

FIRST BOAT

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[Navigation: Set and Drift, Part 2](#)

In this weeks column, Vin Pica continues his explanation of one of the more challenging aspects of nautical navigation...

Guest blog by [Vincent Pica](#)



Navigating is easier when you understand Set and Drift. Photo © [Nautical Sites Media](#)

When we started the [2-part series on Set and Drift](#), we noted that there is a precise way to calculate the correct amount of “leaning in” to do in that column. Here is it and, despite the “math” part of it setting some hearts racing, it is easy...!

Set and Drift

Take a quick look at the diagram below from last week.

Recall the setting. Your pal said, "make your point of sail 200° magnetic and put the hammer down for 60 nautical miles... plug 39° 40' 29" N and 071° 14' 36" W into your GPS and fish all night..."

Now, armed with the knowledge about set and drift from last week, you decide to “do the math.” What math needs doing?

The Four Corners

The four corners of the solution of what Course To Steer (CTS) to actually ensure that your compensation for the set and drift of the current are the following:

- [1] the desired course (200° above)
- [2] speed of your boat (let's say 20 knots)
- [3] the set (direction) of the current
- [4] the drift (speed) of the current

What? How do you figure the last two when that is what you are looking for??? Sometimes, the answer is like a puzzle – if 'x' is true, what else has to be true to make that so...?

If you've ever read an "Eldridge", you know that sets and drift tables are actually available in hardcopy for certain locations – but you can do it yourself. Here's how.

The scenario we set up above is that you've left Moriches Inlet on a heading of 200° magnetic at 20 knots. So, the rhumb line from Moriches Inlet to the specified location (39° 40' 29" N x 071° 14' 36" W) is just a straight line from the Inlet ("a", in the diagram) to the Hudson Canyon. After two hours, you expect to be at "b" – but you're not there. You determine that, per your GPS or other navigation technology/technique, you are at "c!" Clearly, the angle of the line from "b" to "c" is the set (direction) of the current! From the prior article, that's the guy pushing you away from the coffee shop! Let's call that 135° magnetic per the diagram.

But how hard is "he" pushing you?

Measure the distance from "b" to "c" (in nautical miles since we are measuring speed in knots!) and divide it by the number of hours that we took our measurement over (two, in this example.) So, if the distance from "b" to "c" is 5nm, and the time in the example is two hours, the answer is 2.5, i.e., the drift (speed of the current) is 2.5 knots. That's how hard the "guy" is pushing you away the "coffee shop!" Well, we now have all four numbers!

- [1] the desired course - 200° above (a given)
- [2] speed of your boat - 20 knots (a given)
- [3] the set (direction) of the current – 135° mag (derived)
- [4] the drift (speed) of the current – 2.5 knots (derived)

In other words, if it is true that we are at "c" when we thought we are running the rhumb line at 200° mag at 20 knots, then it has to be true that the set is 135° mag and the drift is 2.5 knots!

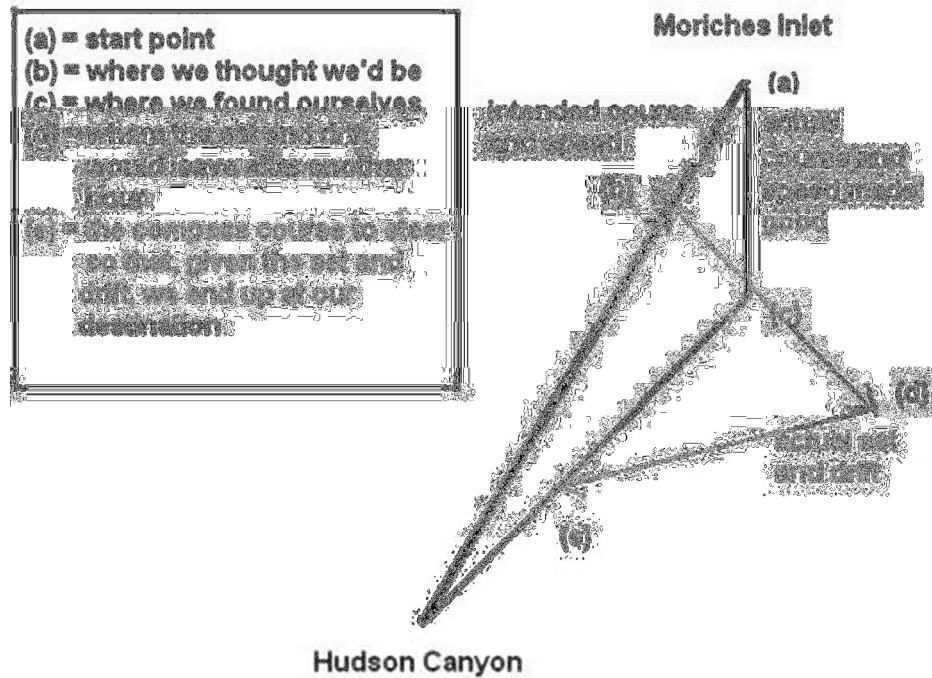
What else have we learned? Well, the distance from "a" to "c" is our actual Course Over the Ground (COG) and, if you divide that by two hours (per our example), you get the actual Speed Over the Ground (SOG).

That wasn't so hard, was it? But now what? How hard do we lean in...?

First, we determine what is the new rhumb line from "c" (where we actually are) to the Hudson Canyon at 39° 40' 29" N x 071° 14' 36" W. If there were no set and drift, that is the course to steer. But what course do you steer? First, extend the "b" to "c" line so that it extends far enough to encompass another hour (called the One Hour Method) of set and drift. This is marked as "d." At 20 knots of speed (a given), you measure off 20 nms from your latitude (NOT longitude) scale along the chart's edge and swing your dividers so that it crosses the original rhumb line – marked as "e" in our example. Draw a line from "d" to "e" and that angle (~255° in the drawing) is your Course To Steer! You're your own GPS now!

Clearly, a GPS does this calculation continuously and with space-age accuracy. But what if it fails...? And you aren't on your way to the Canyons. You're on your way home...

Would you want to bet your life on a couple of double-AA batteries?



BTW, if you are interested in being part of USCG Forces, email me at JoinUSCGAux@aol.com or go direct to the D1SR Human Resources department, who are in charge of new members matters, at [DSO-HR](#) and we will help you "get in this thing..."