

The Land Sea Connection

Coastal Animal Species

Fecal Pathogen Work



Scope of Work

- Test at least 50 fecal samples per animal species from six coastal species for the following fecal pathogens: *Escherichia coli* O157, *Salmonella* spp., *Campylobacter* spp., *Vibrio* spp., *Cryptosporidium* spp. and *Giardia* spp.
- Perform molecular characterization studies using PCR, DNA sequence analysis, PFGE, and antimicrobial resistance testing.

Objectives & Hypotheses

- Obj₁: To determine the prevalence of fecal pathogens in terrestrial animal populations along Monterey Bay and determine the impact that each individual species may have on the Carmel River (CRW) and Elkhorn Slough (ESW) watersheds.
 - H₁: The greatest contributors to fecal pathogen pollution in Monterey Bay, California will be based on local abundance, distribution, fecal load, and other mitigating factors (e.g., proximity to tributaries).

Secondary Objectives & Hypotheses

- Obj₂: To determine if pathogen prevalence is seasonal.
 - H₂: Pathogen prevalence will vary seasonally with the greatest pathogen loads occurring during Spring and Summer for mammals and during Autumn and Winter for gulls



Methods- Cow Sampling

Using a sterile tongue depressor, approximately 25-100g of ≤ 24 hour old feces from an adult beef cow will be collected and split into two Sterile 50ml conical vials.



Methods- Opossum Trapping

Opossums are caught using live traps baited with fruit (bananas, grapes, and figs). Each opossum is removed from the trap, aged, sexed, given an ear tag for future identification and then released.

Fecal samples from live-caught opossums are recovered after the animal is released from the trap. Using sterile instruments, approximately 25-100g of feces will be collected and split into two sterile 50ml conical vials.



Preliminary Results-Cow

Season	Samples Tested	Bacteria	Protozoa
Dry	40	1 positive for <i>Campylobacter</i> (5.5%) ^a	4 positive for <i>C. parvum</i> -like oocysts (10%), 12 positive for <i>Giardia</i> (30%)
Wet	50	1 positive for <i>Campylobacter</i> (2%)	1 positive for <i>C. andersoni</i> (2%), 6 positive for <i>Giardia</i> (12%)

^a Results only reported for 18 of 40 samples.



Preliminary Results-Opossum

Season	Samples Tested	Bacteria	Protozoa
Dry	2	All were negative for <i>Campylobacter</i> , <i>E. coli</i> 0157, <i>Salmonella</i> , <i>Vibrio</i>	1 positive for <i>C. parvum</i> -like oocysts (50%), 2 positive for <i>Giardia</i> (100%)
Wet	6	3 positive for <i>Salmonella</i> (50%), 2 positive for <i>Vibrio</i> (33.3%)	2 positive for <i>C. parvum</i> -like oocysts (66.7%), 2 positive for <i>Giardia</i> (66.7%)



Continuing Work at Palo Corona Regional Park

- Collect more opossum samples during the 2009 wet season.
- Collect additional cow feces and water samples during the 2009 wet and dry seasons.

