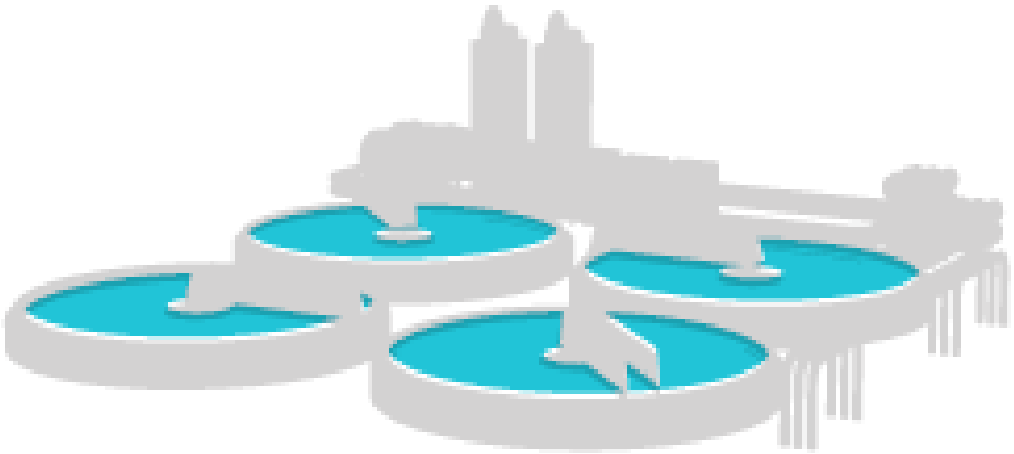
2021 Biennial Report

POINT SOURCE SECTOR



Trevor Sample
Illinois EPA

ILLINOIS
NUTRIENT LOSS
REDUCTION STRATEGY

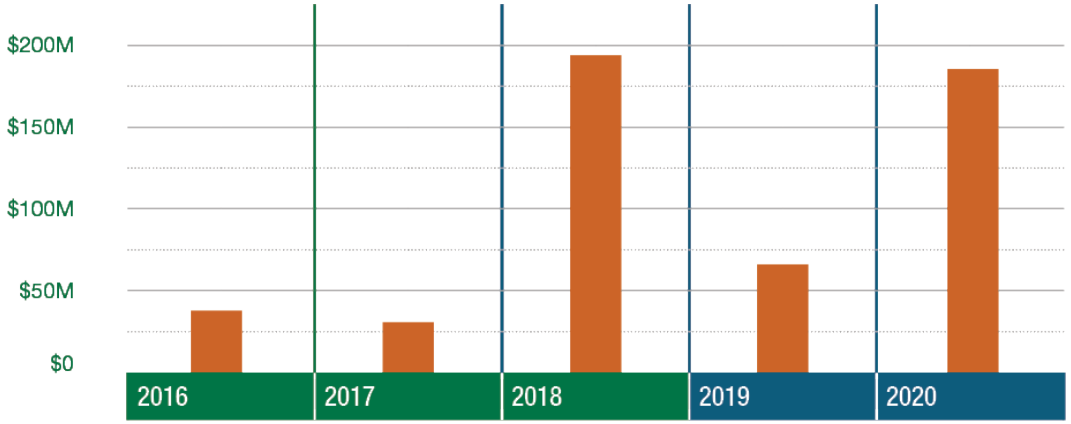


Figure 5.1. *Point source spending comparison for 2016, 2017, 2018, 2019, and 2020*

Table 5.1. *Funds supporting 2019-20 nutrient reduction-related activities in the point source sector for IAWA reporting agencies and watershed groups*

Nutrient Reduction-Related Activity	2019 Totals	2020 Totals
Capital improvement	$60,175,432	$181,581,773
Operations and maintenance	$2,098,370	$665,178
Feasibility studies or permit-required projects	$279,723	$253,056
Staff	$2,357,845	$2,521,000
Other	$221,550	$192,215
Total	**$65,132,920**	**$185,213,223**

Outreach

Table 5.2. *2019-20 point source outreach activities reported by IAWA facilities and watershed groups*

Type of Activity	Number of Events	Attendance
Field Days	2	35
Presentations	9	2,228
Workshops	3	400
Total	**14**	**2,663**

The point source sector's outreach activities reflect enhanced collaborations with stakeholders, including information on Nutrient Assessment Reduction Plans

Metropolitan Water Reclamation District of Greater Chicago conducted extensive public education emphasizing the research and implementation of nutrient loss strategies through press release, website, and social media campaigns

Land & Facilities

Point Source Nutrient Loads

- 2019 and 2020 Nutrient Loads from point sources were calculated by Illinois EPA using a combination of monthly Discharge Monitoring Reports (DMR) and USEPA nutrient loading tools.
- Wastewater facilities required to submit monthly water quality data to Illinois EPA. Most major municipal facilities are required to submit total nitrogen and total phosphorus concentrations.
- Major facility= Discharge ≥1 million gallons per day
- Major Municipal facilities
  - 2019: 210
  - 2020: 211

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Industrial Wastewater Treatment Facilities

- For Industrial Wastewater Facilities, USEPA Water Pollutant Loading Tool was used to calculate annual nutrient loads
  - Uses DMR data to auto-calculate annual loads
- 2019
  - 17 Majors, 313 minors with nitrogen loads
  - 11 Majors, 50 minors with phosphorus loads
- 2020
  - 18 Majors, 300 minors with nitrogen loads
  - 13 Majors, 49 minors with phosphorus loads

2019 & 2020 Statewide Total Phosphorus Loads

Point Source Sector	Total Phosphorus Load (million lb/yr)
2011 Baseline	18.1
2019 Total Phosphorus Load	14.9
› 210 Major Municipals	12.1
› Minor Municipals	2.4
› Major and Minor Industrials	0.4
Reductions from 2011 Baseline	3.2 (18%)

Point Source Sector	Total Phosphorus Load (million lb/yr)
2011 Baseline	18.1
2020 Total Phosphorus Load	15.2
› 211 Major Municipals	12.3
› Minor Municipals	2.4
› Major and Minor Industrials	0.5
Reductions from 2011 Baseline	2.9 (16%)

*Compared to 24% reduction in 2018

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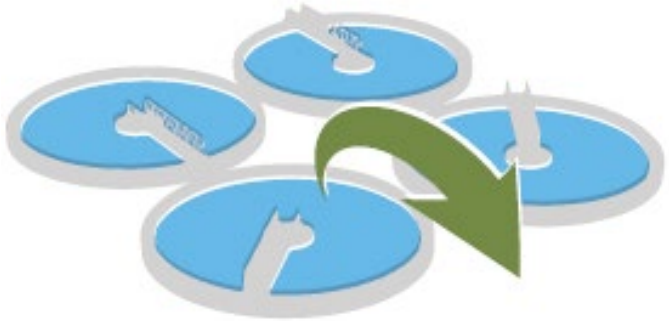
Total Phosphorus Reduction from Individual Municipal Wastewater Facilities

In 2019,
82 facilities
had an annual average total phosphorus concentration of 1 mg/L or less.

32 Facilities ≤ 0.5 mg/L

In 2020,
90 facilities
had an annual average total phosphorus concentration of 1 mg/L or less.

31 Facilities ≤ 0.5 mg/L



ILLINOIS
NUTRIENT LOSS
REDUCTION STRATEGY

2020 Top 10 Major Municipal Facilities Total Phosphorus Loads

NPDES Permit	Facility Name	Baseline 2011 TP Load (lb/yr)	2017 TP Load (lb/yr)	2018 TP Load (lb/yr)	2019 TP Load (lb/yr)	2020 TP Load (lb/yr)	Change from 2011
IL0028061	MWRDGC – Calumet	2,450,714	1,705,544	1,990,902	2,191,160	2,569,259	5%
IL0028053	MWRDGC – Stickney	2,351,312	1,288,296	707,230	2,164,828	2,435,218	4%
IL0028321*	Sanitary District of Decatur	1,562,750	1,770,422	2,022,573	2,011,785	1,897,809	21%
IL0028088	MWRDGC – O'Brien	969,075	916,335	931,333	947,758	978,314	1%
IL0027201	Rock River Water Reclamation District	971,083	232,702	280,051	231,141	223,527	-77%
IL0036340*	MWRDGC – Egan	233,759	206,963	209,074	219,942	210,437	-10%
IL0033481	Granite City, City of	126,431	133,683	330,034	86,593	180,081	42%
IL0028657	Fox River Water Reclamation District	171,050	184,605	171,000	187,850	173,032	1%
IL0034061	Naperville, City of	190,457	163,870	166,060	155,307	162,805	-15%
IL0027731	Bloomington/ Normal Water Reclamation District	139,207	130,866	101,236	132,693	124,924	-10%

*Data provided by facility

Top 10 facilities comprise 59% of the statewide point source phosphorus load

2020 Top 10 Major Municipal Facilities Total Phosphorus Loads (Flow and Concentrations)

NPDES Permit	Facility Name	2019 Avg Flow (MGD)	2019 Avg TP Conc. (mg/L)	2020 Avg Flow (MGD)	2020 Avg TP Conc. (mg/L)
IL0028061	MWRDGC – Calumet	307	2.44	264	3.54
IL0028053	MWRDGC – Stickney	816	0.95	688	1.21
IL0028321*	Sanitary District of Decatur	39	17.18	37	16.96
IL0028088	MWRDGC – O'Brien	257	1.25	207	1.61
IL0027201	Rock River Water Reclamation District	22	1.76	19	2.08
IL0036340*	MWRDGC – Egan	28	2.70	24	3.10
IL0033481	Granite City, City of	19	1.52	15	5.07
IL0028657	Fox River Water Reclamation District	20	3.15	18	3.37
IL0034061	Naperville, City of	22	2.33	20	2.73
IL0027731	Bloomington/ Normal Water Reclamation District	20	2.28	17	2.72

*Data provided by facility

2019 & 2020 Statewide Total Nitrogen Loads

Point Source Sector	Total Nitrogen Load (million lb/yr)	Reduction From Baseline Load (million lb/yr)
2011 Baseline	87.3	
2019 Total Nitrogen Load › 210 Major Municipals › Minor Municipals › Major and Minor Industrials	85.8 80.7 3 2.1	1.5 (1.7%)
2020 Total Nitrogen Load › 211 Major Municipals › Minor Municipals › Major and Minor Industrials	83.2 78 3 2.2	4.1 (4.7%)

*Compared to 10% reduction in 2018

ILLINOIS NUTRIENT LOSS REDUCTION STRATEGY

Flow and Nutrient Concentrations

Table 5.8. *Total annual flow for major municipal facilities*

Year	Total Million Gallons	Percent Change From Previous Year
2018	813,636	—
2019	925,667	13.8%
2020	779,145	-15.8%

Table 5.9. *Average annual total phosphorus concentrations for major municipal facilities*

Year	Total Phosphorus Concentration (mg/L)	Percent Change From Previous Year
2018	2.00	—
2019	1.55	-22.50%
2020	1.72	11.00%

Table 5.10. *Average annual total nitrogen concentrations for major municipal facilities*

Year	Total Nitrogen Concentration (mg/L)	Percent Change From Previous Year
2018	9.34	—
2019	11.6	25.00%
2020	13.07	12.70%

Metropolitan Water Reclamation District of Greater Chicago

- Service area of 882 square miles including city of Chicago and 128 suburban communities in Cook County
  - 10.35 million people per day

- Operate seven wastewater treatment facilities
  - Stickney, Calumet, O'Brien, Egan, Kirie, Lemont, Hanover Park
  - Combined, contributed 42% of statewide point source phosphorus load in 2020

Metropolitan Water Reclamation District of Greater Chicago

- 2019 Biennial Report showed 24% statewide reduction in phosphorus from point sources from 2011-2018

NPDES Permit	Facility Name	Baseline 2011 TP Load (lb/yr)	2017 TP Load (lb/yr)	2018 TP Load (lb/yr)	2019 TP Load (lb/yr)	2020 TP Load (lb/yr)	Change from 2011
IL0028053	MWRDGC – Stickney	2,351,312	1,288,296	707,230	2,164,828	2,435,218	4%

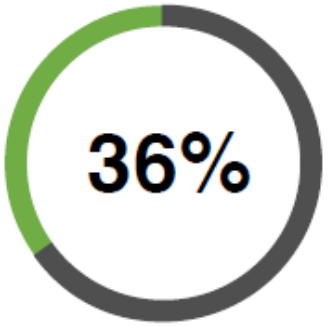
- Increase in load from Stickney is responsible for a majority of the increase in statewide phosphorus load since 2018

Metropolitan Water Reclamation District of Greater Chicago

- Biological nutrient removal system installed at Stickney facility in 2014 and optimized in 2018, resulting in 95% phosphorus removal.
- Problems arose in 2019 that resulted in the system being halted and slowly restarted.
- Chemical phosphorus removal system was installed
- Permit limit 1.0 mg/L total phosphorus became affective in August 2021.
- Calumet Facility is currently designing a chemical phosphorus removal system.
  - Permit includes schedule to achieve 1.0 mg/L total phosphorus January 2024

NPDES Permits Issued with Nutrient Criteria

- **77** Major municipal facilities with permit limits for total phosphorus (1.0 mg/L)



Optimization

14	54	143
Permits to be issued requiring optimization study	Issued permits awaiting optimization study	Optimization studies submitted

Feasibility

14	54	143
Permits to be issued requiring feasibility study	Issued permits awaiting feasibility study	Feasibility studies submitted

ILLINOIS NUTRIENT LOSS REDUCTION STRATEGY

Nutrient Assessment and Reduction Plans (NARPs)

- Special condition added to NPDES permits for major municipal facilities that meet criteria
  - Discharge to a water body impaired for a phosphorus-related pollutant
  - Discharge to a water body at risk for eutrophication
- NARP can be completed by an individual facility or multiple facilities in the same watershed.
- A NARP will
  - Determine phosphorus target levels
  - Identify phosphorus reductions by point and nonpoint sources
  - Include a schedule for implementation
  - May include water quality trading

Nutrient Assessment and Reduction Plans (NARPs)

- At the end of 2020, 53 individual facilities were developing NARPs
- 89 facilities are developing NARPs as part of a watershed group
- It was determined that 42 facilities do not meet the criteria to develop a NARP
- 30 facilities still to be determined
- Most NARPs are due in 2023 and 2024

Nutrient Assessment and Reduction Plans (NARPs)

- Illinois EPA developed an online interactive map showing the locations of facilities and their NARP status:
- https://illinois-epa.maps.arcgis.com/home/item.html?id=dd82c86b7325412f823f623b51fe6db9

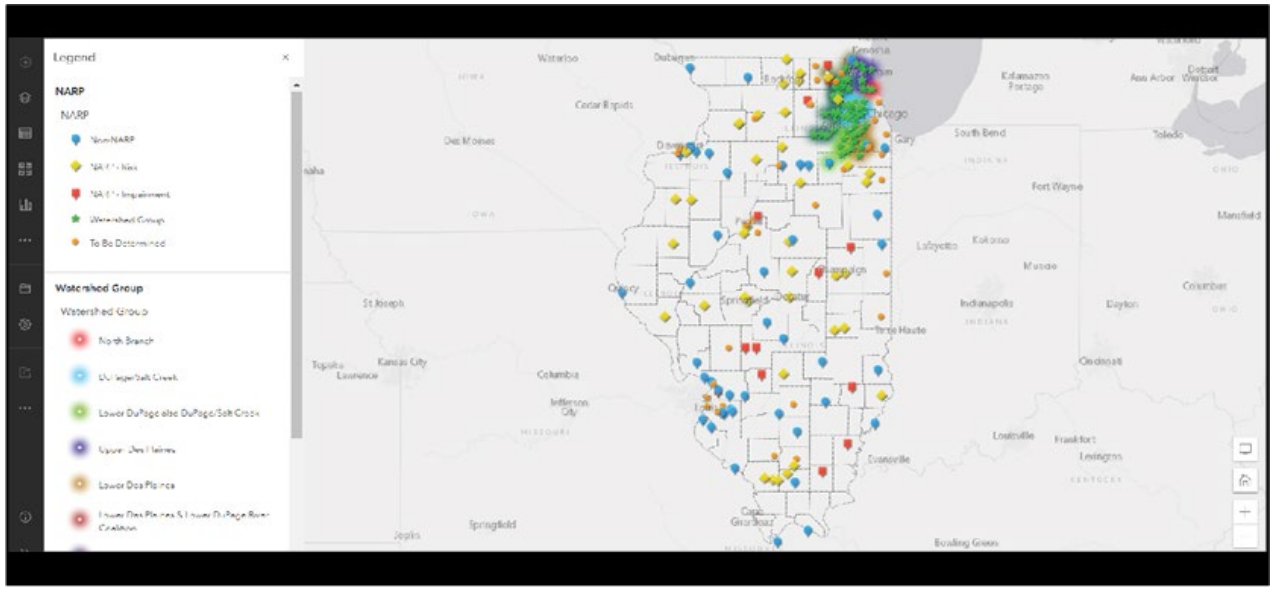


Figure 5.2. *Screenshot of the NARP map website*

Watershed Groups

- Multi-stakeholder watershed groups conducting watershed planning, implementation, and NARP development
- Fox River Study Group
- DuPage River Salt Creek Workgroup
- Lower Des Plaines Watershed Group
- Lower DuPage River Watershed Coalition
- North Branch Chicago River Watershed Group
- Des Plaines River Watershed Workgroup

FOX RIVER STUDY GROUP

RESTORE SALT CREEK
MODIFICATION AND HABITAT RESTORATION

LOWER DES PLAINES WATERSHED GROUP

LOWER DUPAGE RIVER WATERSHED COALITION

NORTH BRANCH CHICAGO RIVER WATERSHED WORKGROUP

DES PLAINES RIVER WATERSHED WORKGROUP

Total Maximum Daily Load program

- TMDLs are watershed studies administered by Illinois EPA
- The studies address both point and nonpoint sources of pollutants, including nutrients at a smaller watershed scale
- 2019-2020: USEPA approved 46 phosphorus TMDLs
- Since 2000, USEPA has approved 139 phosphorus TMDLs and eight nitrate-nitrogen.
- Two watersheds for phosphorus and one for nitrate are currently being developed

Livestock

NPDES Permits

- Illinois EPA issues NPDES permits for Confined Animal Feeding Operations that meet certain criteria
  - 14 CAFOs currently covered under a permit
- On-site inspections in 2020
  - 36 unpermitted large CAFOs
  - 67 medium animal feeding operations
- Since July 1, 2015, Illinois EPA has conducted 351 livestock facility site visits

LMFA

- Illinois Department of Agriculture implements the Livestock Management Facilities Act
- Regulates design and construction standards for new or modified facilities, waste management plans, operator training and testing, financial responsibility and setback requirements.
- Reviewed 72 proposals in 2019 and 65 proposals in 2020

State Revolving Fund

- Illinois EPA State Revolving Fund provides low-interest loans for drinking water and wastewater upgrades
- Water Pollution Control Loan Program includes
  - Upgrades to improve nutrient removal
  - Green infrastructure
  - Urban stormwater treatment
  - Control Combined Sewer Overflows (CSO)
- Projects to reduce nutrients loads from wastewater plants
  - 2019: 12 projects = $187,626,382
  - 2020: 1 project= $12,650,686

ILLINOIS NUTRIENT LOSS REDUCTION STRATEGY

Future Actions

Unsewered Communities Grant Program

- Through the Rebuild Illinois Capital Plan, Illinois EPA will be providing $100 million in construction grants over the next five years
- Wastewater collection and treatment facilities
- More than 200 communities in Illinois have inadequate or nonexistent wastewater collection and treatment facilities.
- $1 million in planning grants available for the next four years to assist small and disadvantaged communities to identify solutions to wastewater collection and treatment needs.

Summary

- 2019-2020 Point Source loads increased slightly from 2018 loads
- Previous issue with Stickney facility is being remedied
- Total Phosphorus limits continue to be included in permits for Major Municipal facilities
- Optimization, Feasibility, and NARP studies continue to be developed
- Significant amount of investment made in nutrient removal technologies. More will be needed.
- Expect to see long term reductions in total phosphorus from the point source sector