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## Where do all Maine's sea lice come from: a sentinel exploration of infestations in Cobscook Bay

Catherine Frederick

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# Where do all Maine's sea lice come from: a sentinel exploration of infestations in Cobscook Bay

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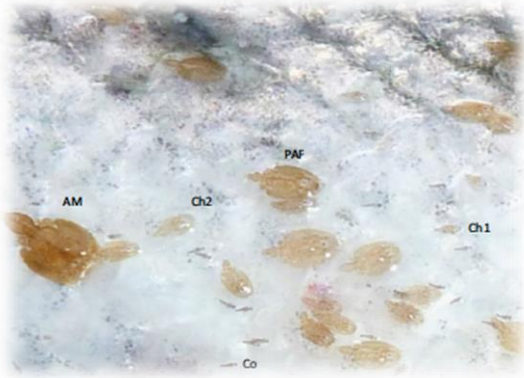


# A Global Epidemic

‘Why are you working on sea lice? Seals are more of a problem to us.’

- Salmon farmer, New Brunswick, 1992

*MacKinnon 1997*



***\$500 Million- \$1 Billion***

***LOST PRODUCTION***

***GLOBALLY***

***EVERY YEAR***

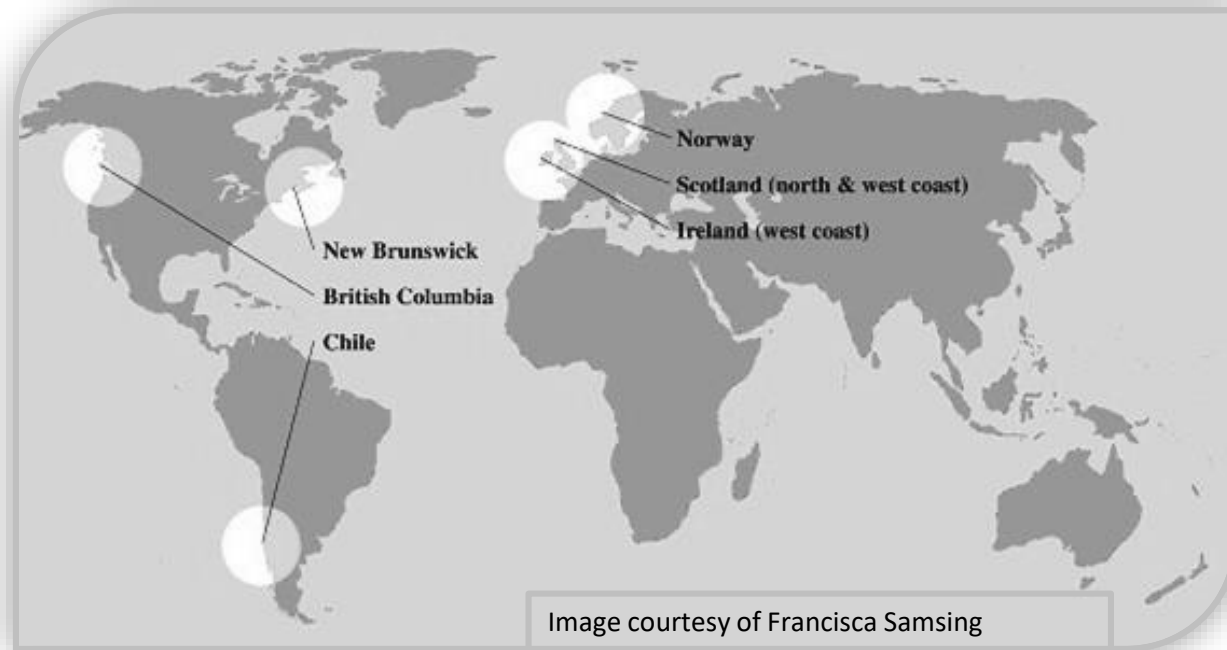
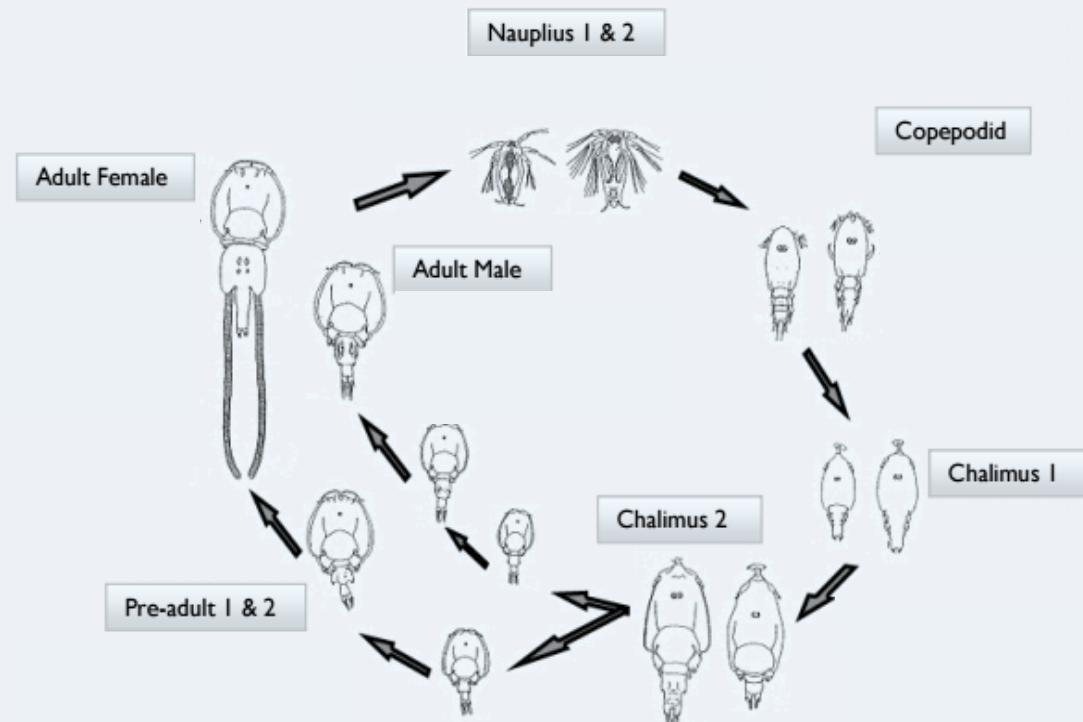
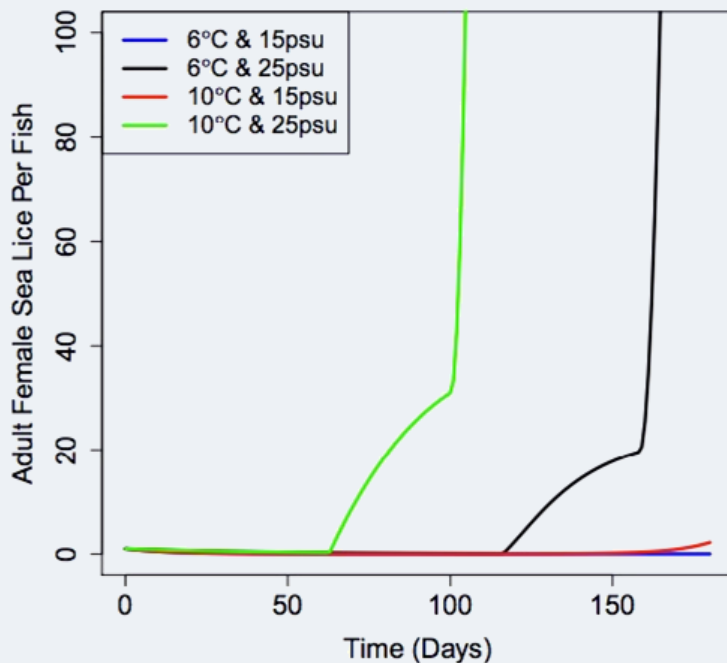


Image courtesy of Francisca Samsing

# Biological controls

**Chemical Properties** control reproductive biology, development, and survival

Successive generations



Hamre et al. 2013

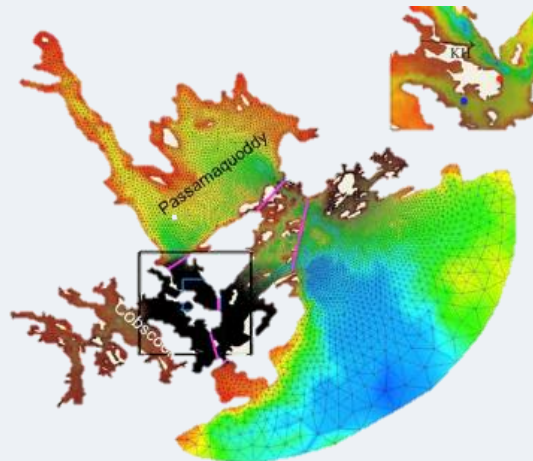
**Idealized conditions** increase potential of disease transmission

# Highlighted Research Interests

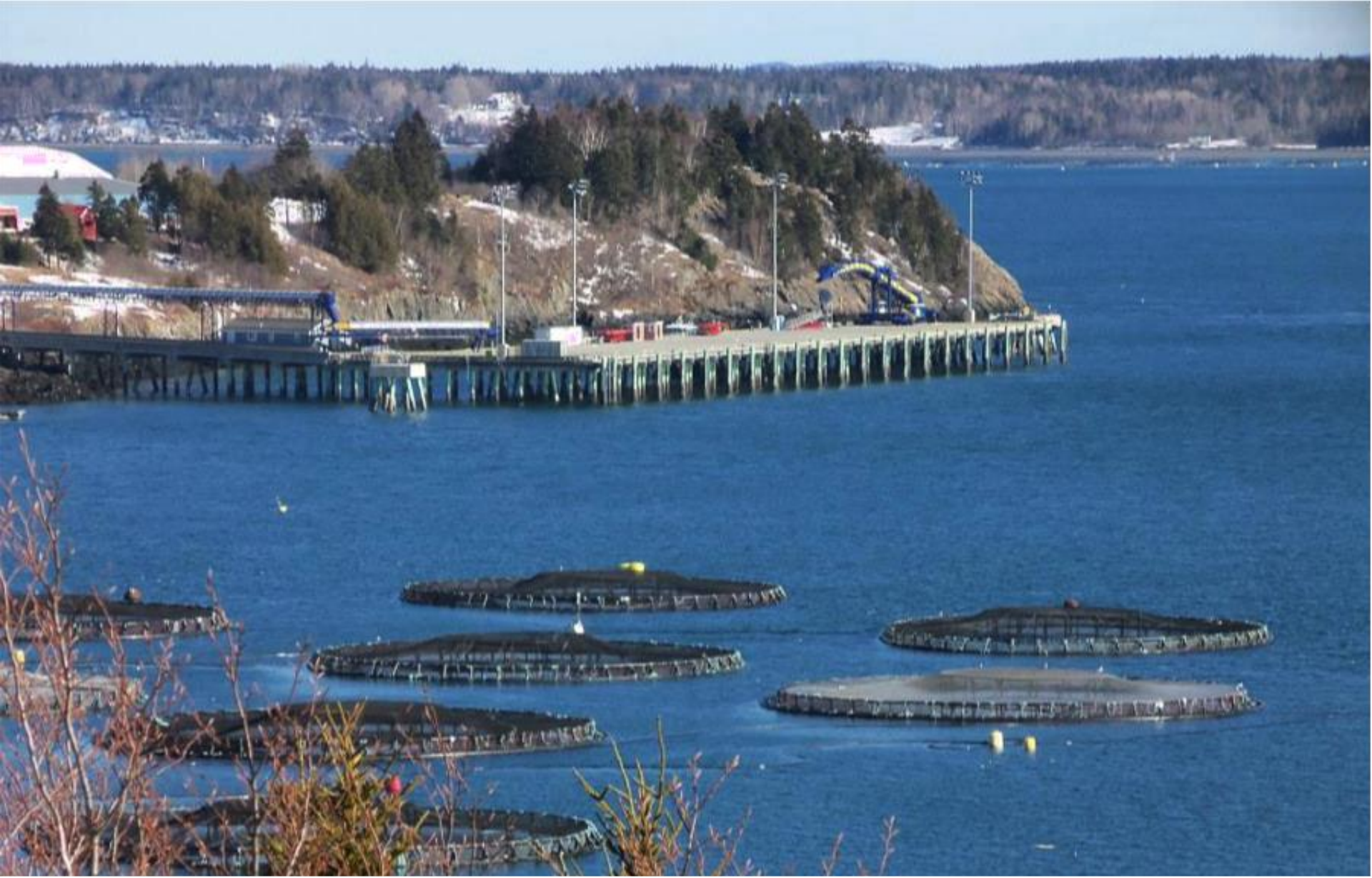
**Establish** a baseline of infection dynamics for Cobscook Bay



**Determine** unique physical controls of infectivity





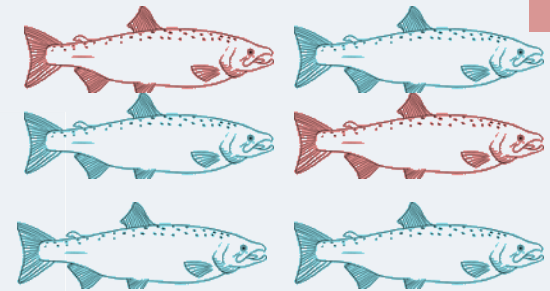


**What are the infection dynamics of sea lice (*L. salmonis*) in Cobscook Bay, Maine?**

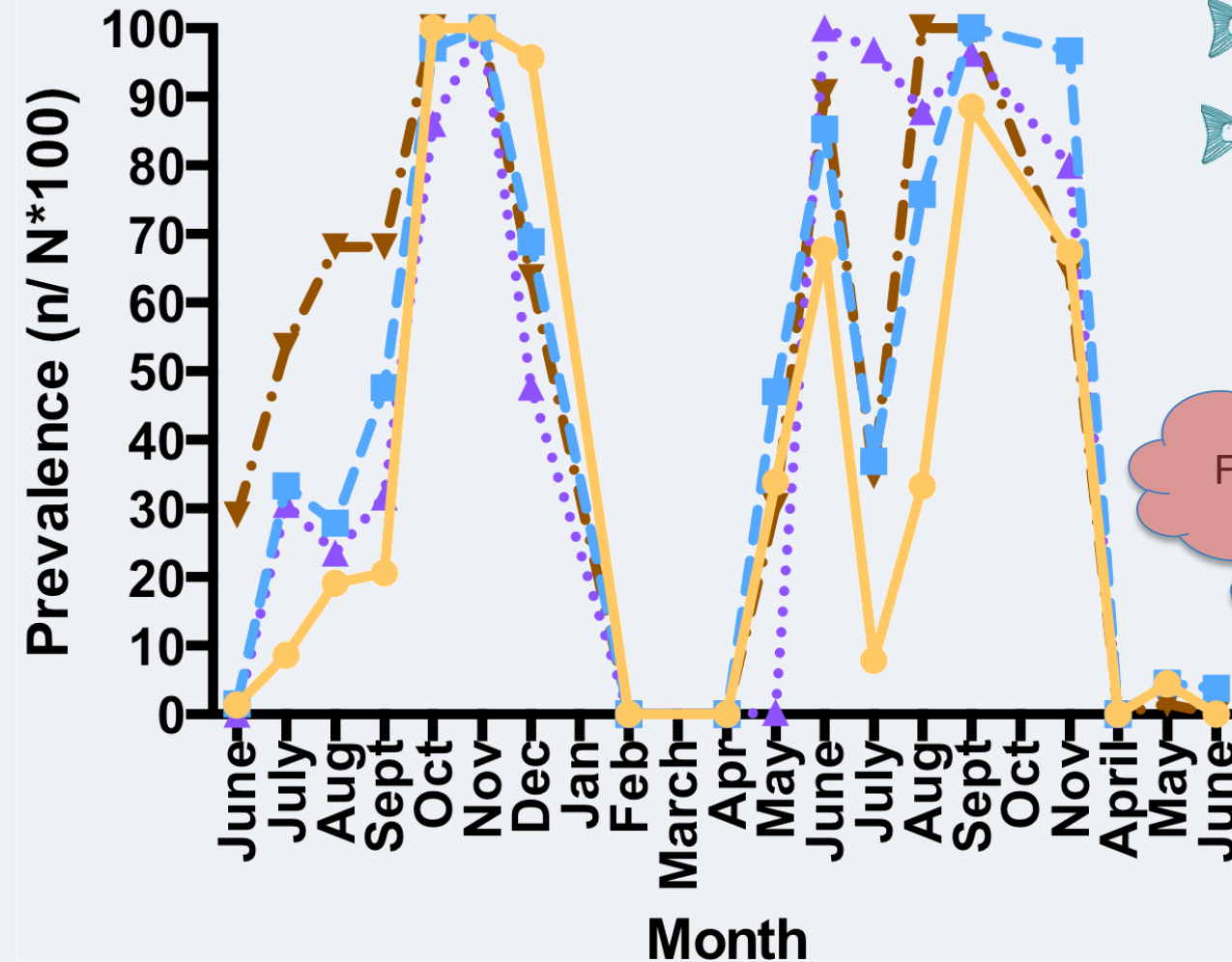
# Prevalence of Sea Lice Infestation

Proportion of host fish infested by one or more sea louse

33.3%



Pembroke Landing (PR) Comstock Cove (CC) Broad Cove (BC) Prince Cove (PC)

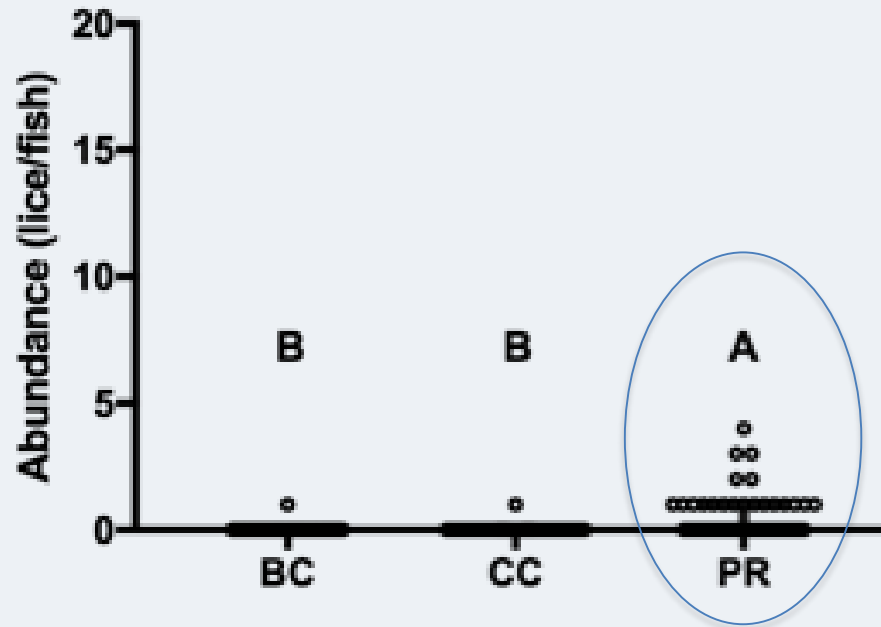


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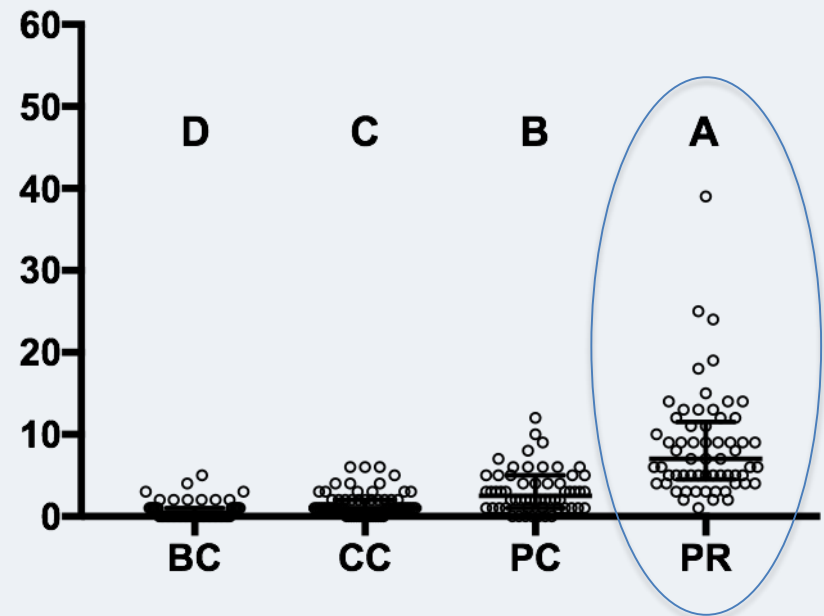


# Do counts differ between sites?

June 2013



August 2014



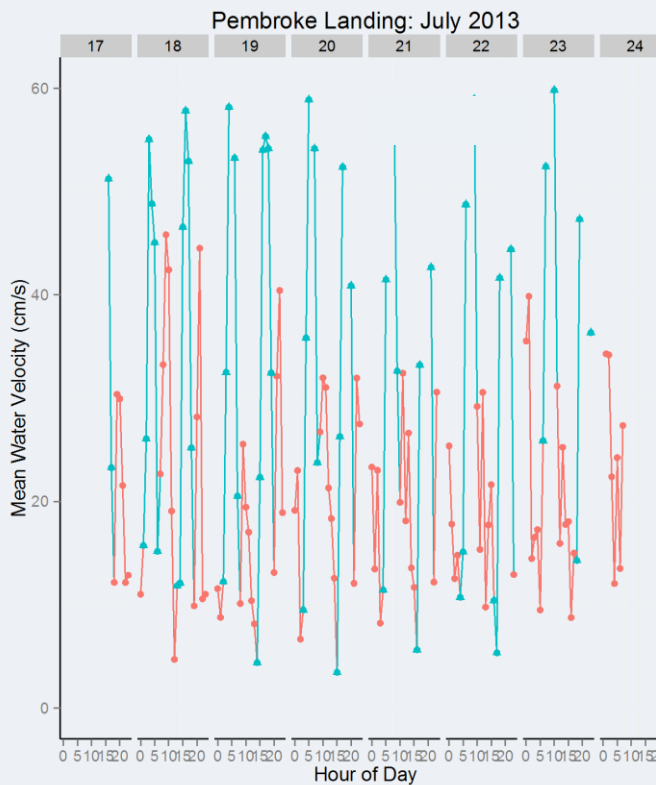




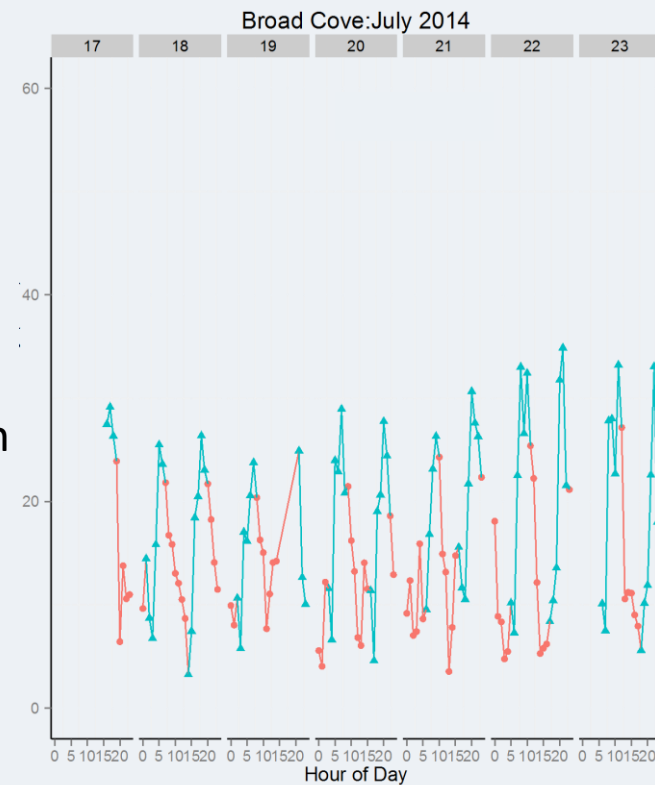
**What is the relationship of total lice count and physical environment?**

# Summarizing Results

**Water Velocity:** Statistically significant variable AND different between sites



**Pembroke Landing** has a velocity profile comprised of a wider range of velocities featuring greater speeds than that observed at **Broad Cove**







**WHAT'S NEXT?**



# Thank you for your time

[catherine.frederick@maine.edu](mailto:catherine.frederick@maine.edu)



Parasite job hunting



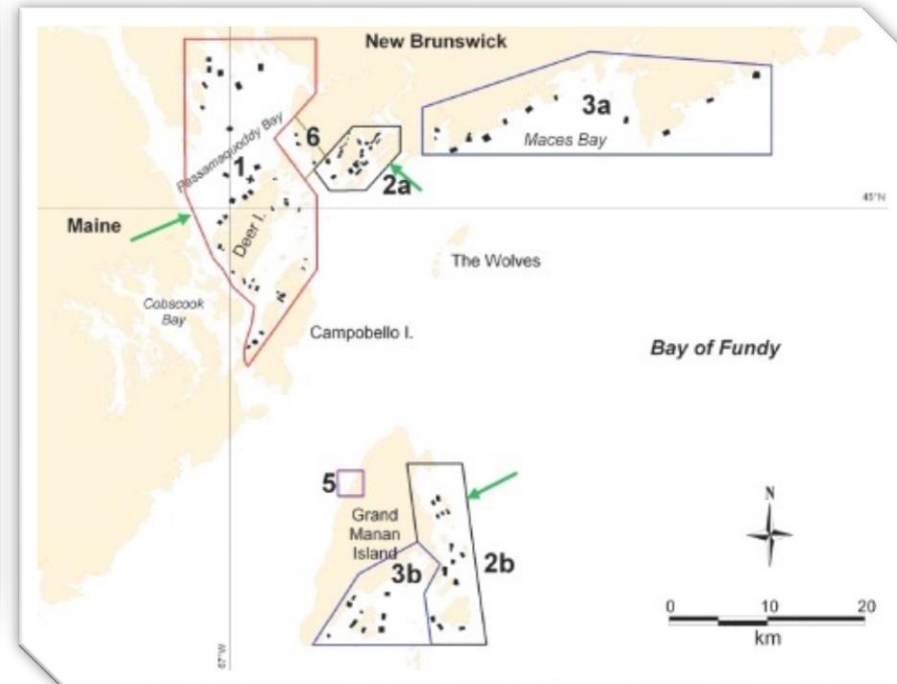


FIN

# Salmon Farm Operations in Cobscook Bay

**Active lease sites** in a tidally dynamic region with high connectivity

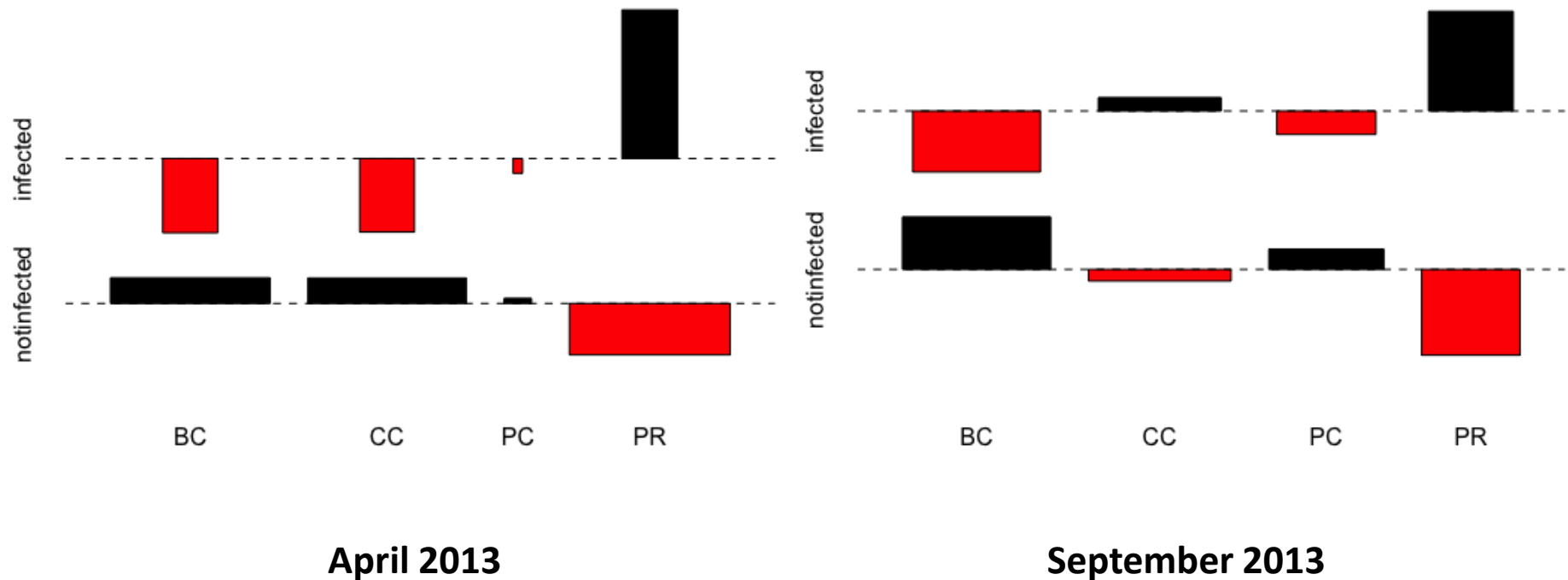
**Bay Management Zones** do not include Cobscook Bay sites



**Maintaining autonomy** of stakeholders whilst building a foundation

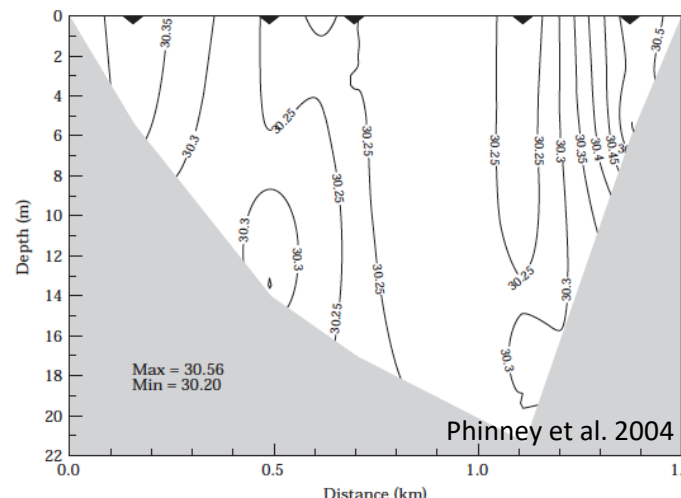
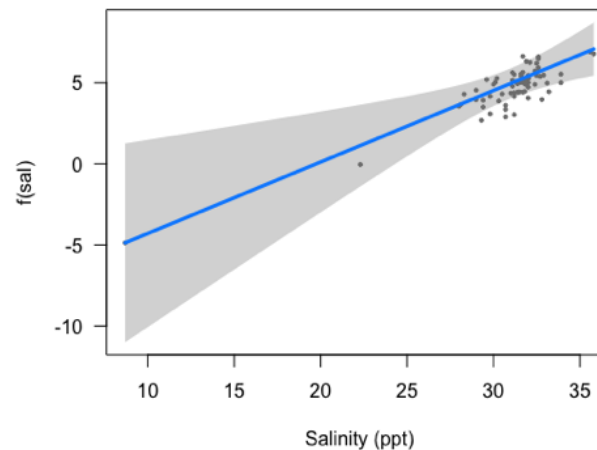
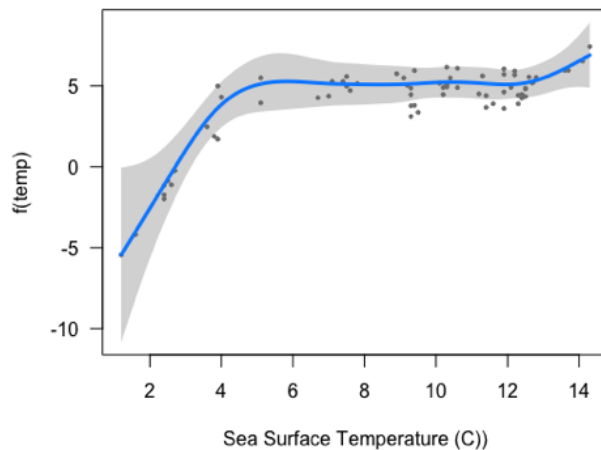
# Are there site to site differences in parasite prevalence?

**Fisher's exact test** examined statistical relationship of infection status and sampling site

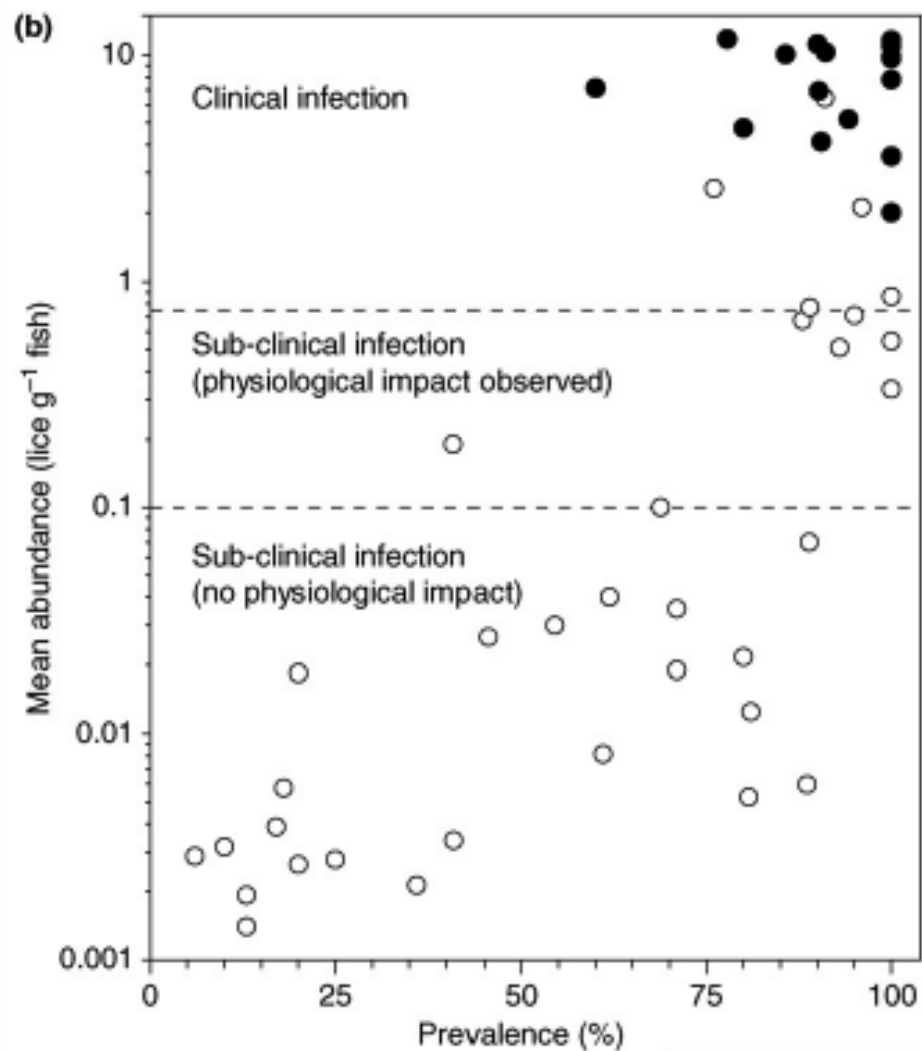


# Summarizing Mathematical Results

**Temperature and Salinity:** Statistically significant variables, but equal between sites







*TRENDS in Parasitology*

Wagner et al. 2008 taken from  
Grimnes and Jakobsen 1996