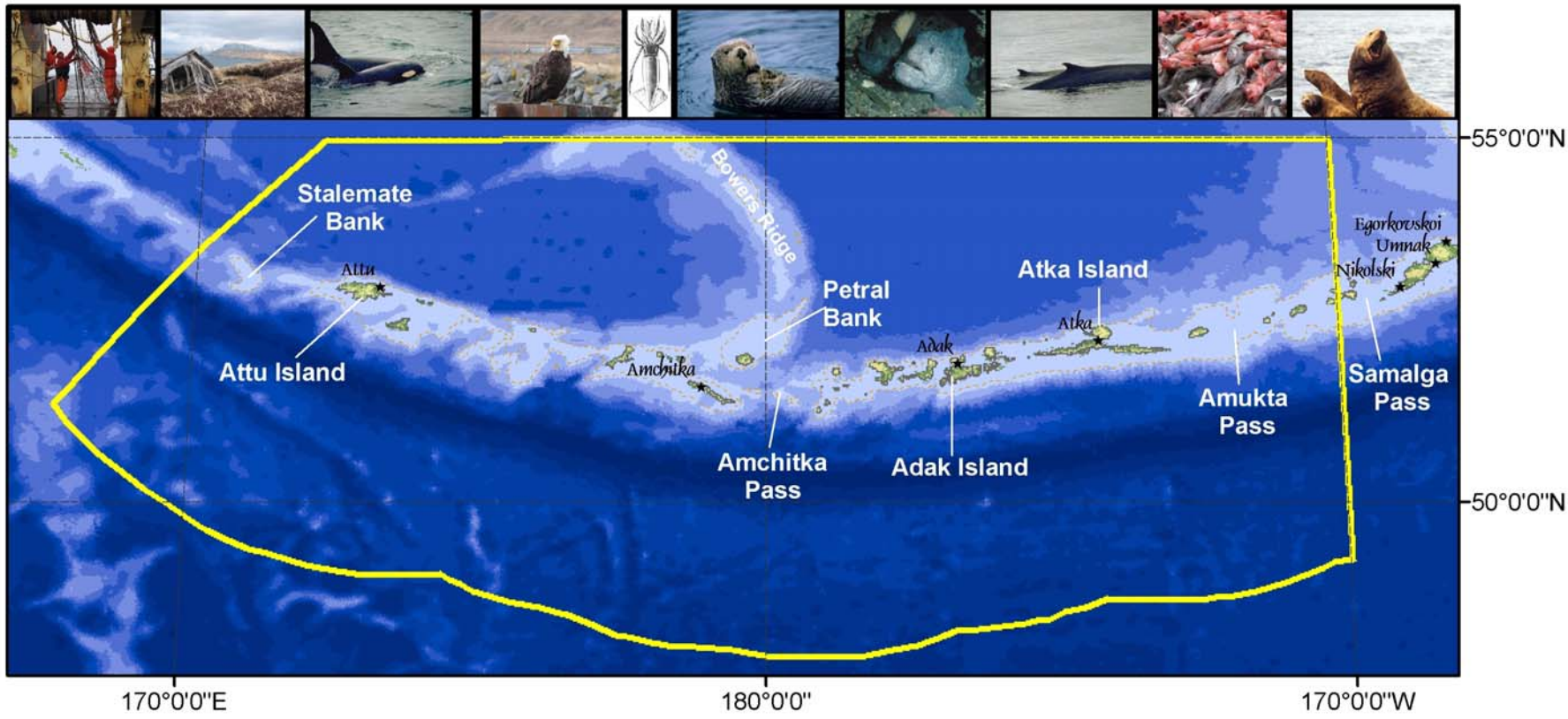
Aleutian Islands Fishery Ecosystem Plan



Presentation to the Council

June 2007

Plan for Presentation

- Discussion of AI FEP
- Ecosystem Committee report and recommendations

FEP Background

- genesis of FEP: ‘area-specific mgmt in AI’ component in PSEIS (June 2004)
- purpose: ecosystem-based management
- development of ideas through the Ecosystem Committee
- Summer 2006: Council appointed an Aleutian Islands Ecosystem Team to write the FEP
  - NMFS, USFWS, ADFG, NPRB scientists

Why FEP in AI

- Stewardship
  - AI is unique environment
  - Opportunity to better integrate emerging knowledge of the functioning of the marine ecosystem
  - AI is the least predictable Alaska marine ecosystem, therefore may need to use other tools
- Leadership
  - Ecosystem approaches to management, including FEPs, ongoing nationally
  - Opportunity to help define standard, see whether FEPs are useful tool (pilot project)

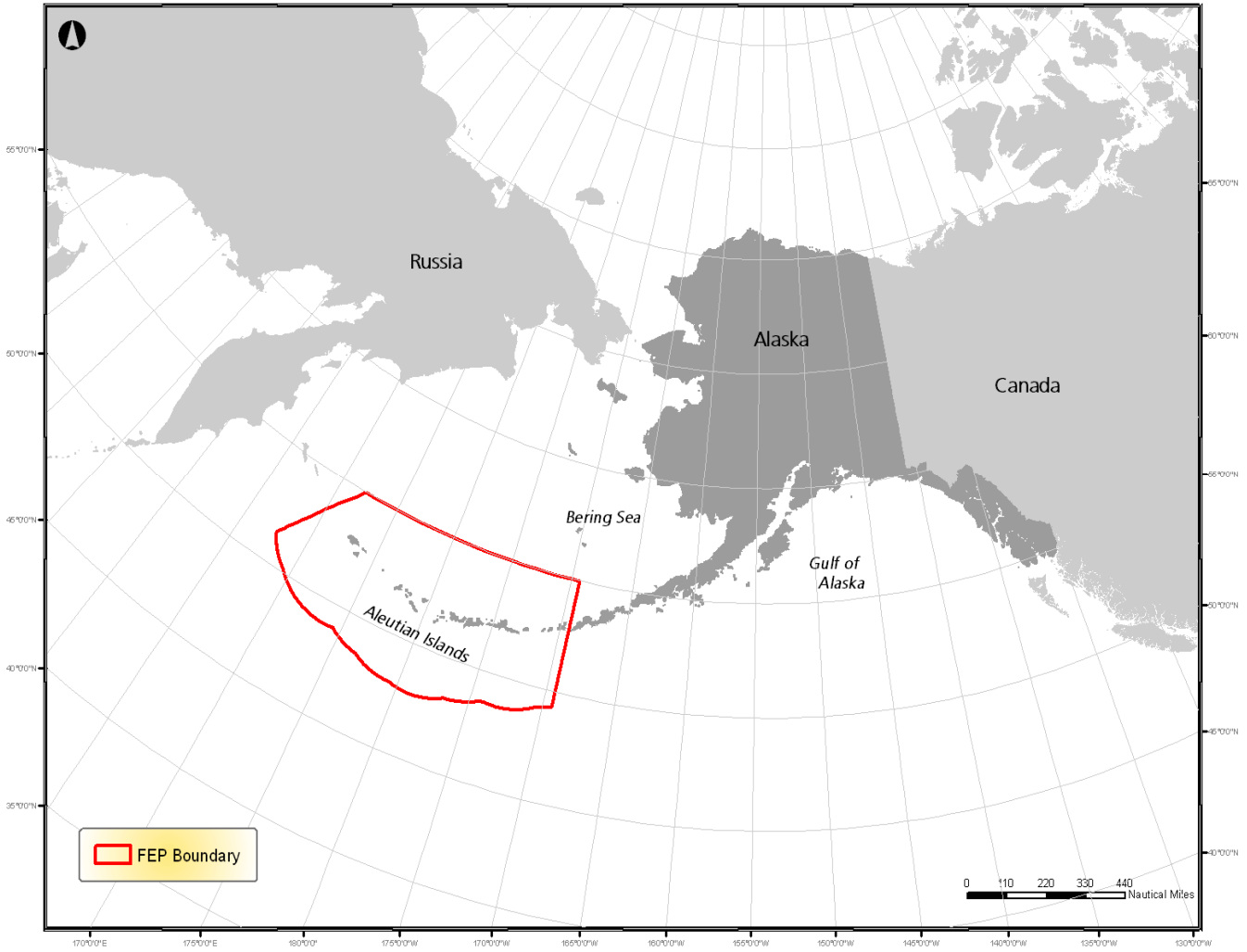
FEP concept for Alaska*

- Policy and planning document
- Applies to all fisheries in the Aleutian Islands ecosystem
- Specific management changes still occur through existing processes

- FEP is not a legal, binding document – it is an educational tool for the Council, to provide an ecosystem context for fishery management

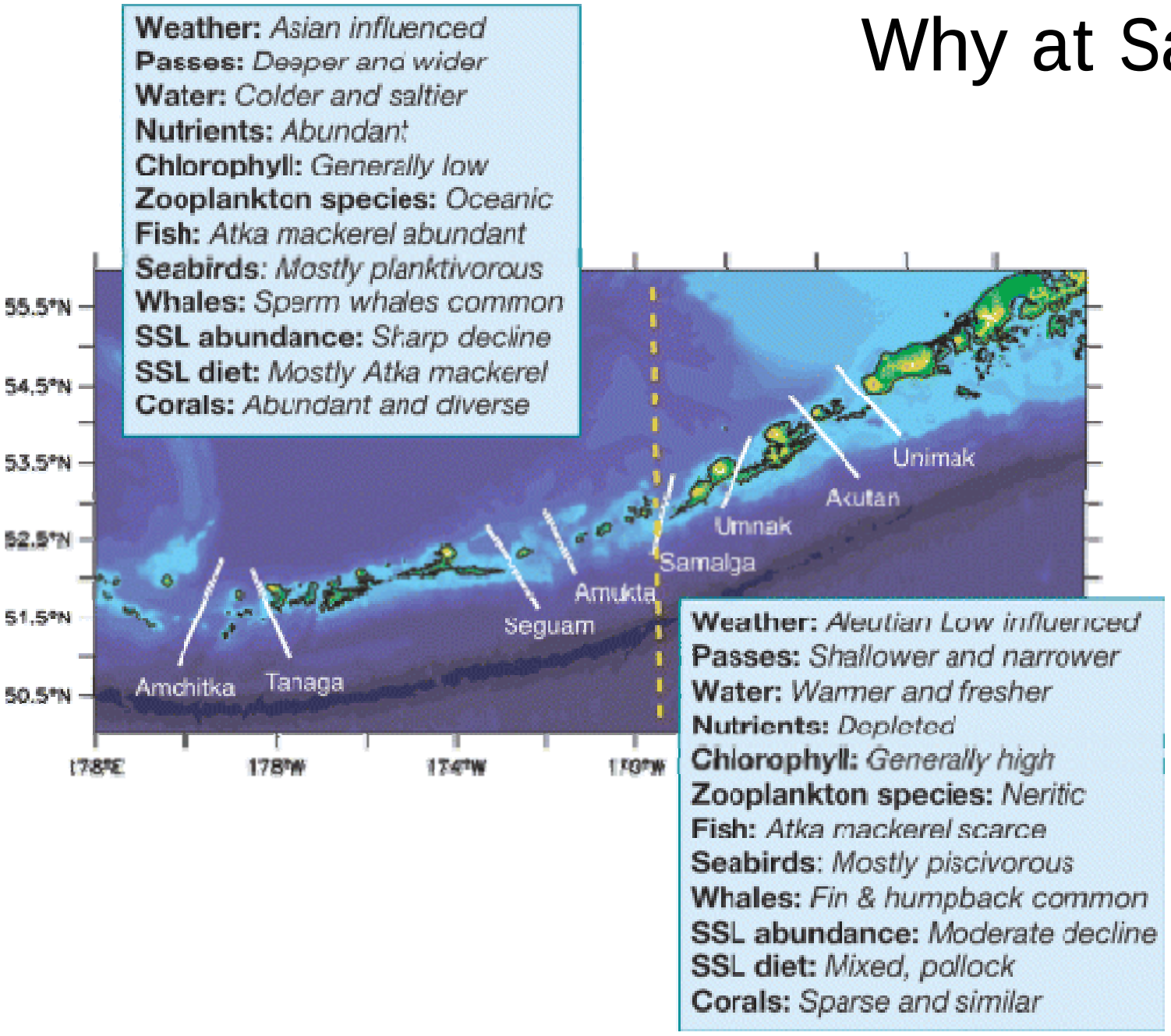
* (other regions may do things differently)

AI Ecosystem Boundary for FEP



2.0, p.6

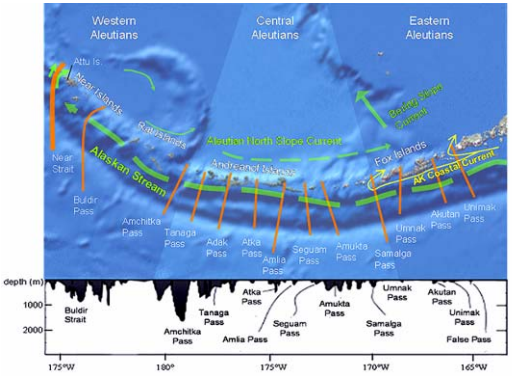
Why at Samalga Pass?

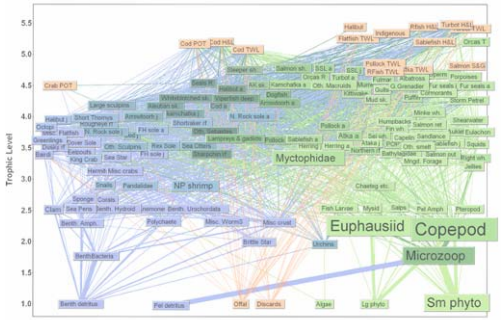


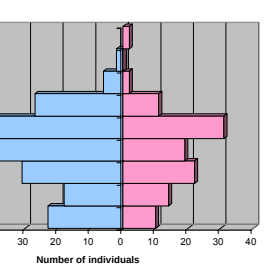
2.0, 3.2, p.22

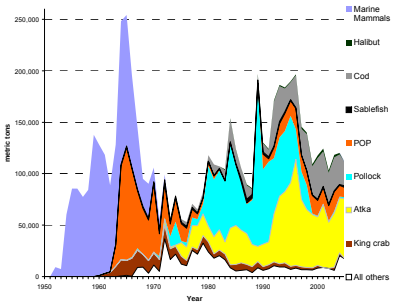
March Draft FEP

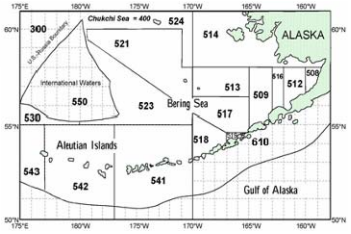
- Council received a presentation in March 2007 from Dr Sarah Gaichas
  - chapters 1-3, including synthesis of key AI interactions
  - first cut at qualitative risk assessment

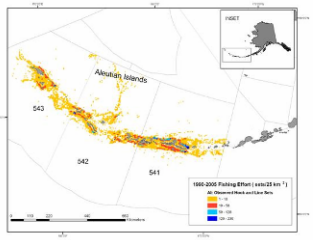


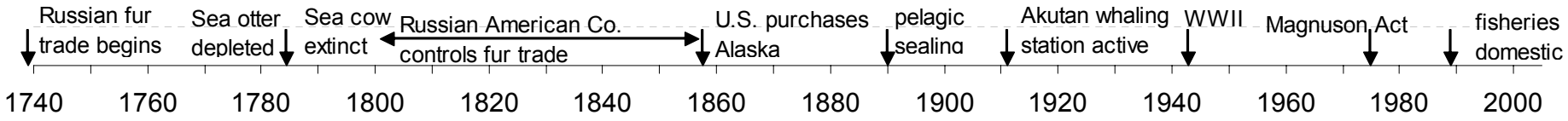












New for May 2007 draft

- reorganization of chapter 4, per SSC comments
- writeup of ‘implications for management’ for each interaction/ risk assessment
- chapter 5 – mapping FEP interactions to FMP objectives
- chapter 6 – priorities and considerations for Council
- chapter 7 – reflection on ‘value-added’ of FEP
- chapter 8 – next steps (how to use FEP, expanding the document)

AI Ecosystem Team membership

Kerim Aydin, NMFS AFSC	Ecosystem / food web modeling
Steve Barbeaux, NMFS AFSC	Pollock biology, assessment
Forrest Bowers, ADF&G	Crab and state fisheries
Vernon Byrd, USFWS, AKRO	Birds and mammals
Diana Evans, NPFMC	FEP policy, implementation
Sarah Gaichas, NMFS AFSC	Ecosystem / food web modeling
Carol Ladd, NOAA PMEL	Physical oceanography
Sandra Lowe, NMFS AFSC	Atka mackerel bio, assessment
John Olson, NMFS AKRO	Habitat, GIS
Jennifer Sepez, NMFS AFSC	Anthropology, socioeconomics
Paul Spencer, NMFS AFSC	Rockfish biology, assessment
Francis Wiese, NPRB	Research, seabirds

Roadmap

1. Introduction/ purpose /scope /implementation
2. Geographic definition of the AI ecosystem
3. Understanding the AI ecosystem

   history, physical/biological/socioeconomic, management
4. Ecosystem Assessment – of 22 key interactions

   description, risk assmt, implications, indicators, research
5. Management objectives
6. Priorities and considerations for Council
7. Value added of FEP?
8. Future steps

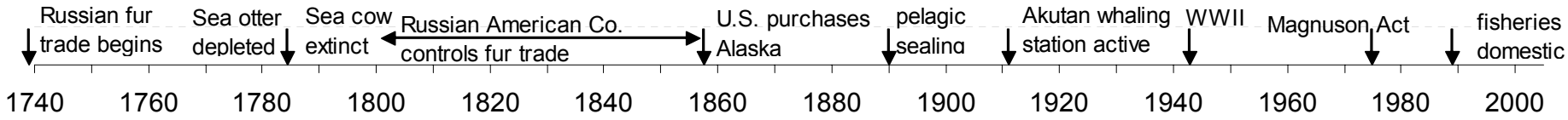
Goal Statement for FEP

- Provide better scientific information and measurable indicators to evaluate and promote ecosystem health, sustainable fisheries, and vibrant communities in the Aleutian Islands region

FEP Purposes

1. Integrate AI information across FMPs
2. Identify ecosystem indicators for the AI
3. Develop and refine tools, i.e. models
4. Identify uncertainty / research needs
5. Assist Council with management objectives and understanding cumulative effects

Aleutian Islands Ecosystem Processes: Visualizing relationships in Section 3



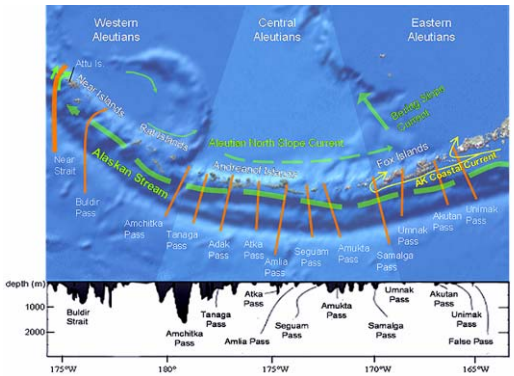
3.1 Historical context
starts p.8

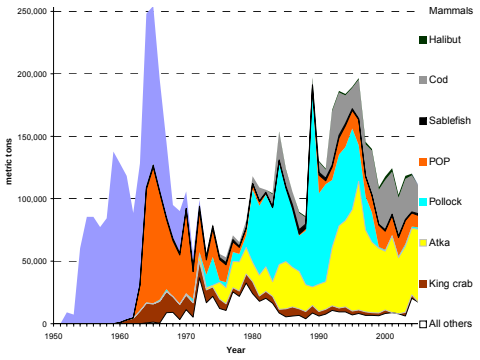
3.2 Physical relationships
starts p.21

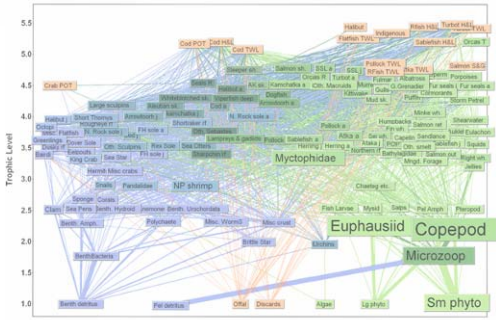
3.3 Biological relationships
starts p.25

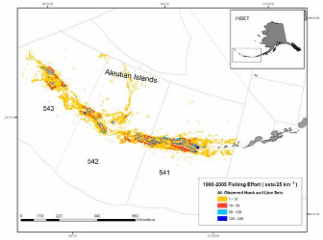
3.4 Socioeconomic relationships
starts p.44

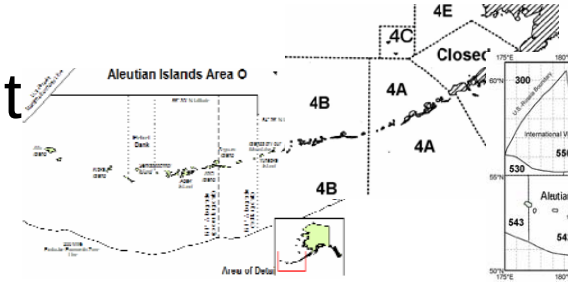
3.5 Management
starts p.57

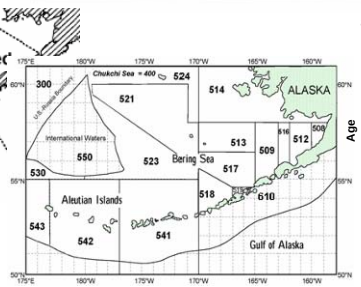


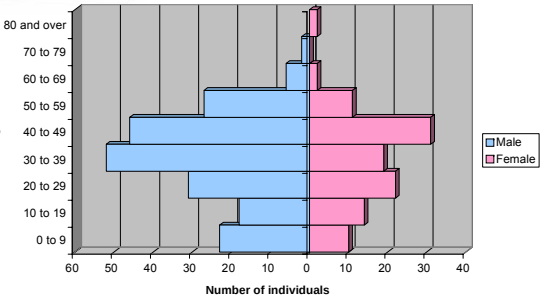






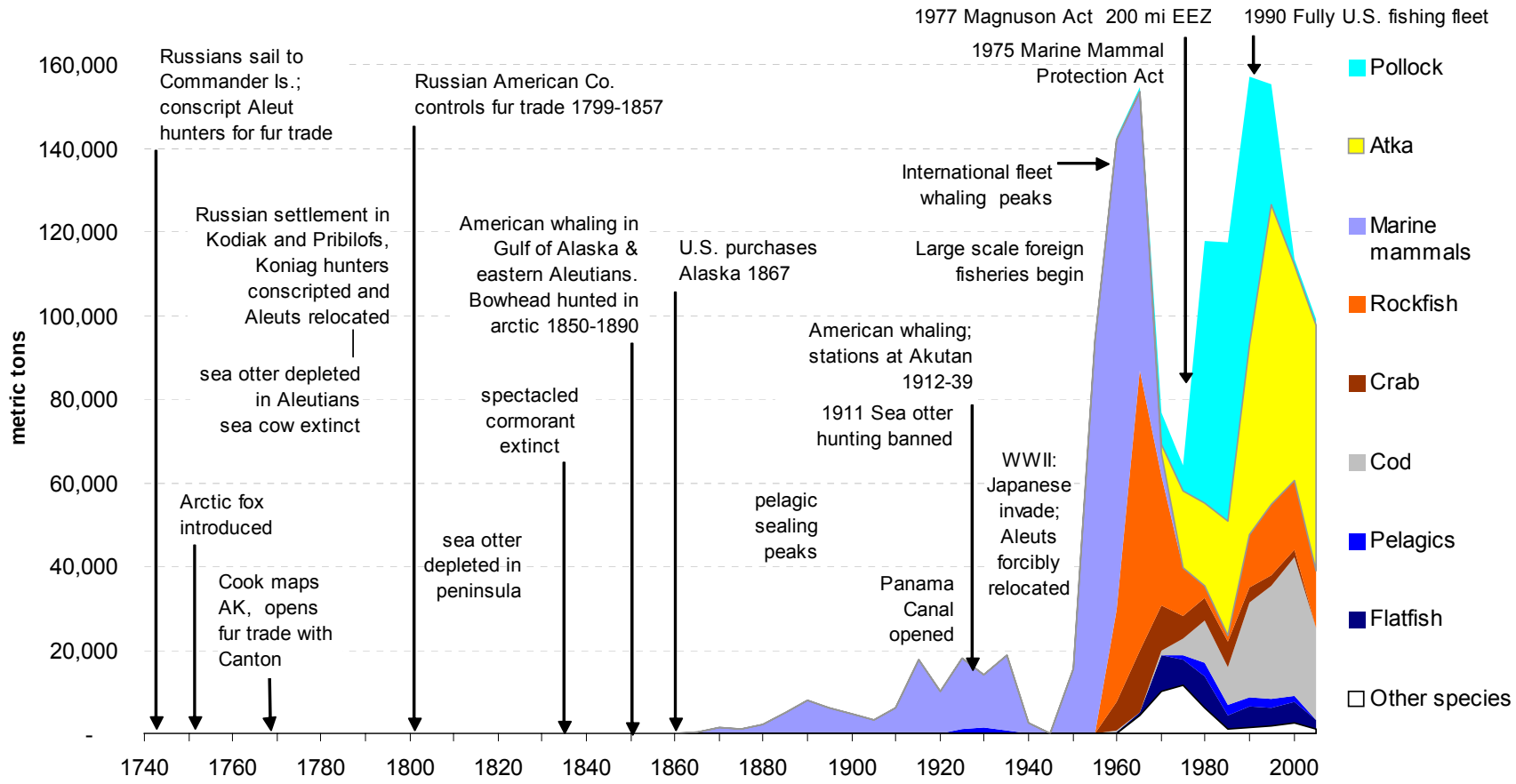






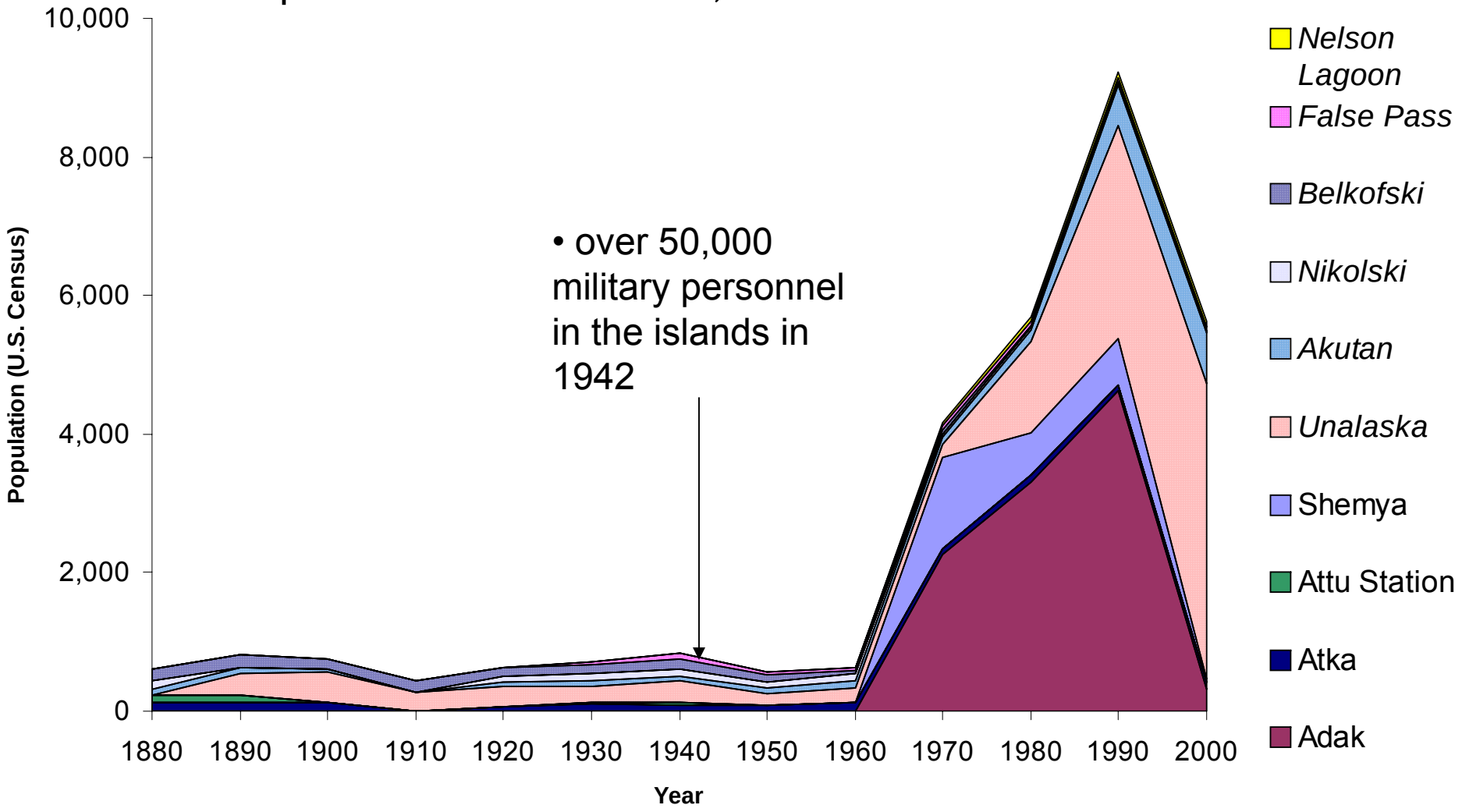
Historical Perspectives:

Commercial resource use



Aleutian Islands: changing populations

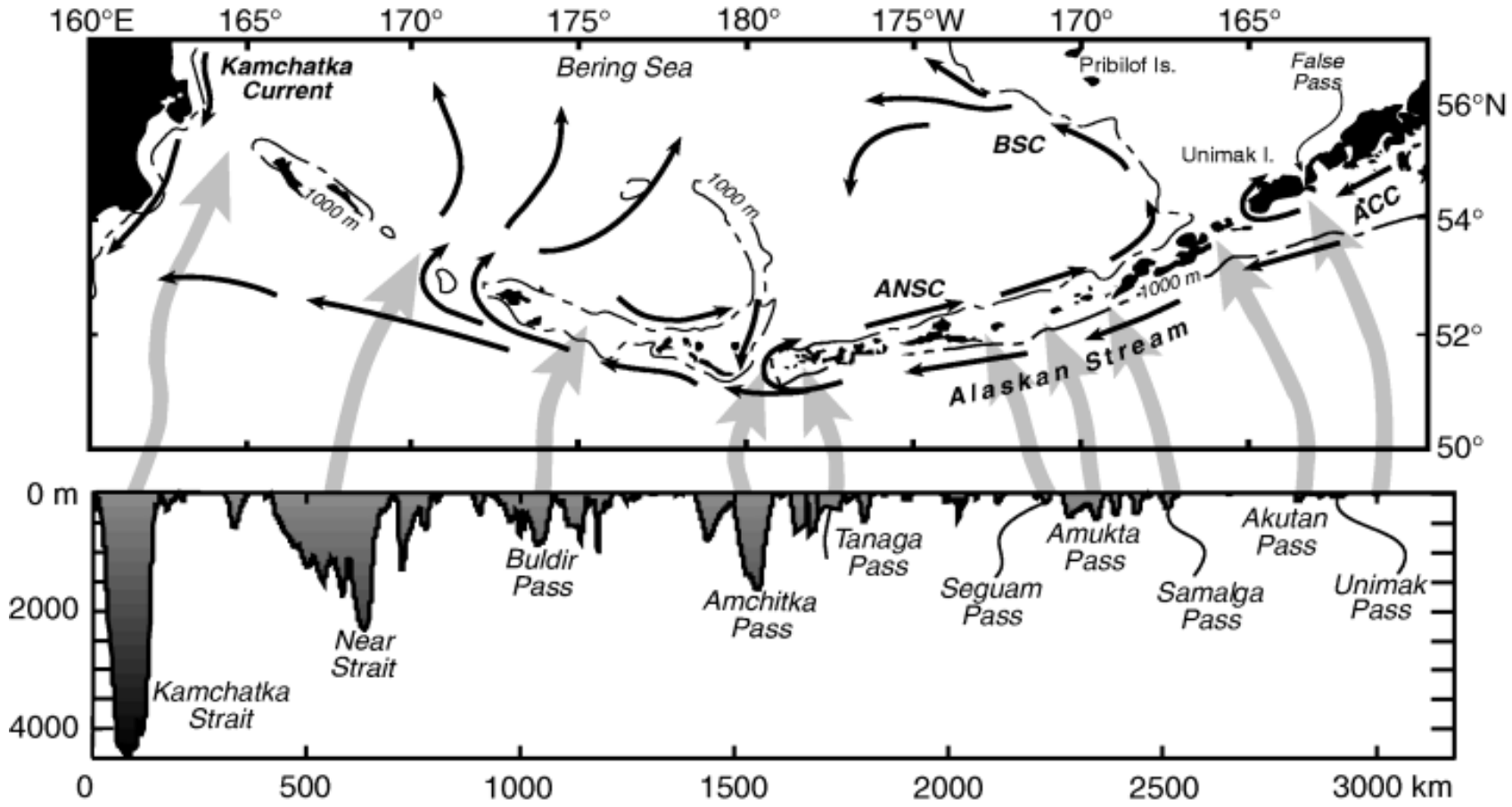
- Population estimate 12-15,000 in 1741



Historical Perspectives - Relationships

- Sea otters → kelp forests → marine communities
  - Kelp forests support a diverse marine community, which supports nearshore seabirds
  - Sea otters eat sea urchins, which eat kelp and prevent forests from growing
  - As sea otter populations increase, so do kelp forests

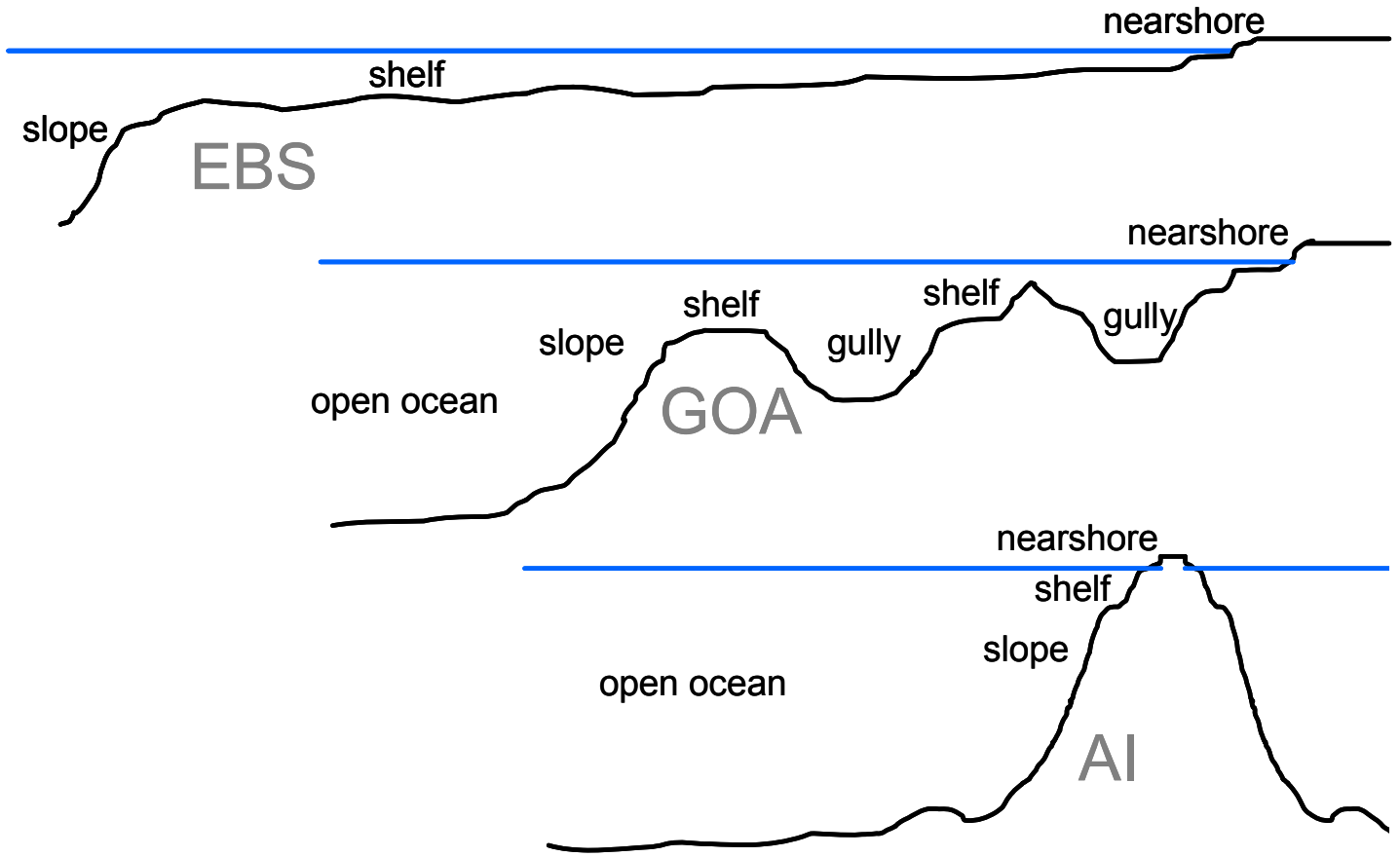
AI Physical Relationships



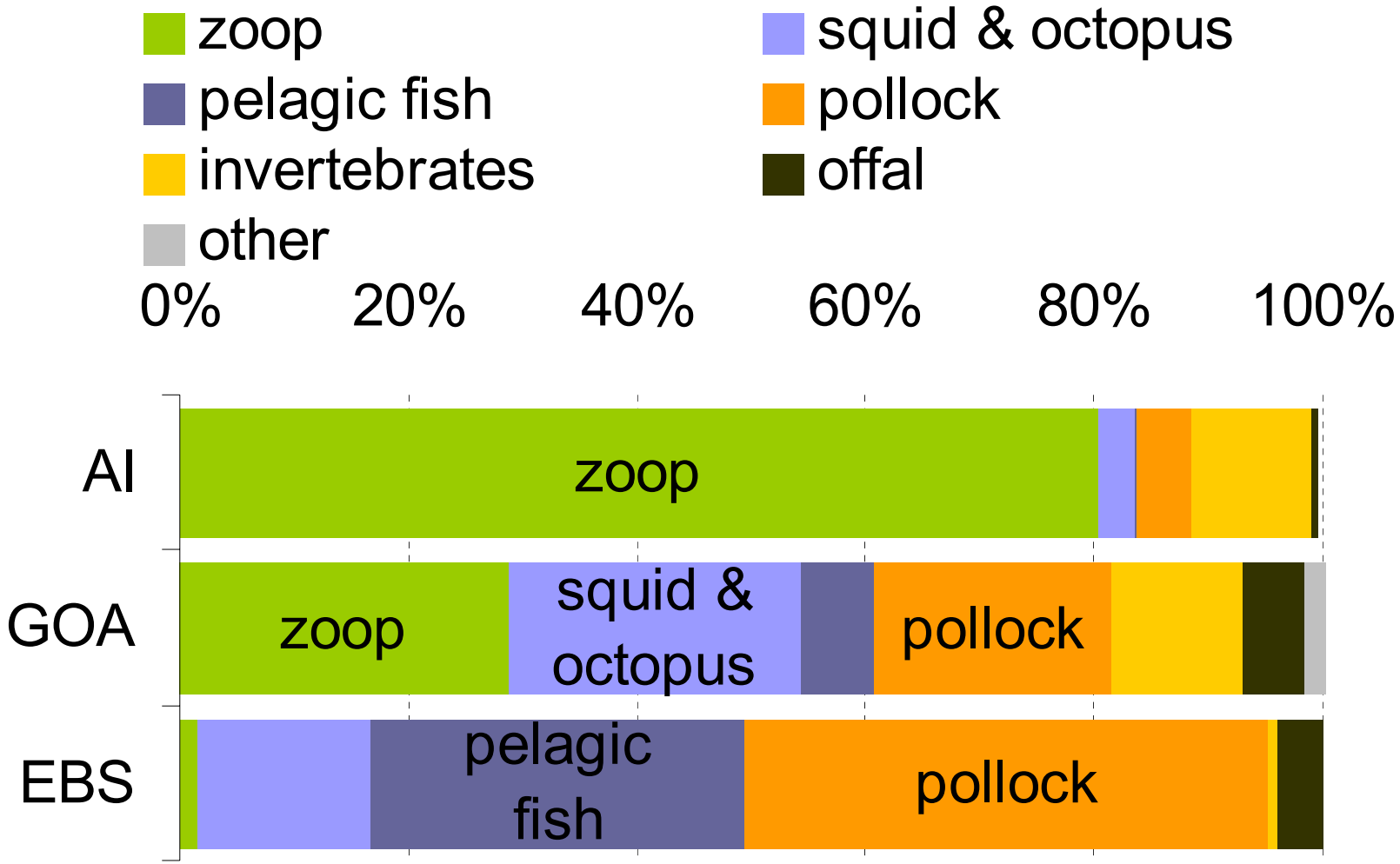
AI water temperature

- Temperature is especially important in the Aleutians
  - Boundary is oriented north/south (unusual in world)
  - That means as temperature changes, species may not be able to adapt easily by moving north or south to stay in their preferred temperature range

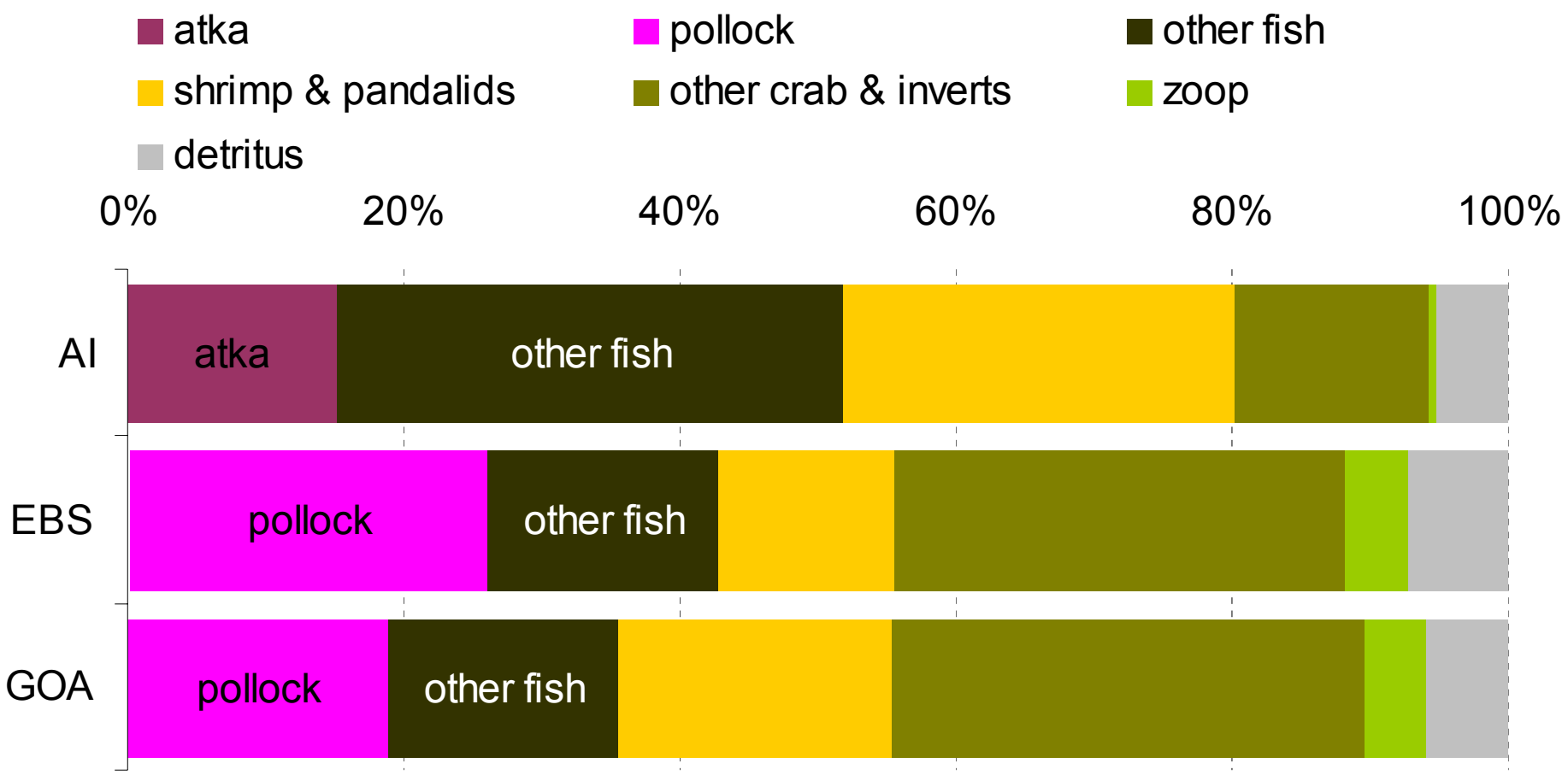
AI has high oceanic influence



Consumption by sablefish in all three systems



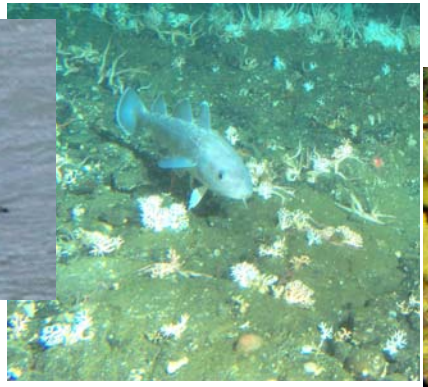
Comparing Pacific cod diets

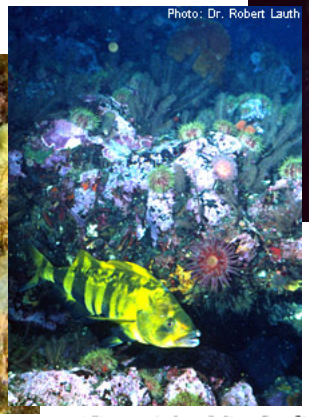


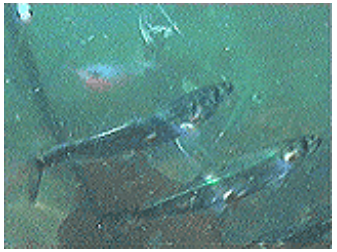
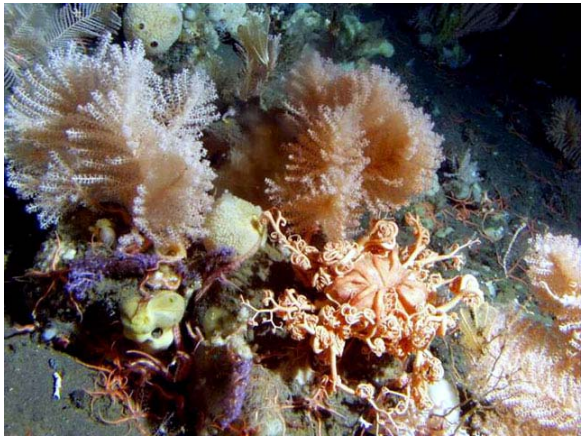
AI Biological relationships

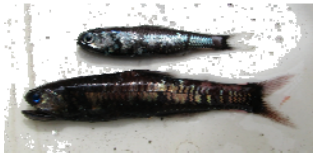




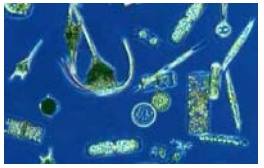





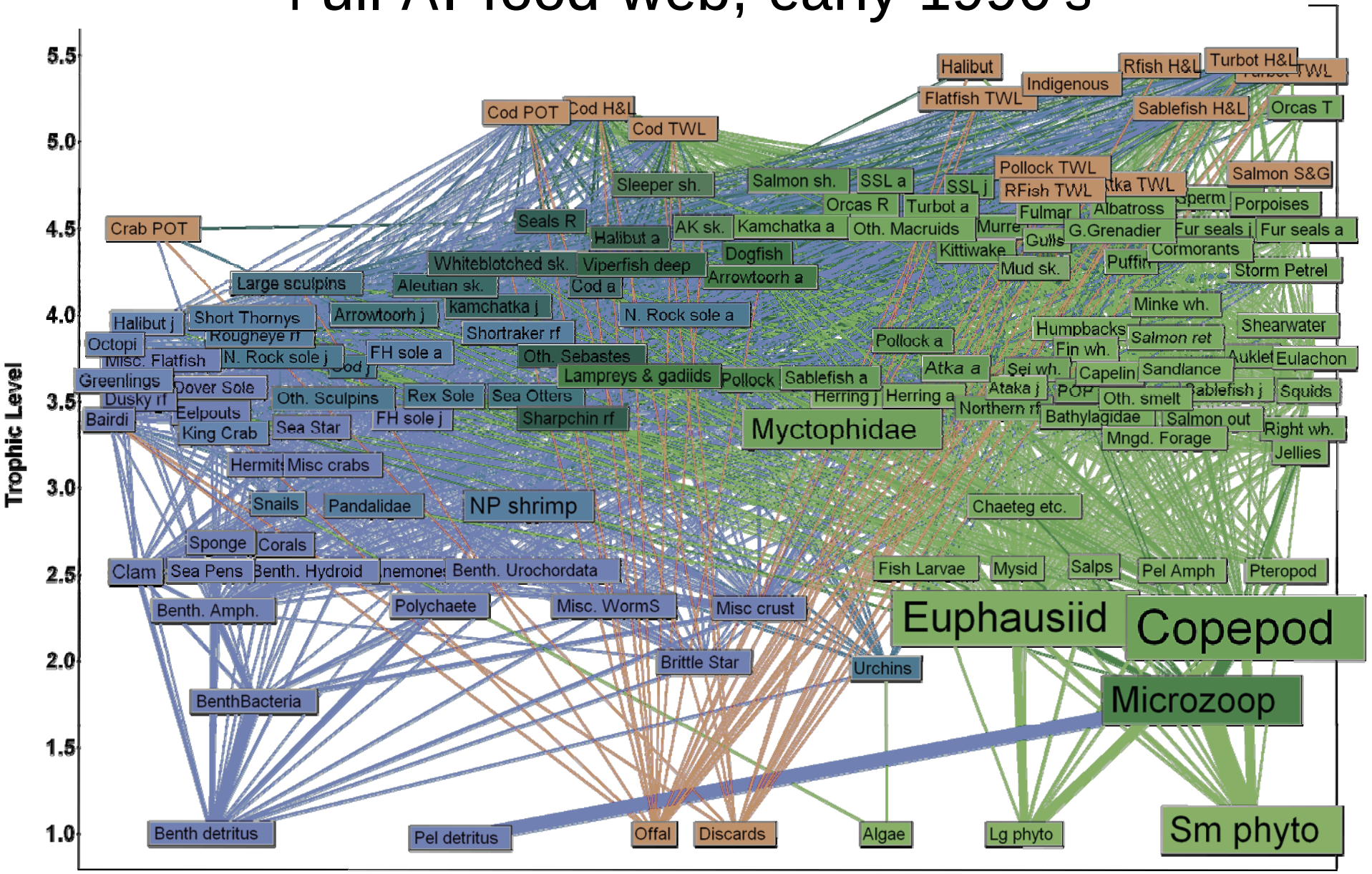






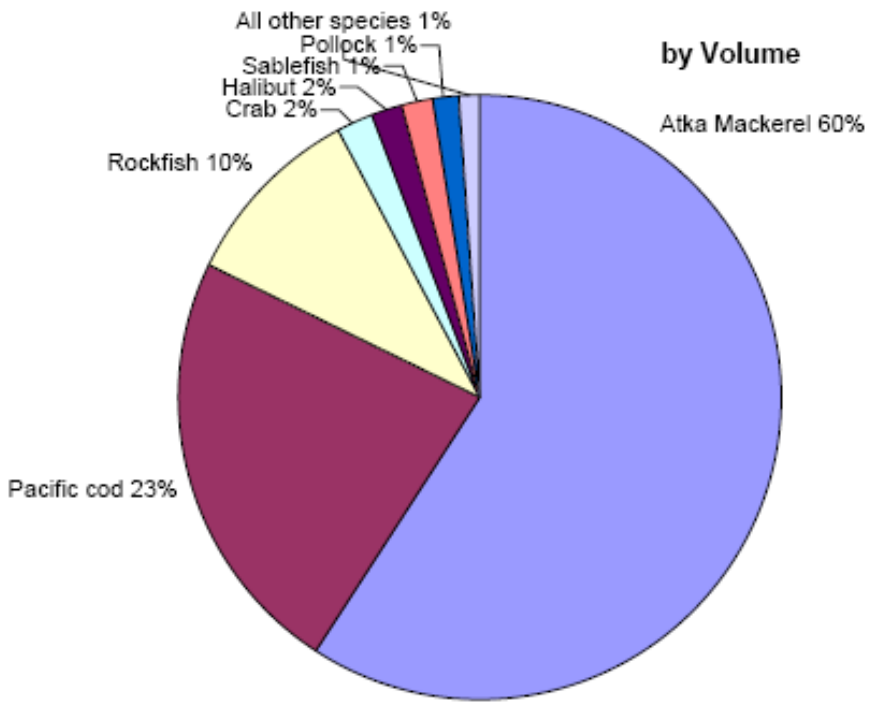


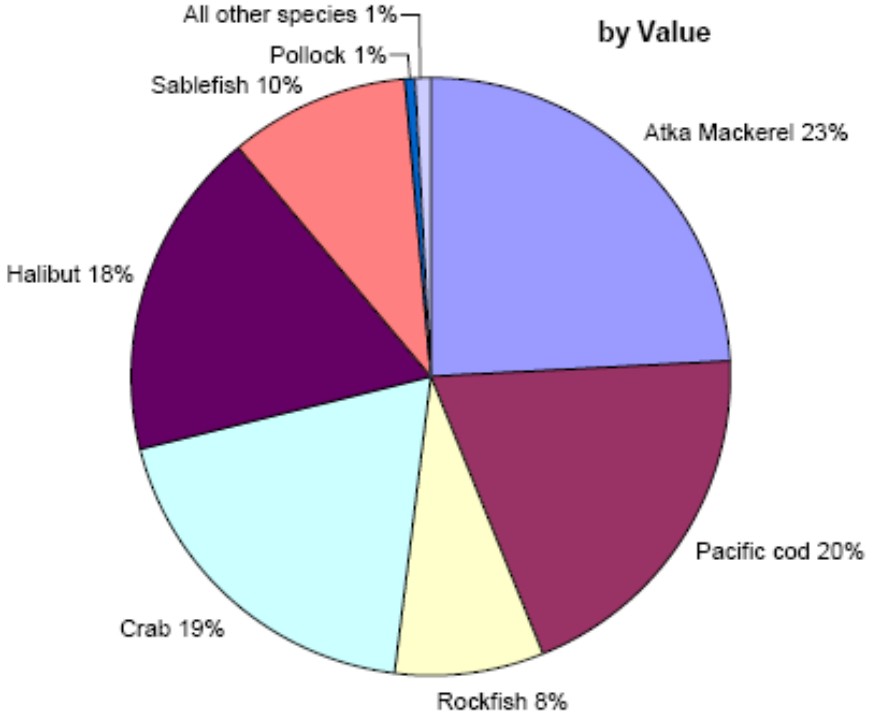


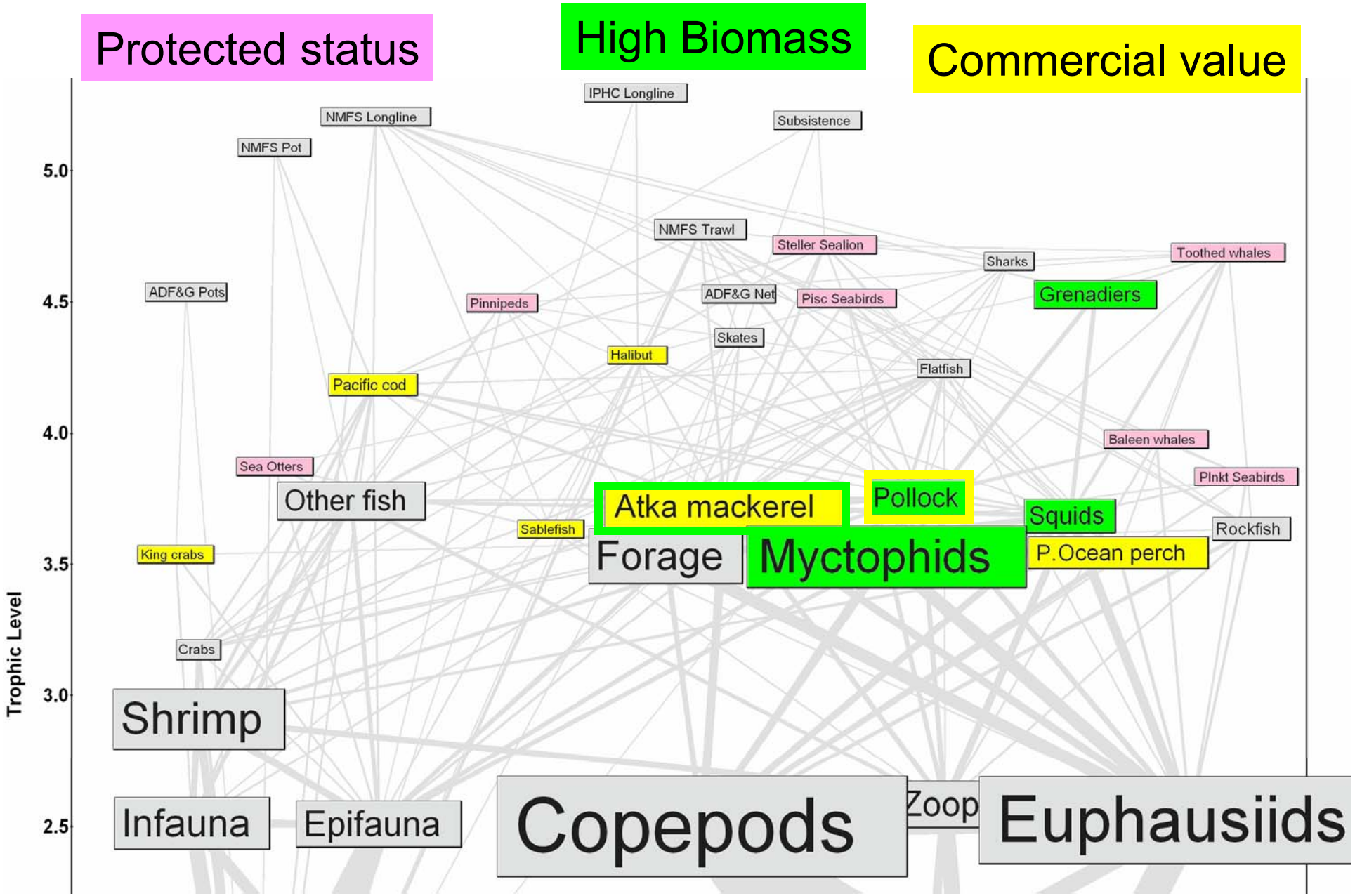
Full AI food web, early 1990's



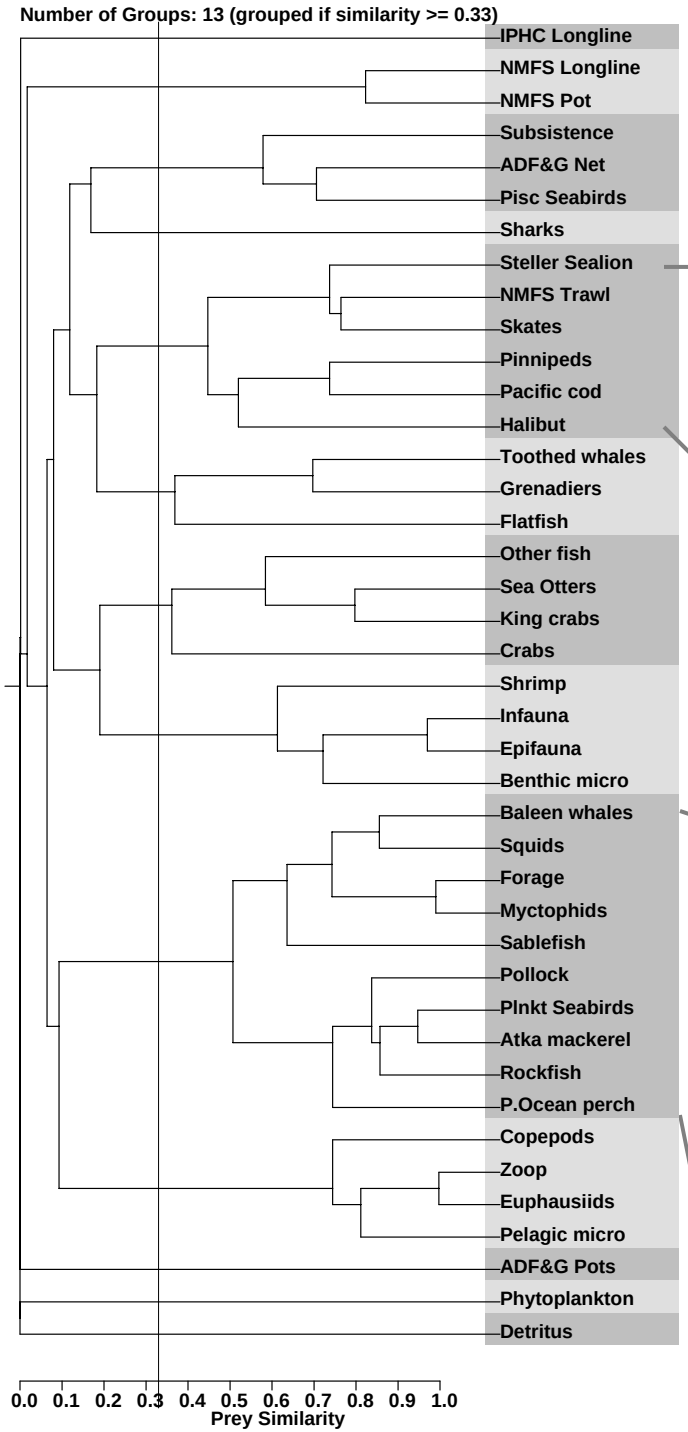
2005 volume and value of AI fisheries

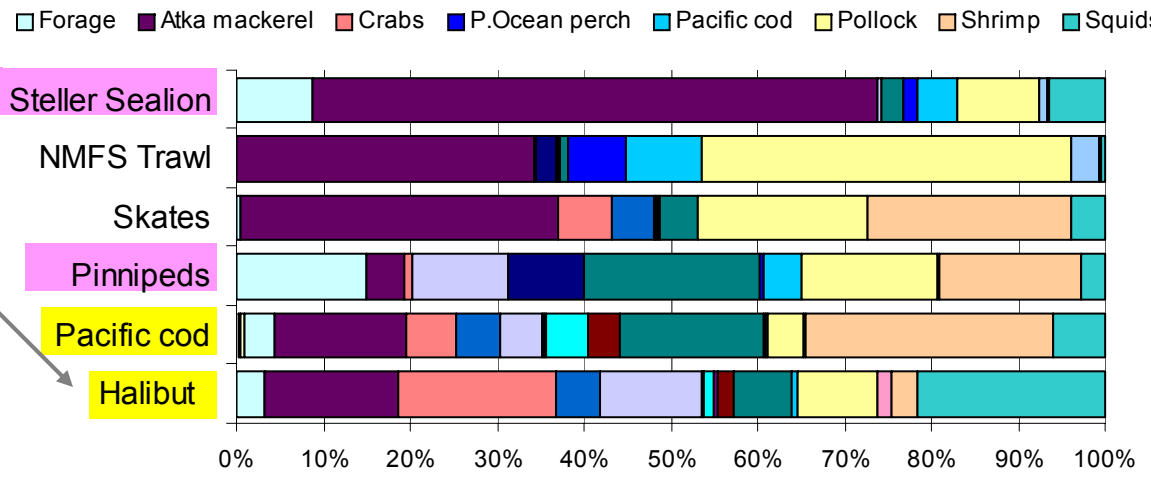


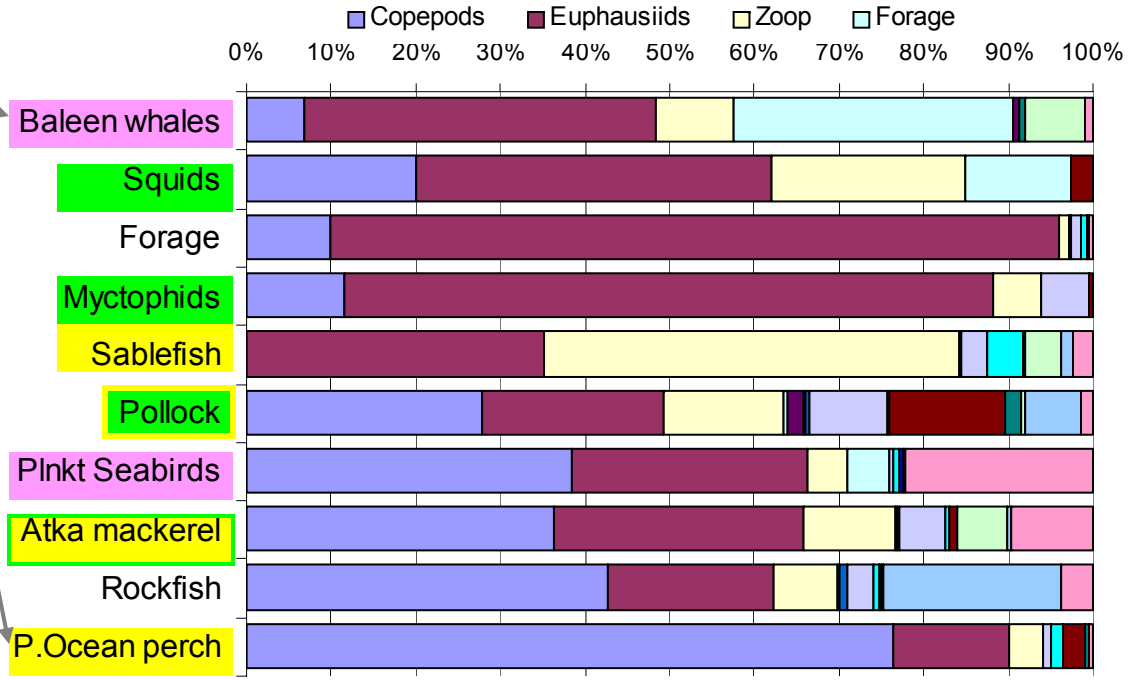


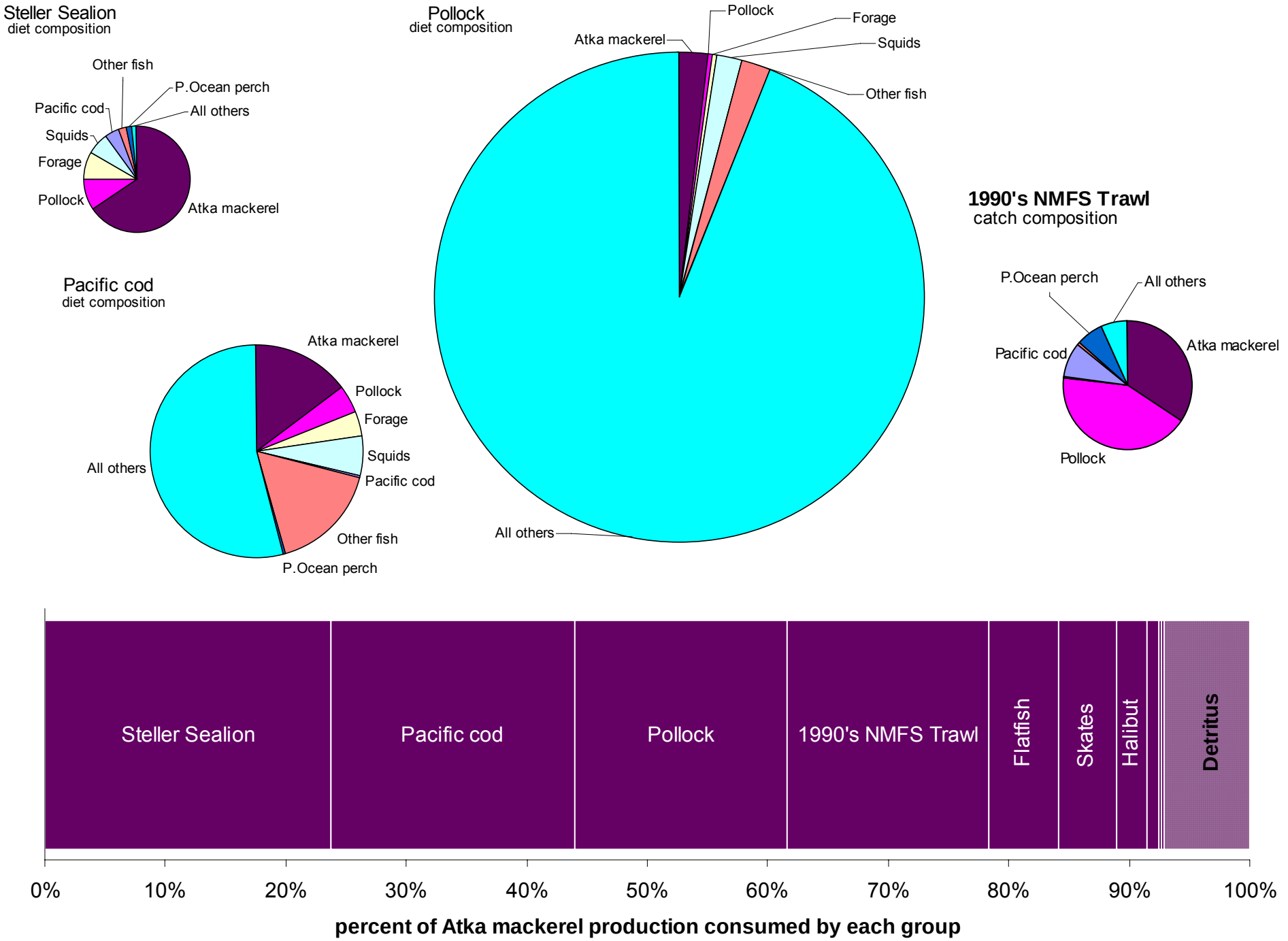

Protected status
High Biomass
Commercial value
IPHC Longline
NMFS Longline
Subsistence
NMFS Pot
NMFS Trawl
Steller Sealion
Sharks
Toothed whales
ADF&G Pots
Pinnipeds
ADF&G Net
Pisc Seabirds
Grenadiers
Skates
Halibut
Flatfish
Pacific cod
Baleen whales
Sea Otters
Plnkt Seabirds
Other fish
Atka mackerel
Pollock
Squids
Sablefish
Rockfish
Forage
Myctophids
P.Ocean perch
King crabs
Crabs
Shrimp
Infauna
Epifauna
Copepods
Zoop
Euphausiids
Trophic Level
5.0
4.5
4.0
3.5
3.0
2.5

Groups with similar diets





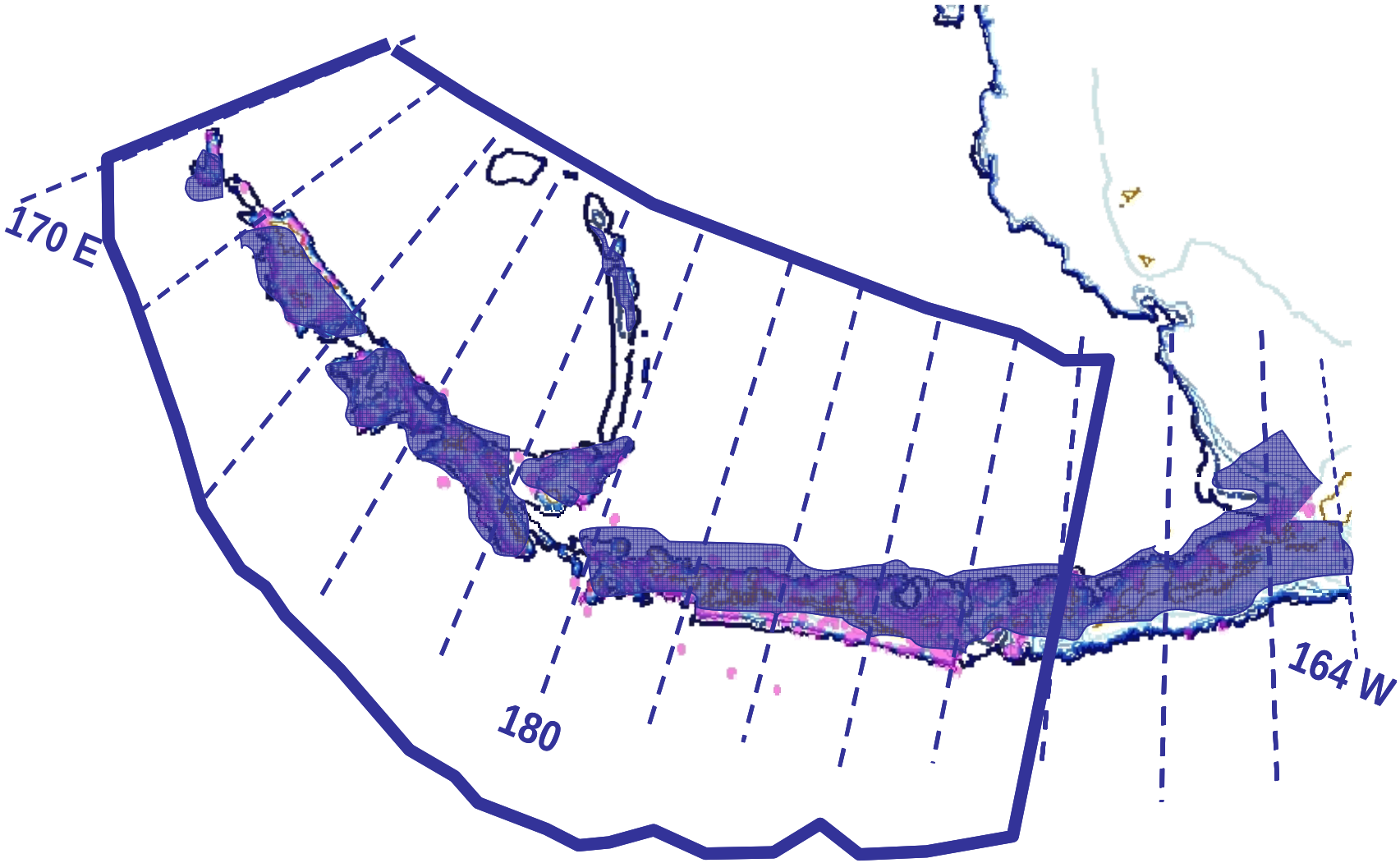



Steller Sealion
diet composition
Other fish
P.Ocean perch
Pacific cod
All others
Squids
Forage
Pollock
Atka mackerel
Pollock
diet composition
Atka mackerel
Pollock
Forage
Squids
Other fish
All others
1990's NMFS Trawl
catch composition
P.Ocean perch
All others
Pacific cod
Atka mackerel
Pollock
Pacific cod
diet composition
Atka mackerel
Pollock
Forage
Squids
Pacific cod
Other fish
P.Ocean perch
All others
Steller Sealion
Pacific cod
Pollock
1990's NMFS Trawl
Flatfish
Skates
Halibut
Detritus
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
percent of Atka mackerel production consumed by each group

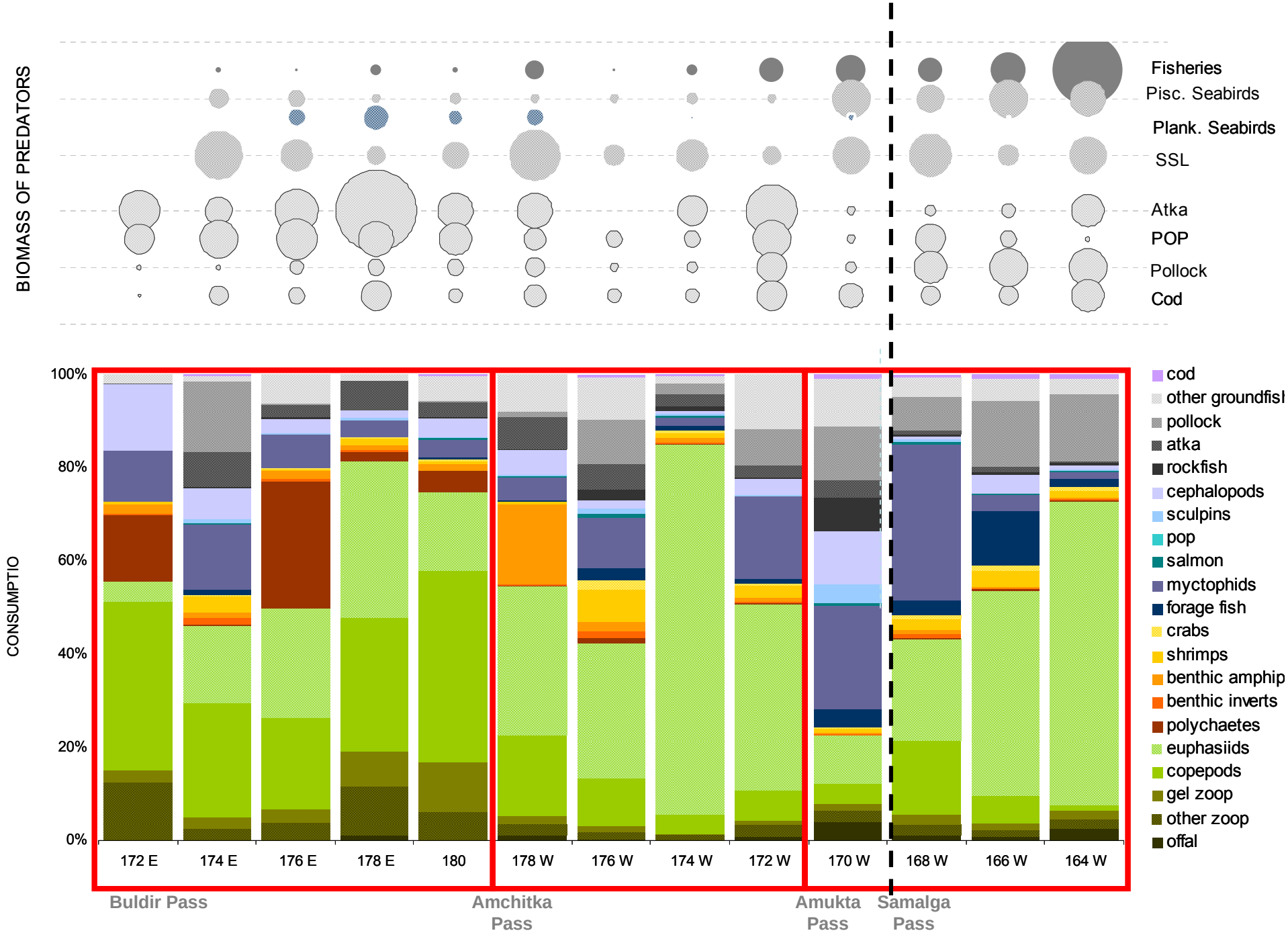
Groundfish species in AI and Bering Sea act differently

- Groundfish relationships differ greatly between the AI and the BS
  - Pacific cod interact strongly with Atka mackerel and sablefish in the Aleutians, and not elsewhere
  - Myctophids, squid, and grenadiers are important to energy flow in the AI, but minor components of the EBS and GOA food webs
- BUT the 2 ecosystems are managed together

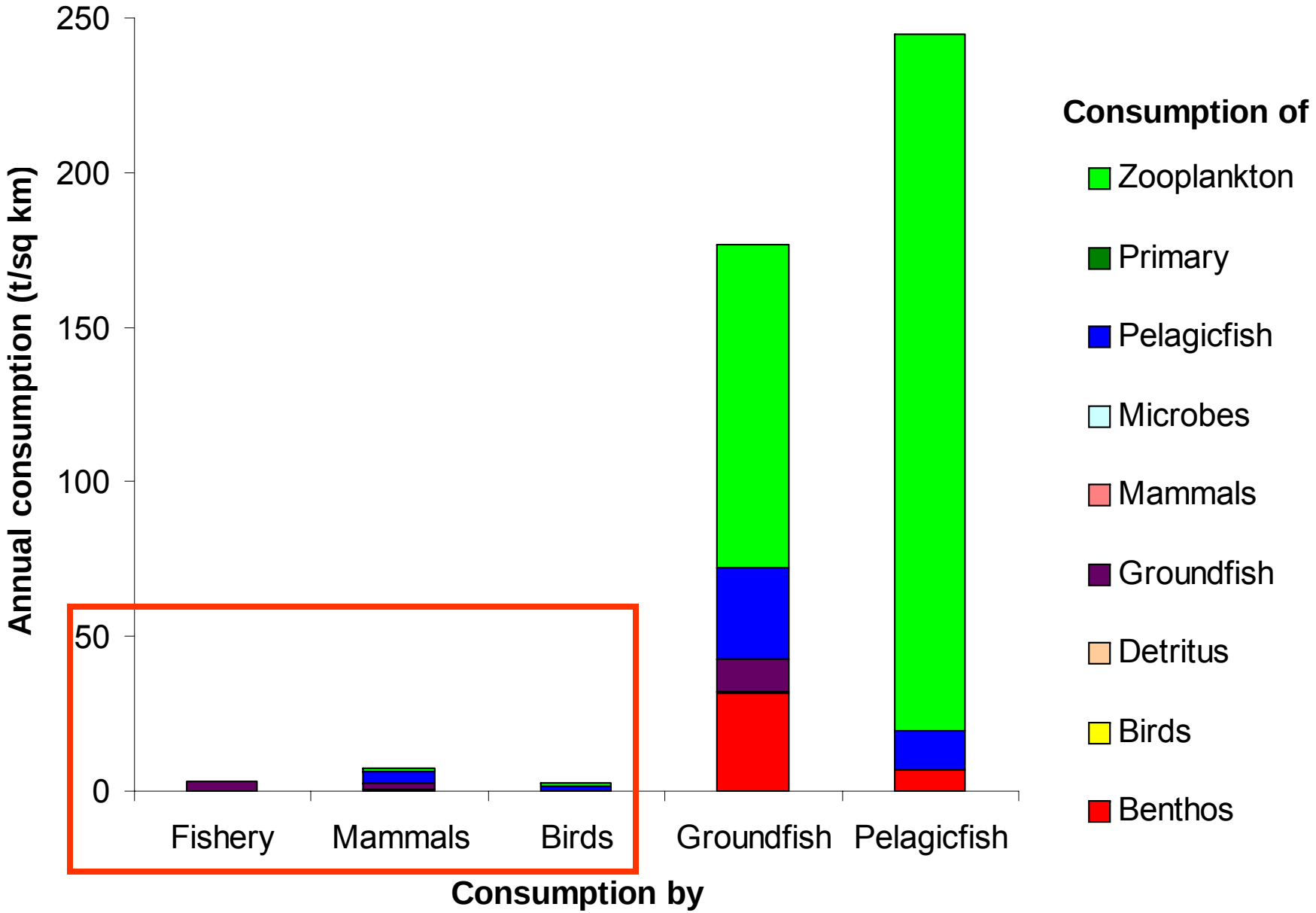
Biological relationships change along the archipelago*

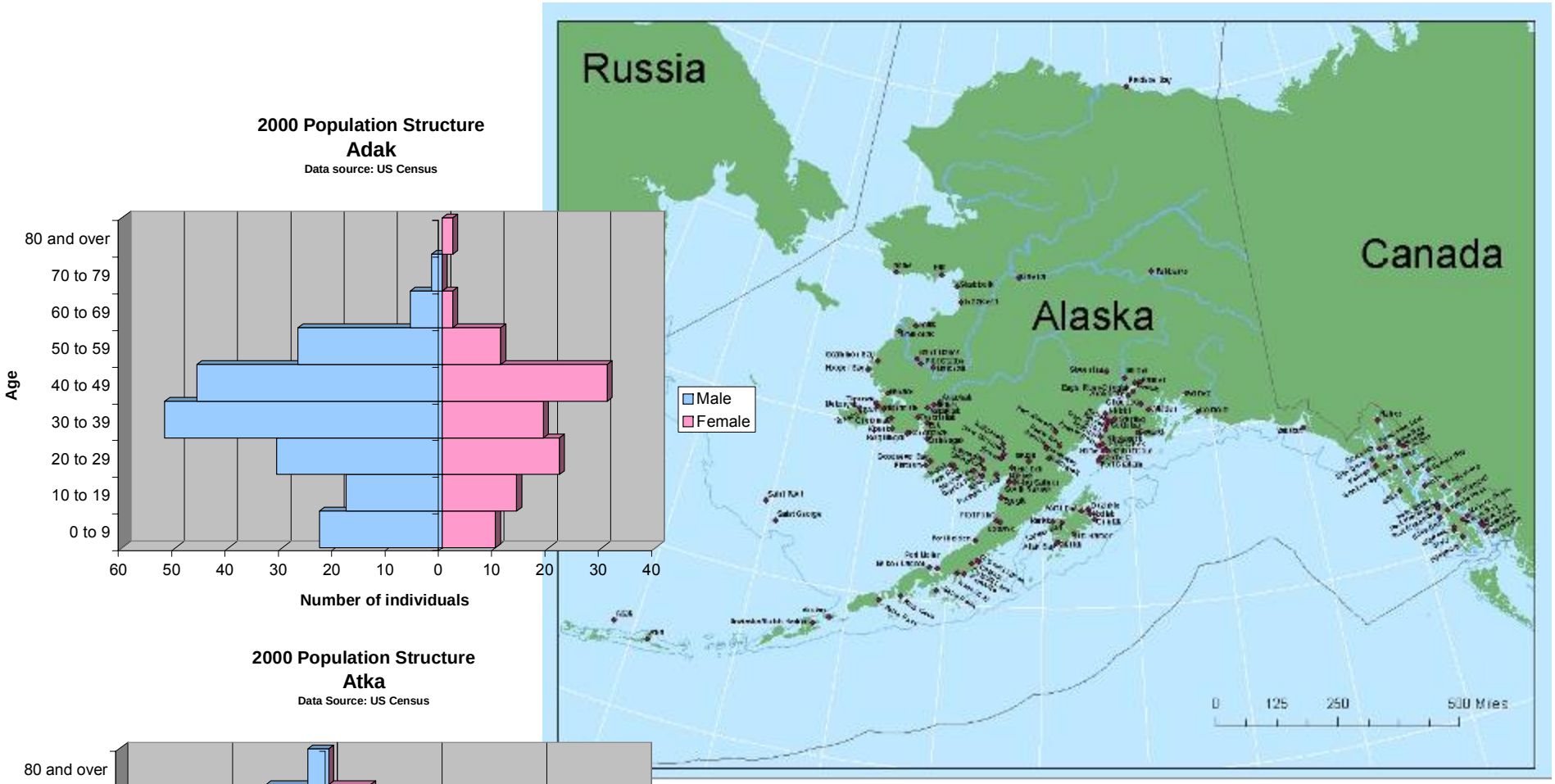


* Based on doctoral research of Dr Ivonne Ortiz, University of Washington


BIOMASS OF PREDATORS
Fisheries
Pisc. Seabirds
Plank. Seabirds
SSL
Atka
POP
Pollock
Cod
CONSUMPTIO
100%
80%
60%
40%
20%
0%
cod
other groundfisl
pollock
atka
rockfish
cephalopods
sculpins
pop
salmon
myctophids
forage fish
crabs
shrimps
benthic amphip
benthic inverts
polychaetes
euphasiids
copepods
gel zoop
other zoop
offal
172 E
174 E
176 E
178 E
180
178 W
176 W
174 W
172 W
170 W
168 W
166 W
164 W
Buldir Pass
Amchitka Pass
Amukta Pass
Samalga Pass

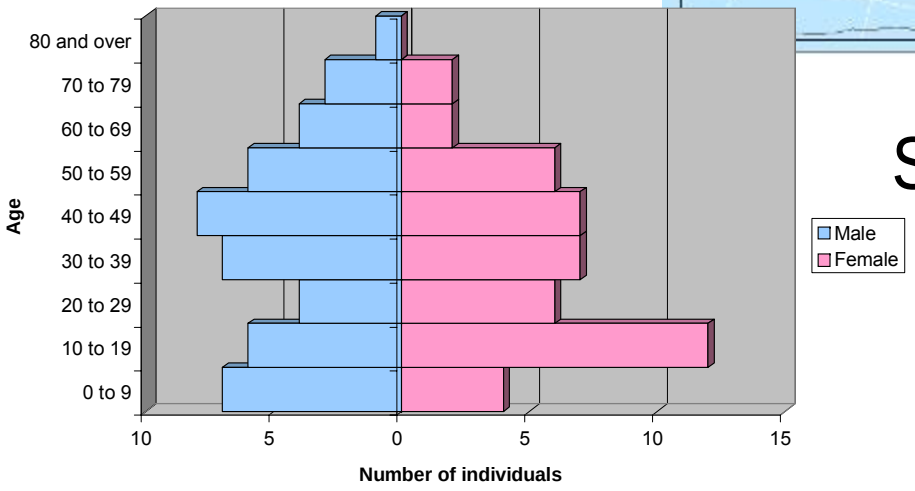
Who eats what in the AI





2000 Population Structure
Adak
Data source: US Census

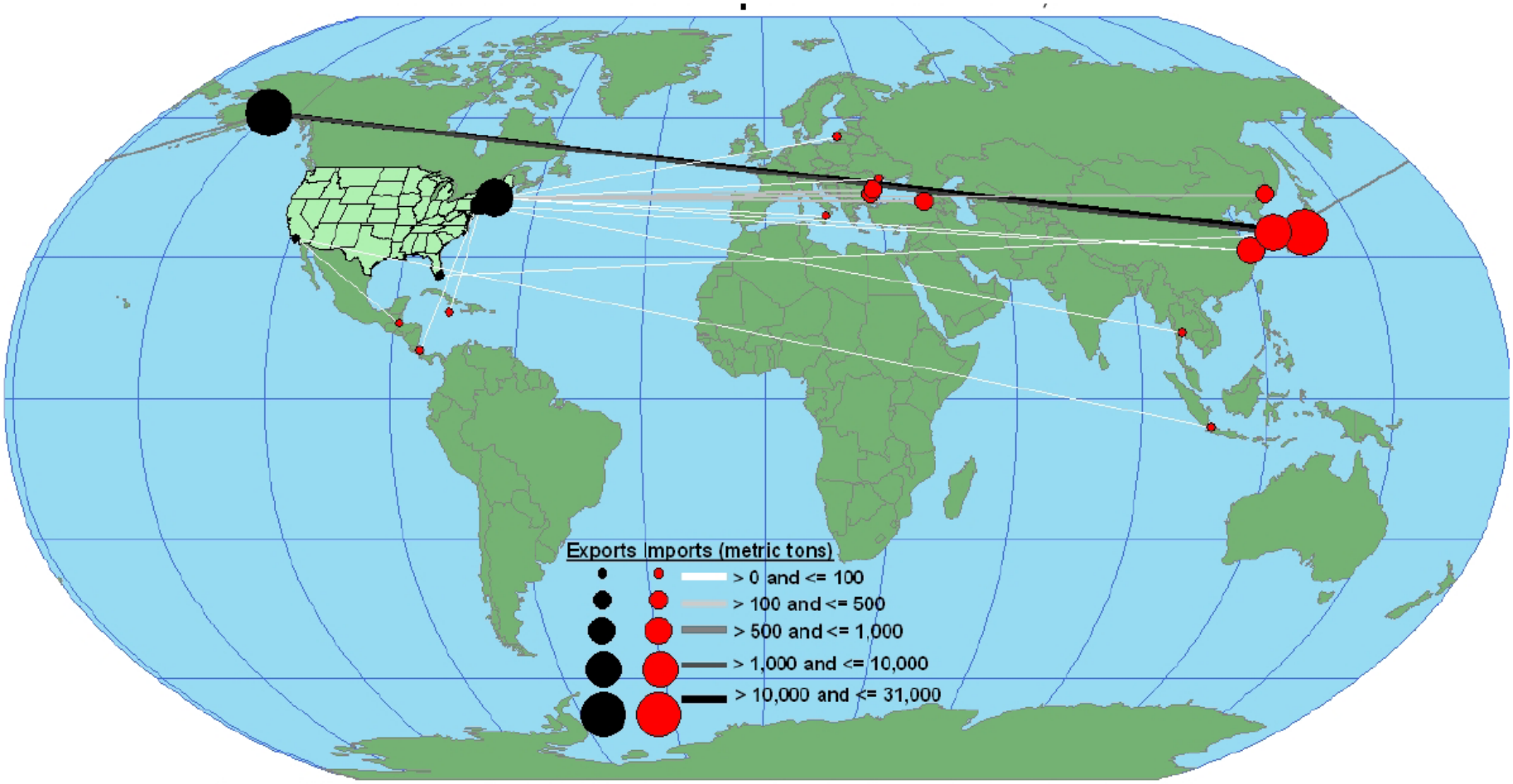
2000 Population Structure
Atka
Data Source: US Census



Socioeconomic relationships: Aleutian Islands Communities

Socioeconomic Relationships

Atka mackerel: Local fish, global market



Source: U.S. Merchandise Trade Statistics, GIS: Alaska Fisheries Science Center (michael.dalton@noaa.gov)

International shipping: global markets, local impacts

Source: The Economist, January 18,2007

Estimated 3000-3500 vessel transits annually through Unimak pass

1600 container ships, 30-40 tankers, and increasing with global trade

Risk concentrated near Dutch Harbor, Unimak Pass, Akun Is., Near Is.

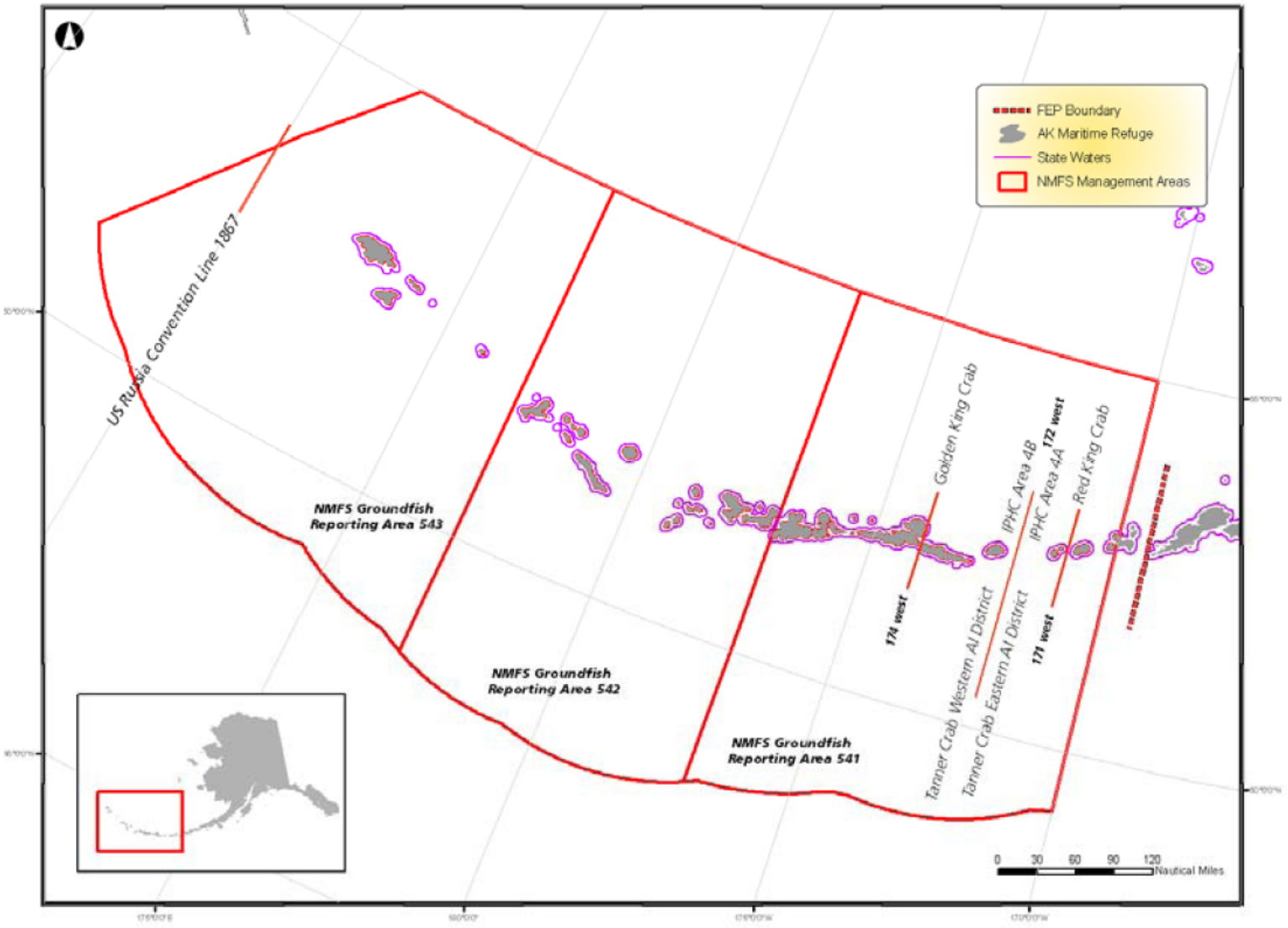
AI Socioeconomic Relationships

- Communities in ecosystem:
  - Shemya and Attu
  - Atka
  - Adak
- Resident population dramatically lower than elsewhere
- Historical influence of struggles over natural resources and territorial control continue to shape communities today

Other Activities in Ecosystem

- Tourism
- Military
- Shipping
- Oil and Gas Development
- Research

Social and management boundaries



Agencies in the AI

Resource, Population	Agency	Responsibility
groundfish	NPFMC/NMFS ADFG	3-200nm; population abundance; setting harvest levels, fishery management, monitoring, and enforcement 0-3nm
halibut	IPHC NPMFC/NMFS	population abundance, setting harvest levels management of fishery
crab	NPFMC/NMFS ADFG	monitor overfishing levels, allocations harvest levels; fishery management, monitoring, enforcement
scallop	NPMFC/NMFS ADFG	monitor overfishing levels harvest levels, fishery management, monitoring, enforcement
salmon	ADFG NPFMC/NMFS	population abundance, harvest levels, fishery management retention prohibited 3-200nm
herring	ADFG	population abundance, harvest levels, fishery management
other fish	NMFS	advisory authority for habitat for all fish including fish in nearshore watersheds
marine mammals (except walrus and otters)	NMFS	population abundance, advisory authority, protection under the MMPA and ESA
walrus and otters	USFWS	population abundance, advisory authority, protection under the MMPA and ESA
birds	USFWS	population abundance, advisory authority, protection under the MBTA
citizens of Adak	City of Adak	municipal responsibility
citizens of Atka	City of Atka	municipal responsibility
land	USFWS BLM DNR DOD	protection of Alaska Maritime National Wildlife Refuge, including marine responsibility extending offshore (own some small parcels) (own some land parcels) Shemya, others?
shipping	DEC USCG	oversight of spill response ensure safety of vessels in US ports and waterways
oil and gas development	MMS DNR or DEC	3-200nm 0-3nm
military activity	Alaskan Command, Pacific Command	Shemya, floating barge
formerly used defense sites	AFCEE	cleanup
Amchitka	DOE	cleanup

KEY: ADFG – Alaska Department of Fish and Game; AFCEE – US Air Force Corps of Engineers; DEC – Alaska Department of Environmental Conservation; DNR – Alaska Department of Natural Resources; DOD – Department of Defense, DOE – Department of Energy, EPA – Environmental Protection Agency, MMS – Minerals Management Service, NMFS – National Marine Fisheries Service, NPFMC – North Pacific Fishery Management Council, USFWS – US Fish and Wildlife Service

Analytical approach

- look at ecosystem area holistically – across fisheries, at ecosystem scale
- ECOSYSTEM ASSESSMENT
  - try to identify key ecosystem interactions
  - qualitative risk assessment of interactions
  - implications: how is Council currently addressing risk, what else could be done
  - indicators/research needed for interactions
- PRIORITIES
  - how do interactions compare to Council mgmt objectives
  - overarching priorities coming out of FEP
- FUTURE STEPS - how to use FEP, how to improve on FEP

Interactions

- Climate and or physically mediated interactions
- Predator-prey (food web mediated) interactions
- Fishing effects interactions
- Regulatory interactions
- Other socioeconomic activity interactions

Risk Assessment

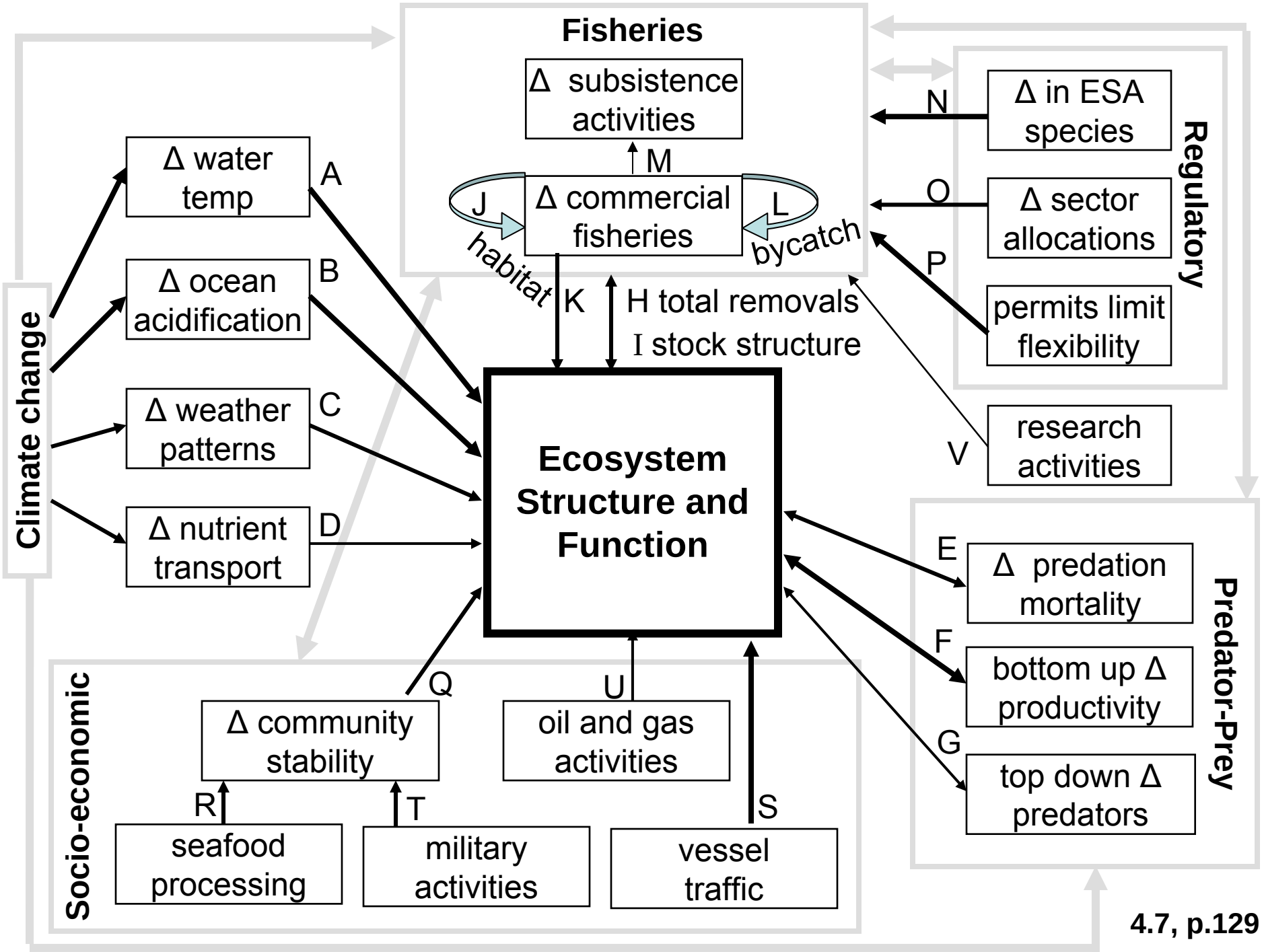
- Not quantitative
- Team members achieved consensus on estimations (low, medium, high, unknown)

1. The probability of each interaction happening
2. The extent of adverse impact of the interaction
   - Ecologically
   - Economically
3. And rated the geographical scope and length of impact (months-centuries)

Methodology 4.1, p.70

Implications for management

- How it risk currently addressed by managers?
- What else might be done to address any risk? Is further action warranted?
- Identify indicators to monitor interactions
- Identify data gaps and research needs


Fisheries
Δ subsistence activities
M
Δ commercial fisheries
J
habitat
L
bycatch
K
H total removals
I stock structure
Climate change
Δ water temp
A
Δ ocean acidification
B
Δ weather patterns
C
Δ nutrient transport
D
Ecosystem Structure and Function
N
Δ in ESA species
O
Δ sector allocations
P
permits limit flexibility
Regulatory
V
research activities
E
Δ predation mortality
F
bottom up Δ productivity
G
top down Δ predators
Predator-Prey
Q
Δ community stability
U
oil and gas activities
S
R
seafood processing
T
military activities
vessel traffic
Socio-economic

4.7, p.129

A. Changes in water temperature may impact ecosystem processes

- Probability: high, ecosystem/economic impact: high
- *What is the risk?*
  - species are dependent on preferred water temperature ranges
  - Council needs to understand how water temperature is changing, and how different temperatures favor/ disfavor managed species or their prey
- *What is Council doing to address risk?*
  - AFSC research on relationship between species/ environmental variables (few studies in the AI)
  - Some tracking of water temperatures (surveys)
- *What else might the Council do?*
  - monitor temperatures, as big changes will impact managed species
  - encourage further research

L. Impact of bycatch on fisheries

- Probability: high, ecosystem/economic impact: medium
- *What is the risk?*
  - unintended level of fishing mortality on ecosystem species (including seabirds and marine mammals)
  - understanding food web connections important to understanding impact of mortality
- *What is Council doing to address risk?*
  - high level of observer monitoring, gear modification, time and area closures - lots of Council attention to this issue
- *What else might the Council do?*
  - improved accuracy and quantification of removals
  - improved monitoring / implementation of monitoring for non-targeted species, especially those that we know are important in the AI food web (e.g. grenadiers)

S. Vessel traffic, and risk of vessel grounding and spillage, may impact ecosystem productivity

- Probability: high, ecosystem/economic impact: high
- *What is the risk?*
  - range of effects is from minor marine emissions to major catastrophic oil spills
- *What is Council doing to address risk?*
  - Alaska DEC and Coast Guard conducting a shipping risk assessment; Council tracking through Alaska Marine Ecosystem Forum
- *What else might the Council do?*
  - consider participating directly in risk assessment process
  - research whether advocating for proactive safety requirements is appropriate

Climate / physical interactions

Interaction	Risk assessment ranking?	Fishery management policy priority?	Within Council control?	What is the Council currently doing to address this risk?	What else might the Council do?	
					Short-term	Long-term
A. Change in water temperature **p.73**	high	no	no	Some Alaska research, not specific to AI.	•Monitor for big changes (need to define 'big')	•Encourage funding for physical data collection in the AI. •Encourage research into biological-physical linkages.
B. ocean acidification **p.75**	high	no	no	NOAA program is investigating.	•Interact with NOAA program to encourage monitoring and investigation in the AI ecosystem	•Develop an ocean acidity monitoring program in AI •Encourage research into the threshold effects of acidification on different parts of the ecosystem
C. nutrient transport **p.77**	unknown	no	no		•Monitor for big changes (need to define 'big')	•Encourage funding for moorings in AI passes.
D. weather patterns **p. 79**	medium	no	no		•Monitor for big changes (need to define 'big')	•Encourage funding for AI weather stations.

4.2, p.73

Predator / prey interactions

Interaction	Risk assessment ranking?	Fishery management policy priority?	Within Council control?	What is the Council currently doing to address this risk?	What else might the Council do?	
					Short-term	Long-term
E. Fishing and predation mortality on managed species **p.80**	high	yes (gfish)	yes	Ad hoc, species by species. SSL protection measures are best example.	•Focus on species with the most important predator-prey interactions •Use food web model and mortality source estimates to characterize commercial species as primarily 'prey' or 'predator', and consider these differently	•Task new or existing management body to provide ecosystem-level advice, rather than species-by-species •Develop framework to 'assign' an amount of a species' productivity to its predators, when setting fishery catch levels •Implement mechanisms which more explicitly integrate ecosystem considerations into the allocation process
F. Bottom up productivity changes **p.86**	high	yes (gfish)	somewhat	Some indices presented as part of Ecosystem Considerations chapter, but AI not well represented.	•Consider species' roles as prey and predator when assessing harvest levels •Encourage AFSC 'Fisheries Interactions in Local Ecosystems' initiative, and include study for AI.	•Consider estimating a measure of optimum yield for the AI ecosystem, that is updated on a periodic timeframe •Develop framework to adjust management for species with shared prey fields
G. Top down predator changes **p.91**	medium	no (except for ESA, see below)	somewhat	For ESA-listed species, interactions are managed; other marine mammals and seabird populations are monitored	•Consider species' roles as prey when assessing harvest levels	•Analyze what level of apex predator biomass would cause substantial conflict with current fisheries

4.3, p.80

Fishing effects interactions

Interaction	Risk assessment ranking?	Fishery management policy priority?	Within Council control?	What is the Council currently doing to address this risk?	What else might the Council do?	
					Short-term	Long-term
H. Total removals **p.95**	high	yes (gfish)	yes	Total removals are well managed for the BSAI groundfish, but not necessarily specific limits for AI specifically.	•Evaluate AI framework of indicators for evidence of a distinct system, particular with regard to genetic flow and trophic linkages	•Evaluate need to develop an AI-specific groundfish cap
I. Stock structure **p.97**	high	no	yes	Some research for certain AI species to look at whether AI population is distinct from EBS population.	•Encourage tagging and genetics studies, research into the interaction between physical and biological characteristics	•Modeling studies to determine biological impact of various scales of spatial management
J. Effects on fishery habitat **p.99**	medium	yes	yes	Bottom trawl fishery constrained to historic fishing areas. Known sensitive areas closed to bottom-tending fishing gear.		•Encourage funding to discover distribution of substrate and habitat type in the AI, other baseline habitat studies in AI.
K. Effects on other habitat **p.101**	unknown	yes	yes	As above.		•Need better sampling mechanisms for 'other biota'.

4.4, p.95

Fishing effects interactions

Interaction	Risk assessment ranking?	Fishery management policy priority?	Within Council control?	What is the Council currently doing to address this risk?	What else might the Council do?	
					Short-term	Long-term
L. Impact of bycatch on fisheries **p.103**	medium	yes (gfish)	yes	Council has myriad bycatch controls in place in the groundfish fisheries, from time/area closures, required gear modifications, seasonal harvest allocations, and a comprehensive observer program.	•Continue to improve accuracy in identification of bycatch species and quantification of removals. •Continue to encourage and promote development of bycatch reduction measures in gear design.	•Consider ways to collect finer scale spatial and temporal catch information. •Consider AI-specific bycatch regulations •Implement direct observation or other monitoring on smaller and halibut vessels •Improve/implement monitoring and stock assessment research of non-target and non-specified species
M. Impacts on subsistence **p.107**	low to medium	yes (crab)	yes	Commercial fisheries do not pre-empt subsistence use.	•Encourage ADF&G to conduct subsistence surveys in AI communities. •Monitor species harvested in both subsistence and commercial fisheries for direct interactions	•Develop local/ traditional knowledge from the people of Atka and Adak. •Consider need for marine heritage zones around villages and important subsistence sites •Estimate and incorporate subsistence harvests into TAC allocations as appropriate

4.4, p.103

Regulatory interactions

Interaction	Risk assessment ranking?	Fishery management policy priority?	Within Council control?	What is the Council currently doing to address this risk?	What else might the Council do?	
					Short-term	Long-term
N. ESA-listed species **p.110**	medium to high	yes (gfish)	somewhat	Council actively involved in development of protection measures for SSLs. Mitigation measures in effect for seabird bycatch.	•Monitor marine mammal and seabird species that breed and/or seasonally occur in the AI for signs of population decline.	•Consider need for action to mitigate against future changes in species of concern
O. Sector allocations **p.113**	low to high	yes	yes	Council thoroughly considers and mitigates differing social impacts of sector allocations.		•Encourage research on differing impacts of sectors on bycatch and habitat
P. Permits limit flexibility **p.115**	medium to high	yes	yes	Council builds in some options for flexibility into permit programs, in particular, entry-level opportunities.	•Continue to provide entry level opportunities as more constraining allocation programs are put in place	•In developing new programs, consider the timeframe at which the Council can change management measures to adjust to changing conditions

4.5, p.110

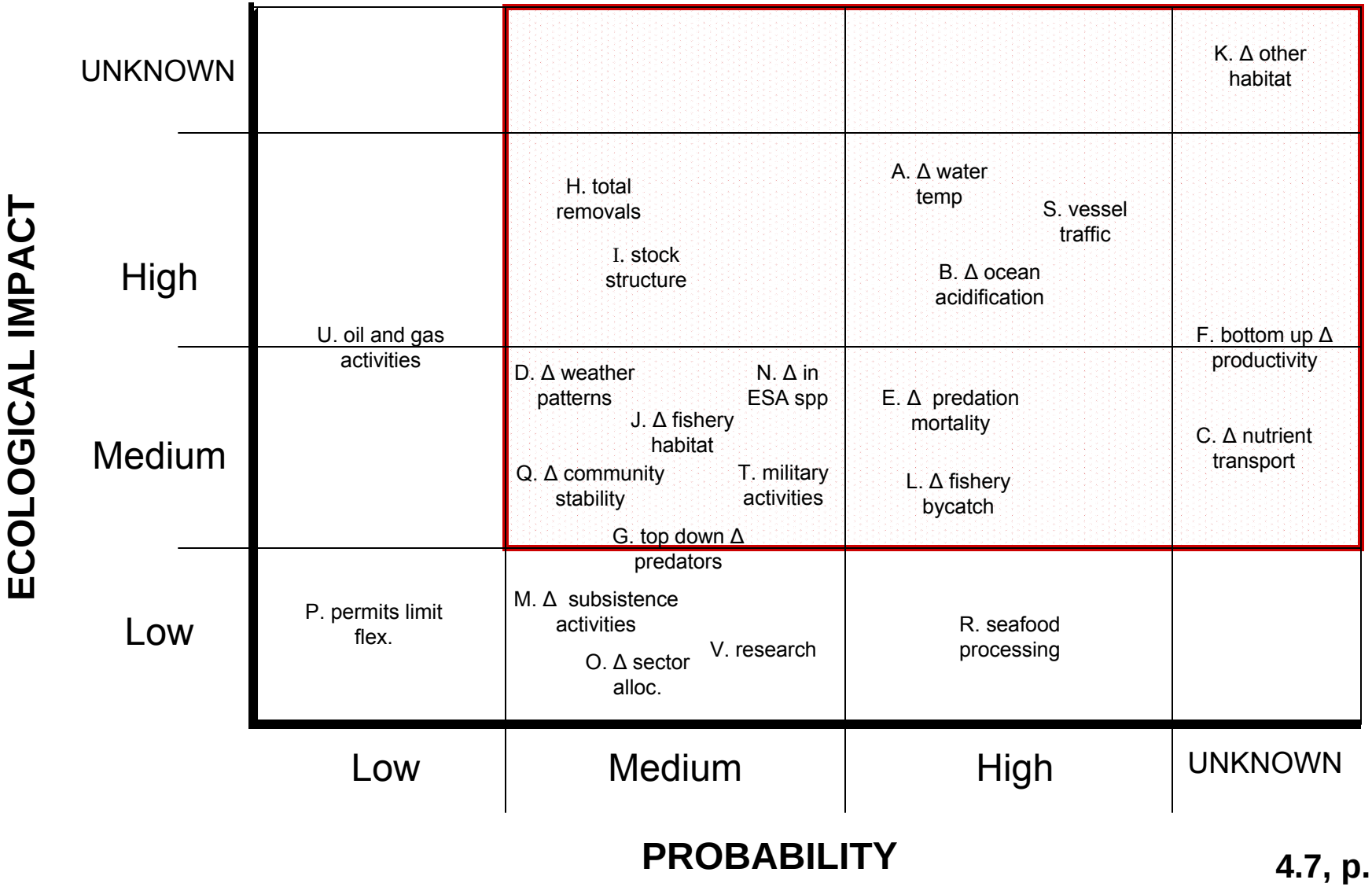
Other socioeconomic interactions

Interaction	Risk assessment ranking?	Fishery management policy priority?	Within Council control?	What is the Council currently doing to address this risk?	What else might the Council do?	
					Short-term	Long-term
Q. Community sustainability **p.117**	medium to high	yes	somewhat	Council considers effects on communities in planning management actions, and conducts a transparent management process that is open to the public.	•Encourage and actively solicit more participation in Council processes by community members from the AI by providing travel funds to attend meetings, video conferencing, and community liaisons	•Encourage development of community sustainability indicators to understand the relationship between communities, population, and ecosystems
R. Seafood processing **p.118**	low	no	somewhat	The Council has allocated a direct pollock allocation which supports the processor at Adak, and halibut allocations benefit the Atka processor.		•Consider allocating other species to benefit AI shoreside processors
S. Vessel traffic **p.120**	high	yes	somewhat	NMFS/Coast Guard require and enforce vessel safety standards for fishing vessels.	•Engage with the State of Alaska/Coast Guard's vessel traffic risk assessment (through Alaska Marine Ecosystem Forum)	•Prepare contingency plan for a response to AI accident scenarios

Other socioeconomic interactions

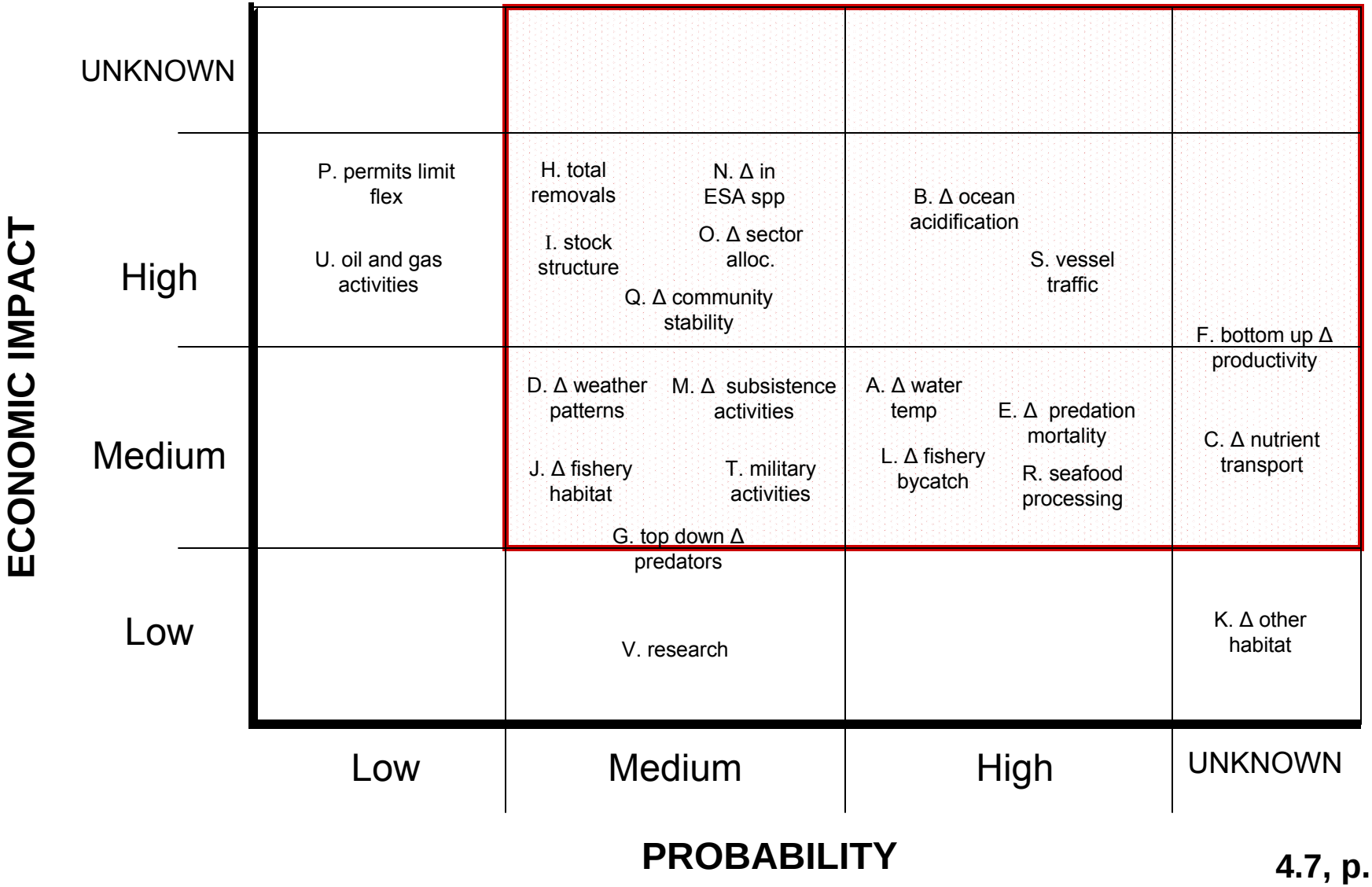
Interaction	Risk assessment ranking?	Fishery management policy priority?	Within Council control?	What is the Council currently doing to address this risk?	What else might the Council do?	
					Short-term	Long-term
T. Military **p.122**	medium	no	no	Dialogue with Alaskan Command through the Alaska Marine Ecosystem Forum.	•Continue to interact with military through the Alaska Marine Ecosystem Forum, and track future planning	
U. Oil and gas **p.124**	high	no	no	Dialogue with Minerals Management Service through the Alaska Marine Ecosystem Forum.	•Monitor lease sales and participate in development of analyses and mitigation for potential impacts on fish stocks and fisheries	•Identify sensitive areas where oil and gas development are not compatible with existing uses/habitat needs, and proactively seek to exclude oil and gas development where it might affect these areas
V. Research **p.126**	low	no	no	Council has opportunity to comment on fishery experimental fishery permits, fishery managers involved through permitting.		•Encourage 'clearing house' of AI research activities

Risk Assessment – Ecological Impact



4.7, p.130

Risk Assessment – Economic Impact



4.7, p.130

Priorities and Considerations

- Area-specific management for AI
  - AI should be recognized as distinct ecosystem in fishery management
  1. address AI as distinct ecosystem in management analyses
  2. AI ecosystem-wide monitoring plan to improve data available

Priorities and Considerations

- Improve ecosystem considerations process
  - no group in Council process with primary task of integrating ecosystem information and providing ecosystem-level advice
  1. Problem is that ecosystem information is often qualitative or interpretative. It is the Council's role, as policy-maker, to determine how to balance risks associated with unquantifiable 'ecosystem considerations'
  2. Council could start by articulating desirable/ undesirable states of ecosystem. What does Council perceive as healthy ecosystem?

Priorities and Considerations

- Dialogue with non-fishery agencies
  - important for Council to interact with other agencies about activities affecting ecosystem
  1. continue participation in Alaska Marine Ecosystem Forum
  2. make it known that Council wants to actively engage in decisions with repercussions on AI ecosystem and fishery resources

Value added?

- Team, Committee: yes
- educational tool for staff, Council, stakeholders
- brings together available information, provides platform to focus future attention and endeavors
- useful approach to developing an indicator framework

How to use FEP

- improve management analyses
  - NEPA environmental analyses – e.g., discuss impacts at separate AI ecosystem scale not just BSAI
- living document
  - update on annual basis, fine-tune to meet analytical needs
- document suggests focus areas for further work
  - perhaps develop through Ecosystem Committee
- 3-5 year re-evaluation of FEP
  - use 2007 evaluation as a baseline to compare, reconsider key AI ecosystem interactions

Link to Ecosystem Considerations chapter

- J Boldt working on incorporating indicators into ecosystem considerations report
  - 3 categories of indicators: some easy, some longer term
- Report is part of Groundfish SAFE. Should all indicators be tracked here?
  - e.g., indicators for other socioeconomic activities (oil and gas, etc.)
  - AFSC is considering best way to address this
  - also, recommend document be integrated into crab fishery management
- still need to develop ‘thresholds’ for indicators (to see whether the early warning system has been triggered)

How to build on FEP in the future

- comprehensive ecosystem assessment
  - not just risk assessment: assess state of ecosystem
  - links with Ecosystem chapter plans?
- Council process to develop policy on desirable/ undesirable ecosystem states
- analyze cumulative impacts of interactions
  - vulnerable species, vulnerable areas
- consider FEP boundary, and connections to surrounding areas
  - eastern AI, Russia

Remaining Tasks for AI Ecosystem Team

- Prepare glossy executive summary of FEP
  - timeline: over summer, ready by October
- Other edits/changes to May 18th draft of FEP following June Council meeting

Action/Timeline

- Ecosystem Committee May meeting
  - recommend adopting FEP, with edits to document
- Timeline if Council adopts FEP:
  - Team will revise FEP document with edits from Committee, SSC/AP/Council
  - Team will prepare glossy synthesis of the FEP
  - both to be completed over the summer

Ecosystem Committee recommendations

- adopt the FEP, with minor revisions
- fold research priorities into SSC/Council list
- keep the Ecosystem Team active
- suggest Ecosystem Committee begins task of identifying desirable/undesirable ecosystem states
- revisit FEPs for other Alaska areas next year
- urge Council to remain active in Alaska Marine Ecosystem Forum

Public Input

- Feedback through Council process
  - February, April, June
- Community meetings
  - Unalaska: March 21
  - Adak: May 23
  - Atka: weather problems cancelled meeting

1.3, p.4; Appendix A

Unalaska Community Meeting

- Discussion and clarifications on the **purpose / use** of the document, **risk assessment**
- Comments on missing elements, risk assessment methodology, reliance on models
  - food web model looks at 2 degree spatial variation; what about differences north/south of islands?
  - are we building human history and human observations into the models?
  - evaluate periodically for bias (models, FEP experts)
  - look at positive future changes as well as adverse ones
  - project is trying to assess resilience, but difficult to do through models

Council's Action today

- review and adopt the FEP
- act on other Ecosystem Committee recommendations