Snails, worms and flies: Invertebrate life in the tidal flats and low marshes of the Saco River Estuary

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Why Benthic Invertebrates?

- Limited mobility
- Wide tolerance range - pollutants and disturbance
- Relatively easy to sample
Questions

1) What types of invertebrates inhabit the tidal flats and low marsh habitats of the Saco River Estuary?

2) How diverse are the invertebrate communities in the tidal flats and low marsh habitats?

3) How similar are the communities in the estuary and what structures these communities?
Who’s in the Saco River Estuary?

- 5 phyla represented
- 24 families (min)
- 19 species (min)
Snails and worm like critters

• Mollusca
  – Bivalvia
    • 2 families
  – Gastropoda
    • 2 families

• Nematoda

• Nemertea
  – 1 family

Hydrobiidae
Worms

Annelida

– Leeches
  • 2 families

– Polychaeta
  • 4 families

– Oligochaeta
  • 2 families

Hediste diversicolor

Oligochaeta
Flies, etc.

**Arthropoda**
- Insecta
  - 5 families
- Malacostraca
  - 5 families

*Bezzia/Palpomyia sp.*
How diverse are these sites?

![Graph showing Shannon-Wiener Diversity for different sites.](#)

- N2
- S1
- N4
- S6
- N10
- S11

- **Tidal Flat**
- **Low Marsh**

Family level except for Oligochaeta and Nematoda
What structures these communities and how similar are the sites in the Estuary?

Two Analytical Approaches:

1. Nested permutational MANOVA
   - Standardized abundances
   - Months nested
2. Hierarchical clustering
   - Presence/Absence
   - Bray-Curtis

Low Marsh Communities

- Salinity Position
- Grain Size

Tidal Flat Communities
Tidal Flat Benthic Invertebrate Communities

Bray-Curtis Distance

Salinity (Pr>F=0.001, p=0.001)
Low Marsh Benthic Invertebrate Communities

Bray-Curtis Distance

Position Effect
Pr>F=0.002 and p=0.01

Salinity Effect
Pr>F=0.007 and p=0.01

S1
S6
N2
N4
N10
S11
Preliminary Conclusions

• Tidal flats versus low marsh habitats
  – Different factors controlling
• In low marsh habitats, need to examine:
  – Land use patterns
  – River Hydrodynamics
• More surveys needed
  – High Marsh
  – Other sampling methods
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