

◆ *Keynote Address: Polar Bears, Seals, and Climate in Hudson Bay and the High Arctic*

Speaker:

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Within days of the polar bear's listing as "threatened" under the Endangered Species Act, Ian Stirling, an emeritus research scientist with the Canadian Wildlife Service whose work was instrumental in that listing, evoked both the polar bear's majesty and its plight in the keynote address for the 2008 CSE annual conference. The polar bear, its habitat threatened by climate change, has become an icon of the environmental cost of inaction and denial. Stirling's presentation, drawing on his life-long study of the polar bear, outlined why such a passive stance is no longer tenable and why we must work together to foster a "climate for change".

The polar bear, which evolved 200,000 to 300,000 years ago, is uniquely adapted to its harsh habitat. Its front paws, as big as a man's forearm, make it an effective swimmer and act almost like snowshoes for traversing icy terrain. Its distinctive metabolism efficiently uses energy stored as fat. Unlike other species of bears, which hibernate only in the winter and would starve without food in warmer months, polar bears can slow their metabolism at any time if food is short and wait for the situation to improve.

The annual sea ice that forms over the continental shelf is the most productive hunting ground for the polar bear. Sub-ice algae are eaten by small cod, which serve as food for seals, which in turn serve as food for the polar bears. Sea ice farther from the

continental shelf has nowhere near this productivity and is not suitable as a substitute hunting ground.

Polar bears need a diet rich in fat, and the ringed seal pup, composed almost entirely of fat, constitutes their meal of choice. Mother ringed seals use their sharp claws to dig lairs in the snow for their pups near the breathing holes they have made in the ice. Using primarily their sense of smell, polar bears seek out these lairs and crash down through the snow to reach the pups.

Stirling's data on the polar bears in Hudson Bay show that their condition varies with the date of sea-ice breakup and that breakup is occurring 3 weeks earlier than it did when he began collecting data 30 years ago. The lost weeks are particularly costly to the polar bear in that it takes in most of its energy for the year in the short time it spends hunting on the sea ice in spring and early summer; it must subsist for the rest of the year largely on the energy that it has stored during this time. If the ice breakup is earlier, bears are robbed of precious weeks when they could be intensively storing calories. They come ashore earlier, thinner, and less equipped to withstand the summer months until they can return to the ice.

With the changes in climate and the earlier ice breakup, Stirling and his colleagues have documented cases of cannibalism, found more carcasses of bears that have starved to death, and noted unprecedented changes in hunting behavior. They have found holes in compacted ice deep enough for a man to stand dug by polar bears in as they searched for food—a marked departure from their usual "crashing through" method to hunt seal pups. Hungry bears are making their way into human settlements, and this leads to more sightings and the mistaken belief that polar bear numbers are unusually high.



Ian Stirling

Stirling ended his sobering and compelling presentation by calling on the journal editors in the audience to recognize the importance of long-range research. Funding organizations and journal editors tend to prefer research that yields results quickly, and this makes it harder for long-range research, such as Stirling's, to be funded and published. Such long-range research is crucial if we are to begin to understand climate change and to reduce the threat to the polar bear and its endangered ecosystem. 🌱