

# Gulf of Mexico Spring Season Preview 2024

## CONDITIONS HEATING UP IN THE GULF OF MEXICO

By Gregory J. Gawlikowski

### Introduction

Continuing our series of “Early Season Previews”, ROFFS™ is providing a spring analysis of the oceanographic conditions for the Gulf of Mexico region derived using a combination of high-resolution satellite data including infrared sea surface temperature (SST) and ocean color/chlorophyll images from late April-Early May 2024. In this preview, we will discuss the overall ocean conditions for the current spring fishing season and how they may transition into the summer conditions compared to the similar time period last year.

ROFFS™ ([www.roffs.com](http://www.roffs.com)) has a 37-year history of monitoring the ocean conditions throughout the Gulf of Mexico for research and fishing applications. Infrared (IR) satellite data is used to observe the SST and ocean color data is used to derive indices of phytoplankton (chlorophyll), water clarity, water color and colorized dissolved organic material (CDOM). Combined with other oceanographic data and using sequential image analysis, these data allow one to visualize the dynamic ocean currents. The satellite data are derived from a variety of sources including NASA, NOAA, University of Wisconsin and the European Space Agency (ESA). ROFFS™ also incorporates a variety of different data derived from NOAA buoys, drifting buoys, and satellite altimeters into its comprehensive fishing forecasting analyses. The altimeter data provides a relatively coarse spatial (~10 mile) and temporal resolution (5-8 days) that limits the data's usage to studying large-scale circulation. It is generally not useful for evaluating smaller scale, near shore and short-term (daily and sub-daily) changes in the ocean currents or their water mass boundaries that often control the location of forage (bait) fish and the larger, more valuable predator/pelagic fish.

### Background and Some Observations for 2024

It is important to look at the year-to-year trends and anomalies along with fishing reports to get a better understanding of how the ocean conditions (SST and Ocean Color/Chlorophyll) compare regarding the conditions and location of the fishes preferred habitat and the likelihood of a productive fishing year. Comparing the similar locations and features to last year, the SST of the core of the Loop Current for late April/early May 2024 (Figure 1a) is approximately 81.5°F-82.9°F which is about the same as the past three years over this same time period. Please note that this year, there are some intrusions of relatively warmer (77°F-80°F) water with direct Loop Current origins moving between the Atwater Valley and Lloyd Ridge and into the De Soto Canyon area due to the interaction with several eddies. This is mainly due to the influence of these eddy features along the northern boundary of the Loop Current. The main body of the Loop Current does seem to occur at a lower latitude than last year and further east than last year with the northern edge of the main body of Loop Current water occurring further southward towards 26°30'N. These eddy features were not present last year and this year they provide a direct route of the warmer Loop Current water directly into the De Soto Canyon and surrounding areas to the north closer to the coasts of Alabama and western Florida. We did observe a large clockwise rotating Loop Current eddy feature break off from the main Loop Current circulation earlier this year, and this feature has progressed southwestward over the Mississippi Canyon and Green Canyon areas and is currently centered in the area near 89°30'W & 26°15'N.

The main body of the Loop Current appears to show normal warm temperatures again this year; and the inshore waters do appear to have similar temperatures to last year. The SST in the northwestern Gulf of Mexico is currently 74.0°F-76.0°F inshore; however, this year, this relatively cooler water extends further offshore towards the 400-600 fathom depths with the warmer 77.0°F-78.0°F water occurring further offshore towards the 600+ fathom depths which is a little bit different than what we observed in these areas last year (Figure 1b) when there were some fingers of the warmer water closer inshore over the 100-200 fathom depths. This may lead to some later arrivals of pelagic species this year in the western Gulf of Mexico. The SST in the offshore southwestern Gulf of Mexico area was observed to be within the 80.0°F-82.0°F range this year, which is slightly warmer than the 79.0°F-81.0°F range we observed last year, but again similar to what we had observed in 2022 (80.0°F-83.0°F). Overall, this is still much warmer than the 76.0°F-77.0°F that was observed back in 2018/2019. Note that the coastal SST's along the west coast of Florida (74.0°F-76.0°F) are showing temperatures similar to last year (75.0°F-77.0°F), but are slightly cooler compared to what we had observed in 2021-2022 (77.0°F-79.0°F). Again, they still range 2.0°F - 3.0°F higher than they were during the same time period back in 2016-2017. Normally, a strong contributor to the warmer SST's is the presence of an El Niño period. We are currently in an El Niño phase; however, the forecast is to transition out of the El Niño stage and into the in an ENSO neutral stage by April-June 2024 (85% chance). We are forecasted to move toward a La Niña phase as early as June-August 2024 (60% chance) ([https://www.cpc.ncep.noaa.gov/products/analysis\\_monitoring/lanina/enso\\_evolution-status-fcsts-web.pdf](https://www.cpc.ncep.noaa.gov/products/analysis_monitoring/lanina/enso_evolution-status-fcsts-web.pdf)).

Currently there is a large, recently detached, Loop Current eddy feature present in the central Gulf of Mexico centered southeast of the Green Canyon area. At the end of April 2024 we were able to observe several eddy features, both clockwise and counter-clockwise rotating, located southeast of the Mississippi River Delta region/northwest of the main Loop Current circulation that continue to pull clean blue water with direct Loop Current origins northward between the Atwater Valley and the Lloyd Ridge regions and towards the area of the De Soto Canyon area with some of this water being pulled west/southwestward towards the Spur, Steps and towards the area south/southeast of the Mississippi River Delta region. Some of the cleaner blended blue to blue water is also moving over the Steps region and inshore of the Spur over the Unexploded Ordnance and towards the Squiggles region. This circulation, along with relatively warm SST's, support normal arrival time (early-to-mid May) in the northeastern Gulf of Mexico of the pelagic species that you usually target offshore (e.g. yellowfin tuna, wahoo, dolphin, kingfish, sailfish, marlin, swordfish, cobia, etc.) as indicated in the fishing reports below.

Recent reports indicate that kingfish action again this year has been decent in March and April offshore of western Florida with sailfish, dolphin (mahi-mahi), blackfin/yellowfin tuna and even early season marlin also being caught offshore of southwest FL particularly along the edges of the warmer bluer water associated with the counter-clockwise rotating eddy located northeast of the main Loop Current circulation. There have also been reports of marlin action, along with dolphin, wahoo and larger yellowfin tuna south/southwest of LA into the Mississippi Canyon and Green Canyon areas and near the offshore rigs. This is not surprising based on the circulation and SST's we have been observing in the areas east of the Green Canyon towards the Mississippi Canyon, south/southeast of the Mississippi River Delta and eastward towards the Steps, Spur and south of the De Soto Canyon. We have also received reports of blue marlin and swordfish in the warmer water with direct Loop Current origins in the De Soto Canyon around the FADs.

## Nowcast Analysis

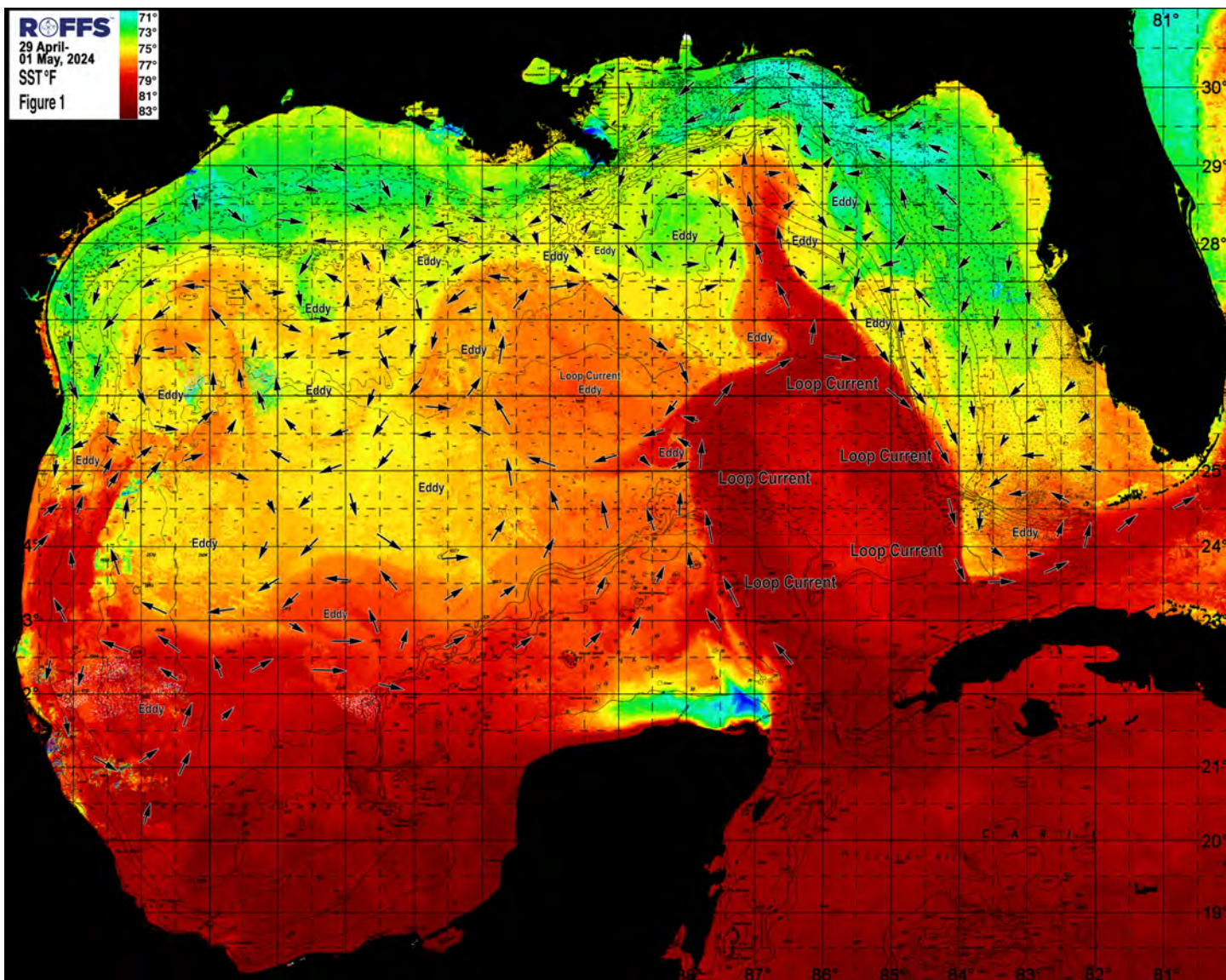
For forecasting short-term oceanographic conditions related to finding fish, ROFFS™ first uses real-time direct observations based on high-resolution satellite data rather than unproven and unreliable ocean models or longer-term composites. We have learned that evaluating the pre-season conditions along 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 movement of water masses, stability, temperature (SST) and water color.

The circulation of the Gulf of Mexico is controlled by the location and flow of the Loop Current, large mesoscale eddies, local and regional winds, and the dynamic thermohaline forces of the fresh water runoff mixing with the ocean water. The Loop Current is a warmer ocean current that flows northward between Cuba and the Yucatan Peninsula into the Gulf of Mexico. It makes a “loop” east/northeastward within the eastern Gulf then southward before exiting through the Straits of Florida and re-joining the Gulf Stream. It is the dominant circulation feature in the eastern Gulf of Mexico and its location varies on a weekly, monthly and annual time scale. The Loop Current and related eddies can be a highway and spawning grounds for pelagic fish moving into the Gulf of Mexico from the Caribbean Sea. The eddies that the Loop Current sheds can be an important fish habitat for longer periods of time as they progress from the eastern Gulf of Mexico to the northeastern, central and western Gulf of Mexico over a time period of several months.

Figure 1a was derived from a variety of U.S. (NASA, NOAA, JPSS and ESA) satellites during the late April to early May (April 29-May 1, 2024) period and Figure 2a was derived from the U.S. SNPP and JPSS VIIRS, Sentinel 3A and 3B, Aqua MODIS and Terra MODIS ocean color/chlorophyll imagery during this same period (April 29-May 1, 2024). As the exact values of the original data from different satellite sensors (VIIRS, MODIS and Sentinel) are not the same, we cross-calibrated the data to derive images that had realistic and consistent watercolor. This is one of the many techniques that we derived during the valuable NASA Earth Science Program projects that ROFFS™ has been involved with over the years.

Figure 1b was derived from a variety of U.S. (NASA, NOAA, JPSS and ESA) satellites during the late April to early May (April 30-May 1, 2023) period and Figure 2b was derived from the U.S. SNPP and JPSS VIIRS, Sentinel 3A and 3B, Aqua MODIS and Terra MODIS ocean color/chlorophyll imagery during this same period (April 30-May 1, 2023).

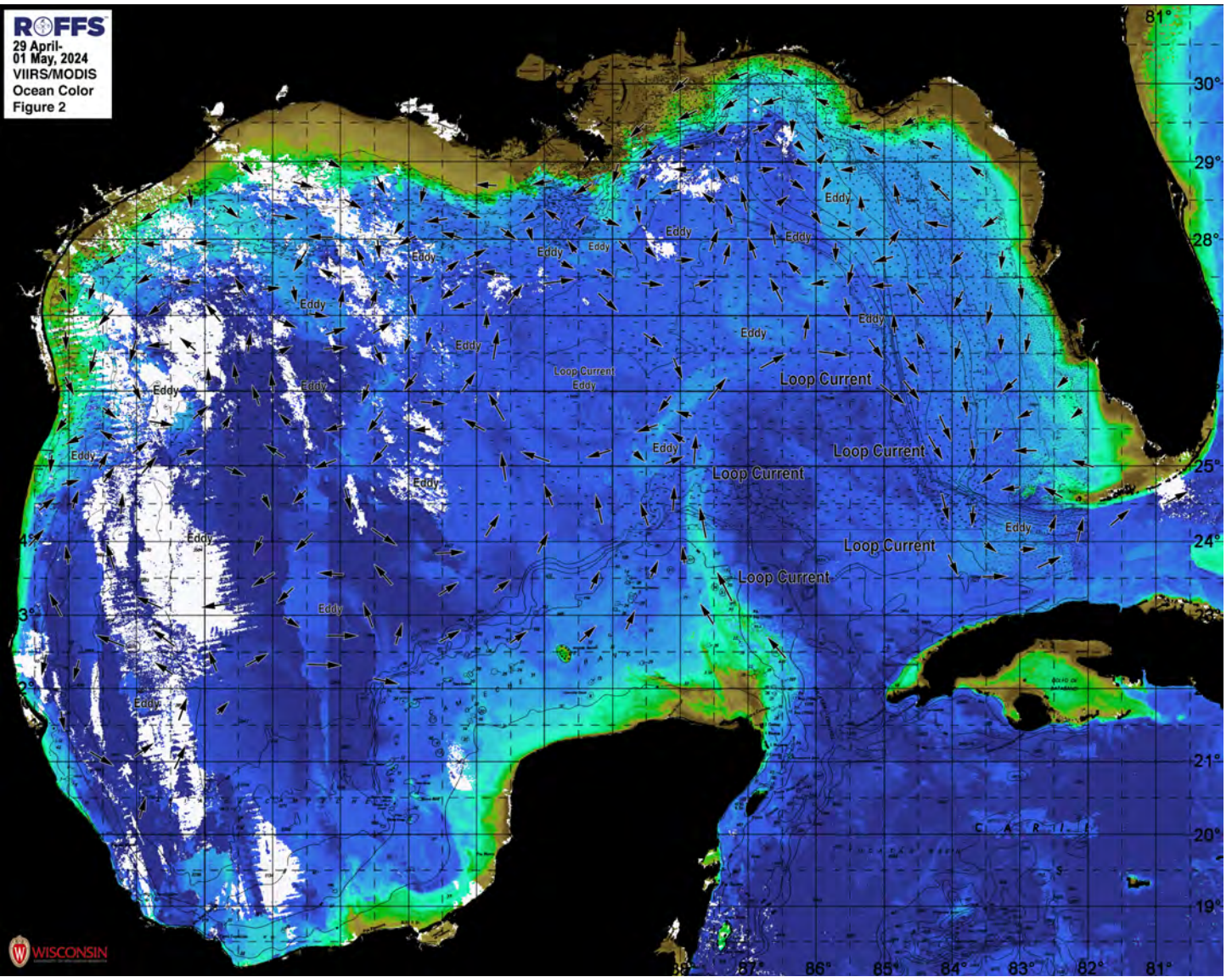
We could not use single and same day imagery for the SST and ocean color data due to cloud cover interference, so we used a combination of imagery and the time-tested ROFFS™ cloud reduction techniques to produce these relatively cloud-free images. However, for comparison purposes we consider these images as an equal image pair for the purposes of this discussion. The directional flow, not speed of the water was derived from our ROFFS™ sequential image analysis, following the motion of the water from image to image based on the water masses distinct, i.e. signature value. An example of this years SST satellite infrared imagery in greytone can be found on the ROFFS™ YouTube™ site (<https://www.youtube.com/watch?v=oEnXYEKgQqU>). Viewing the movie will allow one to observe the flow of the water within the Gulf of Mexico region during the last two months (March 1-April 30, 2024), where the darker greytone water represents the warmer water and white indicates clouds.



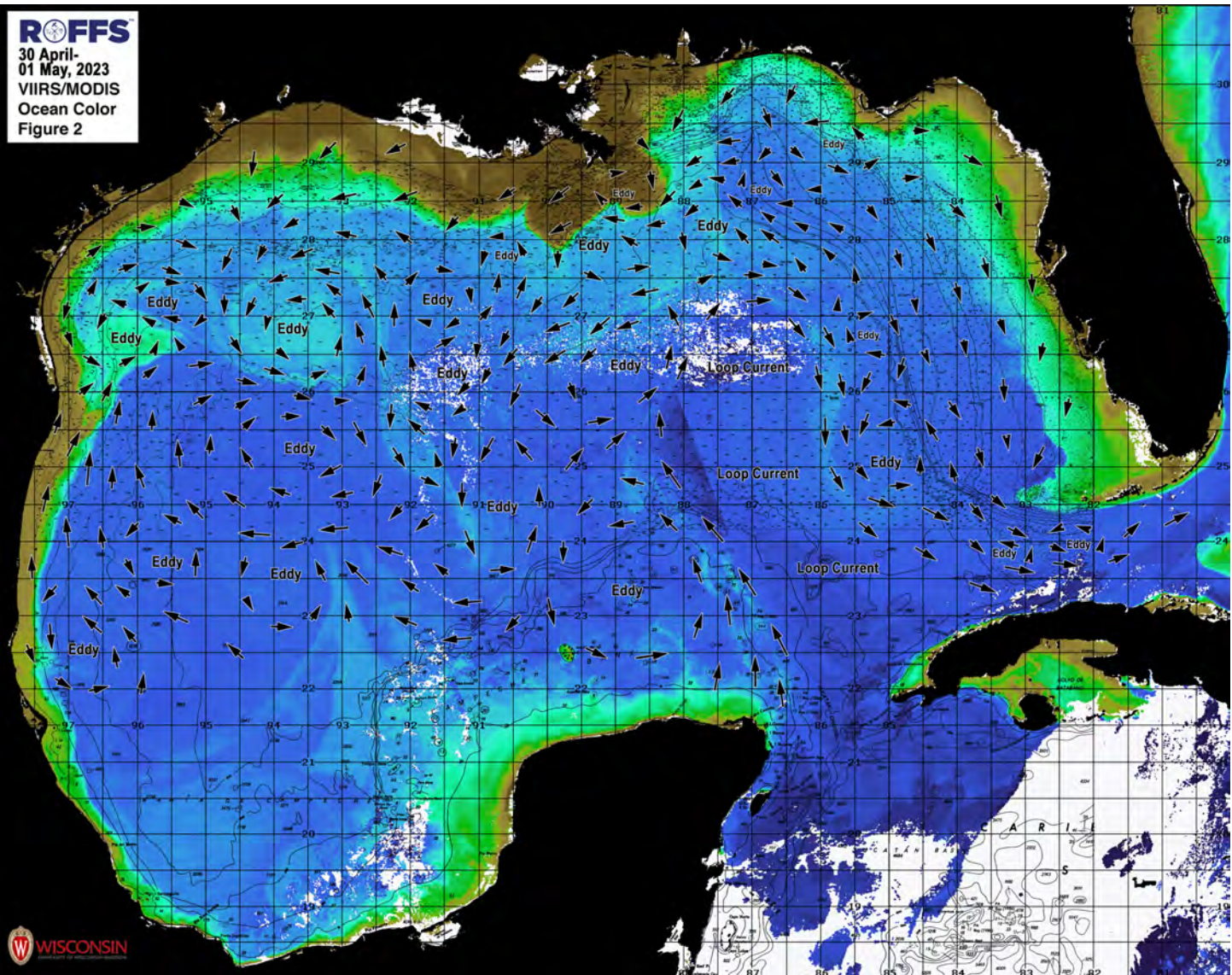
**Figure 1a:** This year's Gulf of Mexico conditions were derived from a variety of infrared sensors to get SST from NASA, NOAA, ESA and JPSS satellites during April 29-May 1, 2024. Main features and surface currents are labeled.



**ROFFS**  
29 April-  
01 May, 2024  
VIIRS/MODIS  
Ocean Color  
Figure 2



**Figure 2a:** This year's Gulf of Mexico conditions derived from the ocean color/chlorophyll imagery during April 29-May 1, 2024 from the VIIRS sensors on SNPP and JPSS satellites in combination with the Aqua and Terra sensors on the MODIS satellite provided by the University of Wisconsin and from ESA's Sentinel 3A & 3B. Same main features and surface currents labeled.



**Figure 2b:** Last year's Gulf of Mexico conditions derived from the ocean color/chlorophyll imagery during April 30-May 1, 2023 from the VIIRS sensors on SNPP and JPSS satellites in combination with the Aqua and Terra sensors on the MODIS satellite provided by the University of Wisconsin and from ESA's Sentinel 3A & 3B. Same main features and surface currents labeled.

When evaluating this year's late April to early May oceanographic conditions, we continue to observe the northern location of the main body of the Loop Current located in a more typical position although not as far northward compared to the last two years. However, this year we did observe one large clockwise rotating Loop Current eddy along with several smaller clockwise and counter-clockwise rotating eddy features north/northwest of the main Loop Current circulation which have pulled up the cleaner blue water with direct Loop Current origins further north/northwestward over the De Soto Canyon, south of the Unexploded Ordnance, the Spur, the Steps and southwestward towards the areas south/southeast of the Mississippi River Delta region. These conditions likely account for the recent early season catches of bluefin tuna, yellowfin tuna, dolphin, wahoo, swordfish and blue marlin in the northeastern Gulf of Mexico. Furthermore, although the main eastern edge of the Loop Current is 120+ miles west/southwest of Tampa, FL there is an abundance of cleaner blended blue to bluer water over the areas inshore of the northeastern Loop Current edge and within 30 miles of the western FL coastline again this year for good chances at fishing action. In the eastern Gulf of Mexico it is important to keep an eye on the Loop Current and the detached Loop Current eddy and how they change in the next month. Some things worth watching are if the Loop Current eddy keeps sliding southwestward and if the direct connection to the Loop Current keeps circulating Loop Current water further northward into the De Soto Canyon and how it interacts with the clockwise and counter-clockwise rotating eddies located north/northwestward of the main Loop Current flow. These changes will determine where the better fishing locations offshore of Florida, Louisiana, Alabama and Mississippi over the late spring to early summer season.

Offshore of Texas and in the western Gulf of Mexico, two key eddy features, one counter-clockwise rotating (centered near 95°30'W & 26°00'N) and one clockwise rotating (centered near 93°30'W & 26°00'N), continue to circulate warmer blue water over the offshore rigs and good bottom areas offshore of the TX coastline offshore of the 500+ fathom depths, over the Dump Site and south of the East Breaks and Flower Gardens regions. Also of note is the large, clockwise rotating eddy centered near 95°00'W & 24°00'N which continues to circulate warmer dark blue water originating from Mexico and moving north/northeastward towards the circulation of the two previously mentioned features. It is important to keep track of this southern eddy, as it will likely continue to move slowly westward to northwestward based on the current circulation. If it moves northwestward, it will push the counter-clockwise rotating eddy to the north further northwestward and with it better conditions closer inshore towards the TX coastline. If it moves more to the southwest, it will likely take longer to push the favorable offshore conditions closer inshore towards TX. Stay tuned and call ROFFS™ to get updated conditions within this entire Gulf of Mexico region to find the best locations to fish nearest to your inlet.

## **Conclusion**

Based on what we are observing currently and what we have been observing over the last several weeks, the present ocean conditions for the Gulf of Mexico region continue to look promising again this year. Although the overall conditions and main features look different than last year, much of the SSTs are already within the preferred fishing habitats of tuna, dolphin and billfish along with bluer water over most of the typical fishing zones within the Gulf of Mexico early this spring season. The overall takeaway is that the majority of the Gulf of Mexico SSTs are similar or slightly warmer than in year's past (again this year) and in line with what we had observed during the favorable early fishing season that occurred over the past two years. Furthermore, there appears to be an abundance of bluer cleaner water closer to the coast in many regions similar to what we had observed last year (especially in the eastern to northeastern Gulf of Mexico). Although, the relatively warmer water appears further offshore of Texas this year early in the season, we expect it to push northwestward closer inshore over the coming weeks



and as the atmospheric temperatures warm, so will the SST. The warmer SST observed again this year may mean an earlier to normal arrival of the larger numbers of target fish species closer to shore.

Furthermore, the large Loop Current eddy present this year in the central Gulf of Mexico, along with the abundance of other favorable blue water features (smaller eddies) in the northeastern Gulf of Mexico are likely to continue to keep the warmer water within these preferred fishing structure zones allowing the already favorable fishing conditions to continue through the spring and into the summer season. Of particular interest, although the northern edges of the main Loop Current circulation are further southward than last year, there are large amounts of blue water with direct Loop Current origins water far northward into the De Soto Canyon for good early season fishing conditions directly offshore of Alabama, Mississippi, and Northwest Florida right now and this should continue for the next few weeks and may even improve further IF the northern edge of the main Loop Current circulation pushes further northward and continues to inject warmer, dark blue water directly into the De Soto Canyon area. Overall, we think that the Gulf of Mexico conditions for spring to early summer are above average again this year and are shaping up very well for rest of the spring season into the bigger summer fishing season. We believe now is time to start fishing and call ROFFS™ for the latest and greatest updates to the changing ocean conditions. Please continue to get your fishing reports and photos in to us at [feedback@roffs.com](mailto:feedback@roffs.com) and be sure to follow us @roffsfishing on [Instagram](#) and [Facebook](#).

It is important to note 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 both the baitfish and larger predatory pelagic 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, 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 (hourly to daily) and relatively small-scale (5-10 mile) movements of the currents and their associated 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, therefore it is extremely important to monitor these conditions and the changes in them on a daily basis.

Contact ROFFS™ (321-723-5759 / [fishing@roffs.com](mailto:fishing@roffs.com) / [www.roffs.com](http://www.roffs.com)) for daily real-time detailed fishing forecasting analyses and get the inside track to where the better conditions will be tomorrow or while you are out fishing. We continue to monitor the Gulf of Mexico conditions and how they change from day-to-day as the recreational fishing season has arrived and the bigger tournament fishing season is arriving soon. The bottom line is: GET READY and GET OFFSHORE NOW and take advantage of the favorable weather windows, for the excellent spring season fishing conditions have already started and should continue to improve throughout May and into the summer months.

Safe and Successful Fishing!  
ROFFS™ Team