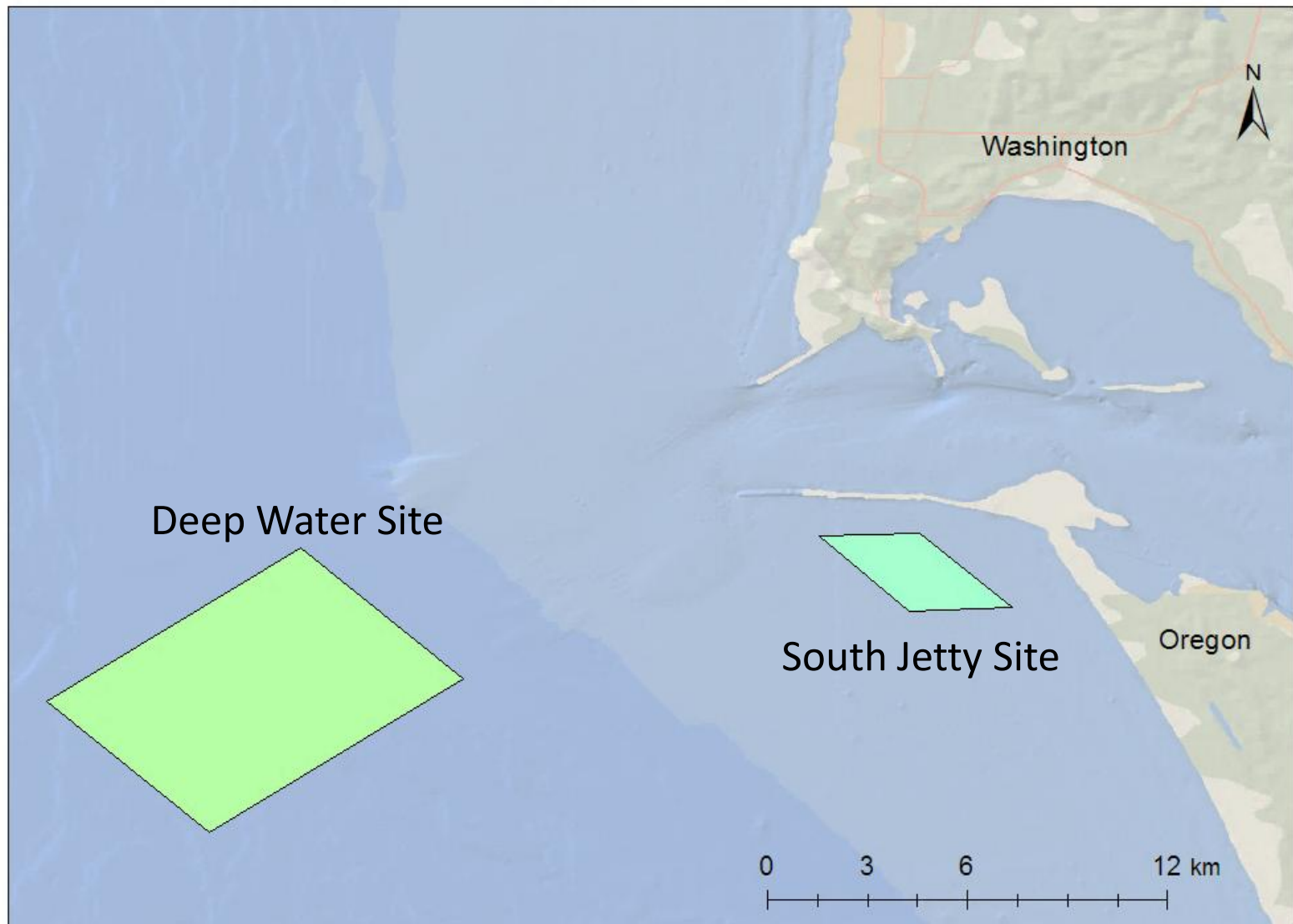
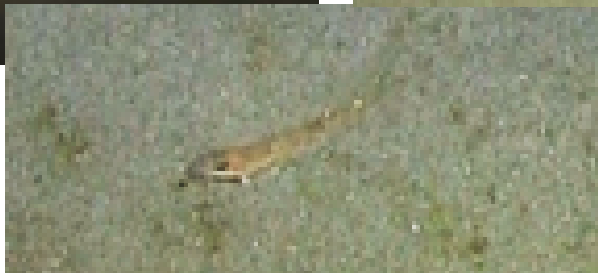


# MCR Benthic Surveys: Video Sled

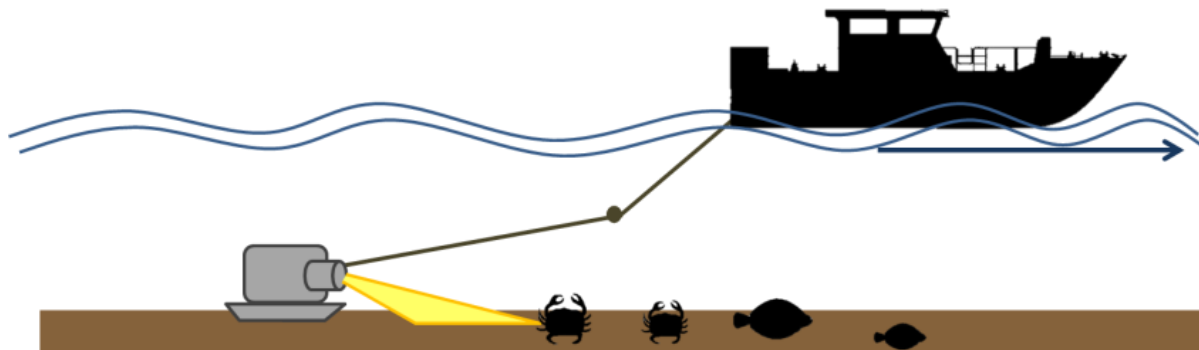
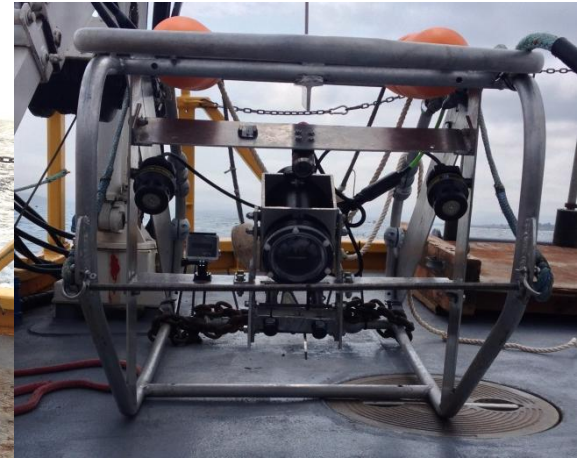


# Benthic Community

- Soft bottom habitat (sand/mud)
- Focusing on the large fish and invertebrates living on the seafloor



# Video Sled



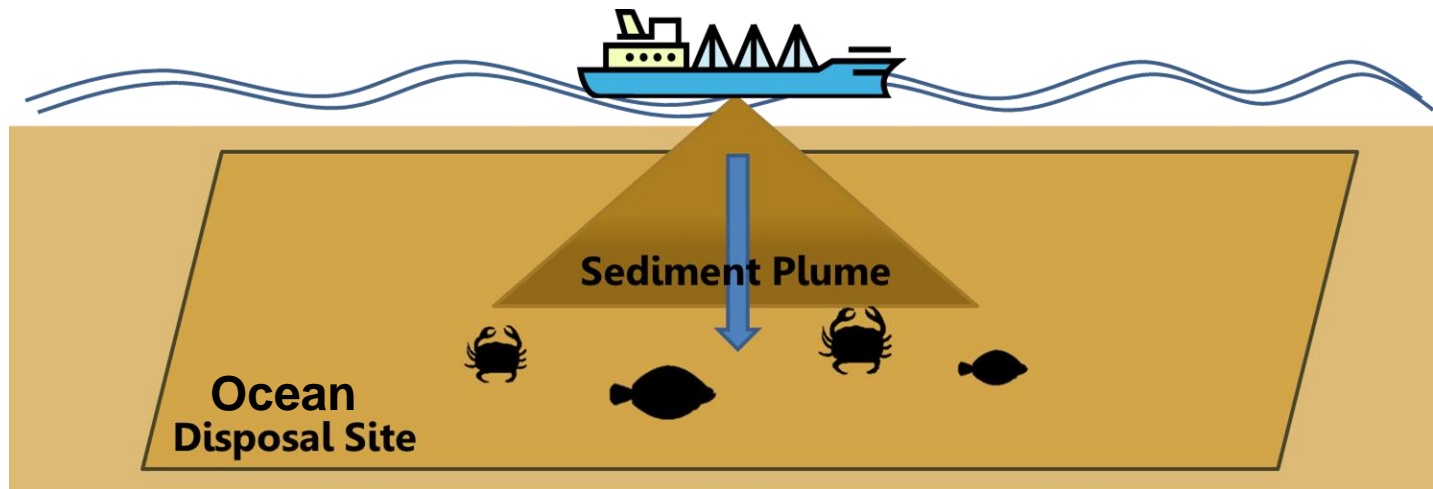
# Video Sled Objectives

- Use *video sleds* to determine the response of the *benthic community* to disposal season at SJS and DWS.
- Null Hypothesis:
  - No difference in densities/composition between impact and control areas.

# Survey Design

## Modified BACI

- Before-After/Control-Impact
  - Added a DURING disposal season component
- x3 replicate video transects within impact and control locations
  - 500m transect length



# Data Analyses

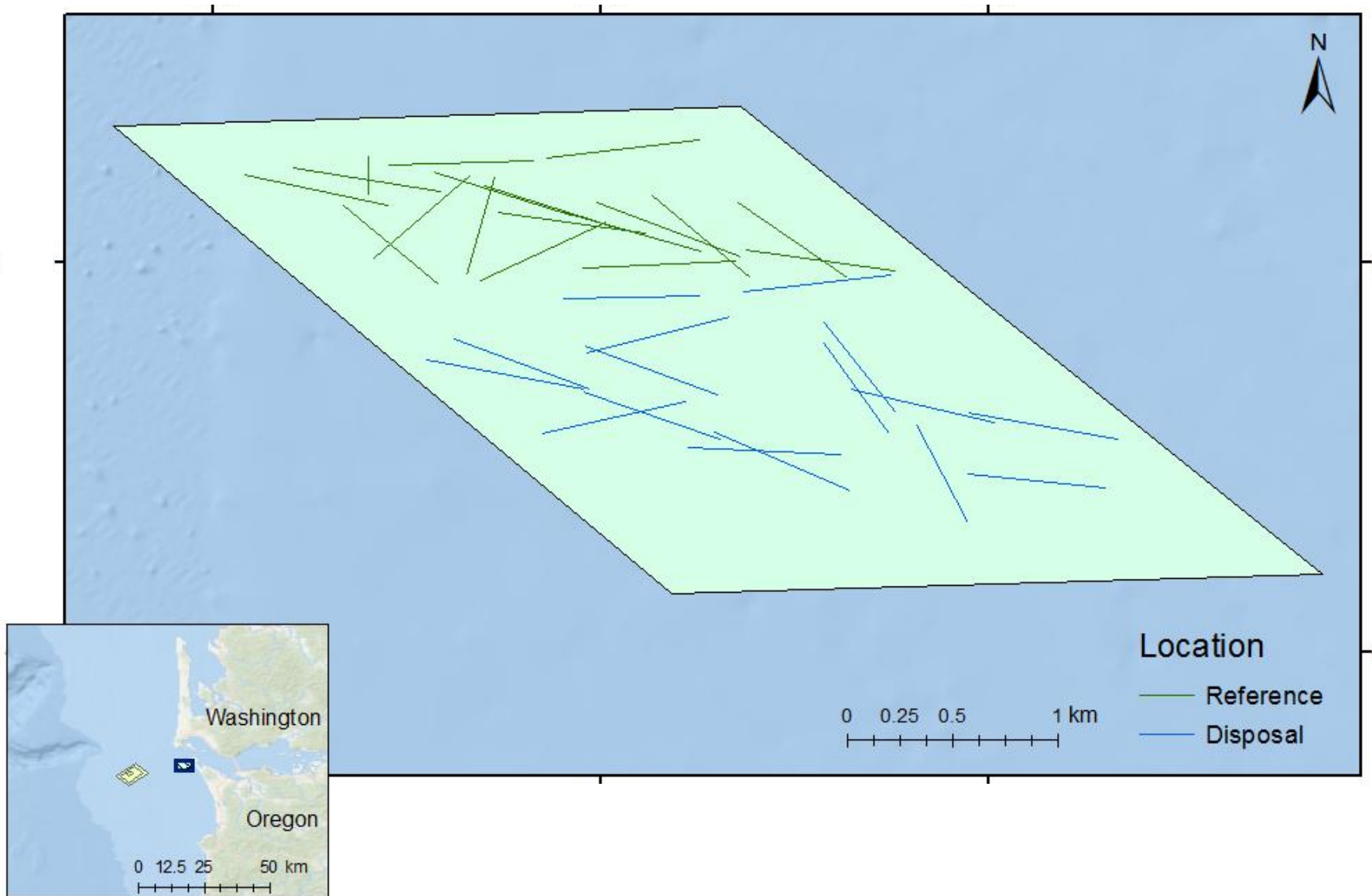
## Metrics

- Organism density (/100m<sup>2</sup>)

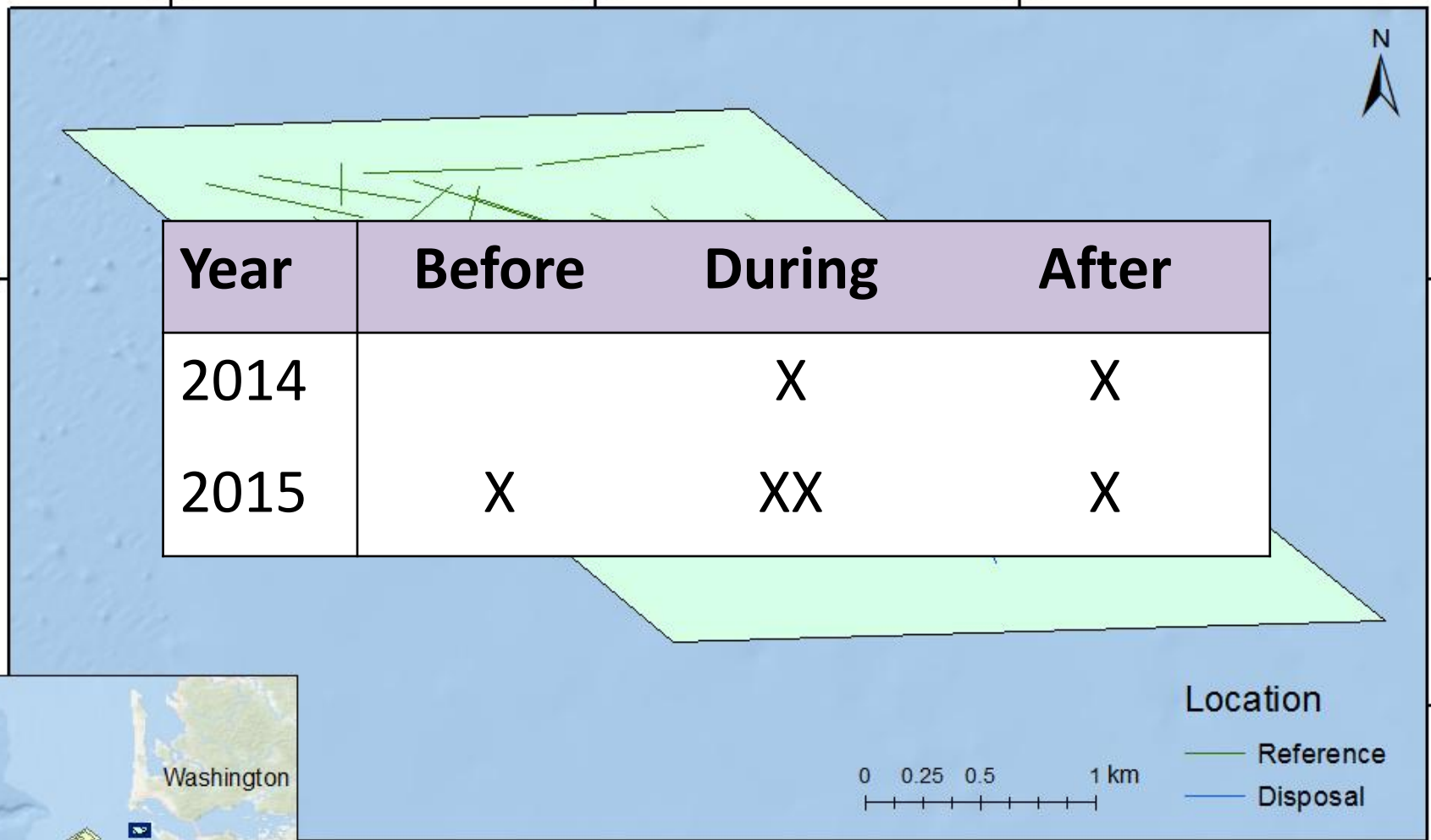
## Data Analysis

- Abundant Organisms
  - Analysis of Variance (ANOVA) – Test if densities differ significantly between Locations and Years
- Community Composition
  - Cluster analysis (tree) – Determine similarities in community compositions between surveys/transects

# SJS Video Sled Surveys



# SJS Video Sled Surveys



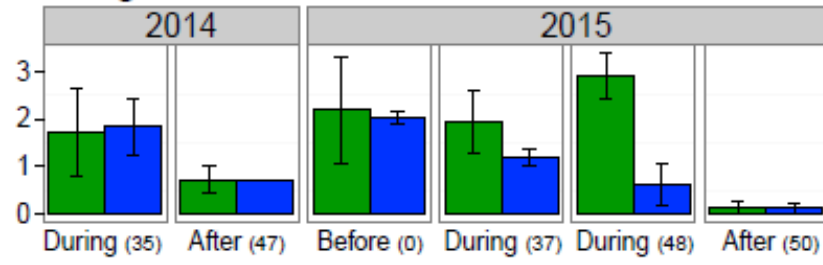


# Abundant Organism Results



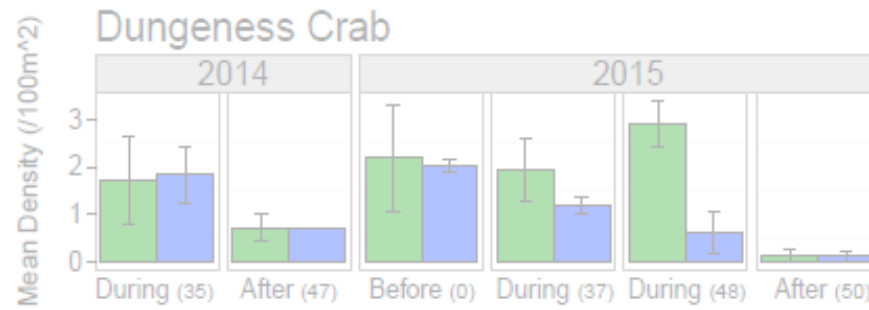
Mean Density (/100m<sup>2</sup>)

## Dungeness Crab

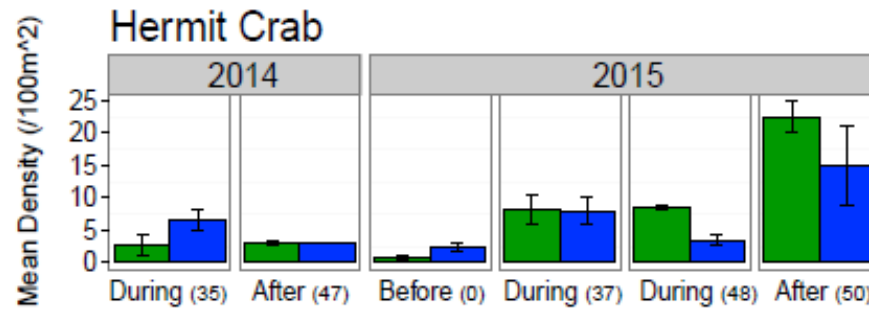


No difference

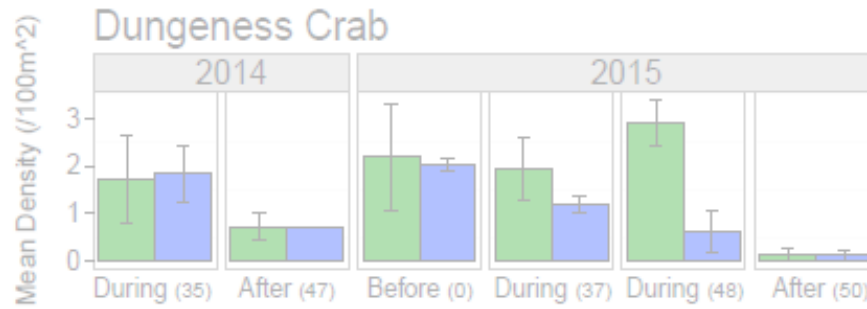
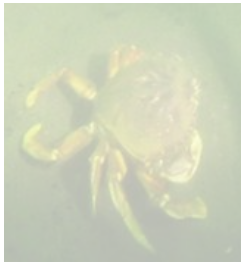




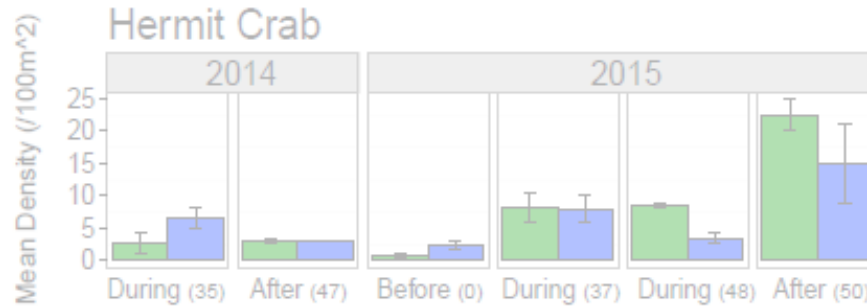
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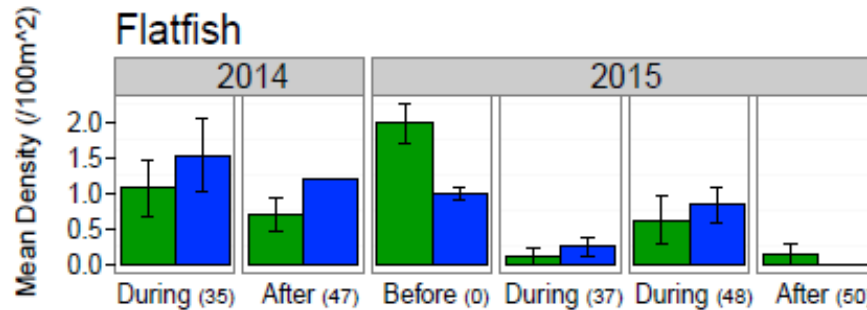
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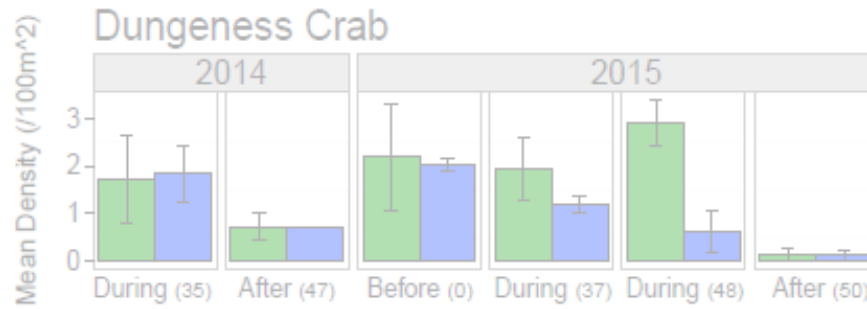
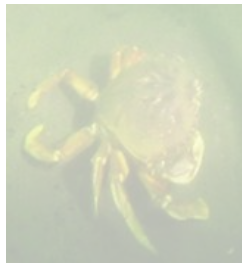
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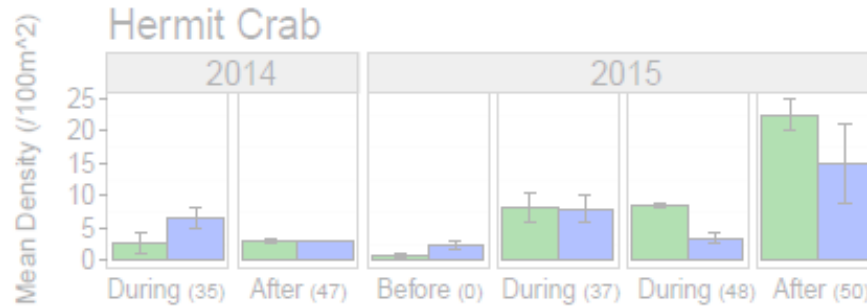
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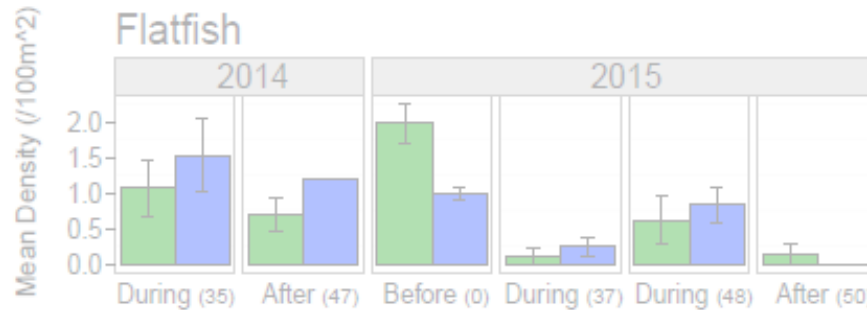
Difference  
between YEAR



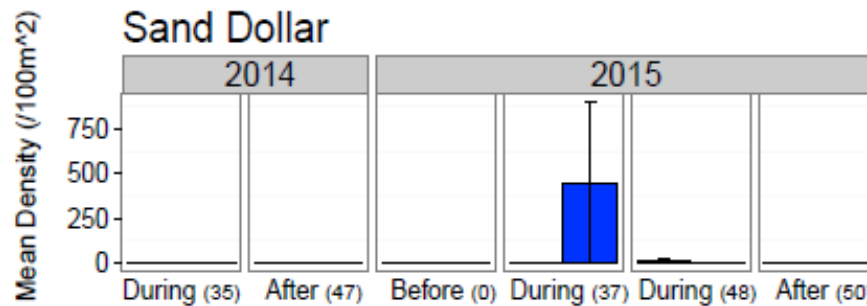
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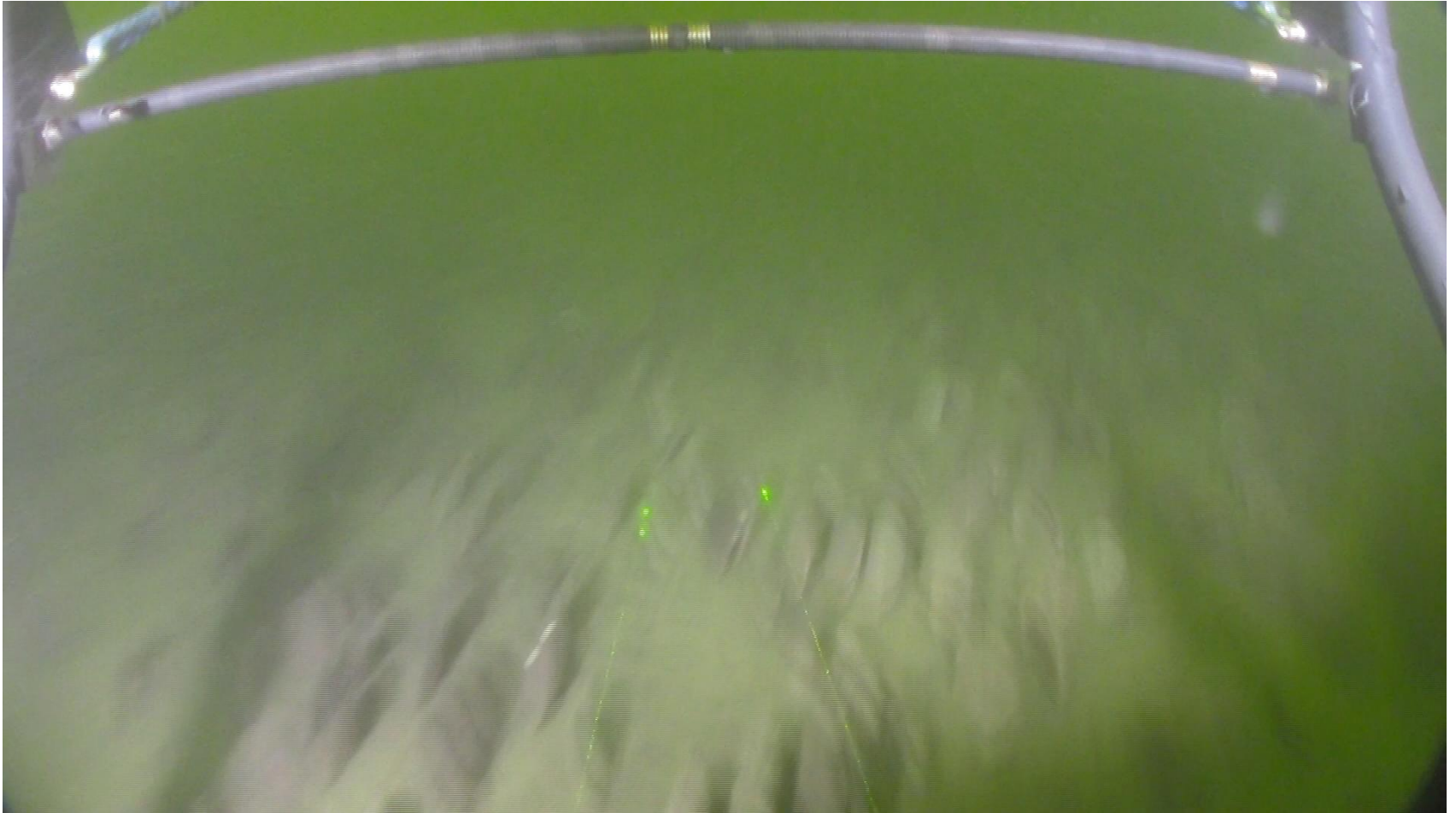
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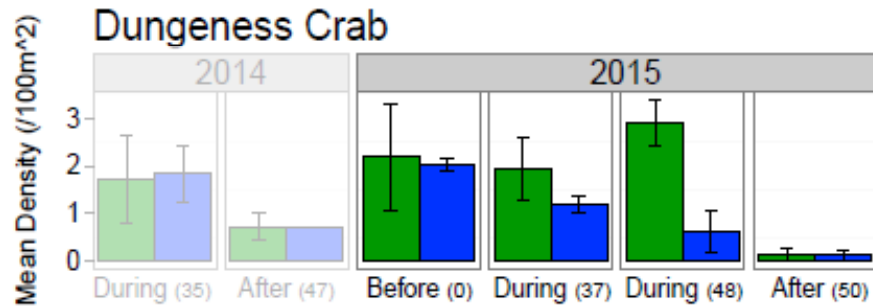
Difference  
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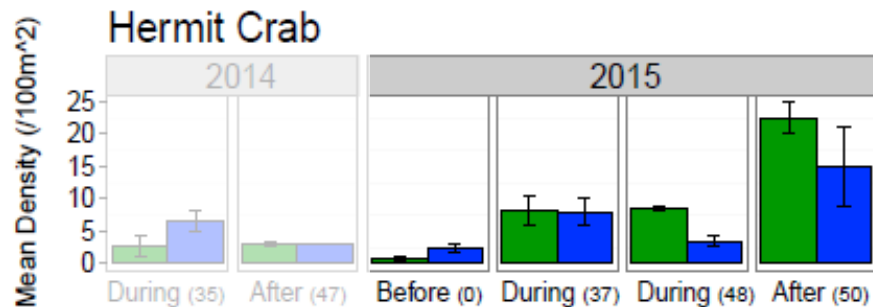
# Sand Dollar Bed



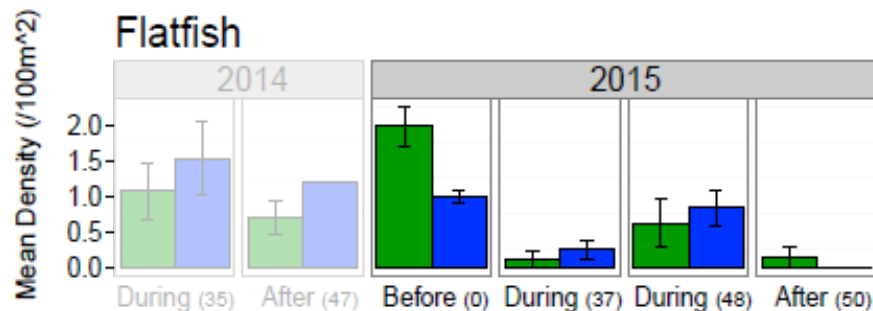
# Abundant Organism Results: 2015 Only



Difference  
between Date



Difference  
between Date

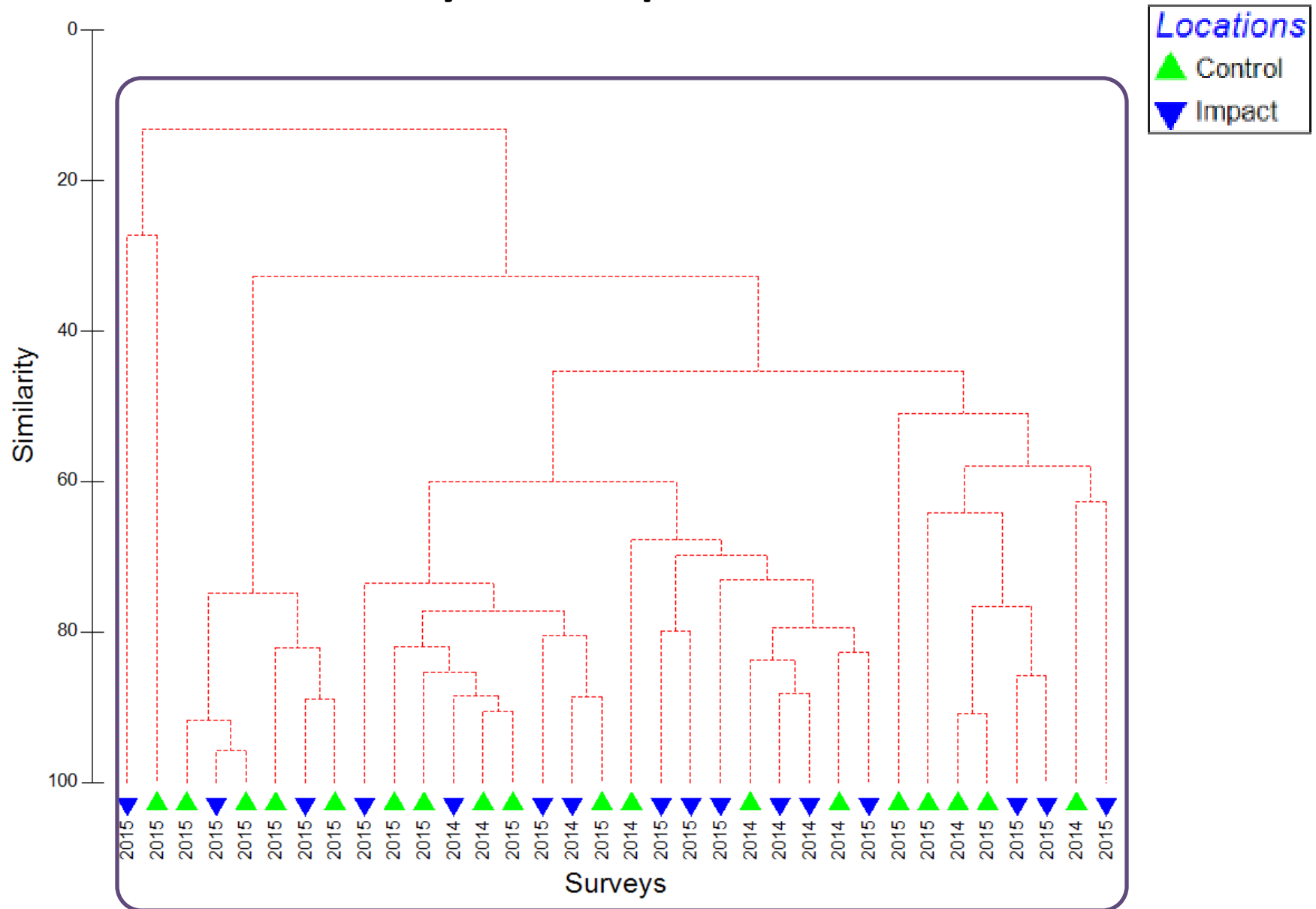


Difference  
between Date

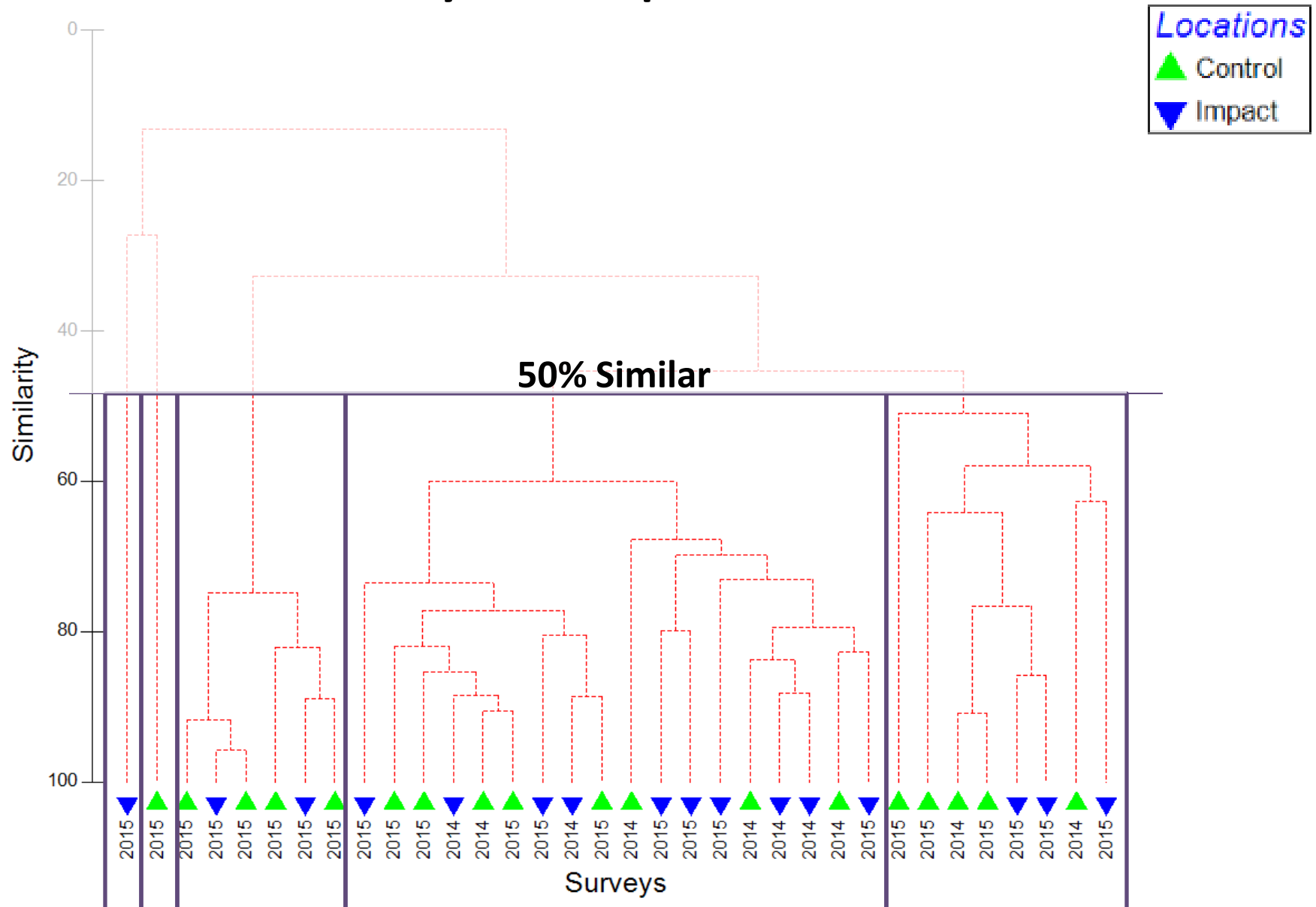


# Community Composition Results

# Community Composition Results



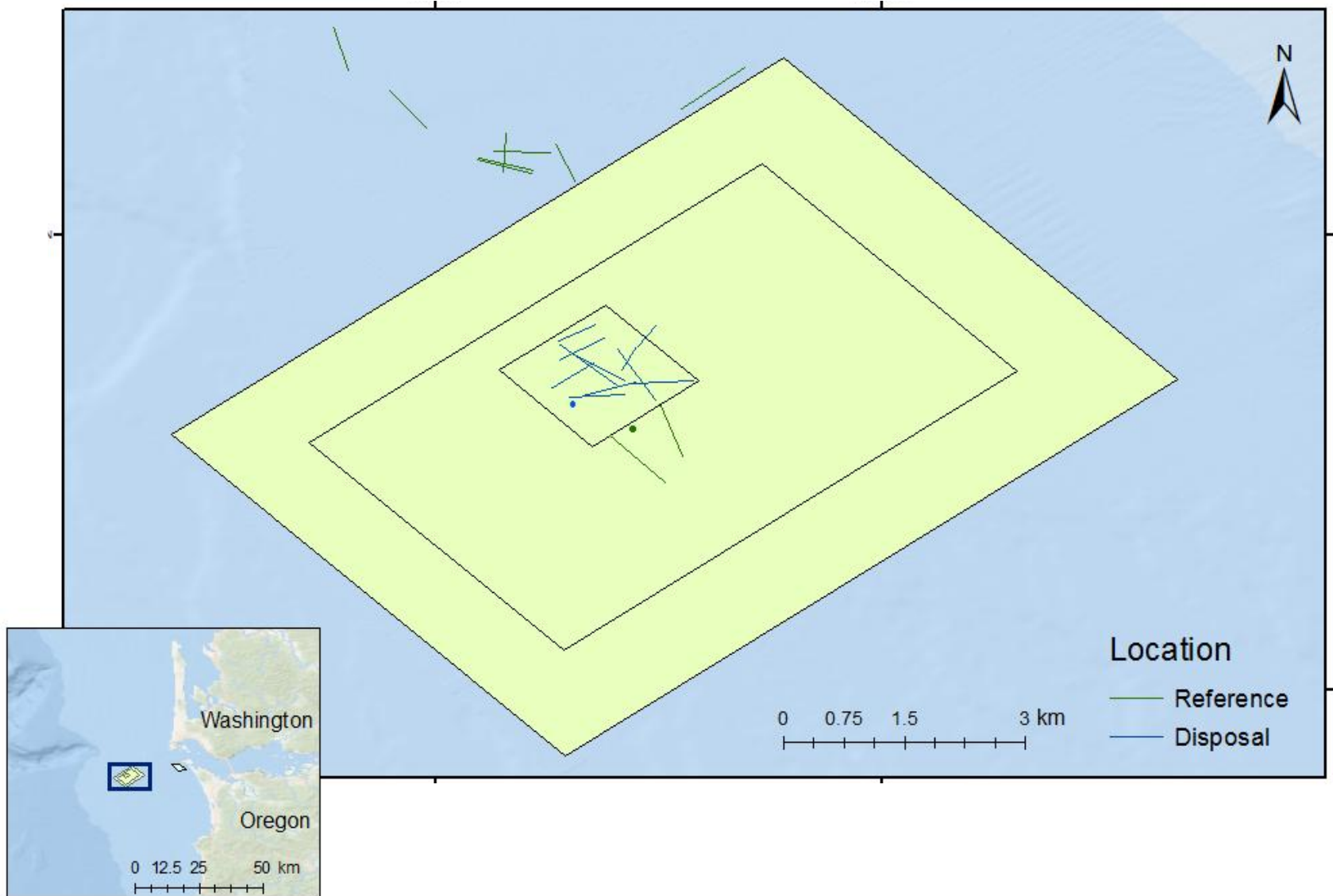
# Community Composition Results



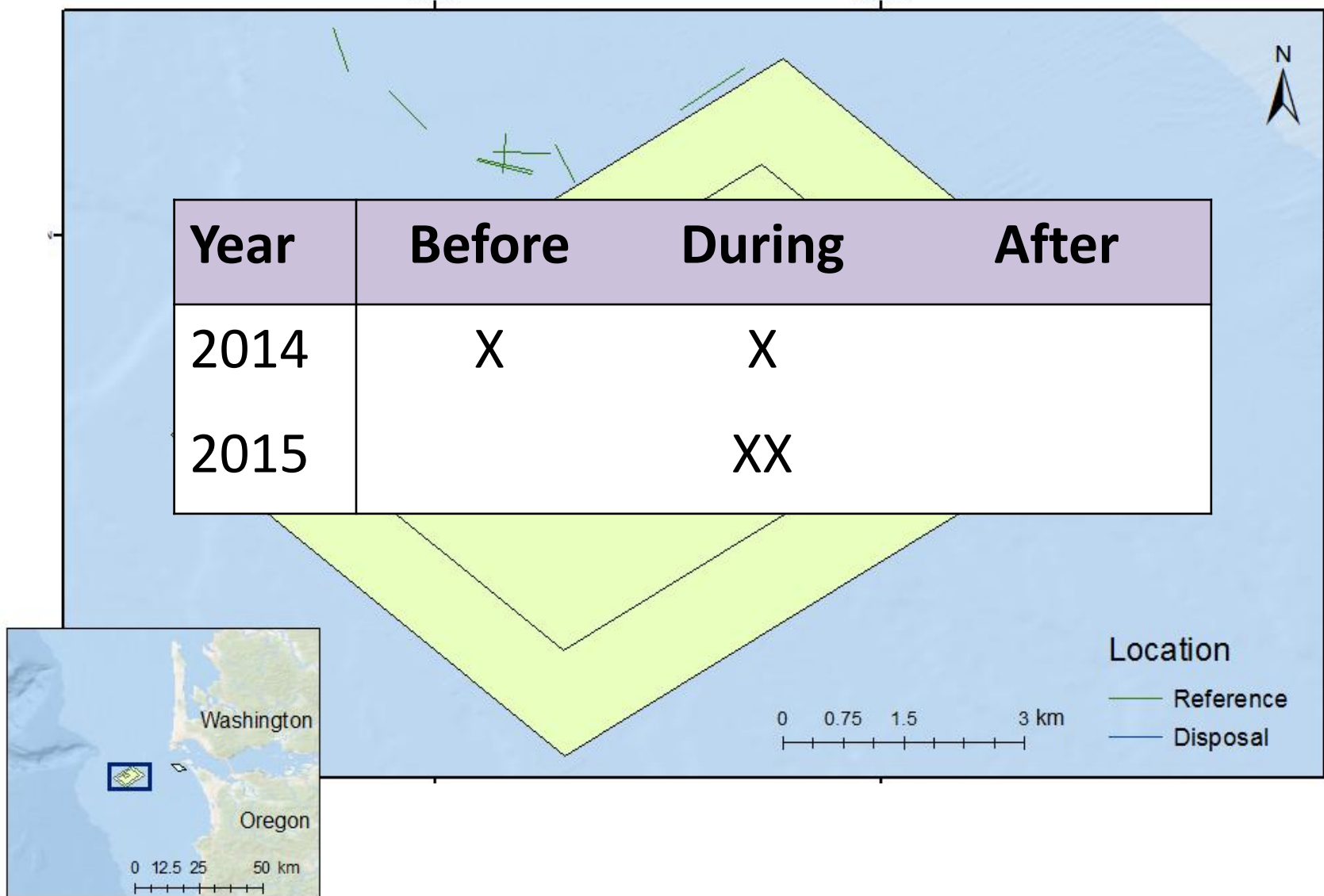
# Conclusions: SJS

- Few species
- No significant differences between control and impact areas
- Dungeness crab decrease in density at impact area in the 2015 season, but overall densities relatively low
  - Decrease in 2015 *after* disposal at *both* sites unexplained

# DWS Sled Surveys

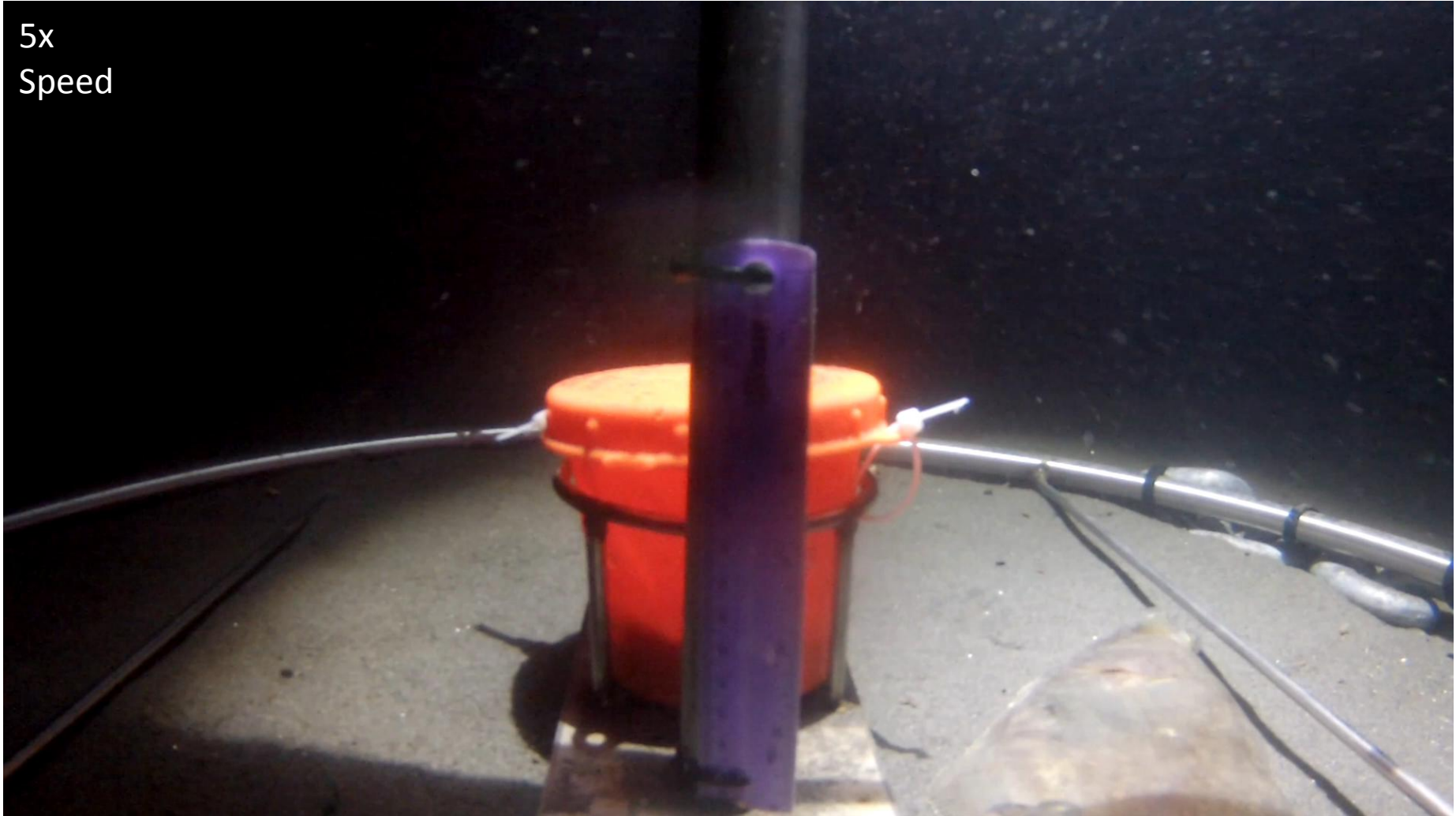


# DWS Sled Surveys



# DWS CamPod: Plume

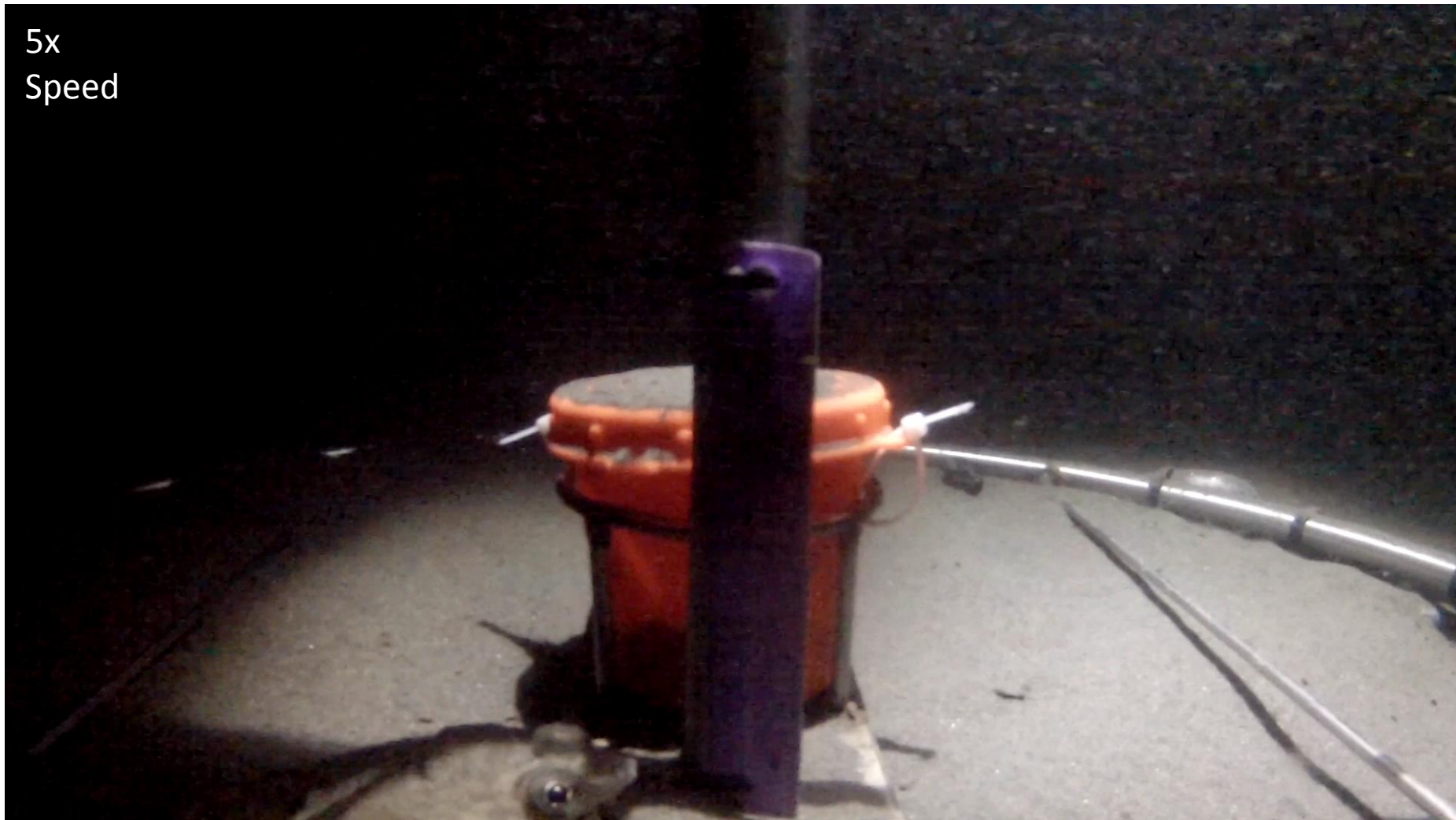
5x  
Speed





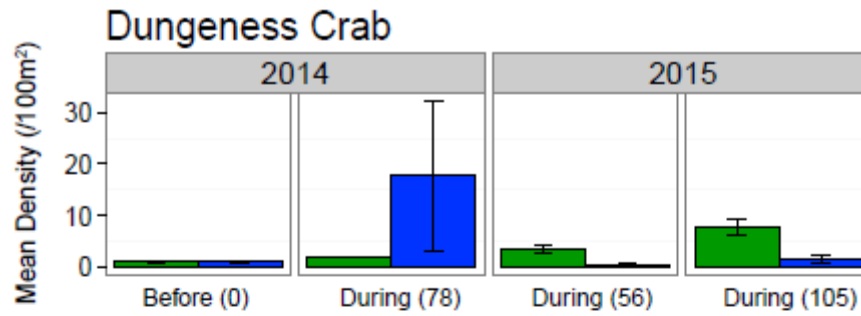
# DWS CamPod: Post Plume

5x  
Speed



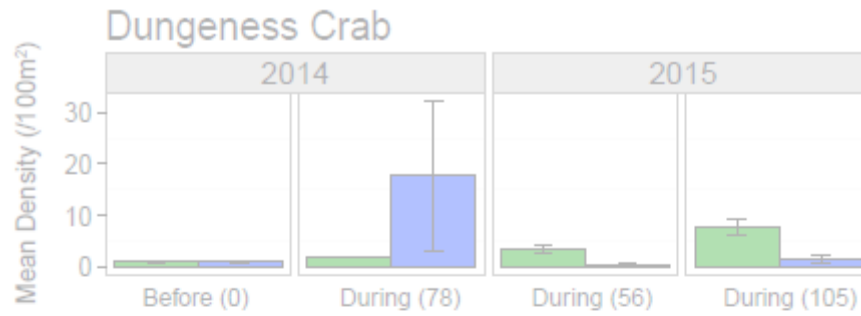


# Abundant Organism Results

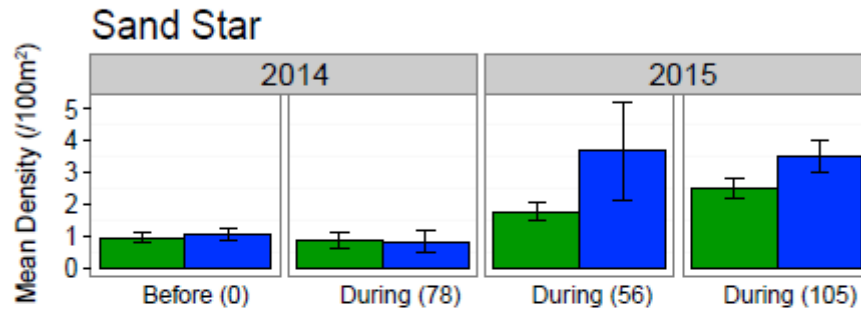


Difference between  
LOCATION is  
opposite between  
YEAR



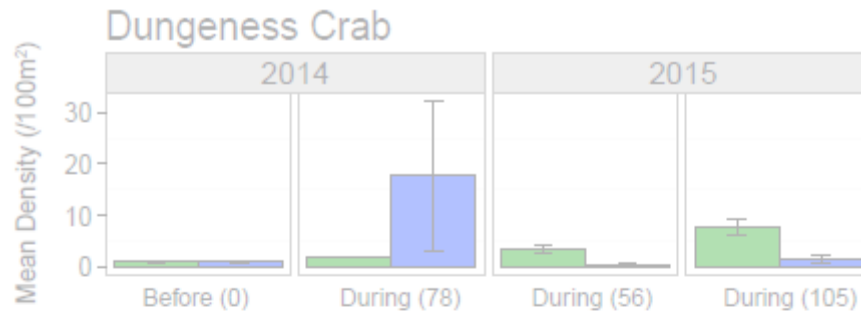


Difference between  
LOCATION is  
opposite between  
YEAR

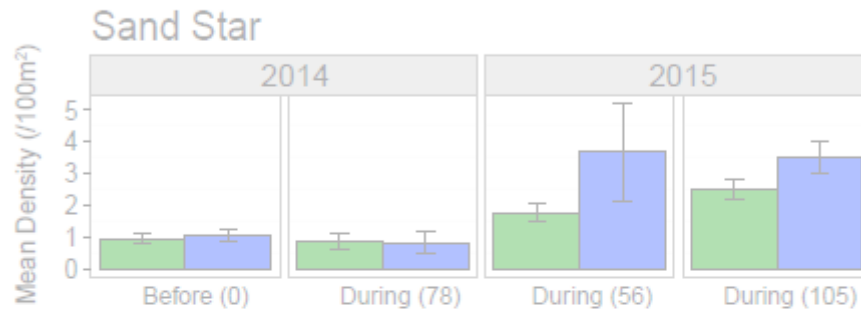


Difference  
between Years

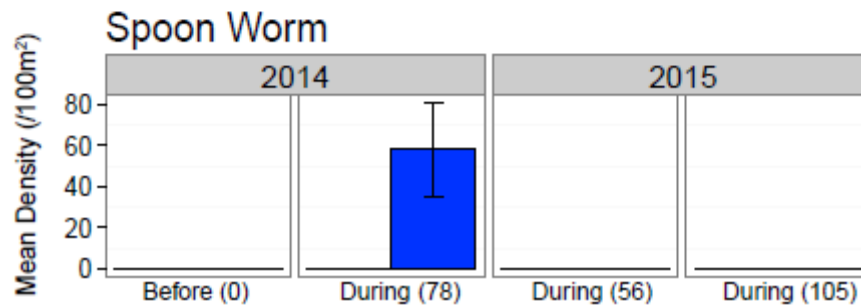
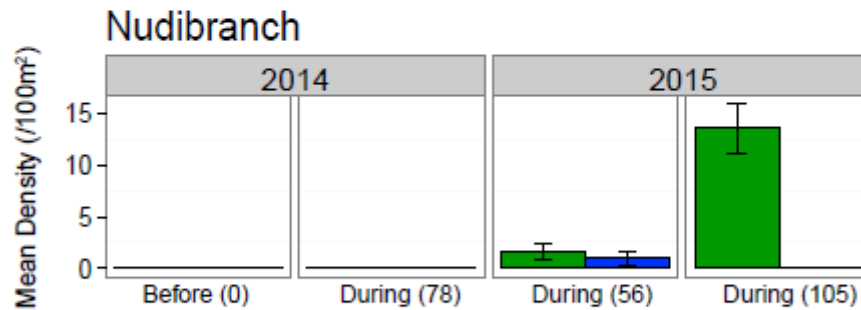




Difference between LOCATION is opposite between YEAR

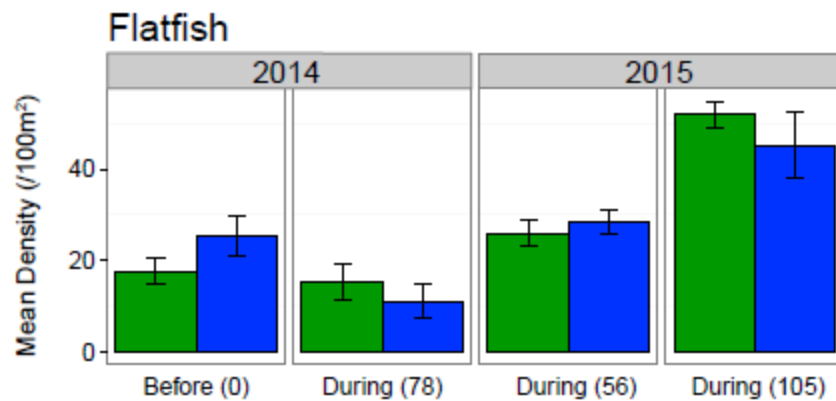


Difference between Years



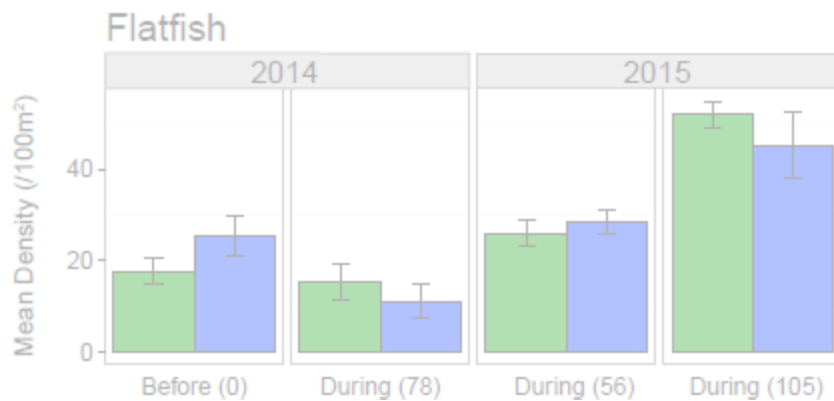
# Deep Water Site: Spoon Worms



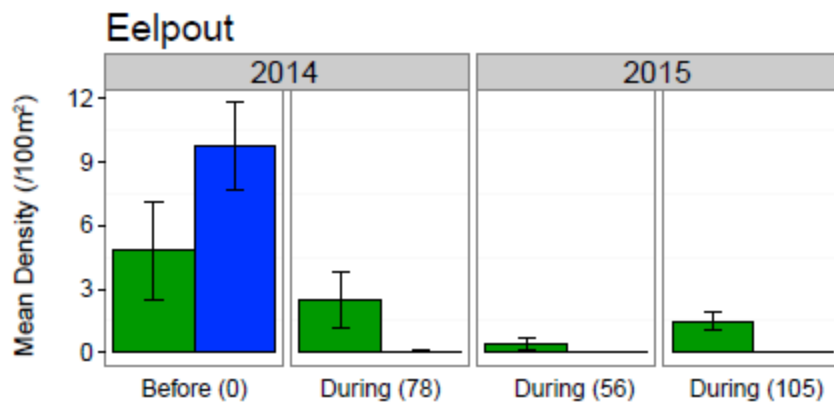
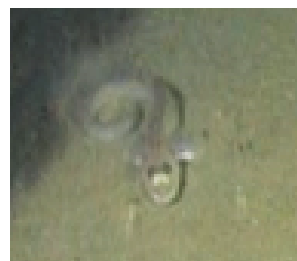


Difference between  
YEARS



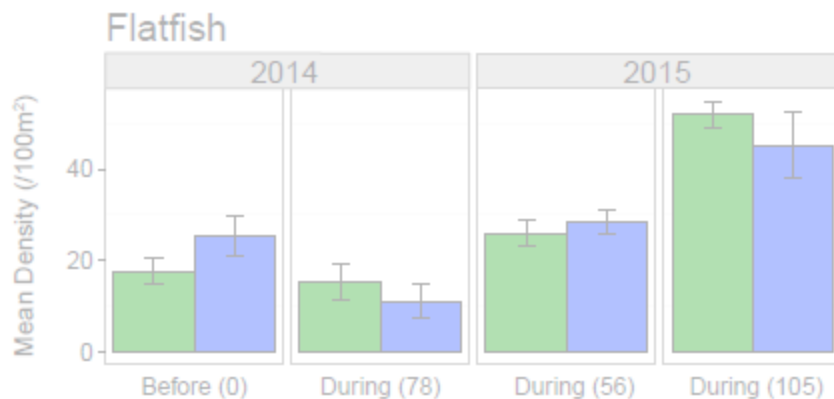
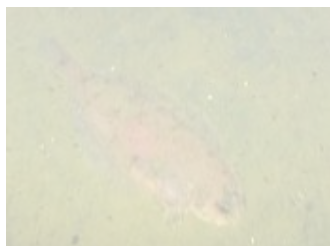


Difference between YEARS

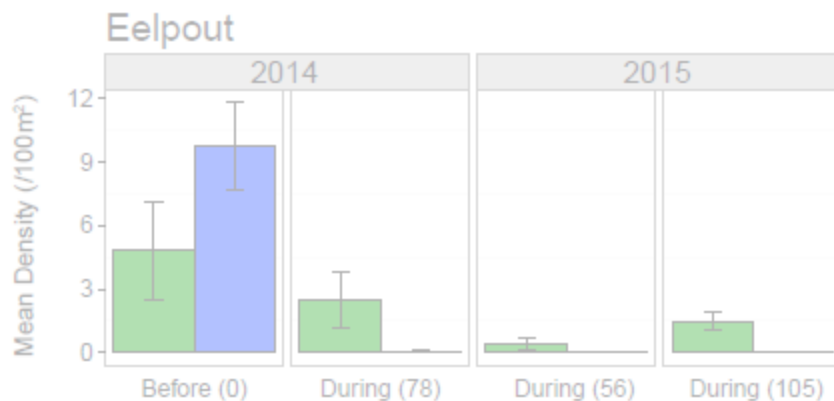


Difference between YEARS

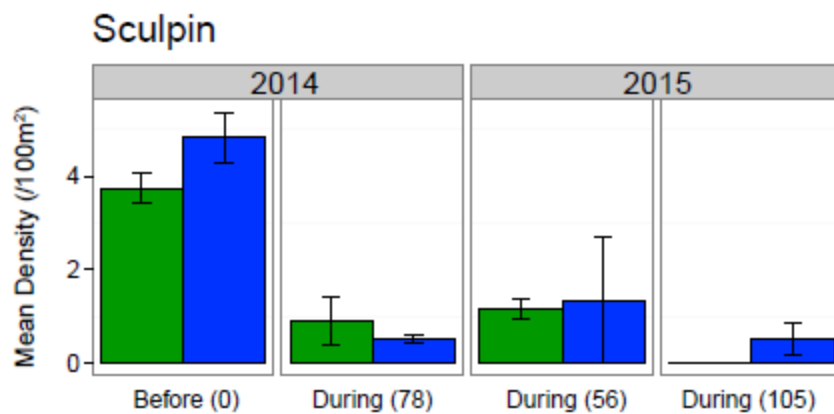
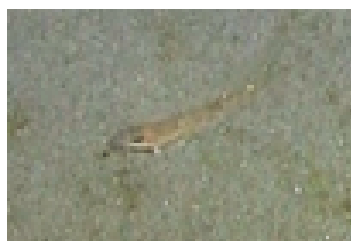




Difference between  
YEARS



Difference between  
YEARS



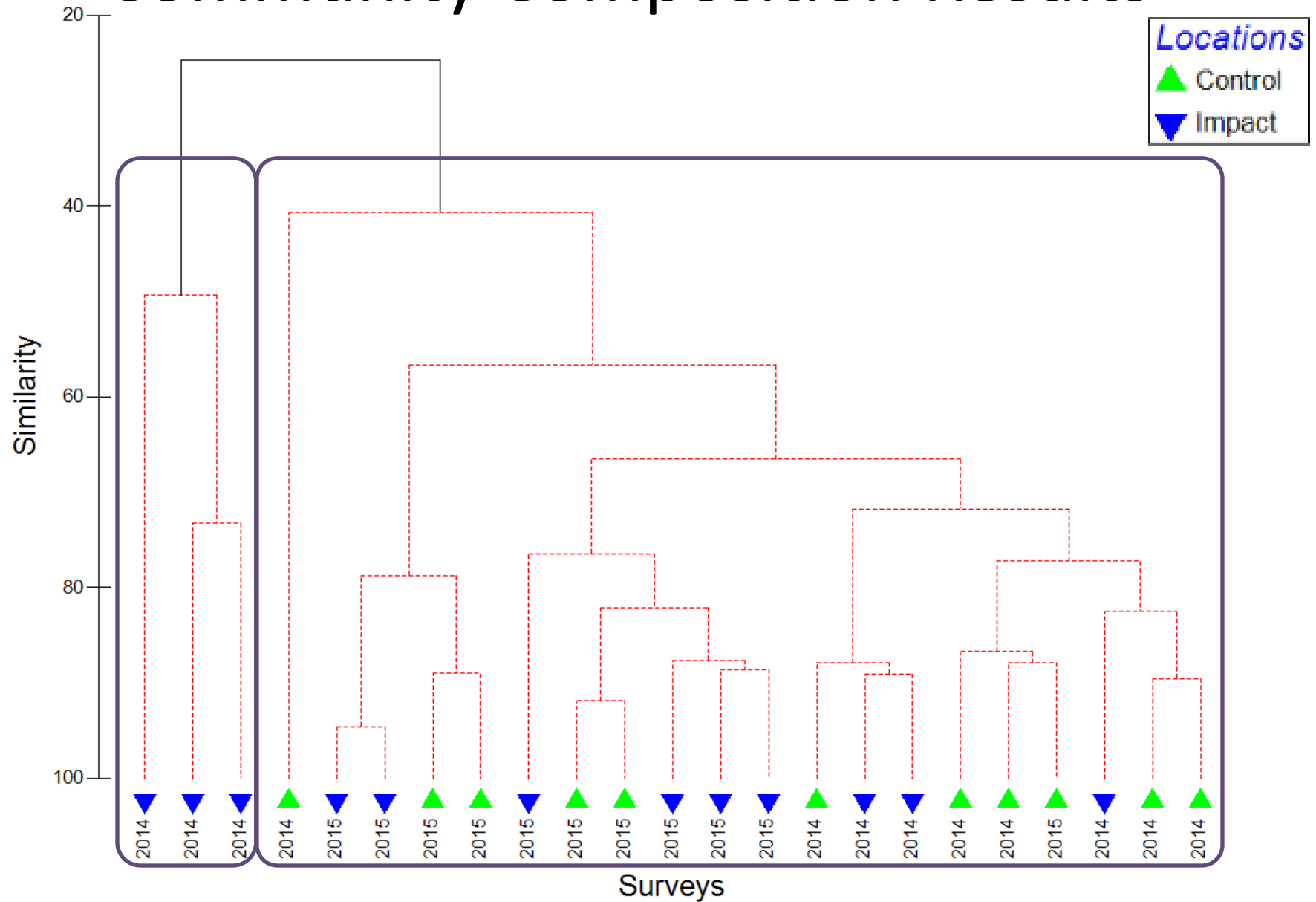
Difference between  
YEARS



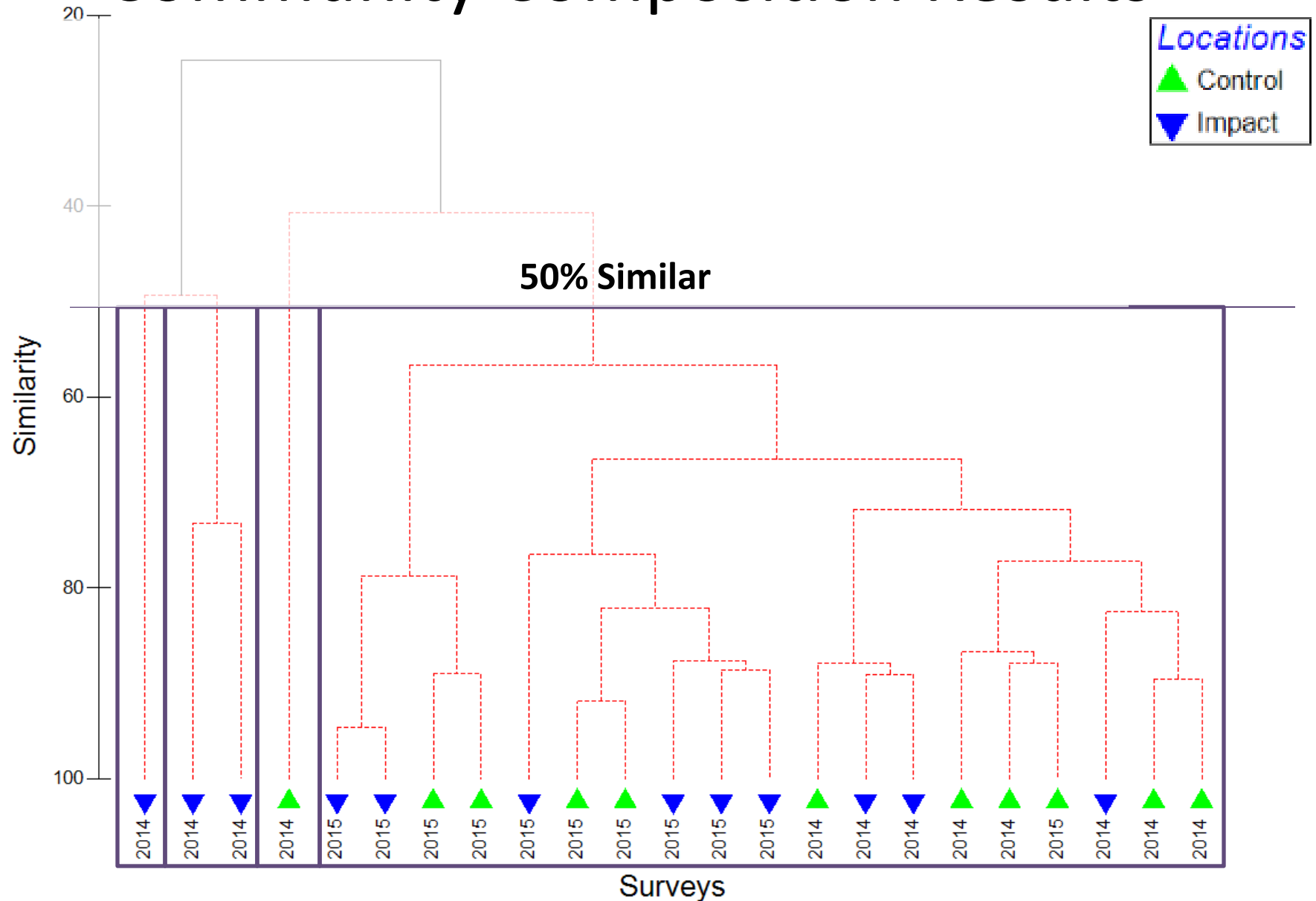


# Community Composition Results

# Community Composition Results

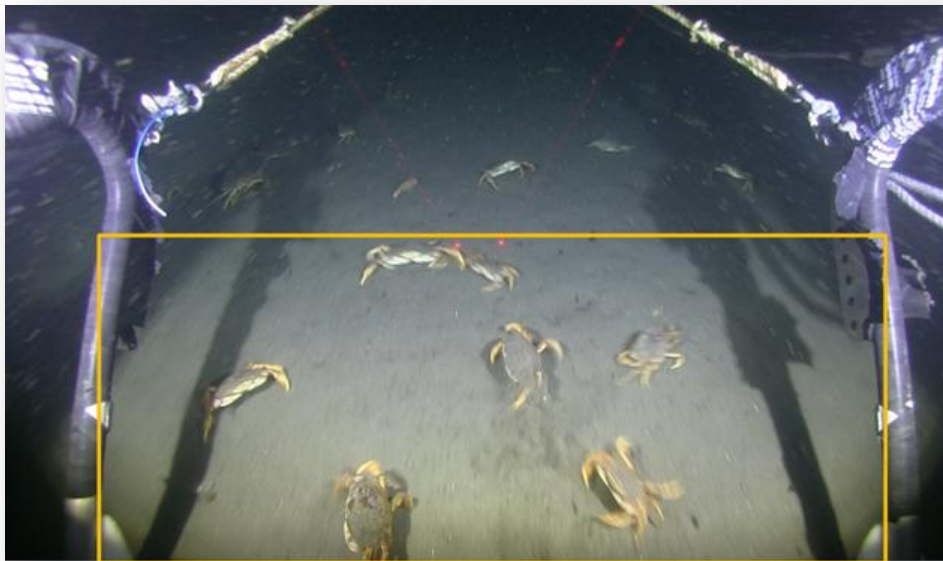


# Community Composition Results



# Conclusions: DWS

- No significant differences between control and impact areas
  - Interannual differences
- Are spoon worms disposal related?



# Monitoring Tool Review

- CamPods provide a new perspective on disposal impacts on crabs that differ from the traditional crab pots
  - For Dungeness crab, not limited by water clarity
- Sled is a non-extractive tool that collected useful data on large organisms
  - Limited by water clarity



# Acknowledgements



**US Army Corps  
of Engineers®**  
Portland District

