

PREDICTING THE EFFECTS OF CLIMATE CHANGE ON FLATFISH DISTRIBUTIONAL SHIFTS INTO THE CHUKCHI SEA

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The habitat of the Chukchi Sea is changing rapidly. Climate change is predicted to drastically alter ocean systems, but rising temperatures and substantial decreases in sea ice cover have already been observed in the Arctic. Three of the four most abundant fish species in the Chukchi Sea are flatfish, and several species of flatfish currently found in the Bering Sea could have potential to colonize the Chukchi Sea if temperatures rise into their preferred range. To get an idea of which of these species might be able to move northward, I worked with resource selection models designed for northern rock sole, flathead sole, arrowtooth flounder, and Pacific halibut. These models combined depth and temperature data collected in the Chukchi Sea by the NOAA Alaska Fisheries Science Center with the results of the sediment analysis I completed during my internship, and represent the combination of habitat preferences specific to each species. I adjusted the temperature in the models to reflect projections of increasing summer sea temperatures between 4 and 8 degrees Celsius in the next century, and the results suggest that the likelihood of both Pacific halibut and arrowtooth flounder presence increases as temperatures in the Chukchi Sea rise and increasing amounts of habitat for juvenile fish become available. These results are consistent with predictions that some species may shift northward as sea temperatures rise, and the introduction of these larger flatfish species from the Bering Sea has potential to dramatically transform the food webs and ecology of the Chukchi Sea.