



Argo Information Centre
jcommops



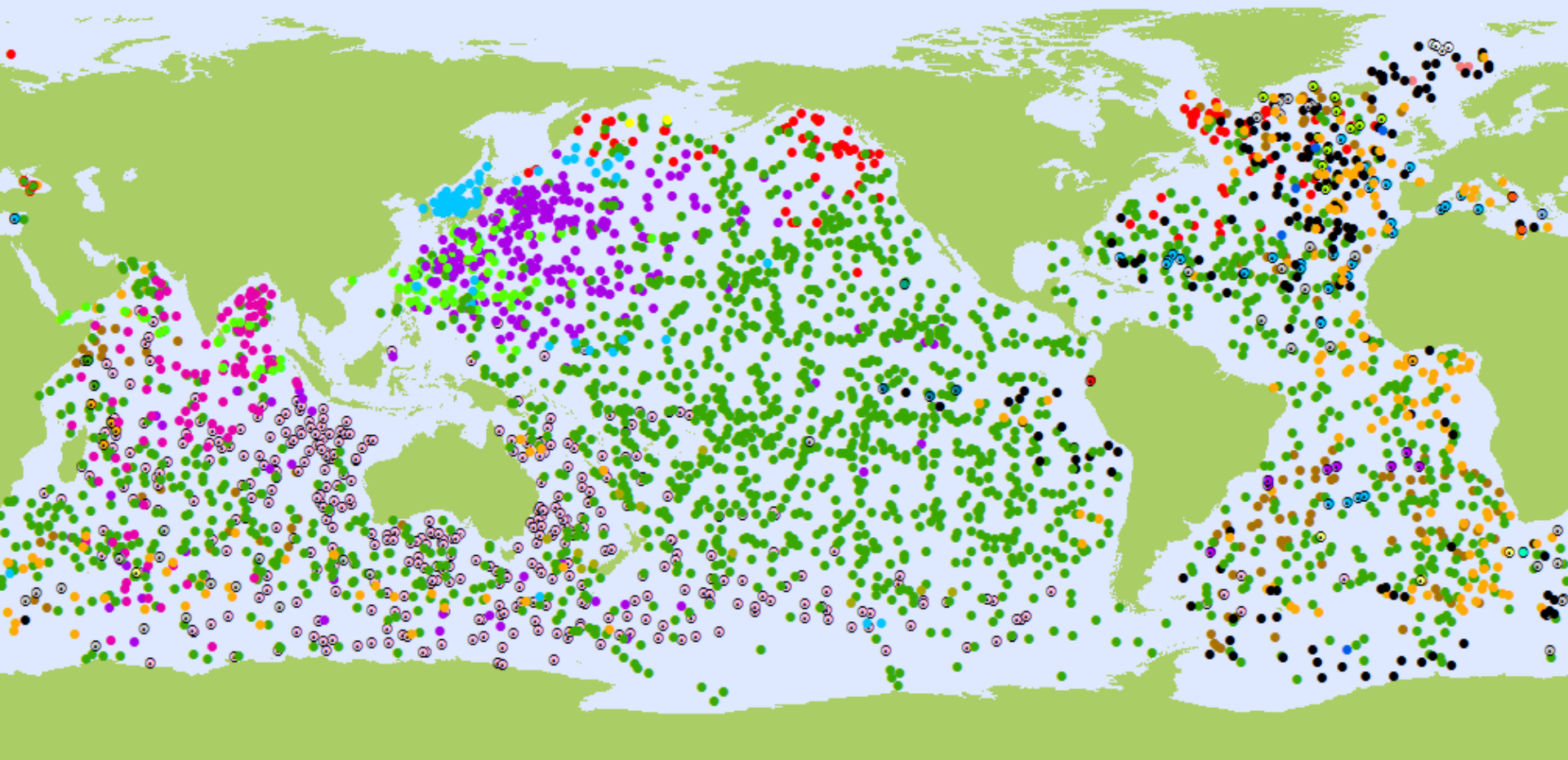
Argo Status

Argo TC

AST#13

March 2012, Paris

Argo has been sustaining a 3000 floats array for 4 years
and is starting improving it...



3500 Active Floats

February 2012

ARGENTINA (4)	CHILE (1)	FRANCE (196)	IRELAND (11)	MAURITIUS (4)	RUSSIAN FEDERATION (2)
AUSTRALIA (385)	CHINA (85)	GABON (1)	ITALY (2)	MEXICO (1)	SOUTH AFRICA (1)
BRAZIL (8)	ECUADOR (3)	GERMANY (176)	JAPAN (269)	NETHERLANDS (37)	SPAIN (32)
BULGARIA (3)	EUROPEAN UNION (6)	GREECE (1)	KENYA (3)	NEW ZEALAND (11)	UNITED KINGDOM (126)
CANADA (98)	FINLAND (4)	INDIA (100)	SOUTH KOREA (79)	NORWAY (3)	UNITED STATES (1848)



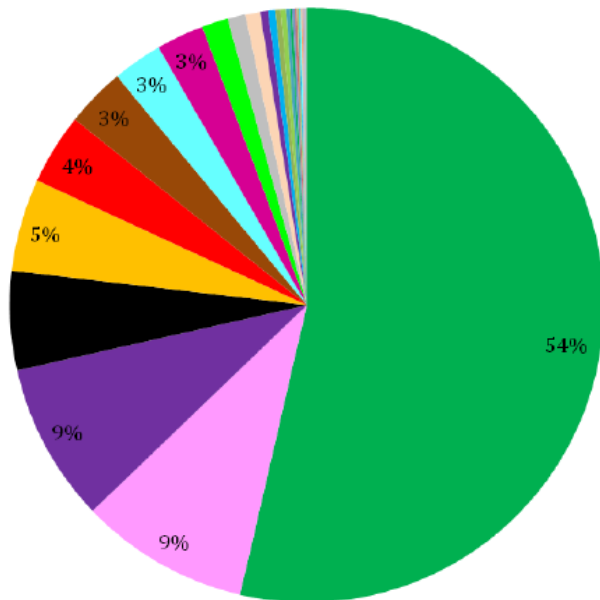
12 nations maintain the global array and 20 more fill regional gaps
18 countries active in 2011 (16 inactive)

However more international cooperation is required!

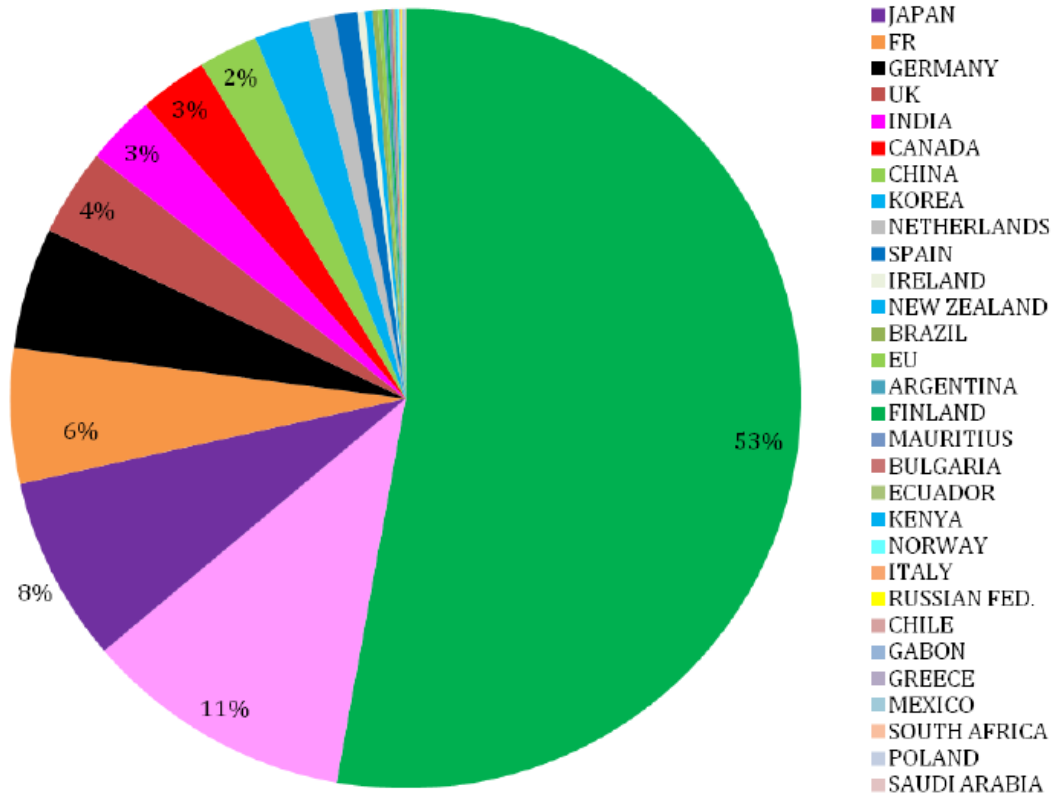


Argo National Contributions (active floats)

March 2011



Argo National Contributions (active floats), March 2012



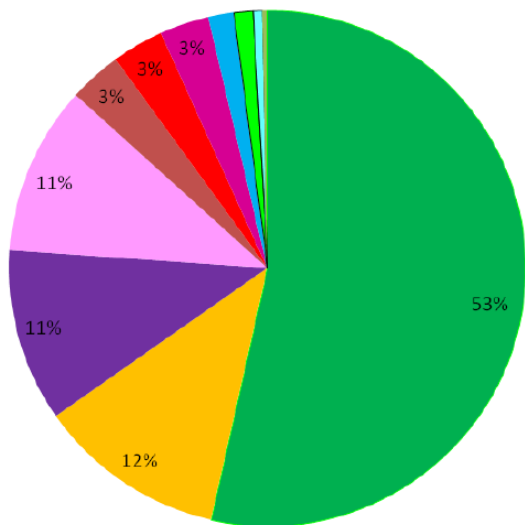
50+% maintained by the USA ...
Growing involvement of Europe is crucial
We need further South American countries participation

Argo should be promoted further in Russia, Mexico, Indonesia, Turkey, Taiwan ...
All these countries have already cooperated.

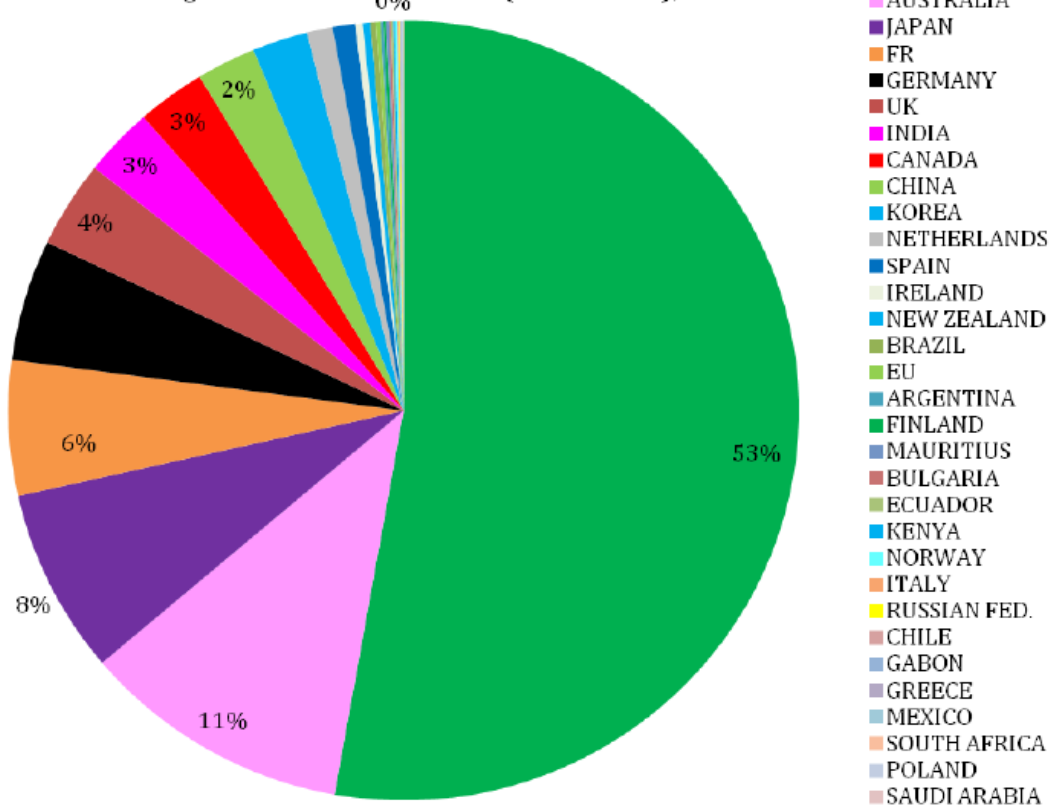
However more international cooperation is required!



Argo Profiles assembled by DACs,
2011



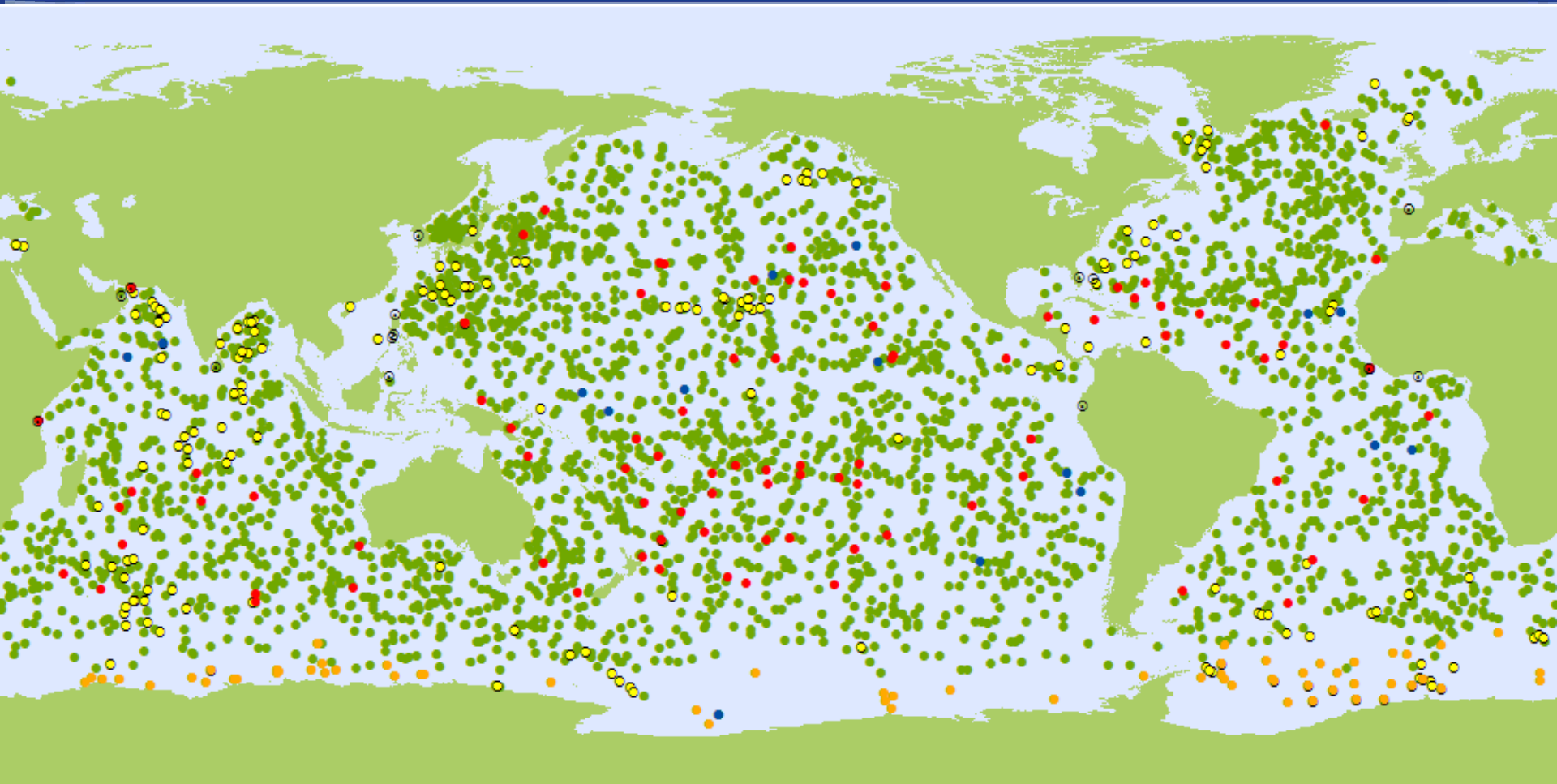
Argo National Contributions (active floats), March 2012



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Argo should be promoted further in Russia, Mexico, Indonesia, Turkey, Taiwan ...
All these countries have already cooperated.

3200 floats are operating well ... 300 have some issues.



3500 Active Floats

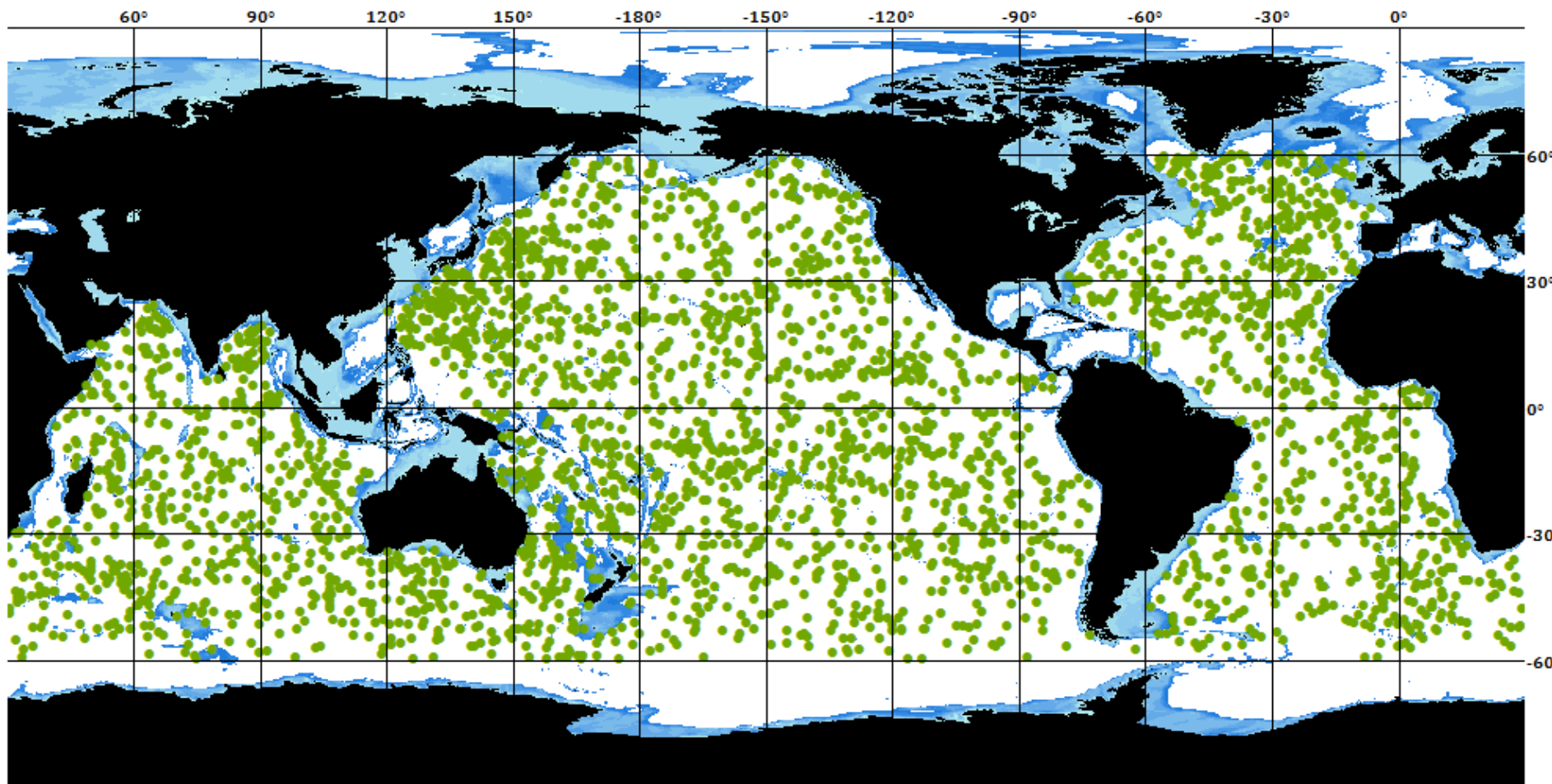
- Beached Floats (16)
- Flagged -Altimetry QC (31)
- No Data (171)
- Grey List(88)
- IcedOver (64)
- "Operational" (3245)

February 2012



Some floats are not sending good data
Some are beached or probably “blocked” under the seasonal ice
Some are bumping each others in marginal seas ...

Argo is approaching the very strict initial target.



Argo Core Mission

60°N - 60°S, no marginal sea, data available, no greylist, no beaching

February 2012

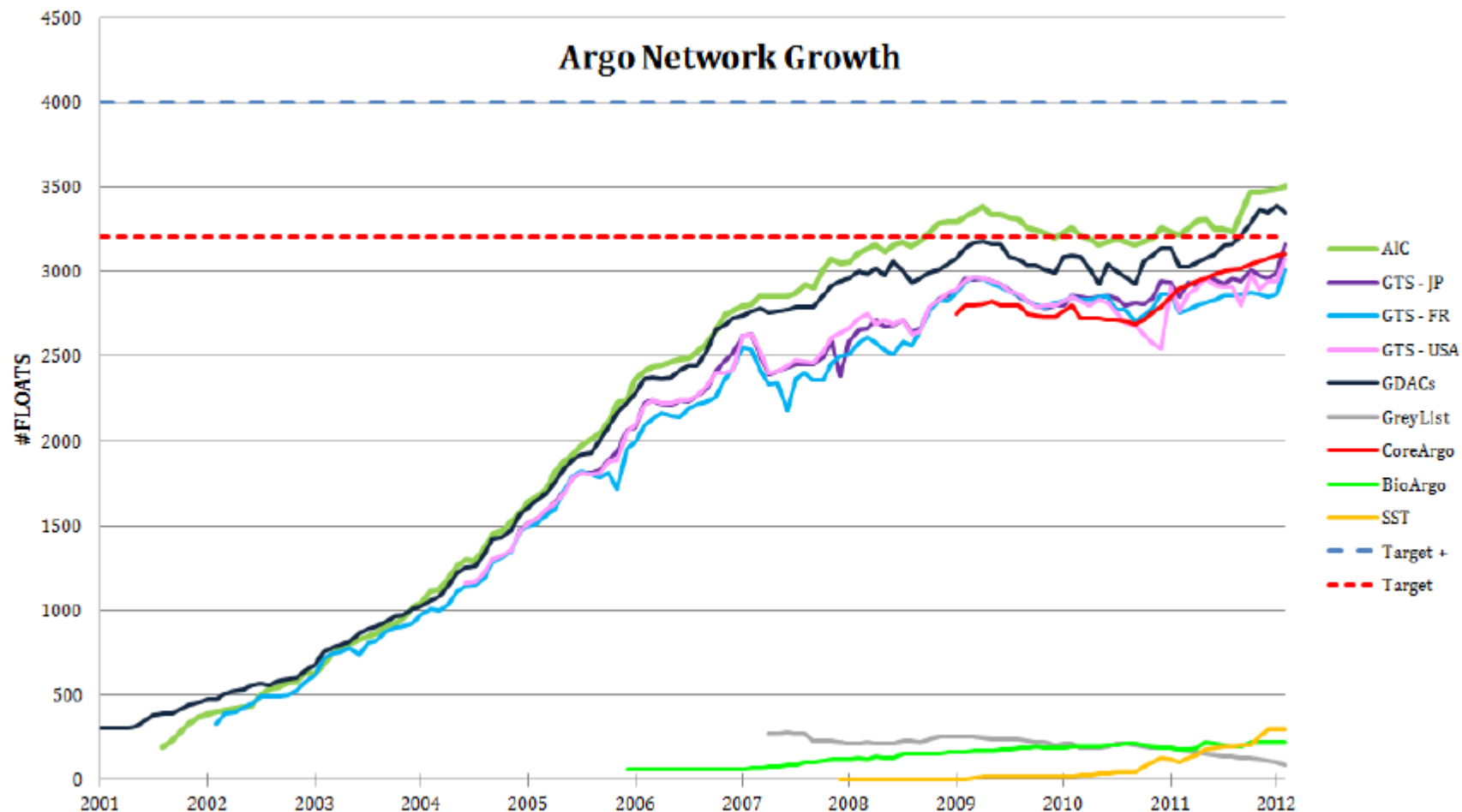
Target 3200

Operational 3106



97% of the array is fulfilling the original AST design (improving, with 90% last year)⁶

After a drop in 2009/2010, Argo was back to its target in 2011
we can be very optimistic for 2012

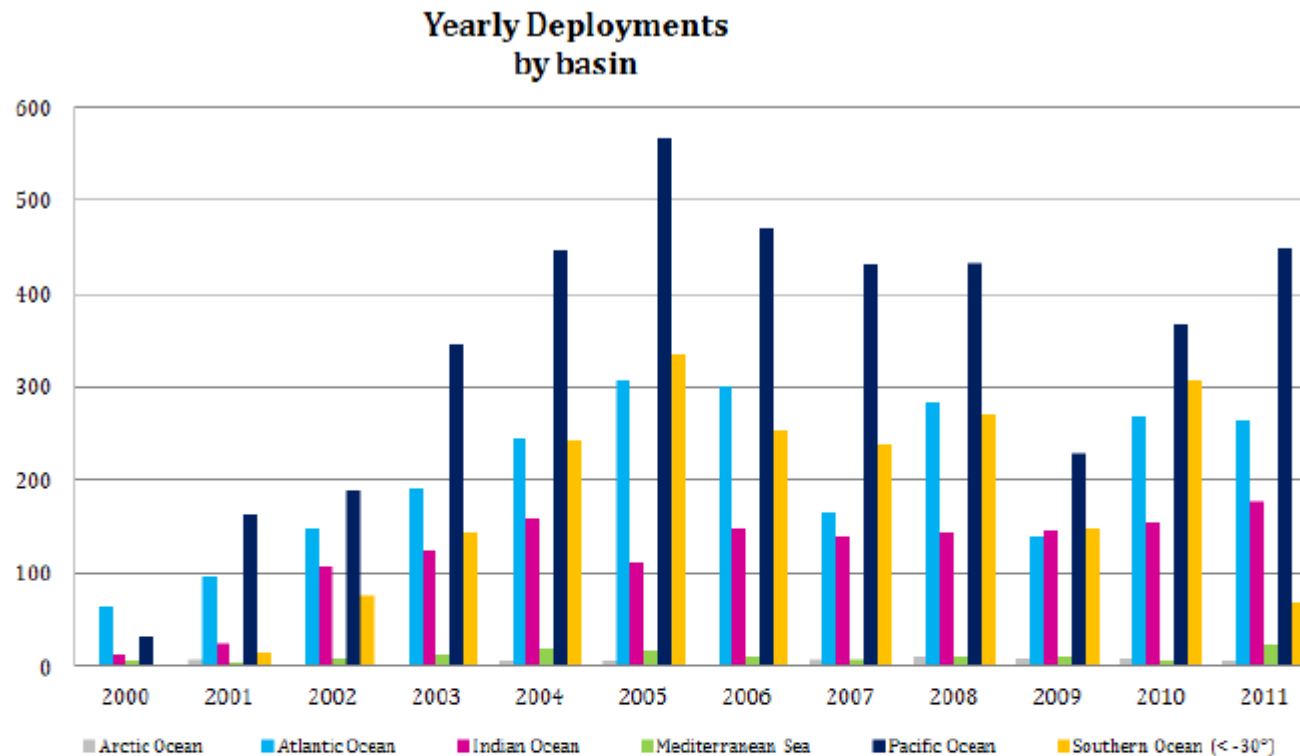


Time to expand from “Core Argo” to “Global Argo” ?
What would be the number for a “Global Argo” $3^\circ \times 3^\circ$?

⇒ ACTION

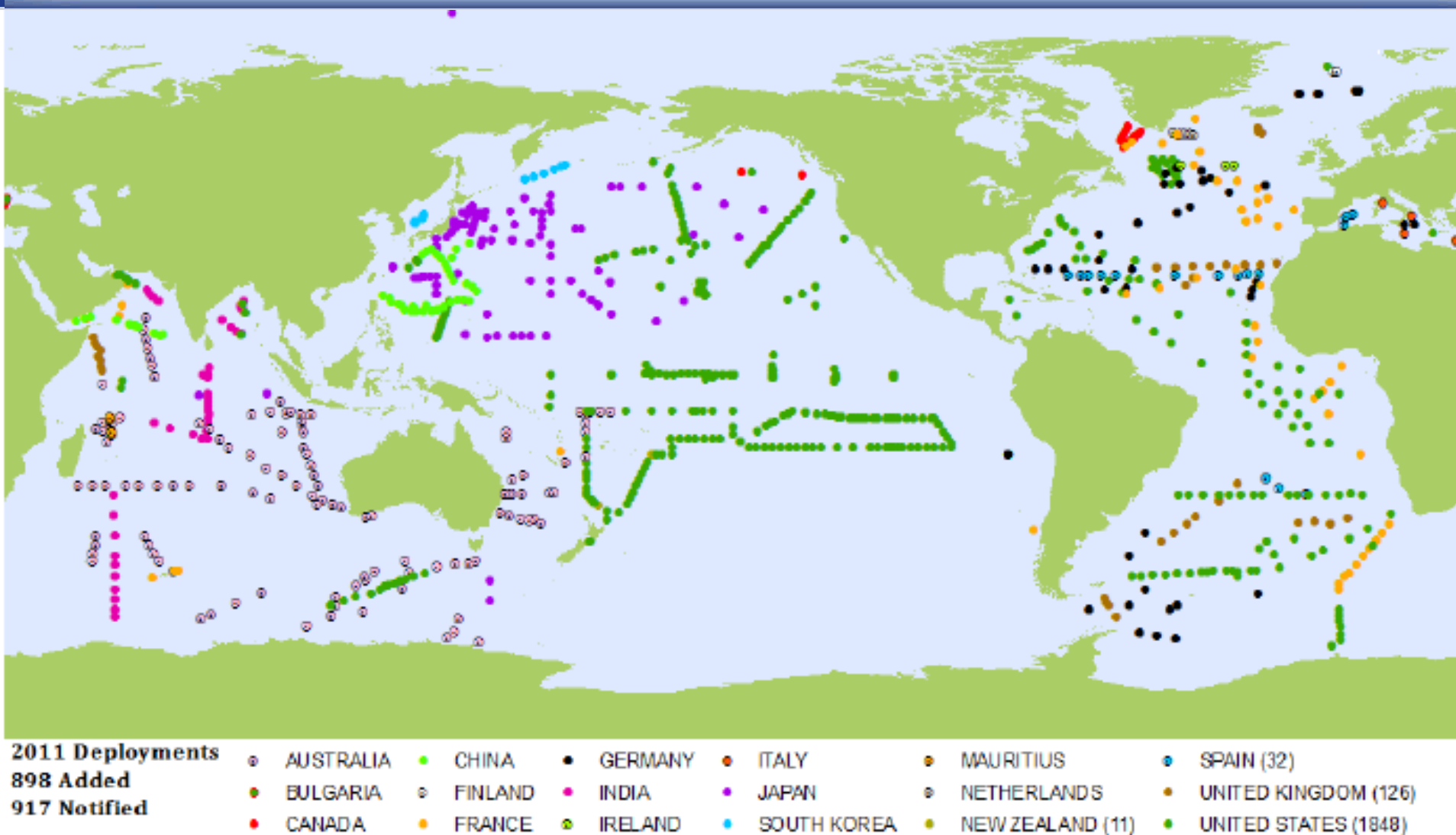
⇒ New global index ? Regional indexes ?

But there is still the 2009 deployments deficit to address It may require a couple more years Warning in the SO ?

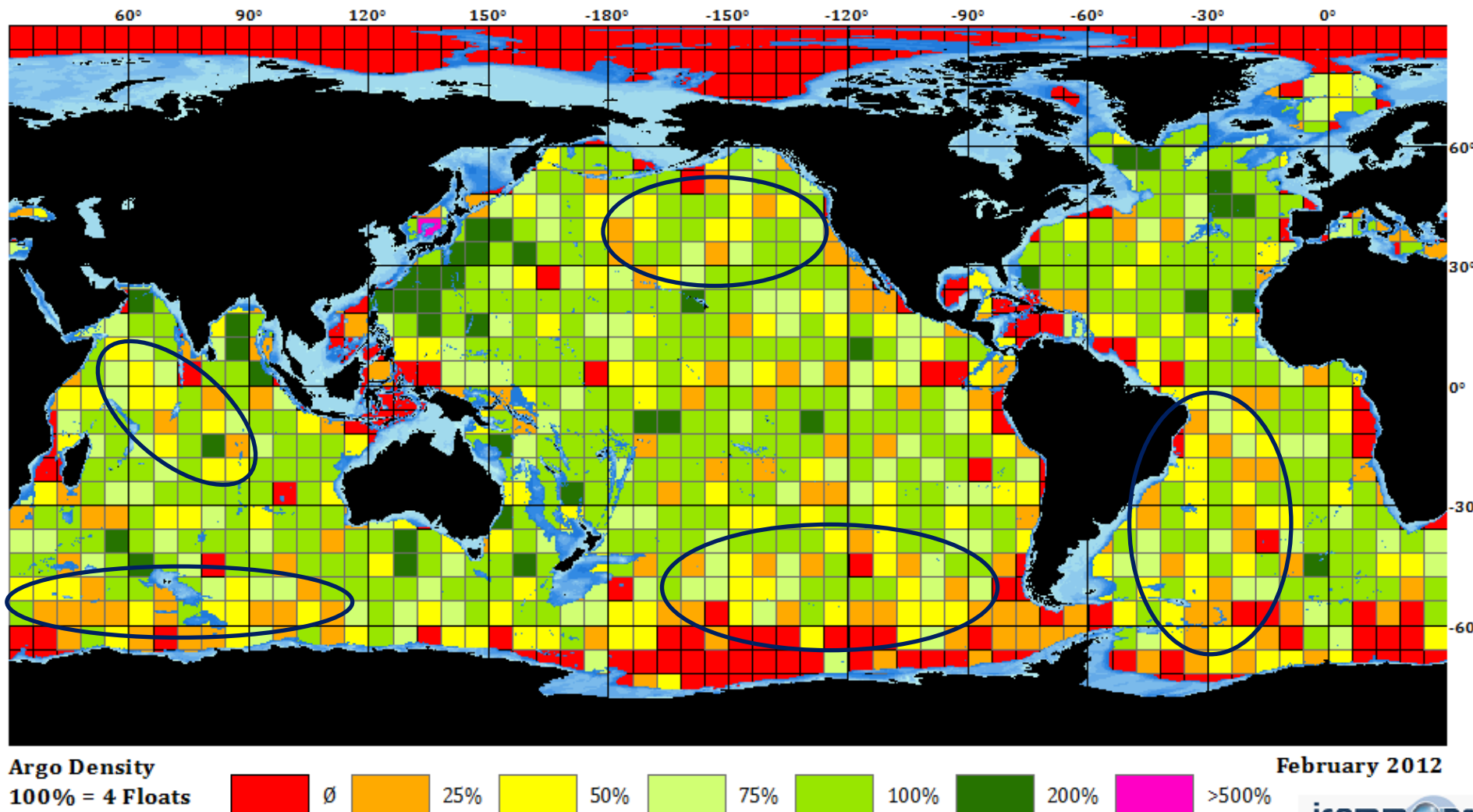


BASIN	2004	2005	2006	2007	2008	2009	2010	2011
Arctic Ocean	5	5	1	8	12	10	10	5
Atlantic Ocean	243	307	301	165	284	139	269	265
Indian Ocean	158	113	149	139	144	147	155	177
Mediterranean Sea	18	17	12	7	11	11	5	23
Pacific Ocean	446	566	470	431	432	228	368	447
Southern Ocean (< -30°)	242	336	254	239	270	148	306	69
Total	870	1008	933	750	883	535	807	917

Challenge in logistics is still impressing

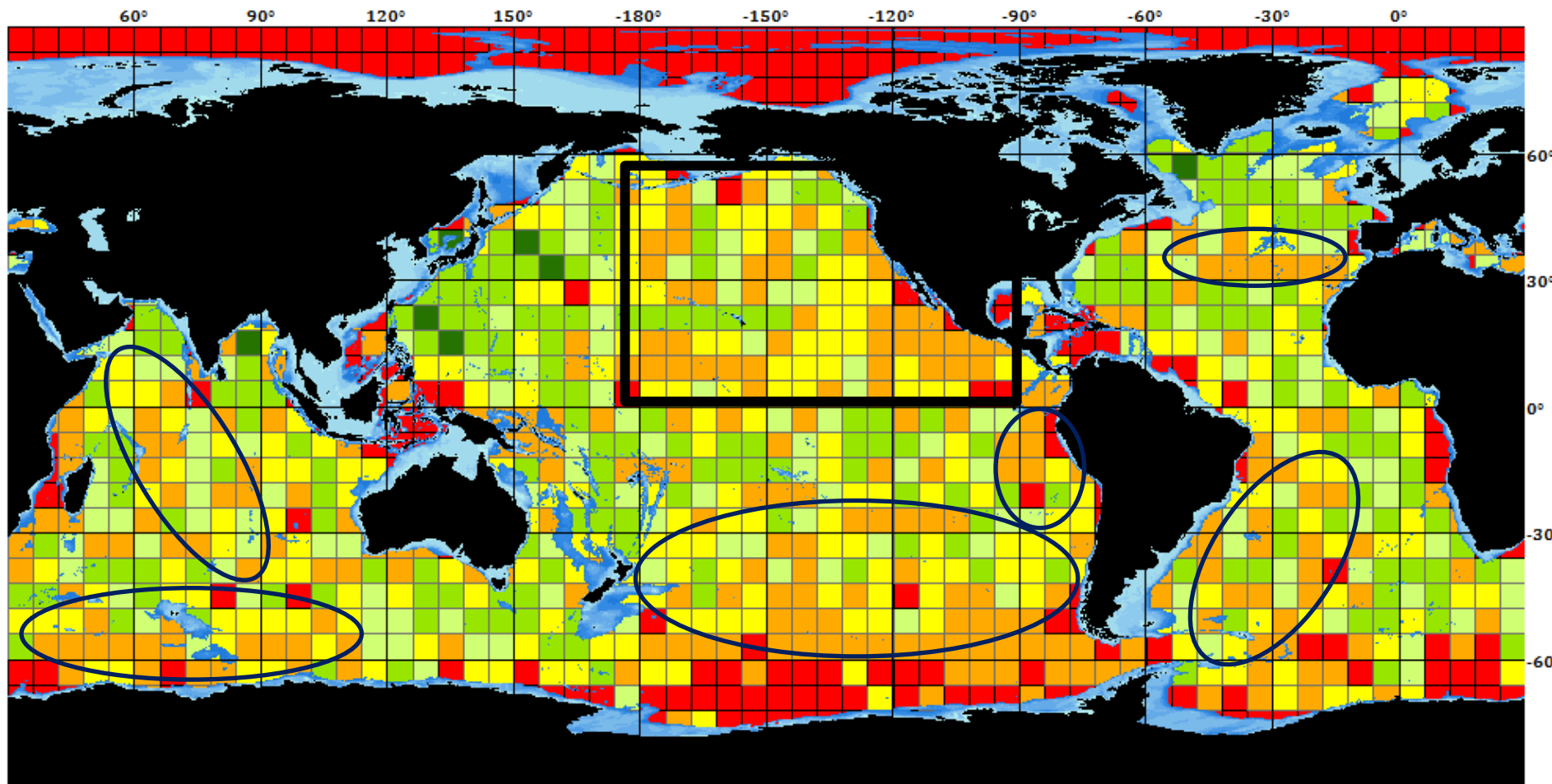


How optimize the network coverage now ?

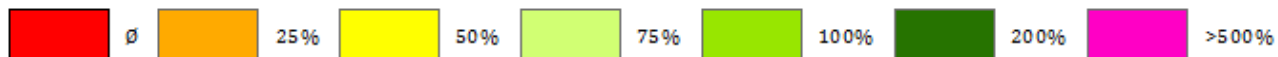


A large part of the Pacific Ocean will need to be covered within a couple of years as well as the W Atlantic and NE/W Indian and SO

... and tomorrow ?



Argo Density $\Sigma(1-p)^*$
100% = 4 (new) Floats

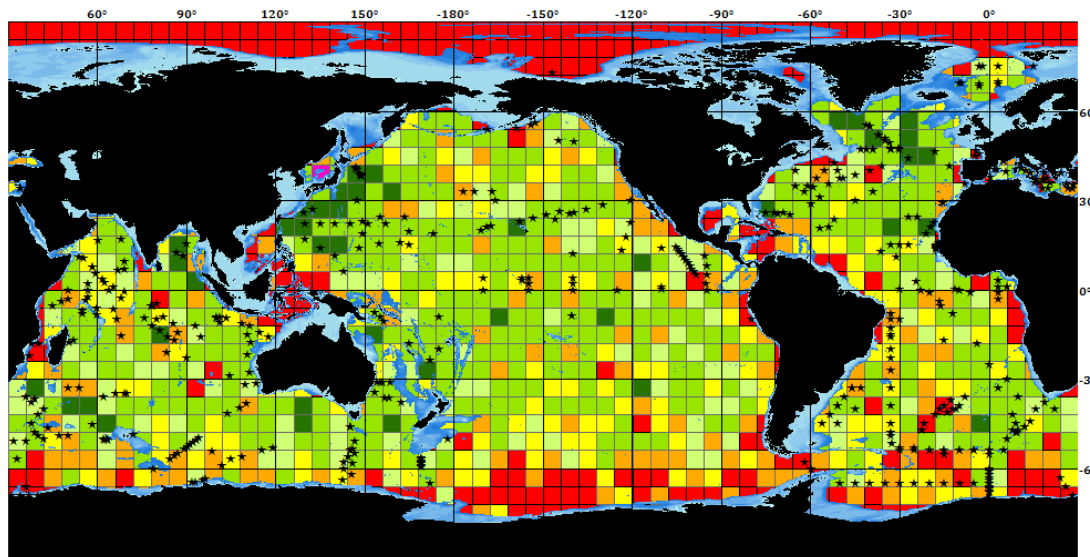


* p = float probability to die

February 2012

jcommops
JCOMM In-situ Observing Platform Support centre

How the Argo teams are going to fill the gaps ?

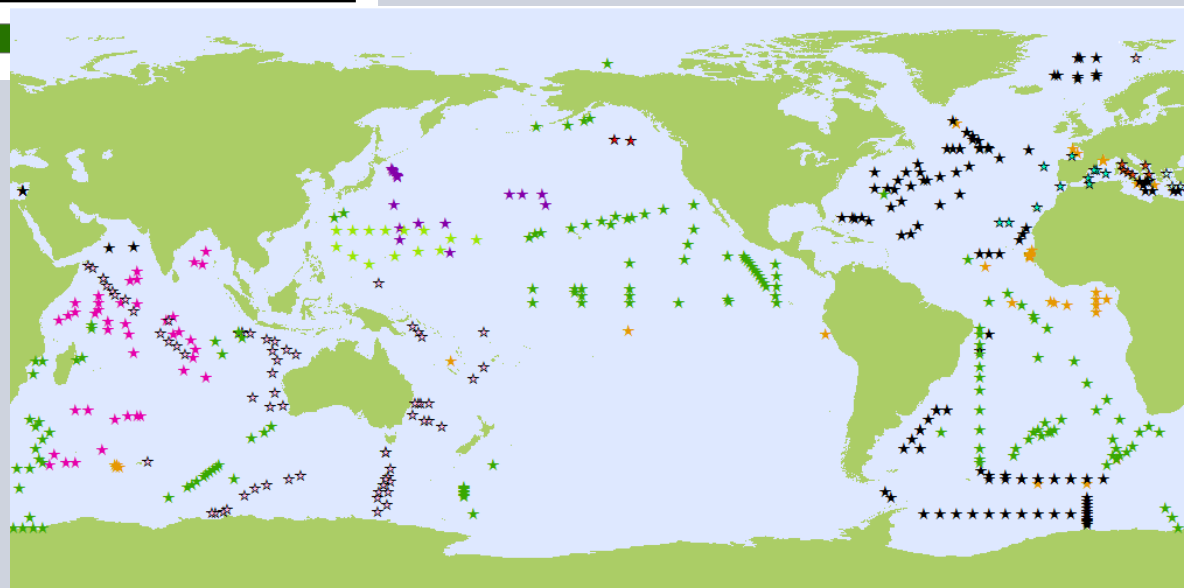


What part of your yearly stock do you allocate to fill global gaps, beyond research regional expertise or areas of national interest ?

It works pretty well as it ...
more commitments to the “Global Argo” could help

Refine density indexes for a
micro planning management
might help

AIC will help (see dep. Opp.)



Planning (485)

★ AUSTRALIA (67)	★ FRANCE (39)	★ INDIA (41)	★ POLAND (1)
★ CANADA (2)	★ GERMANY (124)	★ ITALY (8)	★ SPAIN (11)
★ CHINA (14)	★ GREECE (4)	★ JAPAN (17)	★ UNITED STATES (157)

February 2012

Planning

- Room for improvement and rationalization

- **Deal:**

- AIC develop metafiles loaders (**US meta**, netCDF)

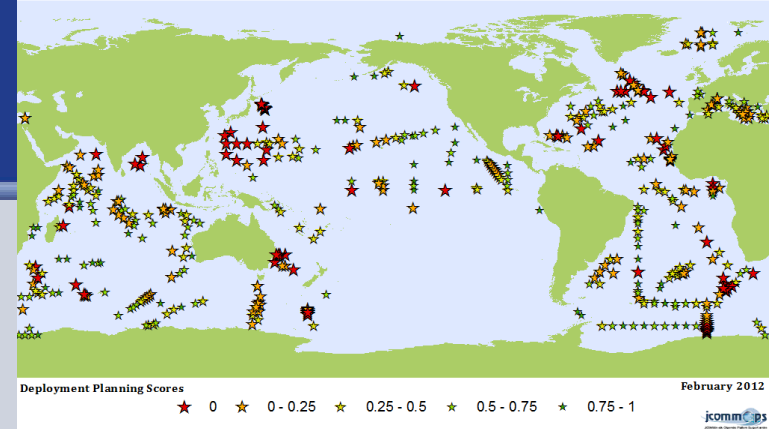
- ⇒no more manual notification

- Deployment Managers/PIs provide plans in advance by maintaining a file:

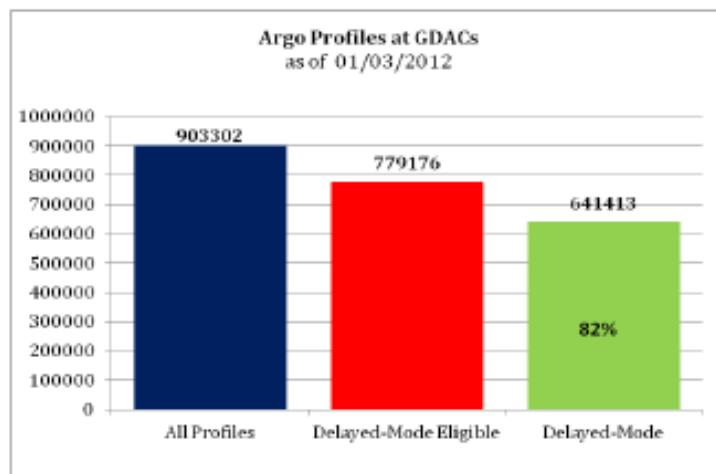
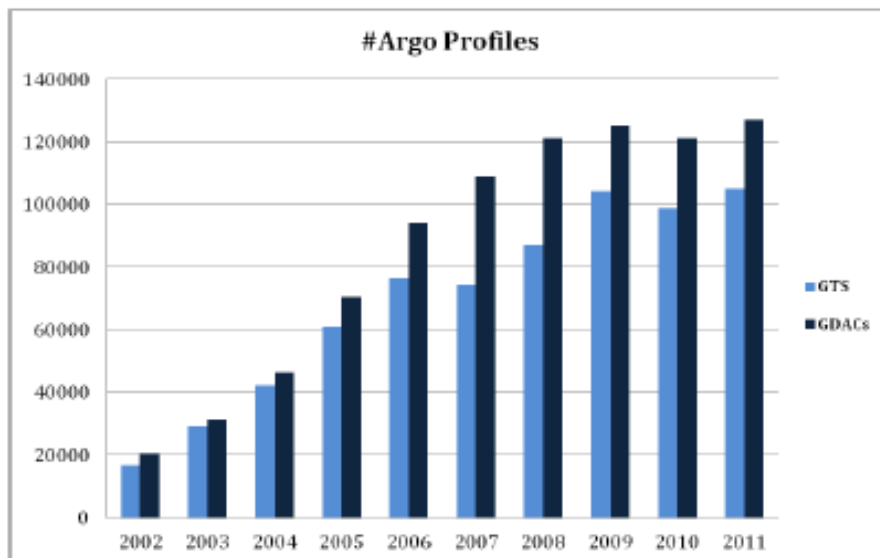
ANY-ID;LAT;LON;DATE;SHIP;CRUISE

- we are almost there

- Do not hesitate to put dots on the map!
- Future Information System: priorities “Float lifetime cycle” management
 - Auto controls for new floats
 - Planning management



Argo Data Stream: All profiles 1 000 000 profiles by the end of 2012 ...

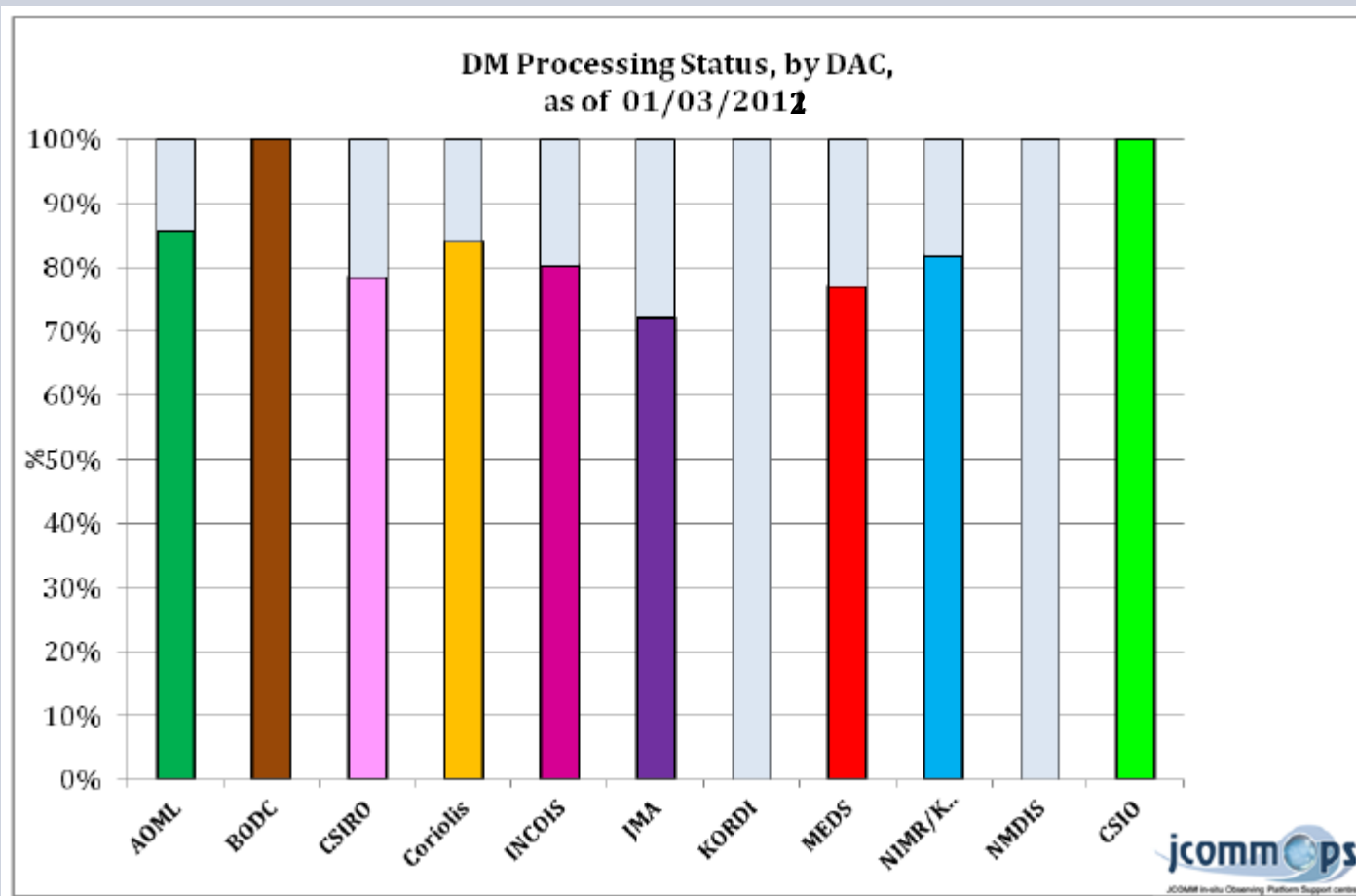


2011 Stats:

GDACs: 127042 profiles from 4098 distinct floats
GTS: 105233 profiles from 3801 distinct floats

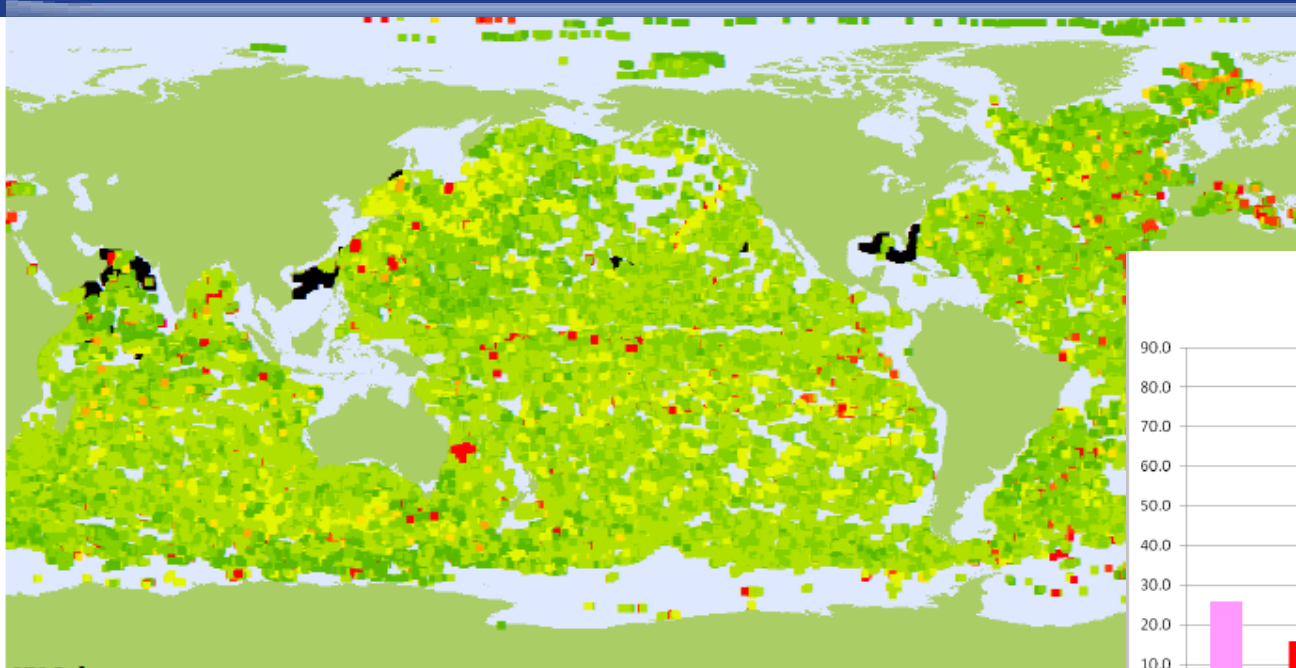
DM

03/2010: 76%
 03/2011: 83%
 03/2012: 82%



03/2010: 76% achieved
03/2011: 83%
03/2012: 82%

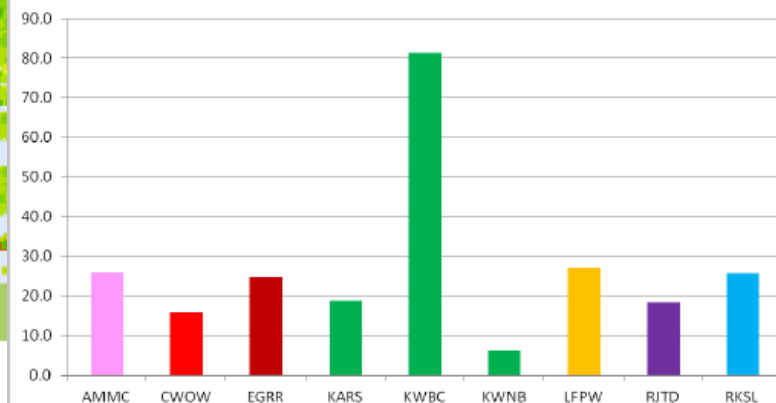
Delays: GTS distribution meets operational requirements



GTS Delays
 $\mu=22h$ $me=14h$
 86% reaches GTS within 24h
 105233 Obs.

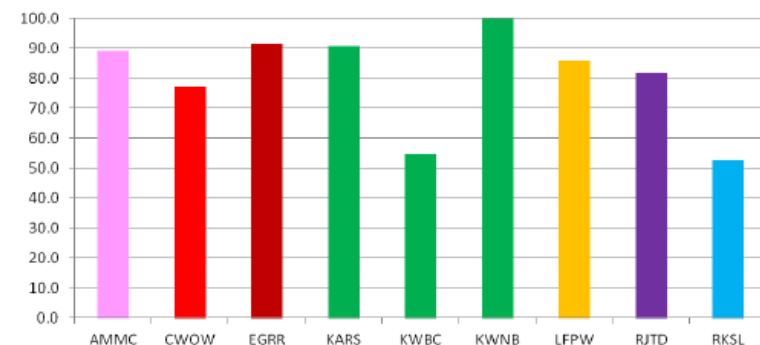
■ Errors	■ 7 - 12h	■ 25 - 48h	■ 73 - 96h	■ 121 - 240h
■ < 6h	■ 13 - 24h	■ 49 - 72h	■ 97 - 120h	■ > 240h

Average delays (hours) on GTS, by GTS Centre
2011

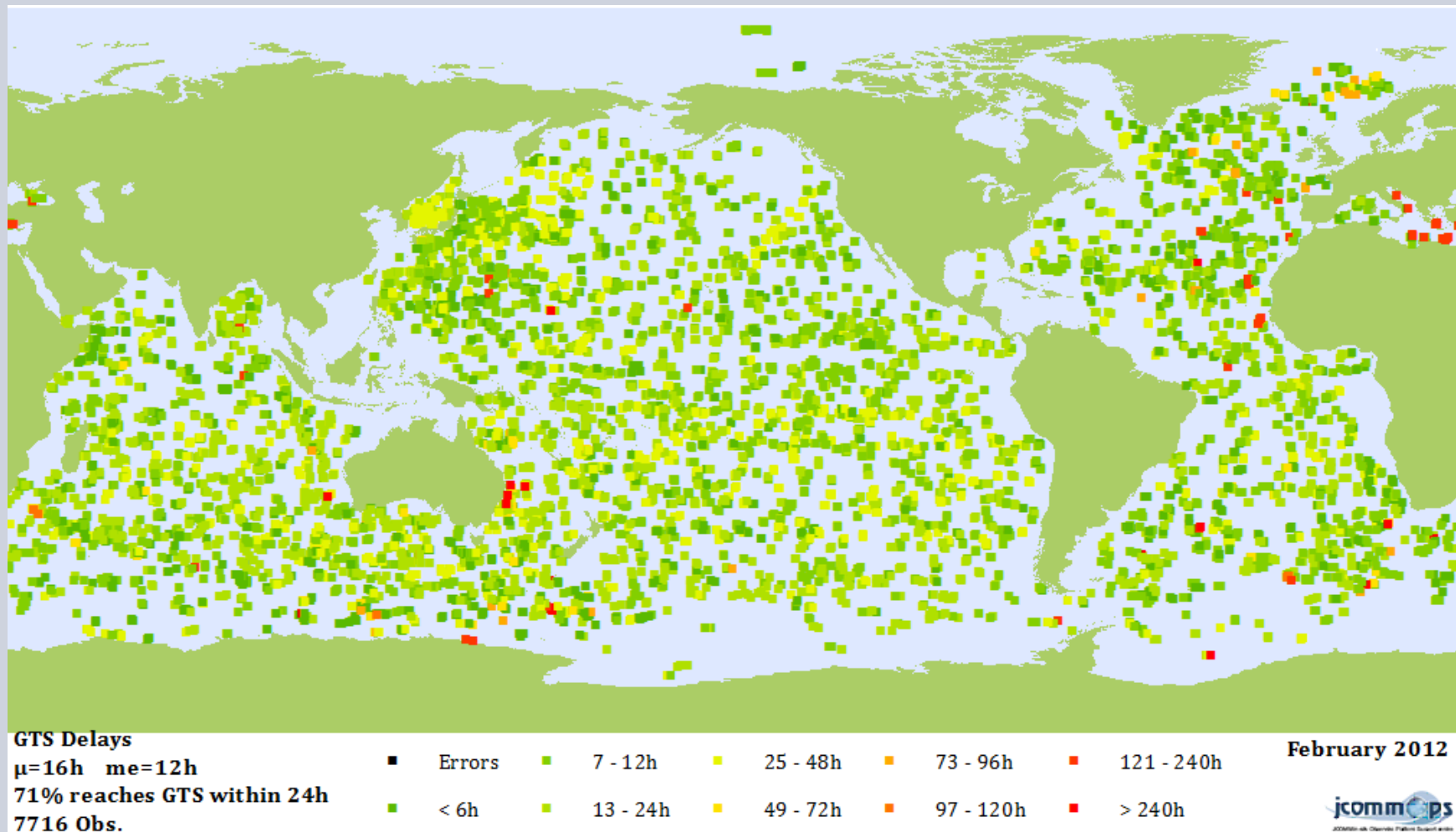


CCCC	DELAY (h)	% < 24h
AMMC	25.9	89.1
CWOW	16.0	77.4
EGRR	24.7	91.6
KARS	18.7	90.7
KWBC	81.3	54.9
KWNB	6.4	100
LFPW	27.1	58.9
RJTD	18.4	81.7
RKSL	25.7	52.7

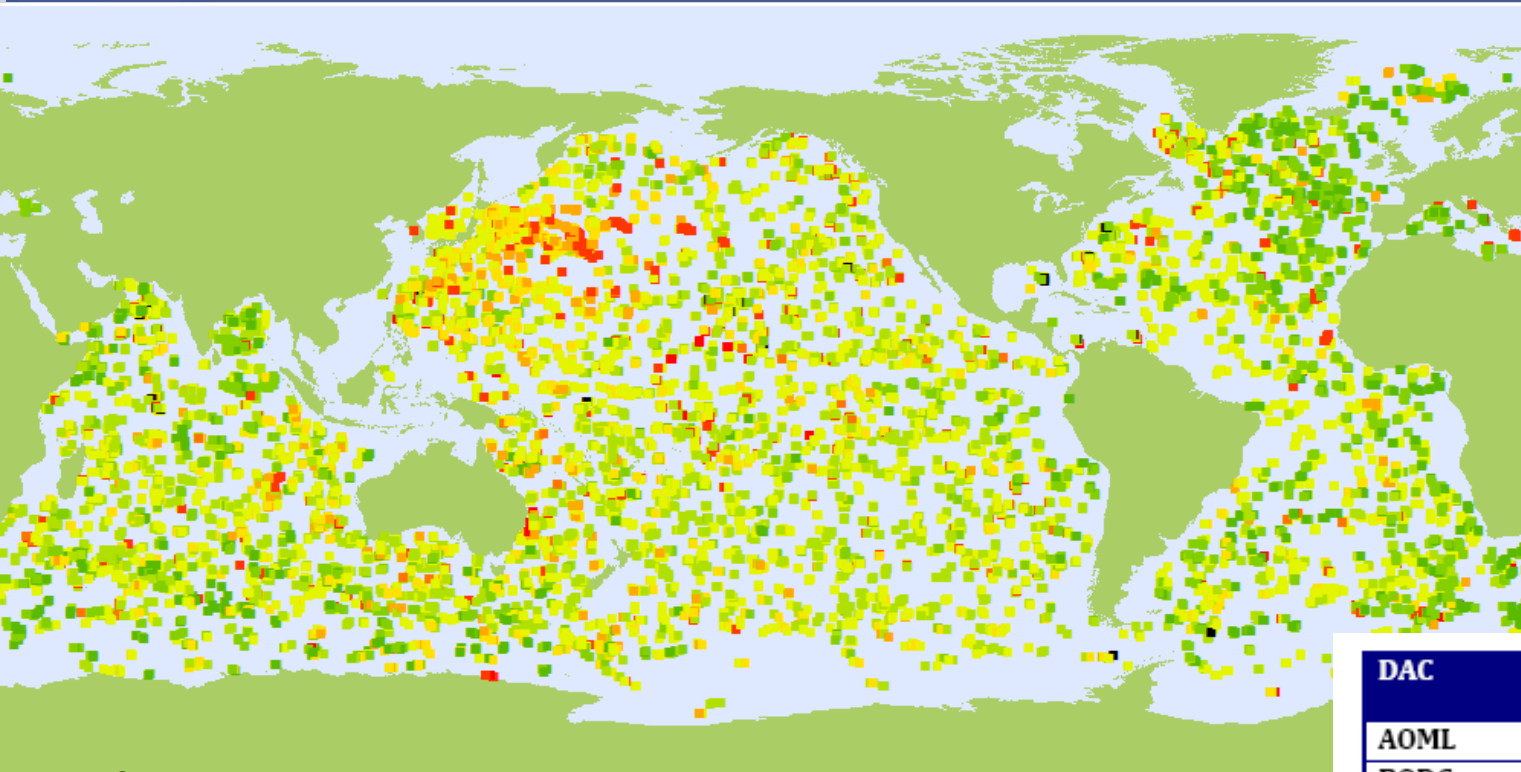
% profiles distributed within 24h on GTS, by GTS Centre
2011



Delays: GTS distribution meets operational requirements



Delays: GDACs distribution - some progress made ? (~80h in 03/2010) 30 - 40h today ...

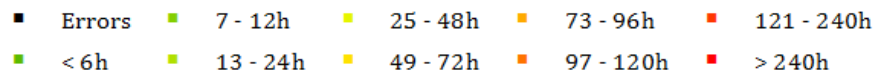


GDACs Delays

$\mu=37$ hours $me=26$

45% reaches GDACs within 24h

10197 Obs.



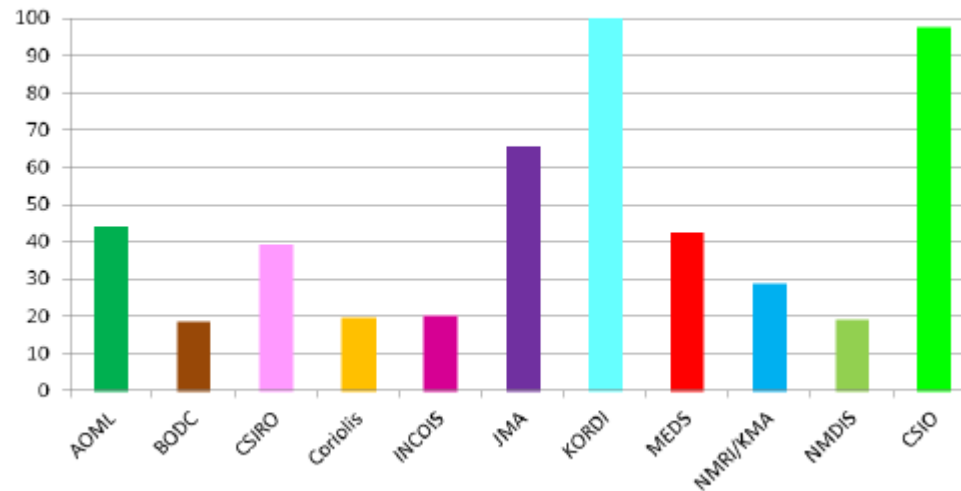
DAC	DELAY (h)	% < 24h
AOML	30.2	33
BODC	18.5	77.9
CSIRO	31.4	54.2
Coriolis	12.7	91.2
INCOIS	32.0	29.4
JMA	28.5	56.6
KORDI	86.9	0
MEDS	27.5	42.25
METRI/KMA	36.4	12.47
NMDIS	12.5	81.25
SIO-SOA	23.4	59.0

*Delays, by DAC, for 2011
(floats delay > 100h excluded)*

Delays: GDACs distribution - some progress to be made

GDACs synchro. add delays ?

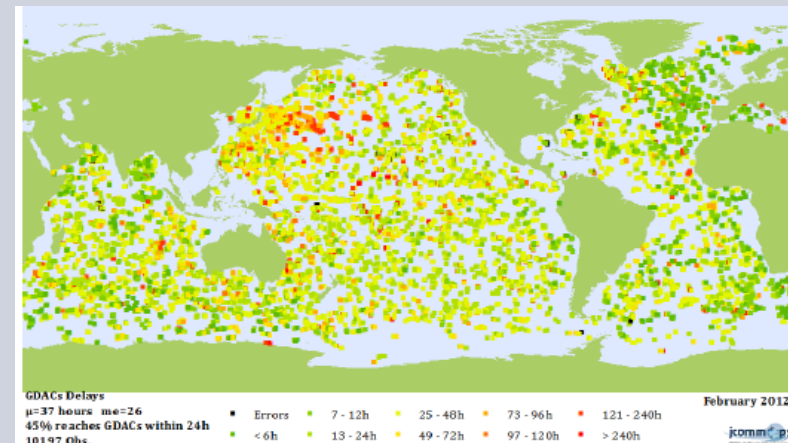
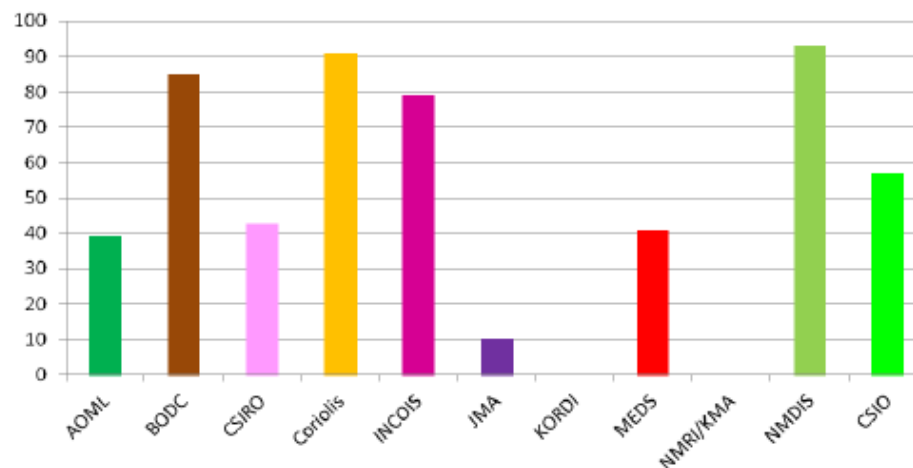
Delays at GDACs , by DAC
February 2012



DAC	DELAY (h)	%< 24h
AOML	44.0	39
BODC	18.4	85
CSIRO	39.2	42.6
Coriolis	19.6	91.1
INCOIS	20.0	79.0
JMA	65.7	10.11
KORDI	177.6	0
MEDS	42.3	41
NMRI/KMA	28.6	0
NMDIS	19.0	93
CSIO	97.4	56.8

Delays, by DAC, for Feb. 2012

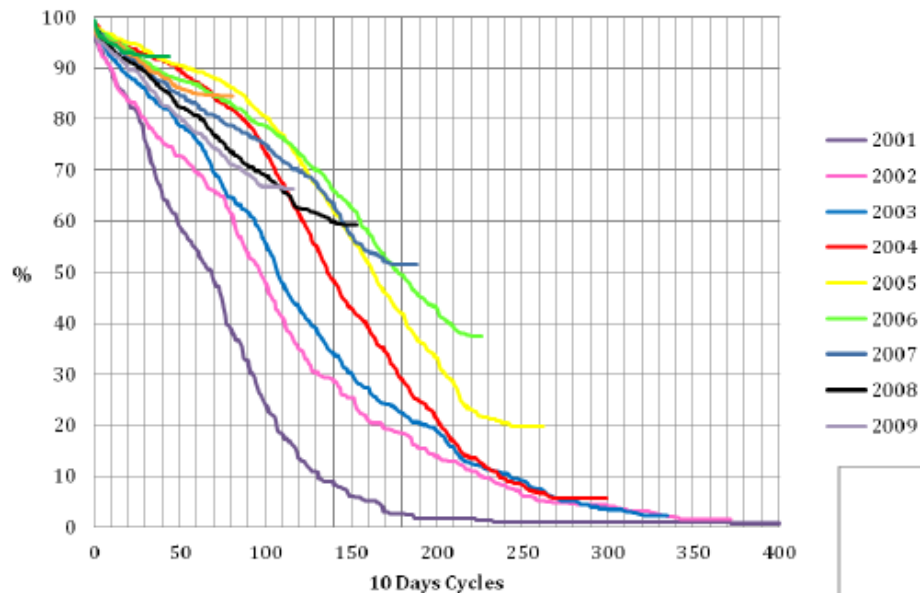
% profiles distributed within 24h at GDACs, by DAC
for February 2012



Float reliability has finally reached manufacturers spec. for most of float models: 150 cycles (almost to 2000m)



ALL Survival Rate

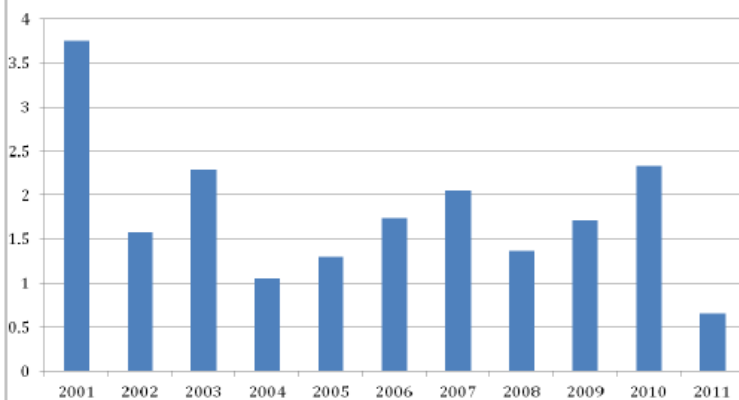


Still too much early failures (10%)

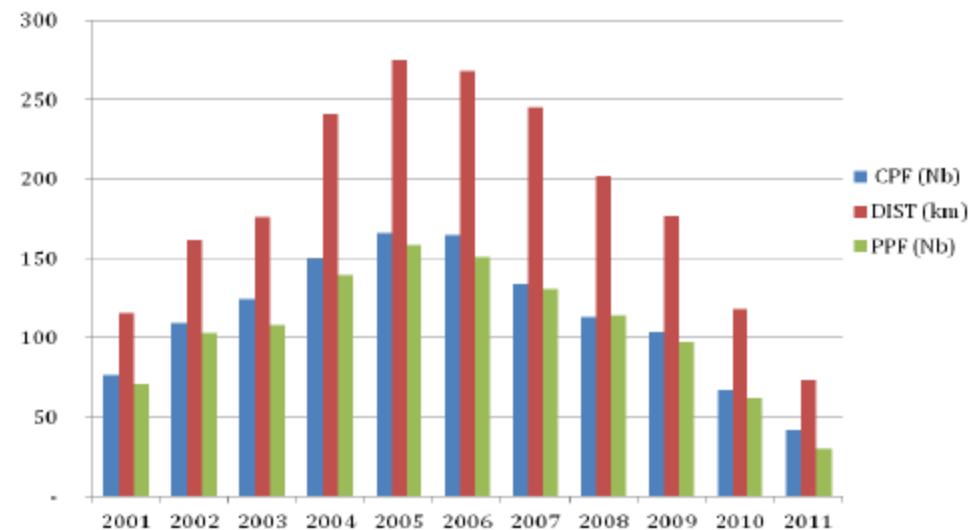
Good deployment practices in 2011

(VOS ships => 10% loss ??)

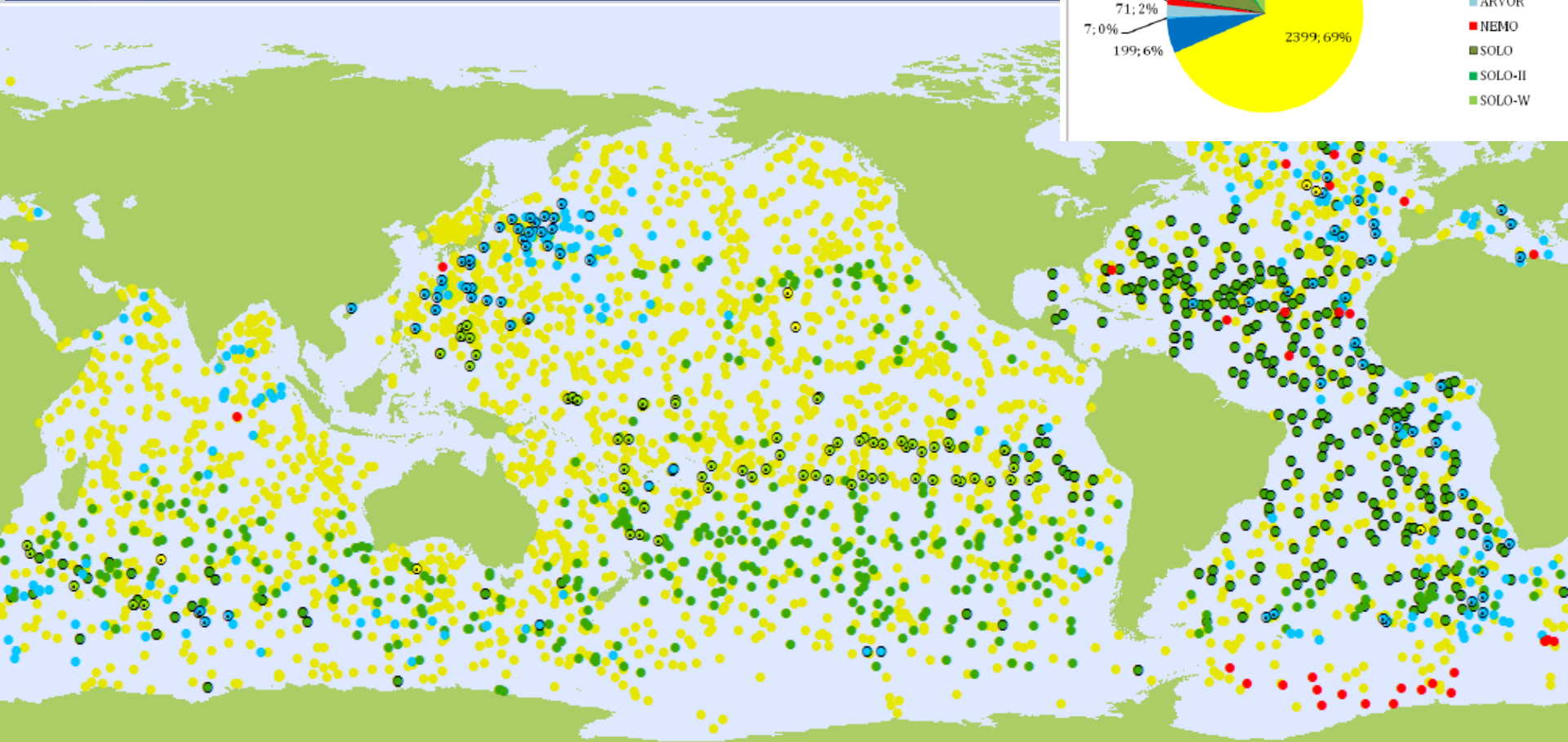
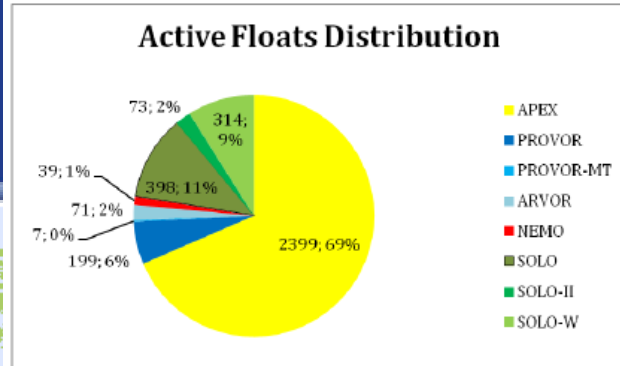
ALL deployment Failure Rate



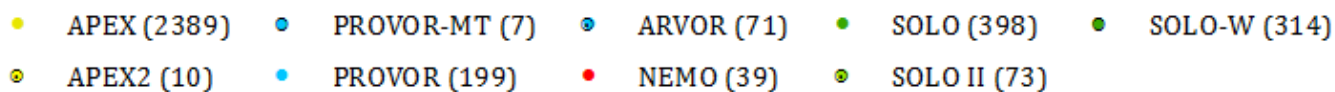
Average 10 days cycles
Average distance profiled
Average profiles
All Argo



A good diversity of float models and manufacturers (7 commercial) 2/3 of the market is handled by Teledyne

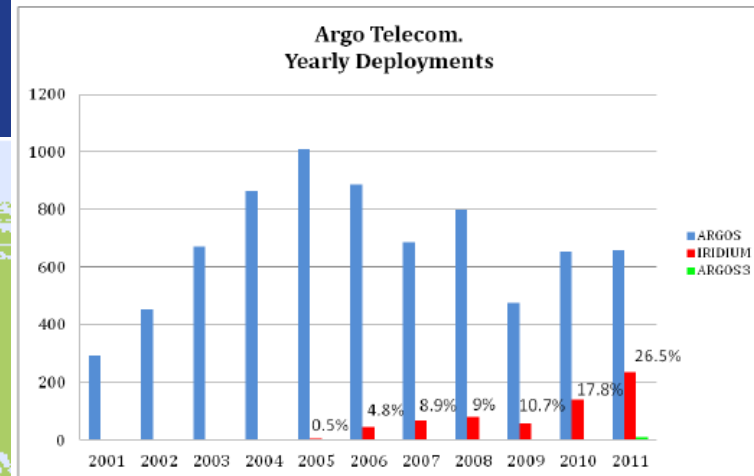
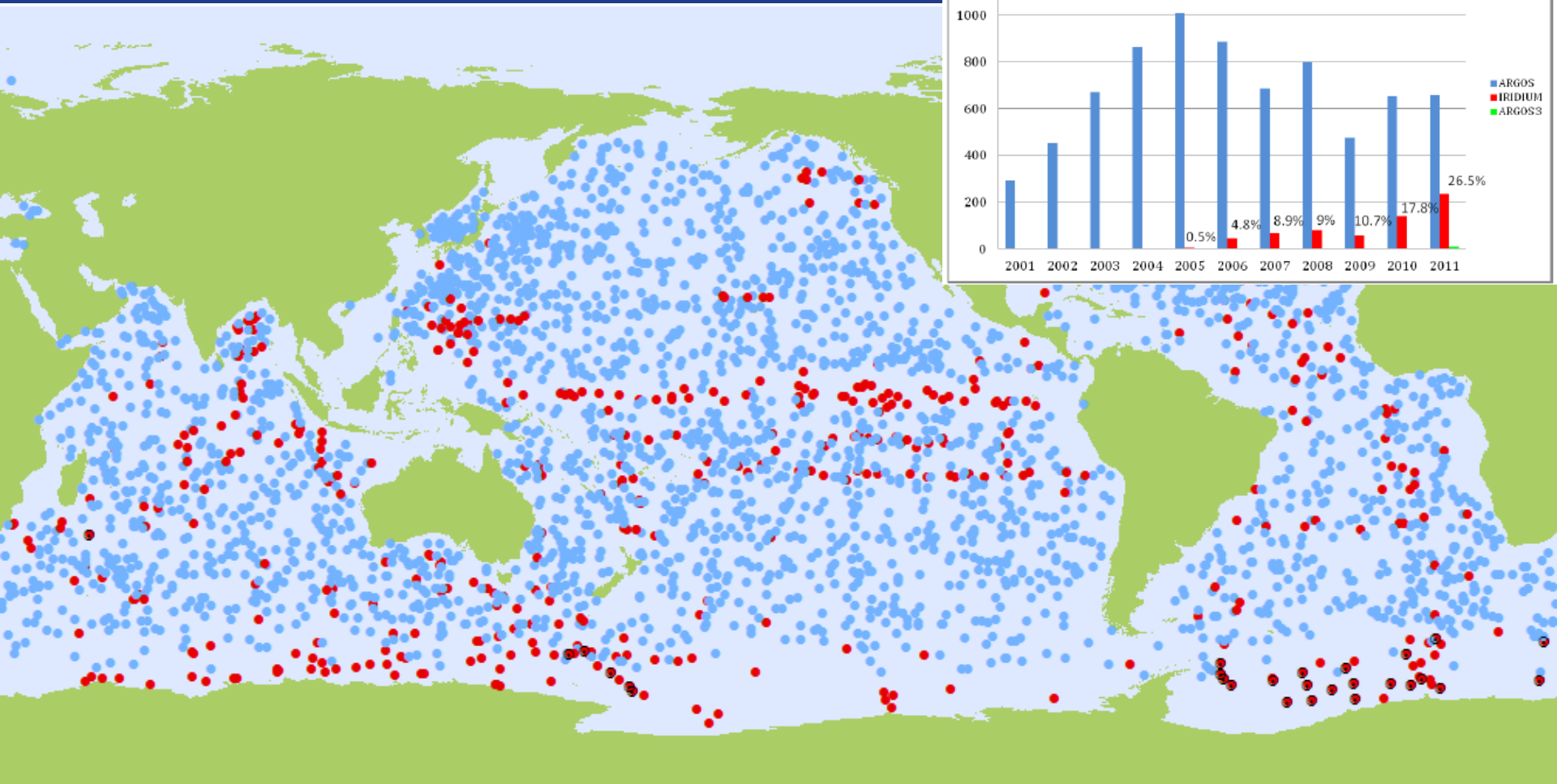


3500 Active Floats



February 2012

Iridium used on 1/4 of 2011 deployments



3500 Active Floats

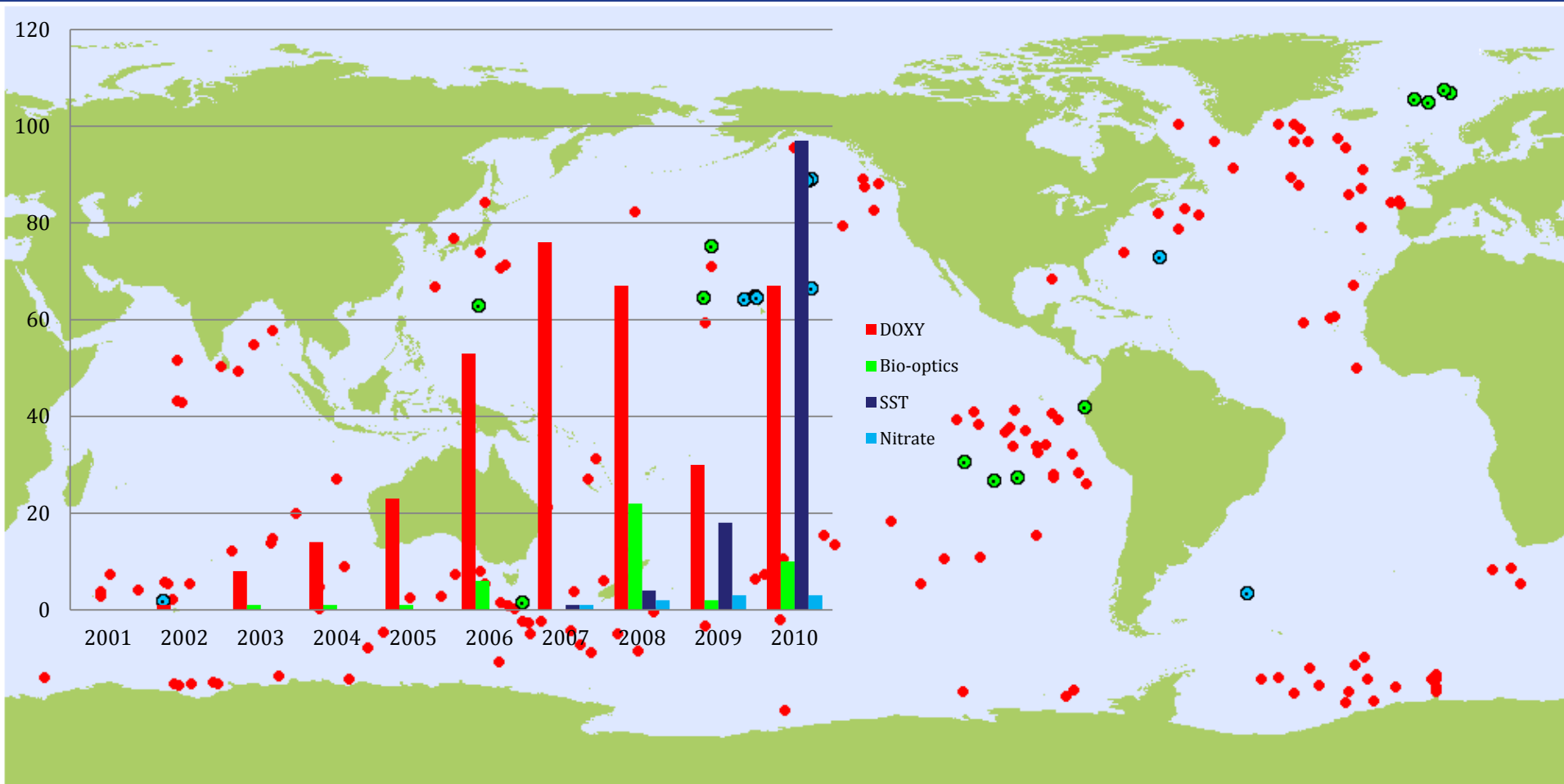
February 2012

• ARGOS (3048) • IRIDIUM (451) • ARGOS3 (1) ⊙ RAFOS (27)



Diversity is important ...

Float technology improving, new sensors are being tested, ...



BIO Argo

February 2011

• Dissolved Oxygen (180) • Bio-optics (14) • Nitrates (10)



- The number of countries involved in Argo is good but not sufficient. Argo would be impacted immediately if USA has difficulties
There is still room for a few more big players.
- 2009 deficit is still not solved.
Lack of resources for ship time management ? Lack of floats ?
Need to plan big deployment batches (efficient) and flexible cruises (micro management)
- From a “Core Argo” to a “Global Argo”: we need better indexes to track progress
- Delays in data availability at the GDACs have been partially solved.
AIC survey of DACs practices might help.
- Float lifetime keeps improving
- New generation of telecoms seems ready on all float models. Groups experiencing.
- Expansion of “Core Argo” to “Global Argo”, and Bio Argo need clear commitments for:
 - floats
 - ship time, data management resources (underestimated by Argo)
 - **resources for the infrastructure (still too weak)**