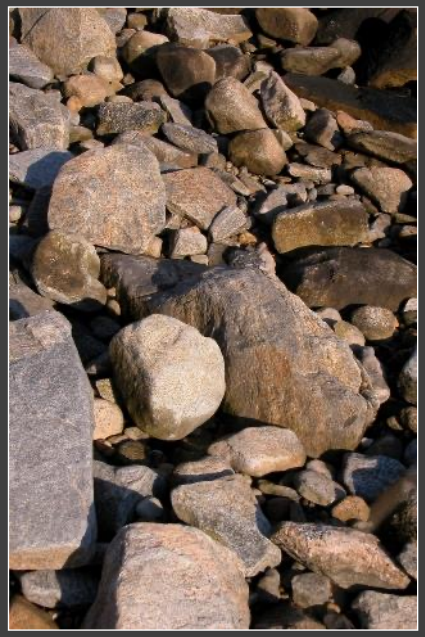
Submerged Bottom: Mud to Boulders

Photo: courtesy of Ivar Babb and LISMaRC Science Team
(UConn/U New Haven/USGS), Long Island Sound Study, CT-DEEP

The seafloor in Long Island Sound is as diverse as the habitats along the shore, varying from mud and silt, to sand, to cobble and boulders



Photos: mud, sand, cobble; courtesy of Nancy Balcom

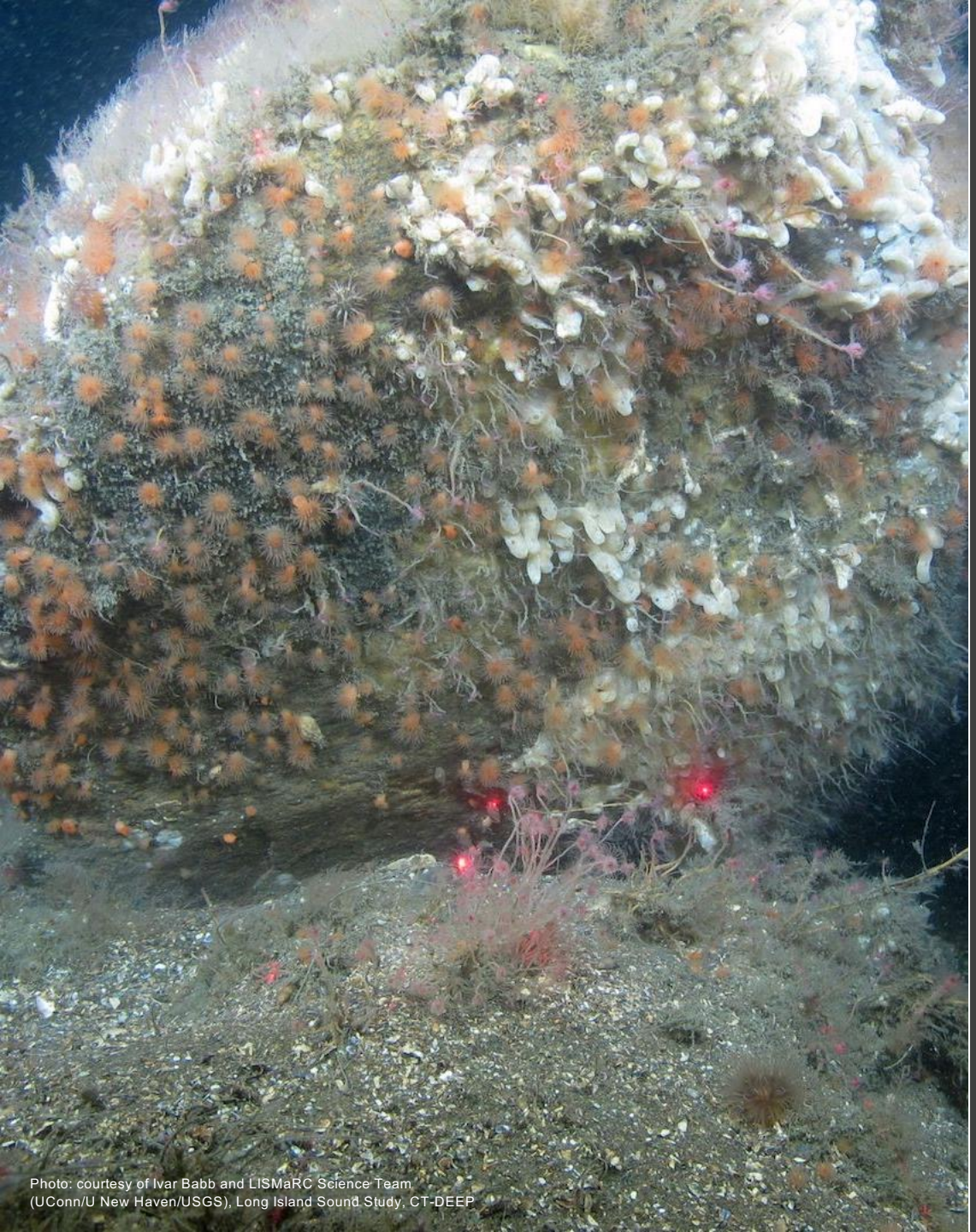


Photo: courtesy of Ivar Babb and LISMaRC Science Team
(UConn/U New Haven/USGS), Long Island Sound Study, CT-DEEP

Boulders, deposited by receding glaciers, provide structure and shelter for organisms living on or near the bottom of Long Island Sound

Brown kelp, a seaweed, grows in subtidal beds or “forests,” attaching to hard surfaces on the bottom with a holdfast; kelp holdfasts and blades provide food and shelter for many benthic and pelagic species

Kelp is farmed in Long Island Sound on longlines as a “sea vegetable”

Photos: Brown kelp, *Laminaria saccharina*, and farmed kelp; courtesy of Nancy Balcom

Photo: Breadcrumb sponges, *Halichondria*, pink tubularians, *Tubularia indivisa*, and pink-orange ghost anemones, *Diadumene leucolena*; courtesy of Ivar Babb and LISMaRC Science Team (UConn/U New Haven/USGS), Long Island Sound Study, CT-DEEP

Yellow breadcrumb sponges, pink tubularians and pink-orange ghost anemones feed by filtering plankton and particulates out of the water

Benthic rocky communities support attached organisms such as this frilled anemone, which, in turn, provide food and shelter for other organisms; anemones, with their stinging cells, are cnidarians

Photo: Frilled or clonal plumose anemone, *Metridium senile*; courtesy of Robert DeGoursey

Photo: Lined anemone, *Fagesia lineata*; courtesy of Robert Bachand

Lined anemones attach to hard surfaces such as rocks, shells or pilings; the tentacles capture and direct food particles to the mouth in the center

Photos: Northern star coral, *Astrangia poculata*; courtesy of Robert Bachand

Corals are living colonies of individual cnidarians set within calcium carbonate shells; this northern star coral is found on rocky reefs in the Sound

Photos: (left) Common sea star, *Asterias forbesi*; courtesy of Nancy Balcom; (right) Common sea star, *Asterias forbesi*; courtesy of Robert Bachand

Echinoderms are spiny-skinned animals with five-part symmetry, like sea stars and sea urchins

Sea stars feed on shellfish, other invertebrates, and even fish, dead or alive

The blood star is another species of sea star that lives in Long Island Sound

Photo: Blood star, *Henricia sanguinolenta*; courtesy of Robert Bachand

Sea urchins, armored with spines, have five hard pointed teeth at the center of their underside which they use to scrape algae and detritus off rocks and other substrates

Photos: (top) Green sea urchin, *Strongylocentrotus droebachiensis*, courtesy of Nancy Balcom; (bottom) Purple sea urchin, *Arbacia punctulata*; courtesy of Nancy Balcom; (bottom right) Sea urchins on LIS bottom courtesy of Ivar Babb and LISMaRC Science Team (UConn/U New Haven/USGS), Long Island Sound Study, CT-DEEP

Photos: (left) Hairy sea cucumber, *Sclerodactyla briareus*, actively feeding and (right) burrowing in Mystic Harbor mud bottom; courtesy of Robert Bachand

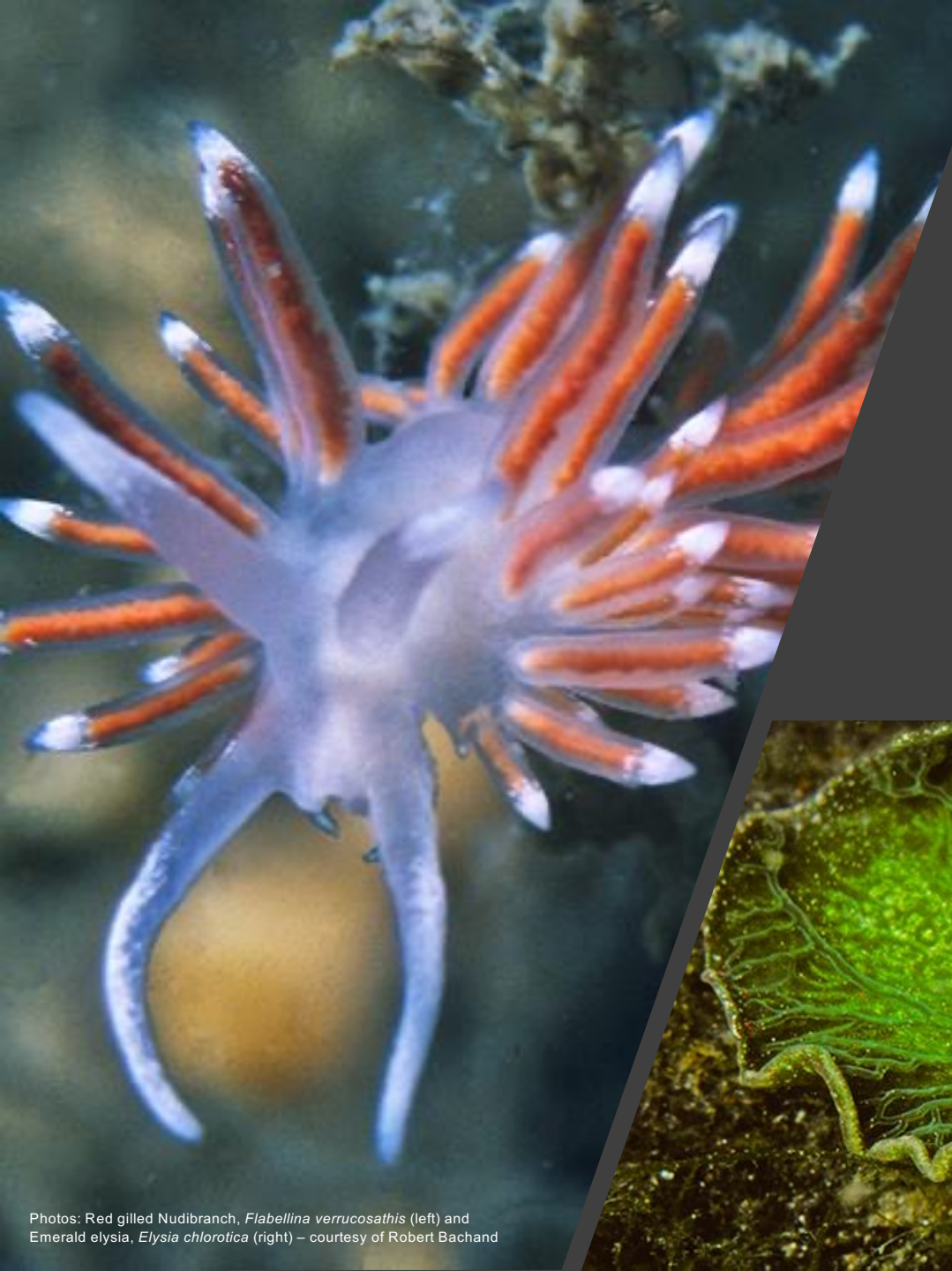
Sea cucumbers are also echinoderms; the hairy or common sea cucumber lives on submerged bottom and feeds using ten finger-like tentacles around its mouth to filter plankton from the water column

Eastern oysters are an important commercial shellfish – bivalve molluscs

They are farmed on the bottom of the Sound on leased grounds, a practice known as aquaculture

Photo: Eastern oyster, *Crassostrea virginica*; courtesy of Briarpatch Enterprises, Milford CT

Nudibranchs are molluscs with no shells; they are sometimes referred to as “sea slugs” and can be very colorful



Photos: Red gilled Nudibranch, *Flabellina verrucosathis* (left) and Emerald elysia, *Elysia chlorotica* (right) – courtesy of Robert Bachand

The most commercially-important crustacean in Long Island Sound is the American lobster

Crustaceans such as lobsters, shrimp and crabs, are arthropods; all arthropods have jointed appendages

A lady crab is identified by its purple spots and sharp pincers

Like the blue crab it is a swimming crab, using its back pair of paddle-shaped swimming legs to propel it through the water

Red beard sponge offers a safe refuge

Photos: (top) Lady crab (Calico crab), *Ovalipes ocellatus*, and red beard sponge, *Microciona prolifera*; (bottom) swimming through the water; courtesy of Robert Bachand

Photos: (left) Spider crab, *Libinia sp.*; courtesy of Ivar Babb and LISMaRC Science Team (UConn/U New Haven/USGS), Long Island Sound Study, CT-DEEP; and (right) Long-nosed spider crab, *Libinia dubia*; courtesy of Robert Bachand

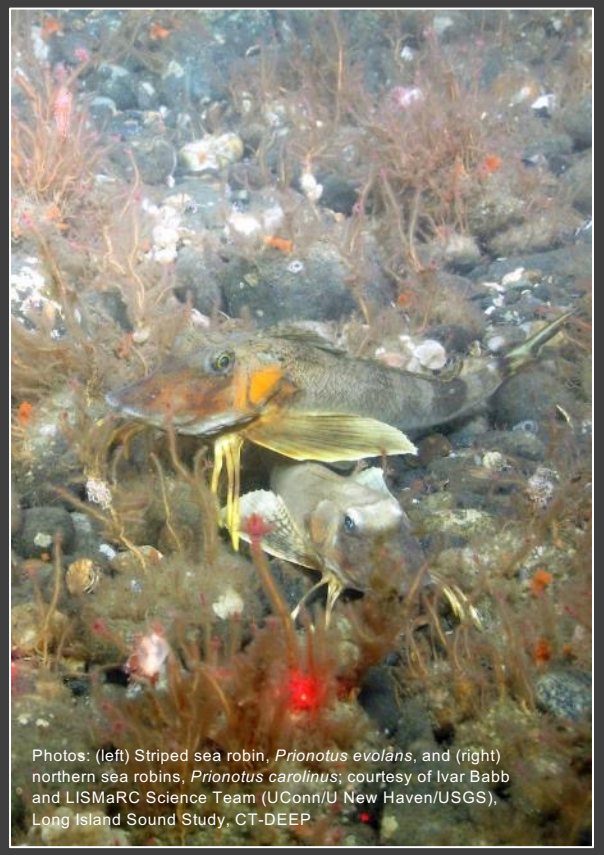
Spider crabs are well camouflaged; primarily scavengers, they cluster together in groups to molt (shed their outer shell or exoskeleton in order to grow larger) and mate

Atlantic rock crabs are the favorite food of lobsters; they feed on worms, molluscs and other invertebrates

Photo: Atlantic rock crab, *Cancer irroratus*; courtesy of Robert Bachand

Named for the translucent areas on either side of its "pointed snout", a clearnose skate feeds along the bottom (benthos) of the Sound; relatives of sharks and rays, skates possess skeletons entirely made of cartilage

Photo: Clearnose skate, *Raja eganteria*; courtesy of Robert Bachand



Photos: (left) Striped sea robin, *Prionotus evolans*, and (right) northern sea robins, *Prionotus carolinus*; courtesy of Ivar Babb and LISMaRC Science Team (UConn/U New Haven/USGS), Long Island Sound Study, CT-DEEP

Striped sea robins (left) and northern sea robins (right) migrate from deeper offshore waters to Long Island Sound in the spring to spawn and feed, returning to the deeper waters in the fall

Sea ravens and their relatives, sculpins, have large spiny heads and wide mouths; sea ravens possess fleshy tabs on their heads and ragged dorsal fins; they inhabit rocky or hard bottoms where they eat both invertebrates and finfish

Winter flounder are year-round residents of Long Island Sound; “right-eyed” flatfish, they swim along the bottom feeding on soft-bodied animals in the sediments

Photo: Winter flounder, *Pleuronectes americanus*; courtesy of Robert Bachand

Photo: Windowpane flounder, *Scophthalmus aquosus*; courtesy of Peter Auster

Windowpane, or sand dabs, are also year-round flatfish residents of the Sound; "left-eyed" flatfish, they have larger mouths than winter flounder, and will leave the bottom to ingest swimming prey

Like all flatfish, "left-eyed" summer flounder have a chameleon-like ability to change their color to blend in with the surrounding sediments, an adaptation that serves them well against most predators

Photo: Summer flounder, *Paralichthys dentatus*; courtesy of Robert Bachand

Photo: (left) Black sea bass, *Centropristis striata*, and (right) scup, *Stenotomus chrysops*; courtesy of Ivar Babb and LISMaRC Science Team (UConn/U New Haven/USGS), Long Island Sound Study, CT-DEEP

A black sea bass (left) and a scup or porgy (right) feed and shelter among the boulders; scup migrate to the Sound from their wintering grounds in Delaware Bay and Chesapeake Bay

Photo: Cunner, *Tautogolabrus adspersus*, courtesy of Robert Bachand

Cunner also like to hang around rocks and boulders; the warming climate has enabled this finfish species to expand its range north into Long Island Sound