



EARTH CUBE
TRANSFORMING GEOSCIENCES RESEARCH



Argovis: A Next Generation Platform for co-located Oceanic and Atmospheric Data to Accelerate Climate Science Workflows

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URL: argovis.colorado.edu
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University of Colorado
Boulder

Argovis is a web app and database

What data are in Argovis at the moment?

- Argo T/S/P profiles
 - In upper 2000 dbar: only QC flag of 1
 - Below 2000 dbar: QC flag up to 2 for T, up to 3 for S
- Weather events, e.g. Atmospheric Rivers, Tropical Cyclones (not yet advertised)
- Gridded products: RG2009 climatology, SOSE sea ice coverage, ... more fields and products will be included

Argovis is a web app and database

- Argo T/S/P profiles
 - In upper 2000 dbar: only QC flag of 1
 - Below 2000 dbar: QC flag up to 2 for T, up to 3 for S
- GO-SHIP profiles (coming up in 2021)
- Weather events, e.g. Atmospheric Rivers, Tropical Cyclones
- Gridded products: RG2009 climatology, SOSE sea ice coverage, ... more fields and products will be included

The **goal**: make it easy for anyone (both scientists and non-scientists) to visualize and access co-located datasets using a browser or not

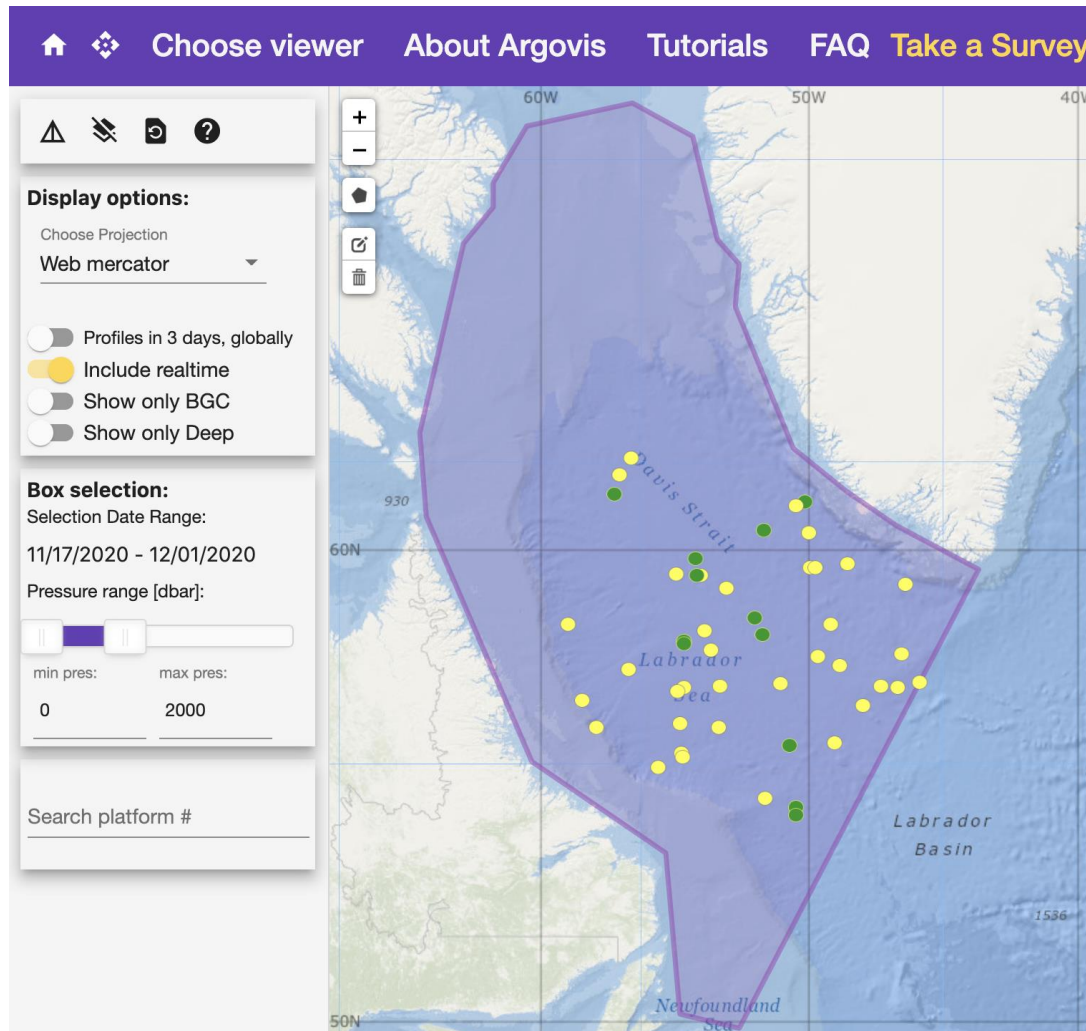
- To facilitate science through FAIR co-located data
- To engage students through in-class activities (examples at SIO and CU)

Argovis is a web app and database

The **goal**: make it easy for anyone (both scientists and non-scientists) to visualize and **access** co-located datasets using a browser or not

- Serving, for the first time, Argo profile data and metadata globally **via API**, including BGC observations
 - real time access: profiles can be imported in your programming environment or in another web app
 - Example scripts available in python, matlab, R
- Selections are possible
 - in time and space (any shape is possible)
 - by platform #, variable (e.g. oxygen), program (e.g. BGC)

Query BGC variables in a region



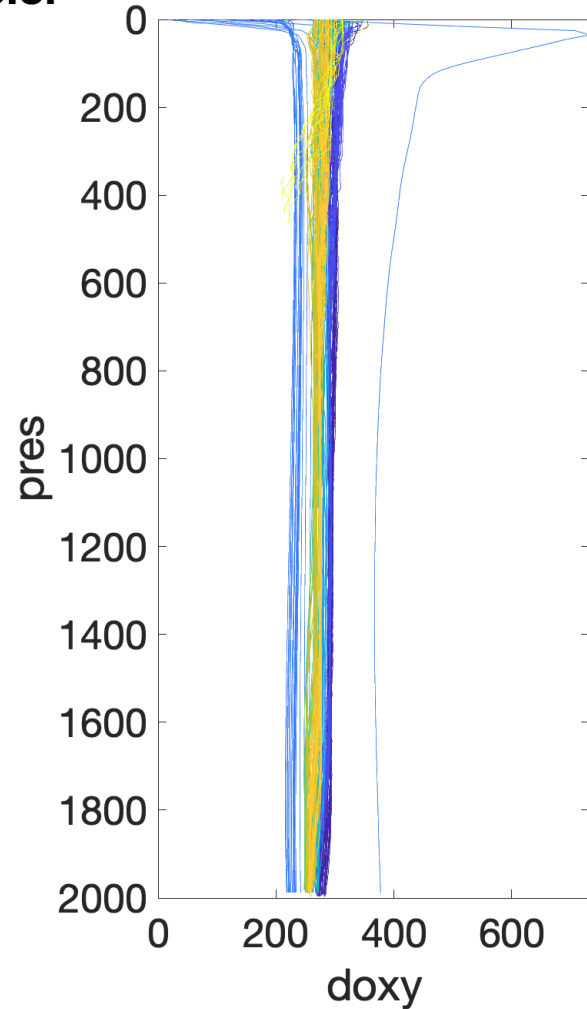
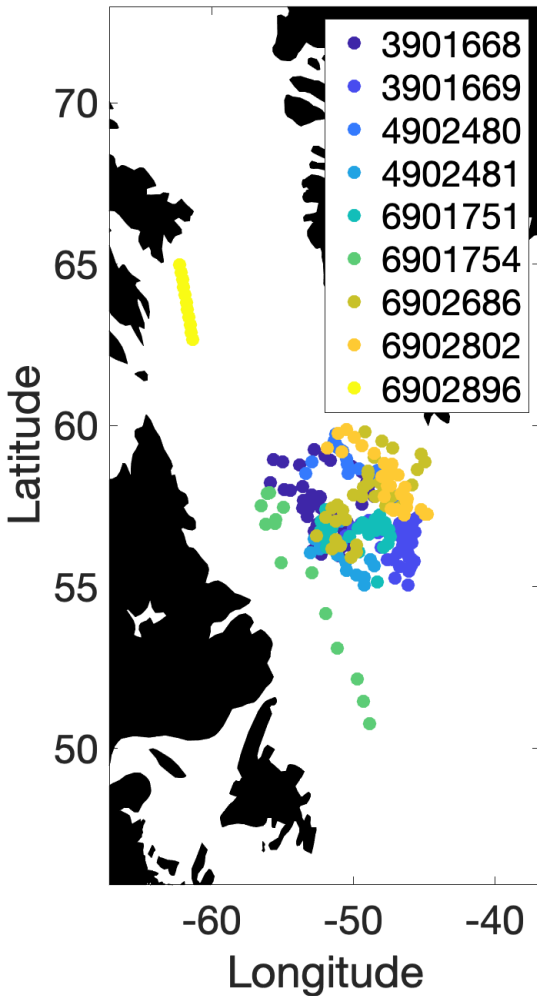
The screenshot shows the Argovis web interface. At the top, there is a navigation bar with links: Home, Choose viewer, About Argovis, Tutorials, FAQ, and Take a Survey. Below the navigation bar is a map of the Labrador Sea region, showing a purple polygon representing the region of interest. The map includes labels for Davis Strait, Labrador Sea, and Labrador Basin. The map also shows latitude and longitude coordinates (60W, 50W, 40W, 60N, 50N) and bathymetry contours (930, 1536). On the left side of the map, there are several control panels:

- Display options:**
 - Choose Projection: Web mercator
 - Profiles in 3 days, globally:
 - Include realtime:
 - Show only BGC:
 - Show only Deep:
- Box selection:**
 - Selection Date Range: 11/17/2020 - 12/01/2020
 - Pressure range [dbar]:
 - min pres: 0
 - max pres: 2000
- Search platform #:

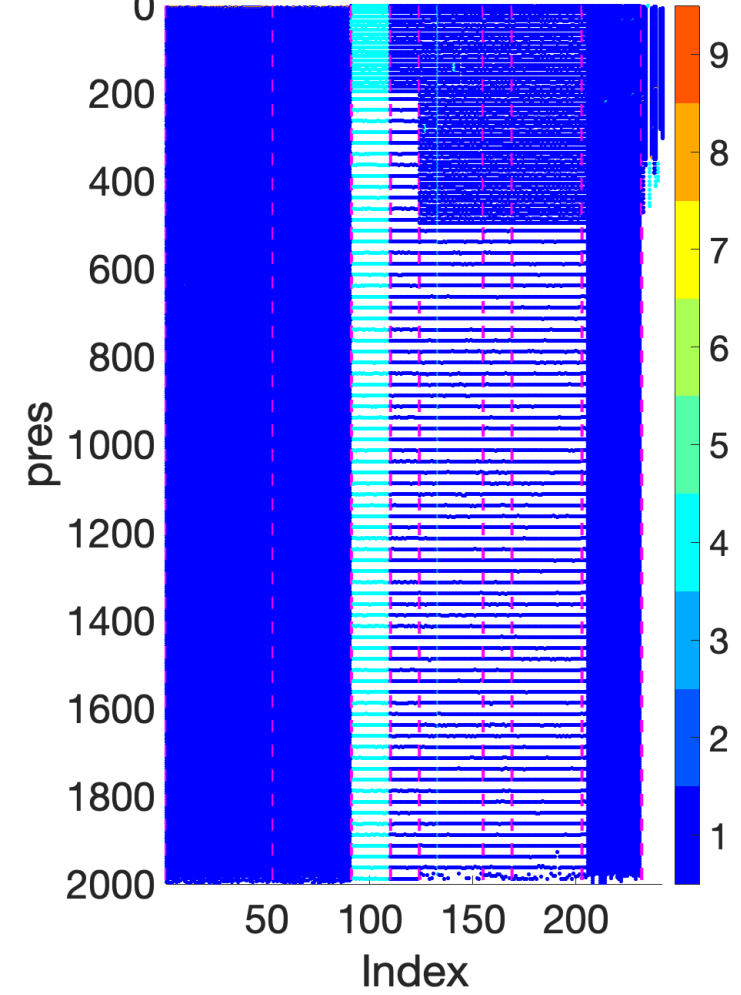
- Go to argovis.colorado.edu
- Draw the region of interest
- Look at the url for how to define the same shape when using the API

Query BGC variables in a region

doxy profiles, WMO# in color



doxy QC in color



Argovis is a web app and database

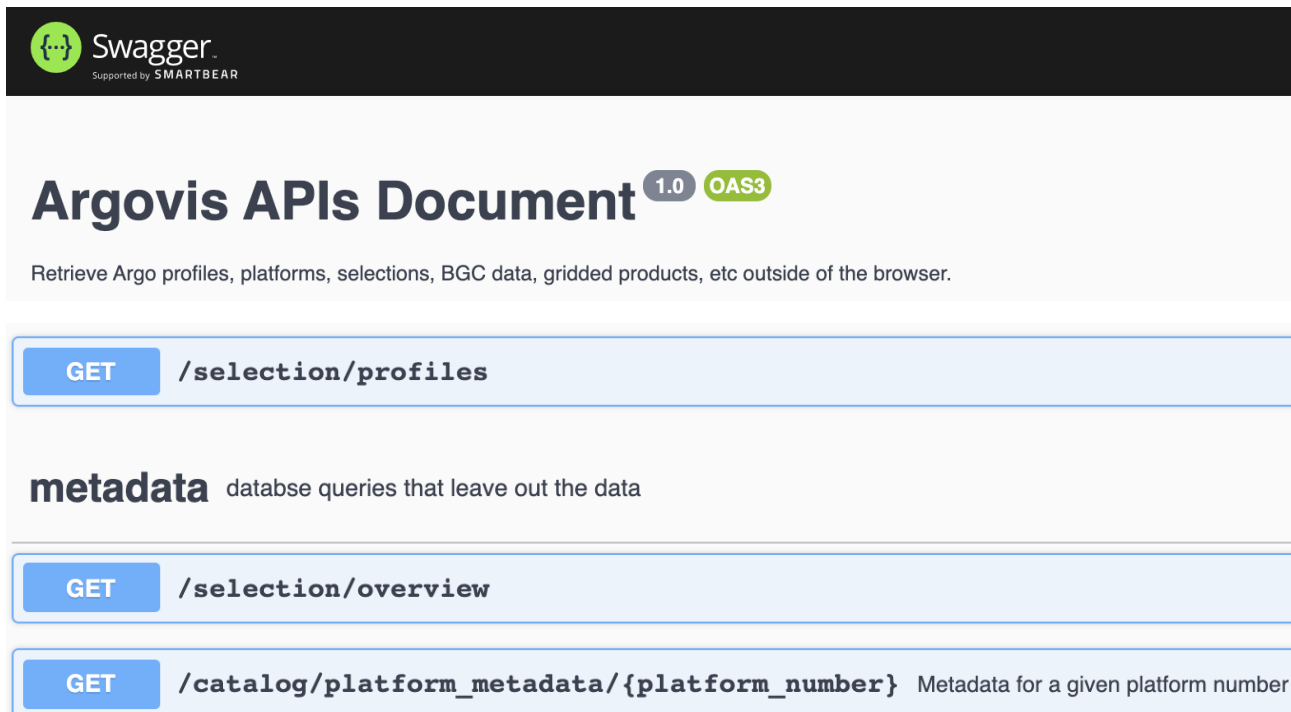
The **goal**: make it easy for anyone (both scientists and non-scientists) to visualize and **access** co-located datasets using a browser or not

- Serving, for the first time, Argo profiles data and metadata globally **via API**, including BGC observations
 - real time access: profiles can be imported in your programming environment or in another web app
 - Example scripts available in python, matlab, R
- Selections are possible
 - in time and space (any shape is possible)
 - by platform #, variable (e.g. oxygen), program (e.g. BGC)
- Co-location enabled (e.g. profiles in AR or near TC track)

Argovis API documentation

Argovis has documented all its API calls including regions, floats, profiles, BGC data, and more, at <https://argovis.colorado.edu/api-docs/>

- Browse Argo profiles on a map

A screenshot of the Swagger API documentation interface for Argovis. The interface has a dark header with the Swagger logo and "Supported by SMARTBEAR". The main content area is white and features the title "Argovis APIs Document" with version "1.0" and "OAS3" tags. Below the title is a description: "Retrieve Argo profiles, platforms, selections, BGC data, gridded products, etc outside of the browser." There are three API endpoint cards, each with a blue "GET" button and a light blue background. The first card is for "/selection/profiles". The second card is for "metadata" with the description "database queries that leave out the data". The third card is for "/catalog/platform_metadata/{platform_number}" with the description "Metadata for a given platform number".

Swagger
Supported by SMARTBEAR

Argovis APIs Document 1.0 OAS3

Retrieve Argo profiles, platforms, selections, BGC data, gridded products, etc outside of the browser.

GET /selection/profiles

metadata database queries that leave out the data

GET /selection/overview

GET /catalog/platform_metadata/{platform_number} Metadata for a given platform number

Argovis API documentation

Argovis has documented all its API calls including regions, floats, profiles, BGC data, and more, at <https://argovis.colorado.edu/api-docs/>

- Browse Argo profiles on a map

Argopy and Argovis are now working together through Argovis API!

Thanks Guillaume Maze and Kevin Balem at Ifremer!

Argovis is a web app and database

The **goal**: make it easy for anyone (both scientists and non-scientists) to visualize and access co-located datasets using a browser or not

- Browse Argo profiles on a map

Toggle to show/hide profiles in a 3-day window, globally.

Select end date for the 3-day window.

Home Choose viewer About Argovis Tutorials FAQ Take a Survey Current viewer: Home (Argo profiles) Argovis

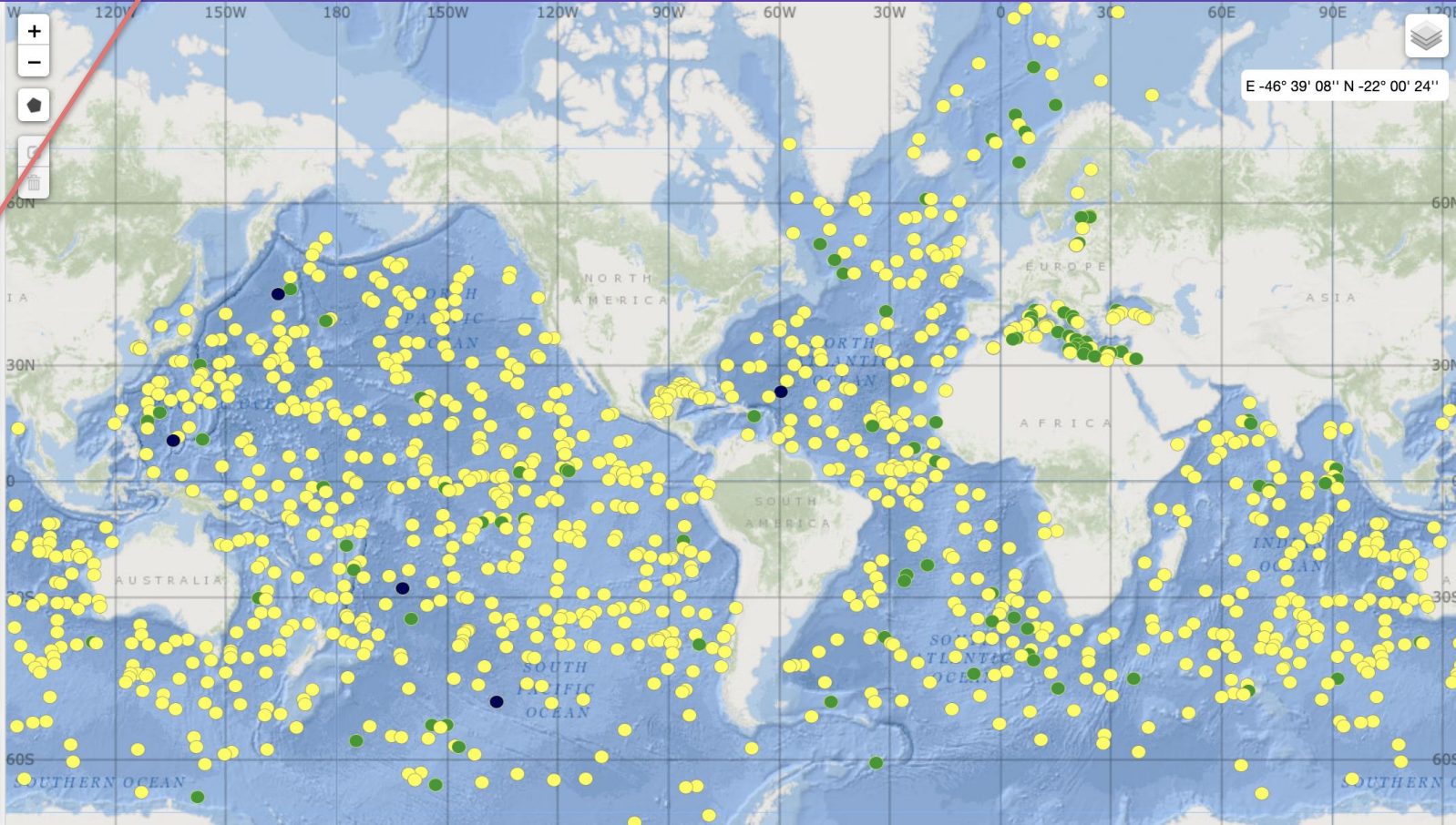
Display options:
Choose Projection
Web mercator

Profiles in 3 days, globally
3 day window end date
11/29/2020

Include realtime
 Show only BGC
 Show only Deep

Box selection:
Selection Date Range:
11/17/2020 - 12/01/2020
Pressure range [dbar]:
min pres: 0 max pres: 2000

Search platform #



Argovis is a web app and database

The **goal**: make it easy for anyone (both scientists and non-scientists) to visualize and access co-located datasets using a browser or not

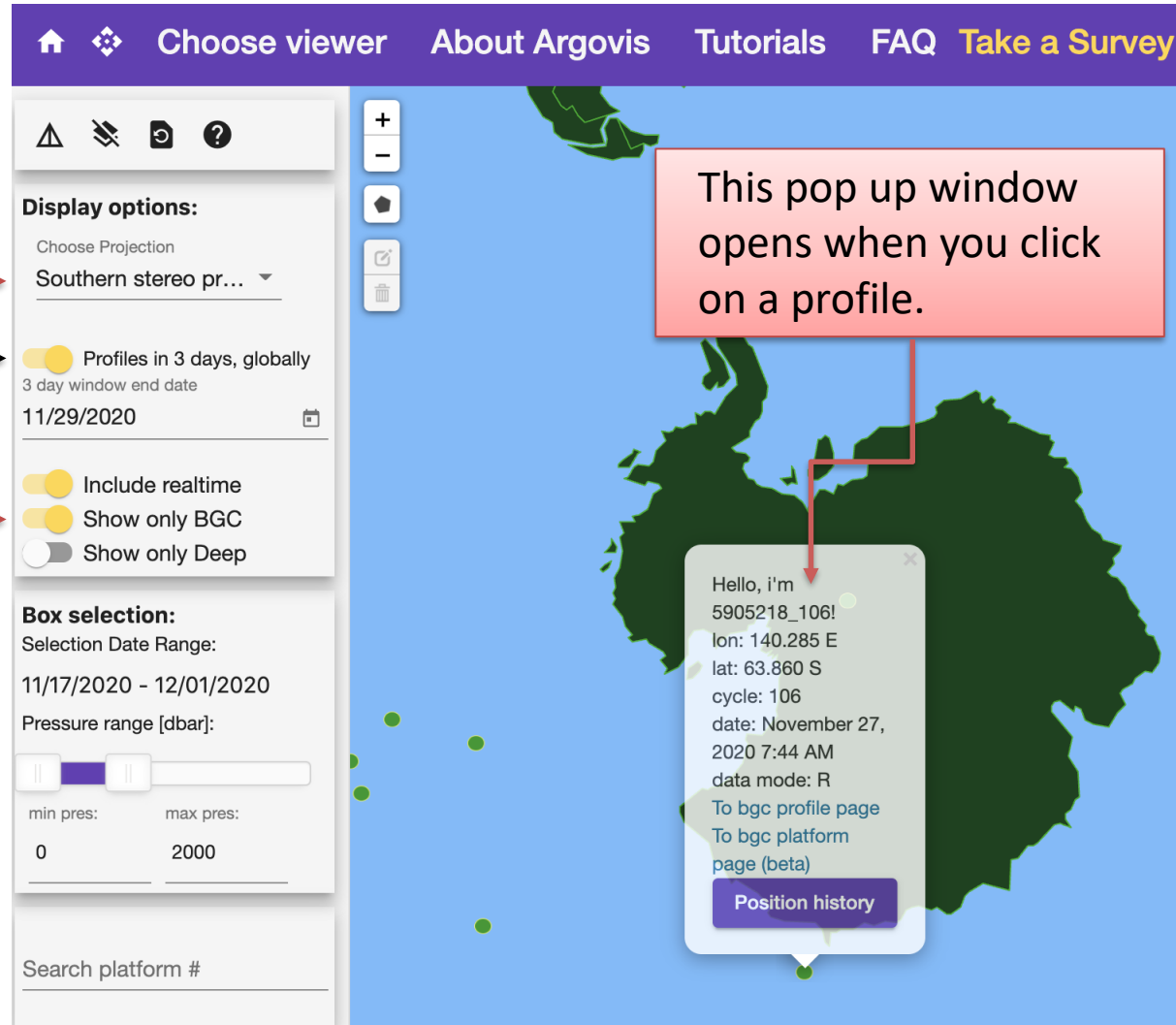
- Browse Argo profiles on a map
- Draw a selection shape and plot the profiles within
- Visit the platform page

Visualize profiles globally: 3-day window

Select projection.

Toggle to show/hide profiles in a 3-day window, globally.

Toggle to show only BGC Argo.



Choose viewer About Argovis Tutorials FAQ Take a Survey

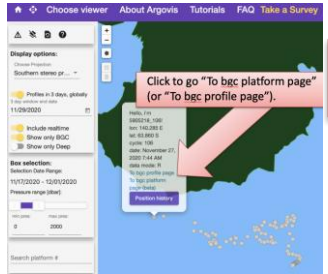
Display options:
Choose Projection
Southern stereo pr...
Profiles in 3 days, globally
3 day window end date
11/29/2020
Include realtime
Show only BGC
Show only Deep

Box selection:
Selection Date Range:
11/17/2020 - 12/01/2020
Pressure range [dbar]:
min pres: 0 max pres: 2000
Search platform #

This pop up window opens when you click on a profile.

Hello, i'm 5905218_106!
lon: 140.285 E
lat: 63.860 S
cycle: 106
date: November 27, 2020 7:44 AM
data mode: R
[To bgc profile page](#)
[To bgc platform page \(beta\)](#)
Position history

Visualize Argo profiles for a platform



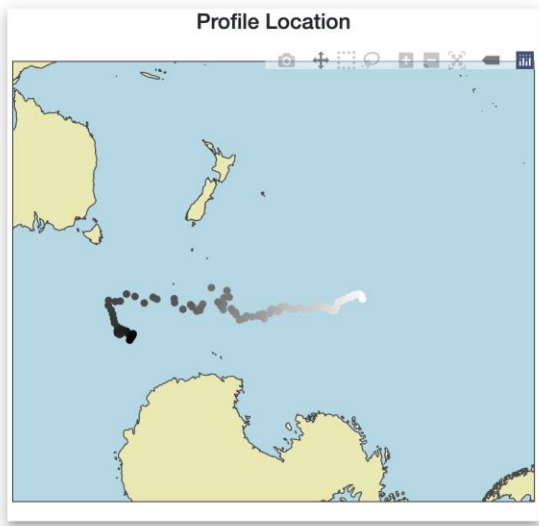
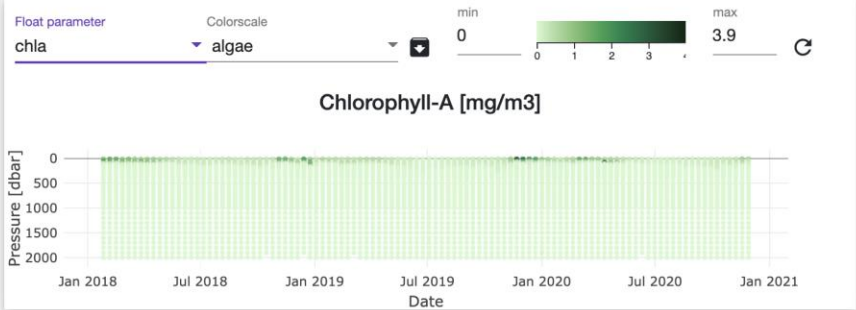
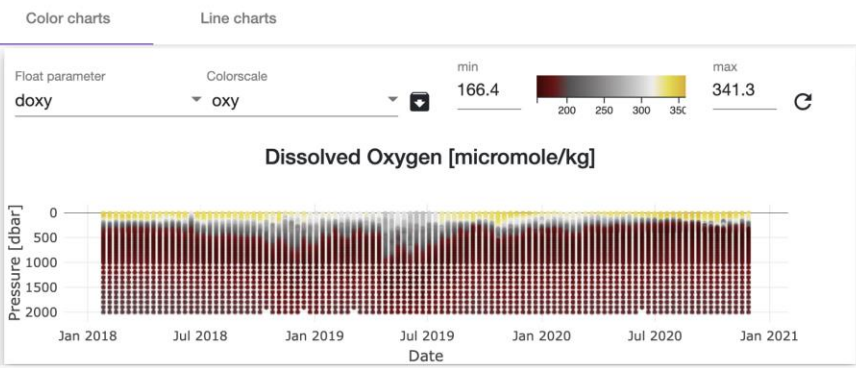
BGC platform page

Beta Product: Still in development!

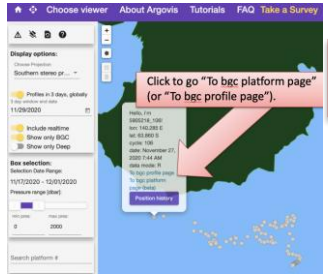
| | | |
|---|---------------------------|---|
| Platform Number: 5905372 | Updated on: Nov 30th 2020 | Number of profiles: 104 |
| PI: STEPHEN RISER, KENNETH JOHNSON | Dac: aoml | See table below for profile information. link to JCOMMOPS |
| Station Parameters: nitrate, pres, chla, doxy, temp, psal, ph_in_situ_total | | Positioning System: GPS link to Fleet Monitor |

Metadata & links

Select parameter and color-scale



Visualize Argo profiles for a platform



BGC platform page

Beta Product: Still in development!

Platform Number: 5905372 Updated on: Nov 30th 2020 Number of profiles: 104
 See table below for profile information. [link to JCOMMOPS](#)

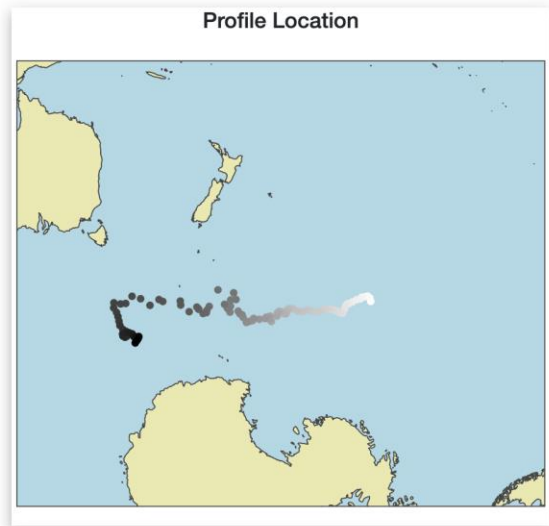
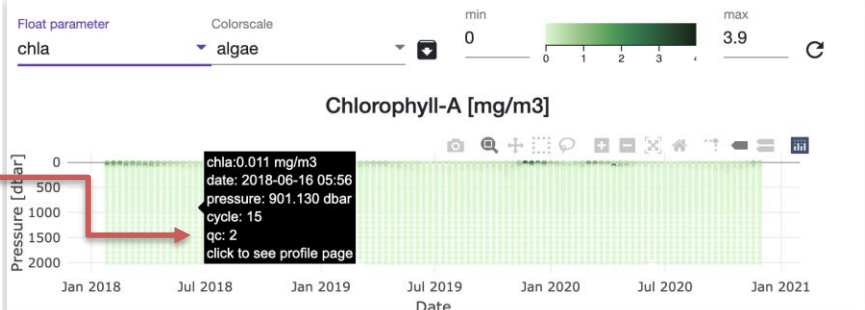
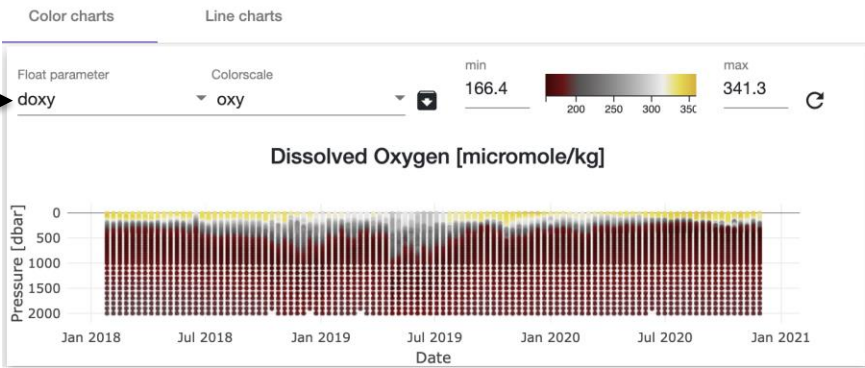
PI: STEPHEN RISER, KENNETH JOHNSON **Dac:** aoml Positioning System: GPS [link to Fleet Monitor](#)

Station Parameters: nitrate, pres, chla, doxy, temp, psal, ph_in_situ_total

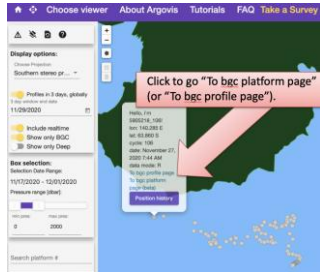
Metadata & links

Select parameter and color-scale

Hover on a point to see qc flag



Visualize Argo profiles for a platform



BGC platform page

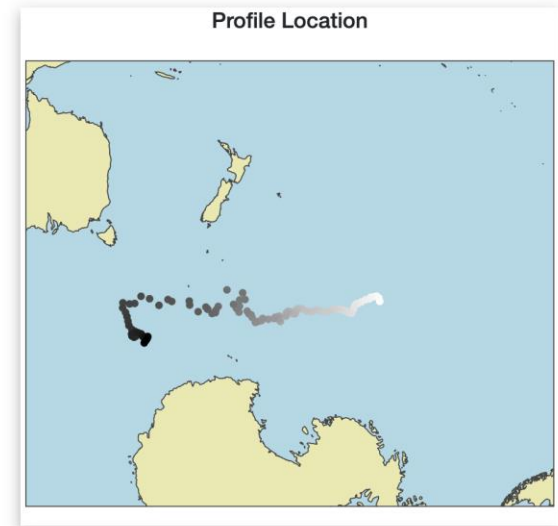
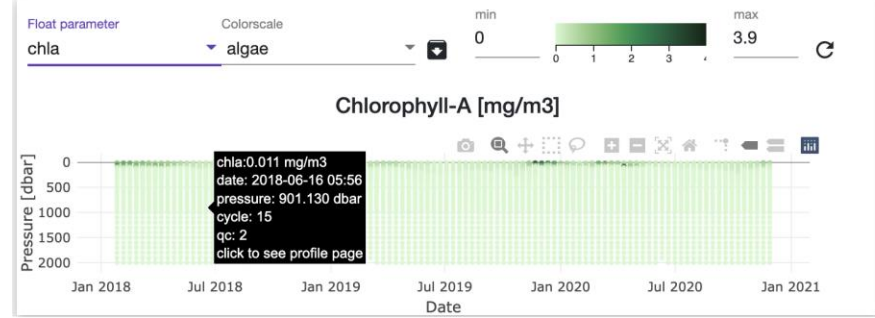
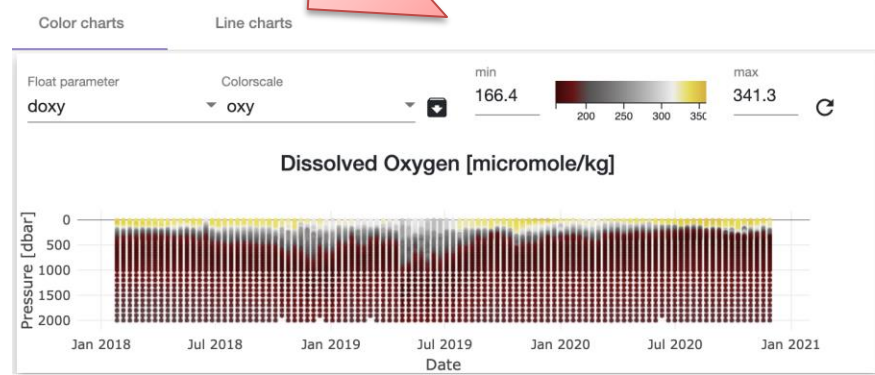
Click here to see plots of overlaid profiles.

Choose viewer About Argovis

Beta Product: Still in development!

Platform Number: 5905372 Updated: 2020-06-16 05:56
 PI: STEPHEN RISER, KENNETH JOHNSON
 Station Parameters: nitrate, pres, chl_a, sal, ph_in_situ_total

Number of profiles: 104
 See table below for profile information. [link to JCOMMOPS](#)
 Positioning System: GPS [link to Fleet Monitor](#)



Beta Product: Still in development!

Platform Number: 5905372

Updated on: Nov 30th 2020

Number of profiles: 104

See table below for profile information. [link to JCOMMOPS](#)

PI: STEPHEN RISER, KENNETH JOHNSON

Dac: aoml

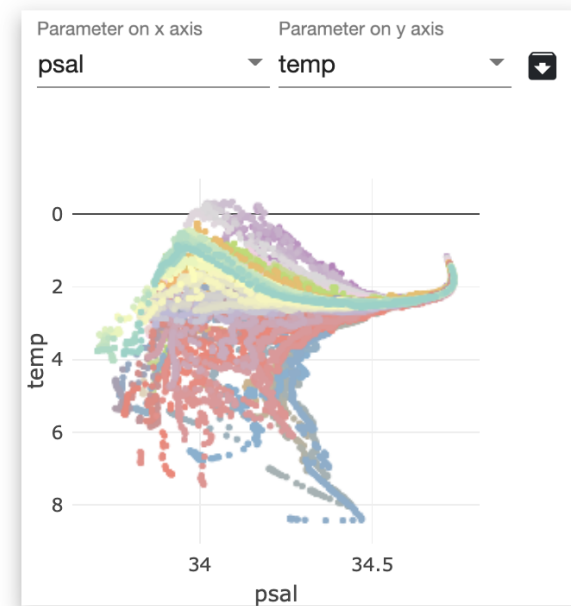
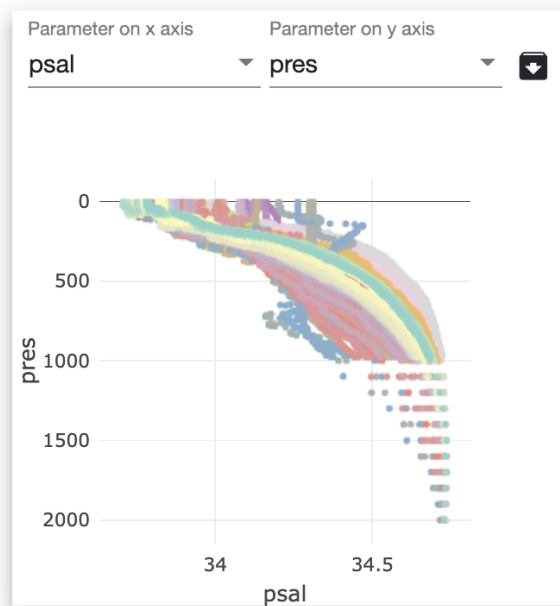
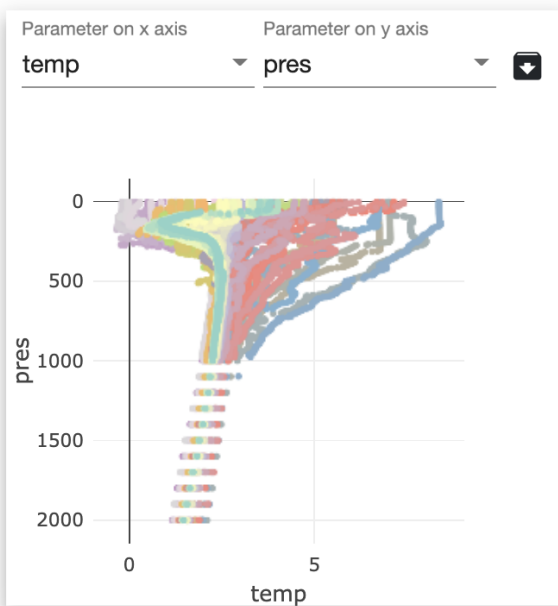
Positioning System: GPS

[link to Fleet Monitor](#)

Station Parameters: nitrate, pres, chla, doxy, temp, psal, ph_in_situ_total

Color charts

Line charts



Filter

| Cycle number | Link to GDAC data | Dac | Date reported | Lat | Lon | Core Data Mode |
|--------------|-----------------------------|------|---------------|----------|-----------|----------------|
| 104 | 5905372_104 | aoml | 2020-11-27 | 57.331 S | 148.728 W | A |
| 103 | 5905372_103 | aoml | 2020-11-17 | 56.904 S | 149.364 W | A |

Beta Product: Still in development!

Platform Number: 5905372

Updated on: Nov 30th 2020

Number of profiles: 104

See table below for profile information. [link to JCOMMOPS](#)

PI: STEPHEN RISER, KENNETH JOHNSON

Dac: aoml

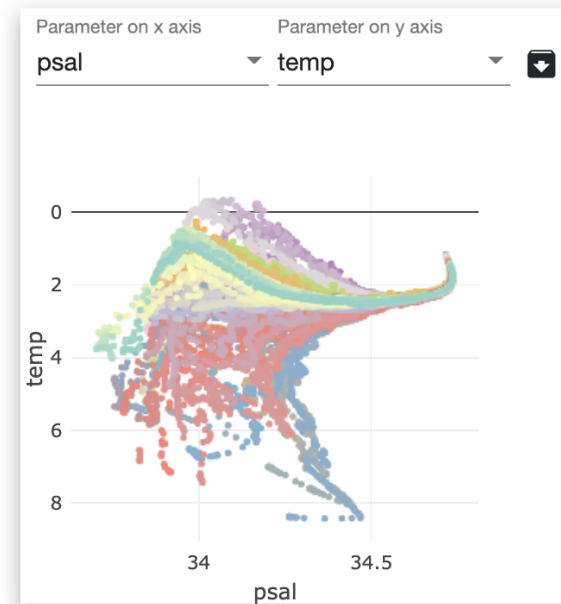
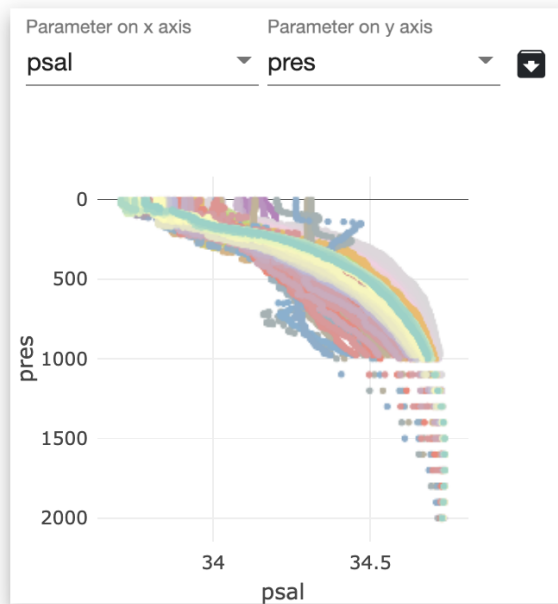
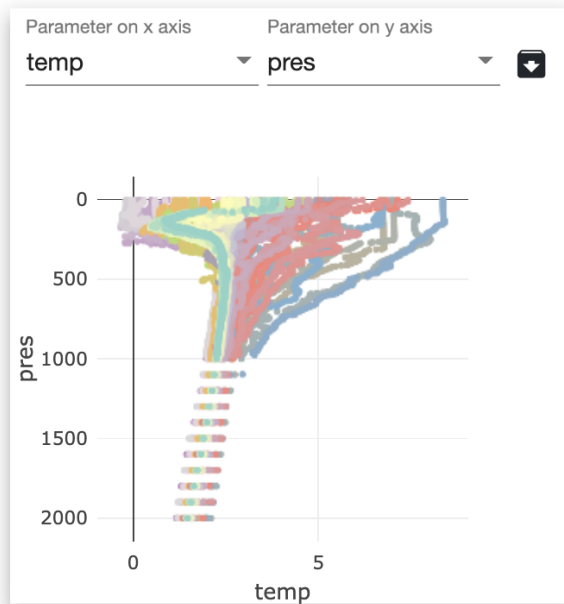
Positioning System: GPS

[link to Fleet Monitor](#)

Station Parameters: nitrate, pres, chla, doxy, temp, psal, ph_in_situ_total

Color charts

Line charts

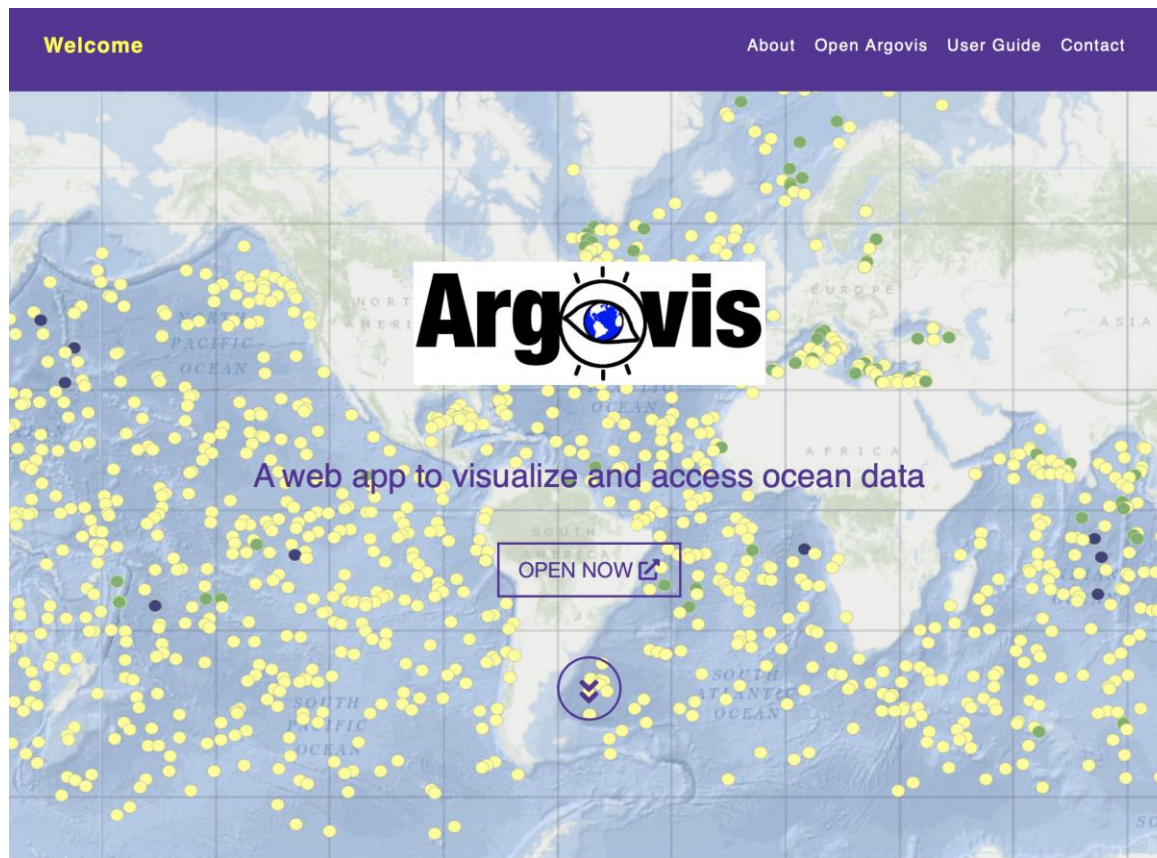


Metadata table at the end of the page: filter, sort by column or download (e.g. .xlsx, .csv, .json, .txt)

Filter

| Cycle number | Link to GDAC data | Dac | Date reported | Lat | Lon | Core Data Mode |
|--------------|-----------------------------|------|---------------|----------|-----------|----------------|
| 104 | 5905372_104 | aoml | 2020-11-27 | 57.331 S | 148.728 W | A |
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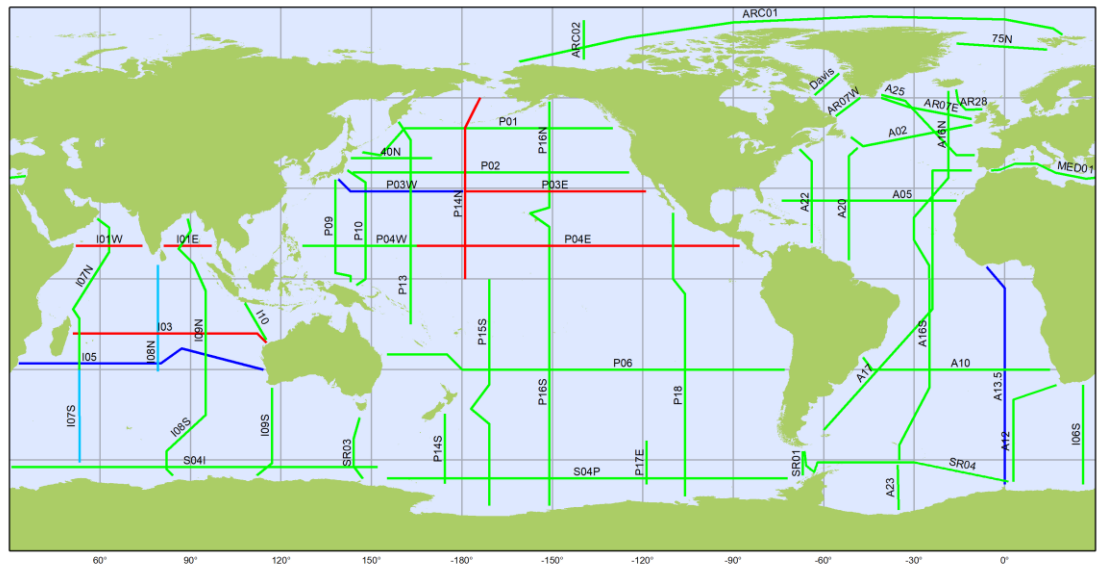
We are adding new, user friendly pages with general information and a User Guide.



The User Guide will include instructions for how to use each viewer, for what API calls are available, and education modules.

New NSF project: co-locate Argo with GO-SHIP data from CCHDO

(in collaboration with Dr. Purkey and CCHDO at SIO)



GO-SHIP Status of 2012-2023 Survey (55 Core Lines) December 2019

- completed (80% of all core lines)
- at sea (4% of all core lines)
- funded (5% of all core lines)
- not planned yet (11% of all core lines)

Lines completed, at sea or funded: 89% (49 core lines)
 Countries providing ship-time: 10
 Elapsed survey time: 73% (floating 11 years)



Generated by www.jcommops.org, 10/01/2020

GO-SHIP data will be available via API, including info about

- date the new/updated profile was added to Argovis
- whether the profile is part of GO-SHIP Easy Ocean (passed additional QC)

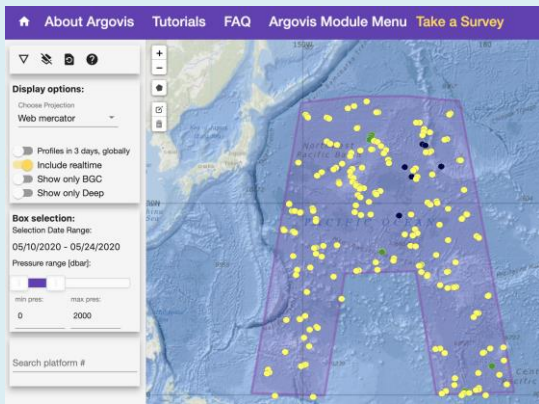


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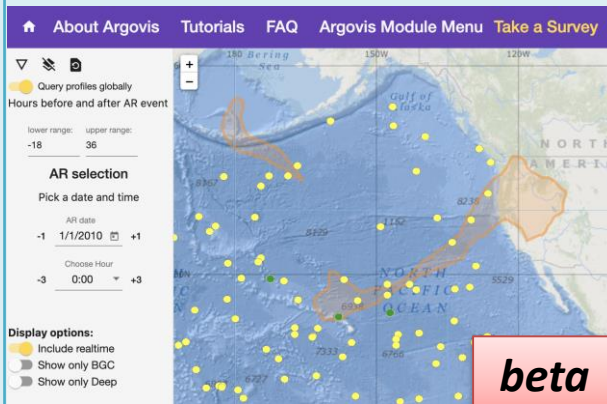


Argovis: A Next Generation Platform for co-located Oceanic and Atmospheric Data to Accelerate Climate Science Workflows

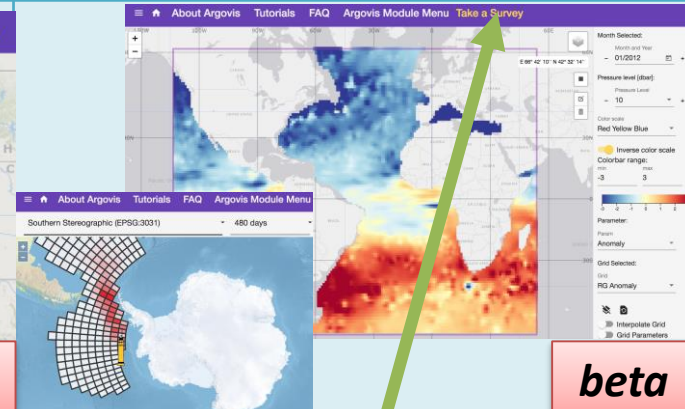
Visualize Argo data by location and time



Co-locate Argo with weather events, satellite data, and more



Display and compare gridded data



Import data of interest in programming environment of choice through API.
For both scientists and non-scientists!

Stay tuned for more gridded products (e.g. B-SOSE, SST, SSH, precipitation, winds, WOA18, ...), weather events (e.g. tropical cyclones), ...

Take a survey and make your request!

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



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