

G. Witch flounder (*Glyptocephalus cynoglossus*)

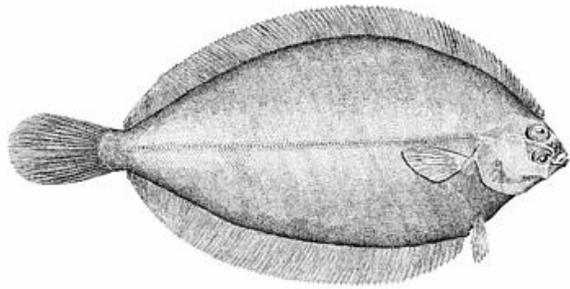


Table summaries in WP 1.1
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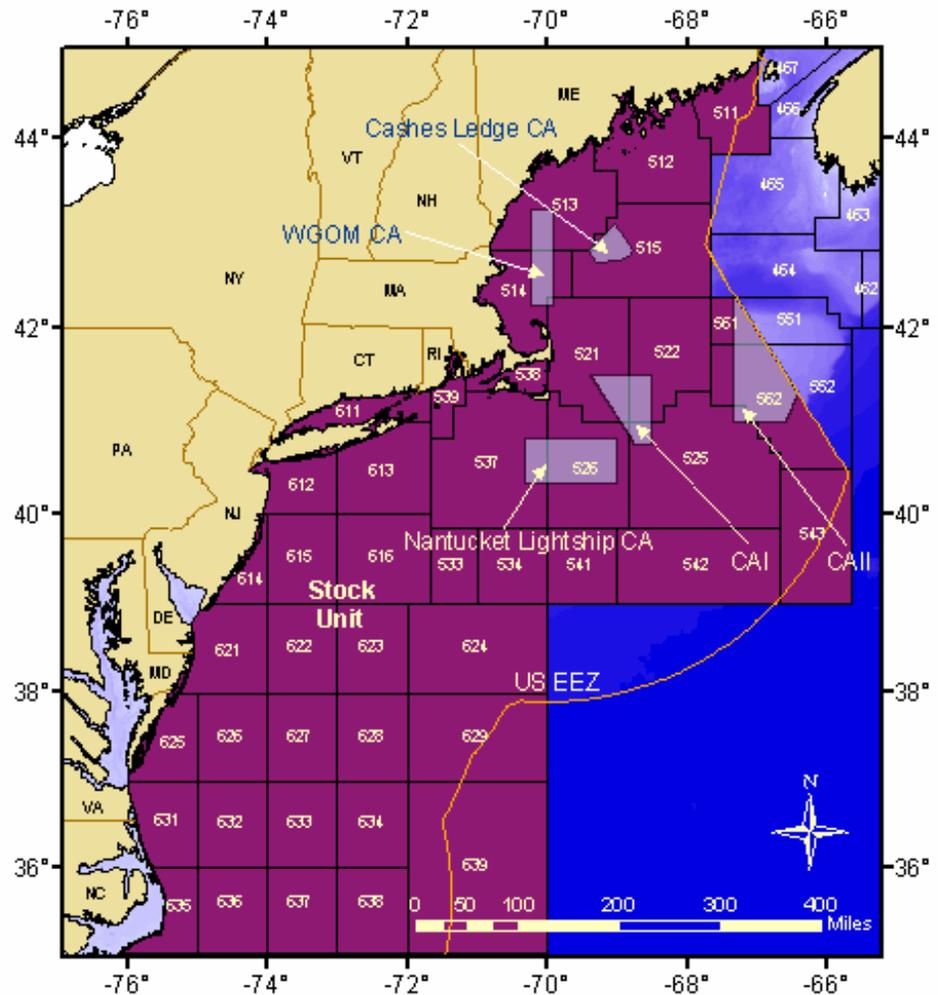
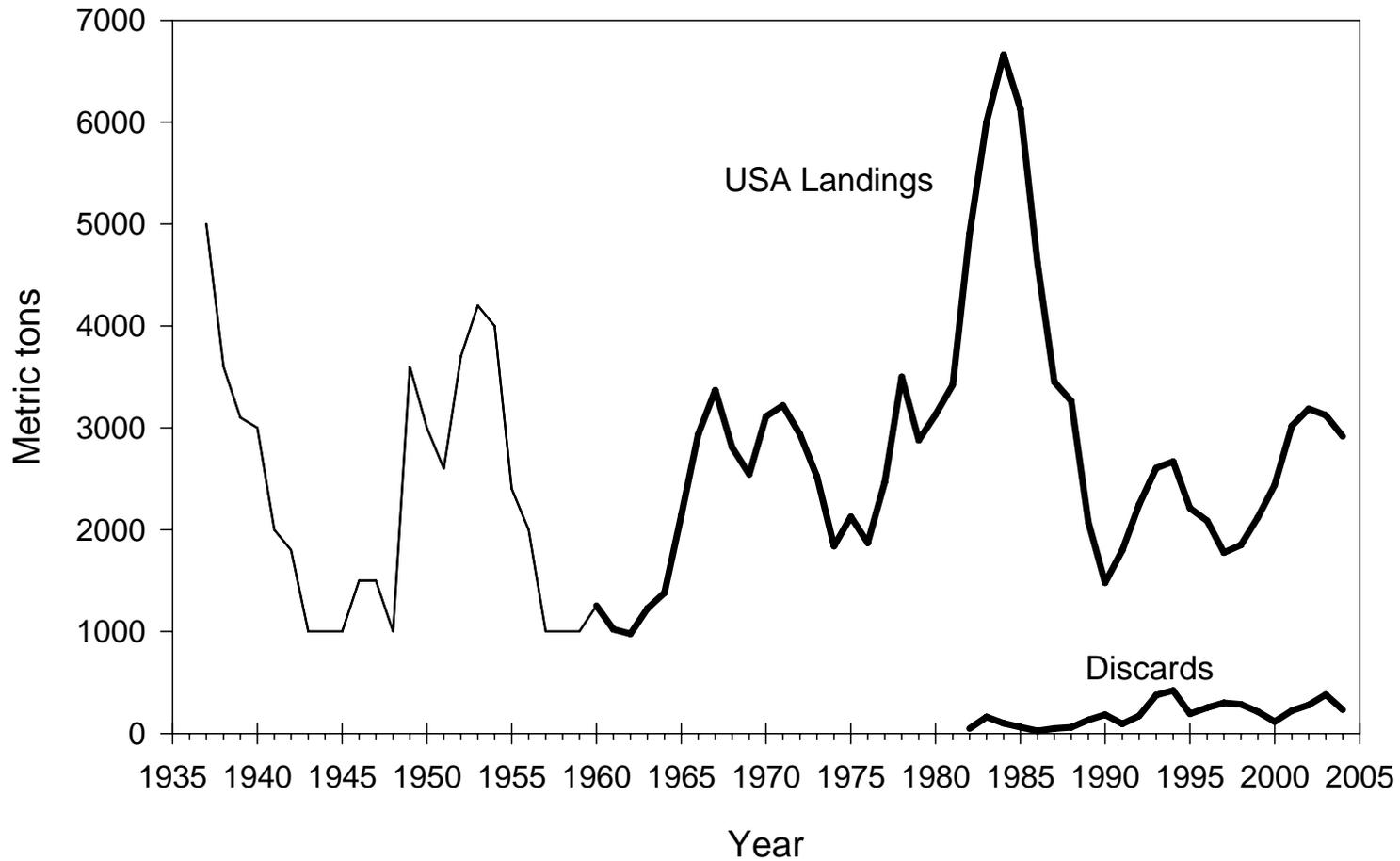


Figure 10.1. Statistical areas used to define the witch flounder stock.

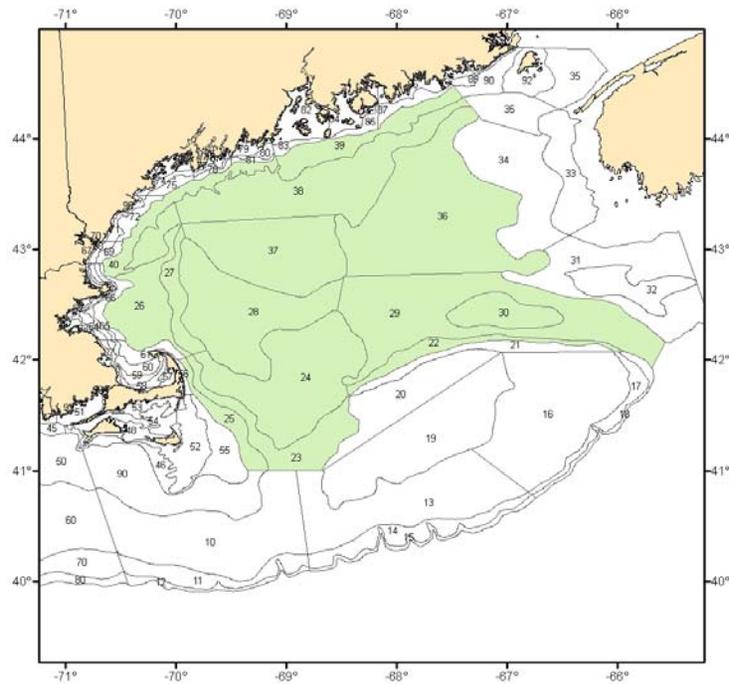
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1937-1959 provisional landings taken from Lange and Lux (1978)

Discards are from large-mesh otter trawl fishery and shrimp trawl fishery

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NEFSC bottom trawl survey
offshore strata 22-30, 36-40

Witch Flounder
NEFSC Spring and Autumn Biomass Indices

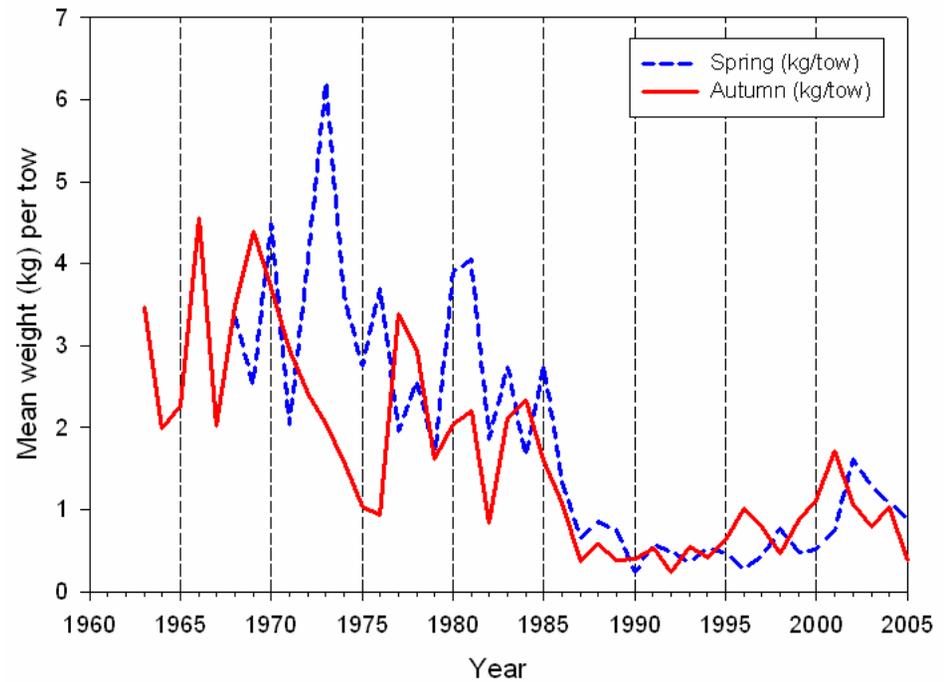


Figure 10.4. Biomass indices (stratified mean weight per tow) of witch flounder from NEFSC research vessel surveys.

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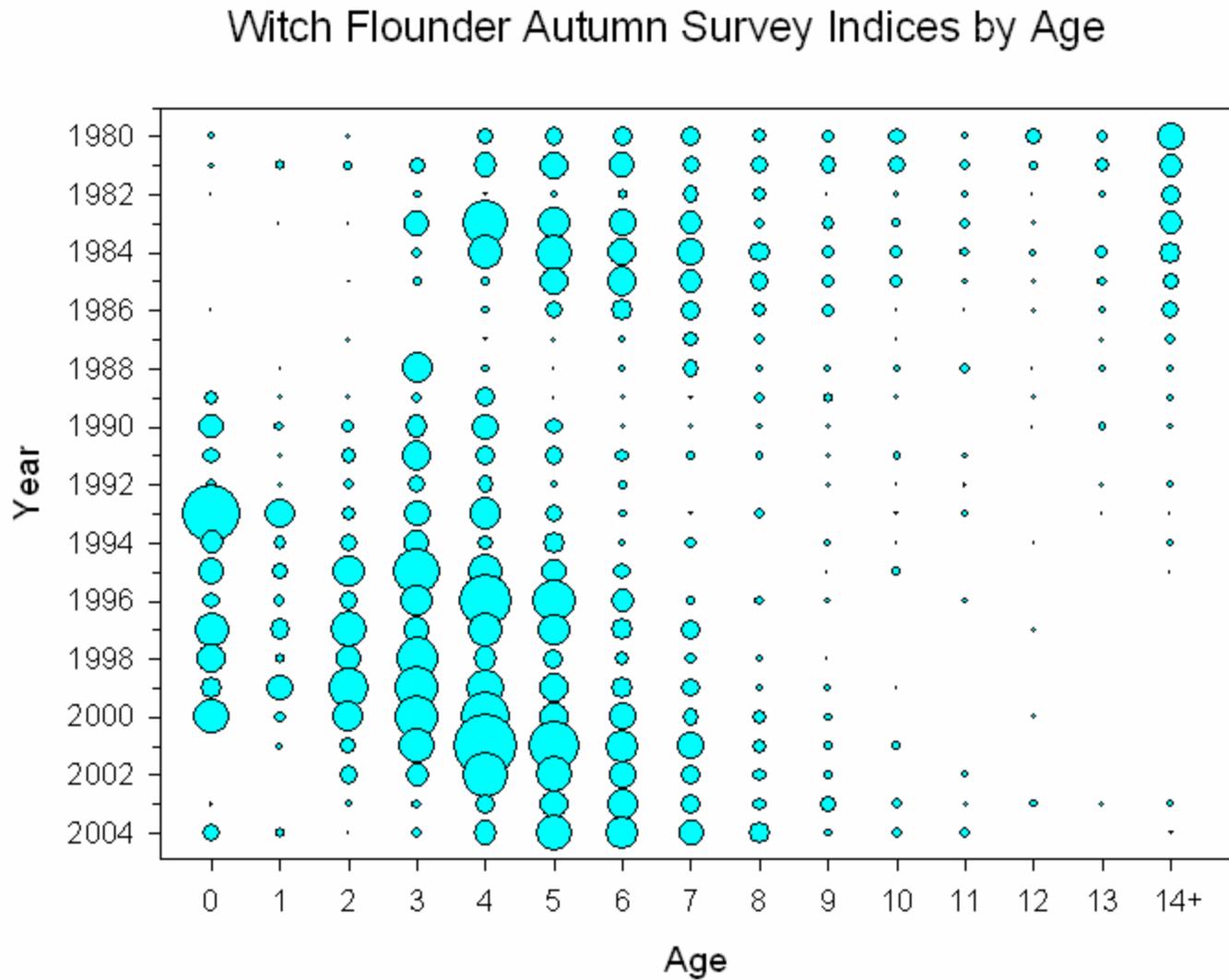


Figure 10.5. Age structure of the witch flounder population, 1980-2004.

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Biological Reference Points & stock status (GARM 2005)

Yield and SSB per Recruit-based Reference Points

$$F_{0.1} = 0.196 \quad F_{\max} = 0.545 \quad F_{40\%} = 0.23$$

MSY-based Reference Points

$$MSY = 4,375 \text{ mt} \quad SSB_{MSY} = 25,248 \text{ mt} \quad F_{MSY} = 0.23$$

Spawning stock biomass has increased since the mid-1990s to 21,175 mt in 2004; the stock is slightly below SSB_{msy} .

Fishing mortality has declined since the mid-1990s to 0.20 in 2004, indicating that F is at or just below all the F reference points.

Witch flounder is not in an overfished condition and overfishing did not occur in 2004.

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Current model approach

Age-based analytic assessments using Virtual Population Analysis have been conducted since 1994 using catch (landings and discards) and NEFSC spring and autumn survey indices from 1982 onward.

In 2003, a benchmark assessment was reviewed (SAW 37). In addition to a VPA, an age-structured forward-projection model (STATCAM) was fit to fishery and survey data during 1937 to 2002, providing an alternative long-term perspective compared to the VPA-based analyses that were limited to 1982 to 2002.

There was general agreement between VPA and STATCAM results between 1982 and 2002. SSB estimates were similar very similar during 1989-1999, however VPA indicated smaller decreases in SSB during 1982 – 1988 and greater increases during 2000-2002. F estimates was similar between models. Recruitment estimates were also similar, however, VPA indicated larger increases in recruitment during the late-1990s.

In 2005, an updated VPA assessment was reviewed at GARM 2005.

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Strengths and weaknesses

VPA has been adequate in capturing the broad-scale stock dynamics of witch flounder.

VPA exhibits a consistent retrospective pattern where F is generally under estimated, SSB is over estimated and recruitment (Age 3) is over estimated.

General data limitations:

Low frequency of samples across some market categories and quarters results in imprecise numbers and mean weights at age during the mid 1990s

Discards prior to 1989 rely on various hindcast methods.

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Feasibility of changing assessment models

Alternative forward-projecting models can be used with existing VPA data sets

These models provide direct estimates of biological reference points and can provide the same input data to NOAA/NFT projection software.

Proposed model for GARM 2008

We propose the VPA model be used until a comparison with the NOAA/NFT ASAP model is evaluated.