

**ALASKA STATE LEGISLATURE**  
**HOUSE SPECIAL COMMITTEE ON FISHERIES**

February 23, 2012

5:05 p.m.

**MEMBERS PRESENT**

Representative Steve Thompson, Chair  
Representative Alan Austerman  
Representative Bob Herron  
Representative Lance Pruitt  
Representative Scott Kawasaki  
Representative Bob Miller

**MEMBERS ABSENT**

Representative Craig Johnson, Vice Chair

**COMMITTEE CALENDAR**

HOUSE BILL NO. 100

"An Act prohibiting growing or cultivating genetically modified fish in the state."

- MOVED CSHB 100(FSH) OUT OF COMMITTEE

HOUSE JOINT RESOLUTION NO. 10

Supporting expanded research concerning the detrimental effects of ocean acidification.

- MOVED CSHJR 10(FSH) OUT OF COMMITTEE

**PREVIOUS COMMITTEE ACTION**

BILL: HB 100

SHORT TITLE: BAN CULTIVATION OF GENETICALLY MOD. FISH

SPONSOR(S): REPRESENTATIVE(S) KAWASAKI

01/18/11	(H)	READ THE FIRST TIME - REFERRALS
01/18/11	(H)	FSH, RES
02/23/12	(H)	FSH AT 5:00 PM CAPITOL 120

BILL: HJR 10

SHORT TITLE: OCEAN ACIDIFICATION RESEARCH

SPONSOR(S): REPRESENTATIVE(S) KERTTULA

01/21/11	(H)	READ THE FIRST TIME - REFERRALS
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01/21/11 (H) FSH, RES  
02/23/12 (H) FSH AT 5:00 PM CAPITOL 120

**WITNESS REGISTER**

MINDY O'NEALL, Staff  
Representative Scott Kawasaki  
Alaska State Legislature  
Juneau, Alaska

**POSITION STATEMENT:** Explained HB 100 for the prime sponsor of the bill, Representative Kawasaki.

PAUL SHADURA II, Member  
Kenai Peninsula Fishermen's Association (KPFA)  
Soldotna, Alaska

**POSITION STATEMENT:** Testified in support of HB 100.

GEORGE PIERCE  
Kasilof, Alaska

**POSITION STATEMENT:** Testified in support of HB 100.

HEATH HILYARD  
Executive Director  
Southeast Alaska Guides Organization (SEAGO)  
Sitka, Alaska

**POSITION STATEMENT:** Testified in support of HB 100.

RICHARD YAMADA, Representative  
Alaska Charter Association  
Homer, Alaska

**POSITION STATEMENT:** Testified in support of HB 100.

GERALD McCUNE, Lobbyist  
United Fishermen of Alaska (UFA)  
Cordova, Alaska

**POSITION STATEMENT:** Testified in support of HB 100.

BEN MULLIGAN, Legislative Liaison  
Alaska Department of Fish & Game  
Juneau, Alaska

**POSITION STATEMENT:** Responded to questions during the hearing on HB 100.

REPRESENTATIVE BETH KERTTULA  
Alaska State Legislature  
Juneau, Alaska

**POSITION STATEMENT:** introduced HJR 10, as the prime sponsor of the bill.

MONIKA KUNAT, Intern  
Representative Beth Kerttula  
Alaska State Legislature  
Juneau, Alaska

**POSITION STATEMENT:** presented HJR 10 on behalf of the prime sponsor, Representative Kerttula.

RICHARD A. FEELY, Ph.D., Senior Fellow  
National Oceanic and Atmospheric Administration (NOAA)  
Seattle, Washington

**POSITION STATEMENT:** Testified during the hearing on HJR 10.

DR. JEREMY MATHIS  
University of Alaska Fairbanks (UAF)  
Fairbanks, Alaska

**POSITION STATEMENT:** Testified in support of HJR 10.

RODGER PAINTER, President  
Alaskan Shellfish Growers Association (ASGA)  
Juneau, Alaska

**POSITION STATEMENT:** Testified in support of HJR 10.

GERALD McCUNE, President  
Cordova District Fishermen United (CDFU)  
Cordova, Alaska

**POSITION STATEMENT:** Testified in support of HJR 10.

#### **ACTION NARRATIVE**

[5:05:11 PM](#)

**CHAIR STEVE THOMPSON** called the House Special Committee on Fisheries meeting to order at 5:05 p.m. Representatives Thompson, Kawasaki, Pruitt, Herron, Austerman, and Miller were present at the call to order.

#### **HB 100-BAN CULTIVATION OF GENETICALLY MOD. FISH**

[5:05:43 PM](#)

CHAIR THOMPSON announced that the first order of business would be HOUSE BILL NO. 100, "An Act prohibiting growing or cultivating genetically modified fish in the state."

[5:06:29 PM](#)

REPRESENTATIVE KAWASAKI, as the prime sponsor of the bill, introduced HB 100 and offered some background on the bill. He explained that proposed HB 100 was "an act prohibiting the growth and cultivating of genetically modified or enhanced fish in the State of Alaska." He pointed out that genetically modified fish had become an increasing problem, with the potential for it to be considered as a food. He referred to earlier testimony objecting to the cross of king salmon and ocean pout, as the potential damage was unknown. He explained that the proposed bill would prohibit the growing and cultivating of any genetically modified fish in the State of Alaska, in order to protect the wild stock of salmon and the natural way of life in Alaska. He pointed to the Alaska Seafood Marketing Institute (ASMI) marketing efforts for wild, untainted fish.

[5:08:54 PM](#)

MINDY O'NEALL, Staff, Representative Scott Kawasaki, Alaska State Legislature, explaining the concern for genetically modified fish, presented a video, available on YouTube, titled "Stop Frankenfish."

[5:11:49 PM](#)

MS. O'NEALL said that Alaska had already taken some steps to prevent this practice in the state. She pointed out that modified fish had to label as such in Alaska.

[5:12:30 PM](#)

REPRESENTATIVE HERRON asked about the reproductive capacity of the Frankenfish.

MS. O'NEALL replied that, according to the producers, the modified fish were all female and were 98 percent sterile.

[5:13:21 PM](#)

REPRESENTATIVE HERRON, noting that the proposed bill did not allow growing or cultivating of the modified fish in Alaska, asked if they could be imported.

MS. O'NEALL replied that she did not have any information about that.

[5:14:02 PM](#)

REPRESENTATIVE MILLER questioned whether there were concerns for possession, sales, or sneaking them in.

MS. O'NEALL agreed that these were all potential concerns as the FDA (U.S. Food and Drug Administration) had not yet ruled on genetically modified fish; however, the sale of any of these fish in Alaska required its being labeled.

REPRESENTATIVE MILLER asked for specifics on live fish.

MS. O'NEALL, in response, reported that although farmed fish were released into wild Alaskan streams every year, there was a concern that genetically modified fish could also be introduced into the wild streams.

[5:15:49 PM](#)

CHAIR THOMPSON asked if other countries were raising genetically modified fish.

MS. O'NEALL replied that other countries were even more hesitant and stringent than the U.S. She pointed out that the U.S. was the first country to request regulations for production of genetically modified fish.

[5:16:37 PM](#)

REPRESENTATIVE HERRON asked if the FDA should be studying the use of genetically modified fish as a food additive.

MS. O'NEALL directed attention to a recent article which called for the FDA to change the specification for genetically modified fish, in order to make the evaluation process more public.

[5:17:55 PM](#)

REPRESENTATIVE HERRON clarified that classification as a food additive required closer scrutiny by the FDA.

[5:18:16 PM](#)

REPRESENTATIVE AUSTERMAN, directing attention to page 2, line 3 of proposed HB 100, pointed out that AS 17.20.040 had two

definitions for genetically modified fish. He suggested a need for a clarification of the definition in the proposed bill.

CHAIR THOMPSON opened public testimony.

[5:20:44 PM](#)

PAUL SHADURA II, Member, Kenai Peninsula Fishermen's Association (KPFA), testified that KPFA was in support of proposed HB 100. He declared that it was "extremely important to have the state go on record with their interest in protecting the natural resources to the highest degree." He expressed concern that, as the sterility factor was not 100 percent, there was a threat to native fish species. He offered his belief that genetically modified fish should be classified as an invasive species, and needed to comply with the current regulations. He referenced the escape of farmed fish from British Columbia, and cited concern for the introduction of virus and disease to Alaska's wild salmon stocks.

[5:23:01 PM](#)

GEORGE PIERCE, testifying in support of proposed HB 100, suggested that it be a worldwide bill. He reflected on a documentary that had caused him great concern, citing the possibilities for escape and the resulting diseases in the wild salmon stock. He questioned whether consumption of the sterile, genetically modified fish could induce sterility in the human population. He declared that this was a worldwide issue, and that it was necessary to stop "messin' with our food chain." He expressed his desire for the Board of Fish to also "tune in and listen."

[5:25:11 PM](#)

HEATH HILYARD, Executive Director, Southeast Alaska Guides Organization (SEAGO), testified in support of proposed HB 100 and echoed the same concerns as the previous witnesses. He declared that there was a threat to the wild salmon stock, citing the quality of the wild salmon. He expressed agreement with an amendment to more closely define genetically modified fish, as mentioned earlier by Representative Austerman.

[5:26:58 PM](#)

RICHARD YAMADA, Representative, Alaska Charter Association, testified in support of proposed HB 100 and reported that there

were several entities attempting to get approval for genetically modified fish through the FDA. He declared that a risk assessment had not been performed for genetically modified fish, and that a risk existed for release of these fish into the wild. He described an outbreak of infectious salmon anemia (ISA) that had infected a hatchery. He relayed that a computer generated model had indicated that should 60 infected salmon be released into a wild stock of 60,000 fish, extinction of that species could occur within 40 generations. He opined that 500,000 fish had escaped from salmon farms in the Northwest in the past 10 years. He emphasized that the risk from genetically modified fish far outweighed any benefit to the State of Alaska for food production.

[5:31:30 PM](#)

REPRESENTATIVE MILLER asked if these genetically modified fish, growing at an accelerated rate, would out-compete wild fish for food.

MR. YAMADA expressed his agreement that the competition for food would be extreme.

REPRESENTATIVE MILLER asked if wild fish swimming in close proximity with pens of confined fish were susceptible to disease.

[5:33:20 PM](#)

MR. YAMADA confirmed that there could be contamination through water transfer; as hatcheries required water exchange, even filtered water could carry lice and diseases.

REPRESENTATIVE MILLER asked if there was any information to the effect of genetically modified or farmed fish on wild fish stock in other parts of the world.

MR. YAMADA replied that he was not aware of any.

[5:34:44 PM](#)

REPRESENTATIVE HERRON asked if Mr. Yamada recommended a ban on the importation of live genetically modified fish.

MR. YAMADA, in response, stated that the fact of not raising fish would assume that there would be not be any import.

[5:35:33 PM](#)

GERALD McCUNE, Lobbyist, United Fishermen of Alaska (UFA), stated that the official UFA stance was for the FDA to prohibit permits for this. He offered his belief that the technology could be sold to someone in closer proximity to Alaska. He suggested that, if permits were approved, it could be necessary for the fish to be labeled, and not allowed to be raised in Alaska. He offered his belief that regulations already existed to prevent the import of live non-native fish or eggs into the State of Alaska.

[5:36:46 PM](#)

CHAIR THOMPSON reflected on reports of the escapement of farmed fish which had been caught in Southeast Alaska.

MR. McCUNE confirmed that the Alaska Department of Fish & Game had documentation of Atlantic salmon being caught in Southeast Alaska, and as far north as the Copper River, which had escaped from Canadian fish farms. He reflected on the problems arising from farmed fish pens in Canada.

[5:38:28 PM](#)

BEN MULLIGAN, Legislative Liaison, Alaska Department of Fish & Game, reported that there were regulations banning the importation of live fish under AS 16.05.251.

[5:39:52 PM](#)

REPRESENTATIVE HERRON, declaring "frankenfish is a scary proposition," asked if it should be included specifically in statute.

MR. MULLIGAN replied that it would not be a bad decision.

REPRESENTATIVE HERRON, reflecting on the concerns, asked if there was any harm to add it to statute.

[5:41:04 PM](#)

CHAIR THOMPSON asked if the definition for genetically modified fish needed to be clarified.

MR. MULLIGAN suggested that the definition in AS 17.20.048 could be included in the proposed amendment to AS 16.40.210.

[5:42:06 PM](#)

REPRESENTATIVE HERRON, reflecting that genetically modified had "been on the books in some fashion since 1949" and that it was currently referred to as genetically engineered, asked if the statutes should reference genetically engineered.

MR. MULLIGAN replied that the wording was interchangeable.

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CHAIR THOMPSON closed public testimony.

[5:43:49 PM](#)

REPRESENTATIVE KAWASAKI read the definition for genetically modified fish in AS 17.20.040(b)(2)(A): "a finfish or shellfish whose genetic structure has been altered at the molecular level by means that are not possible under natural conditions." He noted that the definition further included techniques to genetically modify other species. He opined that the definition for natural conditions, which he had read to the committee, would cover any circumstance for the genetically modified organism.

[5:44:38 PM](#)

REPRESENTATIVE AUSTERMAN replied that it was not his intention to redefine, but an addition of [AS 17.20.040](b)(2)(A) would be helpful.

[5:45:11 PM](#)

REPRESENTATIVE KAWASAKI moved to adopt Conceptual Amendment 1, as follows:

Page 2, line 3, after "AS 17.20.040"  
Insert "(b)(2)(A) and (B)"

There being no objection, it was so ordered.

[5:46:12 PM](#)

REPRESENTATIVE MILLER, directing attention to the definition in AS 17.20.040](b)(2)(A), suggested that "created" should be

substituted for "altered." He nominated that this was necessary for clarity for enforcement.

[5:47:11 PM](#)

REPRESENTATIVE AUSTERMAN opined that a fish that cannot reproduce would need to be "altered."

REPRESENTATIVE MILLER asked to clarify that the alteration occurred at the egg level, or the gene level, which was prior to its being a fish. He expressed his desire to reinforce the amendment.

[5:48:13 PM](#)

REPRESENTATIVE AUSTERMAN moved to report HB 100, as amended, out of committee with individual recommendations and the accompanying zero fiscal notes. There being no objection, CSHB 100(FSH) was reported from the House Special Committee on Fisheries.

The committee took a brief at-ease.

#### **HJR 10-OCEAN ACIDIFICATION RESEARCH**

CHAIR THOMPSON announced that the final order of business would be HOUSE JOINT RESOLUTION NO. 10, Supporting expanded research concerning the detrimental effects of ocean acidification.

[5:51:42 PM](#)

REPRESENTATIVE AUSTERMAN moved to adopt the proposed committee substitute (CS) for HJR 10, Version 27-LS0167\M, Nauman, 2/21/12, as a work draft. There being no objection, Version M was before the committee.

[5:52:18 PM](#)

REPRESENTATIVE BETH KERTTULA, Alaska State Legislature, as the prime sponsor, asked that Monica Kunat present the proposed resolution.

[5:52:30 PM](#)

MONIKA KUNAT, Intern, Representative Beth Kerttula, Alaska State Legislature, paraphrasing from a prepared statement, which read as follows [original punctuation provided]:

Good Evening Mr. Chair, members of the committee. For the Record, my name is Monika Kunat and I am an Intern to Representative Kerttula.

I am very honored to have the privilege of speaking to you this evening. As a child, I spent most of my life living on a boat in Alaska. My father is a commercial diver, and I understand the important role the oceans have in Alaska's Economy.

House Joint Resolution 10 is about the threat Ocean Acidification poses to many sectors of Alaska's economy.

Alaskan oceans are important, they support not only our communities, and they are also a huge player on the global markets, helping feed the world.

Tourism, fishing, substance, and recreation in Alaska are all supported by healthy ocean ecosystems.

Carbon dioxide absorbed by the ocean has altered ocean chemistry.

The implications of ocean acidification are still being researched; however, it is clear that ocean acidification makes it more difficult for organisms that build shells to survive.

Why does this matter?

Many of these organisms are the main food source for fish that support our fisheries industry. For example, the petropod, a type of plankton whose survival is contingent on its ability to build a carbonate shell, is a main food source for salmon.

Because of the interconnected nature of marine ecosystems, it is clear how ocean acidification may be serious threat to many types of marine life.

Mr. Chair, members of the committee, to solve a problem the problem must be first understood. This resolution establishes that the legislature is supportive of the research to better understand how ocean acidification affects Alaska's Oceans and

consequently the industries that rely on the oceans bounty.

The full implications of ocean acidification are unclear. However there is an opportunity to support a better understanding of ocean acidification. If we choose not to seek information, about this serious threat, we will be tying the hands of the young future generations of Alaskans. However choosing to support research for the understanding of Ocean Acidification leaves us with an open opportunity to find solutions for this grave threat.

Thank you again for the opportunity to testify, and I would appreciate your support of the Resolution.

[5:55:11 PM](#)

REPRESENTATIVE MILLER asked when ocean acidification was first recognized.

MS. KUNAT deferred to another witness.

[5:55:48 PM](#)

REPRESENTATIVE HERRON asked if any major research was being conducted in Alaska at this time.

MS. KUNAT replied that Dr. Mathis at University of Alaska Fairbanks (UAF) was conducting research, and that the National Oceanic and Atmospheric Administration (NOAA) was conducting research in Kodiak.

[5:56:40 PM](#)

REPRESENTATIVE HERRON, pointing out that the data indicated that ocean acidification was most dangerous to shell fish, asked about the effects on salmon.

[5:57:00 PM](#)

MS. KUNAT relayed that the food chain of the salmon was threatened, and she deferred any further details to one of the other witnesses.

[5:58:05 PM](#)

RICHARD A. FEELY, Ph.D., Senior Fellow, National Oceanic and Atmospheric Administration (NOAA), provided testimony (via teleconference) on the effects of acidification of the world oceans, paraphrasing from a prepared statement, which read as follows [original punctuation provided]:

I am a NOAA Senior Fellow and head of the Carbon Program at the Pacific Marine Environmental Laboratory in Seattle, Washington. My expertise is in ocean carbon measurements and ocean acidification. Thank you for giving Dr. Mathis and myself the opportunity to speak with you today on ocean acidification, its impacts on marine life, and potential economic impacts.

Fundamental measurable changes in seawater chemistry are occurring throughout the world's oceans. Over the past two and a half centuries, the release of 2 trillion tons carbon dioxide from our industrial and agricultural activities has resulted in atmospheric carbon dioxide levels that have increased from about 280 to 392 parts per million. To date, the oceans have absorbed about one third of the carbon emissions released by human activities during this period. This natural process of absorption has benefited humankind by significantly reducing the greenhouse gas levels in the atmosphere and reducing some of the impacts of global warming. However, decades of ocean observation and research sponsored by NOAA, the National Science Foundation and the Department of Energy show that the ocean's daily uptake of 22 million tons of carbon dioxide is having a significant impact on the chemistry and biology of the oceans.

When carbon dioxide reacts with seawater, chemical changes occur that cause a decrease in seawater pH and carbonate ions. These chemical changes are commonly referred to as "ocean acidification." Scientists have estimated that surface ocean pH has fallen by about 0.1 units since the beginning of the industrial revolution. Since the pH scale, like the Richter scale, is logarithmic, this change represents approximately a 30 percent increase in ocean acidity. Future predictions indicate that the oceans will continue to absorb carbon dioxide and become even more acidic. Estimates of future carbon dioxide levels, based on business as usual emission scenarios,

indicate that by the end of this century the surface waters of the ocean could be nearly 150 percent more acidic, resulting in a pH that the oceans haven't experienced for more than 20 million years.

Many marine organisms that produce calcium carbonate shells or skeletons, such as crabs, oysters, scallops, and pteropods, are negatively impacted by the increasing carbon dioxide levels and decreasing pH in seawater. For example, increasing ocean acidification has been shown to significantly reduce the ability of reef-building corals to produce their skeletons. Coral biologists have reported that ocean acidification could compromise the successful fertilization, larval settlement and survivorship of Elkhorn coral, an endangered species. These research results suggest that ocean acidification could severely impact the ability of coral reefs to recover from disturbance. Other research indicates that, by the end of this century, coral reefs may erode faster than they can be rebuilt. This could compromise the long-term viability of these ecosystems and perhaps impact the estimated one million species that depend on coral reef habitat.

Ongoing research is showing that decreasing pH may also have deleterious effects on commercially important fish and shellfish larvae. King crab, herring and cod exhibit high mortality rates in carbon dioxide-enriched waters. The calcification rates of the edible mussel and Pacific oyster decline linearly with increasing carbon dioxide levels. Since 2006, some oyster hatcheries in the Pacific Northwest have experienced mass mortalities of oyster larvae in association with a combination of factors, including the upwelling of cold, carbon dioxide-rich waters. Scientists have also seen a reduced ability of some types of marine plankton to produce protective carbonate shells. These organisms are important food sources for other marine organisms. One type of free-swimming mollusk called a pteropod is eaten by organisms ranging in size from tiny krill to whales. Pteropods are a major food source for North Pacific juvenile salmon, and are also food for mackerel, herring, and cod.

Since ocean acidification research is still in its infancy, it is impossible to predict exactly how these

impacts will cascade throughout the marine food chain and affect the overall structure of marine ecosystems. It is clear, however, from both the existing data and from the geologic record that some coral and shellfish species will be negatively impacted in a high- carbon dioxide ocean. The rapid disappearance of many calcifying species in past extinction events has been attributed, in many cases, to ocean acidification events. Over the next century, if carbon dioxide emissions are allowed to increase as predicted by business as usual carbon emissions scenarios, humankind may be responsible for making the oceans more corrosive to calcifying organisms than at any time in the last 20 million years.

The impact of ocean acidification on fisheries and coral reef ecosystems could reverberate through the U.S. and global economy. The U.S. is the third largest seafood consumer in the world with total consumer spending for fish and shellfish around \$70 billion per year. Coastal and marine commercial fishing generates upwards of \$35 billion per year and employs nearly 70,000 people. The total value of U.S. commercial harvests from U.S. waters and at-sea processing was approximately \$4 billion in 2007.

In conclusion, ocean acidification is caused by the buildup of carbon dioxide in the atmosphere and can have significant impacts on marine ecosystems. Ocean acidification is an emerging scientific issue and much research is needed before all of the ecosystems' responses are well understood. However, to the limit that the scientific community understands this issue right now, the potential for environmental, economic and societal risk is quite high, hence demanding serious and immediate attention.

[6:04:47 PM](#)

REPRESENTATIVE PRUITT asked if Dr. Feely had been involved with the writing of proposed HJR 10.

DR. FEELY replied that he had not.

REPRESENTATIVE PRUITT read from page 2, line 11 of the proposed resolution:

Whereas carbon dioxide absorbed by the oceans has altered ocean chemistry, increasing the acidity of the ocean by 30 percent on average since the start of the Industrial Revolution;

He asked about the availability of baseline data from prior to the Industrial Revolution.

DR. FEELY explained that this information was obtained from models which depicted the increase of CO<sub>2</sub> in the atmosphere, based on ice core records reflecting back 800,000 years. He stated that these ice cores offered a good indication for the atmospheric concentration of CO<sub>2</sub>. He reported that his research for NOAA included the utilization of models for the circulation of anthropogenic carbon dioxide into the ocean, which showed the changes from pre-Industrial to the present.

[6:06:37 PM](#)

REPRESENTATIVE PRUITT asked about the increases to acidification during the most recent 20-30 years, as the use of hydrocarbon fuels had increased.

DR. FEELY reported that the data from the Atlantic, Pacific, and Arctic Oceans indicated a decrease of .02 pH units per decade.

REPRESENTATIVE PRUITT asked if there was any impact from underwater volcanoes.

DR. FEELY explained that the CO<sub>2</sub> release of fossil fuels by mankind into the atmosphere, and its absorption by the oceans, was 50 times per year the CO<sub>2</sub> release of volcanoes.

REPRESENTATIVE PRUITT asked what outcome or solution was expected.

DR. FEELY relayed that this was a broad question, and quite difficult to answer. He offered an example that in 2006 the hatchery workers had discovered a steep decline in the oyster populations, which had been verified as a result of acidification. Observing systems for pH were set up in the hatcheries which detected increases in pH, and the hatcheries would then avoid using water during those times. He pointed out that in one year the production had been turned around. He explained that the research was to provide information for organism response to CO<sub>2</sub>, and to develop adaptation strategies.

[6:11:32 PM](#)

REPRESENTATIVE MILLER asked if the pH level for acidification was uniform in all the world's oceans.

DR. FEELY, in response, explained that many studies were being conducted for CO2 changes in the atmosphere and the corresponding oceans, and that most of the oceans were demonstrating a clear increase commensurate with atmospheric increases. He pointed out that in some small, specialized places, changes in the biological productivity were able to counteract the CO2 changes.

REPRESENTATIVE MILLER asked at what level of pH change did an indication of problems become evident.

DR. FEELY reported that each species had a different method and level of toleration for pH variance. He noted that shelled organisms had a negative response to increased CO2. Although the Pacific oyster was very sensitive, other oyster species had a different level of tolerance. He pointed out that the research had only just begun in recent years.

[6:14:52 PM](#)

REPRESENTATIVE MILLER, reflecting that absorption appeared to be more prevalent in surface waters, asked how deep surface waters were and if the acidification would reach the bottom of the ocean.

DR. FEELY replied that this was his research area. He said that the concentrations for species were to about 50 meters. Below this depth, the ocean waters circulate more slowly, and changes are less dramatic, as the majority of anthropogenic carbon dioxide was in the upper 500 - 1000 meters of the water column.

[6:16:56 PM](#)

DR. JEREMY MATHIS, University of Alaska Fairbanks (UAF), Fairbanks, Alaska, testified in support of HJR 10 and reported on the detrimental effects of acidification, paraphrasing from a prepared statement:

I have been a Professor of Chemical Oceanography and the director of the Ocean Acidification Research Center at the University of Alaska Fairbanks (UAF) for the past several years. ... It is likely that ocean

acidification will create conditions that will be detrimental to some marine organisms in the Gulf of Alaska, the Bering Sea and in the Arctic Ocean within the next few decades, if not sooner, that will impact the growth, reproduction, and physiological processes of many marine organisms. The most direct impacts will likely be felt by carbonate-forming species, such as crabs, clams and oysters, but it could also affect marine plankton that occupy the base of the food webs that support our pelagic fisheries, like our salmon ... Because of this ocean acidification process, there will likely be winners and losers in the marine environment. Some organisms will fill a niche as others potentially go away. Unfortunately, right now, we can't say what those ecosystems are gonna look like in the future. ... The oceans around our state provide a huge natural resource and a huge benefit to our economy. ... There is a chance that ocean acidification will disrupt some of these fisheries within our lifetime. ... Carbon dioxide that has been absorbed by the ocean, particularly in the past 100 or so years, has significantly reduced the surface water pH making the ocean 30 percent more acidic than it was at the start of the Industrial Revolution. This process has accelerated around Alaska because the carbon dioxide is more soluble in colder waters, and we also have some unique characteristics in that the river discharge and the glacial discharge is low in total alkalinity, which acts as a buffer against changes in seawater pH. Our coastal oceans are really sensitive to further reductions in pH and the concentrations of these carbonate minerals that these shell building organisms use to construct and maintain their shells. There is now clear evidence from the research that myself and others have done over the past few years that ocean acidification is severe in Alaska and is likely occurring faster in the higher latitude regions that it is in more temperate locations.

He stated that his observational programs in the Gulf of Alaska reflected that there was already a pH level harmful to shell building organisms during certain times of year, and his work in the Bering Sea reflected that this area might be Ground Zero for the potential economic disruptions from ocean acidification. He pointed to an expanding region of water at the bottom of the Bering Sea shelf where the carbonate mineral concentrations were

at a level that could also be harmful to shell building organisms at certain times of the year. He reported that his work in the Arctic Ocean reflected that it was experiencing the fastest rate of change for carbonate mineral concentrations. This change was a result of increased carbon dioxide, the accelerated melting of the sea ice, and increased river discharge into the ocean. He declared that this area would be the bellwether for the rest of the global oceans. He offered his belief that it was immediately necessary to make investments for sound management strategies to keep the fisheries sustainable as the oceans became more acidic. He listed a need for increased observations and research, species specific studies, and specific economic modeling. He stated that UAF had submitted a capital improvement request of \$2.7 million for expanding ocean acidification research. He pointed out that a similar program had served as an early warning system for the coastal regions in Oregon and Washington, and helped save those shellfish hatcheries. This request would also fund the development of the economic model for projection of economic consequences from ocean acidification, and for citizen monitoring to help collect water samples and make other measurements for ocean acidification to establish baseline pH levels.

[6:24:19 PM](#)

CHAIR THOMPSON asked if the request for the \$2.7 million was in the governor's budget.

DR. MATHIS replied that efforts were being made to place the request back in the budget.

CHAIR THOMPSON acknowledged that the Yukon-Kuskokwim fishery was concerned with acidification in the Bering Sea and its impact on the food sources for the salmon.

DR. MATHIS offered his belief that the improved observational network, supported by this funding request, would answer that question.

[6:25:43 PM](#)

RODGER PAINTER, President, Alaskan Shellfish Growers Association (ASGA), testified in support of HJR 10 and referred to his letter in support of HJR 10 [Included in members' packets]. He reported that the Alaskan Shellfish Growers Association (ASGA) would receive only 40 percent of the necessary oyster spat in

2011, and that the continued losses from these shortages over the next five years would be about \$1.6 million. He stated that ocean acidification had played a major role in the shortages, reporting that one of the major oyster producing areas in the State of Washington was failing due to the acidification from the changing currents and changing upland warming weather. He suggested that HJR 10 also be referred to the finance committee, for support to the monitoring programs in the Bering Sea and Southeast Alaska. He clarified that the monitors allowed the shellfish growers to divert when the monitors indicated low pH waters. He shared that other shellfish operators also had concerns with ocean acidification.

[6:29:41 PM](#)

CHAIR THOMPSON asked if there had been any difference with the strength of the shells.

MR. PAINTER replied that oysters were no longer bothered by the low pH once they had transitioned from the free swimming larvae to a shellfish.

[6:30:31 PM](#)

GERALD McCUNE, President, Cordova District Fishermen United (CDFU), stating that Cordova District Fishermen United supported HJR 10, said that everything should be done to support research in this area, as it was important to all of Alaska.

[6:31:48 PM](#)

[Public testimony was closed.]

[6:32:00 PM](#)

REPRESENTATIVE AUSTERMAN moved to report the proposed committee substitute (CS) for HJR 10, Version 27-LS0167\M, Nauman, 2/21/12, out of committee with individual recommendations and the accompanying zero fiscal notes. There being no objection, CSHJR 10(FSH) was reported from the House Special Committee on Fisheries.

[6:32:27 PM](#)

**ADJOURNMENT**

There being no further business before the committee, the House Special Committee on Fisheries meeting was adjourned at 6:33 p.m.