ALASKA STATE LEGISLATURE
SENATE RESOURCES STANDING COMMITTEE
March 4, 2019
3:30 p.m.

MEMBERS PRESENT

Senator Chris Birch, Chair
Senator John Coghill, Vice Chair
Senator Cathy Giessel
Senator Lora Reinbold
Senator Click Bishop
Senator Jesse Kiehl

MEMBERS ABSENT

Senator Scott Kawasaki

COMMITTEE CALENDAR

CONFIRMATION HEARING:

Alaska Board of Game
Jerry Burnett - Juneau

- CONFIRMATION ADVANCED

PRESENTATION: "BUILDING ALASKA'S BLUE ECONOMY - ALASKA'S COLLEGE OF FISHERIES & OCEAN SCIENCES"

- HEARD

PREVIOUS COMMITTEE ACTION

No previous action to record

WITNESS REGISTER

JERRY BURNETT, Appointee
Alaska Board of Game
Alaska Department of Fish and Game
Juneau, Alaska
POSITION STATEMENT: Addressed his appointment to the Alaska Board of Game.

ROD ARNO, Executive Director
Alaska Outdoor Council
Palmer, Alaska
POSITION STATEMENT: Testified in support of Mr. Burnett's appointment to the Alaska Board of Game.

MARK RICHARDS, Executive Director
Resident Hunters of Alaska
Fairbanks, Alaska
POSITION STATEMENT: Did not provide a recommendation on Mr. Burnett's appointment to the Alaska Board of Game.

DR. BRAD MORAN, Dean
College of Fisheries & Ocean Sciences
University of Alaska-Fairbanks
Fairbanks, Alaska
POSITION STATEMENT: Provided an overview of the college's value and return on investment to the state via the presentation, "Building Alaska's Blue Economy."

ACTION NARRATIVE

3:30:23 PM
CHAIR CHRIS BIRCH called the Senate Resources Standing Committee meeting to order at 3:30 p.m. Present at the call to order were Senators Coghill, Kiehl, Giessel, and Chair Birch. Senators Reinbold and Bishop joined the committee meeting shortly thereafter.

CONFIRMATION HEARING: Alaska Board of Game

3:31:06 PM
CHAIR BIRCH announced the consideration for the appointment of Jerry Burnett to the Alaska Board of Game. He said Mr. Burnett is a new appointee and, if confirmed, his appointment would be through June 30, 2021.

He detailed that the main role of the Alaska Board of Game is to conserve and develop Alaska's wildlife resources which includes establishing open and closed seasons, areas for taking game, setting bag limits, and regulating methods and means. The board is also involved in setting policy and direction for the management of the state's wildlife resources. The board is charged with making allocative decisions and the Alaska

Department of Fish and Game is responsible for management based on those same decisions.

3:31:53 PM
JERRY BURNETT, Appointee, Alaska Board of Game, Alaska Department of Fish and Game, Juneau, Alaska, provided an overview of his curriculum vitae as follows:

- Alaska Department of Revenue:
  - Deputy commissioner,
  - August 2008-September 2011, and December 2014-December 2017.
- Statewide information technology officer:
  - April 2014-December 2014.
- Alaska Department of Revenue:
  - Administrative director and legislative liaison,
  - December 2004-August 2008, and September 2011-April 2014.
- Alaska Department of Corrections:
  - Administrative director,
  - January 2003-2004.
- Alaska Legislature:
  - Legislative staff,
  - January 1990-December 2002.
- University of Alaska Southeast:
  - Adjunct professor of business administration,
  - 1990-2002.
- Alaska Outdoor Council
  - Southeast vice president in 2000,
  - President in 2002-2003.
- Territorial Sportsmen:
  - Served many years on the board of directors including four years as the president.

He said over the past 20 years he has been deeply involved with the issues that are near and dear to hunters and anglers in Alaska, noting that he has authored or coauthored comments and proposals to the boards of Fish and Game, sometimes working through the local Fish and Game Advisory Committee process. He added that he has authored and coauthored comments on federal and state legislation and proposed regulations concerning access to federal lands, the state's right to manage its resources, and on a variety of land-use proposals. He noted that in his previous state positions he has served on several boards and that has provided him with an appreciation of the process for

hearing and considering public comments and testimony before making decisions and adopting regulations.

MR. BURNETT summarized as follows:

> Section 8 of the Alaska Constitution provides in part that wherever occurring in their natural state, fish, wildlife, and waters are reserved to the people for common use; and that fish, forest, wildlife, grasslands, and all other replenishable resources belong to the state shall be utilized, developed, and maintained on a sustained-yield principle subject to preferences on beneficial uses.
>
> In accordance with the statutory framework developed by the Legislature and codified in Title 16, it is the role of the Board of Game to consider the science developed by the Department of Fish and Game, and the input from the public, to set regulations, seasons, and bag limits that will ensure Alaska's wildlife resources are utilized on the sustained yield principle.

He opined that he is well qualified to be a part of the Board of Game process as a board member.

3:35:56 PM
SENATOR GIESSEL asked him to define "maximum benefit" in terms of allocation when talking about wildlife.

MR. BURNETT answered that the legislature has many definitions, but each game population starts with the subsistence benefit in almost all areas of the state. The maximum benefit of game is preserving the harvestable surplus that can be used for human consumption, but there are a number of different uses that are dependent on location and how easily people can access the game populations, in some cases the maximum benefit for a population may have to do with professional-guided hunts. Maximum benefit is complicated and that is why public comment is important to understand various uses in communities by each user group.

SENATOR GIESSEL asked how many years it has been since a Southeast member has been appointed to the Alaska Board of Game.

MR. BURNETT answered that he was not sure.

SENATOR BISHOP asked how he feels about cow moose hunts.

MR. BURNETT answered that he did not have a feeling on specific antlerless hunts because Board of Game authorization for keeping a game's population balanced in an area depends on habitat degradation due to a rapidly growing population as well as the game's benefit as food.

3:38:56 PM
SENATOR BISHOP noted Mr. Burnett's statement regarding input from the public to set regulations. He said he hoped that Mr. Burnett would pay attention and listen to the public. He pointed out that there are more hunters in the field than there are Alaska Department of Fish and Game (ADF&G) people in the field. He opined that while ADF&G may have the science, there are a lot of people in the field that keep good field notes, not anecdotal but good field notes.

MR. BURNETT replied that he will certainly listen to the public.

SENATOR REINBOLD addressed a public safety concern from car encounters and accidents caused by moose as well as bears being attracted into urban areas. She opined that ADF&G would rather manage the public than the wildlife. She asked how he will manage wildlife and public safety in heavy user areas.

MR. BURNETT said his personal feeling is that a person is much more valuable than any game animal and he is not opposed to managing a population for additional public safety.

SENATOR REINBOLD said there are a lot of people that are concerned about the number of brown and black bears in her community. She opined that game management was done far differently in the past and a massive transition occurred in the 1990s that caused the incredible numbers of game. She asked that, people be kept in the center to ensure public safety.

3:42:16 PM
SENATOR KIEHL remarked that it has been too many years since someone from Southeast Alaska was appointed to the Board of Game.

SENATOR KIEHL addressed the board's use of advisory committees around the state. He opined that many Alaskans put a lot of value into advisory committees, noting that the committees cost a fair amount of money. He asked Mr. Burnett what he viewed as the best way to interact, consolidate, or not to interact with the committees.

MR. BURNETT answered that the state has 84 advisory committees in different regions. He explained that proposals go out to the advisory committees and the department, and then the proposals come back to the board for decisions. He said the advisory committees are expensive, but important. He noted that game management is self-sustaining, paid for by hunting license fees. He disclosed that there are proposals for a joint Fish and Game Board meeting in March to address changes to some of the advisory committees to make it more convenient for people to get together in a community.

3:44:17 PM
CHAIR BIRCH opened public testimony.

3:44:50 PM
ROD ARNO, Executive Director, Alaska Outdoor Council, Palmer, Alaska, testified in support of Mr. Burnett's appointment to the Alaska Board of Game. He said Mr. Burnett is knowledgeable about the Board of Game process which is very important.

3:46:21 PM
MARK RICHARDS, Executive Director, Resident Hunters of Alaska (RHAK), Fairbanks, Alaska, did not provide a recommendation on Mr. Burnett's appointment. He said he looks forward to meeting Mr. Burnett to address questions regarding Article 8 of the Alaska Constitution regarding maximum benefit. He disclosed that RHAK also recommended David Brown from Wrangel, noting that he served on the board from 2014 to 2017.

3:47:52 PM
CHAIR BIRCH closed public testimony.

3:48:14 PM
CHAIR BIRCH stated that in accordance with AS 39.05.080, the Senate Resources Committee reviewed the following and recommends the appointment be forwarded to a joint session for consideration:

Board Member of the Alaska Board of Game
Jerry Burnett - Juneau.

CHAIR BIRCH reminded members that this does not reflect an intent by any of the members to vote for or against the confirmation of the individual during any further sessions.

3:48:50 PM

At ease.

PRESENTATION: "Building Alaska's Blue Economy - Alaska's College of Fisheries & Ocean Sciences"

3:49:50 PM
CHAIR BIRCH called the committee back to order. He announced that the committee would hear from the University of Alaska-Fairbanks College of Fisheries and Ocean Sciences (CFOS) to provide its perspective of how the university system plays a key research and workforce development role in Alaska's marine industries.

3:50:16 PM
DR. BRAD MORAN, Dean, College of Fisheries & Ocean Sciences, University of Alaska-Fairbanks, Fairbanks, Alaska, explained that he wanted to use the title of his presentation, "Building Alaska's Blue Economy," to give the main message of the value of CFOS and the return on investment of CFOS to Alaska.

He addressed "Statewide CFOS presence" as follows:

- CFOS is a statewide entity.
- CFOS has 12 locations, 11 locations are in coastal communities.
- CFOS is the largest research and academic unit in Alaska with geographic diversity with a large budget.
- CFOS is next in line after the Geophysical Institute with a fiscal budget of $46 million, FY2018, in expenditures which are almost entirely in Alaska.
- CFOS received $5.9 million investment, FY2018, from the state's general fund with an output of $46 million in expenditures, an 8:1 return on investment.
- CFOS committed $22.8 million in research, almost entirely federal funds.
- CFOS was awarded $11.3 million from a national science foundation to operate the research vessel (R/V) Sikuliaq.

DR. MORAN addressed CFOS "Research and economic drivers" via facilities and centers as follows:

- Alaska Sea Grant Program:
  - Partnership with the National Oceanic and Atmospheric Administration (NOAA).
  - Housed within CFOS.
  - Director reports to Dr. Moran.

- Coastal Marine Institute.
- Institute of Marine Science.
- Kasitsna Bay Laboratory.
- Kodiak Seafood & Marine Science Center.
- Lena Point Fisheries Facility.
- Ocean Acidification Research Center:
    - Growing concern, particularly in high latitude, cold waters such as the offshore of Alaska.
- Pollock Conservation Cooperative Research Center.
- Rasmuson Fisheries Research Center.
- R/V Sikuliaq and Seward Marine Center.

He said CFOS's facilities and centers are a significant asset within the college that deals with the fisheries, marine biology, and oceanographic challenges that the state faces in a rapidly changing environmental system. The assets have reach and expertise across the state in the noted areas.

3:53:18 PM
SENATOR COGHILL explained that because of ocean acidification, fish migration, and what the state does in high seas fisheries, Alaska ends up working with British Columbia, Hawaii, Korea, and Japan on the state's sciences. He asked if he can explain what CFOS is doing to work with those governing entities. He noted that Dr. Moran's presentation shows federal input, but opined that Alaska sees itself, CFOS too, as the guardians of the north Pacific and Arctic. However, Alaska must share the area with the other entities. He asked if the $46 million is similar to what other states are doing and whether Alaska has good collaboration.

DR. MORAN answered that CFOS is a resource to the state that provides unbiased information, education, and workforce training around fisheries, ocean, and marine biology. CFOS is also a strong resource for its colleagues in other states and countries such as British Columbia, Canada. He emphasized that CFOS has a very competitive and strong program that ranks in the top five. He said the fact that CFOS operates the research vessel (R/V) Sikuliaq puts it on par or more with entities such as the state of Washington, which also operates a global class vessel.

SENATOR COGHILL noted a recent meeting with the Counsel General of Japan and pointed out that Japan is one of Alaska's largest seafood customers in addition to China and Korea. He mentioned Alaska's seafood production base and asked if CFOS competes or

complements for its federal research dollars in comparison to other north Pacific areas.

3:55:41 PM
DR. MORAN answered that NOAA is the primary funder that uses an open competition for proposals that CFOS and any organization in the U.S. can compete for. He said CFOS interacts regularly with many state, national, and international entities as well. He explained that the state's investment to leverage the federal dollars is far reaching. He asserted that CFOS is absolutely competitive with other states, one metric being the return on investment for Alaska.

SENATOR COGHILL explained that his questioning pertains to what the state can or cannot control from a fisheries perspective and CFOS's role in reaching out to national and international organizations.

DR. MORAN replied that Alaska and CFOS are national and international leaders in fisheries. He said CFOS collaborates with faculty in other institutions, but CFOS is competitive as well.

SENATOR COGHILL said he wanted Dr. Moran to say out loud that Alaska and CFOS are world renowned, a position that the state does not want to give up.

DR. MORAN concurred. He said CFOS is very proud of what it has accomplished with an outstanding fisheries department.

3:58:27 PM
He noted that CFOS has a number of industry partnerships. For example, the cooperative with the at-sea processors:

- At-sea processor cooperative:
  - Trident Seafoods;
  - Aleutian Spray Fisheries, Incorporated;
  - American Seafoods Company;
  - Glacier Fish Company.
- Largest philanthropic donor to the University of Alaska in marine sciences.
- Through 2019 approximately $16 million was donated that supports:
  - Students,
  - Research,
  - Workforce training,
  - Ted Stevens Chair in Marine Policy.

- Excellent example of industry supporting and working hand-in-hand with CFOS around fisheries.

DR. MORAN addressed CFOS's "Federal agency partnerships" as follows:

- Alaska Sea Grant partnership:
  - Excellent example of a solid partnership with NOAA.
  - Statewide entity,
  - $1.5 million budget with NOAA with a 50-percent match requirement.
  - CFOS supports Sea Grant, the college's primary outreach arm to coastal communities.
- Department of Interior-Bureau of Ocean Energy Management:
  - Doubled their input into the Coastal Marine Institute from $500,000 to $1 million.
  - Virtual institute, not a bricks-and-mortar.
  - CFOS uses the investment to primarily support student and faculty research.

He explained that the partnerships leverage funding to support research and Alaska's coastal communities.

4:00:23 PM
He addressed "Innovation and commercialization" as follows:

- Blue Evolution leasing space at Kodiak to process kelp for market:
  - Kodiak Seafood Marine Science Center.
  - Make seafood products like salsa and penne made from kelp.
  - Two years in operation.
  - Example of CFOS working with a private corporation.
  - Kelp is a field or mariculture that is an opportunity for Alaska.
- Blue Pipeline Incubator at Seward fostering ocean business and workforce:
  - Just started within the last few months.
  - External support funding from the City of Seward as well as other support lines.
  - Similar to a research park or "incubator" for technology innovation.
- MARINER ARPA-E award to develop sugar kelp for market:
  - Award from the U.S. Department of Energy.
  - CFOS works closely with the University of Alaska-Southeast.

    - Partners in the Lower 48.
    - Sugar kelp has a lot of upside potential.
- Pet treats from fish skins developed at Kodiak:
    - CFOS faculty member has developed commercializable pet treats from fish skins.

DR. MORAN explained that much of the research that CFOS does is basic research, hypothesis testing, and applied-side research.

4:02:38 PM
He addressed "Mariculture facilities, faculty and research" as follows:

- Facilities:
    - Kodiak Seafood and Marine Science Center:
        - Seafood research and development facility.
    - Kasitsna Bay Laboratory:
        - Research on kelp and invertebrate ecology.
        - Partnership with NOAA.
    - Seward Marine Center:
        - Research on mariculture studies.
    - Lena Point:
        - CFOS research and teaching facility in Southeast Alaska.
- Active Mariculture Research:
    - MARINER Program:
        - U.S. Department of Energy ARPA-E Phase I:
            - Proposing Phase II with the University of Alaska-Southeast.
    - Numerous faculty and students working on kelp, crabs, and ocean acidification impacting mariculture.

He addressed Alaska's mariculture opportunity, noting that the state has more coastline than the rest of the Lower 48 combined. He emphasized that there is a tremendous upside potential for non-fin-fish, fin-fish aquaculture, including kelp and shellfish. He said there are some numerics put around the potential for Alaska in the mariculture space, anywhere from $100 million to you pick. The mariculture research is an opportunity, particularly for coastal subsistence communities to engage in a new business venture.

4:03:58 PM
DR. MORAN addressed the "R/V Sikuliaq" as follows:

- Largest federal research asset in Alaska that CFOS operates.
- Only ice capable vessel with the ability to go through 2.5 feet of ice at 2 knots. The vessel is not an icebreaker.
- R/V Sikuliaq is a $200 million vessel, owned by the National Science Foundation (NSF).
- March 2014-2018, CFOS has an operating contract through a cooperative agreement with NSF.
- In 2018, CFOS was successful with renewing its operating contract through 2023 for $33 million:
    - Vessel with be competed nationally for the next contract in 2023.
    - CFOS will have to write a proposal to reup an operating contract that will also require:
        - Good shoreside facilities,
        - Good operations.
- R/V Sikuliaq is paid for by NSF, CFOS does not pay to operate the vessel.
- CFOS shows NSF that it means business by providing support for "ship days" by paying crew, food, and fuel as well as paying for:
    - Half of the salary for CFOS's financial manager.
    - Half-time liaison person to interact with subsistence communities.
    - All the salary cost for the vessel's port captain based in Seward.
    - Three quarters of the cost for the vessel's marine superintendent to operate and function in the Seward marine center.
- R/V Sikuliaq is a significant financial investment coming back to Alaska and the university:
    - Annual indirect cost recovery for the vessel is $1 million to CFOS, a significant amount of revenue.

DR. MORAN set forth that the R/V Sikuliaq is an "absolute gem" for the State of Alaska, likened to, a gift that keeps on giving. The vessel raises the bar for the university in a significant way in ocean science research. He admitted that the R/V Sikuliaq is one of the reasons he moved to Alaska.

4:06:38 PM
CHAIR BIRCH noted that U.S. Senators Murkowski and Sullivan announced that the U.S. Coast Guard has significant investments in infrastructure facilities including cutters and an icebreaker vessel. He asked if the U.S. Coast Guard works with the NSF.

DR. MORAN answered that U.S. Coast Guard is run under the U.S. Department of Homeland Security, an agency whose mission is to protect the country's coast. The R/V Sikuliaq is for enabling discovery and research. He noted that the R/V Sikuliaq can be contracted both nationally and internationally. For example, the Office of Naval Research has used the vessel. The R/V Sikuliaq can support a wide range of capabilities. Internationally the vessel can be used for methane hydrate exploration as well as oil and gas work. The vessel day rate is $50,000.

CHAIR BIRCH asked where the R/V Sikuliaq primarily sails in state waters.

DR. MORAN answered that the vessel goes where investigators propose to do research. The R/V Sikuliaq is a global class vessel that can go anywhere. The only place the vessel cannot go is ocean ice conditions that is greater than 2.5 feet thick.

4:09:16 PM
SENATOR KIEHL asked how much the NSF awards the university each year to operate and maintain the R/V Sikuliaq.

DR. MORAN replied approximately $11 million.

SENATOR KIEHL asked him to explain the $50,000 daily rate.

DR. MORAN explained that CFOS operates the vessel optimally, but the day rate varies based on how many days the vessel is used. He explained that the $11 million NSF award is approximately what the agency believes what is needed for operation. The award is not for the entire year. He noted that the U.S. Navy is being billed $2.3 million for the vessel's use, which is additional revenue on top of cooperative agreement. He disclosed that Canada chartered the vessel for 3 weeks and the European Union (EU) put $500,000 toward a 7-day charter. He offered to submit the vessel's operational data to committee members.

DR. MORAN addressed examples of the value that CFOS brings to understanding the ecosystem function in the coastal and ocean waters. One example is the Northern Gulf of Alaska Long-Term Ecosystem Research Program (NGA LTER) and detailed as follows:

- Started in 2018.
- Funded by NSF.
- The research award is exceptionally hard to get.
- Alaska has four LTERs.

- R/V Sikuliaq will enable the NGA LTER program greatly.

He addressed a map and noted that 45 years of research has occurred along the Gulf of Alaska Mooring (GAK1) line, primarily with a 20-year time series. GAK1 set the stage for the expansion of the program to other areas in the Gulf of Alaska, noting that $2.5 million in research and ship time is spent annually. He said the goal is ultimately to understand changes in the ecosystem that will affect commercial fisheries. The NGA LTER will go at least 10 years.

SENATOR BISHOP asked if the University of Alaska-Fairbanks operates the Toolik Field Station north of Atigun Pass.

DR. MORAN answered yes. He explained that the station is a long-term ecosystem research station.

4:12:15 PM
He addressed the European Union Research Icebreaker Consortium (ARICE). He asserted that on the international stage, CFOS is engaged and known internationally. He explained that ARICE is unique collaboration that came up a couple of years ago. He detailed ARICE vessels as follows:

- PRV Polarstern, Germany;
- IB Oden, Sweden;
- R/V Kronprins Haakon, Norway;
- RRS Sir David Attenborough, United Kingdom;
- CCGS Amundsen, Canada;
- R/V Sikuliaq, United States of America.

He explained that the R/V Sikuliaq is involved with all of the major players that are polar icebreaker operators. He noted that the Sikuliaq is the only non-icebreaker vessel. He disclosed that CFOS receives funding from the "EU Blue Growth Strategy of the Horizon 2020 Initiative" for the consortium collaboration, emphasizing that being involved is difficult to attain.

DR. MORAN addressed "Fisheries graduates in Alaska's economy" as follows:

- Alaska Commercial Fisheries:
    - Yield over 60 percent of the nation’s fishery landings.
    - Over $4 billion wholesale value.
    - Alaska’s largest private employer:

        - 60,000 workers.
- Sport Fisheries/Subsistence:
    - Anglers spend $1 billion on trip-related expenditures, supporting 16,000 jobs in Alaska.
    - Important customary and traditional uses of fishery resources.

He noted that 47 percent of CFOS faculty are women. Half of the graduate students from CFOS continue to work in Alaska, many in the Department of Fish and Game, and NOAA.

4:14:42 PM
He addressed "University of Alaska-Fairbanks Blue MBA" as follows:

- CFOS has worked with the School of Management to create an online MBA program called "Blue MBA."
- Only online MBA program in the U.S. or the world that provides business solutions for a changing Arctic in:
    - Mariculture,
    - Fisheries,
    - Shipping,
    - Ocean observing in forecasting.

He said CFOS is excited about the Blue MBA program, one of two professional master's degrees offered that allows working professionals throughout the world to advance their careers through a master's degree.

He addressed "Beaufort Sea fish monitoring" as follows:

- Goal:
    - As part of their commitment to environmental and social responsibility, since 1985 Hilcorp Energy has funded surveys of nearshore fishes in the Beaufort Sea for potential impacts of oil and gas development.
- Methods:
    - Fyke nets sampled daily from late June to early September.
    - Consideration for funding winter sampling because Arctic cod spawns in the winter.
- Results:
    - Ongoing research is focusing on climate effects on fish communities, bioenergetics, and growth.

DR. MORAN emphasized that the Beaufort Sea monitoring is an example of CFOS being a resource to the state as well as working with industry.

4:17:02 PM
He addressed research on "Whale depredation on longline fisheries" as follows:

- Problems:
  - Management:
    - Inaccurate Stocks Assessments.
  - Fishermen:
    - Reduced Catches,
    - Increased Costs.
  - Whales:
    - Risk of Entanglement,
    - Behavior Change.
- Results:
  - 39-73 percent reduction in survey catches;
  - 35-70 percent reduction in commercial catches of halibut, sablefish and Greenland turbot.
- Outcomes:
  - Adjustments to stock assessments:
    - Pot gear now allowed in Gulf of Alaska.

He addressed "Declines in size of Pacific halibut" as follows:

- Problem:
  - Average weight of age-20 halibut declined from 120 lbs. in 1988 to 45 lbs. in 2015.
  - Population stock also declined.
- Methods:
  - Cumulative effects of size-selective fishing and harvest rates evaluated by simulation models.
- Results:
  - High harvest rates and size-selective fishing explains 30-65 percent of the decline in the Gulf of Alaska.
- Outcome:
  - International Pacific Halibut Commission revised stock assessment model.
- Funding:
  - Pollock Conservation Cooperative Research Center (PCCRC).
  - North Pacific Research Board (NPRB).
- Collaborators:

- Pacific Halibut Research and Stock Management (IPHC).

DR. MORAN said halibut fisheries are critical to the state and the decline is significant, noting that CFOS is actively working on the halibut fisheries.

4:18:17 PM
He addressed "Analysis of tanner crab size limit" as follows:

- Problem:
  - Many tanner crab never grow to legal size, resulting in excessive discards and waste.
- Approach:
  - Computer model analysis of catch, bycatch, and fishery economics.
- Results:
  - Lower size limit reduces discard mortality.
  - Produces higher yields and revenues, and lower fishing costs.
- Outcome:
  - Board of Fisheries approved proposal.
  - Reduce size limit, improve profitability of the tanner crab fishery.

He said the outcome for the tanner crab size limit is a result of direct research by CFOS.

He addressed "Improved hatchery release of salmon" based on a study by Dr. Anne Beaudreau and Douglas Duncan regarding, "How are nearshore predators responding to hatchery released salmon?" as follows:

- Preliminary Results:
  - Sculpin and Dolly Varden consume juvenile salmon in areas near hatchery release sites.
  - Hatchery salmon may be less vulnerable to predators:
    - Released at a large size.
- Application:
  - Optimize hatchery strategies to improve survival.
  - Better understand predation in early marine survival of juvenile salmon.

DR. MORAN detailed that the study was done by the CFOS facility at Lena Point in Juneau. CFOS worked with the Douglas Island Pink and Chum, Inc. (DIPAC) hatchery to optimize their

strategies to ensure the maximum sustainability of wild-caught with hatchery fisheries.

SENATOR BISHOP asked what the impact of low rainfall in Southeast Alaska has had on area hatcheries, particularly DIPAC, and what is the contingency plan for releasing juvenile fish if the low rainfall trend continues.

DR. MORAN replied that he would follow up with some expert information. He added that Senator Bishop's question is a perfect example where CFOS can be a resource for an answer. He opined that the prediction on the impact from low rainfall will be difficult on what might happen in the future, but the topic is an active area of research by CFOS faculty.

4:20:12 PM
He addressed "Research of fishery management: decline of Chinook salmon abundance and size, and interactions of hatchery and wild fish." He detailed that a CFOS researcher is using innovative Global Positioning System (GPS) tagging on Chinook salmon in the Gulf of Alaska to monitor activity, noting an impact was found from salmon shark predation, something that was not previously known. He explained salmon with the GPS tags were serendipitously eaten by the salmon sharks. Salmon shark research is being funded by PCCRC.

He explained that the study on interaction of hatchery and wild fish is a critical question on optimizing wild runs. The different run timing and the overlap on spawning grounds is an area of active research.

He addressed "Solutions across the university" as follows:

- Shark research for biomedical advances:
    - University of Alaska (UA) research on shark jaws develops artificial cartilage implant for discs, knee meniscus, and prosthetic linings.
    - Use for military combat injuries and veterans.
- Expertise for policymakers and coastal communities:
    - UA Fisheries economists inform agencies and resource managers:
        - Example: North Pacific Fisheries Management Council.
    - Researchers study range of topics from global salmon markets, subsistence, and the Arctic.
    - Alaska Sea Grant Program is a resource for fishermen, public, and coastal economies.

4:22:30 PM
DR. MORAN summarized his presentation by referencing an image of a CFOS buoy that is monitoring ocean acidification in one of Alaska's coastal embayments. He said he hoped that his overview left committee members with the following impressions on CFOS:

- Great value to the state.
- Good return on investment.
- Operates major facilities of international repute.
- Students are working in Alaska.
- Drives forward the "Alaska Blue Economy."

CHAIR BIRCH noted that the R/V Sikuliaq will be in Seward during the upcoming summer months.

DR. MORAN answered yes. He said the R/V Sikuliaq will be in Seward the third week of May and the ship will be available for committee members to tour.

SENATOR COGHILL asked if CFOS monitors debris on Alaska's coastline from other countries and how the debris affects fisheries.

DR. MORAN answered that CFOS is engaged in marine debris and can provide additional information. He disclosed that CFOS is not measuring the impacts from Fukushima.

SENATOR COGHILL replied that he does not expect Fukushima monitoring, but that there was a big impact. He added that there has been debris from earthquakes in Indonesia as well.

DR. MORAN disclosed that prior to his career with CFOS, he did measure Fukushima radioactivity coming to the coast of North America. He said there is no threat to Alaska from the Fukushima incident.

CHAIR BIRCH thanked Dr. Moran for the CFOS presentation.

4:24:58 PM
There being no further business to come before the committee, Chair Birch adjourned the Senate Resources Standing Committee meeting at 4:24 p.m.