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Urban-related distribution patterns of an iconic Salish Sea mesopredator, the giant Pacific octopus (*Enteroctopus dofleini*)

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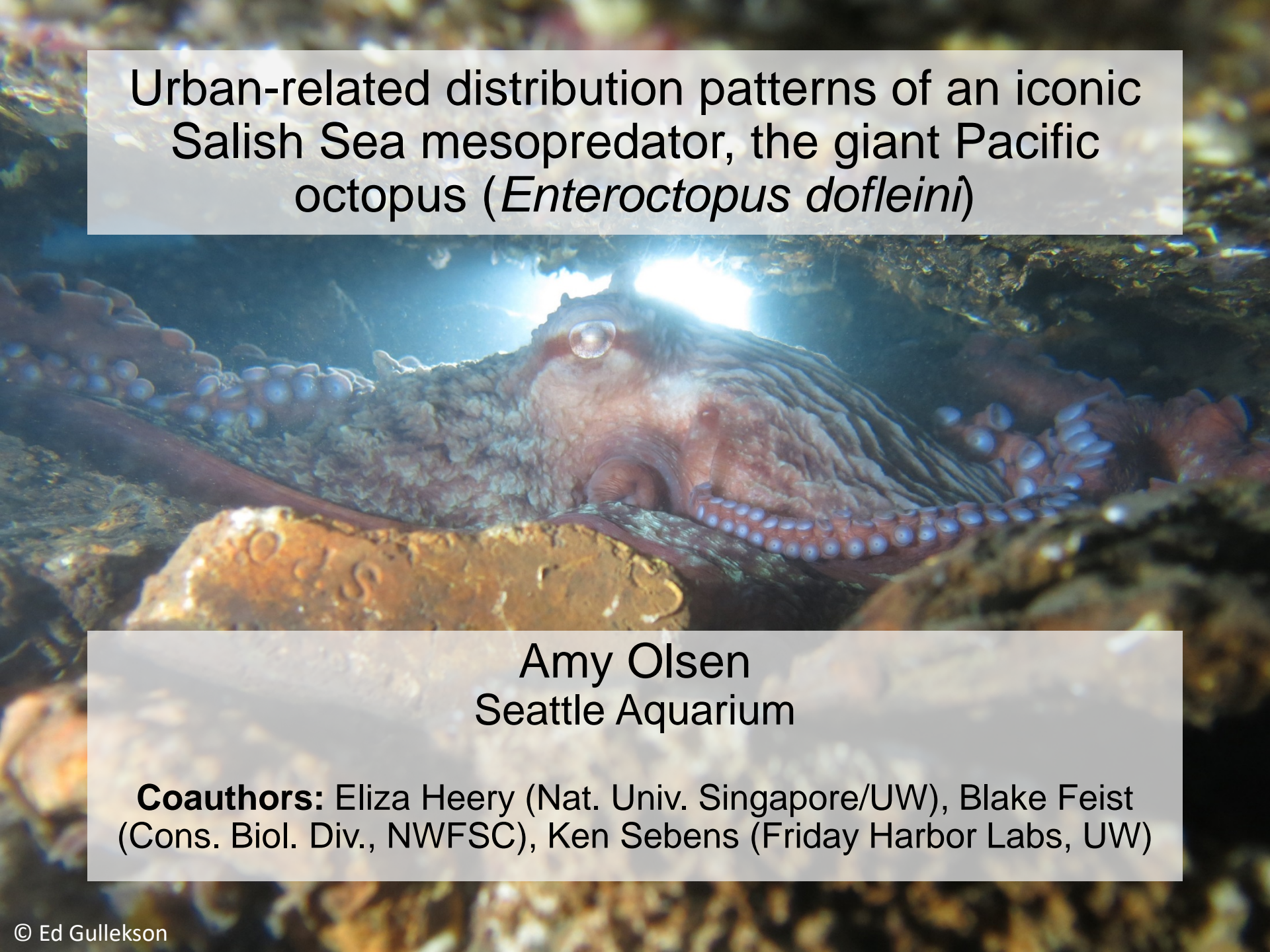
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Urban-related distribution patterns of an iconic
Salish Sea mesopredator, the giant Pacific
octopus (*Enteroctopus dofleini*)

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Urbanization

- Particularly intense on coasts
- Modifies marine environments
- What are the ecological impacts on marine organisms?



Urban terrestrial ecology suggests...

- Rise of mesopredators



- In urban areas: ↑ shelter, food / ↓ predators
- “synanthropic”



Research questions

a) Is there a relationship between octopus occurrence and urbanization?

- H_A : Octopus more common in urban centers

b) Is octopus abundance correlated with anthropogenic debris?

- H_A : Positive correlation

c) Do octopus diets differ with urbanization intensity?

- H_A : More prey and larger prey items in more urban areas



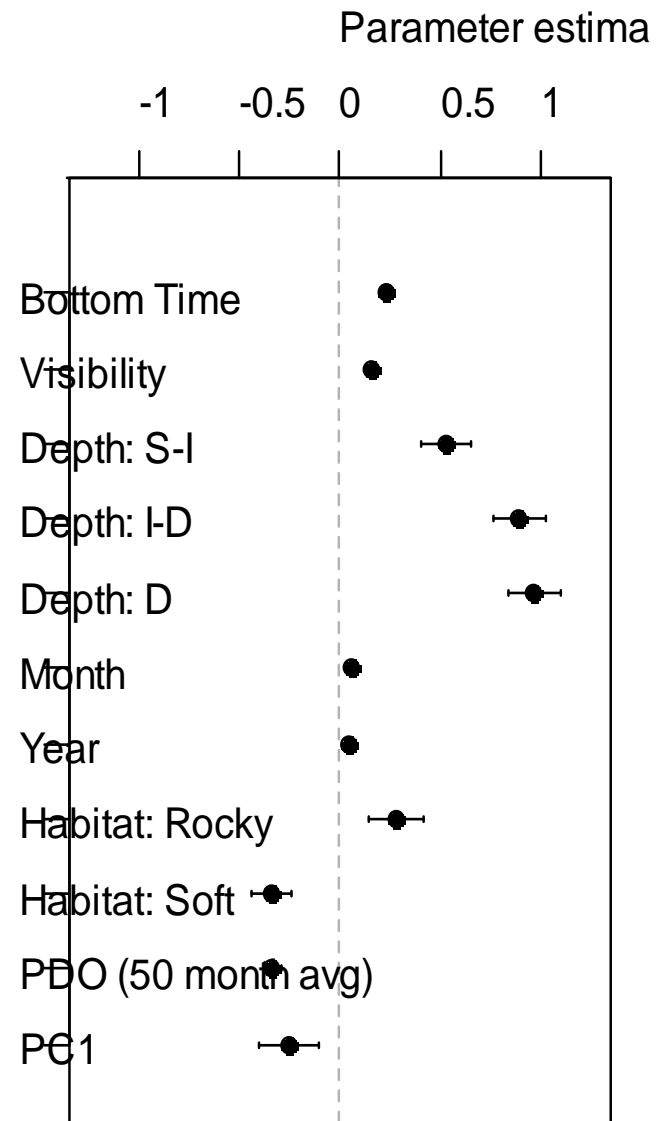
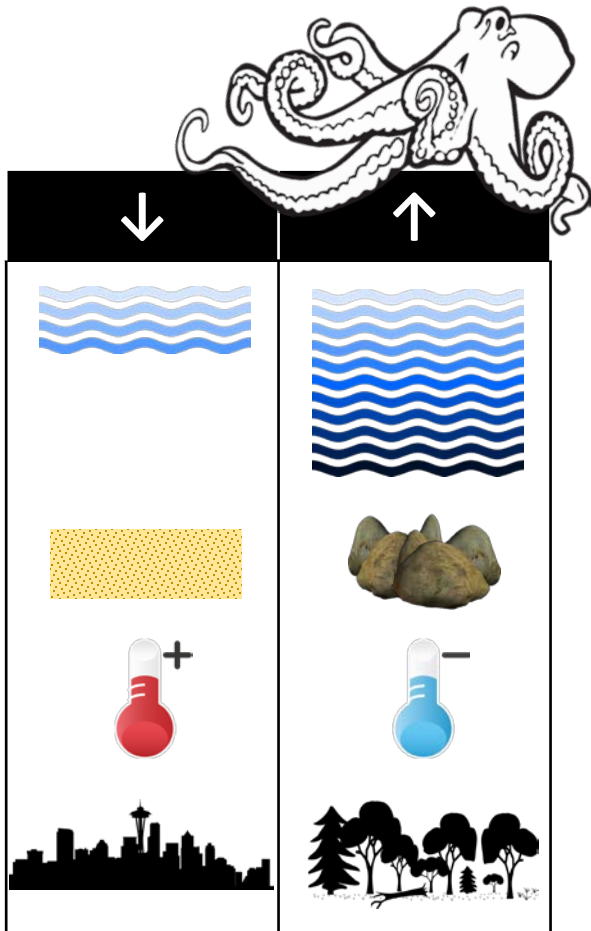
a) Octopus occurrence & urbanization



- Presence/Absence data
- Explanatory variables:
 - Urbanization metric (PC1)
 - From REEF:
 - Bottom Time and Visibility
 - Depth, Date, Habitat Type
 - Oceanographic conditions:
 - Pacific Decadal Oscillation (PDO)
- Mixed-effects logistic regression



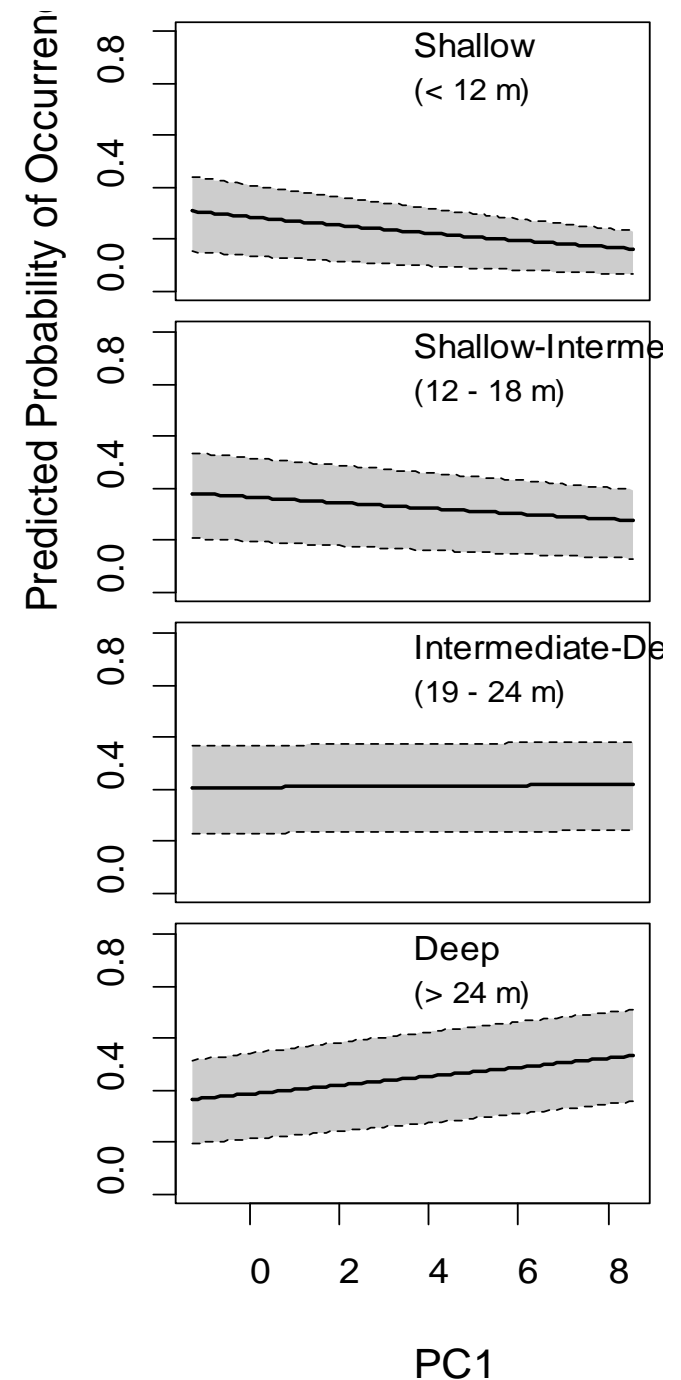
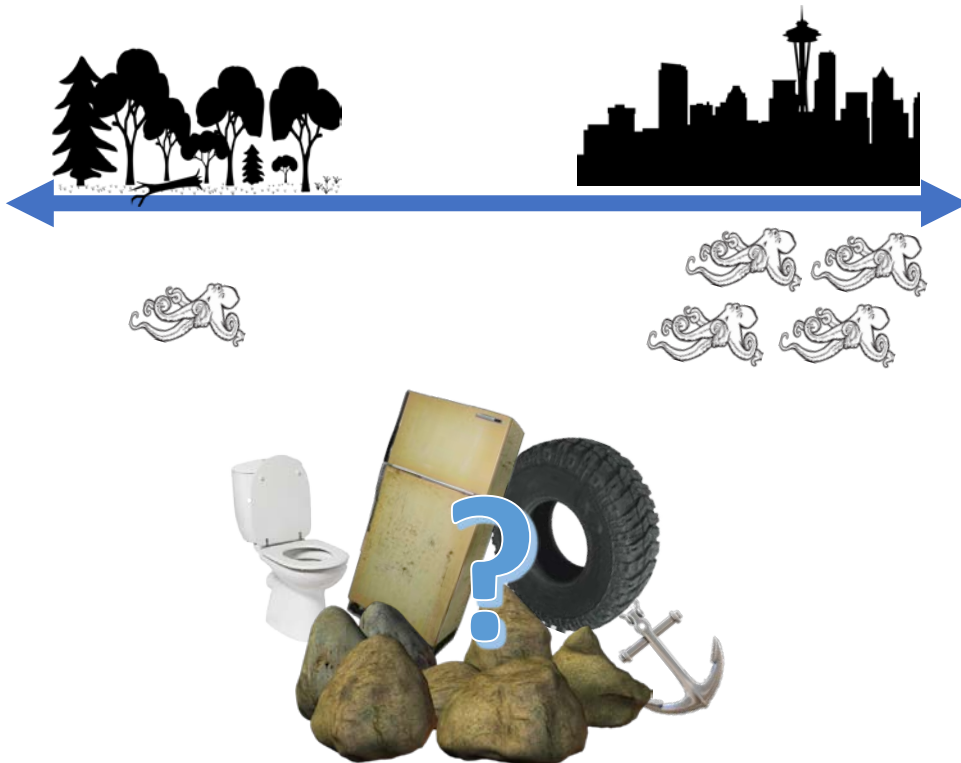
a) Octopus occurrence & urbanization



➔ **Depth × PC1 interaction**

a) Octopus occurrence & urbanization

On deep dives (> 24m)...

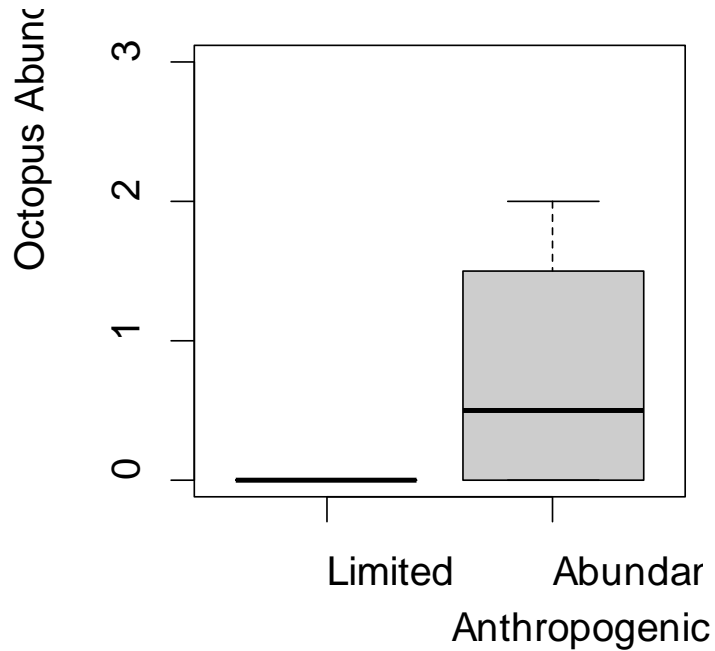


b) Is octopus abundance correlated anthropogenic debris?

- Video transect surveys
- 4 sets of paired sites
 - Site pairs (a,b)
 - a: extensive debris
 - b: limited debris
- Lasers → Measure dimensions of debris



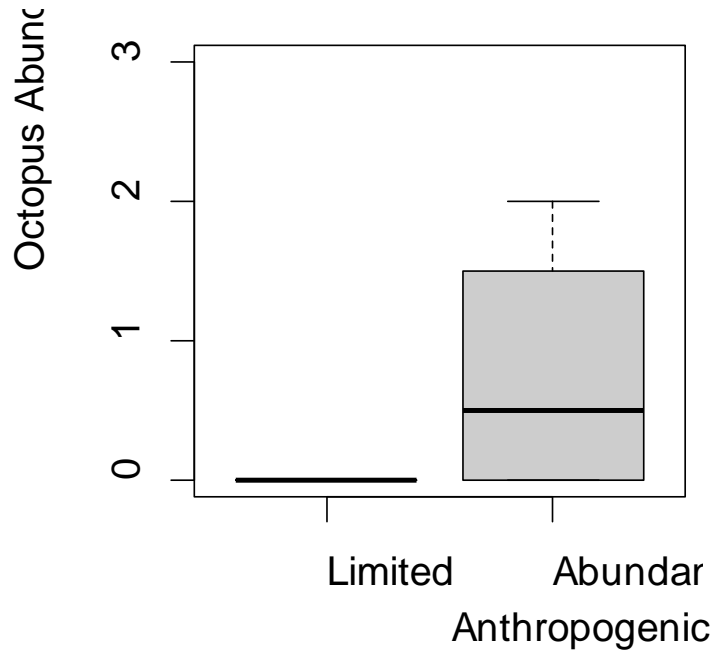
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- Mixed effects model
- Compared fit from:
 - # debris items
 - Horizontal area of debris
 - Maximum height of debris



b) Is octopus abundance correlated anthropogenic debris?



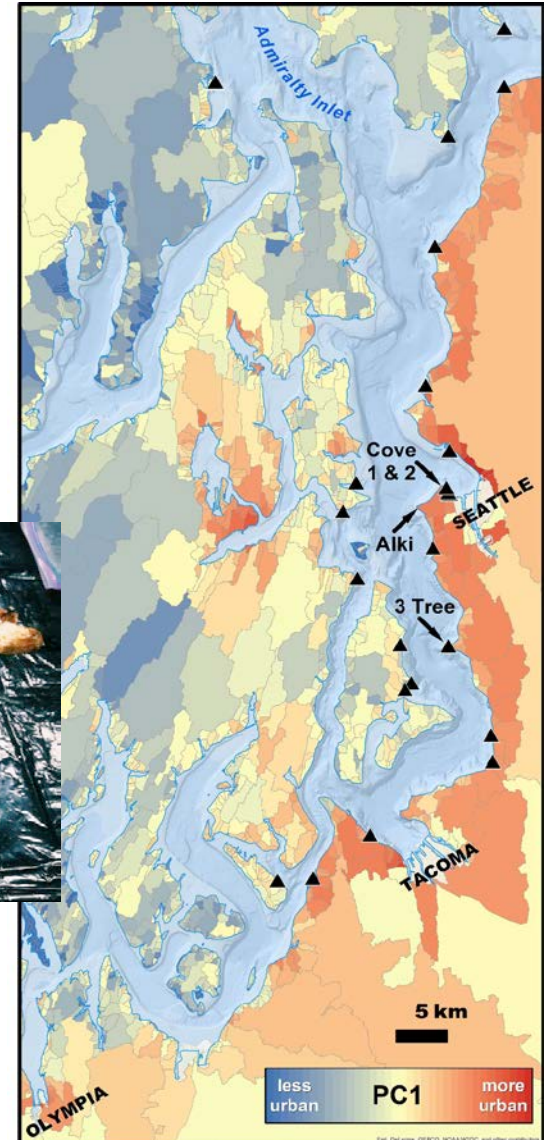
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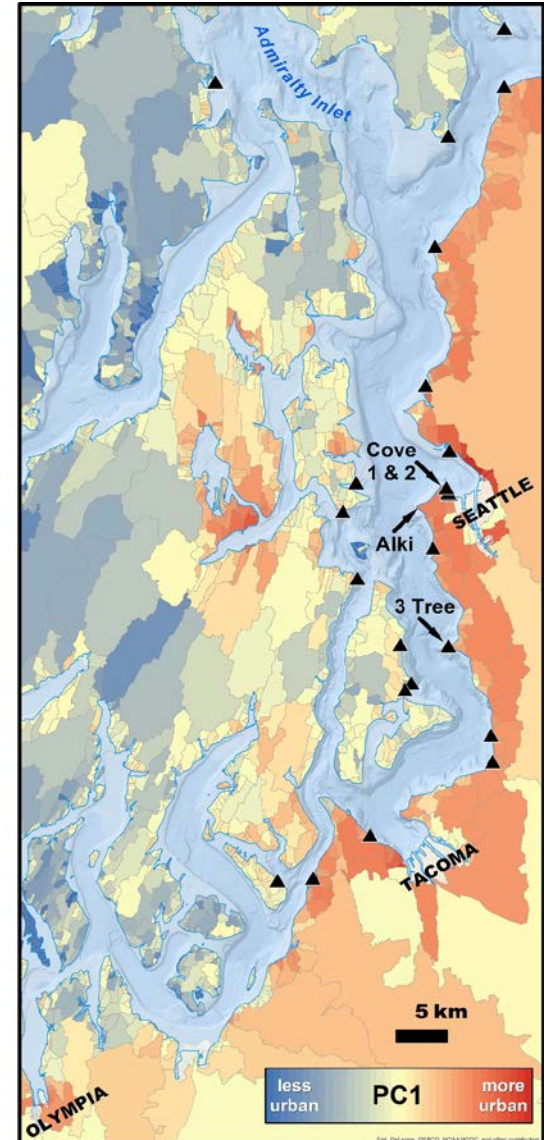
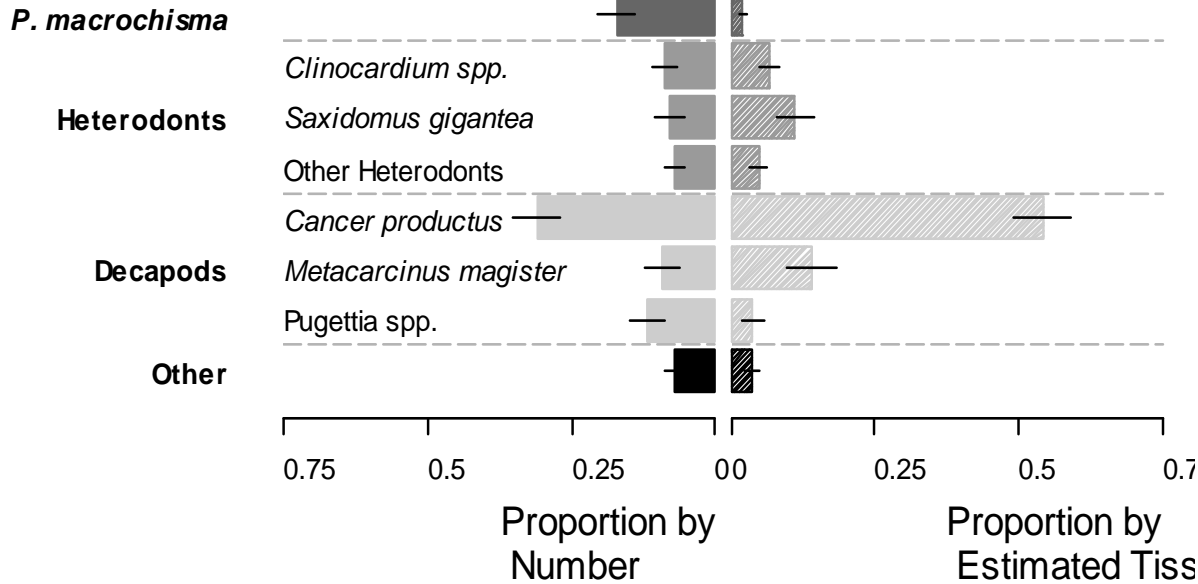
c) Do octopus diets differ with urbanization intensity?



@ Ed Gullekson



c) Do octopus diets differ with urbanization intensity?



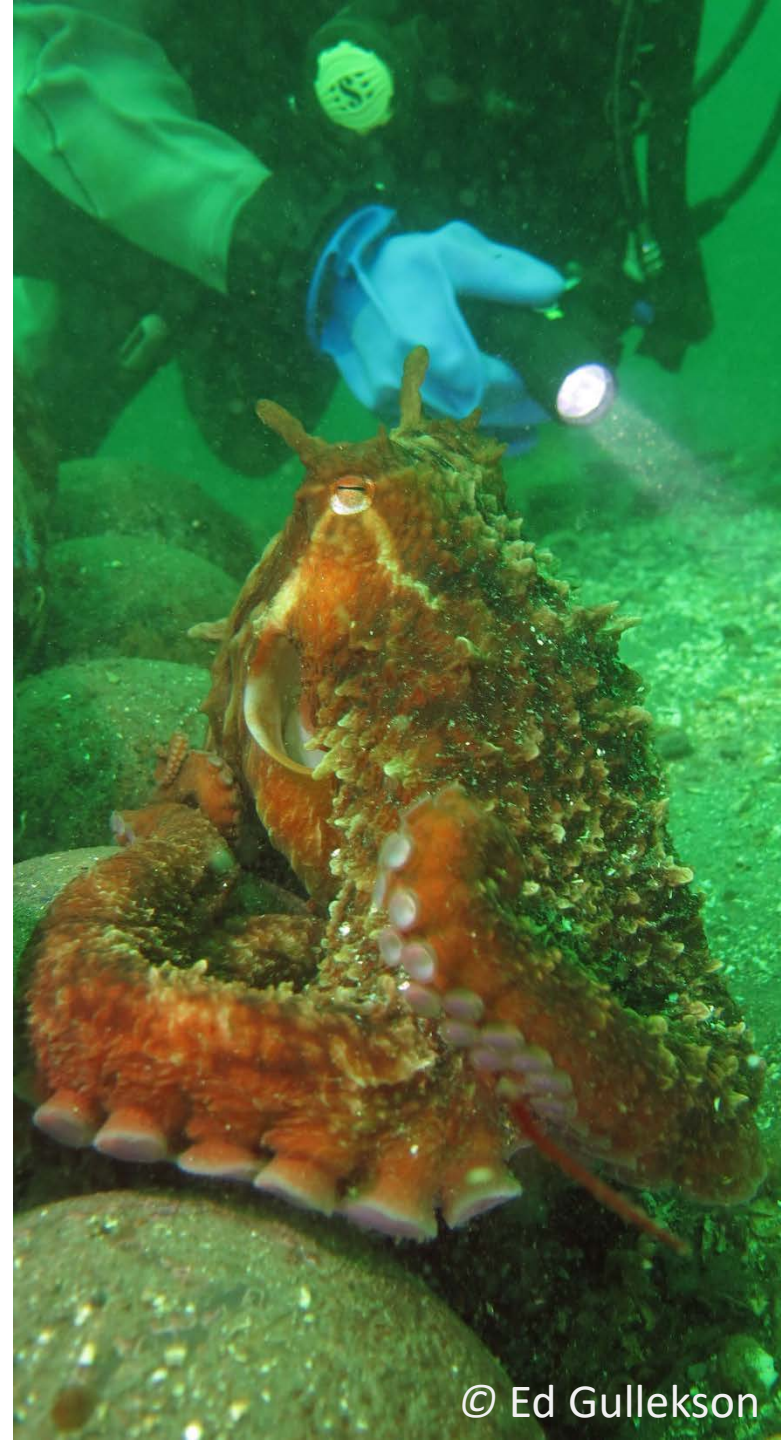
Diet unrelated to urbanization intensity

Conclusions

- Giant Pacific octopus may be synanthropic ***within specific habitats*** (deep, > 24m)
 - Caveats!
- Pattern appears to be unrelated to prey resources
- Importance of anthropogenic debris
- Depth distribution of debris?

Many to Thank:

- Christy Semmens & REEF divers!
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- Dave Thoreson
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Thank YOU!
Questions?