

Ecosystem and Socioeconomic Profiles (ESPs) and climate ready on-ramps

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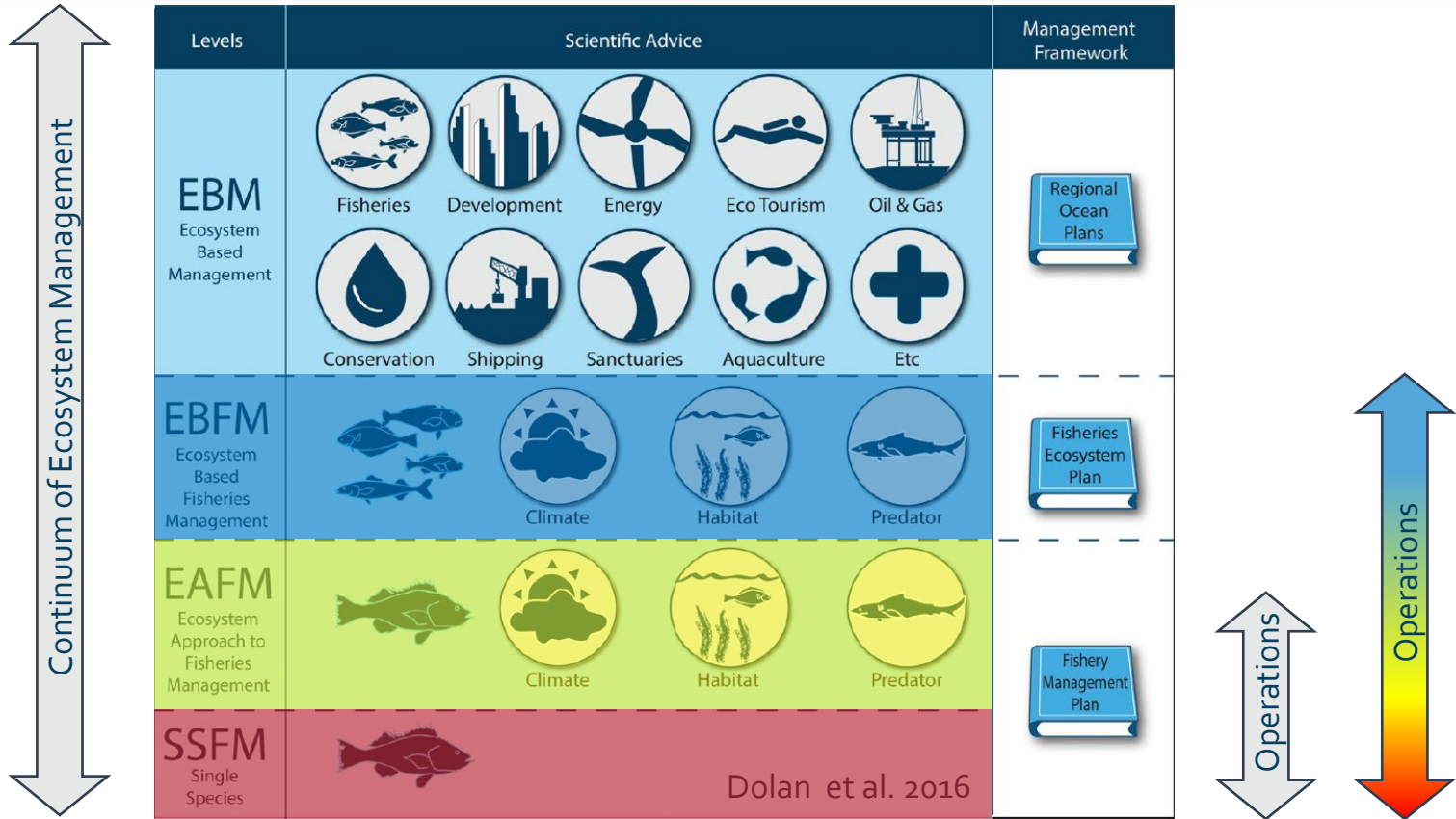
NOAA
FISHERIES

ESP Definition: A standardized framework that facilitates the integration of ecosystem and socioeconomic factors within the stock assessment process and acts as a proving ground for use in management advice.

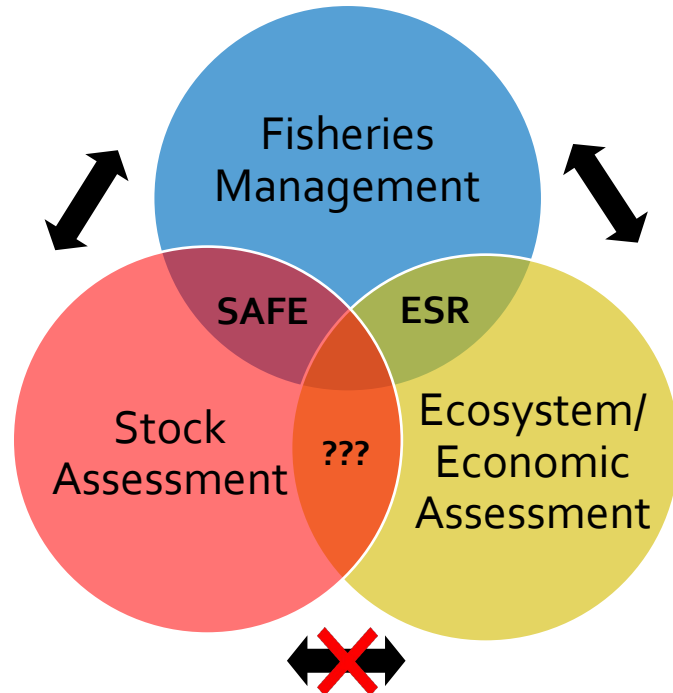
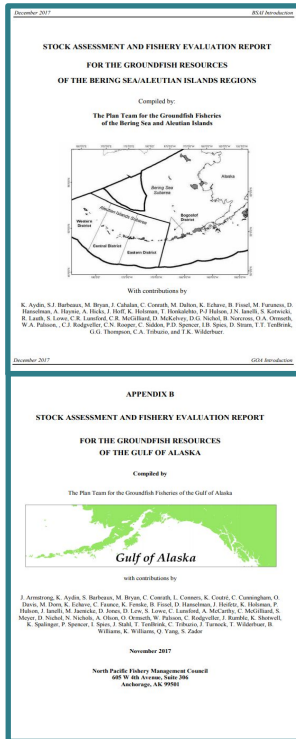


Climate Change Task Force, November 2, 2023

Ecosystem Management (EM)



Communication Gap



No Standard Framework



ESP Progression



Groundfish Plan Team (sablefish, pollock, Pacific cod)

Scientific and Statistical Committee

Center Workshops

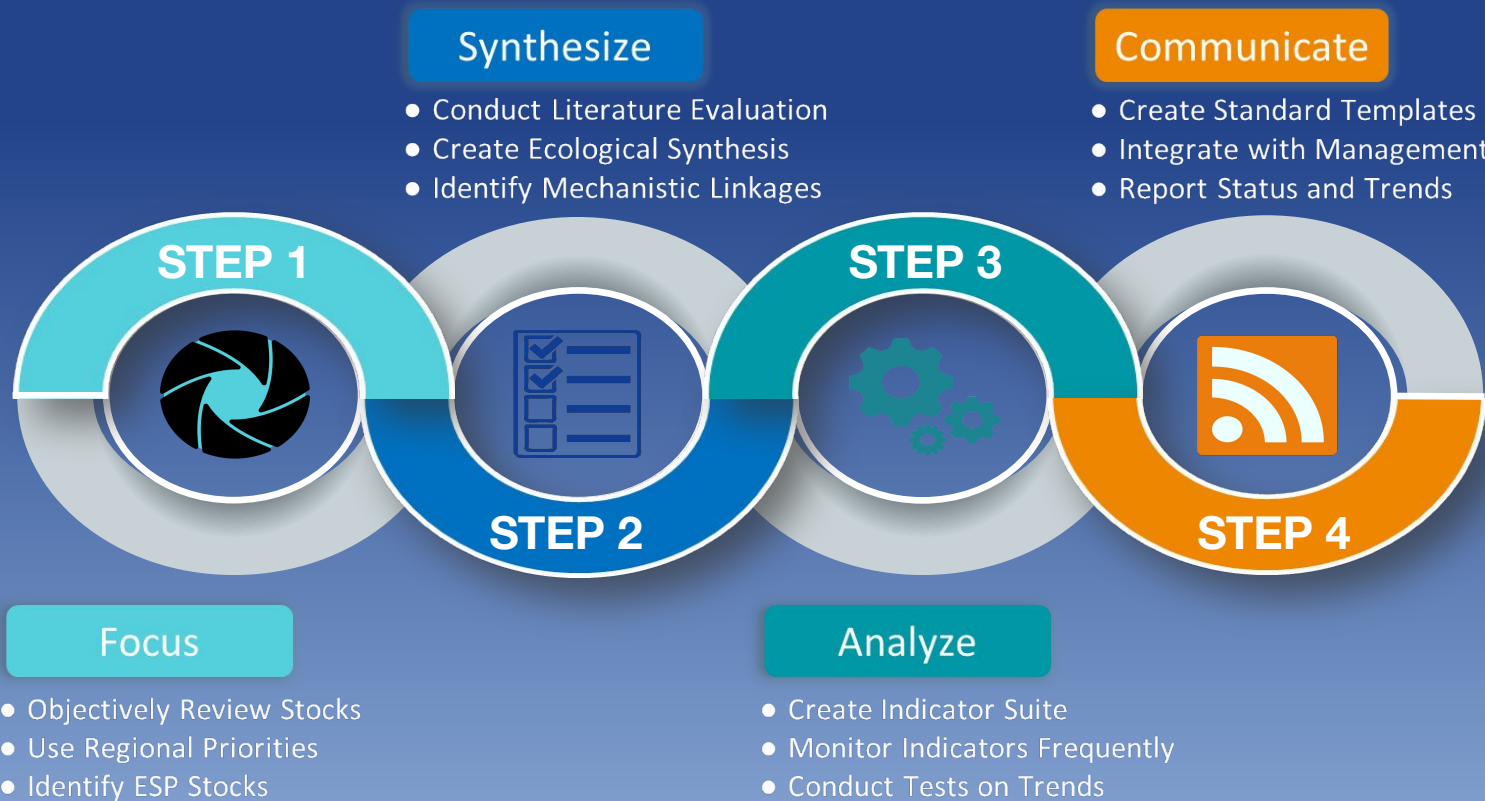
Crab Plan Team (king, snow)

Council

National

- Pacific Islands ESPs (2020, uku)
- Northeast center ESPs (2021, bluefish, seabass, cod, mackerel)

General ESP Process



Decisions from ESPs

Inform uncertainty

Provide additional context



- Risk Tables
- Rebuilding Plans
- TAC Discussions
- Survey Planning
- Research Priorities
- Request for Proposals

Inform assessment model...

assumptions



- Mechanistic linkages
- Consistency with stock life history
- Biological realism

choices



- Inform data conditioning
- Time blocks
- Parameter values consistent with existing info

covariates



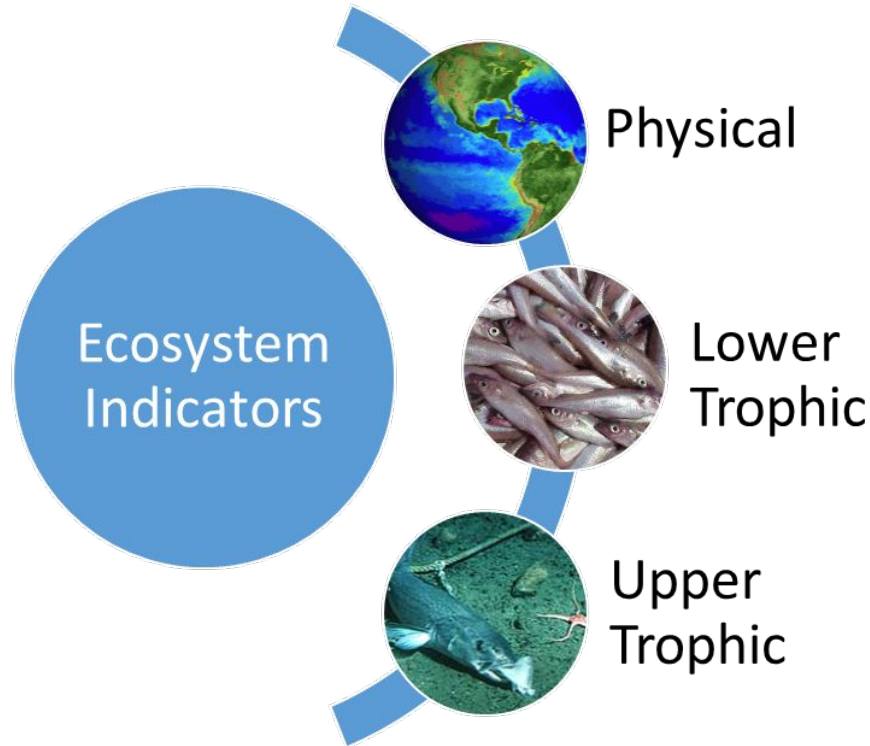
- Indicator time series directly included in model (ex, [Woods Hole Assessment Model](#))



Climate Readiness

1. Focus: use climate vulnerability assessments to determine which stocks are priorities for conducting an ESP
2. Synthesize: identify thresholds and bottlenecks that may influence survival in a changing climate
3. Analyze: create projections using ocean models to make selected indicators climate informed
4. Communicate: include new graphics and measures in standard reporting template to convey climate readiness

Ecosystem Indicators (AK)



1. Marine heatwave index (model)
2. Bottom temperature (survey, **ROMS**)
3. SST, wind stress, sea-ice (satellite)
4. Corrosivity or pH index (**ROMS-NPZ**)
5. Production (chlorophyll *a*, satellite)
6. Small/Large copepods (survey)
7. Euphausiids (survey)
8. Seabird reproductive success (survey)
9. Larval fish abundance, condition (survey)
10. YOY biomass, growth seabird diets (survey)
11. Juvenile CPUE, condition (survey)
12. Juvenile predation mortality (model)
13. Proportion euphausiid in fish diet (survey)
14. Adult condition (survey, fishery)
15. Center of gravity, area occupied (model)
16. Predator biomass (**stock assessment**)
17. Steller sea lion non-pup estimates (survey)

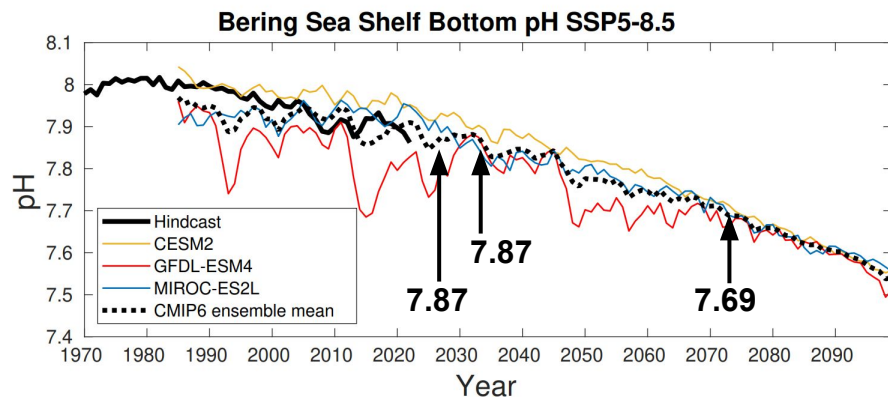
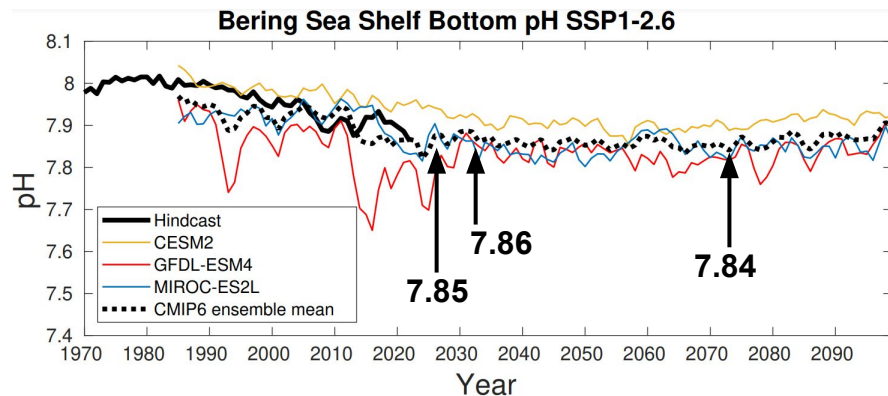
Indicator Projections

- Indicator Expansions

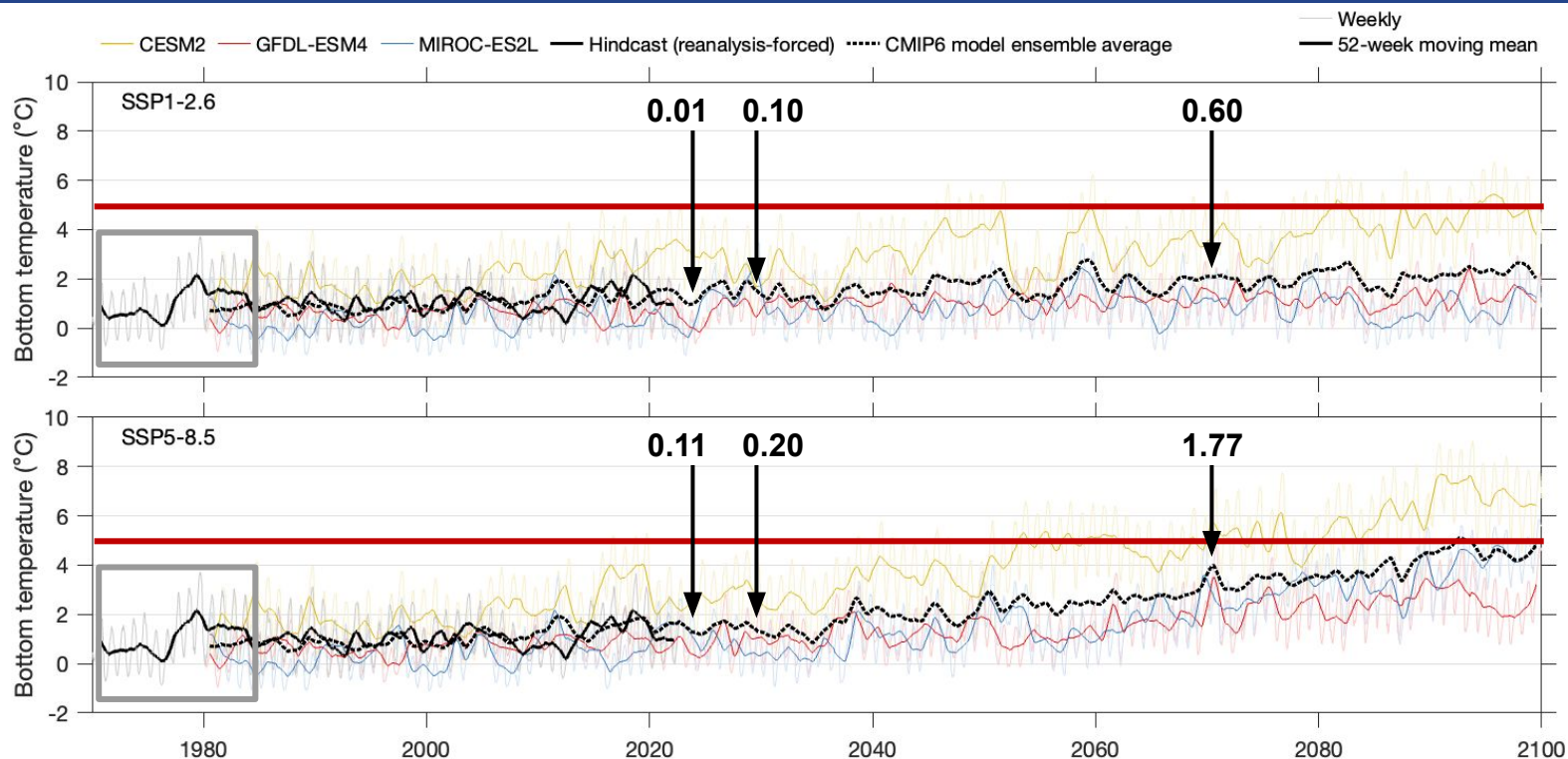
- Include different IPCC models and ensemble mean
- Evaluate over a range of emissions scenarios

- Indicator Metrics

- Calculate moving mean to account for interannual variability
- Report at various future intervals (e.g., 5, 10, 50 years)



Additional Features



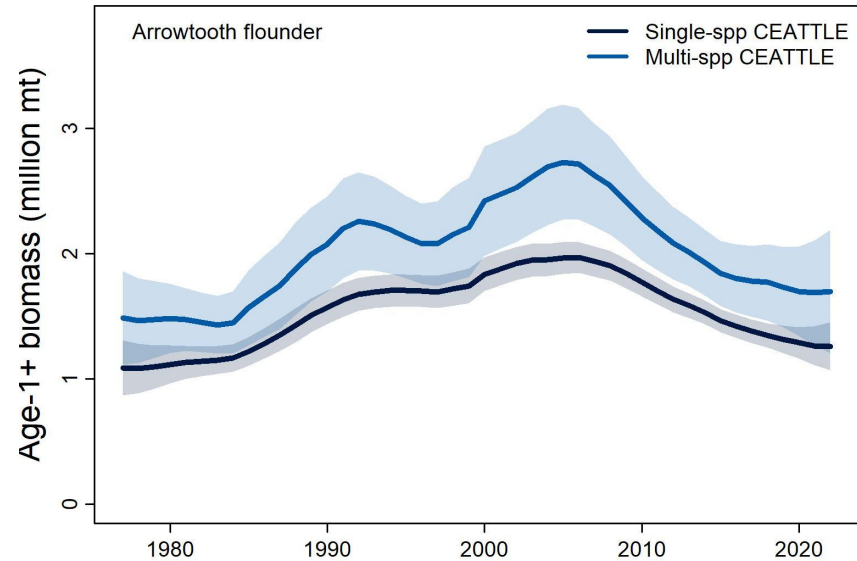
Indicator Enhancements

- Indicator Alternatives

- Include different indicator version based on ecosystem model
- Provide error estimates to allow for comparison of overlap

- Indicator Linkages

- Estimates of time varying stock assessment parameters
- Identify shifts in the indicator and other indicators to monitor



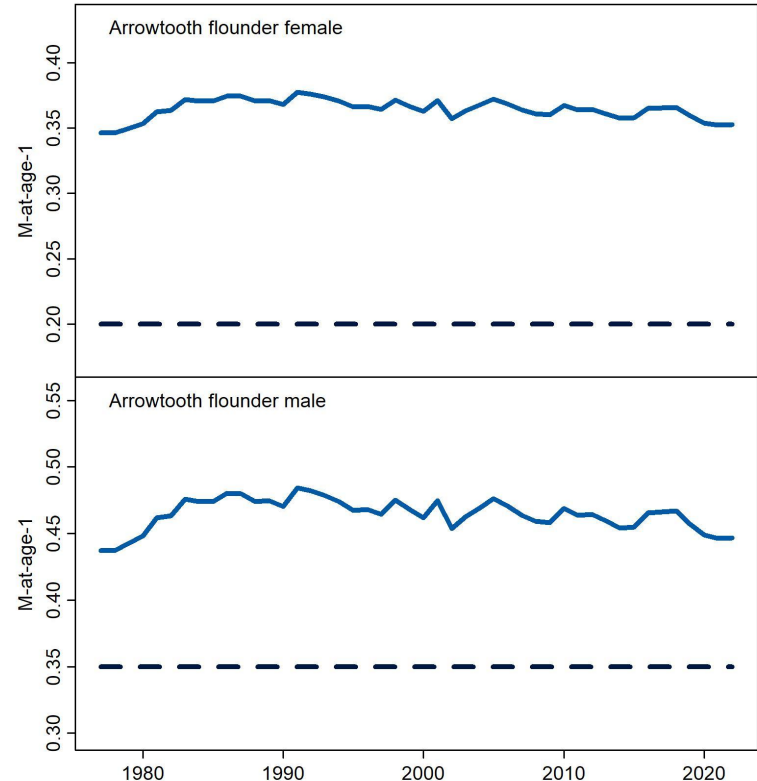
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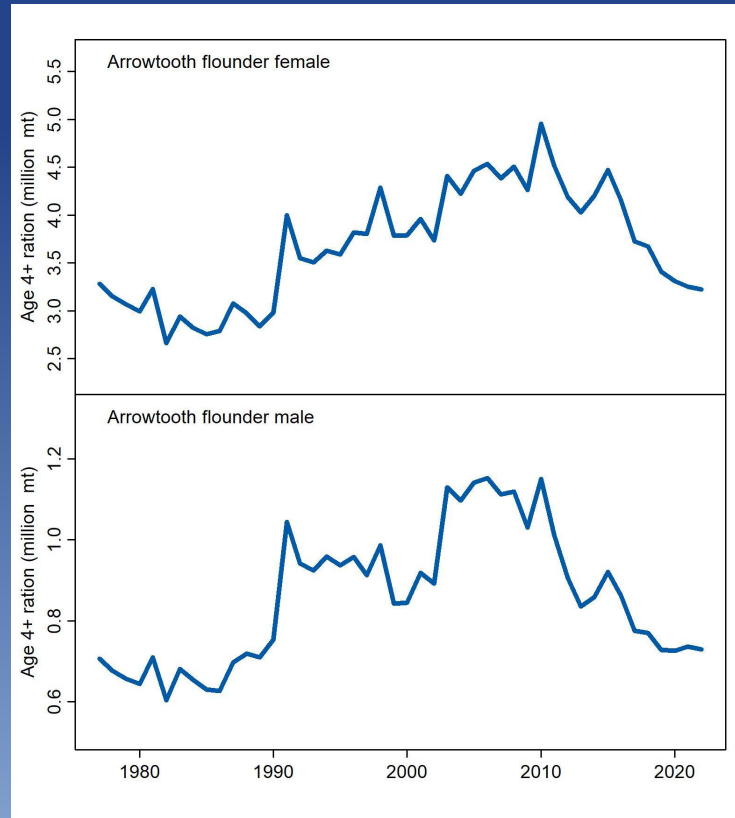
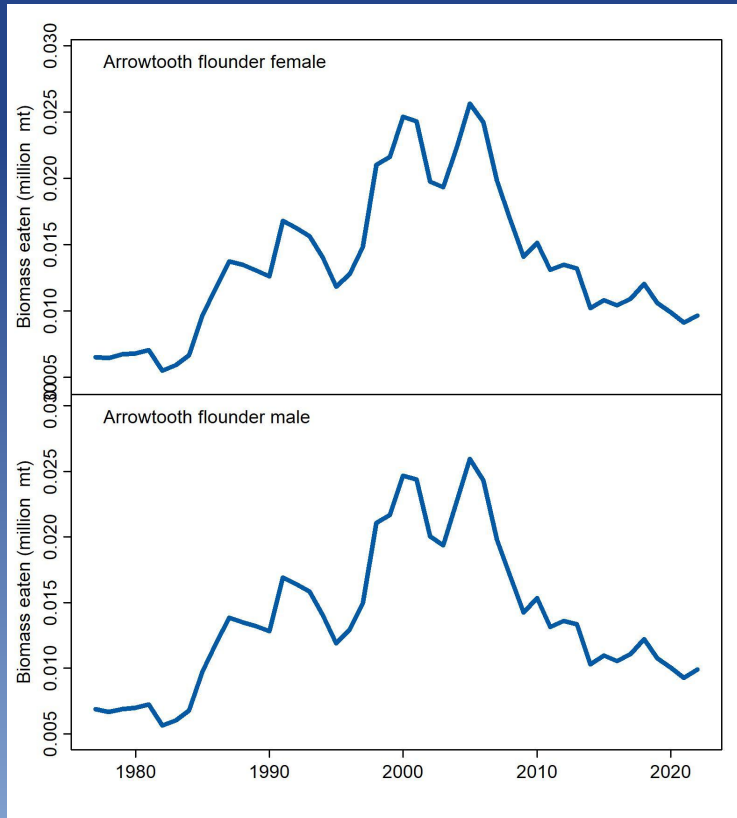
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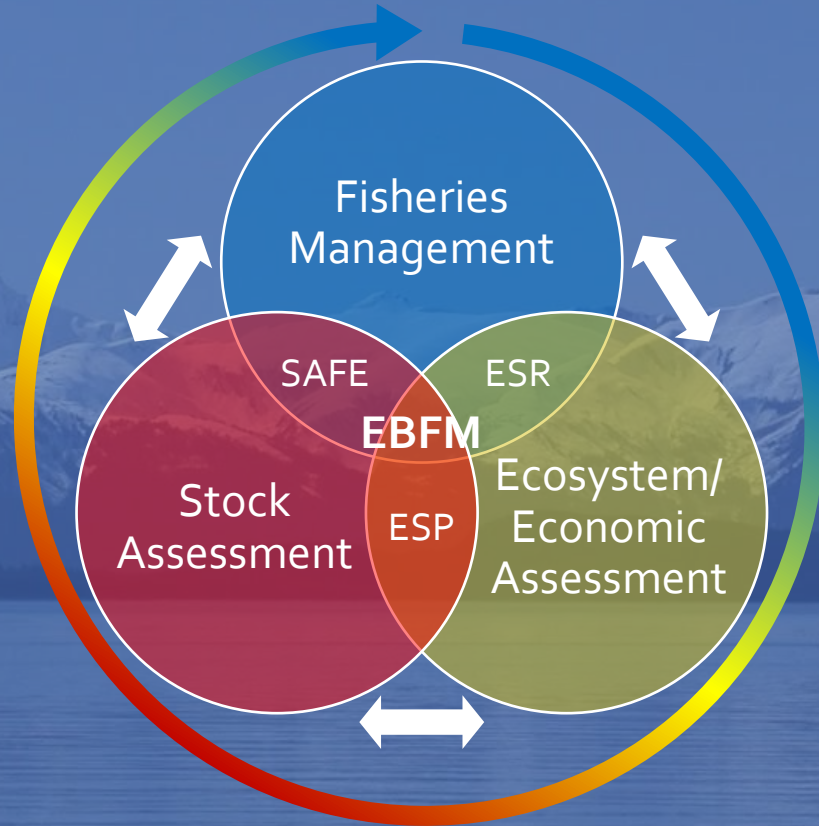




Next Steps

- National ESP Initiative
 - Increased interest from all other science centers to continue or begin creating ESPs for their region
 - Workshops, data management, website
- Future climate ready ESPs
 - Include climate information into operational ESPs
 - Continue exploring value added enhancements

Communication Loop





Thank You! Any Questions?

Contact:

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[Resources](#)