



The Gulf Stream Near the Rhumb Line Newport-Bermuda June 14, 2016
An Analysis of Conditions

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Since we last examined Gulf Stream location and structure in late May (see GS Note #2- posted on <http://Bermudarace.com>) satellite views of the rhumb line have continued to be limited by cloud cover. The few sitings we do have show very little change in the dominant meander and associated rings. The composite Satellite image for the 8th of June (Fig.1) shows an abundance of warm water just off the edge of the continental shelf. There are likely to be weak currents proceeding along the northerly, or inshore, edge of this water mass. The increase in water temperatures from approximately 60-65° F to 70 – 75° F is sometimes confusing leading one to believe that they are entering the main body of the Stream. The satellite image indicates that the main body of the Stream (the darkest red area) is in fact nearly 90 nm to the southeast of the point along the rhumb line where the warm water mass is first encountered or nearly 220 nm from Newport. Main body flows cross the rhumb line from west to east at nearly a right angle. Within 30-40 nm flows turn sharply to the south as part of the next limb of the meander. Beyond the main body the sea surface temperature (SST) image shows some rotational patterns close to the region that has previously been defined as a cold core ring. In this case this pattern may just as likely be an artifact of the compositing process. Additional data are needed to accurately define its exact cause.

The composite image from the 11th of June (Fig.2) shows a slight change in the position and shape of the northern edge of the main body of the Stream. The Stream is a bit closer to Newport (~205-210nm) and the crossing is more oblique resulting in flows proceeding from slightly north of west to south of east. The abrupt turn to the south has moved east by 40 nm. The warm water mass close to the shelf is well east of the rhumb line. Cloud cover obscures features to the south of the main body along the rhumb line.

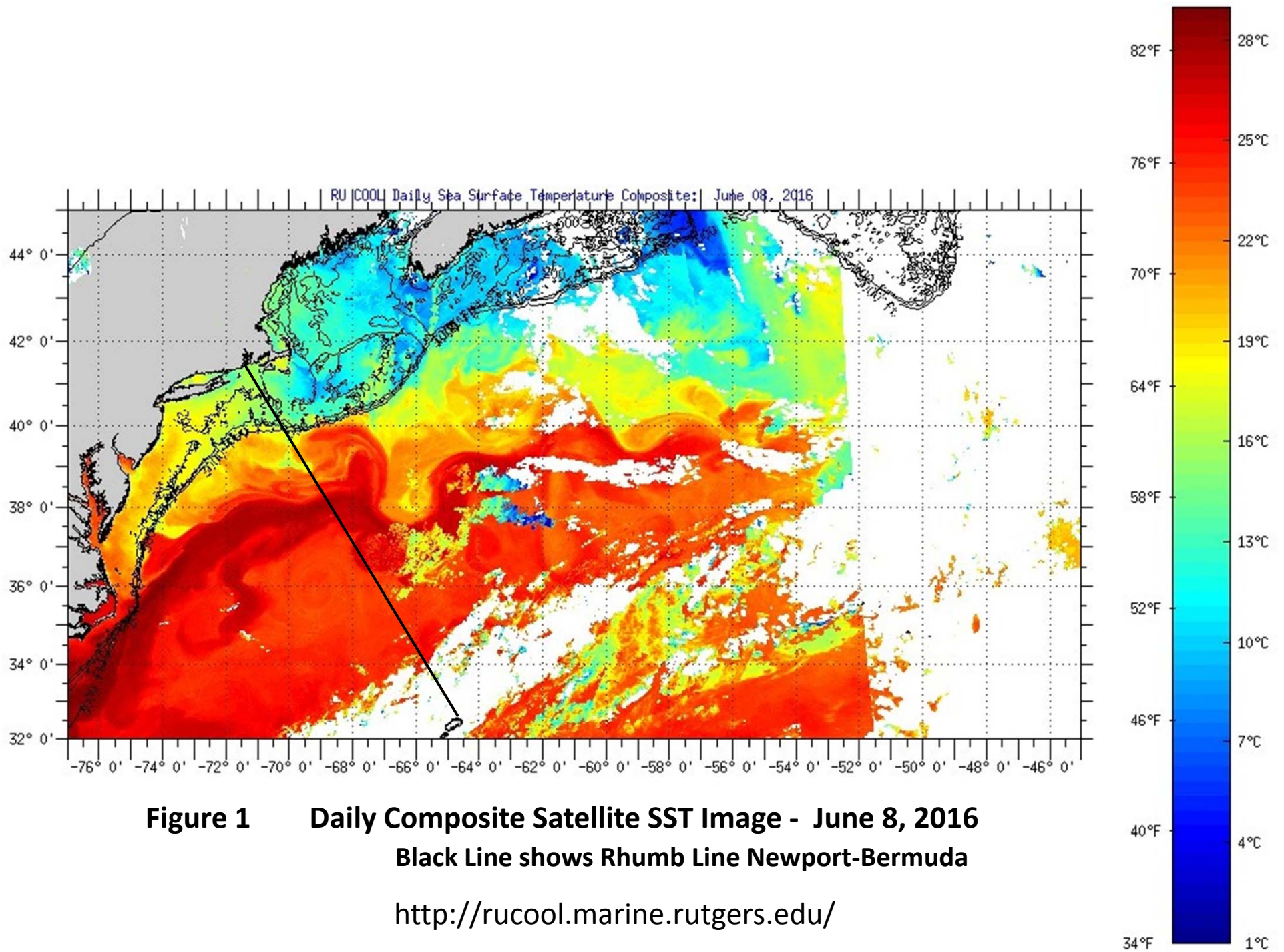
A far more detailed picture of probable Stream structure can be obtained using the altimetry based model of currents in the region of the rhumb line (Fig.3). The product for 13 June (allowing two days for data processing) shows the northern edge of Stream associated flows crossing the rhumb line approximately 240 nm from Newport. This is quite consistent with the SST patterns. Flows proceed from west to east along a gentle meandering track before turning abruptly to the south at a point approximately 90 nm east of the rhumb line. Maximum

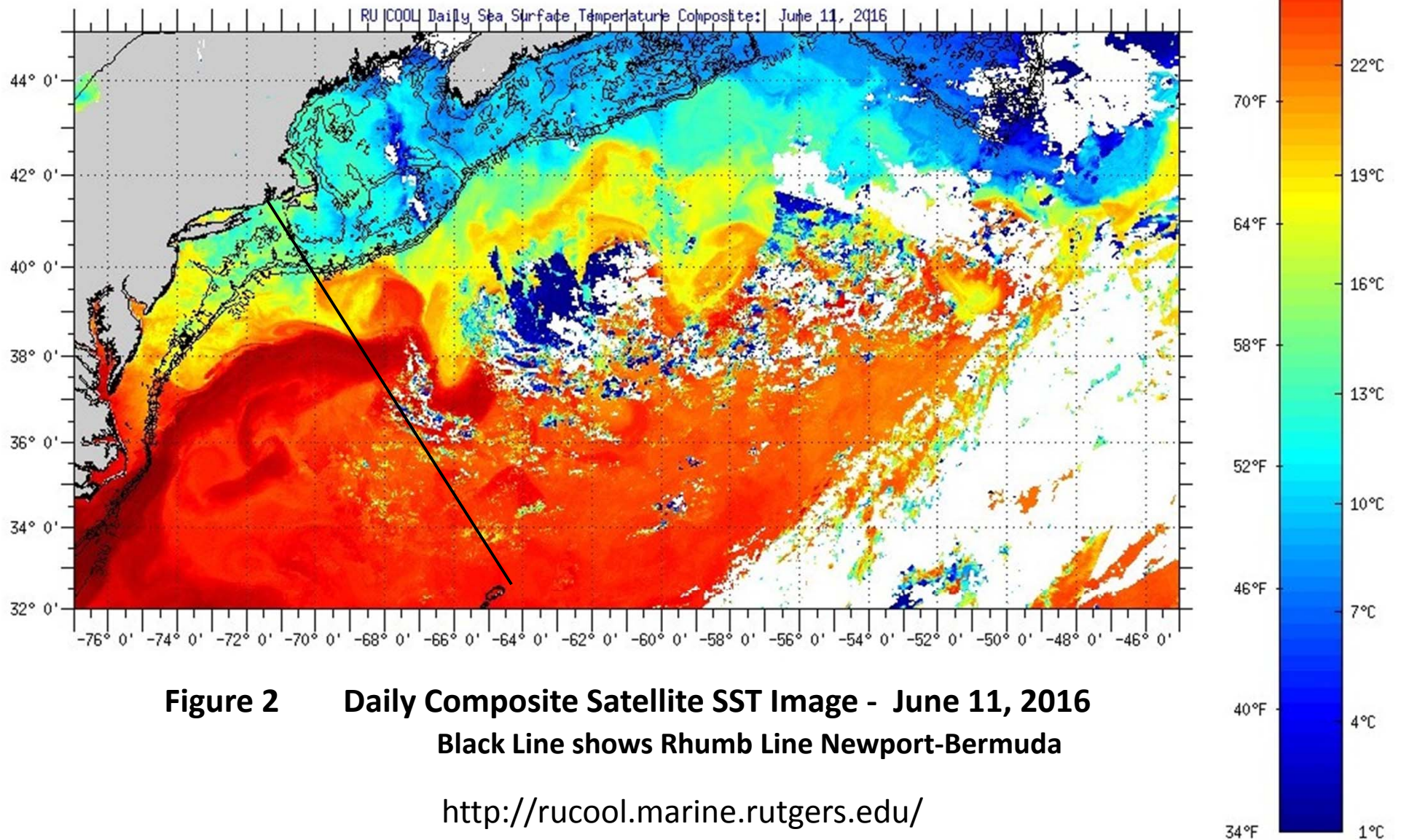
currents are expected to be in the range of 3-5 knots. Current magnitudes are not well represented on the altimetry plots which should be used primarily for location and flow direction.

To the south of the main body of the Stream the altimetry based model shows two prominent areas of rotation, one clockwise and the other counter-clockwise. The CCW feature is centered near 36° N 69° 10' W in contact with the rhumb line. This feature has shown little movement over the past month and will likely remain in place for the Race period as well as the post-Race period. Maximum currents should approach 3 kts giving it the potential to significantly affect routing.

Beyond the area of the CCW ring the altimetry based model shows several other areas of rotation to the west of the rhumb line. The area centered near 34° N 67° 15' W should be considered by boats approaching Bermuda from the west. This feature will likely drift to the west over the next few weeks. Currents are expected to be less than those in the more northerly ring with maxima in the 1 to 1.5 knot range.

Overall, the existing Stream configuration represents a bit of a challenge for the navigator enroute Newport to Bermuda. Optimum routing will very much depend on wind conditions over the course of the Race. This combination of Stream flows and meteorology will be discussed at the upcoming Skipper's Meeting this Thursday.





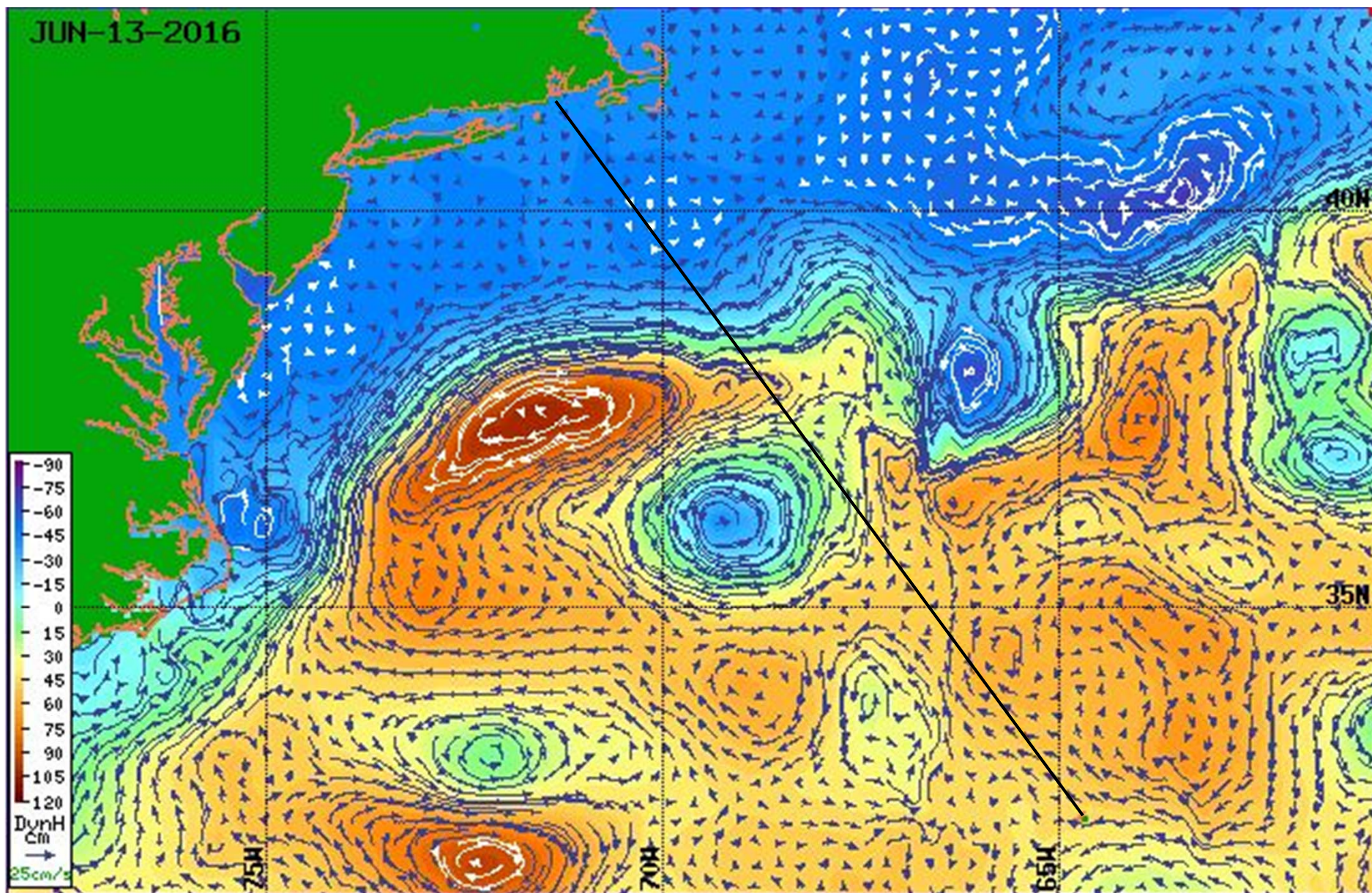


Figure 3 Satellite Altimetry Derived Surface Currents- NW Atlantic Region- June 13, 2016

Black Line shows Rhumb Line Newport-Bermuda

<http://www.aoml.noaa.gov/>