Kane County

KC Energy and Environmental Committee

Agenda

Government Center
719 S. Batavia Ave., Bldg. A
Geneva, IL 60134

BATES, Tarver, Allan, Kious, Penesis, Strathmann, Young, ex-officios Roth (County Vice Chair) and Pierog (County Chair)

Friday, August 15, 2025 **9:00 AM** **County Board Room**

2025 Committee Goals

- Pursue funding to improve energy efficiency in Kane County Government-owned buildings
- Upon passage of the Tree Protection Ordinance, develop budget and implementation strategy for the Ordinance and an educational program to promote Tree Protection
- Develop Client Action Implementation teams and assist team in prioritizing action items and development strategies
- Increase education and improve overall recycling in Kane County buildings
- Community outreach to education about the CAIP

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1. **Call To Order**
2. **Roll Call**
3. **Remote Attendance Requests**
4. **Approval of Minutes: July 11, 2025**
5. **Public Comment (Agenda Items)**
6. **Environmental (J.Wollnik)**
   - **A.** Call2Recycle: Illinois' Upcoming Battery Stewardship Program
   - **B.** Kane County Groundwater Study Update
7. **Recycling/Solid Waste (C. Ryan)**
8. **Sustainability (S.Hinshaw)**
   - **A.** Air Quality in Kane County
   - **B.** Switch Together Update
9. **New Business**
10. **Chairs Comments**
11. **Executive Session (if needed)**

12. Reports Placed On File

13. Adjournment

STATE OF ILLINOIS)
SS.
COUNTY OF KANE)

PRESENTATION/DISCUSSION NO. TMP-25-910

CALL2RECYCLE: ILLINOIS' UPCOMING BATTERY STEWARDSHIP PROGRAM

STATE OF ILLINOIS)
SS.
COUNTY OF KANE)

PRESENTATION/DISCUSSION NO. TMP-25-907

KANE COUNTY GROUNDWATER STUDY UPDATE

Kane County Shallow Groundwater Sustainability Update

May 14, 2025

Daniel R. Hadley
Cecilia Cullen

ISWS Groundwater Science Section

ILLINOIS

Illinois State Water Survey

PRAIRIE RESEARCH INSTITUTE

Assessment of Groundwater Sustainability in Kane County, IL

Next Steps from January

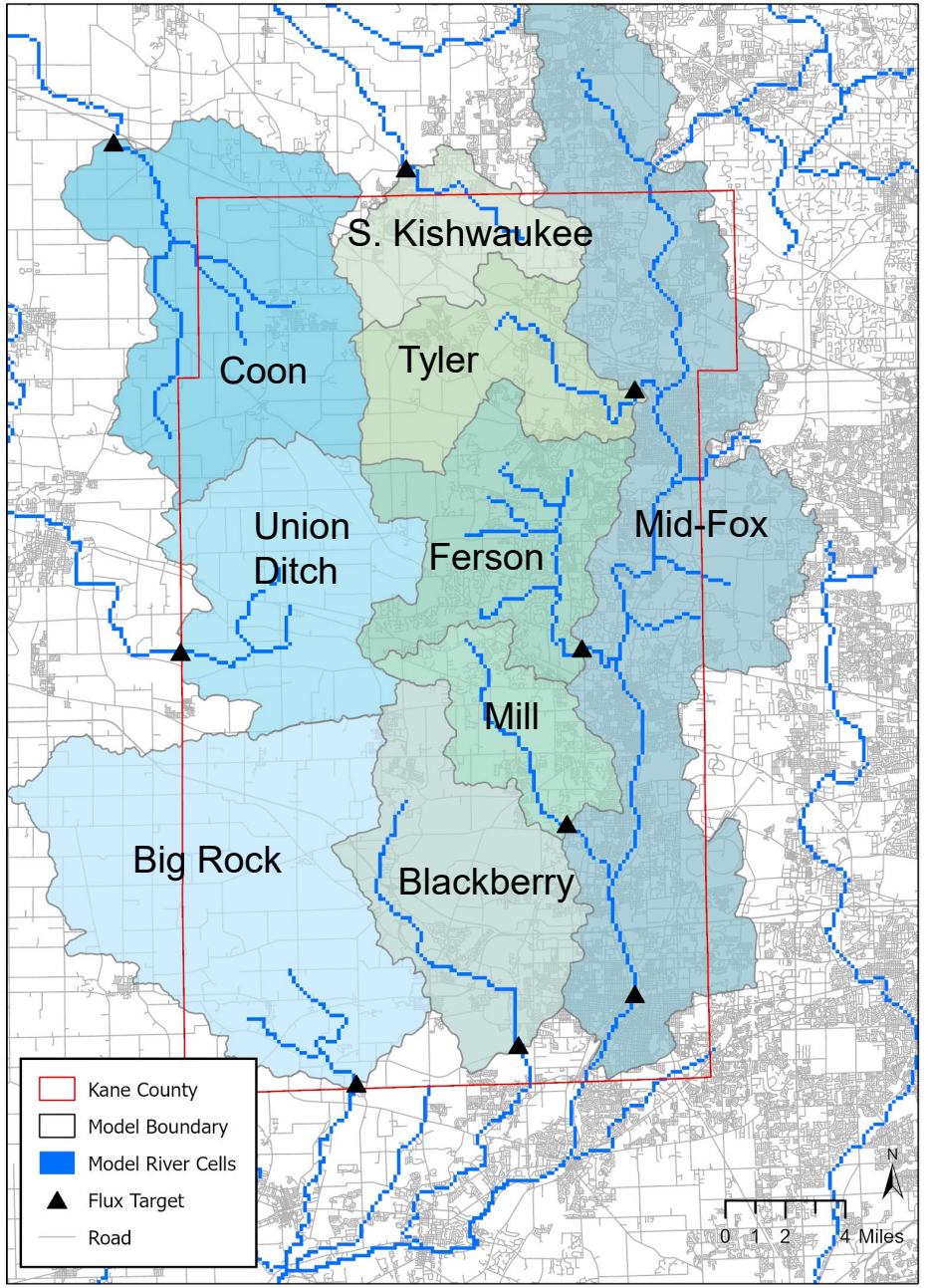
- Monitoring Network In process
  - Install transducers at Long Grove and Virgil wells
  - Scout out drilling locations spring 2025
  - Drill summer/fall 2025

- ✓ Sustainability Modeling
  - ✓ Chloride modeling
    - ✓ Import chloride targets
    - ✓ Design model chloride recharge
    - ✓ Initial results
  - ✓ Metrics
    - ✓ Include CMAP data in our analyses once available
    - ✓ Provide sub-watershed summaries throughout Kane County
  - Calibration
    - Improve head calibration in shallow bedrock layers In process
    - Introduce seasonal recharge to match modern baseflow conditions better In process

Sustainable Supply Estimates (MGD)-Unchanged

Sub-Watershed	Model Recharge Method	Predev. Baseflow Method
Big Rock Creek	2.24	1.45
Blackberry Creek	1.86	1.67
Coon Creek	2.13	1.87
Ferson Creek	1.54	1.32
Mid Fox River	6.03	6.32
Mill Creek	0.72	0.37
S Br. Kishwaukee River	0.58	0.48
Tyler Creek	0.93	0.66
Union Ditch	1.39	1.16
TOTAL	**17.42**	**15.31**

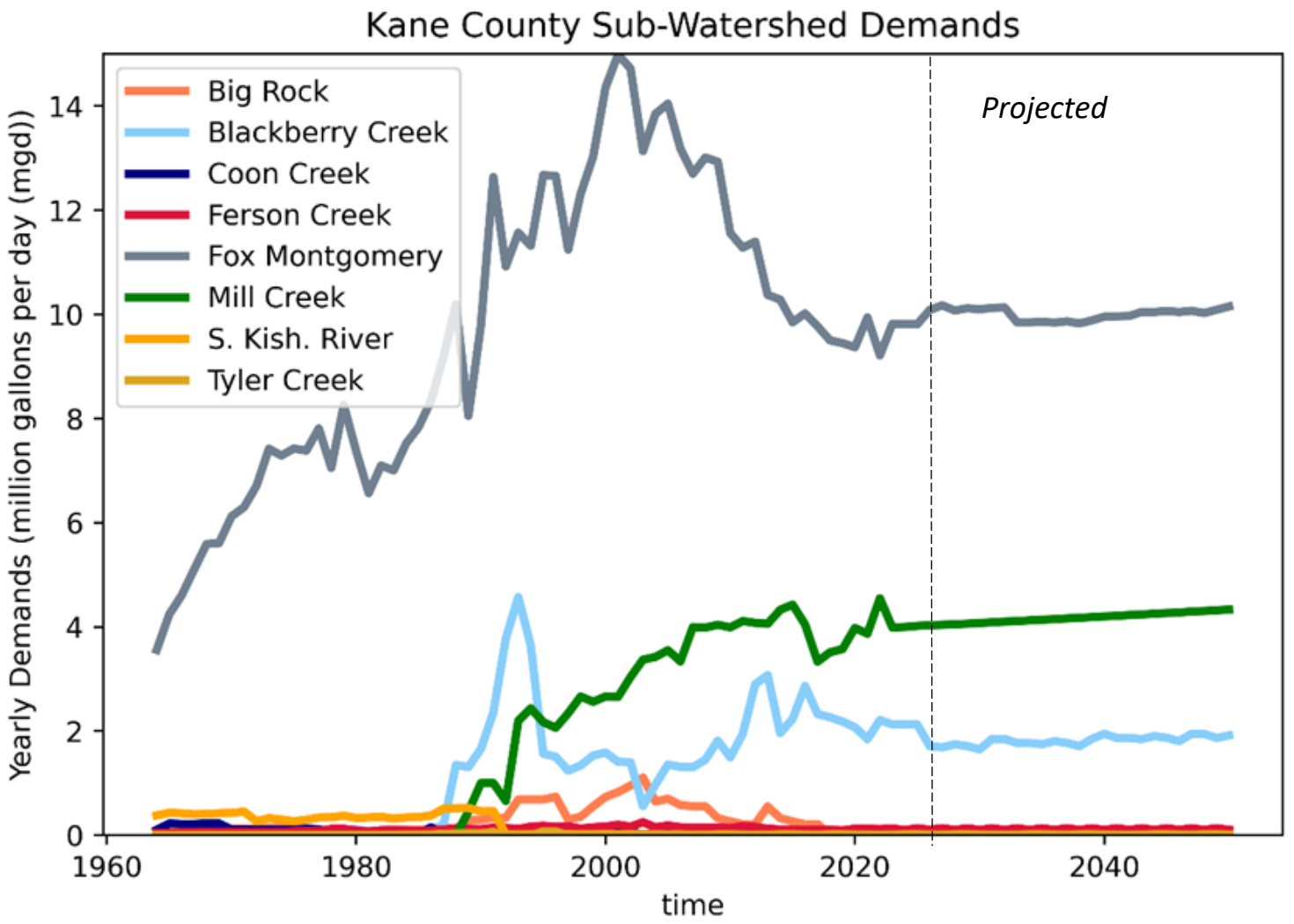
- Sub-watersheds defined by stream gauge locations and model domain size
- Remember, Tier 1 assessment for *county* footprint is 11 mgd

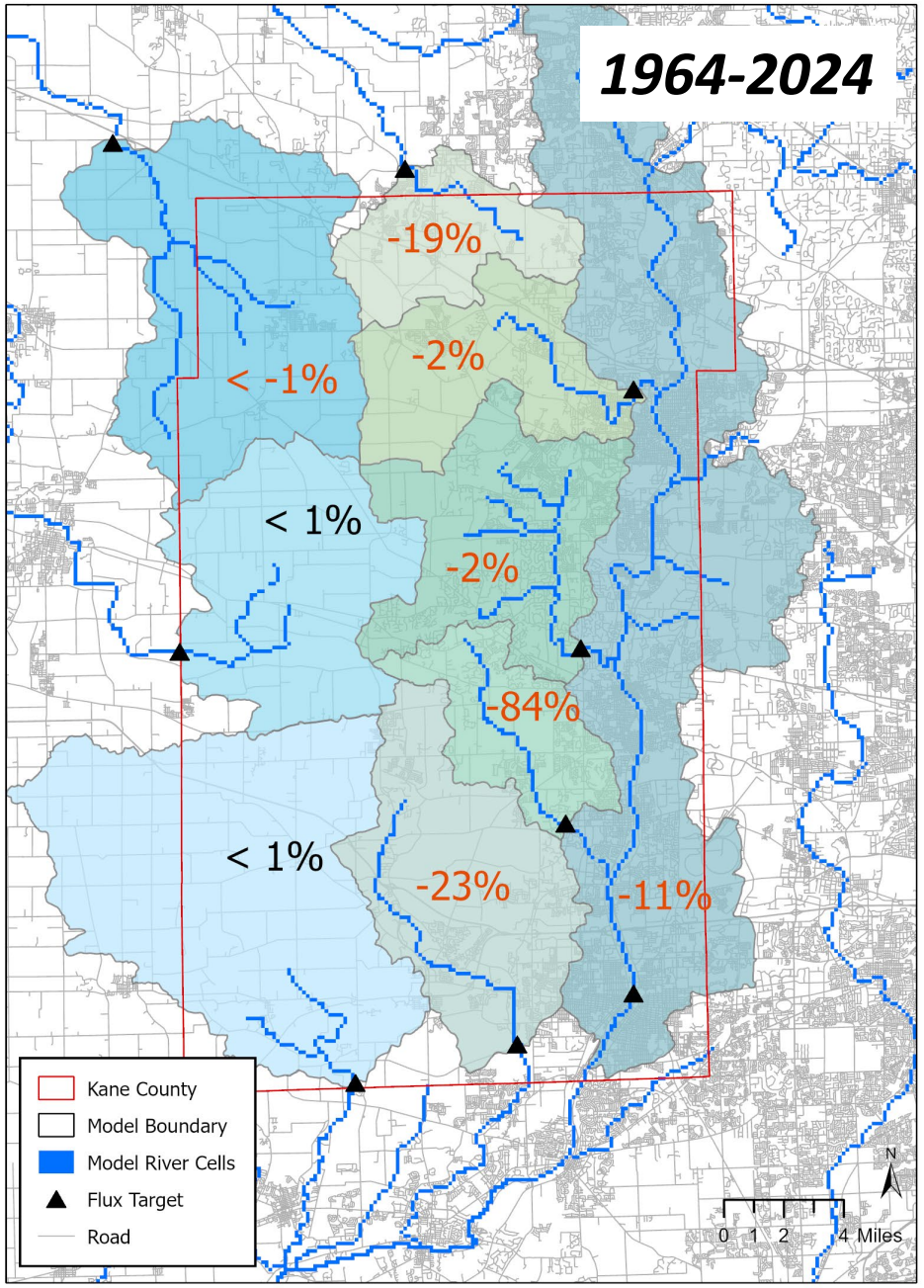


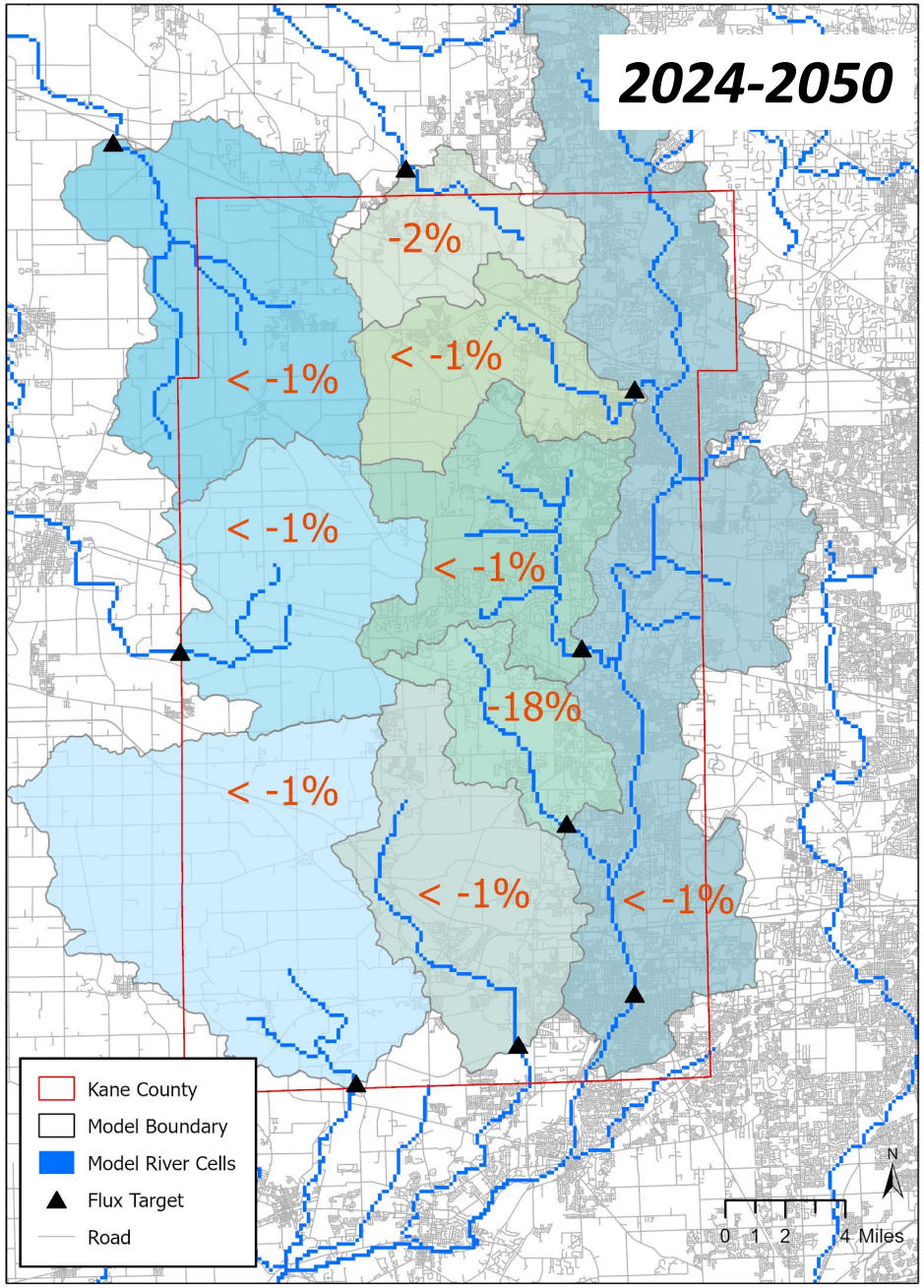
Demand Updates

Model Recharge Supply = 17.42 mgd
ILSAM Supply = 15.31

- Revised demands after NWPA's Water Sustainability Plan review
- We were missing about 2 MGD from smaller industries, non-pws wells (out to 2050)
- Overall demands have exceeded the ILSAM supply metric since ~1990
- *This assumes 15% baseflow reduction is acceptable loss*
- But currently not exceeding model recharge metric.

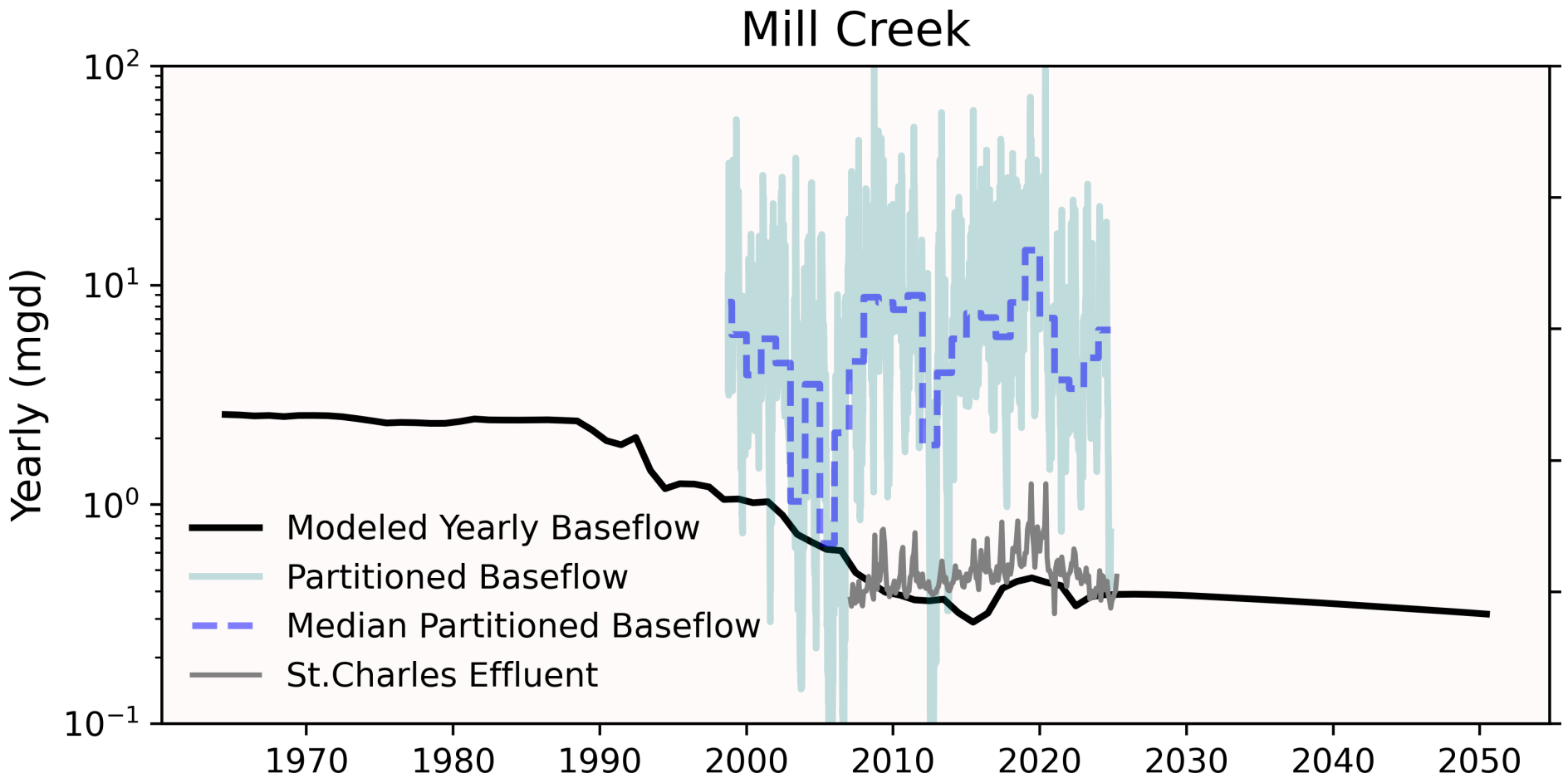



1964-2024
-19%
-2%
< -1%
< 1%
-2%
-84%
< 1%
-23%
-11%
Kane County
Model Boundary
Model River Cells
Flux Target
Road
N
0 1 2 4 Miles


2024-2050
-2%
< -1%
< -1%
< -1%
< -1%
-18%
< -1%
< -1%
< -1%
Kane County
Model Boundary
Model River Cells
Flux Target
Road
N
0 1 2 4 Miles

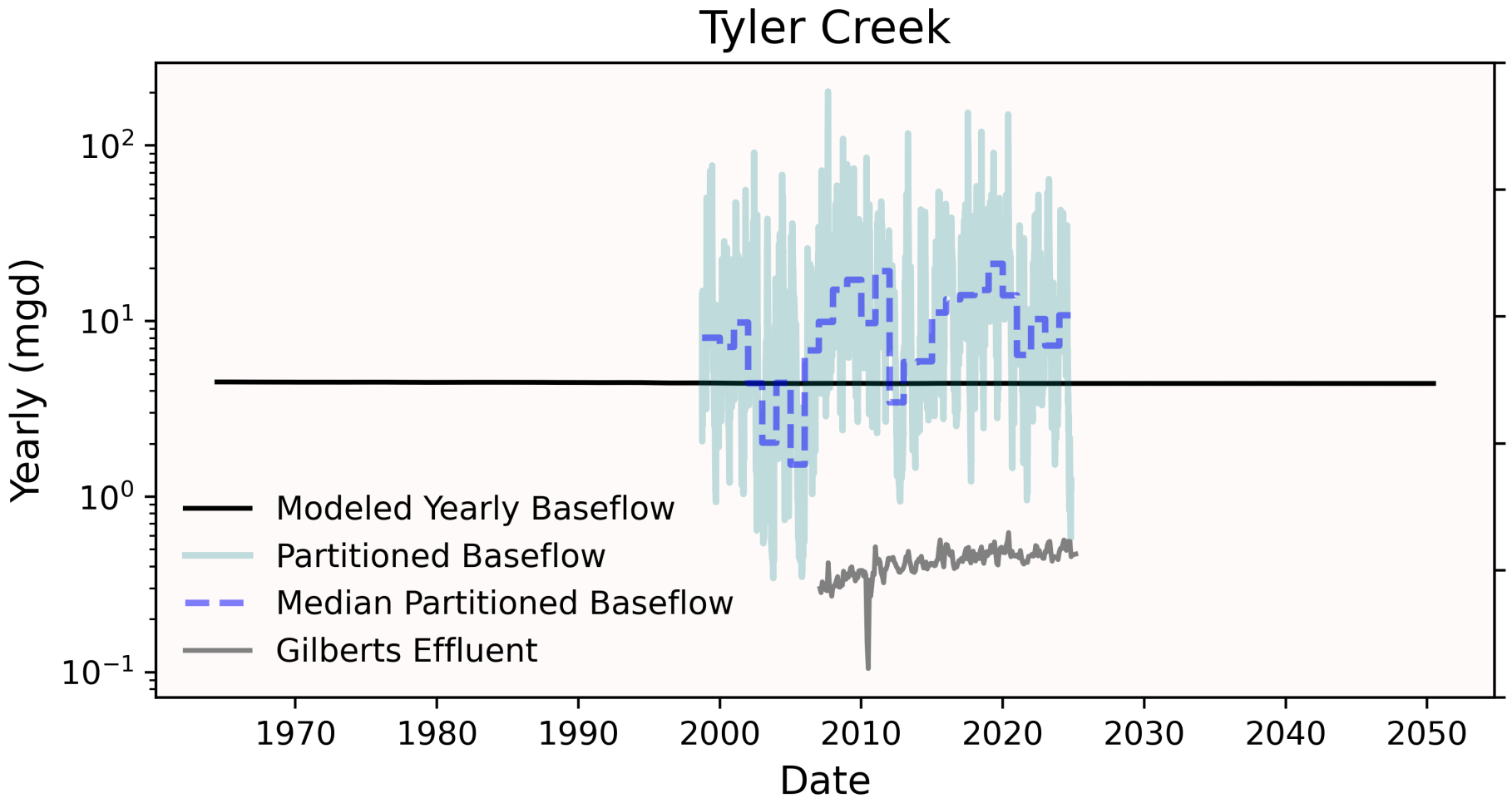
Mill Creek: Simulated baseflow vs. calculated baseflow and effluent

- Effluent is about same amount as modern simulated baseflow
- Wasco Sanitary District and Mill Creek Reclamation District both apply effluent to land surface
- Some may discharge to Mill Creek



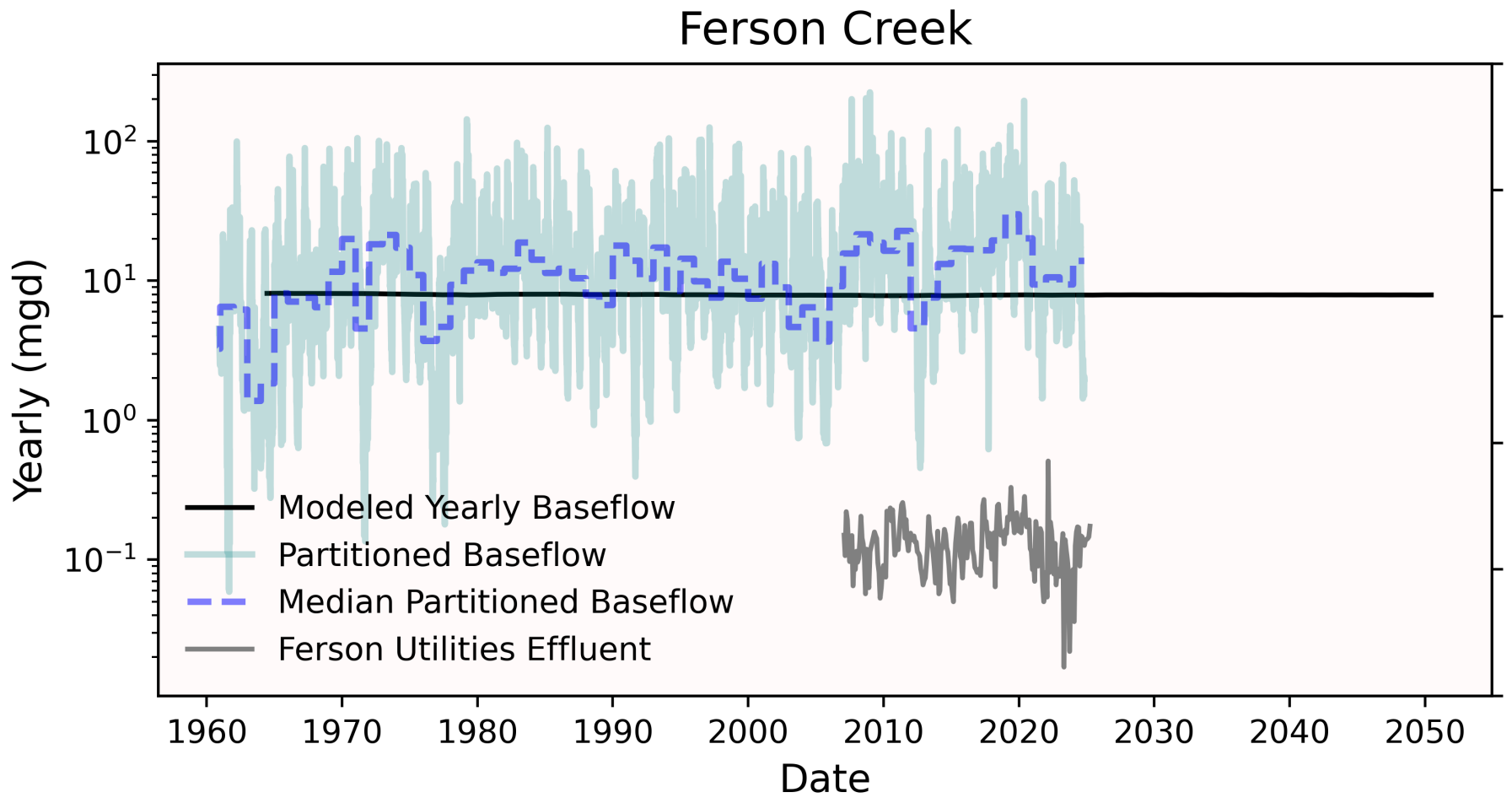
Tyler Creek: Simulated baseflow vs. calculated baseflow and effluent

- Simulated baseflow matches calculated baseflow
- Effluent consistent, but minimal



Ferson Creek: Simulated baseflow vs. calculated baseflow and effluent

- Simulated baseflow matches calculated baseflow
- Effluent consistent, but minimal



Summary of sustainability modeling

- Sustainable usage varies in subwatersheds throughout the county
- Shallow aquifer usage is most stressed in Mill Creek watershed.
- Effluent is significant and offsets baseflow lost from pumping in some subwatersheds.
-

Chloride Modeling

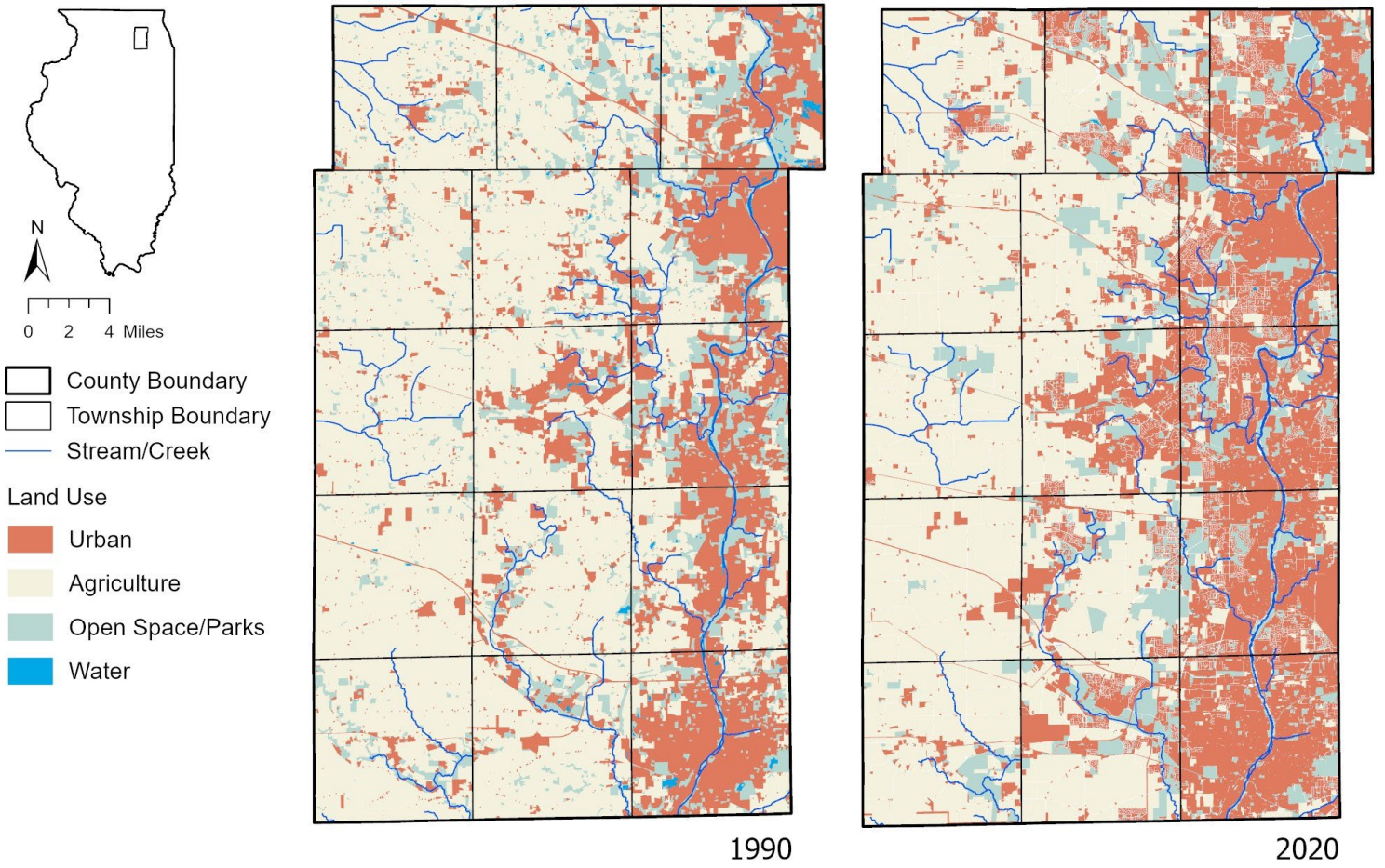
How abundant are chloride concentrations now and in the future?

- Simulate chloride in the shallow aquifers by adding chloride along roadways and in developed areas through time
- Calibrate to any chloride data available from municipalities
- Create maps where there is high potential for chloride to enter the sand and gravel aquifer

Chloride Data Sources

- *KGSG communities:* 290 observations from 17 wells. This was the largest source of data.
- *Kane County water quality study:* 43 wells sampled in 2003, 2015, and 2023. This dataset provided coverage in western and less populated parts of the county.
- *Illinois Groundwater Quality Database:* 84 observations from 9 wells. This helped get observations to calibrate early time steps in our model, pre-1990.
- In total, 502 groundwater chloride observations used in the modeling process.

Land Use and Land Use Change essential to include in chloride model



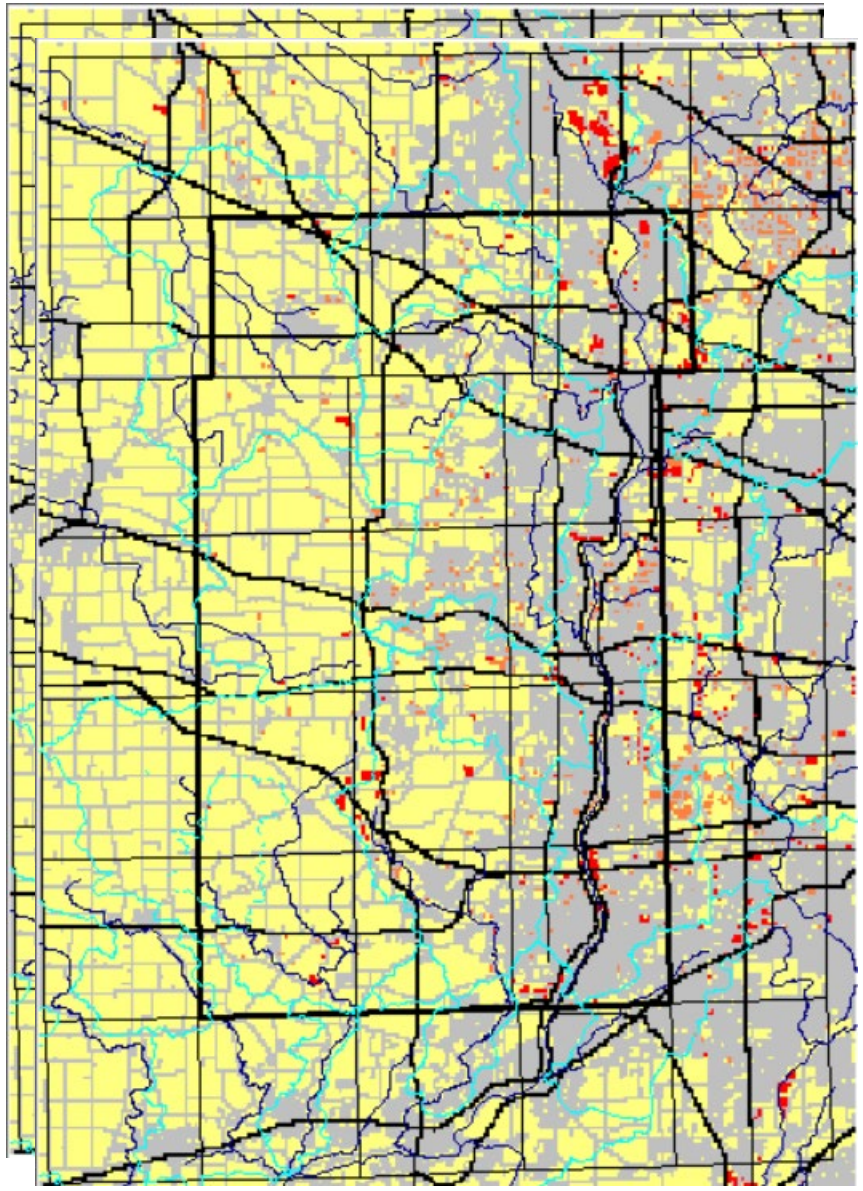
- Land use approximations based on Chicago Metropolitan Agency for Planning (CMAP) data: 1990, 2005, 2020
- USGS National Transportation Dataset (NTD)- 2023

Chloride Modeling methods

- Static Road network (2023 NTD)
- 1964 to 1990
  - Anything not roads is open space
- 1990 to 2005
  - CMAP land use in 1990
- 2005 to 2020
  - CMAP land use in 2005
- 2020 to 2050
  - CMAP land use in 2020 carried forward

Land Use Category	Model Recharge Chloride (mg/L)	
Agriculture Open Space Railways/Utility Infra.	2.5	Yellow
Residential Institutional	2.5	Orange
Road	300	Gray
Highways/Interstate/Randall	500	Black
Commercial/Industrial	1000	Red

1990



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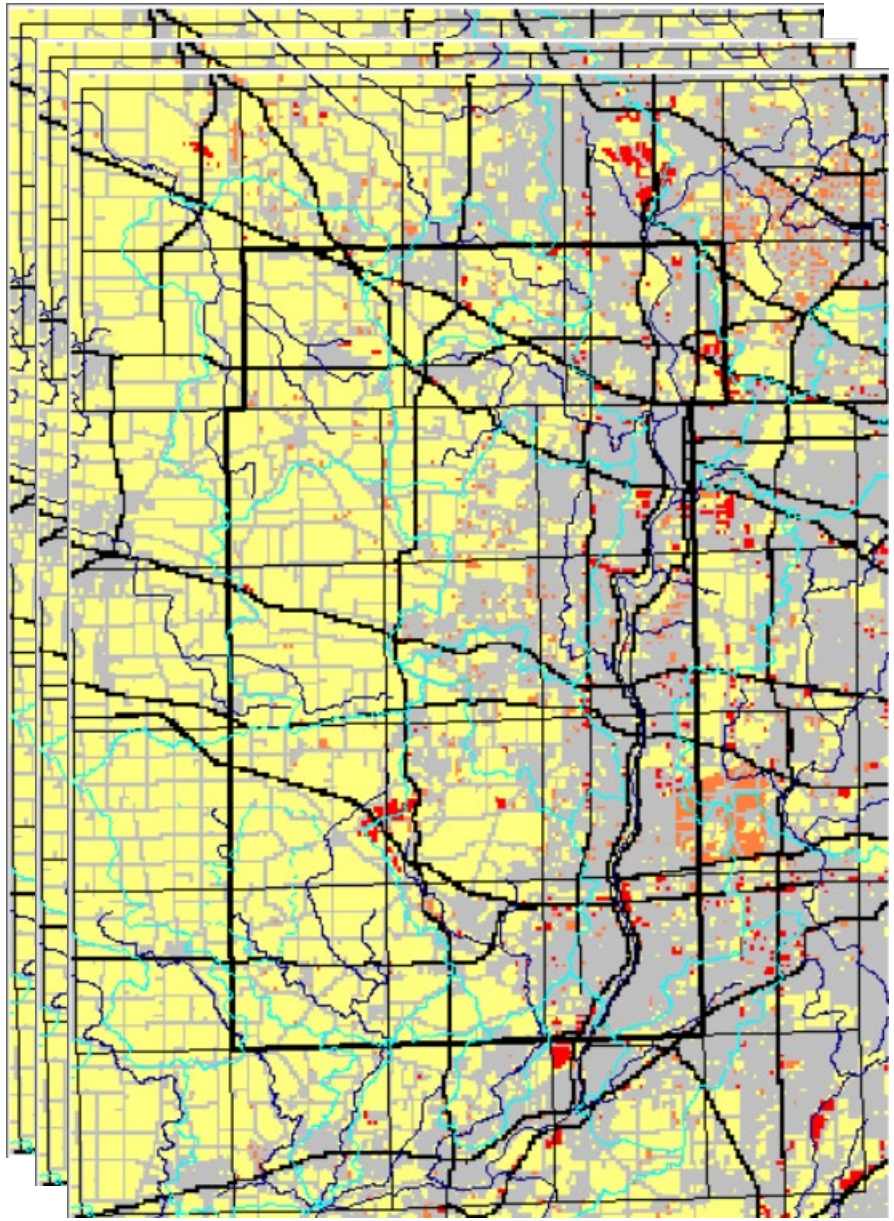

2005

Chloride Modeling methods

- Static Road network (2023 NTD)
- 1964 to 1990
  - Anything not roads is open space
- 1990 to 2005
  - CMAP land use in 1990
- 2005 to 2020
  - CMAP land use in 2005
- 2020 to 2050
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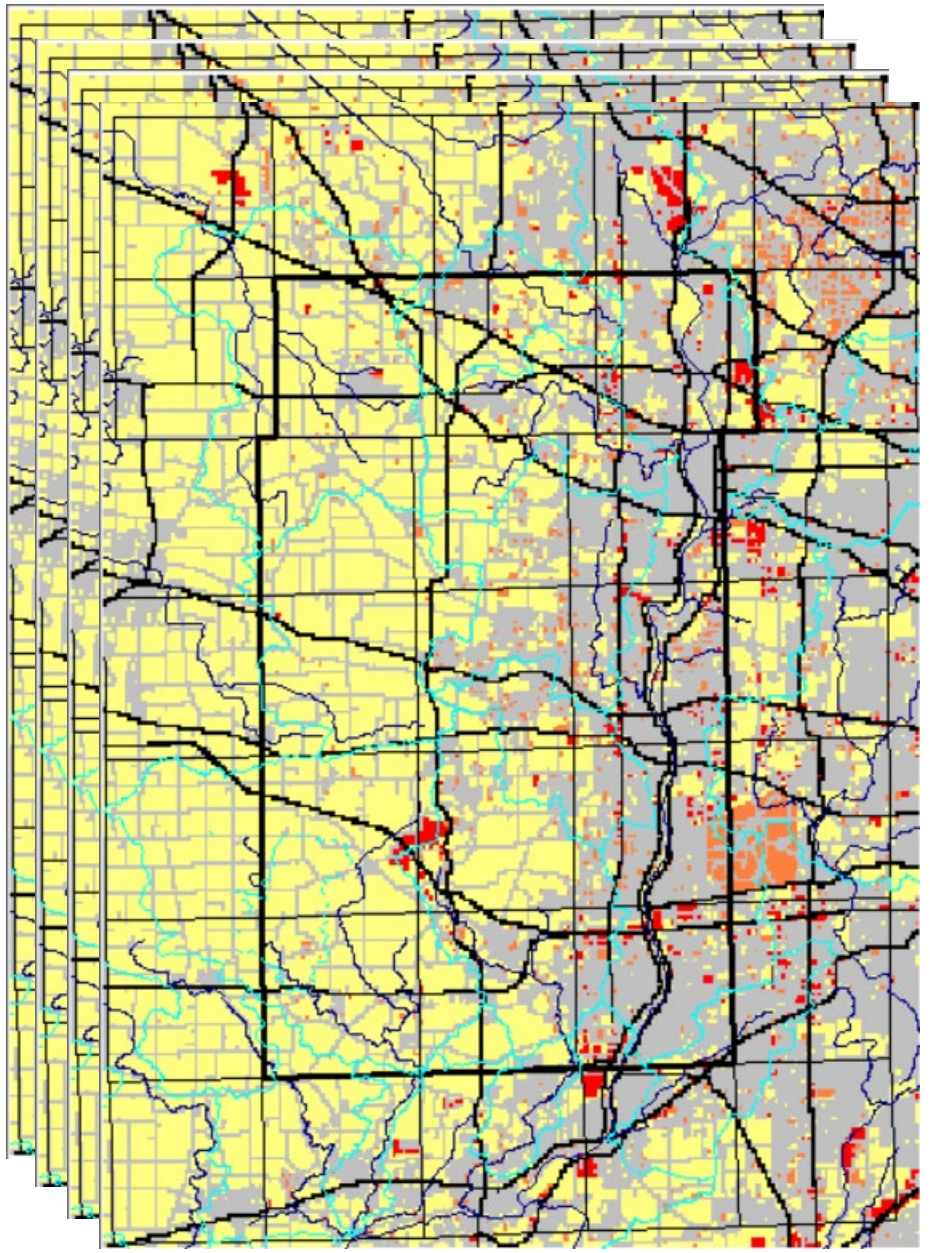
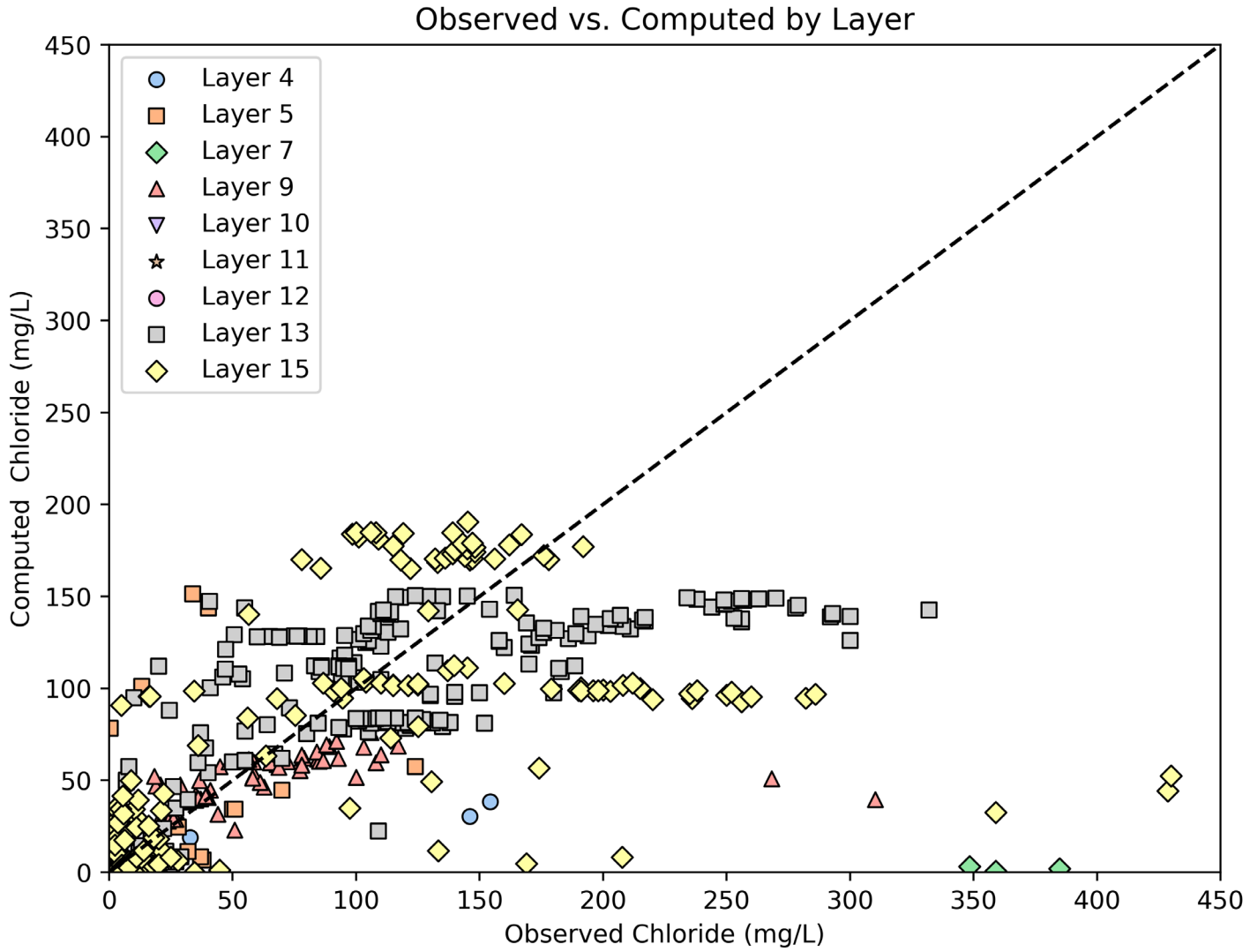


Overall Calibration for Chloride Modeling, So far!

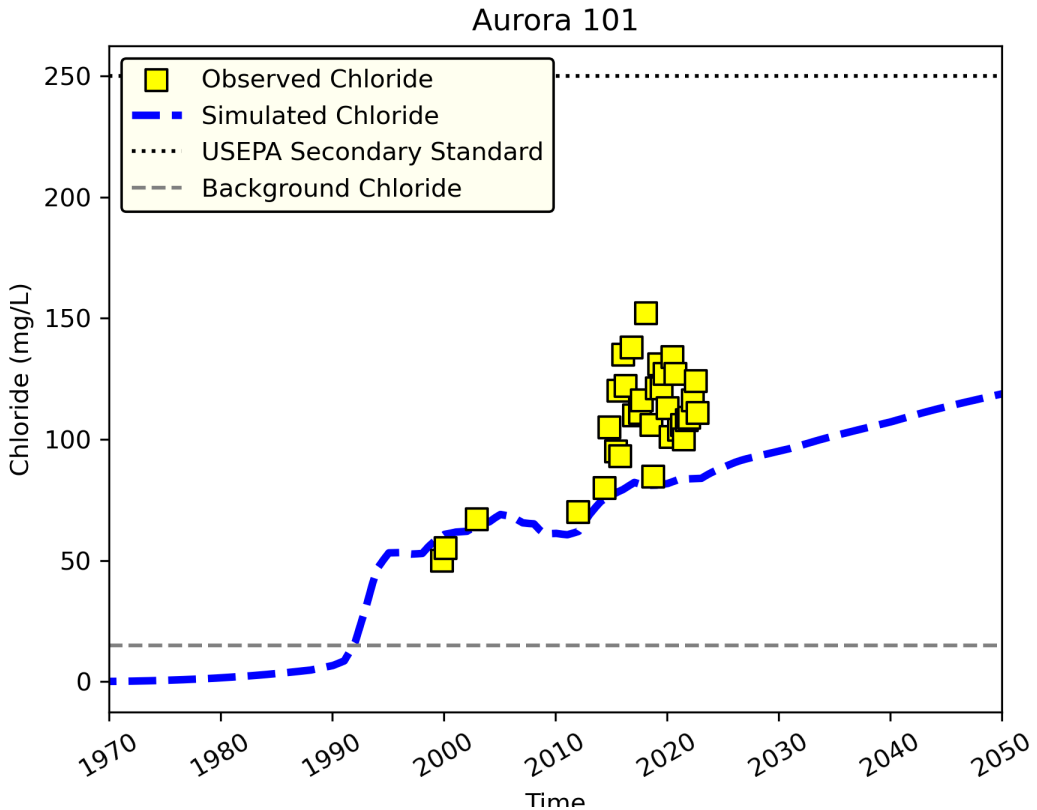
- 1:1 plot observed vs. simulated measurements
- Model is generally best at capturing concentrations of less than 150 mg/L.
- Not able to capture the highest observed groundwater concentrations, but our model is annual average
- Kane water quality study sites have most errors (very localized aquifers)
- Overall, a good starting point!

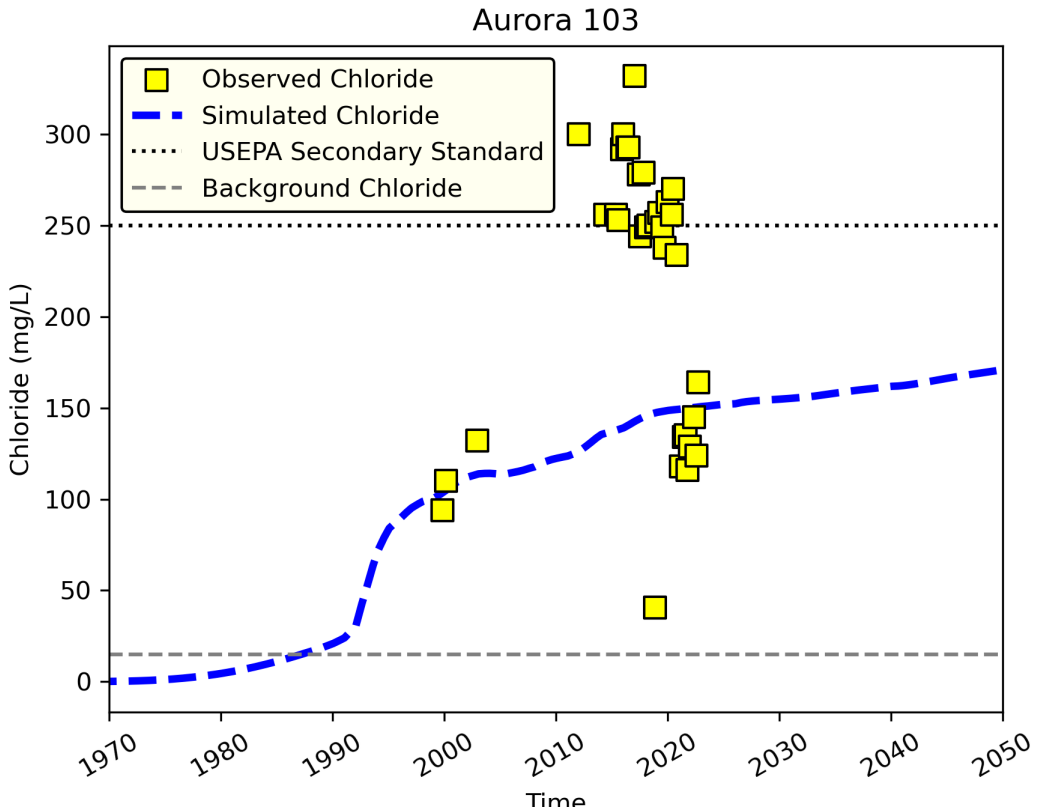


Chloride Results- Aurora Sand and Gravel Wells

- Aurora 103 high points are highly variable, this has been observed in other wells in contact with surface features (rivers, stormwater) that are affected by seasonal chloride

- **Aurora 103 high points are most of the observations that are not successfully calibrated in Layer 13**

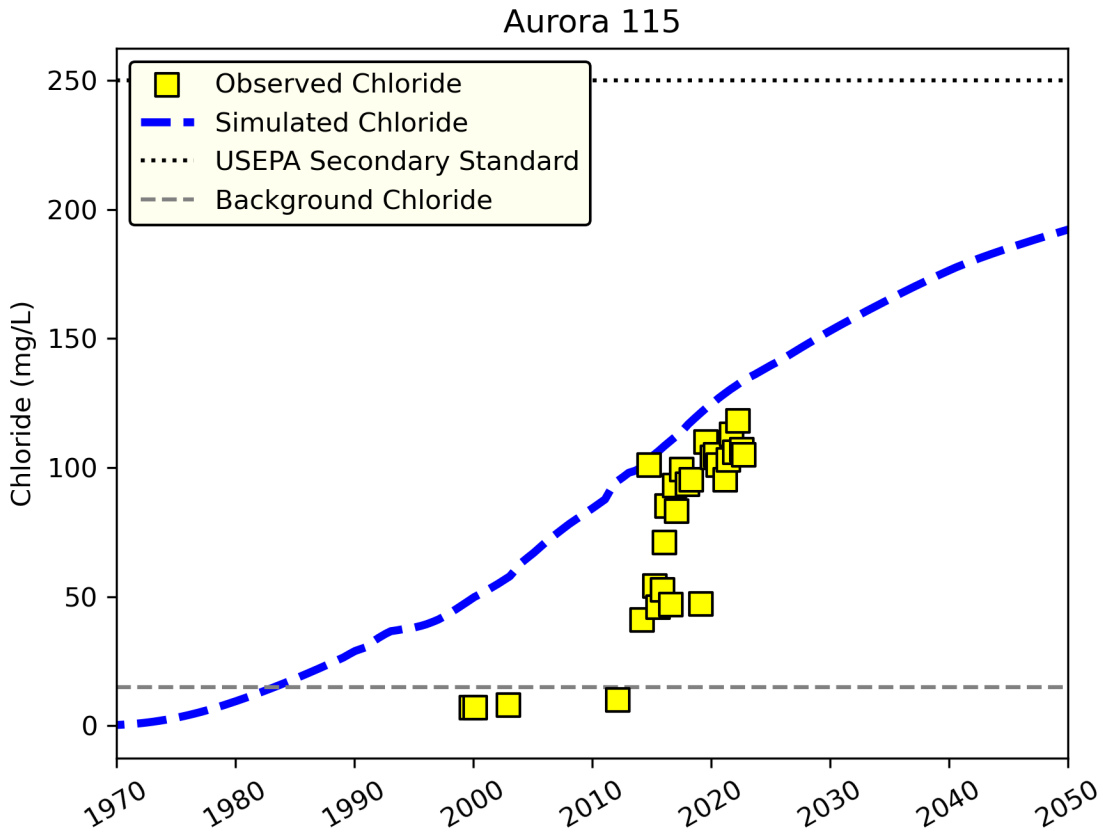


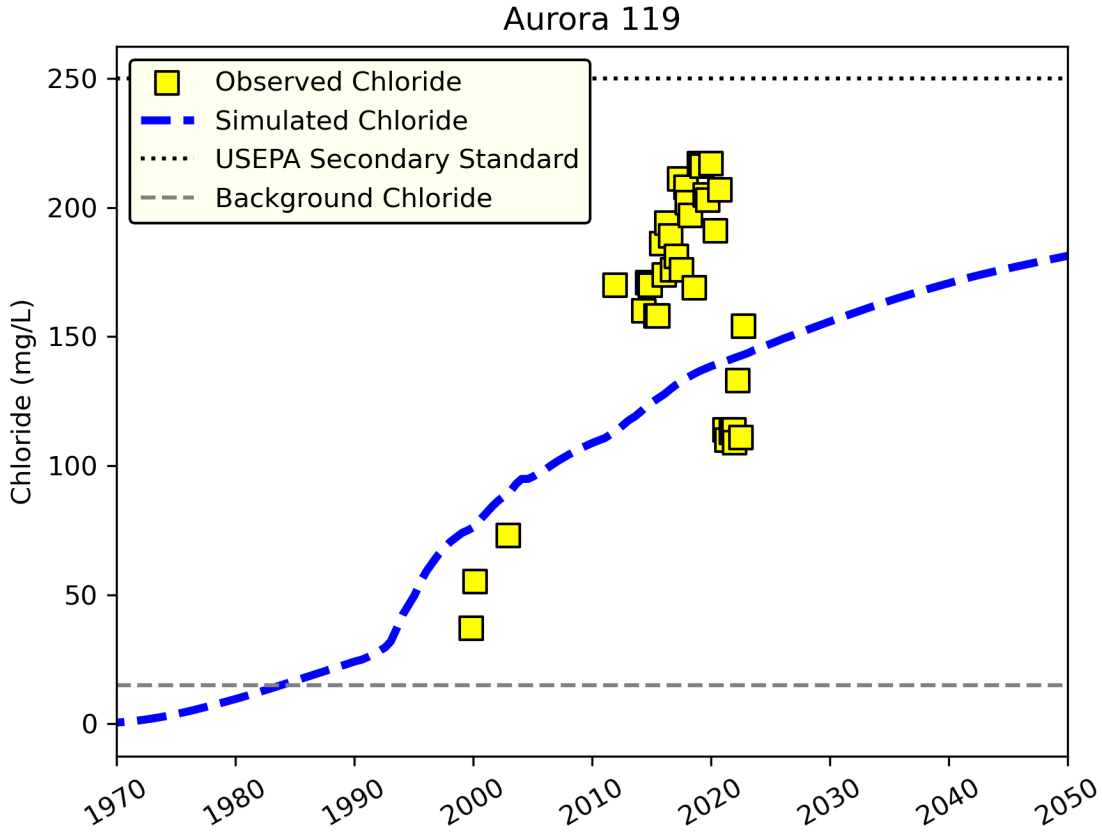


Chloride Results- Aurora Sand and Gravel Wells

- Aurora 115
  - Measured concentrations at background levels in 2000
  - In 2050 they will be approaching 200 mg/L (simulated)

- Aurora 119 high points are are not successfully captured, but overall trend of accumulation is

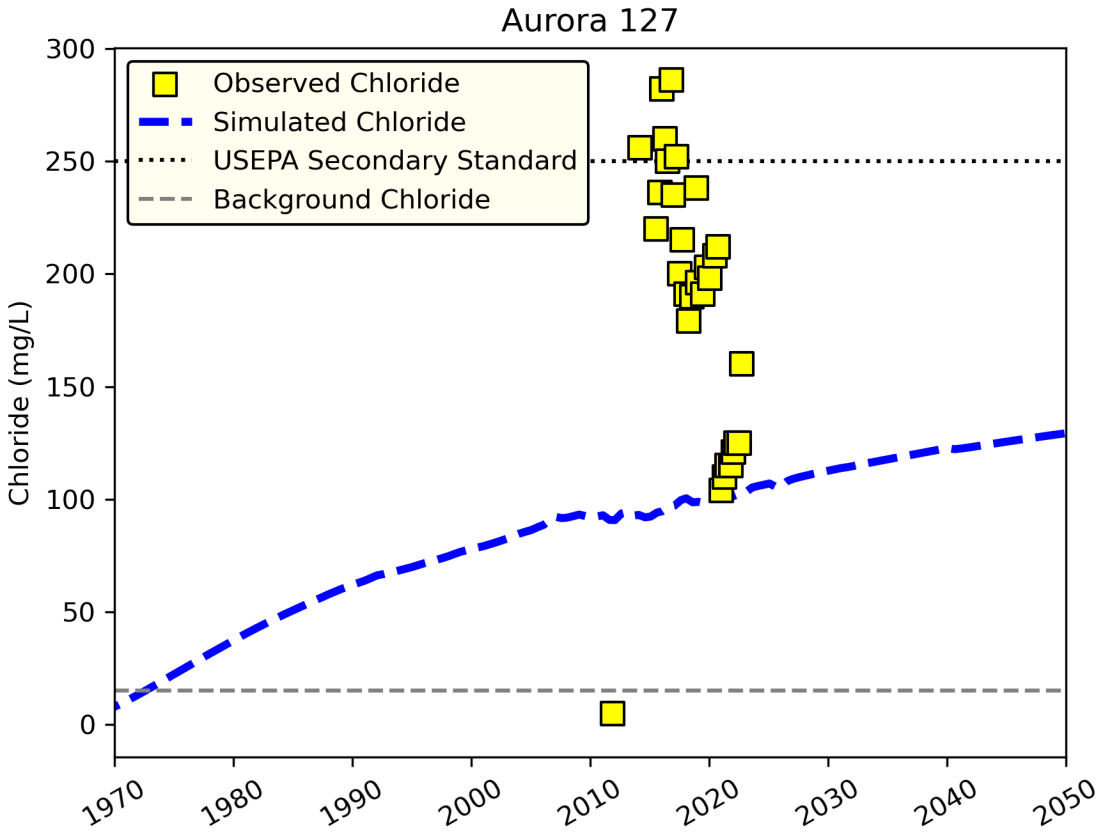


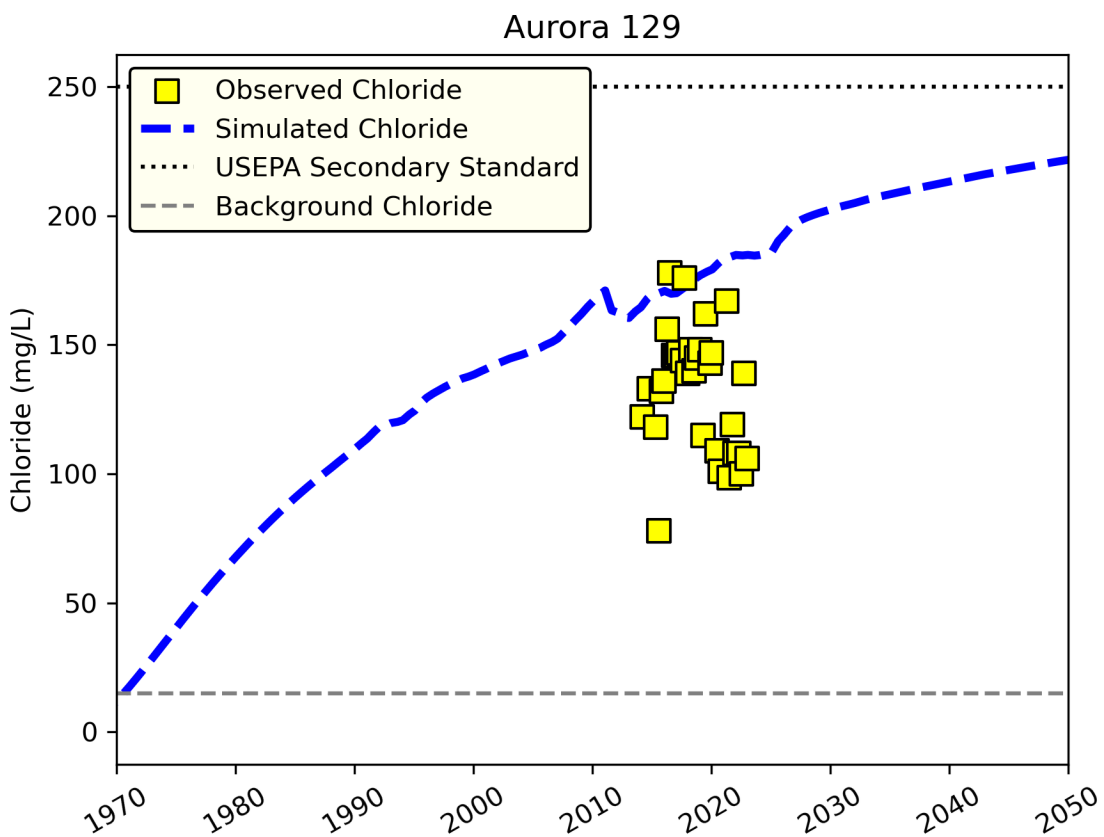


Chloride Results- Aurora Dolomite Wells

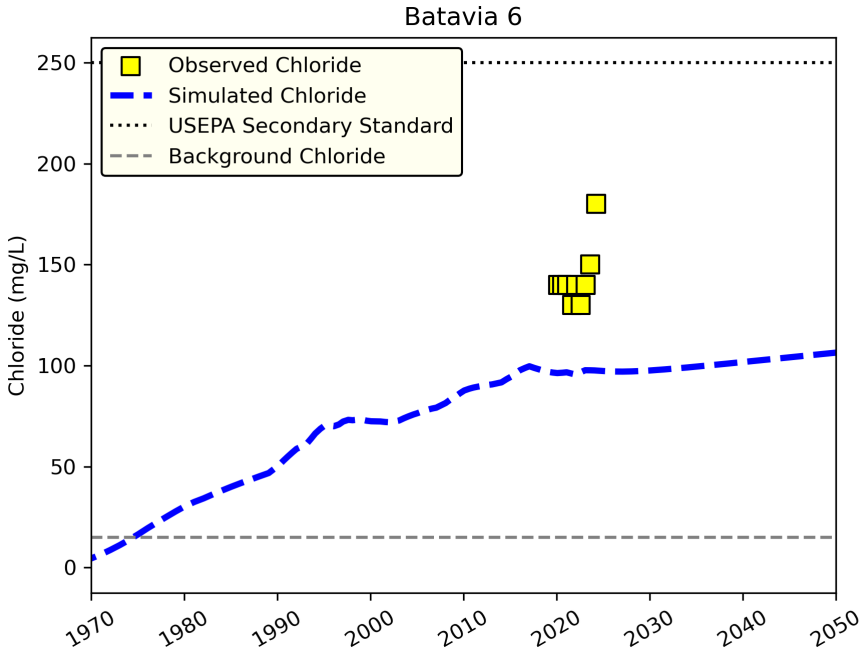
- Well 127
  - Measured concentrations are highly variable (some exceed USEPA secondary standard)
  - Model simulates chloride on lower end of observations

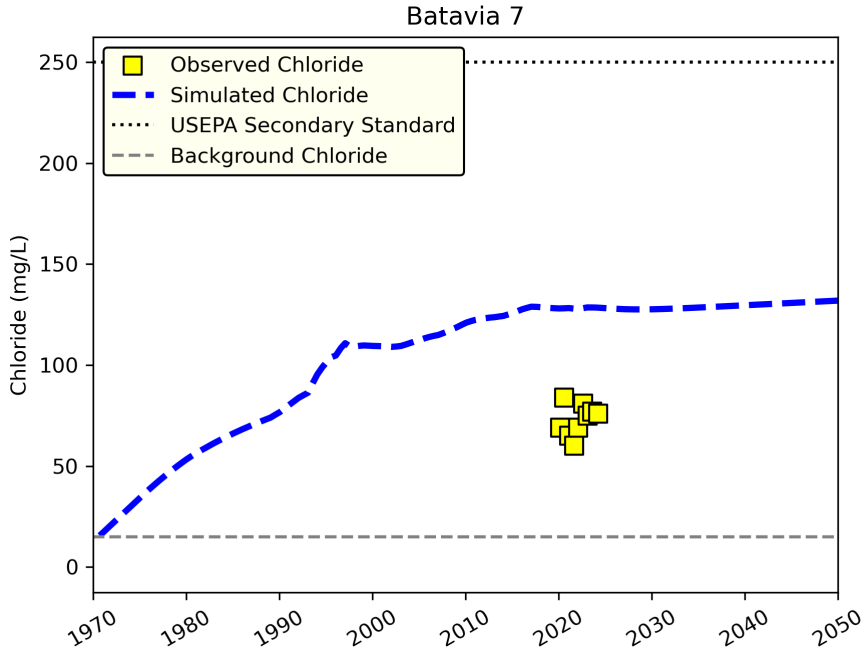
- Well 129
  - Model simulates chloride on lower end of observations





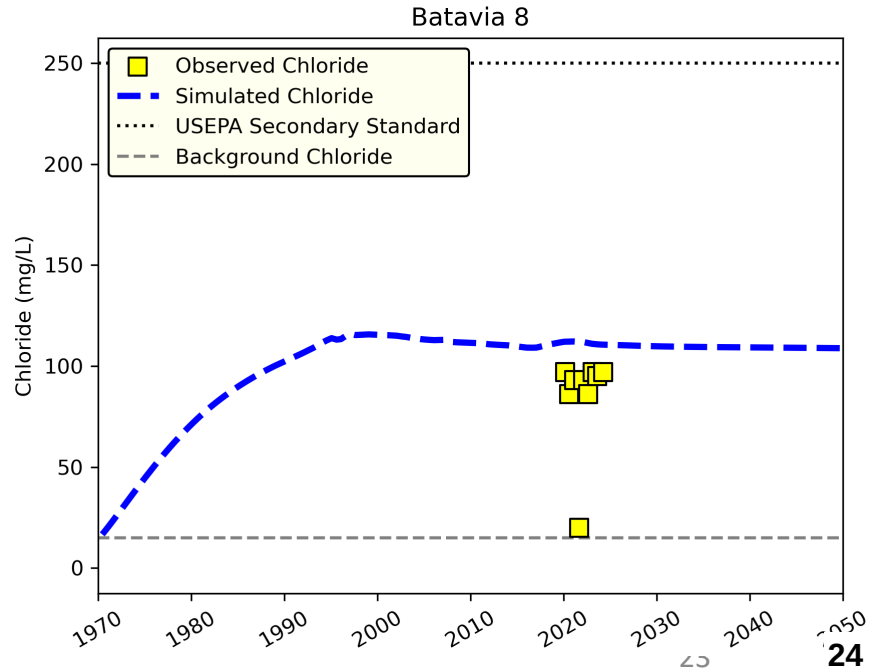
Chloride Results- Batavia Wells





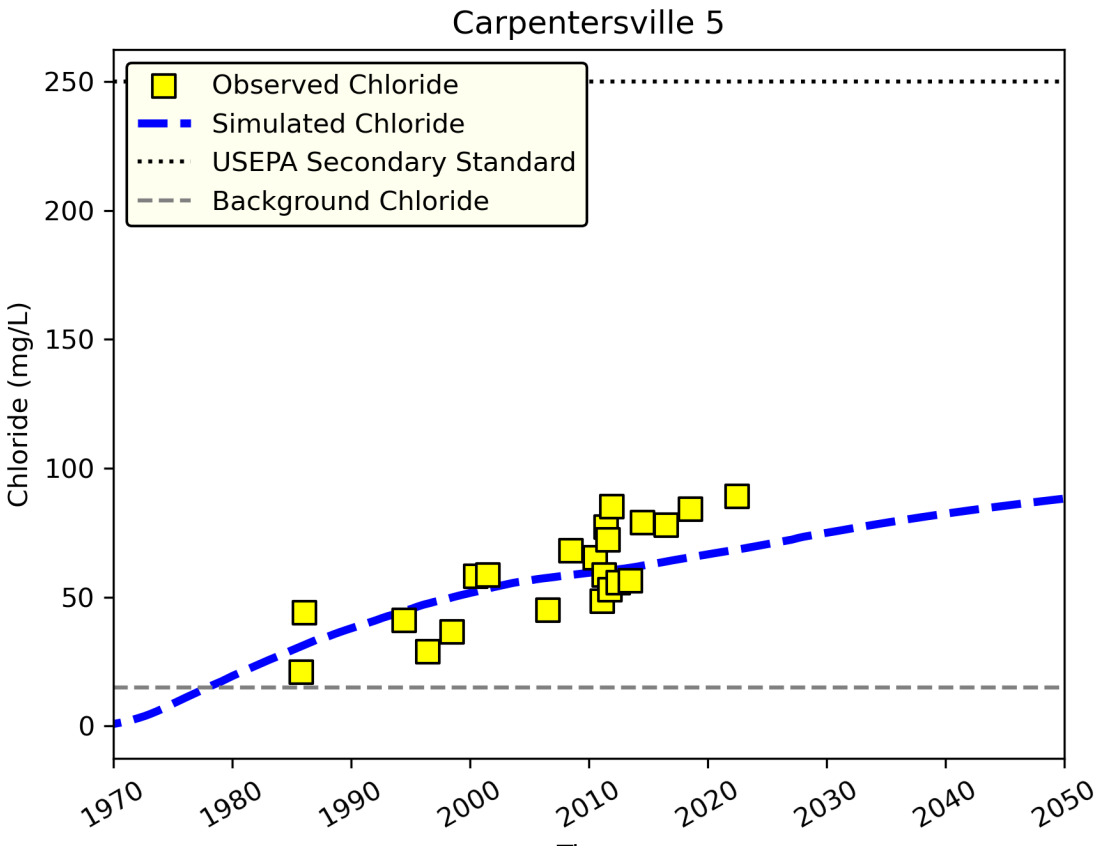
- Surprising variability amongst Batavia wells
- Average measured Cl concentration = 100.4 mg/L
- Model calibration either too high or too low, but overall a decent average fit
- Chloride not simulated to increase dramatically in the future

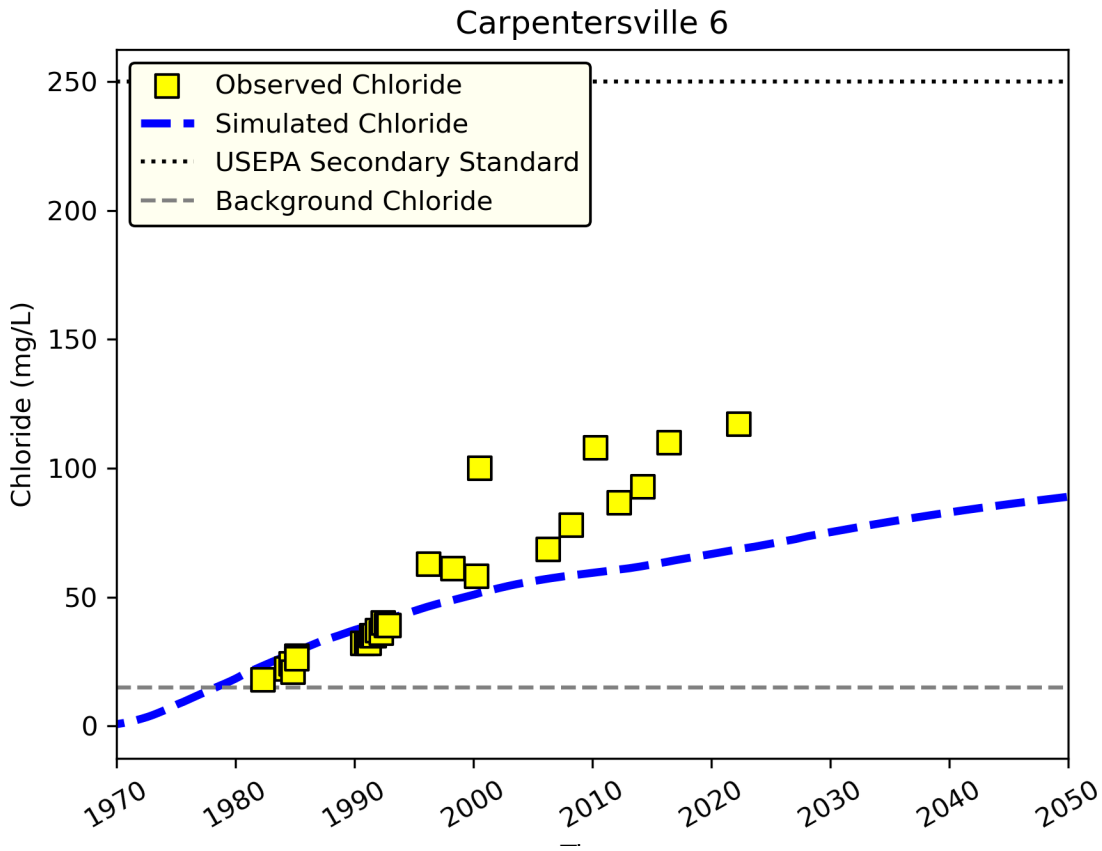
- "Leveling out" may be due to faster transit times and rapid discharge to Mill Creek?



Chloride Results at Carpentersville Wells

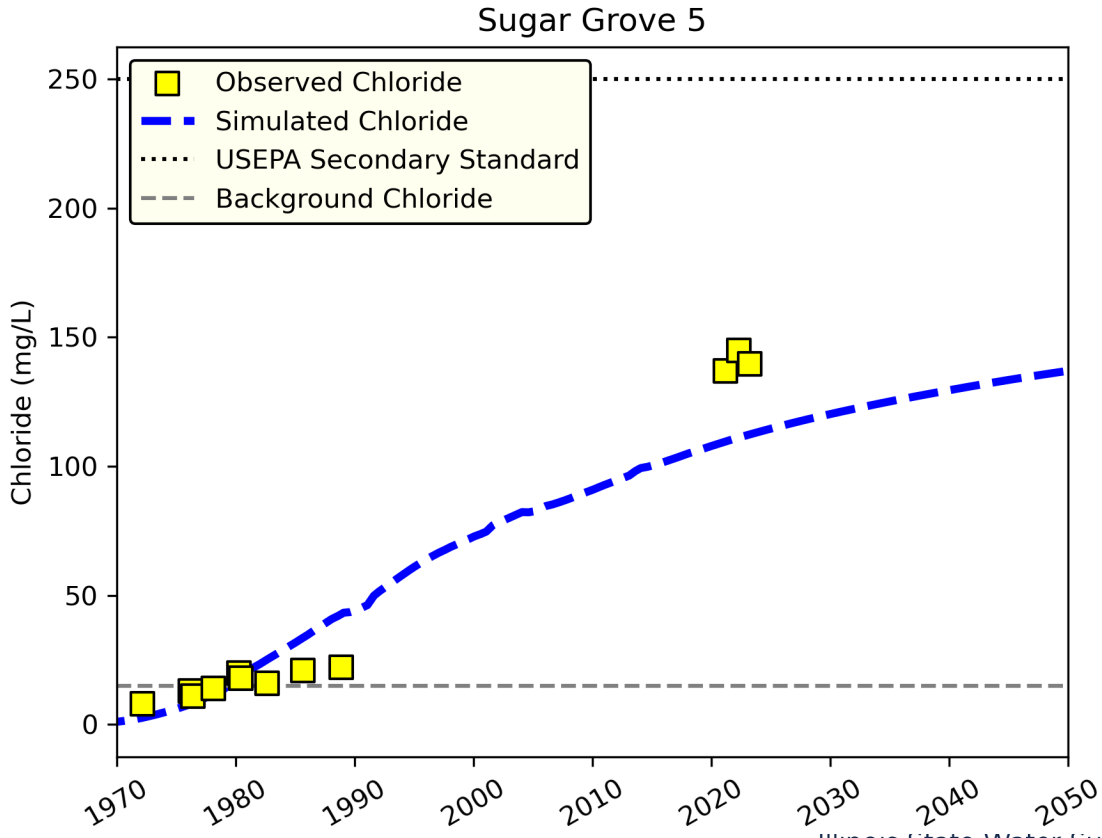
- Two of the longest datasets in this study
- The chloride accumulation trend at Well 5 is well captured
- Slightly under-simulated at Well 6

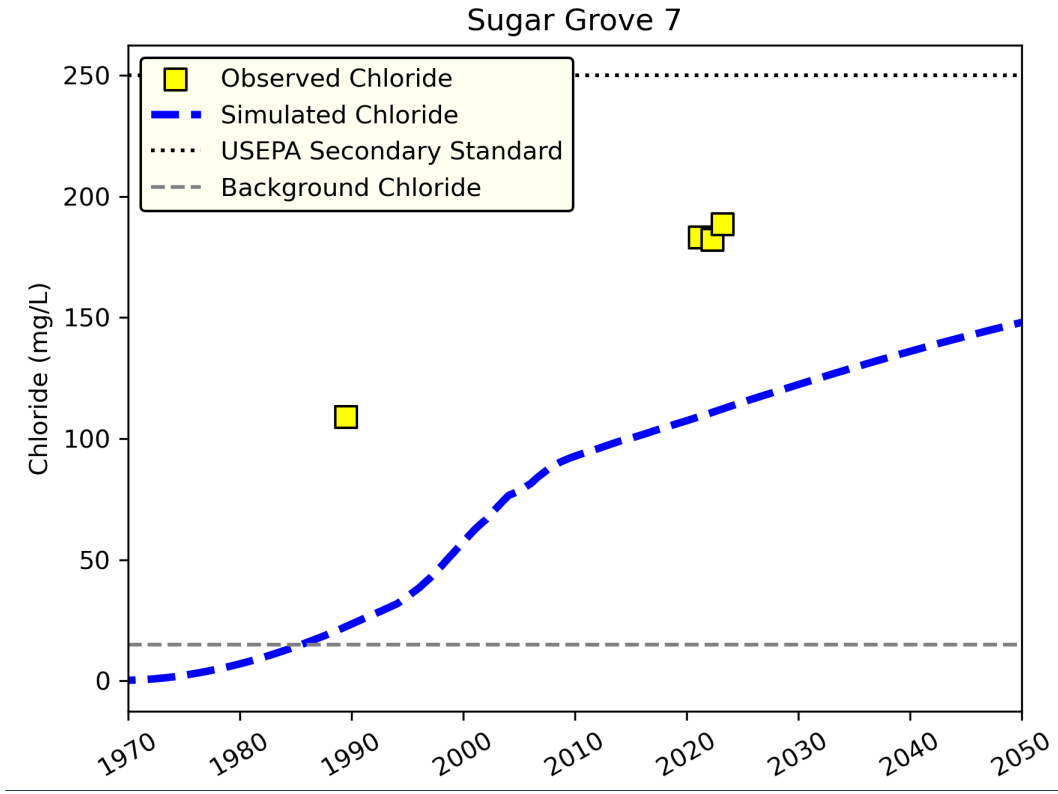




Chloride Results at Sugar Grove Wells

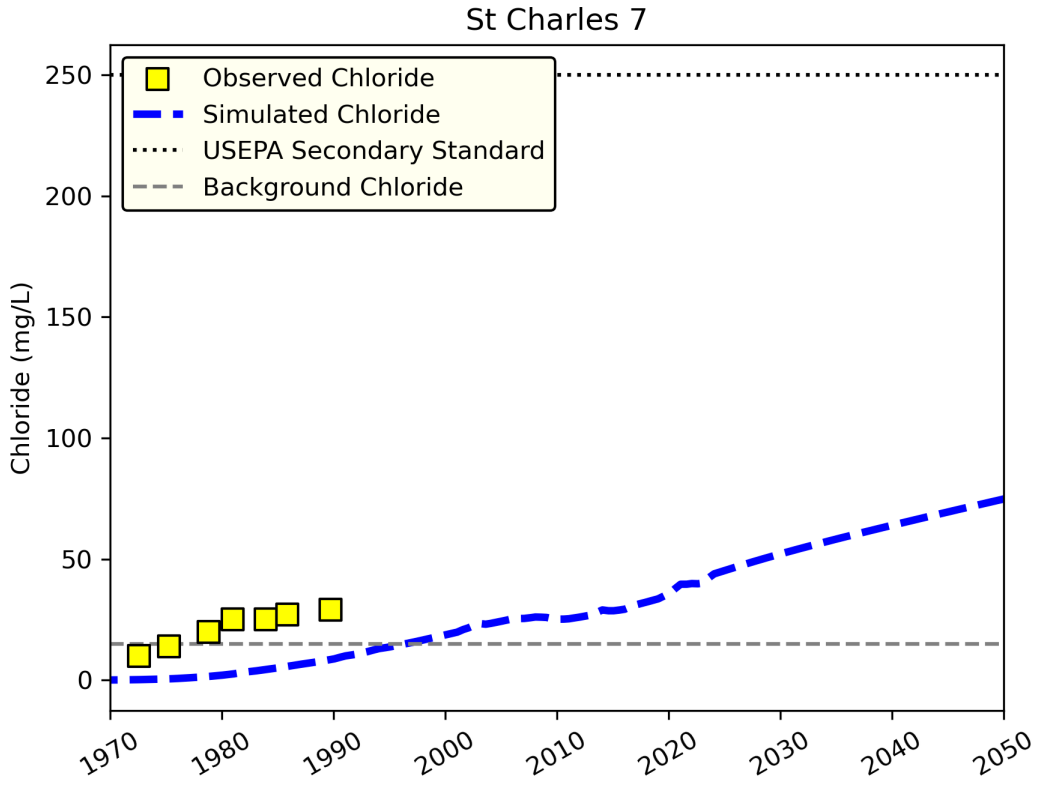
- Well 5
  - Dolomite bedrock well (Layer 15), good calibration
- Well 7
  - Sand and gravel well (Layer 13), simulation not high enough

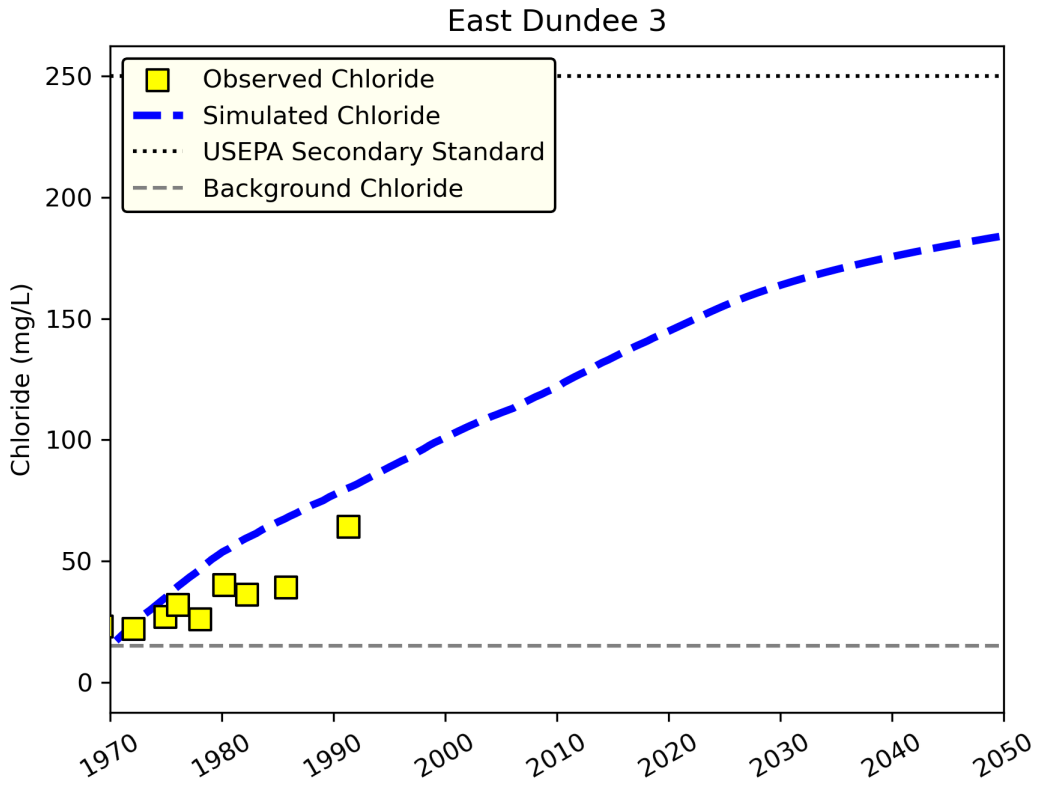




Chloride Results at other wells

- From the ISWS Groundwater Quality database
- Useful sites to test our model calibration in the 1970s, 1980s, and 1990s



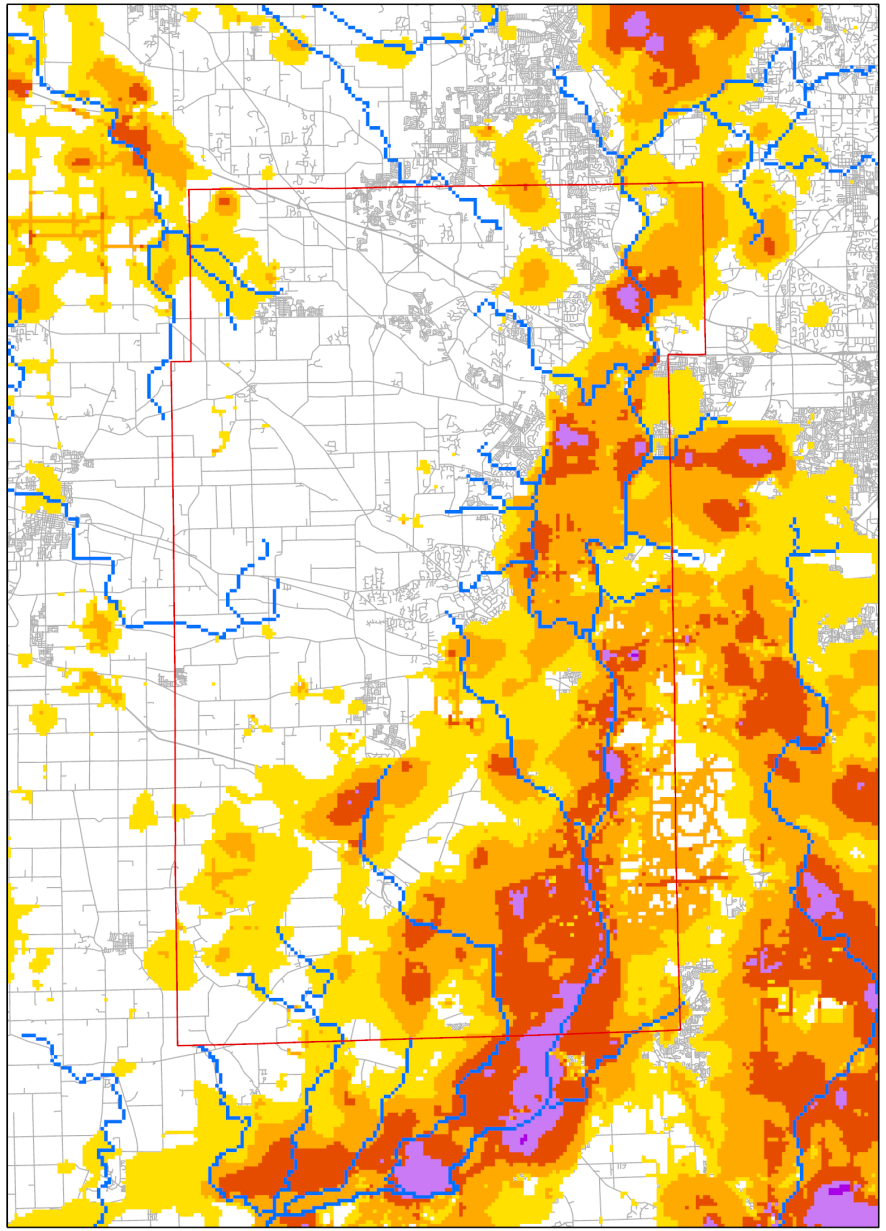


Simulated Chloride Maps

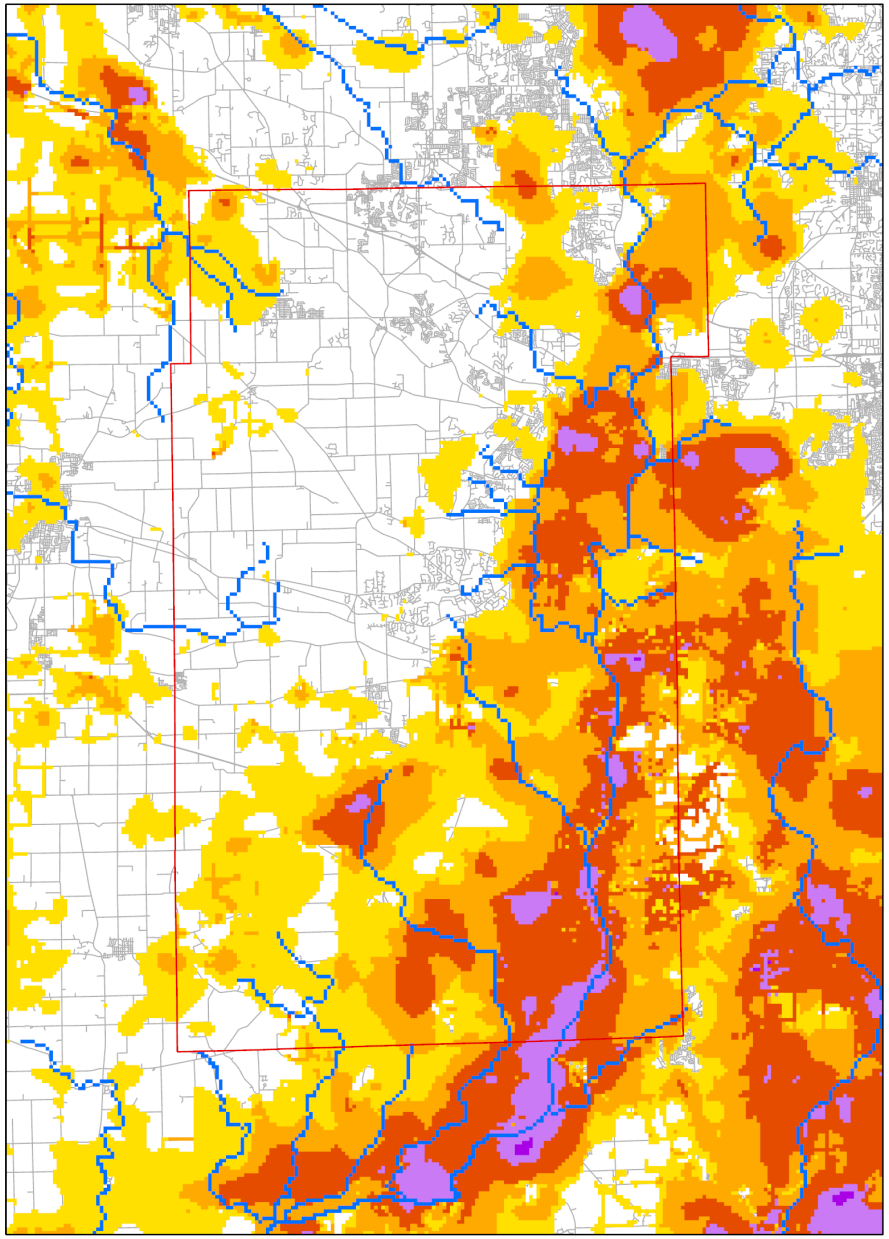
- Major sand unit of the SCBV
- Hotspots of chloride above 250 mg/L
- Very high in Montgomery/Yorkville

- ***Very preliminary!***

Layer 13- 2025



Layer 13- 2050 – business as usual



Summary of chloride modeling

Calibration broadly successful

- Without changing geologic parameters of the original model
- Model still calibrated to flow
- Calibration more successful at municipal wells than at private wells
  - Very local aquifer conditions (in less transmissive aquifers) harder to calibrate to
- Still more calibration to refine further

What future scenarios are useful to run?

- Our water quality study indicated that chloride concentrations are plateauing or decreasing in some eastern Kane County wells, either because of climate, conservation, or both
- What should assumptions of future chloride application rates be?
- How long will chloride take to leave the system?

Establishment of a Real-Time Monitoring Network in Kane County, IL

Kane Observation Network- Progress

PHASE 2 August 2024 - 2025

Potential Year 2 Installations:

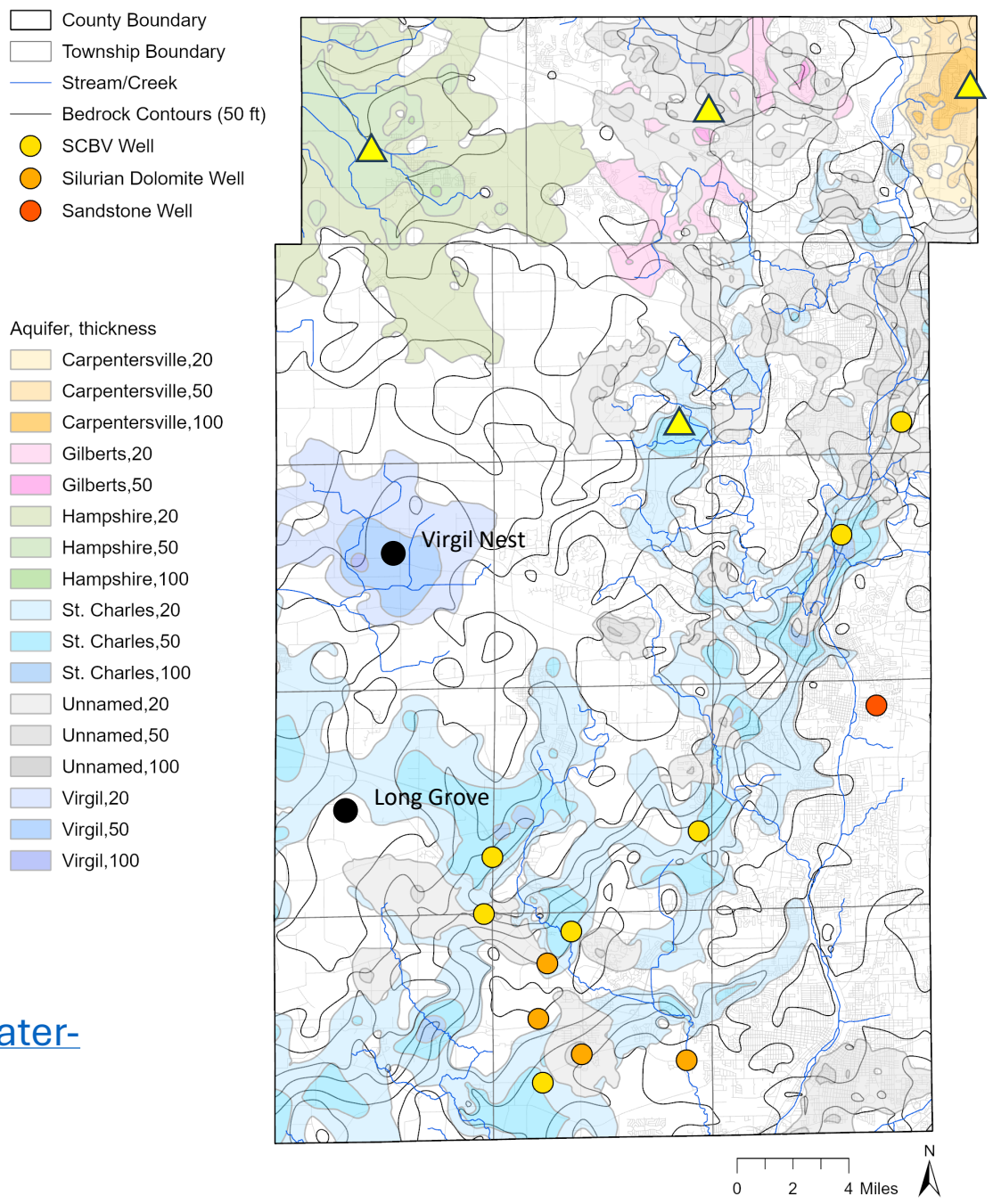
- Virgil Bike path Nest (SSC- 12/13)
  - Maquoketa well
  - Platteville well
- Long Grove FP(SSC-7) - 394 ft deep

Potential Drilling Locations (Sand and Gravel Wells) △

- Hampshire Aquifer
- Gilberts Aquifer
- Carpentersville Aquifer
- Elgin Bedrock Valley

- Only enough for 2 wells
- Drill on Kane Forest Preserve property
- ***Fall 2025***

https://www.isws.illinois.edu/groundwater-science/groundwater-monitoring-well-networks/kane-county



Next Steps

- Monitoring Network
  - Install transducers at Long Grove and Virgil wells
  - Scout out drilling locations summer 2025
  - Drill fall 2025

- Sustainability Modeling
  - Chloride modeling
    - Continue calibrating model
    - Test model cases of different future chloride application
  - Report writing
    - Read about how effluent sustains aquatic environments
    - Begin compiling study conclusions

STATE OF ILLINOIS)
SS.
COUNTY OF KANE)

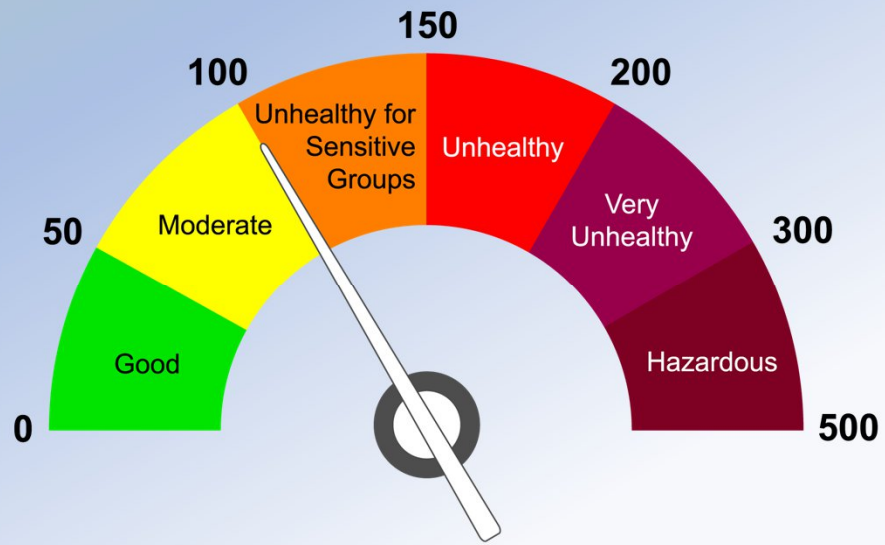
PRESENTATION/DISCUSSION NO. TMP-25-906

AIR QUALITY IN KANE COUNTY

Air Quality in Kane County

Air Quality Index

Air Quality Index (AQI)	PM 2.5	Ozone
Good	0 - 12.0 µg/m³	0 - 0.054 ppm
Moderate	12.1 - 35.4 µg/m³	0.055 - 0.070 ppm
Unhealthy for Sensitive Groups	35.5 - 55.4 µg/m³	0.071 - 0.085 ppm
Unhealthy	55.5 - 150.4 µg/m³	0.086 - 0.105 ppm
Very Unhealthy	150.5 - 250.4 µg/m³	0.106 - 0.200 ppm
Hazardous	Above 250.5 µg/m³	Above 0.201 ppm
	Based on a 24-hour average.	Based on an 8-hour average.

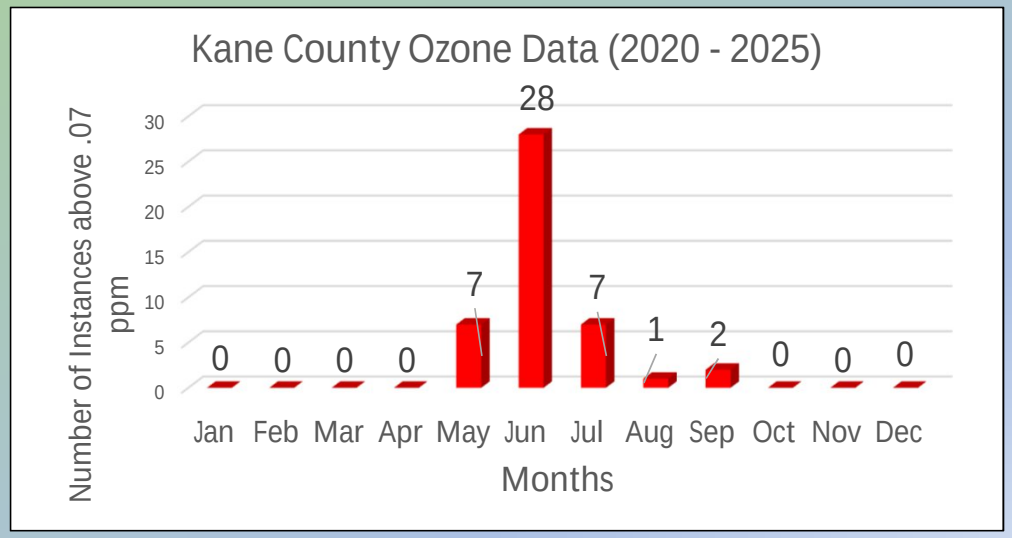


- Ozone = above 0.07 and PM2.5 = above 35.4 is considered unhealthy

5 Components that contribute to the Air Quality Index

- **Ground-level ozone:** A gas formed when pollutants from vehicles and other sources react in sunlight.
- **Particulate matter (PM):** A mixture of tiny solid and liquid particles suspended in the air, including PM2.5 and PM10.
- **Carbon monoxide (CO):** A colorless, odorless gas produced by burning fuel.
- **Sulfur dioxide (SO2):** A gas primarily produced by burning coal and oil.
- **Nitrogen dioxide (NO2):** A gas formed from emissions from vehicles and industrial sources.

Air Quality Ozone and PM2.5 2020-2025



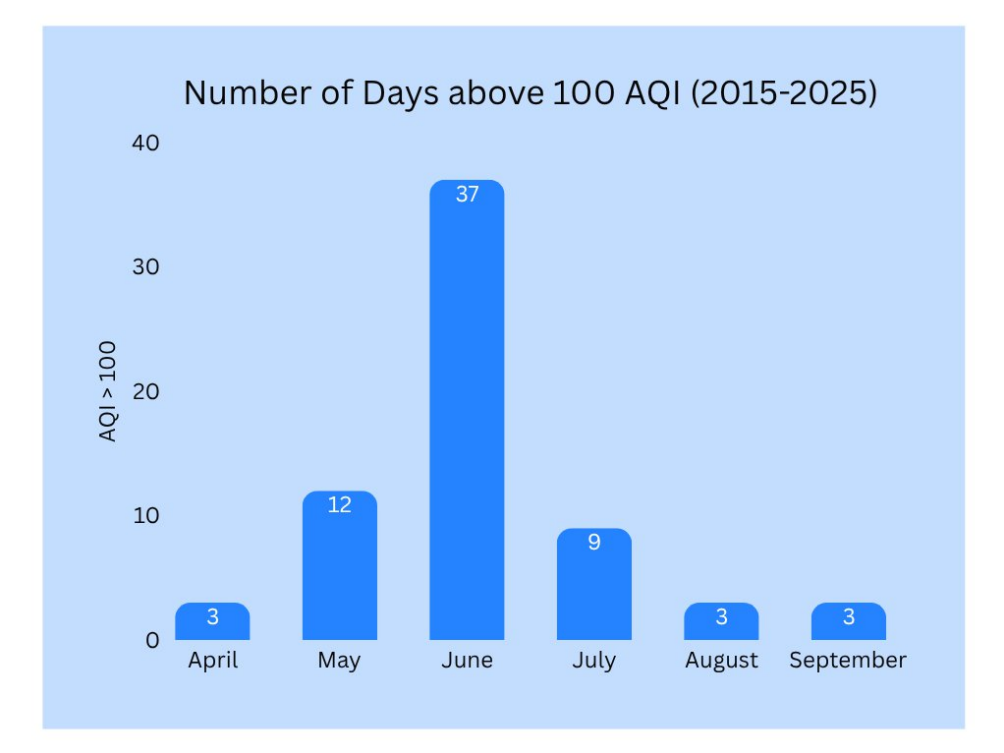
Pollutant: PM2.5
Timeframe: 2020 to 2025
Source: https://www.epa.gov/outdoor-air-quality-data/download-daily-data

Date	PM2.5 Reading (ug/m3)	AQI Reading
4/4/2021	39.9	112
6/28/2023	59.4	154
6/29/2023	65.9	158
6/5/2025	48.3	133
7/21/2025	34.8	99

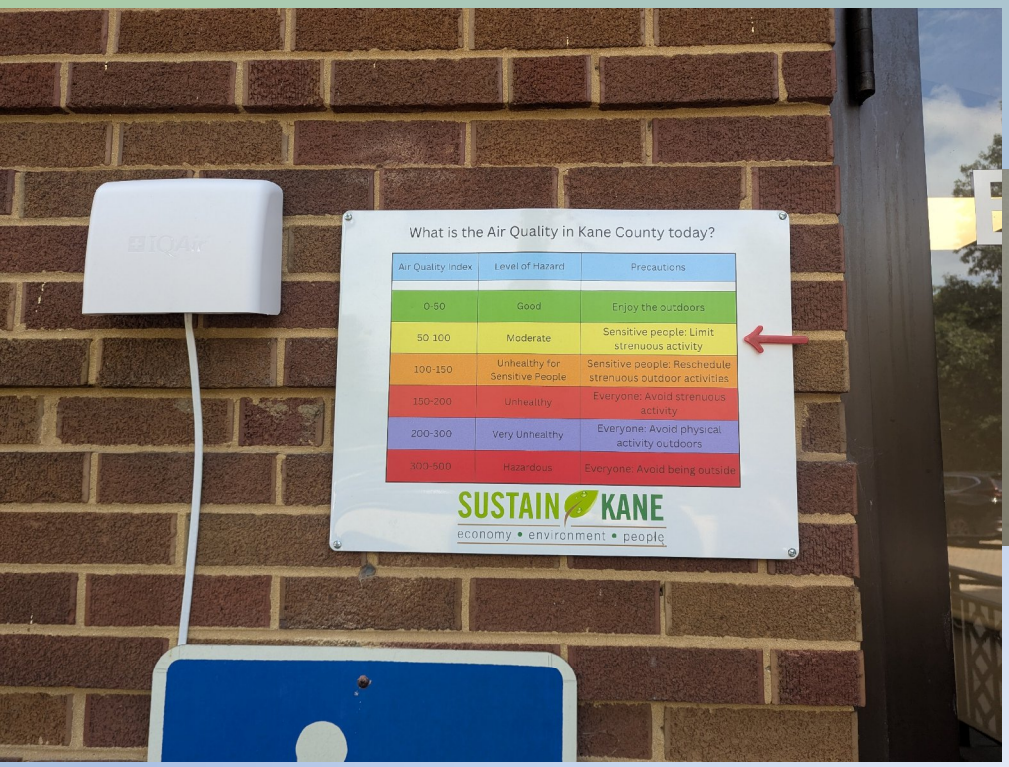
AQI from 2015-2025

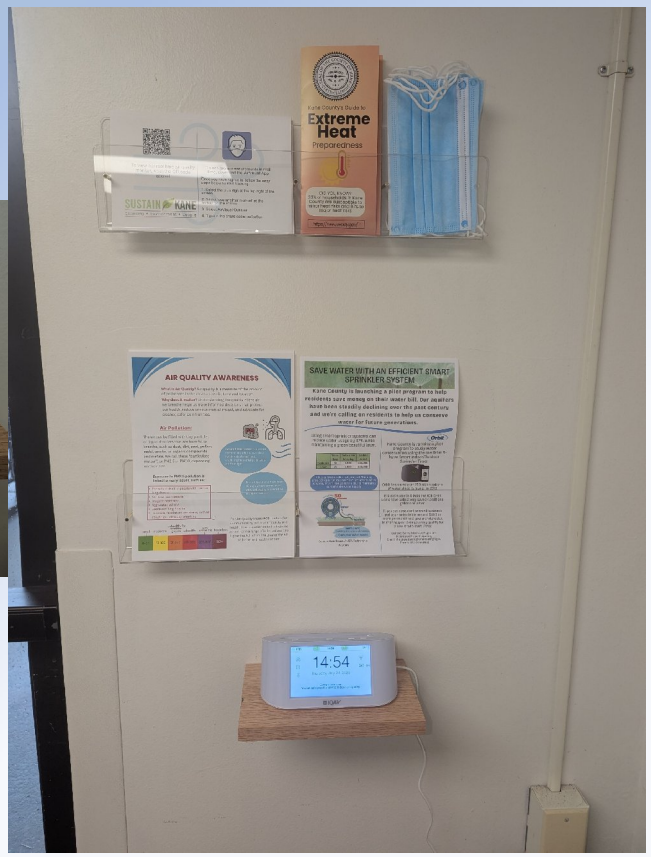
67 Days above 100

Note – not all days were recorded in 2020, 2021, 2022

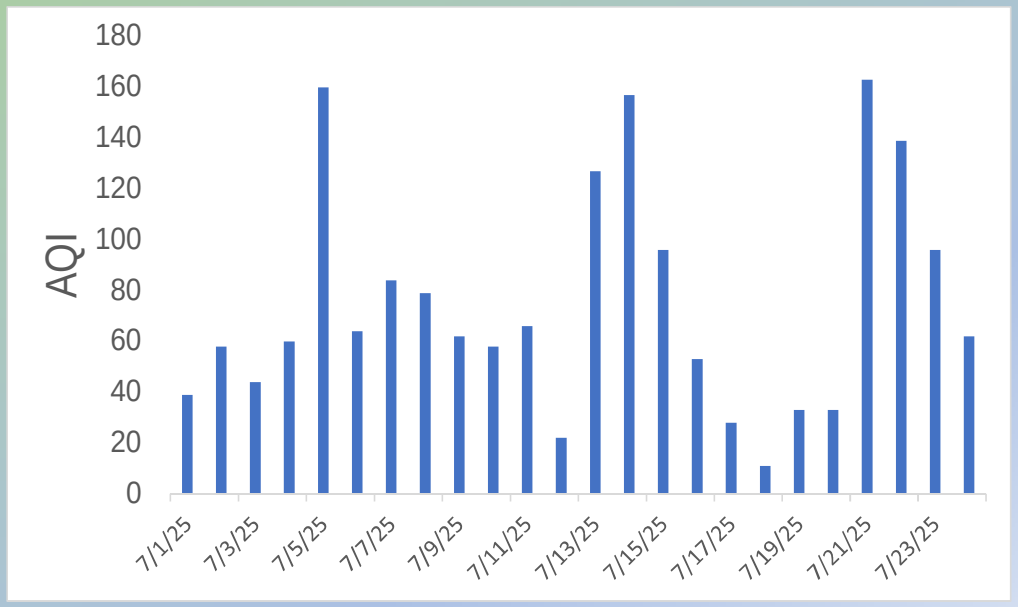


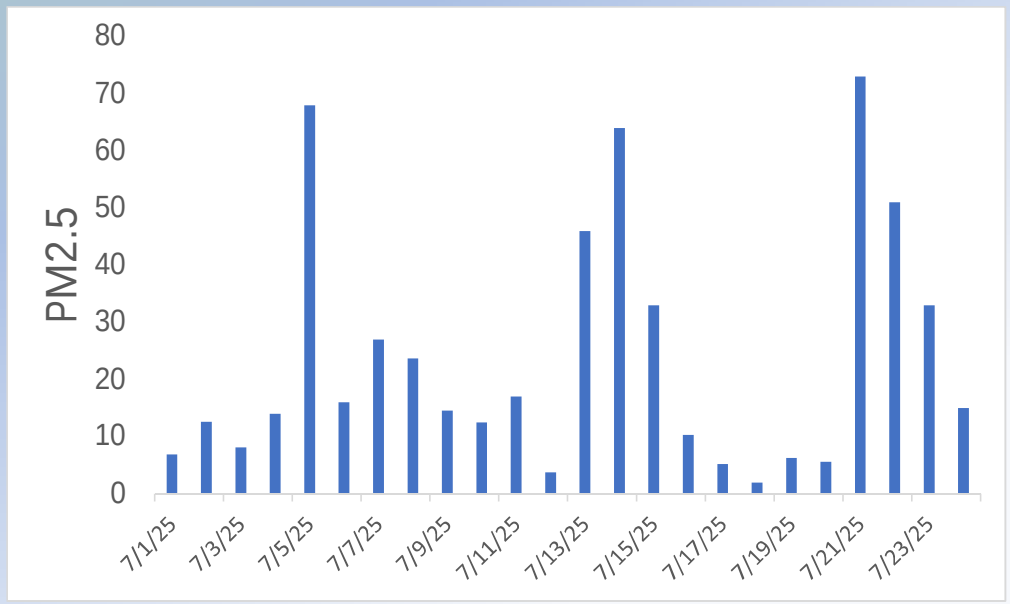
IQAir Air Quality Indoor and Outdoor Monitor





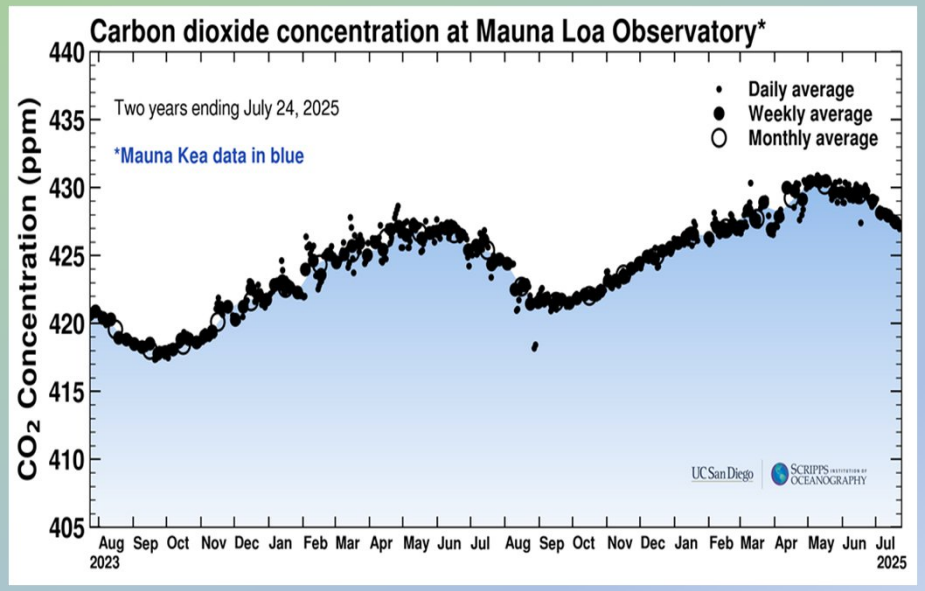
Kane County Air Monitor



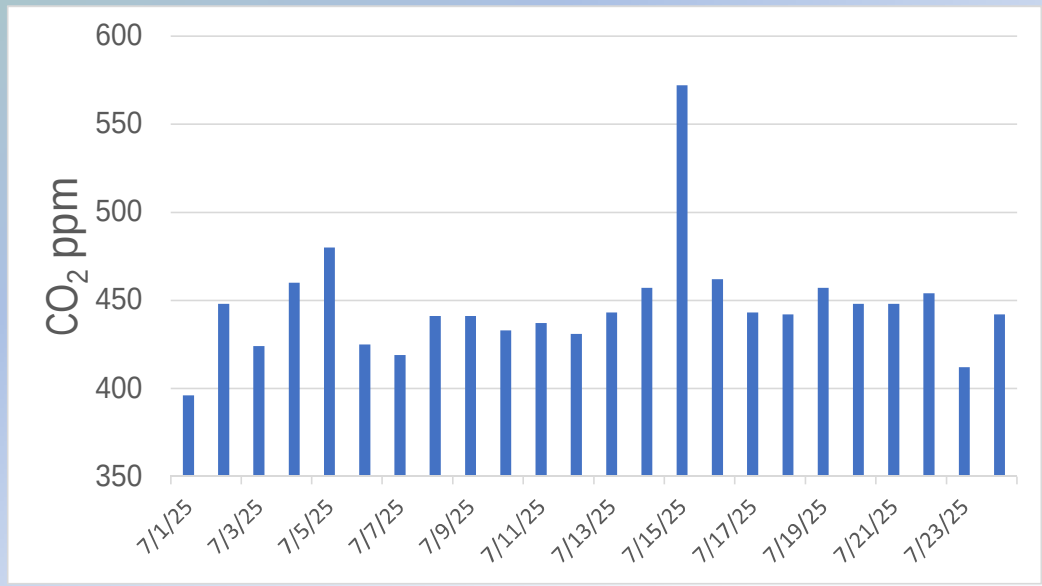


- Since the air monitor has been in place there has been 12 days above 50 and 5 above 100 AQI
- There has been 5 days were PM2.5 has been above 35

Carbon Dioxide



- Global CO_2 for the past two years



- CO_2 at Kane County

Thank you

Sarra Hinshaw PhD
(Ph) 630-208-8665
Environmental and Water Resources Department
Sustain Kane Facebook Page
Sustain Kane Instagram Account

STATE OF ILLINOIS)
SS.
COUNTY OF KANE)

PRESENTATION/DISCUSSION NO. TMP-25-920

SWITCH TOGETHER UPDATE

Switch Together Update

switch together.

Spring Group Buy Update

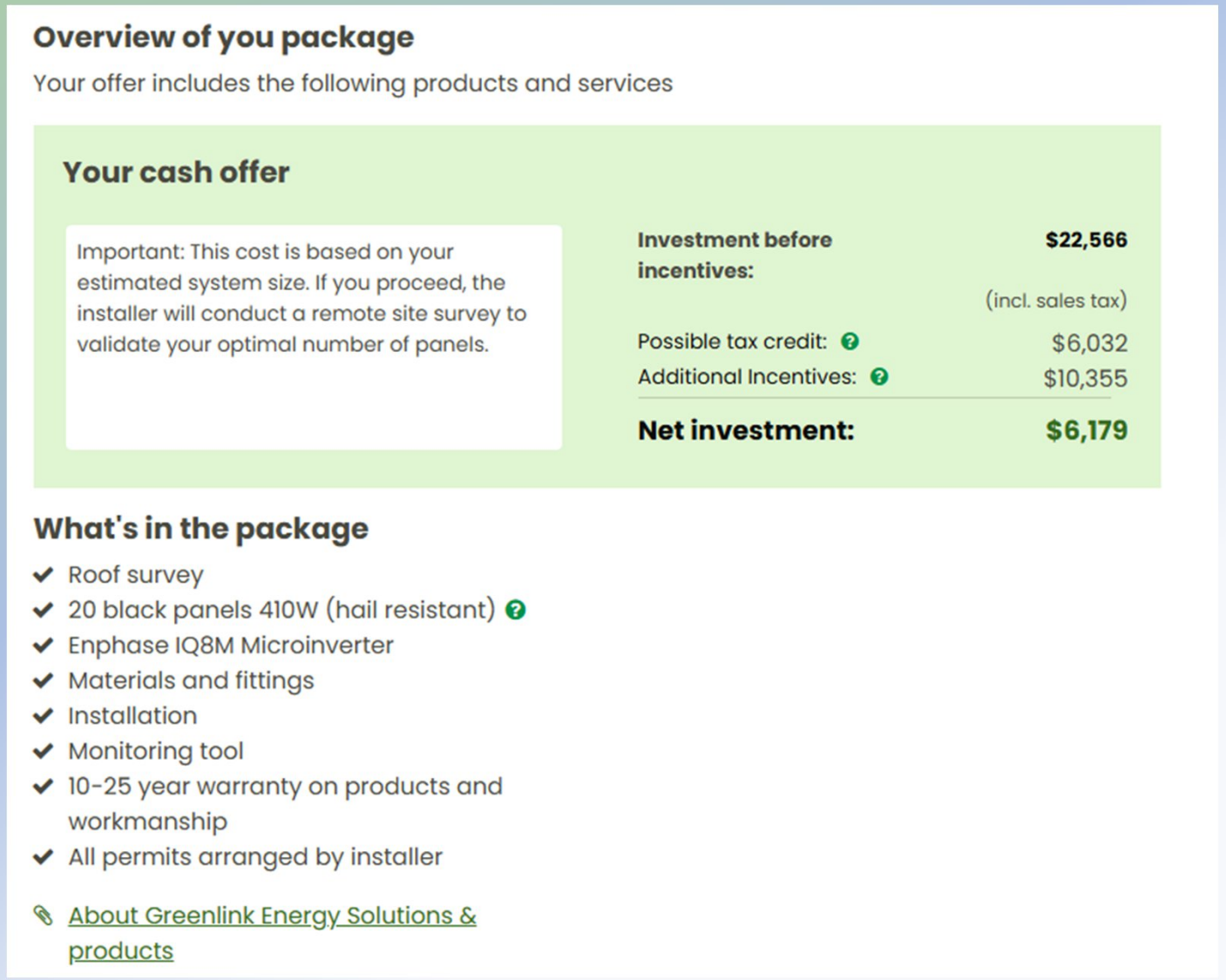
- **New registrations in Kane County:** 215 (1,048 all time)
- **New registrations in IL:** 1,548 (7,225 all time)
- **Accepted and Paid in Kane County:** 34 (198 all time)
- **Accepted and Paid in IL:** 286 (1,508 all time)

Vendors and Cost

- Windfree Solar, Greenlink Energy Solutions, All Energy Solar and RxSun
- $2.77/W
- Average cost in IL = $3.26/W

Example from Sarra's House

New summer program on now. Deadline is September 3, 2025



Overview of you package

Your offer includes the following products and services

Your cash offer

Important: This cost is based on your estimated system size. If you proceed, the installer will conduct a remote site survey to validate your optimal number of panels.

Investment before incentives:	**$22,566** (incl. sales tax)
Possible tax credit:	$6,032
Additional Incentives:	$10,355
Net investment:	**$6,179**

What's in the package

- ✔ Roof survey
- ✔ 20 black panels 410W (hail resistant)
- ✔ Enphase IQ8M Microinverter
- ✔ Materials and fittings
- ✔ Installation
- ✔ Monitoring tool
- ✔ 10-25 year warranty on products and workmanship
- ✔ All permits arranged by installer

About Greenlink Energy Solutions & products

Thank you

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