
Indices of Abundance from the DNR Coastal Bays Trawl and Seine Survey

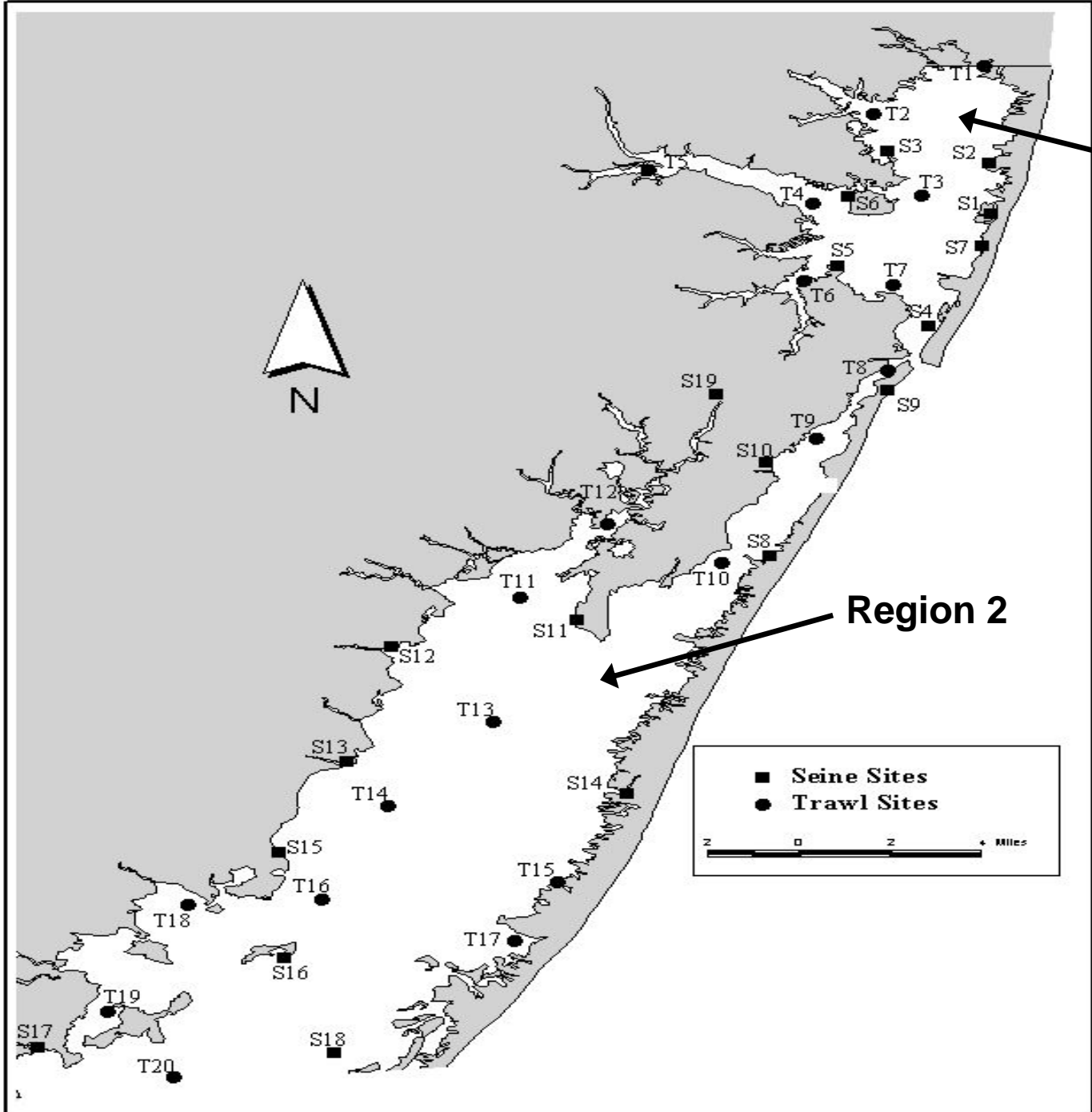
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The MCBTS Survey

- Monitors juvenile fish populations
 - Data from 1972, but standardized in 1989
 - Pre-standardized data no longer used due to extensive changes in methods
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The Changes

- Trawl was standardized in 1989
 - Seine was fully standardized in 1993
 - Before standardization
 - Less frequent sampling
 - Fewer sites sampled
 - Variable lengths of trawls
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Region 1

Region 2

The Problems

- Indices of abundance track changes in abundance
 - Catches in survey only proportional if catchability and effort remain constant
 - If methods and sites are changed over time, can the older data still make useful indices of abundance?
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Objectives

- Develop indices of abundance that will account for changes in the survey over time
 - Compare trawl and seine indices of abundance.
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The Species

- 5 species, representing a broad range of the populations in the bays
 - **Atlantic menhaden (*Brevoortia tyrannus*)**
 - **Summer Flounder (*Paralichthys dentatus*)**
 - **Spot (*Leiostomus xanthurus*)**
 - Bluefish (*Pomatomus saltatrix*)*
 - Weakfish (*Cynoscion regalis*)*
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The Models

- One model for each species and gear type
- I used the equation:

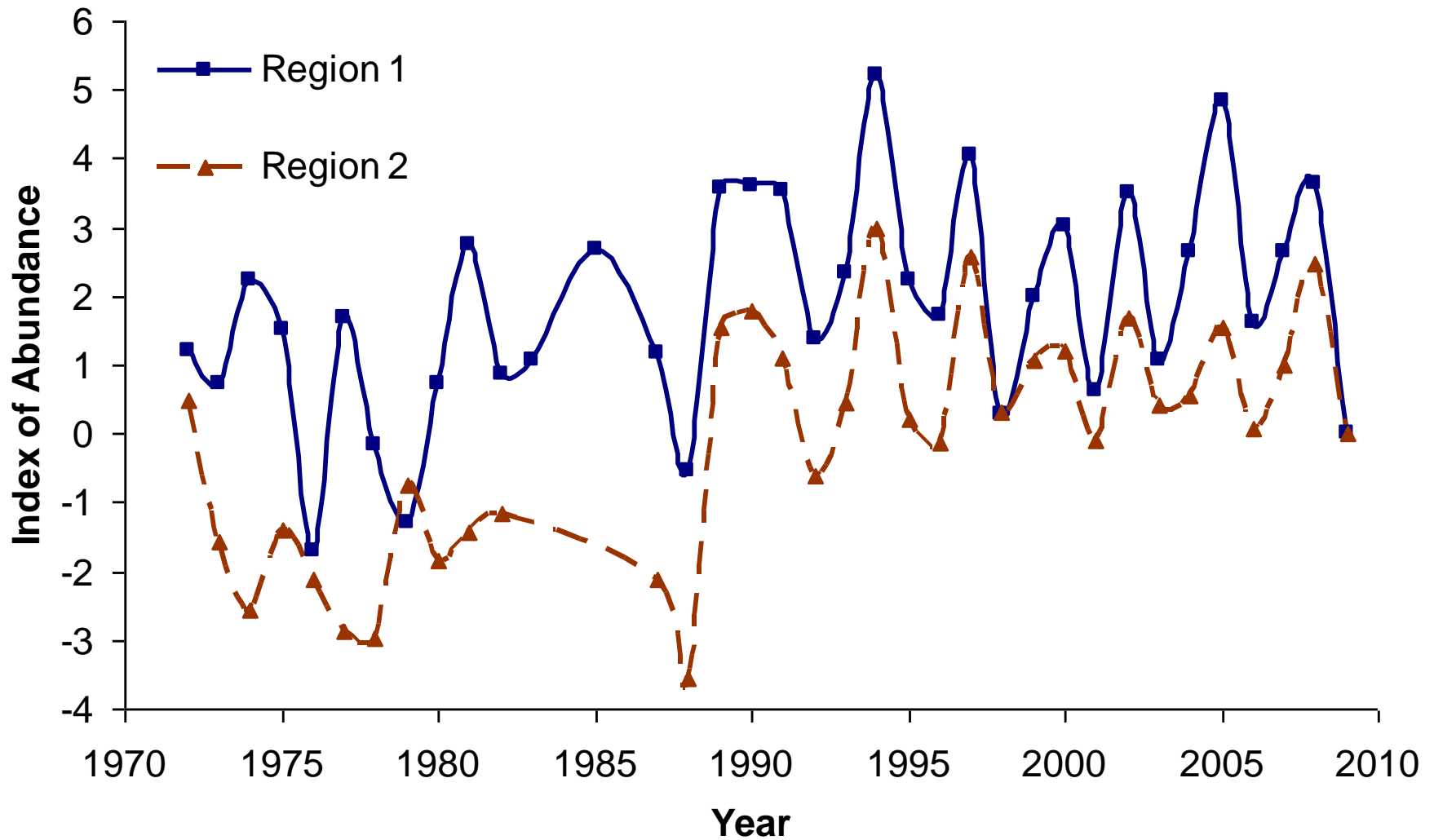
$$\log(E) = \beta_0 + \beta_{Year} + \beta_{Site} + \beta_{Month} + \beta_{Region*Year} + \beta_3(Effort)$$

- Year, site, region, month, and effort are main effects
 - Negative binomial distribution
 - One unit of effort in trawl models equal to 10,000 sq. yards of ground covered
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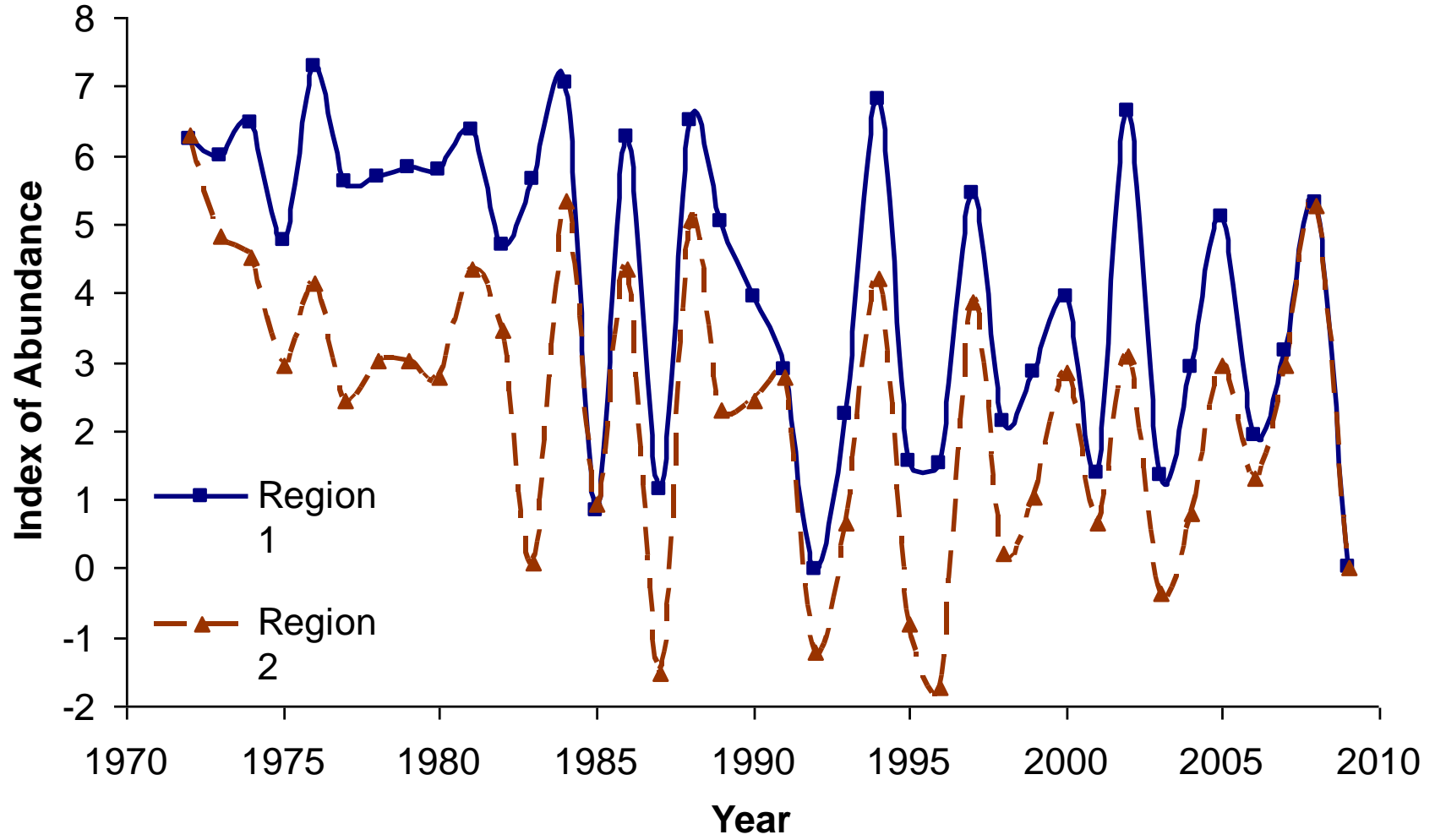
Data Included in Models

- The seine models do not include effort
 - Did not include seine site 19 (aka the drainage ditch)
 - Years and sites where no individuals were caught were excluded
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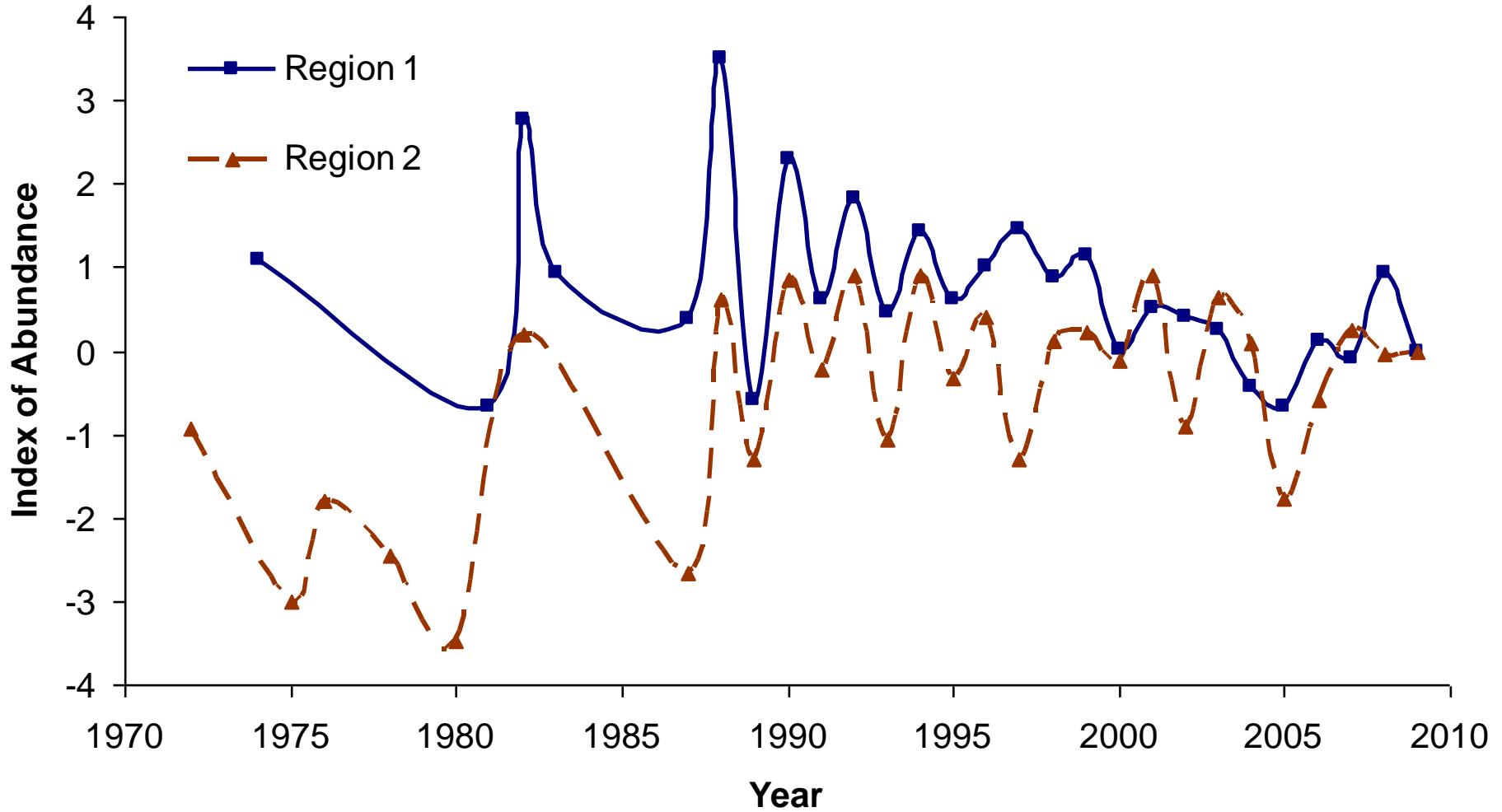
Spot Seine by Region



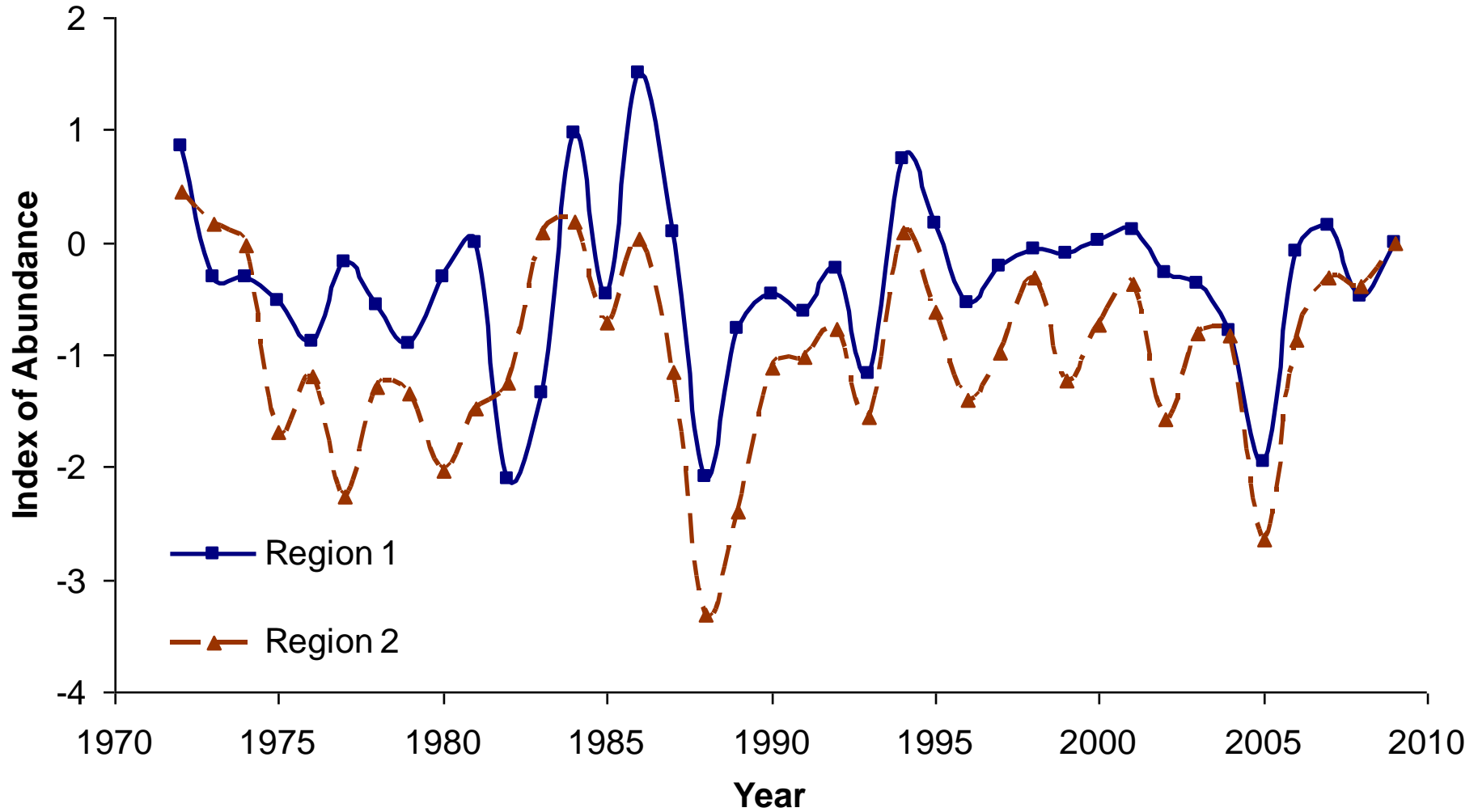
Spot Trawl by Region



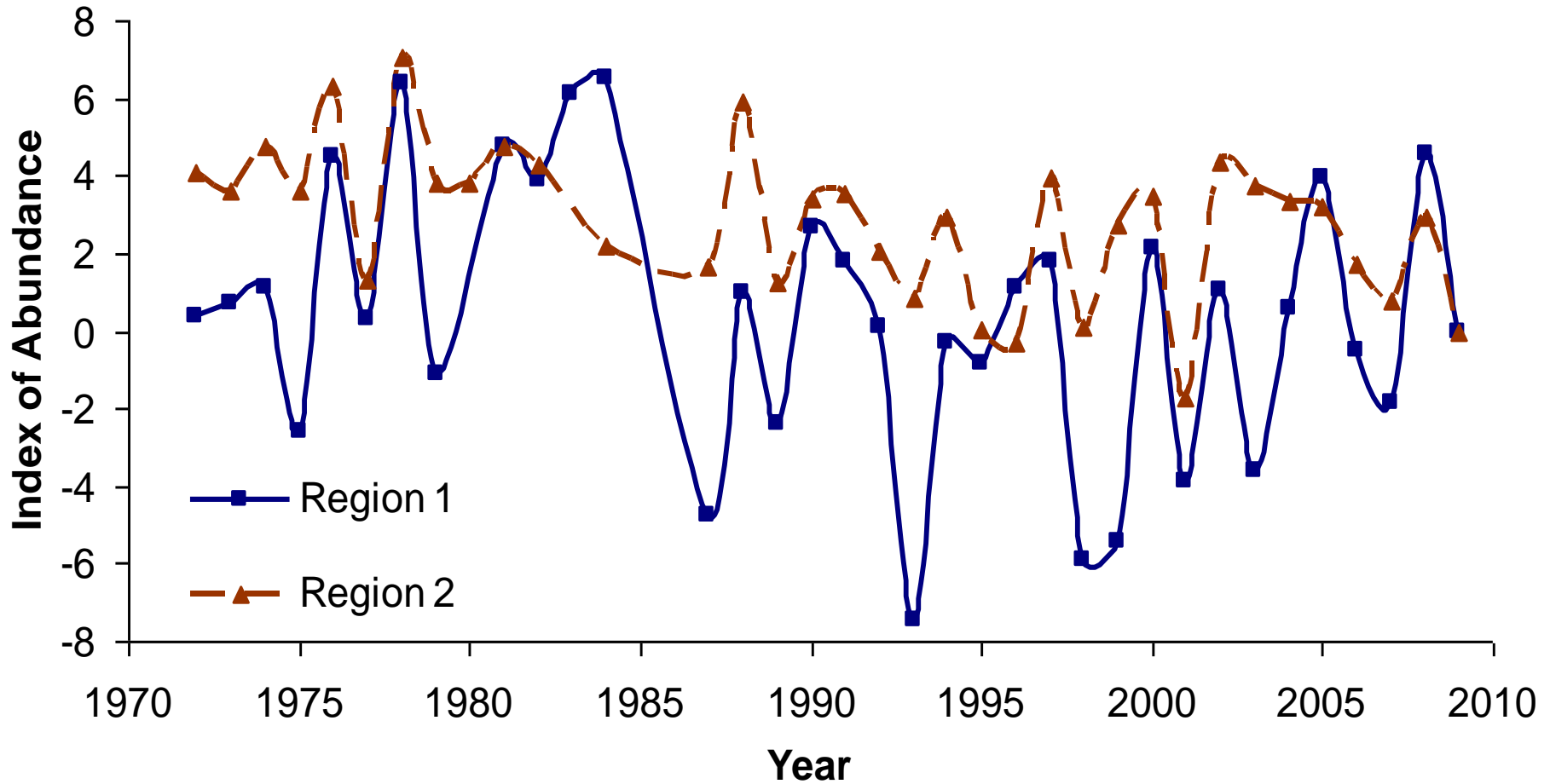
Flounder Seine by Region



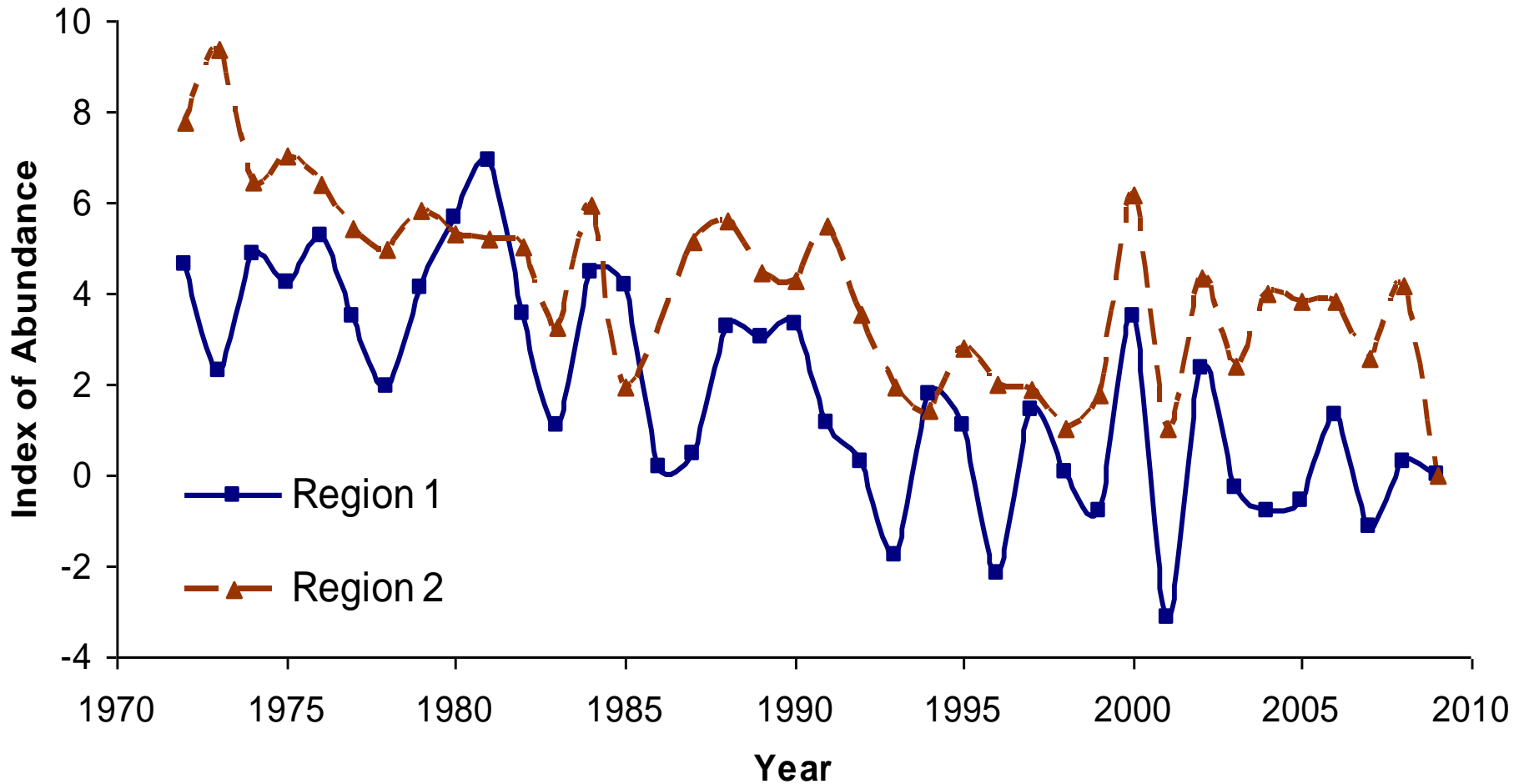
Flounder Trawl by Region



Menhaden Seine by Region



Menhaden Trawl by Region



Gear Comparisons

- We compared the trawl and seine indices of abundance for each species

Flounder		Menhaden		Spot	
Region 1	Region 2	Region 1	Region 2	Region 1	Region 2
-0.320	0.366	0.471	0.597	0.037	-0.031

Conclusions

- These analyses allow us to compare current years to any baseline
 - Analyses recognize changes in survey design
 - Method requires data-rich species
 - Most species show inconsistent trends in trawl and seine indices
 - Gear type used should depend on species behavior and preferences
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Acknowledgments

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 - Lora Harris and Bob Murphy for the “cleaned” dataset
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Size Differences

