# Cooperative Science Services, LLC
# Dolphinfish Research Program

***Made possible by a grant from Marine Ventures Foundation***

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## Is the U.S. Dolphin Fishery Changing?

Since the start of the Dolphinfish Tagging Study fishermen have been asking whether the dolphin fishing is declining. This is a hard question to answer. The biggest issue faced in the management of the U.S. dolphinfish stock(s) is the absence of quality harvest data from domestic fisheries as well as foreign fisheries in the Bahamas and Caribbean Sea. Few coastal states collect data on oceanic pelagic game fish, and those that do use diverse sampling procedures, making it impossible to combining their data sets for a comprehensive look. Only one recreational fisheries survey captures data on the dolphin fisheries on the entire U.S. Atlantic and Gulf coasts. The Marine Recreational Fisheries Statistical Survey (MRFSS) is a national survey contracted out by the National Oceanic and Atmospheric Administration's (NOAA) National Marine Fisheries Service, Statistics Division.

MRFSS utilizes direct intercept of fishermen at the end of their fishing day coupled with a telephone survey to generate the basic fisheries catch and effort data. Because this sampling is done on such a small scale and data are summarized into broad categories for types of fishing, state fisheries managers place little credibility in this survey when looked at on a state level. Its greatest value results from its use on a regional or coast-wide basis.

As questionable as this data base may be, it is the only information available that we can examine to look at possible changes in the U.S. dolphin fisheries. Historically, recreational fishermen have harvested more than 90% of the dolphinfish taken by the U.S. domestic fisheries, and there is nothing to suggest that this has changed. Examination of the MRFSS data at the level of the U.S. Atlantic and Gulf of Mexico (GOM) coasts respectively does suggest changes are taking place in the fisheries.

The following discussion will be based solely on information taken from the MRFSS data base. For the purpose of this analysis we will look at the number of dolphin harvested from the East and Gulf coasts separately from 1990 through 2007. The annual harvest will be examined for each coast from all fishing areas combined (state and federal waters) and from only the Exclusive Economic Zone (EEZ), which is the federal waters from three miles out to the end of federal jurisdiction, usually 200 miles. (The EEZ is the area for all states where the majority of the dolphin are caught.) Limiting analysis to the EEZ also allows exclusion of more types of fishing effort that are not directed at or likely to catch dolphinfish. This gives a more realistic projection of angling effort likely to catch dolphin, which should aid in a more accurate catch-per-unit-of-effort.

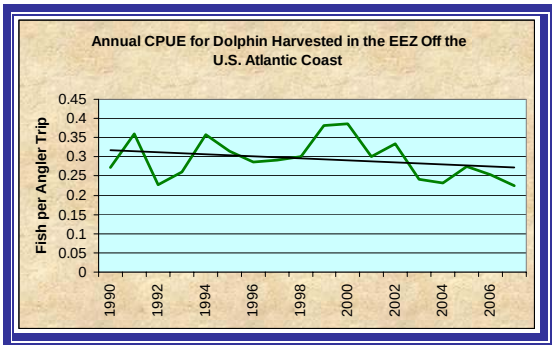
Examination of the annual total U.S. Atlantic coast harvest for dolphinfish showed that it ranged from just under 1 million to more than 2 million fish per year. Comparing the harvest that took place in the EEZ to the total harvest showed that they followed the same pattern of increases and declines. This is no surprise because the EEZ harvest represented an average 89% of all dolphin harvested in the Atlantic. While the graph showed an irregular pattern of rises and falls in the number of fish harvested each year, a linear regression (trend) line showed a steady decline in both the total harvest and EEZ harvest during the 18-year period. The

harvest decline was most pronounced following the peak in the fishery in 2000.

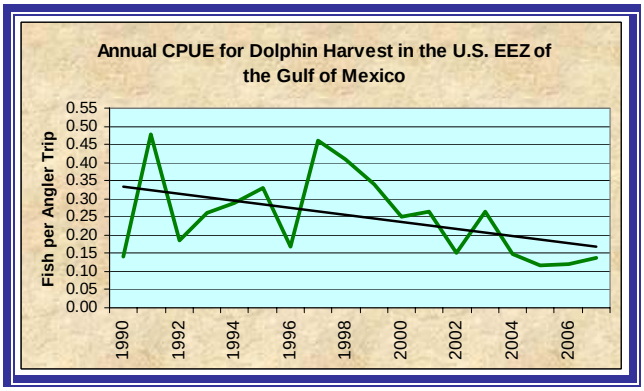
Comparison of the total harvest versus EEZ harvest in the Gulf of Mexico showed a similar trend to the Atlantic fishery, though at a much reduced level. The total annual harvest in the Gulf varied from 217,000 fish to 892,000 fish. Harvest from the Gulf's EEZ accounted for an average of 86% of the total harvest. The linear trend lines for the Gulf harvest showed a much sharper decline in the harvest primarily occurring after the fishery peak in 1997.

While the decline in the number of fish being harvested will likely raise people's eyebrows, by itself it does not warrant concern until we look at the amount of fishing effort expended to harvest the fish. The MRFSS program uses the number of angler trips as determined by intercept and telephone surveys to express the amount of fishing effort. The national survey indicated that during the 18-year period the number of angler trips made to the Atlantic EEZ ranged from 3.18 million to 4.49 million each year. Fishing effort in the Gulf was shown to fluctuate between 1.23 million and 1.75 million angler trips per year. While the linear trend line indicated that the Gulf's fishing effort was increasing, the trend line for the Atlantic EEZ showed a decline in the angling effort. The principal question becomes what role did these changes in fishing effort play in the declining harvests.

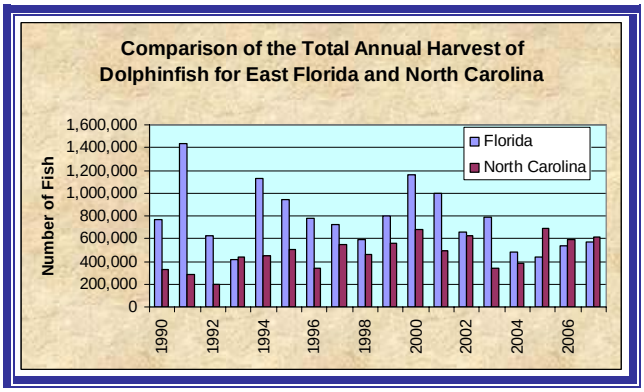
One of the tools used by fishery managers to assess the health of a fishery is look at the catch-per-unit-of-effort (CPUE) for the fishery over a long period. By generating a uniform catch unit comparison, changes in fishing effort from year to year can be filtered out. In this case, by dividing the number of dolphin caught in the EEZ each year by the number of angler trips made in that area each year, a uniform yield per effort is achieved, allowing the fishing success to be directly compared year to year. The following figure shows that the dolphin CPUE in the U.S. Atlantic EEZ varies from 0.22 to 0.39 fish per angler trip over the years examined. The linear trend line indicates that the fishery has been steadily declining during this period. Looking at the annual CPUE line, the angler success rate in the Atlantic has been in a sharper decline since the peak in 2000 and reached its lowest point in 2007.




Annual CPUEs in the Gulf's EEZ exhibited a much wider range, varying from 0.12 to 0.48 dolphinfish per angler trip (following figure). This is a 400% fluctuation in the success rate for the GOM as opposed to the 77% variance among the years observed for the Atlantic EEZ fishery. As in the Atlantic, the linear trend line indicates a steady decline in angler success at catching dolphin during the 18 years. The Gulf fishery also shows a sharper decline since the fishery's peak, 1997. Over the last 4 years, 2004 -2007, angler success in catching dolphin was at its lowest level, with the worst fishing occurring in 2005.




Data collected by MRFSS indicate other changes have also occurred within the U.S. dolphin fishery. One of the most prominent changes concerns a shift in state dominance on the East Coast with regard to dolphin harvest. Historically, Florida and North Carolina have been the two major harvesters of dolphinfish on the U.S. Atlantic coast. In the 1990s, Florida averaged harvesting twice the number of fish as harvested by Tar Heel anglers (following figure). From 2000 through 2004 Florida's dominance fell with the state harvesting an average of only 62% more fish annually than North Carolina. Now, for the past three years, MRFSS data indicates that North Carolina fishermen are continuing to harvest more dolphin than anglers in the Sunshine State.

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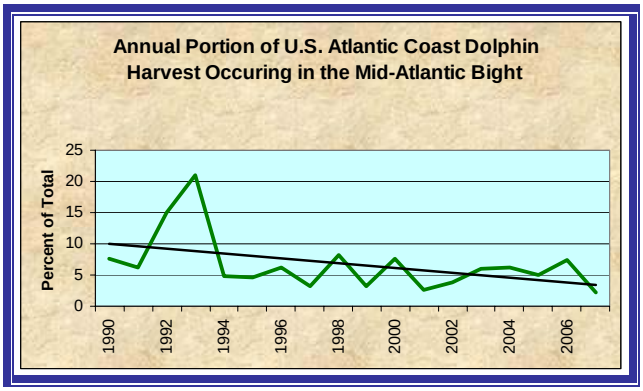
Another change indicated by the MRFSS data is in the share of dolphinfish that the Mid-Atlantic Bight (MAB), Virginia to Massachusetts, harvests in the Atlantic EEZ. The trend line for the 18-year period examined indicated an overall decline taking place. The national survey shows the MAB harvesting an average of 8.0% of the total annual Atlantic coast harvest of dolphin from 1990 through 2000. However, from 2001 through 2007 the MAB share fell to 4.7% of the total harvest.




The MRFSS data base is not the most solid source of information on which to base a claim of a fishery decline. However, declines in the fisheries of the U.S. Gulf of Mexico and along Atlantic coast seems more than a coincidence. It is well documented that specific fisheries can be cyclic, but with seven years of decline in one area and 10 years in the other for a species that is largely an annual crop, it may be time for action on the part of fishery managers.

The shift from Florida to North Carolina as the major harvester is certainly a surprise to this researcher and most likely to Florida fishermen as well. Some managers might suggest that this change was the result of a minimum size restriction that was placed on Florida anglers in 2004 but not on fishermen in North Carolina. But if the Florida minimum-size restriction increased the harvest in North Carolina, it would seem that it should also benefit anglers in the Mid-Atlantic Bight, which it did not. The Mid-Atlantic's share in the dolphin harvest has remained well below its 1990s average. Also, the level of harvest in North Carolina did not increase close to the level of the declines in harvest indicated for Florida.

The information presented here should not be taken as a statement of actual decline in the U.S. stock of dolphinfish but rather as reasons that suggest that it is time for closer examination of the health of the dolphinfish stock. Stock assessments do not happen overnight. It takes time and planning just to identify and assemble the data required for the assessment. If the MRFSS data can be believed, then it is time for fishery managers to begin looking at the health of the dolphin stock.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