Keeping the AST website relevant and up to date

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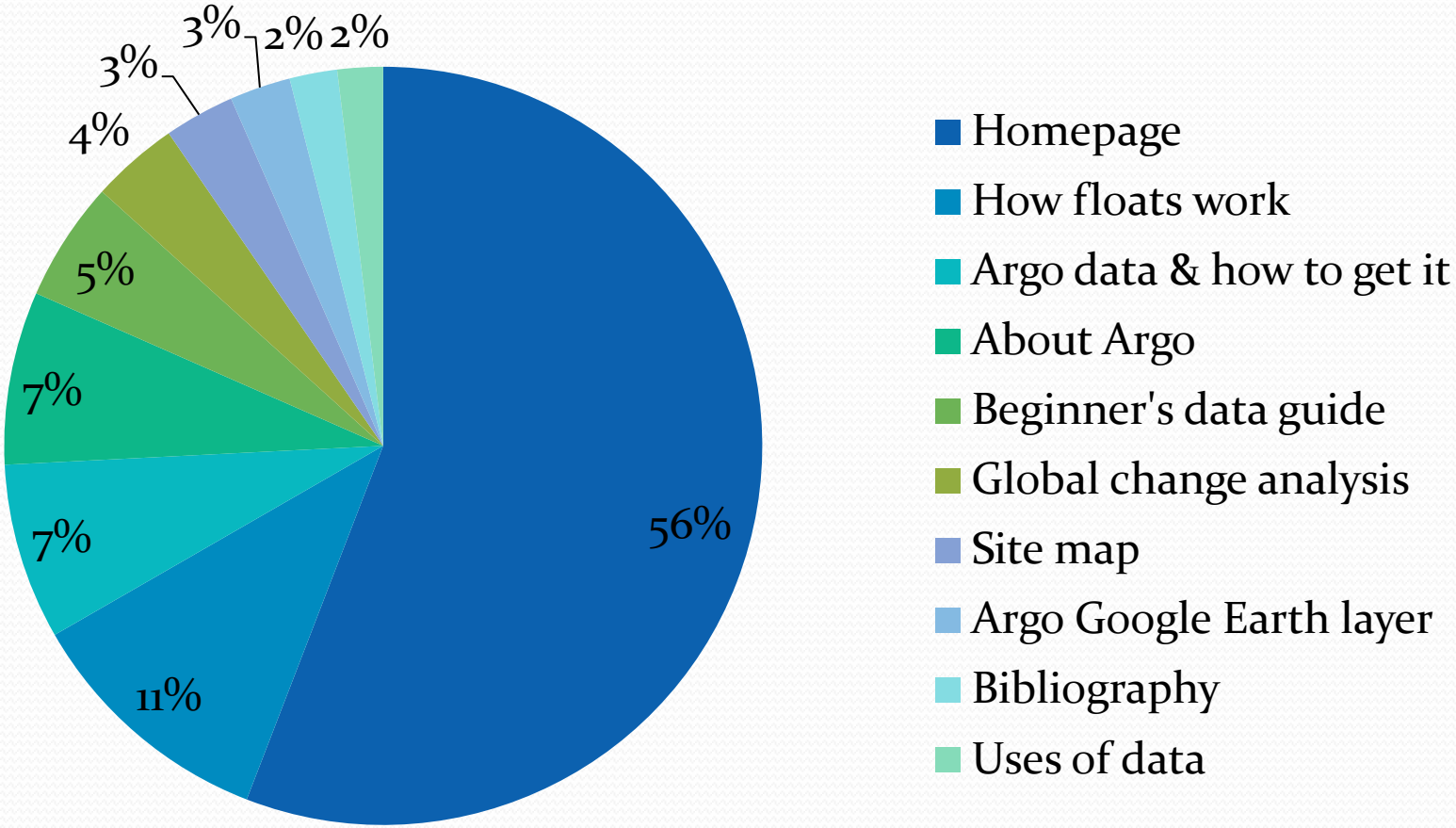
AST-16 Meeting in Brest, France
March 2015

Argo in flux

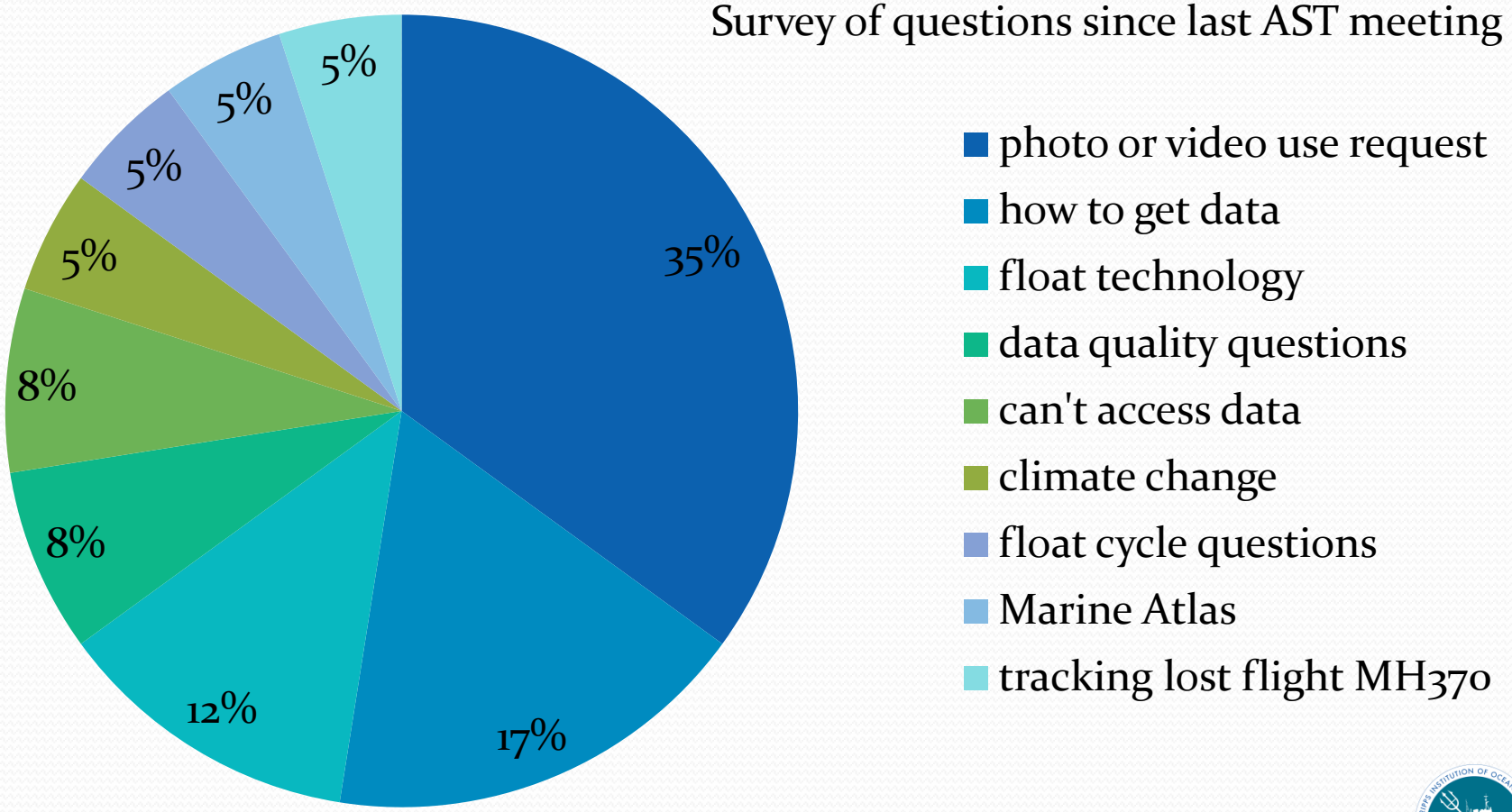
- Original Argo & enhancements
  - Balance funding needs (which differ by country) and the need to relay information to general public
  - Is more information needed on website to clarify definitions? More plots?
- New technology
  - Iridium makes up majority of deployments now
  - High resolution profiles
  - Additional or new sensors
  - Deep floats
- Access to data
  - Via monthly DOIs
  - For education use – ie Google Earth, data viewers, batch ascii, etc.
  - Gridded fields and products

Top 10 most visited pages



~95,600 total pageviews since last AST meeting

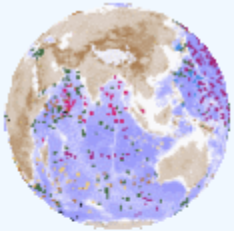
Questions on argo@ucsd.edu and support@jcommops.org



Pages updated since AST-15

- Argo data and how to get it
- Argo Beginner's Guide
- Gridded fields and velocity products
- Operational Use
- Data viewers
- Educational use
- Video Gallery

- All fit in well with top visited pages and requests on email



Argo

part of the integrated global observation strategy

Argo data and how to get it

- ▶ Home
- ▶ About Argo
- ▼ Argo data
- Argo data and how to get it
- Argo data beginners guide
- Acknowledging Argo data
- Gridded fields
- Data viewers
- ▶ Uses of Argo data
- ▶ Media Center
- ▶ Documents
- ▶ Argo Steering Team
- ▶ Meetings
- ▶ Links
- ▶ Google Earth Layer
- ▶ FAQ
- ▶ Data FAQ
- ▶ Contact
- ▶ Site Map

Argo Data FAQ page lists history of pressure problems in Argo dataset

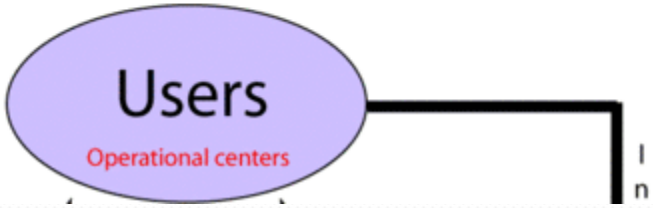
The Argo Data System

When a float surfaces, the data are transmitted and the float's position is determined either by Système Argos or by GPS. The Système Argos data are monitored by the **Argo Information Centre (AIC)** in France and then received by national data centers (DACs). The data from floats using other communications systems may go directly to the float's owner or to the AIC before arriving at the DACs. At the DACs, they are subjected to initial scrutiny using an agreed upon set of real time quality control tests (see the **ADMT Documentation** page for a description of the tests) where erroneous data are flagged and/or corrected and the data are passed to Argo's two Global Data Assembly Centers (GDACS) in **Brest, France** and **Monterey, California**. The GDACs are the first stage at which the freely available data can be obtained via the internet. The GDACs synchronize their data holdings to ensure consistent data is available on both sites. The data reach operational ocean and climate forecast/analysis centers via the **Global Telecommunications System (GTS)**.

The target is for these "real-time" data to be available within approximately 24 hours of their transmission from the float.

Given the expanding size of the Argo data system, there are other ways to access Argo data besides downloading the netCDF files from the GDACs. There are **gridded fields and velocity products** available as well as **data viewers** developed to look at Argo data. See the links to the right for all the options. There is also a **beginner's guide to Argo data**.

- FTP to Coriolis GDAC
- FTP to US GDAC
- Monthly GDAC snapshot with DOI
- Data Selection Tool at Coriolis
- Data Selection Tool at US GDAC
- Gridded Argo data & velocity products
- Data viewers that use Argo data
- Argo in Google Earth
- Archived Argo Data



Could add rsync service here too

Background

- Received feedback "Argo Beginner's Guide" was out of date
- Not enough links to referenced documents, grey list, etc.
- Argo data set becoming larger & more complicated making it harder to begin using the data
- More options available to access data – GDACs, grids, browsers, APIs, etc.
- More variations in data – high bandwidth, near-surface temperature, etc.
- 4th most visited page & ~20% of emails asked about accessing Argo data

Argo

Argo data beginner's guide

part of the integrated global observation strategy

- Argo collects salinity/temperature profiles from a sparse (average 3° x 3° spacing) array of robotic floats that populate the ice-free oceans that are deeper than about 2000m. They also give information on the surface and subsurface currents. Most profiles are made up of about 200 data points, but floats with high speed communications may be sending many more data points given the higher bandwidth. The first Argo floats were deployed in late 1999 and the array contains more than 3600 active floats as of 2014. Argo data are made available to users quickly and free of restriction.

Argo

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Argo data beginner's guide

Accessing Argo data

via GTS for operational centers

via GDACs for the NetCDF files

via Gridded files based on Argo NetCDF files at GDACs

via Data Viewers that incoproate Argo data

via GADR for archived and offline data

Quality of Argo data

Real time data

Delayed mode data

Online resources

Argo Data Management Team website

Argo Regional Centers

Tools for netCDF files

Via GDACs for NetCDF files

- Updated information about http, ftp, OpenDAP access
- Added monthly snapshot access via the Argo DOIs
- Added rsync service
- Stressed that GDACs should be the source of Argo data if users want individual Argo files
- Linked to ADMT documentation page for more information on variable names and quality control flags

Gridded fields & velocity products

- ADMT requested that velocity products be added to provide easy access to ANDRO and its quality controlled trajectory data
- Argo's more than 3000 floats provide 100,000 plus temperature and salinity profiles each year, but often it is necessary to combine the profiles into a grid to look at different water properties. **Additionally, trajectories from Argo floats drifting at depth can be used to calculate velocities which may or may not be gridded to examine the currents at 1000 dbars.** There are now several gridded fields and velocity products available on the world wide web based on Argo data, as well as other data sources.

Velocity products

- Added links to known velocity products (JAMSTEC's gridded version of YoMaHa is included in gridded fields section):
  - ANDRO velocity product
  - ANDRO in Argo trajectory V3 NetCDF files
  - YoMaHa

- Please let me know of any others

Argo

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Use by operational centers

- Action item from AST-15: Ask GODAE OceanView for a list of models that are assimilating Argo data to update the operational use section of the AST website
- Designed a survey & got responses from 8 centers
- Updated information for other centers as well with help from other Argo people
- 20 centers making ocean analyses & reanalyses, ocean and weather forecasts and climatologies
- SST, SSS, SSH, SLA, MLD, THC, T, S, currents, ice parameters, ENSO monitoring and predictions, seasonal forecasts, etc.
- Thank you for all the help!
- Please let me know if I'm missing something

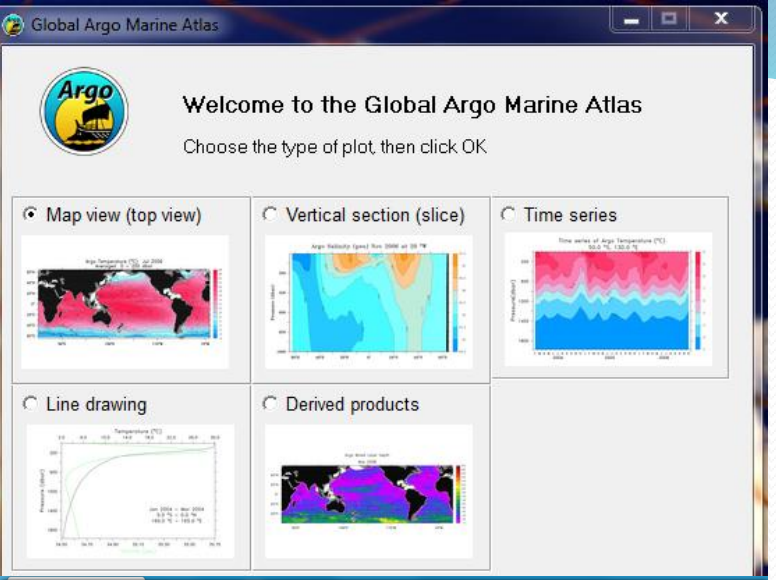
Operational Uses of Argo Data

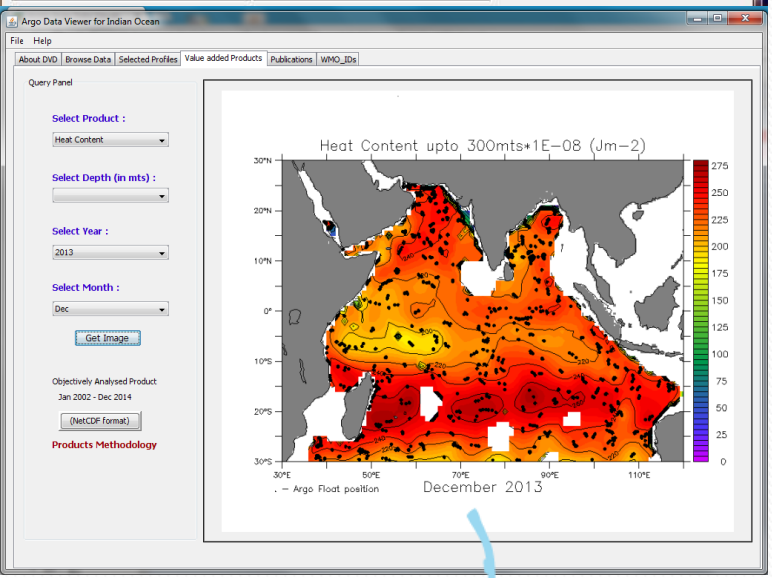
Many centers around the world now use Argo data to produce global and regional analyses of subsurface properties because Argo is the most abundant source of subsurface information, (temperature, salinity, velocity) for the global ocean. The availability of these data in real time lends them to use by operational centers involved in the analysis and forecasting of the state of the ocean and of climate.

The following table summarizes the uses that are presently being made of Argo data by these centers.

Country	Center	System	Type	Region	Products	Argo data assimilated	Contact
Australia	**CSIRO/BOM/Navy**	**Bluelink**	Ocean forecast and reanalysis	• Australian Waters • Global	• **OceanMAPS:** SST, SSS, SLA, and surface currents • **BRAN:** SST and Ocean T	T + S	peter.oke@csiro.au
Australia	**BMRC/CSIRO**	**POAMA**	Climate reanalysis and seasonal forecasting	Global, but focus on tropics	• **Seasonal Climate Outlook** • **ENSO forecasts** • **SST forecasts**	T + S	poama@bom.gov.au
Australia	**BMRC**	**Weekly bulletins**	Sea Surface Temperature analyses	Australian waters & global	**Sea Surface Temperature:** Australian Region, Pacific Region, Indian Ocean and Global	T + S	a.zhong@bom.gov.au
Canada	**DFO**	GIOPS/ CONCEPTS	Ice-ocean analysis and forecast	Global		T + S	
France	**Mercator Ocean**	**Mercator Ocean Forecasts**	Ocean analysis + forecast	N + Trop Atlantic, Med Sea, Global	• **Weekly bulletins**: Salinity, Temperature, Surface Currents, SSH, MLD • **1/12° global data** data via MyOcean • **Global Biogeochemical analysis** data via MyOcean • **Atlantic and Mediterranean Sea** data via MyOcean	T + S	bulletin@mercator-ocean.fr
India	**INCOIS**	**GODAS**	Ocean analysis + forecast	Global	**Ocean Analysis FTP** (login required) and **Ocean Analysis Dataset on LAS**: Analyses of temperature, salinity, currents, SSH, anomalies and indices	T + S	ssiva@incois.gov.in
Italy	**Mediterranean Forecasting System**	**MFS**	Ocean analysis + forecast	Mediterranean	**High** and **low resolution** forecasts and analyses of temperature, salinity, currents, wave, heat flux and wind stress	T + S	
Japan	**JMA**	**Analyzed Oceanic**	Ocean analysis (currents,	NW Pacific	**Daily, 10-day mean and monthly mean**: SST, Subsurface temperature	T + S	neargoos@climar.kishou.go.jp

Data Viewers





JAVAOCEANATLAS
an interactive tool to explore the ocean

- Global Marine Argo Atlas contains gridded Argo data and can be used to create maps, sections, time series, line drawings, etc.
- Indian Ocean Data Viewing Application contains high quality Argo data in Indian Ocean and can be used to create maps, T/S plots and filter data
- Ocean Data View (ODV) and Java Ocean Atlas (JOA) support Argo profile data
- Argo Google Earth layer shows positions of all floats and trajectories can be plotted. Each float has an informational balloon showing profile data, qc and float information

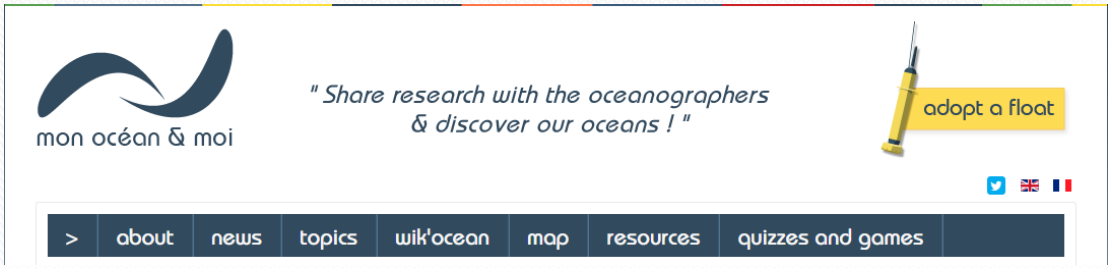
Google earth

Ocean Data View
http://odv.awi.de
© 2010 Reiner Schlitzer

Educational Use

Added links to:

- Mon Océan et Moi



- LEARNZ Virtual Field trip
- PICES Summer School 2014
- Animations and shorts featuring Argo

Photo above: Phil Sutton and Shelley the LEARNZ teacher on video conference with a school
Photo to left: SOLO-II ready for deployment
Photos both courtesy of LEARNZ

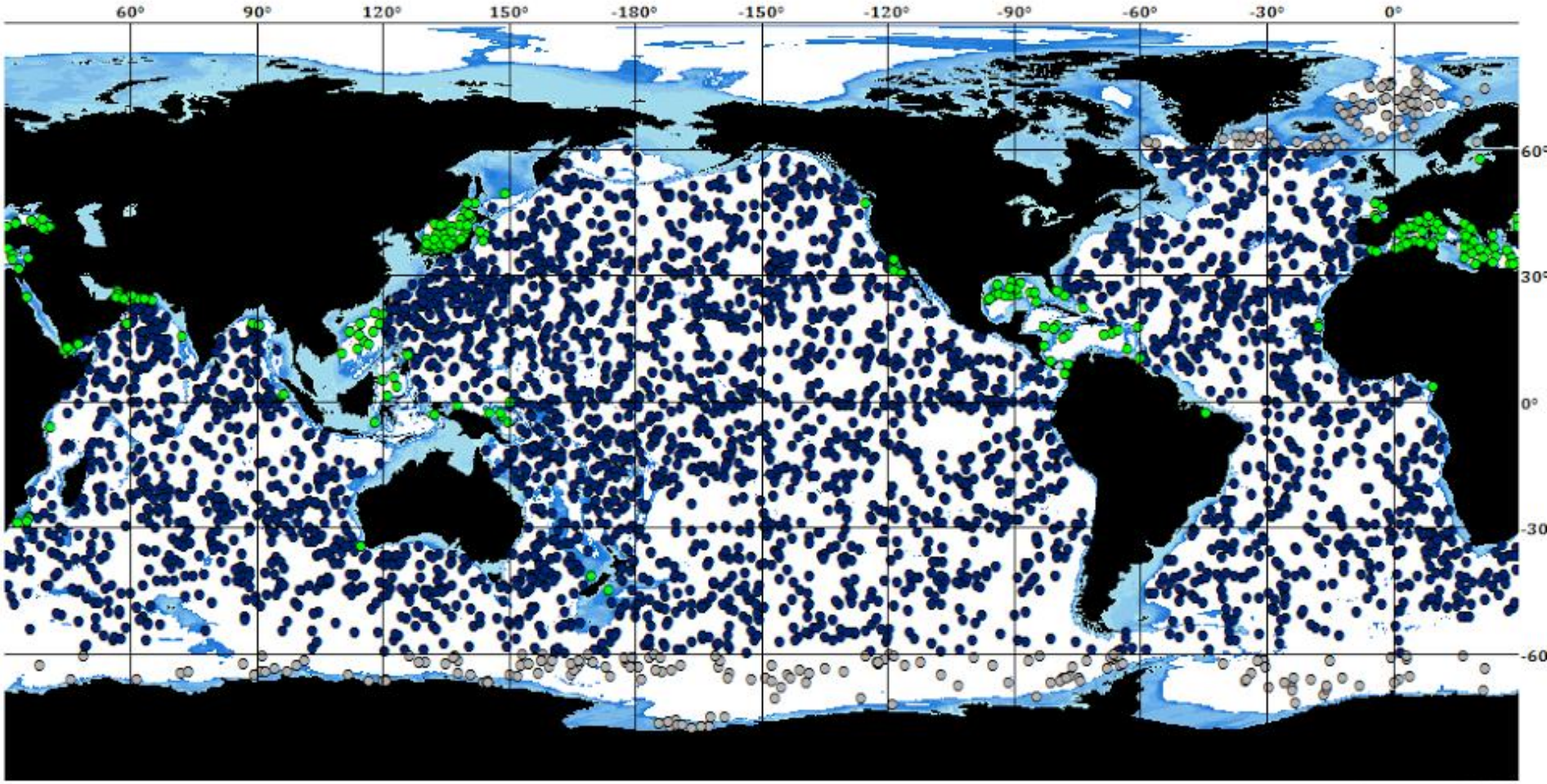
Argo Video Gallery

- Reorganized into sections:
  - Animations
  - Short programs (6 now)
  - Deployments (only a selection embedded on page; rest available via YouTube Argo channel)
- Embed videos and include links to high resolution versions if available
- Getting requests for high resolution videos; if you have any, please send them (IMOS animation??)
- Added selection of LEARNZ videos on deep floats, preparing and deploying both standard and deep floats
- Two Ocean Today videos; Deep Argo & Ocean Temperature

Updating AST homepage

- Only small changes have been made to "Where is Argo now?" section
  - 1,000,000 profile milestone noted
  - Float distribution is still an issue
  - Float reliability is improving & float lifetime is extending
- Background: Action item from AST-15:

  S. Wijffels to work with M. Scanderbeg and M. Belbeoch on some simple changes to the existing Status Maps. Changes might include offering two plots – one for Original Argo and one for Global Argo.
- M. Belbeoch has created a map with different colored dots based on if floats were deployed:
  - Inside original mission areas
  - Poleward of 60N and 60S
  - Inside marginal seas

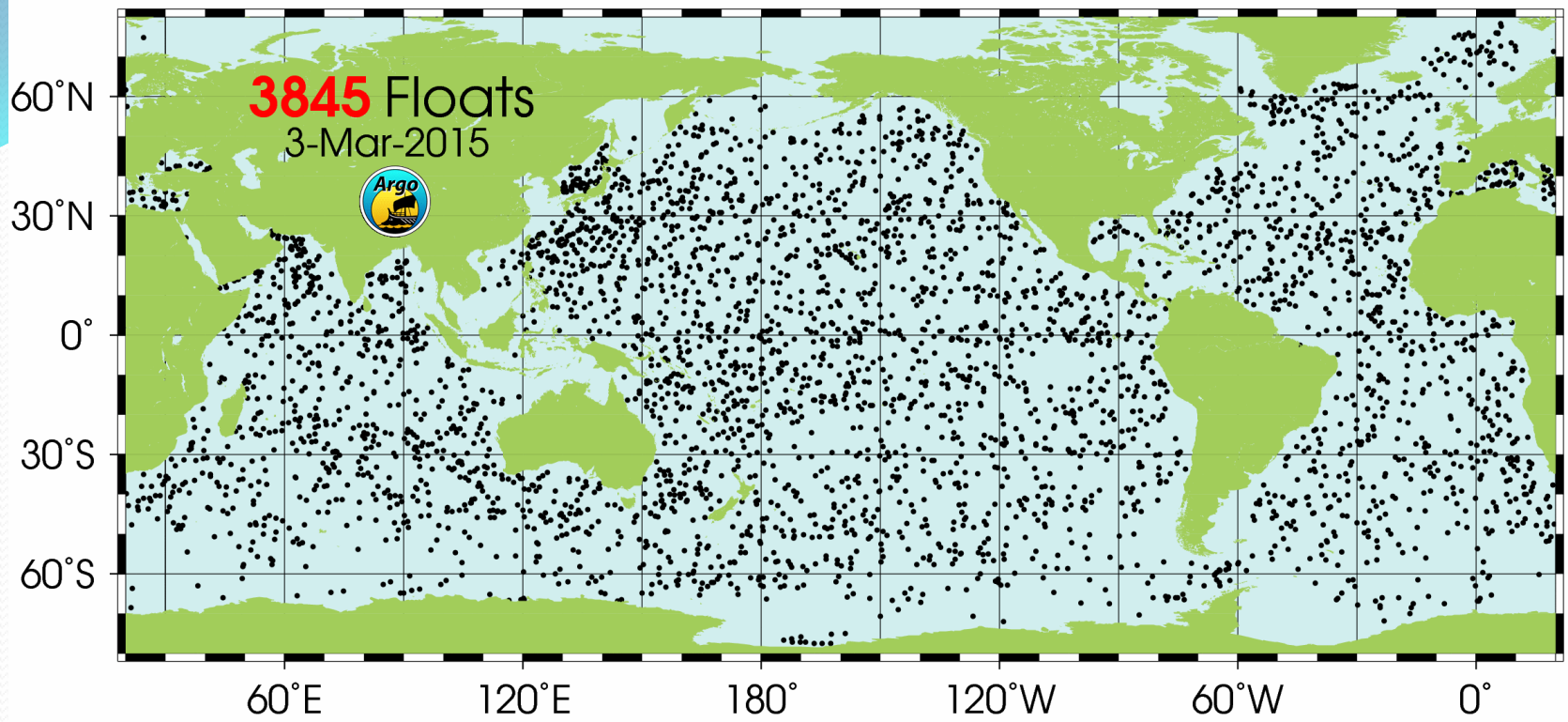


Argo Status
3843 Active Floats

- Argo Initial Design (3 349)
- Polar (244)
- Marginal Seas (249)

January 2015

jcommops



- Alter status map to same three colored dots as ATC?
- What about other enhancements?
  - Deep Argo
  - Western Boundary Currents
  - Equatorial Regions
- Update text to explain original Argo mission plus enhancements? Point to maps by ATC? How does this affect funding?

Conclusion

- Updating information on the website as changes take place but cautious of making large changes
  - Technology changes
  - Additional ways to access Argo data
  - Original array plus enhancements
  - More photo and video media available
  - More educational activities & outreach
- As dataset expands in size and complexity, need to work closely with ADMT to get correct information related to data on AST webpage
- If something looks out of date, is wrong or missing, please let me know