Illinois Nutrient Loss Reduction Strategy

Nutrient Monitoring Council

7th Meeting, December 6, 2016, Urbana, IL

Crane Creek (EH-02), Mason County

Nutrient Monitoring Council Members (12/06/16)

Illinois EPA
Gregg Good, Rick Cobb

Illinois State Water Survey
Laura Keefer

Aqua Illinois
Kevin Culver

Illinois Natural History Survey
Andrew Casper

Illinois Dept. of Natural Resources
Ann Holtrop

University of Illinois
Paul Davidson

Sierra Club
Cindy Skrukrud

MWRDGC
Justin Vick

Illinois Corn Growers Association
Laura Gentry

U.S. Army Corp of Engineers-Rock Island
Chuck Theiling

U.S. Geological Survey
Kelly Warner

National Center for Supercomputing Apps
Jong Lee

Today's Guests???

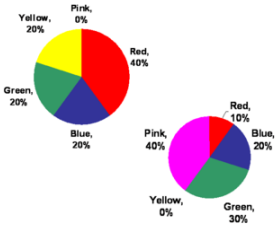
NMC Charges (Revised 10/26/15)

1. Coordinate the development and implementation of monitoring activities (e.g., collection, analysis, assessment) that provide the information necessary to:

   a. Generate estimations of 5-year running average loads of Nitrate-Nitrogen and Total Phosphorus *leaving the state of Illinois* compared to 1980-1996 baseline conditions; and
   b. Generate estimations of Nitrate-Nitrogen and Total Phosphorus loads *leaving selected NLRS identified priority watersheds* compared to 1997-2011 baseline conditions; and
   c. Identify Statewide and NLRS priority watershed *trends in loading over time* using NMC developed evaluation criteria.

2. Document *local water quality outcomes* in selected NLRS identified priority watersheds, or smaller watersheds nested within, where future nutrient reduction efforts are being implemented (e.g., increase in fish or aquatic invertebrate population counts or diversity, fewer documented water quality standards violations, fewer algal blooms or offensive conditions, decline in nutrient concentrations in groundwater).

3. Develop a *prioritized list of nutrient monitoring activities and associated funding* needed to accomplish the charges/goals in (1) and (2) above.



USGS Super Gage Operational Update

Nutrient Monitoring Council
December 6, 2016
Springfield, IL

Kelly Warner, USGS

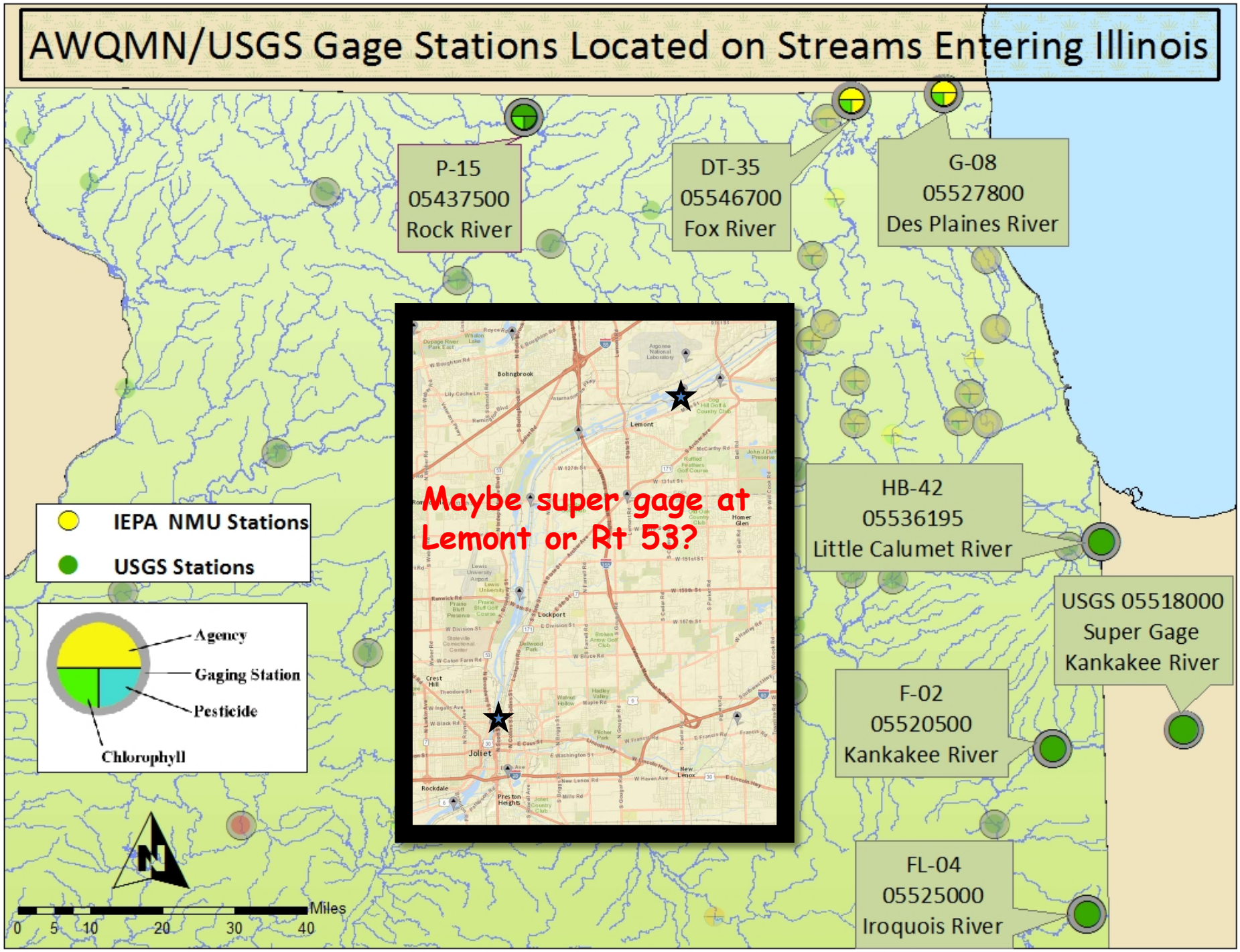
U.S. Department of the Interior
U.S. Geological Survey

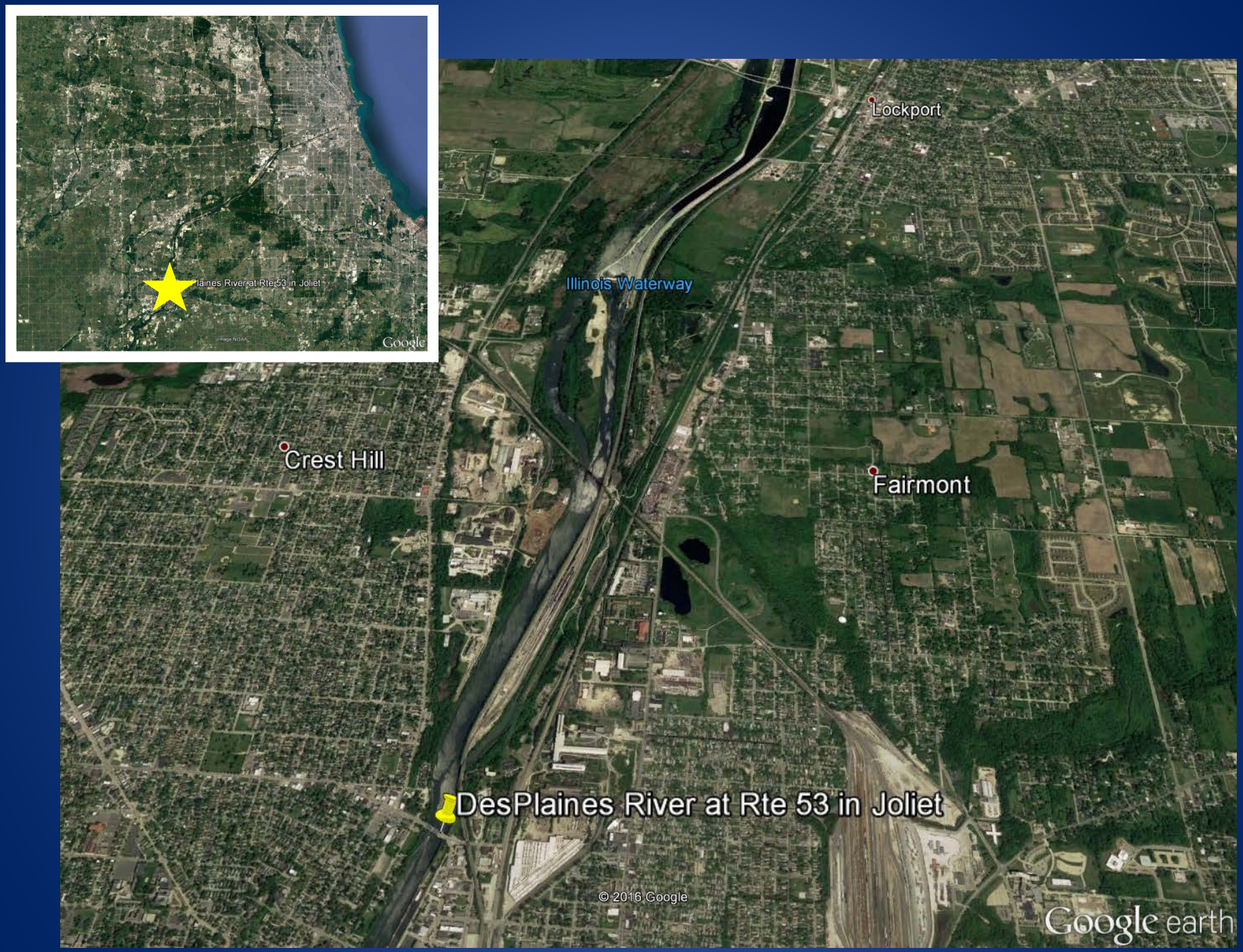
Basins cover almost 75% of the land area in the State

Stream Name	Location	Station Drainage Area in Illinois only, in mi^2	Mean Nitrate-nitrite mg/l
Rock River	Joslin	3,973	3.6
Green River	Geneseo	1,000	4.1
Illinois River	Florence	22,651	4.3
Kaskaskia River	New Athens	5,189	0.89
Big Muddy River	Murphysboro	2,168	0.35
Vermilion River	Danville	1,199	6.9
Embarras River	Lawrenceville	2,348	4.6
Little Wabash River	Carmi	3,102	0.9

USGS science for a changing world

AWQMN/USGS Gage Stations Located on Streams Entering Illinois



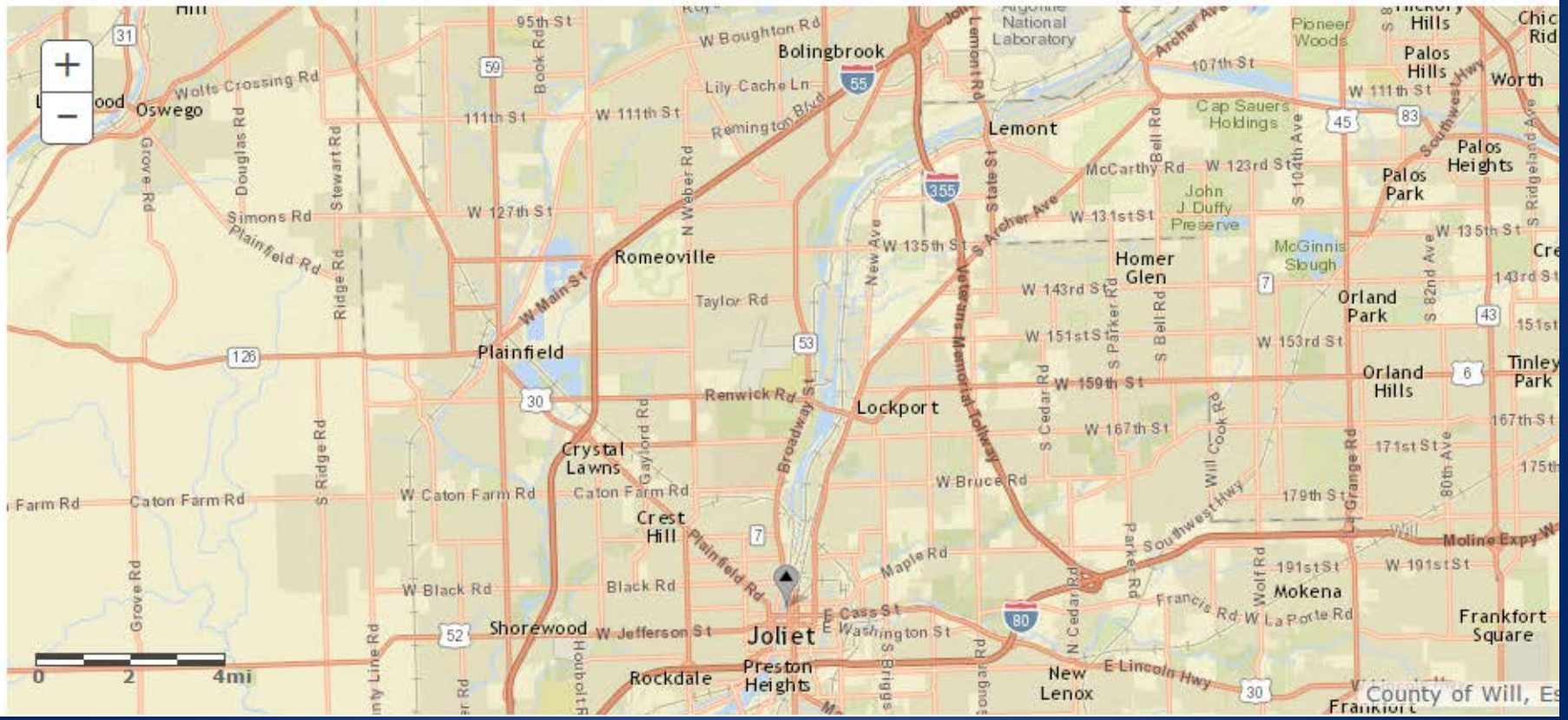

Lockport
Illinois Waterway
Crest Hill
Fairmont
DesPlaines River at Rte 53 in Joliet
© 2016 Google
Google earth
Google

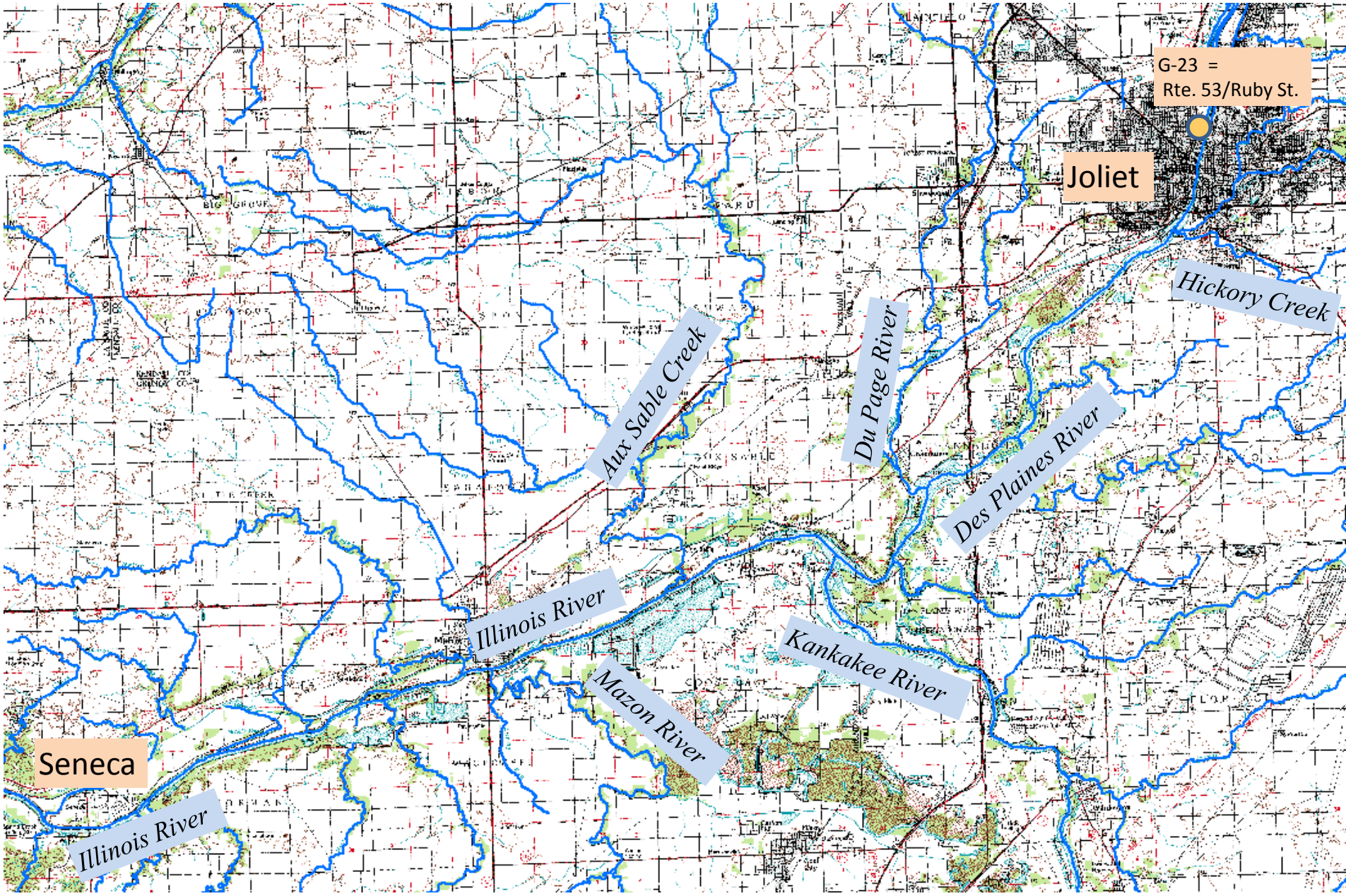
USGS 05537980 DES PLAINES RIVER AT ROUTE 53 AT JOLIET, IL

Available data for this site Location map

Will County, Illinois
Hydrologic Unit Code 07120004
Latitude 41°32'11", Longitude 88°04'57" NAD83
Drainage area 1,502 square miles
Gage datum 0.00 feet above NGVD29

Location of the site in Illinois




G-23 =
Rte. 53/Ruby St.
Joliet
Hickory Creek
Aux Sable Creek
Du Page River
Des Plaines River
Illinois River
Kankakee River
Mazon River
Seneca
Illinois River

Super Gage #9 Questions

- What's the specific goal? Example:
  - *"To capture the change in nutrient loads coming from NE Illinois urban environs as a result of NPDES permitting, urban runoff controls, and other Nutrient Loss Reduction Strategy implementation activities. Cumulative annual loadings will be estimated at this station that encompasses the X, Y, Z, A, B, and C rivers."*
- Cost?
- How to Fund?

gofundme

UPDATE ON PILOT GROUNDWATER ASSESSMENT IN HAVANA LOWLANDS

Nutrient Monitoring Council
December 6, 2016

Rick Cobb, P.G.
Deputy Division Manager
Division of Public Water Supplies
and Manager, Groundwater Section

Illinois EPA

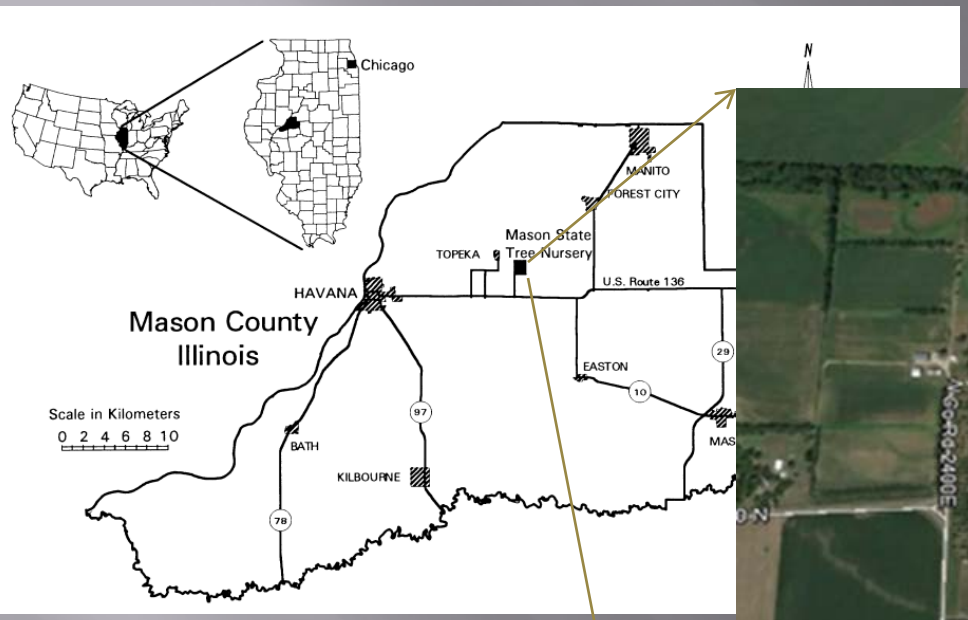
Section 106 Monitoring Grant

- This will help provide key beneficial NLRS information in assessing and managing nitrate in groundwater by:
  - Determining fluctuations in nitrate concentrations resulting from seasonal climatic changes or groundwater conditions such as dissolved oxygen or pH.
  - Assessing the amount of de-nitrification and source indication by conducting nitrogen gas and nitrogen isotope work.
  - Determining temporal nitrate concentrations resulting from agricultural practices such as irrigation or fertigation and possible best management practices that could mitigate these changes.

4 Primary Tasks Under the Project

1. The USGS will install a 4-inch monitoring well.

   A nitrate monitoring sensor will be installed and collect continuous nitrate data along with standard field parameters. Data collection frequency can range from 15 minute intervals up to 12 hours.


Chicago
N
MANITO
FOREST CITY
Mason State
Tree Nursery
TOPEKA
U.S. Route 136
HAVANA
Mason County
Illinois
EASTON
29
10
97
Scale in Kilometers
0 2 4 6 8 10
BATH
KILBOURNE
78


850N
N-CO-Rd-2400E
22.7 mg/L
3
State Tree Nursery
11.4 mg/L
14.0 mg/L
9.3 mg/L
© 2016 Google

4 Primary Tasks Under the Project cont.

2. Data will be collected at the site for one year. Corroborating irrigation/fertigation records (e.g., Irrigation pumps being turned on and off and approximate pumping rates) in the immediate vicinity will also be obtained through cooperation with the IDA or other agricultural stakeholders.

Discrete standard water-quality collection of nutrient samples will be collected three times, once at the beginning, during the middle, and at the end of data collection. These discrete data will be used to compare with continuously monitored nitrate concentrations.

4 Primary Tasks Under the Project cont.

3. Nitrate data, field parameters, climate records of temperature and precipitation, and local irrigation pumping records will be analyzed statistically to determine possible causal relations between nitrate concentrations and these possible change-inducing conditions.

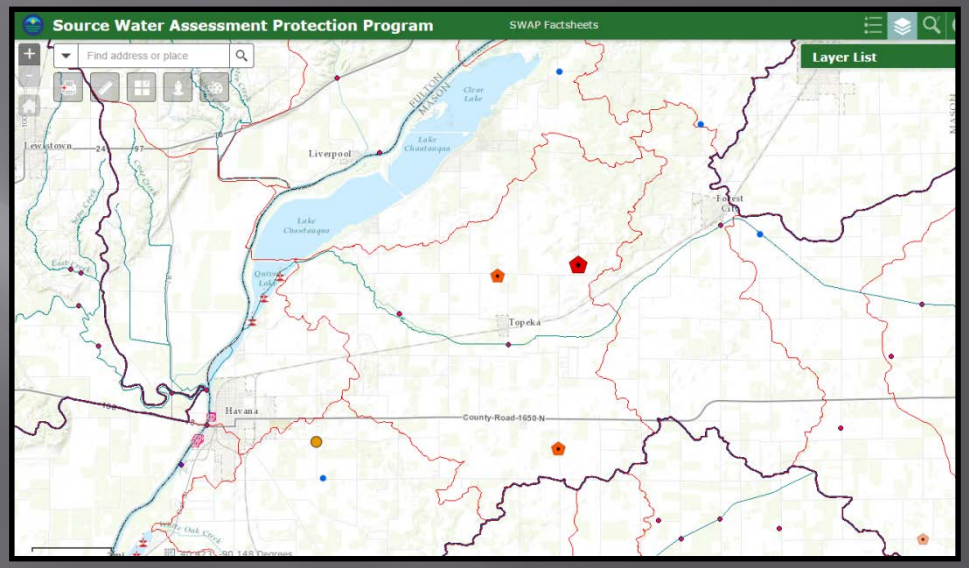
   Fluctuations in nitrate concentrations will be compared with nitrate data collected at the USGS supergage downstream (Illinois River at Florence).

4 Primary Tasks Under the Project cont.

4. Quiver Creek, a surface-water discharge has a drainage area of 197 square miles and a Q 7/10 of 14 cubic feet per second (cfs) (9,000,000 million gallons per day (mg/d)). The 14 cfs is onsidered groundwater discharge (baseflow).

   Baseflow groundwater discharge conditions will be determined from climate observation, discharge, and empirical observation.

   Nitrate will be measured in surface and groundwater at baseflow conditions. A survey measuring nitrate and temperature (as well as pH, DO, SC, and surface-water discharge) will be conducted longitudinally at Quiver Creek in the reach of anticipated groundwater discharge to determine where groundwater concentrations are affecting stream quality.



Great Lakes To Gulf Virtual Observatory Update

Jong Sung Lee (jonglee1@illinois.edu)
Senior Research Scientist, NCSA

December 6, 2016 @ 7th Nutrient Monitoring Council Meeting

National Center for Supercomputing Applications
University of Illinois at Urbana-Champaign

"Stream Water-Quality Monitoring Conducted in Support of the Iowa Nutrient Reduction Strategy"

Prepared by the Iowa Department of Natural Resources in collaboration with the Iowa Department of Agriculture and Land Stewardship, Iowa State University and the IIHR Hydroscience and Engineering Center

August 2016

Lets go to the Web

"Custom Soil Manufacturing for Beneficial Use of Dredged Material and Municipal Waste Recycling"

Chuck Theiling (USACE-Rock Island District)


Let's do
Lunch!


Lunch
CHOCO
MILK


LUNCH
time

Our Collective Goal in *Priority Watersheds*

- *"To hopefully show nutrient reduction and water quality progress through monitoring."*
  - N and P reduction in NLRS Priority Watersheds or Sub-Watersheds (Charge 1b)
  - Loading Trends Over Time (Charge 1c)
  - Local Water Quality Outcomes (Charge 2)
- Want to ultimately develop ***Watershed Nutrient Monitoring Plans*** in all priority watersheds, *but where do we start*?

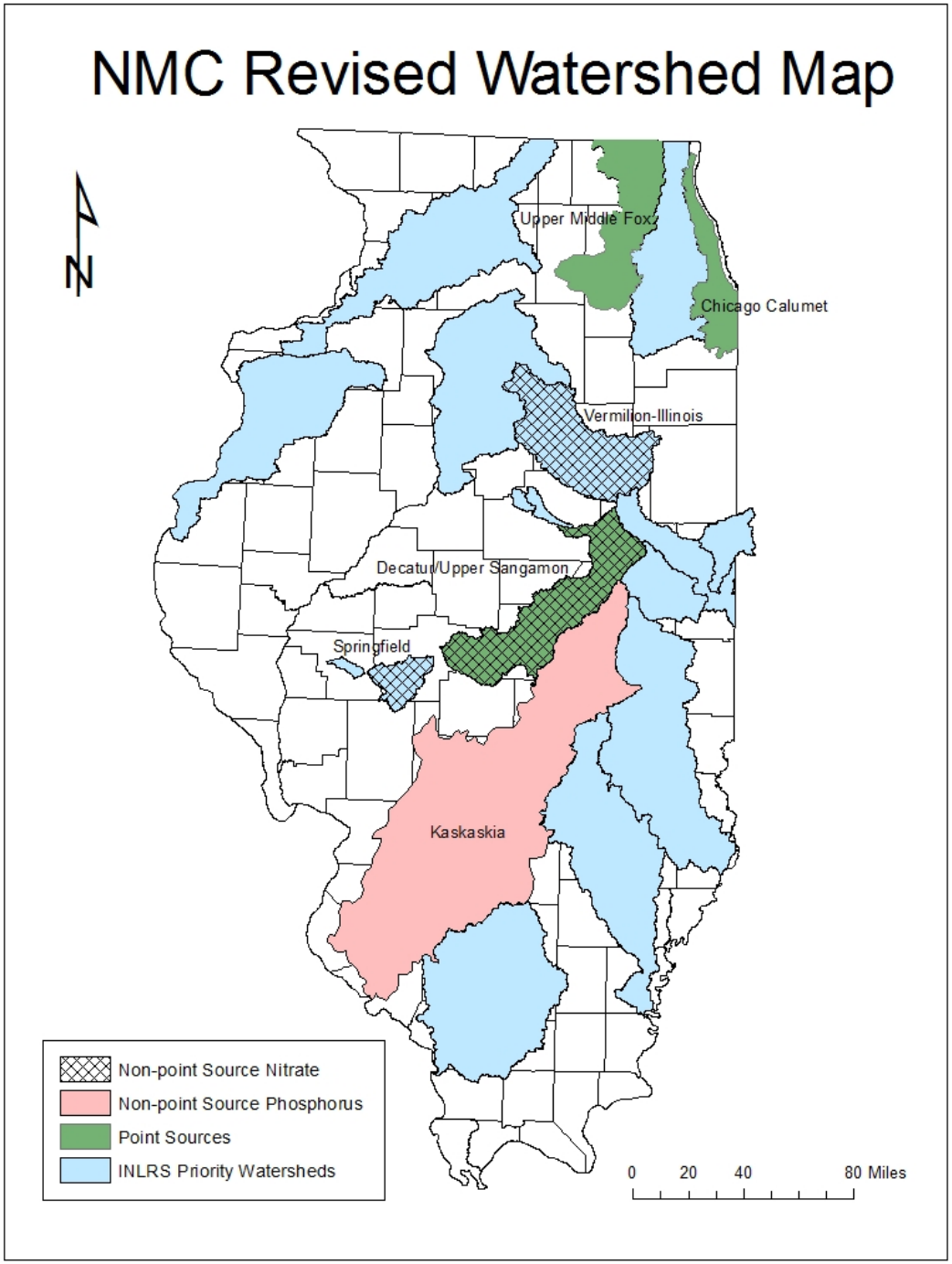
Discussion: Where do we go from here?

- If needed, refine the WQ and Biological data parameters documents, then combine into one.
- Pick a pilot watershed, meet with WQ and Biology partners, ID current programs and likely continuance.
- Develop a template for development of a ***Watershed Nutrient Monitoring Plan.***

- Develop the plan.
  - Um, do we, the NMC, develop the plan?
  - Do we contract development of the plan out to someone, and we, the NMC, provide review and approval/blessing?
  - If contracted out, any idea what one might cost?
  - Potential funding sources (e.g., CWA Section 106)?

- Implement the plan.

We picked the Vermilion (Illinois) River Watershed as a place to start with development of a ***Watershed Nutrient Monitoring Plan.***



Brainstormed what a *Watershed Nutrient Monitoring Plan* "Template" should look like.

TABLE OF CONTENTS

Examples of Template Elements

- *Executive Summary*
- *Introduction*
- *Goals/Objectives*
  - *N & P Load Estimation*
  - *Trends in Loads Over Time*
  - *Resource Quality Outcomes*
- *Public Participation*
- *Study Area Description*
- *Historic/Existing Monitoring and Baseline Data*
- Needed Additional Monitoring
- Monitoring Design
- Implementation
- Data Management
- Quality Assurance/Control
- Assessment and Evaluation Methodologies
- Results and Reporting
- Monitoring Entities
- Monitoring Costs
- Potential Funding/In-Kind
- Milestones/Timelines
- Limitations/Constraints
- Next Steps
- Appendices
- Other_____

Google docs

Lets go to the *"NMC"* Google Doc

How is the NMC Doing?

- Are we meeting our objectives?
- Are these meetings meaningful to you?
- Do we need more interaction with the Policy Working Group, AWQPF, NSAC, Urban Stormwater, or Performance Benchmark work groups?

- Future plans for a NLRS Conference/Summit?

“Next Steps” Summary
(NMC December 6, 2016)

- Summarize today’s action items
  - A.
  - B.
  - C.
- Future topics for the March 14, 2017 meeting?
- Other (TBD)

Next NMC Meetings

- December 6, 2016
- *March 14, 2017*
- *June 6, 2017*


Happy
Holidays