

Life

Two scientists provide a photographic peek of the undersea life of Long Island Sound.

under the Surface

PHOTOGRAPHS BY PETER AUSTER AND ROBERT DEGOURSEY

LONG ISLAND SOUND HAS BEEN CALLED THE “URBAN SEA” because of the millions of people who live close to its shoreline. But while human activities on adjacent lands do affect the Sound, below the water surface rich communities of animal and plant life still exist. About 170 fish and 1,200 invertebrates (animals without backbones) swim and crawl in the Sound, living in unique aquatic habitats. Beautifully colored anemones, sponges, and corals attach to boulder reefs and feed on plankton and other material passing by in the water, while fish, such as tautog and cunner, swim in and out of rock crevices. In the shallow waters near the shore, fish and scallops seek out protection from predators in dense meadows of eelgrass.

Two years ago Peter Auster and Robert DeGoursey, both divers and colleagues at the University of Connecticut in Groton, set out to give people a vivid sense of the life each has studied for more than 30 years. The two scientists produced a CD-ROM called *An Underwater Tour of Long Island Sound*, a photographic journey of the Sound.

“Most folks only see the Sound as a surface from the shoreline, sometimes pulling fish or lobsters through the interface, or simply swimming in the waters along the shoreline,” said Auster, who is the Science Director of the National Undersea Research Center at the University.

The scientists wanted people to see the beauty underneath, but also gain an understanding of why that underwater environment needs to be protected.

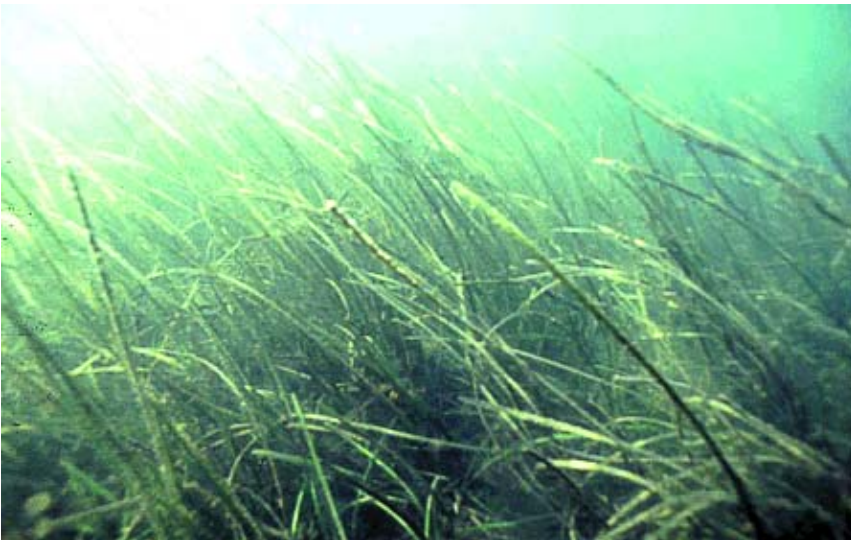
“The conservation and sustainable use of biological diversity in the Sound will need to be based on a public understanding of the underwater landscape and the animals that live within it,” said Auster. “We hoped this ‘tour’ would help the discussion move along.”

THE ECOSYSTEM

1. SEAGRASS
2. MUD
3. SAND
4. MIDWATER
5. BOULDER REEF

2 MUD

In muddy habitats burrowing species, such as lobster, live on or below the surface in depressions and holes. Some species are structure producers, while many use structures produced by other organisms. For example, species like lobsters and four-bearded rockling produce bowl shaped depressions on the sediment surface. Other species, like long-finned squid, use abandoned depressions for cover. Pictured below is a mud shrimp (*Axius serratus*), which can burrow more than three feet deep into mud. A polychaete worm (*Nereis virens*), also below, is a predatory worm that lives within the sediments. It comes to the sediment surface and swims through the water column during spawning. Muddy habitats are found throughout the Sound, mostly in deeper waters, as well as protected near shore areas such as Milton Harbor in Rye or Norwalk Harbor.



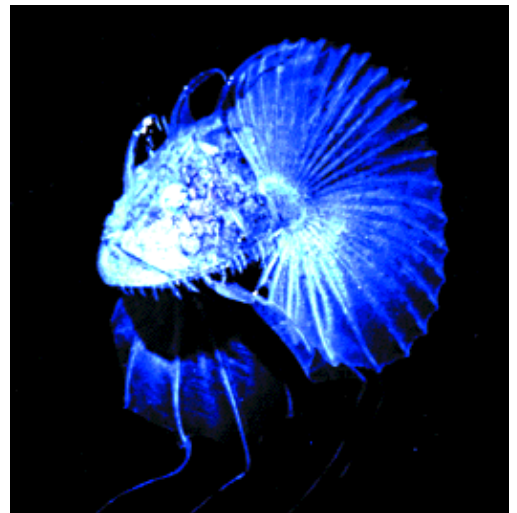
1 SEAGRASS

Like grasses on land, these plants are capable of photosynthesis and creating nutrients using sunlight, water, and carbon dioxide. Dense seagrass meadows and tall forests of kelp provide refuge from predators and tidal currents. Seagrass is generally seasonal. The picture above is an eelgrass (*Zostera marina*) meadow. Although eelgrass has historically existed throughout Long Island Sound, recently it may be found only along the shallows of eastern Connecticut and Fishers Island in New York.



4 MIDWATER

The water column, from water surface to sea floor, provides a habitat for fish and crustaceans such as lobsters and crabs to feed on concentrated microscopic plants and animals called plankton. Jellyfish also provide structure in the water column. Fish resistant to the stinging cells of jellyfish in midwater have been observed using the tentacles and bells of jellyfish for shelter. Although these habitats are ephemeral in nature, they can still increase the chance of survival for individual organisms. Juvenile goosefish (*Lophius americanus*), below, live in midwater after hatching from the egg stage, but migrate to the seafloor with age, where they prey on bottom-dwelling organisms.



3 SAND

Sand grains generally do not stick to each other, thus preventing animals from constructing solid, walled burrows. Nevertheless, many burrowing species adapt to life in these habitats. For example, many crab species can rapidly bury themselves in the sand to avoid threats. Some fish use rocks and plants to help them hold their position on the sea floor from tidal and storm currents that form sand waves and sand ripples. In sedimentary environments, pictured at top, predation may occur beneath the surface. Here a moon snail (*Lunatia heros*) plows beneath the sediment surface in search of prey.

Winter flounder (*Pleuronectes americana*), left, have adapted to catch prey on the sediment surface. Here a small fleshy mouth enhances capture of small clams and worms. Lobsters (*Homarus americanus*) form dish depressions for limited cover in sand habitats. Sandy habitats are found along the shore in more open areas, such around Greens Ledge Lighthouse, off Norwalk or Davids Island, off New Rochelle.



5 BOULDER REEF

Boulder and gravel areas are complex habitats. These areas range from large piles of boulders stretching several feet or more into the water to flat pavements of cobble and pebbles. Crevices between and under boulders, as well as sponges and anemones that are found attached to rocks, pilings, and even shellfish, provide cover from predators and refuges from currents. These varied spaces also allow for a range of sizes of organisms.

Kelp forests (*Laminaria*), left, and boulders provide complex rock reef habitats along the coast. Cunner (*Tautoglabrus adspersus*) are the most common reef fish in this region. Deadman's finger sponge (*Haliclona oculata*), center, is seen here, attached to cobble. The frilled anemone (*Metridium senile*), right, can appear in dense aggregations. Boulder or rock reef habitats can be found throughout the Sound, in places such as Baiting Hollow, off Long Island's North shore, or Penfield Reef, off Fairfield, Connecticut.

