



**NAFO** Northwest Atlantic  
Fisheries Organization



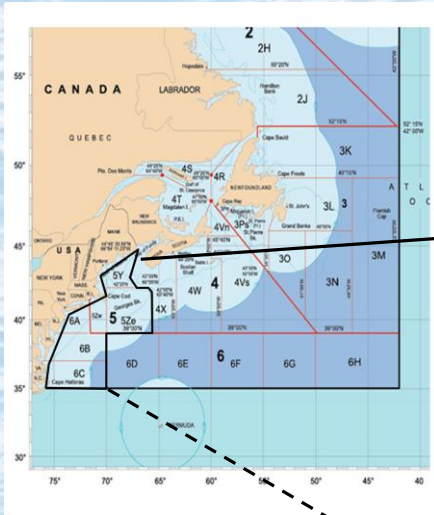
# **The 2021 Overview of hydrographic conditions at NAFO Subareas 5 and 6**



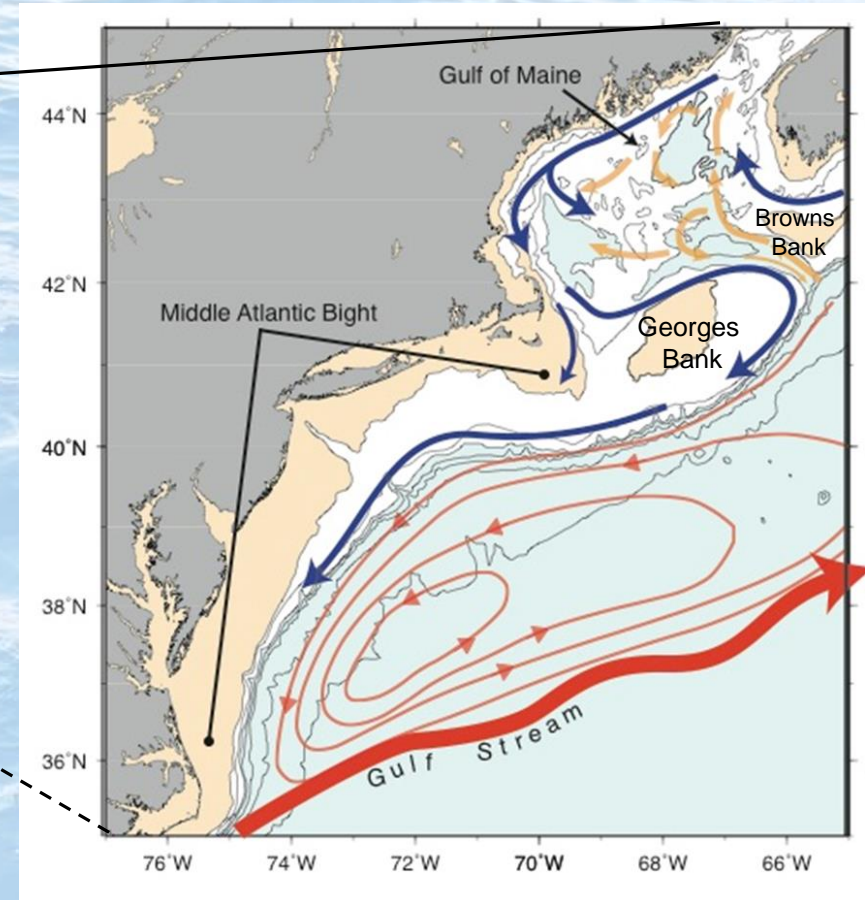
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# NAFO Subareas 5 & 6 – Main features and general circulation

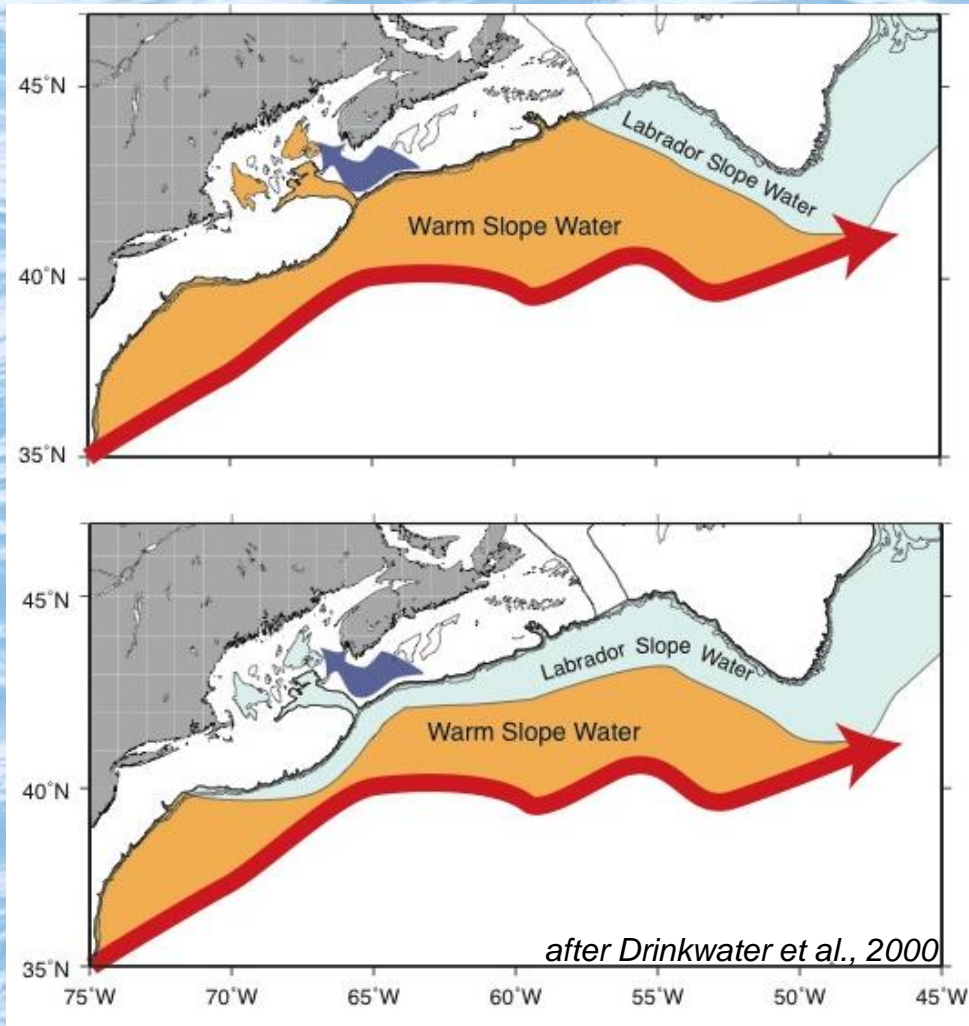


- Hydrography connected to both the Subpolar and Subtropical Atlantic.
- The tail end of boundary current carrying arctic-origin waters.
- At the confluence of two major western boundary currents.
- Hydrography influenced by basin-scale variability.

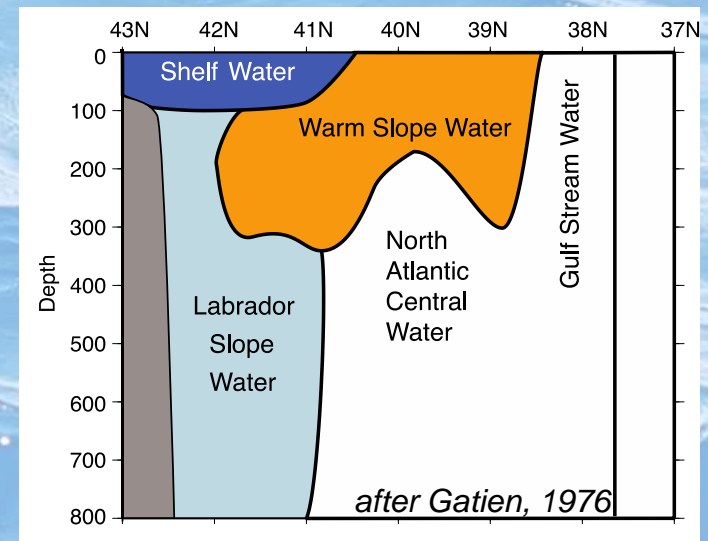




# Hydrographic variability: Changes in proportion/property of source waters

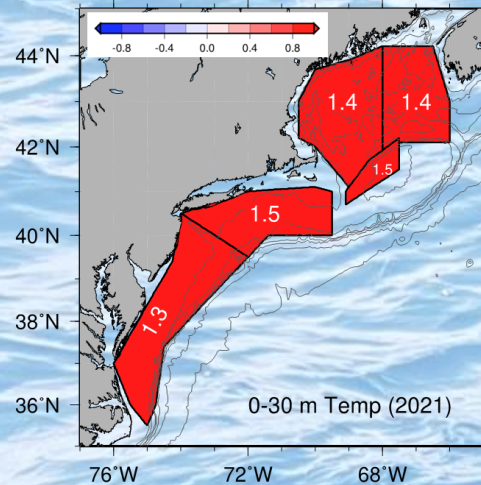


- Periods of increased shelf water inflow coincide with periods of decreased slope water
- The composition of slope water in the NE Channel is correlated with Gulf Stream position and the NAO

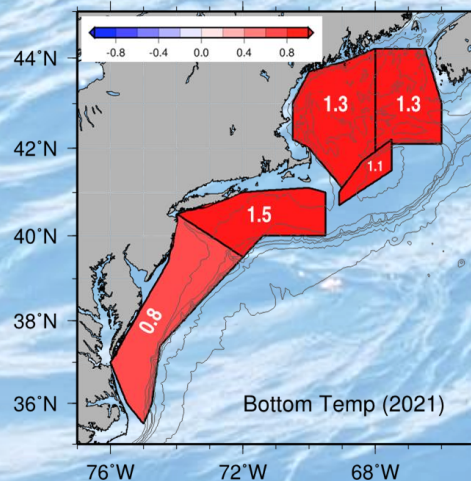




# Temperature – Annual anomaly

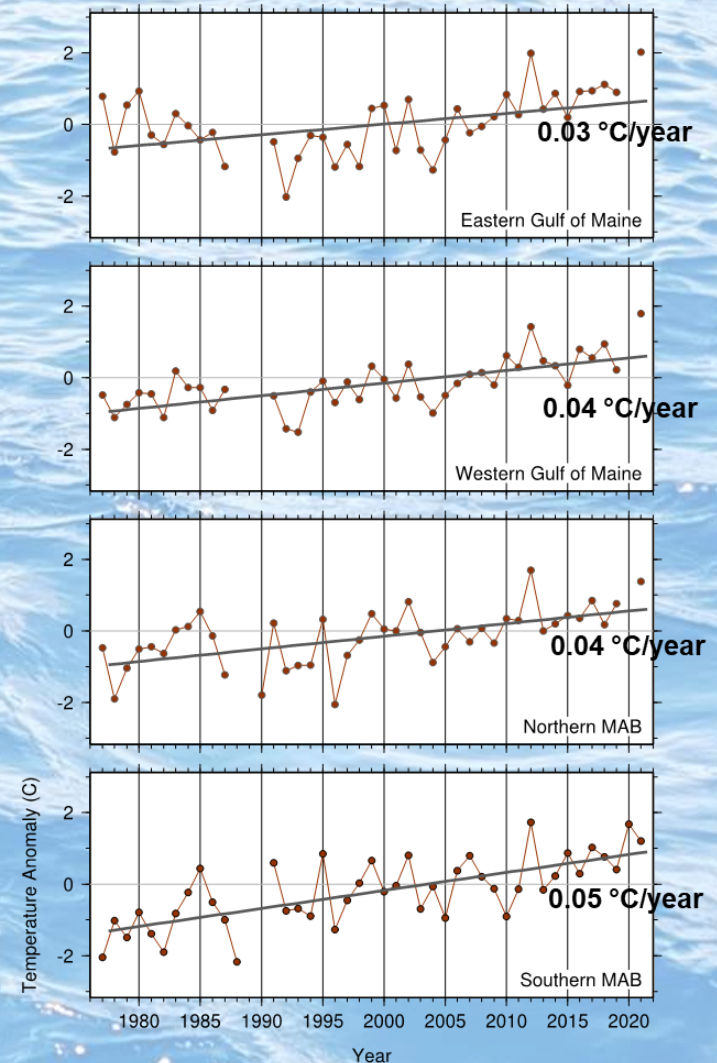


The **upper ocean** (0-30 m) was between 1.3-1.5 °C warmer than normal across the region.



**Bottom temp.** anomalies roughly matching those at the surface.

## Decadal time scale variability

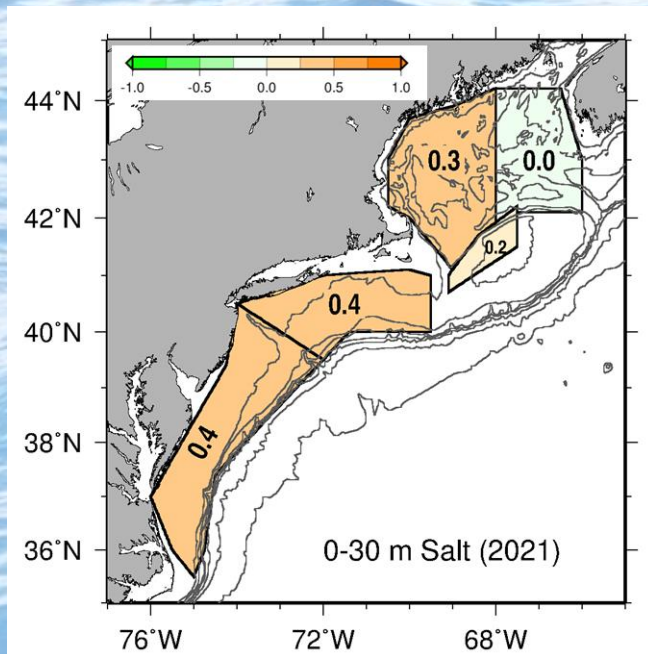


- **Long term** (1977-2021) gradual **warming**.
- Increasing trends are consistent from top to bottom in all region.

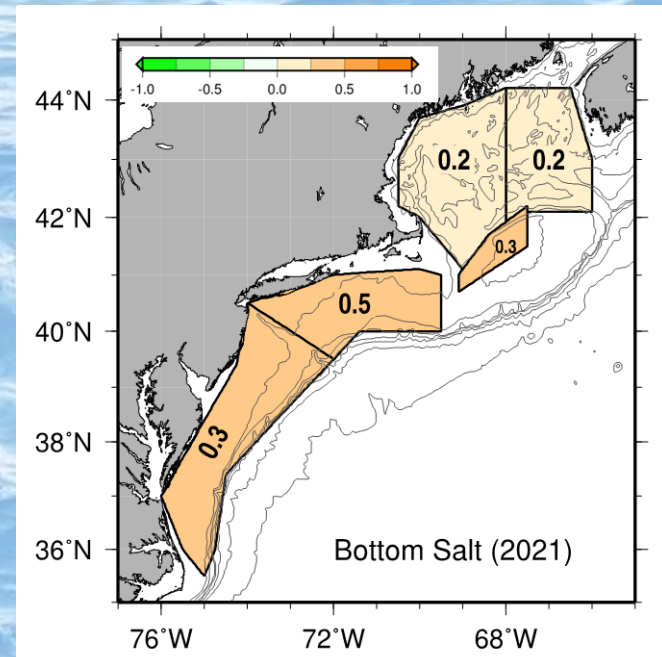




# Salinity – Annual anomaly



Saltier surface conditions were observed except in the eastern Gulf of Maine



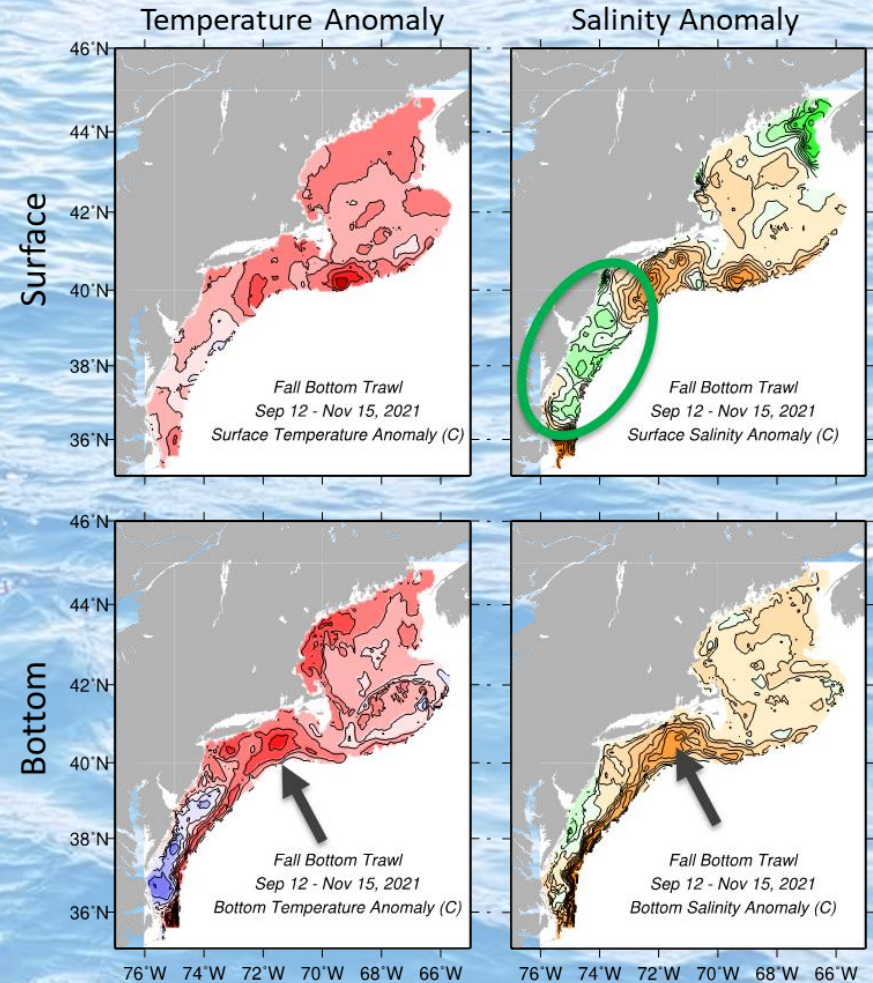
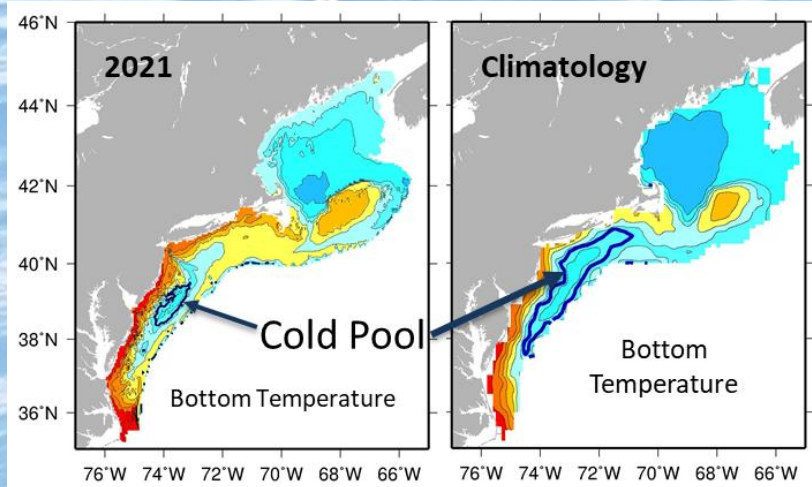
Salinities were anomalously high near bottom in the Mid Atlantic Bight and on Georges Bank





# Synoptic Fields

- Large positive temp. and salinity anomalies extend onshore in the northern Mid Atlantic Bight (MAB).
- Cold (bottom) and fresh (surface) anomalies dominate the southern MAB



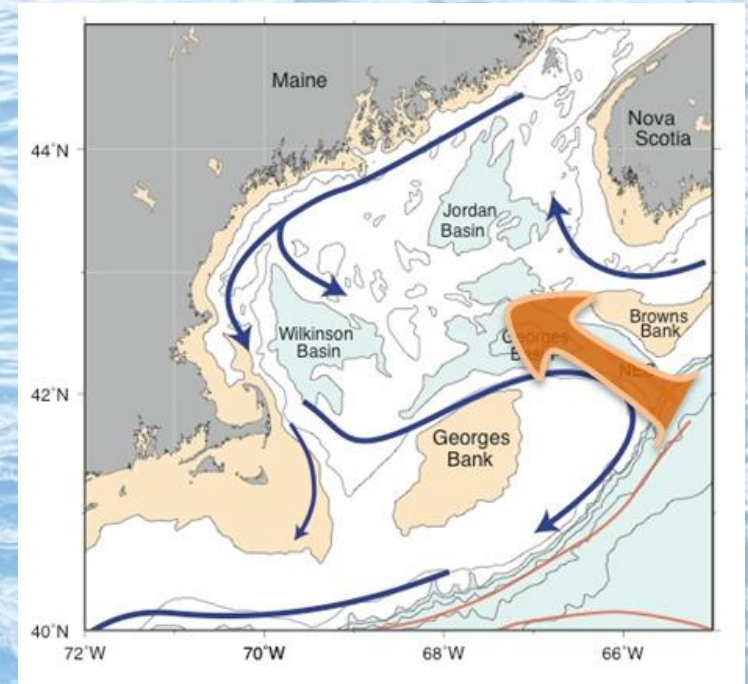
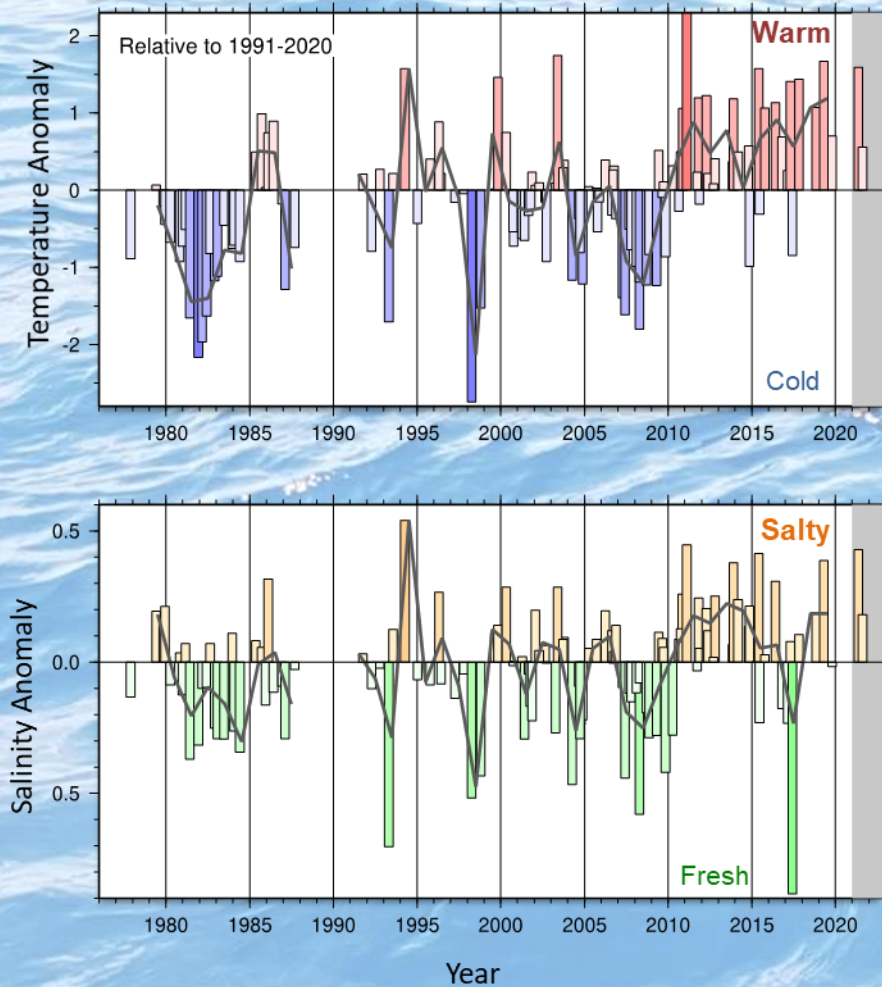
The extremely warm anomalies in the northern MAB are correlated with the inshore movement of the shelf break front.





# Deep Inflow to Gulf of Maine

## Slope Water in the Northeast Channel



- Deep inflow to Gulf of Maine continues warmer and saltier

Warmer Cold Intermediate Layer is capped by very warm surface waters





# Highlights

- The **Northeast US Shelf** was **warmer than normal** across the entire shelf in 2021.
- **Extreme warm and salty anomalies** were observed in the northern **Mid Atlantic Bight** linked to shoreward incursions of the shelf-slope front.
- In the western Gulf of Maine, the **Cold Intermediate Layer** was **warmer** than normal, and the underlying water mass in **Wilkinson Basin** was **warmer and saltier** than normal
- Deep waters entering the **Gulf of Maine** continue to be **warm and salty**, marking **a full decade** that southern source waters have dominated the slope water composition in the region







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Source:

**Fratantoni, P.** (2022). Hydrographic Conditions on the Northeast United States Continental Shelf in 2021 – NAFO Subareas 5 and 6, NAFO SCR Doc. 22/018.



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