Stock Assessment & Projections of Southern Flounder in the South Atlantic

DEPARTMENT OF ENVIRONMENTAL QUALITY

Marine Fisheries

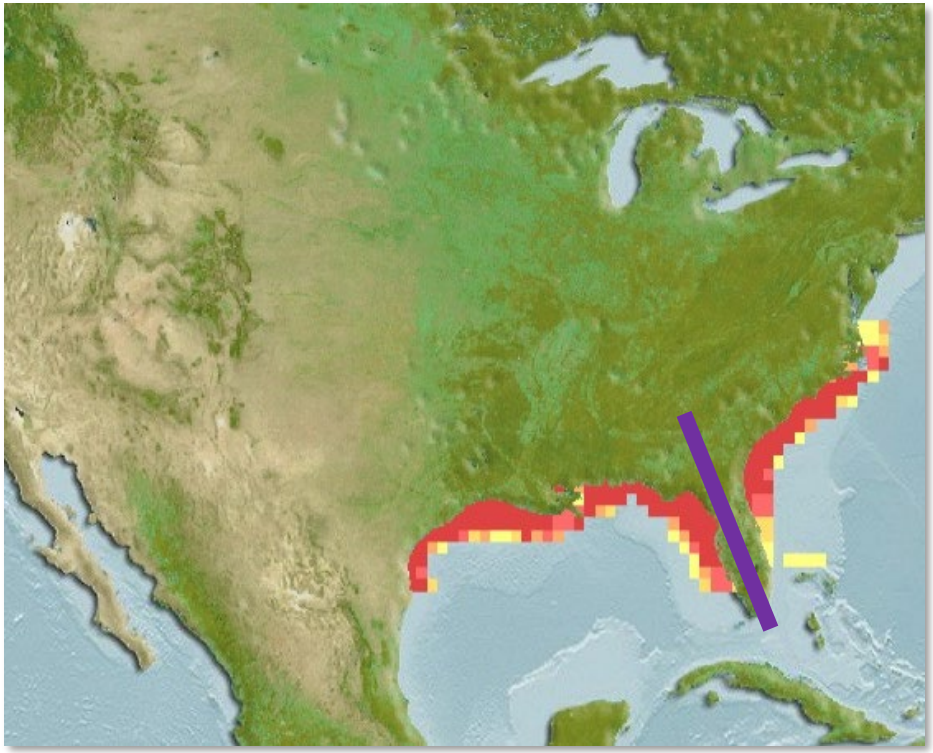
Joint Public Meeting of MFC Northern, Southern, and Finfish advisory committees

| Laura M. Lee | June 3, 2019

Background

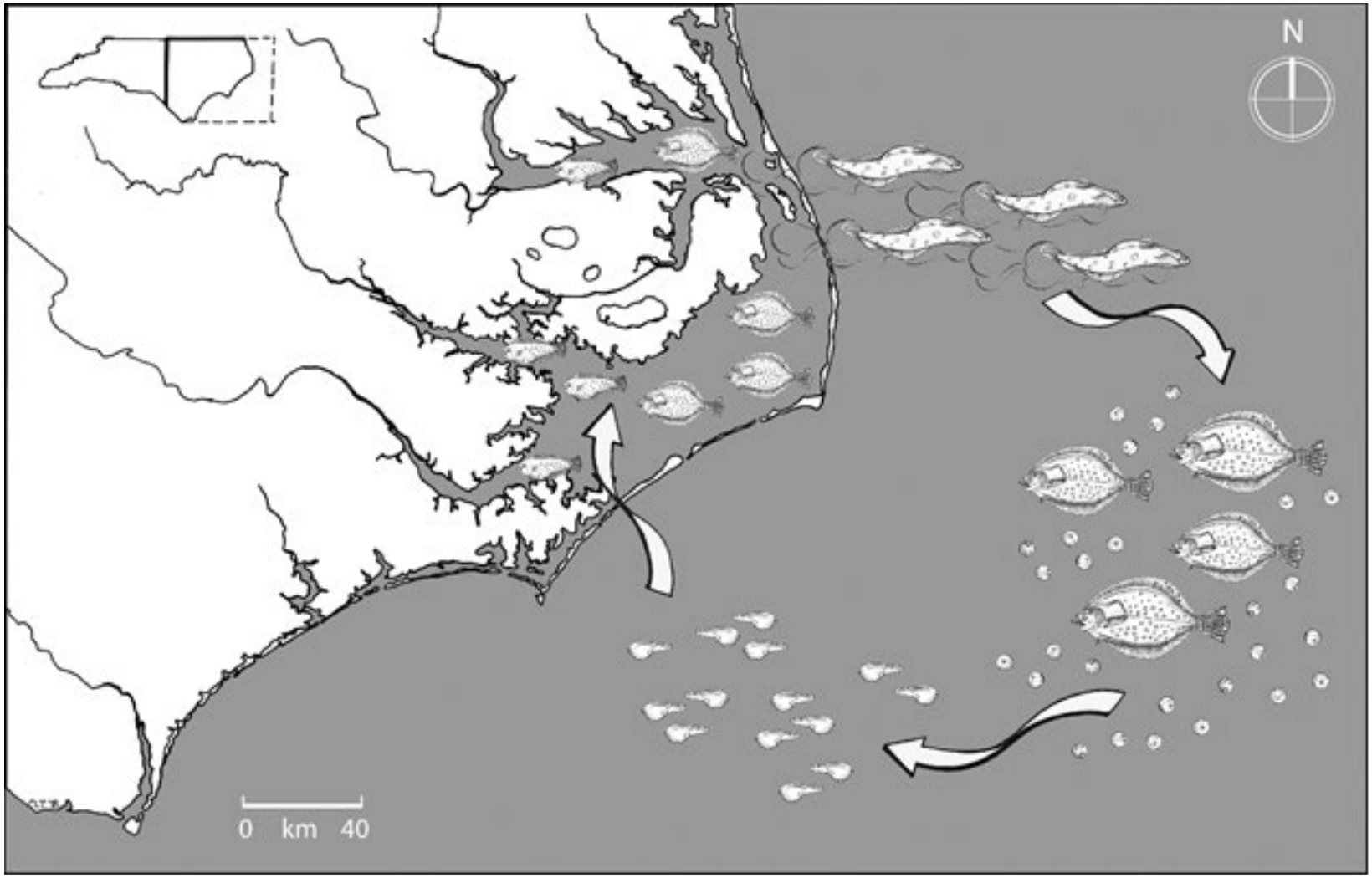
Life History

- Demersal (bottom-dwelling)
- Marine and brackish water
- Female max age and size: 9 years and 33 inches
- Male max age and size: 6 years and 20 inches
- Female length at 50 percent maturity is approximately 16 inches



Life History

Source: Hollensead, L.D. 2018. Dissertation. UNCW, Wilmington.



Current Stock Assessment

- Pooled effort of multiple state agencies and universities
  - North Carolina
  - South Carolina
  - Georgia
  - Florida
  - University of North Carolina at Wilmington
  - Louisiana State University
  - Atlantic States Marine Fisheries Commission
- Includes fisheries-dependent and fisheries-independent data from throughout the South Atlantic
- Presented to peer review panel in December 2017
  - First in-person, public peer review
  - Three-day workshop

Peer Review

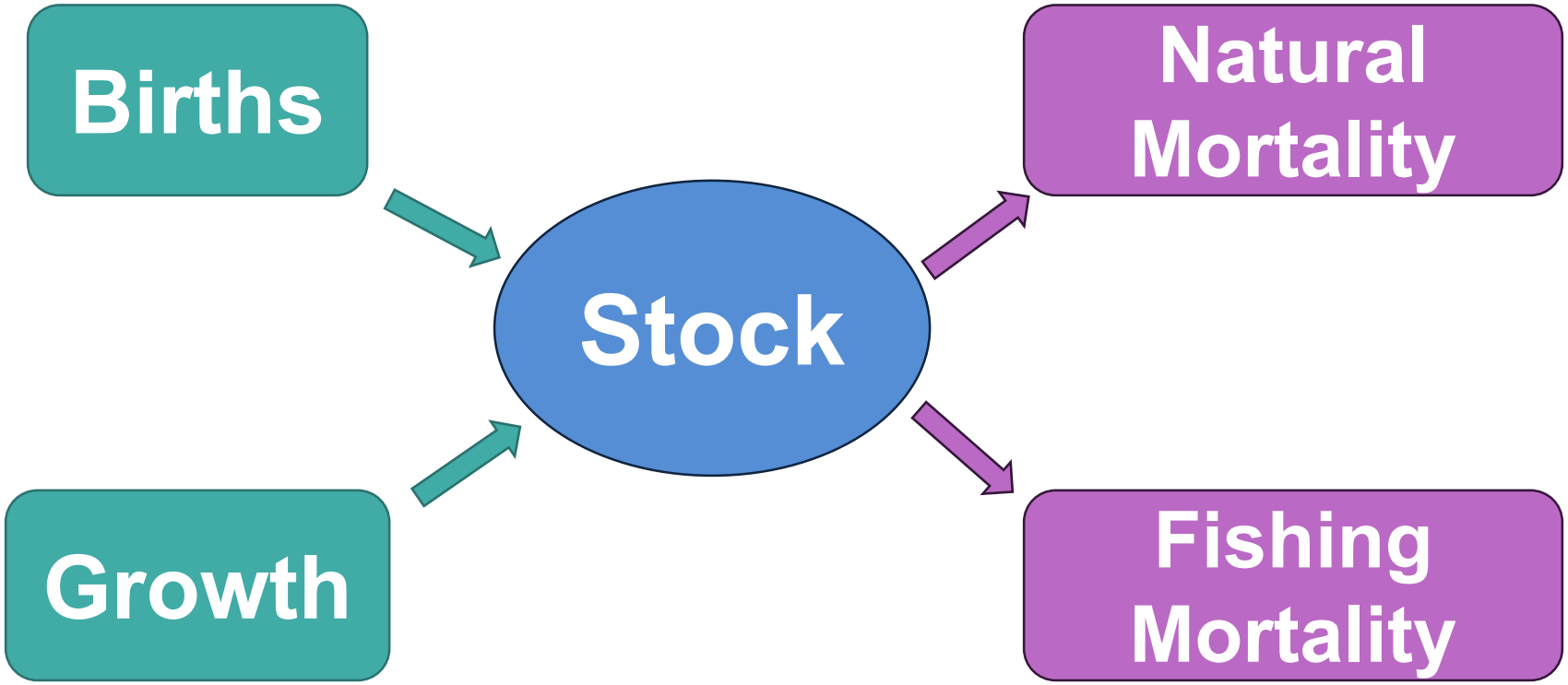
- Accepted the final assessment model, though use contingent on update
- Endorsed basing management using data through 2017
- Update to incorporate expected changes to recreational catch estimates

Assessment Model & Results

What is a Model?

- A simple representation of a complex process
- Assessment model data needs
  - Catch—the amount of fish removed from a stock by fishing
  - Abundance—relative index of the number or weight of fish in a stock
  - Biology—provides information on growth, maturity, and natural mortality
- Data types
  - Fisheries-dependent
  - Fisheries-independent

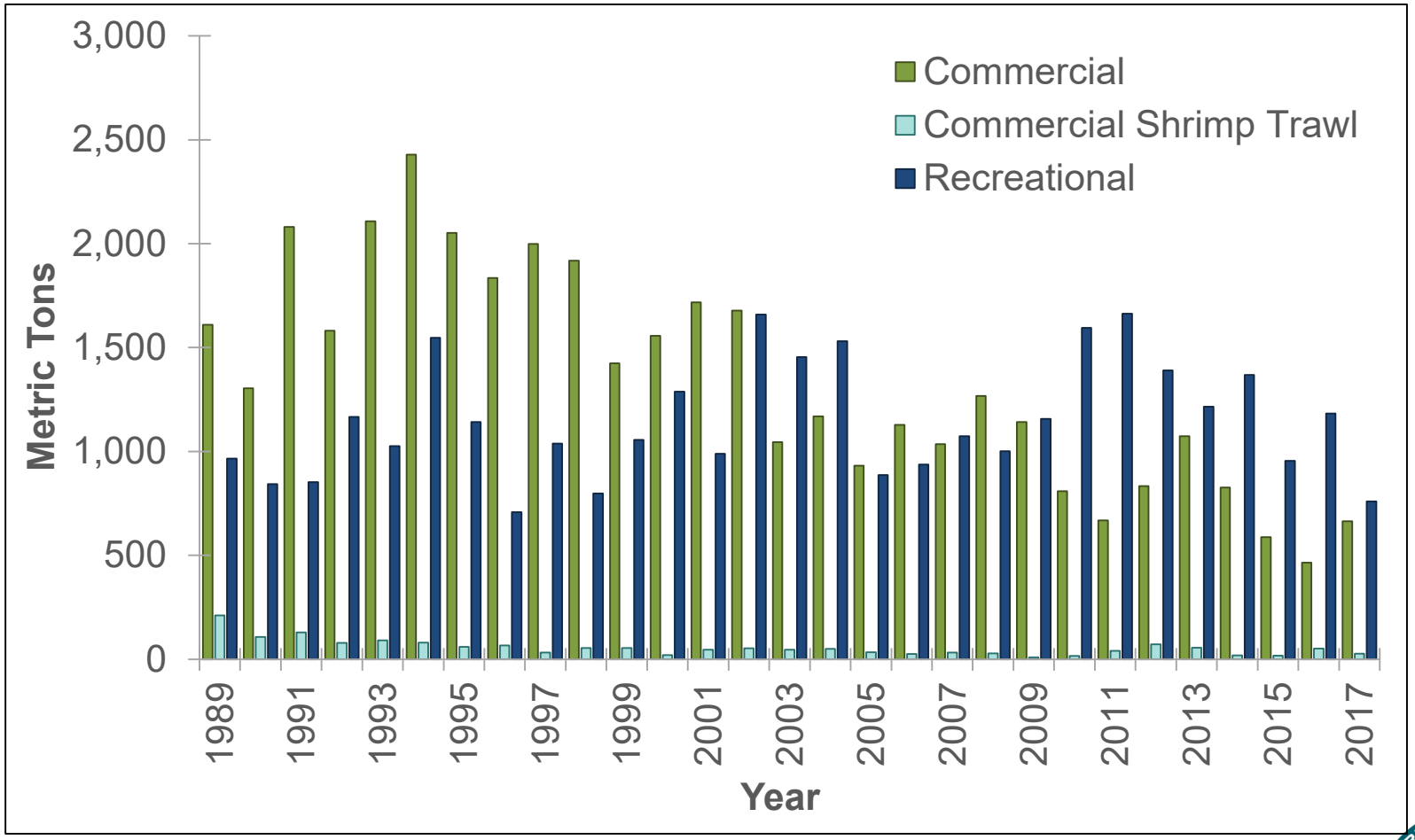
Basic Model



Model Structure

- Age-Structured Assessment Program (ASAP)
- Unit stock: North Carolina through the east coast of Florida
- Calendar year: 1989 through 2017
- Birth date: Jan. 1
- Age range: Age-4 plus group

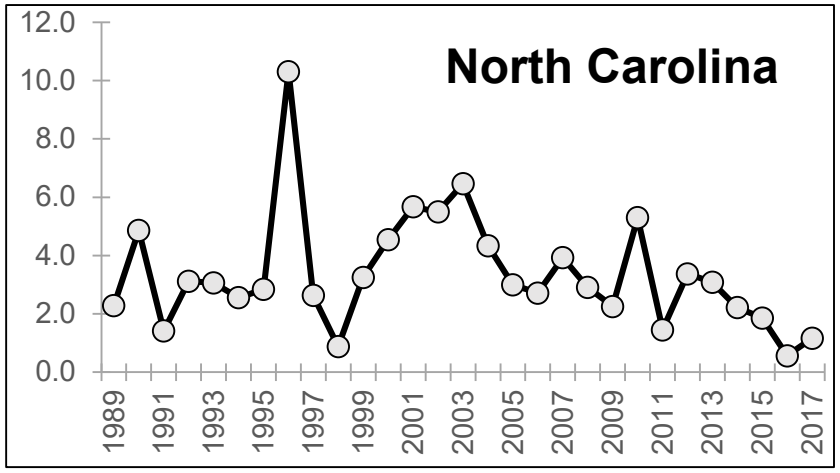
Total Landings & Discards (North Carolina to Florida East Coast)

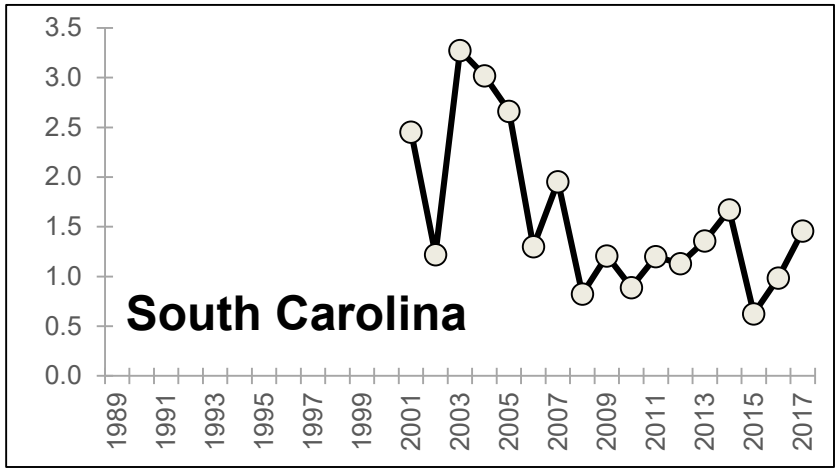


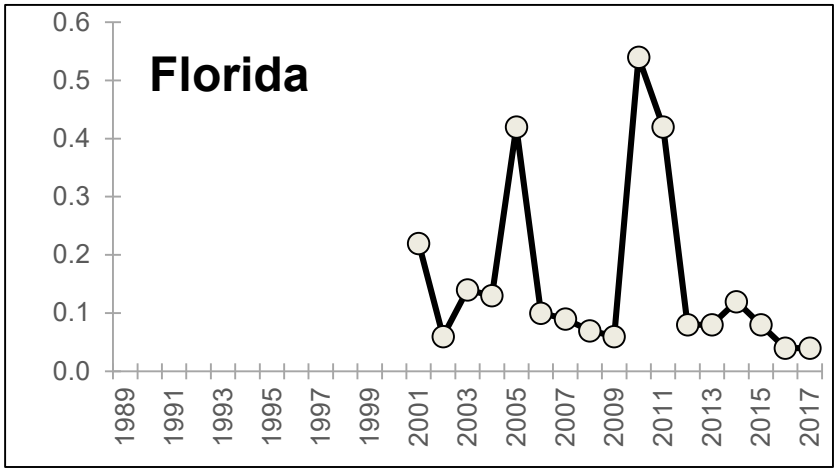
Surveys

- One juvenile (recruitment) survey from each state, except Georgia
- One primarily adult survey from each state
- One ocean survey (SEAMAP)

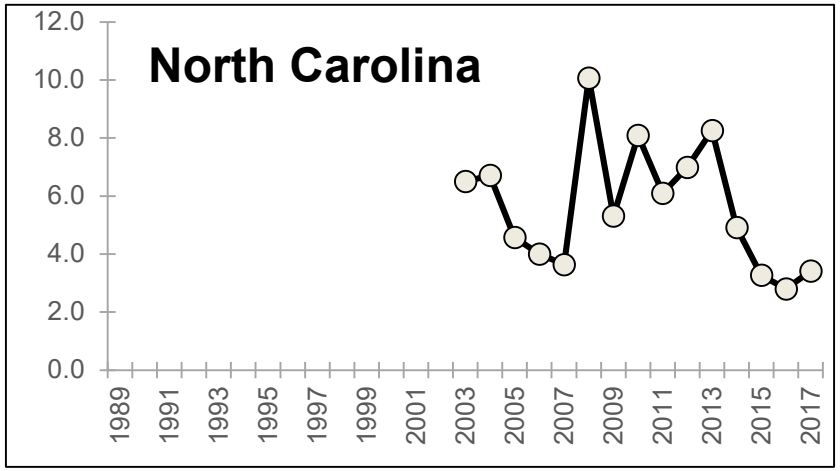
Recruitment Surveys

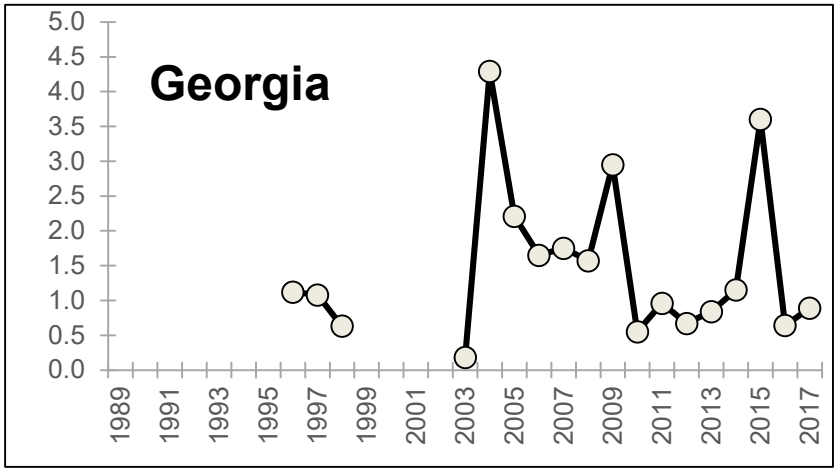


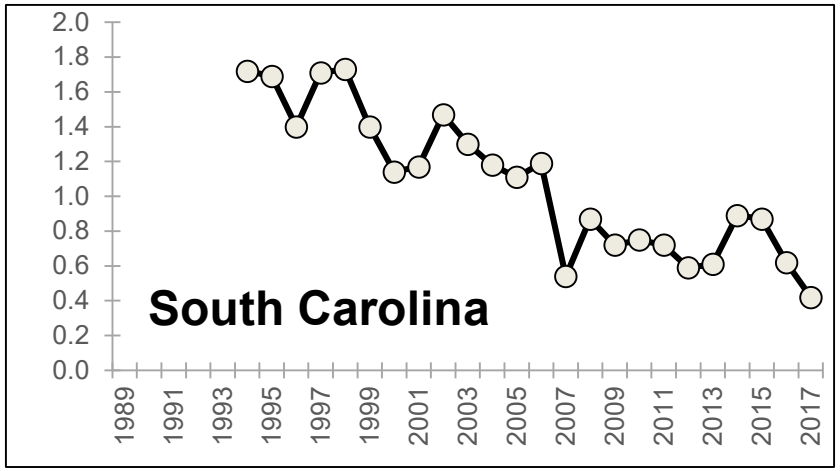


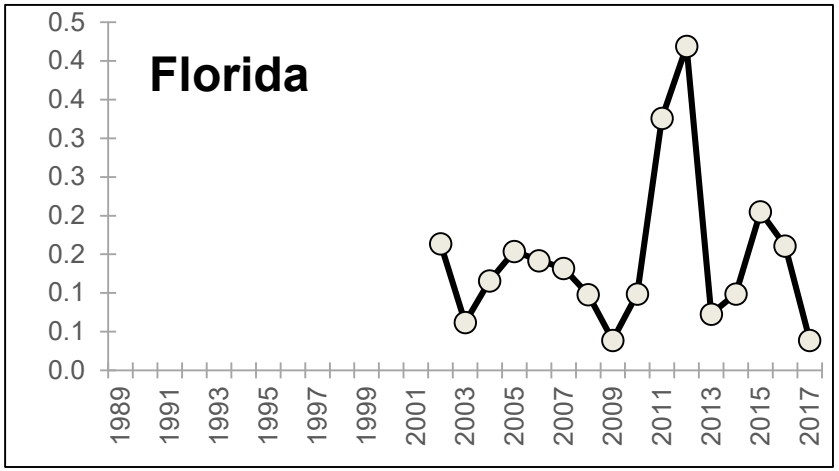


Adult Surveys

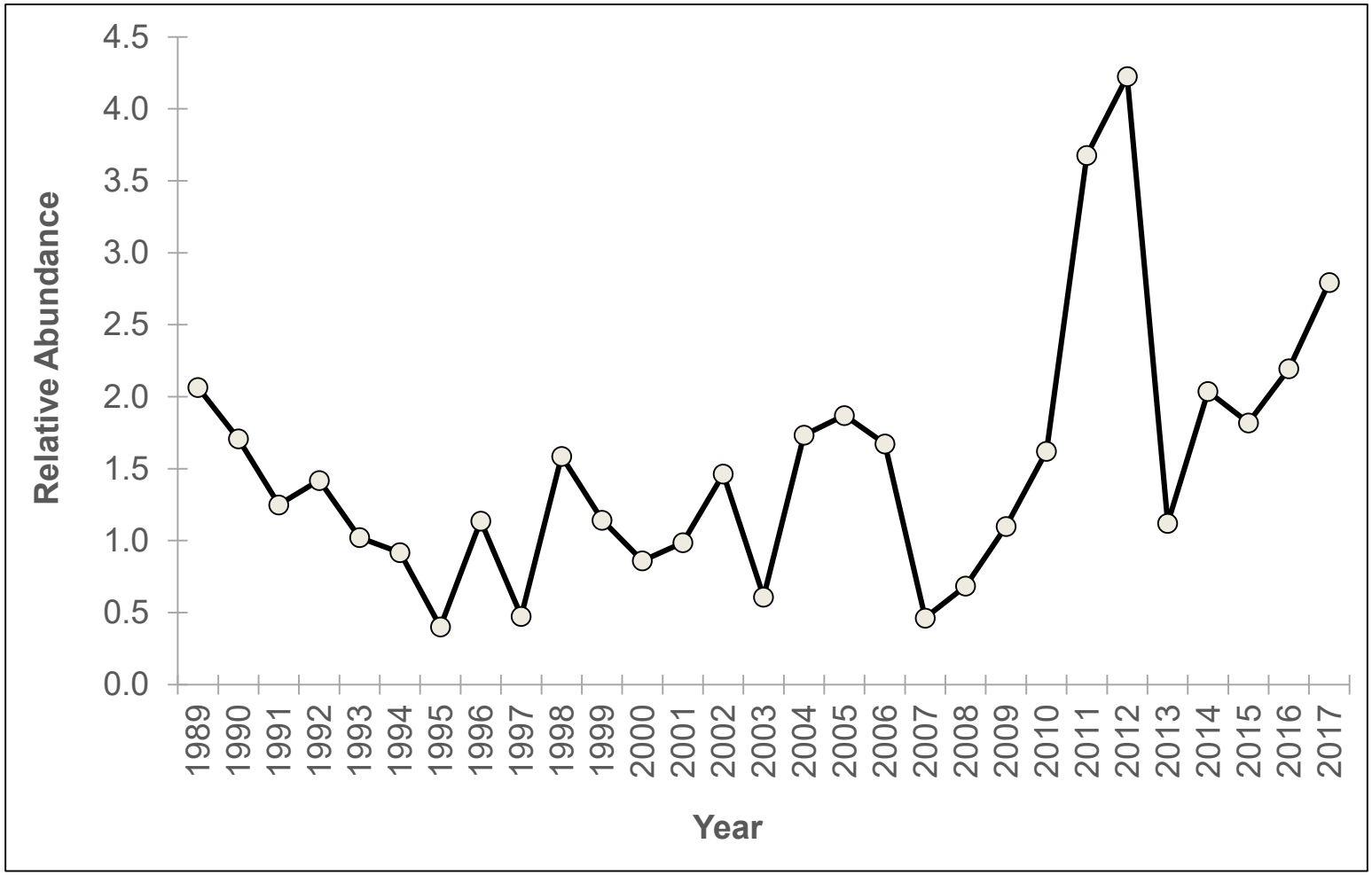




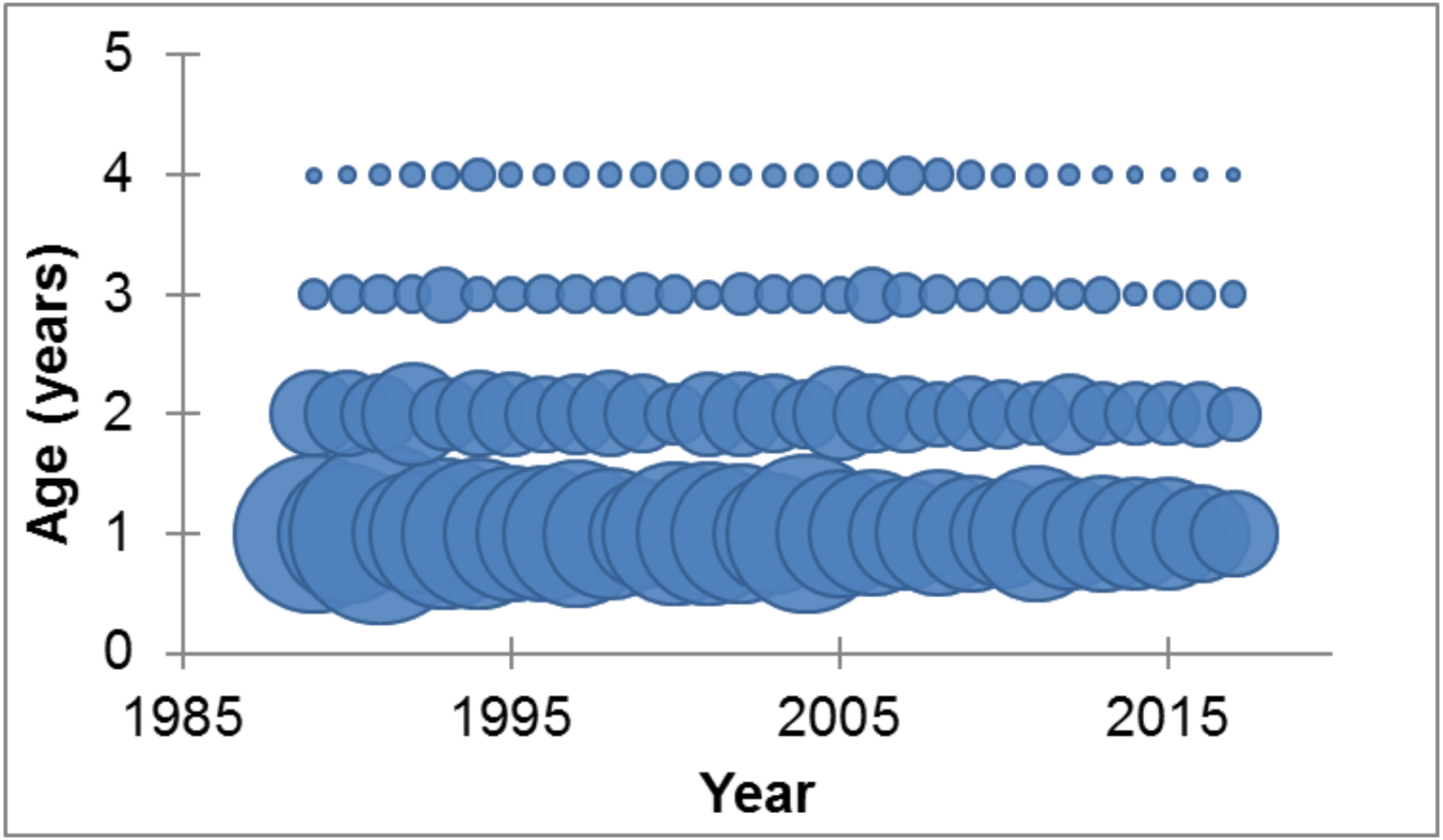




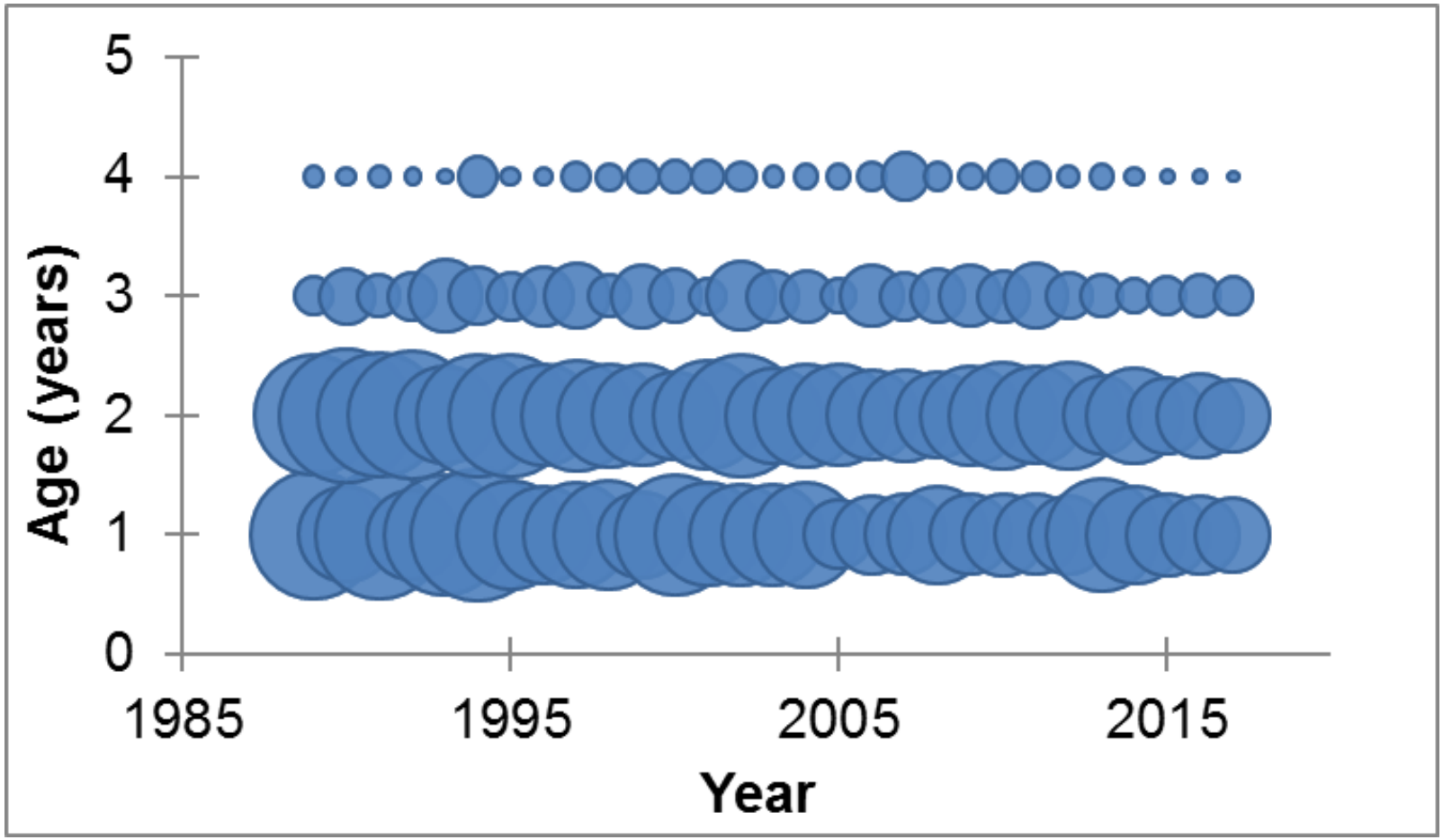
Adult Surveys—SEAMAP



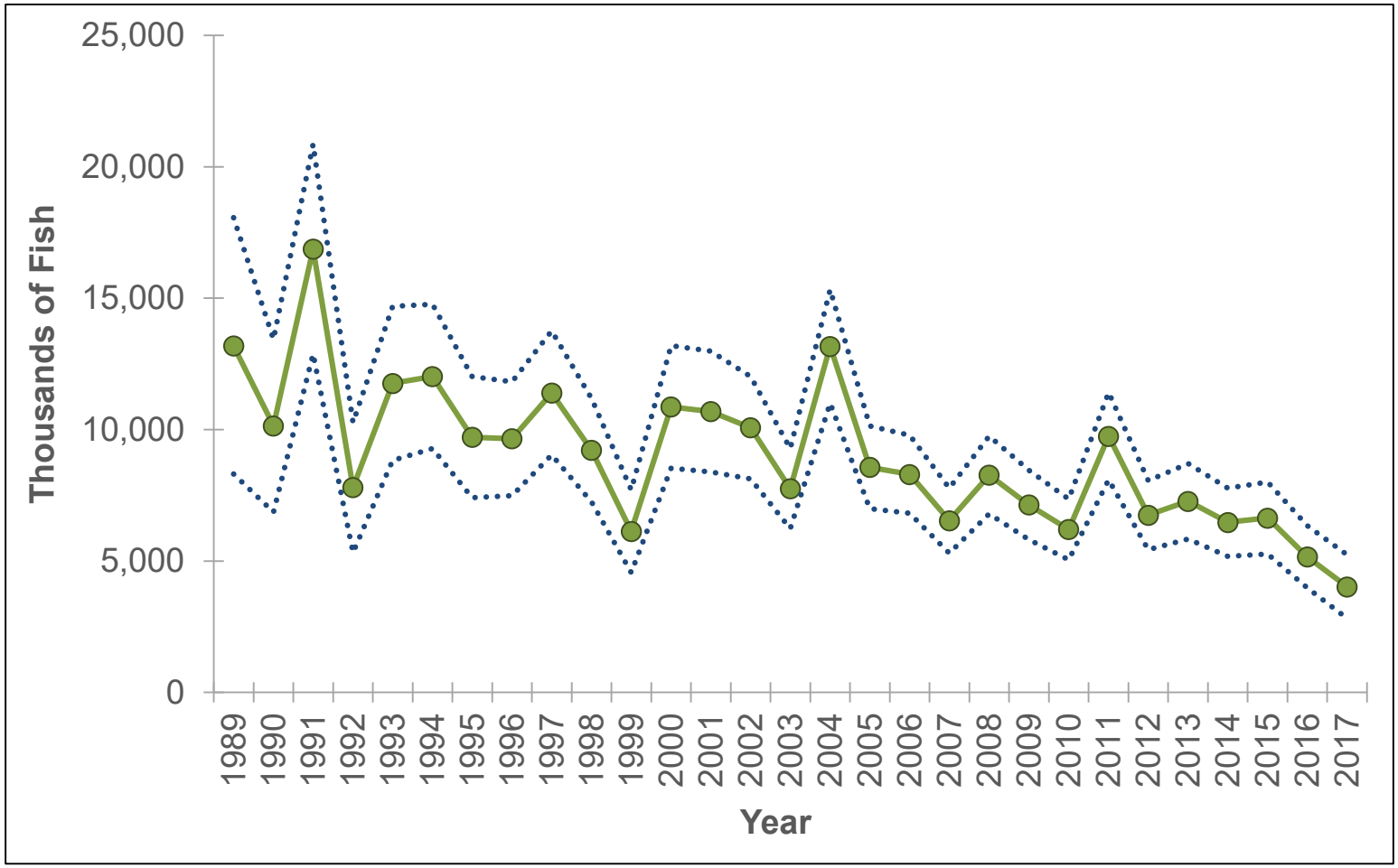
Numbers at Age



Catch at Age



Recruitment (Age-1)



Stock Status

Reference Points

- Female Spawning Stock Biomass (SSB)
  - Target: $SSB_{35\%}$
  - Threshold: $SSB_{25\%}$
- Fishing Mortality (F)
  - Target: $F_{35\%}$
  - Threshold: $F_{25\%}$

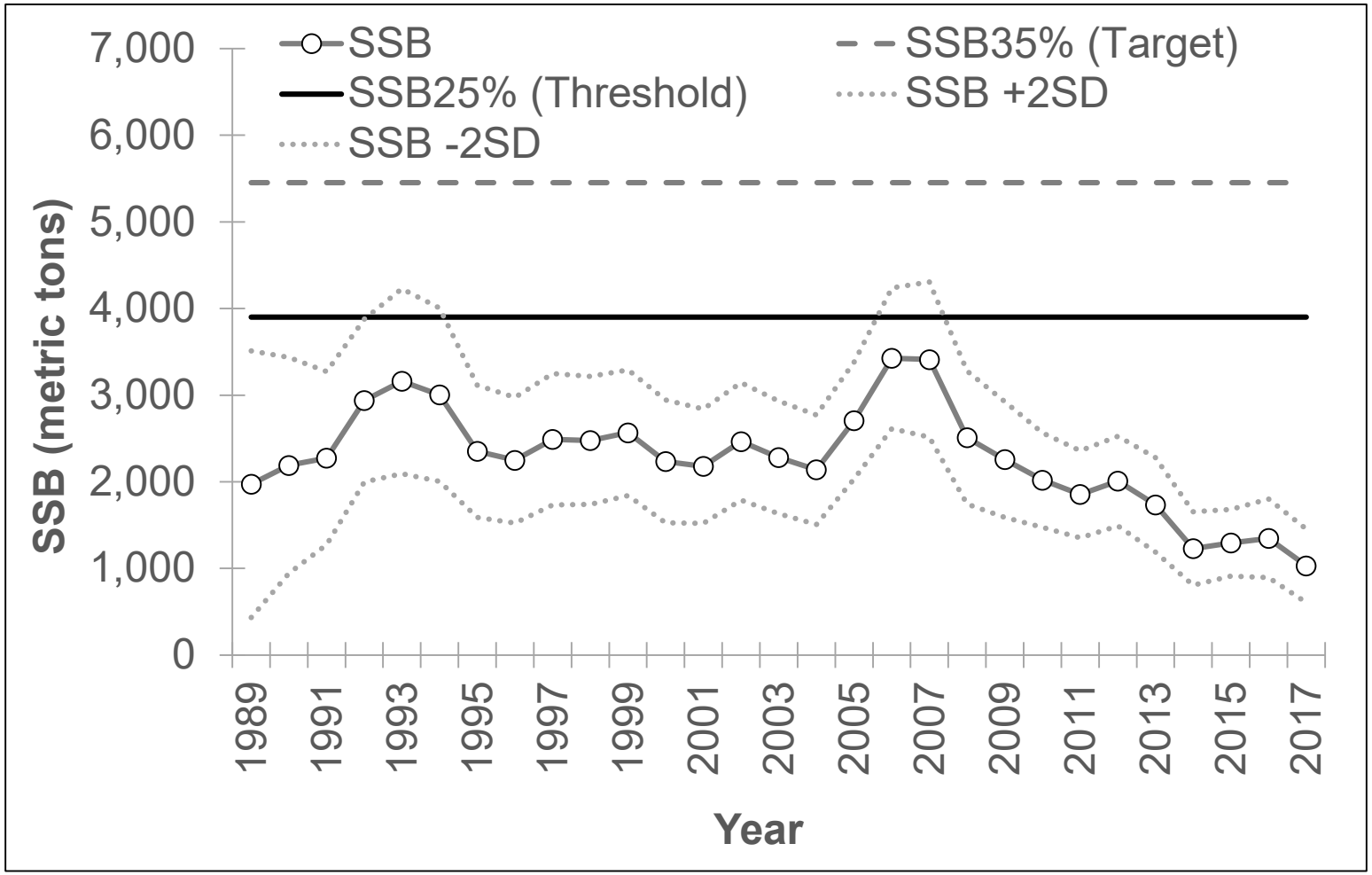
Determining Stock Status

- Female Spawning Stock Biomass (SSB)
  - If current stock size < threshold ($SSB_{25\%}$), then stock is **overfished**
- Fishing Mortality (*F*)
  - If current *F* > threshold ($F_{25\%}$), then **overfishing** is occurring

Stock Status—Female Spawning Stock Biomass

- Female Spawning Stock Biomass (SSB)
  - SSB_{2017} = 1,031 metric tons (2.3 million lb)
  - $SSB_{25\%}$ = 3,900 metric tons (threshold; 8.6 million lb)
  - $SSB_{2017} < SSB_{25\%}$ stock is **overfished**
  - $SSB_{35\%}$ = 5,452 metric tons (target; 12 million lb)

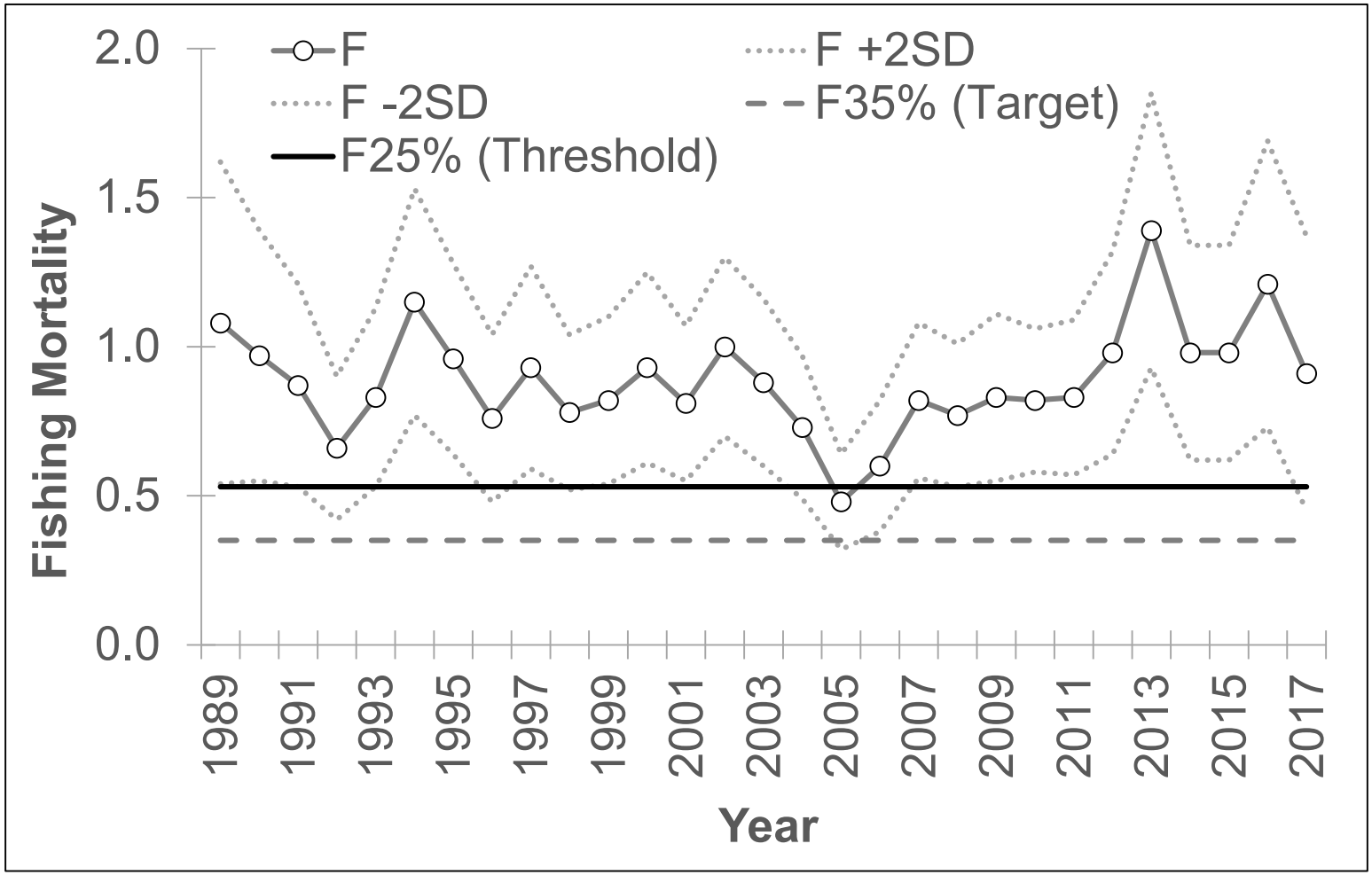
Stock Status—Female Spawning Stock Biomass



Stock Status—Fishing Mortality

- Fishing Mortality
  - F_{2017} = 0.91
  - $F_{25\%}$ = 0.53 (threshold)
  - $F_{2017} > F_{25\%}$ **overfishing** is occurring
  - $F_{35\%}$ = 0.35 (target)

Stock Status—Fishing Mortality



Current Stock Status in 2017

- Lack of age classes and few older fish in catch
- No evidence of recent high recruitment
- The probability that the 2017 stock is experiencing overfishing is 96.4 percent
- The probability that the 2017 stock is overfished is 100 percent

Questions?

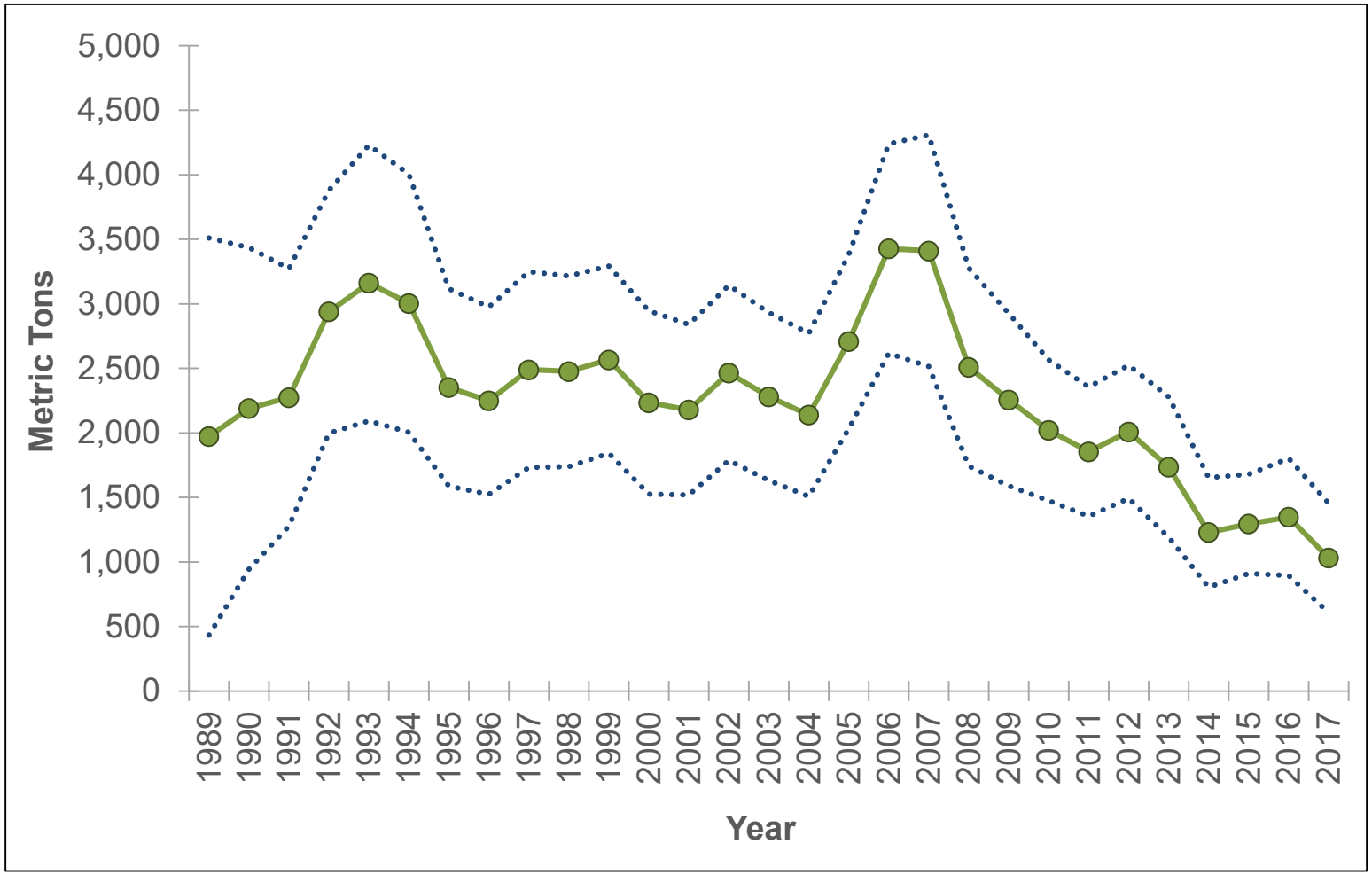
NCDMF Assessment History

- Assessments completed in 2005, 2009, and 2014
- 2005 and 2009 assessments concluded that the stock was overfished and overfishing was occurring
- The 2014 assessment was not considered for management by the N.C. Division of Marine Fisheries due to the definition of unit stock
- Recommendation to expand unit stock based on genetics and tagging data

Fleets

- Commercial
  - Landings and gill-net discards (dead)
- Commercial Shrimp Trawl
  - Bycatch (dead)
- Recreational
  - Harvest and dead releases
  - Includes hook-and-line and gig catches

Female Spawning Stock Biomass



Fishing Mortality