

Hydrographic Conditions in the Western North Atlantic Newfoundland and Labrador, Scotian and Northeast U.S. shelves (NAFO Sub-areas 2-6)



Fisheries and Oceans Pêches et Océans Canada Canada

Atlantic Zone Monitoring Program (AZMP) NAFC Oceanography Section



NAFO Subareas 2, 3, 4, 5 and 6 – Oceanographic stations and survey sections



Newfoundland and Labrador (SA 2-3)

Air temperature

Sea Ice

- Cold Intermediate Layer area
- Station 27 T and S

Scotian Shelf (SA 4-5)

- Air temperature Sable Island
- Sea ice on Scotian Shelf
- Near-bottom T and S at
 - Missaine Bank
 - Cabot Strait (200-300 m)
 - Emerald Basin
 - Georges Basin

NE US shelf (SA 5-6)

- Regional average T & S
 - Gulf of Maine
 - Northeast Channel
 - Georges Bank
 - Middle Atlantic Bight

NAFO Subareas 2, 3, 4, 5 and 6 – Main features and general circulation





Newfoundland and Labrador shelf (SA 2-3)

Air temperature



Overall warm air temperature (9th warmest on record)



Sea Ice





Newfoundland and Labrador shelf (SA 2-3)





Water column characterized by a thin warm and fresh layer



The freshening of the NL shelf continues



Scotian Shelf and Gulf of Maine (SA 4-5)



Annual air temperature anomalies (**dashed line**) and 5-year running means (**solid line**) in Scotian Shelf-Gulf of Maine region.



In 2023, air temperature anomalies were positive for all sites

Scotian Shelf and Gulf of Maine (SA 4-5)



- Water temperatures at selected sites were well above normal for two areas and near normal for the others
- A reversal in the warming trend was observed at all sites on the Scotian Shelf

Annual mean temperature anomaly time series (dotted line with circles) and the 5 year running mean filtered anomalies (heavy solid line) on the Scotian Shelf and in the Gulf of Maine



1960 1970 1980 1990 2000 2010 2020

1950





Mean = 1.62°C





Northeast U.S. Shelf (SA 5-6) – Monitoring plan









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NAFO Subareas 2-6 connection

Labrador Current Transport



More Labrador Current transport means cooler and fresher waters on the NS and NE U.S. shelves



Highlights

Air temperature

On average, warming was observed over most of the region Ocean temperature

Well above normal in the northern regions, particularly at the surface on the Newfoundland Shelf and at depth in Cabot Strait, Gulf of St. Lawrence, and Scotian Shelf. Conditions were near normal across the Northeast U.S. Shelf

Ocean salinity

Fresh conditions on the Newfoundland Shelf. Notable freshening on the Northeast U.S. Shelf for the first time in a decade, consistent with fresh inflow through Northeast Channel and increased volume transport by the Labrador Current south of the Grand Banks

Cold Intermediate Layer Volume

Return from record low to **near normal volume** in Newfoundland and Scotian Shelves, but continued low in Gulf of St. Lawrence

Sea Ice

Coverage was **near normal** across Labrador/Newfoundland but **low** in the Gulf of St. Lawrence





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Sources:

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Northwest Atlantic

Fisheries Organization

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