

# Water Quality Investigations in Seward, Alaska



Alutiiq Pride Shellfish Hatchery



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Seward Marine Center

# Hydrocarbons

- Duesterloh, Switgard. 2004. Chemical analysis of seawater from Resurrection Bay reveals creosote contamination. *In* The role of copepods in the distribution of hydrocarbons: An experimental approach. Ph.d. thesis. UAF.
- 15 seawater samples from SMC water supply between April and June 2001.
- All samples had a PAC signature typical for creosote contamination. Concentrations ranged from 422-2841 ng/Liter.
- This level of contamination reported to cause genetic damage to fish embryos (Rice et al. 2001).
- Intake pipe in vicinity of former railroad dock and warehouse.

# Hydrocarbon Project

Testing survival of blue king crab larvae cultured in seawater with carbon filtration vs. seawater without carbon filtration

- Kodiak beaker design
- Cold room at 6 C
- 2 Treatments
  - Carbon filtration
  - No carbon filtration (control)
- 6 replicates each, 26 zoeae/beaker
- Survival to first juvenile crab stage:
  - 0% with carbon filtration
  - 2% without carbon filtration



# What else?

## Microbiological contamination

- Inadequate water circulation

Aeration



Upwelling



# Microbiological contamination cont.

## – Seawater filtration

- RKC: 3 Sand filters, 3 100  $\mu$  bag filters, 3 10  $\mu$  cartridge filters, UV sterilizer
- BKC: 30  $\mu$  and 10  $\mu$  cartridge filters, 10 $\mu$  carbon filter, UV sterilizer

## – Potential sources of bacteria

- Microalgae
- Brine Shrimp



UV sterilizer



Microalgae



Brine shrimp

# Solutions

- Hydrocarbons
  - Analyze water for creosote contamination
- Water circulation
  - Kreisel-style upwelling tanks
- Filtration
  - Fine-tune carbon filtration system
- Other water issues
  - Run concurrent larval rearing experiments in Kodiak and Seward