

Water Quality Trends Workgroup

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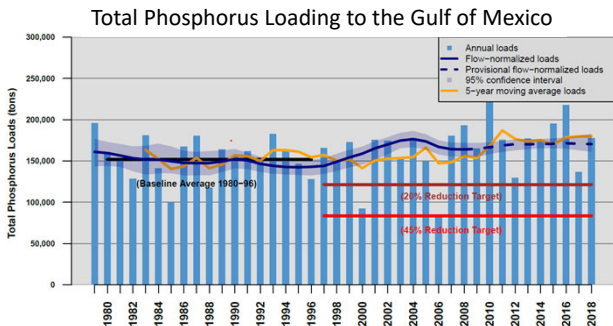
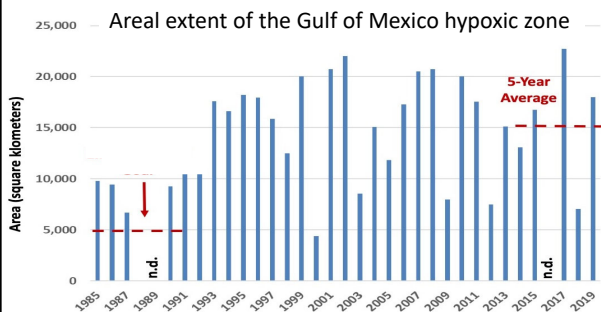
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Current Metrics Used by the Hypoxia Task Force (HTF)



Bottom area of dissolved oxygen < 2 mg/L. Source: Dr. Nancy Rabalais (Louisiana Universities Marine Consortium) and Dr. Eugene Turner (Louisiana State University). <https://gulphypoxia.net/research/shelfwide-cruises/>

Source: U.S. Geological Survey. http://kwsccr.usgs.gov/~cjee/mississippi_loads_trend2020all/#/GULF



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New HTF metrics

To increase awareness of nutrient reduction efforts upstream in the Mississippi River Basin, the HTF is considering new metrics to complement current metrics

1. Point source reduction efforts
2. Nonpoint source reduction efforts
3. Water quality trends within the basin

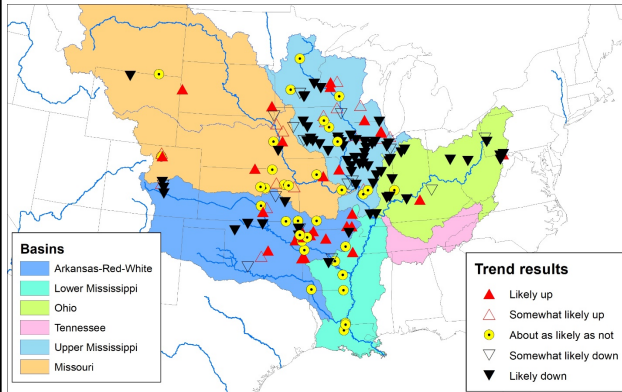


Recommendations for within-basin water quality trends

What metrics?	When?	Across what time period?	Which water quality parameters*?	How?
<ul style="list-style-type: none"> • Load • Concentration 	<ul style="list-style-type: none"> • Annually • Spring 	<p>Multiple periods:</p> <ul style="list-style-type: none"> • HTF Baseline (1985-1996) to 2017 • 10 year: 2007-2017 • 20 or 30 year: 1987- 2017 or 1992-2017 	<ul style="list-style-type: none"> • Nitrate • Total Nitrogen • Total Phosphorus • Dissolved Phosphorous • Orthophosphate • Sediment • Turbidity 	<p>WRTDS: Weighted Regressions on Time, Discharge, and Season</p>
<p>* Not all sites will have data for all water quality parameters</p>	<p>Note: The choice of trend method reflects the workgroup's decision to account for streamflow/precipitation changes and to evaluate significance and uncertainty. Trends will be parsed into the amount of change attributed to trends in streamflow versus changes in watershed management, such as changes in point or non-point sources.</p>			

Case study illustration

Trends in annual flow-normalized nitrate loads between 2002 and 2012 at 166 sites in the Mississippi-Atchafalaya River Basin



Source: Network Controls on Mean and Variance of Nitrate Loads from the Mississippi River to the Gulf of Mexico, Crawford et al., <https://doi.org/10.2134/jeq2018.12.0435>



- Widespread decreases from 2002-2012
 - Largest decreases occurred at sites with the highest loads in 2002
- Despite these reductions, little change occurred downstream where the Mississippi River enters the Gulf
 - To meet HTF nutrient reduction targets, larger and/or more widespread decreases are needed upstream in the basin
 - Legacy nutrient accumulation may be delaying the response to nutrient management
- An updated analysis may have different results and/or different sites

Within-basin results offer an opportunity for the HTF to highlight success stories and gain important insight into where additional management could be most helpful

Partnership with the National Great Rivers Research and Education Center

Next steps

- Identification of monitoring sites with required data
- Discussion of available sites; consider using a subset based on priority information needs
- Follow up with Hypoxia Task Force for further consideration
 - Visuals, storyline, and dashboard for displaying trend results
 - Evaluation of any differences with trend analyses done within state agencies

