

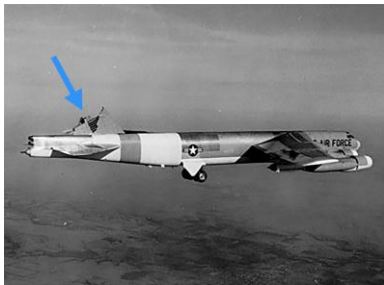
# The Hidden Dangers Of Mountain Wave

By [Colin Cutler](#) 01/21/2016

source: <http://www.boldmethod.com/learn-to-fly/weather/how-mountain-wave-forms-and-the-dangers-it-can-create/>

What happens when you combine strong winds and a mountain range? When the conditions are right, this:

And it can do this to you



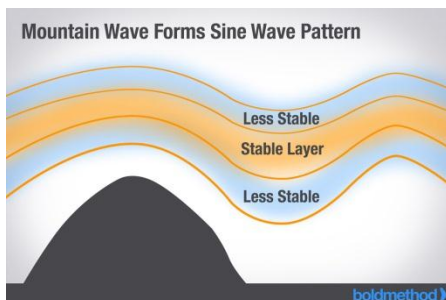
...or this:



But there's more going on than just funny looking clouds and broken airplanes.

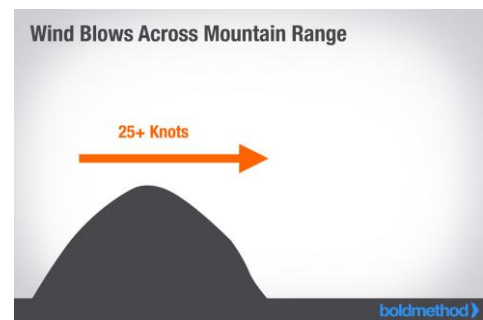
## How Mountain Wave Forms

Mountain waves form when strong winds blow across a mountain range. The winds usually need to be at least 25 knots at the mountain peaks, and they need to blow perpendicular to the range.



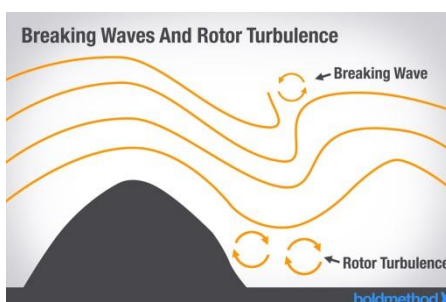
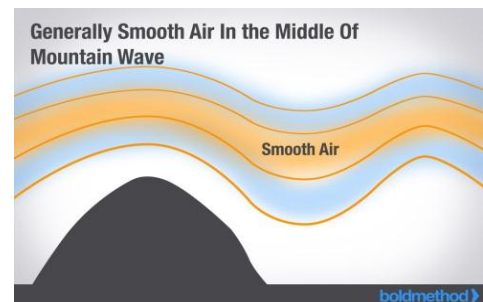
But wait, there's more.

There needs to be a certain stability in the atmosphere for it all to work. Typically, a stable layer of air needs to be sandwiched between two less stable layers of air. When it all comes together, you get what looks like a massive sine wave, flowing up and down for hundreds of miles.



## From Severe Turbulence To Smooth Air

When you're flying in the middle of mountain wave, the air is usually moving up and down smoothly. Gliders operating in the upward moving portion of the wave feel almost nothing, except for the incredible lift it can produce - usually between 300 FPM and 1,200 FPM (up to 8,000 FPM). Airliners tend to experience a little more turbulence, because they're flying through it so quickly. But the turbulence is still typically light.



But at certain spots of mountain wave, things can get a little (or very) bumpy. If a mountain wave is strong enough, parts of it can break away from the main flow, creating breaking waves and rotors.

Breaking waves and rotors can create severe or extreme turbulence, which is dangerous for any aircraft, like the B-52 you saw earlier.

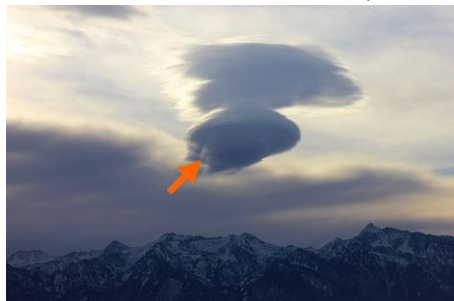
The above shown B-52 was on a weather research mission, and flew into mountain wave turbulence. The turbulence got so bad, the tail came off. Fortunately, the B-52 was able to keep

flying and landed safely. The DC-8 flew into mountain wave turbulence, and an engine came off in-flight.

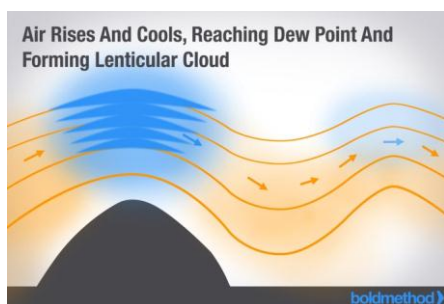
## How To "See" Mountain Wave

While you can't "see" mountain wave with the naked eye, if there's enough moisture in the air, you can find some clues.

The first is a lenticular cloud, which looks like this: or this:



So what's going on with these crazy looking clouds? If there's enough moisture in the air, and the air at the top of the crest of the wave reaches the dew point, a cloud will form. And it forms a lenticular cloud, to be specific.



What's really interesting is that even though lenticular clouds appear to stay in a stationary position, the air particles are constantly moving through them.

Rotor clouds are another sign of mountain wave. When there's enough friction between a mountain wave and the earth's surface, rotors can break off, creating a circular rolling motion.

<https://youtu.be/7yx0dBN0qac>

And while they look impressive, you should stay far away.

## Good For Gliders, Bad For Just About Everyone Else

Mountain wave forms when strong winds blow across a mountain range, causing a wave-like pattern and extending for up to hundreds of miles downwind of the mountain range. And while mountain wave can be beneficial for gliders as a form of lift, breaking waves and rotors can create severe to extreme turbulence, which can make for a very bumpy, and even dangerous flight for just about everyone else.