

For some time I have mulled over the issues of attempting to route through significant areas of doldrums, or indeed any large masses of low wind speed.

In my thinking, the most significant aspect of this circumstance is the nature of the routing algorithm. For the sake of the discussion, let's use this race as an example, because it's a good one.

We've left Victoria and we're heading up the coast of NSW and into Queensland waters in good winds. I'd usually be doing two routing tasks. One would be a long range routing using a 16 day forecast and probably even extending those last wind conditions to get a route to the finish, albeit highly speculative to say the least. This route would show a recommended course through the doldrums. I might even get a higher resolution grib for the doldrums area, to enable a more accurate routing through here. At this stage let's say the recommended long range route passed just off the easternmost tip of New Guinea. In addition I'd then do a short range routing to cover the next 24-48 hours along the long range course in more detail.

Now I think all the routing fraternity are familiar with the experience of watching the long range routing fluctuate on a daily basis, with recommended routings being say east of New Guinea, then west, and then far to the east of New Guinea and even east of the Solomons. Some of these variations are perhaps the result of varying wind conditions thousands of miles north of the doldrums and closer to Osaka, but in the main they are variations based on what has been happening in the doldrums from one day to the next.

Now, long range routings across trade wind areas of the major oceans don't usually show such major oscillations of preferred routes, except perhaps when the router tries chasing a fast moving low pressure system, and interestingly, I think this circumstance has great parallels with what I'm trying to describe here, as we will see shortly.

So what is going on with such wild swings of the routings through the doldrums? Two things I think. Firstly, the router can only work with the data in the grib which it is given. Sure this data is evolving over the time scale of the grib, but the router treats it totally as gospel. So with amazing dexterity, it plots a preferred course through the doldrums, which, if you test it out a bit by inserting a waypoint some distance off to the east or west of the preferred route, you might find the router has determined that you are perhaps say a good 24 hours faster through the doldrums by taking its preferred path rather than via either of the other suggested waypoints.

This is well and good except that when the next grib comes in 6 hours later, its suggested path based on the new data is perhaps 300 miles east or west of the previous routing through the doldrums. In

a trade wind area, the new data wouldn't produce such wild variations in routing outcomes, more perhaps just a refinement a bit more east or west. But data in the doldrums always varies wildly within a set range of low wind speeds, but this is enough to wildly swing the suggested route, because the doldrum areas are so huge. And this brings up the second reason behind the wild swings.

In fact the data which is changing is mostly data about wind conditions varying between say about 1 and 3 knots, so only a couple of knots of wind strength difference. But this tiny difference is all the mathematical algorithm in the router needs to make a suggestion this afternoon to head near New Guinea, and then tonight, change the suggestion to a course 300 miles more easterly. What was 3 knots of wind off the eastern tip of New Guinea this afternoon dropped to a predicted 1 knot tonight, so just a 2 knot change of wind speed led to a suggested course change of hundreds of miles to the east, because out there the wind had picked up from 1 knot to 3 knots. In this instance, the two predicted times to cross the doldrums might only have amounted to 5 to 10 minutes, but again that is enough for the router to make its suggestion of a radical course change.

A further interesting issue here is (and I don't know enough about router algorithms to explain it or be sure about it) that when you are doing a long range routing covering a period of a couple of weeks or more, I suspect the grain of the router calculations is such that it is only roughly sampling doldrum wind strength over quite a large grid (perhaps every 20 or more miles) so probably it's not even a very good calculation of the best way through the doldrums.

All this is happening of course while we are routing still some 1000-1500 miles south of the doldrums, or say maybe a week away. Now I admit in the past to having slalomed my way towards the doldrums over the course of a week of sailing based on wildly varying router predictions over that time. Gradually of course as your position gets closer to the doldrums, the options start to narrow down, but you really have no way of telling whether your course is really faster or not until everyone emerges from the other side of the doldrums.

And indeed, once you are close to the doldrums, even if you suddenly feel you would be better off being a lot more east or west, by then you are sailing so slowly there's nothing you could do about it even if you wanted to.

So what to do about this conundrum? I have to say that I believe that it really is a lottery. I have attempted to use Pilot Chart data in the past and written this up in Solfans. But Pilot Chart data is just long term average wind speed, and this again will work well in the trade wind areas, just like the long range router will, but it will only be of assistance in the doldrums I think if you raced through there hundreds of times, or however many times it would take for the statistical average to start to

come into your favour. But for the particular circumstance of one particular year, you'd probably do as well to guess as to use the Pilot Chart averages.

So for me, about a week out of major doldrums such as that encountered in the M2O race, or something relatively shorter for smaller approaching low wind speed areas, I tend to just sail for max speed or max VMC. And to work out max VMC I take a calculated guess at my preferred course into and through the doldrums and I stick with it no matter what the router says for the week it takes me to get there and the following 3-5 days to get through it. In this race I determined to go just east of New Guinea and west of Bougainville when I was roughly just east of Brisbane, and for most of the week leading into there and up through the Solomon Sea it meant ignoring what the router was saying.

And that sometimes is not a bad thing! :)

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