

Gulf of Mexico Spring Season Preview 2021

CONDITIONS LOOK PROMISING AGAIN THIS YEAR IN THE GULF OF 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 2021. 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 30+ 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, Suomi National Polar-orbiting Partnership (SNPP), the University of Delaware 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 2021

It is important to look at the year-to-year trends and anomalies to get a better understanding of how the ocean conditions 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 2021 is approximately 81.5°F-82.5°F which is about 1.0°F degrees cooler than last year over this same time period. In 2020 the core of the Loop Current water was approximately 82.4°F-83.2°F which was similar and slightly warmer overall compared to the previous several years. Please note; however, that again this year the northern boundary of the Loop Current appears to be at a lower latitude than two years ago (2019) at this same time period, but at a slightly higher latitude than last year (2020). This year there is one newly formed large Loop Current eddy feature that has broken off approximately 7-10 days ago (currently centered near 87°15'W & 26°45'N).

The main body of the Loop Current appears to show normal warm temperatures again this year; however, the other areas within the Gulf of Mexico do not show the warming trend we had observed over the previous three years. The SST in the northwestern Gulf of Mexico is 73.0°F-75.0°F, which is approximately 4.0°F-5.0°F cooler than we observed last year (78.0°F-80.0°F in 2019 and 2020) and

1.0°F-2.0°F cooler than we had observed back in a cooler 2018. 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 cooler compared to the same time period last year (82.0°F - 83.0°F), but still 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 are again showing temperatures similar to last year, but continue to range 4.0°F - 5.0°F higher than they were during the same time period (early to mid April) back in 2016-2017. Also, the coastal waters in the western Gulf of Mexico are significantly cooler this year (71.0°F-72.0°F) than they were last year (76.0°F-77.0°F). Normally, a strong contributor to the warmer SST's is the presence of an El Niño period as observed last year. However currently we are in a La Niña stage with NOAA model predictions indicating an 80% transition into an ENSO neutral stage within the next month. The La Niña phase and cooler than normal winter and early spring atmospheric temperatures could be the cause of the much lower SST readings specifically in the northwest Gulf of Mexico this year.

Currently (as previously discussed) there is one Loop Current eddy feature, which has broken away from (separated from) the main body of the Loop Current over the past two weeks. The clockwise circulation of this feature continues to pull clean blue water with Loop Current origins northward over the Atwater Valley and Lloyd Ridge regions, and several smaller eddies continue to pull this water northwestward towards the region southeast of the Mississippi River Delta/Louisiana. Some of this blue water is also being pulled north/northeastward towards the Squiggles/Wings areas and into the De Soto Canyon area mainly due to the circulation of a large counter-clockwise rotating eddy that has been centered over the De Soto Canyon for over a month now. 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 has been decent so far in March and into April offshore of western Florida with sailfish and dolphin along with blackfin/yellowfin tuna and marlin also being caught offshore of Tampa, FL. We have also had reports of larger bluefin tuna caught in the northeast Gulf of Mexico in mid-to-late March and into April resulting in the early closing (May 4, 2021) of the Gulf of Mexico incidental trophy bluefin tuna season which includes medium, large and giant bluefin tuna measuring 73" or greater. There have also been reports of marlin, wahoo and yellowfin tuna action (some larger than 150+ lbs.) south of LA and in the northeastern Gulf of Mexico area, which is not surprising based on the circulation and SST's we have been observing in the areas east of the Mississippi Canyon, south/southeast of the Mississippi River Delta and eastward into the De Soto Canyon. In the western Gulf of Mexico there have also been reports of releases of blue marlin in the Boomvang Rig and Nansen Rig, along with giant bluefin tuna landings at the Perdido Rig (including the new TX state record) and also good yellowfin tuna, wahoo and dolphin action offshore of Texas towards the Dutra area despite the cooler than normal SST readings in the western Gulf of Mexico.

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 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 sometimes 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 mid-to-late April (April 24-26, 2021) period and Figure 2a was derived from the U.S. SNPP VIIRS, Sentinel 3A and 3B, Aqua MODIS and Terra MODIS ocean color/chlorophyll imagery during this same period (April 24-28, 2021). 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 mid-April (April 25-27, 2020) period and Figure 2a was derived from the U.S. SNPP VIIRS, Sentinel 3A and 3B, Aqua MODIS and Terra MODIS ocean color/chlorophyll imagery during this same period (April 25-27, 2020).

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=0SHz_Eemvcl). Viewing the movie will allow one to observe the flow of the water within the Gulf of Mexico region during the last two months, where the darker greytone water represents the warmer water and white indicates clouds. One can see how a recently shed, elongated clockwise rotating Loop Current eddy has just formed within the past week.

ROFFS™
24-28 April 2021
VIIRS/MODIS
Ocean Color
Figure 2

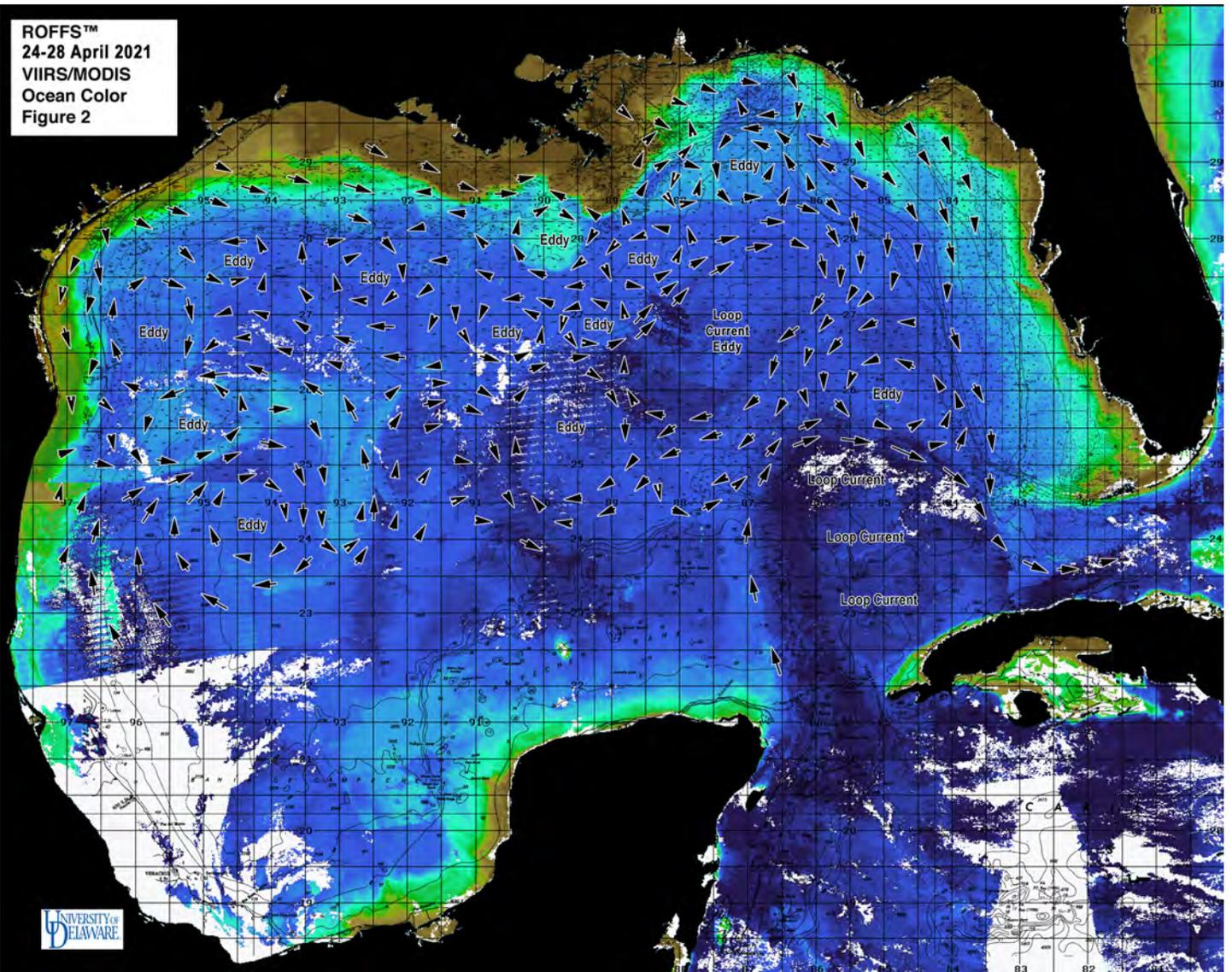


Figure 2a: This year's Gulf of Mexico conditions derived from the ocean color/chlorophyll imagery during April 24-28, 2021 from the VIIRS sensors on SNPP satellite in combination with the Aqua and Terra sensors on the MODIS satellite provided by the University of Delaware and from ESA's Sentinel 3A & 3B. We consider this an image pair with the above SST Figure 1a image. Same main features and surface currents labeled.

ROFFS™
25-27 April 2020
VIIRS/MODIS
Ocean Color
Figure 2

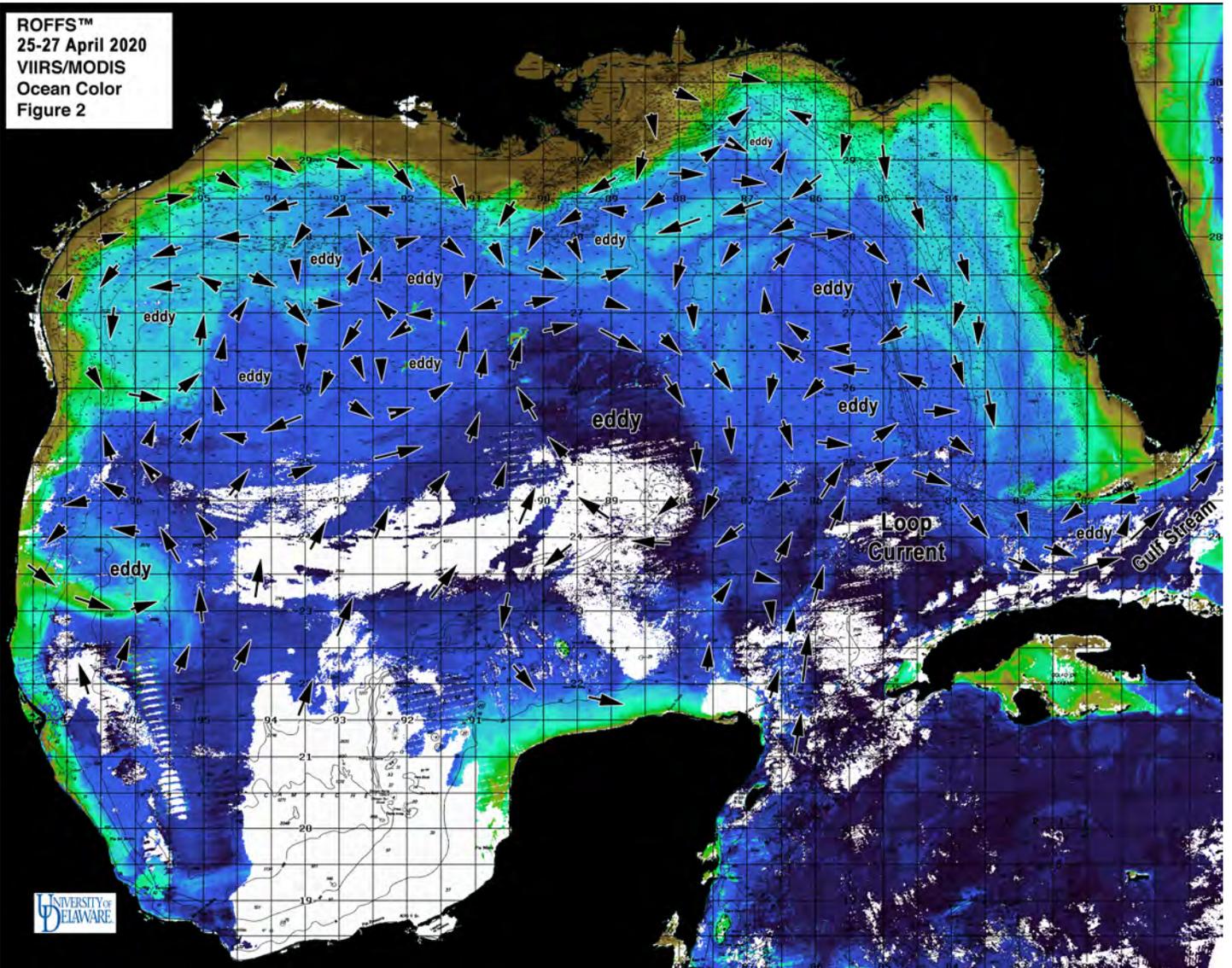


Figure 2b: Last year's Gulf of Mexico conditions derived from the ocean color/chlorophyll imagery during April 25-27, 2020 from the VIIRS sensors on SNPP satellite in combination with the Aqua and Terra sensors on the MODIS satellite provided by the University of Delaware and from ESA's Sentinel 3A & 3B. We consider this an image pair with the above SST Figure 1b image. Same main features and surface currents labeled.

When evaluating this year's late April oceanographic conditions we continue to observe the intrusion and northern location of the main body of the Loop Current located similarly further southward compared to last year; however, as previously stated this year we did observe one distinct Loop Current eddy feature towards the Atwater Valley/Lloyd Ridge region (south of the De Soto Canyon) which has helped the cleaner blue water with Loop Current origins move further north/northwestward and within 10-15 miles of the Mississippi River Delta and also east/northeastward towards the De Soto Canyon area. These conditions likely account for the recent early season catches of larger bluefin and yellowfin tuna, dolphin, wahoo, and blue marlin in the northeastern Gulf of Mexico. Also, although we notice that the main edges of the Loop current are further north than last year, a large counter-clockwise rotating Loop Current frontal eddy (centered in the area near 85°00'W & 26°00'N) north/northeast of the main body of the Loop Current and southeastward of the recently shed Loop Current eddy continues to push clean blue water towards the west coast of Florida and within 80-90 miles west/southwest of Tampa, FL. 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.

Offshore of Texas and in the western Gulf of Mexico, a large clockwise rotating eddy (centered in the area near 94°15'W & 24°30'N) along with a large counter-clockwise rotating eddy farther north (centered near 95°15'W & 25°45'N) continues to circulate warmer blue water (74°F-76°F) over the Perdido Rig area resulting in the recent bluefin tuna catches with some of this same blue water moving more northward towards the area east of the Dump Site and over the Nansen Rig and Boomvang Rig areas due to the influence of a second elongated counter-clockwise rotating eddy (centered in the area near 93°00'W & 24°30'N) resulting in early season blue marlin catches in these areas.

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. There are SSTs that are within the preferred fishing habitats of tuna, dolphin and billfish along with bluer water over much 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 significantly cooler than the past two years, especially within the mid to northwestern Gulf of Mexico and specifically near the coast. However, there appears to be an abundance of bluer cleaner water closer to the coast in many regions compared to last year. The lower than normal SST may mean a later than normal arrival of the larger numbers of target fish species closer to shore especially in the west. These conditions could translate to better oceanographic conditions a bit later this year than normal. In fact, it could lead to better fishing later in the year than previous years. Furthermore, the presence of the large Loop Current eddy along with other favorable blue water features (eddies) will continue to keep the warmer water within these fishing zones allowing the already favorable fishing conditions to continue through the spring and into the summer. If this larger loop current eddy continues its traditional slow migration west then southwest through the spring and into the summer season, the Gulf of Mexico (especially mid-to-western Gulf of Mexico Green Canyon to East Breaks areas) should continue to have plenty of good water to fish throughout the year. Overall, we think that the Gulf of Mexico conditions for spring to early summer are still above average and shaping up very well this year so it is time to start fishing and call ROFFS™ for the latest and greatest updates. 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 GET OFFSHORE NOW, for the favorable spring season fishing conditions have already started and should continue through May and into June and July.

Safe and Successful Fishing!
ROFFS™ Team