

University of Alaska Fairbanks

College of Fisheries and Ocean Sciences

Dean S. Bradley Moran & Professor Gordon Kruse

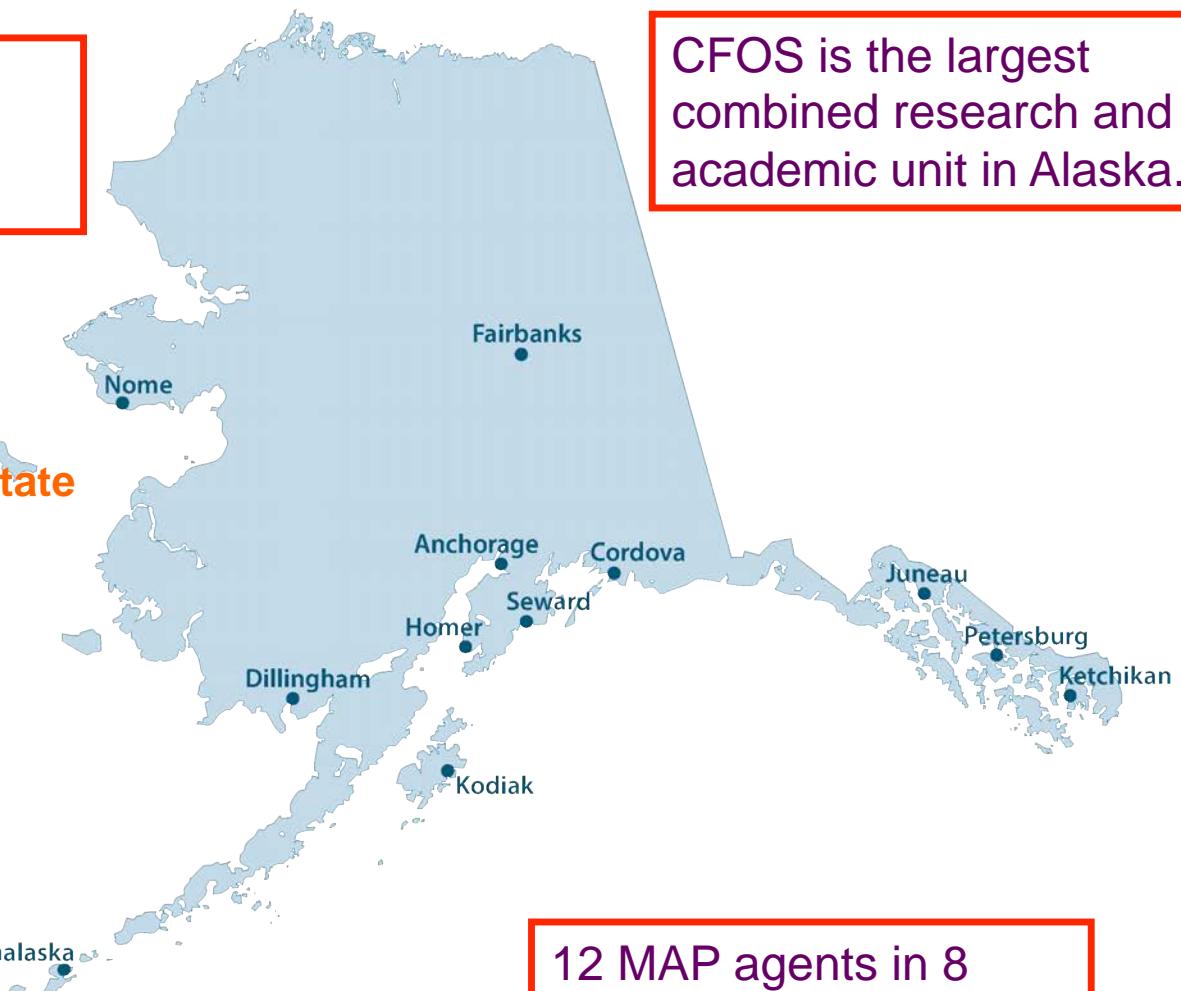
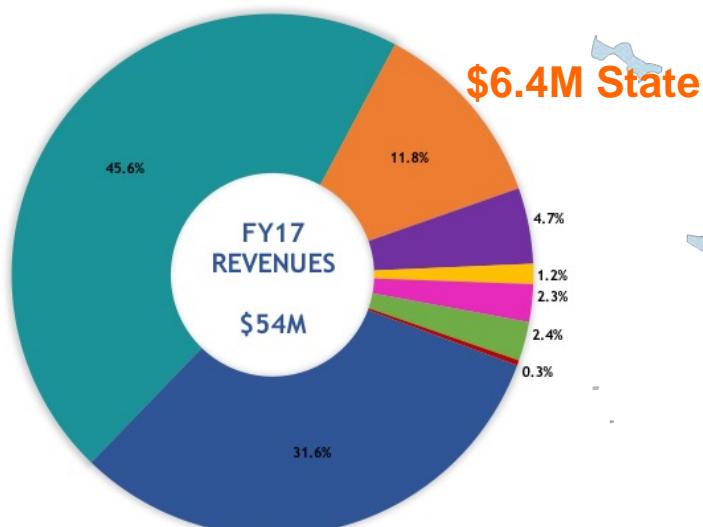
Alaska House Fisheries Committee
February 22nd, 2018

Statewide Presence

Over 300 faculty, staff and students in 12 locations across Alaska.

CFOS is the largest combined research and academic unit in Alaska.

\$24.6M Research



12 MAP agents in 8 coastal communities.

Academic Programs

- **Fisheries – Bachelor of Science (research focus)**
- **Fisheries – Bachelor of Arts (broader focus)**
- **Fisheries – Master of Science and Ph.D.**
- **Marine Biology – Master of Science and Ph.D.**
- **Oceanography – Master of Science and Ph.D.**
- **New Masters of Marine Studies**
- **New Fisheries and Ocean Sciences Undergraduate Degree**



Research & Economic Drivers

4

- Alaska Sea Grant Program
- Coastal Marine Institute
- Institute of Marine Science
- Kasitsna Bay Laboratory
- Kodiak Seafood & Marine Science Center
- Lena Point Fisheries Facility
- Ocean Acidification Research Center
- Pollock Conservation Cooperative Research Center
- Rasmuson Fisheries Research Center
- R/V *Sikuliaq* & Seward Marine Center



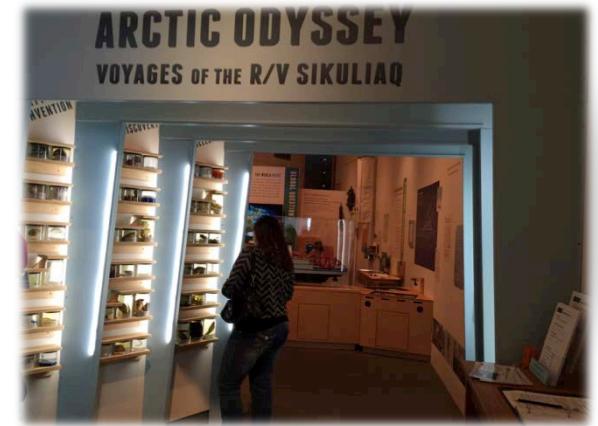
Partnerships

Pollock Conservation Cooperative is UAF's largest donor: ~\$20M since 2000

CFOS donors support the following:



Research Programs
Fisheries Undergraduate Program
Undergraduate Scholarships
Graduate Fellowships
R/V *Sikuliaq* Exhibit at the UA Museum of the North
R/V *Sikuliaq* Alaska Homecoming
Center for Salmon and Society
National Ocean Sciences Bowl
Marine Advisory Program
Citizen Science Initiative
AK Young Fishermen's Summit



CFOS Mariculture Facilities, Faculty and Research 6

Facilities available for research:

Kodiak Seafood and Marine Science Center: Seafood R&D facility; research kitchens, biochemistry, food labs; test & develop new seafood products.



Kasitsna Bay Laboratory: Running sea-water, wet/dry labs, cold room; research on kelp and invertebrate ecology, e.g. conditions for successful settlement and growth, development.



Seward Marine Center: Adjacent to Alutiiq Pride Shellfish Hatchery, facility for research on mariculture studies.

Lena Point: CFOS research and teaching facility in SE Alaska.



CFOS faculty funded for mariculture research (seaweeds, invertebrates):

Keith Criddle (aquaculture), Ginny Eckert (crabs), Sarah Hardy (sea cucumbers), Quentin Fong (seafood science), Amanda Kelley (ocean acidification w/ kelp, clams), Brenda Konar (kelp harvesting, clams), Mike Stekoll (kelp)



- *Networking & coordination*
- *Transnational access*
- *Joint research activities*

PI: S.B. Moran, CFOS/UAF

PRV Polarstern, DE



IB Oden, SE



R/V Kronprins Haakon, NO



RRS Sir David
Attenborough, UK



CCGS Amundsen, CA



R/V Sikuliaq, USA

Training Alaska's Professional Fisheries Workforce: Undergrads

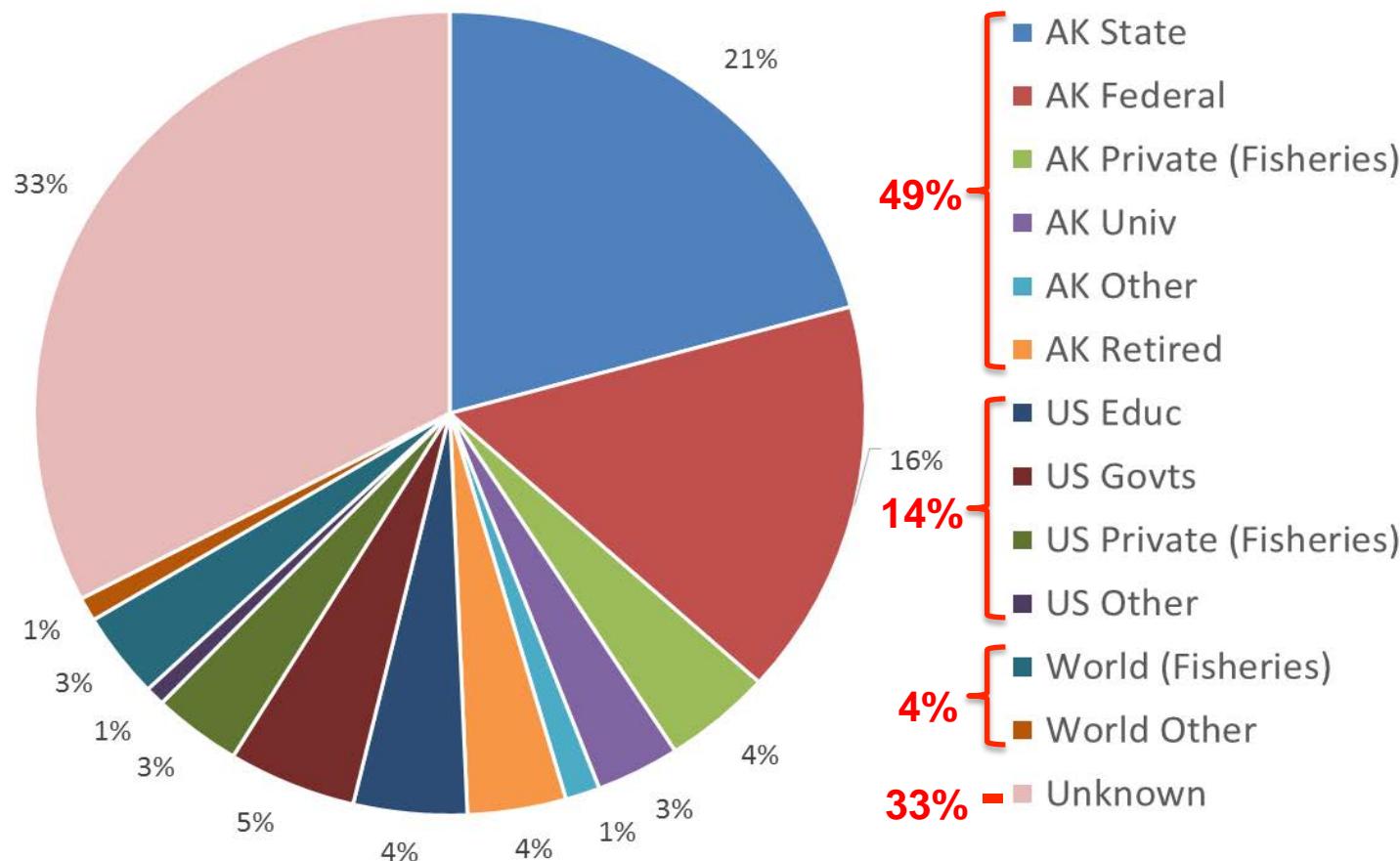
8

- Since 2007, there have been **74** graduates from our undergraduate fisheries program
 - **59** Bachelor of Science (BS)
 - **15** Bachelor of Arts (BA)
- Employment of graduates with BS and BA:
 - **45%** - work for state and federal agencies in Alaska (e.g., ADF&G, NMFS)
 - **27%** - attending graduate school
 - **14%** - work for fishing industry
 - **14%** - work for UAF

Employment of CFOS Fisheries MS and PhD Alumni

9

- **49% of M.S. and Ph.D. graduates work in Alaska**



CFOS Fisheries Graduates in Alaskan Economy¹⁰

- **Commercial fisheries:**
 - In 2015, Alaska commercial fisheries yielded 6B lb (60%) of the nation's fishery landings
 - \$1.8 billion ex-vessel value.
 - Seafood industry is Alaska's largest private employer, averaging ~60,000 workers.
- **Sport fisheries/Subsistence:**
 - In 2007, 475,534 resident/nonresident licensed anglers spent \$1.4 billion trip-related expenditures, supporting ~16,000 jobs in Alaska
 - Important customary and traditional uses of fishery resources

Department of Fisheries

Research Topics

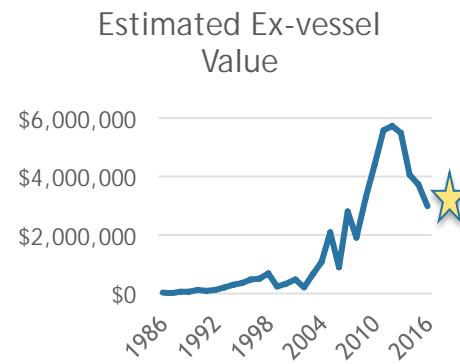
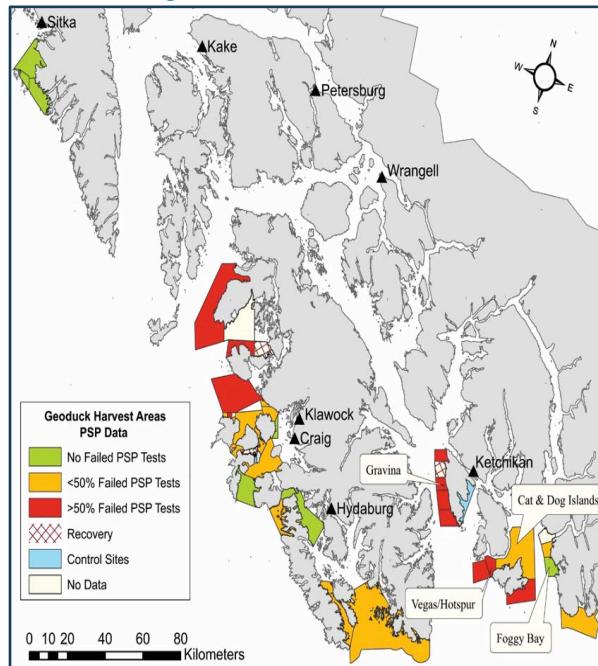
11

- **Topics** – Genetics, biology, ecology, migration, population dynamics, fishery oceanography, economics, human dimensions, and fishery management
- **Freshwater** – salmon, whitefishes, northern pike, rainbow trout, Arctic char, burbot, lampreys.
- **Marine** – Pacific halibut, rockfishes, sablefish, pollock, cod, salmon, herring, crabs, shrimp, skates, dogfish, etc.
- **Mammals** – sea lions, seals, walrus and whales

Algal Toxins Trigger Increased Closures 12 for a Lucrative Clam Fishery

Uncovering the mechanisms behind wintertime paralytic shellfish toxicity in geoduck clam fisheries in Southeast Alaska

Wild harvest of geoduck clams in SE Alaska has declined as a result of failed tests for paralytic shellfish toxins (PSTs); 76% of management areas failed weekly PST over 4 harvest seasons.



Our team is coordinating with resource managers, fishers, and stakeholders to understand why this clam fishery is experiencing an increase in closures so that we can address management and mitigation needs.

Courtney Hart | PhD student
 Ginny L. Eckert | Professor | (<http://bit.ly/2FfaYfc>)




Improved Release of Hatchery Salmon

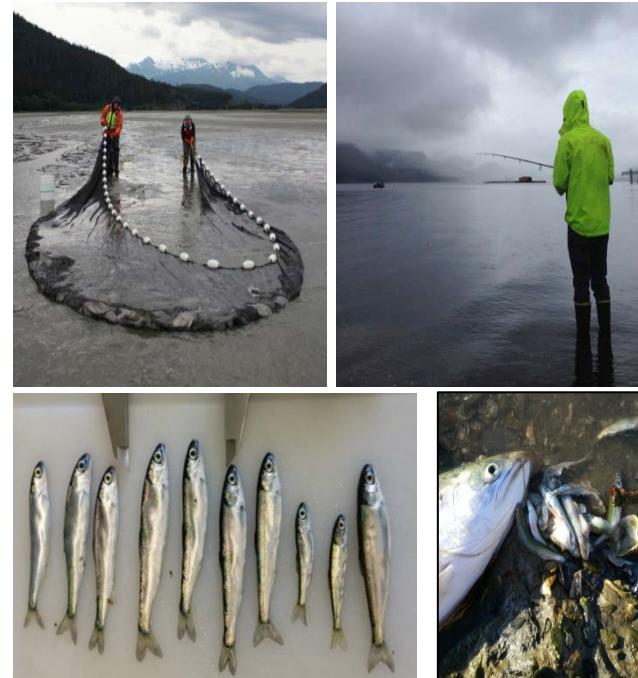
How are nearshore predators responding to hatchery released salmon?

Key Preliminary Results

- Pacific staghorn sculpin and Dolly Varden consume salmon smolts (mostly) and juveniles during May and June, including areas near hatchery release sites.
- As a result, hatchery salmon may be less vulnerable to predators because they are released at a large size.

Application

- Optimal release strategies that improve smolt survival to avoid highest risk of predation.
- Contribution of predation to early marine survival of juvenile salmon.



Research Team: Dr. Anne Beaudreau (UAF PI), Mr. Douglas Duncan (UAF student)

Collaborating Organizations: University of Alaska Fairbanks, University of Alaska Southeast, Alaska EPSCoR program, and the Age Tag Mark Lab of the Alaska Department of Fish and Game

Funders: University of Alaska Fairbanks, Alaska Sea Grant, Douglas Island Pink and Chum, Inc.

Killer Whale Depredation in Longline Fisheries

Problems:

Management: • Inaccurate stocks assessments

Fishermen: • Reduced catches • Increased costs

Whales: • Risk of entanglement • behavior change



Results: 39-73% reduction in survey catches, and 35-70% reduction in commercial catches of halibut, sablefish and Greenland turbot.

Outcomes:

- Adjustments to NMFS stock assessments (in process)
- NPFMC now allows use of pot gear in Gulf of Alaska

Interactions between State Fisheries and Steller Sea Lions

15

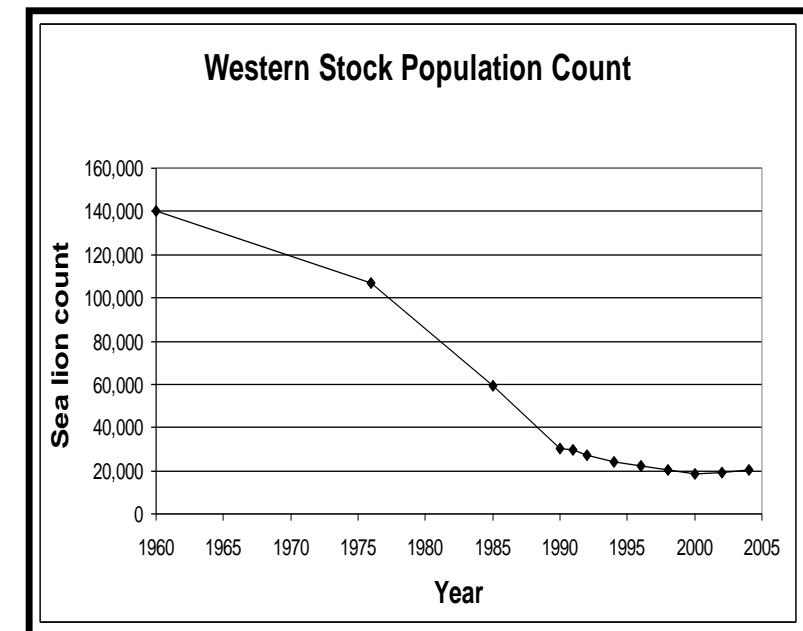
Problem: Decline of western stock of Steller sea lions raised concerns about fishery interactions. Is there evidence that state fisheries are partly responsible?

Approach: Statistical analysis of trends on sea lion rookeries and state fishery catches.



Funding: ADF&G.

Results: No evidence for effects of state fisheries on sea lions was found.



Outcome: Additional costly restrictions were not imposed on state-managed fisheries to mitigate effects on sea lions.

Analysis of Tanner Crab Size Limit

Problem: Many sublegal Tanner crab reach terminal molt and will never grow to legal size, resulting in excessive discards and waste.

Approach: Computer model analysis of catch, bycatch, and fishery economics.



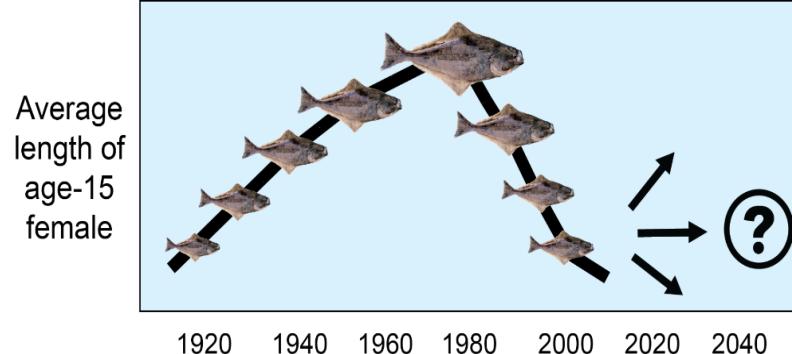
Funding: Bering Sea Fishery Research Foundation.

Results: Lower size limit reduces discard mortality, increases CPUE, produces higher yields and revenues, and lowers marginal fishing costs.



Outcome: Board of Fisheries approved proposal to reduce the size limit, improving the profitability of the Tanner crab fishery.

Declines in Size of Pacific Halibut



Methods: Cumulative effects of size-selective fishing and harvest rates were evaluated by simulation models.

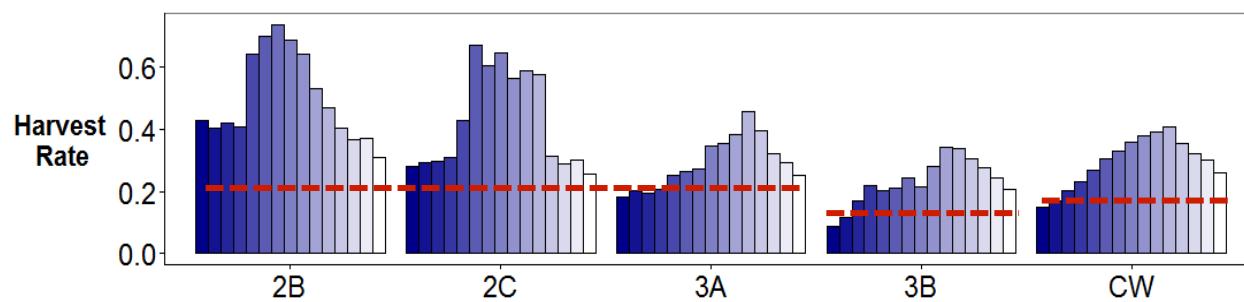
Results: High harvest rates and size-selective fishing explains 30-65% of the decline in the Gulf of Alaska.

Problem:

The average weight of an age-20 halibut declined from 120 lb in 1988 to 45 lb in 2015. The stock also declined.

Outcome: The International Pacific Halibut Commission has revised their stock assessment model to fix the bias.

Funding: PCCRC and NNRB.
Collaborators: IPHC.



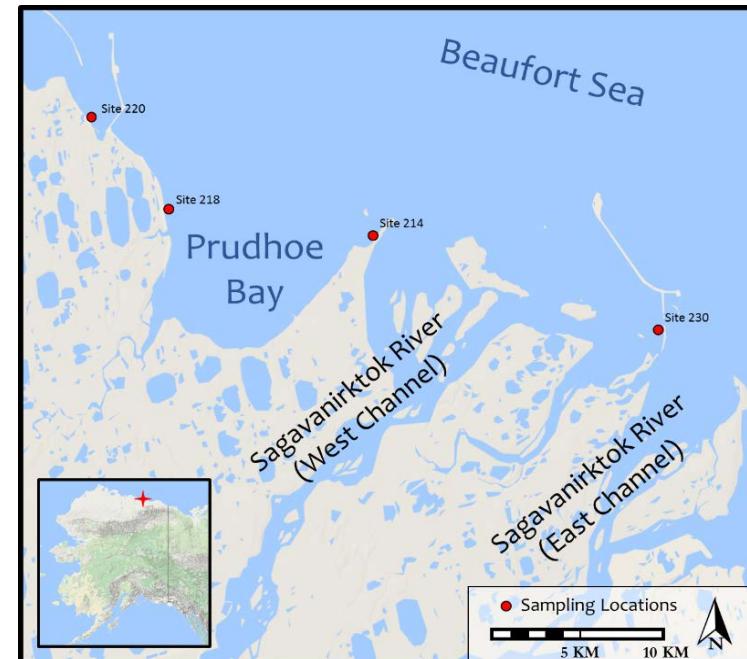
Beaufort Sea Fish Monitoring

Goal: As part of their commitment to environmental and social responsibility, since 1985 Hilcorp 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.

Results: Ongoing research is focusing on climate effects on fish communities, bioenergetics, and growth.



Funding: Hilcorp Energy Company

Thank you!



R/V Sikuliaq

College of Fisheries
and Ocean Sciences

<https://www.sikuliaq.alaska.edu>



APPENDIX

Educating the Next Generation



Fisheries • Marine Biology • Oceanography

Public Engagement

Developing Connections to the Ocean that Last a Lifetime!



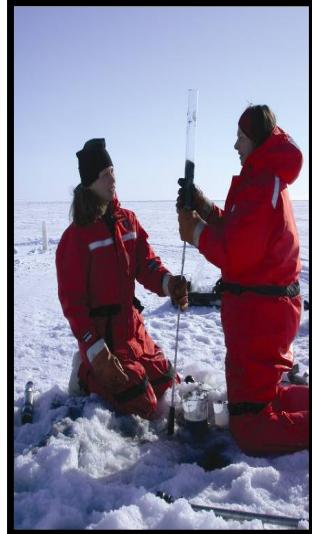
- Alaska Sea Grant Marine Advisory Program
- National Ocean Sciences Bowl – Alaska Tsunami Bowl
- PIO and R/V *Sikuliaq* science liaison

CFOS Fisheries Students in Action



Department of Fisheries

Research Locations



Arctic



Bering



Aleutian



SE Alaska



Gulf of Alaska



Freshwater

Department of Fisheries Faculty Service Activities Examples

- **North Pacific Fishery Management Council –**
Crab and Groundfish Plan Teams and Scientific
and Statistical Committee
- **North Pacific Research Board Science Panel**
- **EVOS Trustee Council Science Panel**
- **North Pacific Marine Science Organization**
Fishery Science Committee – US delegate
- **Juneau Economic Development Council**
Research and Development Working Cluster
- **Community service – high school science fairs**
- **Fishery stakeholders – advice, collaboration**