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Nitrate and Phosphorus Loads from Illinois Rivers

2023 Biennial Update

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U.S. Geological Survey

Methods

Estimate change in nutrient loads from Illinois' eight largest rivers

- *baseline*: loads during water years 1980–1996 estimated by periodic sampling
- *current*: loads during water years 2017–2021 estimated by continuous monitoring
- flow-adjusted loads: flow-weighted concentration multiplied by mean flow
- error bars estimate interannual variability

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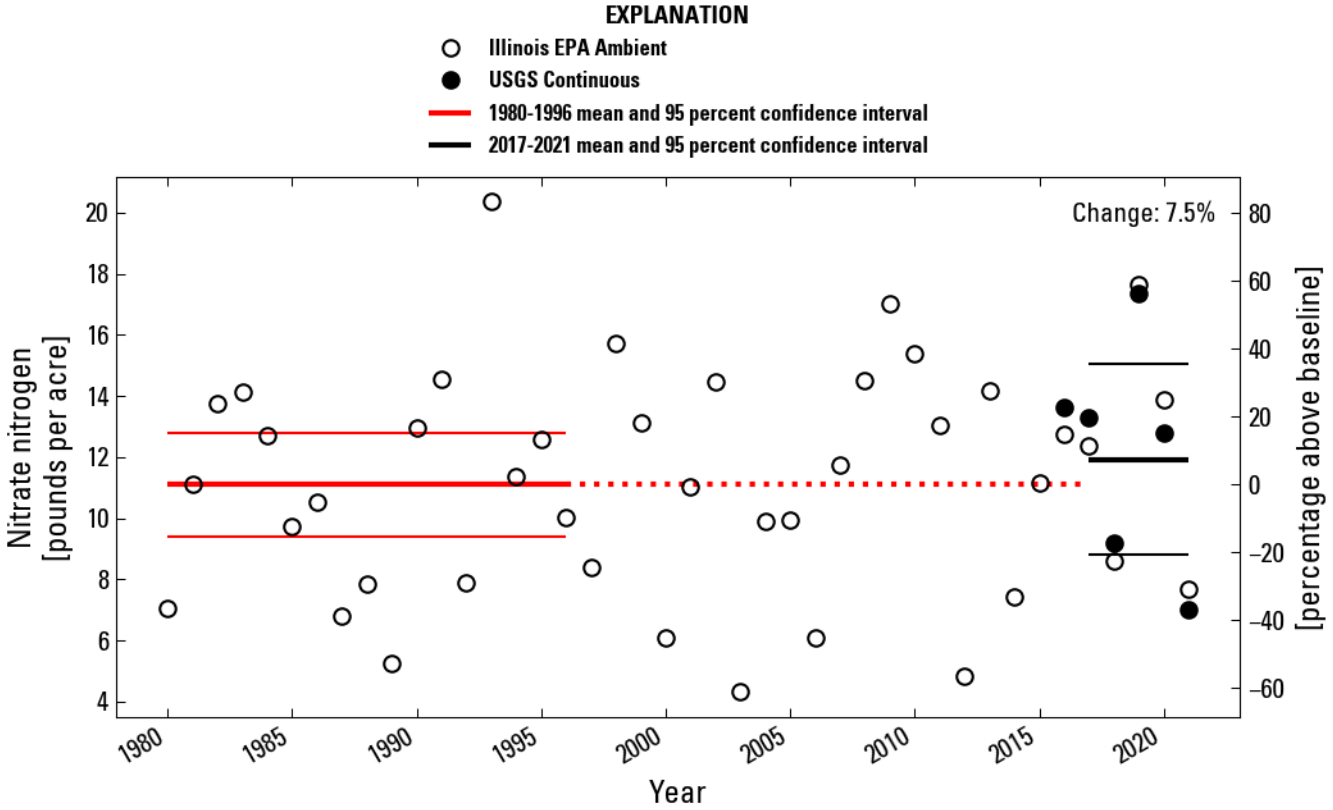
Statewide nitrate yield



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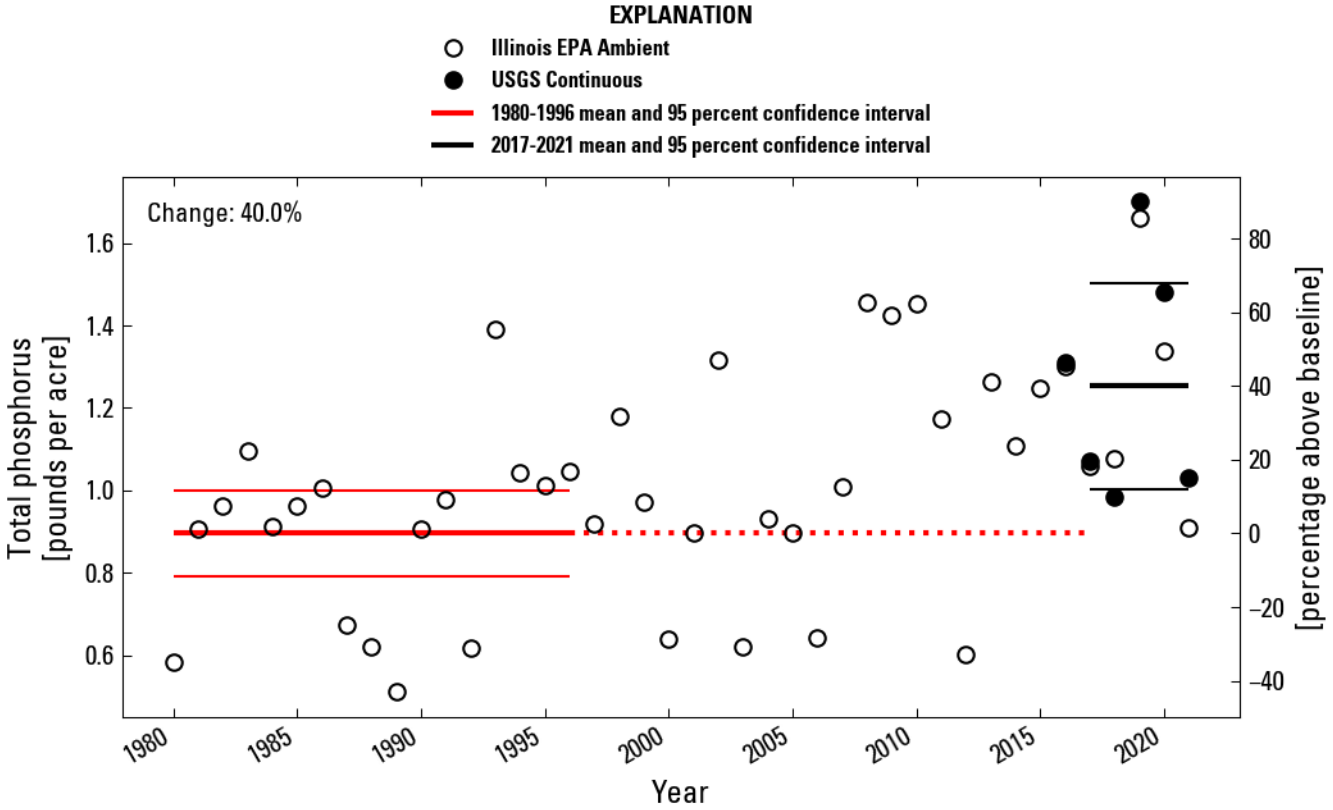
Statewide phosphorus yield



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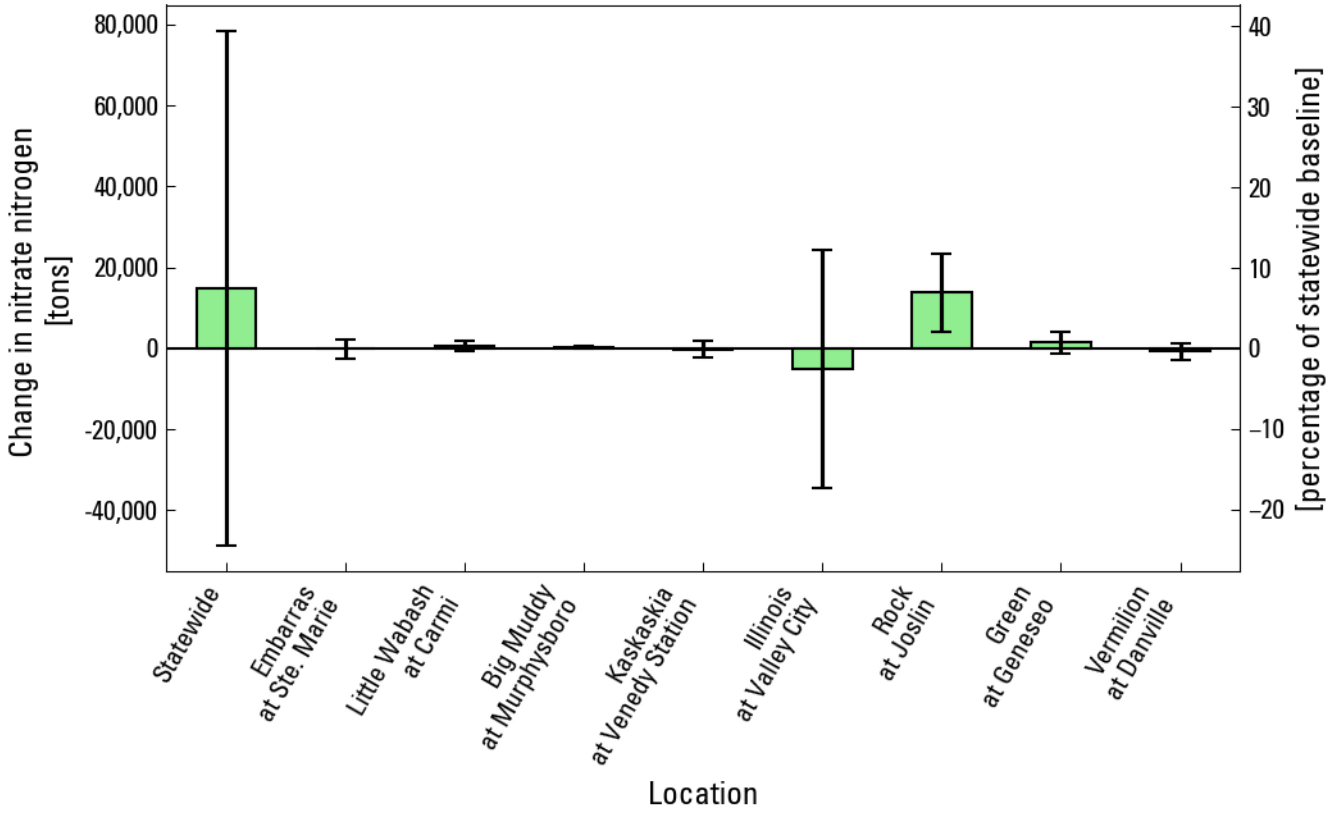
Change in nitrate relative to baseline



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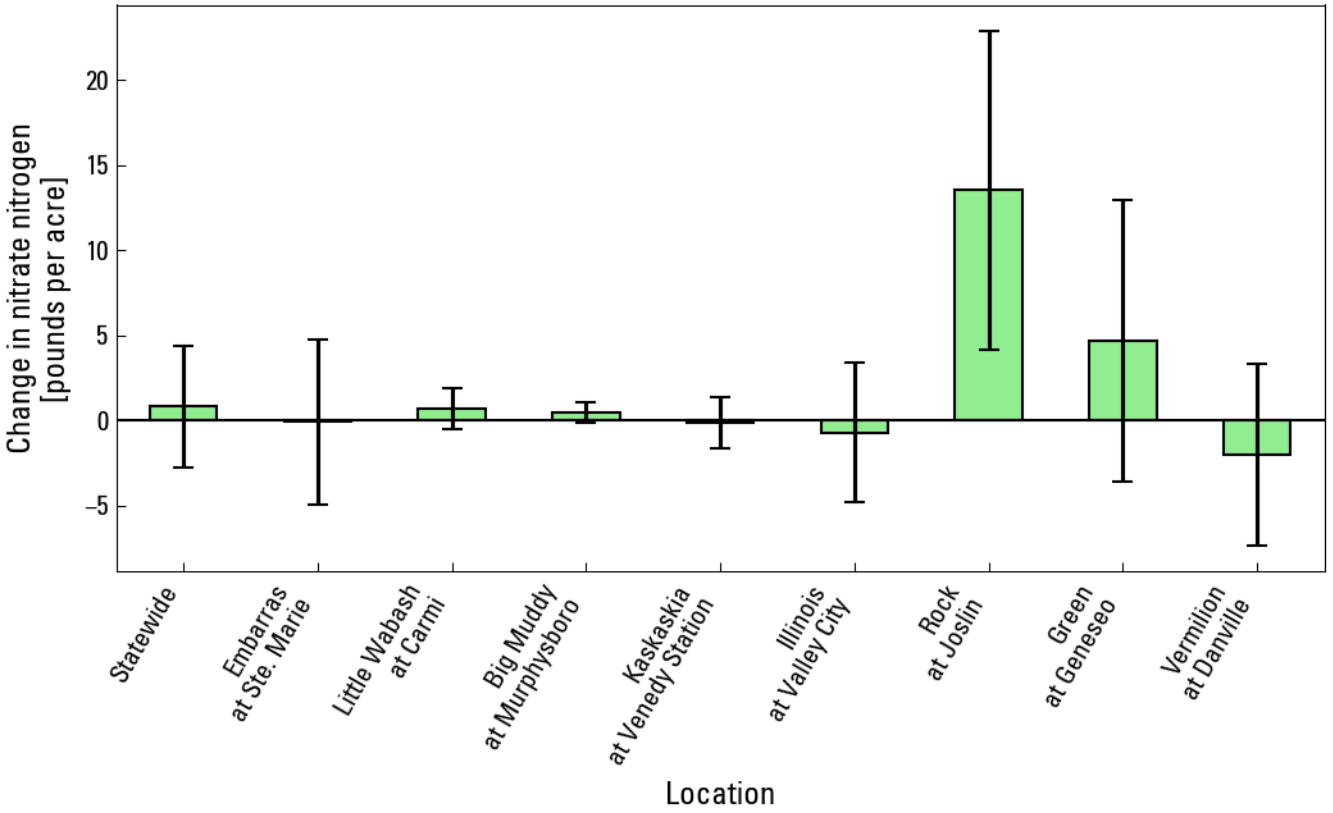
Change in nitrate relative to baseline



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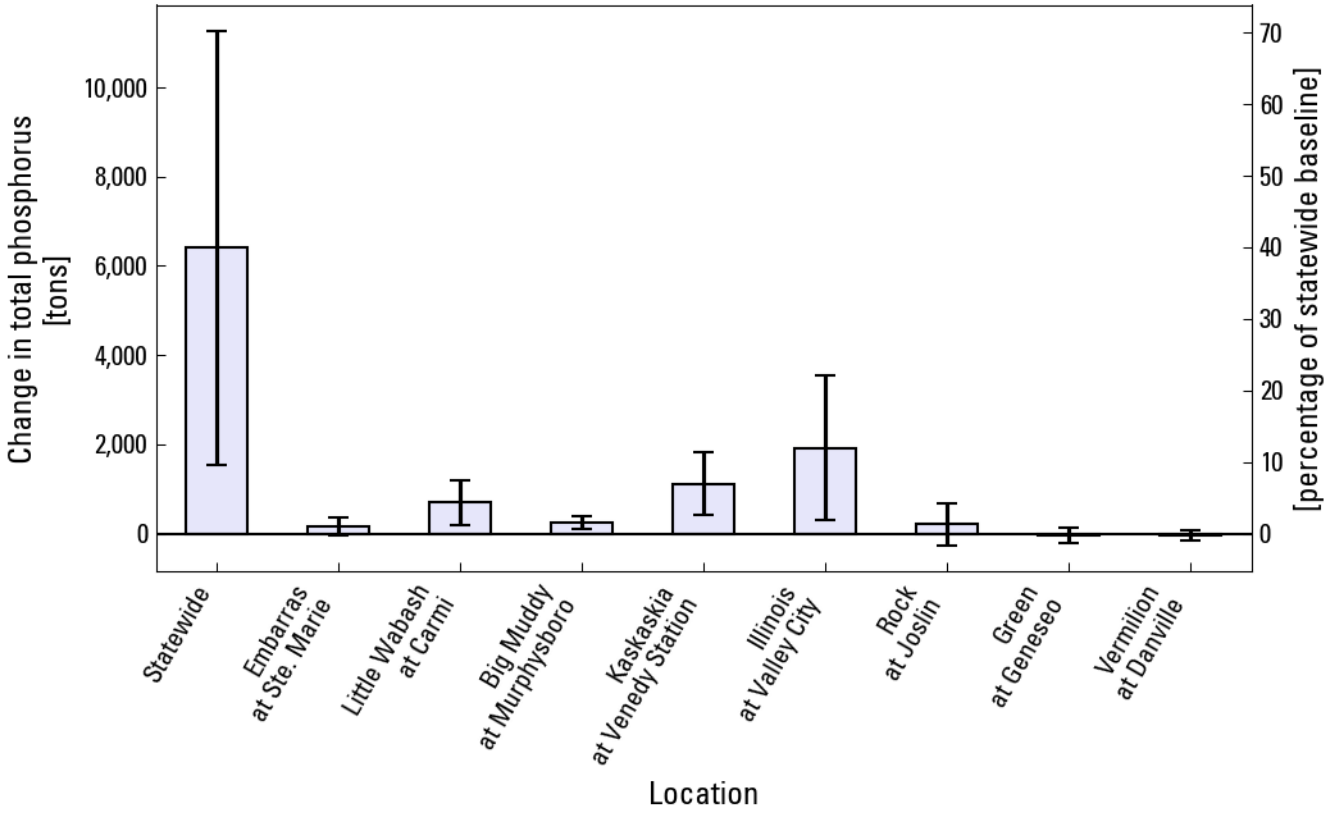
Change in phosphorus relative to baseline



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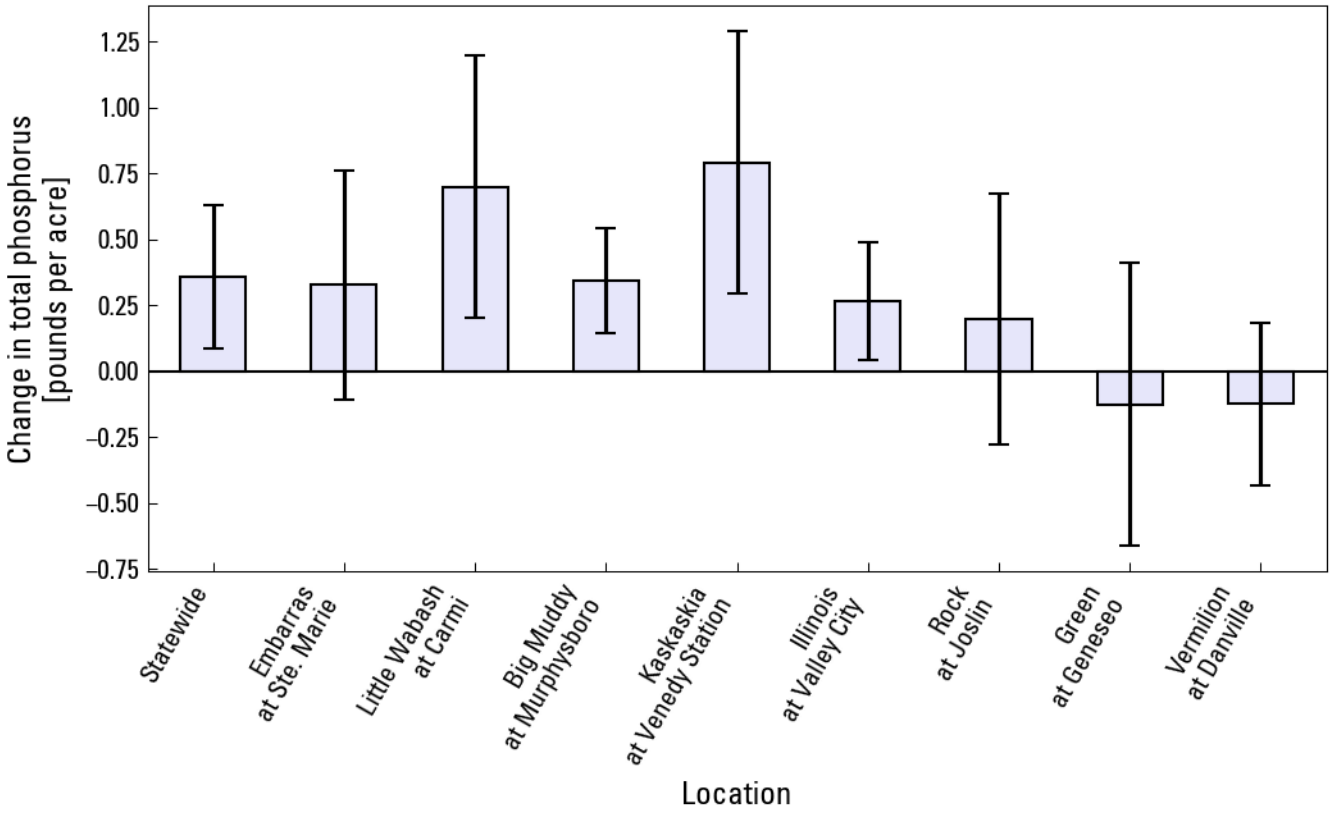
Change in phosphorus relative to baseline



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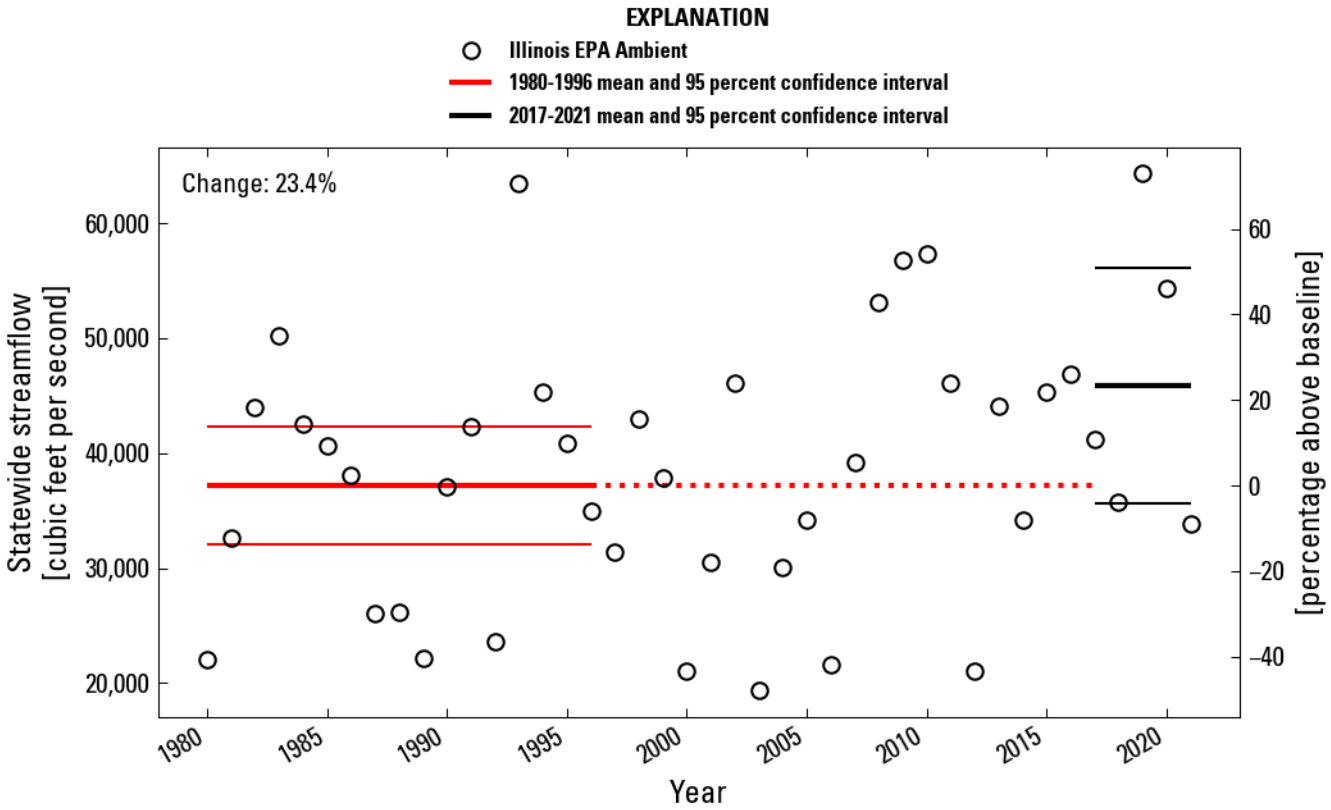
Statewide streamflow



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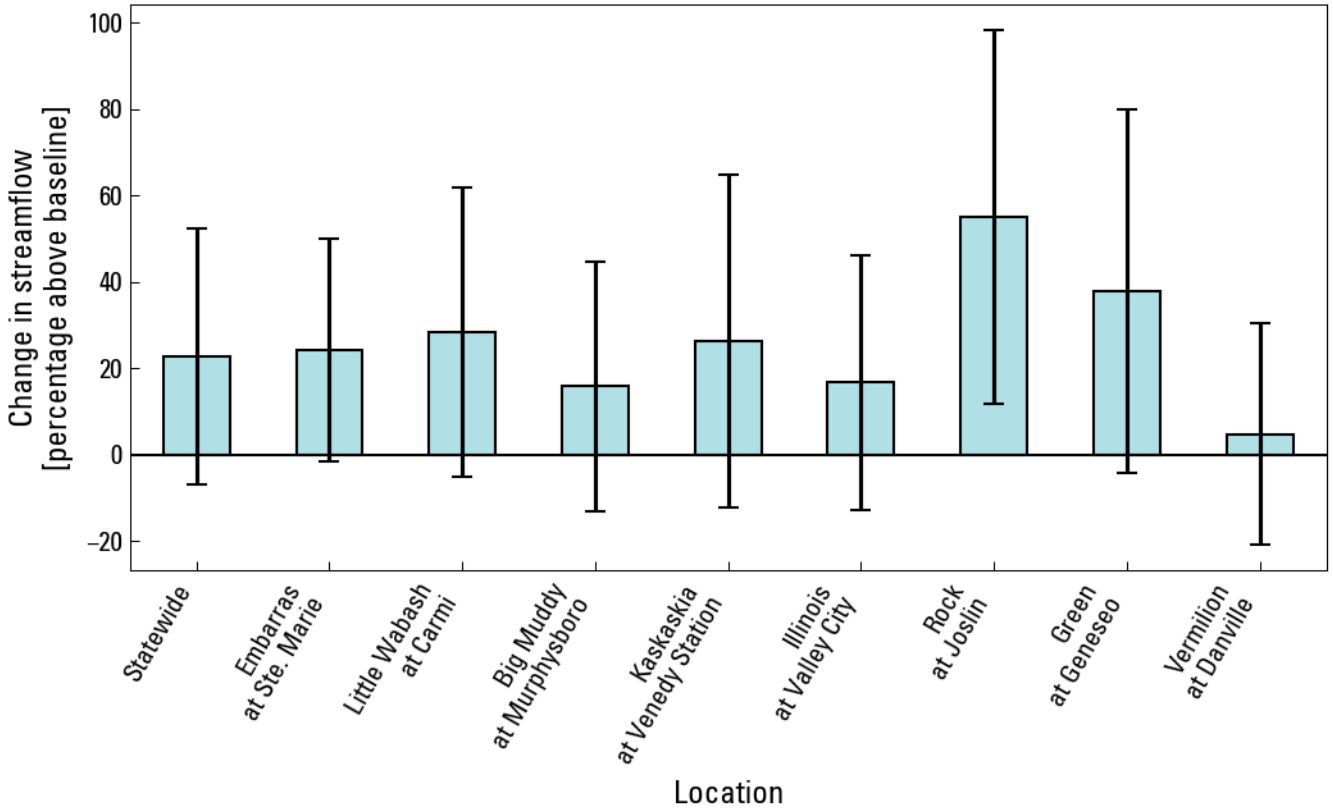
Change in streamflow relative to baseline



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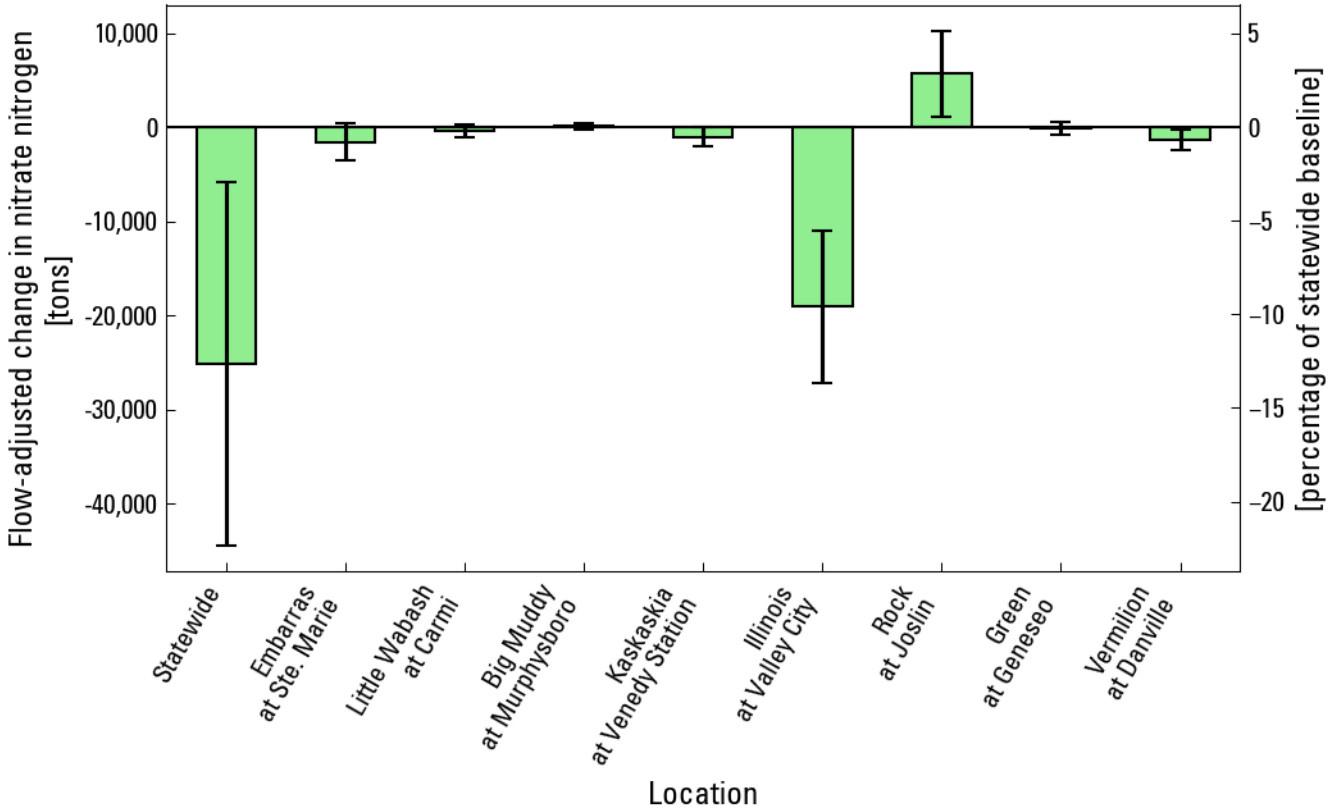
Change in flow-adjusted nitrate load



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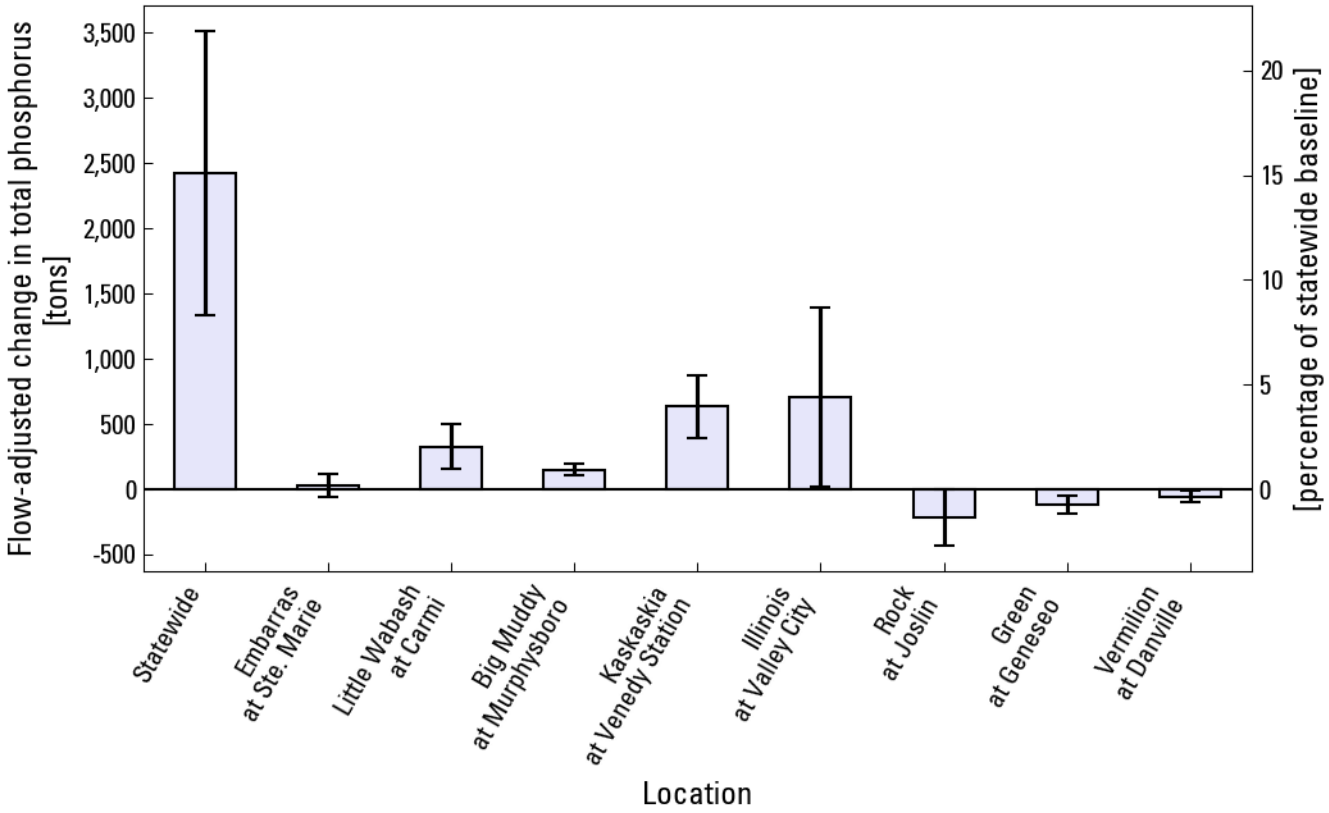
Change in flow-adjusted phosphorus load



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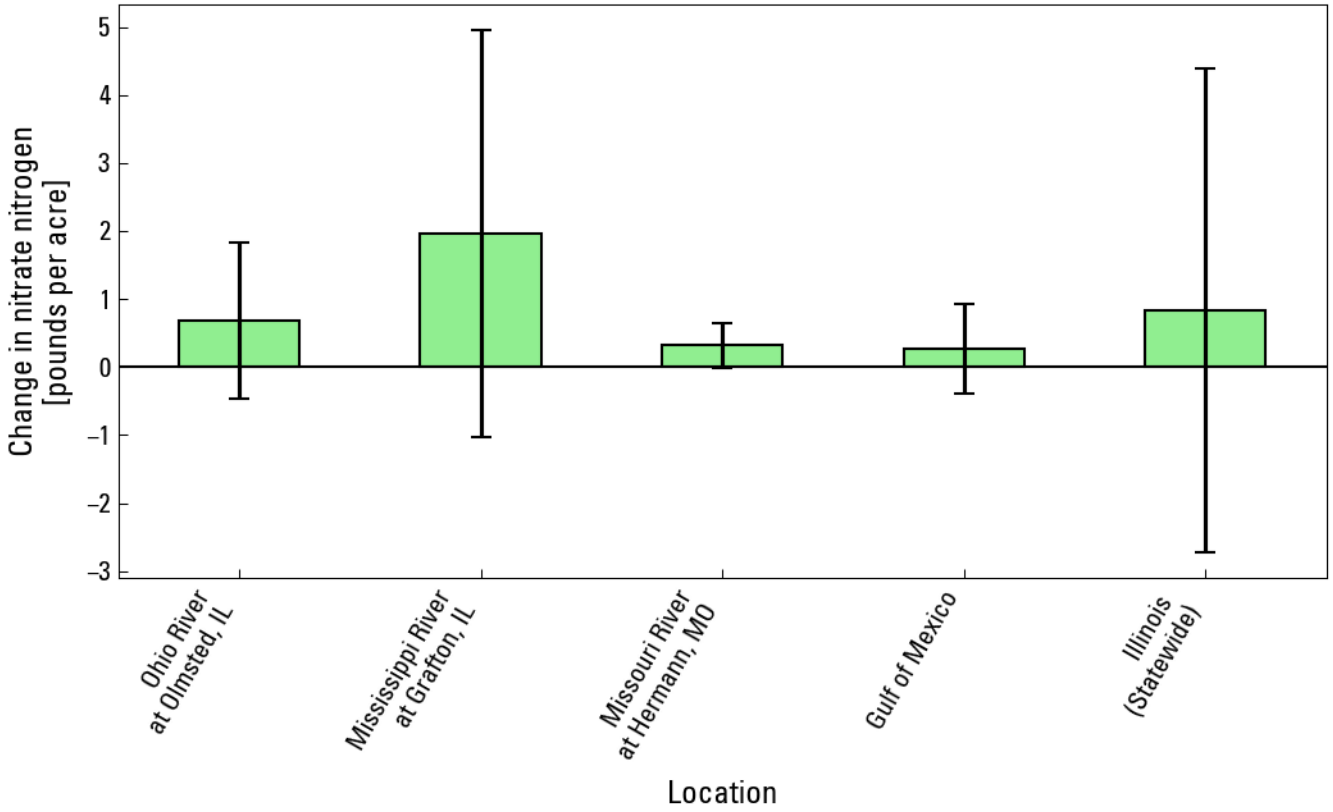
Change in nitrate yield relative to baseline



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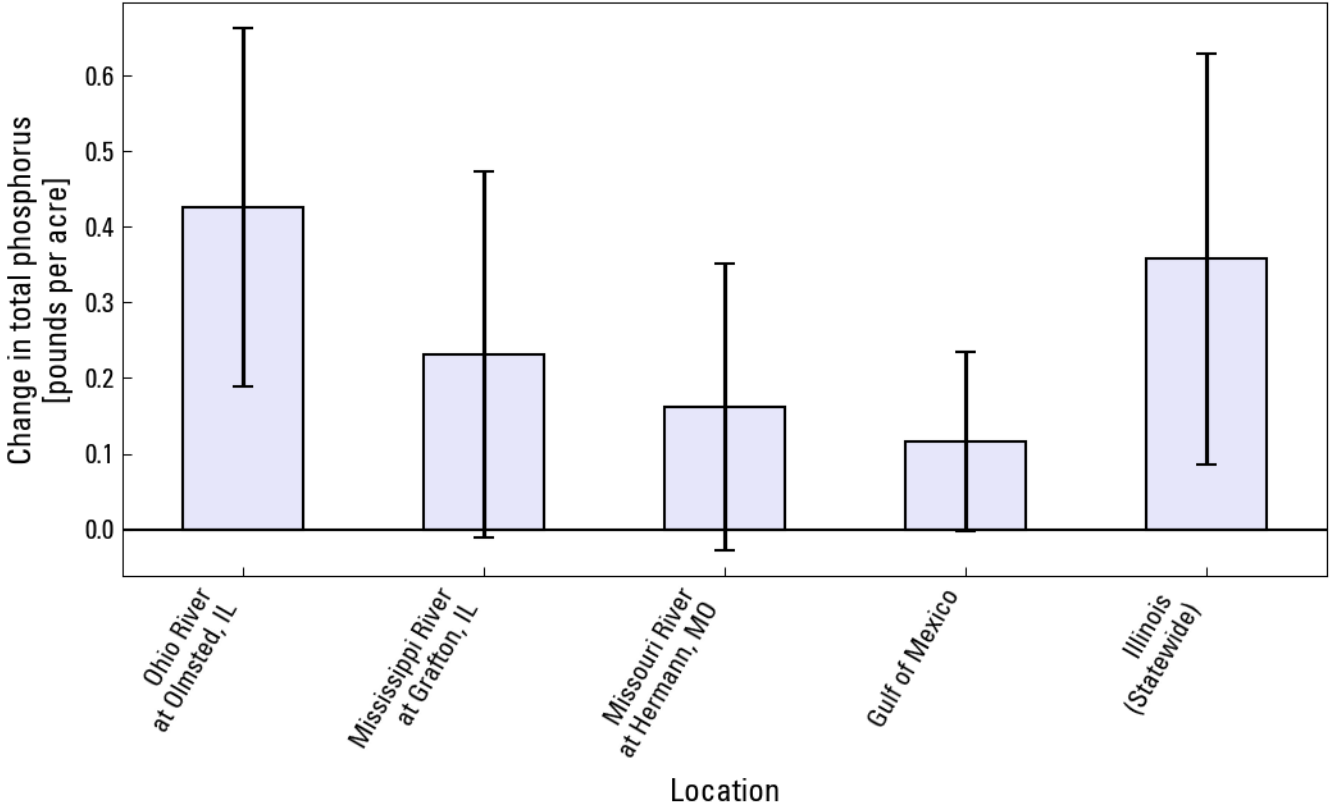
Change in phosphorus yield relative to baseline



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Summary

1. Nitrate load has increased 8% (40% to -25%).
2. Phosphorus load has increased 40% (70% to 10%).
3. While streamflow has increased 23% statewide.
4. On a yield basis, Illinois' nitrate trend is consistent with other major Mississippi River watersheds.
5. Illinois' phosphorus trend is second largest.
6. Large interannual variability.

Nutrient loads are increasing across the Mississippi River Basin. Is the cause changes in management, climate, or legacy effects?

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