

Iowa Geological Survey

Keith Schilling, Ph.D.
State Geologist

THE UNIVERSITY OF IOWA

IHR

IOWA GEOLOGICAL SURVEY

Iowa Geological Survey - Who we are...

Some Details:

With the state:
University of Iowa
Iowa City, IA

Within the University:
IHR Hydrosience & Engineering
College of Engineering

State Geologist:
Keith Schilling, Ph.D.

Staff:
10 geologists and hydrogeologists
1 administrative support

University of Iowa campus
Trowbridge Hall

University of Iowa
Oakdale Research Park

IGS

Our Mission:
"To collect, deposit, and interpret geologic and hydrogeologic data, to conduct foundational research, and to provide Iowans with the knowledge needed to effectively manage our natural resources for long-term sustainability and economic development."

IGS history and timeline:

- Established in 1892 – celebrating our 127th anniversary this year!
- 1892-1986 – independent agency reported directly to Governor
- 1986-2014 – moved to Iowa DNR as Bureau and later dropped to section level
- 2014 – moved oversight of IGS to University of Iowa, College of Engineering, IHR Hydrosience and Engineering. Funding provided by IDNR through contract
- 2018- Code of Iowa changed to recognize IGS as part of U. Iowa. Funding appropriated directly from legislature, State Geologist position moved to U. Iowa.

1892 → ~1960-1990 1990's - 2016 2018-current

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Geology and Mapping

Surficial map of Scott County

Field photos showing geological features and mapping equipment.

Sinkhole Mapping

IGS, IDOT, and DNR sinkhole and karst potential mapping
Worth, Mitchell, Cerro Gordo, and Floyd counties

Diagrams illustrating sinkhole formation: initial karsting, karst expansion, and storm aquifer water into karst.

Iowa Geological Survey – Water Quantity Projects

Water Supply Modeling to help water users in the area maximize and manage their long-term water supply from the Jordan aquifer


Linn/Johnson Counties
Ft Dodge/Webster City region
Des Moines Metro area

"The model has allowed the city to maximize water production while minimizing the impact on the aquifer. It's been a win-win for the city and the other area water users."

Grey Metternich
North Liberty Water Manager

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Iowa Geological Survey – Water Quantity Projects




Well field expansion and drought strategies

Goal: Help communities increase water production and manage their water supply


Clients: Rock Valley Rural Water, Osceola County Rural Water, Rural Water System #1, City of Sioux Center, Iowa Lakes Rural Water, City of Harlan, City of Shenandoah, City of Iowa Falls, City of Marion, City of Fairfax, City of North Liberty



Low-head Dam/Rock Riffle used to store both surface and ground water at Sioux Center




Geophysics was used to help locate future well locations at the City of Harlan



Watershed analysis

- Assessment of environmental performance of practices
- Characterization of soils, hydrology, and surface/groundwater flow
- Watershed assessment and modeling

Observed Processes



Developed new nutrient reduction practice: Multi-purpose oxbows


- Dual benefits for fish and wildlife and water quality
- Engineered to receive tile inputs to achieve maximum N reductions
- 42% nitrate reduction

IGS Data Portal

Providing data access to the public with web applications

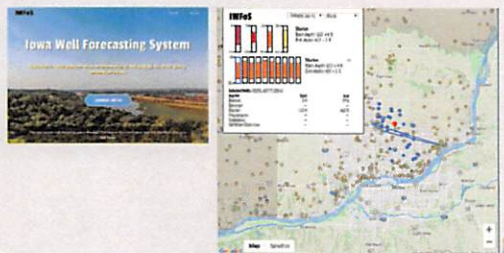

- GeoCore – Photographs of the IGS' Rock Library core collection
- GeoLab – Laboratory results of various geological materials
- GeoSam – Information on wells, rock exposure, & quarry
- Publications – Contains a list of all IGS publications
- PumpTest – Information on hydraulic testing of aquifers

<https://www.ihr.uiowa.edu/igs/iowa-geological-survey-data-portal/>



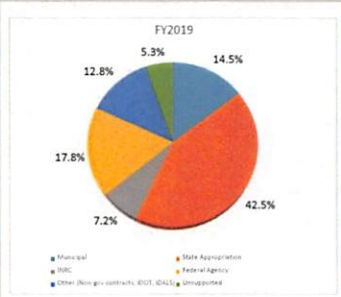
The Next Step

Predicting aquifers and groundwater quality

What is the budget for IGS?

- Total operating costs ~1.6 M
- We receive an appropriation from the legislature for \$695,000
- We leverage some state dollars to obtain matching funds from the USGS
- Remainder made up with outside contracts for projects



FY2019

Source	Percentage
State Appropriation	42.5%
Other	17.8%
Federal Agency	12.8%
Municipal	7.2%
IHR	5.3%

IGS logo

Who do we work with? *Just a partial list...*

IGS Outreach Activities

Vision for IGS

- State supported vs contract funded?
- Half of current operating budget funded by contracted projects and services

New state-wide initiatives require an increase in appropriation

- Developing a county groundwater atlas program
- Delineating source water protection zones for vulnerable aquifer systems
- Evaluating groundwater budgets and well interference issues for local and regional aquifers
- Assessing statewide and county-level hazards, including sinkholes, mining subsidence, groundwater flooding, etc.
- Characterizing hydrogeology of surficial materials, including permeability, recharge and groundwater travel times
- Finding new groundwater sources for municipal and industrial use
- Assessing groundwater quality and vulnerabilities in Iowa's aquifers