

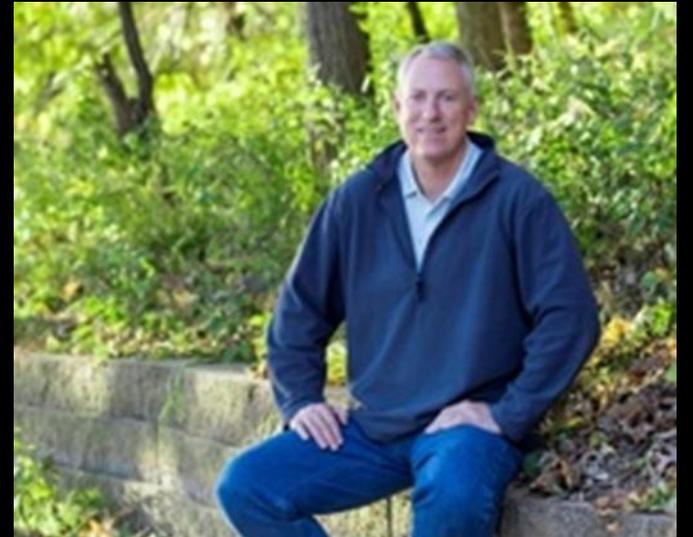
IOWA

***Iowa Geological Survey
Legislative Update:
Groundwater Availability***

Keith Schilling, Ph.D.

**Director and State Geologist, Iowa Geological
Survey, University of Iowa**

February 23, 2026



Iowa Geological Survey - Who we are



Our Mission:

“To collect, reposit, and interpret geologic and hydrogeologic data, to conduct foundational research, and to provide lowans with the knowledge needed to effectively manage our natural resources for long-term sustainability and economic development.”

Some Details:

Location:

University of Iowa
Iowa City, IA

Within the University:

IIHR Hydroscience &
Engineering
College of Engineering

State Geologist:

Keith Schilling, Ph.D.

Staff:

**13 FTE geologists and
hydrogeologists
2 shared/part-time
1 administrative support**

University of Iowa campus
Trowbridge Hall



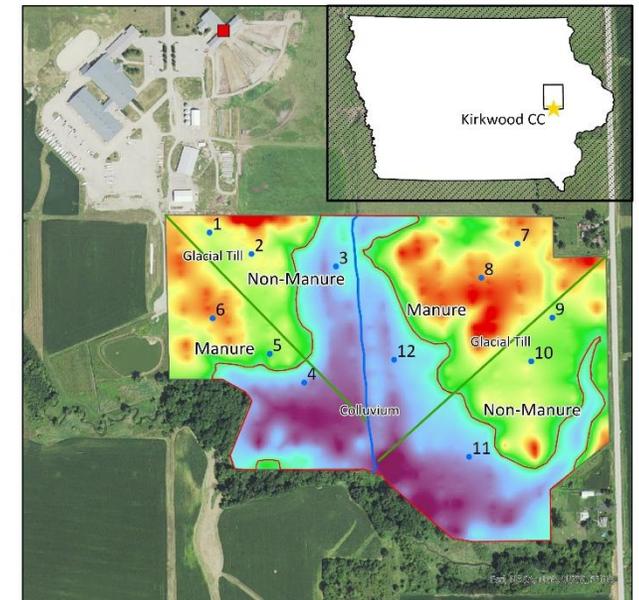
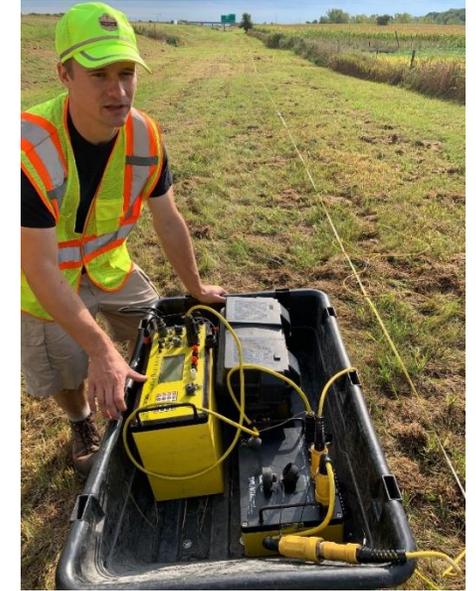
University of Iowa
Oakdale Research Park



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Consistent with our mission:

- Geologic mapping and aquifer characterization
- Groundwater resource evaluation
- Making geologic and water resource information available for the public



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Base Funding

Division 5 Environment First Fund General Appropriations

Sec.26. STATEUNIVERSITYOFIOWA—IOWA GEOLOGICAL SURVEY. There is appropriated from the environment first fund created in section 8.57A to the state university of Iowa for the fiscal year beginning July 1, 2022, and ending June 30, 2023, the following amounts, or so much thereof as is House File 2560, p.16 necessary, to be used for the purposes designated:

1.OPERATIONS For purposes of supporting the operations of the Iowa geological survey of the state as created within the state university of Iowa pursuant to section 456.1, including but not limited to providing analysis; data maintenance, collection, and compilation; investigative programs; and information for water supply development and protection:.....\$200,000

2. WATER RESOURCE MANAGEMENT For purposes of supporting the Iowa geological survey in measuring, assessing, and evaluating the quantity of water sources in this state and assisting the department of natural resources in regulating water quantity as provided in chapter 455B, subchapter III, part4, pursuant to sections 455B.262 Band 456.14:.....\$495,000

Sec. 16. IOWA GEOLOGICAL SURVEY — GROUNDWATER PLANNING AND RESOURCE ASSESSMENT PROJECT.

1. There is appropriated from the general fund of the state to the state university of Iowa for the fiscal year beginning July 1, 2025, and ending June 30, 2026, the following amount, or so much thereof as is necessary, to be used for the purposes designated:

For purposes of supporting a groundwater planning and resource assessment project to be administered by the Iowa geological survey of the state as created pursuant to section 456.1:

..... \$ **200,000**

IGS appropriation of \$695,000 was flat from 2014 to 2024

Appropriation increased by \$200,000 in 2025 for groundwater planning and assessment

However 

Comparison of state appropriations to midwestern state geological surveys:

State	2024
Minnesota	\$1,473,526
South Dakota	\$2,450,000
Nebraska	\$2,500,000
Indiana	\$2,700,000
Wisconsin	\$2,026,146
Kentucky	\$4,181,029
Illinois	\$4,492,841
Ohio	\$6,082,584
Kansas	\$8,800,000
Missouri	\$6,512,479
Michigan	\$3,000,000
Average appropriation	\$4,019,873
Iowa appropriation	\$895,000

The State of Iowa appropriation is less than one-fourth (22%) of the average state appropriation provided to other geological surveys in the region



Emerging issues – Data Centers and Water



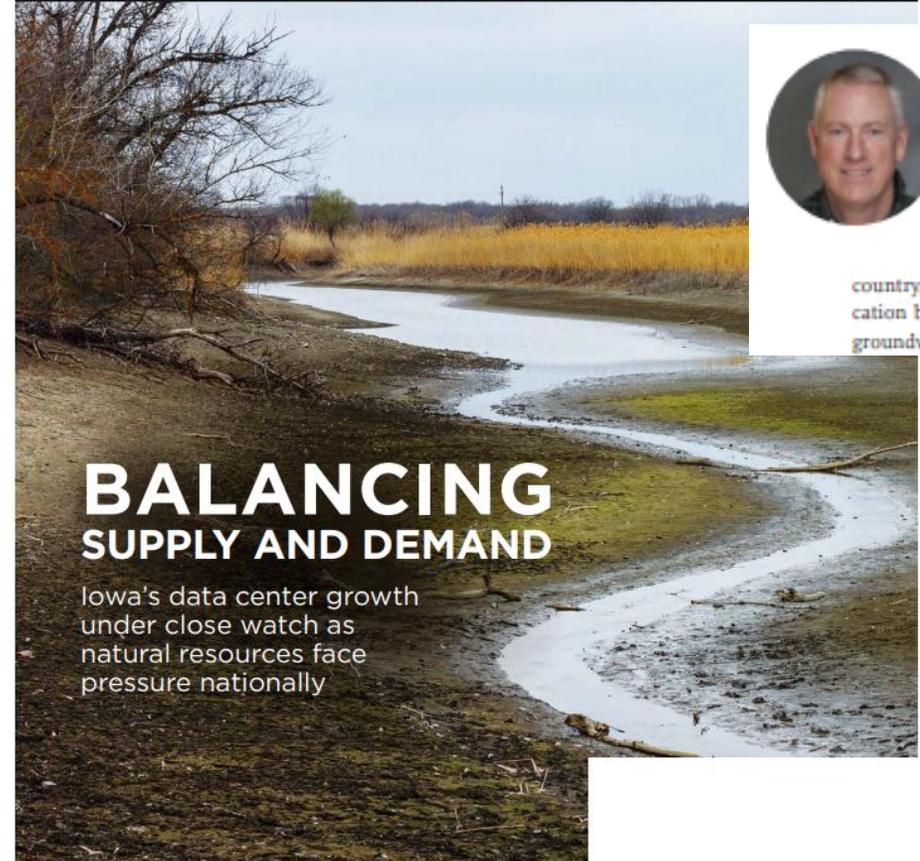
Des Moines Register article on data centers and water quantity



Panel at Iowa Water conference "Data centers and Iowa Water Future"

Business Record

NOVEMBER 28, 2025 Helping businesses do business better. Price: \$1.75



BALANCING SUPPLY AND DEMAND

Iowa's data center growth under close watch as natural resources face pressure nationally



In 2022, there were 2,701 data centers in the U.S., according to Statista.com. By March 2024, the number had nearly doubled to 5,381.

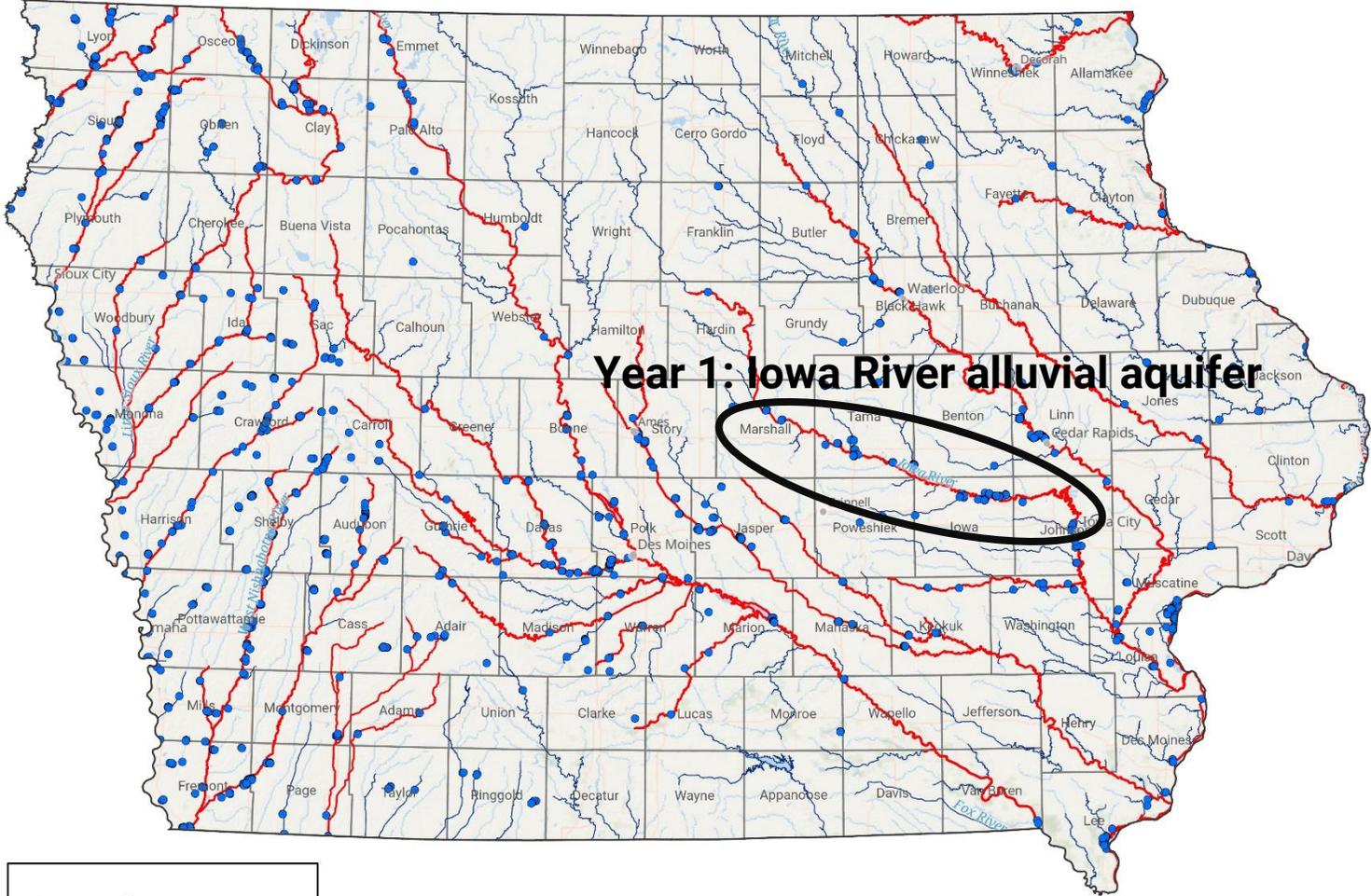
Data centers in Iowa are "not necessarily" choosing to locate in areas with abundant water supplies, said **Keith Schilling**, the state geologist and director of the Iowa Geological Survey, located at the University of Iowa.

"Our groundwater in Iowa, probably, likewise, around the country, is not evenly distributed," he said. "So you may have a great location because of power or urban areas or all these other reasons, but groundwater doesn't respect those boundaries."

"Data centers are not necessarily choosing to located in areas with abundant water supplies"

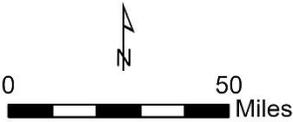
Alluvial Aquifers

More than 40 alluvial aquifer systems are heavily utilized in the state



Legend

- PWS Alluvial Well
- Minor Alluvial Aquifer
- Major Alluvial Aquifer

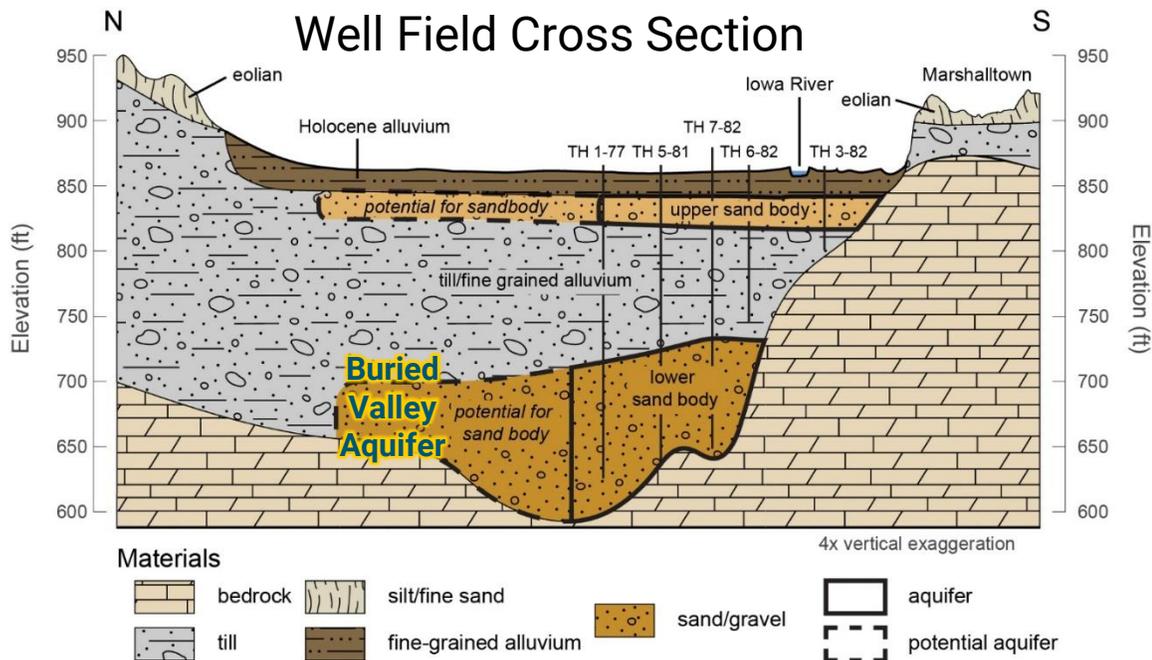
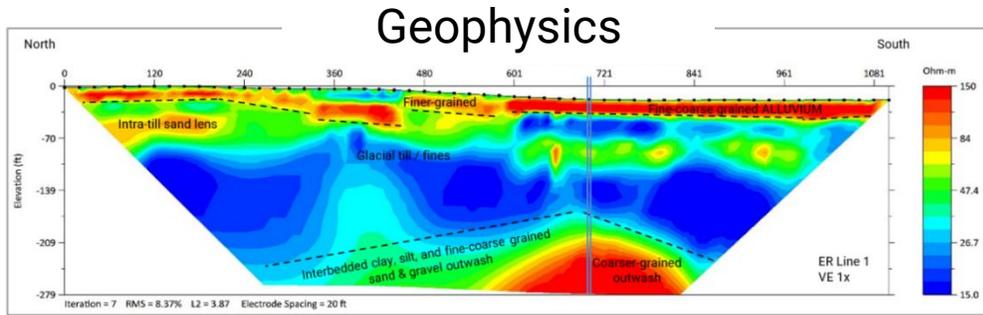


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Iowa Geological Survey

Esri, GEBCO, Garmin, NaturalVue, Iowa DNR, Esri, TomTom, Garmin, FAO, NOAA, USGS, EPA, NPS, USFWS



Water Source and Quantity Evaluation (Marshalltown example)



Water Balance Summary

➤ Inflows (Recharge) - Outflows (Discharge) = Δ storage

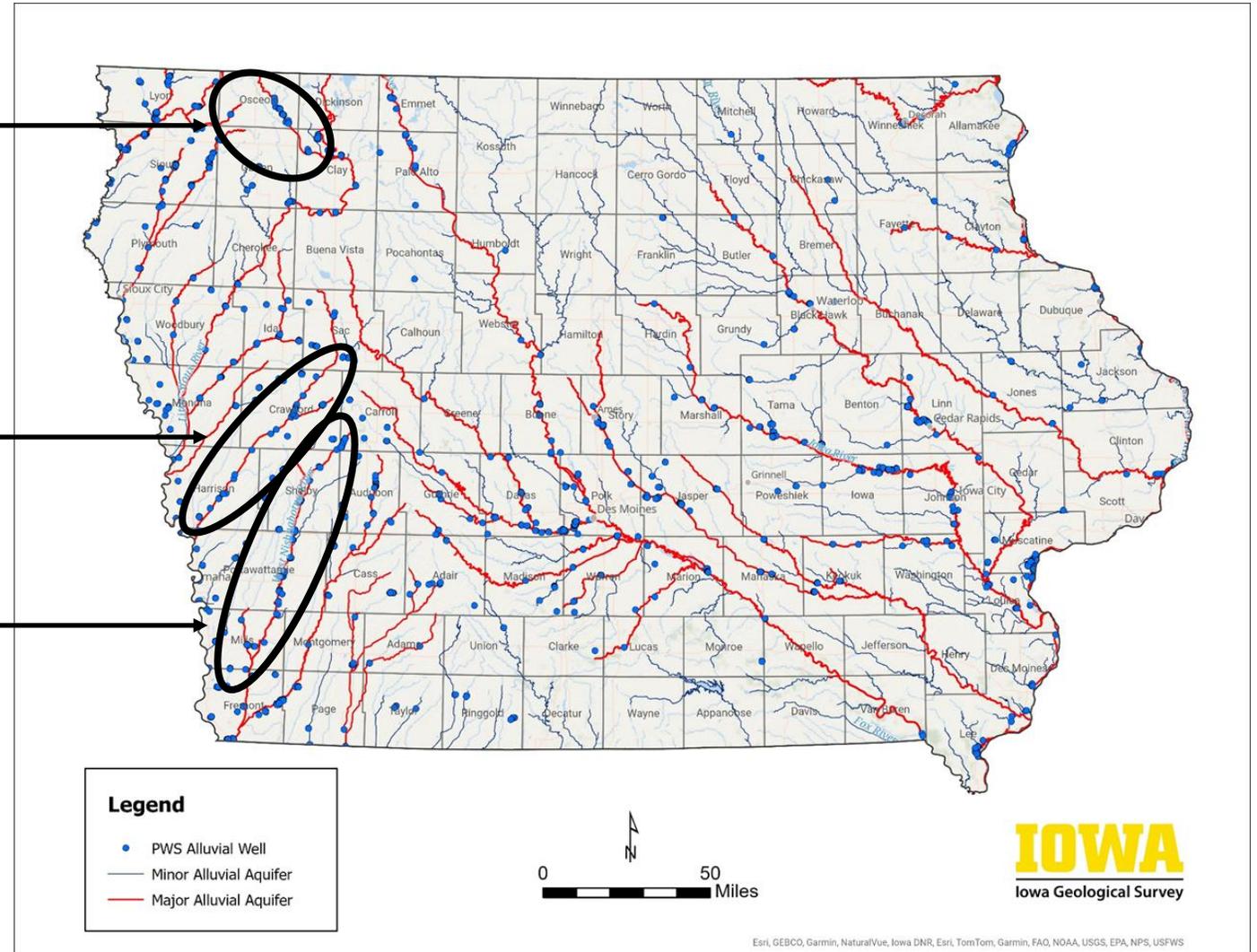
- Water quantity is not the yield-limiting factor
 - 188 Billion gallons in aquifer storage (Abundant)
 - 1.1 Billion gallons in annual water demand
- **Critically, thin aquifer – limited available drawdown**
- During drought, the water table can be 5-10 feet lower
- **Wells will be yield-limited by drawdown** due to a lower water level starting point and the thin nature of the aquifer
- Mapping the three-dimensional volume of our aquifers is critical for evaluating long-term sustainability!

Ongoing alluvial aquifer assessments

Ocheyedon River from headwaters to the Little Sioux River

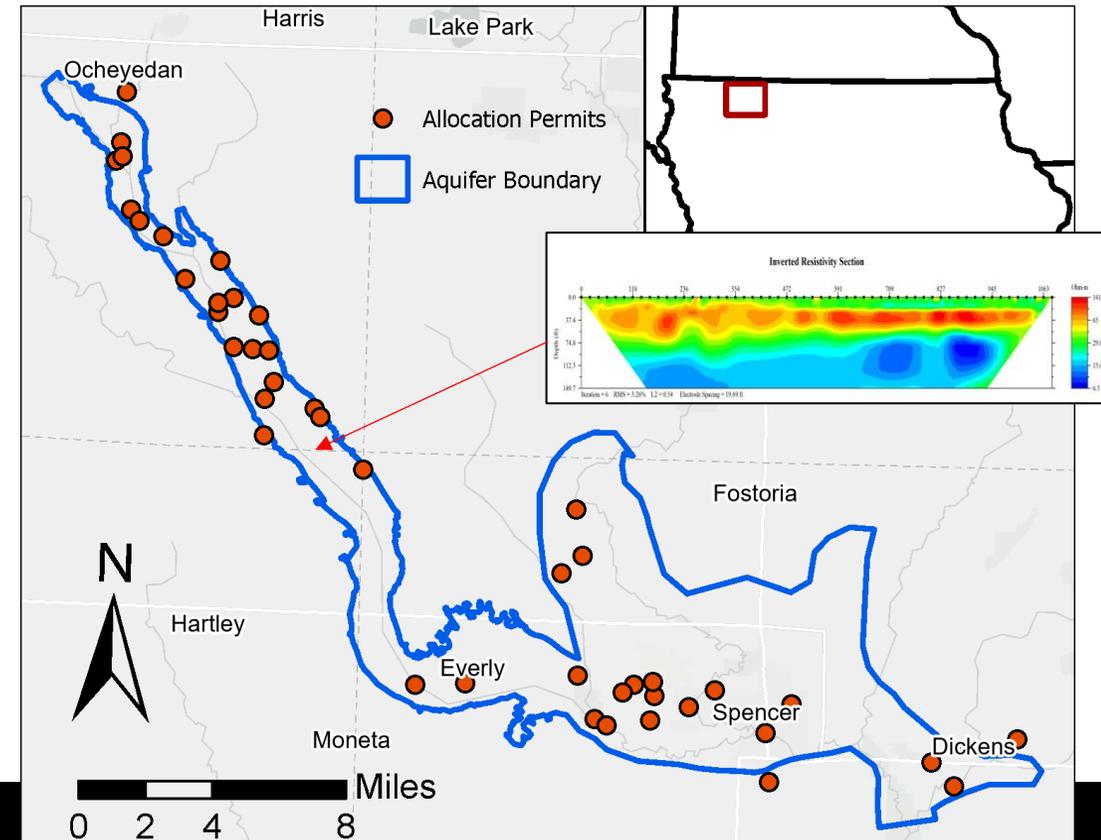
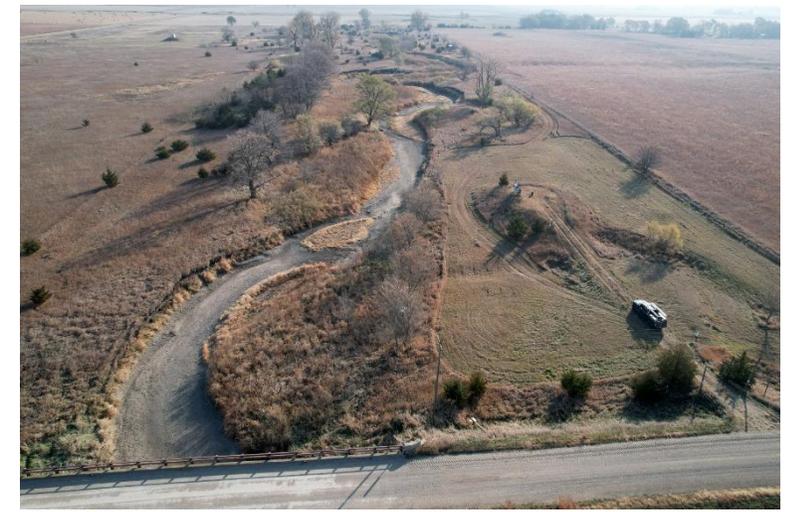
Boyer River from glacial margin to Missouri River

West Nishnabotna from glacial margin to Missouri River



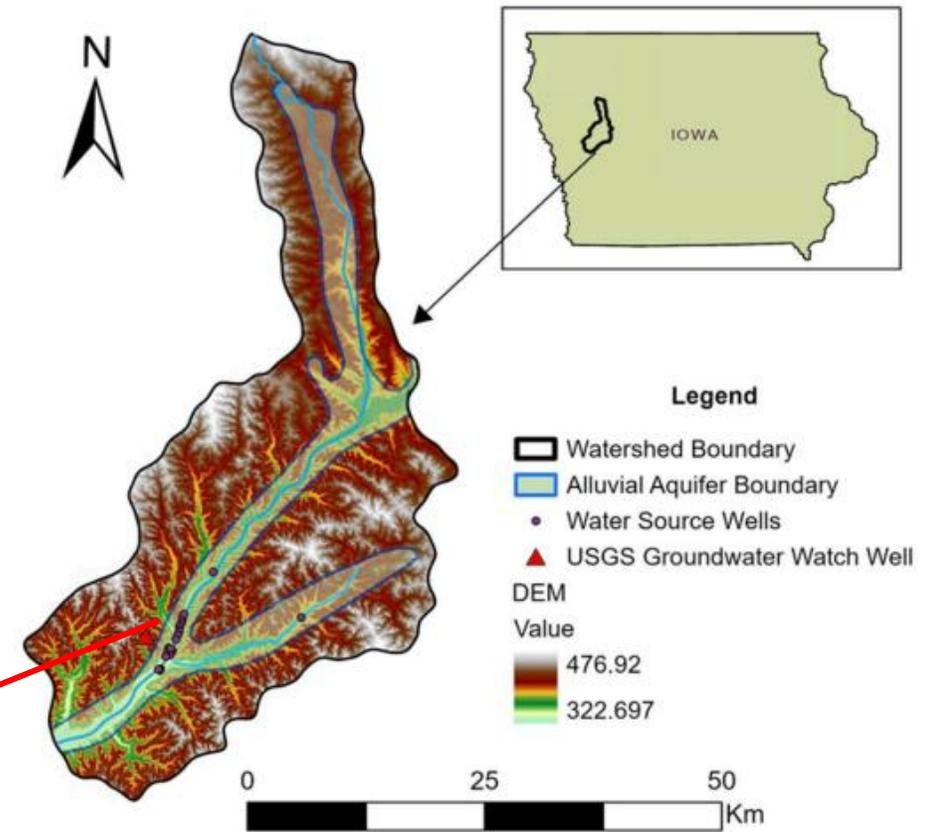
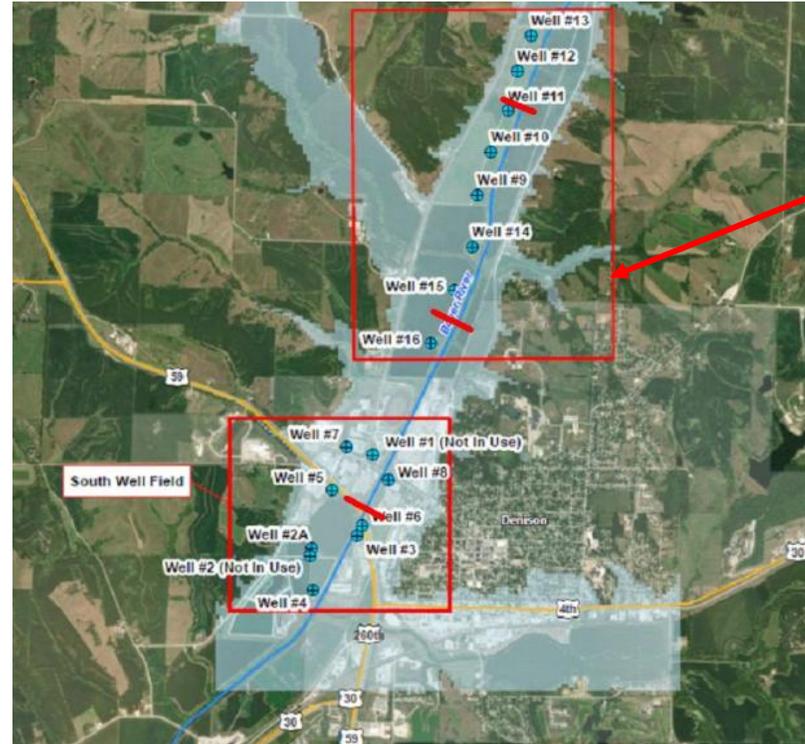
Ocheyedan River alluvial aquifer

- Buried valley filled with glacial sediment
 - Productive
 - Hydraulically connected to river
- Population served >25,000
- Major water source for livestock industry (>90%)
- > 7 billion gallons/year of usage allocated
- Deeper Dakota aquifer not reliable - inconsistent distribution and yield, declining water levels



Boyer River alluvial aquifer

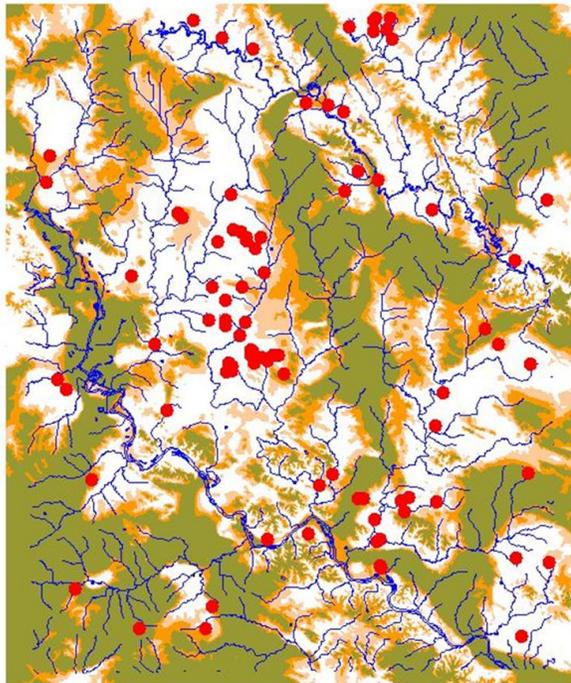
- Denison under water restrictions
- Population served ~8,000
- Shallow aquifer (25-60 ft thick) is vulnerable to droughts
- Resolve groundwater flow system and recharge (budget)
- Other vulnerable communities of Woodbine, Dunlap and Logan



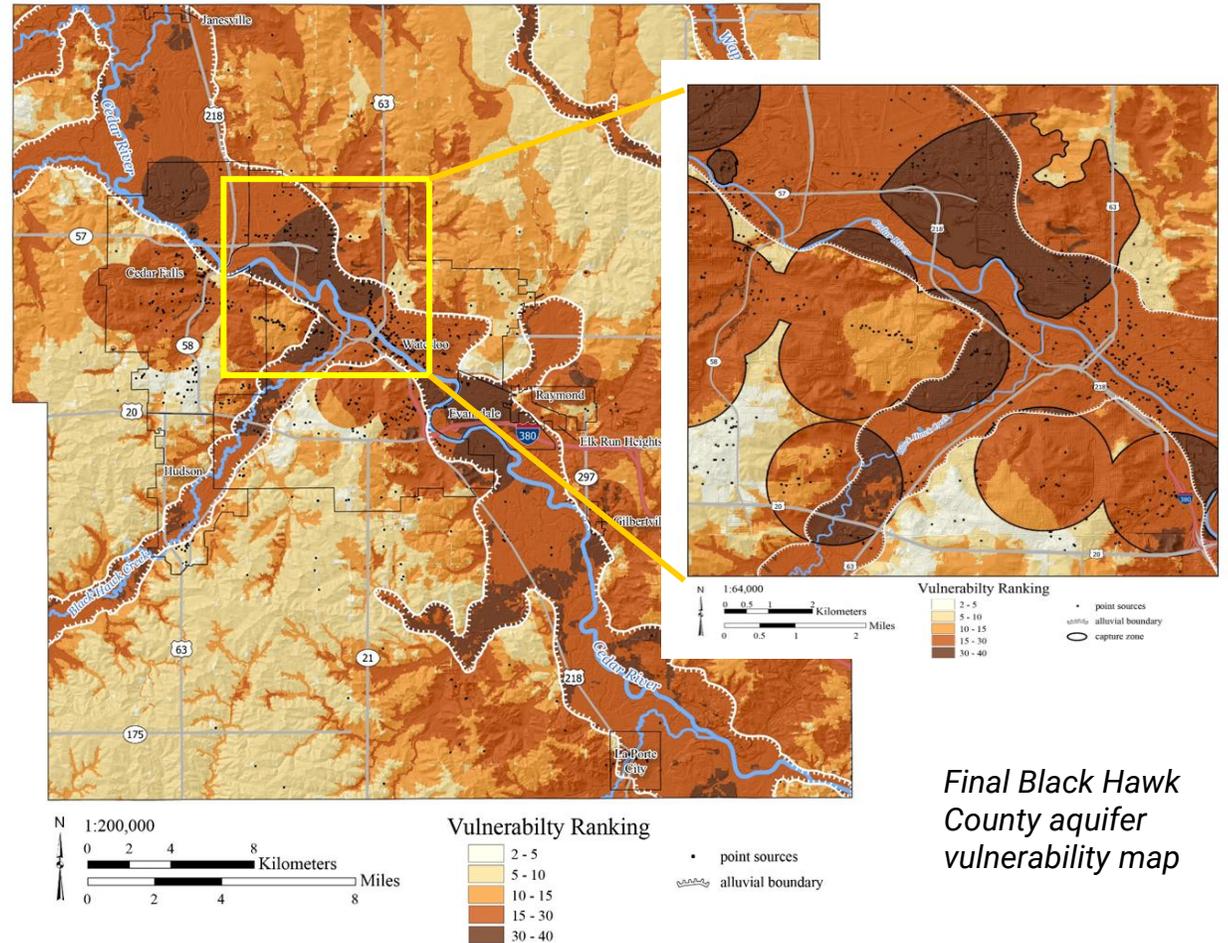
Combining field investigation and groundwater flow model for system

Groundwater Vulnerability Mapping

- Completed Black Hawk County
- Floyd County and Linn County in progress
- Lots of interest in these types of maps



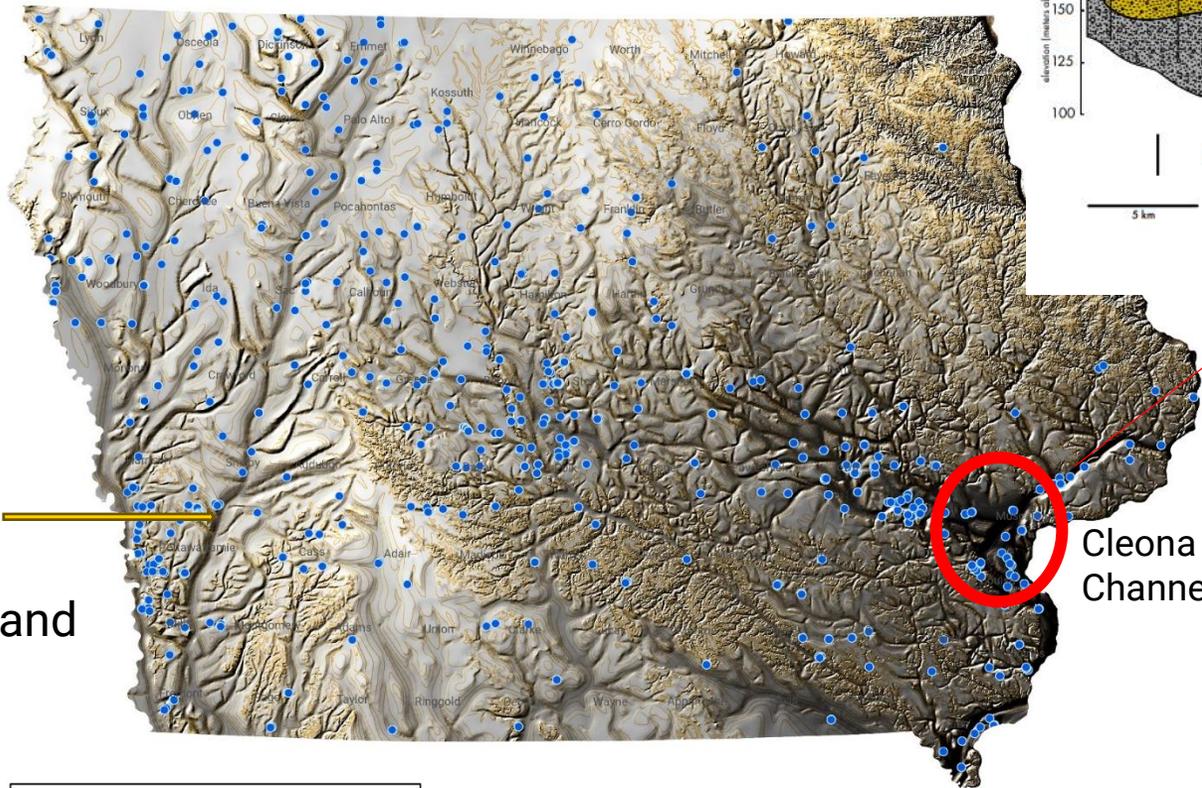
Early version of Linn County



Final Black Hawk County aquifer vulnerability map

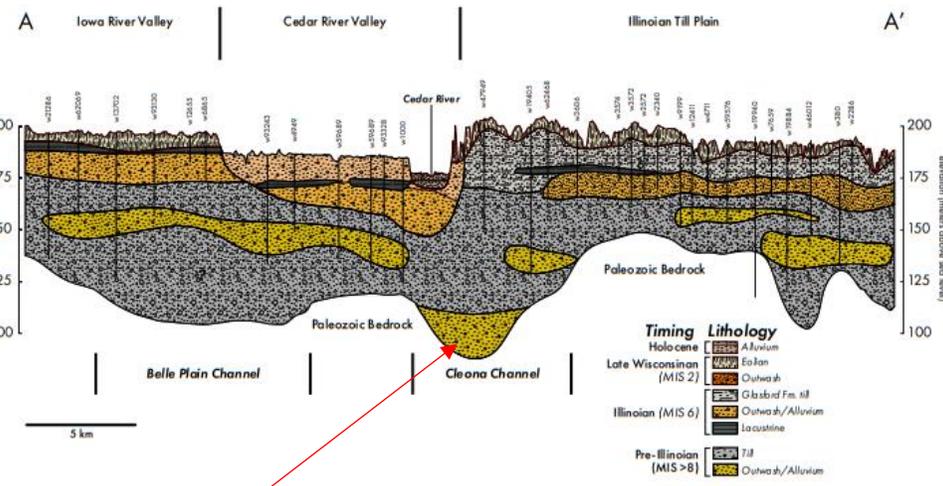
Buried Channel Aquifers

Massive water quantity potential in buried channel aquifers in Iowa – understudied and untapped



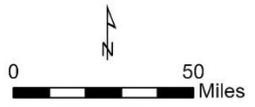
Fremont Channel

- >500 feet deep
- Unknown sand and gravel (aquifer) resources



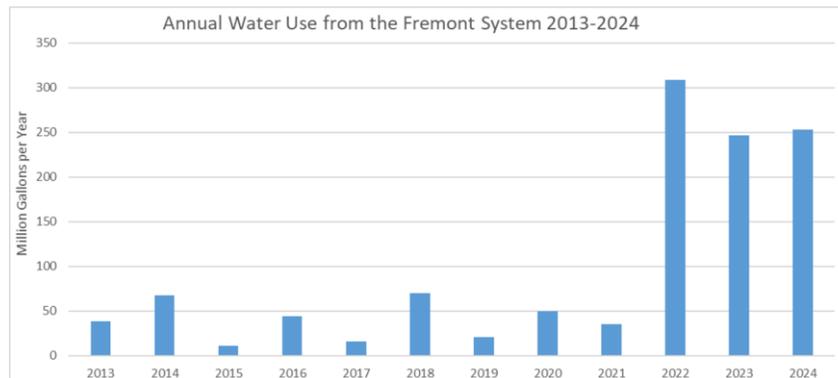
Legend

- Buried Valley Aquifer PWS Well
- Bedrock Surface Showing Buried Valleys



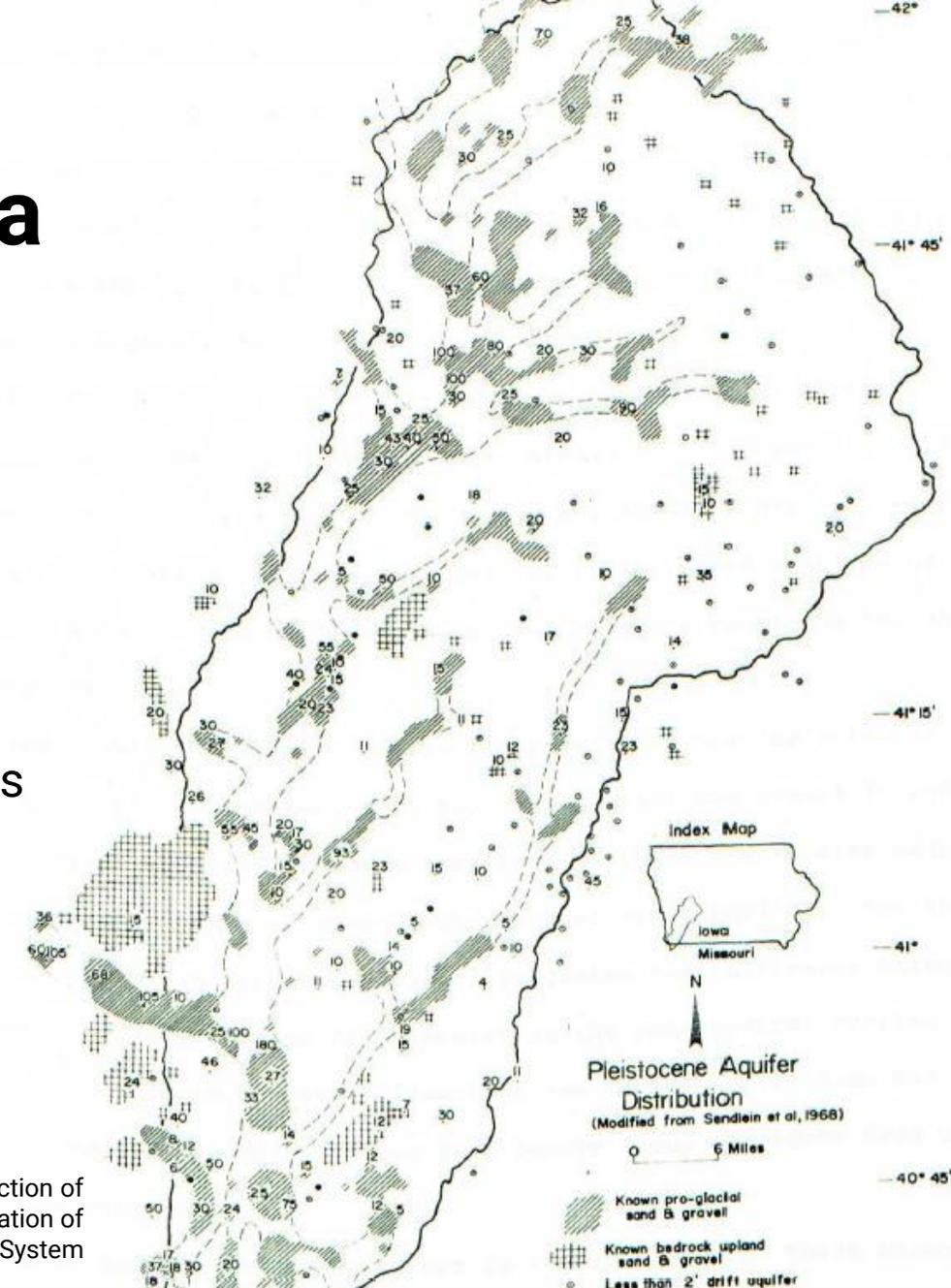
Concerns: Fremont Channel Aquifer System of Western Iowa

- Nishnabotna surficial aquifers are not sufficient for current demands; very drought sensitive
- Deeper Fremont System is poorly understood – more risk for communities that often cannot afford the efforts
- Implementing a new PWS well requires a successful test well and final well
- “Patchy” aquifer distribution makes Fremont System hit-or-miss



Increase in Water Use from Fremont Channel System

Image: Reproduction of original interpretation of Fremont System



Large Scale Investment Needed for Fremont System: Geophysical Mapping and Deep Drilling Program

- Can't drill our way out of this - individual wells are localized data points only
- Propose seismic reflection for large-scale imaging of subsurface geometry
- Reprocess on survey to gain resolution at different depths; address several questions in one excursion
- Supplemental drilling program to confirm and validate seismic mapping results

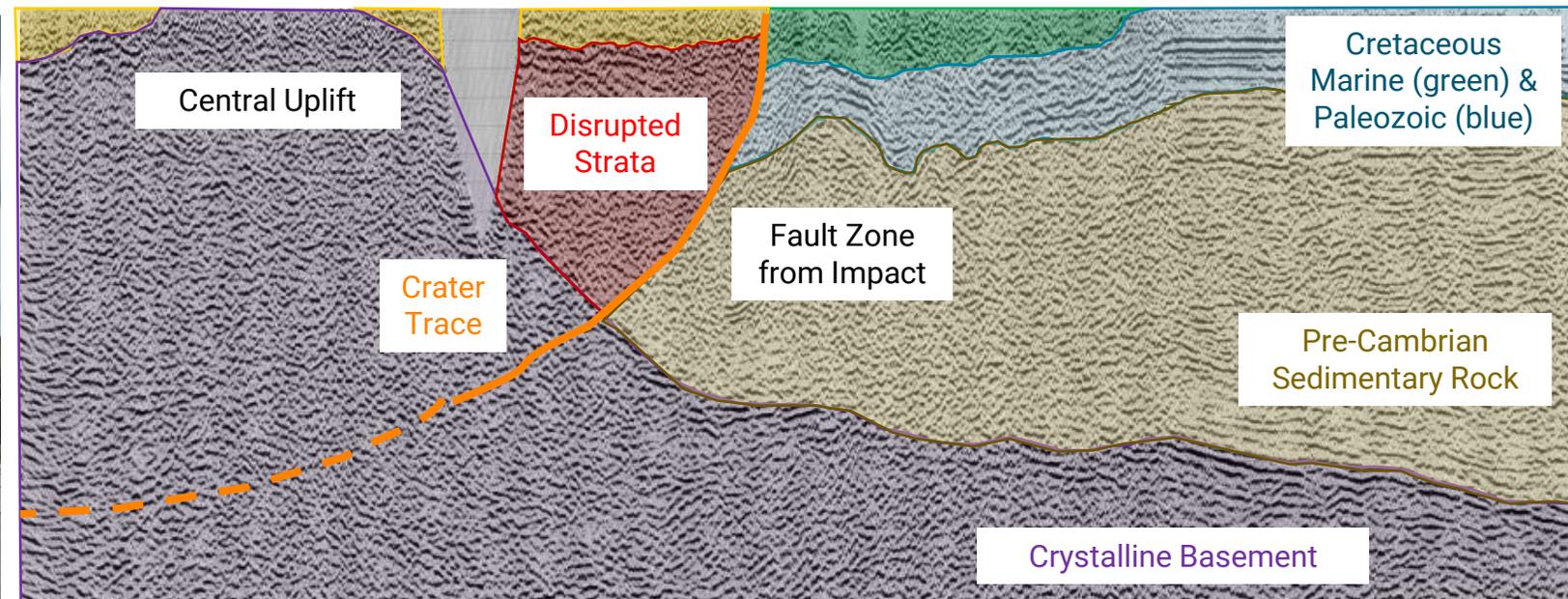
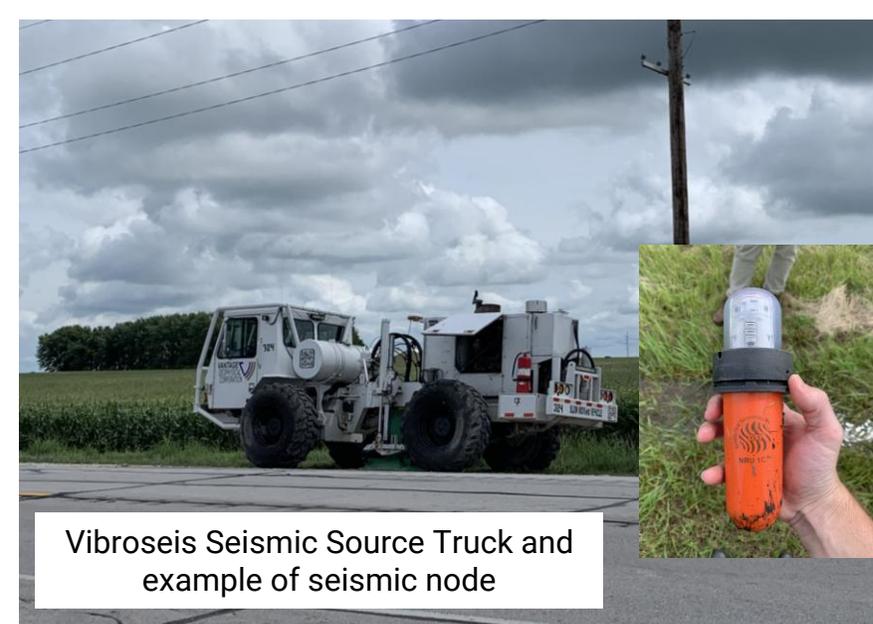
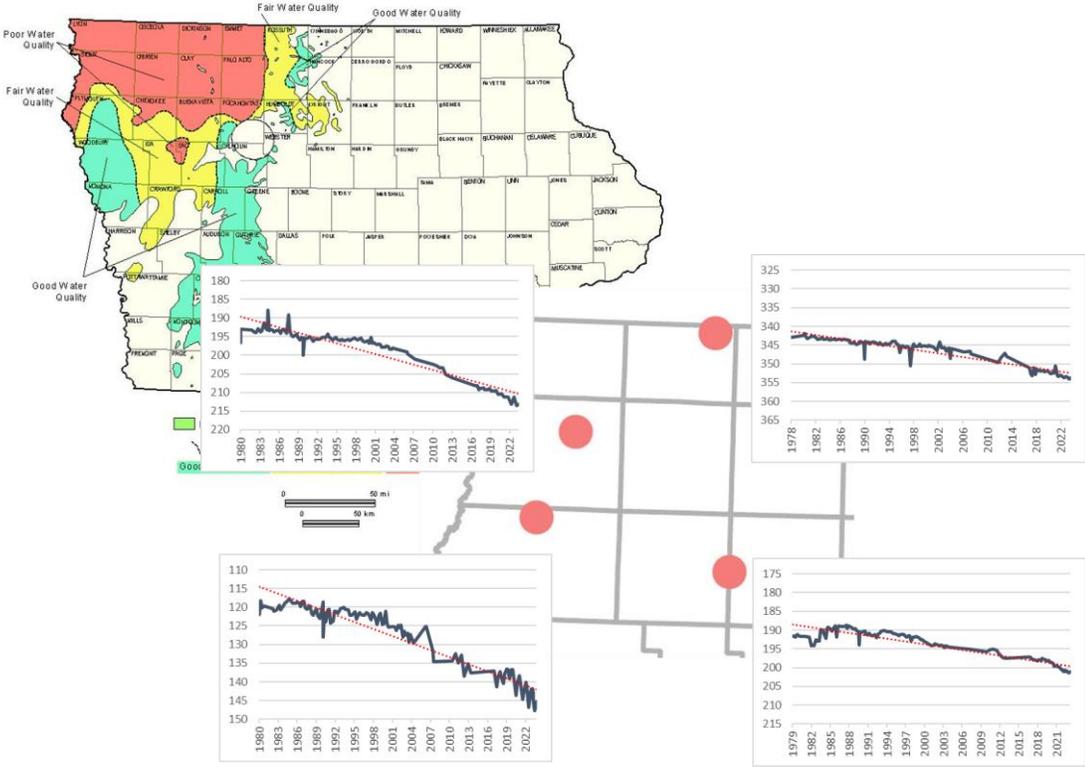


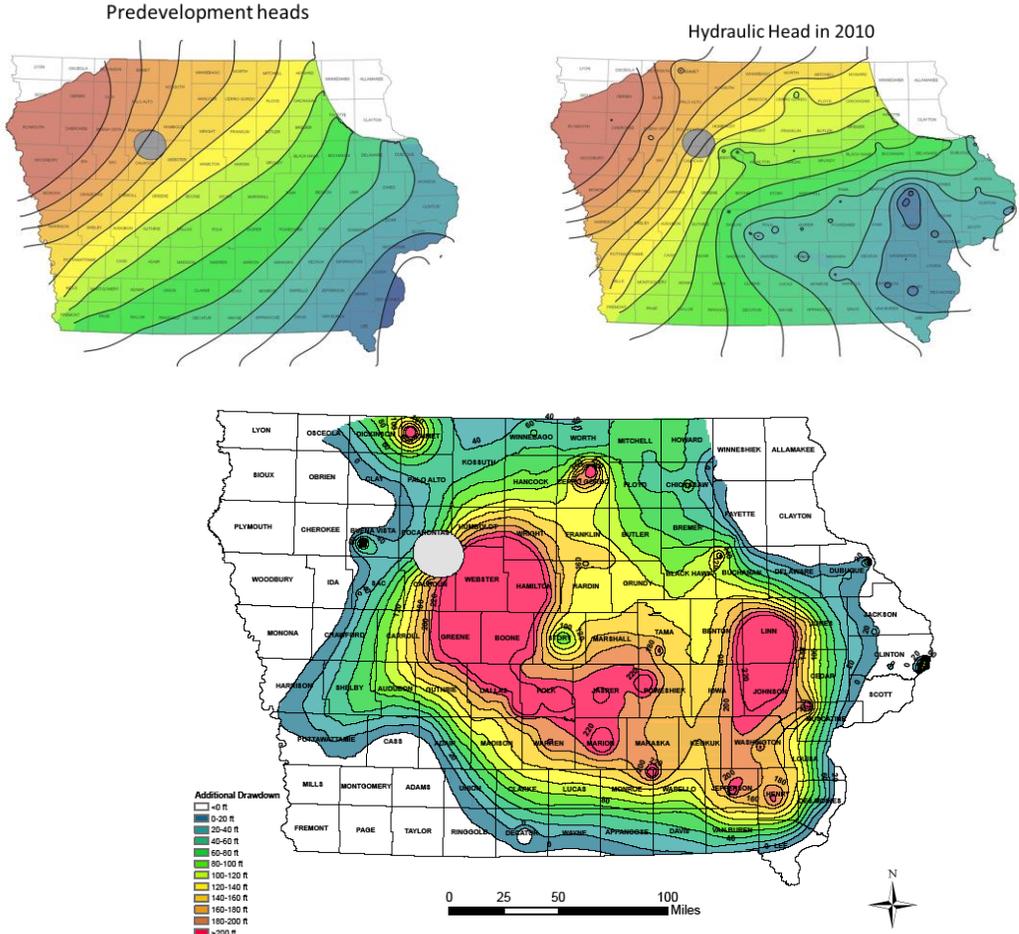
Image: Example of a 2D seismic line over Manson Impact Structure

Emerging issue – Groundwater level trends

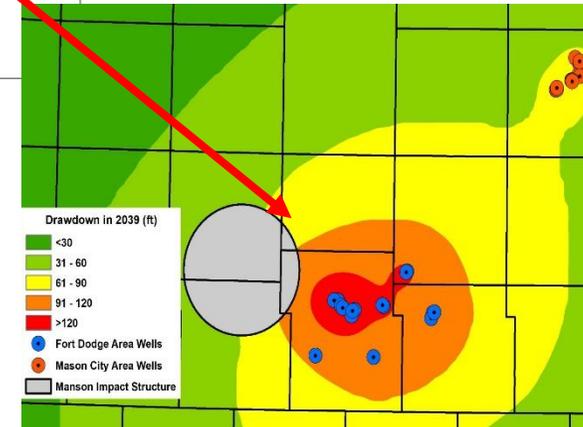
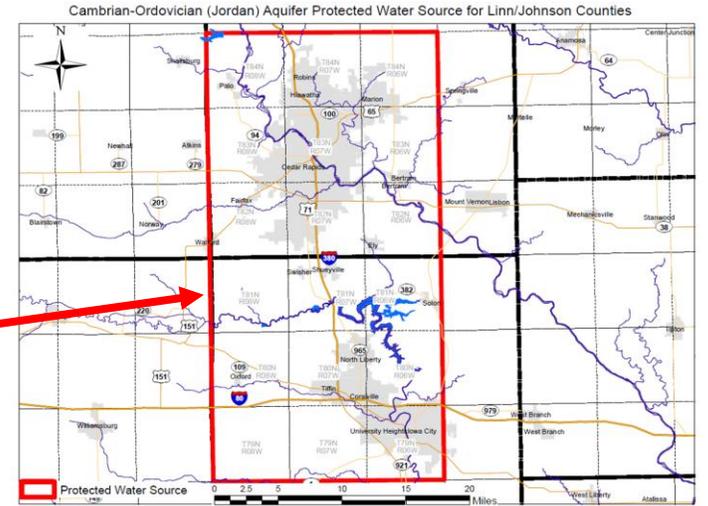
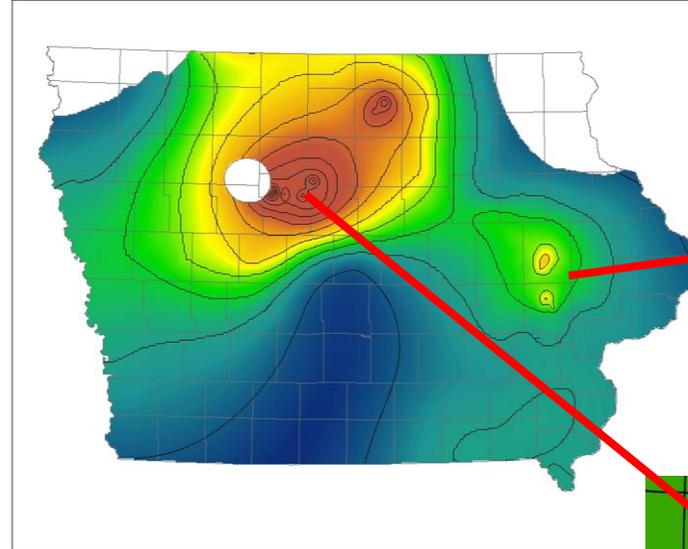
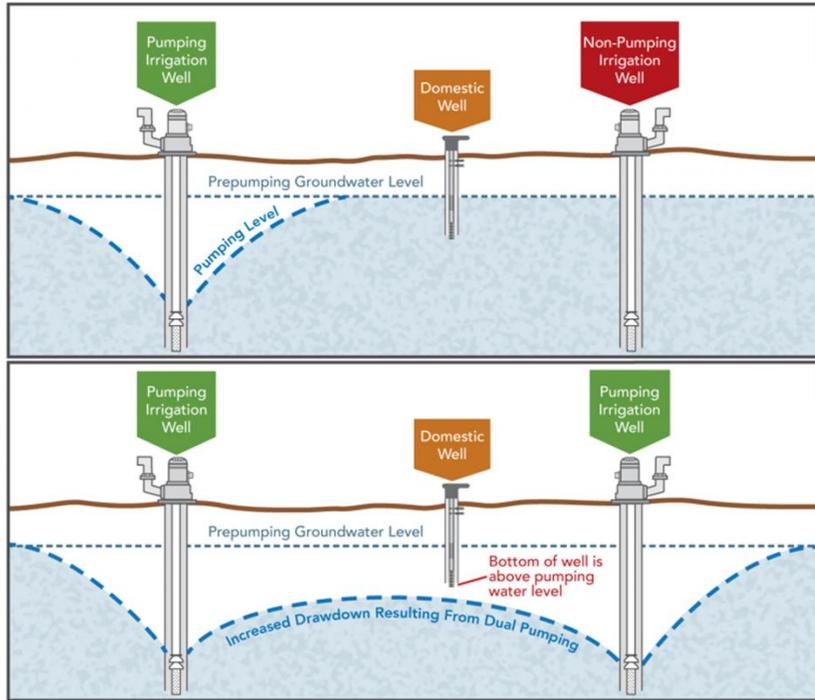
Dakota Aquifer Trends



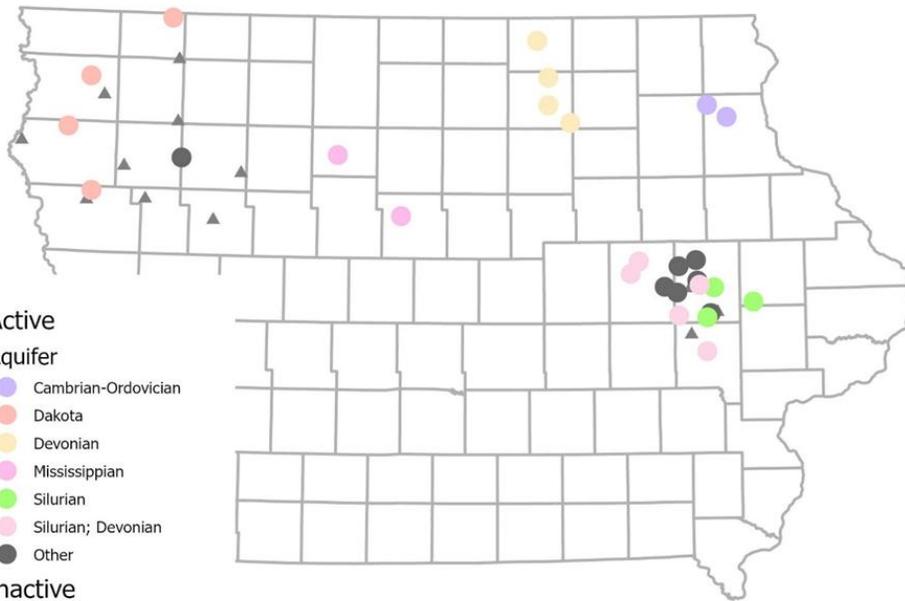
Cambrian-Ordovician (Jordan) Aquifer Trends



Well Interference Concerns

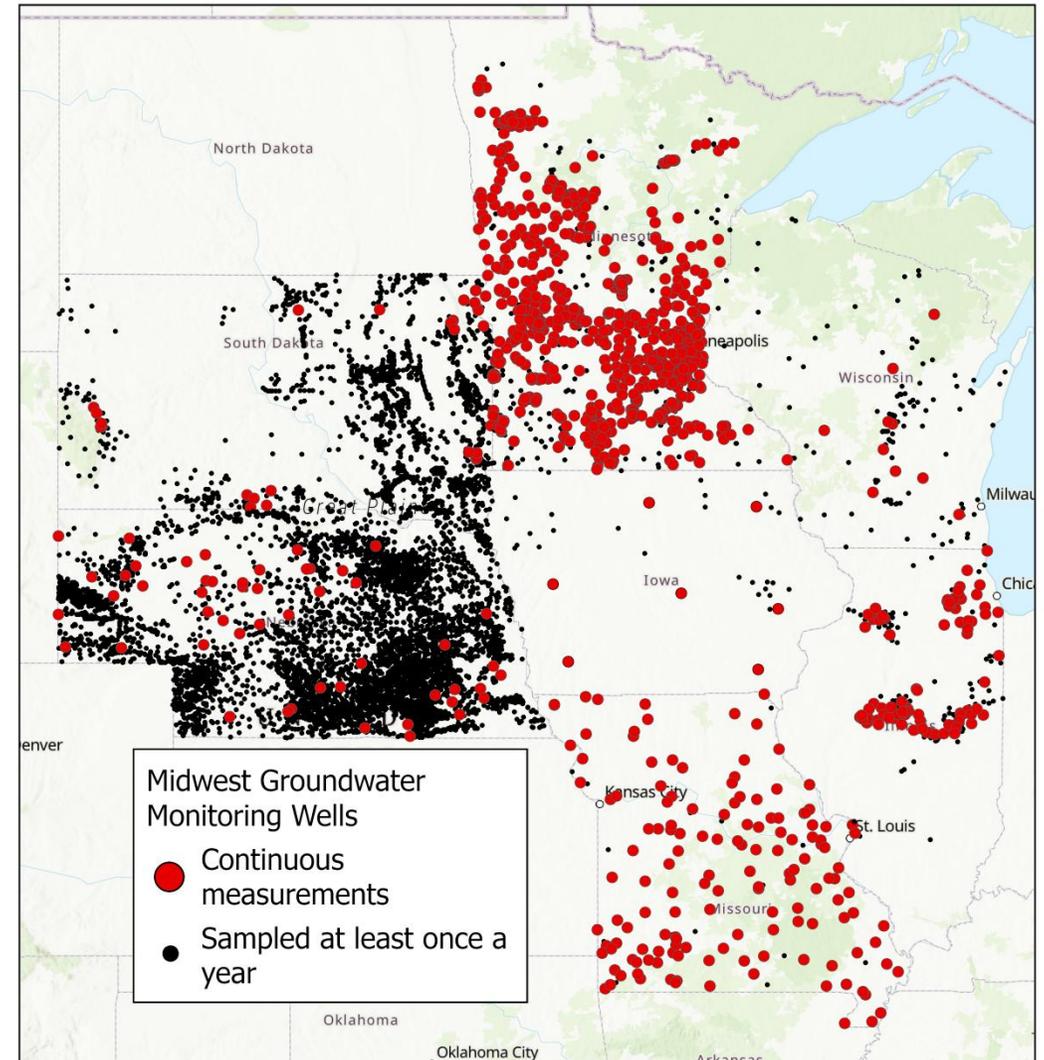


Iowa Groundwater Level Monitoring Network



State	Continuous monitoring wells	Non-continuous monitoring wells	Total monitoring wells
Iowa	7	42	49
Illinois	103	204	307
Minnesota	1091	357	1448
Missouri	149	24	173
Nebraska*	62	5207	5269
South Dakota*	23	1527	1550
Wisconsin	11	141	152

*Majority of wells tied to water rights monitoring



Going forward at IGS – incremental and one-time major investment

Increase in recurring funding to IGS

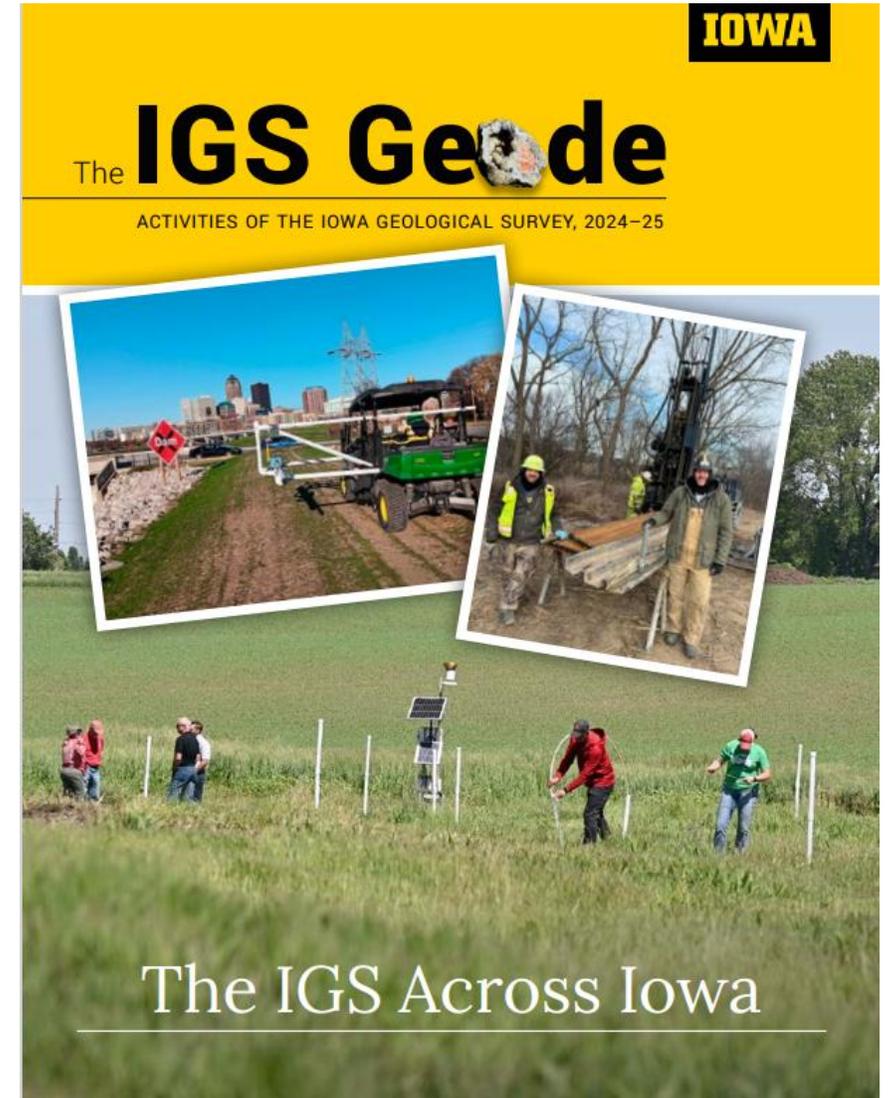
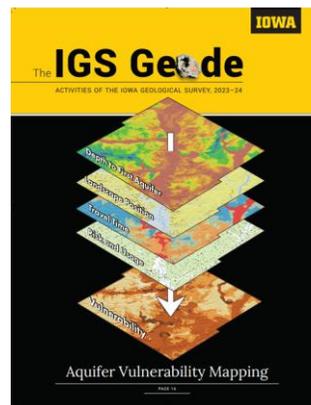
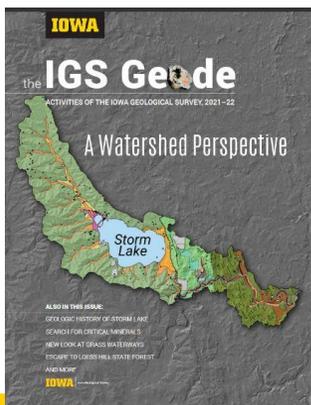
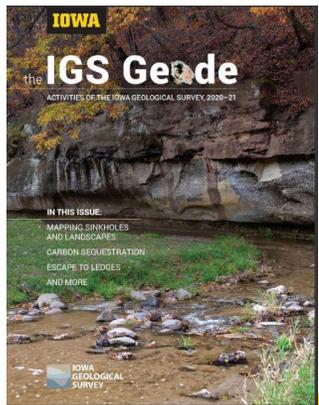
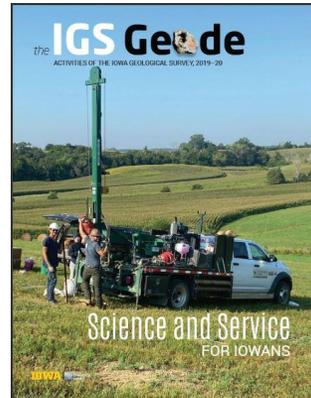
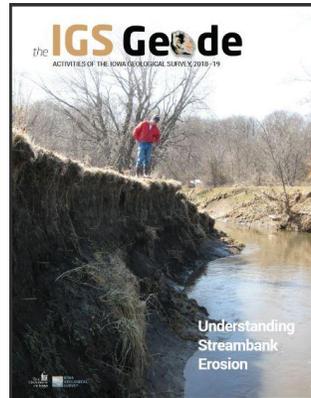
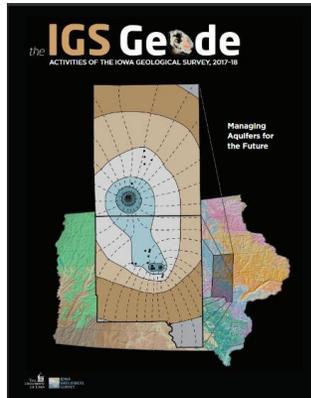
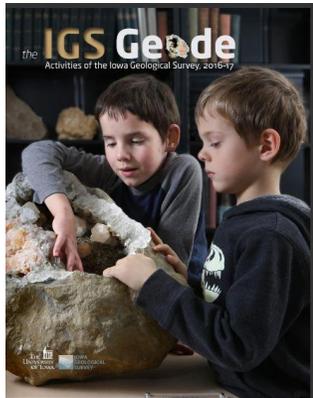
- Expand pace and scale of groundwater mapping across Iowa (\$250K/yr)
- Develop county- and regional-scale groundwater vulnerability maps (\$250K/yr)
- Hydrogen, critical minerals and other energy-related issues are coming to Iowa. IGS is a bridge between industry and state interests. Support a new energy and critical minerals position at IGS (\$300K/yr)

One-time funding of \$4M over four years

- Investigate **Fremont Channel** in western Iowa as a potential groundwater source (\$500K year 1-2 for seismic; \$500K year 2-3 targeted drilling)
- Expand bedrock monitoring well network to evaluate static water levels and future trends (\$500K year for four years)
- Develop comprehensive state groundwater plan (\$500K for two years)

Geode Annual Report

- Began in 2016-17 with new State Geologist appointment
- Annual issues highlight IGS activities



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