



## Des Plaines River Watershed Workgroup

### General Membership Meeting Minutes

08/19/2021 01:30 pm – 03:30 pm

### Virtual Meeting

#### Discussion and Possible Approval of the Following:

Call to order.

Vice President Miller called the meeting to order at 1:32 PM.

#### 1. Introductions and Announcements

Ashley Strelcheck performed roll call. 25 DRWW MEMBERS WERE PRESENT: Dave Miller (North Shore Water Reclamation District); Alana Bartolai (Lake Co. Health Dept.); Heather Galan (Gurnee); Rosemary Heilemann (Sierra Club); Ashley Strelcheck (Lake County Stormwater Management Commission); Mike Brown (Lake Zurich); Jon Happ (Libertyville Twp.), Erika Fable (Hawthorn Woods); Dave Brown (Vernon Hills); Brian Joyce (Lake Forest); Mike Warner (Gewalt Hamilton representing Ela Township, Fremont Township, Village of Long Grove & Riverwoods), Joel Sensenig (Lake Co. Public Works); Brandon Janes (Deerfield); Jim Anderson (Lake Co. Forest Preserves); Michael Talbett (Kildeer); Paul Kendzior (Libertyville); Kyle Johnson (Buffalo Grove); Kirsten James (Hey & Assoc.); Keith Gray (ILM representing Old Mill Creek); James Kim (Vernon Hills Park Dist.); Tom Morthorst (Third Lake); Rishab Mahajan, (Geosyntec).

Also attending: Rob Flood, North Shore Water Reclamation District; Jacob Jozefowski, DRWW/Lake County Stormwater Management Commission; Mike Prusila, Lake County Stormwater Management Commission; Ernesto Huaracha, Lake County Stormwater Management Commission; Mary Mathews, League of Women Voters; Michael Pagonos, Village of Arlington Heights; Jim Duncker, USGS; Leonard Dane, Deuchler Environmental; Don Wilson; Steve Waters, North Shore Water Reclamation District; Chuck Bodden, North Shore Water Reclamation District; Nick Huber, Lake Co. Forest Preserves; Mike Foster, Kieser & Assoc.; Mike Adam, Lake Co. Health Dept.; Thomas Lee (Arceil); Neekita Joshi, Gewalt Hamilton; Tatiana Papakos, Michael Baker International; Jeff Edstrom, Illinois EPA; Brian Vallesky and Adrienne Nemura, Geosyntec; Erin Dellawalla, RES; Mark Toberman, Wheeling Township; Linda Tilton, Citizen; Raymond DeMartini, Citizen.

#### 2. Public Comment

a. None

#### 3. Approve 02/18/21 General Membership Meeting Minutes (p 2-9)

Motion to approve Minutes as presented by Talbett, Seconded by Anderson.

AYES: Joyce, James, Anderson, Sensenig, Strelcheck, Happ, Miller, Heilemann, Johnson, Janes, Galan, Fable, Talbett, M. Brown, Kendzior, Warner, Morthorst, D. Brown, Bartolai, Gray. NAYS: None. Motion passed 23-0

#### 4. DRWW Business

##### a. DRWW Financials: Revenue & Expenditures & DRWW Budget of Accounts

###### i. Geosyntec NARP Services

Motion to approve revenue and expenditures and ratify invoices as presented by Kendzior, seconded by Joyce.

AYES: Joyce, James, Anderson, Sensenig, Strelcheck, Happ, Miller, Heilemann, Johnson, Janes, Galan, Frable, Talbett, M. Brown, Kendzior, Warner, Morthorst, D. Brown, Bartolai, Gray. NAYS: None.

Motion passed 23-0

##### b. Committee Updates

###### i. Executive Board

Dave Miller and Mike Adam, executive board members, provided updates regarding recent executive board action to reduce LCFPD membership fees in the future. The executive board will be working on how to address the impact of this fee reduction.

###### ii. Monitoring/Water Quality Improvements Committee (Steve Waters)

Steve Waters, committee Chair, updated the membership that Lake County Health Dept. is now performing water quality monitoring and testing, NSWRD continues the continuous monitoring sondes at 3 locations.

All data collected over the past years has been transferred to Geosyntec for the NARP

###### iii. Lakes Committee

Mike Adam, committee chair, updated the membership that additional info was provided to Geosyntec for the NARP including bathymetry, and that the DRWW is in receipt of the MBI draft report for 2019 and that is under review.

##### c. Old Business

None

##### d. New Business

###### i. Public Comment Policy

Strelcheck presented the public comment policy that was adopted by the Executive Board in June. It is a simplified version of Lake County's public comment policy. The purpose is to provide for public comment while also allowing adequate time for regular business during meetings.

###### ii. 2021 Northeastern Illinois Deicing Workshop Sponsorship

Motion for DRWW to Sponsor Deicing Workshop for \$250 by Heilemann, seconded by Morthorst.

AYES: Joyce, Mahajan, James, Anderson, Sensenig, Strelcheck, Happ, Miller, Heilemann, Kim, Johnson, Janes, Galan, Frable, Talbett, M. Brown, Kendzior, Warner, Morthorst, D. Brown, Bartolai, Gray. NAYS: None. Motion passed 25-0

#### 5. Guest Speakers

##### a. Des Plaines River Watershed Workgroup Nutrient Assessment and Reduction Plan (NARP)

Rishab Mahajan, Senior Engineer, Geosyntec Consultants and Mike Foster, Kieser & Associates, presented the current status of data collection, modeling, and analysis for the NARP.

Following the presentation the question was asked if nitrogen an issue. Mahajan responded that phosphorus is the limiting nutrient, and although nitrogen will be modeled, phosphorus is driving the impairments.

b. USGS Next Generation Water Observing System (NGWOS)

James Duncker, Hydrologist, United States Geological Survey (USGS) Central Midwest Water Science Center, Urbana, Illinois presented the Next Generation Water Observing System being implemented in the Illinois River Basin (which includes the Des Plaines River watershed).

Following the presentation, the following questions were asked:

What about headwater areas of tributaries? Duncker responded that it is desirable to build datasets in headwater watersheds even if they are not for long periods of time.

Is USGS looking at PFOS as an emerging contaminant? Duncker responded that yes, ILEPA looking at those in wells and USGS is playing catch-up to a degree. There are protocols that must be followed for sample collection and totally different equipment must be used for sampling from typical water quality sampling methods/protocols. There are 2 rounds of PFOS/PFAS sampling scheduled for this year. USGS is also working on correlations that would allow for proxy measurements of PFOS/PFAS.

Is any of the learning from studying the river basins useful for studying the Great Lakes? Or is that a completely separate study? Who is studying Lake dynamincs? Duncker responded that a totally separate group is studying Lake Michigan. They are studying HABs for example. Mahajan added that IL EPA has a Lake Michigan monitoring program with several stations, as does City of Chicago.

6. Watershed Updates & Announcements

- a. 2021 Deicing Workshop (<https://saltsmart.org/workshops/>)

7. Member Remarks

None

8. Next General Membership Meeting February 17, 2022 at 01:30 pm

9. Adjournment

Motion to adjourn made by Anderson, Seconded by Sensenig

AYES: Warner, Mahajan, James, Huber (for Anderson), Sensenig, Strelcheck, Miller, Heilemann, Kim, Galan, Frable, M. Brown, Kendzior, Morthorst, D. Brown, Bartolai, Gray. NAYS: None. Motion passed 20-0

Meeting adjourned at 3:13 PM.

**DRWW**

**Des Plaines River Watershed Workgroup-Expense-Revenue Activity**

**For Period December 2020 - November 2021**

500 W Winchester Rd

Libertyville, Illinois 60048

Phone 847 377 7700

[kwoolfrod@lakecountvill.gov](mailto:kwoolfrod@lakecountvill.gov)

[astrelcheck@lakecountvill.gov](mailto:astrelcheck@lakecountvill.gov)

<b>Ending Balance</b>					
<b>Revenues Received</b>	<b>Current Period</b>	<b>Date Received</b>	<b>Date Deposited</b>	<b>DRWW Ratification</b>	
Carryover	\$ 61,011.85			4/15/2021	
Hey and Associates	\$ 200.00	2/23/2021	2/23/2021	4/15/2021	
Village of Third Lake	\$ 677.47	2/23/2021	2/23/2021	4/15/2021	
Libertyville Township	\$ 2,904.52	3/3/2021	3/3/2021	4/15/2021	
Kildeer	\$ 2,583.39	3/5/2021	3/5/2021	4/15/2021	
Round Lake Park	\$ 256.47	3/8/2021	3/11/2021	4/15/2021	
City of Park City	\$ 446.80	3/8/2021	3/11/2021	4/15/2021	
Fremont Township	\$ 296.86	3/9/2021	3/9/2021	4/15/2021	
Lake Zurich	\$ 1,814.18	3/9/2021	3/9/2021	4/15/2021	
Ela Township	\$ 265.38	3/10/2021	3/10/2021	4/15/2021	
Lincolnshire	\$ 2,076.43	3/12/2021	3/18/2021	4/15/2021	
NSWRD	\$ 93,473.12	3/16/2021	3/18/2021	4/15/2021	
SMC	\$ 200.00	2/28/2021	2/28/2021	4/15/2021	
LCDOT	\$ 28,111.88	2/28/2021	2/28/2021	4/15/2021	
Vernon Hills Park District	\$ 200.00	3/29/2021	4/1/2021	4/15/2021	
Sierra Club	\$ 200.00	3/29/2021	4/1/2021	4/15/2021	
Village of Deerfield	\$ 259.98	3/18/2021	4/1/2021	4/15/2021	NBWW batch#420001495, transfer
County of Lake	\$ 67,468.51	4/2/2021	4/8/2021	4/15/2021	
Village of Round Lake Beach	\$ 575.73	4/15/2021	4/23/2021	6/17/2021	
Town of Vernon	\$ 2,003.81	4/15/2021	4/23/2021	6/17/2021	
Village of Buffalo Grove	\$ 7,906.96	4/27/2021	4/29/2021	6/17/2021	
Village of Gurnee	\$ 7,574.04	5/11/2021	5/13/2021	6/17/2021	
Village of Grayslake	\$ 5,943.53	5/11/2021	5/13/2021	6/17/2021	
Village of Libertyville	\$ 16,291.60	5/14/2021	5/20/2021	6/17/2021	
Village of Lindenhurst	\$ 8,540.39	5/17/2021	5/20/2021	6/17/2021	
Village fo Deer Park	\$ 1,266.88	5/26/2021	5/28/2021	6/17/2021	
City of Zion	\$ 1,341.43	5/26/2021	5/28/2021	6/17/2021	
City of Lake Forest	\$ 318.74	6/1/2021	6/4/2021	6/17/2021	
Geosyntec	\$ 200.00	6/2/2021	6/2/2021	6/17/2021	
Village of Vernon Hills	\$ 4,632.28	6/4/2021	6/4/2021	6/17/2021	
CBBEL	\$ 200.00	6/7/2021	6/7/2021	6/17/2021	
LC Forest Preserve	\$ 14,551.51	6/8/2021	6/8/2021	6/17/2021	
Village of Riverwoods	\$ 1,448.44	6/21/2021	6/25/2021	7/15/2021	
Village of Old Mill Creek	\$ 200.00	7/15/2021	7/23/2021	7/15/2021	
Village of Hawthorn Woods	\$ 3,267.52	7/21/2021	7/21/2021		
Applied Technologies	\$ 200.00	7/21/2021			
<b>Other Contributions Received</b>	\$ 277,897.85				
Total Received:	\$ -				
<b>Total Received + Carryover</b>	\$ 338,909.70				

<b>Expenditures Paid:</b>					
NSWRD	\$ 6,551.76	4/5/2021	4/23/2021	6/17/2021	
LCHD	\$ 17,596.47	4/22/2021	4/23/2021	6/17/2021	
SMC Admin	\$ 10,679.50	4/22/2021	4/23/2021	6/17/2021	
MBI	\$ 11,014.57	5/17/2021	5/27/2021	6/17/2021	
NSRWD	\$ 6,551.76	5/24/2021	6/29/2021	6/17/2021	
Geosyntec	\$ 5,444.50	6/4/2021	6/29/2021	6/17/2021	
Geosyntec	\$ 9,200.25	6/7/2021	6/29/2021	6/17/2021	
SMC Admin	\$ 7,864.50	6/15/2021	6/24/2021	6/17/2021	
LCHD	\$ 13,732.03	6/30/2021	7/15/2021	7/15/2021	
MBI	\$ 4,527.01	7/1/2021	7/15/2021	7/15/2021	
Geosyntec	\$ 7,300.65	7/8/2021	7/15/2021	7/15/2021	
Geosyntec	\$ 7,521.75	8/9/2021			
<b>Total Expenditures Paid</b>	\$ 107,984.75				
<b>Revenue-Expenditures</b>					\$ 230,924.95





PLEASE REMIT PAYMENT TO:  
Geosyntec Consultants, Inc.  
900 Broken Sound Parkway NW, Suite 200  
Boca Raton, Florida 33487-3575 USA  
Tel (561) 995-0900 Fax (561) 995-0925

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DES PLAINES RIVER WATERSHED WORKGRP  
500 W. WINCHESTER ROAD  
LIBERTYVILLE, IL 60048  
Attention: KURT WOOLFORD

Invoice #: 181442916  
Invoice Date: 8/6/2021  
Project: MOW5554  
Project Name: DRWW NARP DEVELOPMENT

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For Professional Services Rendered through transaction date: 7/312021

IF YOU HAVE QUESTIONS ABOUT THIS INVOICE, PLEASE CONTACT RISHAB MAHAJAN AT 630-203-3361

Professional Services	\$5,156.75
Reimbursable Expenses	\$2,365.00
Current Invoice	\$7,521.75

**\*\*Amount Due This Invoice \*\*** **\$7,521.75**

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**Statement**

Prior Billings	\$21,945.40	Project Budget	\$99,700.00
Current Invoice	\$7,521.75	Expended to Date	\$29,467.15
Billed To Date	\$29,467.15	Contract Balance	\$70,232.85
Paid To Date	\$21,945.40	<b>**Amount Due This Invoice **</b>	<b>\$7,521.75</b>

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**Phase : 01) CONDUCT DATA ANALYSIS**

<u>Class / Employee Name</u>	<u>Date</u>	<u>Hours</u>	<u>Rate</u>	<u>Amount</u>
<b>SENIOR STAFF PROFESSIONAL</b>				
RAJSEKHAR, DEEPTHI	07/12/2021	6.25	147.00	918.75
	07/19/2021	4.00	147.00	588.00
Total: SENIOR STAFF PROFESSIONAL		10.25		1,506.75
<b>SENIOR PROFESSIONAL</b>				
MAHAJAN, RISHAB	07/12/2021	0.25	215.00	53.75
	07/26/2021	0.50	215.00	107.50
Total: SENIOR PROFESSIONAL		0.75		161.25
<b>PRINCIPAL</b>				
NEMURA, ADRIENNE	07/15/2021	0.50	235.00	117.50
Total: PRINCIPAL		0.50		117.50
<b>Total Phase : 01) CONDUCT DATA ANALYSIS</b>			<b>Phase Labor</b>	<b>1,785.50</b>

**Phase : 02) DEVELOP MODELING TOOLS**

<u>Class / Employee Name</u>	<u>Date</u>	<u>Hours</u>	<u>Rate</u>	<u>Amount</u>	
<b>PROJECT ADMINISTRATOR</b>					
EDER, TERRI	07/02/2021	0.25	68.00	17.00	
	07/06/2021	0.25	68.00	17.00	
Total: PROJECT ADMINISTRATOR		0.50		34.00	
<b>SENIOR STAFF PROFESSIONAL</b>					
RAJSEKHAR, DEEPTHI	07/26/2021	3.00	147.00	441.00	
Total: SENIOR STAFF PROFESSIONAL		3.00		441.00	
<b>PROFESSIONAL</b>					
QASEM, KAROLINE	07/26/2021	1.25	168.00	210.00	
	07/26/2021	4.75	168.00	798.00	
	07/27/2021	5.00	168.00	840.00	
	07/29/2021	4.00	168.00	672.00	
Total: PROFESSIONAL		15.00		2,520.00	
<b>SENIOR PROFESSIONAL</b>					
MAHAJAN, RISHAB	07/02/2021	0.25	215.00	53.75	
	07/02/2021	0.50	215.00	107.50	
	07/14/2021	1.00	215.00	215.00	
Total: SENIOR PROFESSIONAL		1.75		376.25	
<u>Vendor Name</u>	<u>Doc Nbr</u>	<u>Date</u>	<u>Cost</u>	<u>Multiplier</u>	<u>Amount</u>
<b>Subcontractors-Billable</b>					
KIESER & ASSOCIATES, LLC	21190	08/04/2021	2,365.00	1.00	2,365.00
<b>Total Phase : 02) DEVELOP MODELING TOOLS</b>			<b>Phase Labor</b>	<b>3,371.25</b>	
			<b>Phase Expense</b>	<b>2,365.00</b>	

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	<b>Total Project Labor</b>	<b>5,156.75</b>
	<b>Total Project Expense</b>	<b>2,365.00</b>
<b>Total Project: MOW5554 -- DRWW NARP DEVELOPMENT</b>		<hr/> <b>7,521.75</b>





536 E. Michigan Avenue  
 Suite 300  
 Kalamazoo, MI 49007

# Invoice

DATE	INVOICE #
8/4/2021	21-190

**BILL TO:**

Geosyntec  
 Attn: Rishab Mahajan  
 and Terri Eder  
 1420 Kensington Rd., Suite 103  
 Oak Brook, Illinois 60523

P.O. NO.	TERMS
Project# MOW5554	Net 30

DESCRIPTION	QTY	RATE	AMOUNT
Environmental Engineer I - Task 1	5.5	100.00	550.00
Professional Engineer - Task 1	1.75	160.00	280.00
Senior Scientist/ Principal - Task 1	1.5	210.00	315.00
Environmental Engineer I - Task 2	5	100.00	500.00
Professional Engineer - Task 2	4.5	160.00	720.00
<p>This invoice is for professional services rendered through July 31, 2021, as related to Geosyntec, Des Plaines, SWAT Modeling. Project# MOW5554.</p>			

Please remit payment to Kieser & Associates, LLC  
 For questions, please contact Becky Hough.

<b>Total</b>	USD 2,365.00
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Phone #	Fax #
(269) 344-7117	(269) 344-2493

**Kieser & Associates, LLC**  
**Time by Job Detail**  
 July 2021

<b>Geosyntec Des Plaines SWAT</b>	<b>Date</b>	<b>Name</b>	<b>Duration</b>	<b>Cost</b>	<b>Notes</b>
<b>Geosyntec Des Plaines SW AT - Task 1: Model Background</b>					
	07/02/2021	Foster, Michael	1.00	100.00	Weather and land use data collection and formatting
	07/15/2021	Foster, Michael	1.00	100.00	Model mapping for client and communications with Geosyntec
	07/19/2021	Foster, Michael	1.50	150.00	Project status meeting with Mark Kieser and Andrew Fang
	07/20/2021	Foster, Michael	1.00	100.00	Calibration planning and communications
	07/22/2021	Foster, Michael	1.00	100.00	Call with Geosyntec on calibration/validation plan, edits to plan
	07/06/2021	Fang, Andrew	0.75	120.00	Datasets processing
	07/07/2021	Fang, Andrew	1.00	160.00	Datasets processing
	07/19/2021	Kieser, Mark	1.50	315.00	Project Status Meeting
			<b>8.75</b>	<b>1,145.00</b>	
<b>Total - Geosyntec Des Plaines SW AT - Task 1:</b>					
<b>Geosyntec Des Plaines SW AT - Task 2: SW AT Model Development</b>					
	07/09/2021	Foster, Michael	1.00	100.00	Meeting with Andrew Fang on SWAT model development and progress
	07/08/2021	Foster, Michael	1.00	100.00	Meeting with Andrew Fang on SWAT model development and progress
	07/14/2021	Foster, Michael	2.00	200.00	Edits to SWAT model delineation
	07/30/2021	Foster, Michael	1.00	100.00	Discussion with Andrew Fang on SWAT Model Development & Model Development
	07/08/2021	Fang, Andrew	0.25	40.00	Datasets processing
	07/19/2021	Fang, Andrew	2.00	320.00	Model Development & Project Meeting w/ Mike Foster & Mark Kieser
	07/20/2021	Fang, Andrew	1.00	160.00	Model Development
	07/30/2021	Fang, Andrew	1.25	200.00	Model Development
			<b>9.50</b>	<b>1,220.00</b>	
			<b>18.25</b>	<b>2,365.00</b>	
<b>Total - Geosyntec Des Plaines SWAT:</b>					

<b>FY2021 Des Plaines River Watershed Workgroup Budget (December 2020 thru November 2021)</b>			<b>Actual FY2020</b>	<b>Projected FY2021</b>	<b>Actual FY2021</b>
<b>REVENUE/Description</b>	<b>Account #</b>	<b>PO#</b>			
Dues/Membership dues	775-4220010-46010		\$ 245,246.00	\$ 273,973.92	\$ 277,897.85
Expendable Carryover Addition	775-4220010-46010		\$ 20,085.85	\$ 61,011.55	\$ 61,011.85
Other State Funds/Illinois EPA 319 Grant	775-4220010-45350				
Interest	775-4220010-48011		\$ 89.17		
Other (FPD/LCDOT)					
<b>Total Revenue</b>			<b>\$ 265,421.02</b>	<b>\$ 334,985.47</b>	<b>\$ 338,909.70</b>
<b>EXPENSES/Description</b>					
<b>2020 MBI - 1/3 WATERSHED SAMPLING</b>	<b>775-4220010-71310</b>		-		
2020 MBI - New Sampling	775-4220010-71310		\$ 84,753.87		
2020 SubLabs - New Sampling	775-4220010-71310		\$ 83,736.00		
2020 SMC Administrative/GIS/Tech Support	775-4220010-79940		\$ 25,000.00		
2020 NARP Tasks-NSWRD	775-4220010-71150		\$ 10,919.60		
2021 MBI Sampling	775-4220010-71310			\$ 42,531.42	\$ 15,541.58
2021 LCHD Sampling	775-4220010-71310	212246		\$ 80,353.50	\$ 31,328.50
2021 SMC Administrative/GIS/Tech Support	775-4220010-79940			\$ 25,000.00	\$ 18,544.00
2021 NARP Tasks-NSWRD	775-4220010-71150	212307		\$ 26,207.00	\$ 13,103.52
2021 NARP Tasks-Geosyntec	775-4220010-71150			\$ 99,700.00	\$ 29,467.15
<b>Expenses</b>			<b>\$ 204,409.47</b>	<b>\$ 273,791.92</b>	<b>\$ 107,984.75</b>
<i>Projected Unexpended Carryover</i>			<i>\$ 61,011.55</i>	<i>\$ 61,193.55</i>	<i>\$ 230,924.95</i>

## Des Plaines River Watershed Workgroup Public Comment Policy

*Adopted: 06/17/2021*

- 1) Members of the public shall be afforded time to comment on agenda items and other matters germane to the business of the Des Plaines River Watershed Workgroup (DRWW) in accordance with these Rules.
- 2) The Chair of the Meeting shall manage the public comment section of DRWW Meetings, including enforcing rules governing public comment.
- 3) DRWW administrative staff shall support the management of public comment during all DRWW meetings.
- 4) The agenda of every DRWW meeting shall include a reservation of time near the beginning of the meeting for public comment.
- 5) The Chair of the meeting shall recognize and allow to speak any person desiring to speak during Public Comment.
- 6) The total cumulative time of all public comment shall be limited to 30 minutes unless determined otherwise by the Chair of the meeting.
- 7) Public comment is limited to three minutes per individual, unless the Chair of the meeting designates a longer period.
- 8) No Board or Committee Member should interrupt a speaker during public comment.
- 9) The Chair of the meeting has the right to interrupt a speaker in order to enforce these or other applicable rules.
- 10) Speakers shall be entitled to address the Public Body on a first-recognized, first- served basis. In the event that all persons desiring to speak during the Public Comment are not able to do so within the time limit allowed, the Chair of the meeting shall have the option (but not the obligation) of extending the time allocated for Public Comment, either at the point designated on the agenda, or at such later point on the agenda, or as the Public Body may otherwise determine.

**VIRTUAL  
WORKSHOPS**



**REGISTRATION OPEN**

[www.SaltSmart.org](http://www.SaltSmart.org)

# 2021 Virtual Deicing Workshops

Public Roads  
September 30, 2021  
October 5, 2021  
October 12, 2021  
8 am–12 pm

Parking Lots & Sidewalks  
September 28, 2021  
October 7, 2021  
8 am–12pm

Hosted by:



Registration is available through [SaltSmart.org](http://SaltSmart.org)



Des Plaines River Watershed Workgroup  
Nutrient Assessment and Reduction Plan  
(NARP)

August 19, 2021



THE  
CONSERVATION FUND

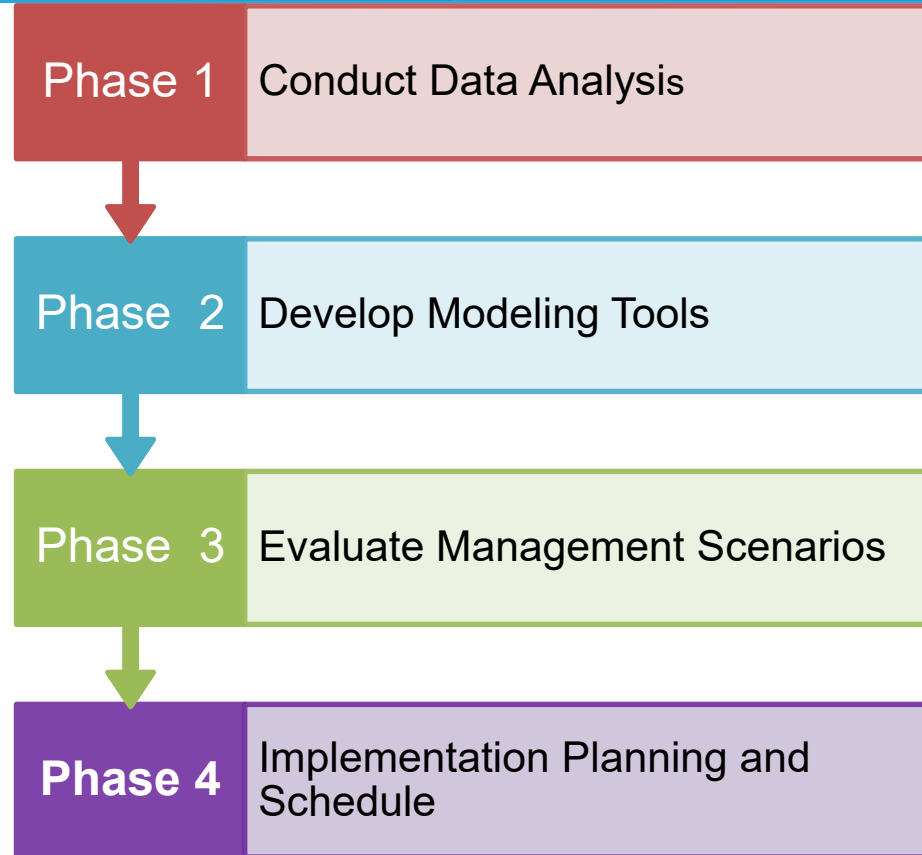
# Outline

- Data Analysis
- Model Development
- Next Steps

# Project Approach

## Project Approach

- Phased approach
- Each phase will be a NARP chapter





# Data Analysis Methodology

- Analyzed flow and rainfall data to identify periods with critical low flows
- Developed understanding of potential relationships between phosphorus, algae, and dissolved oxygen using data
  - Illinois Risk of Eutrophication Criteria
  - Longitudinal Plots

# Critical Flow Periods

Year	2013	2017	2018	2020
Total Mar-Oct precipitation (in)	108	145	130	117

- Driest years: 2013 and 2020
- Flow behavior during the dry years: heavy spring rains followed by dry summers

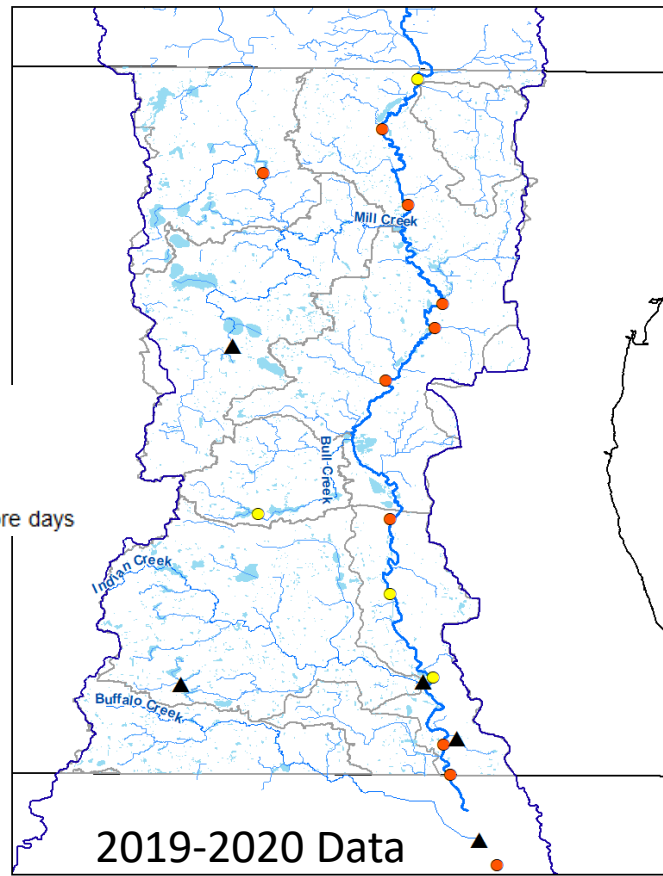
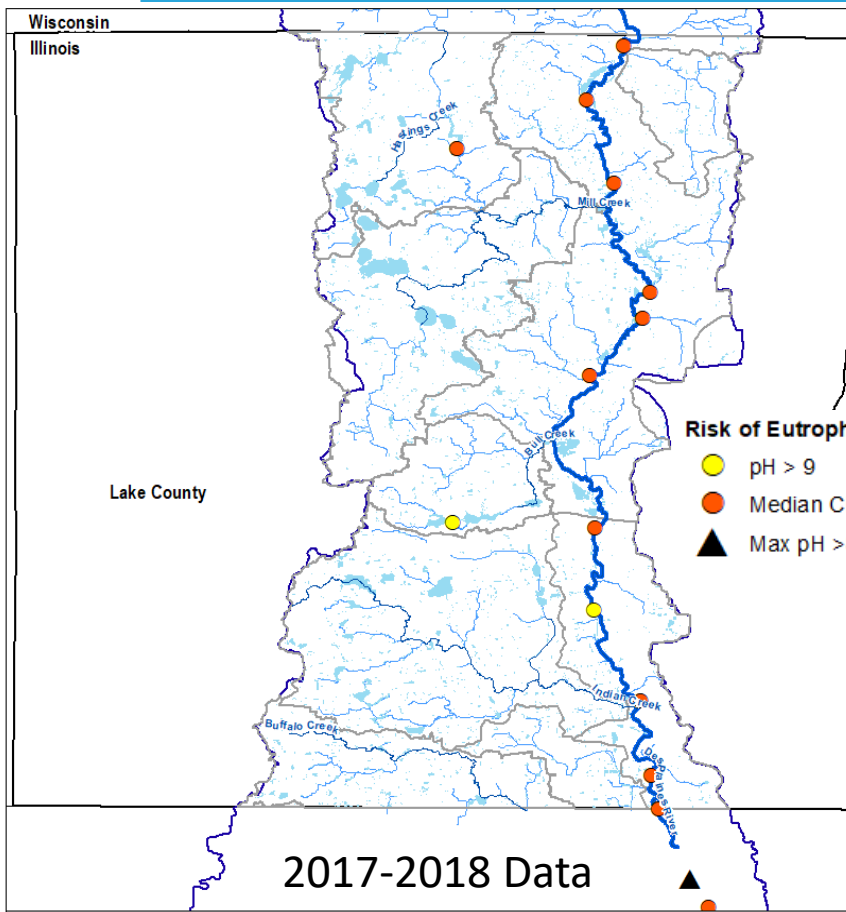
Flow (cfs)	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Average
<b>2013</b>	760	1,597	288	247	199	67	56	47	408
<b>2020</b>	600	631	1,583	213	265	162.1	141	122	465

- Data availability:

Year	Data source	Availability
2013	IEPA	6/25 – 8/28
2020	DRWW	6/25 – 10/31

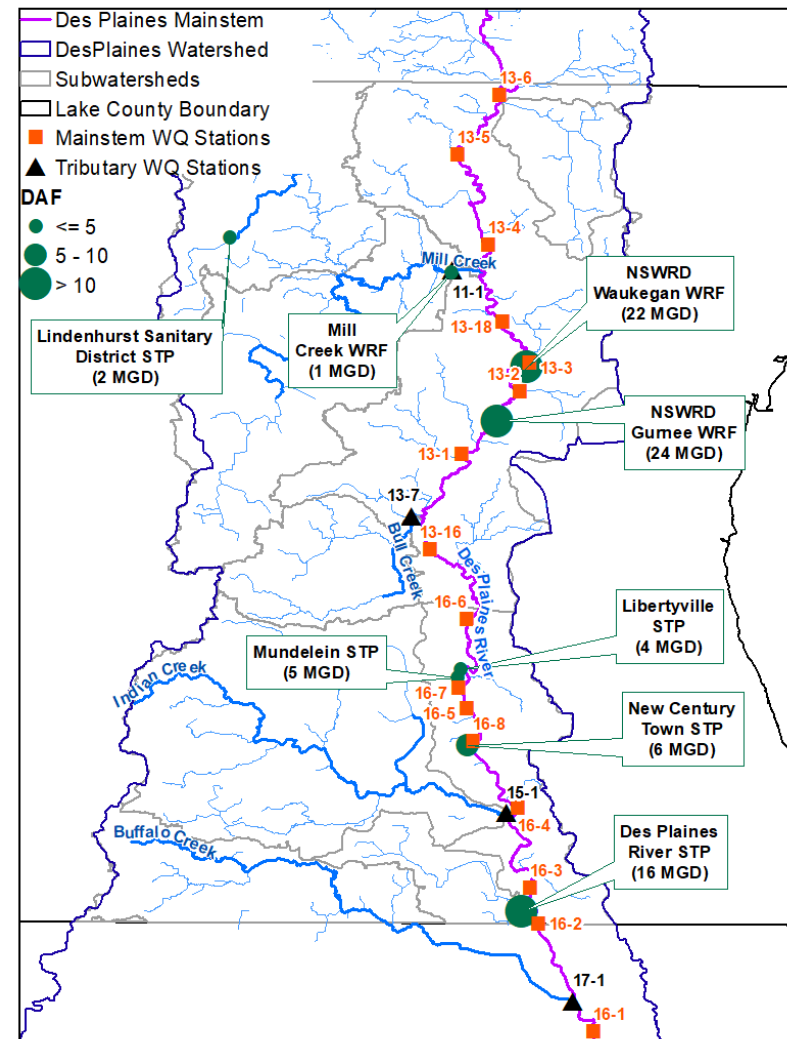
Selected Critical Periods

# Illinois Risk of Eutrophication Criterion

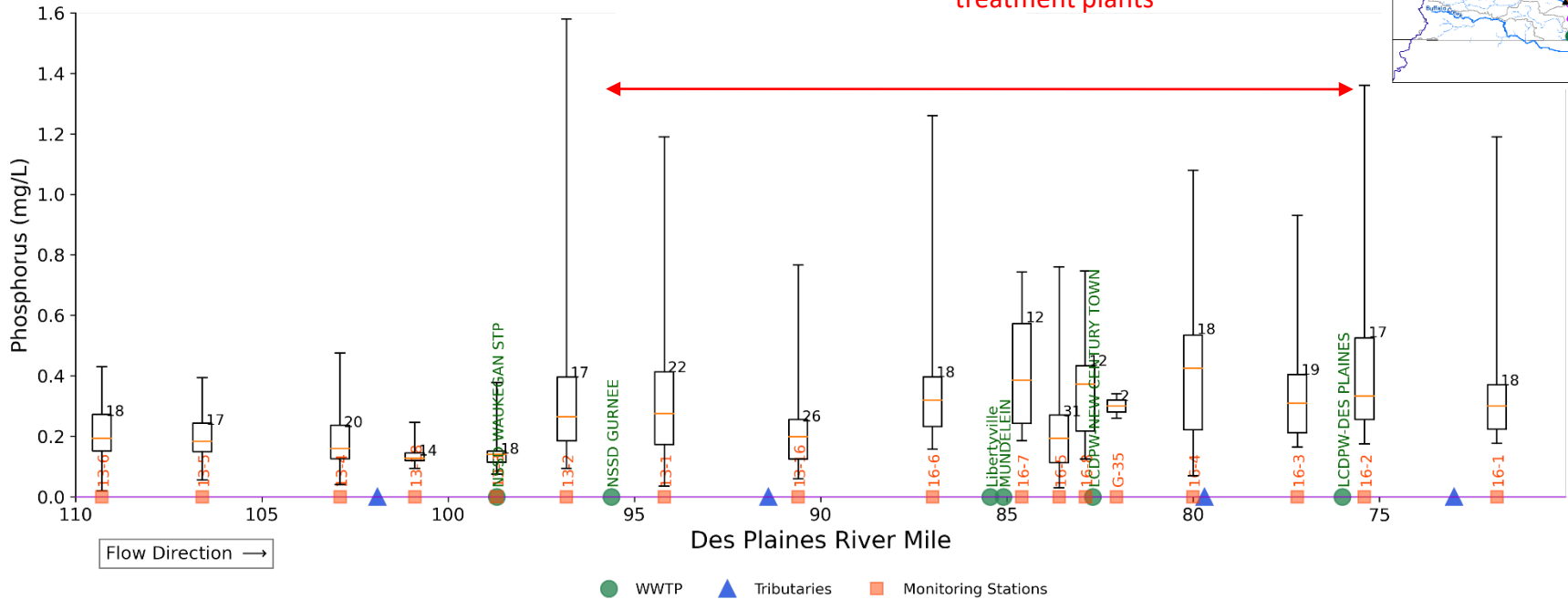
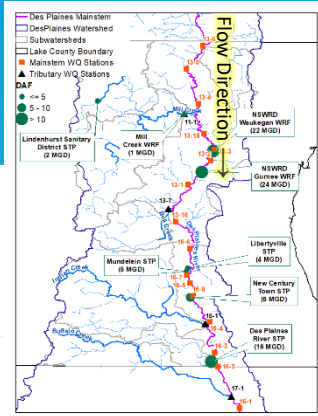


# Longitudinal Plots

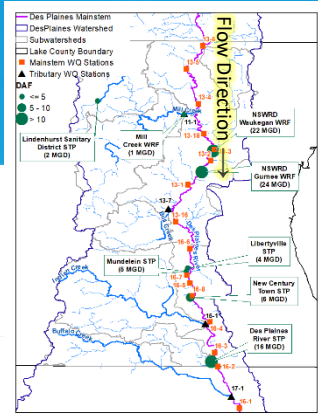
- 17 water quality stations
  - DRWW
  - IEPA
- 3 tributaries
  - Mill Creek
  - Bull Creek
  - Indian Creek
  - Buffalo Creek
- 5 treatment plants
  - NSWRD Waukegan
  - NSWRD Gurnee
  - Libertyville
  - Mundelein
  - LCDPW (New Century Town)
  - LCDPW (Des Plaines)
- Period (May – October)
  - 2017-2021 (last five years)
  - 2008 – 2021 (all data)
  - 2020



# Phosphorus (May – Oct.) 2017-2021

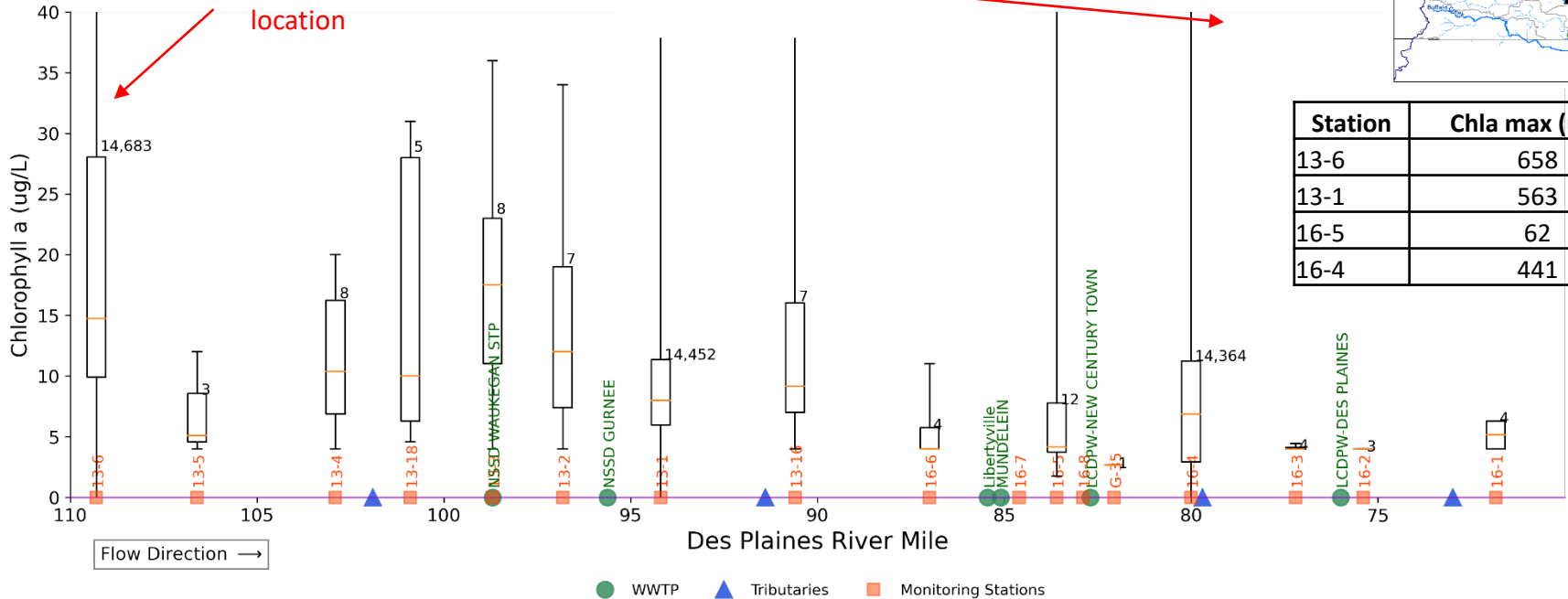


# Chlorophyll-a (May – Oct.) 2017-2021



Chlorophyll-a improves downstream (still maximum values are high)

High Chla at the upstream location

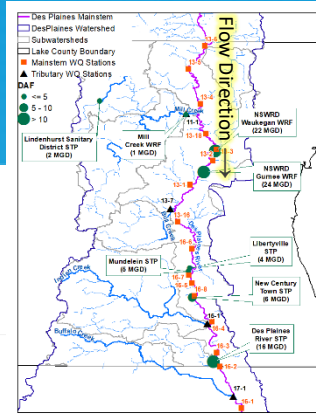
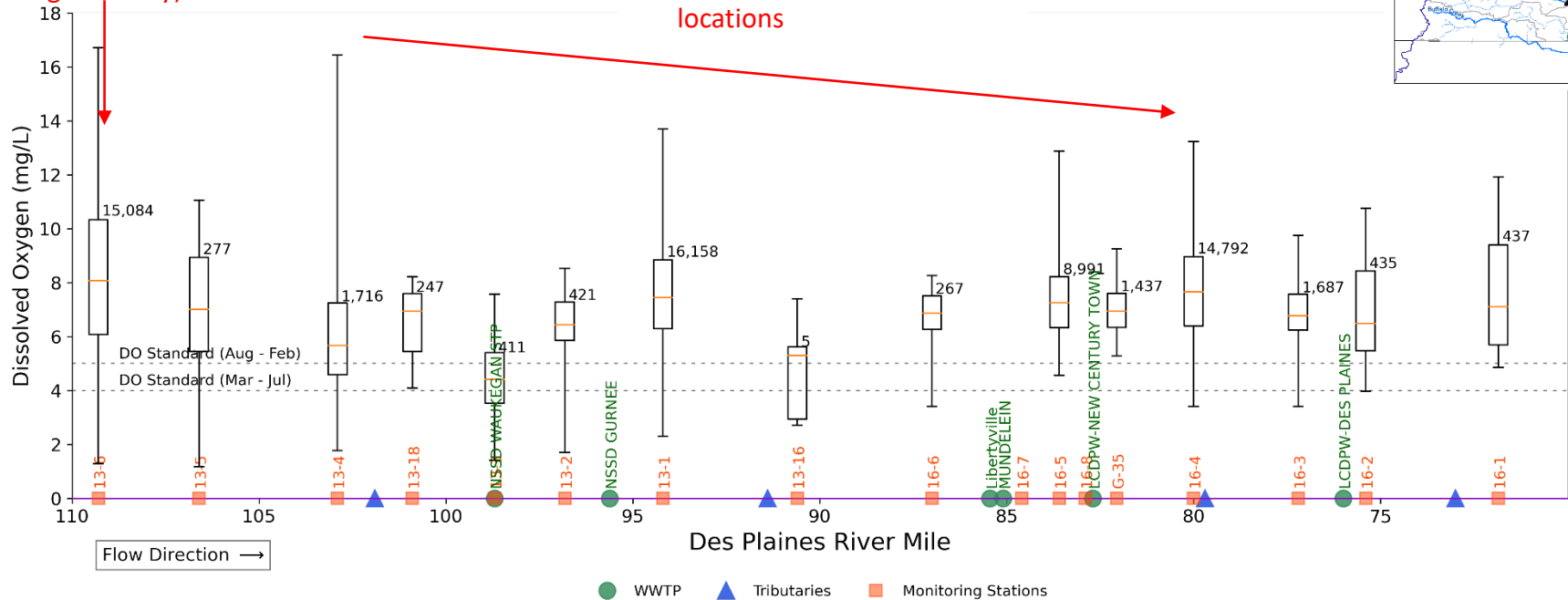


Station	Chla max (ug/L)
13-6	658
13-1	563
16-5	62
16-4	441

# Dissolved Oxygen (May – Oct.) 2017-2021

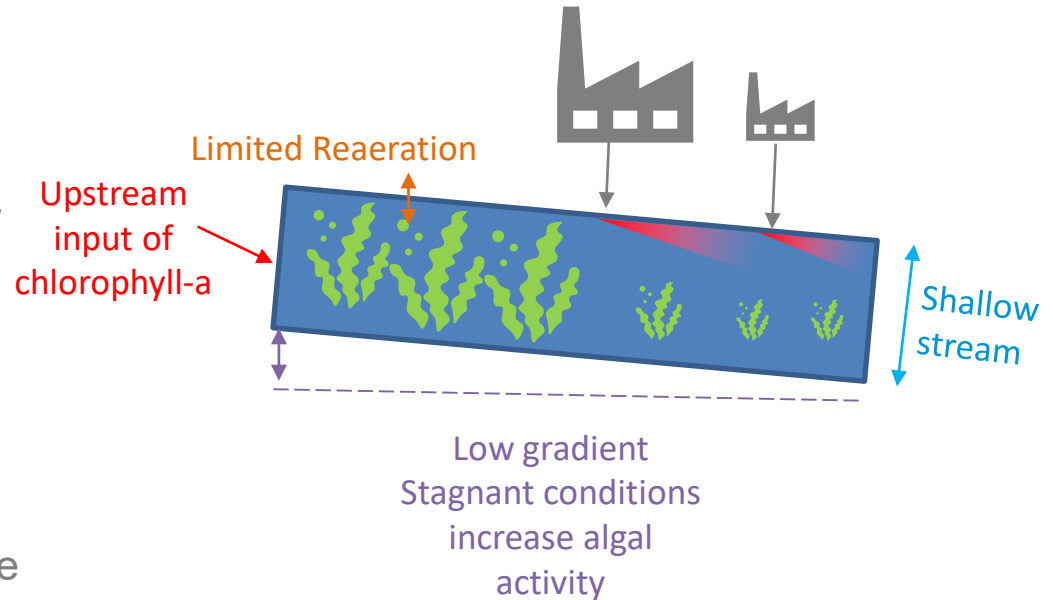
High DO swings coming from the upstream boundary (potential algal activity)

DO swings improve at some downstream locations



# Inferences from Data Analysis

- Low dissolved oxygen is mostly due to:
  - High chlorophyll-a input from the upstream boundary increasing algal activity
  - Limited reaeration due to low flows and small slopes
- While treatment plants contribute to TP concentrations in the river:
  - TP concentrations are reduced after a short distance downstream the plants

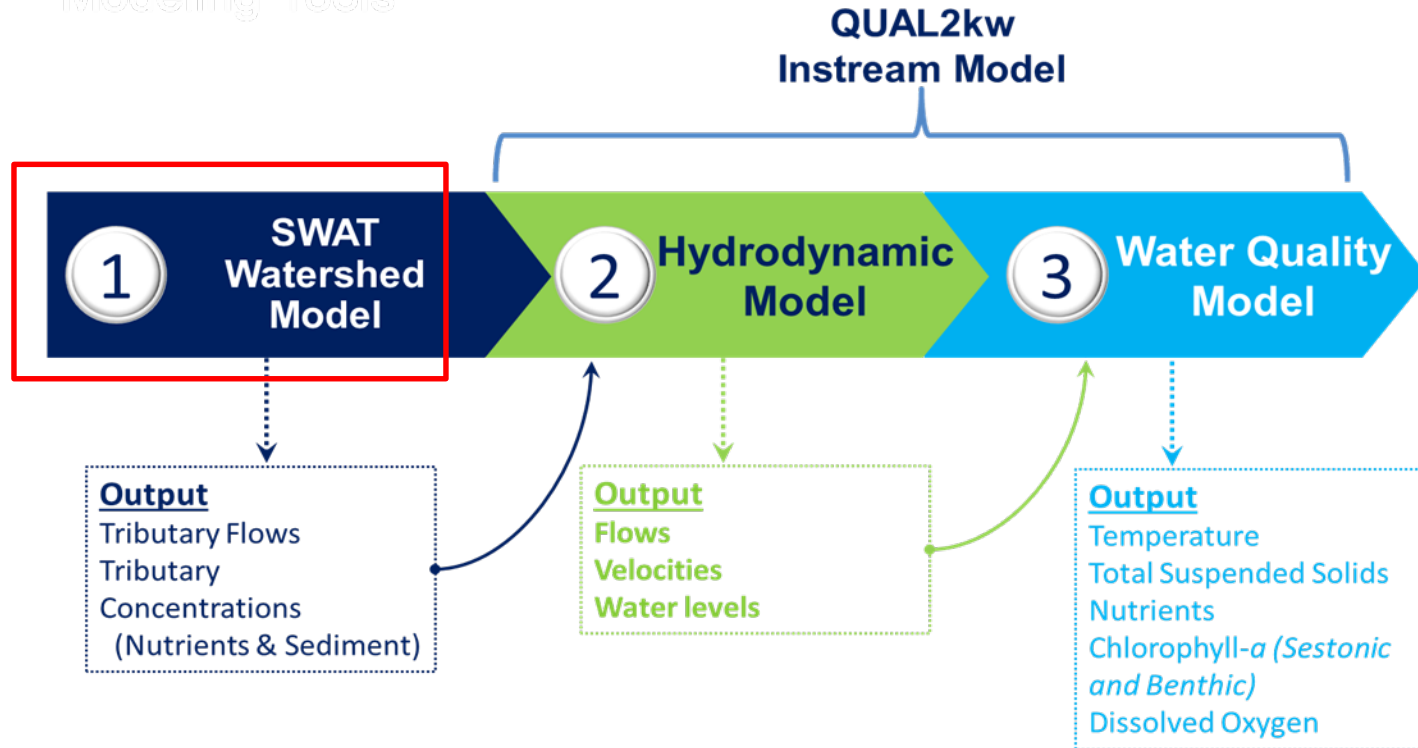




# Phase 2: Develop Modeling Tools

Define the linkage between the phosphorus inputs and related impairments

Modeling Tools

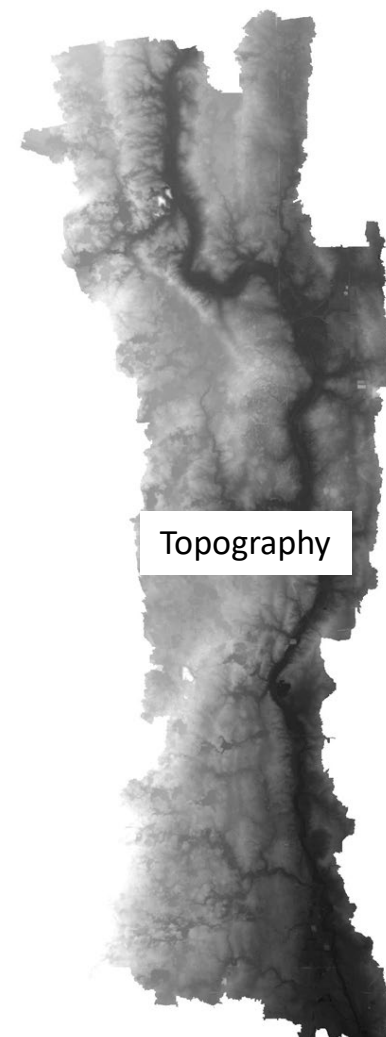
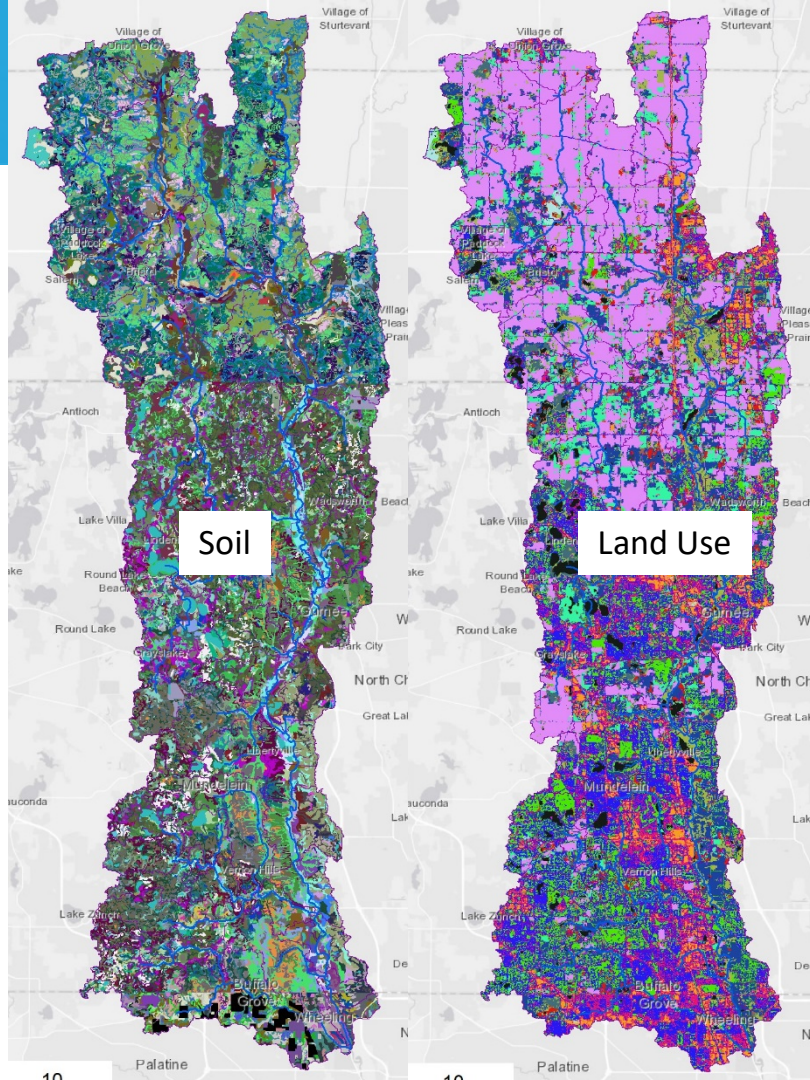


# Why create a watershed model?

- The Des Plaines River Watershed is a complex system
- Modeling enables analysis of the impacts of different management scenarios
  - Which management options provide the most impact?
  - Where in the watershed do management options provide the most impact?

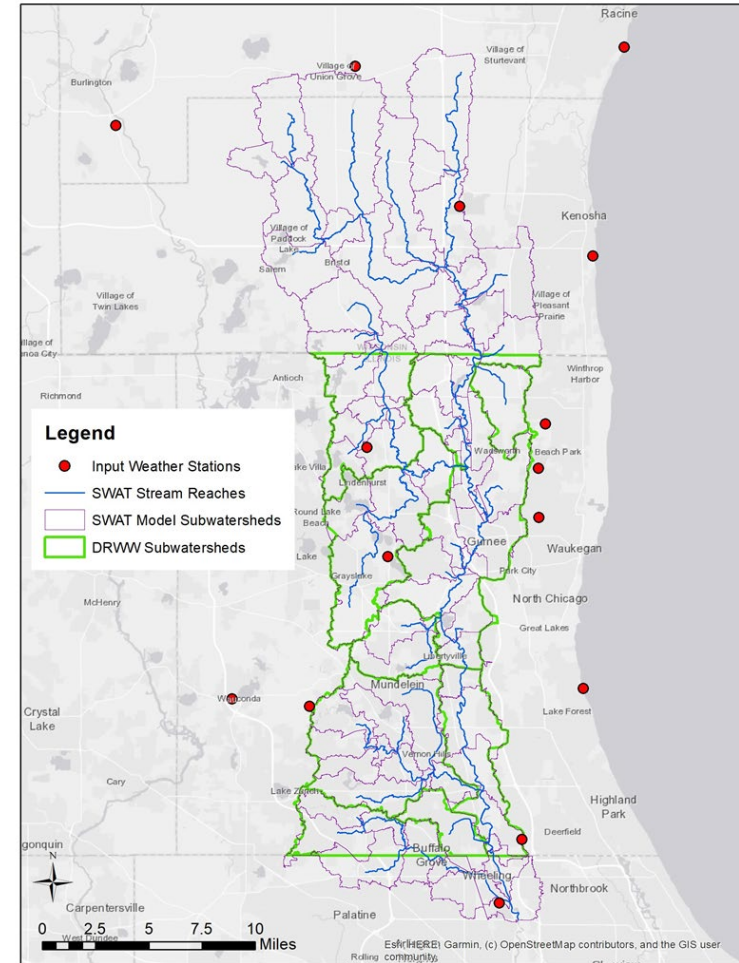


# Model Inputs



# Watershed Model

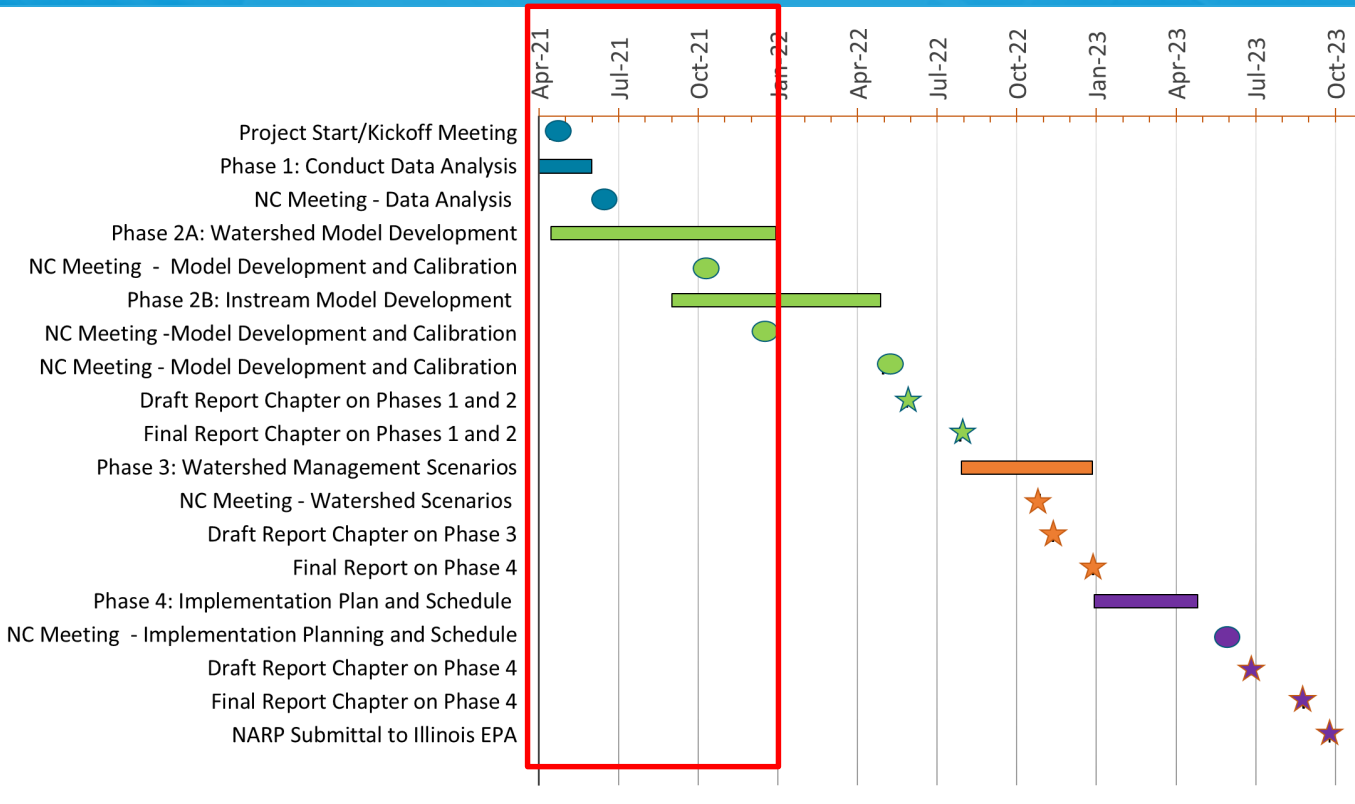
- Outlet sited to pick up all Lake County contributions to the Des Plaines River, including Buffalo Creek
- Watershed boundaries generated using topography data and then adjusted to match previous DRWW delineated boundaries
- 89 delineated subwatersheds
- Model simulation period: 2011-2018
  - Required for long term calibration of flow



## Next Steps

- **Phase 1 Data Analysis**
  - Review the additional data received from Illinois EPA
- **Phase 2 – Model Development**
  - Watershed model calibration – matching to observed data
  - Instream model setup

# Project Schedule

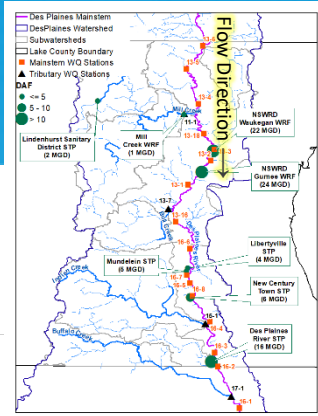
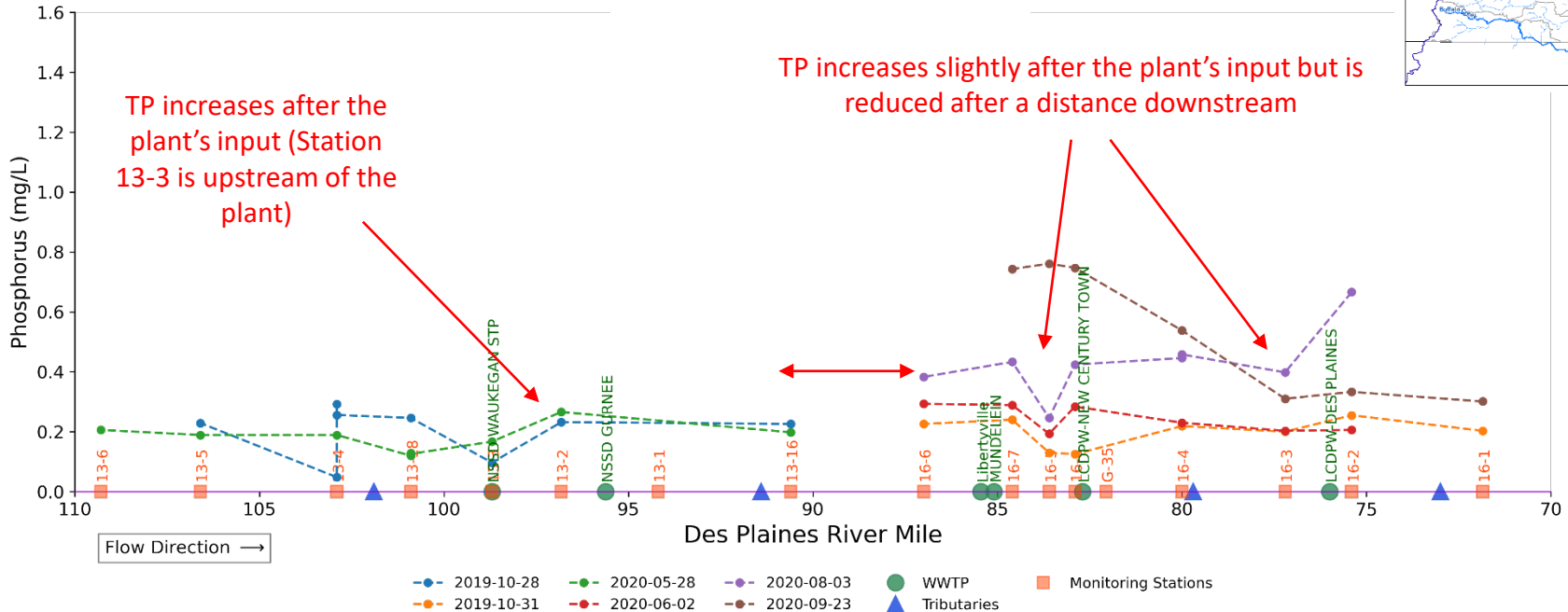


● NARP Committee Meeting Tentative Date

★ Major Project Milestone

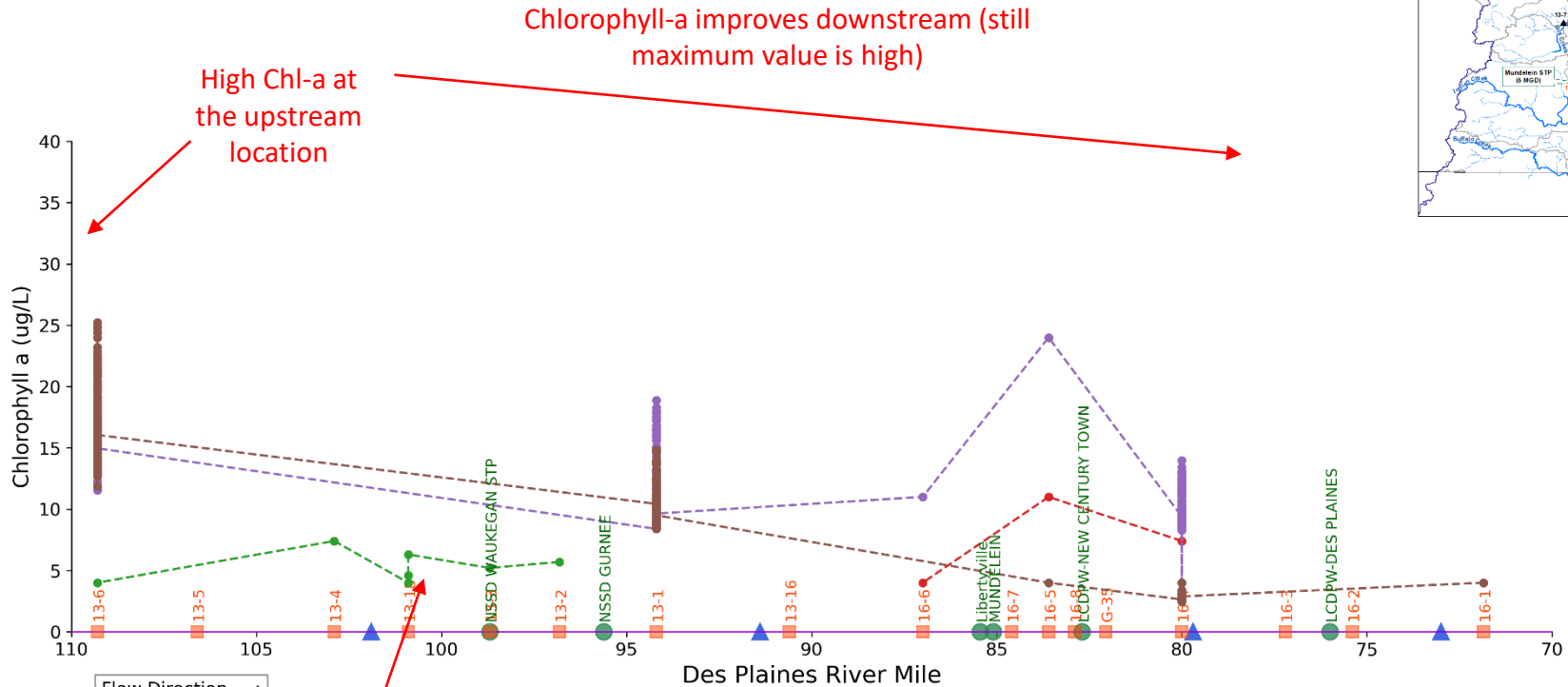
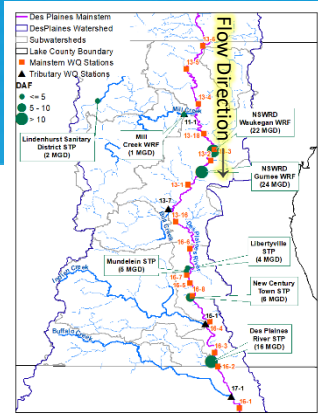
Thank You!

# Phosphorus Selected Events





# Chlorophyll-a Selected Events



Chlorophyll-a improves downstream (still maximum value is high)

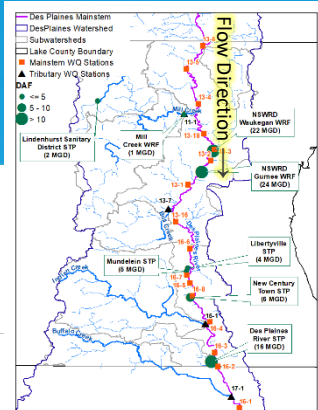
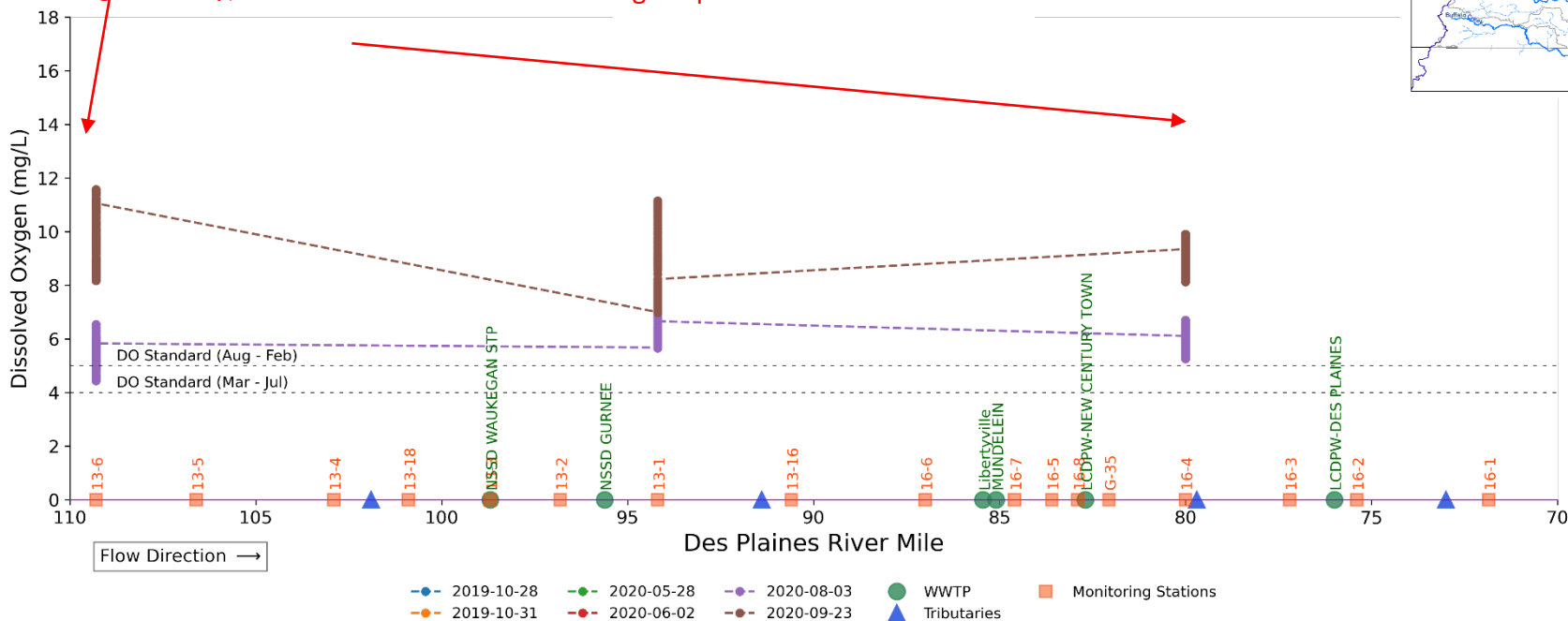
High Chl-a at the upstream location

Chl-a behavior is very similar to TP indicating potential linked algal activity

# Dissolved Oxygen Selected Events

High DO swings coming from the upstream boundary (potential algal activity)

DO swings improve downstream



# USGS Integrated Water Science

A presentation to the

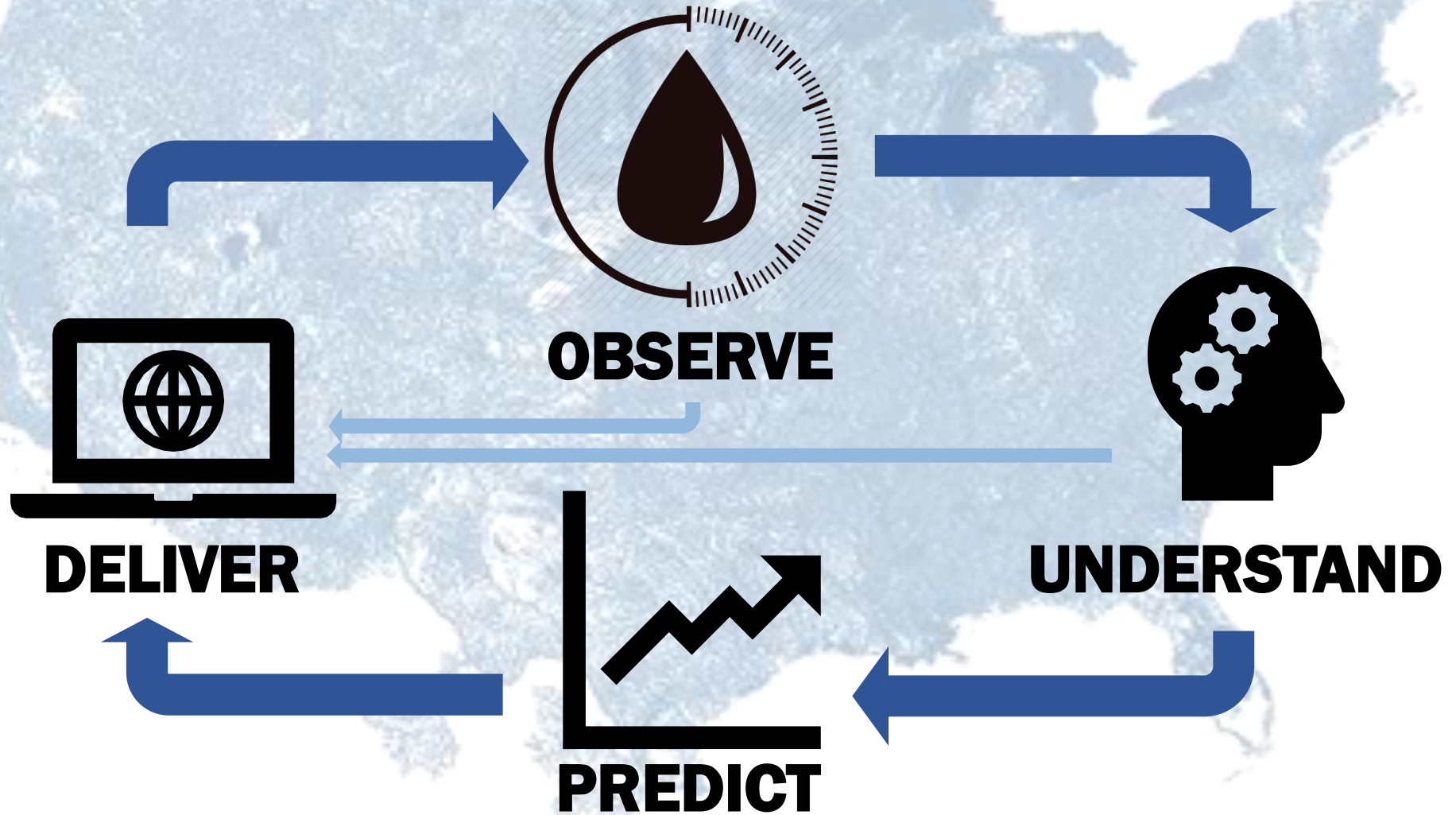
**Des Plaines River Watershed Workgroup**

**Jim Duncker,  
USGS Central Midwest Water Science Center  
August 19, 2021**

# USGS Integrated Water Science Basin Activities in the Illinois River Basin



# Integrated Water Science Process

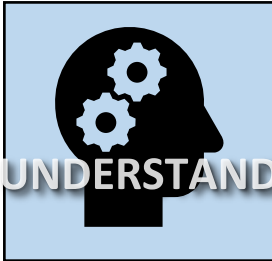


# Integrated Water Science Initiative



## Next Generation Water Observing System (NGWOS)

NGWOS collects real-time data on water quantity and quality in more affordable, rapid, and intensive ways than has previously been possible. The flexible monitoring approach enables USGS networks to evolve with new technology and emerging threats.



## Integrated Water Availability Assessments (IWAA)

IWAAs examine the supply, use, and availability of the nation's water. These regional and national assessments evaluate water quantity and quality in both surface and groundwater, as related to human and ecosystem needs and as affected by human and natural influences.



## Integrated Water Prediction (IWP)

IWP builds a powerful set of modeling tools to predict the amount and quality of surface and groundwater, now and into the future. These models use the best available science to provide information for more rivers and aquifers than can be directly monitored.



## National Water Information System (NWIS) Modernization; National Water Dashboard

NWIS data systems that house USGS water information are being modernized to maximize data integrity, simplify data delivery to the general public, automate early warning to enable faster response times during water emergencies, and support the new National Water Dashboard.

# Integrated Water Science Basins

## 10 Intensive Reference Basins to Drive the Future of Integrated Water Science:

- Regional focus areas for intensive observation, assessments, modeling, and prediction
- 10 river basins (10,000-20,000 mi<sup>2</sup>) representative of larger water-resource regions
- Goal: Establish 10 basins in 10 years
- Develop a deep, integrated understanding that can be extended to the broader region
- Basin selection process includes quantitative metrics and extensive stakeholder engagement



# Illinois River Basin

- Extensive urban and agricultural land uses
- HABs occurrences are commonplace
- Estimated to be one of the largest geographic source of nutrients to the Gulf of Mexico



## Illinois River Basin IWS Insights and Opportunities:

- Improve understanding of nutrient sources and climate and land-use change limits to water availability.
- Improve understanding of HABs occurrences in the broader Mississippi River Basin and Midwestern US.
- High transferability - inform nutrient management to reduce nutrient loads to the Gulf of Mexico and Great Lakes and evaluate conservation practices on water-quality trends at various spatial scales.
- Provide opportunities for integration within USGS activities and Mission Areas.
- Provide opportunities to leverage direct linkages with stakeholders and partners.



# Components of the Integrated Water Science Basins



Catalog existing observational networks, models, and data repositories and identify monitoring and knowledge gaps.



Establish integrated set of fixed and mobile monitoring assets in the water, ground, and air to fill data gaps.



Conduct targeted hydrologic research to fill knowledge gaps.

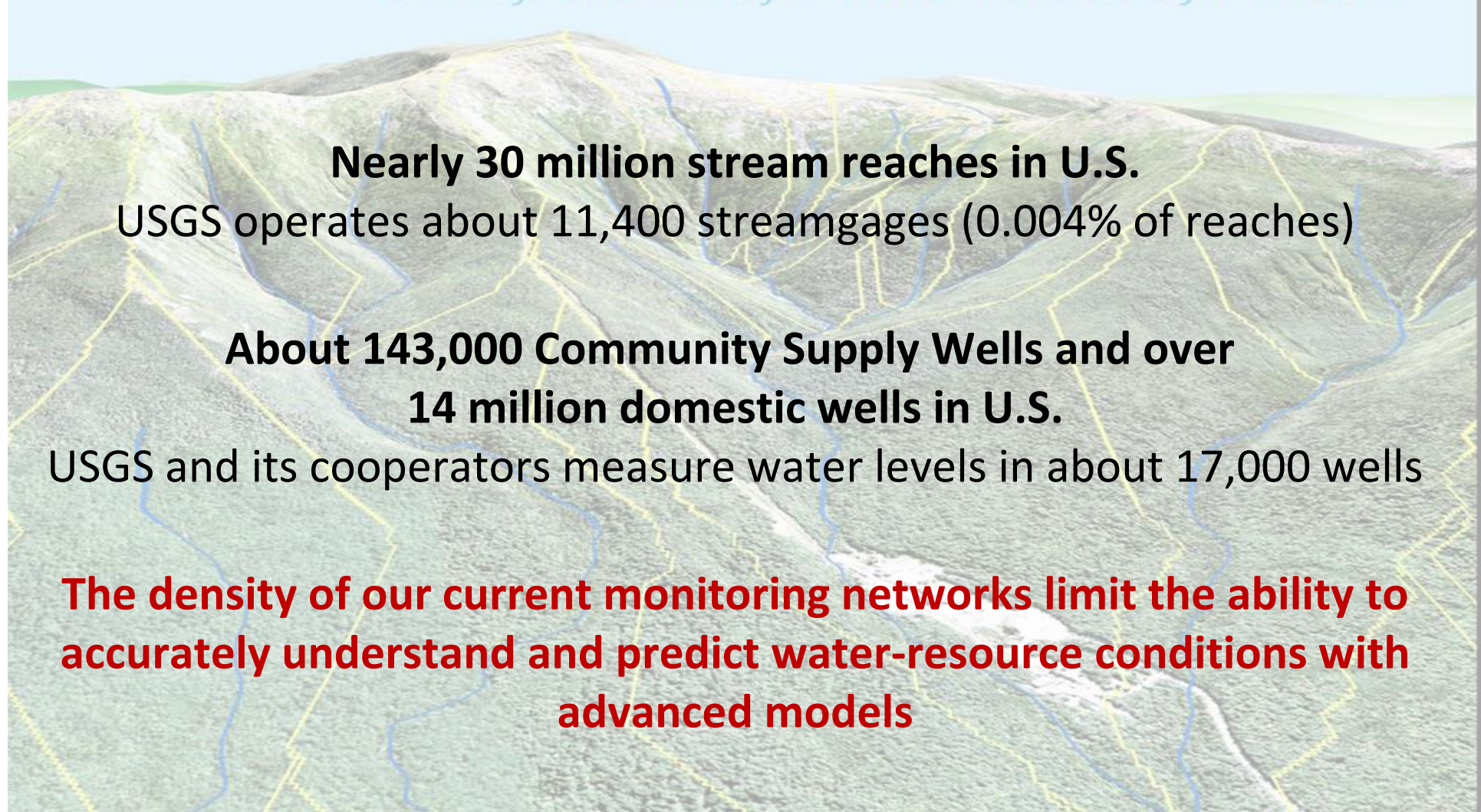


Use new data and knowledge to develop improved basin models.



Use models to assess past, current, and future water availability – including water quantity, quality, and use.

# Advanced Water Models Require High-Density Data

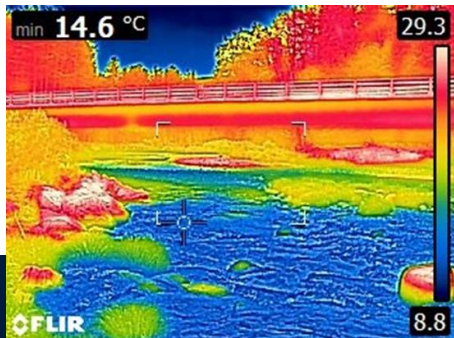
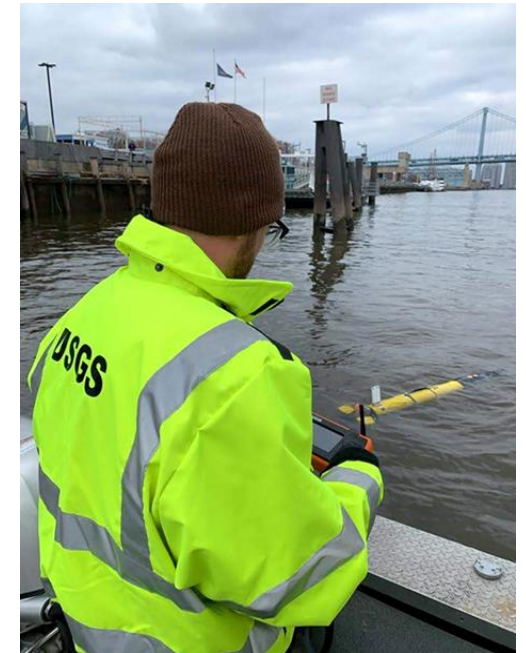


# Next Generation Water Observing System (NGWOS)

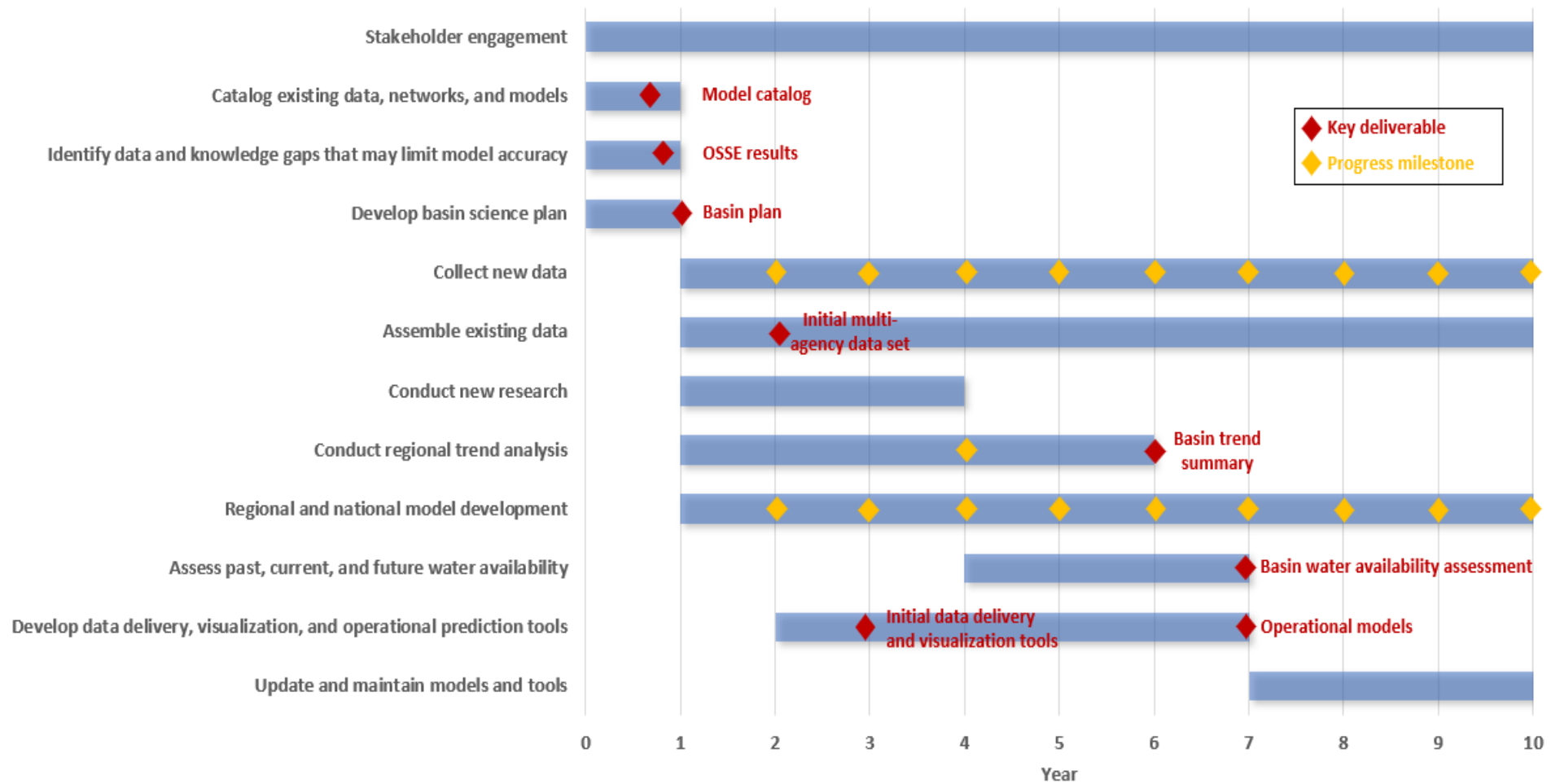
The USGS Next Generation Water Observing System (NGWOS) will provide high-resolution, real-time data on water quantity, quality, and use in Integrated Water Science Basins to support National modern water-availability prediction and decision support systems

## Approach

- Increases spatial and temporal coverage of critical data
- Dense array of sensors at selected sites
- Use state-of-the-art data collection methods
- Test and mature new technologies
- Improved USGS operational efficiency
- Modernized and timely data telemetry, storage, QA/QC and delivery

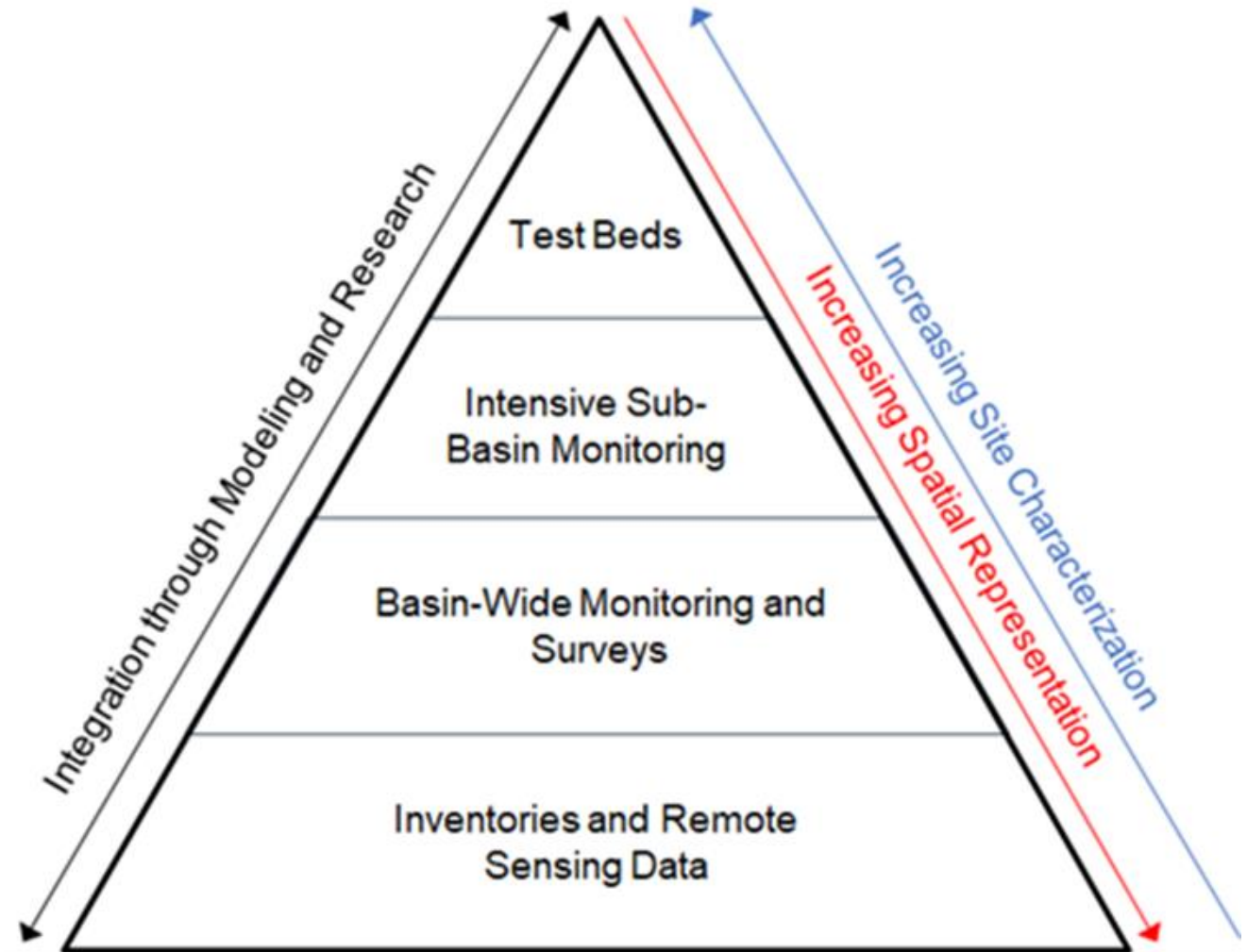


# Standard approach



# NGWOS

The pyramid shape of the framework represents the relative density of observations, with "few intensive sites measuring multiple parameters at a high frequency at the top and many survey points or remotely sensed pixels measured less frequently and for fewer parameters at the base" (Murdoch et al., 2014).



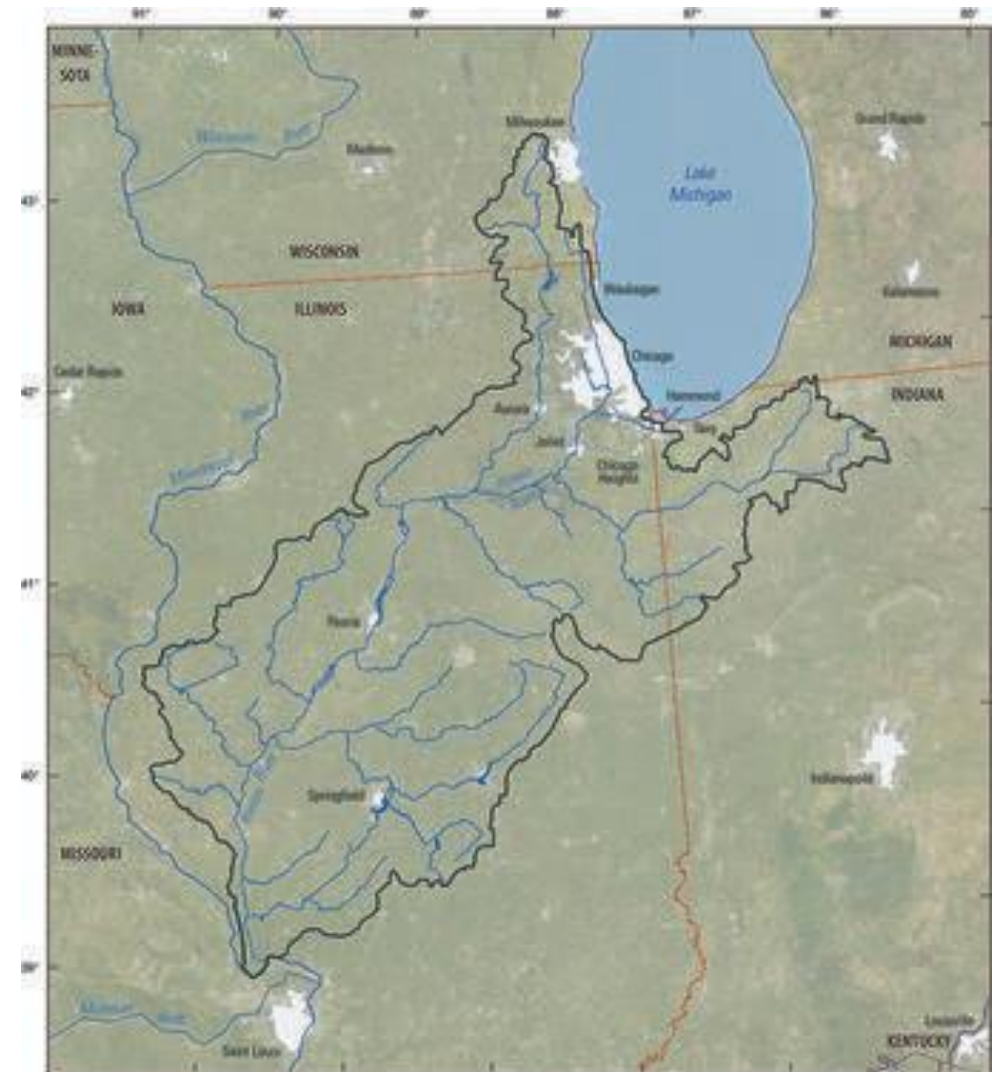
# NGWOS

- State-of-the-art measurements
- Dense array of sensors at selected sites
- Increased spatial and temporal data coverage of all primary components of the hydrologic cycle
- New monitoring technology testing and implementation
- Improved operational efficiency
- Modernized and timely data storage and delivery



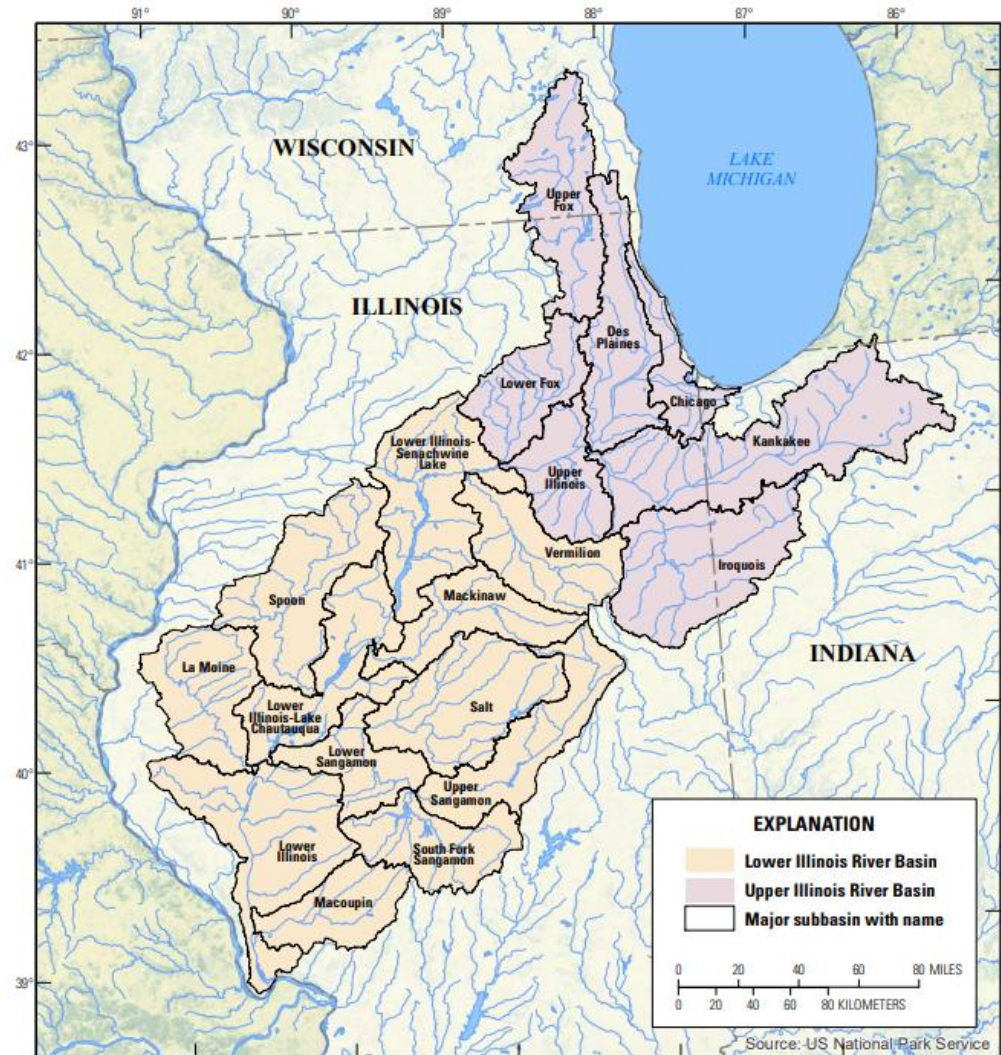
# Illinois River Basin

- 28,756.6 square miles
- Covers 44 % of the state
- 90 % of the state's population
- Drainage basin extends into Wisconsin, Indiana and a very small portion of southwestern Michigan
- Large urban/suburban component in the upper part of the basin and a predominant agricultural component in the lower part of the basin



# Illinois River Basin –major sub-basins

- Major sub-basins
- Drainage basin extends into Wisconsin, Indiana and a very small portion of southwestern Michigan
- Extensive monitoring in both the Upper and Lower Illinois River Basin
- Large urban/suburban component in the upper part of the basin and a predominant agricultural component in the lower part of the basin





# Illinois Waterway-Profile view

- Illinois Waterway 273 miles in length
- Lock and dams form 8 pools
- Nearly 30 million tons of commodities move along the Illinois Waterway each year
- 3 National Wildlife Refuges

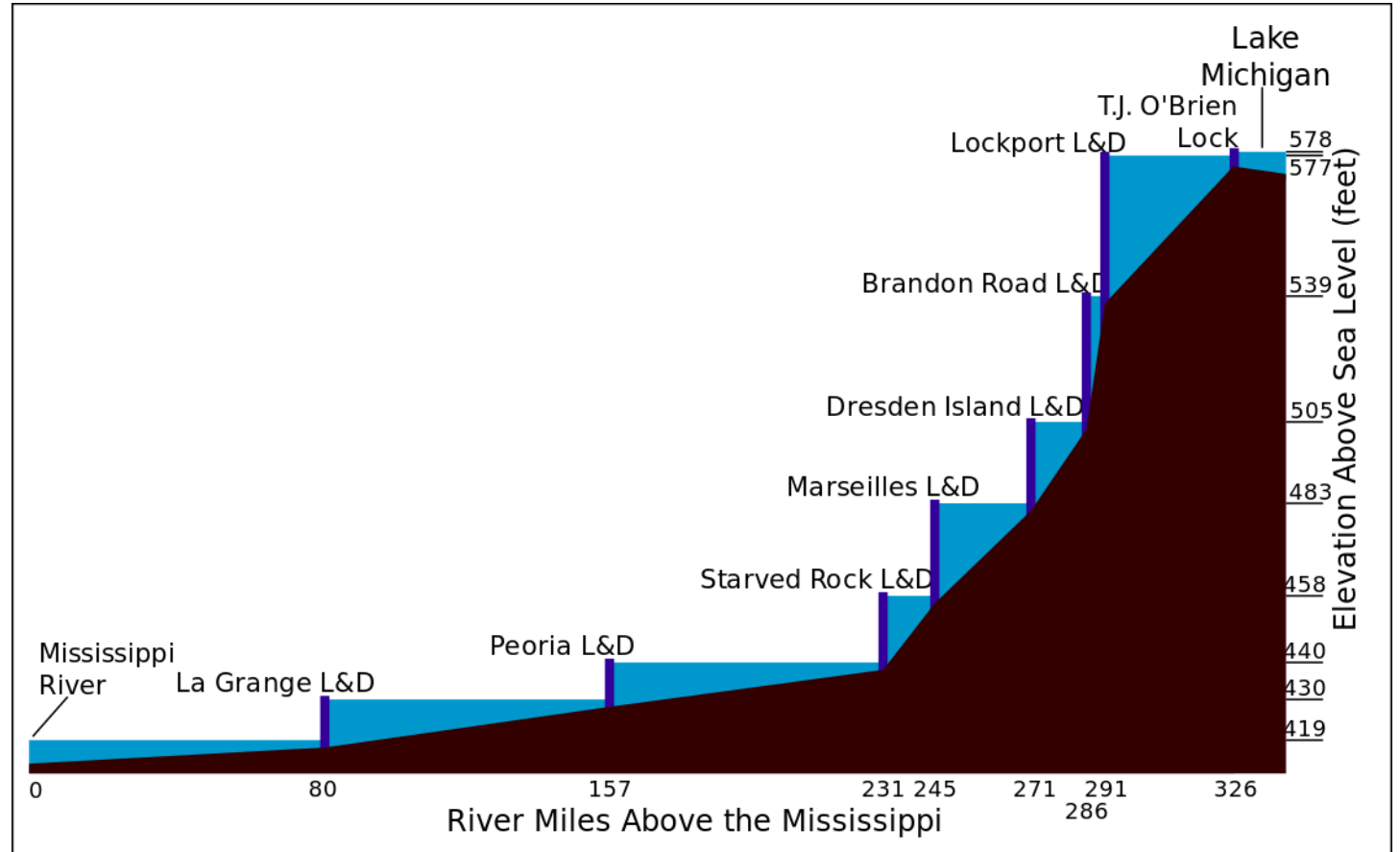
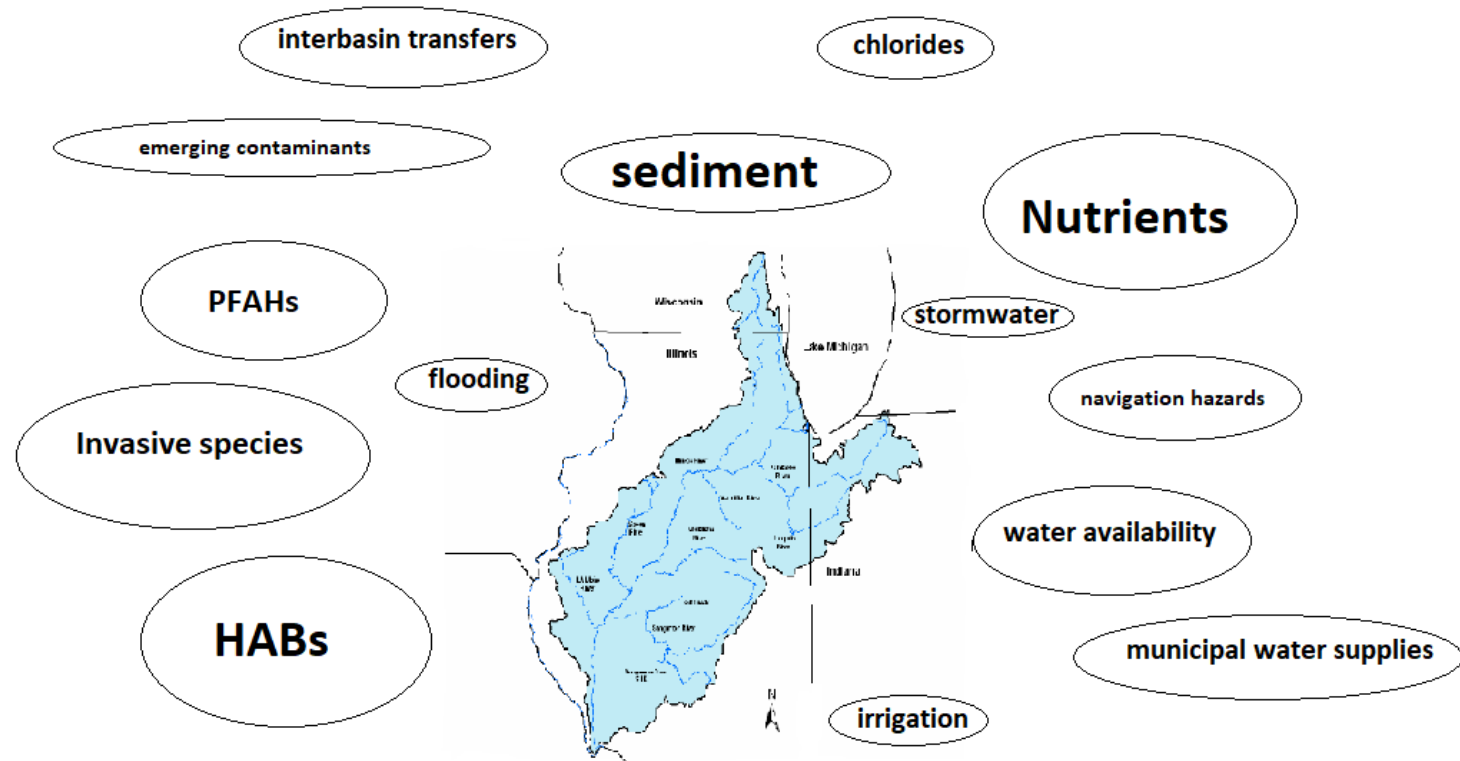


Figure from US Army Corps of Engineers

# Illinois River Basin Issues

- Stakeholder priority issues
- Shared Illinois River Basin issues
- Transferability of NGWOS information



# Basin Issues

## NUTRIENTS-

- Illinois River basin identified as major contributor to Gulf Hypoxia.
- IEPA-led Nutrient Loss Reduction Strategy
  - long-term goal of reducing loads from Illinois for total phosphorus and total nitrogen by 45%, with interim reduction goals of 15% nitrate-nitrogen and 25% total phosphorus by 2025.
- Monitoring 3 sectors
  - -ag stakeholder interest remains high
  - -point source reductions are due to improvements in WWTF.
  - -urban stormwater-green infrastructure.
- Additional continuous monitoring “supergages” provide more sub-basin

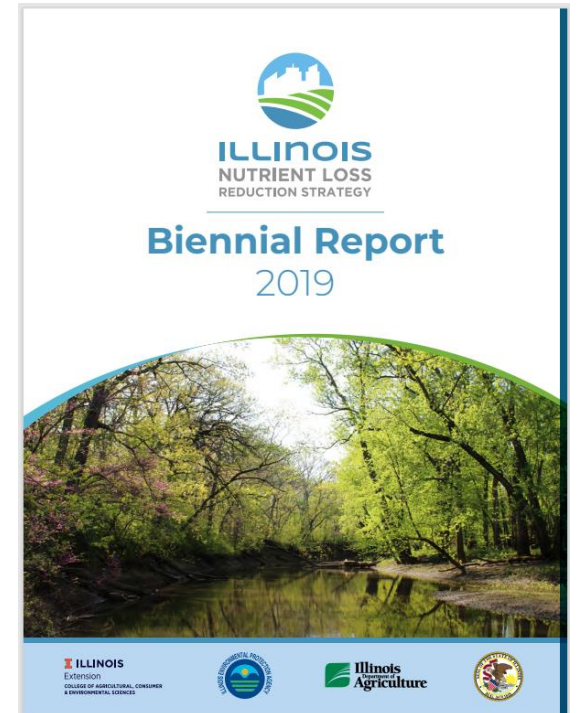


Figure from (IEPA, 2019)

# Basin Issues

## HARMFUL ALGAL BLOOMS

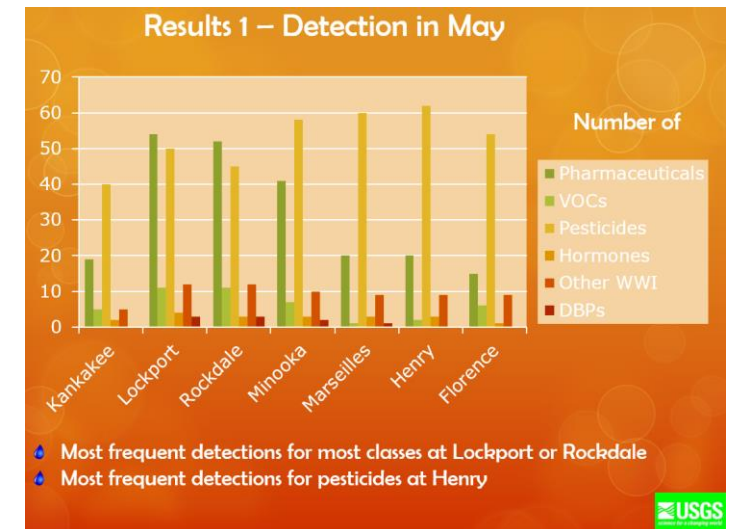
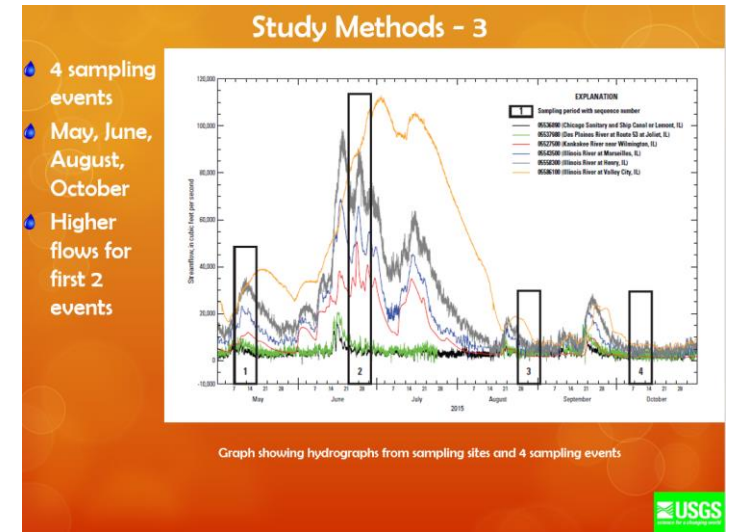
- Identify the algal communities.
  - Baseline information
  - Compare to historical algal community assemblages
- Improve early detection.
  - Nuisance blooms and harmful algal blooms
- Deploy multi-spectral cameras.
- Link multi-spectral cameras to remote sensing data.



# Basin Issues

## EMERGING CONTAMINANTS

- USGS established baseline of emerging contaminants in 2015.
- Water samples were analyzed for over **639 constituents** of which **280 were detected** at least once, including many anthropogenic bioactive chemicals (ABCs) such as pesticides, pharmaceuticals, hormones, and volatile organic compounds (VOCs).
- Little known effects on algal community.



# Basin Issues

## INVASIVE SPECIES

- Asian carp were first detected in the Illinois Waterway in 1986.
- Population front stalled in the Dresden Island Pool
- Filter-feeders used to address algae issues in Asia.
- Represent a significant portion of the river biomass in the lower river.

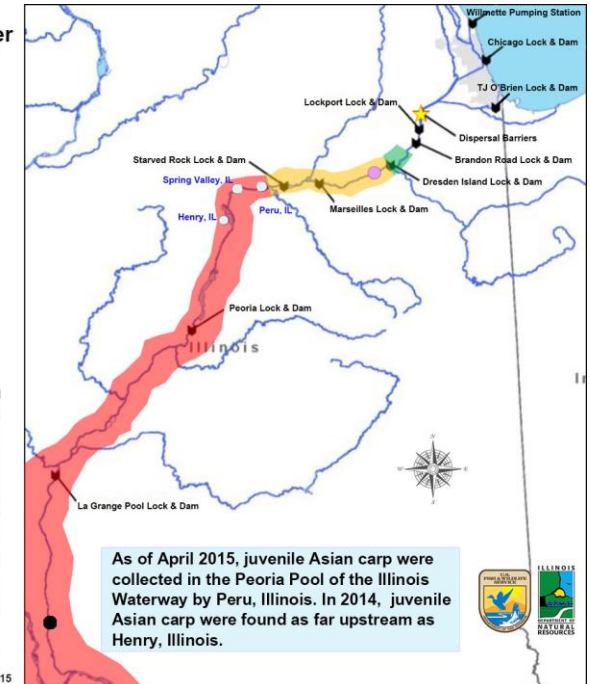


### Presence of Bighead and Silver Carp in the Illinois Waterway

- Adult Population Front
- Presence of Adults
- Observed Spawning
- Verified Spawning
- Three Captures of Black Carp
- Juvenile Collection
- ▼ Lock & Dam
- ★ Dispersal Barriers

### Distance From Lake Michigan

- 55 Miles : Adult Population Front
- 62 Miles : Potential Spawning
- 64 Miles : Observed Spawning
- 110 Miles : Verified Spawning
- ★ 37 Miles : Dispersal Barriers



May 2015

# Basin Issues

## FLOODING

- URBAN FLOODING
  - IDNR reports \$2.3 Billion in non-riverine damages between 2007-2014
- FLOOD INUNDATION
  - Application of new instrumentation



# NGWOS Illinois River Basin-timeline

- Spring 2021 Stakeholder meetings.
- Spring 2021 Identify data gaps.
- Spring 2021 Develop Study Plan.
- Summer 2021 Procure equipment. Stand-up monitoring.
- Fall 2021- Field installations, data mining and compilation.
- Out years Predictive modeling



Identify water monitoring gaps and data needs related to integrated water modeling and stakeholder decision-making.



Establish integrated set of fixed and mobile monitoring assets in the water, ground, and air.



Integrate delivery of water quantity, quality, and use data.



Work with partners and stakeholders to inform modern water prediction and decision-support systems.



# Stakeholder input

## Stakeholder priority issues-

Are existing tools and information adequate to meet the needs/plans/models to inform basin withdrawals? If not, what information do you need, or what uncertainty around information elements or models should be refined to better support or inform decision making?

USGS NGWOS contact information:

Jim Duncker, Acting Basin Coordinator ([jduncker@usgs.gov](mailto:jduncker@usgs.gov))

Brian Pellerin, Program Manager, NGWOS ([bpeller@usgs.gov](mailto:bpeller@usgs.gov))

Chad Wagner, Program Coordinator, Groundwater and Streamflow Information Program ([cwagner@usgs.gov](mailto:cwagner@usgs.gov))

