

# Under the sea ice, behold the ancient Arctic jellyfish

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The doings of creatures under the Arctic sea ice are many, but they are rarely observed by humans; it's pretty hard to get under the ice to look. In recent years, marine biologist Andy Juhl and his colleagues have gotten around this problem by driving snowmobiles several miles from Point Barrow, Alaska, out onto the adjoining frozen Chukchi Sea, drilling holes in the four-foot-plus thick ice, and poking in a video camera attached to an small underwater vehicle.

Among the things that they have observed: sizable *Chrysaora melanaster* [jellyfish](#) floating by, trailing their foot-long-plus tentacles along the shallow bottom. Their presence came as a surprise: adult jellyfish, or medusae, are generally thought to live only a few months. Scientists had assumed that the species survived winter only in a life stage called polyps—formless masses that cling to rocks and release little baby medusae in the spring. In a scientific paper out this week, Juhl and colleagues say the videos indicate that the creatures in fact last through winter. They could even be several years old—the Methuselahs of medusae.

"One reason we were interested was, first of all, we saw them, and it was kind of weird," said Juhl, a researcher at Columbia University's Lamont-Doherty Earth Observatory. "The whole study is based on videos we made over several years." Also, he says, the rich pollock fishery in the nearby Bering Sea is the engine for "everything fish"—fish sticks, fish paddies and other mystery-meat-type marine fast foods. But in some years, jellyfish numbers in the Bering Sea swell, and fishing nets can get

seriously clogged—a problem that may crescendo over several years before dying back again. The study may reveal something about the jellyfish population dynamics that drive these cycles.

Juhl's working hypothesis: cold winters, when sea ice is thick and long-lasting, are good for *Chrysaora* survival. He says the ice probably shields the medusae from turbulent winter storms, and the low water temperatures reduce their metabolism enough for them to subsist on relatively little food. "Life under sea ice is like living in a refrigerator—everything slows down," he said. He said that [jellyfish blooms](#) may follow one or two years of heavy sea-ice cover because lots of adults survive.

Juhl points out that many other Arctic creatures also depend on sea ice. These range from lowly algae and bug-like amphipods that thrive on its underside to giant polar bears who roam around on top, waiting to pick off seals that emerge from breathing holes.

With Arctic climate warming and sea ice declining rapidly, what will happen to *Chrysaora*? Elsewhere in the world, including in the Mediterranean, other species of [jellyfish are swarming and becoming pests](#), apparently in response to warmer waters, overfishing and coastal pollution. These forces are bad for other flora and fauna, but the resilient jellies often thrive, eventually taking over the ecosystem. In the far north, it could be the opposite; ice-loving jellies could decline if things warm up. So could the other, more iconic, creatures of the north that depend on sea ice. But at least jellyfish might not be clogging fishermen's nets so much. "For most things, there are positives and negatives to climate change," said Juhl.

One still unanswered question: Do these jellyfish sting? "I don't know," he said. "There aren't that many people around there swimming to find out."

**More information:** JE Purcell et al. Overwintering of gelatinous zooplankton in the coastal Arctic Ocean, *Marine Ecology Progress Series* (2017). [DOI: 10.3354/meps12289](https://doi.org/10.3354/meps12289)

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