Gulf of Mexico Spring Season Preview 2025

CONDITIONS LOOKING GOOD IN THE GULF OF AMERICA (MEXICO)

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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 2025. 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) has a 38-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 2025

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 2025 (Figure 1a) is approximately 81.7°F-82.5°F which is about the same as the past four years over this same time period. Please note that again this year, there are some intrusions of relatively warmer (77°F-79°F/80°F) water with direct Loop Current origins moving over the Lloyd Ridge and the Atwater Valley further westward towards the Mississippi Canyon before turning northeastward towards the Steps region and 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 and another relatively large clockwise rotating eddy centered southeast of the Mississippi River Delta region. The main body of the Loop Current does seem to occur at a similar latitude compared with last year with the northern edge of the main body of Loop Current water occurring southward towards 26°40'N. These eddy features provide a direct route of the warmer Loop Current water directly into the Mississippi Canyon, towards the Steps region and De Soto Canyon and surrounding areas to the north closer to the coasts of Alabama and western Florida similar to what we observed last year. Again, this year, we observed a large clockwise rotating Loop Current eddy feature

break off from the main Loop Current circulation, and this feature continues to progress southwestward over the Green Canyon area and west/southwestward currently centered in the area near 91°15'W & 26°30'N.

The main body of the Loop Current appears to show normal warm temperatures again this year; and the inshore waters do appear to be slightly warmer (1°F-2°F) when compared to last year. The SST in the northwestern Gulf of Mexico is currently 76.0°F-77.5°F inshore (2°F warmer than last year). Again, this year, this relatively warmer water extends further offshore towards the 400-600 fathom depths with the warmer 77.7°F-78.6°F water (0.5°F-1.0°F warmer than last year) occurring further offshore towards the 600+ fathom depths which is similar to what we observed in these areas last year (Figure 1b) although the general SST in the western Gulf of Mexico appear to be warmer overall this year. The warmer SST this year are likely to lead to some normal arrivals of pelagic species this year in the western Gulf of Mexico (early to mid-May). The SST in the offshore southwestern Gulf of Mexico area was observed to be within the 80.0°F-82.0°F range again this year, which is similar to last year and slightly warmer than the 79.0°F-81.0°F range we observed in 2023. 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 SSTs along the west coast of Florida (76.0°F-77.5°F) are showing temperatures 1.5°F-2.0°F warmer when compared to last year (74.0°F-76.0°F), but are still slightly cooler compared to what we had observed back 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 SSTs is the presence of an El Niño period. We are currently transitioning from a La Nina to an ENSO neutral phase which suggests more average overall SST and is expected to persist through the summer. These ENSO neutral phase conditions current have a 50% chance of persisting through at least October 2025 (https://www.cpc.ncep.noaa.gov/products/analysis_monitoring/lanina/enso_evolution-status-fcsts-web.pdf).

Currently there is a large, detached Loop Current eddy feature present in the west-central Gulf of Mexico centered southwest 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 Lloyd Ridge and the Atwater Valley, towards the Mississippi Canyon and northeastward towards the Steps region and the area of the De Soto Canyon area with some of this water being circulated towards the Spur and the area south of the Nipple by two additional counter-clockwise rotating eddy features. 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 and Wings regions. 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 east/northeastern edges of the main Loop Current circulation. There have also been reports of marlin action, along with larger yellowfin tuna south/southwest of LA into the Mississippi Canyon and Green Canyon areas and near the offshore rigs. This is not surprising due to the presence of the clockwise rotating Loop Current eddy centered southwest of the Green Canyon and also 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.

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 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 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, 2025) period and Figure 2a was derived from the U.S. SNPP and JPSS VIIRS, Sentinel 3A and 3B, Aqua MODIS and Terra MODIS, and PACE ocean color/chlorophyll imagery during this same period (April 29-May 1, 2025). As the exact values of the original data from different satellite sensors (VIIRS, MODIS, Sentinel & PACE) 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 29-May 1, 2024) 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 29-May 1, 2024).

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 year's SST satellite infrared imagery in greytone can be found on the ROFFS™ YouTube™ site (https://www.youtube.com/watch?v=XMrvlWSwYZg). 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-May 1, 2025), where the darker greytoned water represents the warmer water and white indicates clouds.

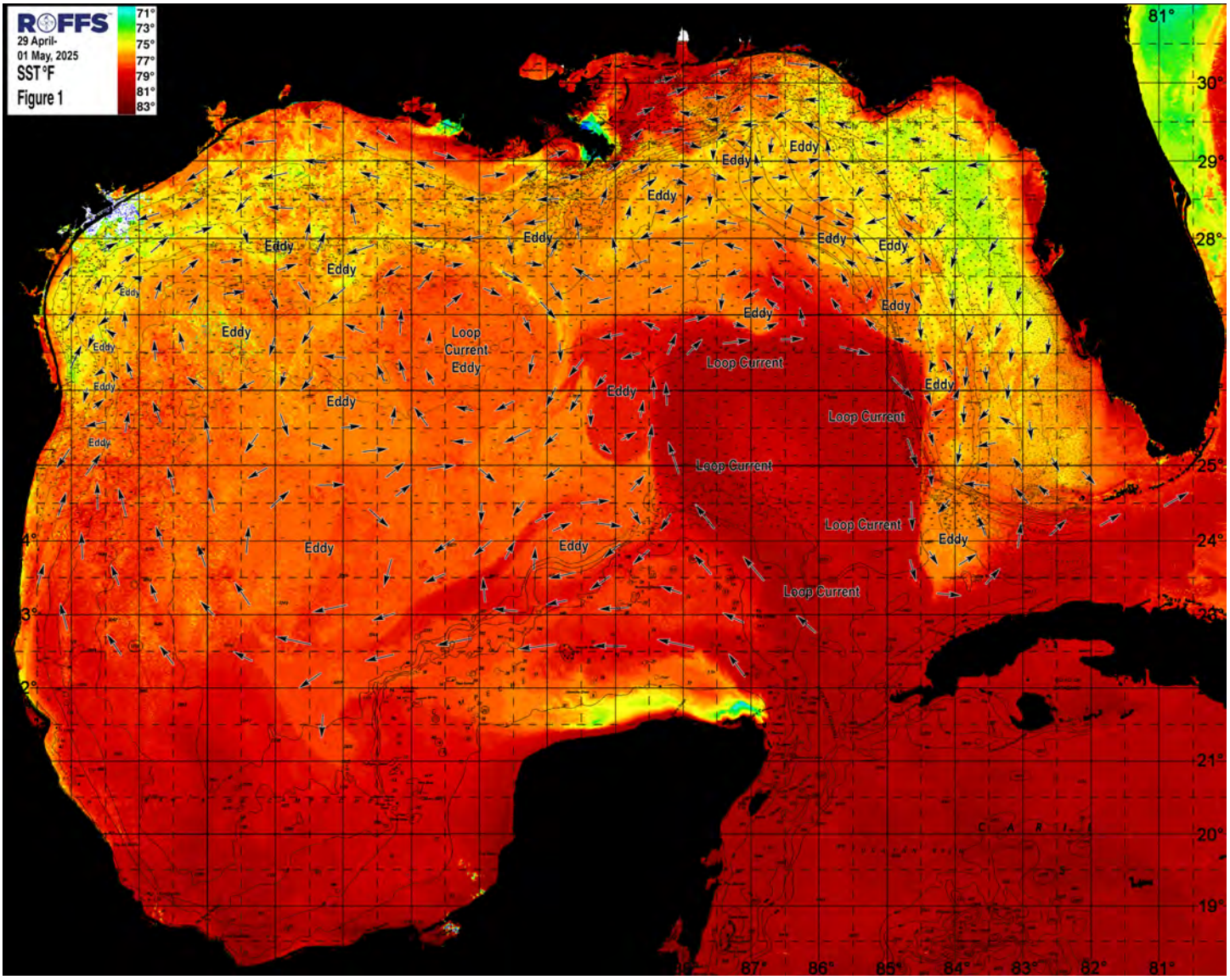

Figure 1a: *This year's Gulf of Mexico conditions were derived from a variety of infrared sensors to get SST from NASA, NOAA, ESA and JPSS satellites during April 29-May 1, 2025. Main features and surface currents are labeled.*

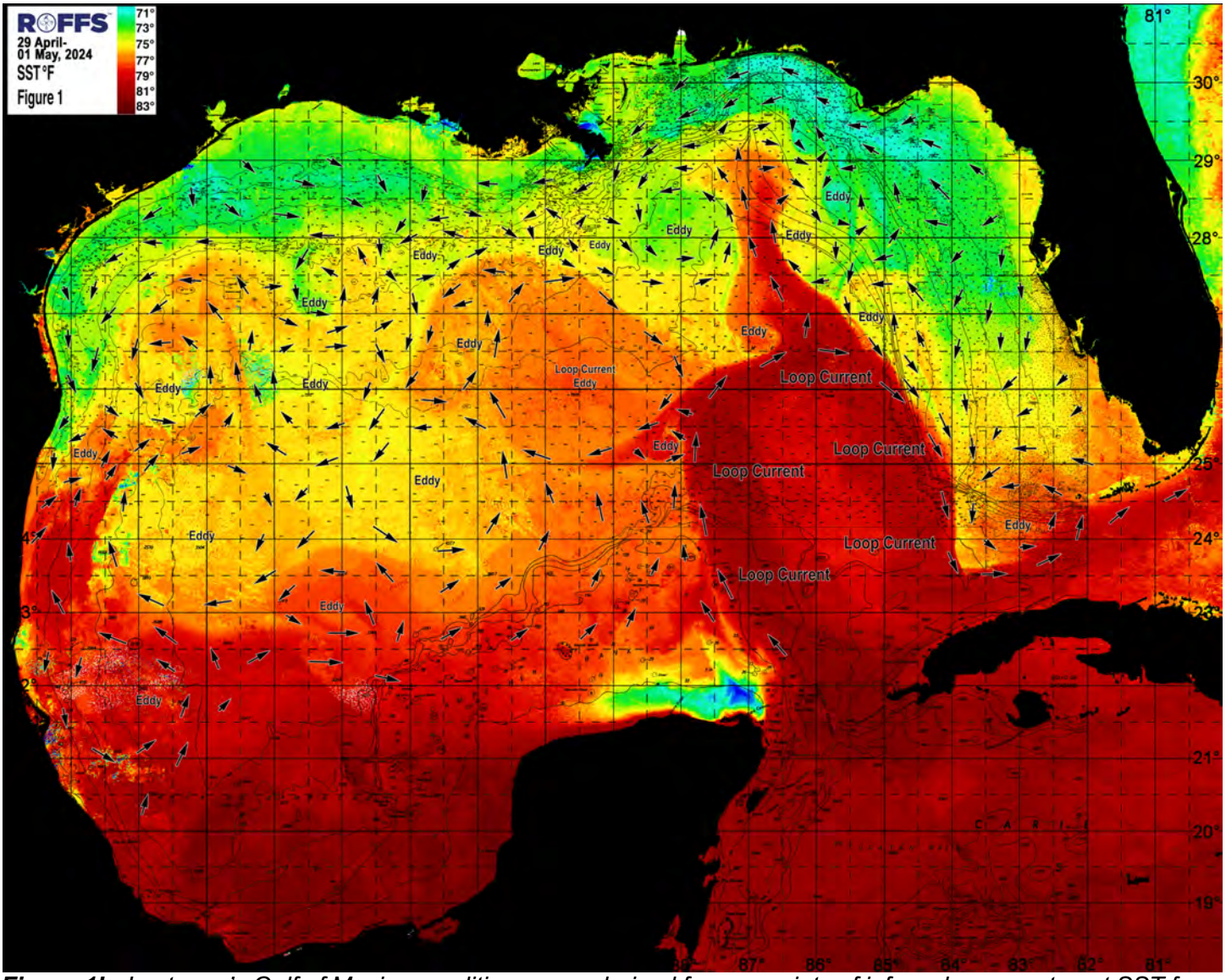

Figure 1b: *Last year's Gulf of Mexico conditions were derived from a variety of infrared sensors to get SST from NASA, NOAA, ESA and JPSS satellites during April 29-May 1, 2024. Main features and surface currents are labeled.*

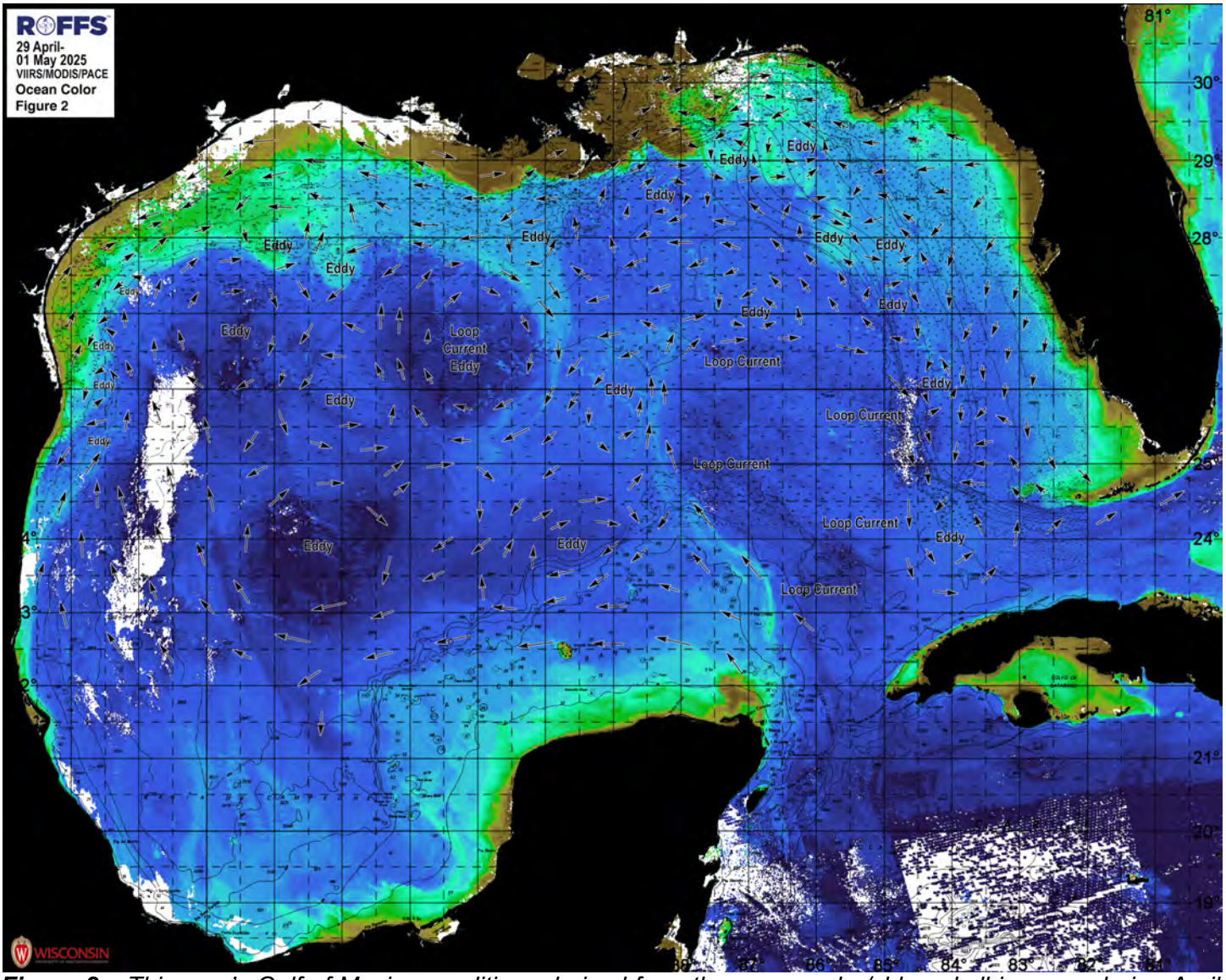

***Figure 2a**: This year's Gulf of Mexico conditions derived from the ocean color/chlorophyll imagery during April 29-May 1, 2025 from the VIIRS sensors on SNPP and JPSS satellites in combination with the Aqua and Terra sensors on the MODIS satellite provided by the University of Wisconsin and from ESA's Sentinel 3A & 3B and PACE satellites. Same main features and surface currents labeled.*

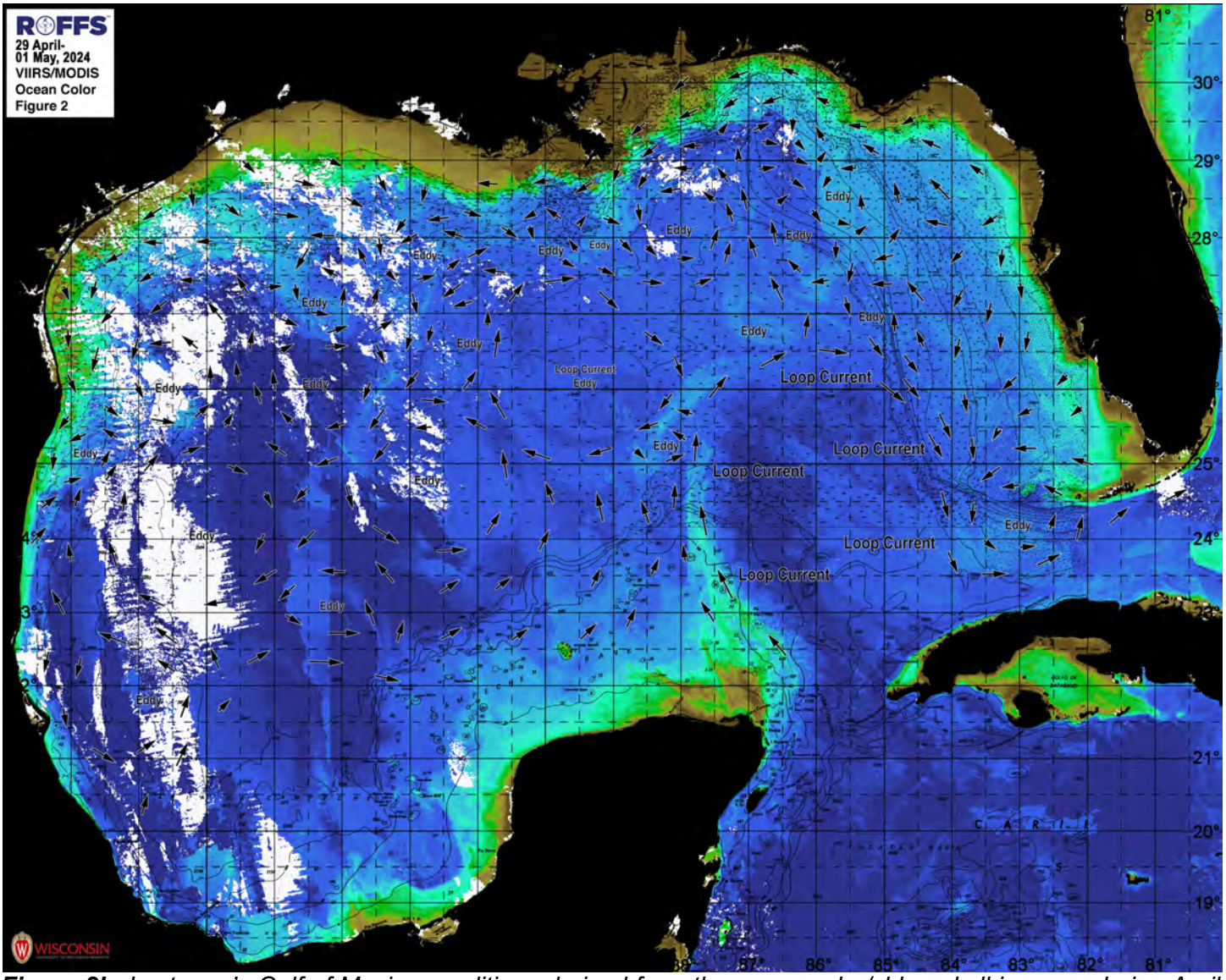

***Figure 2b**: Last year's Gulf of Mexico conditions derived from the ocean color/chlorophyll imagery during April 29-May 1, 2024 from the VIIRS sensors on SNPP and JPSS satellites in combination with the Aqua and Terra sensors on the MODIS satellite provided by the University of Wisconsin and from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

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 again this year, although not as far northward compared to 2022-2023. However, this year we did again 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 100-120+ 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 particularly where these conditions persist for multiple consecutive days. 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 move and 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 will occur.

Offshore of Texas and in the western Gulf of Mexico, two key clockwise rotating eddy features, one counter-clockwise rotating eddy (centered near 96°30'W & 25°15'N) and one clockwise rotating eddy (centered near 94°30'W & 26°45'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 93°30'W & 24°00'N which continues to circulate warmer dark blue water originating from Mexico and moving west/northwestward to northward towards the circulation of the two previously mentioned features. 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 encouraging again this year. The overall conditions and main features look very similar when compared to this same time period last year and 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 three years.

Also, there appears to be an abundance of bluer cleaner water closer to the coast in many regions similar to what we had observed over the past two years. Although, the relatively warmer water appears further offshore of Texas again 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 west 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 appear to be at a “normal” latitude, there are large amounts of bluer water with direct Loop Current origins water far northward into the Mississippi Canyon and northeastward towards 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 areas south/southeast of the Mississippi River Delta region. 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 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 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 / 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: CONDITIONS LOOK GOOD - GET OFFSHORE NOW and take advantage of the favorable weather windows, for the good to 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