

News Release

Sept.19, 2006 Diane Noserale, USGS 703-648-4333 dnoseral@usgs.gov
Teri Frady, NOAA 508-495-2239 teri.frad@noaa.gov
Todd McLeish, URI 401-874-7892 tmcleish@uri.edu

Invasive Sea Squirts Persist on Georges Bank

For high resolution images and more information on *Didemnum* worldwide, see the USGS website <http://woodshole.er.usgs.gov/project-pages/stellwagen/didemnum/index.htm>

WOODS HOLE, Mass.— For the fourth consecutive year, federal and university researchers have surveyed two areas on Georges Bank where an invasive colonial sea squirt continues to thrive on the gravel bottom. The colonies are denser than in 2005 over the 88 square-mile area observed. But scientists found no colonies in nearby Canadian waters, indicating they have not spread eastward. The Georges Bank squirts are a species of the genus *Didemnum*.

“The area of seabed covered by the colonies has doubled at 75 percent of the sites we observed in both 2005 and 2006,” said Dr. Page Valentine of the U.S. Geological Survey, who tracks occurrences of the species off the northeastern U.S., and elsewhere in the world. Greater density of colonies observed during the survey is evidence that the infestation is persistent, and not a short-lived phenomenon.

Robert Reid, a biologist with NOAA Fisheries Service and chief scientist for the survey, agreed that the squirt appears to be proliferating in the study area. “The fact that it is still there in high abundance over a fairly large area certainly indicates this occurrence is not ephemeral,” Reid said.

Scientists remain concerned that the infestation could threaten important fisheries in the region. Sea squirt mats could prevent fish from feeding on worms and crustaceans that live in and on the gravel bottom, reduce the shelter required for these species to avoid predators, and limit the space available for settlement of larvae of sea scallops and other species. *Didemnum* is a nuisance to the aquaculture industry, overgrowing shellfish in New England coastal waters.

Dr. Jeremy Collie, a biologist with the University of Rhode Island, has been studying the benthic communities in the area since before the sea squirts arrived, and he is monitoring the effects the tunicates are having on the benthos. “We haven’t seen any dramatic changes yet, but as the percentage of the area covered by the tunicate gets higher and higher, it’s going to seal off the seafloor. That’s when we expect to see significant effects,” he said.

As in prior years, scientists conducted the annual survey from the NOAA Ship *Delaware II*. Returning researchers included Valentine and Reid, and Collie. This year’s survey included video transects of up to 0.8 miles in length using the USGS seabed observation and sampling system (SEABOSS). Preliminary evaluation of the images show the gravel is 50 to 75 percent covered at some study sites, a marked increase from last year.

Dawn Sephton, a biologist from the Department of Fisheries and Oceans Canada, Maritimes Region, was also part of scientific team this year, since the study included Canadian waters. Sephton currently

leads a project to detect and monitor invasive tunicate species along the Bay of Fundy and Nova Scotia coastlines. “While the absence of *Didemnum* at the Canadian study sites is welcome news, we are concerned about its potential spread and impact on fisheries and shellfish aquaculture in the Maritimes,” Sephton said.

Sea squirts are also called tunicates, having a primitive spinal cord and an outer sheath or “tunic,” from which the name derives. Tunicates spread in several ways: by larvae that swim for only a few hours before settling; by colonies that hitchhike onto surfaces such as boat hulls, moorings, fishing gear, and other manmade objects and are carried to new, favorable habitats; and by fragments of colonies that are broken up by human activities and natural events and drift until they settle elsewhere. They expand outward by budding new millimeter-sized individuals to form circular mats up to a foot in diameter. The mats coalesce with neighboring colonies to form a tough, barren layer of intergrown colonies that attach to hard surfaces including gravel, wood, metal, and plastic. No other species is known to eat or overgrow them.

Scientists first observed the *Didemnum* colonies in 2003, on the U.S. side of the international maritime boundary separating U.S. and Canadian waters of Georges Bank. Georges Bank is frequently fished by commercial vessels, particularly sea scallopers and ground fishermen. The same or similar species of *Didemnum* occur on the coasts of Europe, New England, California, Washington, British Columbia, and New Zealand. So far, this is the only occurrence reported in an offshore fishing ground.

Figure captions:

Map showing the locations on Georges Bank of the two areas of gravel habitat totaling 88 sq mi that are affected by the invasive colonial tunicate, *Didemnum* sp.

Image DSC_2675. Tunicate colony of *Didemnum* sp. growing over and cementing a gravel seabed. Colony mat shown hanging in air to demonstrate its toughness. Northern Georges Bank (41 deg 58.841 min N lat, 67 deg 19.533 min W lon). Water depth 53 m (174 ft). August, 2006. Collectors: Page Valentine, Jeremy Collie, and Robert Reid. Photo credit: Dann Blackwood, U.S. Geological Survey.

Image DSC_2671. Underside of tunicate mat shown in image DSC_2675 showing pebbles that once formed the seabed surface. Northern Georges Bank (41 deg 58.841 min N lat, 67 deg 19.533 min W lon). Water depth 53 m (174 ft). August, 2006. Collectors: Page Valentine, Jeremy Collie, and Robert Reid. Photo credit: Dann Blackwood, U.S. Geological Survey.

Image DSC_2677. Tunicate colony of *Didemnum* sp. growing over a colony of the white tube worm *Filograna implexa*. Note the small openings at the ends of the tubes where the worms live. Northern Georges Bank (41 deg 58.841 min N lat, 67 deg 19.533 min W lon). Water depth 53 m (174 ft). August, 2006. Width of specimen shown is approximately 2.5 cm (1 inch). Collectors: Page Valentine, Jeremy Collie, and Robert Reid. Photo credit: Dann Blackwood, U.S. Geological Survey.

Image DSC_2536. Decorator crab with colonies of the tunicate *Didemnum* sp. growing on its carapace. Northern Georges Bank (41 deg 57.221 min N lat, 67 deg 30.899 min W lon). Water depth 47 m (154 ft). August, 2006. Collectors: Jeremy Collie, Page Valentine, and Robert Reid. Photo credit: Dann Blackwood, U.S. Geological Survey.

Image 06002659. Crew members of the NOAA Ship *Delaware II* in August 2006 deploying the USGS SEABOSS, a system for imaging and sampling the seabed that has video and still cameras and a grab for collecting sediment and benthic fauna. Photo credit: Dann Blackwood, U.S. Geological Survey.

Image DSCN0165. View of a colony of the colonial sea squirt *Didemnum* sp. that forms a mat covering gravel on the Georges Bank seabed. Lumpy surface of the colony is caused by pebbles overgrown by the colony. The sample, collected in August 2006, rests in the grab of the USGS SEABOSS, a system that also has video and still cameras for imaging the sea floor. Scale is in centimeters (image is 16 inches wide). Photo credit: Dann Blackwood, U.S. Geological Survey.

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