Initial Steps (Phase 1 and 2A): Atlantic Cod Stock Structure Working Group and Science/Assessment Workshops

Atlantic Cod Stock Structure & Stock Assessment Timeline

	Stock Structure Working Group (ACSSWG)	Science/Assessment and Management Working Groups	Research Track Stock Assessment
2018	ACSSWG Formed		
2019	ACSSWG Report Completed		
2020	ACSSWG Peer Review (May)		
2021		Science/Assessment Workshops (June-July)	Research Track Working Group Formed (August)
		Management Workshops (Aug-Sept)	
2022			Research Track Working Group conducts the Stock Assessment
2023			Research Track Peer Review (March)

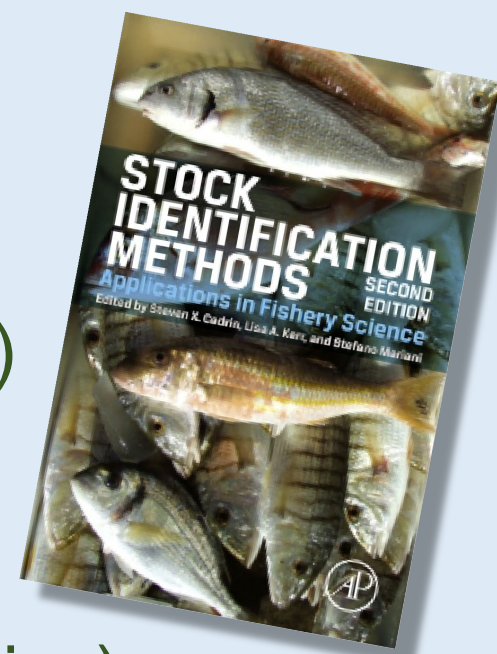# Phase 1: Atlantic Cod Stock Structure Working Group

Atlantic cod stock structure working group

- **Experts (members & partners) working collaboratively**

- **using an interdisciplinary approach**

- **to characterize the biological stock structure of cod**

- **for eventual consideration in monitoring, assessment and management of US Atlantic cod**
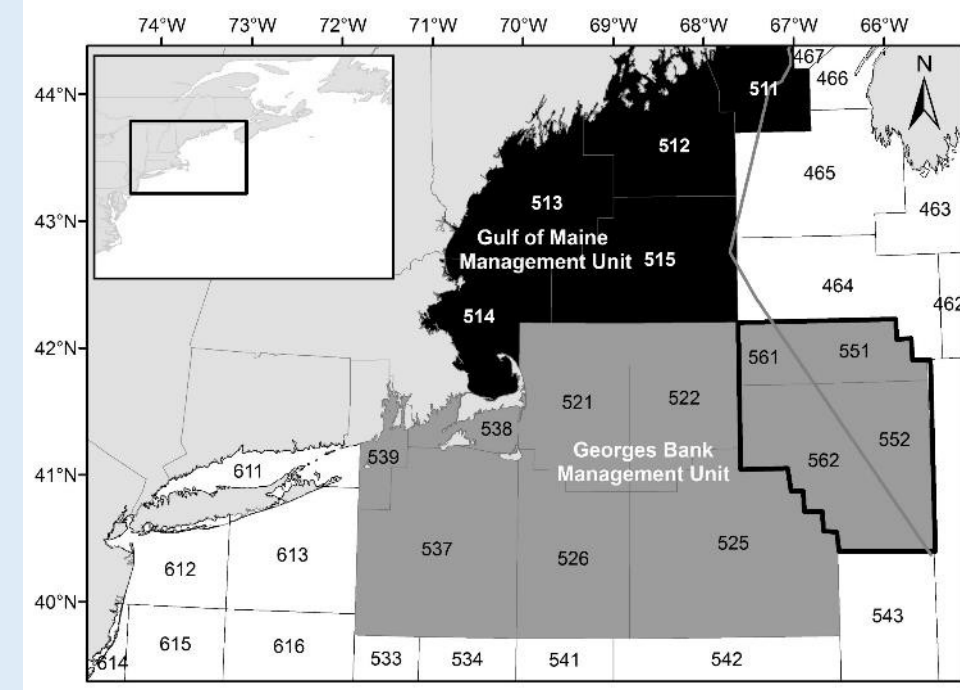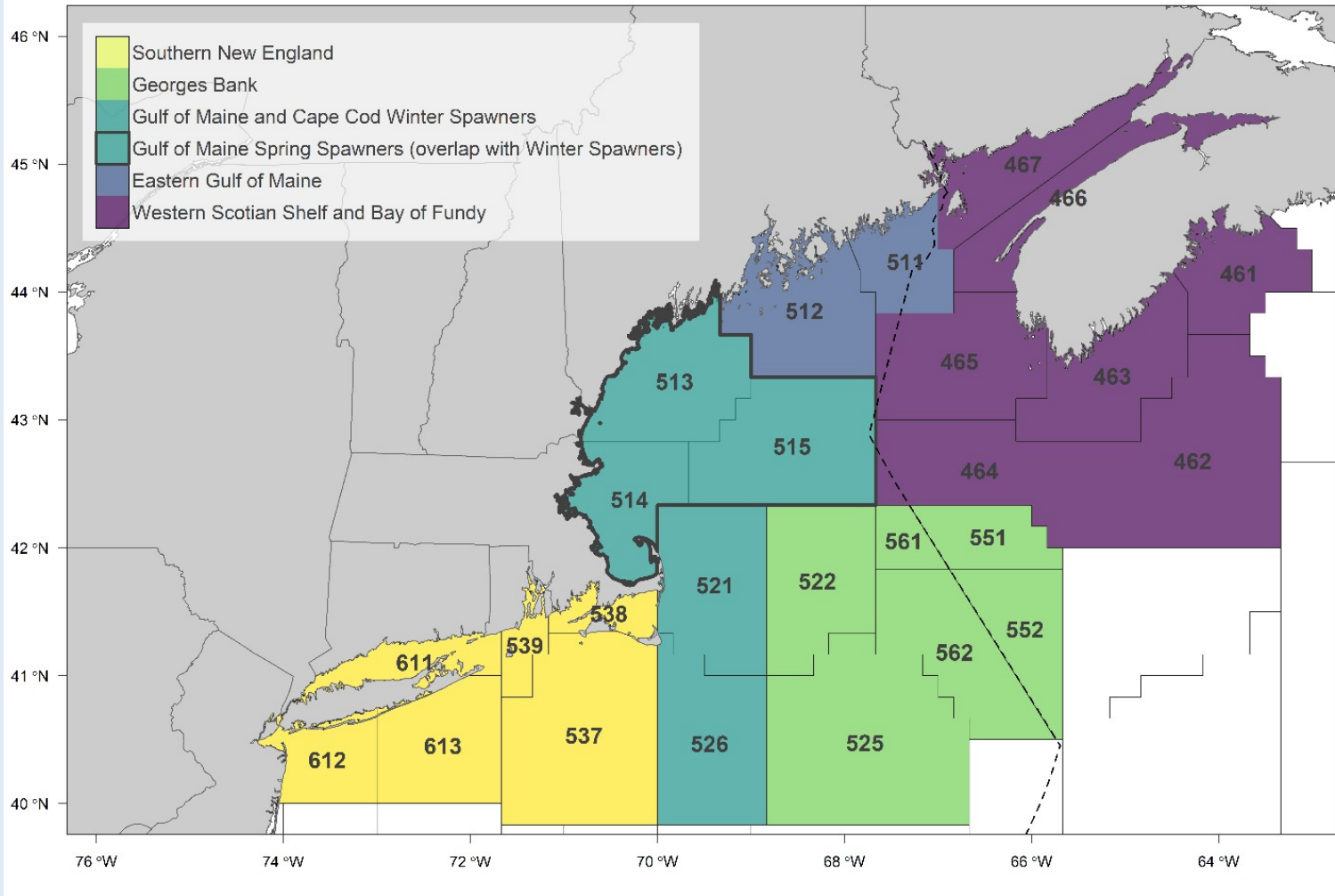
Methods: an interdisciplinary approach

1. Fishermen's ecological knowledge (structured interviews)

2. Early life history (spawning–settlement)

3. Genetic markers (including adaptive markers and genomics)

4. Life history (48 years of the NEFSC bottom trawl survey)

5. Natural markers (otoliths, parasites, color morphs, etc.)

6. Applied markers (200,000 tagged cod; 12,000 recaptures [1923-2013])

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Results: Interdisciplinary Highlights

1) Notable phenotypic and genetic variability among statistical areas
- Cod not well mixed in either US management unit

2) Extensive movements by adults
- exchange between US-US management units
- as well as between US-Canada management units

3) Larval dispersal around Cape Cod
- one-way connectivity between US-US management units

4) Two sympatric, genetically differentiated stocks in SW Gulf of Maine
- adaptive differences between winter- and spring-spawning cod

5 US cod stocks proposed

Legend:
- Southern New England
- Georges Bank
- Gulf of Maine and Cape Cod Winter Spawners
- Gulf of Maine Spring Spawners (overlap with Winter Spawners)
- Eastern Gulf of Maine
- Western Scotian Shelf and Bay of Fundy

This proposal accounts for:
- Within unit variation
- Between unit connectivity
- Winter/spring sympatry

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Phase 2: Science/Assessment and Management Workshops

Science/Assessment Workshops

- Three workshops held in June 2021

Management Workshops

- Five workshops to be held in August/September 2021

Atlantic Cod Science & Assessment Workshop Objectives

- Summarize the historical and current data availability for each of the five proposed stocks/management areas

- Provide a summary of stock assessment prospects based on data availability

- Identify additional data that is available or upcoming research that could be used to inform the assessments for each of the proposed stock/management areas

- Generate initial data gaps and ideas for research to improve the assessment prospects

- Learn how management strategy evaluation (MSE) could be applied to Atlantic cod decision making and the data needed to support this effort

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Science/Assessment Key Conclusions

- Splitting the historical data collected under the two management area design and then partitioning it for use to assess five management areas results in inadequate assessment data for some areas

- The proposed Southern New England and Eastern Gulf of Maine proposed stock areas were particularly data deficient in terms of the representativeness of fishery independent surveys and biological sampling of the catch required to characterize commercial and recreational landings and discards.

- The proposed Western Gulf of Maine area would be relatively stable in terms of the input data and resulting stock assessment.

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Science/Assessment Key Conclusions (cont)

- **The revised Georges Bank stock area would gain data and information as a result of including Statistical Areas 522 and 525 (central Georges Bank)**
  - The assessment would be similar to the current TRAC assessment, which has had to step back to a data limited approach in recent years.
  - There is no guarantee that the binational TRAC/TMGC process will adopt the new stock area definition.
- **The Gulf of Maine spring spawning stock (which include cod in the Great South Channel area) are problematic to assess due to:**
  - Limited fishery independent survey data (NEFSC and MADMF surveys)
  - Spatial overlap with Western Gulf of Maine stock area
  - Need to identify Winter vs. Spring spawners in both current/future data collections and historical data

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Examples of Additional Information to Consider

- **Southern New England stock area**
  - University of Rhode Island GSO bottom trawl surveys
  - Rhode Island DEM Fixed Station and Offshore bottom trawl surveys

- **Eastern Gulf of Maine**
  - Sentinel Hook Survey age samples

- **Gulf of Maine Winter vs. Spring Spawners**
  - Examination of historical survey and commercial otoliths

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Questions?