

Ecosystem Socioeconomic Profile (ESP)

EBS Pacific Cod (Report Card)

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Overview

Appendix in SAFE report

- Draft ESP in Nov 2020
- Full ESP in Sept 2021
- Report card in Nov 2021
 - Simplified template allows for including current year data
 - Some indicators missing due to data timing, analysis
- 8 editors, 17 contributors

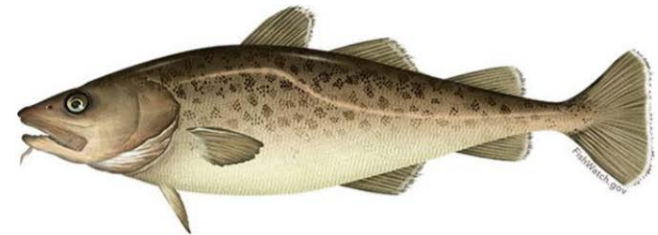
November 2021 Plan Team Draft

EBS Pacific cod

Attachment 2.2.1 Ecosystem and Socioeconomic Profile of the Pacific cod stock in the Eastern Bering Sea - Report Card

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November 2021



With Contributions from:

Kerim Aydin, Steve Barbeaux, Curry Cunningham, Bridget Ferriss, Kirstin Holsman, Beth Matta, Sandi Neidetcher, Jens Nielsen, Patrick Ressler, Heather Renner, Sean Rohan, Ingrid Spies, Katie Sweeney, Muyin Wang, Jordan Watson, Sarah Wise, Stephani Zador

Pp. 347-394, 395-411

ESP Report Card Template

Stock/Complex:

Outline for Ecosystem and Socioeconomic Profile (ESP)

Current Year Update (Report Card)

- Short description of an ESP process and reference to full ESP

Management Considerations

- Summary ecosystem and socioeconomic considerations from the assessment for use in the main stock assessment

Modeling Considerations

- Summary of intermediate stage importance results and research ecosystem linked model status

Assessment

Ecosystem and Socioeconomic Processes

- Short description of ecosystem and socioeconomic processes from full or partial ESP with conceptual models
- Table of data sources, key processes affecting survival, conceptual model graphics

Indicator Suite

- List of ecosystem and socioeconomic indicator titles with standard time series graph

Indicator Monitoring Analysis

- Beginning stage traffic light test with comparison table and historical scoring by ecosystem and socioeconomic indicators

- Intermediate stage importance test with covariate graph, direction, magnitude, and importance results (optional)
- Advanced stage research model update with reference to developed model and supportive graphs (optional)

Data Gaps and Future Research Priorities

- Description of metric or indicator data gaps and needs
- Priorities for ecosystem and socioeconomic research that would support future versions of the ESP |

Acknowledgements & Literature Cited

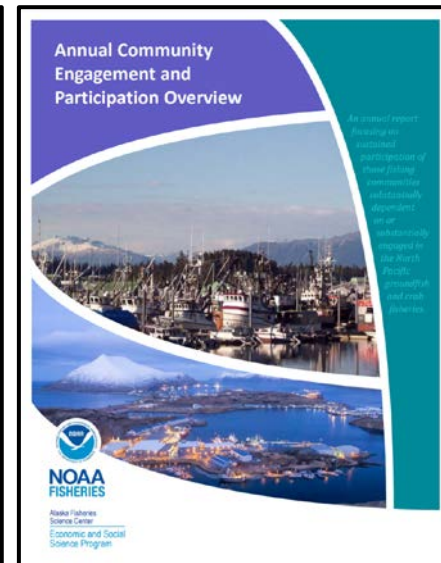
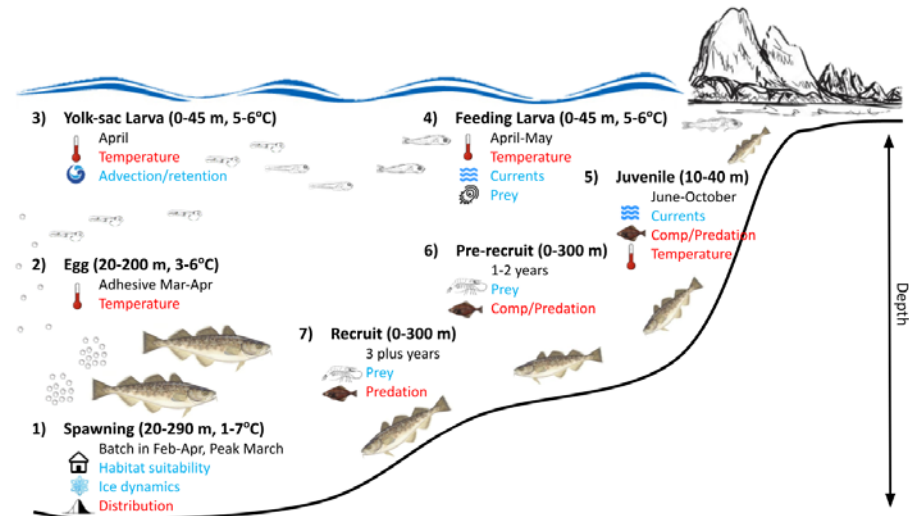
Processes

- Ecosystem

- References main text of the appendix (2.2)
- Includes conceptual model for reference

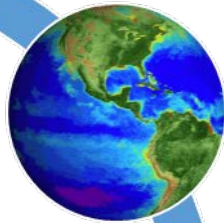
- Socioeconomic

- References main text of the appendix (2.2), in future will reference but not be redundant with Econ SAFE or ACEPO



Ecosystem Indicators

Ecosystem Indicators



Physical



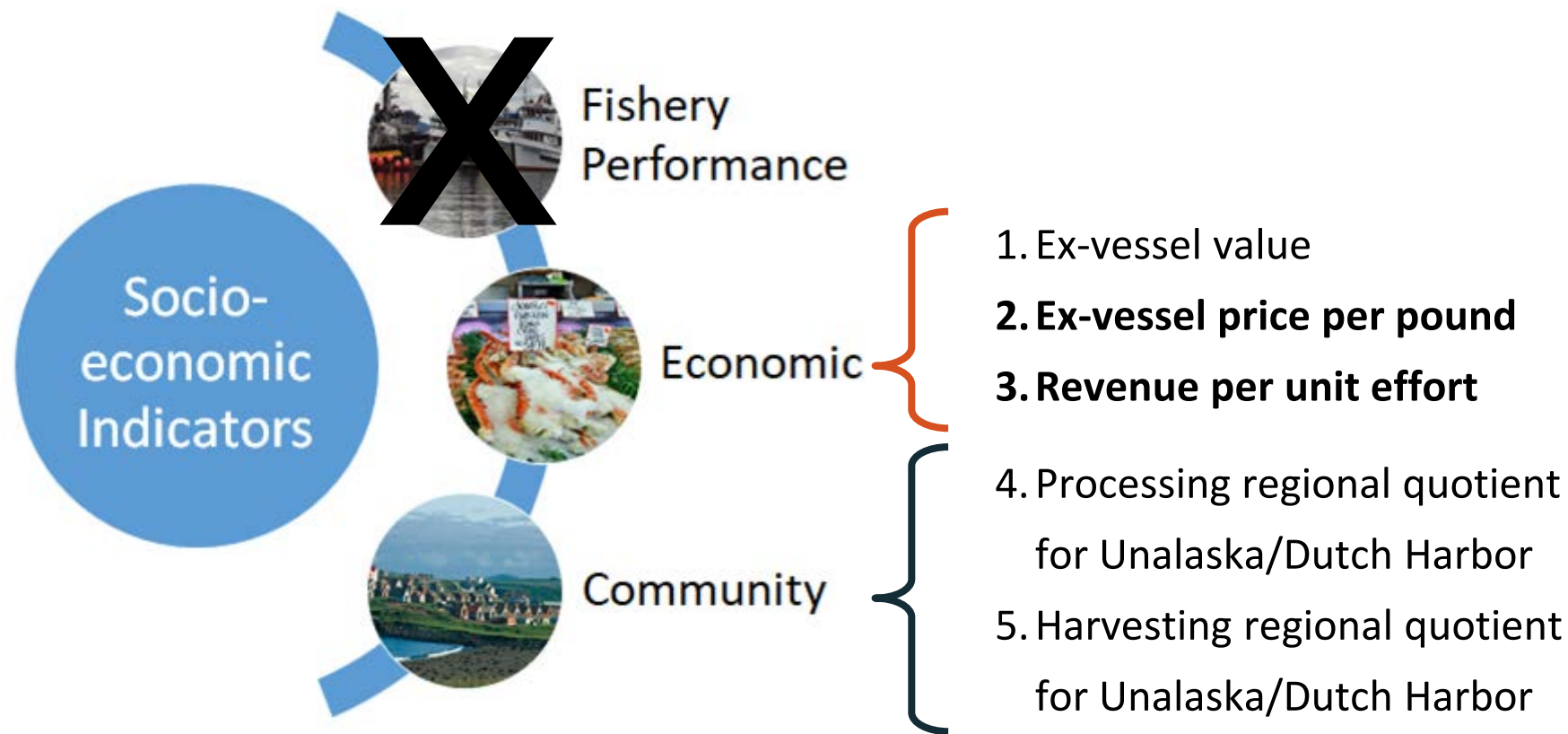
Lower Trophic



Upper Trophic

- + 1. **North Pacific Index (NDJFM, ESR)**
- + 2. Sea ice extent (DJF, NSIDC)
- + 3. Sea ice advance (MAM, NSIDC)
- 4. **Sea surface temperature (satellite)**
- 5. Summer bottom temperature (ROMS)
- + 6. Spring bloom peak timing (satellite)
- + 7. Euphausiids (acoustic backscatter)
- + 8. Juvenile condition (BTS)
- + 9. Adult condition (BTS)
- + 10. Center of gravity, eastings (VAST)
- 11. **Center of gravity, northings (VAST)**
- + 12. Area occupied (VAST)
- 13. Predator biomass, arrowtooth (SAFE)

Socioeconomic Indicators



Indicator Monitoring Analysis

Beginning Stage



Traffic Light

- Historical simple score (SSC)
- Current year trends relative to mean of series
- Evaluate whole suite utility

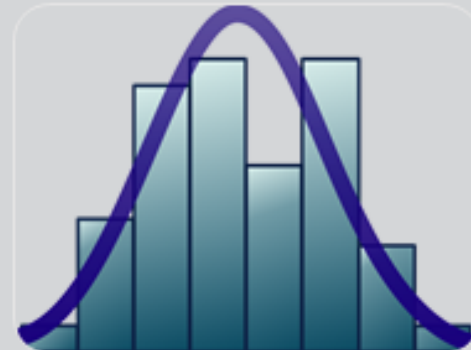
Intermediate Stage



Importance

- Regression R^2
- Direction, magnitude, uncertainty, inclusion weight
- Prediction performance

Advanced Stage

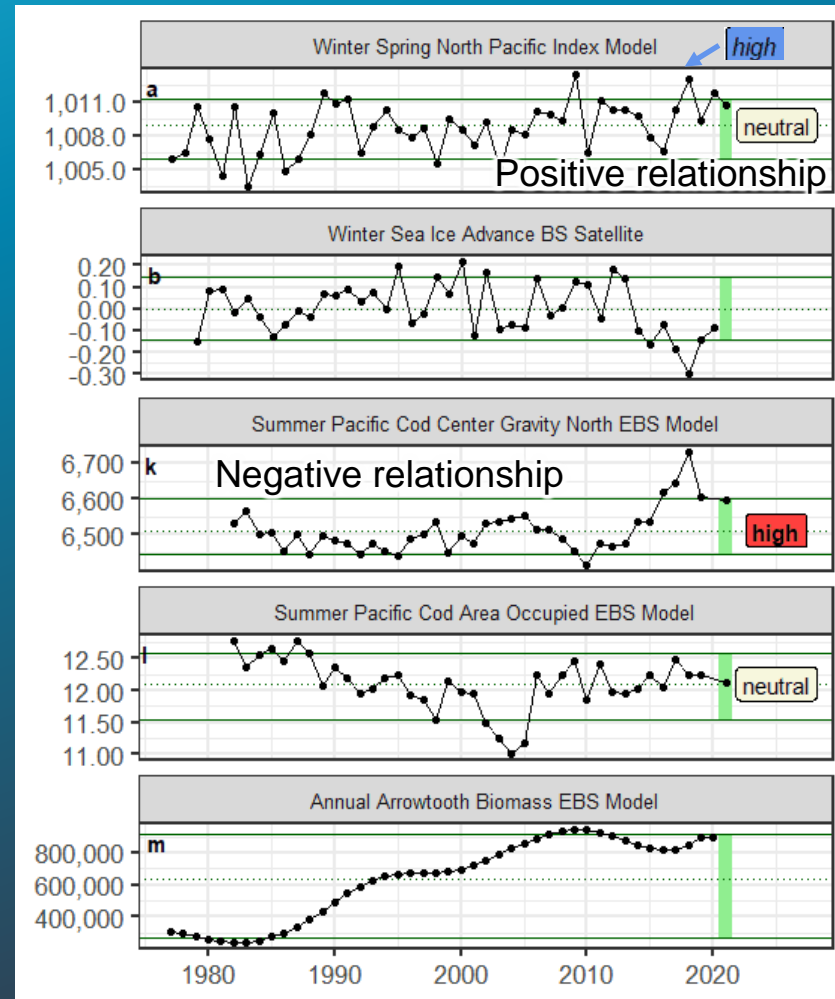


Ecosystem Model Run

- Comparison w/ operational
- Retrospective
- Prediction performance
- Terminal SSB

Traffic Light

- Time series and Table
 - Historical time series (1977:now)
 - Evaluate a given year to one stdev from the long term mean
 - High (H), low (L), neutral (N, color is relationship with stock for ecosystem indicators
- Summary Score
 - Score by category last 20 yrs
 - Sum of H, L, N, color is 1,-1



Note: new
this year for
report card

Traffic Light Table

Indicator category	Indicator	2017 Status	2018 Status	2019 Status	2020 Status	2021 Status
Physical	Winter Spring North Pacific Index Model	neutral	<i>high</i>	neutral	<i>high</i>	neutral
	Winter Sea Ice Advance BS Satellite	low	low	low	neutral	NA
	Spring Sea Ice Retreat BS Satellite	low	low	low	neutral	NA
	Spring Summer Temperature Surface SEBS Satellite	neutral	high	high	high	neutral
	Summer Temperature Bottom SEBS Model	neutral	high	high	neutral	neutral
Lower Trophic	Spring Chlorophyll a Peak SEBS Satellite	low	<i>high</i>	neutral	neutral	neutral
	Summer Euphausiid Abundance EBS Survey	NA	neutral	NA	NA	NA
Upper Trophic	Summer Pacific Cod Condition Juvenile EBS Survey	neutral	neutral	neutral	NA	neutral
	Summer Pacific Cod Condition Adult EBS Survey	low	neutral	neutral	NA	neutral
	Summer Pacific Cod Center Gravity East EBS Model	neutral	low	<i>high</i>	NA	neutral
	Summer Pacific Cod Center Gravity North EBS Model	high	high	high	NA	high
	Summer Pacific Cod Area Occupied EBS Model	neutral	neutral	neutral	NA	neutral
	Annual Arrowtooth Biomass EBS Model	neutral	neutral	high	high	NA

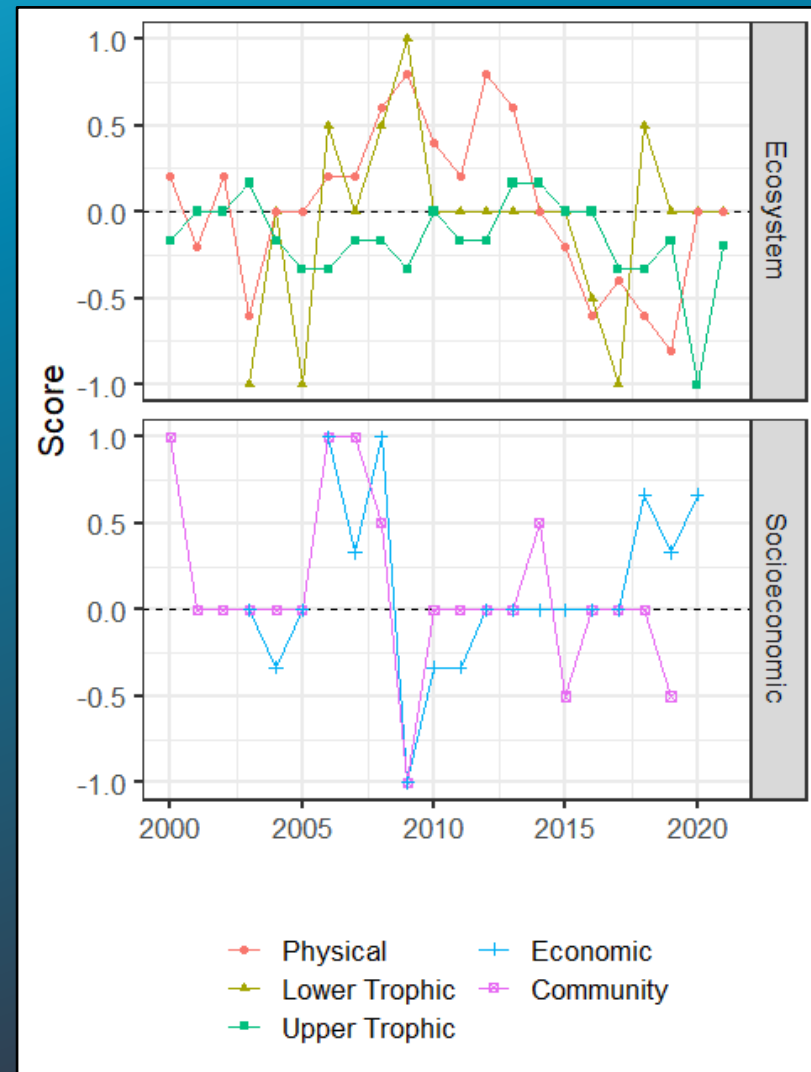
Note: new
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Traffic Light Table

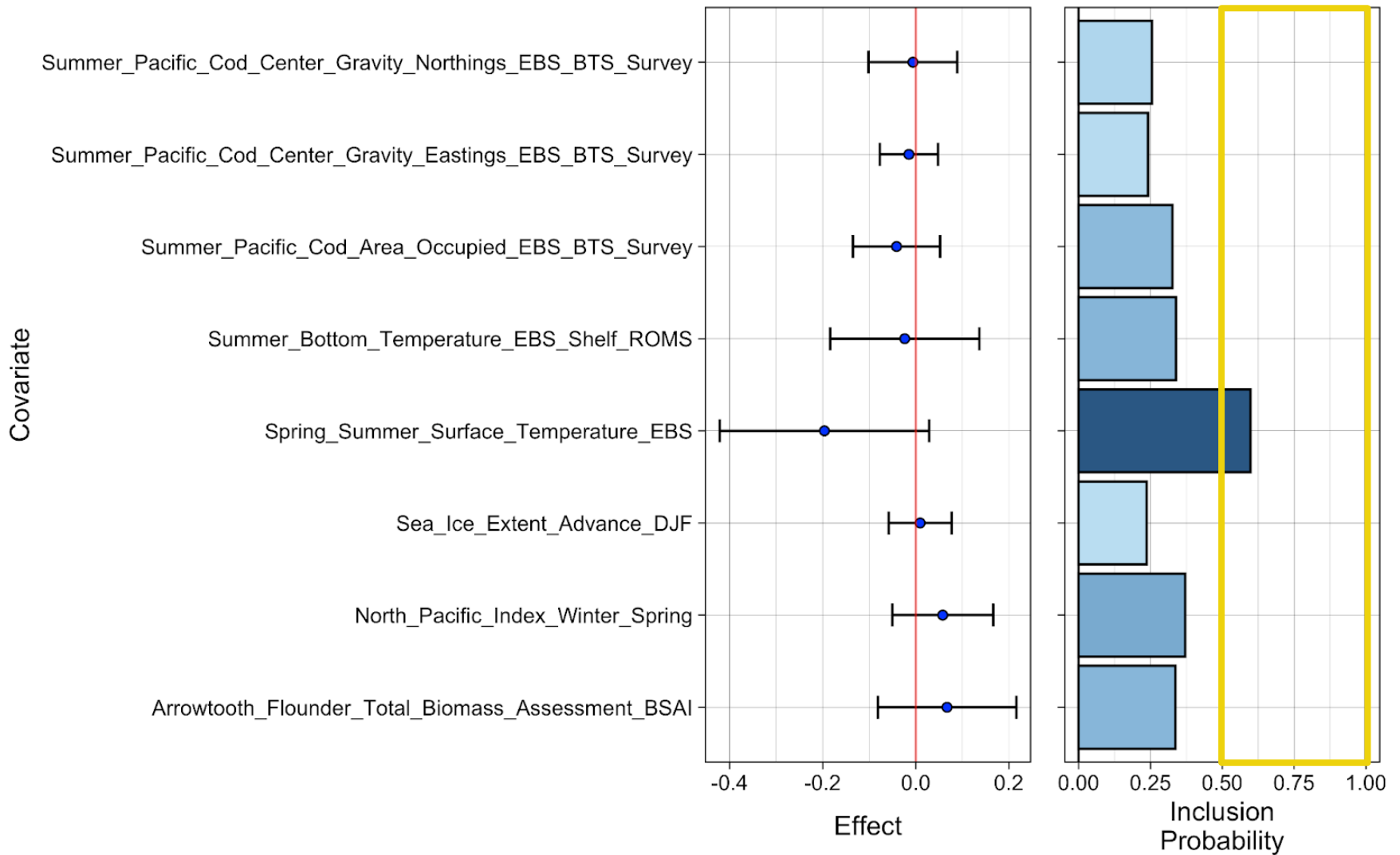
Indicator category	Indicator	2017 Status	2018 Status	2019 Status	2020 Status	2021 Status
Economic	Annual Pacific Cod Real Exvessel Value EBS Fishery	neutral	<i>high</i>	neutral	neutral	NA
	Annual Pacific Cod Real Exvessel Price EBS Fishery	neutral	neutral	neutral	<i>high</i>	NA
	Annual Pacific Cod Real Revenue Per Unit Effort EBS Fishery	neutral	<i>high</i>	<i>high</i>	<i>high</i>	NA
Community	Annual Pacific Cod RQ Harvesting Revenue Dutch Harbor Fishery	neutral	neutral	neutral	NA	NA
	Annual Pacific Cod RQ Processing Revenue Dutch Harbor Fishery	neutral	neutral	low	NA	NA

Traffic Light Score

- Ecosystem (9 of 13 total)
 - Physical remains average
 - Lower trophic remains average
 - Upper trophic > to just below avg
- Socioeconomic (3 of 5 total)
 - Economic lagged by one year and remains above average
 - Community indicators not updated
- 12 of 18 indicators available



Importance



Considerations

- Management Summary

- Calmer conditions, warm surface and bottom temperatures
- Condition juveniles and adults remain avg, sufficient prey
- Population center has moved slightly southwest
- Economic indicators all high

- Modeling Summary

- 1 potential covariate for EBS Pacific cod recruitment
- See Data Gaps and Future Research Priorities section

Next Steps

- 2022 Request for Indicators (RFI)
 - Use ESP data gaps and research priorities
 - ESP team creates RFI in Jan
 - Indicators submitted and reviewed in Feb
 - If new indicators, then initiate partial ESP
- 2022 ESP
 - If partial, in Sept and consider aggregating small communities (SSC)
 - Report card of current data in Nov



Questions?

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