

# Scientists shine light on nitrate levels

## Elkhorn Slough's water examined

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**ELKHORN SLOUGH** — Rain and tides — and the water that washes off roads and fields — all contribute to a constantly changing aquatic environment in Elkhorn Slough.

The composition of the water can shift over short periods of time, such as when the rain sends in a slug of fresh water.

Earlier this month, scientists from

the Monterey Bay Aquarium Research Institute deployed a mooring that houses sensors to measure salinity, oxygen, and nutrients in real time. The mooring is part of a network of sensors placed throughout the slough that will provide a view of the water as it changes over time and distance.

"If you just take a discrete sample once a month, you don't get a sense of the dynamics of the system," said Carlo Sakamoto, a chemical oceanographer at MBARI.

One of the instruments will measure the nutrient nitrate using light. All light can be divided up into different wavelengths, like the rainbow seen when light passes through a prism.

## WHAT'S NEXT

Scientists at MBARI are developing sensors to detect phosphate and ammonium. Another mooring is scheduled to be deployed next spring.

Nitrate absorbs some wavelengths of light.

"The nitrate molecule absorbs light with a unique signature," said Luke Coletti, the engineer who designed the sensor. By measuring the amount of light absorbed across that signature, the sensor can tell how much nitrate is in the water.

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## ELKHORN/ Too much nitrogen can be a problem

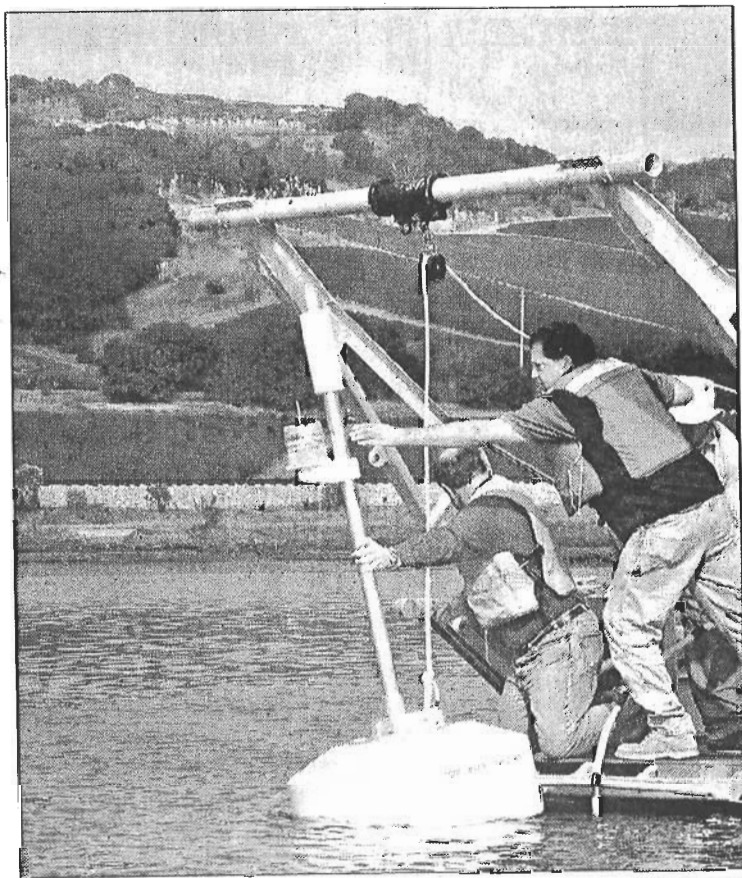
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Too much nitrogen can be a problem. When nitrogen increases, the plants will grow more and die more," said Adina Paytan, a Stanford University oceanographer. "Oxygen is used up, not by the plants, but by the bacteria that degrade the dead plants."

"This is not happening in Elkhorn Slough," Paytan said, "but it has happened in the Mississippi River, which has dead zones where nothing can grow."

MBARI researchers see their network as a model.

"Elkhorn Slough is a tough environment," said oceanographer Joe Needoba. "If the sensor array works here, it will work in other places. This is a good test."



PROVIDED PHOTO

Scientists from the Monterey Bay Aquarium Research Institute set out a buoy to sample the waters of Elkhorn Slough.

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