The Marine Biodiversity Observation Network Pole to Pole of the Americas
MBON Pole to Pole: Building a Regional Community of Practice for Understanding and Conserving Life in the Ocean

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The Charge

Coastal nations need a fit-for-purpose, sustainable observing system that tracks changes in marine biodiversity. A regional Marine Biodiversity Observation Network (MBON) of the Americas – MBON Pole to Pole - is building capacity to: 1) expand our knowledge on biodiversity patterns and drivers; 2) coordinate biodiversity monitoring, share data, experiences, knowledge, and protocols; 3) improve access to information and high-quality data; 4) integrate *in situ* observations with satellite remote sensing; and 5) develop indicators to establish a biodiversity baseline needed for future assessments and science-based decisions.

Gaps in Biodiversity Knowledge
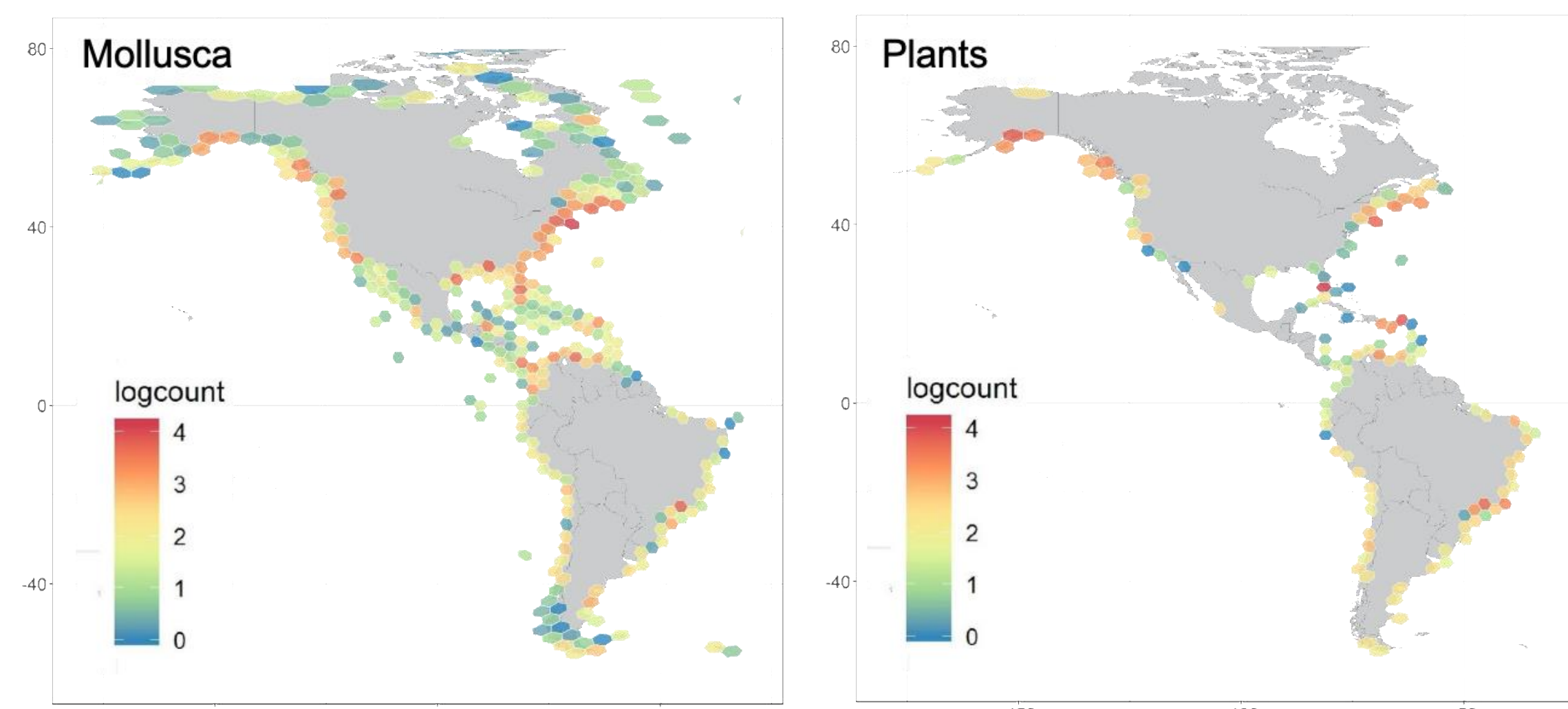
Occurrence counts (1700 – 2018) within the 50 m isobath registered in OBIS. Each hexagon is approximately 250 km wide.
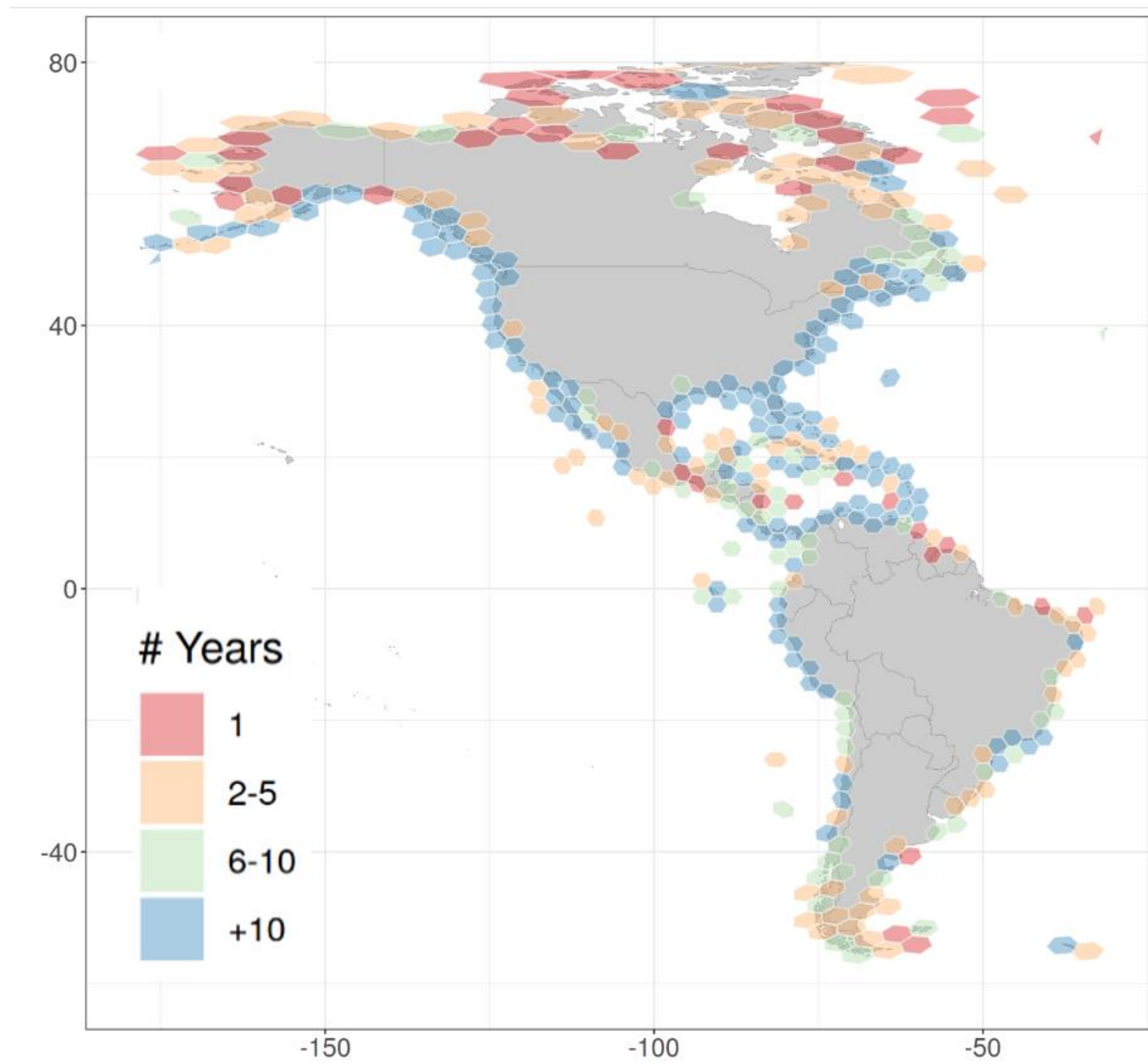
Years of repeated occurrence of all molluscs, echinoderms, annelids and plants records within the 50 m isobath in OBIS.

- Major biodiversity data gaps exist along the east and west coastal areas of the Americas.
- Density of biodiversity records in OBIS vary significantly among taxonomic groups.
- In many areas, biodiversity observations have been collected only once across the region.

Marine Biodiversity Workshops: From the Sea to the Cloud

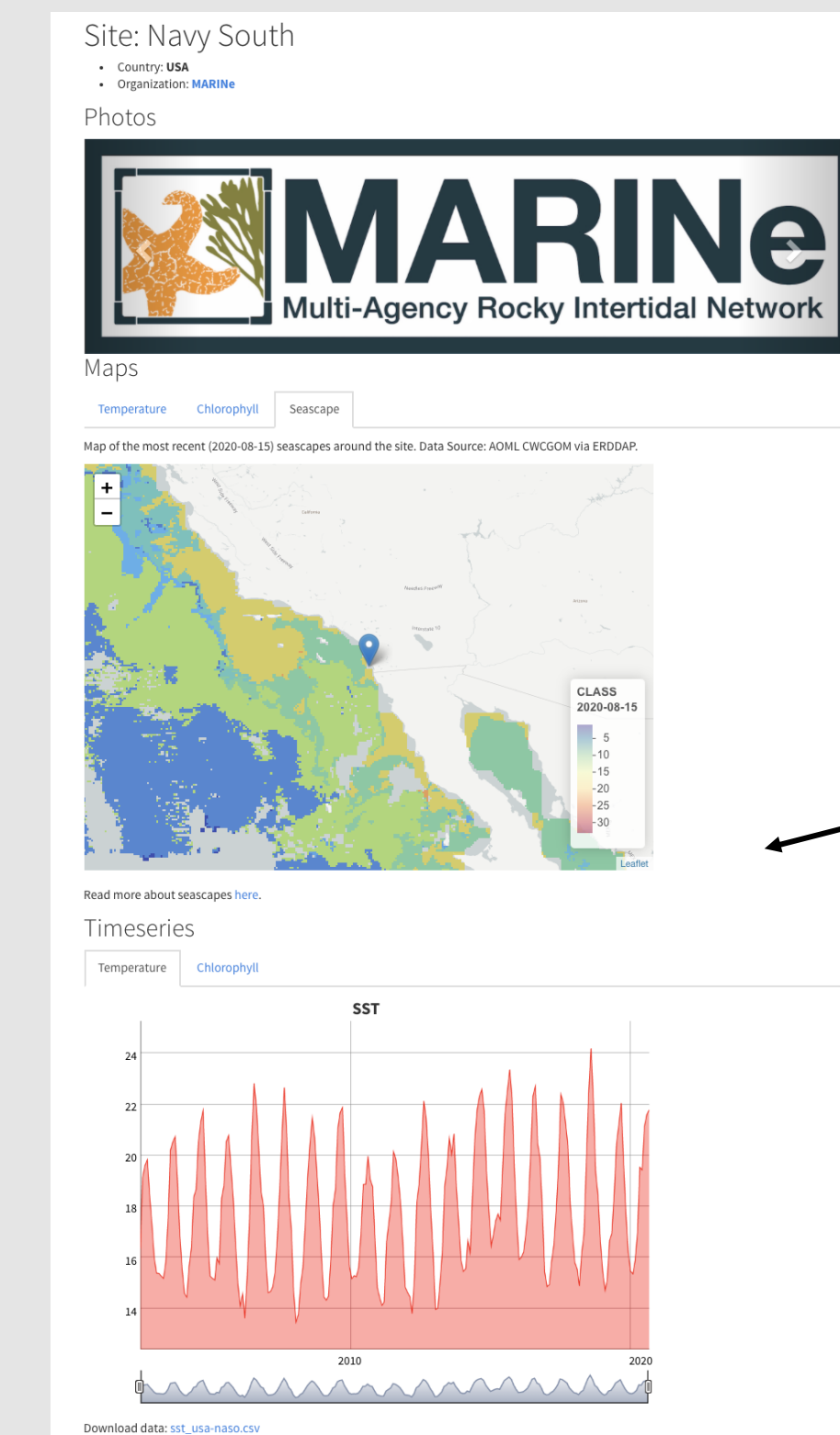São Sebastião, Brazil, August 6-10, 2018

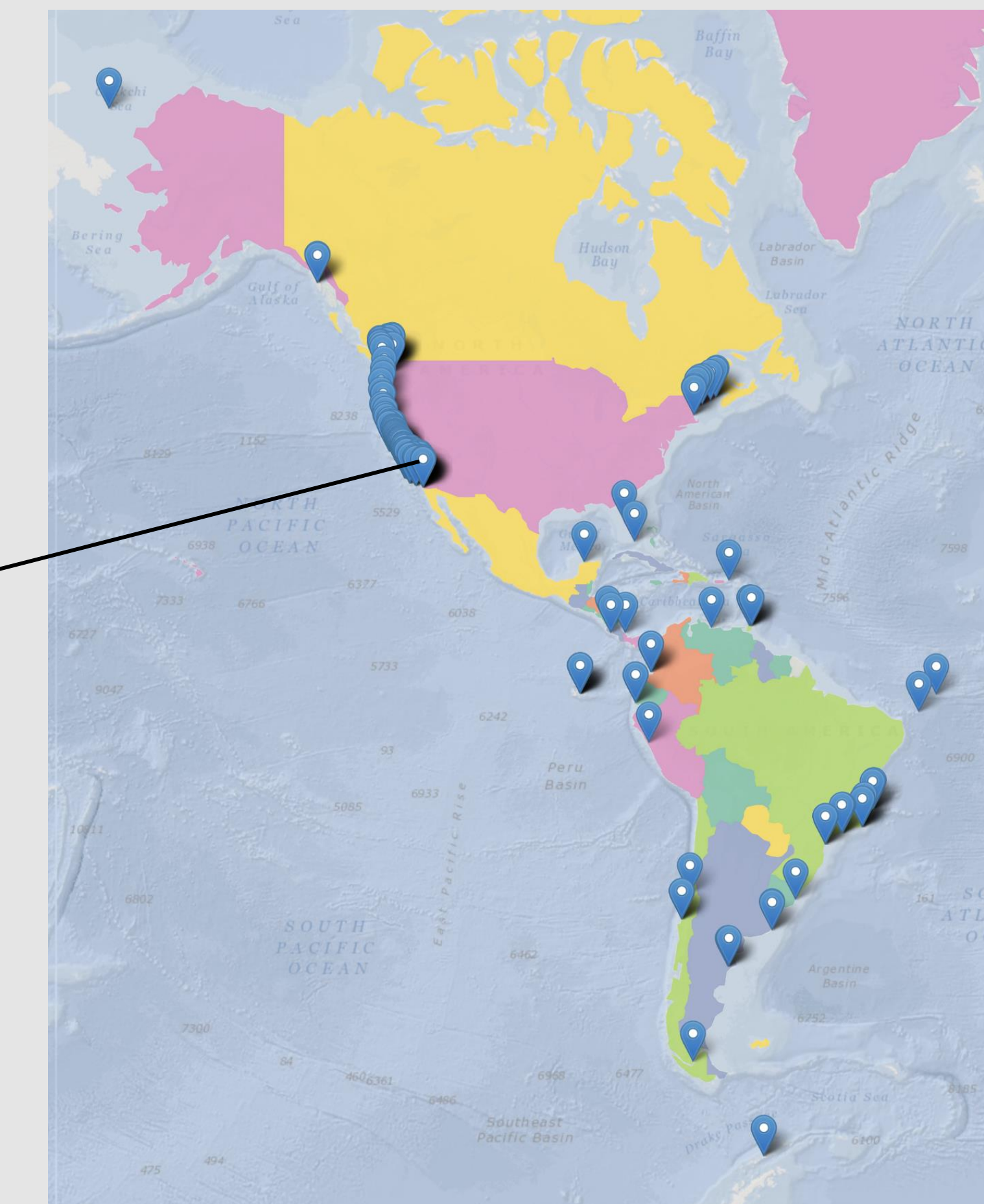Puerto Morelos, Mexico, April 2-5, 2019

Development of best practices and common tools:
- Biodiversity survey protocols
- Data standards and publishing in OBIS
- Data analysis and visualization

Sea surface temperature (SST), chlorophyll-a (Chl) and seascape conditions at monitoring sites available on the MBON Pole to Pole interactive map:
https://marinebon.org/p2p/

Location of monitoring sites on rocky intertidal and sandy beaches participating in the MBON Pole to Pole program.
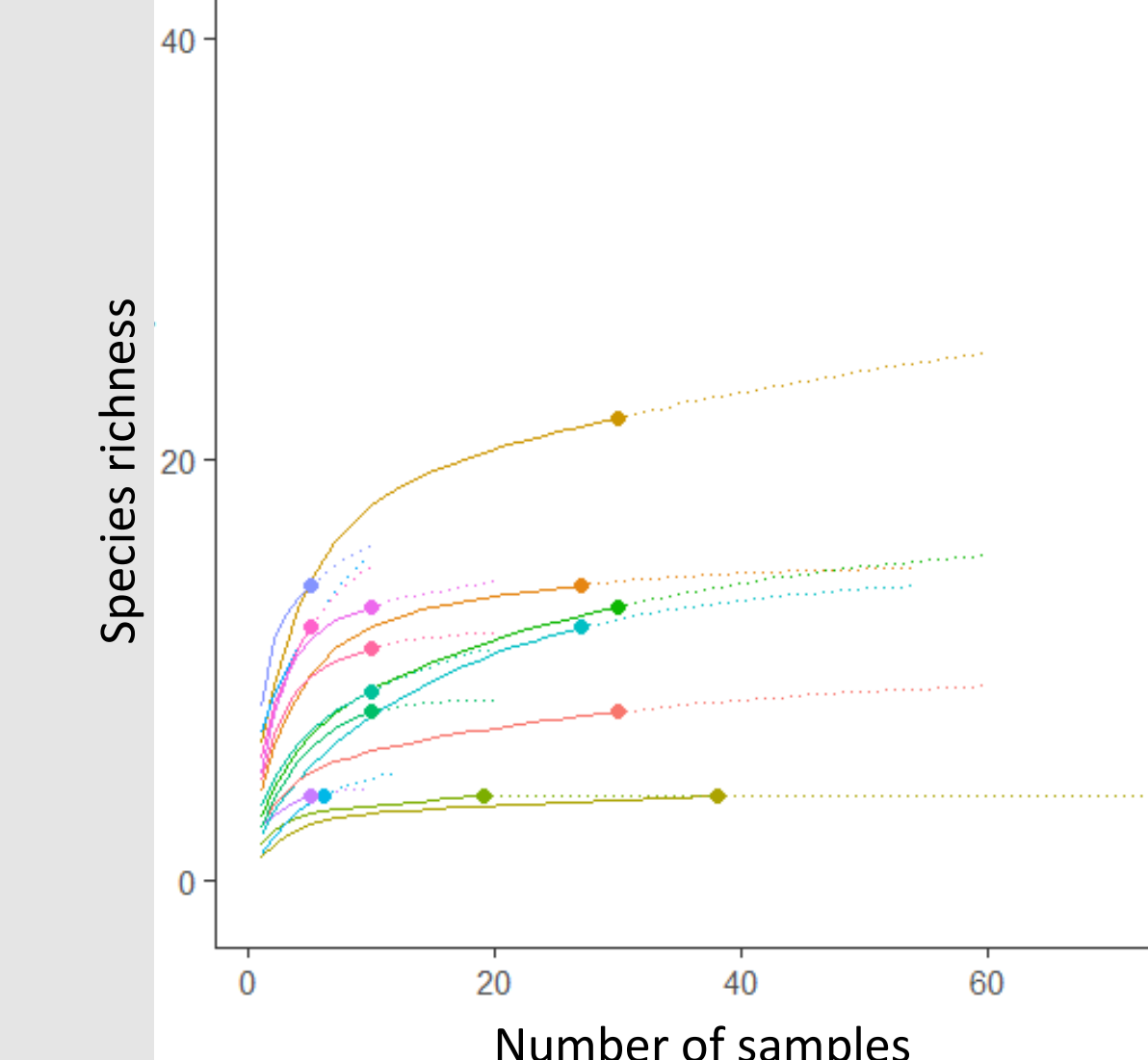
Interactive data dashboards

Data visualization tools developed using R software and R Shiny. Here showing data collected for a MBON Pole to Pole site in Brazil.

### Field sampling effort optimization

Biodiversity survey at the Cocholgue Sur locality in Concepcion, Chile.
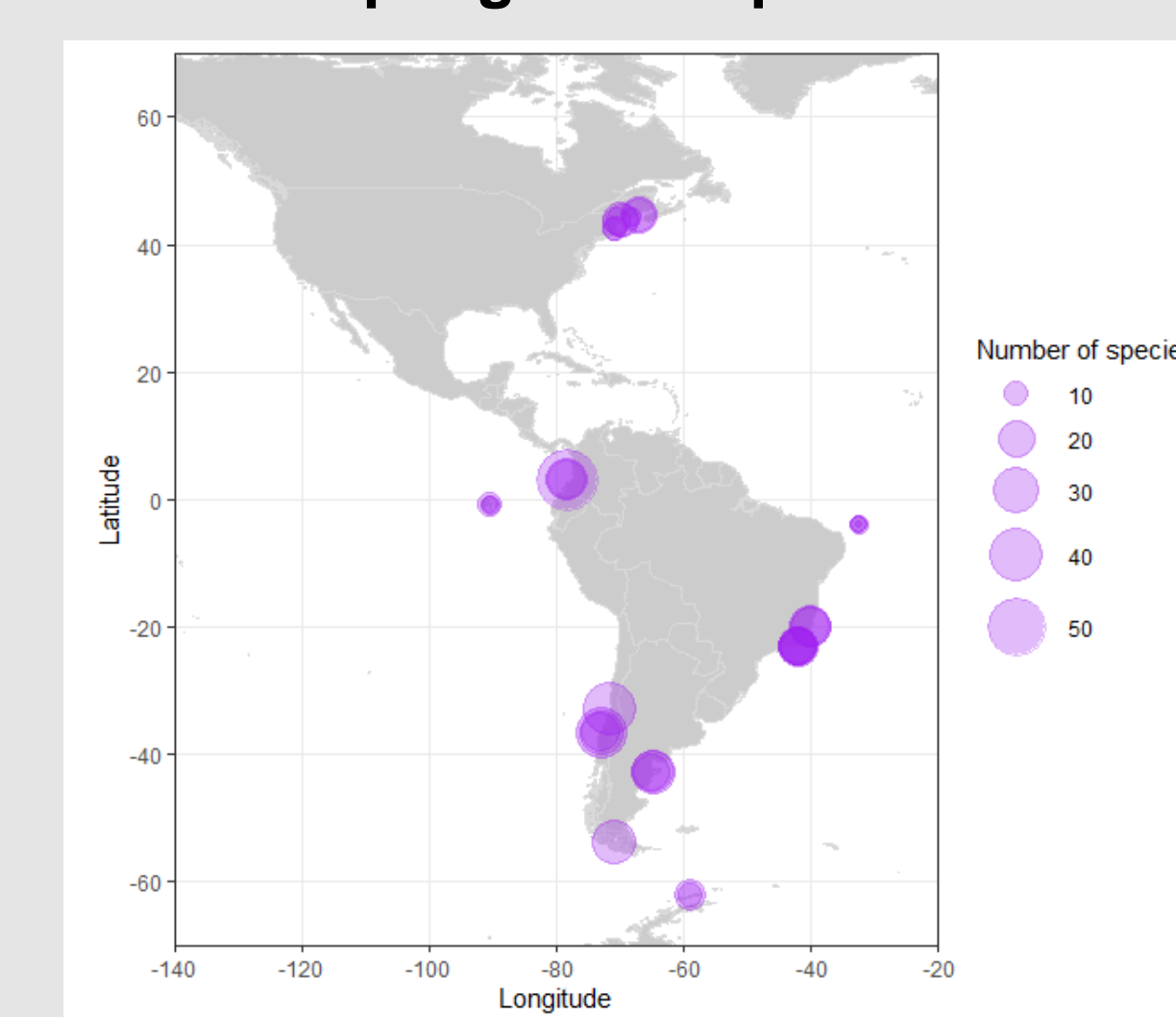
Map shows species richness observed during surveys in 2018 and 2019. The plot below shows rarefaction curves of interpolated and extrapolated species richness as a function of the number of samples (quadrats) taken at each locality at the high tide level derived from species coverage-based stopping at the 90% level.

Satellite Seascapes and Biodiversity
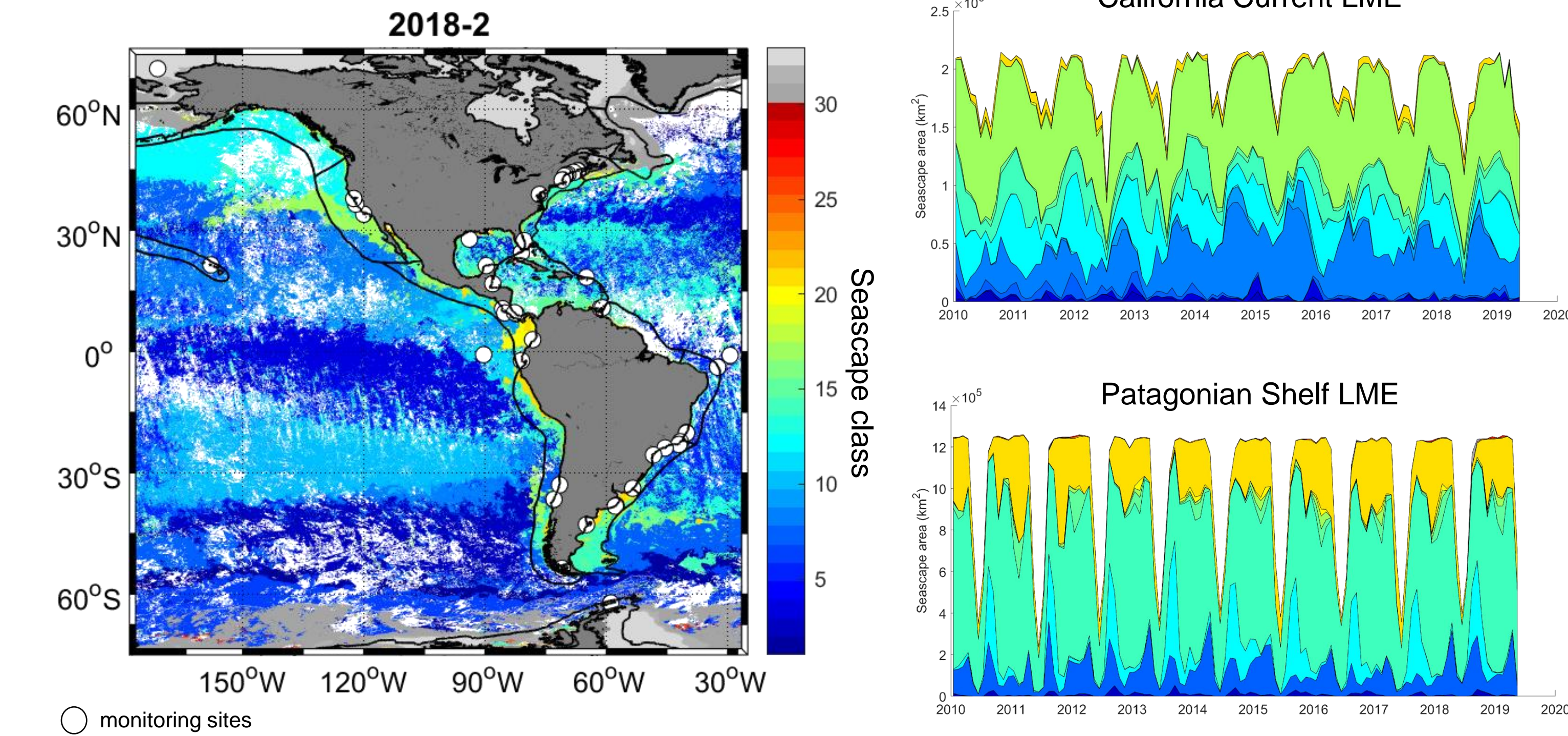
Seascape maps consist of a statistical classification of multivariate satellite data: sea surface temperature (SST), Chl-a, phytoplankton fluorescence (nFLH), colored dissolved organic matter, ECCO-2 salinity, microwave sea-ice, and absolute dynamic topography. Time series plots show seascape area for two Large Marine Ecosystems (LMEs). Global seascape maps are produced and distributed by NOAA Coast Watch at 5 km pixel resolution (https://cwcgom.aoml.noaa.gov/cgom/OceanViewer/).
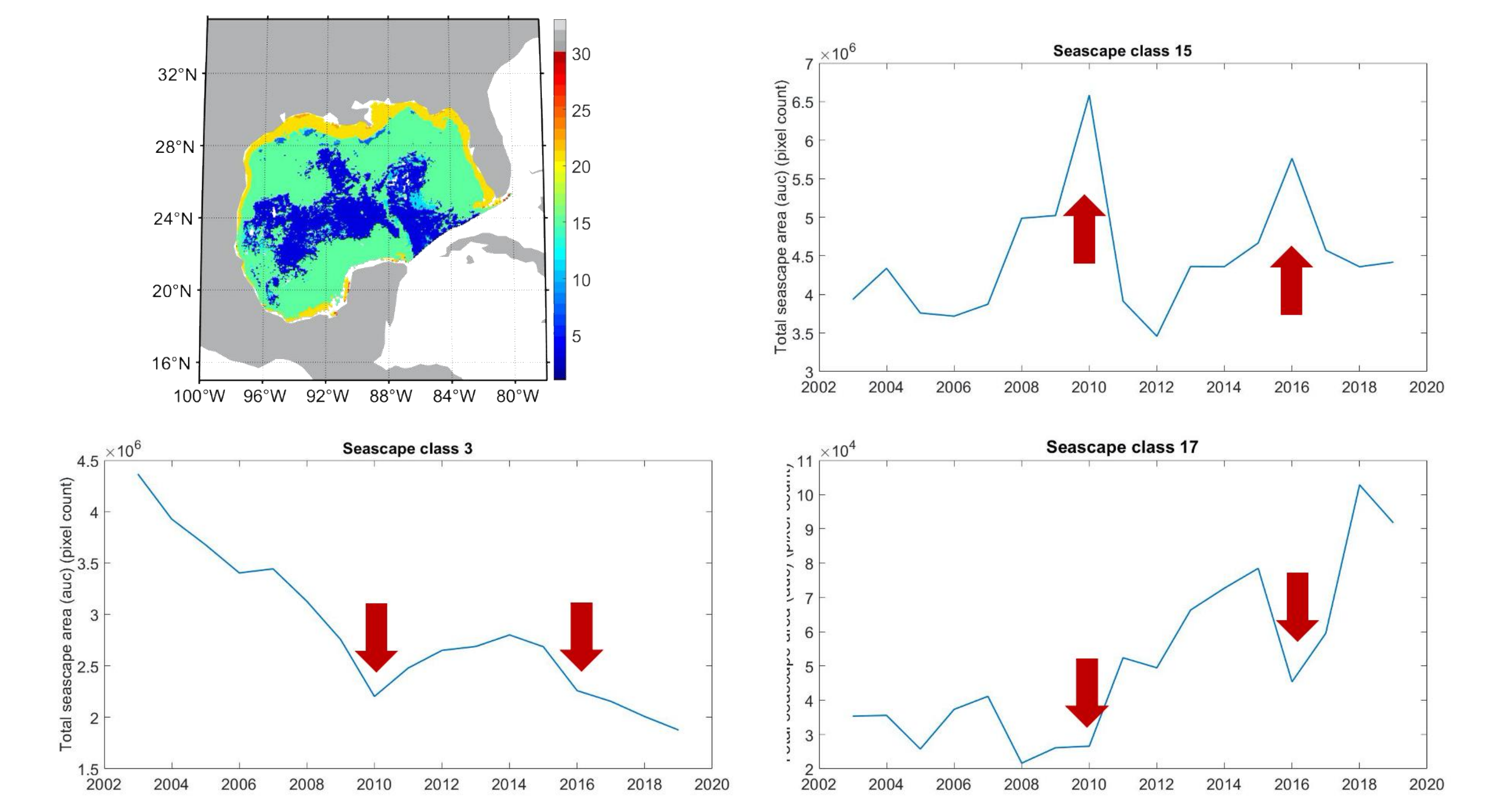
Total annual area (as area under the curve, or auc) occupied by Tropical/Subtropical Transition seascape (class 3), Tropical Seas (class 15) and Subtropical Transition - Low Nutrient Stress seascapes (class 17) in the Gulf of Mexico Large Marine Ecosystem. Map shows monthly mean seascape conditions for January 2003 as reference. The color bar indicates seascape categories.