

# Overview of the Strategic Science & Research Framework and Science Needs Database – One-stop-shop for CBP science needs



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WQGIT Monthly Meeting  
10/24/2022

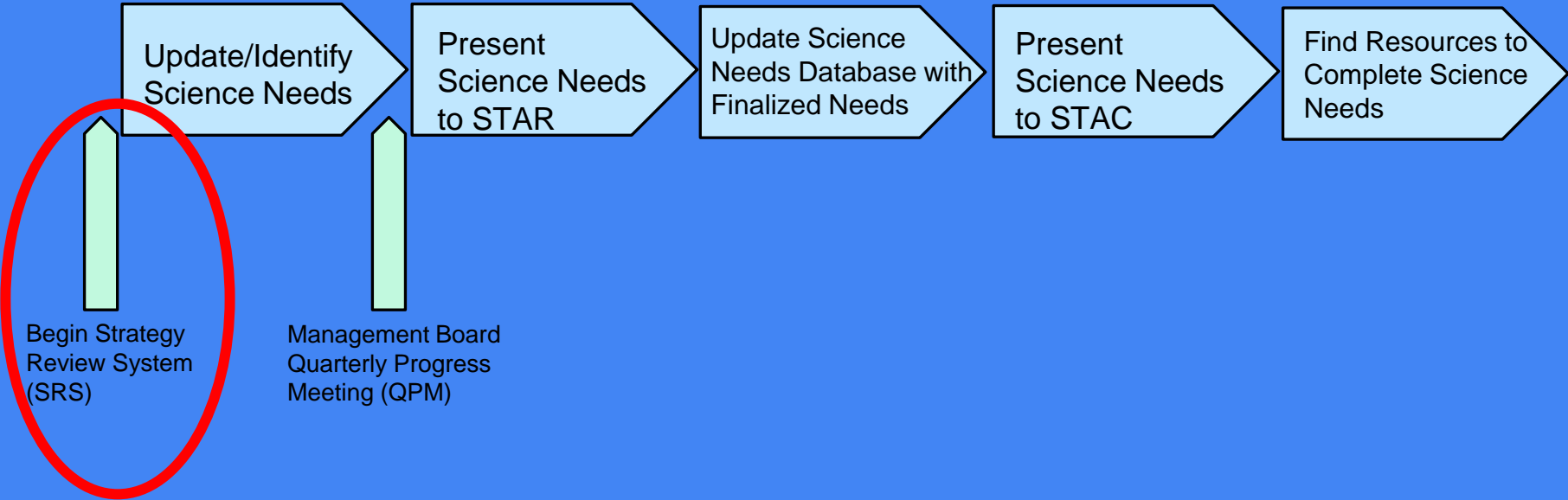
What is the...

Strategic Science  
and  
Research Framework

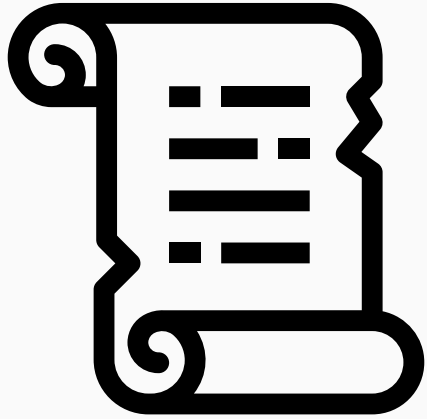
# SSRF provides a strategic approach to:

- 1.) Gather, track, and maintain science needs for each outcome
- 2.) Focus existing resources to address the science needs
- 3.) Leverage the research enterprise
- 4.) More effectively provide science to advance CBP's efforts and decision making

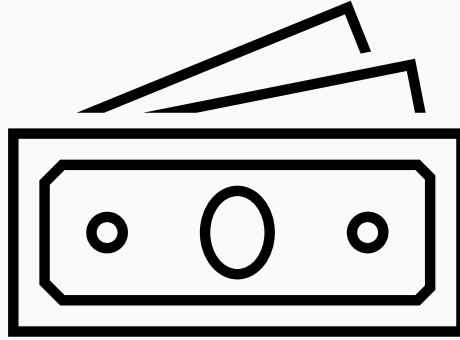
# Strategic Science and Research Framework (SSRF)



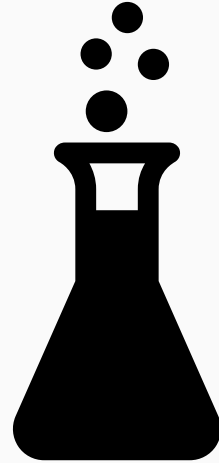
# Policy



# Finance



# Science



## Strategic Science and Research Framework (SSRF)

Update/Identify  
Science Needs

Present  
Science Needs  
to STAR

Update Science  
Needs Database with  
Finalized Needs

Present  
Science Needs  
to STAC

Find Resources  
to Complete  
Science Needs

Begin Strategy  
Review System  
(SRS)

Management Board  
Quarterly Progress  
Meeting (QPM)

Repeat every 2 years



# Chesapeake Bay Program: Science Needs Database



All science needs are available on the database:

<https://star.chesapeakebay.net/>

Used by science providers to **identify projects of interest on which to engage CBP** and help inform decision-making, management, and policy needs

The screenshot shows the web interface of the Chesapeake Bay Program Science Needs Database. At the top, there is a header with the STAR logo, the title 'Chesapeake Bay Program Science Needs Database', and navigation links for 'Home', 'Download', 'About', and 'Log In'. Below the header is a filter section with four input fields: 'Goal Filter', 'Primary Outcome Filter', 'Category Filter', and 'Need Filter', followed by an orange 'Search' button. A 'Clear Filters' button is also present. The main content is a table with four columns: 'Goal', 'Primary Outcome', 'Category', and 'Need'. The table contains four rows of data, with the first row being a header and the subsequent three rows showing specific science needs. Each row has a 'Det...' link in the rightmost column.

Goal	Primary Outcome	Category	Need	
All	All	Analysis, Data Gathering	Ecosystem services identification, quantification and valuation	Det...
Sustainable Fisheries	Fish Habitat	Analysis	Regional Fish Habitat Assessment: 1. compile habitat and environmental, stressor, biological dataset; 2. analyze biological response data for relevance; 3. pilot fish habitat assessment; 4. conduct watershed regional assessment; 5. ID/develop spatial tools useful to partners	Det...
Sustainable Fisheries	Fish Habitat	Monitoring	Maintaining a telemetry network tracking fish movements at mouth of Chesapeake Bay	Det...
Sustainable Fisheries	Fish Habitat	Monitoring	Explore cost-effective methods/approaches to phytoplankton and zooplankton monitoring	Det...



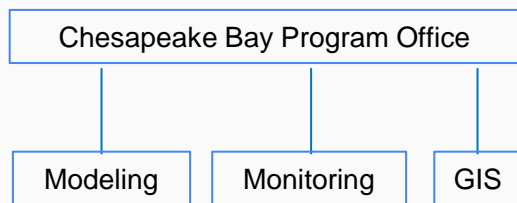
**Chesapeake Bay Program**  
*Science. Restoration. Partnership.*

Chesapeake Bay Program Office



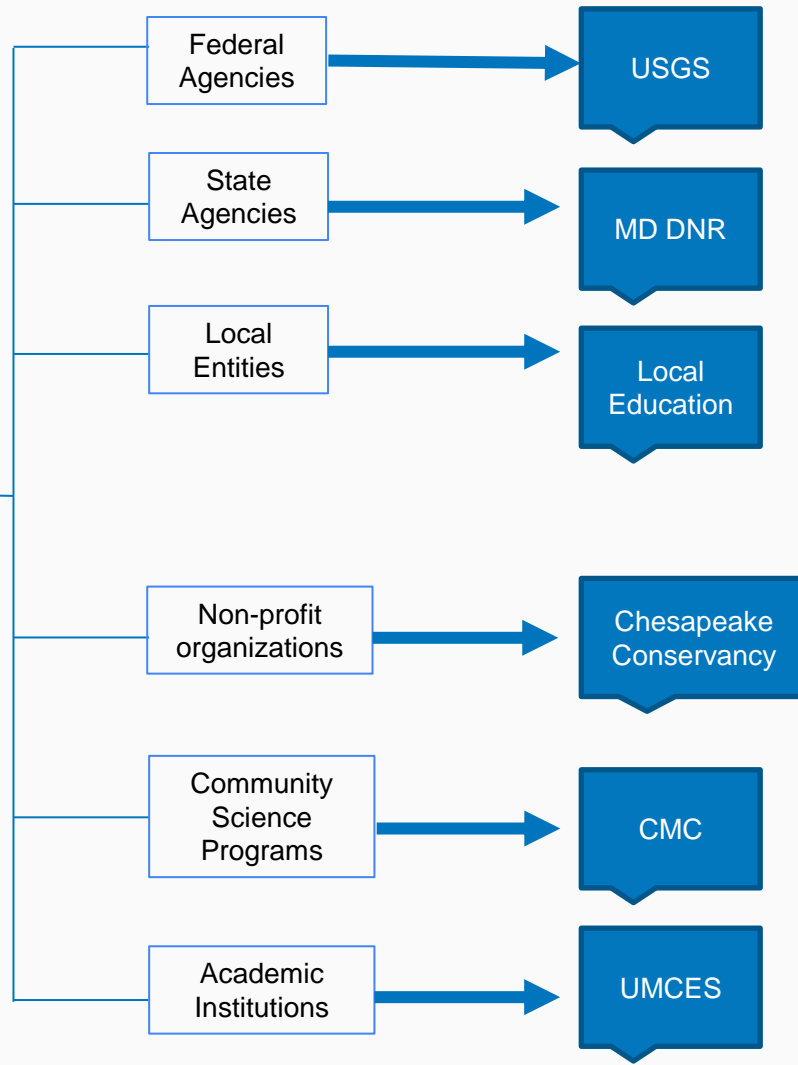
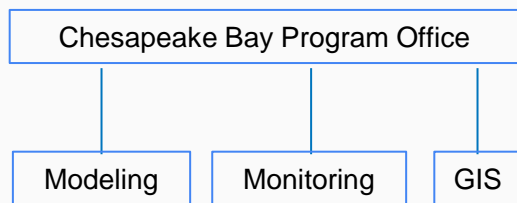


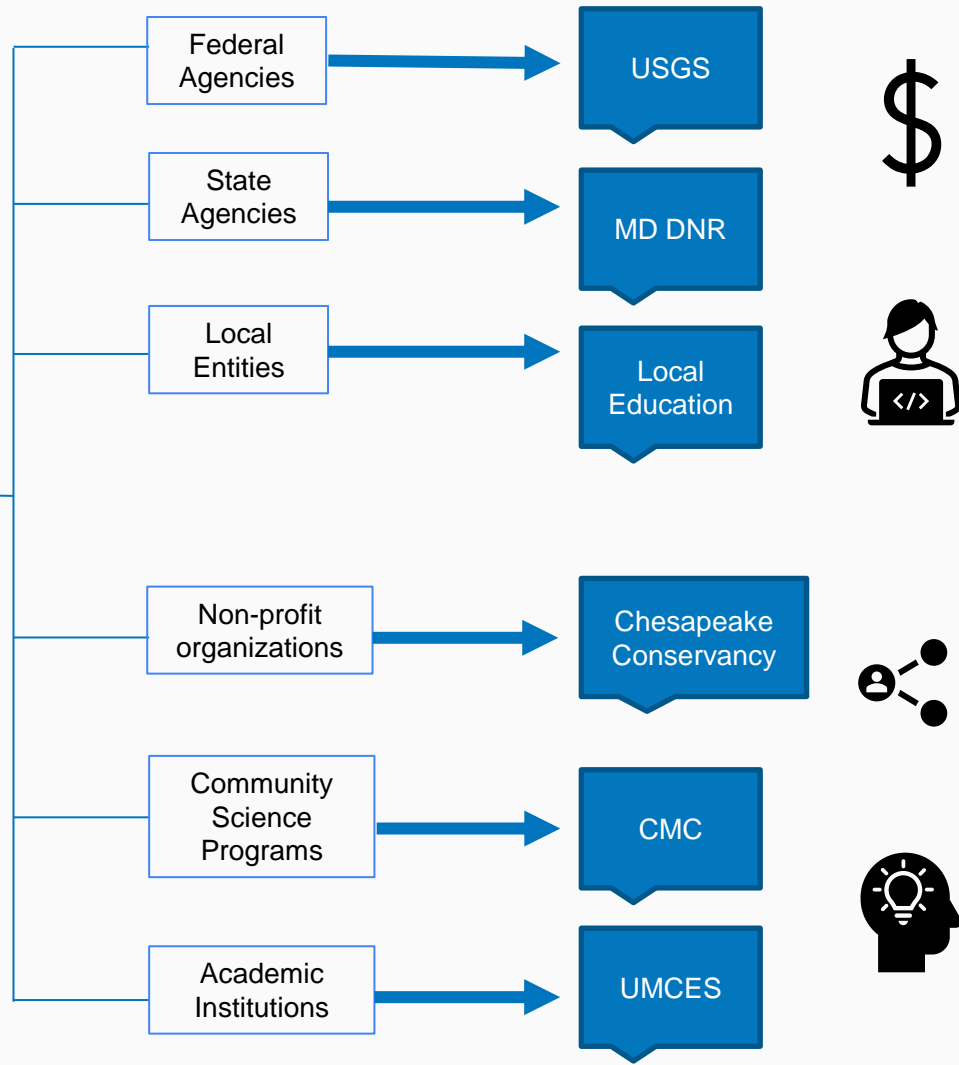
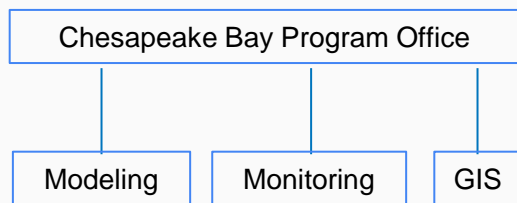
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# Draft WQSAM Outcome Science Needs

# WQSAM Analysis Science Needs: **Monitoring**

- All priority monitoring needs for the CBP core networks can be found in the report, “Enhancing the Chesapeake Bay Program Monitoring Networks.”
  - [https://d18lev1ok5leia.cloudfront.net/chesapeakebay/documents/FINAL\\_Enhancing\\_the\\_Cheseapeake\\_Bay\\_Program\\_Monitoring\\_Networks\\_A-Report\\_to\\_the\\_Principals\\_Staff\\_Committee\\_10.13.22-1.pdf](https://d18lev1ok5leia.cloudfront.net/chesapeakebay/documents/FINAL_Enhancing_the_Cheseapeake_Bay_Program_Monitoring_Networks_A-Report_to_the_Principals_Staff_Committee_10.13.22-1.pdf)
- CBP core networks include:
  - Tidal WQ
  - Nontidal WQ
  - SAV
  - Benthic
  - Community Science
  - Land Use

# WQSAM Analysis Science Needs: Tidal WQ Monitoring

A. Needs related Tidal WQ Monitoring	Status	Resources
1. Equipment for 8 advanced vertical sensor arrays and support for operation and maintenance of 10 sites.	Funding through NOAA and EPA	Full Resources
2. Sustain existing Long-term Tidal Water Quality Program (including Shallow water monitoring program)	117e Grant	Partial Resources
3a. Sustain Community Science monitoring program	Funding through EPA	Full Resources
3b. Expand Community Science monitoring in support of water quality criteria attainment assessment.	To be determined	To be determined
4. AI/ML assessment of spring SAV cover/delineate SAV beds with automated methods supporting water clarity criteria attainment assessment	RFA developed	Full Resources
5. Nutrient limitation re-evaluation to assess Bay status, change in response to management actions, and model performance	RFA developed	Full Resources

# WQSAM Analysis Science Needs: **Nontidal WQ Monitoring**

A. Needs related Nontidal WQ Monitoring	Status	Resources
1a. Adding 7 RIM Continuous Monitoring sensor packages 1b. Support for operation and maintenance	Initial investment secured. Need support to sustain in future	Partial Resources
2a. Adding 3 Lower Susquehanna Reservoir Continuous Monitoring sensor packages 2b. Support for operation and maintenance	Initial investment secured. Need support to sustain in future	Partial Resources
3. 10 more discrete samples at Marietta	Initial investment secured. Need support to sustain in future	Partial Resources
4a. Purchase Small Watershed Continuous Monitoring sensors for stations across the watershed 4b. support for operation and maintenance	Initial investment secured. Need support to sustain in future	Partial Resources

# WQSAM Analysis Science Needs: Tidal Analysis

A. Needs related to criteria assessment	Status	Resources
1. Develop a 4-D interpolator to allow for evaluation of all DO criteria	Work underway at CBP and with contractors	Partial
2. Track/communicate/explain tidal water quality standards attainment/attainment deficit patterns and trends		Partial
3. Evaluate methods and potentially update protocols for criteria assessment to address more temporal periods and use new types of data (e.g., high temporal density water quality, remote sensing)	2 STAC Workshops completed, 1 workshop report still in progress	Present work funded, eventual STAC-review capacity needs



# WQSAM Analysis Science Needs: Tidal Analysis

B. Needs related to explaining change in the estuary	Status	Resources
1. Finish cluster analysis tool to group tidal trend patterns	Work underway through ITAT with contractors	Partial
2. Improve understanding of bay response to loads and BMPs: multiple possible directions include overall water quality, just shallow-water regions, and/or living resources habitat	Some collaborative researchers' current work is relevant, but little CBP capacity to integrate or apply this research currently	Partial
3. Integrate tidal & nontidal water-quality trend results	Some discussion between tidal & nontidal teams, but no resources or current work	No
4. Accelerate shallow & open water attainment with focused nutrient and sediment reduction practices		No

# WQSAM Analysis Science Needs: Nontidal Analysis

A. Needs related to understanding the changes in water-quality patterns in the watershed	Status	Resources
Improve understanding of source sector contributions to N,P,S loading, and how these landscape sources are changing over time.	In Progress	Partial Resources
Better describe patterns of nutrient and sediment trends and analyze patterns of trends in major sources sectors: agricultural, urban, air deposition - to attempt to explain why we observe given trends in monitored streams.	In Progress	Partial Resources
Collaborate with jurisdictions to communicate understanding related to nutrient and sediment trends, as well as the understanding of the drivers of these changes; based on this new understanding develop updated science needs	In Progress	Partial Resources
Improve understanding (conduct analysis) and build capacity for analysis and communication of linkage between watershed changes (including BMPs and land change), to loads to tidal water, and estuary response	In Progress	Partial Resources

# WQSAM Analysis Science Needs: **Nontidal Analysis**

B. Other specific needs	Status	Resources
Compare observed and expected trends in watershed model where differences were identified	In Progress	Partial Resources
Analysis of continuous water-quality records for trend determination.	Planned	No Resources
Analysis of small agricultural monitoring data sets for determining the effects of conservation practices. Note that new analyses are likely needed.	Planned	No Resources