ADAPTIVE MANAGEMENT AND SUBMERGED AQUATIC VEGETATION IN THE CHESAPEAKE BAY

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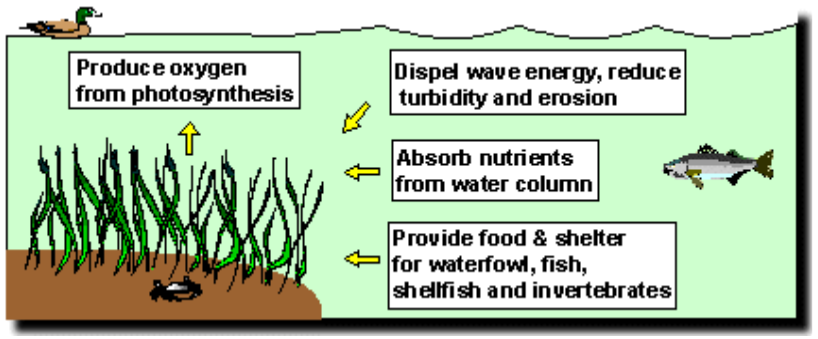
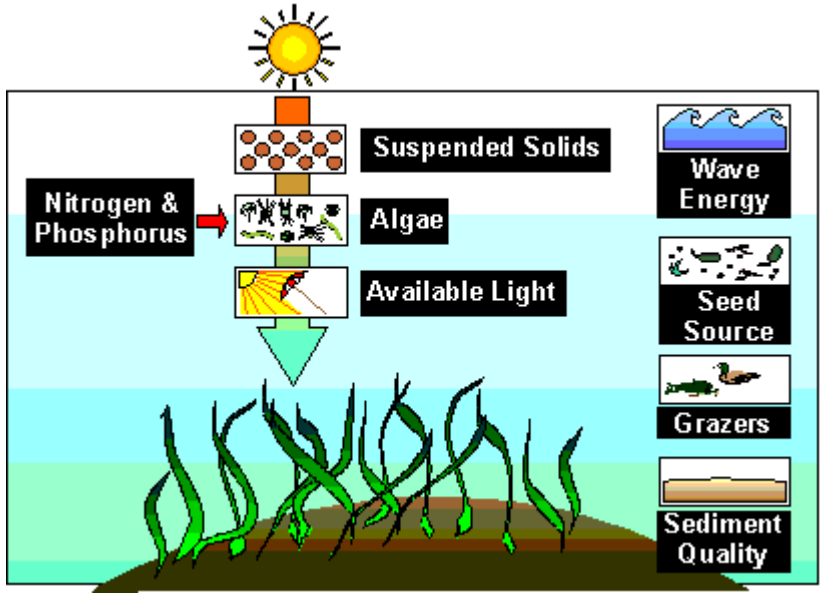
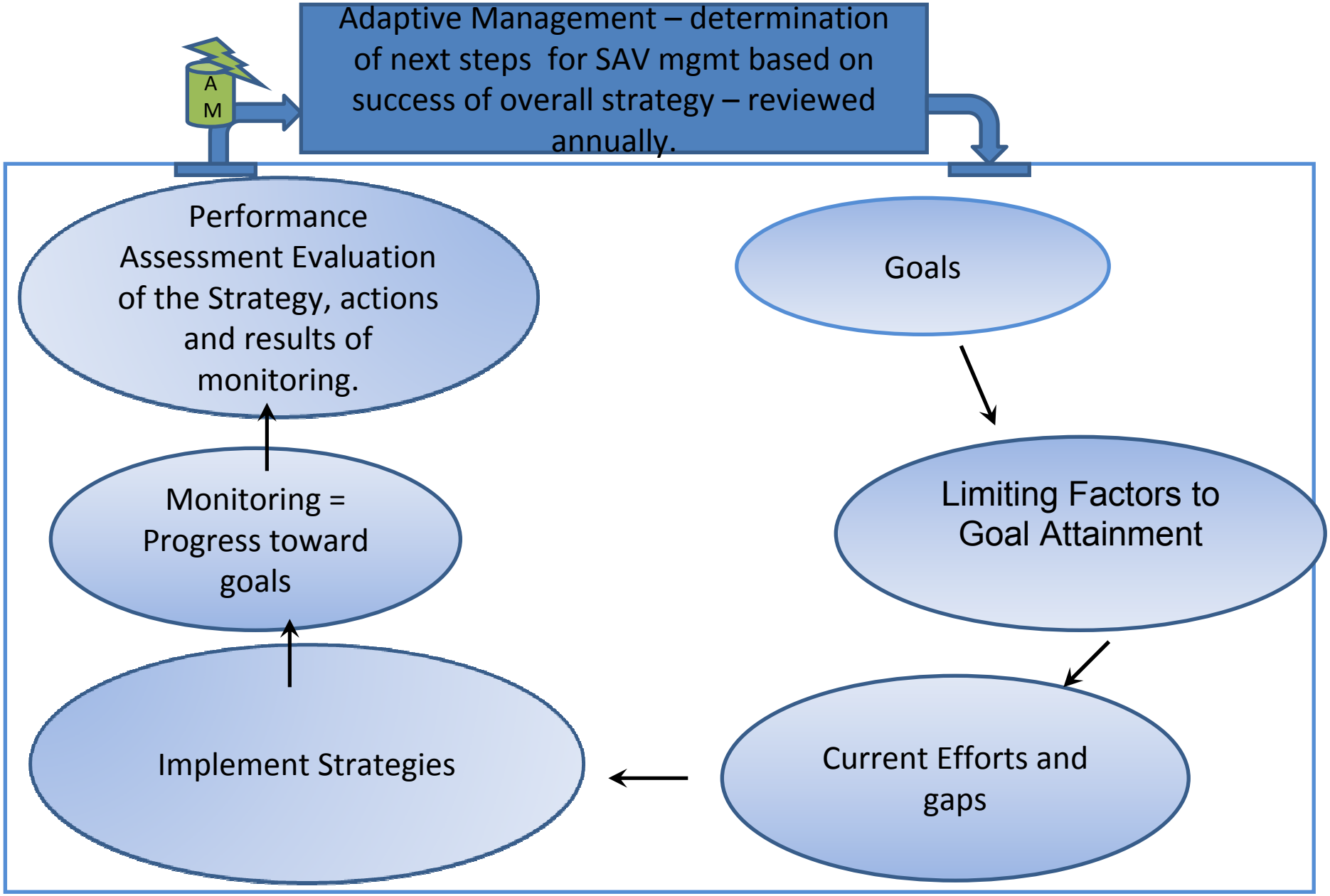
What is SAV and why do we care?

- There are at least 17 different species of vascular plants that live part, if not all, of their lives completely submerged in Chesapeake Bay
- SAV provides services
  - Food for waterfowl and other things
  - Habitat (i. e. blue crab, prey items for other things we like to eat)
  - Improves water quality
    - (Uptake and sequester nutrients, add DO, reduce turbidity, dissipate wave energy)
  - Indicator for water quality, since SAV are sensitive to both improvements and degradation in water quality





SAV Strategy and the Decision Framework




A Goal Without A Plan Is Just A Wish
Antoine de Saint-Exupery

Strategy to

Accelerate the Protection and Restoration of Submerged Aquatic Vegetation in the Chesapeake Bay

Strategy approved by the E. C. in December 2003

Goals

- 185,000 acres of SAV by 2010

- Plant or seed 1,000 acres by 2008

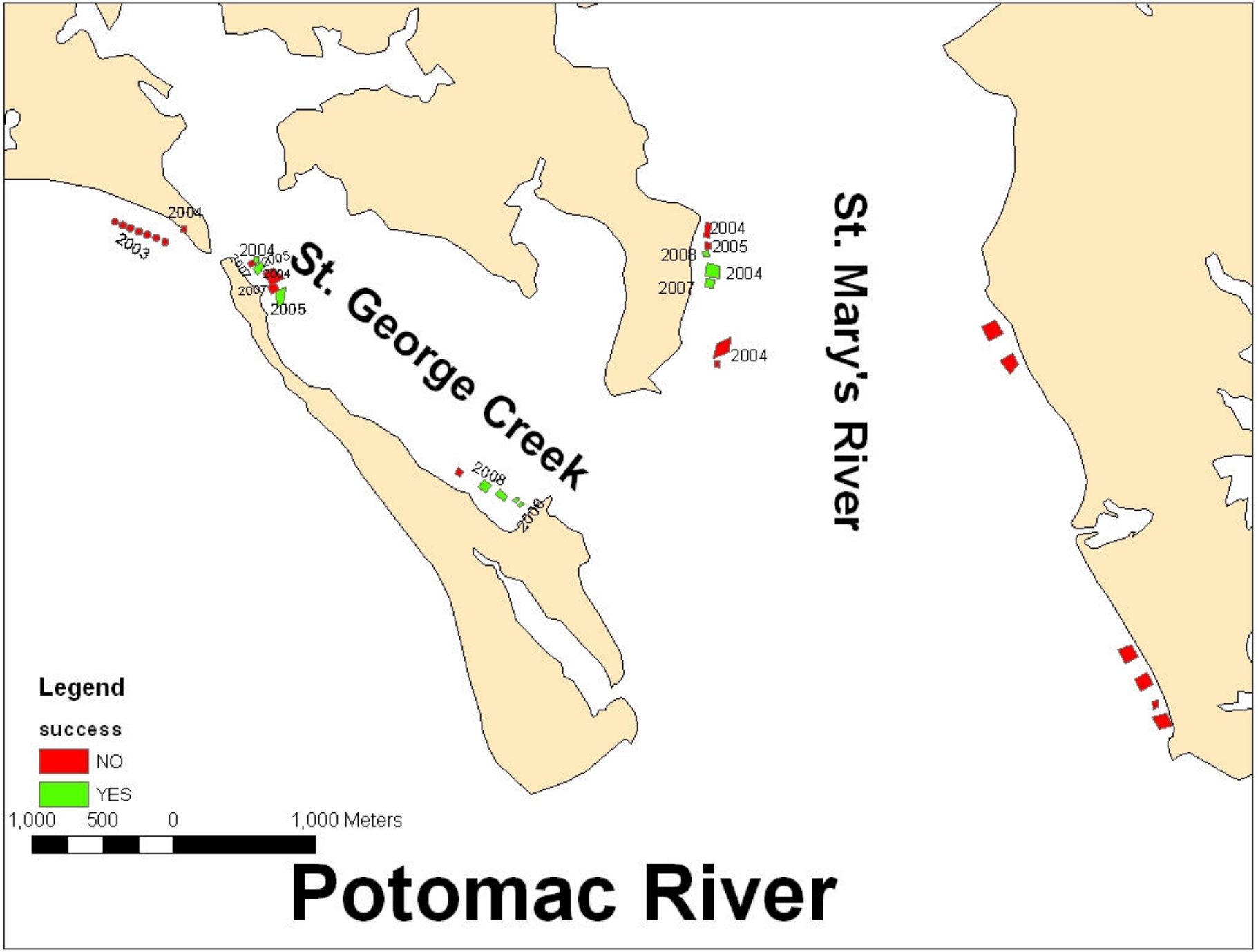
"Learning by doing is essential adaptive management" Carl Hershner

- In Virginia (2003 through 2005) and in Maryland (2003 through 2008), large-scale eelgrass restoration was attempted.
  - Less effort in Freshwater areas
- Extensive follow up monitoring

Results

- Failed to meet 185,000 acre goal
  - This is largely due to failure to meet water quality goals

- Failed to meet 1,000 acre direct restoration goal
  - Achieved roughly 15% of the goal which was commensurate with funding levels
    - Had roughly 15% of the requested funding
  - More troubling though, was a failure of areas planted/seeded with eelgrass to persist over time
    - No multi-year survival in Patuxent or Piankatank Rivers
    - Roughly 40% of our sites on the Potomac had multiyear survival through 2008
      - Some continued survival into 2013
  - Likely due to an incomplete understanding of what water quality conditions are necessary for restoration versus survival, particularly during stressful periods
  - Some success with freshwater species near Baltimore
    - School kids planted ~2.75 acres of SAV over 11 years
    - When mapped in 2009, the area had 9.4 acres of SAV, almost a 350% increase.


St. George Creek
St. Mary's River
2004
2003
2004
2005
2004
2007
2005
2004
2005
2008
2007
2004
2004
2008
2006
Legend
success
NO
YES
1,000 500 0 1,000 Meters
Potomac River

October, 2008 picture of an eelgrass bed planted in 2005

Based on These Results, We Asked STAC for a Review (Performance Assessment)

- **Conclusions of previous restoration efforts**
  - Under the right conditions, SAV can be successfully planted
  - Survival/persistence beyond 5 years is not typical
  - Used informal adaptive management but room for improvement

- **Recommendations going forward**
  - Continue with restoration only in areas with acceptable water quality
  - Continue targeted restoration efforts to establish viable beds and improve site selection criteria
  - Develop SAV restoration strategies that will be responsive to climate change
  - Use formal adaptive management for restoration and protection decision making
  - Build on existing successful research of restoration techniques
  - Guide implementation with focused research

Revised SAV Strategy –Strategies and actions for protection and restoration (will be adopted by the MB)

1: Water Quality characterization/improvement for SAV Habitat protection and restoration leading to reaching the 185,000 acre goal

2: Improve Protection of Existing SAV Beds

3: Strategy to Accelerate SAV Restoration and Understanding of Ecosystem Processes through the Planting and Transplanting of New SAV Beds

20 acres/year specifically to learn how to do future large-scale work better in the future and to feed into item 6 below.

4: Improve coordination of SAV Protection and Restoration

5: Enhance public communication and education

6: Conduct research to support SAV Protection and Restoration

Biggest component of this is effort is to fully and finally understand environmental/habitat conditions necessary for *restoration* as opposed to survival (current level of understanding)

SAV Strategy and the Decision Framework

A M

Adaptive Management – Revised – reviewed annually.

Performance Assessment Evaluation of the revised SAV Strategy, actions and results of monitoring.

185,000 acres/plant 20 acres every year

Monitoring = Progress toward SAV goal

Insufficient water quality, inadequate regulation and protected areas, research needs, improved site selection and technology, funding

SAV Strategy outlines new/continued approaches to restoration and protection

Attempt restoration for habitat improvement AND enhanced knowledge


Thank you for your attention