



# Ecosystem & Socioeconomic Profile

## St. Matthew Blue King Crab Report Card

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September 2022

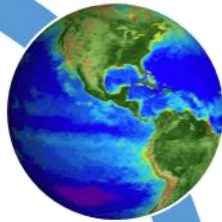
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# Overview

- **General ESP Updates**
  - Preliminary National ESP Workshop in July 2022
  - All ESP indicators now submitted through AKFIN
  - 6 report cards, 1 full ESP for crab and groundfish fall 2022
  - Request for Indicators for all ESPs in Jan-Feb 2023
- **2022 St. Matthew Blue King Crab Report Card**
  - Ecosystem Indicator Assessment and Analysis
  - Socioeconomic Indicator Assessment and Analysis
  - Recommendations and Considerations
  - Proposed Developments (2024)

# Ecosystem Indicators

## Ecosystem Indicators



Physical



Lower Trophic



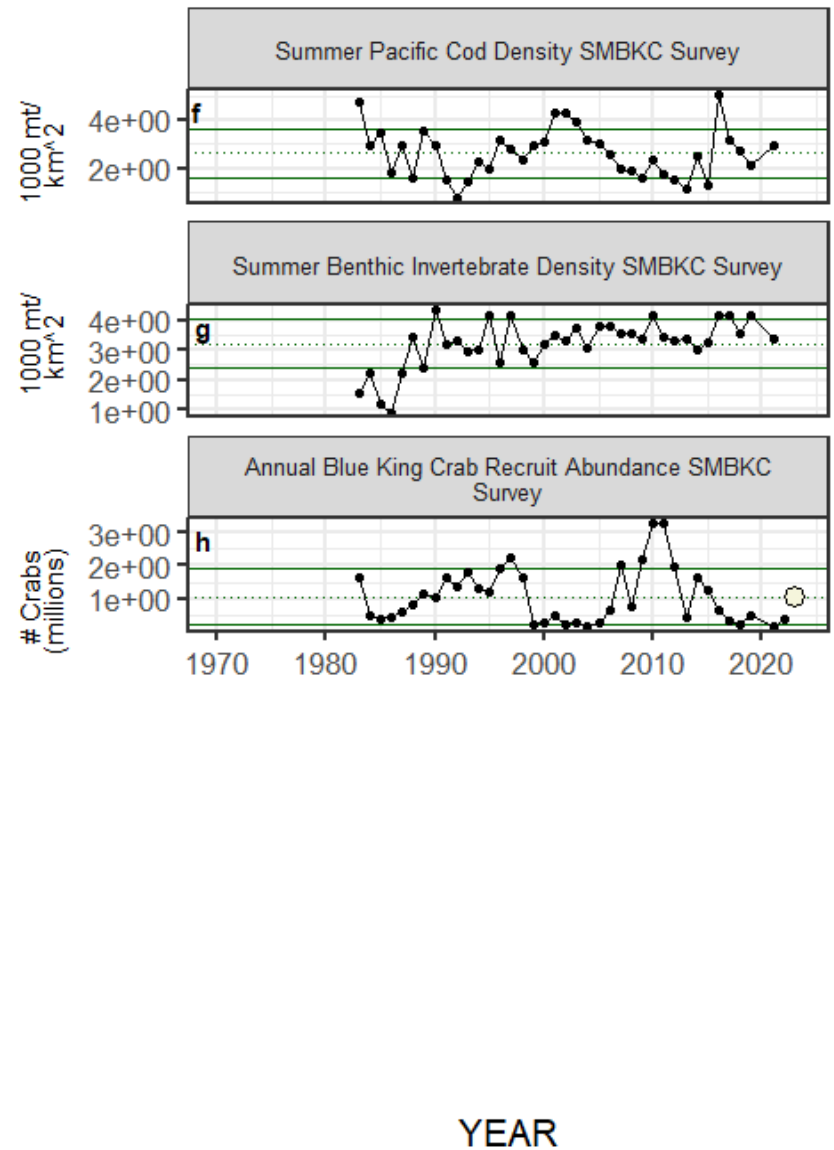
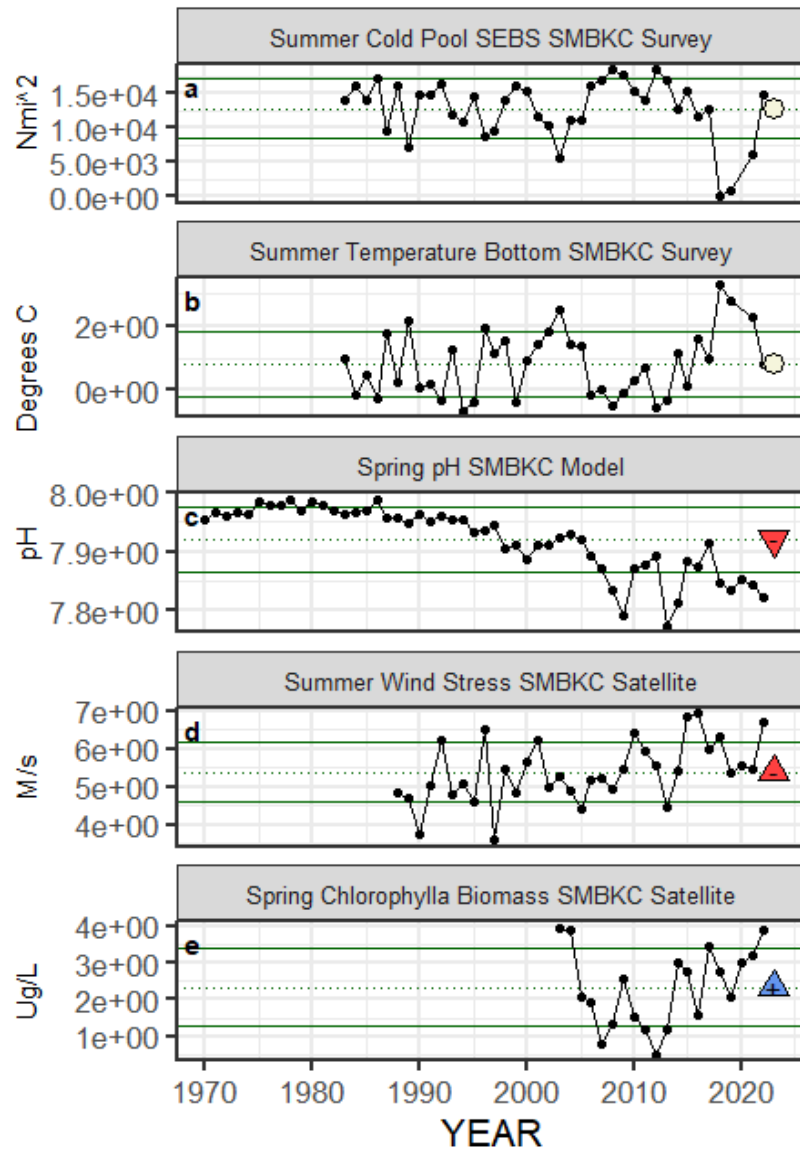
Upper Trophic

- + 1. Cold pool extent (BTS)
- + 2. Summer bottom temperature (BTS)
- + 3. pH index (ROMS model)
- 4. Wind stress (satellite)

- + 5. Chl-*a* Production (satellite)

- 6. Pacific cod density (BTS)
- + 7. Benthic invertebrate density
- + 8. Male recruit abundance (BTS)

# Ecosystem Indicator Time Series



# Ecosystem Traffic Light Table

Indicator category	Indicator	2018 Status	2019 Status	2020 Status	2021 Status	2022 Status
Physical	Summer Cold Pool- SEBS Survey	low	low	NA	low	neutral
	Summer Temperature Bottom- SEBS Survey	high	high	NA	high	neutral
	Spring pH SMBKC- Model	low	low	low	low	low
	Summer Wind Stress SMBKC- Satellite	high	neutral	neutral	neutral	high
Lower Trophic	Spring Chlorophyll- <i>a</i> Biomass- Satellite	neutral	neutral	neutral	neutral	high
Upper Trophic	Summer Pacific Cod Density- SEBS Survey	neutral	neutral	NA	neutral	NA
	Summer Benthic Invertebrate Density- SEBS Survey	neutral	high	NA	neutral	NA
	Annual Blue King Crab Recruit Abundance- SEBS Survey	low	neutral	NA	low	neutral




# Ecosystem Considerations

- In 2022, **bottom temperatures returned to near-average** and the cold pool extended into the majority of the St. Matthew Island management area.
- **Above-average chlorophyll- $\alpha$  biomass** in the St. Matthew Island management area indicates suitable primary production conditions for larval survival
- Despite repeated fishery closures, **SMBKC recruitment remains below-average**, although recruit abundance increased from 2021 to 2022
- **Persistent, corrosive bottom waters** surrounding St. Matthew Island suggest potential impacts on shell formation, growth and survival of BKC if declines in pH continue
- **Above average chlorophyll-a biomass and benthic invertebrate density** in recent years suggests optimal foraging conditions for both larval and benthic stages of SMBKC

# Socioeconomic Indicators




## Socio-economic Indicators



### Fishery Performance

1. Catch-per-unit-effort (SMBKC fishery)
2. Total potlifts (SMBKC fishery)
3. Number active vessels (SMBKC fishery)
4. Incidental catch (groundfish fisheries)



### Economic

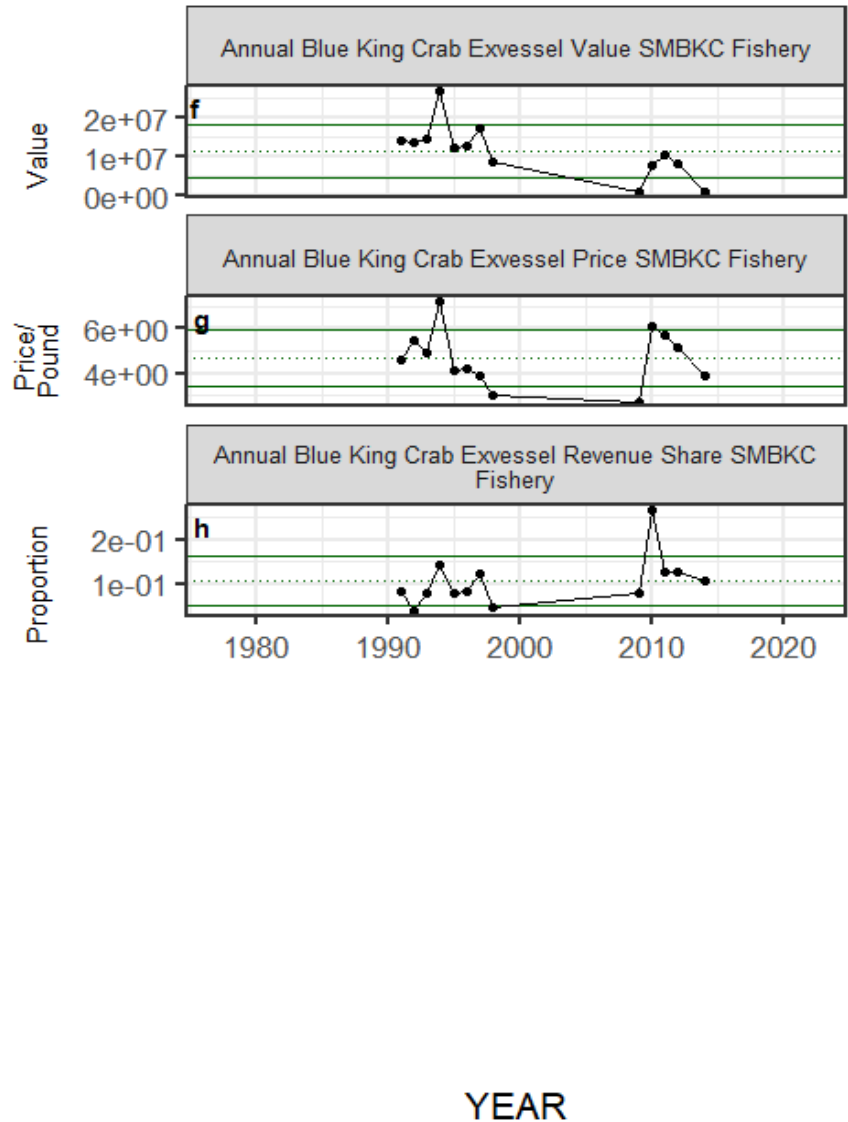
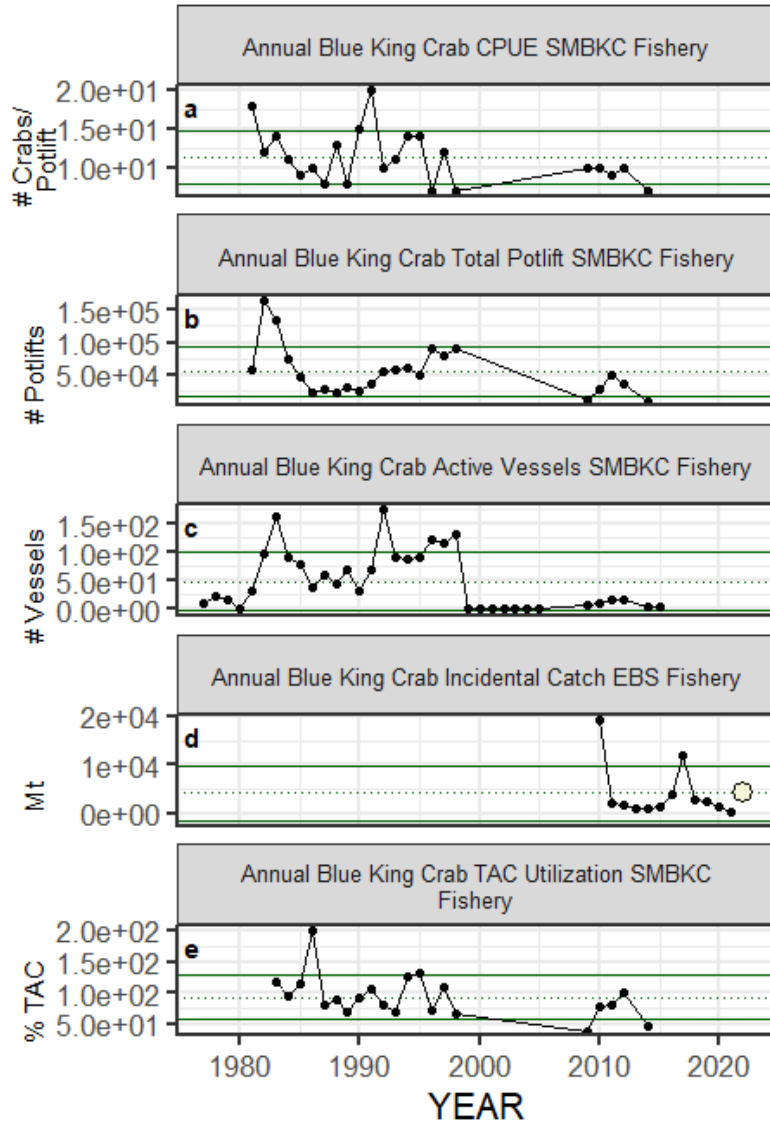
5. TAC Utilization (SMBKC fishery)
6. Ex-vessel value (SMBKC fishery)
7. Ex-vessel price/lb (SMBKC fishery)
8. Ex-vessel revenue share (SMBKC fishery)



### Community

No community indicators proposed

# Socioeconomic Indicator Time Series





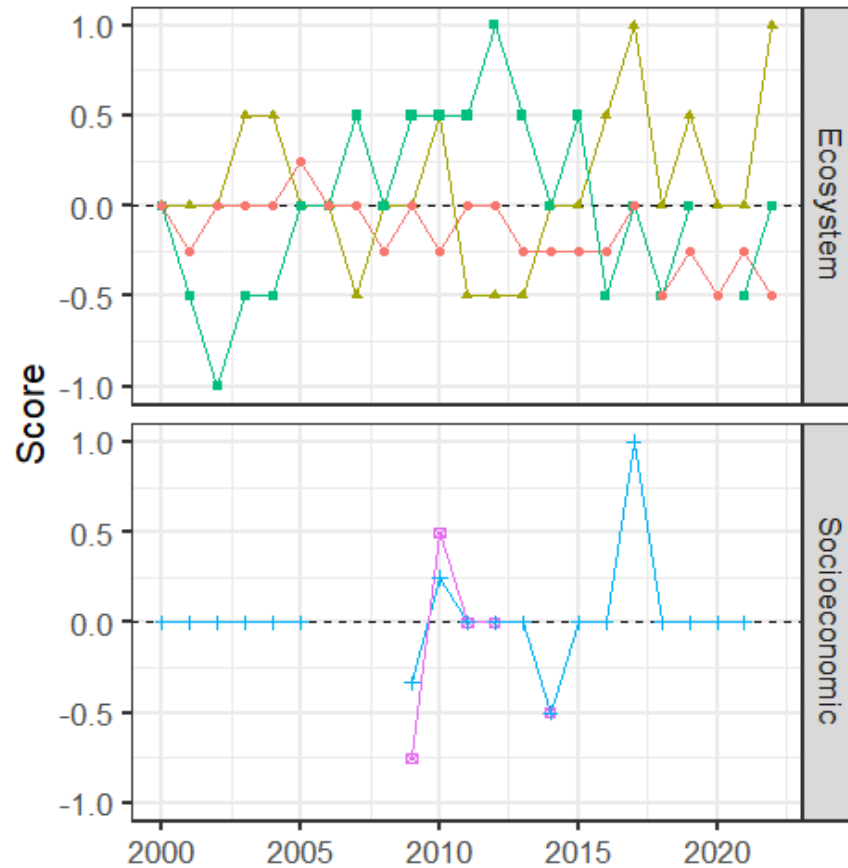
# Socioeconomic Traffic Light Table

<b>Indicator category</b>	<b>Indicator</b>	<b>2017 Status</b>	<b>2018 Status</b>	<b>2019 Status</b>	<b>2020 Status</b>	<b>2021 Status</b>
Fishery Performance	Annual Blue King Crab CPUE SMBKC Fishery	NA	NA	NA	NA	NA
	Annual Blue King Crab Total Potlift SMBKC Fishery	NA	NA	NA	NA	NA
	Annual Blue King Crab Active Vessels SMBKC Fishery	NA	NA	NA	NA	NA
	Annual Blue King Crab Incidental Catch EBS Fishery	high	neutral	neutral	neutral	low
Economic	Annual Blue King Crab TAC Utilization SMBKC Fishery	NA	NA	NA	NA	NA
	Annual Blue King Crab Exvessel Value SMBKC Fishery	NA	NA	NA	NA	NA
	Annual Blue King Crab Exvessel Price SMBKC Fishery	NA	NA	NA	NA	NA
	Annual Blue King Crab Exvessel Revenue Share SMBKC Fishery	NA	NA	NA	NA	NA

# Socioeconomic Considerations

- The SMBKC fishery has remained **closed to targeted fishing** since 2015 (the 2015/2016 crab season).
- **Incidental catch** of SMBKC biomass in EBS groundfish fisheries during 2021 **declined substantially** from the previous year to the lowest value in the available time series, continuing a declining trend observed since a recent high in 2017.

# Overall Stage 1 Score



- Physical
- Lower Trophic
- Upper Trophic
- Fishery Performance
- Economic

# Planned ESP Developments

- Updating the intermediate stage indicator analysis (Bayesian Adaptive Sampling)
- Indicator development: fecundity, habitat quality, larval processes
- Produce a Request for Indicators (RFI) in February 2024 to propose new indicator contributions
- Updates to ecosystem and socioeconomic indicators for 2024 Sept CPT Meeting