



# Uncharted Waters

Boise State scientists, students cast off for 41-day voyage to remote stretch of Pacific as part of major NSF grant

BY JANELLE BROWN

A Boise State University team of scientists and graduate students set sail Feb. 9 for a 41-day voyage to one of the most remote stretches of ocean on Earth as part of a major research grant awarded to BSU by the National Science Foundation.

After leaving port in Tahiti aboard the research vessel *Melville*, the crew didn't expect to encounter any other vessels as they traverse more than 1,000 miles of open seas in the southernmost reaches of the South Pacific.

"We'll be in the latitudes nicknamed the 'Roaring 40s' and the 'Screaming 50s,' where there are no continents to block the wind," says Mitchell Lyle, a paleoceanographer with Boise State's Center for Geophysical Investigation of the Shallow Subsurface (CGISS) and co-chief scientist on the expedition, in an interview prior to the crew's departure.

"We've picked the very best time of the year to be down there, but it's still likely to get rough." Lyle adds.

Lyle is being joined on the voyage by CGISS geophysicist Lee Liberty, Boise State geosciences graduate students Brandi Murphy and Christopher Paul, and students and researchers from University of Michigan, Texas A&M, Indiana University and Oregon

State University. Boise State is the lead institution on the \$318,211 grant from the NSF.

Their mission: to survey drill sites beneath the ocean floor for future



BSU paleoceanographer Mitchell Lyle (left), graduate students Christopher Paul and Brandi Murphy, and BSU geophysicist Lee Liberty look at maps of the southernmost Pacific Ocean, where they are spending 41 days aboard the research ship *Melville*.

studies of the very warm Eocene time period of 34-55 million years ago.

Scientists are increasingly interested in understanding these ancient climate patterns because they offer insights into current climate conditions, including the effects of global warming.

The *Melville*, which is 279 feet long, will be tight quarters for the crew of about 45 over 41 long days. But there are movies, e-mail access and activities

to break up the monotony, and graduate students are also doing some coursework as part of a deep sea field methods course. While open seas will stretch to the horizon, the crew expect to sight albatross, cape pigeons and perhaps some whales and dolphins along the way.

"This is an experience I can't get anywhere else," says Murphy, Post Falls, who plans to eventually earn a Ph.D. that focuses on deep sea methane. "The opportunity is extremely valuable."

Paul, from Eureka, Calif., will miss his youngest son's sixth birthday by going to sea.

"My wife is a BSU geosciences undergraduate, so she understands why it's so important that I do this, but I know my family will be making sacrifices," says Paul, who would like to pursue a Ph.D. in marine geology. "An experience like this is vital to my future career."

Working around the clock, the crew aboard the *Melville* is conducting seismic reflection studies of the ocean floor subsurface using two separate

methodologies. The studies are expected to yield detailed information about the ocean floor topography and underlying sediment layers, which scientists can interpret to identify good sites for future expeditions to drill and recover a thousand or more feet of sediment.

Sediment cores obtained as part of the drilling expeditions are used by scientists to understand climate conditions that existed millions of years ago. By analyzing the fossilized remains of plankton and other organisms found in the samples, scientists can reconstruct a continuous record of the ancient climate conditions, including how fast and when the climate warmed or cooled.

The *Melville* crew is also analyzing piston cores obtained from the first 60-80 feet of ocean subsurface to corroborate information obtained from the seismic studies. And for the first time, the seismic information is being acquired in digital rather than analog format, providing scientists with many more options for studying and manipulating the data.

The research will be conducted in real time; when the crew disembarks from the *Melville* in Tahiti on March 21, they will have the charts

and data in hand.

Lyle, a veteran of nearly 30 scientific ocean expeditions, says the voyage will provide the first-ever detailed survey of drilling sites in the southernmost Pacific. At present, scientists only have a rudimentary grasp of the topography of the ocean floor and subsurface on vast stretches of this remote region.

"These trips are a lot of work, but they can also be a lot of fun," Lyle says "You never know exactly what to expect."



PHOTO COURTESY OF MITCH LYLE

Lee Liberty (left) and Christopher Paul work on seismic equipment aboard the *Melville* in a photo sent from the ship via a satellite link. "Every mile we sail is an entirely new piece of a heretofore blank map," Paul writes in an e-mail.

*The BSU crew is sending e-mail via a satellite link at various points on their voyage. Their dispatches are being posted at <http://news.boisestate.edu/oceanvoyage>. The crew also welcomes questions from FOCUS readers about their expedition, which they will answer online. To submit questions, go to the Web site and follow the prompts.*



PHOTO COURTESY OF MITCH LYLE

Brandi Murphy (left) works in the main lab aboard the *Melville*. "We have been assigned to watches around the clock to monitor equipment and data..." Brandi writes from the ship. "Neither Chris nor I have gotten anything but very mild seasickness which is a pleasant surprise."

## BSU profs tout school turnaround to national audience

Five years ago, test scores at Lapwai Elementary School on the Nez Perce Indian Reservation in northern Idaho were anything but impressive. Only 17 percent of third graders were performing at or above the state's proficiency level in math, and only 16 percent were doing so in reading. But by 2004, the picture had changed dramatically. A whopping 91 percent were at or above grade level in math, and the reading figure had jumped to 73 percent.

What happened? A lot, says William Parrett, a Boise State education professor and director of the Center for School Improvement and Policy Studies. In an article "Against All Odds" published in January in the national magazine *The School Administrator*, Parrett chronicles how the school changed.

"The remarkable success of this school in teaching minority children represents just one of dozens of schools nationwide that have reversed a history of underachievement and low performance," Parrett writes in the article.

Parrett, served as a "coach-adviser" at Lapwai, which received a three-year, \$1.2 million grant from the J.A. and Kathryn Albertson Foundation and several other grants. Now Parrett and Boise State education professor Robert Barr are presenting the school's remarkable story at five major national education conferences this school year. Joining the BSU professors in making the presentations are several Lapwai officials, including the superintendent, school board chair and curriculum director.

Parrett says he's had many positive responses to the article and to his conference presentations. "Any school district can attain and sustain these successes if they employ the pattern of improvement components, as did Lapwai, in their classrooms and schools," he says.

— Janelle Brown