

Not My Fault: Geology, plate tectonics, glaciation and an extraordinary vacation

Lori Dengler/For the Times-Standard
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One of the advantages of being 80% retired is the opportunity to take more than one summer vacation. I just returned from an eight-day canoe trip in British Columbia's Bowron Lakes Provincial Park. Most canoe trips fall into two categories – there and back again or one-way down stream with shuttle. Bowron is one of the few places where you can paddle a loop, returning to where you started without ever going over the same ground.

The first thing one notices about Bowron on a map is the unusual orientation of lakes (5 major ones and 6 or 7 smaller ones depending on how you count), forming a skewed rectangle about 20 miles long and 15 miles wide. The lakes aren't continuous – completing the circuit does require seven portages varying in length between a quarter mile and a mile and a half in length - but 80% of the circuit is in the water.

I first heard about Bowron from Ken and Frederica Aalto. They made the circuit four times and always raved about what a special place it is. I got to thinking more about Bowron since Ken passed on a little more than a year ago. My son Karl did the loop five years ago and decided it was time for the rest of the family, wife Brandi and teenage sons Otto and Alex, to do the trek. He was kind enough to invite Tom and me, the grandparents, to make it a three-generation adventure. Best of all, they did all of the logistics for the trip.

Whenever I travel, I try to include a little geology. The highly unusual lake orientation clearly has a geologic story behind it. Squares and rectangles just aren't part of the normal drainage pattern. When I showed the map to a friend, they asked if it was the result of a meteor, calling on something extraterrestrial for an explanation. The answer is more complex than an impact and took much more time.

First a disclaimer. I don't know much about the geology of British Columbia. I've never done fieldwork there and while eight days in a canoe allows much time for speculation, there is no time for serious examination. So

this is the way overly simplified 400 word arm-waving treatment.

The Bowron Lakes story goes back 4 billion years to the formation of the North American craton, called Laurentia by geologists. Cratons are the oldest and most stable parts of the earth's surface and are made up of really ancient rock, much of which has been cooked and recrystallized over the millennia. Cratons are the core of continents, and while tectonic process move them about and sometimes collect them into supercontinents, a craton seems to remain largely intact. Sometimes called the Canadian Shield, the North American craton includes most of Canada and the central and eastern portion of the United States as well.

Cratons act a bit like bumpers in plate tectonics. The more buoyant minerals that compose them are too light to be subducted and they are so thick and well crystalized that tectonic processes are concentrated near the boundaries. Plate motions sometimes cause other slabs of rock to be slapped onto the margins in a process called accretion. The North American craton is no exception and generations of geologists have made careers out of dissecting the processes that have created the western United States and Canada.

For much of geologic time, the area where Bowron Lakes is now located was under the ocean along the western continental margin of the craton slowly accumulating sediments eroded from the land. Tectonic process scraped and deformed some of these sediments onto the edge of the continent. There were several episodes of mountain building, metamorphosing and uplifting the rock, forming the Cariboo Range, the mountains that now rim the lakes.

The present day appearance of the Bowron Lake circuit is due to far more recent geologic activity, the repeated glaciations over the past two million years. At times the area was covered by a massive ice cap, covering the entire landscape in an ice sheet over a mile thick. Based on the orientation of the glacial valleys and features, the cap was centered over the Cariboo Mountains and the ice moved slowly out in all directions. The movement interacted with the geologic fabric of the land, gouging deeper valleys in weaker areas, and leaving the stronger rocks as sharply etched peaks, and in the Bowron Lakes area, creating a unique circuit of lakes.

The geology is always a plus for me when I travel. But the nicest part of our canoe trip was eight days off line with my family. We were fortunate that after the first day and

a half, the weather was glorious. The water so still and clear on 24-mile long Isaac Lake, the cloud reflections made it feel like paddling in the air. Glorious.

Note: The Humboldt County Fair begins on Thursday April 15th. For the 22nd consecutive year, the Redwood Coast Tsunami Work Group will be providing earthquake and tsunami information. We are still in Hindley Hall the Commercial Building, but this year are located at a booth within the regular display area. Please come by and say hello and get your questions answered about our hazard and what you can do to make yourself and your family safe.

Lori Dengler is an emeritus professor of geology at Humboldt State University, an expert in tsunami and earthquake hazards. Questions or comments about this column, or want a free copy of the preparedness magazine "Living on Shaky Ground"? Leave a message at (707) 826-6019 or email Kamome@humboldt.edu

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