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**Faculty-student collaborative research at UMM is rock-solid**

*Summary: Some people are uneasy when they find themselves between a rock and a hard place. But that's exactly where Jim Cotter loves to be. An NSF award will fund Cotter's geological research with students this summer in Brazil.*

(June 1, 2007)-Some people are uneasy when they find themselves between a rock and a hard place. But that's exactly where Jim Cotter loves to be. The University of Minnesota, Morris professor of geology will do research this summer in Brazil and Minnesota, thanks to a National Science Foundation (NSF) Award of over \$165,000. The funding will facilitate Cotter's research with students through the NSF's Research Experiences for Undergraduates (REU) Program.

"We will be doing research that compares the glacial geology of western Minnesota to the glacial geology of Parana State, Brazil," explained Cotter.

"The difference between the geology of the two places is that in Minnesota glacial deposits are (geologically) very young – less than 20,000 years old. In Brazil the glacial deposits are 300 million years old. Because of this great age the glacial deposits of Brazil are poorly preserved and difficult to interpret. Researchers involved in this project will use their knowledge of and experience with the Minnesota deposits to help make interpretations. The Minnesota research will try to reconstruct very carefully the last glacial retreat from western Minnesota," explained Cotter.

As more attention surfaces on the topic of global warming Cotter's glacial research carries increased significance. "The last time the glaciers retreated from Minnesota, they did so during a period of rapid climatic warming," said Cotter. "In this area there are important lessons to be learned about glaciers, warming climates and landscape changes. In Brazil, the glacial deposits are important reservoirs for both oil and fresh water (depending on depth and location). Understanding the geology of these deposits will aid in the development and care of these valuable resources."

Also significant is that students, three of them from UMM, will partner with Cotter throughout the research project.

"The reason NSF funded this project is because students are involved," said Cotter. He has run a "site" REU program – where students come to him – 10 times since 1989. While Cotter has researched in Brazil for 15 years, only a few students were involved. "Prior to 2005 students only did research in western Minnesota. The Brazil REU program represents an interest that both my colleague, Prof. Antonio 'Tony' Rocha-Campos of the Universidade of Sao Paulo, Brazil, and I have in involving more research by undergraduate students."

This year's research will also engage Megan Carlson, Julie Baumeister and Allison Ameluxen, all UMM students, as well as one student each from Gustavus Adolphus, the University of Minnesota, Duluth, St. Cloud State University, the University of Wisconsin, River Falls, Calvin College and two undergraduates from the Universidade of Sao Paulo, Brazil (where Rocha-Campos is a professor).

NSF's REU program is designed to provide undergraduates with an opportunity to complete research.

“I think that undergraduate research is very important for all areas of study,” said Ameluxen, a junior geology major who is originally from Monticello and graduated from Maple Lake high school. Ameluxen will also earn a secondary education (grades 9-12) licensure in earth and space science from UMM. “[Undergraduate research] involves a different kind of learning and is more hands on. It allows us to come up with a research project of our own, perform the actual research, analyze the results as well as to give a presentation on our findings at the end of the program.” Ameluxen will participate in both REU and the Undergraduate Research Opportunities Program while at UMM.

Also a geology major, but with a minor in statistics, Carlson is from New Hope and will be a senior at UMM this fall.

“We will be meeting new people and exploring Minnesota and Brazil, as well as learning new things,” said Carlson. “I think that research is a really important part of our liberal arts education because it gives us, as undergrad students, the opportunity needed to apply our skills learned at UMM so we are better prepared for the ‘real world.’ I feel like UMM does provide an adequate amount of research opportunities for students...if you want to do research over the summer or during the school year UMM professors are very willing to work with you in finding a project that fits you.”

Baumeister is a junior at UMM who is majoring in geology and environmental science. “I am really excited about this opportunity! It's going to be great research experience that will be incredibly valuable especially for after college,” said Baumeister. “I'm looking forward to improving my skills out in the field...this is great travel experience and a chance to see a part of the world I'd probably never get the chance to see otherwise.”

“At UMM...students have amazing opportunities to do research! I haven't met anyone who wanted to do research and hadn't found a chance. There are so many opportunities here...a factor that greatly contributed to me choosing UMM above other schools,” said Baumeister.

“It has been shown that participating in research as an undergraduate plays an important role in the development of future scientists,” said Cotter. “International research provides a unique learning experience that former UMM geology students frequently cite as an important component of their education. This, together with the positive endorsement of both the NSF and UMM provides a great deal of personal fulfillment to me as a faculty member.”

The additional goal of the UMM REU program is to specifically encourage women to pursue careers in the geological sciences.

“Women have traditionally been, and remain, underrepresented in geologic professions,” said Cotter. The UMM program began in 1989 and by the end of summer 2007, 85 women (30 of them from UMM) will have participated in the UMM program.

While the award sum appears significant and Cotter agreed that it “is a lot of money...this is still only a moderate size grant by NSF standards. The budget turned out to be about what NSF recommends for International Research Experience for Undergraduates (REU) Programs.”

Cotter was awarded the Presidential Award for Excellence in Science, Mathematics and Engineering Mentoring (PAESMEM Award) in 2000, largely because of his REU Program.

“NSF has been very supportive of my research and UMM's geology program,” said Cotter. “Over the years I have received 14 NSF grants to support research in Brazil, equipment for the geology program and REU programs. I have also received grants from foundations, organizations and (frequently) UMM. I'm not shy about asking for research support and I really do appreciate the generosity.”

In addition, said Cotter, “UMM has been very supportive of my research both in terms of grant development and resource matching. The staff of the Grants Development Office at UMM does the ‘yeoman's work’ of getting these proposals together and the end product is both very polished and extremely competitive. UMM administrators have also been very good about finding the necessary ‘matching dollars’ that NSF requires. It also helps that UMM has very talented undergraduates and a very solid geology program.”

Photo: UMM students enjoy a previous research experience with Cotter

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