

Delaware Center for the Inland Bays
Notes from Monitoring Plan Workgroup Meeting
30 July 2015

Attendees:

CIB – Marianne Walch
RKK – Jim Eisenhardt, Larry Trout, Leslie Jamka
DNREC – Robin Tyler, David Wolanski, Michael Bott, Debbie Rouse, Hassan Mirsajadi, John Schneider
University of Delaware (UD) – Joanna York, Kevin Brinson, Tina Callahan, Ed Whereat, Bill Ullman, Joe Farrell, and Scott Andres
USGS – Judy Denver

Introduction

- Monitoring Plan for the Comprehensive Conservation and Management Plan (CCMP)
 - Measures effectiveness of CCMP
 - Written in 1995¹
 - Revised by Robin Tyler (DNREC) in 1996
 - Charged by EPA to update by 1 Oct 2015
 - 2012 CCMP addendum: New goals and strategies to be incorporated into the Monitoring Plan
 - Changes since 1996: New data, programs, partnerships, needs, technologies, understanding of the Inland Bays, TMDLs, etc.

CIB needs/goals

- Status and trends of the Inland Bays
- Identify data needs/gaps
- Identify/access best available data
- Coordination
- Public education/engagement/perception

Objectives of facilitated discussion

- Obtain input from partners
- Monitoring needs/goals
- Identify strengths/weaknesses/gaps
- How best to house/share/archive data
- Identify and prioritize funding needs/opportunities
- Maintain perspective of “importance”; everyone thinks their work is the most important

Parties that should be at the workshop, but are not represented

- Agriculture sector
 - Jennifer Volk, Environmental Quality Extension Specialist (invited)
 - Delaware Department of Agriculture (DDA)
 - Laura Torres, Delaware Nutrient Management Program
 - Laura Match
 - Scott Blair

¹Per Robin, data well pre-dated 1995.

- Sussex County
 - Mike Izzo, County Engineer
 - Heather Sheridan, Director of Environmental Services
- EPA Region III
 - Mike Hoffman (invited)
 - Bill Richardson² (invited)
- DNREC Division of Fish and Wildlife
 - Initiate discussion/review of Monitoring Plan prior to 1 Oct vs. leave placeholders

History and status

- Intern updating datasets
 - Brian Glaser compiled/maintained list of historical studies/reports until 1996
 - Does CIB have this list?
- Folks in the room have considerable experience and long-term involvement
- EPA wants DE to take the lead in estuary management
- Big questions asked in 1996 and addressed with monitoring data
 - Eutrophication, habitat, and wetland loss
 - Dissolved oxygen, nutrients, chlorophyll, and pathogen indicator bacteria
- Continue to monitor for core data

Goals

- How best to dot the i's and cross the t's for EPA *and* obtain data important to DE?
 - Short-term: Submit revised Monitoring Plan to EPA by 1 October 2015³
 - What is needed to update the Monitoring Plan?
 - Use 2011 State of the Delaware Inland Bays as a starting point
 - Report trends; never say “we are there” – insinuates no need for funding
 - Highlight what is being done well and areas that are deficient or need improvement
 - Use the Monitoring Plan to introduce long-term needs and potential management resources
 - Long-term: What do we want to know? What are the big questions monitoring should answer? What needs to be monitored?
 - Continue current monitoring; expand to include new data, such as upper watershed
 - Identify action areas and short/medium/long-range goals
 - What data do we have/need?
 - Can we improve what we have?
 - Are there additional data that can be collected under existing monitoring?
 - Do we know target goals?
 - Do we understand system enough to know goals/needs?
 - Different areas have different goals⁴
 - Monitor water quality or water quality indicators?
 - What are other monitoring criteria?
 - What are other indicators of estuary health?

²Submitted questionnaire.

³Maintain the Monitoring Plan as a living document with opportunities to update.

⁴For example, seeing the stream bottom can be good, but in wetlands, water clarity is bad.

- Broader scope than just water quality: Need to capture chemical, physical, biological data
- Changing needs
 - As initial problems are addressed and the Inland Bays improve, other/secondary problems become apparent
 - Recognize evolutionary changes
 - Is monitoring capturing data?
 - If not, how best to capture?
 - Restoration is really renovation: Bays should look better, but not necessarily what they looked like in the past
 - Do we know what they looked like?
 - Is current level of monitoring sufficient to see/show changes?
- Big picture/think outside the box
 - Key concerns/players/milestones
 - Opportunity to really make a difference
 - Communicate information to future generations
 - Keep science going: Change the lingo, monitoring *is* the science
 - Effective mechanisms for data sharing and collaboration
 - Creative approaches to funding monitoring initiatives

Funding

- Issues
 - Identifying and obtaining funding for monitoring is difficult
 - EPA will not fund monitoring
 - Most states do limited monitoring
 - Need creative approach to fundraising
 - Science often done “EPA’s way” to standardize data/collection for statistical purposes
 - Change is difficult to see
 - Key: Create strategy to motivate change
 - Market the collaborative/collective approach to increase options/opportunities/success
 - CIB is hiring a water quality manager that could manage a grant
 - Leverage research/resources of others
 - Current funding for on-going activities
 - Funding is continuously decreasing with inflation
- Entities
 - Delaware is a small state; how best to market and secure funding?
 - Corporate sponsorships: Walmart, WWTPs, power plants, artesian water, etc.
 - Private parties including non-profits/foundations
 - Kickstarter
- Strategies
 - Avoid using the word monitoring in proposals
 - “Sell” scientific question that can be answered by monitoring data
 - Clearly state why data are needed/utility of data
 - Partner vs. compete with the Chesapeake Bay

Questionnaire compilation/discussion

- How might the intensity, duration, and frequency of events drive the Monitoring Plan? How have these changed over time?
 - Twenty years ago, primarily spot monitoring (exception of pH and conductivity)
 - No option for continuous monitoring
 - Important questions to answer
 - Timescales needed to answer these questions
 - “Vat” of data
 - Need to synthesize and apply to answer bigger questions such as climate change
 - Are there things we should be monitoring, such as water depth?
- How are our actions impacting the Bays?
- Would we know improvement if we saw it?
- Answered lots of questions posed in 1995/1996
- What/where are the critical needs/trends that should be monitored?
 - Bacteria
 - EPA has guidance for the protection of recreational waters
 - CIB is concerned with health risks, which are becoming increasingly important
 - Tests are expensive, but people want these data
 - Look for pathogens vs. indicators
 - Sub-watersheds
 - Streams vs. larger bodies of water
 - Use local studies to inform larger questions
 - Stressors
 - Stressors are changing; point sources have decreased
 - Implications for monitoring
 - Monitoring may lead to identification of new management issues
 - Management practices
 - Example: Monitoring of BMPs
 - Privacy concerns, lack of focus, small scale
 - Need aggregated, doable, monitoring strategy
 - Lack before and after data
 - Know Inland Bays system now much better than in 1995
 - Lots of data
 - Third generation of modelling
 - Problem: Minimal, and/or anecdotal, historical data from the 1950s/60s
 - Look for trends in all applications
 - Example: 305b reporting includes downstream monitoring that summarizes trends
 - 1999 – 2013 trends
 - Nitrogen down, phosphorus up/down
 - Slow, but steady improvement
 - New sources of contamination
 - Chemical indicators for small source monitoring
 - New technology for monitoring
 - Effect on aquatic health
 - How to handle changes/trends that have yet to hit the Inland Bays
 - What are strong indicators of health in the Inland Bays?
 - Hard to quantify if no historical data
 - Short vs. long-term monitoring

- Limited utility of short-term monitoring; need long-term monitoring to see changes, which only manifest with time
 - Consider scale/frequency of sampling/monitoring
 - Intensive monitoring for a year vs. every five years
 - Advantages/necessity of more frequent monitoring
 - Monitoring indicators vs. trends
 - CIB monitoring interests may not match DNREC monitoring interests
 - National vs. state-specific focus
 - DNREC only has one station in the Inland Bays
 - Continue base monitoring of Inland Bays, but add more specific monitoring upland (sub-basins/watersheds)
- Groundwater
 - Is DNREC monitoring groundwater?
 - CCMP goal: Groundwater monitoring for saltwater intrusion
 - Good assessment tools for groundwater, but expensive and difficult
 - Note in Monitoring Plan
 - Lack clear understanding of land-based wastewater; some polluter-based monitoring
 - Target groundwater collection over time
 - Could do more with base flow sampling or mine existing data for flow
 - Need to understand processes and re-sample in networks not sampled recently
 - Jen Volk (UD) does continuous stormwater monitoring
 - Other sampling efforts
 - North East Water Resources Network (NEWRNet)
 - Researchers in Rhode Island, Delaware, and Vermont are using sensors in streams to measure water depth, temperature, dissolved oxygen and organic matter, nutrients, and cloudiness
 - National Estuary Research Reserve
 - Network of 28 coastal sites designated to protect and study estuarine systems
 - NOAA funded; each site managed by state agency or university
 - Maybe options to collaborate
- Data
 - Availability, accessibility, maintenance, integrity
 - Sharing mechanisms
 - STORET (STOrage and RETrieval) data warehouse is EPA's repository for water quality, biological, and physical data
 - Available to state environmental agencies, EPA and other federal agencies, universities, private citizens, etc.
 - At this point, DNREC is the only one populating STORET
 - Historically, difficult to use
 - Greatest challenges
 - How/where to house data: STORET, Delaware Environmental Observing System (DEOS), other?
 - Accessibility is essential to long-term value/utility
 - Need solution for broader datasets
 - DEOS: Data aggregator of continuous data for Delaware
 - Provides interface
 - Mapping application for water quality data (pulls from STORET)

- Need initial start-up funds to purchase equipment
 - DNREC has pool of equipment and experiences personnel within the state
 - Sensor capability
 - Some can collect temperature and salinity data needed for the hydrodynamic model
 - Cannot collect total nitrogen/phosphorus, but can collect nitrate
 - Could equipment be modified to fit need?
- Citizen Monitoring Data (CMD)
 - Questions of variability, quality, etc.
 - Volunteers are all trained and many have years of experience
 - CMD near shore stations vs. DNREC off shore stations
 - Shoreline data are heterogeneous; need large numbers to be meaningful
 - Huge volume of data with considerable buy-in/community support
 - Beneficial to add total nitrogen and total phosphorus
 - CIB wants to include CMD in Monitoring Plan; no one else is collecting these data
 - What can be done to increase credibility?
 - Example: Community Collaborative Rain, Hail and Snow Network (CocoRaHS)
 - How best to integrate?
 - Extensive QA/QC
 - Reports archived on website
 - Volunteer monitoring reports are a good example of data compilation
 - Should data be reviewed prior to posting online?
 - Need to figure out the best way to get the data into STORET
 - These data are very important to the CIB for trends
 - How to expand citizen monitoring activities
 - How best to manage and oversee activities and data?
 - Is engagement an issue?
 - Can we request volunteers do specific things?
 - How best to expand capacity?
- Non-monitoring related needs
 - Searchable library/archive of historical reports, data summaries, etc.
 - Housed at CIB; does CIB have the capacity to maintain?
 - DNREC Watershed Assessment and Management Section moving; great opportunity to scan documents and get them online
 - Need someone to sort through historical data
 - Need summaries or keywords searchable in pdf image
 - Kent Price's student maintained list of reports/datasets until 1972ish
 - Who has this list? DNREC? CIB?
 - Accuracy
 - Not a critical issue unless data are used for regulatory purposes
 - Plot data over time/space; if consistent, accuracy is good
 - Stored electronically (STORET? If not, where?) and link to historical report
 - What is in it for CIB? Trends?
 - Consider compartmentalizing tasks for internships, etc.
 - Target specific sources