

Northeast U.S. Spring Preview 2024

CONDITIONS ARE WARMING UP

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ROFFS™ concludes its 2024 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. For this exercise we will utilize a combination of many different data sets, mainly satellite derived sea surface temperature (SST) and ocean color/chlorophyll images. In this analysis 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 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 (SST) and water color. Please reference our 2024 Bahamas forecast for more in-depth discussion on the environmental and climate indicators that go into our detailed evaluation of the eastern United States fishing forecasting analysis ([Click Here](#)).

Background and Some Observations for 2024

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 2023 was approximately 79.4°F to 80.1°F and for this year (2024) it is about exactly the same (79.8°F to 80.0°F), but about 1°F warmer than in 2022. The SST of the coastal waters offshore of New Jersey, Delaware and Maryland is approximately 3.0°F degrees cooler this year than during the same time period in 2023. Similarly, the SST offshore of Long Island, NY to Rhode Island is about 3.0°F to 4.0°F cooler than this similar time last year. However, the SST in the western Gulf of Maine is significantly warmer this year than last year by about 5°F. These and other indicators, that will be described below, suggest a slightly later and a more normal overall arrival for the main population of tuna, wahoo, and mahi into the northeast U.S. region - specifically the northern canyon regions. Bluefin tuna may be in higher abundance earlier than normal based on the higher overall Gulf of Maine spring temperatures. Reports have confirmed that it has been a slower start to the season from Cape Hatteras to offshore of Virginia for tuna and mahi, but perhaps a stronger blue marlin season already off of North Carolina. Even though the spring season has been relatively cool and windy compared to previous years, there is optimism with certain features and how quickly some of the waters are warming over the past couple of weeks. With June approaching, waters (especially inshore) will be starting to warm at an average rate of up to 0.5°F to 1.0°F per day triggering tuna, dolphin, wahoo and some billfish to start migrating north closer to the canyons in the upcoming weeks, especially with the eddies in this area that are, or have been connected to the Gulf Stream waters along with a northern and western push of the Gulf Stream compared to last few years.

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 positive phase during the months of January, February but then switching to a negative phase in March and April again similar to last year. 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 early spring), but currently there is a switch to a negative phase in March and April which should 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 El Niño phase and transitioning to an ENSO-neutral stage and it is forecasted by NOAA to transition to a La Niña phase later this summer into autumn, which usually means normal to cooler 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 an El Niño year and the Gulf Stream was warmer than we ever remember, but it did not translate to warmer than normal waters in the Northeastern Canyon regions.

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 are usually 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) wahoo, sailfish and blue marlin action along both sides for the Gulf Stream edges from Florida to North Carolina, but not as good overall mahi action yet. 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 spin-off warm core large 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 quite as promising as last year with only one main warm core Gulf Stream eddy offshore of Veatch Canyon (and smaller) and another smaller clockwise rotating eddy centered off of Hudson Canyon.

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 22-24,

2024 period. Figure 2 was derived from the NASA MODIS ocean color satellites (Aqua and Terra) 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 22-24, 2024. Please keep in mind that this is about 5 days later than the previous two years because we had significant cloud and fog cover last week when we usually conduct the northeast U.S. spring forecast.

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=3gsjc0X2OfI>). 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 rapidly the SST is warming over the past week around Memorial Day.

Looking at Figure 1 (below) and comparing the conditions this year to previous years, we notice a few obvious trends and features to keep an eye on. First of all, is the overall shift in the Gulf Stream to the west, closer to the Canyons offshore of southern New Jersey to Virginia. We have noticed this trend on and off since late last summer and into the fall season. It appears that as the Gulf Stream moved and fluctuated further north and inshore in this region over the past 6-8 months, that it shed short-lived eddies pulling in these favorable waters down the bank near or into the canyon regions. This becomes a promising trend in the spring and fall season pushing warmer, bluer water that is more desirable for most tuna, wahoo, mahi and billfish species habitat closer to the coast and canyons that could mean a quicker spring migration of a larger population of fish earlier in the season. However, this does not always transition into better earlier fishing action if the baitfish is not there. With limited effort, fishing reports have suggested that even though these conditions look good, fishing action, specifically for tuna has been slow with only a few caught in the Baltimore to Norfolk Canyons so far this year, meaning the higher numbers are likely not this far north yet, or are further south or east. 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, as we have already seen this spring in the Baltimore to Norfolk Canyon.

Second of all, is the one main Gulf Stream warm core eddy centered south of the Veatch to Hydrographer Canyon region. This eddy is smaller than normal Gulf Stream warm core eddies and is therefore moving quicker to the west. This eddy is still pretty cool only in the mid-60's, but should contain tuna and swordfish among other species and continue to move west and then southwest bringing some favorable conditions into or near the bank and canyon regions into June and July. Similarly is a smaller clockwise rotating eddy centered off of Hudson Canyon that should also start to migrate to the southwest over the next few weeks bringing promising conditions to Toms to

Lindenkolh Canyons shortly. The wildcard is the direction and location of the Gulf Stream. Notice right now it is shifted slightly north and to the west more than normal and may pinch off these eddies and block them from progressing to the southwest into Wilmington to Washington Canyons per normal movements. However, the good thing is if these Gulf Stream warm core eddies get close enough to the Gulf Stream they start to pull Gulf Stream bluer warmer water into the eddies and closer to the canyon and bank regions which usually translates to good fishing conditions for tuna, wahoo, mahi and marlin action earlier in the season. The eddy off of Hudson Canyon has already started to pull up some 65-70°F water within closer range for anglers targeting some early season tuna action in the Hudson Canyon region.

It is also important to look further east for eddies and conditions forming east of Oceanographer Canyon and south to southeast Georges Bank. As these will likely be the features that contribute and progress west then southwest and is what anglers will be targeting during mid-to-late summer season and during the bigger tournament season from over the canyons south of New York then to the canyons offshore of New Jersey, Delaware, Maryland and Virginia. At this time there are a few promising eddies and features containing mixed Gulf Stream water that appears like it will progress to the west in the coming months, specifically the eddy centered near 67°30'W & 39°30'N but it is too far offshore to be useful yet. Another observation and difference from last year is how the SST of the water east and south of the Gulf Stream is 4°F-5°F warmer this year than last year. We are not sure what this means, but could indicate an earlier and better year for billfish.

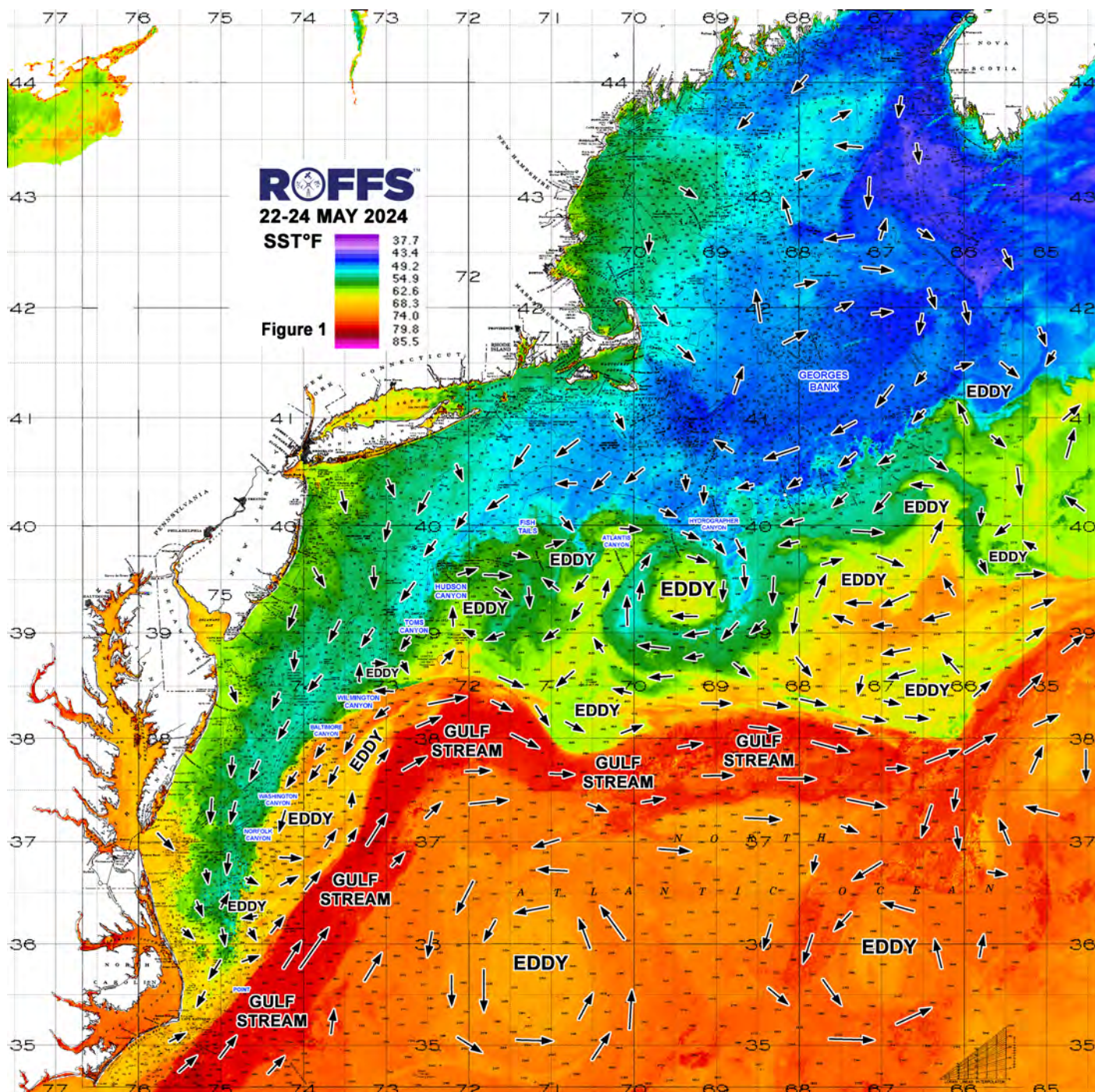


Figure 1: This year's Northeast U.S. conditions were derived from a variety of infrared sensors to get SST from NASA, NOAA and ESA satellites during May 22-24, 2024. Main eddy features, canyons and surface currents are labeled.

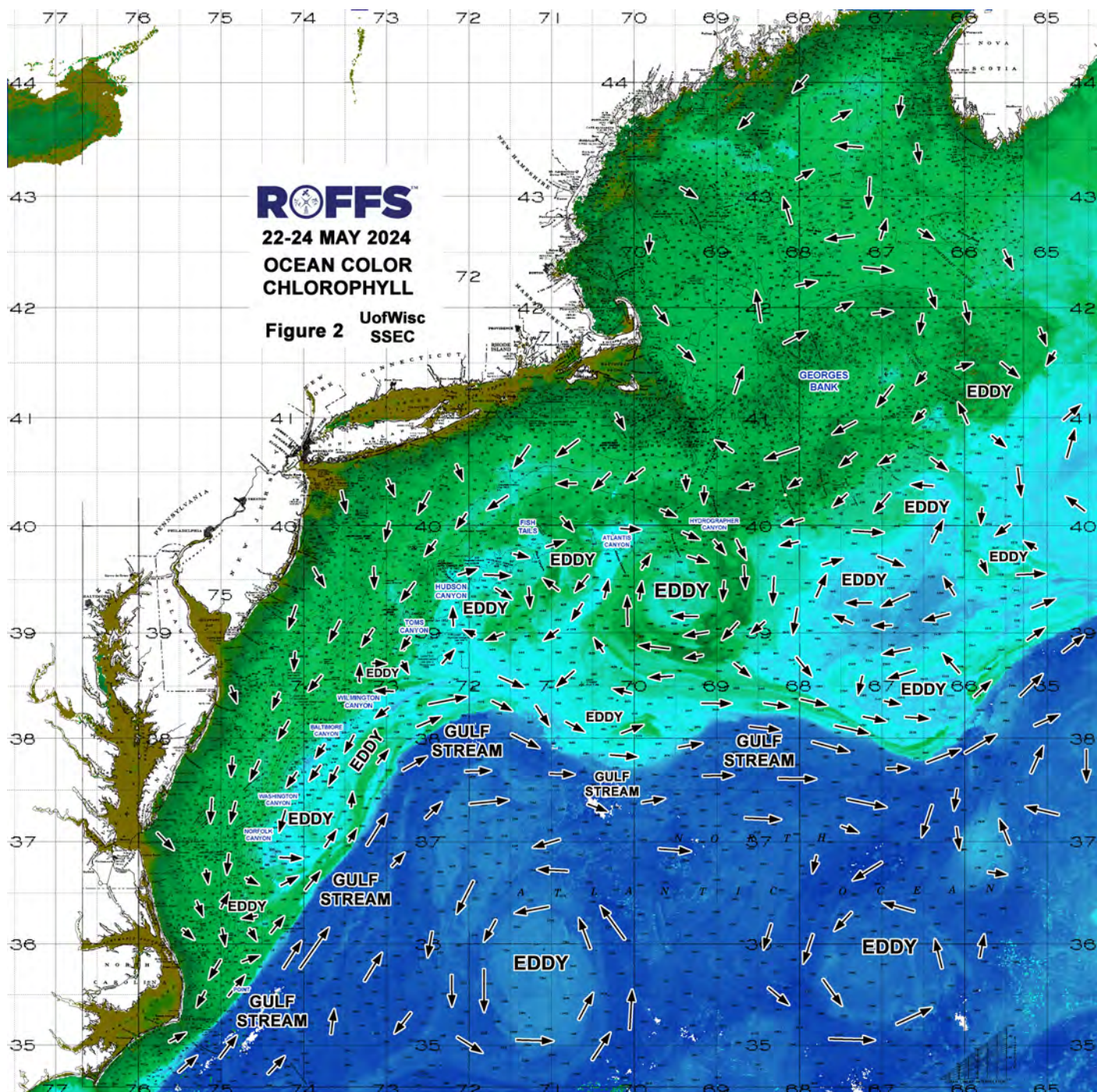


Figure 2: This year's Northeast U.S. conditions derived from the ocean color/chlorophyll imagery during May 22-24, 2024 from the Aqua and Terra sensors on the MODIS satellite and SNPP and NOAA 20 & 21 VIIRS provided by the University of Wisconsin and from Sentinel 3A & 3B ESA satellite data. We consider this an image pair with the above SST Figure 1 image. Same main eddy features and surface currents labeled.

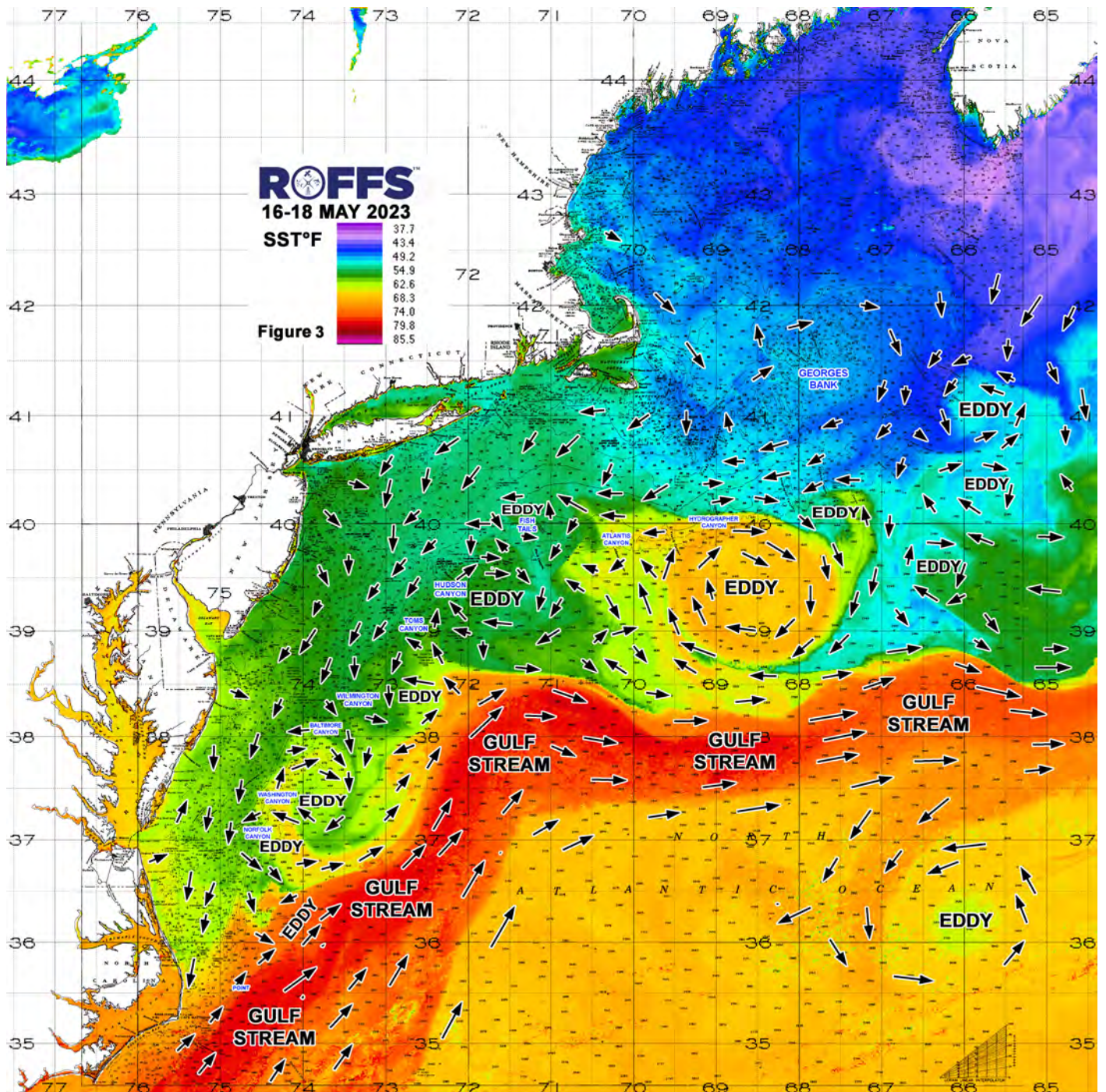


Figure 3. Last year's Northeast U.S. conditions were derived from a variety of infrared sensors to get SST from NASA, NOAA and ESA satellites during May 16-18, 2023. Main eddy features, canyons and surface currents are labeled.

Looking at Figure 2, again notice the lack of bluer water to the north and west of the Gulf Stream (especially inshore out to 50-100 fathoms) at this time because we are at the end of the peak season of the spring algae bloom. 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. However, just because the surface water is greener in color within these offshore eddies, a few feet below the surface the water is likely clearer and bluer. We already notice similar trends as last year as there are some cleaner blended blue to blue-green water filaments that have been pulled in toward and into the Canyon regions such as Atlantis Canyon, Hudson Canyon area and the Baltimore to Norfolk Canyons. The ocean color/chlorophyll signature becomes much more important later in the mid-to late summer to distinguish the main water mass boundaries and features when the SST is so warm and uniform.

Other evidence for forecasting the 2024 season is the recent fishing reports in this region and down south. It has been a slow start and we know many north of North Carolina have not fished much yet and are just getting ready for tuna season. It has been a slightly cooler and breezy spring with not many features to get excited about. However, there has been some promising marlin action off of North Carolina and farther south to perk interest and suggest a decent blue marlin and maybe sailfish season sooner than normal. There have been quite a few yellowfin tuna caught off of the Point area out of Oregon Inlet, so that is promising, but it has been inconsistent, there a couple of days and gone, this we think has to do with the orientation of the Gulf Stream in this area that has remained relatively stable for the past few weeks, but we know that can change in a few days. Not many mahi yet or wahoo, but temperatures are warming quickly now and it will not be long until the larger populations are within reach for most anglers. Reports have been better than normal late winter to spring bluefin action, enough where they had to close the quota earlier than normal for giants through most of this region, but bluefin tuna off of New York to New Jersey was good for several weeks at the beginning of the 2024 which is promising for the bluefin fisheries further north of the summer, some resident bluefin tuna stick around the Mid-Atlantic for a few more months if the food is there.

Conclusion

Based on what we have been observing and hearing over the last few weeks, it appears that the arrival of the larger populations of tuna, wahoo, mahi-mahi may be normal to later than the last few years. However the billfish may arrive at a normal to earlier time this year compared to the past few years. This is because the inshore SST is overall cooler in many areas and there are less promising warm-core Gulf Stream eddies and features in this region compared to last year, but the Gulf Stream is warm and above average for this time of year as is the other side of the Gulf Stream waters. Furthermore, there has been better blue marlin fishing off of North Carolina to South Carolina so far this year compared to last year. Again, it remains to be seen how many bigeye will arrive this year, as last year bigeye tuna seemed to be more prevalent than previous years. Yellowfin tuna is another mystery many years, as usually the best yellowfin action is during the spring and fall and becomes scattered in the summer months. However, last year tuna was pretty steady most of the summer and the billfishing was more scattered and inconsistent (except the eastern canyons). All early indicators suggest this may be a better billfish season and perhaps tuna will be down, but only time and ocean conditions will tell.

The **GOOD NEWS** is that overall we are encouraged by the location of the Gulf Stream closer to some of the western canyon regions providing warmer bluer preferred habitat closer to the coasts earlier in the year for a bridge for tuna, wahoo, dolphin and billfish to migrate closer to the western canyons and not go further east. We also like the location and movement of the main warm core

Gulf Stream eddy south of Veatch Canyon (that I smaller than normal) that should improve conditions over the next few weeks into July for several canyon regions, especially if it interacts with the Gulf Stream that is not too far south. What is a bit discouraging is the slow overall fishing so far this spring and lack of strong features way out east, but these conditions can all change in a matter of weeks. It is looking like it could be one of those years where the conditions during the summer in the Hudson to Norfolk Canyon regions and inshore could be better than the conditions and fishing in the Oceanographer to Atlantis Canyons. Remember the past couple of years the overall conditions and fishing has been better to the eastern Canyons than the western Canyons.

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, and further south and offshore, some mahi and marlin already. What is also encouraging is how rapidly the SST is increasing, especially inshore so it will not be long until most of the offshore regions then inshore will be within range of favorable temperatures and habitat for mahi, tuna, and wahoo action and soon after marlin. These conditions are already favorable now inshore 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 we encourage feedback and pictures and reports.

Best of Luck for a Safe and Successful Fishing Season in the Northeast U.S.,

ROFFS™ Team