

# Species-specific Analyses of Shark Catch Data from the Hawaii-based Longline Fishery, 1995–2006

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# Background (1)

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- **Kitty Simonds (Chair, WPRFMC) wrote to Dr. Sam Pooley (Science Director, PIFSC) in January 2006 soliciting sharks research in this fishery**
- **Project requiring species-specific analyses of sharks catch data (observer and logbook) funded by PFRP, October 2006**
- **Management decisions during study period (1995 – 2006) affected magnitude, composition, and disposition of sharks catch**

## Background (2)

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- **Observer catch data: Sharks, 1995 – 2006**
  - ca. 16% of the catch of all fishes
  - ca. 31% of the fish bycatch
- **Logbook catch data: Sharks, 1995 – 2006**
  - ca. 18% of the catch of all fishes
- **Analytical status: Species-specific analyses limited to blue shark**

# Project Objectives

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- **Assess observer data accuracy regarding species identifications and catch sizes**
- **Estimate size and composition of shark catches**
- **Estimate survival of shark bycatch and disposition of shark catches**
- **Compute standardized CPUE series for major species and assess logbook data accuracy**

# Progress toward Objectives

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- **Observer data accuracy: evaluations completed**
  - **Direct evidence (e.g., photograph, observer notes, sales records) used when possible**
  - **Circumstantial evidence (e.g., distributional information, observer experience) used as necessary**
- **Estimation of size and composition of observed shark catches: completed**
- **Estimation of survival of shark bycatch and disposition of shark catches: completed**

# Observer Data Accuracy

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- **Observer experience principal factor affecting catch data accuracy**
  - **Misidentifications by newly hired observers inflate number of rare and uncommon species**
  - **Newly hired observers sometimes undercounted common species (e.g., blue shark)**

# Species of Major Interest: Requiem Sharks

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Blue shark  
(*Prionace glauca*)



# Species of Major Interest : Requiem Sharks

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Silky shark

(*Carcharhinus falciformis*)



Oceanic whitetip shark

(*Carcharhinus longimanus*)



# Species of Major Interest: Thresher Sharks

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Bigeye thresher

*(Alopias superciliosus)*



Pelagic thresher

*(Alopias pelagicus)*



# Species of Major Interest: Makos

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Shortfin mako  
(*Isurus oxyrinchus*)



Longfin mako  
(*Isurus paucus*)



# **Shark Catches: Major Species**

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- Blue shark: 84.5%; 6.0/set; 4.6/1000 hooks**
- Bigeye thresher shark: 3.8%; 0.3/set; 0.2/1000 hooks**
- Oceanic whitetip shark: 3.1%; 0.2/set; 0.2/1000 hooks**
- Shortfin mako: 2.6%; 0.2/set; 0.1/1000 hooks**
- Silky shark: 1.5%; 0.1/set; < 0.1/1000 hooks**
- Crocodile shark: 1.0%; < 0.1/set; < 0.1/1000 hooks**

# Shark Catch: Set-type Effects

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## Blue shark

- 91.9%; 11.6/set; 14.8/1000 hooks (Shallow sets)
- 81.3%; 4.9/set; 2.5/1000 hooks (Deep sets)

## Oceanic whitetip shark

- 1.5%; 0.2/set; 0.2/1000 hooks (Shallow sets)
- 3.5%; 0.2/set; 0.1/1000 hooks (Deep sets)

## Shortfin mako

- 4.0%; 0.5/set; 0.6/1000 hooks (Shallow sets)
- 2.2%; 0.1/set; 0.1/1000 hooks (Deep sets)

# Shark Catch: Set-type Effects (cont'd.)

## Bigeye thresher shark

- 0.3%; < 0.1/set; < 0.1/1000 hooks (Shallow sets)  
5.8%; 0.3/set; 0.2/1000 hooks (Deep sets)

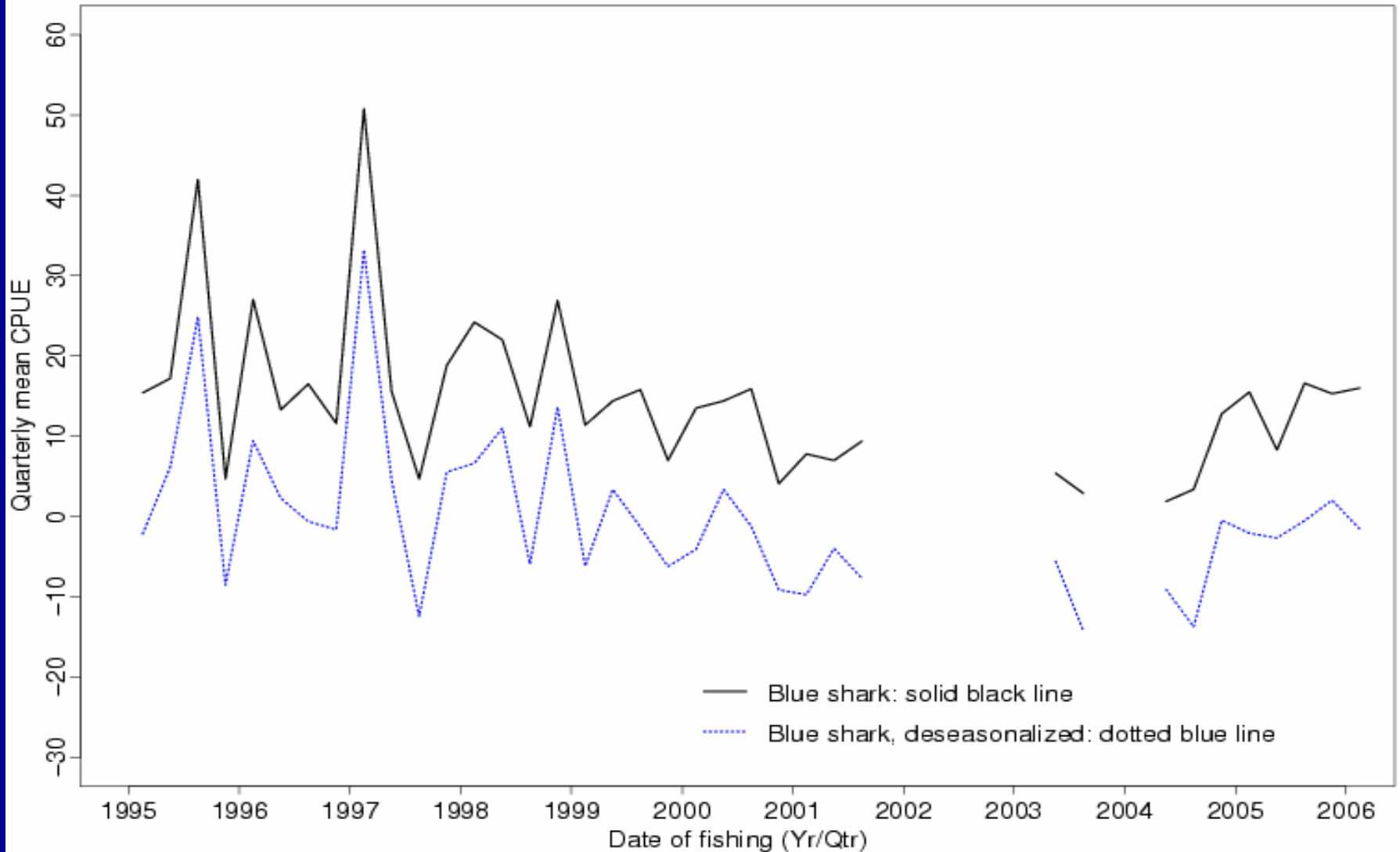
## Silky shark

- 0.1%; < 0.1/set; < 0.1/1000 hooks (Shallow sets)  
2.4%; 0.1/set; 0.1/1000 hooks (Deep sets)

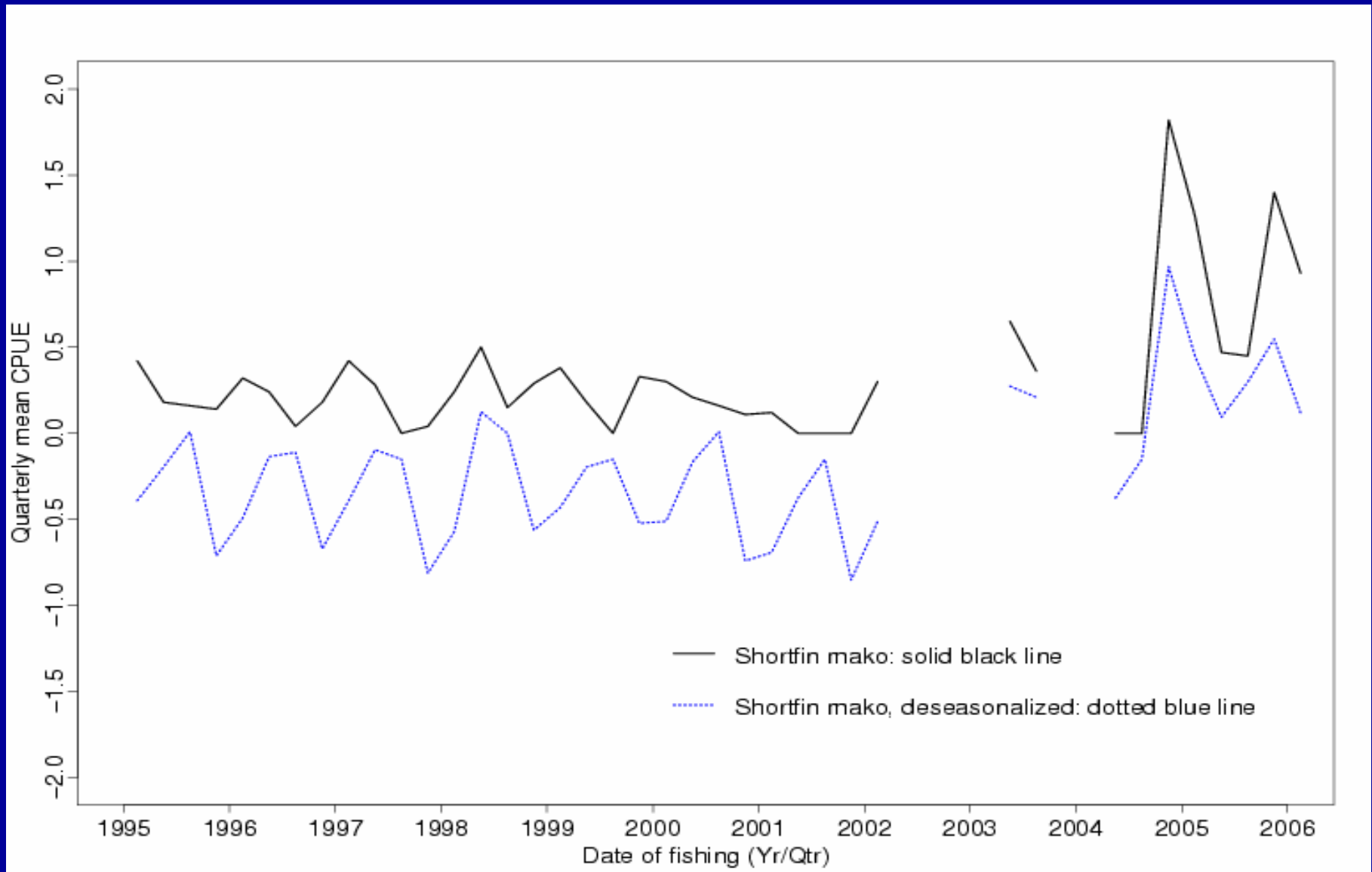
## Crocodile shark

- 0.1%; < 0.1/set; < 0.1/1000 hooks (Shallow sets)
- 1.4%; 0.1/set; < 0.1/1000 hooks (Deep sets)

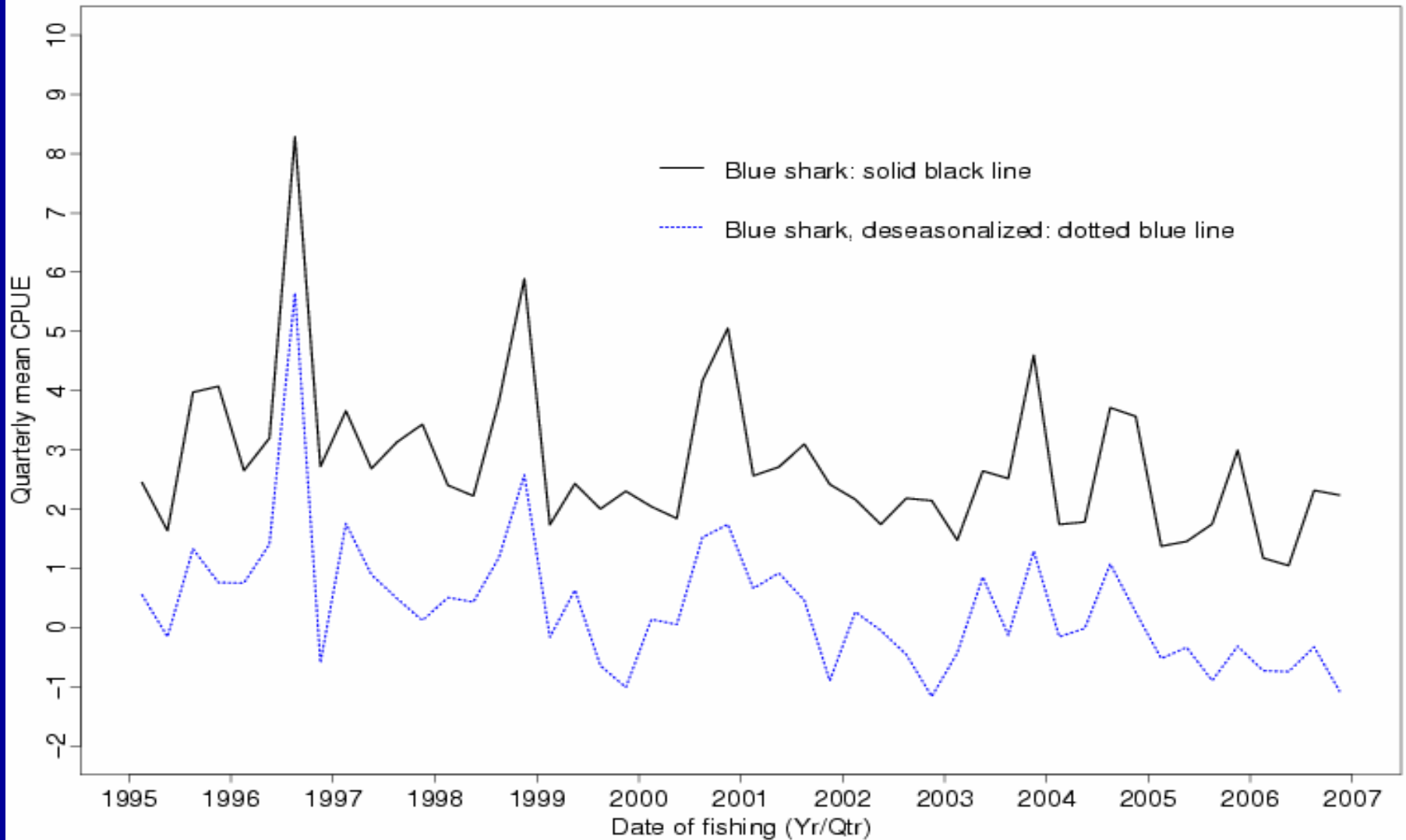
# Blue shark CPUE: Observed Shallow Sets



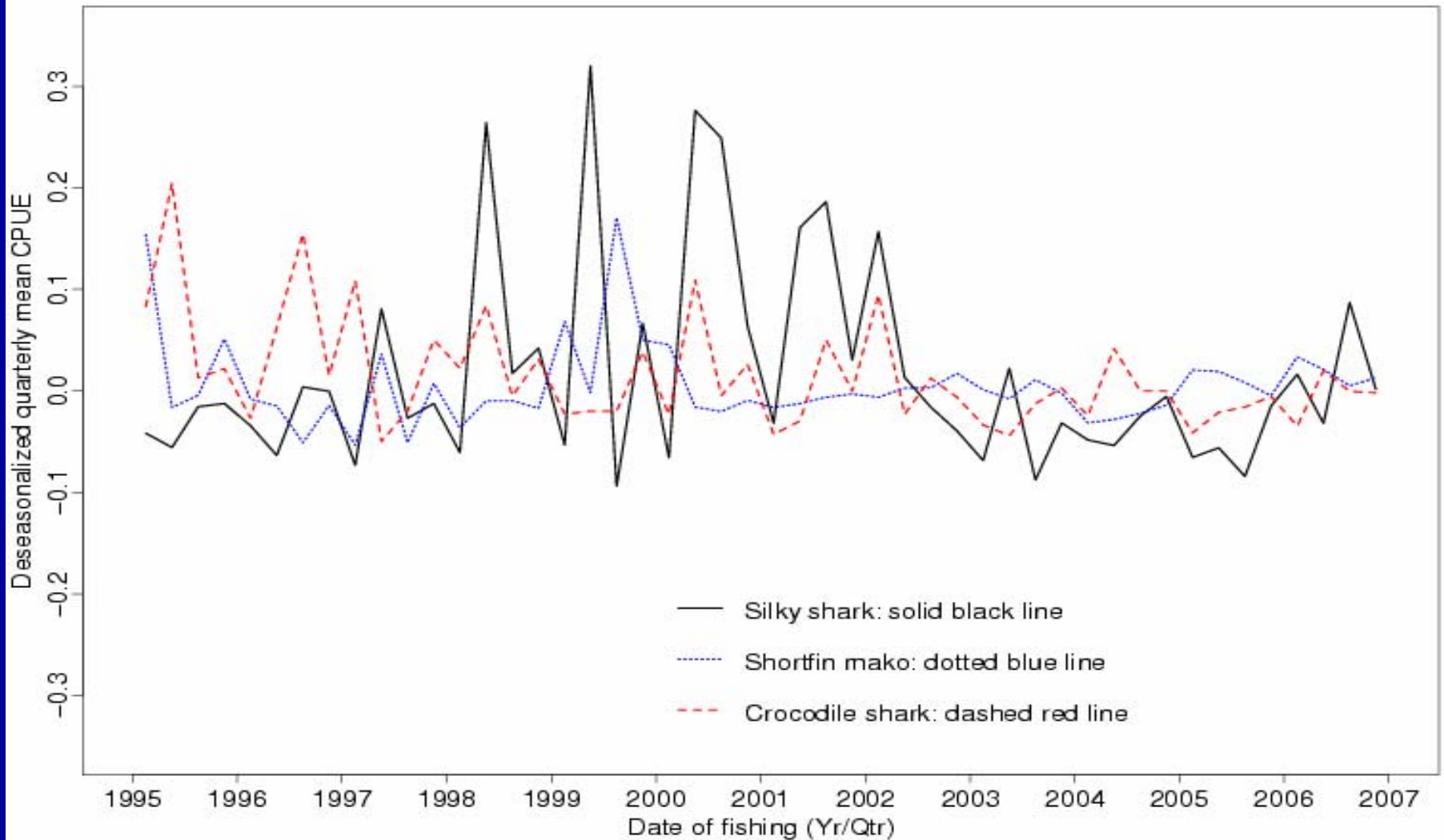
# Shortfin Mako CPUE: Observed Shallow Sets



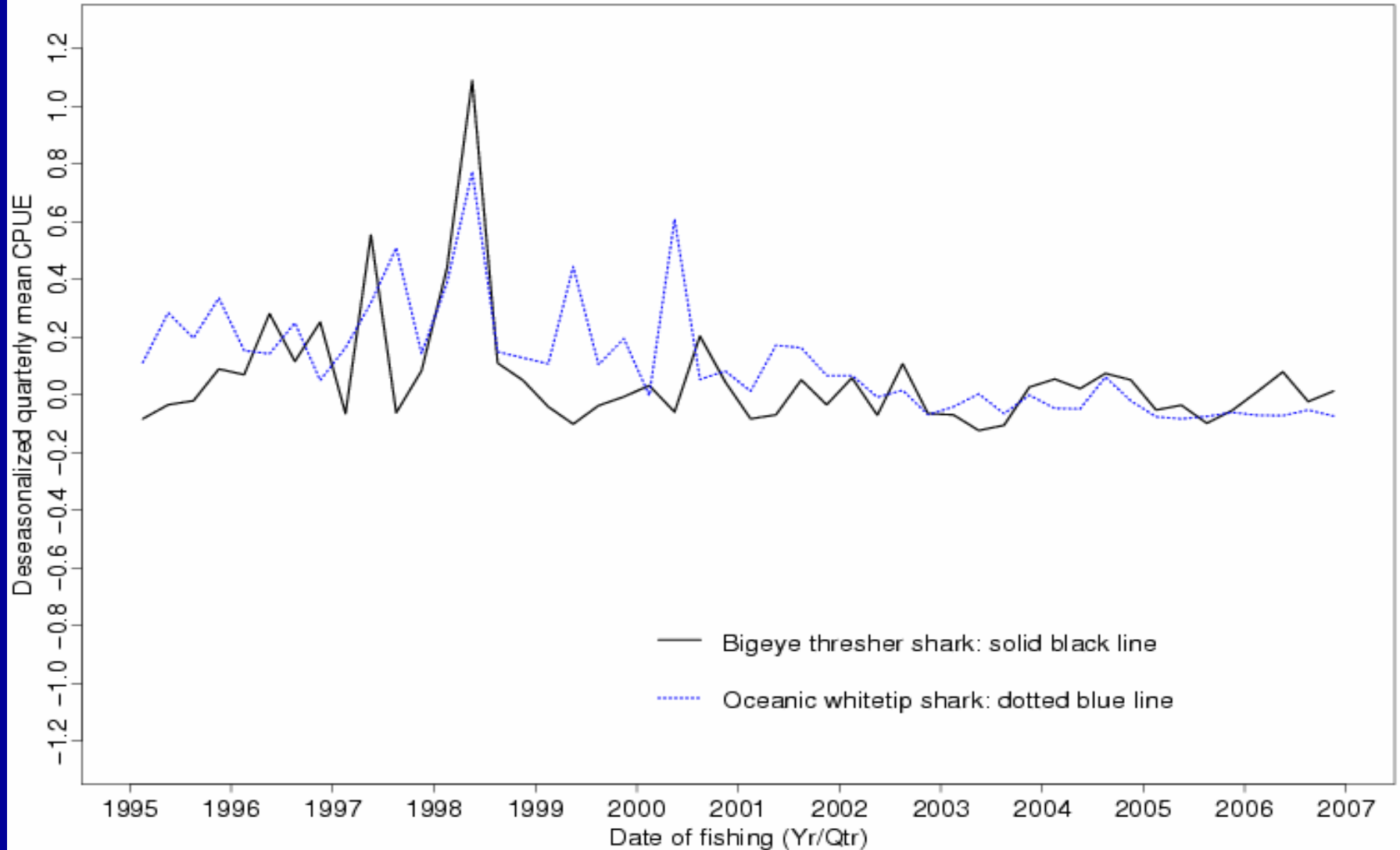
# Blue shark CPUE: Observed Deep Sets



# Shark CPUE: Observed Deep Sets



# Shark CPUE: Observed Deep Sets



# Shark Bycatch Survival: Set-type Effects

	<u>Shallow Sets</u>	<u>Deep Sets</u>
• Blue shark	93.8%	92.4%
• Shortfin mako	58.9%	73.8%
• Oceanic whitetip shark	92.3%	65.6%
• Silky shark	( $N < 50$ )	76.7%
• Bigeye thresher shark	( $N < 50$ )	72.9%
• Crocodile shark	( $N < 50$ )	73.9%

# Acknowledgments

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