

# Towards operational biogeochemical prediction in the northwest Pacific

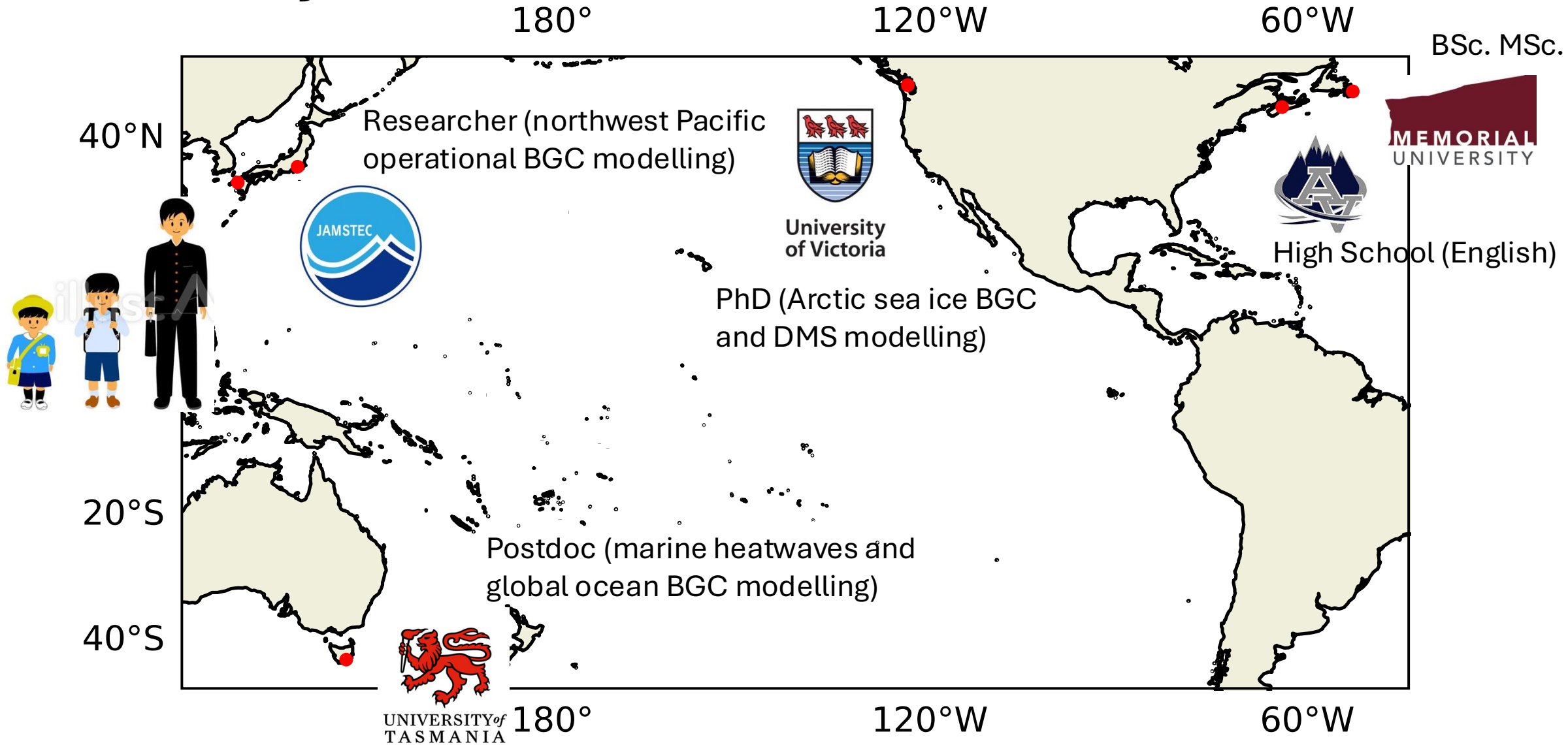
Hakase Hayashida

Researcher at the Japan Agency for Marine-Earth Science and Technology  
(JAMSTEC)

MEAP-TT meeting

2024.10.02

# About myself



# Projects involved

- SCOR WGs
  - Clce2Clouds (polar air-sea-ice-biogeochemical interaction)
  - DMS-PRO (global database of DMS(P) production and removal rates)
- OceanPrediction (Western Pacific and South and East Asia)
- Habitable Japan

Grant-in-Aid for Transformative Research Areas (A) (2024–2028)

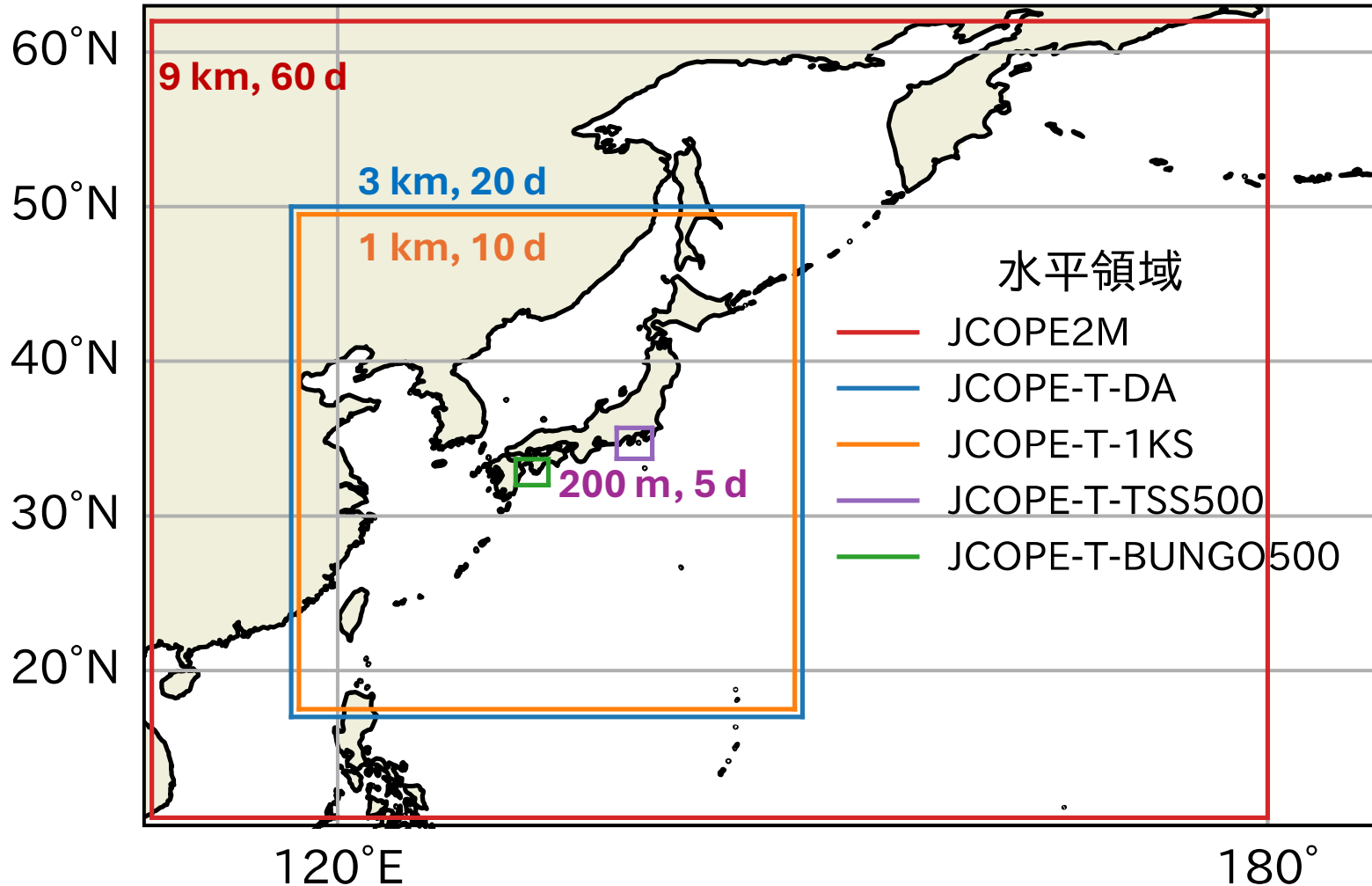
## **Habitable Japan**

**Sustainability of atmospheric and oceanic environment as a survival basis of island country Japan**

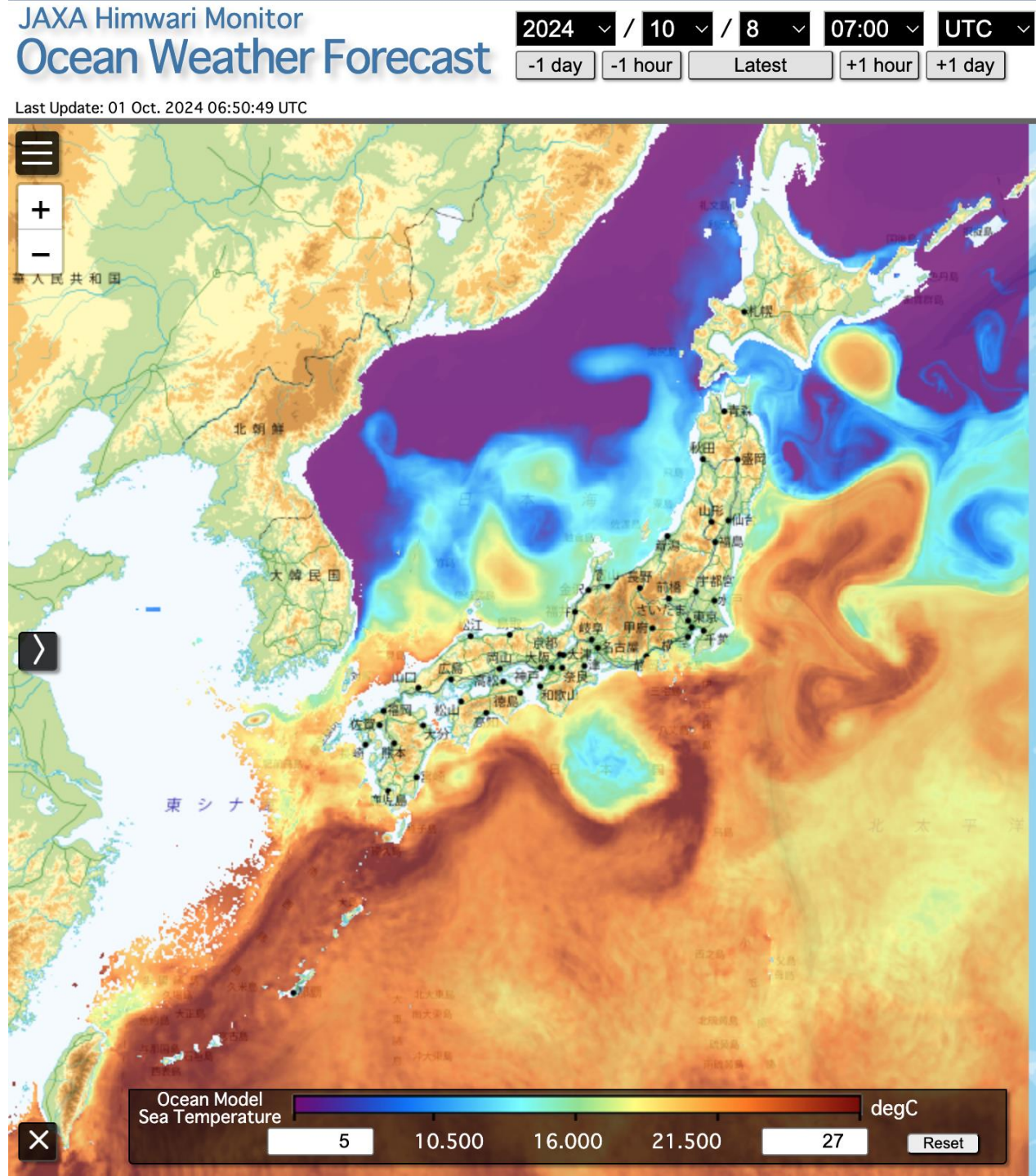
# Japan Coastal Ocean Predictability Experiment

JCOPE routinely provides short-term ocean current prediction focused on the Kuroshio using several configurations.

Model: based on POM  
Boundary conditions: NCEP-CFSv2, near-realtime river runoff



# Weekly forecast (with JAXA)





# Weekly Blog: Kuroshio-Oyashio Watch



Toru Miyama

The banner features a blue ocean background with a map of Japan on the left. Arrows indicate the flow of the Kuroshio and Oyashio currents. Two fish are shown: a blue fish on the left and a larger silver fish on the right. The text '黒潮' (Kuroshio) is written vertically in red on the left, and '親潮' (Oyashio) is written vertically in red in the center. The main title '黒潮親潮ウォッチ' is written in large black Japanese characters, with 'Kuroshio-Oyashio Watch' below it in yellow and white. The top right corner includes 'Application Laboratory' and the JAMSTEC logo. A dark blue navigation bar at the bottom contains the following links: Home, Kuroshio, Oyashio, Announcement, Papers, and 日本語 (Japanese).

Application Laboratory JAMSTEC

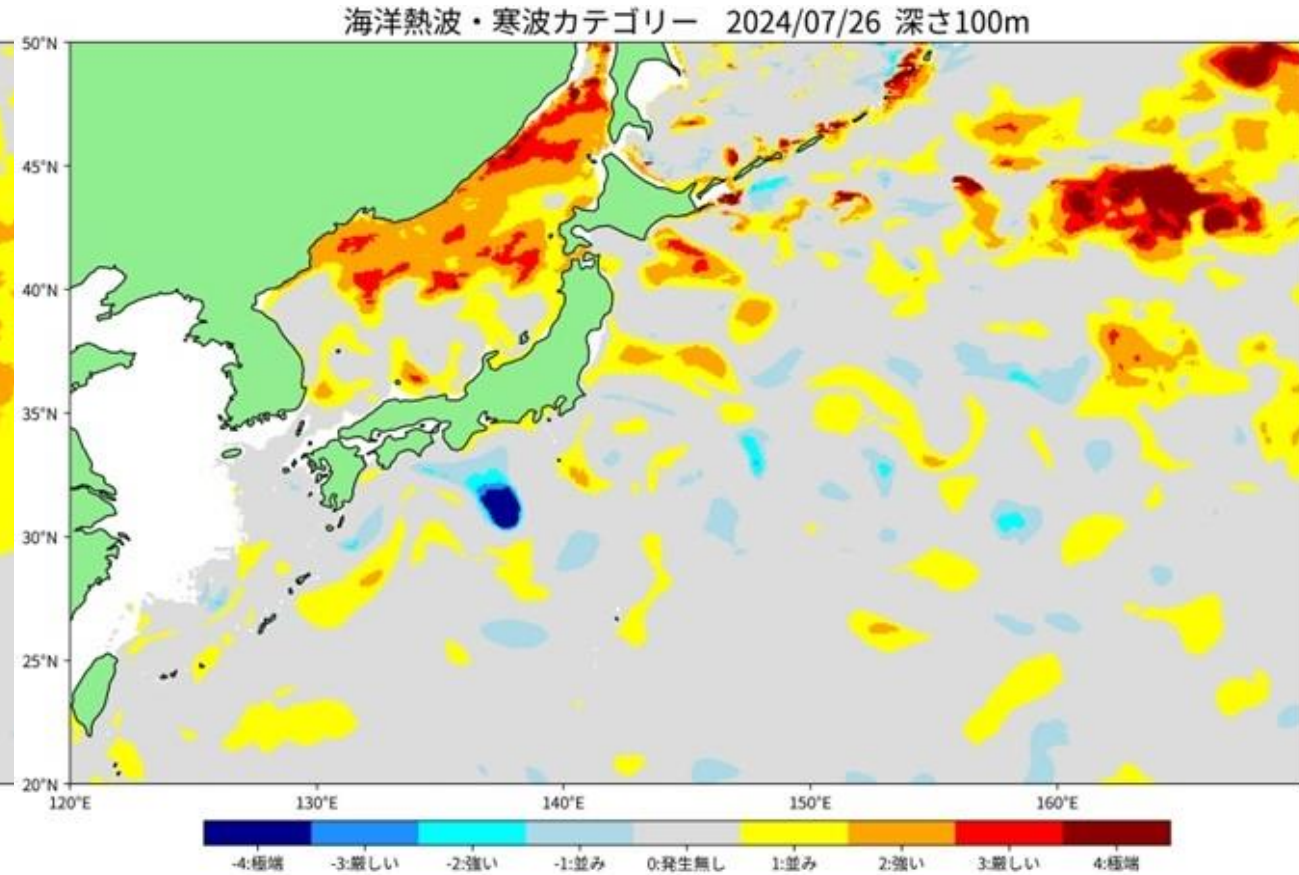
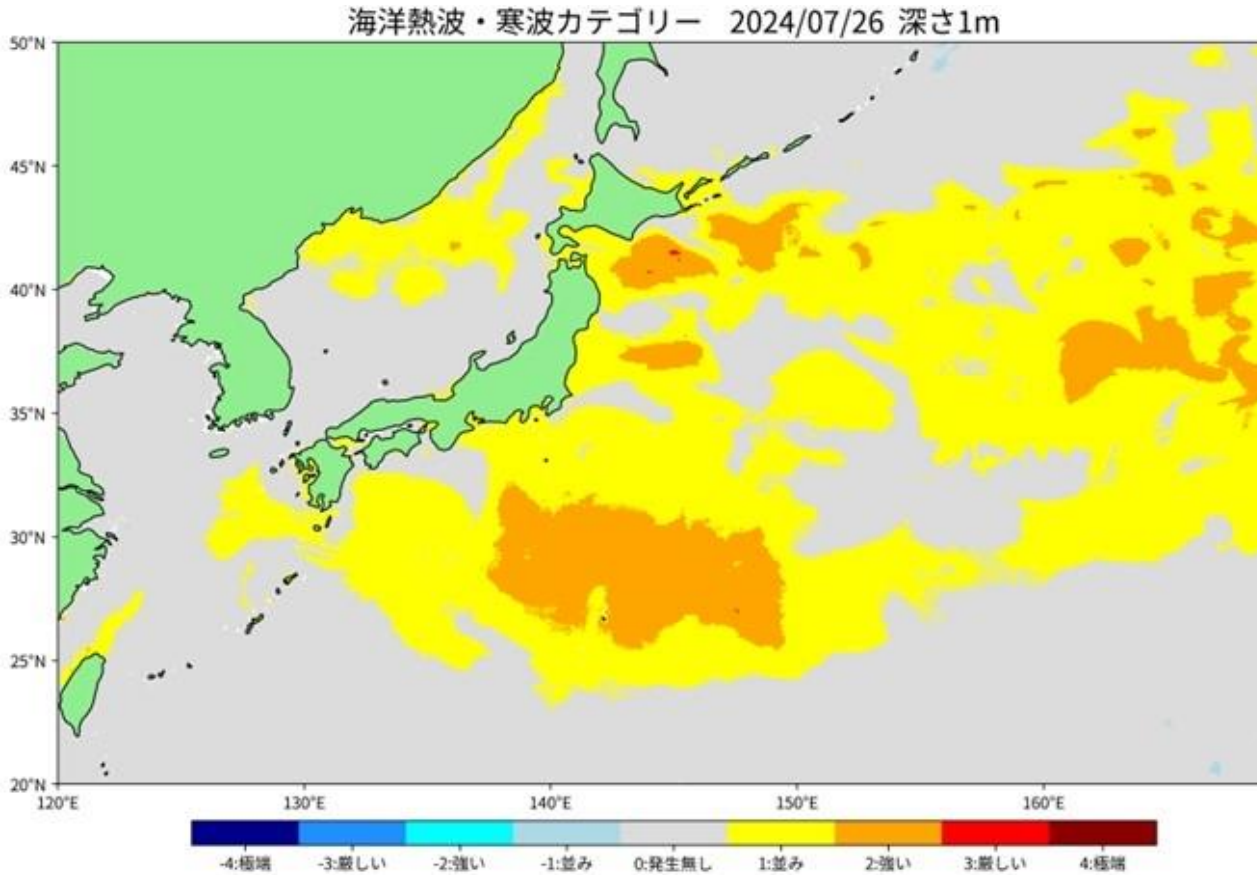
黒潮 親潮

黒潮親潮ウォッチ

Kuroshio-Oyashio Watch

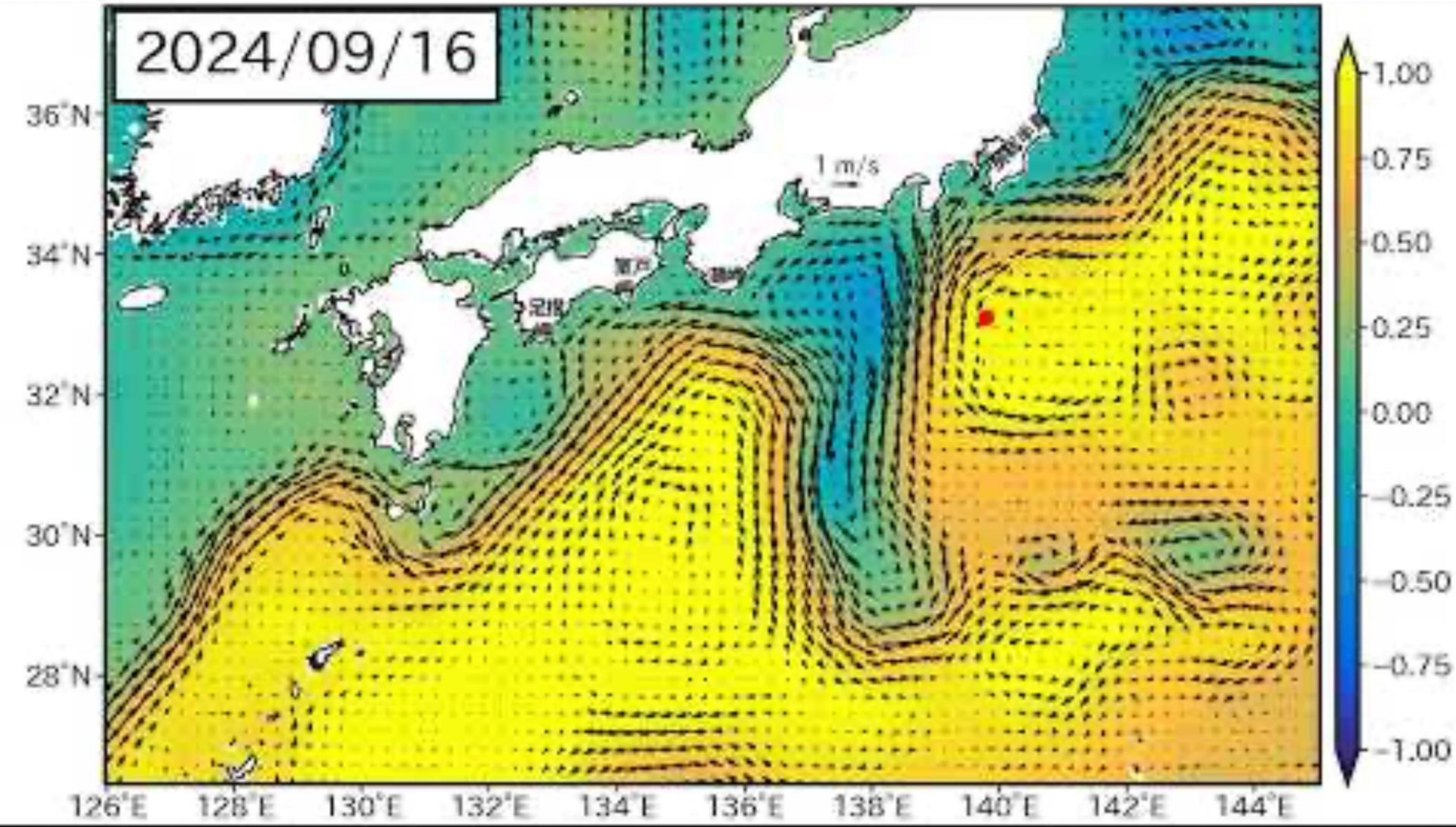
Home Kuroshio Oyashio Announcement Papers 日本語

# Marine heatwaves and cold spells





# Two-month prediction (JCOPE2M)




 APL, JAMSTEC  
[jamstec.go.jp/apl](http://jamstec.go.jp/apl)


## Channel details

 [www.youtube.com/@APLJAMSTEC](http://www.youtube.com/@APLJAMSTEC)

 2.92K subscribers

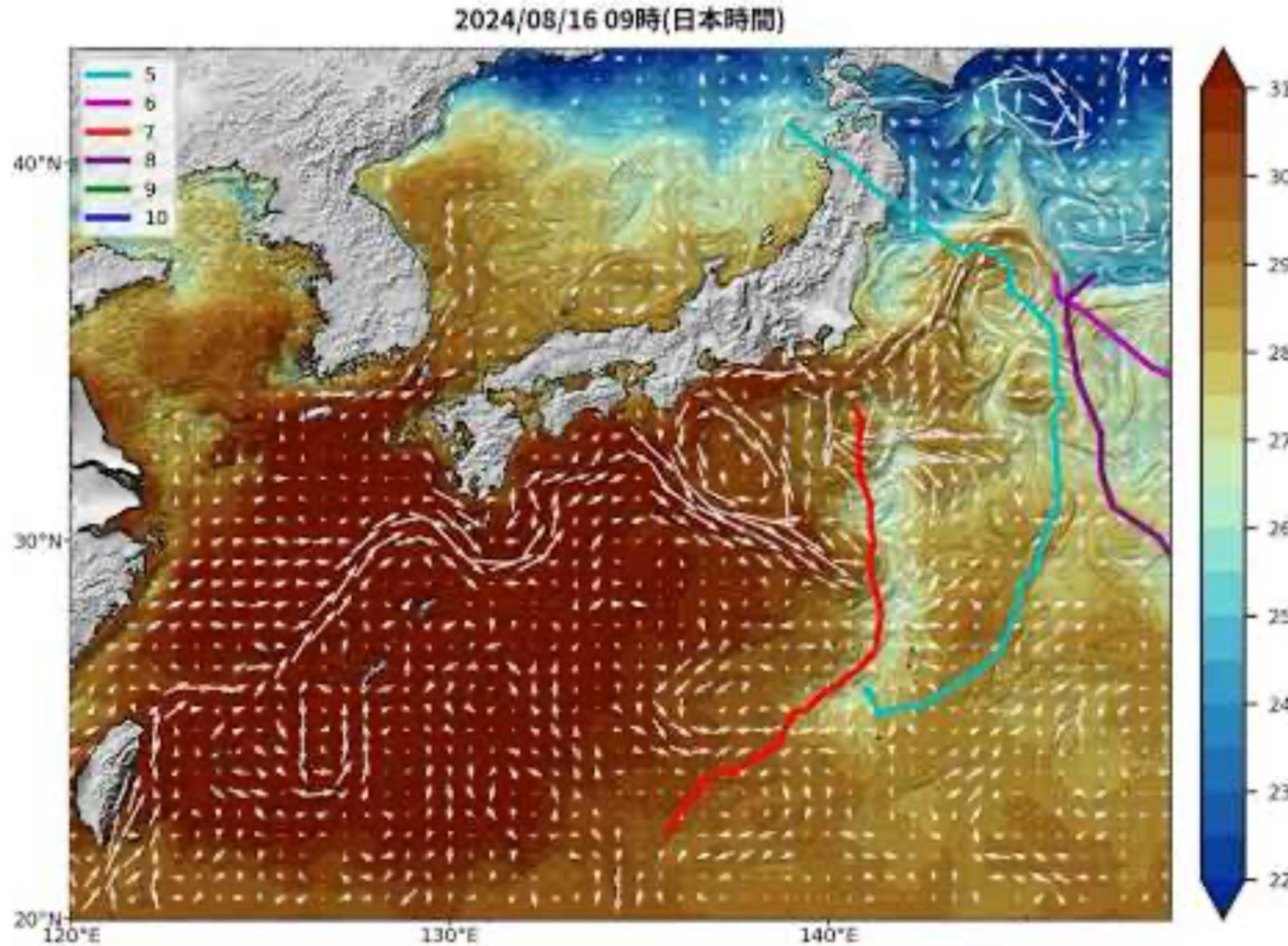
 1,294 videos

 1,061,889 views

 Joined Feb 22, 2016



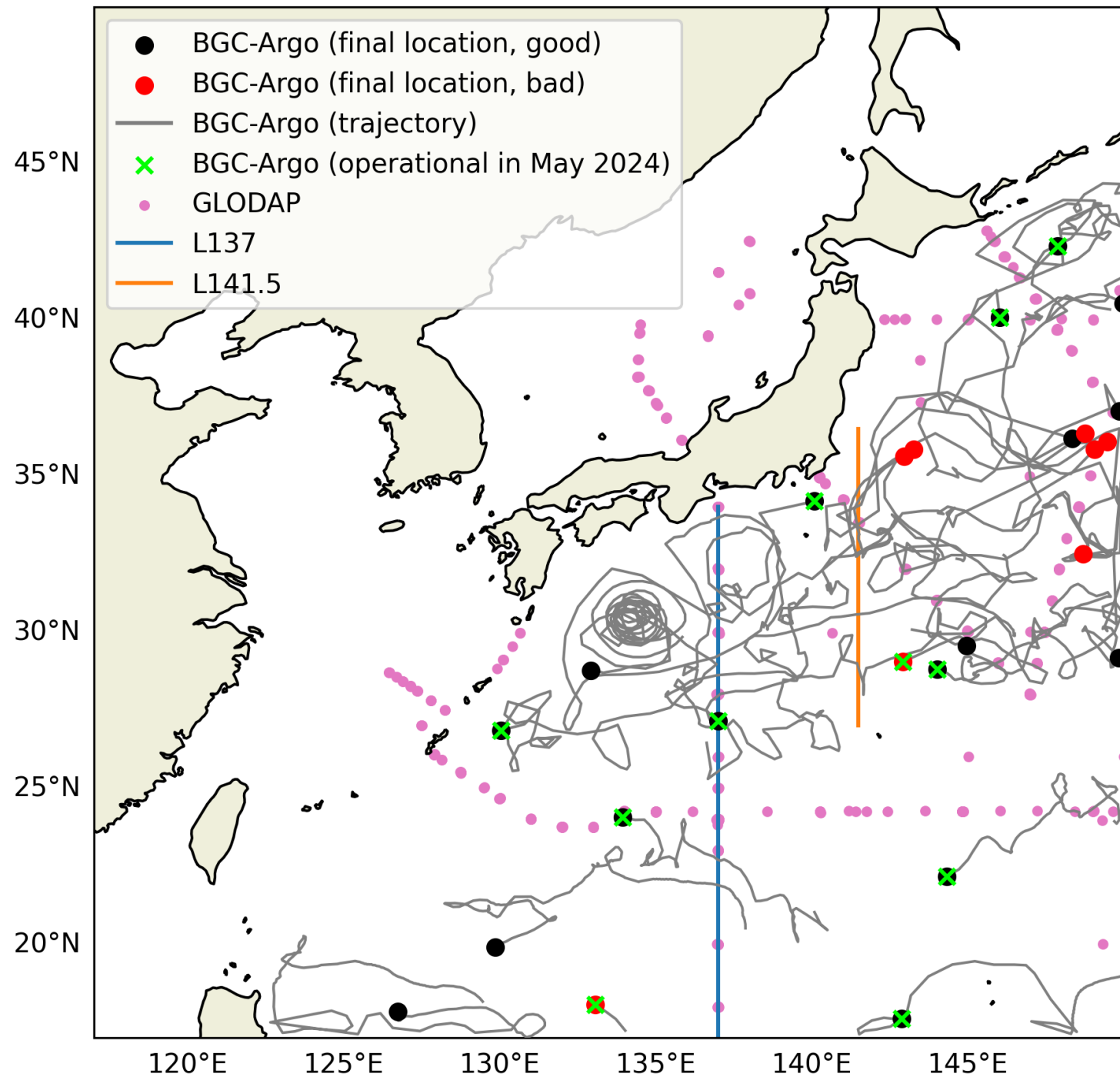
# Typhoon impacts on SST (JCOPE-T-DA reanalysis)



Progress towards biogeochemical prediction...

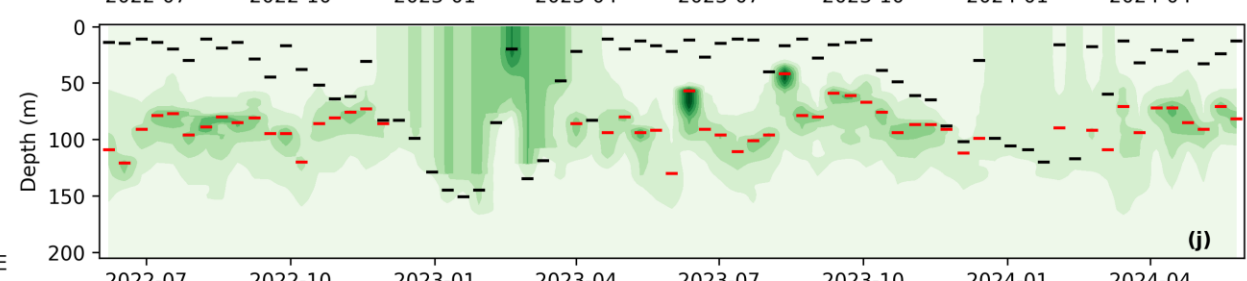
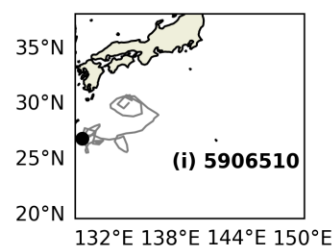
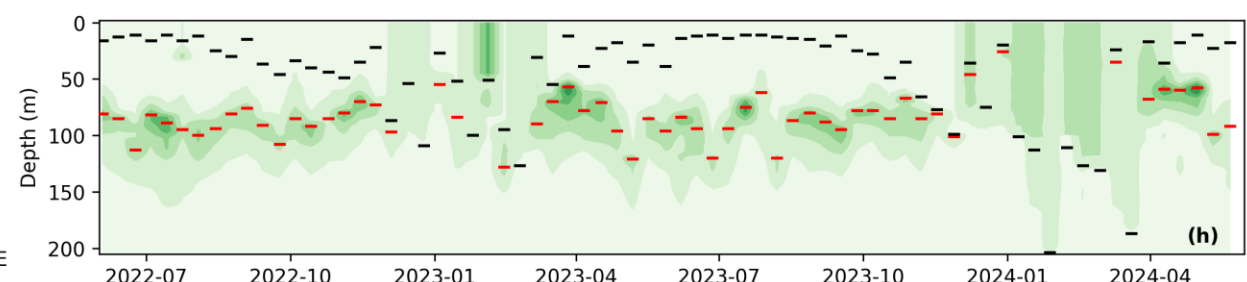
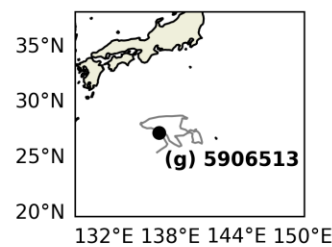
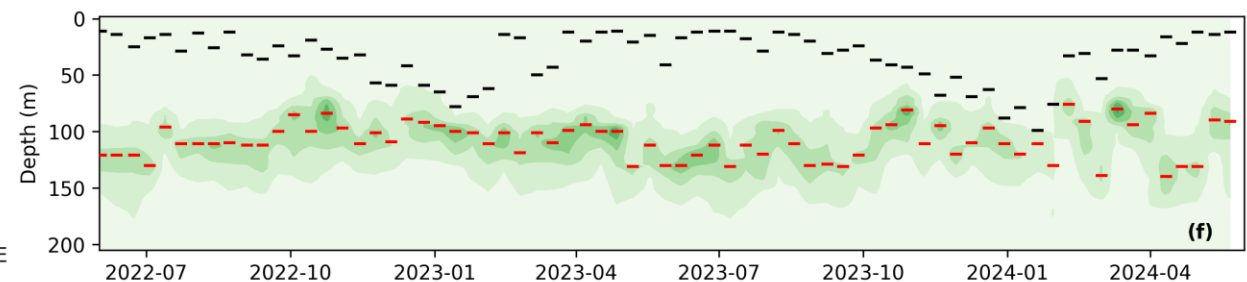
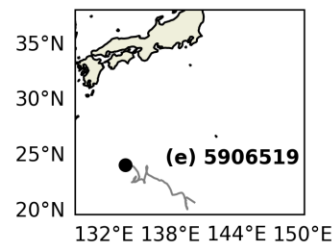
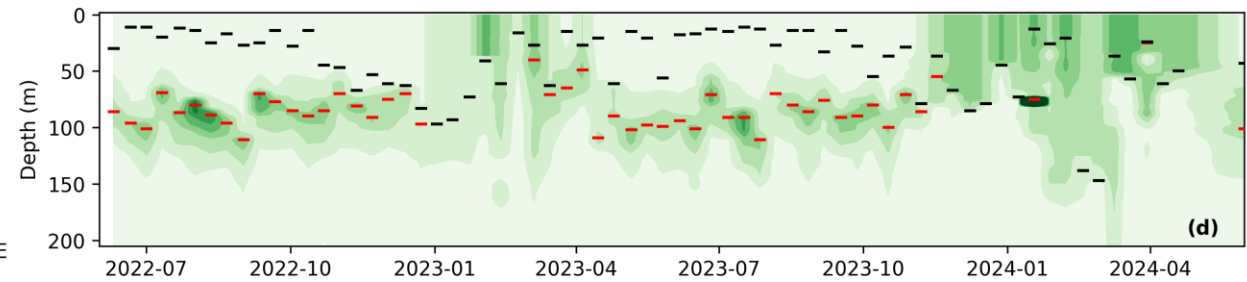
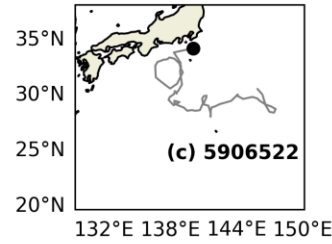
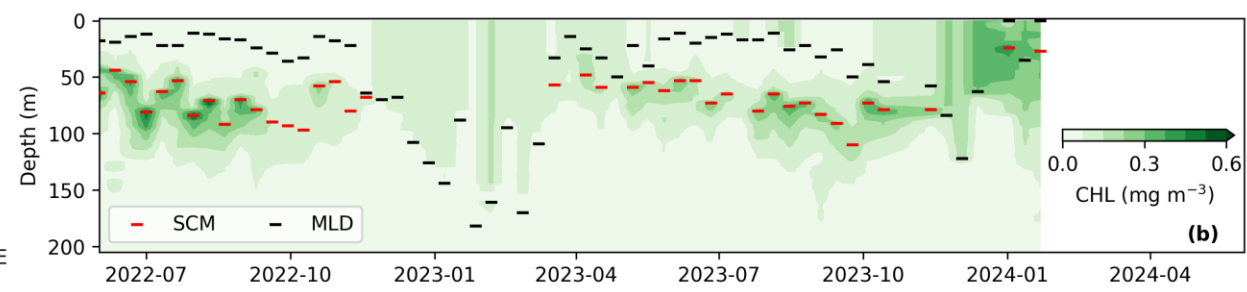
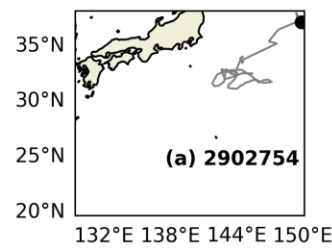
# Status and prospects of BGC-Argo chlorophyll-a observations in the northwest Pacific

Hayashida et al. (submitted)





# Prevalence of subsurface chlorophyll-a maxima



# Next steps

- Coupling of ocean biogeochemistry (NPZD + CHL + O<sub>2</sub>)
- Assimilation of BGC-Argo data
  - Parameter tuning with a 1D model (Bruggeman et al. 2024)
  - Implementation of BGC data assimilation into JCOPE

<https://doi.org/10.5194/gmd-17-5619-2024>

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Article

Assets

Peer review

Metrics

Related articles

Model description paper | 

25 Jul 2024

## EAT v1.0.0: a 1D test bed for physical–biogeochemical data assimilation in natural waters

Jorn Bruggeman , Karsten Bolding, Lars Nerger, Anna Teruzzi, Simone Spada, Jozef Skákala, and Stefano Ciavatta

