Science, Service, Stewardship

SEDAR 27 Gulf Menhaden: Fishery Independent and Dependent Data and Indices

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Overview

- Fishery independent and dependent data available
  - Trawl
  - Seine
  - Gillnet
  - Commercial reduction
- Decisions to be made regarding indices
  - Choice of juvenile abundance index
  - Choice of gillnet index
  - Choice of adult abundance index

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Trawl

- Fishery independent
- Juvenile abundance index (age-0)
- Data available from
  - Texas: 1982-2010
  - Louisiana: 1967-2010
  - Mississippi: 1974-2010
  - Alabama: 1981-2010
  - Florida: 1989-2010
- Cut out trips that caught fish larger then 100 mm FL
- Effort standardized in minutes

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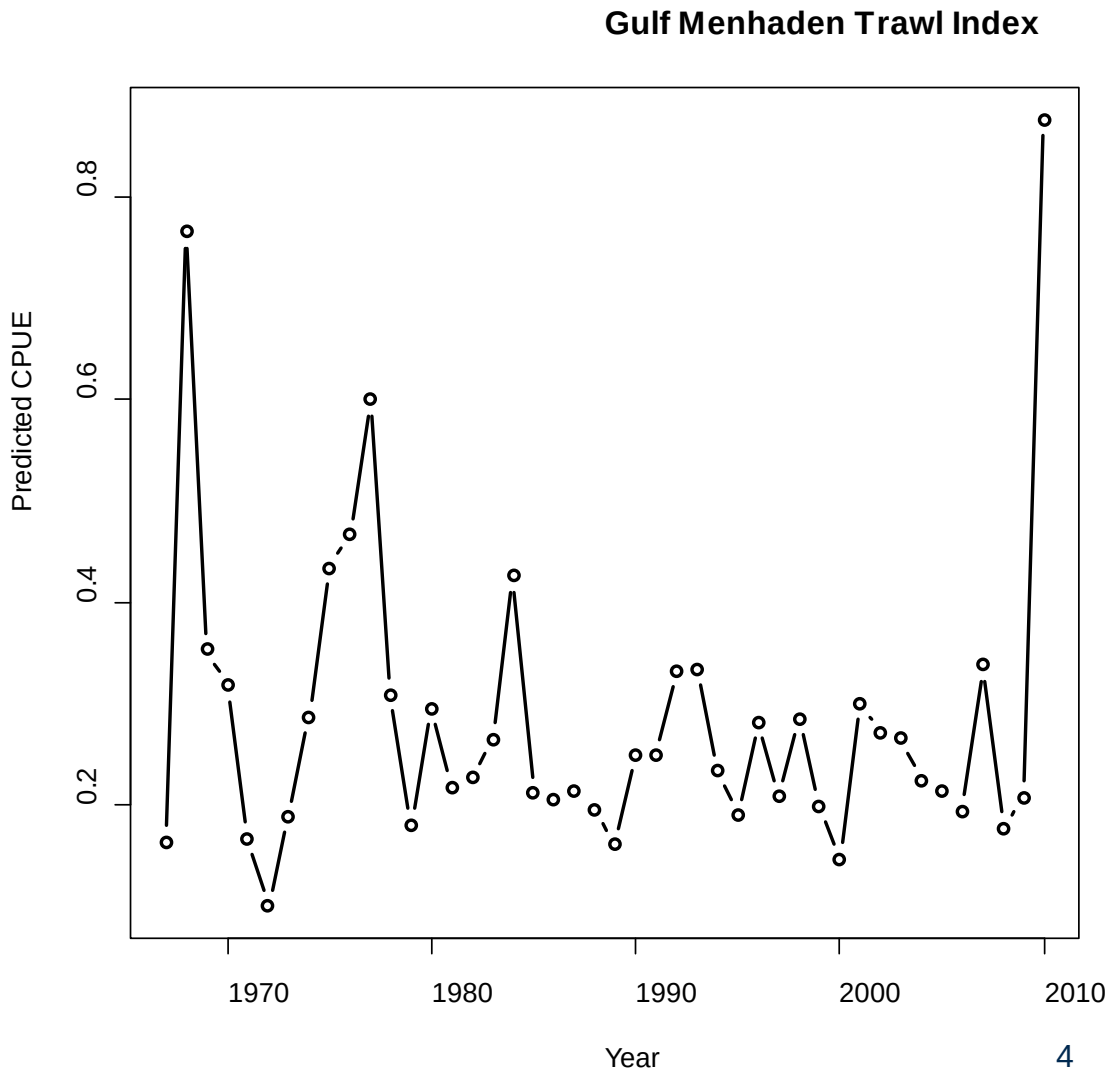
Trawl

- Delta-GLM
  - Bernoulli
    Year, State, Month,Temp, Depth
  - Lognormal
    Year, State, Month, Salinity, Depth



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Seine

- Fishery independent
- Juvenile abundance index (age-0)
- Data available from
  - Texas: 1976-2010
  - Louisiana: 1986-2010
  - Mississippi: 1974-2010
  - Alabama: 1981-2010
  - Florida: 1991-2010
- Effort standardized as area swept
- Index starts in 1977

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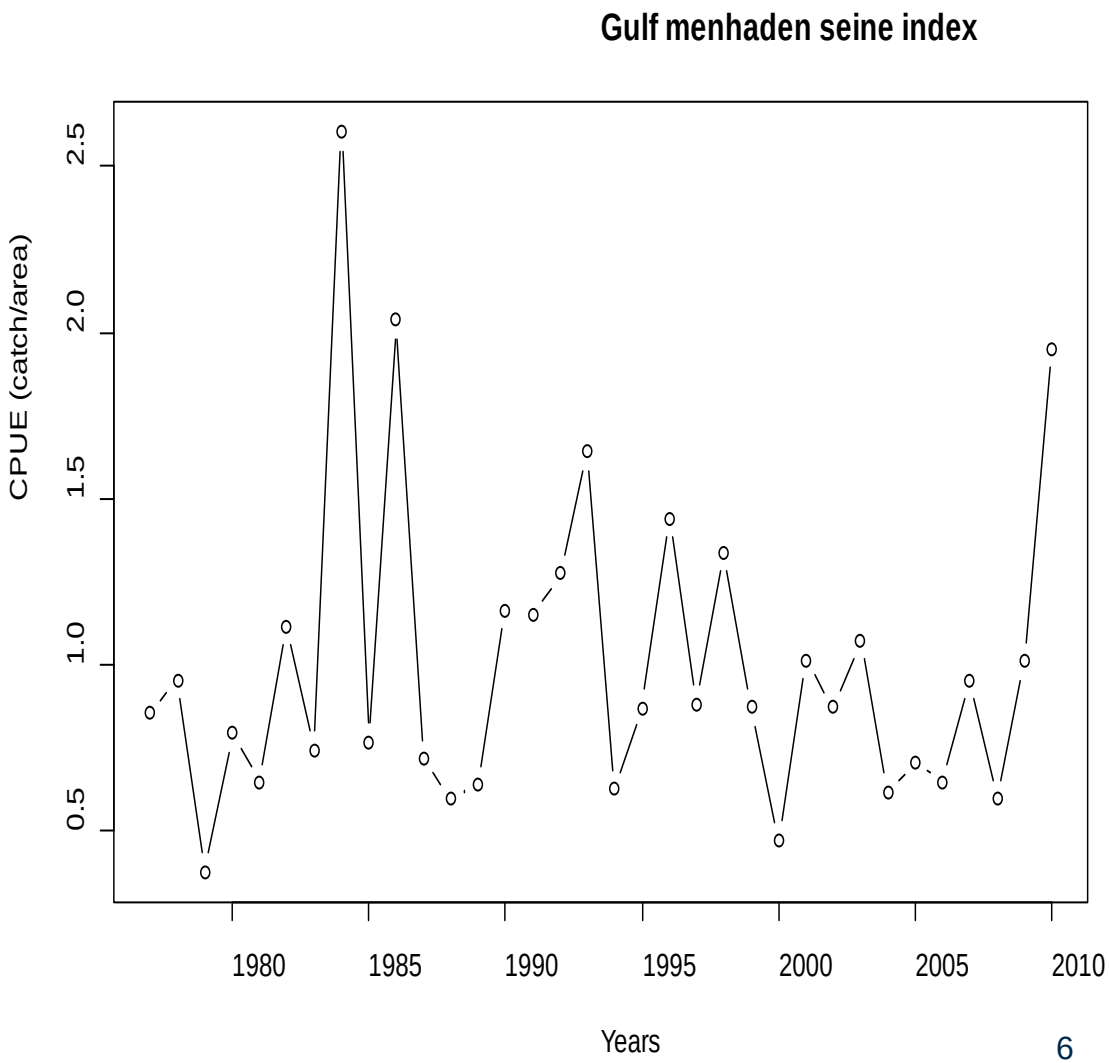
Seine

- Delta-GLM
  - Bernoulli
    Year, State, Month, Temp, Salinity
  - Lognormal
    Year, State, Month



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Gillnet

- Fishery independent
- Adult abundance index
- Data available from
  - Texas: 1975-2010
  - Louisiana: 1986-2010
  - Mississippi: 2005-2010
  - Alabama: 2001-2010

- Index starts in 1986
- Several iterations
  - All states, all meshes
  - All states, only 3 inch mesh
  - Only LA, all meshes

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Gillnet

- Effort standardized
  - All states, all meshes: minutes (LA assumed 30 min)
  - All states, only 3 inch mesh: minutes (LA assumed 30 min)
  - Only LA, all meshes: net set
- How to combine the associated length compositions?
- Delta-GLM factors considered
  - Year, state, month, temperature, salinity, mesh size, day/night

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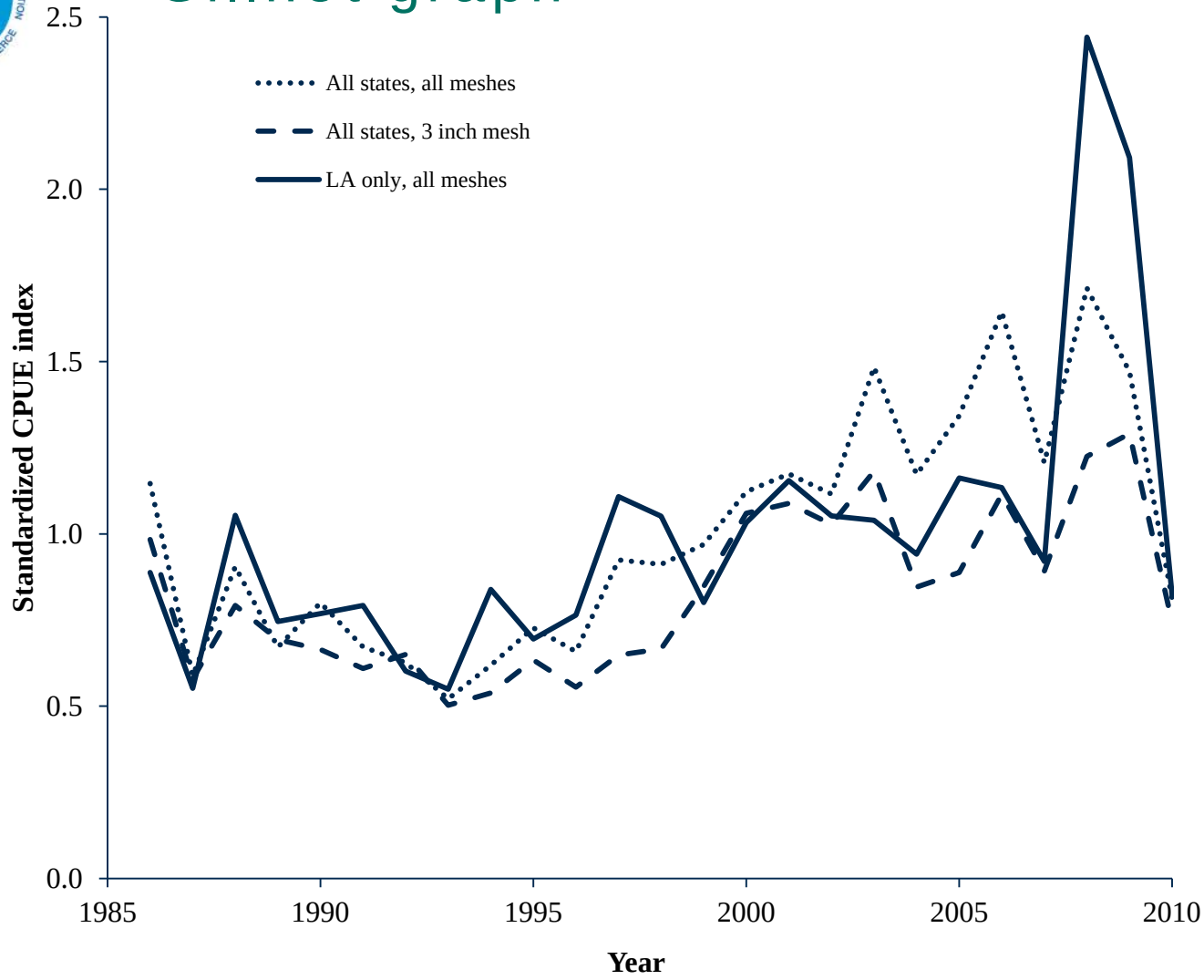
Gillnet-graph



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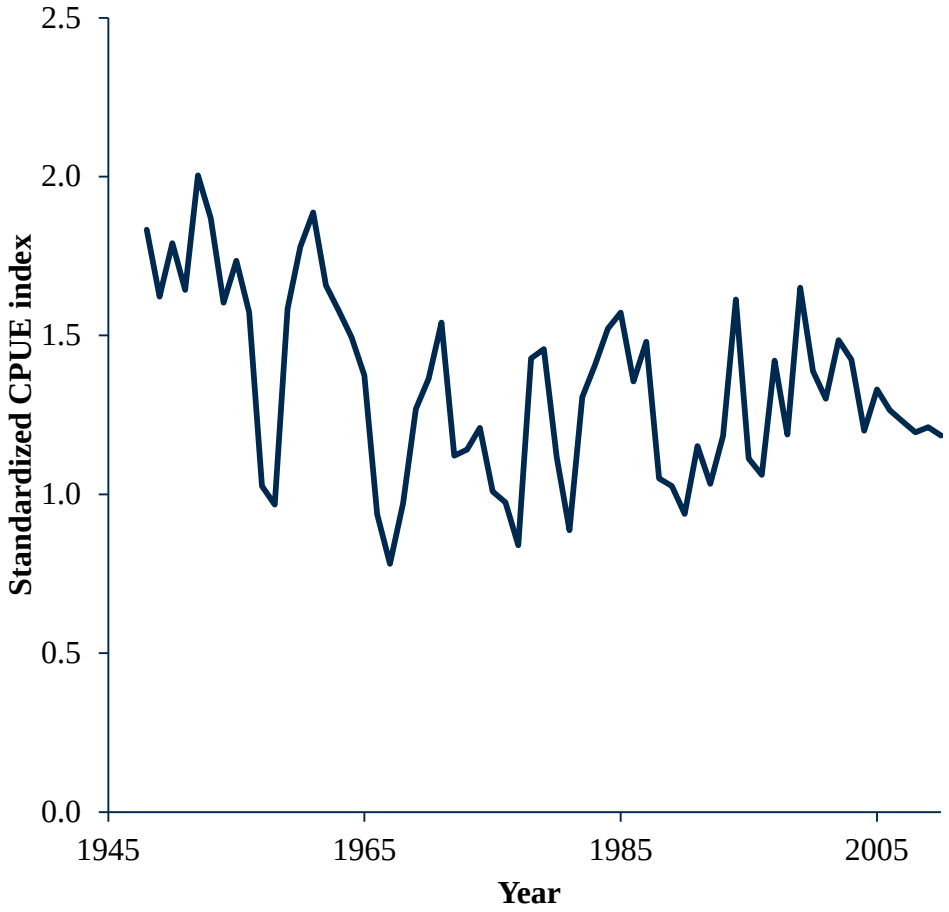
Commercial reduction

- Fishery dependent
- Adult abundance index
- Available from data from reduction plants: 1948-2010
- Effort standardized in vessel-ton-weeks



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Delta-GLM and uncertainty

- Uncertainty surrounding indices derived using delta-GLM
  - Jackknifing
    - Seine
    - Trawl
    - Gillnet
  - Bootstrapping
    - Gillnet
  - Assumed value
    - Commercial reduction

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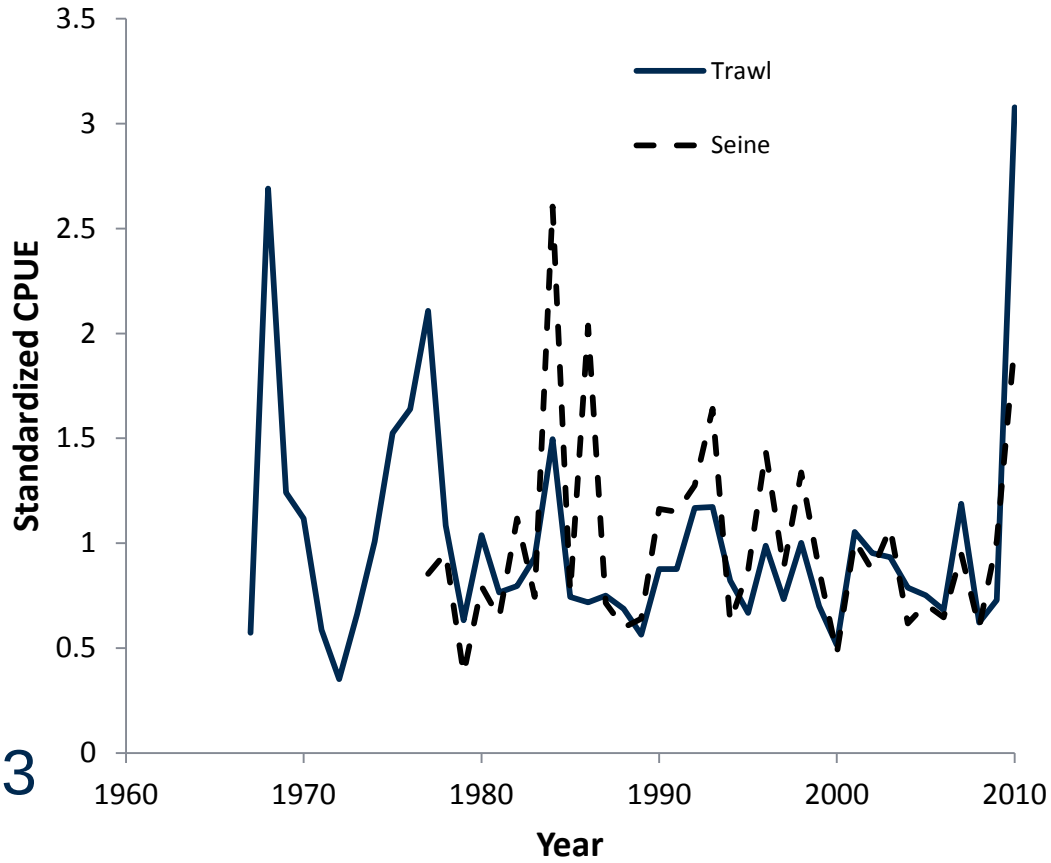
Seine versus Trawl

- Seine index
  - Thought to better represent age-0 abundance
- Trawl used in sensitivity runs
- Correlated
  - Entire time series: 0.53
  - 2000-2010: 0.94



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Gillnet index

- Choose index based on LA only with all meshes
  - No problems combining data
  - No gear differences
  - Center of range, thus thought representative of population level dynamics over time

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Adult abundance index

- Gillnet versus commercial reduction index
- Correlation with juvenile abundance indices
  - Lagged appropriately, gillnet didn’t correlate well
  - Lagged appropriately, commercial reduction was correlated
  - Concerns over lack of correlation for gillnet index and much discussion on if a correlation would be expected
- Gillnet chosen
  - Fishery independent
  - Less concern regarding catchability

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End result

- Fishery independent seine index represents age-0 abundance in base run

- Fishery independent gillnet index based on LA data only represents adult abundance in base run