

Larval Connectivity in South and Southeast Asia

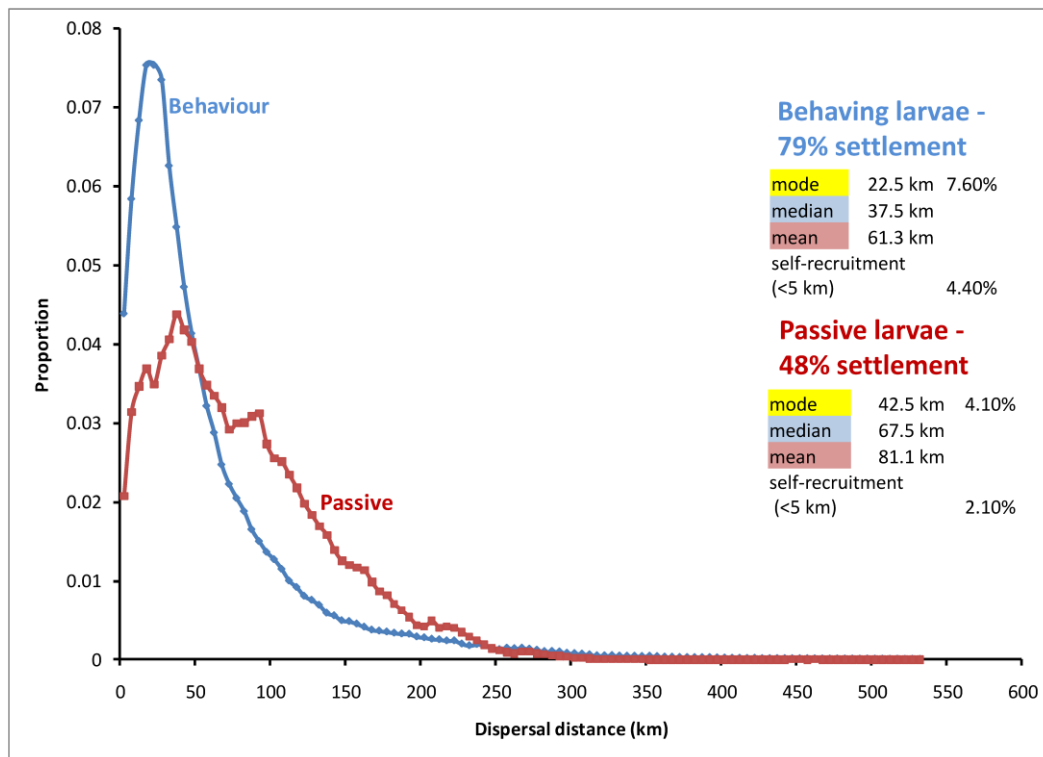
Cesar Villanoy

Outline

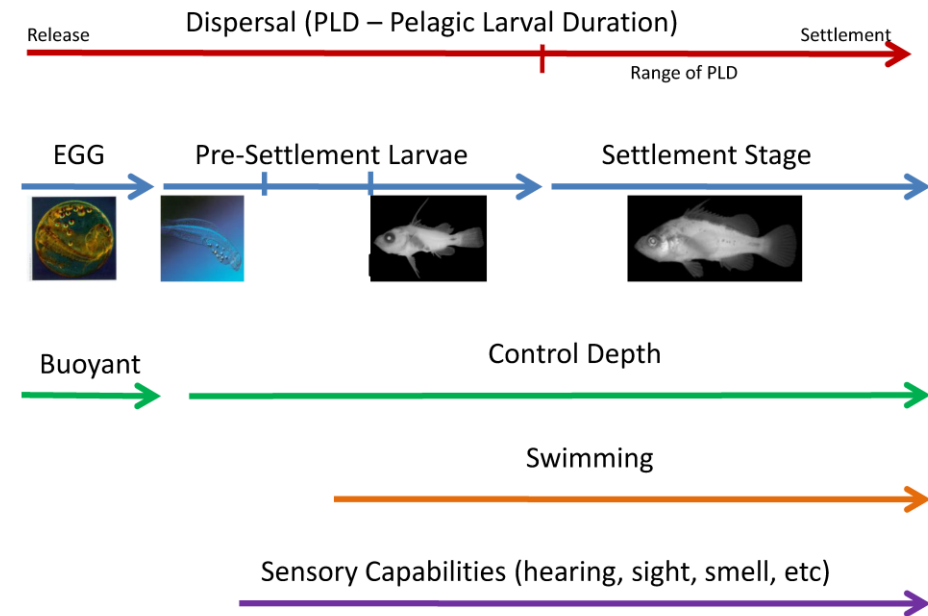
- What is Connectivity?
- Modelling Tools to estimate reef connectivity
- Connectivity within Large Marine Ecosystems
- Importance of resolution in modelling connectivity

Reef Connectivity

- Connection between populations through the exchange of eggs, larvae or other propagules (larval dispersal)
- Larval dispersal can occur in a variety of length scales depending on biology, prevailing currents and extent of favourable habitats

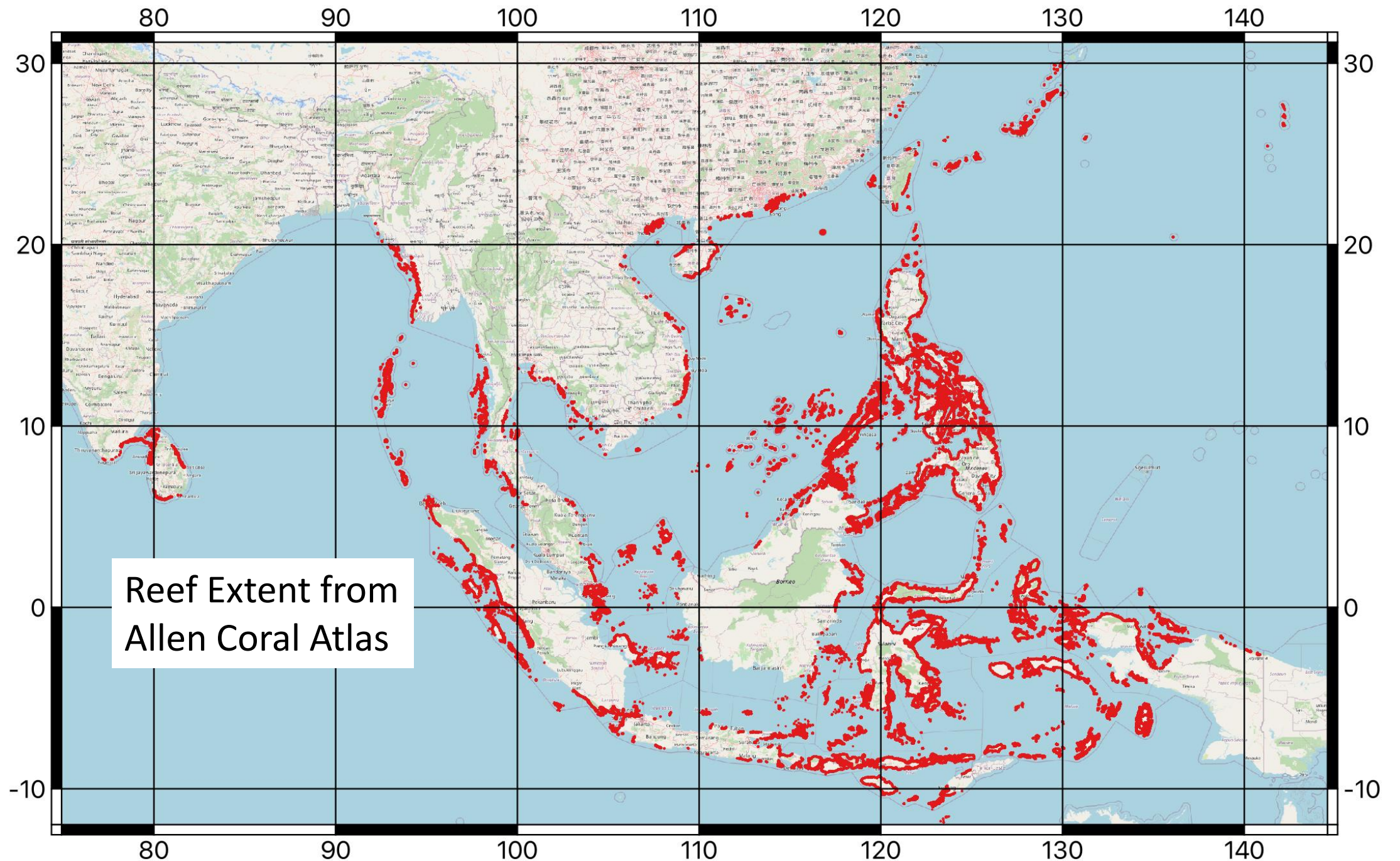


Dispersal Period



Large Marine Ecosystems Included in this Study



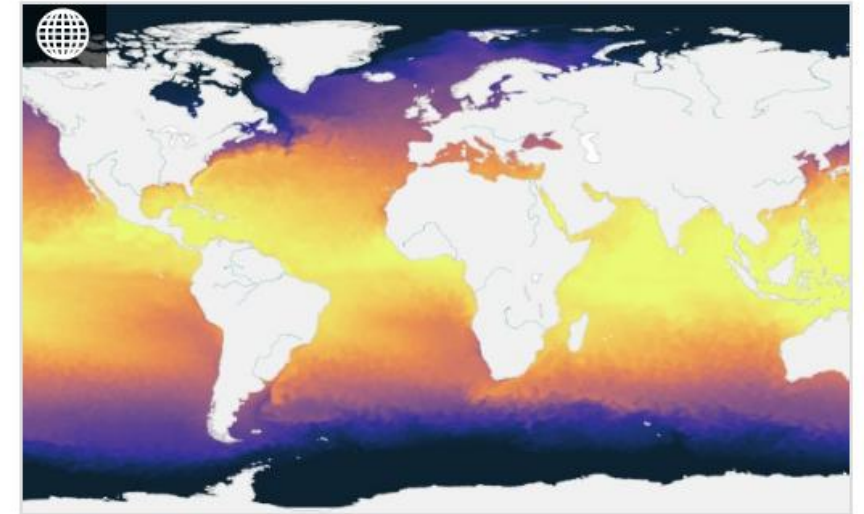


Surface Currents 1/12° (9km) resolution



Copernicus Marine Data

Data downloaded: daily from Jan 2022 to June 2025



Global Ocean Physics Reanalysis

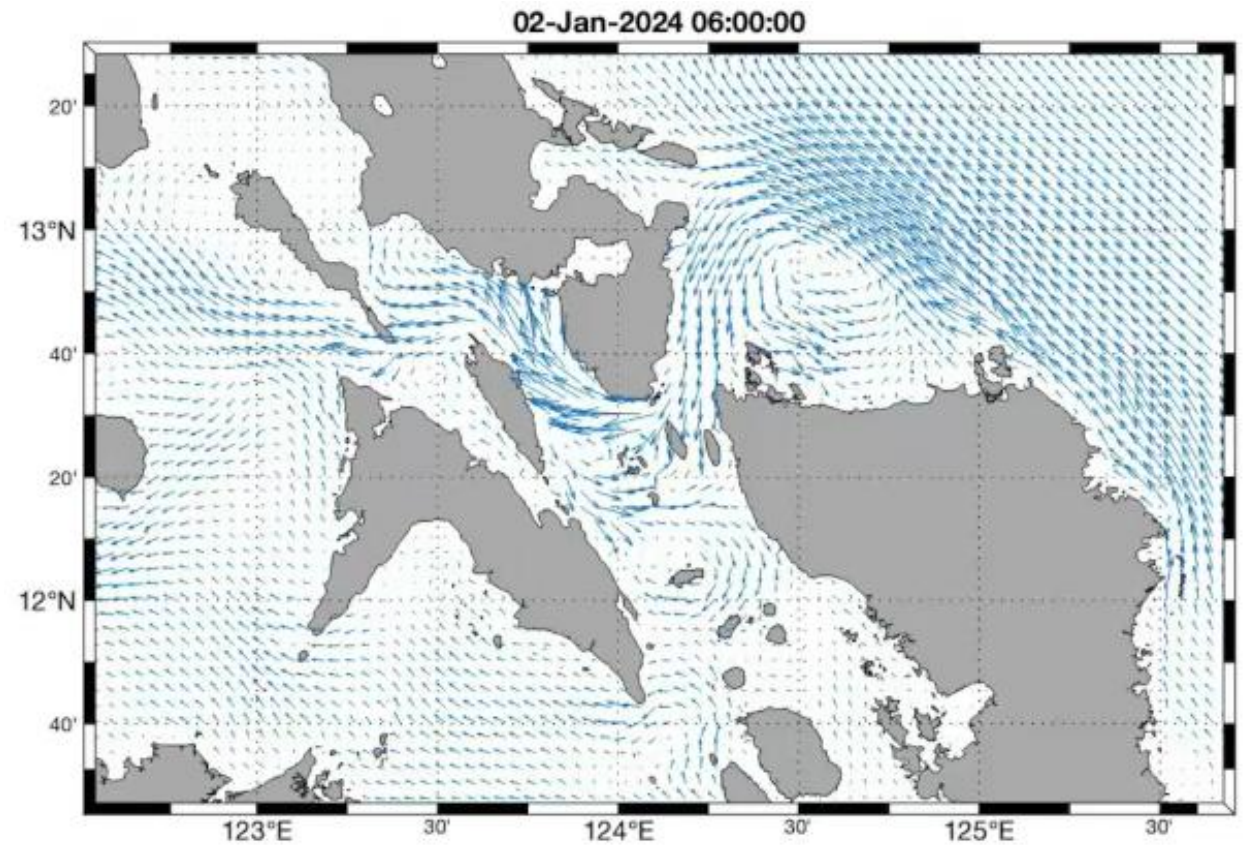
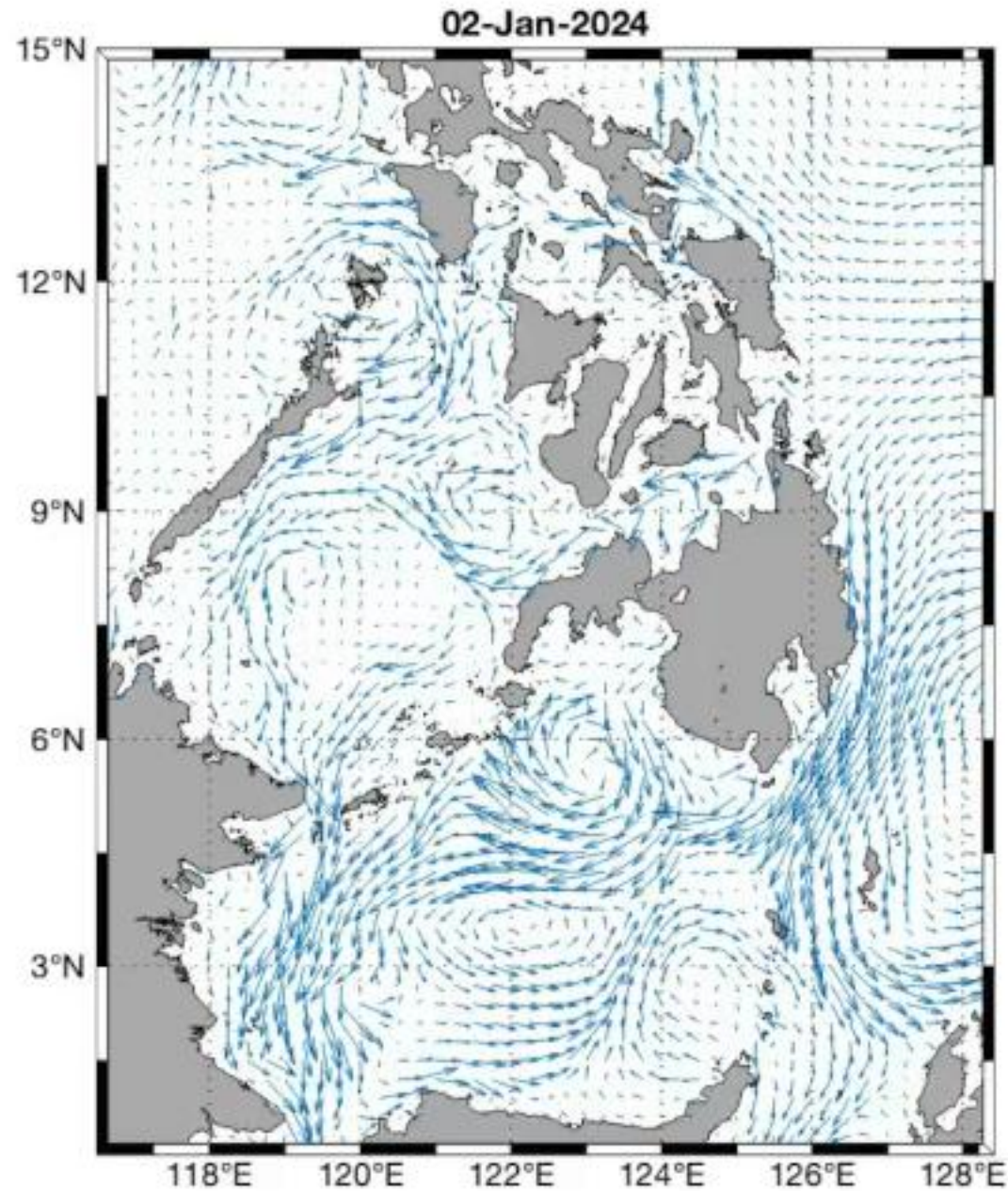
GLOBAL_MULTIYEAR_PHY_001_030

Models

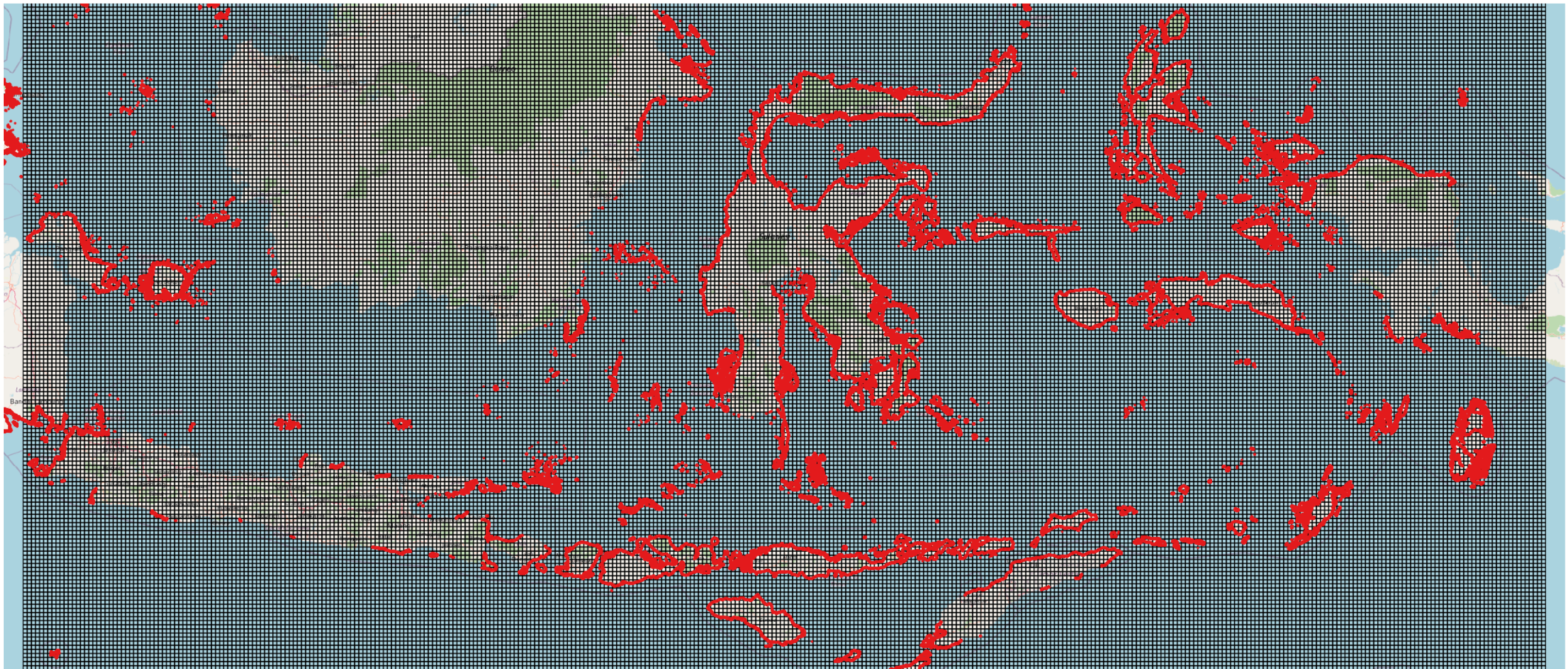
Global, 0.083° × 0.083° × 50 levels

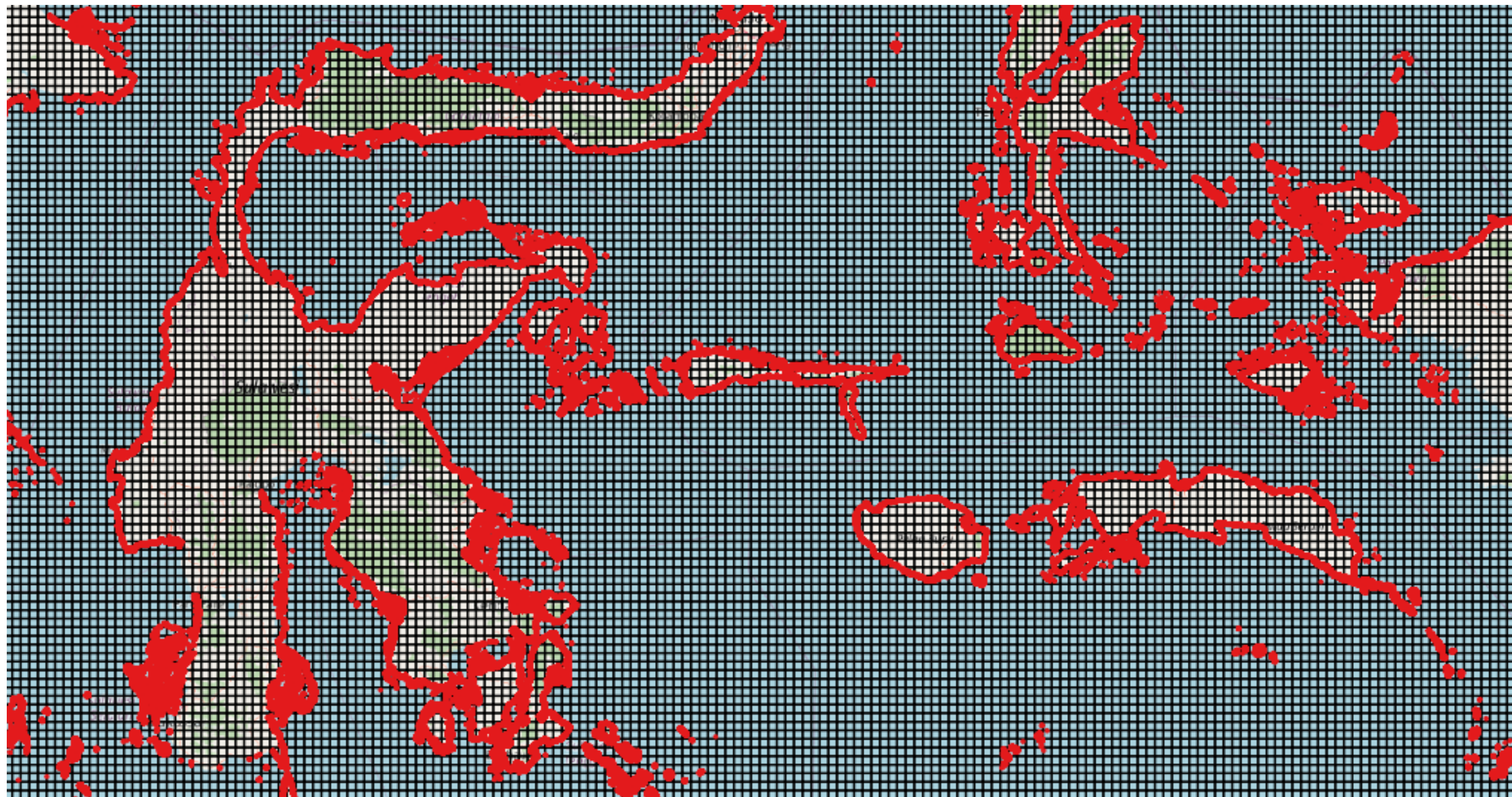
1 Jan 1993 to 29 Jul 2025, daily, monthly

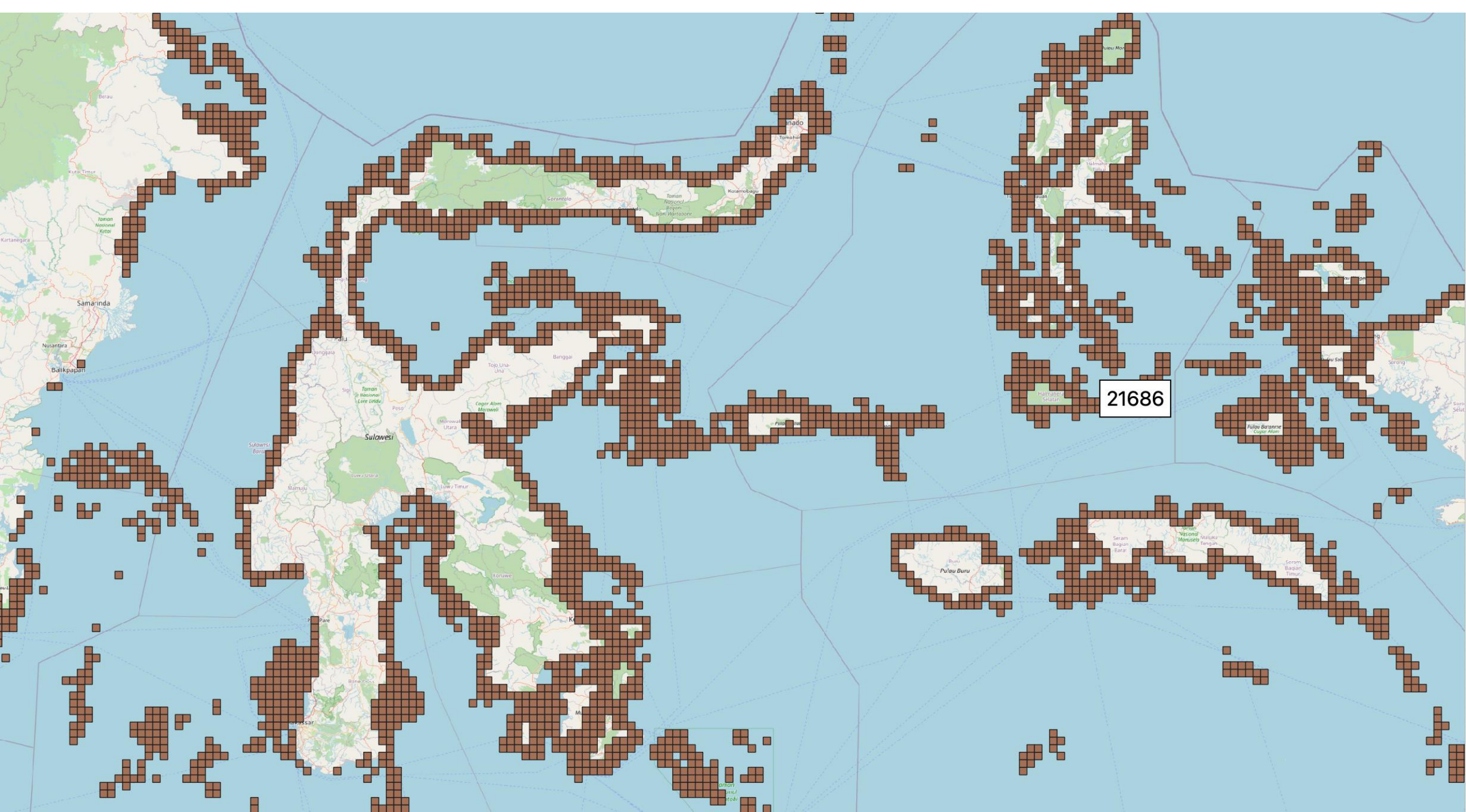
Temperature, salinity, sea surface height,
velocity, mixed layer thickness, sea ice

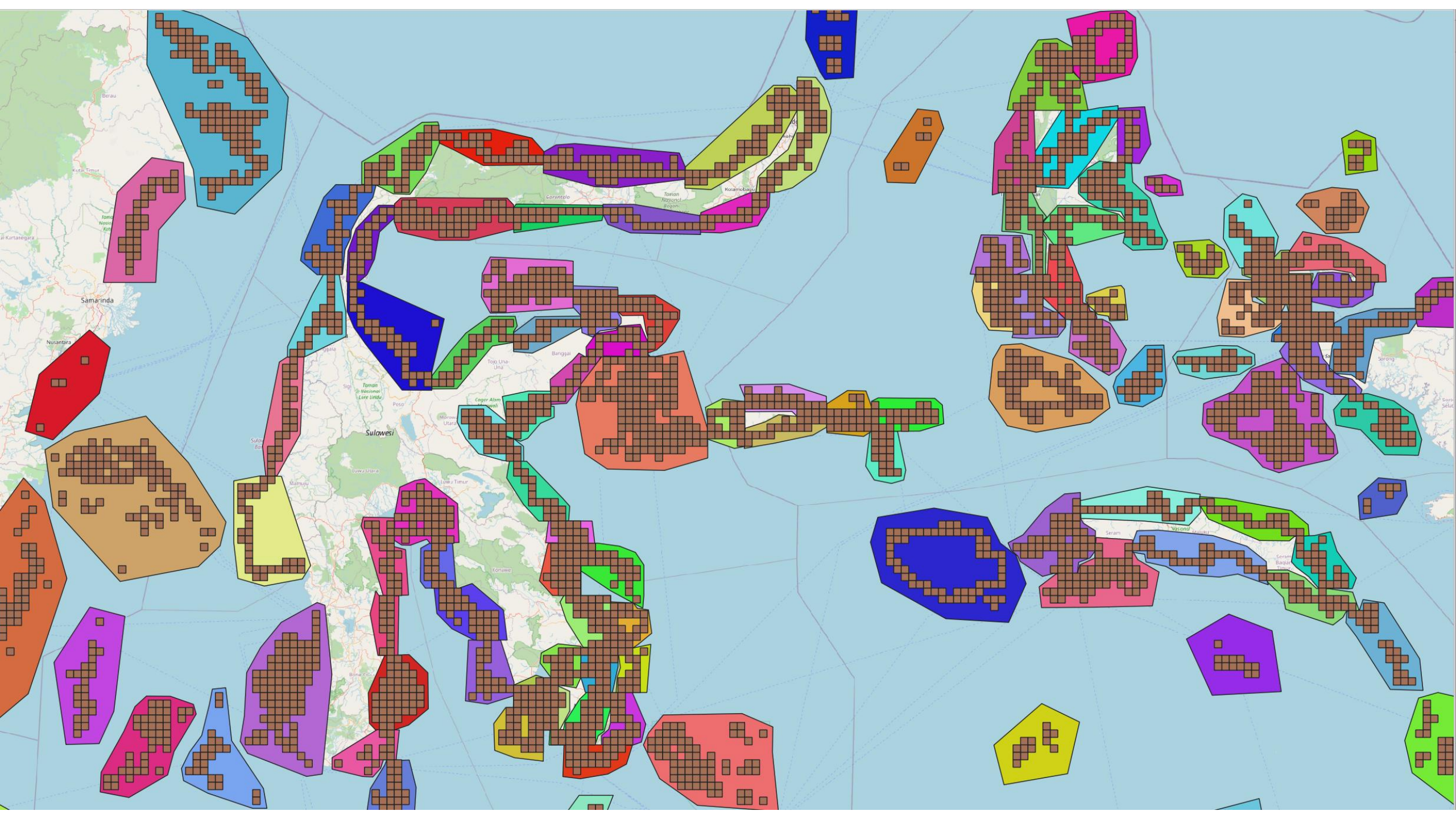


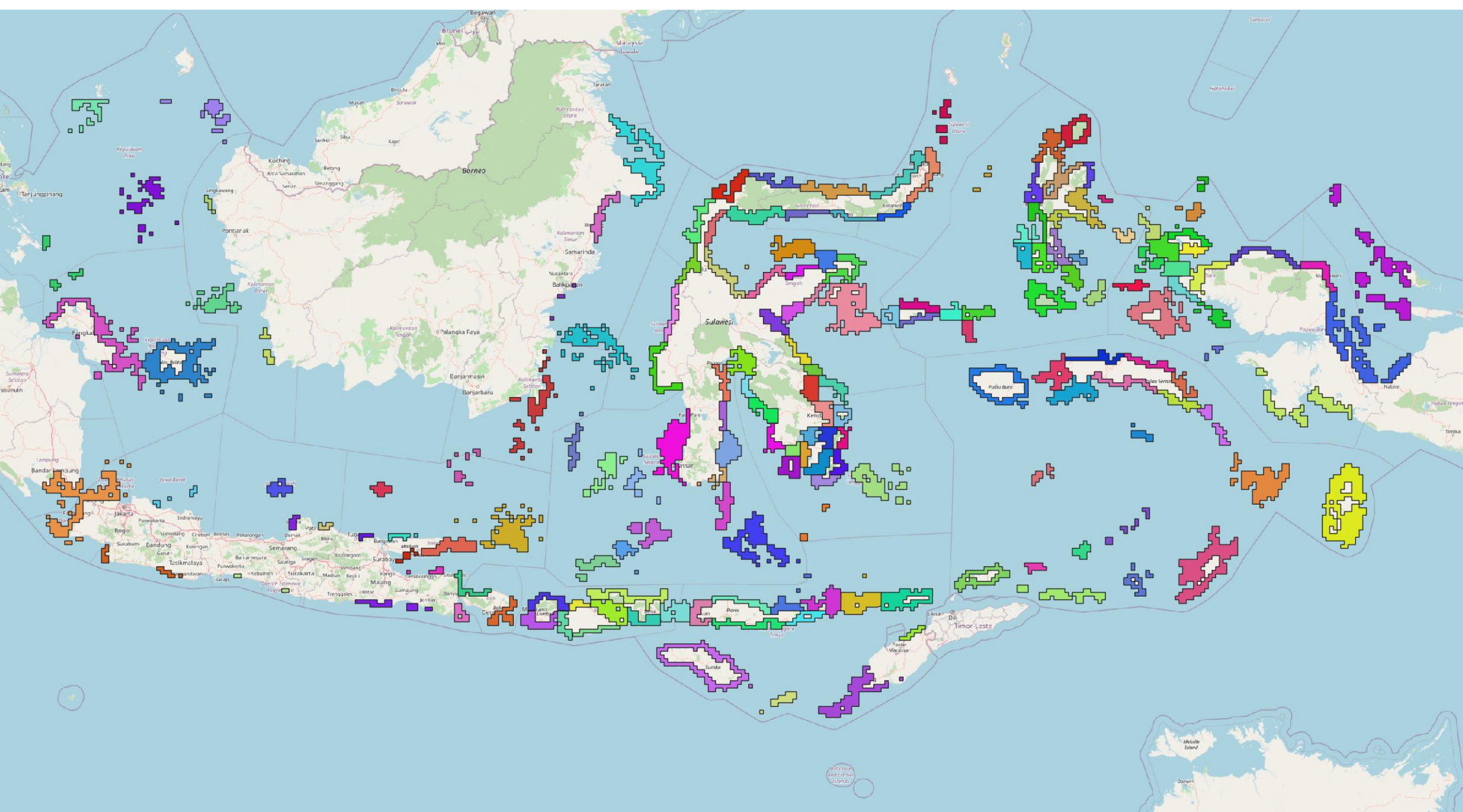
- 1/12° resolution applied to LME-scale connectivity modelling
- Higher resolution in the vicinity of pilot sites to better resolve circulation patterns
 - 1/24° Andaman Sea
 - 1/36° Indonesian Pilot Sites, Western Luzon, Northeast Borneo
 - 1/48° Bicol/Ticao Area



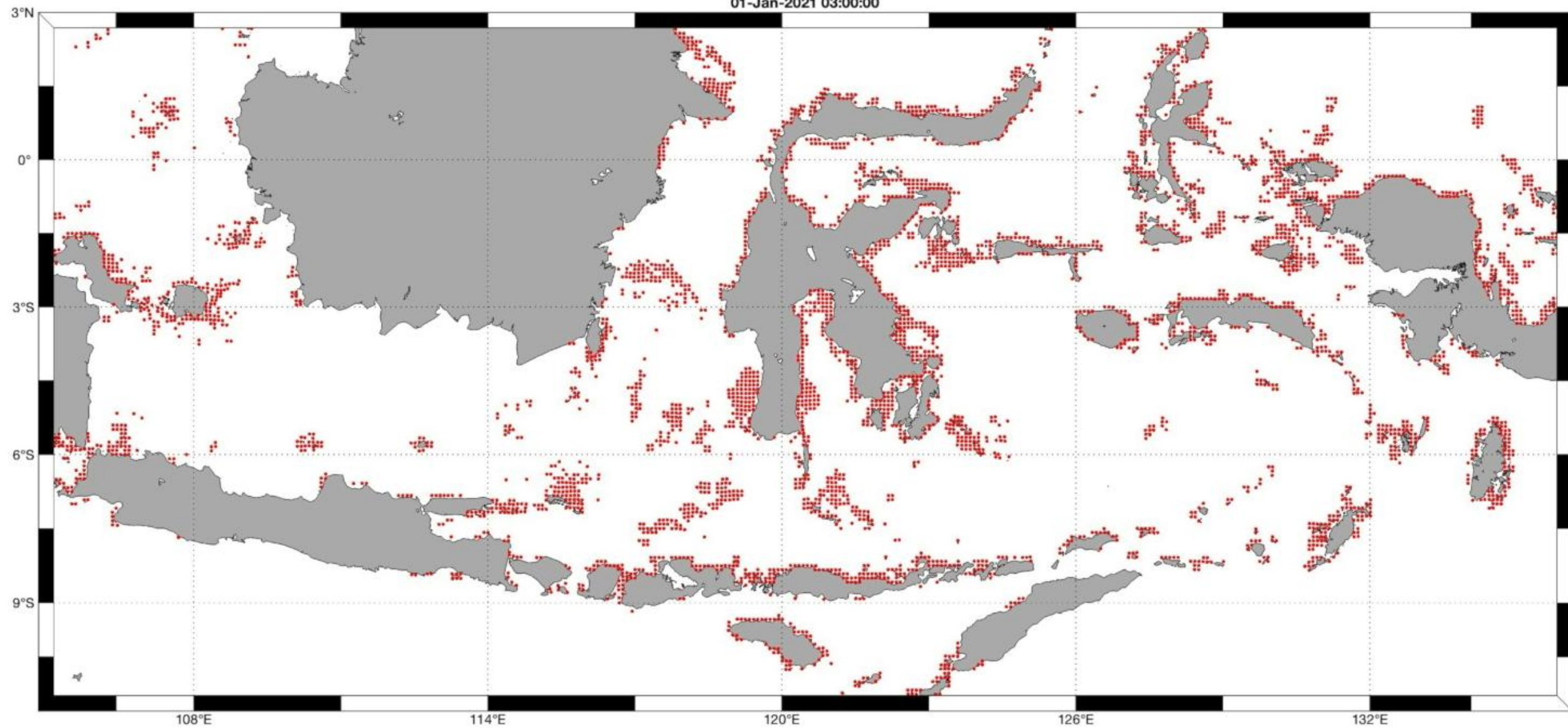




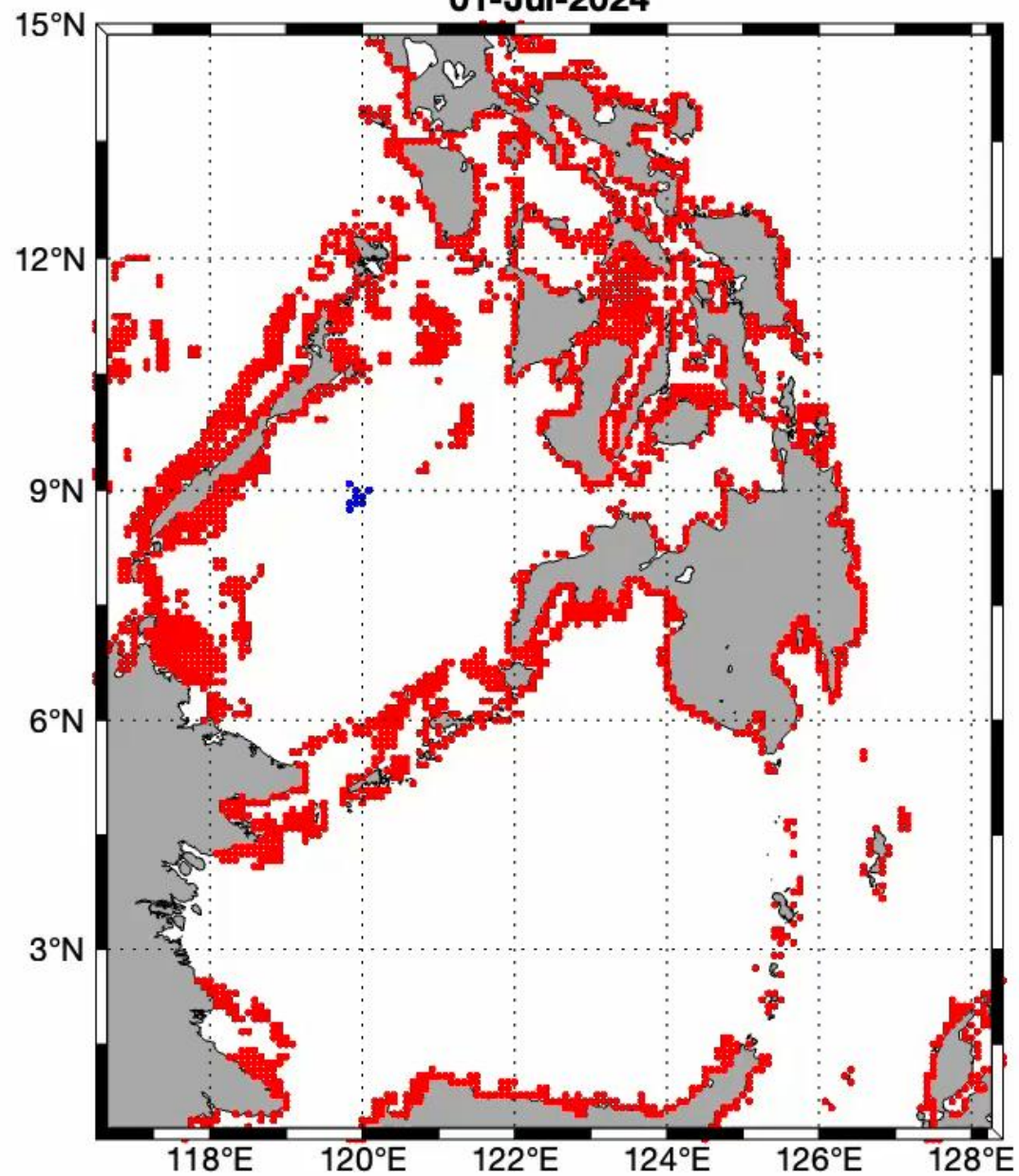




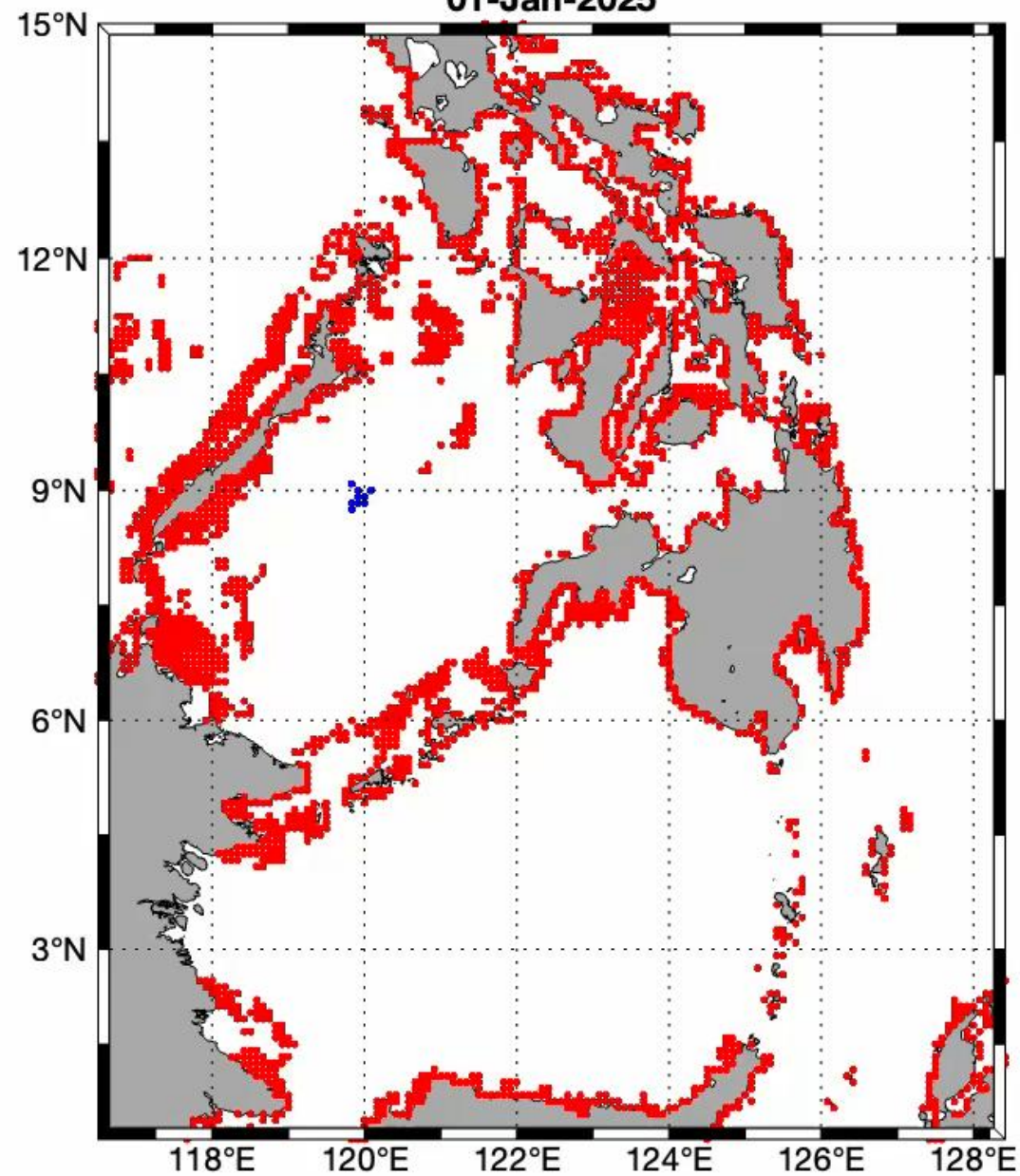
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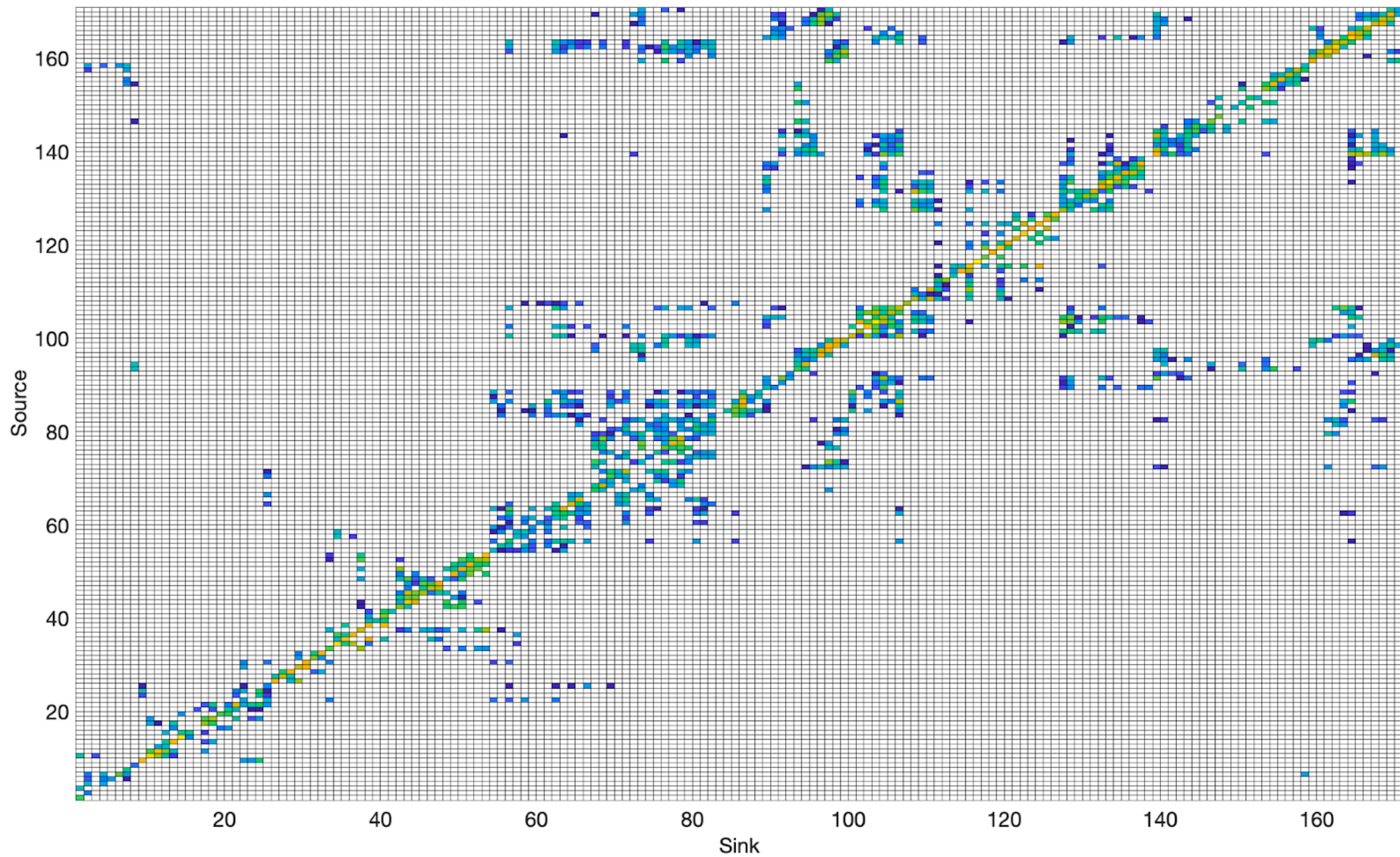


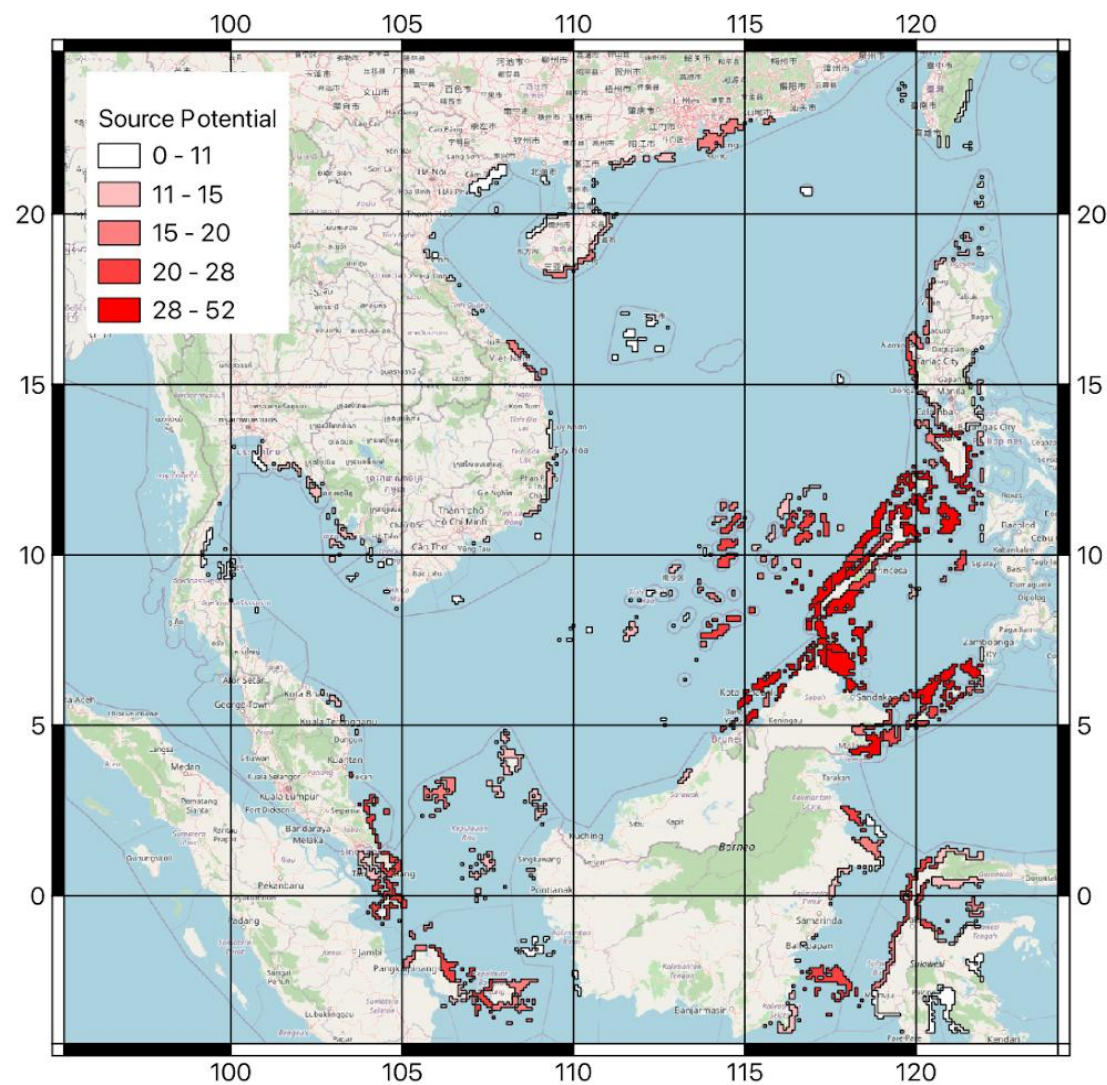
01-Jul-2024



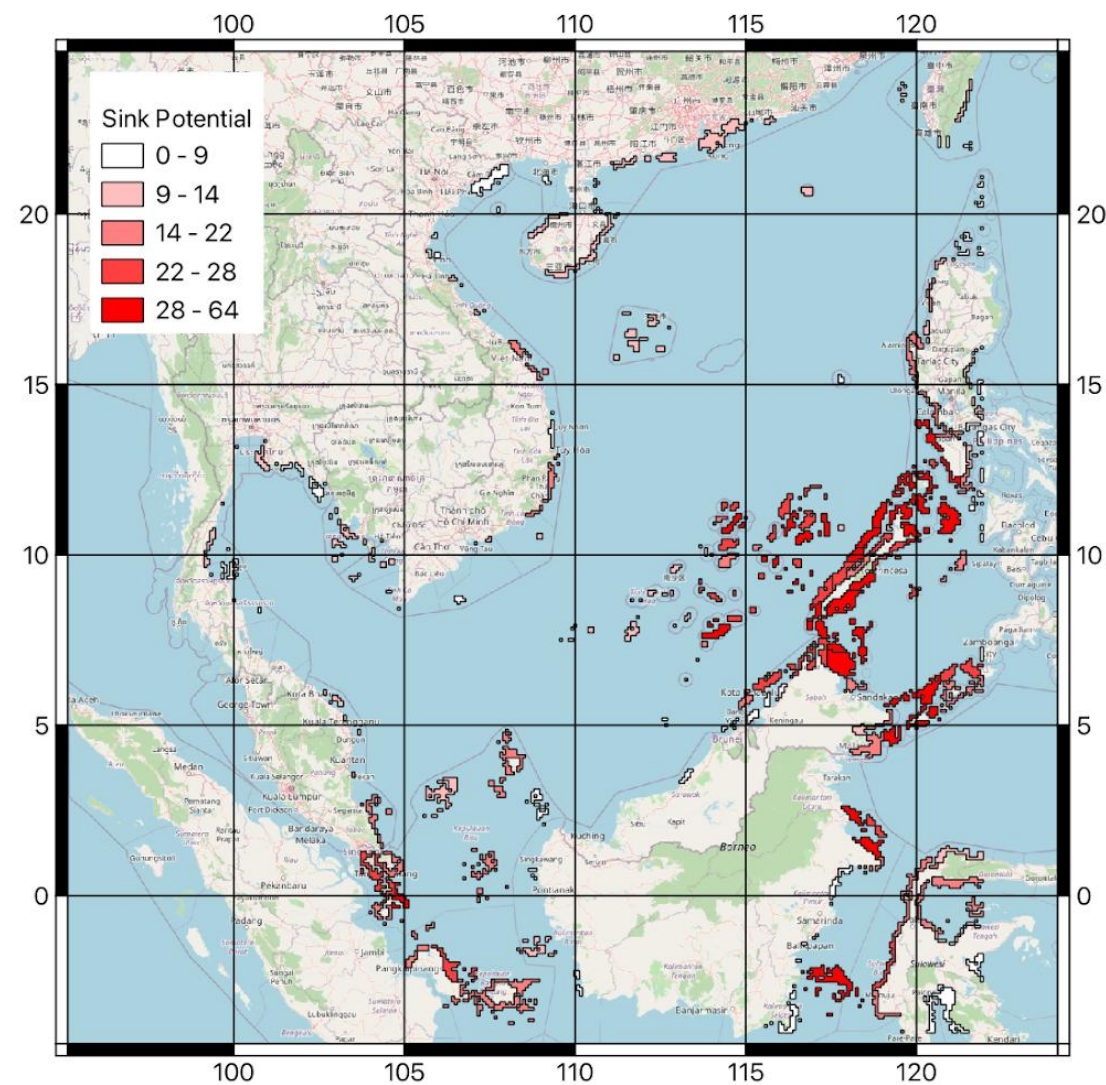
01-Jan-2025







Potential Sources



Potential Sources

Summary

- Multiple resolution models provide insights of connectivities in areas with complicated coastline such as in the Southeast Asian Region
- Reef configurations can be adjusted (area and location) and the larval output scaled to habitat quality to determine major pathways of dispersal
- Multiple runs in time can help address uncertainties in connectivity matrices