The moraine event

Dan Santamaria Tovar, along with advisor Jamie Shulmeister and colleagues, hiked, kayaked and mountain-biked their way through dense New Zealand rainforest in search of the origins of the Waiho Loop moraine.

What was the objective of the work at the beginning of the project? Did it change as work progressed?
Serendipity plays a significant role in science. This project was supposed to be a study of the glacial flood hazard in the Waiho River catchment, Westland New Zealand. The idea was to examine the sedimentary deposits from very recent floods, and then move further down the valley to see how far we could trace flood events, in order to identify flood risks. Of course, this was dependent on identifying the modern flood deposits. When we went to examine sediments from some floods that occurred five years ago, we discovered that most of the outcrop was already covered in dense bush or reworked. We decided it was too risky a project for an honours thesis, so I was sent out on a solo reconnaissance mission to look at moraine outcrops to see if there was a project describing the nature of the local glacial moraines.

Why did you choose this particular location for the fieldwork?
After bashing my way through dense brush, being stopped by impenetrable rivers and carefully crossing fallen trees near power lines, all in typical New Zealand weather, I returned from the reconnaissance having noticed that the Waiho Loop was different from all the other moraines. My supervisors, including Jamie, had doubts, so I was sent back to describe the rock composition systematically. Then Jamie ventured out as well: partly to help, and partly to confirm the results, as we were taken by surprise by the data.

What sorts of data or samples were you after?

This is one of those cases where the science is very low tech. It involved visual identification of rock types (later confirmed with thin sections) and visual measurements of rock shape. Except for the rocks used in thin sections we didn't even need to take samples away.

Journey to the moraine. The team's combination of fieldwork and extreme sports ensured the Waiho Loop was well described.

Did you encounter any difficulties?
On paper/map this looks like an easy project. There are tracks along the river and most sites are no more than a few kilometres from a trailhead. In practice, we, along with field helpers, did some pretty challenging fieldwork. The Waiho Loop and other moraines are covered in very dense temperate rain forest that is almost, but not quite, impenetrable. The main sections are unfortunately in the rivers, so sampling involved standing waist deep in water, and occasionally dodging icebergs.

Did you have encounters with dangerous animals?
There are very few dangerous animals in the New Zealand bush, but possums (an imported Australian pest) make the most unbelievable hissing-gurking-strangling sound. It made you believe that mayhem was going on in the forest only a few metres away from you. The racket definitely made us worry about possum attacks, as they seemed interested in our fire-grilled popcorn.

Any lowpoints, close misses?
At one point, while pulling a kayak out of the water, we heard a noise that sounded just like a big glacial boulder crashing through the woods towards us. When we looked up, it was actually just a huge, beautiful deer, which luckily managed to avoid us on his way to get water.

What was the highlight of the expedition?
The setting at Franz Josef Glacier is truly beautiful. The Waiho River delta was a one day walk, in sand, from Okarito Lagoon, but had truly exceptional views of Mount Cook and the Franz Josef Glacier. Our night-time kayaks out from sites were usually under cloudless skies filled with stars.

Did you learn anything new about yourself or your team members?
Nothing we would like to record!

Did the trip give you any ideas for future research projects?
We suspect that landslide-generated moraines are very common in this type of setting. Although they may be a hassle when trying to evaluate climate change, they could give us a handle on the timing of major earthquakes. We hope future work will contribute to hazard and disaster management in the region.

This is the Backstory to the work by D. Santamaria Tovar and colleagues, published on page 524 of this issue.