Update on the Loads to the Bay Indicator

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Context: The Indicator

Indicator Title:

- Nitrogen, Phosphorus, and Suspended Sediment Loads to the Bay

Relevant Outcome(s):

- 2017 and 2025 Watershed Implementation Plans (WIP) Outcome

Relevant Goal(s):

- Water Quality

Location within Framework (i.e., Influencing Factor, Output or Performance):

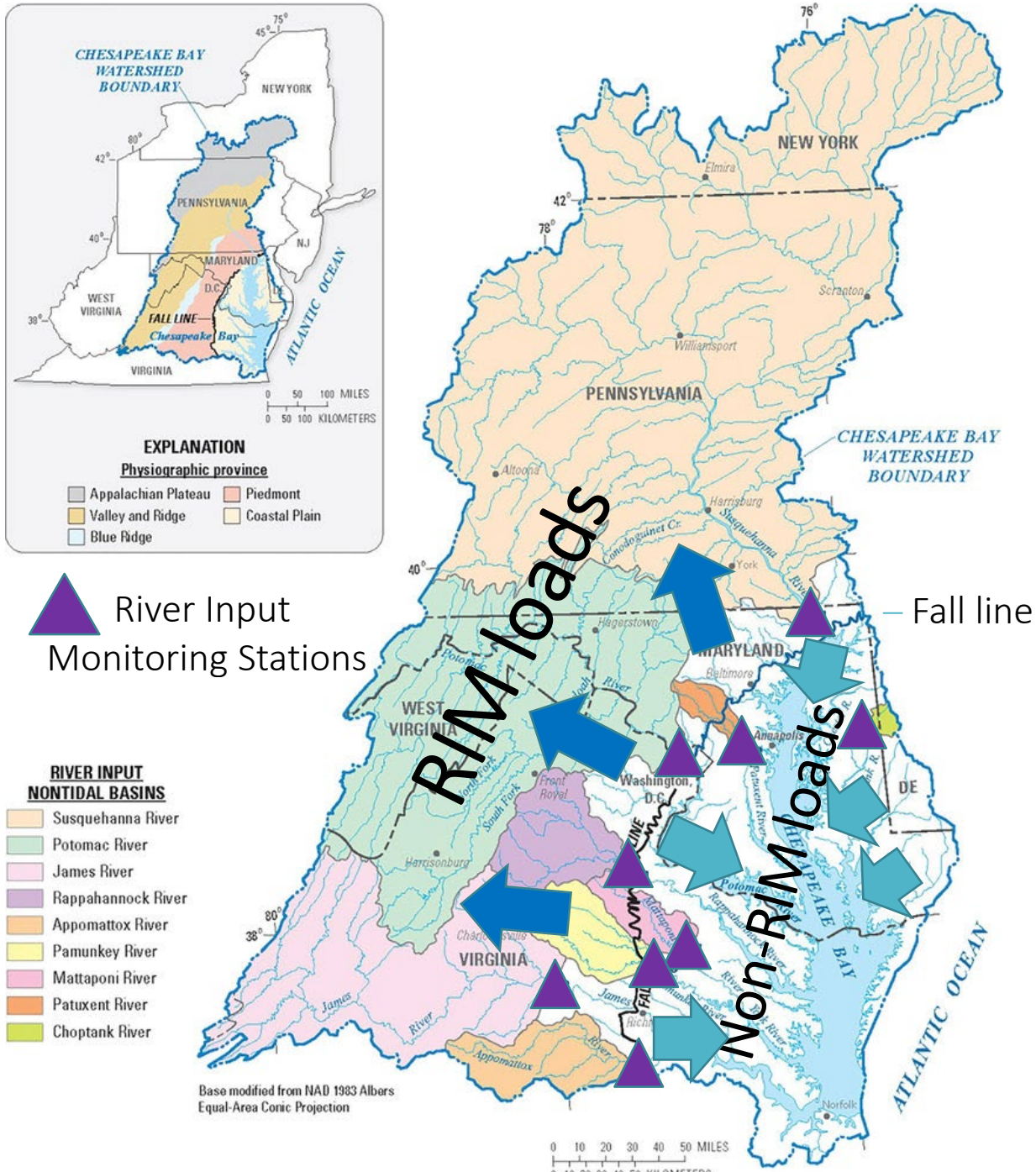
- Performance

Orientation: Terminology

Fall Line

Potomac River – Great Falls

RIM - River Input Monitoring Stations, monitoring sources of loads from the RIM portion of the watershed.



Load computation

Total load

= RIM load *(N, P, SS observed load from USGS at river monitoring stations)*

+ Non-RIM load* *(N, P, SS estimated load from CAST)*

+ Tidal air deposition directly onto bay water *(for N only)*

*Non-RIM load**

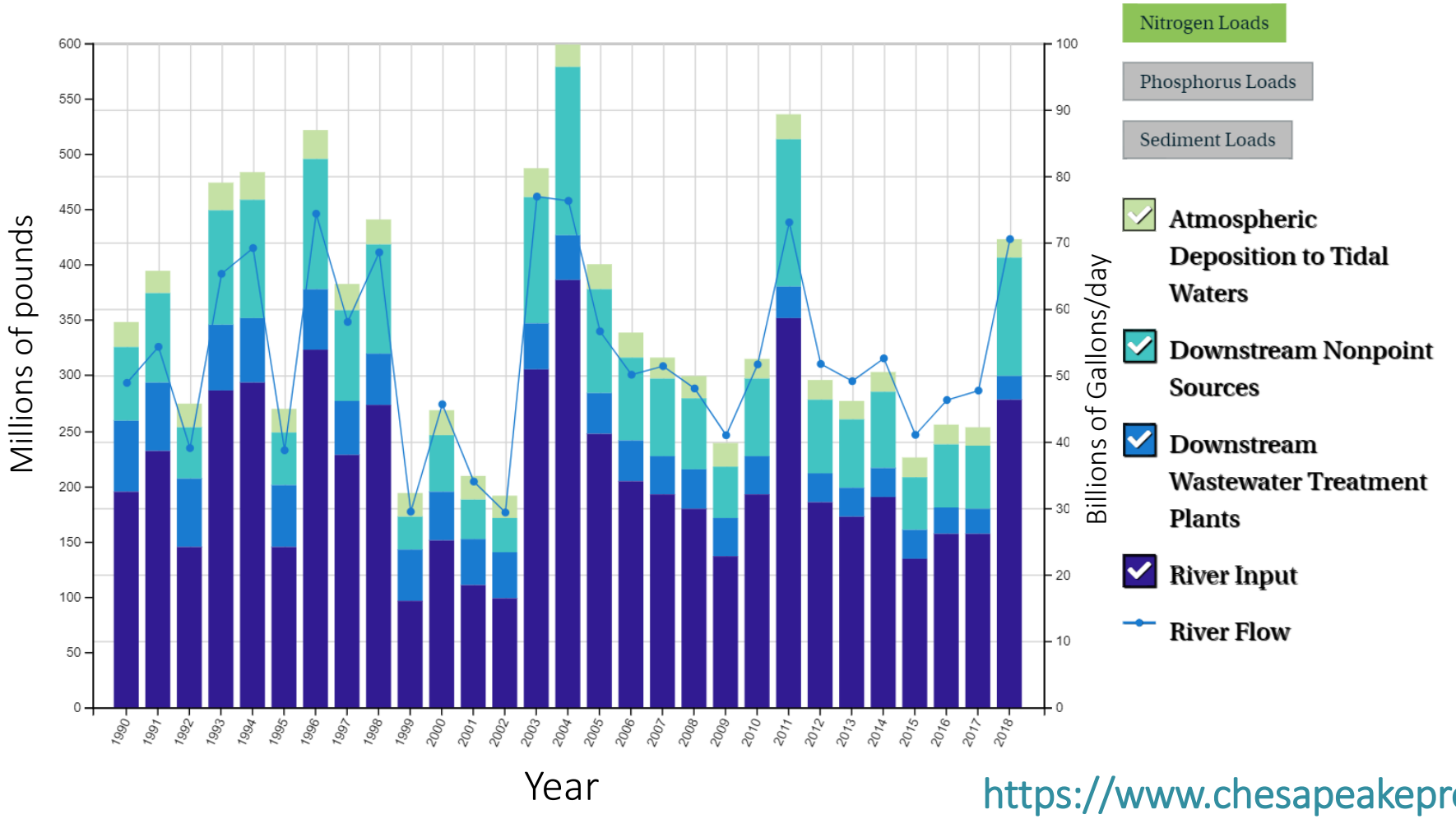
= PS (point source)

+ NPS (non-point source)$_{shoreline}$ (no need to adjust for hydrology)

+ NPS (non-point source)$_{non\text{-}shoreline}$ (need to adjust for hydrology)

Pollution Loads and River Flow to the Chesapeake Bay (1990-2018)

River and Watershed Input of Pollution Loads



https://www.chesapeakeprogress.com/

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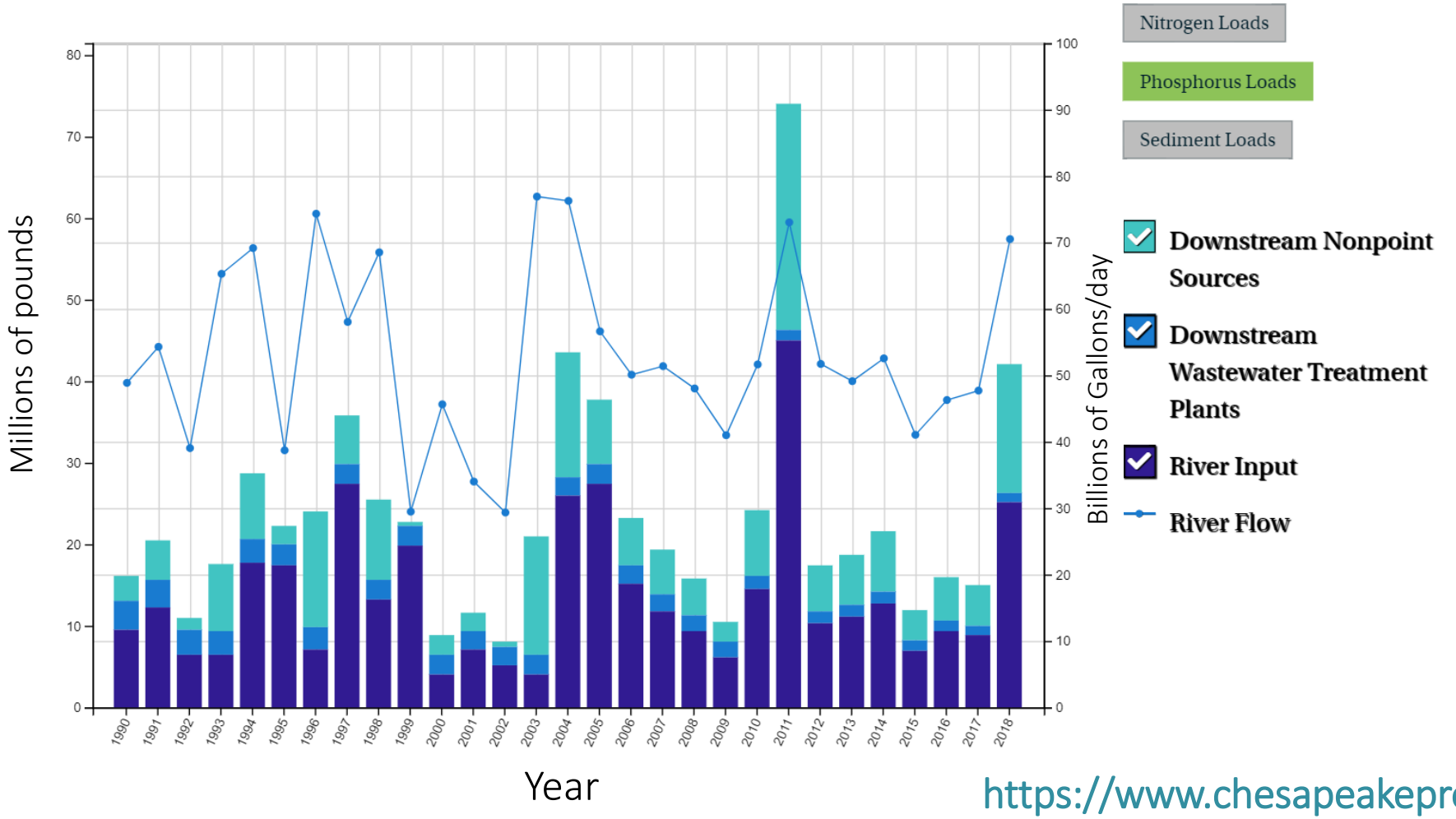

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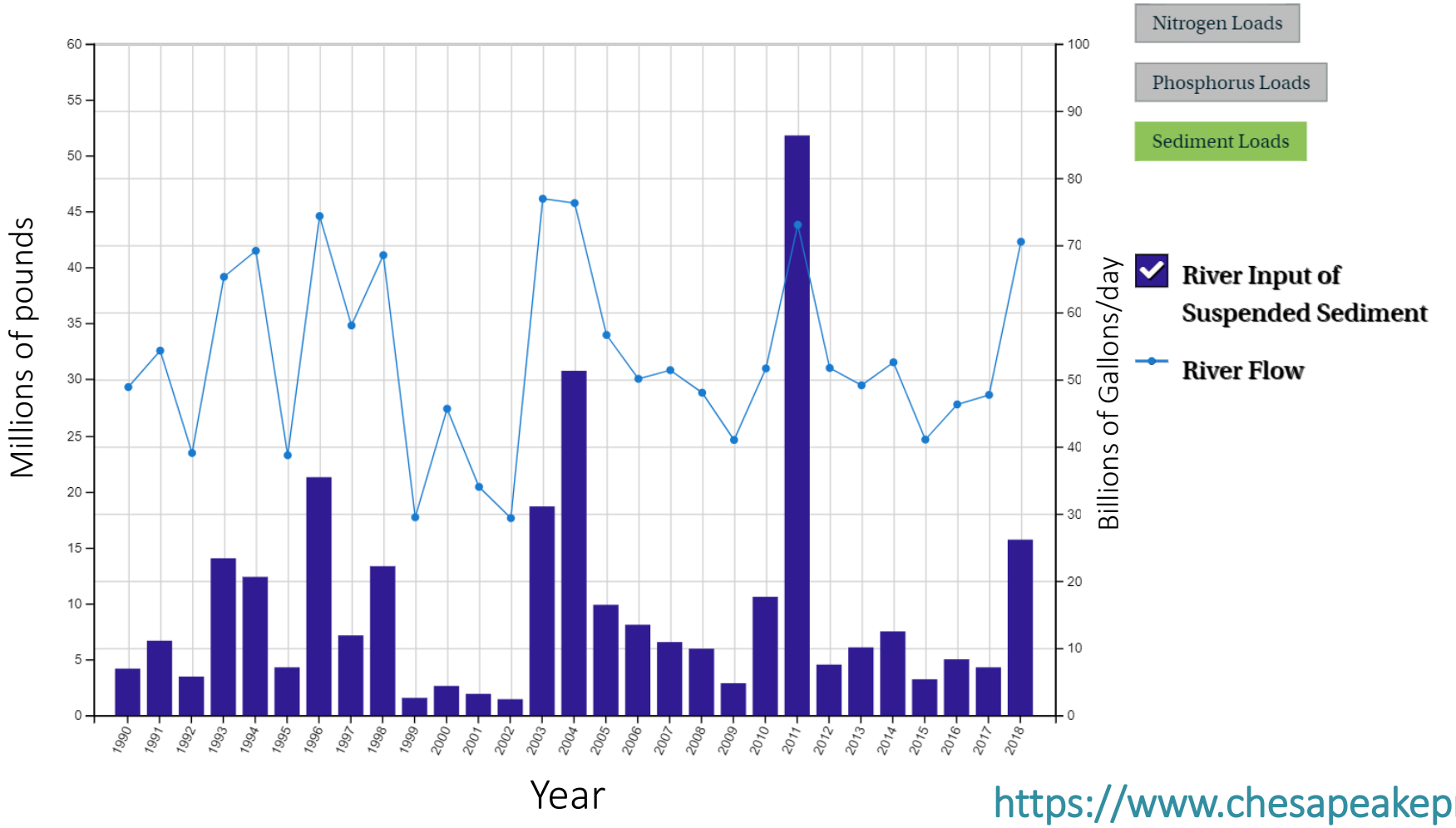

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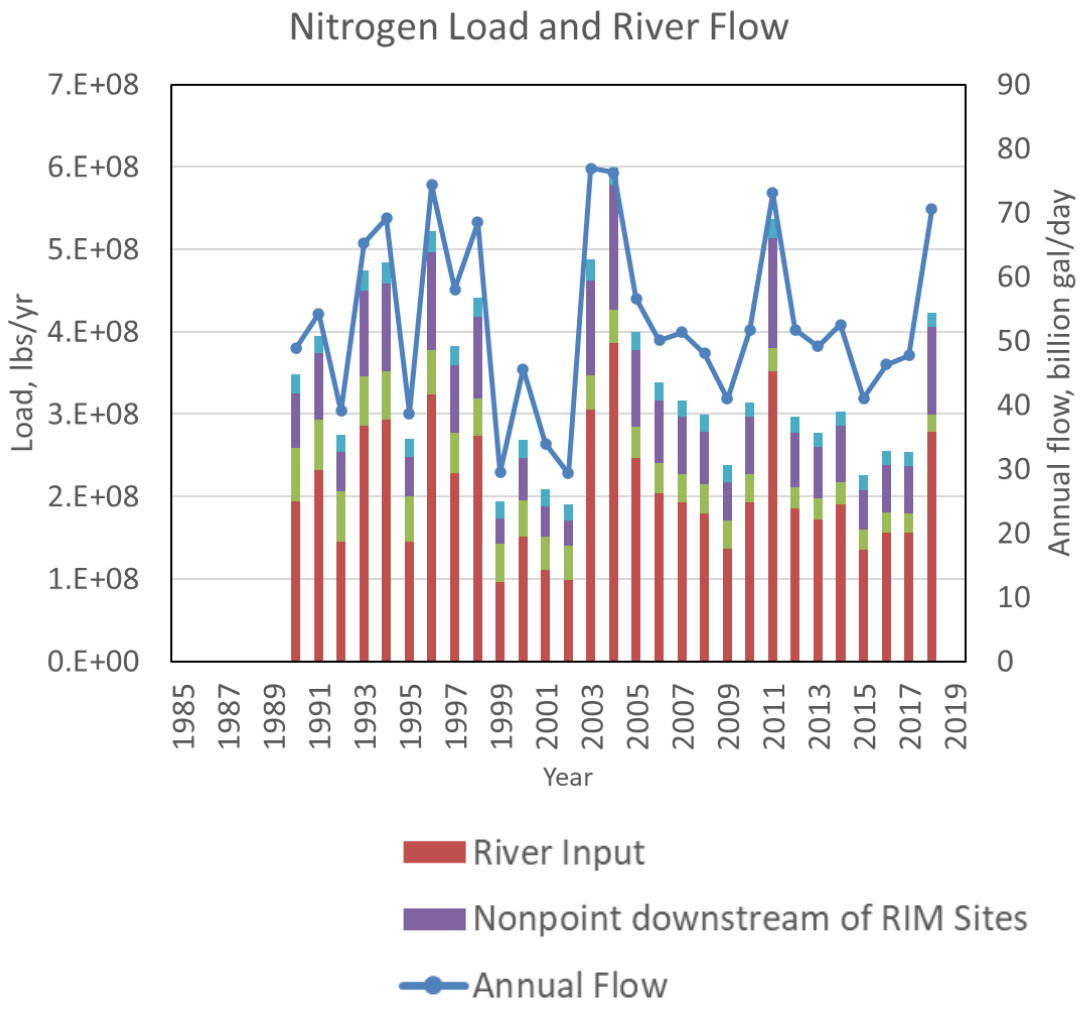
Proposed Changes – leading to no differences

Item	Issue	Proposed Action
1	The term “tidal” was used for phosphorus, whereas “downstream of RIM” was used for nitrogen.	Use “downstream of RIM” for all three constituents.
2	The indicator loads were reported from WY 1990. However, both RIM and non-RIM loads are available from 1985.	Extend the indicator loads back to 1985.
3	Sediment loads were reported only for RIM, while nitrogen and phosphorus loads included non-RIM loads as well.	Include non-RIM loads for sediment to bring consistency with the assessments of nitrogen and phosphorus loads.

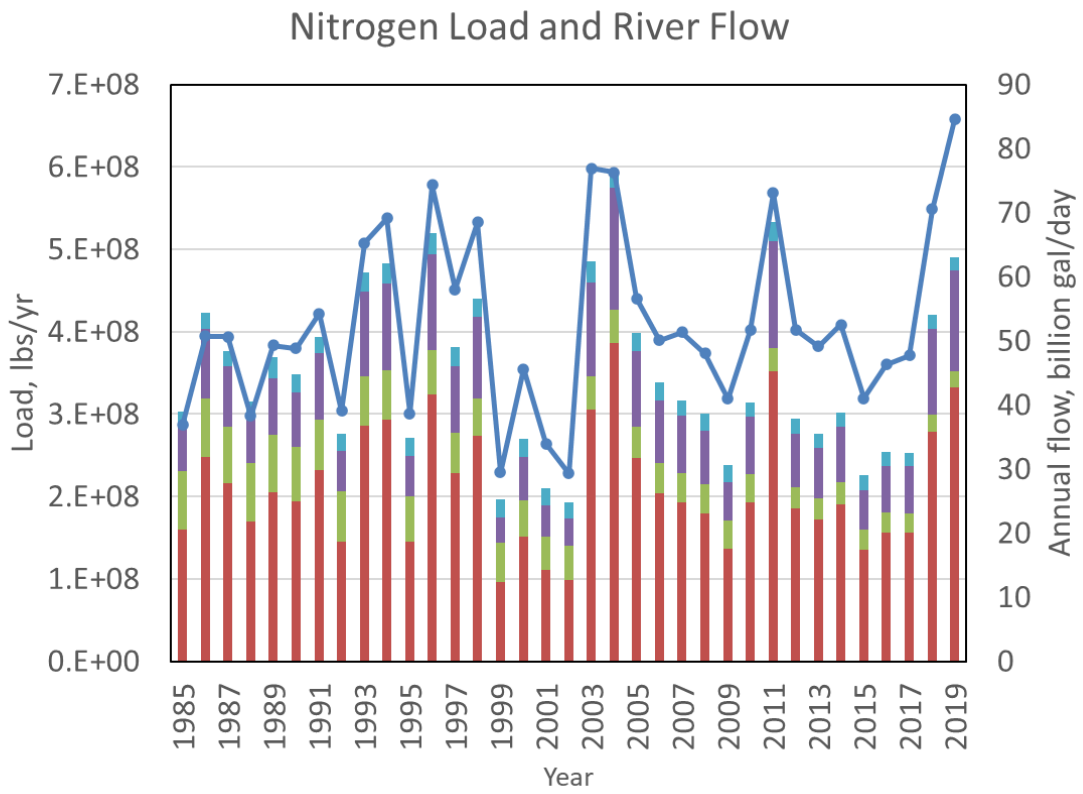
Proposed Changes – leading to some differences

Item	Issue	Proposed Action
4	The indicator loads were reported based on CAST-2017. However, CAST-2019 has become available.	Update the indicator loads to CAST-2019.
5	Nitrogen atmospheric deposition data from CAST had a minor error that was subsequently identified and corrected.	Use the corrected atmospheric deposition data for the period of 1985 through 2019.
6	Shoreline loads were included for phosphorus in the last update. However, it was realized that it should not have been flow adjusted.	Flow adjust the non-shoreline part of the non-RIM NPS loads.

1990-2018 (Last Year)



1985-2019 (Update)



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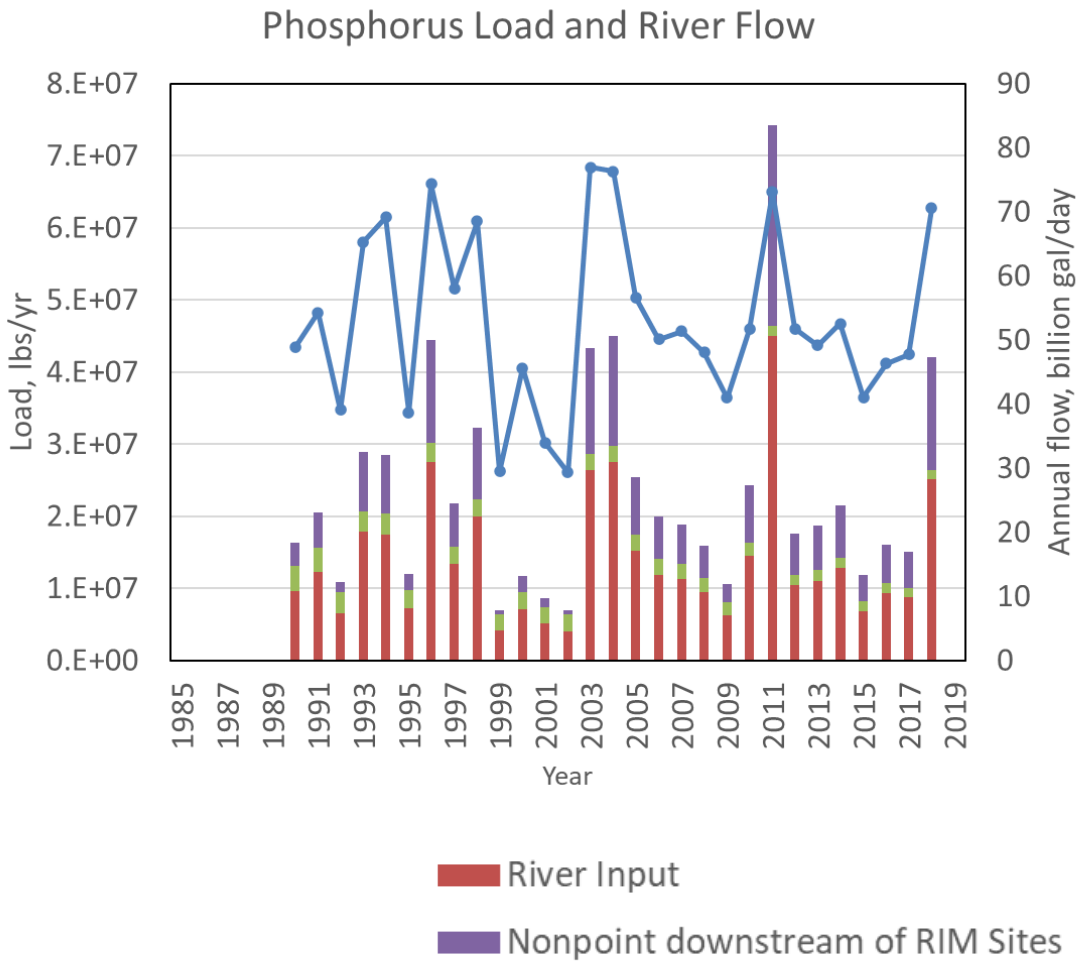

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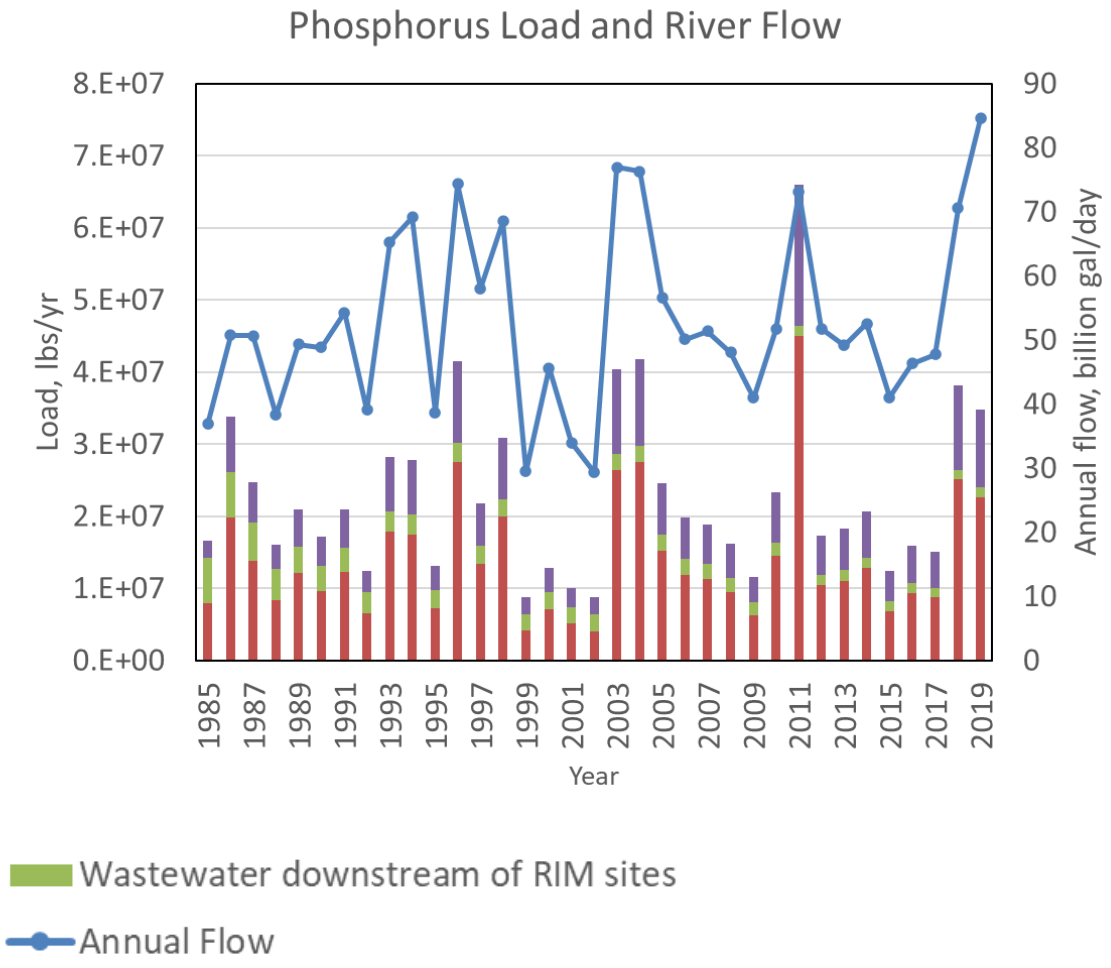

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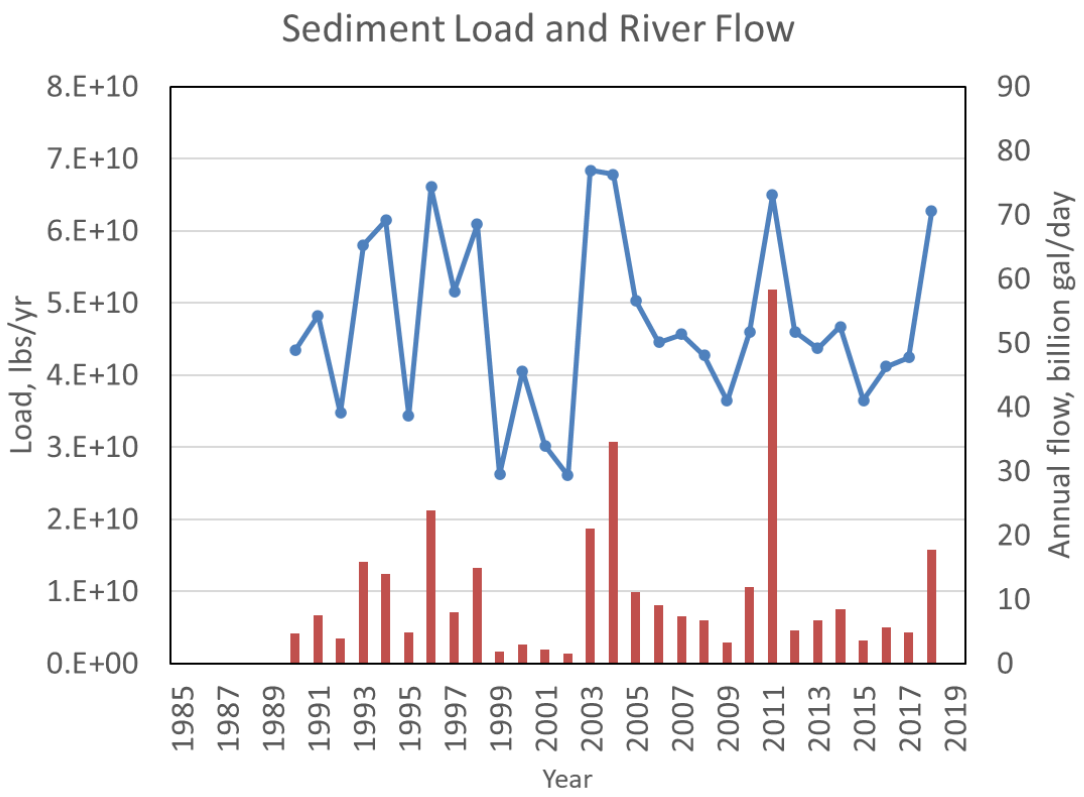

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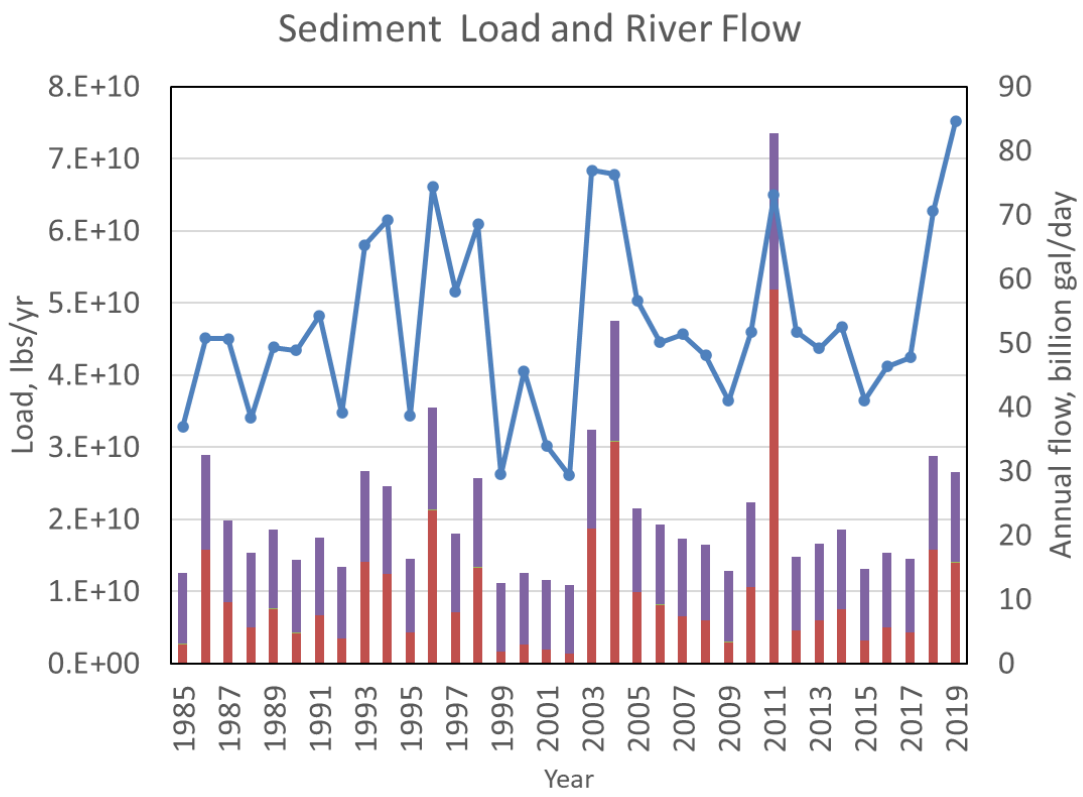
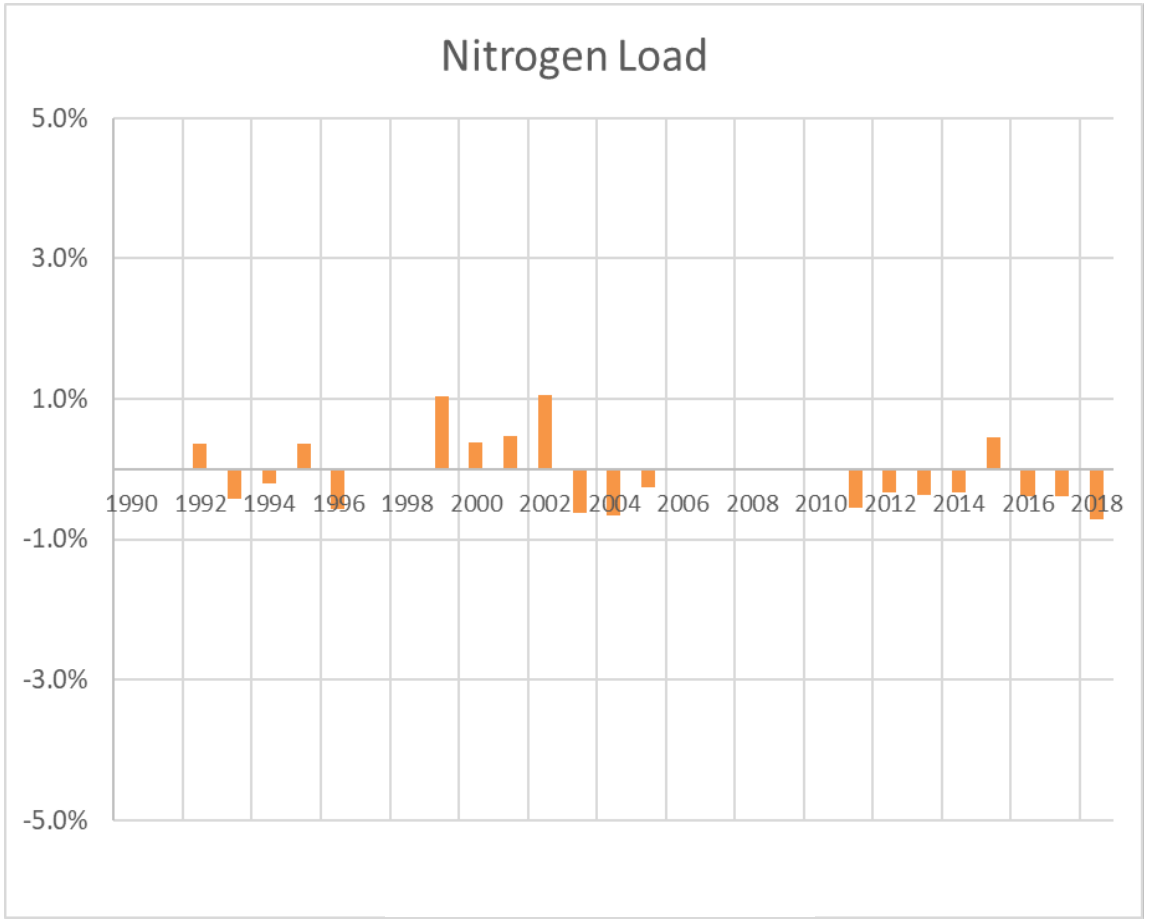
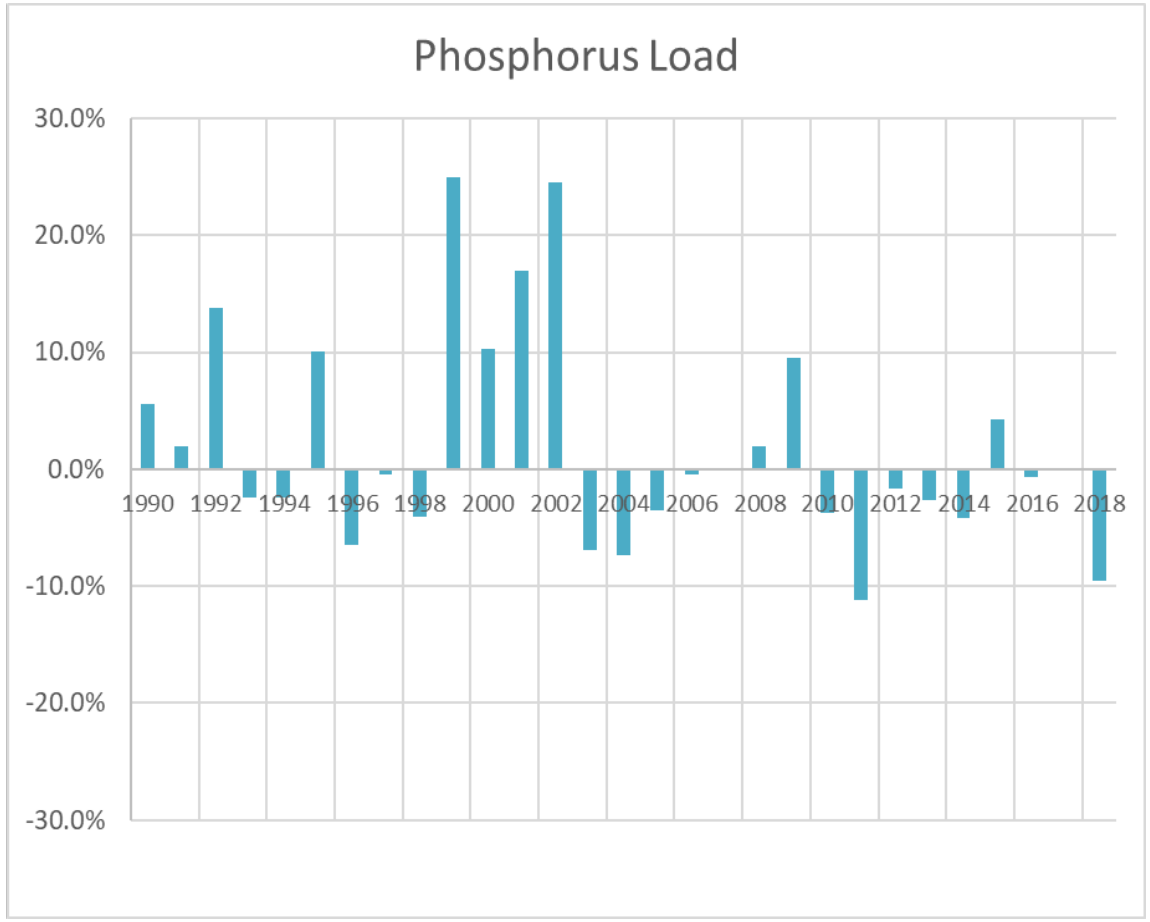


Percent difference between current and previous loads





Flow +60%

Absolute difference between 2019 and long-term mean

Constituent	River Input	Wastewater downstream of RIM sites	Nonpoint downstream of RIM Sites	Atmospheric Deposition to Tidal Waters	Total
	(10^6 lbs/yr)	(10^6 lbs/yr)	(10^6 lbs/yr)	(10^6 lbs/yr)	(10^6 lbs/yr)
N	+121	-25	+48	-4.1	+140
P	+8.7	-1.2	+4.4	-	+12
SS	+4307	-20	+1076	-	+5371

Percent difference between 2019 and long-term mean

Constituent	River Input	Wastewater downstream of RIM sites	Nonpoint downstream of RIM Sites	Atmospheric Deposition to Tidal Waters	Total
N	+58%	-56%	+63%	-20%	+40%
P	+63%	-48%	+69%	-	+52%
SS	+45%	-47%	+9%	-	+25%

Flow +20%

Absolute difference between 2019 and 2018

Constituent	River Input	Wastewater downstream of RIM sites	Nonpoint downstream of RIM Sites	Atmospheric Deposition to Tidal Waters	Total
	(10^6 lbs/yr)	(10^6 lbs/yr)	(10^6 lbs/yr)	(10^6 lbs/yr)	(10^6 lbs/yr)
N	+54	-1.7	+19	-0.15	+71
P	-2.5	+0.19	-1.1	-	-3.3
SS	-1703	+1.1	-465	-	-2200

Percent difference between 2019 and 2018

Constituent	River Input	Wastewater downstream of RIM sites	Nonpoint downstream of RIM Sites	Atmospheric Deposition to Tidal Waters	Total
N	+19%	-8%	+18%	-1%	+17%
P	-10%	+16%	-9%	-	-9%
SS	-11%	+5%	-4%	-	-8%