



# NOAA

NATIONAL OCEANIC AND  
ATMOSPHERIC ADMINISTRATION  
UNITED STATES DEPARTMENT OF COMMERCE



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## **Scientists Discover 'Hot Spot' for Toxic Harmful Algal Blooms Off Washington Coast**

A new study funded by NOAA and the National Science Foundation reveals that a part of the Strait of Juan de Fuca, which separates Washington state from Canada's British Columbia, is a potential "hot spot" for toxic harmful algal blooms affecting the Washington and British Columbia coasts. Understanding where and how these blooms originate and move is critical for accurate forecasts that could provide early warning to protect human and ecosystem health, according to NOAA scientists.

Scientists concluded that under certain conditions, toxic algal cells from this offshore "initiation site" break off and are transported to nearshore areas, where they can trigger blooms that can ultimately force the closure of Washington state shellfish beds on beaches.

The collaborative study, conducted by a team of scientists and students from NOAA's Fisheries Service, San Francisco State University and the universities of Washington, Maine and Western Ontario, is part of the Ecology and Oceanography of Harmful Algal Blooms Pacific Northwest program.

"Understanding how and where harmful algal blooms originate will help provide early warnings to protect human health and reduce the impact of biotoxins on Washington's coastal shellfisheries," said Vera Trainer, Ph.D., lead author of the study and program manager at the NOAA Fisheries' Northwest Fisheries Science Center in Seattle.

Over the course of the five-year study, scientists noted the Juan de Fuca eddy, a circular water mass rotating approximately 30 miles off the northern coast of Washington at the mouth of the Juan de Fuca Strait, frequently contained significant populations of the microscopic alga, *Pseudo-nitzschia*. Scientists and their students undertook thousands of measurements at sea and conducted experiments onboard research vessels and in their laboratories to better understand the factors that initiate and sustain the growth of this toxic alga and determine why it produces a deadly biotoxin.

This naturally-produced biotoxin, domoic acid, can accumulate in shellfish, crabs and some fish. By attacking the nervous system it can cause adverse health effects or even death in birds, marine mammals and humans who consume affected marine species. Fishing communities can suffer severe economic losses due to closures of recreational, subsistence and commercial harvesting and lost tourism.

The study, titled "Variability of *Pseudo-nitzschia* and domoic acid in the Juan de Fuca eddy region and its adjacent shelves," was published this month in *Limnology and Oceanography* and authored by Vera Trainer (NOAA Fisheries); Barbara Hickey and Evelyn Lessard (University of Washington); William Cochlan (San Francisco State University); Charles Trick (The University of Western Ontario); Mark Wells (University of Maine); and Amoreena MacFadyen and Stephanie Moore (University of Washington).

Copies of the paper can be found at [http://aslo.org/lo/toc/vol\\_54/issue\\_1/](http://aslo.org/lo/toc/vol_54/issue_1/)

Through its ECOHAB program, NOAA conducts and supports state-of-the-art research on harmful algal blooms around the coastal U.S. to protect communities and resources. An interagency program, which includes the Environmental Protection Agency, National Science Foundation, National Aeronautics and Space Administration, and the Office of Naval Research, ECOHAB is managed by NOAA's National Ocean Service, National Centers for Coastal Ocean Science, Center for Sponsored Coastal Ocean Research.

NOAA understands and predicts changes in the Earth's environment, from the depths of the ocean to the surface of the sun, and conserves and manages our coastal and marine resources. <http://www.noaa.gov>

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On the Web:

NOAA's Center for Sponsored Coastal Ocean Research HAB Program:

<http://www.cop.noaa.gov/stressors/extremeevents/hab/welcome.html>

ECOHAB Pacific Northwest: <http://www.ecohabpnw.org>

Northwest Fisheries Science Center: <http://www.nwfsc.noaa.gov>