Northeast U.S. Spring Preview 2025
SLOW START but WARMING UP

By: Matthew A. Upton

ROFFS™ concludes its 2025 spring preview series by providing an overall update of the oceanographic conditions from mid-to-late-May offshore of the northeastern United States focusing on the Mid-Atlantic Bight region and its canyons that includes the zone from Cape Hatteras to Georges Bank. We utilize a combination of many different data sets mainly satellite derived sea surface temperature (SST) and ocean color/chlorophyll images. In this report we will discuss the present ocean conditions and what it means for the upcoming late-spring to summer fishing season for the area north of Cape Hatteras, NC to Massachusetts concentrating on the offshore canyon regions.

As a reminder, for forecasting short-term oceanographic conditions related to finding fish, ROFFS™ uses real-time direct observations. We have learned that evaluating the preseason conditions along with regional climate models provides insight into future seasonal trends for fishing. Experience and understanding the ocean – atmospheric dynamics is our guide as we have had moderate success in forecasting seasonal trends of fishing productivity based on the stepwise progression in the location of the fishes' preferred habitat based on temperature and water color. Please reference our 2025 Bahamas forecast for more in-depth discussion on the environmental and climate indicators that goes into our detailed evaluation of the eastern United States fishing forecasting analysis (Click Here).

Background and Some Observations for 2025

It is important to look at the year-to-year trends including the anomalies to gain insight into the location and condition of the fishes' preferred habitat compared with previous years. Comparing similar locations and features to last year during the same time period in mid-May we found that the SST of the core of the Gulf Stream off of Cape Hatteras, NC for 2024 was approximately 79.8°F to 80.0°F and for this year (2025) it is about 1°F warmer at 81.0°F and also 1°F warmer than in 2023. The SST of the coastal waters off of New Jersey, Delaware and Maryland is approximately 1.0°F to 2°F warmer this year than during the same time period in 2024, however the slightly warmer water in this area extends further offshore than last year. The SST offshore of Long Island to Rhode Island is about 4.0°F to 5.0°F warmer than this similar time last year. However, the SST in the majority of the Gulf of Maine is significantly cooler this year than last year by about 5° to 6°F, especially in the western Gulf of Maine. These and other indicators that will be described below could suggest a slightly normal to earlier arrival for the main population of tuna, wahoo, and mahi into the northeast U.S. region comparted to last year specifically the inshore and southern canyon regions.

Bluefin tuna may be in higher abundance later than last year and normal this year based on the cooler overall Gulf of Maine spring temperatures. What is interesting this year compared to the past couple of years, is the warmer water inshore east of Virginia to Northern North Carolina. It is about 6-8°F warmer than last year at this time. And overall the water over the slope and Canyon areas are about 4-5 degrees warmer this year than last year, even though we had a cooler winter this year compared to the past 4-5 years and overall a cool spring, with only a few days of warmer weather. Even though the spring season has been relatively cool and windy, the waters should start to warm more rapidly next week with the start of June approaching triggering tuna, dolphin, wahoo and some billfish to start migrating north closer to the canyons in the upcoming weeks to month. These warmer than normal waters in the south may be an earlier arrival of billfish, mahi and wahoo, but as we will discuss later, the lack of larger eddies and features to the northern canyons off of New Jersey/New York and east, may mean a later than normal arrival of billfish, mahi and wahoo.

One driver for trends and weather and for the spring SST's in the Northeast U.S. region can be attributed to the North Atlantic Oscillation (NAO) and its negative phase during the month of January but then switching to a positive stage in February, then closer to zero in March and April. NAO index is based on the atmospheric surface sea level pressure difference between the Subtropical (Azores) High and the Subpolar Low within the North Atlantic Ocean (https://www.ncdc.noaa.gov/teleconnections/nao/). Typically, positive NAO phases means higher winds, cooler SST and atmospheric temperatures (like this spring), but currently there was just a slight positive phase in March and April which could mean a warming period and less winds in May and early June which is encouraging for warming the SST and calmer winds that lead to relatively favorable fishing conditions and easier access offshore. Another possible factor to consider is the El Niño phase in the Pacific Ocean. Currently we are coming out of an La Niña phase and are in an ENSO-neutral stage and it is forecasted by NOAA to be in a natural stage throughout the summer into early autumn, which usually means normal SST's in the Gulf of Mexico, Caribbean and east to northeast Pacific, but it remains to be seen what that means for waters offshore of the Northeastern U.S. and its fishing conditions. Last year was a weak La Niña year and the Gulf Stream was slightly cooler than the year before which was an El Niño year.

Also, please see ROFFS™ recent Southeast U.S. Gulf Stream fishing conditions analysis (Click here). These Gulf Stream conditions to the south are usually a good indicator and associated with the main populations of mahi, yellowfin tuna and marlin along with other highly migratory species migrating north during the spring months. Reports from mid-April to mid-May have already indicated overall good (better than last year in places, especially Florida) action for sailfish and mahi, good marlin and sailfish action already off of the Carolinas and good billfish action and mahi and wahoo in the Bahamas. There also has been better than last year reports of yellowin and blackfin and even bluefin tuna in the eastern Gulf Stream areas and in the Bahamas and down to the Florida Keys. Based on historical observations, we anticipate that these fish along with the larger populations of yellowfin tuna, mahi, wahoo and then billfish will continue to move to the northeast U.S. regions from the Gulf Stream areas and then closer to the inshore canyon regions by way of eddy features from the Gulf Stream and warming of the waters due to higher atmospheric temperatures.

Nowcast Analysis

One of the most valuable features that we look at when trying to forecast the region in the Northeast U.S. is the number, size and location of clockwise rotating warm core Gulf Stream rings or eddies that are located north of the Gulf Stream region from south of Georges Bank to offshore of New York, New Jersey to Delaware and Maryland areas. These are eddies that have broken off from the Gulf Stream and tend to slowly drift westward toward the Atlantis Canyons to Hudson Canyon and then in a southwestward direction toward the Norfolk Canyon before being pulled back into the Gulf Stream. The environment associated with warmer usually blue water (below the surface) and the strong boundaries of the eddy feature outer edges provide valuable habitat for the highly migratory large pelagic fish that enter this region in the spring and early summer seasons. This year, it appears to be not as dynamic and active as the past two years, with basically no Gulf Stream warm core ring eddies of any importance until you get way out east and south of the Georges Bank area. There is one smaller clockwise eddy well south of Atlantis Canyon and another off of Poor Mans Canyon, but these are blended out with no good signature of Gulf Stream warmer or bluer water.

The recent spring satellite data shown in Figure 1 and 2, and the fishing reports we have already received may provide insight into the upcoming fishing season. Figure 1 was derived from a variety of U.S. (NOAA and NASA) and European (ESA) satellites to show the SST during the May 18-20, 2025 period. Figure 2 was derived from the NASA MODIS ocean color satellites (Aqua), PACE satellite from NOAA/NASA and ESA's Sentinel 3A and 3B satellites along with SNPP and NOAA 20 & 21 VIIRS satellites showing the ocean color/chlorophyll image data during this same period of May 18-20, 2025. Please keep in mind

that this is about 2-3 days earlier than last year because we had significant cloud and fog cover recently near Memorial Day.

We used a combination of imagery over about a three-day period with the time-tested ROFFS™ cloud reduction algorithm to produce these relatively cloud-free images over this entire area. The time of the satellite passes and the amount of data taken from each image is not exactly the same for the SST and ocean color images. Thus, there may be some subtle differences in locations of where the water mass boundaries derived from the SST and chlorophyll/ocean color occurs. In spite of these small discrepancies this image pair is considered more than adequate for the purposes of our seasonal discussion as they were taken from the same two days.

The directional flow of the water was derived from our ROFFS™ sequential image analysis techniques, following the water masses, image to image based on the water mass's distinct, i.e. signature value. An example of this year's SST satellite infrared imagery in a greytone movie can be found on the ROFFS™ YouTube™ site (https://www.youtube.com/watch?v=NqggVNJhXrQ). Viewing the movie several times allows one to visualize the flow of the Gulf Stream and other currents, where the darker greytoned water is the warmer water and white areas are clouds. Notice the progression of these larger warm-core Gulf Stream eddies from east to west then southwest between the Gulf Stream and canyon regions and also notice how the SST is warming over the past week toward the middle of May and beyond.

Looking at Figure 1 (below) and comparing the conditions this year to previous years, we notice glaring differences compared to the last few years. First of all, is that there is an overall lack of significant eddies, with no relevant Gulf Stream Warm Core eddies anywhere close to any of the Canyons this year yet. There is a very promising large push of the Gulf Stream and bulge way out east in the area south of Georges Bank. In fact, we expect this to break off into a Gulf Stream Warm Core eddy in the next week or two, but this eddy will not be a factor to the northern canyons off of Massachusetts to Rhode Island until late June to early July and not to the Hudson to Wilmington Canyon areas until late August or September if it keeps the traditional journey west then southwest. There are a couple of smaller clockwise rotating eddies that may have once been associated with the Gulf Stream water, but are now blended and cool without much signal. There is one centered well south of the West Atlantis Canyon area and another one centered between Baltimore and Washington Canyon, these will not be too productive for another few weeks, unless the Gulf Stream pushes further north or west where the eddies can interact and pull in some favorable newer bluer, warmer water closer to the canyons. So for right now the conditions for late spring and early summer do not look too promising or exciting.

Second of all, is the position and angle of the Gulf Stream. This year the Gulf Stream overall, except in the very eastern area, is well south of where it has been the previous couple of years during the May time period. This is also a sign of slower start of the fishing season for the higher populations of tuna, wahoo, dolphinfish and billfish as the Gulf Stream is much further offshore than previous years, especially for the Lindenkohl to Hudson Canyon and the eastern Canyons. However, one bright spot is that the Gulf Stream is slightly pushed further west in the area off of southern Maryland to Virginia and closer to the canyons. This is encouraging for the southern canyon area as then eddies are more likely to interact and pull in some Gulf Stream water to spark some good bites in the late spring time. The other encouraging trend is the warmer inshore waters from Delaware to Maryland and Virginia where there already might be some inshore tunas and even mahi starting to filter in as there has been some pulses of warmer bluer Gulf Stream related water pushed northward in the inshore area from North Carolina to Virginia.

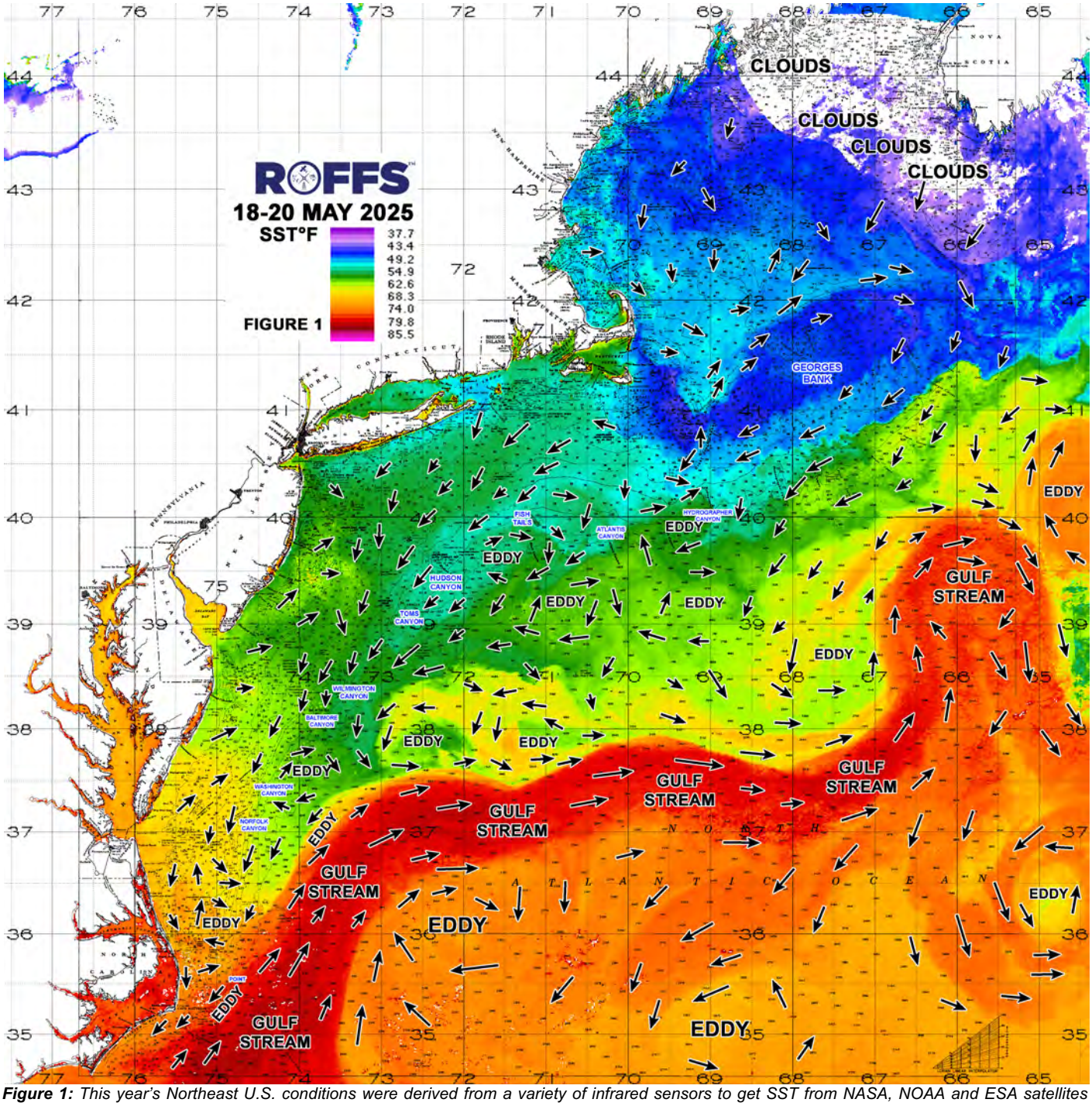

Figure 1: *This year's Northeast U.S. conditions were derived from a variety of infrared sensors to get SST from NASA, NOAA and ESA satellites during May 18-20, 2025. Main eddy features, canyons and surface currents are labeled.*

With very limited offshore effort, fishing reports north of Virginia have confirmed that it is slow or non-existent yet for tuna or any main summer target species yet, with the water too cool and no great features in the canyon areas. However, bluefin tuna has been good and prevalent almost all winter and spring near shore from Delaware to New Jersey and even New York and bottom fishing is still an option when the weather breaks and there is still not a lot of tuna around. The Gulf Stream and its eddies are a big factor and pathway especially during the spring season bringing fish closer to the coast and a shift in the Gulf Stream only takes a few days to a week to change the dynamics and provide pulses of favorable habitat closer to the canyons. We hope this may happen in the next few weeks as the Gulf Stream shifts and conditions change and warm up.

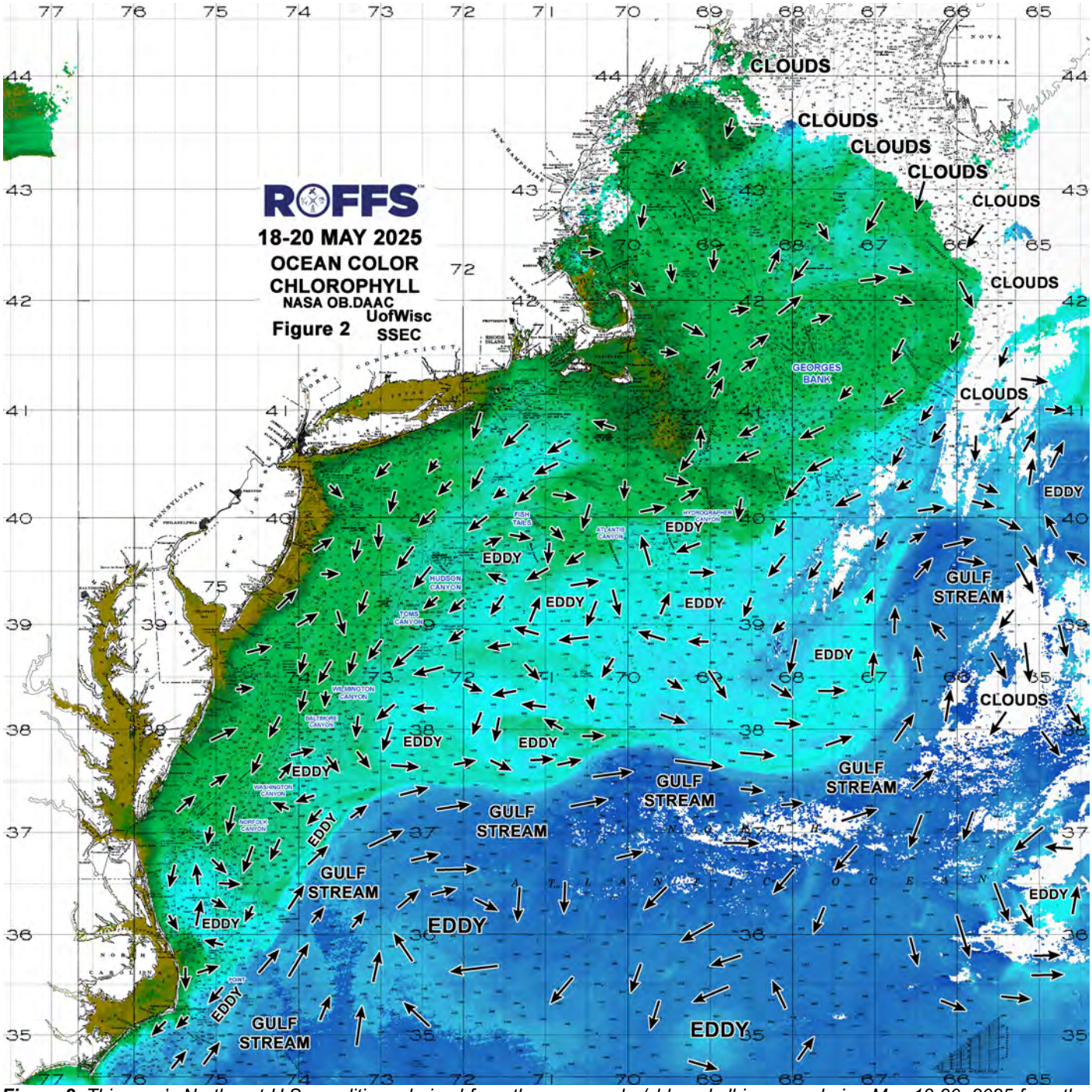

***Figure 2**: This year's Northeast U.S. conditions derived from the ocean color/chlorophyll imagery during May 18-20, 2025 from the Aqua sensors on the MODIS satellite and SNPP and NOAA 20 & 21 VIIRS provided by the University of Wisconsin, from Sentinel 3A & 3B ESA satellite data and now PACE from NASA/NOAA. We consider this an image pair with the above SST Figure 1 image. Same main eddy features and surface currents labeled.*

Looking at Figure 2, notice that there is a lack of blue or even blue-green water over this entire inshore and canyon areas until you get to the Gulf Stream water or way out east. Keep in mind that we are near the peak season of the spring algae bloom, hence the abundance of greener water. This is an annual spring event that provides the food and the beginning of the life cycle for many of the plankton and baitfish species for the next month or two. Also, just because the surface water is greener in color offshore a few feet below the surface the water is likely clearer and bluer. We do notice that the water offshore is a bit less green than last year, but the water in many places near

shore are greener and dirtier than last year. Not much can be derived from the ocean color trend yet. The ocean color/chlorophyll signature becomes more important during the mid-to-late summer to distinguish the main water mass boundaries and features when the SST is warm and uniform.

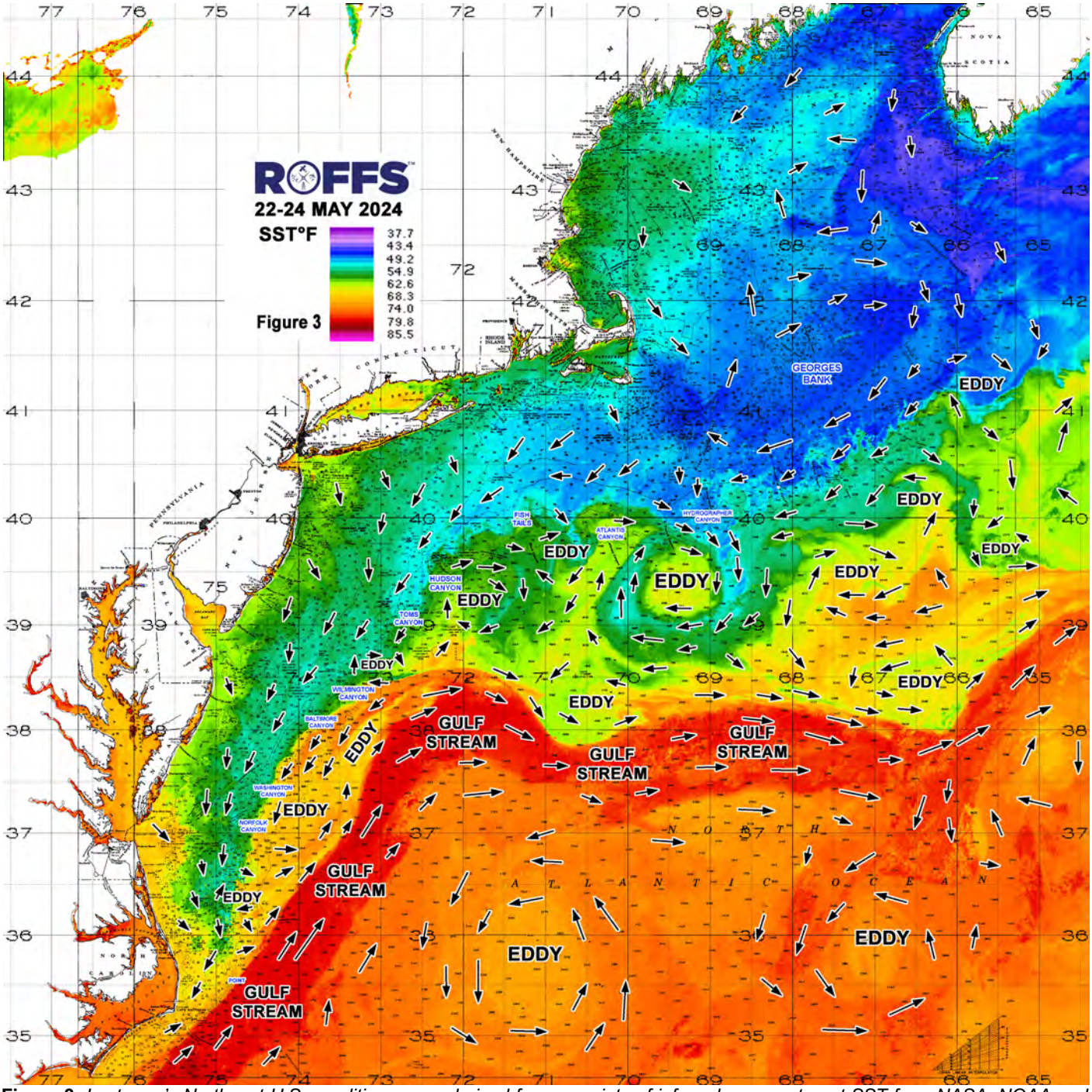

Figure 3. *Last year's Northeast U.S. conditions were derived from a variety of infrared sensors to get SST from NASA, NOAA and ESA satellites during May 22-24, 2024. Main eddy features, canyons and surface currents are labeled.*

Other evidence for forecasting the 2025 main fishing season is the recent fishing reports in this region and down south. It has been a very slow start and we know many north of North Carolina or Virginia have not fished much yet offshore and are just getting ready for tuna season. It has been an overall cool spring and breezy many days and with not many ocean features to get excited about.

However, there has been some promising billfish, wahoo and dolphin action off of North Carolina and South Carolina these past couple of weeks suggesting a decent blue marlin and maybe sailfish season sooner in the southern area up to Virginia if you can out to the Gulf Stream related water. There have been quite a few bluefin caught from off of North Carolina and north through the winter and early spring. Not many yellowfin, bigeye tunas or mahi or wahoo yet, but temperatures should be warming quickly next week and it will not be long until the larger populations are within reach for most anglers.

Conclusion

Based on what we have been observing over the last couple of weeks, it appears that the arrival of the larger populations of billfish, tuna, wahoo, and mahi for most of the canyon regions may be normal to later than the last couple of years. This is mainly because of two factors; first is the lack of strong features and lack of warm core Gulf Stream eddies near the canyon regions, and second, because of the overall southern location of the Gulf Stream compared to recent years. With the cooler winter and an overall cool spring, it is a slower than normal start to the season in the northern canyon regions, but it will be interesting to see if these cooler atmospheric temperatures to start the year has any effect on the overall summer fishing, especially for billfish. In our opinion it may be a better season for baitfish and squid that will translate to a better tuna and billfish season despite the slow start. BUT the warmer SST's in the southern area off of Virginia and North Carolina may mean a slightly earlier start for these species. So unfortunately, it appears that there is a lack of strong features or eddies to be excited about right now, but things could change if the Gulf Stream pushes north or meanders another eddy to the north over the next couple of weeks.

The **GOOD NEWS** is that overall we are encouraged by the slightly western location of the Gulf Stream closer to some of the southern canyon regions providing warmer bluer preferred habitat closer to the southern canyons such as the Norfolk to Washington to Baltimore Canyon region earlier in the year for a bridge for tuna, wahoo, dolphin and billfish to migrate inshore. We also like the large Gulf Stream Warm Core eddy that is about to break off way to the east, to the south of Georges Bank. This will not start to improve conditions for some of the northeast canyons until late June or July, but is encouraging for the rest of the canyon regions for July, August and September if it stays the course. What is a bit discouraging is the slow overall fishing so far this spring and lack of strong features, but these conditions can all change in a matter of weeks. The warmer than normal SST conditions overall is already a decent sign that conditions will improve more rapidly once the warmer weather hits to warm up the water in the coming weeks. Remember some of the better fishing conditions these past few summers have been further east in the Atlantis to Oceanographer Canyons. This year the Hudson to Washington Canyons are due for some better conditions and action particularly for billfish. Last year's overall billfish action was a bit better in the western canyons than the previous year in July and August.

We highly encourage you to take a look at these early season conditions and if you have not done so already, get your boat ready and get offshore when the weather permits, as there are some tuna to be caught now in the south and bluefin inshore and further south and offshore, some mahi and marlin already. What is also encouraging is how rapidly the SST will be increasing next week and early June, especially inshore so it will not be long until most of the offshore regions will be within range of favorable temperatures and habitat for mahi and tuna action and soon after marlin. These conditions are already favorable now inshore off of Virginia to Oregon Inlet areas.

It is important to remember that good fishing action on a daily basis is strongly linked to local, short-term (days) current conditions that concentrate the fish once the preferred habitats of the fish are in a particular region. When the water mass boundaries associated with these currents are geographically stable and favorable, i.e., persistently pushing over “good” bottom topography and/or in a favorable inshore direction creating upwelling, then they concentrate the baitfish and larger fish can be found foraging. This indicates that the fishing action on any given day is controlled by relatively short-term (daily) and relatively small-scale (5-10 mile) movements of the currents and their water mass boundaries. Our experience indicates that to reliably forecast specific concentrations of fish on a daily basis one must evaluate the ocean conditions on these scales. Relatively small subtle changes in the currents and their associated water mass boundary zones often have dramatic effects on the distribution and concentration of fish.

Contact ROFFS™ (1-321-723-5759 / fishing@roffs.com / www.roffs.com, @roffsfishing on Facebook and Instagram) for the up-to-date detailed fishing conditions and get the inside track to where the better fishing locations will be tomorrow and what is new at ROFFS™. Our experienced satellite fisheries oceanographers and front office staff will continue to monitor the northeast U.S. oceanographic conditions as the season quickly improves and the active summer fun fishing and tournament season rapidly approaches. Thank you for your support and as always we encourage feedback, pictures and reports.

Here is to another Safe and Successful Fishing Season in the Northeast U.S.,

ROFFS™ Team