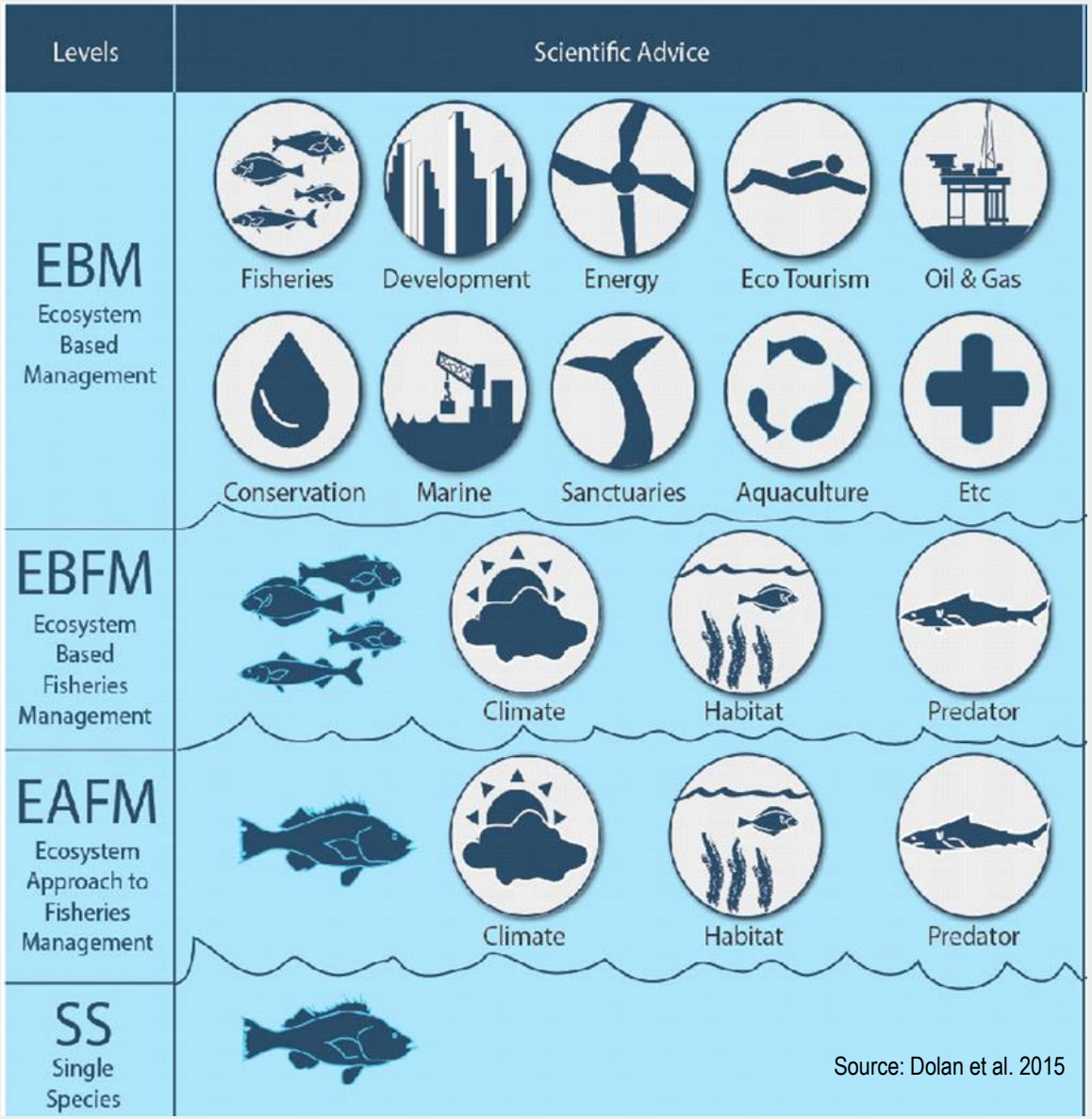
Developing a placed-based participatory IEA framework for coastal communities in the Gulf of Alaska

Judith Rosellon-Druker, Kerim Y. Aydin, Curry J. Cunningham, Stephen Kasperski, Gordon H. Kruse, Jamal H. Moss, Melissa Rhodes-Reese, Ellen Spooner, Marysia Szymkowiak, and Ellen M. Yasumiishi

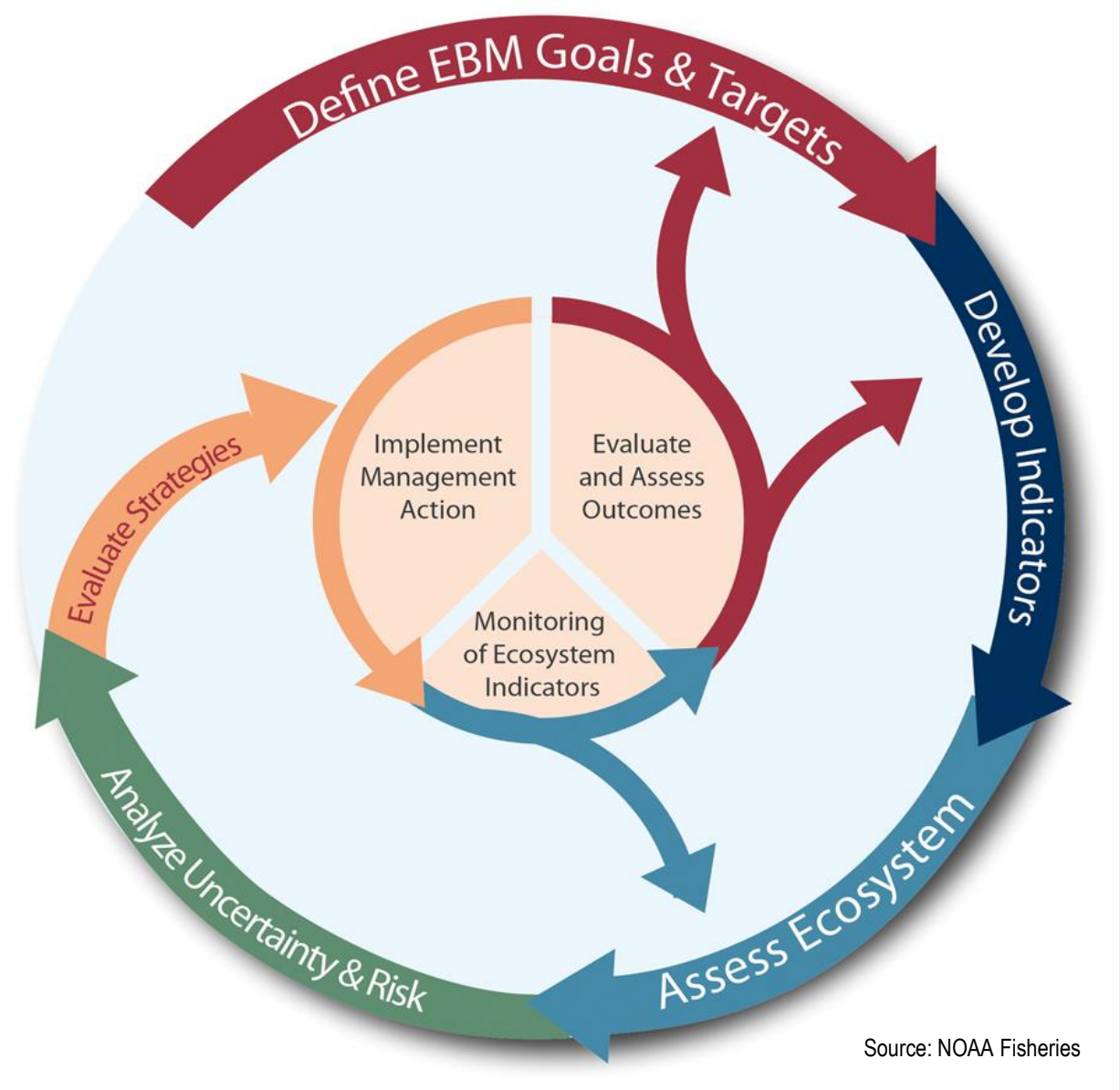
PICES 2019 Annual Meeting
Victoria, BC, Canada

Levels of Application of Ecosystem-based Management



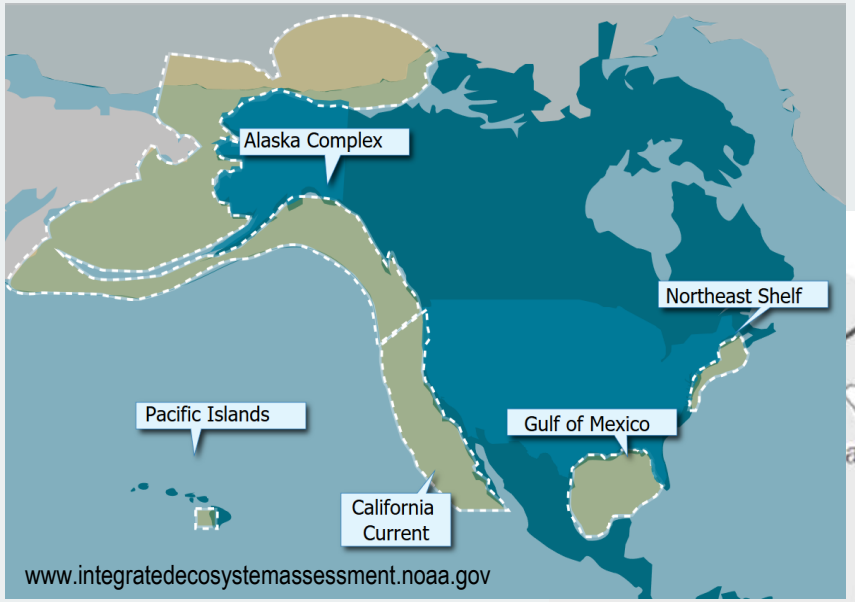
Source: Dolan et al. 2015

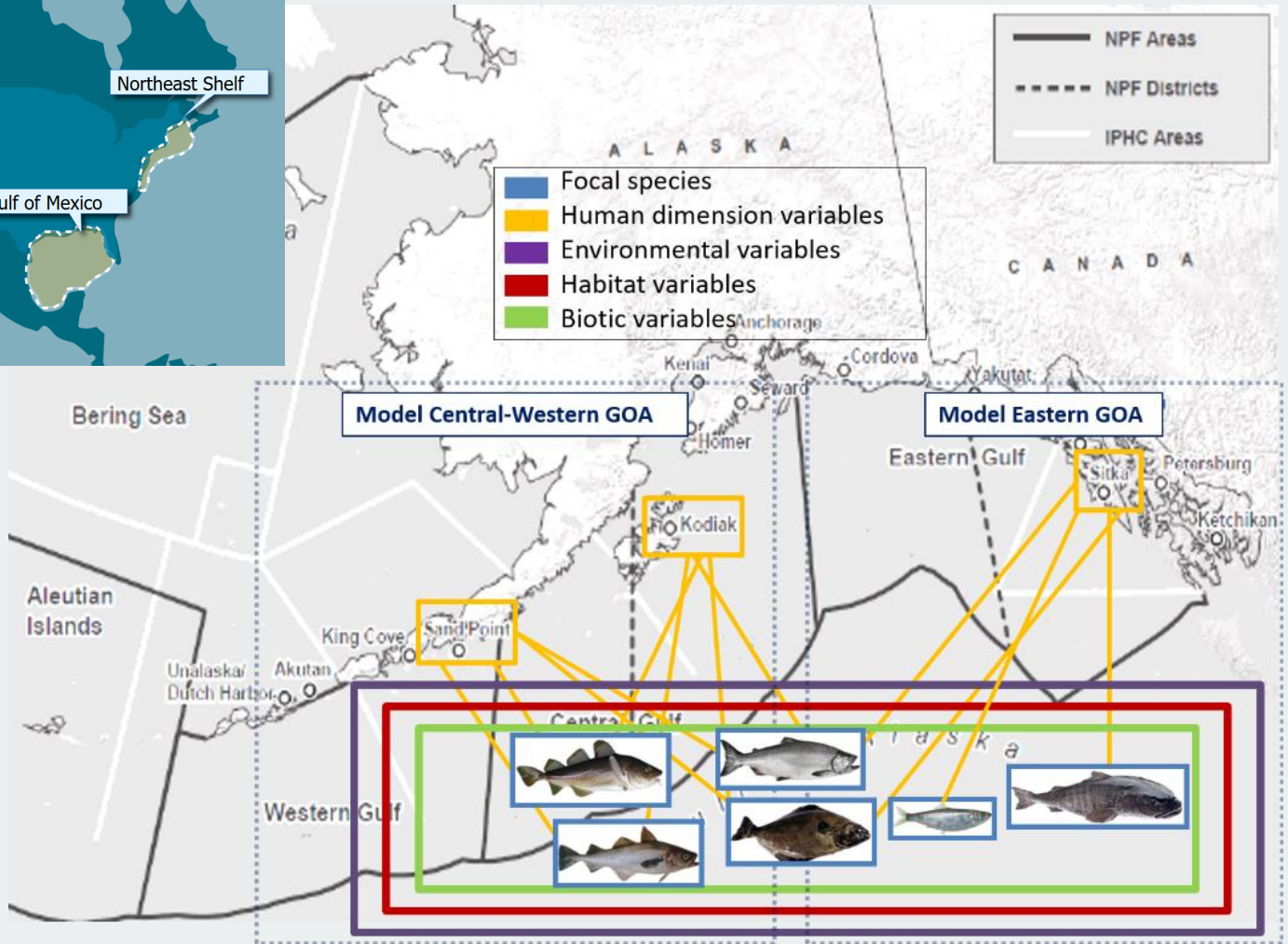
What is an Integrated Ecosystem Assessment?



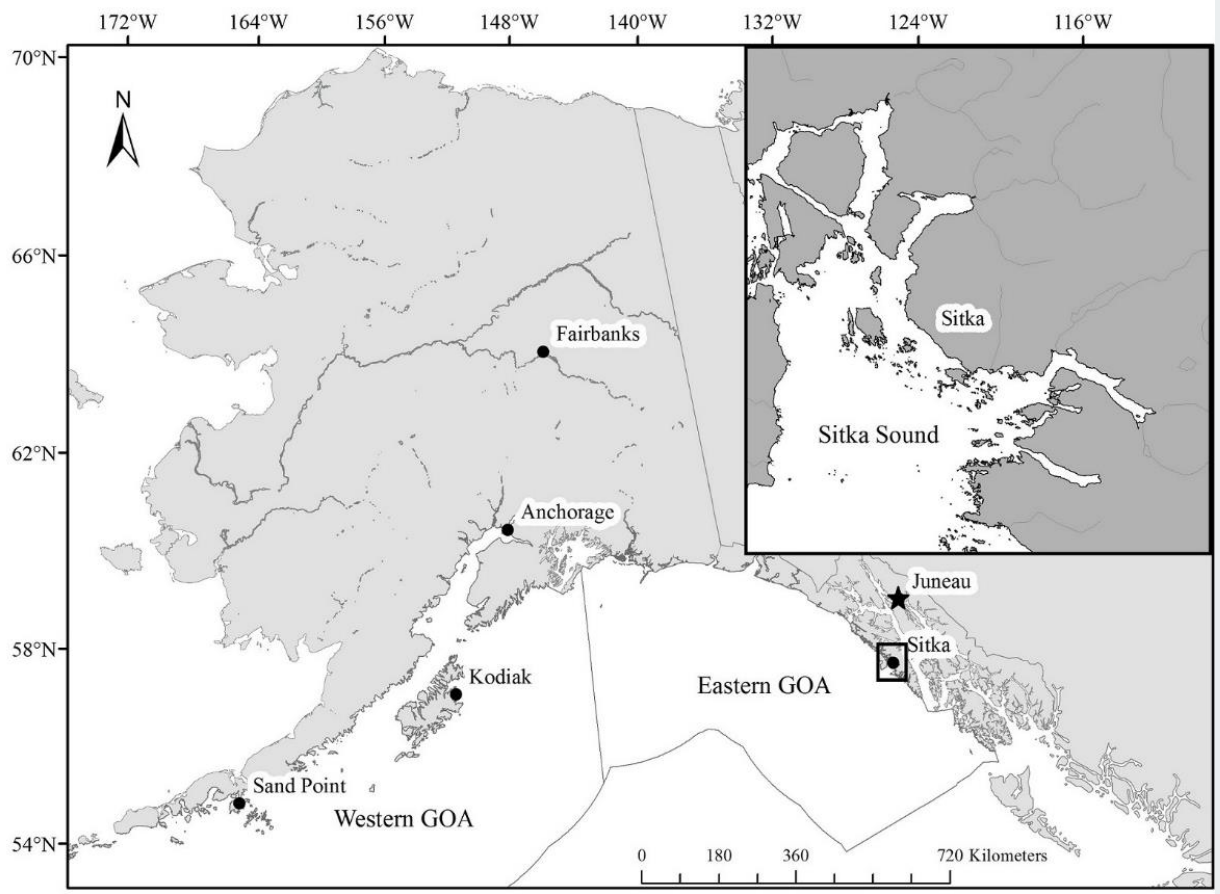
Source: NOAA Fisheries

Regional vs. place-based IEAs

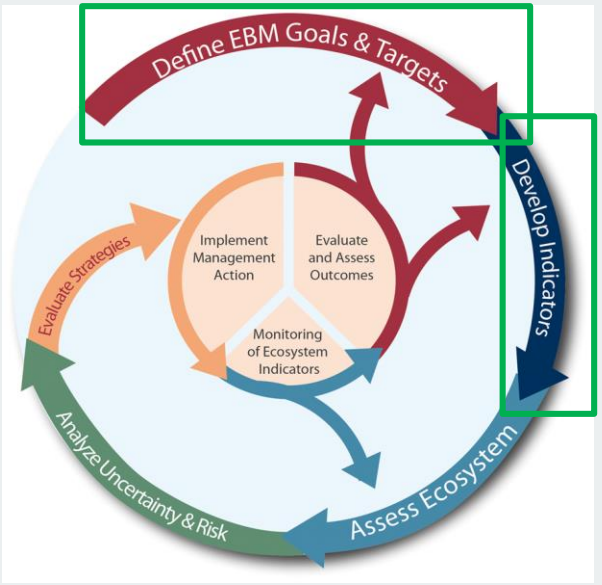




Southeast Alaska case study: Sitka



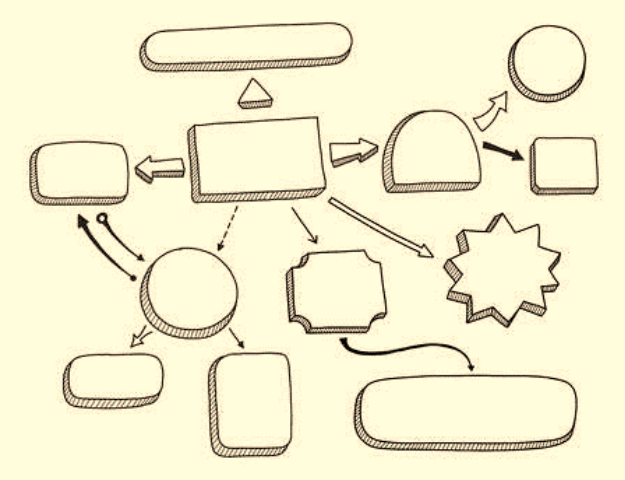
Steps completed:

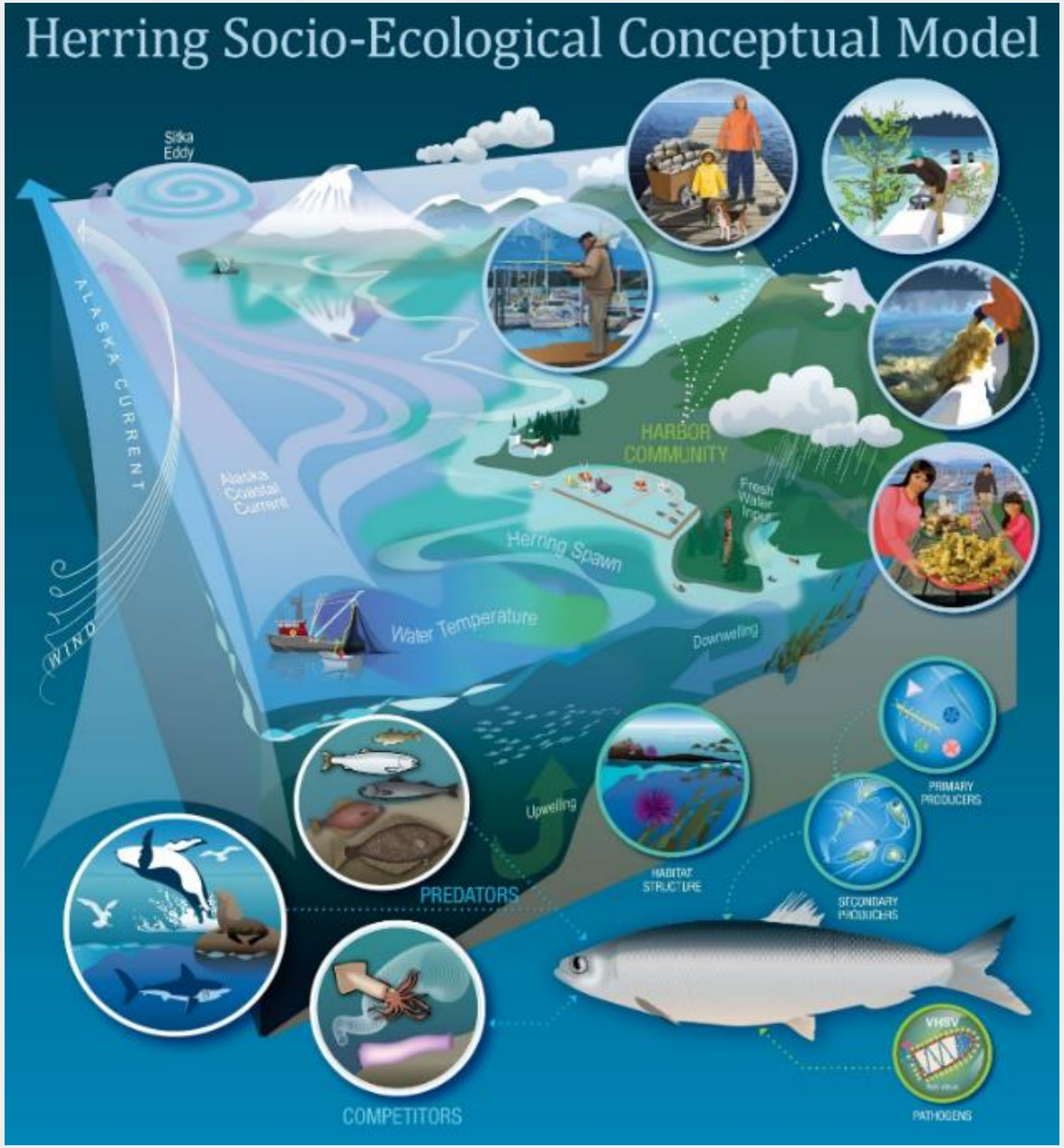


Focal species:

Conceptual models

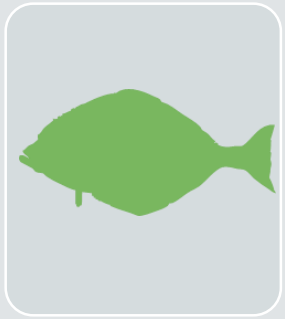
- Essential part of the IEA loop
- Communication tool
- Integration of social, environmental and biological components
- Incorporation of diverse types of knowledge (e.g., science and LEK)→ **Co-production of knowledge**
- Identification of knowledge gaps and research needs





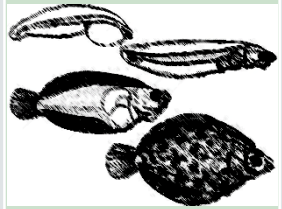
Building conceptual models

- Synthesizing available scientific information

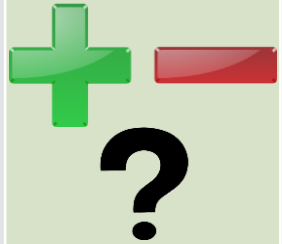


Halibut

Fresh water input



Halibut larvae

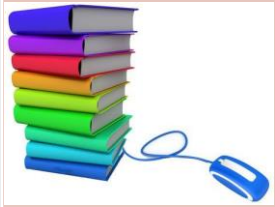


Positive

Alongshore transport enhanced

Micronutrients supplied from river discharge

High levels of chlorophyll-a



Stabeno et al., 2004

Etherington et al., 2007

Bailey et al., 2008

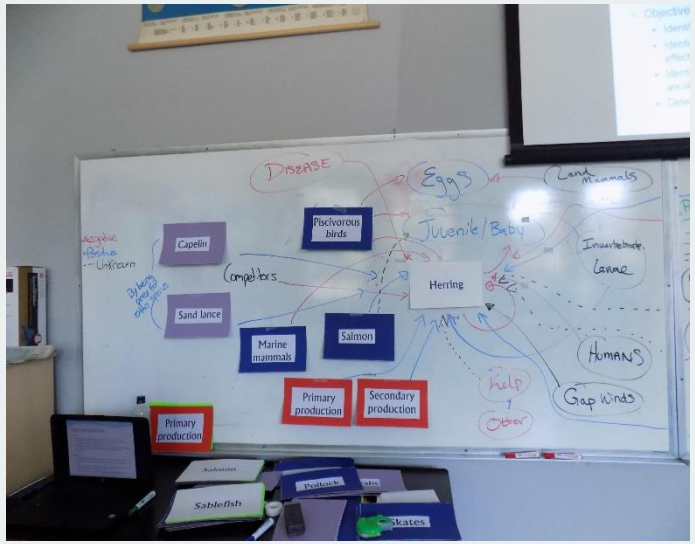
Doyle et al., 2009

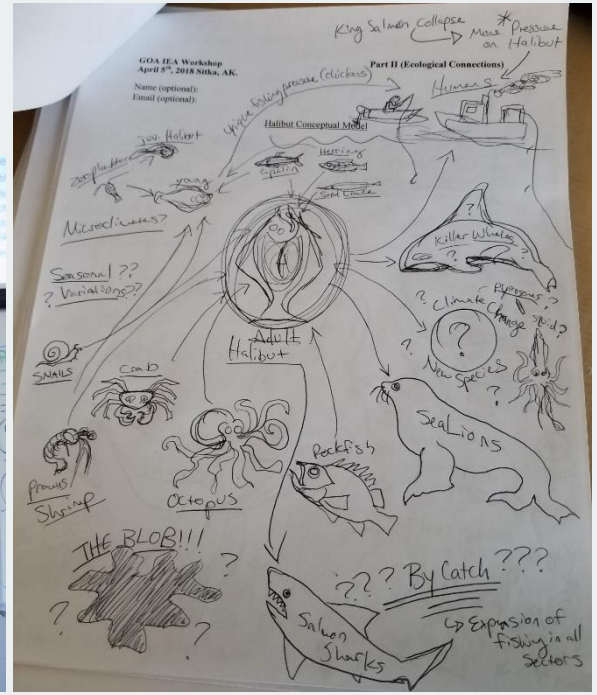
Arimitsu et al., 2016

- Sitka focus groups

Ecological connections

- Environmental variables
- Prey, predators and competitors
- Knowledge gaps





Human dimensions

- Resident's capacity to derive well-being from fisheries

Final conceptual model (herring)

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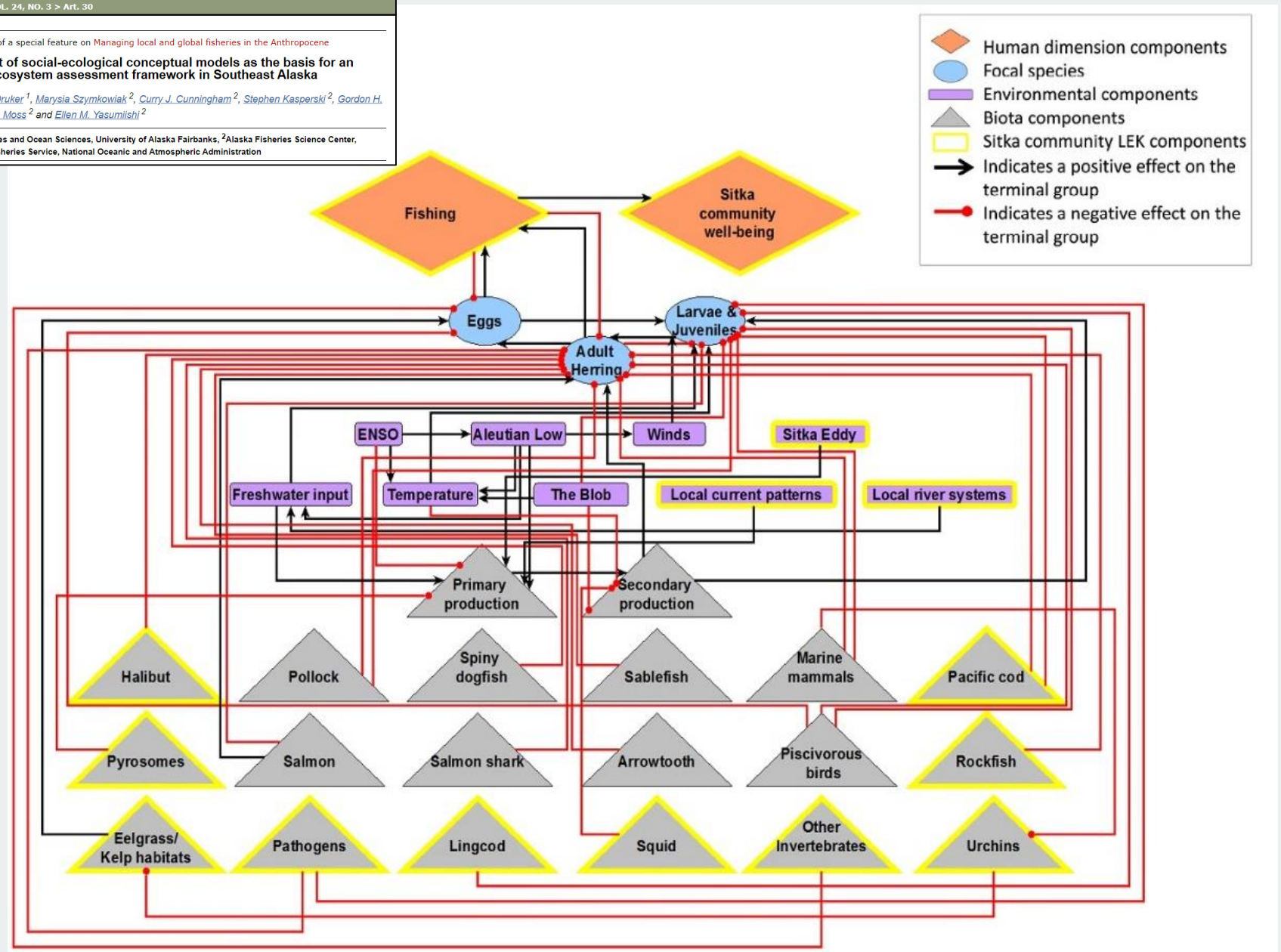
Research, part of a special feature on Managing local and global fisheries in the Anthropocene

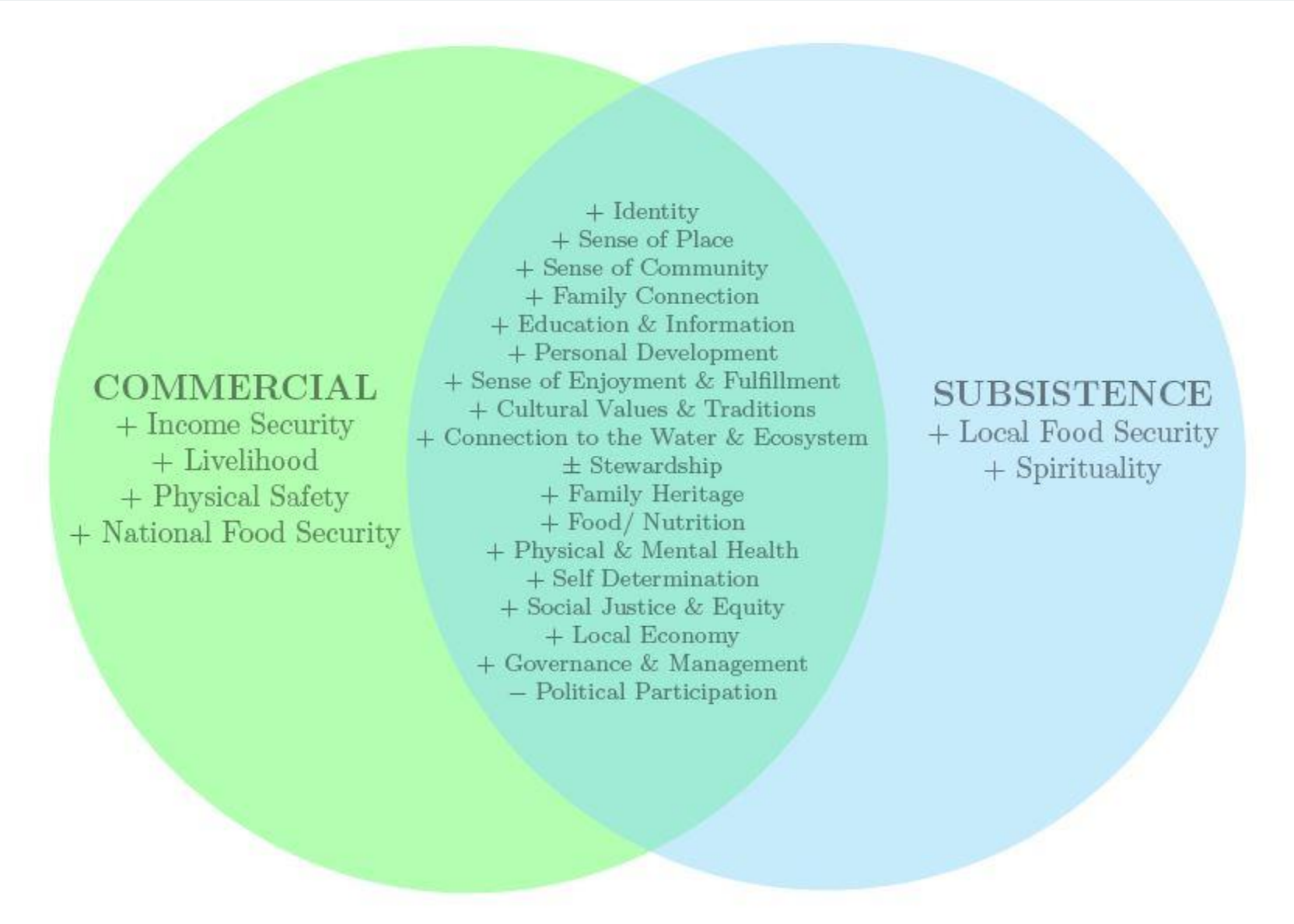
Development of social-ecological conceptual models as the basis for an integrated ecosystem assessment framework in Southeast Alaska

Judith Rosellon-Druker [1], Marysia Szymkowiak [2], Curry J. Cunningham [2], Stephen Kasperski [2], Gordon H. Kruse [1], Jamal H. Moss [2] and Ellen M. Yasumiishi [2]

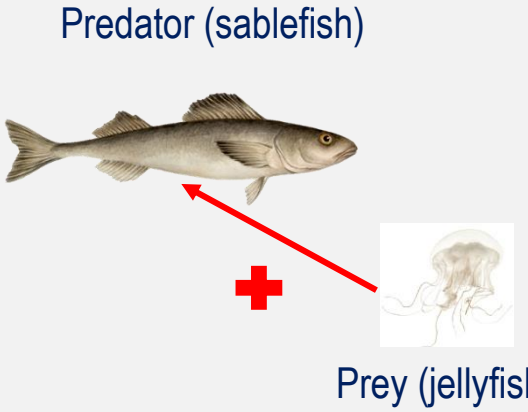
[1]College of Fisheries and Ocean Sciences, University of Alaska Fairbanks, [2]Alaska Fisheries Science Center, National Marine Fisheries Service, National Oceanic and Atmospheric Administration

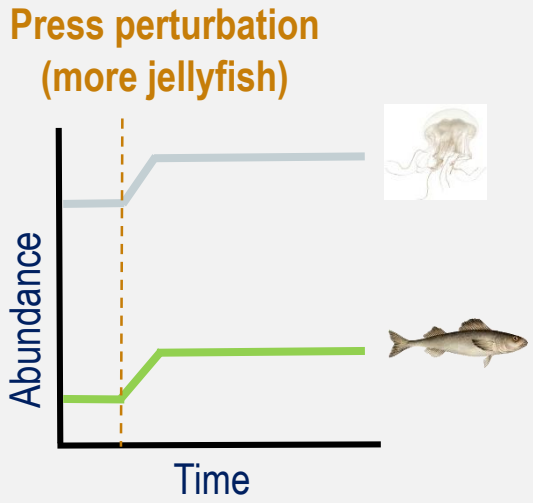


Human well-being indicators

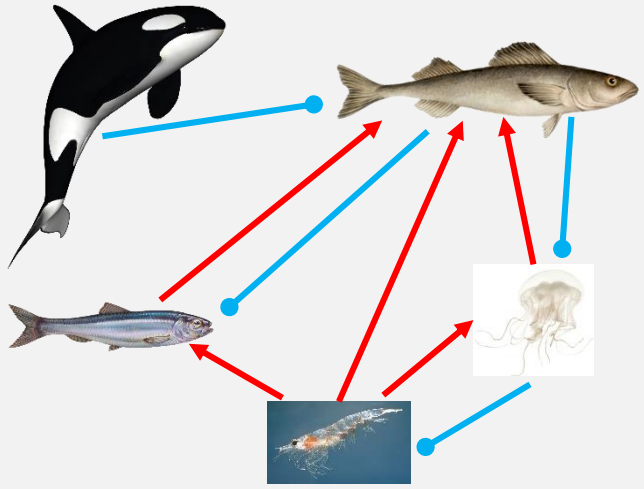


Operationalizing conceptual models (Qualitative network models)





Sablefish model



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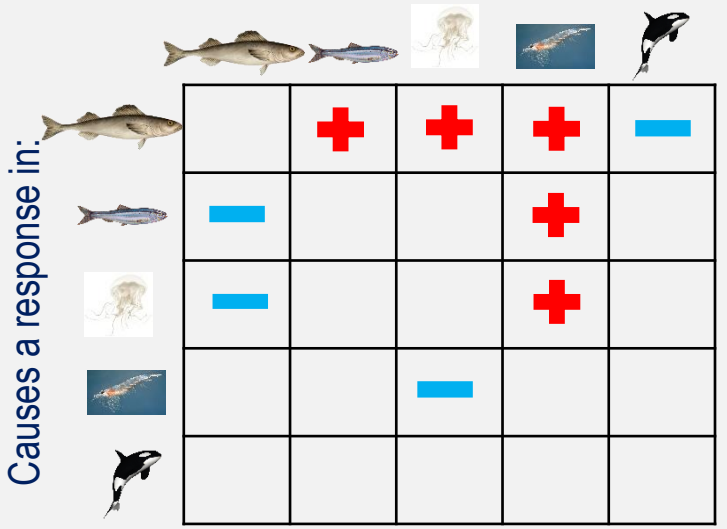
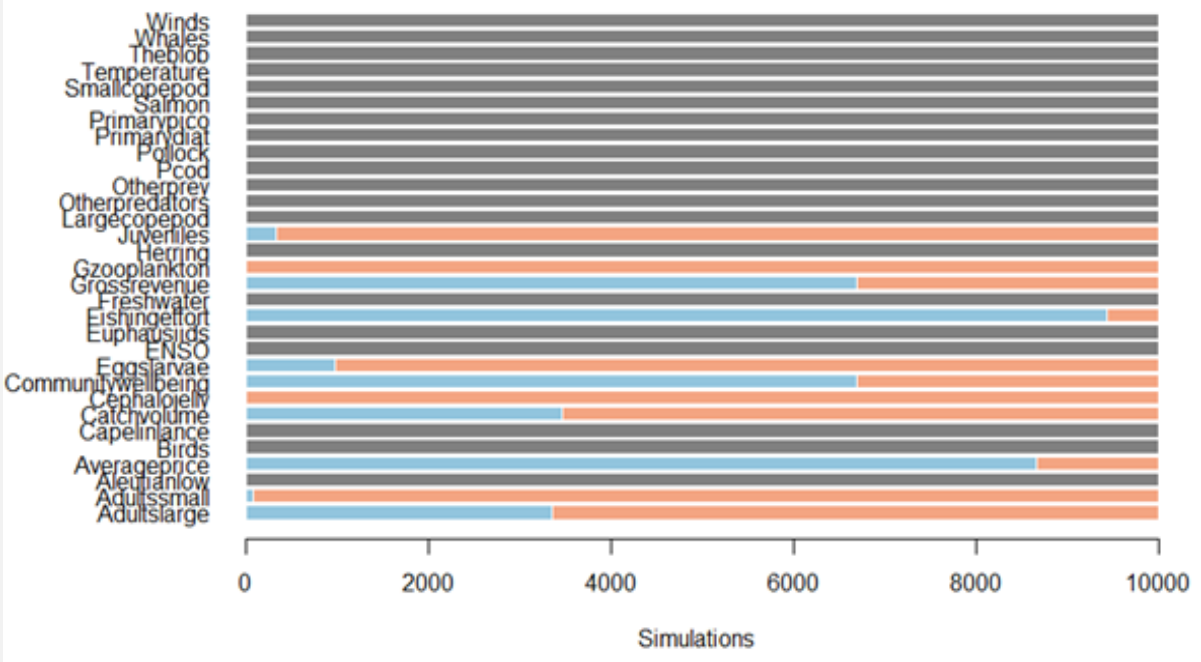
Community matrix

An increase in:



Press perturbation scenario example: ↑Gelatinous zooplankton + ↑Jellyfish and Cephalopods



Positive response
Negative response
No response

≥70% high sign consistency
≤70% low sign consistency

67% positive response on adults large
99% positive response on adults small
97% positive response on juveniles
68% negative response on Gross Revenue
95% negative response on Fishing effort
88% negative response on average price

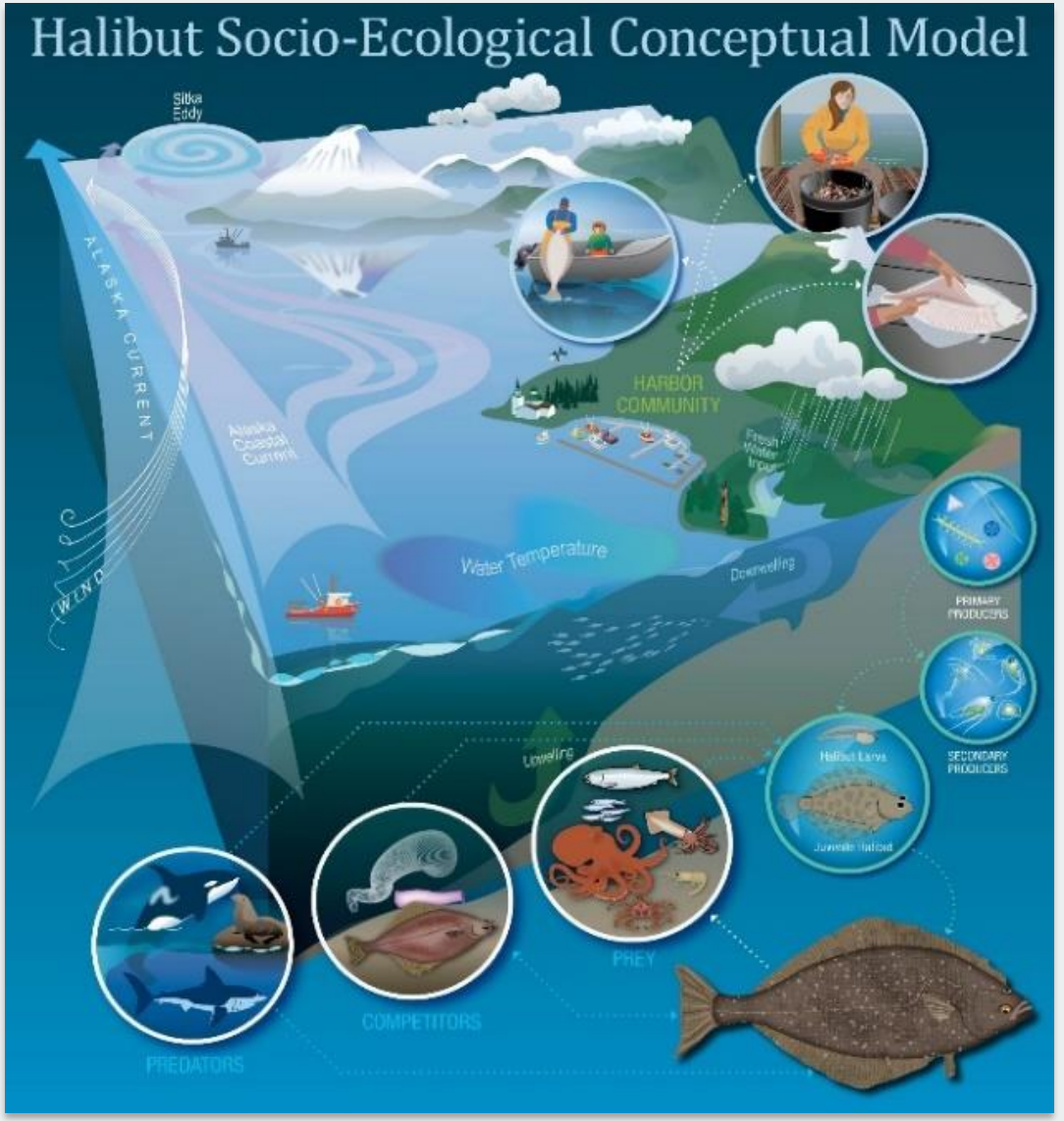
Which linkages are most important to sign outcome of small adults ?

Linkage	Relative influence
Large adults - Eggs & larvae	8.37
Cephalopods & jellyfish - Juveniles	5.78
Fishinge effort - Harvest by volume	4.94
Eggs & larvae - Juveniles	3.69
Cephalopods & jellyfish - Small adults	3.54
Large adults - Harvest by volume	3.30
Small adults - Eggs & larvae	2.96
Euphausiids - Herring	2.17

In summary, our approach is a …

"Placed-based participatory IEA"

- Sitka is a unique fishing community
- Sitka stakeholders have a deep understanding of their local ecosystem
- Conceptual models captured and integrated LEK
- Incorporation of LEK into science needed to achieve sustainable, effective, and equitable management of fisheries
- More informed and empowered community in relation to their local ecosystem and resources
- Operationalizing conceptual models allow an understanding of how different components of the model respond to a particular perturbation
- Long-term goal: Incorporate socio-ecological distinctive regions of GOA into one unifying IEA framework



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- Rebecca Shuford, Stephanie Oakes

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