April 17, 2010

The Honorable Maria Cantwell, Chair
The Honorable Olympia Snowe, Ranking Member
Committee on Commerce, Science, and Transportation
Subcommittee on Oceans, Atmosphere, Fisheries, and Coast Guard
United States Senate
Washington, DC 20510

Dear Madam Chairwoman and Ranking Member Snowe:

As shellfish growers, commercial fishing and seafood industry representatives from all over the United States, we are very concerned about ocean acidification. Together with scientists whose research has been instrumental in bringing to light the urgent threat that ocean acidification poses to fisheries and marine ecosystems, we respectfully request help from policy makers to mitigate the causes and reduce the economic harm resulting from ocean acidification.

It has been proven that ocean acidification results from an excess of CO_2 dissolving into the ocean from the atmosphere. This CO_2 is primarily from the burning of fossil fuels followed by deforestation, cement manufacture, and other human activities.

Acidification from fossil fuel emissions is compounded by the effects of local acidifying factors, such as river runoff containing high loads of nitrogen and carbon, greatly accelerating impacts that scientists predicted from ocean acidification. This confluence of global and local acidification poses grave risk (and in some cases outright harm) to the marine food web and commercially important species. Changes exhibited in parts of Alaska, the East Coast and the West Coast raise serious concerns for fisheries in other regions, such as the Gulf of Mexico, where CO_2-driven acidification may compound the already serious impacts attributed to hypoxia.

A few examples:

1. Clams are dissolving before they can grow beyond their larval stage in parts of many East Coast bays, where impacts of river-borne effluents and eutrophication are aggravated by effects of global CO_2 emissions. This dissolution of young clams now represents a leading cause of mortality for these shellfish in many bays (Green et al). Scientists who documented this mortality say that it offers a preview of conditions that are expected to prevail throughout much of the ocean if CO_2 emissions are not sharply reduced.
2. On the West coast, upwelling of acidified water to a degree not anticipated until 2050 was documented in 2007 in a North American Carbon Program (NCAP) West Coast Cruise that surveyed the length of the west coast from Canada to Baja California (Feely et al 2008). Concurrently, natural oyster beds in the Pacific Northwest have experienced a multi-year recruitment failure, producing no commercially significant oyster sets. Acidification poses a severe threat to hatcheries that supply most of the region's $100 million+ oyster industry. Because this corrosive seawater kills oyster larvae, one of the region's largest hatcheries (Whiskey Creek Shellfish Hatchery at Netarts Bay) suffered a 70- 80% decline in oyster larval production in 2007 and 2008.
3. Laboratory studies subjecting sea urchins and other shellfish to CO_2–enriched seawater situations also have demonstrated larval shell deformation, reduced recruitment and settlement (Hofmann et al 2008); the tipping point for purple sea urchins is 540 ppm. In

the 2007 NOAA cruise, Feely et al found surface pCO_2 at about 850 µatm near the shelf break and higher inshore on some transects in northern California. Coincidentally, a 20-year data set of sea urchin larval recruitment in California indicates diminished recruitment in northern California during high upwelling events.

4. Seasonally acute acidification has now been observed in key fishing areas off Alaska, including the Bering Sea and the Gulf of Alaska (Fabry et al 2009), raising concerns for fisheries in a state that produces more than half the U.S. seafood catch. As in severely acidified waters along the West Coast and East Coast, these corrosive conditions are linked to compounding local acidifying influences from upwelling and river borne effluents. Scientists note that rising CO_2 emissions can be expected to make these corrosive conditions more persistent and widespread in the future.

Globally, ocean acidification has been identified as a serious threat to marine life and fisheries, and scientists have issued a series of unusually clear and urgent warnings about this problem. In the Monaco Declaration (2008), 155 scientists from around the world wrote: “Ocean acidification is accelerating and severe damages are imminent.” Representatives from more than 70 national academies of science (including the United States, China, India, the U.K., Germany, France, and many others) signed a joint statement that read in part: “Marine food supplies are likely to be reduced with significant implications for food production and security in regions dependent on fish protein, and human health and wellbeing” (Inter-Academy Panel 2009).

While some organisms are likely to be more adaptive than others in a high-CO_2 ocean, seafood producers and consumers cannot afford to “whistle in the dark” about these changes. The U.S. seafood industry generates approximately $70 billion annually, fueling jobs and businesses that sustain many thousands of families along the Gulf, Atlantic, the Pacific and Alaskan coasts. Even for fisheries where no direct harm from acidification has yet been documented, the disturbing signs of trouble on the “front lines” reveal a compelling case to prevent the impacts from spreading and growing more severe.

POLICY RESPONSES

If seafood production is to be sustained and the oceans protected for future generations, federal political action is required now:

• **Adequate funding is urgently needed** to develop monitoring and research systems to track biological and ocean-chemistry changes in key areas, including estuaries. By utilizing and building on currently available studies we can create baseline data. From this we will have an accurate characterization of current water conditions thus enabling us to recognize “early warning” signs that may appear in the future. Data, current and future, should be coordinated with existing monitoring effort, such as NOAA’s Integrated Ocean Observing System [IOOS] and the regional partners. Only by knowing what’s coming at us can we hope to protect the resources that provide our food and livelihood.

• **Develop shellfish hatchery techniques and other methods of protecting important finfish and shellfish resources** from acute impacts of acidification. Small-scale experiments have shown that shellfish hatcheries, for example, can dodge some harm by halting production during periods when corrosive water is present and by maximizing production during “good water” periods. Within shellfish hatchery systems, certain water treatments show promise to reduce mortality of larval oysters. Brood stock programs have identified strains of shellfish that appear better able to survive in acidified seawater. Research and development is also needed

to create methods of protecting other fish stocks during vulnerable early life stages. If hatchery techniques can shelter juvenile animals (including finfish if in a hatchery situation) when they are most vulnerable, it may be possible to sustain seafood production while solutions to the global carbon problem are developed.

• **Finance energy efficiency and other measures where needed to reduce carbon emissions within the seafood industry, and encourage private investment that improves carbon efficiency in the sector.** The seafood industry is a small source of carbon emissions, but seafood enterprises recognize the need do their part. Many of the necessary investments to curtail emissions will be initially costly but ultimately cost-effective. For example, to repower with more efficient engines and equipment, or to switch to lower-carbon fuels will require capital that vessel operators, producers, and seafood vendors may not be able to obtain on their own. Programs will need to be in place to encourage these upgrades. The seafood industry also should be encouraged to consider and permitted to improve its carbon and energy efficiency through reforms in fishery management. For example, in many cases rebuilding fish stocks can result in more energy-efficient harvesting. In some cases significant emissions reductions may be obtained by enabling vessel replacement, fleet renewal, downsizing overbuilt fleets, or implementing other management reforms. These changes are not "a one size fits all solution" and can have complex socio-economic effects. Not all communities and segments of the industry will choose them nor should the changes be implemented without regional industry involvement.

Critically important, the United States must lead in the search for global solutions, including:

• **Research in and support of alternative energy initiatives**

• **Cut emissions of carbon dioxide** in order to minimize future harm to fishery resources from ocean acidification. Research on "tipping points" for marine ecosystems and organisms shows that preventing irreversible harm will require limiting maximum atmospheric concentration of CO_2 at no higher than 450 ppm, and then reducing this concentration significantly in the decades ahead. This will require bold steps to place the United States in a position to lead (not lag) in solving this problem globally. To protect fishery resources, as well as future life on this planet, it will be necessary to:

1) cap emissions throughout the U.S. economy,
2) improve energy efficiency,
3) enhance low-carbon energy sources, and
4) negotiate a commensurate international agreement to control emissions throughout the global economy.

In closing, the undersigned shellfish growers and commercial fishing representatives and scientists respectfully request your help to address the urgent threat of ocean acidification.

Sincerely,

(Names are for identification only, do not represent or imply official endorsement from our employers.)

Dale Kelley
Executive Director
Alaska Trollers Association
Juneau, AK

Dorothy Childers
Program Director
Alaska Marine Conservation Council
Anchorage, AK

Dale Beasley
President
Columbia River Crab Fisherman's Association
Ilwaco, WA

Diane Pleschner-Steele
Executive Director
California Wetfish Producers Association
Buellton, CA

Linda Behnken
Executive Director
Alaska Longline Fishermen's Association
Sitka, AK

Bob Rheault
Executive Director
East Coast Shellfish Growers Association
Toms River, NJ

Douglas Dobyns
Environmental Planner
Douglas Indian Association
Juneau, AK

Sara Randall
Juneau
Commercial Fishermen of America
San Francisco, CA

TJ Tate
Executive Director
Gulf of Mexico Reef Fish Shareholders' Alliance
Galveston, TX

David Krebs
President
Gulf of Mexico Reef Fish Shareholders' Alliance
Destin, FL

Larry Simns
President
Maryland Watermen's Association
Rock Hall, MD

David Bitts
President
PCFFA
Eureka, CA

Alena Pribyl
Fisheries biologist
National Research Council post-doctoral fellow (NOAA)
La Jolla,, CA

Nick Jambor
Shellfish Grower
Ekone Oyster Co
South Bend, WA

Robin Downey
Shellfish Grower
Discovery Bay Shellfish Company
Port Townsend, WA

Shelly Pollock
Organizer
Grass Roots Garbage Gang
Ocean Park, WA

Aaron Longton
Commercial Fisherman
F/V Goldeneye
Port Orford, OR

Greg H. Friedrichs
Commercial Fisherman
F/V Cape Cleare
Port Townsend, WA

Richard Oltman
Commercial Fisherman
F/V Cape Cleare
Port Townsend, WA

Sara Gharbi-Reinking
Commercial Fisherman
F/V Charity
Seattle, WA

Martin Gowdy
Commercial Fisherman
F/V Charity
Seattle, WA

Alicia Billings
Scientific Consultant
Lotus Web Design and Consulting
Port Orford, OR

Anne Murphy
Executive Director
Port Townsend Marine Science Center
Port Townsend, WA

Stephen Schroeter
Research Ecologist
University of California Santa Barbara,
Marine Science Institute
Santa Barbara, CA

Bruce Steele
Commercial Sea Urchin Diver
F/V Halcyon
Buellton, CA

Bill Forslund
Advertising Manager
Fishermen's News
Seattle, WA

Art Bloom
Commercial Fisherman
F/V Cape Clear
Juneau, AK

Peter M. Birk
Executive Chef
Ray's Boathouse, Cafe and Catering
Seattle, WA

Peter Thompson
Owner/operator
F/V Dues Payer 2
Kodiak, AK

Darius Kasprzak
Owner/operator
F/V Malka
Kodiak, AK

Mike Friccero
Commercial Fisherman
F/V Miss Gina
Kodiak, AK

Pete Wedin
Owner
Captain Pete’s Alaskan Experience
Homer, AK

Craig Pendleton
Owner / President
F/V Ocean Spray/PENDLE Inc.
Saco, ME

Johnny Greene
Owner/Operator
Intimidator Charters
Orange Beach, AL

Joel Kawahara
Commercial Fisherman
F/V Karolee
Quillicene, WA

Phyllis Grifman
Associate Director
Sea Grant Program, University of Southern
California
Los Angeles, CA

Terry Sawyer
Shellfish Grower
Hog Island Oyster Co.
Marshall, CA

Carl Safina, PhD
President & Co-founder
Blue Ocean Institute
Cold Spring Harbor, NY

Bruce Wallace
Commercial Fisherman
F/V Odyssey
Juneau, AK

Ian Pitzman
Commercial Fisherman/Owner
Fortune Sea, F/V Kona Kai, F/V Cape Caution
Homer, AK

Margaret Curole
Former Shrimper/Fisheries Activist
Galliano, LA

Mark Green, PhD
Shellfish Grower/Oceanographer
Peaks Island Shellfsih Company/St. Joseph's College of Maine
Peaks Island, ME

Donny Waters
Commercial Fisherman
F/V Hustler
Pensacola, FL

Curt Rice
Commercial Fisherman
F/V Robert Michael
Cumberland, ME

Jeremy Brown
Owner/operator
F/V Barcarole
Bellingham, WA

Alan Parks
Commercial Fisherman
F/V Kelsey
Homer, AK

Amanda J. Grondin
Commercial Fisherman
F/V Cape Cleare
Port Townsend, WA

Dean Blanchard
Shellfish Buyer
Dean Blanchard Seafood, Inc.
Grand Isle, LA

Alan Barton
Shellfish Grower
Bear Creek Shellfish Hatchery
Hubert, NC

Mark Wiegardt
Shellfish Grower
Whiskey Creek Shellfish Hatchery
Netarts, OR

Jeremy Mathis
Chemical Oceanographer
University of Alaska, Fairbanks
Fairbanks, AK

Bill Taylor
President
Taylor Shellfish Company
Shelton, WA

Erling Skaar
Owner
FV North American and Gentech Global LLC
Seattle, WA

Adam James
General Manager
Hama Hama Shellfish Company
Lilliwaup, WA

Geoff Lebon
Commercial Fisherman
F/V Halmia
Seattle, WA

Pete Knutson
Owner
Loki Fish Company
Seattle, WA

Niaz Dorry,
Coordinating Director
North Atlantic Marine Alliance
Gloucester, MA

Boyce Thorne-Miller
Science and Policy Coordinator.
North Atlantic Marine Alliance
Dickerson, MD

Angela Sanfilippo
president
Gloucester Fishermen's Wives Association.
Gloucester, MA

Charlie King
Commercial Fisherman
F/V Mar Del Sud, Ltd.
Kodiak, AK

Steve Wilson
Owner
Arcadia Point Seafood (shellfish company)
Shelton, WA

Lisa Bishop
Little Skookum Shellfish Growers
Shelton, WA

Vicki Wilson
Owner
Arcadia Point Seafood (shellfish company)
Shelton, WA

Ian Jefferds
General Manager
Penn Cove Shellfish, LLC
Coupeville, WA

Kevin Lunny
Drakes Bay Oyster Company
Inverness, CA

James T. Golden
Owner
Golden Marine Consulting
Toledo, OR

Kristin Rasmussen
Executive Director
Pacific Shellfish Institute
Olympia, WA

Brian Sheldon
Owner
Northern Oyster Company
Willapa Bay, WA

Dick Sheldon
Owner
Willapa Bay Resources
Willapa Bay, WA