

North Pacific Research Board: 2008 Request for Proposals

INTRODUCTION

The North Pacific Research Board (NPRB) was created by Congress in 1997 to recommend marine research activities to the Secretary of Commerce, funded through a competitive grant program using part of the interest earned from the Environmental Improvement and Restoration Fund. These funds must be used to conduct research activities on or relating to the fisheries or marine ecosystems in the North Pacific Ocean, Bering Sea, and Arctic Ocean (including any lesser related bodies of water). NPRB must strive to avoid duplicating other research activities and must place priority on research designed to address pressing fishery management or marine ecosystem information needs. The Board's long-term vision is to build a clear understanding of the marine ecosystems off Alaska that enables effective management and sustainable use of marine resources.

The Board, guided by its [Science Plan](#), has funded 172 projects totaling \$29 million as a result of six requests for proposals released since early 2002. Descriptions of the projects can be found at <http://project.nprb.org/> and fall into seven broad categories as shown in Table 1.

Table 1. NPRB-supported research initiated in 2002-2007.

<u>Categories of Research</u>	<u>Projects</u>	<u>Total Funding</u>	<u>Percent</u>
Ecosystem Studies	50	\$8,109,633	28
Fish and Invertebrates	43	\$7,121,466	25
Salmon	9	\$2,289,404	8
Fish Habitat	14	\$3,027,566	10
Marine Mammals	28	\$4,470,482	15
Seabirds	12	\$2,578,527	9
Humans	16	\$1,351,465	5

In addition, the Board recently has funded a \$14 million Bering Sea Integrated Ecosystem Research Program (BSIERP), which, in collaboration with NSF (Bering Ecosystem Study - BEST), will start in late 2007. More information on this project can be found at http://www.nprb.org/research/BSIERP/bsierp_intro.htm.

The subject of this current notice constitutes the regular 2008 RFP for projects commencing in 2008. It is similar in form and content to past NPRB requests for proposals, with research priorities structured around the 2005 Science Plan. It calls for **full proposals due November 30, 2007**. The table below summarizes the priorities and funding targets in this year's RFP. Explanation of the research priorities begins on p. 4. NPRB strongly encourages support for graduate students in its funded research.

2008 Request for Proposals: Research Priorities (Total: \$4.0 million)

PLEASE CAREFULLY READ THE EXPLANATORY PARAGRAPHS (starting on p.4) FOR THE RESEARCH PRIORITIES SUMMARIZED BELOW AND BE AWARE THAT ALL SECTIONS HAVE FIRM CAPS ON THE INDIVIDUAL PROPOSAL FUNDING AMOUNTS. CAPS ARE THE OVERALL CATEGORY AMOUNTS UNLESS OTHERWISE NOTED IN TEXT. PROPOSALS EXCEEDING THOSE CAPS WILL NOT BE PROCESSED. AMOUNTS ARE NOT PER YEAR, THEY ARE FOR THE ENTIRE STUDY.

Table 2. 2008 RFP Regular Research Priorities and target amounts totaling \$4.0 million.

1. General Research Priorities on Ecosystems Components	\$2,950,000
a. Oceanography and Lower Trophic Level Productivity	\$350,000
i. Coupling between shelf, nearshore and inland waters in the Alaska Coastal Current (ACC) as well as the importance of freshwater runoff	
ii. Population dynamics, distribution and abundance, productivity and trophic roles of appendicularians and pteropods	
iii. Oceanic zooplankton species in shelf food webs: on-shelf transport processes	
iv. Euphausiid biology	
b. Fish Habitat	\$350,000
Habitat Mapping in the Northern Bering Sea Research Area	
c. Fish and Invertebrates	\$1,100,000
i. Local impacts of fishing on prey availability for top trophic level consumers	
ii. Stock assessment and life history of sleeper and salmon sharks	
iii. Skate nurseries	
iv. Rockfish	
v. Efficacy of bycatch mitigation measures	
vi. Processes controlling recruitment dynamics for all crab species	
vii. Over-winter survival of Pacific Salmon species	
viii. Pacific Cod	
d. Marine Mammals	\$500,000
i. Ice Seals	
ii. Steller Sea Lions	
iii. Pacific Walrus in the Chukchi Sea	
iv. Polar Bears	
e. Seabirds	\$350,000
i. Seabird - ecosystem relationships	
ii. Indirect and long-term population effect of contaminants	
iii. Spectacled Eiders	
f. Humans	\$200,000
i. Analyses of current determinants of exvessel, wholesale, international, and retail demands for principal seafood products from the GOA and BSAI	
ii. Pre- and post-implementation studies of the benefits and costs associated with changes in management regimes	

iii. Prospective and retrospective analyses of changes in the spatial and temporal distribution of fishing effort	
g. Contaminants	\$100,000
2. Local and Traditional Knowledge	\$100,000
3. Collaboration with Oil Spill Recovery Institute (\$200,000 total)	\$100,000
a. Socio-economics: modeling community impacts	
b. Contaminant baseline assessment	
c. Forage fish and near-shore habitat associations	
4. Cooperative Research with Industry	\$400,000
a. Topics for Fishing Industry	
i. Gear modification	
ii. Fisheries Monitoring	
iii. Bycatch reduction	
iv. Ecosystem Monitoring and Research	
v. Whale Entanglement Avoidance and Deterrents	
vi. Habitat mapping	
b. Topics for Oil and Gas Industry	
i. Polar bears	
ii. Marine Mammal Acoustic studies	
iii. Shoreline change	
iv. Ice Seals	
v. Salmon distribution	
vi. Influence of oil and gas development on marine bird distribution, migration and habitat use in Beaufort Sea	
5. Community Involvement	\$100,000
6. Aleutian Islands	\$350,000
a. Nearshore Dynamics of the Aleutian Islands	
b. Ecosystem impacts of climate and ocean conditions in the Aleutian Islands	
c. Fishing effect interactions	
d. Advancing ecosystem approach to fisheries management	
e. Development of forecasting tools that incorporate ecosystem indicators	
f. Ecosystem indicators including retrospective studies	
TOTAL	\$4,000,000

Request for Proposals for 2008**1. General Research Priorities on Ecosystems Components \$2,950,000**

The following research priorities follow the structure of the Science Plan. Please consult the Science Plan for clarification of appropriate research to be conducted under each heading. Care should be taken to consult current NPRB-funded projects including components under the BEST/BSIERP program to avoid overlap and create synergies wherever possible.

a. Oceanography and Lower trophic level productivity \$350,000

The NPRB expects to fund projects under this general category across the topical areas listed below. Proposals responsive to these topics should address linkages of lower trophic level organisms to forage and commercial fish where appropriate and resultant information should prove useful to fisheries management. Applicants should also consult the recently funded Bering Sea Integrated Ecosystem Research Program / Bering Sea Ecosystem Study to avoid overlap.

- i. Coupling between shelf, nearshore and inland waters in the Alaska Coastal Current (ACC) as well as the importance of freshwater runoff

Significant volumes of freshwater (precipitation, snow and glacier melt) are discharged into the Gulf of Alaska, coastal embayments, and inland waters from coastal watersheds. Near the coast, surface waters are typically fresher and less dense than waters farther offshore. The Alaska Coastal Current (ACC), an along-shore current (the coast is to the right when looking downstream), is the dynamical response to this cross-shore density gradient. Water exchange between deep bottom water, the ACC, and coastal embayments might be the primary physical process influencing the abundance and distribution of plankton that provide food for schools of herring and other small fishes as well as out-migrating juvenile salmon. Yet we have a limited understanding of how much water is actually exchanged, at what frequency, and at what times during the year. Proposals in this category should aim at better understanding the relationship between shelf, nearshore and possibly inland waters (Southeast Alaska). They should provide an improved description of the mixing dynamics and the spatial and temporal variability of this coastal flow and its connections with the coastal region.

- ii. Population dynamics, distribution and abundance, productivity, and trophic roles of appendicularians and pteropods.

Appendicularians and pteropods are the main food items for juvenile pink salmon in the Gulf of Alaska, and limited data indicate they are abundant in the summer and fall in the Gulf of Alaska and the Bering Sea. Information on their population dynamics, distribution and abundance, productivity, and trophic roles in these regions is needed in order to understand the structure and functioning of lower trophic levels, and the production of fish species utilizing these organisms as food items.

- iii. Oceanic zooplankton species in shelf food webs: on-shelf transport processes

Spring meso-zooplankton in continental shelf regions of the Gulf of Alaska and the Bering Sea is heavily dominated (in terms of biomass) by oceanic species, mainly *Neocalanus* spp. These are important prey items for some fish and some seabirds, and variation in their abundance has consequences for higher trophic levels. These copepod species cannot complete a full life cycle on

the continental shelf and their early developmental stages are transported onto the shelf in the late winter or early spring each year. These seed populations significantly determine the stocks of mesozooplankton on the continental shelf each year. Issues affecting the timing and on-shelf transport of these oceanic populations onto the shelf of the GOA and the BS need to be addressed.

iv. Euphausiid biology

Although there has been considerable effort expended to determine the abundance and distribution of euphausiids in the Bering Sea and the Gulf of Alaska, much less information is available on their basic biology. Information on their rates of growth, reproduction and development, and overall productivity are needed on these important forage species.

b. Fish Habitat

\$350,000

NPRB is seeking proposals related to habitat mapping in the Northern Bering Sea Research Area. (per NPFMC action, June 2006 http://www.fakr.noaa.gov/npfmc/current_issues/BSHC/BSHC.htm). Research should be focused on field studies to assess habitat types, substrates, associated invertebrates, and habitat forming epifauna in the Northern Bering Sea Research Area. Applicants should consult NPRB project 615 for information on the recent Marine Habitat Mapping Technology Workshop for Alaska.

c. Fish and Invertebrates

\$1,100,000

The individual proposal funding cap under Fish and Invertebrates is \$250,000.

i. Local impacts of fishing on prey availability for top trophic level consumers

There is a continued need for studies that measure the impact of commercial fishing on the foraging success of top trophic level consumers. NPRB requests proposals that are designed to address this issue. Potential investigators should provide a description of the power of their analysis to differentiate responses of prey and predators to fishing and natural effects as well as a statement regarding the applicability of their results to other areas and seasons. *Care should be taken not to overlap with NPRB [Project 730](#).*

ii. Stock assessment and life history of sleeper and salmon sharks

Sharks form part of the ‘other species’ category used by the North Pacific Fishery Management Council. There is insufficient life history and stock assessment information for these species to be properly managed. The NPRB is seeking proposals that will research and develop improved stock assessments for those stocks that are difficult to assess with current methodology, and to fill gaps within our current understanding of their life history, as well as their distribution and abundance. Studies could include process studies to understand population fluctuations of sharks, but priority will be given to projects that address the concerns listed above.

iii. Skate nurseries

Skates are part of the “other species” category used by the North Pacific Fishery Management Council. There continues to be a need for basic life history information for these species, some of which are being addressed through current NPRB projects ([415](#), [510](#), [621](#), and [715](#)). This year the NPRB is also inviting proposals to identify the location and distribution of skate nursery areas

across the Bering Sea shelf and slope.

iv. Rockfish

NPRB is seeking proposals that will conduct direct observations (e.g., submersible and dive surveys) to compare rockfish densities between trawlable and non-trawlable habitats; improve surveys for minor rockfish species to verify range relative to standard surveys; or perform supplemental trawl survey biomass estimates to address patchy distribution.

v. Efficacy of bycatch mitigation measures

Research is needed on the efficacy of bycatch mitigation measures (e.g., PSCs, time/area closures) and their effects on populations of the bycatch and target species, effects of changes in abundance of bycatch species on bycatch rates, and methods for assessing the economic and social costs of bycatch.

vi. Processes controlling recruitment dynamics for all crab species

Proposals are requested that will improve understanding of processes controlling recruitment dynamics of crab, incorporate these processes into scenarios regarding temporal trends in recruitment, and perform a management strategy evaluation using variable recruitment scenarios. This is a very broad topic encompassing the need to identify and assess biological and environmental effects on egg production, egg hatching, and larval survival, as well as mechanisms controlling the abundance of juvenile crabs from settlement to recruitment into the fishery. Factors include larval transport, predation, competition, and habitat availability. Primary emphasis is on stocks currently declared overfished. *Care should be taken not to overlap with previously funded NPRB Projects on this topic.*

vii. Over-winter survival of Pacific salmon species

NPRB is requesting proposals to identify the physical and physiological factors that affect the marine survival of juvenile Pacific salmon over their first ocean winter in the Bering Sea.

viii. Pacific Cod

Genetic analysis has suggested that limited stock structure may exist across the range of Pacific cod in Alaska. Additional research is needed in two areas. The first is to address the potential for segregation of cod populations at scales significant to management, that is, within management areas, and this may best be accomplished with mark-recapture methods and/or archival tags to be able to look at final scale and water column use. The second is the identification of cod spawning areas in relation to potentially distinct population segments and an evaluation of potential impacts of fishing on those spawning aggregations. *Proposals should draw upon knowledge gained from other NPRB funded projects on this topic, particularly [618](#) and [620](#).*

d. Marine Mammals

\$500,000

i. Ice Seals

The four species of ice-associated seals which inhabit the Bering, Chukchi and Beaufort Seas

(ringed (*Phoca hispida*), bearded (*Erignathus barbatus*), ribbon (*Phoca fasciata*), and spotted seals (*Phoca largha*)) play an important role in the Arctic ecosystem. Ice seals are important prey items for polar bears (*Ursus maritimus*) and provide important subsistence resources for Native people in northern and western Alaska. While research on ringed seals has increased in recent years, relatively little is known about the population structure, distribution, trend abundance or life history traits of the other 3 species. Diet and foraging behaviors are also poorly understood. These species are highly sensitive to changing sea ice conditions and may be particularly vulnerable to climate change impacts. Research priorities for bearded, ribbon and spotted seals include assessment of population abundance and distribution, stock structure, habitat-use patterns and the physical and ecological characteristics of preferred habitat, foraging ecology and an evaluation of potential affects of climate change. Proposals may also address the unknown extent to which these seals interact with commercial fisheries. *Applicants should be aware that NPRB has funded research on ice seals, generally ringed seals, in the past. Any proposals for research of this type should be careful to avoid duplicating previous (312) and ongoing projects (515 and 631). See also ice seals under cooperative research.*

ii. Steller Sea Lions

The western stock of Steller sea lions declined by 80% between the 1970s and the late 1990s, resulting in the listing of the species as threatened under the Endangered Species Act in 1990. The western distinct population segment (DPS) was subsequently upgraded to Endangered in 1997. It has been suggested that due to regime shifts in the North Pacific Ocean the carrying capacity for Steller sea lions has been reduced, thus preventing the recovery of the western stock of Steller sea lions to pre-decline population levels. The NPRB is requesting proposals to investigate and evaluate whether or not the western DPS of Steller sea lions is at or near a new equilibrium in abundance, possibly through an analysis of vital rates and other population dynamic indices in comparison to similar indices for other mammal populations. Proposals could also address this question by including an analysis of historical and archaeological information regarding Steller sea lion abundance and concurrent changes in the ecosystem. Proposals are to use this information to focus on the current state of the Steller sea lion population, not on the factors which contributed to the decline of the population. Results of this research are expected to provide important information to management agencies. This topic has been noted as a top research priority by the Scientific and Statistical Committee of the North Pacific Fishery Management Council.

iii. Pacific Walrus in the Chukchi Sea

A recently completed at-sea survey of Pacific Walrus (*see NPRB project 632*) may shed new light on the status of this species' population; however, retreats of sea ice beyond effective foraging depths in the Chukchi Sea, along with recent sightings of orphaned calves and increases in numbers of cows and calves on haul-outs in Siberia suggests that changes are occurring to Pacific Walrus and their environment. In addition, oil and gas leasing is planned in important Pacific walrus habitats in the Chukchi Sea. The NPRB is requesting proposals for research to investigate the effects of changing environmental conditions, particularly sea ice and benthic habitats, and/or the effects of coastal and offshore human activities and disturbance on the distribution and population dynamics of Pacific walrus in the Chukchi Sea.

iv. Polar Bears

In 2007 a proposed rule was filed by the USFWS to list polar bears as threatened under the Endangered Species Act. This, and continuing climate change trends, has increased the level of scrutiny on the status and health of polar bear populations worldwide. The most serious

conservation issues facing U.S. polar bear populations are the potential effects of climate change on habitat and prey availability. Other serious issues include the effect of contaminants, the potential over-harvest of bears and the impact of human activities (e.g., oil and gas exploration and development) on polar bear habitat. The NPRB is requesting proposals for research to investigate the potential effects of changing environmental conditions (e.g., sea ice, snow cover, prey availability, and in particular seasonality of those factors), contaminants, and/or the effects of coastal and offshore human activities and disturbance of habitat on the distribution and population dynamics of polar bears. *Proponents should consider the potential for obtaining funding from NPRB, industry groups, and NGO funding sources; such cooperative funding is not required for submitting proposals under this topic, but it is strongly encouraged.*

e. Seabirds

\$350,000

i. Seabird – ecosystem relationships

Seabirds are integral members of marine ecosystems in the North Pacific, and may serve as sensitive and cost-effective indicators of their health and status. The NPRB funded a project (516) wherein an international panel of marine bird ecologists synthesized current knowledge of “seabirds as indicators”. More recently, NPRB supported a pilot study relating seabird phenology and salmon returns in Bristol Bay (531). Based on the results of this pilot study, NPRB is seeking proposals that further explore the concept of trophic equivalency and the use of seabirds as indicators of food web conditions that also affect and relate to other species of interest, especially fish.

ii. Indirect and long-term population effect of contaminants (plastic, oil, heavy metals, etc.)

The NPRB is seeking proposals that will investigate the indirect and long-term population effect of contaminants (plastic, oil, heavy metals, etc.). Comparative studies between seabird species feeding at different trophic levels, habitats, and with different life histories are encouraged.

iii. Spectacled Eiders

The NPRB is seeking proposals that will investigate the distribution and seasonal habitat usage of marine areas by Spectacled Eiders, with an emphasis on winter habitat such as open water polynyas near St. Lawrence and St. Mathew Islands. Projects may be able to link to BEST/BSIERP benthic and patch dynamics studies.

f. Humans

\$200,000

NPRB is requesting proposals that address any of the general research priorities for humans, as identified in Table 3-13 of the science plan. In general these include fishery management and policy, baseline assessment issues, human health and marine resources, human values and resource protection, and climate variability and change. Other human-related issues are also addressed under the LTK component of this RFP. ***Highest priority will be given to proposals that address Table 3-13 AND the following identified by the North Pacific Fishery Management Council:***

i. Analyses of current determinants of exvessel, wholesale, international, and retail demands for principal seafood products from the GOA and BSAI.

ii. Pre- and post-implementation studies of the benefits and costs, and distribution of benefits and costs associated with changes in management regimes (e.g., changes in product markets, characteristics of quota share markets, changes in distribution of ownership, changes in crew compensation, as a consequence of the introduction of dedicated access privileges in the halibut/sablefish, pollock, and crab fisheries). “Benefits and costs” include both economic and social dimensions.

iii. Prospective and retrospective analyses of changes in the spatial and temporal distribution of fishing effort in response to management actions (e.g., time/area closures, marine reserves, bycatch restrictions, co-ops, IFQs) including methods for assessing the economic and social costs.

g. Contaminants

\$100,000

The NPRB will consider proposals that address any of the research priorities identified in the science plan, including studies of sources, transport, effects, and accumulation of contaminants in subsistence, recreational, and commercial species, and other ecosystem components. However, efforts that address the following will be given priority consideration.

Projects should relate to community concerns and focus on marine species that are human dietary items. The Alaska DEC has started a bio-monitoring program for fish and proposals should not duplicate this effort. Monitoring for newly identified contaminants in important food sources for humans is a priority. Sampling design should include background levels of the contaminant(s) and examine input sources and levels. Sampling and analytical protocols should be peer reviewed.

A relevant program could be two-tiered:

Long Term:

- Develop sampling and analytical protocols for monitoring contaminant trends in the environment (e.g. plankton, seabird or fish eggs, marine mammals). The proposed monitoring should be efficient, robust and able to be used periodically to assess ecosystem contaminants levels.
 - The protocols developed should provide for samples to be taken each year but analyzed only periodically to determine if contaminant levels have changed.
 - The matrix measured should integrate spatially and temporally. Archival storage for samples should be described in the proposal.
 - Opportunities for community involvement in sampling are encouraged.

Point Source Contamination:

- Develop sampling and analytical protocols for monitoring point source contaminants the environment (e.g. marine mammals, fish, shellfish, birds). The proposed monitoring should be efficient, robust and responsive to the context of the contaminant event.

2. Local and Traditional Knowledge \$100,000

The Board is requesting proposals that address one or more of the research priorities identified elsewhere in this 2008 RFP (that are not related to or take place in the BSIERP study area, which has its own integral LTK component) and engage local and traditional knowledge (LTK) and its holders. Potential projects must be responsive to the LTK section of Chapter 4 of the NPRB science plan and contribute to the mission of the NPRB. In addition to the usual proposal evaluation criteria, LTK proposals will be assessed with regard to: (a) the depth to which they engage LTK throughout the project, including design and interpretation as well as the collection of data and information, and (b) the demonstrated commitment of community partners (where “community” may refer to a geographic, ethnic, occupational, or other group), for example as research team members or in letters of support.

3. Collaboration with Oil Spill Recovery Institute \$100,000 (\$100,000 NPRB; \$200,000 total)

An opportunity exists to conduct collaborative research in the Gulf of Alaska. This is the third year of collaboration between NPRB and the Oil Spill Recovery Institute (OSRI), and again this year, NPRB and OSRI have each committed up to \$100,000 for this collaboration, yielding a total of up to \$200,000. This section of the RFP is open to all organizations and individuals and is in no way restricted to those associated with OSRI or the Prince William Sound Science Center. The research topics have changed for this 2008 RFP and are as follow:

a. Socioeconomics: modeling community impacts - \$75,000

The coastal regions of Alaska have experienced and are experiencing considerable environmental and anthropogenic changes, such as impacts from oil spills, to marine and adjacent ecosystems, with potentially significant effects on natural resources available for commercial, recreational or subsistence harvest and other uses, as well as on the coastal economies, culture and social fabric. In order to anticipate and plan for these changes, coastal communities and resource planners in Alaska need to understand the size and directions of social, economic, and cultural responses to ecosystem changes. As a first step, a specific need is a model for estimating the community impacts of the changes and events that affect the natural resource base of marine resource dependent industries and activities. The model should focus on one or more communities with strong marine resource dependent economies, examining the effects of an oil spill along with other changes and influences on the marine environment and human uses thereof in the past two to three decades. The model may incorporate both traditional and emerging sectors, as well as consumptive and non-consumptive uses, and should be designed to allow its extension to other coastal communities in Alaska. Proposers should document their reasons behind the communities chosen, assumptions and decisions about the scope of analysis, and explain how they expect their results can be built upon to create the larger model. Existing models can be adapted. Individual proposal funding cap is \$75,000.

b. Contaminants baseline assessment - \$75,000

Subsistence usage of marine resources as a main source of protein is a significant part of the Alaska Native culture. Hence, food safety is of great importance and of continued concerns especially in light of changing ocean conditions. National programs such as the National Oceanic and Atmospheric Administration’s (NOAA) National Status and Trends (Benthic Surveillance and/or Mussel Watch Program) have limited spatial coverage to assess the range of potential contaminants in the Gulf of Alaska (including the Aleutian Islands). We are looking for proposals that will improve the spatial coverage of baseline contaminant assessment in the Gulf of Alaska. The proposed study should be compatible with an

existing contaminant program so that this one-time baseline assessment will inform the expansion of contaminants monitoring in the Gulf of Alaska.

In addition to overall concerns about the health of subsistence foods, one of the goals of the project is to provide background information that would be useful for assessing affects of future oil or fuel spills. Thus, proposals should demonstrate that the suite of analytes are consistent with lessons learned from past monitoring and sampling programs. At a minimum, the list of analytes that should be included in the proposed program are: parent and alkylated PAHs, POPs (including PCBs, DDTs, chlorinated pesticides-including toxaphene and lindane), and perfluorinated octane sulfates (PFOS).

Justification for site selection, including a discussion of known existing or potential sources of contamination (including areas at highest risk for oil spills), must be provided. It is not the intention of the RFP to support analysis of contaminants at sites that are already included in existing contaminant programs or where historical background information already exists. Merit will be provided for programs that make efforts to coordinate with other coastal contaminant measurement programs in the Gulf of Alaska. Individual proposal funding cap is \$75,000.

If shellfish are selected as monitoring organisms, the NPRB will provide an additional \$25,000 to add domoic acid to the assessment. Domoic acid (DA) is a newly recognized toxin produced by diatoms in the genus *Pseudonitzschia*. Domoic acid is known to occur in Alaskan coastal waters. DA vectors into all components of the marine food web including forage fish, benthic organisms and subsequently into the diets of top predators. Significant health effects in humans (original outbreak in Prince Edward Island, Canada) and marine mammals have been documented (CA-WA coasts). DA is a stable toxin and may persist in the environment. A baseline assessment of DA in shellfish would be valuable information for resource managers.

c. Forage fish and near-shore habitat association - \$50,000

Proposals are requested that will define relationships between the kinds and amounts of near-shore, shallow-water habitat (different geological features, floral assemblages, man-made structures, other, in water depth less than 30 meters) and the occurrence of selected fishes. Proposals should not include any new data collection but the intention should be to combine existing datasets to help increase our knowledge on forage fish habitat requirements and associations as well as to validate the use of shore zone and other mapping data. Previous shore zone mapping studies have produced detailed near-shore habitat maps, including features that may be critical rearing and reproductive habitat for demersal and pelagic species. If strong correlations can be demonstrated between habitat type and fish dependencies (any or all life stages), the information will assist resource managers in protecting stocks in specific near-shore regions. Proposals should demonstrate the ability to provide a quantitative and repeatable measure of habitat use by selected fishes, and statistical or other analyses must be sound. Individual proposal funding cap is \$50,000.

4. Cooperative Research with Industry

\$400,000

The Board is requesting proposals that address one or more of the research priorities identified below ***and engage the fishing and oil and gas industries or others as appropriate***. Potential projects must be responsive to the cooperative research section of Chapter 4 of the NPRB science plan and contribute to the mission of the NPRB. In addition to the usual proposal evaluation criteria, cooperative research proposals will be assessed with regard to: (a) the depth to which they directly engage the relevant industry throughout the project, including project identification, design, and interpretation as well as the collection of data and information;(b) the applicability of the proposal to addressing pressing conservation

and management needs identified for the applicable industry; (c) the extent to which the project will help to build a better understanding between science and industry, and greater confidence in the products of research and in the regulatory process; and (d) scientific integrity, practicality, and cost effectiveness of the experimental design and how the results will be applied to fishery management if such alteration is beneficial or required. Cooperative research priorities identified by industry are listed below and will be given highest priority. The NPRB also will consider other proposals relating to other priorities in its Science Plan as long as they have a strong cooperative research component.

a. Topics identified by fishing industry

i. Gear Modification

Gear modification studies are a traditional area for industry/scientist cooperative research. Such cooperative research studies can be very cost effective, and provide a good opportunity to bring practical industry experience and scientific methodologies together. Areas of interest include gear modifications to reduce habitat impacts, gear loss, interactions with non-target species of fish, avoid or minimize marine mammal or seabird interactions, and reduce the impacts of lost gear. Gear modifications are not limited to trawls and studies may include gear for rocky areas as well as improvements in survey method design.

ii. Fisheries Monitoring

Improvements in fishery monitoring require at-sea testing and evaluation. Cooperative research efforts can play a useful role in reducing costs and ensuring that projects are efficient, effective, and have industry buy-in. This can range from remote monitoring and video monitoring programs to modifications or refinement of observer program protocols and operations.

iii. Bycatch Reduction

Bycatch reduction projects are already underway, such as the salmon and halibut excluder projects. These are closely related to gear modification cooperative research projects. Other kinds of bycatch reduction could include cooperative research projects to look at bycatch in fixed gear or pots, studies to reduce crab mortalities in pot gear, or investigations into modification of fishing practices (time, depth, seasons, etc) to reduce bycatch while maintaining healthy catch rates for target species.

iv. Ecosystem Monitoring and Research

Ecosystem monitoring and research could include utilizing platforms of opportunity in the fleet to carry or deploy monitoring oceanographic sensors, cooperative biomass assessments and surveys, marine mammal/fishery interactions and methodologies to reduce such interactions, assist in deployment of acoustic monitors (right whales), evaluation of non-fisheries activities on fish behavior (seismic testing), and cooperative marine mammal or seabird monitoring.

v. Whale Entanglement Avoidance and Deterrents

The Central North Pacific humpback whale population is increasing and the risk of interactions with salmon net fisheries (gillnet and seine) in the Gulf of Alaska has also increased. NPRB is seeking proposals with a focus on cooperative testing of avoidance techniques with potential equipment development and evaluation to reduce entanglements.

vi. Habitat mapping

NPRB is seeking cooperative proposals that will undertake comprehensive surveys of habitat types in the Bering Sea canyons. Applicants should consult NPRB [project 615](#) for information on the recent Marine Habitat Mapping Technology Workshop for Alaska.

b. Topics identified by oil and gas industry

The Oil and Gas industry is supportive of cooperative research in long-term monitoring with an emphasis in the Beaufort Sea. Applicants should contact potential industry partners before preparing and submitting proposals. Areas of particular interest include:

- i. Polar bears: distribution, abundance, den emergence, den detection, and hearing ability (i.e., research related to disturbance) in the Beaufort Sea – see also polar bears under marine mammals.
- ii. Marine mammal acoustic studies with a focus on a better understanding of ambient sound in the Beaufort Sea.
- iii. Assessment and analysis of shoreline change over the past 30 years in the Beaufort Sea.
- iv. Basic and/or applied work on ice seals (especially ringed seals in the Beaufort Sea) – see also ice seals under marine mammals.
- v. Salmon distribution: evaluation and analysis of salmon distribution from catch data, including Local and Traditional Knowledge, in the Beaufort Sea.
- vi. Influence of outer continental shelf oil and gas exploration on marine bird distribution, migration and habitat use in the Beaufort Sea. These areas of exploration are utilized by several species of seabirds that generally move from wintering areas in the North Pacific Ocean to summer breeding, feeding, and molting areas in the Chukchi and Beaufort Seas and their associated coastal areas and loons which transition through coastal areas. Species of particular concern are the spectacled eider and Steller's eiders (both listed as threatened species under the Endangered Species Act), common eiders and long-tailed ducks (which appear to be in decline), and yellow-billed and red-throated loons. Little is known about the distribution, timing of migration, migration routes, and food habits of these species when they are at remote locations in the Arctic Ocean. In addition, changes in sea ice and marine community shifts may influence habitat use patterns of these birds. Basic biology and habitat needs are necessary for industry and natural resource agencies to conduct environmental planning and avoid habitat impacts for these birds.

5. Community Involvement**\$100,000**

The NPRB seeks proposals for small-scale research activities based in communities along the coast of the Gulf of Alaska, Aleutians, or Arctic Ocean. The intent is to provide community-based organizations and individuals with the chance to gain experience in conducting research projects and to address their research interests and priorities, consistent with the overall mission of the NPRB. This section of the RFP is not intended to discourage community-based organizations from applying for other and larger projects under any other section of the RFP. Instead, it provides an opportunity for those organizations to define priority research, to explain how that research is connected to the NPRB mission, and to describe how the

project would be conducted to meet scientific standards as well as community expectations. The NPRB intends to fund two or three projects under this item.

6. Aleutian Islands

\$350,000

The Aleutian Archipelago consists of hundreds of small, volcanic islands, separated by oceanic passes that connect the waters of the North Pacific with the Bering Sea. The Aleutian Islands region has a complicated mixture of substrates, including a significant proportion of hard substrates (pebbles, cobbles, boulders, and rock). Cold-water corals and sponge communities are a dominant feature of benthic communities on the steep rocky slopes of the Aleutian Islands and provide important habitat for a variety of fish and invertebrate species.

The North Pacific Fishery Management Council has chosen the Aleutian Islands as the pilot ecosystem area for its first Alaskan [Fishery Ecosystem Plan](#) (FEP) in an effort to move forward with an ecosystem approach to fishery management. The Aleutian Islands area is an ideal candidate as it is ecologically and historically unique in several aspects. Many Council management actions in the past have focused on the area's important resources, such as Steller sea lions, seabirds, benthic habitats that support coral and sponges, and other special resources of public interest (such as deep sea coral gardens). The Aleutian Islands have also been at the center of allocation issues related to the Aleutian Islands pollock and Pacific cod fisheries. Far less is understood about the ecological interactions in the Aleutians than in the eastern Bering Sea, yet the two areas are managed under one the Federal fishery management plan. The Council recognizes that the Aleutian Islands contain unique and valuable ecological qualities that should be preserved, and wishes to build upon past actions by considering fishery interactions and cumulative impacts within this ecosystem more explicitly. Applying an ecosystem approach to fisheries management through the implementation of a FEP may promote this goal.

Through the process of developing the FEP for the Aleutian Islands, research gaps have been identified. The NPRB is seeking proposals that address gaps in the Aleutian Islands for the following six categories:

a. Nearshore Dynamics of the Aleutian Islands

The Aleutian Islands are the exposed mountain tops of the submarine, volcanic range extending between North America and Asia. The large populations of marine birds and mammals which breed and rear young here require adequate prey within energetically efficient foraging distances of breeding sites. The steep-sloped submarine mountains are generally surrounded by deep water, particularly south of the islands, so the nearshore, shallow water fringe is relatively narrow. Nevertheless, this zone is ecologically very important. The shallowest portions of the narrow shelf are dominated by kelp forests and associated biota, and the outer edge of the shelf and upper portions of the slope are inhabited by large populations of marine fish (e.g., Pacific Ocean Perch, Atka Mackerel). Extensive work has been done along the Aleutians to document species abundance, distribution and life history parameters. However, relatively little study has been devoted to ecosystem processes that link the nearshore and pelagic zones. Furthermore, basic physical drivers (e.g., passes, major slope currents) are not well understood except at very broad scales, but are known to be important and predictable "hotspots" for many marine birds and mammals. NPRB will consider proposals that address ecosystem processes in the nearshore marine waters of the Aleutian Islands, including integrated analysis of patterns of change in physical and biological elements for use in predictive models addressing how the nearshore and pelagic systems interact and how the nearshore system is likely to change due to climate effects.

b. Ecosystem impacts of climate and ocean conditions and trends in the Aleutian Islandsc. Fishing effect interactions

Differences between spatial stock structure and the spatial scale of fishery management may impact managed species in undesirable ways. NPRB will support proposals that research the extent of spatial dispersal for commercial stocks, determine larval distribution and drift of key species in the Aleutian Island ecosystem, or address the level of conservation obtained from various management scenarios.

Commercial fisheries may impact subsistence uses. Studies relating to the local and traditional knowledge of subsistence use patterns and how they may have been impacted by commercial fisheries are requested. To this end it would be useful to support a compilation and evaluation of local and traditional knowledge from residents of Atka and Adak.

NPRB held a Bering Sea indicator workshop in 2006 ([Project 502](#)). From this workshop followed a series of recommendations on how to proceed with research on indicators. The following categories were developed as result and should specifically be focused for the Aleutian Islands.

d. Advancing ecosystem approach to fisheries management.

This includes development of suitable indicators and indicator species (including developing ecosystem reference points, optimum yield (OY) cap considerations, and improvements of current ecosystem models.

e. Development of forecasting tools with indicators.

Development of forecasting tools that incorporate ecosystem indicators into single or multi-species stock assessments to conduct management strategy evaluations under differing assumptions regarding climate and market demands. Standardization of "future scenarios" will help to promote comparability of model outputs. Process-oriented research focused on local impacts of fishing on prey availability for top trophic level consumers will also be informative.

f. Ecosystem indicators including retrospective studies.

Research is still needed into the assessment and determination of appropriate ecosystem indicators. Current models are designed for gradual changes based on observed ecosystem states, yet many biological system show threshold responses. Research could focus on evaluating current indicators (false positives, etc. see 502 report) and/or a 'risk assessment' approach to determine indicators for shifts into alternate states, i.e. regime shifts. Indicators for critical ecosystem processes should be developed and evaluated including retrospective studies. An objective review of ecosystem responses to existing climate indicators could be done. The use of remotely sensed high resolution wind stress measurements (i.e. QuikSCAT) and sea surface heights (SSH) (TOPEX/POSIDEN) could be used to improve existing ecosystem indicators such as upwelling indices and to develop new circulation indicators. The development and testing of new biological indicators are also encouraged.

PROPOSAL APPLICATION MATERIALS

All applicants should refer to http://www.nprb.org/research/2008_RFP.htm for a copy of proposal application materials. Please contact the NPRB office by phone at (907) 644-6700, or by email to NPRB's assistant program managers, Carolyn Rosner (Carolyn.Rosner@nprb.org) and Carrie Eischens (Carrie.Eischens@nprb.org) if you need further information.

Please note that if the links to the template documents provided below do not work on your computer due to your internal security settings, you may find all templates at the above mentioned website.

PROPOSAL SUBMISSION AND DEADLINE

Proposals must be submitted online at http://www.nprb.org/research/2008_RFP.htm). Applicants will need to prepare the following information and documents (described in more detail below). Sections 1-7 (except for names of potential reviewers) will be sent out for technical reviews.

1. Proposal summary (abstract of max 250 words)
2. Proposal classification
3. Contact information for the Principal Investigator, Co-Investigators, Collaborators, Grant Managers, and potential Reviewers
4. Research Plan (max 12 pages, *use provided template*)
5. Budget Information and Budget Narrative (*use provided templates*)
6. Résumés (max 2 pages per principal investigator)
7. Previously Funded NPRB Projects
8. Current and Pending Support (*use provided template*)
9. Community Involvement
10. Letters of support
11. Other Requirements

Online submission for proposals will be available between 1 November and 30 November 2007. During the submission process you will create an account to which you can return at a later date if needed. Returning applicants can use their existing accounts. You will be asked to fill in a variety of forms with information from the list above as well as to upload files (research plan, CV's, etc.). **Templates** for the research plan, budget summary, budget narrative and the current and pending support form will be provided (blue links in the appropriate sections below) and **must be used**. Download these templates, fill them in and upload them again in the appropriate places. Your information will be saved as you move through this process and you will have the ability to update any information you have provided at any time before your final submission.

A link to a generated complete summary page(s) will appear as soon as you have provided the following information: full address and contact information for each agency or entity that will be legally bound to perform the research if funded, name of the principal investigators and co-investigators that will be associated with the project and their agency/organization affiliation and email address, and the 250 word summary. Please print this page(s) and have it signed by the appropriate legal representatives of each institution participating in this research. Once you have finalized your submission you will be assigned a reference number. Insert this number in the appropriate place on the signed summary page and mail it to:

**North Pacific Research Board
1007 West 3rd Avenue, Suite 100
Anchorage, AK 99501**

It is acceptable for each authorized representative to sign a different sheet of paper and send it in separately. The proposal Applicant should sign the overall summary sheet.

Proposals must follow the guidelines and criteria specified herein and **must be submitted online by 4 p.m., Alaska time, 30 November 2007. In the interest of fairness, no proposals received after the deadline will be considered for funding. The signed summary page generated by the system at the end of the application process must be received at the NPRB office no more than one week after this deadline, i.e. 4 p.m., Alaska time, 7 December 2007. Please note that courier and express deliveries to Anchorage, Alaska, normally require a minimum of two days for delivery.**

Confidentiality of Proposals

If a proposal is submitted, but not funded, only the following information will be released to the public: Proposal title, names of principal and co-investigators, funding amount requested, duration, and the proposal summary page which is generally limited to 250 words or less. If a proposal is approved for funding by NPRB and the Secretary of Commerce, then the full proposal (without salary information) will be released to the public. Proposals submitted in response to the joint NPRB-OSRI collaboration will go through a special joint review process and will be distributed to the OSRI Board and its advisory bodies in accordance with their standard operating procedures.

I. Proposal Package

The full proposal package consists of ten elements:

1. Proposal Summary Page

The proposal summary page will be created automatically based on the information you provide during the online submission process. It will include a **title, project period, names of applicant organization and principal/co-investigators, a summary of work** (250 words or less), **requested funds and other support**, and a place for the signature of an official authorized to legally bind the submitting organization. This page is not confidential and will be made available to the public. Ensure that you have not included any social security numbers in any of the fields. The proposal summary page is not a numbered page and thus does not count towards the 12 page limit of the Research Plan.

1. Proposal classification

During your submission, you will be asked to provide the following:

- a. *Keywords:* Describe your project with 5-10 keywords (do not include any words that would apply to items b-c below).
- b. *Ecosystem Components:* Indicate one or more of following ecosystem components addressed in your study: Atmosphere/Ocean, Lower Trophic Level, Fish and Invertebrates, Habitat, Seabirds, Marine Mammals, Humans, Ecosystem Indicators, Modeling, and/or Ecosystem Studies.
- c. *Large Marine Ecosystem(s) (LME):* Note the LME(s) in which your study takes place: Arctic Ocean, Bering Sea and Aleutian Islands, and/or Gulf of Alaska (consult the Science Plan for LME boundary definitions).
- d. *Research Priority:* Identify ONE primary research priority from the 2008 RFP which your proposal will compete under. In Section C of the research plan you may identify up to three secondary research priorities to show the broader responsiveness of your proposals to the RFP, but staff will not move your proposal from the primary category you indicated above.

