Argo Information Centre

jcommops

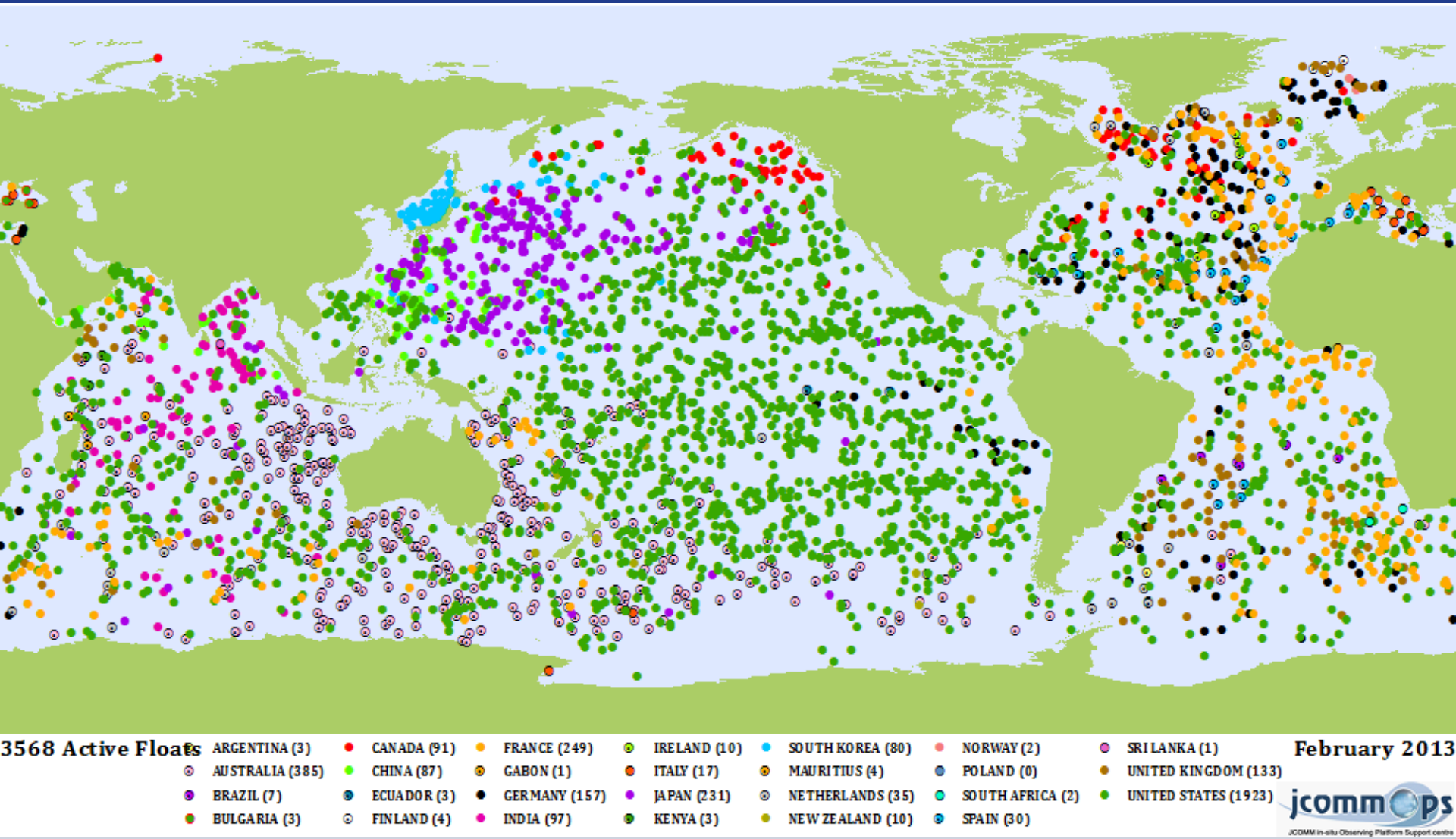
Argo Status

Argo TC

AST#14

March 2013. Wellington

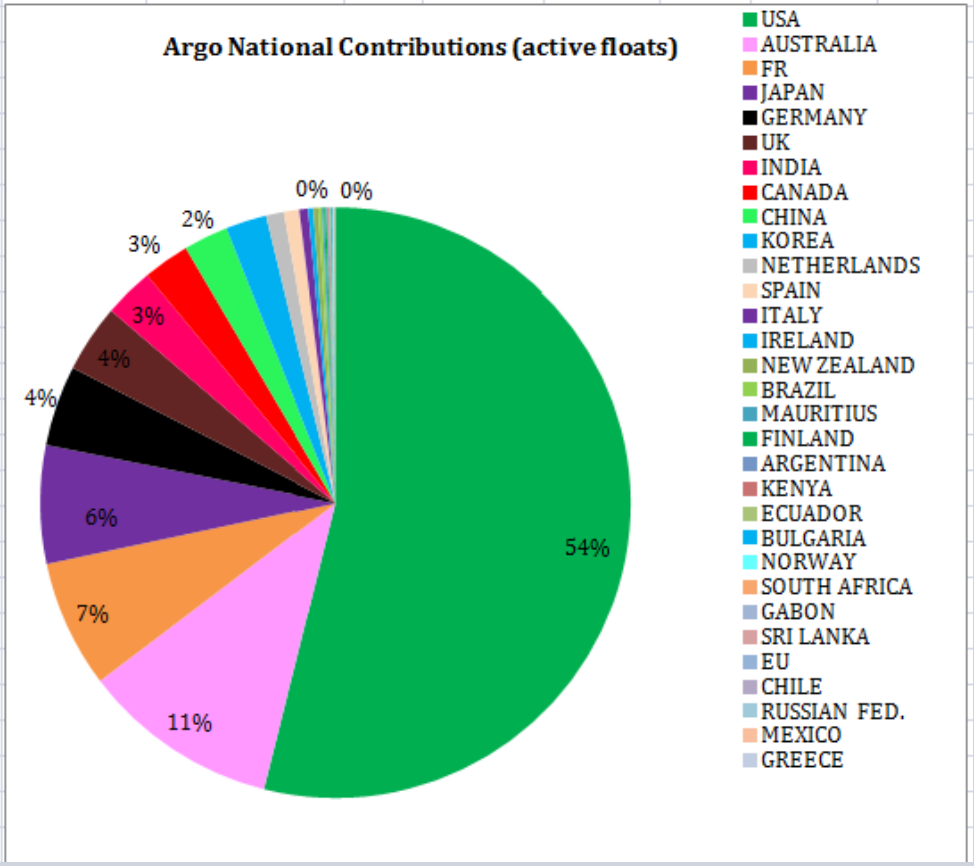
Argo is on the way to the « Global » array ... 4000 floats



Light increase since AST#13 (3500) ~50 floats pending confirmation (Iridium)
20 active countries in 2012

However more international cooperation is required
Argo is « vulnerable »

COUNTRY	March 2013	%
USA	1923	59.9
AUSTRALIA	385	12.0
FR	249	7.8
JAPAN	231	7.2
GERMANY	157	4.9
UK	133	4.1
INDIA	97	3.0
CANADA	91	2.8
CHINA	87	2.7
KOREA	80	2.5
NETHERLANDS	35	1.1
SPAIN	30	0.9
ITALY	17	0.5
IRELAND	10	0.3
NEW ZEALAND	10	0.3
BRAZIL	7	0.2
MAURITIUS	4	0.1
FINLAND	4	0.1
ARGENTINA	3	0.1
KENYA	3	0.1
ECUADOR	3	0.1
BULGARIA	3	0.1
NORWAY	2	0.1
SOUTH AFRICA	2	0.1



60% maintained by the USA …

Growing involvement of Europe is crucial (committed to ¼) and on his way

Strengthening of Asia contribution important (in particular for going to the "Global")

We need further South American countries participation (waiting for Brazil)

From « Original » to « Global»
... opportunity to call for additional support nationally and seek new partners

- Some national budgets reached a limit, or could even be declining
- Float lifetime increase won't solve the equation

- Current Argo partners can increase their contribution? Can we help?

- Argo should be promoted further in Russia, Mexico, Indonesia, *Turkey*
  - Cooperation (float donation) win/win - (marginal seas access)
  - Foster float funding

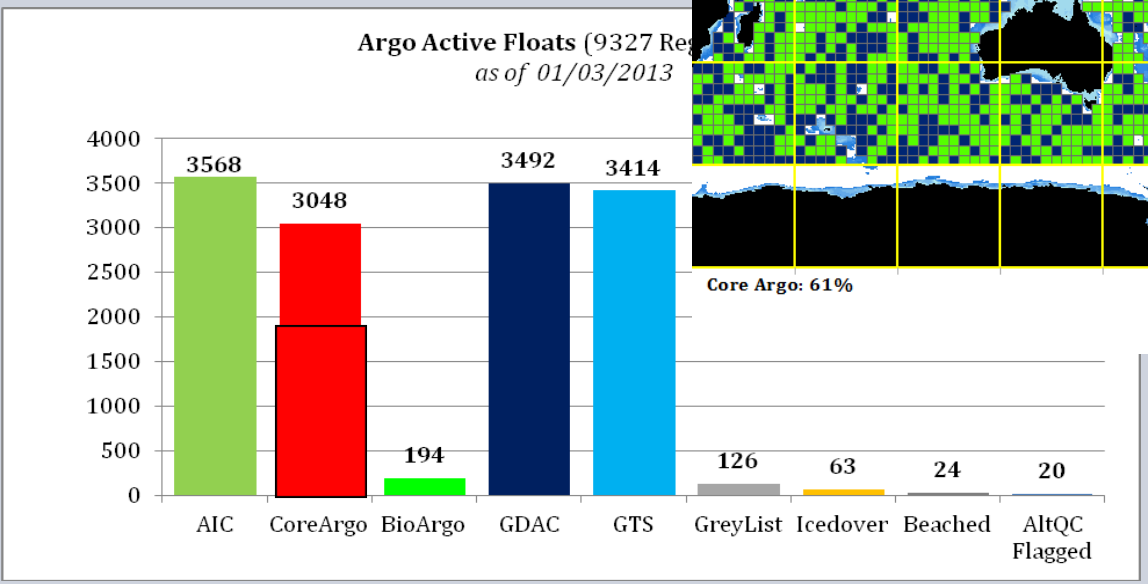
- TC/Director available with mission budget

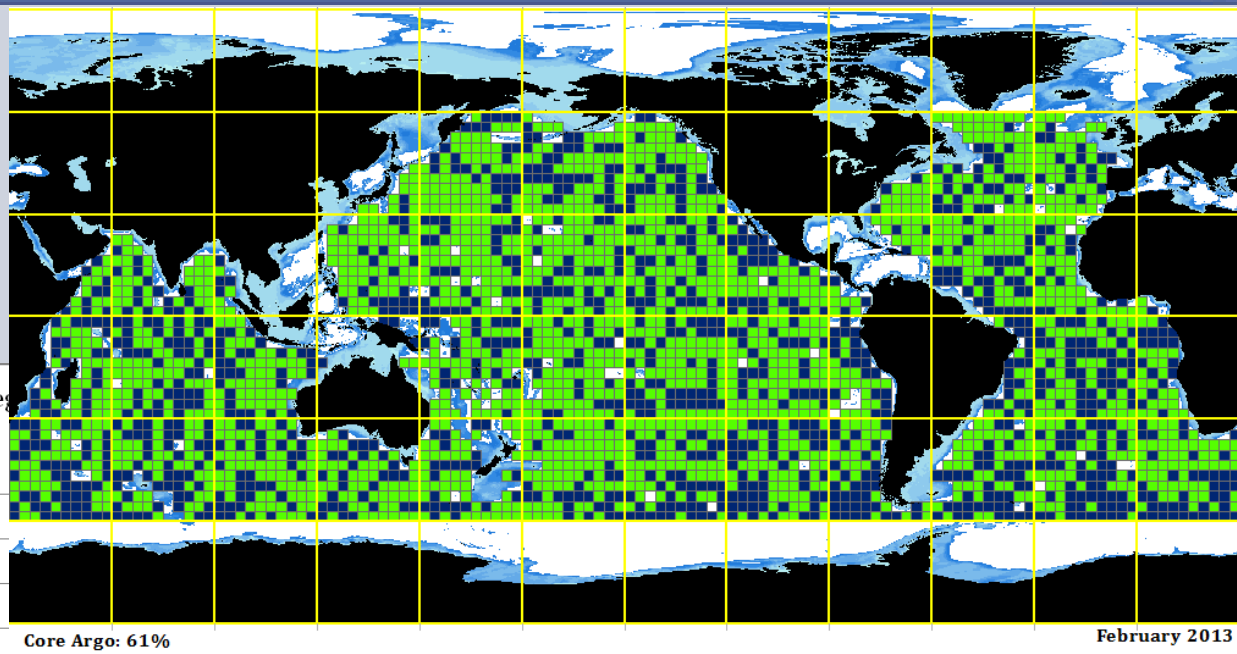
- Cooperation to be developed continuously (floats required)
  - Half dozen countries ready
  - Not always works perfectly (Kenya, Morocco)

- Partnerships possible (manufacturers, sailing communities, see agenda items 5.3 and 5.7)

COUNTRY	GDP billion $
UNITED STATES	14 660.0
CHINA	10 090.0
JAPAN	4 310.0
INDIA	4 060.0
GERMANY	2 940.0
RUSSIA	**2 223.0**
UNITED KINGDOM	2 173.0
BRAZIL	**2 172.0**
France	2 145.0
ITALY	1 774.0
MEXICO	**1 567.0**
INDONESIA	**1 567.0**
REPUBLIC OF KOREA	1 459.0
SPAIN	1 369.0
CANADA	1 330.0
TURKEY	**960.0**
AUSTRALIA	882.0
NETHERLAND	676.0

Argo is approaching the very strict « ~~Core~~ Original » target.



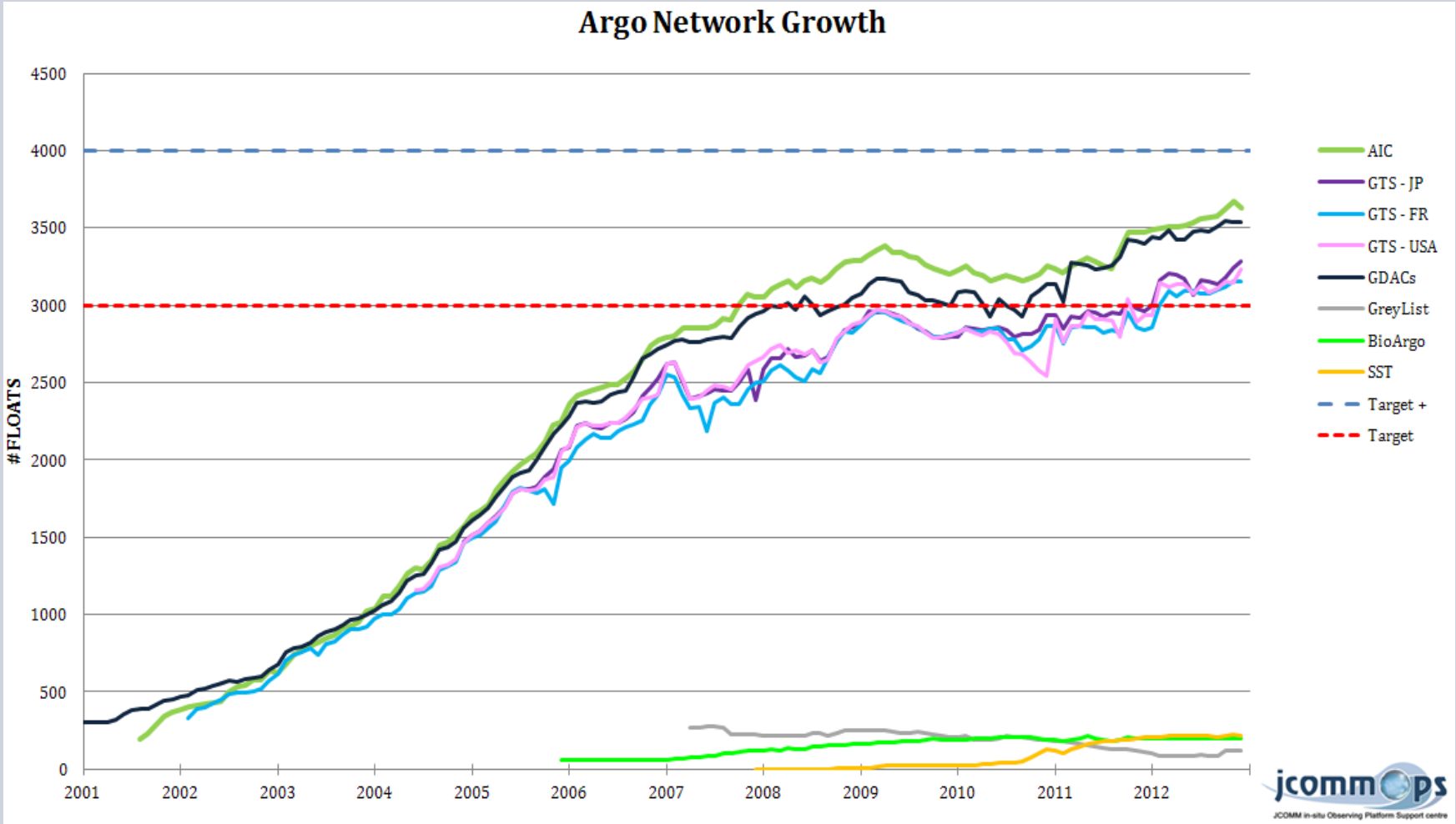


If "we do not consider spatial distribution" Core Argo is implemented .

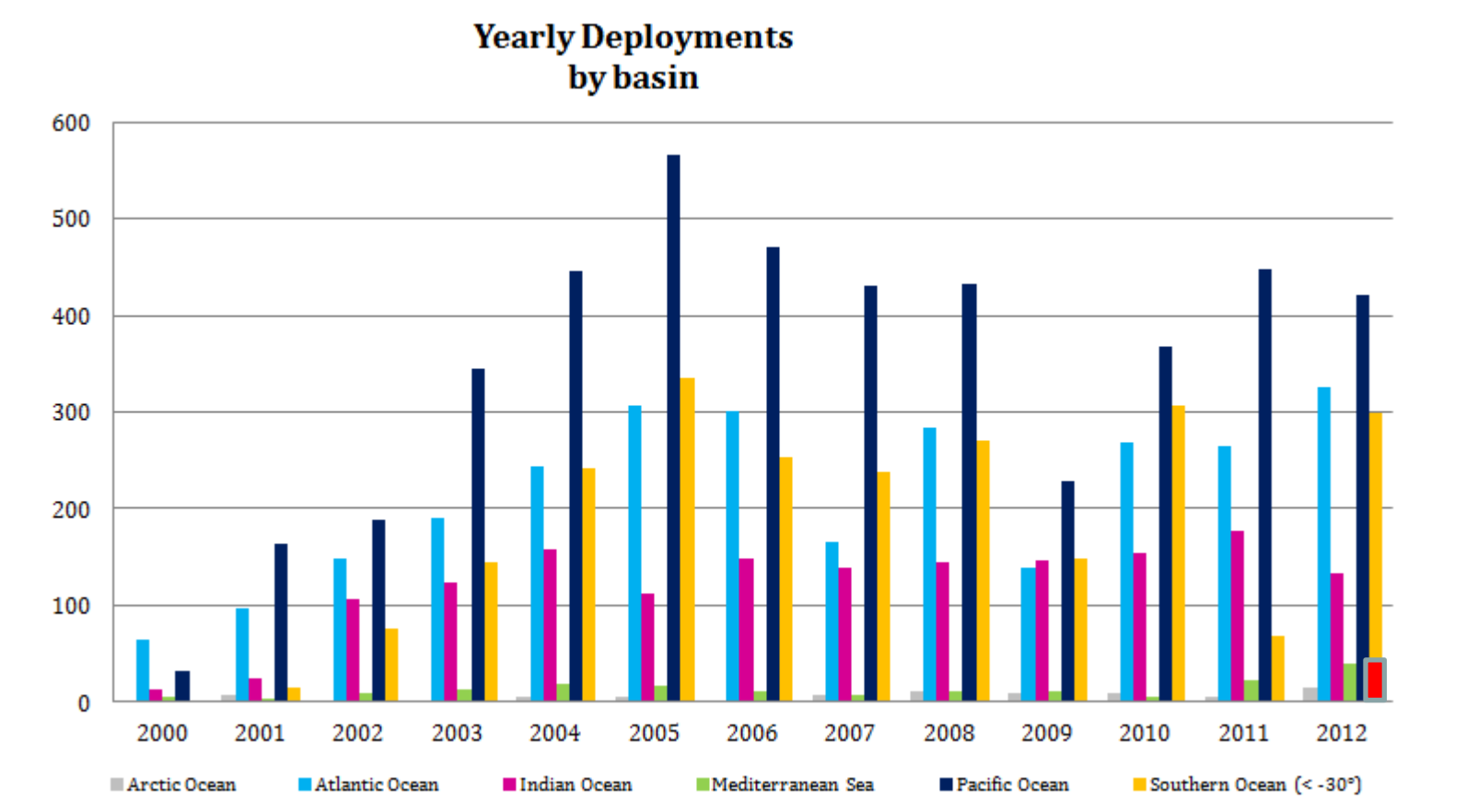
We have enough floats but they are only covering 2/3 of the original array.

Spatial dispersion of floats to be studied (Germany WP in EuroArgo - floats residence)

Argo is slowly strengthening its array since 2011

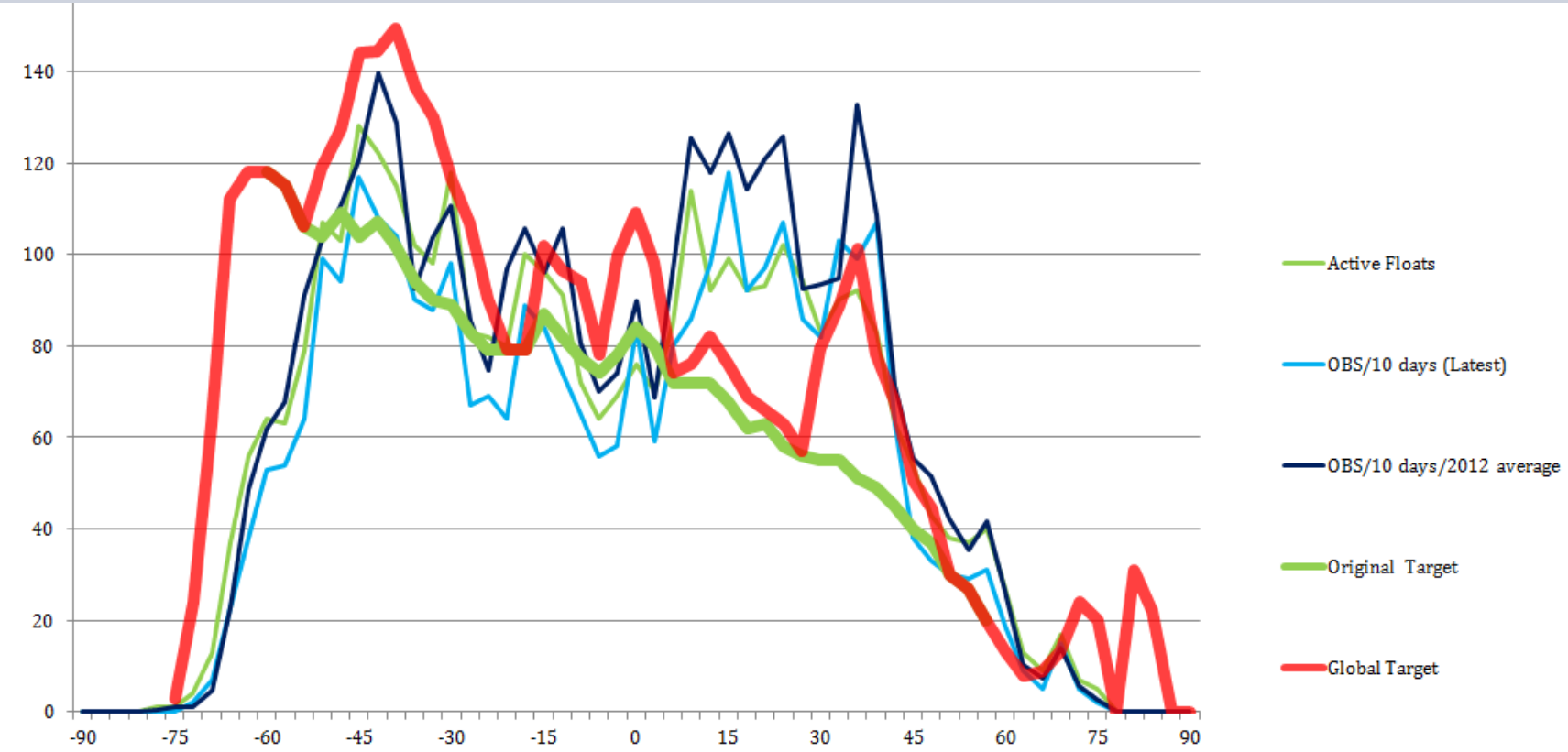


2009 deployments deficit solved
light decrease in the Indian Ocean



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	Total	AVG (3 years)
Arctic Ocean	0	7	1	0	5	5	1	8	12	10	**10**	**5**	**16**	80	10
Atlantic Ocean	65	97	148	190	243	307	301	165	284	139	**269**	**265**	**326**	2799	287
Indian Ocean	13	24	106	124	158	113	149	139	144	147	**155**	**177**	**133**	1582	155
Mediterranean Sea	6	4	9	13	18	17	12	7	11	11	**5**	**23**	**39**	175	22
Pacific Ocean	32	163	188	345	446	566	470	431	432	228	**368**	**447**	**421**	4537	412
Southern Ocean (< -30°)	0	16	76	145	242	336	254	239	270	148	**306**	**69**	**299**	2400	225
Total	**116**	**295**	**452**	**672**	**870**	**1008**	**933**	**750**	**883**	**535**	**807**	**917**	**935**	**9173**	886

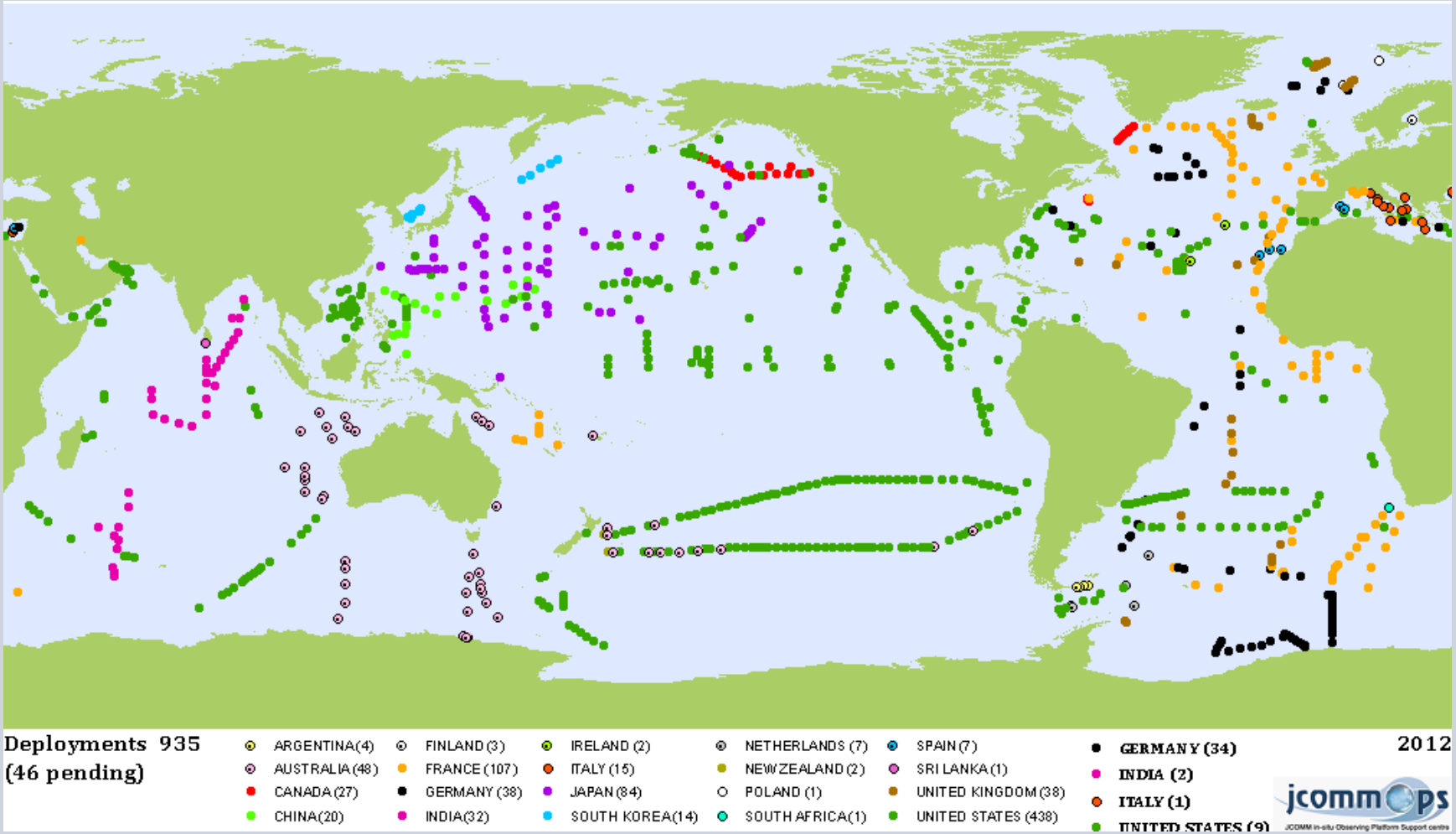
Sum of floats along longitude by latitude bin



Clear need between 50/60°S
Light need of floats between 10°S and the equator

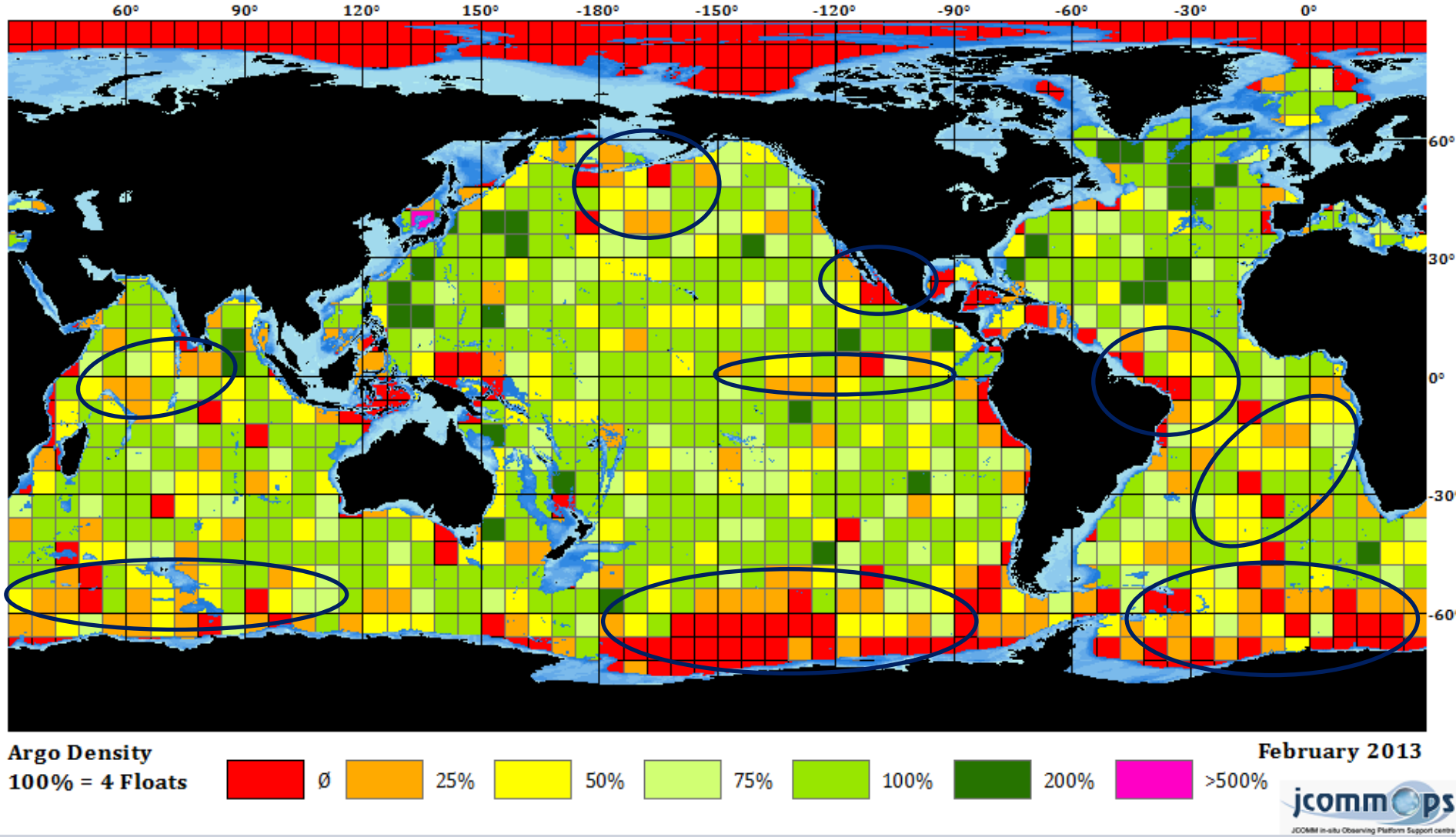
Excess in the 10/45° band (Marginal Seas) and around -45°
Accumulation zones ? Or excess due to dep. opportunities?
=> can be redistributed for WBC regions

Challenge in logistics is still impressing ....



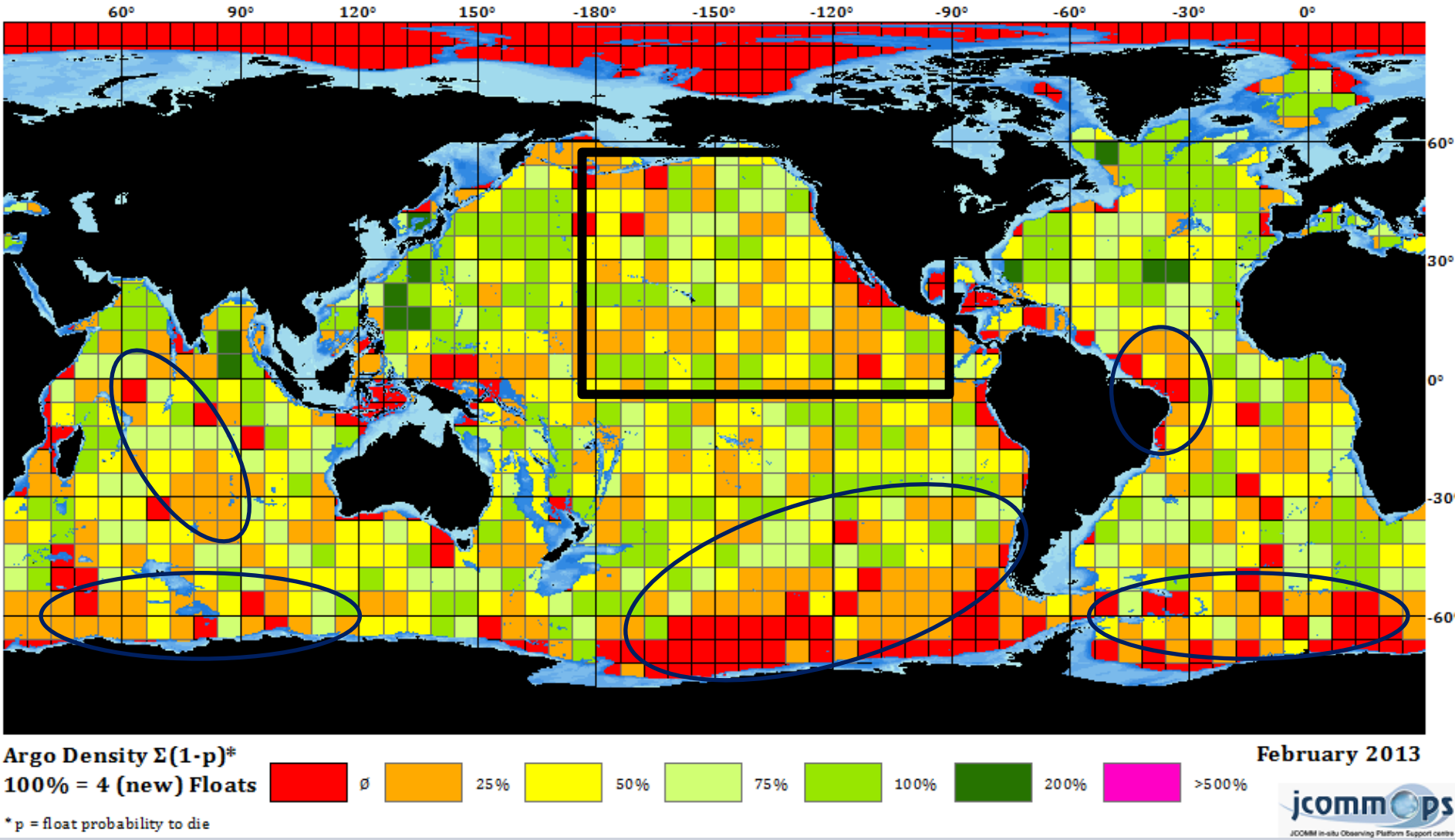
South Pacific Kaharoa ... whatelse
Can't maintain all alone.

How optimize the network coverage now ?



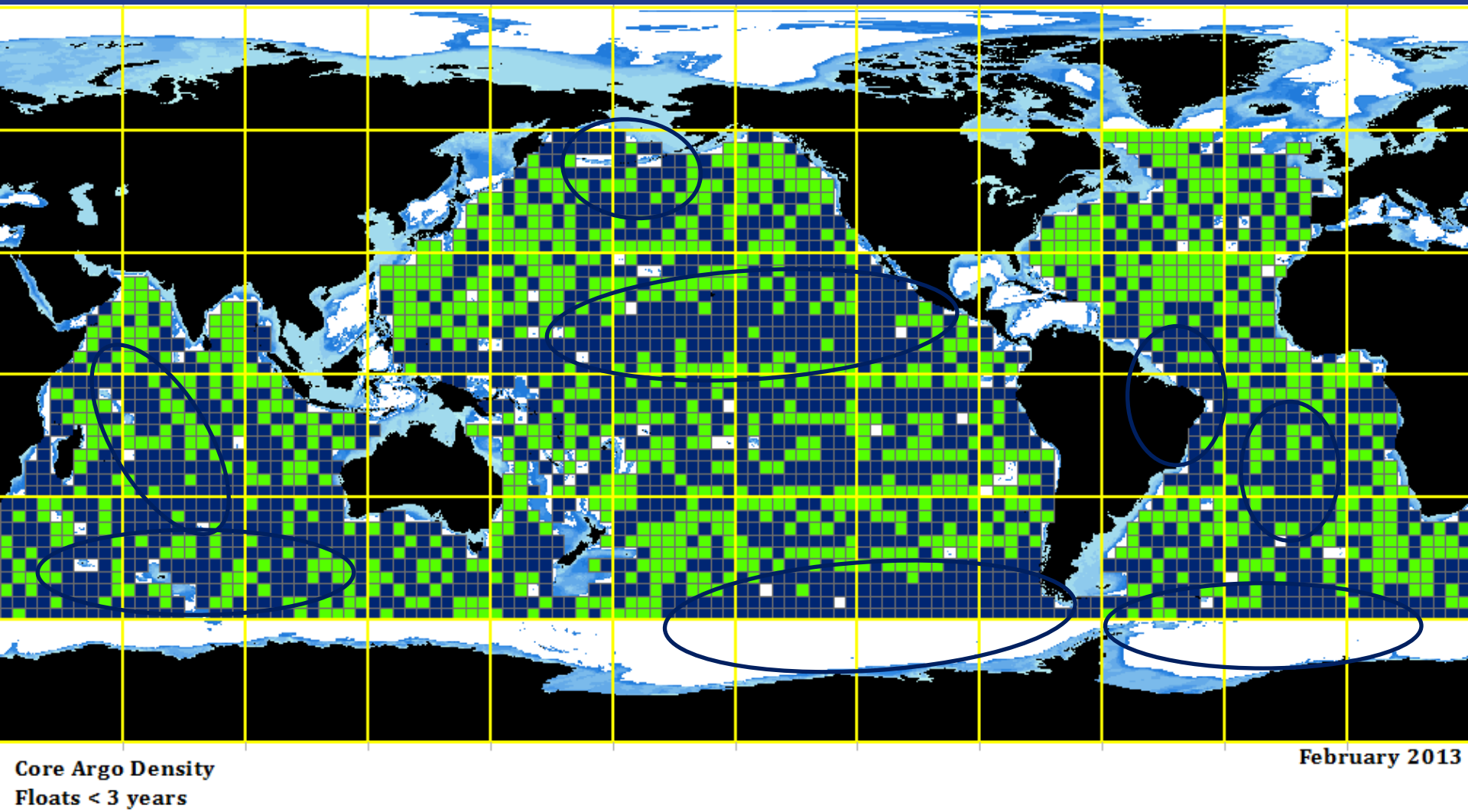
gaps and excess zones identified in the “latitude plot”are confirmed

... and tomorrow ?

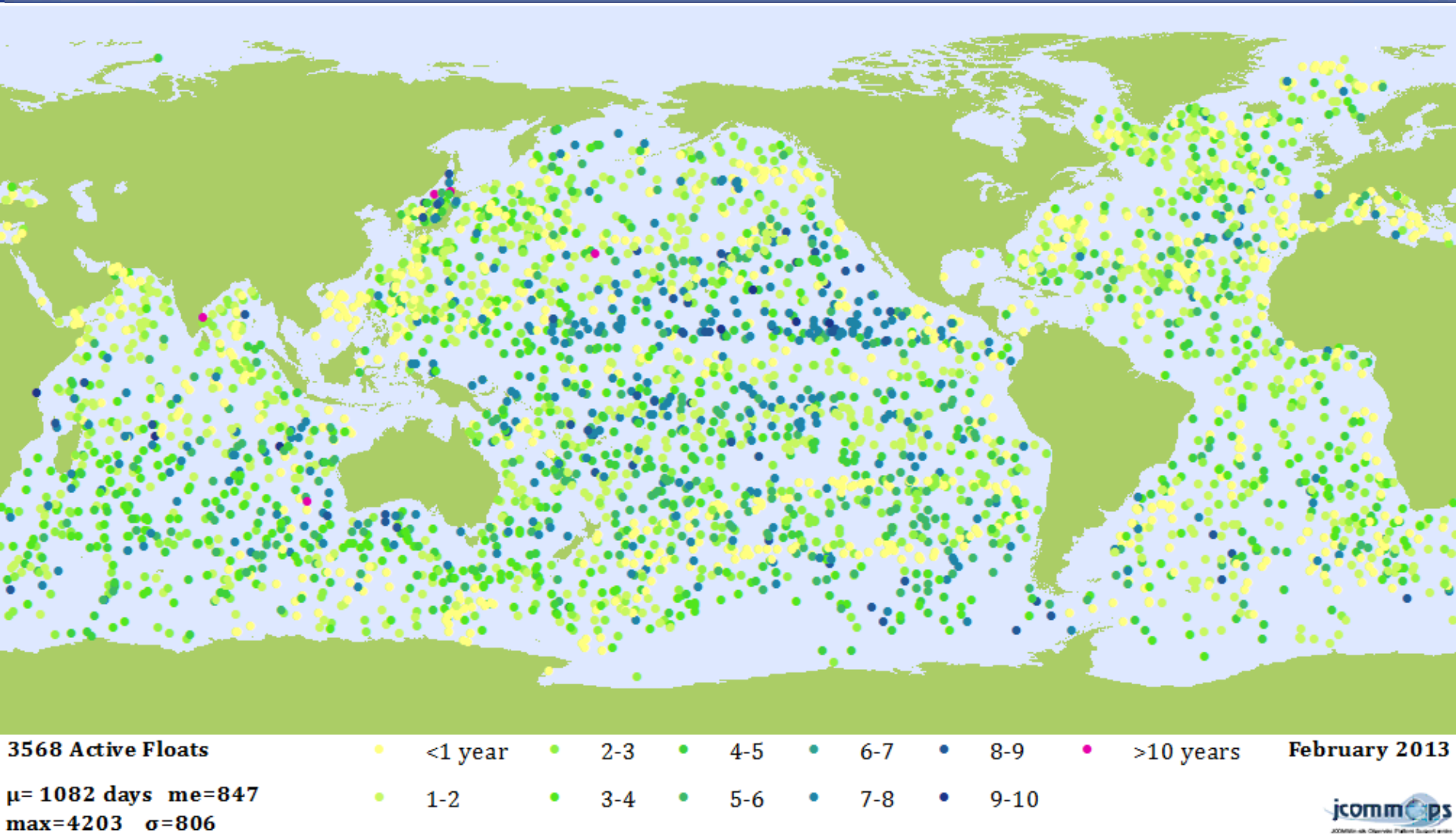


And increased with time (using decimal floats).

… and tomorrow ?

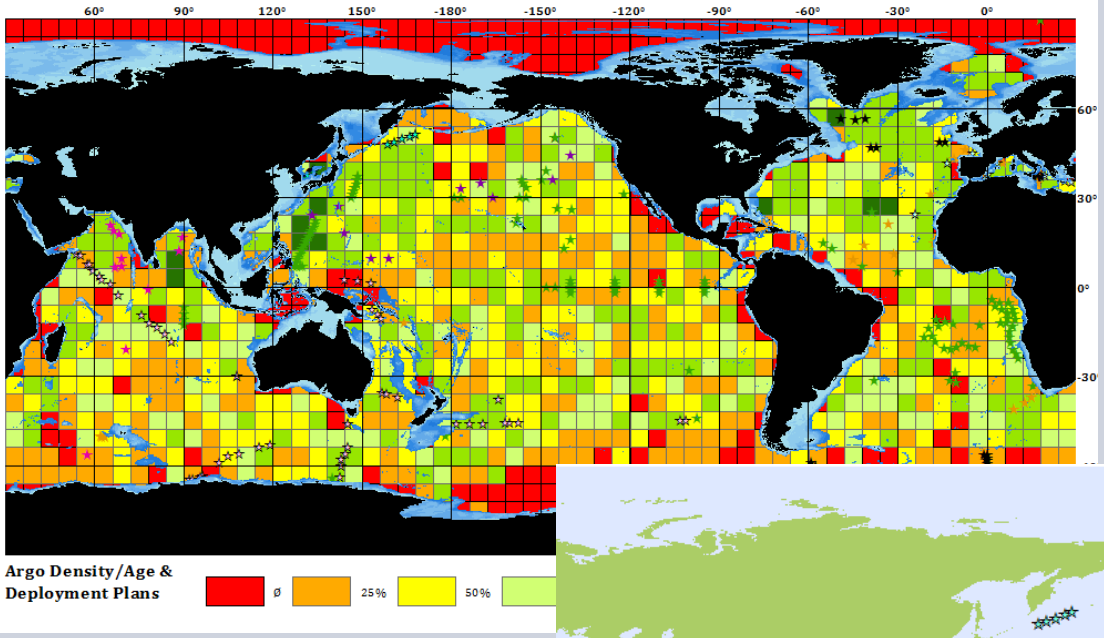


Here on a 3°x3° original grid (decimal floats > 3 years removed)


3568 Active Floats
<1 year
2-3
4-5
6-7
8-9
>10 years
February 2013
μ= 1082 days me=847
max=4203 σ=806
1-2
3-4
5-6
7-8
9-10
jcommops

Quick check …

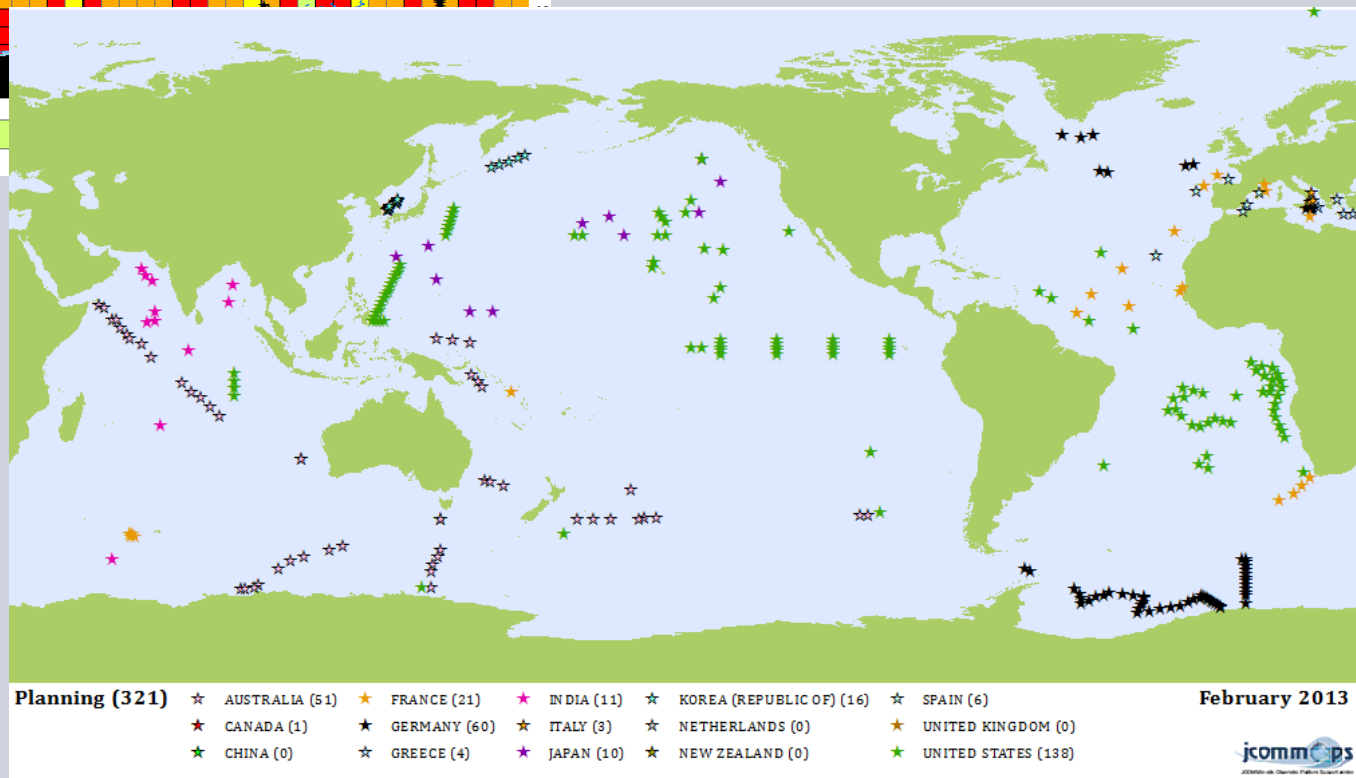
How the Argo teams are going to fill the gaps ? We don't know yet !

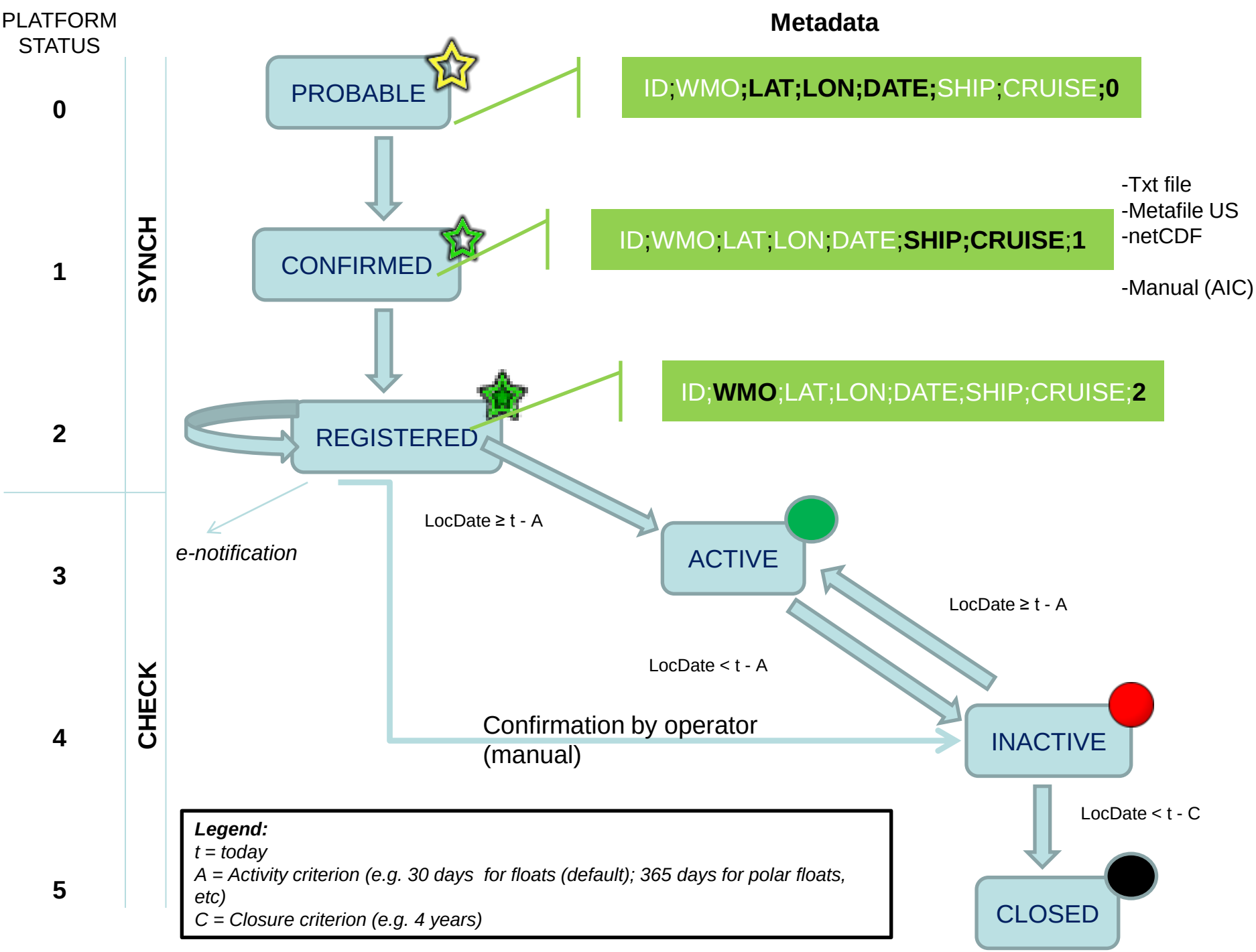


Please update your deployment plans !!!

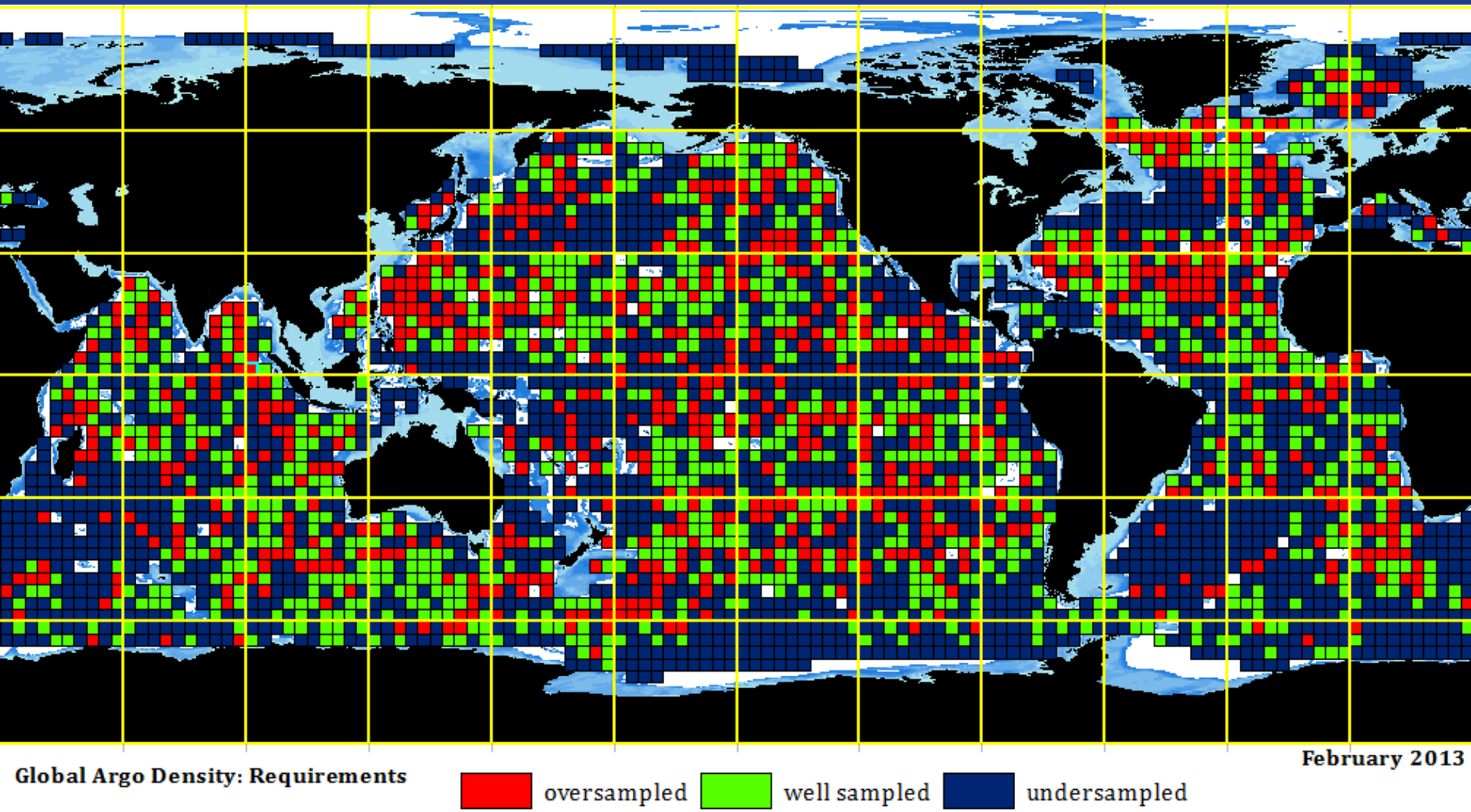
Use AIC resources

=> Action AST please

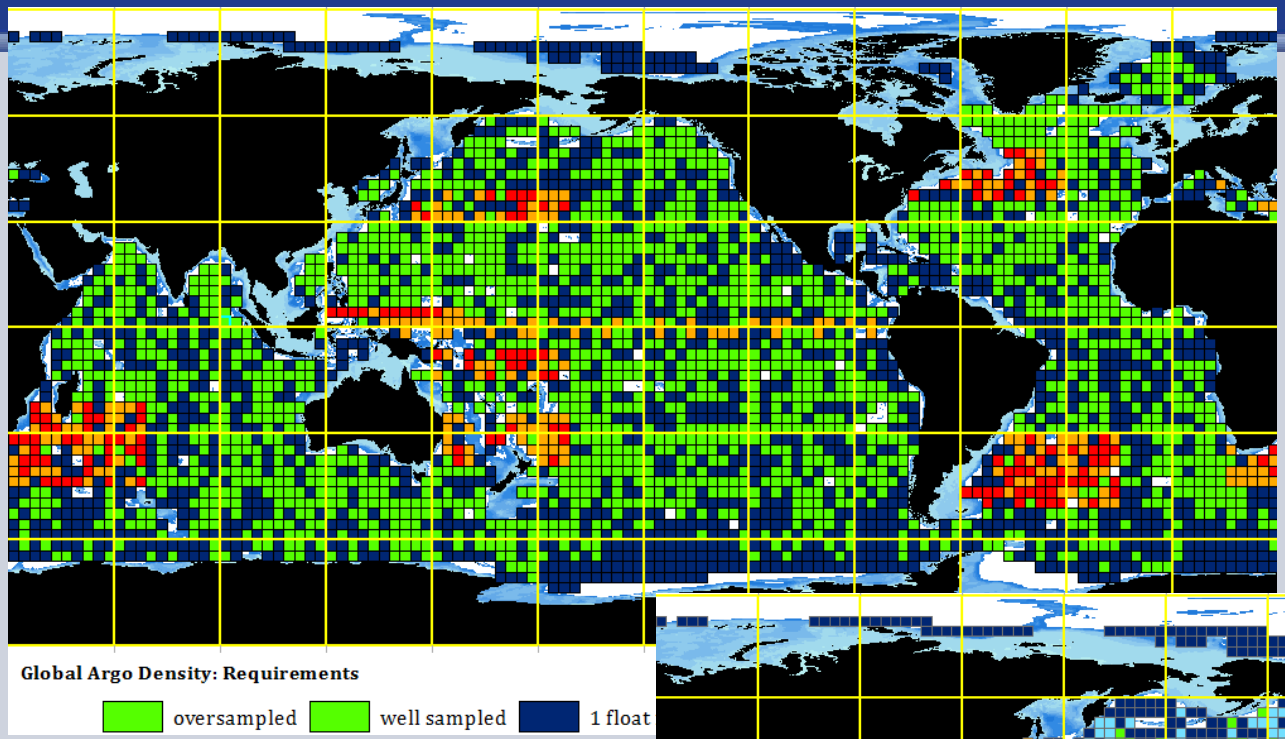


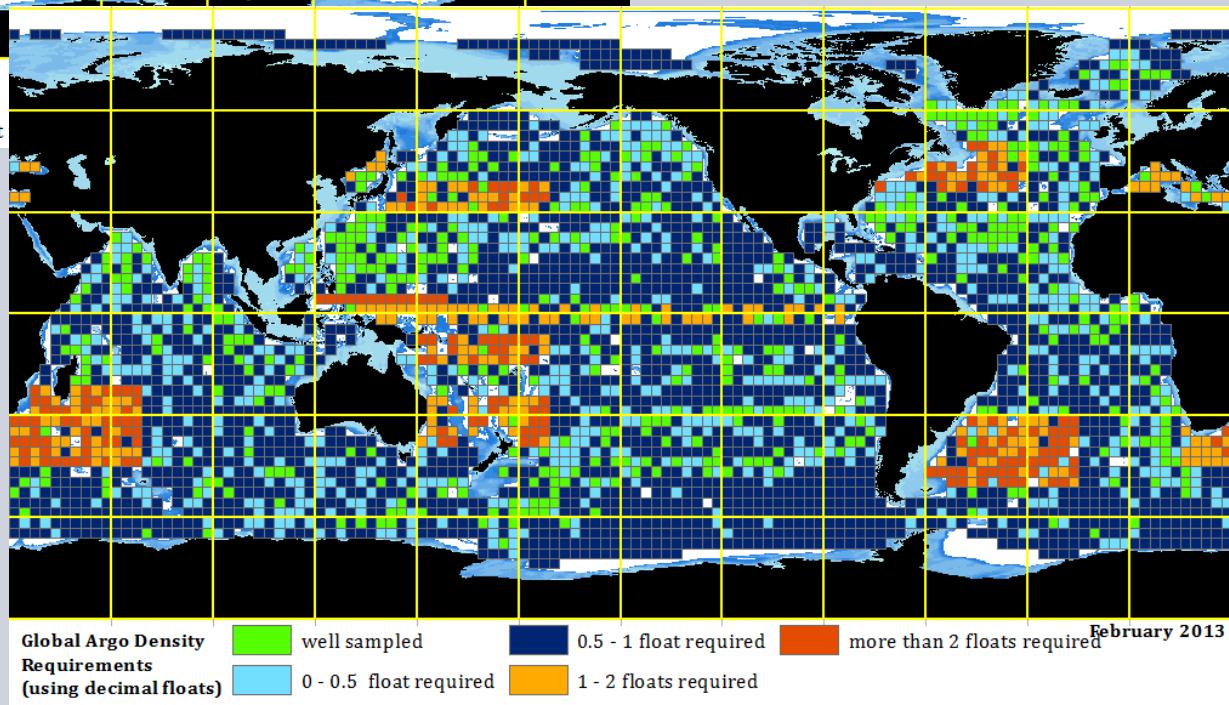

PLATFORM STATUS
Metadata
0
1
2
3
4
5
SYNCH
CHECK
PROBABLE
CONFIRMED
REGISTERED
ACTIVE
INACTIVE
CLOSED
ID;WMO;LAT;LON;DATE;SHIP;CRUISE;0
ID;WMO;LAT;LON;DATE;SHIP;CRUISE;1
ID;WMO;LAT;LON;DATE;SHIP;CRUISE;2
-Txt file
-Metafile US
-netCDF
-Manual (AIC)
e-notification
LocDate ≥ t - A
LocDate ≥ t - A
LocDate < t - A
Confirmation by operator (manual)
LocDate < t - C
Legend:
t = today
A = Activity criterion (e.g. 30 days for floats (default); 365 days for polar floats, etc)
C = Closure criterion (e.g. 4 years)

… and with regard to « Global Argo » ?

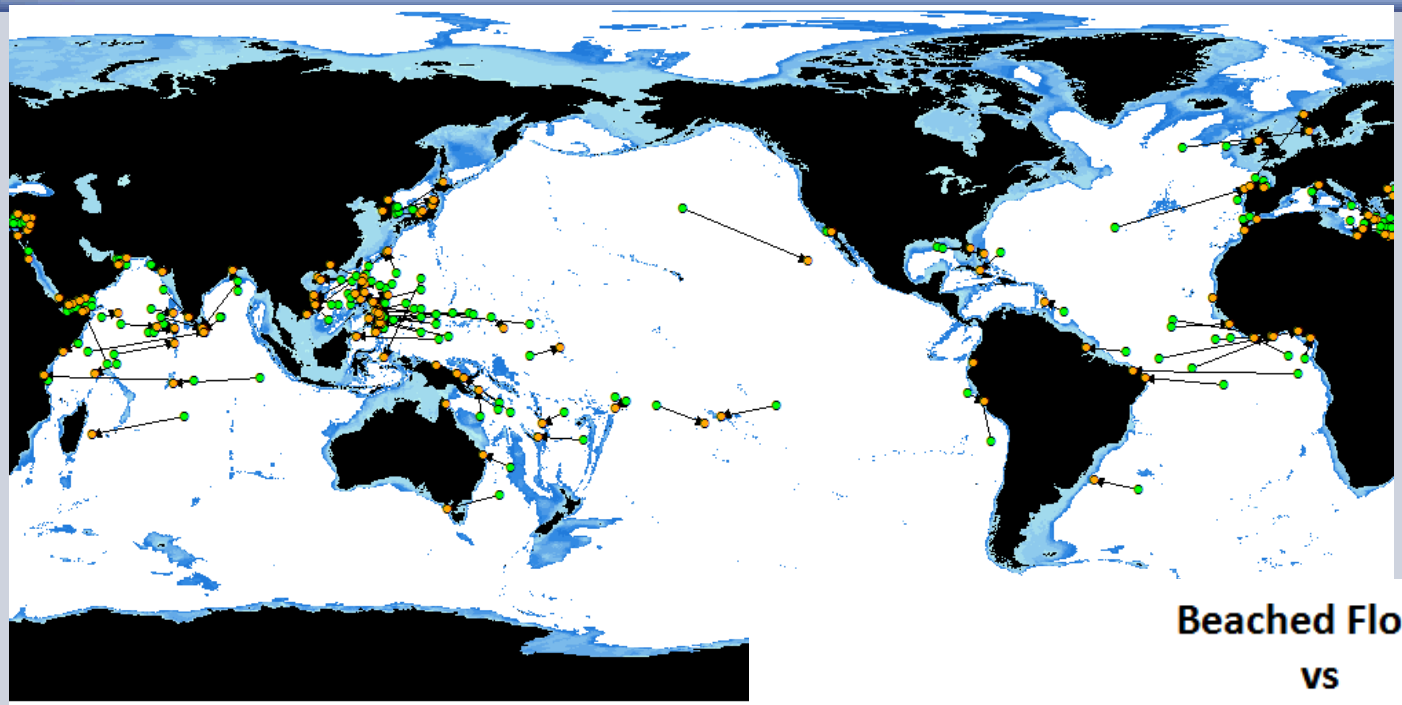


… and with regard to « Global Argo » ?

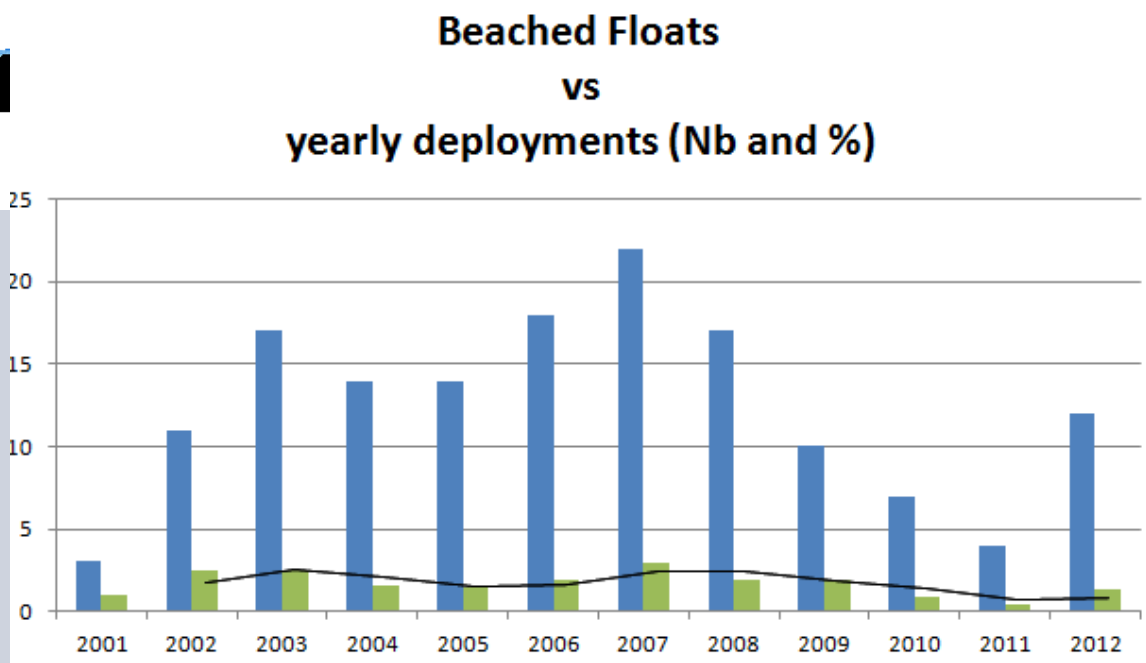




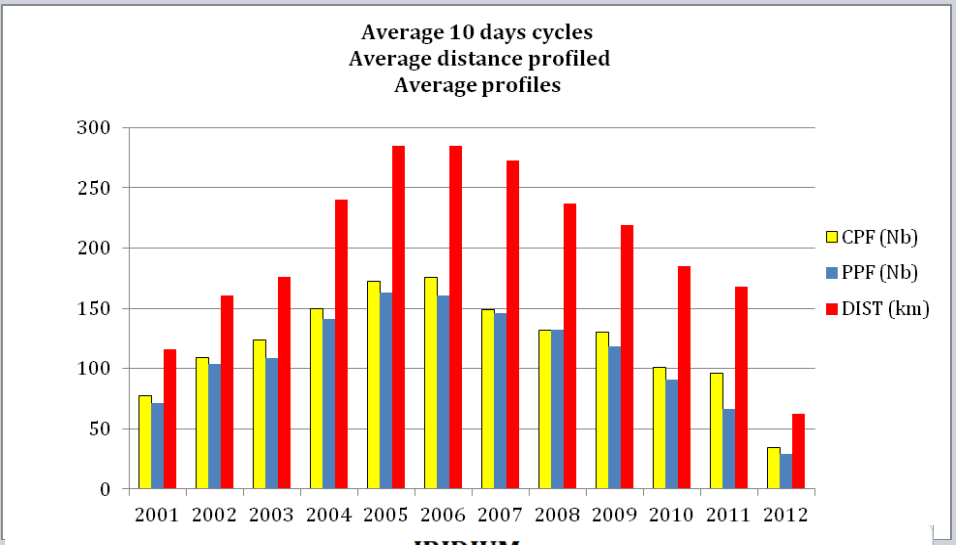
Beached floats … ~1 per month (~1.5% yearly deployments)



Beached Floats



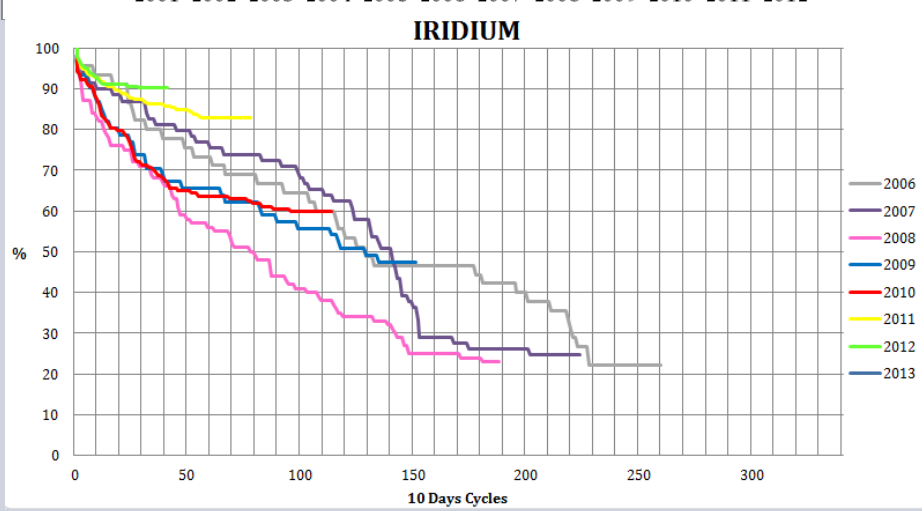
Float reliability has finally reached manufacturers spec. for most of float models: 150 cycles (almost to 2000m)

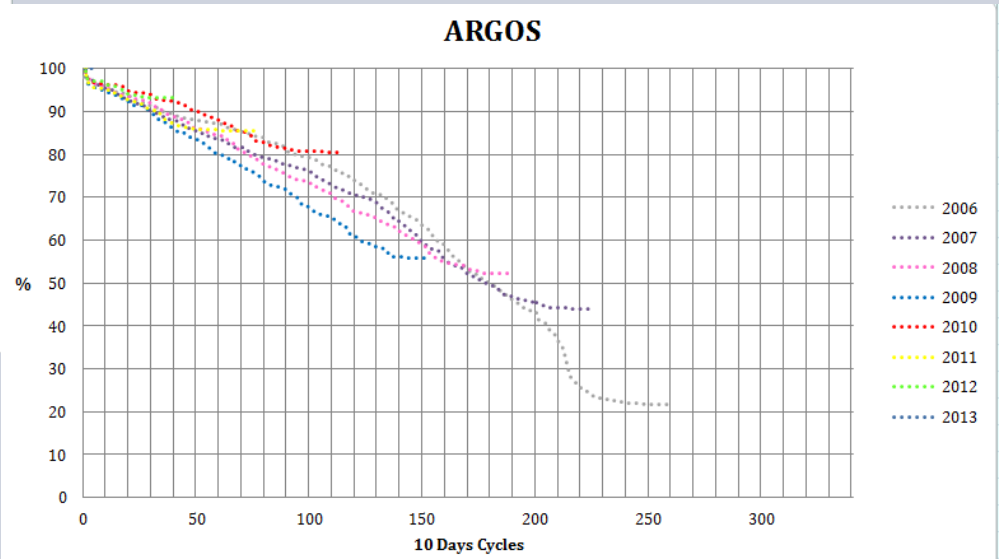


Still to much early failures (10%)

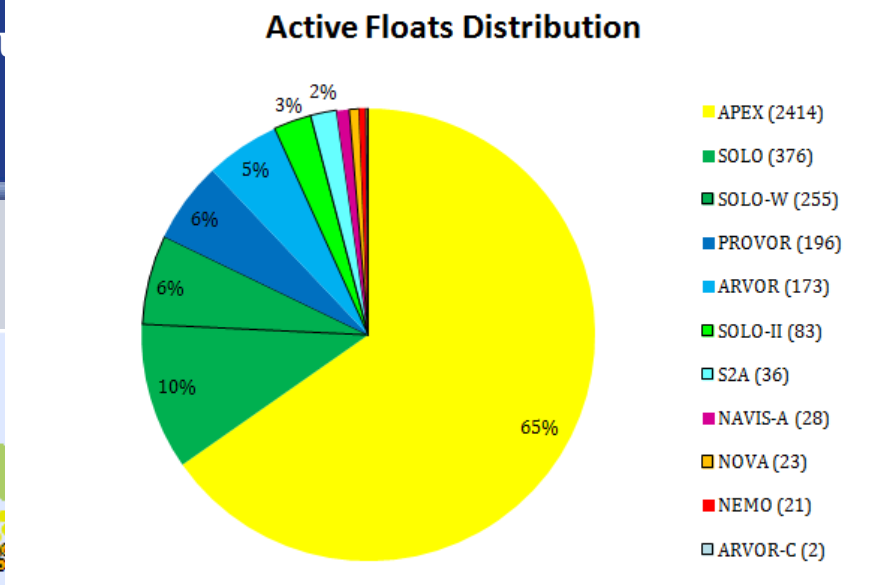
Good deployment practices in 2011 (0.5%)
Not so good in 2012 (2.5%)
VOS ships => 10% loss

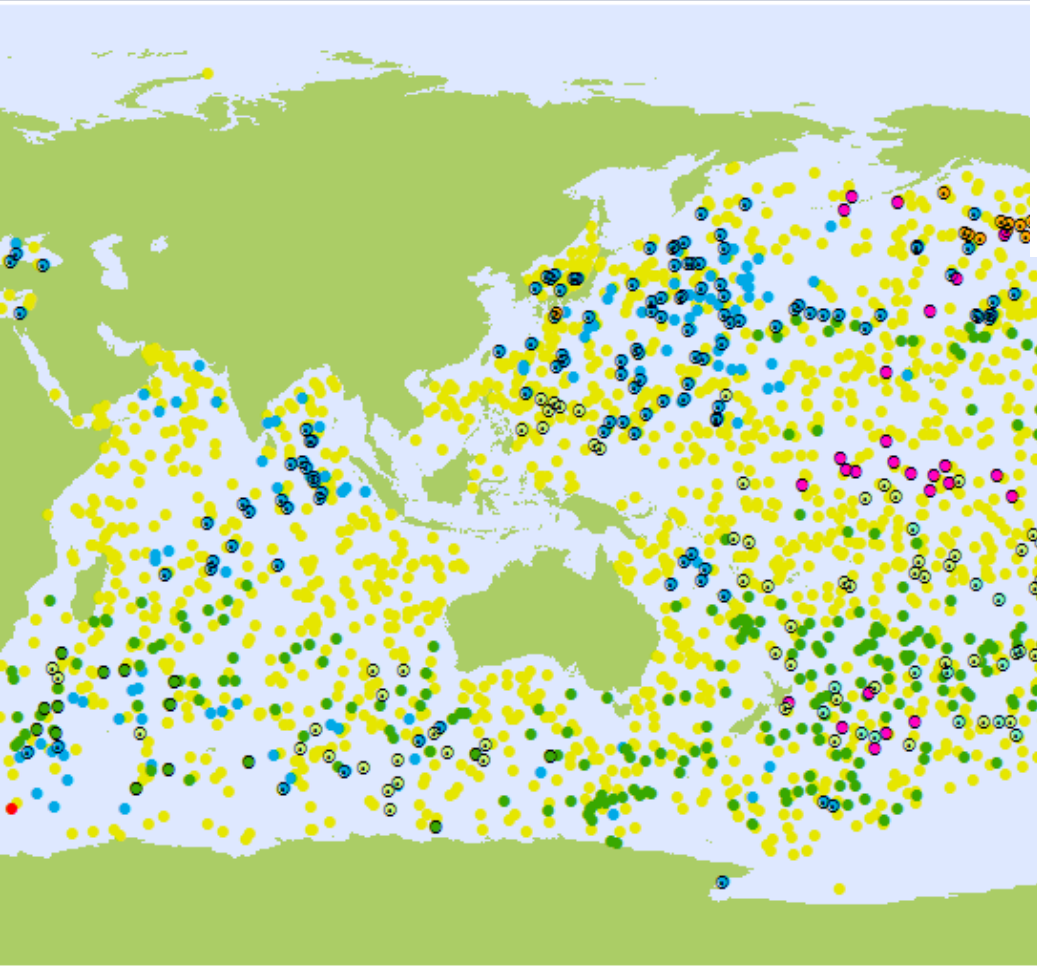
Iridium float reliability improving vs Argos





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



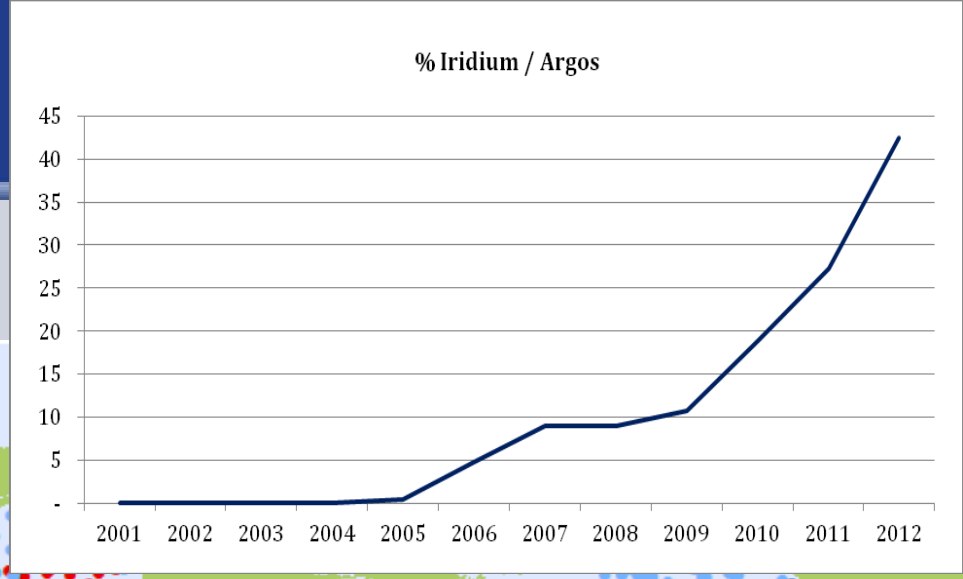


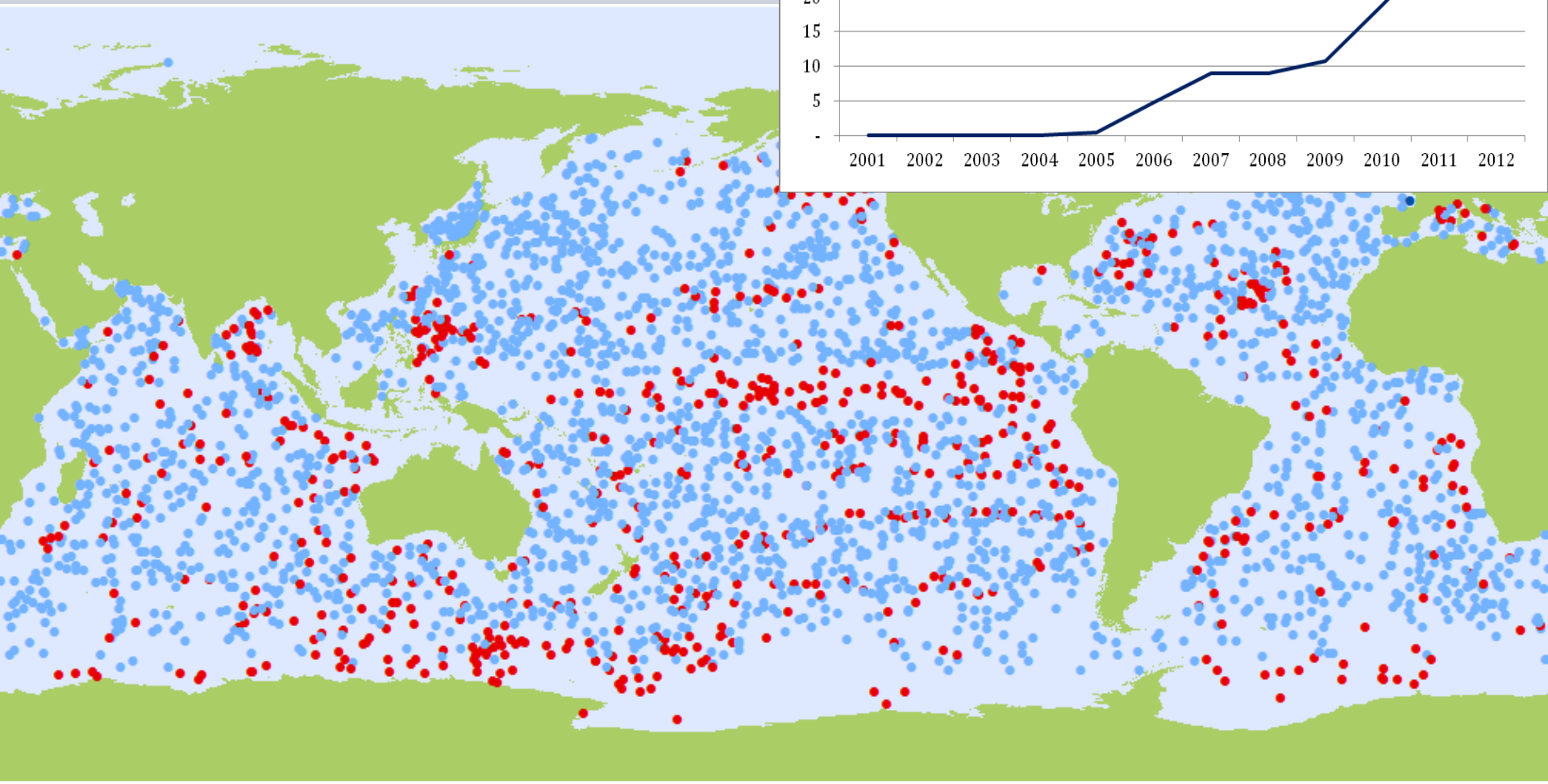
3568 Active Floats **February 2013**

APEX (2330) PROVOR-II (5) ARVOR_C (1) NOVA (25) SOLO (373) SOLO-II (96)

PROVOR (189) ARVOR (206) NAVIS-A (32) NEMO (17) SOLO-W (228) S2A (66)

Iridium used on ¼ of 2011 deployments 40% in 2012 …





3568 Active Floats **February 2013**

ARGOS (2861) ARGOS3 (2) IRIDIUM (705)

Conclusion

- Challenge: “Original” to “Global”
  - More international partners (?)
  - Increased national contributions (?)
  - Improved float lifetime (limited) and deployment practices
  - Accurate target(s)
  - Better metrics to track progress
  - Tools to monitor spatial distribution with time
  - Better planning to optimize use of resources and array distribution
  - New deployment opportunities

- Opportunity for a (new) communication strategy to keep Argo under the radar of funding agencies