

Updates to AST Website

M. Scanderbeg

AST-19 March 2018

Sidney, B.C.



Audience Overview

Mar 14, 2017 - Feb 20, 2018

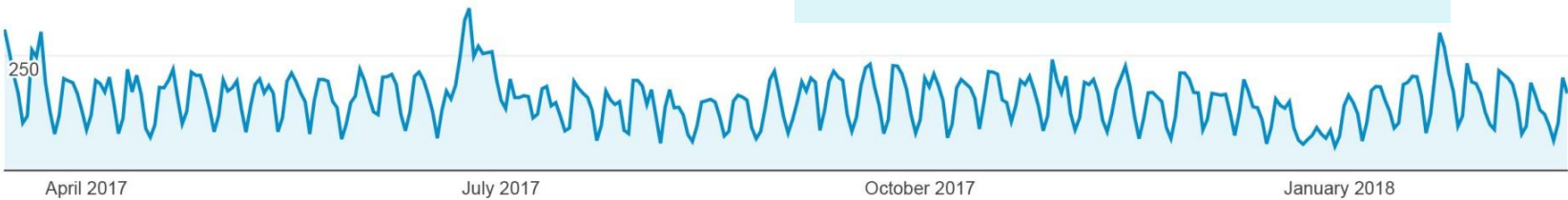


All Users
100.00% Users

Overview

● Users

500



- 8%↓ in pageviews since last AST
- 19%↓ in users

Users

39,553



New Users

38,499



Sessions

61,496



Number of Sessions per User

1.55



Pageviews

117,970



Pages / Session

1.92



Avg. Session Duration

00:02:21

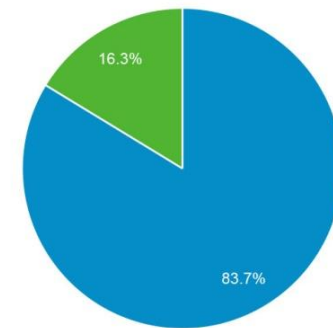


Bounce Rate

64.68%



■ New Visitor ■ Returning Visitor



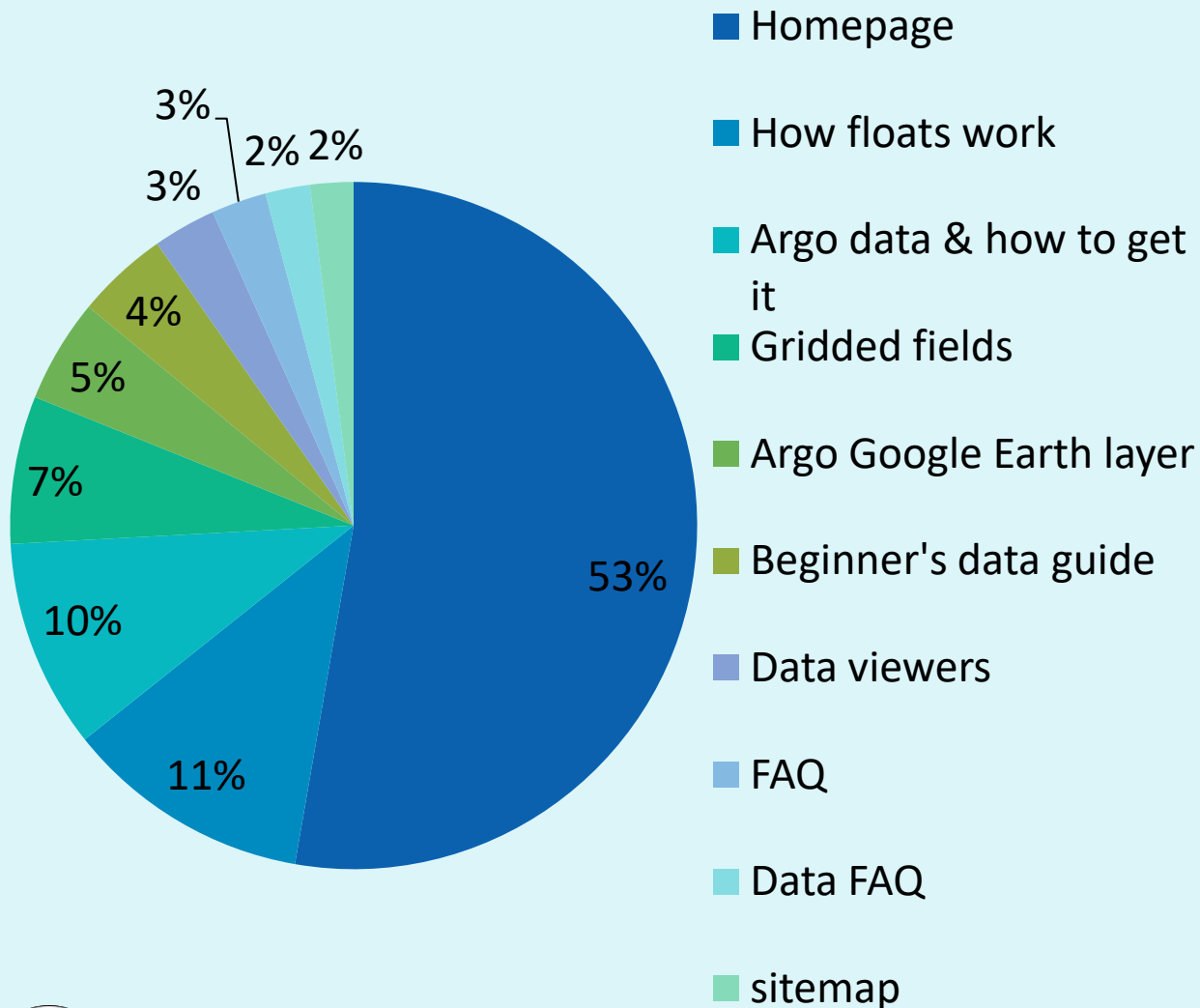
185 countries

62% English language

11% Asian languages

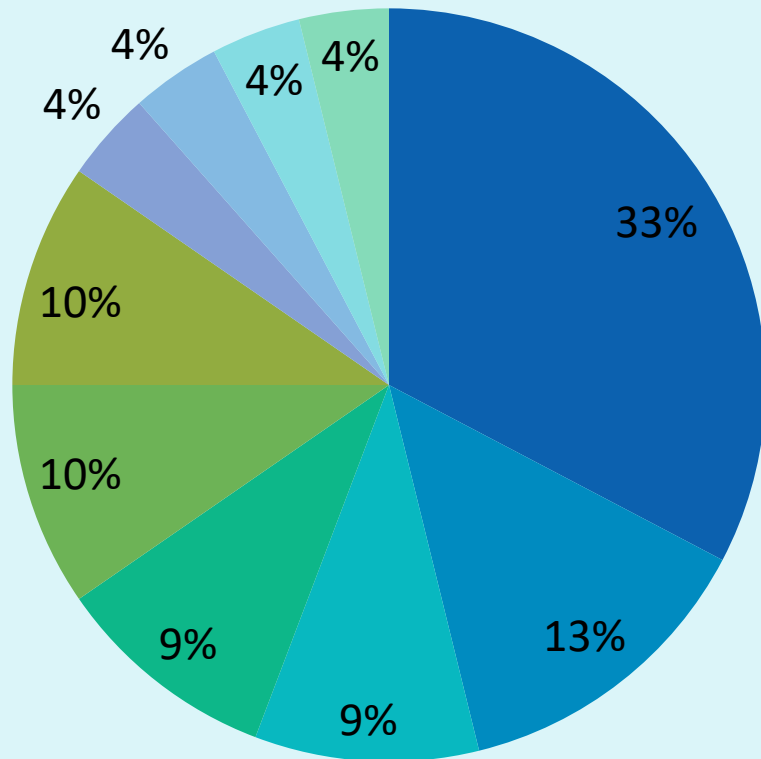
10% European languages

Top 10 most visited pages



- Change in top 10 pages: FAQ pages in, Global change analysis and About Argo out
- I changed name of 'Global Change Analysis' page to 'Global research' and it got fewer views

Questions on argo@ucsd.edu and support@jcommops.org



- photo or video use request
- how to get data
- float operation
- data clarification
- other float missions?
- data problems
- how to buy float/join Argo
- notice of beached floats
- deployment opportunities
- pollution

- Top ten categories
- Blue means new category
- No citation questions
- 3 times the image requests
- Several requests from students
- ~65 initial emails; 30% increase



- Future Argo & extension pages (AST-18 Action item #27)
- Ocean Heat Content plots from gridded fields monthly (AST-17 Action item)
- Overview of how new web pages fit into <http://www.argo.ucsd.edu>
- Argovis: a new Argo visualization website



Evolving Argo

Argo's design needs to adapt as technologies and requirements change. A new global design is under development, which includes three elements: driving towards spatial completeness; increasing regional resolution in key areas; major new missions. Pilots of these are underway and will help inform how Argo's new design is refined.

Towards spatial completeness

Argo is evolving its global coverage plan to include polar regions and marginal seas, which were not initially part of Argo's original design due to technological limitations and high float losses in these regions. Now, operation of floats in these areas is feasible. The concept of Argo is of a spatially complete global array. Therefore, including seasonal sea-ice zones and marginal seas, moves the target number of Argo floats from 3000 to 3800.

Polar
Regions

Marginal
Seas

Increasing regional resolution

Our user community has identified two regions where Argo's current sampling is not meeting requirements due to important faster and high spatial scale phenomena. The equatorial regions and western boundary currents and their extensions are two such areas, where enhanced Argo densities might be required.

Equatorial
Region

Western Boundary
Currents

Major new missions

Adapting Argo to start sampling biogeochemical parameters and the deep ocean, involves major sensor, platform and resource challenges.

BioGeoChemical
Argo

Deep Argo

Future Argo

Layout of each extension page will be:

- Design
- Technical challenges (if applicable)
- Pilot Arrays
- Links to related pages
- Task Team leads



Polar Argo

What Is Polar Argo?

Argo floats have been successfully deployed in the seasonal ice zone of both poles over the past decade. More than 45,000 profiles south of 60°S have been collected since 2001. Advances in float technology including two-way communications through the Iridium satellite network, software modifications (ice avoidance algorithm and the ability to store winter profiles) and improved hardware have resulted in ice floats surviving multiple winters under sea ice.

In recognition of the successful deployment of floats into the seasonal ice zone and the desire for a truly global

- E. van Wijk & B. Klein are lead authors working with me to manage the content of the page
- All sections are complete, but should still be revisited yearly

Baffin Bay and the Chukchi Sea. The failure rate in the Southern Ocean and Nordic Seas is slightly higher overall (20-30%) due to the increased risk of damage through encounters with ice. Plans to re-seed ice floats in the Polar Regions should take into account the slightly lower overall life expectancy.

Special ice pilot studies are underway in the Arctic and in many sectors of the Antarctic. Floats equipped with biogeochemical (BGC) sensors, floats with acoustic RAFOS sensors for under-ice geolocation, deep bottom-following floats on the Antarctic slope and floats deployed on the Antarctic continental shelf are all extending the boundaries of what's possible for Polar Argo.

Polar Argo Design

Technology challenges

Pilot arrays

Links to related pages

Task team leads



Photos from SOCCOM

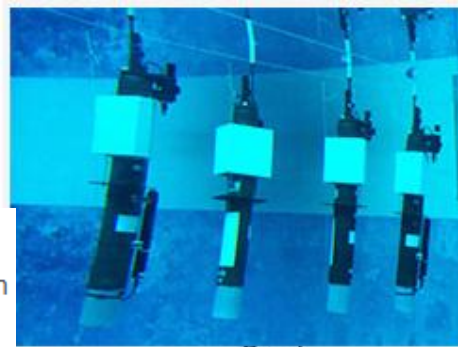
http://www.argo.ucsd.edu/Polar_Argo.html

BGC Argo

What Is Biogeochemical-Argo?

Biogeochemical-Argo (**BGC-Argo**) is the extension of the Argo array of profiling floats to include floats that are equipped with biogeochemical sensors for pH, oxygen, nitrate, chlorophyll, suspended particles, and downwelling irradiance. A Biogeochemical-Argo array would enable direct observation of the seasonal, to decadal-scale variability in biological productivity, the supply of essential plant nutrients from deep-waters to the sunlit surface layer, ocean acidification, hypoxia, and ocean uptake of carbon dioxide. It would extend ocean color remote sensing observations deep into the ocean interior and throughout the year in cloud covered areas. The system would drive a transformative shift in our ability to observe and predict the impact of climate change on ocean ecology, metabolism, carbon uptake, and marine resource modeling.

Development of a global BGC-Argo array is proceeding on two tracks. First, a variety of regional-scale programs are in progress around the globe, in addition to a large number of smaller scale deployments. These regional-scale programs demonstrate the capability of biogeochemical (BGC) sensors to collect climate-quality data (i.e., "time series of measurements of sufficient length, consistency and continuity to determine climate variability and change", NRC, 2004) and the integration of the BGC data with numerical ocean models. A second track performs the planning needed to scale the various regional projects into an integrated, global program. This effort includes a variety of analyses and Observing System Simulation Experiments (OSSE) to determine the appropriate array size.



Photos from remOcean

BGC Argo Design

Technology challenges

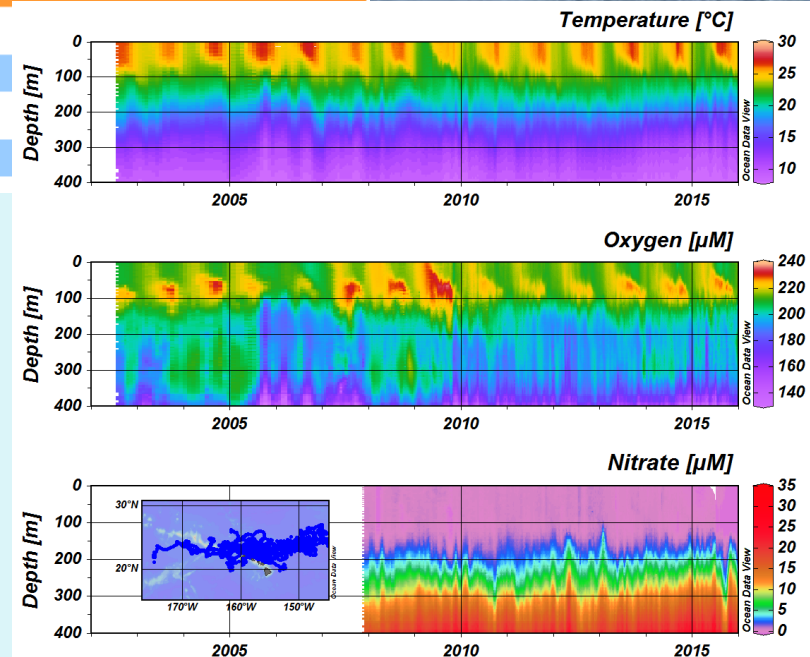
Pilot arrays

Links to related pages

Task team leads

- K. Johnson and H. Claustre are lead authors working with me to manage the content of the page
- All sections are complete, but should still be revisited yearly

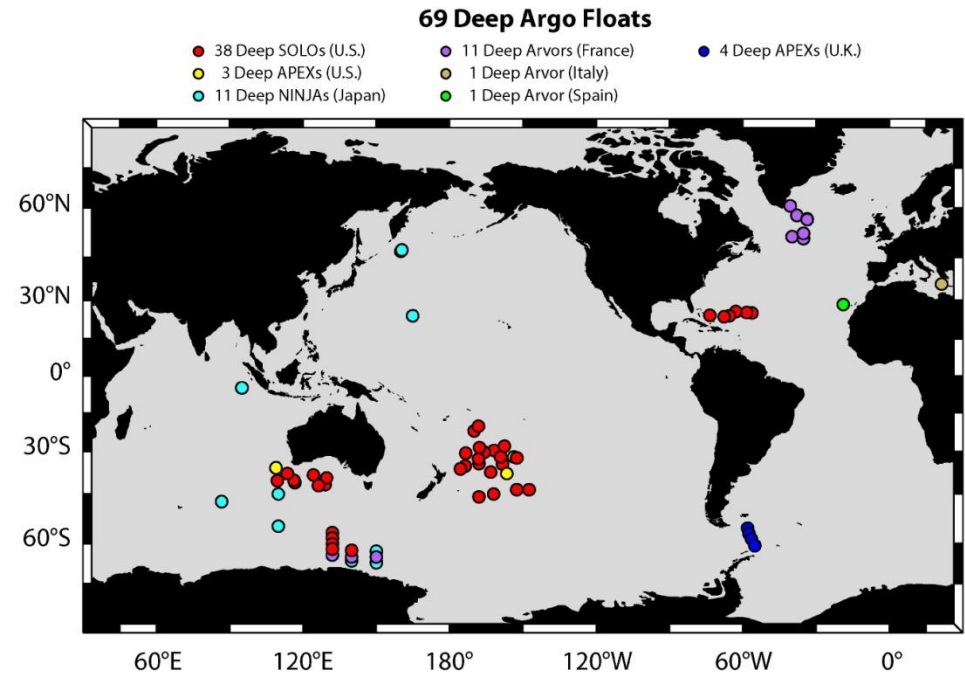
http://www.argo.ucsd.edu/BGC_Argo.html



Deep Argo

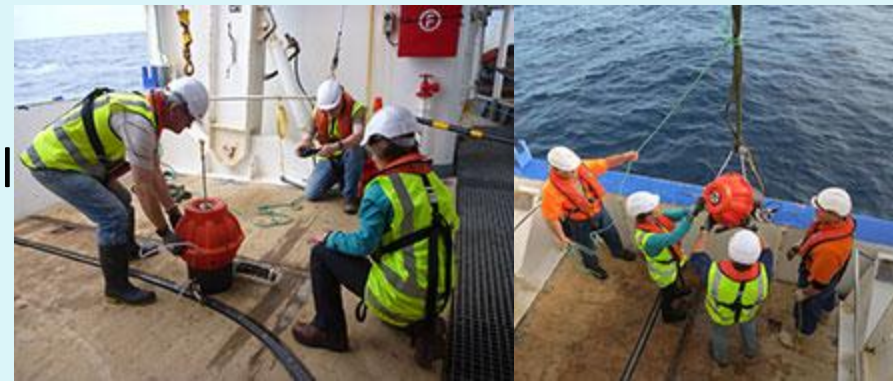
What Is Deep Argo?

The scientific community agrees that a systematic sampling of the full ocean depth is needed to close the planetary budgets of heat and freshwater, and the global sea level budget. The strength and variability of the large-scale ocean circulations that extend from the sea surface to the ocean bottom play significant roles in the uptakes and transports of heat and freshwater, and melting of sea ice. Since the implementation of the Argo (0-2000 m) and the accuracy of sensors was similarly limited, a new generation of autonomous floats called Deep Argo with the Deep SOLO and Deep APEX capable of reaching 6000 to 4000 m. Regional Deep Argo arrays in the Southwest Pacific and North Atlantic Ocean are leading the way forward to a transition to systematic full-depth global ocean observation.



- N. Zilberman is lead author working with me to manage the content of the page
- Sections are complete for now, but should be re-visited yearly

http://www.argo.ucsd.edu/Deep_Argo.html



Other extensions

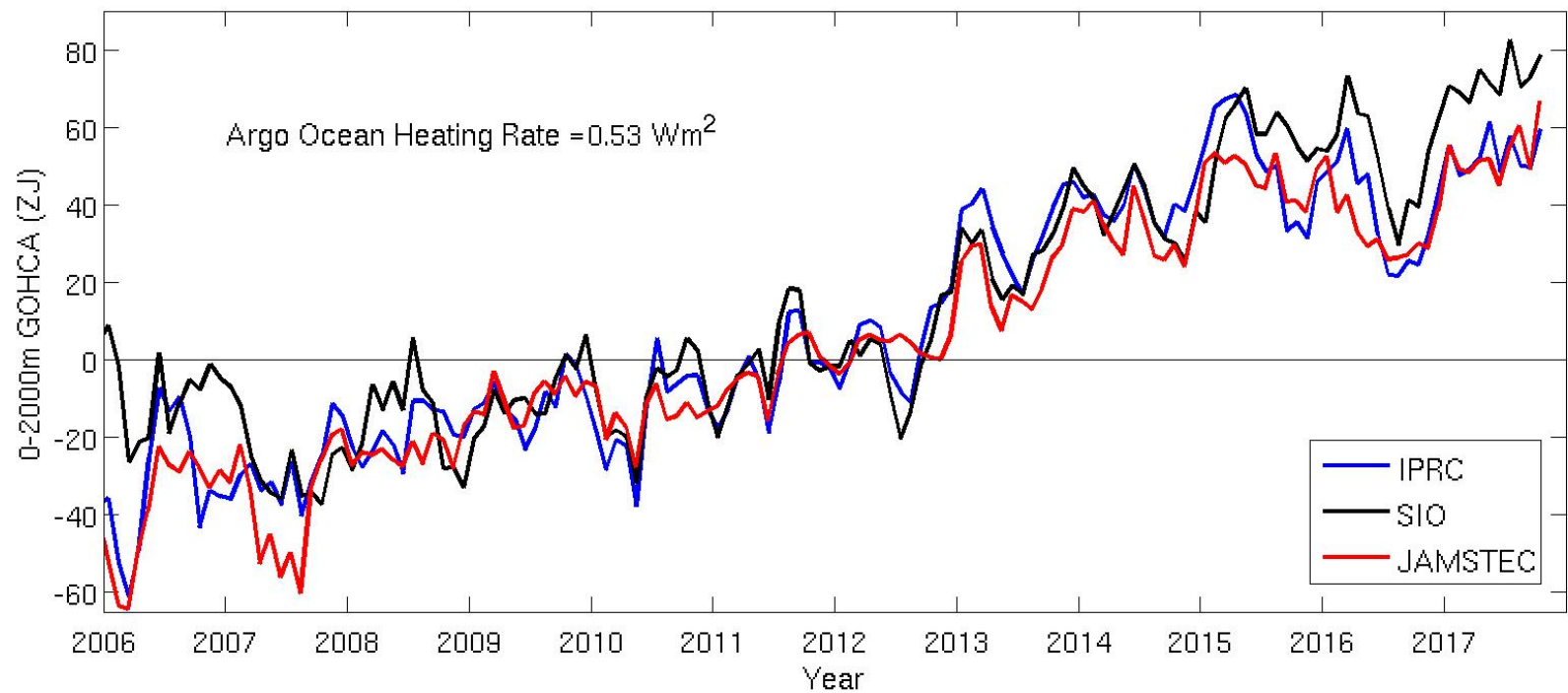
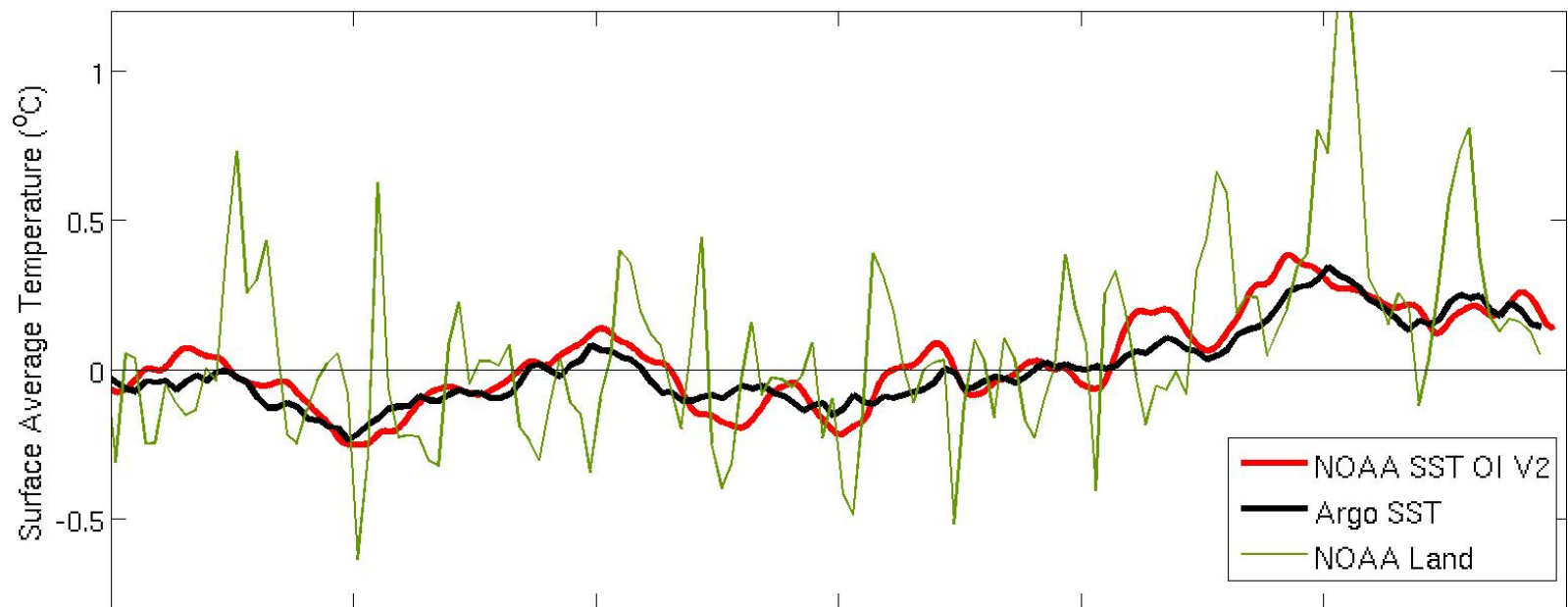
- P-M Poulain lead on Marginal Seas
- D. Roemmich & S. Wijffels leads on Equatorial Region
- T. Suga WBC lead?
- Suggest I post the Future Argo page with live links to BGC, Deep and Polar; no links for other pages until they are created
- Basic info on these pages to give general public idea of what Argo extensions are and to officially recognize them
- Links on individual extension pages to more detailed extension websites if they exist

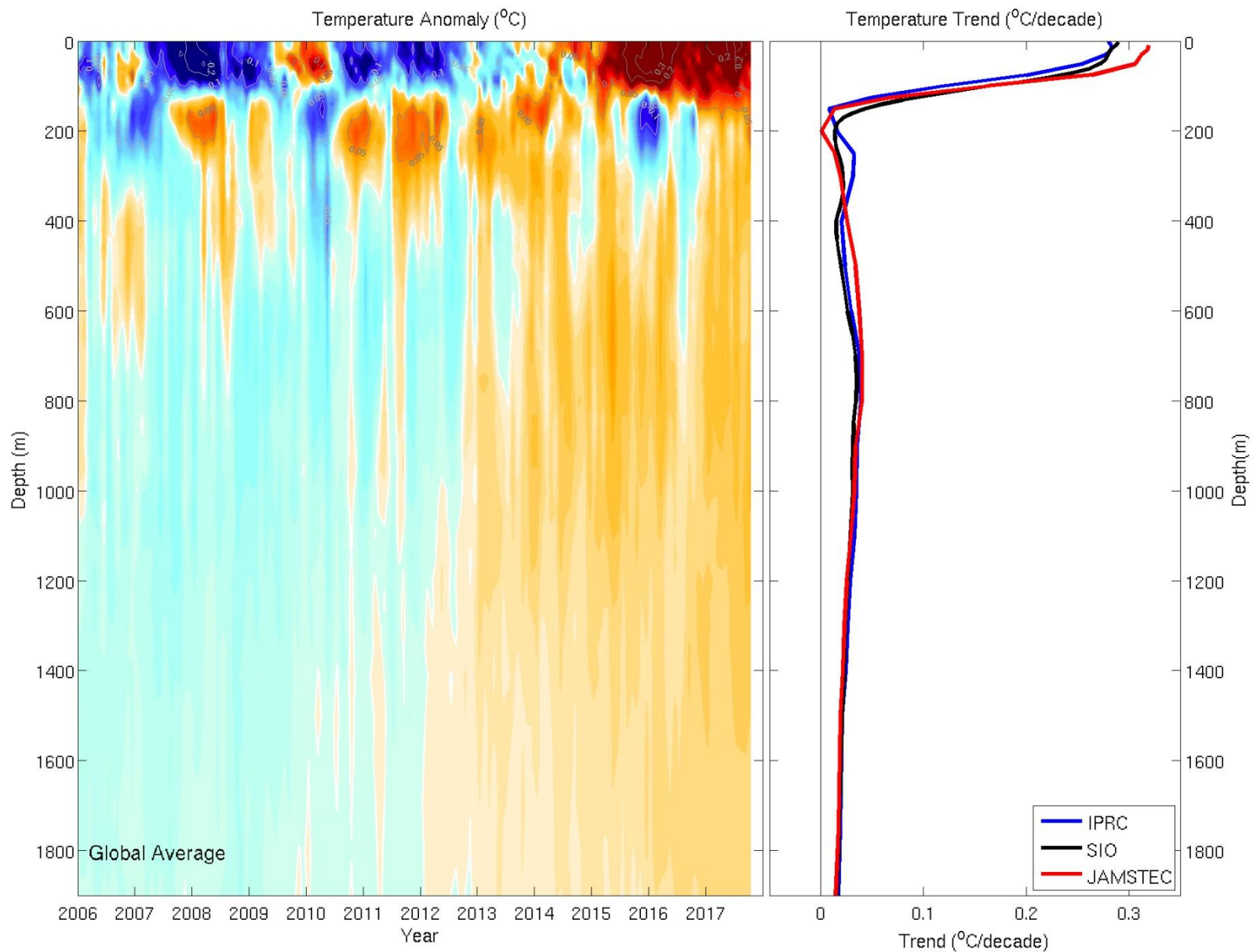


Ocean Heat Content Anomalies

- Would like to feature ocean heat content plots on a new webpage on AST website which would be updated several times a year
- Need to finalize format, types of plots, which products will be used, and captions
 - RG/Scripps grid, JAMSTEC grid and IPRC grid currently featured
- Feedback welcomed!
 - Contact me and AST co-chairs
- Show suggested plots now, but website is available online for further review after meeting:
http://www.argo.ucsd.edu/ocean_heat_content.html

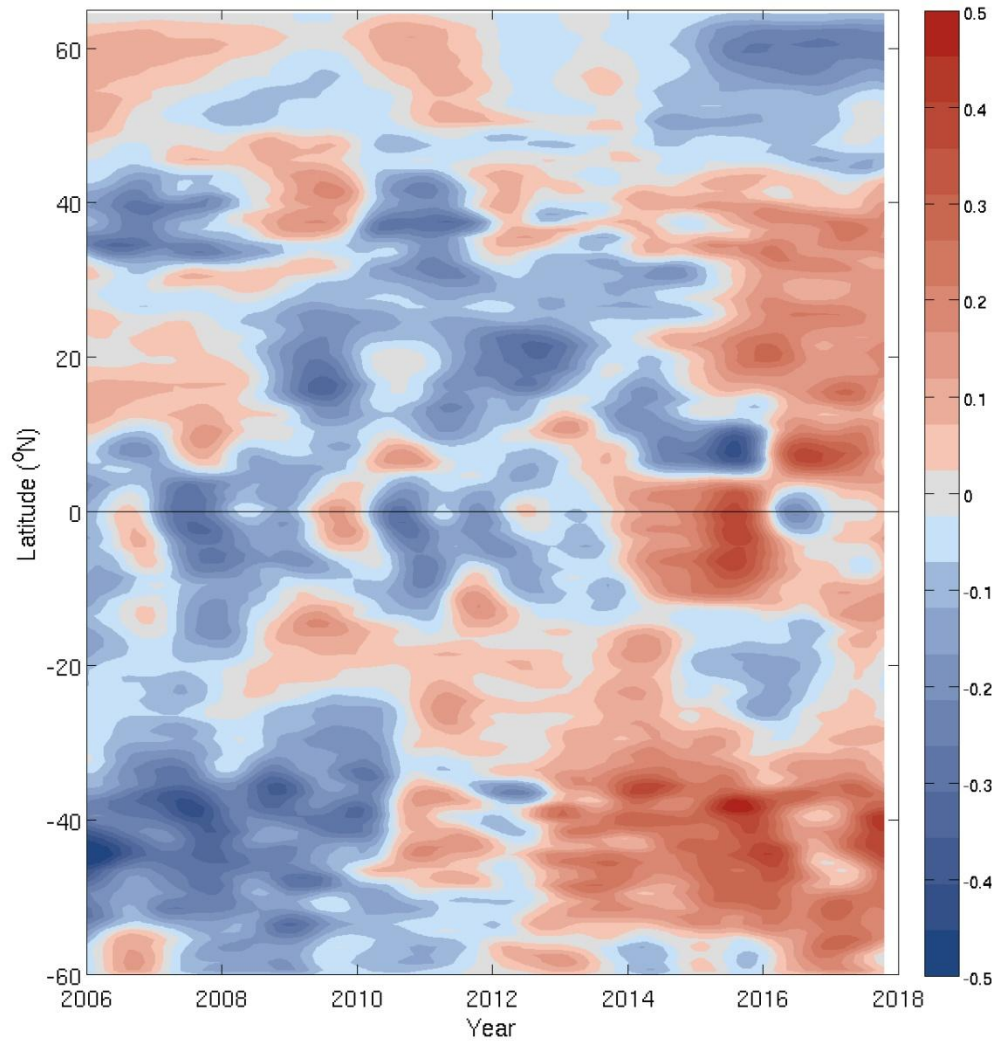




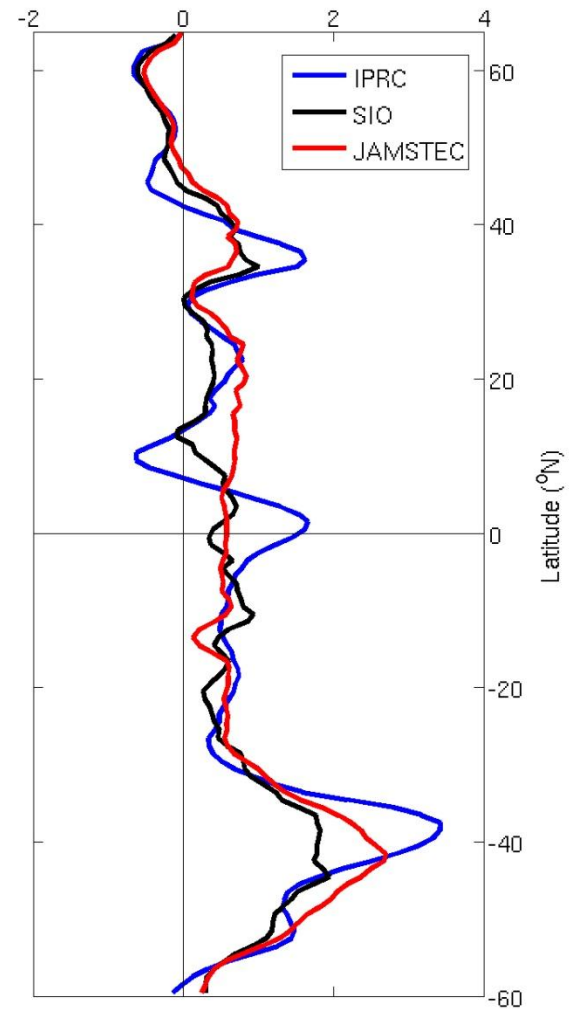


SIO

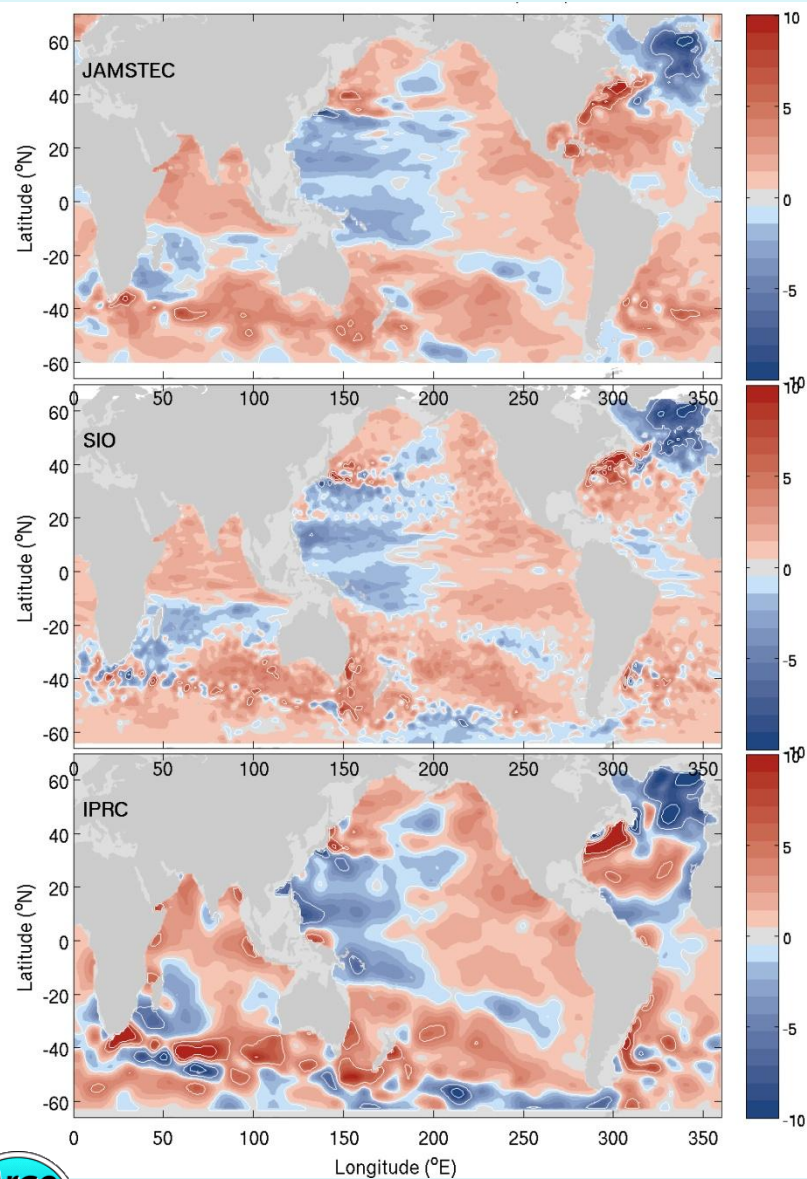
0 – 2000m 12 month average OHA (10^9 J/m^2)



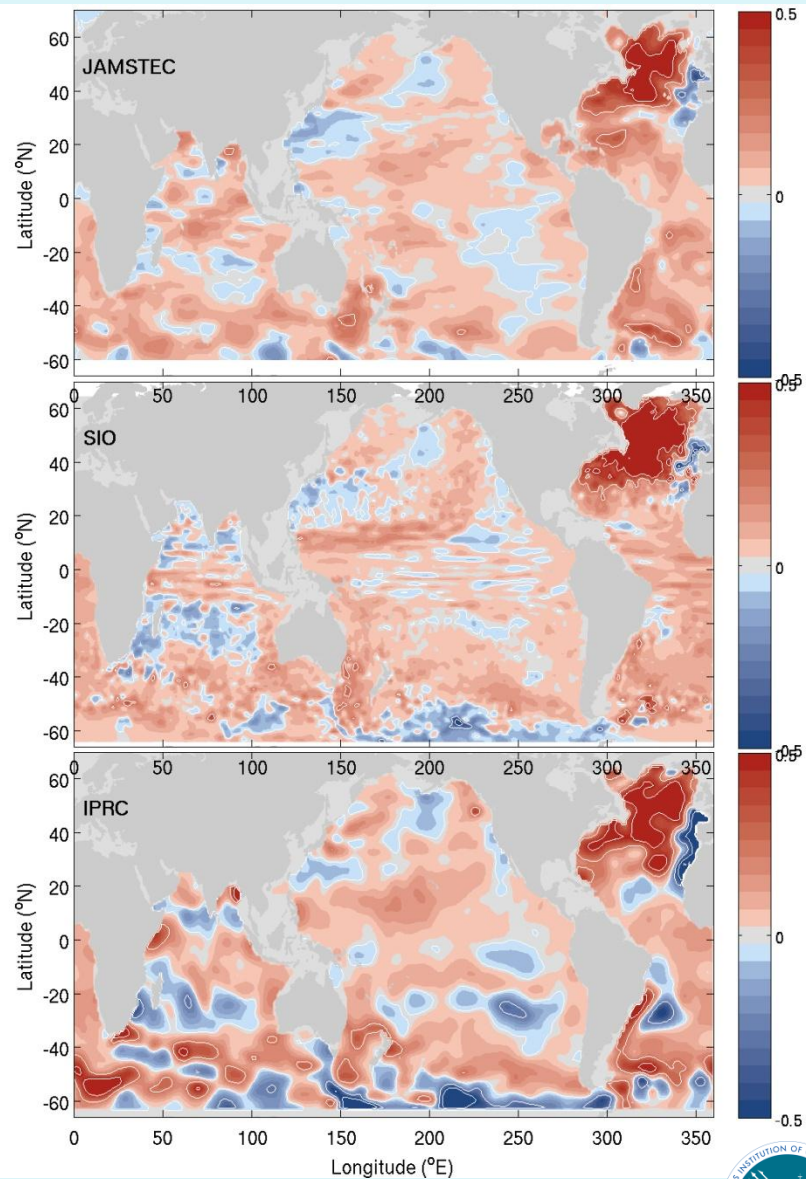
0-2000m OHC trends (ZJ/decade/ $^{\circ}$ latitude)

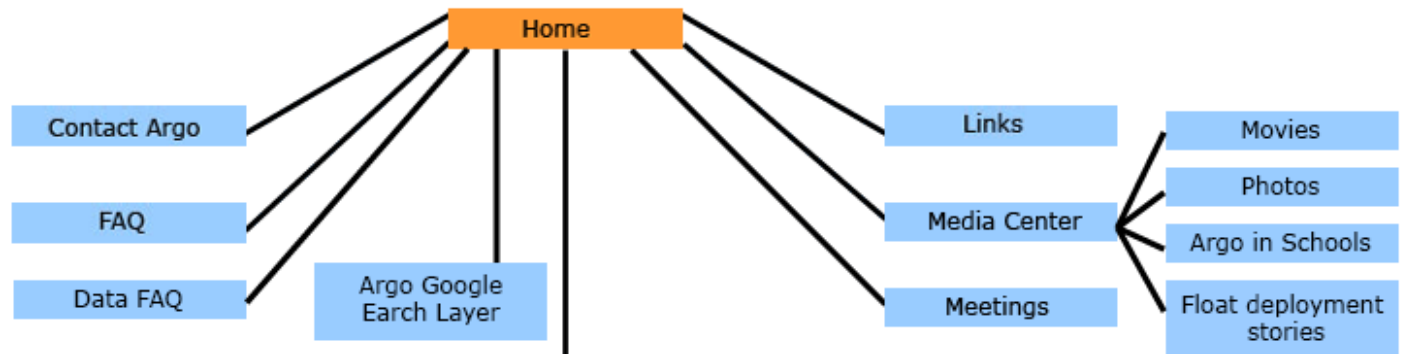


2006 – 2017 Trend in 0 - 1800m OHC (W/m^2)



2006 – 2017 Trend in 1500 - 1800m OHC (W/m^2)





- About Argo
- How Argo floats work
- The novel nature of Argo data
- Origins of Argo
- International collaboration
- Argo Project Office
- Argo Regional Centers (ARC)

- Argo data and how to get it
- Argo data beginner's guide
- Acknowledging Argo data
- Data products
- Data viewers
- Auxiliary Data

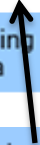
- Uses of Argo data
- Uses by operational centers
- Global research
- Research Use
- Educational Use
- Acknowledging Argo data
- Ocean heat content from Argo

- Argo bibliography
- Argo research in press
- Argo Thesis Citation List
- Complete float bibliography
- Newsletter: Argonautics
- Argo User Groups Reports
- Argo brochures
- Argo design papers
- News archive

- Argo Steering Team
- Members
- Meeting reports

Argo float requirements

Future Argo

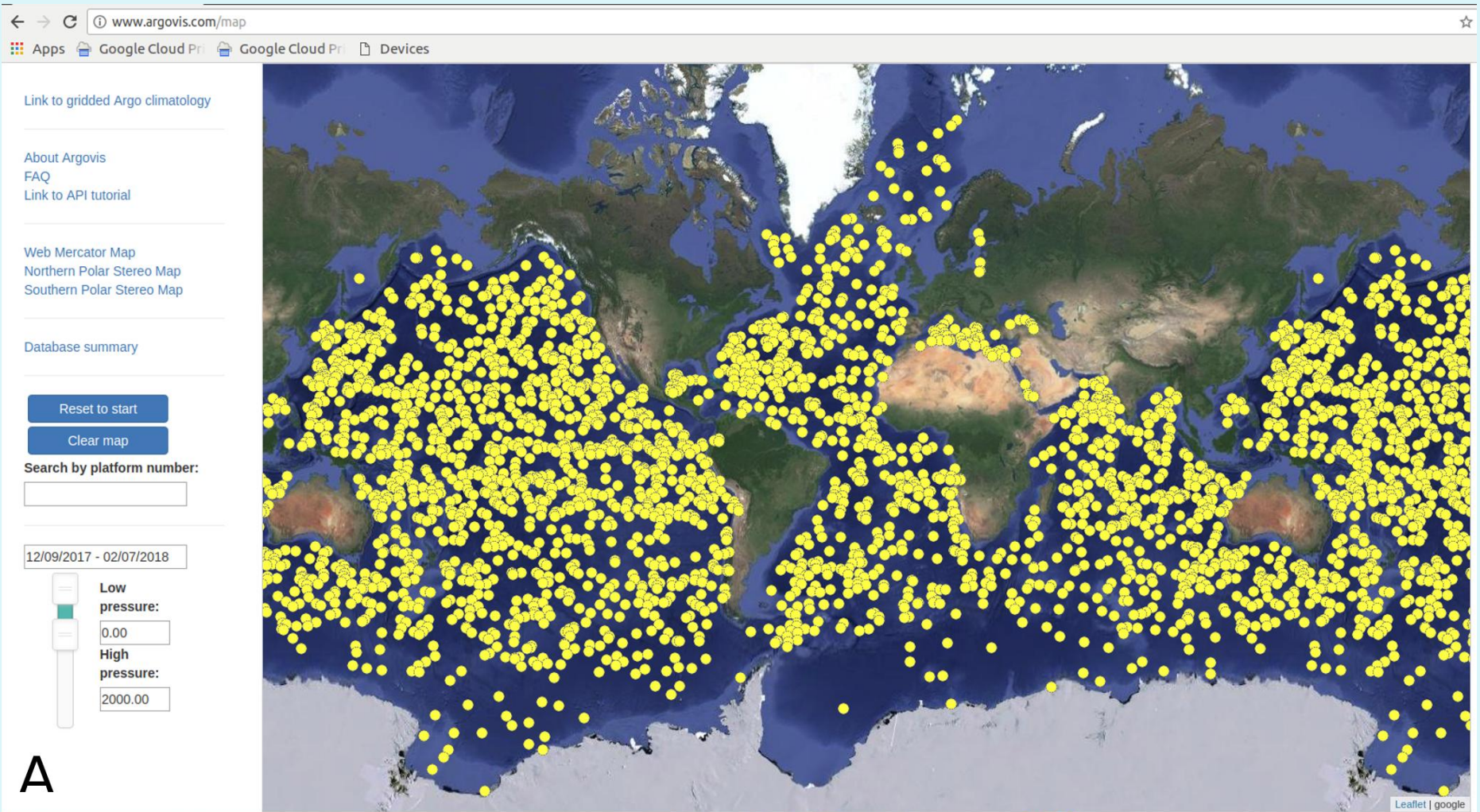


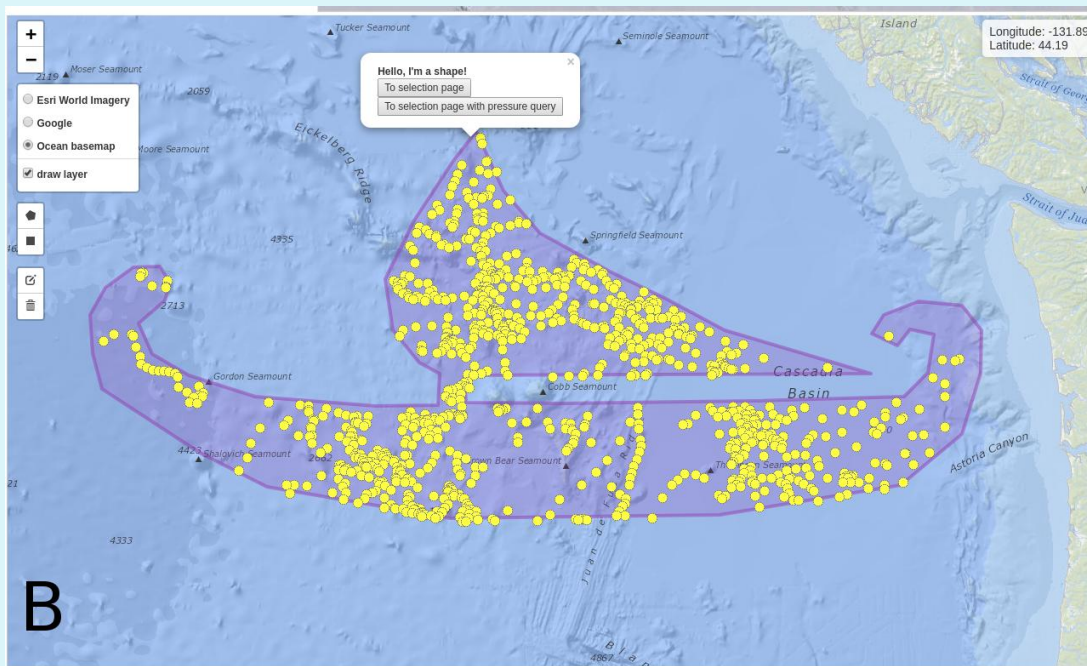
What is Argovis?

- Modern web app tool which came out of an Argo STATMOS workshop at Scripps pairing statisticians with scientists who use Argo data
- Argovis website is a RESTful application which allows for easy navigation of temperature and salinity profiles from Argo GDACs
- Simple interface offers both scientists and the general public to:
 - Select profiles by region, date and pressure range by drawing polygons on an interactive map
 - Query by platform and view platform history
 - Access Argovis database via customizable API
 - Visualize gridded Argo products



Screen shot of home page showing most recent Argo profiles in past 7 days

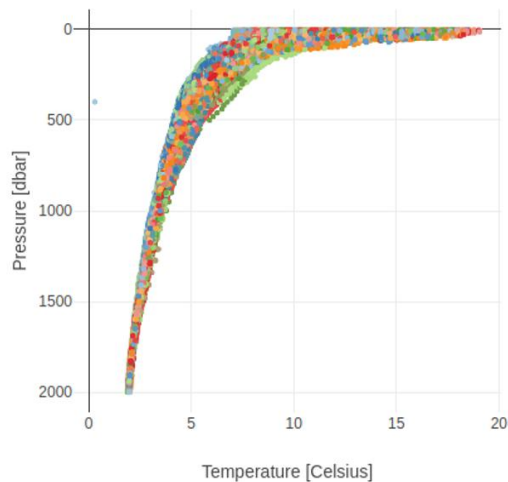




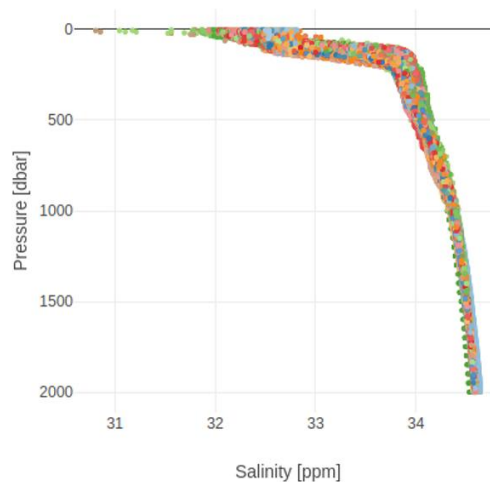
B

- After drawing a shape, the map clears of all profiles except ones inside drawn region
- A pop up appears with links to the T/S/P charts and a table with metadata on each profile
- Clicking on either a point in the plots or a link in the table takes users to individual float page with historic data

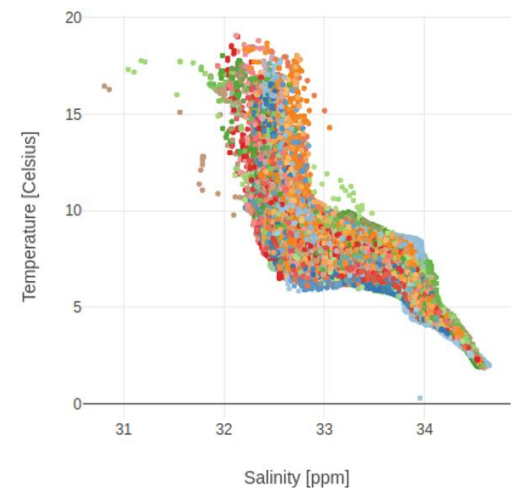
Pressure vs Temperature



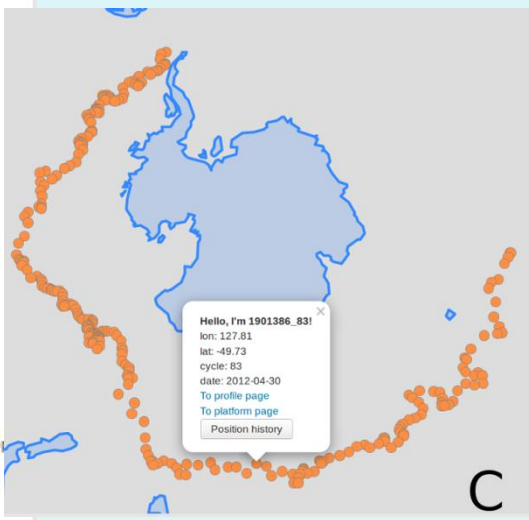
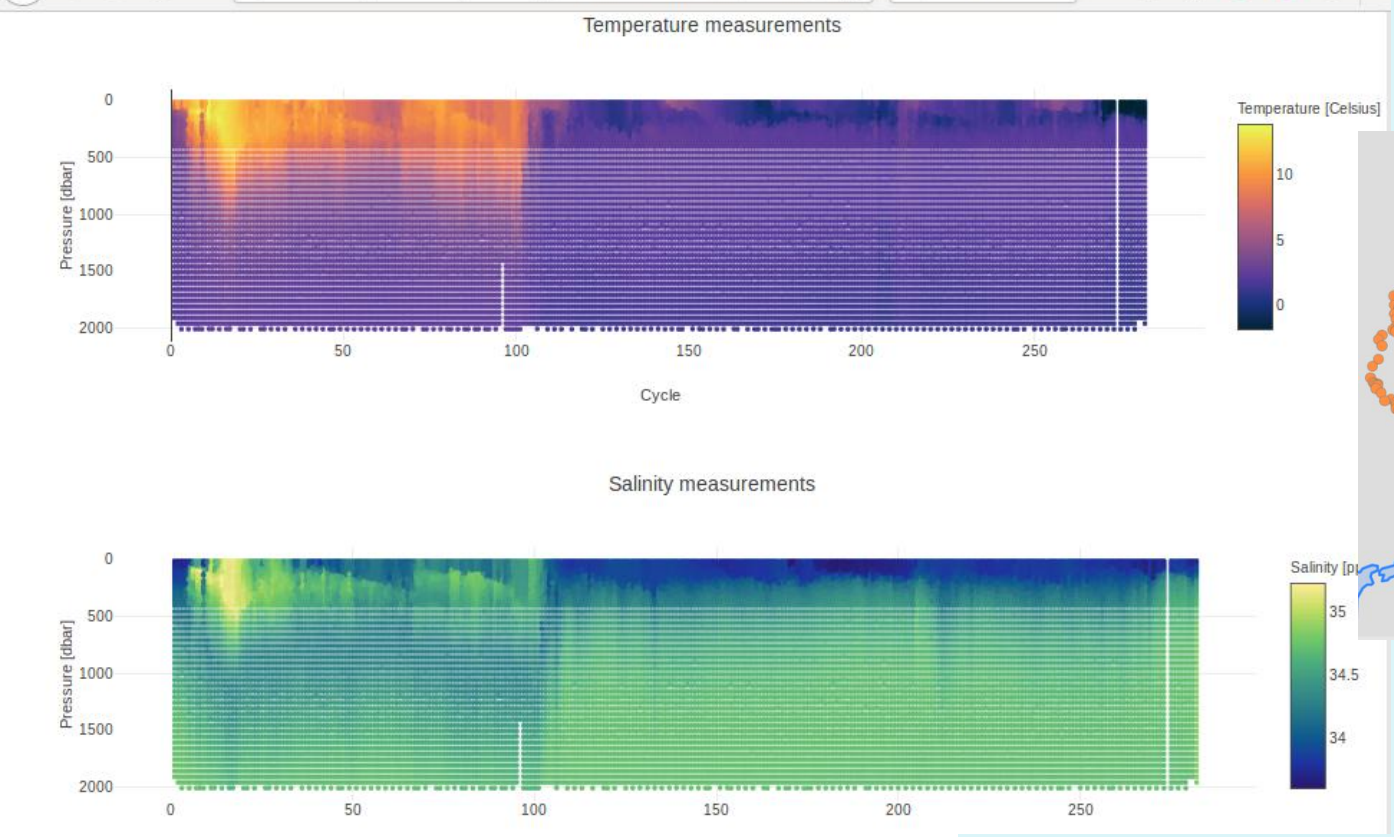
Pressure vs Salinity



Temperature vs Salinity



D



Disclaimer: profiles with Iridium (Positioning System GPS) plot only 200 points max.

Download data as JSON

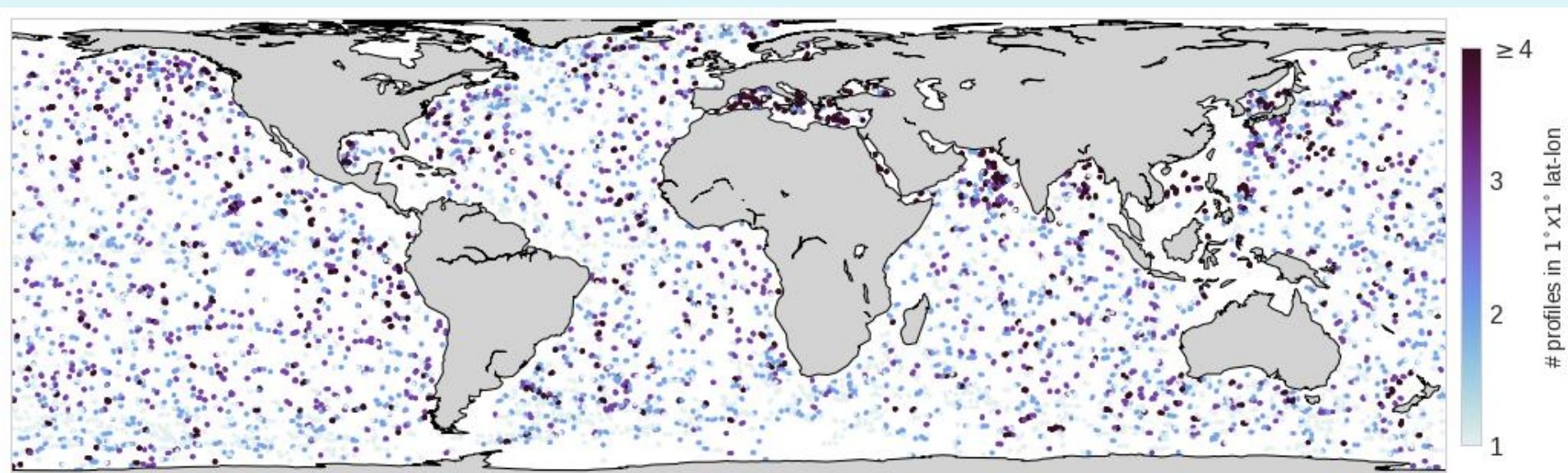
[To platform PT, PS, and TS plot pages](#)
[To main page](#)

Export table to csvExport table to xlsExport table to txt

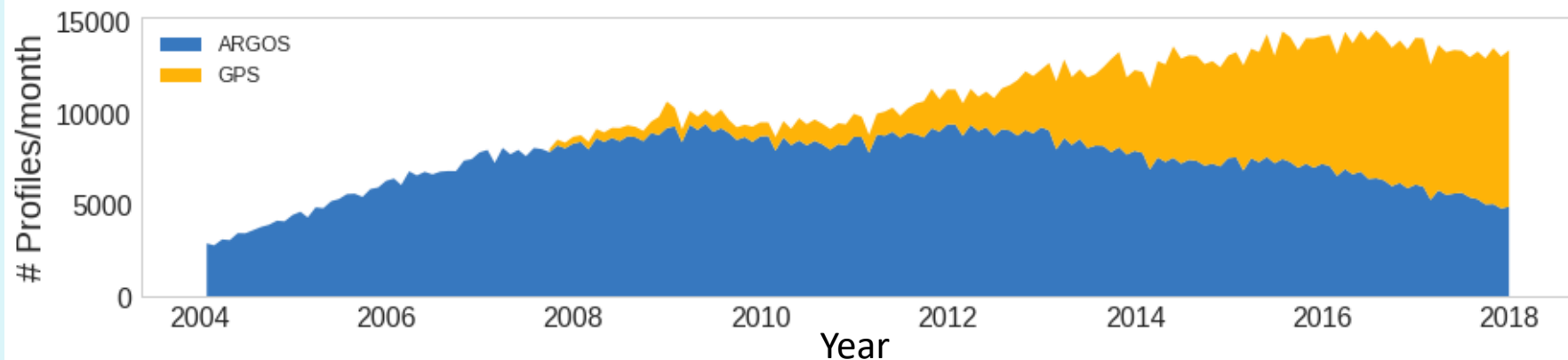
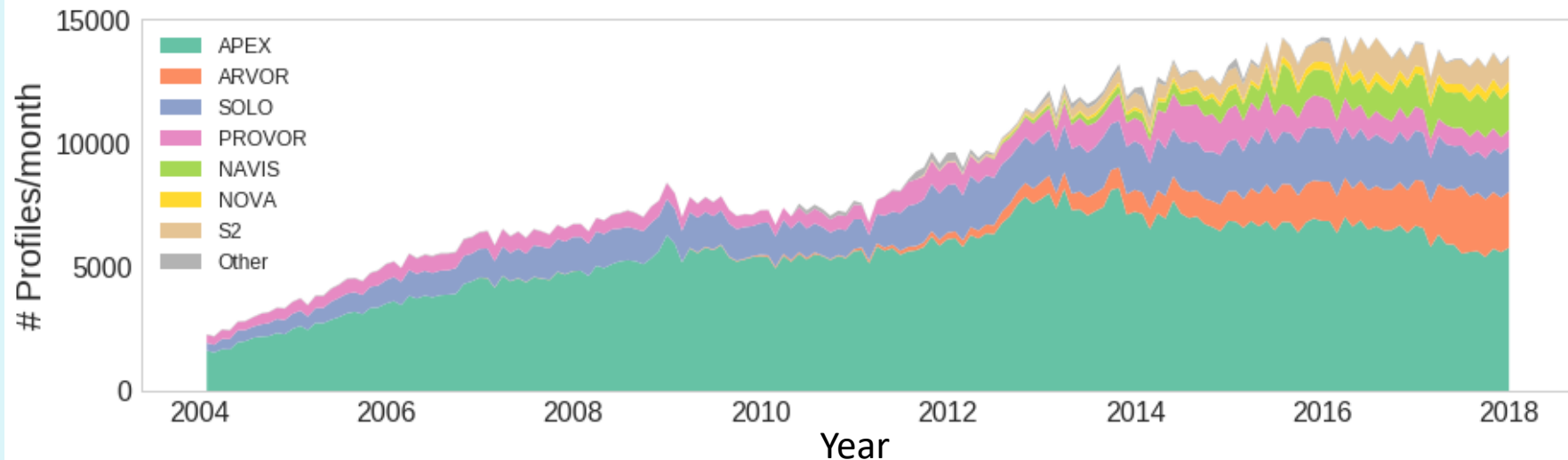
Link to GDAC data	Dac	Parameters	Positioning system	Link to profile page	Date reported	Cycle number	Data mode	Number of measurements
1901386_162 data	aoml	PRES,TEMP,PSAL	ARGOS	1901386_162 page	2014-07-13 00:09	162	D	70
1901386_202 data	aoml	PRES,TEMP,PSAL	ARGOS	1901386_202 page	2015-08-23 15:55	202	D	71

- Platform history and trajectory
- North and South Pole stereographic projections available

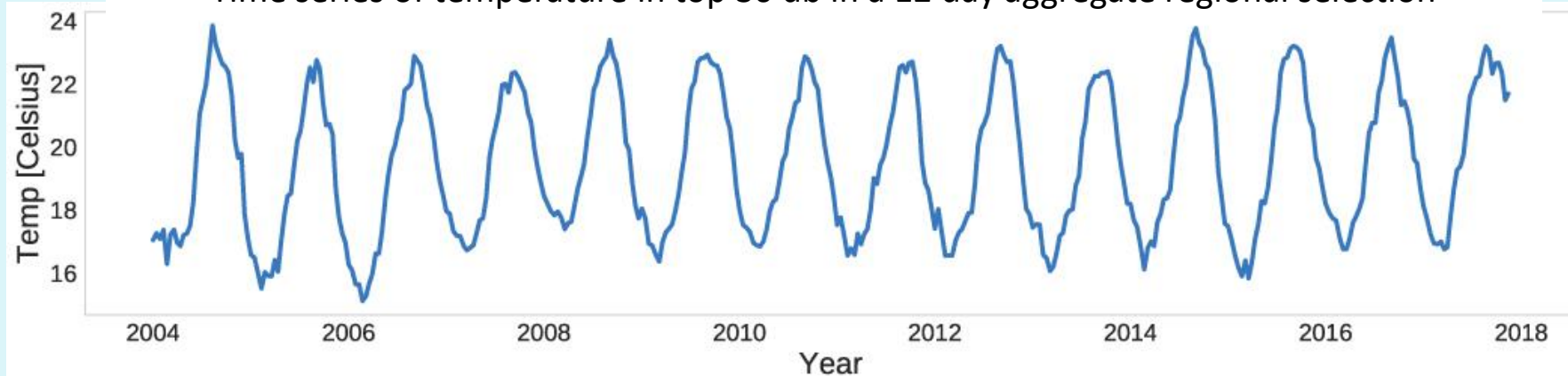
- The API brings data from Argovis into a user's scientific programming environment to produce custom figures and metrics of the Argo dataset and its metadata over time
- Python tutorial exists at:
<http://www.itsonlyamodel.us/argovis-python-api.html>
- Similar commands work in Matlab as well



Number of profiles in 1 x 1 degree bins in January 2018



Time series of temperature in top 30 db in a 12 day aggregate regional selection



Gridded data component

- Features the Roemmich Gilson 2016 Argo climatology
- More gridded products will be included for easy comparison
- Beta version online works best in Chrome, Safari, Edge

Menu options on website (current in black)

Variables	Fields	Views
Conservative temperature	Time mean	Map
Absolute Salinity	Annual Cycle	Meridional Section
Dynamic Height	Annual Anomaly	Times Series
	Interannual Anomaly	Hovmöller Diagram



* Beta version 2 Feb 2018

Display 1 figure ▼

Figure 1 active ▼

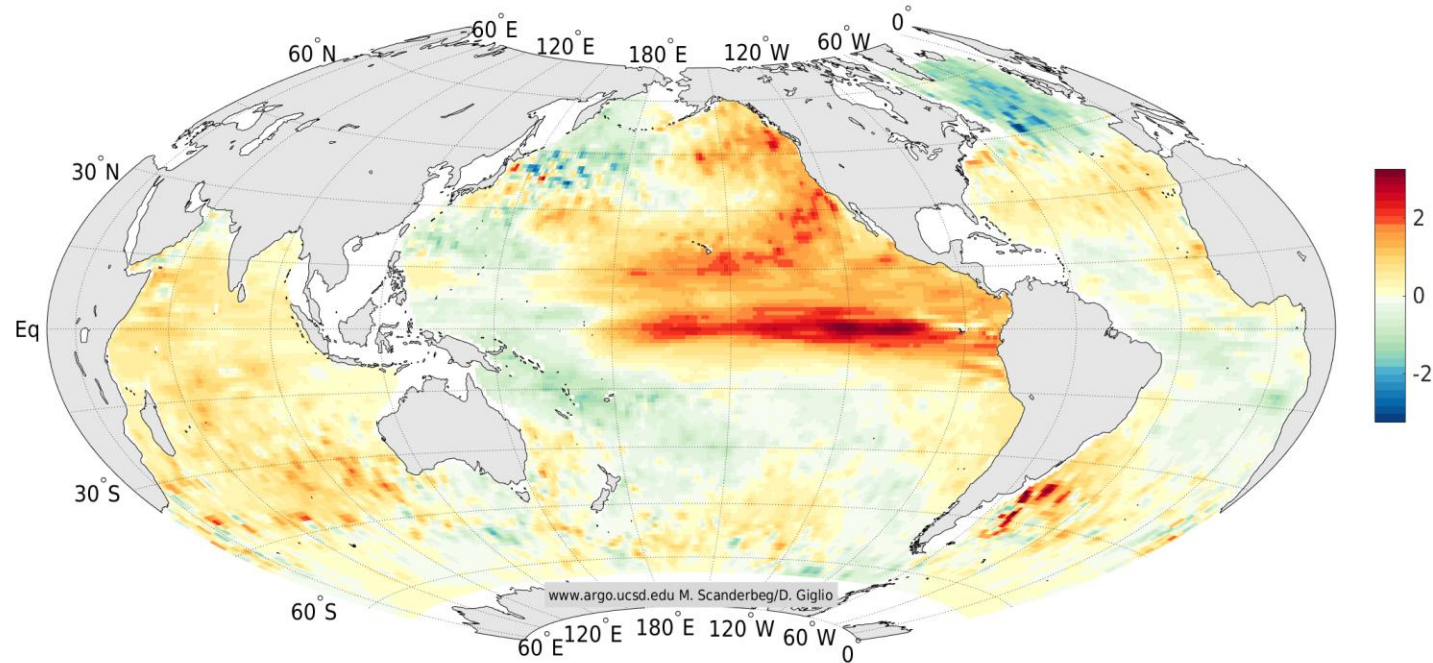
Temperature ▼

Interannual anomaly ▼

Map ▼

2.5 dbar ▼

August 2015



- www.argovis.com
- Plan to improve front-end using React or Angular framework
- Consider include BGC measurements
- Create option to view only dmoded Argo profiles
- Suggestions and collaboration from community are welcome