Integrated Watershed TMDL Indicator and Dashboard Products

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STWG

03/13/2022

Follow up from 11/14/2022 https://d18lev1ok5leia.cloudfront.net/chesapeakebay/documents/2022-11-14-Monitored-TMDL-Indicator-gshenk-WQGIT.pdf

Purpose of presentation

- Update on Integrated Watershed-Wide Indicator
  - TMDL-required Reduction of N and P separated into:
    - Implemented and realized
    - Implemented but lagged
    - Future Implementation
    - + other smaller categories
- Discussion of station-level dashboard products
  - Compare expectations to monitored trends

WIP Indicator

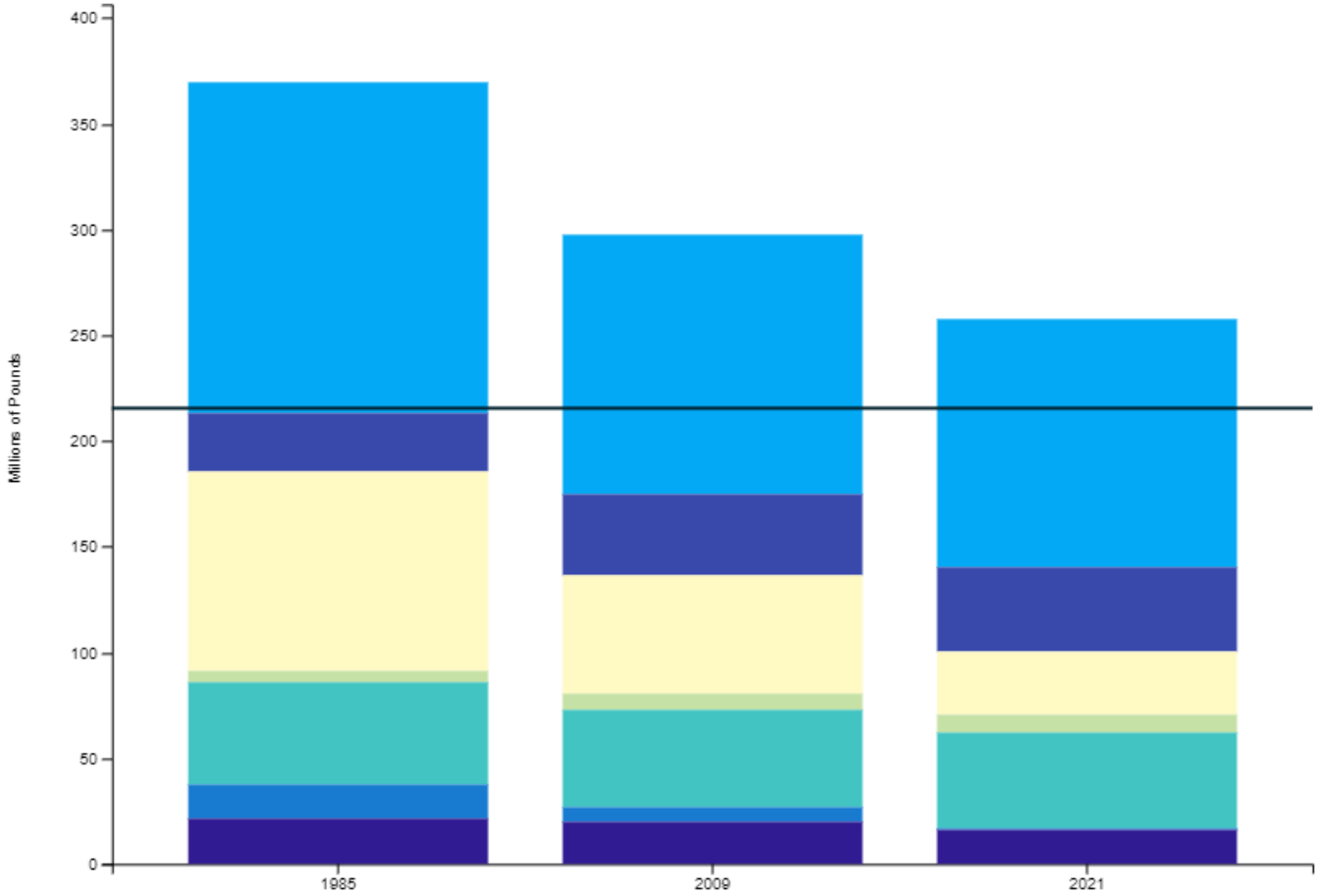
We've almost hit the target level of implementation?

Modeled Nitrogen Loads to the Chesapeake Bay (1985-2021)

Loads simulated using CAST19 and jurisdiction-reported data on wastewater discharges. *The natural sector wetlands which are preferable land use types with the lowest loading rates among sources.

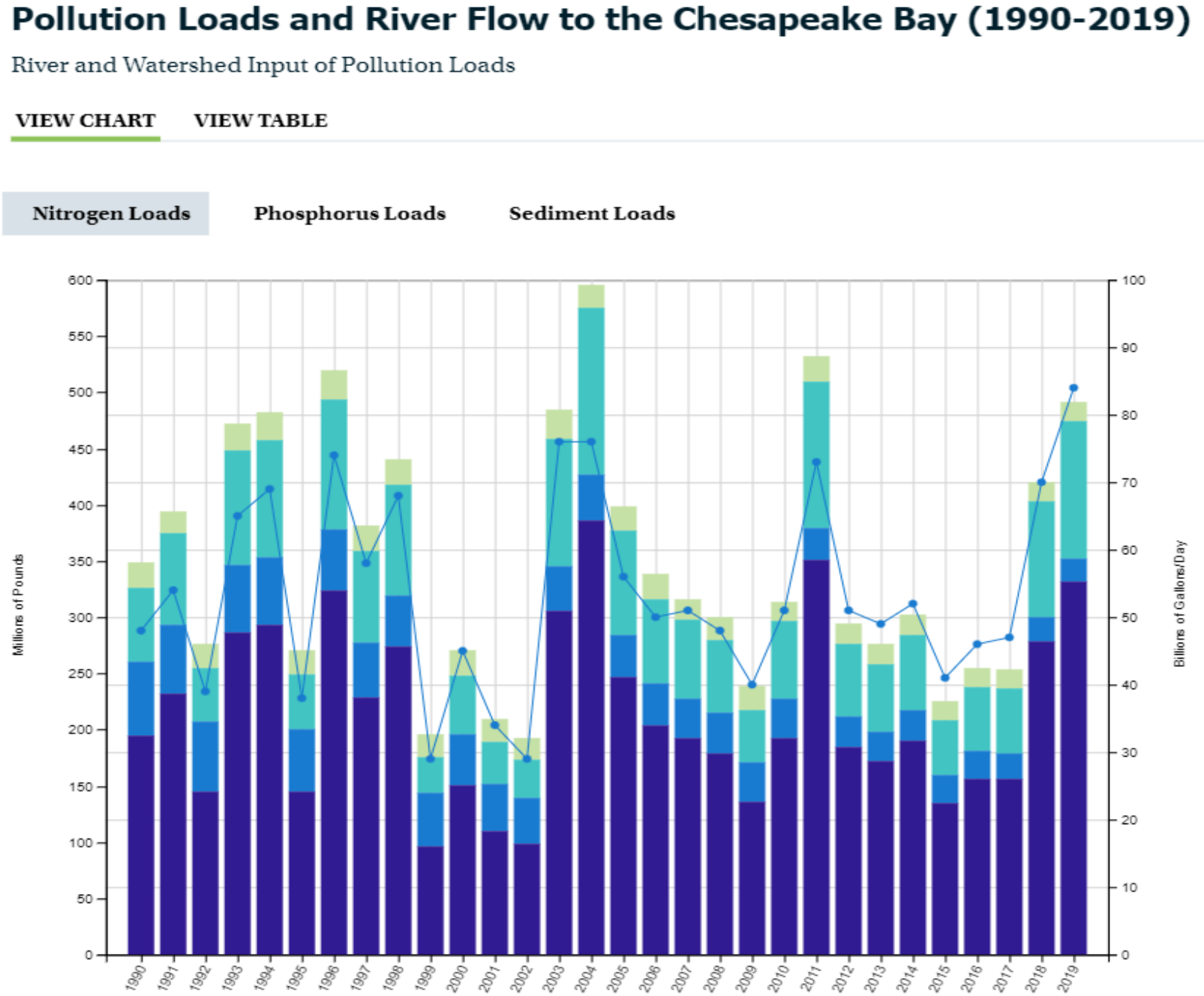
VIEW CHART VIEW TABLE

Loads by Source Loads by Jurisdiction



Nontidal Load Indicator

Extreme variability
No Clear Trend



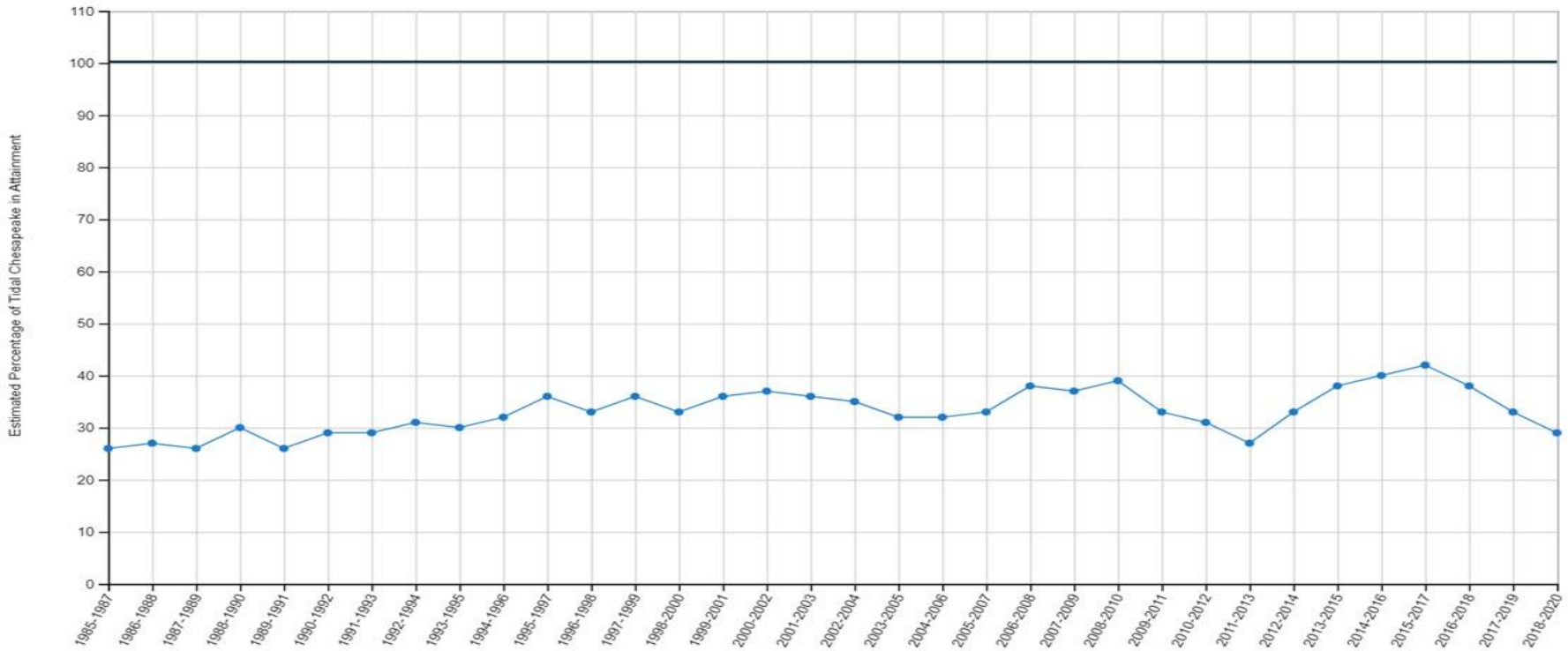
Tidal Water TMDL Indicator

Very slow positive change

Water Quality Standards Attainment (1985-2020)

Water quality is evaluated using three parameters: dissolved oxygen, water clarity or underwater grass abundance, and chlorophyll a (a measure of algae growth).

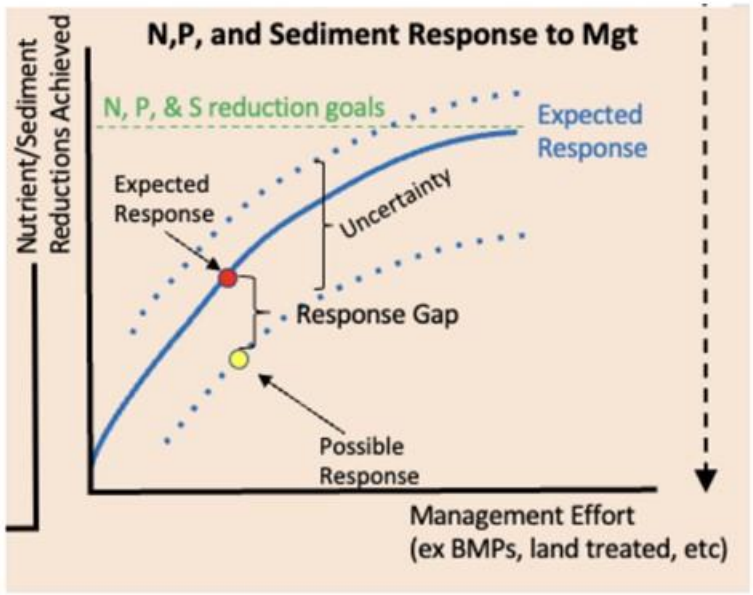
VIEW CHART VIEW TABLE



STAC Comprehensive Evaluation of System Response Report

Watershed Framing Questions

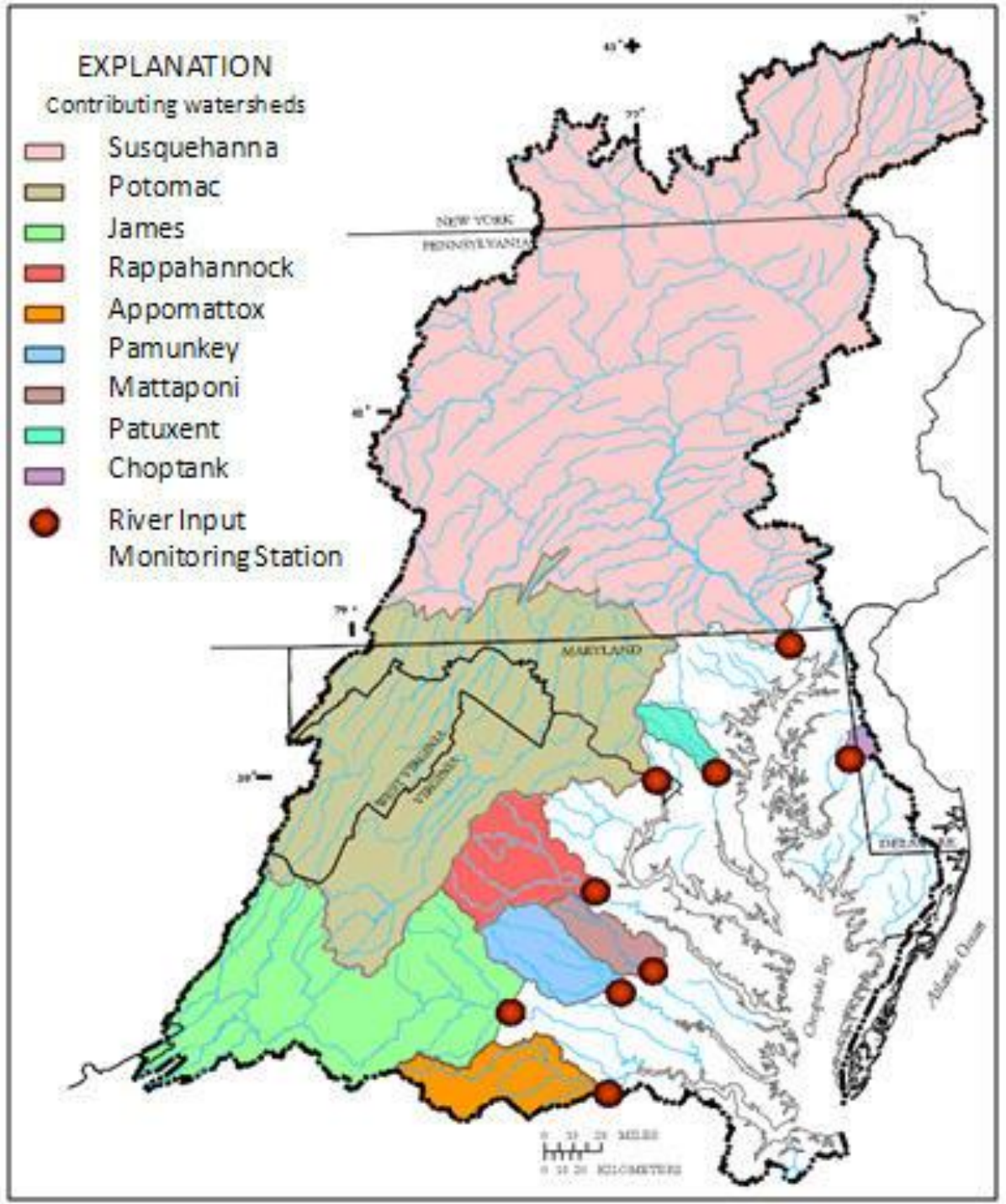
- Is the physical and social system responding to management efforts to meet TMDL N, P, and S goals in ways consistent with expectations?
- What are the major uncertainties in efforts to reduce N, P, and S stressors delivered to the Chesapeake Bay?
- What management actions/policy options could improve nutrient/sediment response or reduce response uncertainties? (see implications)



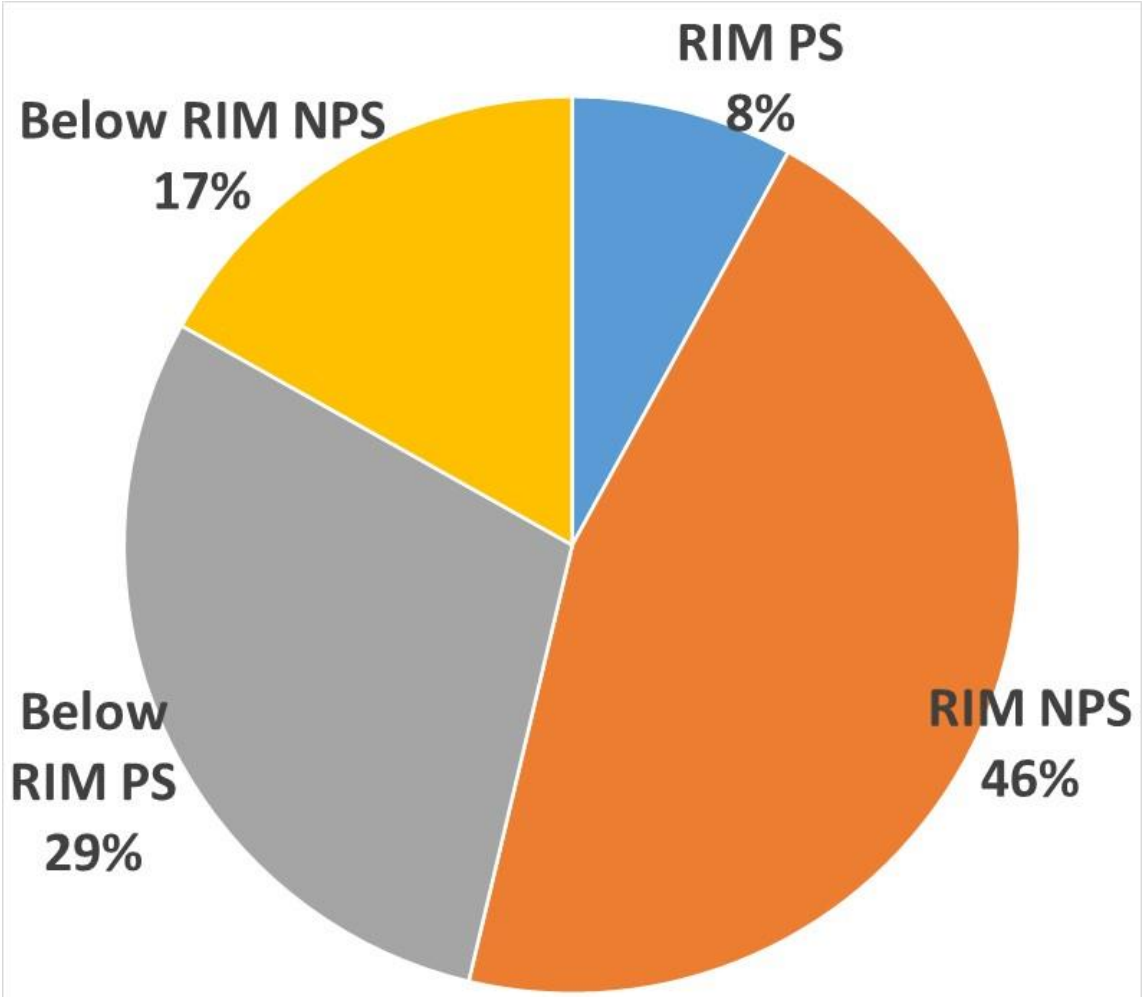
- Presented to WQGIT 10/26/2021
- https://d18lev1ok5leia.cloudfront.net/chesapeakebay/documents/cesrtowqgit10-26-2021_final.pdf

Purpose: Build an indicator that is:

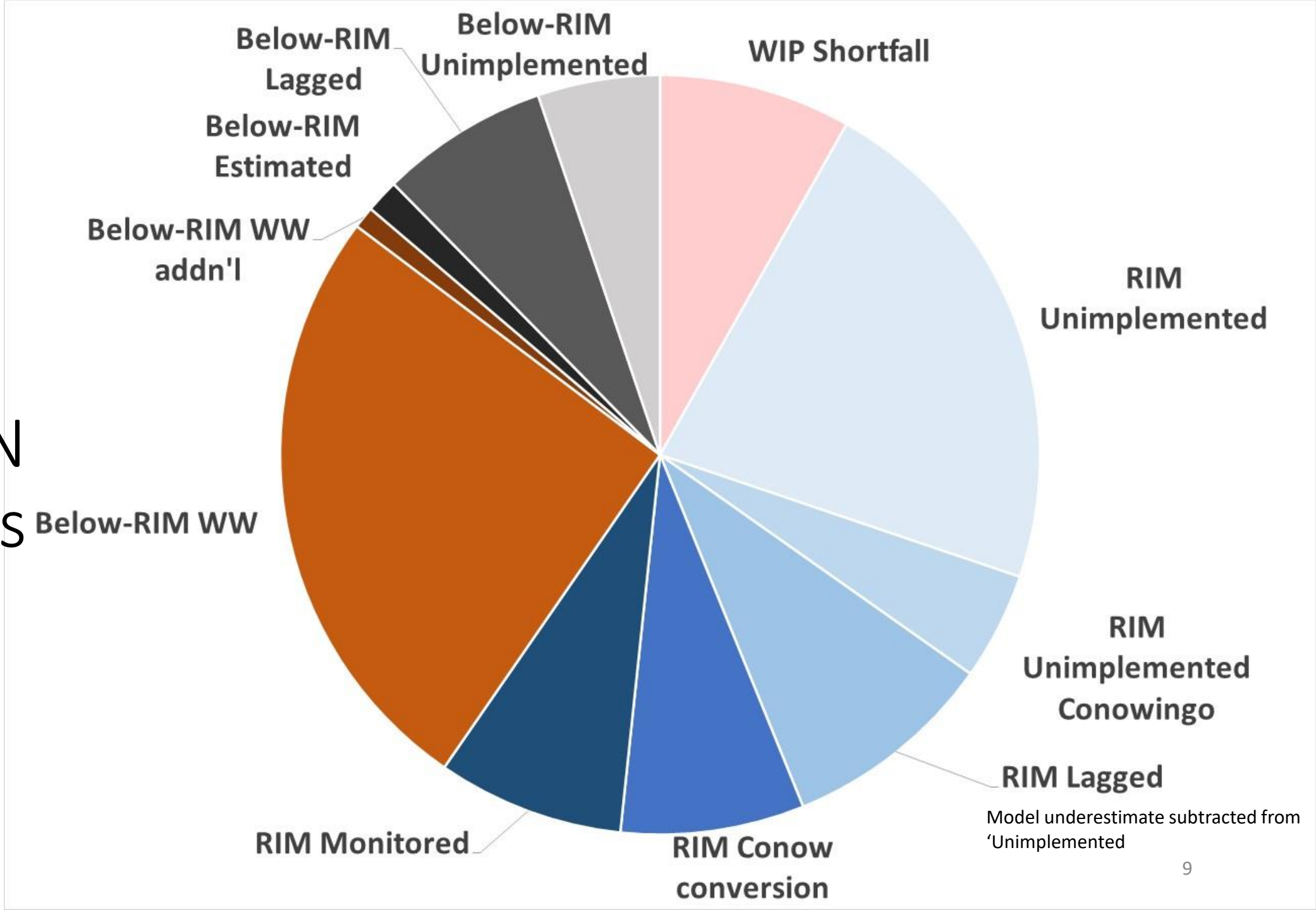
- Relevant to the TMDL
- Based on monitored changes in load to the extent possible
- Bridges monitoring and modeling by assessing lag time and other effects



83% of Expected Reduction is Monitored



Overall indicator of TMDL N reductions

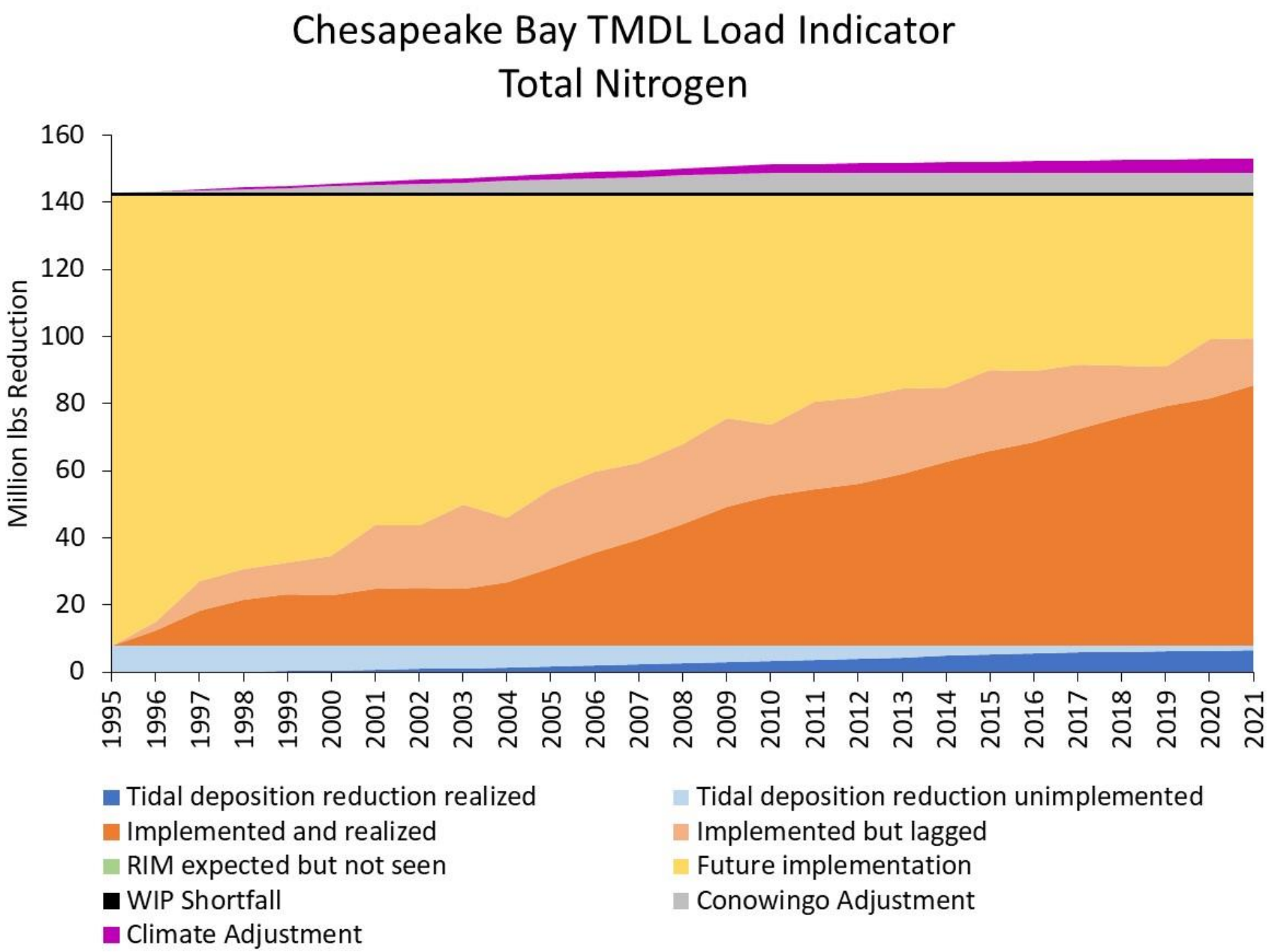


Model underestimate subtracted from 'Unimplemented

Public Indicator

Updated Annually

Web team will reformat



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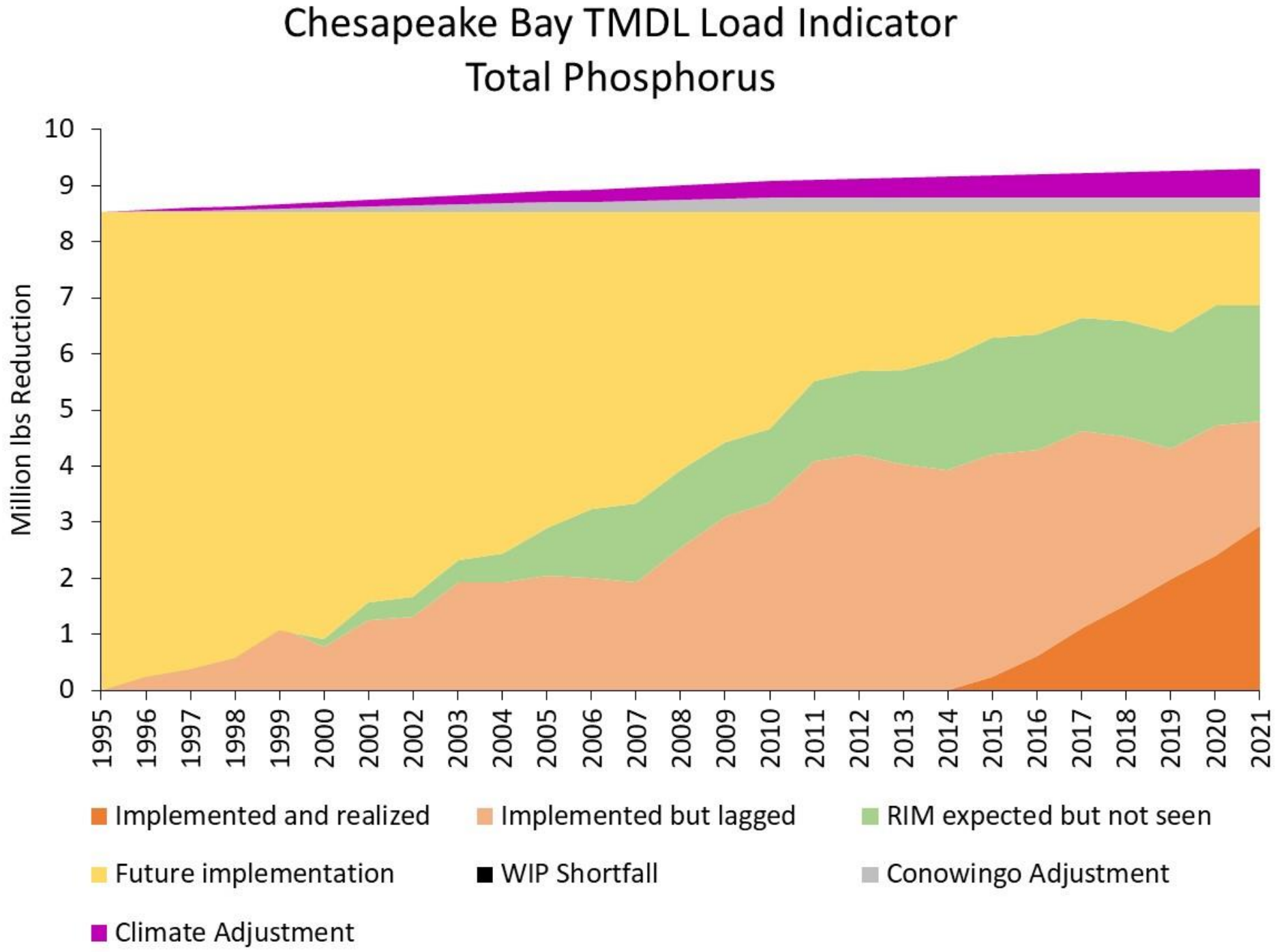
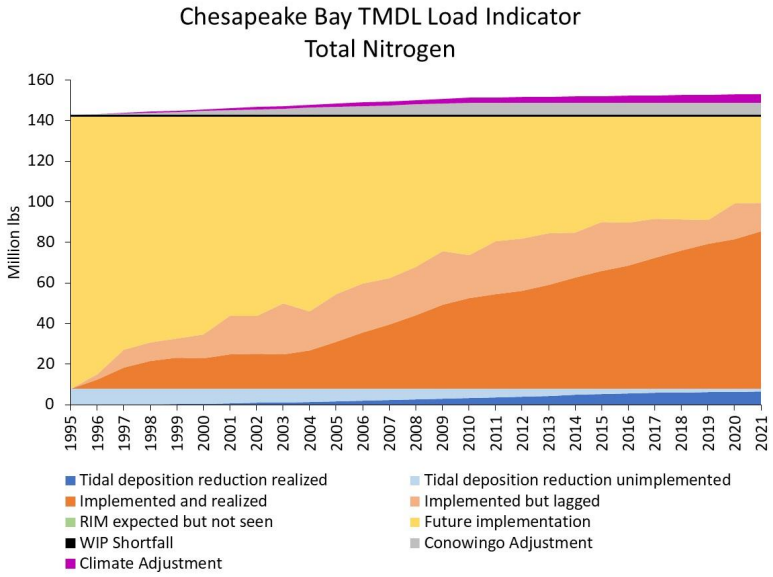
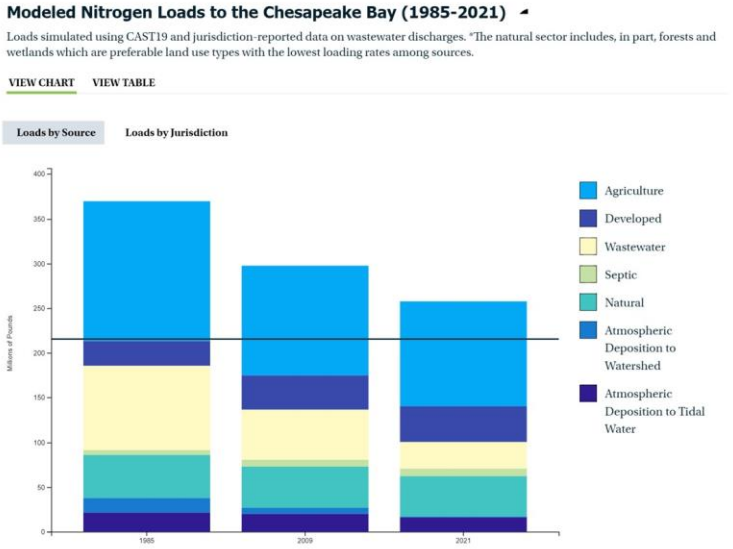
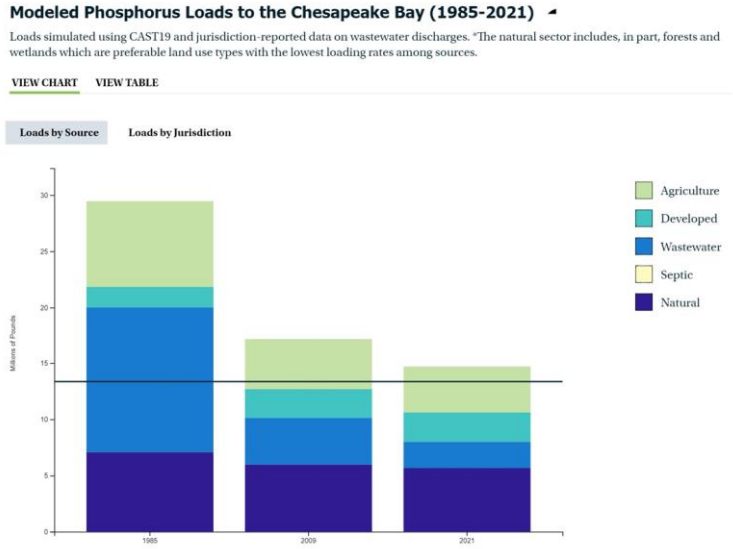
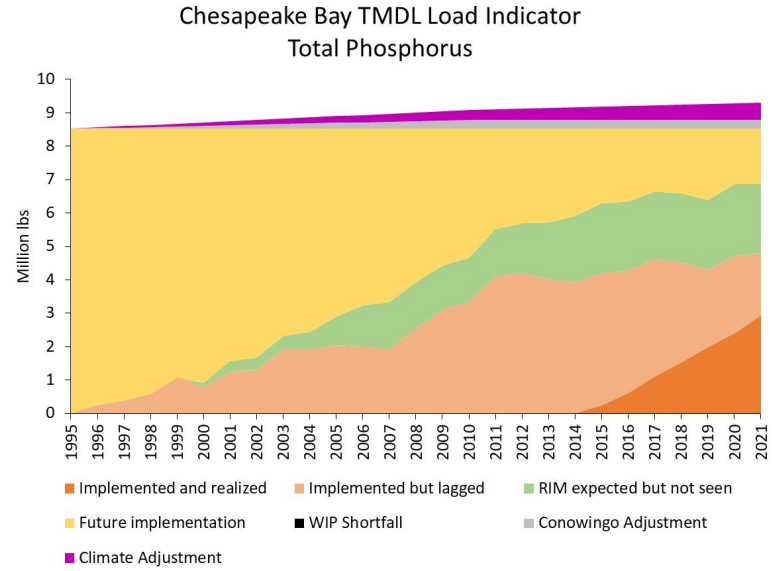


Location: WIP 2025 outcome









Partnership Product for Data Dashboard

Plus all years in between. Updated Annually

	Nitrogen				Phosphorus			
Category	1995	2005	2015	2021	1995	2005	2015	2021
WIP Shortfall	0.92	6.58	10.25	11.25	-0.87	-0.50	-0.21	-0.09
WIP Shortfall	0.92	0.92	0.92	0.92	-0.87	-0.87	-0.87	-0.87
Conowingo Adjustment	0.00	4.00	6.01	6.01	0.00	0.17	0.26	0.26
Climate Adjustment	0.00	1.66	3.32	4.32	0.00	0.20	0.40	0.52
RIM Unimplemented	68.30	43.75	26.73	26.65	6.33	4.28	2.18	1.77
RIM Unimplemented Conowingo	6.67	6.67	6.67	6.67	0.14	0.14	0.14	0.14
RIM expected but not seen	0.00	0.00	0.00	0.00	0.00	1.77	2.09	2.07
RIM Lagged	0.00	17.94	21.39	16.87	0.00	2.29	3.58	2.40
RIM Conowingo Conversion	0.00	8.81	11.81	11.26	0.00	1.86	2.95	2.30
RIM Monitored	0.00	-2.20	8.38	13.53	0.00	-3.88	-4.48	-2.21
Below-RIM PS Implemented	0.00	17.56	30.04	37.19	0.00	0.32	1.25	1.38
Below-RIM PS Unimplemented	37.41	19.85	7.38	0.22	1.57	1.25	0.32	0.19
Below-RIM Estimated	0.00	-1.11	7.85	15.67	0.00	0.79	0.52	1.48
Below-RIM Lagged	0.00	5.60	2.71	-2.95	0.00	-0.25	0.38	-0.55
Below-RIM Unimplemented	21.44	16.96	10.88	8.72	1.36	0.82	0.46	0.43
Tidal Deposition Reduction Realized	0.00	1.68	5.18	6.50				
Tidal Deposition Reduction Unimplemented	7.92	6.24	2.74	1.42				

Station-level dashboard Product

Qian Zhang

Specify the water-quality parameter

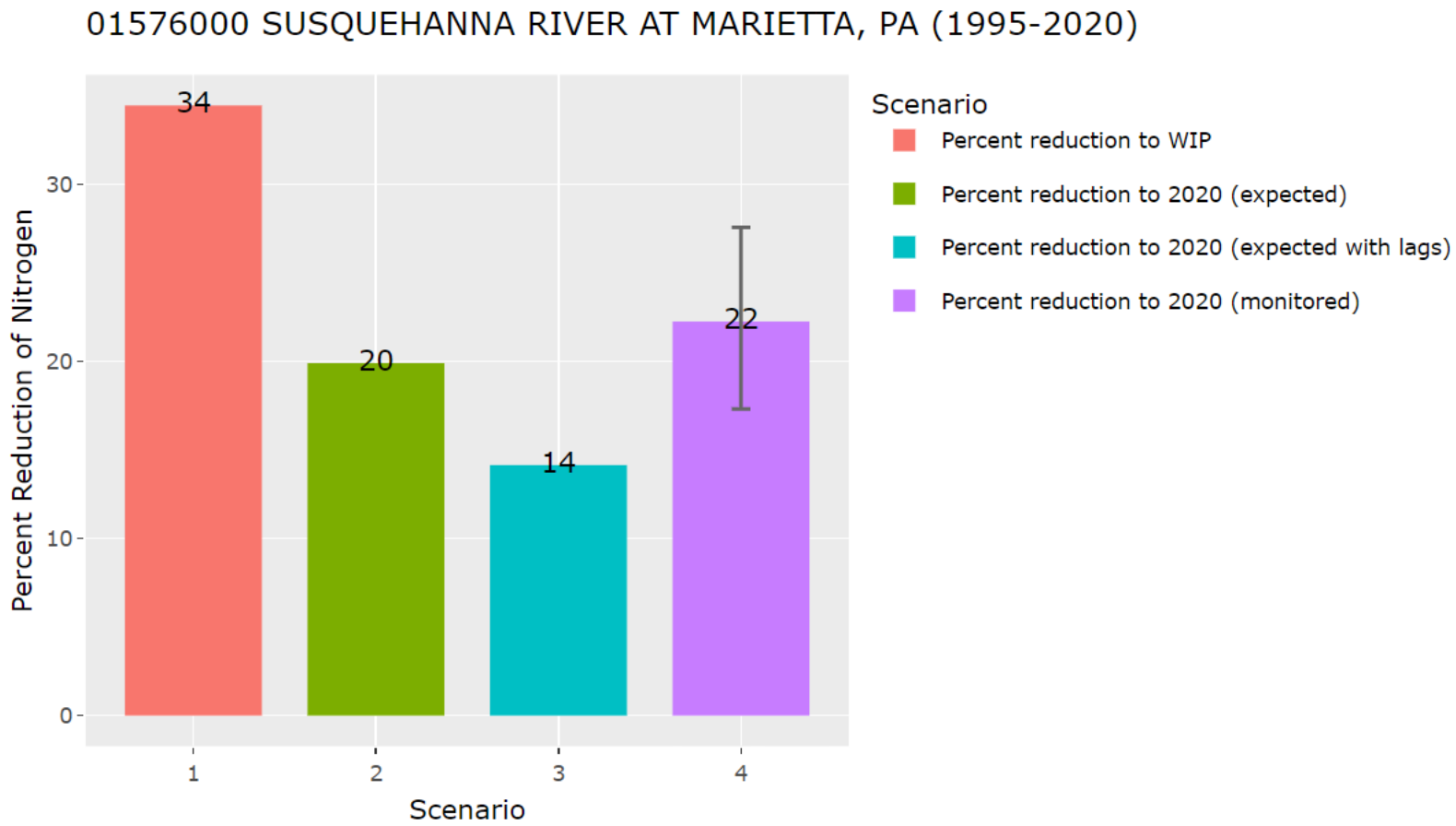
Nitrogen

Specify the monitoring station

01576000 SUSQUEHANNA RIVER AT MARIETTA, PA

Download Data Table

Timeseries | Barplot 1 | Barplot 2 | Data Table | About



https://zhangqian0324.shinyapps.io/CBNTN_TMDL_Indicator/

Station-level dashboard Product

Qian Zhang

Specify the water-quality parameter

Phosphorus

Specify the monitoring station

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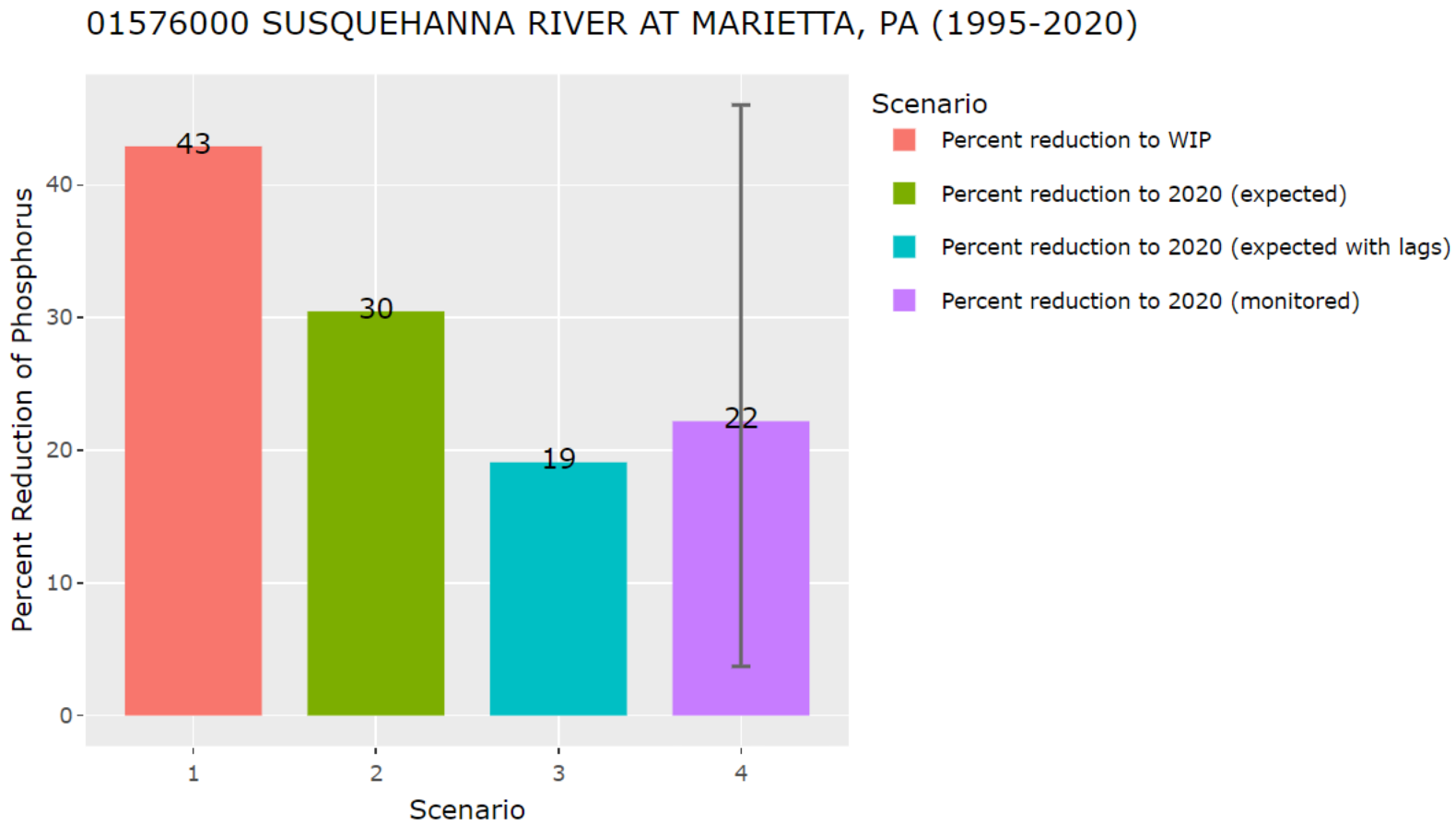

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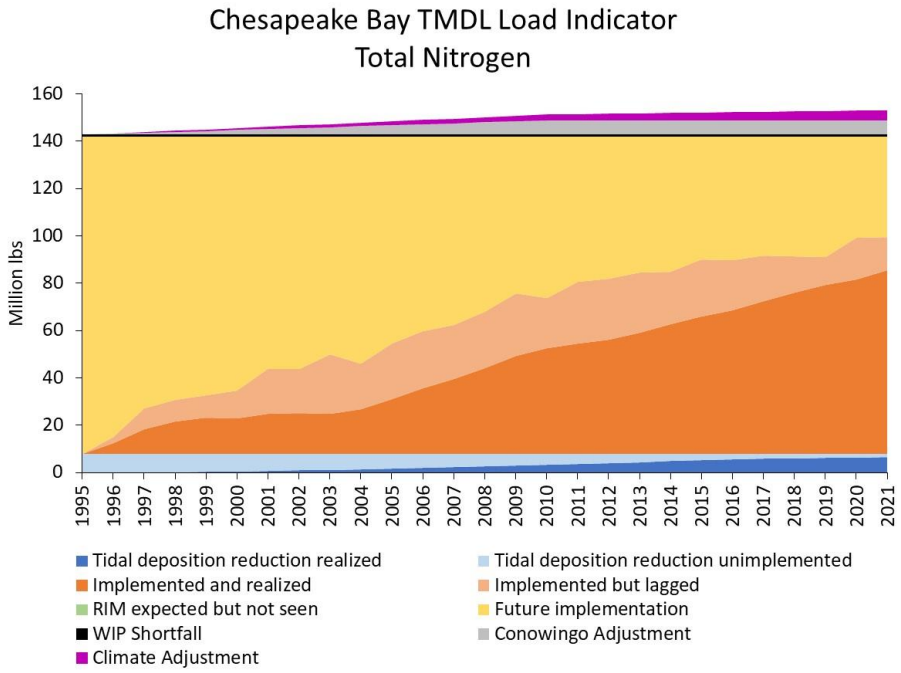
Partnership Vetting

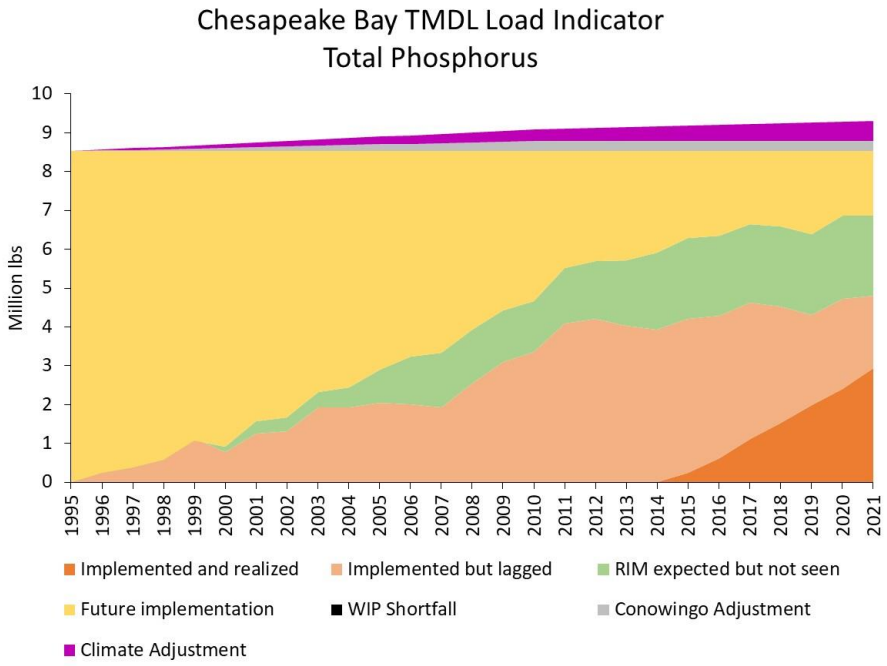
- 9/2021 CBPO discussions
- 7/2022 USGS-led Factors Affecting Trends Group
- 8/2022 Status and Trends Workgroup
- 10/2022 Watershed Technical Workgroup
- 11/2022 WQGIT
- 3/2023 Status and Trends Workgroup

- Each meeting produced recommendations that strengthened the product.

Next Steps: Decision by WQGIT

- Ask to approve the Integrated Watershed TMDL Indicator as a supplemental indicator under the WIP 2025 Outcome





- Begin working with the STWG, CBP web and communications teams

Next Steps

- Add the annual finer-category data to the nontidal data dashboard

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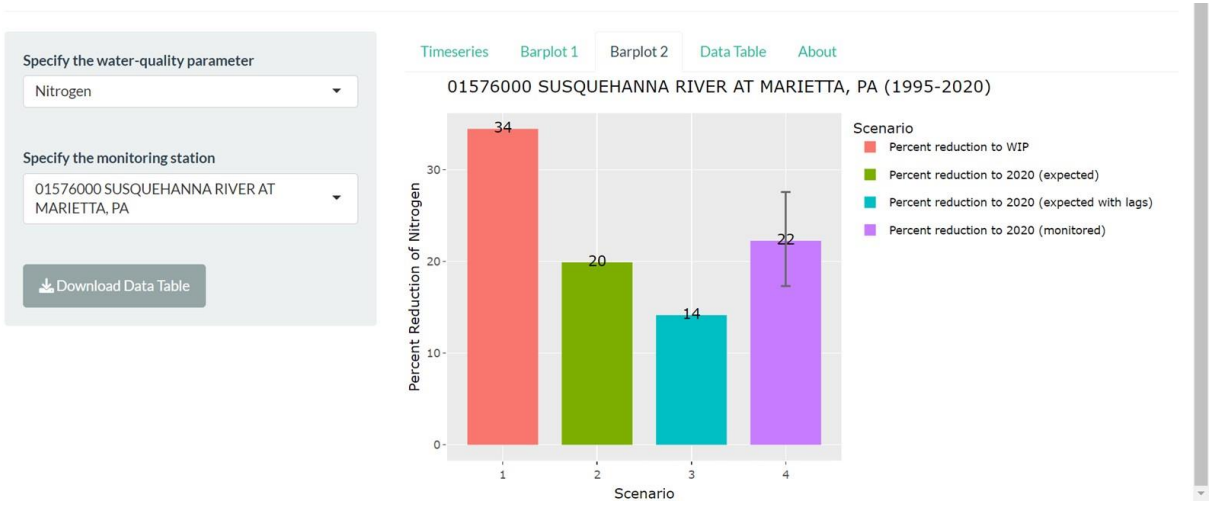
Next Steps

- Continue working on the station-level dashboard product



- Adding a clickable map

Discussion