Monitoring Inventory and Needs Assessment - 2018
Survey and Workshop Plan
NEP Task Coordination

1996, 2018, 2028

CCMP
10 year cycle
> PDE Strategic Plan

Implementation

Strategies

PDE
5 year strategic plans

DELEP
Partners

Tracking

Monitoring
Annual: STAC/MACC
5 years: Inventory

Non-DELEP
Activities

Indicators
5 year cycle: TREB, SOE

2012, 2017, 2022, 2027

2008, 2019, 2024, 2029
NEP Task Coordination

**CCMP**
- 10 year cycle
- > PDE Strategic Plan

**Indicators**
- 5 year cycle: TREB, SOE
  - 2012, 2017, 2022, 2027

**Implementation**

**Monitoring**
- Annual: STAC/MACC
  - 5 years: Inventory
    - 2008, 2019, 2024, 2029

**PDE**
- 5 year strategic plans

**DELEP Partners**

**Non-DELEP Activities**

**Strategies**

**Tracking**
Monitoring Approach

Objectives

The objectives of the Comprehensive Conservation and Management Plan (CCMP) are articulated in the “How We Will Measure Success” sections for each set of strategies. To track progress on implementing the CCMP to meet these objectives, the Management Conference has developed a multi-tiered system of tracking/reporting summarized in Table RevCCMPMeasures at the end of this section. A brief description of the multiple tiers within this system are as follows:

- **Outputs.** Outputs are the deliverables directly produced by activities described in the CCMP. For example, an outcome might be a public outreach workshop, a data set for research, or trees planted for restoration. Outcomes (see below) are generally an immediate result, are cost-effective, and can be observed and measured in the short-term.

- **Outcomes.** Outcomes are the results produced by outputs. For example, an outcome might be improved understanding by workshop participants; the findings or knowledge gained from research; or the water filtering services provided by trees planted for restoration. Some outcomes can be measured in the short-term; others take longer or are not cost-effective to measure, and therefore, need to be estimated.

- **Impacts.** Impacts are the lasting results produced by outputs and their outcomes. For example, an impact might be pollution-reducing behavior as the result of a workshop for outreach, reduced pollution from using a new tool or practice resulting from research, or water quality improvements in a stream resulting from trees planted for restoration. Impacts can only be measured by monitoring and tracking conditions over time and with significant investment. It can be challenging (if not impossible) to isolate and measure the impacts of some outputs/outcomes with precision.

For each suite of strategies, the Management Conference has identified ways to measure outputs, outcomes, and impacts using the tools and resources available or anticipated. A brief explanation of what and how the tools/resources will be used, include the following:
Future Monitoring Approach

The approach to monitoring in the Delaware Estuary has evolved significantly since the original CCMP was published. The RIMS envisioned in the original CCMP was never fully realized because it would require considerable manpower and resources to develop and maintain such a system for the large and complex Delaware Estuary. Instead of a comprehensive monitoring system, the Management Conference decided to adapt and evolve monitoring programs to address specific aquatic resource management needs, such as assessment against water quality standards, evaluation of status and trends, and examination of ecological function and health. Over time, the STAC and MACC have developed successful processes for working together to coordinate efforts and share monitoring results for the Delaware Estuary through two key activities. In addition to continuing the first two activities below, PDE and DRBC will also collaborate on the third new activity:

1) **Annual joint meetings of the STAC/MACC** to share results for activities that were monitored, and coordinate monitoring plans for the upcoming year, which are then shared with the EIC. These meetings are also used to identify emerging needs and opportunities for collaboration, thus strengthening ties among monitoring programs, water resource management initiatives, and the CCMP.

2) **Collaboration on State of the Estuary reporting every 4-5 years.** Led by the STAC and MACC, PDE identifies and collects indicator datasets from diverse monitoring and research programs. Subject matter experts then serve as authors of chapters of a TREB, including subjects on Watersheds and Landscapes, Water Quantity, Water Quality, Sediment, Aquatic Habitats, Living Resources, Climate Change, and Restoration. By analyzing these datasets, TREB authors help prioritize current and future monitoring. TREB chapters serve as the basis for a more public-oriented State of the Estuary Report.

3) **Monitoring Workshops every 4-5 years.** Following production of each State of the Estuary report (every 4-5 years), key partners engaged in environmental monitoring will be convened to create/update an inventory of critical monitoring in the region. The first of these workshops will be convened in 2018 and will focus on measures needed to track CCMP outcomes and impacts, as well as monitoring needs identified in the 2017 TREB report, and the impacts of CCMP implementation over time. This monitoring will also provide an opportunity to explore and utilize linkages with the new monitoring and research being undertaken for the DRWI. The resulting inventory and list of monitoring priorities will be treated as a monitoring plan that can serve as a tool for framing annual joint STAC/MACC coordination meetings in the future. Once the plan is prepared in 2018, it will be linked as a reference to this revised CCMP.

- **STAC-MACC Meeting**
  - every year

- **TREB Collaboration State of Estuary**
  - every 5 years

- **Monitoring Workshop**
  - every 5 years
"Collection and compilation of datasets from these and other monitoring programs is a collaborative effort for which PDE’s STAC works closely with the DRBC’s MACC."

<table>
<thead>
<tr>
<th>Name</th>
<th>CCMP Strategy / Lead</th>
<th>Sampling Activity and Location</th>
<th>Example Metrics</th>
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</thead>
</table>
| Delaware Estuary Water Quality Monitoring Program (DRBC Boat Run) | W1                   | Surface water samples from main channel                | • Dissolved and Particulate Nutrients  
• Chlorophyll-a  
• Silica, metals  
• Organic compounds |
| Continuous Water Quality Monitors (USGS, PWD) | W1                   | Surface water sensors at tidal and non-tidal stations | • DO, temperature, pH, conductivity  
• Chlorophyll  
• Precipitation and photosynthetically active radiation (Schuylkill) |
| Oyster Population Stock Assessment (Rutgers) | H3                   | Samples from Delaware Bay seed beds                    | • Abundance  
• Size demographics  
• Condition index  
• Recruitment |
| Mid-Atlantic Coastal Wetland Assessment (PDE, ANSDU, State of DE) | H1                   | Surveys and samples at stations in tidal Wetlands      | • Surface elevation  
• Dissolved nutrients  
• Sediment chemistry  
• Vegetation and fauna robustness  
• Condition |
| Freshwater Mussel Recovery Program (PDE, PWD, ANSDU) | H3                   | Surveys and samples of freshwater tidal and non-tidal bottom areas | • Baseline survey areas expanded each year  
• Survival and growth of extant and restored populations at >11 sentinel sites |
Goals (for DELEP, as per CCMP Monitoring Approach)

• Inventory critical monitoring in region
• Create a list of monitoring priorities

DELEP Focus

• measures needed to track CCMP outcomes
• Delaware Estuary study region
Monitoring Assessment 2018

Tentative Plan

• Inventory critical monitoring in region
• Create a list of monitoring priorities
Monitoring Assessment 2018

Activities

Inventory Database Set-Up
June

Inventory Population
from TREB, DEWOOS
July

Inventory Draft 1

Survey 1
Identify missing programs/studies
August

Inventory Draft 2

Events

Monitoring Workshop
Refine inventory, list/prioritize needs – October 30

Products

Survey 1

Inventory Draft 2

Share
October
Monitoring Assessment 2018

Activities

Inventory Database Set-Up
June

Inventory Population
from TREB, DEWOOS
July

Inventory Draft 1

Survey 1
Identify missing programs/studies
August

Survey 2
Refine needs and priorities
December

Inventory Draft 2

Inventory Draft 3

Compile Input
November

Needs Draft 1

Compile Input
December

Events

Monitoring Workshop
Refine inventory, list/prioritize needs – October 30

Compile Input

Survey 2

Needs Draft 1

Compile Input

Draft Monitoring Assessment Report

Products

Inventory

Draft Monitoring Assessment Report

Share Report
January

Summit Panel
Present results, solicit final input on needs late January

Compile Input
February

Final Monitoring Assessment Report by 2/28/19
Monitoring Assessment Report

• Will provide a baseline for 5 year reassessment
  *Are we sustaining, enhancing, adapting over time?*

• Will help track CCMP implementation, indicator reporting

• Provides opportunity to explore new linkages among ecosystem features (and next gen indicators)

• Helps link assessment programs (e.g. DRWI, DRBC, etc.)
Monitoring Workshop

When:  Tuesday, October 30th
       9:00AM – 3:00PM

Where: John Heinz National Wildlife Refuge at Tinicum

Monitoring Workshop Goals:
• Review the draft inventory of monitoring programs
• Identify gaps in data collection
• Gather input to help prioritize future monitoring efforts
Monitoring Inventory Stats

- Received ~400 monitoring programs
- Monitoring programs submitted by ~30 organizations or partnerships

American Rivers
Berks Nature and volunteers
Bucks County Conservation District
Delaware Nature Society
Delaware State University
Delaware StreamWatch
DNHP/DNREC
DNREC
DNREC/DNERR
DNREC/PDE
DRBC
DRBC/DNREC
DRBC/NJDEP
DRBC/NPS
DVRPC
Independence Seaport Museum
Lower Merion Conservancy
NJDEP
PADEP/CRM
Pennypack Ecological Restoration Trust
PWD
PWD/USGS
Rutgers Haskin Shellfish Research Laboratory
Temple University
TNC DE Volunteers
TNC NJ/Rutgers University
TTF
USGS
Villanova University
White Clay Wild and Scenic River Program
WVWA
Monitoring Workshop Agenda

Discussion Topics:

• Important resources and/or parameters to monitor over the next ten years
• Type of data most important to have over the next ten years

Topical Group Discussion:

• Missing programs/parameters from draft inventory
• Geographic data gaps
• New programs and efforts to be prioritized for the future

Photo Credit: Martha Gery, Prime Hook NWR
Monitoring Workshop
Next Steps

• Review input received during the workshop (and other information sent following workshop)
• Send out follow-up survey
• Further refine inventory/needs and priorities

Want to register for the workshop?
Go to:
delestmonitoring.eventbrite.com
Danielle Kreeger
Science Director
(302) 655-990, x104 | DelawareEstuary.org

Connecting people, science, and nature for a healthy Delaware River and Bay