



Alaska Marine Policy Forum

Summary from Wednesday, December 14, 2022

Host: Ginny Eckert, Alaska Sea Grant

Notes by Molly Cain

The Alaska Marine Policy Forum is a bimonthly teleconference for Alaskans to network and share information about marine policy, budgets, and legislation at state, national, and international levels, sponsored by Alaska Sea Grant and the Alaska Ocean Observing System (AOOS). Contact dawn.montano@alaska.edu to receive email reminders and agendas for upcoming calls, and summary notes following each call.

Alaska Congressional Delegation Update

Carina Nichols, Senator Sullivan's Office

- Updates from Congress: The Continuing Resolution to maintain government funding runs out on Friday Dec. 16. Congress is working to finish the FY 2023 Omnibus Appropriations bill and the NDAA, which includes the Coast Guard bill and Maritime Administration Reauthorization (MARAD). Sullivan's office is working on technical amendments to the Save Our Seas 2.0 Act, finishing the Alaska Salmon Research Task Force Bill, and discussions on Fisheries disaster funding. Working on Save Our Seas 3.0, which relates to marine debris. If folks have ideas, reach out to Carina (carina_nichols@sullivan.senate.gov) or Mary Eileen (mary-eileen_manning@sullivan.senate.gov).

Tyson Fick, Representative Peltola's Office

- It's a busy time in Congress, and thanks for the invitation to this forum.

Alaska Legislative Updates

Thatcher Brouwer, Rep. Carr's office

- The House has not organized, do not know the chair of the Fisheries Committee or any other committee as of yet.

Invited Speakers

Ben Daly, Westward Region Shellfish/Groundfish Research Coordinator

Alaska Department of Fish and Game

Topic: Bering Sea crab stock status

Determining stock status and the state of Bering Sea crab stock

- Status of Bering Sea crab stock is not good this year, with a few exceptions
- How quantitative predictions are made about crab populations - the federal stock assessment process uses models with input from survey data.
- Stock status is calculated as the ratio of mature male biomass and the biomass that enables a stock to deliver maximum sustainable yield
- Population fluctuations over time are a natural part of the biology of these stocks.
 - Additions = recruitment (new individuals entering a population), growth (existing individuals transitioning to a larger size class)
 - Subtractions = fishing mortality and natural mortality
- We usually see some fluctuation, but for Bering Sea stock we have seen an unprecedented crash in recent years. This year all of the Bering Sea crab fisheries were closed, with the exception of Bering Sea Tanner crab.

Current stock status and outlooks

- Bering Sea snow crab
 - Current stock status: 23% = Lowest stock status ever seen
 - Very warm waters in 2018 and 2019. Fisheries were fishing farther north than ever seen. Reflects spatial distribution of snow crabs trying to find colder water.
 - Future environmental conditions and snow crab recruitment is unknown. Unknown if the recent mortality event is “over” or when the next one will occur.
 - There is a Snow Crab Rebuilding Plan that is under review. It would allow a directed fishery under the state harvest strategy.
- Bering Sea Tanner crab
 - Current stock status: 178% = Good.
 - Strong juvenile cohort in recent years but not seeing progress into larger industry-preferred sizes. The cause is unclear.
 - The effects of warmer conditions on Tanner crab are unknown.
- Bristol Bay red king crab
 - Current stock status is 69%
 - The fishery has been closed the last 2 seasons based on the mature female abundance below the closure threshold in the state harvest strategy.
 - Increasing trends for mature males in the last 2 years = good sign
 - The steady decline in the last 2 decades is results from low recruitment
 - Uncertain how fluctuating environmental conditions will impact red king crab
- Current status of other stocks:
 - St. Matthew blue king crab: 36% (overfished)
 - Pribilof Islands red king crab: 227% (reasonably healthy)
 - Pribilof Islands blue king crab: 4% (overfished, extremely depressed)

What do we do now?

- Cooperative research projects fall into 3 main categories:

- Crab distributions with changing environmental conditions
- Bycatch reduction
- Better understand benefits of closure areas
- Areas of research efforts for red king crab
 - Seasonal movement: satellite tagging
 - Recruitment limitation projects in development related to nursery habitat assessment and larval supply
 - Winter survey for spatial distributions
- Areas of research efforts for snow crab
 - Distribution and abundance
 - Bycatch reduction
 - Juvenile distribution
 - Habitat
 - Other: Disease monitoring, ocean acidification, borealization

Erin Fedewa, Fisheries Biologist

NOAA Alaska Fishery Science Center

Topic: Climate influence on Bering Sea crab stocks

Talk focuses on 4 climate indicators hypothesized to drive stocks: Cold pool extent, bottom temperatures, Arctic oscillation, pH

- Cold Pool Extent
 - Cold Pool = A body of water in the Bering Sea which is less than -2 degrees C. It is driven by sea ice and controls the distribution of stocks
 - In 2018 and 2019
 - Smallest cold pool extent on record - likely resulted in species shifts and die-offs
 - Juvenile snow crab need cold water. Pacific cod are predators of snow crab. Cold-water habitat provides predator refuge. 3 degree C is thought to be a critical threshold for juvenile snow crabs and temperatures were above that in 2018.
 - In 2022 survey
 - Environmental signals looked better. Dramatic decline in temperature in areas occupied by juveniles. Cold pool extent returned to near-average conditions = good news for juvenile snow crab.
 - Mature males extended their range and reoccupied near-shore areas that have historically been important for stocks.
- Arctic Oscillation
 - An important mode of climate variability; due to changes in pressure in the Arctic and mid-latitudes
 - Poor snow crab recruitment associated with positive phase of Arctic Oscillation
 - In addition to anomalous heat wave, 2019 also had the highest Arctic oscillation index in history
- pH
 - There is a steady decline in bottom water pH (becoming more acidic) in Bristol Bay due to ocean acidification (ocean uptake of anthropogenic CO₂)

- Negative effects of acidified water on red king crab on shell hardening, growth, and survival. pH threshold for red king crab is 7.8, which we are approaching.
- Borealization
 - Borealization = A shift from arctic to subarctic state; loss of sea ice
 - New research study questions whether collapse was related to borealization
 - Study goals/questions
 - Develop an index that captures the process of borealization
 - A model to evaluate whether borealization is related to immature snow crab abundance explains 53% of variability in snow crab abundance, suggesting that borealization is strongly associated with decline.
 - Forecasting stocks is very difficult, so this ongoing study asks whether there is potential to use the borealization index to forecast snow crab abundance and estimate the probability that the eastern Bering Sea will continue transition to subarctic conditions.

Q&A

- How are snow crab populations doing in other locations and/or in places where fisheries management techniques are different than in Alaska?
 - Snow crab populations in Canadian waters did not experience the same collapse in recent years. Their trajectory has been different in terms of climate. Their warming event happened prior to ours. They attributed their stock decline to temperatures. There are similarities in that system, but it hasn't followed the same trajectory in how the climate is shifting in the Bering Sea.

Announcements

Sheyna Wisdom, AOOS

- Reminder to register and plan to attend the Alaska Marine Science Symposium taking place January 23-27. Register: <https://www.alaskamarinescience.org/>
- AOSS is hosting a marine research planning event Wednesday evening.

Ginny Eckert, Alaska Sea Grant

- Alaska Sea Grant State Fellowship Program is recruiting hosts and fellows. Applications are due Feb. 9. Fellowship information and application instructions found at <https://alaskaseagrant.org/education/awards-fellowships/state-fellowship/>.

Keith Criddle, Professor, University of Alaska Fairbanks

- UAF has an open search for a tenure-track position in marine policy. Applications must be received no later than 11:55 pm Alaska Standard Time on February 5, 2023, to ensure full consideration. This recruitment will remain open until filled. Applicants must be legally authorized to work in the United States without restriction to be eligible for this position. The full position announcement can be viewed at <https://careers.alaska.edu/en-us/job/522217/assistant-professor-of-marine-policy-college-of-fisheries-and-ocean-sciences>.

Kris Holderied

- Job vacancy announcement: Federal position with NOAA Kasitsna Bay Lab for a Research Marine Biologist or Research Physical Scientist. Job Announcement # (DHA): NOS NCCOS-23-11726360-DHA. Full announcement can be viewed at <https://www.usajobs.gov/GetJob/ViewDetails/693222000>

Please reach out to Ginny or Sheyna if you would like to hear about a particular topic during future forums.

The next Alaska Marine Policy Forum call will be February 15, 2023 at 1 pm Alaska time. To register visit:

<https://alaskaseagrant.org/event/alaska-marine-policy-forum-february-2023/>