



NPRB Report June 2024

Lynn Palensky, Executive Director
Dr. Matthew Baker, Science Director

NPRB report

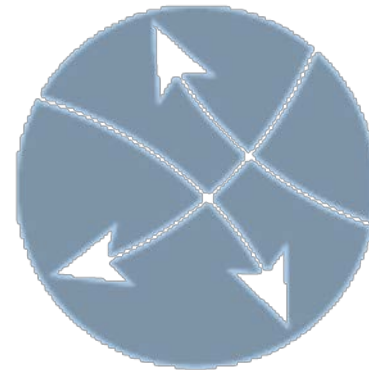
- Coordination with the Council
- Research Priorities
- Recently Funded Research (salmon, cod, crab)
- Northern Bering Sea Integrated Ecosystem Research Program
- Fishing Industry Seat Nominations and Other News
- Chair Mezirow's Accomplishments and Departure



Pressing Fishery Management Issues

NPRB-NPFMC have developed a coordinated approach to research priorities:

- 1) Identify research priorities to inform management
- 2) Monitor investments and related results:
 - what priorities are addressed
 - what information is developed through research
 - how that information is applied to inform management



2021 & 2024 TOP RESEARCH PRIORITIES

| 2021 Top Priorities | 2024 Top Priorities |
|--|--|
| Spatial distribution and movement of crabs relative to life history events and fishing | Further research to reduce western Alaska salmon bycatch in Bering Sea groundfish fisheries (808). |
| Conduct routine fish, crab, and oceanographic surveys in the Arctic Ocean | Quantify the magnitude of fishing gear impacts on crab and their associated benthic habitat and develop fishing gear innovations where needed (809). |
| Develop a framework and collect economic information | Evaluate direct marine mammal-fishery interactions (including feeding on discards and spatio-temporal trends in bycatch) and potential mitigation measures for marine mammal conservation (810). |
| Develop stock-specific ecosystem indicators and incorporate into stock assessments | * Examine the economic, social, and cultural effects of fisheries and fishery management policy on coastal communities over time (including impacts from fishery policy changes and Tribal citizen and Tribal Nation reliance on, participation in, and impacts of federally managed fisheries) (811). |
| Cooperative research efforts to supplement existing at-sea surveys that provide seasonal, species-specific information on upper trophic levels | * Develop actionable ecosystem indicators relevant to single-species stock assessments and ecosystem assessments that address climate change impacts to managed stocks (812). |
| Develop tools for analyzing coastal community vulnerability to fisheries management changes | * Continue to acquire basic life history information with an emphasis on improved estimates of size/age at maturity to advance understanding of the mechanisms for how maturity changes over space and through time (813). |
| Maturity estimates for Bering Sea and Aleutian Island crab stocks | * Increased understanding of the spatial distribution, habitat requirements, and movement of crabs relative to life history events and fishing (814). |
| Collection of socio-economic information | Develop predictive tools and models that evaluate the impact of multiple projected climate scenarios on managed resources to inform management options related to ecosystem production and resilience and adaptation of fishing communities (815). |
| Gap Analyses on loss of biological samples due to implementation of EM | Retrospective and meta-analysis regarding whether, how, when and why objectives and goals of fishery management plans are or are not achieved over time (e.g., Bmsy proxy evaluation) (816). |
| Norton Sound Red King Crab case study | * Norton Sound Red King Crab case study (731). |
| | Improve surveys in untrawlable habitat, particularly for rockfish, Atka mackerel, sculpins, and snow crab (817). |
| | Improve discard mortality rate estimates for scallops, crab, and groundfish stocks by gear types (818). |

* RP similar on [2021 Top list](#) Related RIDs: ≥800 = new/edited; <800 = [existing](#) priority; NXXX = [public](#) submission; other alpha-numeric = [Plan Team](#) submission

North Pacific Fishery Management Council: Research Priorities

Query List Reports

Research Priorities Query and Records List

Export

Plan Teams -

10 records per page

Search:

- Joint Groundfish PT
- Crab PT
- Scallop PT

Council Actions -

Ecosystem Area -

Council Priority -

SSC Priority -

Research Status -

Duplicates -

| ID | Title | Council Priority | SSC Priority | Research Status | Ecosystem Area | Related Council Action |
|-----|--|-----------------------------|-----------------------------|--------------------|--|---|
| 228 | Monitor subsistence harvest (patterns, norms, quantiles) in communities affected by Council actions. | Critical Ongoing Monitoring | Critical Ongoing Monitoring | Partially underway | Gulf of Alaska, Bering Sea, Aleutian Islands | Fishery Dependent Community Assessments |
| 611 | Collection of socio-economic information | Critical Ongoing Monitoring | Critical Ongoing Monitoring | Partially underway | Gulf of Alaska, Bering Sea, Aleutian Islands, Arctic | General |
| 226 | Monitor the economic effects from fishery policy changes on coastal communities. | Critical Ongoing Monitoring | Critical Ongoing Monitoring | Partially underway | Gulf of Alaska, Bering Sea, Aleutian Islands, Arctic | Economic impacts |
| 186 | Collect and maintain zooplankton and meroplankton biomass and community composition time series | Critical Ongoing Monitoring | Critical Ongoing Monitoring | Partially underway | Gulf of Alaska, Bering Sea, Aleutian Islands, Arctic | Ecosystem impacts |
| 187 | Continue to develop and improve the use of indicator-based ecosystem assessments throughout the range of the Council's | Critical Ongoing Monitoring | Critical Ongoing Monitoring | Underway | Bering Sea | Harvest specifications |

North Pacific Fishery Management Council: Research Priorities

Query List Reports

Research Priorities Query and Records List

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Plan Teams -

- Joint Groundfish PT
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Council Priority -

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Use the search tool to discover the Core-funded projects that the North Pacific Research Board has funded since 2002. To view additional project information, click on the view more for each project. Note, due to the legacy of some projects, not all abstract content is available at the moment, but will be added soon.

PROJECT SEARCH

YEAR FUNDED:

RESEARCH PRIORITY:

LARGE MARINE ECOSYSTEM (LME):

SEARCH:

Showing 1-3 of 3 rows

| YEAR | MORE | PROJ |
|------|-------------------------------------|-------|
| 2007 | <input type="button" value="view"/> | THE E |

- Skate nurseries
- Small or declining marine mammal populations
- Small or declining seabird populations
- Social sciences applied to management, policy and communities
- Southeast Alaska sea otters
- Spatial and temporal variation in stock structure and distribution patterns
- Spectacled Elders**
- Squid and shark assessment
- Steller sea lions
- Stock assessment and life history of rockfish, sharks, skates, squid, sculpins and octopus
- Stock assessment research and model development
- Stock assessment support
- Stressed and endangered species survival
- Tag and marking technologies
- Technology Development
- The values of salmon systems in the Arctic-Yukon-Kuskokwim region
- Tier 5 rockfish
- Topics for Fishing Industry
- Trophic ecology of seabirds
- Whale Entanglement Avoidance and Deterrents; Fishing; Cooperative Research with Industry

NPRB Research Priorities

Searchable database

Search: sablefish

Bering Sea

Project title: Testing two countermeasures to reduce sablefish depredation by sperm and killer whales in the Gulf of Alaska and Bering Sea
Year: 2012
Research Priorities: Ecosystem observations and research
Award: \$172733

Project title: Testing two countermeasures to reduce sablefish depredation by sperm and killer whales in the Gulf of Alaska and Bering Sea
Year: 2012
Research Priorities: Ecosystem observations and research
Award: \$172733

Other

Gulf of Alaska

Project title: Seasonal patterns of energy allocation and implications for overwinter survival of post-settlement juvenile sablefish
Year: 2017
Research Priorities: Estimation of life history parameters that impact stock assessmentsFishes and Invertebrates
Award: \$224333

Project title: Environmental factors contributing to starvation resiliency in first feeding Sablefish (*Anoplopoma fimbria*)
Year: 2020
Research Priorities: Fishes and Invertebrates
Award: \$143901

Search: red king crab

Bering Sea

Project title: Assessment of Bristol Bay Red King Crab Resource for Future Management Action--A New Approach
Year: 2006
Research Priorities: Life history, ecology and fluctuations in BSAI crab stocksOther fish and invertebrate research
Award: \$250000

Project title: Developing biological reference points for crustacean fisheries: Reproductive potential of Bristol Bay red king crab and eastern Bering Sea snow crab
Year: 2007
Research Priorities: Life history, ecology and fluctuations in BSAI crab stocks
Award: \$248206

Project title: Assessment of Bristol Bay Red King Crab Resource for Future Management Action - Implementing a Cooperative Approach
Year: 2008
Research Priorities: Ecosystem Monitoring and Research: Fishing: Cooperative Research with Industry
Award: \$209900

Project title: Red king crab movement, growth, and size composition within eastern Norton Sound.
Year: 2011
Research Priorities: Fish and Shellfish movement
Award: \$293522

Project title: Impacts of climate change on red king crab larval advection in Bristol Bay: implications for recruitment variability
Year: 2014
Research Priorities: Impacts of climate change on fish and crab stocks
Award: \$284860

Project title: Assessment of Bristol Bay Red King Crab Resource for Future Management Action--A New Approach
Year: 2006
Research Priorities: Life history, ecology and fluctuations in BSAI crab stocksOther fish and invertebrate research
Award: \$250000

Project title: Developing biological reference points for crustacean fisheries: Reproductive potential of Bristol Bay red king crab and eastern Bering Sea snow crab
Year: 2007
Research Priorities: Life history, ecology and fluctuations in BSAI crab stocks
Award: \$248206

NPRB Research Priorities

Searchable database


The screenshot displays the NPRB Research Priorities website interface. At the top, there are navigation tabs for 'CORE PROGRAM', 'LONG TERM MONITORING PROGRAM', 'GRADUATE STUDENT RESEARCH AWARDS', 'ARCTIC PROGRAM', 'BERING SEA PROJECT', and 'GULF OF ALASKA PROJECT'. Below these are secondary navigation links: 'CORE PROGRAM', 'REQUEST FOR PROPOSALS', 'PROJECT SEARCH & DATABASE', 'PUBLICATION LIBRARY', and 'RESOURCES & REQUIREMENTS'. The main content area features an 'Advanced search options' section with a list of filters, each with a count in a circle:

- ARCTIC OCEAN (1)
- BERING SEA/ALEUTIAN ISLANDS (6)
- FISH HABITAT (6)
- GULF OF ALASKA (8)
- HUMANS (5)
- LOWER TROPHIC LEVEL PRODUCTIVITY (6)
- MARINE MAMMALS (3)
- NPRB ANNUAL PROJECTS (27)
- NPRB LONG-TERM MONITORING PROJECTS (1)
- OTHER PROMINENT ISSUES (4)
- SEABIRDS (1)

Two project listings are shown:

1426 Long-term Monitoring Project: Ecosystem monitoring and detection of wind and ice-mediated changes through a year-round physical and biogeochemical mooring in the Northeast Chukchi Sea

Advances in instrument technology now allow us to autonomously sample the marine ecosystem from the vantage of multiple disciplines and across multiple trophic levels. We propose to deploy a subsurface mooring on the Northeast Chukchi Sea shelf to record with high temporal resolution throughout the year, including the under-sampled and poorly understood seasons when sea ice typically inhibits ship-based sampling. The mooring will record physic...




[Seth Danielson](#) • [Catherine Lalande](#) • [Russell Hopcroft](#) • [Thomas Weingartner](#) • [Peter Winsor](#) • [Claudine Hauri](#) • [Andrew McDonnell](#) • [Seth Danielson](#)

[Info](#) [Documents](#)

1501 How many krill are there in the Bering Sea and Gulf of Alaska? Quantitative acoustic assessment of euphausiid abundance and their role in these ecosystems.

Euphausiids (or 'krill') play a key role in many ecosystems including the eastern Bering Sea (EBS) and Gulf Alaska (GOA), channeling energy from phytoplankton to fish and higher predators, yet their abundance is difficult to measure. We will develop an improved euphausiid standing stock estimate in the EBS and GOA using 1) new measurements and modeling of the acoustic and material properties of euphausiids and 2) acoustic-trawl survey data whi...



[Joseph Warren](#)



Pacific Salmon

Salmon winter ecology

NOAA-AFSC

2020-2023

Automation of scale age estimation

PWSSC

2022-2025

Engaging Yukon fishers in Chinook and Chum research*

YRDFA

2023-2026

Climate Drivers of Yukon River Chinook Productivity

ADFG

2023-2026

Decadal Study on Ecological Dynamics of Pacific Salmon

UAF

2023-2026

Marine survival of hatchery- and wild-origin sockeye salmon

NOAA-AFSC

2024-2026

Total Investments: \$2.8M



Pacific Cod

| | | |
|---|--------------|-----------|
| Thermal effects on cod in the Gulf of Alaska* | NOAA-AFSC | 2018-2022 |
| IBM validation and enhancement | NOAA-AFSC | 2018-2022 |
| Population structure in the Aleutians | NOAA-AFSC | 2019-2022 |
| Spawning habitat in a changing Bering Sea | NOAA-AFSC | 2020-2023 |
| Passive acoustic monitoring in the Arctic | U Victoria | 2022-2025 |
| Evaluating cod response to warming* | Oregon State | 2023-2025 |
| Age validation | U Florida | 2023-2026 |

Total Investments: \$2.9M



North Pacific Crab

| | | |
|---|-------------|-----------|
| North Pacific crab growth | UW | 2016-2019 |
| Pribilof Islands blue king crab recruitment | UAF | 2016-2019 |
| Qualitative approaches to blue king crab management | UW | 2016-2019 |
| Tanner crab response to temperature change | NOAA-AFSC | 2017-2020 |
| Snow crab body condition | NOAA-AFSC | 2020-2024 |
| Pathology of black eye syndrome | Bigelow Lab | 2021-2025 |
| Fatty acid sampling in snow crab* | Bigelow Lab | 2022-2025 |
| Bristol Bay red king crab movement* | NOAA-AFSC | 2023-2026 |
| Bristol Bay red king crab settlement potential* | ADFG | 2023-2026 |

Total Investments: \$2.2M



Cooperative Research with Industry

Bristol Bay red king crab movement

NOAA-ADFG-BSFRF

Bristol Bay red king crab settlement potential

NOAA-ADFG-BSFRF

Bering Sea Inner Shelf: improving system understanding

NOAA-UW-APU-Alaska Seafood Cooperative

Total Investments: \$1.2M



Cooperative Research with Industry

Bristol Bay red king crab movement

NOAA-ADFG-BSFRF

Bristol Bay red king crab settlement potential

NOAA-ADFG-BSFRF

Bering Sea Inner Shelf: improving system understanding

NOAA-UW-APU-Alaska Seafood Cooperative

Total Investments: \$1.2M

- A80 fishers target 2-3°C to maximize YFS and minimize halibut bycatch. Platforms, moorings, and net sensors measure real-time temperature to:
- improve understanding of regional oceanography
 - inform biophysical models and stock assessments
 - reduce bycatch



Community Involvement

Engaging Yukon fishers in research on Chinook salmon decline
Climate drivers of Yukon River Chinook productivity
Bridging knowledge to inform Bering Sea Management
Qangyut: Gulf of Alaska Ocean Forecast (GAKOF)

YRDFA
YRDFA-ADFG-NOAA-USGS
NOAA-BBNA-Kawerak-Bering Sea Elders
NOAA-AOOS-Chugach Resource Commission

Total Investments: \$1M



Community Involvement

Engaging Yukon fishers in research on Chinook salmon decline

Climate drivers of Yukon River Chinook productivity

Bridging knowledge to inform Bering Sea Management

Qangyut: Gulf of Alaska Ocean Forecast (GAKOF)

YRDFA

YRDFA-ADFG-NOAA-USGS

NOAA-BBNA-Kawerak-Bering Sea Elders

NOAA-AOOS-Chugach Resource Commission

Total Investments: \$1M

Research directly addresses Bering Sea Fishery Ecosystem Plan aim to....

- promote partnerships for TK holders, scientists, and fisheries managers
- develop Indigenous Conceptual Models of the BS ecosystem
- document collaborative methods used to bridge knowledge systems to inform fisheries management



Applications to Management

Combining the Eastern Bering Sea Shelf and Slope Surveys

Age validation of Gulf of Alaska groundfishes

Resource partitioning among North Pacific flatfishes

Western Arctic continuous plankton recorder survey

Quantitative methods for ecosystem indicators

Total Investments: \$1.8M



Applications to Management

Combining the Eastern Bering Sea Shelf and Slope Surveys

Age validation of Gulf of Alaska groundfishes

Resource partitioning among North Pacific flatfishes

Western Arctic continuous plankton recorder survey

Quantitative methods for ecosystem indicators

Total Investments: \$1.8M

Gear comparisons will inform survey redesign efforts.

Data from paired trawling experiments will...

- produce local abundance indices
- inform gear selectivity ratios to enable retrospective analyses
- improve understanding of migration and spatial ecology



Applications to Management

Combining the Eastern Bering Sea Shelf and Slope Surveys

Age validation of Gulf of Alaska groundfishes

Resource partitioning among North Pacific flatfishes

Western Arctic continuous plankton recorder survey

Quantitative methods for ecosystem indicators

Total Investments: \$1.8M

Challenges remain for incorporating ecosystem information into stock assessment models and fishery management processes. Building on the Council's Ecosystem and Socioeconomic Profiles (ESPs), research explores methods for quantifying:

- (1) direction, magnitude, and relative importance of ecosystem indicators' impacts on demographic processes like recruitment;
- (2) whether relationships are stable through time.



INTEGRATED ECOSYSTEM RESEARCH PROGRAM

NPRB aims to improve understanding of how changing environmental conditions influence physical, chemical, and biological processes in marine ecosystems.



INTEGRATED ECOSYSTEM RESEARCH

To support innovative multi-disciplinary research to improve understanding of the complex mechanistic processes that influence the structure and function of marine ecosystems.

[Learn More](#)

- ### Intent
- understand mechanistic processes that influence the structure and function of marine ecosystems
 - characterize processes and interactions to improve forecasts

- ### Design
- promote collaboration across disciplines (e.g., oceanography, fisheries, social science)
 - promote integration across ecosystem components (e.g., physics, plankton, fishes)
 - advance partnership and exchange



INTEGRATED ECOSYSTEM RESEARCH PROGRAM

NPRB aims to improve understanding of how changing environmental conditions influence physical, chemical, and biological processes in marine ecosystems.

Arctic IERP (2016-2022)

ARCTIC PROGRAM DATA & RESULTS

Principal investigators who have completed NPRB-funded research are required to provide datasets and metadata records for all data collected under NPRB grants as per the NPRB Metadata and Data Policy. Final reports are also required at the conclusion of the program. Peer-reviewed publications will be posted here as they become available.



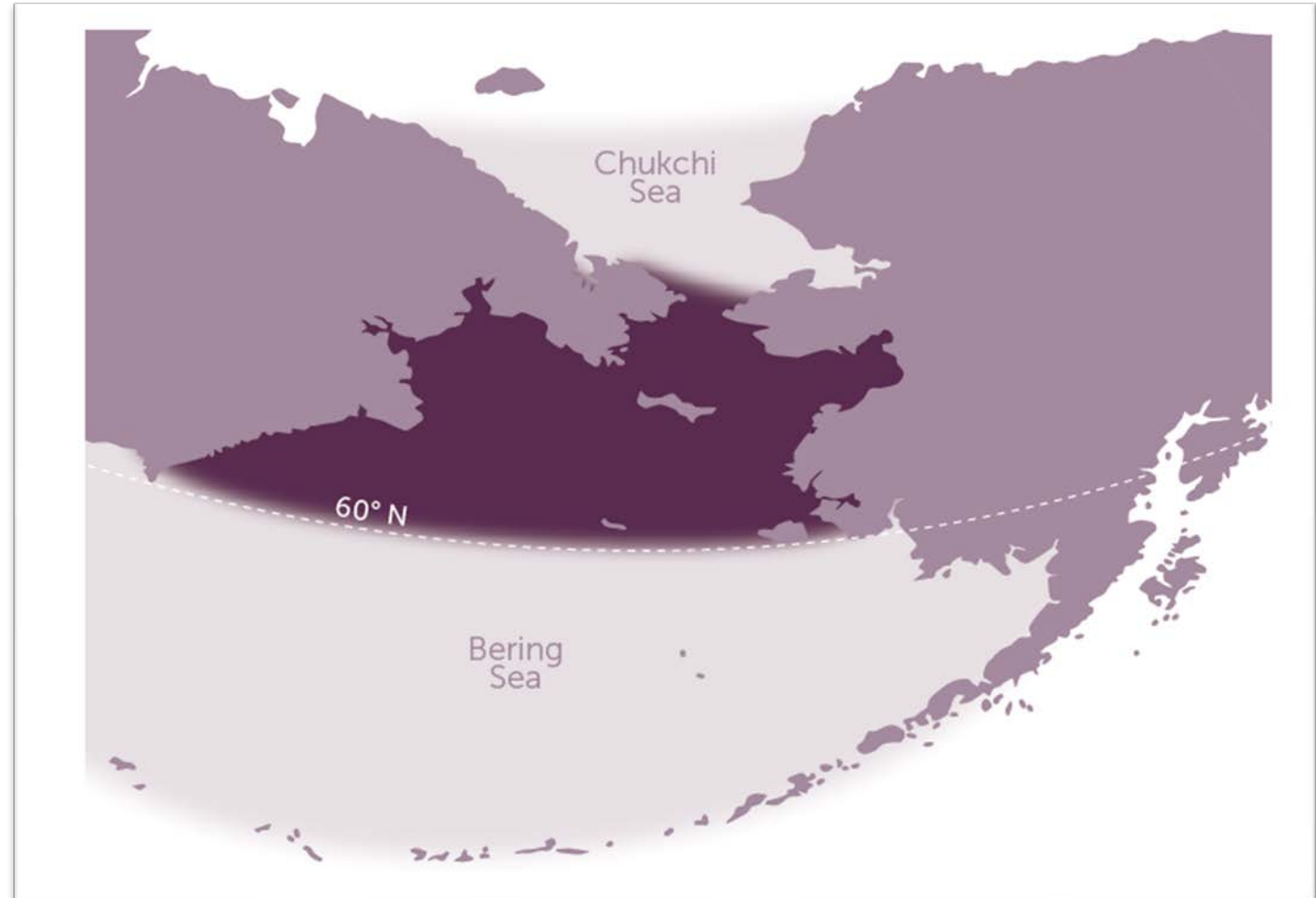


INTEGRATED ECOSYSTEM RESEARCH PROGRAM

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Northern Bering Sea IERP (2024-2030)

- Arctic IERP documented significant changes in the environment and community responses.
- NBS IERP will further investigate changing ecosystem in this region.





INTEGRATED ECOSYSTEM RESEARCH PROGRAM

NPRB aims to improve understanding of how changing environmental conditions influence physical, chemical, and biological processes in marine ecosystems.

Areas of scientific interest:

- *Influence of shifts in environment on species of commercial, ecological, and subsistence importance*
- *Implications for fisheries management, and communities that depend on these resources*



IMPORTANCE
TO COASTAL
COMMUNITIES



IMPORTANCE
TO INDUSTRY
STAKEHOLDERS



INTEGRATED ECOSYSTEM RESEARCH PROGRAM

NPRB aims to improve understanding of how changing environmental conditions influence physical, chemical, and biological processes in marine ecosystems.

ANTICIPATED TIMELINE OF ACTIVITIES

Approximately \$6.5 million have been made available by NPRB for this program. NPRB anticipates additional resources from funding partners.



OCTOBER
2023

NPRB solicits pre-proposals.



OCTOBER
2024

NPRB invites full proposals with additional awards to support Indigenous partnerships.



SUMMER
2025

NPRB coordination with funding partners.



OCTOBER
2025

NPRB announces funding decisions and scope of funded research program.



2026-
2031

Coordinated research, fieldwork, analysis, and outreach.



INTEGRATED ECOSYSTEM RESEARCH PROGRAM

NPRB aims to improve understanding of how changing environmental conditions influence physical, chemical, and biological processes in marine ecosystems.

Physical and Biochemical processes

- atmospheric, water mass and circulation, river discharge, and sea ice dynamics
- nutrient and biochemical loading and cycling
- ocean acidification and harmful algal blooms
- modes of primary production and energy pathways related to plankton and fish production

Fishes, invertebrates and marine birds and mammals

- species distributions, interactions, and food webs
- environment and ecosystem affects on crabs, salmon, groundfish, marine birds and mammals, and fisheries



INTEGRATED ECOSYSTEM RESEARCH PROGRAM

NPRB aims to improve understanding of how changing environmental conditions influence physical, chemical, and biological processes in marine ecosystems.

Methodological Approaches

- Earth System models and Regional Ocean models
- Food Web models and Ecosystem models
- Autonomous drifting and moored instruments, uncrewed systems
- Research cruises and aerial surveys
- Community observations
- Use of archived samples, existing surveys, and retrospective analyses

INTEGRATED ECOSYSTEM RESEARCH PROGRAM

- Board to invite full proposals from subset of 13 submissions (Oct 2024)
- Full proposals due May 2025
- NPRB to engage with potential funding partners (summer 2025)
- List of interested parties
- Contact NPRB staff for more info on schedule, process, partnerships and ways to stay engaged



NPRB Announcements

1. Nominations for Fishing Industry Board Seat
(Submit by August 1)
2. 2024 Photography Awards
(Submit photos by Sept 2)
3. Hiring Alaska Marine Science Symposium Coordinator
(Apply by July 1)





Fishing Charter Owner



“As a regional fishery management council member, taking actions that improve conditions for the resources and for fishermen is incredibly rewarding.” Andy Mezirow, Alaska



Andy Mezirow – Chair of NPRB Nov 2018-August 2024



NPRB's Accomplishments under Andy Mezirow's leadership

- ✓ Approving the Northern Bering Sea Integrated Ecosystem Research Program
- ✓ Hiring a new ED & Navigating COVID
- ✓ Advancing partnerships: International Year of the Salmon and with Alaska Native interest groups and industry partners
- ✓ Working with Alaska delegates
 - ✓ adding an Alaska Native Board seat
 - ✓ increasing term limit for fishing industry seat
- ✓ Supporting's NPRB's assistance in reviewing research proposals under crab disaster funding
- ✓ **Lastly, most importantly funding \$29M in marine research!**



Thank you, Andy!

