Preliminary NARP Objectives

Geosyntec consultants

DRWW Preliminary NARP Workplan Development

Task 1: Project Management and Preliminary NARP Objectives

Project Management: monthly progress reports, interim progress calls

- Kick-off Meeting
- Develop NARP Objectives & Outline
- Review Data Assessment with Illinois EPA
- Monitoring & Modeling Review Meeting
- Meet with Illinois EPA
- Review of Draft Workplan
- Finalize Workplan

Task 2: Review Background Information

Data assessment:
- Monitoring including nutrient and DO fluxes
- Previous modeling
- Watershed Based Plan: pollutant sources, modeling, and projects
- IPS Tool

Complete needs assessment for DPR tributary flow and pollutant loadings to mainstem

Complete needs assessment for hydraulic and water quality model of DPR and tributaries

Data Assessment Table/Maps

Task 3: Identify Missing Components and Refine Objectives

- Refine NARP Objectives
- Draft Outline of Workplan
- Evaluate Watershed & Hydraulic/Water Quality Models, Data Needs
- Monitoring & Modeling Options

Task 4: Develop Preliminary Workplan

- Draft Workplan
- EC Collaboration
- Draft Scope, Schedule, Cost
- EC Collaboration
- Draft Workplan

When is a NARP Required?

PHOSPHORUS RELATED IMPAIRMENT

Listed on 303(d) list for:

- Dissolved oxygen
- Offensive condition (algae and/or aquatic plant growth)

RISK OF EUTROPHICATION

Information that plant, algal, or cyanobacterial growth is causing or will cause violations of water quality standards

- pH
- Dissolved oxygen
- Chlorophyll-a

OTHER

Permit can be re-opened if

- Phosphorus related impairment
- Risk of eutrophication

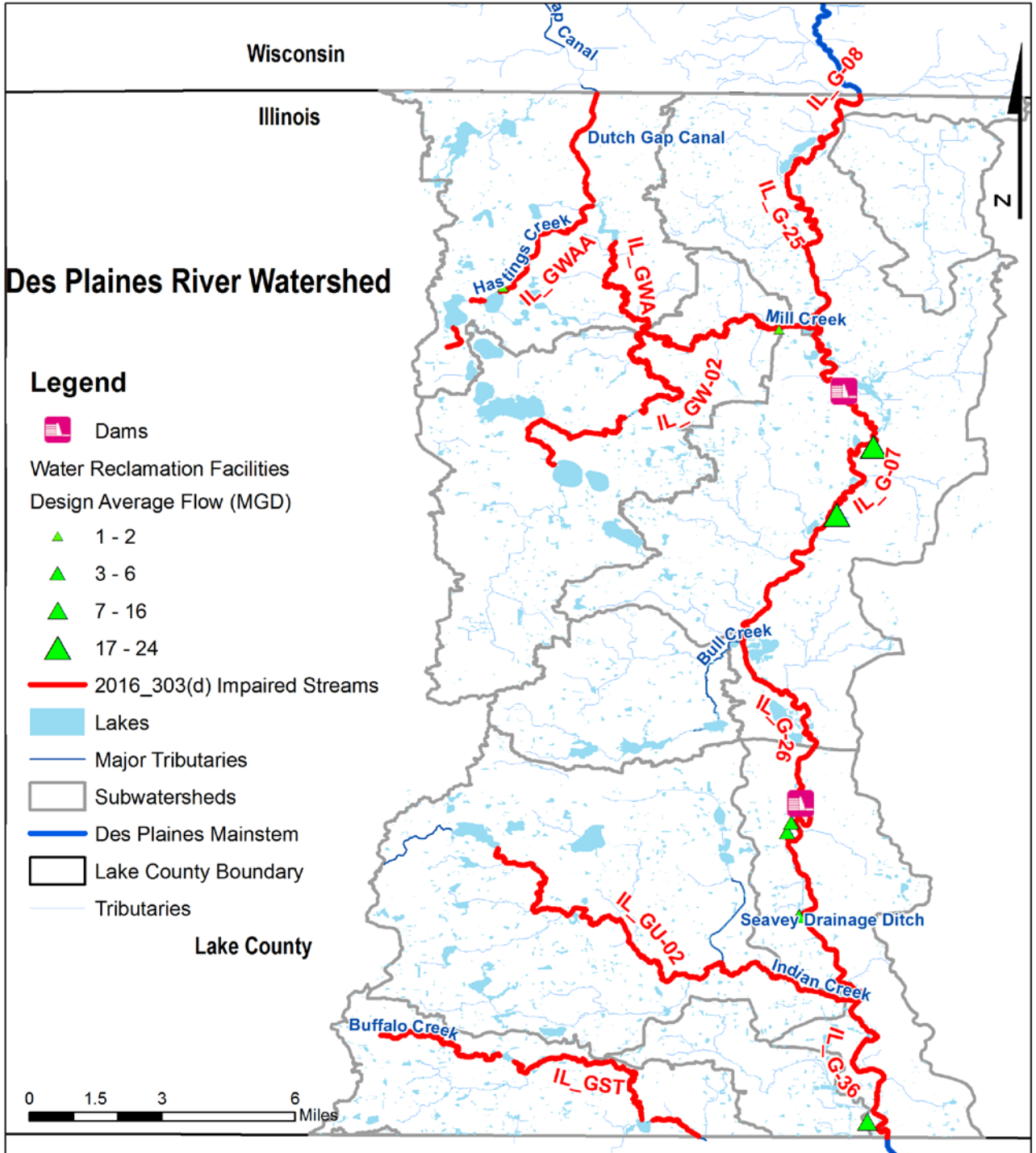
Impaired Reaches

- Impaired Reaches

Segment	Miles	Impairment
IL_G-25	6.9	Arsenic, Mercury, Oxygen, Dissolved, Sedimentation/Siltation, Total Suspended Solids (TSS)
IL_G-35	5.0	Cause Unknown, Mercury, Phosphorus (Total), Polychlorinated biphenyls
IL_G-36	7.2	Fecal Coliform, Mercury, Phosphorus (Total), Polychlorinated biphenyls
IL_G-07	10.8	Arsenic, Chloride, Fecal Coliform, Mercury, Phosphorus (Total), Polychlorinated biphenyls
IL_G-08	1.0	Fecal Coliform, Mercury, Oxygen, Dissolved, Total Suspended Solids (TSS)
IL_G-26	6.0	Cause Unknown, Mercury, Polychlorinated biphenyls
IL_GWA	5.5	Arsenic, Manganese, Phosphorus (Total), Sedimentation/Siltation
IL_GST	10.7	Total Suspended Solids (TSS)
IL_GW-02	13.0	Oxygen, Dissolved, pH
IL_GU-02	11.3	Oxygen, Dissolved
IL_GWAA	4.0	Arsenic, Phosphorus (Total), Sedimentation/Siltation

NARP related impairment

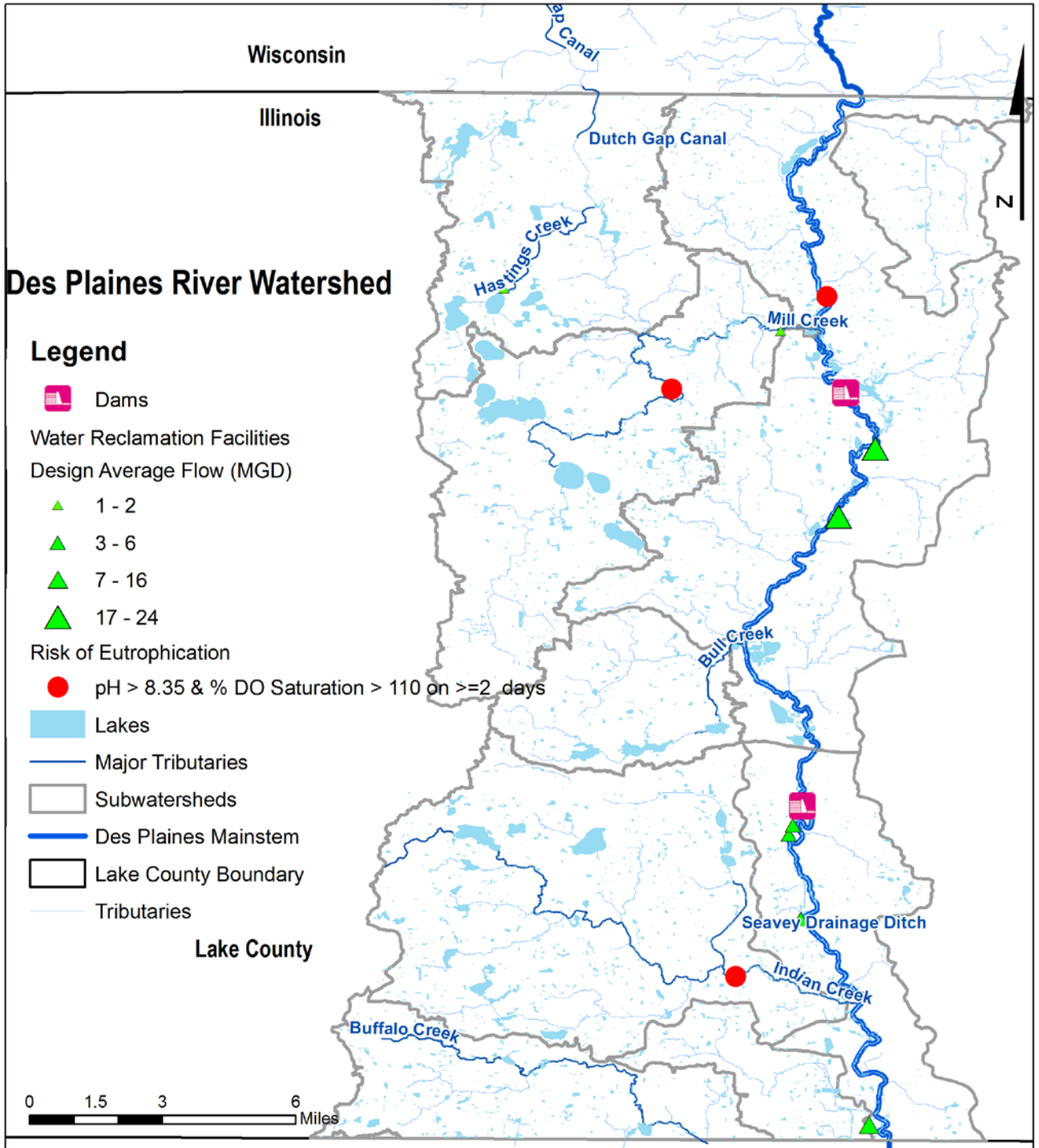
Based on IEPA data only*



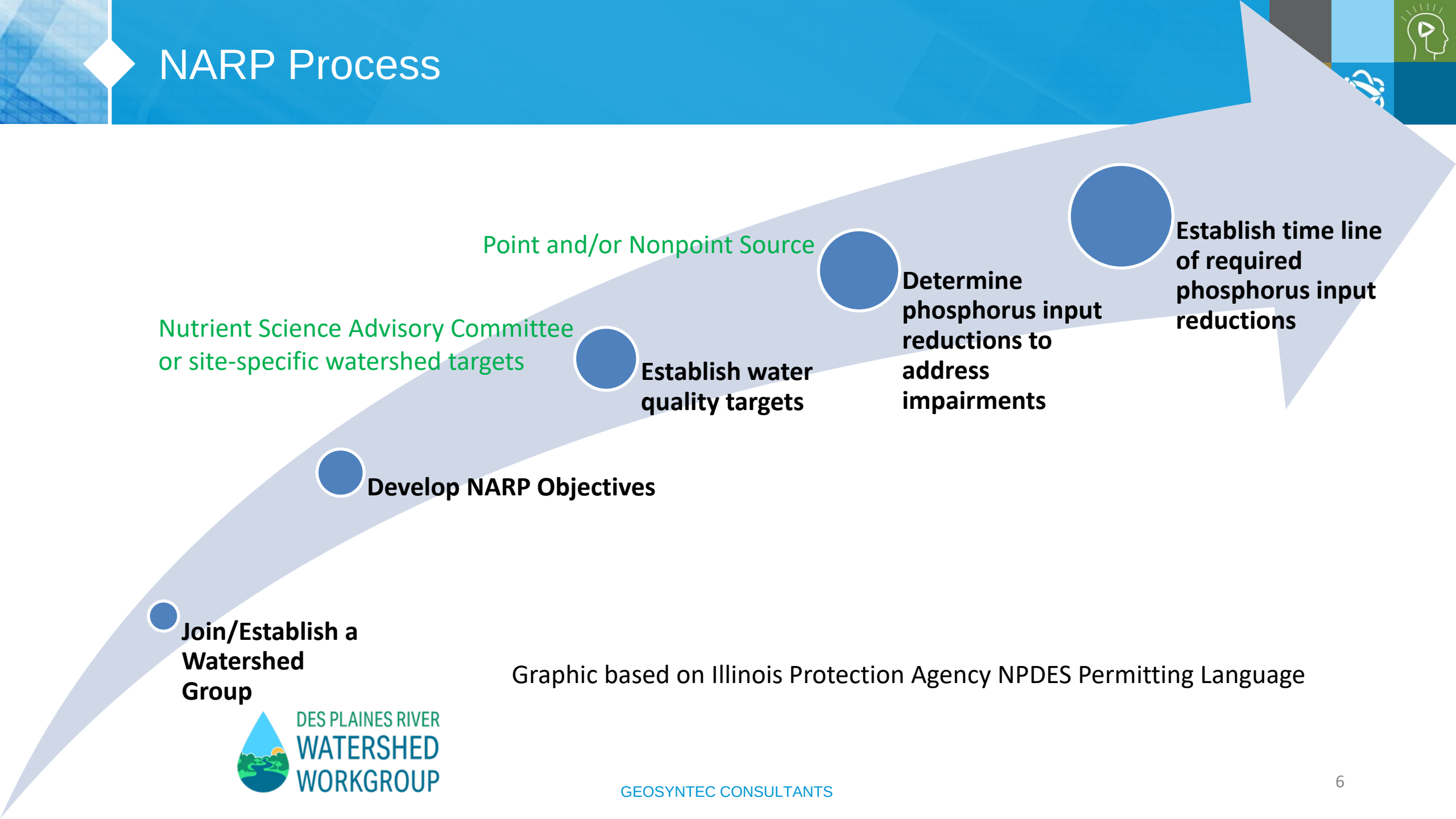
Risk of Eutrophication

- Site is at risk of eutrophication if one of following criteria is satisfied
  - pH > 9
  - Median Chl-a > 25 ug/L
  - pH > 8.35 & DOsat > 110% for 2+ days
- IEPA data
  - Three sites found at risk of eutrophication
- DRWW data
  - No station found at risk of eutrophication
  - Limited continuous data available* for assessment

*Only 2017 data



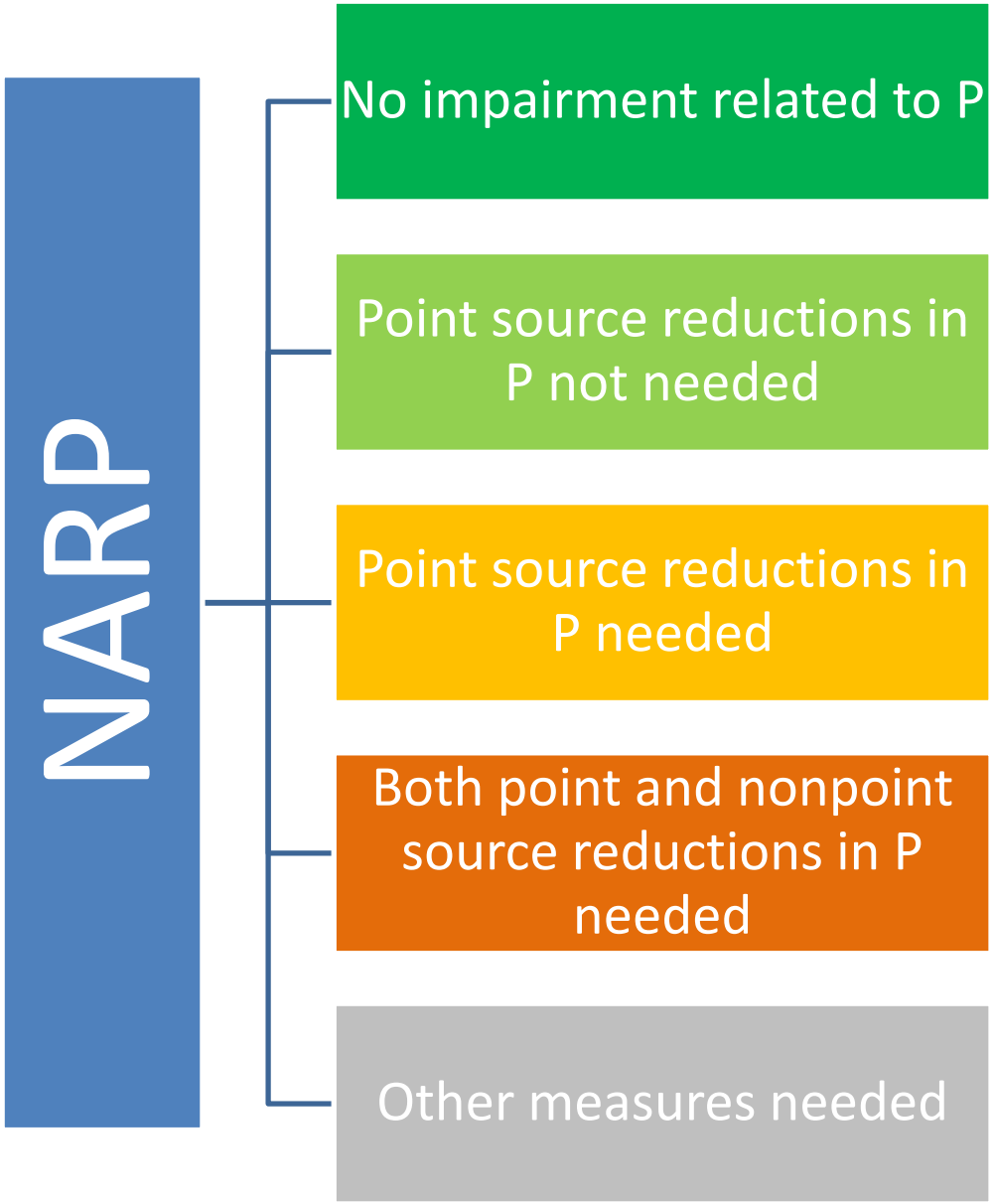
NARP Process



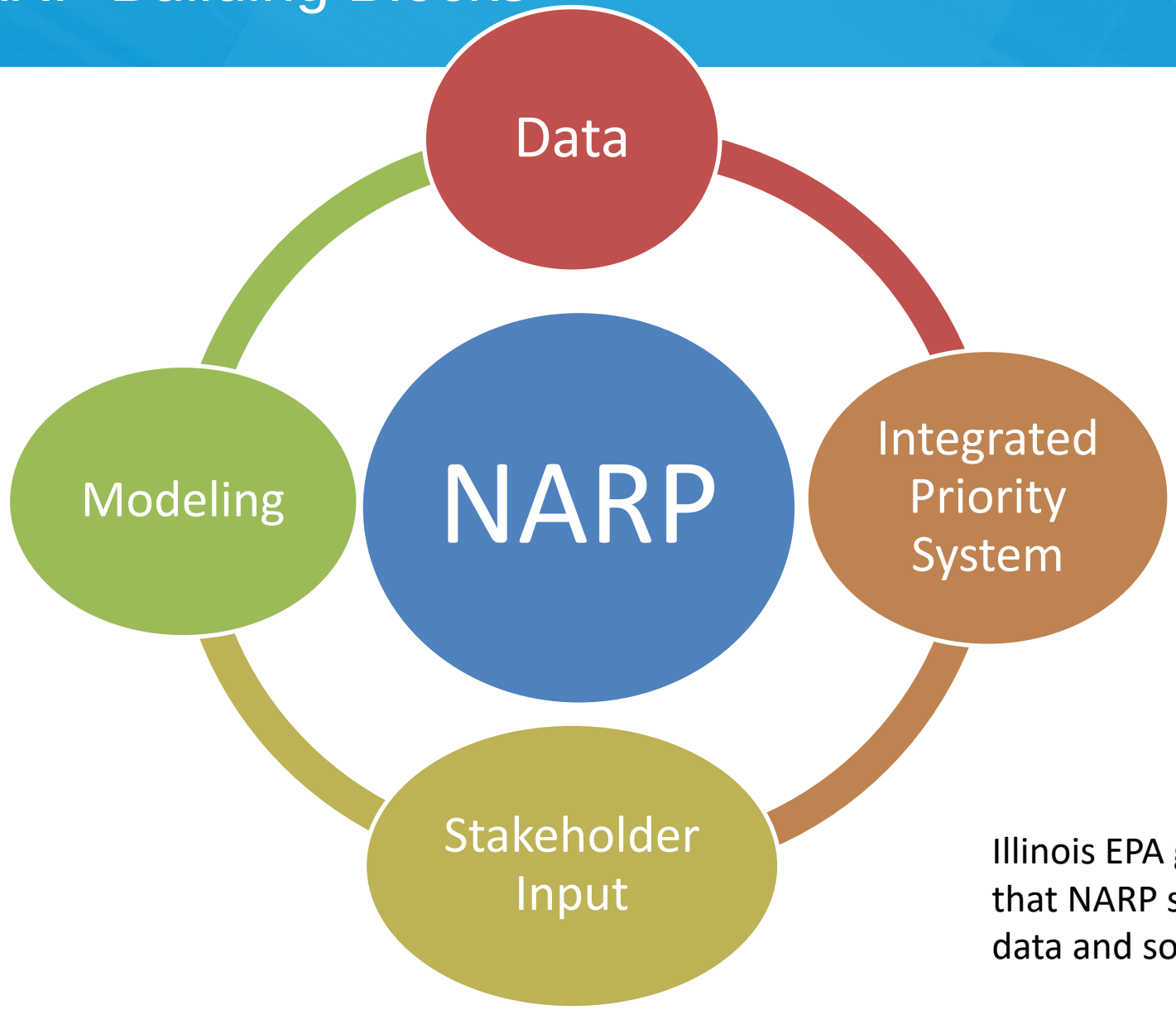
Graphic based on Illinois Protection Agency NPDES Permitting Language

DES PLAINES RIVER WATERSHED WORKGROUP

Possible NARP Outcomes



NARP Building Blocks



Illinois EPA guidance recommends that NARP should be based on data and sound scientific rationale

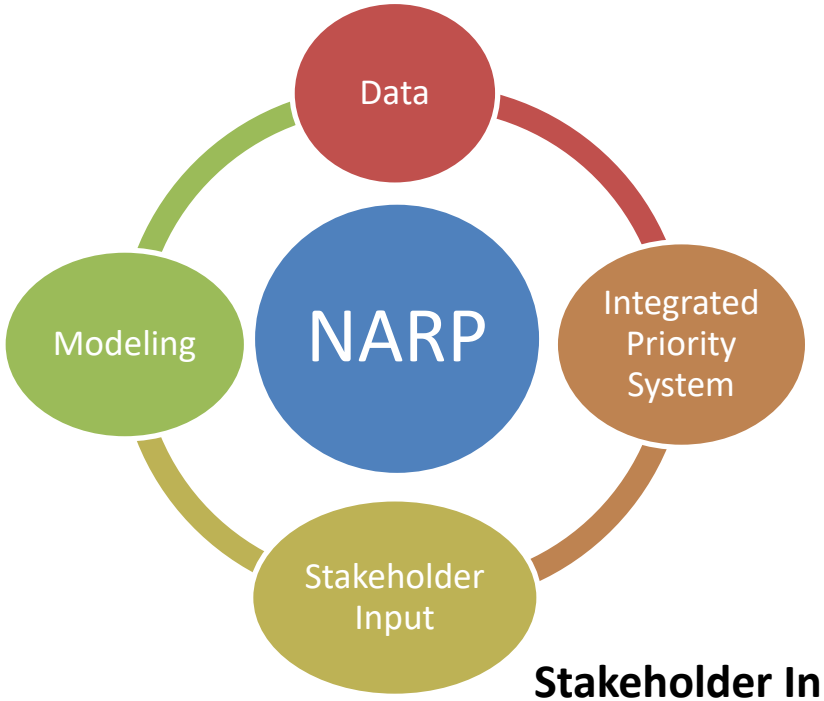
NARP Building Blocks

Data

- Define contribution of upstream sources
- Calibrate the IPS and watershed, hydrodynamic, and water quality models
- Measure improvements resulting from management actions

Modeling

1) Fill in spatial and temporal gaps in the data
2) Calculate contribution of point and nonpoint sources P-loads
3) Forecast potential improvements in water quality from reductions in point and nonpoint source P-loads
4) Forecast potential improvements from other management actions (e.g., source reduction, riparian shading, streambank stabilization, lake management)



Integrated Priority System (IPS)

1) Prioritize Capital Improvement Projects to improve water quality and aquatic habitat for different geographic scales:
   - Watershed
   - Subwatershed
   - Municipal
2) Establish thresholds for various stressors (including P) for biological scores

Stakeholder Input

- Inform development of the NARP
- Define potential management actions and constraints

Potential DRWW NARP Objectives

1) Establish watershed-specific water quality targets
2) Determine phosphorus reductions needed to achieve site-specific water quality targets or if targets are infeasible
3) Assess the other measures needed to address aquatic life impairments
4) Identify specific projects to address water quality and aquatic life impairments and establish timeline for implementation
5) Identify mechanisms to facilitate cost-effective implementation of the NARP

Potential DRWW NARP Objective 1

Establish watershed-specific targets for water quality

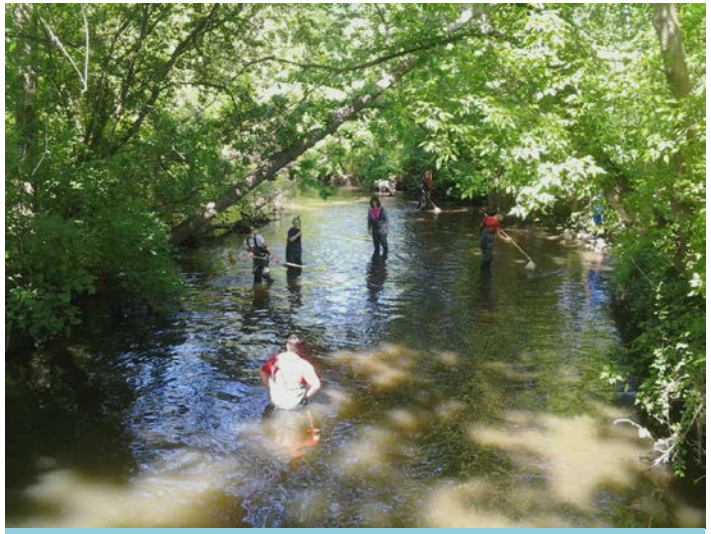
- Dissolved oxygen
- Chlorophyll-a
- Total phosphorus (dissolved reactive phosphorus)
- Nitrogen?

Non Wadeable Streams

Sestonic chlorophyll-a*

*Some streams might require both sestonic and benthic chlorophyll

Wadeable Streams

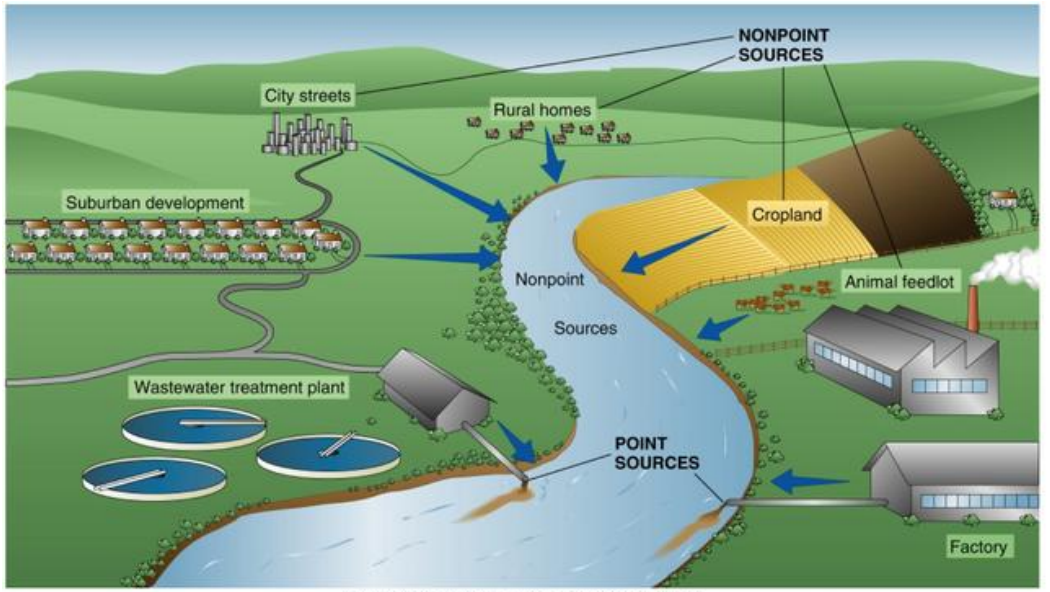


Benthic chlorophyll-a

Potential DRWW NARP Objective 2

Determine phosphorus reductions needed to achieve site-specific water quality targets or if targets are infeasible

- Point sources
  - Wastewater treatment plants
    - 8 major
    - 10 minor
- Nonpoint sources
  - Small Municipal Separate Storm Sewer Systems (MS4s)
  - Agriculture



Potential DRWW NARP Objective 3

Assess the other measures needed to address aquatic life impairments

Major Causes Associated with Aquatic Life Impairments: Upper Des Plaines 2016

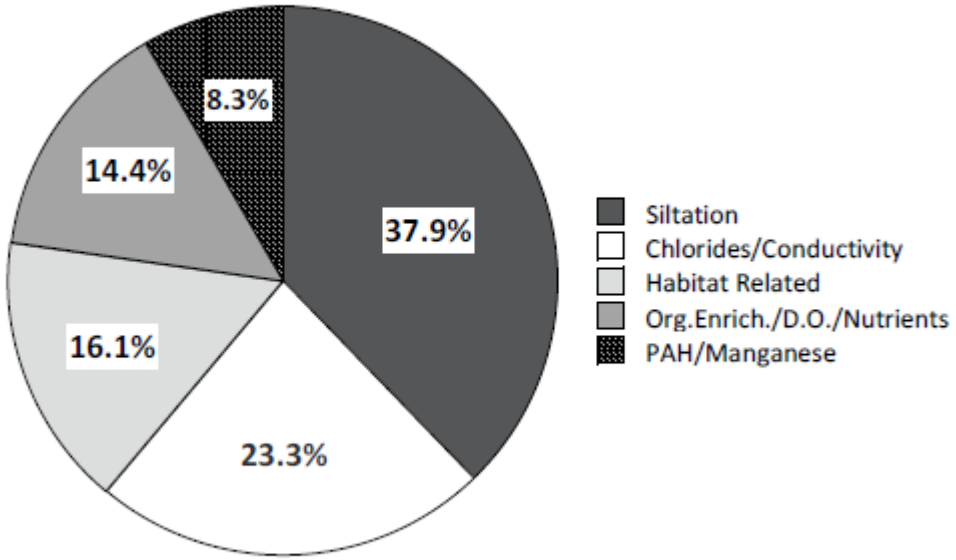


Figure 1. *Major causes associated with aquatic life impairments in the Upper Des Plaines study area, 2016.*

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Major Causes Associated with Aquatic Life Impairments: Year 1 Subwatersheds 2017

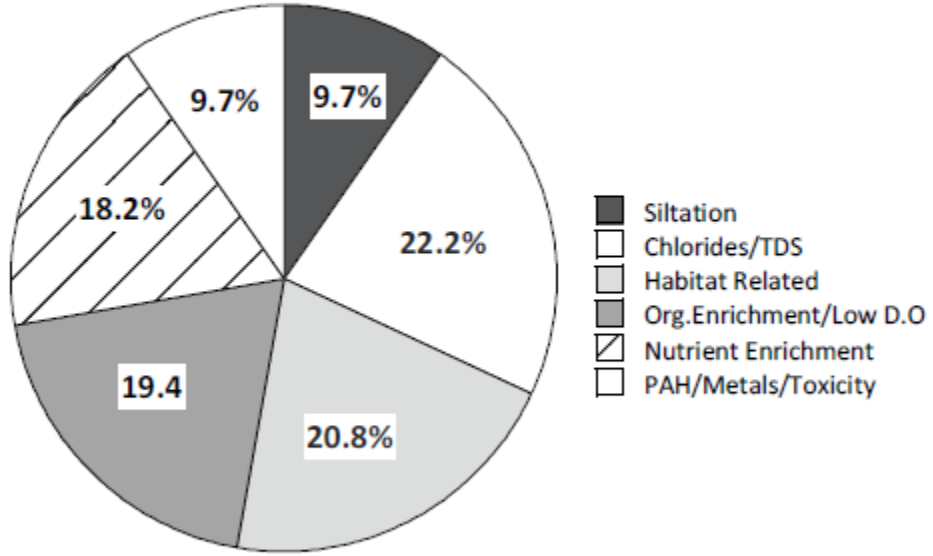

Figure 1. *Major causes associated with aquatic life impairments in the Year 1 subwatersheds, 2017*

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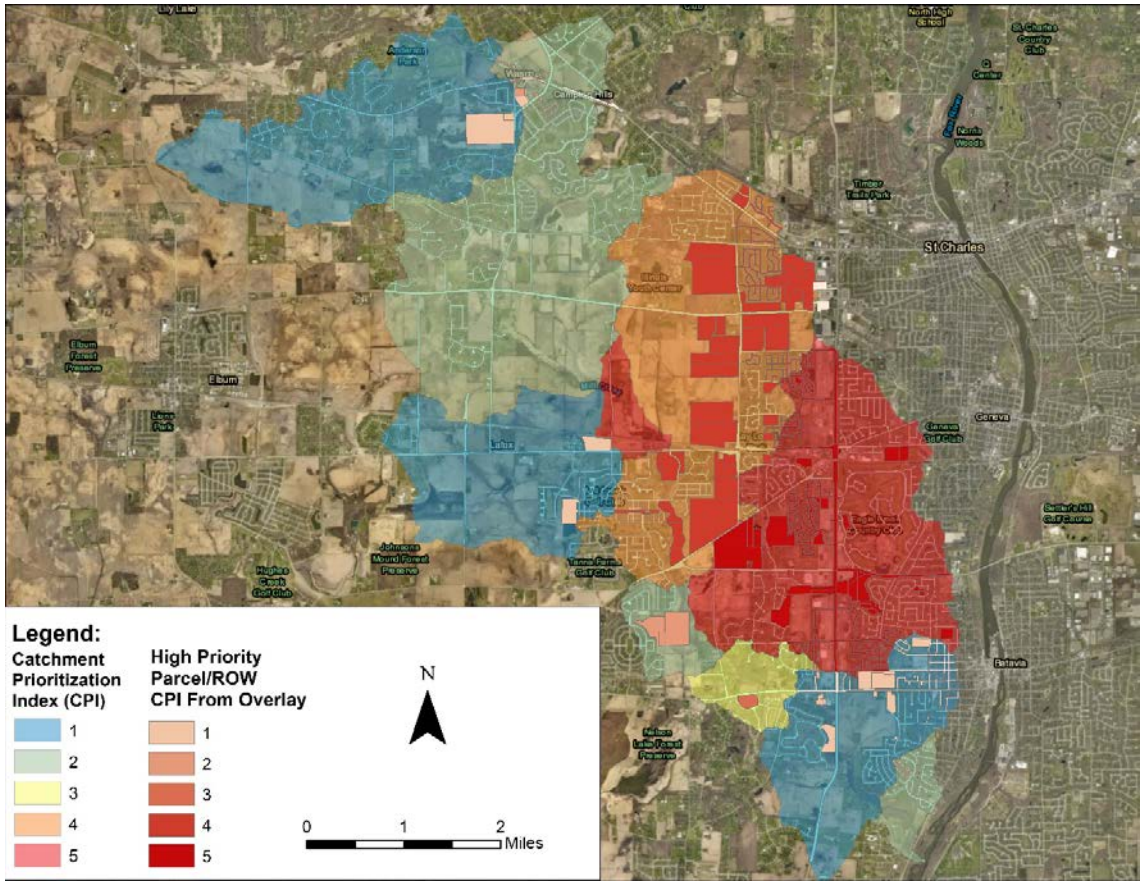
Potential DRWW NARP Objective 4

Identify specific projects to address water quality and aquatic life impairments and establish timeline for implementation



Example output from Geosyntec's BMP prioritization tool for Mill Creek showing the high priority parcels for BMP application overlaid with catchment loading.

Potential DRWW NARP Objective 5

Identify mechanisms to facilitate cost-effective implementation of the NARP:

- Point-to-point trading program
- Point-to-nonpoint trading program
- Funding plan