Responding to the PSC Request to Improve the CBP Monitoring Networks

Peter Tango, Scott Phillips, Lee McDonnell, Breck Sullivan

Management Board Meeting
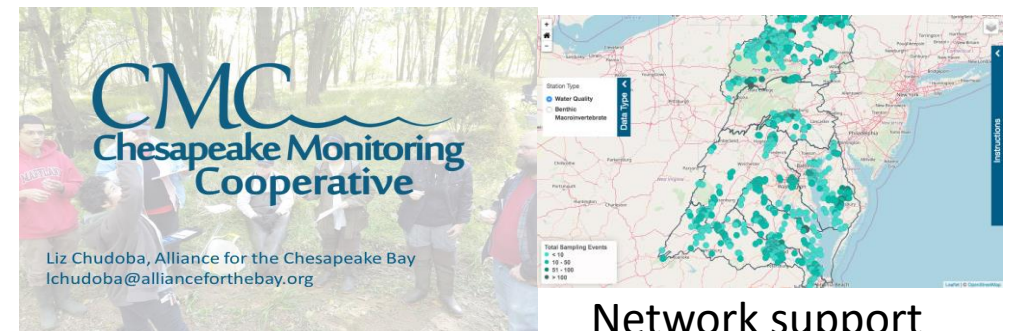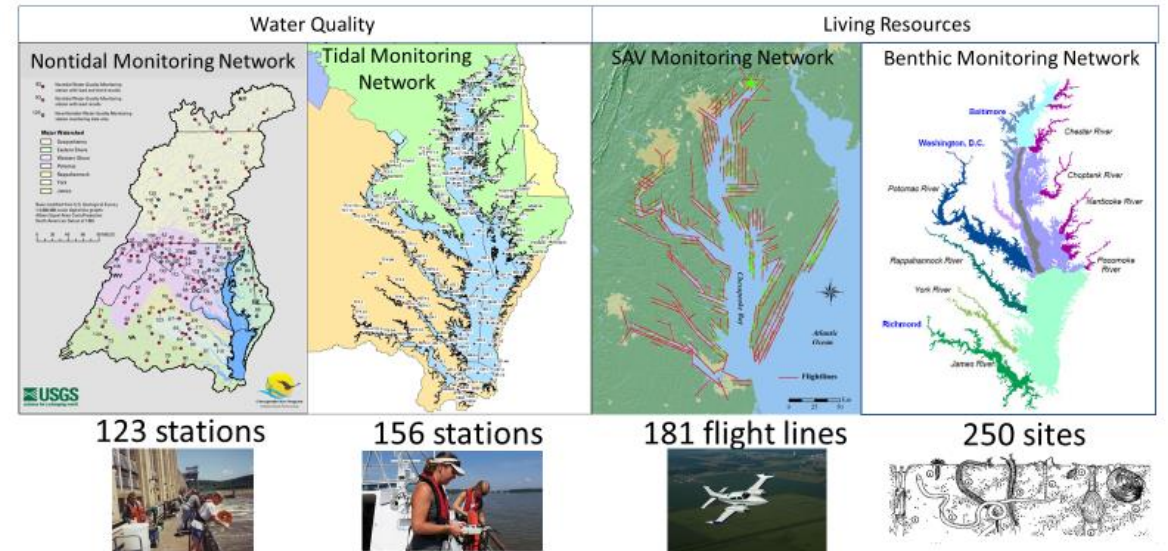
April 8, 2021

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


CBP Partnership Monitoring Networks: Annual Monitoring

Water Quality		Living Resources	
Nontidal Monitoring Network	Tidal Monitoring Network	SAV Monitoring Network	Benthic Monitoring Network
123 stations	156 stations	181 flight lines	250 sites

CMC
Chesapeake Monitoring Cooperative

Liz Chudoba, Alliance for the Chesapeake Bay
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Network support

Chesapeake Bay Monitoring Program Capacity Status?

Traditional Monitoring Program Capacity: Good/**Fair**/Poor


Count of Tidal Water-quality Samples
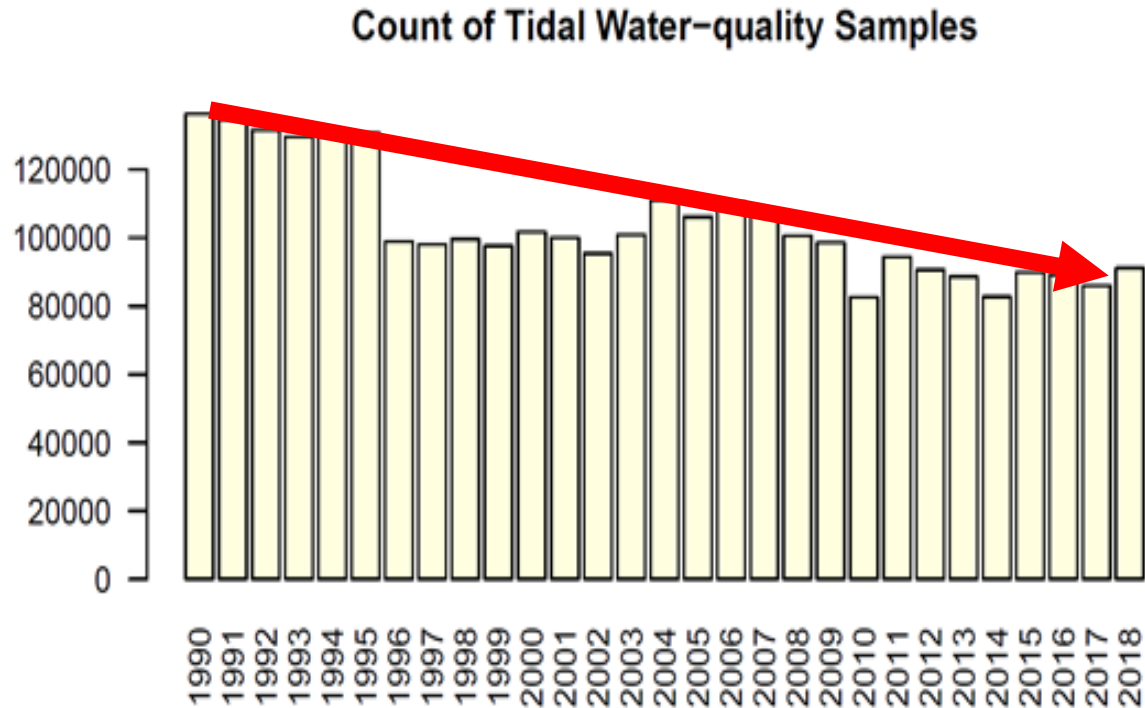
- Traditional capacity is highly stressed and declining

  ~20 years: Tidal data monitoring remains "marginal" to address management needs

  Nontidal data collection "adequate" for the watershed load estimates, station losses ahead

  Flat funding ignores inflation/COLAs translating to station and data losses.

  Impending SAV program cost increases may challenge program after 2021

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 sustainability, and
  - (3) what is already available to address monitoring and assessment capacity shortfalls.

- STAR will Coordinate Response
  - Deliver network assessment and recommendations by January 2022
  - Work plan being developed

CBP Organizational Structure and Leadership 09-20-10
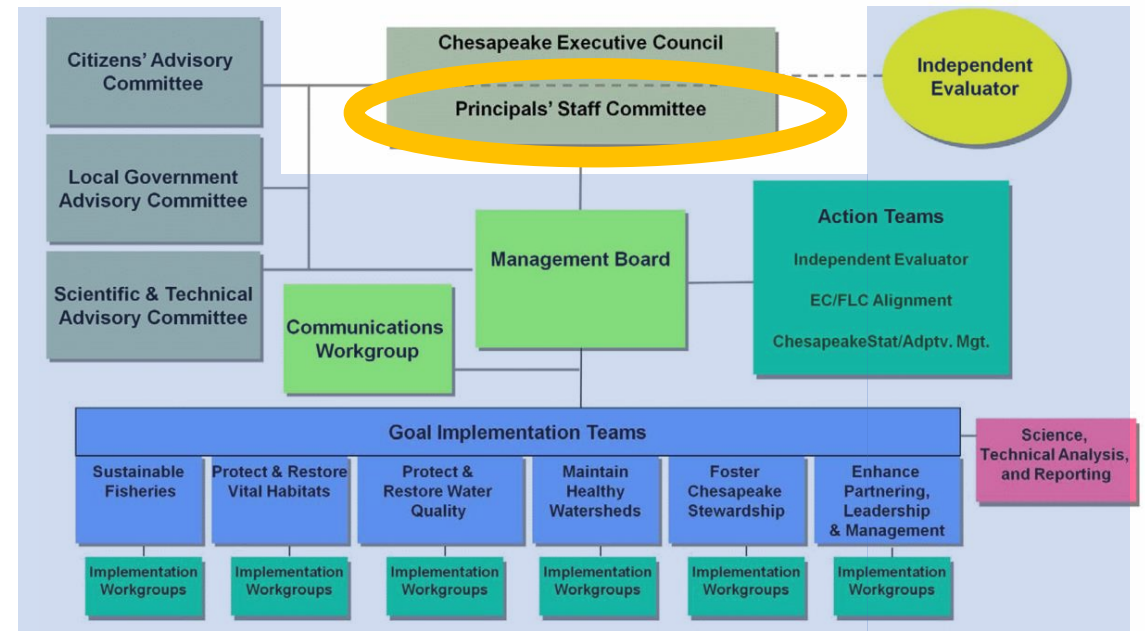
Opportunities and Benefits of PSC request

Through the 2014 Chesapeake Bay Watershed Agreement, *the Chesapeake Bay Program has committed to...*
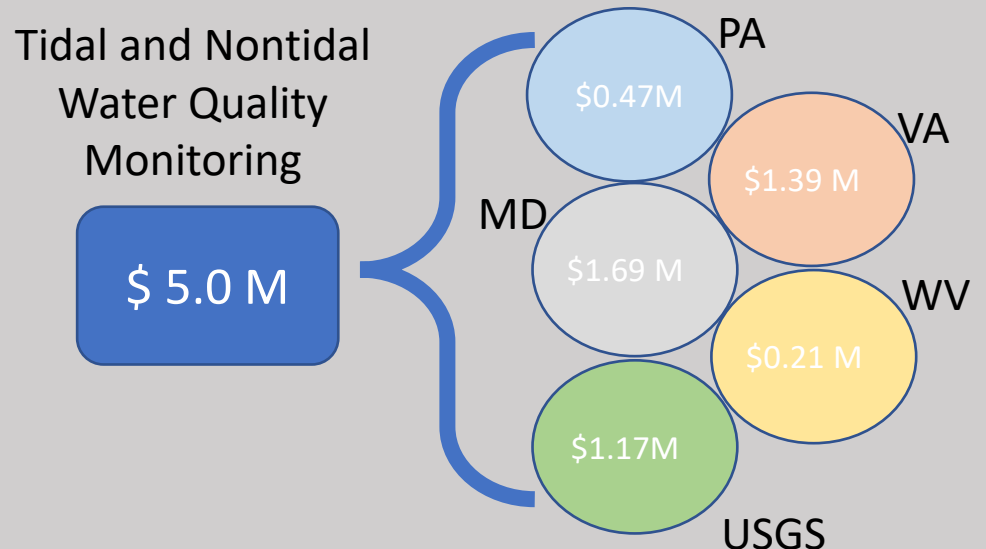
Goal: *Water Quality*

Outcome: *Continually improve the capacity to monitor and assess the effects of management actions* being undertaken to implement the Bay TMDL and improve water quality. Use the monitoring results to report annually to the public on progress made in attaining established Bay water-quality standards and trends in reducing nutrients and sediment in the watershed.

- Over a decade since the last CBP monitoring evaluation

- Address CBP Outcome: Standards Attainment and Monitoring Outcome

- Address selected monitoring needs of other CBP outcomes

- Consider new technologies and innovation

- Identify priority improvements and gaps

Integrated partner contributions: It takes a village.

Tidal and Nontidal Water Quality Monitoring
$ 5.0 M

PA — $0.47M

VA — $1.39 M

MD — $1.69 M

WV — $0.21 M

USGS — $1.17M

SAV
$ 400 K

Citizen Science
$ 450 K

CBPO Support for monitoring
$ 5.85 M

>$ 12M Chesapeake Monitoring Program Partnership Investment

State 117e Matching Funds
$ 3.76 M

Estimated Additional Partner Network Support
$ 2.0 M

USGS Streamflow and Water Quality Monitoring
$ 750K

SAV Partners (MDE, MD DNR, VA CZW, VA)
$ 412 K

Citizen Science
priceless

Partner support for monitoring
$ 7.0 M

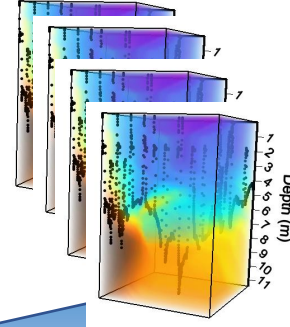# We need to leverage successful research innovations. Adopt, integrate and adapt to address capacity shortfalls.
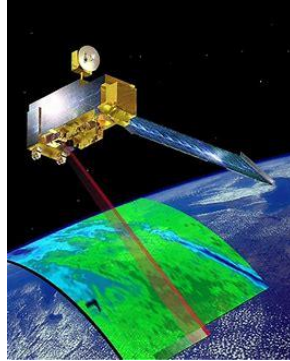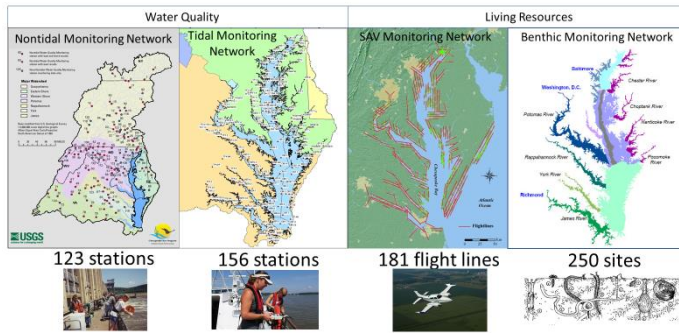
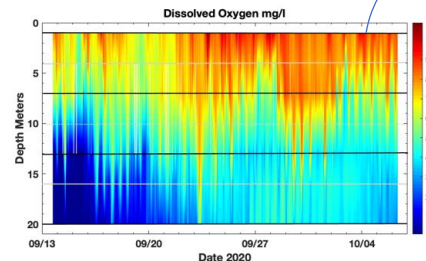**2. Adapt to baywide satellite-based data (SAV, Kd, CHLA)**

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

Traditional networks

CBP Partnership Monitoring Networks: Annual Monitoring

Water Quality		Living Resources	
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Expanded capacity

Monitoring and assessment capacity building beyond traditional monitoring

Expanded capacity

Chesapeake Monitoring Cooperative

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1. Apply Citizen-based observations (MOU 2018)

Dissolved Oxygen mg/l

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

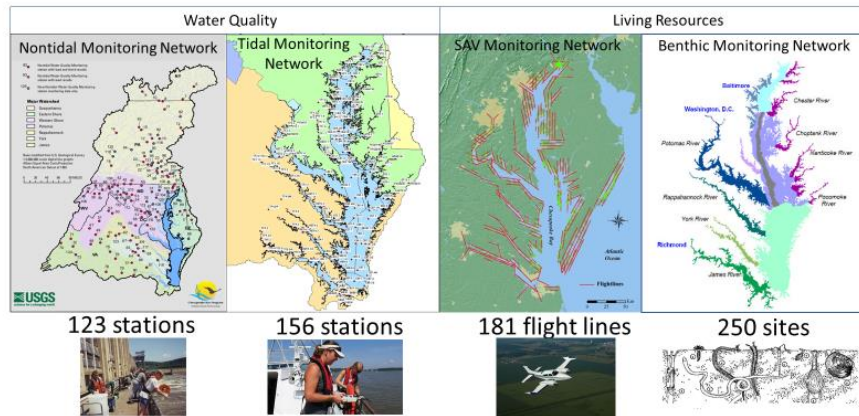**Full Water Quality Standards Attainment Assessment for Chesapeake Bay**

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CrossGIT Benefits

WQ Standards Attainment will be one priority

Traditional networks

CBP Partnership Monitoring Networks: Annual Monitoring

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- ==We need to address capacity==

- ==We need to adapt our program==

- **Water quality standards** – ==**0 of 92**== segments have ever been fully assessed with our traditional monitoring and evaluation tools since criteria were published in USEPA (2003)

- Fish Habitat resolution improvements are needed over the National Assessment applied to Chesapeake Bay
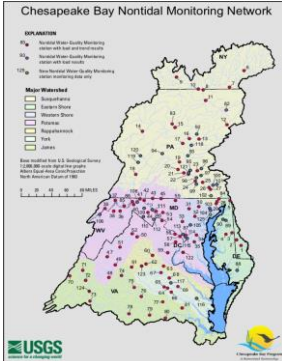
- Downsizing of program elements has occurred
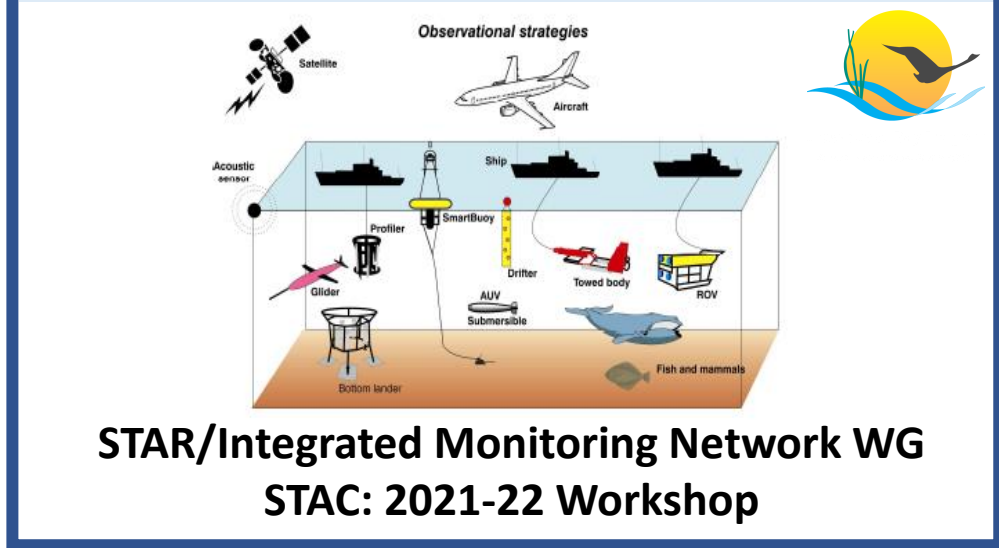
- Vulnerabilities within operation exist

Watershed loads
Nontidal Network
Lead – NTN WG
(Coordinator: Peter Tango)

Living Resources - Tidal
SAV Network Lead – SAV WG
(Chair – Brooke Landry)
Support by Citizen
Science Network
Benthic network Lead – CAP WG
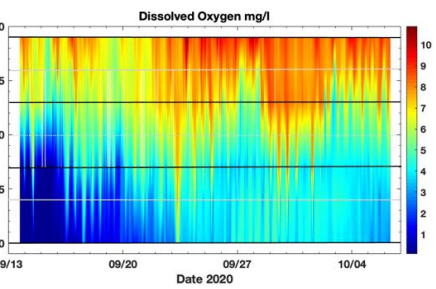(Chair – Peter Tango)

Network & Workgroup leadership developing recommendations to the PSC

STAR/Integrated Monitoring Network WG
STAC: 2021-22 Workshop

Fish Habitat
Tidal Network
Lead – Hypoxia Collaborative
(Coordinators: Bruce Vogt,
Peter Tango)

Water Quality Standards
Tidal Network
Lead – CAP WG
(Chair – Peter Tango)
Support: Citizen
Science Network

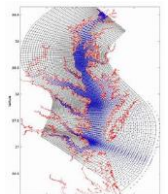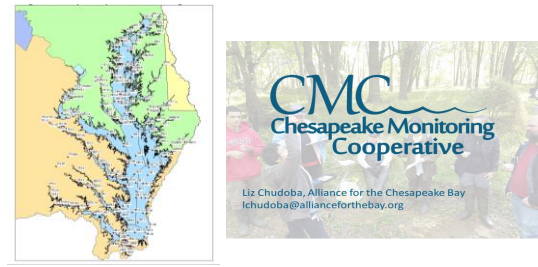**Tidal Water Quality Standards/Habitat Analysis**
4-D Water Quality Estimator Team
4D BORG
(Coordinators – Peter Tango, Rebecca Murphy)

Supporting group consultations

Data Integrity WG – All Network update considerations

Climate Resiliency WG – All networks

Fish Habitat Action Team – Tidal network, Hypoxia Collaborative, 4D BORG links

Forage Fish Team – Benthic Network

Black Duck Team – Benthic Network
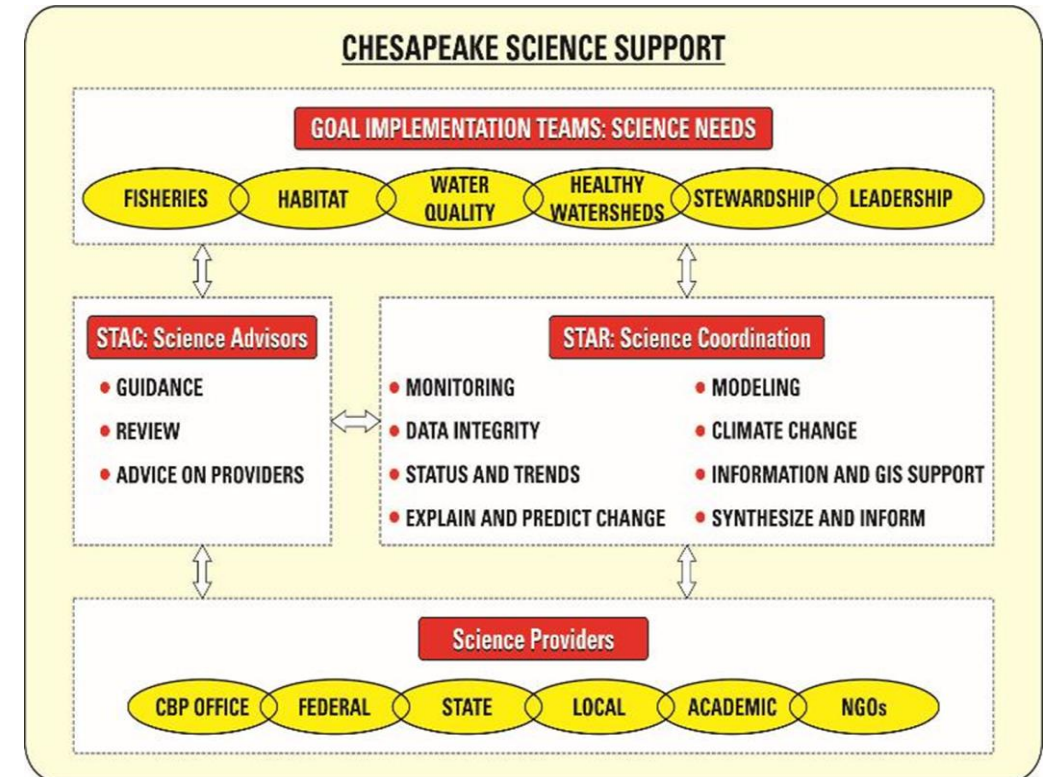
Healthy Habitats – outputs of 4-D analysis

Modeling WG – 4D water quality estimator
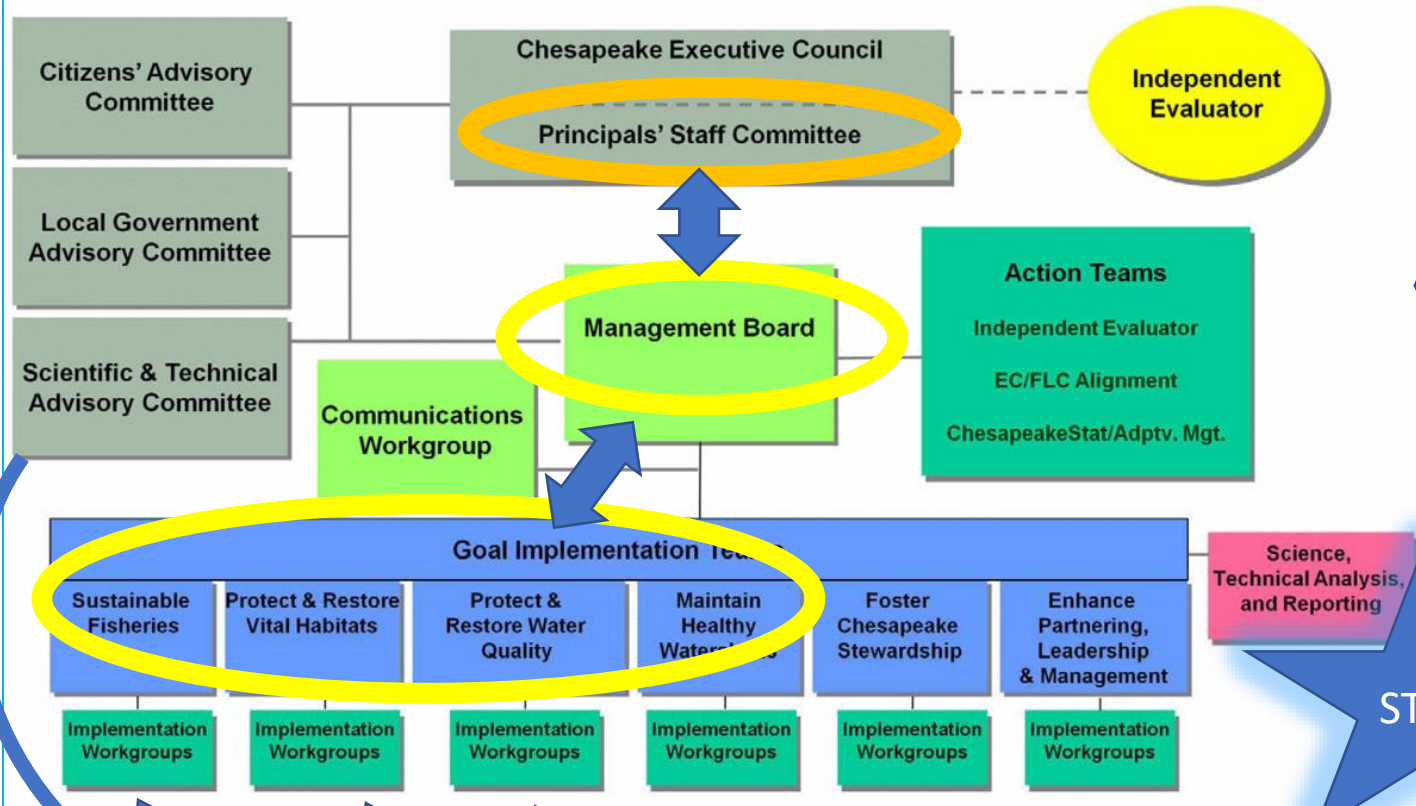
Water Quality GIT

STAR

STAC

Cross-goal benefits connections

Data Integrity WG
Inform sampling designs, infrastructure design, protocol design

Climate Resiliency WG Indicator Support

Fish Habitat Action Team High resolution habitat data, habitat analysis framework

Forage Fish Team – food web dynamics, energetics

Black Duck Team – Food web dynamics, energetics

Healthy Habitats Measures of habitat condition for State habitat goals, factors influencing status & trends

Modeling WG – evaluate existing model performance to guide future updates

Water Quality GIT – WIP action targeting in space, ecosystem response

STAR

STAC

CHESAPEAKE SCIENCE SUPPORT

GOAL IMPLEMENTATION TEAMS: SCIENCE NEEDS
FISHERIES — HABITAT — WATER QUALITY — HEALTHY WATERSHEDS — STEWARDSHIP — LEADERSHIP

STAC: Science Advisors
- GUIDANCE
- REVIEW
- ADVICE ON PROVIDERS

STAR: Science Coordination
- MONITORING
- DATA INTEGRITY
- STATUS AND TRENDS
- EXPLAIN AND PREDICT CHANGE
- MODELING
- CLIMATE CHANGE
- INFORMATION AND GIS SUPPORT
- SYNTHESIZE AND INFORM

Science Providers
CBP OFFICE — FEDERAL — STATE — LOCAL — ACADEMIC — NGOs

Addressing other CBP monitoring networks: STAR working with Goal Teams and MB

Integrated Monitoring Networks WG

- **Nontidal Network**
- **4D Interpolator Team (BORG)**
- **Hypoxia Collaborative**
- **Criteria Assessment Protocol WG**
- **Citizen Science Program**
- **Data Integrity WG**

- STAC Workshop (approved 3/2021) – Advanced Monitoring
- SAV WG, FHT, Forage Team, Modeling WG, more
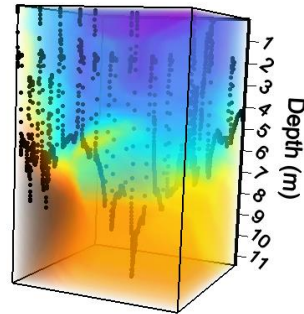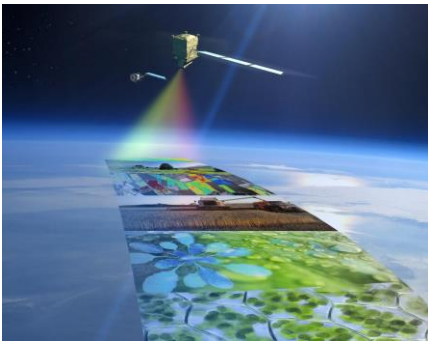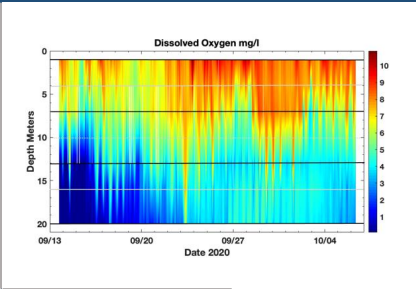
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Benefits and Co-benefits

Next Steps

Develop a work plan for PSC to endorse at their May 2021 meeting
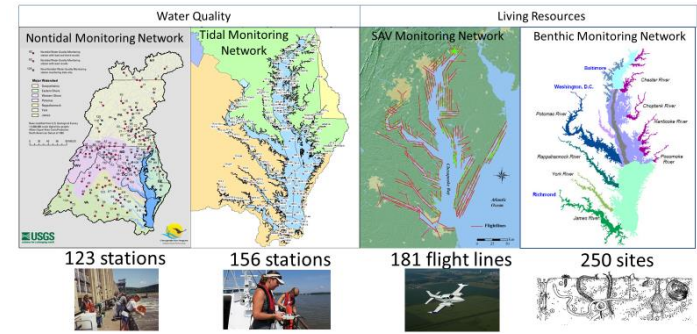
Coordinate with teams to address the questions for each network (Spring-Summer-Fall 2021)

STAC workshop (fall-winter 2021-22)

Initial recommendations by January 2022.

CBP Partnership Monitoring Networks: Annual Monitoring

Thank you and Discussion

The MB can help in two ways: (1) provide input to STAR as materials are prepared to address the PSC request, and (2) have agency personnel involved with CBP monitoring networks be available to participate.

Chesapeake Bay Program
Science. Restoration. Partnership.