OneArgo – Evolving and extending Argo's missions and data delivery.

Achievements, status and outlook.

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Why OneArgo ?

Earth Energy Imbalance

Ocean heat content

(and sea level via expansion, $Trillion at risk)

Changing water cycle (inferred from salinity)

De-oxygenation, acidification, ecosystem changes, ocean health and sustainability, marine productivity, carbon uptake, cycling and export

Baseline ocean state and monitoring for marine CDR

Prediction – improved performance in Nino indices, remove bias in deep ocean prediction, correct timing of cycles of productivity, and countless other impacts demonstrated through OSEs and OSSEs

What is OneArgo ?

At the OceanObs19 Conference, the OneArgo design was endorsed as an evolution and extension of the original Argo mission.

- ➢ ¼ of the floats would measure T&S to full ocean depth
- ➢ ¼ of the floats would measure 6 BioGeoChemical parameters in addition to T&S
- ➢ The remaining half would continue to measure Core parameters, with geographical extensions to the seasonal ice edge and increased density of coverage in the tropics and western boundaries

Argo has established Mission Teams to oversee the implementation of the Deep, BGC and Polar Missions

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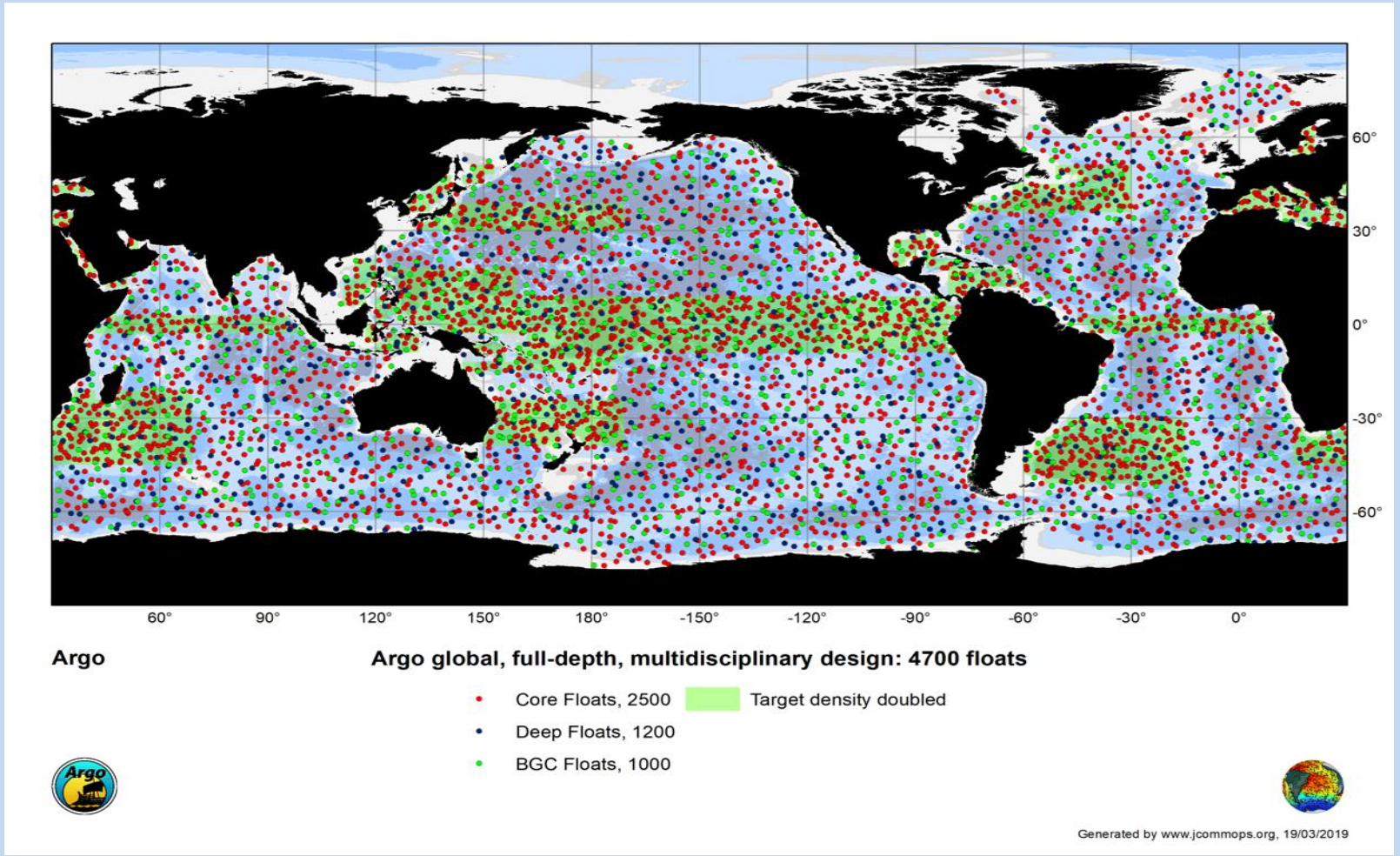
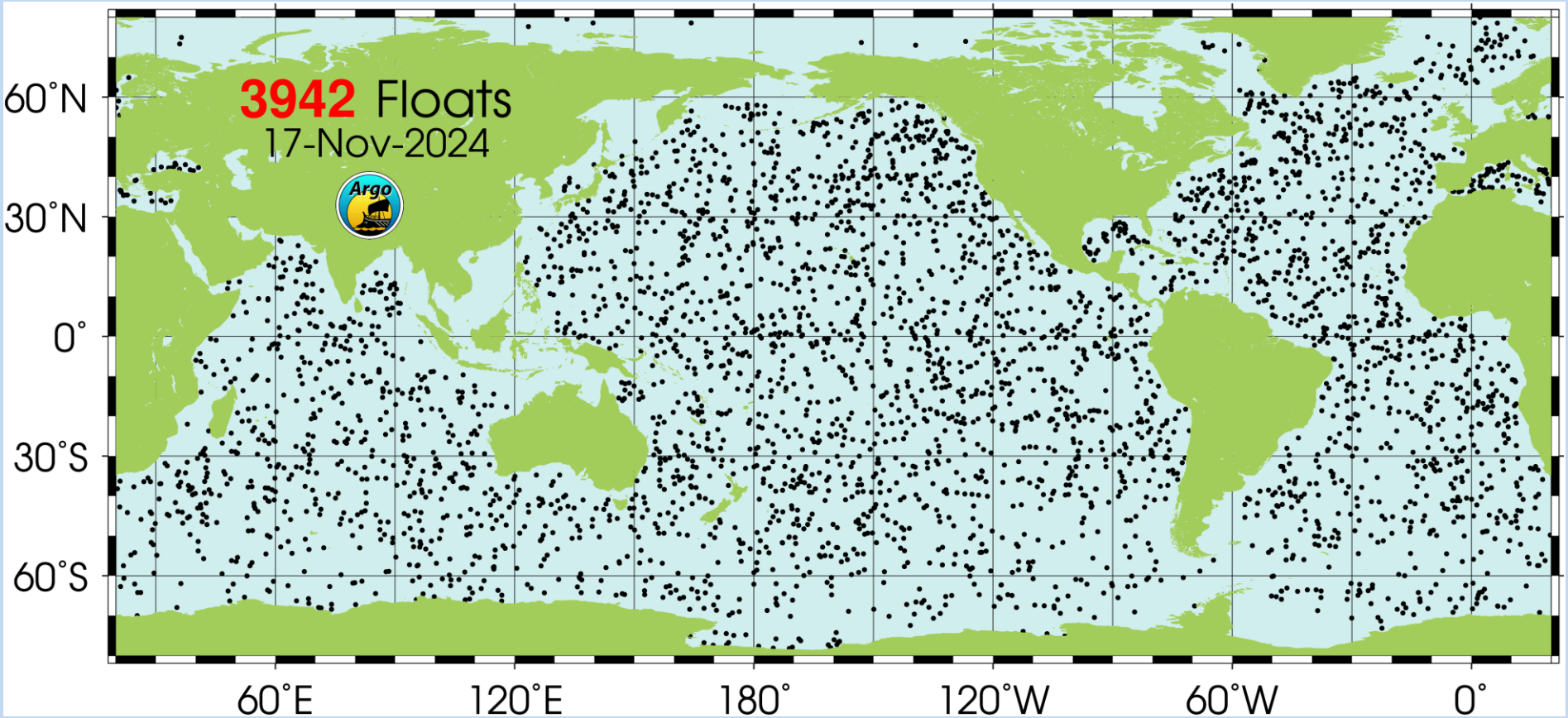


What is the status of OneArgo ?

All floats 3942 active

Core + BGC + Deep

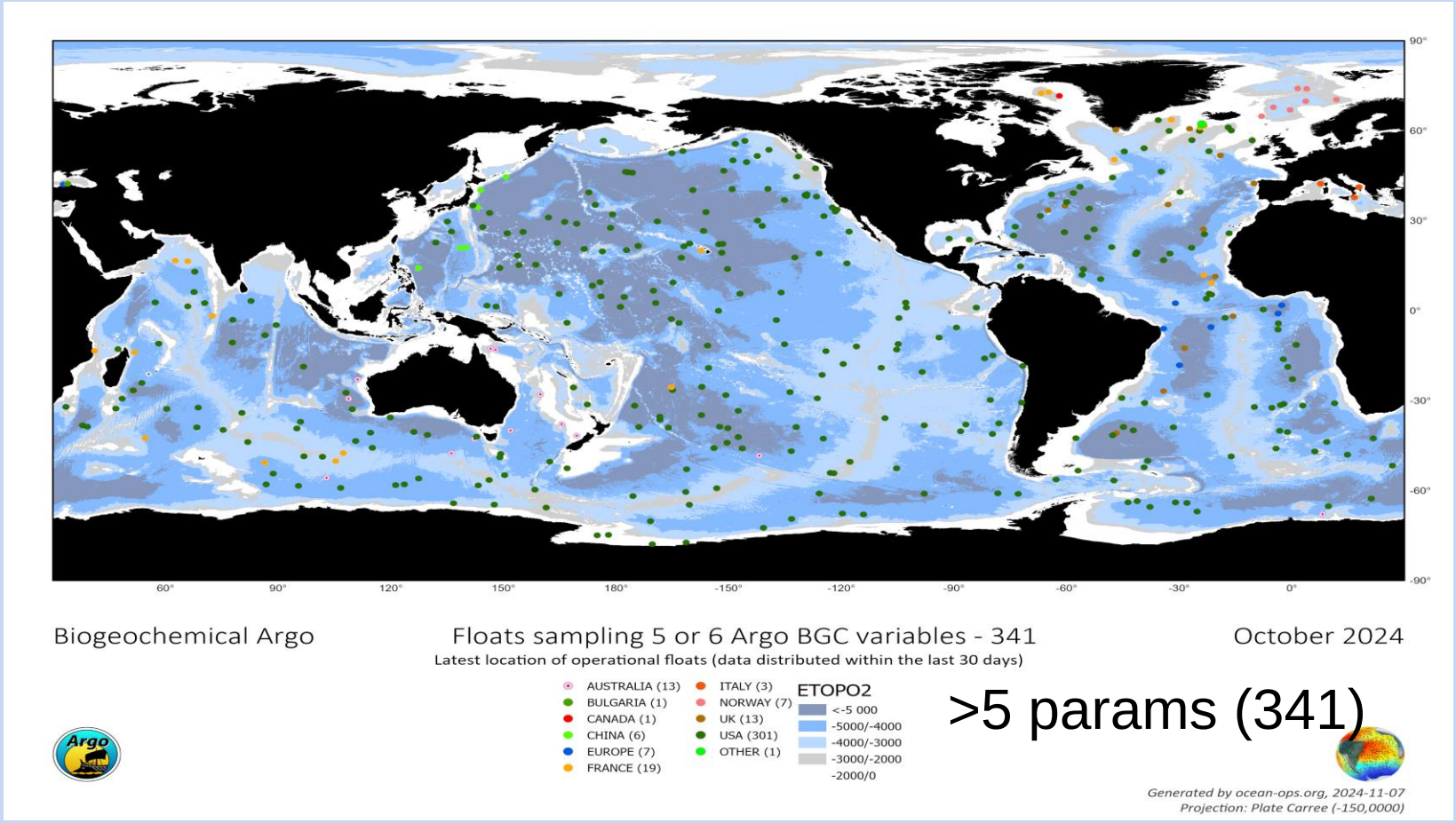


What is the status of OneArgo ?

BGC parameters. 341 floats have 5 or 6 parameters

Oxygen (694), Nitrate (382) , pH (391)

Chlorophyll fluorescence (478), Backscatter (478), Irradiance (139)



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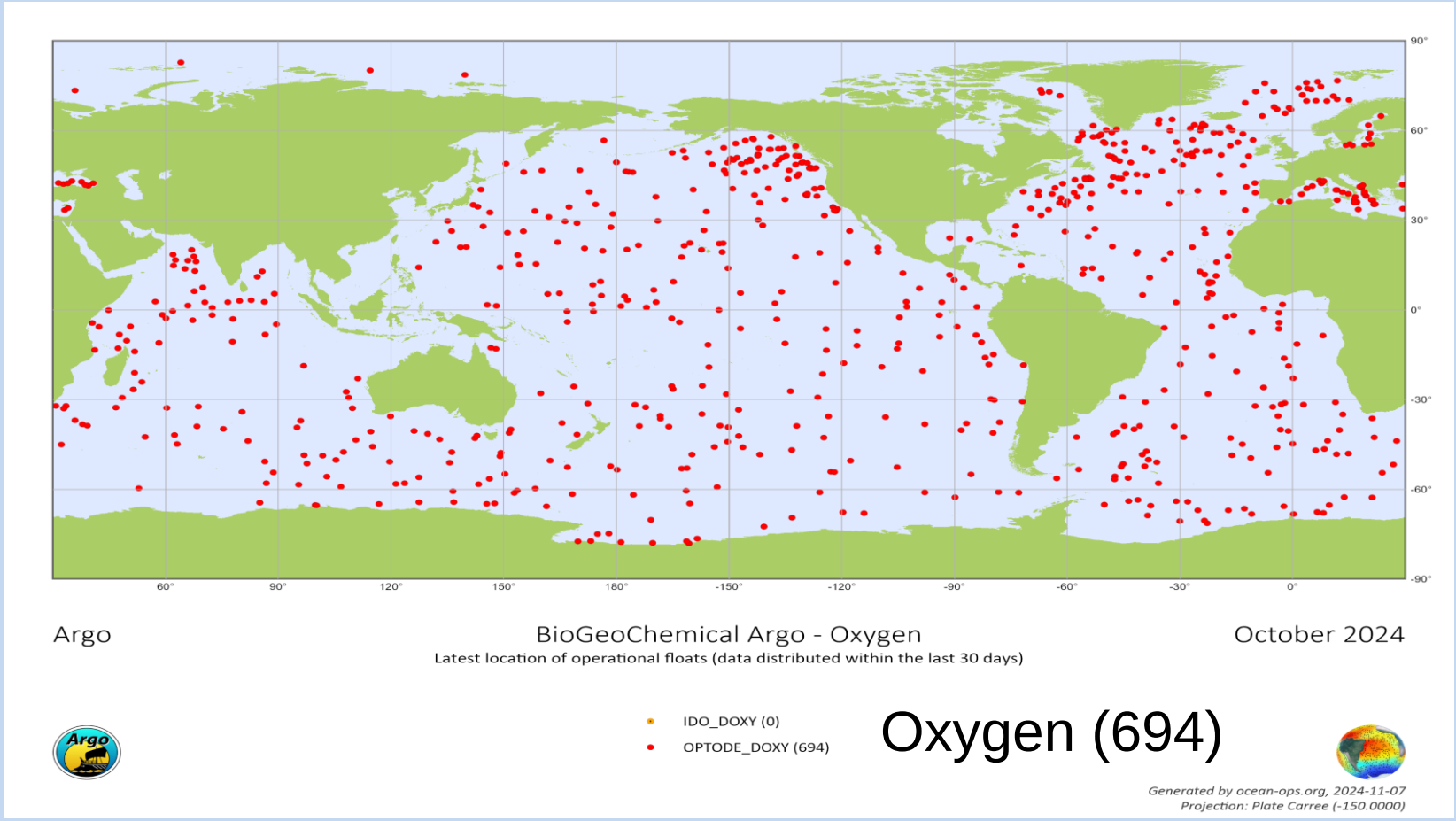
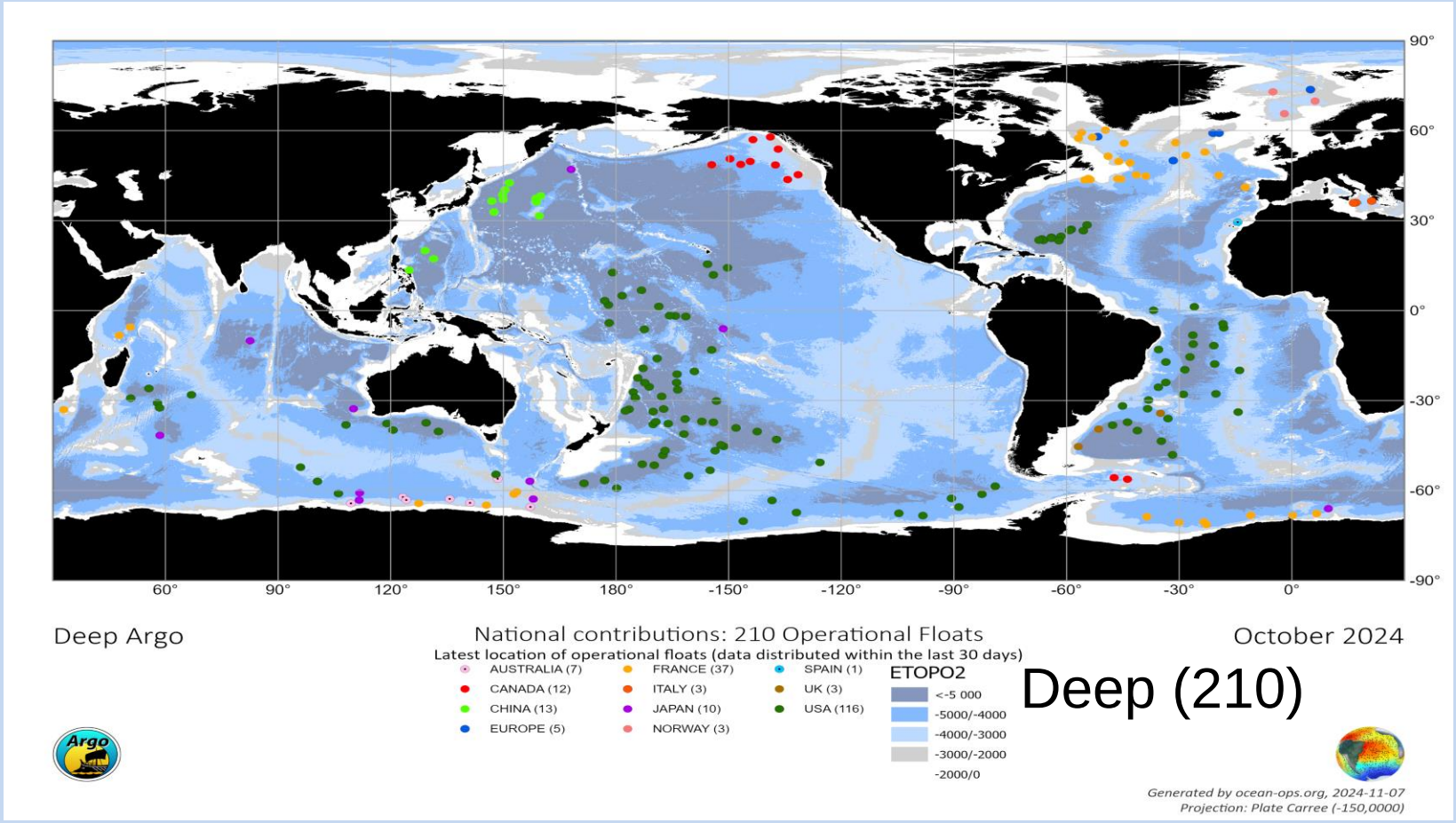


What is the status of OneArgo ?

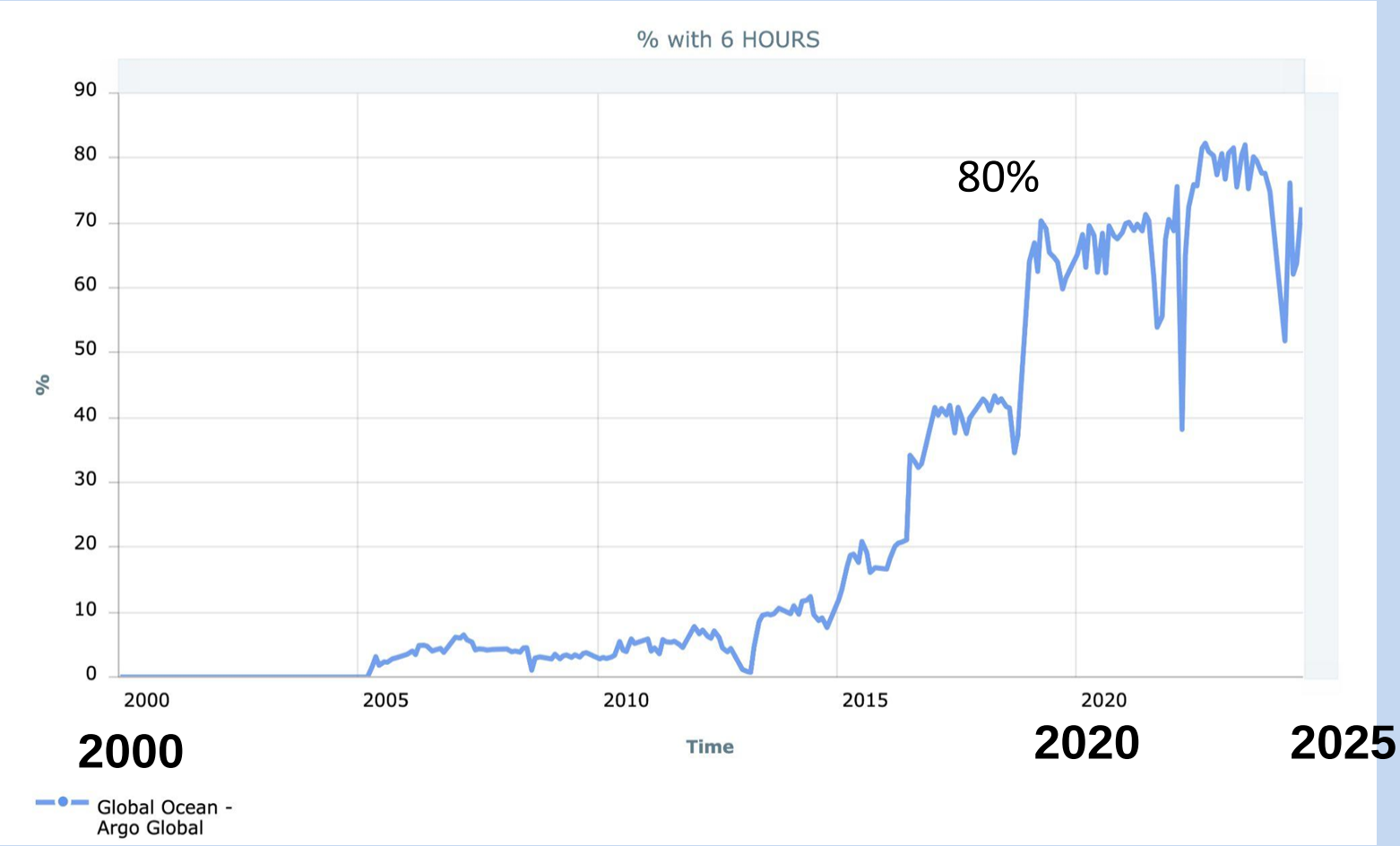
Deep floats 210 active



Technical advances

Latency between measurements and data distribution is being continually reduced

Percent of T&S data distributed within 6 hours



Technical advances

The quality of measurements distributed in real-time is improved (biases removed)

For the latest generation of floats, half of the profiles have the shallowest measurement in the upper 2 metres of the ocean to better serve air-sea and mixed-layer requirements

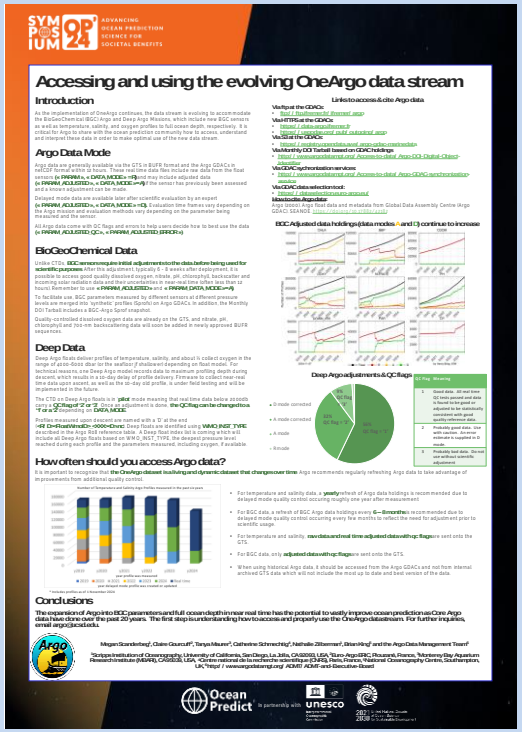
Argo has taken steps to avoid fixed-time-of-day sampling that could introduce diurnal bias in upper ocean measurements

Interaction with data users

BGC and Deep data are ready for operational use by any model able to make use of them – Argo is eager to discuss data distribution and measurement uncertainty with users

We have a poster about accessing and using the evolving OneArgo data stream

- Find out more about Deep and BGC data
- Find out more about Real-Time and Delayed-Mode data quality
- Find out why and how often you might want to refresh your data holdings



Interaction with data users

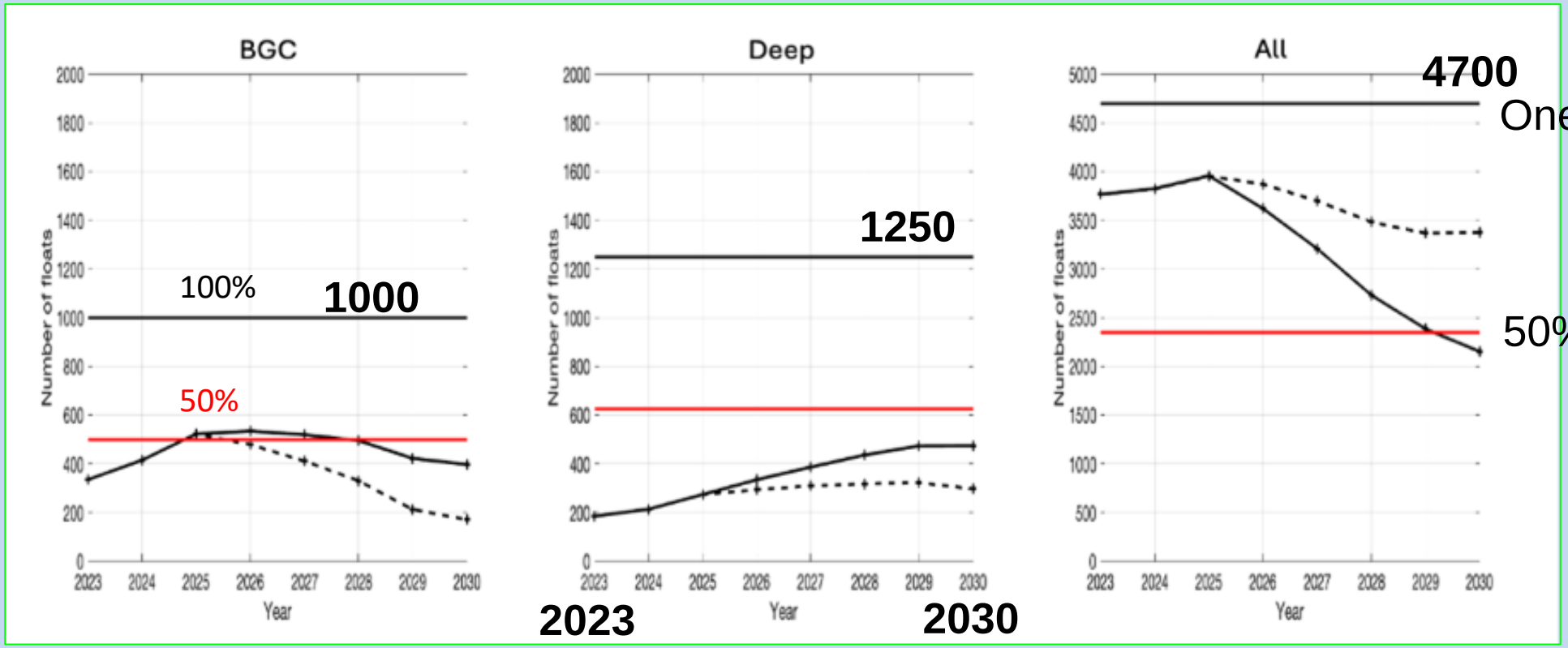
We have engaged with collection curators and operational groups to **ensure faster refresh of collections** with Delayed Mode data and use of grey list and QC flags. Direct engagement with UK's EN4 and Copernicus Marine Service.

Through the UN Decade, Argo is engaged in co-design with complementary observing networks that extend into boundary and coastal regions. While there are competing requirements to optimise for different use cases, Argo seeks interactions on how to improve its new design.

Future array size under different resource scenarios

Dotted: Business as Usual - continuing what we are doing now (based on poll of national programs)

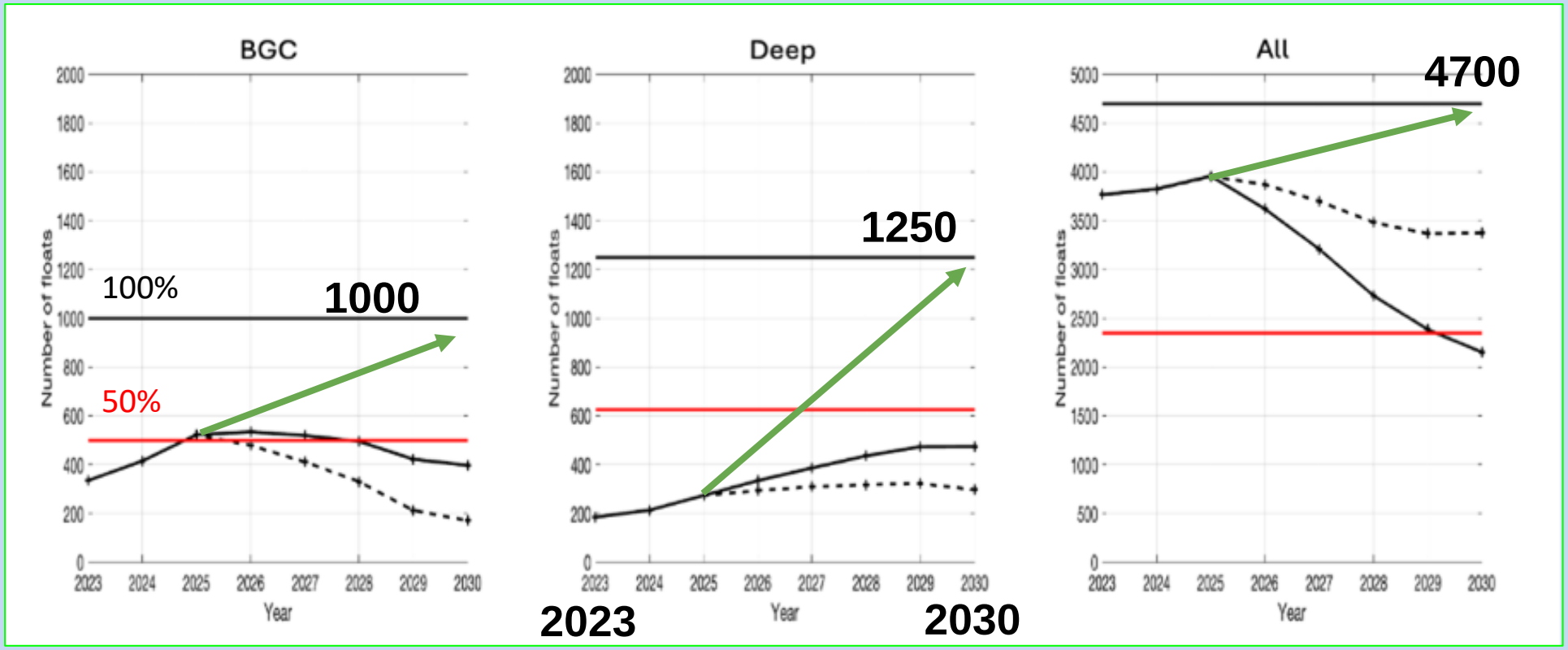
Solid: Preserve capability in programs and commercial suppliers – distribute present resources over OneArgo missions



Future array size under different resource scenarios

Green arrows:

Full funding of OneArgo requires a 3x increase in resources , ~ USD 100M per year globally between all international partners



Summary

- OneArgo has solved the majority of technical problems and is ready for full implementation of BGC and Deep Missions
- BGC and Deep data are ready for operational use by any model able to make use of them – Argo is eager to discuss data distribution and measurement uncertainty with users
- OneArgo is not yet funded - Data users can assist by demonstrating the impact OneArgo will have on science and services, and by advocating for its value to both users and supporting agencies.