



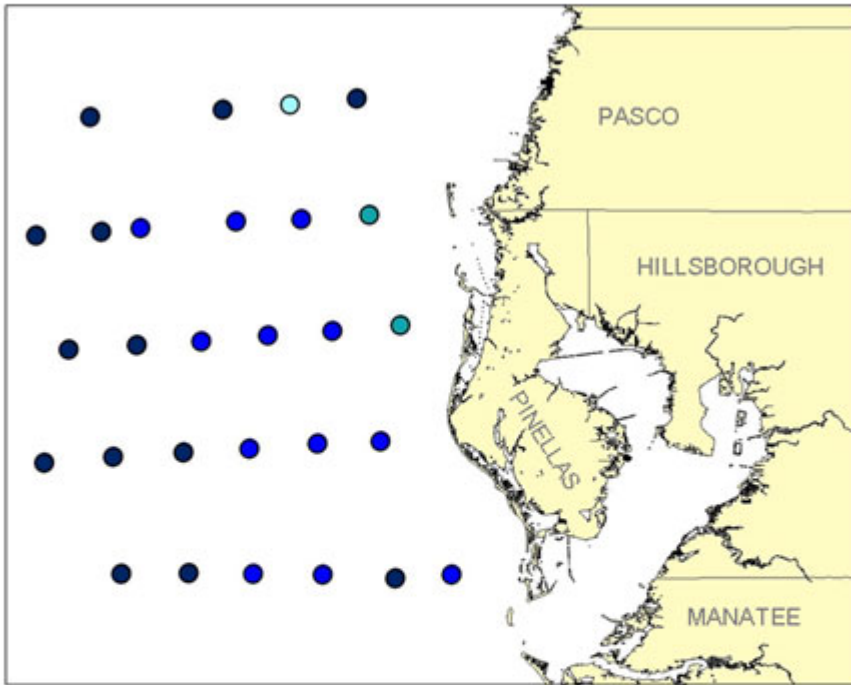
Offshore Red Tide-Associated Mortalities and FWRI Event Response (Updated August 17, 2005)

During the first week of August 2005, FWRI received reports of mass mortalities of fish and other animals inhabiting reefs. The reports extend from New Port Richey to Sarasota. FWRI is investigating these reports.

Preliminary Results of FWRI Research Cruise

Researchers with the Florida Fish and Wildlife Conservation Commission's (FWC) Fish and Wildlife Research Institute and the University of South Florida conducted a successful research cruise this weekend to investigate areas of mass bottom mortalities in the eastern Gulf of Mexico. The cruise, funded by the National Oceanic and Atmospheric Administration's (NOAA) Center for Sponsored Coastal Ocean Research (CSCOR), sampled 28 stations from the mouth of Tampa Bay north to Pasco County, from along the shore out to 30 miles offshore. Preliminary cruise results show well oxygenated surface waters in all but one station sampled. Anoxic (no oxygen) and hypoxic (low oxygen, <2 milligrams per liter) conditions on the gulf bottom were observed at selected stations sampled between northern Pinellas and Pasco counties during the cruise.

Dissolved Oxygen at Surface (August 10–12, 2005)



DO (mg/L)

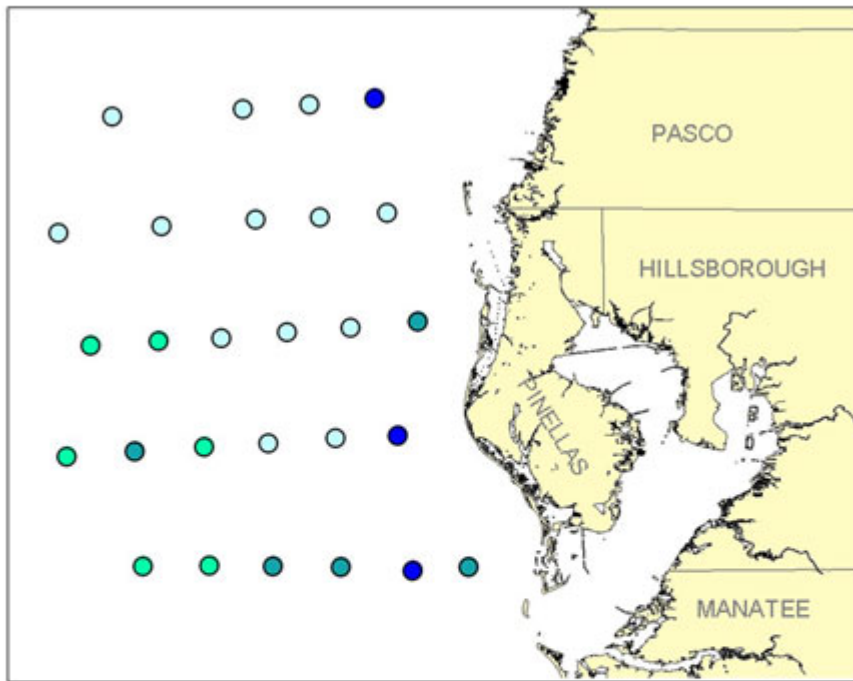
- 0-2
- >2-4
- >4-6
- >6-8
- >8

DO = dissolved oxygen.
mg/L = milligrams per liter.

10 0 10 Miles



Dissolved Oxygen at Bottom (August 10–12, 2005)



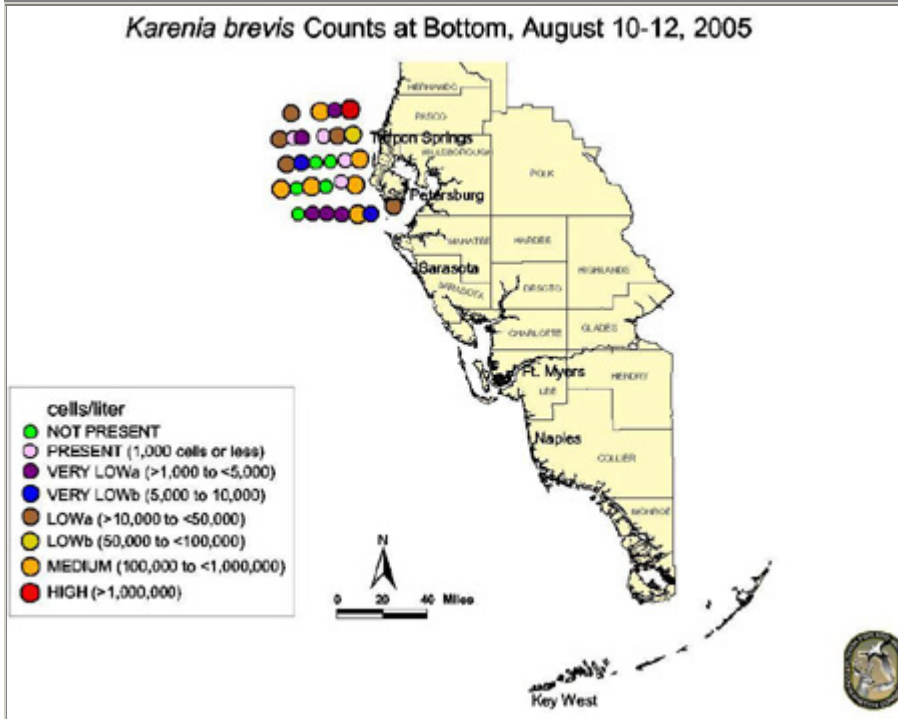
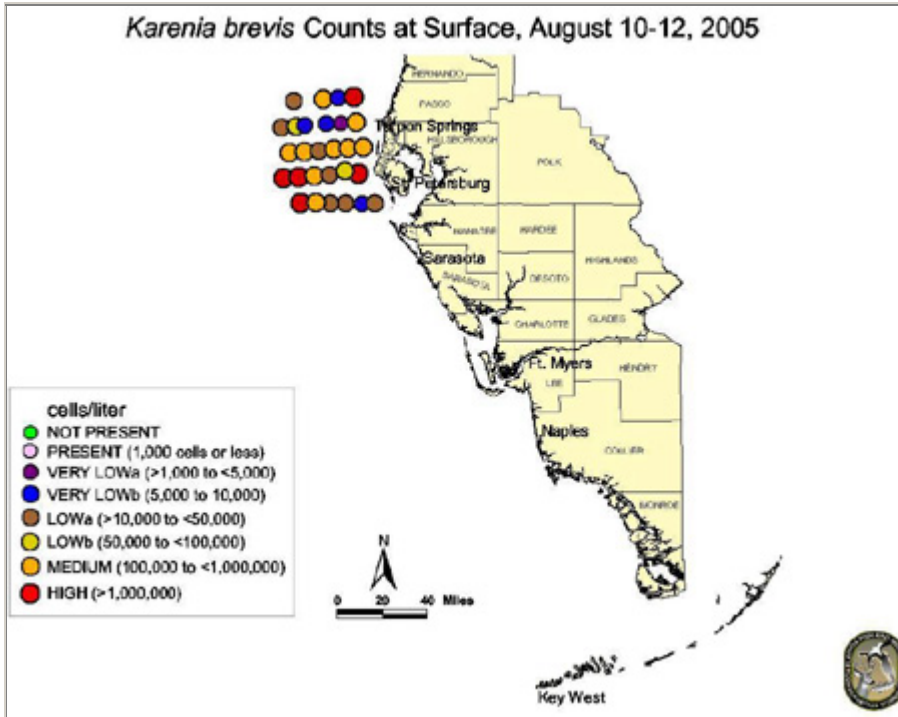
DO (mg/L)

- 0–2
- >2–4
- >4–6
- >6–8
- >8

DO = dissolved oxygen.
mg/L = milligrams per liter.



The affected zone lies approximately 10 miles offshore and encompasses the locations of the initial benthic kills reported by divers. Comparison of these cruise results with data collected in previous weeks from the transect at the mouth of Tampa Bay suggest that the low oxygen conditions are transient; higher concentrations of oxygen are already returning to the southern area. High concentrations of red tide were documented in both surface and bottom waters sampled in the nearshore region, and high concentrations of red tide were found in surface waters offshore of the affection region. A strong thermocline (zone of abrupt change in water temperature with depth) was observed throughout the region sampled during the cruise.



Researchers conducted dives at eight sites during the cruise and observed variable effects from site to site. Sites that were affected had high hydrogen sulfide levels and low visibility. Unaffected sites looked like typical live, soft bottom Gulf of Mexico habitats and were located on the western fringes of the hypoxic region.

Background Information

During the first week of August 2005, FWRI received reports from diving and fishing charter businesses of mass mortalities of fish and other animals inhabiting reefs. Reports also mentioned an odor like rotten eggs and divers' silver jewelry and coins turning black. These reports spanned a geographical area extending from New Port

Richey south to Sarasota and from approximately 3 to 23 miles offshore. It is estimated that bottom communities within an approximate area of 2,162 square miles have potentially been affected. Organisms affected include dead fish present on the bottom (ranging from baitfish to goliath grouper) as well as dead sponges, corals, worms, mollusks, crabs, sea urchins, starfish, and sea turtles. Bottom visibility was also reported as being significantly reduced. Large fishing boats have also reported severe declines in catches the previous week. Although these mortalities are linked to the persistent red tide of the toxic dinoflagellate *Karenia brevis* off the central west Florida shelf (**Florida Red Tide Current Status**), FWRI is investigating the potential for secondary effects due to the presence of toxins, hypoxia (low dissolved oxygen), and/or anoxia (no dissolved oxygen). We are examining data from our ongoing monitoring program of the existing red tide. FWC divers were transported offshore August 6, 7, and 8 by volunteer dive and fishing charter businesses (Narcosis, Reef Tours, and Wolfmouth Charters) and by Gulfstream Gas Corporation. Water, sediment, and biological samples were collected for testing and to document the status of both the red tide and resident biota. Additional samples were collected by Tanks-a-Lot. Red tide and bottom sampling protocols will be incorporated into other existing state, federal, and private studies to maximize sampling efforts for offshore locations. Additionally, the NOAA CSCOR Harmful Algal Bloom Event Response Program is providing funding for a 3-day research cruise (August 10, 11, and 12) to map the areal extent of the bloom and any resultant low-oxygen regions and to conduct diving operations. A large-scale assessment of the potential biological and economic impacts of this red tide on the offshore reef communities would require significant additional funding and logistical support.

The following map depicts the geographical extent of the reports, confirmation of bottom mortalities, red tide monitoring transects, and other observations. The map will be updated with new observations and sampling efforts as they become available. Preliminary results provided through the volunteer effort show that water samples from 4, 9.5, and 12 miles offshore, west of Clearwater, had low *Karenia* concentrations in surface samples at 4 miles and medium *Karenia* concentrations at 9.5 and 12 miles. Since no *Karenia* was detected in bottom samples at all three locations, the bottom mortalities could be attributable to secondary effects of red tide (red tide toxins, low dissolved oxygen, or no dissolved oxygen). Sediments are currently being tested for toxins. During anoxic (no dissolved oxygen) conditions, hydrogen sulfide is produced by bacteria, resulting in a rotten egg smell. The hydrogen sulfide would cause silver jewelry/coins to tarnish. On Monday, August 8, FWC divers reported no evidence of bottom mortalities in 77- to 80-foot depths (approximately 19 miles offshore of Clearwater) and observed healthy sponges, octocorals, stony corals, gag groupers, barracuda, and bar jacks. Inshore (50-foot depths and less), however, divers' observations confirmed the mass mortality reports.

Distribution of Reef Mortality Reports and Red Tide Transects

