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# Understanding oyster growth in the Damariscotta River using a coupled modeling approach

Katie Coupland

Damariscotta River Meeting

April 1st, 2016

# What is our goal for this project?

- Develop a tool that can be used for:
  - Selecting new lease sites based on where oysters will grow best, high resolution (10m)
  - Determining the ecological carrying capacity of the river.
  - Understand how the river is changing currently and into the future, how will that affect growth?
    - This can be used to inform Department of Marine Resources on how many lease sites can go in one area now and into the future

# Why should you care?

Oysters are tasty!

Increase jobs through farming, distribution, tourism increase

Further solidify our reputation as an incredible place to grow oysters!

# Hydrodynamic – Biogeochemical Modeling

## Hydrodynamic

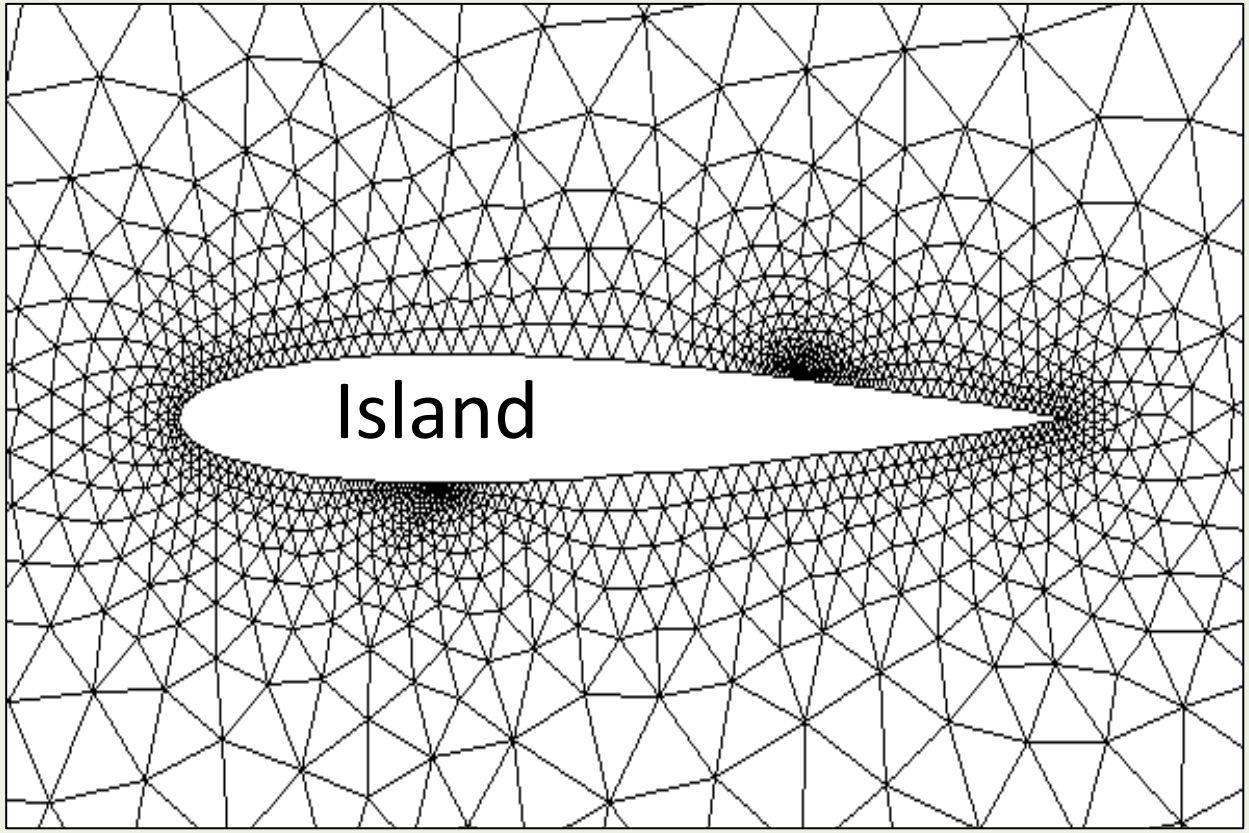
- How the waters moves, the physics
  - Tides
  - Wind
  - Temperature
  - Salinity

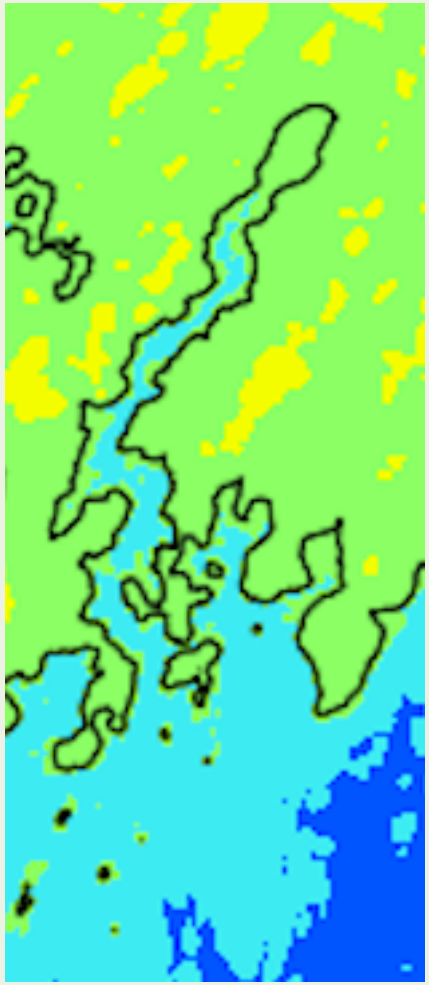
## Biogeochemical

- The biology, associated chemistry and geology
  - How much algae is growing?
  - What is the nutrient concentration
    - How fast are the nutrients being used and released?
  - Light
  - Filtration rates (temp dependent)
  - Etc..

Oyster Growth

# Unstructured Grid from Bathymetry

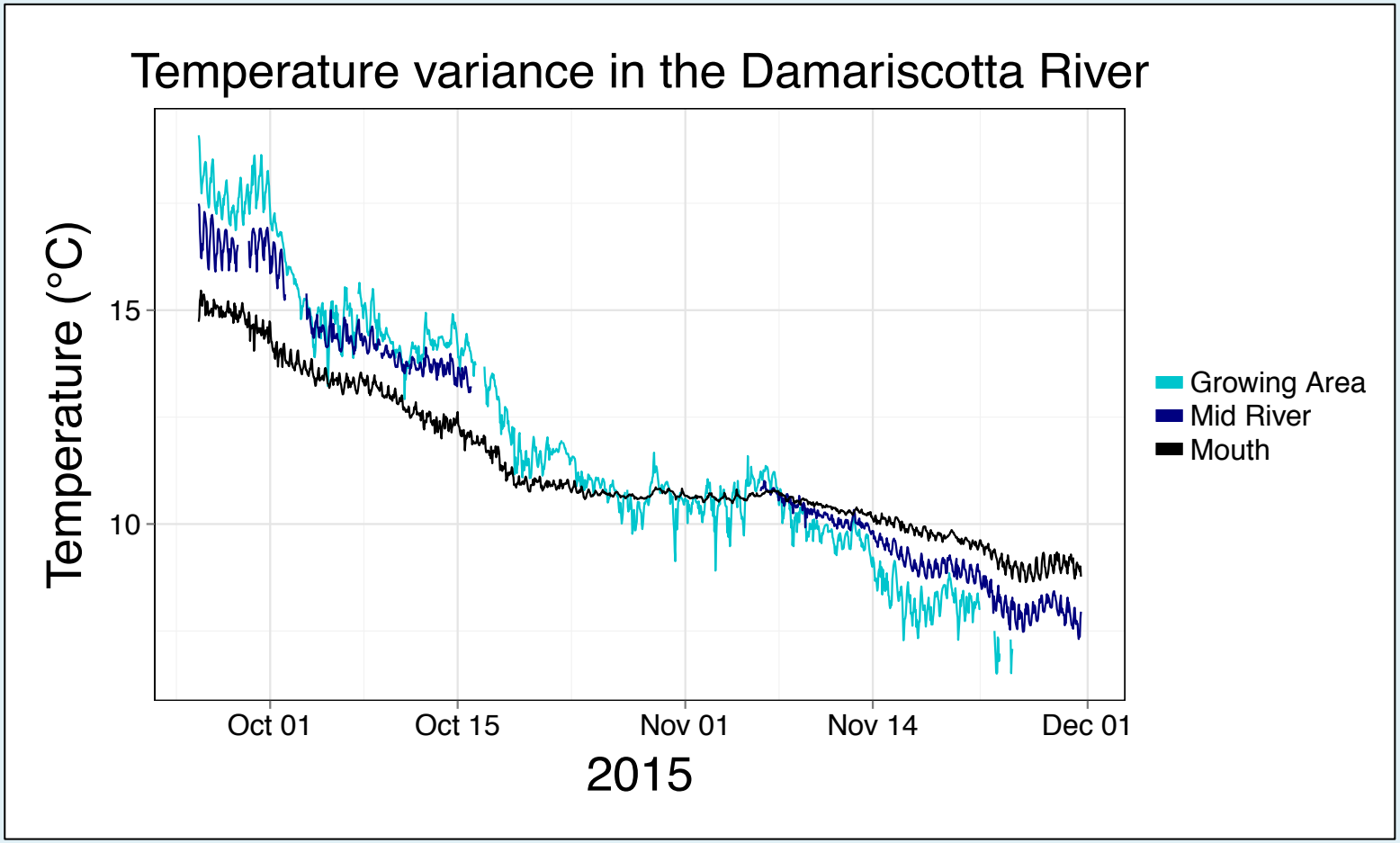


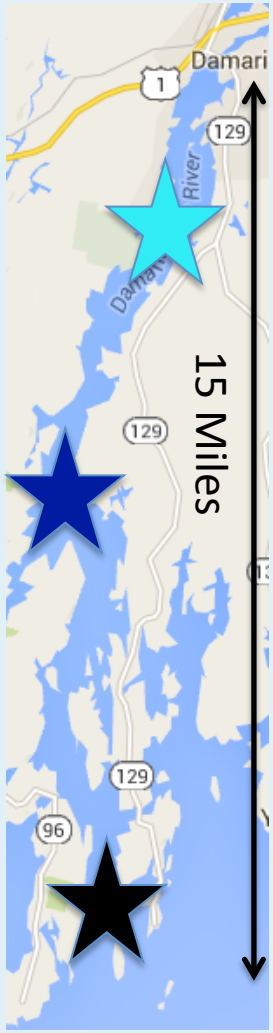



Damariscotta River Bathymetry courtesy of Emily Chandler and Joe Kelley

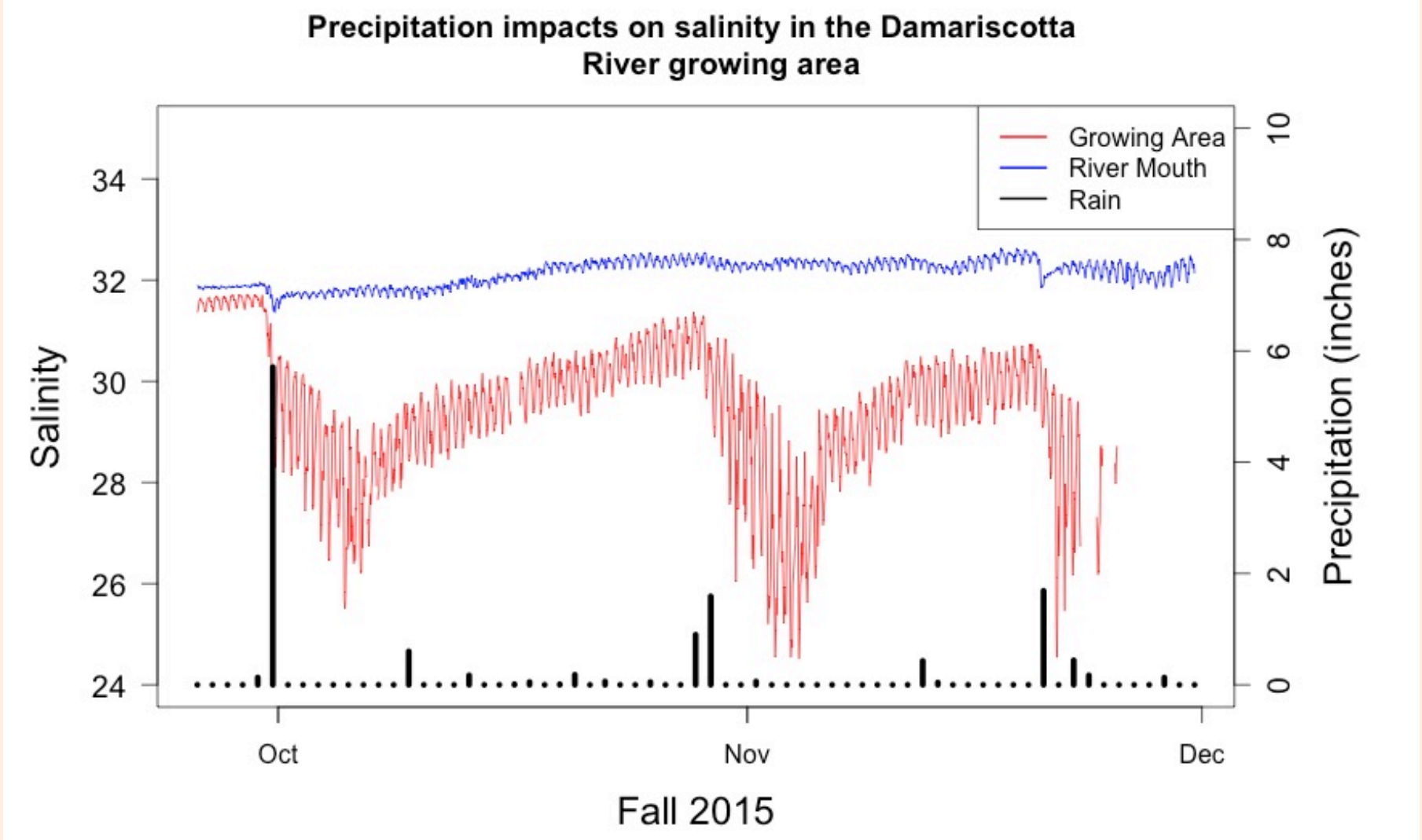
# Fall 2015 Buoy Data

## Temperature

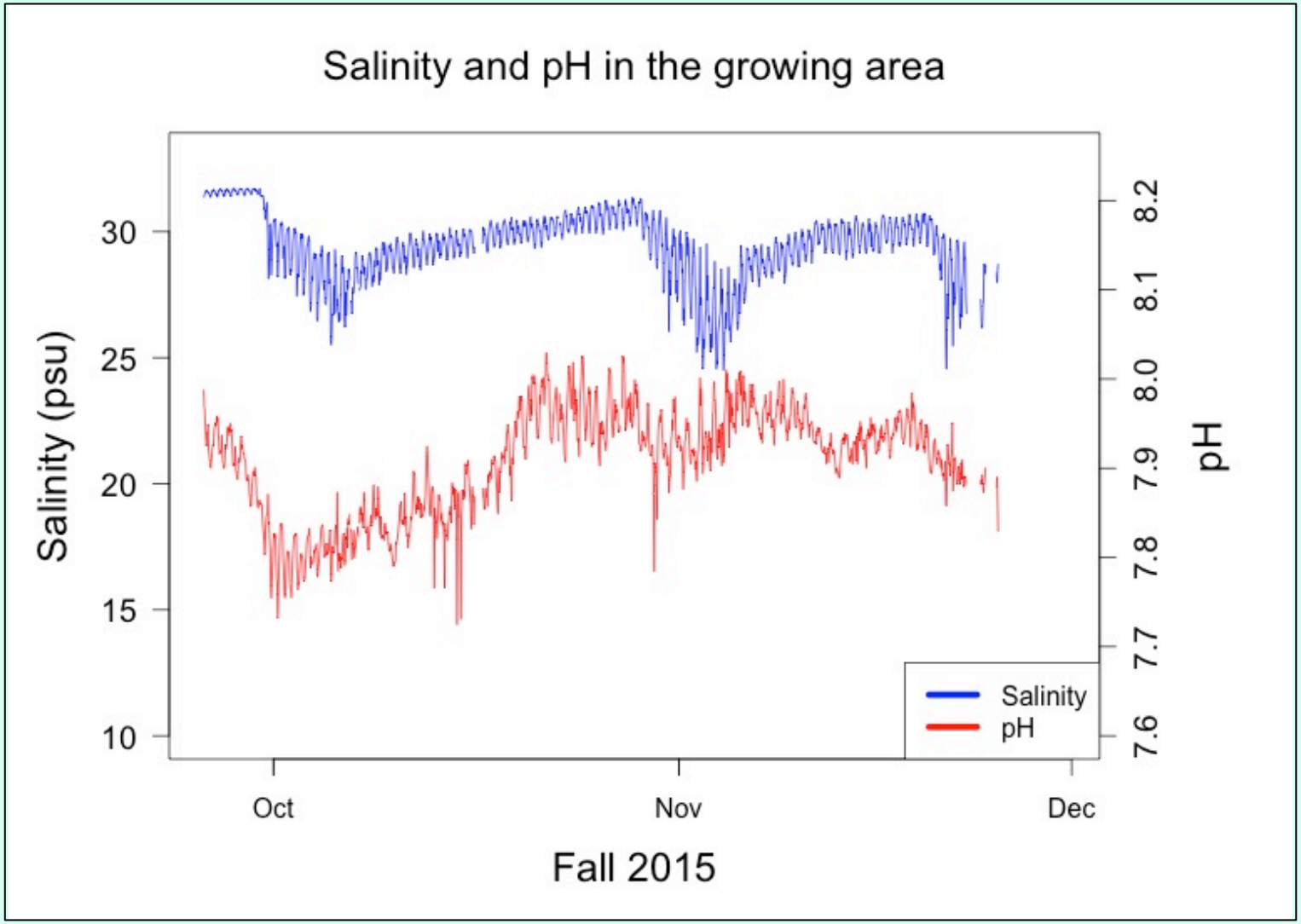


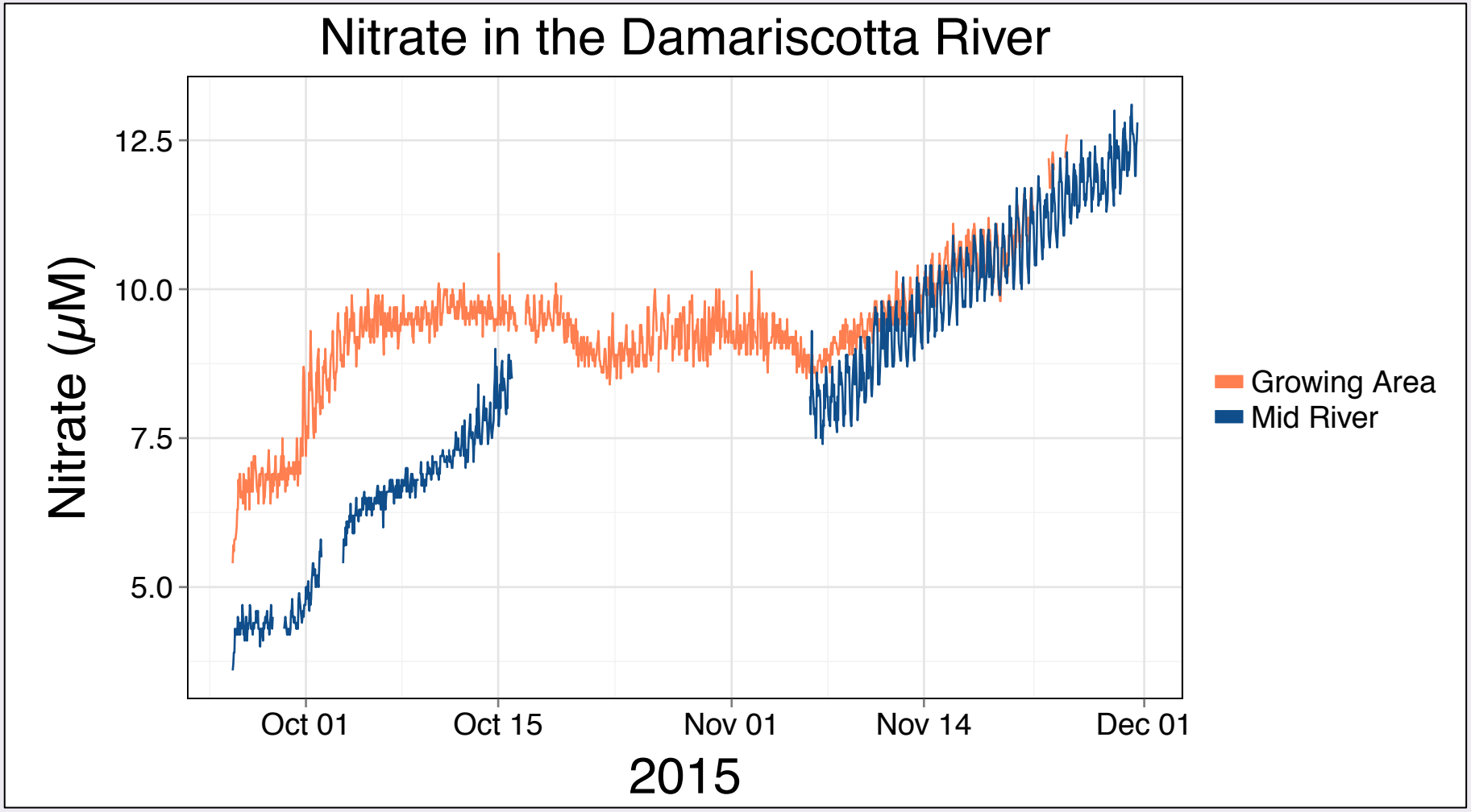
# Increasing Rain?



# How will this impact pH?



# How do nutrients differ between parts of the River?



# The take away

Building this model, collecting buoy and water sample data will allow us to:

- Understand how the river works
- Estimate how many oysters we can grow now and in the future
- Pick high growth sites in the River for possible future leases

Has to potential to increase:

- Jobs
- Tourism

And expand an incredible, local product!

# Thank you!

## Questions?

Follow us on Twitter for the most up to date findings of our research!

@BradyBunchDMC
#DamData