Argo Status

M. Belbeoch, Argo/SOT TC

SOT V

May 2009, Geneva

Argo - Infrastructure

Argo is internationally managed by the Argo Steering Team.
2 co-chairs, National Argo programmes representatives, TC

- Argo Data Management team coordinates data issues

- Argo Data Management is a distributed system
  - National Data Centres (DACs) feed GTS and GDACs
  - REAL TIME (GTS, GDACs) with standard/automatic QC
  - DELAYED-MODE files replace RT files (GDACs, after 6-12 months)

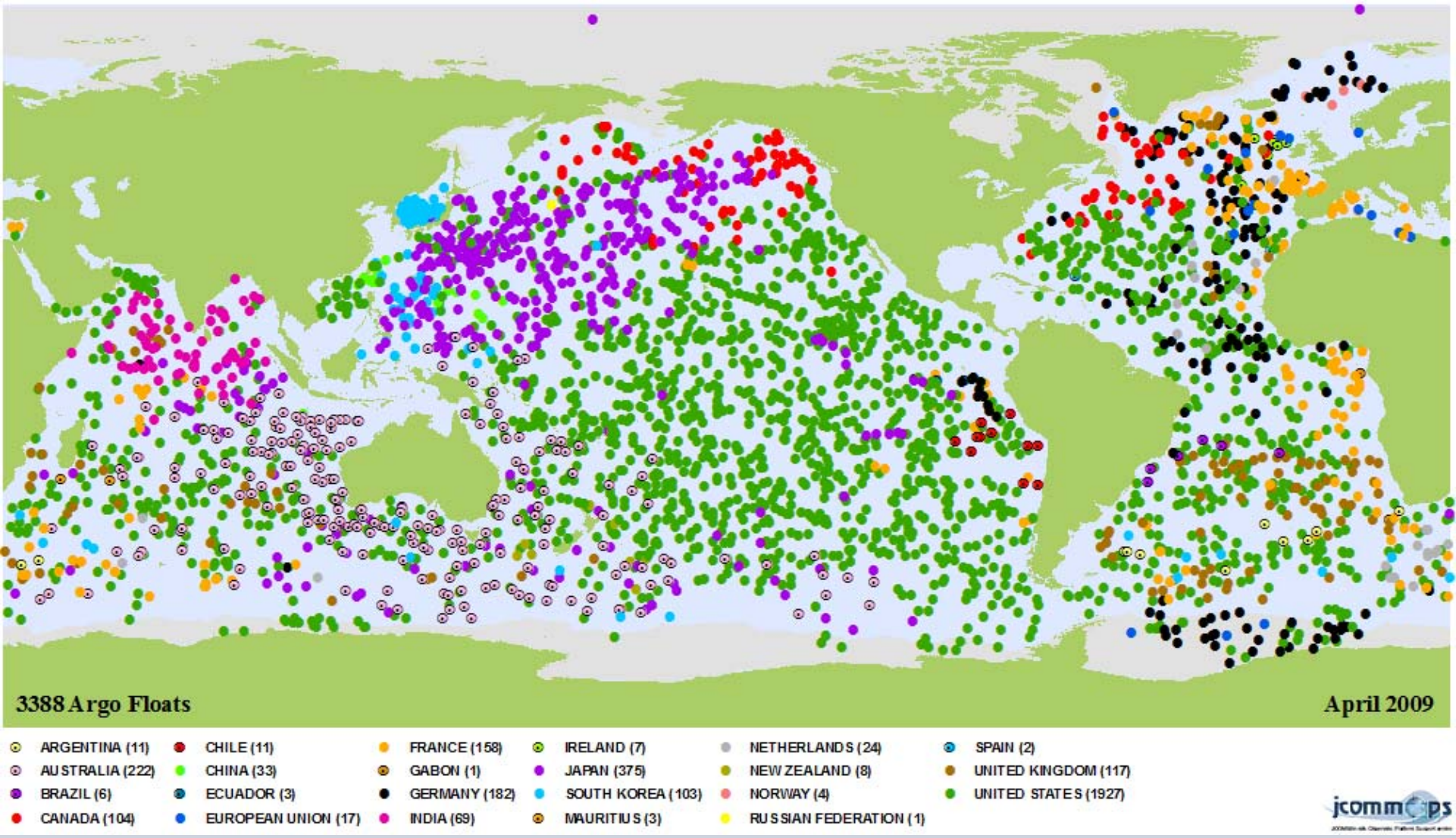
- 2 Global Data Centres (USA, FR)

- Regional Centres being developed

- Long term archival centre at US NODC

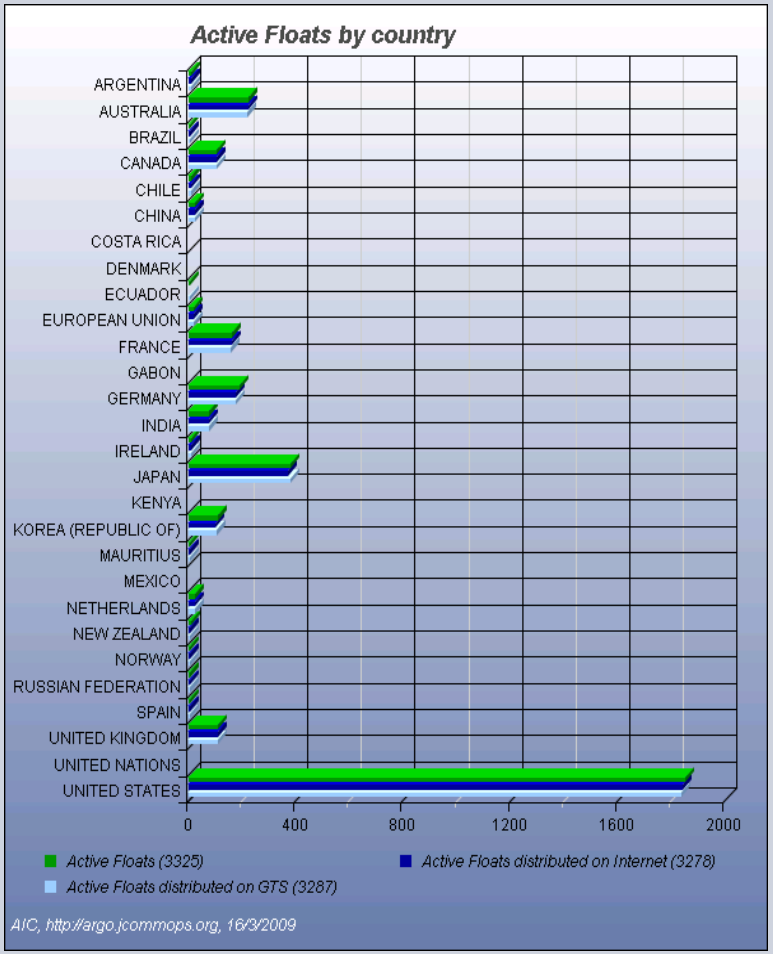
- Argo Information Centre/JCOMMOPS/Argo Project Office

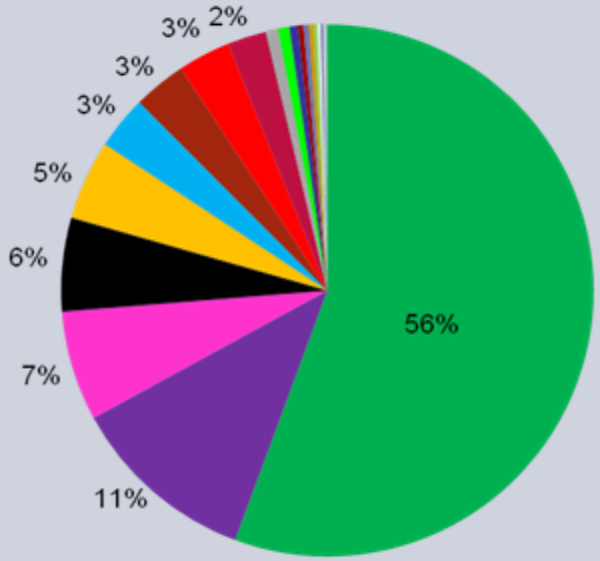
National Contributions

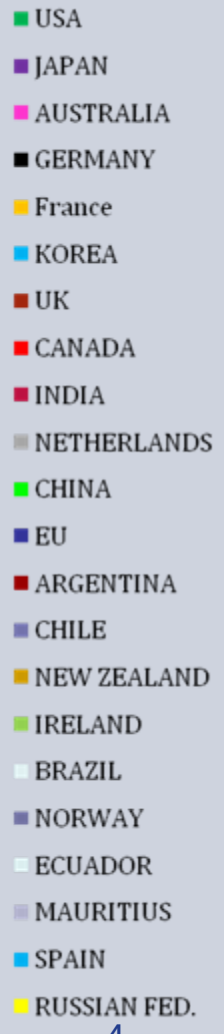


Argo is the sum of national contributions

National Contributions

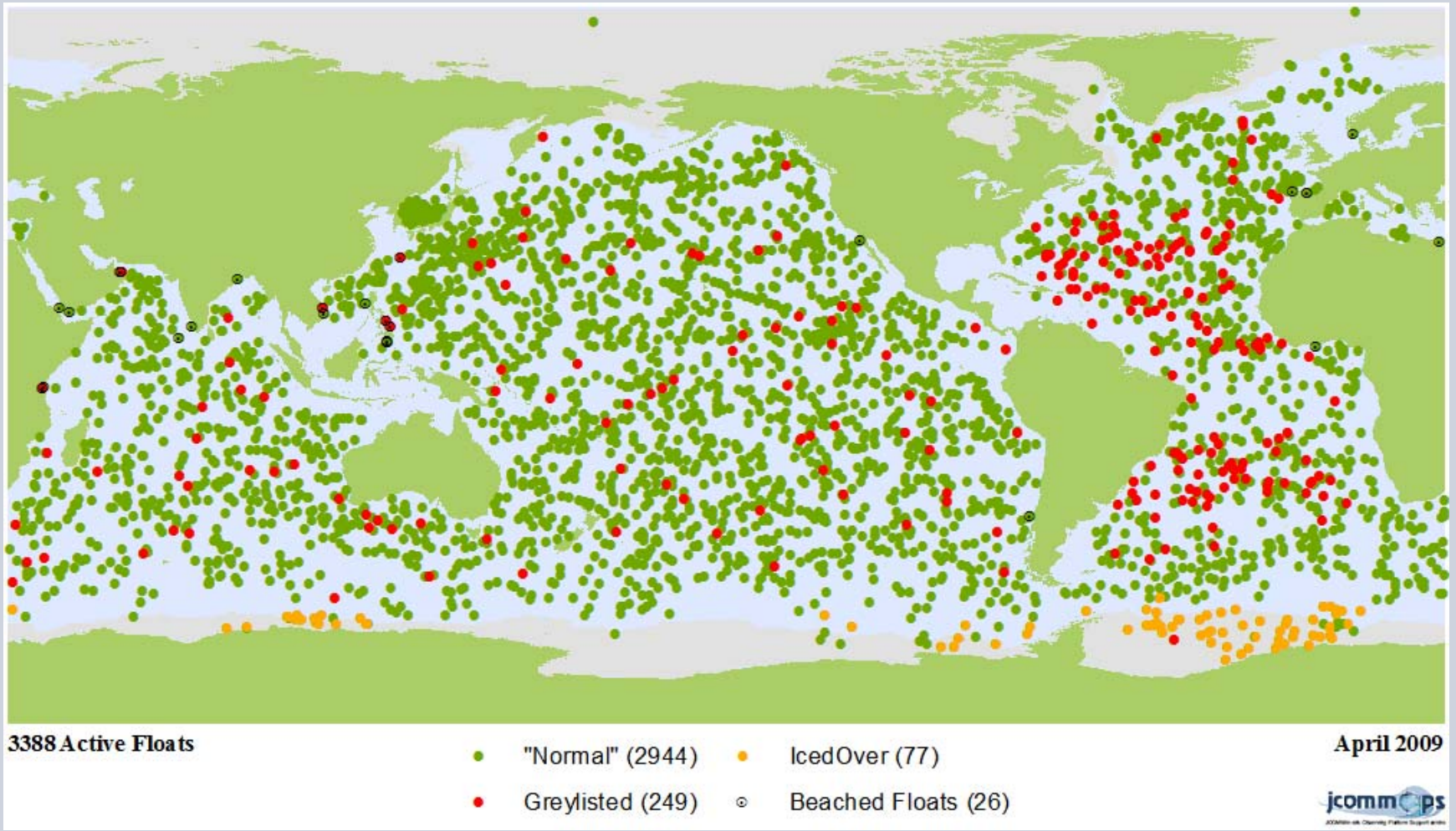






A dozen countries are sustaining the global network, another dozen takes care of regional gaps, and many other are supporting Argo.

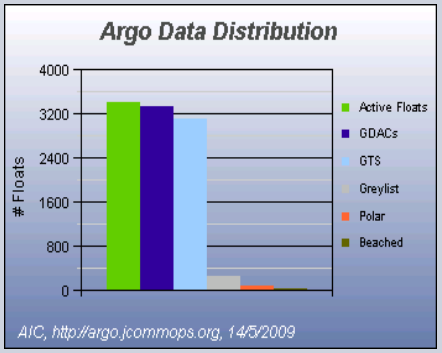
Argo - Status

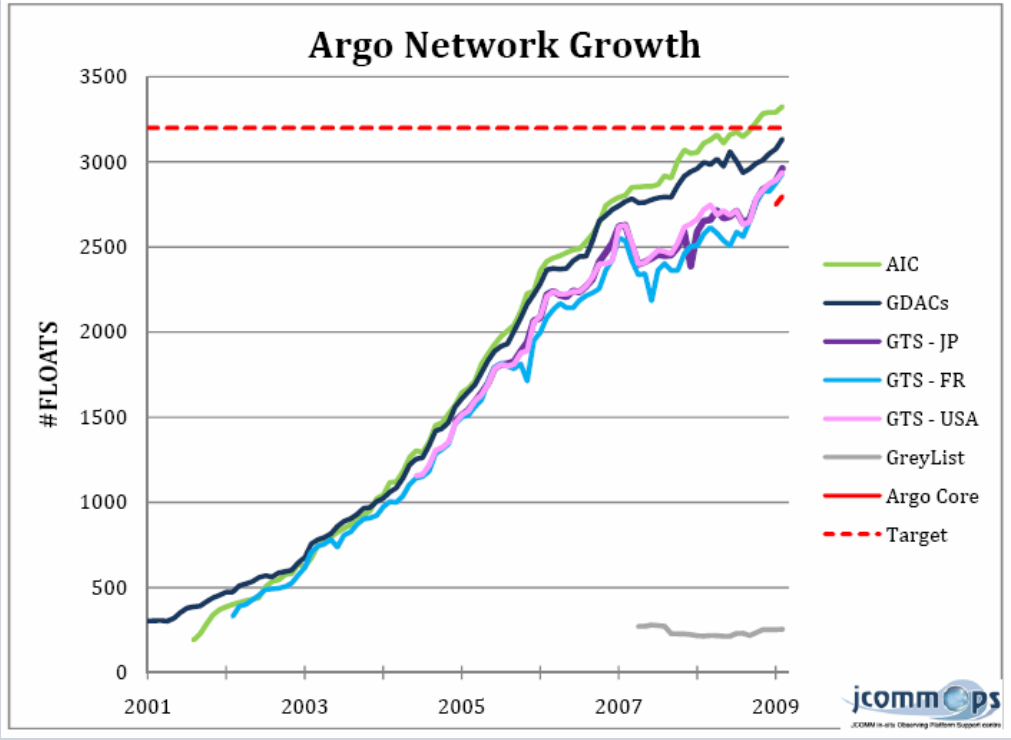

3388 Active Floats
"Normal" (2944)
IcedOver (77)
Greylisted (249)
Beached Floats (26)
April 2009
jcommops

Argo Status: float counts

Argo Floats in AIC database **6331**

Active Floats **3388**
Argo Core ~**2824**
GDACs **3322**
GTS **3336**
Grey Listed **249**
Polar Floats **77**
Active Floats "Beached" **19**

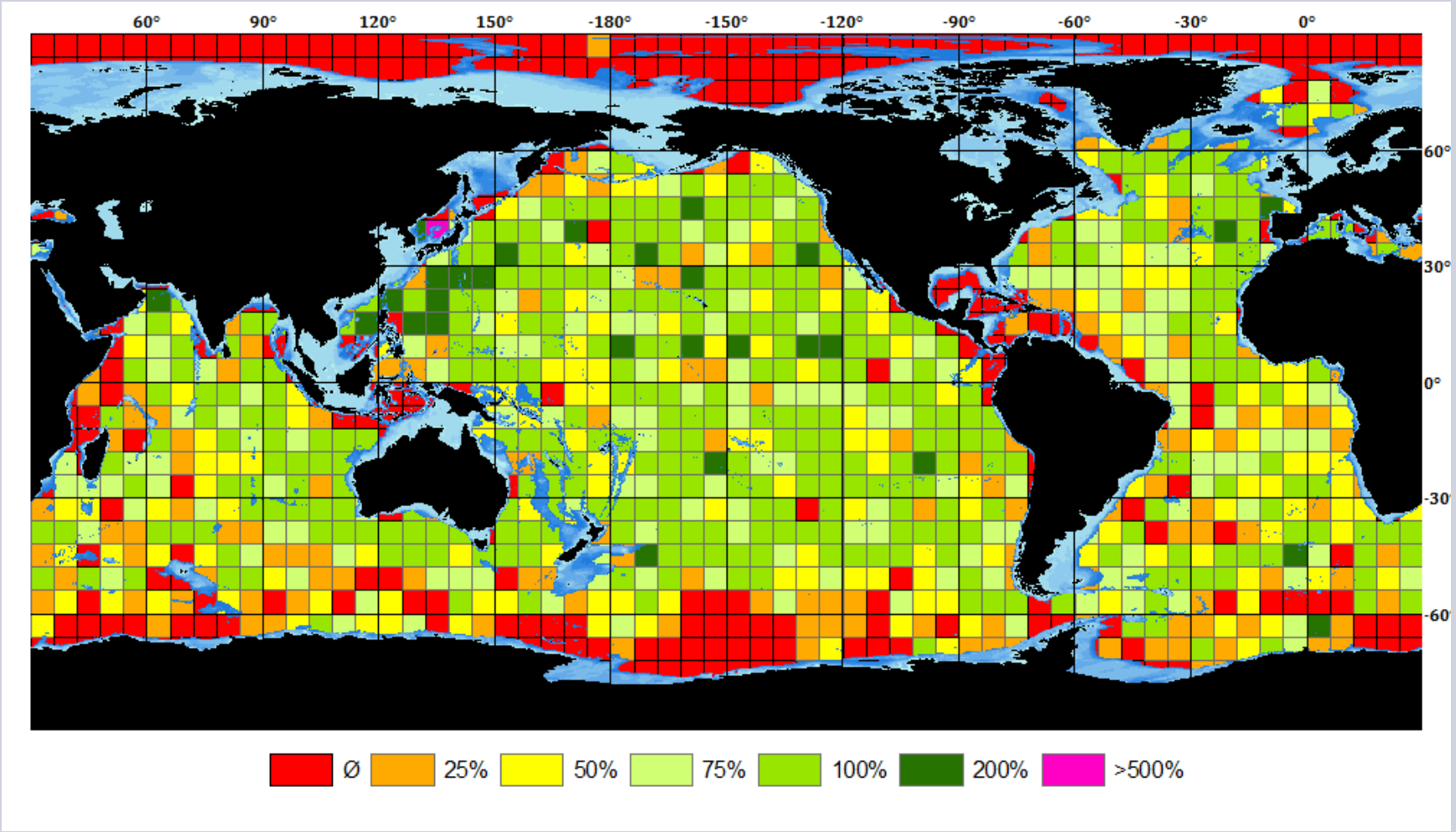




Argos has achieved the 3000 floats milestone
Argo Core Mission (60°N;60°S), no marginal seas: NOT YET ACHIEVED
600 floats are required in the southern hemisphere

AIC: tracks routinely the difference platforms operating/data distributed

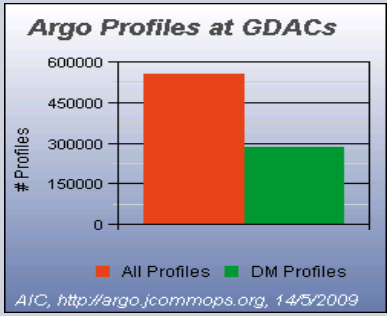
Argo Status



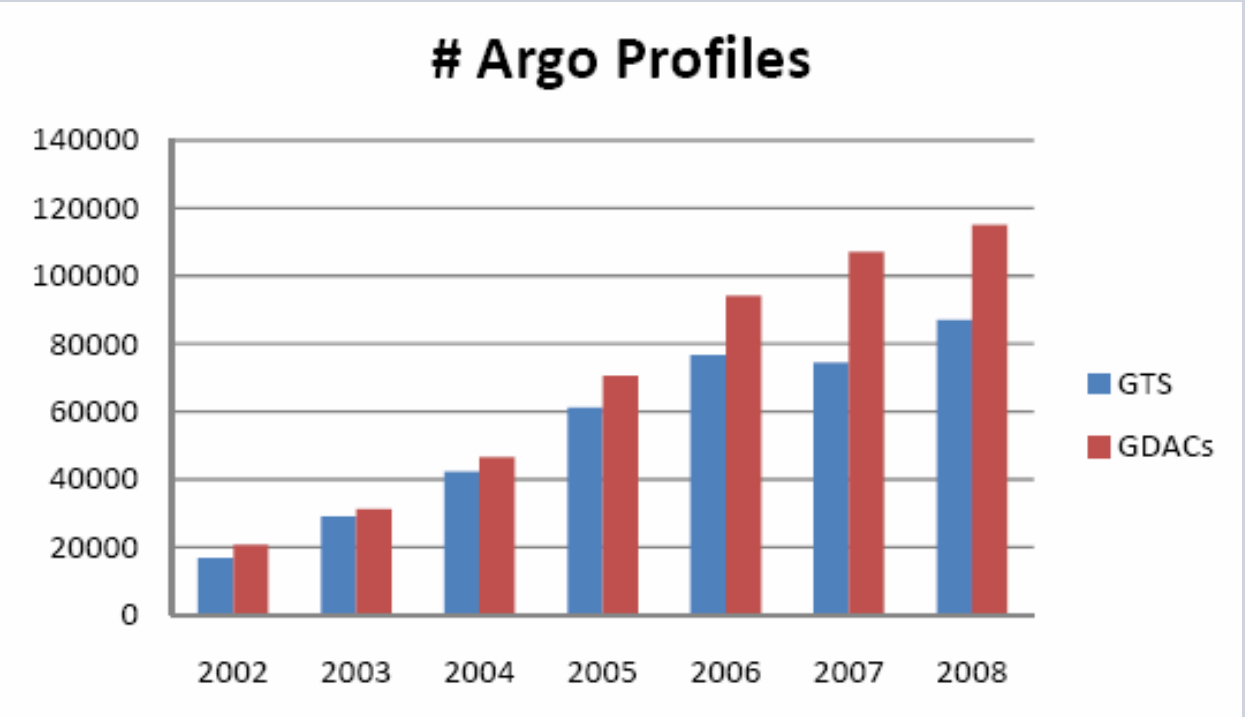
Float density (100%=4 floats): good floats only

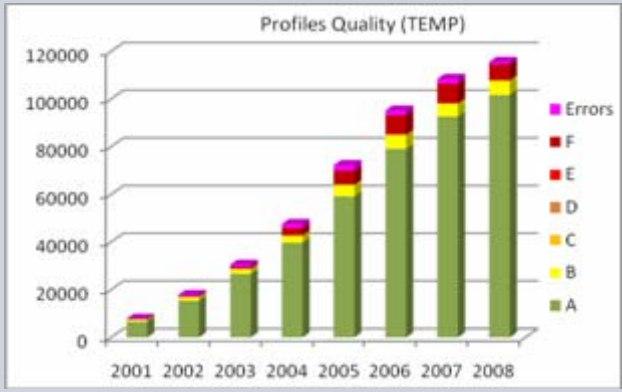
Argo = 100 000+ profiles / year

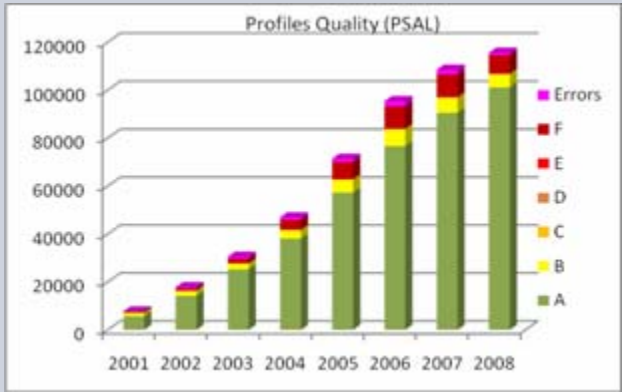
- #All Profiles **554070**
- #DM Profiles **285630**



- **90% optimal quality (but not for all applications)**
- **90 % reach the GTS/GDACs within 24h**







Argo – QC issues

- Salinity Drift: bio-fooling and others reasons

  DMQC (dedicated working group)

  Comparison with CTD data, and nearby float data

  ~70 % processed (need resources)

- Accuracy of temperature versus pressure
  - Applications of Argo data for climate change issues requires highest quality possible (heat content, steric sea level change).
  - Years required to detect small biases (comparison with CTD)
  - Free data => educate users

- Recent problem on SBE CTD pressure: most of new deployments will be postponed …
  This is the disadvantage of having a single sensor manufacturer

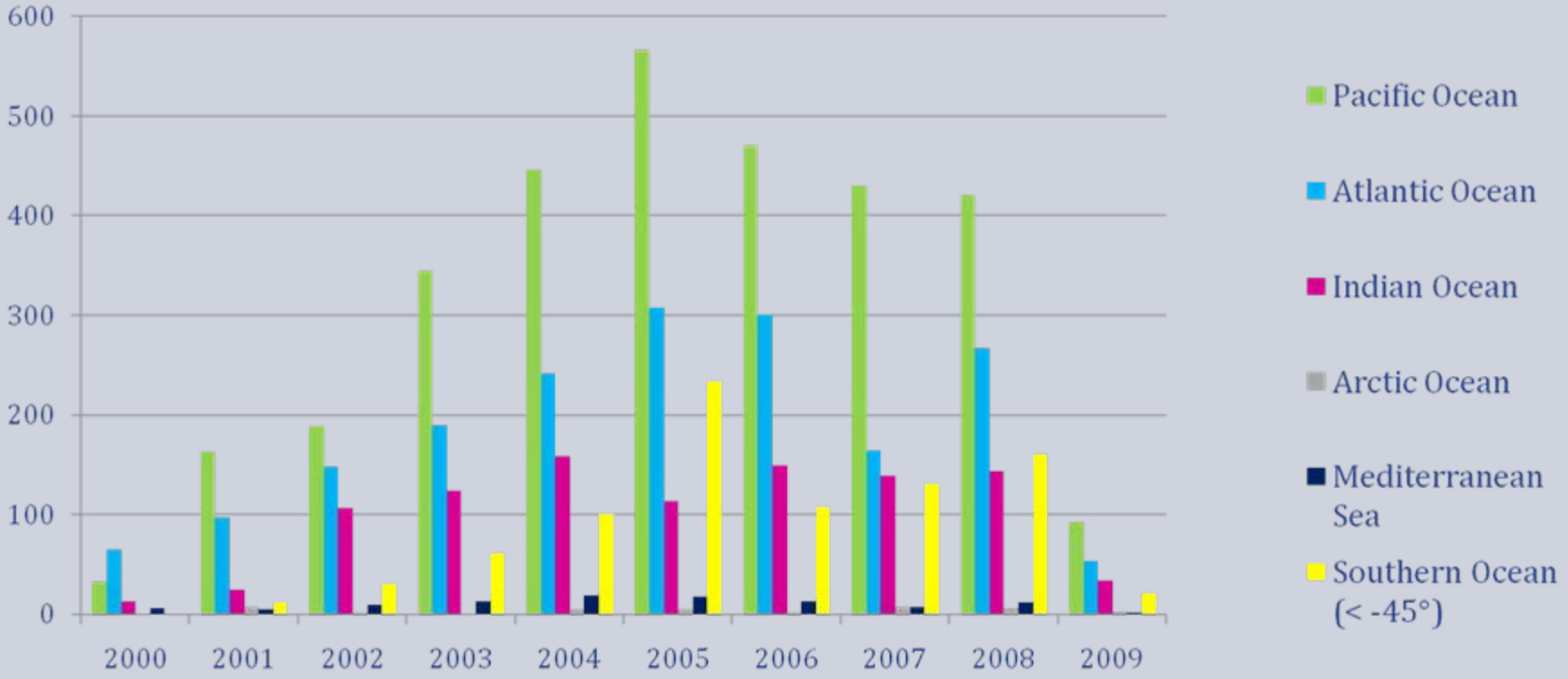
2000-2008: 6000+ Deployments

Logistical challenge:

- Ship time
- Cooperation required (Argo, Argo/GOOS/JCOMM, new partners)

Deployments: ~880 units / year

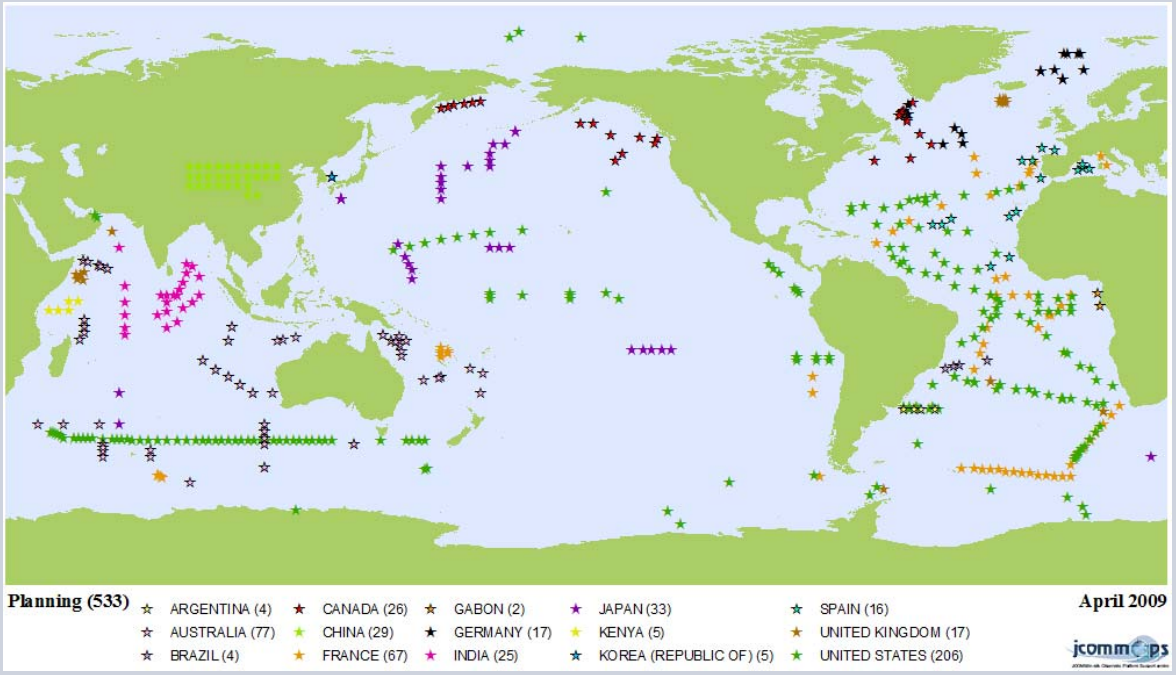
	2000	2001	2002	2003	2004	2005	2006	2007	2008
Total	**116**	**295**	**452**	**672**	**869**	**1008**	**933**	**747**	**848**

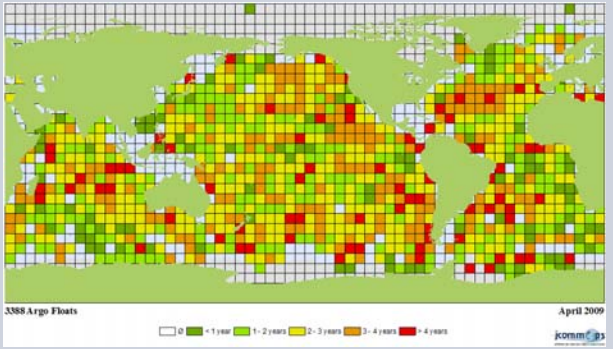


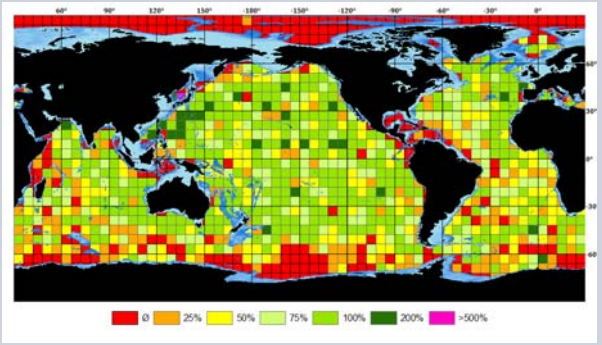
2008 was a good year for Argo, with increased contributions from Australia, China, France and Germany.
Southern Ocean still challenging.

Planning

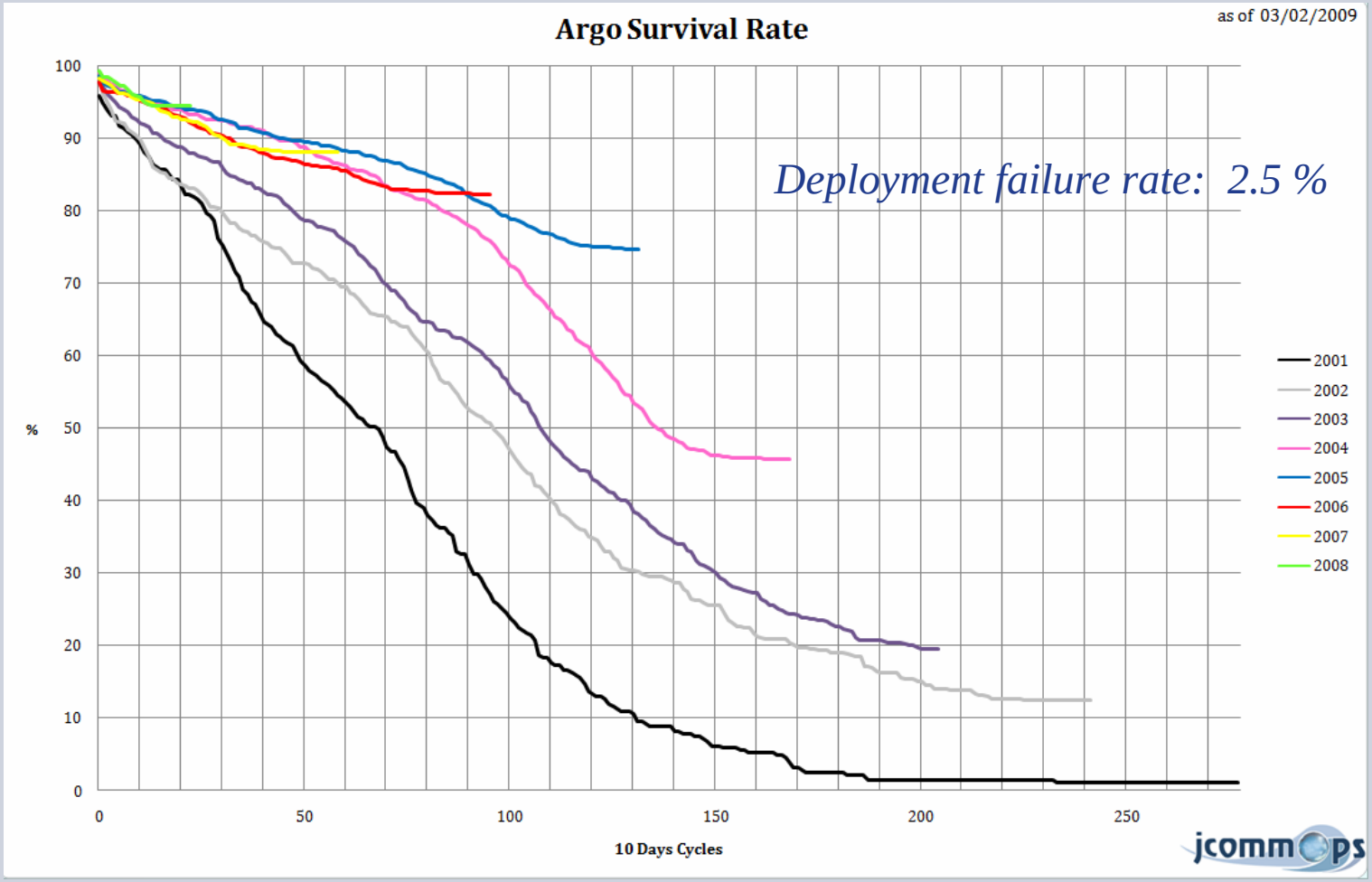
- Argo groups are making substantial efforts to plan their deployments and optimize the array coverage.
- Implementing an empty ocean … maintaining a global array.
- All deployments are registered on line from a draft state to the final confirmation/notification.
- Crucial metadata are controlled by TC







Technology progressing



Still room for improvement: all floats do not reach yet the 4 years lifetime
This target will likely be reached and exceeded
This will help to fill gaps … without deploying more floats

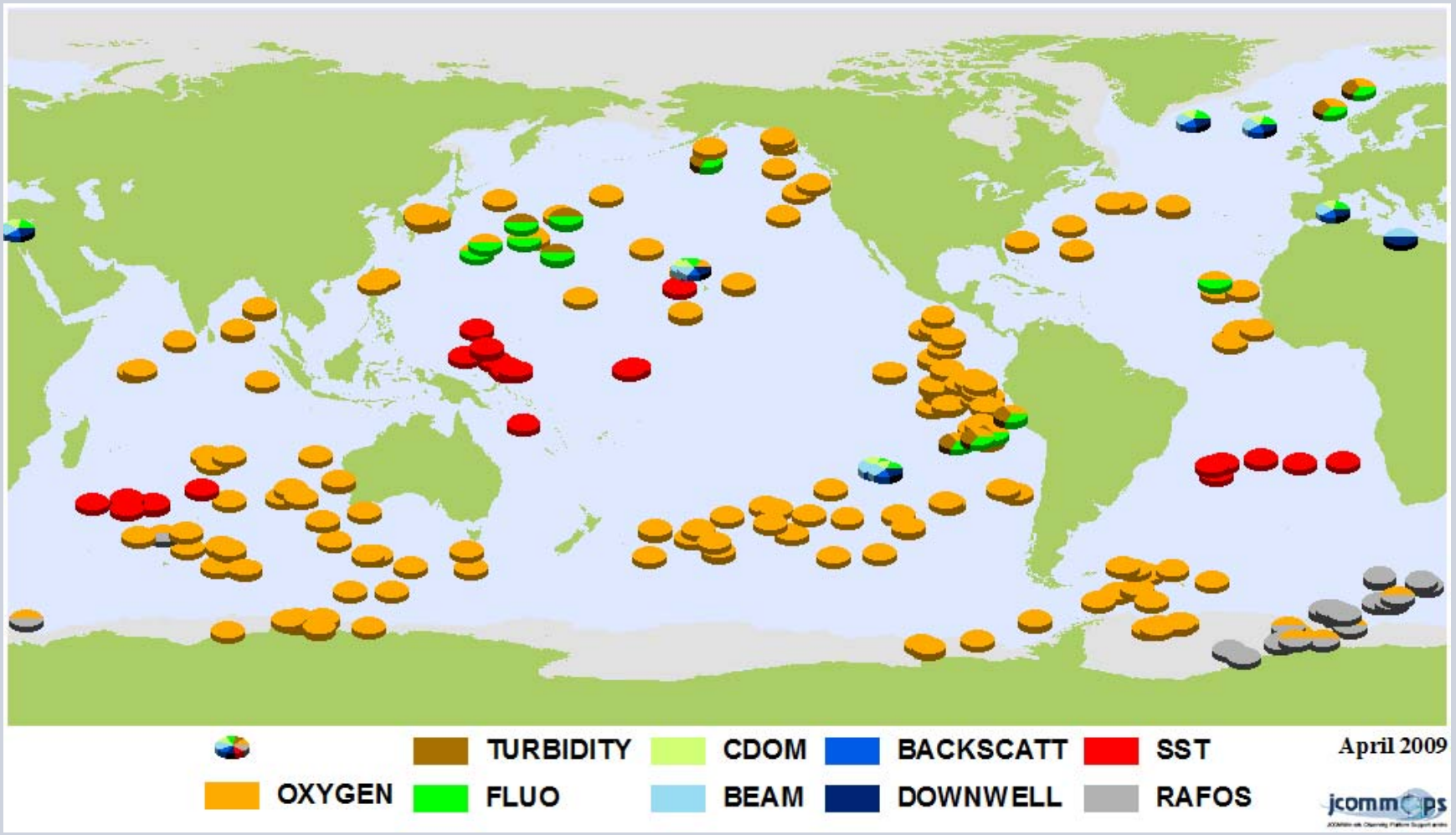
Technology

- Ongoing efforts in float technology development are aimed at **increasing float capabilities** (buoyancy capacity, communications, sampling under seasonal ice) and efficiency.

- **Future floats** will be smaller and lighter, therefore easier to ship and deploy and require less energy for buoyancy adjustment. Development of an abyssal profiling float is under consideration.

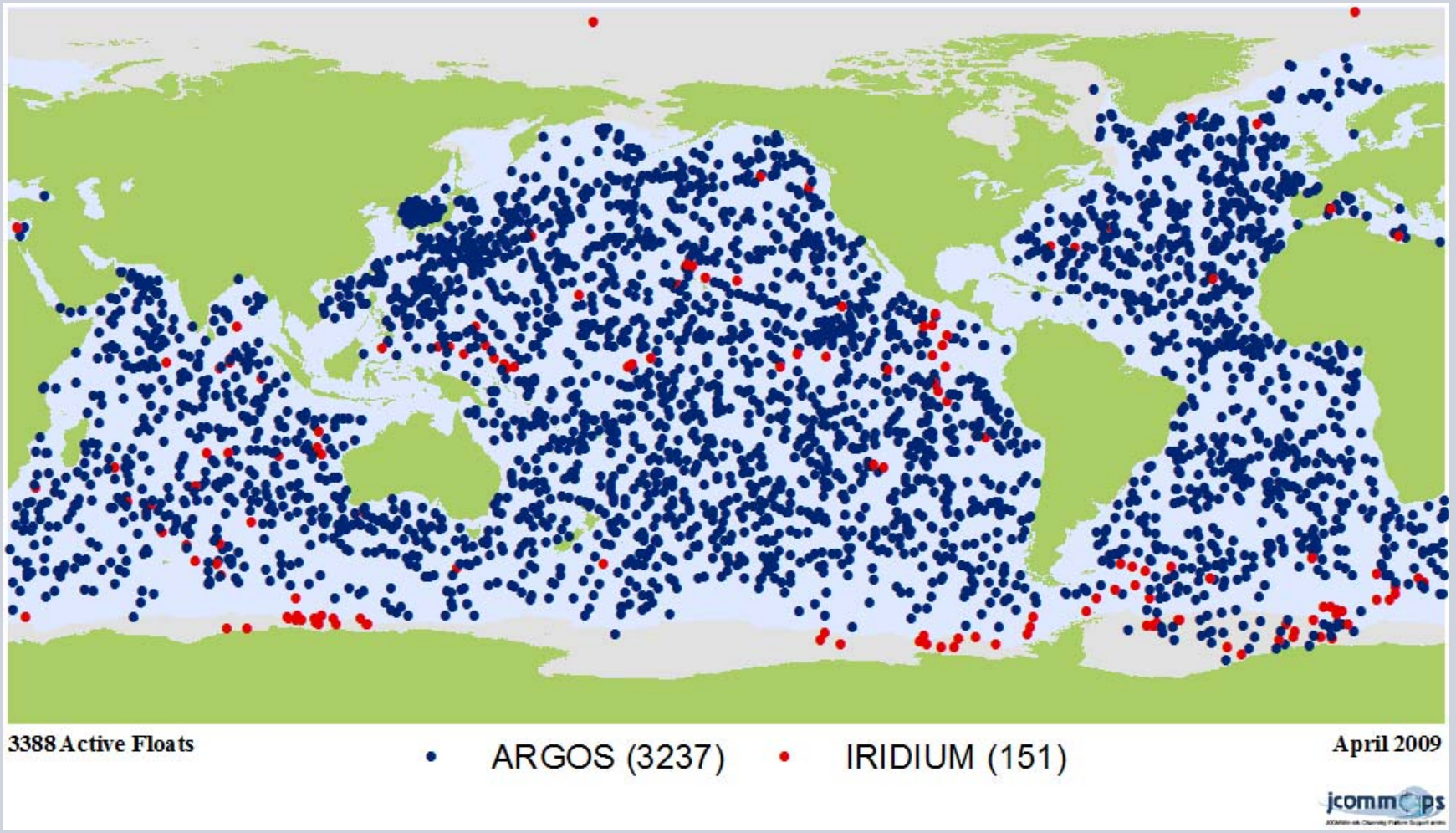
- **New sensor** development is an exciting area of work, with potential to increase Argo's future value. New sensors for biological and geochemical parameters, for wind and rainfall, and for better sampling of temperature and salinity structure in the ocean's surface layer are being tested. Sensor development and demonstration are carried out as activities separate from Argo.

Technology: Sensors



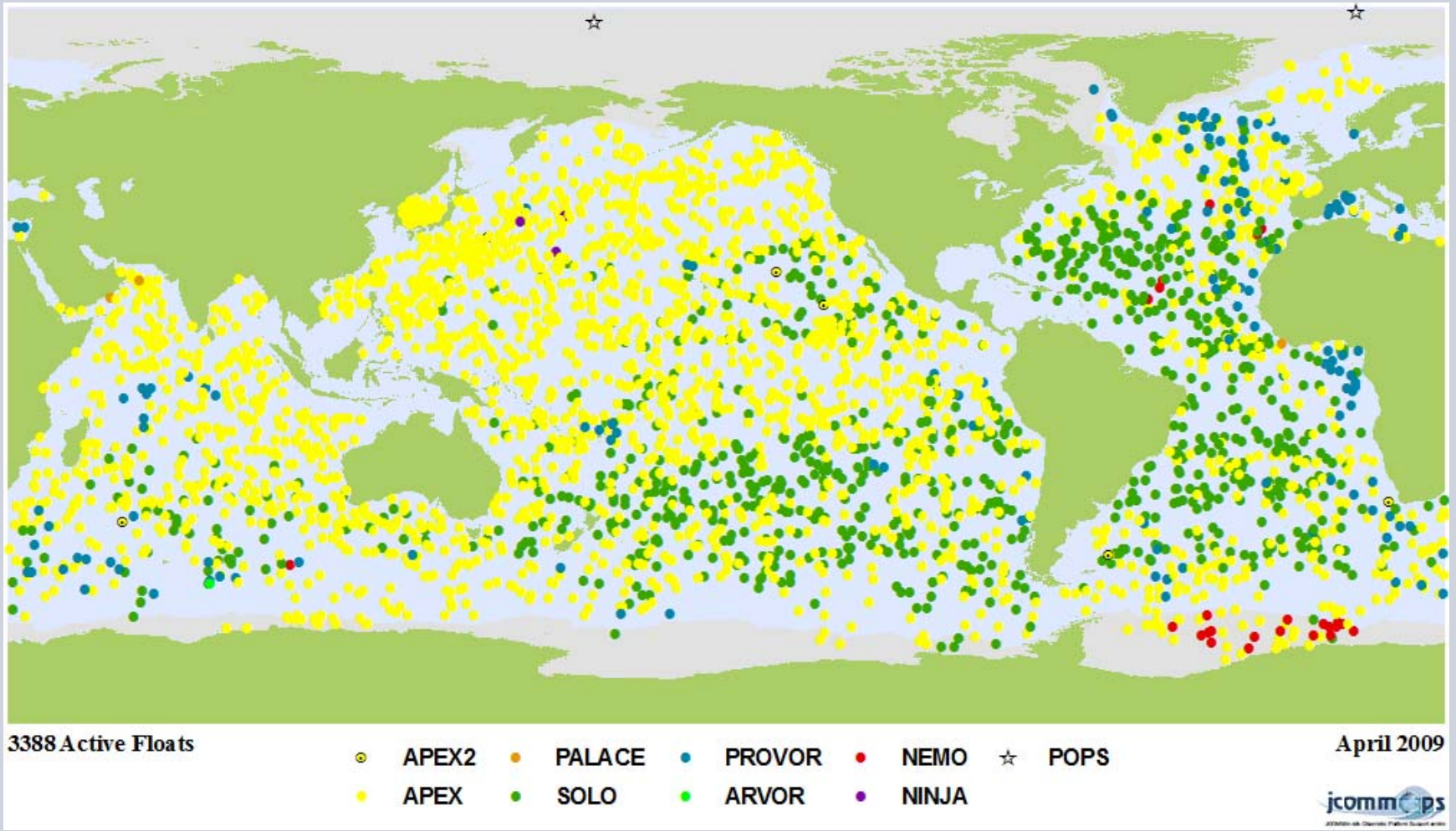
At present ~150 Argo floats carry dissolved oxygen sensors.
First floats are providing **SST** (at no cost). This is likely to be extended to all floats.

Technology: Telecommunication Systems



~8% of deployments with Iridium (2007, 2008) – Argos 3 pilot projects started
More are anticipated in 2009 (Australia)

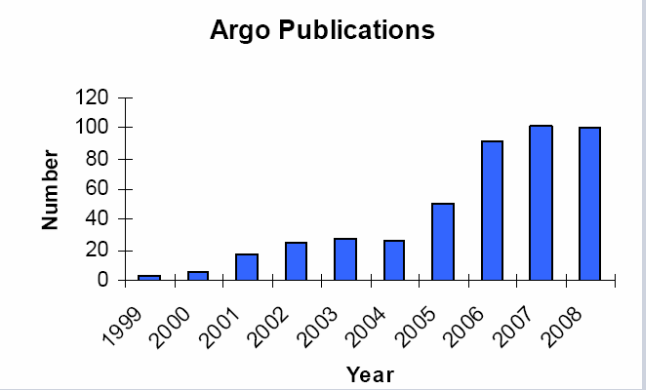
Technology: Float Models

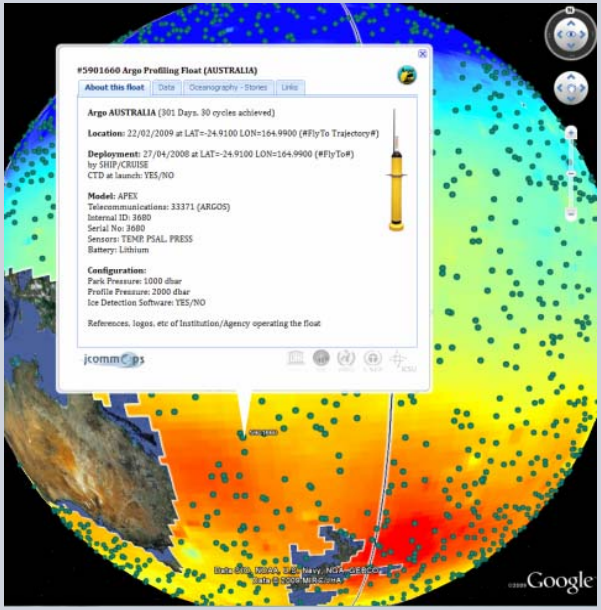


Argo – Benefits

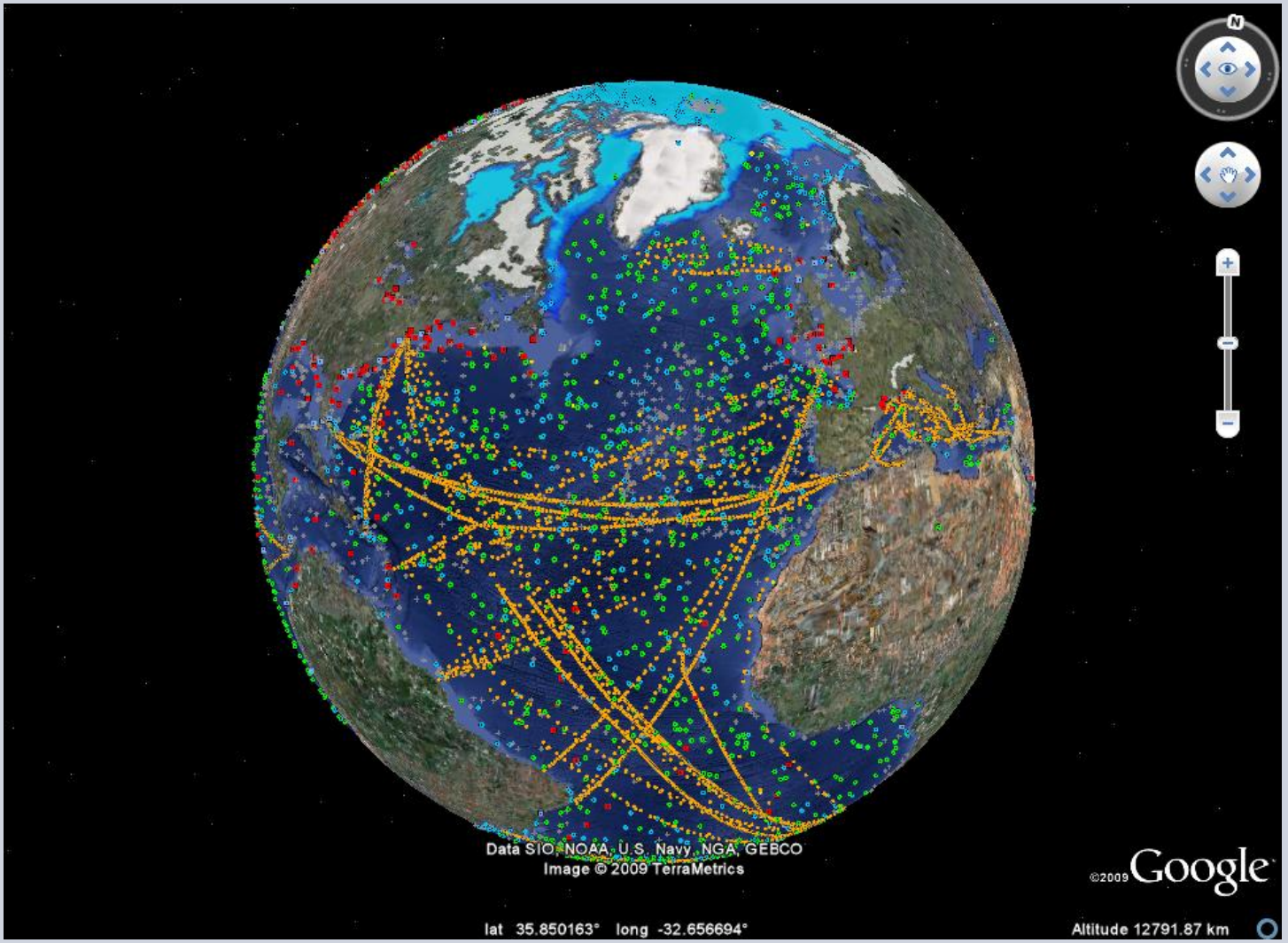
- Operational use: requirements for long term
- Research application growing
- Training Workshops
  Capacity building initiatives on data use
- Educational initiatives
- Google Ocean & Argo partnership

  network status (gateway)
  products (T, S, anomalies)
  stories by oceanographers
  climate change focus
- To be extended to other networks monitored by JCOMMOPS.

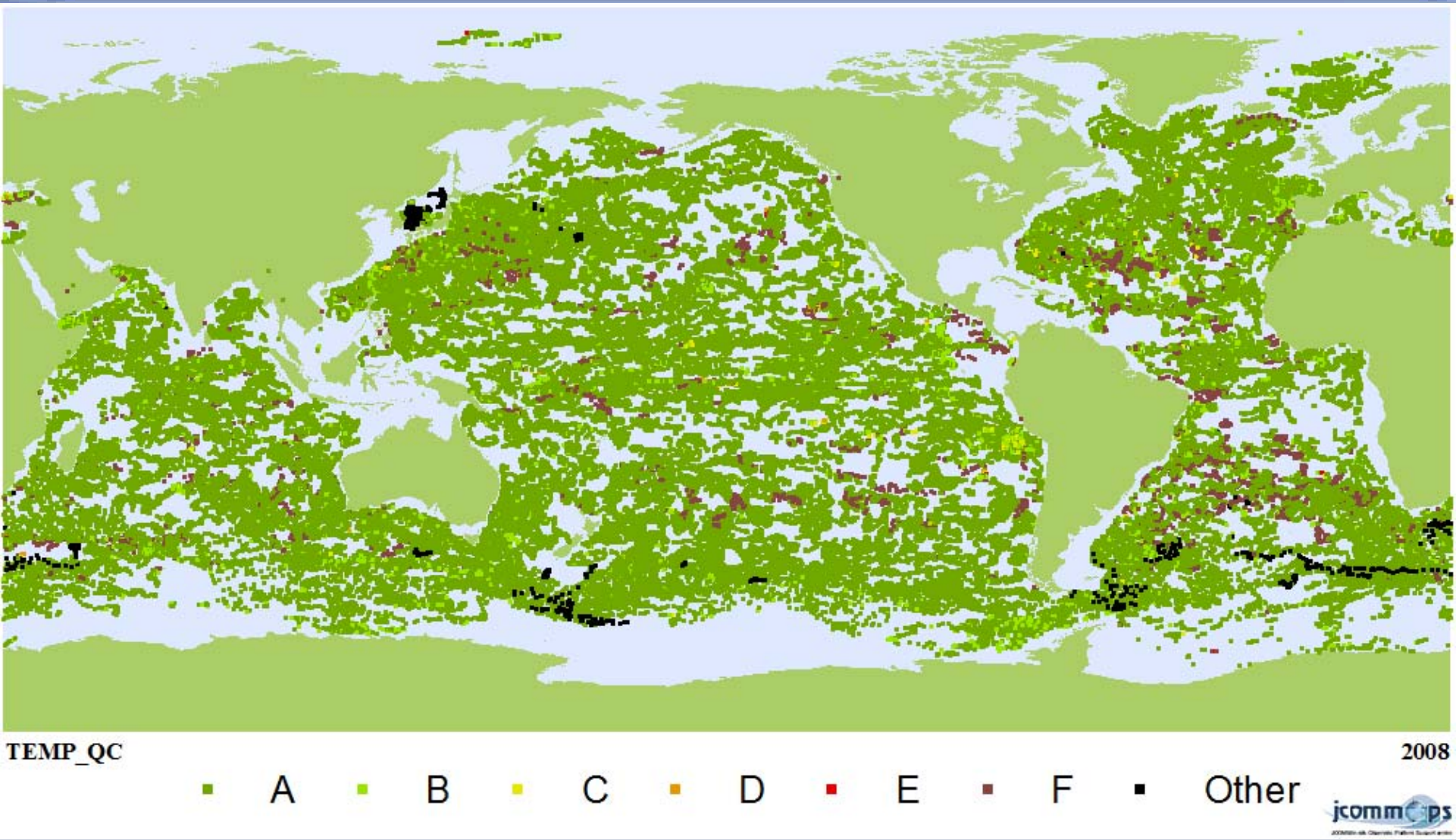




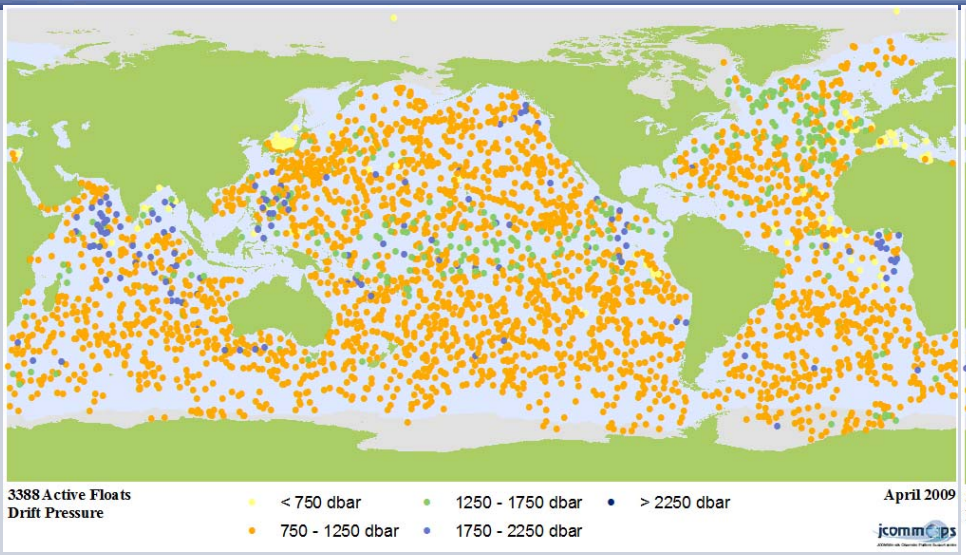
Argo & GO

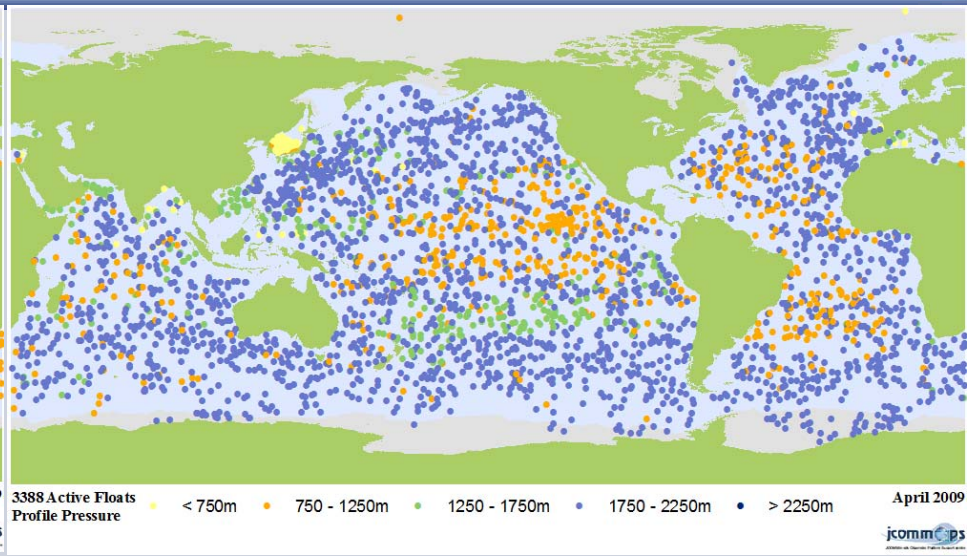

Data SIO, NOAA, U.S. Navy, NGA, GEBCO
Image © 2009 TerraMetrics
©2009 Google
lat 35.850163° long -32.656694°
Altitude 12791.87 km

#Profiles (2008)



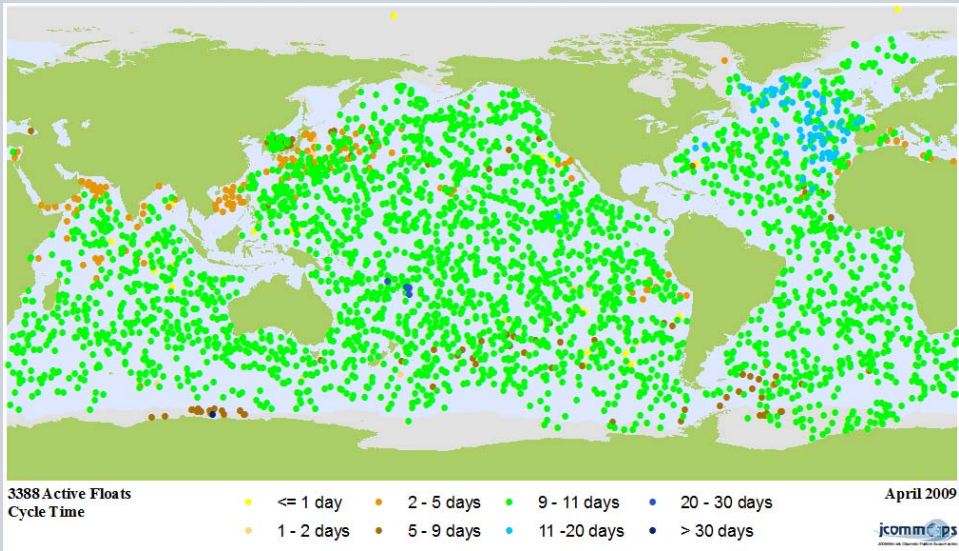
Float Cycles





80% of the fleet is drifting at 1000 dbar as decided by the AST
70 % is profiling at a depth > 1500 dbar
80 % is cycling on a 9-11 days basis

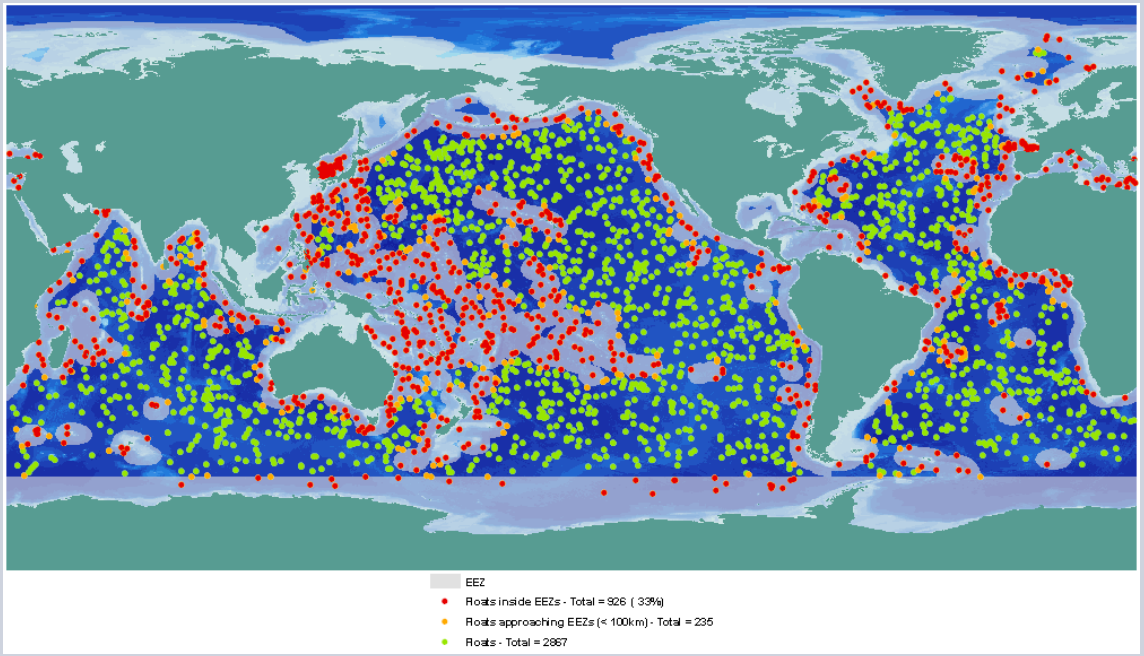
Extend instrument capabilities to profile everywhere at 2000dbar



30% of the fleet is operating in EEZs

IOC Res. XX-6.: *"(…) notify to Member States of all floats which might drift into some EEZs (…)"*

IOC Res. XLI-4 adopted in June 2008, recognized Argo as a "programme" to be sustained, acknowledged the work of the AIC within JCOMMOPS



⇒*Transparency & **Cooperation** required*

⇒*Argo Donor Programmes (promoted and coordinated by the AIC)*
⇒*Training Workshops (West Africa, Pacific Islands)*

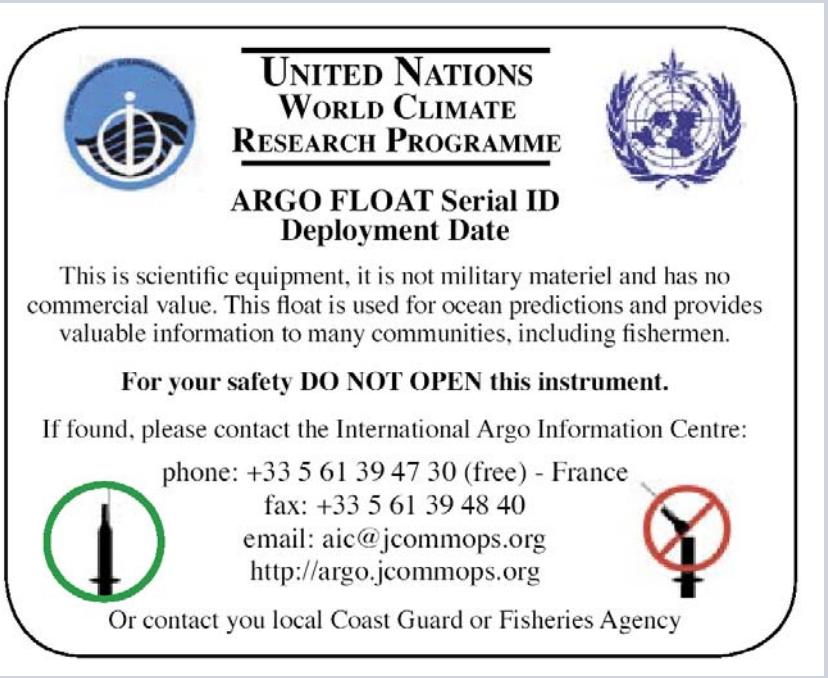
Floats Retrieval

- 1.5% are Beached or trapped in fishermen nets
  (15% in Marginal Seas)

- Redeployed

or

- Secured
- Shipped back / Recycled



Argo – SOT/SOOP

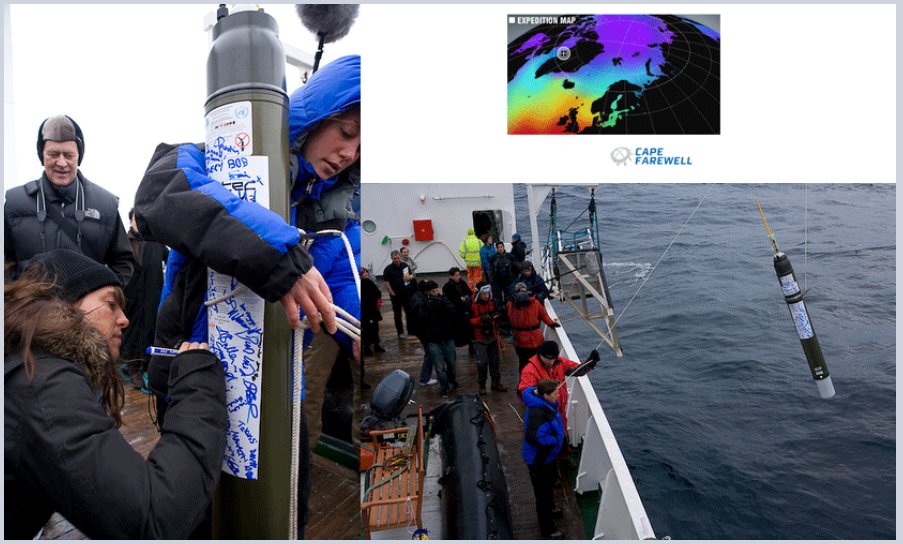
- Common TC to encourage cooperation
  - Remark: SOT TC funding issue to be resolved
- Logistics: SOT/SOOP ships to deploy floats
  - already the case in the Atlantic
  - To be developed in other basins
  - This will need some planning information from SOT
  - JCOMMOPS will help
- Data systems (common netCDF format for subT data, common QC procedures)
- Integrated monitoring tools (by variable)
  - To be developed with JCOMM OCG / JCOMMOPS
- Common Training Workshops/ Donor Programmes (next: Gabon)

Argo - Objectives

Objectives for the Argo Program in the coming years related to array performance are:

- Achieve mean float lifetimes of 4 years or longer, needed to sustain the core Argo array with 800 floats deployed per year.
- Deploy more floats in the southern hemisphere to achieve the array's design requirements.
- Extend instrument capabilities for profiling to 2000 m everywhere in the oceans.
- Sustain funding (Argo is 20% underfunded)

Thank you …



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