

# Analyzing Oceanographic Data

Shauna Acuna

# Atlantic Menhaden

*Brevoortia tyrannus*



# Who Cares About Menhaden?

- Largest landings (catch) by volume along the U.S. East Coast (second largest catch in the United States)
- Filterers of ocean and estuary waters
- Food for larger fish, birds, and whales and dolphins
- Rich in omega-3 fatty acids
- Named munnawhatteaug, which means fertilizer, by pre-colonial native Americans

# Working with Menhaden Data

The National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NOAA/NMFS) provides fish-catch data at <http://www.st.nmfs.noaa.gov/commercial-fisheries/commercial-landings/monthly-landings/> that look like this.

You Asked For the Following:

Year : From:2000 To: 2011

Month : YEAR BY MONTH

State : Virginia

Species : menhaden

"Year","Month","Species","Metric Tons","Pounds","\$"

"2000","Jan","MENHADEN","	9.9","	21,840","	2,184"
"2002","Jan","MENHADEN","	1.1","	2,454","	207"
"2004","Jan","MENHADEN","	0.0","	29","	4"
"2005","Jan","MENHADEN","	0.1","	122","	15"
"2006","Jan","MENHADEN","	1.5","	3,243","	389"
"2007","Jan","MENHADEN","	11.0","	24,268","	1,765"
"2008","Jan","MENHADEN","	9.7","	21,466","	2,131"
"2009","Jan","MENHADEN","	5.0","	10,925","	1,147"
"2010","Jan","MENHADEN","	1.6","	3,435","	336"
"2011","Jan","MENHADEN","	0.5","	1,000","	80"

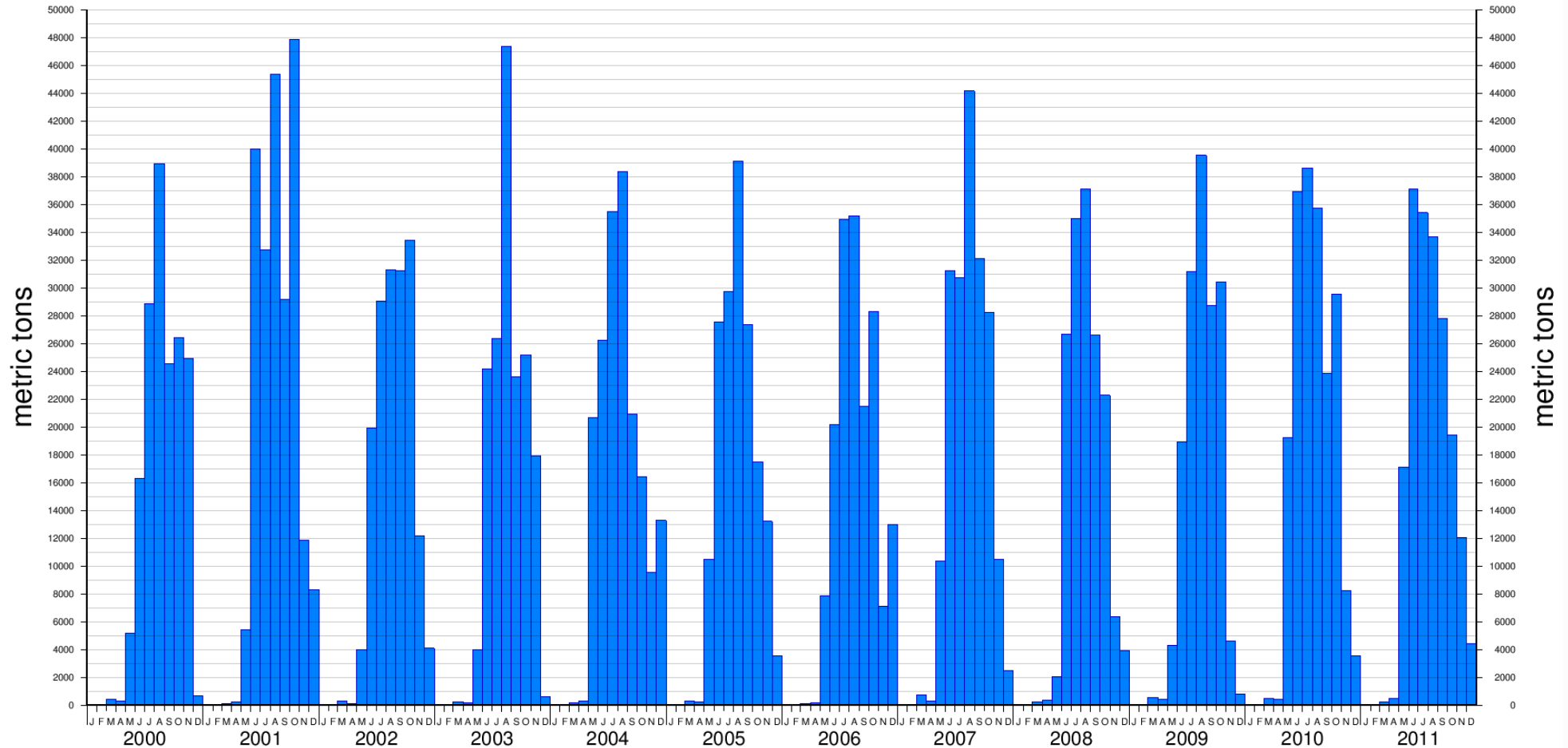
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We took those data and plotted them...

Commercial Menhaden Landings in Virginia



... and from the plot certain patterns become visible.

What patterns do you see?

What might cause those patterns?

# Factors affecting Menhaden catches

- Migration patterns
- Schooling behavior
- Legislation (legal fishing season)
- Weather
- Water quality
- Equipment failures
- Overfishing

For more information on menhaden ecology in the Chesapeake Bay see <http://www.chesbay.org/forageFish/menhaden.asp> .

# Conclusion



Fisherman use aircraft to find the menhaden schools that they harvest because it's easier to spot them from above than from the deck of a ship.

My mentor uses spacecraft to spot phytoplankton (*a.k.a. Menhaden food*) from space for the same reason.

I will be doing this too over the summer.

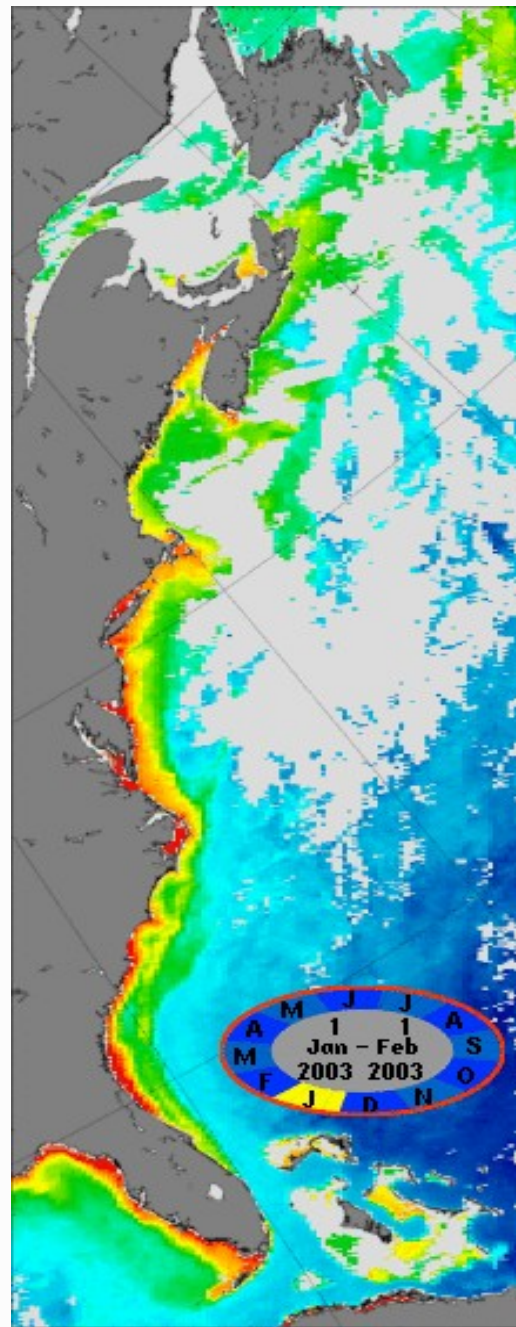


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Aqua MODIS







Chlorophyll  $a$  ( $\text{mg} / \text{m}^3$ )

