The Gulf Stream Near the Rhumb Line Newport-Bermuda June 4, 2026
An Analysis of Conditions

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The meandering form of the northern edge of the Gulf Stream shown in the Sea Surface Temperature (SST) image from Rutgers on May 13th (see GS Note #1) has continued to evolve over the past 2-3 weeks with details often obscured by clouds. By 21 May a prominent trough had formed to the west of the rhumb line (Fig.1 24hr composite image) resulting in a crest crossing the rhumb line near 38^0 N 68^0 45' W with near perpendicular flows from west to east across the line. It was accompanied by a more extensive trough to the east of the rhumb line leading to a massive crest similar to a breaking wave. This substantial alteration in form continues the rapid (and to some extent unusual) evolution in Gulf Stream form characterizing the system this year.

The altimetry based model of currents for 23 May (Fig.2) (displaying conditions for 21 May due to two day data reduction) shows the currents crossing the rhumb line to be slightly more oblique than suggested by the SST image. In less than 10nm to the west of the line adverse currents, for those enroute Newport to Bermuda, are encountered. In addition, the altimetry continues to show a prominent cold core feature centered near 35^0 30'N 68^0 45'W. This counterclockwise rotating ring has been evident over the past few months displaying little westerly movement. This unusual situation appears to be the result of some slight entrainment in the flow of the main body of the Stream which has effectively offset the density driven transport to the west. It seems likely that it will continue to exert some influence on the optimum route to Bermuda after 19 June.

From 23 May to 1 June satellite infrared images of the Stream were often obscured by cloud cover. The image of 1 June (Fig.3) shows the prominent trough to the west of the rhumb line producing flow southwest to northeast flow across the line suggesting that the meander has progressived, but slightly to the northeast. The altimetry for this day (Fig.4) shows a more complicated flow pattern with the northern limits of the main body of the Stream flowing from southwest to northeast across the rhumb line while the southern portion crosses at a near right angle. The cold core ring remains stationary. Overall the combination continues to produce a large area of adverse northwest going currents extending for more than 200nm along the rhumb line.

In addition to the complexity of the images provided by the combination of satellite IR observations and the altimetry based model the navigator is confronted by the variety of results provided by NOAA's Global Real time Ocean Forecast System (GRTOFS) and the European Center's Copernicus Products or the Mercator Model. Analysis of the NOAA product (Fig.5) requires careful

study with the major feature somewhat obscure. The meander is shown as is the ring but both with minimal detail. The extent to which the model accurately simulates actual flows is difficult to determine. The Mercator result appears to better represent the consensus (Fig.6) at least for the day in question. The observed problem with this model is that the results are often "ephemeral" changing substantially over short periods of time. Viewing the video (as the results are displayed) one has the impression of an aerial view of a stream flowing over a bed. The Gulf Stream flows certainly display similar characteristics but Stream flows also include masses of water the retain properties distinct from their surroundings. These properties, such as water temperature and salinity affect local density characteristics and the associated flow also distinct from the surrounding flow. In many cases, such as the cold core ring that has persisted for several months and is characterized by counterclockwise flow, the Mercator model does a poor job representing these distinct characteristics. On many occasions the model shows this area rotating clockwise for a period followed by a period of counterclockwise rotation. This is not realistic behavior.

The development of an optimum routing strategy for this year's Newport Bermuda Race requires careful observation of the Gulf Stream and weather conditions over the next two weeks. Given the behavior observed over the past few months it seems likely that Stream form and placement may experience substantial change. Similarly the weather conditions may display high frequency variability and prove difficult to forecast due to developing upper level patterns. Careful study of the 500mb contours is recommended. It should be an interesting time. More to follow.

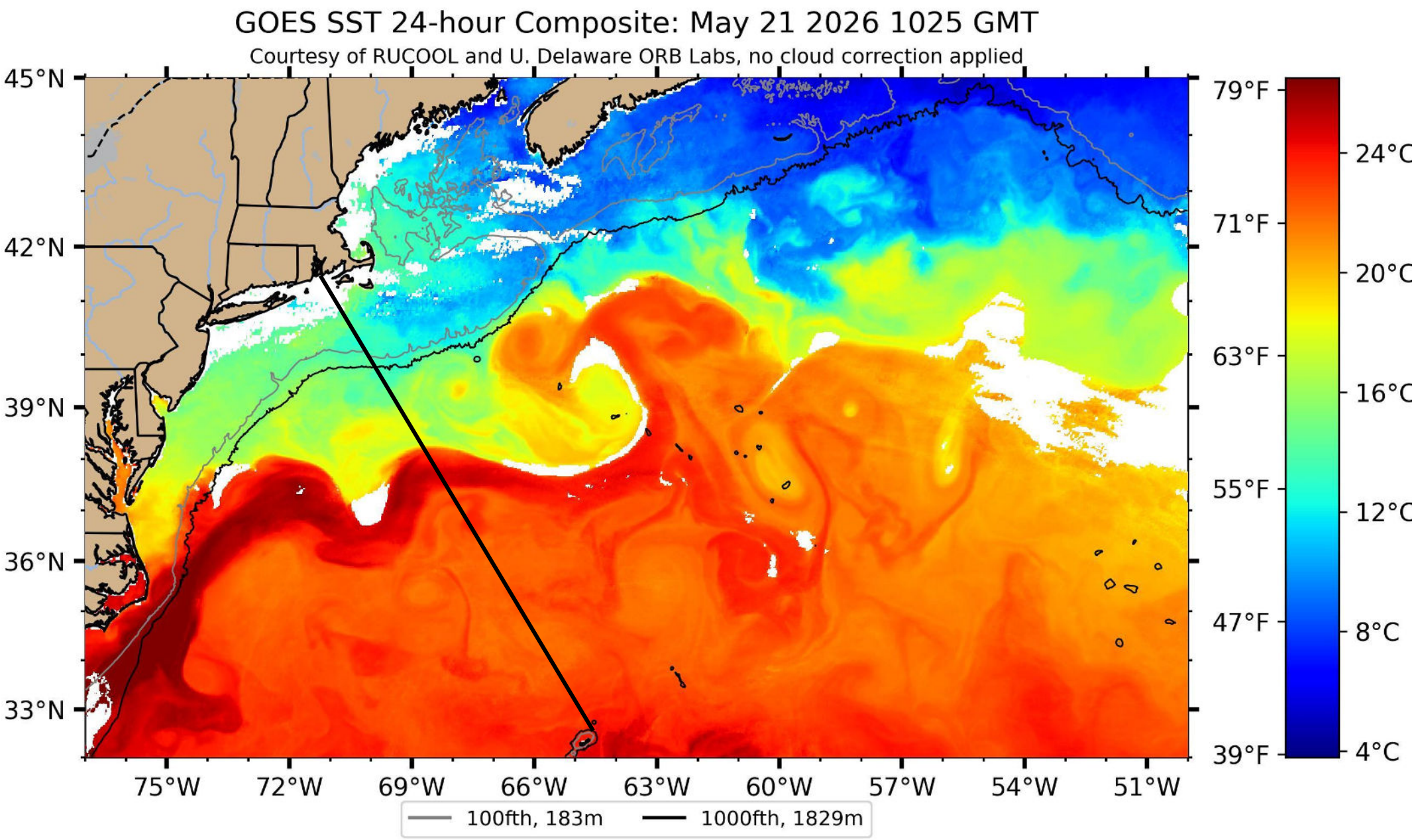

Figure 1 Gulf Stream Sea Surface Temperatures Showing Meandering North Wall Pattern
Black Line Represents The Newport to Bermuda Rhumb Line

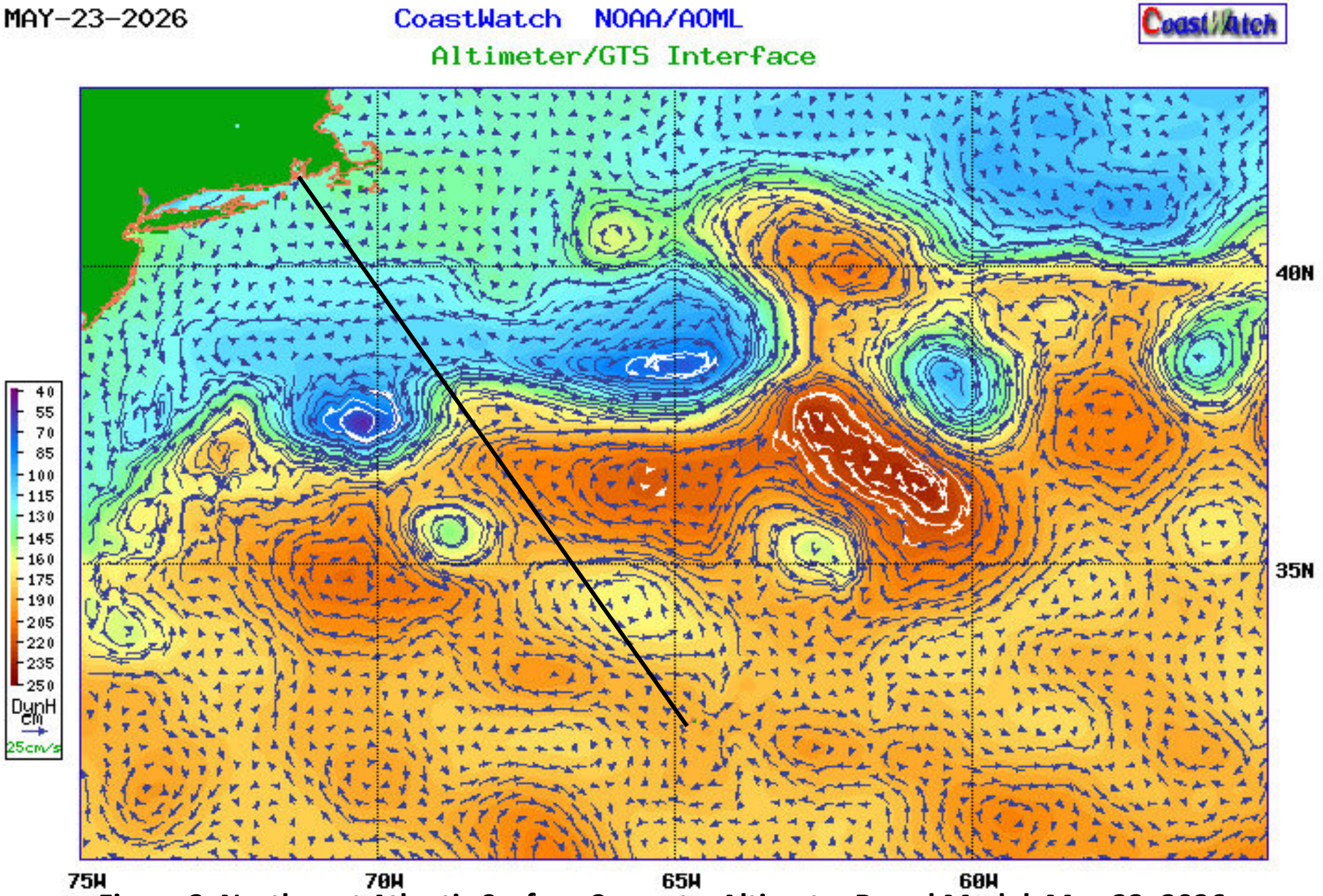

Figure 2 Northwest Atlantic Surface Currents- Altimetry Based Model May 23, 2026
Black Line Represents The Newport to Bermuda Rhumb Line

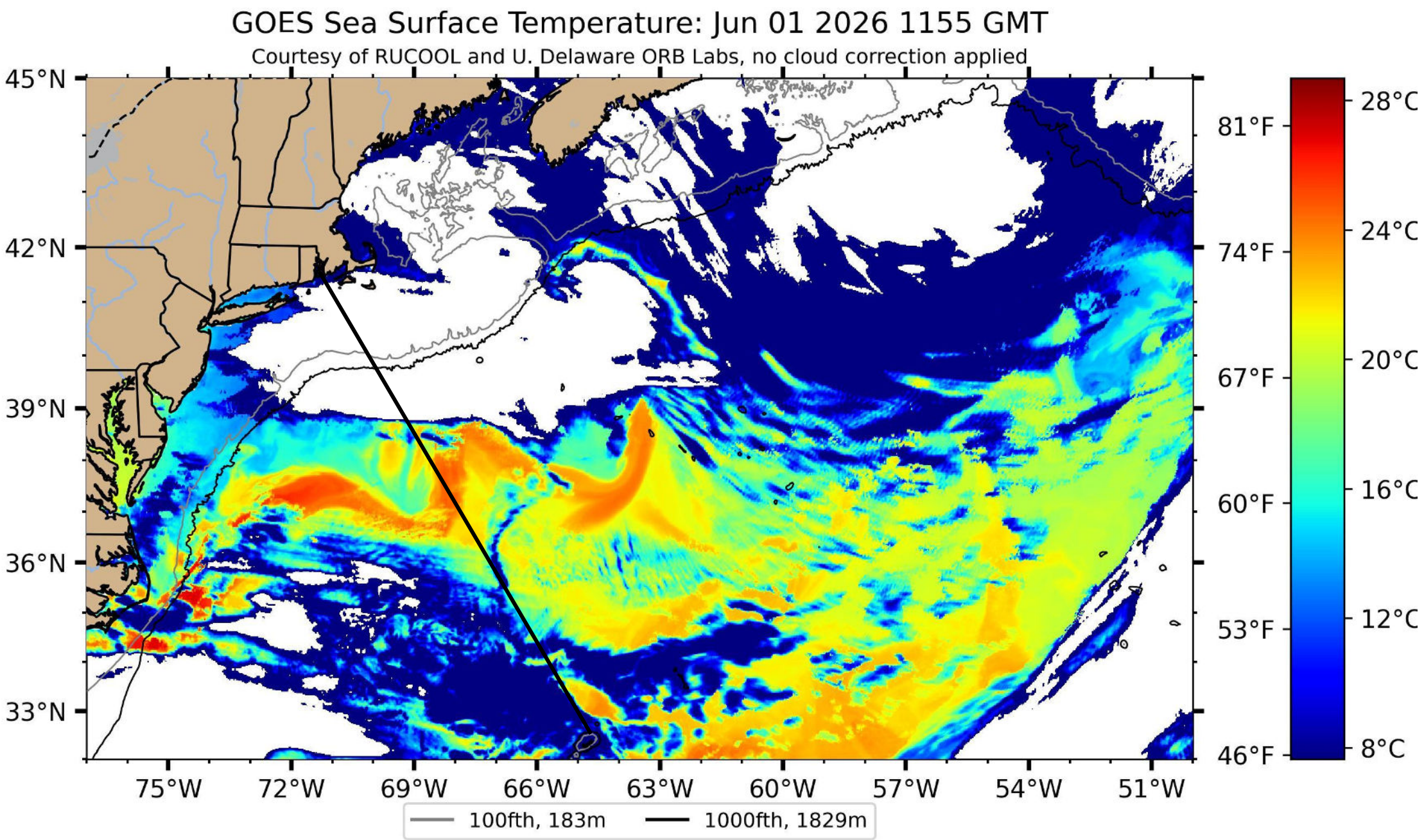

Figure 3 Gulf Stream Sea Surface Temperatures - IR Satellite Image
Line Represents The Newport to Bermuda Rhumb Line

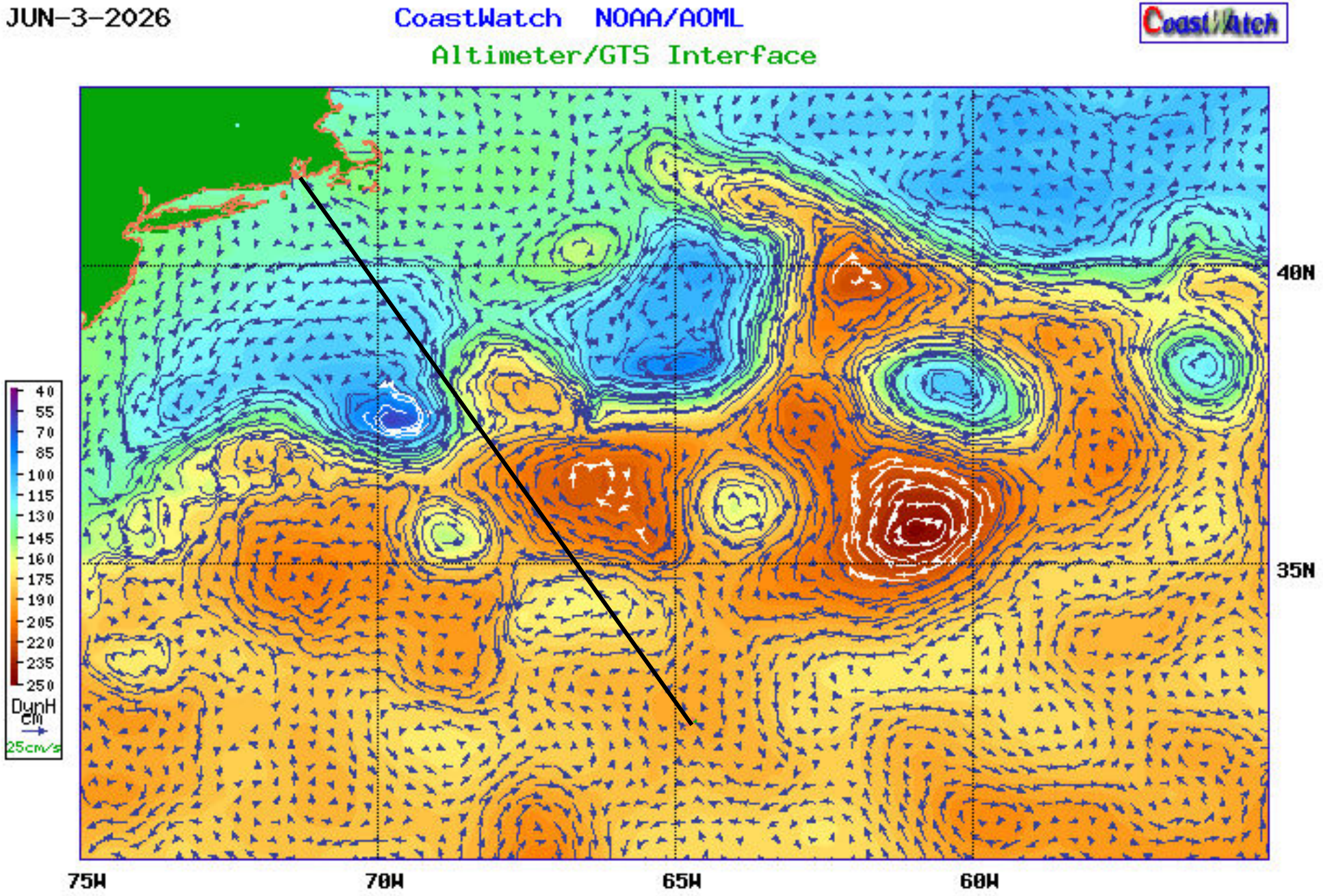

Figure 4 Northwest Atlantic Surface Currents- Altimetry Based Model June 3, 2026
Black Line Represents The Newport to Bermuda Rhumb Line

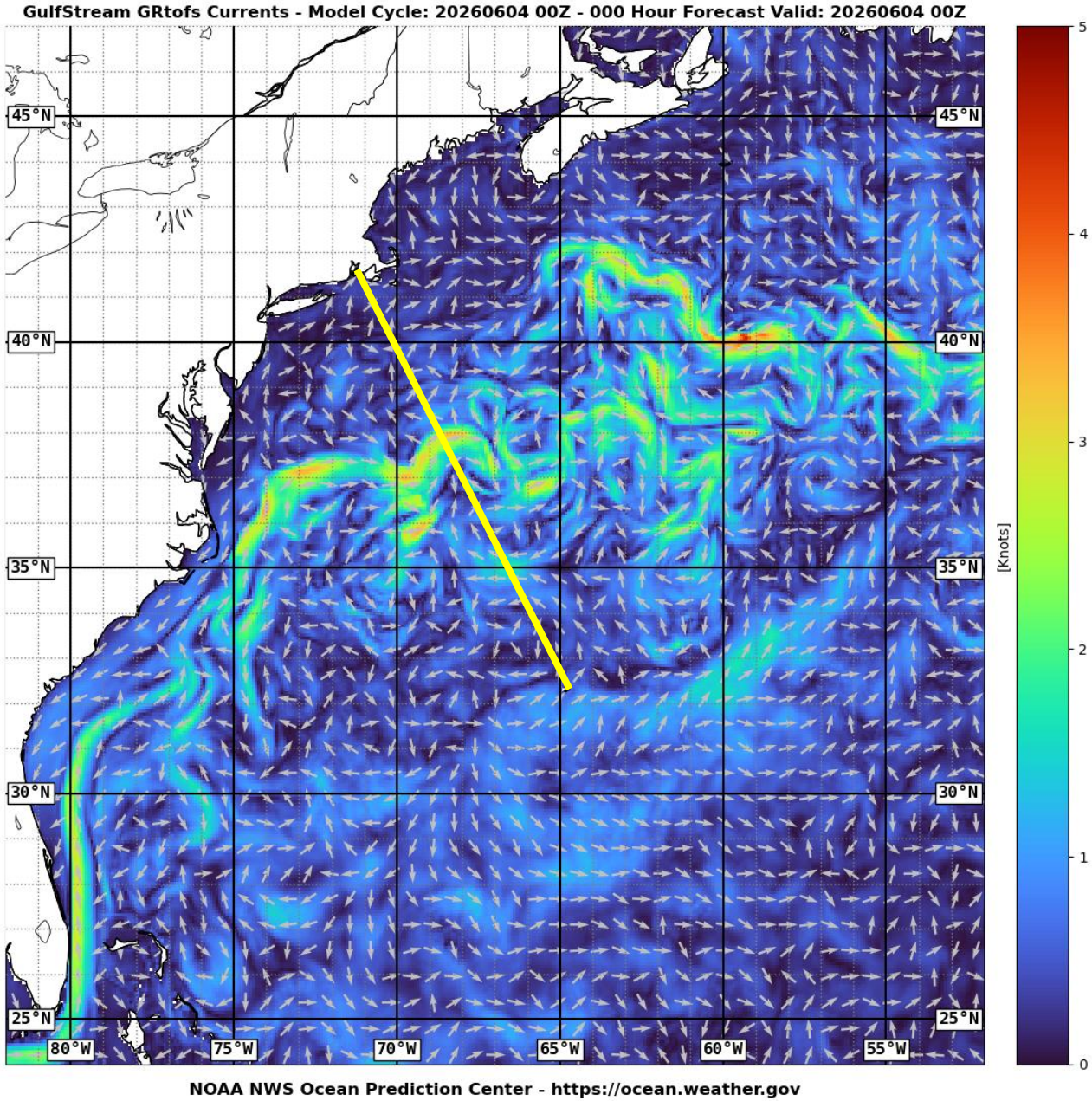

Figure 5 NOAA GRTOFS Model Result – Currents - June 4 , 2026
Yellow Line Represents the Rhumb Line Newport to Bermuda

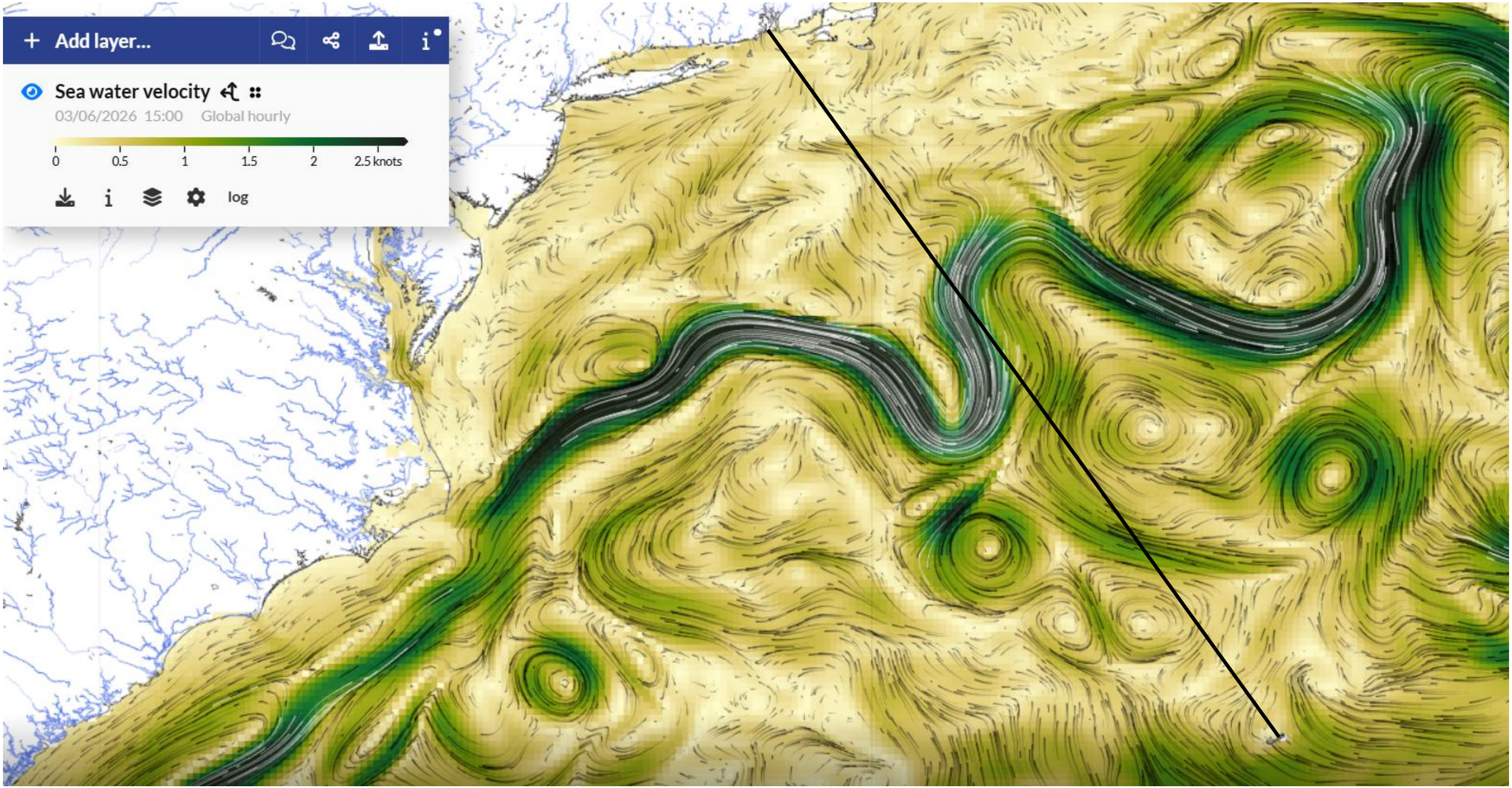

Figure 6 Mercator Model Result – Sea Water Velocity - June 3, 2026
Black Line Represents the Rhumb Line Newport to Bermuda