

Ocean Observations: Data Storage and Transfer

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Fourth Data Buoy Cooperation Panel (DBCP) Pacific Islands Training Workshop
on Ocean Observations and Data Applications (DBCP-PI-4)
September 13-16, 2019

Got Telemetry?

got telemetry?

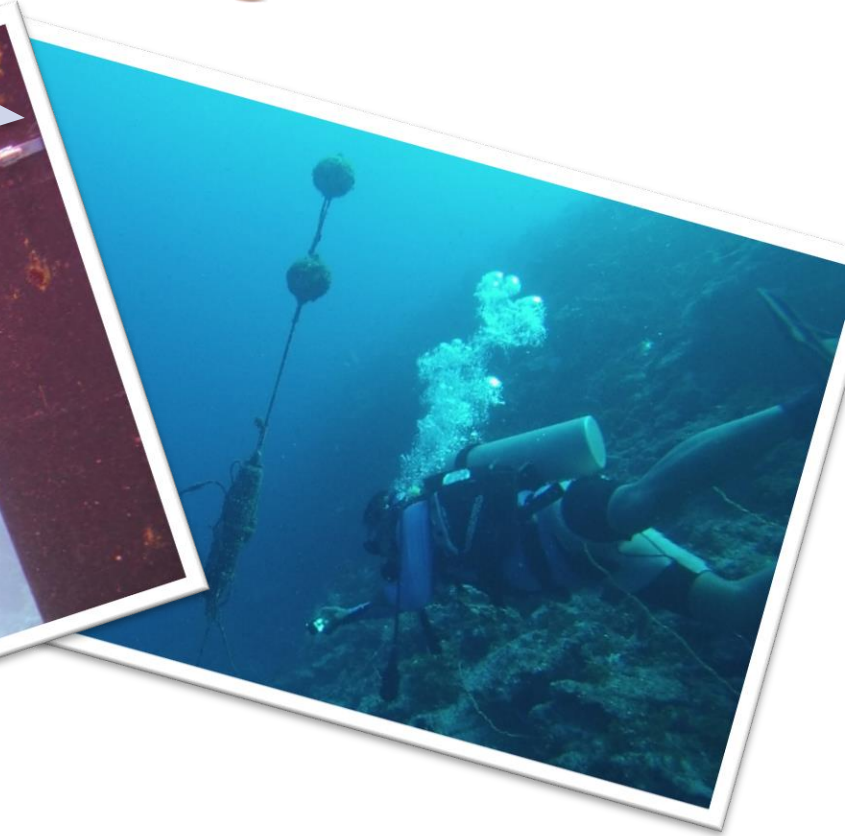
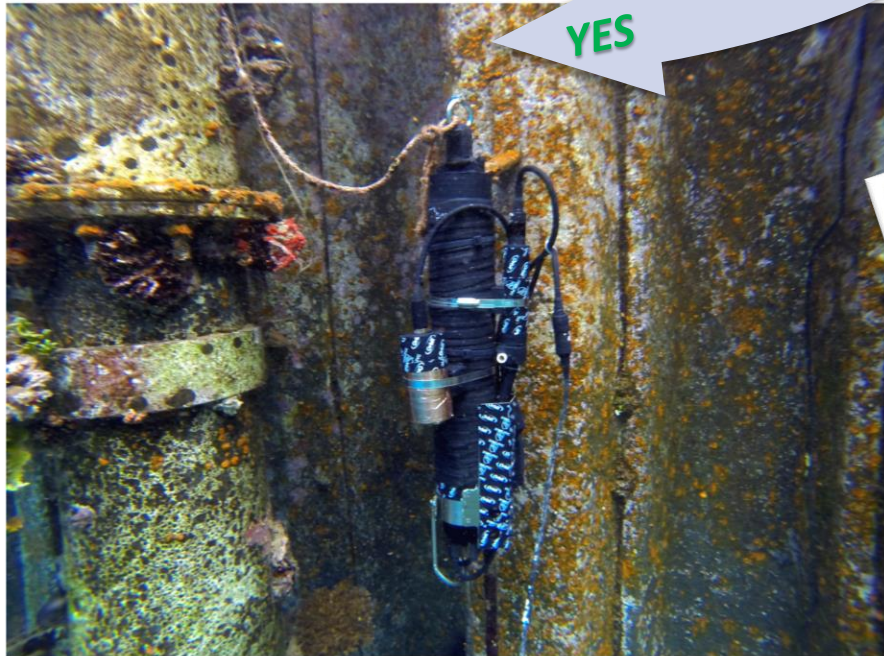


 **Near Real-Time (NRT)**

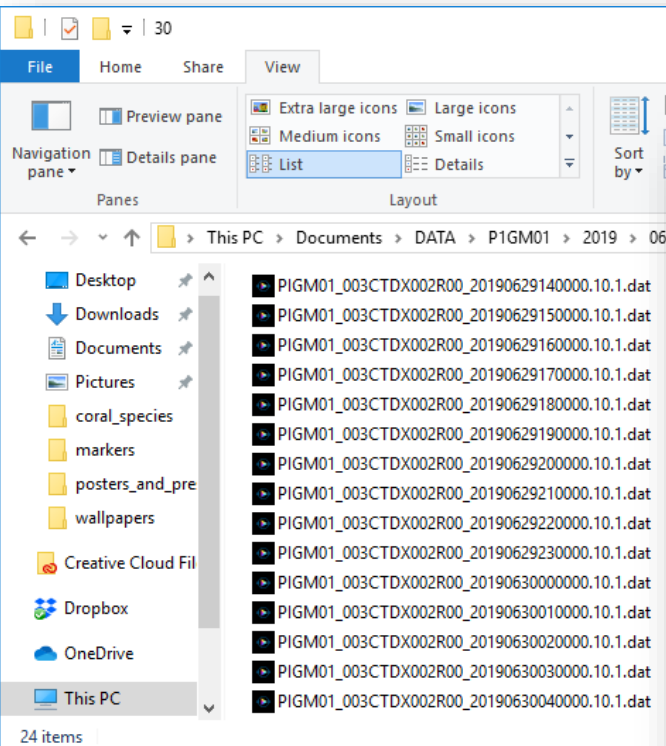
Delayed Mode 

YES

NO




Raw Files

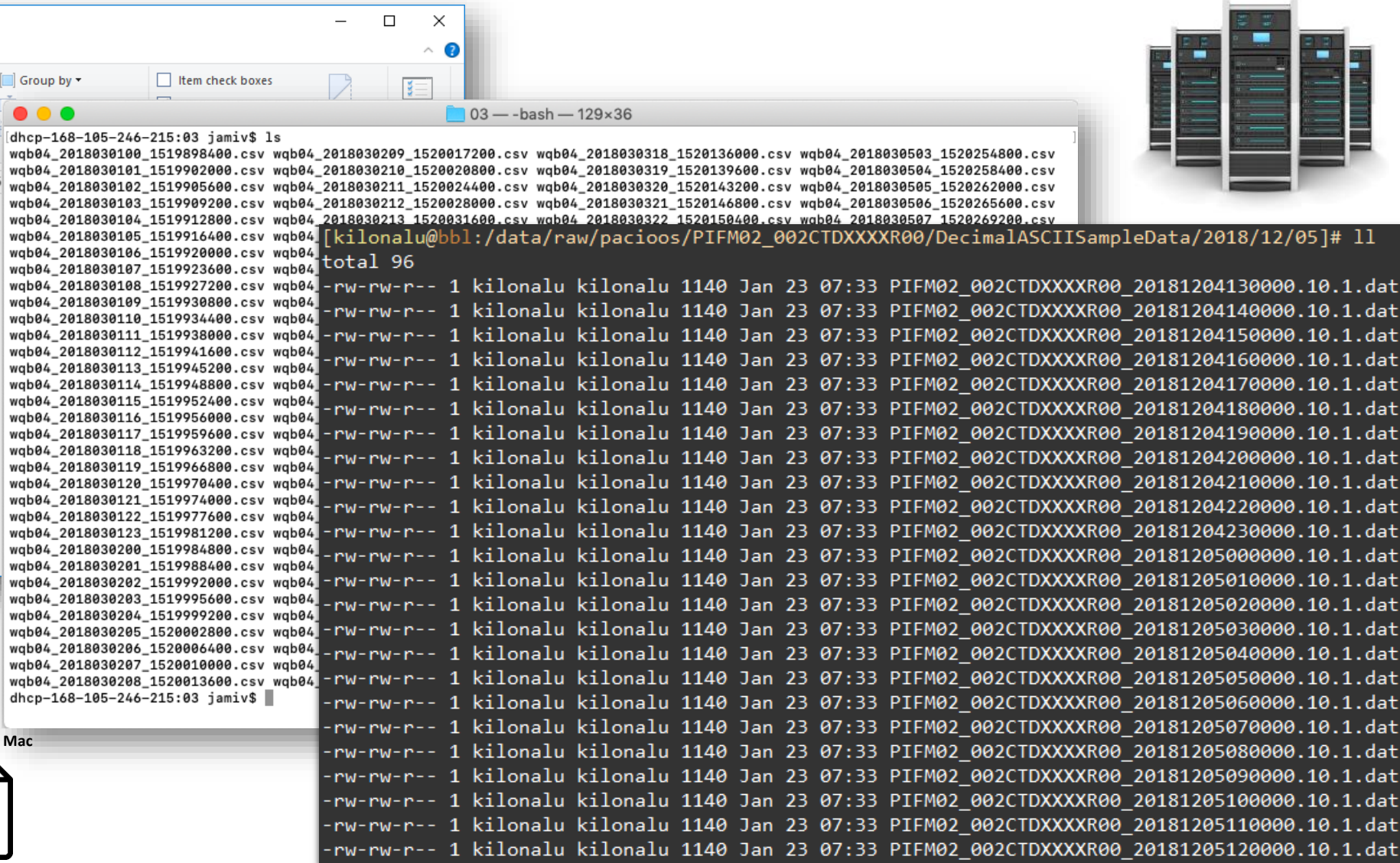


Windows

Example file suffixes:



Mac



Linux

Raw Files: PacIOOS Nearshore Sensor Example

```
SBE16plus_01605268_2017_05_03_jm.txt - Notepad
File Edit Format View Help
* Sea-Bird SBE16plus Data File:
* FileName = C:\Documents and Settings\Jeff Sevadjian\Desktop\gordon\PacIOOS\NS02\20170503\SBE16plus_01605268_2017_05_03.hex
* Software version 1.1f
* Temperature SN = 5268
* Conductivity SN = 5268
* System Upload Time = May 03 2017 20:32:18
* <ApplicationData>
* <Seaterm232>
* <SoftwareVersion>1.1f</SoftwareVersion>
* <BuildDate>27-Apr-2011</BuildDate>
* </Seaterm232>
* </ApplicationData>
* <InstrumentState>
* <HardwareData DeviceType='SBE16plus' SerialNumber='01605268'>
*   <Manufacturer>Sea-Bird Electronics, Inc.</Manufacturer>
*   <FirmwareVersion>2.5.2</FirmwareVersion>
*   <FirmwareDate>12 Mar 2013 11:50</FirmwareDate>
*   <CommandSetVersion>2.3</CommandSetVersion>
*   <PCBAsembly PCBSerialNum='not assigned' AssemblyNum='41054F'>
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*   <PCBAsembly PCBSerialNum='not assigned' AssemblyNum='41056F'>
*   <PCBAsembly PCBSerialNum='not assigned' AssemblyNum='not assigned'>
*   <MfgDate>31 march 2008</MfgDate>
*   <InternalSensors>
*     <Sensor id='Main Temperature'>
*       <type>temperature0</type>
*       <SerialNumber>01605268</SerialNumber>
*     </Sensor>
*     <Sensor id='Main Conductivity'>
*       <type>conductivity-0</type>
*       <SerialNumber>01605268</SerialNumber>
*     </Sensor>
*     <Sensor id='Main Pressure'>
*       <type>none</type>
*       <SerialNumber>not assigned</SerialNumber>
*     </Sensor>
*   </InternalSensors>
* </HardwareData>
* </InstrumentState>
* </ApplicationData>
* </Seaterm232>
* </ApplicationData>
```

**XML
information**

.hex file



↓
KEEP
CALM
AND
SCROLL
DOWN

Raw Files: PacIOOS Nearshore Sensor Example



```
SBE16plus_01605268_2017_05_03_jm.txt - Notepad
File Edit Format View Help
* Sea-Bird SBE16plus Data File:
* FileName = C:\Documents and Settings\Jeff Sevadjian\Desktop\gordon\PacIOOS\NS02\20170503\SBE16plus_01605268_2017_05_03.hex
* Software version 1.1f
* Temperature SN = 5268
* Conductivity SN = 5268
* System Upload Time = May 03 2017 20:32:18
* <ApplicationData>
* <Seaterm232>
* <SoftwareVersion>1.1f</SoftwareVersion>
* <BuildDate>27-Apr-2011</BuildDate>
* </Seaterm232>
* </ApplicationData>
* <InstrumentState>
* <HardwareData DeviceType='SBE16plus' SerialNumber='0
* <Manufacturer>Sea-Bird Electronics, Inc.</Manufac
* <FirmwareVersion>2.5.2</FirmwareVersion>
* <FirmwareDate>12 Mar 2013 11:50</FirmwareDate>
* <CommandSetVersion>2.3</CommandSetVersion>
* <PCBAsembly PCBSerialNum='not assigned' Assembly
* <PCBAsembly PCBSerialNum='not assigned' Assembly
* <PCBAsembly PCBSerialNum='not assigned' Assembly
* <PCBAsembly PCBSerialNum='not assigned' Assembly
* <MfgDate>31 march 2008</MfgDate>
* <InternalSensors>
* <Sensor id='Main Temperature'>
* <type>temperature0</type>
* <SerialNumber>01605268</SerialNumber>
* </Sensor>
* <Sensor id='Main Conductivity'>
* <type>conductivity-0</type>
* <SerialNumber>01605268</SerialNumber>
* </Sensor>
* <Sensor id='Main Pressure'>
* <type>none</type>
* <SerialNumber>not assigned</SerialNumber>
* </Sensor>
* </InternalSensors>
```

```
SBE16plus_01605268_2017_05_03_jm.txt - Notepad
File Edit Format View Help
03A01109CDAB04A2FD2D1F051535
03872209CDAD03EA0B161F051625
03765C09CDAF0D32178A1F051715
03650A09CDAD1DB143F21F051805
034C2F09CD8F037A04181F0518F5
032E0D09CD43037804171F0519E5
03162709CCDB03E7079C1F051AD5
02FFEB09CC9A03DA07971F051BC5
03409F18AAB01539099C1F051CB5
0340FD1891C50EFC07F61F051DA5
0340E1887A9121008721F051E95
0340DB1892D0104408A41F051F85
0340F6189461152607B71F052075
034077188BFF132E09DD1F052165
034008188DB12DE09AD1F052255
0340201893C3129E096D1F052345
0341DA18A20415D8090E1F052435
034041189516156808C41F052525
033F691891A1138F09E01F052615
033F36189419127007D91F052705
033F6618A2FC12FE08D61F0527F5
033E3E18A4781487098D1F0528E5
033CAF1892B8111308591F0529D5
033EB318AE47140D09001F052AC5
033E9218A2821706098C1F0528B5
03406C18A47B1447097C1F052CA5
033E4918B34C17B50A7F1F052D95
033CB3189D6F14B60A0E1F052E85
033B7A18A0E0119108771F052F75
033BE118A20F14A7092D1F053065
033BED189EE5136E0AEE1F053155
033B8F18A1CA128F08761F053245
033E5118A9A9154809CE1F053335
033C3518A17F12E008781F053425
032F81181EB7139D09101F053515
033C89189B6714C608A61F053605
033C7E18A16F180F097F1F0536F5
```

data in
hexadecimal
format



Raw Files



no header row

#	69.84	8.65	70.270000	347.02	999.000000000	928.17	-999.0	02 Nov 2018 14:00:00
#	69.70	8.63	70.320000	343.69	999.000000000	930.01	-999.0	02 Nov 2018 14:15:00
#	69.75	8.62	69.300000	347.89	999.000000000	929.68	-999.0	02 Nov 2018 14:30:00
#	69.96	8.64	67.410000	355.14	999.000000000	927.60	-999.0	02 Nov 2018 14:45:00
#	69.69	8.60	70.130000	346.78	999.000000000	925.89	-999.0	02 Nov 2018 15:00:00
#	69.39	8.56	68.190000	348.28	999.000000000	925.82	-999.0	02 Nov 2018 15:15:00

header row

#	69.16	8.52	66.350000	348.28	999.000000000	925.82	-999.0	02 Nov 2018 15:15:00
#	69.16	8.52	69.160000	348.28	999.000000000	925.82	-999.0	02 Nov 2018 15:15:00
#	69.01	8.49	65.390000	348.28	999.000000000	925.82	-999.0	02 Nov 2018 15:15:00
#	68.74	8.46	63.560000	348.28	999.000000000	925.82	-999.0	02 Nov 2018 15:15:00
#	68.71	8.46	63.740000	348.28	999.000000000	925.82	-999.0	02 Nov 2018 15:15:00
#	68.59	8.44	67.580000	348.28	999.000000000	925.82	-999.0	02 Nov 2018 15:15:00
#	68.64	8.45	62.970000	348.28	999.000000000	925.82	-999.0	02 Nov 2018 15:15:00
#	68.57	8.44	63.720000	348.28	999.000000000	925.82	-999.0	02 Nov 2018 15:15:00
#	68.24	8.40	66.540000	348.28	999.000000000	925.82	-999.0	02 Nov 2018 15:15:00
#	67.99	8.37	64.500000	348.28	999.000000000	925.82	-999.0	02 Nov 2018 15:15:00
#	68.00	8.37	68.210000	348.28	999.000000000	925.82	-999.0	02 Nov 2018 15:15:00
#	67.79	8.35	66.400000	348.28	999.000000000	925.82	-999.0	02 Nov 2018 15:15:00
#	68.20	8.41	66.690000	348.28	999.000000000	925.82	-999.0	02 Nov 2018 15:15:00
#	68.16	8.40	66.700000	348.28	999.000000000	925.82	-999.0	02 Nov 2018 15:15:00
#	68.40	8.43	62.200000	348.28	999.000000000	925.82	-999.0	02 Nov 2018 15:15:00
#	68.41	8.44	67.420000	348.28	999.000000000	925.82	-999.0	02 Nov 2018 15:15:00
#	68.26	8.42	65.030000	348.28	999.000000000	925.82	-999.0	02 Nov 2018 15:15:00
#	68.29	8.43	65.880000	348.28	999.000000000	925.82	-999.0	02 Nov 2018 15:15:00
#	68.41	8.44	65.020000	348.28	999.000000000	925.82	-999.0	02 Nov 2018 15:15:00
#	68.34	8.44	61.310000	348.28	999.000000000	925.82	-999.0	02 Nov 2018 15:15:00
#	68.17	8.42	65.910000	348.28	999.000000000	925.82	-999.0	02 Nov 2018 15:15:00
#	68.11	8.41	61.820000	348.28	999.000000000	925.82	-999.0	02 Nov 2018 15:15:00
#	68.12	8.41	66.370000	348.28	999.000000000	925.82	-999.0	02 Nov 2018 15:15:00
#	68.10	8.41	64.480000	348.28	999.000000000	925.82	-999.0	02 Nov 2018 15:15:00
#	67.82	8.38	65.970000	348.28	999.000000000	925.82	-999.0	02 Nov 2018 15:15:00

of decimal places varies

observation_time_iso8601,	temp_c,	pressure_mb,	relative_humidity,	rain_rate_in_per_hr,	wind_degrees,	wind_mph,	wind_ten_min_gust_mph
2019-06-23T11:50:00-10:00,	27.4,	1018.4,	79,	0.0000,	139,	13.0,	15.0
2019-06-23T11:55:00-10:00,	27.3,	1018.2,	77,	0.0000,	133,	13.0,	15.0
2019-06-23T12:00:00-10:00,	27.4,	1018.1,	78,	0.0000,	132,	13.0,	15.0
2019-06-23T12:05:00-10:00,	27.5,	1018.2,	79,	0.0000,	141,	13.0,	15.0
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2019-06-23T12:15:00-10:00,	27.5,	1018.2,	77,	0.0000,	143,	13.0,	14.0
2019-06-23T12:20:00-10:00,	27.7,	1018.2,	77,	0.0000,	159,	11.0,	14.0
2019-06-23T12:25:00-10:00,	27.6,	1018.3,	83,	0.0000,	187,	10.0,	14.0
2019-06-23T12:30:00-10:00,	27.6,	1018.3,	83,	0.0000,	181,	10.0,	12.0
2019-06-23T12:35:00-10:00,	27.6,	1018.3,	83,	0.0000,	182,	10.0,	12.0
2019-06-23T12:40:00-10:00,	27.7,	1018.3,	84,	0.0000,	190,	10.0,	11.0
2019-06-23T12:45:00-10:00,	27.6,	1018.2,	83,	0.0000,	197,	10.0,	11.0
2019-06-23T12:50:00-10:00,	27.6,	1018.3,	83,	0.0000,	199,	10.0,	12.0
2019-06-23T12:55:00-10:00,	27.6,	1018.3,	83,	0.0000,	197,	10.0,	12.0
2019-06-23T13:00:00-10:00,	27.6,	1018.1,	84,	0.0000,	188,	10.0,	11.0
2019-06-23T13:05:00-10:00,	27.6,	1018.2,	83,	0.0000,	186,	9.0,	10.0
2019-06-23T13:10:00-10:00,	27.6,	1018.1,	83,	0.0000,	174,	9.0,	10.0
2019-06-23T13:15:00-10:00,	27.6,	1018.0,	82,	0.0000,	174,	9.0,	10.0
2019-06-23T13:20:00-10:00,	27.7,	1018.2,	83,	0.0000,	166,	8.0,	10.0
2019-06-23T13:25:00-10:00,	27.8,	1018.2,	81,	0.0000,	158,	8.0,	9.0
2019-06-23T13:30:00-10:00,	27.8,	1018.2,	82,	0.0000,	155,	8.0,	9.0
2019-06-23T13:40:00-10:00,	27.9,	1018.2,	79,	0.0000,	156,	8.0,	9.0
2019-06-23T13:45:00-10:00,	28.0,	1018.2,	80,	0.0000,	167,	8.0,	9.0
2019-06-23T13:50:00-10:00,	28.0,	1018.3,	81,	0.0000,	159,	8.0,	9.0
2019-06-23T13:55:00-10:00,	28.1,	1018.2,	80,	0.0000,	169,	8.0,	9.0
2019-06-23T14:00:00-10:00,	28.0,	1018.3,	80,	0.0000,	165,	8.0,	9.0
2019-06-23T14:05:00-10:00,	27.9,	1018.3,	79,	0.0000,	160,	8.0,	9.0
2019-06-23T14:10:00-10:00,	27.9,	1018.3,	80,	0.0000,	155,	8.0,	9.0
2019-06-23T14:15:00-10:00,	27.9,	1018.4,	81,	0.0000,	155,	8.0,	9.0
2019-06-23T14:20:00-10:00,	27.9,	1018.5,	81,	0.0000,	163,	7.0,	8.0
2019-06-23T14:25:00-10:00,	28.0,	1018.5,	80,	0.0000,	150,	7.0,	7.0

opening character

tab-separated values (TSV)

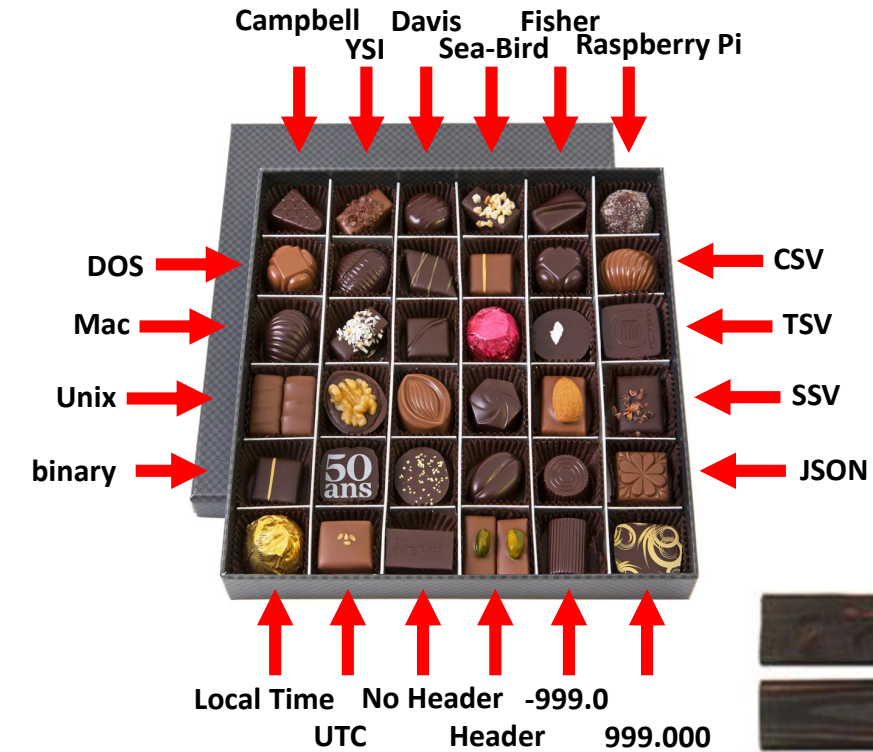
29.2707	5.598730	1.591	-999.0	-999.0	33.9120	23 Apr 2019 11:01:58
29.3072	5.602445	1.580	-999.0	-999.0	33.9115	23 Apr 2019 11:05:58
29.3384	5.605997	1.580	-999.0	-999.0	33.9137	23 Apr 2019 11:09:58
29.3583	5.607673	1.592	-999.0	-999.0	33.9110	23 Apr 2019 11:13:58
29.3824	5.609676	1.572	-999.0	-999.0	33.9076	23 Apr 2019 11:17:58
29.4181	5.613461	1.550	-999.0	-999.0	33.9082	23 Apr 2019 11:21:58
29.4452	5.616712	1.542	-999.0	-999.0	33.9112	23 Apr 2019 11:25:58
29.4597	5.617818	1.552	-999.0	-999.0	33.9085	23 Apr 2019 11:29:58
29.4690	5.618025	1.534	-999.0	-999.0	33.9033	23 Apr 2019 11:33:58
29.4941	5.619391	1.515	-999.0	-999.0	33.8949	23 Apr 2019 11:37:58
29.5042	5.620624	1.522	-999.0	-999.0	33.8962	23 Apr 2019 11:41:58
29.5447	5.623408	1.496	-999.0	-999.0	33.8866	23 Apr 2019 11:45:58
29.5543	5.624664	1.510	-999.0	-999.0	33.8883	23 Apr 2019 11:49:58
29.5658	5.624589	1.499	-999.0	-999.0	33.8798	23 Apr 2019 11:53:58
29.5917	5.627628	1.502	-999.0	-999.0	33.8821	23 Apr 2019 11:57:58

comma-separated values (CSV)

space-separated values (SSV)

datetime string format

Box Of Chocolates



Raw Files



Treat your
docs with
“D.O.C.”

DOCUMENTATION

D

- variables
- units of measure
- missing value
- sampling interval
- time zone
- datetime format
- calibration coefficients?
- sampling location (latitude, longitude, water depth)
- **README** (*good*), self-documenting file (*e.g.*, **NetCDF**) (*better*), and/or metadata (**ISO-19115** or **FGDC**) (*best*)

ORGANIZATION

O

- file duration (*e.g.*, daily, hourly, monthly)
- filename convention
- directory structure

CONSISTENCY

C

- changes to any of the above can impact users and break automated processes
- *e.g.*, column ordering, syntax, missing value, etc.

Box Of Chocolates



Box Of Chocolates



PacIOOS Metadata Viewer

PacIOOS Nearshore Sensor 02 (NS02): Hawaii Yacht Club, Oahu, Hawaii

- Identification Information
- Data Quality Information
- Spatial Representation Information
- Content Information
- Distribution Information
- Metadata Reference Information

Identification Information

Citation:

Citation information:

Title: PacIOOS Nearshore Sensor 02 (NS02) Here

Date: July 29, 2008

Date Type: creation (CI_DateTypeCode)

Identifier:

PacIOOS Nearshore Sensor 02 (NS02): Hawaii Yacht Club, Oahu, Hawaii

id: NS02agg

The nearshore sensors are part of the Pacific Islands Ocean Observing System (PacIOOS) and are designed to measure a variety of ocean parameters at fixed point locations along the south shore of Oahu. NS02 is located at a floating dock off the Hawaii Yacht Club. The instrument is a Sea-Bird Electronics model coupled with a WET Labs ECO-FLINTX combination sensor. The package is fixed to a below the ocean surface.

begin date: July 29, 2008 end date: March 18, 2019

keywords: show

access methods: HTML • Voyager • THREDDS • ERDDAP • OPeNDAP



ERDDAP > tabledap > Make A Graph

Dataset Title: PacIOOS Nearshore Sensor 02 (NS02), Hawaii Yacht Club, Oahu, Hawaii

Location: University of Hawaii (Dataset ID NS02)

Information: Longitude = 157.8428 to 157.8438, Latitude = 21.2641 to 21.2641, depth = 0 to 0.5 m, time = 2008-07-29T00:00:00Z

Graph Type: Line

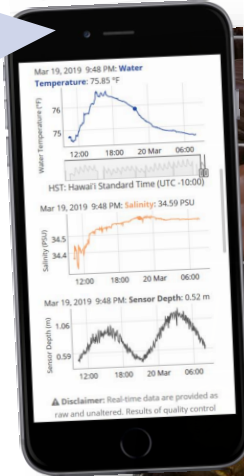
Y Axis: Temperature

Constraints

Server-side Functions

Scan Settings

Redraw the Graph



Web Accessible



- FTP client software free, but users must install (e.g., **SSH**, **PuTTY**, **WinSCP**, **FileZilla**, **CyberDuck**)
- Command-line utility also available for Unix/Mac: **pwd**, **cd**, **lcd**, **ls**, **get**, **bye**
- **mget** (multiple get) command useful for downloading many files at once (e.g., **mget *.dat**)
- can also access through a web browser; example: <ftp://ftp.soest.hawaii.edu>



- a.k.a. web-accessible folder (**WAF**)
- access through web browser
- no special FTP clients or commands needed
- time-consuming to download multiple files (i.e., no “mget” command)—but can be automated via shell script or Python, etc.
- **wget** and **curl** useful Unix command-line utilities for downloading a file at a URL

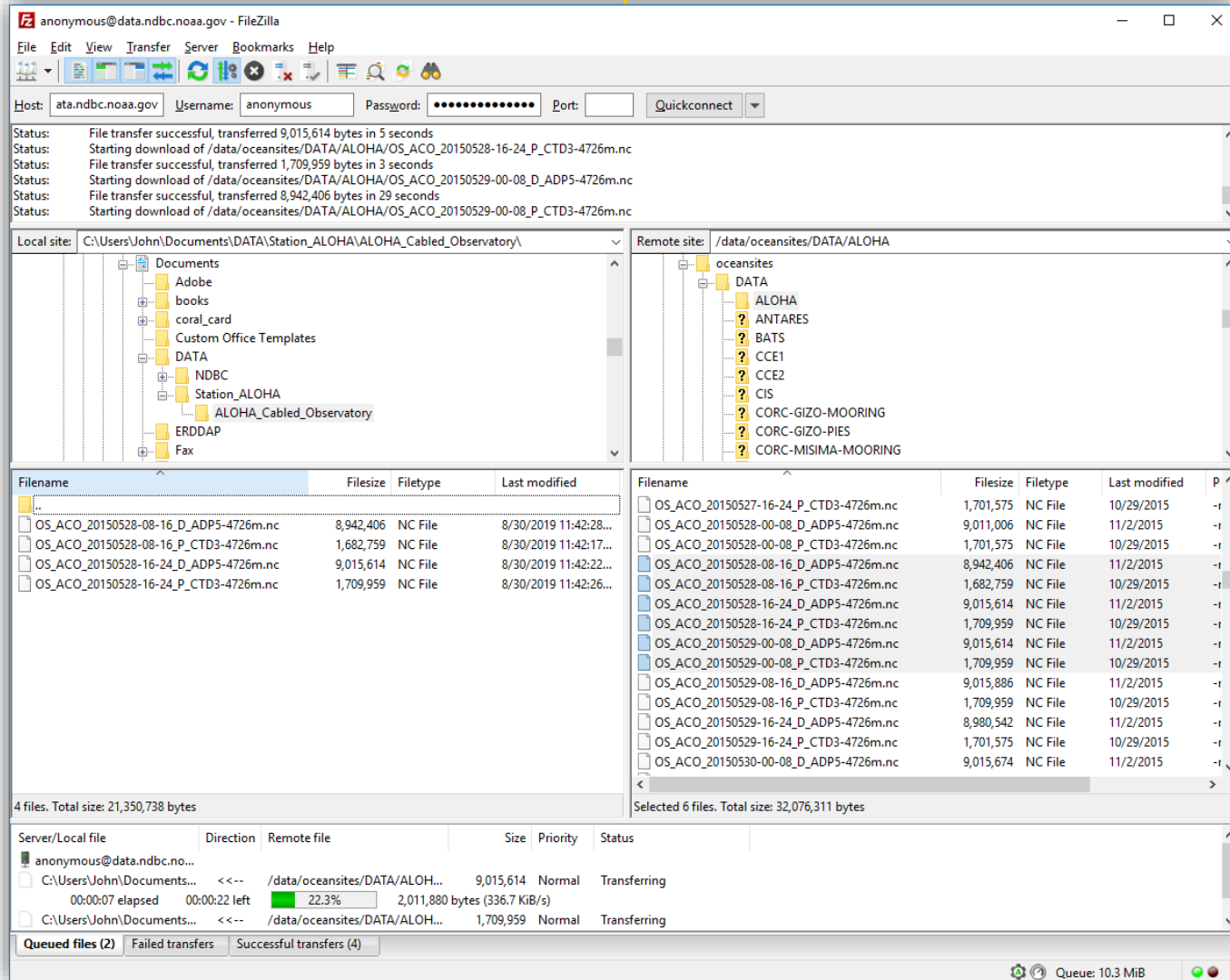


- **NOAA** Environmental Research Division's Data Access Program (ERDDAP)
- aggregates *files* into virtual *datasets*
- subset time/space/variables on-the-fly
- multiple output formats and web services
- rudimentary data visualization (good for QC)
- standardization and interoperability: plug into the global research community!
- **installation and configuration learning curve**

Web Accessible

FTP Client:

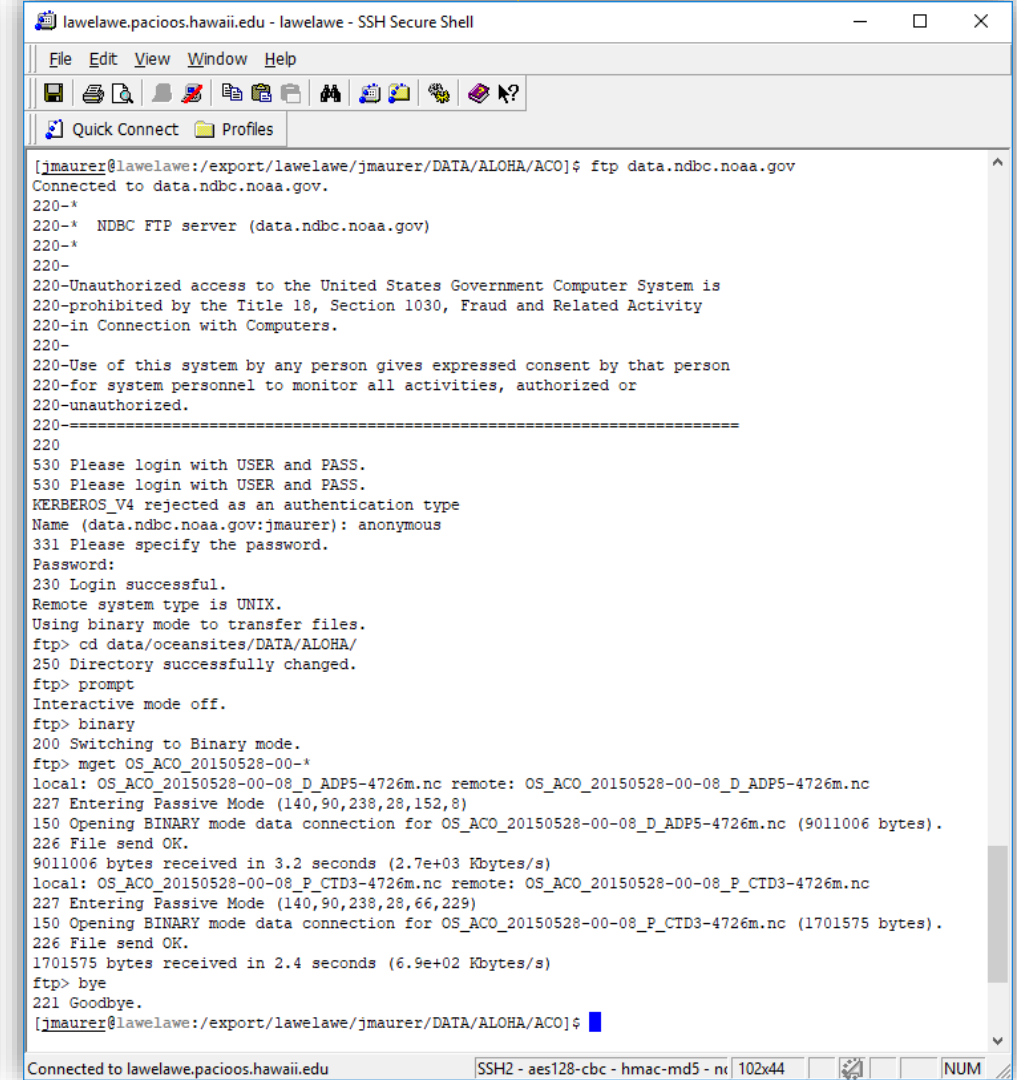
FTP Command-Line:



The screenshot shows the FileZilla FTP client interface. The top toolbar includes File, Edit, View, Transfer, Server, and Bookmarks. The Host is set to data.ndbc.noaa.gov, Username is anonymous, and Password is masked. The Local site is C:\Users\John\Documents\DATA\Station_ALOHA\ALOHA_Cabled_Observatory\ and the Remote site is /data/oceansites/DATA/ALOHA. The interface displays two file lists: Local files and Remote files. The Local files list shows 4 files with a total size of 21,350,738 bytes. The Remote files list shows 6 files with a total size of 32,076,311 bytes. A transfer progress bar at the bottom indicates two files are being transferred.

Filename	Filesize	Filetype	Last modified
OS_ACO_20150528-08-16_D_ADP5-4726m.nc	8,942,406	NC File	8/30/2019 11:42:28...
OS_ACO_20150528-08-16_P_CTD3-4726m.nc	1,682,759	NC File	8/30/2019 11:42:17...
OS_ACO_20150528-16-24_D_ADP5-4726m.nc	9,015,614	NC File	8/30/2019 11:42:22...
OS_ACO_20150528-16-24_P_CTD3-4726m.nc	1,709,959	NC File	8/30/2019 11:42:26...

Filename	Filesize	Filetype	Last modified
OS_ACO_20150527-16-24_P_CTD3-4726m.nc	1,701,575	NC File	10/29/2015
OS_ACO_20150528-00-08_D_ADP5-4726m.nc	9,011,006	NC File	11/2/2015
OS_ACO_20150528-00-08_P_CTD3-4726m.nc	1,701,575	NC File	10/29/2015
OS_ACO_20150528-08-16_D_ADP5-4726m.nc	8,942,406	NC File	11/2/2015
OS_ACO_20150528-08-16_P_CTD3-4726m.nc	1,682,759	NC File	10/29/2015
OS_ACO_20150528-16-24_D_ADP5-4726m.nc	9,015,614	NC File	11/2/2015
OS_ACO_20150528-16-24_P_CTD3-4726m.nc	1,709,959	NC File	10/29/2015
OS_ACO_20150529-00-08_D_ADP5-4726m.nc	9,015,614	NC File	11/2/2015
OS_ACO_20150529-00-08_P_CTD3-4726m.nc	1,709,959	NC File	10/29/2015
OS_ACO_20150529-08-16_D_ADP5-4726m.nc	9,015,886	NC File	11/2/2015
OS_ACO_20150529-16_P_CTD3-4726m.nc	1,709,959	NC File	10/29/2015
OS_ACO_20150529-16-24_D_ADP5-4726m.nc	8,980,542	NC File	11/2/2015
OS_ACO_20150529-16-24_P_CTD3-4726m.nc	1,701,575	NC File	10/29/2015
OS_ACO_20150530-00-08_D_ADP5-4726m.nc	9,015,674	NC File	11/2/2015



The screenshot shows an SSH Secure Shell terminal window. The user is logged in as jmaurer@lawelawe:/export/lawelawe/jmaurer/DATA/ALOHA/ACO. The terminal shows the execution of the ftp command to connect to data.ndbc.noaa.gov. The terminal output includes the FTP server banner, login prompts, directory changes, and file transfer progress.

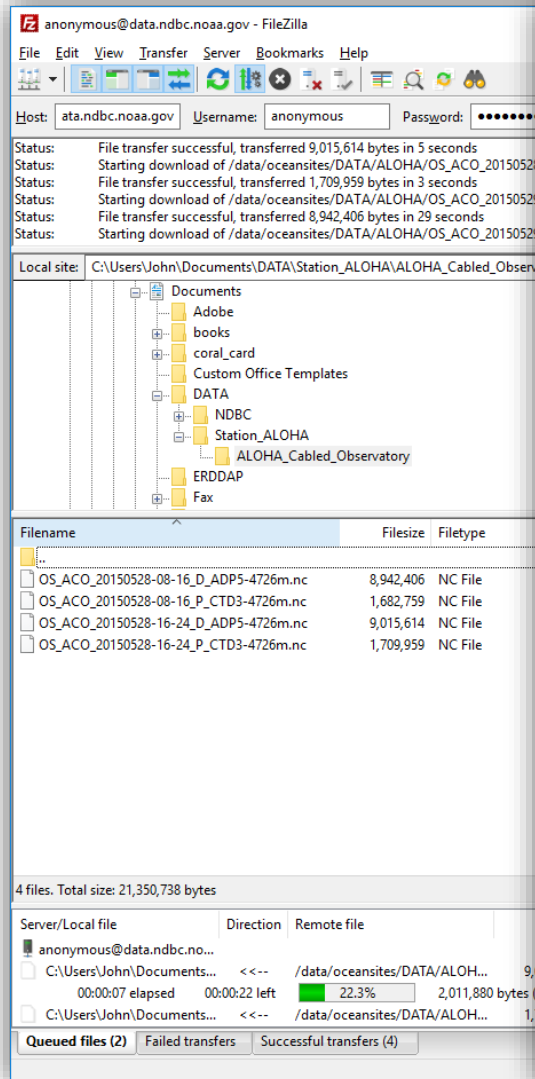
```
[jmaurer@lawelawe:/export/lawelawe/jmaurer/DATA/ALOHA/ACO]$ ftp data.ndbc.noaa.gov
Connected to data.ndbc.noaa.gov.
220-*
220-* NDBC FTP server (data.ndbc.noaa.gov)
220-*
220-
220-Unauthorized access to the United States Government Computer System is
220-prohibited by the Title 18, Section 1030, Fraud and Related Activity
220-in Connection with Computers.
220-
220-Use of this system by any person gives expressed consent by that person
220-for system personnel to monitor all activities, authorized or
220-unauthorized.
220-----
220
530 Please login with USER and PASS.
530 Please login with USER and PASS.
KERBEROS_V4 rejected as an authentication type
Name (data.ndbc.noaa.gov:jmaurer): anonymous
331 Please specify the password.
Password:
230 Login successful.
Remote system type is UNIX.
Using binary mode to transfer files.
ftp> cd data/oceansites/DATA/ALOHA/
250 Directory successfully changed.
ftp> prompt
Interactive mode off.
ftp> binary
200 Switching to Binary mode.
ftp> mget OS_ACO_20150528-00-
local: OS_ACO_20150528-00-08_D_ADP5-4726m.nc remote: OS_ACO_20150528-00-08_D_ADP5-4726m.nc
227 Entering Passive Mode (140,90,238,28,152,8)
150 Opening BINARY mode data connection for OS_ACO_20150528-00-08_D_ADP5-4726m.nc (9011006 bytes).
226 File send OK.
9011006 bytes received in 3.2 seconds (2.7e+03 Kbytes/s)
local: OS_ACO_20150528-00-08_P_CTD3-4726m.nc remote: OS_ACO_20150528-00-08_P_CTD3-4726m.nc
227 Entering Passive Mode (140,90,238,28,66,229)
150 Opening BINARY mode data connection for OS_ACO_20150528-00-08_P_CTD3-4726m.nc (1701575 bytes).
226 File send OK.
1701575 bytes received in 2.4 seconds (6.9e+02 Kbytes/s)
ftp> bye
221 Goodbye.
[jmaurer@lawelawe:/export/lawelawe/jmaurer/DATA/ALOHA/ACO]$
```

Web Accessible

FTP Client:

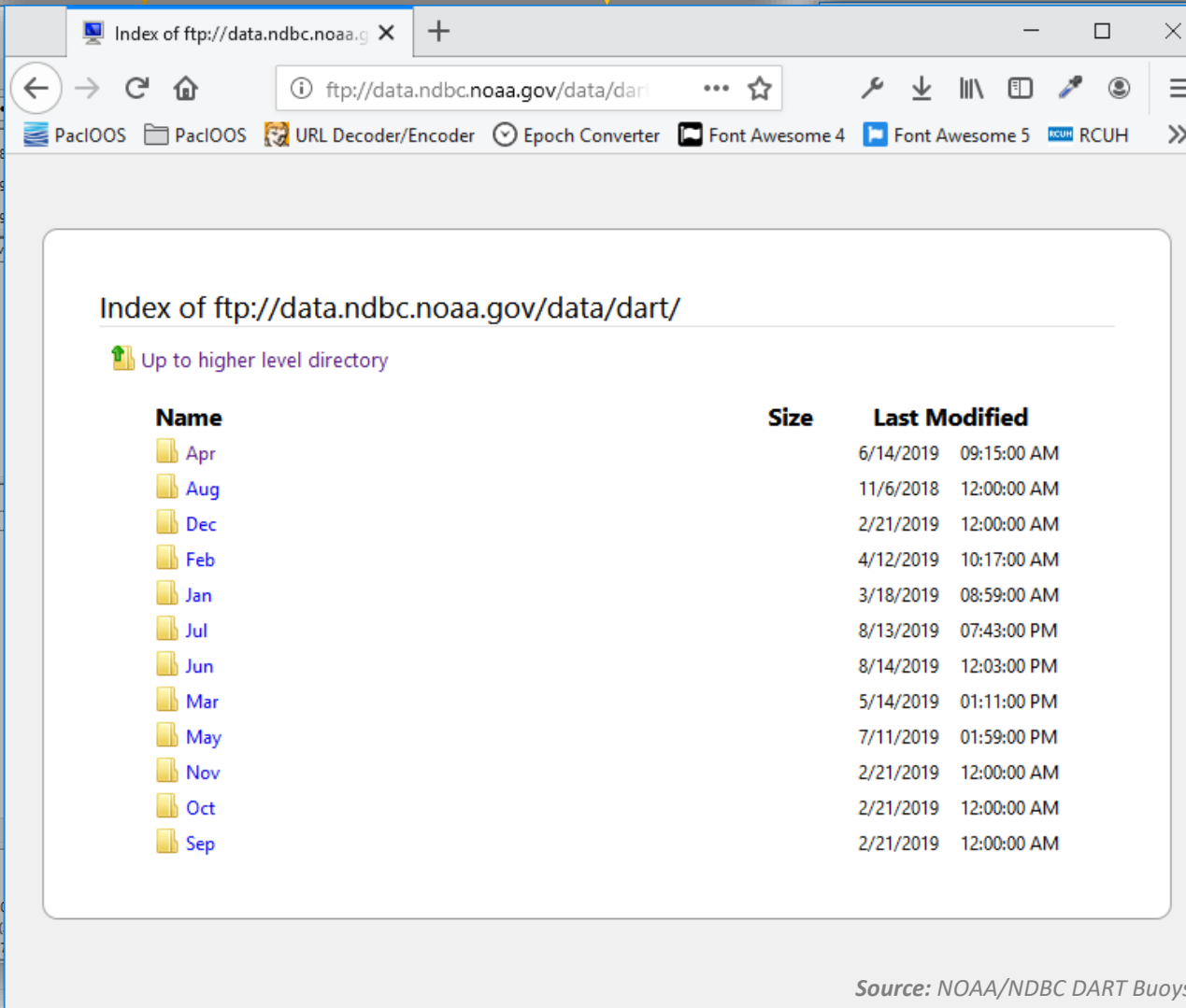
FTP Web Browser:

FTP Command-Line:



FileZilla interface showing local site structure and file list:

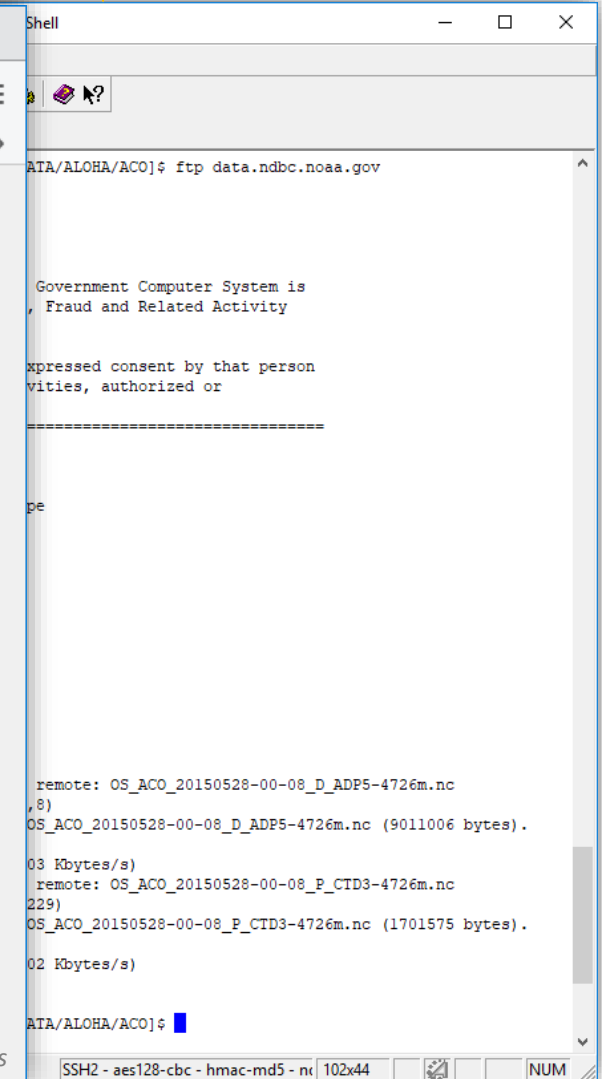
Filename	Filesize	Filetype
OS_ACO_20150528-08-16_D_ADP5-4726m.nc	8,942,406	NC File
OS_ACO_20150528-08-16_P_CTD3-4726m.nc	1,682,759	NC File
OS_ACO_20150528-16-24_D_ADP5-4726m.nc	9,015,614	NC File
OS_ACO_20150528-16-24_P_CTD3-4726m.nc	1,709,959	NC File



Index of ftp://data.ndbc.noaa.gov/data/dart/

Up to higher level directory

Name	Size	Last Modified
Apr		6/14/2019 09:15:00 AM
Aug		11/6/2018 12:00:00 AM
Dec		2/21/2019 12:00:00 AM
Feb		4/12/2019 10:17:00 AM
Jan		3/18/2019 08:59:00 AM
Jul		8/13/2019 07:43:00 PM
Jun		8/14/2019 12:03:00 PM
Mar		5/14/2019 01:11:00 PM
May		7/11/2019 01:59:00 PM
Nov		2/21/2019 12:00:00 AM
Oct		2/21/2019 12:00:00 AM
Sep		2/21/2019 12:00:00 AM



```
ATA/ALOHA/ACO] ftp data.ndbc.noaa.gov

Government Computer System is
, Fraud and Related Activity

expressed consent by that person
ivities, authorized or

-----

remote: OS_ACO_20150528-00-08_D_ADP5-4726m.nc
,8)
OS_ACO_20150528-00-08_D_ADP5-4726m.nc (9011006 bytes).
03 Kbytes/s)
remote: OS_ACO_20150528-00-08_P_CTD3-4726m.nc
229)
OS_ACO_20150528-00-08_P_CTD3-4726m.nc (1701575 bytes).
02 Kbytes/s)

ATA/ALOHA/ACO] $
```

Source: NOAA/NDBC DART Buoys

Web Accessible **HTTP WAF:**

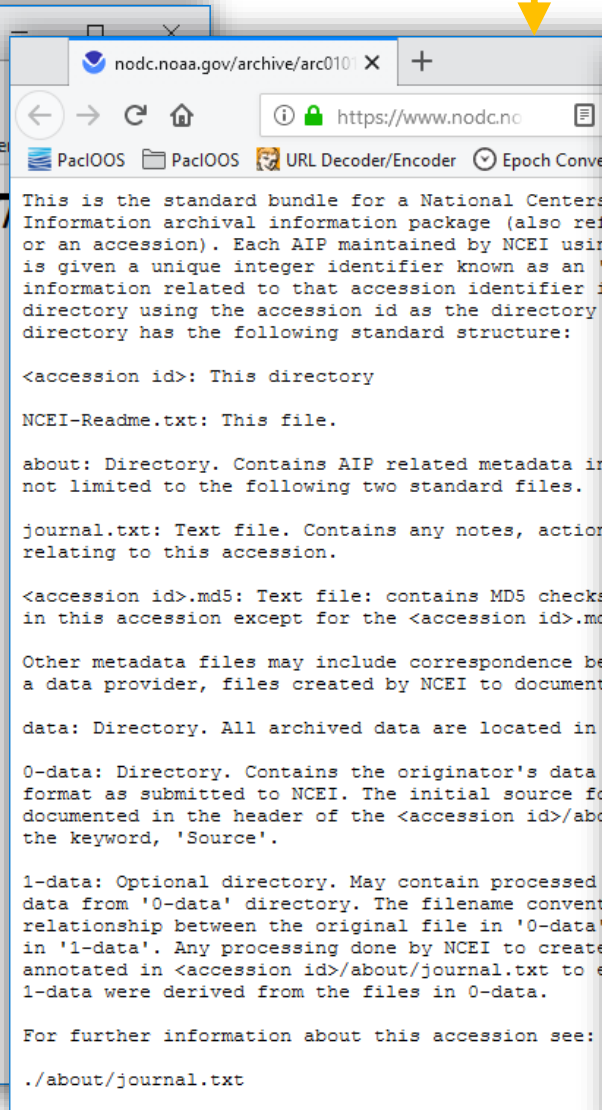
README

Download Files Individually



Index of /archive/arc0101/0157443/

Name	Last modified	Size	Description
Parent Directory	-	-	-
NCEI-Readme.txt	07-Jun-2018 19:47	1.8K	
about/	17-Apr-2019 13:40	-	
data/	11-Dec-2016 13:42	-	



This is the standard bundle for a National Centers for Environmental Prediction (NCEP) Information Archival Package (also referred to as an accession). Each AIP maintained by NCEP is given a unique integer identifier known as an 'accession id'. Information related to that accession identifier is stored in a directory using the accession id as the directory name. A directory has the following standard structure:

```
<accession id>: This directory

NCEI-Readme.txt: This file.

about: Directory. Contains AIP related metadata information, not limited to the following two standard files.

journal.txt: Text file. Contains any notes, action items, or other information relating to this accession.

<accession id>.md5: Text file: contains MD5 checks for the files in this accession except for the <accession id>.md5 file.

Other metadata files may include correspondence between the data provider, files created by NCEP to document the data, etc.

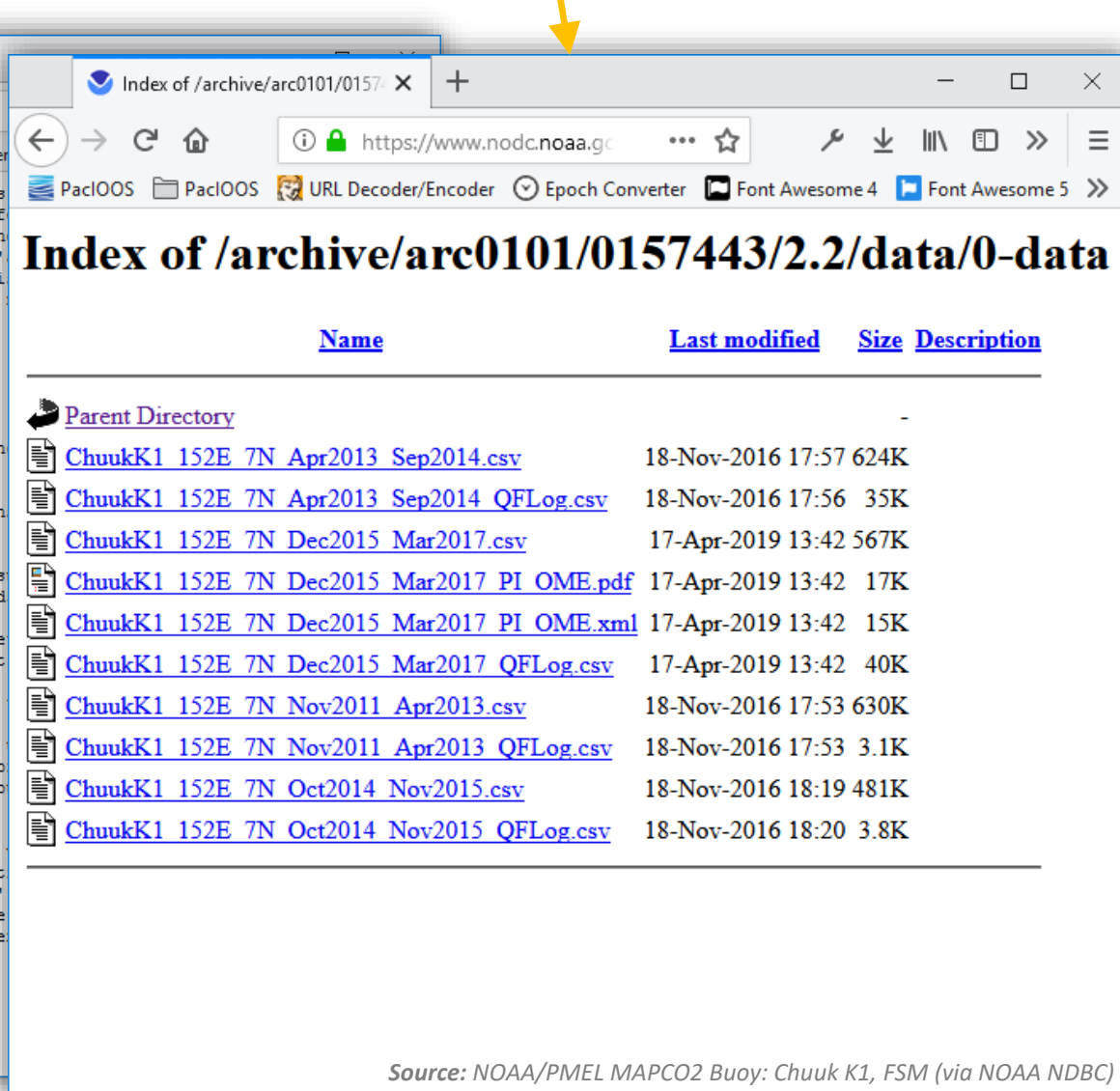
data: Directory. All archived data are located in this directory.

0-data: Directory. Contains the originator's data in the format as submitted to NCEP. The initial source for the data is documented in the header of the <accession id>/about/0-data.txt file. The keyword, 'Source'.

1-data: Optional directory. May contain processed data from '0-data' directory. The filename convention is documented in the header of the <accession id>/about/1-data.txt file. Any processing done by NCEP to create the data is annotated in <accession id>/about/journal.txt to explain the relationship between the original file in '0-data' and the processed file in '1-data' were derived from the files in 0-data.

For further information about this accession see:

./about/journal.txt
```



Index of /archive/arc0101/0157443/2.2/data/0-data

Name	Last modified	Size	Description
Parent Directory	-	-	-
ChuukK1 152E 7N Apr2013 Sep2014.csv	18-Nov-2016 17:57	624K	
ChuukK1 152E 7N Apr2013 Sep2014 QFLog.csv	18-Nov-2016 17:56	35K	
ChuukK1 152E 7N Dec2015 Mar2017.csv	17-Apr-2019 13:42	567K	
ChuukK1 152E 7N Dec2015 Mar2017 PI OME.pdf	17-Apr-2019 13:42	17K	
ChuukK1 152E 7N Dec2015 Mar2017 PI OME.xml	17-Apr-2019 13:42	15K	
ChuukK1 152E 7N Dec2015 Mar2017 QFLog.csv	17-Apr-2019 13:42	40K	
ChuukK1 152E 7N Nov2011 Apr2013.csv	18-Nov-2016 17:53	630K	
ChuukK1 152E 7N Nov2011 Apr2013 QFLog.csv	18-Nov-2016 17:53	3.1K	
ChuukK1 152E 7N Oct2014 Nov2015.csv	18-Nov-2016 18:19	481K	
ChuukK1 152E 7N Oct2014 Nov2015 QFLog.csv	18-Nov-2016 18:20	3.8K	

Source: NOAA/PMEL MAPCO2 Buoy: Chuuk K1, FSM (via NOAA NDBC)

Web Accessible ERDDAP Make A Graph:

ERDDAP Data Access Form:

ERDDAP > tabledap > Make A Graph

Dataset Title: **PacIOOS Nearshore Sensor 08 (NS08): Koror, Palau**

Institution: University of Hawaii (Dataset ID: nss08_agg)

Range: longitude = 134.4658 to 134.4658°E, latitude = 7.338408 to 7.338408°N, depth = 3.5 to 3.5m, time = 2010-05-24T00:00:00Z to 2014-05-27T23:56:00Z

Information: [Summary](#) | [License](#) | [FGDC](#) | [ISO 19115](#) | [Metadata](#) | [Background](#) | [Data Access Form](#)

Graph Type: lines

X Axis: time

Y Axis: temperature

Time range: 2 day(s)

Constraints

Optional Constraint #1	Optional Constraint #2
time >= 2014-05-24T23:56:00Z <= 2014-05-26T23:56:00Z	

Server-side Functions

Graph Settings

Color: [Color palette]

Y Axis Minimum: [] Maximum: [] Ascending

Redraw the Graph (Please be patient. It may take a while to get the data.)

Optional: Then set the File Type: .htmlTable (File Type information) and Download the Data or an Image or view the URL: http://oos.soest.hawaii.edu/erddap/tabledap/nss08_agg.htmlTable (Documentation / Bypass this form)

PacIOOS Nearshore Sensor 08 (NS08): Koror, Palau
Data courtesy of University of Hawaii

ERDDAP > tabledap > Data Access Form

Dataset Title: **PacIOOS Nearshore Sensor 08 (NS08): Koror, Palau**

Institution: University of Hawaii (Dataset ID: nss08_agg)

Information: [Summary](#) | [License](#) | [FGDC](#) | [ISO 19115](#) | [Metadata](#) | [Background](#) | [Make a graph](#)

Variable	Optional Constraint #1	Optional Constraint #2	Minimum	Maximum
<input checked="" type="checkbox"/> time (UTC)	>= 2014-05-24T23:56:00Z	<= 2014-05-26T23:56:00Z	2010-05-24T00:00:00Z	2014-05-27T23:56:00Z
<input type="checkbox"/> depth (depth below mean sea level, m)	>= []	<= []	3.5	3.5
<input type="checkbox"/> latitude (degrees_north)	>= []	<= []	7.338408	7.338408
<input type="checkbox"/> longitude (degrees_east)	>= []	<= []	134.4658	134.4658
<input checked="" type="checkbox"/> temperature (Celsius)	>= []	<= []	27.055	32.0594
<input type="checkbox"/> conductivity (S m-1)	>= []	<= []	0.12267	5.8545
<input checked="" type="checkbox"/> turbidity (NTU)	>= []	<= []	-0.33	24.3685
<input checked="" type="checkbox"/> chlorophyll (kg m-3)	>= []	<= []	-0.00999066	2.42995E-4
<input checked="" type="checkbox"/> salinity (1e-3)	>= []	<= []	0.5478	34.1807
<input type="checkbox"/> pressure (dbar)	>= []	<= []	-72.556	5.633

Server-side Functions

File type: (more info)

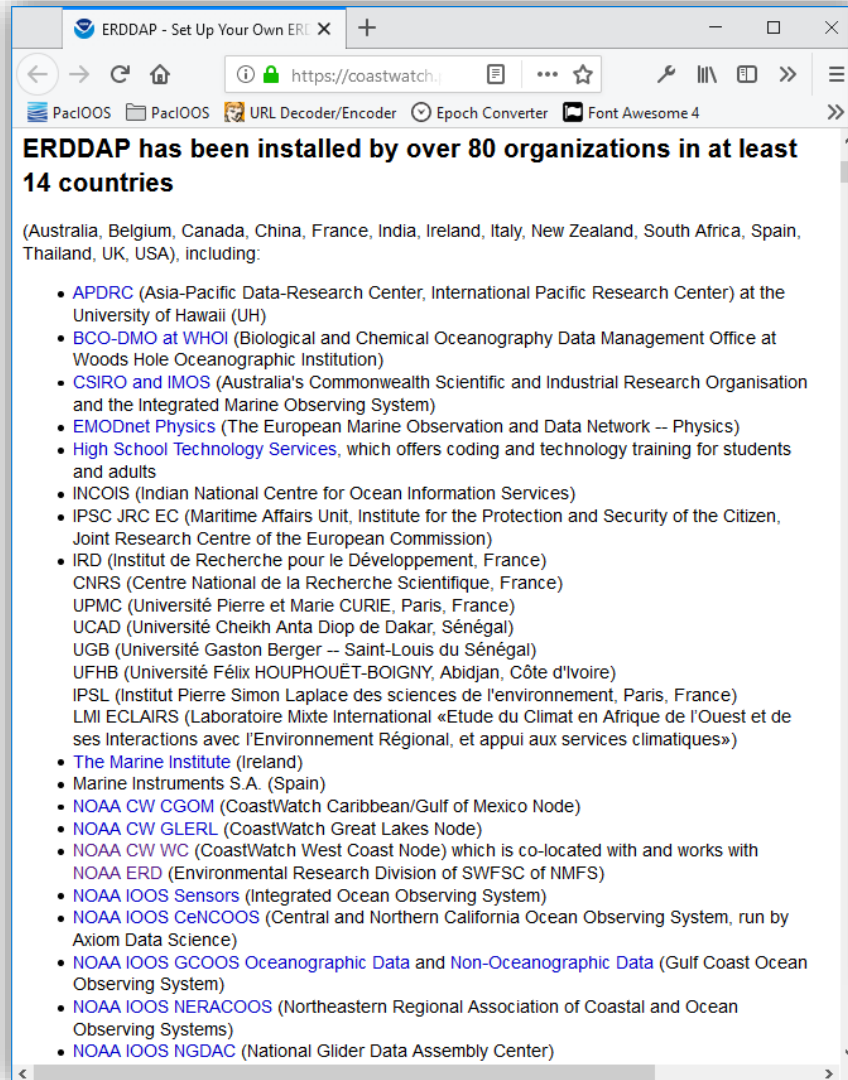
.htmlTable - View a UTF-8 .html web page with the data in a table. Times are ISO 8601 strings.

Just generate the URL: []

(Documentation / Bypass this form)

Submit (Please be patient. It may take a while to get the data.)

Web Accessible

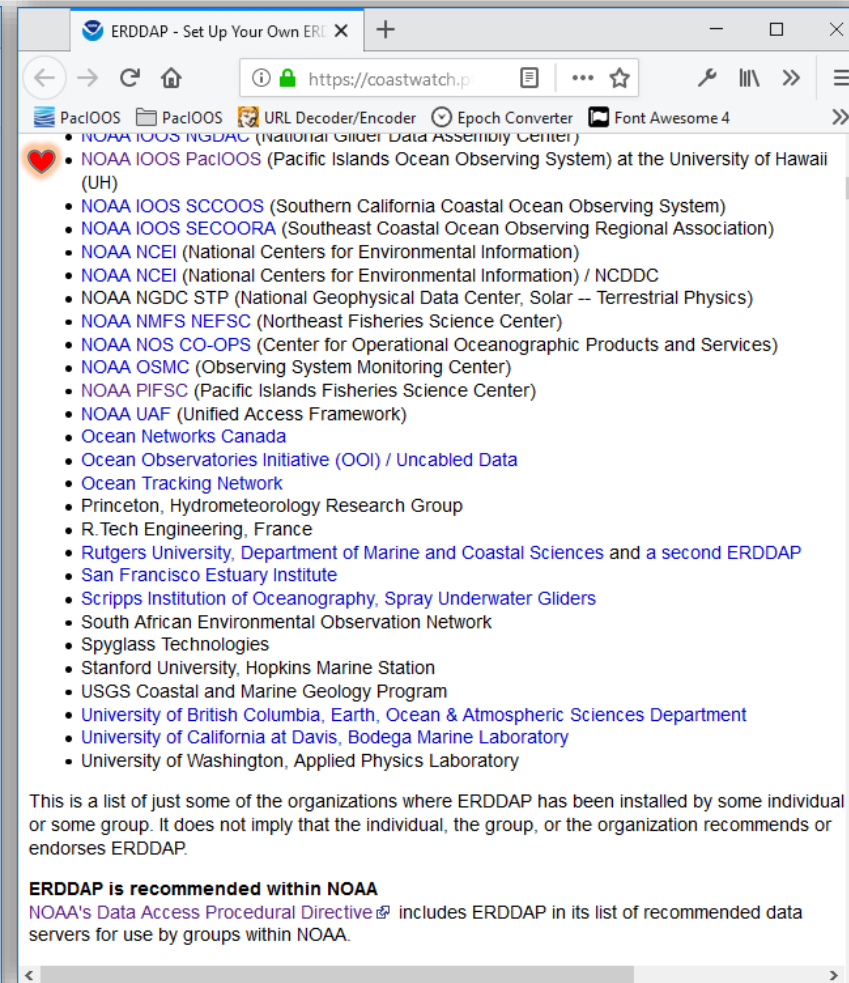


ERDDAP - Set Up Your Own ERDDAP

ERDDAP has been installed by over 80 organizations in at least 14 countries

(Australia, Belgium, Canada, China, France, India, Ireland, Italy, New Zealand, South Africa, Spain, Thailand, UK, USA), including:

- [APDRC](#) (Asia-Pacific Data-Research Center, International Pacific Research Center) at the University of Hawaii (UH)
- [BCO-DMO at WHOI](#) (Biological and Chemical Oceanography Data Management Office at Woods Hole Oceanographic Institution)
- [CSIRO and IMOS](#) (Australia's Commonwealth Scientific and Industrial Research Organisation and the Integrated Marine Observing System)
- [EMODnet Physics](#) (The European Marine Observation and Data Network -- Physics)
- [High School Technology Services](#), which offers coding and technology training for students and adults
- [INCOIS](#) (Indian National Centre for Ocean Information Services)
- [IPSC JRC EC](#) (Maritime Affairs Unit, Institute for the Protection and Security of the Citizen, Joint Research Centre of the European Commission)
- [IRD](#) (Institut de Recherche pour le Développement, France)
- [CNRS](#) (Centre National de la Recherche Scientifique, France)
- [UPMC](#) (Université Pierre et Marie CURIE, Paris, France)
- [UCAD](#) (Université Cheikh Anta Diop de Dakar, Sénégal)
- [UGB](#) (Université Gaston Berger -- Saint-Louis du Sénégal)
- [UFHB](#) (Université Félix HOUPOUËT-BOIGNY, Abidjan, Côte d'Ivoire)
- [IPSL](#) (Institut Pierre Simon Laplace des sciences de l'environnement, Paris, France)
- [LMI ECLAIRS](#) (Laboratoire Mixte International «Etude du Climat en Afrique de l'Ouest et de ses Interactions avec l'Environnement Régional, et appui aux services climatiques»)
- [The Marine Institute](#) (Ireland)
- [Marine Instruments S.A.](#) (Spain)
- [NOAA CW CGOM](#) (CoastWatch Caribbean/Gulf of Mexico Node)
- [NOAA CW GLERL](#) (CoastWatch Great Lakes Node)
- [NOAA CW WC](#) (CoastWatch West Coast Node) which is co-located with and works with [NOAA ERD](#) (Environmental Research Division of SWFSC of NMFS)
- [NOAA IOOS Sensors](#) (Integrated Ocean Observing System)
- [NOAA IOOS CeNCOOS](#) (Central and Northern California Ocean Observing System, run by Axiom Data Science)
- [NOAA IOOS GCOOS Oceanographic Data and Non-Oceanographic Data](#) (Gulf Coast Ocean Observing System)
- [NOAA IOOS NERACOOS](#) (Northeastern Regional Association of Coastal and Ocean Observing Systems)
- [NOAA IOOS NGDAC](#) (National Glider Data Assembly Center)



ERDDAP - Set Up Your Own ERDDAP

ERDDAP has been installed by over 80 organizations in at least 14 countries

- [NOAA IOOS NGDAC](#) (National Glider Data Assembly Center)
- [NOAA IOOS PacIOOS](#) (Pacific Islands Ocean Observing System) at the University of Hawaii (UH)
- [NOAA IOOS SCCOOS](#) (Southern California Coastal Ocean Observing System)
- [NOAA IOOS SECOORA](#) (Southeast Coastal Ocean Observing Regional Association)
- [NOAA NCEI](#) (National Centers for Environmental Information)
- [NOAA NCEI](#) (National Centers for Environmental Information) / NCDDC
- [NOAA NGDC STP](#) (National Geophysical Data Center, Solar -- Terrestrial Physics)
- [NOAA NMFS NEFSC](#) (Northeast Fisheries Science Center)
- [NOAA NOS CO-OPS](#) (Center for Operational Oceanographic Products and Services)
- [NOAA OSMC](#) (Observing System Monitoring Center)
- [NOAA PIFSC](#) (Pacific Islands Fisheries Science Center)
- [NOAA UAF](#) (Unified Access Framework)
- [Ocean Networks Canada](#)
- [Ocean Observatories Initiative \(OOI\) / Uncabled Data](#)
- [Ocean Tracking Network](#)
- [Princeton, Hydrometeorology Research Group](#)
- [R.Tech Engineering, France](#)
- [Rutgers University, Department of Marine and Coastal Sciences and a second ERDDAP](#)
- [San Francisco Estuary Institute](#)
- [Scripps Institution of Oceanography, Spray Underwater Gliders](#)
- [South African Environmental Observation Network](#)
- [Spyglass Technologies](#)
- [Stanford University, Hopkins Marine Station](#)
- [USGS Coastal and Marine Geology Program](#)
- [University of British Columbia, Earth, Ocean & Atmospheric Sciences Department](#)
- [University of California at Davis, Bodega Marine Laboratory](#)
- [University of Washington, Applied Physics Laboratory](#)

This is a list of just some of the organizations where ERDDAP has been installed by some individual or some group. It does not imply that the individual, the group, or the organization recommends or endorses ERDDAP.

ERDDAP is recommended within NOAA
NOAA's [Data Access Procedural Directive](#) includes ERDDAP in its list of recommended data servers for use by groups within NOAA.

Web Accessible



- E-mail users data upon request or subscription
- Manually intensive for data manager
- Users need to specify time period of interest, etc.: provide request form?
- Data volume might be too large for e-mail (even with ZIP, gzip, or other compression methods)
- Users **cannot automate data ingest** procedures

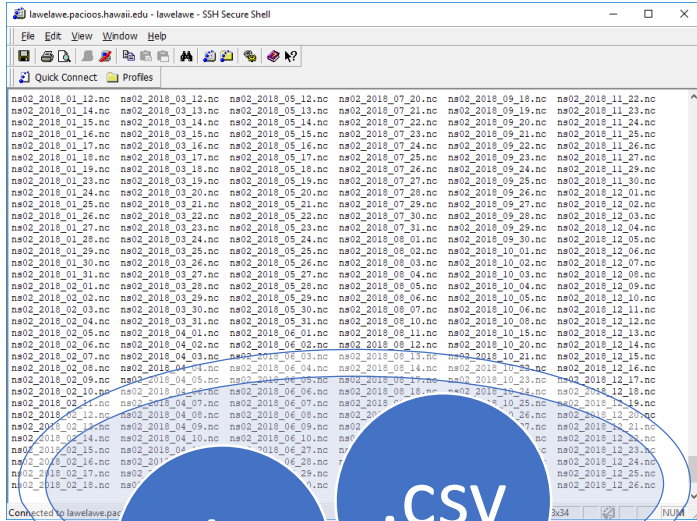


- Can share folders with select users and/or share link publicly
- Shared users receive e-mail notifications when new data are available, and these files automatically get pushed to their account
- **Cannot automate data ingest** procedures: unpredictable file URL; new file discovery.
- Size constraints for free usage; subscription options (\$) for increased storage.



- Ditto Dropbox...
- Could upload data in raw format *or* import to **Google Spreadsheets** for added features

ERDDAP: Environmental Research Division's Data Access Program



Web Services

<http://pacioos.org/erddap/>

PacIOOS ERDDAP
Easier access to scientific data

ERDDAP > tabledap > Make A Graph

Dataset Title: **PacIOOS Nearshore Sensor 02 (NS02): Hawaii Yacht Club, Oahu, Hawaii**

Institution: University of Hawaii (Dataset ID: ns02_agg)

Range: longitude = -157.8428 to -157.8428°E, latitude = 21.28641 to 21.28641°N, depth = 0.0 to 0.5m, time = 2008-07-29T00:00:00Z

Information: Summary | License | FGDC | ISO 19115 | Metadata | Background | Data Access Form

Graph Type: lines
time
temperature

Optional Constraint #1: >= 2019-03-16T23:56:00Z

Server-side Functions: distinct

Graph Settings: Color, Y Axis Minimum, Maximum, Ascending: ascending

Redraw the Graph (Please be patient. It may take a while to get the data.)

Temperature (processed) (Celsius)

2019-03

PacIOOS Nearshore Sensor 02 (NS02): Hawaii Yacht Club, Oahu, Hawaii
Data courtesy of University of Hawaii

OPeNDAP

format

subset

REST = Representational State Transfer

API = Application Programming Interface

<http://some.address.org/directory/filename.nc>

<http://some.address.org/give-me?dataset&vars&time&format>



ERDDAP

abstract

aggregate

.dat

.csv

.nc

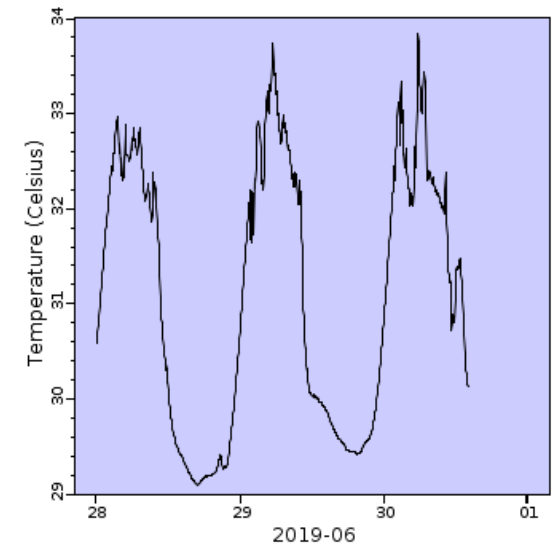
ERDDAP: Output Formats



Data fileTypes	Description	Info	Example
.asc	View OPeNDAP-style ISO-8859-1 comma-separated text.	info	example
.csv	Download a ISO-8859-1 comma-separated text table (line 1: names; line 2: units; ISO 8601 times).	info	example
.csvp	Download a ISO-8859-1 .csv file with line 1: name (units). Times are ISO 8601 strings.	info	example
.csv0	Download a ISO-8859-1 .csv file without column names or units. Times are ISO 8601 strings.	info	example
.dataTable	A JSON file formatted for use with the Google Visualization client library (Google Charts).	info	example
.das	View the dataset's metadata via an ISO-8859-1 OPeNDAP Dataset Attribute Structure (DAS).	info	example
.dds	View the dataset's structure via an ISO-8859-1 OPeNDAP Dataset Descriptor Structure (DDS).	info	example
.dods	OPeNDAP clients use this to download the data in the DODS binary format.	info	example
.esriCsv	Download a ISO_8859_1 .csv file for ESRI's ArcGIS 9.x and below (separate date and time columns).	info	example
.fgdc	View the dataset's UTF-8 FGDC .xml metadata.	info	example
.geoJson	Download longitude,latitude,otherColumns data as a UTF-8 GeoJSON .json file.	info	example
.graph	View a Make A Graph web page.	info	example
.help	View a web page with a description of tabledap.	info	example
.html	View an OPeNDAP-style HTML Data Access Form.	info	example
.htmlTable	View a UTF-8 .html web page with the data in a table. Times are ISO 8601 strings.	info	example
.iso19115	View the dataset's ISO 19115-2/19139 UTF-8 .xml metadata.	info	example
.itx	Download an ISO-8859-1 Igor Text File. Each response column becomes a wave.	info	example
.json	View a table-like UTF-8 JSON file (missing value = 'null'; times are ISO 8601 strings).	info	example
.jsonlCSV1	View a UTF-8 JSON Lines CSV file with column names on line 1 (mv = 'null'; times are ISO 8601 strings).	info	example
.jsonlCSV	View a UTF-8 JSON Lines CSV file without column names (mv = 'null'; times are ISO 8601 strings).	info	example
.jsonlKVP	View a UTF-8 JSON Lines file with Key:Value pairs (missing value = 'null'; times are ISO 8601 strings).	info	example

Data fileTypes	Description	Info	Example
.mat	Download a MATLAB binary file.	info	example
.nc	Download a flat, table-like, NetCDF-3 binary file with COARDS/CF/ACDD metadata.	info	example
.ncHeader	View the UTF-8 header (the metadata) for the NetCDF-3 .nc file.	info	example
.ncCF	Download a NetCDF-3 CF Discrete Sampling Geometries file (Contiguous Ragged Array).	info	example
.ncCFHeader	View the UTF-8 header (the metadata) for the .ncCF file.	info	example
.ncCFMA	Download a NetCDF-3 CF Discrete Sampling Geometries file (Multidimensional Array).	info	example
.ncCFMAHeader	View the UTF-8 header (the metadata) for the .ncCFMA file.	info	example
.nccsv	Download a NetCDF-3-like 7-bit ASCII NCCSV .csv file with COARDS/CF/ACDD metadata.	info	example
.nccsvMetadata	View the dataset's metadata as the top half of a 7-bit ASCII NCCSV .csv file.	info	example
.ncoJson	Download a UTF-8 NCO lvl=2 JSON file with COARDS/CF/ACDD metadata.	info	example
.odvTxt	Download longitude,latitude,time,otherColumns as an ISO-8859-1 ODV Generic Spreadsheet File (.txt).	info	example
.subset	View an HTML form which uses faceted search to simplify picking subsets of the data.	info	example
.tsv	Download a ISO-8859-1 tab-separated text table (line 1: names; line 2: units; ISO 8601 times).	info	example
.tsvp	Download a ISO-8859-1 .tsv file with line 1: name (units). Times are ISO 8601 strings.	info	example
.tsv0	Download a ISO-8859-1 .tsv file without column names or units. Times are ISO 8601 strings.	info	example
.wav	Download a .wav audio file. All columns must be numeric and of the same type.	info	example
.xhtml	View a UTF-8 XHTML (XML) file with the data in a table. Times are ISO 8601 strings.	info	example

Image fileTypes	Description	Info	Example
.kml	View a .kml file, suitable for Google Earth.	info	example
.smallPdf	View a small .pdf image file with a graph or map.	info	example
.pdf	View a standard, medium-sized .pdf image file with a graph or map.	info	example
.largePdf	View a large .pdf image file with a graph or map.	info	example
.smallPng	View a small .png image file with a graph or map.	info	example
.png	View a standard, medium-sized .png image file with a graph or map.	info	example
.largePng	View a large .png image file with a graph or map.	info	example
.transparentPng	View a .png image file (just the data, without axes, landmark, or legend).	info	example



— PacIOOS Hearshore Sensor 17 (HS17): Pago Bay, Guam
Data courtesy of University of Hawaii



For examples and further details, please visit:

<https://coastwatch.pfeg.noaa.gov/erddap/tabledap/documentation.html#fileType>

ERDDAP: Output Formats

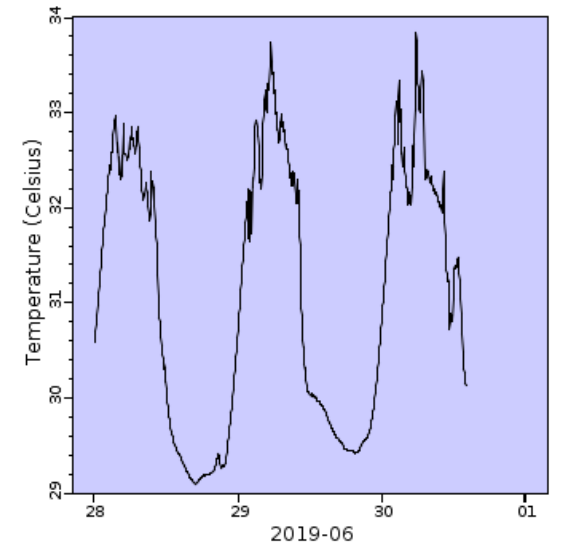
Data fileTypes	Description	Info	Example
.asc	View OPeNDAP-style ISO-8859-1 comma-separated text.	info	example
.csv	Download a ISO-8859-1 comma-separated text table (line 1: names; line 2: units; ISO 8601 times).	info	example
.csvp	Download a ISO-8859-1 .csv file with line 1: name (units). Times are ISO 8601 strings.	info	example
.csv0	Download a ISO-8859-1 .csv file without column names or units. Times are ISO 8601 strings.	info	example
.dataTable	A JSON file formatted for use with the Google Visualization client library (Google Charts).	info	example
.das	View the dataset's metadata via an ISO-8859-1 OPeNDAP Dataset Attribute Structure (DAS).	info	example
.dds	View the dataset's structure via an ISO-8859-1 OPeNDAP Dataset Descriptor Structure (DDS).	info	example
.dods	OPeNDAP clients use this to download the data in the DODS binary format.	info	example
.esriCsv	Download a ISO_8859_1 .csv file for ESRI's ArcGIS 9.x and below (separate date and time columns).	info	example
.fgdc	View the dataset's UTF-8 FGDC .xml metadata.	info	example
.geoJson	Download longitude,latitude,otherColumns data as a UTF-8 GeoJSON .json file.	info	example
.graph	View a Make A Graph web page.	info	example
.help	View a web page with a description of tabledap.	info	example
.html	View an OPeNDAP-style HTML Data Access Form.	info	example
.htmlTable	View a UTF-8 .html web page with the data in a table. Times are ISO 8601 strings.	info	example
.iso19115	View the dataset's ISO 19115-2/19139 UTF-8 .xml metadata.	info	example
.itx	Download an ISO-8859-1 Igor Text File. Each response column becomes a wave.	info	example
.json	View a table-like UTF-8 JSON file (missing value = 'null'; times are ISO 8601 strings).	info	example
.jsonICSV1	View a UTF-8 JSON Lines CSV file with column names on line 1 (mv = 'null'; times are ISO 8601 strings).	info	example
.jsonICSV	View a UTF-8 JSON Lines CSV file without column names (mv = 'null'; times are ISO 8601 strings).	info	example
.jsonIKVP	View a UTF-8 JSON Lines file with Key:Value pairs (missing value = 'null'; times are ISO 8601 strings).	info	example

time	temperature	conductivity	turbidity	chlorophyll	salinity
UTC	Celsius	S m-1	NTU	kg m-3	1e-3
2019-08-27T22:00:00Z	28.5807	5.52234	5.088	3.1920001E-6	33.8784
2019-08-27T22:04:00Z	28.6388	5.52571	8.426	3.2159999E-6	33.8602
2019-08-27T22:08:00Z	28.6484	5.53238	2.9360003	3.371E-6	33.8993
2019-08-27T22:12:00Z	28.658	5.53495	2.452	3.249E-6	33.9103
2019-08-27T22:16:00Z	28.7173	5.53903	2.5699997	3.2280002E-6	33.8961
2019-08-27T22:20:00Z	28.7393	5.53857	2.646	3.2609998E-6	33.8773
2019-08-27T22:24:00Z	28.7289	5.54225	7.4939995	3.203E-6	33.91
2019-08-27T22:28:00Z	28.7355	5.54403	3.0559998	2.7320002E-6	33.9175
2019-08-27T22:32:00Z	28.7329	5.54619	3.0879998	3.383E-6	33.9342
2019-08-27T22:36:00Z	28.6955	5.54443	2.354	3.2980001E-6	33.9488
2019-08-27T22:40:00Z	28.6868	5.5437	2.5239997	2.708E-6	33.95
2019-08-27T22:44:00Z	28.7021	5.54261	2.79	3.4439997E-6	33.9315
2019-08-27T22:48:00Z	28.7331	5.54361	2.8140001	3.3469998E-6	33.9163
2019-08-27T22:52:00Z	28.7563	5.54563	5.442	3.095E-6	33.9137
2019-08-27T22:56:00Z	28.7677	5.54748	2.496	3.308E-6	33.9184
2019-08-27T23:00:00Z	28.7849	5.55307	6.448	4.217E-6	33.9446
2019-08-27T23:04:00Z	28.7941	5.55906	2.9579997	3.3459999E-6	33.9792
2019-08-27T23:08:00Z	28.8393	5.56038	3.508	3.7109999E-6	33.9561
2019-08-27T23:12:00Z	28.862	5.55854	3.3639998	3.3809997E-6	33.9273
2019-08-27T23:16:00Z	28.8812	5.5582	3.154	3.467E-6	33.9113
2019-08-27T23:20:00Z	28.847	5.55521	3.34	3.396E-6	33.915
2019-08-27T23:24:00Z	28.8453	5.5559	3.4380002	3.205E-6	33.921
2019-08-27T23:28:00Z	28.8393	5.55543	2.35	3.1439997E-6	33.922
2019-08-27T23:32:00Z	28.8324	5.55871	3.48	3.1069999E-6	33.9495
2019-08-27T23:36:00Z	28.8545	5.56089	2.716	3.249E-6	33.9487
2019-08-27T23:40:00Z	28.857	5.55998	3.244	3.5550001E-6	33.9407
2019-08-27T23:44:00Z	28.8535	5.55517	3.484	3.468E-6	33.9102
2019-08-27T23:48:00Z	28.8568	5.55623	3.7699997	3.156E-6	33.9151
2019-08-27T23:52:00Z	28.8836	5.56123	3.2480001	3.1799998E-6	33.9304
2019-08-27T23:56:00Z	28.8896	5.56831	2.48	3.01E-6	33.9747

ERDDAP, Version 2.01
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Image fileTypes	Description	Info	Example
.kml	View a .kml file, suitable for Google Earth.	info	example
.smallPdf	View a small .pdf image file with a graph or map.	info	example
.pdf	View a standard, medium-sized .pdf image file with a graph or map.	info	example
.largePdf	View a large .pdf image file with a graph or map.	info	example
.smallPng	View a small .png image file with a graph or map.	info	example
.png	View a standard, medium-sized .png image file with a graph or map.	info	example
.largePng	View a large .png image file with a graph or map.	info	example
.transparentPng	View a .png image file (just the data, without axes, landmark, or legend).	info	example



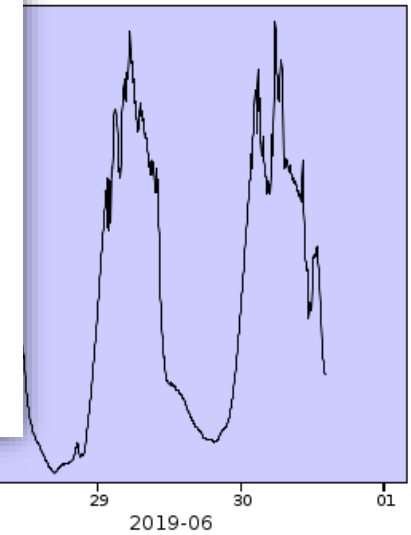
— PacIOOS Hearshore Sensor 17 (HS17): Pago Bay, Guam
 Data courtesy of University of Hawaii

Further details, please visit:
<https://coastwatch.pfeg.noaa.gov/erddap/tabledap/documentation.html#fileType>

ERDDAP: Output Formats



Data fileTypes	Description	Info	Example	Data fileTypes	Description	Info	Example	Image fileTypes	Description	Info	Example
.asc	View OPeNDAP-style ISO-8859-1 comma text.			time (UTC), temperature (Celsius), conductivity (S m ⁻¹), turbidity (NTU), chlorophyll (kg m ⁻³), salinity (1e-3)	time (UTC), temperature (Celsius), conductivity (S m ⁻¹), turbidity (NTU), chlorophyll (kg m ⁻³), salinity (1e-3)				suitable for Google Earth.	info	example
.csv	Download a ISO-8859-1 comma-separated (line 1: names; line 2: units; ISO 8601 times)			2019-08-27T22:00:00Z,28.6388,5.52571,8.426,3.2159999E-6,33.8602	2019-08-27T22:00:00Z,28.6388,5.52571,8.426,3.2159999E-6,33.8602				df image file with a graph or map.	info	example
.csvp	Download a ISO-8859-1 .csv file with line (units). Times are ISO 8601 strings.			2019-08-27T22:08:00Z,28.6484,5.53238,2.9360003,3.371E-6,33.8993	2019-08-27T22:08:00Z,28.6484,5.53238,2.9360003,3.371E-6,33.8993				d, medium-sized .pdf image file with a	info	example
.csv0	Download a ISO-8859-1 .csv file without (or units). Times are ISO 8601 strings.			2019-08-27T22:12:00Z,28.658,5.53495,2.452,3.249E-6,33.9103	2019-08-27T22:12:00Z,28.658,5.53495,2.452,3.249E-6,33.9103				df image file with a graph or map.	info	example
.dataTable	A JSON file formatted for use with the Google Visualization client library (Google Charts)			2019-08-27T22:16:00Z,28.7173,5.53903,2.5699997,3.2280002E-6,33.8961	2019-08-27T22:16:00Z,28.7173,5.53903,2.5699997,3.2280002E-6,33.8961				ng image file with a graph or map.	info	example
.das	View the dataset's metadata via an ISO-8 OPeNDAP Dataset Attribute Structure (DAS)			2019-08-27T22:20:00Z,28.7393,5.53857,2.646,3.2609998E-6,33.8773	2019-08-27T22:20:00Z,28.7393,5.53857,2.646,3.2609998E-6,33.8773				d, medium-sized .png image file with a	info	example
.dds	View the dataset's structure via an ISO-8 OPeNDAP Dataset Descriptor Structure (DDS)			2019-08-27T22:24:00Z,28.7289,5.54225,7.4939995,3.203E-6,33.91	2019-08-27T22:24:00Z,28.7289,5.54225,7.4939995,3.203E-6,33.91				ng image file with a graph or map.	info	example
.dods	OPeNDAP clients use this to download the DODS binary format.			2019-08-27T22:28:00Z,28.7355,5.54403,3.0559998,2.7320002E-6,33.9175	2019-08-27T22:28:00Z,28.7355,5.54403,3.0559998,2.7320002E-6,33.9175				age file (just the data, without axes, legend).	info	example
.esriCsv	Download a ISO_8859_1 .csv file for ESRI and below (separate date and time columns)			2019-08-27T22:32:00Z,28.7329,5.54619,3.0879998,3.383E-6,33.9342	2019-08-27T22:32:00Z,28.7329,5.54619,3.0879998,3.383E-6,33.9342						
.fgdc	View the dataset's UTF-8 FGDC .xml metadata			2019-08-27T22:36:00Z,28.6955,5.54443,2.354,3.2980001E-6,33.9488	2019-08-27T22:36:00Z,28.6955,5.54443,2.354,3.2980001E-6,33.9488						
.geoJson	Download longitude,latitude,otherColumns UTF-8 GeoJSON .json file.			2019-08-27T22:40:00Z,28.6868,5.5437,2.5239997,2.708E-6,33.95	2019-08-27T22:40:00Z,28.6868,5.5437,2.5239997,2.708E-6,33.95						
.graph	View a Make A Graph web page.			2019-08-27T22:44:00Z,28.7021,5.54261,2.79,3.4439997E-6,33.9315	2019-08-27T22:44:00Z,28.7021,5.54261,2.79,3.4439997E-6,33.9315						
.help	View a web page with a description of table			2019-08-27T22:48:00Z,28.7331,5.54361,2.8140001,3.3469998E-6,33.9163	2019-08-27T22:48:00Z,28.7331,5.54361,2.8140001,3.3469998E-6,33.9163						
.html	View an OPeNDAP-style HTML Data Access			2019-08-27T22:52:00Z,28.7563,5.54563,5.442,3.095E-6,33.9137	2019-08-27T22:52:00Z,28.7563,5.54563,5.442,3.095E-6,33.9137						
.htmlTable	View a UTF-8 .html web page with the data. Times are ISO 8601 strings.			2019-08-27T22:56:00Z,28.7677,5.54748,2.496,3.308E-6,33.9184	2019-08-27T22:56:00Z,28.7677,5.54748,2.496,3.308E-6,33.9184						
.iso19115	View the dataset's ISO 19115-2/19139 UML metadata.			2019-08-27T23:00:00Z,28.7849,5.55307,6.448,4.217E-6,33.9446	2019-08-27T23:00:00Z,28.7849,5.55307,6.448,4.217E-6,33.9446						
.itx	Download an ISO-8859-1 Igor Text File. Each response column becomes a wave.	info	example	2019-08-27T23:04:00Z,28.7941,5.55906,2.9579997,3.3459999E-6,33.9792	2019-08-27T23:04:00Z,28.7941,5.55906,2.9579997,3.3459999E-6,33.9792						
.json	View a table-like UTF-8 JSON file (missing value = 'null'; times are ISO 8601 strings).	info	example	2019-08-27T23:08:00Z,28.8393,5.56038,3.508,3.7109999E-6,33.9561	2019-08-27T23:08:00Z,28.8393,5.56038,3.508,3.7109999E-6,33.9561						
.jsonCSV1	View a UTF-8 JSON Lines CSV file with column names on line 1 (mv = 'null'; times are ISO 8601 strings).	info	example	2019-08-27T23:12:00Z,28.862,5.55854,3.3639998,3.3809997E-6,33.9273	2019-08-27T23:12:00Z,28.862,5.55854,3.3639998,3.3809997E-6,33.9273						
.jsonCSV	View a UTF-8 JSON Lines CSV file without column names (mv = 'null'; times are ISO 8601 strings).	info	example	2019-08-27T23:16:00Z,28.8812,5.5582,3.154,3.467E-6,33.9113	2019-08-27T23:16:00Z,28.8812,5.5582,3.154,3.467E-6,33.9113						
.jsonKVP	View a UTF-8 JSON Lines file with Key:Value pairs (missing value = 'null'; times are ISO 8601 strings).	info	example	2019-08-27T23:20:00Z,28.847,5.55521,3.34,3.396E-6,33.915	2019-08-27T23:20:00Z,28.847,5.55521,3.34,3.396E-6,33.915						
.wav	Download a .wav audio file. All columns must be numeric and of the same type.	info	example	2019-08-27T23:24:00Z,28.8453,5.5559,3.4380002,3.205E-6,33.921	2019-08-27T23:24:00Z,28.8453,5.5559,3.4380002,3.205E-6,33.921						
.xhtml	View a UTF-8 XHTML (XML) file with the data in a table. Times are ISO 8601 strings.	info	example	2019-08-27T23:28:00Z,28.8393,5.55543,2.35,3.1439997E-6,33.922	2019-08-27T23:28:00Z,28.8393,5.55543,2.35,3.1439997E-6,33.922						



— PacIOOS Hearshore Sensor 17 (HS17): Pago Bay, Guam
Data courtesy of University of Hawaii

For examples and further details, please visit: <https://coastwatch.pfeg.noaa.gov/erddap/tabledap/documentation.html#fileType>

ERDDAP: O

nss02_agg_64ef_04c2_682f.csv [Read-Only] - Excel

John Maurer

File Home Insert Page Layout Formulas Data Review View Help Tell me what you want to do

Clipboard Font Alignment Number Styles Cells Editing

Calibri 11 Wrap Text Merge & Center

General

Conditional Formatting Format as Table Cell Styles

Insert Delete Format

AutoSum Fill Clear Sort & Filter Find & Select

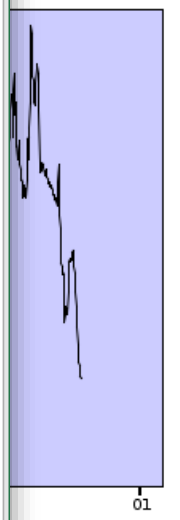
L38

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	time (UTC)	temperature (Celsius)	conductivity (S m-1)	turbidity (NTU)	chlorophyll (kg m-3)	salinity (1e-3)								
2	2019-08-27T22:00:00Z	28.5807	5.52234	5.088	3.19E-06	33.8784								
3	2019-08-27T22:04:00Z	28.6388	5.52571	8.426	3.22E-06	33.8602								
4	2019-08-27T22:08:00Z	28.6484	5.53238	2.9360003	3.37E-06	33.8993								
5	2019-08-27T22:12:00Z	28.658	5.53495	2.452	3.25E-06	33.9103								
6	2019-08-27T22:16:00Z	28.7173	5.53903	2.5699997	3.23E-06	33.8961								
7	2019-08-27T22:20:00Z	28.7393	5.53857	2.646	3.26E-06	33.8773								
8	2019-08-27T22:24:00Z	28.7289	5.54225	7.4939995	3.20E-06	33.91								
9	2019-08-27T22:28:00Z	28.7355	5.54403	3.0559998	2.73E-06	33.9175								
10	2019-08-27T22:32:00Z	28.7329	5.54619	3.0879998	3.38E-06	33.9342								
11	2019-08-27T22:36:00Z	28.6955	5.54443	2.354	3.30E-06	33.9488								
12	2019-08-27T22:40:00Z	28.6868	5.5437	2.5239997	2.71E-06	33.95								
13	2019-08-27T22:44:00Z	28.7021	5.54261	2.79	3.44E-06	33.9315								
14	2019-08-27T22:48:00Z	28.7331	5.54361	2.8140001	3.35E-06	33.9163								
15	2019-08-27T22:52:00Z	28.7563	5.54563	5.442	3.10E-06	33.9137								
16	2019-08-27T22:56:00Z	28.7677	5.54748	2.496	3.31E-06	33.9184								
17	2019-08-27T23:00:00Z	28.7849	5.55307	6.448	4.22E-06	33.9446								
18	2019-08-27T23:04:00Z	28.7941	5.55906	2.9579997	3.35E-06	33.9792								
19	2019-08-27T23:08:00Z	28.8393	5.56038	3.508	3.71E-06	33.9561								
20	2019-08-27T23:12:00Z	28.862	5.55854	3.3639998	3.38E-06	33.9273								
21	2019-08-27T23:16:00Z	28.8812	5.5582	3.154	3.47E-06	33.9113								
22	2019-08-27T23:20:00Z	28.847	5.55521	3.34	3.40E-06	33.915								
23	2019-08-27T23:24:00Z	28.8453	5.5559	3.4380002	3.21E-06	33.921								
24	2019-08-27T23:28:00Z	28.8393	5.55543	2.35	3.14E-06	33.922								
25	2019-08-27T23:32:00Z	28.8324	5.55871	3.48	3.11E-06	33.9495								
26	2019-08-27T23:36:00Z	28.8545	5.56089	2.716	3.25E-06	33.9487								
27	2019-08-27T23:40:00Z	28.857	5.55998	3.244	3.56E-06	33.9407								
28	2019-08-27T23:44:00Z	28.8535	5.55517	3.484	3.47E-06	33.9102								
29	2019-08-27T23:48:00Z	28.8568	5.55623	3.7699997	3.16E-06	33.9151								
30	2019-08-27T23:52:00Z	28.8836	5.56123	3.2480001	3.18E-06	33.9304								
31	2019-08-27T23:56:00Z	28.8896	5.56831	2.48	3.01E-06	33.9747								
32														

nss02_agg_64ef_04c2_682f

100%

	Info	Example
	info	example
or map.	info	example
file with a	info	example
or map.	info	example
or map.	info	example
file with a	info	example
or map.	info	example
out axes,	info	example



igo Bay, Guam

ERDDAP: Output

Panoply: Panoply — Sources

File Edit View History Bookmarks Plot Window Help

Create Plot Combine Plot Open Dataset Remove Remove All Hide Info

Datasets Catalogs Bookmarks

Name	Long Name	Type
nss02_agg_d25f_2...	PacIOOS Nearshore Senso...	Local File
chlorophyll	Chlorophyll (processed)	Geo2D
conductivity	Conductivity (processed)	Geo2D
depth	depth below mean sea level	1D
latitude	Latitude	1D
longitude	Longitude	1D
salinity	Salinity (processed)	Geo2D
temperature	Temperature (processed)	Geo2D
time	Time	1D
turbidity	Turbidity (processed)	Geo2D

Show: All variables

File "nss02_agg_d25f_2417_7756.nc"

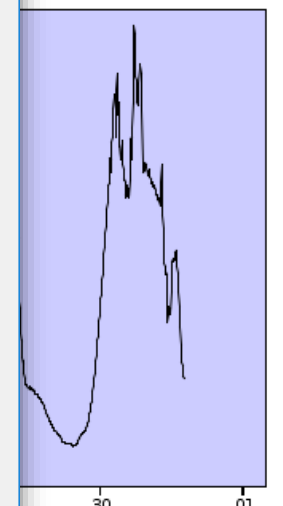
File type: NetCDF-3/CDM

```
netcdf file:/C:/Users/John/Downloads/nss02_agg_d25f_2417_7756.nc {
  dimensions:
    row = 30;
  variables:
    float longitude(row=30);
      :_CoordinateAxisType = "Lon";
      :actual_range = -157.8428f, -157.8428f; // float
      :axis = "X";
      :ioos_category = "Location";
      :long_name = "Longitude";
      :short_name = "lon";
      :standard_name = "longitude";
      :units = "degrees_east";

    float latitude(row=30);
      :_CoordinateAxisType = "Lat";
      :actual_range = 21.28641f, 21.28641f; // float
      :axis = "Y";
      :ioos_category = "Location";
      :long_name = "Latitude";
      :short_name = "lat";
      :standard_name = "latitude";
      :units = "degrees_north";

    float depth(row=30);
      :_CoordinateAxisType = "Height";
      :_CoordinateZisPositive = "down";
      :actual_range = 0.5f, 0.5f; // float
      :axis = "Z";
```

	Info	Example
Google Earth.	info	example
in a graph or map.	info	example
...pdf image file with a	info	example
in a graph or map.	info	example
in a graph or map.	info	example
...png image file with a	info	example
in a graph or map.	info	example
...data, without axes,	info	example



7 (HS17): Pago Bay, Guam
of Hawaii

ERDDAP: Output

Data fileTypes	Description
.asc	View OPeNDAP-style ISO-text.
.csv	Download a ISO-8859-1 co (line 1: names; line 2: units)
.csvp	Download a ISO-8859-1 .c (units). Times are ISO 860
.csv0	Download a ISO-8859-1 .c or units. Times are ISO 86
.dataTable	A JSON file formatted for u Visualization client library (
.das	View the dataset's metadata OPeNDAP Dataset Attribut
.dds	View the dataset's structur OPeNDAP Dataset Descrip
.dods	OPeNDAP clients use this DODS binary format.
.esriCsv	Download a ISO_8859_1 . and below (separate date
.fgdc	View the dataset's UTF-8 f
.geoJson	Download longitude,latitude UTF-8 GeoJSON .json file.
.graph	View a Make A Graph web
.help	View a web page with a de
.html	View an OPeNDAP-style H
.htmlTable	View a UTF-8 .html web pa Times are ISO 8601 string
.iso19115	View the dataset's ISO 19 metadata.
.itx	Download an ISO-8859-1 r response column becomes
.json	View a table-like UTF-8 JS 'null'; times are ISO 8601 s
.jsonICSV1	View a UTF-8 JSON Lines on line 1 (mv = 'null'; times
.jsonICSV	View a UTF-8 JSON Lines names (mv = 'null'; times a
.jsonIKVP	View a UTF-8 JSON Lines (missing value = 'null'; times are ISO 8601 strings).

Panoply: Panoply — Sources

temperature in nss02_agg_d25f_2417_7756

File Edit View History Bookmarks Plot Window Help

Plot Array 1

Temperature (processed)

— Temperature (processed) (Celsius)

Data Min = 28.6, Max = 28.9

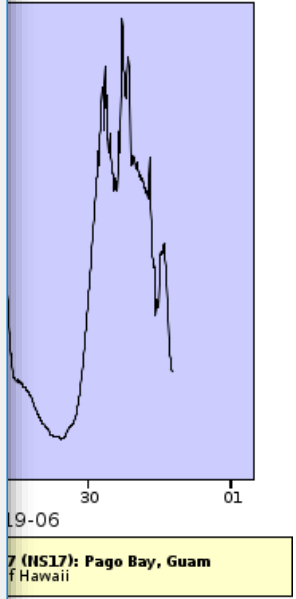
Array(s) Grid Stroke Labels

Plot: Array 1 Only

Array 1: temperature
No additional dimensions

Show: All variables

	Info	Example
Google Earth.	info	example
in a graph or map.	info	example
...pdf image file with a	info	example
in a graph or map.	info	example
in a graph or map.	info	example
...png image file with a	info	example
in a graph or map.	info	example
data, without axes,	info	example



ERDDAP: Output Formats

0101
1010
0110



Data fileType

- .asc
- .csv
- .csvp
- .csv0
- .dataT
- .das
- .dds
- .dods
- .esriC
- .fgdc
- .geods
- .graph
- .help
- .html
- .htmlT
- .iso19
- .itx

RGui (64-bit)

File History Resize Windows

R Console

```

> # Load libraries. If not installed yet, first run:
> # install.packages("rerddap")
> # install.packages("ggplot2")
> # install.packages("parsedate")
> library("rerddap")
> library("ggplot2")
> library("parsedate")
>
> # Tell "rerddap" to use PacIOOS ERDDAP server:
> Sys.setenv(RERDDAP_DEFAULT_URL = "http://oos.soest.hawaii.edu/erddap/")
>
> # Load data by specifying an ERDDAP identifier and subset params:
> nss02_info <- info("nss02_agg")
> nss02_data <- tabledap(nss02_info, fields = c("time", "temperature"), 'time>=2019-08-24', 'time<=2019-08-27')
>
> # Convert temperatures from char to num:
> nss02_data$temperature <- as.numeric(nss02_data$temperature)
>
> # Convert times char to R date-time:
> nss02_data$time <- parse_iso_8601(nss02_data$time)
>
> # Make time series plot:
> ggplot(nss02_data, aes(time, temperature)) +
+   geom_line() +
+   theme_bw() +
+   ylab("water temperature (Celsius)") +
+   ggtitle("PacIOOS Nearshore Sensor 02: Hawaii Yacht Club, Oahu, Hawaii")
> |
                    
```

R Graphics: Device 2 (ACTIVE)

PacIOOS Nearshore Sensor 02: Hawaii Yacht Club, Oahu, Hawaii

Info	Example
info	example
info	example
info	example
info	example
info	example
info	example
info	example

.json	View a table-like UTF-8 JSON file (missing value = 'null'; times are ISO 8601 strings).	info	example
.jsonICSV1	View a UTF-8 JSON Lines CSV file with column names on line 1 (mv = 'null'; times are ISO 8601 strings).	info	example
.jsonICSV	View a UTF-8 JSON Lines CSV file without column names (mv = 'null'; times are ISO 8601 strings).	info	example
.jsonIKVP	View a UTF-8 JSON Lines file with Key:Value pairs (missing value = 'null'; times are ISO 8601 strings).	info	example

.xhtml	View a UTF-8 XHTML (XML) file with the data in a table. Times are ISO 8601 strings.	info	example
--------	---	----------------------	-------------------------

— PacIOOS Nearshore Sensor 17 (HS17): Pago Bay, Guam
Data courtesy of University of Hawaii

i For examples and further details, please visit:
<https://coastwatch.pfeg.noaa.gov/erddap/tabledap/documentation.html#fileType>

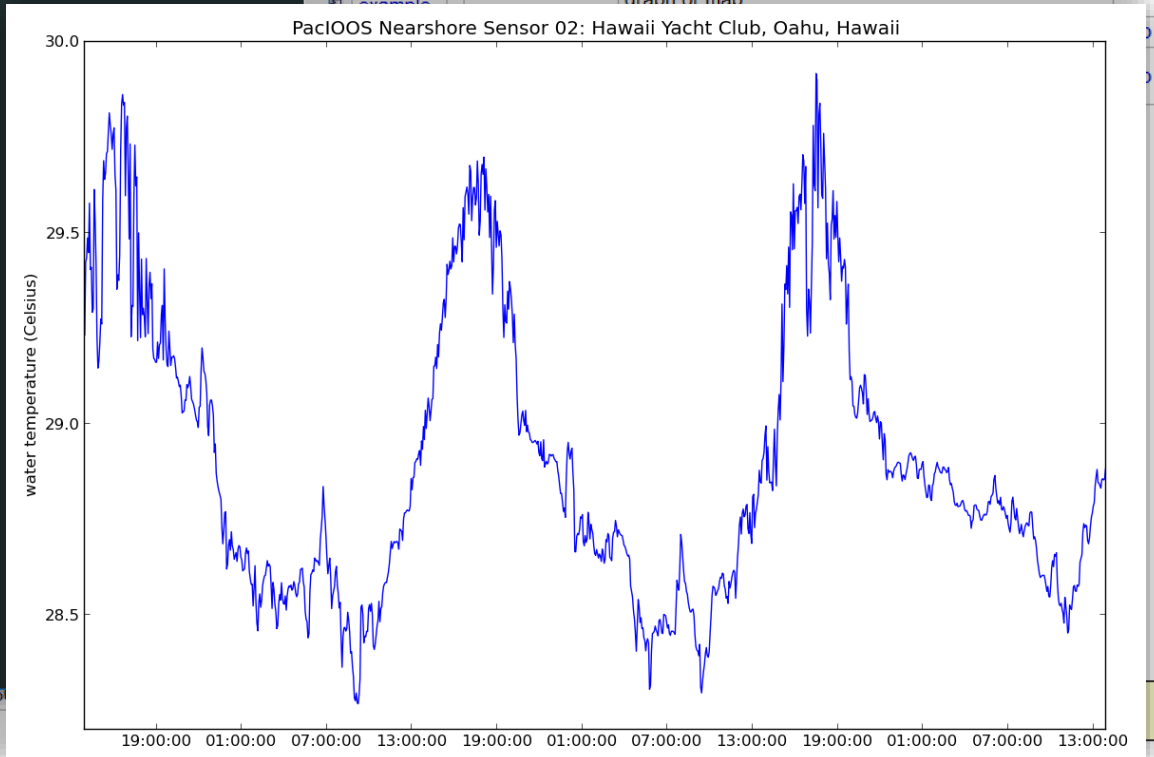


```

Python 2.7 (r27:82500, Jan 26 2011, 11:47:03)
[GCC 4.1.2 20071124 (Red Hat 4.1.2-42)] on linux2
Type "help", "copyright", "credits" or "license" for more information.
>>> # Import required Python modules:
... from pydap.client import open_dods
>>> import matplotlib.pyplot as plt
>>> import datetime
>>>
>>> # Load data by specifying an ERDDAP .dods URL with subset params:
... nss02_dods = open_dods('http://oos.soest.hawaii.edu/erddap/tabledap/nss02_agg.dods?time,temperature&time>=20
19-08-24T23:56:00Z')
>>>
>>> # All data stored in "s" object (for sequence):
... nss02_data = nss02_dods['s']
>>>
>>> # Convert epoch timestamps to Python datetimes:
... time = [datetime.datetime.fromtimestamp(date) for date in nss02_data['time']]
>>>
>>> # Extract water temperatures:
... temperature = [x for x in nss02_data['temperature']]
>>>
>>> # Make time series plot:
... plt.figure(figsize=(12,8))
&ltmatplotlib.figure.Figure object at 0x13c6fe50>
>>> plt.plot(time, temperature)
&ltmatplotlib.lines.Line2D object at 0x13e1c0d0>
>>> plt.title('PacIOOS Nearshore Sensor 02: Hawaii Yacht Club, Oahu, Hawaii')
&ltmatplotlib.text.Text object at 0x13d26bd0>
>>> plt.ylabel('water temperature (Celsius)')
&ltmatplotlib.text.Text object at 0x13d18dd0>
>>> plt.tight_layout()
>>> plt.show()
>>>
>>> # Save plot:
... plt.savefig('nss02_data.png')
>>>
    
```



Example	Image fileTypes	Description	Info	Example
example	.kml	View a .kml file, suitable for Google Earth.	info	example
example	.smallPdf	View a small .pdf image file with a graph or map.	info	example
example	.pdf	View a standard, medium-sized .pdf image file with a graph or map.	info	example
example	.largePdf	View a large .pdf image file with a graph or map.	info	example
example	.smallPng	View a small .png image file with a graph or map.	info	example
example	.png	View a standard, medium-sized .png image file with a graph or map.	info	example



.jsonCSV1	View a UTF-8 JSON Lines CSV file with column names on line 1 (mv = 'null'; times are ISO 8601 strings).	info	example
.jsonCSV	View a UTF-8 JSON Lines CSV file without column names (mv = 'null'; times are ISO 8601 strings).	info	example
.jsonKVP	View a UTF-8 JSON Lines file with Key:Value pairs (missing value = 'null'; times are ISO 8601 strings).	info	example

i For examples and further details, please visit: <https://coastwatch.pfeg.noaa.gov/erddap/tabledap/documentation.html#fileType>

MATLAB R2019a - academic use

HOME PLOTS APPS

New Script New Live Script New Open Find Files Import Data Save Workspace New Variable Open Variable Clear Workspace Favorites Analyze Code Run and Time Clear Commands Simulink Layout Preferences Set Path Add-Ons Help Community Request Support Learn MATLAB

FILE VARIABLE CODE SIMULINK ENVIRONMENT RESOURCES

C:\Users\John\Documents\MATLAB

Command Window

```
>> % Load data by specifying ERDDAP .mat URL with subset params:
>> load(urlwrite('http://oos.soest.hawaii.edu/erddap/tabledap/nss02_agg.mat?time,temperature&time>=2019-08-25T00:00:00Z&time<=2019-08-27T00:00:00Z', 'nss02_agg.mat'))
>> % Make time series plot:
>> plot(datetime(nss02_agg.time, 'convertfrom','posixtime'), nss02_agg.temperature)
>> % Add plot labels:
>> title('PacIOOS Nearshore Sensor 02 (NS02): Hawaii Yacht Club, Oahu, Hawaii')
>> ylabel('water temperature (Celsius)')
>> xlabel('UTC')
>> |
```

Workspace

Name	Value
nss02_agg	1x1 struct

Figure 1

PacIOOS Nearshore Sensor 02 (NS02): Hawaii Yacht Club, Oahu, Hawaii

water temperature (Celsius)

UTC

2019

Aug 25, 00:00 Aug 25, 12:00 Aug 26, 00:00 Aug 26, 12:00 Aug 27, 00:00

MATLAB

ERDD

- Data file Types
- .asc
- .csv
- .csvp
- .csv0
- .dataTable
- .das
- .dds
- .dods
- .esriCsv
- .fgdc
- .geoJson
- .graph
- .help
- .html
- .htmlTable
- .iso19115
- .itx
- .json
- .jsonCSV
- .jsonCSV

```

-<gmd:identificationInfo>
  -<gmd:MD_DataIdentification id="DataIdentification">
    -<gmd:citation>
      -<gmd:CI_Citation>
        -<gmd:title>
          -<gco:CharacterString>
            PacIOOS Nearshore Sensor 02 (NS02): Hawaii Yacht Club, Oahu, Hawaii
          </gco:CharacterString>
        </gmd:title>
        -<gmd:date>
          +<gmd:CI_Date></gmd:CI_Date>
          </gmd:date>
        -<gmd:date>
          -<gmd:CI_Date>
            -<gmd:date>
              <gco:Date>2008-07-29</gco:Date>
            </gmd:date>
          </gmd:CI_Date>
          -<gmd:dateType>
            <gmd:CI_DateTypeCode codeList="https://data.noaa.gov/resources/iso19139/schema/resources/Codelist/gmxCodeLists.xml#gmd:CI_DateTypeCode"
              codeListValue="issued">issued</gmd:CI_DateTypeCode>
            </gmd:dateType>
          </gmd:CI_Date>
          </gmd:date>
        -<gmd:identifier>
          -<gmd:MD_Identifier>
            -<gmd:authority>
              -<gmd:CI_Citation>
                -<gmd:title>
                  <gco:CharacterString>oos.soest.hawaii.edu</gco:CharacterString>
                </gmd:title>
                <gmd:date gco:nilReason="inapplicable"/>
              </gmd:CI_Citation>
              </gmd:authority>
            -<gmd:code>
              <gco:CharacterString>nss02_agg</gco:CharacterString>
            </gmd:code>
          </gmd:MD_Identifier>
          </gmd:identifier>
        -<gmd:citedResponsibleParty>
          -<gmd:CI_ResponsibleParty>
            -<gmd:individualName>
              <gco:CharacterString>Margaret McManus</gco:CharacterString>
            </gmd:individualName>
            -<gmd:organisationName>
              <gco:CharacterString>University of Hawaii</gco:CharacterString>
            </gmd:organisationName>
          </gmd:CI_ResponsibleParty>
        </gmd:citedResponsibleParty>
      </gmd:CI_Citation>
    </gmd:citation>
  </gmd:MD_DataIdentification>
</gmd:identificationInfo>
  
```



ISO 19115-2/19139

```

-<metadata xsi:noNamespaceSchemaLocation="http://fgdxml.sourceforge.net/schema/fgdc-std-012-2002/fgdc-std-012-2002.xsd">
  -<idinfo>
    -<citation>
      -<citeinfo>
        -<origin>
          Project: Pacific Islands Ocean Observing System (PacIOOS) Name: Margaret McManus Email:
          mamc@hawaii.edu Institution: University of Hawaii InfoURL: https://www.pacioos.hawaii.edu/water/
          /sensor-hawaiiyachtclub/ Source URL: http://pacioos.org
        </origin>
        <pubdate>20080729</pubdate>
      </citeinfo>
      -<title>
        PacIOOS Nearshore Sensor 02 (NS02): Hawaii Yacht Club, Oahu, Hawaii
      </title>
      <edition>Unknown</edition>
      <geoform>tabular digital data</geoform>
      -<pubinfo>
        <pubplace>Honolulu, HI, USA</pubplace>
      </pubinfo>
      <publish>
        ERDDAP, version 2.01, at Pacific Islands Ocean Observing System (PacIOOS)
      </publish>
      <pubinfo>
        -<onlink>
          http://oos.soest.hawaii.edu/erddap/tabledap/nss02_agg.html
        </onlink>
        -<onlink>
          http://oos.soest.hawaii.edu/erddap/tabledap/nss02_agg.graph
        </onlink>
        -<workcit>
          -<citeinfo>
            <origin>Pacific Islands Ocean Observing System (PacIOOS)</origin>
          </citeinfo>
        </workcit>
      </pubinfo>
    </citation>
  -<descript>
    -<abstract>
      The nearshore sensors are part of the Pacific Islands Ocean Observing System (PacIOOS) and are
      designed to measure a variety of ocean parameters at fixed point locations along the south shore of Oahu.
      NS02 is located at a floating dock off the Hawaii Yacht Club. The instrument is a Sea-Bird Electronics
      model 16+ V2 coupled with a WET Labs ECO-FLNTUS combination sensor. The package is fixed to a
      floating dock just below the ocean surface.
    </abstract>
    <purpose>Unknown</purpose>
  </descript>
  -<supplinf>
    https://www.pacioos.hawaii.edu/water/sensor-hawaiiyachtclub/
  </supplinf>
</metadata>
  
```



FEDERAL GEOGRAPHIC DATA COMMITTEE
FGDC-STD-001-1998

- example
- example
- example
- example
- example
- example
- example
- example

.jsonIKVP View a UTF-8 JSON Lines file with Key:Value pairs (missing value = 'null'; times are ISO 8601 strings). info example

i For examples and further details, please visit: <https://coastwatch.pfeg.noaa.gov/erddap/tabledap/documentation.html#fileType>

ERDDAP: Output Formats

Data fileTypes	Description	Info
.asc	View OPeNDAP-style ISO-8859-1 comma-separated text.	info example
.csv	Download a ISO-8859-1 comma-separated text table (line 1: names; line 2: units; ISO 8601 times).	info example
.csvp	Download a ISO-8859-1 .csv file with line 1: name (units). Times are ISO 8601 strings.	info example
.csv0	Download a ISO-8859-1 .csv file without column names or units. Times are ISO 8601 strings.	info example
.dataTable	A JSON file formatted for use with the Google Visualization client library (Google Charts).	info example
.das	View the dataset's metadata via an ISO-8859-1 OPeNDAP Dataset Attribute Structure (DAS).	info example
.dds	View the dataset's structure via an ISO-8859-1 OPeNDAP Dataset Descriptor Structure (DDS).	info example
.dods	OPeNDAP clients use this to download the data in the DODS binary format.	info example
.esriCsv	Download a ISO_8859_1 .csv file for ESRI's ArcGIS 9.x and below (separate date and time columns).	info example
.fgdc	View the dataset's UTF-8 FGDC .xml metadata.	info example
.geoJson	Download longitude,latitude,otherColumns data as a UTF-8 GeoJSON .json file.	info example
.graph	View a Make A Graph web page.	info example
.help	View a web page with a description of tabledap.	info example
.html	View an OPeNDAP-style HTML Data Access Form.	info example
.htmlTable	View a UTF-8 .html web page with the data in a table. Times are ISO 8601 strings.	info example
.iso19115	View the dataset's ISO 19115-2/19139 UTF-8 .xml metadata.	info example
.itx	Download an ISO-8859-1 Igor Text File. Each response column becomes a wave.	info example
.json	View a table-like UTF-8 JSON file (missing value = 'null'; times are ISO 8601 strings).	info example
.jsonlCSV1	View a UTF-8 JSON Lines CSV file with column names on line 1 (mv = 'null'; times are ISO 8601 strings).	info example
.jsonlCSV	View a UTF-8 JSON Lines CSV file without column names (mv = 'null'; times are ISO 8601 strings).	info example
.jsonlKVP	View a UTF-8 JSON Lines file with Key:Value pairs (missing value = 'null'; times are ISO 8601 strings).	info example

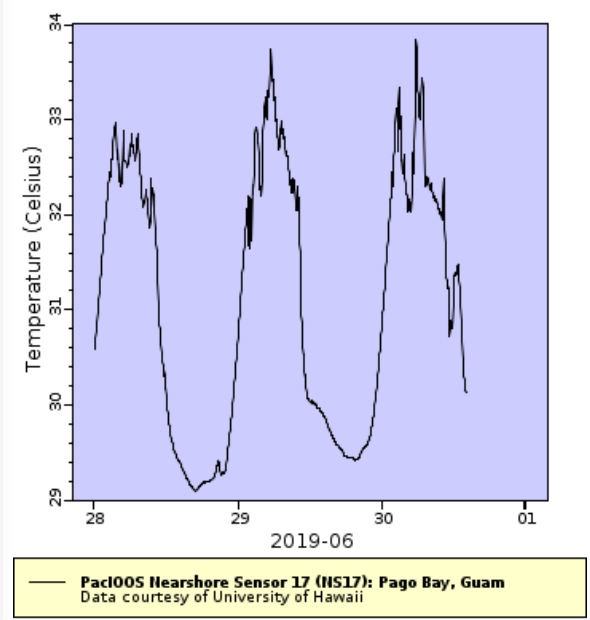
```

1 {
2   "table": {
3     "columnNames": ["time", "temperature"],
4     "columnTypes": ["String", "float"],
5     "columnUnits": ["UTC", "Celsius"],
6     "rows": [
7       ["2019-08-25T00:00:00Z", 29.4241],
8       ["2019-08-25T00:04:00Z", 29.435],
9       ["2019-08-25T00:08:00Z", 29.487],
10      ["2019-08-25T00:12:00Z", 29.4487],
11      ["2019-08-25T00:16:00Z", 29.5782],
12      ["2019-08-25T00:20:00Z", 29.4044],
13      ["2019-08-25T00:24:00Z", 29.4102],
14      ["2019-08-25T00:28:00Z", 29.2926],
15      ["2019-08-25T00:32:00Z", 29.3019],
16      ["2019-08-25T00:36:00Z", 29.6139],
17      ["2019-08-25T00:40:00Z", 29.5328],
18      ["2019-08-25T00:44:00Z", 29.4189],
19      ["2019-08-25T00:48:00Z", 29.2238],
20      ["2019-08-25T00:52:00Z", 29.1466],
21      ["2019-08-25T00:56:00Z", 29.1654],
22      ["2019-08-25T01:00:00Z", 29.2136],
23      ["2019-08-25T01:04:00Z", 29.2749],
24      ["2019-08-25T01:08:00Z", 29.262],
25      ["2019-08-25T01:12:00Z", 29.5853],
26      ["2019-08-25T01:16:00Z", 29.6893],
27      ["2019-08-25T01:20:00Z", 29.6402],
28      ["2019-08-25T01:24:00Z", 29.6565],
29      ["2019-08-25T01:28:00Z", 29.7081],
30      ["2019-08-25T01:32:00Z", 29.7128],
31      ["2019-08-25T01:36:00Z", 29.7664],
32      ["2019-08-25T01:40:00Z", 29.8145],
33      ["2019-08-25T01:44:00Z", 29.7827],
34      ["2019-08-25T01:48:00Z", 29.7588],
35      ["2019-08-25T01:52:00Z", 29.719],
36      ["2019-08-25T01:56:00Z", 29.7583],
37      ["2019-08-25T02:00:00Z", 29.7753],
38      ["2019-08-25T02:04:00Z", 29.6539],
39      ["2019-08-25T02:08:00Z", 29.6122],
40      ["2019-08-25T02:12:00Z", 29.3526],
41      ["2019-08-25T02:16:00Z", 29.3906],
42      ["2019-08-25T02:20:00Z", 29.3759],
43      ["2019-08-25T02:24:00Z", 29.4427],
44      ["2019-08-25T02:28:00Z", 29.7149]
45    ]
46  }
47 }

```

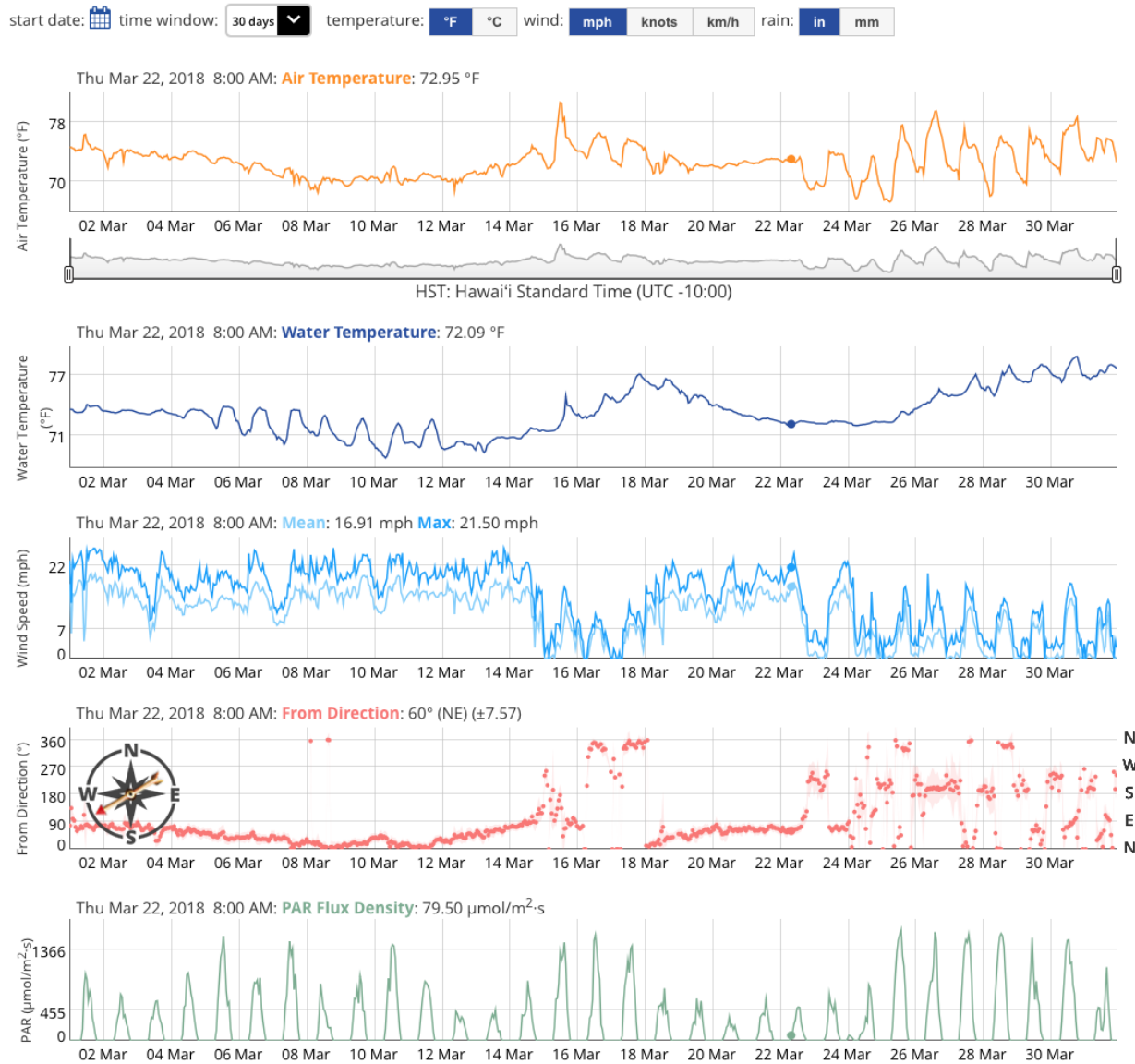


Description	Info	Example
View a .kml file, suitable for Google Earth.	info	example
View a small .pdf image file with a graph or map.	info	example
View a standard, medium-sized .pdf image file with a graph or map.	info	example
View a large .pdf image file with a graph or map.	info	example
View a small .png image file with a graph or map.	info	example
View a standard, medium-sized .png image file with a graph or map.	info	example
View a large .png image file with a graph or map.	info	example
View a .png image file (just the data, without axes, landmark, or legend).	info	example



i For examples and further details, please visit: <https://coastwatch.pfeg.noaa.gov/erddap/tabledap/documentation.html#fileType>

Dynamic Custom Data Visualization



PacIOOS Nearshore Sensor 02 (NS02): Hawaii Yacht Club, Oahu, Hawaii

id: NS02agg

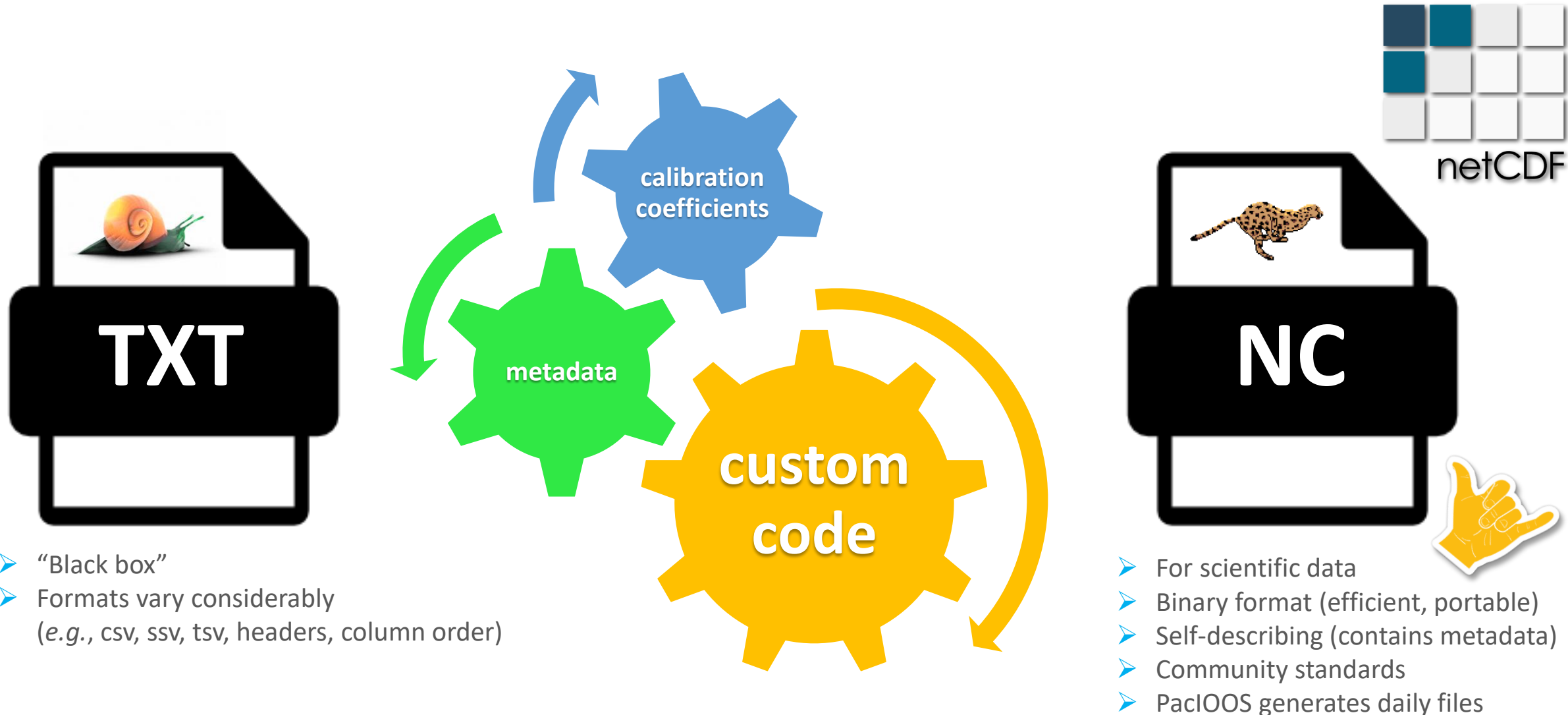
The nearshore sensors are part of the Pacific Islands Ocean Observing System (PacIOOS) and are designed to measure a variety of ocean parameters at fixed point locations along the south shore of Oahu. NS02 is located at a floating dock off the Hawaii Yacht Club. The instrument is a Sea-Bird Electronics model 16+ V2 coupled with a WET Labs ECO-FLNTUS combination sensor. The package is fixed to a floating dock just below the ocean surface.

begin date: July 29, 2008 **end date:** March 18, 2019

keywords: [show](#)

access methods: [HTML](#) • [Voyager](#) • [THREDDS](#) • [ERDDAP](#) • [OPeNDAP](#)

NetCDF: Network Common Data Form



ERDDAP Installation



Bob Simons

NOAA Environmental Research Division
Monterey, California, USA

Is the installation procedure hard? Can I do it?

The initial installation takes some time, but it isn't very hard. **You can do it.** If you get stuck, email me at [bob dot simons at noaa dot gov](mailto:bob_dot_simons_at_noaa_dot_gov). I will help you.

Or, you can join the [ERDDAP Google Group / Mailing List](#) and post your question there.



How To Do the Initial Setup of ERDDAP on Your Server

ERDDAP can run on any server that supports **Java and Tomcat** (and perhaps other application servers). ERDDAP has been tested on Linux (including on Amazon's AWS), Mac, and Windows computers.

- **Amazon** -- If you are installing ERDDAP on an Amazon Web Services EC2 instance, see this [Amazon Web Services Overview](#) (below) first.
- **Docker** -- Axiom now offers [ERDDAP in a Docker container](#). If you don't already use Docker, we don't recommend this. If you chose to install ERDDAP via Docker, we don't offer any support for the installation process. We haven't worked with Docker yet. If you work with this, please send us your comments.
- **Linux and Macs** -- ERDDAP works great on Linux and Mac computers.
- **Windows** -- Windows is fine for testing ERDDAP and for personal use, but we don't recommend using it for public ERDDAPs. Running ERDDAP on Windows may have problems: notably, ERDDAP may be unable to delete and/or rename files quickly. This is probably due to antivirus software (e.g., from McAfee and Norton) which is checking the files for viruses. If you run into this problem (which can be seen by error messages in the [log.txt](#) file like "Unable to delete ..."), changing the antivirus software's settings may partially alleviate the problem. Or consider using a Linux or Mac server instead.



Apache
Tomcat



For further details, please visit:

<https://coastwatch.pfeg.noaa.gov/erddap/download/setup.html>

ERDDAP Configuration



datasets.xml



Some Assembly Required

Setting up a dataset in ERDDAP isn't just a matter of pointing to the dataset's directory or URL. You have to write a chunk of XML for `datasets.xml` which describes the dataset.

Making the `datasets.xml` takes considerable effort for the first few datasets, but **it gets easier**. After the first dataset, you can often re-use a lot of your work for the next dataset. Fortunately, there are two [Tools](#) to help you create the XML for each dataset in `datasets.xml`.

If you get stuck, please send an email with the details to `bob dot simons at noaa dot gov`. Or, you can join the [ERDDAP Google Group / Mailing List](#) and post your question there.



For further details, please visit:

<https://coastwatch.pfeg.noaa.gov/erddap/download/setupDatasetsXml.html>

ERDDAP Configuration



datasets.xml



Some Assembly Required

Setting up a dataset in ERDDAP isn't just a matter of pointing to the dataset's directory or URL. You have to write a chunk of XML for `datasets.xml` which describes the dataset.

Making the `datasets.xml` takes considerable effort for the first few datasets, but **it gets easier**. After the first dataset, you can often re-use a lot of your work for the next dataset. Fortunately, there are two **Tools** to help you create the XML for each dataset in `datasets.xml`. If you get stuck, please send an email with the details to `bob dot simons at noaa dot gov`. Or, you can join the [ERDDAP Google Group / Mailing List](#) and post your question there.



ERDDAP command-line utilities:

➤ **GenerateDatasetsXml**

generate a rough draft of the dataset XML for almost any type of dataset

➤ **DasDds**

test and refine the XML prior to adding to your `datasets.xml`



For further details, please visit:

<https://coastwatch.pfeg.noaa.gov/erddap/download/setupDatasetsXml.html>

```
lawelawe.pacioos.hawaii.edu - lawelawe - SSH Secure Shell
File Edit View Window Help
Quick Connect Profiles

<dataset type="EDDTableFromNoFiles" datasetID="nss02_agg">
  <nDimensions>4</nDimensions>
  <reloadEveryNMinutes>10</reloadEveryNMinutes>
  <fileDir>/export/lawelawe/nss/nss02/agg</fileDir>
  <recursive>>false</recursive>
  <fileNameRegex>nss02_.*\nc</fileNameRegex>
  <metadataFrom>last</metadataFrom>
  <preExtractRegex>nss02_</preExtractRegex>
  <postExtractRegex>\nc</postExtractRegex>
  <sortedColumnName>time</sortedColumnName>
  <defaultGraphQuery>time,temperature&amp;time&gt;=max(time)-3days&amp;.draw=lines</defaultGraphQuery>
  <defaultDataQuery>time,temperature,conductivity,turbidity,chlorophyll,salinity&amp;time&gt;=max(time)-3days</default
DataQuery>
  <addAttributes>
    <att name="title">PacIOOS Nearshore Sensor 02 (NS02): Hawaii Yacht Club, Oahu, Hawaii</att>
    <att name="summary">The nearshore sensors are part of the Pacific Islands Ocean Observing System (PacIOOS) and a
re designed to measure a variety of ocean parameters at fixed point locations along the south shore of Oahu. NS02 is located
at a floating dock off the Hawaii Yacht Club. The instrument is a Sea-Bird Electronics model 16+ V2 coupled with a WET Labs
ECO-FLNTUS combination sensor. The package is fixed to a floating dock just below the ocean surface.</att>
    <att name="id">NS02agg</att>
    <att name="naming_authority">org.pacioos</att>
    <att name="Conventions">CF-1.6, ACDD-1.3</att>
    <att name="Metadata_Link">http://pacioos.org/metadata/NS02agg.html</att>
    <att name="ISO_Topic_Categories">environment, oceans</att>
    <att name="keywords">Earth Science &gt; Oceans &gt; Ocean Chemistry &gt; Chlorophyll, Earth Science &gt; Oceans
&gt; Ocean Optics &gt; Turbidity, Earth Science &gt; Oceans &gt; Ocean Temperature &gt; Water Temperature, Earth Science &gt;
Oceans &gt; Salinity/Density &gt; Conductivity, Earth Science &gt; Oceans &gt; Salinity/Density &gt; Salinity, Earth Scien
ce &gt; Oceans &gt; Water Quality</att>
    <att name="keywords_vocabulary">GCMD Science Keywords</att>
    <att name="platform">In Situ Land-based Platforms &gt; Ocean Platform/Ocean Stations &gt; Coastal Stations</att>
    <att name="platform_vocabulary">GCMD Platform Keywords</att>
    <att name="instrument">In Situ/Laboratory Instruments &gt; Chemical Meters/Analyzers &gt; &gt; &gt; Fluorometers
, In Situ/Laboratory Instruments &gt; Conductivity Sensors, In Situ/Laboratory Instruments &gt; Photon/Optical Detectors &gt;
&gt; &gt; Turbidity Meters, In Situ/Laboratory Instruments &gt; Profilers/Sounders &gt; &gt; &gt; CTD, In Situ/Laboratory
Instruments &gt; Temperature/Humidity Sensors &gt; &gt; &gt; Temperature Sensors</att>
    <att name="instrument_vocabulary">GCMD Instrument Keywords</att>
    <att name="locations">Continent &gt; North America &gt; United States Of America &gt; Hawaii, Ocean &gt; Pacific
Ocean &gt; Central Pacific Ocean &gt; Hawaiian Islands &gt; Oahu &gt; Ala Wai Canal, Ocean &gt; Pacific Ocean &gt; Central
Pacific Ocean &gt; Hawaiian Islands &gt; Oahu &gt; Honolulu, Ocean &gt; Pacific Ocean &gt; Central Pacific Ocean &gt; Hawaii
an Islands &gt; Oahu &gt; Waikiki</att>
    <att name="locations_vocabulary">GCMD Location Keywords</att>
    <att name="standard_name_vocabulary">CF Standard Name Table v39</att>
    <att name="history">UH/SOEST (M. McManus), PacIOOS asset (07/2008), QARTOD QA/QC implemented (01/2016)</att>
    <att name="comment">Data produced by Dr. Margaret McManus (mamc@hawaii.edu). Point of contact: Gordon Walker (gw
alker@hawaii.edu).</att>
    <att name="geospatial_lat_min" type="double">21.286407</att>
    <att name="geospatial_lat_max" type="double">21.286407</att>
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    <att name="geospatial_vertical_positive">up</att>
    <att name="geospatial_bounds">POINT Z (21.286407 -157.84276 -0.5)</att>
    <att name="geospatial_bounds_crs">EPSG:4326</att>
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```

#1/4

```
lawelawe.pacioos.hawaii.edu - lawelawe - SSH Secure Shell
File Edit View Window Help
Quick Connect Profiles

<att name="geospatial_lat_resolution" type="double">0.0</att>
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<att name="creator_email">mamc@hawaii.edu</att>
<att name="creator_name">Margaret McManus</att>
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<att name="creator_url">http://www.soest.hawaii.edu/oceanography/faculty/mcmanus.html</att>
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<att name="project">Pacific Islands Ocean Observing System (PacIOOS)</att>
<att name="program">Pacific Islands Ocean Observing System (PacIOOS)</att>
<att name="contributor_name">Jim Potemra</att>
<att name="contributor_role">distributor</att>
<att name="publisher_email">info@pacioos.org</att>
<att name="publisher_name">Pacific Islands Ocean Observing System (PacIOOS)</att>
<att name="publisher_url">http://pacioos.org</att>
<att name="publisher_institution">University of Hawaii</att>
<att name="publisher_type">group</att>
<att name="processing_level">near real-time (nrt)</att>
<att name="license">The data may be used and redistributed for free but is not intended for legal use, since it
may contain inaccuracies. Neither the data Contributor, University of Hawaii, PacIOOS, NOAA, State of Hawaii nor the United
States Government, nor any of their employees or contractors, makes any warranty, express or implied, including warranties o
f merchantability and fitness for a particular purpose, or assumes any legal liability for the accuracy, completeness, or us
efulness, of this information.</att>
<att name="acknowledgement">The Pacific Islands Ocean Observing System (PacIOOS) is funded through the National
Oceanic and Atmospheric Administration (NOAA) as a Regional Association within the U.S. Integrated Ocean Observing System (I
OOS). PacIOOS is coordinated by the University of Hawaii School of Ocean and Earth Science and Technology (SOEST).</att>
<att name="odm_data_type">Point</att>
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tt>
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  <destinationName>depth</destinationName>
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    <att name="scale_factor" type="float">-1</att>
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```

#2/4

```
lavelawe.pacioos.hawaii.edu - lavelawe - SSH Secure Shell
File Edit View Window Help
Quick Connect Profiles

</addAttributes>
</dataVariable>
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  <destinationName>longitude</destinationName>
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</erddapDataset>
```

#3/4

7319,9 31%

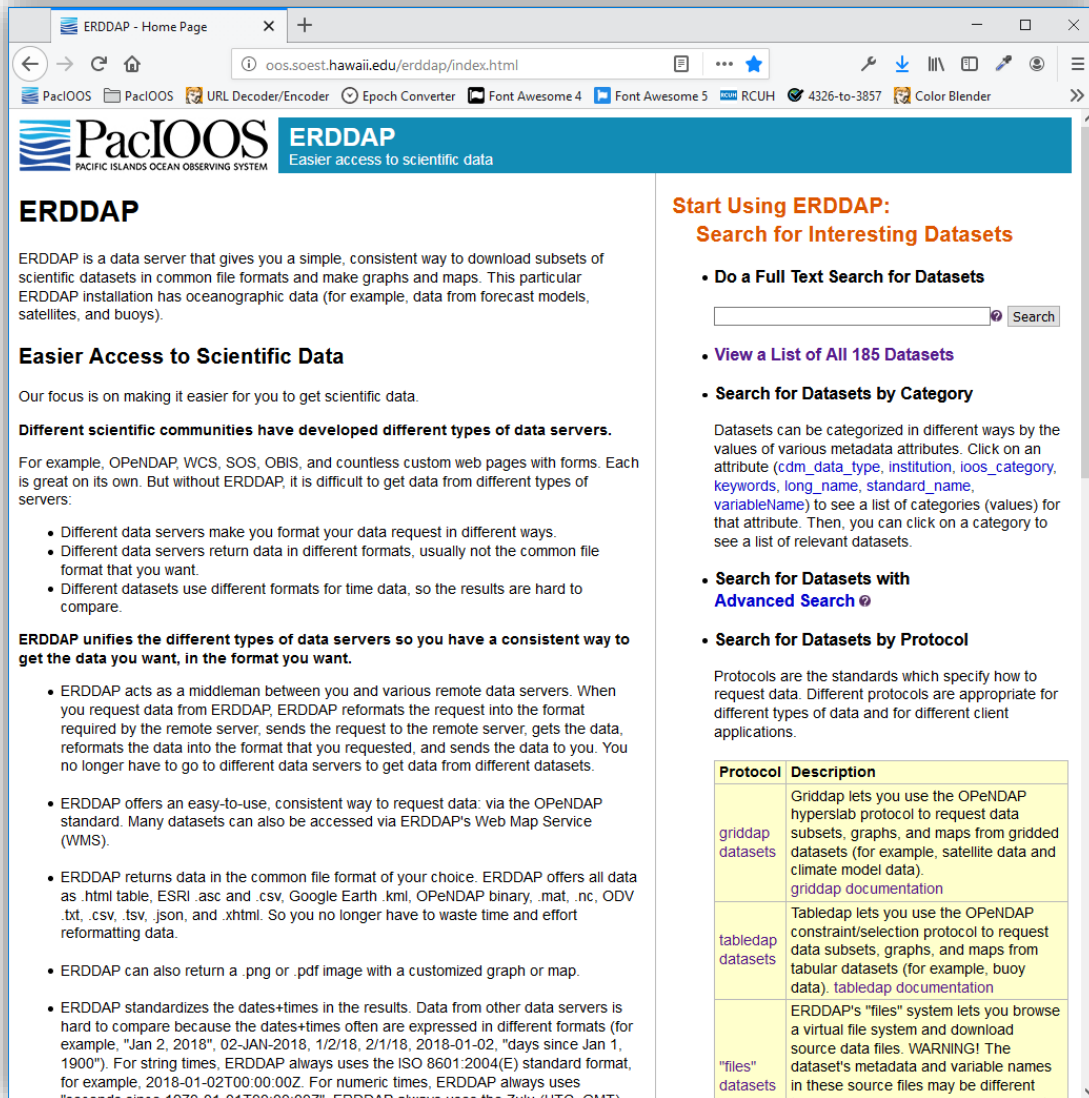
```
lavelawe.pacioos.hawaii.edu - lavelawe - SSH Secure Shell
File Edit View Window Help
Quick Connect Profiles

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#4/4

7350,1 Bot

ERDDAP Data Provider Form



The screenshot shows the ERDDAP website interface. The browser address bar shows 'oos.soest.hawaii.edu/erddap/index.html'. The page header includes the PacIOOS logo and the text 'ERDDAP Easier access to scientific data'. The main content is divided into two columns. The left column contains the title 'ERDDAP', a brief description of the data server, and sections for 'Easier Access to Scientific Data' and 'ERDDAP unifies the different types of data servers...'. The right column features a section titled 'Start Using ERDDAP: Search for Interesting Datasets' with three bullet points: 'Do a Full Text Search for Datasets' (with a search input field), 'View a List of All 185 Datasets', and 'Search for Datasets by Category'. Below these is a paragraph explaining how datasets are categorized. Further down are two more bullet points: 'Search for Datasets with Advanced Search' and 'Search for Datasets by Protocol'. At the bottom of the right column is a table with two columns: 'Protocol' and 'Description'. The table lists three protocols: 'griddap datasets', 'tabledap datasets', and 'files datasets', each with a brief description of how they work.

ERDDAP

ERDDAP is a data server that gives you a simple, consistent way to download subsets of scientific datasets in common file formats and make graphs and maps. This particular ERDDAP installation has oceanographic data (for example, data from forecast models, satellites, and buoys).

Easier Access to Scientific Data

Our focus is on making it easier for you to get scientific data.

Different scientific communities have developed different types of data servers.

For example, OPeNDAP, WCS, SOS, OBIS, and countless custom web pages with forms. Each is great on its own. But without ERDDAP, it is difficult to get data from different types of servers:

- Different data servers make you format your data request in different ways.
- Different data servers return data in different formats, usually not the common file format that you want.
- Different datasets use different formats for time data, so the results are hard to compare.

ERDDAP unifies the different types of data servers so you have a consistent way to get the data you want, in the format you want.

- ERDDAP acts as a middleman between you and various remote data servers. When you request data from ERDDAP, ERDDAP reformats the request into the format required by the remote server, sends the request to the remote server, gets the data, reformats the data into the format that you requested, and sends the data to you. You no longer have to go to different data servers to get data from different datasets.
- ERDDAP offers an easy-to-use, consistent way to request data: via the OPeNDAP standard. Many datasets can also be accessed via ERDDAP's Web Map Service (WMS).
- ERDDAP returns data in the common file format of your choice. ERDDAP offers all data as .html table, ESRI .asc and .csv, Google Earth .kml, OPeNDAP binary, .mat, .nc, ODV .txt, .csv, .tsv, .json, and .xhtml. So you no longer have to waste time and effort reformatting data.
- ERDDAP can also return a .png or .pdf image with a customized graph or map.
- ERDDAP standardizes the dates+times in the results. Data from other data servers is hard to compare because the dates+times often are expressed in different formats (for example, "Jan 2, 2018", "02-JAN-2018", "1/2/18", "2/1/18", "2018-01-02", "days since Jan 1, 1900"). For string times, ERDDAP always uses the ISO 8601:2004(E) standard format, for example, "2018-01-02T00:00:00Z". For numeric times, ERDDAP always uses "seconds since 1970-01-01T00:00:00Z". ERDDAP always uses the Zulu (UTC) GMT.

Start Using ERDDAP: Search for Interesting Datasets

- **Do a Full Text Search for Datasets**

- **View a List of All 185 Datasets**
- **Search for Datasets by Category**

Datasets can be categorized in different ways by the values of various metadata attributes. Click on an attribute ([cdm_data_type](#), [institution](#), [ioos_category](#), [keywords](#), [long_name](#), [standard_name](#), [variableName](#)) to see a list of categories (values) for that attribute. Then, you can click on a category to see a list of relevant datasets.

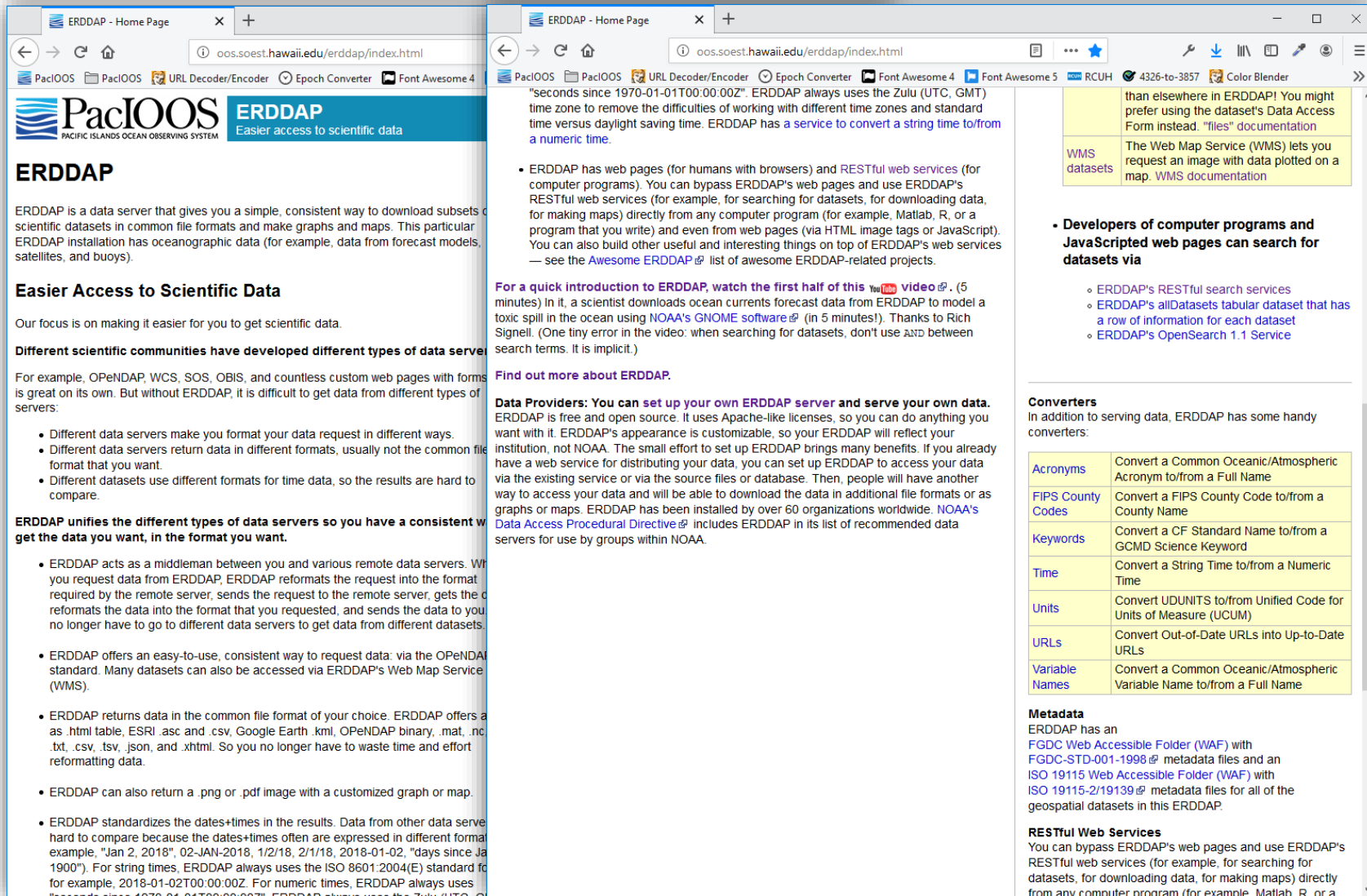
- **Search for Datasets with [Advanced Search](#)**
- **Search for Datasets by Protocol**

Protocols are the standards which specify how to request data. Different protocols are appropriate for different types of data and for different client applications.

Protocol	Description
griddap datasets	Griddap lets you use the OPeNDAP hyperslab protocol to request data subsets, graphs, and maps from gridded datasets (for example, satellite data and climate model data). griddap documentation
tabledap datasets	Tabledap lets you use the OPeNDAP constraint/selection protocol to request data subsets, graphs, and maps from tabular datasets (for example, buoy data). tabledap documentation
files datasets	ERDDAP's "files" system lets you browse a virtual file system and download source data files. WARNING! The dataset's metadata and variable names in these source files may be different



ERDDAP Data Provider Form



ERDDAP
Easier access to scientific data

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- ERDDAP offers an easy-to-use, consistent way to request data: via the OPeNDAP standard. Many datasets can also be accessed via ERDDAP's Web Map Service (WMS).
- ERDDAP returns data in the common file format of your choice. ERDDAP offers data as .html table, ESRI .asc and .csv, Google Earth .kml, OPeNDAP binary, .mat, .nc, .txt, .csv, .tsv, .json, and .xhtml. So you no longer have to waste time and effort reformatting data.
- ERDDAP can also return a .png or .pdf image with a customized graph or map.
- ERDDAP standardizes the dates+times in the results. Data from other data servers is hard to compare because the dates+times often are expressed in different formats. For example, "Jan 2, 2018", "02-JAN-2018", "1/2/18", "2/1/18", "2018-01-02", "days since Jan 1900". For string times, ERDDAP always uses the ISO 8601:2004(E) standard for dates+times. For example, "2018-01-02T00:00:00Z". For numeric times, ERDDAP always uses the ISO 8601:2004(E) standard for dates+times. For example, "1970-01-01T00:00:00Z". ERDDAP always uses the Zulu (UTC, GMT) time zone to remove the difficulties of working with different time zones and standard time versus daylight saving time. ERDDAP has a service to convert a string time to/from a numeric time.

Data Providers: You can set up your own ERDDAP server and serve your own data. ERDDAP is free and open source. It uses Apache-like licenses, so you can do anything you want with it. ERDDAP's appearance is customizable, so your ERDDAP will reflect your institution, not NOAA. The small effort to set up ERDDAP brings many benefits. If you already have a web service for distributing your data, you can set up ERDDAP to access your data via the existing service or via the source files or database. Then, people will have another way to access your data and will be able to download the data in additional file formats or as graphs or maps. ERDDAP has been installed by over 60 organizations worldwide. NOAA's Data Access Procedural Directive includes ERDDAP in its list of recommended data servers for use by groups within NOAA.

Converters

In addition to serving data, ERDDAP has some handy converters:

Acronyms	Convert a Common Oceanic/Atmospheric Acronym to/from a Full Name
FIPS County Codes	Convert a FIPS County Code to/from a County Name
Keywords	Convert a CF Standard Name to/from a GCMD Science Keyword
Time	Convert a String Time to/from a Numeric Time
Units	Convert UDUNITS to/from Unified Code for Units of Measure (UCUM)
URLs	Convert Out-of-Date URLs into Up-to-Date URLs
Variable Names	Convert a Common Oceanic/Atmospheric Variable Name to/from a Full Name

Metadata

ERDDAP has an FGDC Web Accessible Folder (WAF) with FGDC-STD-001-1998 metadata files and an ISO 19115 Web Accessible Folder (WAF) with ISO 19115-2/19139 metadata files for all of the geospatial datasets in this ERDDAP.

RESTful Web Services

You can bypass ERDDAP's web pages and use ERDDAP's RESTful web services (for example, for searching for datasets, for downloading data, for making maps) directly from any computer program (for example, Matlab, R, or a

than elsewhere in ERDDAP! You might prefer using the dataset's Data Access Form instead. "files" documentation

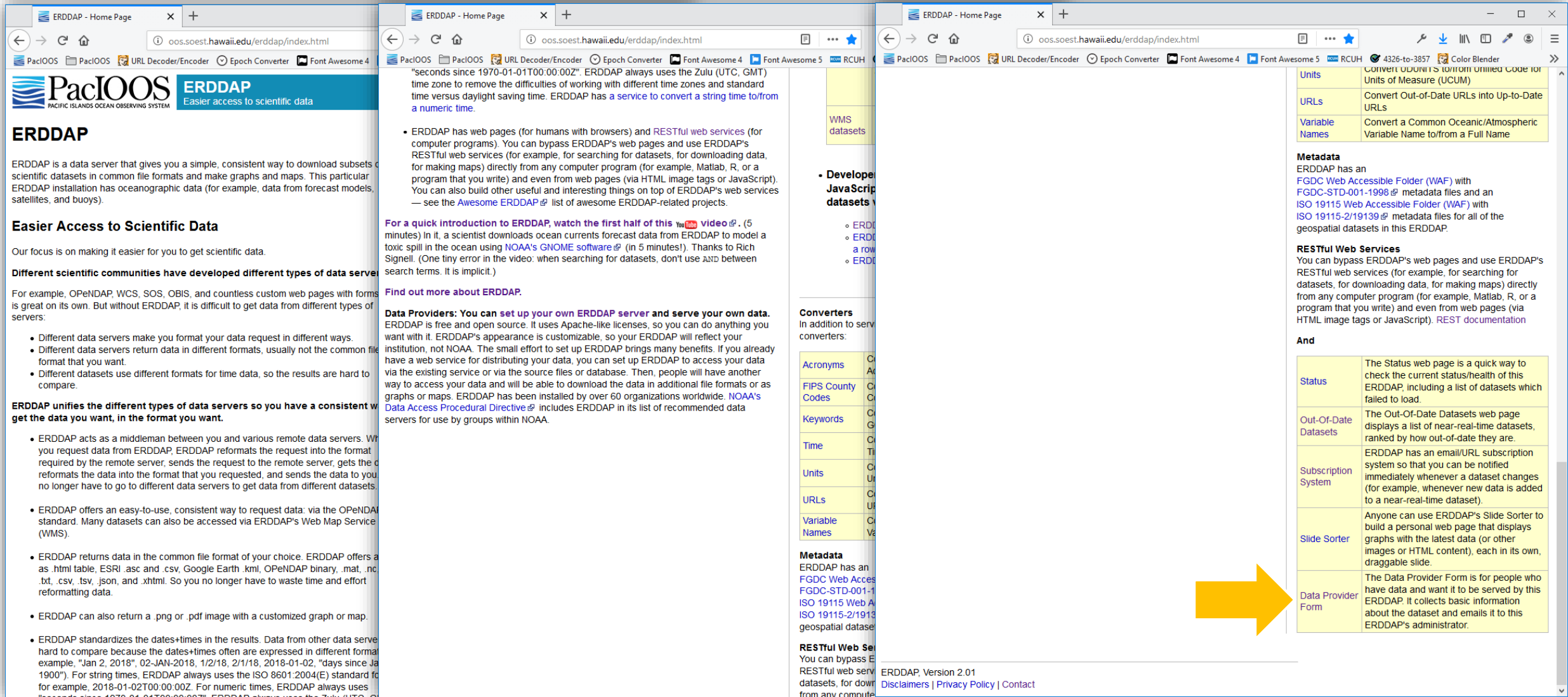
WMS datasets The Web Map Service (WMS) lets you request an image with data plotted on a map. WMS documentation

• **Developers of computer programs and JavaScripted web pages can search for datasets via**

- ERDDAP's RESTful search services
- ERDDAP's allDatasets tabular dataset that has a row of information for each dataset
- ERDDAP's OpenSearch 1.1 Service



ERDDAP Data Provider Form



The screenshot shows the ERDDAP website with the 'Data Provider Form' section highlighted by a yellow arrow. The page is titled 'ERDDAP - Home Page' and has the URL 'oos.soest.hawaii.edu/erddap/index.html'. The main content area is divided into several sections:

- ERDDAP**: A data server that gives you a simple, consistent way to download subsets of scientific datasets in common file formats and make graphs and maps.
- Easier Access to Scientific Data**: Our focus is on making it easier for you to get scientific data.
- Different scientific communities have developed different types of data servers**: For example, OPeNDAP, WCS, SOS, OBIS, and countless custom web pages with forms are great on its own. But without ERDDAP, it is difficult to get data from different types of servers.
- ERDDAP unifies the different types of data servers so you have a consistent way to get the data you want, in the format you want.**

The **Data Provider Form** section is highlighted by a yellow arrow. It contains the following text:

Data Providers: You can set up your own ERDDAP server and serve your own data. ERDDAP is free and open source. It uses Apache-like licenses, so you can do anything you want with it. ERDDAP's appearance is customizable, so your ERDDAP will reflect your institution, not NOAA. The small effort to set up ERDDAP brings many benefits. If you already have a web service for distributing your data, you can set up ERDDAP to access your data via the existing service or via the source files or database. Then, people will have another way to access your data and will be able to download the data in additional file formats or as graphs or maps. ERDDAP has been installed by over 60 organizations worldwide. NOAA's [Data Access Procedural Directive](#) includes ERDDAP in its list of recommended data servers for use by groups within NOAA.

Converters
In addition to serving data, ERDDAP also provides several converters:

Acronyms	Converts acronyms to full names
FIPS County Codes	Converts FIPS county codes to names
Keywords	Converts keywords to standardized terms
Time	Converts time strings to standard formats
Units	Converts units to standard units
URLs	Converts URLs to standard formats
Variable Names	Converts variable names to standard formats

Metadata
ERDDAP has an [FGDC Web Accessible Folder \(WAF\)](#) with [FGDC-STD-001-1998](#) metadata files and an [ISO 19115 Web Accessible Folder \(WAF\)](#) with [ISO 19115-2/19139](#) metadata files for all of the geospatial datasets in this ERDDAP.

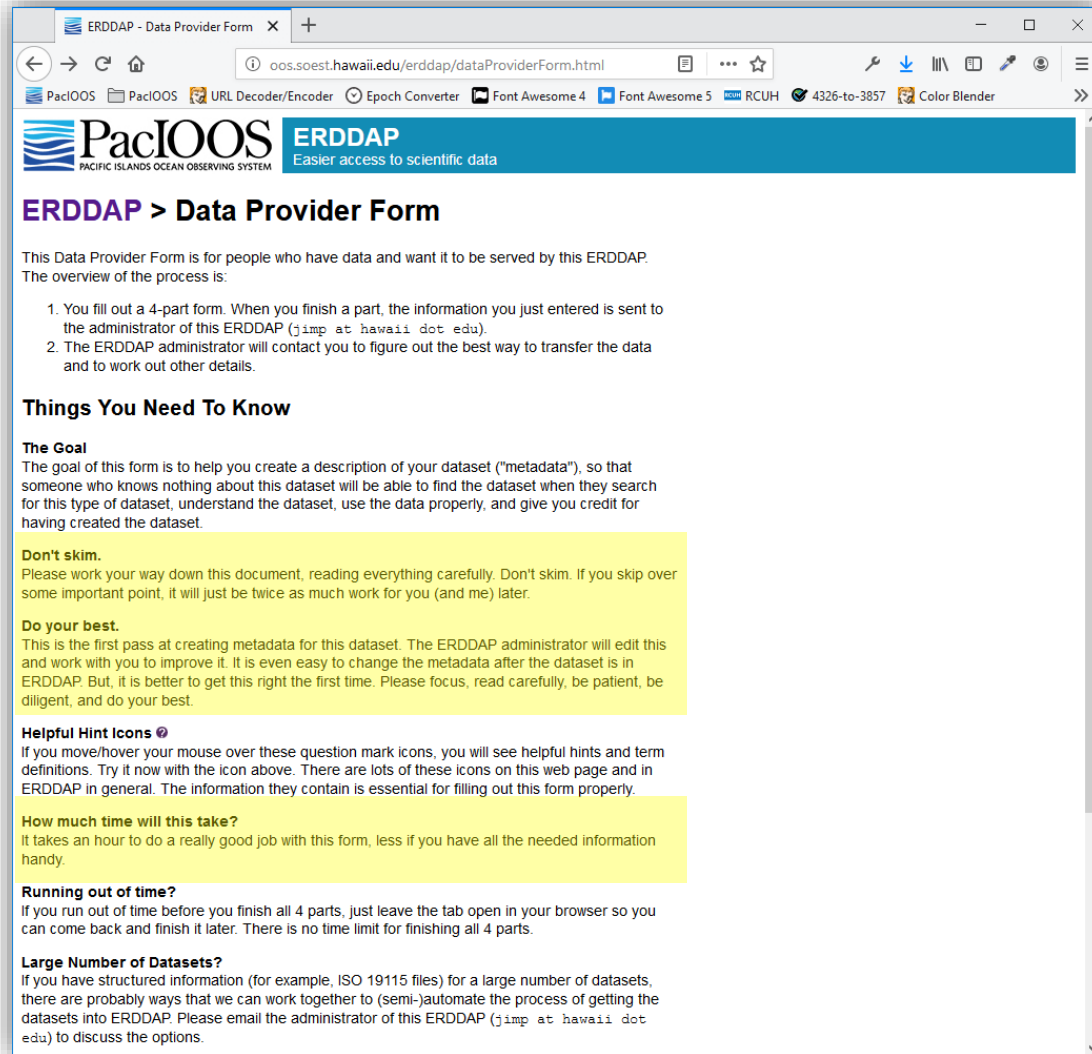
RESTful Web Services
You can bypass ERDDAP's web pages and use ERDDAP's RESTful web services (for example, for searching for datasets, for downloading data, for making maps) directly from any computer program (for example, Matlab, R, or a program that you write) and even from web pages (via HTML image tags or JavaScript). [REST documentation](#)

And

Status	The Status web page is a quick way to check the current status/health of this ERDDAP, including a list of datasets which failed to load.
Out-Of-Date Datasets	The Out-Of-Date Datasets web page displays a list of near-real-time datasets, ranked by how out-of-date they are.
Subscription System	ERDDAP has an email/URL subscription system so that you can be notified immediately whenever a dataset changes (for example, whenever new data is added to a near-real-time dataset).
Slide Sorter	Anyone can use ERDDAP's Slide Sorter to build a personal web page that displays graphs with the latest data (or other images or HTML content), each in its own, draggable slide.
Data Provider Form	The Data Provider Form is for people who have data and want it to be served by this ERDDAP. It collects basic information about the dataset and emails it to this ERDDAP's administrator.

ERDDAP, Version 2.01
[Disclaimers](#) | [Privacy Policy](#) | [Contact](#)

ERDDAP Data Provider Form



The screenshot shows a web browser window with the URL `oos.soest.hawaii.edu/erddap/dataProviderForm.html`. The page header includes the PacIOOS logo and the text "ERDDAP Easier access to scientific data". The main heading is "ERDDAP > Data Provider Form". The content includes an introductory paragraph, a numbered list of two steps, a "Things You Need To Know" section with sub-sections for "The Goal", "Don't skim", "Do your best", "Helpful Hint Icons", "How much time will this take?", "Running out of time?", and "Large Number of Datasets?".

ERDDAP > Data Provider Form

This Data Provider Form is for people who have data and want it to be served by this ERDDAP. The overview of the process is:

1. You fill out a 4-part form. When you finish a part, the information you just entered is sent to the administrator of this ERDDAP ([jimp at hawaii dot edu](mailto:jimp@hawaii.edu)).
2. The ERDDAP administrator will contact you to figure out the best way to transfer the data and to work out other details.

Things You Need To Know

The Goal
The goal of this form is to help you create a description of your dataset ("metadata"), so that someone who knows nothing about this dataset will be able to find the dataset when they search for this type of dataset, understand the dataset, use the data property, and give you credit for having created the dataset.

Don't skim.
Please work your way down this document, reading everything carefully. Don't skim. If you skip over some important point, it will just be twice as much work for you (and me) later.

Do your best.
This is the first pass at creating metadata for this dataset. The ERDDAP administrator will edit this and work with you to improve it. It is even easy to change the metadata after the dataset is in ERDDAP. But, it is better to get this right the first time. Please focus, read carefully, be patient, be diligent, and do your best.

Helpful Hint Icons ⓘ
If you move/hover your mouse over these question mark icons, you will see helpful hints and term definitions. Try it now with the icon above. There are lots of these icons on this web page and in ERDDAP in general. The information they contain is essential for filling out this form properly.

How much time will this take?
It takes an hour to do a really good job with this form, less if you have all the needed information handy.

Running out of time?
If you run out of time before you finish all 4 parts, just leave the tab open in your browser so you can come back and finish it later. There is no time limit for finishing all 4 parts.

Large Number of Datasets?
If you have structured information (for example, ISO 19115 files) for a large number of datasets, there are probably ways that we can work together to (semi-)automate the process of getting the datasets into ERDDAP. Please email the administrator of this ERDDAP ([jimp at hawaii dot edu](mailto:jimp@hawaii.edu)) to discuss the options.

Need help?
If you have questions or need help while filling out this form, please send an email to the administrator of this ERDDAP ([jimp at hawaii dot edu](mailto:jimp@hawaii.edu)).

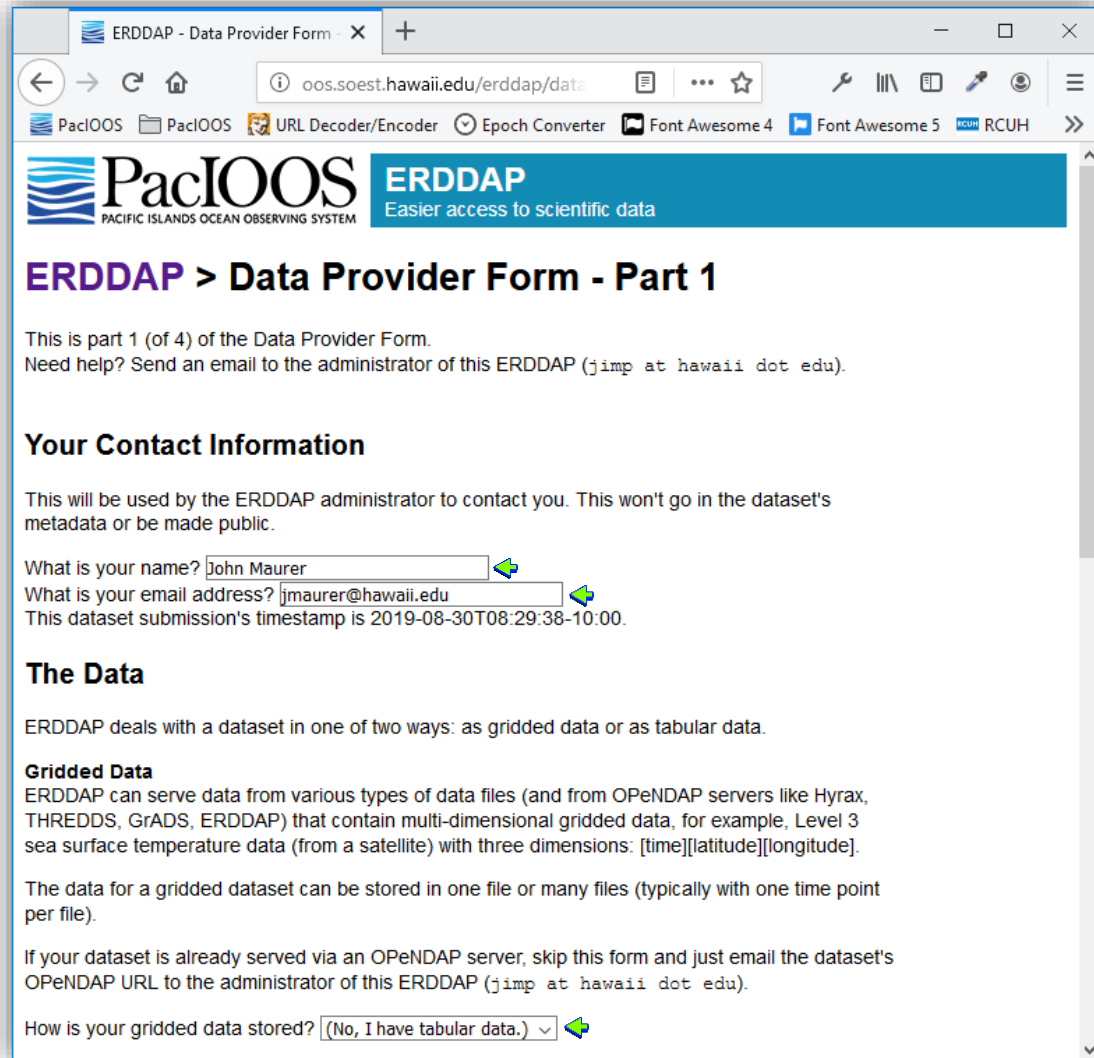
[Click Here for Part 1 \(of 4\) of the Data Provider Form](#)

ERDDAP, Version 2.01
[Disclaimers](#) | [Privacy Policy](#) | [Contact](#)



TAKE YOUR TIME.

ERDDAP Data Provider Form: Part 1 (of 4)



ERDDAP - Data Provider Form - X

oos.soest.hawaii.edu/erddap/data

PacIOOS PACIFIC ISLANDS OCEAN OBSERVING SYSTEM

ERDDAP

Easier access to scientific data

ERDDAP > Data Provider Form - Part 1

This is part 1 (of 4) of the Data Provider Form.
Need help? Send an email to the administrator of this ERDDAP (jmaurer@hawaii.edu).

Your Contact Information

This will be used by the ERDDAP administrator to contact you. This won't go in the dataset's metadata or be made public.

What is your name?

What is your email address?

This dataset submission's timestamp is 2019-08-30T08:29:38-10:00.

The Data

ERDDAP deals with a dataset in one of two ways: as gridded data or as tabular data.

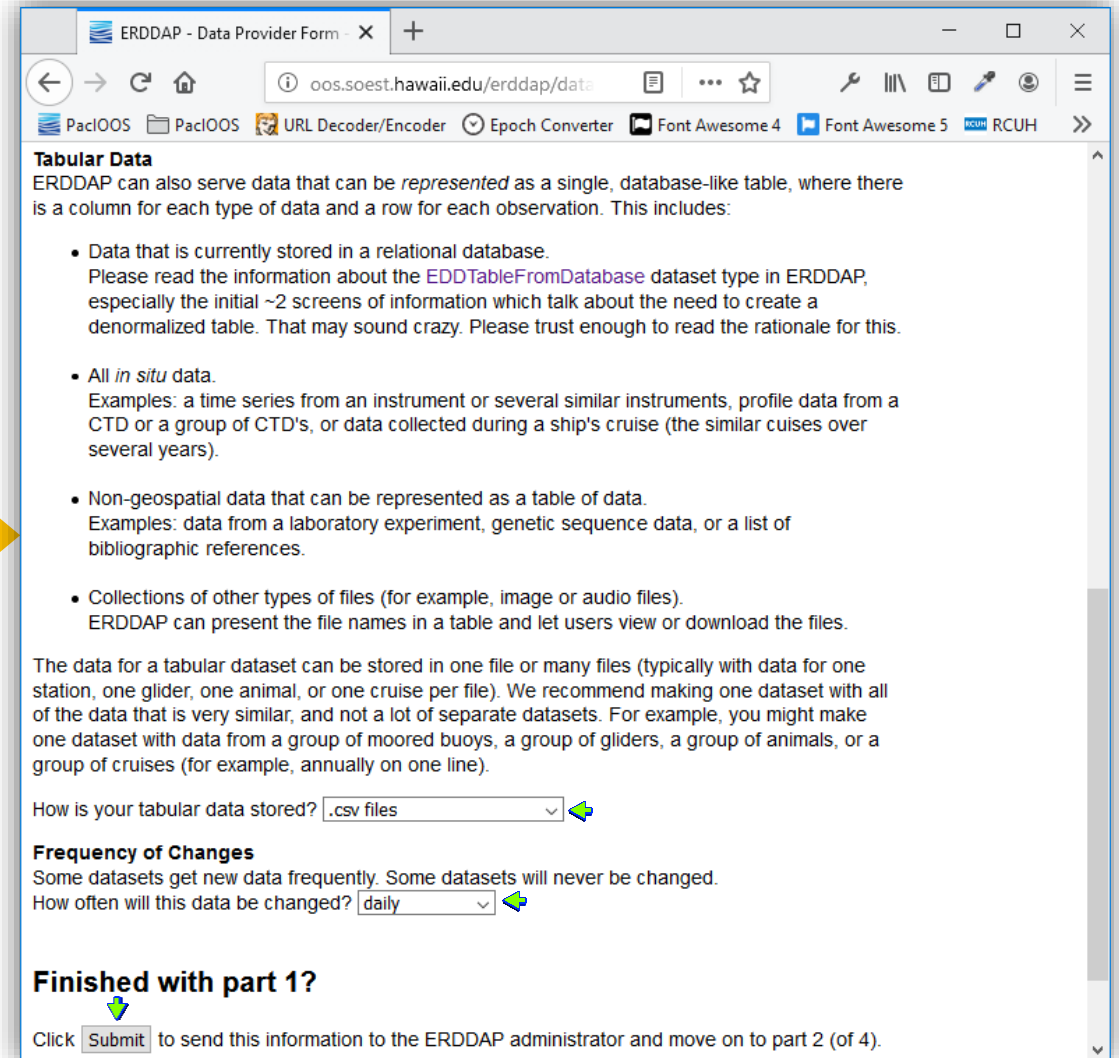
Gridded Data

ERDDAP can serve data from various types of data files (and from OPeNDAP servers like Hyrax, THREDDS, GrADS, ERDDAP) that contain multi-dimensional gridded data, for example, Level 3 sea surface temperature data (from a satellite) with three dimensions: [time][latitude][longitude].

The data for a gridded dataset can be stored in one file or many files (typically with one time point per file).

If your dataset is already served via an OPeNDAP server, skip this form and just email the dataset's OPeNDAP URL to the administrator of this ERDDAP (jmaurer@hawaii.edu).

How is your gridded data stored?



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Tabular Data

ERDDAP can also serve data that can be *represented* as a single, database-like table, where there is a column for each type of data and a row for each observation. This includes:

- Data that is currently stored in a relational database.
Please read the information about the [EDDTableFromDatabase](#) dataset type in ERDDAP, especially the initial ~2 screens of information which talk about the need to create a denormalized table. That may sound crazy. Please trust enough to read the rationale for this.
- All *in situ* data.
Examples: a time series from an instrument or several similar instruments, profile data from a CTD or a group of CTD's, or data collected during a ship's cruise (the similar cruises over several years).
- Non-geospatial data that can be represented as a table of data.
Examples: data from a laboratory experiment, genetic sequence data, or a list of bibliographic references.
- Collections of other types of files (for example, image or audio files).
ERDDAP can present the file names in a table and let users view or download the files.

The data for a tabular dataset can be stored in one file or many files (typically with data for one station, one glider, one animal, or one cruise per file). We recommend making one dataset with all of the data that is very similar, and not a lot of separate datasets. For example, you might make one dataset with data from a group of moored buoys, a group of gliders, a group of animals, or a group of cruises (for example, annually on one line).

How is your tabular data stored?

Frequency of Changes

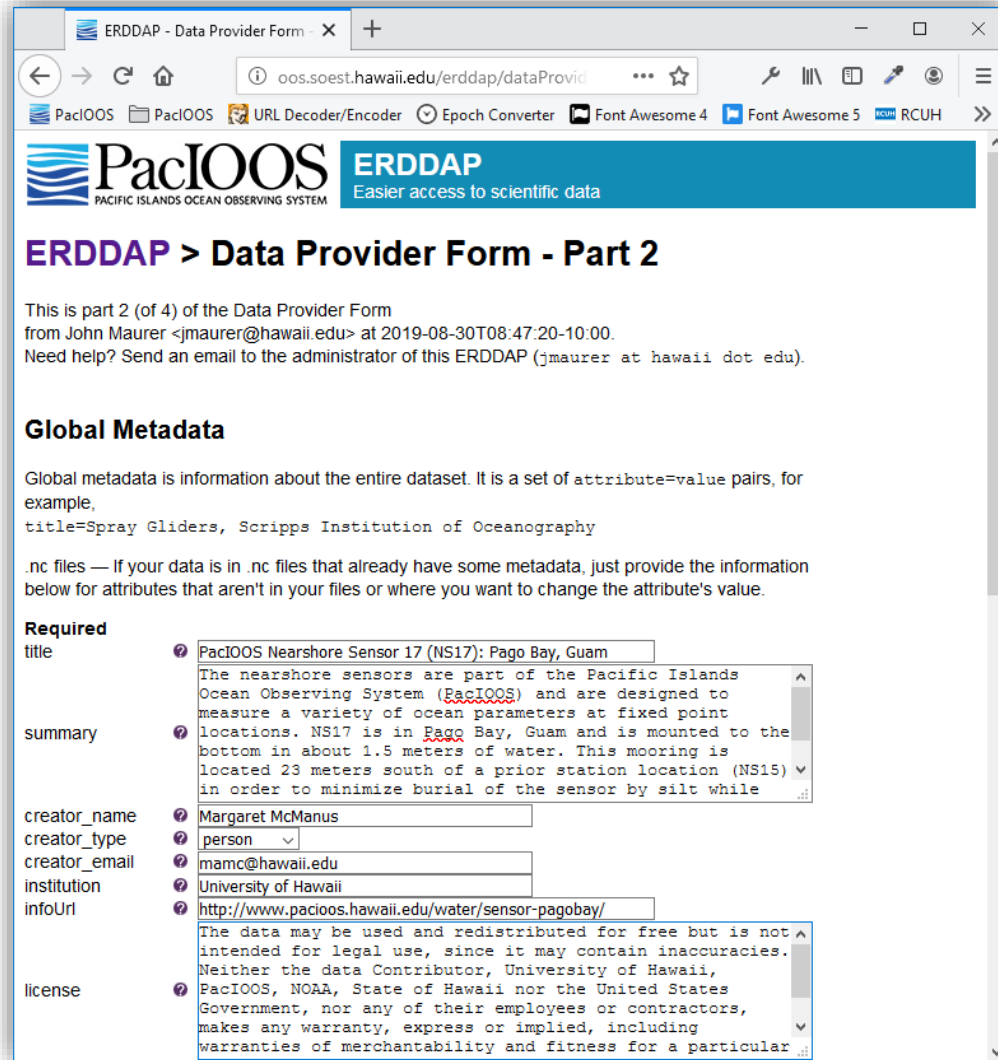
Some datasets get new data frequently. Some datasets will never be changed.

How often will this data be changed?

Finished with part 1?

Click to send this information to the ERDDAP administrator and move on to part 2 (of 4).

ERDDAP Data Provider Form: Part 2 (of 4)



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ERDDAP > Data Provider Form - Part 2

This is part 2 (of 4) of the Data Provider Form
from John Maurer <jmaurer@hawaii.edu> at 2019-08-30T08:47:20-10:00.
Need help? Send an email to the administrator of this ERDDAP (jmaurer at hawaii dot edu).

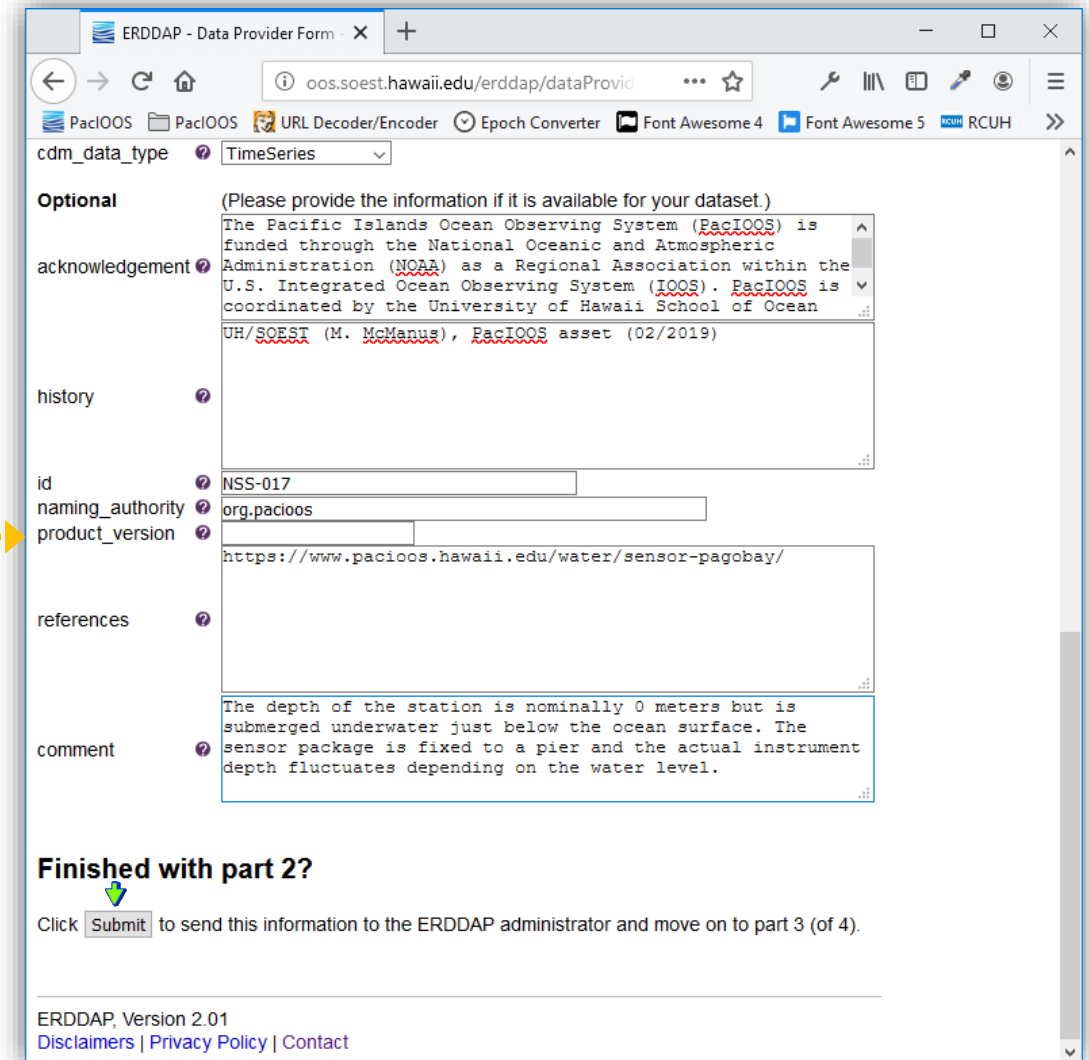
Global Metadata

Global metadata is information about the entire dataset. It is a set of attribute=value pairs, for example,
title=Spray Gliders, Scripps Institution of Oceanography

.nc files — If your data is in .nc files that already have some metadata, just provide the information below for attributes that aren't in your files or where you want to change the attribute's value.

Required

title	<input type="text" value="PacIOOS Nearshore Sensor 17 (NS17): Pago Bay, Guam"/>
summary	<input type="text" value="The nearshore sensors are part of the Pacific Islands Ocean Observing System (PacIOOS) and are designed to measure a variety of ocean parameters at fixed point locations. NS17 is in Pago Bay, Guam and is mounted to the bottom in about 1.5 meters of water. This mooring is located 23 meters south of a prior station location (NS15) in order to minimize burial of the sensor by silt while"/>
creator_name	<input type="text" value="Margaret McManus"/>
creator_type	<input type="text" value="person"/>
creator_email	<input type="text" value="mamc@hawaii.edu"/>
institution	<input type="text" value="University of Hawaii"/>
infoUrl	<input type="text" value="http://www.pacioos.hawaii.edu/water/sensor-pagobay/"/>
license	<input type="text" value="The data may be used and redistributed for free but is not intended for legal use, since it may contain inaccuracies. Neither the data Contributor, University of Hawaii, PacIOOS, NOAA, State of Hawaii nor the United States Government, nor any of their employees or contractors, makes any warranty, express or implied, including warranties of merchantability and fitness for a particular"/>



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cdm_data_type

Optional (Please provide the information if it is available for your dataset.)

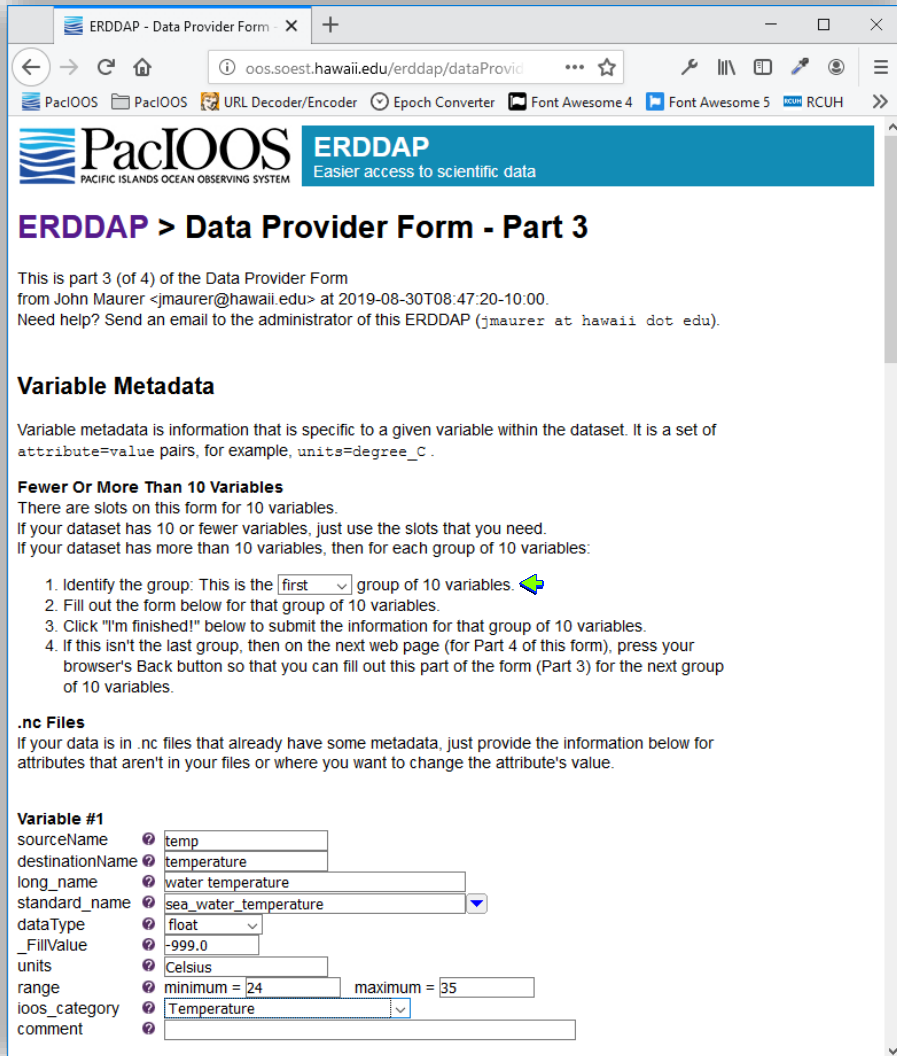
acknowledgement	<input type="text" value="The Pacific Islands Ocean Observing System (PacIOOS) is funded through the National Oceanic and Atmospheric Administration (NOAA) as a Regional Association within the U.S. Integrated Ocean Observing System (IOOS). PacIOOS is coordinated by the University of Hawaii School of Ocean UH/SOEST (M. McManus), PacIOOS asset (02/2019)"/>
history	<input type="text"/>
id	<input type="text" value="NSS-017"/>
naming_authority	<input type="text" value="org.pacioos"/>
product_version	<input type="text"/>
references	<input type="text" value="https://www.pacioos.hawaii.edu/water/sensor-pagobay/"/>
comment	<input type="text" value="The depth of the station is nominally 0 meters but is submerged underwater just below the ocean surface. The sensor package is fixed to a pier and the actual instrument depth fluctuates depending on the water level."/>

Finished with part 2?

Click to send this information to the ERDDAP administrator and move on to part 3 (of 4).

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ERDDAP Data Provider Form: Part 3 (of 4)



ERDDAP - Data Provider Form - Part 3

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ERDDAP > Data Provider Form - Part 3

This is part 3 (of 4) of the Data Provider Form from John Maurer <jmaurer@hawaii.edu> at 2019-08-30T08:47:20-10:00. Need help? Send an email to the administrator of this ERDDAP (jmaurer at hawaii dot edu).

Variable Metadata

Variable metadata is information that is specific to a given variable within the dataset. It is a set of attribute=value pairs, for example, units=degree_C.

Fewer Or More Than 10 Variables

There are slots on this form for 10 variables. If your dataset has 10 or fewer variables, just use the slots that you need. If your dataset has more than 10 variables, then for each group of 10 variables:

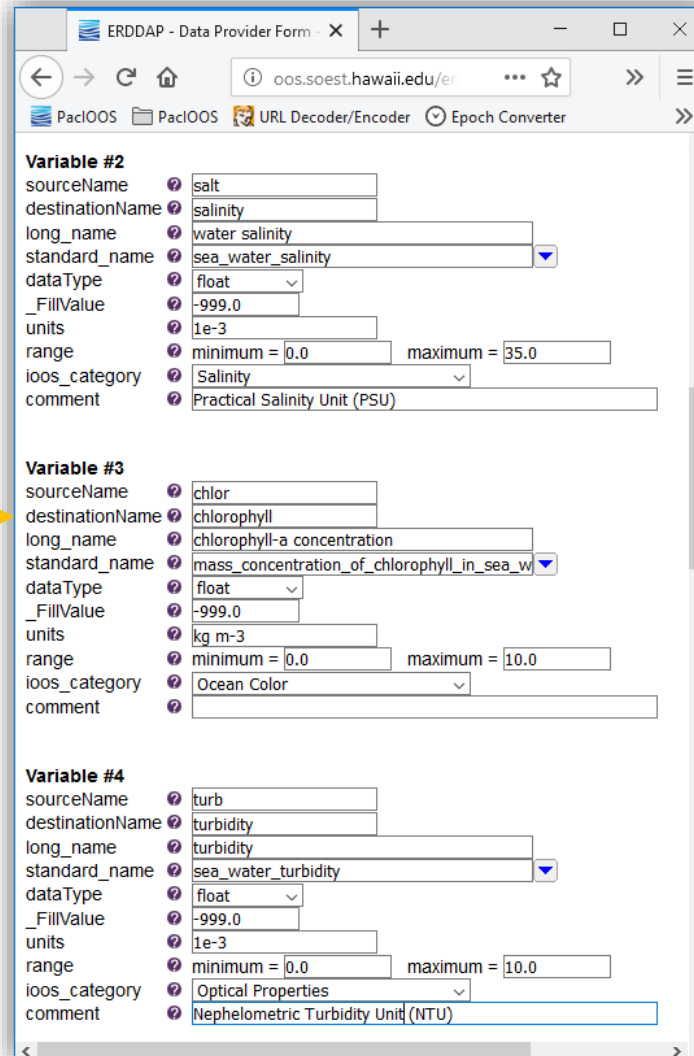
1. Identify the group: This is the first group of 10 variables.
2. Fill out the form below for that group of 10 variables.
3. Click "I'm finished!" below to submit the information for that group of 10 variables.
4. If this isn't the last group, then on the next web page (for Part 4 of this form), press your browser's Back button so that you can fill out this part of the form (Part 3) for the next group of 10 variables.

.nc Files

If your data is in .nc files that already have some metadata, just provide the information below for attributes that aren't in your files or where you want to change the attribute's value.

Variable #1

sourceName temp
destinationName temperature
long_name water temperature
standard_name sea_water_temperature
dataType float
_FillValue -999.0
units Celsius
range minimum = 24 maximum = 35
ioos_category Temperature
comment



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Variable #2

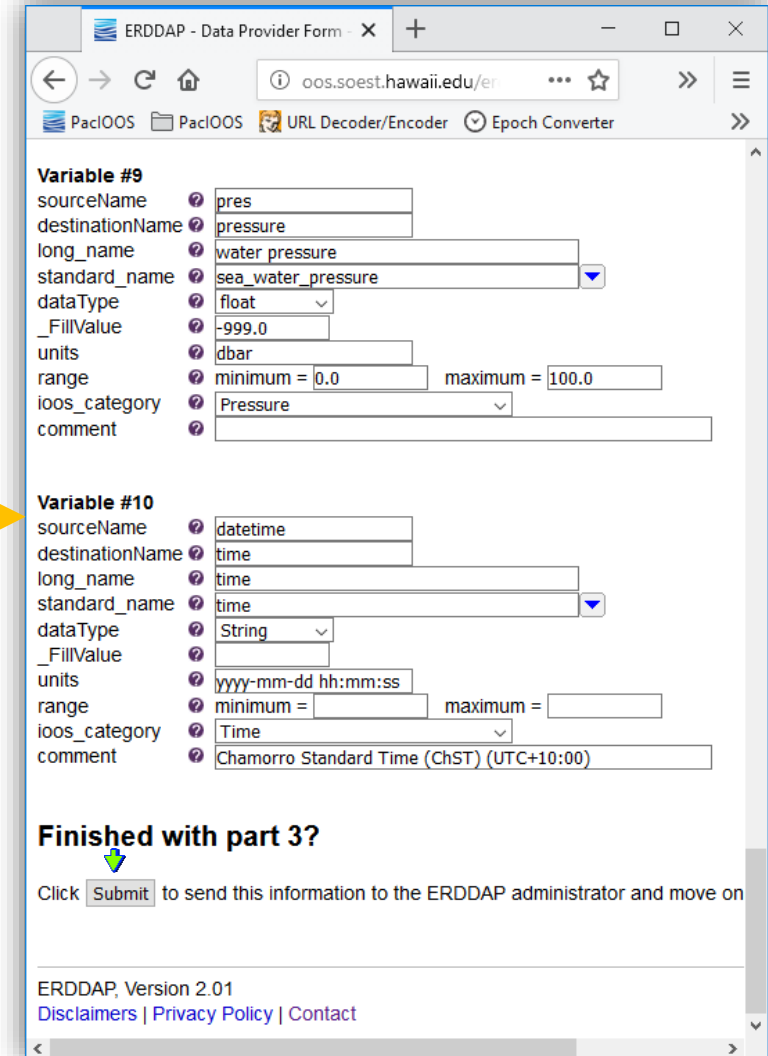
sourceName salt
destinationName salinity
long_name water salinity
standard_name sea_water_salinity
dataType float
_FillValue -999.0
units 1e-3
range minimum = 0.0 maximum = 35.0
ioos_category Salinity
comment Practical Salinity Unit (PSU)

Variable #3

sourceName chlor
destinationName chlorophyll
long_name chlorophyll-a concentration
standard_name mass_concentration_of_chlorophyll_in_sea_w
dataType float
_FillValue -999.0
units kg m-3
range minimum = 0.0 maximum = 10.0
ioos_category Ocean Color
comment

Variable #4

sourceName turb
destinationName turbidity
long_name turbidity
standard_name sea_water_turbidity
dataType float
_FillValue -999.0
units 1e-3
range minimum = 0.0 maximum = 10.0
ioos_category Optical Properties
comment Nephelometric Turbidity Unit (NTU)



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Variable #9

sourceName pres
destinationName pressure
long_name water pressure
standard_name sea_water_pressure
dataType float
_FillValue -999.0
units dbar
range minimum = 0.0 maximum = 100.0
ioos_category Pressure
comment

Variable #10

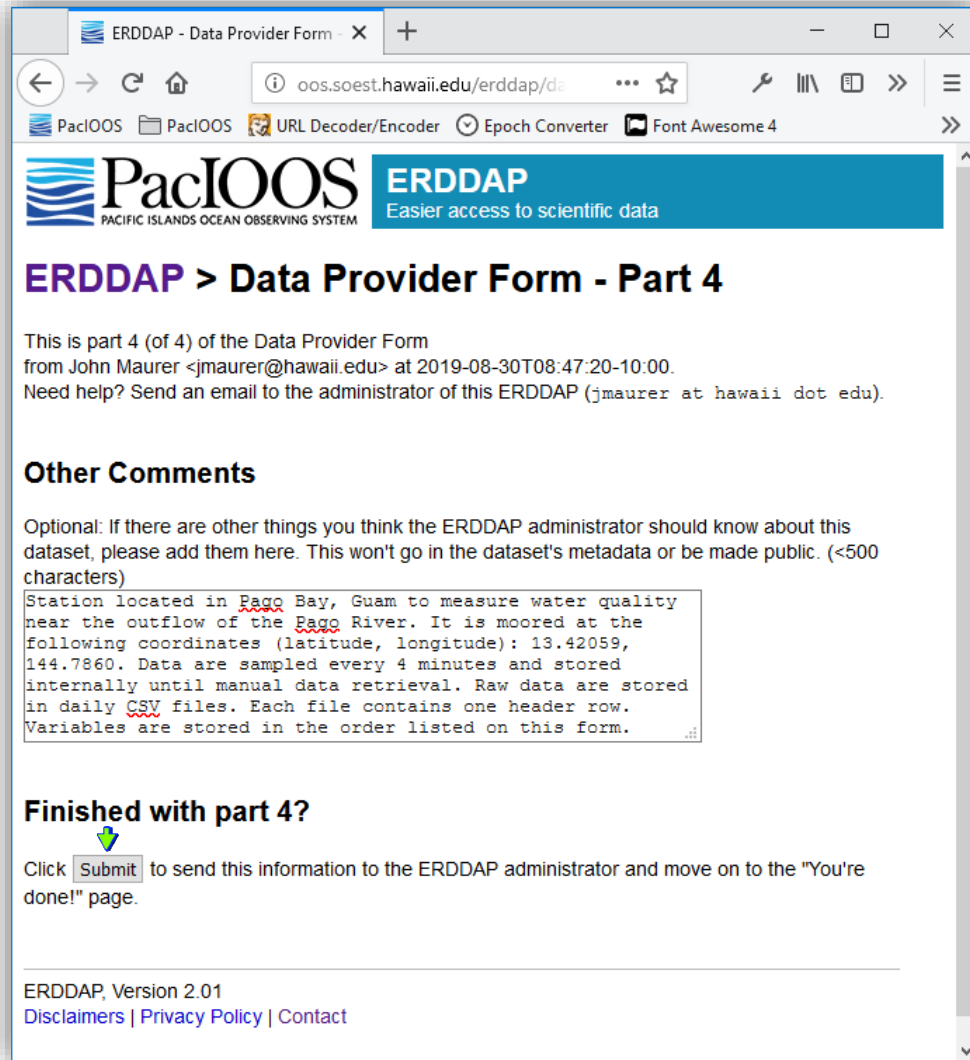
sourceName datetime
destinationName time
long_name time
standard_name time
dataType String
_FillValue
units yyyy-mm-dd hh:mm:ss
range minimum = maximum =
ioos_category Time
comment Chamorro Standard Time (ChST) (UTC+10:00)

Finished with part 3?

Click **Submit** to send this information to the ERDDAP administrator and move on

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ERDDAP Data Provider Form: Part 4 (of 4)



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ERDDAP > Data Provider Form - Part 4

This is part 4 (of 4) of the Data Provider Form
from John Maurer <jmaurer@hawaii.edu> at 2019-08-30T08:47:20-10:00.
Need help? Send an email to the administrator of this ERDDAP (jmaurer at hawaii dot edu).

Other Comments

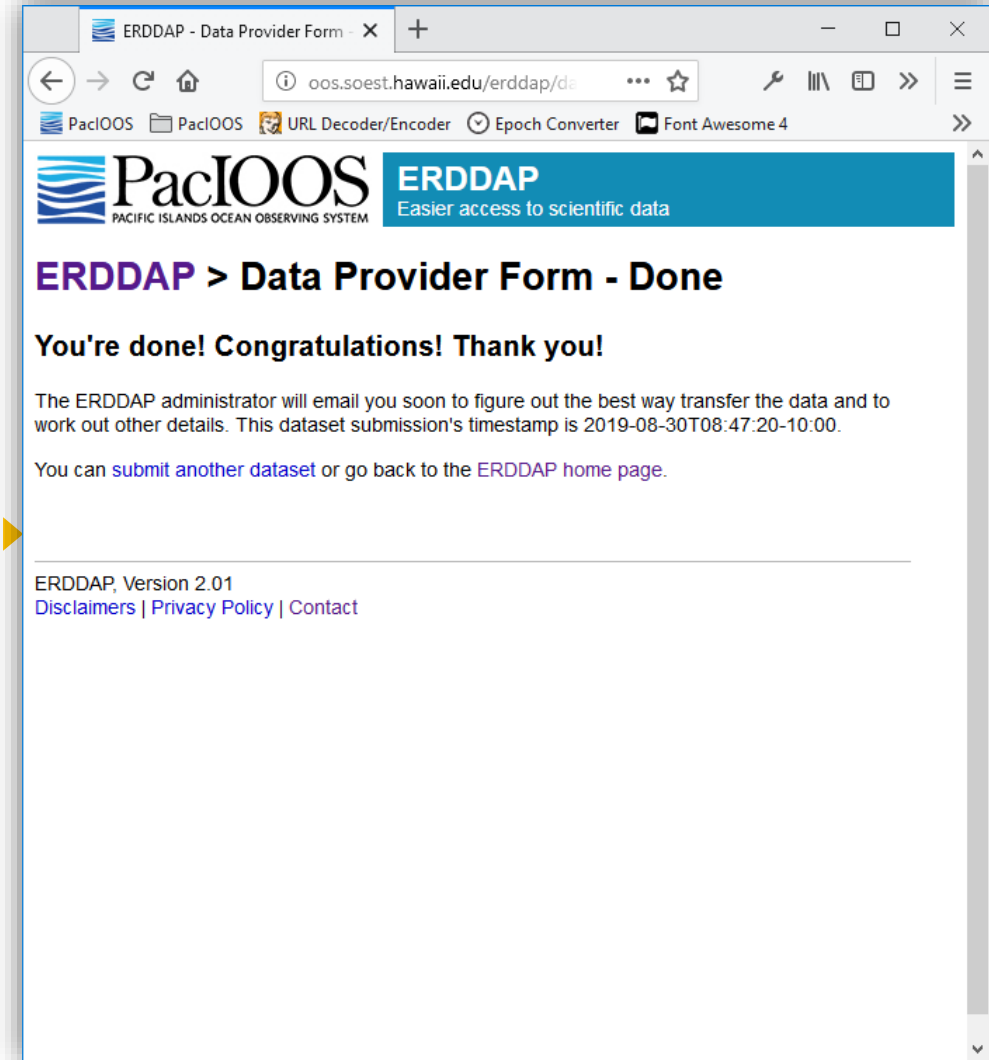
Optional: If there are other things you think the ERDDAP administrator should know about this dataset, please add them here. This won't go in the dataset's metadata or be made public. (<500 characters)

```
Station located in Pago Bay, Guam to measure water quality near the outflow of the Pago River. It is moored at the following coordinates (latitude, longitude): 13.42059, 144.7860. Data are sampled every 4 minutes and stored internally until manual data retrieval. Raw data are stored in daily CSV files. Each file contains one header row. Variables are stored in the order listed on this form.
```

Finished with part 4?

Click to send this information to the ERDDAP administrator and move on to the "You're done!" page.

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ERDDAP > Data Provider Form - Done

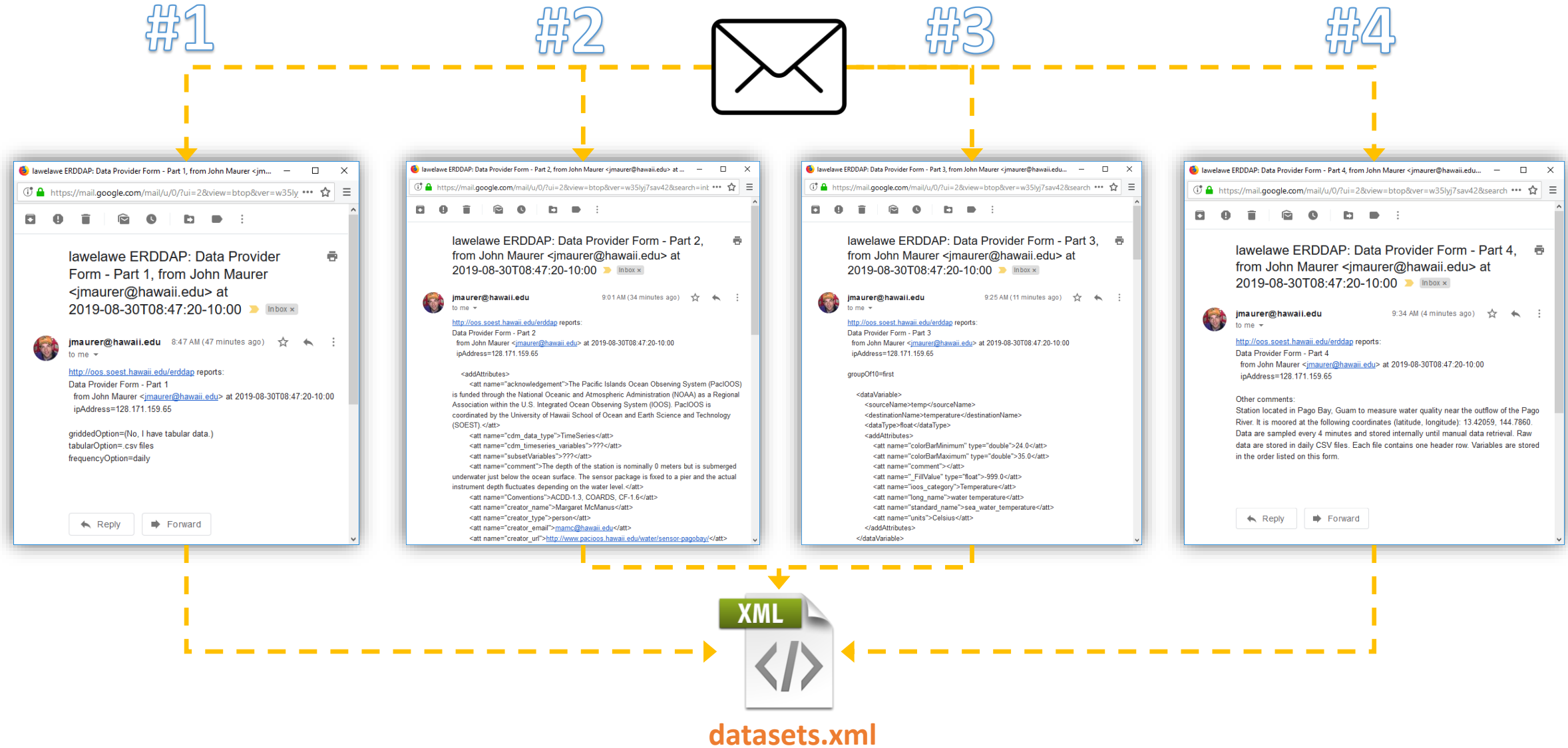
You're done! Congratulations! Thank you!

The ERDDAP administrator will email you soon to figure out the best way transfer the data and to work out other details. This dataset submission's timestamp is 2019-08-30T08:47:20-10:00.

You can [submit another dataset](#) or go back to the [ERDDAP home page](#).

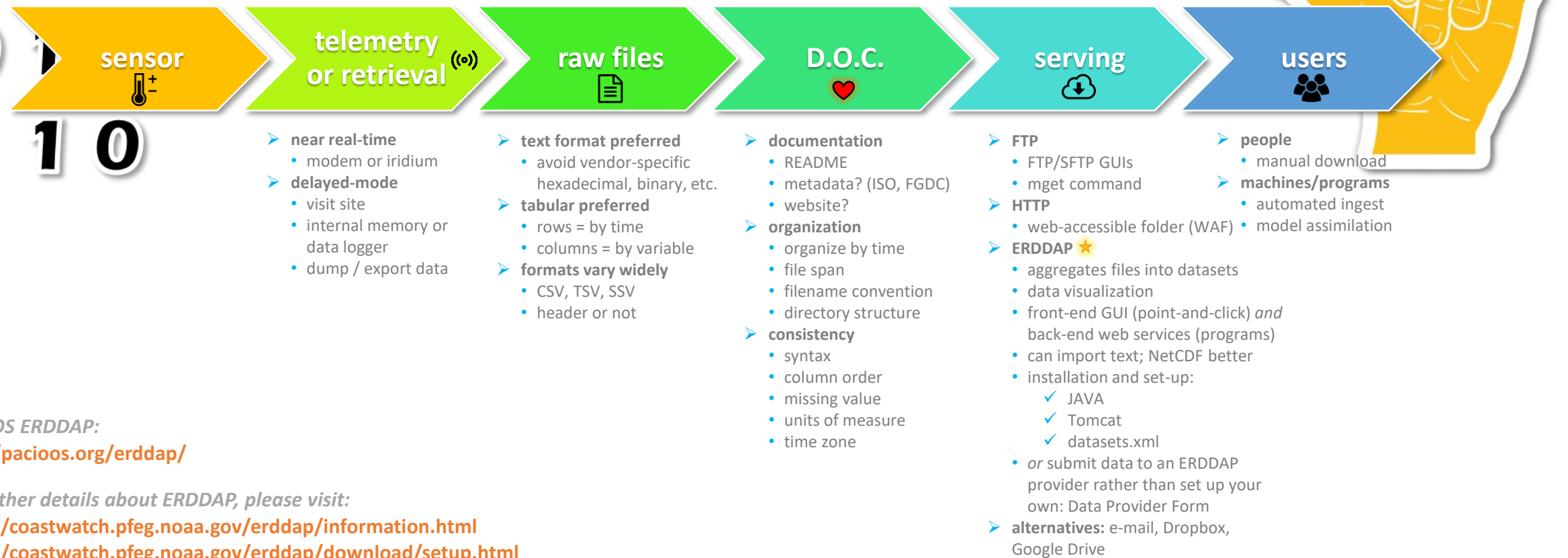
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ERDDAP Data Provider Form: Admin Notifications



Summary

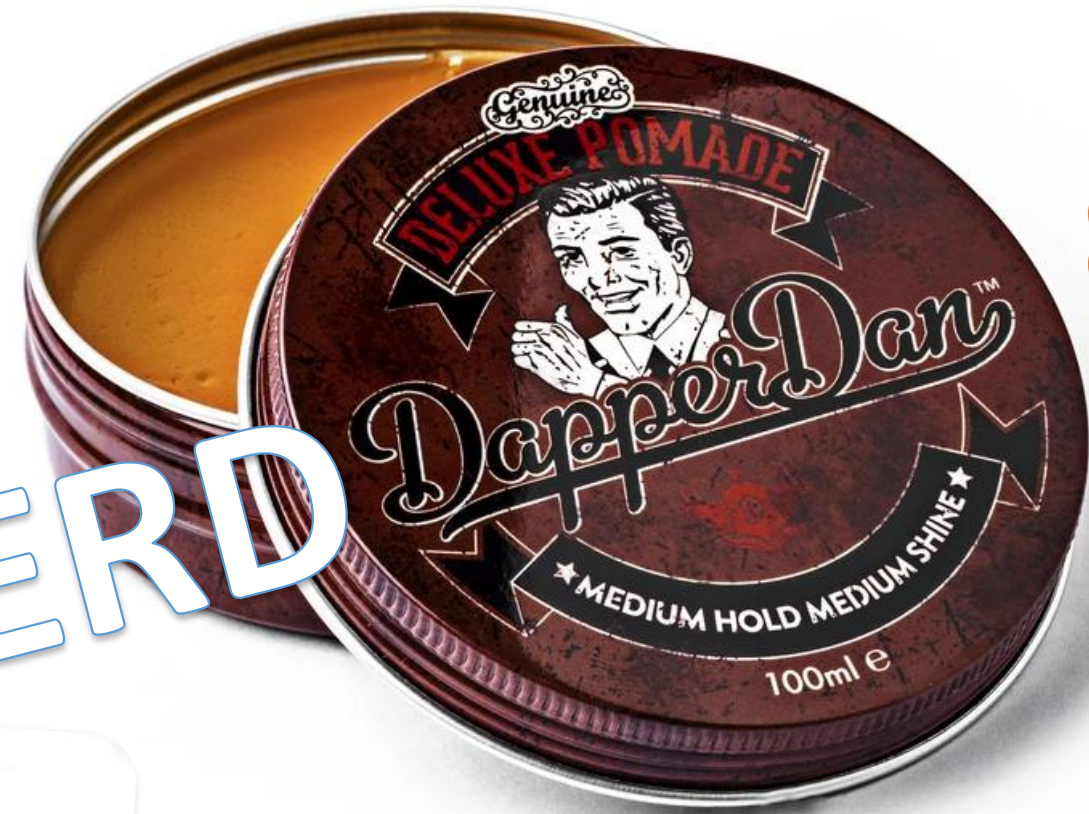
0 1 0 1
1 0 1
0 1 1 0



 **PacIOOS ERDDAP:**
<http://pacioos.org/erddap/>

 **For further details about ERDDAP, please visit:**
<https://coastwatch.pfeg.noaa.gov/erddap/information.html>
<https://coastwatch.pfeg.noaa.gov/erddap/download/setup.html>

ERDDAP: Environmental Research Division's Data Access Program



ERD

 For further details, please visit:
<https://coastwatch.pfeg.noaa.gov/erddap/information.html>

Thank you!
Any questions?

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