

## Minnesota Now (MPR) | Minnesota Now What makes Buffalo Ridge Minnesota's best spot to harness wind energy? 01GSTQMCH35SV3T111NRX8YYTG

CATHY WURZER: If you've ever driven by the Buffalo Ridge in southwestern Minnesota, you'll see the horizon dotted with wind turbines. It's been that way since 1994 when the first turbines were built. What makes that part of Minnesota the ideal location for harnessing the wind? And what is the Buffalo Ridge, atop which the turbines do their work?

Jim Cotter is Professor of Geology at the University of Minnesota, Morris. Every month on *Minnesota Now*, Professor Cotter tells the story of our state through geology. Hey, welcome back.

**JAMES COTTER:** Thanks, Cathy. It's nice to be back.

**CATHY** Explain to folks what is the Buffalo Ridge.

**WURZER:**

**JAMES COTTER:** So it's a ridge, which is a linear hill, in southeastern Minnesota, as you pointed out, that generates a lot of wind. And it's known as being part of what's called Minnesota's wind belt. If you look at any map of either wind speeds or wind energy in Minnesota, Buffalo Ridge really stands out. There's over 1,000 turbines up there.

**CATHY** All of western Minnesota is pretty windy. It must be a function of the elevation, right?

**WURZER:**

**JAMES COTTER:** That's exactly right. It stands about 200 feet higher than either, say, Lake Benton, which is north of it, or Pipestone, which is south of it. And as the air mass is forced up and over the ridge, it speeds up. It's kind of like putting your finger over the edge of a hose. The same volume has to come out, so it speeds up to do that.

**CATHY** I know there's a story, a geologic story, behind the Buffalo Ridge. How did it form?

**WURZER:**

**JAMES COTTER:** Yeah, that's right. Buffalo Ridge is just the Minnesota part of a very large feature that's mostly in eastern South Dakota and North Dakota called the Coteau des Prairies. The Coteau des Prairies is a flat-iron shape, kind of a wedge, that's over 200 miles from north to south and 70 miles wide from east to west. It's really a big feature.

And its high point is about an elevation of 2,200 feet. And if you go from that high point down to, say, the Minnesota border of Big Stone Lake, you drop an elevation 1,000 feet. That's about 30 miles, that distance is. But when you think about it, the distance from Big Stone Lake down to New Orleans is 1,000 feet. So it's really a lot of relief for the western part of Minnesota.

**CATHY** So talk about how this formed-- probably, before glaciation, right?

**WURZER:**

**JAMES COTTER:** Yeah, that's what most people think. It's an interesting kind of geologic problem that I think most people believe has been solved. It probably was a topographic high before glaciation, probably a place where bedrock stood higher than the surrounding landscape. Once glaciation began, that bump would cause the glacier to deposit sediment around it, and over time, it built up enough material, that it was large enough to actually split the glacier in half.

And so a portion of it goes down the Minnesota River Valley in Western Minnesota, but the other part goes down the James River Valley in South Dakota. And this is something that's really unusual, because most of the time, rivers flow together to join a larger river. There's a confluence of rivers, and you make a bigger one. But this is a unique instance where, actually, two rivers split apart, and that's unusual, at least on Earth.

On Mars, the Martian channels, their valleys split apart. And I once heard that as NASA started studying the Martian channels, they use the Coteau as a model for how drainages might be split. It's really, really an interesting place.

**CATHY** What does the Coteau look like, for folks who-- can you describe it? And can you go out there and take a peek?

**WURZER:**

**JAMES COTTER:** It really is a beautiful place to visit. It varies from place to place in Minnesota, the Buffalo Ridge part. It's a hill that's kind of subdued landscape, but rivers and creeks have cut these really interesting valleys into it.

The Prairie Coteau Scientific and Nature Area really gives a good sense of what the Minnesota part is. But in the north end of the Coteau, where-- right at the North Dakota, South Dakota border-- Minnesotans would describe it as lake countries. There's lake upon lake upon lake.

An example is Pickerel Lake State Park in South Dakota. It's a beautiful lake, and it has a really interesting geologic history. But the lakes are a little bit different in South Dakota, because of the high evaporation rates, and because the bedrock is that salty cretaceous seaway I talked about a couple of months ago. Sometimes they turn salty, and sometimes they're a little bit redder than Minnesota lakes. It's just an interesting place to visit.

**CATHY** Yeah, it sounds like it. Well, I appreciate your time here, Dr. Cotter. Thank you so much.

**WURZER:**

**JAMES COTTER:** You're welcome, Cathy.

**CATHY** Jim Cotter is Professor of Geology at the University of Minnesota, Morris.

**WURZER:**