



Australia's National Science Agency

Argo Australia: achievements and outlook

An update for 2023

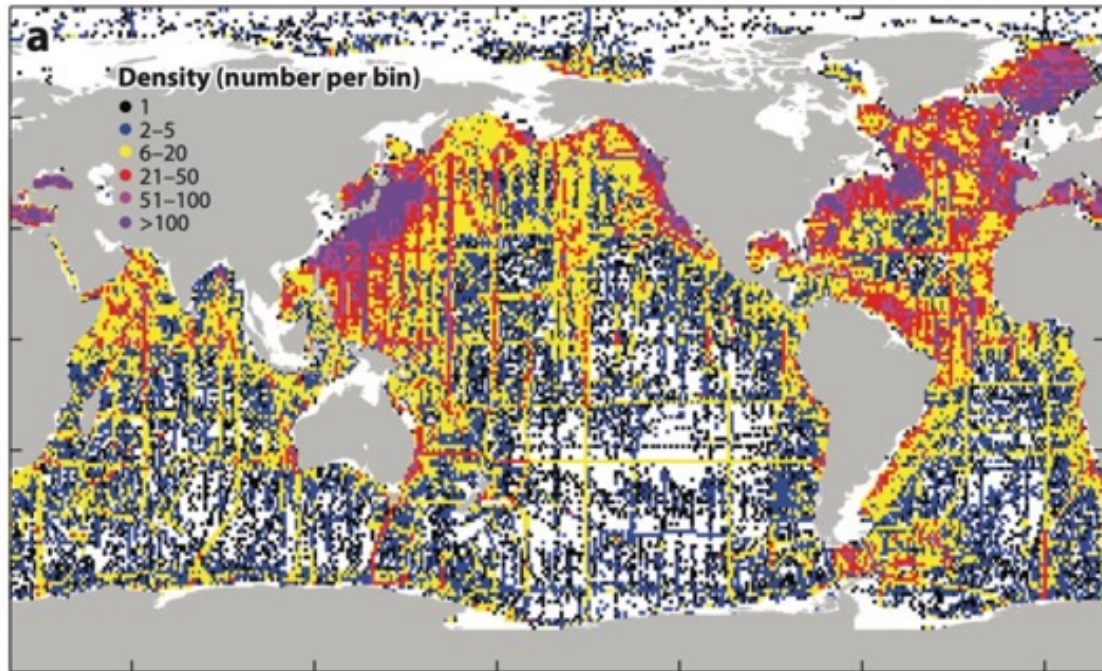
Gabriela S.Pilo, on behalf of the Argo Australia team



ACHIEVEMENTS

What has Argo achieved?

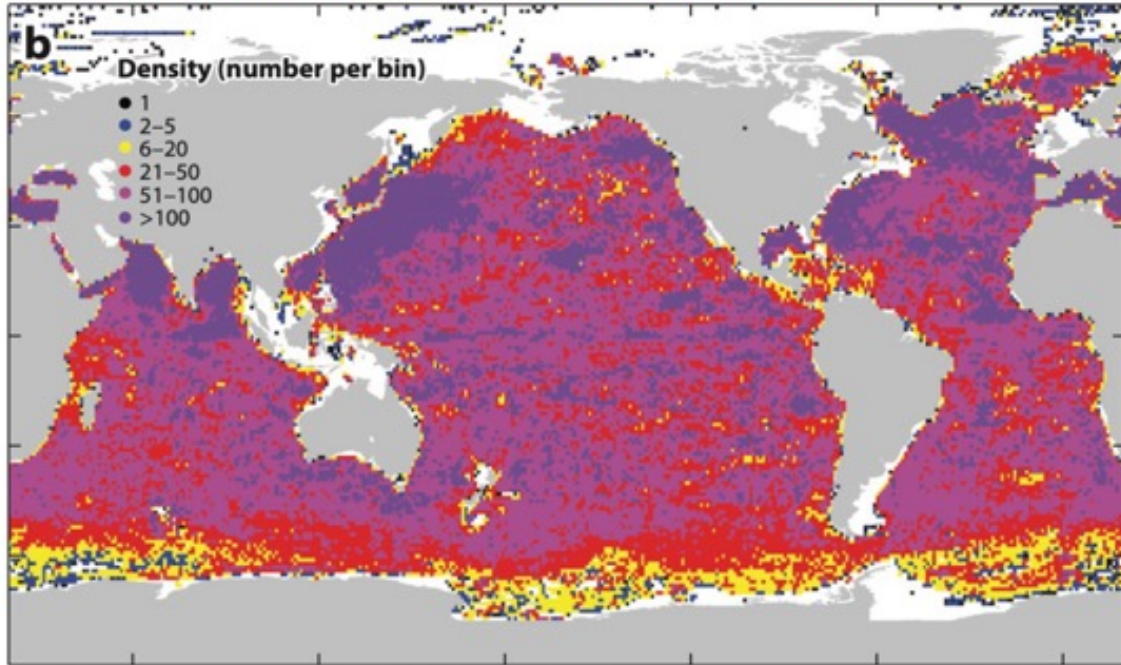
One hundred years of ocean observing, preceding 2018, delivered 594,285 profiles (from WODB2018) of subsurface temperature and salinity to a depth of 1000 m or deeper from shipboard measurements (below).



Source: <https://doi.org/10.1146/annurev-marine-022521-102008>

What has Argo achieved?

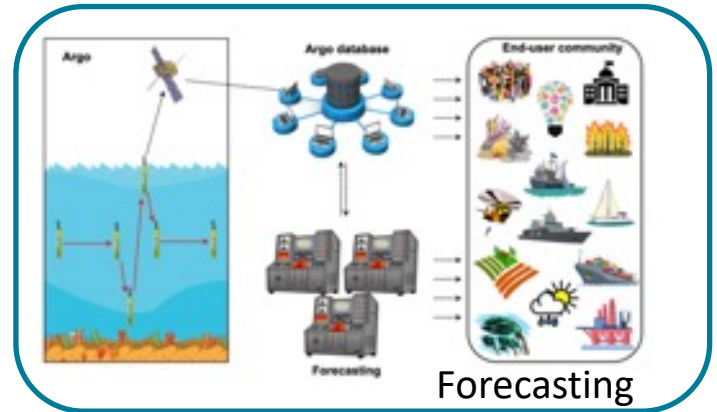
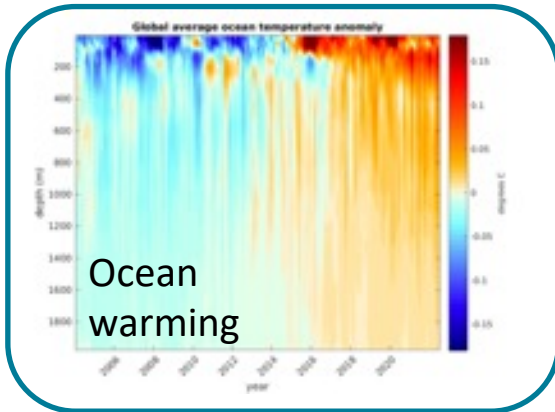
Up until February 2021, Argo delivered 2,385,052 profiles of subsurface temperature and salinity to a depth of 1000 m, or deeper.



Source: <https://doi.org/10.1146/annurev-marine-022521-102008>

Most impactful Argo achievements

- Quantifying deep ocean warming
- Enabling ocean forecasting and seasonal prediction



Argo is part of the Global Ocean Observing System

The quality of Argo data critically depends on other ocean observing platforms.



Argo Australia's achievements

- Sustained success by maintaining strong partnerships with IMOS, CSIRO, Defence, AAPP, BoM, UTAS
- Deployed over 1100 floats
- Manage ~10% of the global array, including ~350 operational floats

Argo Australia's achievements

- Sustained success by maintaining strong partnerships with IMOS, CSIRO, Defence, AAPP, BoM, UTAS
- Deployed over 1100 floats
- Manage ~10% of the global array, including ~350 operational floats
- On average our floats return ~250 profiles

DAC	Country	Number of floats deployed	Average number of profiles per float	Average years of survival
AOML	USA	7968	194	4.5
BODC	UK	785	147	3.6
Coriolis	Europe	3291	152	2.8
CSIRO	Australia	1058	253	5.6
JMA	Japan	1830	138	2.7
MEDS	Canada	606	123	3.1
CSIO/NMDIS	China	535	158	3.0
INCOIS	India	476	180	3.5
KMA/KORDI	Korea	361	158	3.7

Statistics are based on “dead” floats – that haven’t reported for a year. Years and number of profiles differ because some groups profile more/less frequently



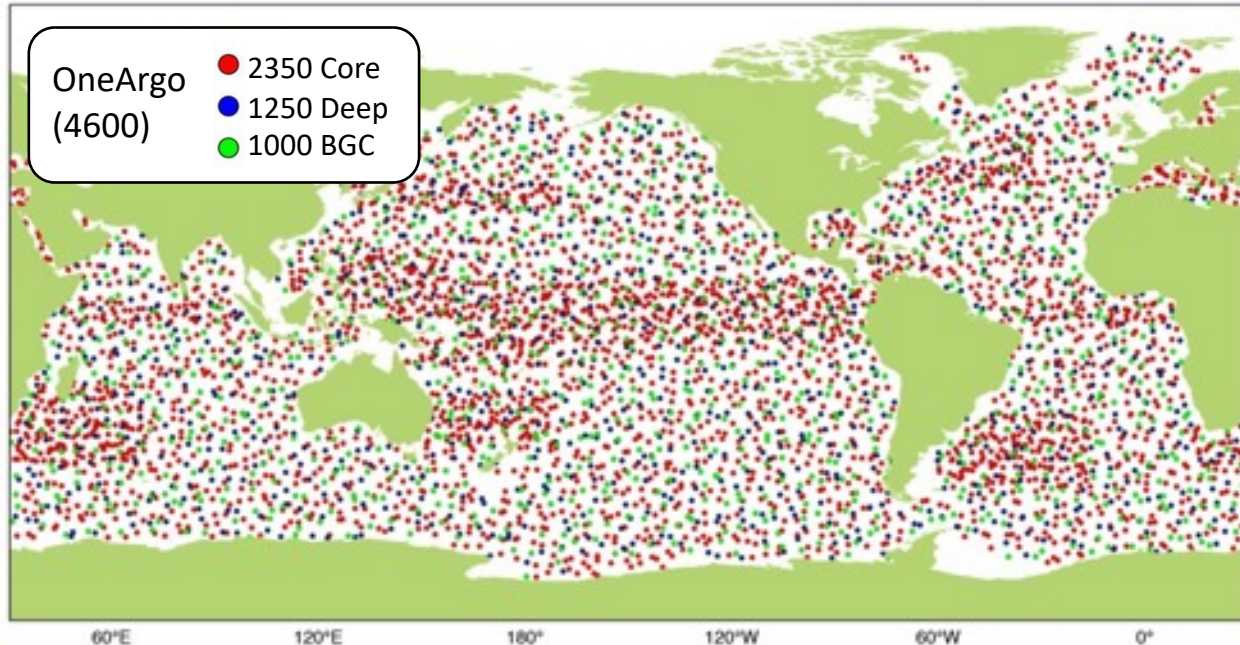
OUTLOOK

International Argo Program

- Many regional Data Acquisition Centres
- Two Global Data Acquisition Centres
- Core Argo + pilot projects → OneArgo
- OneArgo costs ~3 times Core Argo

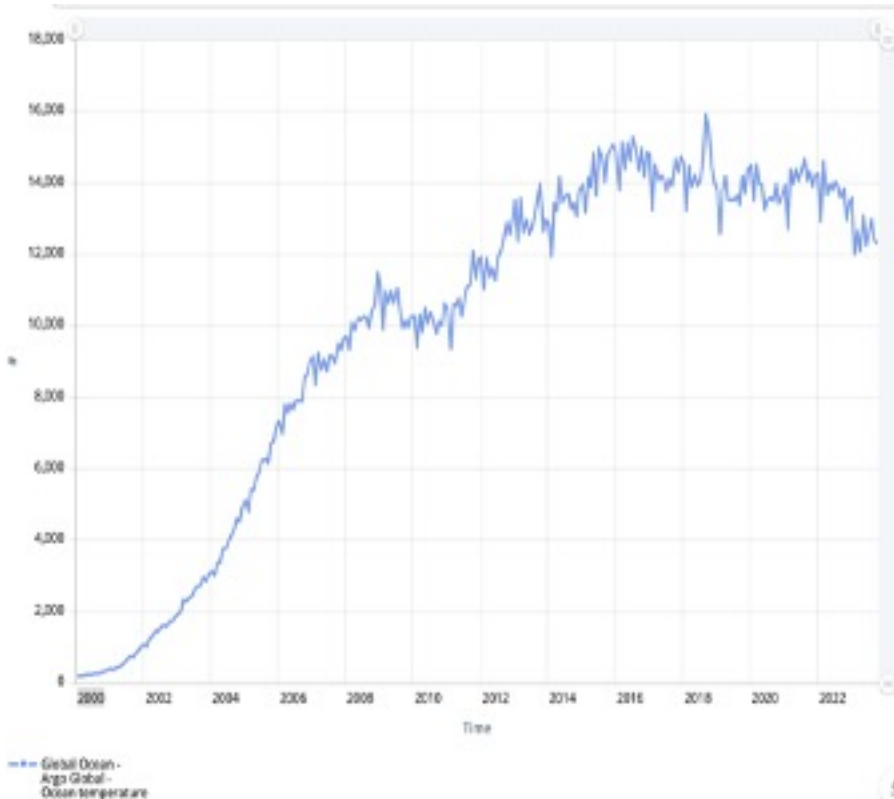
OneArgo

- truly global
- full depth
- multidisciplinary



Progress towards OneArgo

(showing number of profiles per day)



As BGC and Deep float deployments have increased, Core deployments have declined, resulting in an overall decrease.

Flat budgets + developing new capabilities + facing COVID inflation

Progress towards OneArgo



Red arrow pointing to the map: Total = 3821/4700 (81%)

Green arrow pointing to the map: Deep = 198/1250 (16%)

Green arrow pointing to the map: Biogeochemical (≥ 5 params) = 291/1000 (29%)

Argo National contributions - 3821 operational floats Latest location of operational floats (data distributed within the last 30 days) September 2023

- | | | | | |
|-------------------|-----------------|--------------------|---------------------------|--------------|
| • AUSTRALIA (291) | • FINLAND (6) | • IRELAND (15) | • NORWAY (47) | • UK (138) |
| • BULGARIA (8) | • FRANCE (309) | • ITALY (88) | • PERU (1) | • USA (2082) |
| • CANADA (165) | • GERMANY (226) | • JAPAN (182) | • POLAND (10) | • OTHER (2) |
| • CHINA (57) | • GREECE (5) | • NETHERLANDS (36) | • KOREA, REPUBLIC OF (19) | |
| • EUROPE (64) | • INDIA (22) | • NEW ZEALAND (14) | • SPAIN (14) | |

Generated by ocean-ops.org, 2023-10-01
Projection: Plate Carree (1:150,000)

Currently, the Argo system is in net decline

A critical time for Argo

- After nearly **10 years of work** we have developed the **technology to implement the OneArgo design**, including attracting the interest and investment of our commercial suppliers
 - The main **impediment** is the required **large** increase in **sustained funding** required (2.5-3 times 'core Argo')
 - We have a ~5 year window to move into implementation mode... otherwise we will lose interest of our suppliers and **continue to degrade core coverage**
- Argo seeks assistance from the community to demonstrate impact and to advocate for the Program.

Summary

- Argo Australia maintains about 10% of the global array.
- Floats managed by Argo Australia outperform floats managed by every other country.
- Argo is the only observing platform that returns measurements of subsurface ocean properties in real-time.
- OneArgo is an ambitious new design. But it requires a 2-3 times increase in funding that hasn't been realised.
- Please advocate for Argo to help us realise our vision, so we can keep delivering data to support your research applications.

Thank you
Questions?

CSIRO Environment

Dr. Gabriela Semolini Pilo
gabriela.semolinipilo@csiro.au

Dr. Peter Oke
peter.oke@csiro.au

