GO-SHIP, CCHDO, and GOMO

Practical Adoption of Standards

Steve Diggs

Technical Director / CCHDO

GOMO Review

2022-06-26 (2nd Draft for Review)

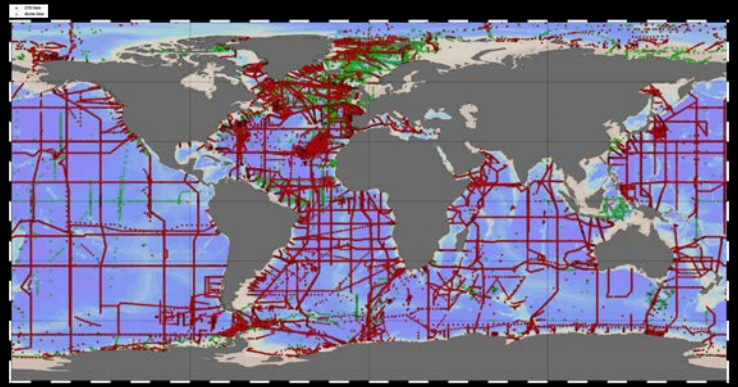
UC San Diego | SCRIPPS INSTITUTION OF OCEANOGRAPHY

CCHDO: **CLIVAR & Carbon Hydrographic Data Office**
Officially: Data Office for GO-SHIP, CLIVAR, WOCE, pre-WOCE
Location: Scripps Institution of Oceanography / UCSD
Data: **>2500** Cruises / **>107,000** profiles
Purpose: Data Assembly and Dissemination Center

Type of Data Managed: Sustained hydrographic observations of ***trans-oceanic reference quality hydrographic***, ocean carbon, and tracer measurements.

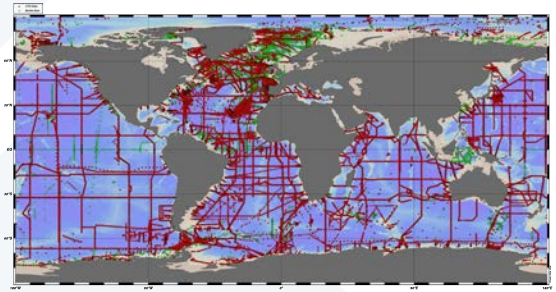
Contacts:

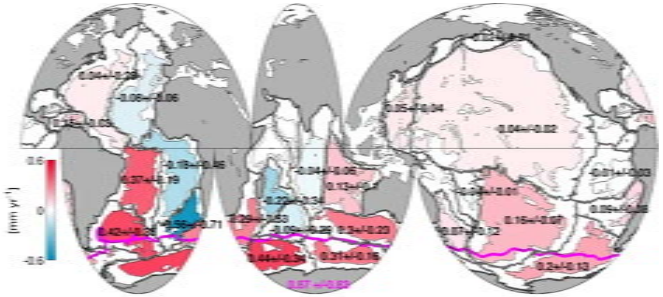
- Technical Dir. : **Steve Diggs**
- Scientific Adv. : **Sarah Purkey**
- Director : **Karen Stocks**
- Emeritus Adv. : **Jim Swift**



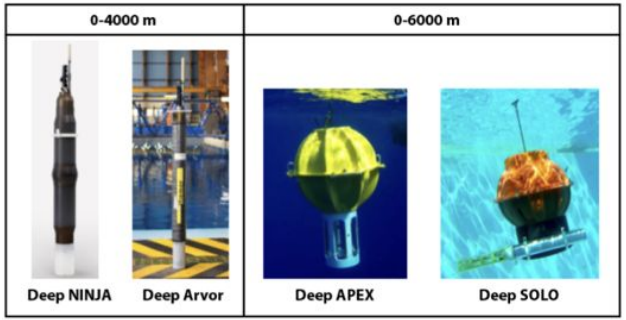
NOAA/GOMO: GO-SHIP and CCHDO

The **Global Ocean Ship-based Hydrographic Investigations Program (GO-SHIP)** coordinates a network of measurements that provide approximately decadal resolution of the changes in inventories of heat, freshwater, carbon, oxygen, nutrients and transient tracers, covering the ocean basins from coast to coast and full depth (top to bottom), with global measurements of the highest required accuracy to detect these changes.





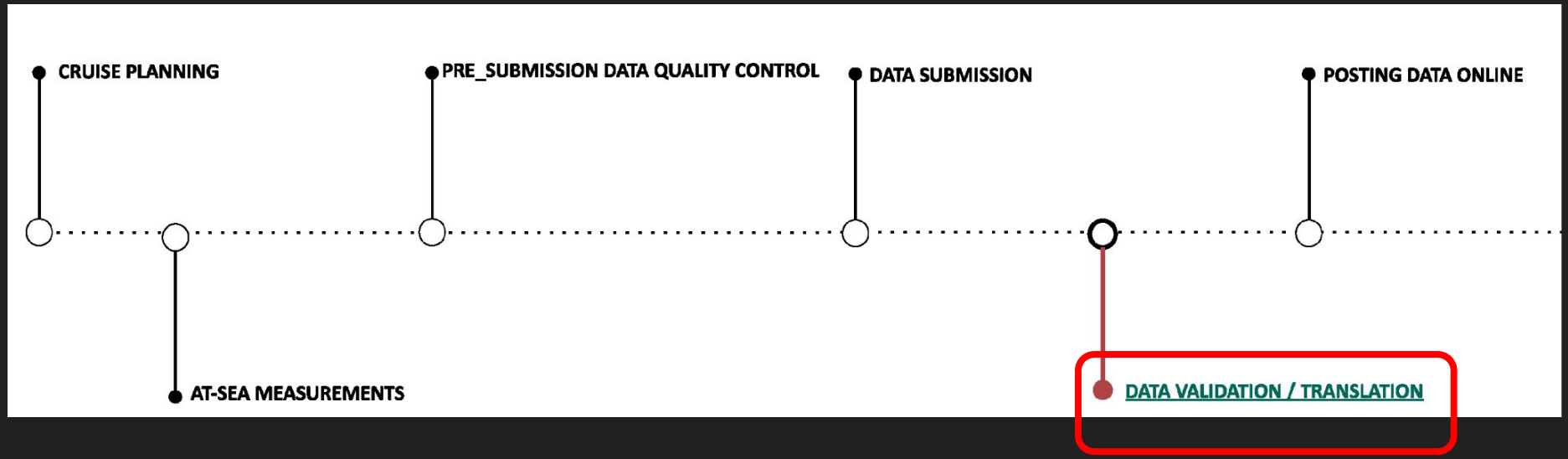
(Purkey and Johnson 2010)



GO-SHIP CTD data are inputs to the OWC algorithms that are used to estimate the time-varying correction of conductivity measurements from **Argo floats.**

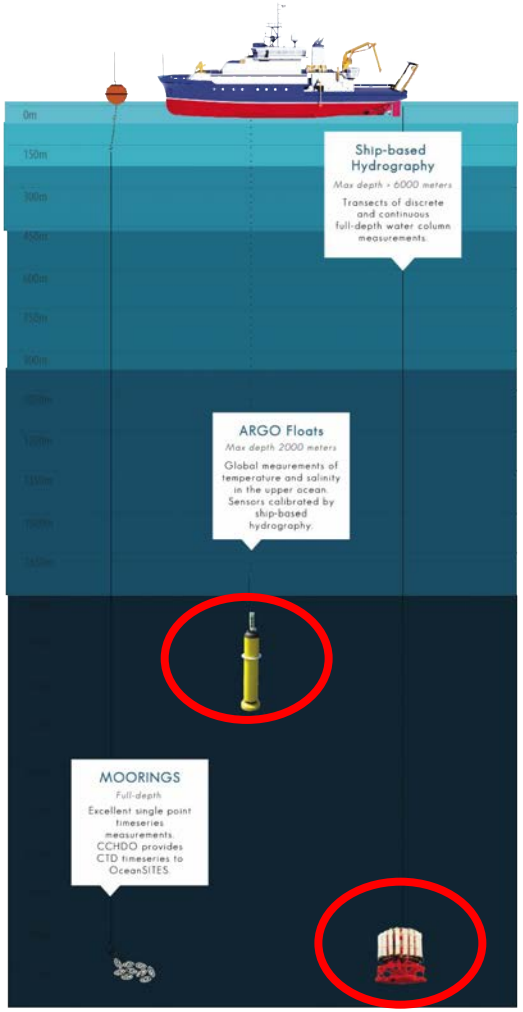
Many opportunities to make things better

We chose to work on our data format



Strategy

- **Leverage existing infrastructure**
- Deliver functionality to scientists in their existing workflows
- Focus on compatibility with existing tools and systems
- Minimal maintenance

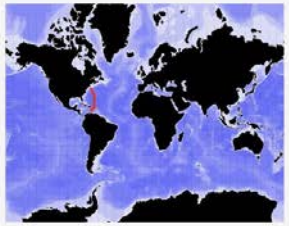


Text/csv formats are limited - move to CF

- How do we fit more data/metadata into our files?
  - Formal file metadata should be in the file (hashes, dates, etc)
  - Not by adding ad-hoc scientific metadata to structures that weren't meant for it
- Emphasize machine readability
  - Better website APIs to find changing data, automatic updating models = faster science
- Less steps to data munging in future
  - Instead of csv -> netCDF, netCDF + netCDF
- CCHDO isn't funded to *develop* file formats, we process and serve data
- CCHDO isn't scoped to name new parameters
  - Better to adopt vocabulariess from CF, NERC, etc.
- Data by profile is desirable and becomes possible
  - Per cruise is a WOCE-era thing, per profile opens up the data to a wider community

CF files are offered as an *additional* file type

Hydrographic Cruise: 325020210420



Date Start/End:
2021-04-20/2021-05-16

Chief Scientists:
Viviane Menezes
Jesse Anderson (Co-Chief)

Ship:
RV Thomas G. Thompson

Country:
US

Dataset

Files in the Dataset have been checked for format consistency, and merged into a single, integrated, downloadable file.

Download Entire Dataset | Submit Data For This Cruise | How to Cite Dataset

bottle

- **CF netCDF:** 325020210420_bottle.nc (Updated 2021-06-11, 753.8 kB) NEW
- **exchange:** 325020210420_hy1.csv (Updated 2021-06-11, 1.6 MB)
- **WHP netCDF:** 325020210420_nc_hyd.zip (Updated 2021-06-11, 643.8 kB)

ctd

- **CF netCDF:** 325020210420_ctd.nc (Updated 2021-06-11, 6.5 MB) NEW
- **exchange:** 325020210420_ct1.zip (Updated 2021-06-11, 2.2 MB)
- **WHP netCDF:** 325020210420_nc_ctd.zip (Updated 2021-06-11, 2.6 MB)

documentation

- **pdf:** 325020210420_do.pdf (Updated 2021-08-16, 41.9 MB)
- **text:** 325020210420_do.txt (Updated 2021-08-16, 230.8 kB)

summary

- **WOCE:** 325020210420su.txt (Updated 2021-10-12, 12.7 kB)

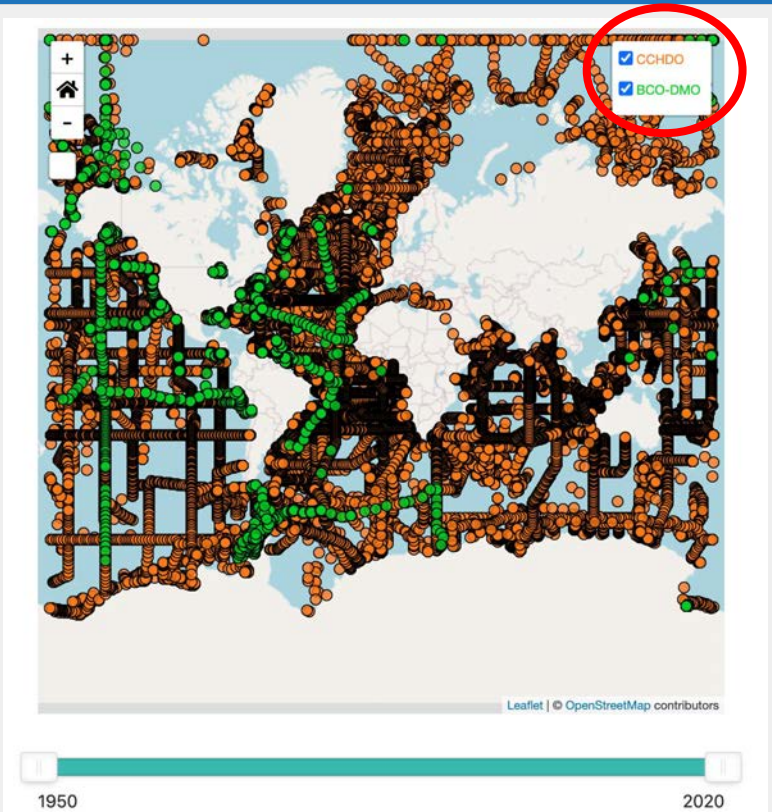
CCHDO data in CF-netcdf is makes *data-by-profile* available in almost 40 different formats through ERDDAP

1 .asc - View OPeNDAP-style ISO-8859-1 comma-separated text.
2 .csv - Download a ISO-8859-1 comma-separated text table (line 1: names; line 2: units; ISO 8601 times).
3 .csvp - Download a ISO-8859-1 .csv file with line 1: name (units). Times are ISO 8601 strings.
4 .csv0 - Download a ISO-8859-1 .csv file without column names or units. Times are ISO 8601 strings.
5 .dataTable - A JSON file formatted for use with the Google Visualization client library (Google Charts).
6 .das - View the dataset's metadata via an ISO-8859-1 OPeNDAP Dataset Attribute Structure (DAS).
7 .dds - View the dataset's structure via an ISO-8859-1 OPeNDAP Dataset Descriptor Structure (DDS).
8 .dods - OPeNDAP clients use this to download the data in the DODS binary format.
9 .esriCsv - Download a ISO_8859_1 .csv file for ESRI's ArcGIS 9.x and below (separate date and time columns).
10 .fgdc - View the dataset's UTF-8 FGDC .xml metadata.
11 .geoJson - Download longitude,latitude,other Columns data as a UTF-8 GeoJSON .json file.
12 .graph - View a Make A Graph web page.
13 .help - View a web page with a description of tabledap.
14 .html - View an OPeNDAP-style HTML Data Access Form.
15 .htmlTable - View a UTF-8 .html web page with the data in a table. Times are ISO 8601 strings.
16 .iso19115 - View the dataset's ISO 19115-2/19139 UTF-8 .xml metadata.
17 .itx - Download an ISO-8859-1 Igor Text File. Each response column becomes a wave.
18 .json - View a table-like UTF-8 JSON file (missing value = 'null'; times are ISO 8601 strings).
19 .jsonlCSV1 - View a UTF-8 JSON Lines CSV file with column names on line 1 (mv = 'null'; times are ISO 8601 strings).
20 .jsonlCSV - View a UTF-8 JSON Lines CSV file without column names (mv = 'null'; times are ISO 8601 strings).
21 .jsonlKVP - View a UTF-8 JSON Lines file with Key:Value pairs (missing value = 'null'; times are ISO 8601 strings).
22 .mat - Download a MATLAB binary file.
23 .nc - Download a flat, table-like, NetCDF-3 binary file with COARDS/CF/ACDD metadata.
24 .ncHeader - View the UTF-8 header (the metadata) for the NetCDF-3 .nc file.
25 .ncCF - Download a NetCDF-3 CF Discrete Sampling Geometries file (Contiguous Ragged Array).
26 .ncCFHeader - View the UTF-8 header (the metadata) for the .ncCF file.
27 .ncCFMA - Download a NetCDF-3 CF Discrete Sampling Geometries file (Multidimensional Array).
28 .ncCFMAHeader - View the UTF-8 header (the metadata) for the .ncCFMA file.
29 .nccsv - Download a NetCDF-3-like 7-bit ASCII NCCSV .csv file with COARDS/CF/ACDD metadata.
30 .nccsvMetadata - View the dataset's metadata as the top half of a 7-bit ASCII NCCSV .csv file.
31 .ncoJson - Download a UTF-8 NCO lvl=2 JSON file with COARDS/CF/ACDD metadata.
32 .odvTxt - Download longitude,latitude,time,otherColumns as an ISO-8859-1 ODV Generic Spreadsheet File (.txt).
33 .subset - View an HTML form which uses faceted search to simplify picking subsets of the data.
34 .tsv - Download a ISO-8859-1 tab-separated text table (line 1: names; line 2: units; ISO 8601 times).
35 .tsvp - Download a ISO-8859-1 .tsv file with line 1: name (units). Times are ISO 8601 strings.
36 .tsv0 - Download a ISO-8859-1 .tsv file without column names or units. Times are ISO 8601 strings.
37 .wav - Download a .wav audio file. All columns must be numeric and of the same type.
38 .xhtml - View a UTF-8 XHTML (XML) file with the data in a table. Times are ISO 8601 strings.
39 .kml - View a .kml file, suitable for Google Earth.

Connecting repositories (2019)

Google YAHOO! bing

schema.org



CCHDO Bottle CTD Data

Show 10 entries

Search:

Expocode	Start Date	End Date
33RO20180423	2018-04-23	2018-06-06
320620180309	2018-03-09	2018-05-14
740H20180228	2018-02-28	2018-04-10
320620170820	2017-08-20	2017-09-30
320620170703	2017-07-03	2017-08-17
33RO20161119	2016-11-19	2017-02-03
096U20160426	2016-04-26	2016-06-22
33RR20160321	2016-03-21	2016-04-28
096U20160314	2016-03-14	2016-04-13
33RR20160208	2016-02-08	2016-03-06

Showing 1 to 10 of 947 entries

Previous Next

BCO-DMO CTD Data

Show 10 entries

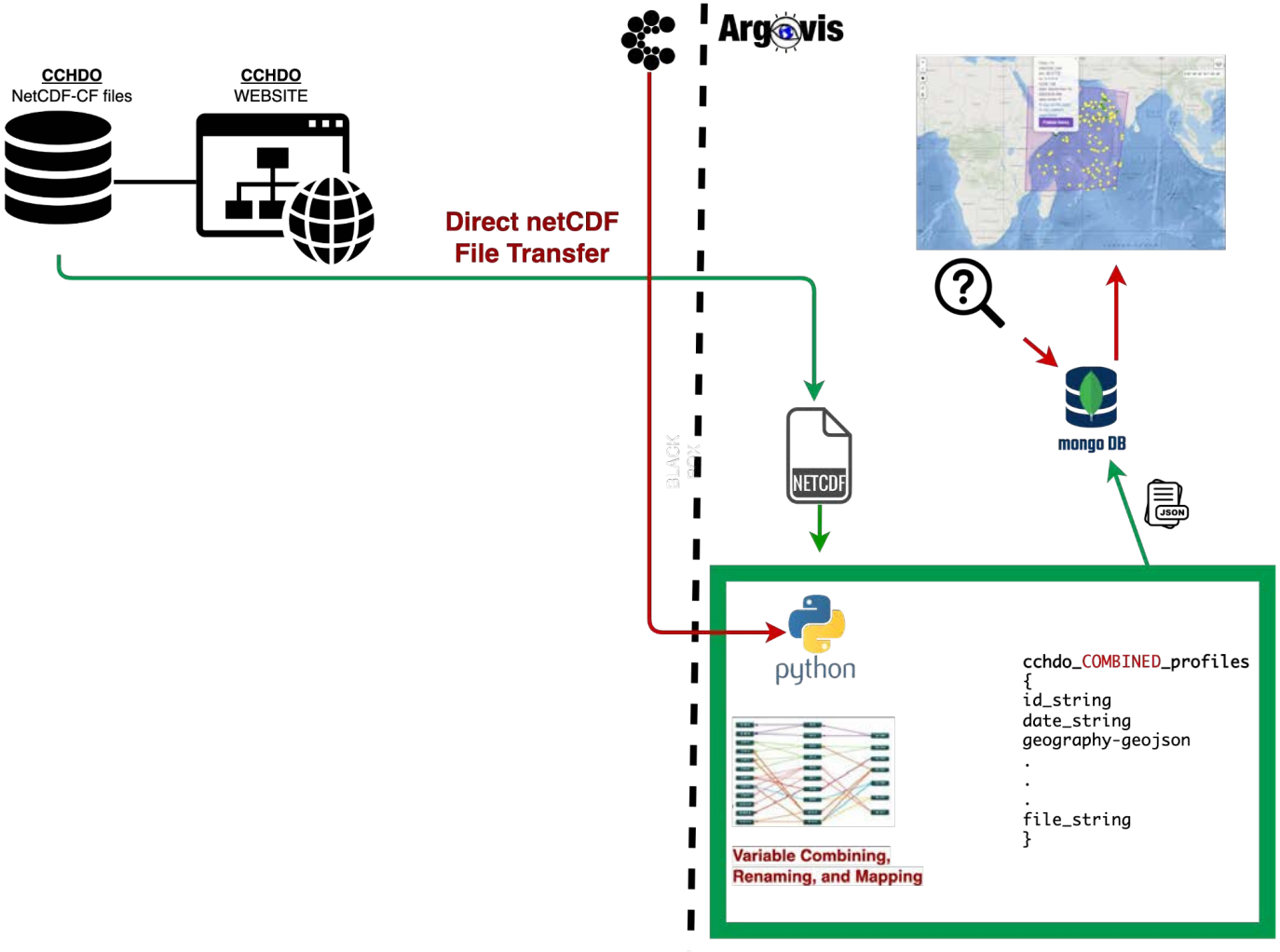
Search:

Dataset Id	Start Date	End Date
3566		
3358		
781545	2019-07-25	2019-07-25
774859	2019-05-20	2019-05-23
774958	2019-05-20	2019-05-23
757784	2018-05-07	2018-05-29
765868	2017-12-16	2017-12-22
757722	2017-10-14	2017-10-27
753679	2017-03-30	2017-04-04
753624	2016-09-07	2016-09-09

Showing 1 to 10 of 73 entries

Previous Next

https://lmerchant.github.io/dist/

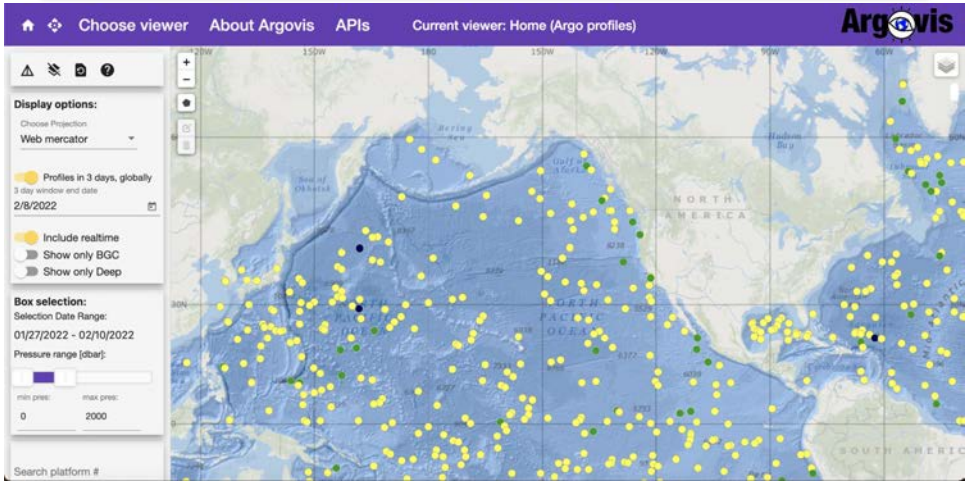

CCHDO
NetCDF-CF files
CCHDO
WEBSITE
Argovis
Direct netCDF
File Transfer
BLACK BOX
NETCDF
mongo DB
JSON
python
Variable Combining,
Renaming, and Mapping
cchdo_COMBINED_profiles
{
id_string
date_string
geography-geojson
.
.
.
file_string
}

Argovis

A Next Generation Platform for co-located Oceanic and Atmospheric Data to Accelerate Climate Science Workflows: ***now also integrating Argo and GO-SHIP data***

In collaboration with S. Purkey, S. Diggs, A. Barna, L. Merchant at SIO

Argovis team: D. Giglio, W. Mills, M. Scanderbeg, T. Tucker



URL: argovis.colorado.edu
Contact: **argovis@colorado.edu**
Twitter: ArgovisWebApp, @ArgovisCU

Argovis supports:

Who? Climate scientists, students, people curious about the climate system

What? Research, education, outreach

How? By making it easy for anyone to visualize and access co-located datasets using a browser or not (Argo, GO-SHIP, weather events, gridded products)

EarthCube

This work supported through the National Science Foundation Award #1928305 and #2026954.

alignment

ipcc
INTERGOVERNMENTAL PANEL ON climate change

WMO UNEP

Argo

OceanSITES

Ocean Data View
https://odv.awi.de
© 2021 Reiner Schlitzer

ERDDAP
Easier access to scientific data

Panoply
Version 4.12.8
Build PANM6SPR — 2021-06-26
NASA/GISS
NASA Goddard Institute for Space Studies
2880 Broadway, New York, NY 10025 USA
Panoply uses several third-party, open-source Java libraries. See the 'Credits & Acknowledgments' help window for more information.