

AQUANEWS

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Experts Tracking Coral Reef Killers

By JEFF BARNARD (Associated Press Writer)

June 12, 2006 3:18 PM EDT

ASHLAND, Ore. - When death strikes a coral reef, whether from an oil spill off Mexico or sediment unleashed by a dam bursting in Hawaii, marine biologists know what to look for, but not how to document and preserve their findings so they will hold up in court.

Now biologists and criminalists from around the world are joining forces to develop crime-scene investigation techniques that work under water.

The "CSI"-type standards will govern such things as how to take notes under the sea, how to mark off the crime scene, how to photograph it, and how to preserve the "chain of custody" so that defense attorneys cannot argue that evidence was tampered with.

"This is going to be startling," said David Gulko, a coral reef ecologist for the state of Hawaii. "Once we have standards accepted by the resource management community within a region, it will no longer be a lone resource manager going up against the paid expert witness with a long list of credentials."

Coral reefs, some of the most biologically diverse habitats in the world, are suffering from higher ocean temperatures associated with climate change. As much as 40 percent of the coral in waters around the U.S. Virgin Islands died last year.

While no one has figured out what to do about warm water, they can take action against damage from ships spilling oil, running aground or dumping garbage, runoff from farm fields, pollution from factories and cities, sediment deposits from onshore development, and poachers using cyanide and chlorine to flush out fish.

Gulko and his team will present their

recommendations at an international symposium in October in Mexico and offer a five-day training session afterward for marine biologists from around the world. Gulko has been put in charge of the project by the International Coral Reef Initiative, which is dedicated to protecting reefs. Ken Goddard, director of the U.S. Fish and Wildlife Service Forensics Laboratory here and a former homicide cop, is supplying the criminal investigation expertise. He had to take a crash course in scuba diving.

"The coral reef is the body," Goddard said. "Except I can't take it in for an autopsy." The team has devised a number of investigative techniques to help preserve evidence. Instead of crime scene tape, they use buoys to mark the perimeter, and numbered buoys to mark pieces of evidence, such as paint scraped off a ship's hull, or burn marks left on shellfish from a poacher using bleach to drive fish out of rock crevices.

Speed is of the essence in gathering evidence. Not only are investigators limited by the air in their tanks, but currents constantly change the scene, and fish swim in and out, sometimes eating the evidence, Goddard said.

To speed up the initial video survey of the reef, Gulko worked with Dive Xtras in Shoreline, Wash., which makes a dive scooter that appeared in "Mission: Impossible III."

At Gulko's request, they put a video camera and two laser beams in the nose of a standard scooter, said co-owner Andrew Georgitsis. Two spots from the lasers show up the same distance apart in every scene, providing scale. A global-positioning

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Experts Tracking Coral Reef Killers

(continued from page 1)

satellite unit will imprint latitude and longitude for location reference.

As for taking notes under water, investigators will write with Hello Kitty pencils - a child's pencil from Japan with quick-change tips that don't need to be sharpened - on a rough-surfaced plastic slate, then photograph the notes before erasing them. Though there have been problems with some investigations because of a lack of experience, biologists have not been totally helpless. A developer in Hawaii recently agreed to pay a \$200,000 fine for erosion that deposited silt on a coral reef, Gulko said.

Standardized investigative techniques could have a real effect on coral reefs, Stanford University marine ecologist Steve Palumbi said.

"It makes a huge difference in the willingness of people to actually enforce marine regulation," he said. "It also makes a difference in people being willing to actually follow the rules."

Goddard said the popularity of the TV show "CSI" has made it easier to enlist the cooperation of people in other countries in developing crime scene standards.

"Everyone knows `CSI,'" he said. "We just mention that term and everyone smiles and nods and says, `We understand.'"

On the Net:

U.S. Fish and Wildlife Service Forensics Laboratory: <http://www.lab.fws.gov>

International Coral Reef Initiative: <http://www.icriforum.org>

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Members of the Rockland Aquanauts Organization Inc.

We need articles for our newsletter! Any help is appreciated.
Contact our webmaster webmaster@rocklandaquanauts.org

Rockland Aquanauts Organization Inc.

Mission Statement:

To provide, promote, and advance environmental protection, care, and voluntary clean-up of waterways by any and all lawful means; to promote the importance and care in every manner possible by environmental awareness and otherwise; to purchase, print, publish, and circulate literature to promote the importance and care of the waterways and the work of the Corporation. To perform all acts the Corporation may deem appropriate or advisable in such operation; to establish, provide, and voluntary clean-up waterways, to encourage, support and subsidize the cleaning and protection from pollution.

New lab to help scientists map sources of polluted storm water

BY KIRK MOORE, TOMS RIVER BUREAU

<http://www.app.com/apps/pbcs.dll/article?AID=/20060523/NEWS01/605230356/1004>

GALLOWAY — To a team of investigators working at the end of an old country lane here, the bacteria and viruses floating in their water samples can now be as incriminating as a bad check or a bullet case at a crime scene.

For the first time, scientists with the state Department of Environmental Protection say they can test water from oceans, bays and rivers and know right away when pollution is coming from a leaky sewer pipe or other human source — the most critical information for assessing public health risk from swimming or eating shellfish.

"Before, the bacteria levels would throw a red flag up," explained environmental specialist Bruce Hovendon, as he stood outside the "clean room" where he analyzes viruses. "But no one would know if it was human or animal."

New advanced microbiology laboratory will help scientists watch for leaks from the Shore's regional sewer systems, and advance their next frontier — mapping sources of polluted storm water that pose the biggest threat to coastal waters.

"We've gone about as far as we can with controlling wastewater pollution. This new lab is really going to help us tackle the next problem, which is nonpoint source pollution," said Robert Connell, chief of the DEP's Bureau of Marine Water Monitoring.

One project is the upper Navesink River in Monmouth County, where the bureau is tracking down pollution that has forced the closure of some shellfish areas, said Eric Feerst, the bureau's section chief.

"Every estuary is unique," said Feerst, who explained how the team started by looking at digital landscape maps. "On the upper Navesink, around the Swimming River reservoir, at one time it had a lot of horse farms. But now that's diminished, and it's mostly residential."

That shift away from agriculture changed the pollution profile too, Feerst said. Investigators are now seeing pollution from suburban development, and probably some leaking sewer pipes west of the Route 35 bridge at Red Bank, he said.

The water bureau's forensic work already is helping to clean up Barnegat Bay on the west side of Seaside Heights and Ortley Beach. Tests helped state and local officials trace periodic bouts of pollution to two stormwater pipes; work is ongoing to find and disconnect improper sanitary sewer tie-ins to the pipes, according to the DEP.

All warm-blooded animals and humans carry coliform bacteria in their digestive tracts, so the bacteria has long been a broad indicator for pollution. One trick for determining the exact source is the Multiple Antibiotic Resistance test, checking bacteria for resistance to antibiotics, Hovendon said.

"If I see a high resistance and I find it's a human antibiotic, I can assume it's a human source," Hovendon said. In contrast, coliform from animals — say, the Shore's ubiquitous Canada geese — will show low antibiotic resistance, he said.

"It's like a fingerprint," Hovendon said. Likewise, viruses are key indicators revealed during a molecular biology process called polymerase chain reaction, performed in the clean room to avoid contamination of the viral DNA sequences.

Along with biological and chemical testing, the bureau is getting into remote sensing, using buoys, aircraft and even robotic submarines to monitor the bays and ocean. Rutgers University is loaning the DEP use of its Slocum electric gliders, long-ranging submersible probes that transmit data by satellite link, according to Scott Glenn, an oceanography professor with the university's Institute of Marine and Coastal Science.

For the DEP's purposes, undersea gliders will carry a sensor to measure dissolved oxygen in ocean water — a critical indicator that can warn of algae blooms that can cause fish kills.

"A glider can cover the whole coast south to Cape May in about five days," said Robert Schuster, a senior environmental specialist with the water bureau.

Over Barnegat Bay, bureau workers team with the state Forest Fire Service air wing based at Coyle Field in Burlington County. They're flying missions in a single engine Cessna carrying a hyperspectral sensor to measure levels of chlorophyll in the bay waters, a measure of algae activity that can be fed by nutrient pollution.

The new lab cost \$191,000, including equipment, and can handle all the state's water testing needs, said Leslie McGeorge, the DEP's administrator for water monitoring and standards.

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<http://www.app.com/apps/pbcs.dll/article?AID=/20060523/NEWS01/605230356/1004>

Dolphins, Like Humans, Recognize Names

From www.enn.com

May 09, 2006 — By Deborah Zabarenko, Reuters

WASHINGTON — Bottlenose dolphins can call each other by name when they whistle, making them the only animals besides humans known to recognize such identity information, scientists reported Monday.

Scientists have long known that dolphins' whistling calls include repeated information thought to be their names, but a new study indicates dolphins recognize these names even when voice cues are removed from the sound.

For example, a dolphin might be expected to recognize its name if called by its mother, but the new study found most dolphins recognized names -- their signature whistles -- even when emitted without inflection or other vocal cues.

More than that, two dolphins may refer to a third by the third animal's name, said Laela Sayigh, one of three authors of a paper published in the Proceedings of the National Academy of Sciences.

"They are known to produce these individually distinctive signature whistles, like names," Sayigh said in a telephone interview. She said the researchers wanted to know what information in the whistles helped dolphins identify each other's names.

The scientists already knew that dolphins responded to whistles, but wondered if something in the actual voice of the whistling dolphin was making the identity clear, or if the name itself was enough for recognition.

To find out, they studied bottlenose dolphins in Sarasota Bay, Florida. Instead of playing recordings of actual dolphins making signature whistles, the researchers synthesized signature whistles with the caller's voice features removed and played them to dolphins through an underwater speaker.

In nine out of 14 cases, the dolphin would turn more often toward the speaker if it heard a whistle that sounded like a close relative's.

"It's a very interesting finding that encourages further research, because they are using whistles as referential signals -- that's what words are," said Sayigh, of the University of North Carolina Wilmington. "Dolphins appear to be using these arbitrary signals to identify another dolphin."

She stopped short of saying dolphins might have a human-like language.

"I tend to shy away from using the word 'language' myself, because it's such a loaded term," Sayigh said. "I still really feel strongly that there is no evidence for something like our language. (Dolphins) have got the cognitive skills at least to have referential signals."

Source: Reuters

US researchers find 18th-century British warships

By Richard C. Lewis *Tue May 16, 7:48 PM ET*

Four ships from a British fleet used during the U.S. Revolutionary War have been found off Rhode Island, and one may be the vessel 18th century explorer Captain James Cook sailed on his epic voyage to Australia, archaeologists said on Tuesday.

Researchers with the Rhode Island Marine Archaeology Project said they believe the four ships, and two others previously discovered, are part of a 13-vessel transport fleet intentionally sunk by the British in Newport Harbor in 1778 to keep French ships from landing to aid the Americans' drive for independence.

Using historical materials and sonar, the archaeologists discovered the ships in Narragansett Bay, within a mile (km) of Newport, Rhode Island's shoreline.

Divers found ballast piles about 30 feet underwater, with the ship's keel and other parts embedded in the sea floor. They also found at least one cannon, an anchor with a 16-foot (4.9-meter) shank and a cream-colored fragment of an 18th-century British ceramic teapot.

According to the team of archaeologists, one of the 13 ships in the sunken British fleet was the "Lord Sandwich," which records show was once the Endeavour, the vessel Cook used to sail the Pacific Ocean, map New Zealand and survey the eastern coast of Australia in 1768-1771.

Cook, acknowledged by historians as one of the greatest navigators of all time, is credited with surveying Australia's east coast on the Endeavour expedition.

'47 PERCENT CHANCE'

Archaeologists said it was unclear which ship could be the Endeavour. Seven of the ships in the British fleet have not been found. But they said the latest find raises the chances that one of the discovered ships is the Endeavour.

"There is a 47 percent chance that we have our hands on the Endeavour," said D.K. Abbass, executive director of the Rhode Island Marine Archaeology Project, a nonprofit organization devoted to studying the state's maritime history.

She added it was unlikely anything on the ships would provide a direct link to Cook.

"Quite frankly, we could be working on her right now and never be able to prove it," Abbass said.

It may take years to fully investigate the shipwrecks found so far, Abbass said.

Historically, the finding is significant because it helps tell the story of the siege of Newport, marking France's first attempt to aid the American insurrection against the British.

Though the effort failed, leaders from each side, George Washington representing the Americans and Comte de Rochambeau for America's French allies, met in Newport two years later, to formalize their cooperation for subsequent battles.

The French ultimately helped the Americans entrap British forces on a peninsula at Yorktown, Virginia.

"So, what you have here is the British are geared up for the colonial rebellion and now they're looking at an international conflict," said Rod Mather, a British citizen and associate professor of maritime history and underwater archaeology at the University of Rhode Island.

The shipwrecks are Rhode Island property, Abbass said. There are no plans to raise them. Officials estimate more than two dozen ships from the Revolutionary War period lie beneath Rhode Island's waters. They include British Royal Navy frigates, vessels from the Continental Navy and a French ship.

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Proposed Dive schedule
For
Hessian Lake, Lake Sebago, Lake Welch

Hessian Lake

Saturday June 3rd 2006 at 9:00 AM
Sunday July 9th 2006 at 9:00 AM
Saturday August 5th 2006 at 9:00 AM
Sunday September 10th 2006 at 9:00 AM
Saturday September 30th at 10:00 AM
Sunday October 8th at 10:00 AM
Saturday October 14th at 10:00 AM

Lake Sebago

Saturday June 24th at 9:00 AM
Sunday July 23rd at 9:00 AM
Saturday August 26th at 9:00 AM

Lake Welch

Sunday September 17th at 10:00 AM

Only the Lake Welch dives are still pending approval, all other dives are confirmed



**Rockland Aquanauts
Post Office Box 387
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August 2006

Tracking Coral Reef Killers, Dolphins, New Lab, US researchers find 18th-century British warships

*****Don't forget*****

The Next Dive of Hessian Lake is scheduled for:

Sunday August 5th 9:00 AM