



USC Scientists Join Forces With Redondo Beach to Shed Light on Toxic Algae Blooms

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By James Longton

Following two years of intensive bouts of red tide in King Harbor, scientists and city officials are hoping to determine its cause.

REDONDO BEACH - The Biological Science Department at the University of Southern California (USC) has created an innovative new relationship with the city of Redondo Beach and the city's Water Quality Task Force in hopes of understanding what is happening with the water quality inside King Harbor.

While the occurrence of an annual red tide is a natural, perhaps even essential, part of the Pacific marine habitat, the phenomena has increased over the last several years to an extent that has attracted interest and alarm.

In the summer of 2005, King Harbor saw a toxic bloom so severe that volunteers cleared an estimated 10 tons of fish carcasses from its waters. Last year, the deaths weren't as severe, but the blooms were still much more intense than usual.

"We're trying to figure out what is triggering these harmful algae blooms and why they've been so drastic," said USC Professor Dave Caron.

The current thinking is that the problem experienced inside the harbor is a consequence of low oxygen concentration resulting from the excessive toxic bloom, which then leads to excessive fish kills. But where the problem is originating is a more important issue to some.

"I'm not convinced that King Harbor is any sort of a 'problem spot,'" Caron said. "It may be that material is building up offshore and moving into the harbor. It's an enclosed, not terribly well-flushed area, and once the material is built up in the corners of the marina, the biomass itself may cause an issue with the oxygen levels."

Caron and his team of leading researchers placed sensor buoys in the waters of three marinas in King Harbor, and one off the foot of the Harbor Patrol Pier. The sensors are part of a "red tide monitoring study" designed to track the levels of dissolved oxygen, temperature and the changes in algae in the marine waters. If the problem is an oxygen-related issue, the sensors should indicate it and help to determine the algae's origin. If this is the case, a complex and expensive aeration system could be used to counteract the harmful effects.

In some situations, blooms that originate inside the harbor can excrete toxins in addition to absorbing oxygen, which would require a completely different solution. Just last summer, Southern California saw an outbreak of domoic acid resulting from unusually extreme toxic algae blooms. The dangerous acid, noted for causing dementia in marine life, poisoned several pelicans along the coast.

"While it is a related problem, we have monitored the waters in King Harbor for almost a year now, and haven't seen signs of domoic acid come up in abundance," Caron said. "So far, it appears that this is a coastal issue."



Cause and Effect - Scientists and officials from Redondo Beach are studying what causes red tide in an effort to improve water quality in King Harbor. The last two years have seen particularly extensive algae blooms, leading to massive fish kills, in the harbor.

Photo by: James Longton photo

The city of Redondo Beach and the harbor patrol have been eager to assist the scientists in their efforts. The research is being funded by the National Science Foundation, which supported research at the University of California, Los Angeles (UCLA) to develop the sensor relays being used in the project.

Caron and his team from USC will return throughout the year to take and compare water samples. They are presently establishing baseline samples while the water is cold and not conducive to algae blooms, in preparation for comparison during the warm summer months.

"We are trying to identify what the problem is exactly, and ultimately help the city to make decisions on how deal with it," he said.

James Longton