



# Margaret Hiza Redsteer

GRFP Recipient: 1990

*Undergraduate Institution:*  
B.S. 1989, Northern Arizona  
University

*Graduate Institution:*  
M.S. 1993, Montana State University  
Ph.D. 1999, Oregon State  
University

*Graduate Field of Study:*  
Isotope and Trace Element  
Geochemistry

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*Current Position:*  
Research Scientist, U.S. Geological  
Survey

## RESEARCH INTERESTS //

Margaret Hiza Redsteer has several interests including geomorphology, landscape ecology, climate change and its impacts on Native American communities, tracking the history of these impacts using local and traditional knowledge and water quality. Redsteer's interest in geology began when she became concerned about the quality of the water on the native lands on which she lived. Her pioneering work includes using meteorological data sets, accounts from tribal elders, historic scientific literature, aerial photographs, mapping of landscape change and applying remote sensing techniques to track changes in vegetation, sand dune migration, and changes to surface water features on the Navajo Nation.

## A PERSONAL ANECDOTE OF THE BENEFIT FROM THE GRF PROGRAM //

"The fellowship made a huge difference. It paid for my master's thesis and there was enough for us to live on too. I don't think I could have considered doing a master's degree without it," says Redsteer.

## AWARDS/ HONORS //

Northern Arizona University Cum Laude (1989)

Honors: National Dean's List 1986-1989

### *Scholarships and Fellowships*

- L.M. Jones Memorial Scholarship in Environmental Science 1987
- Melvin Slipher Scholarship, College of Arts & Sciences, NAU 1989
- Single Parent Scholarship, Northern Arizona University 1989
- National Science Foundation Fellowship 1990
- D.L. Smith Memorial Scholarship, Montana State University 1990
- Geological Sciences Departmental Scholarship, University of Washington 1993
- J.D. Love Memorial Fellowship 1994
- Pierce-Heart Mountain Memorial Fellowship 1996
- Taubeneck Geology GTA Scholarship, Oregon State University 1998

STAR Award (ESP Team, USGS) 2000

Received for work on organizing a colloquium series for the Denver Federal Center. STAR Award (ESP Team, USGS) 2001

Received for exceptional initiative in proposing new interdisciplinary research. STAR Award (ESP Team, USGS) 2006

Received for proposing and helping to implement the USGS SISNAR Native American Internship program. STAR Award (ESP Team, USGS) 2007

Received for teaching USGS Native American relations training (2005-2007)

U.S. Department of Interior Diversity Champion Award 2009

Received from Ken Salazar

## POSITION PROFILE //

Originally setting out to complete an undergraduate degree, Redsteer quickly became swept up in science. She was awarded a National Science Foundation Graduate Research Fellowship to pursue a master's degree at Montana State University, studying how volcanoes erode to form new layers of sedimentary rocks.

She is currently a research scientist on the U.S. Geological Survey Earth Surface Processes Team, where she has been employed since 1999. Redsteer, who is of Crow descent, is project chief of the Navajo Land Use Planning Project at the Flagstaff Science Center in Arizona. She works on the Navajo Nation, conducting geologic mapping, studying climate and land use history, and assessing drought impacts, wind erosion and water quality. Redsteer's specific expertise is in sand dune mobility and the mobility of surface sediment resulting from changes in climate and land use.

Hiza Redsteer developed a project geared toward providing information to Native communities in the southwest where increasing aridity, combined with poor socioeconomic conditions, is stressing limited natural resources. Besides leading and coordinating a multi-disciplinary research team, her work has been to conceptualize a research strategy aimed at unraveling complex changes resulting from climate change and land use, and how these changes have altered or threaten local ecological conditions. Her contribution to the research is to gain a greater understanding of how changes are occurring (i.e. seasonal temperatures, precipitation, and wind energy, and extreme events) and how they affect the region and its vast aeolian deposits. To that end, her work includes meteorological monitoring, seasonal vegetation surveys, sediment sampling, and measurement of the rates and conditions of sand dune movement, and evaluation of how these processes relate to surficial geologic and ecologic conditions. She had partnered with local ethnohistorians to compile interviews from tribal elders that record the changes in weather, land use, water sources, etc. Her current research goal is to work toward understanding the interconnections between climatic change impacts and the additional stresses from land use and vegetation change, tipping points in the connections among these processes, and how these changes are affecting the region and its people.

