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### **Tropicalization of US fisheries catches**

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#### **Abstract Text:**

Climate change is affecting the abundance, distribution, and productivity of fish and invertebrate stocks that support fisheries significant to the US economy. Sustainable, climate-adaptive fisheries management requires an improved understanding of how rising water temperatures affect stocks and fisheries. A well-established index that has been used to assess climate-induced changes in regional fisheries is the mean temperature of the catch (MTC), which can detect the signature of ocean warming in the most widely available dataset for fisheries, i.e., fisheries catches. Here, we used up-to-date catch datasets from the National Oceanic and Atmospheric Administration (NOAA) Fisheries, spanning from 1950 to 2022, to detect MTC trends over a latitudinal gradient along the East and Gulf Coasts of the United States. We found variability in the estimated MTC trends among the different US regions, owing to differences in local catch composition and prevailing water temperatures. Nevertheless, results indicate that, in all four studied regions, the MTC has been significantly increasing over the past seven decades, ranging from 0.09°C per decade in the Middle Atlantic region to 0.5°C per decade in the South Atlantic (Figure 1). Increasing MTC values were associated with significantly higher catches of warm-water species like the longfin squid in the Northeast US and Caribbean spiny lobster in the Gulf of Mexico.

Overall, except in the South Atlantic, the observed patterns of MTC change over time were in line with observed increases in sea surface temperature, that rose by  $0.07^{\circ}\text{C}$  per decade in the Gulf of Mexico and by  $0.2^{\circ}\text{C}$  per decade in the Middle Atlantic and Northeast US (Figure 1). Revealing patterns of shifting stocks, which have consequences for seafood supply, fisheries revenues, and livelihoods, may help project future conditions and inform management policies in a changing climate.

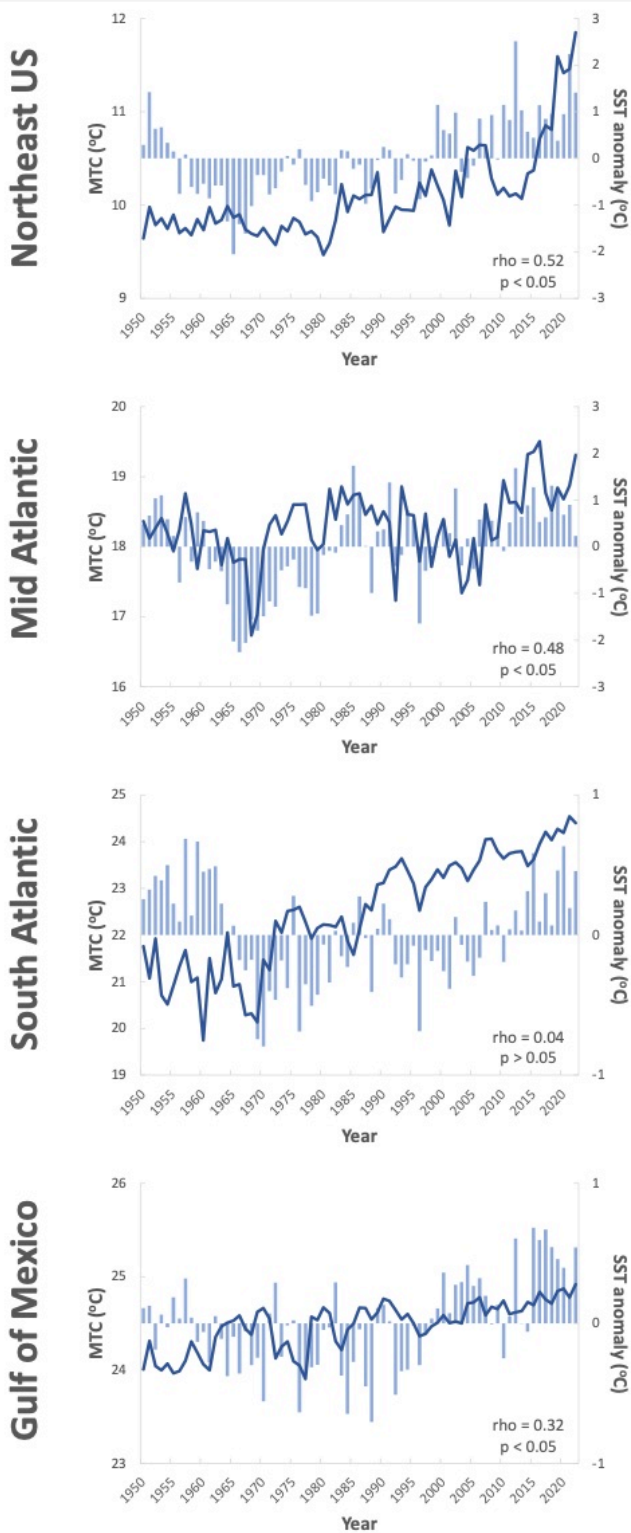


Figure 1. MTC (dark blue line; left y-axis) and SST anomaly (light blue bars; right y-axis) values for four regions along the East and Gulf Coasts of the United States from 1950 to 2022. Spearman’s rank correlation was used to measure the strength and direction of correlation between MTC and SST anomaly (rho = correlation coefficient).

**Session Selection:**

F001. Emerging And Innovative Technologies for Sustainable Fisheries Management.

**Submitter's E-mail Address:**

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**Abstract Title:**

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Yes

**Previously Published?:**

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