

7.–8. nóvember í Hörpu

**Stjórnun
fiskveiða**

– svo miklu meira en kvóti

Fiskveiðistjórnun í Norður-Kyrrahafi Samvinnurannsóknir með iðnaði

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Reykjavík, Ísland



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SJÁVARÚTVEGS
RÁÐSTEFNAN

2024



Thank you for the invitation, to learn from your experiences, and to share some perspectives from Alaska.

Góðan dag.

Þakka ykkur fyrir boðið, að læra af reynslu ykkar, og deila nokkrum sjónarhornum frá Alaska.



SJÁVARÚTVEGS
RÁÐSTEFNAN
2024

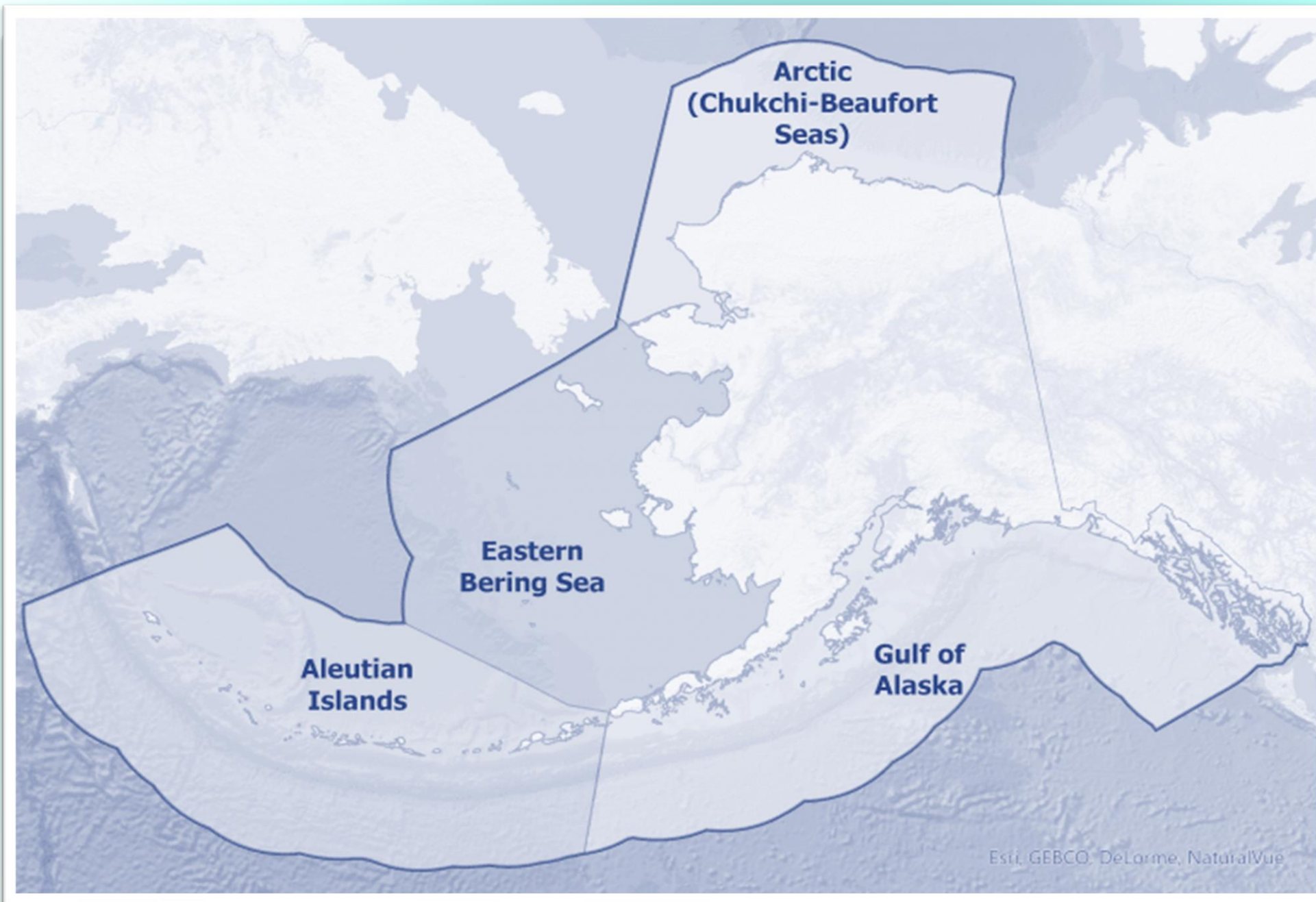
Rannsóknarráð Norður-Kyrrahafs

Supporting scientific research to inform effective fisheries management and sustainable use of marine resources



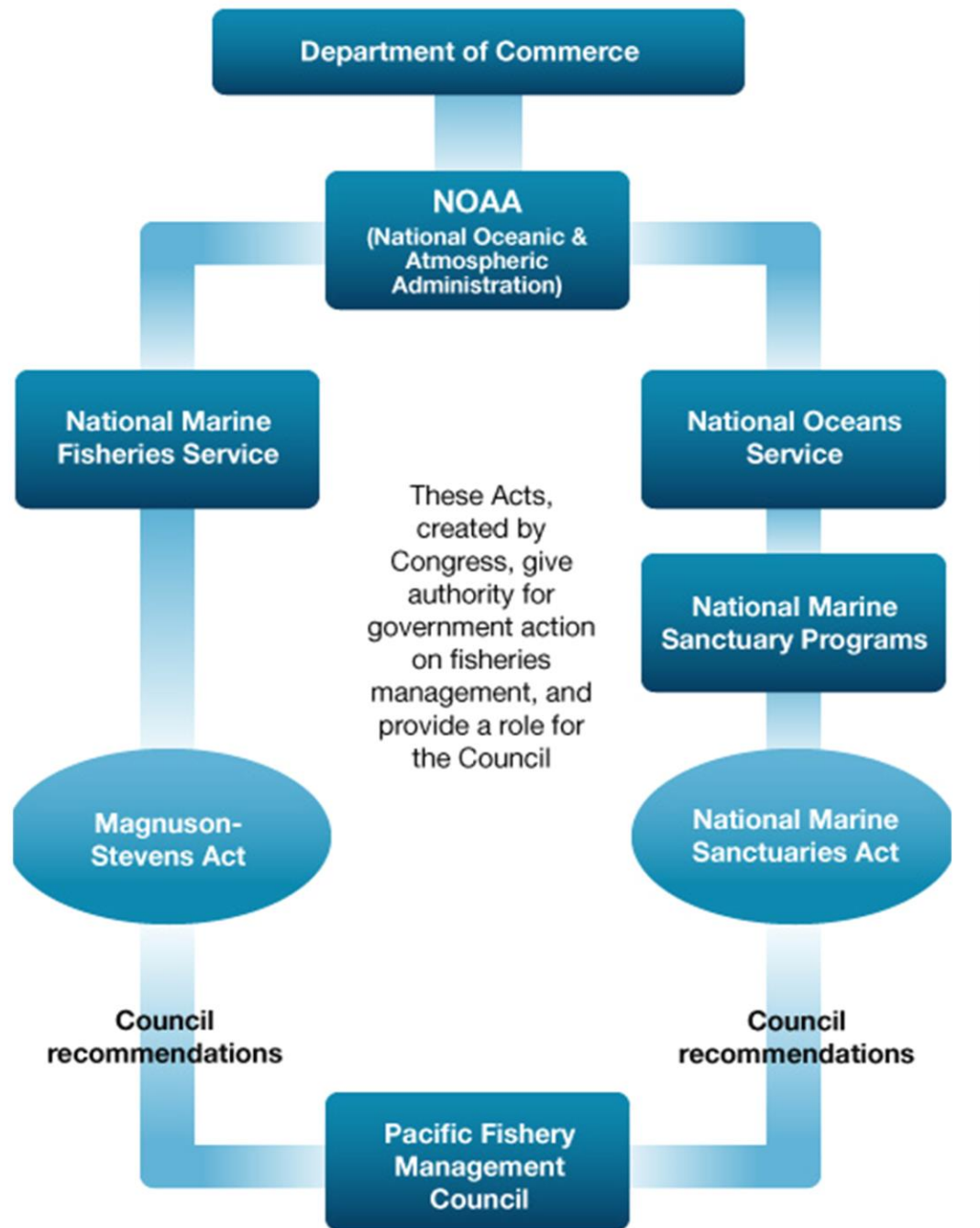
Norður-Kyrrahaf





**Fiskveiðistjórnunarráð
Norður-Kyrrahafs**
1 of 8 regional councils

1 af 8 svæðum sem
stofnuð voru með
lögum um verndun og
stjórnun fiskveiða til
að stjórna fiskveiðum



Council works with scientists, stakeholders, public...

.....to balance conservation, economic and social concerns to manage sustainable fisheries for the greatest benefit to the nation.

Council sets:

- o Harvest quotas (Kvóta)
- o Prohibited species catch limits (Verndum tegunda)
- o Habitat protections (Verndum búsvæði)
- o Restrictions to gear, area, and season (Takmarkarnir)
- o Monitoring programs (Eftirlit)
- o Access privileges (Aðgangsstýring)



FROM AN IDEA TO IMPLEMENTATION

THE COUNCIL PROCESS
is guided by federal laws and policies.

IT TAKES MANY STEPS to get from an IDEA TO IMPLEMENTATION.
Each issue is reviewed at several meetings,
and some issues are more complex and take longer.

1 Most **IDEAS** can be brought to the Council during public testimony or through an advisory body. New issues are often raised up during Staff Tasking at the end of the meeting.

2 **DISCUSSION PAPER** / Expanded Discussion Paper: The staff prepares a discussion paper to explore the scope of an issue and can help the Council develop alternative solutions. For very complex issues, several discussion papers may be needed to explore all components of an issue. Based on the discussion paper and public input, the Council adopts a problem statement and identifies several distinct alternatives for **ANALYSIS**. (Simpler issues may go directly to analysis and initial review.)

3 **INITIAL REVIEW**: Staff prepares a draft analysis incorporating applicable laws, public input and development from earlier stages. Depending on feedback from the SSC, stakeholder advisory bodies and the public, the Council will determine whether the analysis is ready to advance to final action or needs more development.

4 **FINAL ACTION**: Staff revises the analysis based on advisory body and Council recommendations. The public provides comment, and the AP makes a recommendation to the Council regarding a preferred alternative. The Council makes a final decision.

The ability to comment is available at every stage.

APPROVAL AND IMPLEMENTATION

The National Marine Fisheries Service **PREPARES REGULATIONS BASED ON COUNCIL ACTION** and after a comment period and approval, new regulations take effect and are enforced.

1

Hugmyndir

Ideas submitted thru public testimony or advisory groups

2

Umræða

Discussion developed by Council Staff and reviewed at Science and Advisory Committees

3

Upphafleg endurskoðun
Initial Review

4

Lokaaðgerð
Final Action



Forgangsverkefni fiskveiðistjórnunarráðs eru vísindalegar þarfir og hagsmunir til að bæta stjórnun sjávarauðlinda og sjálfbærra fiskveiðisamfélaga.



Council's research priorities....

science to improve
stewardship of
marine resources
and sustainable
fishing
communities



PROJECT SEARCH

Since 2002, NPRB has supported three major ecosystem research programs, over 430 multi-annual projects, 62 graduate students, and three long-term monitoring projects. We are working on several tools for users to search, query, and learn more about our funded projects.



CORE PROJECT SEARCH

The Core Program is NPRB's longest active program. It has supported a wide range of marine science research projects that have been funded since 2002. Search and query project information

Leita eftir verkefni

[MORE INFO](#)



SEARCH BY LOCATION

Looking for a different way to browse our project information? Search by location. Filter projects by spatial project location. Discover how projects relate to the Gulf of Alaska, Bering & Aleutian Islands, and

Leita eftir staðsetningu

[MORE INFO](#)



ARCTIC DATA PORTAL

Axiom Data Science provided data management services for the Arctic Data Portal. Discover data collected by the program. Click the button below to access the data portal.

Gagnagátt

[ACCESS PORTAL](#)



0207 Detecting change in the Bering Sea ecosystem

Project Overview ⓘ

Project Data (2) 

Downloads ▾

+ Files

Abstract

The project addresses three major issues for the Bering Sea ecosystem: 1) organization and maintenance of historic and current information, 2) understanding of regional climate variability and its consequences, and 3) detecting changes in the long-term regimes. During the work on the project a new interactive web site has been developed. This web site – www.BeringClimate.noaa.gov – provides up-to-date information on the status of the Bering Sea ecosystem and facilitates access to the metrics characterizing different aspects of the ecosystem. In addressing the second issue a particular attention has been paid to the Aleutian low, which is the main climate feature influencing the Bering Sea. A classification of large-scale atmospheric circulation patterns associated with warm and cold winters in the Bering Sea has been developed. A timely detection of regime shifts in marine ecosystems is critically important for ecosystem-based fishery management. Existing methods for regime shift detection all the methods have a common problem: the drastic deterioration of the test statistics toward the ends of timeseries. To overcome this problem a new method based on sequential t-test analysis has been developed.



North Pacific Fishery Management Council: Research Priorities

[Query List](#)[Reports](#)

Research Priorities Query and Records List

[Export](#)

Plan Teams ▾

- ☐ Joint Groundfish PT
- ☐ Crab PT
- ☐ Scallop PT

Council Actions ▾

Ecosystem Area ▾

- ☐ Gulf of Alaska
- ☐ Bering Sea
- ☐ Aleutian Islands
- ☐ Arctic

Council Priority ▾

Research Status ▾

10 records per page

Search:

ID	Title	Council/SSC Priority	Research Status	Ecosystem Area	Related Council Action
144	District-wide survey for demersal shelf rockfish in Southeast Alaska	Critical Ongoing Monitoring	No action	Gulf of Alaska	Harvest specifications
145	Continuation of State and Federal annual and biennial surveys	Critical Ongoing Monitoring	Underway	Gulf of Alaska, Bering Sea, Aleutian Islands	Harvest specifications
146	Improve surveys in untrawlable habitat, particularly for rockfish, Atka mackerel, and sculpins	Urgent	Partially underway	Gulf of Alaska, Bering Sea, Aleutian Islands	Harvest specifications
147	Life history research on data poor or non-recovering crab stocks	Important	No action	Bering Sea	Harvest specifications



**NPRB SCIENCE
FOUNDATION**
THE BACKBONE OF OUR SCIENCE



**THREE OVERARCHING
PREMISES**
UNDERLYING SCIENCE
ASSUMPTIONS



**GENERAL SCIENCE
PRIORITIES**
THE SCIENCE NPRB SUPPORTS



**TYPES OF RESEARCH
APPROACHES**
SUPPORTED METHODS OF
RESEARCH

SCIENCE PRIORITIES & APPROACHES

Science priorities reflect broad research interests relevant to all NPRB research programs. To establish a research priority, general areas of interest are identified. They encompass scientific interests that have been identified in past NPRB RFPs and are considered to be of continued or persistent interest. In addition, more immediate interest also may be identified, specific to the program and RFP. In general, the NPRB encourages the development of relevant, novel approaches. *Research approaches* are developed through engagement with Alaska's coastal communities and/or industries, preserve and protect the environment, and to support new and innovative technological developments.





Cooperative research engages industry partners and leverages industry insight and infrastructure to address management needs, improve shared understanding, and support marine observations



COOPERATIVE RESEARCH WITH INDUSTRY

RESEARCH APPROACH

Samstarf við iðnaðinn felur í sér að virkja samstarfsaðila iðnaðarins og nýta innsýn og innviði iðnaðarins til að takast á við brýnar stjórnunarþarfir, bæta sameiginlegan skilning og styðja við hafrannsóknir



Cooperative research must ensure the scientific integrity, practicality, and cost effectiveness of the experimental design and ensure application to fishery management



COOPERATIVE RESEARCH WITH INDUSTRY

RESEARCH APPROACH

Samstarfsrannsóknir verða að tryggja vísindalega heiðarleika, hagnýtni og kostnaðaráætlun í tilraunahönnuninni, auk þess að tryggja að niðurstöður hafi notkun í fiskveiðistjórn

Af hverju við tökum þátt í því

Sambætta sjónarmið vísinda og iðnaðar

- ferli til að þróa og ramma inn spurningar
- nálgun við hönnun rannsókna, greina niðurstöður, sambætta gögn og athuganir
- leiðir til að nýta auðlindir, færni og innsýn
- tækifæri til að upplýsa, tulka, og beita niðurstöðum



Why we engage in it

- process to develop and frame questions
- approach to design studies, analyze results, integrate data and observations
- means to leverage resources, skills, and insights
- opportunity to inform interpretation and application of results

Perspectives | science & industry

Sjónarmið | Stjórnendur og iðnaður

Managers/Scientists

- Seek verifiable facts (Áreiðanleiki)
- Develop professional consensus (Samstaða)
- Prioritize and plan (Skipulag)
- Generate and test hypotheses (Prófanir)
- Technocratic, bureaucratic (Stofnanamiðað)
- Importance of peer review (Ritrýni)
- Seek to understand bio-complexity (Flækja)

Industry/Stakeholders

- Seek useful information (Skýrt og gagnlegt)
- Resolve disputes quickly (Leysa ágreining)
- Solutions, timely outcomes (Lausnamiðað)
- Intuition and experience (Reynsla)
- Public, adversarial (Almenningsmiðað)
- Importance of reputation (Endurgeranleiki)
- Seek to simplify and categorize (Einfaldleiki)

Assets and Skills | science & industry

Eiginleikar og færni | Vísindi og iðnaður

Managers/Scientists

- Fish biology
- Scientific design
- Models
- Laboratory trials
- Video/data analysis
- Technology development

Industry/Stakeholders

- Innovation
- On the water experience
- Insights on fish and gear behavior
- Identifying pressing issues
- Vessel/ logistic support for research
- Linking results with application

Aðgerðir og aðferðir

Samvinnurannsóknir virka best þegar vísindamenn og sjómenn bera kennsl á ákveðna spurningu og viðurkenna að samvinna sé áhrifaríkasta leiðin til að takast á við þá spurningu.

Strategies and Approaches

Cooperative research works best when scientists and fishermen identify a specific question and explicitly acknowledge that working together is the most effective way to address that question.



Cooperative Research with Industry

Staðlar og væntingar

- þátttaka iðnaðarins, hugmynd til greiningar
- beiting við brýnar stjórnunarþarfir
- Möguleiki á að bæta skilning
- notkun núverandi innviða

Standards and Expectations

- industry engagement (conception to analysis)
- applicability to management needs
- potential to improve understanding
- use of existing infrastructure



Cooperative Research with Industry

Rannsóknarþarfir

- Breytingar á veiðarfærum til að draga úr áhrifum búsvæða
- breytingar á veiðarfærum sem bæta veiðihæfni/valhæfni
- áhrif veiða á aðrar tegundir
- aðferðir til að draga úr meðafla og brottkastsdauða
- gögn um sókn og nýtingarhlutfall fiskveiða
- líffræðilegar upplýsingar

Types of Research

- gear modifications to reduce habitat impacts
- gear modifications that improve catchability/selectivity
- gear loss and interactions with non-target species
- methods to reduce bycatch and discard mortality
- data on fishery effort and exploitation rates
- biological data

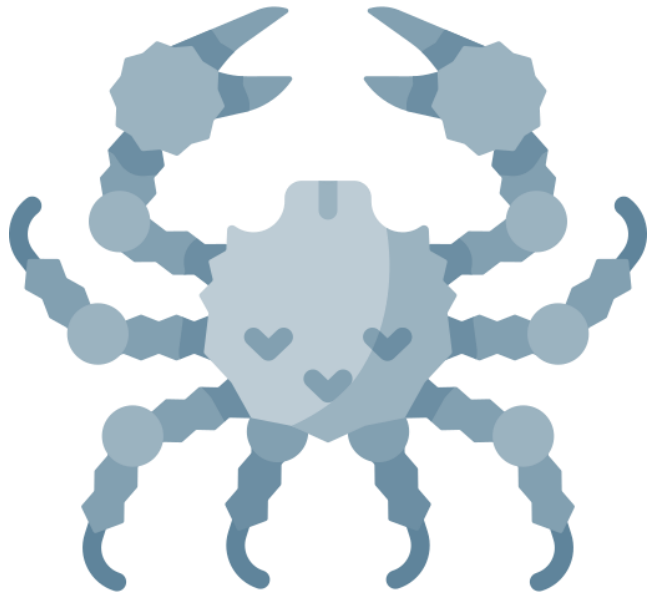


Cooperative Research with Industry

EXAMPLES



Improved estimates of Red King Crab biomass



RKC fishery closed for 6 years

Mark-recapture study

Industry wants to reopen fishery

Incorporated information
in stock assessments

Fishery reopened

Red King Crab



Context

Survey suggested low stocks and closed fishery

- Model assumption that survey catch was proportional to abundance
- Complex geography and seasonal movement of crab
- Industry knowledge suggested increasing populations

Red King Crab

A photograph of a wooden pier structure over water. The pier has a dark wooden building on the left and a walkway with a metal railing extending to the right. The water is calm, and the sky is filled with many white birds, likely gulls, flying in various directions. In the background, there are rolling hills or mountains under a hazy sky.

Approach

commercial vessels set pots in mark-recapture study

Red King Crab



Outcome

Mark-Recapture produced greater estimates than survey

→ adjusted biomass estimates → opening of fishery

→ improved spatial understanding of crab distributions

Development of raised gear in trawl fishery



Concern about trawl gear impacts

Industry proposed study on potential modifications

Estimates on habitat impacts

Gear modifications implemented in policy

Reduced spatial constraints on fishery

Reduced seabird bycatch in longline fisheries



Incidental catch of seabirds limiting fishing (albatross)

Industry wants to reduce bycatch

Implementation of experimental streamer lines

Incorporated technology into fishery

Fishery maintained without loss in catch

Reduced whale predation in longline fisheries



Sperm whales remove fish from commercial longline fishing gear

Implementation of underwater cameras and hydrophones

Industry wants to deter whales

Improved understanding of behavior and deterrence

Industry modifications reduced whale depredation on black cod

Tags on whales

How do they behave underwater?
Where do they go?



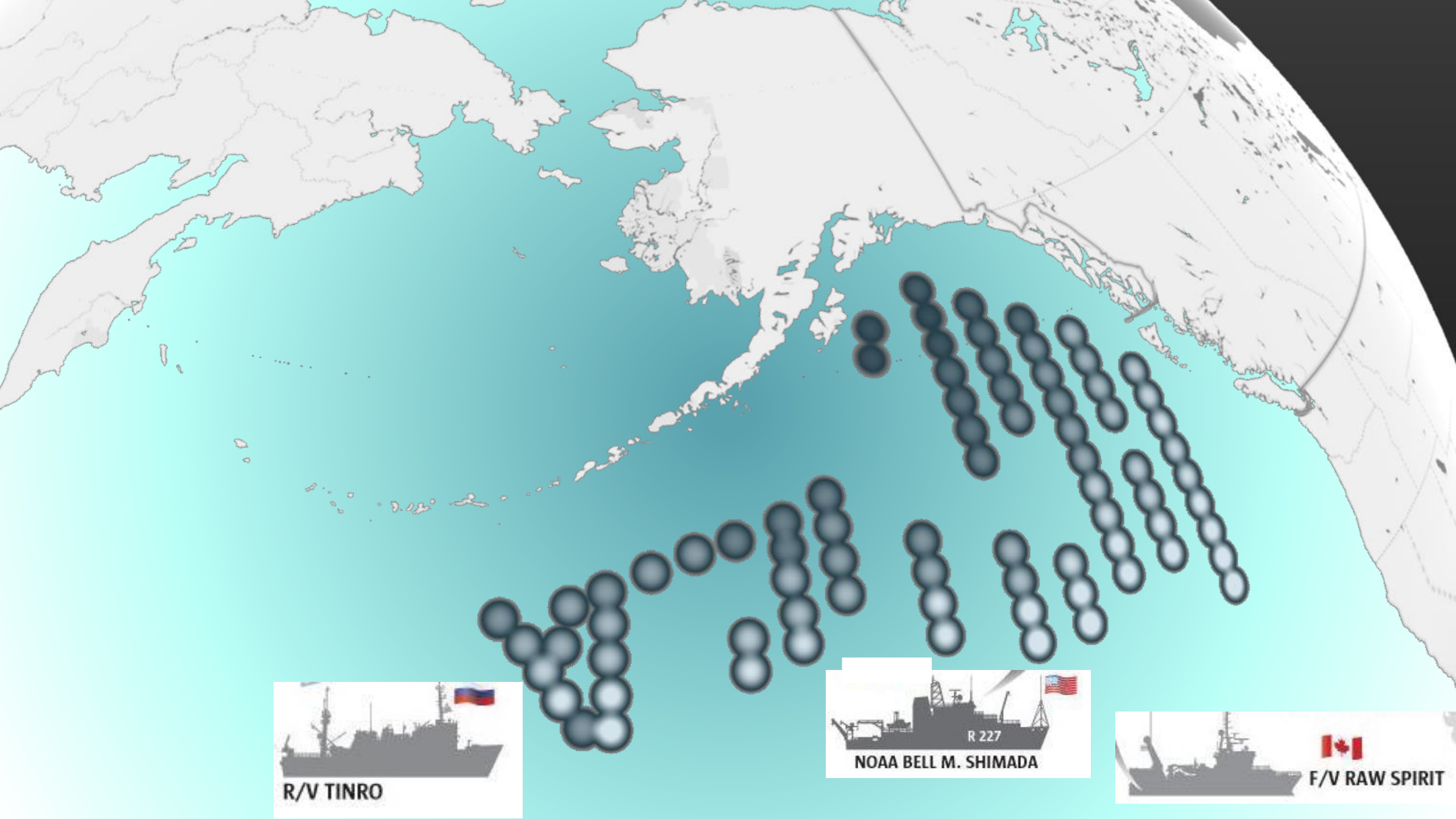
Cameras and Hydrophones

What is happening underwater



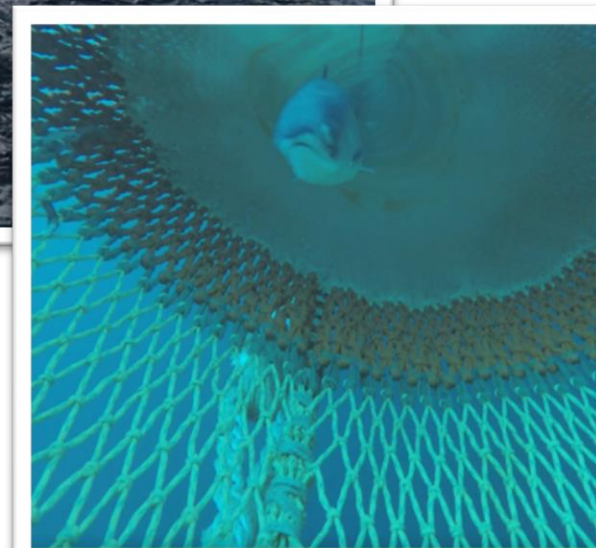
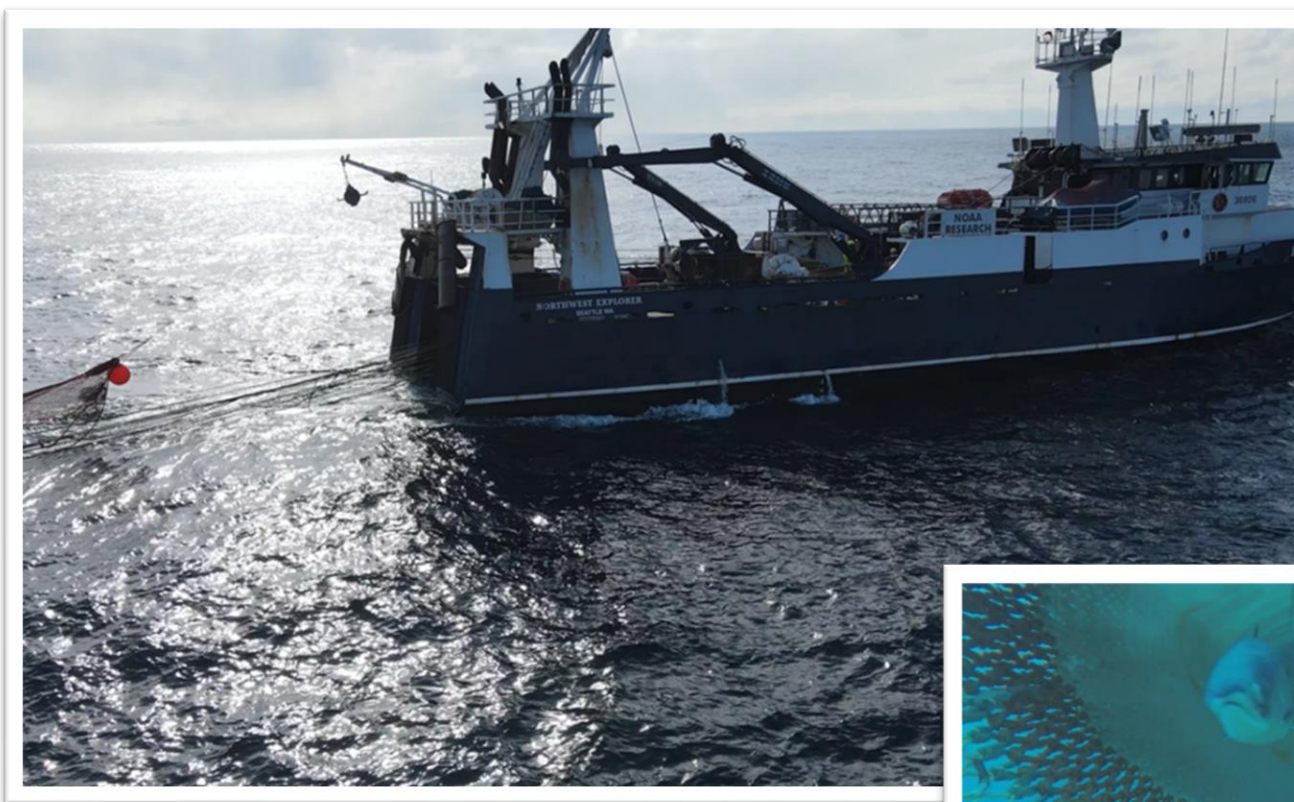
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INTERNATIONAL
YEAR OF THE SALMON



The 2022 Pan-Pacific Winter High Seas Expedition

The largest ever pan-Pacific expedition to study the winter ecology of salmon in the North Pacific Ocean

The 2022 Winter High Seas Cruise Reports and [Data Portal](#) are available online.

More available:

<https://yearofthesalmon.org/2022expedition/>

https://yearofthesalmon.org/northwest_explorer/

<https://storvmaps.arcgis.com/stories/661e6f158120464da454a8ab828465c2>



INTERNATIONAL
YEAR OF THE SALMON



BSFRF

Bering Sea
Fisheries
Research
Foundation



Industry-led Cooperative Research

- **Assumptions** – better research will result in better management
- **Approach** – develop research priorities (owners, skippers, processors)
- **Finances** – funded from voluntary industry participants (\$100 in research funds generated from \$15,000 of crab landed)



BSFRF

Bering Sea
Fisheries
Research
Foundation



Industry-led Cooperative Research – Recommendations

- Understand the management process and its timing
- Avoid conflicts of interest
- Ensure results are robust
- Strive for transparency
- Share data and results
- Acknowledge disagreement
- Find strong leaders

Lowell Wakefield Fisheries Symposium

Cooperative Research

strategies for integrating industry perspectives and insights in fisheries science





Lowell Wakefield Fisheries Symposium

2019 Wakefield Fisheries Symposium

Cooperative Research — strategies for integrating industry perspectives and insights in fisheries science

May 7–9, 2019 • Anchorage, Alaska

Description

Fishermen and industries engaged in marine resource extraction are invested in understanding the status and trends of marine ecosystems and targeted resources. These industries are also well positioned to contribute to, support and inform marine science. Individuals involved in those industries have direct interest in and knowledge of marine resource dynamics. The intent of this

symposium is to explore effective strategies and approaches to integrate industry perspectives and insights in fisheries science.

Effective cooperative research between scientists and industry requires identifying questions of joint interest, determining effective means to collaborate and leverage resources, skills, and insights, and processes to facilitate the integration of data and perspectives to inform interpretation and application of results.

kanna árangursríkar aðferðir og aðferðir til að samþætta sjónarmið iðnaðarins og innsýn í sjávarútvegsfræði

Árangursríkar samvinnurannsóknir vísinda og iðnaðar krefjast þess að bera kennsl á sameiginlega hagsmuni, ákvarða árangursríkar leiðir til samstarfs og nýta auðlindir, færni og innsýn og ferla til að auðvelda samþættingu gagna og upplýsinga til að upplýsa túlkun og beitingu niðurstaðna



Cooperative Research

cooperation – process of working together to the same purpose

partnership – state of being engaged together in the same activity

collaboration – action of working with others to accomplish something

How to define it

What is cooperative research?

Good research needs scientific discipline

Right approach requires both perspectives





How to implement it

Integrate science and industry perspectives...
...to develop questions, design studies, analyze results

Word Diagram – Noelle Yochum, NOAA

[illegible][illegible]

How to implement it

Integrate science and industry perspectives...
...to develop questions, design studies, analyze results

A word cloud diagram containing various terms such as: Trust, Synergy, Managers, Understand The Community, Let Go Of Preconceived Ideas, Transparency, Consider Opportunity Costs, Tailor Research To Fishery Needs, Engage Buy-in, Time Is Money, Voices Heard, Expect Change, Identify Roles, Disseminate Results, Accountability, Commitment, Synergy, Progress, Innovation, Obstacles, Funding Needed, Fishermen, Collaborative Research, Create A Contract, Relationships, Worthwhile For Crew, Remember The Little Guy, Obstacles, Accountability, Buy-in, Progress, Engagement, Honesty, Benefits, Scientists, Innovation, Progress, Obstacles, Transparency, Honesty, Accountability, Managers, Trust, Synergy, Community, Benefits.

Word Diagram – Noelle Yochum, NOAA

Lessons Learned

- common objectives
- clarity of motivation
- importance of communication and trust
- application of results towards management or operations

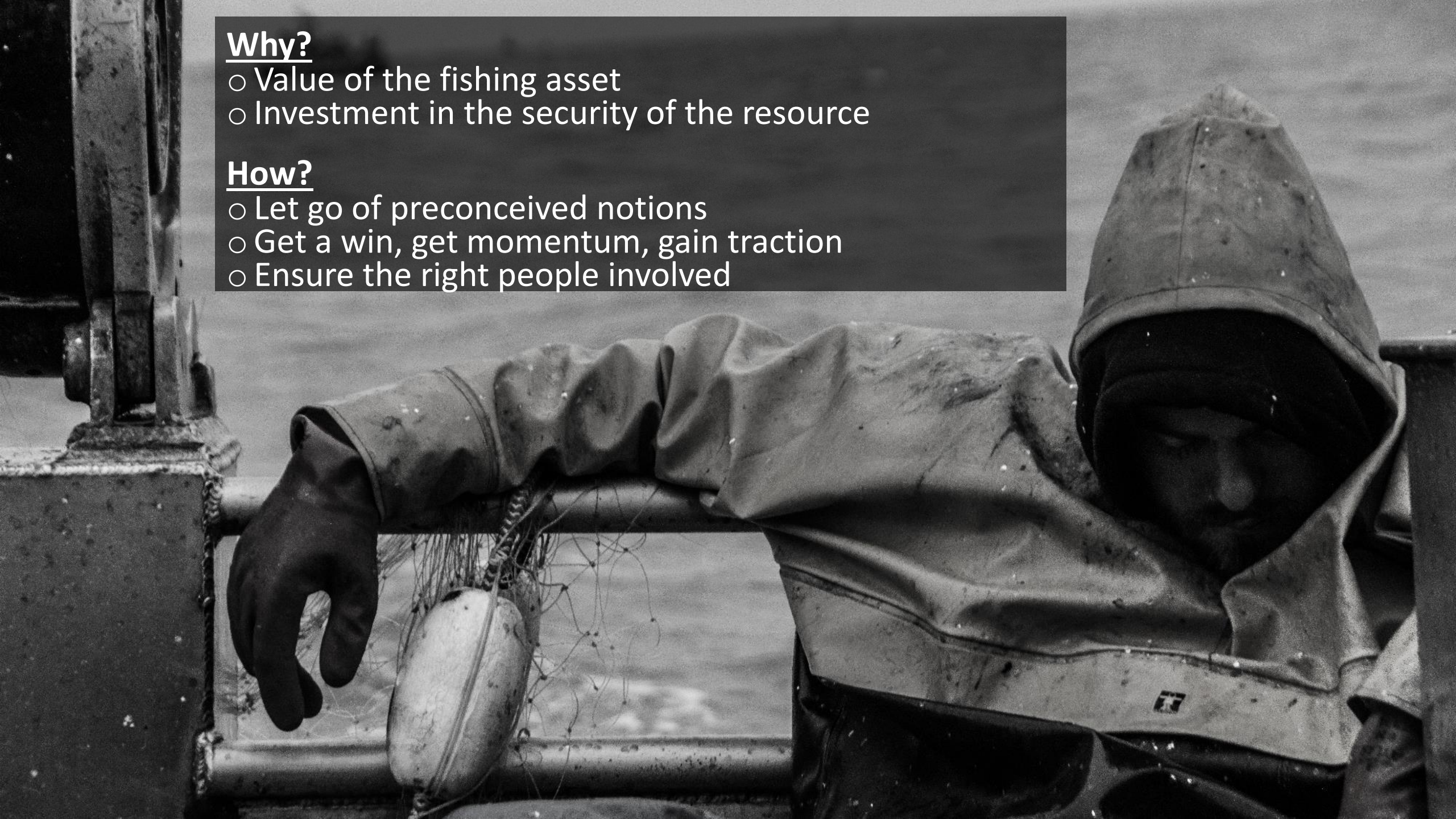


Why?

- Value of the fishing asset
- Investment in the security of the resource


How?

- Let go of preconceived notions
- Get a win, get momentum, gain traction
- Ensure the right people involved



Discussion

Strategies for integrating industry perspectives and insights in fisheries science



"In collaborative research, sometimes it is stakeholders who lead the way."

"Institutions enable cooperative research, but people conduct cooperative research."

Co-creating Knowledge with Fishers: Challenges and Lessons for Integrating Fishers' Knowledge Contributions into Marine Science in Well-Developed Scientific Advisory Systems

2,026
Total Downloads

23k
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Overview Articles 15 Authors 114 Impact

About this Research Topic

15 Articles

There is increasing support in the established scientific advisory frameworks for the integration of data and information provided by the fishing industry. Science-industry research collaboration (SIRC) is driven by a clear willingness by the fishing industry to collect and provide information, and by a growing interest within the scientific community to collaborate with fishers; particularly in relation to efforts to apply the best available information to assessment and management problems. While the relevance for using fishers' knowledge contributions* is recognized, there are challenges about how to do it in a way that delivers good quality information that is considered trustworthy within the constraints of established evidence-based decision-making processes.



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Mechanisms and models for industry engagement in collaborative research in commercial fisheries

 Matthew R. Baker¹  Robert Alverson^{2†}  Ruth Christiansen^{3†}  Keith Criddle^{4¶}  Danny Eilertsen^{5‡}  Robert J. Foy^{6‡}  John Gauvin^{7*}  Scott E. Goodman^{8‡}  Leigh Habegger^{9†}  Bradley P. Harris^{10*}  Nicole Kimball^{11‡}  Anna Malek Mercer^{12¶}  Edward Poulsen^{13†}  Matt Robinson^{14†}  Jeremy Rusin^{6†}  Rebecca Skinner^{15†}  Claus Reedtz Sparrevohn^{16‡}  Kevin D. E. Stokesbury^{17‡}  Daryl R. Sykes^{18‡}

Insights of 100 scientists, managers, industry representatives and fishers....

...outline actionable recommendations for effective approaches to integrate industry data and perspectives into fisheries science

...highlight opportunities and address challenges and limitations

¹⁵ Alaska Whitefish Trawlers Association, Kodiak, AK, United States

¹⁶ Danish Pelagic Producers Organization, København, Denmark

¹⁷ Department of Fisheries Oceanography, University of Massachusetts, Dartmouth, MA, United States

¹⁸ New Zealand Rock Lobster Industry Council, Wellington, New Zealand

**Claus Reedtz Sparrevohn,
Martin Pastoors and
Steven Mackinson**

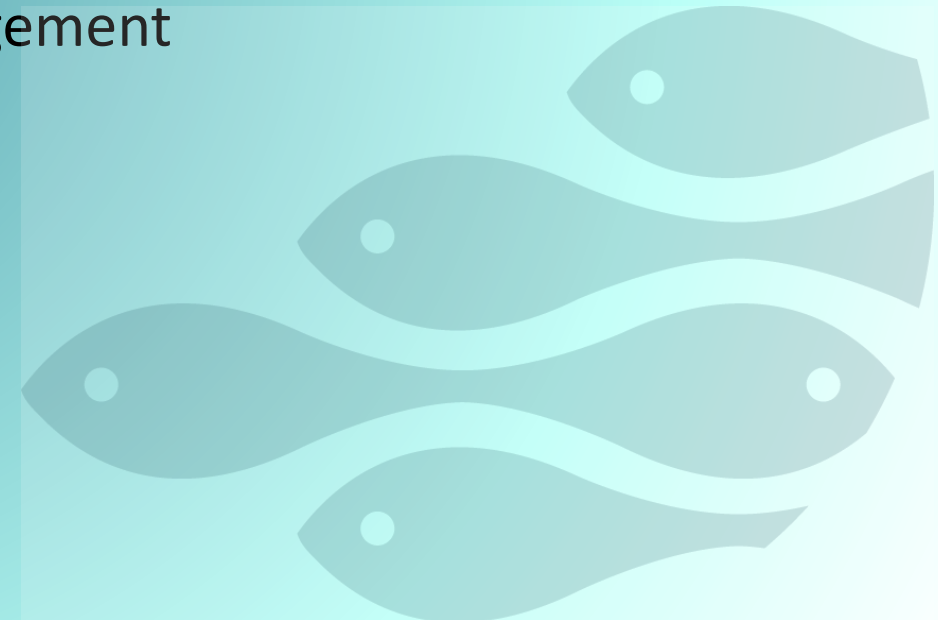
Experiences from Europe

Where science can do better

- Communicate results
- Avoid unrealistic assumptions and expectations

Where industry can do better

- Discriminate between what is science and what is management
- Collect data and quantitative observations



POLICY AND PRACTICE REVIEWS article

Front. Mar. Sci., 31 October 2023

Sec. Marine Fisheries, Aquaculture and Living Resources

Volume 10 - 2023 | <https://doi.org/10.3389/fmars.2023.1144181>

This article is part of the Research Topic

Co-creating Knowledge with Fishers: Challenges and Lessons for Integrating Fishers' Knowledge Contributions into Marine Science in Well-Developed Scientific Advisory Systems

[View all 17 articles >](#)

A new era for science-industry research collaboration – a view towards the future



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Andries de Boer^{5§}



Dirk Haasnoot^{6§}



Stephanie Madsen^{7§}



Johan Muller^{8§}



Kobus Post^{9§}



Claus R. Sparrevohn^{10§}



Mart van der Meij^{8§}

Guidelines and best practices to...

- clarify expectations
- develop avenues for iterative collaboration and engagement
- sustain efforts

Intent is to...

- improve and expand data streams to inform ecosystem processes, stock assessment and economics.

ORIGINAL RESEARCH article

Front. Mar. Sci., 18 December 2022

Sec. Marine Fisheries, Aquaculture and Living Resources

Volume 9 - 2022 | <https://doi.org/10.3389/fmars.2022.954959>

This article is part of the Research Topic

Co-creating Knowledge with Fishers: Challenges and Lessons for Integrating Fishers' Knowledge Contributions into Marine Science in Well-Developed Scientific Advisory Systems

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A will-o'-the wisp? On the utility of voluntary contributions of data and knowledge from the fishing industry to marine science



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Science-Industry research collaboration...

- willingness of the fishing industry to provide information
- interest in the scientific community to collaborate with fishers

Outline how to do this within the constraints of established evidence-based decision-making processes.

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¹¹ Marine Institute, Galway, Ireland

¹² Department of Sociology, Memorial University of Newfoundland, St. John's, NL, Canada

¹³ Institute for Marine and Antarctic Studies, University of Tasmania, Hobart, TAS, Australia

EDITORIAL article

Front. Mar. Sci., 10 December 2023

Sec. Marine Fisheries, Aquaculture and Living Resources

Volume 10 - 2023 | <https://doi.org/10.3389/fmars.2023.1338271>

This article is part of the Research Topic

Co-creating Knowledge with Fishers: Challenges and Lessons for Integrating Fishers' Knowledge Contributions into Marine Science in Well-Developed Scientific Advisory Systems

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Editorial: Co-creating knowledge with fishers: challenges and lessons for integrating fishers' knowledge contributions into marine science in well-developed scientific advisory systems

 Nathalie A. Steins^{1*}  Matthew R. Baker²  Kate Brooks³  Steven Mackinson⁴  Robert L. Stephenson^{5,6}

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Knowledge gaps could be addressed more fully by accessing and integrating fishers' observational and experiential knowledge....

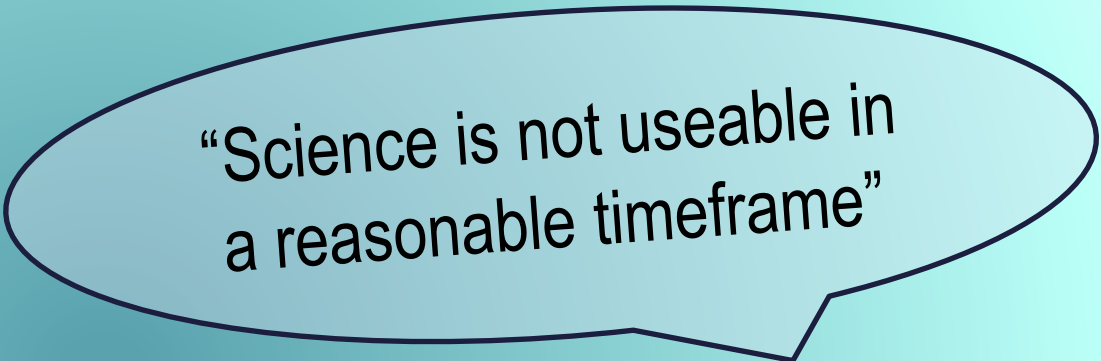
.....Papers here outline how to approach that in the context of best available information

Identify common interest


Collaborative Research often starts out of conflict



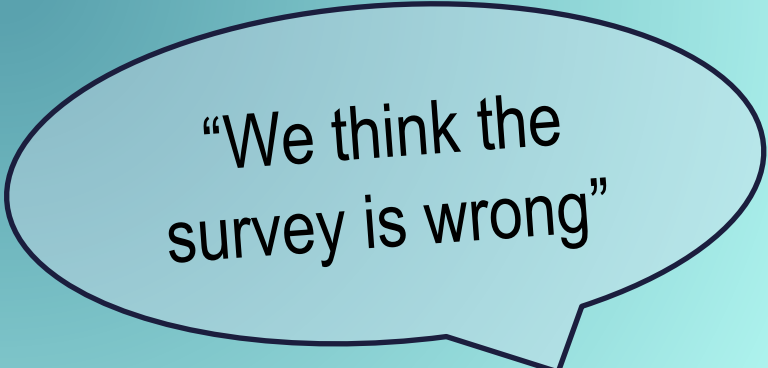
“We need the data now”



“Science is not useable in a reasonable timeframe”



“We don’t trust the industry motivations”



“We think the survey is wrong”



Successful Engagement

- Mutual respect (does not mean agreement!)
- Identify complimentary assets
- Identify data gaps and priorities



Action

Need for boots on the ground

Thank you again.

I hope these examples of science-industry collaboration are useful.

Þakka þér aftur.

Ég vona að þessi dæmi um samstarf vísinda og iðnaðar séu gagnleg.



Acknowledgements

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John Gauvin, Chris Siddon, Craig Rose, Brad Harris, Scott Goodman, Lauren Wild, Jan Straley, Robert Foy, Madison Shipley, John Gauvin, John Gruver, Noelle Yochum, Susie Zagorski, and Craig Rose, Claus Reedtz Sparrevohn, Martin Pastoors and Steven Mackinson Cara Rodgveller, Chris Lunsford, Lara Erikson Ed Melvin, Bob Alverson, Rob Suryan

Collaborating Institutions:

Alaska Longline Fishermen Association, Digital Observer, Natural Resources Consultants, Fishing Vessel Owners Association, Bering Sea Fisheries Research Foundation, Yukon River Drainage Fisheries Association, Petersburg Vessel Owners Association, Shell, Alaska Crab Coalition, Alaska Marine Conservation Council, Alaska Groundfish Data Bank, Alaska Bering Sea Crabbers, Groundfish Forum, United Catcher Boats, Smart Vision, Embedded Solutions, Alaska Seafood Cooperative, US Seafoods, Aleutian King Crab Research Foundation, Adak Community Development Foundation, Alaska Seafoods, B&N Fisheries, Ocean Peace, Aleutian Spray Fisheries, North Pacific Longline Association



Þakka þér aftur

Ég vona að þessi dæmi um samstarf vísinda og iðnaðar séu gagnleg