Ocean Acidification Data Sharing Update

NROC 2024 Fall Meeting

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NROC Northeast Regional Ocean Council

NERACOOS NORTHEASTERN REGIONAL ASSOCIATION OF COASTAL OCEAN OBSERVING SYSTEMS

University of New Hampshire

Gulf of Maine Research Institute

Ocean Acidification Data Sharing

Goal: Integrate ocean acidification data into the NERACOOS climatology tool

- NERACOOS climatology background
- Data processing upgrades
- UNH CO2 buoy climatology examples

Daily Climatology

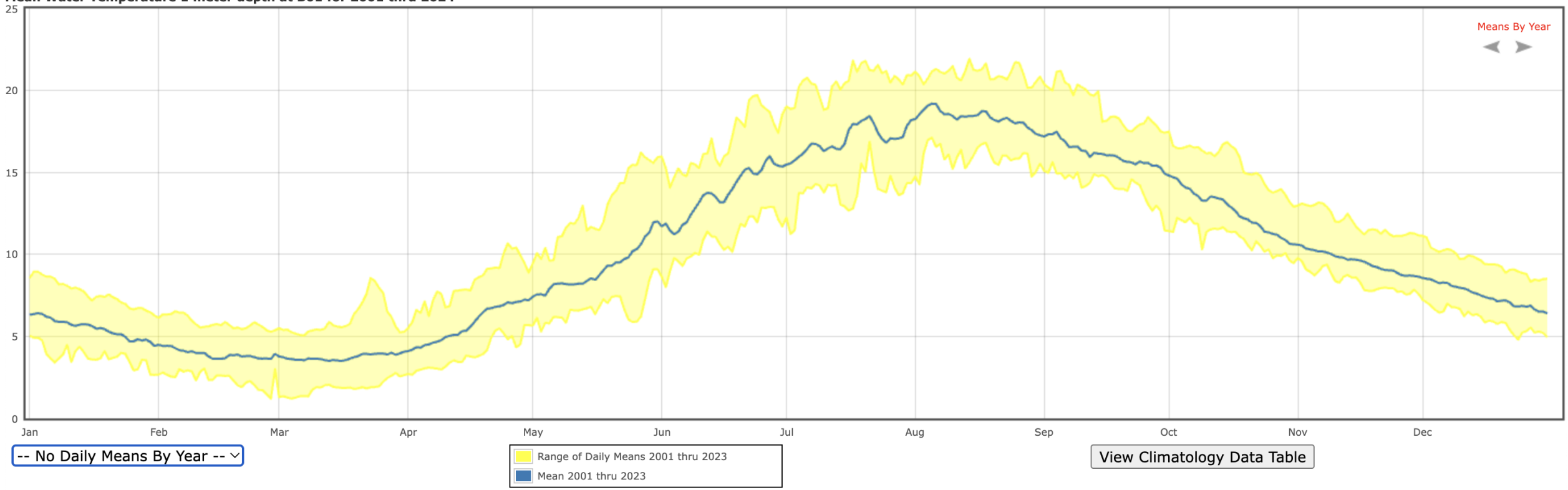
To view different plots, select buoy, data type and the averaging time period from the selections below. For more information on the product, view the information page. For an overview of how to use the display, or if you are having problems viewing the page, go to the How To Guide.

Buoy Location B01, Western Maine Shelf - UMaine

Data Type Water Temperature 1m

Averaging Time Period Daily

Mean Water Temperature 1 meter depth at B01 for 2001 thru 2024



-- No Daily Means By Year --

View Climatology Data Table

Daily Climatology

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Buoy Location B01, Western Maine Shelf - UMaine

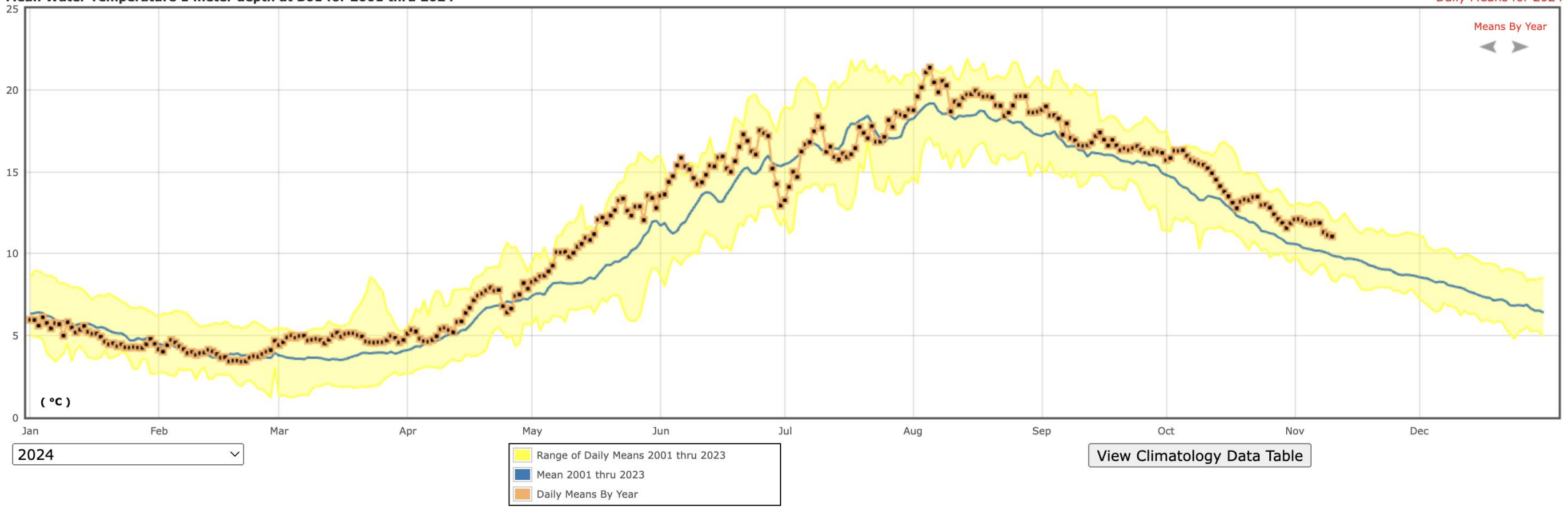
Data Type Water Temperature 1m

Averaging Time Period Daily

NERACOOS

Mean Water Temperature 1 meter depth at B01 for 2001 thru 2024

Daily Means for 2024



2024

View Climatology Data Table

Daily Climatology

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Buoy Location: B01, Western Maine Shelf - UMaine

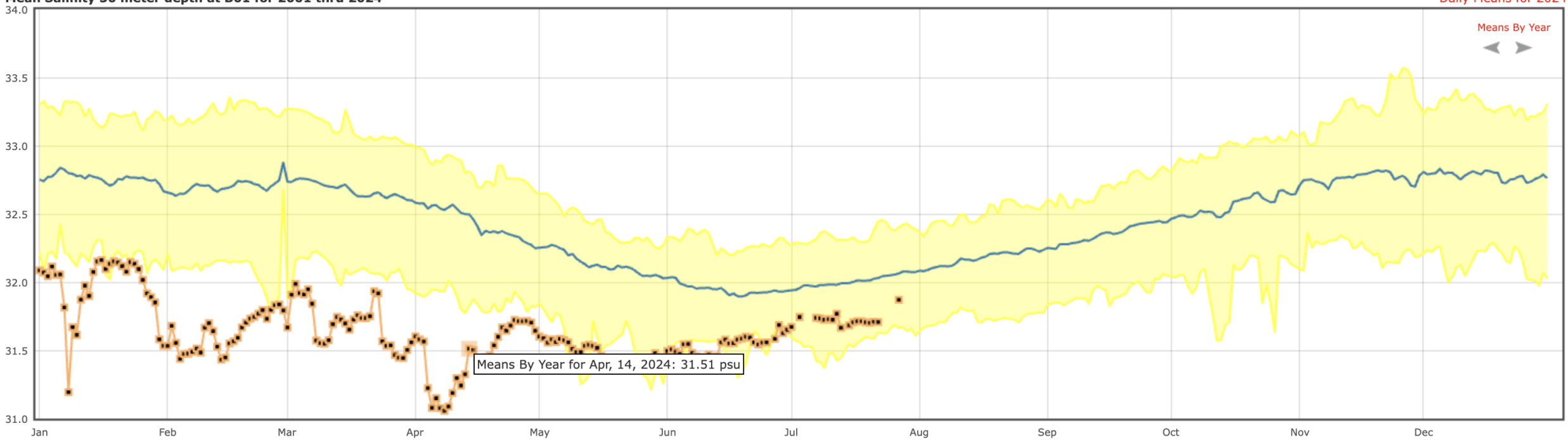
Data Type: Salinity 50m

Averaging Time Period: Daily

NERACOOS

Mean Salinity 50 meter depth at B01 for 2001 thru 2024

Daily Means for 2024

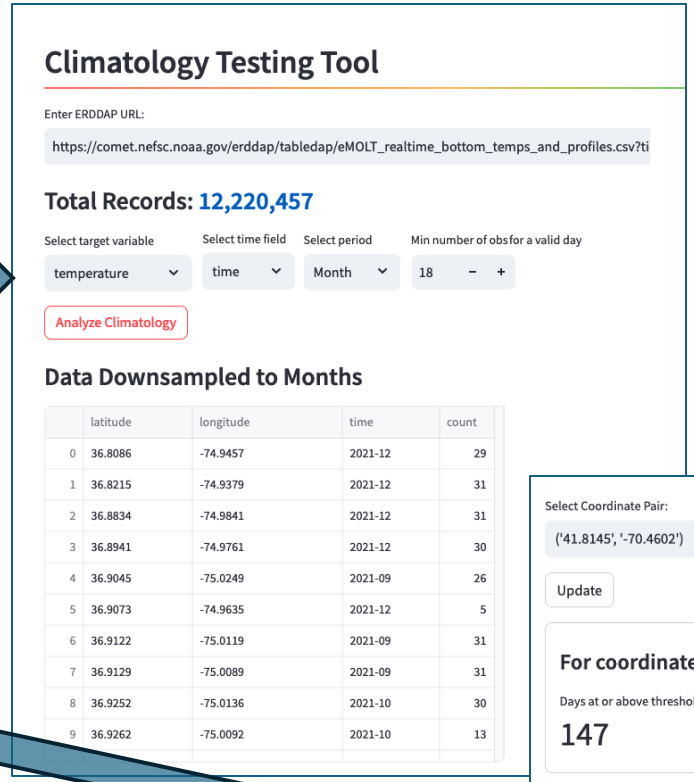


2024

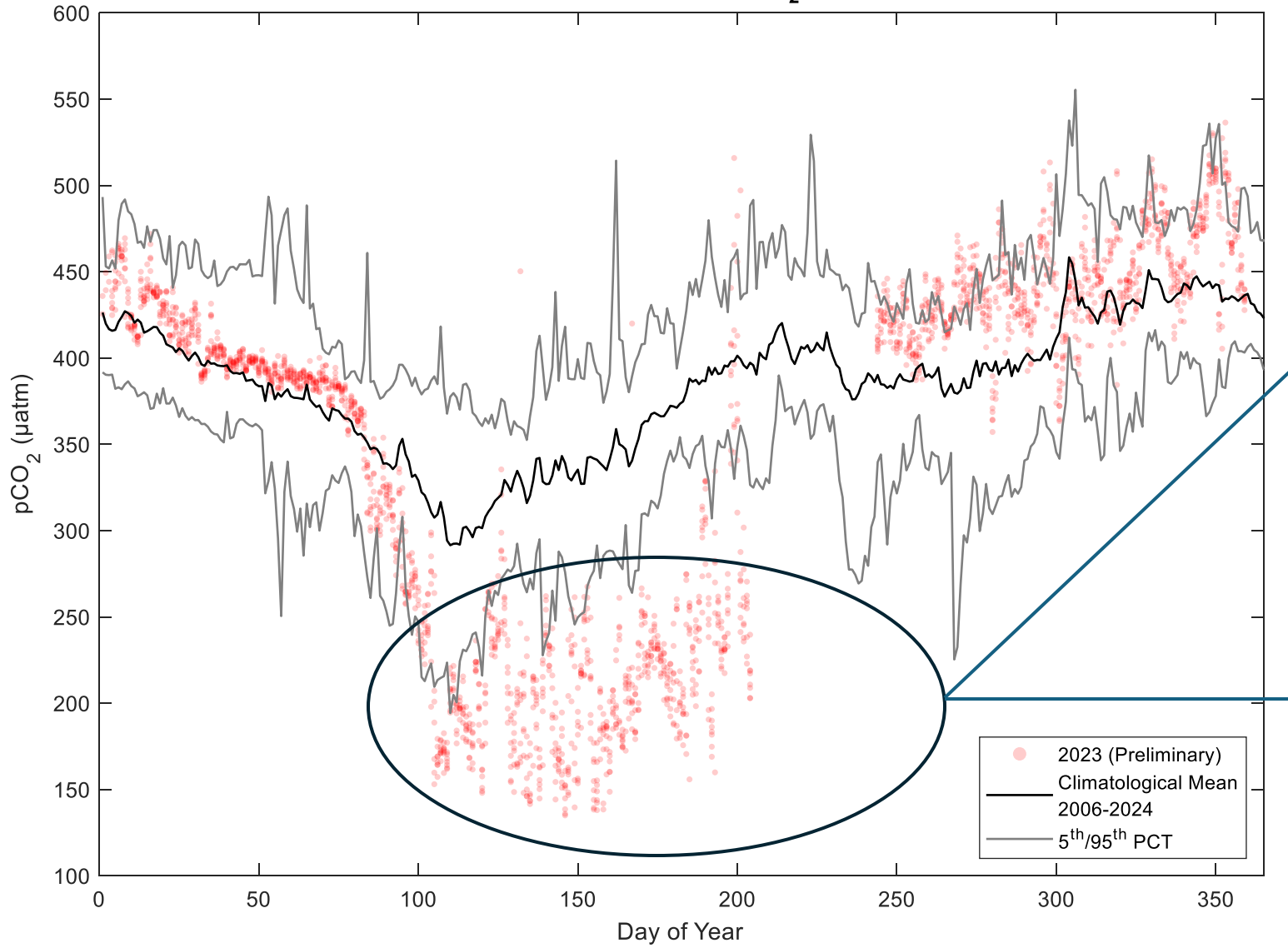
View Climatology Data Table

Climatology 2.0 – Backend Data Processing Tool

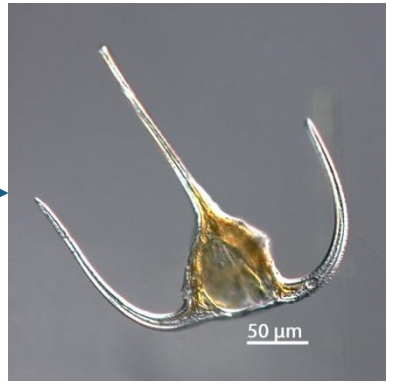
- Ingest directly from ERDDAP dataset
- Update processing scripts
  - Initial review/down sample of data
    - # of complete observations by hour, day, month, year
  - Set thresholds
    - Based on WMO recommendation for hourly data (legacy product, UMaine buoys)
      - A valid day - >18/24 observations w/no more than 4 consecutive missing hours;
      - A valid month –> 25/30 valid days, with no more than 3 consecutive missing days)
  - Calculate # of obs above threshold
    - Can modify thresholds (if data have coarser resolution than hourly)
  - Run climatology stats
    - Daily/monthly background climatology (min, max, average, standard dev.)
    - Daily/monthly running average of RT dataset
    - Output files for data visualization tools
      - For each station/depth/variable (> 100s!)

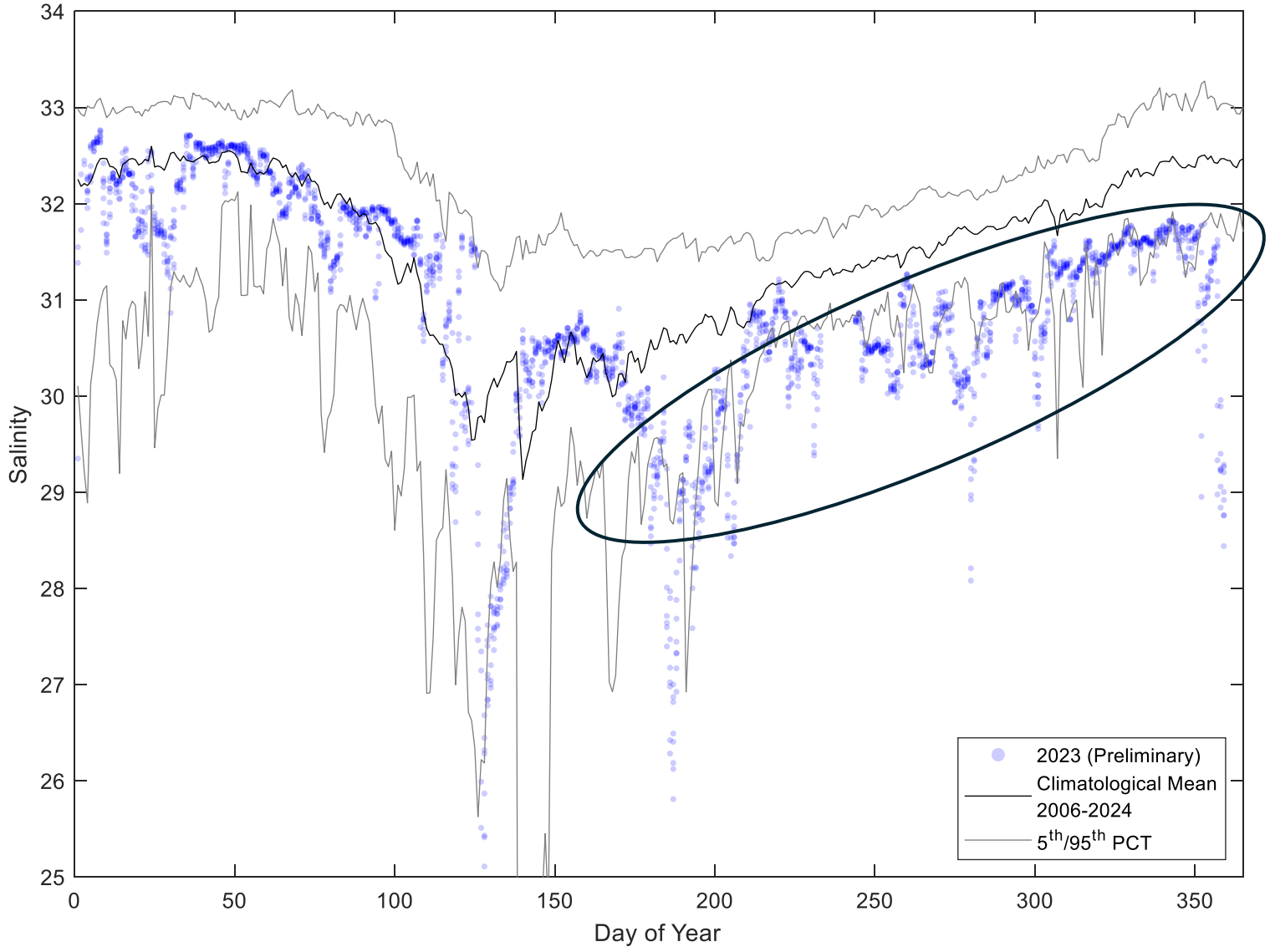


Gulf of Maine Coastal CO_2 Buoy

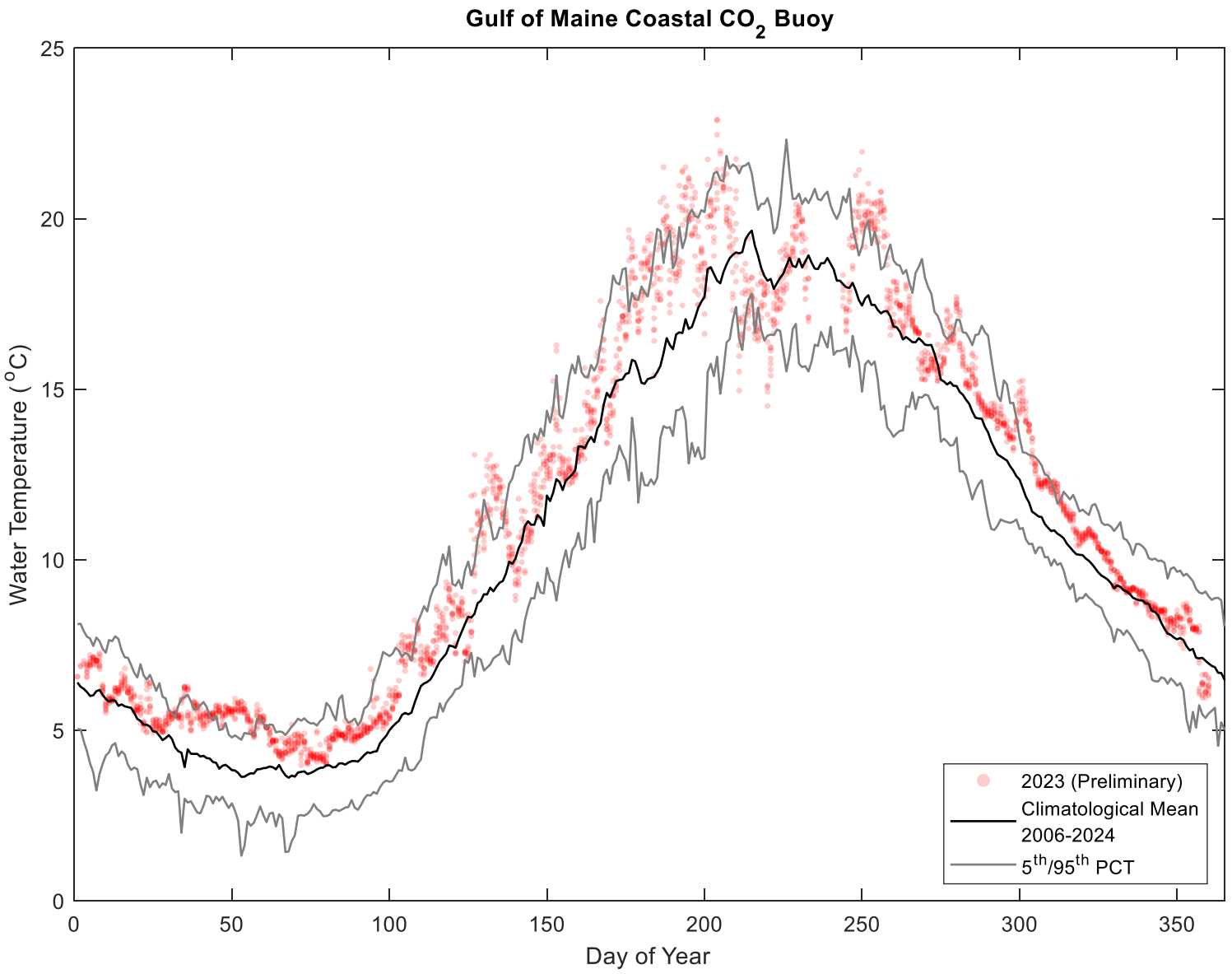


Offshore of G. Bank, 12 May 2023 R/V Henry Bigelow (photo from K. McGinnis NOAA)



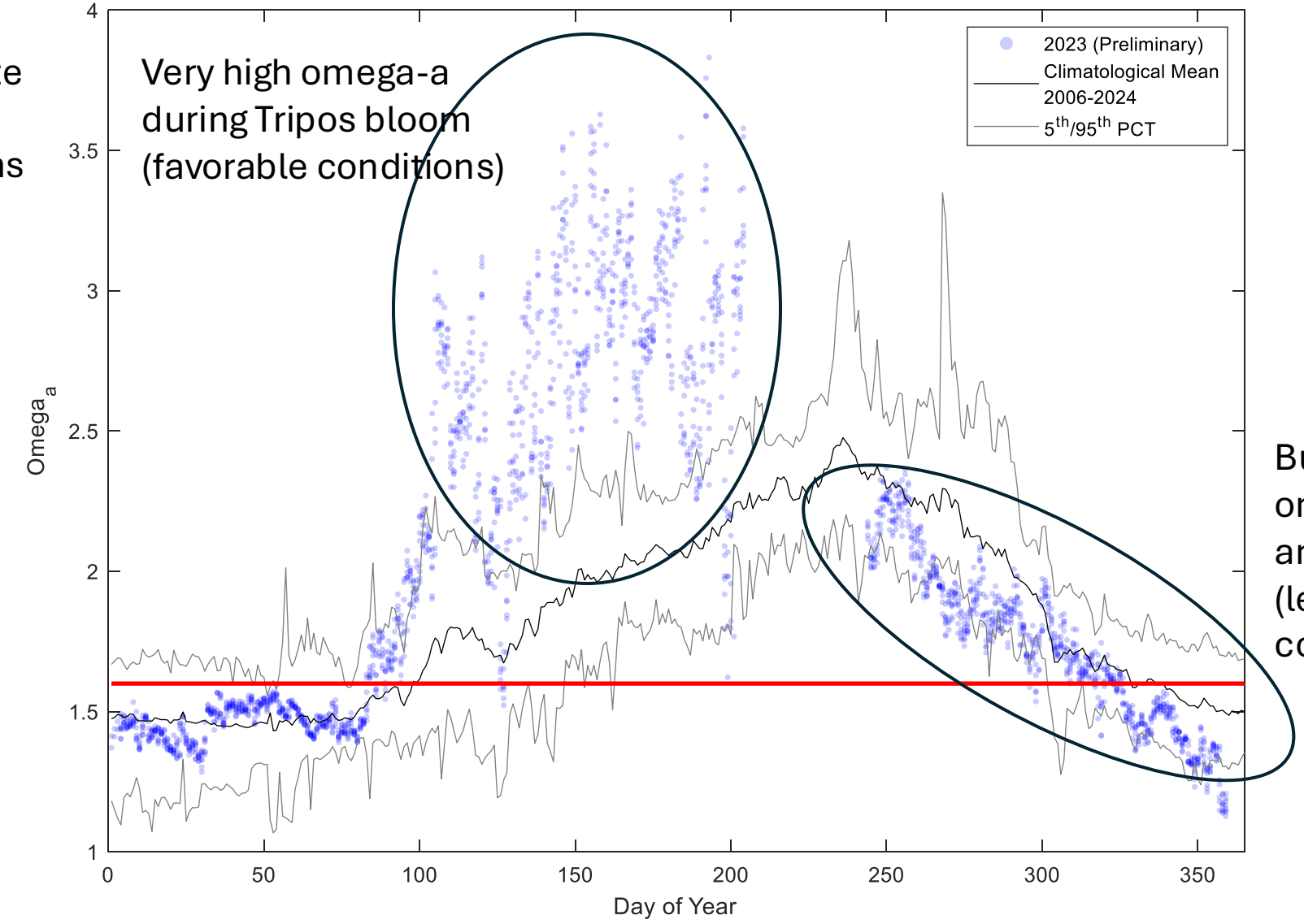


Salinity unusually low in summer/fall/early winter


Gulf of Maine Coastal CO2 Buoy
Water Temperature (°C)
Day of Year
0
5
10
15
20
25
0
50
100
150
200
250
300
350
2023 (Preliminary)
Climatological Mean
2006-2024
5th/95th PCT

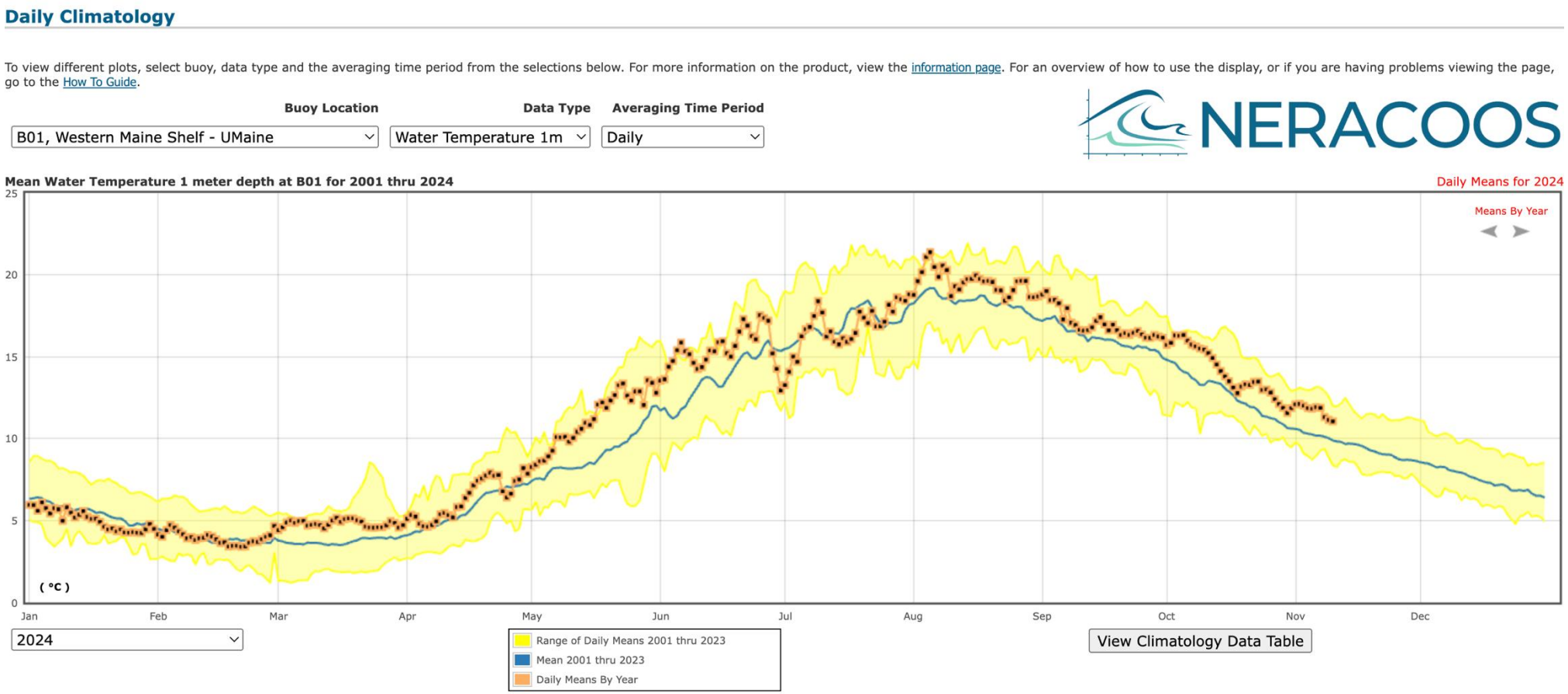
Omega-a is saturation of calcium carbonate

Index of conditions for shell-forming organisms



But persistently low omega-a during fall and early winter (less favorable conditions)

Questions?


Daily Climatology
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B01, Western Maine Shelf - UMaine
Data Type
Water Temperature 1m
Averaging Time Period
Daily
NERACOOS
Mean Water Temperature 1 meter depth at B01 for 2001 thru 2024
Daily Means for 2024
Means By Year
25
20
15
10
5
0
(°C)
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
2024
Range of Daily Means 2001 thru 2023
Mean 2001 thru 2023
Daily Means By Year
View Climatology Data Table