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Monitoring, Modeling, and Research as part of the Baltimore Urban Waters Partnership

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Outline

- Urban Waters Federal Partnership
- Baltimore/Patapsco UWP
  - Strategic framework
  - Future directions
  - Monitoring, Modeling, Research pillar
- 2014 and 2016 Monitoring Workshops
- Collaborative project example

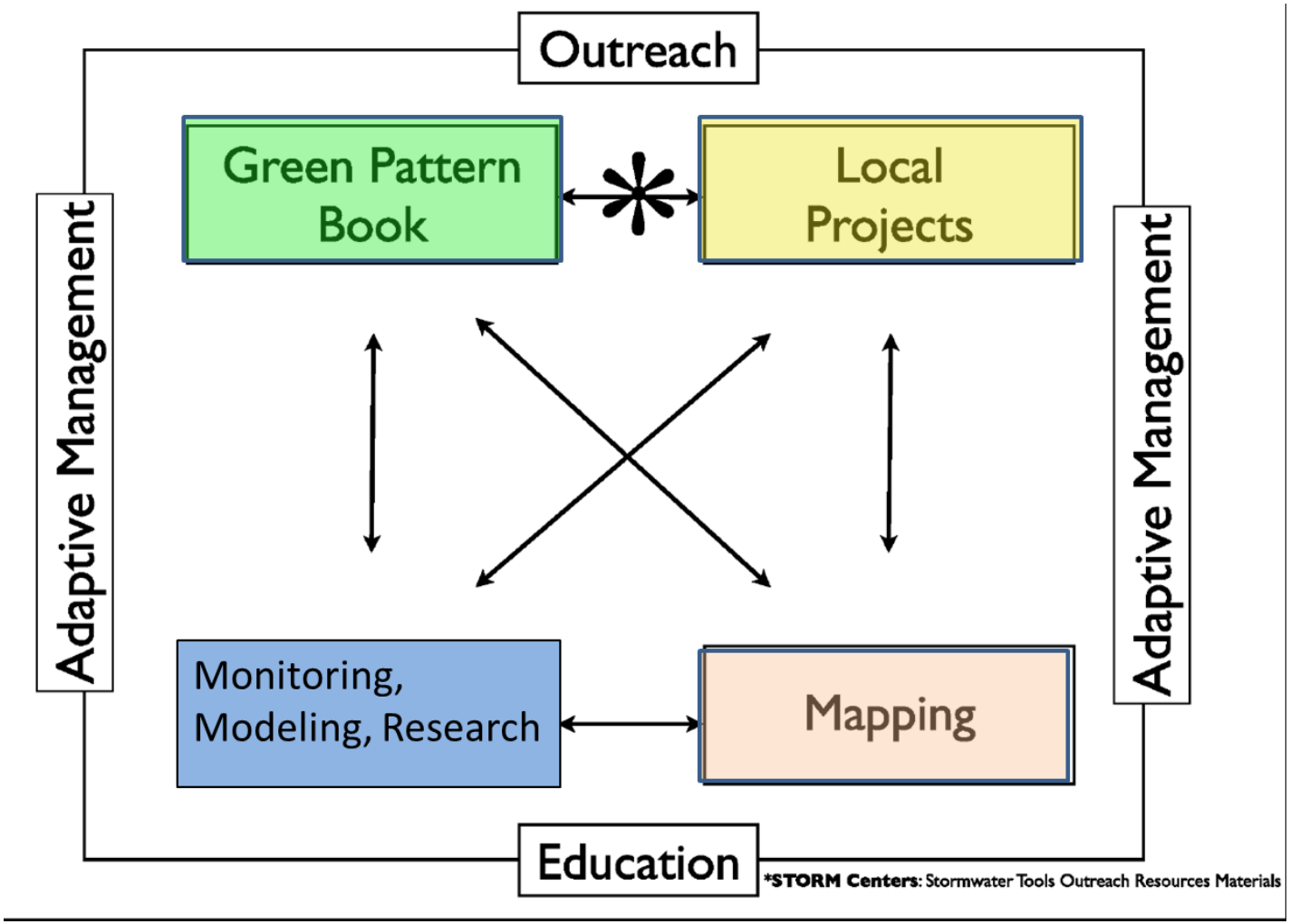
Urban Waters Federal Partnership

- 13 Federal agencies, initiated EPA
- Vision
  - To protect and restore America's urban waters and reconnect communities, especially underserved or economically distressed communities, to those waters.
- Program Components
  - National Partnership
  - 19 Locations, 7 pilots
  - Grants
  - Urbanwaters.gov
  - Links to Ladders of Opportunity, SC2, Partnership for Sustainability, Americas Great Outdoors

Baltimore Urban Waters Partnership

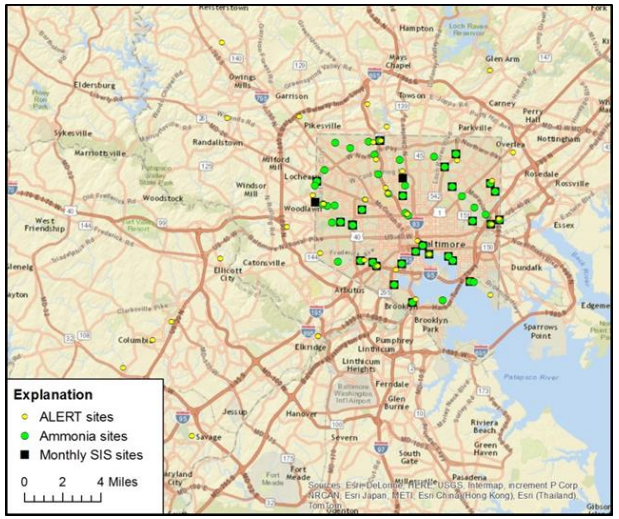
- Led by the USDA Forest Service's Northeast Baltimore Field Station, pilot 2011
- Works to develop projects devoted to protecting and restoring urban waters; promoting community revitalization and strengthening the social fabric through the removal of blight, establishment of open spaces, and creation of economic development to serve as catalyst opportunities for disadvantaged neighborhoods, and capitalize on the social and economic benefits derived from improved urban waters and adjacent lands
- **http://urbanwaters.gov/baltimore/index.html**

Strategic Framework – 2011-2016



Revised Strategic Framework
Work in Progress – 2016-forward

- Expansion to more regional vision
- Green corridor focus from forest to suburban/ex-urban to urban – watersheds, not jurisdictions
- "Actionable Science" pillar – facilitate a stronger connection between research and policy/decision-making



Monitoring, Modeling, Research Steering Committee Working Goals

- Data Assessment: Optimize monitoring to better assess progress toward water quality improvement via restoration at various scales
- Facilitate Communication: Facilitate communication between stakeholders to provide a consistent venue for technical feedback and exchange (researchers to practitioners, researchers to regulators, and stakeholders to researchers).

Monitoring, Modeling, Research Workshops

- 2014 goals: (1) inventory monitoring assets in the region, and (2) initiate discussion about a monitoring network(s) that adds value, maximizes efficiency, aids in decision making, and is comprehensive enough for evaluating trends and other stories in the data
- 2016 goals: (1) Inform with practical updates from researchers, (2) encourage collaboration across practice lines and jurisdictions to maximize resources, (3) brainstorm data gaps/needs looking forward, identify data assessment questions

Workshop Attendees

- Local governments (City of Baltimore, Baltimore, Anne Arundel, Carroll, Harford, and Howard counties)
- NGOs (Blue Water Baltimore, Center for Watershed Protection, Baltimore Parks and People Foundation, National Aquarium, others)
- Academic and research (BES, UMBC/CUERE, U Balt, UMCES) and Practitioners (2016 only; KCI, others)
- State government (MDE, DNR)
- Federal government (USDA-FS, USGS, USGS-CBP)

Common Stakeholder Messages from 2014 Workshop

There is a need for:

- Increased water-quality monitoring at existing flow monitoring stations
- Expanded bacteria analysis
- Better defined pre- and post-restoration monitoring protocols
- More interpretation of the data – *what does it all mean?*

Stakeholder Gaps and Recommendations 2014 Workshop

- More engagement of citizen groups and NGOs in the region
- Development of an integrated database or data portal to access management and restoration project inventories and status, pre-and post-restoration monitoring plans, contact information, as well as raw monitoring data facilitated by USGS or Baltimore Neighborhood Indicator Alliance) BNIA
- Continued and expanded collaboration between research community (BES, CUERE, USGS) and the city and county governments

Data Gaps-Recommendations 2014

- Three areas of focus:
  - Track watershed level improvements to water quality
  - Assess impacts and success of restoration and management efforts
  - Provide flood-related information and help answer resilience and sustainability questions
- Steering committee had many discussions about ways to reframe these gaps into data assessment questions.
- Formulation of goals – focus for committee, project proposals, etc.

Stakeholder Messages from 2016

- Gaps to achieving TMDL compliance for toxics and bacteria. Innovative samplers, molecular tools show promise but will need to be demonstrated.
- Interest in emerging contaminants and effects on stream biology – some of this going on with BES, room to expand. Regulations likely coming.
- Innovative ways – collaborations, grant funds obtained by jurisdictions – needed to fill data gaps
- Follow up on workshop topics with targeted, focused one-topic discussions

Example - Collaborative Project

- USGS, Cary Institute Ecosystem Studies (BES PI), Blue Water Baltimore
- In response to “Tracking watershed level improvements to water quality”
- Applied for funding through a private foundation (received) and EPA Urban Waters Small Grant program (waiting notification)

Gwynns Falls Retrospective Trends Analysis

- Examine long-term trends in water-quality of the Gwynns Fall watershed (a data-dense watershed in Baltimore City and County) and to further elucidate which factors, both human and natural, may be driving these trends
  - Stakeholders meeting to prioritize potential mechanistic drivers of water quality trends
  - Trends analysis, examination of drivers of trends
  - Inform policy makers, practitioners, and residents of the Baltimore region as a whole through various means (written publications, in person meetings, and online) products to communicate the study findings and provide an understanding to communities if their water-quality is improving or degrading and what are some causes of these changes.

Questions? Thank You.

Long-term Monitoring Network will

- Add value
- Maximize efficiency
- Aid in decision making
- Be comprehensive enough for evaluating trends and other stories in the data

This Network of Networks will enable stakeholders to:

- Track watershed level improvements to water quality
- Assess impacts and success of restoration and management efforts
- Provide flood-related information and help answer resilience and sustainability questions

Break out groups for these three topics

Track Watershed Level Improvements to Water Quality – Data Gaps

- Improve the conceptual model of the urban water sources in order to better define where the water ultimately goes (i.e., stormwater, sanitary sewers, groundwater and streams) and what controls the amount and partitioning of water between the various pathways
- Define the causes (e.g., land use change, BMP implementation, climate change) and resulting effects (e.g., improved or degraded water quality) for watershed improvements
- Define optimal timeframe of data collection needed to detect a change in the long-term trends

Track Watershed Level Improvements to Water Quality – Recommendations

- Use analytical models as a way to better relate cause and effect in the watershed
- Develop a case study watershed (or subwatershed) such as the BES Gwynns Falls location, to possibly fill these data gaps and then translate understanding to other watersheds in various jurisdictions

Impacts and Success of Restoration and Management Efforts – Data Gaps

- Determine the effectiveness of management projects at variable scales
- Account for the lag time in biology, groundwater impacts, and other typical monitoring measures from the time of implementation through the typical monitoring cycle

Impacts and Success of Restoration and Management Efforts – Recommendations

- Develop protocols for short-term and long-term impacts and success based on experience in the field
- Shift to more functional process restoration and evaluation methods in order to aid in the determination of impacts of management and restoration

Resilience and Sustainability – Data Gaps

- Understand how flooding and drought impact water resources (both quality and quantity)
- Assess the long-term shoreline data and how flooding changes over time

Resilience and Sustainability – Recommendations

- Use modeling for predictive purposes and design monitoring accordingly
- Consider drought, coastal surge (long-term impacts) and catastrophic storms (short-term impacts) in monitoring design