



Adapting to change in the Norton Sound Red King Crab Fisheries: Including local knowledge to inform decision-making



Scientific and Statistical Committee, NPMFC
Social Scientist
April 05, 2023
Sarah Wise, ESSR - AFSC

Overview

- **Human Dimension of Fisheries Data Explorer**
- **Norton Sound Red King Crab research**
- **Story maps**



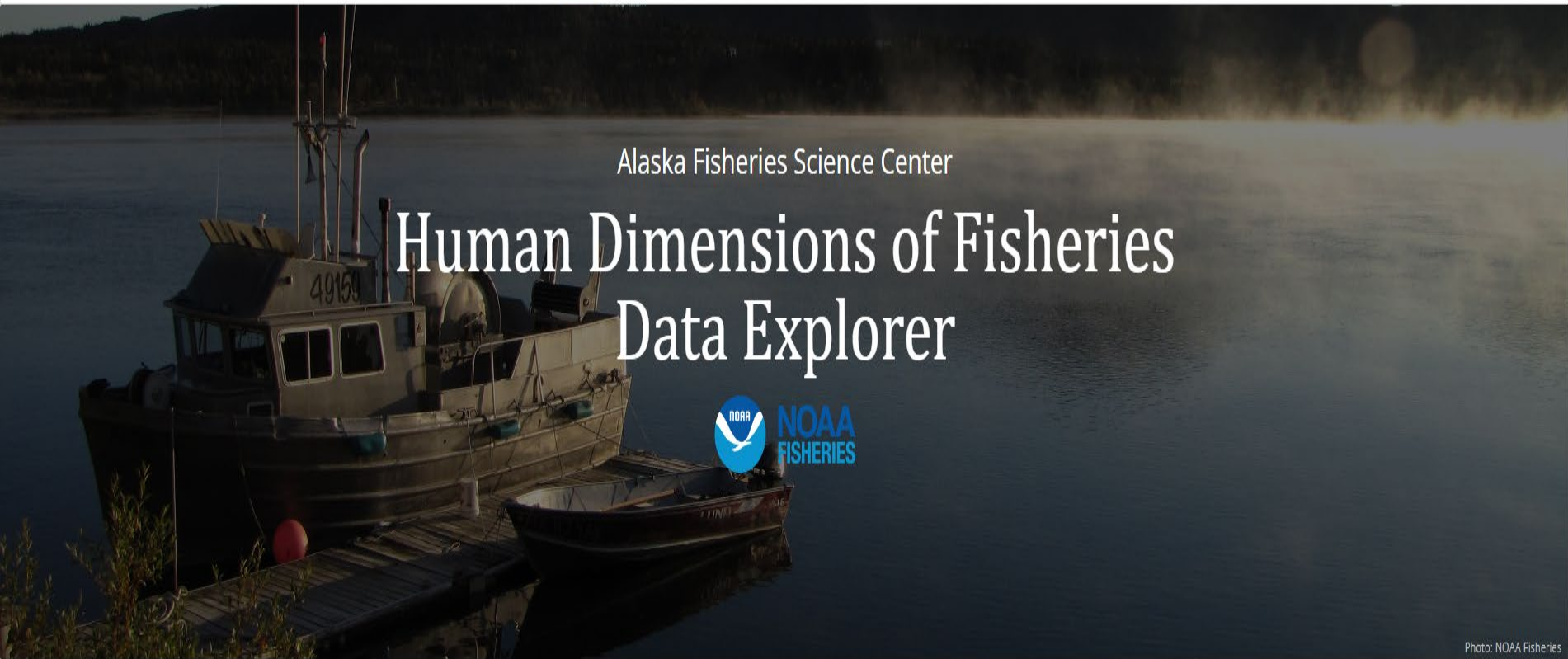


Photo: NOAA Fisheries

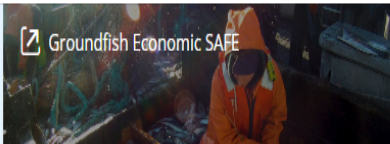


About the Human Dimensions Data Explorer

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Fishing Communities

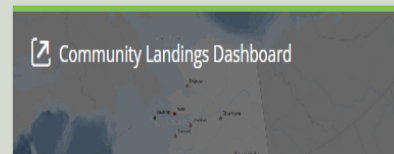
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The **Magnuson Stevens Fishery Conservation and Management Act (MSA)** defines a fishing community as a community which is substantially dependent on or substantially engaged in the harvest or processing of fishery resources to meet social and economic needs, and includes fishing vessel owners, operators, and crew and United States fish processors that are based in such community. As mandated under MSA National Standard 8, these policies and regulations shall take into account the importance of fishery resources to fishing communities in order to (1) Provide for the sustained participation of such communities; and (2) To the extent practicable, minimize adverse economic impacts on such communities.

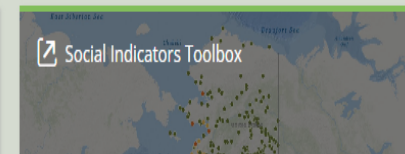
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COMING SOON
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Coming soon
Norton Sound Red King Crab

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Scientific and Statistical Committee, NPMFC

April 2023



NOAA
FISHERIES



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Purpose

To include local knowledge (LK) of NS RKC fisheries to better understand how conditions have changed over time, to inform ecosystem-based fisheries management.

Objectives

- 1) Document observed changes in the RKC commercial and subsistence fisheries over time.
- 2) Examine the social and ecological effects of these changes on Norton Sound communities.
- 3) Better understand community perspectives and concerns about NSRKC



Local Knowledge

LK develops from the observations and experiences of people living, working, harvesting, and processing in specific places. (LKTKS taskforce)

Local Knowledge (LK) can:

- Provide additional data on climatic and marine ecological changes beyond Western science - *Thornton and Scheer 2012; Ban et al. 2017; Beaudreau and Levin 2014; Blake et al. 2022*
- Increase trust between managers and fishers - *Wilson et al., 2006*
- Lead to improved fishery health - *Anbleyth-Evans, 2018*
- Reflect insight into interactions between humans and marine species - *Thornton et al, 2010; Johannes, 2008*



Photo credit: Kelsi Ivanoff



Norton Sound

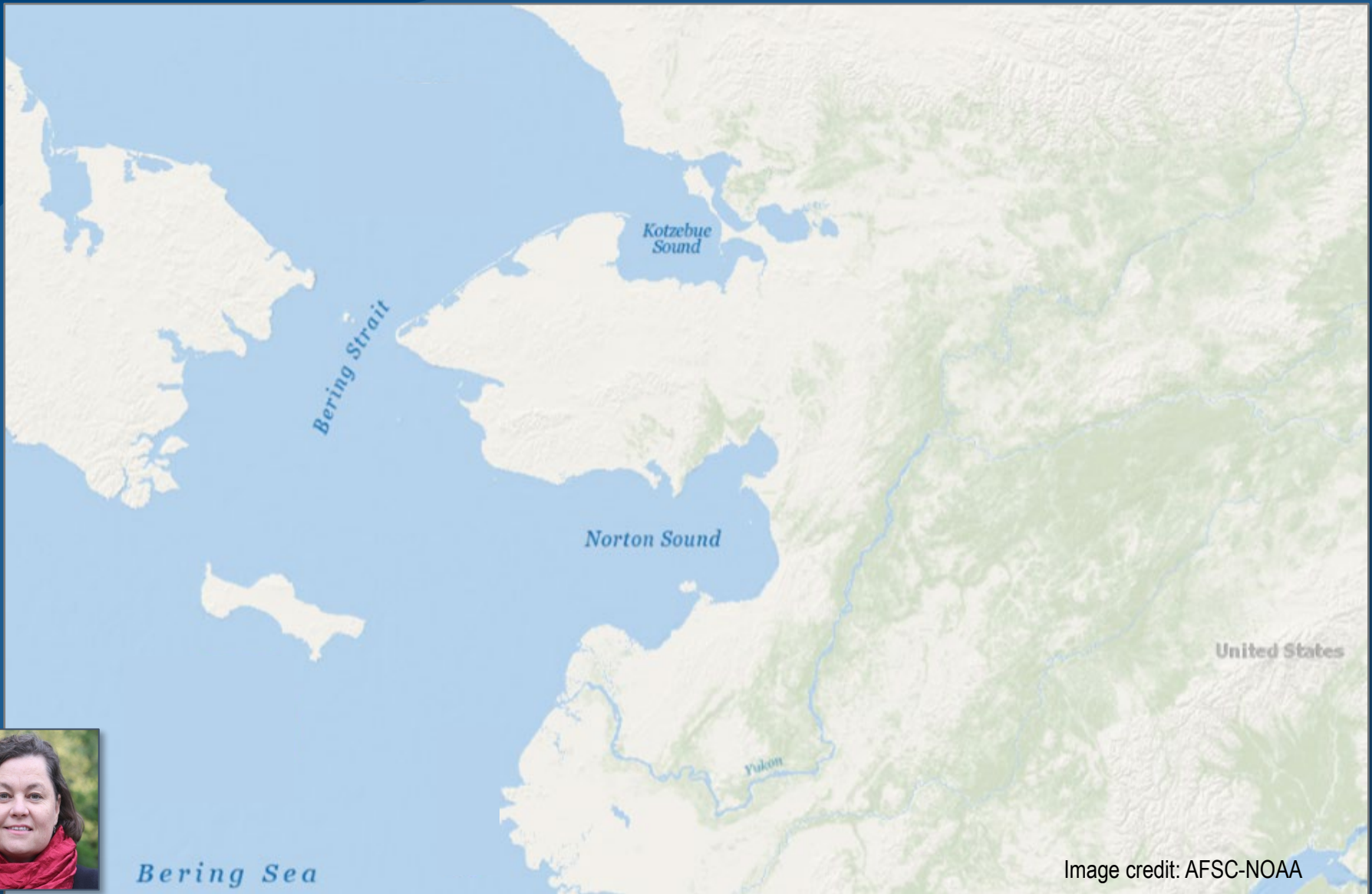


Image credit: AFSC-NOAA



NOAA FISHERIES

Norton Sound Red King Crab

- Jointly managed by Alaska Department of Fish & Game and NOAA Fisheries
- Summer & winter commercial fisheries, and a summer & winter subsistence fisheries.
- Norton Sound Economic Development Committee (CDQ Group) is primary buyer.



Methods



Photo credit: Kelsi Ivanoff

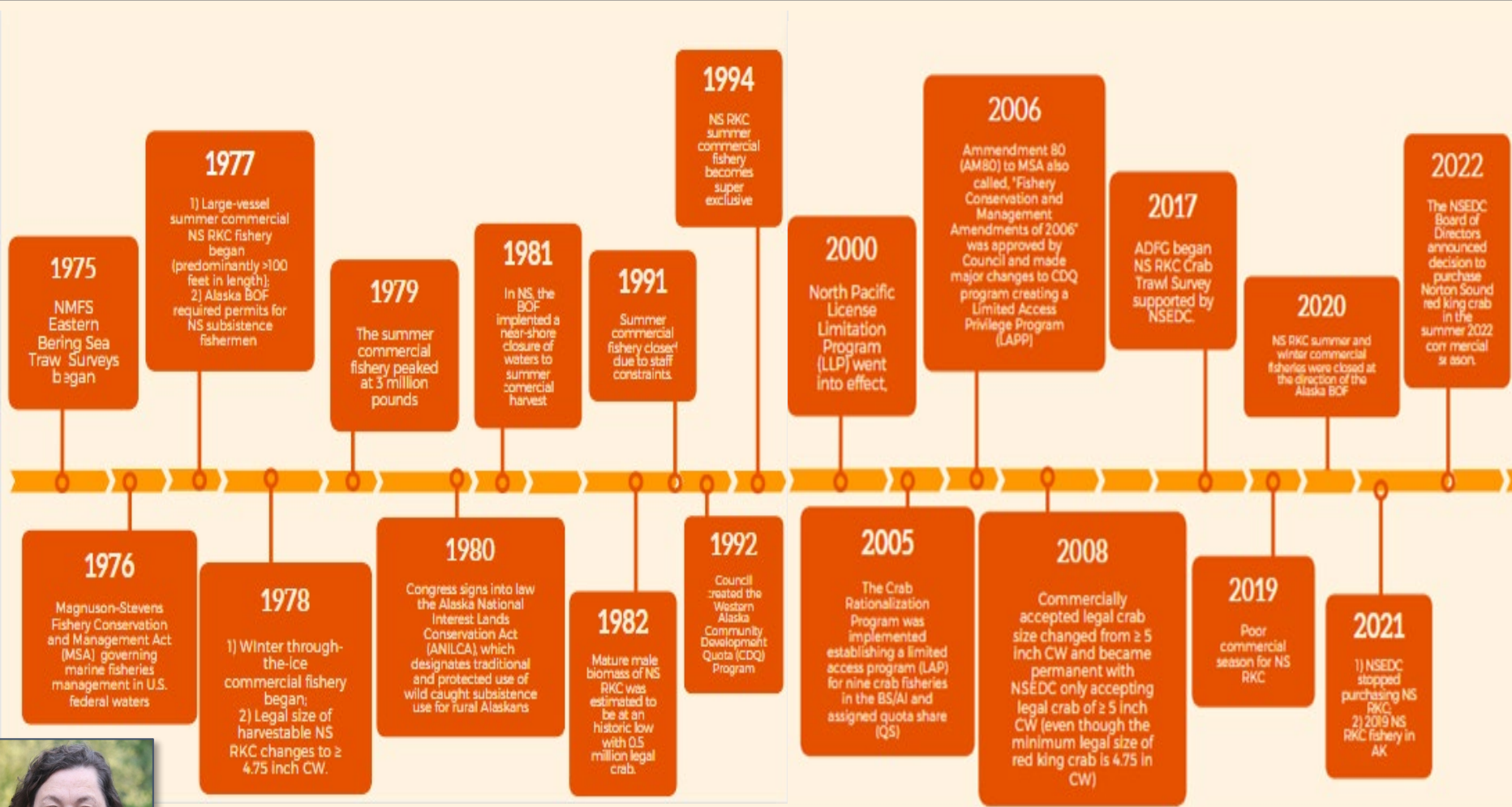


- Secondary fishery performance data analysis (2004-2021)
- Literature Review of gray literature, and narrative sources in the NPFMC's LKTKS Taskforce Search Engine
- Policy mapping
- Open-ended ethnographic interviews (n=7) (*by phone*)
- Key participants identified in fisheries, opportunistic sampling - *Bernard and Ryan, 2010; Yin, 2015*)

Sample included long term marine resource users (subsistence fishers, commercial fishers, and Indigenous and non-Indigenous community members)

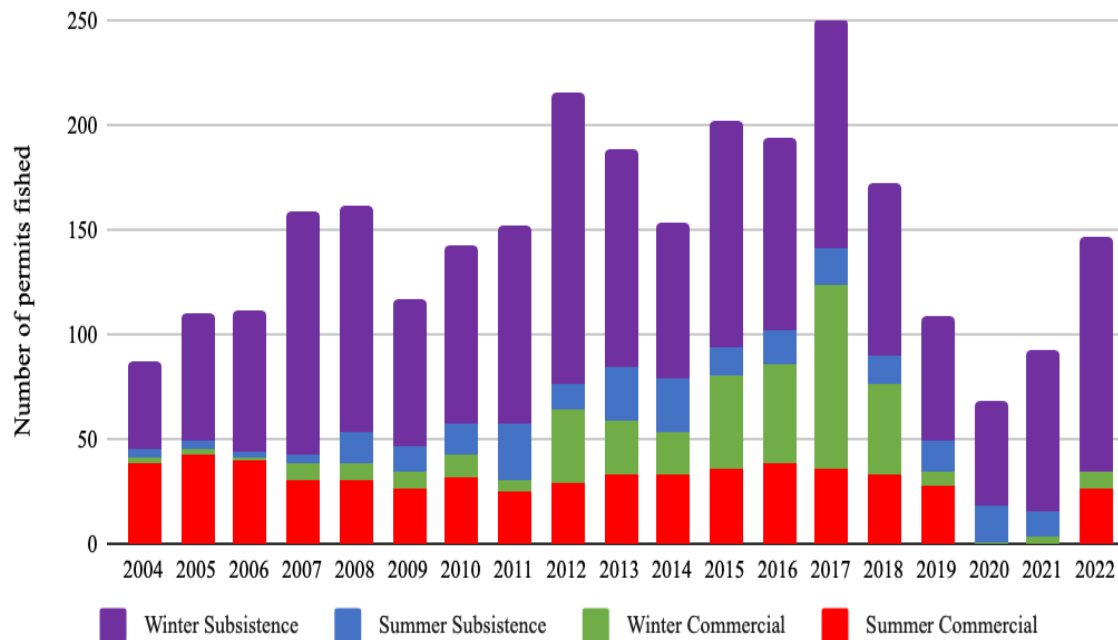
- Narrative analysis and coding of ethnographic interviews

Policy Map



Results - Sustained Participation

NS RKC Number of Permits Fished (2004-2022)



Key Policies shifts:

1994: Summer commercial Super-exclusive designation (fishery shifts to smaller vessels)

2000: North Pacific License Limitation Program (LLP)

2019: Declines in stock

2020: Summer Commercial Harvest Closure through ADFG

2021: NSEDC stopped purchasing NS RKC to bolster stock

2021: U.S. Secretary of Commerce declare natural resource disaster

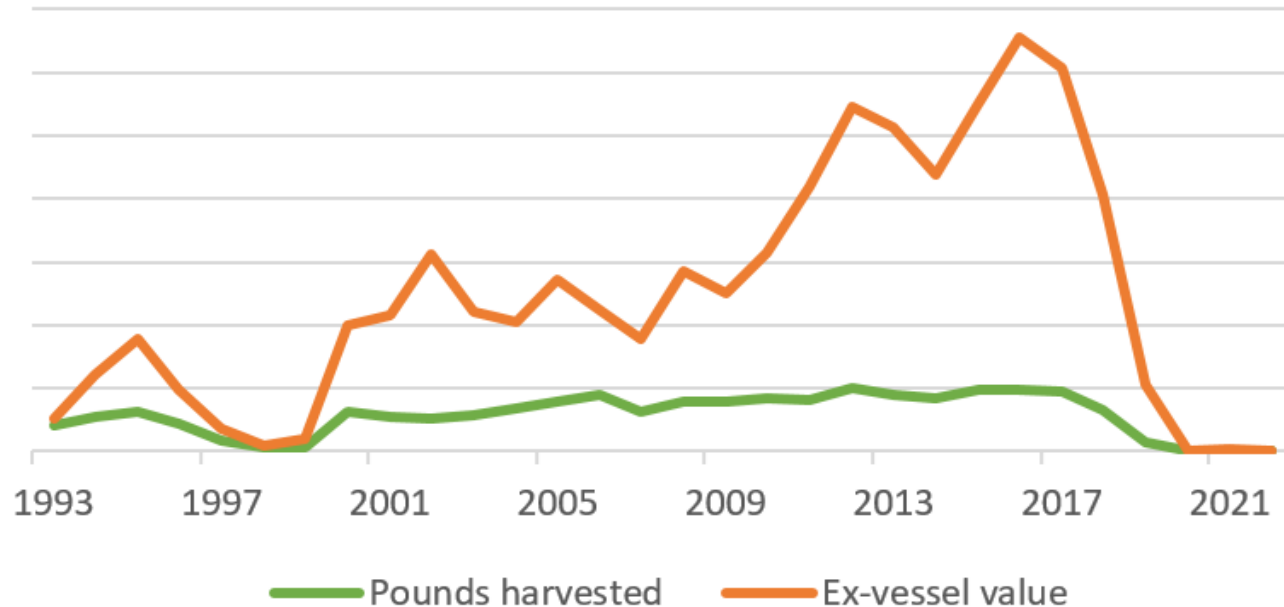


Results - Sustained Participation

NS RKC Ex-vessel Value and Pounds Harvested by Norton Sound Residents (1993 – 2022)

Summary Commercial Fishery

Ex-vessel value
[Confidential]



Results

Overarching Themes:

- I. Observed changes
- II. Effects on communities
 - Climatic change and safety
 - Changes in NS RKC and effects on subsistence and food sovereignty
- III. Challenges and informational needs



I. Observed changes

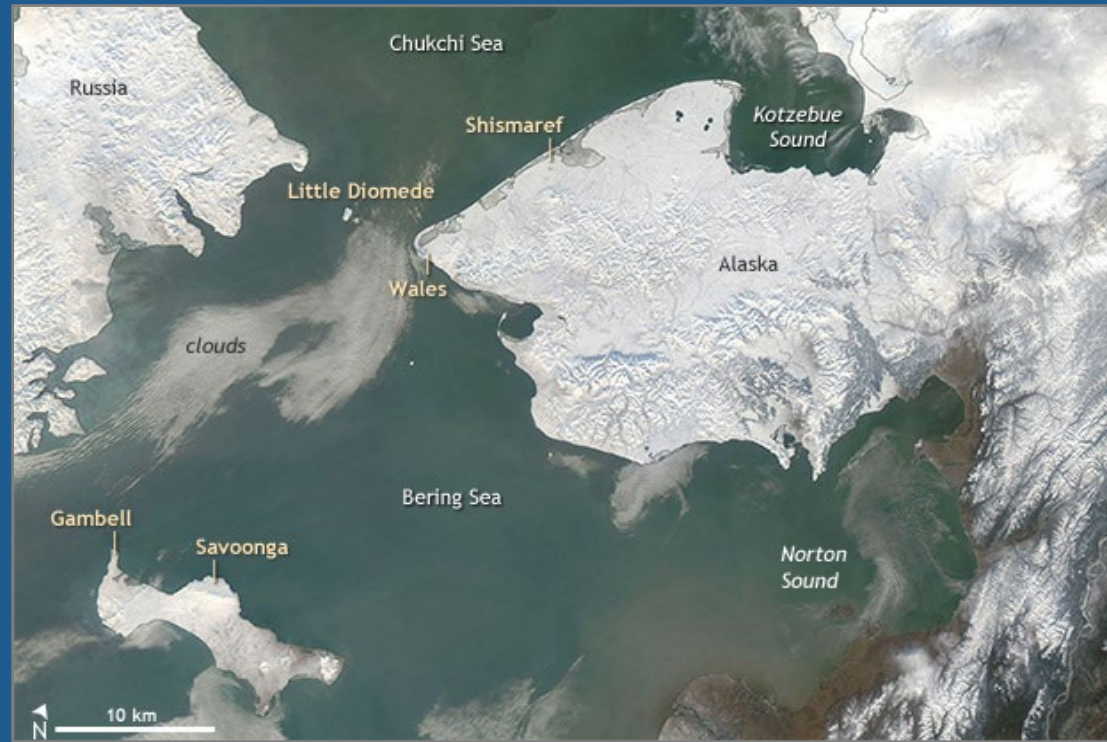
- Climatic changes
 - Bigger, more frequent storms
 - Increase in ocean rain
 - Wetter conditions overall
 - New weather patterns - Unpredictable weather
 - Changes in wind direction
- Shore fast ice
 - Less stable ice
 - Forming later in the season, breaking up earlier
 - No longer a barrier for storms
 - Increased Pollock
- Species shifts
 - Change in timing of jellyfish arrival (earlier than past years)
 - Increase in skip-molt (sublegal male crab)
 - Smaller crab, less abundant in previous years
 - Increased abundance this year (2023)



II. Effects on communities

Growing Safety concerns

- Increased risk on ice
- Loss of gear
- Increase in “ghost gear”
- Unpredictability in weather, season, & management
- Have to check gear more regularly, higher risk of loss



II. Effects on communities - *continued*

- Effects on subsistence activities
 - Shorter seasons
 - Shift to other species leading to increased pressure
 - Disruption in subsistence activities
 - Disruption in family and community crabbing activities
 - Requires greater knowledge and expertise to navigate risks
 - Affects mental health and identity
- Disrupts ties to the land/sea, heritage, and history
- Disrupts culture and traditional activities
- Greater reliance on summer fishery (requires boat)
- Reduced access



III. Challenges and informational needs

- Strong community support for the fishery
 - NSEDC only buys crab/sells bait to NS residents
 - Family fishery, critical to subsistence needs
 - Central to mixed economy
- Challenges
 - Competition with others,
 - Number of participating vessels may not reflect who is in the fishery.
 - Monitoring number of vessels is important .
- Information needs
 - On climate effects on abundance and movement
 - Seasonal predictions
 - Weather predictions



Conclusion



Photo credit: Kelsi Ivanoff

- NSRKC fisheries support community wellbeing, food sovereignty, and cultural cohesion.
- Climate change directly affects key commercial and subsistence fisheries.
 - Changes in abundance, location, size,
 - Increased risks
 - Unpredictability in weather, fisheries, management
 - Increased concerns (safety, food security, disruption in subsistence activities and cultural cohesion.
- Given uncertainty and unpredictability, greater need for timely and relevant information

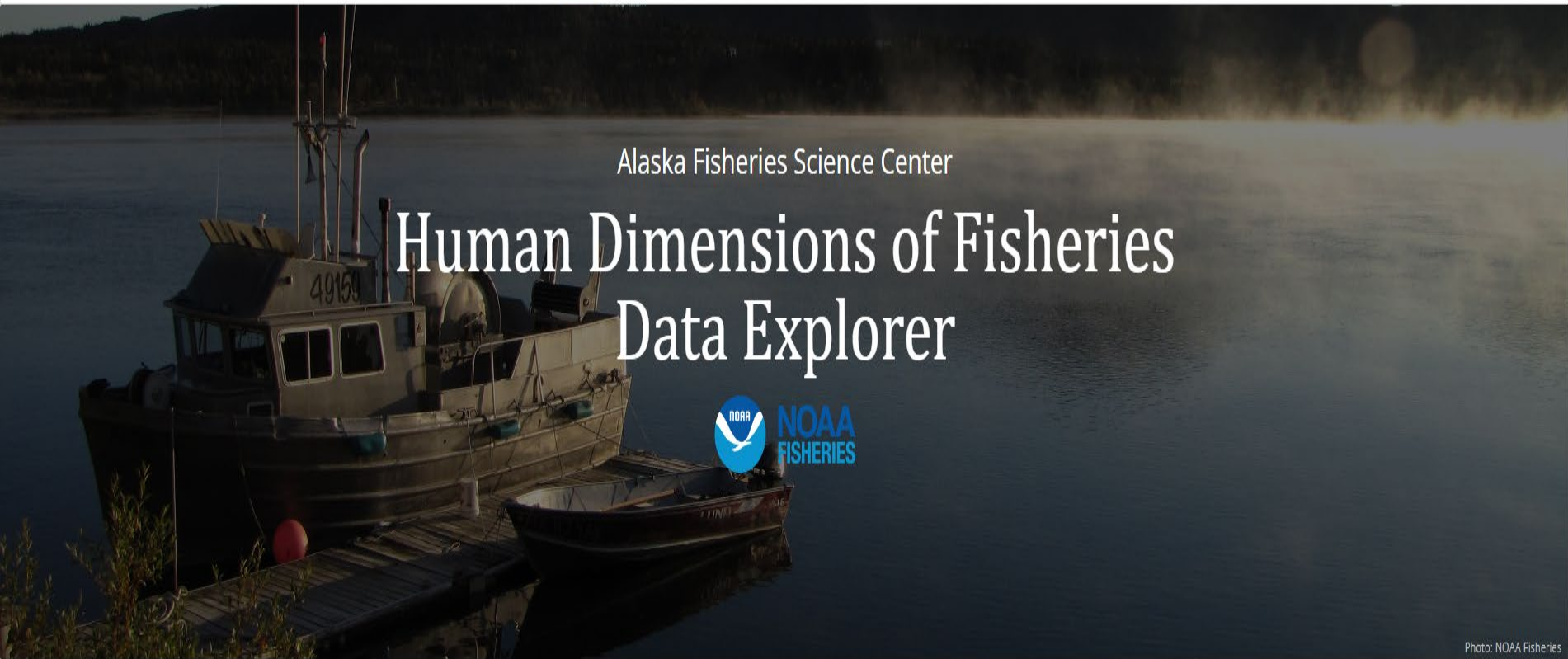


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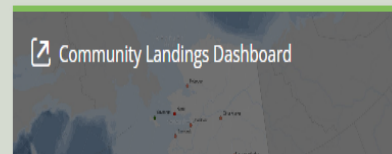
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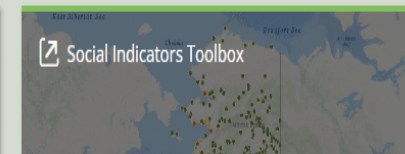
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A Way of Life

Fishing sustains small communities in Bristol Bay, Alaska
Alaska Fisheries Science Center
September 2021

Authors

Jean Lee, Anna Lavoie, Kim Sparks, Sarah Wise



<https://storymaps.arcgis.com/stories/94091df4896f4eca9fee3bc293e56388>

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Typically the men drifted and the wives and kids stayed on the beach, and set netted. It should have been the other way around because those grandmas and moms, holy cow! Especially when they've got the mud...just picking off the beach bent over and in the mud.

Annette Caruso

[Listen to Annette's oral history](#)



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NOAA FISHERIES



Alaska Fisheries Science Center

Human Dimensions of Fisheries Data Explorer



Questions?

Photo: NOAA Fisheries



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