

Glossary

COSEE-West

Lecture: March 21, 2007

“Ecological responses of Antarctic krill to environmental variability”

- A** **apex predator:** animal that is at the top of a food web. Apex predators play a crucial role in maintaining and determining the health of ecosystems. The killer whale and leopard seal are examples of apex predators in the Antarctic.
- autotroph:** an organism that manufactures its own food.
- C** **chlorophyll:** green pigment in plants and algae that is essential for photosynthesis.
- cryogenic:** of or relating to very low temperatures
- F** **fecundity:** a measure of the capacity for producing offspring, especially in abundance
- foundation species:** a single species that defines much of the structure of a community by creating locally stable conditions for other species, and by modulating and stabilizing fundamental ecosystem processes.
- H** **herbivore:** an animal that eats plants
- I** **intermolt period (IMP):** the time interval between molts – Crustaceans such as krill have an exoskeleton that has to be shed (a process called molting) and replaced as they grow.
- K** **krill:** small, shrimp-like animals (crustaceans) that are found in all parts of the ocean. Krill are a major item worldwide in the diet of predators such as fish, squid, penguins, seals and baleen whales. Antarctic krill (*Euphausia superba*) are of central importance in the Antarctic food web, and they are considered to be a foundation species. They grow to about 6 cm in length and live for up to 5 - 7 years.
- L** **LTER: Long-Term Ecological Research program** – an international collaborative effort to investigate ecological processes over long temporal and broad spatial scales. Currently there are 26 LTER Sites funded through the National Science Foundation that represent diverse ecosystems and research emphases.
- M** **molt:** the exoskeleton that is shed in the process of molting
- O** **omnivore:** an animal that eats both plants and animals
- P** **physiological condition:** a measure of the bodily health of an organism
- primary production:** the conversion of inorganic carbon (usually carbon dioxide) into organic compounds by autotrophs
- R** **recruitment:** entry of young individuals into a population; the source can be birth of new individuals or immigration from another population

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S **salps:** transparent, gelatinous animals in the zooplankton that occur as individuals and in colonies that form chains up to several meters long. Salps consume microscopic marine plants called phytoplankton. In some years, salp swarms may replace krill, which also eat phytoplankton. But while krill provide a rich, critical food source for whales and penguins, salps provide little nutrition.

SeaWiFS: “Sea-viewing Wide Field-of-view Sensor” – an Earth-orbiting satellite that collects data on ocean color, which is a tool to determine surface concentrations of microscopic marine plants (phytoplankton). This information can be used to assess the ocean's role in the global carbon cycle and the exchange of other critical elements and gases between the atmosphere and the ocean.

SIMCOs: **S**ea-**I**ce **M**icrobial (microscopic plants and animals) **C**ommunities

Southern Ocean: Sometimes called the Antarctic Ocean, this is the ring of ocean that circles Antarctica. It is the second-smallest of the world's five oceans. (The Pacific, Atlantic, and Indian Oceans are larger; the Arctic Ocean is smaller.) The Antarctic continent provides a clear southern boundary, but the northern limit of the Southern Ocean is not so clearly defined. Oceanographers usually consider the Subtropical Front - a transition zone between cool, fresh, nutrient-rich subantarctic waters and warm, salty, nutrient-poor subtropical waters – to indicate the northern extent of the Southern Ocean.

Southern Ocean GLOBEC: An organization that supports research to learn about shelf-circulation processes and their effect on sea-ice formation and krill distribution, and to examine the factors that govern krill survivorship and availability to higher trophic levels, including penguins, seals and whales. GLOBEC is the acronym for the United States Southern Ocean Global Oceans Ecosystems Dynamics program.

Southern Oscillation Index: a measure of the large-scale fluctuations in air pressure occurring between the western and eastern tropical Pacific. Long periods of negative SOI values coincide with abnormally warm ocean waters across the eastern tropical Pacific, typical of El Niño episodes. Long periods of positive SOI values coincide with abnormally cold ocean waters across the eastern tropical Pacific, typical of La Niña episodes.

T **Teleconnection:** or coupling of regions to global climate systems refers to recurring and persistent, large-scale patterns of pressure and circulation anomalies that span vast geographical areas. Teleconnection patterns influence temperature, rainfall, storm tracks, and jet stream location/ intensity over vast areas. In the Southern Ocean the region west of the Antarctic Peninsula has strong teleconnections to the Southern Oscillation Index and the El Niño/ La Niña patterns.