Integrated Cook Inlet Environmental Monitoring and Assessment Program (ICIEMAP): Kachemak Bay Benthic Infaunal Communities

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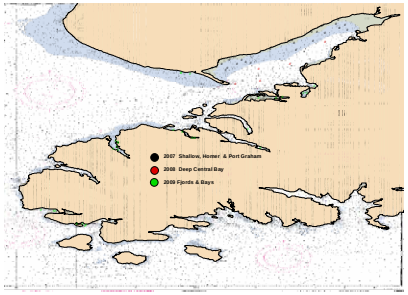
INTRODUCTION

Over 3 years, the NOAA Bioeffects Program in collaboration with CIRCAC and AK DEC characterized benthic habitats in Kachemak Bay and the Kenai Peninsula. The goal is to assess habitat conditions that influence biodiversity and distribution of infaunal communities by characterizing sediment properties, infaunal distributions, contaminant concentrations, and toxicity. Sediment samples were taken at each site using standard NS&T methods. Samples were analyzed for organic contaminants and metals. Benthos samples taken in 2008 were sieved through nested sieves of 1.0 and 0.5mm mesh.

CONCLUSIONS

- **PAH concentrations are elevated in the harbors, but not the Bay**
- **Some metals accumulate in deep sediments**
- **Metals concentrations in the fjords are site specific**
- **Benthic communities have little overlap in species composition between areas**
- **Sieving samples with a 1mm sieve loses significant diversity and abundance**

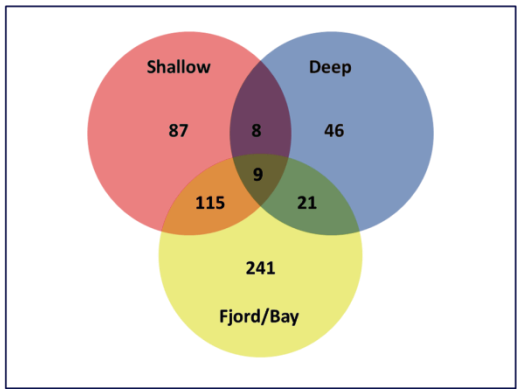
Sampling Locations



Effect of Sieve Size

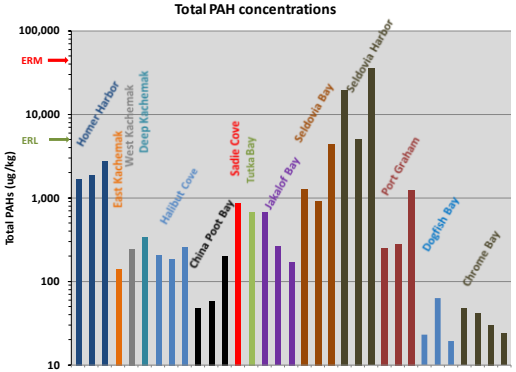
Abundance and number of taxa identified in 1.0 vs 0.5 mm sieve were significantly different. Over half of the abundance and one-third of the species are lost through a 1.0 mm screen.

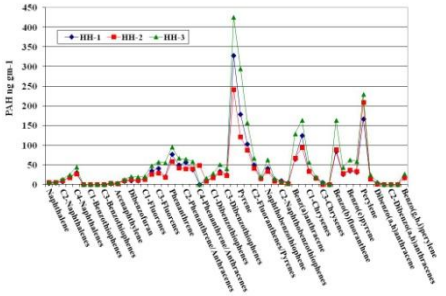
Station	KB01		KB02		KB03		KB04		KB05	
Sieve	0.5 mm	1.0 mm	0.5 mm	1.0 mm	0.5 mm	1.0 mm	0.5 mm	1.0 mm	0.5 mm	1.0 mm
Abundance	477	369	333	247	676	350	248	185	560	588
Total Abundance	846		580		1026		433		1148	
# Taxa	40	46	41	40	56	56	37	41	35	32
Total # Taxa	67		65		89		62		56	

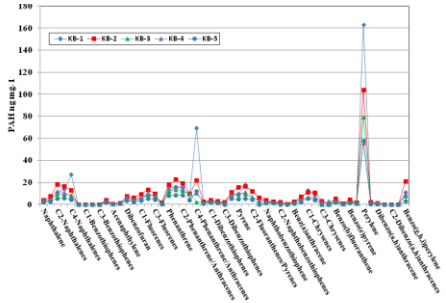


Species Overlap in Different Habitats

Species composition in the different regions had little In common. Bays at the end of the peninsula were considerably more diverse than inside Kachemak Bay.

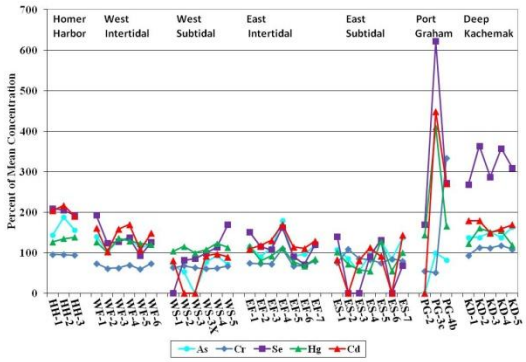






PAH Concentrations

Total PAH concentrations were generally low except in harbor areas. Typical fingerprints of PAHs in the harbors are shown above right, with characteristic combustion by-products. PAHs in the open Bay (right) do not contain oil or combustion by-products. Perylene was dominant.



Metals Concentrations

When normalized to the mean concentration found in the Bay (=100%), specific metals appear to be accumulating in the deep, fine grained sediment. Some metals are very high or very low in specific locations in the small bays, probably related to local geology.