

What is all that bumpiness going on lately?

May 2010

What is all that bumpiness going on lately? Well, if you have flown recently in the Bay Area, you have probably been tossed around quite a bit. Turbulence...it is probably the most dreaded condition of commercial passengers, and many general aviation pilots are not fond of it either.

What is turbulence and what causes it?

Simply stated, *it is air moving up and down*. We feel it because we happen to be in an airplane in an airmass with air movement. Turbulence is air movement that normally cannot be seen. It may occur when the sky appears to be clear and can happen unexpectedly.

What typically causes the light to moderate turbulence you may experience in the Bay Area? The most common causes are thermals, local terrain features, cold or warm fronts, and low altitude temperature inversions.

We will focus on the most common causes in the Bay Area...**thermals and terrain features**.

A **thermal column** (or **thermal**) is a column of rising air. Thermals are created by the **uneven heating** of the Earth's surface from **solar radiation**. The Sun warms the ground, which in turn warms the air directly above it. The sun warms different surfaces more than others - asphalt, concrete, grass, and water - all heat differently. The warmer air expands, becoming less dense (lighter) than the surrounding air mass. The mass of lighter air rises, and as it does, it cools due to its expansion at lower, high-altitude pressures. It stops rising when it has cooled to the same temperature as the surrounding air. Associated with a thermal is a downward flow surrounding the thermal column. The downward moving exterior is caused by colder air being displaced at the top of the thermal.

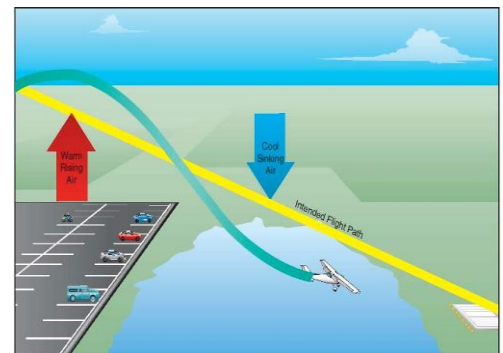


Figure 10-14. Currents generated by varying surface conditions.

So imagine around the Bay Area thousands of columns of air being heated at different rates. Combine that with uneven terrain features, and you get turbulence. The next time you encounter turbulence...be comforted and remember it is probably just air moving up and down caused by radiational heating and terrain. Easier said than done. The best thing to do is ride with it.

How do you keep informed about turbulence?

Prior to flight:

Pull up the Area Forecast (FA) on DUATS or the NWS, or 1-800-WX-Brief and talk to a briefer

In flight:

HIWAS - tune in a local VOR with HIWAS capabilities

Flight Watch - 122.0

To find out more about the different intensities of turbulence and Pireps - go here: [AIM 7-1-23](#) (go 2/3's of the way down in the document)

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