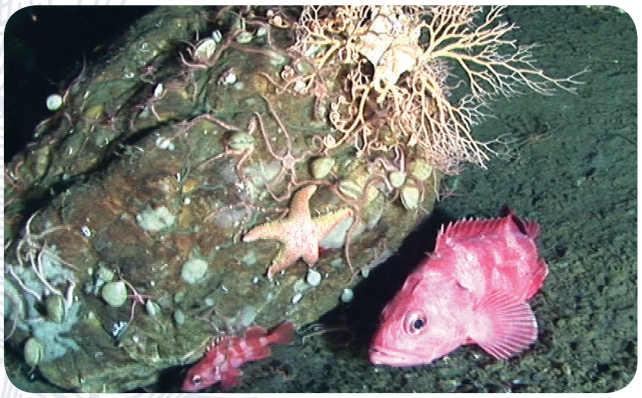
PROTECTING THE GRAND CANYONS OF THE BERING SEA

Two of the largest canyons in the world are found not on land, but deep in the Bering Sea. Situated between Alaska and Russia, Zhemchug and Pribilof canyons—both larger than Arizona's Grand Canyon—cut into the slope along a several-hundred-mile stretch of the continental shelf break that is so productive scientists named it the "Green Belt."[1,2] Here, nutrient-rich waters flow up from the deep to help create one of the richest ecosystems on the planet—home to ocean albatross and kittiwakes, orcas, walrus and fur seals, king crab, squid, salmon, cold water corals, and a near countless variety of marine life.

Recent findings published in a peer-reviewed scientific journal report the results of an expedition to systematically survey the canyons. The report provides evidence of higher densities of coral in the canyons than most areas surveyed in the North Pacific outside the Aleutian Archipelago, and confirms coral's important role as habitat for fishes in some of America's most productive fishing grounds.[3] The expedition found several coral species previously unknown to the Bering Sea, and also yielded the discovery of an entirely new sponge given the name *Aaptos kanuux*—the Aleut word for heart—symbolizing a view of the canyons as the heart of the Bering Sea. Contrary to assertions that fisheries were not jeopardizing seafloor marine life, the expedition found evidence of impact in both canyons.

Rare Canyons

Submarine canyons are rare, occurring in only 4% of the world's oceans, and they provide important habitat and refuge for biological diversity.[4] The hydrodynamics of shelf edge canyons support higher biomass than other marine areas due to elevated productivity of phytoplankton and zooplankton—the microscopic plants and animals at the base of the food web. Upwelling and currents combine with canyon topography to create a virtual conveyor belt of food, making the slope and shelf-break area surrounding the canyons a biodiversity hot spot.



Bering Sea Gold

The Bering Sea is home to an amazing array of wildlife including at least 450 species of fish, crustaceans, and mollusks. The area supports about 80% of the US seabird population, estimated at 36 million birds in 35 species. At least 25 species of marine mammals inhabit or migrate through the area including endangered bowhead and northern right whales. Many species are unique and endemic to the area. The canyons provide important foraging habitat for a number of protected species, including northern fur seals, Steller sea lions, and endangered short-tailed albatross.

People have long recognized the special nature of the canyons—Zhemchug means "pearl" in Russian—and conservationists have sought to protect these 'Grand Canyons of the Sea' for years. The indigenous peoples of Alaska have lived in balance with the bounty of the Bering Sea for millennia. Today, however, their culture and subsistence way of life is threatened as once-plentiful sources of food are disappearing.

The Bering Sea is also one of the biggest fishing grounds in the world. The area produces more than half of the U.S. catch and constitutes one of the world's major sources of dietary protein—including salmon, king crab, Pacific cod, flounder, halibut, and pollock. Preserving these fisheries and the many jobs they support depends on maintaining a productive and resilient ecosystem.

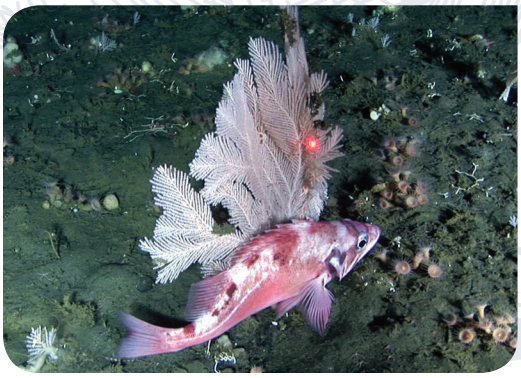
Corals

Deep-sea corals and sponges create essential living habitat in places that would otherwise be barren of food and shelter. Coral and sponge assemblages protect fish and a host of other marine life from predators and strong currents. They provide nursery areas, and feeding, spawning and breeding zones. Many rockfish species, for instance, are found near high relief seafloor habitats comprised of boulders, corals and other structures.

Federal law requires fishery managers to identify coral habitats under their jurisdiction and report to Congress regarding efforts to protect them from fishing impacts.[5]

Threats

Some of the most intense fishing has occurred along the margin of the outer continental shelf, in the Green Belt zone (200–1000m), including the canyons. Chronic bottom trawling reduces structural complexity and diversity of bottom-dwelling species in the eastern Bering Sea, including slow-growing corals that can be hundreds or even thousands of years old. They are especially vulnerable to trawling since a single pass of a trawl can destroy them, wiping out the habitat structure they provide. Recovery, if possible at all, could take decades. The National Marine Fisheries Service (NMFS) estimates that even "pelagic" trawl gear contacts the bottom 44% of the time, but anecdotal reports from fishermen suggest it could be nearly double this figure.



Bycatch

Bycatch—the indiscriminate catch of a non-target species by another fishery—is a looming problem for Alaska trawling and longline fisheries. Species impacted by bycatch include salmon, halibut, crab and endangered short-tailed albatross, as well as vulnerable deep-sea corals and sponges and deep-sea fish species that are typically found in the canyons such as long-lived and slow-growing rockfish, skates (and skate nurseries), sleeper sharks, grenadiers, and sculpins. Bycatch reports from fishery observers working in the canyons frequently include corals and sponges, as do trawl surveys conducted by NMFS.

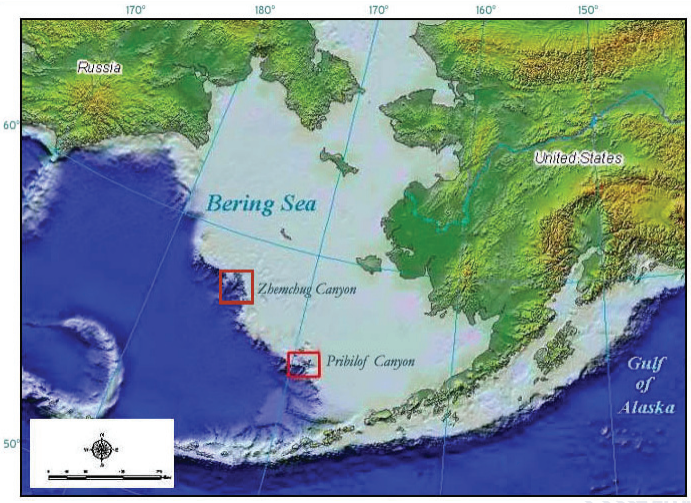
Forage Species

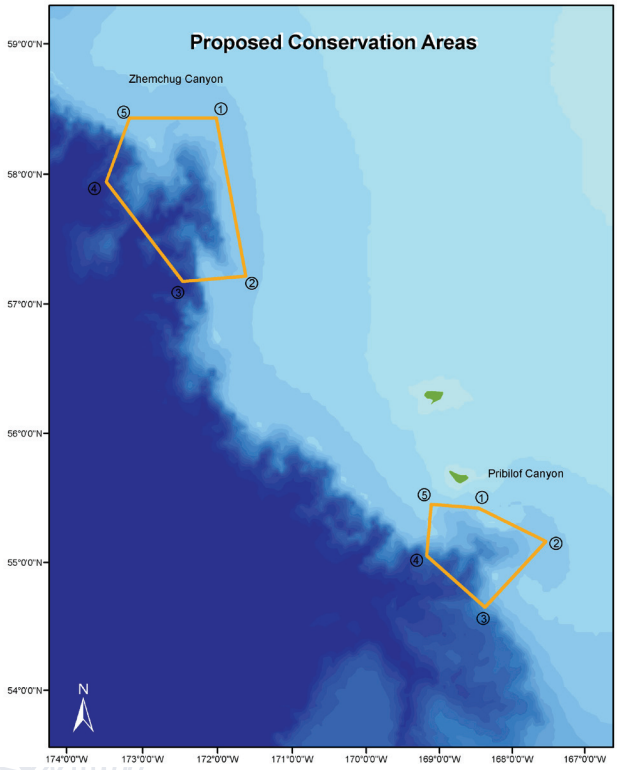
Pollock is the dominant prey fish in the Bering Sea. NMFS has linked the decline of endangered Steller sea lion populations to a lack of available prey, and pollock is a well-documented staple in the diet of sea lions. Pollock is also a major prey of fur seals, harbor seals, ringed seals, several endangered large whale species, and many fish-eating seabirds such as murres and kittiwakes. Under conventional single-species approaches, fishery managers do not explicitly account for the needs of pollock predators when determining the allowable catch level for the fishery.

Protecting Ecosystems

Human activities have taken a huge toll on oceans. In 2010 President Obama issued an Executive Order ushering in a National Ocean Policy recognizing the need to protect the ecological relationships that support ocean services. Today resource managers are charged with adopting ecosystem-based management approaches that preserve the resilience of marine systems and give our oceans the best chance of adapting to rapidly changing conditions like climate change and ocean acidification.

Common sense dictates that when you don't know all the facts, you proceed with caution. We still have much to learn about the greater ecosystem effects of bottom fishing but hints are present in shrinking populations closely linked to the benthic food web: Pacific cod, shrimp, Tanner crab, snow crab, and king crab have all declined, some to the point where they are no longer fishable. Scientists from the Center of Independent Experts have advised NMFS that "many of the stock collapses or severe declines around the world could have been avoided or lessened by following a precautionary approach." They recommended that research closures be utilized to assess the habitat's ecological role and the impacts of fishing, and say protected areas "could be very useful in terms of potentially enhancing adjacent fisheries and ensuring healthy ecosystem functioning."





Proposed conservation areas encompass coral and sponge habitat identified during a 2007 collaborative research expedition which provided the most extensive in situ observations of the seafloor habitat along the Bering Sea slope to date.

Marine Protected Areas

The science is in: Marine Reserves work! Well-designed reserves have resulted in an increase in the amount, size, and diversity of fish and other marine life.[6] NMFS, the American Fisheries Society, and many hundreds of marine scientists have recommended Marine Protected Areas (MPAs) as a buffer against the variability in stock recruitment and unforeseen fishing mortality events, and as control areas, or living laboratories, for scientific learning. Fishermen too know the benefit of MPAs; instead of fished-out zones to avoid they pull their boats up to the edge of reserves knowing that fish will spill across the watery boundary and into their nets. Yet, only about 1% of the world's oceans have been given any protection at all.

The Bering Sea canyons, like much of the deep-sea, are one of this world's final frontiers. If we are not careful to protect vulnerable habitats in the deep-sea we could unknowingly lose them before we understand their full value—like blowing up Mars before we even get there. Scientists believe they have yet to collect hundreds of species in the Aleutian Islands, many unknown to science. The Bering Sea canyons may yield more species too, and like biodiverse rainforests, some could hold disease-fighting agents invaluable to humanity.

Alaska Native communities too are calling for protections for the spectacular canyons, understanding their important role in the ecosystem as a source of their native foods. No MPAs exist in the Bering Sea to protect their cultural heritage, nor are there any protections in place along the fishable depths of the Bering Sea Green Belt despite its invaluable role in the ecoregion.

A growing coalition of conservation organizations, Alaska Native communities, and public stakeholders are calling on the North Pacific Fishery Management Council to provide protections for the Zhemchug and Pribilof canyons now. Too much is at stake, both ecologically and economically, to wait any longer to preserve these areas for future generations.

1. Alan M. Springer et al. (1996), The Bering Sea Green Belt: shelf-edge processes and ecosystem production, Fisheries Oceanography 5: 205–223
2. National Research Council (1996
3. Robert J. Miller et al. (2012), Structure-forming corals and sponges and their use as fish habitat in Bering Sea submarine canyons, PLoS ONE
4. Bob McConnaughey and Meghan McGovern (2009), AFSC Quarterly Report, April-June 2009: 8–9
5. MSA § 303(b)(2)(B) (16 U.S.C. § 1853(b)(2)(B)).
6. Partnership for Interdisciplinary Studies of Coastal Oceans. 2011. PISCO Consortium 5 Mar. 2012 http://www.piscoweb.org/outreach/pubs/reserves

GREENPEACE