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THE BEAR FACTS... AND MORE

Nelson takes location and environmental measurements. PHOTO: DIANA NETHERCOTT. *Inset: grizzly bear.* PHOTO: VALERIE SHORE.

Grizzly bear conservation is just one of many ways to apply the growing field of geomatics

BY KIM WESTAD

We live in a world filled with spatial information, and we add to it whenever a satellite is used, whenever we call on a cell phone, or even whenever we tweet.

And a University of Victoria research lab is making the most of it.

The amount of spatial information—where we're at when we do something or something happens—has increased dramatically since the 1990s, largely due to the proliferation of data-sharing technologies and location-aware mobile devices. It is a treasure-trove of information for those who study the growing field of geomatics, a branch of science that collects, analyzes and interprets data relating to location.

At the forefront of this type of study is UVic's Spatial Pattern Analysis and Research (SPAR) Lab, headed by geographer Trisalyn Nelson. She and the dozen students who work in the lab use spatial data to provide analysis on everything from when to close roads so that female grizzly bears can best feed, to helping predict crime areas, to mapping local food supply and demand.

"Our society is now generating incredible amounts of spatial information, creating an explosion of really large datasets that we can use for research and projects in communities," says Nelson.

Geomatics can be used in more traditional geographical applications—think of forestry, urban and regional studies and transportation—and many other fields, such as health, astronomy, social network analysis and medical imaging.

No more plotting information on transparent maps and laying them on top of each other to look for patterns, relationships and trends. Now, the massive amounts of information can be analyzed with geographic information systems (GIS) that capture, store and manipulate all types of data. GIS essentially merges cartography, statistical analysis and computer science technology.

Students and researchers in the SPAR lab often team up with other institutions or businesses to tackle issues. Recently, they worked with the Foothills Research Institute, looking at the impacts of habitat conditions and human disturbance on the long-term stress and health of grizzly bears in northern Alberta.

Researchers can't ask a grizzly why it prefers one patch of berries over another, or how a bear adapts in former wilderness areas that are logged, mined or used for recreation.

But the animal's travel patterns—collected via satellite collars—speak for them. For example, mapping found that female grizzlies spend more time than male bears near roads. That puts them at a higher risk of human-caused mortality, either from poaching or being struck by vehicles. And losing more females from the grizzly population is a serious conservation concern.

"The findings have some pretty important management implications," says Nelson. "Using maps, we can locate where and when conflict between people and bears is likely."

Online community mapping could be used for many other things, including an interactive map for cyclists showing locations of high accident risk. Even activities like the annual Victoria flower count could benefit—to map flower locations and counts.

"How spatial analysis and mapping can be put to use is limited only by imagination," says Nelson.

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