Argo Information Centre

jcommops

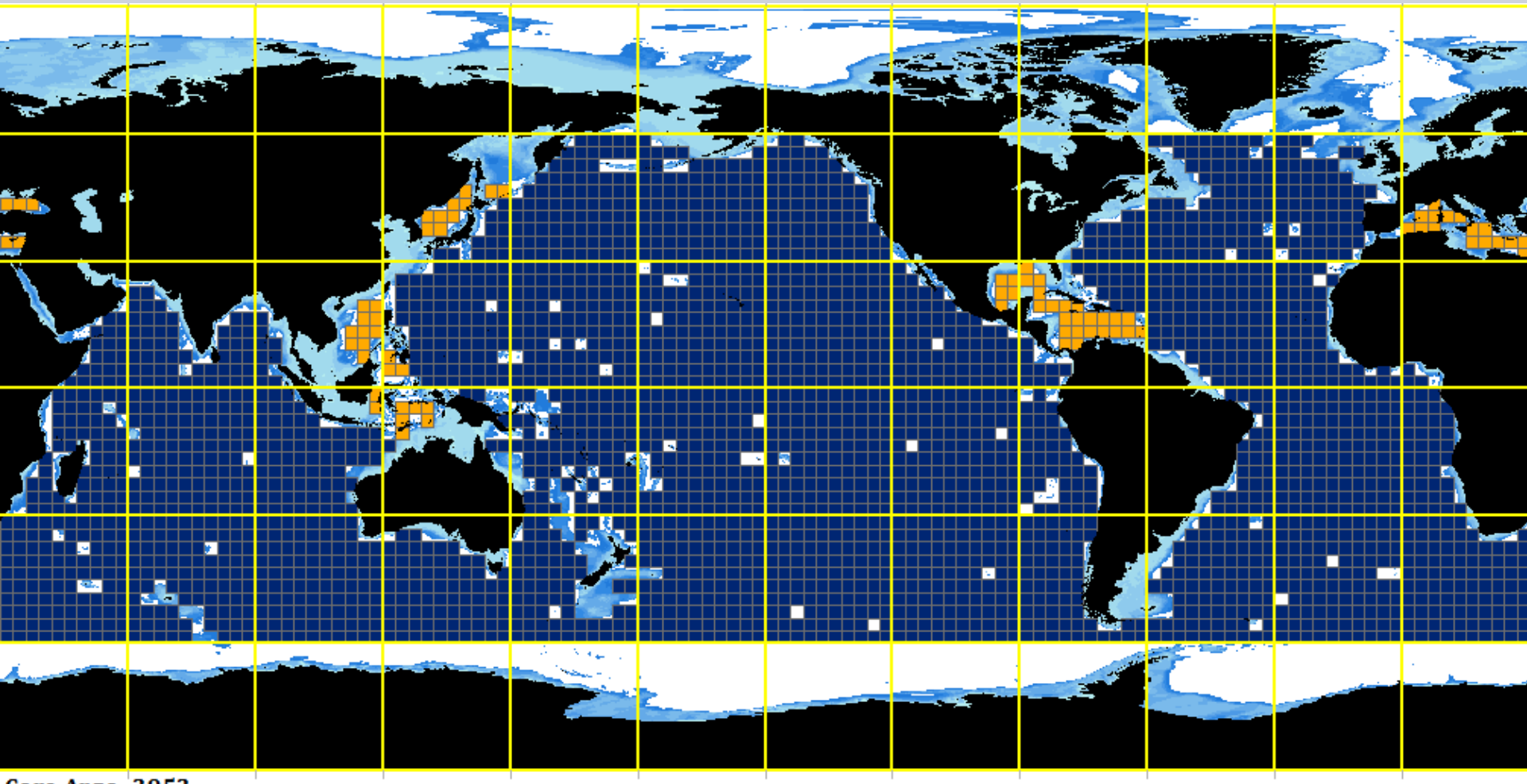
Argo Design from Original to Global

Argo TC

AST#14

March 2013. Wellington

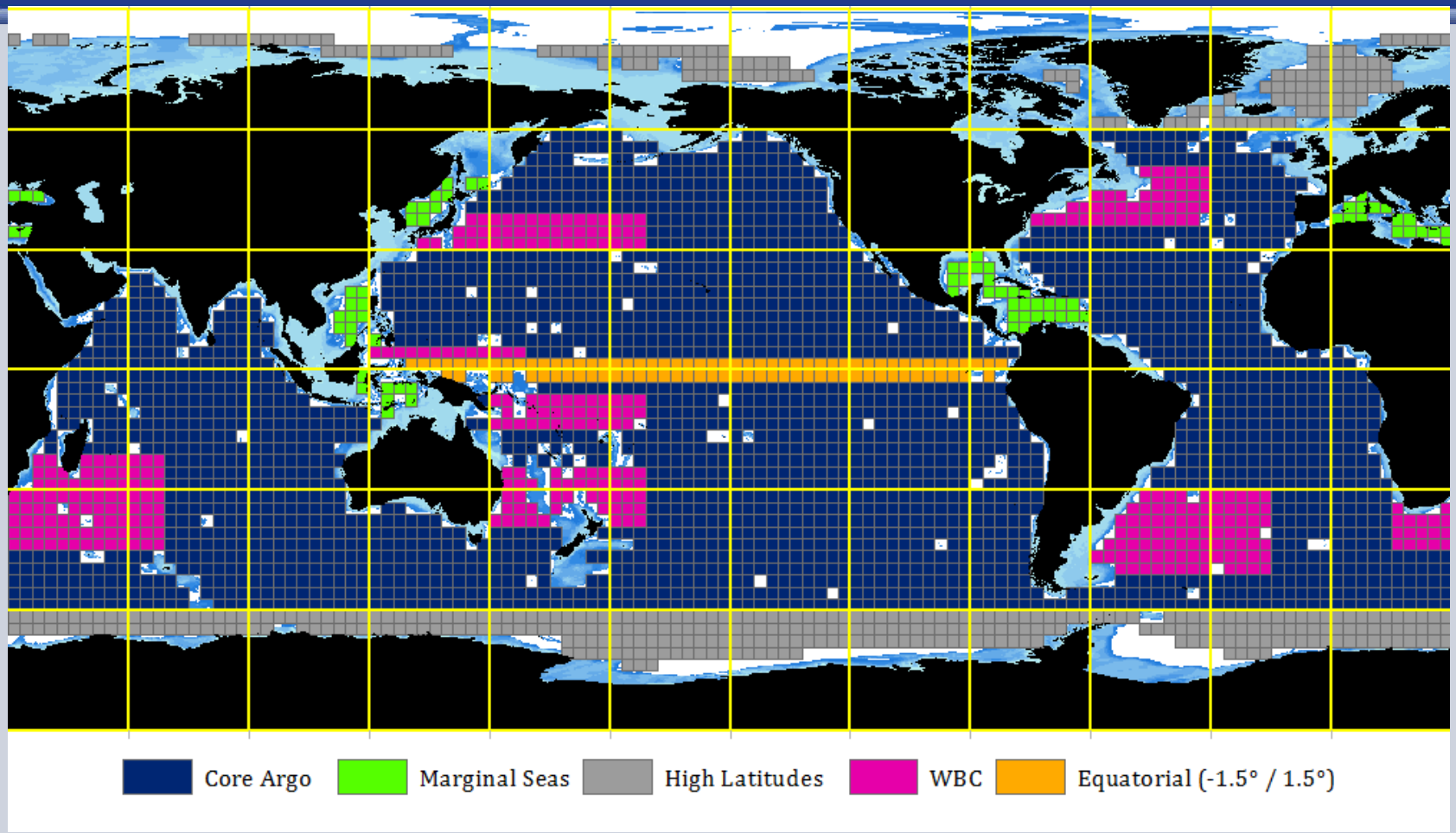
Original design: ~3000



Core Argo: 2952
Marginal Seas: 81

Can be improved in some coastal areas (comparison grid/bathymetry was strict). Some discontinuities to be smooth ("circulation")

Potential enhancement following ASW4 inputs



Original (Argo x 1)
Marginal Seas (x2)
WBC (x 2.25)
Equatorial Pac. (x1.5)
High Latitudes (x1)

Marginal Seas

- (Argo x 2) everywhere ?
- If yes then **160 floats required**

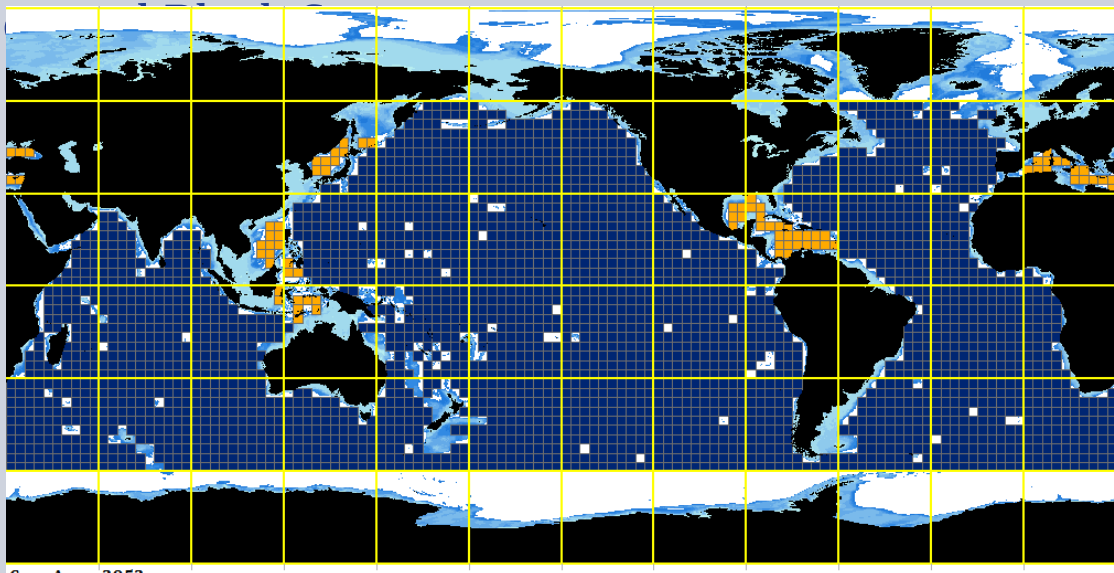
- Norwegian Sea (High Latitude) x1 or x2 ?

- 3°x3° and 2000 m not adapted everywhere (1000m ?)

- No feedback beyond Med. S
- Priorities ?

Floats are operating in:
Med Sea
Black Sea
Gulf of Mexico
Sea of Japan
Norwegian Sea
South China Sea

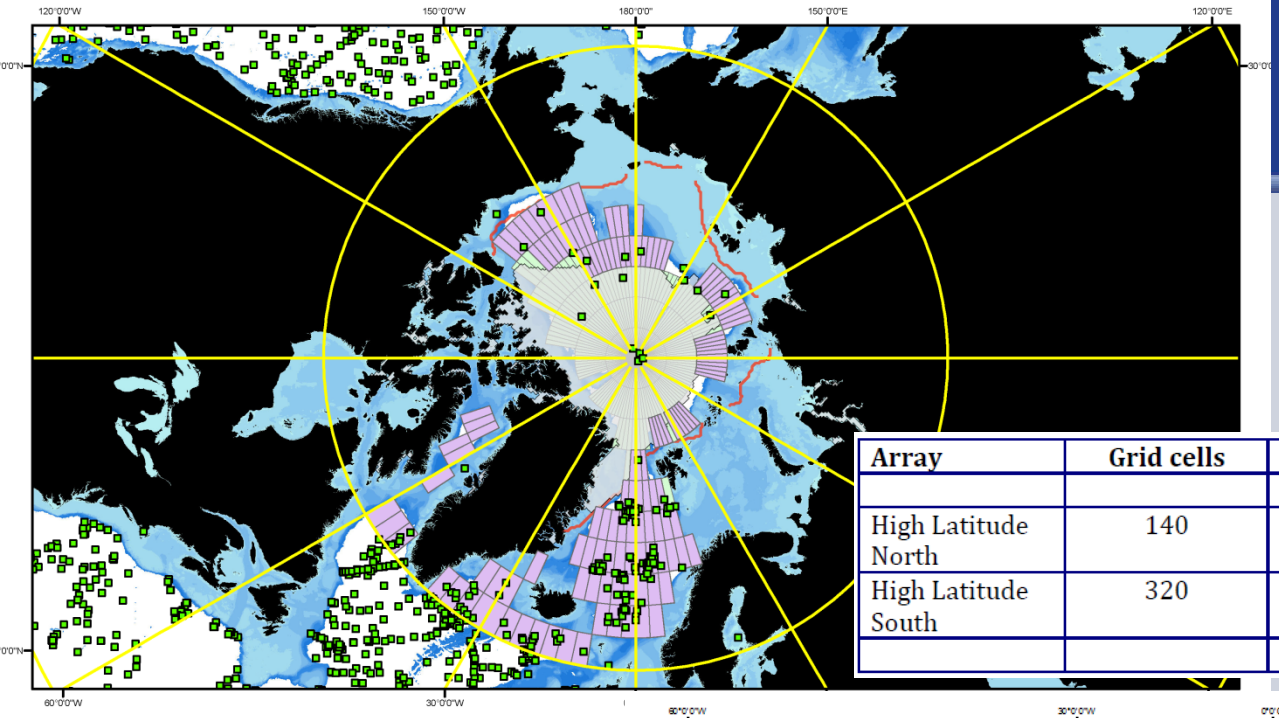
Floats are rarely deployed in:
Caribbean Sea
Baltic Sea
Baffin Bay (summer only)
Celebes Sea
Red Sea
Sea of Okhotsk (summer only)
Mozambique Channel
...



Core Argo: 2952
Marginal Seas: 81

High Latitudes

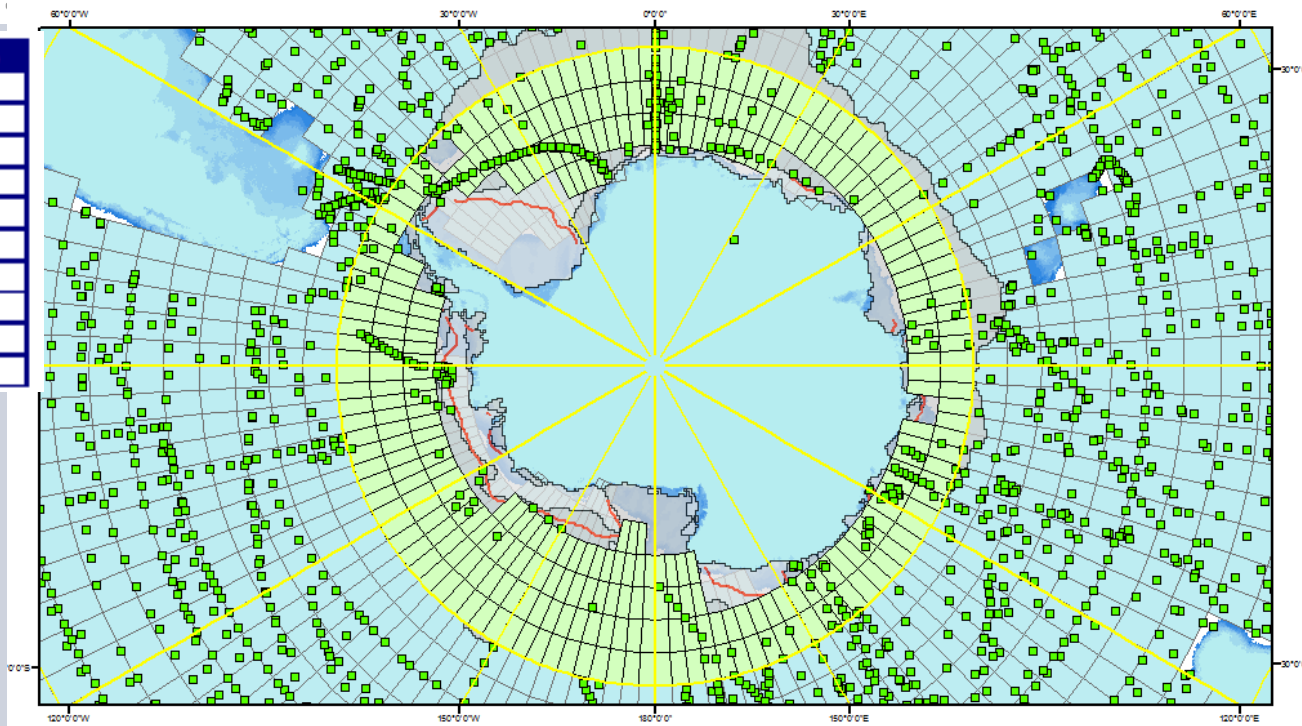
(Argo x 1) North ?
(Argo x 1) South ?



Array	Grid cells	Density coef.	Total	ASW4
High Latitude North	140	1	**140**	**300**
High Latitude South	320	1	**320**	**360**
			460	**660**

Latitude	Distance of 1° longitude (km)	Ratio
0	111.307	1
10	109.627	1
20	104.635	0.9
30	96.475	0.9
40	85.384	0.8
50	71.687	0.6
60	55.736	0.5
70	38.182	0.3
80	19.391	0.2
90	0	0

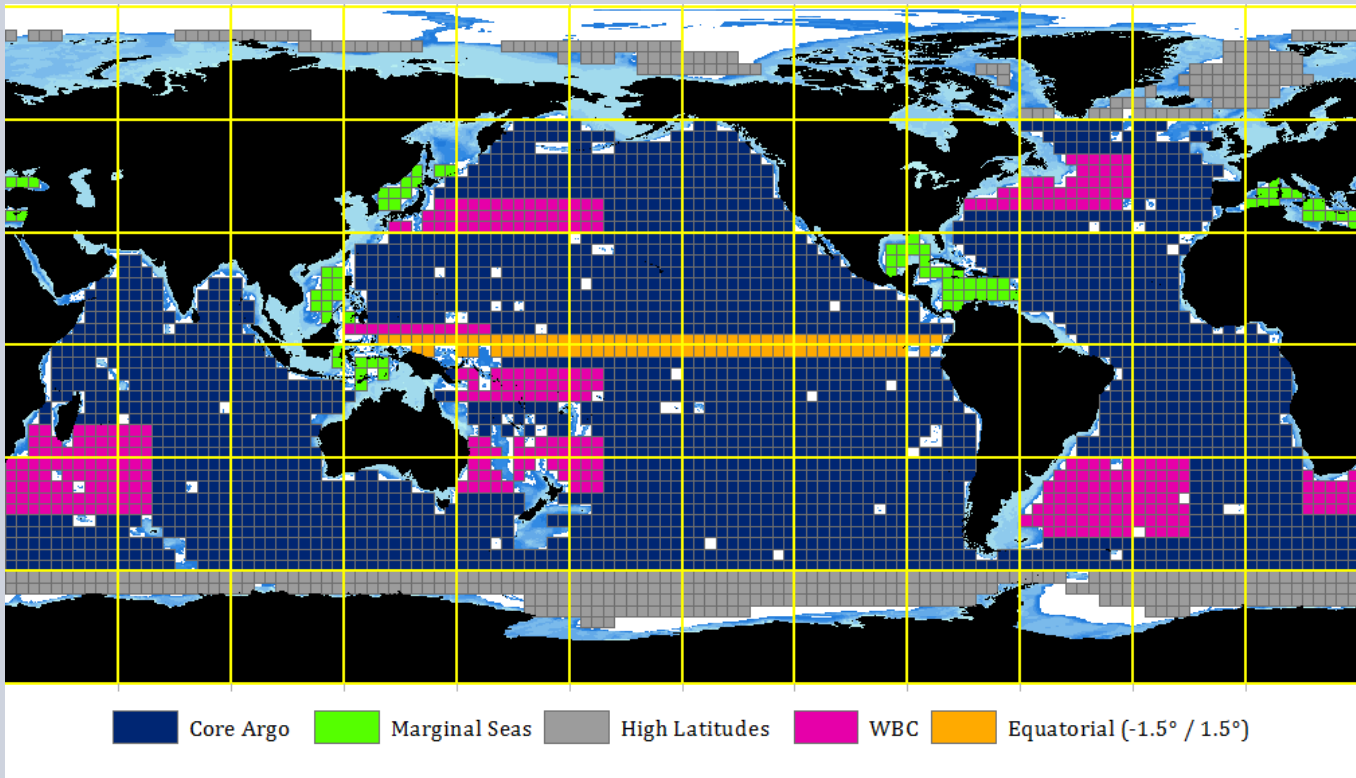
- 3°x3° not adapted at high lat.
-Operational capacities limited
-Lifetime weak



WBC and Equatorial regions

- Clear design, clear target (Argo x 2.25)
- 500 floats increase from "Original Argo"

- Equatorial Pacific (Indian, Atlantic ?) 46/18/17 floats required



Summary of requirements

Array	NB	density	total	Increase
Original	2952	1	2952	0
North	140	1	140	140
South	320	1	320	320
HL Total			**460**	**460**
Aghulas	110	2.25	247.5	137.5
East Aust Cur	45	2.25	101.25	56.25
Solomon Sea	35	2.25	78.75	43.75
Mindanao	13	2.25	29.25	16.25
Kurioshio Ext	49	2.25	110.25	61.25
Brazil/Malvinas	88	2.25	198	110
Gulf stream	46	2.25	103.5	57.5
WBC Total	**386**	**2.25**	**868.5**	**482.5**
Eq. Pac	**92**	**1.5**	**138**	**46**
Eq. In	*36*	*1.5*	*54*	**18**
Eq. At	*34*	*1.5*	*51*	**17**
Med Sea	18	2	36	36
Black Sea	3	2	6	6
Sea of Japan	8	2	16	16
Gulf/Caribb.	*29*	2	58	58
Okhotsk	*2*	2	4	4
South China Sea	*10*	2	20	20
Celebes/Banda Sea	*11*	2	22	22
Marginal Seas Total	**81**		**162**	162
TOTAL			**4685.5**	**1185.5**

Conclusion:

Global Argo = N floats

- Study to be continued according to AST recommendations and users community feedback (e. g. GODAE).
- Need to consider float lifetime and residence in sub-arrays to refine the yearly deployment rate
- AST to clarify the “Global Array” definition and set priorities globally (voluntary base), and for each enhancement.
- Some targets will remain unachieved: can be good in term of communication or not. It can be better to have a “reasonable” target in some cases (2 steps approach).
- If there are some scientific inputs (e.g. scale of eddies) to consider, I can.
- Deep Argo, Bio Argo: It would be good to map targets for these pilot projects