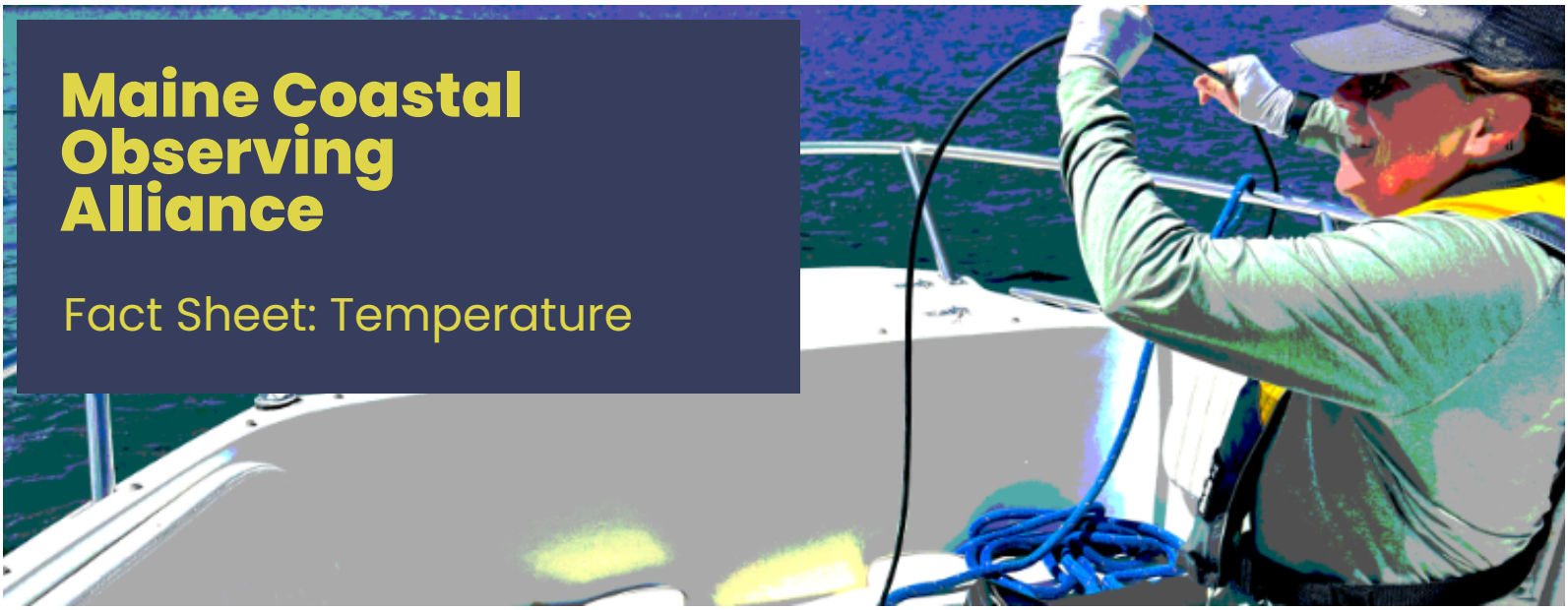


Maine Coastal Observing Alliance

Fact Sheet: Temperature

Why do we monitor temperature?

Water temperature is an essential parameter for estuarine and coastal monitoring. Many plants and animals are sensitive to temperature changes. Some animals, like lobsters, are at risk of contracting new diseases as a result of rising temperatures in coastal waters. Although temperature is highly variable in estuaries, ongoing monitoring will provide baseline data for future comparison. Indeed, over the last few decades, a rise in water temperature in the Gulf of Maine has been detected. We are interested to learn if, and to what degree, estuaries are impacted by these changes.

August Surface Temperatures at Inland Sites

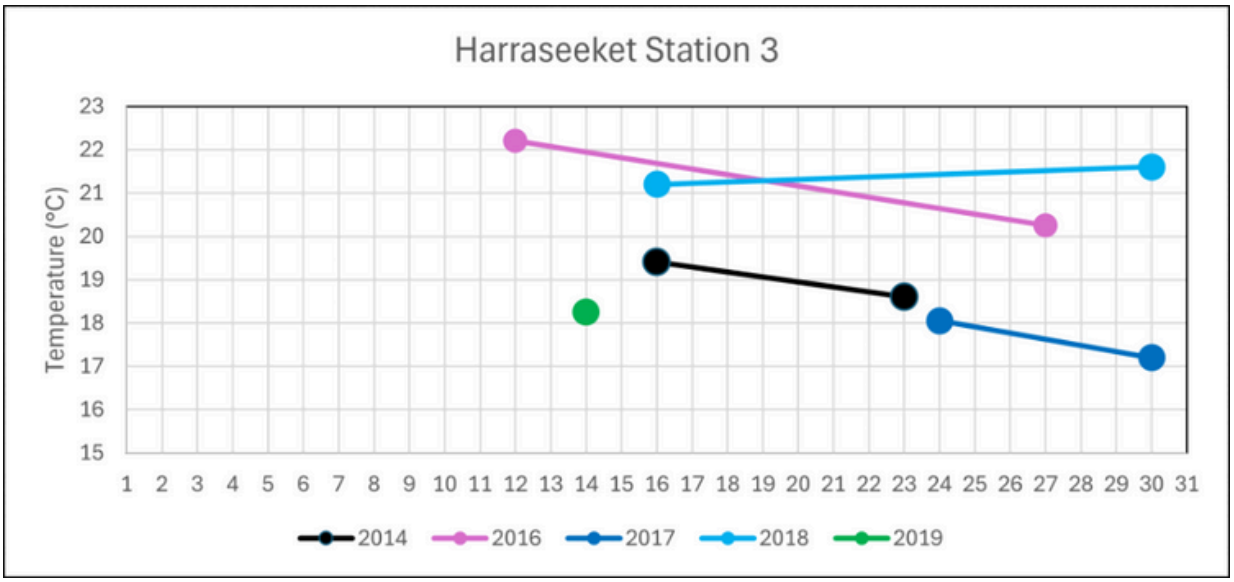
MCOA conducts water quality monitoring within estuaries and bays throughout midcoast Maine at a minimum of four times per year between August and October. MCOA data is collected according to a Quality Assurance Project Plan. Monitoring is focused on projected worst-case conditions of late summer, when the water temperatures are highest, and when low pH and dissolved oxygen are most likely to occur.

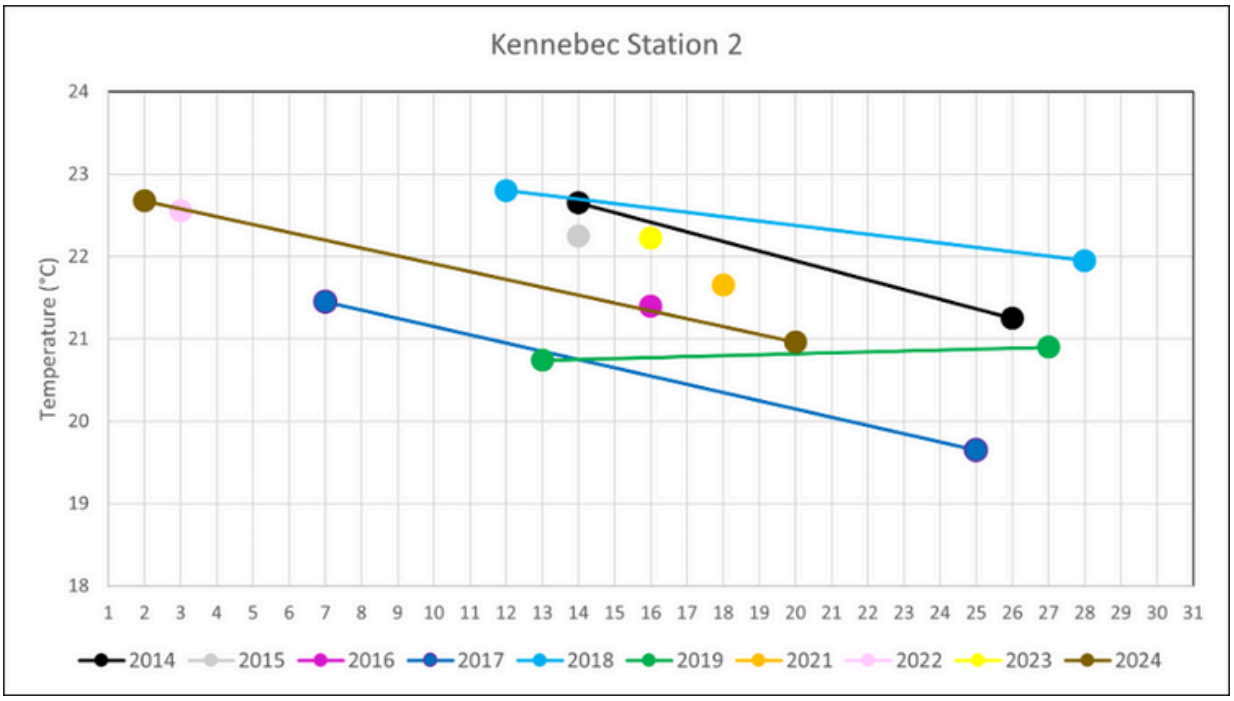
The monitoring is spatially spread out over each estuary, or bay. It is conducted during the day and begins around the time of the high tide, moving upriver against an outgoing tide where applicable. MCOA sampling stations are located from Belfast Bay to Harraseeket Bay. In the MCOA program, temperature is measured with a sensor that is lowered through the water column with a cable.

Photo: Tom Field

Understanding the Graphs

The day of sampling through August across all years is shown across the x-axis while the y-axis indicates the temperature in degrees celsius at the surface. Note that the y-axis scale varies from one graph to another. The stations chosen for these graphs are located at the most inland end of the estuaries, where the oceanic impact is least and the land-based impact is the greatest. A few of the regions, like Rockport and Boothbay, are coastal areas not linear estuaries, and therefore a nearshore site by a village area has been chosen. Graphs are arranged from southwest to northeast.


Harraseeket Station 3
Temperature (°C)
23
22
21
20
19
18
17
16
15
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
2014
2016
2017
2018
2019


Kennebec Station 2
Temperature (°C)
24
23
22
21
20
19
18
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
2014
2015
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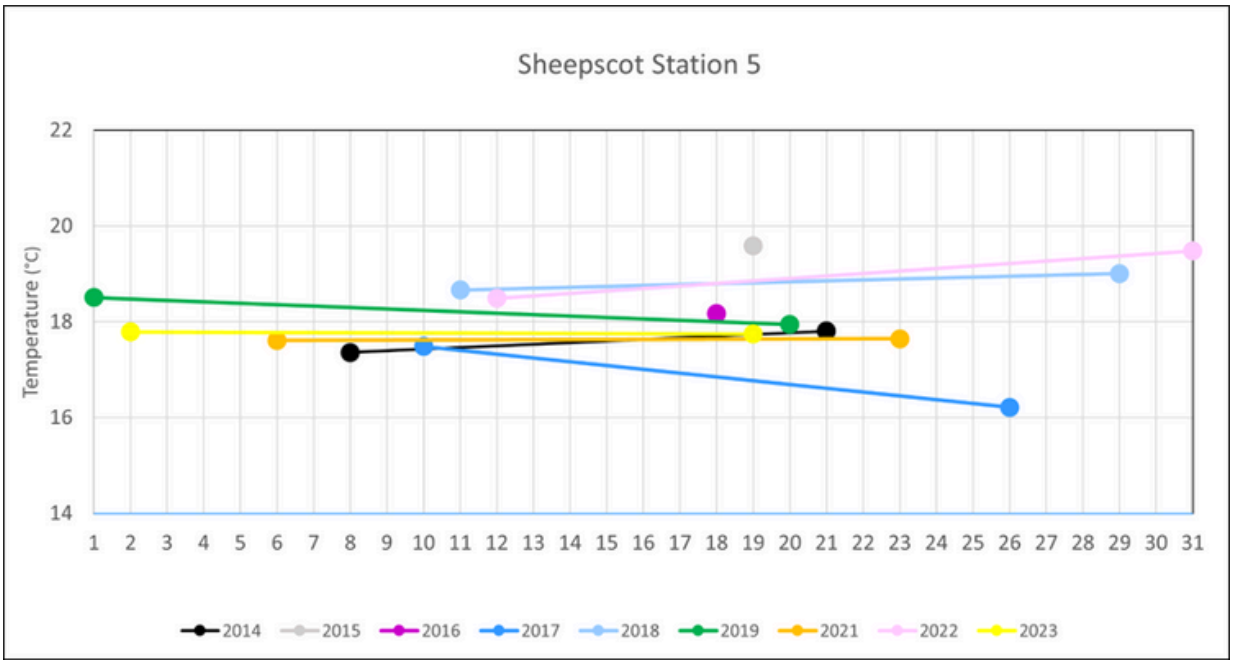
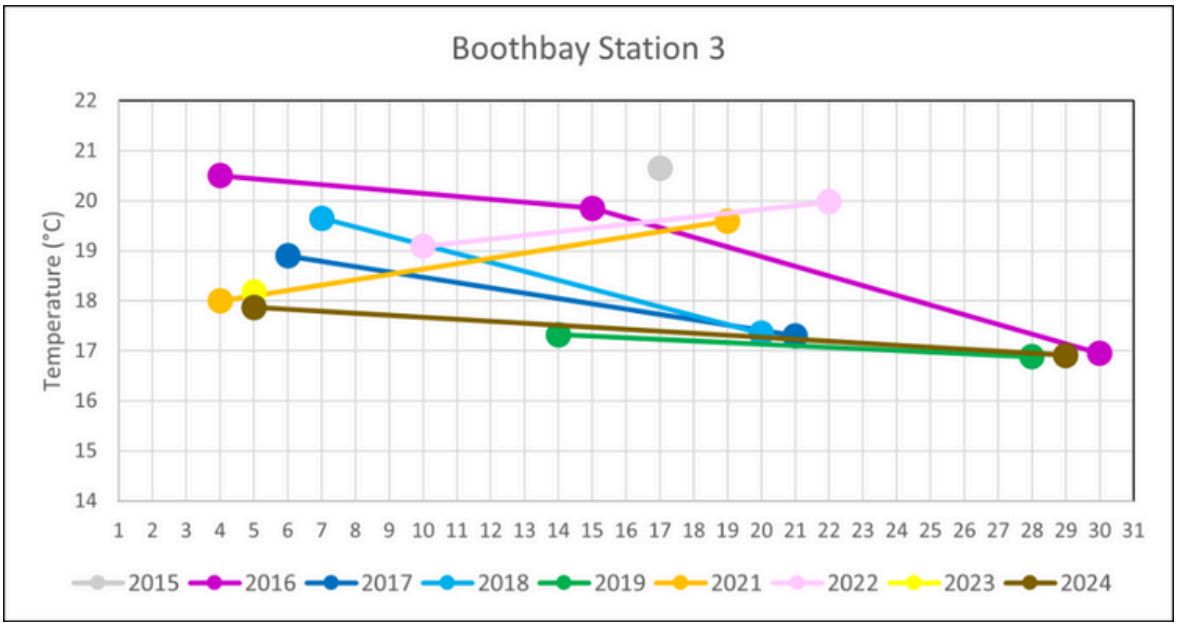
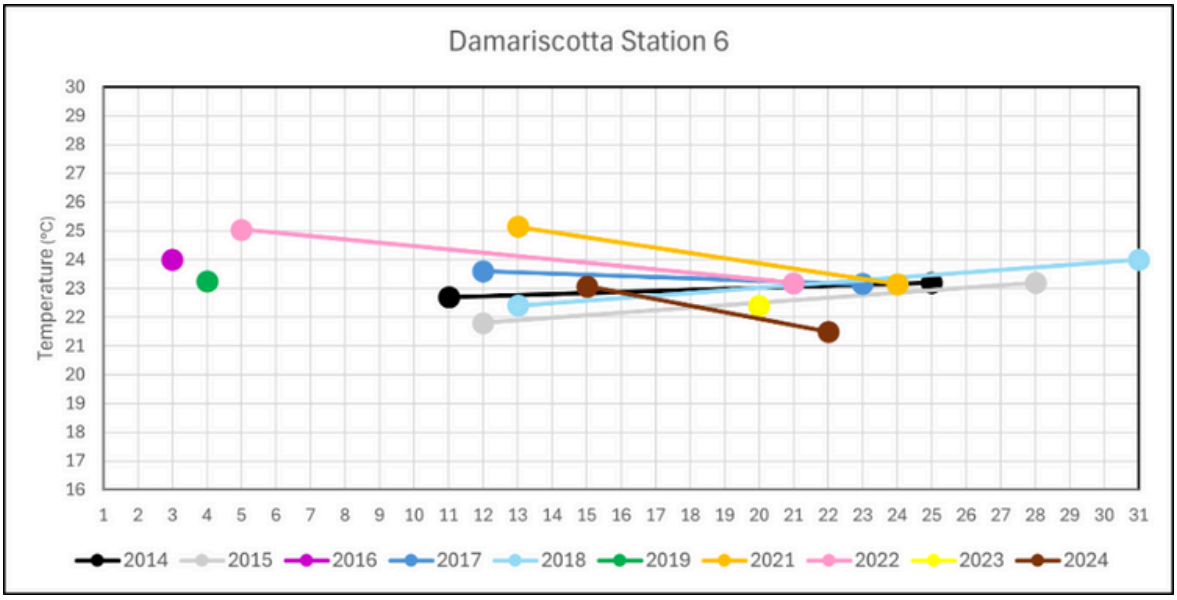
2021
2022
2023
2024


Sheepscot Station 5
Temperature (°C)
22
20
18
16
14
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
2014
2015
2016
2017
2018
2019
2021
2022
2023


Boothbay Station 3
Temperature (°C)
22
21
20
19
18
17
16
15
14
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
2015 2016 2017 2018 2019 2021 2022 2023 2024


Damariscotta Station 6
Temperature (°C)
30
29
28
27
26
25
24
23
22
21
20
19
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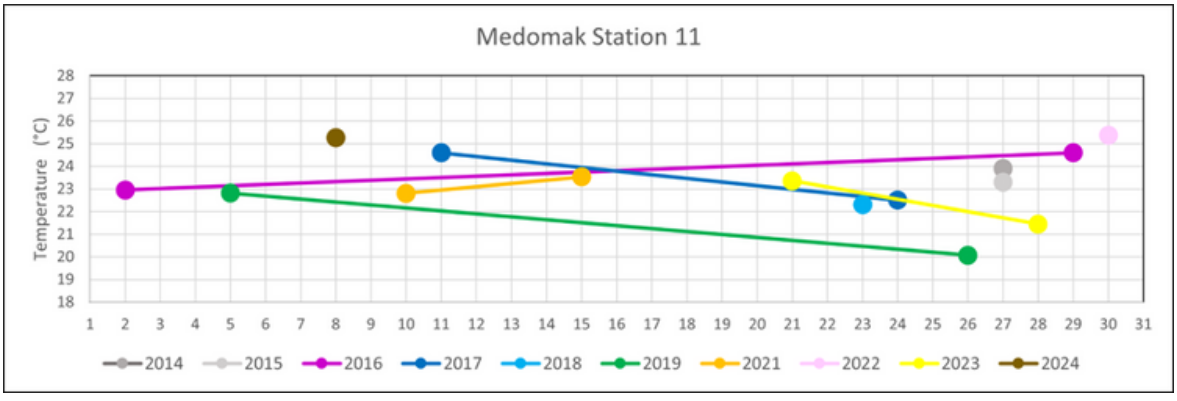
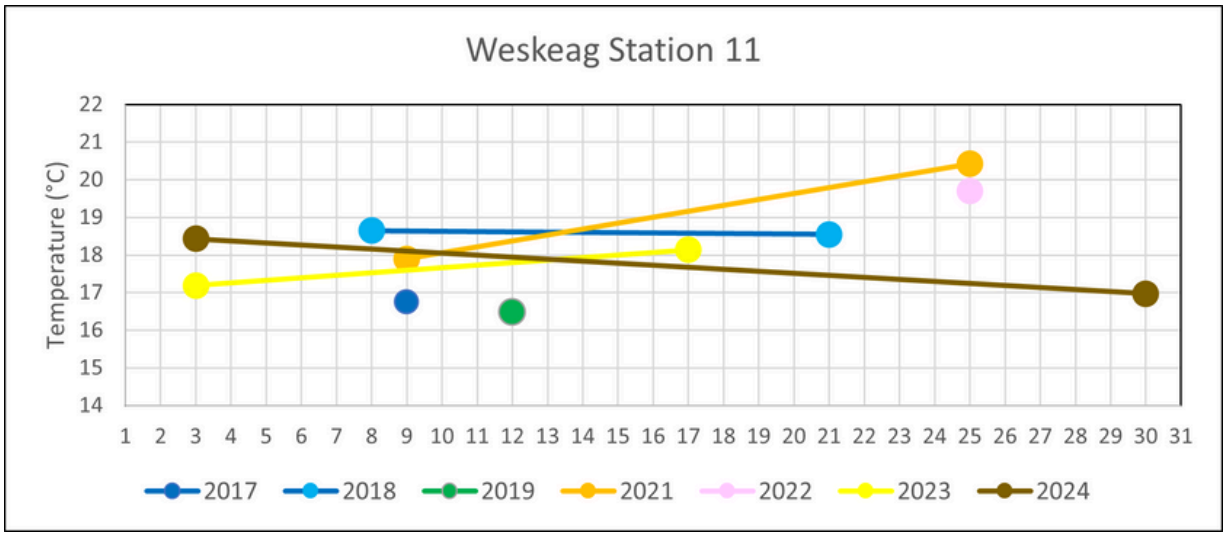
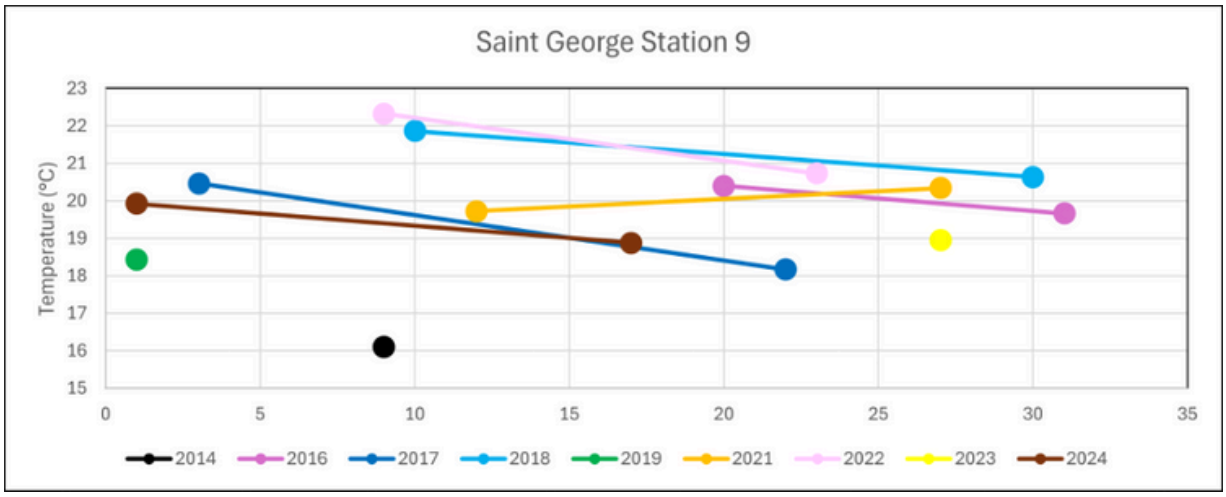
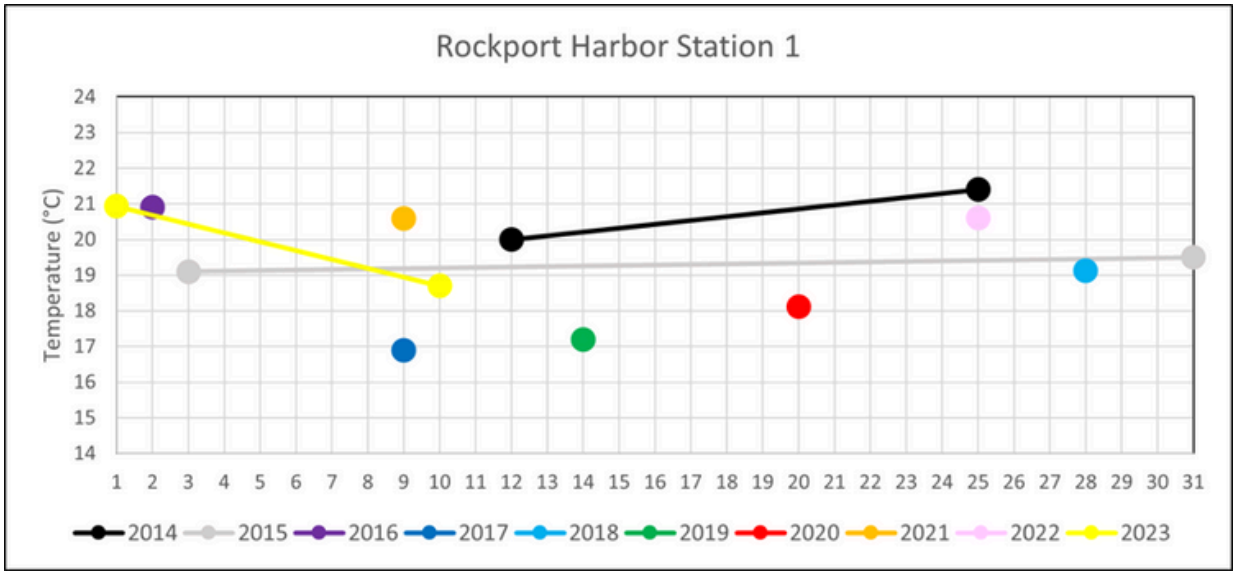
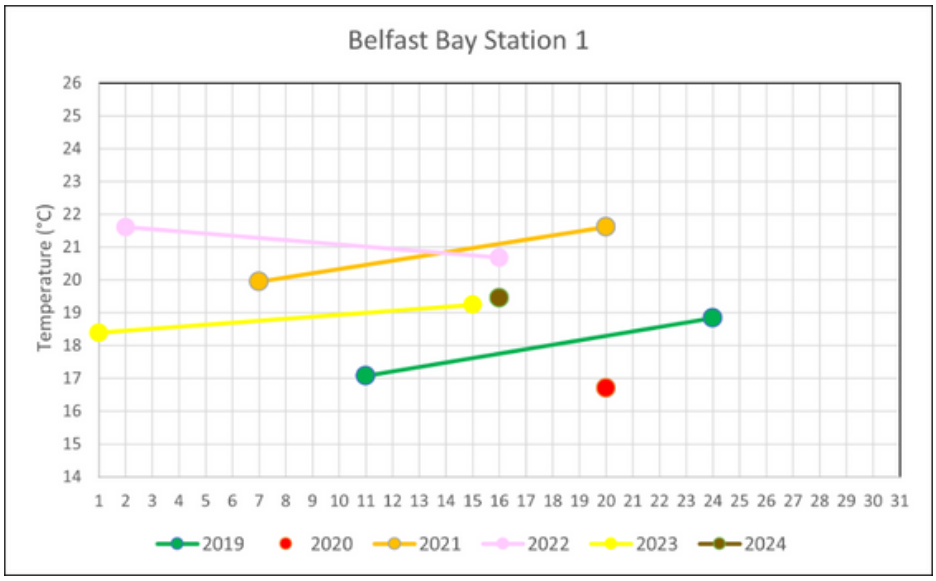
17
16
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
2014 2015 2016 2017 2018 2019 2021 2022 2023 2024


Medomak Station 11
Temperature (°C)
28
27
26
25
24
23
22
21
20
19
18
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
2014 2015 2016 2017 2018 2019 2021 2022 2023 2024


Weskeag Station 11
Temperature (°C)
22 21 20 19 18 17 16 15 14
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
2017 2018 2019 2021 2022 2023 2024


Saint George Station 9
Temperature (°C)
23 22 21 20 19 18 17 16 15
0 5 10 15 20 25 30 35
2014 2016 2017 2018 2019 2021 2022 2023 2024


Rockport Harbor Station 1
Temperature (°C)
24 23 22 21 20 19 18 17 16 15 14
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
2014 2015 2016 2017 2018 2019 2020 2021 2022 2023



Summary

The estuaries across this region vary considerably with regard to temperature. Depth of the station and overall topography of the region influence temperatures greatly. In August of 2022, the inland stations of most MCOA estuaries recorded some of the warmest surface temperatures - this is particularly evident in the estuarine areas as compared to the more open water regions. This is expected as these open water areas are influenced to a greater degree by the colder Gulf of Maine waters. The open water areas, including Rockport and Boothbay, had some of the coldest August surface temperatures at the most inland stations in 2017. In 2017, this was not seen in most of the estuarine areas. Estuaries, and the life within them, are quite resilient to temperature variation as the daily and seasonal range in temperature is wide. It is important to continue to monitor and add to the temperature data in order to reveal any long term trends in temperature in the MCOA estuaries and coastal areas.

MCOA Partners:

Belfast Bay Watershed Coalition
Boothbay Region Land Trust
Coastal Rivers Conservation Trust
Friends of Casco Bay
Friends of the Weskeag
Georges River Land Trust
Kennebec Estuary Land Trust
Midcoast Conservancy
Rockport Conservation Commission

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Photo: Tom Field

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