Integrating data and analysis On bridging data publishers and computational environments

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	Search Data.Gov	Q
ĐATA.GOV	DATA TOPICS - IMPACT APPLICATIONS DEVELOPERS CO	NTACT
LIMATE – DATA CATA	ALOG ALOG Organizations ?	
Themes - Data Resourc	es Challenges FAQ Contact Climate	
Search datasets Datasets ordered by Popular	Q Order by: Popular	×
Topics: Climate X		
Filter by location Clear Enter location	481 datasets found U.S. Hourly Precipitation Data ≥ 1512 recent views National Oceanic and Atmospheric Administration, Department of Commerce – Hourly Precipitation Data (HPD) is digital data set DSI-3240, archived at the National Climatic Data Center (NCDC). The primary source of data for this file is HTML HTML HTML HTML EMPREST KM2 11 more in dataset Fruit and Vegetable Prices ≥ 725 recent views Department of Agriculture – How much do fruits and vegetables cost? ERS estimated average prices for	
Map tiles & Data by <u>OpenStreetMap</u> under <u>CC BY SA</u>	153 commonly consumed fresh and processed fruits and vegetables.	
Topics Clear All Climate (481)	American FactFinder II 2712 recent views Department of Commerce – American FactFinder is the Census Bureau's online, self-service tool	210-31
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Disasters (19) AAPI (13)	National Oceanic and Atmospheric Administration, Department of Commerce – Storm Data is provided by the National Weather Service (NWS) and contain statistics on personal injuries and damage estimates. Storm Data covers the United States of	Neral .
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Show More Topics	estimates. Storm Data cove					

Catalogs were a great first step but ...

	Search Data.Gov
DATA.GOV DATA TOPICS	- IMPACT APPLICATIONS DEVELOPERS CONTACT
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Index of /pub/data/swdi/stormevents/csvfiles/

[parent directory]

Name	Size	Date Modified
legacy/		5/14/14, 2:00:00 AM
README	2.0 kB	5/14/14, 2:00:00 AM
Storm-Data-Export-Format.docx	23.3 kB	5/6/14, 2:00:00 AM
StormEvents_details-ftp_v1.0_d1950_c20170120.csv.gz	10.3 kB	1/20/17, 1:00:00 AM
StormEvents_details-ftp_v1.0_d1951_c20160223.csv.gz	11.7 kB	2/24/16, 1:00:00 AM
StormEvents_details-ftp_v1.0_d1952_c20170619.csv.gz	12.3 kB	6/19/17, 2:00:00 AM
StormEvents_details-ftp_v1.0_d1953_c20160223.csv.gz	21.3 kB	2/24/16, 1:00:00 AM
StormEvents_details-ftp_v1.0_d1954_c20160223.csv.gz	25.6 kB	2/24/16, 1:00:00 AM

We can do better ...

Neon Data

Ansicht

Zeilenumbruch

📰 📰 Verbinden und zentrieren 👻

NEON.D03.JERC.DP1.00003.001.000.060.030.TAAT_30min.2018-07.expanded.20180813T145532Z

Standard

9 * % 000

Zahl

€,0 ,00 0,0 €,00

Formatierung

Als Tabelle Zelle

Formatvorlagen

formatieren

Curl

curl -X GET --header 'Accept: application/json' 'http://data.neonscience.org/api/v0/data/DP1.00003.001/J ERC/2018-07'

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Einfügen

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3

Zwischenablage 🗔

Datei

Request URL

http://data.neonscience.org/api/v0/data/DP1.0000

Response Body

A1 fx startDateTime startDateTim endDateTim tempTripleN tempTripleN tempTripleV tempTripleN tempTripleE tempTripleE tempTripleS rangeFailQM rangePassQN rangeNA -Signature=+9da1/9+bed315a963d1/211b9d29dba23a+ 2 2018-07-01T(2018-07-01T(23.8256 23.7252 23.91 0.0018 1800 0.0137 0.001 0 100 ł, 2018-07-01T(2018-07-01T(23,7421 23.3832 23.899 0.0182 1800 0.0212 0.0032 0 100 2018-07-01T(2018-07-01T(23.2335 23.1541 23.4653 0.0067 1800 0.02 0.0019 0 100 5 2018-07-01T(2018-07-01T(23.0989 23.1689 23.2118 0.0004 1800 0.0193 0.0005 0 100 "crc32": "f14d3818cdf8e83b675038d654e70l 6 2018-07-01T(2018-07-01T(23.1448 23.07 23.2102 0.0011 1800 0.0136 0.0008 0 100

Seitenlavout

- 11

Schriftart

Formeln

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Daten

Überprüfen

Ausrichtung

200

"name": "NEON.D03.JERC.DP1.00003.001.000.060.030.TAAT 30min.2018-07.expanded.20180813145532

Z.csv",

},

"size": "485127",

"url": "https://neon-prod-pub-1.s3.data.neonscience.org/NEON.DOM.SITE.DP1, .001/PROV/JER 7.expanded.20180813T145532Z.csv?X-Amz-Algorithm=AWS4-HMAC-SHA256&X-Amz-Date=20.80919T161158Z&X-Amz-Si gnedHeaders=host&X-Amz-Expires=3600&X-Amz-Credential=pub-internal-read%2F20180919%2Fus-west-2%2Fs3%2F aws4 request&X-Amz-Signature=1558e7fb29fc42aeba66ebd39d097f34c88932598d1f33575cd3b7f645363daf"

"crc32": "6c3ae69817dc5d9848971fe2bb020940",

Parameter(s):	# Name	Short Name	Unit	Principal Investigator	Method	Comment
	1 🗰 DEPTH, sediment/rock 🔍	Depth	m			Geocode
	2 🗰 Alkenone, unsaturation index UK'37 🔍	UK'37		Müller, Peter J 🔍	Calculated from C37 alkenones (Prahl & Wakeham, 1987) Q	
	3 🏭 Sea surface temperature, annual mean 🔍	SST (1-12)	°C	Müller, Peter J 🔍	Calculated from UK'37 (Prahl et al., 1988) Q	



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Size: 64 data points

Data

Download dataset as tab-delimited text (use the following character encoding: windows-1252: Windows Western •)

202302 10 Depth [m] UK'37 SST (1-12) [°C] 0.03 0.667 18.50 0.08 0.656 18,10 0.13 0.652 18.00 0.18 0.663 18.40 0.23 0.652 18.00 0.28 0.656 18.10 0.33 0.658 18.20 0.38 0.662 18.30 0.43 0.656 18.10 0.48 0.658 18.20 0.53 0.660 18.30 0.58 0.675 18.70 0.63 0.669 18.50 0.68 0.664 18.40 0.73 0.658 18.20 0.78 0.652 18.00 0.83 0.643 17.80 0.88 0.614 16.90 0.93 0.614 16.90 0.98 0.603 16.60 1.03 0.607 16.70 1.08 0.600 16.50 1.13 0.605 16.60

https://doi.org/10.1594/PANGAEA.80968

ms@elephant:"\$ curl -D- -H "Accept: text/tab-separated-values" -L https://doi.org/10.1594/PANGAEA.80968 HTTP/2 302 date: Wed, 19 Sep 2018 15:56:51 GMT content-type: text/html;char<u>set=utf-8</u> content-length: 183 set-cookie: ___fduid=db883aff5ac15916de1657fa2092dea341537372611; expires=Thu, 19-Sep-19 15:56:51 GMT; expires: Wed, 19 Sep 2018 16:13:47 GMT location: https://data.datacite.org/10.1594%2FPANGAEA.80968 vary: Accept expect-ct: max-age=604800, report-uri="https://report-uri.cloudflare.com/c<u>dn-cgi/beacon/expect-ct"</u> server: cloudflare cf-ray: 45cd3ea6687297b0-FRA HTTP/2 303 date: Wed, 19 Sep 2018 15:56:52 GMT content-type: text/html; charset=utf-8 location: https://doi.pangaea.de/10.1594/PANGAEA.80968 set-cookie: AWSALB=iCe/M/m2+PFFoagavMw8u4RAyEmMAJB2vryZHTWuI3hOSyf16TuWhe0EVDgN1+1rcixPn4Fu9FcSIwo4HhzIV status: 303 See Other cache-control: no-cache vary: Accept-Encoding, Origin x-request-id: c5e08e6a-7d1e-48e3-b7dd-<u>586c580b1192</u> accept: text/tab-separated-values x-runtime: 0,149856 x-powered-by: Phusion Passenger 5.3.4 server: nginx/1.14.0 + Phusion Passenger 5.3.4 HTTP/1.1 200 OK Server: PANGAEA/1.0 Date: Wed, 19 Sep 2018 15:56:52 GMT Transfer-encoding: chunked Vary: Accept Link: <https://doi.org/10.1594/PANGAEA.80968>;rel="cite-as", <https://doi.pangaea.de/10.1594/PANGAEA.80 ://doi.pangaea.de/10.1594/PANGAEA.80968?format=citation_bibtex>:rel="describedby";type="application/x-b Content-disposition: attachment; filename=IOW226660-5_UK37_SST.tab X-robots-tag: noindex,nofollow,noarchive Content-type: text/tab-separated-values;charset=UTF-8 X-ua-compatible: IE=Edge X-content-type-options: nosniff Strict-transport-security: max-age=31536000 /* DATA DESCRIPTION: Mollenhauer, Gesine; Müller, Peter J (2002): UK37 and alkenone sea surface temperatures Citation: In supplement to: Mollenhauer, Gesine; Eglinton, Timothy I; Ohkouchi, Nachiko; Schneider, Ralph tps://doi.org/10.1016/S0016-7037(03)00168-6 Related to: Mollenhauer, Gesine (2002): Organic carbon accumulation in the South Atlantik Ocean: Se Geosciences, University of Bremen (GeoB) (URI: http://www.geo.uni-bremen.de/page.php?la Project(s): LATITUDE: -24.108000 * LONGITUDE: 12.765000 Coverage: DATE/TIME START: 2000-08-08T00:00:00 * DATE/TIME END: 2000-08-08T00:00:00 MINIMUM DEPTH, sediment/rock: 0.03 m * MAXIMUM DEPTH, sediment/rock: 1.58 m IOW226660-5 (M48/2_359) * LATITUDE: -24.108000 * LONGITUDE: 12.765000 * DATE/TIME: 2000-Event(s): Event(s): IDE2coder's (Harr__333) Enriced. Enriced. Enriced Enric Sea surface temperature, annual mean [°C] (SST (1-12)) * PI: Müller, Peter J * METHOD: Calculat Creative Commons Attribution 3.0 Unported (CC-BY) icense: Size: 64 data points Depth [m] UK'37 SST (1-12) [°C] 0,667 18,50 .03 0,656 0,652 0,663 0.08 0.13 0.18 0.23 0.28 0.33 0.38 18,10 18.00 18.40 0.652 18.00 0,656 18.10 0.658 18,20 0.66218.30 0.656 18.10

curl -D- -H

"Accept: text/tab-separated-values" -L https://doi.org/10.1594/PANGAEA.80968

	Depth	[m]	UK'37	SST	(1-12)	[°C]
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). /	0.08	0.656	18,10			
	0.13	0,652	18.00			
/	0,18	0.663	18,40			
/	0.23	0.652	18,00			
	0.28	0.656	18,10			
	0.33	0.658	18,20			
	0.38	0.662	18,30			
	0.43	0.656	18,10			
	0.48	0.658	18,20			

• DOI based access is great, should perhaps be LCD: Why?

- DOI based access is great, should perhaps be LCD: Why?
- In practice, we struggle with large differences in data access
- Is there a good reason for this heterogeneity?

- DOI based access is great, should perhaps be LCD: Why?
- In practice, we struggle with large differences in data access
- Is there a good reason for this heterogeneity?
- APIs are great, but data are delivered to local hard drive as files
- What we really want is ...

... data loaded into a computational environment

http://data.neonscience.org/api/v0/data/DP1.00003.001/JERC/2018-07

https://doi.org/10.1594/PANGAEA.80968



Approaches





getPackage() can be used to pull a single zip file (all the data for a single data product by site by month combination) using the NEON API.

Plant phenology observations from the Jornada LTER site, May 2017
getPackage(dpID = "DP1.10055.001", site_code = "JORN", year_month = "2017-05", package = "basic")

https://github.com/NEONScience/NEON-utilities/tree/master/neonUtilities





Still, data are not immediately processable

getPackage() can be used to pull a single zip file (all the data for a single data product by site by month combination) using the NEON API.

Plant phenology observations from the Jornada LTER site, May 2017
getPackage(dpID = "DP1.10055.001", site_code = "JORN", year_month = "2017-05", package = "basic")

https://github.com/NEONScience/NEON-utilities/tree/master/neonUtilities

> 1	ibrary(panga	aear)		
> d	<- pg_data(("10.1594	A/PANGAEA.80	968")
Dow	nloading 1 d	datasets	from 10.159	4/PANGAEA.80968
Рго	cessing 1 fi	lles		
> d	[[1]]\$data			
# A	tibble: 32	х З		
	`Depth [m]`	`UK'37`	`SST (1-12)	[°C]`
	<dbl></dbl>	<dbl></dbl>		<dbl></dbl>
1	0.03	0.667		18.5
2	0.08	0.656		18.1
3	0.13	0.652		18
4	0.18	0.663		18.4
5	0.23	0.652		18
6	0.28	0.656		18.1
7	0.33	0.658		18.2
8	0.38	0.662		18.3
9	0.43	0.656		18.1
10	0.48	0.658		18.2
# .	with 22 r	nore rows	5	





https://tibhannover.github.io/2018-07-09-FAIR-Data-and-Software/FAIR-remix-PANGAEA/

from pandata.pandataset import PanDataSet

ds = PanDataSet('10.1594/PANGAEA.80968')

ds.data[["Depth", "UK'37", "SST (1-12)"]]

	Depth	UK'37	SST (1-12)
0	0.03	0.667	18.5
1	0.08	0.656	18.1
2	0.13	0.652	18.0
3	0.18	0.663	18.4
4	0.23	0.652	18.0
5	0.28	0.656	18.1
6	0.33	0.658	18.2
7	0.38	0.662	18.3
8	0.43	0.656	18.1
9	0.48	0.658	18. <mark>2</mark>
10	0.53	0.660	18.3





https://github.com/huberrob/panpython/

Easy for CSV/TSV but ...

@prefix dul: <http://www.ontologydesignpatterns.org/ont/dul/DUL.owl#> . @prefix geosparql: <http://www.opengis.net/ont/geospargl#> . @prefix gn: <http://www.geonames.org/ontology#> . @prefix lode: <http://linkedevents.org/ontology/> . @prefix rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#> . @prefix rdfs: <http://www.w3.org/2000/01/rdf-schema#> . @prefix sf: <http://www.opengis.net/ont/sf#> . @prefix smear: <http://avaa.tdata.fi/web/smart/smear/> . @prefix time: <http://www.w3.org/2006/time#> . @prefix was84: <http://www.w3.ora/2003/01/aeo/was84 pos#> . @prefix xml: <http://www.w3.org/XML/1998/namespace> . @prefix xsd: <http://www.w3.org/2001/XMLSchema#> . <http://avaa.tdata.fi/web/smart/smear/2c3514176ca67a77a99292cbb4b6a3ae> a lode:Event ; smear:hasClassification smear:ClassIa : lode:atPlace <http://sws.geonames.org/656888/> : lode:atTime <http://avaa.tdata.fi/web/smart/smear/0cf796b1a1b4fb5563a52fb2b5ec6093> ; lode:inSpace <http://avaa.tdata.fi/web/smart/smear/7f885190eb43154e01c97f814b287a4b> . <http://avaa.tdata.fi/web/smart/smear/0cf796b1a1b4fb5563a52fb2b5ec6093> a time:Interval ; time:hasBeginning smear:f72d5d2e62f9747161bb9fd127a64590 ; time:hasEnd smear:ffade79921356c06cbdcf1c1c8fdb4dc . <http://avaa.tdata.fi/web/smart/smear/7f885190eb43154e01c97f814b287a4b> a sf:Point, wgs84:SpatialThing ; geospargl:asWKT "POINT (24.29077 61.84562)"^^geospargl:wktLiteral . smear:ClassIa a smear:Classification : rdfs:label "Class Ia"^^xsd:string : rdfs:comment "Very clear and strong event"^^xsd:string . smear:f72d5d2e62f9747161bb9fd127a64590 a time:Instant : time:inXSDDateTime "2013-04-04T10:30:00+03:00"^^xsd:dateTime . smear:ffade79921356c06cbdcf1c1c8fdb4dc a time:Instant : time:inXSDDateTime "2013-04-04T12:00:00+03:00"^^xsd:dateTime . <http://sws.geonames.org/656888/> a gn:Feature, dul:Place : an:countrvCode "FI"^^xsd:string : qn:locationMap <http://www.geonames.org/656888/hyytiaelae.html> ; qn:name "Hvytiälä"^^xsd:string ; wqs84:lat 6.184562e+01 : wqs84:long 2.429077e+01 .



	<pre>dul: <http: dul="" dul.owl#="" ont="" www.ontologydesignpatterns.org=""> geosparql: <http: geosparql#="" ont="" www.opengis.net=""> .</http:></http:></pre>	×
	gn: <http: ontology#="" www.geonames.org=""> .</http:>	
(prefix	<pre>lode: <http: linkedevents.org="" ontology=""></http:> .</pre>	
Oprefix	rdf: <http: 02="" 1999="" 22-rdf-syntax-ns#="" www.w3.org=""> .</http:>	
Oprefix	rdfs: <http: 01="" 2000="" rdf-schema#="" www.w3.org=""> .</http:>	
Oprefix	sf: <http: ont="" sf#="" www.opengis.net=""> .</http:>	
@prefix	smear: <http: avaa.tdata.fi="" smart="" smear="" web=""></http:> .	
@prefix	time: <http: 2006="" time#="" www.w3.org=""> .</http:>	
@prefix	wgs84: <http: 01="" 2003="" geo="" wgs84_pos#="" www.w3.org=""> .</http:>	
@prefix	xml: <http: 1998="" namespace="" www.w3.org="" xml=""> .</http:>	
Oprefix	xsd: <http: 2001="" www.w3.org="" xmlschema#=""> .</http:>	

<http://avaa.tdata.fi/web/smart/smcar/2c3E14176ca67a77a99292cbb4b6a3ae> a lode:Event ;
 smear:hasClassification smear:ClassIa ;
 lode:atPlace <http://sws.geonamcs.org/656888/> ;
 lode:atTime <http://avaa.tdata.fi/web/smart/smear/0cf796b1a1b4fb5563a52fb2b5ec6093> ;
 lode:inSpace <http://avaa.tdata.fi/web/smart/smear/7f885190eb43154e01c97f814b287a4b> .

<pre><http: 0cf796b1a="" avaa.tdata.fi="" pre="" smart="" smear="" smear:f72d5d2e62f9747161b<="" time:hasbeginning="" web=""></http:></pre>		beginning	end	classification	place	latitude	longitude
<pre>time:hasEnd smear:ffade79921356c06cbdcf1c1c <http: 7f885190e<="" avaa.tdata.fi="" pre="" smart="" smear="" web=""></http:></pre>	0	2007-05-18 12:30:00+03:00	2007-05-18 14:00:00+03:00	Class la	Hyytiälä	61.8456	24.2908
wgs84:SpatialThing ; geosparql:asWKT "POINT (24.29077 61.84562)"	4	2011-04-19 09:00:00+03:00	2011-04-19 14:00:00+03:00	Class la	Hyytiälä	61.8456	24.2908
<pre>smear:ClassIa a smear:Classification ; rdfs:label "Class Ia"^^xsd:string ;</pre>	2	2013-04-04 10:00:00+03:00	2013-04-04 12:00:00+03:00	Class la	Hyytiälä	61.8456	24.2908
rdfs:comment "Very clear and strong event"	AXSI	d:string .					





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 - Data Syntax (CSV, XML, RDF, just to name a few)
 - Exchange Protocols (HTTP but it is more complicated)
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 - Data Syntax (CSV, XML, RDF, just to name a few)
 - Exchange Protocols (HTTP but it is more complicated)
 - Programming Language (there are plenty)
- Developing libraries that cover these dimensions is expensive
- Is there an alternative?