

## **Analyzing historical CTD data in the Penobscot River, Maine, between 1993 and 2021**

The Gulf of Maine (GoM) is warming faster than most of the world's ocean due to climate change. Within the GoM, few studies have focused on the Penobscot River for long-term studies involving water temperature and salinity. The Ocean Studies department at Maine Maritime Academy has been collecting water property data using a CTD for over 28 years as part of an Introductory Oceanography course. This study analyzes the changes in river temperature and salinity from 1993 to 2021 in the month of October using the student-collected data. While there is no significant change in the water temperature, there is a noticeable increase in temperature and significant decrease in salinity over time. The lack of significance doesn't confirm if there is no change in the water temperature trend from 1993 to 2021, only that the data points gathered were to spread apart to make a confirmation. As for salinity, the decrease in salinity over the years implies that the water is becoming fresher, though salinity decrease is often paired with warm water. This study from 1993 to 2021 can hopefully be repeated in a few years to observe if there are any new changes measured within the Penobscot River, as continuing long-term data collection and analyzation can provide more information about the changing region as climate change impacts it.

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