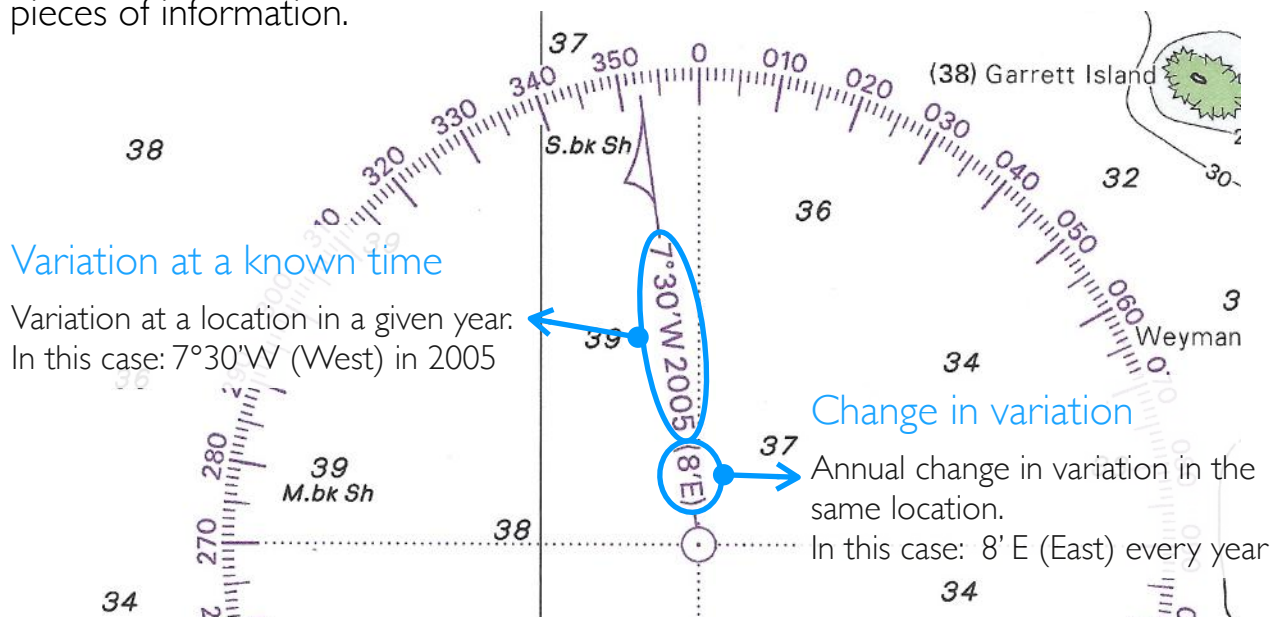Variation is the term used to describe the difference between True North, the point at the top of the globe where the latitude lines meet, and Magnetic North, the direction a compass points. True and Magnetic North are not only in different places, but Magnetic North also moves. As navigators, we rely on our compass for direction. To translate a compass bearing (aligned to Magnetic North) to a chart bearing (aligned to True North), we must know the current difference between True and Magnetic North.

Charts have the necessary information to calculate variation appropriate for their coverage area. They provide the local variation at a given date (year), and the amount and direction variation changes yearly on a Compass Rose.

We can calculate today's variation for that area on that chart using these two pieces of information.

Variation at a known time

Variation at a location in a given year.
In this case: 7°30'W (West) in 2005

Change in variation

Annual change in variation in the same location.
In this case: 8' E (East) every year

Calculating variation now

Step 1: Number of years to account for
In 2020, we would need to account for 15 years of change (2020 - 2005, the year given on the compass ross, is 15 years).

Step 2: Calculate the amount of change
The rose tells us that variation changes by 8' E (East) annually. 15 years of 8'E change is a total of 120'E (15 years × 8 minutes).

Step 3: Convert minutes to degrees
120 minutes of change = 2° (There are 60 minutes in every degree), so the change since 2005 is 2°E (East).

Step 4: Calculate variation now
Variation in 2005 was 7°30'W (anti-clockwise from the north) and changed 2°E (clockwise), reducing the westerly variation. 7°30'W - 2°E = 5°30'W