

The 13th Leading Special Lecture

July 24(Thu), 2014, 16:00~17:30
Lecture Hall, Graduate School of Veterinary Medicine,
Hokkaido University, JAPAN



Losing an Arctic icon:
Polar bears and disappearing sea ice

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The sea ice of the circumpolar Arctic is one of the last truly wild parts of the world but global warming has resulted in major ecosystem change with even greater change to come. The defining feature of Arctic marine ecosystems is sea ice and the most productive habitats occur over continental shelves where the sea ice persists for only part of the year. A cycle of annual productivity results in a pulse of productivity in the spring and summer as the ice recedes. Many species in the Arctic exploit this massive pulse of available energy and convert it to fat stores used to survive through the rest of the year. At the top of the food web, polar bears rely on the presence of sea ice as a platform to travel, hunt, mate, and in some areas, to rear cubs.

It is best to think of polar bears as a marine mammal because all of their life history is tied to sea ice. In the 4-6 million year since they separated from their brown bear ancestor, polar bears have adapted to the Arctic: their fur matches their wintry world, their skulls narrowed and lengthened, their molars became more carnivorous, claws became sharper, shorter and predatory, and the bears, except pregnant females, no longer hibernate in dens.

Sea ice is an ephemeral habitat and is as vital to the Arctic marine ecosystem as soil is to a forest. Just as giant pandas need bamboo, the polar bear needs seals. Most polar bears make a living from 2 species of seals that are only found where sea ice exists. No sea ice, no ice seals. No ice seals, no polar bears. Projected trends in sea ice loss may eliminate 2/3 of the world's polar bears by mid-century. If any species can motivate humans to reduce greenhouse gas production, it might be polar bears. Future generations will judge us harshly if we fail to protect them.