CBP Tributary Summary StoryMaps: Communication Tool Describing Water Quality Trends to Inform Management Decisions

STAR Meeting on Connecting CBP Science with Local Entities

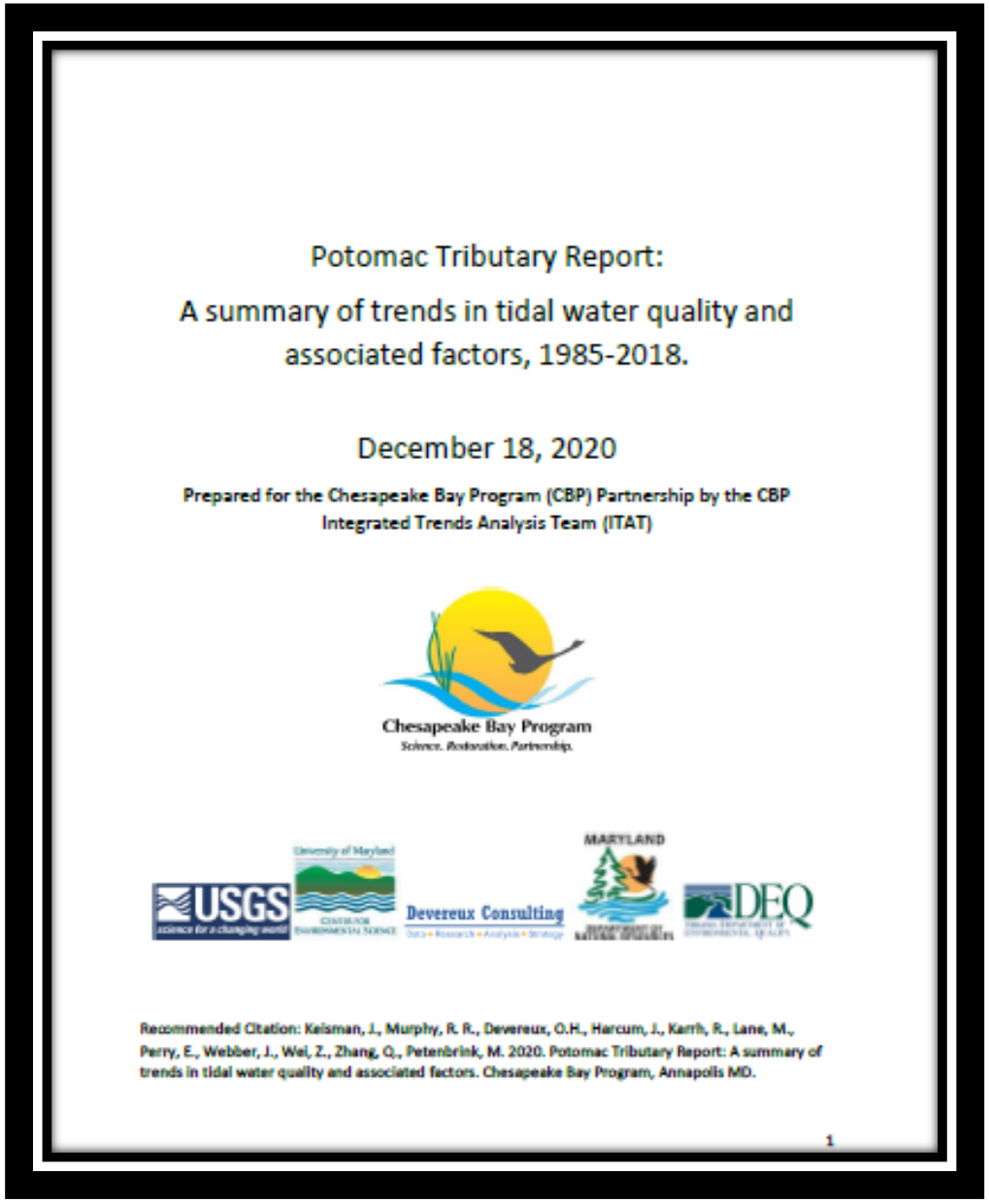
October 26, 2023

Presented by: Alex Gunnerson (Chesapeake Research Consortium)

On Behalf of: The Chesapeake Bay Program Integrated Trends Analysis Team (ITAT) and partners

Overview of Presentation

- What are the Tributary Summaries?
- Tributary Summary StoryMaps
- Case Study: The Rappahannock



Potomac Tributary Report:

A summary of trends in tidal water quality and associated factors, 1985-2018.

December 18, 2020

Prepared for the Chesapeake Bay Program (CBP) Partnership by the CBP Integrated Trends Analysis Team (ITAT)

Chesapeake Bay Program
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USGS
Devereux Consulting
MARYLAND
DEQ

Recommended Citation: Kelsman, J., Murphy, R. R., Devereux, O.H., Harcum, J., Karrh, R., Lane, M., Perry, E., Webber, J., Wei, Z., Zhang, Q., Petenbrink, M. 2020. Potomac Tributary Report: A summary of trends in tidal water quality and associated factors. Chesapeake Bay Program, Annapolis MD.

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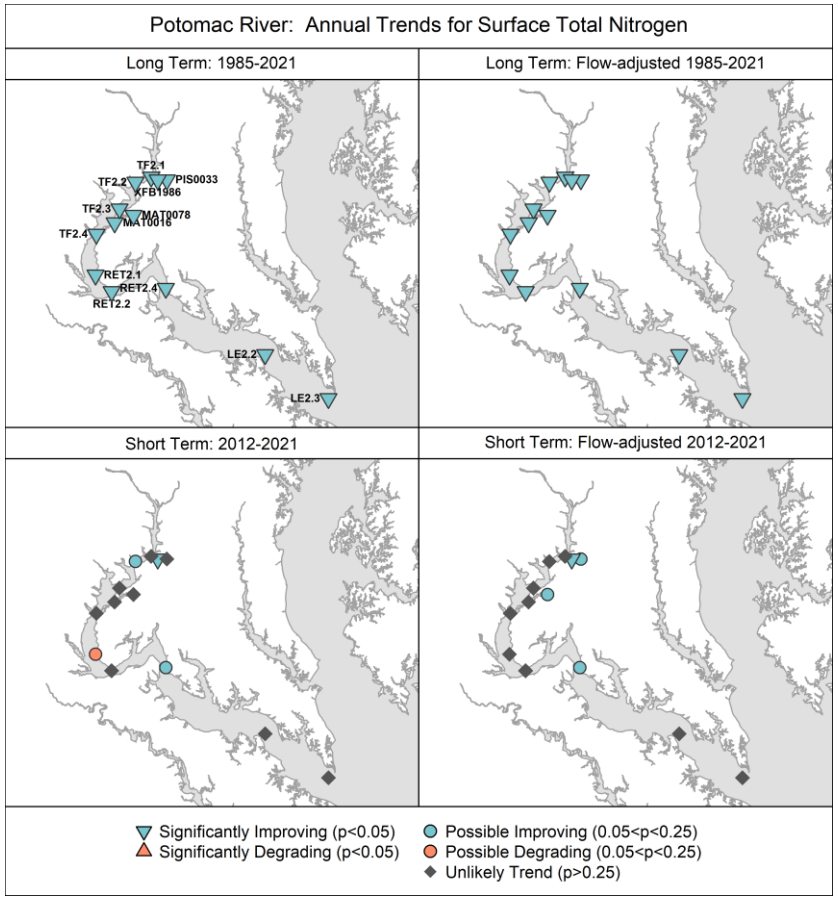
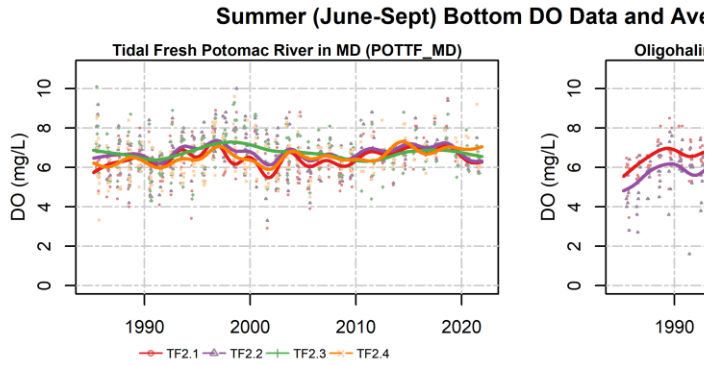
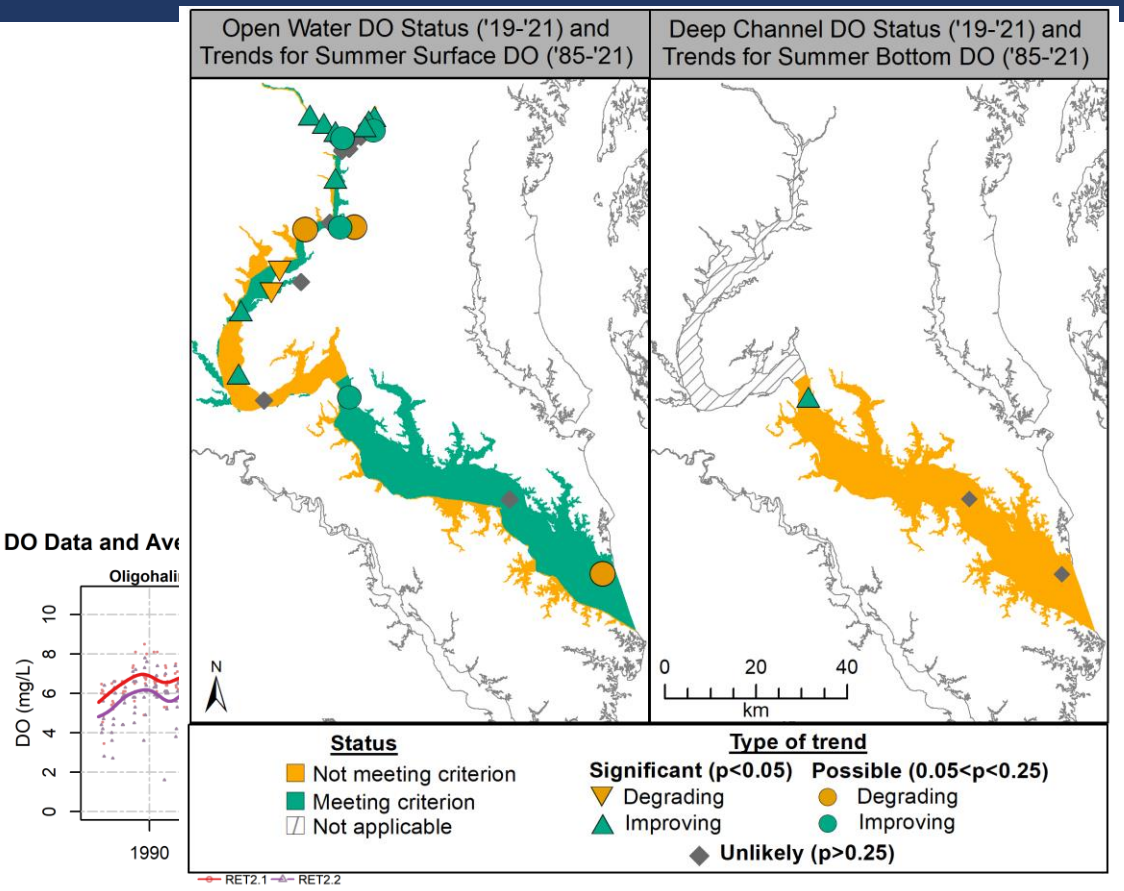
What are the Tributary Summaries?

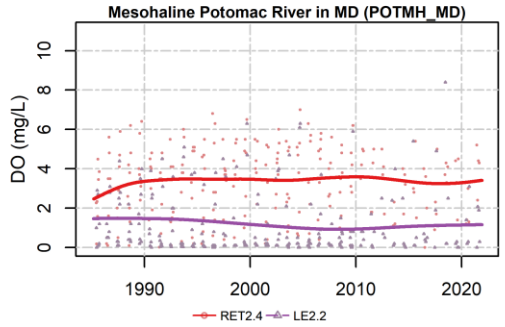
A compilation of information by tributary or region on:

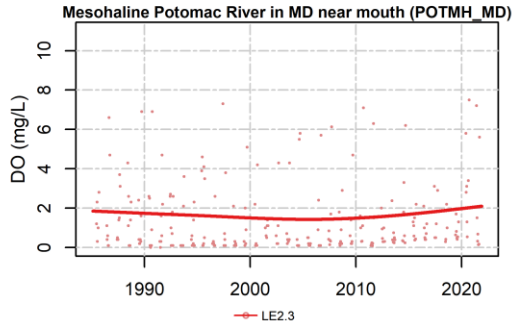
- **Tidal water quality and trends**







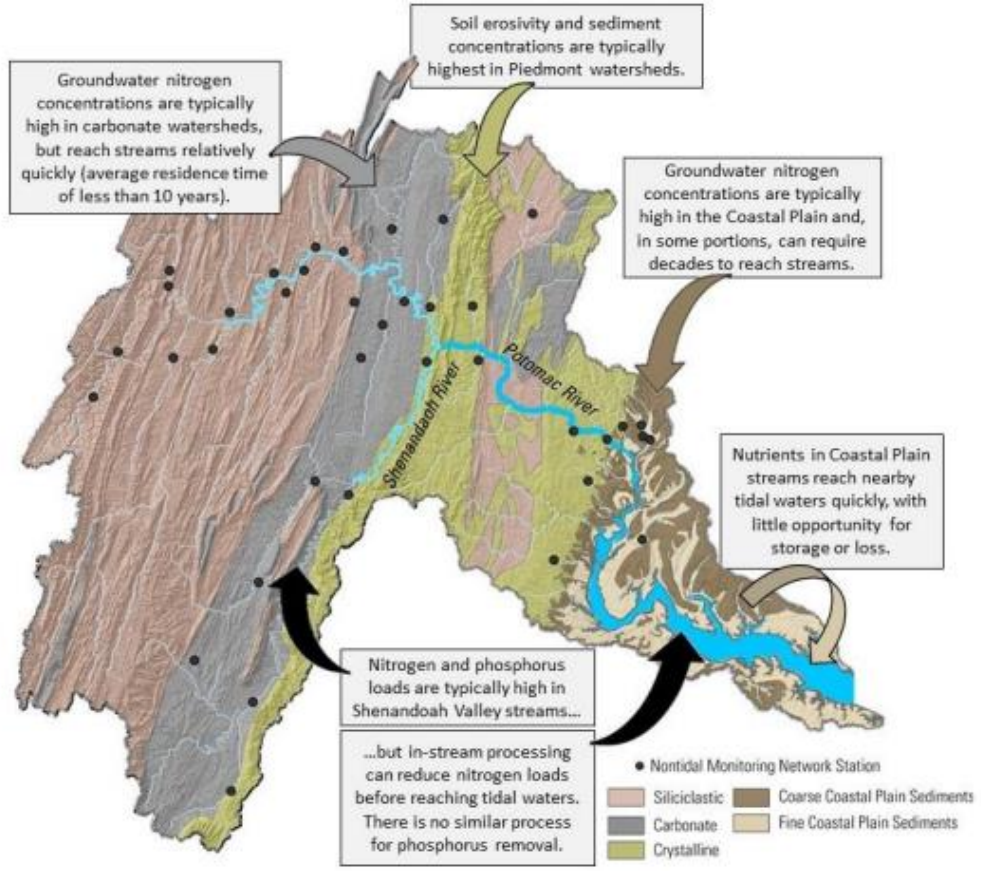


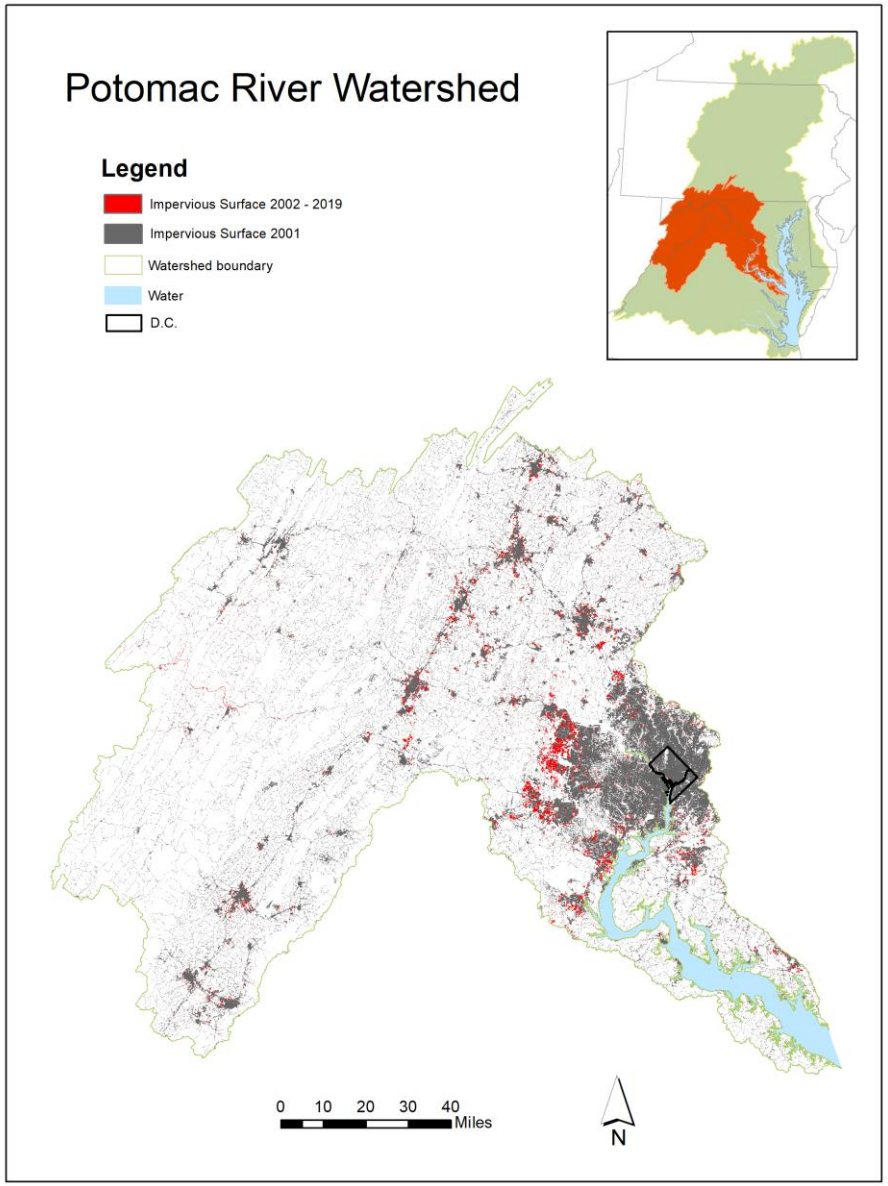


What are the Tributary Summaries?

A compilation of information by tributary or region on:

- Tidal water quality and trends,
- **Watershed characteristics and changes**





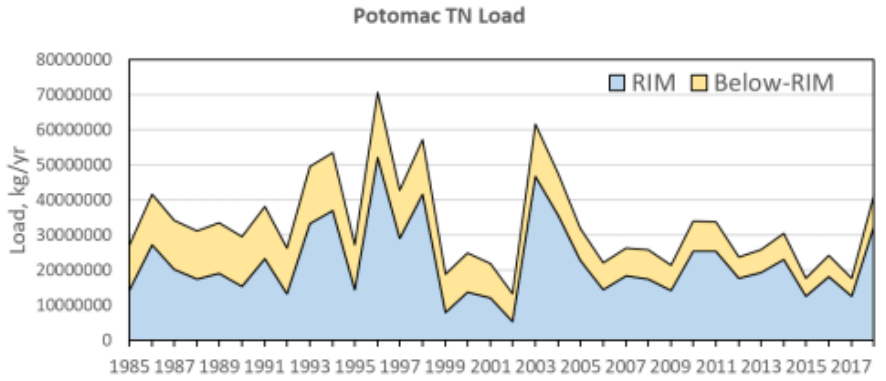
What are the Tributary Summaries?

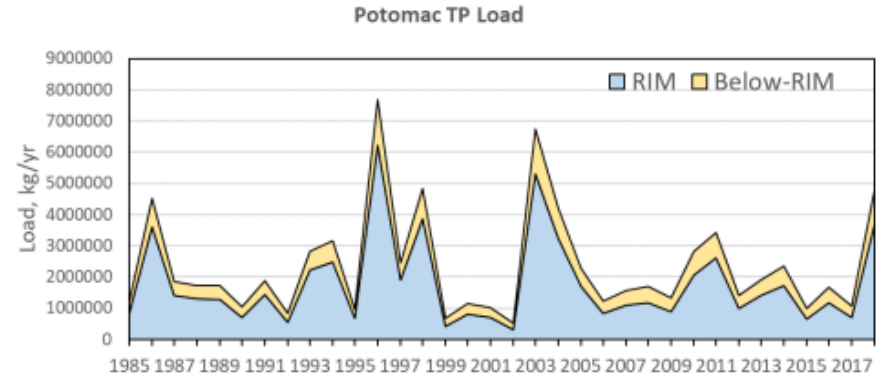
A compilation of information by tributary or region on:

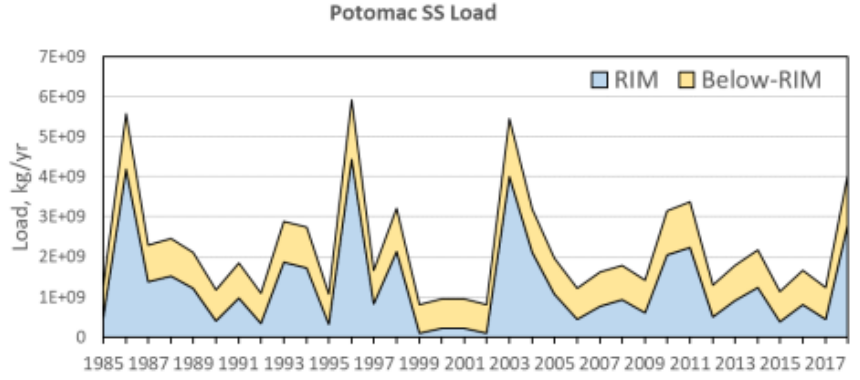
- Tidal water quality and trends,
- **Watershed characteristics and changes**

Table 3. Trends (2009 – 2018) in flow normalized total nitrogen (TN), total phosphorus (TP), and suspended sediment (SS) for nontidal network monitoring locations in the Potomac River watershed.

Parameter	No. of stations	Value	Trend direction		
			degrading	improving	no trend
TN	28	n	7	14	7
		median %	15.4%	-5.8%	1.1%
TP	18	n	0	12	6
		median %	-	-28.9%	8.5%
SSC	18	n	5	5	8
		median %	23.7%	-24.4%	5.2%



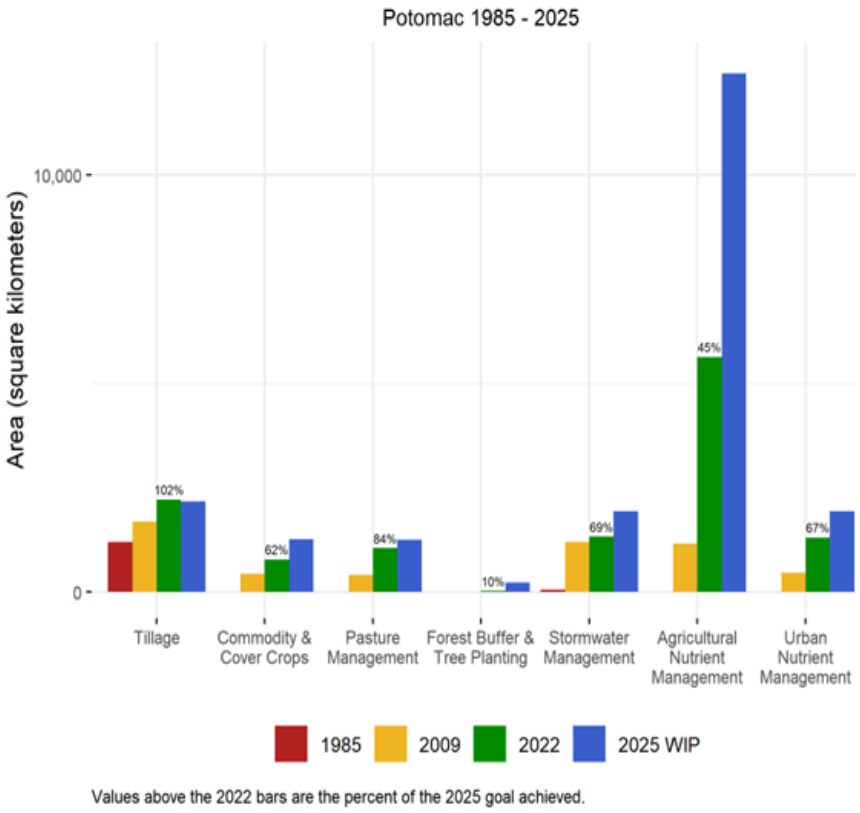


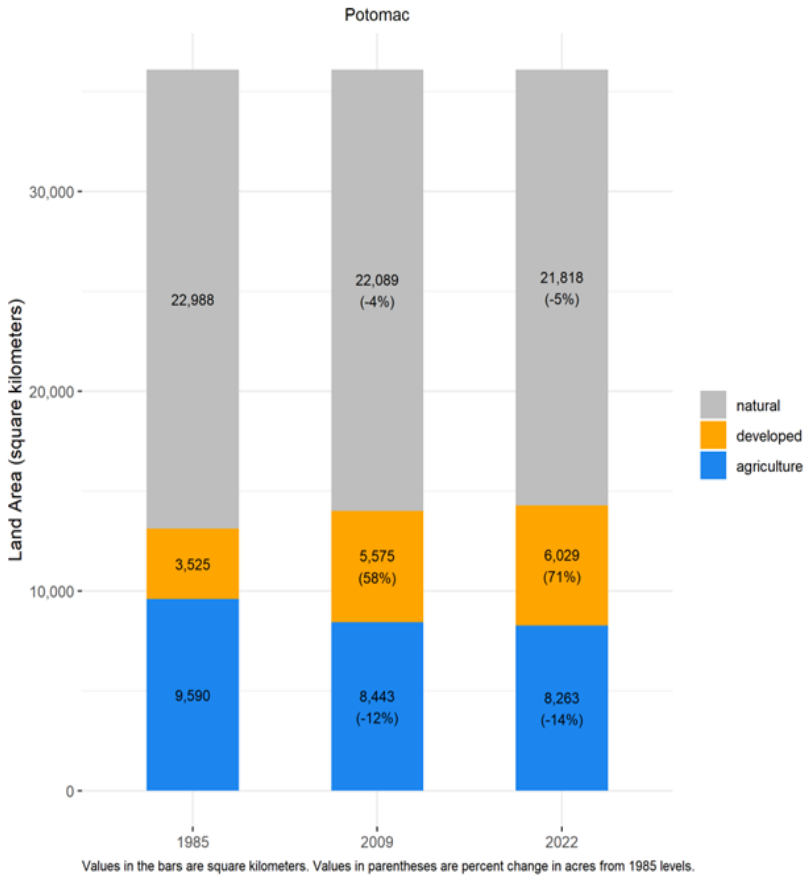


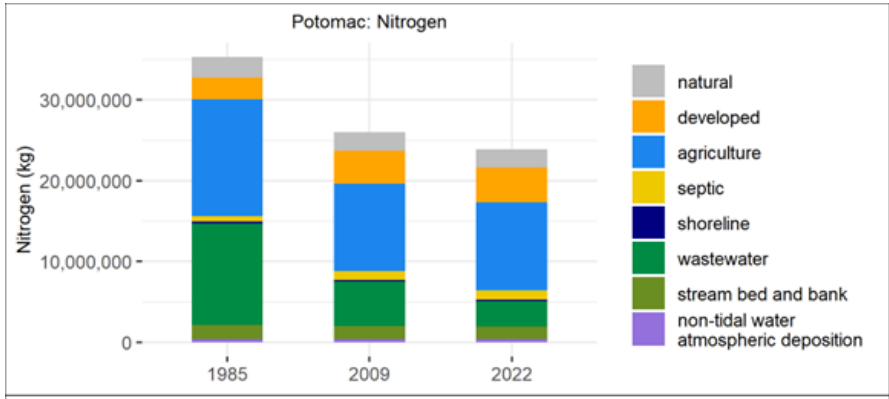
What are the Tributary Summaries?

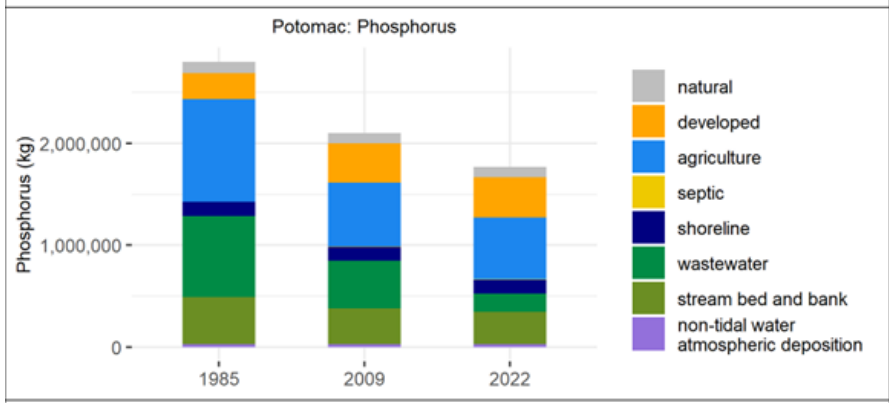
A compilation of information by tributary or region on:

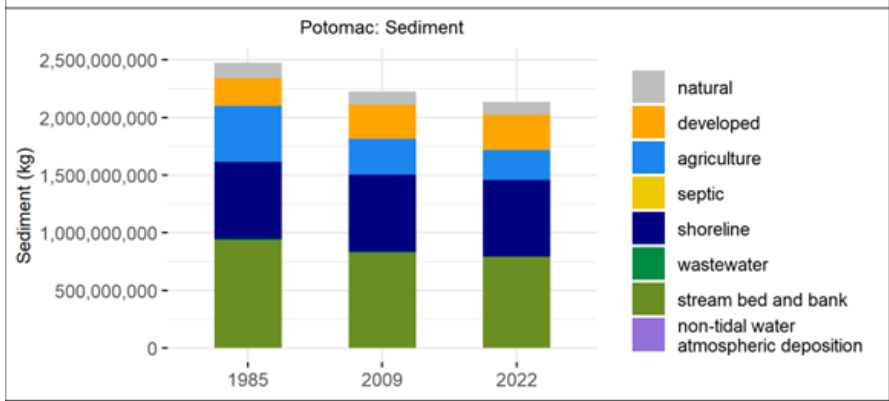
- Tidal water quality and trends,
- Watershed characteristics and changes,
- **Landscape drivers.**



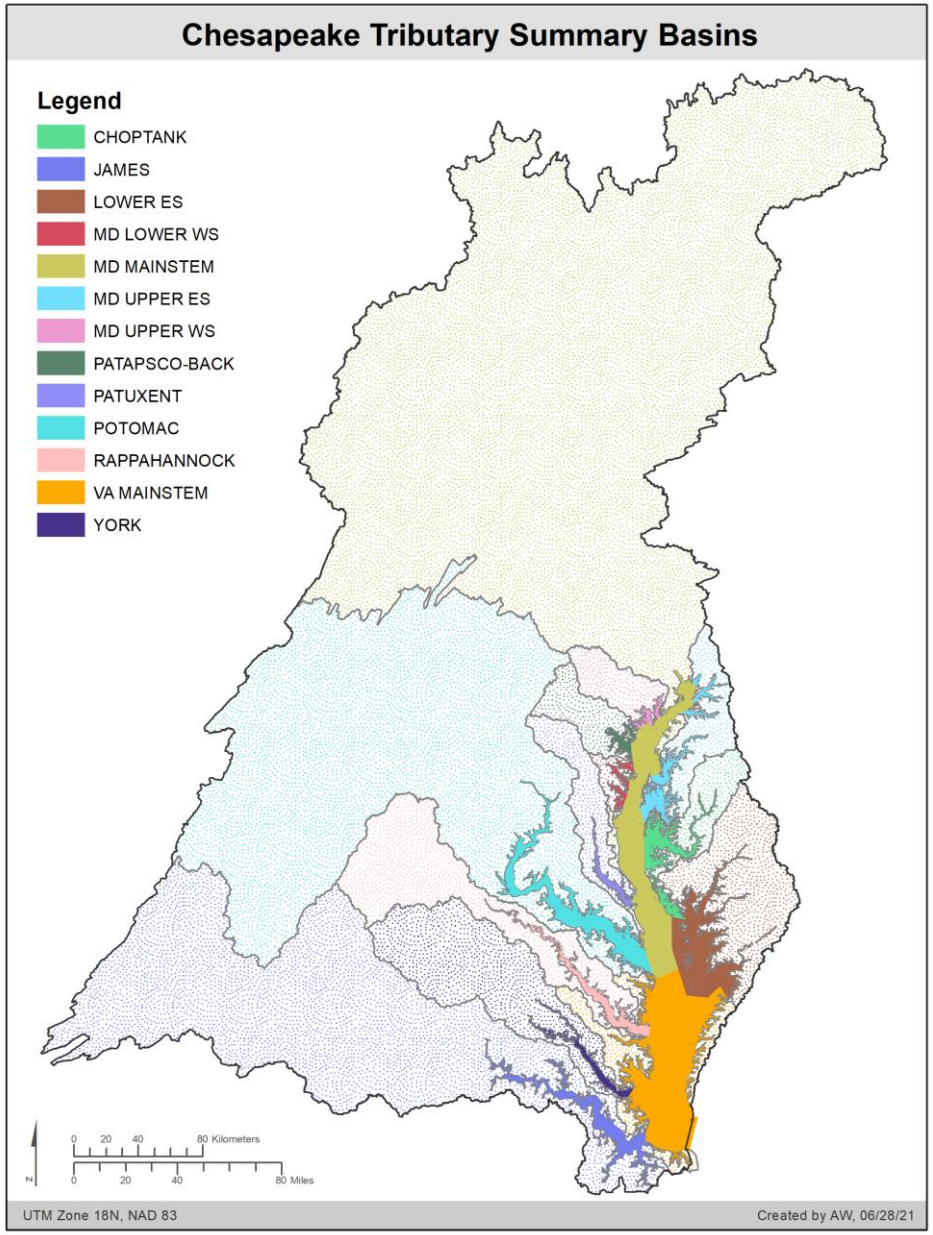








12 Tributary Summaries



- **Maryland Mainstem** *(The 5 Chesapeake Bay mainstem segments within the MD state boundary. Drainage basins include the Susquehanna River and upper Chesapeake shorelines)*
- **Maryland Upper Eastern Shore** *(The Northeast, Bohemia, Elk, Back Creek, Sassafras, and Chester Rivers, the C&D Canal, and Eastern Bay)*
- **Choptank** *(the Choptank, Little Choptank, and Honga)*
- **Maryland Upper Western Shore** *(Bush, Gunpowder, Middle Rivers)*
- **Maryland Lower Western Shore** *(Magothy, Severn, South, Rhode, and West)*
- **Patapsco & Back Rivers**
- **Patuxent** *(includes the Western Branch tributary)*
- **Potomac**
- **Rappahannock** *(includes the Corrotoman tributary)*
- **York** *(includes the Mattaponi and Pamunkey tributaries)*
- **James** *(includes the Appomattox, Chickahominy, and Elizabeth tributaries)*
- **Lower E. Shore** *(includes the Nanticoke, Manokin, Wicomico, Big Annemessex, and Pocomoke rivers & Tangier Sound)*
- **Virginia Mainstem** *(no summary but Appendices are provided)*

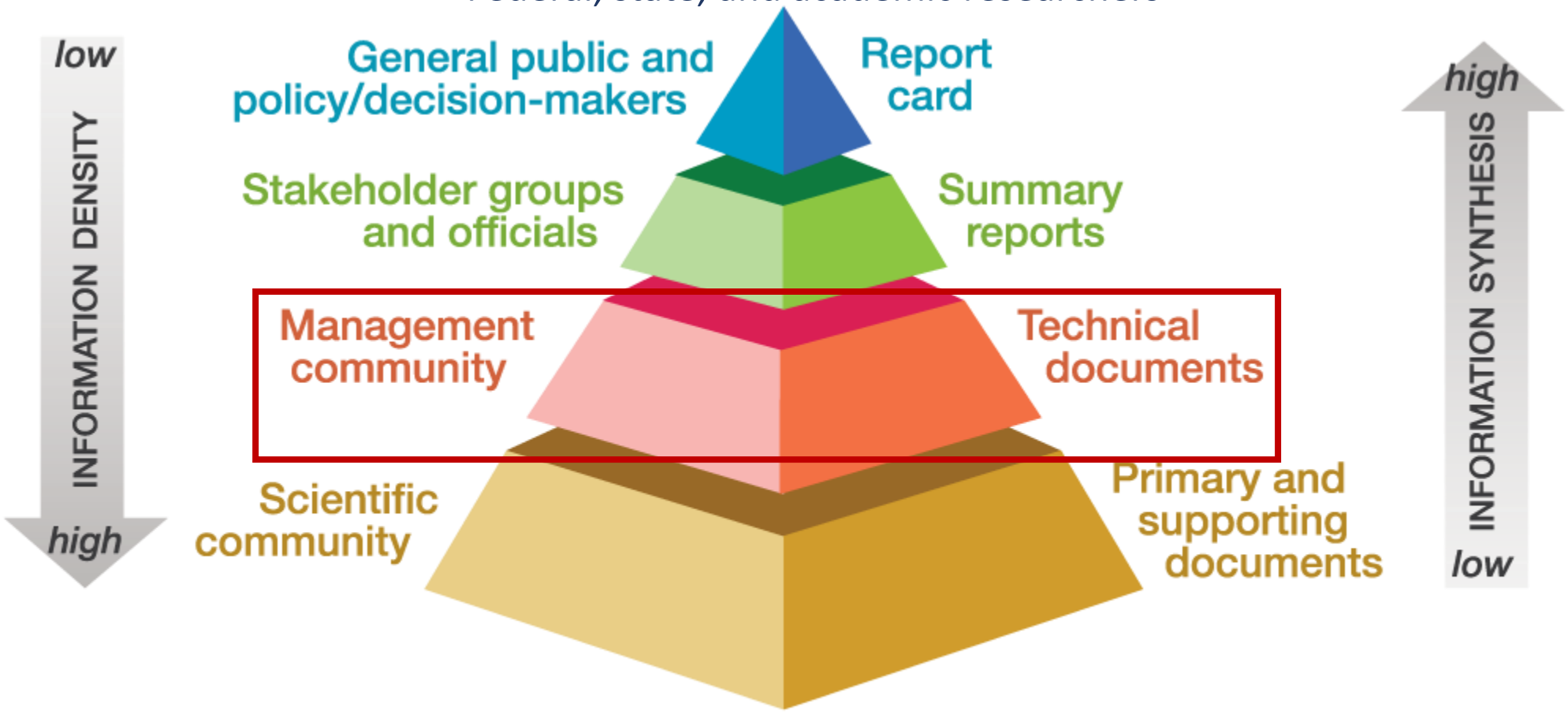
How do we use the information found in the tributary summaries?

- As readily-available ***background*** for change over time in tidal water quality observed with monitoring data.

- To answer questions such as:
  - *Have water quality indicators in my river been improving or degrading over time?*
  - *How have landscape factors that drive water quality change in my watershed changed over time?*
  - *What clues do they provide that might explain observed water quality change (or lack of change)?*
  - *What should I target to turn a degrading trend around or maintain improvements for future water quality and living resource conditions?*
  - *What should scientists focus our analyses on to provide better answers in the future?*

Who is the audience for the tributary summaries?

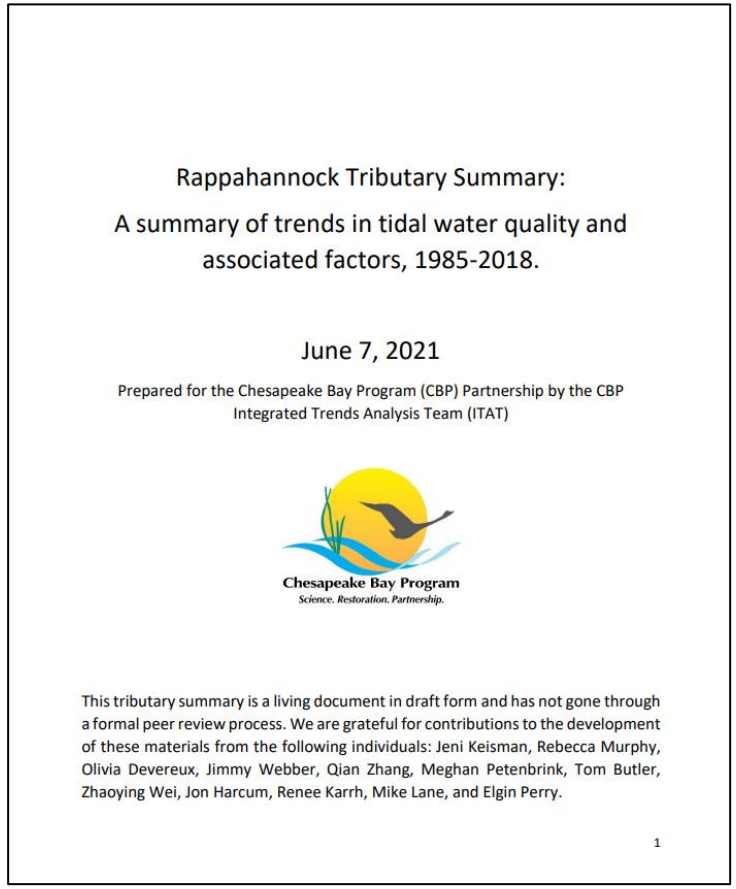
- Technical managers within jurisdiction agencies
  - Local watershed organizations
- Federal, state, and academic researchers



Jane Hawkey, Integration and Application Network (ian.umces.edu/media-library)

Tributary Summary StoryMaps

- Purpose: create an interactive and more digestible product that conveys key water quality information and can serve as communication tool for local watershed organizations.



Rappahannock Tributary Summary:

A summary of trends in tidal water quality and associated factors, 1985-2018.

June 7, 2021

Prepared for the Chesapeake Bay Program (CBP) Partnership by the CBP Integrated Trends Analysis Team (ITAT)

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This tributary summary is a living document in draft form and has not gone through a formal peer review process. We are grateful for contributions to the development of these materials from the following individuals: Jeni Keisman, Rebecca Murphy, Olivia Devereux, Jimmy Webber, Qian Zhang, Meghan Petenbrink, Tom Butler, Zhaoying Wei, Jon Harcum, Renee Karrh, Mike Lane, and Elgin Perry.

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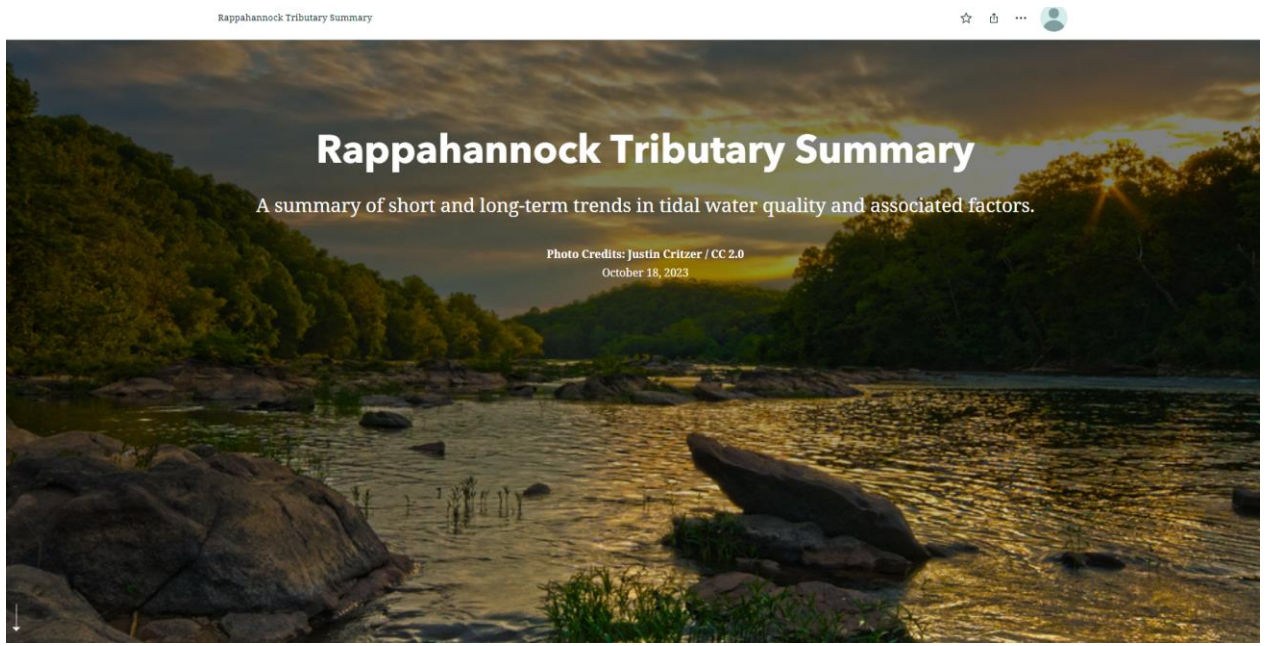
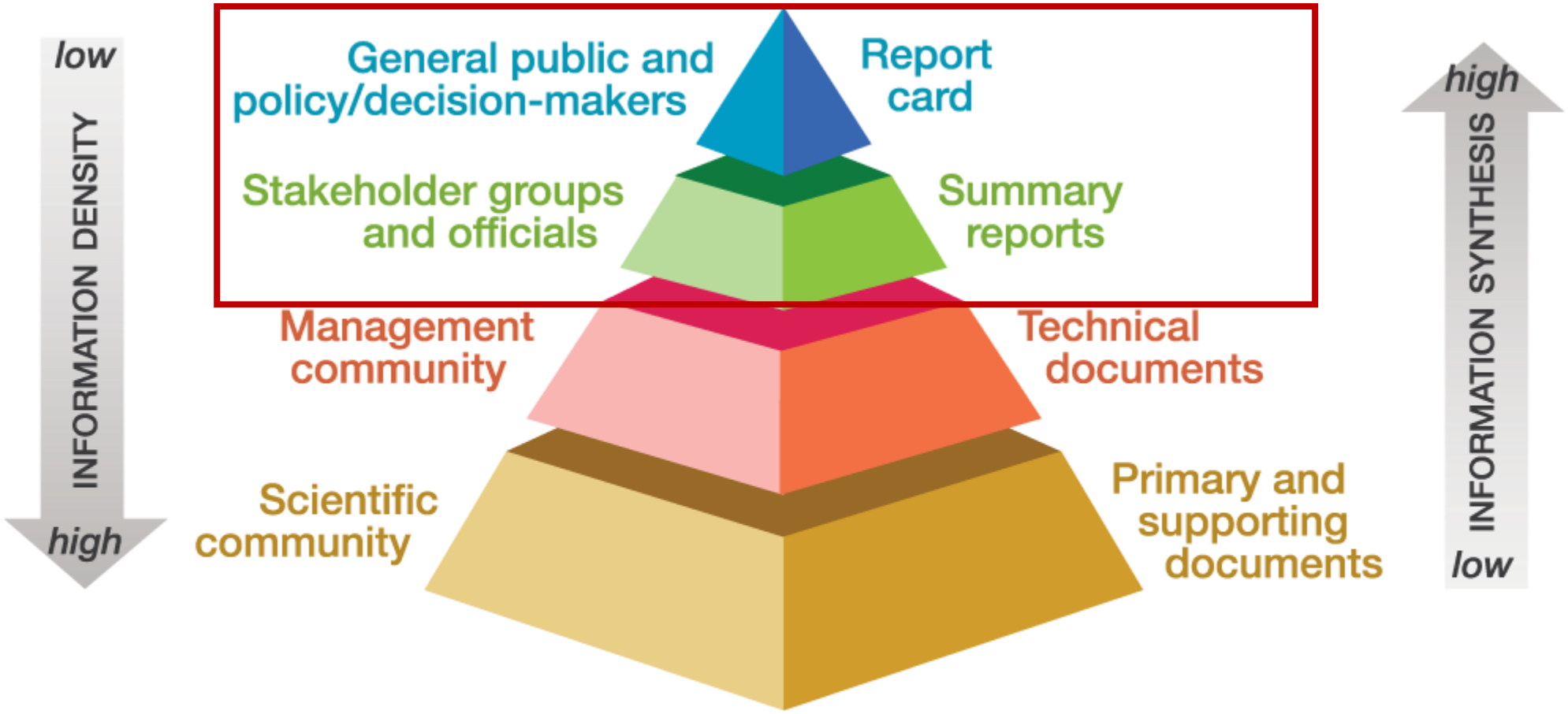


Who is the audience for the Tributary Summary StoryMaps?

- Local watershed organizations



Jane Hawkey, Integration and Application Network
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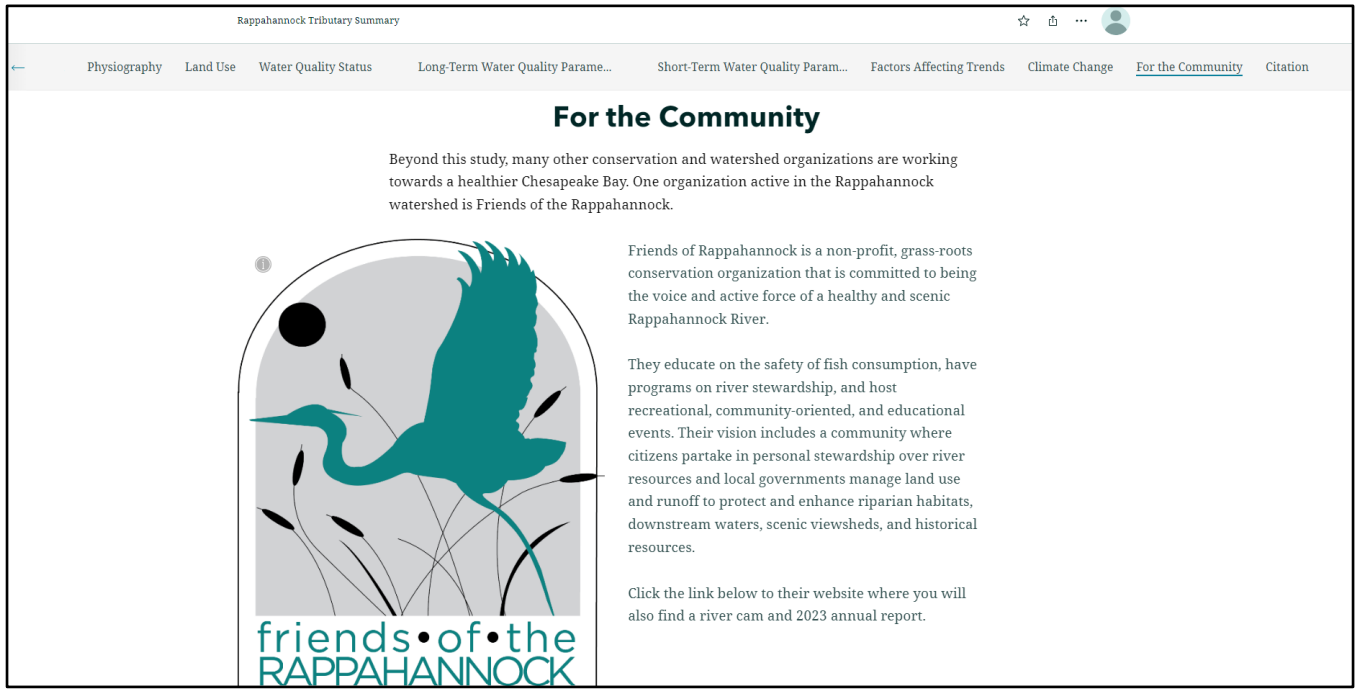
Tributary Summary StoryMaps

- Anoosh Tauqir (C-StREAM intern) created a template StoryMap that can easily by replicated for the 12 tributaries as the reports are updated.
- Solicited input from local watershed organizations, which led to:
  - Clarifying language in the text and in map symbology
  - A new section highlighting watershed organizations' programs

C-StREAM



Case Study: Rappahannock Story Map

- Co-produced the Rappahannock Tributary Summary StoryMap with input from Friends of the Rappahannock (FOR).
  - FOR expressed plans to use this as a communication tool during meetings with stakeholders and in outreach events.

  - Anoosh presented results at the Rappahannock River Symposium on October 25th.

Contact Information

Thank you!!

- **ITAT Co-coordinator:** Breck Sullivan, USGS: bsullivan@chesapeakebay.net
- **ITAT Co-coordinator:** Kaylyn Gootman, EPA: gootman.kaylyn@epa.gov
- **ITAT Staffer:** Alex Gunnerson, Chesapeake Research Consortium: agunnerson@chesapeakebay.net