PSC Review: Findings on 5 networks from May-Aug 2021

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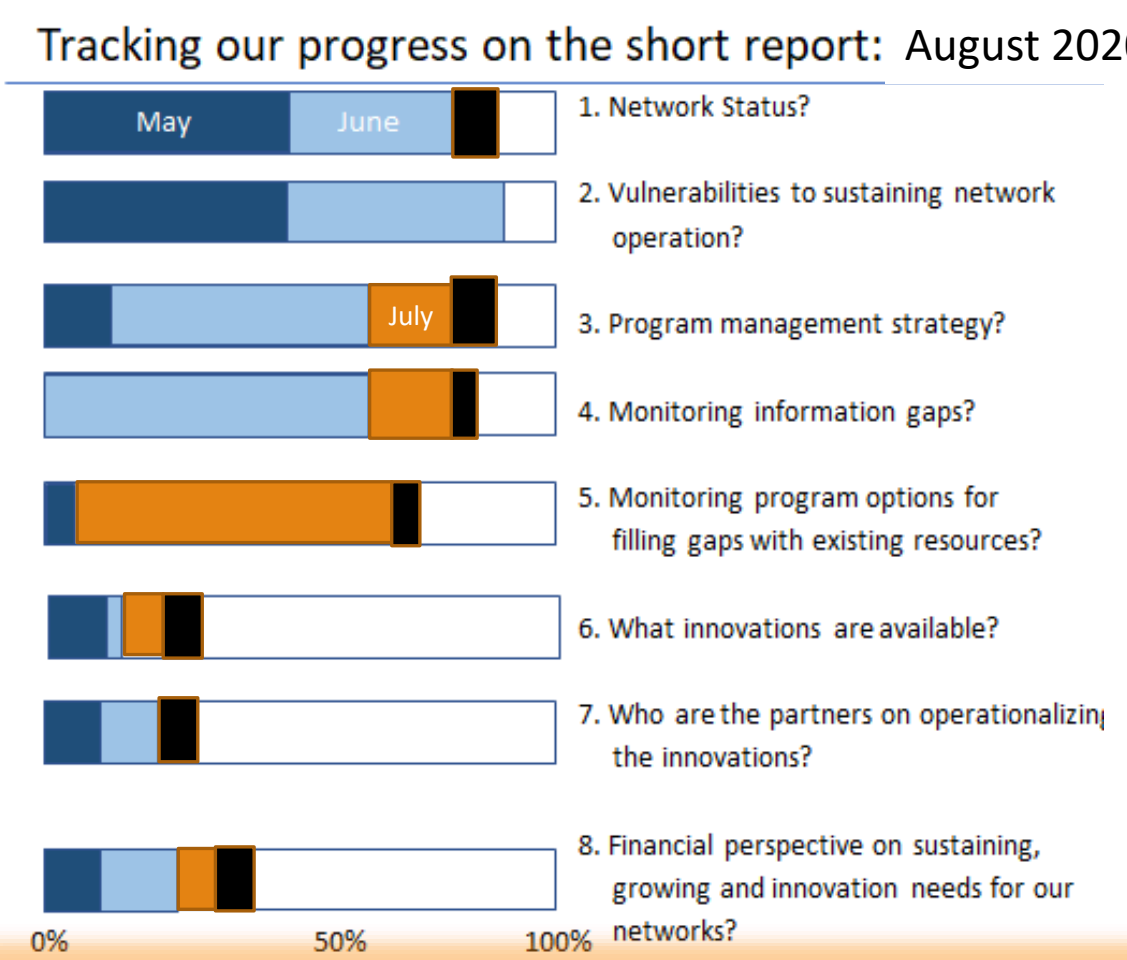
STAR MEETING AUGUST 26, 20201

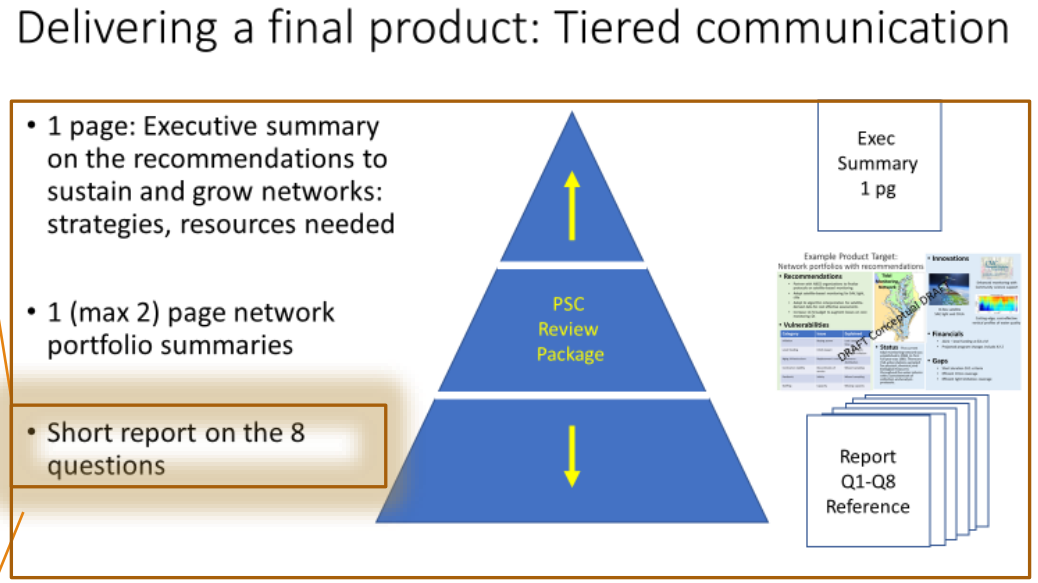
General path of recommendations development for PSC: 9 months

Teams/Groups	April 2021	May	June	July	Aug	Sept	Oct	Nov	Dec	2022
										Winter
NTN	**SPRING** **Status and vulnerabilities of existing network**			*In Progress* **SUMMER** **Innovation Assessment, Financials of Sustaining networks**			**FALL** **Evaluate limitations, Financials for adopting innovations, recommendations**			Consolidate recommendations, financials for PSC Presentation
CAP WG with DIWG										
Hypoxia Collaborative										
Cit Sci										
Fish Forage/Black Duck/117e grants										
Fish Habitat										
SAV										
4-D Interpolator				*In Progress too*						
STAC Workshop	✓	✓	✓	Planning and organizing phase			Early Themed Workshop meetings			Continue
STAR/WQGIT updates				Presentation prep		Input from all GITs	Presentation prep STAC Workshop panels, meeting support as targeted		Early PSC material PPT and review	
PSC Presentation										★

STAC input — STAR presents at STAC

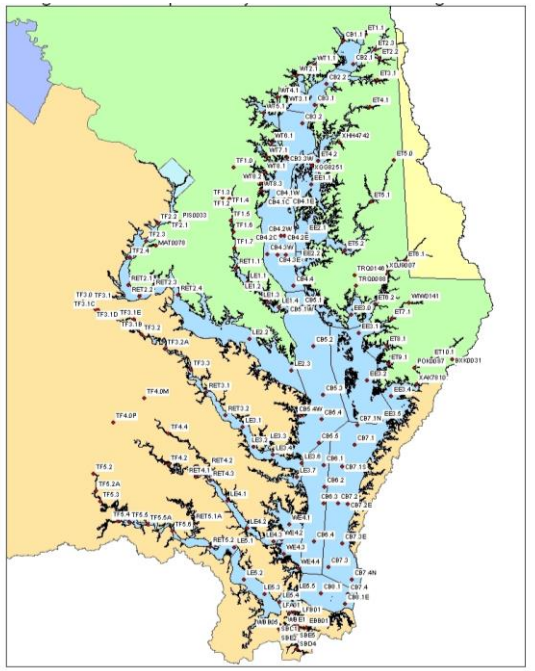
Report Progress:





Q9. Addressing needs beyond the water quality networks

Status: Tidal Water Quality Monitoring Network



Tidal Water Quality Monitoring (1)
Time needed (i.e., about a year) before additional investment in high frequency monitoring sampling design

- **Documentation development** was started for the new interpolator (4D Team)
- **Initiated development on a case study** with new methods for interpolation (4D Team)
- **2 new mainstem bay deployments of vertical monitoring arrays** located on eastern and western sides of the deep channel (Hypoxia Collaborative)
- **High frequency DO monitoring design issue needs more work** before forming a project/workshop (Multiple teams)
  - Monitoring the position of the hypoxia boundaries is key to standards attainment assessments.
  - Existing monitoring and new deployments will support model evaluations of fish habitat suitability.
    - Additional detail is needed to support standards and attainment assessments.
  - General feedback from multiple groups – we need a bit more time before delving into a sampling design plan to account for detailed .
    - All groups understand the value and importance of the sampling design needs.
    - No group (e.g., Hypoxia Collaborative, CAP WG, Fish Habitat Action Team, 4D Interpolator Team) was prepared to take the lead on a GIT-funded proposal this year to focus on improved hypoxia monitoring

Tidal Water Quality Monitoring (2)
Monitoring workshop planning progresses

STAC Workshop on Advanced Monitoring

- **Subcommittee held its first meeting** in August
  - Meg Cole helping us plan next subcommittee meeting
- **SAV Workshop element is taking shape** for early December
  - Review the report findings from the 2019-2020 pilot study on
    - The testing of the process of acquiring data when and where it is needed, (i.e., Digital Globe satellite imagery)
    - Comparison of aerial image assessment vs. satellite based assessment with existing protocols.
  - Presentations on advances in SAV assessment with other satellite resources, image filter improvements, AI algorithms for interpreting imagery
  - Program recommendations on next steps in time for PSC review.

Tidal Water Quality Monitoring (3)
Fill in details on financial assessments now

Financials

- Peter needs some one-on-one time with the agencies now.
  - We have had various conversations during grant progress reviews as well as in various meetings. Ready to tighten up status and outlook details now.

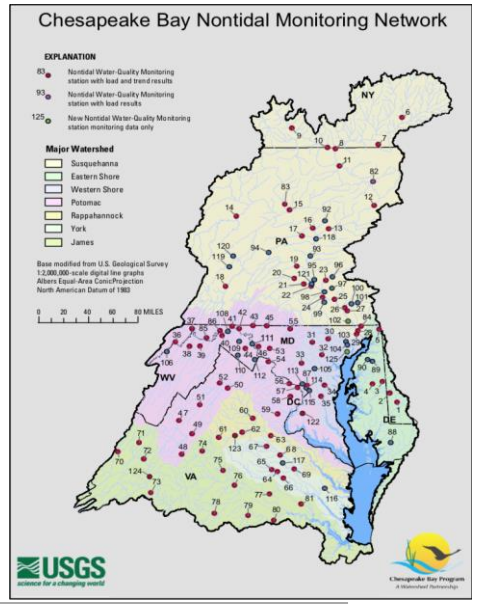
Table 4. Fundamental investment targets needed to maintain existing operations and address required growth to meet gaps in the existing monitoring programs to address essential remaining management decision support.

Network	Sustain existing network capacity	Grow existing network operations	Adopt new approach to fill assessment gap
Tidal	Annual COLA	Revised shallow water monitoring strategy	Hypoxia network investment
	Field and Lab audits		Satellite assessment - Chlorophyll
	Infrastructure (MD)?		
Nontidal	Annual COLA	Storm flow at 2ndary stations in Virginia	Not applicable
	Lost station funding (Deer Creek, MD)		
SAV	Supported	None	Satellite assessment – SAV & light limitation
			Algorithm application
Benthic Invertebrates	Supported	None	Not applicable
Citizen Science	Supported	Supported	Not applicable

Blue identified from the CBP Science Needs Database, Green identified from STAC Workshop activities, Yellow have been discussed in workgroup meetings.

Evolving report table and info

Status: NonTidal Monitoring Network



Nontidal Water Quality Monitoring

Immediate need for backfill on lost partner support at 1 station, optimization work getting established.

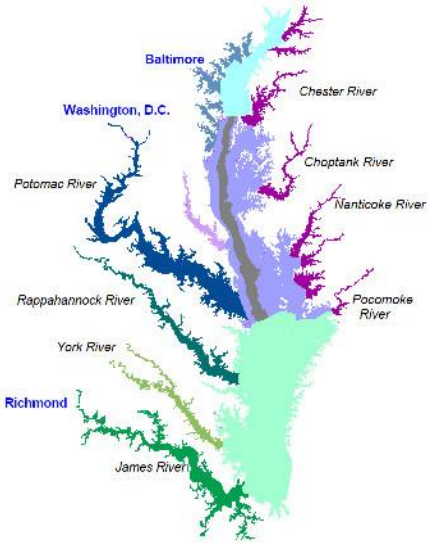
Nearterm:

- **Unplanned losses** on a near annual frequency remain a key vulnerability challenging the good plans and support to date maintaining the network.
  - **2021: Deer Creek monitoring station is losing support.**
- **One partner is operating with a bootstrapped budget structure** – we need to visit this with EPA leadership.
- **Optimization tools** were reviewed by Matt Cashman (USGS). Qian Zhang (STAR Team, UMCES) is learning the tools to assist with network optimization work.
  - This work will feed into Financial need assessment for maintaining the network.

Long term:

- Considerations are being evaluated on where and when continuous monitoring stations may be added into the network.

Status: Tidal Benthic Monitoring Network



Tidal benthic invertebrate community monitoring

Summer season monitoring focus continues.
No additional support requested at this time.

Summer CAP WG meeting Review

- Historically we had spring and summer assessments
- Spring sampling was defunded 2009/2010.

- States are well positioned in grants for continuing nearterm (i.e., 5-year) summer IBI support.

- No support given for the return of spring programming at this time.

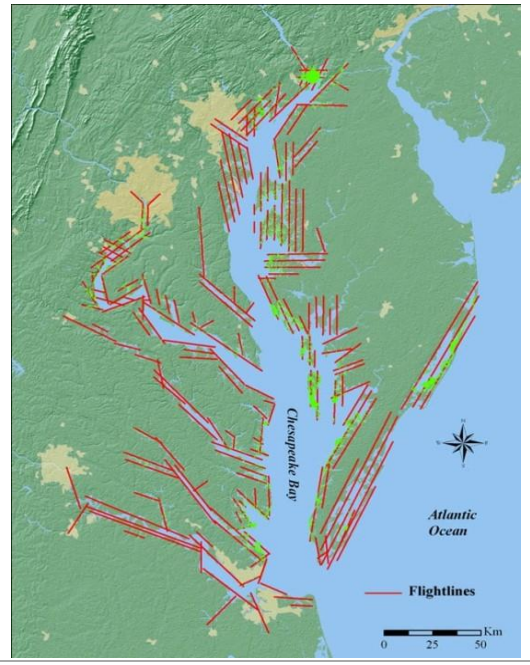
Black duck food layer.

- Black duck focuses on winter food resources/habitat. No support for the spring assessment (A Berlin, Pers. Comm.)

Fish Habitat

- Presented the idea in discussions, no specific request for additional spring benthic monitoring data.

Status: SAV Monitoring



SAV Annual Survey

Stable. Support needs will be evaluated to match any new recommendations from the upcoming workshop

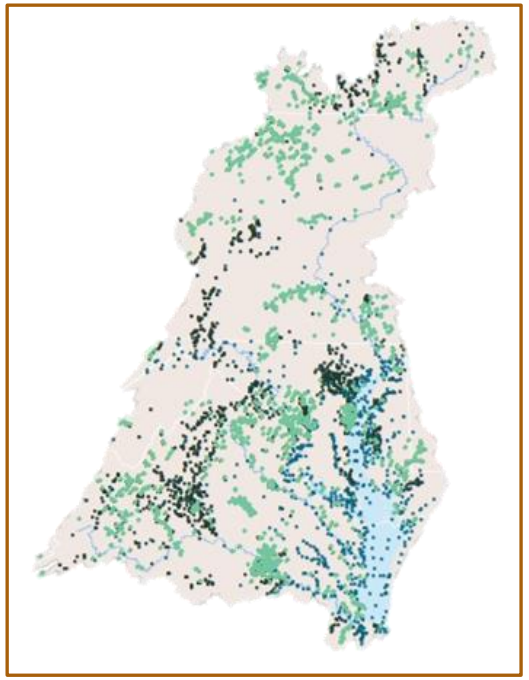
SAV Annual Survey

- Exploring Satellite-based Assessment STAC Workshop report released in 2021
- Pilot work on satellite based SAV assessment following recommendations from the workshop using commercial satellite imagery was funded by EPA.
  - Report in review.
- Researchers continued working on additional recommendations for
  - Other satellite resources
  - AI algorithm development for image interpretation across diverse habitat conditions

STAC Advanced Monitoring Workshop 2021-22 (early December 2021 target)

- Full report out on findings of the 2020 pilot study
- Progress in satellite-based SAV assessment beyond the funded study
- Provide recommendations on program adaptation and finances as a function of workshop findings

Status: Community Science



Blue: Chesapeake Bay Program

Black: Volunteer monitors

Green: CMC integrated volunteer monitoring data locations

Community Science – new award in 2021.
No new resources requested at this time.

CMC is focusing on filling gaps in

- **Tidal water quality monitoring** supporting water quality standards attainment assessments, and
- **Nontidal benthic macroinvertebrate sampling** supporting Stream Health Outcome
- **Other monitoring support needs will be evaluated** during the award period

CMC is already capturing additional data that may serve other workgroup needs, e.g.,

- Salt Watch
- Bacteria
- And more…

Community Science – new award in 2021. *Award is helpful in leveraging other resources.*

CMC is coordinating with EPA Wheeling Laboratory on CBT-sponsored work aligned with Stream Health monitoring needs through community science support. Deliverables include:

- Sample identification for CBT sponsored sampling the next 6 years (approximately 100 samples)
- Documenting a protocol for sample collection
- Documenting a protocol for picking samples for identification purposes in the lab

CMC is coordinating with NFWF on a habitat assessment protocol for stream health monitoring sites.

Q9: Addressing needs beyond WQ Networks (continued)

* **Coincident monitoring programming needs have been identified including:**
    - **Carbonate chemistry (Ocean/Estuarine Acidification) monitoring**
        - 5/17 notes: Climate science highlights tracking targets for the bay
        - 7/2 plans for Ocean Acidification monitoring with Julie, MD-DNR, others.
        - MD and VA have OA strategies now.
    - **Temperature**
        - hot-spot temperature monitoring (Air temperature) of heat islands
        - tracking management impact of local efforts (e.g., urban tree plantings)
            - 5/17 notes: Climate science highlights and 6/21 STAC Temp Workshop – 1st session. Outcome – Impact tracking is a community priority compared to temperature data itself or source management tracking.
        - Groundwater temperature? (STAC Temperature Workshop) – **Emails shared from NTN WG (8/2021)**
    - **Indicator support**
        - Field monitoring data needs for indicator support are
            - 1) wetlands – Brian Lamb PhD work – mid Atlantic.
            - 2) brook trout – NFWF support, **August 2021 – GIT funding proposal on monitoring strategy development support with Habitat GIT, BT WG, CRWG and STAR in discussion.**
            - 3) black duck
            - 4) stream health.
                - 6/7/21: S&T WG notes
                - 2020-21 CMC received funding for program support
                - USGS modeling efforts of BIBI to fill monitoring information gaps

Q9: Addressing needs beyond WQ Networks (continued)

- **PCBs**
  - 6/9/21 Toxics:
    - See S. Phillips STAR presentation 8/2021.
- **Microplastics**
  - 6/24 Microplastics Monitoring and Science Strategy – monitoring details TBD, extensive program development needs require focused objectives, unified protocols/analysis and reporting
- **Social Science**
  - 6/24 meeting discussions – survey support?
- **Living resources**
  - Zooplankton, Phytoplankton (SSRF database)
- **Baywide shoreline characterization**
  - Shoreline hardening/ adjacent and aquatic habitat characterization –
    - Discussion with Fish Habitat Action Team - A variety of communities are taking aim at this, USGS, etc.

Q9: Addressing needs beyond WQ Networks (continued)

Non-network operation-related gaps in the monitoring programs

- **Data Management**
  - Living Resource Analyst position
- **Research**
  - Describe patterns in bay and watershed health
  - Improve understanding in SAV, water quality, living resources response to climate change and management actions
  - Understand SAV, fish, wildlife habitat requirements
  - Forecasting future habitat availability
  - Assess impact of expanding aquaculture, climate change effects in the bay on SAV goals
- **Analysis**
  - Update tidal and nontidal water quality trends, criteria assessments
  - Related changes in habitat to BMP effectiveness
- **Reporting and Communications**

Thank you

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