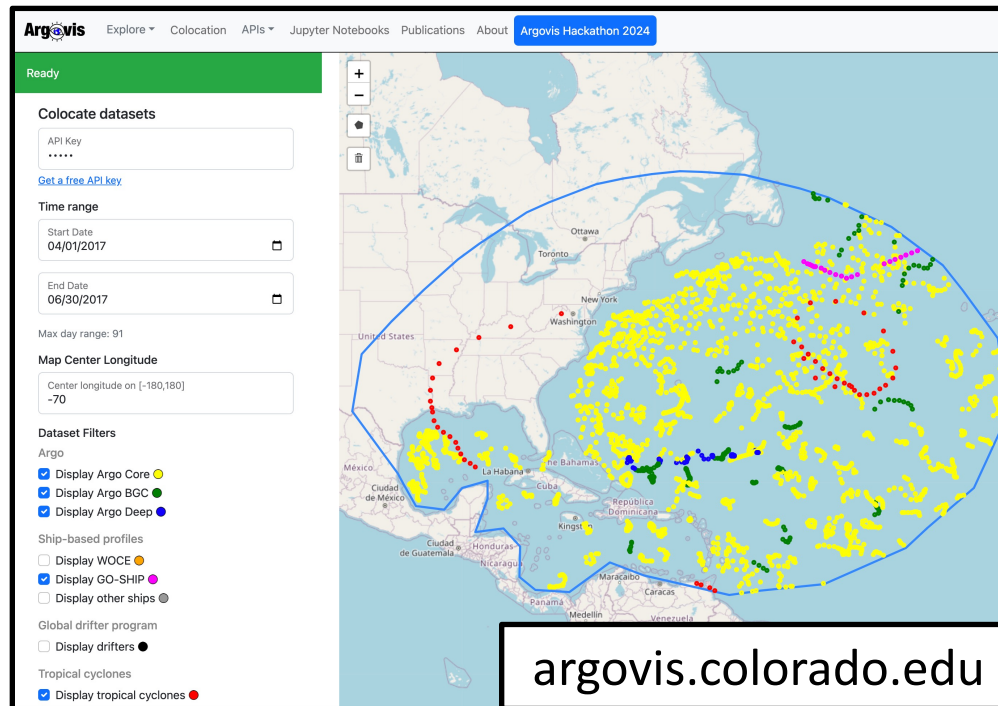


Argovis: A Next Generation Platform for co-located Oceanic and Atmospheric Data to Accelerate Climate Science, Outreach, and Education

Donata Giglio

Bill Katie-Anne Mills, Megan Scanderbeg, Sarah Purkey, Lynne Merchant, Tyler Tucker, Steve Diggs, Andrew Barna



Collaborators: Sam Shen, Julien Pierret, Lynne Talley, Gui Castelao, Matt Mazloff, Aneesh Subramanian, Giovanni Seijo-Ellis, Susan Anil, Shane Elipot, Philippe Miron

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

argovis.colorado.edu

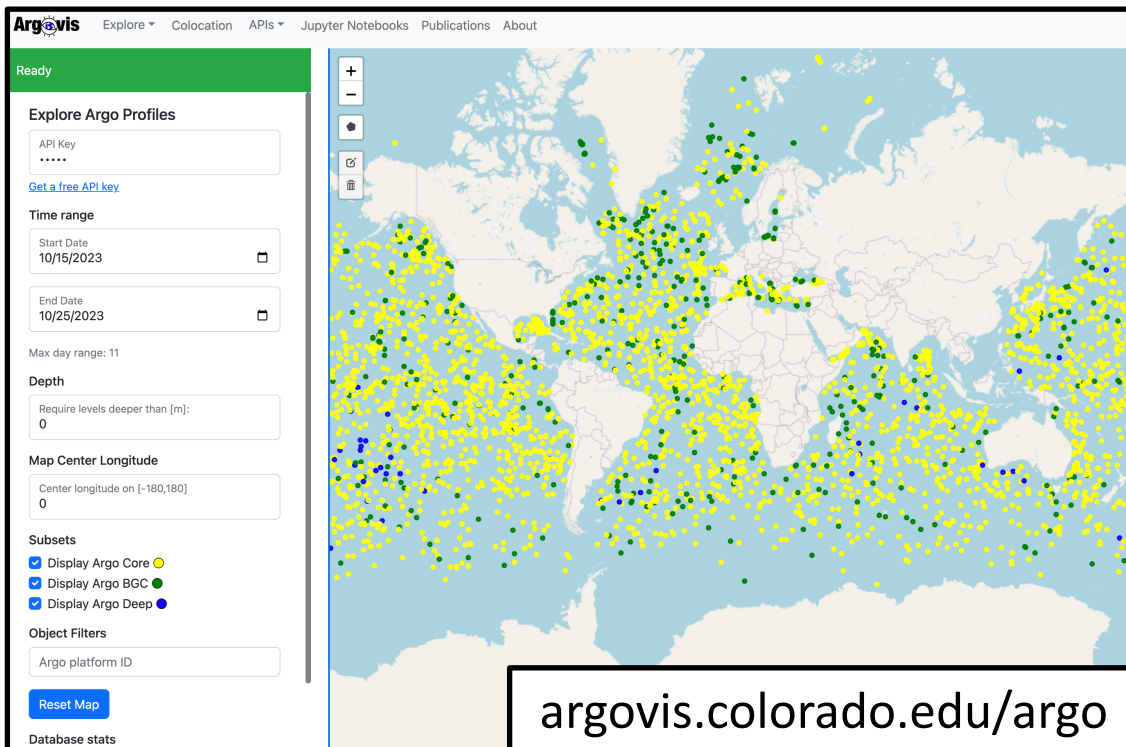
Argovis is a web app and database

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

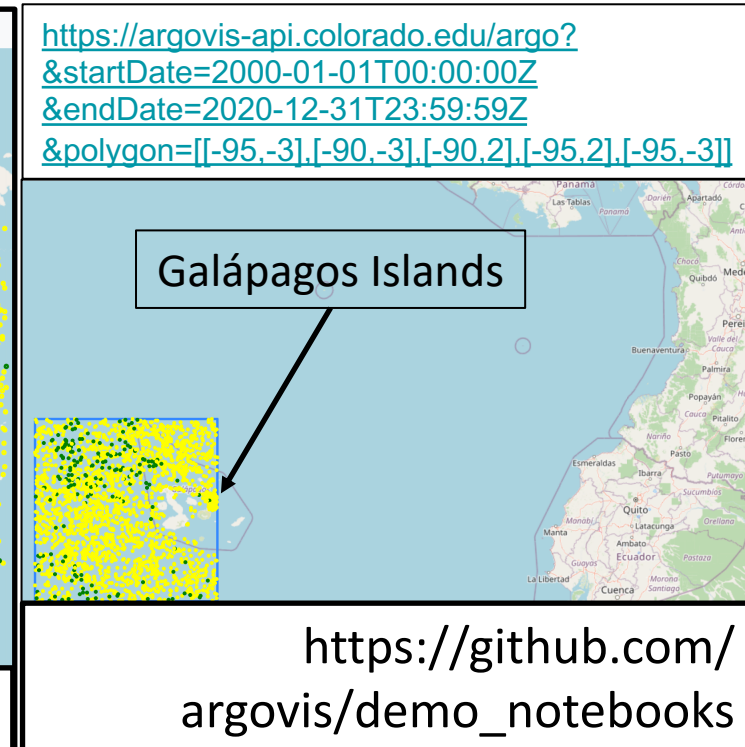
(e.g. oceanic profiles, weather events, gridded fields)

Access via web interface

Or via API (e.g. notebooks on browser)



argovis.colorado.edu/argo



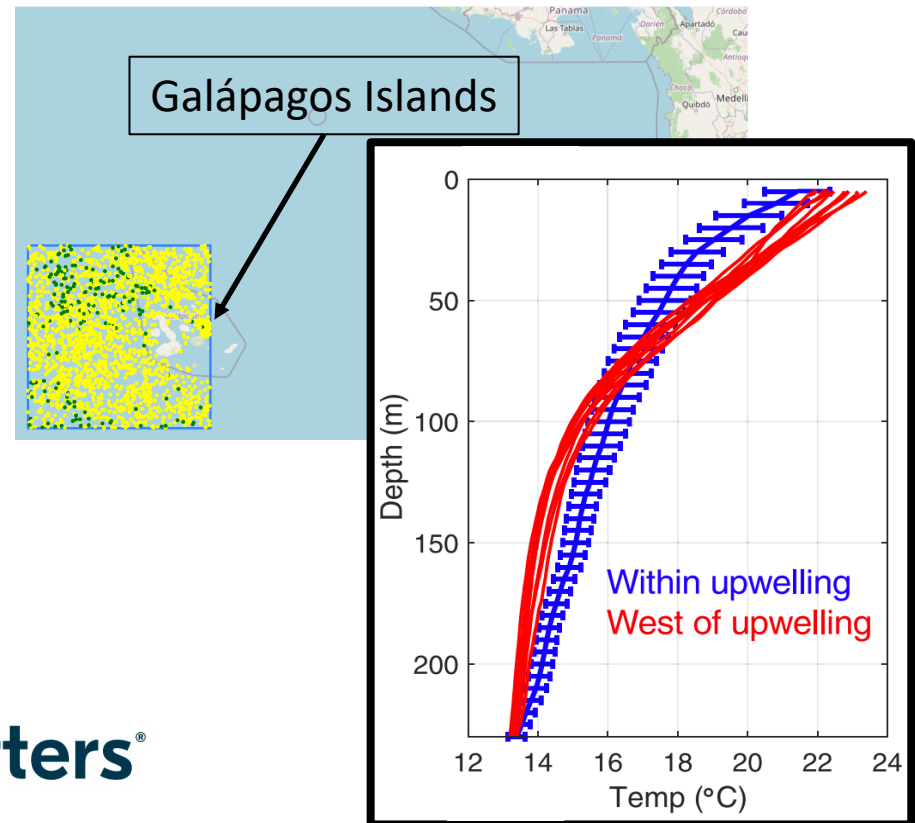
[https://argovis-api.colorado.edu/argo?
&startDate=2000-01-01T00:00:00Z
&endDate=2020-12-31T23:59:59Z
&polygon=\[\[-95,-3\],\[-90,-3\],\[-90,2\],\[-95,2\],\[-95,-3\]\]](https://argovis-api.colorado.edu/argo?&startDate=2000-01-01T00:00:00Z&endDate=2020-12-31T23:59:59Z&polygon=[[-95,-3],[-90,-3],[-90,2],[-95,2],[-95,-3]])

Galápagos Islands

[https://github.com/
argovis/demo_notebooks](https://github.com/argovis/demo_notebooks)

Argovis enables targeted search

- Query the exact measurements needed
 - even subsets of individual measurements
- Save bandwidth & post-processing



Geophysical Research Letters®

RESEARCH LETTER

10.1029/2022GL098744

Key Points:

Argo Reveals the Scales and Provenance of Equatorial Island Upwelling Systems

Kristopher B. Karneckas^{1,2}  and Donata Giglio¹ 

Research example

https://github.com/argovis/demo_notebooks

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

- **In-Situ obs**: Argo profiles, CCHDO ship-based profiles, Global Drifter Program Data
- **Grids based on in-situ obs**: Roemmich-Gilson Argo Climatology, GO-SHIP Easy Ocean, LocalGP ocean heat content, GLODAPv2
- **Grids based on satellite data**: Aviso Sea Surface Height, NOAA OI Sea Surface Temperature v2, REMSS cross-calibrated multi-platform winds
- **Weather events**: Atmospheric River Climatology, Tropical cyclone data
- **Other**: BSOSE (in progress), Argo trajectories, ARGONE

*Dataset details at <https://argovis.colorado.edu/about>

Argovis enables a targeted search

- Query profiles in a region and time of interest, e.g.
 - all BGC profiles (using browser)
 - only oxygen profiles with best QC flag (via API)

Ready

Explore Argo Profiles

API Key

.....

[Get a free API key](#)

Time range

Start Date

03/16/2022

End Date

03/16/2023

Max day range: 366

Depth

Require levels deeper than [m]:

0

Map Center Longitude

Center longitude on [-180,180]

0

Subsets

☐ Display Argo Core

☒ Display Argo BGC

☐ Display Argo Deep

Object Filters

Argo platform ID

Reset Map

ID: 6902802_154
 Long / Lat: -57.04293333333333 / 65.09882666666667
 Date: 2022-09-14T06:46:29.999Z
 Data Sources: argo_bgc, argo_core
[Platform Page](#)
[Profile Page](#)
[Regional Selection Page](#)

Ready

Explore Argo Profiles

API Key
.....

[Get a free API key](#)

Time range

Start Date
01/09/2020

End Date
03/06/2023

Max day range: 11

Depth

Require levels deeper than [m]:
0

Map Center Longitude

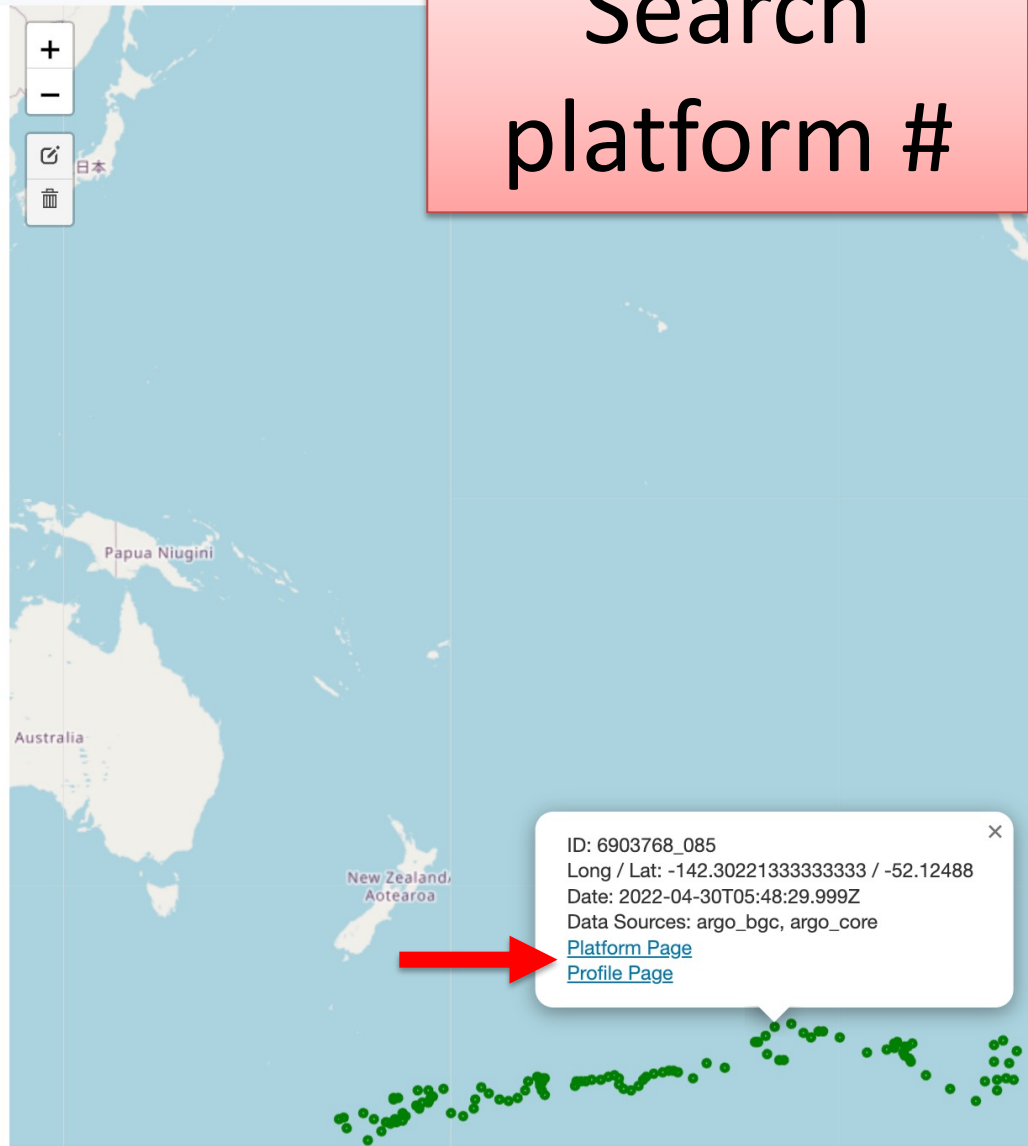
Center longitude on [-180,180]
100

Subsets

- ☐ Display Argo Core ●
- ☒ Display Argo BGC ●
- ☐ Display Argo Deep ●

Object Filters

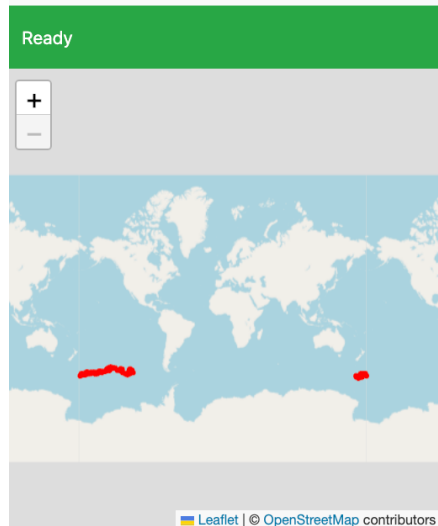
6903768



Search
platform #

<https://argovis-api.colorado.edu/argo/vocabulary?parameter=platform>

Custom 3D plots



Axis Controls

x-axis variable

temperature

min

Auto

max

Auto

Reverse x axis

☐

Reset x Limits

y-axis variable

pressure

min

Auto

max

Auto

Reverse y axis

☒

Reset y Limits

color variable

temperature_argoqc

min

Auto

max

Auto

Reverse color axis

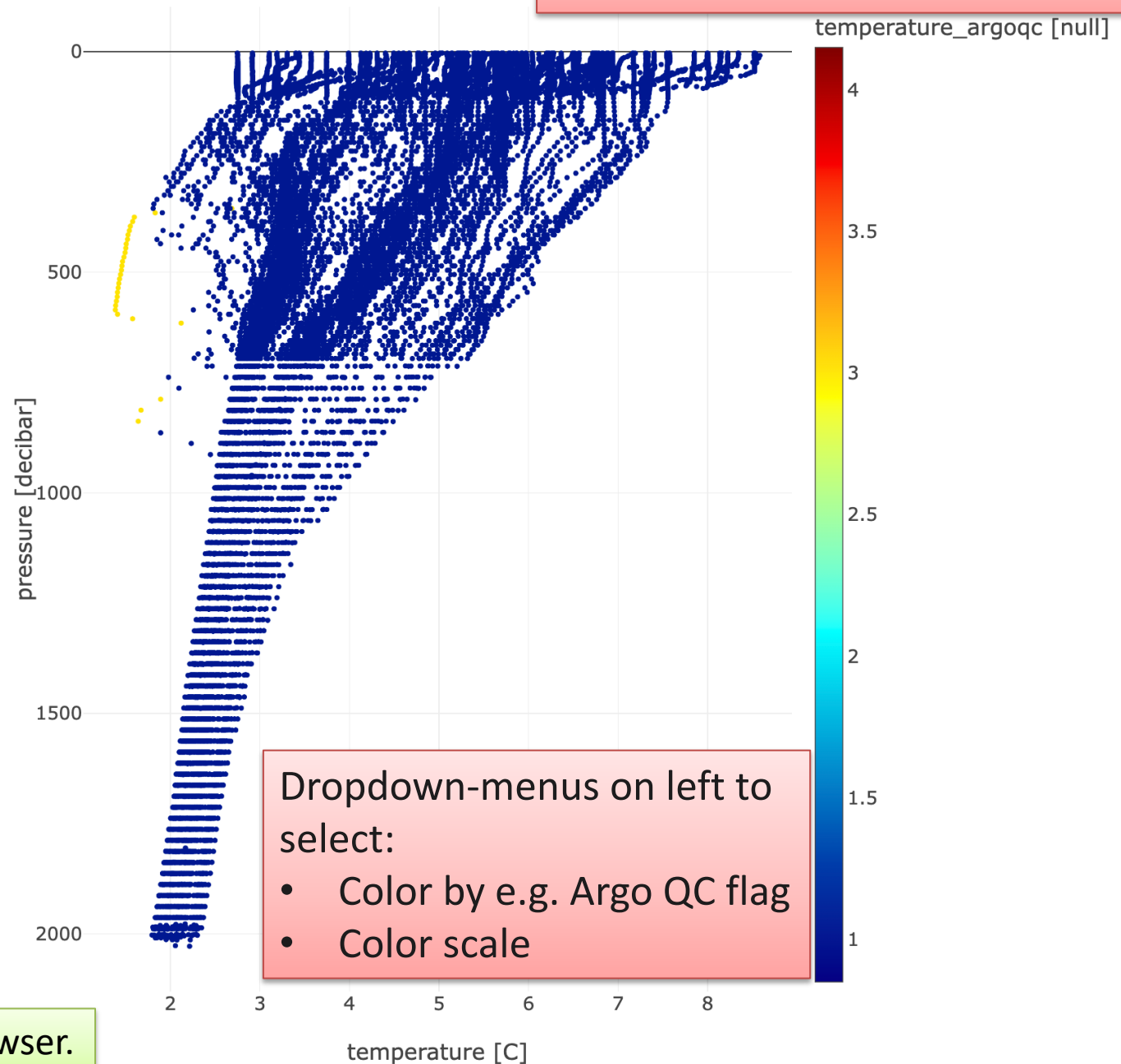
☐

Reset color Limits

color scale

Jet

Argo profile

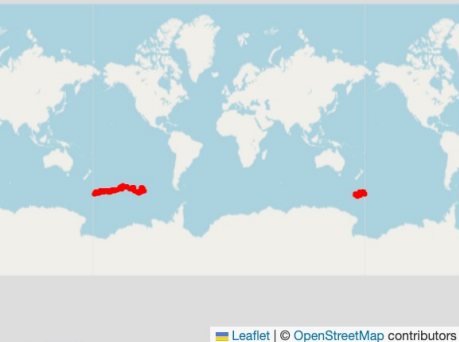


Dropdown-menus on left to select:

- Color by e.g. Argo QC flag
- Color scale

Using Argo vis on the browser.

Ready



Leaflet | © OpenStreetMap contributors

Reverse x axis



Reset x Limits

y-axis variable

month

min

Auto

max

Auto

Reverse y axis



Reset y Limits

color variable

month

min

Auto

max

Auto

Reverse color axis



Reset color Limits

color scale

Electric

z-axis variable

pressure

min

Auto

max

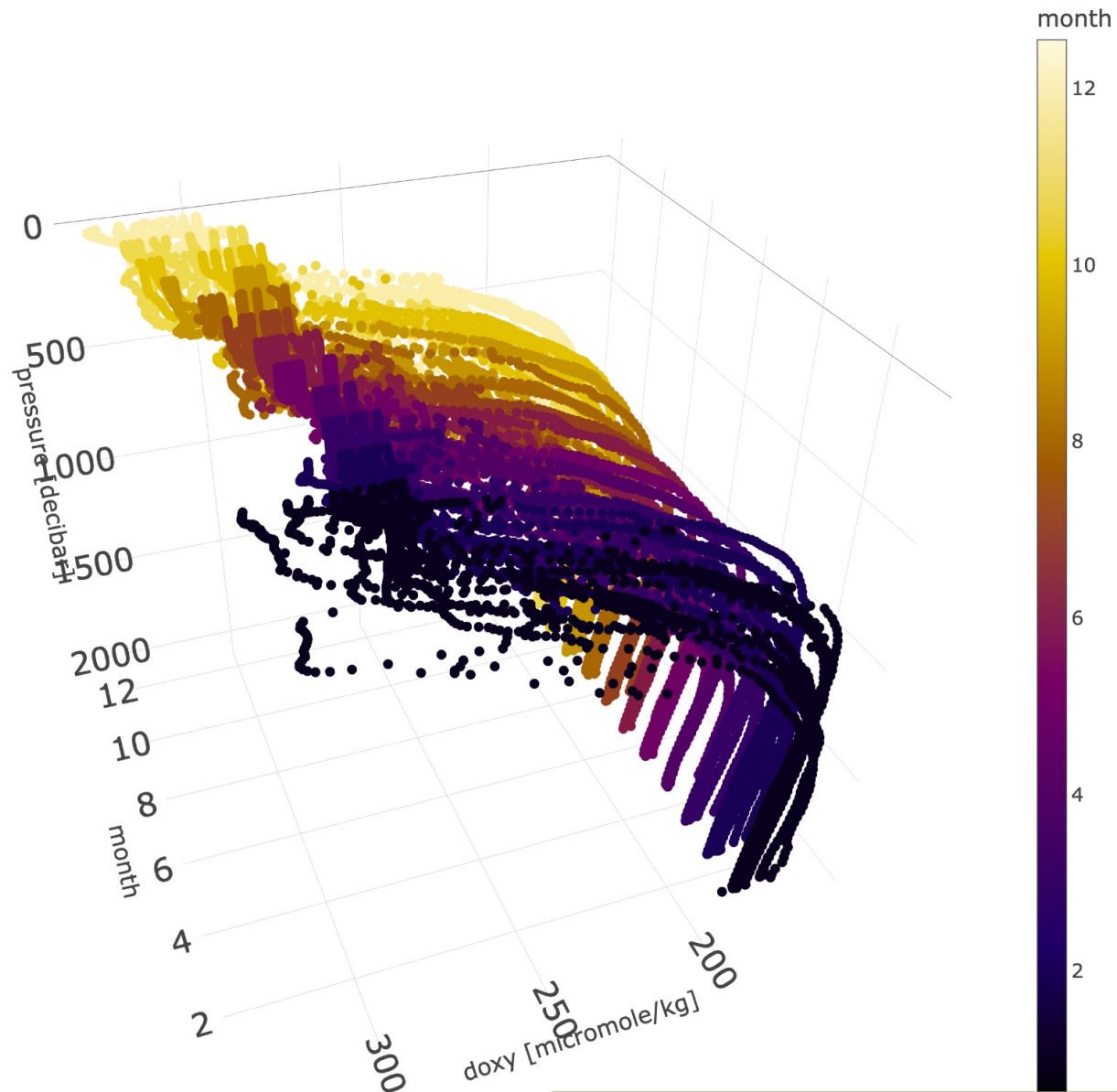
Auto

Reverse z axis



Reset z Limits

Argo profile



Using ArgoVis on the browser.

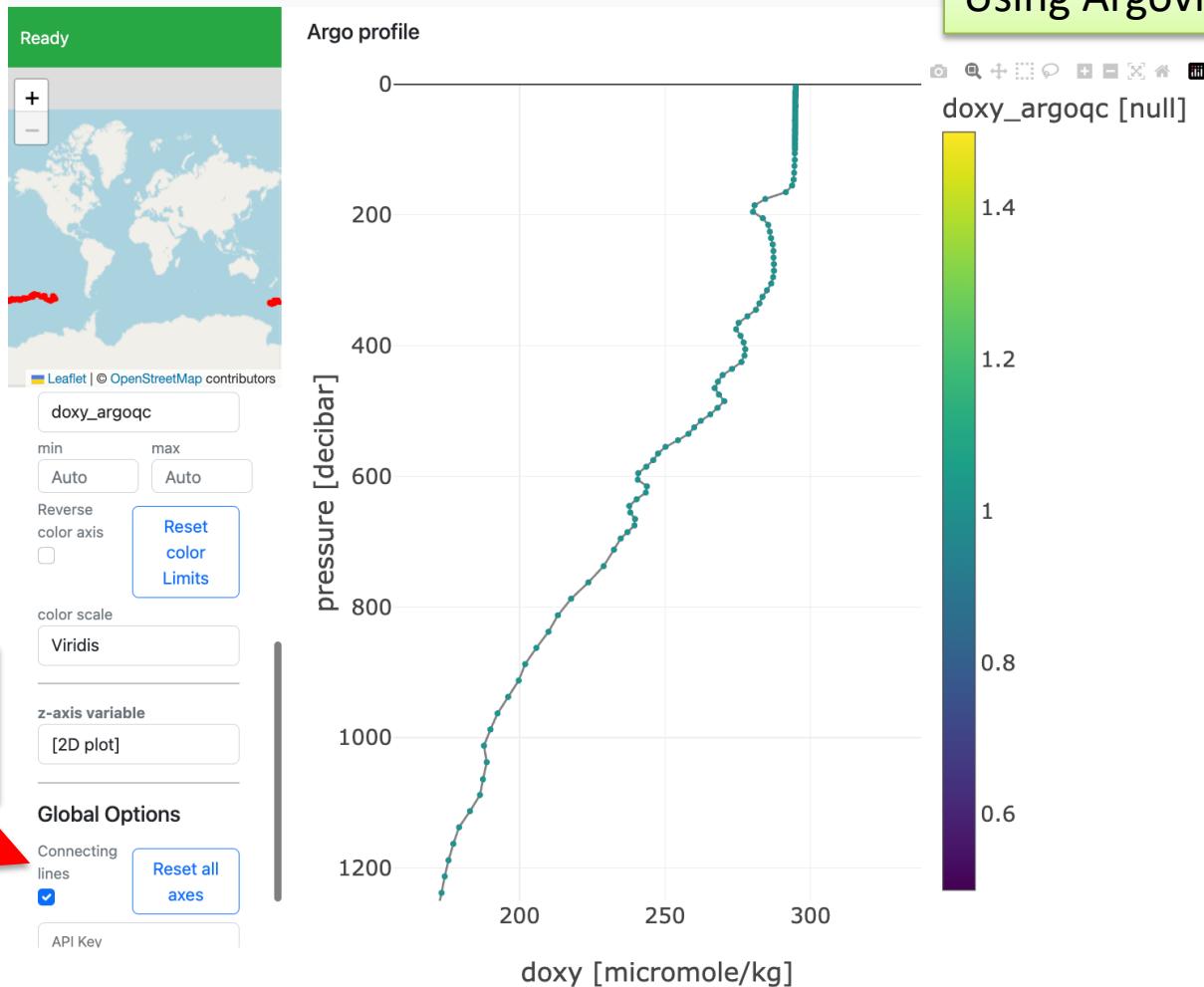


Table on ALL plot pages (bottom): select profiles to show!

Download Table CSVDownload Complete JSONOcean Ops Page for float ID 6903768Fleet Monitoring Page for float ID 6903768							
Show ☐	ID	Longitude	Latitude	Timestamp	DAC	Original Files	
☒	6903768_116	-114.58295	-55.750458333333334	2023-03-06T05:41:30.000Z	IF	BGC	Core
☐	6903768_115	-115.52426666666666	-55.69484	2023-02-24T05:46:30.000Z	IF	BGC	Core
☐	6903768_114	-116.60646166666666	-55.73682	2023-02-14T05:47:30.000Z	IF	BGC	Core

Access Argo profiles and more via API

Access Argovis data via API using your own code or code that runs on your browser

https://github.com/argovis/demo_notebooks

Click on the Binder badge  and (once Binder finished set up) open the notebook e.g. Intro_to_Argovis.ipynb, Argovis_explore_ocean_vertical_structure.ipynb

No description, website, or topics provided.

[Readme](#)[Activity](#)[Custom properties](#)[3 stars](#)[3 watching](#)[2 forks](#)[Report repository](#)

bkatiemills copy update

edfbf47 · 14 hours ago · 276 Commits

dataset_sepecific_notebooks	dataset specific notebooks moved	18 hours ago
work_in_progress	reorganized folders	15 hours ago
.DS_Store	Organizing folders	19 hours ago
.gitignore	gitignore	last year
.zenodo.json	zenodo metadata	4 months ago
Argovis_explore_maps.ipynb	copy update	14 hours ago
Argovis_explore_ocean_vertical_structure.ip...	copy update	14 hours ago
Intro_to_Argovis.ipynb	copy update	14 hours ago
README.md	drop enso	4 months ago
environment.yml	copy update	14 hours ago

Apr 15, 2024, 6:41 PM MDT

[0.0.1 Latest](#)
on Dec 18, 2023

Packages

No packages published
[Publish your first package](#)

Contributors 2

 donatagiglio bkatiemills Bill Katie-Anne Mills

Languages

Jupyter Notebook 99.8%
Python 0.2%

Suggested workflows

Based on your tech stack

README



Argovis Demo Notebooks

This repository contains notebooks meant to be followed by individuals who want to learn more about searching, downloading and processing data with Argovis. Start with [Intro to Argovis](#), and then follow along with any other notebooks that are relevant to your interests.

See Also

- [Argovis' EarthCube 2022 submission](#): illustrates dataset colocation, QC filtering, and interpolation.

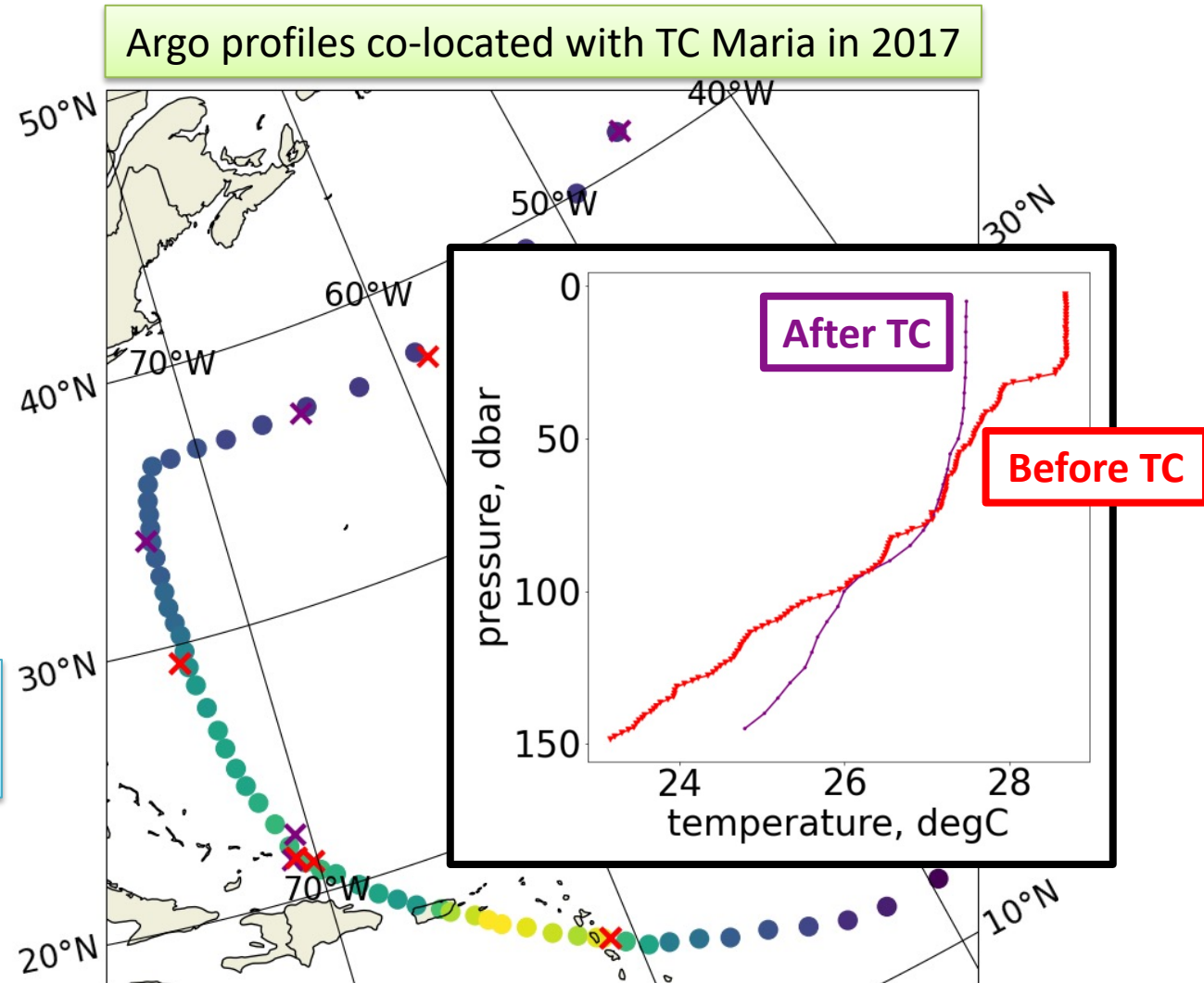
Argovis enables data co-location

- Research & Education

- e.g. upper ocean changes during weather events

https://github.com/argovis/demo_notebooks

Education and research example



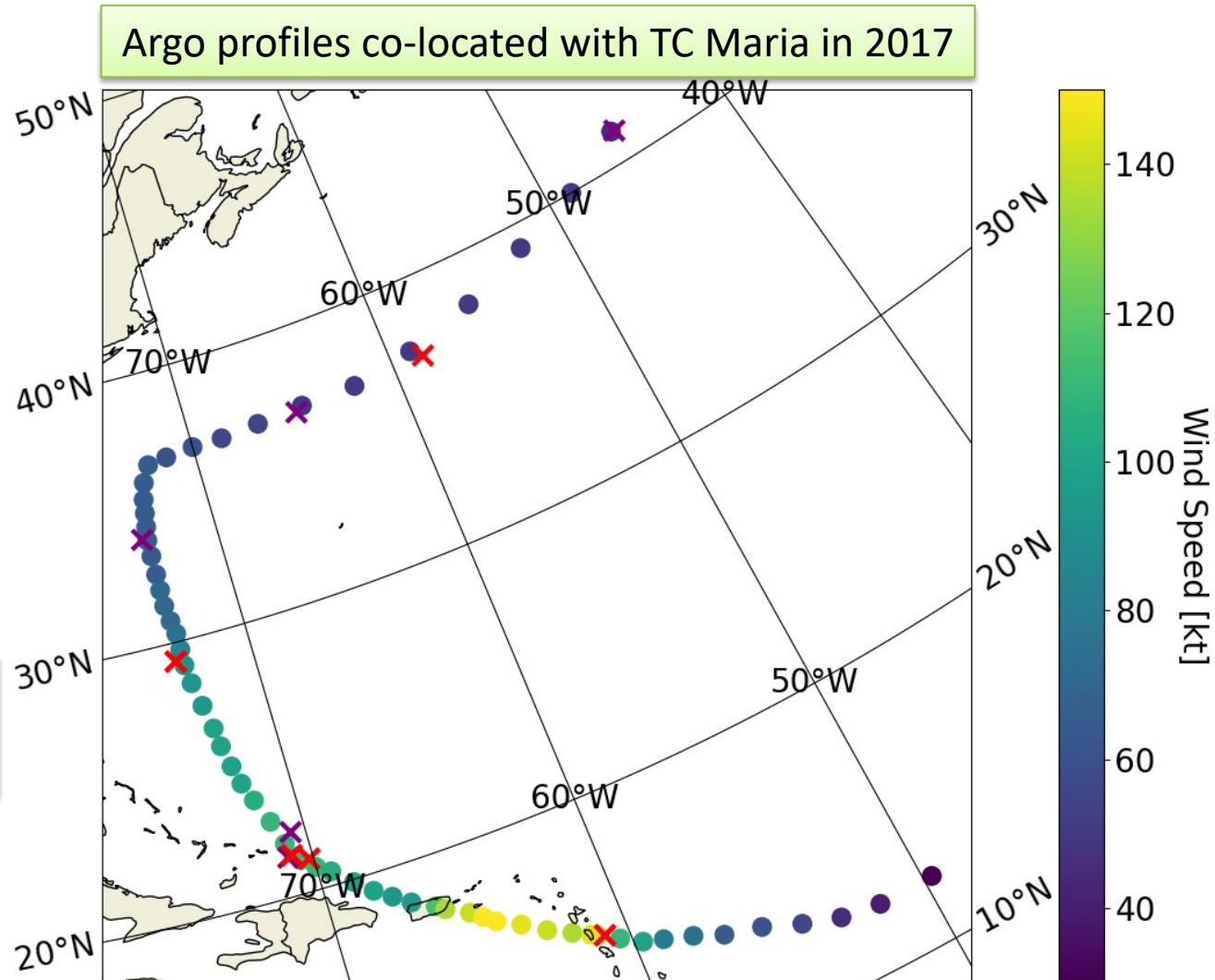
Argovis enables data co-location

- Research & Education

- e.g. upper ocean changes during weather events

https://github.com/argovis/demo_notebooks

Education and research example



Swagger documentation


Swagger
Supported by SMARTBEAR

/api-docs

Explore

Argovis API 2.0 OAS3

/api-docs

REST API for Argo profiles, platforms, selections, BGC data, gridded products, etc.

[Argovis Collaboration - Website](#)

[Send email to Argovis Collaboration](#)

[MIT](#)

[Find us on GitHub](#)

<https://argovis-api.colorado.edu/docs/>

Servers

<https://argovis-api.colorado.edu> ▾

argo Argo profile data, including core, BGC and deep floats



GET /argo Argo search and filter.



GET /argo/meta Argo metadata search and filter.



GET /argo/vocabulary List all possible values for certain Argo query string parameters



GET /argo/overview Summarizes some collection-level statistics about Argo data.



GET /argo/dacs Summarizes some datacenter-level statistics about Argo data.



GET /argo/bgc Summarizes some float-level statistics for Argo BGC floats.



cchdo CCHDO profile data.



GET /cchdo CCHDO search and filter.



Swagger documentation



Argovis API ^{2.0} OAS3

/api-docs

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REST API for Argo profiles, platforms, selections, BGC data, gridded products, etc.

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<https://argovis-api.colorado.edu> ▾

argo Argo profile data, including core, BGC and deep-ocean floats



GET

/argo Argo search and filter.



GET

/argo/meta Argo metadata search and filter.



GET

/argo/vocabulary List all possible values for certain Argo query string parameters



GET

/argo/overview Summarizes some collection-level statistics about Argo data.



GET

/argo/dacs Summarizes some datacenter-level statistics about Argo data.



GET

/argo/bgc Summarizes some float-level statistics for Argo BGC floats.



cchdo CCHDO profile data.



GET

/cchdo CCHDO search and filter.



Swagger documentation

argo Argo profile data, including core, BGC and deep floats

GET

/argo Argo search and filter.

Parameters

Name	Description
id string (query)	Unique ID to search for. 49029110
startDate string (query)	ISO 8601 UTC date-time formatted string indicating the beginning of the time period of interest. 2010-01-01T00:00:00.000Z
endDate string (query)	ISO 8601 UTC date-time formatted string indicating the end of the time period of interest. 2010-01-01T00:00:00.000Z
polygon string (query)	array of [lon, lat] vertices describing a polygon bounding the region of interest; final point must match initial point [[[-74.1,40.5],[-73.7,40.5],[-74.0,40.8],[-74.1,40.5]]
multipolygon string (query)	array of polygon regions; region of interest is taken as the intersection of all listed polygons.

Swagger documentation


Swagger
Supported by SMARTBEAR

/api-docs

Explore

Argovis API 2.0 OAS3

/api-docs

REST API for Argo profiles, platforms, selections, BGC data, gridded products, etc.

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<https://argovis-api.colorado.edu/docs/>

Servers

<https://argovis-api.colorado.edu> ▾

argo Argo profile data, including core, BGC and deep floats ▾

GET

/argo Argo search and filter.



GET

/argo/data Argo metadata search and filter.



GET

/argo/vocabulary List all possible values for certain Argo query string parameters



GET

/argo/overview Summarizes some collection-level statistics about Argo data.



GET

/argo/dacs Summarizes some datacenter-level statistics about Argo data.



GET

/argo/bgc Summarizes some float-level statistics for Argo BGC floats.



cchdo CCHDO profile data. ▾

GET

/cchdo CCHDO search and filter.



Swagger documentation

<https://argovis-api.colorado.edu/docs/>

argo Argo profile data, including core, BGC and deep floats

GET **/argo** Argo search and filter.

GET **/argo/meta** Argo metadata search and filter.

GET **/argo/vocabulary** List all possible values for certain Argo query string parameters

Parameters

Try it out

Name	Description
parameter * required string (query)	Argo query string parameter to summarize possible values of. Available values : platform, source, meta, metadata, platform_type

platform

Demo notebooks on GitHub

← → ↺ github.com/argovis/demo_notebooks

argovis / demo_notebooks

<> Code Issues 2 Pull requests Actions Projects Wiki Security Insights Settings

 demo_notebooks Public

main 3 Branches 1 Tags

Go to file

 bkatiemills copy update

dataset_sepecific_notebooks	dataset specific notebooks moved
work_in_progress	reorganized folders
.DS_Store	Organizing folders
.gitignore	gitignore
.zenodo.json	zenodo metadata
Argovis_explore_maps.ipynb	copy update
Argovis_explore_ocean_vertical_structure.ip...	copy update
Intro_to_Argovis.ipynb	copy update





How to use the Argovis API for this event

<https://docs.docker.com/engine/install/>

<https://hub.docker.com/r/argovis/notebooks>

Useful links


Explore ▾ Colocation APIs ▾ Jupyter Notebooks Publications About

Argovis Hackathon 2024

Ready

Colocate datasets

 API Key

[Get a free API key](#)

Time range

 Start Date
 04/01/2017

 End Date
 06/30/2017

Max day range: 91

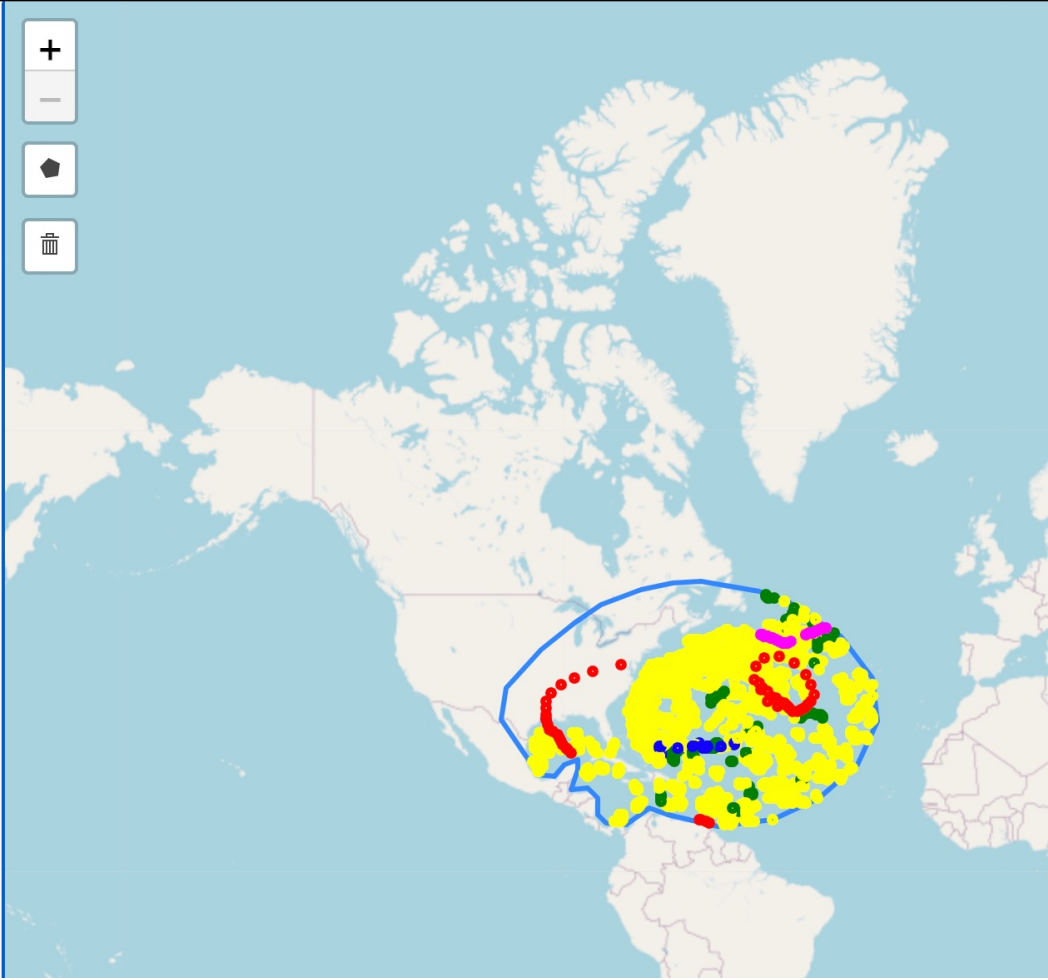
Map Center Longitude

 Center longitude o...
 -70

Dataset Filters

Argo

☒ Display Argo Core



Argovis Hackathon 2024

Schedule & Registration

- **When:** April 29-May 1, 11am-1pm MT each day
- **Where:** online (on Zoom)
- **How to register for the event** (and receive the Zoom link to attend): fill in [this Google form](#) by Friday, April 12, 2024

For questions about the event, please email: donata.giglio@colorado.edu or mscanderbeg@ucsd.edu.

Description

We are pleased to invite you to attend **an online hackathon on setting up data analysis projects (for research and/or education) in small groups using the Argovis data service.**

Argovis (argovis.colorado.edu) is a data search, distribution, and visualization service developed at the University of Colorado Boulder that leverages modern technologies to enable **targeted searches of and fast access to** oceanic profiles (from Argo profiling floats and GO-SHIP hydrography) and derived gridded products, drifter observations, weather events, and satellite data products. (Please find a full list of datasets currently in Argovis at the end of the page).

While the hackathon will provide an introduction to Argovis tailored to the level of expertise of different participants, the focus will be on the setup of specific projects of interest in small groups. Our goal is to develop projects that can be continued after the hackathon, used for research and/or education, and shared with the community.

During this hackathon, participants will (1) Learn what resources are available to accelerate research projects and to enhance educational activities, (2) Work in small groups to set up a data analysis project of interest for research and/or education, (3) Provide the Argovis team with feedback on Argovis' technology and resources made available.

Datasets* in Argovis:

- In-Situ obs: Argo profiles, CCHDO ship-based profiles, Global Drifter Program Data
- Grids based on in-situ obs: Roemmich-Gilson Argo Climatology, GO-SHIP Easy Ocean, LocalGP ocean heat content, GLODAPv2
- Grids based on satellite data: Aviso Sea Surface Height, NOAA OI Sea Surface Temperature v2, REMSS cross-calibrated multi-platform winds
- Weather events: Atmospheric River Climatology, Tropical cyclone data
- Other: BSOSE (in progress), Argo trajectories, ARGONE

*Dataset details at <https://argovis.colorado.edu/about>

Notes and resources

- UCSD DataHub: <https://datahub.ucsd.edu/hub>
- Argovis demo notebooks: https://github.com/argovis/demo_notebooks