Forage Fish & Land Use

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Nutrients and Watershed Land Use

- Total N and P increase with % cropland (except in a drought year such as 2012)
- Total N increases with % developed land
- Total N and P decrease with increasing salinity

Persistent Organic Pollutants in Atlantic Silversides:

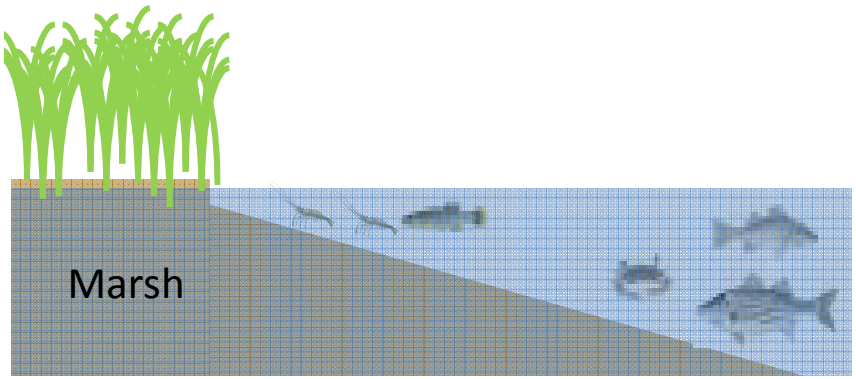
PCB, DDT, Chlordane, and Dieldrin increase with % developed land in the watershed

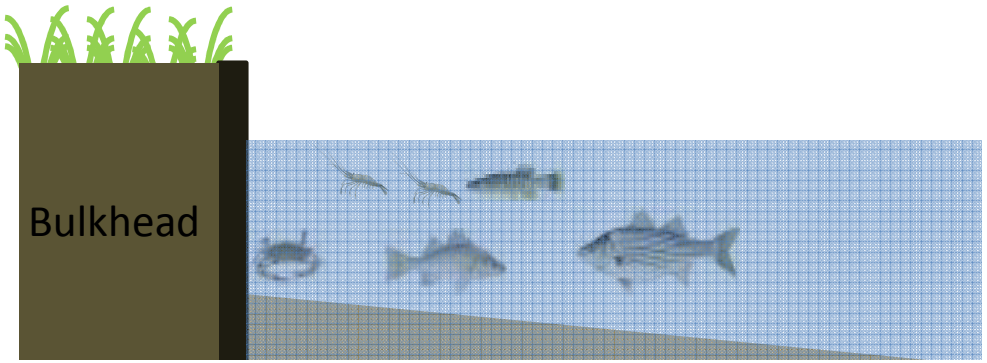
Summary:
Patuxent River Results

- Benthic habitat near marshes has highest density and diversity of infauna.
- Rip-rap and bulkhead show negative effects on infauna.
- Epibenthic predator abundance increases with prey abundance.
- Habitat degradation may be linked with loss of higher trophic levels.
- Protection and restoration of marshes may be essential to sustaining high benthic production and consumer biomass in Chesapeake Bay and similar estuarine systems.

Take Home Points – Shoreline Alteration

- Natural shorelines provide critical refuge habitat for prey species
  - •Open water species at beach, littoral species at marsh
  - • Highest fish diversity at marsh habitats
- Altered shorelines appeal to species that orient to 3D structure
  - • Similar patterns at riprap and bulkhead; building riprap doesn't necessarily solve shoreline-alteration issues





Take Home Points – Land Cover

• There are a number of significant correlations between macrofauna abundance/diversity and land cover, even when including shoreline habitat and salinity in statistical models

• Hypothesis: reduced water quality associated with high levels of crop or developed land may be affecting macrofauna

•Future analysis will incorporate direct measures of water quality (e.g. DO, TSS, Chlorophyll a)

•**If** water quality is driving these correlations, then efforts to improve water quality (e.g. riparian conservation) may benefit macrofauna