

The Ocean is Our Grocery Store & It's Changing in Ways We've Never Seen

The Bering Sea/Bering Strait and Chukchi Sea form one of the richest, most pristine and biologically productive ocean systems on the planet. The same unique characteristics that support this area's productivity – particularly the annual variations in sea ice – make this region especially vulnerable to the impacts of climate change.

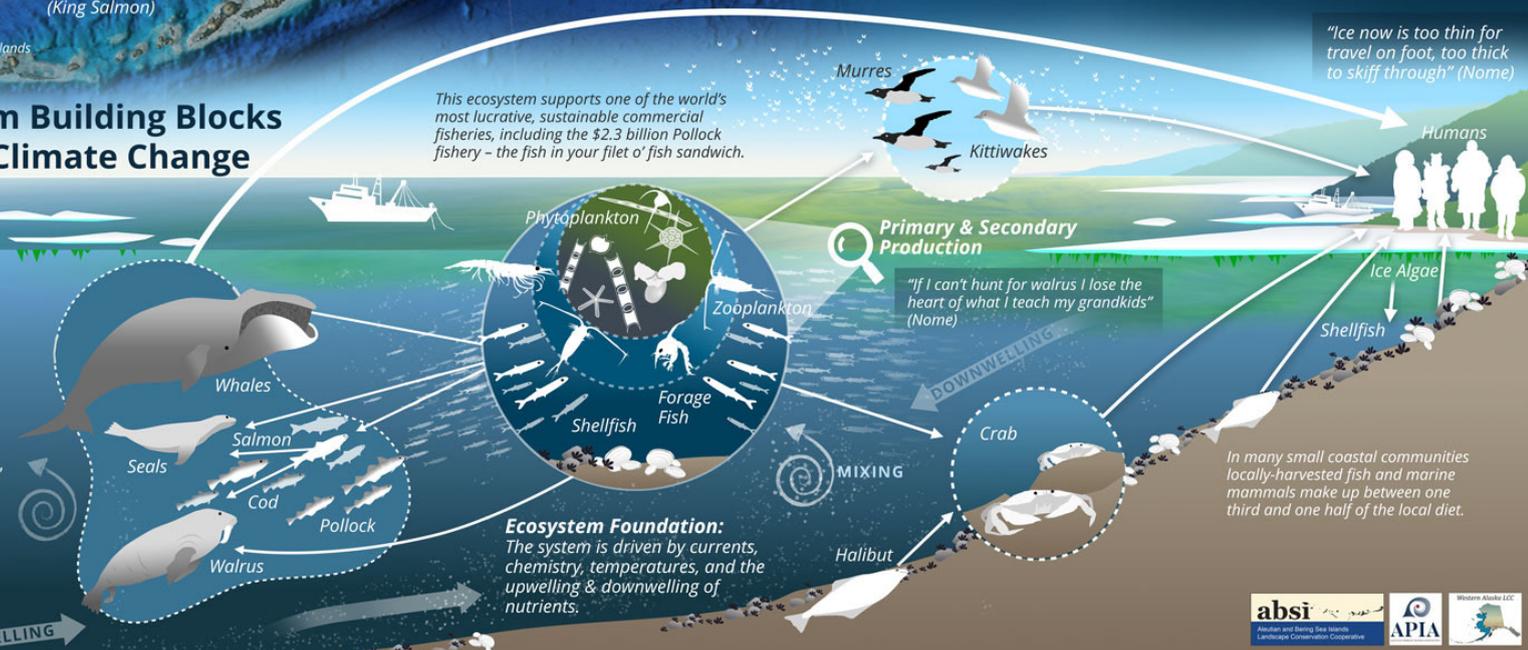


Changing Sea Ice/Changing Ecosystems:
 "We're seeing changing boundary lines; humpbacks, sea lions, other species are moving north" (Kotzebue).

"Currents push super rich deep sea water up onto the Bering Sea shelf; it's amazingly productive & the reason 30,000 people live in the region."
 (King Salmon)

Complex Ecosystem Building Blocks are Vulnerable to Climate Change

The abundant life in the Bering Sea region emerges from a complex web of physical, chemical and biological building blocks. Climate change is altering the structure of this system. This in turn could dramatically change what the ecosystem provides, including subsistence food on the table and the basis for this region's robust commercial fishing industry.



This ecosystem supports one of the world's most lucrative, sustainable commercial fisheries, including the \$2.3 billion Pollock fishery – the fish in your filet o' fish sandwich.

Primary & Secondary Production

"If I can't hunt for walrus I lose the heart of what I teach my grandkids"
 (Nome)

"Ice now is too thin for travel on foot, too thick to skiff through"
 (Nome)

In many small coastal communities locally-harvested fish and marine mammals make up between one third and one half of the local diet.

Ecosystem Foundation:
 The system is driven by currents, chemistry, temperatures, and the upwelling & downwelling of nutrients.

How is Climate Changing Impacting Marine Ecosystems? And How Might We Respond? Three Examples:

NEW PATHS FOR WHALES & MARINE SHIPPING?

CHANGE DRIVER: Reduced sea ice opens the arctic to new vessel traffic, posing risks of oil spills and disturbance of species and subsistence hunting.



CHALLENGES & EMERGING STRATEGIES: Climate change is altering whale migration timing and pushing migration routes farther from shore, disrupting vital subsistence traditions and forcing hunters to travel farther into hazardous seas. Growing vessel traffic requires establishing rules for shipping routes and vessel noise, and creating capacity for local oil spill response.

WALRUS, EIDERS & MELTING SEA ICE

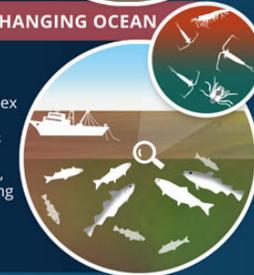
CHANGE DRIVER: Warmer air and water reduces sea ice and changes where and when ice can be found. Algae growing on the underside of ice drives the food chain for benthic (bottom-dwelling) marine animals. Less sea ice triggers a cascading decline in systems providing food for things we like to eat, like crab, halibut and walrus.



CHALLENGES & EMERGING STRATEGIES: Arctic wildlife and people have evolved sophisticated ways of living based on sea ice. Lose the ice, and lose the platform that walrus, seals and eiders use to hunt, rest, or raise their young. And local people lose both safe places to hunt and cultural traditions based on subsistence life. Response strategies include managing new onshore walrus haulouts, and devising tools so hunters have real-time sea ice information.

SALMON, COD, POLLOCK IN A CHANGING OCEAN

CHANGE DRIVER: Warming Waters & Ocean Acidification The health of the Bering Sea ecosystem rests on a complex web of nearly invisible creatures, from algae to zooplankton. Warming waters and ocean acidification are fundamentally altering this rich system, leading to shifting fish locations, growing risks of harmful algal blooms, and less nutritious food for salmon, cod and pollock.



CHALLENGES & EMERGING STRATEGIES: Climate change impacts will modify and likely decrease key fish species, affecting everything from subsistence to jobs and government tax revenues. Needed responses include better environmental monitoring and a new generation of regulations dynamic enough to keep up with a changing climate.

