# Golden Gate Endeavour

## Weather

Lee Bruce

Mick and Chris are near the end of an incredible journey that included huge obstacles—any one of which could've ended the adventure. From their blog, it's obvious that the row was meticulously planned, and that they had the skills to improvise when problems threatened to cut the row short. The weather is one element they couldn't influence—they could only plan for the "norm" and adjust as the inevitable "abnormal" occurred.

The planning included evaluating the average weather (climatology) and ocean current pattern for the North Pacific. Traditional climatology records are based on decades of data, and can be useful as long as we understand the limitations. Because the data are averaged over long periods, we can lose a feel for variations that may occur. Extreme events are masked, so we don't know how bad it could be in a worst-case scenario. The problem is compounded over vast ocean areas because—until recently—there has not been a reliable data collection process. Ship reports are sparse and tend to be clustered near traditional trade routes. Extreme events may go under-reported because the crew is busy dealing with the problem at hand, and does not have the opportunity to report conditions.

But for several years, a product has been available that uses sensors on a satellite to measure the wind over open ocean surfaces. The system (reading near real-time data collected by NASA/JPL's SeaWinds Scatterometer aboard the QuikSCAT satellite) scans the oceans twice each day, as the satellite revolves around the earth from pole to pole. Due to the footprint of the sensor, there is a shifting data gap with each pass that is widest near the equator. But overall, the information gathered is very good, and is a tremendous advantage over any previous data-gathering method.

Two of my favorite web sites that use QuickSCAT data can be used to review overall wind regimes for a passage. You can check wind observations on a daily/weekly/monthly basis for a particular year, or averaged over five years for a particular month.

Oregon State University has a site that shows monthly averages over a five year period, and also presents a wind rose to show the wind distribution.
http://numbat.coas.oregonstate.edu/cogow/index.html

Remote Sensing Systems presents QuickSCAT data as a monthly average for a specific year, a weekly average, or as raw daily data:
http://www.ssmi.com/qscat/scatterometer_data_monthly.html

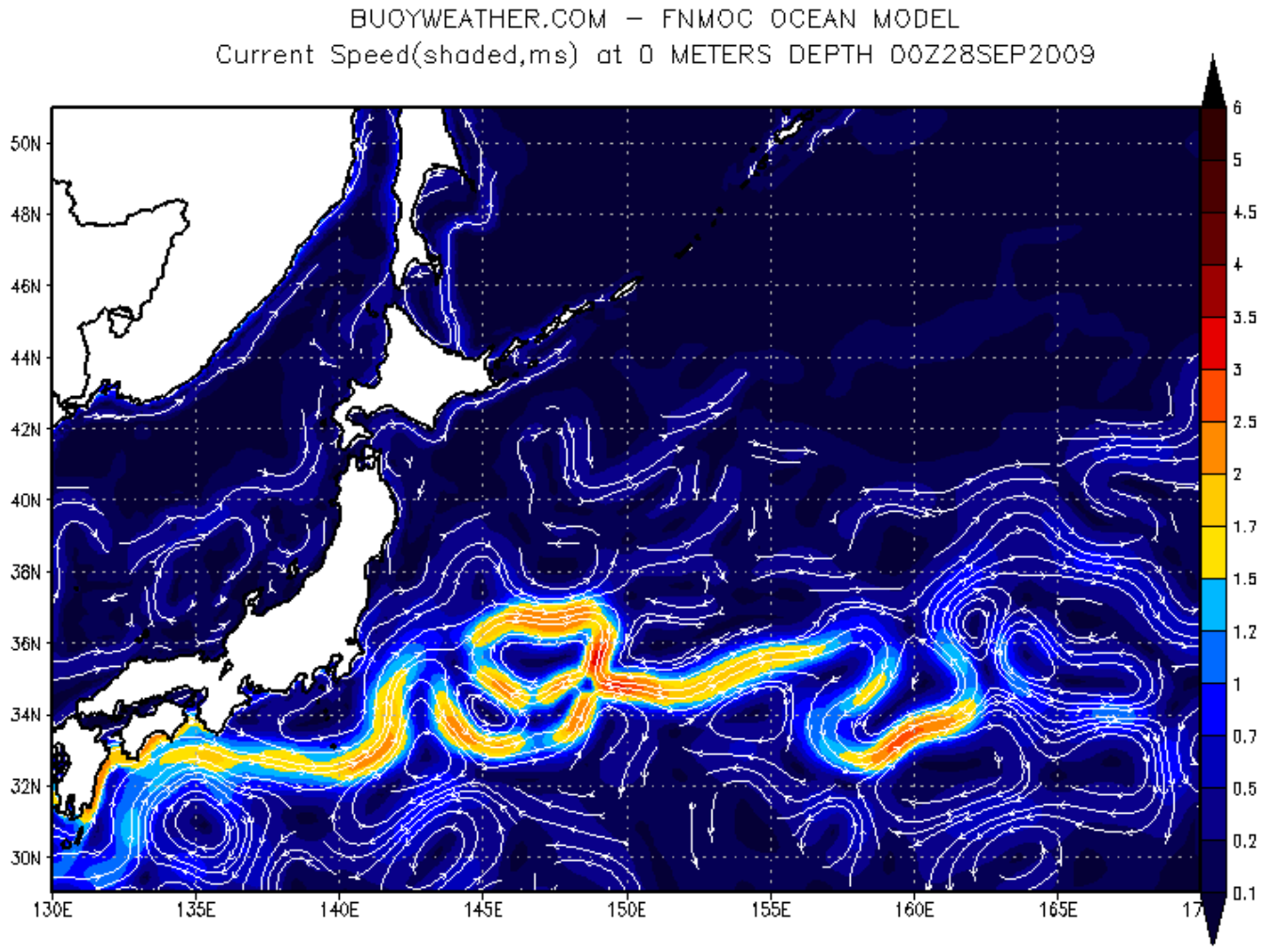

email: weather@oceanmet.com post: 26130 Glen Oak Dr., Wyoming, MN 55092 USA
telephone/fax(call first): USA 651 462 7274 mobile phone: USA 603 707 0128

Using the two web sites, I evaluated the Pacific Ocean route and worked out a plan to use the likely wind and currents to get the guys to San Francisco. But even though the scatterometer data are an improvement over previous options, they still couldn't tell me exactly what the guys would encounter over such a long row. We needed to stay in daily contact to adjust to changing conditions. Weather affects all aspects of the row, from the rowing schedule to meal plans, battery charging to clothes drying, and can push the psychological buttons of an exhausted crew.

And no matter what detail I could offer, it would be useless if I couldn't get the information to the boat. From the communications aspect, this project has been the most trouble-free of the 14 ocean rows I've worked on—kudos to the guys for putting together an excellent system, and for being able to repair it when needed.

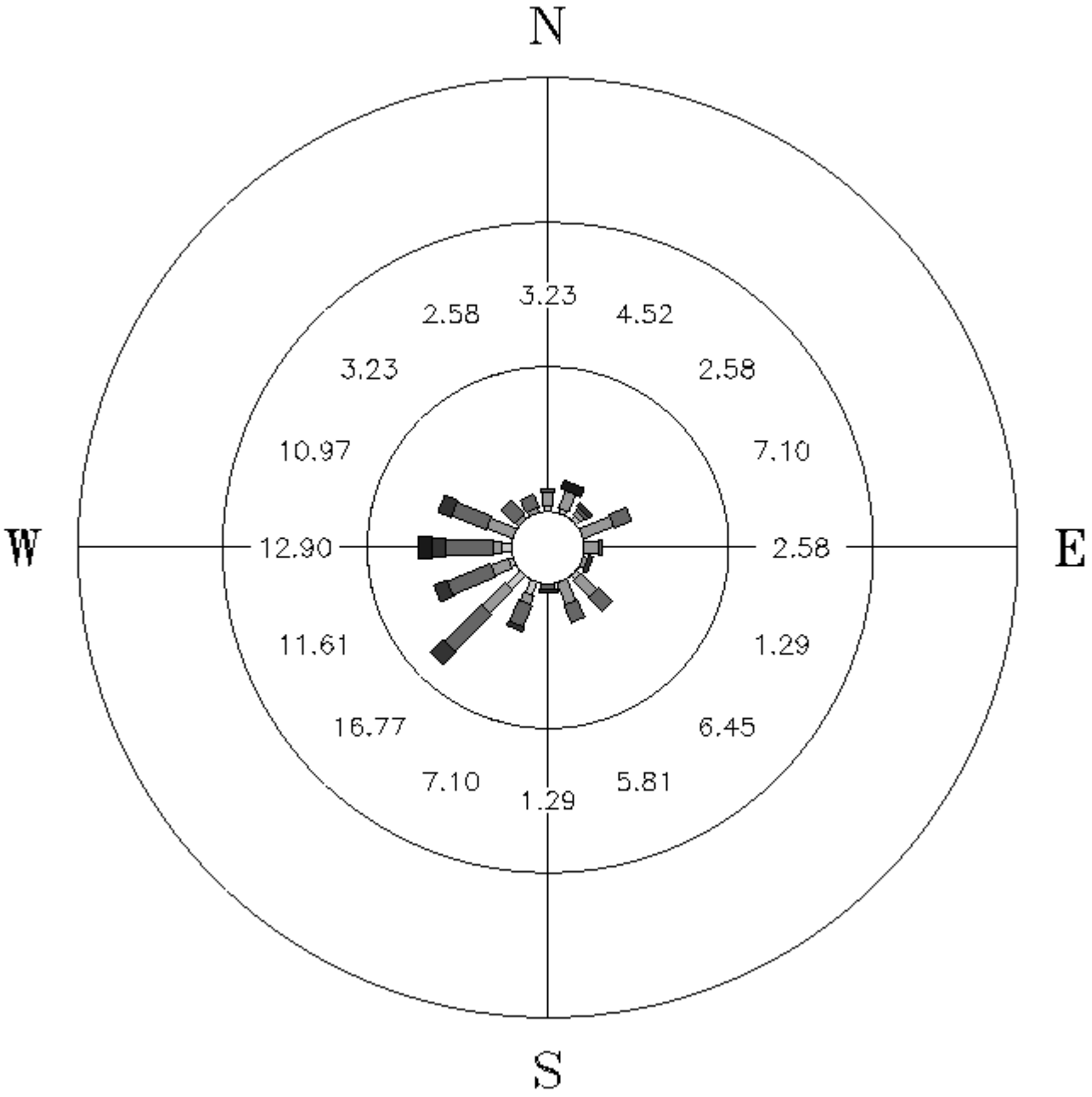
In addition to the wind and waves, the ocean surface current was a big player for this row. One of the world's largest currents—the Kuroshio—snakes eastward from Japan, and often helped push BO and the guys toward San Francisco. But even a well-established current can cause problems, because it does not flow smoothly. Rather, there are kinks and loops that can push a row boat in the wrong direction—even in a circle. The chart on the next page shows a snapshot of the Kuroshio current, to illustrate the problem:

# Kuroshio Current

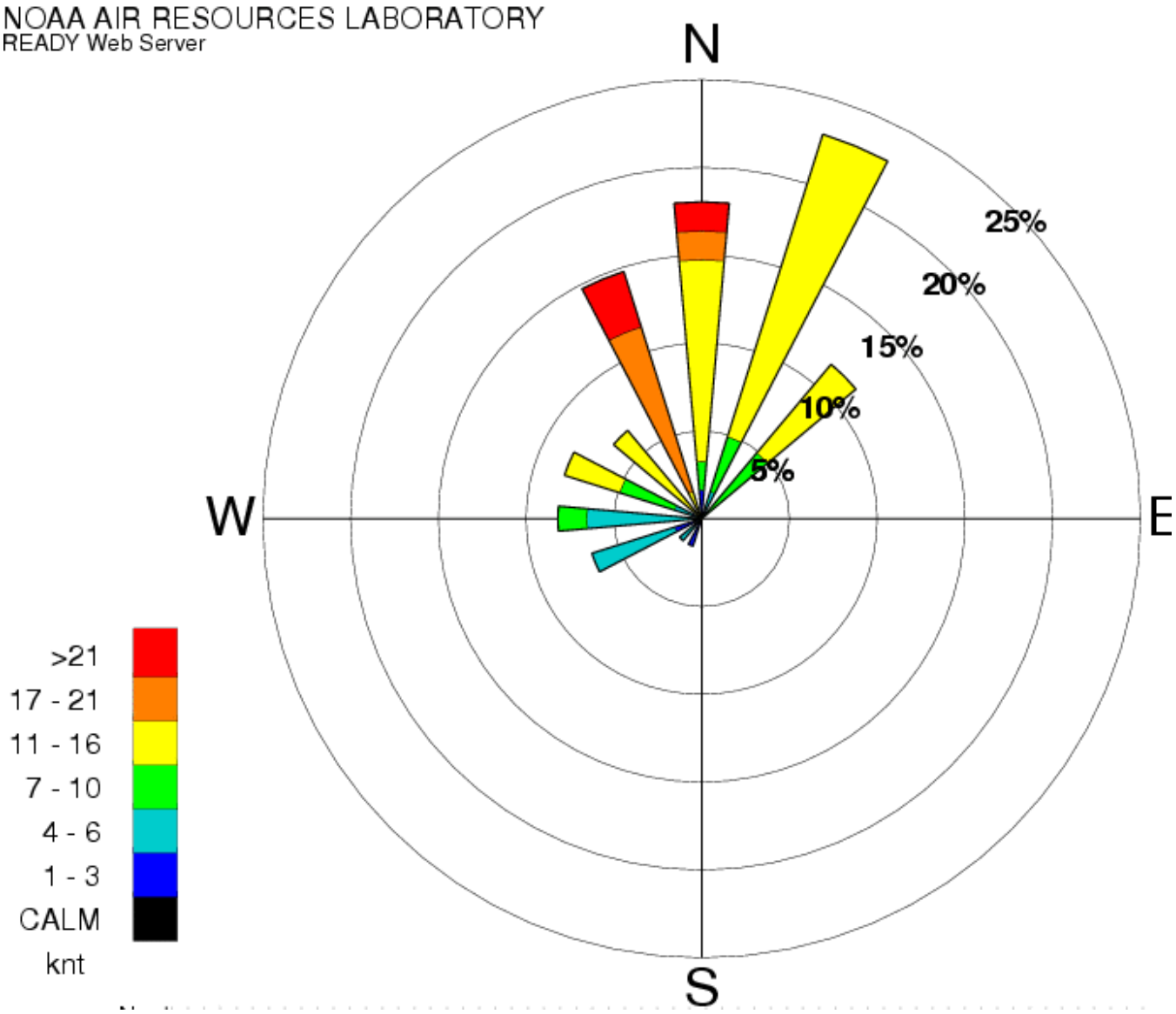



The standard description of the Kuroshio current shows a nice smooth West-to-East flow off the Japan coast, but the chart above shows the reality of a twisting current that is anything but smooth. Mick and Chris had to negotiate the ever-changing flow, trying to find the pockets of advantageous current and avoid the adverse portions. Add wind that often works against a plan, and you can imagine how difficult the task was.

# Comparing climatology to actual wind.




Just as the “average” current often does not match reality, the “normal” wind also is rarely aligned with day-to-day conditions. To illustrate the problem of what climatology suggests versus what can occur, the graphic above depicts the dispersion of wind reports over a five-year period for a point near 41N 140W (about 840nm to the WNW of San Francisco, along the projected path for Bojangles). As the graphic suggests, the wind should mostly be from the SW to WNW at about 11-17kt. But as the next chart shows, that isn’t necessarily the case…….




As Mick and Chris approached the 41N 140W mark, this is the wind forecast they faced. The wind was forecast to be mostly from the NNW to NNE, at speeds of 11-21kt, occasionally >21kt. As the previous graphic implied, the wind “should’ve been” mostly SW to WNW at about 11-17kt. Although climatology has some use, the actual weather often is significantly different, since climatology is an average of all of the extremes. That is why Mick and Chris were constantly adjusting their watch schedule to deal with changing weather.

The wind off California tends to be from the NNW much of the time, which is why Mick and Chris rowed to the north of San Francisco. The idea was to set up in a northern position to reduce the risk of being blown past San Francisco. To leave Japan and row to a specific location such as San Francisco is an unbelievably complicated plan. Even as I write this, there are difficult times ahead (negotiating local currents, wind, fishing fleets, fog, and commercial traffic), so none of us will rest until Bojangles is tied to a dock.

Rowing a boat across an ocean may seem straight-forward, but it involves myriad disciplines: boat fabrication, communications, system maintenance, nutrition, fitness, sleep management, navigation, psychology, etc. I can't begin to appreciate all that Mick and Chris have gone through, but I certainly do respect and admire it.

Lee Bruce
OceanMet