Sabbaticals and the Scientific Method

A joint presentation to the Academic Affairs, Student Affairs and Personnel Committee and the Research and Innovation, Legal and Legislative Affairs Committee

Reed Scherer, BoT Professor
Department of Geology & Environmental Geosciences

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My Sabbatical, Fall 2016

- NSF-funded WISSARD Project (2009-2015)
  - Drilling through the West Antarctic Ice Sheet to study ice sheet stability and history
  - Relevant to society because knowing the history of ice sheet changes provides key constraints for models that forecast future behavior in a rapidly warming, CO$_2$-enhanced world
• Among the many discoveries, our research showed a very surprising and controversial finding based on analysis of subglacial sediment cores
• We then broadened our analyses to include subglacial sediments we’d recovered years ago

My Sabbatical, Fall 2016
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• Our chief finding:
  • Following the end of the last Ice Age, ~9,000 years ago, the West Antarctic Ice Sheet retreated much faster and much further than previously known
  • Retreat then halted and the ice sheet regrew to its current configuration, suggesting some previously unknown resilience
My Sabbatical, Fall 2016

• We knew that publishing our findings in the peer-reviewed literature was going to be difficult - the scientific community would be resistant
  • The peer-review process often requires convincing skeptical colleagues (often our competitors for research funding) to change their understanding
  • For maximum impact we strive to publish in the most competitive journals
    • *Nature* Magazine is the highest ranked scientific journal, accepting only 7.7% of submitted research papers (following a very long vetting process).
A break from teaching was needed to allow me to focus on the difficult process of writing the manuscript

- (note that colleagues at most large research universities have lower teaching loads)

For my 2016 sabbatical I contacted a colleague at Lamont-Doherty Earth Observatory (LDEO), Columbia University, NY and was offered a formal invitation to be Visiting Senior Scientist

- A talk I gave at Columbia on WISSARD research turned into a game-changer!
My Sabbatical, Fall 2016

• Joining forces with my new colleagues resulted in a paradigm-changing paper in *Nature* (published June, 2018)
  • NIU co-authors include Profs. Ross Powell & Nathan Stansell, Ph.D. Candidate Jason Coenen, and NIU alumni Slawek Tulaczyk

• This paper is ranked in the top 1% of scientific research papers in terms of impact (Altimetric score of 263).

Extensive retreat and re-advance of the West Antarctic Ice Sheet during the Holocene

Student Success

- This is only one of a number of prominent WISSARD Project papers, several led by graduate students
- Most recently, Coenen et al., 2019 (just out in print this week)
Student Success

- Jason can certainly attest to the fact that publishing peer-reviewed research papers is a painful, even gut-wrenching process.
  - It requires extraordinary levels of patience, perseverance and the development of a very thick skin! This is similarly the case with obtaining research grants.
  - The chief reward is the respect and esteem of colleagues around the world.
    - This extends to your institution!

Geophysical Research Letters

Research Letter

Paleogene marine and terrestrial development of the West Antarctic Rift System

J.J. Coenen, R. Scherer, P. Baudoin, S. Warry, I.S. Castañeda, R. Askin

First published: 19 December 2019 | https://doi.org/10.1029/2019GL085281
During the sabbatical, I also:

- Gave talks at 5 different universities
- Attended and spoke at 2 research conferences
- Submitted (and was awarded) a $10,000 research grant from the Columbia University Climate Research Foundation
  - Used to support NIU undergraduate student research
- Developed new lines of research and new collaborations
- Held regular Skype meetings with my graduate and undergraduate students
- Had numerous media contacts
Media contacts

- During the 2016 sabbatical I was interviewed by numerous US and international print and broadcast media regarding my research findings, including the *Washington Post* and *Popular Science*, with a potential reach of 60 million readers, not counting Twitter and Facebook hits.

- Media from the 2018 *Nature* paper was cited by 40 major news outlets with a reach of 215 million readers, not including Twitter or Facebook.

- **Advertising Value Equivalency (AVE) of $2M**
Typical timeline for a scientific research project: 5-8 years

- Cultivate an idea & mature a hypothesis into a viable research proposal: 1-2+ years
- Prepare and submit the research proposal: 3-4 months
- Continue this or other research while waiting for proposal results: 1 year
- If not funded on first go (likely), revise & resubmit, wait for result: 1 year
- Once funded, perform research: 2-4+ years
- Prepare manuscript for publication based on new results: 1-2 years
- Submit, wait for reviews, revise & resubmit (repeat as needed): 2± years

Somewhat analogous to a small start-up business, from idea to profitability
Sabbatical leaves are a critical component of all research universities

- They enhance the profile of the home institution
- They offer important professional development opportunities for the faculty
- Increase likelihood of future grant funding
- Inform and revitalize pedagogy
- Can offer critical connections, networking and career opportunities for our students (e.g., graduate programs, research collaborations & jobs)
- All of which pay dividends in enhancing NIU’s profile, grant dollars and student career success!

- THANK YOU