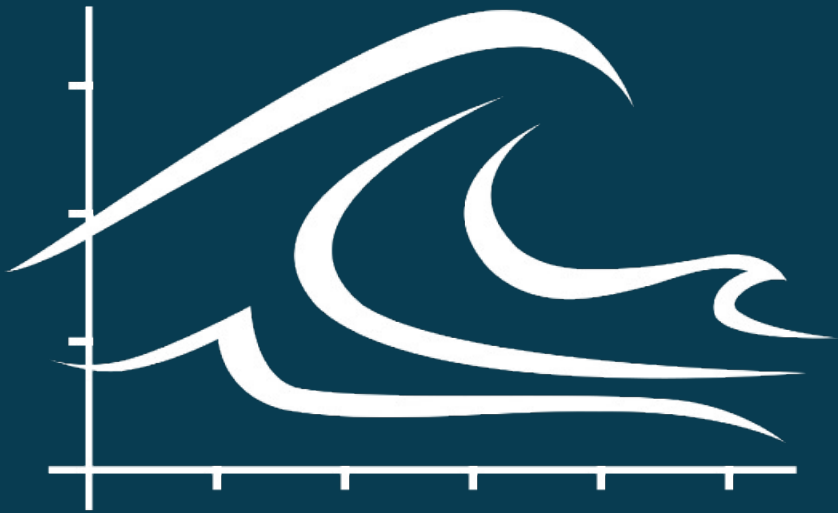


NERACOOS



NORTHEASTERN REGIONAL ASSOCIATION
OF COASTAL OCEAN OBSERVING SYSTEMS

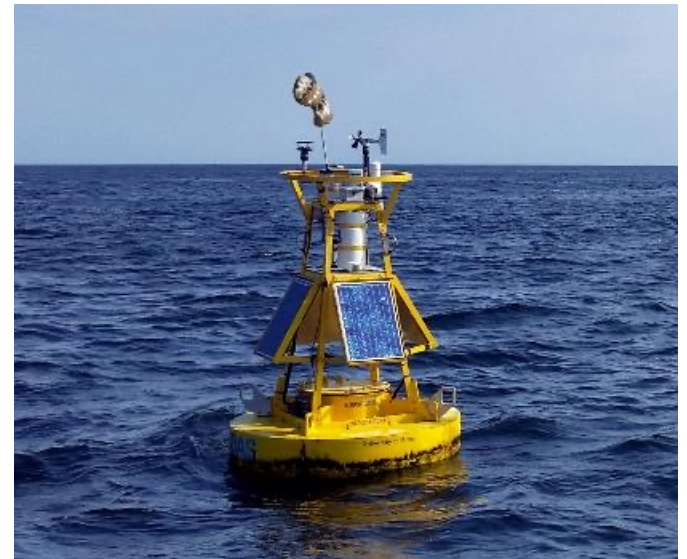
Gulf of Maine Ocean Climate Trends in 2023

Jake Kritzer

Eastern Regional Climate Team
Virtual Meeting
April 30, 2024

Overview

- Snapshot of IOOS & NERACOOS.
- Gulf of Maine ocean climate trends in 2023.
 - Temperature
 - Salinity
 - Plankton
- Summer forecasts for 2024.





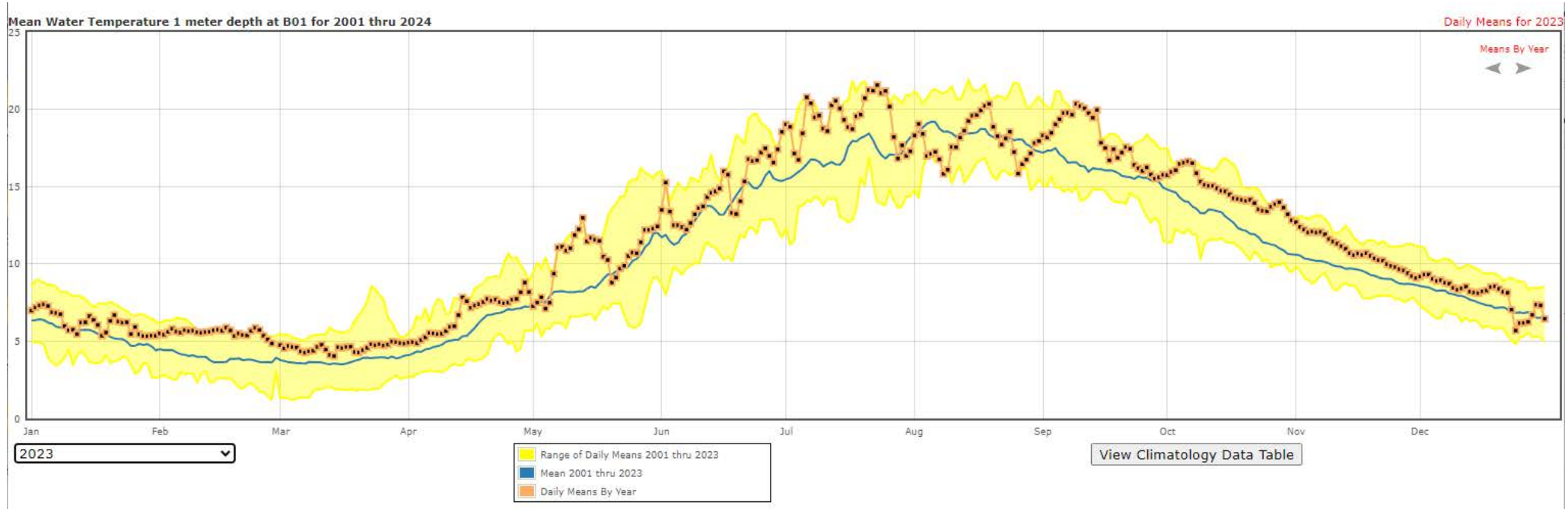
IOOS

Integrated Ocean Observing System

IOOS is our eyes on the ocean, coasts, and Great Lakes. We are an integrated network of people and technology gathering observing data and developing tracking and predictive tools to benefit the economy, the environment, and public safety at home, across the nation, and around the globe.



Western Maine Shelf – Temperature at 1m

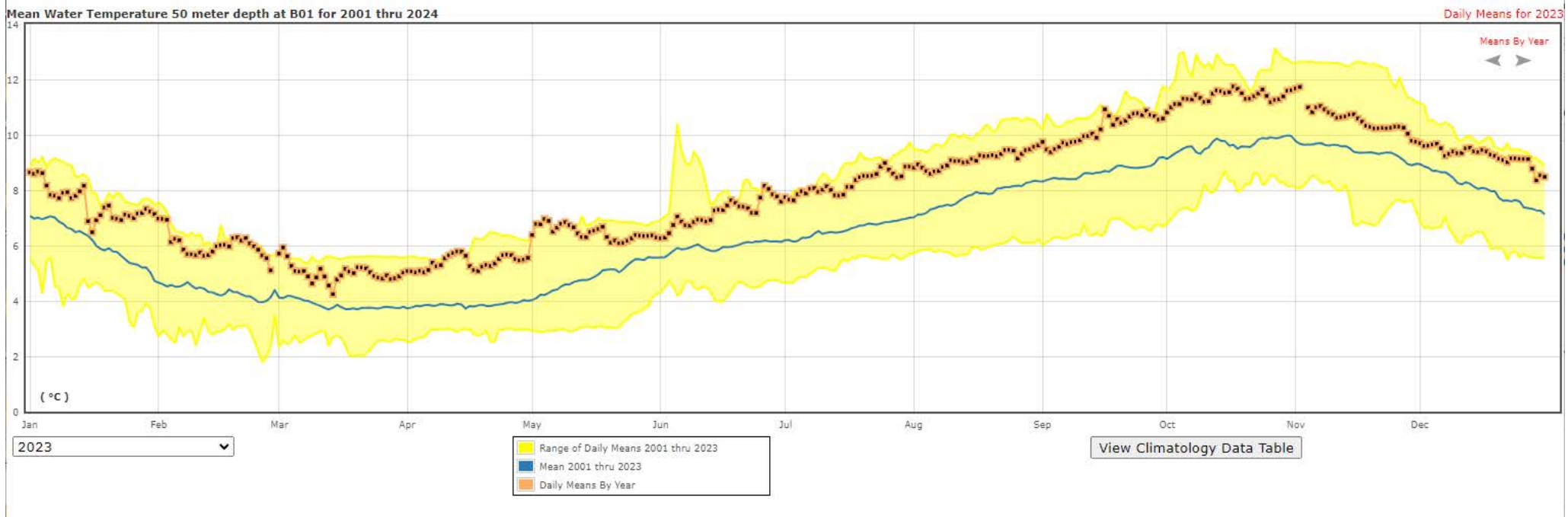


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Gulf of Maine
Research Institute

Western Maine Shelf – Temperature at 50m

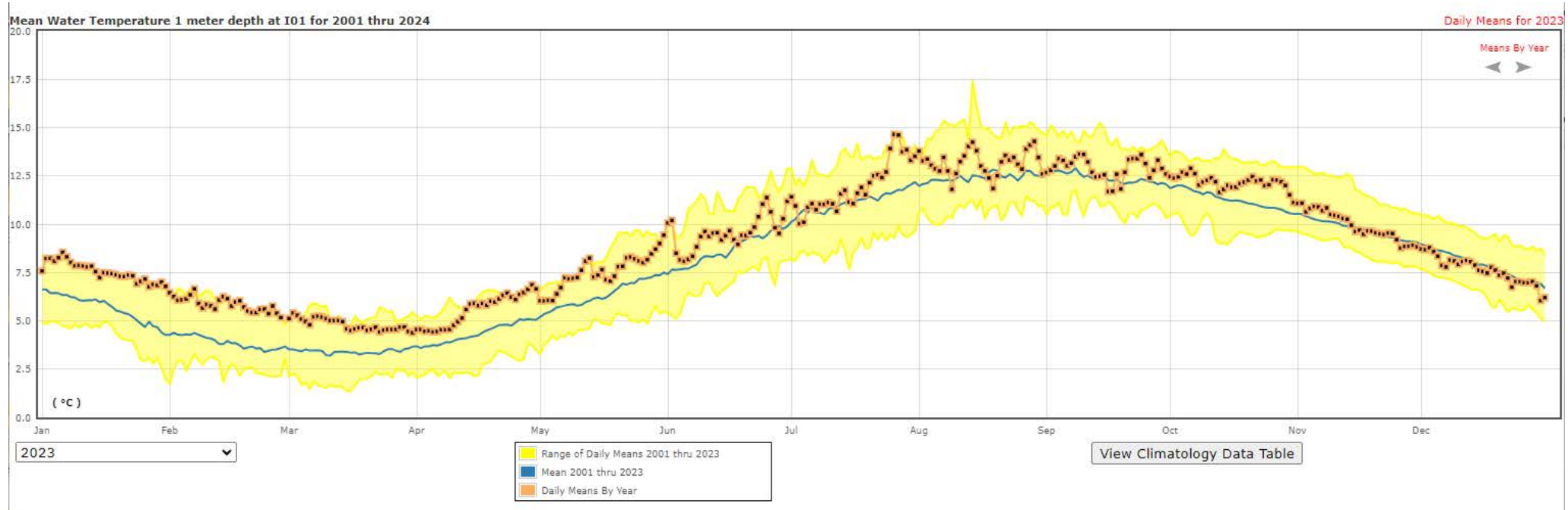


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Eastern Maine Shelf – Temperature at 1m

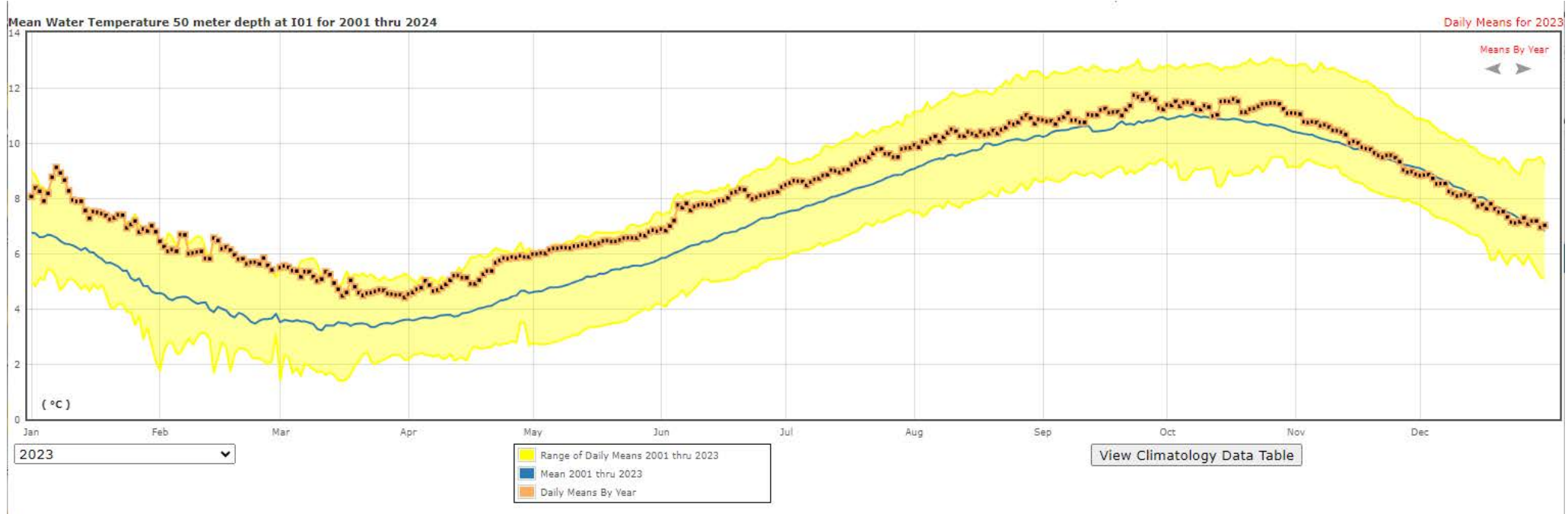


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Eastern Maine Shelf – Temperature at 50m

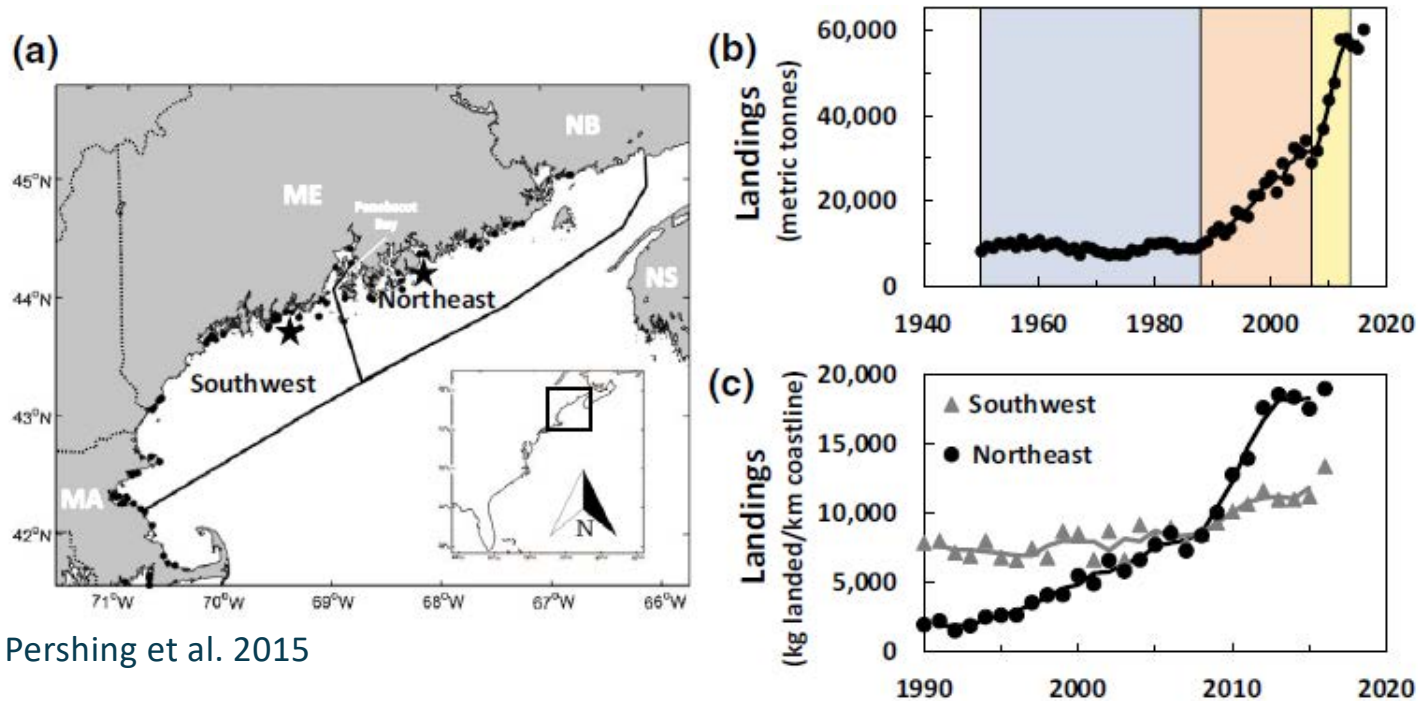


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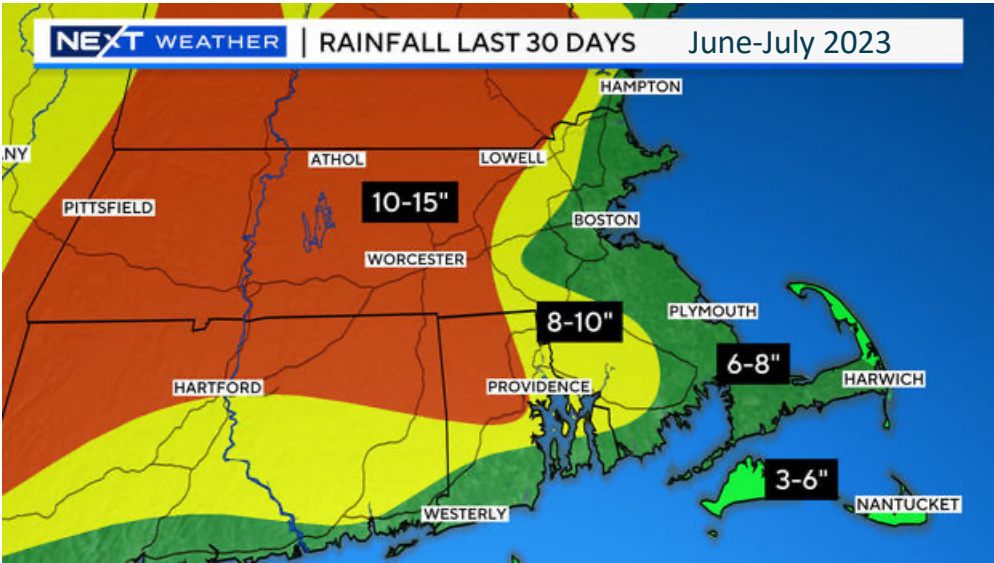
Spatial Trends in Lobster Abundance



→ Driven by warming water + greater mixing due to larger tides Downeast



2023 Rainfall Records



WBZ Boston

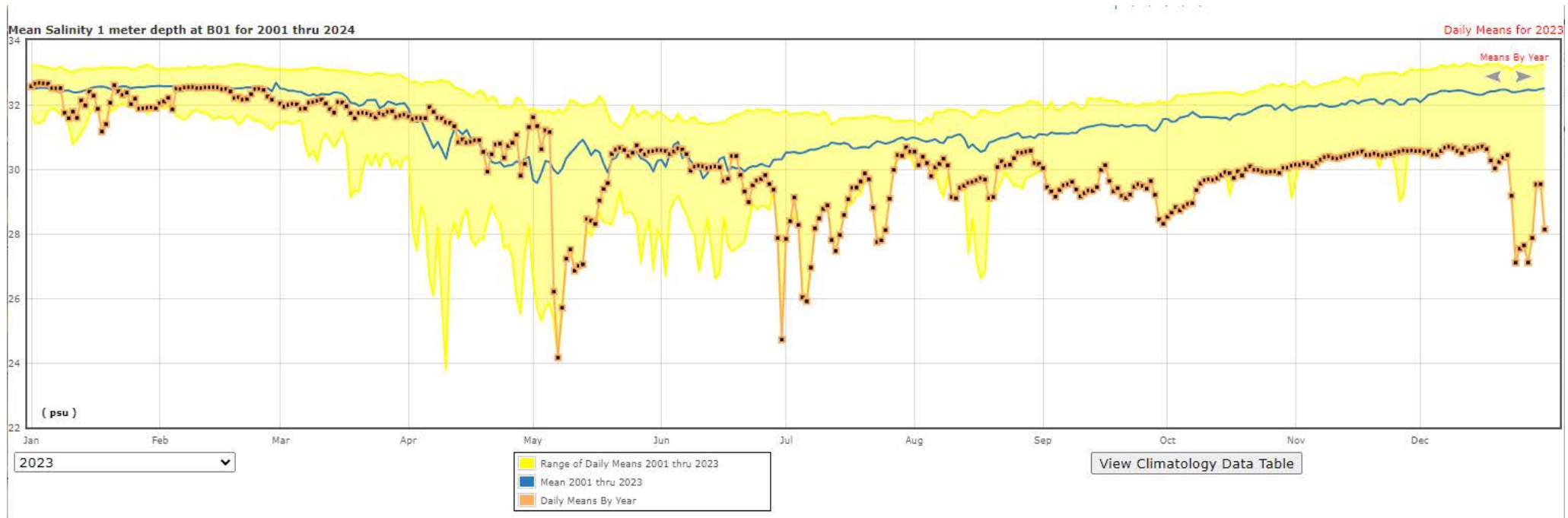


Bangor Daily News



NERACOOS

Western Maine Shelf – Salinity at 1m

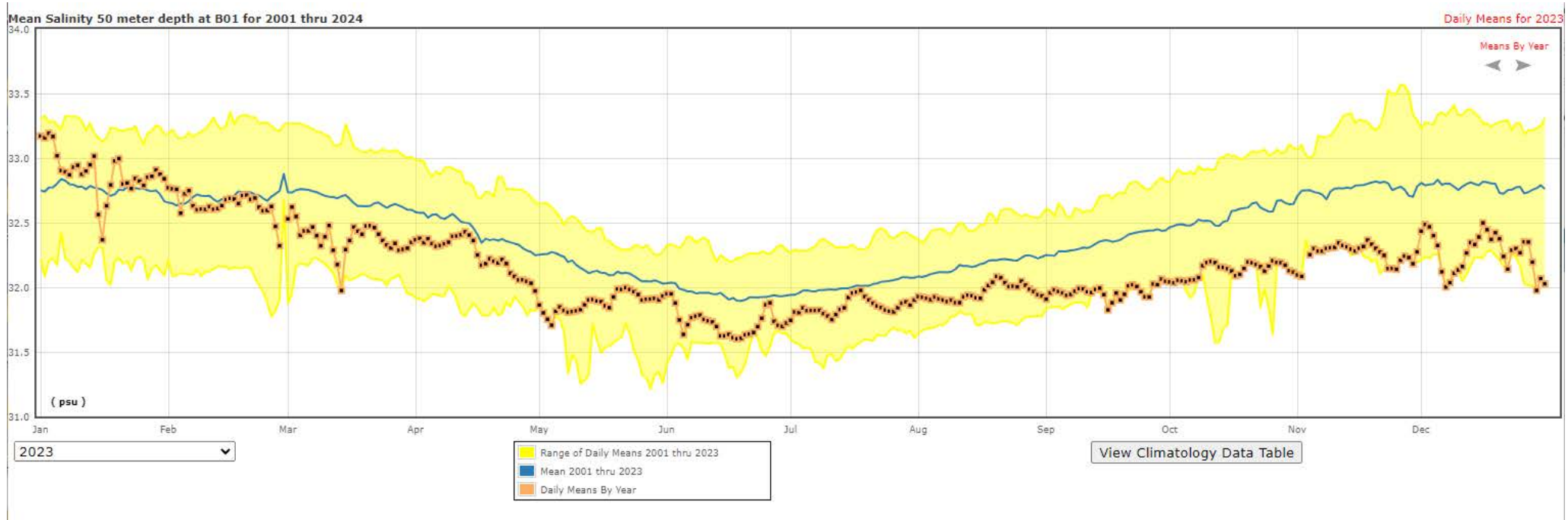


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Research Institute

Western Maine Shelf – Salinity at 50m

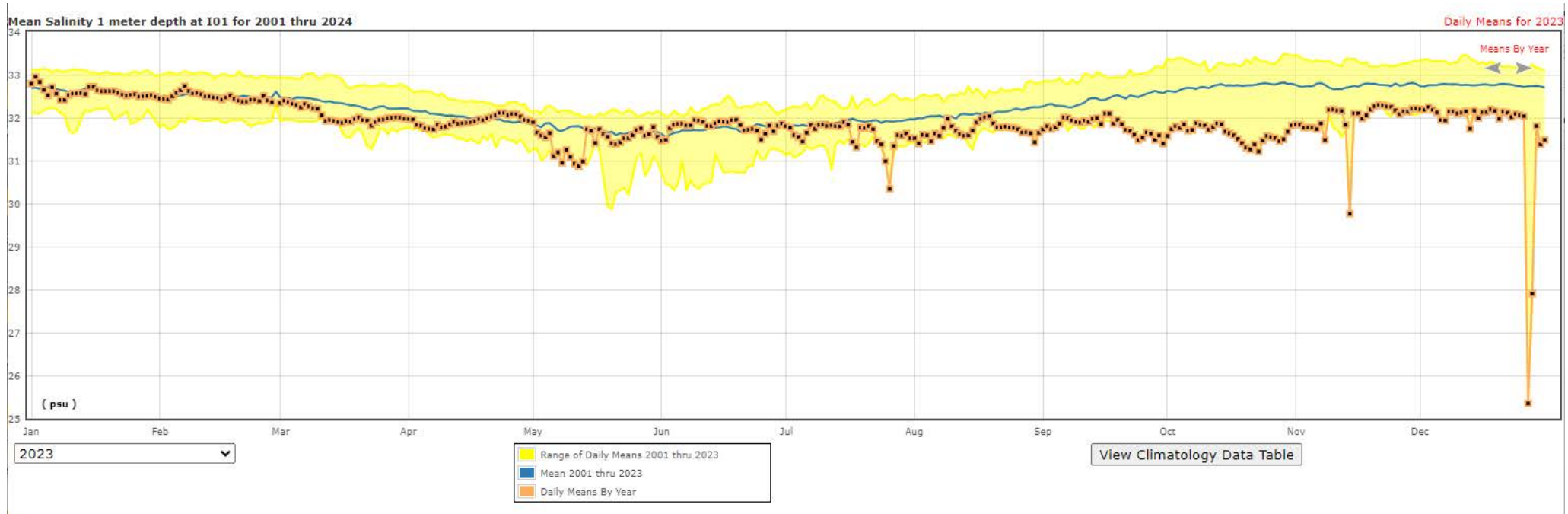


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Eastern Maine Shelf – Salinity at 1m

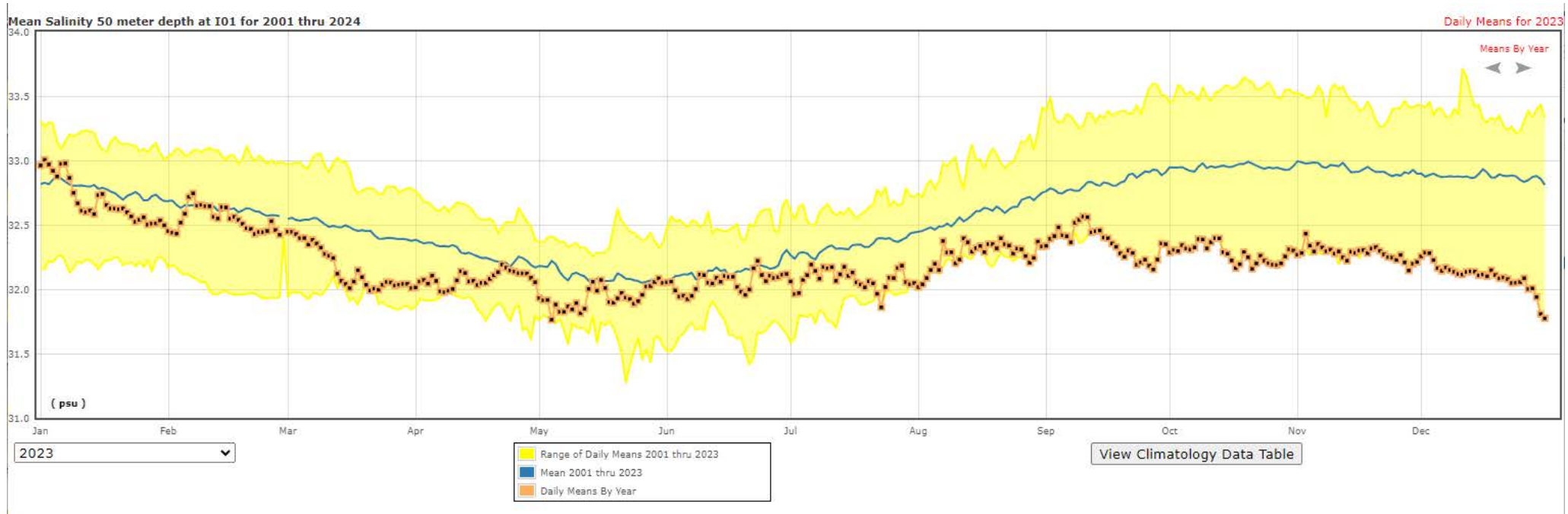


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Eastern Maine Shelf – Salinity at 50m

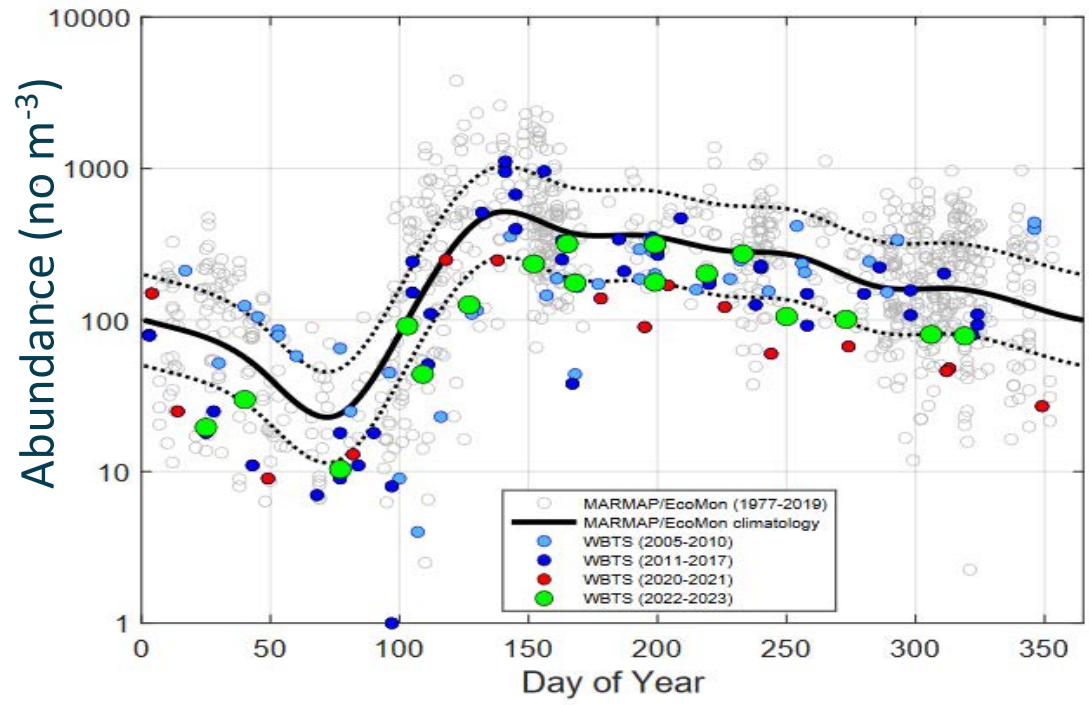
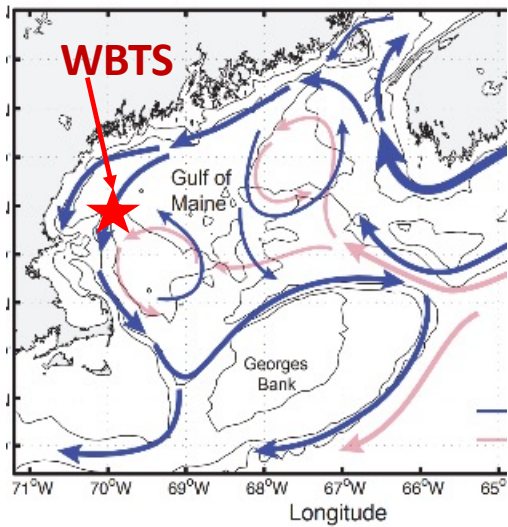


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Calanus Index

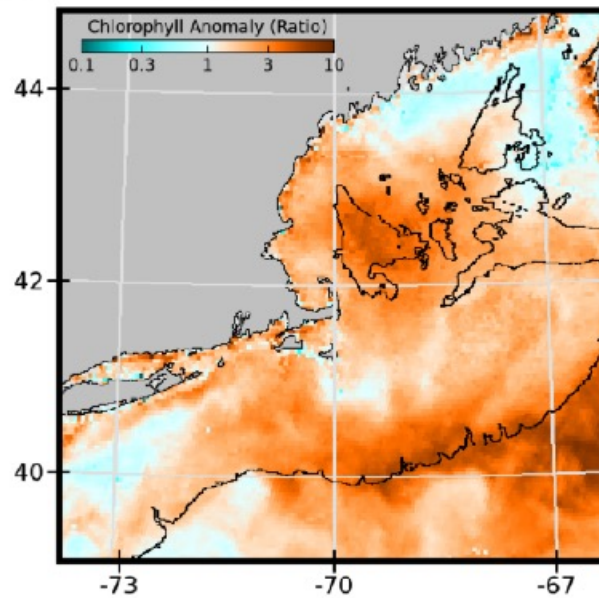
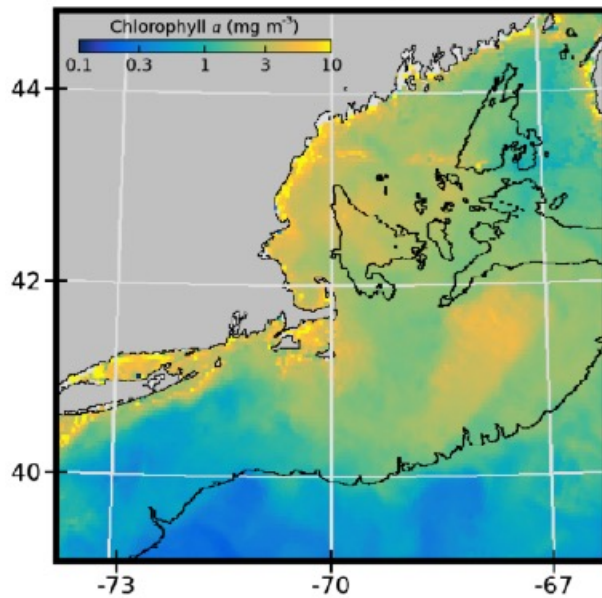


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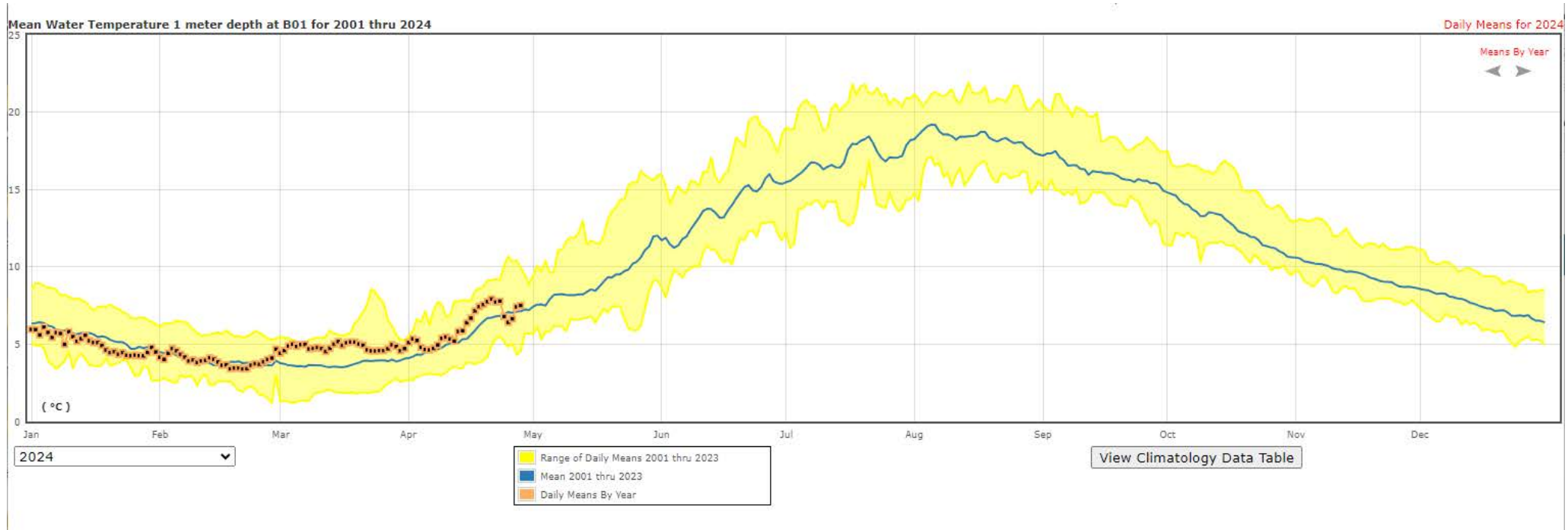
Triplos Bloom

Week 38: 20230917 - 20230923



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2024 So Far: Western Maine Shelf – Temp. at 1m

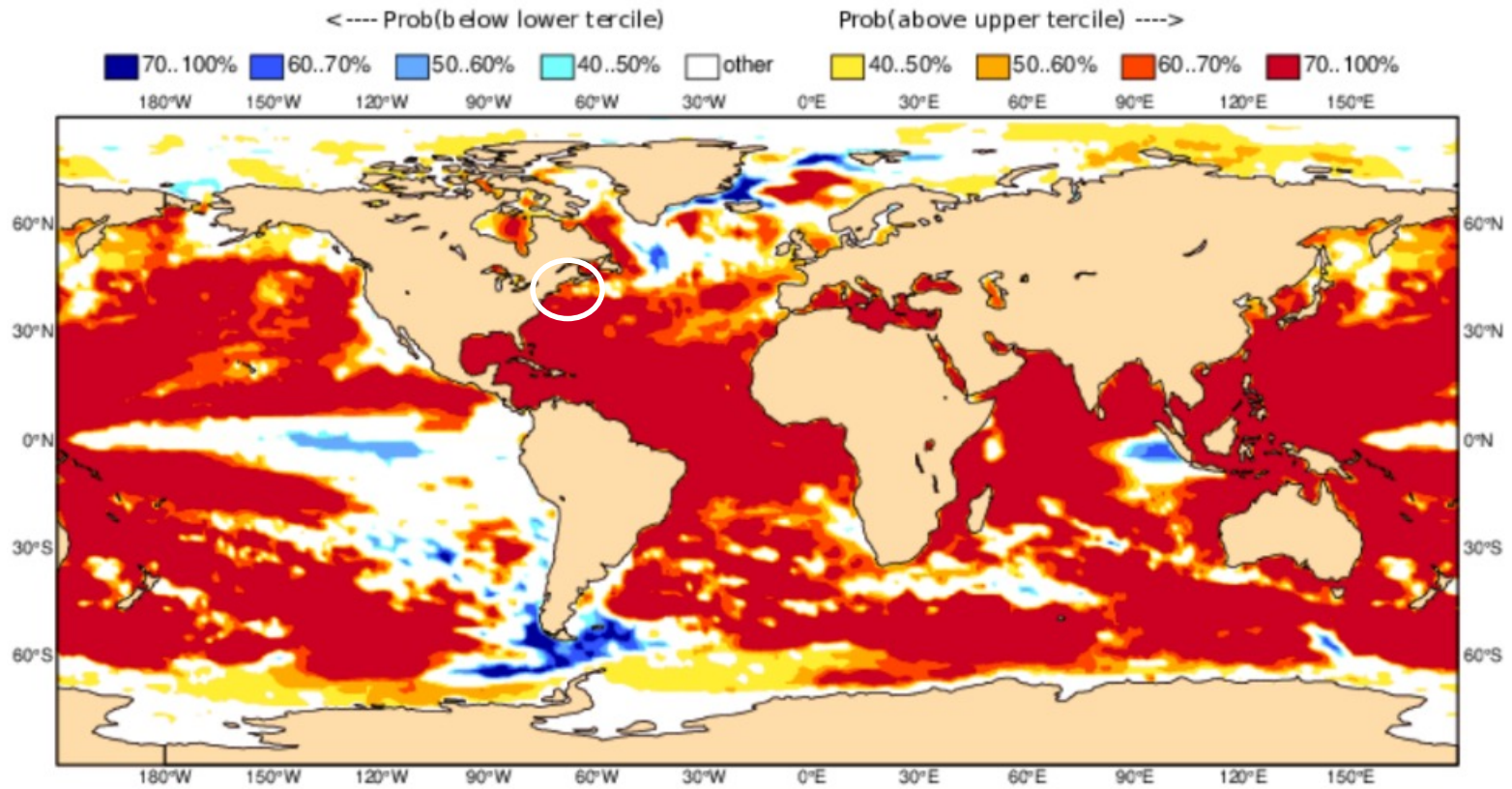


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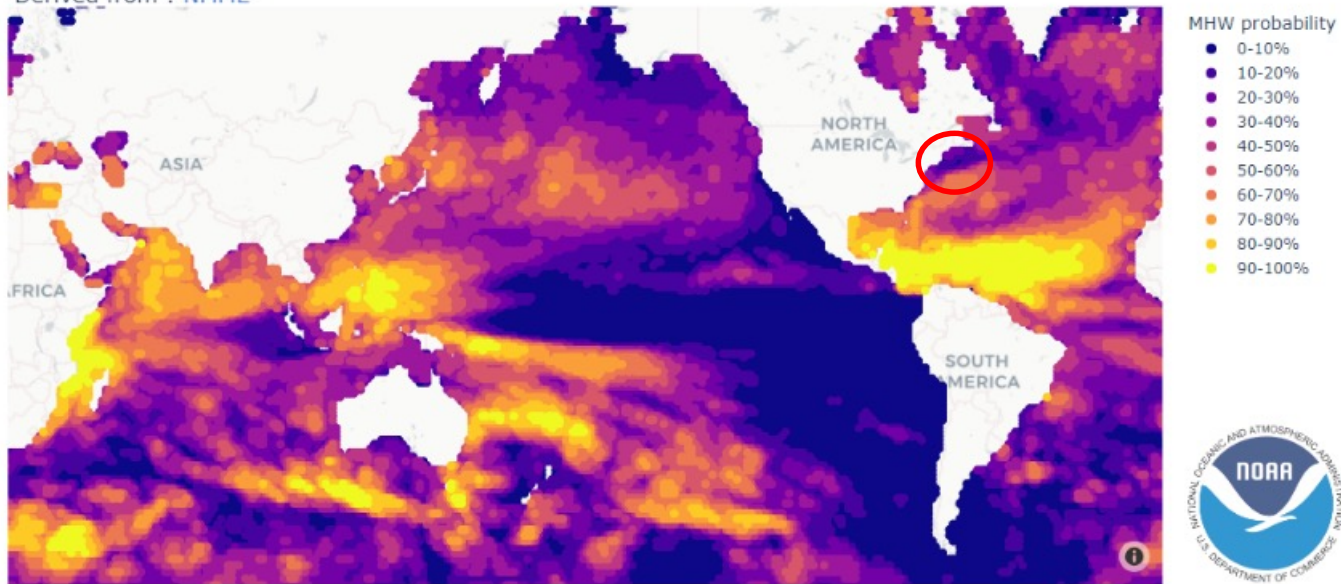
Gulf of Maine
Research Institute

ECMWF SST Forecast



NOAA PSL MHW Forecast

Marine Heatwave (MHW) Forecast [Jacox et al., 2022]
Derived from : NMME



Lead time = 4.5 months (08/2024)



NERACOOS

Summary


- **Trends in 2023:**

- Temperatures were generally, but not anomalously high.
- More cooling throughout the water column late in the year in Eastern Maine.
- Greater stratification in Western Maine with temperature remaining relatively higher at depth.
- Record low salinities took hold over the second half of the year throughout the system following record high rainfall.
- *Calanus* index show some signs of recover from record lows in 2020-2021.
- *Tripos* was through the roof, but the drivers and long-term consequences are unclear.

- **Forecasts for 2024:**

- Early temperature trends are average to high, but not yet extreme.
- Forecast for ~60-70th percentile summer temperatures.
- Probability of summer marine heat wave is low.



A composite image illustrating oceanographic research and satellite technology. The top half shows a view of Earth from space with several satellites in orbit, each emitting a beam of light towards the ocean surface. Below the surface, various research vessels and equipment are depicted, including a yellow autonomous underwater vehicle (AUV), a yellow and blue buoy, and a yellow and black AUV. The bottom half shows a detailed view of the ocean floor with various marine life, including fish, a whale, a crab, and a turtle. A yellow and black AUV is also shown in the bottom right corner. The text "Thank You! Questions? jake@neracoos.org" is overlaid in the center of the image.

Thank You! Questions?
jake@neracoos.org