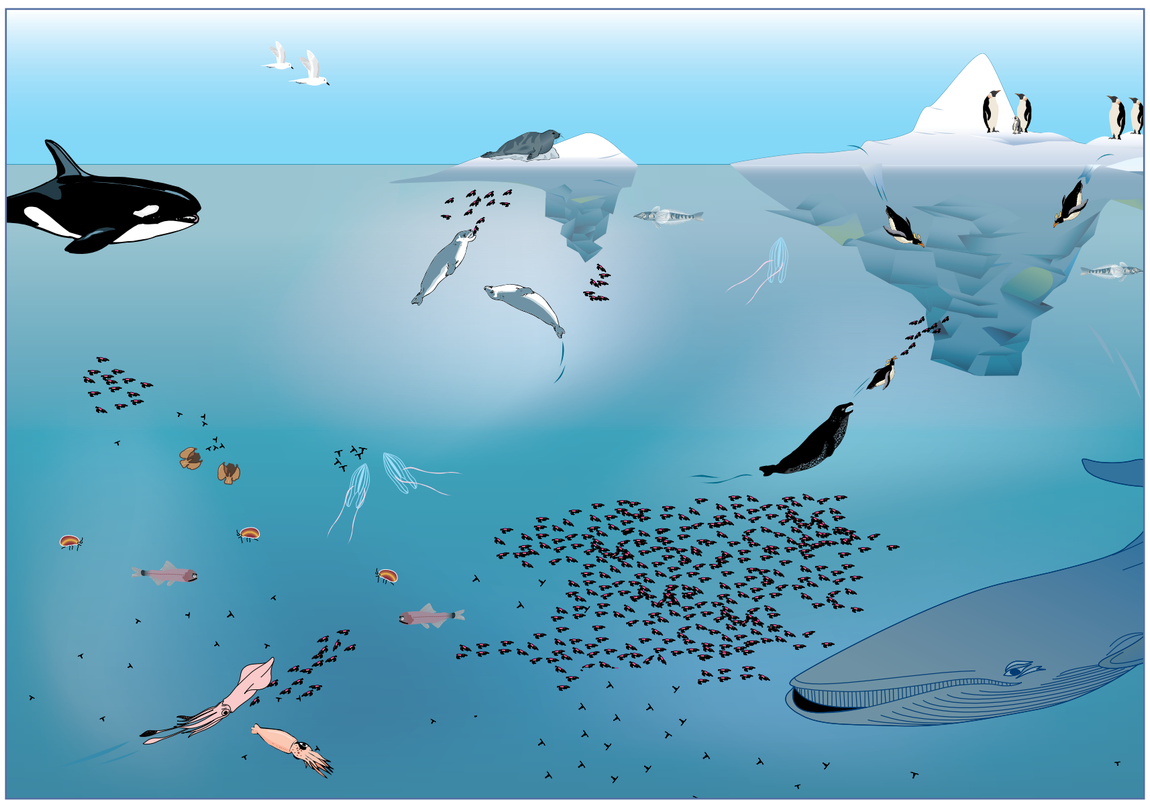
From Penguins to Polar Bears

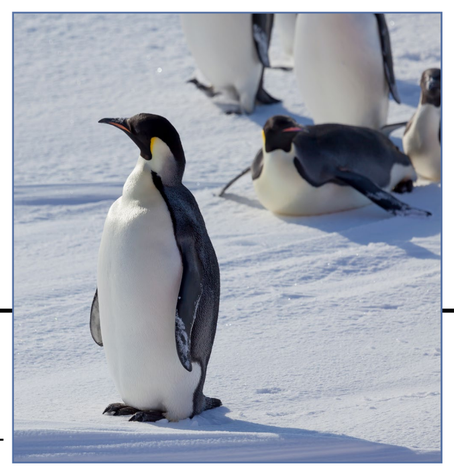
The Impacts of Climate Change

Sponsor: Elizabeth W. and Henry A. Morss, Jr., Colloquia Endowed Fund

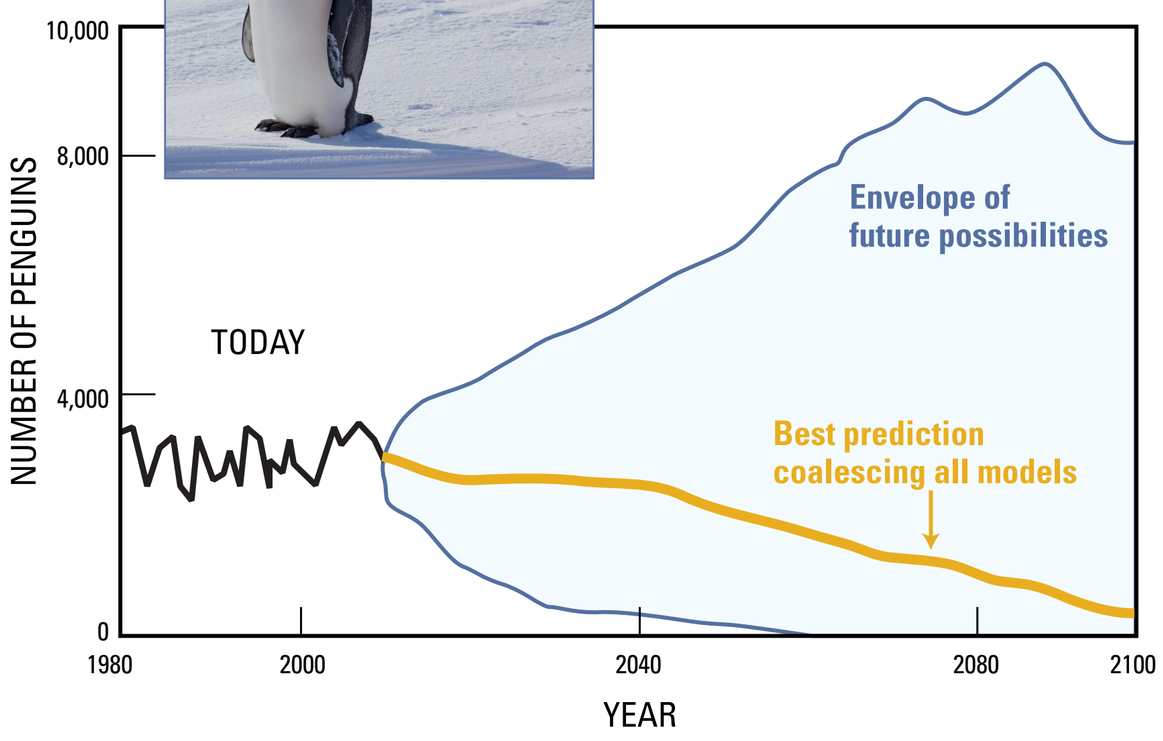


THE ANTARCTIC ECOSYSTEM

Antarctic seas are extremely productive because phytoplankton grows abundantly during the extended daylight of summer and the blooms feed huge populations of krill. Krill are key animals in this ecosystem as prey for top predators: whales, penguins, and seals.



EMPEROR PENGUIN POPULATION



Projection of emperor penguin population size by the year 2100 in Terre Adélie, Antarctica. The Emperor penguin depends on sea ice, which is projected to shrink because of climate change. Dr. Jenouvrier and colleagues measure how changes in sea ice affect emperor penguins, and predict how these conditions will influence their future by estimating survival and breeding as functions of ice and linking the results to global climate models. Although there is a wide range of possibilities in the future, the median population size is projected to decline from 3,000 breeding pairs today to less than 500 penguins by 2100.

Penguins and Krill

Penguins, the iconic species of the Antarctic, are in peril due to global climate change. Sea ice can determine their survival as their habitat and the availability of food fluctuates with the ice. The underside of sea ice is a habitat for algae, an important food source for young shrimp-like krill that congregate under the ice all winter. Krill is a significant prey item for many animals in Antarctica. As sea ice decreases, the amount of krill declines, stressing the other animals that depend upon it.

Woods Hole Oceanographic Institution (WHOI) researchers are studying the effects of climate change on Antarctic penguins including the Emperor, Adélie, Gentoo, and Chinstrap species. Current research projects devastating declines of Emperor penguins within the next 100 years due to climate change.

WHOI research will help guide conservation measures such as adding the Emperor penguin to the list of Endangered Species due to the effects of climate change and creating the world's largest marine reserve in the Southern Ocean to protect Antarctic krill.

What You Can Do

Reduce your carbon footprint. Increased carbon dioxide in the atmosphere is raising the global temperature, which in turn is reducing sea ice. Sea ice is critical for penguin's survival.

Support science. Having scientific data to show the effects of climate change helps decision-makers develop sound policies. Support organizations like WHOI so they can research and communicate the effects of climate change on polar species.

Stay informed.
Organizations are working to protect the Emperor penguin under the Endangered Species Act and to create a Marine Protected Area in Antarctica.

Center for Biological Diversity

Pew Cheritable Trust

Woods Hole Oceanographic Institution

www.whoi.edu