Enhancing the Chesapeake Bay Program Monitoring Networks

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Nontidal Network Workgroup Meeting

October 19, 2022

Where did we start?

- Principal Staff Committee (CBP Policy Advisors) March 2021 Meeting
  - Provided an overview of the status and potential reductions to the current CBP monitoring networks

Photo Credit: Will Parsons (Alliance)

The Scientific Technical Assessment and Reporting Team (STAR) listed the condition of the networks as “fair” during the August 2020 SRS quarterly review to the Management Board.

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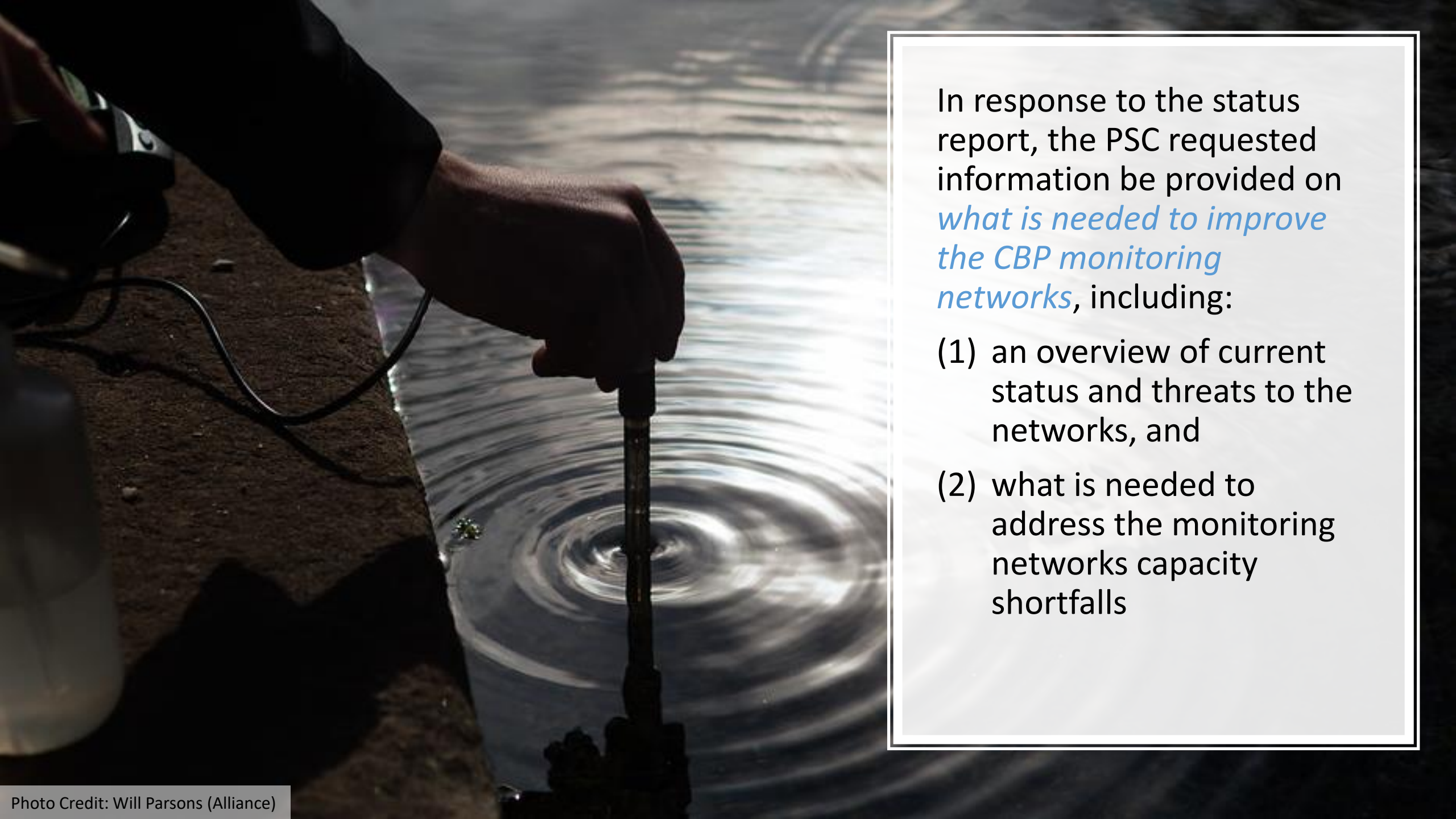


In response to the status report, the PSC requested information be provided on *what is needed to improve the CBP monitoring networks*, including:

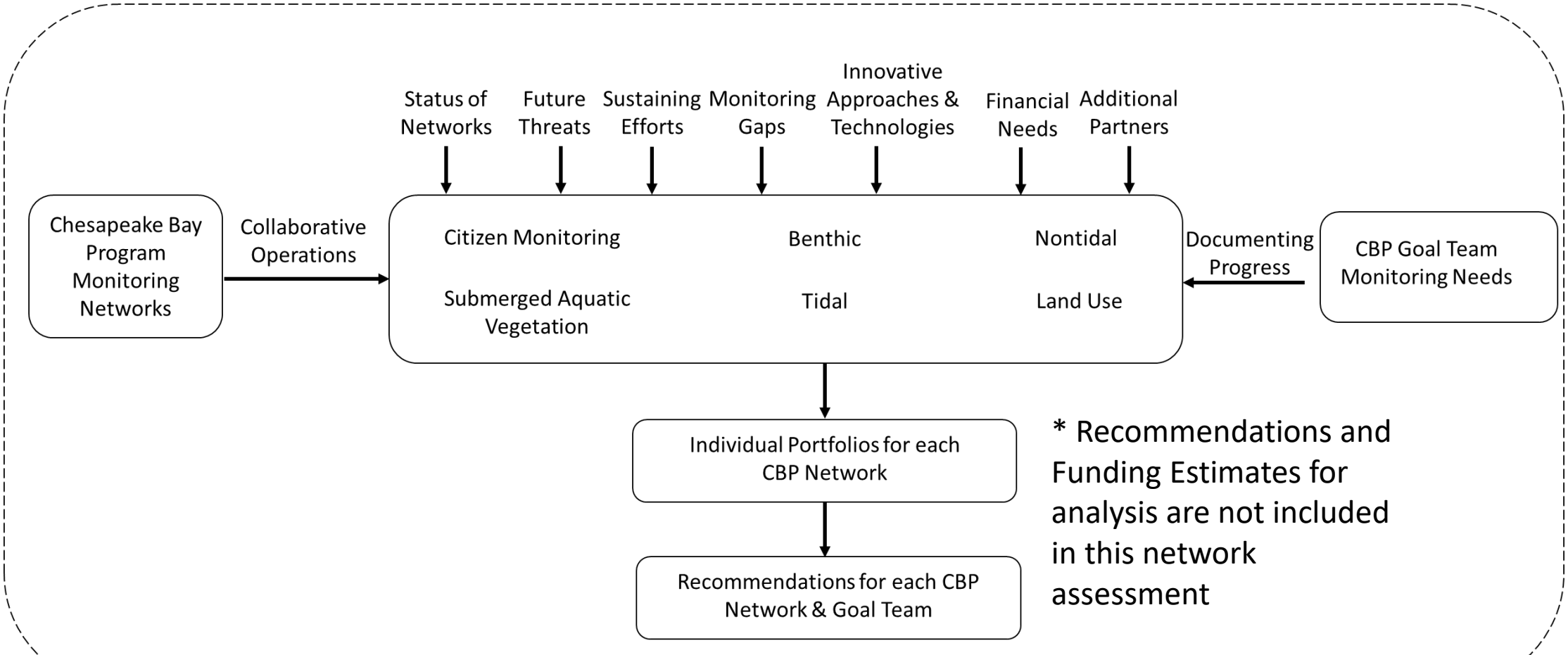
(1) an overview of current status and threats to the networks, and

(2) what is needed to address the monitoring networks capacity shortfalls

Photo Credit: Will Parsons (Alliance)

How did we get there?

STAR-STAC team engaged multiple CBP partners and GITs to refine monitoring needs and develop recommendations



Process of developing recommendations

Needs assessments have been developed and cataloged into the SSRF database

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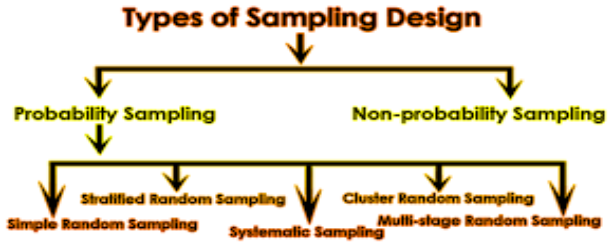
Groups developed sampling designs to address data collection needs



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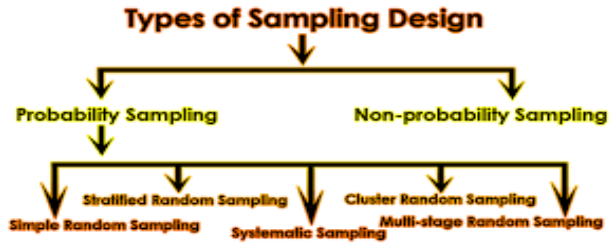


Managers and scientists developed costs for need based on proposed designs

COST MANAGEMENT CATEGORY	Year 1
Salaries and Wages (Data management, regression development)	$21,520
Salaries and Wages (Installation of QW sondes)	$ 21,300
Equipment and Installation Supplies	$105,000

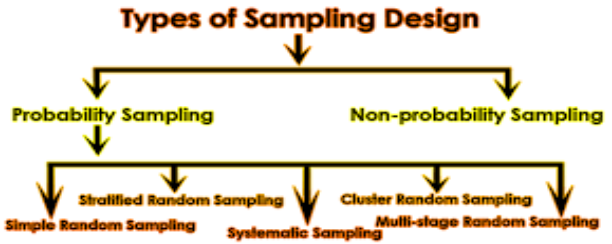
Process of developing recommendations

Needs assessments have been developed and cataloged into the SSRF database

Groups developed sampling designs to address data collection needs

Managers and scientists developed costs for need based on proposed designs

Cost estimates were collated and summed



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Total cost for first year: $5.1M

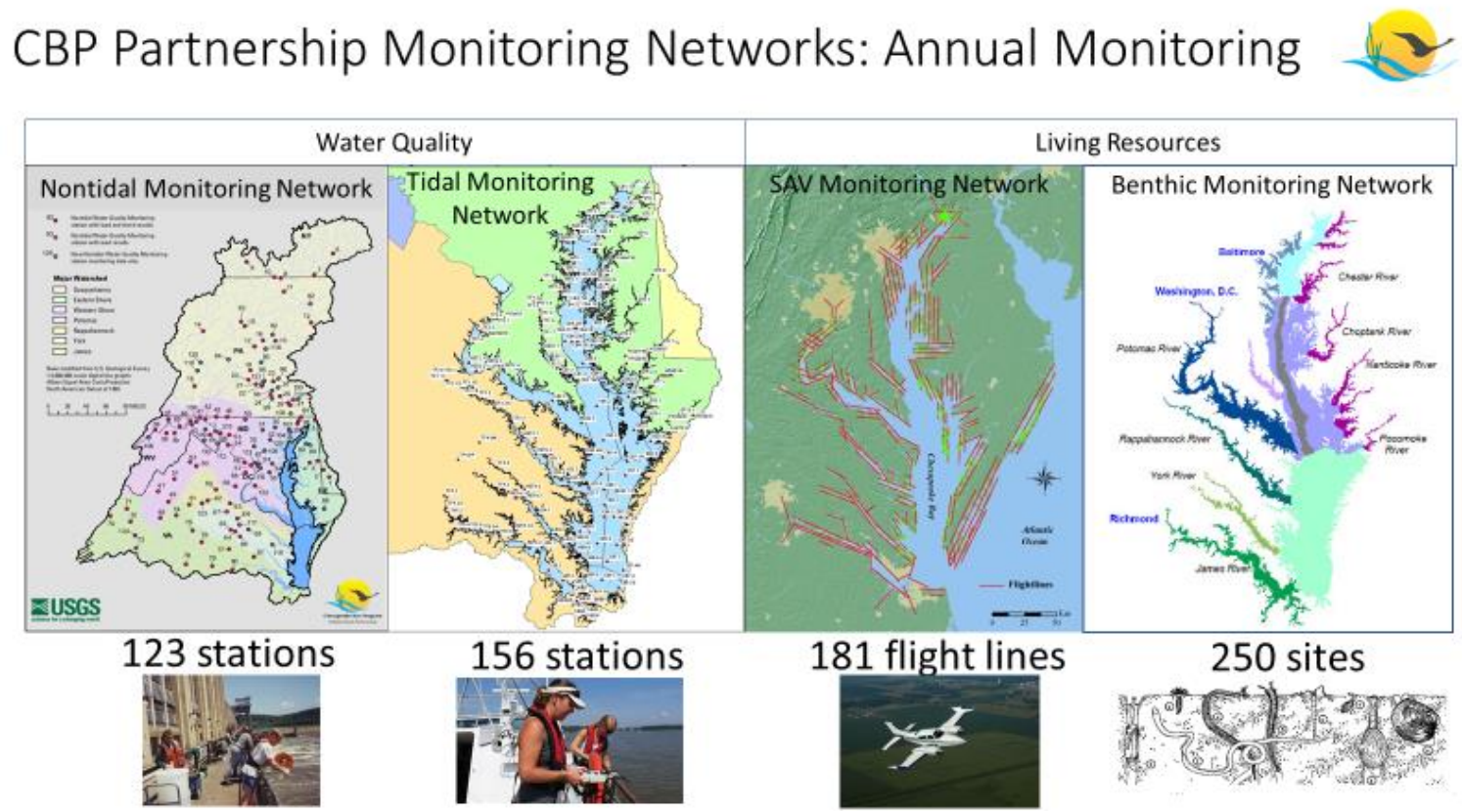
Key findings

- Monitoring is critical
  - Monitoring shows CBP partners progress from water-quality and restoration efforts
  - Need to maintain and enhance core CBP monitoring networks AND partner monitoring programs

- Monitoring for many CBP outcomes is insufficient
  - No segment of the bay has assessed all water-quality criteria, and therefore can't be delisted!
  - Some Outcomes need a more coordinated effort to track progress
  - Some Outcomes lack information to assess progress

- Opportunities for fundings exist
  - The CBP partners committed to achieving these outcomes have a unique opportunity to build monitoring capacity.

Report Section 1: Enhancing CBP Networks



Network Portfolios:

Detail basis for recommendations

Each Portfolio contains:

- Status
- Gaps
- Current Investment
- Innovations
- Vulnerabilities
- Monitoring Gaps
- Recommendations
  - LINE ITEM expressed in overall recommendations

NONTIDAL NETWORK – WATERSHED MONITORING

RECOMMENDATIONS

- $325,000. Capital Cost. Enhance network efficiency and capacity. One time purchase of equipment and supplies for 5 advanced RIM continuous water quality monitoring stations equipped with 6-parameter continuous water quality monitoring sensor arrays.
- $126,300. Capital Cost. Adding 3 Lower Susquehanna Reservoir continuous monitoring sensor packages in Pennsylvania (Marietta).
- $375,000. Capital Cost. Adding 5 Small Watershed Continuous Monitoring stations (locations TBD).
- $150,000, Plan 5% COLA. Operations. 5 new small watershed continuous monitoring sites.
- $233,000. Operations. Annual network sustainability and integrity. PADEP.
- $210,000 Yr1, Plan 2% COLA. Operation. Sustain 5 new RIM continuous monitoring network sites + 2 (Potomac & Susquehanna) funding ends FY22.
- $125,570 Yr1, Plan for COLA increase. Operation. Sustain new Lower Susquehanna continuous monitoring stations.
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- $45,000 Yr1 – 5. Operation. Annual Risks Coverage: Station loss backfill.
- **Total Capital cost investment need:** $826,300
- **Total Operations and maintenance annual investment need:** $781,030 Yr1, estimated growth for Yrs 2-5.
- ***Funding for data analysis and reporting are not included.**

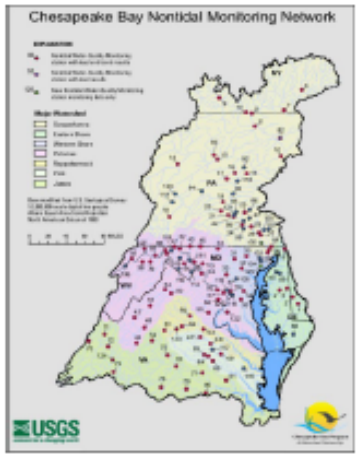

Figure 1. Chesapeake Bay Nontidal Monitoring Network.

STATUS: The current nontidal water quality monitoring network has 123 monitoring stations. The network was established with 85 stations in September 2004 with the signing of a Nontidal Network (NTN) Memorandum of Understanding (MOU). The MOU aligned the seven jurisdictions, the Susquehanna River Basin Commission, and USGS under an agreement to use the same set of standardized sample and analysis protocols for NTN operations. Protocols were based on USGS field sampling methods and EPA-approved analytical lab methods. Approximately $2M was invested from EPA between 2009-2012 to expand the network into small watersheds, coastal plain geography, and under-represented land uses. Advanced statistical analyses are used to report streamflow statistics, monthly and annual nitrogen, phosphorus and suspended sediment loads, as well as 10-year and long-term trends in loads. https://cbrim.er.usgs.gov/

CURRENT INVESTMENT: EPA 117e grants and USGS-EPA IAG. Approximately $2.3M. Includes State match 1:1 on 117e grant funding.

INNOVATIONS:

- Robust, cost-effective continuous monitoring sensor units including nutrient (nitrate) sensors for concentration and load measurement support
- "Big data" management
- Advanced statistical analyses

VULNERABILITIES:

- The cost of living is increasing, but the level of funding towards the program is staying fixed.
- Meeting the Clean Water Act 117e match obligations has and will be a challenge based on current conditions, reducing the amount of funding towards monitoring.
- Unpredictable changes in partner support threatens network integrity on an annual basis, lessening the ability to assess the water-quality response to nutrient reduction efforts being implemented.

MONITORING GAPS:

- Need for high temporal frequency monitoring which supports detection of water quality change through time more quickly due to the power of enhanced data density.
- Spatial representation of our network has diverse watershed sizes. Small watersheds are underrepresented. Targeted monitoring in small watersheds where significant BMP actions are planned and underway are important.
- Under-representation of coastal plain geography and single-land use monitoring station positions remain important to network growth considerations.

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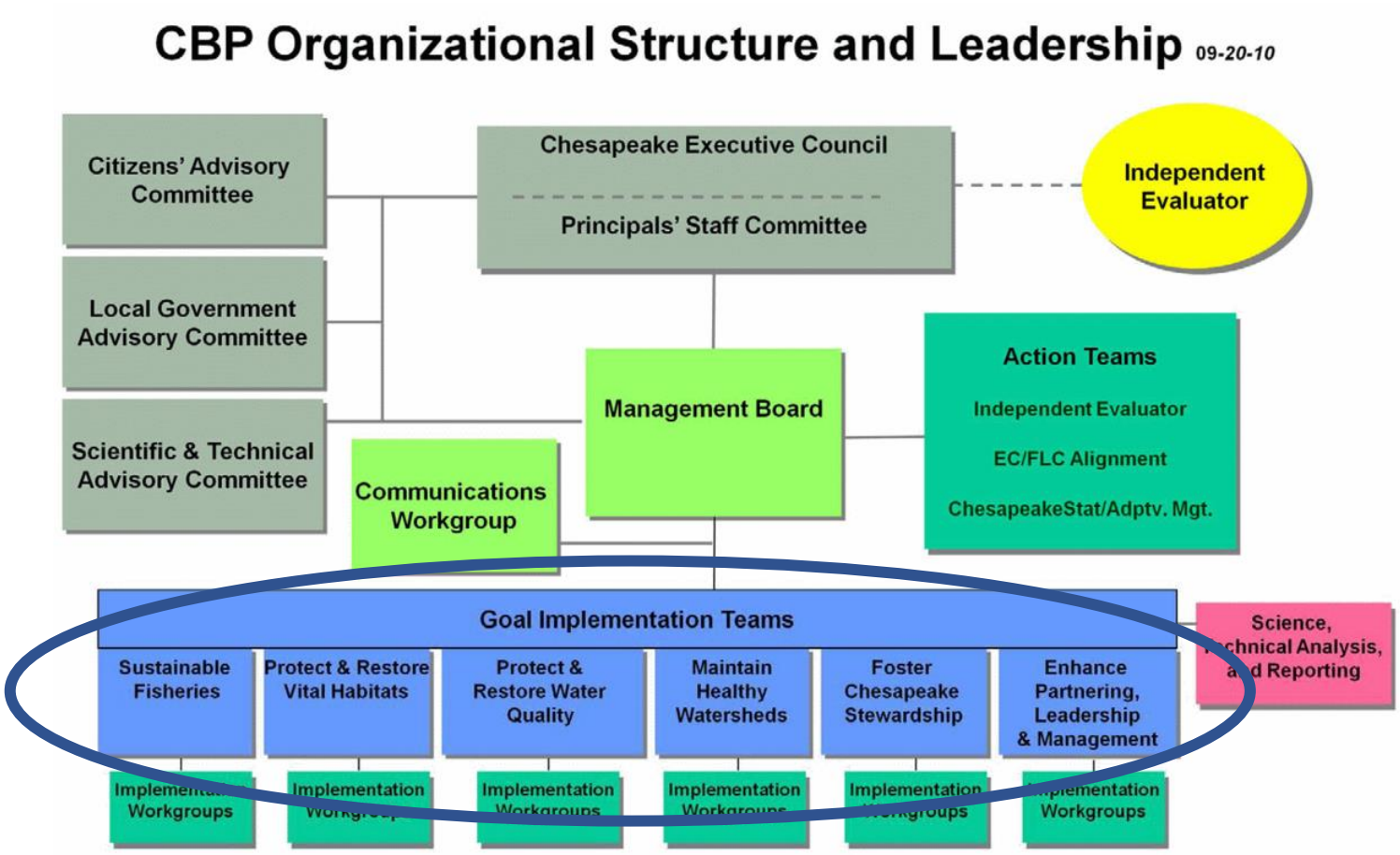
Report Section 2: Monitoring Needs for CBP Goals and Outcomes



Maintain Success of Existing Monitoring Network

12 Outcomes

Examples
Blue Crabs
Oysters

Enhance Efficiency and Capacity of Monitoring Network

12 Outcomes

Examples
Wetlands
Stream Health

Establish a New Coordinated Monitoring Network

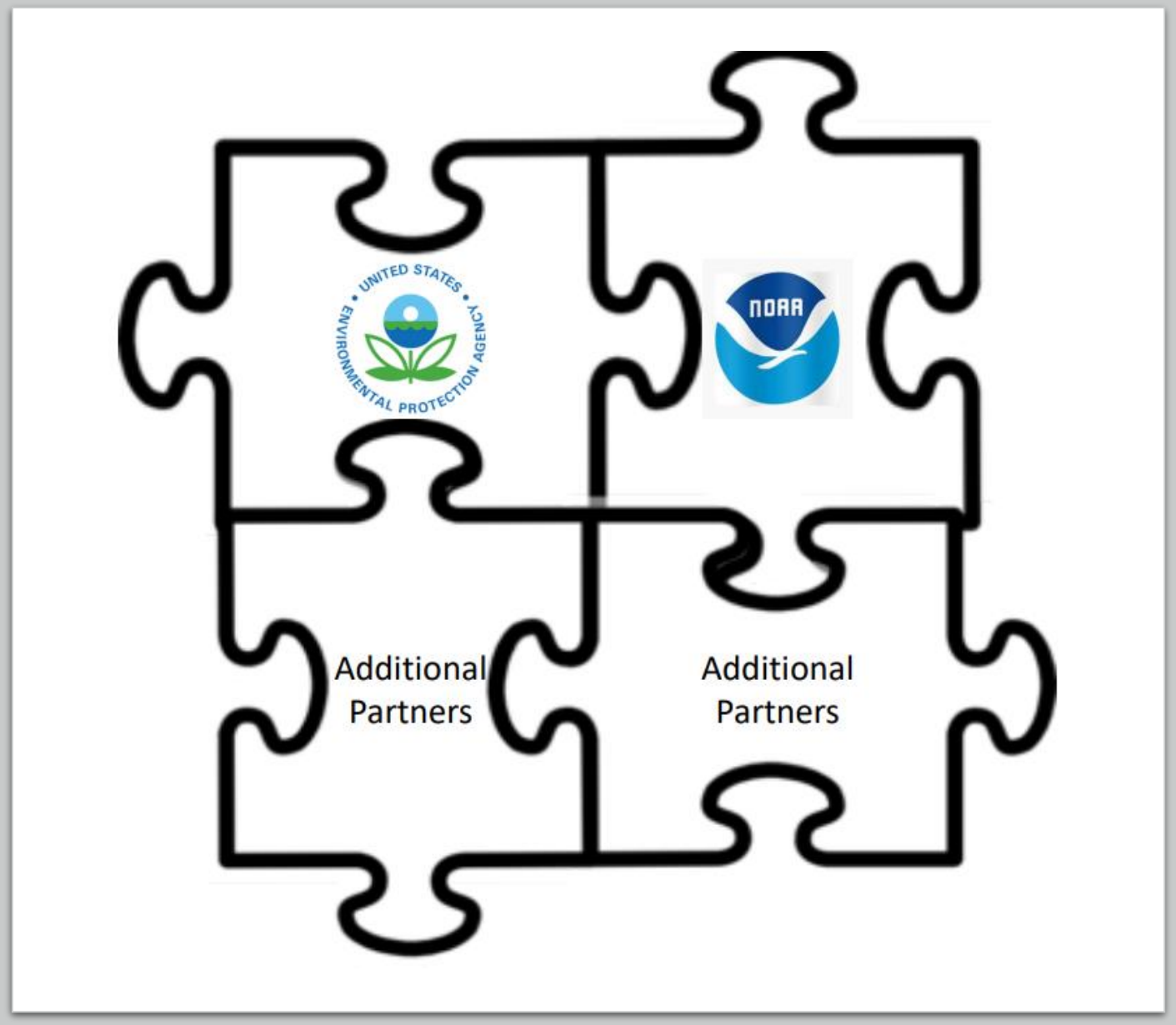
7 Outcomes

Examples
Climate
Local Leadership

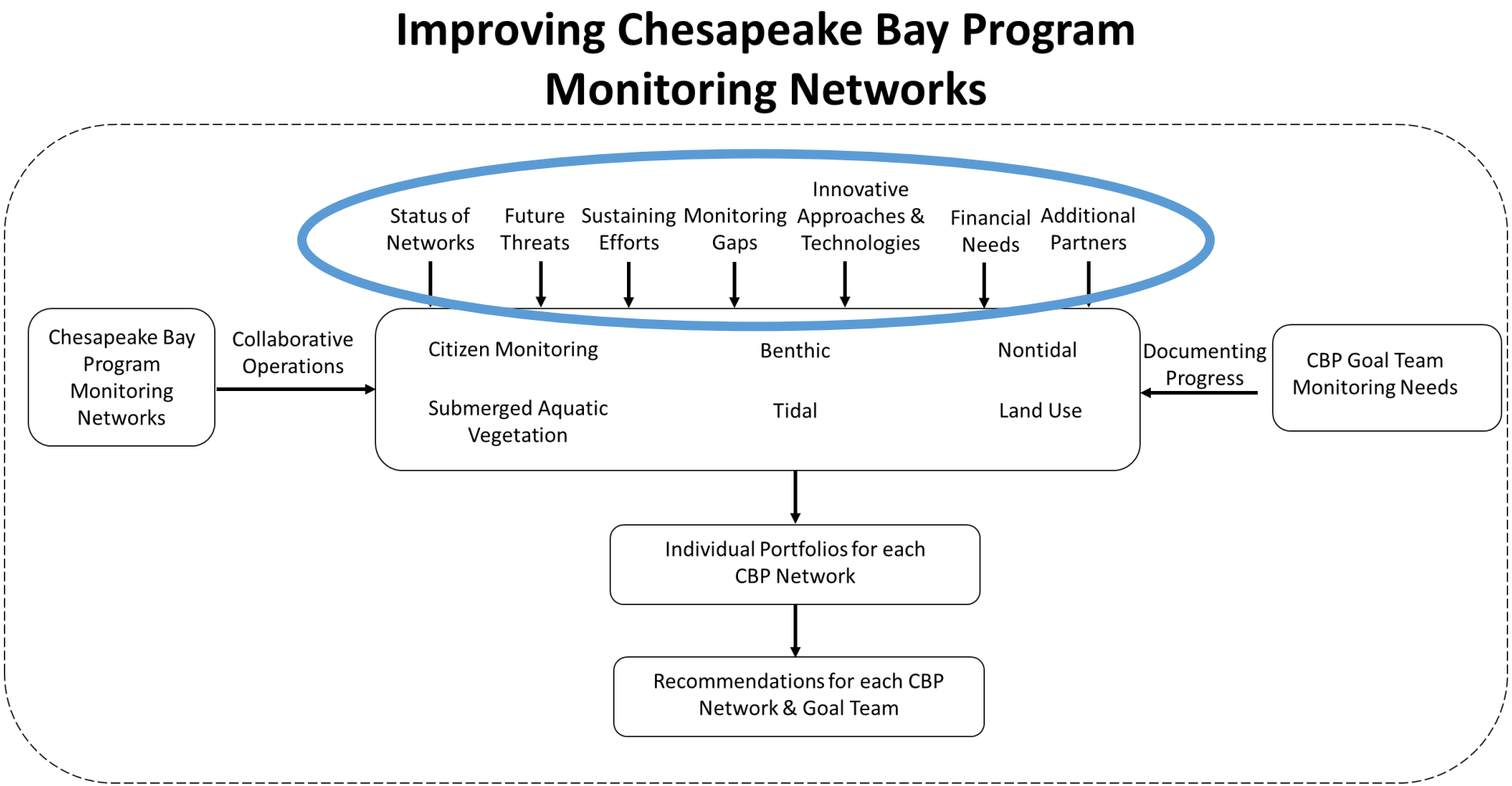
Report Section 3: Building Monitoring Capacity

Building Monitoring Capacity

- Need a *multi-partner approach* to invest in gaps.
- Partners can identify which monitoring items they want to support
- Example: Hypoxia collaborative



Report Section 4: PSC Charge to the Monitoring Review Team and Foundational Assessment Results



Recommendations based on CBP needs assessment

Core Networks now. More networks to come.

Webinar: December 13, 2022

Overview of Monitoring Review Effort.

Kick-off Meeting: January 11, 2023

Evaluate opportunities and assess efficiencies to establish sustainable funding for the recommendations addressed in the report

Focus of Today's Meeting: Nontidal Network Portfolio

- Status
- Gaps
- Current Investment
- Innovations
- Vulnerabilities
- Monitoring Gaps
- **Recommendations**
  - **LINE ITEM expressed in overall recommendations**

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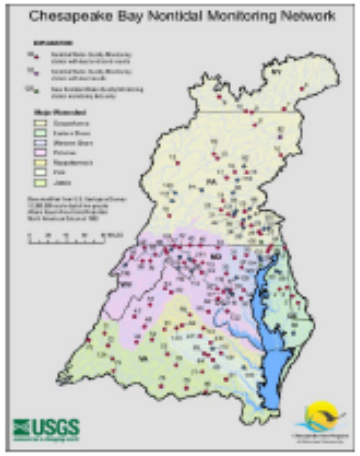

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- Program sustaining funds were brought up to speed with long-term funding gap updates
- Almost every nontidal line-item has received support for year 1.

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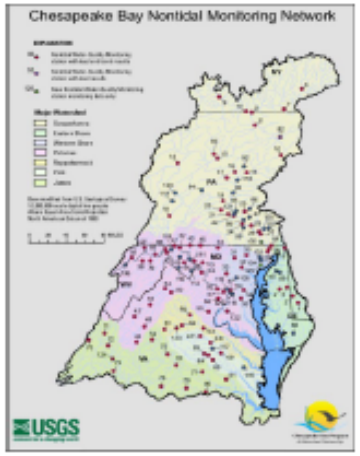

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Recommendation #1 and #2

- Enhance network efficiency and capacity. One time purchase of equipment and supplies for 5 advanced RIM continuous water quality monitoring stations equipped with 6-parameter continuous water quality monitoring sensor arrays.
- Capital Cost: $325,000
- Sustain 5 new RIM continuous monitoring network sites + 2 (Potomac & Susquehanna) funding ends FY22
- Operation & Maintenance: $210,000 Yr1, Plan 2% COLA

Recommendation #3 and #4

- Adding 5 Small Watershed Continuous Monitoring stations (locations TBD).
- Capital Cost: $375,000
- Discussion later in agenda will focus on potential criteria for the locations chosen and how the partnership can leverage available funding for this recommendation

- Sustain 5 new small watershed continuous monitoring sites.
- Operation & Maintenance: $150,000 Yr1, Plan 5% COLA

Recommendation #5

- Annual network sustainability and integrity. PADEP.
- Operations & Maintenance: $233,000

Recommendation #6 and #7

- Adding 3 Lower Susquehanna Reservoir continuous monitoring sensor packages in Pennsylvania (Marietta).
- Capital Cost: $126,300

- Sustain new Lower Susquehanna continuous monitoring stations.
- Operation & Maintenance: $125,570 Yr1, Plan COLA increase

Recommendation #8

- Adding 10 more discrete samples at Marietta annually. Costs align with Conowingo protocols.
- Operation & Maintenance: $17,460 Yr1, Plan 1.5% COLA after Yr2

Recommendation #9

- Annual Risks Coverage: Station loss backfill
- Operation & Maintenance: $45,000

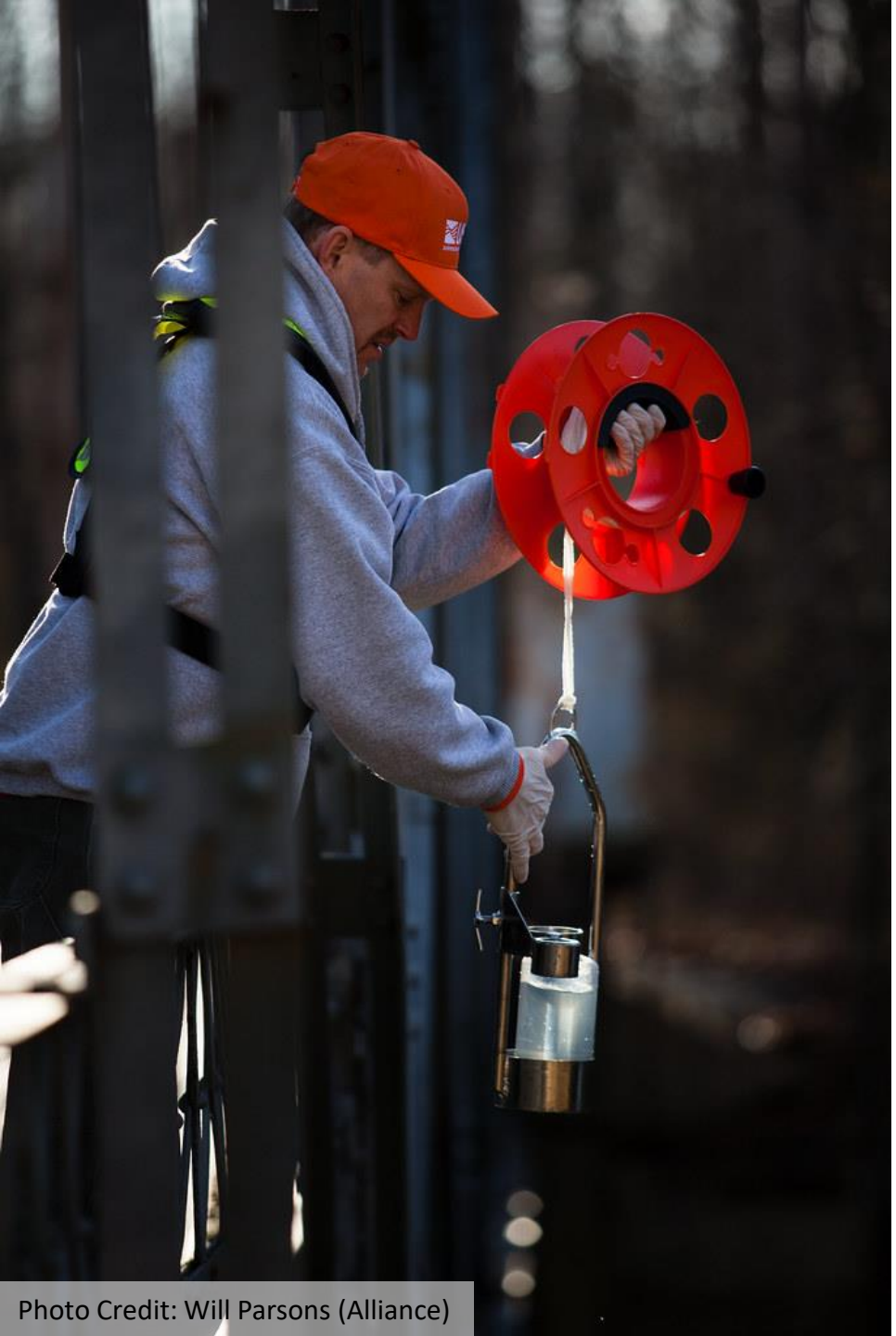

Photo Credit: Will Parsons (Alliance)

How can the Nontidal Network Workgroup Help?

- Help in partnership approach for leveraging available funding in network enhancement
  - Year 1 funding is supported, but we need to understand what can we do in the for the near-term years for sustainable funding
- Assist in establishing criteria for selecting sites for new monitoring
- Interested parties may attend the Kick-off meeting in January 2023

Thank you!

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