Geospatial technologies in the undergraduate curriculum: Course development to research

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Today's chat

- Background to Mayville State University (MaSU)
- Trace the development of our geospatial technologies learning progression (i.e., LP)
- Achievements to date
- Expectations and future directions

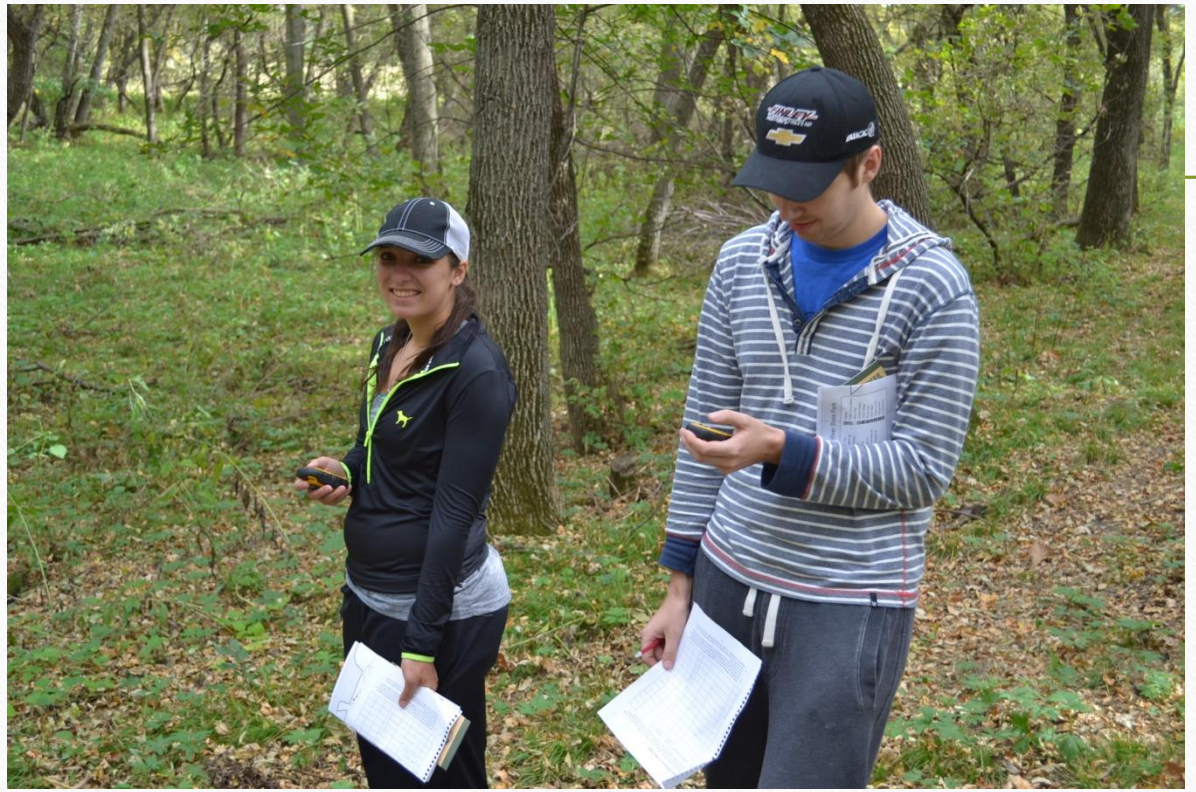
Mayville State University

- Established in 1889
- Between Grand Forks and Fargo
- Smallest university in NDUS system (<500)
- Teaching college

Old Main, MaSU

Getting the ball rolling…

- 2013: No institutional memory of GISciences
- Students with limited understanding of basic map reading and geospatial concepts/applications/technologies
- Goal to develop learning progression from near zero to TBD!
  - GoogleEarth to remotely-sensed images to ESRI StoryMaps to research
- 2014: Funding for GPS receivers (North Dakota STEM Education)



MaSU students during GPS exercises

Phase 2

- 2014: Introduction to GIS (social science education majors)
- 2015: ND Space Grant Summer Faculty Fellowship
  - Introduction to GIS for majors in Science/Science Education
  - Adapted case studies and examples specific to natural sciences
  - Included research trip to state park
- Immediate aim to create a group of students across natural and social sciences with working knowledge of GIS for future K-12 teaching/research

Mapping plant diffusion

Phase 3

- Links to the nature of geography
- Bridge disciplines, blend the natural and social sciences with GIS, and teach qualitative research methods at an undergraduate level

If "*North Dakota feeds the world*"…

- 2015: NASA-relevant Research Focus Areas Fellowship (with S. Sletten)
  - "Relating Interpretations with Practice: A GIS-centered Analysis of Farmer Opinion on Climate Change in the Red River Valley of North Dakota, USA"

Phase 4

- Compiled a research team
  - Application
  - Interview process
- Total of 4 undergraduate students
- Assisted students with IRB training

Phase 5

- Explored definitions of climate change and formulated opinions
- Collecting literature from academic and popular presses
- Crash course in interviewing methods
  - Assist in the design of the interview schedule
  - Dry runs and loops

Let the fun begin

- 3/2016: First 2 interviews
  - Collaborative listen-back
  - Feedback discussions on process and data collected
- Currently at 6 (with goal of 15)
  - Students setting up own appointments
  - Students also responsible for transcription

Adding the geospatial

- Context will partially depend on quality/nature of qualitative data
- Limitations of GIS capabilities
  - Some guided analyses
- Aerial photography/remotely-sensed images
- Students finding climate-related data sets
- Possible weighted modeling
- Situate qualitative data and identify spatial relationships

Summary

- MaSU now has a geospatial technologies learning progression
  - **All** MaSU students work with remotely-sensed images and GoogleEarth
  - Employing these technologies to explore real-world issues
  - LP includes options for more advanced experiences in geospatial technologies

Summary

- Interviews with farmers have begun and students working with climate data
- Results to follow
- Goals of this research project
  - Capstone projects, regional conference presentations, undergraduate publications???
  - Peer reviewed process-orientated research paper