Chesapeake Bay Program

Science. Restoration. Partnership.

Responding to the PSC Request to Improve the CBP Monitoring Networks- Update

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Chesapeake Bay Program

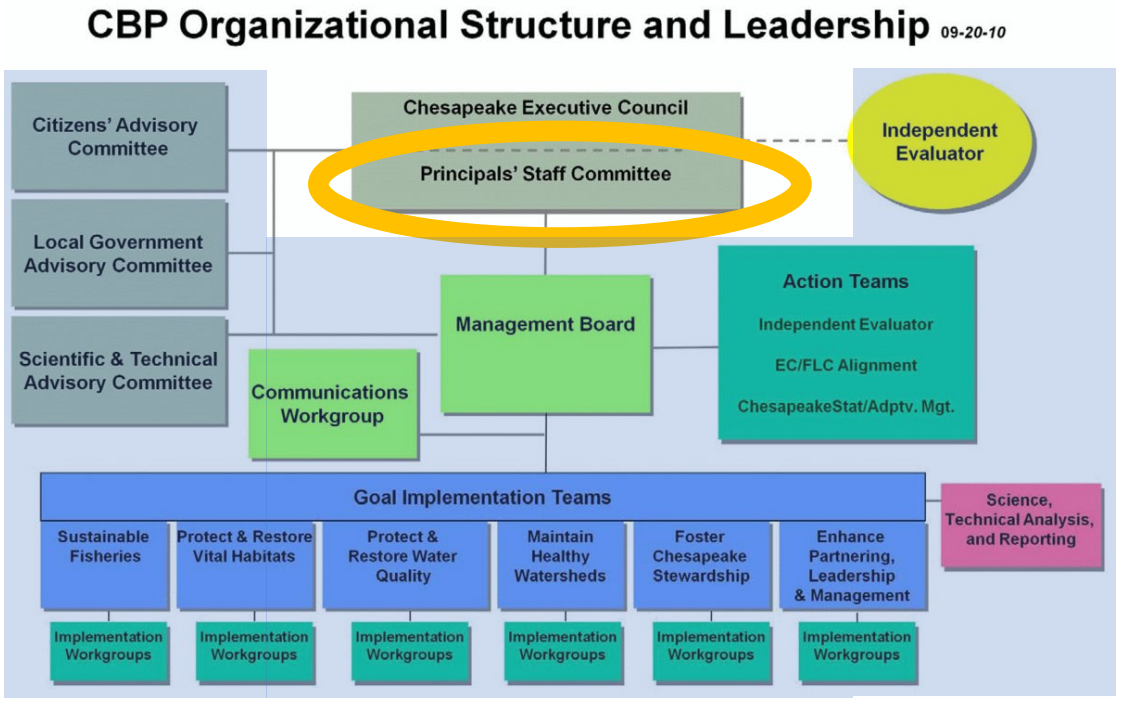
Fisheries GIT Meeting

January 7, 2022

Addressing the Principal Staff Committee Request

- Provide information needed to improve CBP monitoring networks, including:
  - (1) Current status and threats to the networks
  - (2) What is needed to improve the monitoring network sustainability
  - (3) What is already available to address capacity shortfalls in monitoring and assessment
  - (4) Opportunities for CBP networks to address multiple outcomes

- STAR will Coordinate Response
  - Work plan shared with PSC June 2021
  - Compile and finalize network assessment and recommendations by January 2022
  - Provide update of report and recommendations to MB in February 2022
  - Deliver report and recommendations to PSC in February 2022
  - Present report and recommendations to PSC during March 2nd meeting



Process

9 months start to finish

8 questions to answer

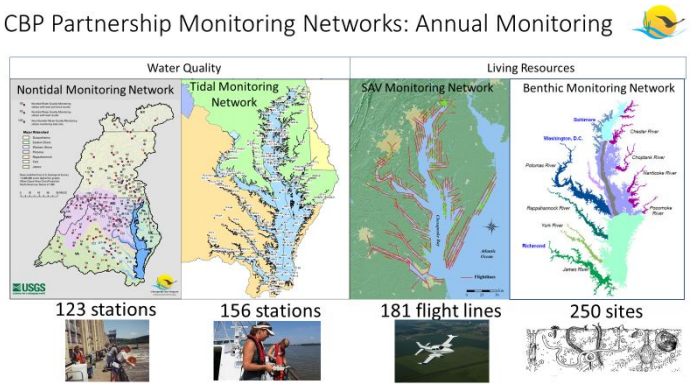
Provide a short synthesis to address the questions, vision going forward.

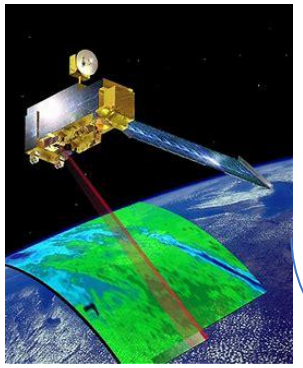
Findings:
What we need

- Sustaining existing foundations of monitoring programming
- Strategic growth addressing gaps in space and time for monitoring needs
- Address costs and cost effectiveness of programming, especially when adopting new monitoring approaches

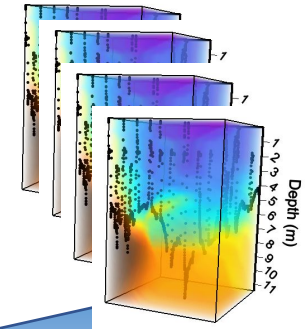
We envisioned leveraging innovations in this review. All items addressed in the review.

Traditional networks





2. Adapt to baywide satellite-based data (SAV, Kd, CHLA)



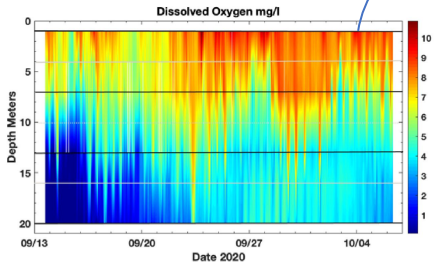
4. Improve assessment tools (4D water quality estimator)

Expanded capacity

Monitoring and assessment capacity building beyond traditional monitoring

Expanded capacity

1. Apply Citizen-based observations (MOU 2018)



3. Innovate and adopt new WQ and living resource monitoring at needed data scales (CBT 2020 work, Bever et al. sampling design insights)

Full
Water Quality Standards Attainment Assessment for Chesapeake Bay

+

CrossGIT Benefits

Draft Findings Theme 1 of 3 in PSC reporting: Investment needs for Water Quality monitoring support with unassessed criteria

(Present funding estimate of "$2M +/-" initial investment and lower for subsequent annual need)

1. **Increase in funding over 5 years to sustain existing monitoring programs that are affected by cost-of-living impacts and aging infrastructure.**
2. **Address diverse community needs and the nearly 20-year gap in not evaluating short-duration dissolved oxygen criteria through infrastructure, maintenance, and implementation of a 11 high frequency water column sensor system.**
3. **Support protocol development for satellite image collection, data management, historical protocol alignment with new protocols for SAV assessment needs.**
4. **Address cost of living updates in Tidal benthic macroinvertebrate monitoring program to support sustaining base operations.**
5. **Develop and maintain 4D interpolator to ingest available data to output assessments for all frequencies provided for dissolved oxygen criteria.**

Recommendations on sampling design for the next phase of hypoxia monitoring network development

- Mainstem bay (3)
  - 2 existing arrays with an east-west pair in the mainstem
  - 1 new “reference array” at another latitude
- Lower tributaries: Potomac and Rappahannock. (4)
  - 2 new Potomac arrays
  - 2 new Rappahannock arrays
- Mobile, targeted study arrays (4)
  - 3 new as a suite for evaluating scales of variability
  - 1 existing with MD DNR and their Fishing Bay study area

n=11 arrays.

- Growing the water quality network from “Fair” to “good”, addressing high frequency water quality habitat conditions with this level of investment and build out of the program.

- **3 existing arrays**
- **8 new locations for arrays.**

Leverage links to existing nearshore continuous monitoring and proposed river input continuous monitoring as well as lower temporal resolution long-term monitoring network in this strategic addition to bay habitat monitoring programs

Draft Findings Theme 2 of 3 : Investment needs for explaining responses to management actions

(Estimated initial investment of “$1.95M”+/- with lower investment for annual O&M support)

1. Maintain long term 123 station nontidal network
2. Improve River Input Monitoring network with continuous sensors. Align data scales with bay 4D interpolator and other models in setting boundary conditions for major tributaries.
3. Annually operate and maintain new RIM continuous monitoring network
4. “+1M” annually for watershed-wide imagery tracking land use/cover status, change. Present assessment occur at 4 – year intervals
5. Nutrient limitation reassessment in the Bay/model validation (approx. 150K)

Draft Findings Theme 3 of 3 : Investment needs supporting 2014 Bay Agreement Goals and Outcomes (Outcome specific investments are being finalized as available)

1. Toxics monitoring - Monitoring of PCB response to management efforts. For one geographic-focus area (with a minimum of three new sites) the estimated annual cost would range from $66,000 for fish sampling to $210,000 for surface-water sampling.

2. Other outcomes and indicators monitoring, and funding details continue to mature at different paces and will be presented in the report in various ways:

   - Link to the Science Needs Database,

   - Paragraph describing need, urgency, and management relevance

   - Summary of proposed network objectives, design, gaps, and estimated costs

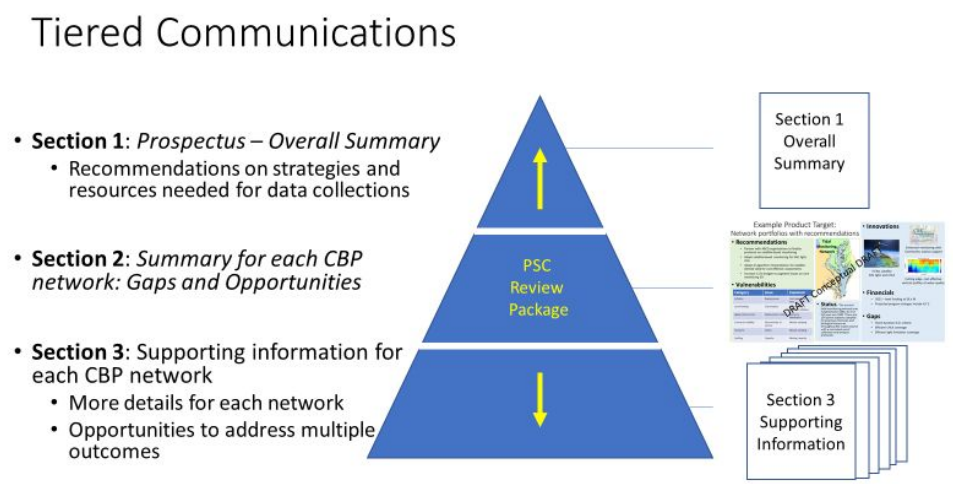
Current Monitoring Science Needs: Sustainable Fisheries GIT

1. Monitoring vertical water column habitat (DO volume and spatial extent for hypoxia)
2. Explore cost-effective methods/approaches to phytoplankton and zooplankton monitoring
3. Oyster restoration monitoring
4. Develop shallow water monitoring survey proposal for gaps
5. Forage fish indicator

CBP Science Needs Database: https://star.chesapeakebay.net/

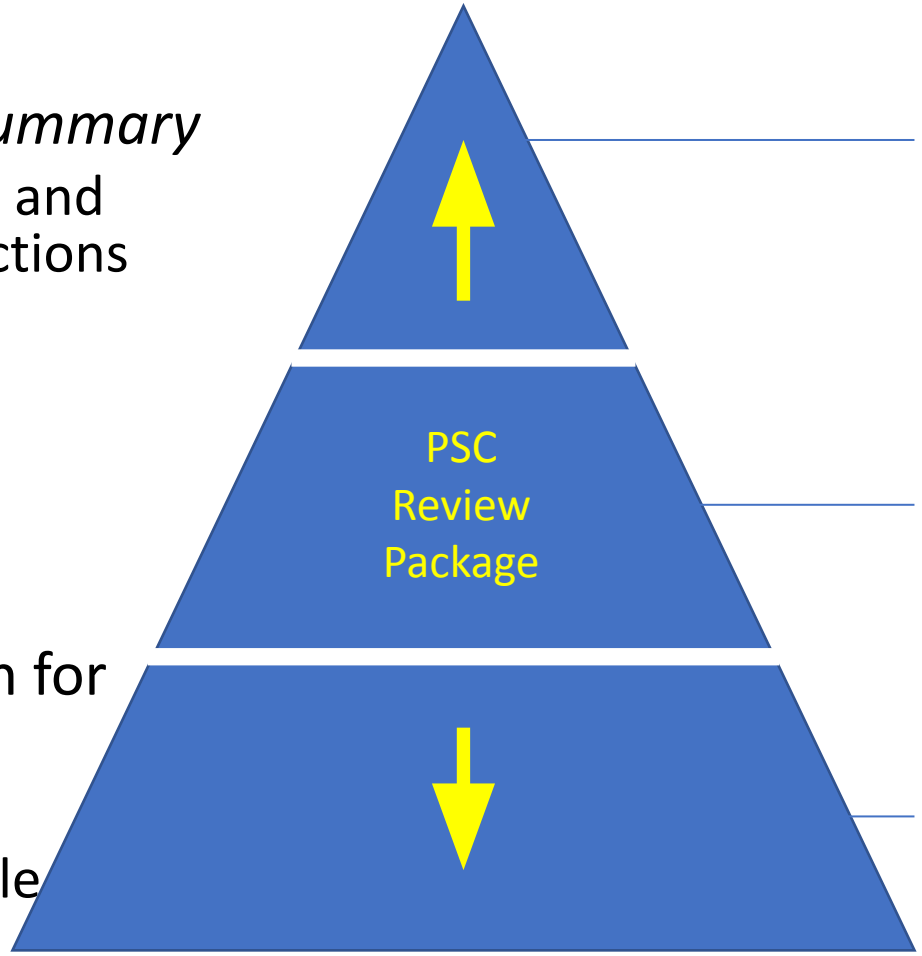
All sections of the synthesis report are in rough draft form today.

- Section 1. Charge of the review, overview of findings.
- Section 2. Portfolios of existing CBP networks addressing questions
- Section 3. Details of findings, references, appendices

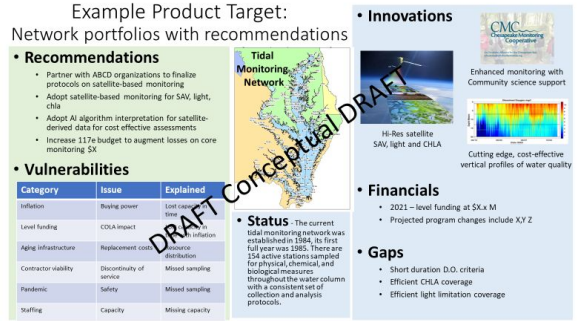


Tiered Communications

- **Section 1**: *Prospectus – Overall Summary*
  - Recommendations on strategies and resources needed for data collections
- **Section 2**: *Summary for each CBP network: Gaps and Opportunities*
- **Section 3**: Supporting information for each CBP network
  - More details for each network
  - Opportunities to address multiple outcomes



Section 1
Overall
Summary



Section 3
Supporting
Information

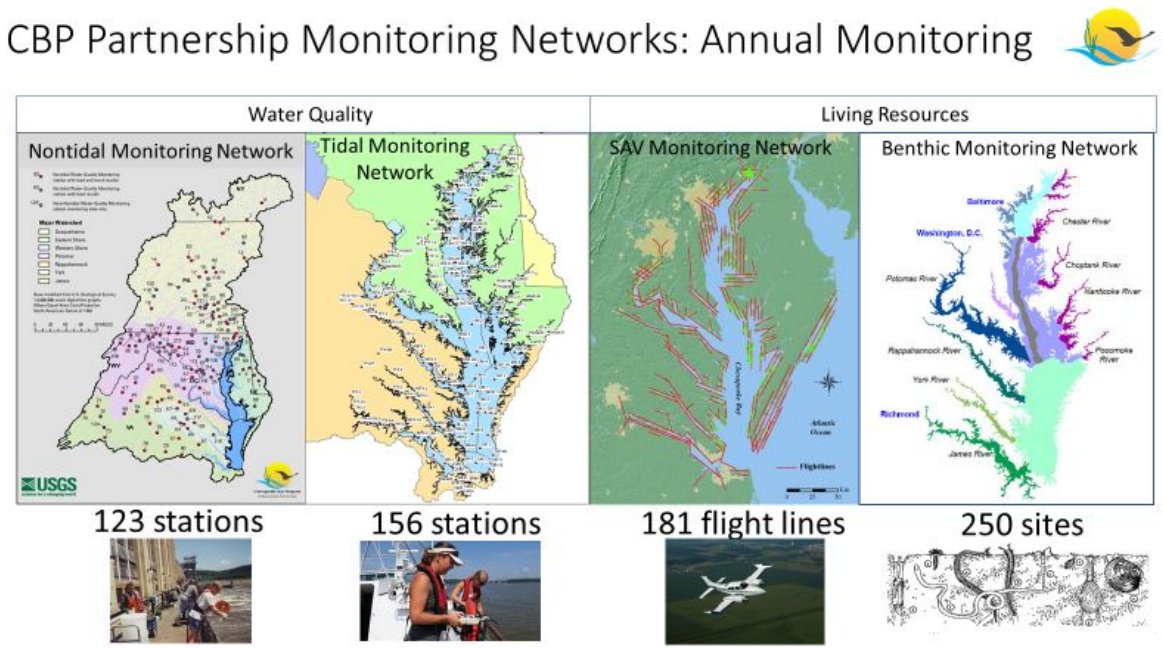
The last monitoring review was 10 years ago! Take part in this opportunity to have the PSC hear your monitoring needs!

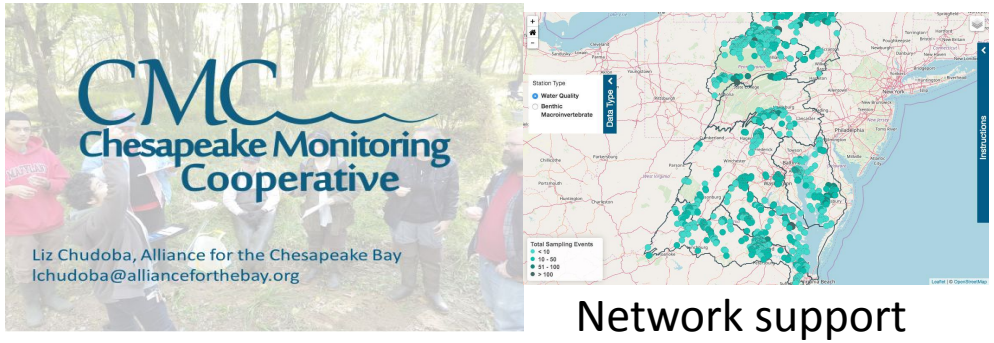
Are their explicit, well-defined monitoring needs with sampling designs and cost estimates available not yet captured in the review ?

Thank you! ☺️

REMINDER: Monitoring Presentation to the Principal Staff Committee

- Lee McDonnell provided monitoring presentation on March 2
- Help them better understand CBP budget and funding for monitoring
- CBP networks:
  - Tidal water quality
  - Nontidal nutrients and sediment
  - SAV
  - Tidal Benthic organisms
  - Citizen Monitoring
- Current Funding:
  - CBP $5M and partners >$7M





Network support