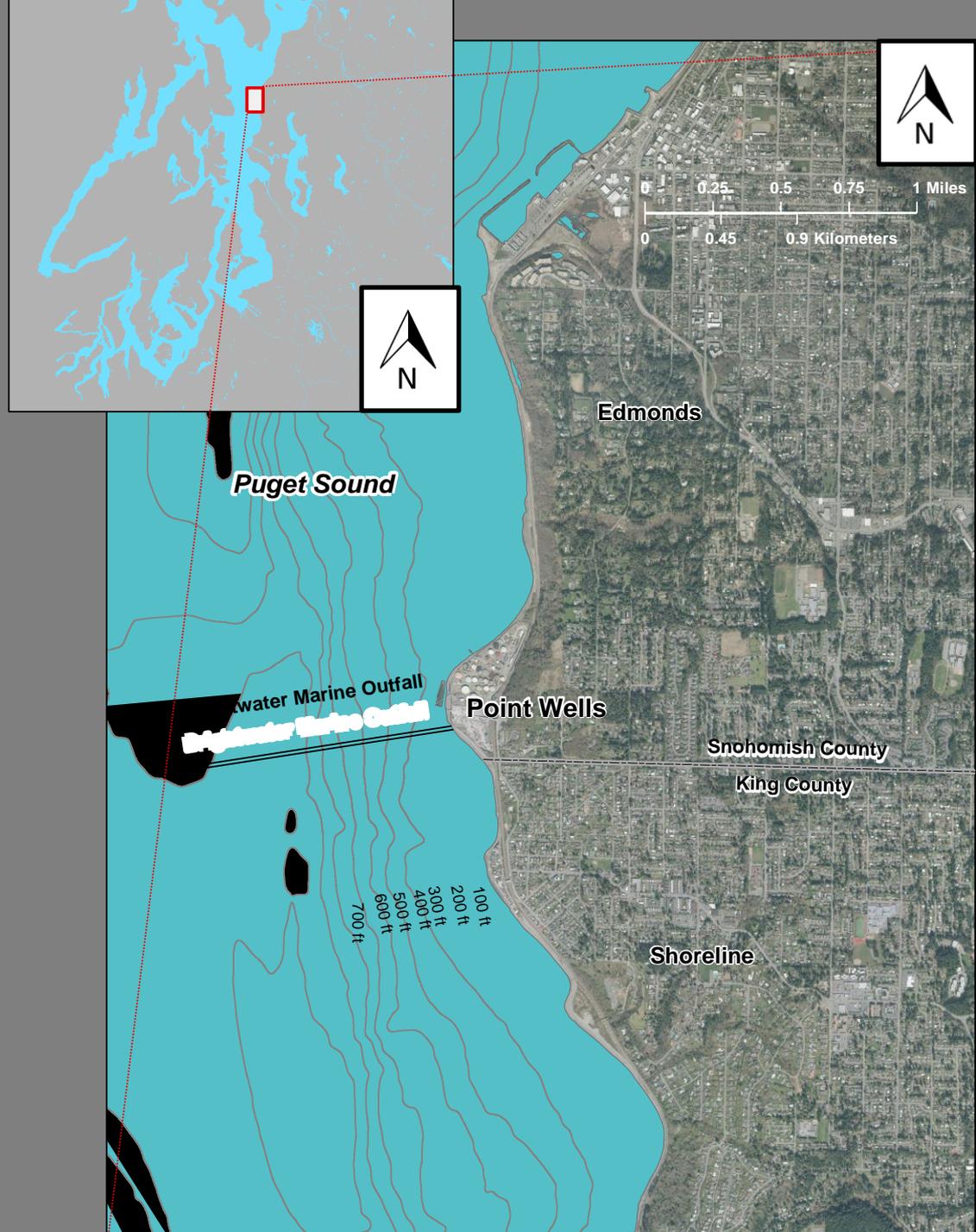


**Biological and structural integrity
assessment at the Brightwater
marine outfall**

**Wendy Eash-Loucks, Kim Stark, Jeff Lundt
King County, DNRP**

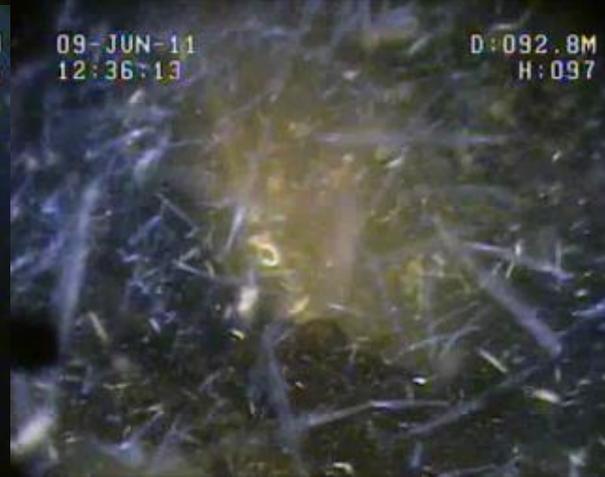
Brightwater Treatment Plant

- Newest treatment plant
 - Services N King County and S Snohomish County
- Outfall completed in 2008
 - Twin, 63-in diameter, 5,000 ft long HDPE pipes
 - Terminates at -600 ft MLLW (500 ft diffuser)
 - Weighted with concrete collars
 - Exposed from -80 deeper
- Outfall began discharging in Sept., 2012



Initial Surveys

- Underwater video collected from -80 to -130 ft MLLW
 - 2010
 - 2011
 - 2013
 - 2013
- Rapid colonization of pipe by sessile organisms
- Attract mobile organisms



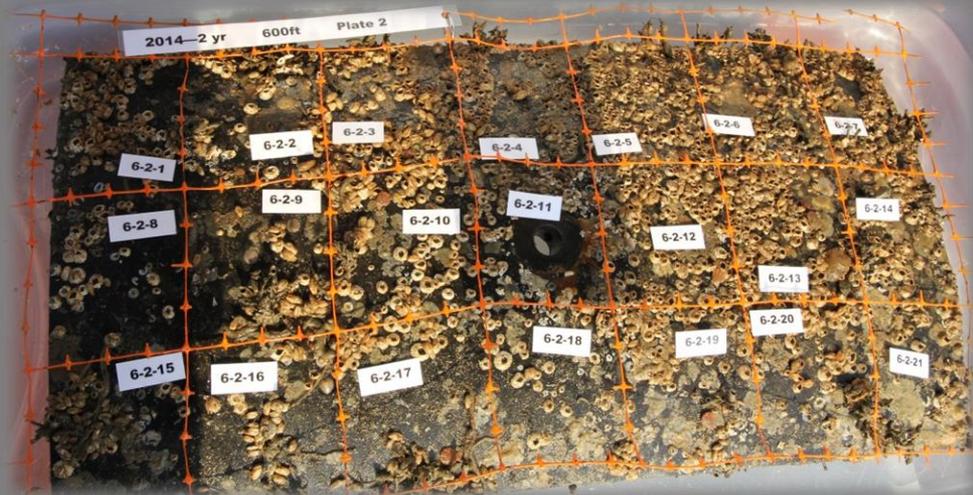
Study Design

- 2 ft x 1 ft sections of pipe deployed in 2012
 - -100, -300, -600 ft MLLW
 - Reference site (-600 ft)
- 9 “settlement plates” for each site
- 3 replicates to be collected at each depth
 - 2, 5, and 10 years



Sample Retrieval

- ROV collection
- Samples assessed for % cover
- Flexible mesh grid aids in estimation
 - 21 cells
- Macroscopic biota identified in the field
- Photographs of each cell
 - Future identification
 - Better estimate of % cover
- Structural integrity tests conducted on plates





Pododesmus macrochisma



Serpulidae



Delectopecten vancouverensis



Schizoporella sp.
&
Spirorbis sp.



Tubulipora sp.?



Trichotropsis cancellata



Chlamys hasta



Chelyosoma sp.



Urticina crassicornis



Crisia sp.



Chlamys rubida



Hiatella arctica



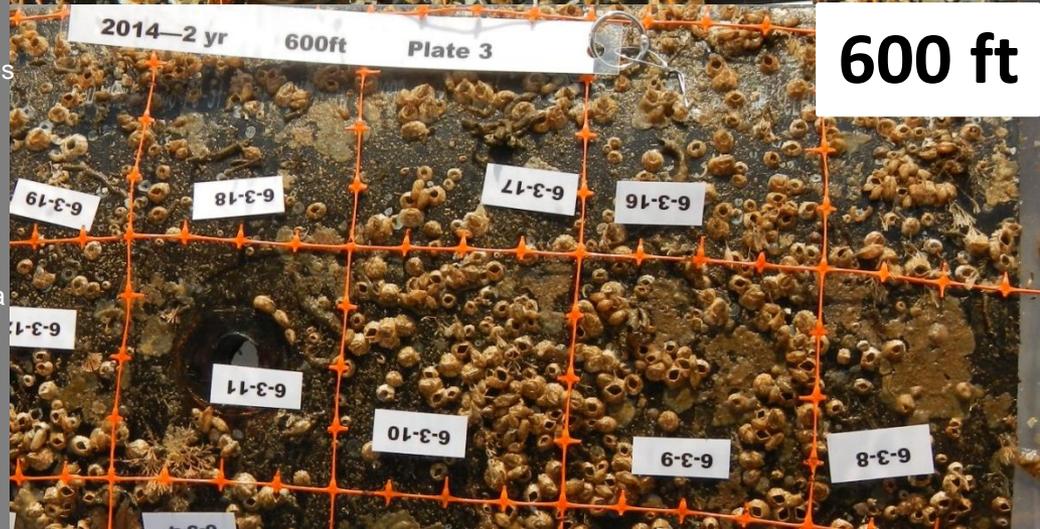
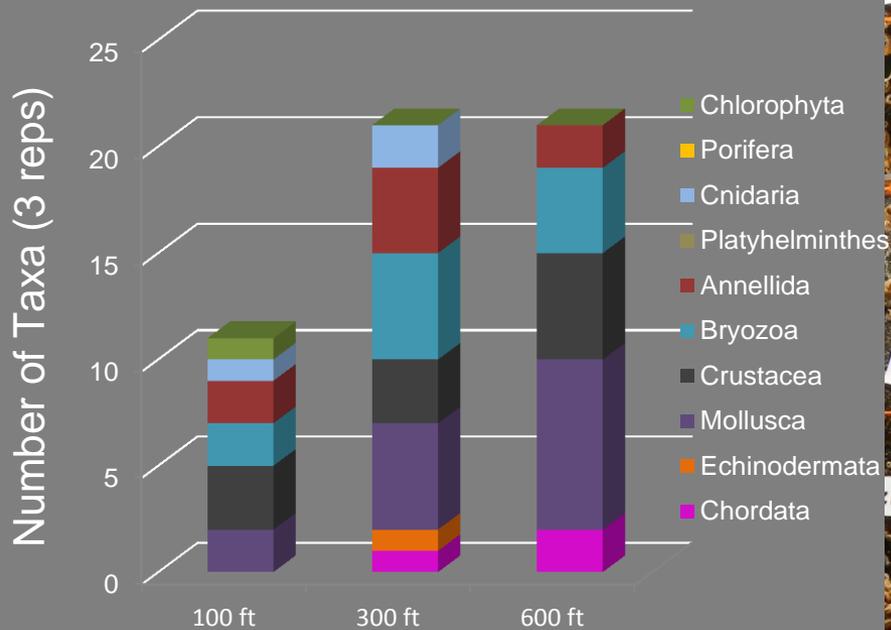
Harmothoe sp.



Strongylocentrotus sp.

Preliminary Results

- Diversity increased past 100 ft



Preliminary Results – 100 ft

- Little diversity (11 taxa)
- Heavy grazing
 - Sea stars?
 - Crabs?
 - Perch?
- Algae!
 - *Ulva* sp.



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Striped surfperch

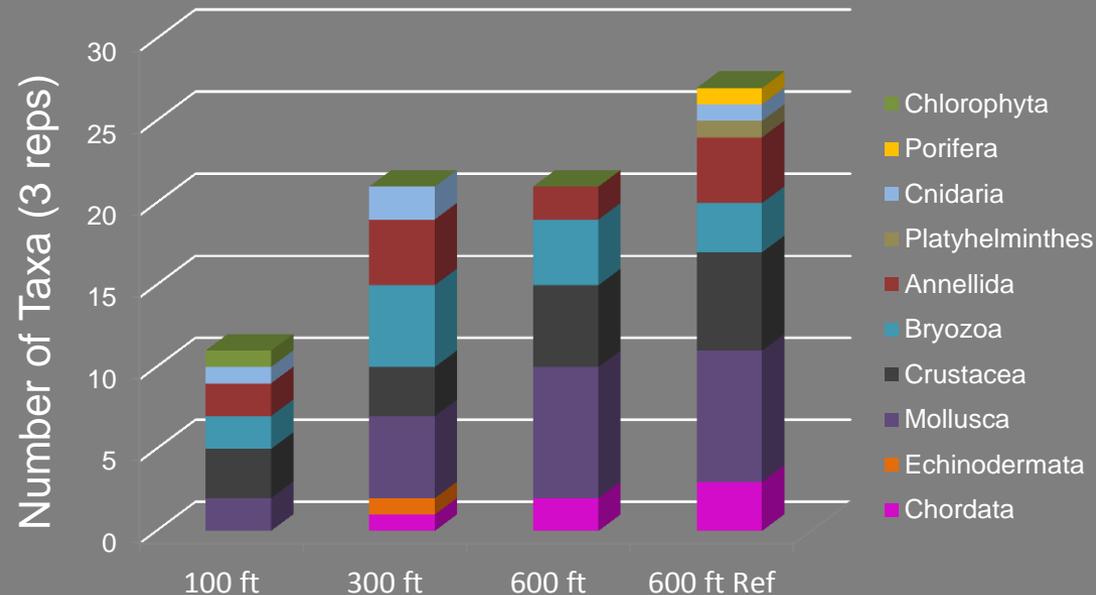


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Pile perch

Preliminary Results - Reference

- More taxa at reference site than 600 ft
- Is this significant?
Need more testing
- Why the difference?
 - Distance from pipe = less predation?
 - Currents?
 - Proximity to diffusers?
- More exploration is needed



Conclusions

- **38 = total number of taxa identified**
- **Diversity was lowest at 100 ft and highest at the reference site**

The Future...

- **Measure percent cover**
- **Determine variability of community and relative contribution of each taxon**
- **Plates will be evaluated for structural damage by colonizing organisms**