.3	-13.4	-49.4	-75.7	-86.9	-81.0	-59.0	-25.3	13.4	49.4	75.7	86.9	81.0	59.0
7/4	-61.1	-76.6	-76.9	-62.0	-34.8	-0.8	33.5	61.1	76.6	76.9	62.0	34.8	0.8	-33.5
7/5	-77.6	-43.8	-1.4	41.3	75.9	95.4	96.0	77.6	43.9	1.4	-41.3	-75.9	-95.4	-96.0
7/6	-25.7	17.6	57.4	85.9	97.3	89.5	64.0	25.7	-17.6	-57.4	-85.9	-97.3	-89.5	-64.0
7/7	77.9	73.2	54.0	24.2	-10.5	-43.1	-67.1	-77.9	-73.2	-54.0	-24.2	10.5	43.1	67.1
7/8	66.8	30.6	-11.7	-51.6	-81.3	-94.9	-89.7	-66.8	-30.6	11.7	51.6	81.3	94.9	89.7
7/9	-42.1	-58.9	-64.1	-56.5	-37.8	-11.5	17.0	42.1	58.9	64.1	56.5	37.8	11.5	-17.0
7/10	-72.8	-55.6	-27.4	6.2	38.6	63.3	75.5	72.8	55.6	27.4	-6.2	-38.6	-63.3	-75.5
7/11	6.9	41.2	67.4	80.2	77.1	58.8	28.8	-6.9	-41.2	-67.4	-80.2	-77.1	-58.8	-28.8
7/12	62.0	68.9	62.2	43.2	15.6	-15.0	-42.7	-61.9	-68.9	-62.2	-43.2	-15.6	15.0	42.7
7/13	31.5	3.1	-26.0	-49.9	-63.9	-65.3	-53.7	-31.5	-3.1	26.0	49.9	63.9	65.3	53.7
7/14	-55.8	-69.8	-69.9	-56.2	-31.4	-0.4	30.8	55.8	69.8	69.9	56.2	31.4	0.4	-30.8
7/15	-22.0	-9.5	4.9	18.3	28.1	32.3	30.1	22.0	9.5	-4.9	-18.3	-28.1	-32.3	-30.1
7/16	38.4	48.2	48.4	39.0	21.9	0.5	-21.1	-38.4	-48.2	-48.4	-39.0	-21.9	-0.5	21.1
7/17	22.2	15.4	5.5	-5.5	-15.4	-22.3	-24.7	-22.2	-15.4	-5.5	5.5	15.4	22.3	24.7
7/18	-32.4	-37.9	-36.0	-26.9	-12.5	4.4	20.4	32.4	37.9	36.0	26.9	12.5	-4.4	-20.4
7/19	-23.8	-20.3	-12.8	-2.8	7.8	16.8	22.5	23.8	20.3	12.8	2.8	-7.8	-16.8	-22.5
7/20	5.2	0.2	-4.8	-8.9	-11.2	-11.3	-9.1	-5.2	-0.2	4.8	8.9	11.2	11.3	9.1
7/21	-8.4	-16.1	-20.6	-21.0	-17.3	-10.1	-0.9	8.4	16.1	20.6	21.0	17.3	10.1	0.9
7/22	-8.3	1.6	11.2	18.6	22.3	21.6	16.6	8.3	-1.6	-11.2	-18.6	-22.3	-21.6	-16.6
7/23	3.8	13.6	20.7	23.6	21.9	15.9	6.7	-3.8	-13.6	-20.7	-23.6	-21.9	-15.9	-6.7
7/24	26.9	29.1	25.6	17.0	5.0	-7.9	-19.3	-26.9	-29.1	-25.6	-17.0	-5.0	7.9	19.3
7/25	16.4	17.2	14.5	9.0	1.7	-6.0	-12.4	-16.4	-17.2	-14.5	-9.0	-1.7	6.0	12.4
7/26	17.6	-2.8	-22.7	-38.1	-46.0	-44.7	-34.6	-17.6	2.8	22.7	38.1	46.0	44.7	34.6
7/27	-11.3	-25.5	-34.6	-36.9	-31.9	-20.6	-5.2	11.3	25.5	34.6	36.9	31.9	20.6	5.2
7/28	-35.8	-14.7	9.3	31.5	47.4	54.0	49.8	35.8	14.7	-9.3	-31.5	-47.4	-54.0	-49.8
7/29	-21.8	-2.8	16.7	33.0	42.7	44.0	36.5	21.8	2.8	-16.7	-33.0	-42.7	-44.0	-36.5
7/30	5.2	1.5	-2.4	-5.8	-8.1	-8.8	-7.8	-5.2	-1.5	2.4	5.8	8.1	8.8	7.8
7/31	20.6	14.1	4.8	-5.5	-14.6	-20.9	-23.0	-20.6	-14.1	-4.8	5.5	14.6	20.9	23.0
8/1	21.7	7.0	-9.1	-23.4	-33.0	-36.2	-32.1	-21.7	-7.0	9.1	23.4	33.0	36.2	32.1
8/2	-21.6	-23.2	-20.2	-13.2	-3.5	6.8	15.8	21.6	23.2	20.2	13.2	3.5	-6.8	-15.8
8/3	-17.1	2.0	20.7	35.3	42.9	42.0	32.8	17.1	-2.0	-20.7	-35.3	-42.9	-42.0	-32.8
8/4	17.4	32.9	41.9	42.6	34.8	20.1	1.5	-17.4	-32.9	-41.9	-42.6	-34.8	-20.2	-1.5
8/5	23.1	15.3	4.4	-7.4	-17.7	-24.5	-26.4	-23.1	-15.3	-4.4	7.4	17.7	24.5	26.4
8/6	17.9	-2.4	-22.2	-37.7	-45.6	-44.6	-34.7	-17.9	2.4	22.2	37.7	45.6	44.6	34.7
8/7	-30.6	-46.3	-52.9	-49.0	-35.4	-14.8	8.7	30.6	46.3	52.9	49.0	35.4	14.8	-8.7
8/8	-29.7	-22.2	-10.4	3.5	16.7	26.6	31.2	29.7	22.2	10.4	-3.5	-16.7	-26.6	-31.2
8/9	6.1	20.0	29.9	33.9	31.2	22.3	9.0	-6.1	-20.0	-29.9	-33.9	-31.2	-22.3	-9.0
8/10	14.3	14.2	11.4	6.3	-0.1	-6.4	-11.5	-14.3	-14.2	-11.4	-6.3	0.1	6.4	11.5
8/11	8.9	-1.3	-11.2	-18.9	-22.9	-22.3	-17.3	-8.9	1.3	11.2	18.9	22.9	22.3	17.3
8/12	-30.7	-34.1	-30.8	-21.3	-7.7	7.5	21.2	30.7	34.1	30.8	21.3	7.7	-7.5	-21.2
8/13	-0.6	9.5	17.6	22.3	22.6	18.3	10.5	0.6	-9.5	-17.6	-22.3	-22.6	-18.3	-10.5
8/14	48.2	55.0	51.0	36.8	15.4	-9.1	-31.8	-48.2	-55.0	-51.0	-36.8	-15.4	9.1	31.8
8/15	16.2	8.3	-1.2	-10.5	-17.8	-21.5	-20.9	-16.2	-8.3	1.2	10.5	17.8	21.5	20.9
8/16	1.6	-10.3	-20.2	-26.0	-26.7	-22.1	-13.1	-1.6	10.3	20.1	26.0	26.7	22.1	13.1
8/17	-38.5	-36.2	-26.7	-12.0	5.1	21.2	33.1	38.5	36.2	26.7	12.0	-5.1	-21.2	-33.1
8/18	-45.5	-30.5	-9.5	13.3	33.6	47.2	51.4	45.5	30.5	9.5	-13.3	-33.6	-47.1	-51.4
8/19	6.2	29.0	46.1	54.1	51.3	38.4	17.9	-6.2	-29.0	-46.1	-54.1	-51.3	-38.4	-17.9
8/20	48.0	54.8	50.7	36.6	15.3	-9.1	-31.7	-48.0	-54.8	-50.7	-36.6	-15.3	9.1	31.7
8/21	9.2	-14.7	-35.7	-49.6	-53.7	-47.1	-31.2	-9.2	14.7	35.7	49.6	53.7	47.1	31.2
8/22	-29.6	-51.9	-63.9	-63.3	-50.1	-27.0	1.5	29.6	51.9	63.9	63.3	50.1	27.0	-1.5
8/23	-38.8	-26.4	-8.7	10.6	27.9	39.7	43.6	38.8	26.4	8.7	-10.6	-27.9	-39.7	-43.6
8/24	27.4	49.6	62.0	62.2	50.0	27.9	0.3	-27.4	-49.6	-62.0	-62.2	-50.0	-27.9	-0.3
8/25	49.9	43.6	28.7	8.1	-14.1	-33.5	-46.3	-49.9	-43.6	-28.7	-8.1	14.1	33.5	46.3

8/26	36.2	4.2	-28.7	-55.8	-71.9	-73.8	-61.0	-36.2	-4.2	28.7	55.8	71.9	73.8	61.0
8/27	-24.2	-33.8	-36.7	-32.3	-21.6	-6.5	9.8	24.2	33.8	36.7	32.3	21.6	6.5	-9.8
8/28	-69.2	-39.5	-2.1	35.8	66.6	84.2	85.1	69.2	39.5	2.1	-35.8	-66.6	-84.2	-85.1
8/29	6.9	23.0	34.6	39.3	36.2	25.9	10.5	-6.9	-23.0	-34.6	-39.3	-36.2	-25.9	-10.5
8/30	61.4	52.0	32.3	6.2	-21.1	-44.2	-58.6	-61.4	-52.0	-32.3	-6.2	21.1	44.2	58.6
8/31	5.5	-16.8	-35.9	-47.8	-50.3	-42.8	-26.8	-5.5	16.8	35.9	47.8	50.3	42.8	26.8
9/1	-44.4	-50.5	-46.7	-33.6	-13.9	8.6	29.4	44.3	50.5	46.7	33.6	13.9	-8.6	-29.4
9/2	-48.6	-24.3	4.9	33.1	54.7	65.5	63.4	48.6	24.3	-4.9	-33.1	-54.7	-65.5	-63.4
9/3	19.2	30.5	35.8	34.0	25.5	11.9	-4.0	-19.2	-30.5	-35.8	-34.0	-25.5	-11.9	4.0
9/4	40.2	21.7	-1.1	-23.7	-41.6	-51.3	-50.8	-40.2	-21.7	1.1	23.7	41.6	51.3	50.8
9/5	8.6	2.1	-4.8	-10.8	-14.6	-15.6	-13.5	-8.7	-2.1	4.8	10.8	14.6	15.6	13.5
9/6	-17.6	-14.7	-8.9	-1.3	6.5	13.0	17.0	17.6	14.7	8.9	1.3	-6.5	-13.0	-17.0
9/7	19.4	14.8	7.2	-1.8	-10.5	-17.1	-20.3	-19.4	-14.8	-7.2	1.8	10.5	17.1	20.3
9/8	31.7	20.0	4.4	-12.1	-26.2	-35.1	-37.1	-31.7	-20.0	-4.4	12.1	26.2	35.1	37.1
9/9	6.3	9.0	9.8	8.7	5.9	1.9	-2.4	-6.3	-9.0	-9.8	-8.7	-5.9	-1.9	2.4
9/10	-34.1	-16.8	3.9	23.8	39.0	46.5	44.7	34.1	16.8	-3.9	-23.8	-39.0	-46.5	-44.7
9/11	-55.1	-44.0	-24.3	0.3	24.8	44.4	55.2	55.1	44.0	24.3	-0.3	-24.8	-44.4	-55.2
9/12	-35.3	-32.3	-22.9	-9.0	6.7	21.1	31.3	35.3	32.3	22.9	9.0	-6.7	-21.1	-31.3
9/13	7.3	7.6	6.4	3.9	0.7	-2.7	-5.5	-7.3	-7.6	-6.4	-3.9	-0.7	2.7	5.5
9/14	45.6	45.9	37.1	21.0	0.7	-19.7	-36.2	-45.6	-45.9	-37.1	-21.0	-0.7	19.7	36.2
9/15	75.4	63.9	39.8	7.7	-25.9	-54.3	-72.0	-75.4	-63.9	-39.8	-7.7	25.8	54.3	72.0
9/16	-8.2	-22.0	-31.4	-34.6	-31.0	-21.2	-7.2	8.2	22.0	31.4	34.6	31.0	21.2	7.2
9/17	-47.1	-39.0	-23.2	-2.7	18.2	35.6	45.9	47.1	39.0	23.2	2.7	-18.2	-35.6	-45.9
9/18	-0.8	8.9	16.8	21.4	21.8	17.8	10.3	0.8	-8.9	-16.8	-21.4	-21.8	-17.8	-10.3
9/19	-5.8	0.3	6.4	11.2	13.8	13.7	10.8	5.8	-0.3	-6.4	-11.2	-13.8	-13.7	-10.8
9/20	-14.1	-25.9	-32.5	-32.8	-26.5	-15.0	-0.5	14.1	25.9	32.5	32.8	26.5	15.0	0.5
9/21	-12.1	-22.5	-28.5	-28.9	-23.5	-13.4	-0.8	12.1	22.5	28.5	28.9	23.5	13.4	0.8
9/22	-10.2	0.3	10.7	19.0	23.5	23.4	18.6	10.2	-0.3	-10.7	-19.0	-23.5	-23.4	-18.6
9/23	4.8	19.8	30.8	35.8	33.6	24.8	11.1	-4.8	-19.8	-30.8	-35.8	-33.6	-24.8	-11.1
9/24	18.1	18.2	14.6	8.2	0.1	-7.9	-14.5	-18.1	-18.2	-14.6	-8.2	-0.1	7.9	14.5
9/25	-5.0	-24.5	-39.2	-46.1	-43.9	-33.0	-15.5	5.0	24.5	39.2	46.1	43.9	33.0	15.5
9/26	5.7	0.4	-4.9	-9.3	-11.9	-12.1	-9.9	-5.7	-0.4	4.9	9.3	11.9	12.1	9.9
9/27	34.9	36.8	31.4	19.8	4.3	-12.1	-26.1	-34.9	-36.8	-31.4	-19.8	-4.3	12.1	26.1
9/28	21.4	19.6	14.0	5.6	-3.9	-12.7	-18.9	-21.4	-19.6	-14.0	-5.6	3.9	12.7	18.9
9/29	-34.1	-16.4	4.5	24.6	39.8	47.1	45.0	34.1	16.4	-4.5	-24.6	-39.8	-47.1	-45.0
9/30	-39.8	-13.7	15.2	41.1	58.8	64.9	58.1	39.9	13.7	-15.2	-41.1	-58.8	-64.9	-58.1
10/1	-2.9	-12.5	-19.6	-22.8	-21.5	-15.9	-7.2	2.9	12.5	19.6	22.8	21.5	15.9	7.2
10/2	28.7	2.2	-24.7	-46.7	-59.5	-60.5	-49.5	-28.7	-2.2	24.7	46.7	59.5	60.5	49.5
10/3	24.5	13.3	-0.5	-14.2	-25.1	-31.0	-30.8	-24.5	-13.3	0.5	14.2	25.1	31.0	30.8
10/4	-19.3	-9.7	1.9	13.0	21.6	25.9	25.1	19.3	9.7	-1.9	-13.0	-21.6	-25.9	-25.1
10/5	8.3	20.3	28.2	30.6	26.9	17.9	5.3	-8.3	-20.3	-28.2	-30.6	-26.9	-17.9	-5.3
10/6	43.8	40.0	28.3	11.1	-8.4	-26.2	-38.8	-43.8	-40.0	-28.4	-11.1	8.4	26.2	38.8
10/7	3.6	-16.4	-33.2	-43.4	-45.0	-37.7	-22.9	-3.6	16.4	33.2	43.4	45.0	37.7	22.9
10/8	-63.4	-74.5	-70.9	-53.3	-25.1	8.1	39.6	63.4	74.5	70.9	53.3	25.1	-8.1	-39.6
10/9	-77.8	-54.3	-20.0	18.3	53.0	77.1	86.0	77.8	54.3	20.0	-18.3	-52.9	-77.1	-86.0
10/10	9.6	39.8	62.1	72.1	67.9	50.1	22.5	-9.6	-39.8	-62.1	-72.1	-67.9	-50.1	-22.5
10/11	86.5	89.5	74.8	45.3	6.8	-33.0	-66.3	-86.5	-89.5	-74.8	-45.3	-6.8	33.0	66.3
10/12	41.5	8.1	-26.9	-56.5	-75.0	-78.6	-66.6	-41.5	-8.1	26.9	56.5	75.0	78.6	66.6
10/13	-24.9	-50.4	-66.0	-68.5	-57.5	-35.0	-5.6	24.9	50.4	66.0	68.5	57.5	35.0	5.6
10/14	-40.6	-33.8	-20.3	-2.8	15.3	30.3	39.3	40.6	33.8	20.3	2.8	-15.3	-30.3	-39.3
10/15	8.9	34.1	52.5	60.5	56.5	41.4	18.0	-8.9	-34.1	-52.5	-60.5	-56.5	-41.4	-18.0
10/16	39.3	39.6	32.1	18.2	0.7	-17.0	-31.2	-39.3	-39.6	-32.1	-18.2	-0.7	17.0	31.2
10/17	-12.4	-25.9	-34.2	-35.8	-30.3	-18.8	-3.6	12.4	25.9	34.2	35.8	30.3	18.8	3.6
10/18	-14.2	-10.0	-3.8	3.1	9.5	13.9	15.6	14.2	10.0	3.8	-3.1	-9.5	-13.9	-15.6
10/19	9.2	12.1	12.6	10.6	6.4	1.0	-4.5	-9.2	-12.1	-12.6	-10.6	-6.4	-1.0	4.5
10/20	-11.8	-7.8	-2.2	3.8	9.0	12.5	13.4	11.8	7.8	2.2	-3.8	-9.0	-12.5	-13.4
10/21	-33.9	-21.9	-5.6	11.8	26.9	36.6	39.1	33.9	21.9	5.6	-11.8	-26.9	-36.6	-39.1
10/22	11.5	14.8	15.3	12.7	7.6	1.0	-5.8	-11.5	-14.8	-15.3	-12.7	-7.6	-1.0	5.8
10/23	45.5	38.6	24.0	4.7	-15.6	-32.8	-43.4	-45.5	-38.6	-24.0	-4.7	15.6	32.8	43.4
10/24	17.6	-2.7	-22.5	-37.8	-45.7	-44.5	-34.5	-17.6	2.7	22.5	37.8	45.7	44.5	34.5
10/25	-49.6	-61.2	-60.7	-48.1	-26.1	1.2	28.2	49.6	61.2	60.7	48.1	26.1	-1.2	-28.2
10/26	-73.8	-56.7	-28.3	5.7	38.6	63.8	76.4	73.8	56.7	28.3	-5.7	-38.6	-63.8	-76.4
10/27	42.1	68.0	80.4	76.9	58.2	27.9	-7.9	-42.1	-68.0	-80.4	-76.9	-58.2	-27.9	7.8
10/28	83.6	73.9	49.6	15.5	-21.7	-54.6	-76.7	-83.6	-73.9	-49.6	-15.5	21.7	54.6	76.7

Date														
10/29	9.3	-13.2	-33.2	-46.6	-50.7	-44.8	-30.1	-9.3	13.2	33.2	46.6	50.7	44.8	30.1
10/30	-42.2	-44.3	-37.7	-23.5	-4.7	15.0	31.7	42.2	44.3	37.7	23.5	4.8	-15.0	-31.7
10/31	-9.0	-2.6	4.3	10.3	14.3	15.5	13.6	9.0	2.6	-4.3	-10.3	-14.3	-15.5	-13.6
11/1	11.9	17.5	19.7	18.0	12.7	4.9	-3.8	-11.9	-17.5	-19.7	-18.0	-12.7	-4.9	3.8
11/2	22.6	20.9	15.1	6.2	-3.8	-13.2	-19.8	-22.6	-20.9	-15.1	-6.2	3.8	13.1	19.8
11/3	-9.7	-11.2	-10.5	-7.7	-3.4	1.6	6.3	9.7	11.2	10.5	7.7	3.4	-1.6	-6.3
11/4	-46.4	-45.6	-35.8	-19.0	1.7	22.0	37.9	46.4	45.6	35.8	19.0	-1.6	-22.0	-37.9
11/5	-45.7	-30.4	-9.1	14.0	34.4	47.9	51.9	45.7	30.4	9.1	-14.0	-34.4	-47.9	-51.9
11/6	9.0	28.5	42.3	47.7	43.7	31.0	12.2	-9.0	-28.5	-42.3	-47.7	-43.7	-31.0	-12.2
11/7	32.2	32.5	26.5	15.1	0.8	-13.6	-25.4	-32.2	-32.5	-26.5	-15.2	-0.8	13.6	25.4
11/8	8.4	-11.3	-28.7	-40.4	-44.2	-39.2	-26.4	-8.4	11.3	28.7	40.4	44.2	39.2	26.4
11/9	7.4	-1.4	-10.0	-16.6	-19.9	-19.3	-14.8	-7.4	1.4	10.0	16.6	19.9	19.3	14.8
11/10	-8.4	-16.3	-21.0	-21.5	-17.8	-10.5	-1.1	8.4	16.3	21.0	21.5	17.8	10.5	1.1
11/11	-51.8	-59.9	-56.1	-41.2	-18.1	8.5	33.5	51.8	59.9	56.1	41.2	18.1	-8.5	-33.5
11/12	-55.9	-34.4	-6.1	23.4	48.3	63.6	66.4	55.9	34.4	6.1	-23.4	-48.3	-63.6	-66.4
11/13	65.8	91.2	98.5	86.3	57.0	16.4	-27.4	-65.8	-91.2	-98.5	-86.3	-57.0	-16.4	27.4
11/14	136.1	111.7	65.2	5.7	-54.8	-104.6	-133.6	-136.1	-111.7	-65.2	-5.7	54.8	104.6	133.6
11/15	4.4	-30.7	-59.7	-76.9	-78.8	-65.2	-38.6	-4.4	30.7	59.7	76.9	78.8	65.2	38.6
11/16	-83.1	-78.0	-57.5	-25.5	11.4	46.1	71.7	83.1	78.0	57.5	25.6	-11.4	-46.1	-71.7
11/17	-16.9	11.5	37.7	56.4	63.9	58.8	42.0	16.9	-11.5	-37.7	-56.4	-63.9	-58.8	-42.0
11/18	33.8	29.6	19.5	5.6	-9.5	-22.6	-31.3	-33.8	-29.6	-19.5	-5.6	9.5	22.6	31.3
11/19	23.3	0.1	-23.2	-41.8	-52.2	-52.3	-42.0	-23.4	-0.1	23.2	41.8	52.2	52.3	42.0
11/20	-8.4	-17.8	-23.6	-24.7	-21.0	-13.1	-2.6	8.4	17.8	23.6	24.7	21.0	13.1	2.6
11/21	-44.8	-27.1	-4.0	19.9	39.9	51.9	53.7	44.8	27.1	4.0	-19.9	-39.9	-51.9	-53.7
11/22	-5.2	10.1	23.4	32.1	34.4	29.9	19.5	5.2	-10.1	-23.4	-32.1	-34.4	-29.9	-19.5
11/23	8.8	9.7	8.6	5.9	1.9	-2.4	-6.2	-8.8	-9.7	-8.6	-5.9	-1.9	2.4	6.2
11/24	-2.5	-3.1	-3.1	-2.5	-1.4	0.0	1.4	2.5	3.1	3.1	2.5	1.4	0.0	-1.4
11/25	8.1	1.1	-6.2	-12.1	-15.7	-16.2	-13.5	-8.1	-1.1	6.2	12.1	15.7	16.2	13.5
11/26	2.6	-1.9	-6.1	-9.0	-10.1	-9.3	-6.6	-2.6	1.9	6.1	9.0	10.1	9.3	6.6
11/27	-13.4	-8.7	-2.2	4.6	10.6	14.5	15.4	13.4	8.7	2.2	-4.6	-10.6	-14.5	-15.4
11/28	-6.9	10.3	25.6	35.8	38.8	34.2	22.9	6.9	-10.3	-25.6	-35.8	-38.8	-34.2	-22.9
11/29	13.2	11.6	7.8	2.4	-3.4	-8.6	-12.1	-13.2	-11.6	-7.8	-2.4	3.4	8.6	12.1
11/30	2.1	-2.1	-6.0	-8.6	-9.6	-8.6	-6.0	-2.1	2.1	6.0	8.6	9.6	8.6	6.0
12/1	5.8	4.1	1.5	-1.3	-3.9	-5.7	-6.4	-5.8	-4.1	-1.5	1.3	3.9	5.7	6.4
12/2	38.0	26.1	9.0	-9.9	-26.8	-38.4	-42.4	-38.0	-26.1	-9.0	9.9	26.8	38.4	42.4
12/3	18.6	-12.4	-40.9	-61.4	-69.7	-64.2	-46.0	-18.6	12.4	40.9	61.4	69.7	64.2	46.0
12/4	-71.0	-57.1	-31.9	-0.4	31.1	56.5	70.8	71.0	57.1	31.9	0.5	-31.1	-56.5	-70.8
12/5	-37.6	12.8	60.7	96.6	113.3	107.6	80.6	37.6	-12.8	-60.7	-96.6	-113.3	-107.6	-80.6
12/6	59.0	59.1	47.5	26.5	0.2	-26.1	-47.2	-59.0	-59.1	-47.5	-26.5	-0.2	26.1	47.2
12/7	31.9	-14.6	-58.1	-90.2	-104.4	-97.9	-72.0	-31.9	14.5	58.1	90.2	104.4	97.9	72.0
12/8	-23.4	-36.0	-41.5	-38.8	-28.4	-12.3	6.2	23.4	36.0	41.5	38.8	28.4	12.3	-6.1
12/9	-25.7	0.7	27.0	48.0	59.4	59.1	47.1	25.7	-0.7	-27.0	-47.9	-59.4	-59.1	-47.1
12/10	7.8	29.0	44.5	51.2	47.7	34.8	15.0	-7.8	-29.0	-44.5	-51.2	-47.7	-34.8	-15.0
12/11	41.8	29.2	10.9	-9.6	-28.2	-41.3	-46.1	-41.8	-29.2	-10.9	9.6	28.2	41.3	46.1
12/12	16.5	1.4	-14.0	-26.6	-34.0	-34.6	-28.3	-16.5	-1.4	14.0	26.6	34.0	34.6	28.3
12/13	-39.6	-41.2	-34.6	-21.2	-3.5	14.8	30.2	39.6	41.2	34.6	21.2	3.5	-14.8	-30.2
12/14	-42.3	-23.4	0.2	23.7	42.5	52.9	52.9	42.3	23.4	-0.2	-23.7	-42.5	-52.9	-52.9
12/15	-11.4	9.0	27.6	40.7	45.8	41.8	29.5	11.4	-9.0	-27.6	-40.7	-45.8	-41.8	-29.5
12/16	39.6	27.0	9.0	-10.7	-28.4	-40.4	-44.4	-39.6	-27.0	-9.0	10.7	28.4	40.4	44.4
12/17	25.4	1.1	-23.5	-43.3	-54.6	-55.1	-44.6	-25.4	-1.1	23.5	43.3	54.6	55.1	44.6
12/18	-15.4	-19.8	-20.2	-16.7	-9.8	-1.0	8.0	15.4	19.8	20.2	16.7	9.8	1.0	-8.0
12/19	-23.1	-3.3	17.2	34.3	44.6	46.0	38.4	23.1	3.3	-17.2	-34.3	-44.6	-46.0	-38.4
12/20	46.1	55.3	53.4	41.0	20.5	-4.1	-27.9	-46.1	-55.3	-53.4	-41.0	-20.5	4.1	27.9
12/21	32.0	18.6	1.6	-15.7	-29.9	-38.2	-39.0	-32.0	-18.6	-1.6	15.7	29.9	38.2	39.0
12/22	-50.9	-58.9	-55.2	-40.6	-17.9	8.3	32.8	50.9	58.9	55.2	40.6	17.9	-8.3	-32.8
12/23	-55.5	-56.1	-45.6	-26.0	-1.3	23.6	43.9	55.5	56.1	45.6	26.0	1.3	-23.6	-43.9
12/24	-20.1	-10.2	1.7	13.3	22.2	26.8	26.0	20.1	10.2	-1.7	-13.3	-22.2	-26.8	-26.0
12/25	16.8	19.0	17.5	12.5	5.0	-3.5	-11.2	-16.8	-19.0	-17.5	-12.5	-5.0	3.5	11.2
12/26	1.8	3.0	3.7	3.6	2.9	1.5	-0.2	-1.8	-3.0	-3.7	-3.6	-2.9	-1.5	0.2
12/27	-27.4	-28.0	-23.0	-13.5	-1.3	11.1	21.4	27.4	28.0	23.0	13.5	1.3	-11.1	-21.4
12/28	-16.6	-14.9	-10.4	-3.7	3.7	10.3	14.9	16.6	14.9	10.4	3.7	-3.7	-10.3	-14.9
12/29	23.1	34.2	38.6	35.3	25.0	9.8	-7.4	-23.1	-34.2	-38.6	-35.3	-25.0	-9.8	7.4
12/30														
12/31														

1998 Time Filtered Broadband Pressure Data
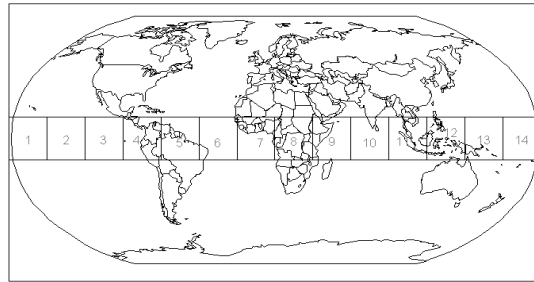
This is 1998 worldwide time filtered broad band pressure data. Lat -15 to 15, Long: 25.7 blocks around the world
5 day running average is subtracted from Raw surface Pressure
and color coded for Positive (Black Lettering) and Negative (White Lettering)

Units for colored numbers are Pascals

Day (0 UT)	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1/1														
1/2														
1/3	-34.8	-60.8	-47.2	-105.2	-25.2	7.6	31.8	1.8	-22	35.4	71.8	32.8	19.2	4.2
1/4	-53	-26.2	-28	-82.2	-38.6	0.2	72.8	90	55.8	120.8	86.6	14.4	-39.6	-50.4
1/5	22.4	10	-18.8	-20	-40.6	-32.8	16.2	85.4	99.4	-15	1.8	4.6	30.2	21.8
1/6	43.2	52.8	57.4	43	-23	-17.4	-85.8	-62.4	-24.8	-73.6	-43.2	27.8	33.4	-3.6
1/7	47	79.4	67	13.6	-28.8	-50.4	-94.4	-115.8	-63.2	34.4	63.8	82.4	-1	-52.2
1/8	15.2	10.4	-0.4	27.8	35.2	-43.2	-15.2	-27	-2.8	45.6	27	-25.6	-17.2	9.2
1/9	-63.8	-83.6	-77	3	12.2	46.2	102	61.4	-29	-62	-83.6	-73.8	-1.6	10
1/10	-76.2	-70.4	-1	27.2	36.8	22.6	-13.4	-28.6	-29.6	-32.6	-17.4	-4.6	-26.8	-23.2
1/11	31.4	37	-1.6	-25.6	10	6.6	-53.6	-28.4	40.2	51.4	29.8	34.2	-30.2	-4.6
1/12	50.2	33	14.4	-1	-18.8	40	70.6	78.8	7.4	-53.8	-47.6	-37	11.8	25.8
1/13	-18	-8.8	2.8	26.6	46.4	49.8	57.6	42.4	-33	-66.4	-54.2	-11	59.2	14.8
1/14	21.8	52.8	49.8	21	-36.2	-45.8	-35.4	-28.2	5.2	47.8	22.4	14	33.8	29.8
1/15	42.8	13.8	-11.6	-78.8	-55	-57.4	-8.2	50.4	93.4	57	9.6	-64.4	-82	24.6
1/16	39.6	-40.4	-40	-32.4	-10	-19	-2.6	16	14	-33	-26.2	-42	-13.2	17.6
1/17	-29.8	24.8	43.6	72.4	69.6	9.6	-68	-90.8	-76	-4.2	45.4	14.2	-8.4	-71.6
1/18	-25.8	51.8	57.2	52.2	25.6	24.6	-13.2	-50.6	-22	28	-11.6	17	-13	-26.6
1/19	12	-3.8	-12	-16	-49	13.4	120.6	57.8	-13.6	-7.6	9.4	50.2	38.8	32.2
1/20	18	-60.2	-83.2	-13	10.4	20.8	21	54.4	30.2	7.2	44.8	78.4	59.4	47.4
1/21	-72	-68.2	-45.6	-34	28.6	12.6	-59.6	-19.8	52.6	6	-1.2	21	43.2	-14.6
1/22	-81.8	-57.8	-2	-26.6	-33.6	-15.8	-26.8	14.8	38.2	23	-19.4	-74.4	-74.4	-77
1/23	-11.8	-2	10.8	3	-15.4	-16.8	38.2	14.6	-23.8	-54.6	-66.6	-94.8	-117.2	-62.2
1/24	48.8	41.2	14.6	-8.2	-18.4	-53	-17.8	-36	-95.8	-48.2	0.8	16.2	1.8	36.8
1/25	78.2	80	30.2	-7.4	-26.6	-34.8	-85.8	-44.4	1.8	60.2	82	42.8	54.8	65.2
1/26	7.4	14.8	-40.4	-54.6	-9.8	14	1.4	16.2	66.4	5.6	-33	-10.6	11.4	-2.6
1/27	-52.8	-35.6	-30.4	-1.2	13	15	-15	-84.8	-58	-33.6	-60.2	-4	15	-24.6
1/28	-3.6	-12.2	30.6	82	70.4	51	12.6	-52.6	-52.2	5.8	36.4	10.2	-23.4	-24.8
1/29	9.8	25.4	83.2	81.8	53.4	35	30.8	32.4	-10.4	6.2	41.6	7.4	-12.8	24.4
1/30	16.2	13	29.2	54.8	-26.8	-28.8	39.4	95	50.2	7.8	37.2	10.6	58.2	44.4
1/31	-14.6	-48.4	-38.2	-29.2	-15.4	10.4	29.6	44	63.8	20.8	-10.8	43.6	37	-0.8
2/1	-51.8	-46.8	-40	-68	0.4	30	29.4	33.2	30.4	-9.6	-32	11.8	-14.2	-21.6
2/2	14.6	16.6	-43.4	-90.6	-0.8	33.4	30	8.2	-8.4	2.4	-33.6	-22.8	5.6	-10.6
2/3	13.4	24.4	2.4	12.8	-28.8	-31.8	-42.8	-12	-27.8	9	7.4	-2.6	15.8	22.2
2/4	7	-34.8	22	8.4	-34.4	-82.6	-39.6	-4.6	7.2	31.6	39	26.4	5.4	35.2
2/5	39.6	-12.6	-57.4	-84.2	-52.6	-30.6	-71.4	-52.8	10.2	19	37.2	-23.8	-22.2	21.6
2/6	4	23.2	-28.6	-7.6	16.6	-0.2	-2.2	-50.6	-11.8	3.2	-14.4	-42	-39.2	-22.6
2/7	-41.6	35.8	48.8	66.4	80	67.4	84	23.6	-6.2	-25.8	-55.8	-14	-31.6	-57.2
2/8	6.6	53.6	110.6	96.6	14	34.4	27	16.8	-13.6	-46.6	-23.8	0.8	-13.4	-27
2/9	81.6	36.2	51.6	27.8	-49.8	-52.2	-60.8	-30.2	-5.8	-10.8	25.6	42.8	34.8	34.6
2/10	-2.6	1	-13	1	-24.8	6.8	-29.2	-30.4	-33.8	21	36.2	10.2	23.2	22

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2/11	-17.8	-0.6	-25.4	7.4	40.8	2.2	-18.4	-32	-49	-41.6	-9	-20.8	-32.2	-28.4
2/12	8.4	-15	-30.4	-3.8	20.6	-61.8	-14.2	1.6	19	-64.4	-40.6	-3.8	62.2	34.6
2/13	-19.6	-62	-21.6	-28.8	-11.6	-18.2	6.6	49.6	43	45.2	7.4	32.2	34.4	15.2
2/14	-53.6	-46.6	1.2	20.4	-31.6	46.8	65.4	81.4	46.4	99	55.2	35.4	-44.2	-23.6
2/15	28.6	45	3.2	38.6	92.4	88.8	77.8	17.8	-2.4	-21.6	3	-11.4	-8.4	22.8
2/16	46.4	24.8	-39.2	-54.4	74.4	58.4	-11	-18.4	11.8	-15.6	-20.6	-34.8	28	34.2
2/17	-25.4	-57.2	-46.8	-78.4	-56	-34.6	-18.6	25.2	49	39.8	27.4	4.2	-0.2	-5.8
2/18	-79.4	-22.8	47.2	18.2	-68.6	-28.2	40.2	52	13.8	1.6	-25.6	-21.8	-24.6	-60.8
2/19	-59.8	36.4	55	2.4	-23.2	5.6	-4.6	-70.6	-81.8	-49.8	-44.4	-34.8	-27.4	-56.6
2/20	98	69.8	1.8	11.4	-14.2	-43.8	-64	-91.2	-79.2	-4.8	6.4	-27.6	-27.8	18
2/21	105.6	50.6	10	25.4	-21.8	-49.6	-62.6	54.4	70	87.4	55.8	23.8	9.8	56.2
2/22	24.6	-25.6	-24	-35.2	31.6	12.2	47.2	80	52	-31	-12	85.4	53	50.8
2/23	-46.8	-49.2	-50.2	-58	30	35.2	29.6	-21	-40.4	-80.6	-47.8	32.6	39.4	-29
2/24	-69.6	-14	62.8	112.8	48.8	55.2	-8.8	-83.8	-41.8	30.4	32	-16.4	-21.8	-44.4
2/25	26.8	45	67.6	67	23	7.2	-25.4	-7.2	22.6	7.4	28.8	-32.4	-31.6	58.6
2/26	42.8	-2	-29.4	-52.8	-77.6	-55	11	35	22.8	-27	-27.2	-56.8	13.6	61.2
2/27	-18.6	-38	-77	-47.8	-34.6	-19	18.2	17.4	-17.8	-6.8	-4	5.2	2.8	-30.2
2/28	-67.4	-18.4	-22.4	-21	20.8	11.8	1	-37.2	-9.6	54.8	20.2	34.6	-49	-69.8
3/1	8.2	24.6	46.6	26.6	10.6	-18.4	-31	-9.6	35	27.6	-42.8	-15.8	-3.6	-37
3/2	43.6	-18	-19.8	6	-27.8	-59	-24	31.8	-38.2	-41.8	-3.8	12.6	70.6	51
3/3	-65.8	-40.8	-35.4	-34.2	-12	36.4	25.2	35.6	8.6	-8.2	54.4	8	-13.6	-35.2
3/4	-4	-15.6	-13.4	-20.2	53	82.4	31	-44.6	45.6	42.8	31.6	3.4	-46.8	-39.2
3/5	27.2	33.6	50.8	65.8	45	33	-1.6	-47	-24	3.8	-30.6	24.8	-12.8	1.2
3/6	-3.4	37.2	20.2	24.2	-26	-46.4	4.4	30.2	-52.8	5	9.2	17	43.8	40.2
3/7	6.6	23.8	9.8	-53.4	-82.2	-47.6	-2.2	59.8	33.4	-42	-25	-13.6	20.2	8.6
3/8	-43.8	-90.2	-84	-79.2	-10.4	21.4	20.6	50.4	37.6	-21.4	-28.4	-58	-58.8	-28.2
3/9	-13.6	-39	-19	3.4	75.2	4.8	-39.2	-48.4	-41.8	-40.2	-31.6	-51.2	-53.8	-15.4
3/10	33.8	63.2	82.4	62.6	-3.6	-57.2	-61	-42.6	-50.6	-66	-68.8	-29	2.8	-2.6
3/11	13	33.2	-24.8	19	-53.8	-13	20.8	-0.4	6.4	47.2	56	57.8	50.2	29.4
3/12	34.4	36.2	3.2	-40.6	-2.8	79.8	33.6	-54.6	9.6	78	68.8	52	19.2	11.4
3/13	-27.6	-53.4	3	27.4	52.4	41.8	5	60.6	135	99.8	44.2	-11.6	-1.6	-18.6
3/14	-23	-3	18.2	88.2	59	-12.2	15	68.4	68	-22.6	-70.6	-53.4	-20.6	-13.2
3/15	90.6	112.2	103	53.4	-6.8	-28.8	21.2	-41.4	-128.4	-132.8	-47	-5	35.8	90.4
3/16	93.8	100	33	-44	-54.4	-53.8	-54	-151.4	-194.4	-56	56.6	61.2	66.4	71.8
3/17	-11.8	-67.4	-63.6	-80.4	-25.2	4	-14.2	-7.6	17.8	77.6	32.2	22.2	0.8	-16
3/18	-129.6	-183	-128	-44.2	-19.4	-15.4	-9	92	172.2	104.8	11.2	5.6	-29.4	-63
3/19	-72.2	-20.2	-48.4	-3.4	13.4	16.4	37	97.4	16.8	-52.6	-11.6	-12.2	-46.8	-93.4
3/20	1.2	69.8	93.4	45.2	72.4	73	59.2	-11.6	-75.4	-87.4	-53.4	-68.4	-73.2	-37
3/21	46	-40.8	5.2	-6	2.8	20	-28.2	-20.6	2.2	81.6	16.2	-4.8	-1.2	42.2
3/22	-13	-75.2	-74.6	-72.8	-85.4	-68.4	-35.2	4.8	64.8	38.6	33.4	61.4	74.6	50.8
3/23	-59	4.4	-9	-28.4	-57.6	-36.2	-8.8	19.8	56.8	-2.6	4.4	30.2	26.8	-35.8
3/24	11.2	73.4	17.6	47.4	16	-9.4	-22	-36.2	-26.8	-9.2	-18.6	-43	-38.2	-22.2
3/25	48.4	29.2	-6.6	42.2	92.6	20.4	7.6	-45.8	-80.4	-57	-50	-61.2	-40.8	1
3/26	44.8	70.4	98	93.6	110	35	-11.2	-57.6	-70.6	-22.2	57.8	56.8	18.6	-6
3/27	28.8	27	49.8	-1.4	-78	42	86.2	17	37	23	5.4	8.4	21	44
3/28	-19.8	-59.6	-55.2	-66.6	-41.4	27.2	15.4	24.4	27.2	-6	-61.4	-21.2	29.2	36
3/29	-13	-17.8	-15.4	1	23.8	-14.6	-51.8	51.4	41.4	-18.4	-17	36.4	56.4	10
3/30	16	37.8	43	28	-18.6	-85.2	-45	11.6	-39.2	-12.6	61.4	20	-23.6	-13.4
3/31	41	-11	-26.4	-43	-90.8	-79.2	-35.8	-2.4	-50.2	-6.2	-10.8	-41.8	-52	-2.2
4/1	-45.6	-59.2	-88.2	-95.2	-50	-2.6	35.4	3.8	77.2	99.6	26	-17	-30.6	6.8
4/2	-108.8	-94.4	-10.2	25.2	91.4	119.4	46.8	4.8	93.6	79.4	16.4	2	-15.6	-53.4
4/3	-11.6	60.6	63	100	94.2	22.6	-8	-42	-75.2	-53	-40.8	-13.4	-1.2	-43
4/4	59.8	112.2	98.4	68.8	56.8	-18.6	-4.8	-31.8	-67.6	-130.6	-27.8	44	64.4	45
4/5	102.2	4.4	-58.6	-65.8	-73	-32.2	-17.2	19.4	-18.4	-16.6	49.4	65.6	82.4	107.4
4/6	-2.2	-46.4	-62	-72.2	-81.2	-4.6	3	45	40.6	136.6	86.8	25.6	-2	5.8
4/7	-40	-27.6	31.2	5.2	-19.8	41.8	70	56.2	121.2	77	-6.4	-38	-66	-62
4/8	-30.2	-1.8	15.2	29.6	82.6	62.2	65	41.8	1	-66.6	-77.8	-69.2	-47.2	-49.6
4/9	22	19	23.2	23.4	51.8	13.2	-49.2	-35.8	-69.6	-106	-92.6	-28.8	18	16.4
4/10	37.8	37.2	-24.2	-9.4	-34.4	-110	-112	-102.2	-114.4	-50.8	27.8	47.2	51.2	64
4/11	-69	-42.8	-10.8	9.4	-60.2	-69.2	-6.6	-20.6	24.2	89	108.8	41.8	-15.4	-49.8

Date														
4/12	-21	-7.8	9.4	-2	-13.6	62	60.4	38.6	109.8	74.2	-34.4	-72	-60.8	-42.6
4/13	53.8	29.8	-1	-2.2	35	55.6	-11.6	-36	-35	-120.2	-115.6	-69.8	-26.2	13
4/14	22.4	11.6	-25.6	10.4	49.4	-4.2	-42.2	-39.6	-113.8	-67.8	0.8	39.4	49	23.4
4/15	-30.4	-22.4	7	9	-19.6	-62	-29.6	38.6	20.8	47.4	67.8	60.2	28.8	21
4/16	-47	-58.2	8.2	-9	-53.4	-26	43	77.6	57.6	30	16.8	3.8	-34.4	-26.2
4/17	-14.6	-8.4	-23.2	-51.4	-22.6	93.2	76.8	-21.4	7	6.6	10.2	-7.2	-31.6	-44.4
4/18	49.8	83.8	23.8	-27	28.8	45.2	22.8	-44	-14	50	29.2	-22	-0.8	2.8
4/19	59.6	40.4	10.4	26.8	11.6	-88.2	-87	28.8	26	39.4	-22	-51.2	72	85.6
4/20	10.6	-24.6	2.4	45.8	2.4	-65.4	-42.6	41.8	34.8	-49.2	-49.4	18.6	23.2	32.2
4/21	-28.2	-9.4	-5.8	-29.2	-10.4	18	24	-2.2	5.2	-27.4	8.6	57.2	-59.8	-54.4
4/22	-42.4	-42.2	-24.4	-4	28.4	60.4	47.2	-36.8	-21.4	-7.4	-9	-6.4	-50	-52.8
4/23	-49.2	-48	-28.2	-10.4	-3	42.4	16.8	-49.4	-1	39	28.4	-12.4	9	7.4
4/24	-42	18.6	49.4	54.2	-5.8	10.2	4	47	-32.8	-10	10	24.6	27.2	-44
4/25	61.2	53.2	19.4	18.6	20.8	-18.4	18.2	74.8	6.2	-55.6	6.2	12.8	13.4	19
4/26	87.6	48	30.8	22.2	44.8	-4.6	-8.4	-12.2	-5.6	15.4	-0.2	-14.2	13	59.6
4/27	28	9.4	-17.6	-58.8	-71.2	-76	-57.6	-83.8	-33.2	28.8	-16.6	-20.8	31.6	60.8
4/28	-28.6	-33.8	-26.8	-73.8	-98.2	-23.2	-53.2	-55.2	20.4	39.2	27	-1.2	32.8	37.8
4/29	-65.2	-98.2	-65.6	16.6	44.8	91	27	55.2	55.6	12.2	5.6	-3	-41.4	-63
4/30	-31	31.4	6.2	18.2	73	47.6	77.2	24	4.6	-33.2	-30.8	-14	-46.8	-86.2
5/1	12.4	24.2	32	20.8	-8	-81.6	-34	-21.2	-15.8	-14.2	11.6	21.4	5.2	1
5/2	57.2	-30	-22.4	14	-33	-80.2	-64.2	0	-32.2	38.6	60	90.2	79.8	107.8
5/3	5	-18.2	-13	-9.6	-0.6	25	5.2	30.6	33.2	60.6	48.8	5.2	30.8	18
5/4	-62.4	44	76.8	10.4	-32.6	67.6	73.2	59.8	52	-36.2	-69.8	-102	-100.4	-102
5/5	12.6	60.6	74.4	27.6	21.8	6.4	16.2	-48.6	-65.6	-91.4	-102.4	-32.2	-57.4	-34.2
5/6	71.2	-27.2	-51.6	4.6	37.6	-55.2	-81.6	-93.6	-81	-37.4	-12	27.2	27.6	61
5/7	44	29	-47	-25.6	-24.4	-88	-99	-64	-2	17.4	68.4	73	82	69.6
5/8	-59.8	10.8	71	-9.4	-69.6	-67.2	27.6	52	82.8	90.4	57.4	20.6	3	-43.6
5/9	-59	-96.4	-78.4	-33.8	59	151.6	117.2	78	33	-10.2	-28	-67.4	-51.2	-50
5/10	-7	-11.6	-25	30	102.2	151	50.4	-35	-25.4	-35.2	-33.6	-19.6	-9.4	-4.2
5/11	15.8	78	30.2	54.8	0.6	-8	-51.6	-18.2	-61	9.8	14.8	-3.6	41.4	31.8
5/12	70.6	46.2	44.4	-29.2	-59.6	-67.8	-2.2	42.6	13.8	-5.2	-22.2	-4.8	34.8	69.4
5/13	-6	-109.2	-14.2	-17.6	15.2	20.4	84.6	75	4.4	-15.6	6.6	22.4	-11.6	-7.4
5/14	-47.6	6.2	14.4	82	11.6	39.6	18.4	43.2	-3.6	-8.8	-2.2	-50	-83.6	-92.6
5/15	-8.2	83.2	-10.2	-50.4	-64.2	-43.4	-40.6	-34.2	-27	-48.6	-70.6	-69.2	-82.6	-19.8
5/16	53.4	-9	-28	-85.6	-71	-114	-124.4	-116.4	-31.8	-15.8	-8.6	-12	12.2	51.4
5/17	-7.4	-9.6	-41.2	-9.4	3.6	-46	-70.6	-51.2	39.6	59.6	73	67.6	62	-27.8
5/18	-77	-56	-45.4	-13.8	29	17.6	70.2	79.6	95.6	84.8	48	60.6	0.4	-62.8
5/19	-30	-47.2	38.8	11.8	43.4	53	89.4	23.4	-2.4	-32.8	-53.2	-3.4	28.4	25.8
5/20	-30	4.2	66.2	93.8	70.8	57	-10.4	-23	-56.6	-55.4	-13	28.4	27.6	14.2
5/21	15.6	9.6	11.2	33.8	49.8	8.8	-80.4	-23.4	4.4	0.2	37.6	53	-11.4	2.4
5/22	23.8	-34.8	-135.4	-92.8	-25	0.4	34	45.4	54.2	16	30	-11.6	-18.8	7.4
5/23	51	1.4	-44.6	-76.2	-52.4	17.8	71.2	25.6	8.2	4	-37.2	-85.4	-8.4	29.2
5/24	5	49.8	122	59.6	-20.8	1.2	19.2	-14.2	-66.2	-3.2	-35	-57.8	-26.4	10
5/25	16	102.4	108.2	43.8	-17.6	-26.6	-20.8	8	-33	-20.4	-40.8	-51.6	-60	-46.8
5/26	31.6	14.6	-17	-35.6	-30.2	-21.6	-19.8	6.4	14	-28	7.8	69.6	50.6	23.4
5/27	-25.6	-68.8	-90.2	-30.4	0	-4.8	-38.8	-7.4	69.8	51.8	100.8	123.6	94.6	41.8
5/28	-107.4	-96	-0.2	54.8	10.2	16.4	32.8	-18.6	2.2	83.6	70	0	-15.4	-62.4
5/29	30.6	63.4	53.2	76.6	13.2	11.2	18.4	-36.4	-71.6	-39	-77	-109	-26.4	-29.2
5/30	136.2	78	2.4	-18	4.4	-49.6	-34.4	-32	-53.6	-76.2	-81.4	-7.4	59.8	128.6
5/31	50.8	-39	-66.4	-61.6	-6.4	-39.6	-82.6	-10.4	67.6	34.6	70.8	121	70.6	85.2
6/1	-102	-73.4	-36.8	-9.6	-69.4	3.2	21.2	89.6	101.6	69.6	46.2	13	-70.2	-95.4
6/2	-72.6	15.4	37	6.4	53	61.8	95.2	35	-22	-41.8	-82.8	-103.2	-83.8	-98
6/3	33.4	78	96	39.6	80.6	2	-53.4	-95.2	-69.6	-16.2	-28.8	-34.4	-1.8	40.6
6/4	52.2	33.6	32.4	21.8	30	-3.4	-38.4	-19.4	8.8	29.6	40.2	28.8	7.2	18.6
6/5	20.2	-47.8	-67.2	-45	-36.4	-11.2	21.8	33	17.6	5.4	4.8	26.6	28.4	16.4
6/6	-69.8	-55	-71.4	-23	1	68.4	102	71.6	-39.2	-74	-42.8	-6.2	-9.6	-49
6/7	-15.4	3	42.4	38.6	3.2	25.8	3.4	-59.4	-68.6	-42.8	22.8	0.2	-25	-27.8
6/8	53.6	46	-3.6	-40.8	-23.8	-48.6	-42.6	-17.6	-16.6	11.6	-8	-25	9	73.4
6/9	-49.2	-2.2	7.6	21.6	-12	-12.2	4.2	51.4	61.4	37.2	-4.6	1.2	20.8	16.4
6/10	-1.4	27.4	51.2	31.4	-10.6	-29.6	-18.2	14.2	21.6	39	64.4	53.2	-3.4	-49

6/11	-13.2	-22.6	-4.8	-12.6	-32	-44.8	-50.6	-18.6	25.8	25	62.2	18.2	-9.6	-58.6
6/12	17.2	-36.4	-95.6	-24.8	29	27.2	18.6	1.8	56.2	19	-48.4	-79.2	-29.8	-7.6
6/13	24.2	-27.8	-22.2	-34.2	18.6	55	62.4	28.8	-17.4	-41.4	-90.2	-28.4	-0.2	46.6
6/14	2	-10.6	63.4	4.2	-23.4	30.4	41	-20.6	-46	-54.6	-36.2	56.4	49.6	48.6
6/15	-16.8	33.2	0.4	35.6	20	7.2	-56.2	-37	-25	51.6	91.6	60.4	27	3
6/16	-15	23.8	7.8	20.6	-1.8	-39.4	-31.8	15.2	59.2	60.6	48.4	-9.4	-18.8	-24
6/17	18.2	20.2	52	16.8	51.6	-21.2	31	54.8	33.8	-38	-59.8	-73.4	-11.6	18.2
6/18	39.6	10.6	10.4	2.4	-8.2	-22.4	-5.4	1.6	-65.4	-109.4	-37.2	-25.6	12	21.4
6/19	25.4	7	-35.4	-4	-7	32.6	-58.6	-81.8	-33.2	17.4	64.2	62.8	7.6	0.4
6/20	31.2	16.8	-18.6	-43.4	-80	9.6	-4.4	-42.8	16.4	71.6	41.4	40	30.4	8.6
6/21	-14	-24.2	-4.4	-23.6	-20	-3.8	63.6	50.2	42.8	23.4	-38.4	-8.2	-5.2	-20
6/22	-106.4	-58.4	0.8	49.2	61.6	-8.2	14.4	50.4	-20.4	-4.2	-5.6	-24.2	-53.4	-57.6
6/23	-51.6	-26.4	-18	4.8	-41.2	-50.6	-46.4	-9.8	-46.6	-18.2	-0.8	-8.8	-50.4	-9.4
6/24	-2	-10	-28	-48.4	-28.2	-28.2	-41	-24	14.2	-15.2	5	-3.4	25.2	-5.2
6/25	63.6	37.8	19.8	47.4	89.2	39.8	26.6	-9.4	46.8	14	-19.2	-43.8	8.6	8.6
6/26	55.2	48.4	24.6	0.6	20.2	16	-1	4.4	-9.2	2.2	-44	-29	-10	58.4
6/27	26.2	28	14.4	-46.2	-71.2	0.6	8.8	-36.2	-45	-26.2	14.8	53	36.2	29.2
6/28	-45.6	-44.8	-32.8	-41.8	-31.8	28.8	50.2	27.8	10.4	15.4	73.8	50.4	13.2	-38
6/29	-63.6	-23.8	4	73.4	43.2	4.8	-24.8	20.4	25.6	20.8	-2.4	-34.4	-82.4	-83.8
6/30	-55.4	-42.6	1.6	26.8	41.2	-18.8	-26.6	-20.2	-4.6	-22.6	-64.8	-31	5.4	-53.4
7/1	-33.2	-54.2	-29.6	-27	51.6	16	9.4	28.4	48.4	-22	-61.6	-20.8	18.8	9.6
7/2	48.6	14.8	-47.4	-49.4	24.6	47.4	57	51.2	10.4	-31.2	-15	-4.8	-7.2	45.2
7/3	100.8	104	46.4	14.8	-64.4	-32	3.6	-15.6	-57.2	-36.2	-11	-4.8	25.2	52.8
7/4	24.4	56.8	67	-11	-74.6	-34.6	7.8	-36.4	-48.2	-6	45.4	12.4	3.4	33.8
7/5	7.8	16.4	23.8	7.2	-7.2	22.2	-25.4	-56	-13.8	58.6	71.4	52.4	40	33
7/6	76.8	-24.6	-16.2	62.4	69.6	14.4	-50.6	27	49	78	67.8	41	31	40
7/7	-9.6	-7.6	17.2	35.8	9.4	-23.2	-46.2	42.8	80.4	22.6	20.2	3	-7	-29.6
7/8	-53.8	18	4.4	-43.8	-76.8	-61.6	5.4	-12	-40.6	-40.2	-70.4	-11.2	-1	-34.8
7/9	-90.8	-108.4	-107.8	-96	-57.6	-30.2	34.6	-24.8	-63.6	-15.2	-36	-12.2	-18.8	-29.4
7/10	-62	-81	-81	-3.4	20.2	31.2	45.6	-28	34.6	38.4	-5.8	-31.6	-52.2	-40.6
7/11	-34.6	25.8	38.6	65.2	69	52.4	50.2	26	48.8	-28.6	-24.4	-45	-38.6	-33
7/12	64.6	91.8	111.4	50.6	64	40	-52.2	22	-21	-74.2	-25.4	-23	31.2	53.2
7/13	98	56	59.4	45.8	34.2	15.4	-34	-9.8	-42.6	-16.2	47.8	62.2	56.6	53.8
7/14	47.4	-14	-21	-45.2	-28.2	-43.2	-4.8	-36.2	-13	31.4	56	90.8	16.4	5.8
7/15	-30.2	-36.2	-43	-53	-28.6	8.2	17.6	11.4	64.2	84.2	36	-1	-42.6	-47.8
7/16	-44	26.8	-13.8	-19	-11.6	35.8	22	55.2	13.6	0.4	-59.8	-67	-12.6	-5.8
7/17	-7.2	35.4	11	45.4	-0.4	-47.2	-2.8	22.6	-49.6	-80.2	-84.4	-32.8	67.8	32.6
7/18	47.2	3	14.4	4.2	-18.8	-52.8	-24.8	-39.2	-9.6	25.4	48.6	44.2	31.2	42.2
7/19	25.2	-64.2	-41.8	3.6	21.4	45.4	17.4	-4	68.6	82.6	78.2	37.4	-36.8	-9.8
7/20	-37.8	-54	-27.4	-3	19.4	55	50.4	-4.8	0.8	-40.4	-32	-40.6	-32.4	-10.6
7/21	-23	33.4	30.6	-20.6	13.2	2.8	-7.4	-10.2	-75.6	-53.8	-12.8	-38	-22	-34.6
7/22	-24.4	58.6	57.2	-11.8	-52	-43.2	-41	29.8	-27.2	-4	-10.2	5.4	-18	-25.2
7/23	-13.2	-37.4	-12.6	8.2	-42.8	-29	24	23.4	9.6	12.6	-36.8	0	-13.2	7.4
7/24	-31.2	-17.8	-29.2	-2.4	-3.8	-5.2	-13.4	-52.4	13.2	11.8	9.4	-3.6	1.6	-39
7/25	0.2	-1.2	-26.4	16.2	48.4	-9.6	-69.6	-39.4	2.4	-19.4	31.4	11	35	-11
7/26	63.8	29.2	39	20	31.4	-24.6	-63.4	-2	27.6	-5.8	28.2	14	14.2	68.4
7/27	40.2	3.6	36	8.4	-26.8	11.2	26	27.8	3.8	28.4	9.6	-1.6	-13	52.8
7/28	-30.6	-39	-34.2	-28	-65.4	42.6	123.2	50.8	5.2	34.2	-20.8	-17.6	-30	-30.2
7/29	-22.2	5.8	-11.2	-30.6	25	5.2	10	-34.8	-30	-17	-58.4	-32.8	-11.2	-51.6
7/30	-18.2	16.4	-35.8	17.8	61.2	-4.2	-28.2	5.4	-1	-18.2	-70.2	-36	-0.2	-13.4
7/31	-18.4	-36	-4.2	18	-16.6	-19.2	12.6	7.8	0.2	-47.6	15	29.8	3.8	2
8/1	25.6	3.4	31.8	18.2	18.2	0	-17.6	-5	18.2	-39.6	5.8	30.4	-0.6	10.4
8/2	15.2	39.2	-18.2	-28	19	27.6	-73.6	-26.2	-23.8	5.8	24.4	11.4	32.8	2
8/3	20.4	25	-24.2	-83	-49.6	7.2	-3.4	-22	-2.4	71	74.2	13.4	15.2	22.2
8/4	-8.2	-19.8	10	-13.8	-17	7.4	69	26.2	40.6	54.6	32.8	6.2	3.4	7
8/5	-50.2	-60.8	22	67.6	30	21.8	41.6	49.8	12.4	-10	12	-8.8	-31.6	-16.4
8/6	22.8	29	38.8	62.2	0.2	-20.6	-11.8	-17.2	-34	-39.4	-39.2	-19	-2.2	35.4
8/7	6.4	4	-30	-19.8	-38.4	-45.2	16.8	40.8	20.8	9.4	-11.4	2.6	39.2	-11.6
8/8	-18.8	24	-3.6	9.2	36.2	14.4	-7.4	25.4	37.4	39.6	-17	-25.4	-46	-69.4
8/9	14.8	42.2	17	-22	27.8	15	-53.6	-66	-65.8	-34	-31.6	18.2	7.4	24.4

8/10	32.8	-32.4	36.6	7.8	-42.4	-49.8	-74.4	-78	-6.8	-11.6	21.2	50	65	87
8/11	-16.4	-54.2	-37.2	-34.4	-34.6	-25.8	-2.6	23.8	103.4	46.6	61.4	15.8	24.6	-26.4
8/12	-24.6	-18.2	-73.6	-15	75.6	89.2	117.2	56.2	-2.8	6.2	-10.2	-10.2	-44.4	-69.6
8/13	44.6	92.8	57.2	68	20	46.6	62.8	6.8	-67	-68.4	-86.8	-41.8	-61.4	10.4
8/14	63.6	34.4	37.4	22.4	-61.4	-65.2	-59	-17	-16	-47.6	-4.4	15.6	56.2	93.4
8/15	-18.8	-47.6	-24	-88.4	-77.6	-27.2	-40.8	25.2	19.2	16.6	76.8	41	54.8	55.2
8/16	-69.2	-59.8	-24.2	2.4	86.6	82.8	75.4	60.8	-15.4	61	39.8	-50.2	-83.8	-95.8
8/17	18.2	36.6	54.4	99.2	131.8	41.6	17.4	-46.6	-41.6	-22.6	-9.2	-3.6	-23.6	-61.8
8/18	49.8	74.6	32.4	30	-21.8	-65.2	-86.4	-94.4	-13.6	0.2	21.4	37.6	67.2	36.2
8/19	-85.6	1.2	0.8	-39.2	-111	-102	-82.6	-8	61.4	63.6	4.2	-16.8	-10.6	-24.2
8/20	-71.8	-87	-32.4	-56.6	-65	9.4	20.2	41.4	38.4	12.2	-58.8	-57	-62.6	-56.6
8/21	22.4	-37.6	10	5	41.6	57.4	61.2	42.6	-17	-28.4	-76.6	-41.6	-53.2	-11
8/22	106.8	25.2	-33	7.8	64.6	9.8	54	-18.4	-6	-45.4	-48.8	17	28.4	95.2
8/23	25	17.8	-43.2	-16.8	11.4	13.2	12.4	-15.6	-29.2	-22.2	10	64.8	97	92.6
8/24	-35.8	7.4	-7.4	-3.2	-47.2	-32.8	-48.2	-24.8	-44.6	5	51.8	25.8	30.8	-25.8
8/25	-16	43	41.2	10.4	-72.4	8.4	-17.8	16	1.4	-31.6	-31.6	-68	-90.2	-99.8
8/26	-9	-15.6	-8.2	-10.2	-10.2	57.2	-7	29.8	-15.2	-52.4	10	-0.6	-5.8	-2.2
8/27	-10.6	-88.4	-32.2	1.4	65.2	-48.8	-14.8	7.2	23.8	2.4	67.8	82.4	63.8	34.6
8/28	-61.2	-22.6	3.6	-6.8	-31.6	-155	-50.8	-41.8	18.4	86.6	80.8	49.2	4.6	-30.8
8/29	-34.6	36.2	6.4	-49.2	-41.8	1.8	20.2	-14.6	56.8	64.8	-23	-87	-67.8	-29.4
8/30	32.2	17	0.6	-22.2	62.2	124.2	88	52	19.2	-13.4	-50.8	-71.2	-40.2	-3.8
8/31	13.4	14.4	26.6	89.6	89.4	97.2	17.4	-16.4	-44	-63.4	-35.2	-30	-26	-20.4
9/1	49.4	3.4	12.2	66.2	0.4	-33.6	-71.6	-35.4	-42.2	-6	-26.8	17	19	20.8
9/2	86.2	51.6	-2.6	-62.6	-51.4	-39.8	-7.2	-2.8	19.8	37	19.6	59.8	70.6	92.2
9/3	-9.4	15	11.4	-2.6	-4.6	20.4	37.6	27.4	-2.8	-1.2	29.2	61.8	28.8	20.6
9/4	-54.2	-38.6	0.6	-7.2	-17.6	-12.4	-8.4	17.6	-8	26.6	43	28.4	-13.4	-36.6
9/5	-1.8	-18	-28.4	-25.8	3.8	-11	7.6	14.2	41	22.2	15.4	-50.8	-9	3.8
9/6	4.4	-25.6	-39.8	22.4	71.4	48.4	52.2	23.8	40	-26.4	-56.4	-30.8	56.4	22.6
9/7	13	31.2	45.8	26.4	-26	11	-2.4	-10.6	-25	-58.4	-55.8	23.4	63.8	43.6
9/8	18	37	34.6	-7	-112	-79.4	-67.4	-19.2	-21.4	5.8	59.4	59.8	-9.2	1.8
9/9	-11	-17.8	-23.6	-37	17	-31.4	-44.8	-1	26.4	98.2	104	19	-71.4	-74.6
9/10	-32	-11.4	-15	2.2	94.2	101	73.8	27.4	8.4	-21.6	-63	-53.2	-44.2	-36.2
9/11	-14.6	14.4	29	78.6	-0.2	11.2	35.4	-16	-72.4	-80.2	-81.8	-45.2	-46.4	-6.2
9/12	14.4	-9	19.6	-12.4	-53.6	-78	-54.8	-45.4	-51.8	-18.6	29	21	37	57.8
9/13	21.2	-36.8	-58.2	-51.8	-47.8	-58.4	-71	-49.6	21.4	78.4	73.4	30.6	41.4	18
9/14	-6.8	-11	-21.4	-47.4	1.6	34	-8.4	16.2	63	34.4	12.6	-30.2	-24.6	-51.4
9/15	-48.4	35	38	32.8	66	43	39.4	63.4	39.8	-27	-77.4	-36.4	-29.6	-48.4
9/16	3.2	15	2.8	42	67.6	17.2	90.4	25.8	-23.8	-60.6	-10.6	34	21	15
9/17	54.4	-2.6	-13	18	-37.6	-29.4	-3	-42.6	-51.2	-7.8	21.4	9.6	-2.8	71.2
9/18	-20.6	-60	-13.2	-44.8	-89	-18.4	-56	-56.4	-12.2	53.8	16.8	-41.4	4.4	27.8
9/19	-33.6	-15.6	-4.6	-28.6	-20.4	47.2	7	16.4	45	0.2	-31.2	-36	4.6	-44.6
9/20	-9.8	39.4	4	16.4	33.8	35	15	60.8	12.6	-28.6	-22.4	10	-17	-49.8
9/21	54.8	32.6	14.2	29	91.4	-41.8	-18.8	11.6	-30	-50.2	-13.2	31.6	2.6	10.8
9/22	-5.2	12.4	40.8	34.4	8.8	-86.2	-56.2	-7.6	32	18.4	22.6	55	17.8	24.2
9/23	-35.8	-50.2	-5.4	-4.6	-56.4	8.2	26	-47	-11.6	26.2	12.4	-14.2	20.4	22.4
9/24	9.8	-15.2	-55.2	-67.4	-7.4	91	73.6	3	-39.4	18.2	17.2	-8.8	6	-25.8
9/25	44.4	66.8	8.6	-23.6	35.8	38	3	42.2	27	38.8	17.4	-11.2	-32.6	14.4
9/26	23.6	35.4	46.4	58.6	46.2	-42	-37	8	45.2	22.4	24.6	8.8	3.4	59.2
9/27	3.8	1.6	20	20.8	-69.2	-46	7.6	21.6	26.6	-13.4	-17.2	-2.4	34.4	-19.6
9/28	-16	-25.4	13.4	-9.4	-100.2	8.2	8	-0.8	-24	-9.4	-58	-8.2	-24.6	-48.2
9/29	-35.8	-25	-35	-2.6	18.2	21.2	-33	-65.6	-7.8	-12.4	-46.2	-18.8	-54	-40.2
9/30	-11.4	-15.4	-67	-12.8	58.6	22.4	-8.6	-34.8	-45.6	-51.2	34.6	13	-5.8	-2
10/1	-18.8	12.6	23.8	-5	25.4	11.6	-6.2	32.8	-47.4	-57.2	47.2	36	45.6	36.4
10/2	-7.6	-36.8	22.6	4.6	39.2	-28.2	12.8	68	53	41.2	26.2	-15.4	28	22.6
10/3	-1.2	-36.8	-1.6	25	29.6	25.2	87.4	39.2	45.4	32.2	-14.2	-42	-17.4	-2
10/4	23.2	25.6	20.8	23.6	-1.6	11.2	2	-33.2	-10.4	16.4	11.2	7.6	8.6	-29
10/5	58.4	85.6	-1.8	-36.6	-58.2	-37.8	-87.8	-30	-24.4	10.2	23.8	11.2	13.2	7.6
10/6	33.8	64.6	3.8	-29	-84.4	-47.6	-37.2	-36.4	-22.6	-10.6	-34.6	-7.6	-21.4	9.2
10/7	-81.6	-94	-26.6	-5	-52.8	-39.4	78.6	-7.4	-30.2	-9.6	-54.4	-12.4	-10	-0.6
10/8	-73.6	-117.4	-40.6	17.8	38	42	-6.8	-28.2	12.6	14.8	-16.2	12.2	7	-4.2

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10/9	-5	26.8	16.4	10.8	90	76.6	-24.8	29.4	54.4	15.6	18.4	14.8	7.2	-43.2
10/10	71.6	104	31	-18	48.6	-5.4	-19.4	50.6	27.8	-3.2	-14.8	-11.2	-37.2	-11.8
10/11	60.6	-22.4	-44.6	-41.6	-5	-17.6	15.4	-24.4	-35.2	-42.6	-15.4	24.8	-3.8	89.6
10/12	-30.8	-33.8	27	39.6	-40	14.8	20.4	-54.2	-56.4	-29.4	29.2	50	50.2	23.6
10/13	-58.4	15	80.2	40.6	-53.8	-47.4	2.8	24.6	23	47.2	29	-35.4	-6.2	-59.6
10/14	63.6	45.4	-21.4	-36.2	6.8	-5.2	8.4	62.2	56	-8	-51.8	-98.2	-10.2	15.8
10/15	16.4	-1.4	-82.8	-43.4	74	67.4	-6.6	0.6	-35.6	-112.4	-70.8	-8.2	7.8	17
10/16	-79.2	-46.8	-10.4	43.4	18	-7.6	-30.2	-55.8	-124.8	-43.6	82.6	98.8	15.6	-58.8
10/17	-35	-28.4	27.2	27.6	-97.4	-108	-53.2	-18.2	56.6	125	88.4	31	-37.8	-8.8
10/18	21	-0.8	4	-38.6	-41.4	-23.2	13.6	5.6	85	103.6	20.6	-36.4	-34.2	3.6
10/19	17.8	-3.8	-4.6	-25.2	35.2	51.8	72.2	-8.2	-24.6	-48.8	-47.4	1.4	11.4	-17.8
10/20	12.4	9	-52.4	-5.4	14.4	14	-26	-2	0	-10	-1.6	22.6	29.6	20
10/21	-20	-19.4	-45.8	-27.4	15.4	-6.2	-25.2	37.4	82	65.4	18.6	-31.6	0	-6.8
10/22	-37.4	-7.6	61	19.6	-8.8	-7.4	-4.8	39.4	10.4	-15.2	-8	-44.4	-8.8	-8.4
10/23	29.4	33	67.8	55.4	0.4	72.8	66.8	-38.2	-109	-135.2	-70.4	-17.4	-37.2	13.8
10/24	56.4	50	44	55.2	69.4	80.2	6.2	-42	-85.2	-20.8	-4.6	5.2	0.2	14.8
10/25	79.4	71.8	-5.8	9	22.4	-83.4	-65	13.4	70.6	104.2	40.8	-12.8	23.8	39.8
10/26	33	21.4	-5.6	-39.2	-47.2	-79.4	-3.8	51	91.8	46	20.4	1	22.6	51
10/27	-54.2	-45.4	53.8	45.2	-18.2	31	49.8	17.8	-31.6	-76	-30.4	44.4	42.8	3.6
10/28	-65.2	-40.4	21	48.4	25.6	88	47.6	-20.4	5.2	28.4	43.6	51.4	12.4	-30.4
10/29	-26.4	-41	-91	-76.8	-4.8	40.2	3.4	1.8	17.4	23.8	14	-7.6	-11.4	-29.4
10/30	25.2	-34.6	-102.6	-66	-7.6	-45.8	-50	8.6	-21.6	-12.6	-29.2	-2.6	6	-5.4
10/31	-0.8	19	32	-17.6	4.4	-47.4	-5.8	14.4	-28.6	-19.2	-34.2	5.6	-26	-31.2
11/1	31	77.6	79.6	5.8	-41	-68	1.2	0.4	15	-3.8	4.4	-14.6	-42.6	11.6
11/2	20.8	-14.4	-8.4	47.2	-5	12	-15.8	-28	3	30.2	60.6	28.6	19.8	53.2
11/3	-68.2	-94.4	-75.2	-38.6	0.2	78.6	37.2	-8.4	16.8	21	8.6	-13.8	33.6	-0.6
11/4	-51.6	-4.6	-10.2	-31	-6.4	-42	-42.4	-15.4	1.2	5	-28.6	-26.6	-0.4	-49
11/5	58.4	71.2	16.4	-38	-24.2	-64.2	-34.4	2.4	-9	-14.2	-20.8	4.8	-13.6	-15.4
11/6	34	17.6	-31.2	-10.4	7.4	36.2	50	16.4	-57.8	-49.6	-4	-10.2	-21.8	1.4
11/7	-1.6	-11.4	66	109.8	58.4	39.8	13	-28.6	-43	-39.6	-32.2	-28	-21.6	0.6
11/8	18.4	38	110	124	59.8	7.2	-66.6	-49	45.8	20.2	-27.6	-6.6	-9	5.6
11/9	34.2	12.6	-21.8	-71.8	-23.8	9.2	-2.4	2	35.4	37.2	8.8	40.6	49.2	79.6
11/10	-5.4	-48.4	-112.8	-92.2	-42.2	11	55.6	51.4	-44	-26.8	41.8	60	56.6	36.6
11/11	-82	-34.8	3.6	27.4	9.8	-29.2	2.8	7	4.4	-15.6	48.4	3.2	-9.8	-55.4
11/12	-62.4	40.4	70.8	47.2	-5.2	-15	7.8	43.2	85.8	87.8	36.6	-72.2	-68.8	-92.2
11/13	48.2	31.8	35.8	27.8	16.6	34.4	52	66.2	37.8	-17.8	-94.4	-68.6	-42.4	10
11/14	58.2	-1.4	-32.4	4.4	20	25	-27.8	-45.2	-57.6	-68	-47.8	60.2	60.2	53
11/15	-16.4	-39.8	-48.2	-40	-33	-47.2	-64	-49.8	-4	55.2	81.8	73.4	15.8	-10.4
11/16	-25.8	-31.2	-43.6	-68.4	-60.6	-33	15	-0.6	5.6	28.6	42	-11	-51.6	-60.6
11/17	-45.6	-22	-13.8	18	-3.6	50.6	79	15.8	-33	-63.8	-63.6	-68.8	-33.4	-5.6
11/18	21.8	2.4	9.2	-0.6	44	-11	-56.4	-10.4	-25	-38.2	-39.2	-27	55.4	49
11/19	21.8	-12	17	-2.2	5.6	-45.8	-63	-17.4	28.2	39.2	8.4	17.4	31.4	-5
11/20	-8.8	22.8	2.2	-39.6	-36	-11.6	0.8	-7.2	41.8	69.2	-6.2	-0.2	-42	-46.8
11/21	-26.4	-7.2	-1.8	-23.4	-10.6	52.4	31.6	-29.6	-24.8	-3.6	21.8	32.2	-18	17
11/22	-18.2	-42.6	-15.2	47.6	71.6	37.4	33.2	31.2	-8.8	-91.2	-15.2	18.8	-20.6	15.6
11/23	17	47.2	35.6	80.6	78.4	-55	-22.2	56.8	-7.4	-16.6	26.4	5.8	39	28.8
11/24	67.6	94.8	77.8	42.2	-61.2	-47.6	-8.4	15.2	-5.6	43.2	44.8	-44	13	20.6
11/25	20.4	-35.2	-53	-95.6	-110.2	60.8	57.4	-34.6	1.4	13.2	-22	-69.4	-23	-10.2
11/26	-19.4	-60.6	-62	-53.6	13.4	49	-22	-92.2	-27.8	10.6	-25.8	-6.8	4.6	-0.4
11/27	-13.6	37.2	47.6	79.6	60	-33	-18.4	9.8	11.2	3.2	0.4	59.2	28.8	-5.2
11/28	-30	45	81.2	19	15.8	-6.2	29	110	34.4	-53.8	-54.8	4.8	-6.2	-22.8
11/29	74	-12.8	-62	-17.4	17.8	20	-7.2	19.8	19	-27.6	-23.4	33.8	26.2	54
11/30	43.2	-3.8	-105.2	-62.2	41.4	20.2	-50.2	-76.4	-7.8	74.4	92.8	34	-2.2	11.8
12/1	-47.4	11.4	65.6	35.2	-20.4	-62.6	-26.8	-64	-19	47.4	53.4	-27.6	-32.4	-53.4
12/2	-10.6	-10.4	106.2	44.2	-118.2	-77.2	-14.8	17	-56.8	-86	-49.8	-10.2	23	36.4
12/3	22.2	-48.2	-63	-14.8	-13	31.8	2.6	-17.4	-45.4	-14.6	16.6	35.6	38.4	50
12/4	-85	-91.8	-137.4	-64	38.6	55.8	42	-8.8	43.4	48.6	10.8	-2.4	-8.2	-66.4
12/5	-68.4	-23	24.4	-5.2	25.2	3.8	18.8	39.8	26	15.8	-15.2	-13.4	-22.2	-68.6
12/6	35.8	82.4	125.8	56.2	-6.6	-33.8	0.4	89	52.6	34.8	24.8	11.2	-29.6	7.8
12/7	49.4	87.8	13.8	6.6	-0.6	-8.8	-0.8	-15.4	17.4	5.2	-23.2	-19.2	-43.6	52.2

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12/8	2.6	-3	-41.2	4.4	40.4	69	0.6	-61.2	-79.8	-61	-66.8	-32.8	-3.6	27.2
12/9	-3.6	-17.6	15.4	-6.4	-41	-20.4	-34.2	-20.2	-27.8	-31	-16.6	9	20.4	-29.4
12/10	-9.4	-0.8	33.4	-15.6	-25.2	-62.8	5.6	36	83	57	66.2	-2	10.8	-51.6
12/11	11.8	5.6	4.4	4.4	-27.8	-8.4	12	-2.2	68	39.6	11.2	-13	6.8	-28.4
12/12	14.8	-53.2	-61.2	14.2	23	50.8	6	-35.4	-28.2	-29.4	-32.8	-19	27.4	45.8
12/13	-27.4	15.6	-59.4	0.6	63.8	32.2	-8.8	11.4	-61	-51.8	9.4	10.6	-11	20.2
12/14	10.8	53.4	69.2	-10.6	-6.6	13.2	46.6	30.2	-29	-19.2	12.8	25.2	-32	-27
12/15	97	17.6	2.4	-7.6	23.8	-16.8	3.6	27.4	33.8	-1.8	-9.8	11.4	11.4	55.2
12/16	-32.4	-68	-22.4	-4.6	1.2	25	21.4	-7.2	16	-13.2	-0.8	41	56.8	49.6
12/17	-99.8	-61	-3.6	4.6	-42.6	1.6	18	18	-6.6	52	43.8	24.4	1.4	-37.4
12/18	0.4	46.8	17.6	16.4	-12.4	-24.2	-40	15.4	21	53.8	42.8	-11.8	-26.8	-18.2
12/19	46.4	43.2	-5.4	-23.4	44	0.6	8	18.2	38.8	37.4	-7.8	-60.6	-34.2	-10.4
12/20	42	7.8	14.8	36.8	56.8	37	21.8	14	-11.2	-60.8	-70.4	-62	-2.4	5.8
12/21	-28.6	0.8	59	51.8	-74.6	-67.8	-78.8	-90	-61	-52.6	-25.8	8.8	41.6	26
12/22	-17.2	-16.4	-47.8	-73	-114.6	-78.2	-42.8	-46.2	-53	-26	-7.2	19.2	10.8	-2
12/23	-0.4	-10.2	-76.8	-56.4	1.4	-16.4	11.4	-26	-33.4	-34	-36.8	11.6	-23	-28.4
12/24	-52	-42.8	6.6	25.8	79.6	54.8	13.8	49.4	35.4	54.6	51.2	37.6	-14.2	-31
12/25	37	-2.4	35.2	12.2	59.6	41.4	45.2	76.8	91.4	47.2	19.4	-9	-37.6	6
12/26	80.8	86.4	40.2	14.6	7.8	25.2	39.4	3	33.4	-9.6	-49.4	-53.2	6.8	39
12/27	-27.4	-13	-26.4	12.2	30.2	48.8	-41.4	-65.4	-106.4	-32	7.6	35	88.2	38.4
12/28	-65.2	-13.2	36.2	45.4	4.4	-46	-69.2	-42	-35.6	34.6	91	95.2	41.8	-33.4
12/29	-20.2	-8.4	8.2	-22.8	-80.6	-56	0.8	7.4	93.4	51.4	2.4	-27.4	-75.6	-73.2
12/30														
12/31														

1998 Spectral Results for Time Filtered Pressure

This is 1998 spectra of time filtered pressure data. The time filtered pressure is fourier transformed in the space domain
Amplitude 1 and Phase 1 are the amplitude and phase of zonal wave number 1
Units of Amplitudes are Pascals/Wavenumber and Phase is degrees where 0 Phase degrees translates to -180 Longitude

Day	Amplitude 0	Phase 0	Amplitude 1	Phase 1	Amplitude 2	Phase 2	Amplitude 3	Phase 3	Amplitude 4	Phase 4	Amplitude 5	Phase 5	Amplitude 6	Phase 6
1/1														
1/2														
1/3	12.9	180.0	50.0	118.5	22.0	105.9	22.6	-56.7	12.1	127.9	12.7	167.7	9.4	68.4
1/4	17.5		78.6	149.0	23.6	-62.8	25.0	-72.2	11.5	115.7	12.6	-151.4	11.1	68.9
1/5	23.5		26.5	121.3	37.0	-7.4	23.5	155.2	14.5	-43.1	5.5	94.3	11.6	-116.1
1/6	10.9	180.0	57.8	-13.6	12.1	-136.6	15.4	-178.6	18.9	-91.1	15.9	36.8	11.3	-63.9
1/7	2.6	180.0	59.1	17.9	57.2	-134.3	33.6	-67.0	10.6	-92.4	12.6	-16.4	8.1	26.8
1/8	5.6		7.2	1.2	21.2	-116.2	19.9	40.4	11.4	58.4	13.3	-109.3	7.0	138.7
1/9	34.2	180.0	51.9	-144.7	55.9	68.0	18.9	140.3	17.8	92.7	10.7	-105.0	5.7	-136.5
1/10	33.9	180.0	24.2	-127.8	33.8	158.2	11.0	125.7	4.9	114.2	9.5	98.0	4.3	119.0
1/11	13.8		17.0	71.3	23.4	-102.2	24.3	-1.5	18.8	-87.7	9.1	68.8	5.5	102.8
1/12	24.8		24.2	-94.9	47.4	23.0	15.0	-145.4	4.3	42.8	1.5	89.7	9.3	-55.8
1/13	15.5		30.3	-96.2	40.9	84.7	21.6	173.6	3.2	-145.2	10.1	-129.9	4.8	-45.7
1/14	21.8		34.9	29.1	26.5	-93.7	4.4	160.0	12.8	155.8	5.7	-82.1	1.1	-130.2
1/15	9.4	180.0	29.4	129.0	64.7	-37.1	20.5	27.8	6.4	43.3	13.1	120.0	9.4	121.8
1/16	24.5	180.0	3.4	133.7	26.7	23.6	15.2	67.4	12.3	11.8	5.2	72.7	3.7	-16.8
1/17	9.9	180.0	34.2	-47.8	63.9	-164.3	14.1	-41.9	6.3	-75.7	8.9	-120.9	7.5	-52.7
1/18	13.4		26.0	-61.8	31.2	-145.0	8.4	-78.8	16.5	-161.1	7.4	-41.7	5.6	131.1
1/19	33.2		19.2	130.4	36.6	53.7	31.6	-125.4	18.4	86.9	11.9	-38.5	5.7	140.5
1/20	33.7		43.0	114.4	36.3	93.0	10.3	98.2	19.5	-6.9	4.5	39.7	3.9	-60.3
1/21	21.6	180.0	30.7	131.6	26.4	152.9	25.6	98.0	26.0	-115.2	10.1	121.3	2.5	-103.0
1/22	59.1	180.0	42.0	-172.3	28.8	-87.1	8.7	113.0	10.7	168.7	8.8	119.1	5.2	-15.9
1/23	56.9	180.0	49.9	-110.3	28.4	-32.5	10.7	-94.7	14.5	49.6	3.1	4.1	5.1	133.7
1/24	16.7	180.0	48.1	0.1	6.6	67.0	16.9	-87.3	16.9	39.6	7.6	-135.0	7.3	96.6
1/25	42.3		65.3	37.7	25.3	-101.2	18.9	-0.6	4.7	-133.8	7.5	169.9	7.7	-59.5
1/26	2.0	180.0	17.2	141.5	24.9	7.7	8.7	53.2	23.9	-108.5	2.4	13.4	5.0	-150.3
1/27	51.0	180.0	15.1	-58.8	33.4	135.3	3.9	77.8	16.9	-158.6	11.7	-41.9	4.7	145.6
1/28	18.6		30.7	-85.4	42.6	177.0	15.6	-19.1	12.7	72.1	6.6	-12.1	1.6	-41.0
1/29	58.3		28.7	-84.1	17.3	-149.7	6.8	-144.2	17.7	70.8	10.5	135.8	1.7	49.9
1/30	57.2		13.3	107.5	18.0	-17.7	32.1	166.1	18.1	58.6	5.7	-146.1	13.0	-87.9
1/31	13.1		38.0	138.1	17.1	59.5	14.7	146.9	10.0	-102.2	10.8	10.8	3.5	63.3
2/1	21.3	180.0	36.7	169.5	20.8	64.5	5.1	-150.5	14.5	-113.9	7.9	101.0	10.0	100.2
2/2	14.2	180.0	10.5	164.5	31.0	36.9	20.7	-35.2	18.0	-125.7	9.4	-125.8	7.2	53.8
2/3	5.5	180.0	25.3	22.6	8.9	-92.2	2.9	104.7	5.1	83.7	6.3	-130.0	6.1	-58.1
2/4	2.0	180.0	33.8	65.9	20.2	-109.7	15.8	129.8	19.2	65.7	5.1	88.5	8.4	82.4
2/5	40.0	180.0	39.8	70.6	15.3	-36.7	32.8	8.1	2.5	-77.9	10.8	105.1	5.5	-83.3
2/6	24.6	180.0	13.5	-82.6	6.2	-87.1	22.0	-2.2	4.3	-119.1	9.5	-77.3	9.3	-172.9
2/7	24.8		65.2	-111.0	10.5	152.1	16.9	-134.3	9.0	-124.7	10.5	-67.9	9.3	139.0
2/8	33.7		50.8	-74.7	15.7	-116.7	28.7	-149.3	3.7	106.6	10.2	41.2	6.5	-62.6
2/9	17.9		53.3	20.5	18.2	-86.8	7.4	-171.2	8.7	16.5	13.8	36.0	9.2	-36.2
2/10	1.8	180.0	21.2	50.6	12.7	167.7	9.3	-15.1	10.2	128.4	3.3	-165.1	8.7	-69.0
2/11	32.1	180.0	20.5	-79.0	16.5	155.6	10.0	-14.9	11.0	-23.2	7.9	-147.0	4.0	-166.4
2/12	12.5	180.0	18.6	21.0	21.4	61.7	31.2	129.9	14.7	-45.3	8.0	-118.1	9.3	-173.3
2/13	10.3		39.2	126.5	7.0	61.2	18.5	129.6	1.8	124.5	1.0	82.7	11.9	50.8
2/14	35.9		60.4	165.4	14.6	-113.5	11.0	-109.3	20.2	100.0	9.2	39.4	6.3	33.7
2/15	53.5		40.2	-101.6	22.7	85.9	17.8	-20.5	5.6	-26.0	5.3	-144.1	10.4	-169.1
2/16	12.0		11.9	-51.4	28.4	63.0	33.2	22.1	24.0	-102.3	12.6	-179.4	0.7	-69.2
2/17	25.3	180.0	50.8	119.9	13.0	-26.2	5.6	84.0	2.8	-170.9	7.4	114.9	4.2	28.2
2/18	22.7	180.0	30.4	-164.2	21.5	-73.3	39.4	-162.4	17.9	128.7	3.8	-17.9	2.8	-19.4
2/19	50.5	180.0	38.3	-62.7	16.1	-156.1	27.2	-108.7	22.0	176.7	4.0	-121.5	3.2	-176.6
2/20	21.0	180.0	58.8	-5.5	17.4	-85.1	32.9	-11.7	11.7	29.7	11.0	-64.9	3.7	-52.6
2/21	59.3		39.3	61.1	43.4	-61.8	22.4	59.3	19.2	-1.0	1.5	47.9	11.2	-18.6
2/22	44.1		23.0	122.0	38.7	64.4	19.7	165.9	22.4	-44.9	9.2	83.2	14.1	99.7
2/23	36.6	180.0	10.4	-156.0	50.2	101.8	13.9	-133.9	19.3	-100.4	1.1	-77.9	6.4	107.0
2/24	5.9		36.6	-93.8	60.3	-165.6	6.2	6.5	25.2	138.8	6.2	-8.3	9.1	-104.3
2/25	36.8		28.4	-45.5	24.2	-92.2	14.7	61.5	13.1	86.6	16.7	116.8	10.2	-146.0
2/26	20.2	180.0	21.6	62.0	50.3	5.1	11.5	122.6	12.4	82.4	4.1	160.6	6.7	-114.4
2/27	35.7	180.0	27.3	132.4	17.4	64.7	7.6	-95.6	7.6	-4.4	11.0	-79.5	2.8	-37.6
2/28	21.7	180.0	28.3	168.5	32.3	-160.5	19.2	-45.9	10.0	-129.9	6.8	-57.9	13.9	109.6
3/1	3.0		14.4	-70.4	27.0	-89.7	12.7	119.1	15.6	-123.3	9.8	-29.9	7.6	35.1
3/2	2.4	180.0	35.1	34.1	21.7	58.2	22.1	150.5	19.2	27.9	8.7	-126.5	11.8	-27.4
3/3	11.0	180.0	39.5	162.5	14.0	132.9	15.2	-97.3	2.0	55.7	14.1	141.9	9.5	-97.6
3/4	15.1		32.0	-164.8	15.8	-177.8	35.0	-9.9	14.6	-132.9	13.9	41.9	6.9	152.3
3/5	24.2		36.6	-55.1	18.3	-168.1	5.6	-3.7	4.6	-137.4	15.0	-1.6	8.1	94.9
3/6	14.7		24.3	21.5	2.6	5.0	20.4	-162.9	15.0	81.7	19.0	-128.8	1.6	34.9

Date														
3/7	14.8	180.0	17.2	74.8	39.9	-8.8	27.4	-165.2	5.4	-94.0	8.8	136.3	6.3	-75.9
3/8	53.2	180.0	52.1	176.3	28.4	36.6	12.5	49.8	6.0	-22.7	12.9	117.0	1.7	22.7
3/9	44.3	180.0	30.2	-85.9	18.6	155.9	24.7	40.5	9.4	-17.4	8.7	156.6	7.8	96.9
3/10	19.5	180.0	65.3	-32.6	20.0	-88.8	20.3	167.7	3.7	-61.2	4.4	-54.2	3.2	-8.9
3/11	34.4		35.6	76.9	2.5	-153.0	11.0	-103.0	8.7	101.3	14.5	-53.4	12.9	-122.6
3/12	46.9		21.4	91.4	11.1	160.6	42.7	-34.6	22.4	-170.8	10.0	16.0	1.3	137.9
3/13	50.9		55.8	170.1	22.8	-111.2	32.1	79.4	8.3	-134.5	8.1	87.6	6.0	-32.0
3/14	14.0		45.9	-117.9	15.9	-47.9	41.3	126.4	12.6	-26.9	5.2	-82.1	6.6	-158.6
3/15	16.6		98.8	-26.1	24.9	47.2	30.2	-129.1	18.7	69.8	5.3	-164.6	7.2	169.8
3/16	17.9	180.0	110.7	12.1	24.3	135.1	49.9	-66.2	14.3	101.0	12.1	-126.1	2.2	87.7
3/17	18.8	180.0	50.5	121.9	5.4	136.5	21.2	6.2	7.4	-166.2	3.3	0.2	13.8	38.3
3/18	33.6	180.0	120.2	153.2	9.8	-117.8	47.6	102.4	9.5	-78.8	11.9	43.1	1.5	61.0
3/19	25.7	180.0	54.6	-160.7	6.5	49.3	24.4	-146.7	25.2	-32.6	10.2	-162.0	8.9	-89.8
3/20	1.1		85.4	-83.4	3.0	83.4	27.3	-84.3	4.3	137.3	9.8	157.6	5.1	125.8
3/21	16.4		15.6	77.4	5.3	-124.4	31.1	34.5	15.4	123.2	8.6	42.9	18.4	29.9
3/22	13.7	180.0	78.1	94.1	12.9	49.2	22.4	121.5	3.2	-167.2	8.4	38.7	2.7	-158.9
3/23	13.6	180.0	30.0	119.3	12.1	-74.9	26.6	-167.8	16.6	-118.9	1.3	30.6	10.8	-137.6
3/24	8.6	180.0	35.8	-56.6	21.5	-96.2	10.2	-19.9	3.3	-62.1	11.3	-96.0	10.3	-136.1
3/25	14.3	180.0	58.9	-66.2	15.6	104.1	24.0	10.5	14.7	5.0	13.1	-104.6	4.9	118.7
3/26	59.6		55.5	-40.6	48.6	-175.2	19.0	-66.8	10.8	-14.6	4.3	-157.1	4.0	63.0
3/27	44.3		6.0	109.4	28.0	3.0	19.5	-113.6	29.2	141.8	18.6	28.3	6.6	-130.2
3/28	24.5	180.0	24.4	139.4	40.2	47.8	15.7	103.5	16.6	-169.2	7.1	64.9	4.0	16.9
3/29	10.3		14.4	95.2	8.2	104.7	30.4	134.6	24.0	-68.1	8.7	154.7	7.4	-14.8
3/30	2.8	180.0	26.4	17.4	33.0	-108.7	18.1	-129.3	26.2	23.6	12.2	-173.2	1.8	-7.8
3/31	58.7	180.0	23.3	44.2	30.4	-31.8	9.2	-48.5	22.4	54.1	2.7	-53.0	9.7	8.7
4/1	19.9	180.0	68.2	137.6	17.9	-10.8	24.6	18.3	18.2	161.1	3.2	-11.8	13.2	149.1
4/2	28.1		77.0	-170.1	39.1	169.1	23.0	62.3	26.4	-160.6	11.8	58.3	4.1	133.0
4/3	7.5		66.4	-66.4	32.5	-178.0	8.7	-147.1	8.7	-70.8	15.4	-102.4	1.0	-149.0
4/4	38.3		83.1	-28.4	15.8	116.9	31.1	-151.3	17.2	-44.9	6.6	-171.5	10.2	-176.3
4/5	21.3		70.3	57.3	40.8	46.6	6.8	-41.3	17.0	19.7	5.3	96.4	8.8	-45.9
4/6	10.4		74.7	119.4	16.9	-55.9	21.0	-13.0	16.2	113.2	1.5	-80.0	13.1	0.9
4/7	20.4		64.6	-171.1	35.5	-62.7	2.9	141.7	17.2	171.3	17.6	29.5	2.1	131.3
4/8	6.4	180.0	70.7	-114.4	17.2	60.0	6.7	166.8	9.2	-72.4	5.0	-157.6	3.2	137.4
4/9	27.9	180.0	59.3	-46.0	23.7	94.4	13.2	123.3	15.2	-77.8	5.8	153.6	5.8	12.1
4/10	41.7	180.0	86.8	22.4	20.8	165.4	2.8	-33.6	15.2	14.0	12.8	-137.6	6.0	-172.1
4/11	10.2	180.0	53.0	118.3	47.8	-132.3	10.8	-116.1	20.1	92.0	7.8	-53.1	7.6	-155.2
4/12	14.3		57.4	-161.5	35.5	-42.4	13.9	38.1	23.1	-177.2	14.3	16.5	3.2	-117.2
4/13	32.9	180.0	62.0	-63.2	36.5	47.3	11.9	32.0	17.7	-87.1	11.1	64.4	4.9	-93.5
4/14	12.4	180.0	42.2	-7.1	41.4	126.4	6.1	-63.8	17.5	-18.7	14.7	-140.0	5.6	5.5
4/15	19.5		39.9	95.4	21.7	-135.6	18.9	162.4	12.5	42.7	9.4	175.2	4.4	81.5
4/16	2.5	180.0	46.1	159.8	19.4	-52.2	22.7	-175.1	15.2	78.7	9.2	66.6	4.4	68.2
4/17	4.4	180.0	32.5	-168.6	16.3	70.9	35.8	-54.8	18.3	-175.6	13.6	27.1	5.8	-119.6
4/18	32.6		16.2	-32.8	9.8	-63.2	39.2	-27.7	17.3	-163.7	11.2	-116.4	1.7	135.6
4/19	21.7		42.6	21.2	29.3	-41.8	46.5	96.5	3.2	-7.1	24.0	-139.4	8.9	-19.8
4/20	2.8	180.0	13.6	6.1	8.1	-1.0	43.7	137.0	21.3	-16.1	6.4	50.6	1.9	120.6
4/21	16.3	180.0	19.7	-178.9	8.4	179.6	26.9	-94.5	13.8	-50.6	16.7	52.4	11.4	130.3
4/22	23.0	180.0	35.4	-143.9	23.1	141.0	19.0	-40.7	5.8	164.4	10.3	9.5	5.9	140.8
4/23	8.4	180.0	20.4	150.1	22.0	147.7	16.0	14.7	24.0	151.6	2.4	32.7	7.2	-139.5
4/24	15.8		13.2	-103.6	18.2	-160.9	32.7	-152.8	1.6	92.0	8.4	-134.0	14.2	-32.9
4/25	35.7		17.4	-37.2	22.0	6.3	16.1	-154.9	27.5	-12.6	9.0	-177.4	3.9	-68.0
4/26	39.5		33.3	-17.8	11.2	-19.5	20.5	33.2	6.0	25.6	4.4	-121.9	6.3	72.2
4/27	39.6	180.0	54.9	39.4	14.0	-24.2	15.8	38.0	20.1	153.2	7.3	-84.2	6.3	117.9
4/28	33.8	180.0	50.7	81.5	5.3	-47.2	8.7	40.8	27.5	167.9	11.5	88.2	7.3	-103.1
4/29	4.1	180.0	69.2	-171.4	23.2	135.4	13.2	66.0	10.5	-46.5	12.8	59.8	10.5	-53.0
4/30	5.7		55.5	-124.6	5.0	138.7	19.7	-95.1	17.0	-70.5	11.1	-84.0	9.2	153.8
5/1	6.6	180.0	28.4	14.3	20.3	-111.6	13.4	-178.1	11.4	11.1	5.1	-102.9	7.1	131.9
5/2	26.5		72.2	54.5	13.8	142.1	19.4	107.8	25.5	43.8	1.4	-112.7	9.9	37.9
5/3	31.6		27.2	126.9	0.4	-168.8	10.8	38.1	7.1	140.9	4.8	178.9	9.5	-33.2
5/4	17.4	180.0	77.4	-126.1	41.8	-43.5	29.5	-125.6	21.3	-168.0	11.4	79.9	10.2	-102.2
5/5	30.3	180.0	69.1	-64.3	6.3	-20.3	20.3	-115.6	7.6	-115.2	8.6	5.7	13.2	114.8
5/6	30.1	180.0	56.5	12.9	29.3	128.8	29.6	46.4	21.0	0.9	7.0	-48.4	8.7	82.3
5/7	4.8		79.6	50.5	14.0	-169.0	14.6	57.4	14.1	-45.1	7.6	-134.2	10.1	-148.3
5/8	23.7		43.2	132.4	49.8	-86.7	31.5	-157.8	18.8	149.4	3.2	-124.4	5.5	116.2
5/9	5.1	180.0	92.6	-158.3	45.7	75.2	17.7	-0.4	5.2	174.4	7.2	102.4	7.8	-45.4
5/10	18.2		51.8	-108.5	46.4	112.8	27.2	1.3	14.4	-132.7	6.8	43.3	5.9	-114.5
5/11	19.3		41.3	-8.9	14.9	-140.3	1.0	-103.7	5.1	138.0	18.1	-134.0	12.5	-69.2
5/12	18.7		36.6	27.6	43.4	-13.4	16.6	173.6	7.0	81.7	4.0	168.2	7.8	59.0
5/13	6.7		41.3	177.3	29.1	80.8	12.9	-168.5	23.6	48.0	10.6	58.5	17.4	52.1
5/14	10.4	180.0	55.8	-127.8	25.4	-116.0	11.0	-119.0	11.7	28.5	3.0	-45.1	16.1	-76.2
5/15	69.4	180.0	27.5	-40.2	39.6	-35.7	15.9	-65.4	11.7	-114.2	6.0	-172.9	14.0	-174.0
5/16	71.4	180.0	73.9	36.5	13.8	-52.9	22.9	40.0	3.2	-138.6	6.3	84.3	6.3	105.6
5/17	6.0		49.7	83.7	35.8	-156.7	11.6	54.3	18.6	-85.7	10.6	-66.5	6.7	-96.8
5/18	33.0		77.8	159.9	13.6	-166.6	9.8	-175.1	9.7	-74.9	8.7	-64.4	9.3	119.0
5/19	20.7		32.2	-121.5	34.0	86.1	19.1	168.2	17.1	147.5	5.2	56.7	13.2	96.8
5/20	24.8		44.7	-63.1	42.0	155.1	16.0	171.9	2.6	152.2	8.4	112.8	2.6	-56.4
5/21	15.9		16.2	8.2	31.3	-160.8	12.6	40.1	21.7	-45.3	13.6	98.7	2.4	5.7
5/22	15.3	180.0	52.5	134.3	37.2	29.2	25.0	3.8	17.9	-20.0	3.3	-115.7	9.4	-138.4
5/23	13.7	180.0	11.7	174.3	56.3	16.1	18.6	-13.0	16.4	131.6	6.8	-80.8	3.9	-59.3
5/24	6.2		50.9	-58.0	21.7	-79.9	16.8	-133.4	32.6	124.7	2.6	-160.7	8.4	32.6
5/25	5.6	180.0	51.3	-60.4	45.7	-74.7	22.8	-122.2	2.7	-175.6	5.8	-151.2	5.5	9.8

Date														
5/26	9.4		34.7	57.9	13.8	58.0	12.4	-149.7	17.3	-64.3	6.7	49.8	0.7	-138.2
5/27	30.9		77.3	100.5	37.6	145.4	17.1	84.2	14.8	-66.8	7.3	66.1	9.6	-135.1
5/28	4.3	180.0	49.1	172.2	50.4	-166.9	3.5	118.8	29.8	115.7	8.2	-53.1	3.0	-68.2
5/29	17.4	180.0	69.5	-67.4	14.3	-46.2	3.7	-46.6	14.9	125.6	19.8	-78.1	11.2	-65.7
5/30	8.1		80.5	-3.6	48.0	32.1	15.4	72.6	11.9	-31.6	5.7	-105.9	8.8	108.4
5/31	27.8		78.7	77.3	14.4	120.7	24.4	65.9	25.0	-50.5	17.5	82.3	6.5	110.4
6/1	16.1	180.0	84.4	161.7	31.2	-94.1	16.7	-161.7	3.3	44.8	13.0	53.6	8.3	-78.0
6/2	28.6	180.0	85.4	-120.6	10.9	-1.8	19.5	-107.2	13.0	-174.1	12.6	-129.5	6.3	113.5
6/3	10.1		71.2	-36.0	22.2	-149.5	17.3	19.7	14.0	-171.9	12.6	-174.6	12.8	103.3
6/4	34.6		22.0	13.9	18.8	-125.7	13.2	13.3	7.8	-36.9	3.6	90.1	4.4	30.1
6/5	4.8	180.0	34.7	112.8	26.1	51.8	2.9	110.4	8.7	8.1	7.5	-15.0	4.2	-4.8
6/6	28.1	180.0	52.4	-156.2	49.4	80.1	26.8	-129.1	6.5	9.6	5.7	-103.4	5.2	-88.9
6/7	14.2	180.0	28.4	-58.3	27.1	177.5	20.7	-84.5	12.3	99.8	7.1	62.8	5.8	-101.3
6/8	4.7	180.0	39.2	23.8	24.9	-15.1	15.8	32.1	3.4	113.9	11.7	-169.1	5.9	113.2
6/9	20.2		21.8	153.1	12.1	-66.0	25.5	141.5	8.5	-179.8	4.9	-167.6	5.8	-157.6
6/10	27.2		12.8	94.7	38.7	-120.2	18.5	-125.5	7.8	-19.5	2.7	-0.8	4.9	-9.9
6/11	19.5	180.0	28.0	104.0	32.1	-123.1	4.3	-83.7	7.5	-31.6	4.0	52.5	8.9	-56.6
6/12	21.8	180.0	32.0	-165.9	26.2	24.3	39.3	44.5	8.4	-83.6	11.4	-50.1	7.1	-128.0
6/13	3.7	180.0	24.0	-106.8	51.1	53.0	6.6	69.1	5.4	165.8	5.2	40.3	12.6	77.0
6/14	14.9		25.8	-16.3	30.4	95.0	27.8	-148.8	17.4	150.0	16.8	51.3	10.2	84.5
6/15	27.9		26.0	55.5	42.9	-163.4	13.6	-27.3	2.5	-62.8	9.4	-156.1	8.4	-95.6
6/16	13.6		18.1	130.9	38.5	-97.9	8.6	75.8	3.9	-40.1	6.8	-142.4	7.1	-128.0
6/17	13.2		37.0	-92.0	29.1	-11.4	22.9	129.6	3.8	-2.0	12.3	-174.4	8.3	107.4
6/18	25.1	180.0	38.9	-31.8	25.1	54.0	14.3	-156.2	15.7	15.8	6.4	153.6	6.3	-58.3
6/19	0.4	180.0	31.6	47.9	31.5	172.2	30.4	-21.3	7.9	-74.5	11.4	36.5	9.2	-83.1
6/20	11.0		42.3	80.2	8.5	-60.9	22.0	-40.3	18.6	176.9	16.2	-4.8	6.5	-60.8
6/21	2.6		30.3	177.2	22.0	2.6	12.6	-178.4	6.3	166.8	10.3	-33.6	9.4	84.4
6/22	23.1	180.0	49.4	-146.4	27.6	-170.6	19.6	156.4	14.7	38.9	16.3	-160.2	7.9	94.8
6/23	53.3	180.0	5.5	61.1	14.4	-133.6	7.6	-175.1	15.3	54.5	7.1	150.2	3.1	165.1
6/24	27.0	180.0	23.2	71.5	3.7	10.8	3.8	77.4	11.3	-106.0	3.7	140.9	6.0	-90.4
6/25	47.1		32.6	-85.5	6.8	-20.9	26.5	45.0	9.7	-90.5	9.7	-58.2	3.5	-139.6
6/26	19.5		28.5	-40.0	22.8	3.2	14.1	33.1	3.4	-179.3	3.8	162.8	8.3	85.4
6/27	1.9	180.0	37.0	36.5	15.0	66.3	28.5	-97.2	10.2	161.9	8.9	45.0	0.4	-151.2
6/28	5.0		46.1	140.8	17.3	133.1	25.0	-98.9	4.3	96.6	4.0	89.8	5.7	-80.9
6/29	17.6	180.0	46.2	-139.8	38.9	-128.6	11.6	99.4	11.3	-10.6	9.1	-46.7	4.1	-85.3
6/30	37.9	180.0	23.7	-110.9	17.5	178.7	24.9	127.2	11.5	-114.8	9.1	-79.2	5.1	48.5
7/1	9.5	180.0	24.7	-162.7	23.8	69.1	28.1	106.7	15.8	-105.0	5.6	142.2	8.8	103.5
7/2	20.6		10.7	-154.5	44.5	43.0	15.1	-20.1	12.7	-28.4	6.9	145.8	5.3	142.1
7/3	18.1		59.1	-4.9	30.2	-11.1	21.1	-96.2	10.9	76.0	8.2	-57.2	7.8	-80.6
7/4	5.7		38.1	17.1	16.1	-70.4	29.5	-98.1	23.2	114.5	5.6	117.5	4.8	-166.5
7/5	32.9		31.2	52.8	26.9	-170.7	16.0	-24.6	15.8	159.0	3.7	71.5	2.2	-70.3
7/6	66.5		19.4	86.1	19.8	-158.0	38.4	57.4	22.1	-4.3	4.0	21.7	15.3	-11.6
7/7	15.5		16.5	159.3	29.4	-99.1	21.9	123.1	15.0	-49.8	7.3	92.2	8.4	-63.0
7/8	59.8	180.0	8.8	7.2	15.4	-10.7	32.1	-147.7	13.3	-170.4	10.9	-85.2	8.0	129.0
7/9	93.7	180.0	40.0	141.1	34.0	89.9	8.1	-98.1	14.9	118.2	10.1	-84.5	12.0	109.1
7/10	30.8	180.0	50.5	-178.1	14.7	144.0	22.9	32.8	8.0	130.6	14.2	-21.1	12.5	177.9
7/11	24.5		55.8	-116.9	7.2	-107.2	8.2	146.2	6.5	-102.8	3.1	120.5	14.4	-154.0
7/12	47.6		66.9	-42.2	7.1	-17.0	10.1	149.7	13.7	-81.5	26.0	141.6	12.2	-29.0
7/13	60.9		50.6	-0.4	13.5	158.7	8.0	-60.4	13.7	-5.1	5.7	106.1	12.8	-11.0
7/14	6.0		46.2	71.9	9.7	173.2	18.8	-58.7	11.1	2.2	13.2	-2.8	13.2	85.0
7/15	8.7	180.0	52.5	149.1	18.0	-80.8	17.5	-11.2	7.9	-165.2	6.6	4.3	3.1	95.8
7/16	11.4	180.0	29.6	-138.2	26.7	5.2	6.0	151.1	16.5	-159.9	14.0	-155.6	5.6	-88.0
7/17	12.8	180.0	40.0	-35.1	22.9	50.9	37.8	160.4	1.5	-3.2	20.9	-115.5	6.8	-105.8
7/18	16.5		41.5	44.3	11.4	-138.4	4.1	21.0	11.6	62.0	5.3	-5.3	4.7	103.8
7/19	31.9		43.8	146.9	16.5	-160.4	31.7	13.1	10.1	29.6	20.9	33.5	1.5	22.7
7/20	22.5	180.0	36.3	-138.6	23.9	86.7	4.9	35.9	7.6	129.9	8.7	62.9	7.0	-159.9
7/21	31.1	180.0	29.3	-65.5	3.6	161.9	21.0	-94.5	2.1	-146.6	18.8	-171.8	4.2	10.4
7/22	15.1	180.0	14.8	-0.6	29.2	-76.6	27.7	-138.0	4.9	-130.5	12.4	176.1	7.5	26.2
7/23	14.3	180.0	13.0	151.8	12.3	-0.7	15.5	153.1	12.5	88.1	12.3	-11.5	6.4	94.4
7/24	23.1	180.0	10.6	136.2	16.9	-165.2	7.1	19.6	9.5	-141.7	9.3	-34.7	9.2	-134.8
7/25	4.6	180.0	15.8	24.4	25.8	176.6	16.1	63.2	19.4	-62.1	7.4	-167.4	11.4	-93.0
7/26	34.3		33.8	10.4	12.1	-82.6	19.5	74.6	13.0	-18.9	17.0	119.7	1.3	93.2
7/27	29.5		4.8	21.9	17.2	-13.8	2.9	-23.9	19.3	96.0	9.6	71.6	7.0	49.8
7/28	5.7	180.0	48.3	179.5	28.3	29.2	21.9	-98.9	24.1	120.8	17.7	-27.6	1.8	71.1
7/29	36.3	180.0	20.7	-99.5	6.2	94.2	7.4	-47.0	16.5	-128.6	13.1	-87.5	7.8	87.4
7/30	17.8	180.0	23.6	-91.8	5.5	77.4	21.7	89.4	20.1	-78.2	16.3	-115.3	3.3	148.2
7/31	7.5	180.0	5.8	113.1	11.9	127.3	18.4	-172.0	13.8	30.3	9.6	60.9	7.3	-149.3
8/1	14.2		14.2	-22.4	4.9	-171.9	6.7	166.9	12.4	-35.7	15.4	74.5	2.1	156.9
8/2	1.1		22.6	27.0	11.8	167.6	18.1	-4.5	20.7	-99.9	13.6	179.5	12.6	-44.0
8/3	9.1		42.1	87.1	9.0	-38.1	33.0	-34.0	15.0	164.4	8.1	-173.4	2.4	-33.1
8/4	28.3		29.4	151.2	8.4	-22.3	5.5	-94.8	17.2	123.4	4.8	-18.4	6.3	123.0
8/5	11.3		39.1	-146.3	15.2	174.1	18.7	156.8	20.4	62.6	7.7	88.2	1.1	-94.0
8/6	0.7		39.6	-38.2	3.6	-43.1	13.0	144.3	10.7	70.3	3.5	-15.0	4.1	-157.6
8/7	2.3	180.0	20.8	105.9	18.9	-1.3	15.1	177.9	4.5	-43.9	15.6	-83.1	4.4	-52.8
8/8	0.2	180.0	31.5	-146.9	23.7	-92.3	8.0	14.2	17.2	-86.2	8.5	-95.8	3.6	26.0
8/9	15.2	180.0	40.9	-15.7	15.7	135.5	13.2	-25.5	16.0	-116.0	7.4	150.5	9.1	88.7
8/10	0.7		60.6	33.9	15.1	168.2	20.0	113.2	12.7	126.4	20.2	64.4	1.5	114.9
8/11	6.3		55.0	127.5	13.1	-83.3	11.1	106.6	5.1	-89.0	7.7	43.3	10.1	-96.1
8/12	10.8		65.7	-154.9	29.0	85.2	25.3	-46.0	12.6	-36.5	16.7	-84.6	4.9	116.9
8/13	12.0		73.4	-71.1	22.7	11.7	19.9	-95.0	8.2	61.3	8.6	-32.4	7.1	155.5

Date														
8/14	7.5		61.8	16.3	15.7	-7.3	20.9	148.7	10.5	61.8	9.4	88.5	8.1	-96.9
8/15	5.1	180.0	63.3	90.3	9.6	57.2	6.7	-167.7	8.6	130.0	24.7	130.9	7.7	-38.1
8/16	1.5		80.4	-157.5	21.0	178.6	25.3	-27.3	11.4	68.3	16.5	-146.9	13.6	30.0
8/17	27.2		60.3	-81.1	38.3	-174.1	10.7	-19.1	13.8	-40.2	14.0	-66.9	4.4	92.6
8/18	9.7		67.7	17.5	24.2	-128.7	5.3	89.4	10.9	-118.3	8.8	-52.5	10.8	-128.9
8/19	49.9	180.0	44.3	99.3	49.6	-84.0	22.1	151.0	20.4	-173.7	5.3	177.1	7.7	-151.9
8/20	60.9	180.0	52.3	179.2	21.3	-9.9	9.6	152.5	14.1	161.4	11.8	54.5	8.4	24.9
8/21	3.6	180.0	47.8	-116.5	26.8	46.1	4.1	28.9	7.1	46.8	8.9	32.6	17.7	52.1
8/22	36.7		33.0	-23.6	45.1	58.3	20.4	41.1	16.3	-9.9	13.2	-28.1	18.4	139.0
8/23	31.0		38.0	41.1	42.6	90.9	2.2	105.7	4.1	-107.2	7.2	-124.7	9.0	-174.6
8/24	21.3	180.0	27.8	61.8	23.5	-159.1	15.6	-118.4	3.4	128.6	9.6	-141.6	12.9	-70.0
8/25	43.9	180.0	33.7	-108.3	41.7	-66.6	24.6	-105.8	4.5	-127.7	9.7	53.0	18.3	-63.7
8/26	5.6	180.0	10.3	-133.0	17.4	86.3	9.5	-102.4	5.2	-31.7	18.6	111.1	14.8	-58.8
8/27	22.0		38.5	97.8	37.9	147.2	24.5	114.6	22.2	0.6	6.4	154.6	11.5	104.7
8/28	22.5	180.0	54.3	88.8	55.9	-125.2	13.5	159.6	11.1	69.4	17.1	-104.3	18.6	130.0
8/29	23.0	180.0	26.2	-167.4	42.9	-52.5	17.9	-8.4	28.3	178.8	3.3	-121.1	11.0	174.2
8/30	27.7		57.5	-123.4	38.5	36.3	23.5	-13.4	10.5	-142.0	5.7	123.4	5.6	11.1
8/31	16.1		63.9	-86.3	26.4	136.1	8.7	4.3	7.2	-29.3	5.7	42.4	10.2	-71.7
9/1	3.9	180.0	39.9	-5.6	14.2	-156.7	17.3	97.9	11.2	10.7	12.4	-20.2	11.1	-7.7
9/2	38.6		60.4	52.4	28.5	8.5	5.9	-29.1	5.8	-141.4	2.9	-28.3	8.5	98.9
9/3	33.1		11.3	101.2	13.0	107.1	19.5	-124.4	0.6	75.1	3.2	119.0	4.7	144.5
9/4	11.5	180.0	26.1	141.3	21.3	-155.8	12.1	-133.0	6.5	75.3	5.4	149.7	5.8	26.0
9/5	5.3	180.0	19.2	157.3	14.2	-22.8	16.3	49.8	3.5	107.7	7.7	-165.1	5.3	-126.5
9/6	23.2		26.2	-128.3	36.6	74.3	26.7	96.5	11.0	-106.9	10.6	-74.3	6.5	-130.4
9/7	11.4		36.4	-17.5	19.0	69.3	25.3	-177.9	12.5	-163.6	7.4	32.7	3.9	-78.3
9/8	14.2	180.0	51.3	48.6	33.7	-95.3	25.9	-119.5	11.3	47.6	11.1	66.8	5.6	-69.3
9/9	6.9	180.0	42.2	134.8	47.4	-120.3	30.7	-16.8	15.0	-13.0	7.6	-173.1	10.1	48.2
9/10	4.3		65.8	-127.6	24.2	79.7	12.7	8.0	13.0	-118.0	3.7	-145.7	6.8	113.2
9/11	27.8	180.0	57.0	-75.5	9.6	77.5	16.2	-160.9	16.2	78.1	10.1	-22.3	7.2	-161.7
9/12	20.7	180.0	52.1	33.9	6.5	-164.1	9.3	170.6	17.0	86.2	7.3	144.0	1.8	91.4
9/13	12.7	180.0	64.6	81.7	16.0	-132.5	23.5	31.8	2.4	143.6	4.6	-56.9	6.1	-36.2
9/14	5.6	180.0	31.9	170.0	15.0	-57.3	15.9	3.6	17.5	-113.4	5.7	100.6	8.5	-41.7
9/15	12.9		57.6	-119.5	10.2	-25.8	19.0	168.9	20.6	-102.4	7.3	-153.1	6.1	127.0
9/16	34.1		25.8	-93.0	30.7	97.0	17.8	-145.9	15.6	7.8	9.8	-88.0	15.5	156.7
9/17	2.2	180.0	35.1	20.3	8.5	67.9	11.1	-0.6	26.8	70.2	8.0	11.2	5.3	-174.0
9/18	44.2	180.0	33.8	80.9	9.0	-92.5	17.6	41.6	32.9	140.4	9.1	80.4	10.8	-30.2
9/19	13.5	180.0	26.9	-166.7	10.3	3.1	3.6	164.7	22.8	-144.7	5.8	62.4	11.9	-56.8
9/20	14.2		28.8	-124.2	4.2	-9.2	15.0	-132.6	23.1	-61.6	4.8	-150.7	4.6	-44.3
9/21	17.8		32.9	-34.2	8.2	142.2	6.5	121.0	34.4	-22.7	10.6	-137.1	14.7	93.6
9/22	15.9		29.3	43.4	30.4	-121.7	24.4	141.7	10.3	-19.8	2.5	130.0	13.2	127.7
9/23	15.7	180.0	16.0	107.3	10.7	127.3	1.1	62.4	33.2	134.7	9.3	9.1	6.2	-126.8
9/24	0.1	180.0	25.7	174.1	33.2	76.3	38.1	-45.6	11.8	169.5	7.2	-76.9	10.9	-20.9
9/25	38.4		8.6	-124.4	22.1	-34.4	23.5	-14.3	12.1	-72.2	12.5	170.4	4.8	62.9
9/26	43.3		19.4	-2.9	23.8	-102.3	24.3	98.6	9.8	9.8	9.2	151.3	11.3	156.9
9/27	4.5	180.0	10.0	65.3	18.2	-39.9	28.2	-178.8	4.6	120.3	13.0	-22.7	11.4	-73.4
9/28	42.1	180.0	7.0	-149.3	13.4	-19.0	22.0	-133.7	15.4	152.4	21.8	11.4	13.9	-11.9
9/29	48.1	180.0	18.1	-114.1	15.0	178.1	17.0	24.7	13.0	-113.6	10.9	18.4	6.9	158.1
9/30	18.0	180.0	2.9	-65.1	35.1	128.4	18.9	-13.0	18.4	-22.0	10.5	-175.7	10.6	-152.0
10/1	19.5		15.0	9.3	24.5	120.7	19.6	-140.9	8.4	8.8	26.9	161.6	3.7	-67.4
10/2	32.9		22.5	153.8	8.3	-59.9	24.9	117.2	8.3	63.7	14.7	-174.8	9.4	51.2
10/3	24.1		39.5	-154.7	13.4	17.2	10.9	82.1	14.9	100.2	10.1	-39.7	5.2	128.1
10/4	10.9		11.0	-29.4	13.1	-136.9	11.2	-57.2	5.0	-161.6	12.3	-33.0	6.1	-50.4
10/5	9.5	180.0	49.2	29.5	24.9	-64.8	18.4	-43.4	13.9	-84.1	6.2	-157.7	12.1	-54.7
10/6	31.4	180.0	34.6	14.6	29.6	-38.0	13.0	-82.4	5.6	-151.0	7.7	-13.5	4.2	-161.3
10/7	49.3	180.0	25.2	173.2	20.5	84.6	24.8	176.0	31.7	110.9	15.9	-33.3	16.8	128.3
10/8	20.4	180.0	30.8	176.0	40.2	143.5	26.4	89.2	9.7	162.0	12.1	43.2	4.8	79.5
10/9	41.1		25.7	-139.6	17.0	-163.7	10.8	24.5	32.4	-89.8	11.4	144.6	9.0	-29.9
10/10	30.4		22.9	-58.4	35.4	-42.0	13.2	-33.7	31.0	-57.7	12.8	-171.1	8.1	68.0
10/11	8.9	180.0	27.9	28.6	36.6	61.2	13.5	14.1	17.5	34.9	9.3	61.1	16.4	125.1
10/12	1.5		19.5	22.7	35.2	143.9	21.0	-142.2	24.1	119.1	12.4	27.3	8.0	-112.9
10/13	0.2		13.4	-173.6	46.1	-97.9	27.5	-163.4	22.1	134.5	7.9	-121.0	9.1	-58.4
10/14	3.9		15.5	-107.7	54.1	-7.3	19.5	57.7	11.9	-71.5	12.4	-147.6	7.7	-62.7
10/15	25.4	180.0	26.4	-78.5	55.0	79.4	13.9	22.2	33.5	-64.5	10.0	153.7	4.0	-146.4
10/16	28.4	180.0	13.0	43.8	74.3	166.5	31.6	-113.8	18.7	27.7	5.2	-143.7	3.9	-51.7
10/17	4.4	180.0	53.7	98.5	65.1	-105.3	9.5	130.0	26.4	96.5	11.2	14.7	4.8	152.0
10/18	11.8		32.0	132.7	41.5	-55.4	20.3	26.0	16.3	152.3	7.3	0.8	6.2	106.3
10/19	1.3		24.7	-102.2	33.2	76.1	14.6	-81.9	8.8	-116.4	9.2	-26.2	7.3	89.7
10/20	3.5		12.5	56.6	15.9	95.5	10.1	47.2	15.0	-64.5	3.5	-114.0	6.8	-103.0
10/21	5.2		37.3	146.8	16.7	-61.3	26.5	65.5	11.0	-102.8	9.9	-162.2	4.0	-82.4
10/22	2.9	180.0	18.1	-113.9	14.9	-75.4	21.0	168.3	11.2	127.0	15.1	145.7	6.4	-29.0
10/23	9.7	180.0	74.7	-63.9	32.0	82.3	31.8	-106.6	15.7	90.6	18.1	45.5	4.2	-150.5
10/24	32.7		51.7	-53.0	24.4	139.8	24.6	-31.3	1.6	78.5	2.0	-54.9	9.1	2.7
10/25	44.0		36.6	55.6	45.7	-71.1	34.1	55.9	13.4	-42.7	20.7	-114.3	1.7	98.9
10/26	23.3		39.9	90.6	41.8	-32.7	17.2	119.8	3.2	-1.9	4.3	-170.3	8.6	159.9
10/27	4.7		17.0	-93.4	32.0	116.4	44.0	-166.4	13.2	124.2	14.6	55.2	1.5	-42.9
10/28	30.7		29.5	-166.9	42.1	163.4	11.3	-102.1	16.9	159.9	13.3	32.7	4.9	-113.2
10/29	26.8	180.0	39.5	148.1	16.5	79.6	22.9	-5.9	12.5	-107.2	2.7	-169.6	4.3	-64.5
10/30	48.3	180.0	25.3	85.4	20.8	49.8	16.5	47.5	23.6	-36.6	11.2	-107.2	9.4	21.6
10/31	19.3	180.0	12.6	-52.3	12.3	-65.6	16.1	-140.3	9.2	-35.6	6.5	-130.0	17.0	76.8
11/1	8.1		25.1	-14.4	44.2	-61.9	16.8	-125.6	7.9	78.6	4.3	117.9	12.7	148.0

Date														
11/2	29.1		20.6	56.0	17.4	174.6	14.5	41.9	15.9	79.3	8.5	45.7	10.5	-111.0
11/3	14.7	180.0	44.8	160.6	38.5	106.3	14.2	43.1	21.3	169.8	3.4	66.8	9.3	-84.5
11/4	43.1	180.0	6.4	143.4	14.1	-108.9	8.8	142.2	15.6	-123.9	12.0	-130.6	2.8	61.0
11/5	11.5	180.0	28.8	9.7	30.7	-43.6	12.4	-91.6	18.7	-53.7	7.0	-105.7	8.0	69.2
11/6	3.1	180.0	17.9	-84.6	27.3	62.6	23.3	-62.9	14.9	21.9	4.3	-113.6	3.4	-83.3
11/7	11.7		54.5	-77.3	23.5	171.4	10.9	124.4	15.3	86.8	8.9	27.9	2.1	-44.3
11/8	38.6		46.1	-53.9	45.2	-124.6	29.4	100.5	11.0	-139.2	16.1	39.1	0.7	-158.3
11/9	27.0		39.1	75.1	24.5	35.5	11.3	23.6	14.5	-148.8	7.2	107.3	8.6	109.7
11/10	8.4	180.0	49.3	108.6	55.3	76.4	20.3	-92.3	14.0	22.1	10.3	-149.0	2.5	-61.0
11/11	17.2	180.0	22.7	177.9	29.7	-160.1	18.8	-167.0	8.5	41.2	8.9	-171.9	10.3	-136.1
11/12	14.8		45.7	-156.4	67.3	-91.9	5.7	-167.7	13.6	164.3	9.2	-141.0	8.6	-101.2
11/13	19.6		46.7	-101.9	43.2	-4.7	11.0	113.6	1.1	-74.0	7.3	10.1	6.0	47.7
11/14	0.1		41.6	-0.3	43.3	97.2	5.1	69.4	15.8	-59.0	12.4	9.6	4.1	24.8
11/15	18.1	180.0	56.0	87.0	31.1	-163.4	12.2	-12.9	5.1	-19.9	2.7	21.0	2.4	66.2
11/16	42.2	180.0	38.2	137.4	15.8	-69.0	22.3	-63.5	7.1	68.6	2.4	-52.0	0.4	146.7
11/17	27.1	180.0	46.3	-116.7	29.7	60.8	9.7	-147.5	16.8	116.8	1.5	-48.8	10.4	-142.4
11/18	3.7	180.0	31.9	-15.1	15.5	84.8	24.5	96.9	8.9	-99.3	15.0	-177.2	7.6	4.9
11/19	3.4		24.0	57.7	20.3	-116.5	17.4	93.4	9.2	-93.1	2.8	-31.6	11.3	26.4
11/20	8.8	180.0	21.1	145.5	30.6	-72.2	13.7	-43.4	15.2	-145.0	9.9	-23.7	8.5	93.3
11/21	1.4		5.8	157.7	18.9	122.1	21.1	-62.9	12.2	149.5	12.1	80.2	9.0	155.2
11/22	6.2		32.3	-111.4	33.9	109.5	13.7	150.0	24.4	-0.4	13.4	97.6	9.7	176.9
11/23	44.9		24.3	-33.0	14.2	-135.1	25.4	140.2	25.7	0.2	26.2	-147.5	1.8	-133.1
11/24	36.1		33.1	2.1	46.9	-64.1	10.7	-100.5	20.8	101.5	11.6	-116.6	15.8	-63.5
11/25	42.9	180.0	23.3	148.9	40.8	23.1	32.4	-34.2	31.6	155.0	18.7	19.0	13.5	-65.8
11/26	41.9	180.0	8.1	111.5	31.9	121.1	30.6	16.1	20.4	-160.2	9.3	16.3	4.4	79.2
11/27	38.1		16.9	-36.2	28.7	-152.5	24.2	160.1	15.1	-46.6	8.8	-90.8	9.3	129.6
11/28	23.6		32.8	-110.1	22.9	-26.5	44.9	-170.3	15.0	-68.9	14.2	152.3	8.1	74.0
11/29	16.3		15.2	50.3	34.3	58.2	17.7	54.2	22.5	-35.6	10.3	31.2	2.4	5.3
11/30	1.4		41.8	86.7	23.4	163.7	59.7	1.3	14.2	-56.0	7.1	-117.6	2.9	-162.8
12/1	20.1	180.0	6.4	-5.9	54.3	-123.0	8.6	-99.9	21.6	123.2	7.9	-110.7	4.3	-176.1
12/2	29.6	180.0	41.9	-11.1	17.2	-28.0	56.9	-173.3	31.1	99.6	14.8	74.0	8.7	-22.3
12/3	2.7	180.0	22.0	68.0	38.7	98.7	11.0	7.6	10.2	60.1	6.0	29.1	6.4	-45.1
12/4	32.1	180.0	71.1	163.7	31.8	121.0	25.0	17.5	16.8	-115.8	12.5	-72.1	7.3	-169.7
12/5	8.9	180.0	37.8	-159.9	14.4	-123.0	15.1	-172.2	9.6	-130.1	6.9	-158.9	8.8	61.8
12/6	64.4		14.9	-60.9	52.7	-71.8	24.1	-163.2	9.6	29.6	11.6	131.0	8.4	50.7
12/7	17.3		26.4	-28.7	29.4	-33.3	15.6	1.1	2.9	-70.9	1.2	63.9	17.6	166.2
12/8	29.3	180.0	37.9	-62.2	40.4	97.2	19.7	10.0	7.3	-157.5	2.1	-51.9	3.5	-143.2
12/9	29.1	180.0	14.7	18.1	5.5	-175.7	14.8	-158.0	3.8	-138.5	6.6	23.7	11.7	-20.6
12/10	17.8		35.0	129.1	39.1	-85.9	12.3	-170.7	0.4	-121.6	5.1	-127.0	3.4	-57.7
12/11	12.0		16.2	141.9	21.6	-67.2	3.8	81.1	8.8	-157.3	13.2	-14.1	8.5	-99.6
12/12	11.0	180.0	8.6	-59.9	39.9	94.7	24.2	53.7	5.8	107.0	8.3	3.8	7.5	-88.3
12/13	7.9	180.0	13.2	-83.2	31.7	114.8	10.6	-21.4	19.4	-22.7	21.5	-171.7	8.9	-165.1
12/14	19.6		17.1	-81.7	11.0	-56.1	37.2	-103.7	2.9	37.5	6.0	129.9	9.9	76.6
12/15	35.4		17.7	15.9	25.7	7.3	14.8	58.1	17.1	-15.2	5.6	36.8	8.8	72.9
12/16	8.9		19.2	113.4	34.6	107.1	17.6	130.8	10.0	153.1	10.9	61.0	5.3	167.5
12/17	12.5	180.0	40.8	149.2	25.5	-168.5	17.8	-151.2	21.3	127.1	2.1	-143.7	3.4	-21.3
12/18	11.5		7.3	92.3	36.3	-93.2	6.8	-12.6	2.5	-14.8	9.1	-157.8	6.0	-73.3
12/19	13.5		15.5	-123.4	28.6	-38.1	25.3	16.7	9.7	-74.1	12.0	-130.1	4.1	85.0
12/20	4.3		47.1	-81.1	22.6	46.7	13.2	88.0	6.5	-36.3	2.2	-60.2	6.0	-31.5
12/21	41.6	180.0	55.1	3.4	23.2	-156.1	29.2	169.7	19.6	137.2	9.4	35.6	9.2	-108.4
12/22	70.6	180.0	46.2	61.2	8.3	18.9	16.9	-118.6	5.5	121.5	4.7	-33.8	1.9	-136.0
12/23	45.3	180.0	5.3	126.5	20.4	73.1	14.3	-43.7	16.3	-50.6	11.6	-61.8	10.9	128.8
12/24	38.4		43.0	-176.5	30.8	-177.3	5.8	62.9	6.5	-44.8	10.2	146.5	9.2	52.0
12/25	60.3		35.6	-159.2	20.8	-42.2	13.4	50.3	8.4	-17.4	11.6	93.5	9.7	70.2
12/26	37.8		35.1	-53.8	38.3	-7.6	8.8	15.2	10.6	-153.9	7.2	-35.9	6.9	-142.2
12/27	7.4	180.0	32.2	5.3	57.1	131.1	4.3	2.4	12.0	-175.3	12.0	-148.7	10.7	-50.6
12/28	6.3		32.4	65.3	64.1	-163.0	18.8	-154.7	2.3	33.0	5.9	-159.6	2.6	-1.8
12/29	28.7	180.0	34.8	154.0	52.8	-70.0	5.2	-139.0	4.4	-176.3	17.9	15.1	5.8	-174.1
12/30														
12/31														

1998 Pressure Wavenumber 1
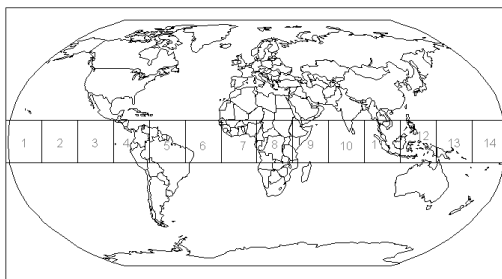
This sheet is for pressure analysis for around the world to find the 5 day pressure wave described by Madden.
This is 1998 ground pressure data filtered spacially and then filtered for wave 1 for Lat: -15 to 15 long: around
the world in 25.7 degree blocks **This is only wave number 1 as best as it can be reproduced from the pressure data**
Units of colored numbers are Pascals. Negative (White Lettering) Postive (Black Lettering)

Day (0 UT)	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1/1														
1/2														
1/3	-23.9	-40.6	-49.2	-48.2	-37.5	-19.5	2.4	23.9	40.6	49.2	48.2	37.5	19.5	-2.4
1/4	-67.3	-78.2	-73.6	-54.5	-24.5	10.3	43.1	67.3	78.2	73.7	54.5	24.5	-10.3	-43.1
1/5	-13.8	-22.2	-26.3	-25.2	-19.1	-9.2	2.6	13.8	22.2	26.3	25.2	19.1	9.2	-2.6
1/6	56.2	56.5	45.7	25.8	0.8	-24.4	-44.7	-56.2	-56.5	-45.7	-25.8	-0.8	24.4	44.7
1/7	56.3	42.8	20.9	-5.2	-30.2	-49.3	-58.6	-56.3	-42.8	-20.9	5.1	30.2	49.3	58.6
1/8	7.2	6.4	4.4	1.4	-1.7	-4.6	-6.5	-7.2	-6.4	-4.4	-1.4	1.7	4.6	6.5
1/9	-42.3	-25.1	-2.9	19.9	38.7	49.9	51.2	42.3	25.1	2.9	-19.8	-38.7	-49.9	-51.2
1/10	-14.8	-5.0	5.7	15.3	21.9	24.2	21.6	14.8	5.0	-5.7	-15.3	-21.9	-24.2	-21.6
1/11	5.4	-2.1	-9.2	-14.5	-16.9	-16.0	-11.9	-5.4	2.1	9.2	14.5	16.9	16.0	11.9
1/12	-2.1	8.6	17.6	23.1	24.0	20.2	12.4	2.1	-8.6	-17.6	-23.1	-24.0	-20.2	-12.4
1/13	-3.3	10.1	21.5	28.6	30.1	25.6	16.0	3.3	-10.1	-21.5	-28.6	-30.1	-25.6	-16.0
1/14	30.5	20.1	5.8	-9.7	-23.3	-32.3	-34.8	-30.5	-20.1	-5.8	9.7	23.3	32.2	34.8
1/15	-18.5	-26.6	-29.4	-26.4	-18.2	-6.3	6.8	18.5	26.6	29.4	26.4	18.2	6.4	-6.7
1/16	-2.4	-3.2	-3.4	-2.9	-1.9	-0.5	1.1	2.4	3.2	3.4	2.9	1.9	0.5	-1.1
1/17	23.0	31.7	34.1	29.8	19.6	5.5	-9.7	-23.0	-31.7	-34.1	-29.8	-19.6	-5.5	9.7
1/18	12.3	21.1	25.6	25.1	19.6	10.3	-1.1	-12.3	-21.1	-25.6	-25.1	-19.6	-10.3	1.1
1/19	-12.4	-17.5	-19.2	-17.0	-11.5	-3.7	4.9	12.4	17.5	19.2	17.0	11.5	3.7	-4.9
1/20	-17.7	-33.0	-41.7	-42.1	-34.2	-19.6	-1.0	17.7	33.0	41.7	42.1	34.2	19.6	1.0
1/21	-20.4	-28.3	-30.7	-26.9	-17.9	-5.3	8.4	20.4	28.3	30.7	26.9	17.9	5.3	-8.4
1/22	-41.6	-35.0	-21.6	-3.8	14.7	30.3	39.9	41.6	35.0	21.6	3.8	-14.7	-30.3	-39.9
1/23	-17.3	4.7	25.8	41.8	49.5	47.4	35.9	17.3	-4.7	-25.8	-41.8	-49.5	-47.4	-35.9
1/24	48.1	43.3	29.9	10.6	-10.8	-30.0	-43.3	-48.1	-43.3	-29.9	-10.6	10.8	30.0	43.3
1/25	51.7	29.2	1.0	-27.5	-50.5	-63.5	-63.9	-51.7	-29.2	-1.0	27.5	50.5	63.5	63.9
1/26	-13.5	-16.8	-16.8	-13.4	-7.4	0.0	7.5	13.5	16.8	16.8	13.4	7.4	0.0	-7.5
1/27	7.8	12.7	15.0	14.3	10.9	5.2	-1.5	-7.8	-12.7	-15.0	-14.3	-10.9	-5.2	1.5
1/28	2.5	15.5	25.5	30.4	29.3	22.4	11.1	-2.5	-15.5	-25.5	-30.4	-29.3	-22.4	-11.1
1/29	3.0	15.1	24.2	28.5	27.2	20.5	9.7	-3.0	-15.1	-24.2	-28.5	-27.2	-20.5	-9.7
1/30	-4.0	-9.1	-12.4	-13.3	-11.5	-7.4	-1.9	4.0	9.1	12.4	13.3	11.5	7.4	1.9
1/31	-28.3	-36.5	-37.5	-31.1	-18.5	-2.2	14.5	28.3	36.5	37.5	31.1	18.5	2.2	-14.5
2/1	-36.1	-35.4	-27.7	-14.5	1.5	17.3	29.6	36.1	35.4	27.7	14.6	-1.5	-17.3	-29.6
2/2	-10.2	-10.4	-8.5	-5.0	-0.5	4.1	7.9	10.2	10.4	8.5	5.0	0.5	-4.1	-7.9
2/3	23.4	16.8	7.0	-4.3	-14.7	-22.2	-25.3	-23.4	-16.8	-7.0	4.3	14.7	22.2	25.3
2/4	13.8	-0.9	-15.5	-27.0	-33.2	-32.8	-25.8	-13.8	0.9	15.5	27.0	33.2	32.8	25.9
2/5	13.2	-4.4	-21.1	-33.7	-39.6	-37.6	-28.2	-13.2	4.4	21.1	33.7	39.6	37.6	28.2
2/6	1.7	7.3	11.5	13.4	12.6	9.4	4.2	-1.7	-7.3	-11.5	-13.4	-12.6	-9.4	-4.2
2/7	-23.4	5.4	33.0	54.1	64.5	62.1	47.5	23.4	-5.4	-33.0	-54.1	-64.5	-62.1	-47.5
2/8	13.4	33.3	46.7	50.8	44.8	30.0	9.2	-13.4	-33.3	-46.7	-50.8	-44.8	-30.0	-9.2
2/9	50.0	36.9	16.6	-7.1	-29.3	-45.7	-53.1	-50.0	-36.9	-16.6	7.1	29.3	45.7	53.1
2/10	13.5	5.0	-4.4	-13.0	-19.0	-21.2	-19.3	-13.5	-5.0	4.4	13.0	19.0	21.2	19.3
2/11	3.9	12.3	18.2	20.5	18.8	13.3	5.2	-3.9	-12.3	-18.2	-20.5	-18.8	-13.3	-5.2
2/12	17.3	12.7	5.6	-2.6	-10.4	-16.0	-18.5	-17.3	-12.7	-5.6	2.6	10.4	16.0	18.5
2/13	-23.3	-34.7	-39.2	-35.9	-25.5	-10.1	7.3	23.3	34.7	39.2	35.9	25.5	10.1	-7.3
2/14	-58.5	-59.3	-48.4	-27.8	-1.8	24.6	46.1	58.5	59.3	48.4	27.8	1.8	-24.6	-46.1
2/15	-8.0	9.8	25.8	36.6	40.2	35.8	24.3	8.1	-9.8	-25.8	-36.6	-40.2	-35.8	-24.3

2/16	7.4	10.7	11.9	10.7	7.4	2.6	-2.6	-7.4	-10.7	-11.9	-10.7	-7.4	-2.6	2.6
2/17	-25.3	-41.9	-50.2	-48.5	-37.3	-18.6	3.7	25.3	41.9	50.2	48.6	37.3	18.6	-3.7
2/18	-29.2	-22.7	-11.8	1.6	14.6	24.7	29.9	29.2	22.7	11.8	-1.6	-14.6	-24.7	-29.9
2/19	17.6	30.6	37.6	37.1	29.3	15.7	-1.1	-17.6	-30.6	-37.6	-37.1	-29.3	-15.7	1.0
2/20	58.5	55.2	40.9	18.5	-7.5	-32.0	-50.3	-58.5	-55.2	-40.9	-18.5	7.5	32.0	50.2
2/21	19.0	2.2	-15.1	-29.3	-37.8	-38.8	-32.0	-19.0	-2.2	15.1	29.3	37.8	38.8	32.1
2/22	-12.2	-19.5	-22.9	-21.8	-16.3	-7.7	2.5	12.2	19.5	22.9	21.8	16.3	7.7	-2.5
2/23	-9.5	-6.7	-2.6	2.0	6.2	9.2	10.4	9.5	6.7	2.6	-2.0	-6.2	-9.2	-10.4
2/24	-2.5	13.6	27.0	35.0	36.1	30.1	18.0	2.5	-13.6	-27.0	-35.0	-36.1	-30.1	-18.0
2/25	19.9	26.7	28.3	24.2	15.3	3.4	-9.1	-19.9	-26.7	-28.3	-24.2	-15.3	-3.4	9.1
2/26	10.1	0.9	-8.6	-16.3	-20.8	-21.2	-17.4	-10.1	-0.9	8.6	16.3	20.8	21.2	17.4
2/27	-18.4	-25.3	-27.2	-23.8	-15.6	-4.3	7.8	18.4	25.3	27.2	23.8	15.6	4.3	-7.8
2/28	-27.7	-27.4	-21.7	-11.7	0.7	12.9	22.5	27.7	27.4	21.7	11.7	-0.7	-12.9	-22.5
3/1	4.8	10.2	13.6	14.3	12.1	7.6	1.5	-4.8	-10.2	-13.6	-14.3	-12.1	-7.6	-1.5
3/2	29.0	17.6	2.7	-12.7	-25.6	-33.5	-34.7	-29.0	-17.6	-2.7	12.7	25.6	33.5	34.7
3/3	-37.7	-39.1	-32.8	-20.0	-3.2	14.2	28.8	37.7	39.1	32.8	20.0	3.2	-14.2	-28.8
3/4	-30.8	-24.1	-12.7	1.3	15.1	25.8	31.4	30.8	24.1	12.7	-1.3	-15.1	-25.8	-31.4
3/5	20.9	31.9	36.5	33.9	24.6	10.4	-5.8	-20.9	-31.8	-36.5	-33.9	-24.6	-10.4	5.8
3/6	22.6	16.5	7.1	-3.7	-13.7	-21.1	-24.3	-22.6	-16.5	-7.1	3.7	13.7	21.1	24.3
3/7	4.5	-3.1	-10.2	-15.1	-17.1	-15.7	-11.2	-4.5	3.1	10.1	15.1	17.1	15.7	11.2
3/8	-52.0	-48.3	-35.1	-14.9	8.3	29.8	45.4	52.0	48.4	35.1	14.9	-8.3	-29.8	-45.4
3/9	2.2	15.0	24.9	29.8	28.9	22.2	11.1	-2.2	-15.0	-24.9	-29.8	-28.9	-22.2	-11.1
3/10	55.0	64.8	61.8	46.5	22.0	-6.8	-34.3	-55.0	-64.8	-61.8	-46.5	-22.0	6.8	34.3
3/11	8.1	-7.8	-22.1	-32.0	-35.6	-32.1	-22.3	-8.1	7.8	22.1	32.0	35.6	32.1	22.3
3/12	-0.5	-9.8	-17.1	-21.0	-20.8	-16.4	-8.8	0.5	9.8	17.1	21.0	20.8	16.4	8.8
3/13	-54.9	-53.7	-41.8	-21.6	2.9	26.7	45.3	54.9	53.7	41.8	21.6	-2.8	-26.7	-45.3
3/14	-21.5	-1.7	18.4	34.8	44.4	45.1	37.0	21.5	1.7	-18.4	-34.8	-44.4	-45.1	-37.0
3/15	88.7	98.8	89.3	62.1	22.6	-21.3	-61.1	-88.7	-98.8	-89.3	-62.1	-22.7	21.3	61.1
3/16	108.2	87.5	49.4	1.5	-46.6	-85.6	-107.5	-108.2	-87.5	-49.4	-1.5	46.6	85.6	107.5
3/17	-26.7	-42.7	-50.2	-47.7	-35.8	-16.9	5.5	26.7	42.7	50.2	47.7	35.9	16.9	-5.5
3/18	-107.3	-120.2	-109.3	-76.8	-29.1	24.4	73.1	107.3	120.2	109.4	76.8	29.1	-24.4	-73.1
3/19	-51.6	-38.7	-18.1	6.1	29.1	46.3	54.3	51.6	38.7	18.1	-6.1	-29.0	-46.3	-54.3
3/20	9.9	45.7	72.5	84.9	80.5	60.2	27.9	-9.9	-45.7	-72.5	-84.9	-80.5	-60.2	-27.9
3/21	3.4	-3.5	-9.8	-14.1	-15.6	-14.0	-9.7	-3.4	3.5	9.8	14.1	15.6	14.0	9.7
3/22	-5.5	-38.8	-64.3	-77.1	-74.7	-57.4	-28.8	5.5	38.8	64.3	77.1	74.7	57.4	28.8
3/23	-14.7	-24.6	-29.6	-28.7	-22.2	-11.3	1.9	14.7	24.6	29.6	28.7	22.2	11.3	-1.9
3/24	19.7	30.7	35.6	33.5	24.7	11.1	-4.8	-19.7	-30.7	-35.6	-33.5	-24.7	-11.1	4.8
3/25	23.8	44.8	57.0	57.9	47.3	27.3	2.0	-23.8	-44.8	-57.0	-57.9	-47.3	-27.3	-2.0
3/26	42.1	53.6	54.5	44.5	25.8	1.9	-22.3	-42.1	-53.6	-54.5	-44.5	-25.8	-1.9	22.3
3/27	-2.0	-4.2	-5.7	-5.9	-5.1	-3.2	-0.7	2.0	4.2	5.7	5.9	5.1	3.2	0.7
3/28	-18.6	-23.6	-24.0	-19.6	-11.4	-0.9	9.8	18.6	23.6	24.0	19.6	11.4	0.9	-9.8
3/29	-1.3	-7.4	-12.0	-14.3	-13.7	-10.4	-5.1	1.3	7.4	12.0	14.3	13.7	10.4	5.1
3/30	25.2	19.3	9.6	-2.1	-13.3	-21.9	-26.1	-25.2	-19.3	-9.6	2.1	13.3	21.9	26.1
3/31	16.7	8.0	-2.3	-12.1	-19.6	-23.1	-22.1	-16.7	-8.0	2.3	12.1	19.6	23.1	22.1
4/1	-50.3	-65.3	-67.3	-56.1	-33.7	-4.6	25.4	50.3	65.3	67.3	56.1	33.7	4.6	-25.4
4/2	-75.9	-62.6	-36.9	-3.9	29.9	57.7	74.1	75.9	62.6	36.9	3.9	-29.9	-57.7	-74.1
4/3	26.6	50.3	64.1	65.2	53.4	31.0	2.4	-26.6	-50.3	-64.1	-65.2	-53.4	-31.0	-2.4
4/4	73.1	83.0	76.5	54.9	22.3	-14.6	-48.7	-73.1	-83.0	-76.5	-54.9	-22.4	14.6	48.7
4/5	38.0	8.6	-22.5	-49.2	-66.1	-69.9	-59.9	-38.0	-8.6	22.5	49.2	66.1	69.9	59.9
4/6	-36.7	-61.3	-73.7	-71.6	-55.3	-28.0	4.8	36.7	61.3	73.7	71.6	55.3	28.0	-4.8
4/7	-63.8	-53.1	-31.9	-4.4	24.0	47.6	61.8	63.8	53.1	31.9	4.4	-24.0	-47.6	-61.8
4/8	-29.3	1.6	32.1	56.3	69.3	68.6	54.3	29.3	-1.6	-32.1	-56.3	-69.3	-68.6	-54.3
4/9	41.2	55.6	59.1	50.8	32.5	7.7	-18.6	-41.2	-55.6	-59.1	-50.8	-32.5	-7.7	18.6
4/10	80.3	58.0	24.2	-14.4	-50.1	-75.9	-86.7	-80.3	-58.0	-24.2	14.3	50.1	75.9	86.7
4/11	-25.1	-42.9	-52.2	-51.1	-39.9	-20.8	2.4	25.1	42.9	52.2	51.1	39.9	20.8	-2.4
4/12	-54.4	-41.1	-19.7	5.7	29.9	48.2	57.0	54.4	41.1	19.7	-5.6	-29.9	-48.2	-57.0
4/13	27.9	49.2	60.7	60.2	47.7	25.8	-1.2	-27.9	-49.2	-60.7	-60.2	-47.7	-25.8	1.2
4/14	41.9	40.0	30.2	14.4	-4.2	-22.1	-35.5	-41.9	-40.0	-30.2	-14.4	4.2	22.1	35.5
4/15	-3.7	-20.6	-33.4	-39.6	-37.9	-28.8	-13.9	3.7	20.6	33.4	39.6	37.9	28.8	13.9
4/16	-43.3	-45.9	-39.5	-25.2	-5.9	14.5	32.1	43.3	45.9	39.5	25.2	5.9	-14.5	-32.1
4/17	-31.8	-25.9	-14.8	-0.8	13.4	24.9	31.5	31.8	25.9	14.8	0.8	-13.4	-24.9	-31.5
4/18	13.6	16.0	15.3	11.6	5.5	-1.6	-8.4	-13.6	-16.0	-15.3	-11.6	-5.5	1.6	8.4
4/19	39.7	29.1	12.7	-6.2	-23.8	-36.8	-42.5	-39.7	-29.1	-12.7	6.2	23.8	36.8	42.5
4/20	13.6	11.6	7.3	1.6	-4.4	-9.6	-12.8	-13.6	-11.6	-7.3	-1.6	4.4	9.6	12.8

Date														
4/21	-19.7	-17.6	-12.0	-4.0	4.8	12.6	18.0	19.7	17.6	12.0	4.0	-4.8	-12.6	-18.0
4/22	-28.6	-16.7	-1.5	14.0	26.7	34.2	34.9	28.6	16.7	1.5	-14.0	-26.7	-34.2	-34.9
4/23	-17.7	-20.4	-19.0	-13.9	-6.0	3.1	11.5	17.7	20.4	19.0	13.9	6.0	-3.1	-11.5
4/24	-3.1	2.8	8.1	11.8	13.2	12.0	8.4	3.1	-2.8	-8.1	-11.8	-13.2	-12.0	-8.4
4/25	13.9	17.1	16.9	13.4	7.2	-0.4	-7.9	-13.9	-17.1	-16.9	-13.4	-7.2	0.4	7.9
4/26	31.7	33.0	27.7	17.0	2.9	-11.8	-24.1	-31.7	-33.0	-27.7	-17.0	-2.9	11.8	24.1
4/27	42.4	23.1	-0.8	-24.5	-43.4	-53.6	-53.3	-42.4	-23.1	0.8	24.5	43.4	53.6	53.3
4/28	7.5	-15.0	-34.5	-47.2	-50.6	-43.9	-28.6	-7.5	15.0	34.5	47.2	50.6	43.9	28.6
4/29	-68.5	-57.2	-34.6	-5.2	25.3	50.8	66.2	68.5	57.2	34.6	5.2	-25.3	-50.8	-66.2
4/30	-31.5	-8.6	16.0	37.5	51.5	55.4	48.2	31.5	8.6	-16.0	-37.5	-51.5	-55.4	-48.2
5/1	27.5	21.7	11.7	-0.7	-13.0	-22.7	-27.9	-27.5	-21.7	-11.7	0.7	13.0	22.7	27.9
5/2	41.9	12.2	-19.8	-48.0	-66.6	-72.1	-63.2	-41.9	-12.2	19.8	48.0	66.6	72.1	63.2
5/3	-16.3	-24.2	-27.2	-24.9	-17.6	-6.9	5.3	16.3	24.2	27.2	24.9	17.6	6.9	-5.3
5/4	-45.6	-13.9	20.5	50.9	71.2	77.4	68.2	45.6	13.9	-20.5	-50.9	-71.2	-77.4	-68.2
5/5	30.0	54.0	67.3	67.3	54.0	29.9	0.0	-30.0	-54.0	-67.3	-67.3	-54.0	-29.9	0.0
5/6	55.1	44.2	24.5	0.0	-24.5	-44.2	-55.1	-55.1	-44.2	-24.5	0.0	24.5	44.2	55.1
5/7	50.6	19.0	-16.4	-48.6	-71.1	-79.5	-72.2	-50.6	-19.0	16.4	48.6	71.1	79.5	72.3
5/8	-29.1	-40.1	-43.1	-37.6	-24.6	-6.8	12.4	29.1	40.1	43.1	37.6	24.6	6.8	-12.4
5/9	-86.1	-62.7	-27.0	14.2	52.5	80.4	92.4	86.1	62.7	27.0	-14.2	-52.5	-80.4	-92.4
5/10	-16.5	6.5	28.1	44.2	51.6	48.7	36.2	16.5	-6.5	-28.1	-44.2	-51.6	-48.7	-36.2
5/11	40.8	39.6	30.4	15.3	-2.9	-20.5	-34.0	-40.8	-39.6	-30.4	-15.3	2.9	20.5	34.0
5/12	32.5	21.9	7.0	-9.3	-23.8	-33.5	-36.6	-32.5	-21.9	-7.0	9.3	23.8	33.5	36.6
5/13	-41.3	-38.1	-27.3	-11.1	7.3	24.2	36.3	41.3	38.1	27.3	11.1	-7.2	-24.2	-36.3
5/14	-34.2	-11.6	13.2	35.4	50.6	55.8	50.0	34.2	11.6	-13.2	-35.4	-50.6	-55.8	-50.0
5/15	21.0	26.6	26.9	21.9	12.6	0.8	-11.2	-21.0	-26.6	-26.9	-21.9	-12.6	-0.8	11.2
5/16	59.4	34.5	2.7	-29.6	-56.0	-71.3	-72.6	-59.4	-34.5	-2.7	29.6	56.0	71.3	72.6
5/17	5.5	-16.5	-35.2	-47.0	-49.4	-42.1	-26.4	-5.5	16.5	35.2	46.9	49.4	42.1	26.4
5/18	-73.1	-77.5	-66.5	-42.4	-9.9	24.6	54.2	73.1	77.5	66.5	42.4	9.9	-24.6	-54.2
5/19	-16.8	-3.2	11.0	23.1	30.5	32.0	27.1	16.8	3.2	-11.0	-23.0	-30.5	-32.0	-27.1
5/20	20.3	35.6	43.8	43.4	34.4	18.6	-0.9	-20.2	-35.6	-43.8	-43.4	-34.4	-18.6	0.9
5/21	16.1	13.5	8.2	1.3	-5.8	-11.8	-15.5	-16.1	-13.5	-8.2	-1.3	5.8	11.8	15.5
5/22	-36.6	-49.3	-52.2	-44.8	-28.5	-6.6	16.7	36.6	49.3	52.2	44.8	28.5	6.6	-16.7
5/23	-11.6	-11.0	-8.1	-3.7	1.5	6.3	10.0	11.6	11.0	8.1	3.7	-1.5	-6.3	-10.0
5/24	27.0	43.1	50.6	48.1	36.1	16.9	-5.6	-27.0	-43.1	-50.6	-48.1	-36.1	-16.9	5.6
5/25	25.3	42.2	50.7	49.1	37.9	19.1	-3.4	-25.3	-42.2	-50.7	-49.1	-37.9	-19.1	3.4
5/26	18.4	3.9	-11.5	-24.6	-32.8	-34.5	-29.4	-18.4	-3.9	11.5	24.6	32.8	34.5	29.4
5/27	-14.1	-45.7	-68.2	-77.3	-71.0	-50.7	-20.3	14.1	45.7	68.2	77.3	71.0	50.7	20.3
5/28	-48.7	-46.8	-35.6	-17.4	4.3	25.1	41.0	48.7	46.8	35.6	17.4	-4.3	-25.1	-41.0
5/29	26.7	51.9	66.9	68.6	56.7	33.6	3.8	-26.7	-51.9	-66.8	-68.6	-56.7	-33.6	-3.8
5/30	80.3	74.6	54.1	22.8	-12.9	-46.1	-70.2	-80.3	-74.6	-54.1	-22.8	12.9	46.1	70.2
5/31	17.3	-17.7	-49.3	-71.0	-78.7	-70.8	-48.9	-17.3	17.7	49.2	71.0	78.7	70.8	48.9
6/1	-80.1	-83.7	-70.7	-43.7	-8.1	29.2	60.6	80.1	83.7	70.7	43.7	8.1	-29.1	-60.6
6/2	-43.5	-7.3	30.4	62.0	81.4	84.6	71.1	43.5	7.3	-30.4	-62.0	-81.4	-84.6	-71.1
6/3	57.6	70.1	68.6	53.6	27.9	-3.2	-33.8	-57.6	-70.1	-68.6	-53.6	-28.0	3.2	33.8
6/4	21.3	16.9	9.2	-0.4	-9.9	-17.4	-21.5	-21.3	-16.9	-9.2	0.4	9.9	17.4	21.5
6/5	-13.5	-26.0	-33.4	-34.2	-28.2	-16.6	-1.7	13.5	26.0	33.4	34.2	28.2	16.6	1.7
6/6	-48.0	-34.1	-13.4	9.9	31.3	46.4	52.4	48.0	34.1	13.4	-9.9	-31.3	-46.4	-52.4
6/7	15.0	24.0	28.2	26.9	20.2	9.6	-3.0	-15.0	-24.0	-28.2	-26.9	-20.2	-9.6	3.0
6/8	35.9	25.4	10.0	-7.5	-23.4	-34.7	-39.2	-35.9	-25.4	-10.0	7.5	23.4	34.7	39.2
6/9	-19.4	-21.8	-19.8	-14.0	-5.3	4.4	13.2	19.4	21.8	19.8	14.0	5.3	-4.4	-13.2
6/10	-1.0	-6.5	-10.6	-12.7	-12.2	-9.3	-4.6	1.0	6.5	10.6	12.7	12.2	9.3	4.6
6/11	-6.8	-17.9	-25.5	-28.0	-25.0	-17.0	-5.7	6.8	17.9	25.5	28.0	25.0	17.0	5.7
6/12	-31.1	-24.6	-13.3	0.7	14.5	25.5	31.4	31.1	24.6	13.3	-0.7	-14.5	-25.5	-31.4
6/13	-6.9	3.7	13.6	20.9	24.0	22.3	16.2	7.0	-3.7	-13.6	-20.9	-24.0	-22.3	-16.2
6/14	24.8	25.5	21.2	12.6	1.6	-9.8	-19.2	-24.8	-25.5	-21.2	-12.6	-1.6	9.8	19.2
6/15	14.7	4.0	-7.6	-17.6	-24.2	-25.9	-22.5	-14.7	-4.0	7.6	17.6	24.2	25.9	22.5
6/16	-11.9	-16.6	-18.1	-16.0	-10.7	-3.3	4.7	11.9	16.6	18.1	16.0	10.7	3.3	-4.7
6/17	-1.3	14.9	28.1	35.8	36.4	29.7	17.2	1.3	-14.9	-28.1	-35.8	-36.4	-29.7	-17.2
6/18	33.1	38.7	36.7	27.4	12.6	-4.6	-20.9	-33.1	-38.7	-36.7	-27.4	-12.7	4.6	20.9
6/19	21.2	8.9	-5.1	-18.2	-27.6	-31.6	-29.3	-21.2	-8.9	5.1	18.2	27.6	31.6	29.3
6/20	7.2	-11.6	-28.1	-39.0	-42.3	-37.1	-24.6	-7.2	11.6	28.1	39.0	42.3	37.1	24.6
6/21	-30.3	-28.0	-20.1	-8.2	5.3	17.7	26.7	30.3	28.0	20.1	8.2	-5.3	-17.7	-26.7
6/22	-41.1	-25.2	-4.3	17.5	35.8	47.0	48.9	41.1	25.2	4.3	-17.5	-35.8	-47.0	-48.9
6/23	2.6	0.3	-2.1	-4.1	-5.2	-5.4	-4.4	-2.6	-0.3	2.1	4.1	5.2	5.4	4.4

6/24	7.3	-2.9	-12.6	-19.8	-23.1	-21.8	-16.2	-7.3	2.9	12.6	19.8	23.1	21.8	16.2
6/25	2.6	16.4	27.0	32.2	31.1	23.8	11.8	-2.6	-16.4	-27.0	-32.2	-31.1	-23.8	-11.8
6/26	21.8	27.7	28.0	22.8	13.0	0.7	-11.7	-21.8	-27.7	-28.0	-22.8	-13.0	-0.7	11.7
6/27	29.7	17.3	1.4	-14.8	-28.0	-35.7	-36.3	-29.7	-17.3	-1.4	14.8	28.0	35.7	36.3
6/28	-35.7	-44.8	-45.0	-36.4	-20.5	-0.5	19.5	35.7	44.8	45.0	36.4	20.5	0.5	-19.5
6/29	-35.3	-18.8	1.3	21.2	36.9	45.3	44.7	35.3	18.8	-1.3	-21.2	-36.9	-45.3	-44.7
6/30	-8.4	2.0	12.0	19.7	23.4	22.6	17.2	8.4	-2.0	-12.0	-19.7	-23.4	-22.6	-17.2
7/1	-23.6	-18.1	-9.0	1.9	12.4	20.5	24.5	23.6	18.1	9.0	-1.9	-12.4	-20.5	-24.5
7/2	-9.7	-6.7	-2.4	2.3	6.6	9.6	10.7	9.7	6.7	2.4	-2.3	-6.6	-9.6	-10.7
7/3	58.9	55.2	40.7	18.0	-8.2	-32.7	-50.8	-58.9	-55.2	-40.7	-18.1	8.1	32.7	50.8
7/4	36.4	28.0	14.0	-2.8	-19.0	-31.4	-37.6	-36.4	-28.0	-14.0	2.8	19.0	31.4	37.6
7/5	18.9	6.2	-7.7	-20.0	-28.4	-31.2	-27.8	-18.9	-6.2	7.7	20.0	28.4	31.2	27.8
7/6	1.3	-7.2	-14.3	-18.5	-19.1	-15.9	-9.6	-1.3	7.2	14.3	18.5	19.1	15.9	9.6
7/7	-15.4	-16.4	-14.2	-9.1	-2.3	5.1	11.4	15.4	16.4	14.2	9.1	2.3	-5.1	-11.4
7/8	8.7	7.4	4.6	0.9	-3.0	-6.3	-8.3	-8.7	-7.4	-4.6	-0.9	3.0	6.3	8.3
7/9	-31.1	-38.9	-39.0	-31.4	-17.6	-0.2	17.1	31.1	38.9	39.0	31.4	17.6	0.2	-17.1
7/10	-50.5	-44.7	-30.1	-9.6	12.9	32.8	46.2	50.5	44.7	30.1	9.6	-12.9	-32.8	-46.2
7/11	-25.2	-1.1	23.2	42.9	54.1	54.6	44.3	25.2	1.1	-23.2	-42.9	-54.1	-54.6	-44.3
7/12	49.6	64.1	66.0	54.8	32.7	4.2	-25.2	-49.6	-64.1	-66.0	-54.8	-32.7	-4.2	25.2
7/13	50.6	45.8	31.8	11.6	-10.9	-31.3	-45.5	-50.6	-45.8	-31.8	-11.6	10.9	31.3	45.5
7/14	14.4	-6.1	-25.3	-39.6	-46.0	-43.3	-32.0	-14.4	6.1	25.3	39.6	46.0	43.3	32.0
7/15	-45.1	-52.3	-49.2	-36.3	-16.2	7.0	28.9	45.1	52.3	49.2	36.3	16.2	-7.0	-28.9
7/16	-22.1	-11.3	1.7	14.3	24.2	29.2	28.5	22.1	11.3	-1.7	-14.3	-24.2	-29.2	-28.5
7/17	32.7	39.4	38.4	29.7	15.2	-2.4	-19.5	-32.7	-39.4	-38.4	-29.7	-15.2	2.4	19.5
7/18	29.7	14.2	-4.1	-21.6	-34.8	-41.1	-39.3	-29.7	-14.2	4.1	21.6	34.8	41.1	39.3
7/19	-36.7	-43.4	-41.5	-31.4	-15.1	4.2	22.7	36.7	43.4	41.5	31.4	15.1	-4.2	-22.7
7/20	-27.2	-14.1	1.8	17.3	29.5	35.7	34.9	27.2	14.1	-1.8	-17.3	-29.4	-35.7	-34.9
7/21	12.1	22.5	28.4	28.7	23.3	13.3	0.6	-12.1	-22.5	-28.4	-28.7	-23.3	-13.3	-0.7
7/22	14.8	13.4	9.3	3.4	-3.2	-9.1	-13.3	-14.8	-13.4	-9.3	-3.4	3.2	9.1	13.3
7/23	-11.5	-13.0	-12.0	-8.6	-3.5	2.3	7.7	11.5	13.0	12.0	8.6	3.5	-2.3	-7.7
7/24	-7.7	-10.1	-10.5	-8.9	-5.5	-1.0	3.7	7.7	10.1	10.5	8.9	5.5	1.0	-3.7
7/25	14.4	10.2	3.9	-3.2	-9.6	-14.1	-15.8	-14.4	-10.2	-3.9	3.2	9.6	14.1	15.8
7/26	33.2	27.3	15.9	1.4	-13.4	-25.5	-32.6	-33.2	-27.3	-15.9	-1.4	13.3	25.5	32.6
7/27	4.5	3.3	1.4	-0.8	-2.8	-4.2	-4.8	-4.5	-3.3	-1.4	0.8	2.7	4.2	4.8
7/28	-48.3	-43.7	-30.5	-11.2	10.3	29.8	43.4	48.3	43.7	30.5	11.2	-10.3	-29.8	-43.4
7/29	-3.4	5.8	13.8	19.2	20.7	18.1	11.9	3.4	-5.8	-13.8	-19.2	-20.7	-18.1	-12.0
7/30	-0.7	9.6	18.0	22.8	23.1	18.9	10.9	0.7	-9.6	-17.9	-22.8	-23.1	-18.9	-10.9
7/31	-2.3	-4.4	-5.6	-5.7	-4.7	-2.8	-0.3	2.3	4.4	5.6	5.7	4.7	2.8	0.3
8/1	13.2	14.2	12.4	8.2	2.4	-4.0	-9.5	-13.2	-14.2	-12.4	-8.2	-2.4	4.0	9.5
8/2	20.2	13.7	4.5	-5.5	-14.5	-20.6	-22.6	-20.2	-13.7	-4.5	5.5	14.5	20.6	22.6
8/3	2.1	-16.3	-31.6	-40.6	-41.5	-34.2	-20.2	-2.1	16.3	31.6	40.6	41.5	34.2	20.2
8/4	-25.7	-29.3	-27.1	-19.5	-8.1	5.0	17.0	25.7	29.3	27.1	19.5	8.1	-5.0	-17.0
8/5	-32.5	-19.9	-3.3	14.0	28.4	37.3	38.8	32.5	19.9	3.3	-14.0	-28.4	-37.3	-38.8
8/6	31.1	38.6	38.5	30.8	16.9	-0.3	-17.4	-31.1	-38.6	-38.5	-30.8	-16.9	0.3	17.4
8/7	-5.7	-13.8	-19.2	-20.8	-18.2	-12.1	-3.6	5.7	13.8	19.2	20.8	18.2	12.1	3.6
8/8	-26.4	-16.3	-3.0	10.9	22.6	29.9	31.2	26.4	16.3	3.0	-10.9	-22.6	-29.9	-31.2
8/9	39.3	40.3	33.2	19.6	2.0	-15.9	-30.6	-39.3	-40.3	-33.2	-19.6	-2.1	15.9	30.6
8/10	50.3	30.7	5.0	-21.7	-44.1	-57.8	-60.0	-50.3	-30.7	-5.0	21.7	44.1	57.8	60.0
8/11	-33.5	-49.1	-55.0	-50.0	-35.1	-13.2	11.2	33.5	49.1	55.0	50.0	35.1	13.2	-11.2
8/12	-59.5	-41.5	-15.2	14.0	40.4	58.9	65.7	59.5	41.5	15.2	-14.0	-40.4	-58.9	-65.7
8/13	23.7	51.5	69.1	73.0	62.4	39.5	8.7	-23.7	-51.5	-69.1	-73.0	-62.4	-39.5	-8.7
8/14	59.3	45.9	23.4	-3.7	-30.1	-50.6	-61.0	-59.3	-45.9	-23.4	3.7	30.1	50.6	61.0
8/15	-0.3	-27.8	-49.7	-61.8	-61.7	-49.3	-27.2	0.3	27.8	49.7	61.8	61.7	49.3	27.2
8/16	-74.3	-53.6	-22.2	13.5	46.6	70.4	80.3	74.3	53.6	22.2	-13.5	-46.5	-70.4	-80.3
8/17	9.3	34.3	52.4	60.2	56.0	40.8	17.5	-9.3	-34.3	-52.4	-60.2	-56.0	-40.8	-17.5
8/18	64.6	49.3	24.3	-5.5	-34.2	-56.2	-67.0	-64.6	-49.3	-24.3	5.5	34.2	56.2	67.0
8/19	-7.1	-25.4	-38.7	-44.3	-41.1	-29.8	-12.6	7.1	25.4	38.7	44.3	41.1	29.8	12.6
8/20	-52.3	-47.4	-33.2	-12.4	10.9	32.0	46.7	52.3	47.4	33.2	12.4	-10.9	-32.0	-46.7
8/21	-21.3	-0.6	20.2	37.0	46.5	46.7	37.8	21.3	0.6	-20.2	-37.0	-46.5	-46.7	-37.8
8/22	30.3	33.0	29.2	19.6	6.1	-8.5	-21.5	-30.3	-33.0	-29.2	-19.6	-6.1	8.5	21.5
8/23	28.6	15.0	-1.7	-17.9	-30.7	-37.3	-36.6	-28.6	-15.0	1.6	17.9	30.7	37.3	36.6
8/24	13.1	1.2	-10.9	-20.9	-26.8	-27.3	-22.5	-13.1	-1.2	10.9	20.9	26.8	27.3	22.5
8/25	-10.6	4.4	18.4	28.9	33.6	31.7	23.4	10.6	-4.4	-18.4	-28.9	-33.6	-31.7	-23.5
8/26	-7.0	-3.0	1.5	5.8	8.9	10.2	9.6	7.0	3.0	-1.5	-5.8	-8.9	-10.2	-9.6

8/27	-5.2	-21.3	-33.1	-38.3	-36.0	-26.5	-11.8	5.2	21.2	33.1	38.3	36.0	26.5	11.8
8/28	1.1	-22.6	-41.8	-52.7	-53.2	-43.2	-24.6	-1.1	22.5	41.8	52.7	53.2	43.2	24.6
8/29	-25.6	-20.6	-11.5	-0.1	11.2	20.4	25.5	25.6	20.6	11.5	0.1	-11.2	-20.4	-25.5
8/30	-31.7	-7.7	17.8	39.8	53.9	57.3	49.4	31.7	7.7	-17.8	-39.8	-53.9	-57.3	-49.4
8/31	4.1	31.4	52.4	63.1	61.3	47.3	24.0	-4.1	-31.4	-52.4	-63.1	-61.3	-47.3	-24.0
9/1	39.7	37.4	27.8	12.6	-5.0	-21.7	-34.0	-39.7	-37.4	-27.8	-12.6	5.0	21.7	34.0
9/2	36.8	12.4	-14.5	-38.5	-54.9	-60.4	-54.0	-36.8	-12.4	14.5	38.5	54.9	60.4	54.0
9/3	-2.2	-6.8	-10.0	-11.3	-10.3	-7.3	-2.8	2.2	6.8	10.0	11.3	10.3	7.3	2.8
9/4	-20.4	-25.4	-25.5	-20.5	-11.4	-0.1	11.3	20.4	25.4	25.5	20.5	11.4	0.1	-11.3
9/5	-17.7	-19.2	-16.9	-11.2	-3.3	5.3	12.8	17.7	19.2	16.9	11.2	3.3	-5.2	-12.8
9/6	-16.2	-5.7	6.0	16.5	23.7	26.2	23.6	16.3	5.7	-6.0	-16.5	-23.7	-26.2	-23.6
9/7	34.7	36.0	30.2	18.4	2.9	-13.1	-26.5	-34.7	-36.0	-30.2	-18.4	-3.0	13.1	26.5
9/8	33.9	13.9	-8.9	-30.0	-45.0	-51.2	-47.2	-33.9	-13.9	8.9	30.0	45.0	51.2	47.2
9/9	-29.8	-39.8	-42.0	-35.8	-22.6	-4.8	13.8	29.8	39.8	42.0	35.8	22.6	4.9	-13.8
9/10	-40.1	-13.5	15.7	41.9	59.8	65.8	58.8	40.2	13.5	-15.7	-41.9	-59.8	-65.8	-58.8
9/11	14.3	36.8	52.1	57.0	50.6	34.3	11.1	-14.3	-36.8	-52.1	-57.0	-50.6	-34.3	-11.1
9/12	43.2	26.4	4.2	-18.7	-38.0	-49.7	-51.6	-43.2	-26.4	-4.2	18.7	37.9	49.7	51.6
9/13	9.3	-19.3	-44.1	-60.2	-64.4	-55.8	-36.1	-9.3	19.3	44.1	60.2	64.4	55.8	36.1
9/14	-31.5	-30.7	-23.9	-12.4	1.6	15.3	25.9	31.5	30.7	23.9	12.4	-1.6	-15.3	-25.9
9/15	-28.3	-3.8	21.5	42.6	55.2	56.8	47.3	28.3	3.8	-21.5	-42.6	-55.2	-56.8	-47.3
9/16	-1.3	10.0	19.3	24.8	25.4	21.0	12.4	1.4	-10.0	-19.3	-24.8	-25.4	-21.0	-12.4
9/17	33.0	24.4	11.0	-4.5	-19.2	-30.1	-35.0	-33.0	-24.4	-11.0	4.5	19.2	30.1	35.0
9/18	5.4	-9.7	-22.8	-31.4	-33.8	-29.5	-19.3	-5.4	9.7	22.8	31.4	33.8	29.5	19.3
9/19	-26.2	-20.9	-11.5	0.2	11.9	21.2	26.3	26.2	20.9	11.5	-0.2	-11.9	-21.2	-26.3
9/20	-16.2	-4.3	8.5	19.6	26.9	28.8	25.0	16.2	4.3	-8.5	-19.6	-26.9	-28.8	-25.0
9/21	27.2	32.5	31.4	24.1	12.0	-2.5	-16.5	-27.2	-32.5	-31.4	-24.1	-12.0	2.5	16.5
9/22	21.3	10.4	-2.5	-14.9	-24.3	-29.0	-27.9	-21.3	-10.4	2.5	14.9	24.3	29.0	27.9
9/23	-4.8	-10.9	-14.9	-16.0	-13.9	-9.0	-2.4	4.8	10.9	14.9	16.0	13.9	9.0	2.4
9/24	-25.5	-24.2	-18.0	-8.3	3.1	13.9	21.9	25.5	24.2	18.0	8.3	-3.1	-13.9	-21.9
9/25	-4.9	-1.3	2.5	5.8	8.0	8.6	7.5	4.9	1.3	-2.5	-5.8	-8.0	-8.6	-7.5
9/26	19.4	17.9	12.9	5.3	-3.4	-11.3	-17.1	-19.4	-17.9	-12.9	-5.3	3.4	11.3	17.1
9/27	4.2	-0.2	-4.5	-8.0	-9.8	-9.8	-7.7	-4.2	0.2	4.5	8.0	9.8	9.8	7.7
9/28	-6.0	-3.9	-1.0	2.1	4.8	6.5	7.0	6.0	3.9	1.0	-2.1	-4.8	-6.5	-7.0
9/29	-7.4	0.5	8.3	14.4	17.7	17.5	13.8	7.4	-0.5	-8.3	-14.4	-17.7	-17.5	-13.8
9/30	1.2	2.2	2.8	2.8	2.3	1.3	0.0	-1.2	-2.2	-2.8	-2.8	-2.3	-1.3	0.0
10/1	14.8	12.2	7.3	0.9	-5.6	-11.1	-14.3	-14.8	-12.2	-7.3	-0.9	5.6	11.1	14.3
10/2	-20.2	-22.5	-20.3	-14.2	-5.2	4.8	13.9	20.2	22.5	20.3	14.2	5.2	-4.8	-13.9
10/3	-35.7	-24.8	-9.1	8.5	24.4	35.4	39.5	35.7	24.8	9.1	-8.5	-24.4	-35.4	-39.5
10/4	9.5	10.9	10.2	7.4	3.1	-1.7	-6.3	-9.5	-10.9	-10.2	-7.4	-3.1	1.7	6.3
10/5	42.8	28.1	7.8	-14.1	-33.1	-45.6	-49.1	-42.8	-28.1	-7.8	14.1	33.1	45.6	49.1
10/6	33.5	26.4	14.1	-1.0	-15.9	-27.7	-33.9	-33.5	-26.4	-14.1	1.0	15.9	27.7	33.9
10/7	-25.0	-23.9	-17.9	-8.5	2.7	13.3	21.3	25.0	23.9	17.9	8.5	-2.7	-13.3	-21.3
10/8	-30.7	-28.6	-20.8	-8.9	4.7	17.4	26.7	30.7	28.6	20.8	8.9	-4.7	-17.4	-26.7
10/9	-19.6	-10.4	0.8	11.9	20.6	25.3	24.9	19.6	10.4	-0.8	-11.9	-20.6	-25.3	-24.9
10/10	12.0	19.3	22.7	21.7	16.3	7.8	-2.3	-12.0	-19.3	-22.7	-21.7	-16.3	-7.8	2.3
10/11	24.5	16.3	4.8	-7.6	-18.5	-25.7	-27.9	-24.5	-16.3	-4.8	7.6	18.5	25.7	27.9
10/12	18.0	13.0	5.3	-3.3	-11.4	-17.1	-19.5	-18.0	-13.0	-5.4	3.3	11.4	17.1	19.5
10/13	-13.4	-11.4	-7.1	-1.5	4.4	9.5	12.7	13.4	11.4	7.1	1.5	-4.4	-9.5	-12.7
10/14	-4.7	2.2	8.6	13.3	15.4	14.5	10.6	4.7	-2.2	-8.6	-13.3	-15.4	-14.5	-10.6
10/15	5.3	16.0	23.5	26.4	24.1	16.9	6.5	-5.3	-16.0	-23.5	-26.4	-24.1	-16.9	-6.5
10/16	9.4	4.5	-1.2	-6.7	-10.8	-12.9	-12.3	-9.4	-4.5	1.2	6.7	10.8	12.9	12.3
10/17	-8.0	-30.2	-46.5	-53.5	-50.0	-36.5	-15.9	8.0	30.2	46.5	53.5	50.0	36.5	15.9
10/18	-21.7	-29.8	-31.9	-27.8	-18.1	-4.9	9.3	21.7	29.8	31.9	27.8	18.1	4.9	-9.3
10/19	-5.2	5.8	15.6	22.3	24.7	22.1	15.2	5.2	-5.8	-15.6	-22.3	-24.7	-22.1	-15.2
10/20	6.9	1.7	-3.9	-8.6	-11.7	-12.5	-10.7	-6.9	-1.7	3.9	8.6	11.7	12.5	10.7
10/21	-31.2	-37.0	-35.4	-26.8	-13.0	3.5	19.2	31.2	37.0	35.4	26.8	13.0	-3.5	-19.2
10/22	-7.3	0.6	8.4	14.5	17.8	17.5	13.8	7.3	-0.6	-8.4	-14.5	-17.8	-17.5	-13.8
10/23	32.8	58.7	72.9	72.7	58.1	32.0	-0.5	-32.8	-58.7	-72.9	-72.7	-58.1	-32.0	0.5
10/24	31.1	45.9	51.7	47.2	33.3	12.9	-10.1	-31.1	-45.9	-51.7	-47.2	-33.3	-12.9	10.1
10/25	20.7	5.5	-10.7	-24.8	-34.1	-36.5	-31.8	-20.7	-5.5	10.7	24.8	34.1	36.5	31.8
10/26	-0.5	-17.7	-31.5	-39.0	-38.8	-30.9	-16.9	0.4	17.7	31.5	39.0	38.8	30.9	16.9
10/27	-1.0	6.5	12.7	16.3	16.8	13.9	8.3	1.0	-6.5	-12.7	-16.3	-16.8	-13.9	-8.3
10/28	-28.7	-23.0	-12.7	0.1	12.9	23.2	28.8	28.7	23.0	12.7	-0.1	-12.9	-23.1	-28.8
10/29	-33.6	-39.3	-37.3	-27.8	-12.9	4.6	21.2	33.6	39.3	37.3	27.9	12.9	-4.6	-21.2

Date													
10/30	2.0	-9.1	-18.5	-24.1	-25.0	-21.0	-12.8	-2.0	9.1	18.5	24.1	25.0	21.0	12.8
10/31	7.7	11.3	12.6	11.5	8.0	3.0	-2.6	-7.7	-11.3	-12.6	-11.5	-8.0	-3.0	2.6
11/1	24.3	24.6	20.0	11.5	0.7	-10.3	-19.2	-24.3	-24.6	-20.1	-11.5	-0.7	10.3	19.2
11/2	11.5	3.0	-6.2	-14.1	-19.2	-20.5	-17.8	-11.5	-3.0	6.2	14.1	19.2	20.5	17.8
11/3	-42.2	-44.5	-38.0	-23.9	-5.1	14.7	31.6	42.2	44.5	38.0	23.9	5.1	-14.7	-31.6
11/4	-5.1	-6.3	-6.2	-4.9	-2.6	0.2	3.0	5.1	6.3	6.2	4.9	2.6	-0.2	-3.0
11/5	28.4	23.5	13.9	1.6	-11.1	-21.5	-27.7	-28.4	-23.5	-13.9	-1.6	11.1	21.5	27.7
11/6	1.7	9.2	14.9	17.7	17.0	12.9	6.2	-1.7	-9.2	-14.9	-17.7	-17.0	-12.9	-6.2
11/7	12.0	33.9	49.1	54.5	49.2	34.1	12.2	-12.0	-33.9	-49.1	-54.5	-49.2	-34.1	-12.2
11/8	27.2	40.6	46.1	42.4	30.3	12.2	-8.3	-27.2	-40.6	-46.1	-42.4	-30.3	-12.2	8.3
11/9	10.0	-7.4	-23.3	-34.6	-39.0	-35.8	-25.4	-10.0	7.4	23.3	34.6	39.0	35.8	25.4
11/10	-15.7	-34.4	-46.3	-49.0	-42.0	-26.7	-6.1	15.7	34.4	46.3	49.0	42.0	26.7	6.1
11/11	-22.7	-20.8	-14.8	-5.9	4.2	13.5	20.1	22.7	20.8	14.8	5.9	-4.2	-13.5	-20.1
11/12	-41.9	-29.8	-11.8	8.5	27.2	40.4	45.7	41.9	29.8	11.8	-8.5	-27.2	-40.4	-45.7
11/13	-9.6	11.1	29.7	42.4	46.7	41.7	28.5	9.6	-11.1	-29.7	-42.4	-46.7	-41.7	-28.5
11/14	41.6	37.6	26.1	9.5	-9.1	-25.8	-37.4	-41.6	-37.6	-26.1	-9.5	9.1	25.8	37.4
11/15	3.0	-21.6	-41.9	-53.8	-55.2	-45.6	-26.9	-3.0	21.6	41.9	53.8	55.2	45.6	26.9
11/16	-28.1	-36.5	-37.7	-31.5	-19.0	-2.7	14.1	28.1	36.5	37.7	31.5	19.0	2.7	-14.1
11/17	-20.7	-0.8	19.4	35.7	44.9	45.3	36.6	20.8	0.8	-19.4	-35.7	-44.9	-45.3	-36.6
11/18	30.8	31.4	25.7	15.0	1.2	-12.7	-24.1	-30.8	-31.4	-25.7	-15.0	-1.3	12.7	24.1
11/19	12.8	2.7	-7.9	-16.9	-22.7	-23.9	-20.4	-12.8	-2.7	7.9	16.9	22.7	23.9	20.4
11/20	-17.4	-20.9	-20.2	-15.5	-7.8	1.5	10.5	17.4	20.9	20.2	15.5	7.8	-1.5	-10.5
11/21	-5.3	-5.8	-5.0	-3.3	-1.0	1.6	3.9	5.3	5.8	5.0	3.3	1.0	-1.6	-3.9
11/22	-11.7	2.5	16.2	26.7	31.9	30.8	23.6	11.8	-2.5	-16.2	-26.7	-31.9	-30.8	-23.6
11/23	20.3	24.1	23.0	17.4	8.4	-2.4	-12.6	-20.3	-24.1	-23.0	-17.4	-8.4	2.3	12.6
11/24	33.1	29.3	19.7	6.2	-8.6	-21.6	-30.3	-33.1	-29.3	-19.7	-6.2	8.6	21.6	30.3
11/25	-20.0	-23.2	-21.9	-16.2	-7.3	3.0	12.8	20.0	23.2	21.9	16.2	7.3	-3.0	-12.7
11/26	-3.0	-6.0	-7.8	-8.1	-6.7	-4.1	-0.6	3.0	6.0	7.8	8.1	6.7	4.1	0.6
11/27	13.7	16.6	16.3	12.8	6.7	-0.7	-8.0	-13.7	-16.6	-16.3	-12.8	-6.7	0.7	8.0
11/28	-11.3	3.2	17.0	27.5	32.5	31.1	23.5	11.3	-3.2	-17.0	-27.5	-32.5	-31.1	-23.5
11/29	9.7	3.7	-3.1	-9.2	-13.6	-15.2	-13.8	-9.7	-3.7	3.1	9.2	13.6	15.2	13.8
11/30	2.4	-15.9	-31.1	-40.1	-41.2	-34.1	-20.3	-2.4	15.9	31.1	40.1	41.2	34.1	20.3
12/1	6.4	6.0	4.5	2.1	-0.8	-3.5	-5.4	-6.4	-6.0	-4.5	-2.1	0.8	3.5	5.4
12/2	41.1	40.5	31.9	17.0	-1.3	-19.3	-33.5	-41.1	-40.5	-31.9	-17.0	1.3	19.3	33.5
12/3	8.2	-1.4	-10.8	-18.1	-21.7	-21.1	-16.3	-8.2	1.4	10.8	18.1	21.7	21.1	16.3
12/4	-68.2	-70.1	-58.2	-34.7	-4.3	26.9	52.8	68.2	70.1	58.2	34.7	4.3	-26.9	-52.7
12/5	-35.5	-26.3	-11.9	4.8	20.6	32.3	37.6	35.5	26.3	11.9	-4.8	-20.6	-32.3	-37.6
12/6	7.2	12.1	14.7	14.3	11.0	5.6	-0.9	-7.2	-12.1	-14.7	-14.3	-11.0	-5.6	0.9
12/7	23.2	26.4	24.3	17.5	7.2	-4.5	-15.4	-23.2	-26.4	-24.3	-17.5	-7.2	4.5	15.4
12/8	17.7	30.5	37.2	36.6	28.8	15.2	-1.4	-17.7	-30.5	-37.2	-36.6	-28.8	-15.2	1.3
12/9	14.0	10.6	5.1	-1.4	-7.6	-12.3	-14.6	-14.0	-10.6	-5.1	1.4	7.6	12.3	14.6
12/10	-22.0	-31.6	-35.0	-31.4	-21.5	-7.5	8.1	22.0	31.6	35.0	31.4	21.5	7.5	-8.1
12/11	-12.8	-15.8	-15.8	-12.6	-6.9	0.1	7.2	12.8	15.8	15.8	12.6	6.9	-0.1	-7.2
12/12	4.3	7.1	8.5	8.2	6.3	3.1	-0.7	-4.3	-7.1	-8.5	-8.2	-6.3	-3.1	0.7
12/13	1.6	7.1	11.2	13.1	12.4	9.3	4.3	-1.6	-7.1	-11.2	-13.1	-12.4	-9.3	-4.3
12/14	2.5	9.6	14.8	17.0	15.9	11.7	5.1	-2.5	-9.6	-14.8	-17.0	-15.9	-11.7	-5.1
12/15	17.1	13.3	6.8	-0.9	-8.5	-14.4	-17.5	-17.1	-13.3	-6.8	0.9	8.5	14.4	17.5
12/16	-7.6	-14.5	-18.5	-18.9	-15.5	-9.0	-0.8	7.6	14.5	18.5	18.9	15.5	9.0	0.8
12/17	-35.0	-40.7	-38.2	-28.2	-12.6	5.5	22.5	35.0	40.7	38.2	28.2	12.6	-5.5	-22.5
12/18	-0.3	-3.4	-5.9	-7.1	-7.0	-5.5	-2.9	0.3	3.4	5.9	7.1	7.0	5.5	2.9
12/19	-8.5	-2.1	4.8	10.7	14.5	15.4	13.3	8.5	2.1	-4.8	-10.7	-14.5	-15.4	-13.3
12/20	7.2	26.7	40.9	46.9	43.7	31.8	13.6	-7.2	-26.7	-40.9	-46.9	-43.7	-31.8	-13.7
12/21	55.0	48.2	31.8	9.1	-15.4	-36.8	-51.0	-55.0	-48.2	-31.8	-9.1	15.4	36.8	51.0
12/22	22.3	2.5	-17.7	-34.5	-44.4	-45.5	-37.6	-22.3	-2.5	17.7	34.5	44.4	45.5	37.6
12/23	-3.2	-4.7	-5.3	-4.9	-3.5	-1.4	1.0	3.2	4.7	5.3	4.9	3.5	1.4	-1.0
12/24	-42.9	-37.5	-24.7	-7.0	12.1	28.8	39.8	42.9	37.5	24.7	7.0	-12.1	-28.8	-39.8
12/25	-33.3	-24.5	-10.9	4.9	19.7	30.7	35.5	33.3	24.5	10.9	-4.9	-19.7	-30.7	-35.5
12/26	20.8	31.0	35.1	32.2	23.0	9.2	-6.4	-20.8	-31.0	-35.1	-32.3	-23.0	-9.2	6.4
12/27	32.0	27.6	17.7	4.2	-10.0	-22.3	-30.1	-32.0	-27.6	-17.7	-4.2	10.0	22.3	30.1
12/28	13.6	-0.5	-14.6	-25.7	-31.7	-31.5	-25.0	-13.6	0.5	14.6	25.7	31.7	31.5	25.0
12/29	-31.3	-34.8	-31.4	-21.9	-7.9	7.5	21.5	31.3	34.8	31.4	21.9	7.9	-7.5	-21.5
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