



2023 IEPA Annual Report

Background

For over two decades, a diverse coalition of stakeholders (see Directors sidebar and Supporters list) has been leading a watershed-wide effort to understand and improve the water quality of the Fox River and its tributaries for the Fox River Study Group (FRSG). This undertaking has received wide-spread financial and in-kind support from watershed communities, water reclamation districts, environmental organizations and foundations. Our efforts have been backed by the USEPA, IEPA, Chicago Metropolitan Agency for Planning and engaged the scientific expertise of the Illinois State Water Survey (ISWS), United States Geological Survey (USGS) and private consultants. For seven years, the Fox River Study Group was implementing its first Fox River Implementation Plan since its completion in 2015. Now the FRSG is following the recommendations of a F2022 update of the FRIP which IEPA received on December 30, 2022. Throughout 2023, the FRSG continued to meet on a monthly basis and the group's activities were supplemented by committee actions. All board meetings were conducted virtually in 2023. A 20th anniversary annual meeting celebration was held on November 9th at the Centre in Elgin at which the group's funders and volunteers received certifications of appreciation.



Modeling

To make informed decisions about how best to maintain and improve the quality of the Fox River in our urbanizing watershed, the FRSG has developed two computer models of the Fox River watershed – an HSPF model and a QUAL2K model. Updates of these models were completed by Geosyntec Consultants with the HSPF model update completed in 2018 and a QUAL2kw update, a dynamic version of QUAL2k, completed in 2019.

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Modeling work completed in 2023 was an update of a HSPF subwatershed model that was used to develop a watershed-based plan for the Indian Creek watershed in Kane County. This planning effort was led by Holly Hudson of the Chicago Metropolitan Agency for Planning along with a Technical Advisory Committee that included a number of FRSG board members. Geosyntec Consultants updated the FRSG's HSPF model for this effort with funding provided by the FRSG.

Monitoring & Analysis

In April 2023 the FRSG began the 22nd year of its all-volunteer water quality monitoring program. This data collection includes monthly monitoring of 7 mainstem locations and 7 tributary locations along a 67-mile stretch of the Fox River from Johnsbury to Yorkville. Laboratory analysis and data management are donated as in-kind services by the City of Elgin, the Fox River Water Reclamation District and the Fox Metro Water Reclamation District. These data have been utilized to support the ongoing modeling efforts and to periodically assess water quality trends.

The Illinois State Water Survey (ISWS) updates the FoxDB for the FRSG, which is the publicly available, online water quality monitoring database. In 2023, the ISWS continued its work to update the FoxDB and completed a new water quality trends analysis.

The FoxDB environmental database (see <http://ilrdss.sws.uiuc.edu/fox/>) was last updated on December 21, 2023. ISWS staff are also periodically providing Fox Watershed data for incorporation into the Great Lakes to Gulf Virtual Observatory (see <https://greatlakestogulf.org/>) which is an interactive application that provides user-friendly access to water quality information about the Mississippi River and its tributaries.

The water quality trends analysis, including the analysis of trends in chloride, conductivity, turbidity, water temperature, pH, and chlorophyll levels in the watershed, was received from ISWS on December 28, 2023. The full report is available at <https://www.ideals.illinois.edu/items/129469>. In addition, ISWS staff developed a web application that helps one view the water quality trends, including trend maps, water quality data factsheets for each constituent studied, and exploratory data analysis (EDA) outputs by monitoring site. Tableau dashboards were also created for better visualization of the data. These additional tools as well as the Fox DB can be found in the [ISWS 2023 Trends Report Folder](#).

Additional monitoring is also continuing at the upstream boundary of the group's study area. The FRSG currently has a three-year contract through September 30, 2024 with the USGS to collect more real-time data at the Stratton Dam. A new water quality monitoring station was installed by USGS in August 2018 at the dam ([USGS Station #05549500](#)). During the growing season, continuous measurements of temperature, pH, conductivity, dissolved oxygen, chlorophyll a, blue-green algae and turbidity are collected at this station. The USGS is also collecting in-situ measurements at the Stratton Dam to characterize the upstream boundary condition. The discrete samples are collected on a monthly basis during station equipment calibration and are analyzed for chlorophyll a, Nitrogen-Ammonia, Nitrogen Nitrate + Nitrite, Total Nitrogen (includes filtered organics), Phosphate-Orthophosphate, and Total Phosphorus. Since August 2019, the USGS has been utilizing the blue green algae sensing capabilities of the chlorophyll sensor to report that data at the station's website.

Reports

2022 Fox River Implementation Plan (FRIP) As the FRSG is using the 2022 FRIP to guide our work for the next ten years, here we are providing links to the report (which are also available at our website) along with the plan's major findings.

- The Executive Summary of the 2022 FRIP can be found at tinyurl.com/FRIP2022ExSum. The full plan and its appendices are located at tinyurl.com/2z9ksn63.

The plan's major findings for the Fox River Study Group and our watershed partners are:

- Major wastewater treatment plants should proceed with capital improvements to achieve a 0.5 mg/L annual geometric mean total phosphorus limit by 2030;
- FRSG should focus on collaborating with partners to support removal of dams along the mainstem river and monitor the resulting water quality impacts when the U.S. Army Corps of Engineers completes the Fox River Connectivity & Habitat Study;
- FRSG should encourage state-of-the-art watershed management practices that can mitigate the impact of projected population growth in the FRIP study area;
- FRSG should leverage statewide work on evaluation of streambank erosion and quantify its impact on phosphorus loads in the watershed;
- FRSG should partner with efforts to reduce nutrients entering the FRIP study area from Illinois and Wisconsin and should also partner with agricultural entities;
- FRSG should continue to engage, collaborate, and partner with other agencies and organizations, including those in Wisconsin, to progress towards the goal of eliminating the impairments in the river due to other pollutants besides nutrients and therefore removing the river from the Illinois EPA list of impaired waters.

In 2023, the FRSG board and membership has continued to work with entities throughout the Fox River watershed to build community support and to find the resources needed to implement the identified projects in the 2022 FRIP.

2023 Illinois State Water Survey Report: *Water Quality Trends for Selected Constituents in the Fox River Watershed: Stratton Dam to the Illinois River*

- ISWS Contract Report 2023-03 is available at <https://www.ideals.illinois.edu/items/129469>
- Web tools and Tableau dashboard can be found in the [ISWS 2023 Trends Report Folder](#).

Fox River Connectivity & Habitat Study In 2023, the FRSG continued to work with the U.S. Army Corps of Engineers (Corps) and the Illinois Department of Natural Resources to complete the Corps' Fox River Connectivity & Habitat Study (Study). The Corps held periodic meetings with their IDNR and FRSG partners throughout 2023 as they worked to finalize the Study and their Tentatively Selected Plan (TSP). Corps staff provided updates to the watershed community at the March Fox River Summit and the November FRSG Annual Meeting.

On September 5, the draft Study entitled draft Project Implementation Report and Environmental Assessment (PIR/EA) for the Fox River Connectivity & Habitat Study in Kane and McHenry Counties, Illinois was released for a 60-day public comment period. Three public meetings were held during the public comment period. At each of these meetings, engineer Art Malm, who represents Friends of the Fox River on our board, provided the Fox River Study Group's findings on the impacts of dams on water quality in the Fox River. The Study Group's key message is that dam removals are necessary and cost effective for improving water quality in our reach of the river. Our modeling predicts dam removal is necessary to resolve river dissolved oxygen impairments. Without dam removal further reductions in discharged phosphorus by wastewater treatment plants improvements would have an insignificant impact on total algae populations and not eliminate the dissolved oxygen impairments in dam impoundments despite the high cost of those improvements. Throughout the past year, FRSG also provided a lot of information to the community on why dam removal makes sense at our website and through other communication materials. During the public comment period, the FRSG provided the Corps with all the analyses that went into the 2022 FRIP's recommendation for the FRSG to support removal of dams along the mainstem river in order to improve water quality in a cost-effective manner.

The FRSG made a second local cost-share payment of \$90,300 to IDNR in 2023. The Corp's final Director's Report on the completed study is scheduled to be released in March 2025. Corps' [website](#) on the Fox River Connectivity & Habitat Study, IL.

Public Outreach

The FRSG continued public outreach on the findings of the 2022 Fox River Implementation Plan (FRIP), including how the plan's findings inform the Army Corps of Engineer's Fox River Connectivity and Habitat Study on the impacts of the Fox River dams on river water quality. 2023 outreach efforts included:

Presentations-

Fox River Ecosystem Partnership January 11 Fox River Study Group Update- Cindy Skrukrud, FRSG Chair [slides](#)

Fox River Summit March 16

- 2022 Update of the Fox River Study Group's Fox River Implementation Plan (FRIP)- Cindy Skrukrud, FRSG Chair [video](#)
- Fox River Connectivity & Habitat Study: ecosystem restoration and dams assessment on the Fox River (IL) - Ryan Johnson, Biologist, US Army Corps of Engineers, Chicago District [video](#)

Illinois Association of Wastewater Agencies Technical Session July 14 Watershed Workgroups Roundtable Discussion- Karen Clementi, FRSG Treasurer [slides](#)

U.S. Army Corps of Engineers Public Meetings on the Fox River Connectivity and Habitat Study Tentatively Selected Plan

- Art Malm, FRSG's Dam Communications Subcommittee Chair, present at meetings on September 18 in St. Charles, September 19 in Elgin [video](#) and September 20 in Aurora

FRSG 20th Anniversary Annual Meeting November 9

- 20 Years of the Fox River Study Group- Cindy Skrukrud, Fox River Study Group Chair [slides](#)
- Wastewater Treatment Plants Nutrient Reduction Progress Report- Karen Clementi, District Manager Fox Metro WRD and Tim Wilson, Public Works Manager-Environmental Services, City of St. Charles [slides](#)
- Dam Removal: An Opportunity to Develop Resilient Communities and Restore River Ecosystems- Serena McClain, Senior Director, River Restoration and Dam Removal Program, American Rivers [video](#)
- Current Status of the Fox River Fishery, Effects of Dams and Benefits of Dam Removal- Tristan Widloe, Region II Stream Specialist, IDNR [slides](#)
- USACE Fox River Habitat & Connectivity Study Next Steps- Ryan Johnson, Biologist and Cody Johnson, Project Manager, USACE, Chicago District [slides](#)

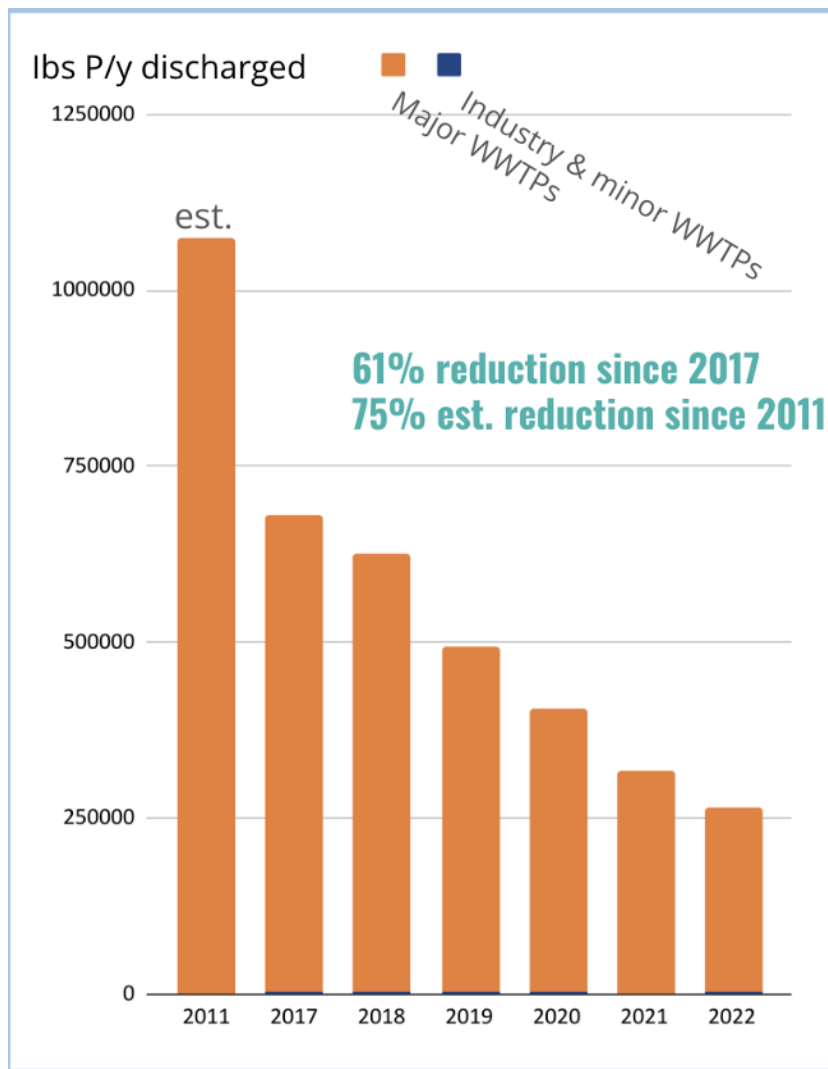
FRSG Lunch & Learn November 30 What's New on GLTG- Laura Kammin and Jong Sung Lee, Great Lakes to Gulf Virtual Observatory [video](#), Passcode: 89S=e#f7

Point Source Nutrient Reductions

The major (discharge > 1 mgd) wastewater treatment facilities were issued permits with phosphorus reduction requirements during the previous permit cycle. In late 2018 and extending into 2019, the Fox River permits were issued with updated phosphorus compliance schedules. Most wastewater treatment facilities are on schedule to meet their phosphorus limit of 1.0 mg/l annual average by various dates through 2023. Phosphorus discharge optimization plan (PDOP) requirements were added to most major permits during this permit cycle, requiring a comprehensive study of potential phosphorus input reductions and operational improvements at the wastewater treatment plants. These PDOPs are mostly complete for major permittees watershed-wide.

Trevor Sample of IEPA provided the FRSG with data for Fox River watershed dischargers from the dataset that he now compiles annually for the Illinois Nutrient Loss Reduction Strategy. These data show the progress being made in the Fox River watershed in reducing phosphorus inputs by the wastewater sector. Major WWTPs completed reductions to meet the 1 mg/l annual mean TP limit and 75% load reduction target included in the first FRIP (2015) by the end of 2022. Compilation of the 2023 data is scheduled to be completed in Spring 2024.

Wastewater Total Phosphorus Reductions in the Fox River Watershed



Financial Solvency

The FRSG is a 501c3 not for profit organization. Independent audits are performed annually to ensure proper financial management and a copy of the most recent audit is available upon request. FRSG continues to be funded by member agencies in the watershed at the rate of 25¢ per capita. At the beginning of each year, a contribution request is sent to communities. FRSG maintains a sufficient balance to fund activities and these funds are allocated to completing the action items described above: modeling, monitoring, public outreach, and the U.S. Army Corps of Engineers Fox River Habitat & Connectivity Study. In 2021, the group also updated our budget and long-term financial plan.

Financial and In-Kind Supporters

The Fox River Study Group greatly appreciates the continued support from:

Financial Support

Village of Algonquin
City of Aurora
Village of Barrington
City of Batavia
Village of Carpentersville
Village of Cary
Village of East Dundee
Village of Elburn
City of Elgin
Fox River Water Reclamation District
City of Geneva
Village of Gilberts
Kane County
Lake in the Hills Sanitary District
City of Plano
Village of Sandwich
City of St. Charles
Yorkville-Bristol Sanitary District
Village of Wauconda
City of Yorkville

In-Kind Support

Village of Algonquin
City of Crystal Lake
City of Elgin
Environmental Defenders of McHenry County
Fox Metro Water Reclamation District
Fox River Water Reclamation District
Friends of the Fox River
Northern Moraine Water Reclamation District
Illinois EPA
Illinois Department of Natural Resources
Illinois State Water Survey
City of St. Charles
Sierra Club
Yorkville-Bristol Sanitary District