Building And Sustaining Integrated Networks: BASIN

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BASIN webinar series

- Dec 2013; Case studies = Puget Sound & Great Lakes
- Jan 2014; Case studies = MARACOOS, Upper Mississippi, Moreton Bay, Great Barrier Reef

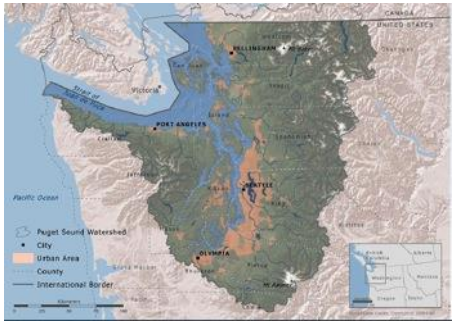
Chesapeake Science & Technical Advisory Committee (STAC) monitoring concerns

- 'Monitoring for attainment' focus needs to shift to 'monitoring for adaptive management' (What is working?)
- Integration of citizen science and modern technologies needs to occur
- Major monitoring overall likely necessary, not just minor tweaks
- New Bay Agreement should clearly articulate goals, outcomes, strategies to identify monitoring needs

Case study comparisons

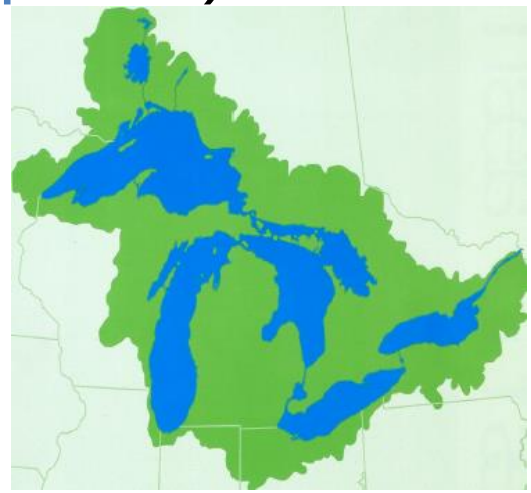
(Scale = 1/10 to 20X Chesapeake)

Puget Sound



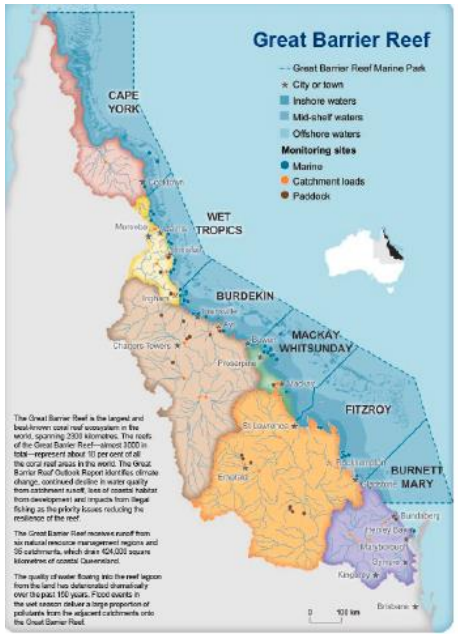
Upper Mississippi River

Great Lakes



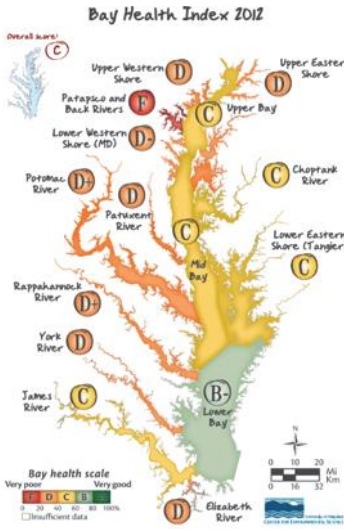
Moreton Bay

Great Barrier Reef

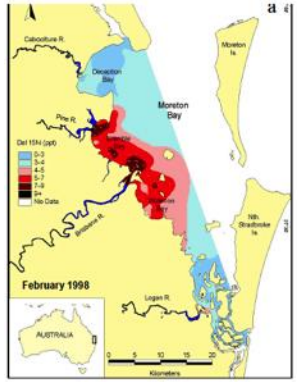


1. What are network objectives and design?

- **Chesapeake:**
  - Water quality: monthly, 150+ stations, 26 parameter
  - Shallow water monitoring; 3 yr rotations
  - Benthic infauna; fixed and random, annual
  - Aquatic grasses; aerial photos, annual
  - Fisheries independent surveys; annual
  - Phyto and zooplankton; historical



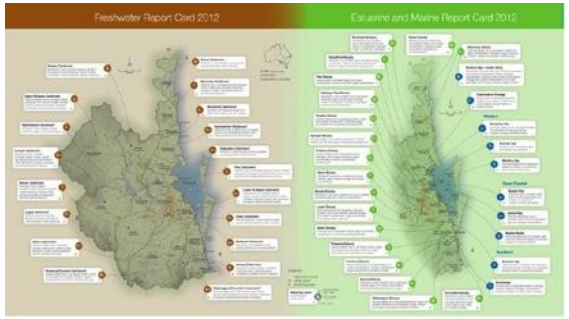
- **Case studies:**
  - Water quality, habitat, fisheries (all)
  - Sewage plume tracking (Moreton Bay)
  - Pressure – State – Response (Great Barrier Reef)



2. Describe your operations model, including innovations

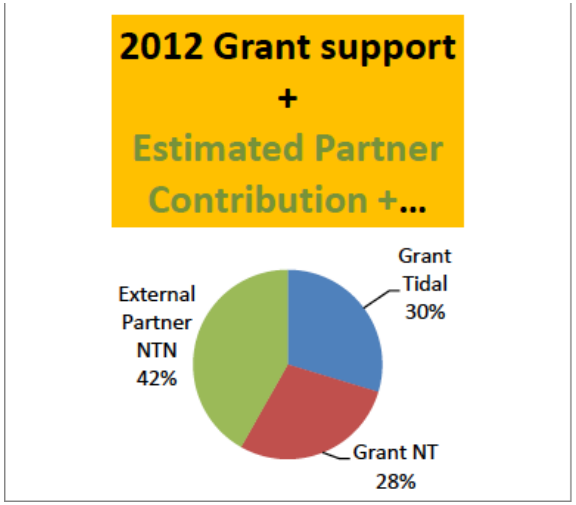
- **Chesapeake:**
  - DATAFLOW for underway sampling
  - Vertical profilers
  - Citizen scientists engaged (MTAC)
  - Regular, qualitative remote sensing
  - Highly evolved reporting, report cards, ‘stat-ing’

- **Case studies:**
  - Technical capacity through agencies (all)
  - Citizen scientists engaged (all)
  - Vital signs (Puget Sound)
  - Freshwater & marine (Moreton Bay)



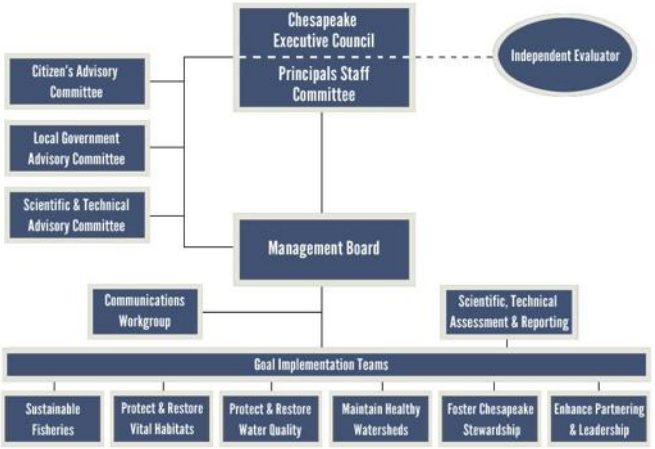
3. Describe your business model

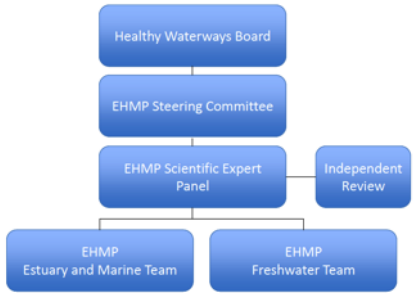
- Multiple funding sources with different mechanisms of delivery to science providers
- Partner organizations provide significant matching funding
- Evolution toward ‘user pays’

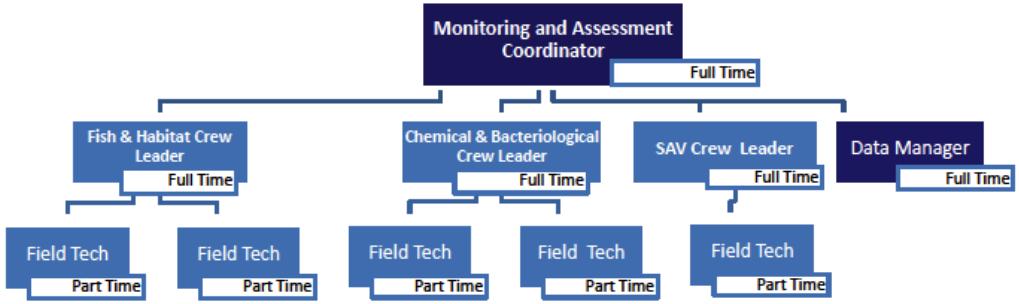


4. What is your governance model?

- Highly variable; little commonality
- Fairly complex: Many people from different organizations involved
- Technical oversight and review provided

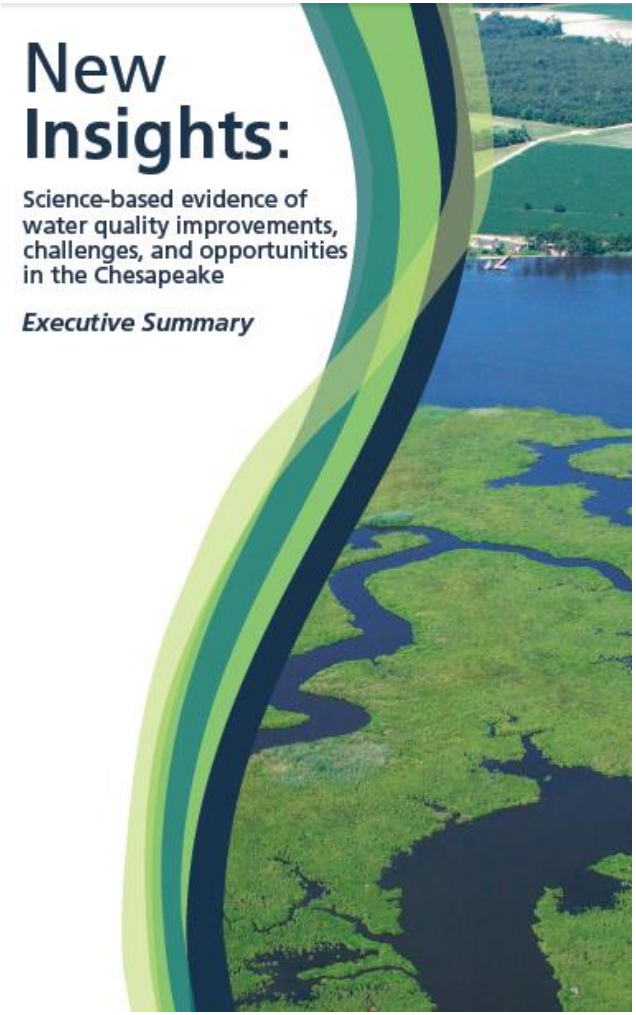






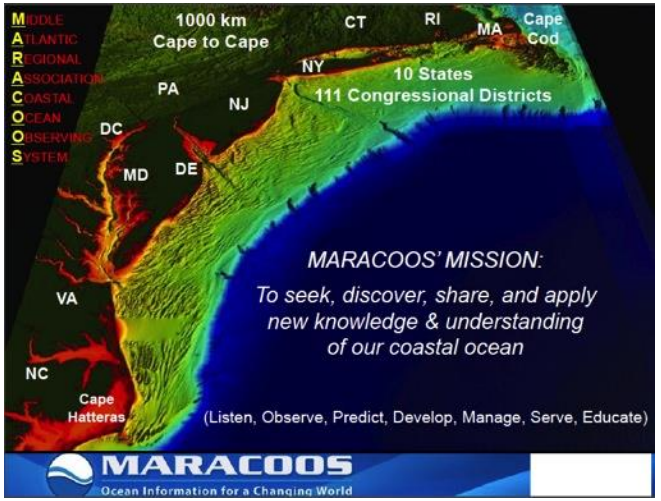
5. Describe successes and challenges

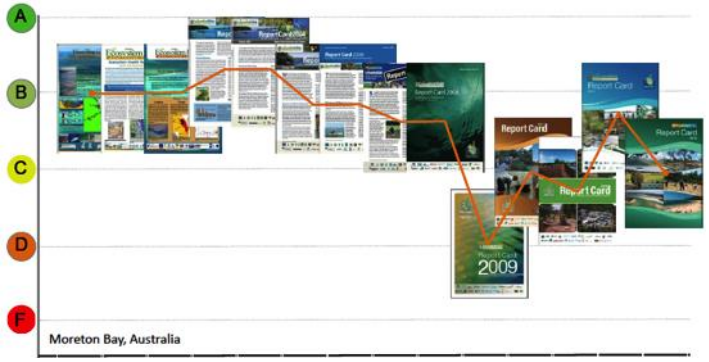
- **Chesapeake:**
  - Successes
    - Scientific basis for nutrient and sediment reduction strategy
    - Identified and tracked major inputs and impacts
    - Providing feedback on overall management effectiveness
  - Challenges
    - Steady slow erosion of funding support
    - Realignment; tidal to nontidal
    - Recent major funding shortfalls



5. Describe successes and challenges

- **Case studies:**
  - Successes
    - Partnerships established (e.g., MARACOOS)
    - Expanded monitoring to include management responses (Great Barrier Reef)
    - Tracked management actions (Moreton Bay)
  - Challenges
    - Difficulty in securing funding (all)
    - Report card fatigue (Moreton Bay)
    - Selecting reporting indicators (e.g., Great Lakes, Upper Miss. R)



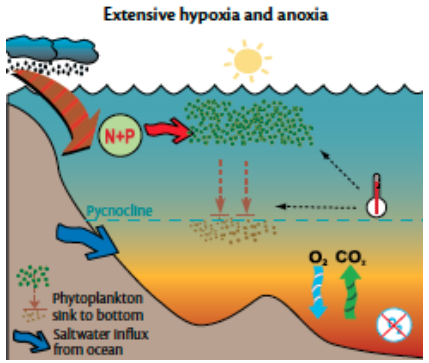


Effective monitoring requires significant resources

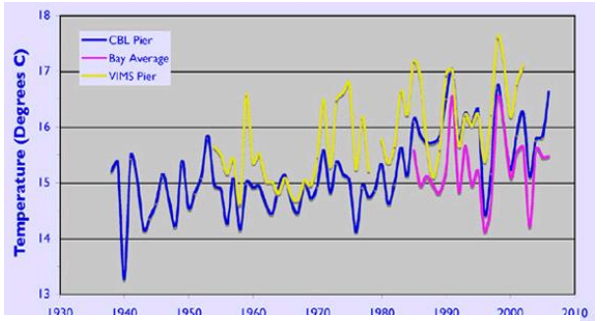
- Field work is expensive (people, equipment, vehicles, boats)
- Data analysis is time intensive (database development & maintenance, statistical analyses)
- Recurring costs are subject to inflationary pressures

Highlights from 25 years of Chesapeake monitoring

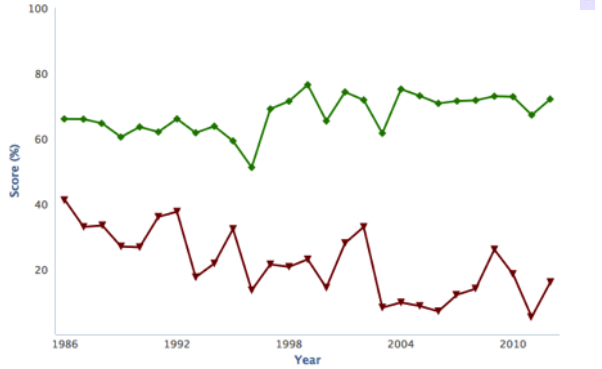
- Identification of eutrophication causes and impacts



- Climate trends and impacts (e.g., DO, SAV)

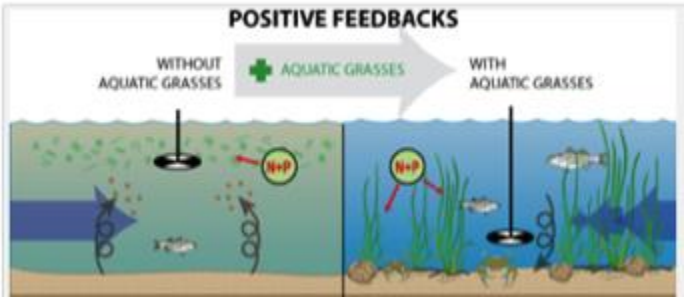


- Status and trends of key indicators (e.g., improving nutrients, degrading clarity)

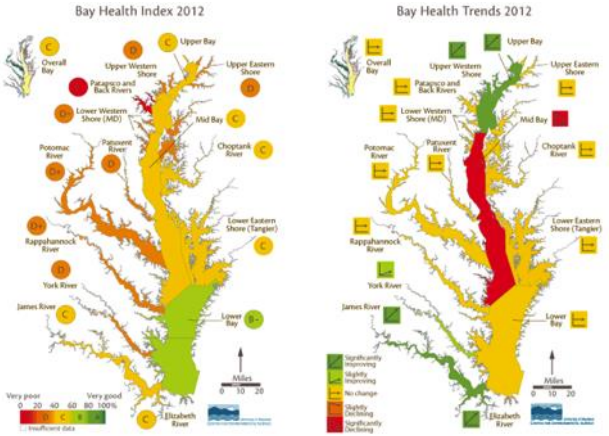


Highlights from 25 years of Chesapeake monitoring

- Ecological thresholds ‘tipping points’ & feedbacks

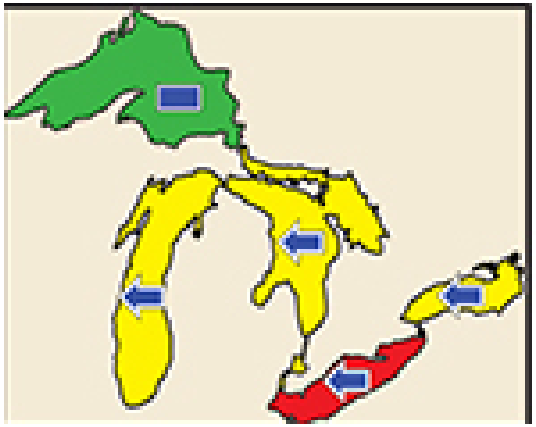


- Input to report cards, Bay Barometer, research programs



- Water quality criteria assessment

Convergent reporting frameworks



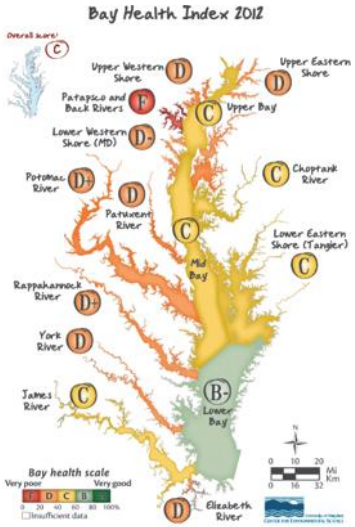
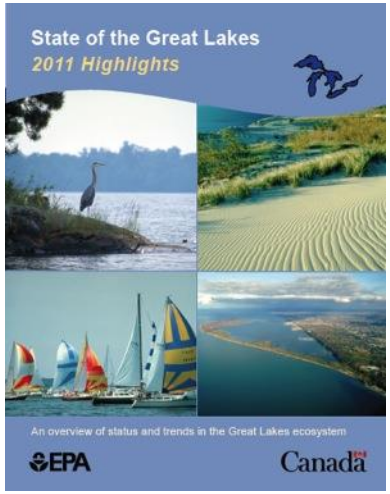
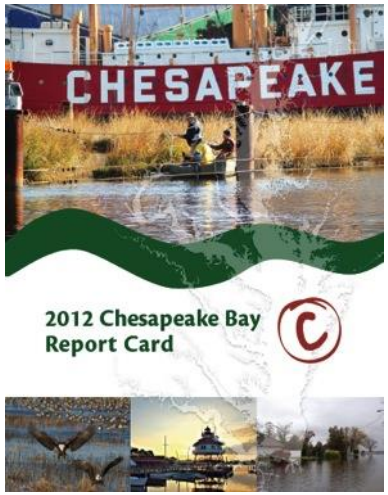


Table 3.3. Summary of Progress Toward 2020 Targets Based on the 21 Vital Signs - 2013

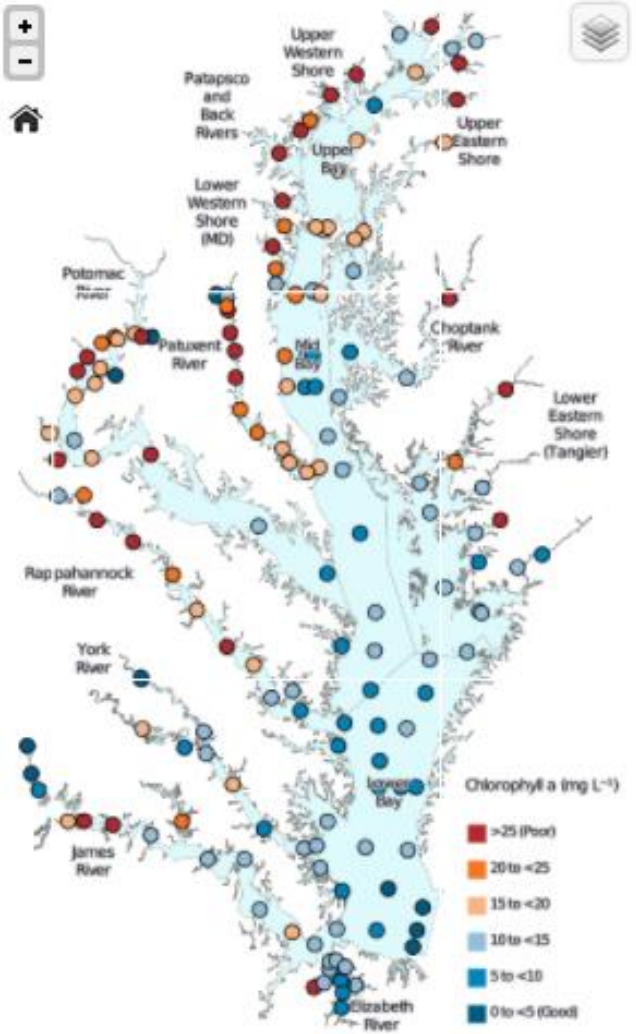
Vital Sign	Are Vital Signs showing progress towards 2020 target?	Basis for decision about progress	Goals associated with Vital Sign?
Swimming Beaches	YES	The percent of beaches meeting water quality standards in 2012 was somewhat higher than the 2004 baseline reference.	
Shellfish Beds	YES	A net increase of 2,880 acres of harvestable shellfish beds between 2007 and 2013.	
Estuaries	YES	Approximately 2,266 acres of estuarine wetlands were restored to tidal inundation from 2006 to 2012 in the 16 major river delta estuaries.	
Chinook Salmon	NO no change	The total number of Chinook salmon in Puget Sound declined from 2006-2010, and no regions have yet met their target to improve 2-4 populations.	
Eelgrass	NO no change	No change in eelgrass area in 2011 relative to baseline reference of 2000-2008.	
Summer Stream Flows	NO no change	No change since 2011 in the set of rivers that met their target.	
Orcas	NO worsening	Fewer whales in June 2013 than in the 2010 baseline year (down from 86 to 82 individuals).	
Herring	NO worsening	The spawning biomass for most individual stocks either stayed the same or declined in 2012 relative to 2011. Each of the three target stock groupings remain below their individual 25-year mean baseline references and their 2020 target values. Cherry Point remains severely depressed.	
Marine Water Quality	NO worsening	The Marine Water Condition Index was slightly lower in Puget Sound in 2012 relative to the 10-year, 1998-2008 baseline. Data are not available yet for the dissolved oxygen target.	
On-site Sewage Systems	MIXED	The number of septic systems inventoried and inspected both increased. However, data for the other targets are not yet available.	





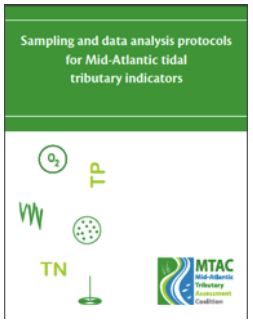
Institutional monitoring needed

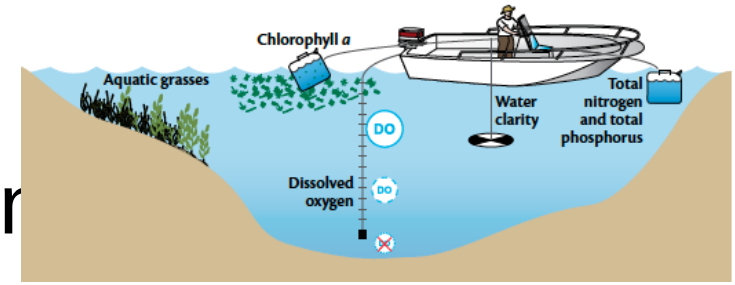
- Institutional monitoring provides the skeletal backbone of additional monitoring (e.g., citizen science monitoring)
- High quality, timely, accessible data with continuity is essential
- Piecemeal data does not replace integrated monitoring
- Adaptive monitoring is part of adaptive management



Citizen science can augment but CANNOT replace institutional monitoring

- Coordination needed
- Training needed; personnel turnover issue; QA/QC issues
- Continuity essential
- There are some difficult ar dangerous locations where trained personnel are needed
- Tremendous untapped potential

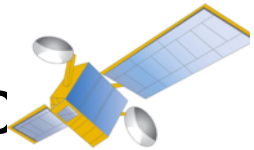




MTAC
Mid-Atlantic Tributary Assessment Coalition

Technology can augment but CANNOT replace in situ sampling

- Purchase price of technology can be prohibitive
- Technology requires calibration, maintenance, operational costs
- Some features (e.g., nutrient samples) need to be sampled on site
- Technological innovation dc provide new partnership opportunities



Case study discussion

- Value in comparing strategies; historically research is shared, but not monitoring
- Revised terminology; e.g., instead of “monitoring” use “intelligence gathering”
- Funding insecurity common
- Broad engagement; multiple stakeholders involved, different reporting mechanisms
- Critical need to connect monitoring results to management actions