

# MAGNETIC VARIATION

Solar orientation relates an object, building or site to **true north** (and true south), points which are defined by the earth's axis of rotation.

The compass needle points to **magnetic north** rather than **true north**. The needle will point east of true north (easterly variation) or west of true north (westerly variation) since magnetic north and true north rarely coincide.

The first map pictured at right, which comes from the Sun Angle Calculator User's Manual (1.8 MB PDF download: <http://www.sbse.org/resources/sac/index.htm>), was printed in 1951 and included with the original Sun Angle Calculators. It provides values for magnetic variation for the contiguous United States.

However, the magnetic north pole is not stationary, and has moved since then. This movement alters the magnetic variation of your location over time.

As can be seen in the second map at right from 2001 (borrowed from the U.S. Government website dealing with geomagnetism), the location of the **agonic line** (a line where magnetic north and true north are aligned -  $0^\circ$  magnetic variation) has moved from its location off the east coast of Florida to a point near New Orleans. In the 50 years separating these two maps, the magnetic variation in the Dallas-Fort Worth area has changed by nearly  $5^\circ$  (from over  $9\frac{1}{2}^\circ$  of easterly variation at the UTA campus in 1951 to a  $4^\circ 51'$  easterly variation in February 2006).

The direction of true north can be determined with a compass if you know your current magnetic variation. Current or previous magnetic variations of your locality can be obtained by consulting the website: <http://www.ngdc.noaa.gov/seg/geomag/jsp/Declination.jsp>. Canada also maintains a website dealing with these issues. The site contains some interesting historical background on geomagnetism: [http://gsc.nrcan.gc.ca/geomag/field/mdcalc\\_e.php](http://gsc.nrcan.gc.ca/geomag/field/mdcalc_e.php).

