



# Partner Perspectives

Research leads to land-management breakthrough



## Partner Perspective

Department of Geography  
University of Calgary

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**Julie Linke PhD**  
University of Calgary

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### Overview

Julia Linke celebrated Christmas with a newly-minted PhD degree forged in a multi-year relationship with the scientists and technicians at Foothills Research Institute. Her academic career began with a Bachelor of Forestry at the University of New Brunswick, then came a Master's program at the University of Calgary Geography Department. This initiated her contact with Foothills Research Institute and its extensive collection of data on relationships between landscape characteristics and grizzly bear habitat. Linke's interest in landscape ecology will continue into the future with NSERC funding for post-doctoral work.

### Challenge

For her PhD work, Linke led a Canadian study team exploring the development of strategies for tracking landscape changes and disturbances using satellite remote sensing technologies within a geographic information system. One problem is the rapid rate of change on Alberta's west-central landscape and the data "noise" created by factors within the ecosystem and within the technological monitoring systems. Just looking at 40,000 ha south of Hinton, Linke says, there's an average of one half-hectare of change on every square kilometre every year. The change could involve roads, mines, forest harvesting and regrowth, seismic lines and much more.

### Solution

Working with colleagues in the university's Foothills Facility for Remote Sensing and GIS Science, and professor Greg McDermid, Linke created a monitoring system using Landsat satellite images and data from the Hinton-based Grizzly Bear Program, which has masses of data collected over years of tracking and study. Linke's work solved a number of complex issues, including the elimination of errors caused by system noise, and the accommodation of various geographic data models.

### Results

Linke and her team applied the methodology to track landscape changes occurring across Alberta's threatened grizzly bear range. "What we have achieved for the first time is an annual series of highly-detailed, spatially-consistent maps of the same large area," she says. "It gives us the opportunity to build a really refined monitoring framework for a very dynamic area, and something that can be used for many purposes in other parts of the world." The team's work has already attracted worldwide scientific attention. "The Institute's dataset provided me with a tremendous opportunity to link internationally with people who are working on similar problems," Linke says. "The international profile of the Institute, and the international audience you can reach with this work, is really an amazing opportunity."

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