Written Statement of
Dan L. Ayres
Fish and Wildlife Biologist
Coastal Shellfish Lead
Washington State Department of Fish and Wildlife
before the
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I am pleased to submit this prepared testimony to members of the Subcommittee on Energy and Environment of the United States House of Representatives.

As a Washington State coastal shellfishery manager, I represent the many state and tribal fishery managers, aquaculture industry members, and human health experts, who like me, work hard to manage important sustainable shellfish resources, allowing for the maximum socio-economic value these resources can provide to the small communities along the Washington Coast. We each have responsibility in our respective areas – to manage the harvest of the bountiful natural resources we've been blessed with in the Pacific Northwest.

Each of us can tell you the story of how important these resources – and the ability to harvest them – are to the citizens of our state and tribal communities.

The West Coast aquaculture industry, which produces a large portion of the nation's oysters, mussels and hardshell clams, is valued at more than $110 million annually.[1]

In an average year, landings in the West Coast Dungeness crab fishery[2] have a value – just to the fishermen – of between $25 to $45 million, making this fishery a very important coastal economic driver for the hundreds of licensed fishers (both state and tribal) and many more people involved in shore-side processing operations.

And the fishery that I know so well, Washington State's recreational razor clam fishery[3] is a very popular activity that draws very large numbers of participants from great distances to the small communities along the Washington coast during the October to May season when few visitors would otherwise be present. The most recent 2008-09 season recorded just under 250,000 digger trips and generated an estimated $12.5 million to the many small tourist-related coastal businesses.

Razor clams also provide an important source of sustenance and much-needed income to members of the Quinault Indian Nation[4] who have a very long history of depending on safe sources of shellfish.

However, all of us find our job is made much more difficult by the ever present threat of harmful algal species that are naturally occurring in the waters of the Washington coast and the threat they pose to human health.

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[1] http://www.pcsga.org/pub/farming/farm_benefits.shtm

[2] http://wdfw.wa.gov/fish/shelfish/crabreg/comcrab/coast/index.htm
http://www.oregondungeness.org/general-info/ODCC_the_fishery.htm
http://www.dfg.ca.gov/marine/dungeness.asp

[3] Washington State has actively managed razor clam populations along 58 miles of its Pacific Ocean coastline for more than 70 years. http: http://wdfw.wa.gov/fish/shelfish/razorclm/razorclm.htm

[4] http://209.206.175.157/index1.htm

When the growth of these species takes off - or bloom - and produce dangerous toxins[5], then the fisheries we manage are disrupted and the activities and income of those who depend on them are greatly impacted.

For example, the Washington and Oregon razor clam fisheries have seen numerous closures – often erasing an entire season for state and tribal recreational and commercial fishers and creating a big economic loss for the tourist communities who depend on these visitors.

In Puget Sound, not a year goes by when some areas are closed and the harvest and shipment of shellfish is banned because of harmful algae. Some of these closures can last for many months – perhaps affecting a shellfish grower's entire annual income.

This last winter, the NOAA Center for Sponsored Coastal Ocean Research hosted the first-ever West Coast HAB (Harmful Algal Bloom) Summit[6]. This three day workshop, in Portland, Oregon, brought together a large group of West Coast scientists, state and tribal fisheries managers, human health experts and aquaculture industry members to

[5] Eating of fish and shellfish containing domoic acid causes the human illness known as amnesic shellfish poisoning (ASP). Symptoms include vomiting, nausea, diarrhea and abdominal cramps within 24 hours of ingestion. In more severe cases, neurological symptoms develop within 48 hours and include headache, dizziness, confusion, disorientation, loss of short-term memory, motor weakness, seizures, profuse respiratory secretions, cardiac arrhythmia, coma. People poisoned with very high doses of the toxin can die. There is no antidote for domoic acid. Research has shown that razor clams accumulate domoic acid in edible tissue (foot, siphon and mantle) and are slow to depurate (purify) the toxin.
Eating of fish and shellfish containing saxitoxin causes human illness known a paralytic shellfish poisoning (PSP). Symptoms include tingling of the lips followed by paralyzing of the diaphragm and possible death.

[6] http://www.cop.noaa.gov/stressors/extremeevents/hab/current/HAB_Summit09/west_coast_summit.html

design a West Coast Regional HAB Monitoring, Alert and Response Network as well as a West Coast Regional HAB Forecasting Network. In addition, workshop participants also focused on beginning the process of developing a West Coast HAB Research and Action Plan.

The concept of joining regional expert scientists and managers to address regional HAB problems has proven to be very valuable. The solutions to these problems can best be found within each region – with the help, support and guidance of federal agencies. We applaud NOAA's efforts, along with representatives of the West Coast Governor's Agreement on Ocean Health to organize and execute the West Coast HAB Summit.

Much work remains on these important regional plans and NOAA remains the collaborative yet driving force that will ensure these plans reach their goals of completion and implementation.

Direction to federal agencies to continue to organize and fund regional workshops that result in regional HAB research action plans around the nation should be an integral part of future legislation.

I was honored to be invited in 2007 to participate in a NOAA-sponsored workshop that brought together a group of HAB researchers and coastal managers from around the nation to provide input into the National Scientific Research, Development, Demonstration, and Technology Transfer Plan on Reducing Impacts from Harmful Algal

Blooms,[7] (RDDTT Plan). The major result of this plan was the call for three new federal programs. First, a program that focuses on development, demonstration, and technology transfer of methods for prevention, control, and mitigation of HABs; also, a comprehensive national HAB Event Response program: and finally, a Core Infrastructure program.

While we see all three new programs as important to move the nation ahead in addressing HAB-related issues, as a state fishery manager I worked hard on the HAB Event Response Program. Today we want to strongly encourage you to consider this as a potential new program the federal agencies are directed to implement. Such a program will improve access to existing resources for response through better information sharing, communication, and coordination and provide essential new resources. Our proposal lays out a regionally based, federal HAB Event Response Program linked to a network of Regional HAB Coordinators.

However, it is true that improving our national response to regional HAB events is only half of the battle. We would like today to also encourage you to include in any future HAB legislation support for continued research into ways to mitigate for and someday actually prevent HAB events.

The other two programs proposed in the RDDTT Plan will certainly move the nation in that direction. The Prevention, Control and Mitigation Program will focus on moving promising technologies and strategies that arise through basic research programs from

[7] www.whoi.edu/fileserver.do?id=43464&pt=10&p=19132

development to demonstration to technology transfer for field application by managers or other end-users. The Core Infrastructure Program will increase availability of adequate analytical facilities, reference and research materials, technical training, and access to data; improve integration of HAB activities with existing monitoring and emerging observational programs; and enhance communication and regional and national coordination.

We are concerned that two key existing HAB programs administered by NOAA are not called out specifically in the Committee's draft legislation for the reauthorization of the Harmful Algal Blooms and Hypoxia Research and Control Act. On the Washington Coast we now are enjoying the results from the work of two important projects that were funded through these programs, the Monitoring and Event Response for Harmful Algal Bloom (MERHAB) program and Ecology and Oceanography of Harmful Algal Blooms (ECOHAB) program.

MERHAB provided 5 years of funding that allowed Seattle-based NOAA HAB researchers, University of Washington oceanographers and algae experts, state and tribal fishery managers and human health experts to form a successful partnership we call the Olympic Region Harmful Algal Bloom project. MERHAB funding allowed us to ramp up our ability to monitor for harmful algal species in our marine waters – providing much needed advance notice of potential HAB events. This endeavor started with MERHAB funds in 2000 and transitioned to state dollars (generated by a surcharge on shellfish licenses) in 2005. In addition, on-going MERHAB funded programs in our region

continue to add to our ability to monitor for and respond to potential HAB events. In just the last few days, data collected by the Oregon's MOCHA (Monitoring Oregon Coastal HABs)[8] project – funded by MERHAB – alerted our staff to watch closely for increases in the harmful algae species that could produce PSP (paralytic shellfish poison) in shellfish.

ECOHAB funding of an ambitious 5-year project, ECOHAB-PNW,[9] has provided us with valuable understanding of how HAB events initiate in Washington's northern off-shore marine waters and how and why they then move to our near-shore waters, potentially affecting Washington's coastal shellfish resources. ECOHAB is also funding a new project (PNW-TOX) that will allow University scientists in both Washington and Oregon to look specifically at HAB events that initiate in Oregon's off-shore waters and then move to both Oregon and southern Washington's near-shore waters affecting shellfish resources on the coasts of both states.

Programs such as MERHAB and ECOHAB are vitally needed by Washington state and the other states of our region.

As you continue to work on the draft of the reauthorization of the Harmful Algal Blooms and Hypoxia Research and Control Act we urge you to specifically direct NOAA to continue the very valuable MERHAB, ECOHAB and the newly started PCM HAB programs.

[8] http://bioloc.oce.orst.edu/strutton/hab_intro.html
[9] http://www.ecohabpnw.org/

In the end, the ability to reliably predict the onset of these harmful algal blooms – both when and where they can be expected – to better respond on a region-wide basis and to share expertise, and to find new innovative ways to mitigate and even prevent these dangerous blooms will be a huge step forward in allowing us to better accomplish our mission – to provide our citizens safe access to some of the best seafood found anywhere in the world.

Dan Ayres is a Fish and Wildlife Biologist who leads the Washington Department of Fish and Wildlife's coastal shellfish unit based in Montesano and Willapa Bay. He manages Washington's very popular razor clam fishery and oversees the unit's work managing the coastal Dungeness crab, pink shrimp and spot prawn fisheries, the Willapa Bay oyster reserves and research projects in Willapa Bay.

He has also worked closely with other state and federal agencies on harmful algal bloom issues since the marine toxin domoic acid was first found along the Washington Coast in 1991. Dan is currently serving his second term on the National Harmful Algal Bloom Committee. He has represented WDFW in testimony on this topic at both the state and federal level. He has collaborated on several national HAB plans including; *Harmful Algal Research and Response: A National Environmental Science Strategy (2005); Harmful Algal Research and Response: a Human Dimensions Strategy (2006)*; *Harmful Algal Bloom Research and Development, Demonstration and Technology Transfer – National Workshop Report (2008).* He also worked to organize the recently held *West Coast HAB Summit (2009)* and is currently working with the team developing the reports that will be products of the summit.