thermore, that paper cites unpublished work by the group suggesting that the proteins may also be involved in the movements of the growing tips of neurons and might thus contribute to axonal migration during development and synapse formation. If all this is borne out by future work, APP may turn out to have more talents than anyone suspected.

–JEAN MARX

MARINE BIOLOGY

Interest Blooms in Growing Jellyfish Boom

SAN FRANCISCO, CALIFORNIA—A jellyfish invasion might sound like the plot of a bad movie on late-night TV. But the pulsing, tentacled predators were a star attraction at a marine science meeting* here last week.

Populations of some jellyfish appear to be exploding in several parts of the world, U.S. and Russian scientists reported, raising fears that they are taking over ecosystems that nurture key commercial fish stocks. The Gulf of Mexico and the Bering and Black seas have been particularly hard hit. In some cases, however, researchers don't know whether the blooms are unusual or just natural population fluctuations, says Claudia Mills, a jellyfish expert at the University of Washington's marine laboratory in Friday Harbor.

In the Bering Sea off Alaska, the population of *Chrysaora melanaster* has jumped at least 10-fold over the past decade, reaching record numbers last year, reported biologist Richard Brodeur of the National Marine Fisheries Service in Newport, Oregon. Brodeur suspects that long-term climate shifts, which have affected ice cover and water temperatures, may explain the increase. But whatever the cause, the huge summer blooms could deliver a two-fisted punch to the Bering's fish stocks, which account for 5% of the world's catch.

The problem is that the 2-meter-long jellyfish not only compete for food with young pollock—one of the Bering's most valuable fish—but also feed on them. In a 1999 study conducted off the Pribilof Islands, Brodeur reported, the jellyfish consumed about 5% of the annual crop of zooplankton and about 3% of newborn pollock. Some fishing boat captains now avoid one area, dubbed "Slime Bank," because countless jellyfish foul their nets.

In the northern Gulf of Mexico, a foreign jellyfish produced a huge bloom last summer, reported Monty Graham of Alabama's Dauphin Island Sea Lab. Native to the tropical Pacific Ocean, *Phyllorhiza punctata* apparently drifted in from the Caribbean. Now, Graham and colleagues are waiting to see whether it and several native species continue to thrive, perhaps encouraged by declining coastal water quality and a growing thicket of offshore oil-drilling platforms. The platforms' steel legs, Graham speculates, may be one source of the hard substrate that jellyfish polyps—a bottom-dwelling life stage—need to thrive.

Russian scientists, meanwhile, are keeping a close eye on booming Black Sea jellyfish, which have contributed to falling anchovy catches in the past several decades. Tamara Shiganova of the Shirshov Institute of Oceanology in Gelendzhik, Russia, noted that two species—one apparently native and the other introduced from the western Atlantic Ocean—now appear in often alternating blooms, vacuuming up the plankton that feed young fish. The Atlantic invader, *Mnemiopsis leidyi*, may soon get its comeuppance, however, because yet another exotic jellyfish has arrived—one that feasts on *M. leidyi*. Meanwhile, *Mnemiopsis* has invaded the nearby Caspian Sea, prompting fears that it could endanger a threatened seal species by reducing fish populations.

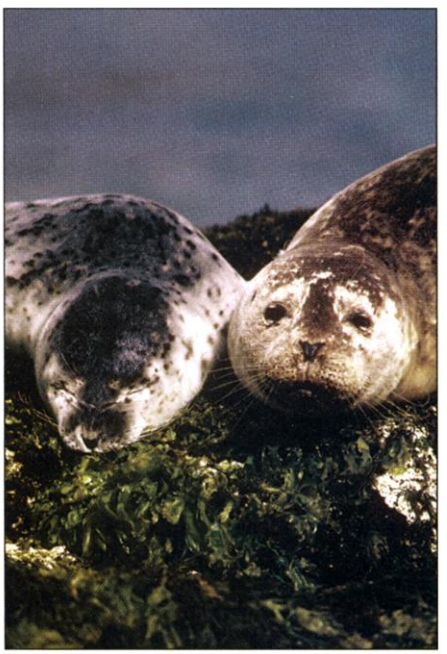
On the flip side, notes Mills, some jellyfish have disappeared—along with other marine species—with little notice from polluted coastal waters, such as the Adriatic Sea and Puget Sound. Determining how such departures and arrivals influence complicated marine food webs will be difficult work, she says, involving laborious field surveys and careful counts of the contents of jellyfish's stomachs. Handling their gelatinous, watery bodies and stinging tentacles can be a chore, she adds: "Jellyfish can be really unpleasant."

–DAVID MALAKOFF

* Second Symposium on Marine Conservation Biology, 22–25 June.

CREDITS: (TOP TO BOTTOM) GREGORY OCHOCKI/PHOTO RESEARCHERS; MONTY GRAHAM

Gelatinous onslaught. Jellyfish blooms, like this one in the Gulf of Mexico, present a puzzle.



Going with the flow. Harbor seals use their whiskers to follow trails of turbulence.

MARINE MAMMALS

By a Whisker, Harbor Seals Catch Their Prey

When mammals began to colonize the ocean some 50 million years ago, they immediately faced a huge challenge: hunting under water. The sharp vision their ancestors had evolved on land to take advantage of the transparency of air was of little use in the ocean's murky darkness.

Some species of dolphins and whales adapted to the new environment by evolving echolocation, which allows them to "see" with their ears. How other marine mammals manage to hunt without echolocation has long been a mystery, though. On page 102, German researchers report that part of the answer has been hiding in plain view: They use their whiskers.

Earlier studies by several researchers had shown that seal whiskers are remarkably sensitive to even the slightest bending. "They can use whiskers like we can use our hands for object identification," explains Guido Dehnhardt of Ruhr University Bochum in Germany. "They can measure the height of objects, they can discriminate different shapes, and they can very accurately determine an object's surface." In 1998 Dehnhardt, then at the University of Bonn, and his colleagues showed that whiskers are not just sensitive to objects but even to tiny movements of water generated by passing fish.

Given this exquisite sensitivity, seals might use their whiskers at close quarters to detect moving prey and then identify them