

How are drumlins formed?

I live in southern Wisconsin, USA, an area full of glacial geology features. Drumlins seem such an enigmatic glacial feature. Easily recognized, but seemingly a mystery of how it is formed. What is the latest thoughts on how drumlins were formed. Are any noted from Antarctica or Greenland?

Asked by Daniel

Many people think that drumlins are a mystery. For over 100 years, scientists have puzzled about how they formed, coming up with a whole load of different hypotheses – one even invoked asteroid impacts. However, we are now much closer to consensus. All current hypotheses agree that they form from the movement of sediment and water beneath ice sheets – though people do debate the specifics of drumlin formation at a particular place.

One mathematically grounded theory shows that when there is ice above wet sediment, the pressure of the ice causes it to deform (squidge and slop around). This movement organises itself into bedforms – similar to how the blowing of wind causes sand dunes, or water moving causes ripples on the beds of rivers.

We have imaged related landforms beneath Antarctica – very long drumlins called mega-scale glacial lineations, and a few drumlins. However, access to these environments is tricky, due to the kilometre thick ice on top.

Answered by Dr Jeremy Ely

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