Boating, Erosion, and Nutrients: Problems and Solutions for the South River, Rhode River, and Severn River Tributaries of the Chesapeake Bay

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I. Tributaries In Consideration

A. Rhode River
B. Severn River
C. South River

II. Boating

A. Background Information
    1. The effects of a single boat may seem insignificant, but when multiplied by the tens of thousands, the effects are dramatic.
    2. Maintaining/operating a boat, its engine, and marine sanitation devices are factors that can have severe negative impacts on water quality, shoreline stability, and Bay life.
B. Marine Sanitation Devices (MSD's)
    1. Human waste contains nitrogen and phosphates that contribute to water pollution, such algal blooms and oxygen depletion.
    2. Human waste contains bacteria that can transmit diseases to swimmers and can close shellfish beds.
    3. Preventable problems
        a. sewage discharge
        b. failure to meet EPA standards (heads/toilets)
        c. Lack of on-shore pump-out stations
        d. Failure to maintain/rinse the MSD
C. Littering
    1. Plastic and litter ruin the natural beauty of the Bay and injure/kill aquatic life.
    2. The dumping of any material in any in-land waterway (rivers, lakes, bays, and sounds) is illegal.
    3. Plastics are prohibited from being thrown overboard worldwide.
    4. Preventable problems include illegal dumping of wastes.
D. Boat Wakes
    1. Wakes contribute to shoreline erosion, especially in smaller coves and creeks.
    2. Wakes stir up bottom sediments, which reduces sunlight essential to underwater grasses.
    3. Preventable problems include violators of speed limit.
E. Boat Appearance and Maintenance
    1. Scrapings from sanding/scraping are hazardous waste.
    2. Due to its toxicity, it is illegal to use an anti-fouling coating on your boat to prevent growth on the bottom.
    3. A single quart of spilled oil can pollute up to two acres, the equivalent to nearly three football fields of water surface.
    4. The alcohol content of unleaded fuels has a tendency to deteriorate fuel line hoses.

5. It is illegal to dump antifreeze into the Bay and its tributaries.
6. Oil in bilge water can be pumped overboard by the bilge pump.

7. Preventable problems:
   a. Failure to report oil spills or toxic products spills in general
   b. Using toxic boat cleaners

III. Nutrient Pollution

A. Wastewater Treatment Plants
   1. Maryland has 62 major wastewater treatment plants.
   2. Due to pollution from excess nitrogen and phosphorus, the Chesapeake Bay remains on the Clean Water Act list of impaired waters.
   3. The Chesapeake 2000 Agreement, signed by Maryland, Virginia, the District of Columbia and the Environmental Protection Agency, commits to taking actions necessary to removing the Bay and its tidal tributaries from the list by 2010.
   4. Currently, wastewater treatment plants contribute 61 million pounds of nitrogen per year.
   5. Upgrading the major wastewater treatment plants to achieve nitrogen reductions of 3 mg/liter would remove 42 million pounds of nitrogen in the Bay each year or 31 percent of total nitrogen reductions needed to meet 2010 goals.
   6. To meet 2010 goals, annual nitrogen discharges into the Bay must be reduced by at least 150 million pounds from the current 300 million pounds.

B. Nitrogen and Phosphorus
   1. Nitrogen pollution causes algae blooms that consume oxygen, which lowers dissolved oxygen levels so that fish and shellfish die.
   2. Over abundance of nitrogen contributes to the Bay's "Dead Zone" and creates algae blooms that block sunlight to underwater grasses and prevents their growth.
   3. As land use patterns change and the watershed's population grows, the amount of nitrogen entering the Bay's waters increases tremendously.
   4. The majority of nitrogen pollution comes from human impacts such as sewage treatment plants, large-scale animal operations, agriculture, air pollution, and smoke stacks.
   5. Agricultural runoff contributes 40% of the nitrogen and 50% of the phosphorus entering the Bay.
   6. Nutrients come from natural sources such as decaying organic matter in forests and wetlands.
   7. Other sources include septic systems, runoff from roadways, development, residential and commercial lawn fertilizers, and air deposition from factories.
   8. Too many nutrients pose the threat of *Pfiesteria piscicida,* a microscopic organism that has been linked to people having difficulties learning and concentrating.

IV. Erosion

A. During periods of rain or melting snow, soil and other particles are carried off the land and into waterways.
B. Sediments can smother bottom-dwelling plants and animals, such as oysters and clams.
C. Suspended sediments make the water cloudy so less light is available for underwater Bay grasses.
D. Sediments can carry high concentrations of certain toxic materials that contaminate waterways.
E. Sediments also carry nutrients, particularly phosphorus, which increases nutrient pollution in the Bay.
F. Other natural processes that contribute to sediments in the Bay are wind, ice-flows and water currents.
G. Sediments are loose particles of clay, silt, sand and other substances that are suspended in the water and settle to the bottom of a water body.

V. Landscaping to Deal With Erosion:

A. Cover the soil
    1. Choose grasses, perennials, shrubs, and trees that fit your landscape
    2. Use mulch and straw to cover the soil
    3. Direct downspouts onto grass or mulched planting beds (use splash blocks to reduce impact)
B. Improve the soil
    1. Add organic matter
    2. Compost yard wastes and use planting beds as a place to recycle fallen leaves
    3. Use raised beds with framed solid sides (will keep soil in place)
    4. Plant cover crops in the garden (a.k.a. green manures)
C. Stabilizing slopes and gardening on slopes
    1. Use native grasses, groundcovers, or shrubs (do not use grass clippings as mulch)
    2. Plant along the contour
    3. Construct terraces
D. Implementation
    1. Local business support. Selected lawn suppliers will offer discount prices on mulch, grasses, and shrubs.
    2. Local lawn services will offer a discount on landscaping. The citizen may landscape his own yard if he/she prefers.

VI. Landscapes That Help the Chesapeake Bay: The following landscaping recommendations will be beneficial to the environment around the Chesapeake Bay.

A. Keep paved areas to a minimum
    1. Hard surfaces do not allow water to soak into the ground
    2. Instead use gravel, wood chips, stepping stones, or bricks on sand
B. Rethink the lawn

1. Consider making it smaller
2. Plant wildflowers

C. Conserve water
1. Use plants adapted to this region
2. Use plants that are extremely drought tolerant
3. Group plants that require regular watering to minimize waste
4. Use soaker hoses or drip-irrigation
5. Water lawn only when grass shows signs of needing water

D. Leave buffer strips
1. 25-foot wider strip of unmowed grass or woodland along the water
2. Will slow runoff, filter water pollutants, and provide food and shelter for wildlife

E. Deal with pests sensibly
1. Integrated Pest Management (IPM)
2. Plant a variety of species to avoid widespread damage
3. Use disease and insect-resistant plants
4. Monitor your landscape

F. Conserve energy
1. Leave trees standing around building
2. This will reduce energy consumed by heating and air conditioning units

G. Implementation
1. Tax conventional insecticides/herbicides.
2. A Public works group should construct drains leading to the ground in hard surfaces, or remove hard surface entirely.
3. See Section V for landscaping plan.

VII. Solutions to Prevent Erosion From Boating

A. Implementation – develop a uniform rip rap and bulkhead policy along protected shorelines.
1. This has proven to reduce erosion by more than 80% in some areas
2. The cost of this implementation is considerably small when you consider how expensive it will be 20 years from now to recover
3. Bulkheads not only prevent erosion but also protect all wildlife that exists around it and helps prevent flooding.

B. Reduce speed rates on the rivers in all areas as they have done on the South River
1. Since the speed limit has been reduced to 35 mph, Turkey Point Beach has been taken off the Critical Beach list for the Chesapeake Bay.
2. If all areas where residential housing has already made to sediment subject to erosion had the speed limit reduced, similar success could be expected.

C. Do not allow boats with a horsepower of over 7 mph in some narrow coves and stream since these places are much more susceptible to erosion.
1. This plan has been put into place in areas such as Deep Creek Lake with great success.
2. This also prevents boaters from running their vessels aground because of the legal ramifications that will be put into place

3. Boat wakes contribute to shoreline erosion, especially in smaller coves and creeks. Stir up bottom sediments, which reduces sunlight essential to underwater grasses.

VIII. Nutrient runoff

A. The problems of nutrient runoff can be solved by
   1. Sparing use of fertilizer or use of fertilizer alternatives encouraged by federally supported regional government taxes
   2. Set yearly goals for reducing nutrient runoff in industry. Upgrade wastewater treatment facilities and tax facilities that do not meet industry goals by the quantity over the goal.
   3. Teaching practices that prevent erosion and runoff, and assistance from public works/municipalities/local businesses to implement them

B. Fertilizer Use and Alternatives - Educate persons about alternatives and about proper, effective fertilizer uses, and put a heavy tax on fertilizer.
   1. Education for the proper use
      a. Use fertilizer from September to November.
         i. This allows grass to recover from summer stresses.
         ii. It also may reduce the amount of runoff.
         iii. Maximizes nitrogen uptake
      b. Keep fertilizer off of pavement
      c. Use a drop spreader in restricted spaces.
      d. Fix your spreader to prevent over-application
      e. Avoid Natural drainage areas.
      f. Do not use on dormant or icy lawns.
      g. See attached sheet for proper amount. Try to keep in minimum.
      h. Water only when absolutely necessary.
      i. Maximum amount of fertilizer for each lawn should not exceed two pounds for any lawn.
   2. The tax on fertilizer should encourage new alternatives.
      a. Corn Gluten – not harmful – biodegrades to a natural nitrogen fertilizer
      b. Compost pile – use organic soil parts such as peat moss, bone/blood/horn/hoof meal, fish, manure. Biodegrades into soil nutrients.
      c. Milorganite – Frederick County uses this organic fertilizer as a substitute.

C. Implementation of Proper Land
   1. Farmers and civilians will be required to administer a soil quality test and make evaluations of a their lawn.
   2. They will then report their results to the state government, and then determine what materials are needed to make the resident more environmentally safe. These materials will be offered to the resident at a reduced price. Some changes:
      a. Topsoil must be covered with shrubs, grasses, etc to keep runoff to a minimum.
      b. Mulching is an effective way to reduce topsoil runoff.
      c. Garden on level ground. If you must garden on a hill, reduce runoff by

d. creating terraces. Public Works programs could assist in building upon request.
e. Shrubs and other grasses also reduce erosion and runoff. (See sections V and VI)

3. Citizens who fail to send in results or reform their lawn will be punished with a fine.

IX. Solutions to Prevent Pollution From Boating on the Chesapeake

A. Government public works will inspect marine gas stations to encourage improvement of conditions.
   1. Too many marinas in and around our area do not practice safe policies when pumping gas.
   2. Over the past year the DNR has issued over 120 citations to Marinas for thing such as gas spillage and improper disposal of toxic chemicals.
   3. These facts should also be made more accessible to the public to create a pressure on the marinas.

B. Crack down harder on shipping freights that are on their way into the Inner Harbor
   1. Often times these ships pump bilge and release their waste tanks into the Bay, which in turn drifts into our rivers and does considerable damage

2. If we make pump stations for this waste more accessible then maybe these ships would be encouraged to dispose of their waste properly.

X. Funding

A. Charitable Donations - Post donation tabs at local businesses that will call on residents to donate
   1. Hold charitable dinners with goods donated by local businesses
   2. Hold penny drives during environmental education weeks in schools

B. Taxes
   1. A state tax on fertilizer to provide funds and discourage overuse.
   2. Local at risk businesses can be charged with taxes that support preservation causes
   3. Companies requesting construction in at risk areas would be charged a fee to protect those areas
   4. Waterway Fund Tax check off

C. Private Fees
   1. Individuals that participate in hazardous activities toward the waterways, could be charged addition fees
   2. Design and market license plates and other commodities
   3. Tax deduction for ecological improvements or donations from individuals

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