



Aquatic Consulting Services

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Boating Tip #7: Course Correction

The magnetic north pole moves. The true north pole is at 90° north latitude. Currently the magnetic north pole is at 74°N 101° W, in Canada below the true north pole. True and magnetic poles do not coincide, nor do true and magnetic meridians. The difference between the true and magnetic meridians is called variation. Because you read true course on a chart, but steer the compass course, you need to know how to convert from one to the other.

Variation

Variation is the angular difference between magnetic north and true north. Nautical charts are drawn using true north. Always add westerly variation and subtract easterly variation when converting from true to magnetic, and vice versa when converting from magnetic to true. To find variation in the area where you are sailing, look at the center of the compass rose on a chart.

Compass Rose

The compass rose is a set of concentric circles printed on a chart. The outer circle has 0 (zero) at true north and is marked with a star. The inner circle shows magnetic north and is marked with an arrow. The difference between the 0 on both circles is the magnetic variation at the location where the compass rose is positioned. The variation east or west is labeled in the center of the compass rose along with the annual rate of change in variation. Always use the compass rose closest to the area where you are plotting on the chart.

Deviation

Deviation is the onboard electrical or magnetic variation, or the magnetic error caused by the vessel and its mechanical and electrical equipment. Deviation changes as equipment is moved or brought aboard. Deviation must be corrected for each heading. A compass can be “swung” to determine deviation at each point. You can also find the deviation at each point by comparing the reading on your magnetic compass from the true heading displayed on a GPS or auto pilot fluxgate compass.

TVMDC

TVMDC (True Variation Magnetic Compass add West) is used for uncorrecting the compass to determine the compass course to steer. When converting from the true course plotted on the chart to the compass course you want to steer in order to get to your destination, use the memory aid “True Virgins Make Dull Company add Whiskey”. Add westerly variation and subtract easterly variation when converting from a true to magnetic course.

CDMVT

CDMVT (Compass Deviation Magnetic Variation True add East) is used for correcting the compass to determine the true course to plot. When converting from compass course to true course, use the memory aid “Can Dead Men Vote Twice at Elections”. Add easterly variation and subtract westerly variation when converting from a magnetic to true course.

Finding Compass Error

Compass error is the sum of variation and deviation, or the difference between true and compass readings. To find compass error, add the variation and deviation and indicate the direction east or west of the error. For example, if variation is 13° E and deviation is 1° W, the compass error is 12° E.

Range

A range is two objects identified on a chart which line up with the bow (or beam or stern) of the vessel.

To find deviation from a range, find the true direction from one charted object to the other. Uncorrect from true to compass using TVMDC. Fill in true direction and magnetic variation from the chart to find the magnetic bearing. Fill in the compass bearing from your handheld compass. The difference between the magnetic and compass bearing is the deviation. Find direction of the error using the memory aid “If the compass is best, the error is west. If the compass is least, the error is east.”