Sea Ice

The polar regions are very important to the overall climate of the Earth, but scientists have a lot to learn about these regions. One of the mysteries still needing more study is sea ice. The difficult climate conditions of the polar regions make them hard to study. Most of the research has been done from ships and satellites, with some trips from bases on the land.

There is sea ice in both the Arctic and Antarctic regions. Both places experience continuous change. In warmer months ice is melting and in colder months it is re-forming. In summer months Arctic sea ice covers about 7 million square kilometers (about the size of the Amazon rain forest!) – and doubles to 14 million square kilometers in the winter months! To give you an idea of the sizes, the continent of Europe is a little more than 10 million square kilometers.

Changes in the Earth's climate affect sea ice, and this is something that scientists are studying. For many years, they have been taking measurements of ice thickness and how much of the sea it covers. The fact that sea ice has been decreasing by 2.8% every 10 years since 1978 is a sign that there is climate change around the world. Its thickness varies, from about 2-3 feet thick up to 10-12 feet thick!

Usually people would think that very little life can survive in the extreme cold conditions of sea ice. However, scientists have found numerous and fairly complex plants and animals. They have found "ice algae" and very small animals that feed on these algae. They have also found bacteria, viruses, and fungi.

The sea ice is also used by other animals like the polar bear, which uses it as a platform for hunting and migration. Small plants and animals that survive on the ice floes are food for other marine life. Scientists are also learning more about the links in the food webs between the sea ice and ocean water (in general) and also the ocean floor. We are realizing that sea ice is an important part of the Earth's ecology!

Sea ice landscape in the Canada Basin in late summer of 2002. Image courtesy of Rolf Gradinger, University of Alaska Fairbanks (UAF)

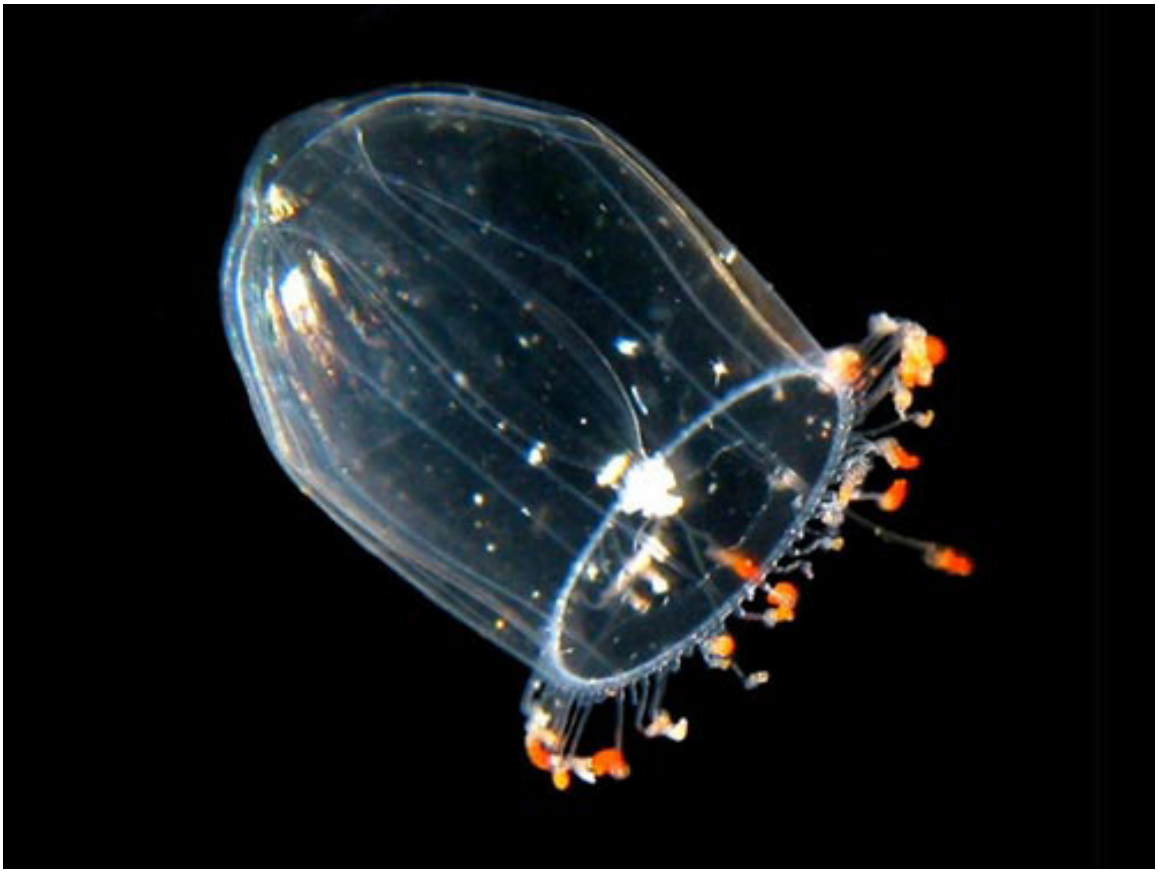
The ice cover of the Arctic Seas consists of individual ice floes separated by areas of open waters. Floe sizes range from several m to km. In summer, light blue, freshwater melt puddles may cover up to 60% of the surface of the ice. (Photo courtesy of Rolf Gradinger).

The science team carries their equipment to a sample site away from the Louis St-Laurent in an effort to obtain samples that will not be affected by the ship's presence.

NOAA research ship, Healy – and here a scientist holds a safety line for divers beneath the ice. Image courtesy of Elizabeth Calvert, University of Alaska, Fairbanks

A female polar bear and her cub decide to pay the Healy a visit, approaching within 200 meters of the ship. Image courtesy of The Hidden Ocean, Arctic 2005 Exploration.

Young under-ice amphipod collected by SCUBA divers under Arctic sea ice. Image courtesy of Rolf Gradinger and Bodil Bluhm, University of Alaska Fairbanks (UAF)



A small hydrozoan medusae common in the upper waters of the Arctic.
Image courtesy of Kevin Raskoff, California State University, Monterey Bay