Barton STEM

Dr. Jennifer Bernatis

Executive Director Health, Humanities, and Science

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STEM Club Events

- Approximately a dozen members, all but one graduated
- Meetings/activities often include community businesses coming in to provide talks
  - High Performance Crop Research
  - Animal Medical Center
  - Great Bend Zoo
- Fundraisers through local business
- Working with a Great Bend Rec Center event on October 18
- Local Meteorologists for a panel - hopefully

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STEM LSAMP

- Louis Stokes Alliances for Minority Participation
- NSF grant, we are a subaward from KSU
- Recent activities
  - Weather stations
  - 3D printers
  - Drones
- Past activities
  - Travel to scientific meetings for students

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STEM GEOPaths

- KSU grant
  - Water quality project testing area wells
- Provides Barton students with $3000 stipends
  - Designed for students with an interest in hydrology and geology
  - Limited spots are available
  - Last year we had 7 spots, all filled
    - Braden Boswell, Quentin Bickham, Keith Dunn, Daniel Hammeke, Katherine Bruning, April Hough, Lakyn Fischer
  - Five spots filled this year, technically all spots
- Hosted the Community Presentation session

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Kansas Groundwater Geopaths

About the Project

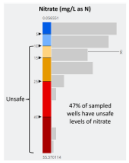
Kansas Groundwater Geopaths is a 3-year NSF-supported project that introduces students to environmental geoscience and provides them with career-relevant training. Results they collect can in-turn help private well owners in south-central Kansas learn about the quality of their groundwater.

Results shown here include data from the first year of the project (2023) along with data collected previously (2020-2021).

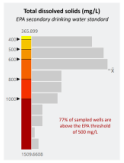
Benefits of participating

- $3,000 scholarship
- Career relevant training
- Career and transfer advising
- Interdisciplinary research experience
- An opportunity to help people learn about their water

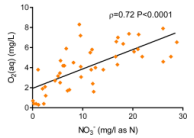
Groundwater Quality Analysis

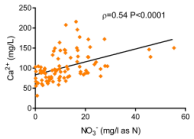


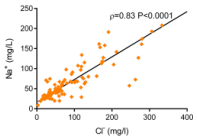
Nearly half of the samples collected have nitrate (NO_3^-) content > EPA standards for safe drinking water (10 mg/L as N).



Total dissolved solids (TDS) > secondary EPA standards (500 mg/L) for nearly 80% of the samples.







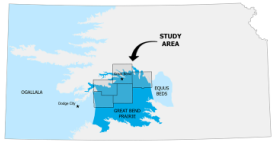
- NO_3^- levels tended be lower in groundwater with less dissolved oxygen (O_2(aq)) reflecting aquifer microbial reactions
- NO_3^- levels tended to be higher in water with more calcium (Ca^{2+}), possibly from lime inputs to crop soil and/or leaching effects
- Among other analytes, sodium (Na^+) and chloride (Cl^-) were strongly correlated in response to mixing between deep salty water and fresh water in the aquifer

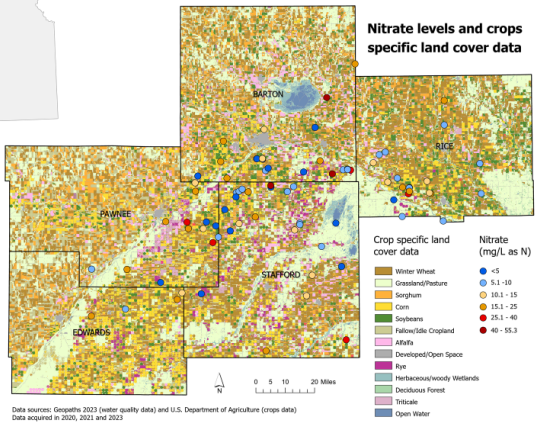
For more information

To learn more, scan the QR code and/or contact any of the project leaders:

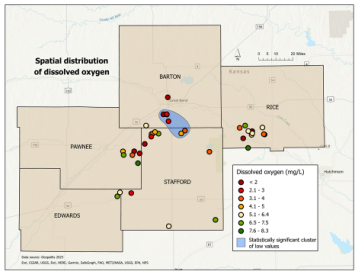
- **K-State:** Matthew Kirk (mfkirk@ksu.edu), Helene Avocat (havocat@ksu.edu)
- **Barton CC:** Amanda Alliband (allibanda@bartonccc.edu),
- Rick Sloan (sloanr@bartonccc.edu)
- **Dodge City CC:** Sherry Rogers (srogers@dc3.edu)

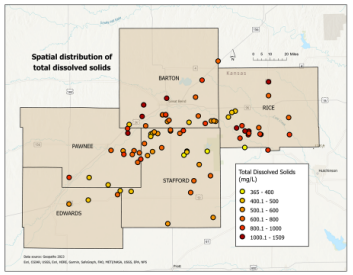
Geospatial Analysis





- Wells producing low NO_3^- (< 5 mg/L) groundwater tended to have a slightly higher proportion of grassland/pasture and herbaceous wetlands in their vicinity
- A significant spatial cluster of low O_2(aq) occurred in groundwater from wells located near the Stafford Co.- Barton Co. boundary





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STEM Noyce/CREST

- NSF grant, subaward through FHSU
  - Robert Noyce Scholarship – Certified Rural Enhanced STEM Teachers
- STEM majors who plan on double majoring in education
- Students will have STEM related educational experiences
- Students will help with hosting events
- We provide a small student stipend ($500 - $1000) for this effort

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STEM Great Bend Schools

- Wild Robot Great Bend Elementary Schools
- Every Friday for 6 weeks in Jan/Feb
- Met with every grade at each school
  - K- 6th
  - About 1,300 students
- Different types of activities depending on the grades and leader
  - i.e. coding, drone and RC, body movement, interpretation

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STEM Support

- Senior Day
- Junior Day
- Career Experience Event
- Haunting on the Hill
- Outreach events on campus and in community
  - For example:
    - STEM Buddies with Ellinwood Elementary School
    - Earth Day at the Zoo

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Thank you
and
Questions

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