North Pacific Research Board

Presentation

to

PICES

October 2005

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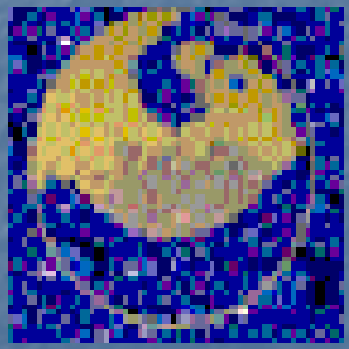
North Pacific Research Board
Anchorage, Alaska



www.nprb.org

NPRB MISSION

Building a clear understanding of the North Pacific, Bering Sea, and Arctic Ocean ecosystems that enables effective management and sustainable use of marine resources.

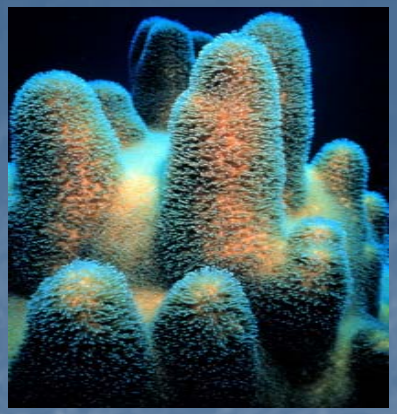
Research Funds

Dinkum Sands funds – 1997: 20% of interest

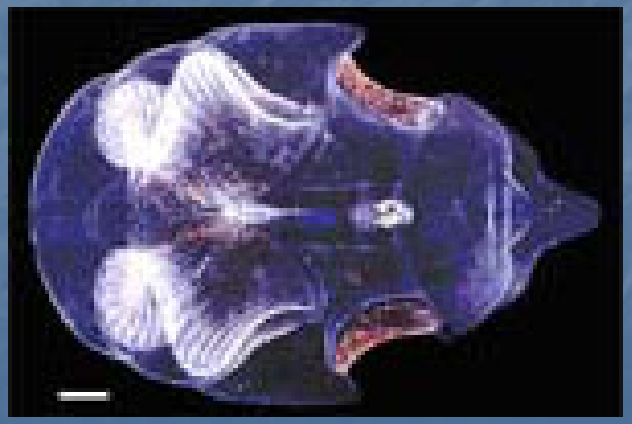
Total Research thru 2005 - $17 million for 94 projects:

- **$1.2 million for 2002**
- **$7.0 million for 2003**
- **$3.3 million for 2004**
- **$5.5 million for 2005**

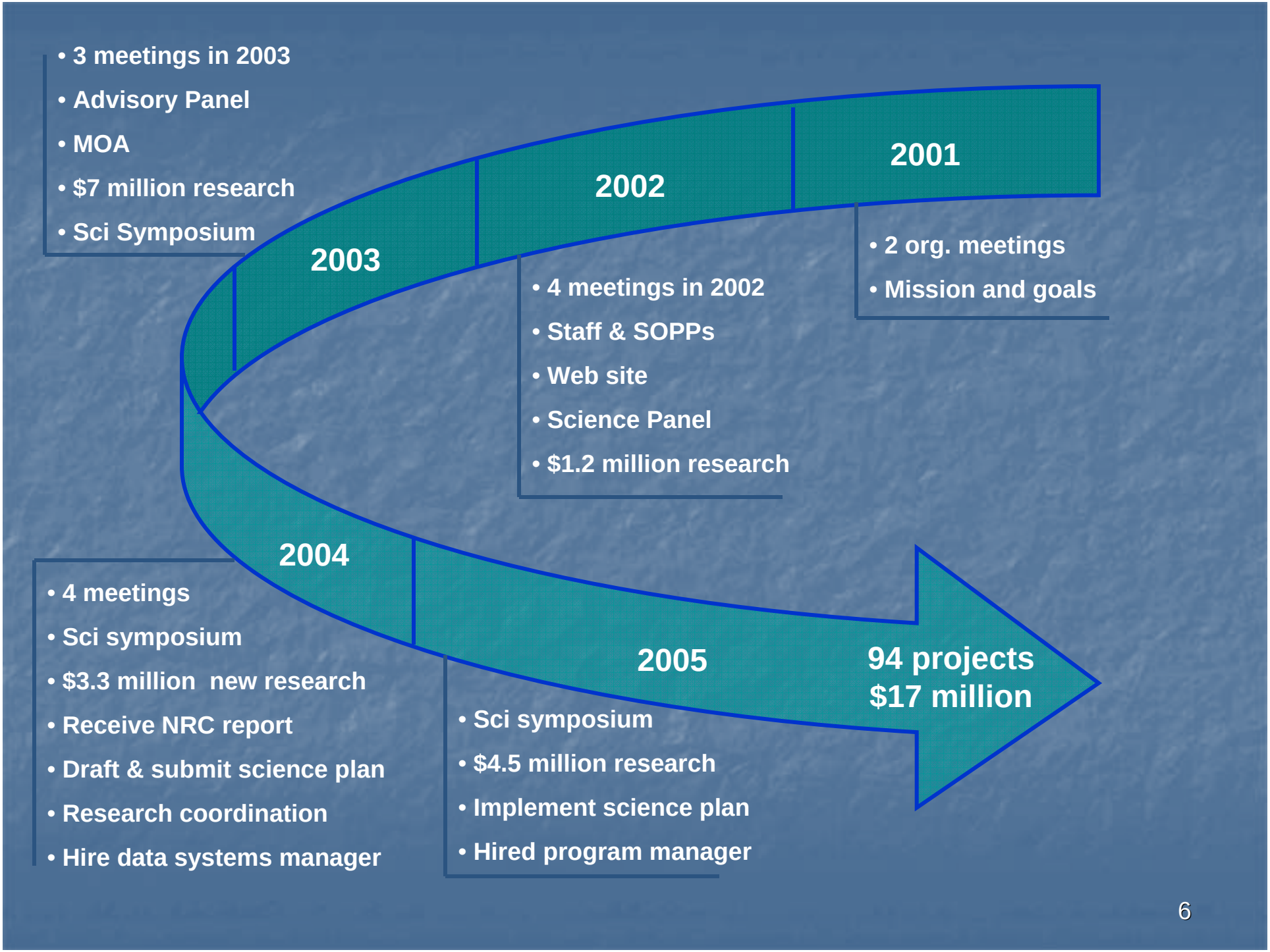
Plan for about $6 million annually plus appropriations which were $3 million in 2004 and 2005



Research on the fisheries or marine ecosystems in the north Pacific Ocean, Bering Sea, and Arctic Ocean



Research should address pressing fishery management issues or marine ecosystem information needs


• 3 meetings in 2003
• Advisory Panel
• MOA
• $7 million research
• Sci Symposium
2003
2002
2001
• 2 org. meetings
• Mission and goals
• 4 meetings in 2002
• Staff & SOPPs
• Web site
• Science Panel
• $1.2 million research
2004
• 4 meetings
• Sci symposium
• $3.3 million new research
• Receive NRC report
• Draft & submit science plan
• Research coordination
• Hire data systems manager
2005
• Sci symposium
• $4.5 million research
• Implement science plan
• Hired program manager
94 projects
$17 million

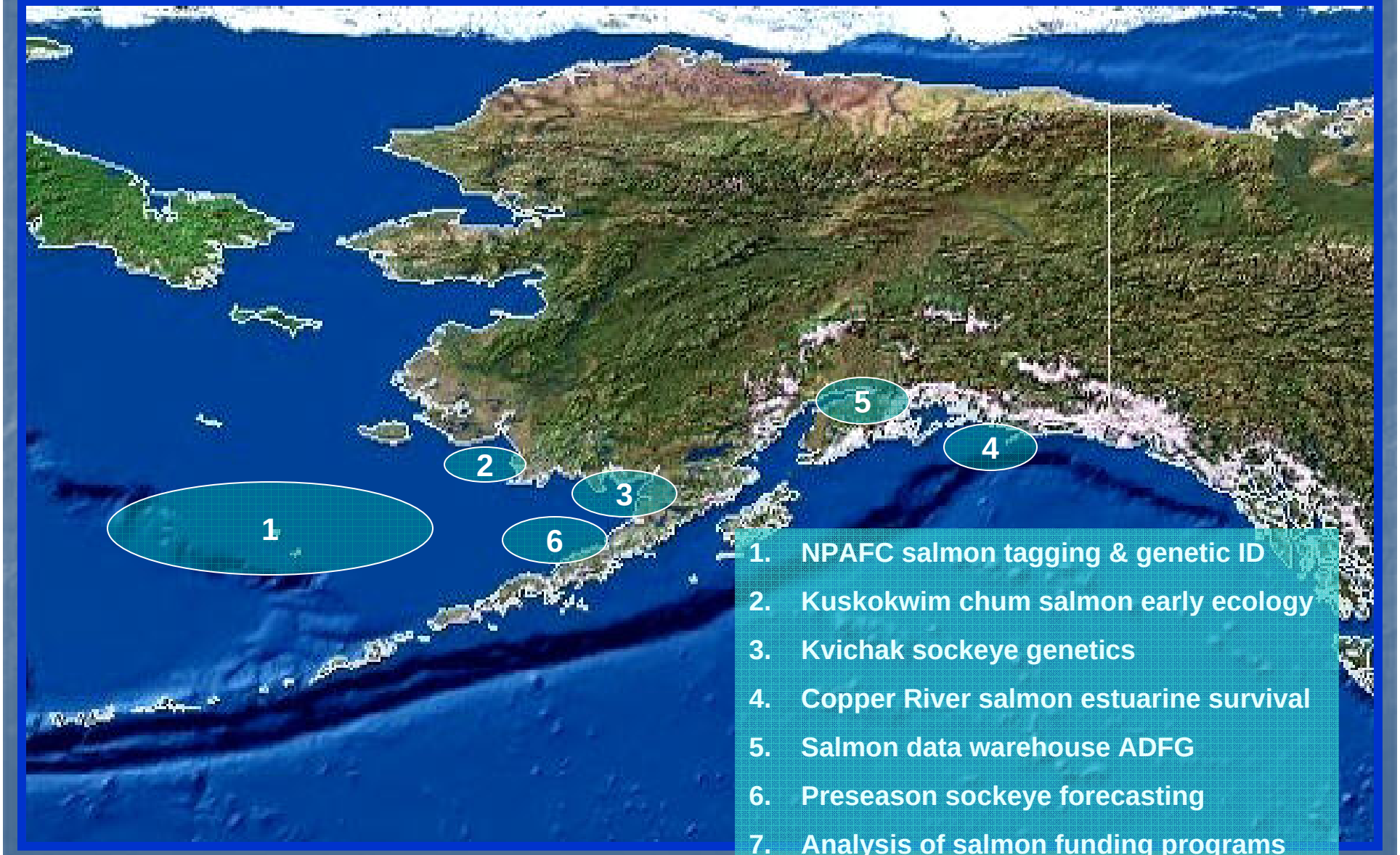
Institutions Receiving Over $300,000

Institution	NPRB Funding	% Total
University of Alaska	$5,059,194	29.2
NOAA Alaska Fisheries Science Center	4,781,321	27.6
Alaska Dept of Fish and Game	913,270	5.3
NOAA Pacific Marine Env. Lab.	820,630	4.7
University of Washington	640,517	3.7
Alaska SeaLife Center	443,948	2.6
U.S. Geological Survey	417,720	2.4
Prince William Sound Science Center	400,022	2.3
PRBO Conservation Science	398,681	2.3
U.S. Fish and Wildlife Service	395,558	2.3
Oregon State University	385,040	2.2
University of California	362,548	2.1
North Pacific Anadromous Fish Comm.	317,865	1.8

NPRB 2002-2005 Research: 94 projects for $17 million

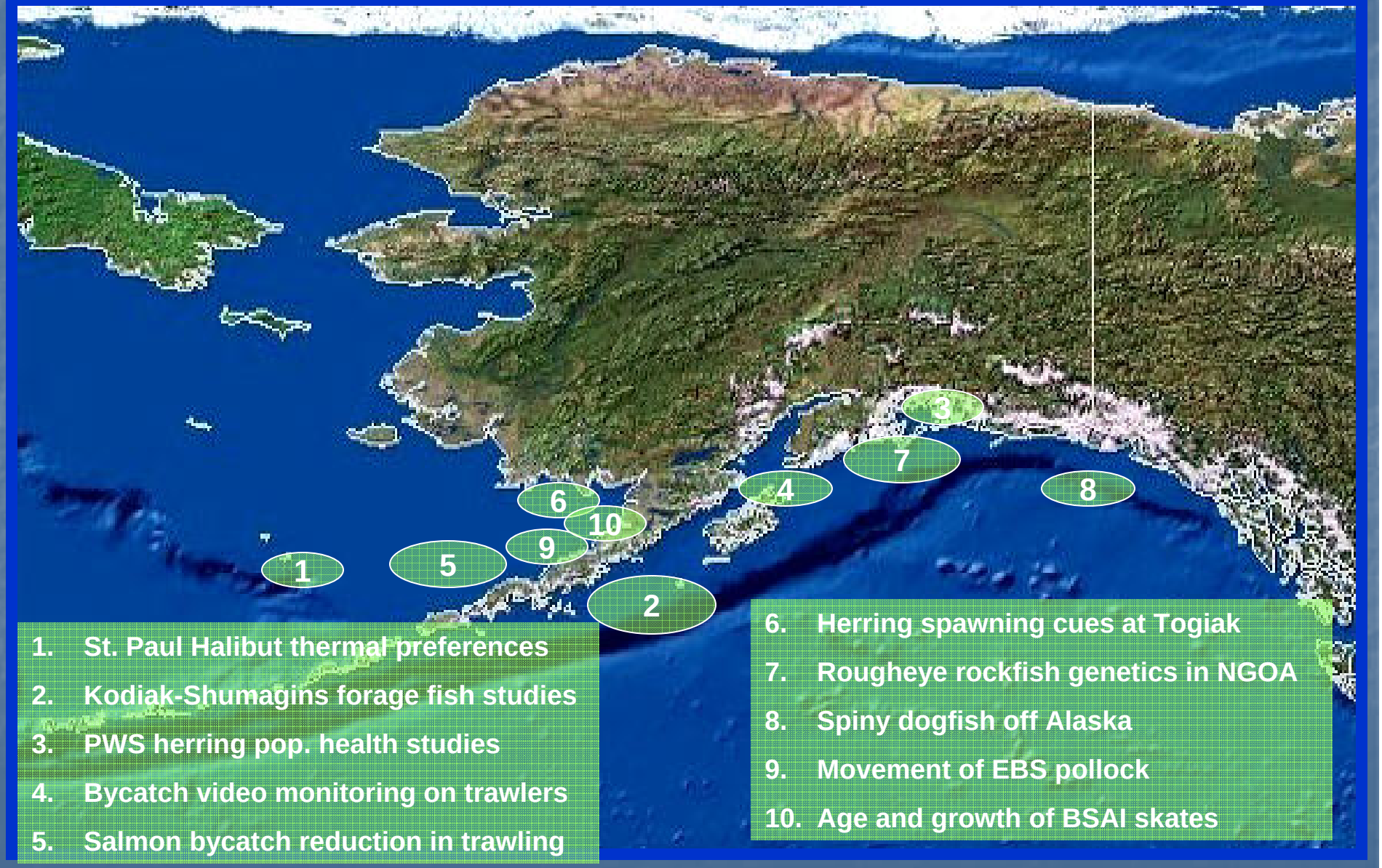
Categories of Research	No. Projects	Total Funding ($ millions)	%
Oceanic and Estuarine Salmon	9	$2.29	13
Other Fisheries-Related Research	22	$2.66	15
Fisheries Habitat	12	$3.15	18
Marine Mammals	16	$2.76	16
Seabirds	10	$2.07	12
General Ocean & Ecosystem Studies	19	$3.79	21
Education, Outreach, and Synthesis	6	$1.12	6

Salmon | O. Fish | Habitat | Shellfish | Ecosystem | Mammals | Seabirds



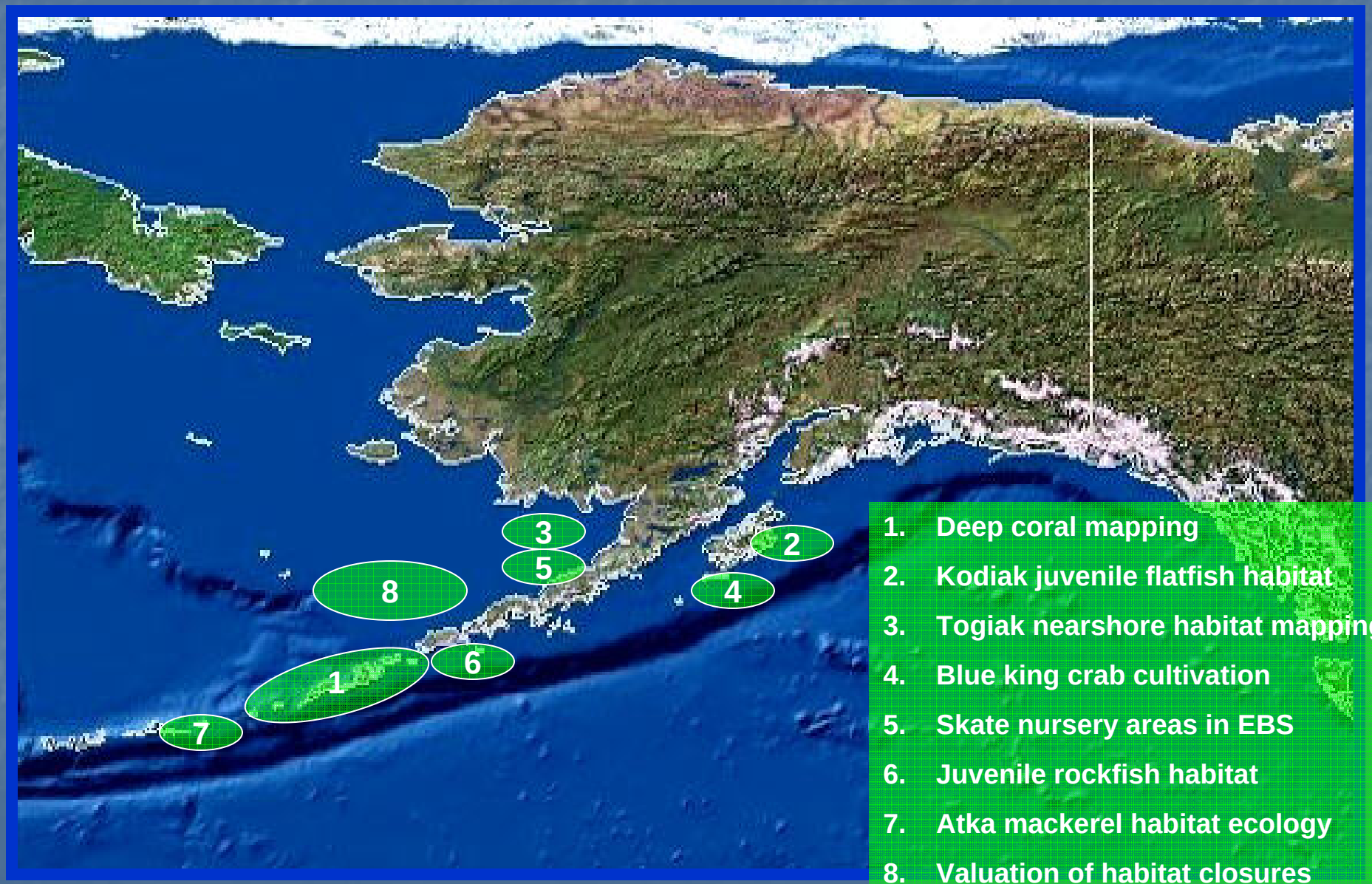
1. NPAFC salmon tagging & genetic ID
2. Kuskokwim chum salmon early ecology
3. Kvichak sockeye genetics
4. Copper River salmon estuarine survival
5. Salmon data warehouse ADFG
6. Preseason sockeye forecasting
7. Analysis of salmon funding programs

Salmon | O. Fish | Habitat | Shellfish | Ecosystem | Mammals | Seabirds



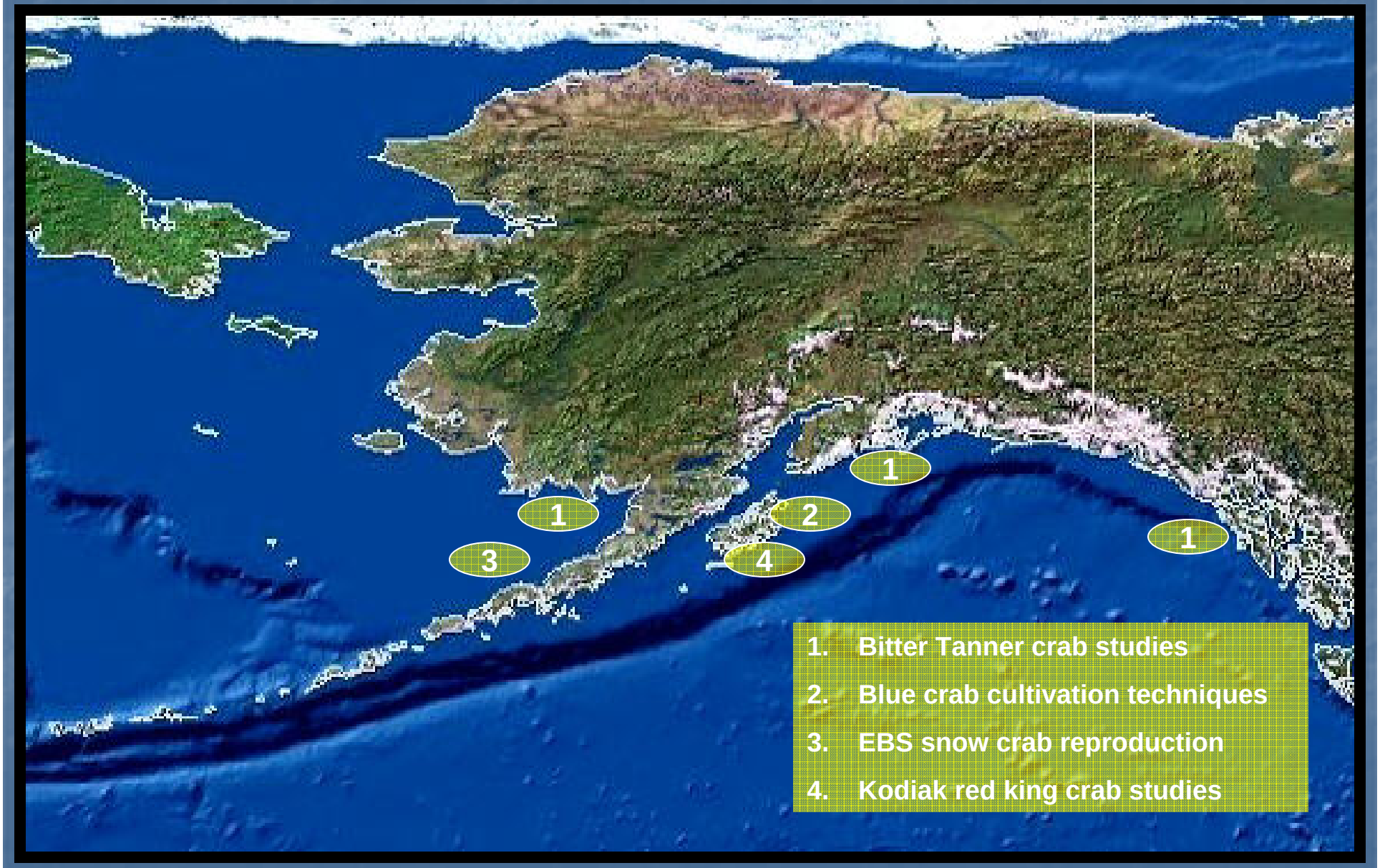
1. St. Paul Halibut thermal preferences
2. Kodiak-Shumagins forage fish studies
3. PWS herring pop. health studies
4. Bycatch video monitoring on trawlers
5. Salmon bycatch reduction in trawling
6. Herring spawning cues at Togiak
7. Rougheye rockfish genetics in NGOA
8. Spiny dogfish off Alaska
9. Movement of EBS pollock
10. Age and growth of BSAI skates

Salmon | O. Fish | Habitat | Shellfish | Ecosystem | Mammals | Seabirds

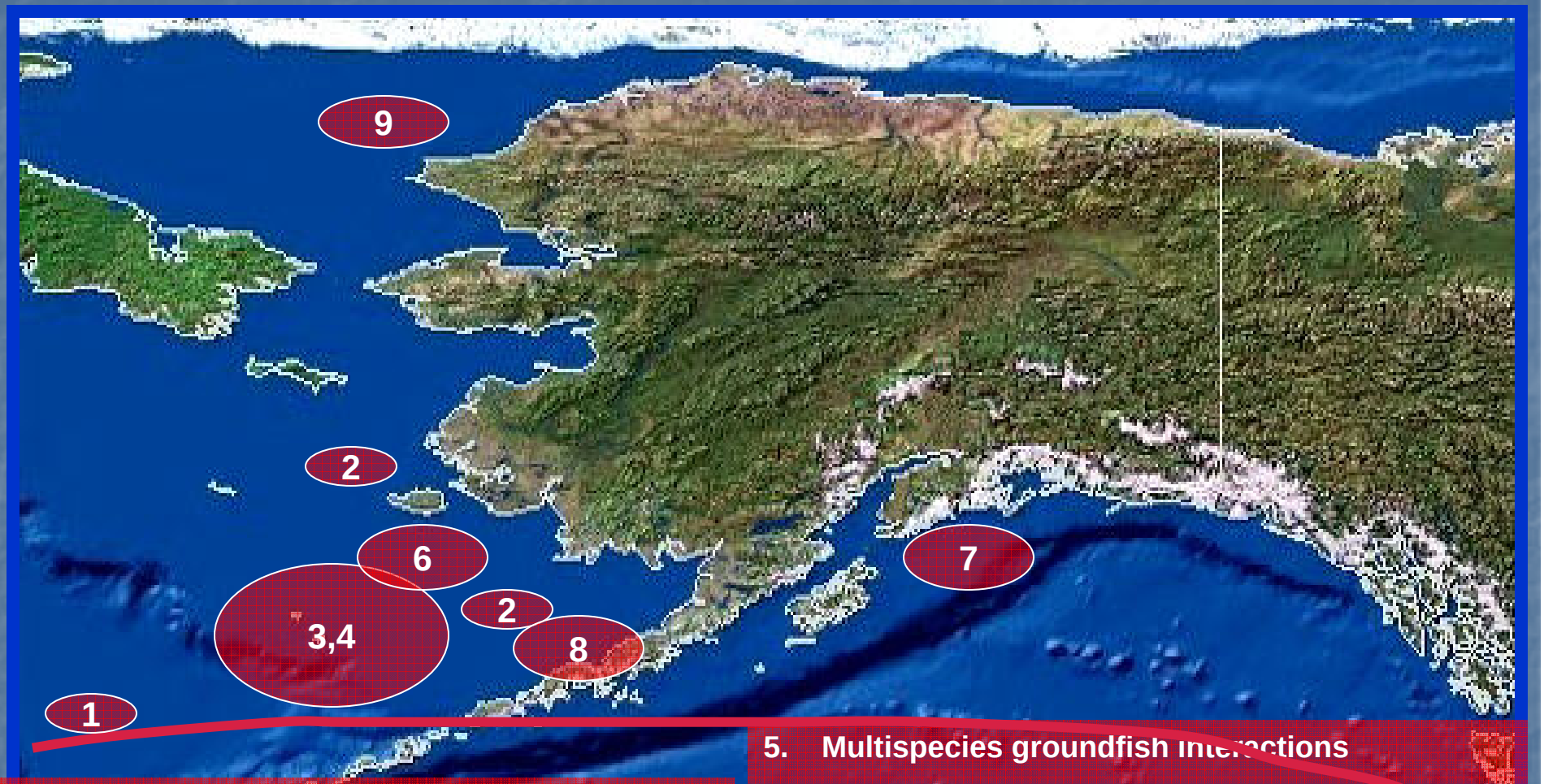


1. Deep coral mapping
2. Kodiak juvenile flatfish habitat
3. Togiak nearshore habitat mapping
4. Blue king crab cultivation
5. Skate nursery areas in EBS
6. Juvenile rockfish habitat
7. Atka mackerel habitat ecology
8. Valuation of habitat closures

Salmon | O. Fish | Habitat | **Shellfish** | Ecosystem | Mammals | Seabirds

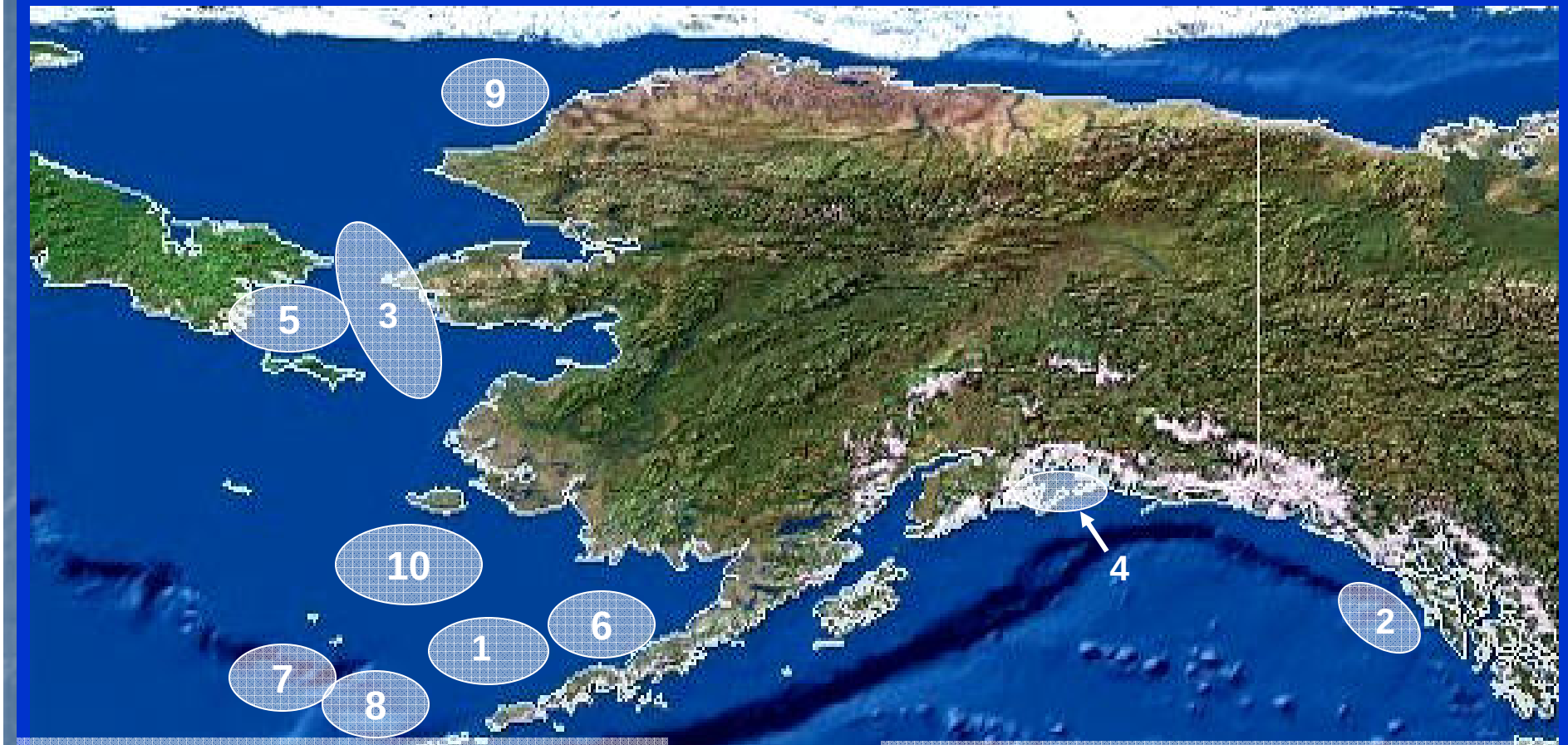


Salmon | O. Fish | Habitat | Shellfish | **Ecosystem** | Mammals | Seabirds



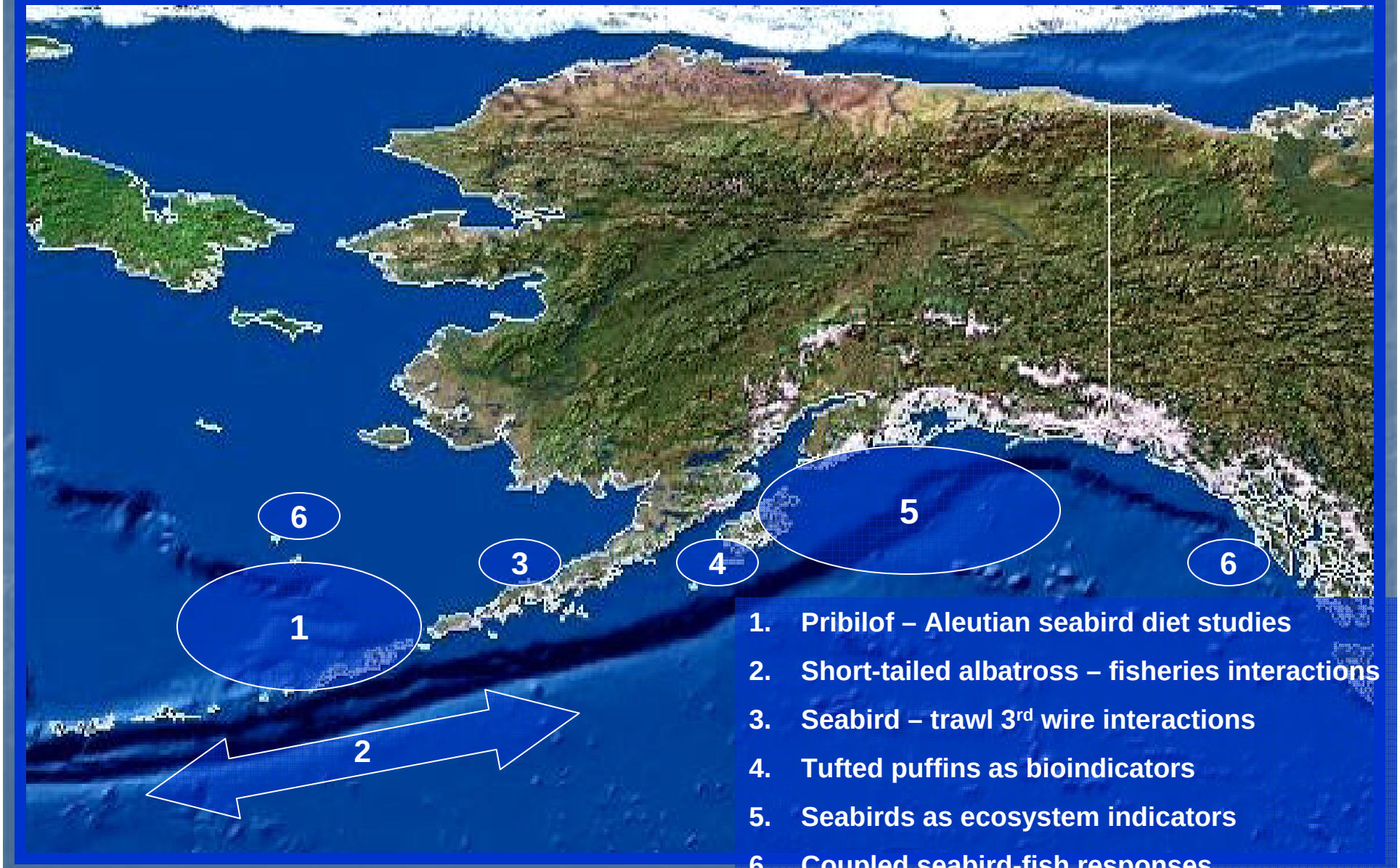
1. CPR: plankton, seabird and marine mammals
2. Biophysical moorings 2, 4, 5, 8
3. Protocol for detecting change in Bering Sea
4. Evaluation of ocean circulation models
5. Multispecies groundfish interactions
6. Utility of ecosystems indicators for Bering Sea
7. GOA Seward Line observations
8. Multiple forage fish studies
9. Arctic synthesis

Salmon | O. Fish | Habitat | Shellfish | Ecosystem | **Mammals** | Seabirds



1. Right Whale acoustics
2. Sperm whale – longline interactions
3. Ice seal bio-monitoring
4. PWS harbor seals foraging ecology
5. Beluga whale wintering grounds
6. Diets of BSAI killer whales
7. Fur seal foraging strategies
8. Winter movement of fur seal pups
9. Ice seal stock structure
10. Oceanography and endangered whales

Salmon | O. Fish | Habitat | Shellfish | Ecosystem | Mammals | **Seabirds**



1. Pribilof – Aleutian seabird diet studies
2. Short-tailed albatross – fisheries interactions
3. Seabird – trawl 3rd wire interactions
4. Tufted puffins as bioindicators
5. Seabirds as ecosystem indicators
6. Coupled seabird-fish responses

Annual Cycle

Late September	**Meeting: Board approves RFP Release**
Early October	**Release RFP**
Early December	**Proposals due**
January	**Science Symposium and Peer reviews**
March	**Meeting: Board approves proposals**
May-June	**Meeting: Science reports and draft research priorities**

Meetings mainly in Anchorage, but could be elsewhere.

5-7 year Science Plan

- Conceptual Foundation
  - Atmospheric and Oceanographic features
  - Ecosystem Dynamics
  - Human Dimensions
- Research Approaches
- Ecosystem Indicators
- Research Themes
  - Lower Trophic Level Productivity
  - Fish Habitat
  - Fish and Invertebrates
  - Marine Mammals
  - Seabirds
  - Humans
  - Other Prominent Issues
    - Contaminants
    - HAB
    - Aquaculture
    - Climate Change
    - Invasive Species
- Integrated Ecosystems Research
- Other Research Approaches
  - Local and Traditional Knowledge
  - Cooperative Research
  - Coordination
  - Education and Outreach
- Policies and Procedures
  - Data Management
  - Scientific Integrity
  - Specimen Archives
  - Intellectual Property Rights
  - Equipment Sharing

	Summary of research themes for major ecosystems components.					
	Lower Trophic Level Productivity	**Fish Habitat**	**Fish and Invertebrates**	**Marine Mammals**	**Seabirds**	**Humans**
Pressing Fishery Management Issues		Other Human-Related Impacts Fishing Effects Habitat Mapping	Stock Assessment Research & Development Alternative Harvest Strategies Socio-economic Considerations Reducing Catch of Unwanted Species Causes of Perturbations of Major Species Ecosystem Change Implications on Fisheries Management	Other Human-Related Impacts Fisheries Interactions Marine Habitat Use Foraging Success Population Dynamics Long-term Climate Change	Other Human-Related Impacts Fisheries Interactions Marine Habitat Use Foraging Success Population Dynamics Long-term Climate Change	Fishery Management & Policy Baseline Assessment Issues Human Health and Marine Resources Human Values and Resource Protection Climate Variability and Change
↕	Nutrient Dynamics	Ecosystem Functions of Habitat				
Marine Ecosystem Information Needs	Phytoplankton Ecology Phytoplankton – Sea Ice Dynamics Zooplankton Ecology					

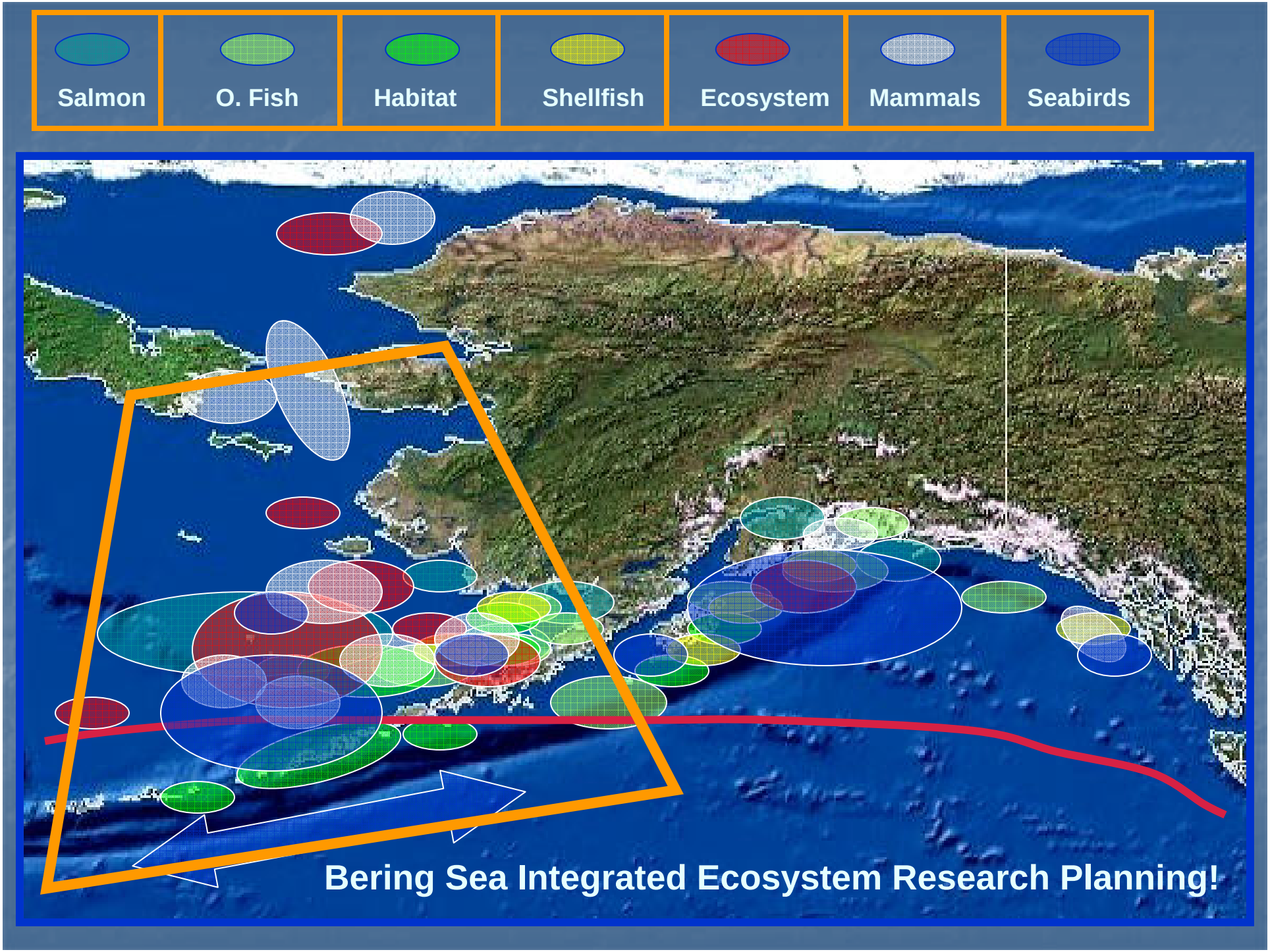
Implementation Plan

- General directions for next 4 years
- Review and revise annually
- ~$6 million/year for planning purposes
- Relates back to science plan
- Helps shape annual requests for proposals

Science Plan — **5-7 years: 2005-2010**

Implementation Plan — **4 years: 2005-2008**

Request for Proposals — **1 year: 2006**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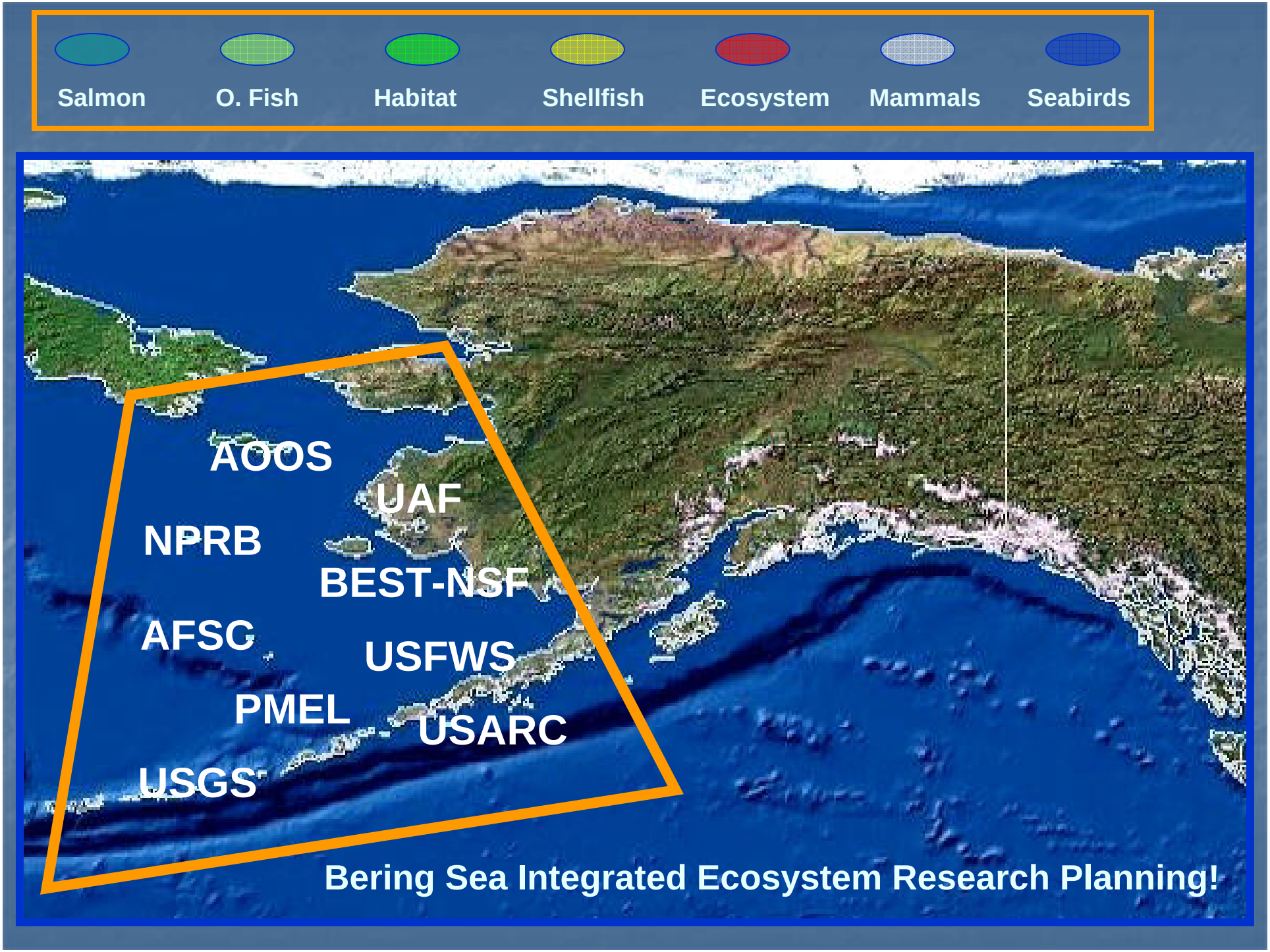
Bering Sea Integrated Ecosystem Research Planning!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AOOS
UAF
NPRB
BEST-NSF
AFSC
USFWS
PMEL
USARC
USGS
Bering Sea Integrated Ecosystem Research Planning!

Bering Sea Integrated Research Planning: Core Questions

- **How does the Bering Sea ecosystem respond to climate variability and how will it respond to climate change?**
- **Is the observed warming of the Bering Sea part of decadal variability or is it a long-term secular trend?**
- **Can we predict how that warming and changing sea-ice dynamics will affect the biological resources of the Bering Sea (commercial, subsistence, ecological, and protected)?**
- **What measurable factors (physical, chemical, and biological) serve as the best indicators of ecosystem change at different trophic levels and different spatial and temporal scales?**

Bering Sea Integrated Research Planning: Information Gaps

- Coordinated ocean ecosystem observations that adequately sample physics and lower trophic levels
- Good ocean circulation models for eastern Bering Sea
- Broad-scale observations of essential benthic habitat, including measures of productivity and community structure
- At-sea distributions and abundance of seabirds and their diets
- Habitat requirements for key species
- Accurate, sensitive, measurable indicators of ecosystem change
- Predictive knowledge of impacts of changing temperatures on ecosystem
- Basic information on ice-dependent marine mammal abundance, distribution, and population trends

Bering Sea Integrated Research Planning:
Response of the Bering Sea Ecosystem to Climate Change

- Are the distributions (range, spawning and breeding locations) and abundances of species in the Bering Sea ecosystem changing in response to climate change? If so, how?
- Are the physical and chemical attributes of the ecosystem changing in response to climate change? If so, how?
- Is lower trophic level production (quantity and form) changing in response to climate change? If so, how?
- What are the principal processes controlling energy pathways in the Bering Sea? What is the role of climate change in these processes?
- What are the linkages between climate change and vital rates of living marine resources in the Bering Sea?
- What are the economic and sociological impacts of a changing ecosystem on the coastal communities and resource users of the Bering Sea?

NPRB 2006 Research Priorities	Target Amounts
1. Bering Sea Integrated Ecosystem Research Program "Response of the Bering Sea Ecosystem to Climate Change"	**$1.2 million**
2. General Research Priorities on Ecosystems Components	**$3.25 million**
a. **Ocean Monitoring**	**$300,000**
b. **Lower Trophic Level Productivity**	**$300,000**
c. **Fish Habitat**	**$550,000**
i. *Recovery and resilience of fish habitat*	*$250,000*
ii. *Marine habitat mapping technology workshop*	*$150,000*
iii. *Other fish habitat research*	*$150,000*
d. **Fish and Invertebrates**	**$1,150,000**
i. *Migration patterns and spatial connectivity*	
ii. *Seasonal diets of exploited fish stocks*	
iii. *Life history, ecology and fluctuations in BSAI crab stocks*	
iv. *Reduction of bycatch and bycatch rates*	
v. *Stock assessment and life history of rockfish, sharks, skates, squid, sculpins and octopus*	
vi. *Other fish and invertebrate research*	*$150,000*

NPRB 2006 Research Priorities	**Target Amounts**
e. **Marine Mammals**	**$600,000**
i. *Distribution and abundance of ice seals and walrus*	
ii. *Distribution and abundance of Northern Right Whales*	
iii. *Other marine mammal research*	
f. **Seabirds**	**$300,000**
i. *Distribution and abundance of seabirds at sea*	
ii. *Determination of demographic parameters*	
iii. *Human impacts during migration and overwintering*	
g. **Humans**	**$50,000**
3. Collaboration with Oil Spill Research Institute: Forage Fish	**$100,000**
4. Local and Traditional Knowledge	**$300,000**
a. Pilot project for community-based observation system	$150,000
b. LTK studies related to other RFP priorities	$150,000
5. Other Prominent Issues – Contaminants	**$300,000**

TOTAL: $ 5.15 million

Schedule for RFP

Release of RFP	October 7, 2005
Deadline for Proposals	December 9, 2005
Technical Evaluations	December 2005 – February 2006
Science Panel Review	Early March 2006
NPRB Selection	Late March 2006
Submission to NMFS	April 2006
Final Notification of PIs	April 2006
Grant Agreements to PIs	April–May 2006
Possible Commence Research	May 1, 2006