INVASIVE MARINE SPECIES FOUND ON GEORGES BANK

Nov. 19, 2003 — Researchers have found what is believed to be an invasive species of sea squirt on the northern edge of Georges Bank, colonizing a 6.5 square mile area about 160 miles off outer Cape Cod, at a depth of just over 150 feet. These siphon-feeding animals form dense mats, made of many thousands of individuals, encrusting and smothering hard sea bottom and organisms attached to it. **(Click NOAA image for larger view of tunicate colonies of the genus Didemnum (probably the species D. vexillum) advancing from left to right over pebble gravel habitat taken November 2003 on northern Georges Bank. Image height is 20 inches. Water depth was 41 meters or 135 feet. Click here for high resolution version, which is a large file. Please credit "USGS/NOAA.")**

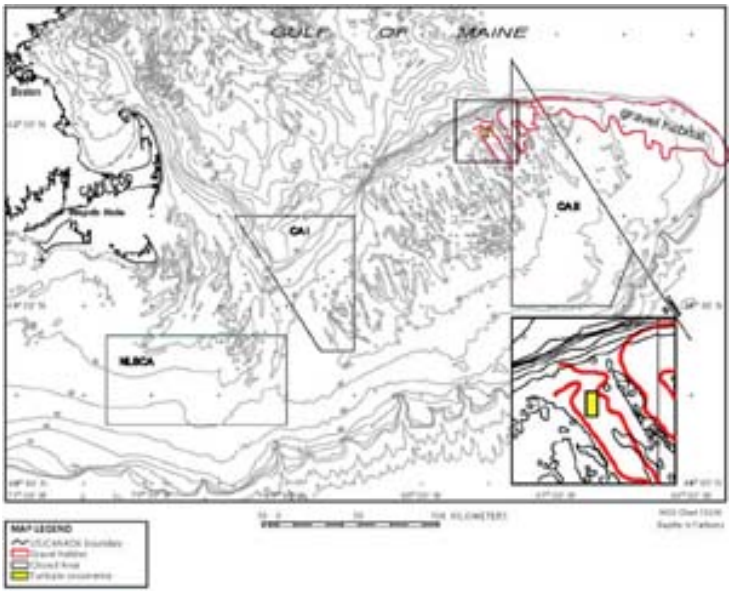
An "invasive species" is one that is not native to an ecosystem and may harm that ecosystem if introduced. Sea squirts are tunicates, sea life with a primitive spinal cord and a firm, flexible outer covering called a "tunic," from which the name derives.

"Not everything in the study site was 100 percent covered by tunicates," said U.S. Geological Survey researcher Page Valentine, "but in some places the mats were quite dense, covering more than 90 percent of the seabed." The growth may be more widespread than observed in the study area alone, where the mats have grown dramatically in size and distribution in one year's time. **(Click NOAA image for larger view of tunicate colony of the genus Didemnum encrusting a mussel shell taken November 2003 on northern Georges Bank. The long rope-like extensions possibly encrust organisms such as hydroids that commonly attach to shells. White bar is 2 centimeters (0.8 inches). Water depth was 45 meters or 148 feet. Click here for high resolution version, which is a large file. Please credit "USGS/NOAA.")**

"We weren't looking for invasive species," said Robert Reid of NOAA Fisheries, chief scientist for the cruise aboard the NOAA Ship Delaware II when the observations were made during early November. "This certainly highlights the value of regular monitoring to detect change in important marine habitats," he said. Georges Bank is a well-known and highly productive fishing ground for both fish and sea scallops. According to NOAA scientists, this is just one example of how an invasive species can come into nation's waters and affect a fragile ecosystem. **(Click NOAA image for larger view of tunicate colonies of the genus Didemnum (probably the species D. vexillum) encrusting a naturalist dredge sample of pebble gravel shown on deck the NOAA Ship Delaware II. The encrusted sea scallop is approximately five inches in diameter. Water depth was 47 meters or 154 feet. Click here for high resolution version, which is a large file. Please credit "USGS/NOAA.")**

Valentine, Reid and Jeremy Collie of the University of Rhode Island have been visiting sites on Georges Bank regularly over the past nine years, taking bottom samples and using video and photographic imagery to document the sea floor, marine habitats and their recovery following closure of large areas of the Bank to some kinds of fishing.

"Based on our personal observations, Didemnum is changing the composition of benthic communities in the areas it has colonized," said Collie, whose work in the study area has focused on recovery of bottom habitats in the absence of fishing with dragged gear. "Our time-series of data will be able to document this shift," he said.



Researchers are concerned that the species could be carried elsewhere on Georges Bank on ships' hulls, in ballast water or on fishing gear, widening the infestation. **(Click NOAA image for larger view of Georges Bank map. Click here for high resolution version, which is a large file. Click here for PDF version.)**

This is perhaps the first documentation of this species, believed to be Didemnum vexillum, in offshore waters. Didemnum vexillum has been reported fouling coastal structures and seabeds along the coasts of New England and the U.S. West Coast.

It was first documented in New England in 2000, by researchers tracking invasive species in coastal waters. Anecdotal observations suggest the species was present in the region by the mid-1990s. California researchers documented the species in their waters during 1998. In 2001, infestation by a similar tunicate threatened the green mussel aquaculture operations of Marlborough, New Zealand, where officials took extraordinary steps to contain its spread. Its

waters of origin are not known.

This species is known to reproduce both sexually and asexually. Larvae are fragile and short-lived, and are likely to settle relatively near their point of origin. However, fragmented pieces of the colony can free float indefinitely, reattach to a hard surface, and grow asexually. Such fragments can also contain incubated larvae.

According to researchers, the Georges Bank infestation may exceed documented occurrences on hard bottoms and structures in shallow coastal waters, where this animal can reach very high densities. The creatures exude a noxious substance as a byproduct of its metabolic processes, one that prevents fouling of its exterior and discourages predators.

Little is known about how Didemnum can affect fishery resources, or its survival in offshore waters. It needs a hard, or relatively stable, surface to which it can attach. It has proven difficult to eradicate elsewhere in the world's nearshore waters. Until now, primary threats have been in nearshore areas where the mat could grow over structures used in aquaculture.

NOAA Fisheries is dedicated to protecting and preserving the nation's living marine resources and the habitat on which they depend, including the sustainable use of fishery resources, through scientific research, management and enforcement.

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