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Updating long-standing fisheries-independent bottom trawl surveys

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“Slow is smooth, smooth is fast”

-U.S. Navy SEALs

“What then, is the true
Gospel of consistency? Change.”

-Mark Twain

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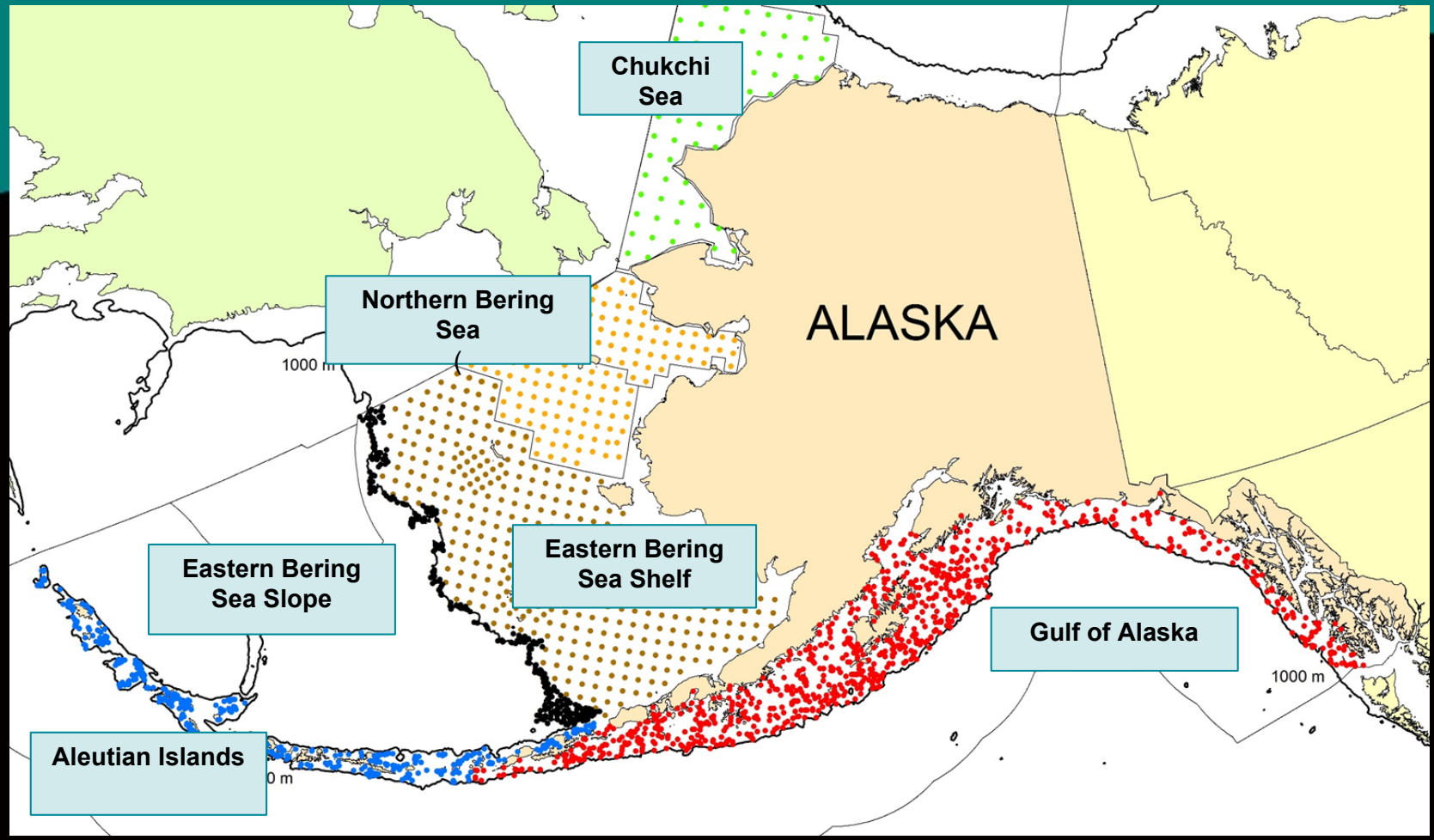

- AFSC GAP surveys: Since 1975
- Surveys differ by design, gear, frequency
- We must protect the TIME SERIES

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Why Change?

F/V *Dorothy*, 1940-1941
Alaska king crab exploration

-Changes in funding levels
- 5 boat model -> 4 boat model
- increasing expenses - must maximize efficiency

-Obsolescence of gear and trawl design ($$$$)
- raw materials availability dwindling
- maintaining multiple gear types inefficient

-Obligation to provide the best available science
- legacy gear design and trawl protocols suboptimal
- species distributions are changing

Change is inevitable, so how do we maintain consistency?

Option A: Continue to use current gear, protocols, and survey design until we are forced into immediate change (Reactive: crisis mgmt)
Pros: no additional costs, no changes in data products
Cons: inflexible, consistency ultimately compromised

Option B: Prepare for change by anticipating crises, researching and testing updated gear, protocols, and survey designs
Pros: flexible, consistency maintained through research and calibration
Cons: significant short-term costs, discomfort among data users

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How do we implement Option B?

- Begin with research into various facets of survey design and implementation (WKUSER I in 2019 and II in 2022)
- Acquire and test modern gear
- Begin transition with extensive calibration experiments
- Examples in progress: GoA, Bering Sea

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Gulf of Alaska Bottom Trawl Survey

- Long standing, standardized survey (1990 - present)
- Stratified random design: 59 subjectively designated strata
- Since 1990 there have been,
  9 surveys ≤ 1,000 m (3 trawlers)
  6 surveys ≤ 700 m (2 trawlers)
- Future expectation: 2-boat surveys to 700 m… & more changes

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Updating the GoA Trawl Survey: Restratification

- Optimization strategy used spatiotemporal distribution info from historical surveys
- 14 species of groundfishes included
- one boat, two boat, three boat models
- criterion was to minimize CV in biomass estimates across species set

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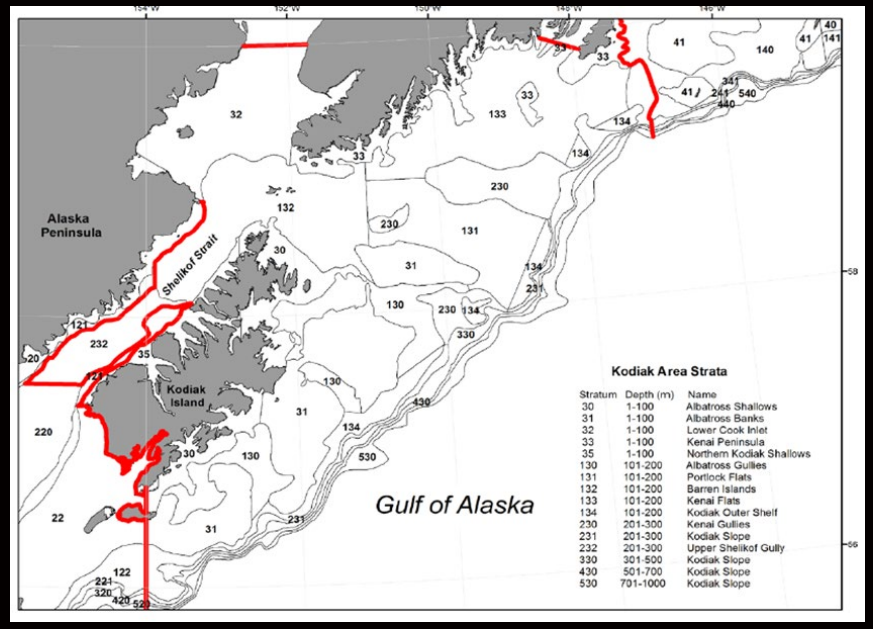
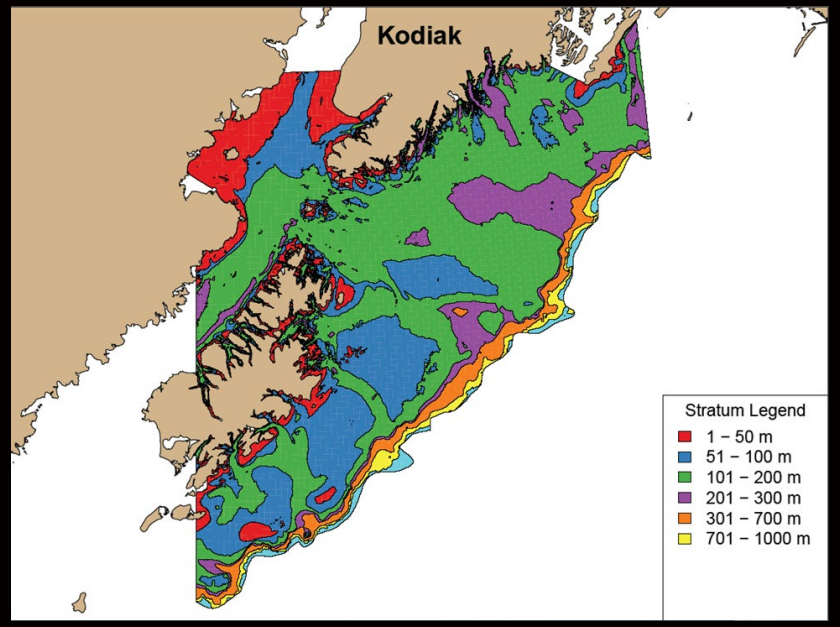
Summary of GOA Restratification



- Historical Strata (N = 59)
- IPNFC Areas
- Neyman allocation



- 2025 Strata (N = 30)
- NMFS Areas
- Bethel algorithm allocation
- More flexible, minimized CV

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Bering Sea Bottom Trawl Survey(s)

- Design one survey for all 3 historical regions
  - EBS shelf (1982-present)
  - NBS shelf (2010, 2017-2022)
  - EBS slope (sporadic, last in 2016)

- Optimize, expand, flexible(ize) effort allocation

- Update and replace obsolete gear, protocols

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Timeline for Bering Sea Survey Redesign

2023: New door testing

2024-2025: New net testing

2021-2024: 15/30 min calibration

2023-2025: Slope/Shelf gear calibration and standardization

2025-2026: Standardization of new methods and testing new survey design

2026-2027: Inter survey calibration

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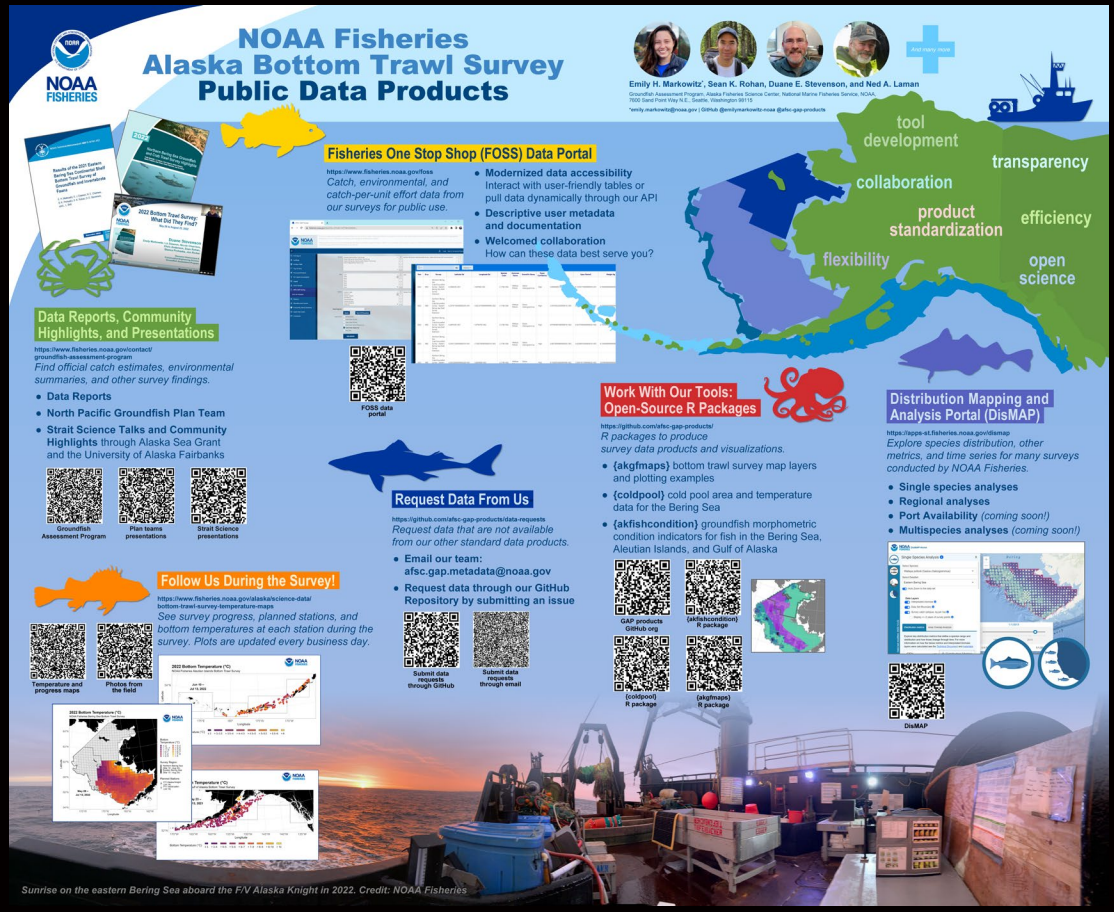
Updating the Data Delivery Model

- Public data interfaces: (FOSS,DisMAP)
- Tracking data requests in Github
- Optimizing AKFIN data delivery
- Optimizing internal database structures
- Design-based -> Model-based



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So What's the Downside?

- Testing and calibration activities are $$$$
- Testing and calibration activities consume time and effort (need to drop something)
- Concerns of data users; continuity of results

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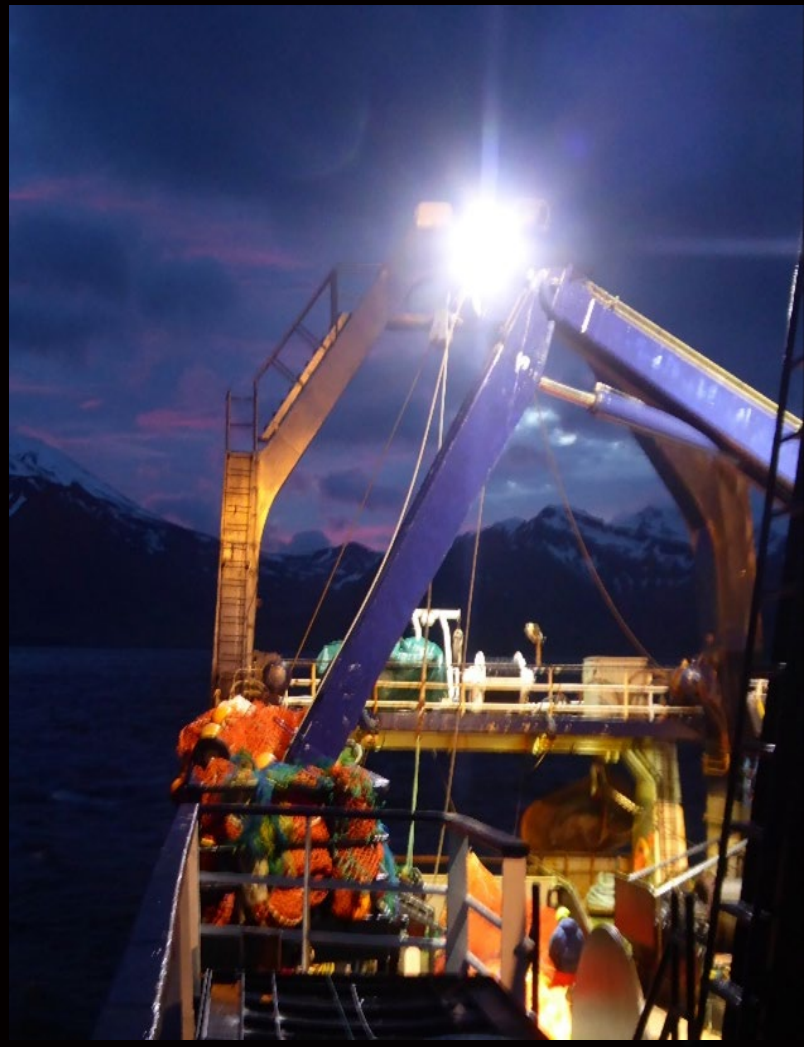
Summary

- Change is inevitable – we need to prepare in order to provide consistently high-quality data
- Thoughtful survey redesign is expensive!
  - Simulation studies
  - Gear development, testing
  - Calibration studies
- Comprehensive redesign of AFSC trawl surveys in Alaska is well underway

Slow is smooth, smooth is fast



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Thank you!