MAKING RESEARCH MATTER
democratizing science & other lofty goals

Michigan Tech Research Forum • October 13, 2016
Richelle Winkler, Associate Professor of Sociology & Demography, Dept of Social Sciences
AGENDA

1. Democratic science
2. My goals & approach to democratic science
3. Examples from projects
   Some things that have worked for me
4. Issues in community engaged research
   Do you really want to do this?
5. Goals
   • share ideas/lessons learned
   • stimulate thinking
   • raise questions
1. **Science for the people**
   - Gives voice
   - Answers peoples’ questions/problems
   - Engage with people
   - Shared and accessible results

2. **Science by the people**
   - People ask the questions
   - Skills and collaboration - empowers people
   - Shared knowledge

3. **Collaborative science**
   - Interdisciplinary/Transdisciplinary
   - Share data
MY LOFTY GOALS

1. **Share data & findings with public and researchers**
   - Data repositories
   - Websites
   - Research briefs
   - Press
   - Infographics

2. **Problem/people driven questions that help broad publics and/or less powerful groups**
   - Choosing the research question
   - Work *with* people to answer the question

3. **Scholarship that integrates teaching-research-service**
   - Service to community: Campus-community partnerships
   - Involve students as partners
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1. **Create & serve useful data - make it fun**
   www.netmigration.wisc.edu
   - Funded by NIH - NICHD
   - Over 185,000 maps created
   - Over 5,000 data downloads

2. **Data repositories - ICPSR - “sharing data to advance science”**
   - http://www.icpsr.umich.edu/icpsrweb/
   - Help with metadata and archiving
Moving Toward Integration? Effects on Ethnoracial Segregation Across the Rural-Urban Continuum

Richelle L. Winkler¹ · Kenneth M. Johnson²

How Migration Impacts Rural America
Brief No. 03-16
September 2016
Miranda N. Smith, Richelle L. Winkler, and Kenneth M. Johnson

Migration Shapes Rural Communities in Different Ways
A keynote story of rural America since the 1950s has been the saga of young people leaving rural America for education, excitement, and careers in cities. But, relentless youth outmigration is only one dimension of the rural migration story. Some rural places attract migrants while others lose them; and whom they attract and whom they lose varies. Some rural places attract retirees, others attract families, and some even attract young adults.

Rural migration patterns reflect the varying social, economic, and environmental conditions across rural America. And, these differential migration patterns have significant implications for population structure, service needs, and community and economic development potential of rural communities. Understanding distinct migration patterns can help community leaders to develop strategies to improve the well-being of their communities.

Here, we summarize migration patterns by age across rural (nonmetropolitan) America from 1950-2010. Focusing on the most recent decade, we identify five distinct types of counties according to their age-specific net migration patterns.

Center for Demography and Ecology
University of Wisconsin-Madison

County-Specific Net Migration by Five-Year Age Groups, Hispanic Origin, Race and Sex 2000-2010

Richelle L. Winkler
Kenneth M. Johnson
Cheng Cheng
Paul R. Voss
Katherine J. Curtis

Age and Lifecycle Patterns Driving U.S. Migration Shifts

Kenneth M. Johnson, Richelle Winkler, Luke T. Rogers

Migration—people moving between locations—is now driving much of the demographic change occurring in the United States. Over time, the ebb and
1. **Publishing the peer reviewed article**
   - Open source?
   - Demographic Research; Demography
   - Researchgate- *connect the world of science and make research open to all*

2. **Research Briefs**
   - [http://w3001.apl.wisc.edu/b03_16](http://w3001.apl.wisc.edu/b03_16)
   - [http://scholars.unh.edu/carsey/192/](http://scholars.unh.edu/carsey/192/) - 500+ downloads

3. **Working Papers**

4. **The press and media**
   - Do press releases!
   - UMC can help
   - Self promotion or knowledge sharing?

5. **Infographics**
PRESS RELEASES MATTER!

LEAVE THE GRID IN THE UP? MICHIGAN TECH TEAM FINDS IT FEASIBLE

Houghton — While Michigan's Upper Peninsula is not the sunniest place in the world, solar energy is viable in the region. With new technologies, some people might be inclined to leave the electrical grid. A team from Michigan Technological University looked into the economic viability of grid defection in the Upper Peninsula.

Known for snow rather than sun, the region could still support a significant network of solar photovoltaic energy systems. Solar panels could generate enough power to supply the households in the area, offsetting the grid's electricity needs. This could lead to a more sustainable and resilient energy system in the Upper Peninsula.
Lighter bars represent seasonal resident rates, darker permanent.
WHY SHARE?

1. Informed people can make better decisions
2. Informed people can organize to speak truth to power with evidence to back them up
3. If we don’t engage with people, someone else will!
   - Upper Peninsula energy crisis issue
   - Interest groups have big incentive
   - Who drives the discourse?
MY LOFTY GOALS

1. **Share data & findings with public and researchers**
   - ICPSR
   - Websites
   - Research briefs
   - Press
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   - Service to community: Campus-community partnerships
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MY COMMUNITY ENGAGED SCHOLARSHIP GOALS

1. **Combine research-teaching-service**
   - course-based
   - students get free entry
   - challenging to do a good job in one semester

2. **Build reciprocal & collaborative campus-community relationships**
   - MTU *cares*?

3. **Promote long-term empowerment. Give voice.**

4. **Provide students with real-world opportunities**

5. **Promote interdisciplinary collaborations and team science**

6. **Answer questions of interest to communities- provide direction for sustainable community development**

7. **Case studies – look out for generalizable findings**
SOME OUTCOMES

- Curbside recycling
- Sustainability Director
- Houghton semifinalist in GUEP - reduced gas/electric consumption ~5%
- Journal article published in *Sustainability*
- EPA P3 Honorable mention award
- Most community engaged and likely to promote real sustainability
- KNHP exhibit on minewater geothermal
- MS thesis (Edward Louie)
- I got tenure doing this stuff!
- Growing interest
- Fun, motivating

Won the American Institute of Chemical Engineers’ Youth Council on Sustainable Science and Technology Award for most interdisciplinary and community engaged project with potential to improve lives and sustainability.
1. Limited recycling & lack of choice or democratic decisions in waste management

2. Copper Country Recycling Initiative
   - Needed data! Were organized.

3. Hancock efforts-
   - Hugh Gorman & Susan Burack

4. “We’ve tried it before…”

5. Grad Class 2015
   - Data/cities/companies/cases
   - Pulling together information
   - It was the right time!
   - Report on web
   - Presentation @ library (press!)
   - Presentation to MTU senate
CALUMET SUSTAINABLE COMMUNITIES PROJECT

Picture Source: Keweenaw National Historic Park
GENERAL METHODS

- Design research collaboratively
- Engage community in learning process
- Community meetings/advisory board
- Present in community
- Write accessible report
- Explore additional publication opportunities
1. How does arts development impact community development in a shrunken city like Calumet?
   - Promise
   - Building social, cultural, and political capital - new ways of thinking, being, and envisioning the community

2. Could we and should we tap into water in abandoned mines for geothermal energy?

3. Does it make sense for Calumet area municipalities to cooperate more or even consolidate?
   - Ongoing project - presentation Dec 9 @ MTU and Dec 12 @ CLK Schools

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**Article**

**Boom, Bust and Beyond: Arts and Sustainability in Calumet, Michigan**

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Abstract: Cycles of boom and bust plague mining communities around the globe, and decades after the bust the skeletons of shrunken cities remain. This article evaluates strategies for how former mining communities cope and strive for sustainability in the decades well beyond the bust, using a case study of Calumet, Michigan. In 1910, Calumet was at the center of the mining industry in the Upper Peninsula of Michigan, but in the century since its peak, mining employment steadily declined until the last mine closed in 1968, and the population declined by over 80%. This paper explores challenges, opportunities, and progress toward sustainability associated with arts-related development in this context. Methods are mixed, including observation, interviews, document review, a survey, and secondary data analysis. We follow Flora and Flora’s Community Capitals Framework to analyze progress toward sustainability. Despite key challenges associated with the shrunken city context (degraded tax base, overbuilt and aging infrastructure, diminished human capital, and a rather limited set of volunteers and political actors), we find the shrunken city also offers advantages for arts development, including low rents, less risk of gentrification, access to space, and political incentive. In Calumet, we see evidence of a spiraling up pattern toward social sustainability resulting from arts development; however impacts on environmental and economic sustainability are limited.

Keywords: art; mining; boom and bust; community development; social capital; infrastructure; tax base; community identity
Could we and should we tap into water in abandoned mines for geothermal energy?
THE TEAM

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Andrew Garrod, undergrad, mechanical engineering
Dana Savage, undergrad, chemical engineering
Kayla Warsko, undergrad, chemical engineering
TECHNICAL INFRASTRUCTURE

- 37 Shafts in and around Village of Calumet, mostly inclined shafts
- Some access issues
- Temperature ~ 55 °F
- Billions of gallons of water
- Close proximity to downtown, residences, industrial park
- Heating demand is substantial, cooling a plus
- Everyday tools

Photo by Edward Louie, of Red Jacket Shaft
SHAFT LOCATIONS

- Google Map
- Publicly accessible
- Tools

https://www.google.com/maps/d/edit?hl=en&authuser=0&mid=1EEokxJHNS-nlZoJ164wWJ2JEcp4
<table>
<thead>
<tr>
<th>Shaft</th>
<th>Building</th>
<th>Distance (FT)</th>
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<tbody>
<tr>
<td>Calumet 1</td>
<td>Township Office Building</td>
<td>106</td>
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<tr>
<td></td>
<td>CLK Schools</td>
<td>210</td>
</tr>
<tr>
<td></td>
<td>Mishawaubik Club</td>
<td>250</td>
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<tr>
<td></td>
<td>National Park Warehouse</td>
<td>280</td>
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<tr>
<td></td>
<td>Colloseum</td>
<td>330</td>
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<tr>
<td></td>
<td>National Park Headquarters</td>
<td>400</td>
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<tr>
<td></td>
<td>National Park Visitor Center</td>
<td>750</td>
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<tr>
<td>Calumet 3</td>
<td>CLK School</td>
<td>80</td>
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<tr>
<td></td>
<td>Michigan House Cafe</td>
<td>1,530</td>
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<tr>
<td>Calumet 5</td>
<td>Golden Horizon Apartments</td>
<td>50</td>
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<tr>
<td></td>
<td>GardenView Assisted Living</td>
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<tr>
<td>Hecla 1</td>
<td>National Park Library</td>
<td>30</td>
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<tr>
<td></td>
<td>Calumet Electronics - Business center</td>
<td>95</td>
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<tr>
<td></td>
<td>Barbara Kettle Gundlach Shelter</td>
<td>165</td>
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<tr>
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<td>National Park Warehouse</td>
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<td>National Park Visitor Center</td>
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<td>Hecla 2</td>
<td>Calumet Fire Department</td>
<td>175</td>
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<td></td>
<td>Calumet Electronics-Roundhouse</td>
<td>310</td>
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<tr>
<td>Osceola 15</td>
<td>Aspirus Keweenaw Hospital</td>
<td>1,250</td>
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<tr>
<td></td>
<td>Vertin Gallery</td>
<td>1,850</td>
</tr>
<tr>
<td>Red Jacket Shaft</td>
<td>REL Building</td>
<td>230</td>
</tr>
</tbody>
</table>
ECONOMICS

- Geothermal Heat Pumps usually save $ (even vs low nat gas), better than electric heat or propane
- Air conditioning very cheap with a geothermal heat pump
- But….economics are not good for this in Copper Country now
COMMUNITY IMPACTS

- **Natural**: Renewable energy source, reduce dependence on fossil fuels and carbon dioxide emissions. *Turns a negative into a positive.*

- **Cultural**: Reinforces community identity and celebrates cultural connections to mining. People feel the community owns the water and the legacy. Much interest.

- **Human**: Some opportunity for training and cultivating interest and skills in renewable energy systems.

- **Political**: Would require political will and coordination between several political entities: Village, Township, NPS, School District, etc. Concerns about who benefits/who pays/who controls.

- **Social**: Could reinforce and build social relationships and connections b/t organizations.

- **Financial**: How to finance initial costs? Not currently favorable economically in comparison to natural gas.

- **Built**: New infrastructure that would need to be maintained; questions about who benefits and who pays.
Could we and should we tap into water in abandoned mines for geothermal energy?

Could we? Yes.

Should we?

Maybe someday. Now is not the best time economically, unless incentive structures change. Option for County Ice Arena.

Structural roadblocks make it difficult:

- “Cheap” natural gas
- No powerful champions – no BIG $$ to be made
- Not “normal”
A empowering tool to help communities to self-evaluate the possibility of minewater geothermal projects in their area

- What is minewater geothermal?
- Community Participatory Planning
- Gathering Data and Understanding Your Minewater
- Technical and Economic Feasibility Tool
- Environmental Considerations
- Deciding on a location
- Ownership structures
- Funding sources
- Legal Considerations
- Examples and Resources
Doing Community Engaged Scholarship @ MTU
WHY **NOT** DO CES?

- Extra work - transdisciplinary, organization & planning
- Chaotic and confusing for students
- *Are you working with the right people? Who is “the community”?*
- Can be difficult to find generalizable outcomes
- **Political**
- At the edge of expertise
- **Burn out**
- Publishing is slow
- *We don’t really know how...*
WHY **DO** CES?

- It makes research matter! (relevance & impact)
- Community demand
- Experiential learning enriches students’ learning & prepares for civic life
- Super rewarding
- Can drive other research questions
- Sometimes you really can facilitate positive change
- Makes MTU look good- brings value to the region
- Increase diversity/attract female and minority scholars
- Legitimates the academy & broadens financial support
- University Learning Goal
- If we don’t do it, someone else (with interests) will!
LESSONS & HINTS

- Set clear deadlines and organizational structure- grades
- Build trust
- Work with groups who are organized
- Stay close to comfort zone
- Ask for help – reach out
- Learn from others, but pave your own way
- Concentrate on team spirit and collaboration
- Don’t try to do it all at once
HURDLES FOR DOING THIS @ MTU

- No reward/compensation system
- No resources/center for connecting parties
- Little to no organized support
- Administrative buy in?
- Funding comes from different places
RESOURCES

- **Campus Compact**
- **Engagement Scholarship Consortium**
  
  https://engagementscholarship.org/
- **APLU (Assoc of Public & Land-Grant Universities)**
  Task Force on New Engagement
- **Professional Associations- Public Science revolution**
- **Colleagues & Peers @ MTU**
  
  Don Lafreniere & Sarah Scarlett- Keweenaw Time Traveler
  Sarah Green- Skeptical Science website- http://www.skepticalscience.com/
  Joshua Pearce- Open Sustainability Technology lab
  Carol MacLennan & Noel Urban- Torch Lake projects
  Lorelle Meadows & the Honors College crew
  Susan Amato-Henderson- service learning
Higher education must move engagement from the margin to the mainstream by fully embedding engagement into the central core of the institution as a scholarly approach to teaching, research and service.