Using Fisheries-Dependent Video Data to Examine S. Windowpane Flounder

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Fishery dependent data

- Monitoring
- Quota management
- Catch reporting
  - Discards
- Stock assessments
  - Total biomass
  - Length/age data
- Compliance
- Spatial management
- Research
- Ecological questions, etc...
Electronic Monitoring

- Compliance
- Catch reporting
  - Discards
- Length/age data for stock assessments
- Use of EM to refine management measures
S. Windowpane Flounder

- S. Windowpane are currently a prohibited stock
- Temporary restricted area imposed if discards hit threshold
Electronic Monitoring Program

Electronic Monitoring Program Data
Combined Fishery Dependent and Independent data to examine Windowpane distribution.

- Trawl Data Used in Abundance Estimates
  - Electronic Monitoring Data
  - NEFSC Spring Trawl Survey
  - RI DEM Spring and Monthly Trawl Surveys
  - NEAMAP Spring Trawl Survey
  - Block Island Wind Farm Trawl
- Years included: 2010-2017
- Months included: January - May
Distribution of Windowpane
Abundance in the Context of Management: Reduce Fishing Mortality

- Abundances not greatest in the AM areas: are they effective?
  - Depends on the spatial distribution of effort

- Fishery-dependent data (NOAA Study Fleet Program) indicates effort is high in the AM areas

- So while the AM area may not indicate best-windowpane habitat, it may be effective in reducing discard mortality
Conclusions

• Electronic Monitoring data can be used to convert fishers observations into ‘hard numbers’ for quantitative analyses
• High resolution data prompted a specific industry questions that directly lead to a research project
• Highest density windowpane areas were not in the AM areas
• Discards appear highest in or around the AM areas
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- U.S. Fish and Wildlife State Wildlife Grant Program
- Rhode Island Marine Fisheries Institute
Next Steps

• Include temporal (e.g. months) and habitat variables (depth, temperature) within the spatial – delta GLMM
• Further refine the windowpanes biomass distribution model in VAST
• Extend data stream through 2018 (EM and FI data)
• Discuss findings with industry participants (corroboration of results)
• Compare abundance estimates to VTR discard data
• Present findings to the NEFMC PDT
Windowpane Flounder

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Commercial Fishing Activity

Ground fish VMS data
Research Goals

• Examine the spatial distribution of windowpane flounder
• Examine seasonal changes in abundance
• Estimate selectivity across multiple surveys
• Examine spatio-temporal dynamics in the context of discards
Spatial Delta Generalized Linear Mixed Model

- Linear model - mixed (fixed and random) effects
  - Random effect → multiple surveys
- Delta model
  - Presence/absence
  - Positive tows
- Spatial-Gaussian Markov random fields
  - Smooth field representing unobserved aggregate impact of environmental and biological factors

VAST package (R)
Thorson and Ward 2014, Thorson et al. 2015, Thorson and Haltuch 2018, Thorson 2018