



The Teaser®

Season Fishing Forecast for 2009: Ocean Conditions Variable

By Mitchell A. Roffer, Ph.D.

While we have developed a standard method in investigating the ocean and atmospheric conditions for providing the annual fishing forecast for the entire Bahamas Billfish Championship (BBC) season, we have learned the limitations that some of the indicators provide. One of the limitations relates to the number and location of relatively large (> 30 miles in diameter) clockwise and counter-clockwise eddy features in the Bahamas region. Since we started this annual oceanographic challenge in 2003, we continue rely on our main working hypothesis which has proven correct the last six years.

The hypothesis for forecasting the seasonal marlin fishing action stems from the location and geographic extent of the bluer and often warmer water that occurs from the Cat Island – San Salvador Island area where we presume that the marlin concentrate before spawning. We have been calling this water “blue marlin water.” We assume that the marlin are associated with this water and the more “blue marlin water” that exists in the Abaco Islands and Eleuthera Island areas, the greater the marlin relative apparent abundance will be in these areas. This assumes that the temperature of the water is within the preferred temperature range of the marlin.



Recent electronic tagging and other research results by National Marine Fisheries Service, Southeast Fisheries Science Center suggest that the peak abundance of marlin off Bermuda occurs when the sea surface temperature is between 81° F and 82° F which is probably similar to the conditions in the Bahamas when there has been good catches of blue marlin. However, these temperatures usually do not exist in the Bahamas when we make our seasonal forecast, so we monitor the location and condition of the “blue marlin water” from its signature temperature (warmer) and water color (bluer) using a variety of NOAA, NASA, and European satellites. The NASA ocean color satellite data provide particularly useful data to identify and track this bluer water mass.

It is important to note that in some years the sea surface temperature off Abaco barely reaches these 81° F - 82° F temperatures. However, our experience in other areas indicate that blue marlin will swim into surface water with temperatures between 72° F and 86° F and the electronic tagging data indicates that marlin can withstand water temperatures lower than 72° F. The understanding of the effect of the water temperature on blue marlin is a critical aspect when trying to understand their migration routes. From what we have been observing the last several weeks, it appears that we are about to learn more about this factor during this year's season as the present surface water conditions are approximately five degrees below what we have been observing the last several years.

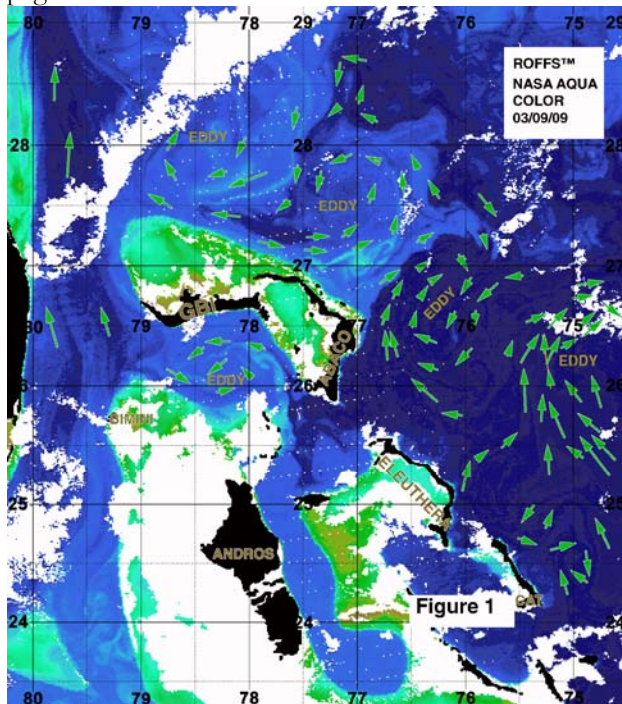
An additional factor comes into play when trying to predict the relative apparent abundance of blue marlin in the BBC tournament region in that there is a 60 mile tournament limit from each tournament location. This means that even if blue marlin are in the Abaco – Eleuthera region, they may not appear to be abundant to tournament fisherman if they occur beyond the 60 mile limit, i.e., they are not available to your fishing effort.

We have observed that excellent fishing action occurs within the BBC tournament area when there is substantial volume of the “blue marlin water” pushing over the 100 fathom ledges along the eastern side of

Eleuthera and Abaco. Good fishing seasons occur when this water occurs over the 1000 fathom curves of both areas. The degree which the catch rates occur is controlled by the persistence and direction of the flow which act to concentrate baitfish and cause them to become more vulnerable. When the “blue marlin” water remains outside the 60 mile tournament limit, then overall fishing success with blue marlin is relatively poor.

Last year the conditions were favorable as early as January and February. However, due to the currents generated by a relatively large eddy located northeast of Eleuthera, the “blue marlin” water was pulled away from the BBC tournament area. There were periods when some of this water moved into the tournament areas, but these favorable conditions were not persistent throughout the entire tournament trail.

As customary we will now consider the regional and global conditions before we discuss the present and forecast conditions for the upcoming season. Presently in the eastern tropical Pacific Ocean there are La Niña conditions that are dissipating to a El Niño – La Niña neutral state. This is probably a good thing for the BBC since a well developed La Niña is associated with more hurricanes in the Atlantic Ocean, (fewer in the Pacific Ocean). La Niña conditions are also statistically associated with less rain and more heat for the already drought-stricken southern U.S., and milder spring and summer in the northern states. See NOAA’s climate prediction website (www.cpc.noaa.gov/) for more details, especially their frequently asked questions page.



After several years of trying to associate the eastern tropical Pacific Ocean conditions to Bahamas fishing we still have not learned any strong relationship, but we will continue to study this. One important aspect is that climate data trends are centered around "average" shifts in temperature and precipitation due to such events as La Niña. However, no two La Niña (or El Niño) episodes are alike, nor are the climate impacts seen from these events. It is important to consider the range of possibilities that accompanies these episodes rather than counting on climate patterns close to the "average" for La Niña or El Niño. “Average” conditions never really exist; they are the mathematically calculated mean conditions.

While others use much longer records, we have evaluated the sea surface temperature in the core of Gulf Stream off Miami, Florida for the last seven years as an index of the seasonal warming. The mean sea surface temperature during the 2003-2008 during the March 5th - 6th time period is 79.1° F. This is above the 77° F longer term mean that climatologists use. This year (2009) the water temperature was 74.8°F in the core of the Gulf Stream. This was approximately the same temperature that we had measured from satellite the previous 10 days, so the value was unaffected by the cold front the previous weekend. We also evaluated the water temperature of the bluer water off Cat Island – Eleuthera and noted that this year the surface temperature is approximately 72.5° F, while it was approximately 77.0° F last year (2008). Thus, the water temperatures in the BBC areas are below the short-term and long-term statistical mean at the present time.

Considering the regional Atlantic Ocean conditions and forecasts, we rely on our own data and other sources such as the Florida State University Center for Ocean-Atmospheric Prediction Studies program (see www.coaps.fsu.edu, as well as, www.coastalclimate.org/marine/sst.php and agroclimate.org/forecasts/current_climate_outlook.php).

We also use the Columbia University’s International Research Institute for Climate and Society, known as IRI (portal.iri.columbia.edu/) for more information. It remains to be seen how important this is considering that the IRI’s sea surface temperature forecast is only for a -0.5° F to -1.0° F anomaly from the

climate mean for the April – June period and no anomaly for the May – July period. This suggests that a warming trend is anticipated over the next few months.

When we started evaluating the ocean conditions during the second week of February, 2009 in anticipation of the Miami Boat Show, we observed poor blue marlin conditions off Abaco and Eleuthera as an eddy northeast of Eleuthera was pulling most of the “blue marlin water” northward and away from the BBC area. Some of this water, in pulses moved westward along the northeast side of the Great Abaco Canyon area due to another eddy that was located north of Abaco and moving westward. During the third week in February a pulse of “blue marlin water” moved northwestward along the eastern side of Eleuthera and Abaco creating favorable conditions. However, that appeared to be short lived since another larger eddy moved northeast of Eleuthera that pulled most of the “blue marlin water” northward from Cat Island. However, these conditions changed.

Figure 1 and Figure 2 show the conditions on which we have based our forecast for this coming season. The satellite images shown in these figures were derived from data received on March 09, 2009. Figure 1 was derived from the ocean color MODIS sensor on the NASA Aqua satellite and Figure 2 was derived from several NOAA and NASA satellites using the infrared sensors for sea surface temperature.

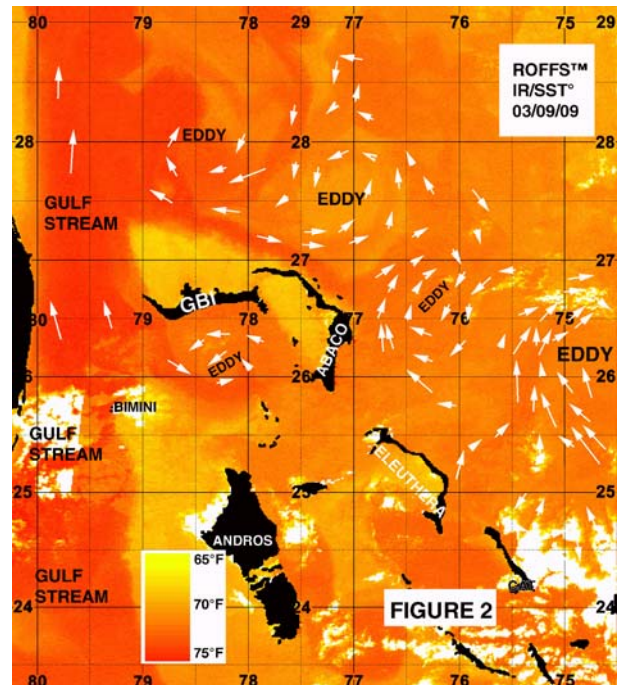
In Figure 1, the “blue marlin water” appears as a much darker blue color. In Figure 1 and 2 there are five eddy relatively large eddy features controlling the circulation in this region. In both figures the direction (not speed) of the water flow is summarized by arrows.

In early February the clockwise rotating eddy now centered near 75°00' W & 26°00' N was pulling most of the “blue marlin water” northward and away from Eleuthera and Abaco in a manner similar to the conditions during several weeks last summer that resulted in mediocre blue marlin fishing. However, this year this eddy appears to be further south.

There is another eddy centered north of Abaco (near 77°00' W & 27°30' N) that has a counter-clockwise rotation that was pulling the “blue marlin water” along the eastern side of Abaco that occurs within approximately 45 miles of the coast. The circulation of these two eddy features caused this water to rotate and form the clockwise eddy (centered near 76°15' W & 26°45' N) that is pulling the “blue marlin water” over Little Abaco Canyon. While it may not be obvious from these figures, the Little Abaco Canyon eddy is pulling some of the “blue marlin water” from the larger eddy located northeast of Eleuthera. These are excellent water color conditions for the Abaco area, but the “blue marlin water” is being pulled away from Eleuthera which is an unfavorable condition for this more southern island.

It remains to be seen how long the Little Abaco Canyon eddy will remain in this area since the eddy over the Great Abaco Canyon is moving westward. We are uncertain if the Little Abaco Canyon eddy will move northward or be pulled eastward by the larger eddy. In 2008; however, when conditions similar to that which are seen in Figures 1 and 2 off Abaco, there was good blue marlin fishing action over the Little Abaco Canyon.

During the next several weeks we anticipate that the eddy centered northeast of Eleuthera will drift northwestward pulling more blue water toward Abaco and if the eddy moves more westward than northwestward, then the flow of the water will be favorable for the areas along the eastern side of Eleuthera by Palmetto Point and over the Little Abaco Canyon. This suggests that the Central Abaco Championship will experience favorable conditions for blue marlin action. By the time the Cape Eleuthera Championship occurs these conditions will have substantially changed. However, using the satellite altimeter data available



from the NOAA Atlantic Oceanographic and Meteorological) (www.aoml.noaa.gov/phod/altimetry) and the NOAA GOES satellite data it appears that several additional eddy features are headed toward the northern Bahamas area. If the present situation continues, then there is likely to be another eddy moving toward Eleuthera and Abaco. If the eddy track continues to remain more southerly than northward, then good fishing action is likely during the Cape Eleuthera and Boat Harbor Championships. Also if all the eddy features remain on a southerly track all the BBC season, then the Treasure Cay Championship should be a productive blue marlin tournament as well.

When viewing the altimetry data remember that the model which calculates the flow fields uses a 10-day running mean of all the altimeter satellite passes over the area and that the resolution of the data are significantly lower than what is derived from the NOAA and NASA satellite data shown in Figures 1 and 2. An advantage of the altimeter data is that the derived data are not affected by clouds like the infrared and ocean color data.

The bottom line is that the water remains substantially cooler than what has been experienced in the Bahamas for the last six years. However, we do not anticipate that the water temperatures will preclude the marlin in the BBC tournament region. If the eddy features continue to take the southerly tracks that they currently are taking, then the 2009 marlin season is likely to be much better than 2008. Since we are paid the big bucks for this forecast (☺), we have been told to stick our necks out. Thus, we are now forecasting a good BBC marlin season for 2009.

For the inaugural Bimini Championship the conditions controlling the arrival blue marlin are different. We have not studied the factors for seasonal forecasts in that area for a long enough period to provide as many details. However, if the counter-clockwise eddy features that form between the Grand Bahama Island and the Berry islands remain persistent or reoccur frequently, then more of the “blue marlin water” will be pulled within the 60 mile tournament boundary creating favorable marlin conditions. With the water temperatures being abnormally cool now, it is unlikely that a substantial amount of blue marlin will move from Gulf Stream’s Loop Current water in the Gulf of Mexico to Bimini from the southwest.

Finally, while the occurrence of the “blue marlin water” is a prerequisite for the arrival of the blue marlin, the daily catch rates are controlled by the presence and persistence of concentrations of baitfish that are strongly influenced by the persistence of the convergence of water mass boundaries (ocean fronts) and the direction of the current flow. Such conditions cannot be forecast this far in advance.

Safe and Successful fishing for all!

Mitch Roffer