Filter Feeder Options for the Chesapeake Bay

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Bay Filter Feeders

Menhaden Population

- The population of menhaden in the Chesapeake Bay is unknown, making modeling difficult.
- There is currently an annual harvest cap (109,020 metric tons) on menhaden in to allow more time for stock assessment (cap recently extended to 2013)
  - Purse seine reduction fishery is only in VA
  - MD fishery is much smaller

Menhaden Nutrient Assimilation

- Brush et al. (2009) from VIMS have assessed the nutrient assimilation capacity of menhaden
  - Adult menhaden are “unlikely to significantly impact phytoplankton biomass and production on a bay-wide basis”
  - Juvenile impacts would be “small at best” even assuming the entire coast-wide population of juveniles were in the Bay
    - estimates using entire population result in consumption of 5% of summer biomass and 20% of fall biomass
  - Juveniles could have some localized impacts in tributaries or bay segments or within a menhaden school

Oyster Nutrient Assimilation

- Stephenson (2008) estimates between 700 and 5,550 pounds of TN are removed annually per 1,000,000 market-sized oysters
- This is a wide range of biomass needed for offsets
- The cost of TN reduction via nutrient assimilation varies between $0 and $100/pound. In comparison agricultural BMPs in VA range from $4-$200/pound, with urban stormwater BMPs being much more expensive (Stephenson 2009).

Oyster Restoration & Preservation

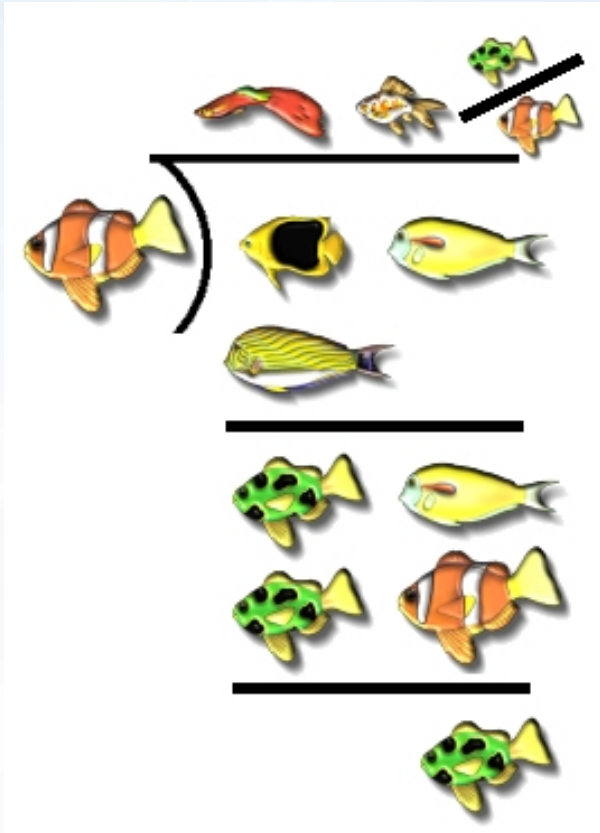
- Expanded sanctuaries are already planned by the VA Oyster Restoration Plan and MD Priority Reserve Areas.
- 2009 Maryland Oyster Restoration and Aquaculture Development Plan will expand sanctuary area from 9% to 24% of remaining quality habitat (36,000 acres)
- 2009 MD Oyster Restoration and Aquaculture Development Plan outlines 600,000 acres newly available for bottom leasing, including 95,524 acres of natural oyster bars that were formerly off limits.
- Also developing Aquaculture Enterprise Zones – areas pre-approved for leasing.

Oyster Challenges

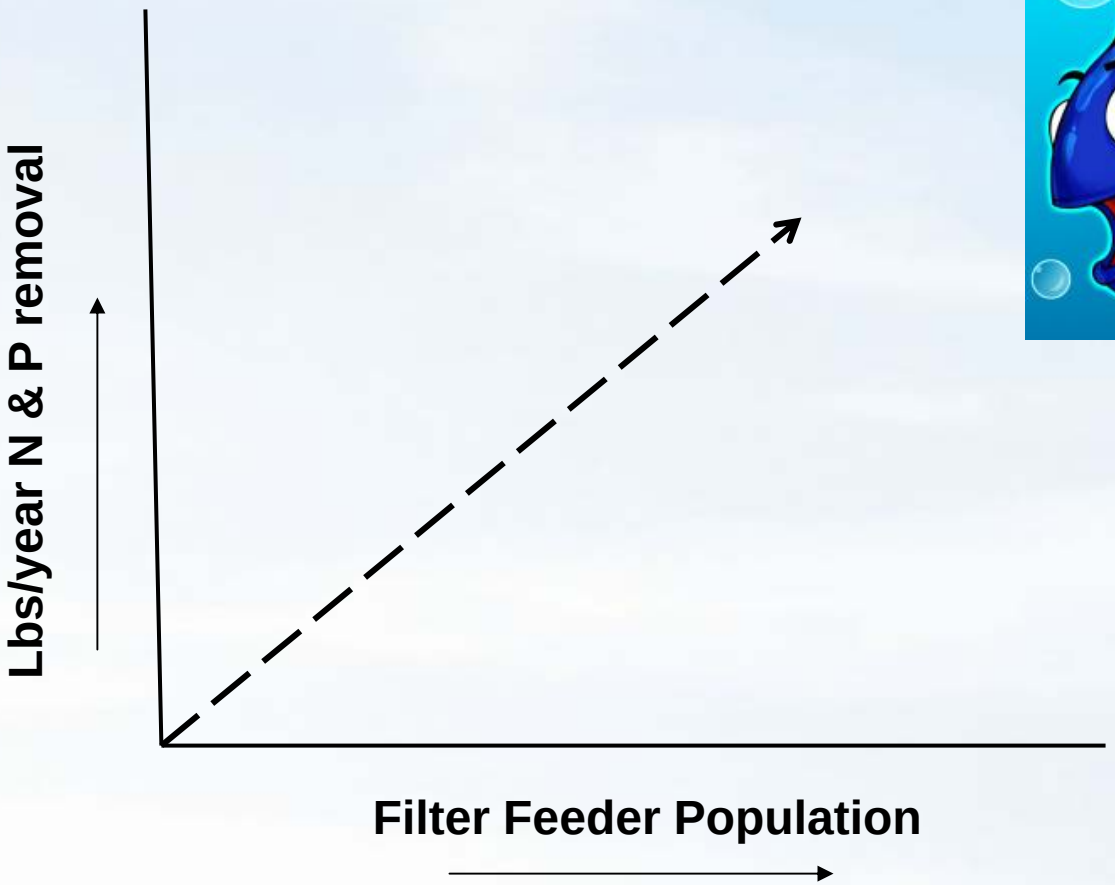
- Disease mortality and reduced fecundity are major inhibitors to population expansion
- Older oysters have slower metabolism and reduced nutrient assimilation
- Oyster Aquaculture is limited by the supply of disease resistant seed oysters
- Seed oysters are limited by cost-effective market production

Accounting for Filter Feeders

- TMDL will be based on current assimilative capacity
- TMDL does not account for future population changes



Hypothetical Nutrient Removal Efficiency



Proposal for Addressing Filter Feeders

- Assume current assimilative capacity will continue
- If future monitoring shows increases in filter feeder population then 2-year milestone delivered reductions will be adjusted accordingly
- Adjusted loads will be compared to the 2 year milestone commitments

Crediting Filter Feeder Benefits

- Options
  - State responsible for filter feeder increase benefits
  - Distribute nutrient reduction evenly across States and DC
- Benefits of filter feeders varies based on monitoring
- Filter Feeder management should be addressed in WIP for MD and VA

Other Issues

- Nutrient Assimilation in the Bay does not reduce nutrients at their source
- Over-reliance on nutrient assimilation at the Bay may make meeting upstream in-stream water quality targets difficult
- Some regulators consider nutrient assimilation an “in-stream” treatment, which is not allowed in lieu of advanced wastewater treatment
- Need to consider confidence in population permanence, reliability and be verifiable to track and report milestones