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# Distribution of red snapper catches from headboats operating in the South Atlantic

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## Data Collection

The Southeast Region Headboat Survey (SRHS) collects self-reported catch records (logbooks) for each trip from headboats. All headboats are required to complete catch records for each trip, but the actual number submitted varies by area and year. Recent efforts to mandate reporting have increased the compliance in 2008 and 2009. The catch records have fields for the numbers of fish caught and discarded by species, as well as a location field. The location field is reported using a grid code which corresponds to a 10 minute x 10 minute grid of latitude and longitude position. Headboat captains are instructed to fill this field out for the location of their fishing activity. There is only one entry for this per trip.

Using the data reported on the catch records, we can compute the number of kept and discarded red snapper and assign this to the reported location field. We assumed here that all fields were reported accurately, although with self-reported data, this assumption may not be perfectly met. The accuracy of this data can be affected by the willingness of the participants to divulge information, as well as their perception of how the data will be used by management. The SRHS has conducted some limited analyses to compare at-sea observer data with the catch record data. These limited analyses (still ongoing) suggest that on average the number of kept fish is reportedly accurately. Preliminary analysis of the headboat data suggests there may be some degree of under-reporting of discards on the catch records. Analysis of the location field has not been conducted. In this report we examine some patterns in the reporting of this field.

## Reliability of Location Field in the SRHS

We do not have an independent source of data to confirm the accuracy of the location field reporting in the SRHS. However, some simple examinations may indicate some patterns to suggest its utility. Upon first examination of this field, it is clear that in many cases it is simply left blank or only partially filled out on the catch record form (Table 1). The majority of incomplete records report latitude and longitude as integers (hours), which is a much broader scale.

It is also apparent that there is an increase in the reporting of the location field. This is probably due to a renewed effort to force legal compliance of catch record reporting. From Table 1 it seems roughly 3-26 % of the locations are not reported or incomplete. This amount of unusable records could present a problem if the remaining reporting is biased in some way.

Further analysis of the complete location records might reveal other issues for concern. One way in which this field may be misreported is by simply putting in the same location for every trip. This is not to say that this could not be possible, but it seems unlikely that a headboat would fish the same grid for the whole entire year. Figure 1 shows plots of individual vessels by year, indicating the total number of trips and the number of different locations reported. We wouldn't necessarily expect a linear relationship between number of trips and number of locations, but it raises questions about accuracy of reporting when a vessel reports running over 150 trips to the same location.

Of course one of the best determinants of reporting accuracy for location data (besides independent verification) is to see if the location itself seems plausible. In Figures 2-7 the location of red snapper catches, as reported on the SRHS catch records, are shown alongside the U.S. Southeast coastline. These figures indicate further mis-reporting of the location field. Many of the locations report red snapper catches in areas too close to the coast (in depths of less than 20 feet), or too far from the coast (some locations are nearly 80 miles offshore for one day trips) to be reasonable.

All of these exploratory analyses suggest the location field being reported on the SRHS catch record forms is at a minimum incomplete and potentially biased.

#### Headboat Catches by Inlet

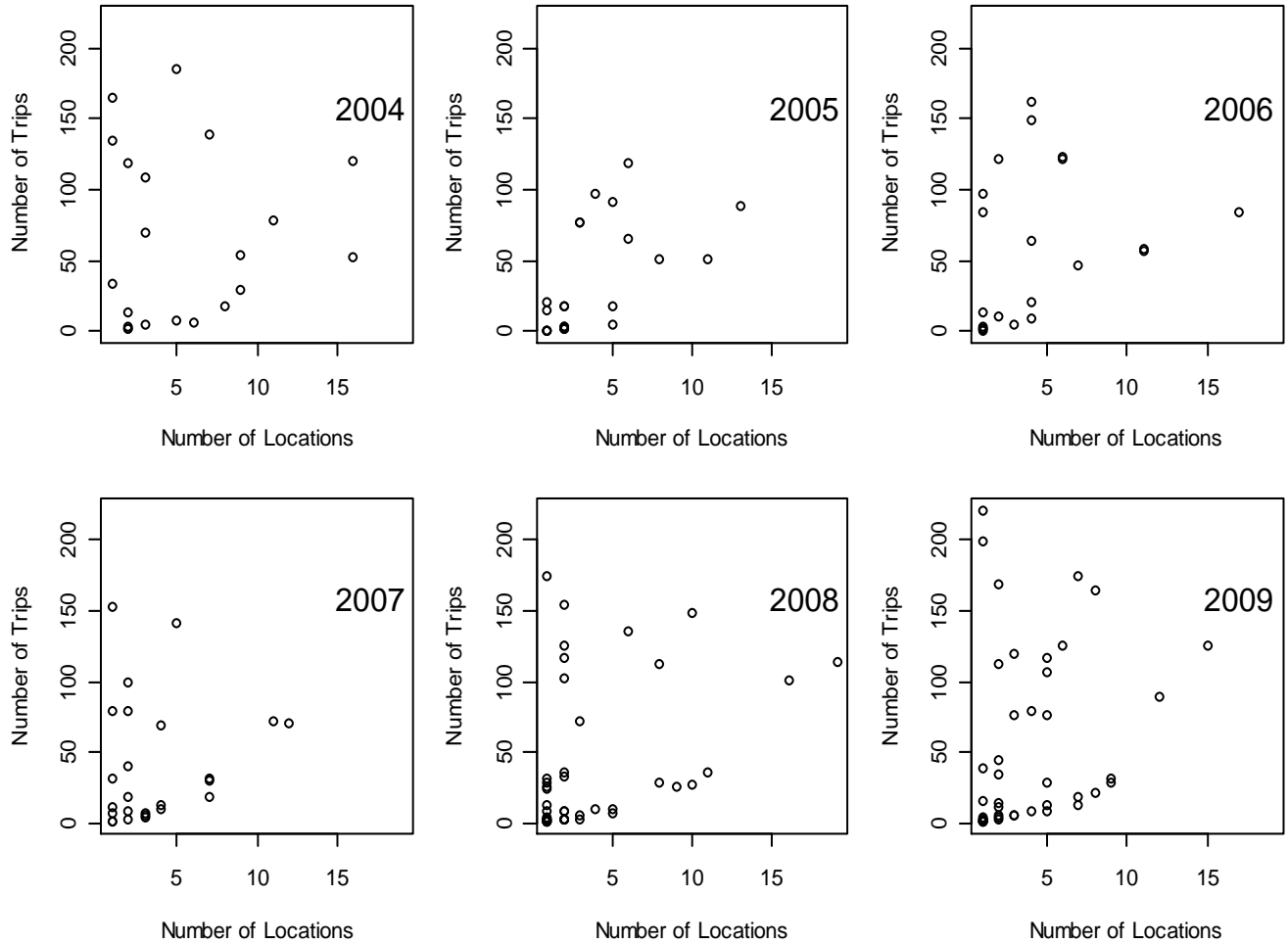
Since the location reported on the SRHS catch records is incomplete and potentially error prone, we are left with the spatial location of the vessels themselves for area reporting. Although not a fine detail of area reporting, it may be the best available for characterizing the distribution of red snapper catches. For each headboat vessel we know the port at which the boat ties up and we also know the inlet that vessel uses to head out to the fishing grounds. Red snapper headboat catches in the South Atlantic from 2004 -2009 have been predominantly from vessels using inlets in northeast Florida, which include; St. John's River Entrance, FL, St. Augustine Inlet, FL, Ponce Inlet, FL and Port Canaveral, FL. Vessels using these inlets accounted for 78% of estimated red snapper landings for this period, while inlets in South Carolina and Georgia represented 14% of the landings. The remaining 8% of red snapper headboat catches were widely distributed from Cape Hatteras, NC to Key West, FL.

The physical location of the inlet is very likely a limiting factor of how far the vessels are willing to travel for a single day fishing trip. Half day trips are probably even further restricted by distance relative to full day trips. So, using this information we can start to define some feasible boundaries offshore that could be fished by these vessels. The maximum distance headboats will operate on full and half day trips is likely 50 and 25 miles, respectively, and the average distance is probably 35 and 15 miles, respectively (Bob Dixon, pers. comm.). Add to these restrictions the fact that red snapper probably don't occur in depths less than 40 feet and headboats rarely fish waters deeper than 300 feet and we begin to be able to apply a reasonable, fishable area to each inlet. Additional spatial analysis to determine these boundaries would include assigning the red snapper catch from the vessels operating out of a particular inlet to the area defined by traveling distance, species minimum depth, and maximum fishing depth.

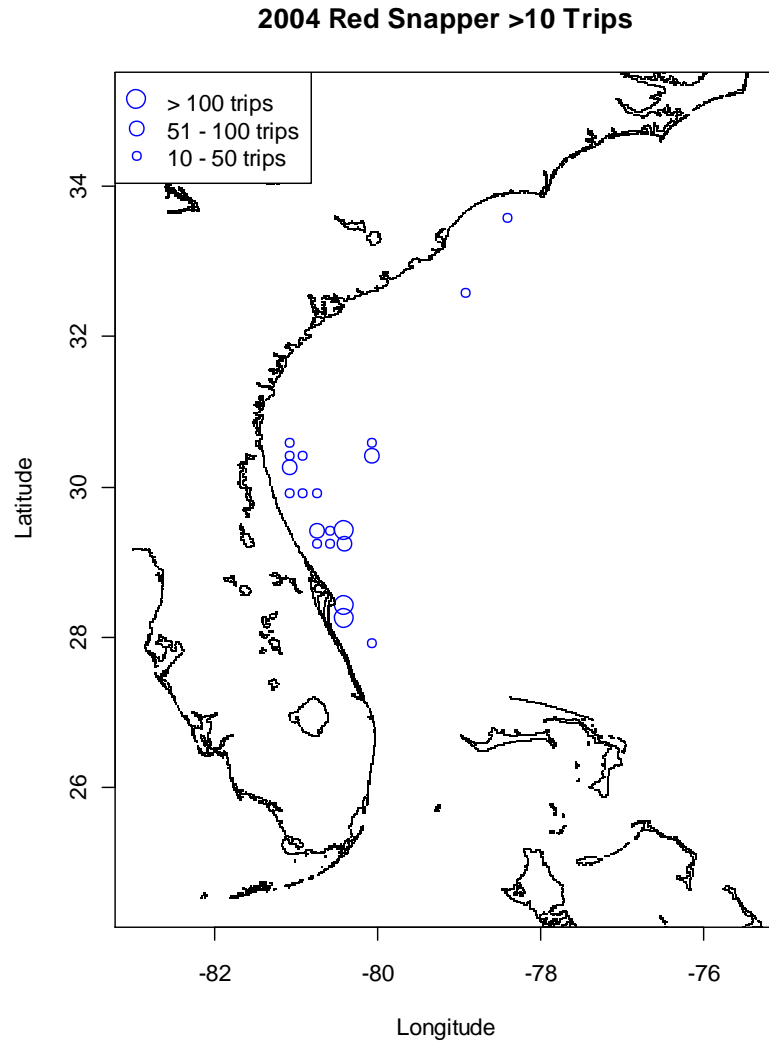
**Table 1.** Number of catch records that reported red snapper with a complete location field (Complete), partially filled out location field (Incomplete), or missing location field (None) for headboats operating in the South Atlantic.

<b>Year</b>	<b>None</b>	<b>Incomplete</b>	<b>Complete</b>	<b>Percent Missing/Incomplete</b>
2004	155	318	1344	26.0%
2005	147	99	1224	16.7%
2006	104	86	1281	12.9%
2007	75	149	1365	14.1%
2008	16	244	1854	12.3%
2009	31	46	2476	3.0%

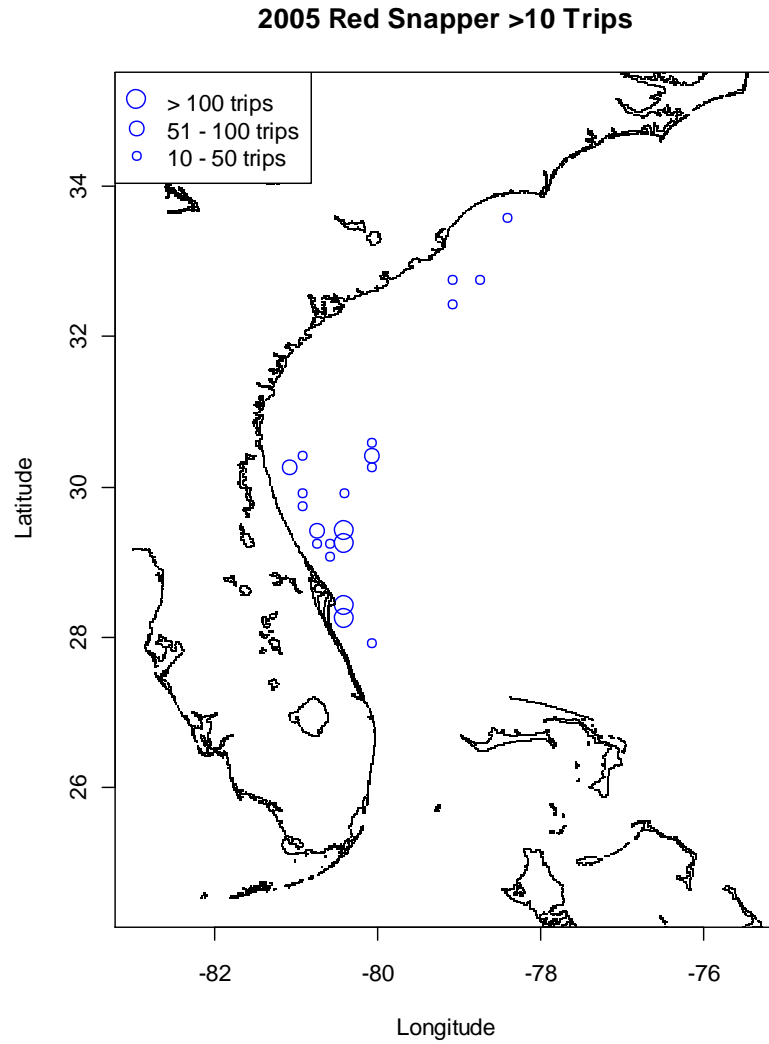
**Figure 1.** Plot of the total number of trips compared to the number of locations reported by vessel (points) for each year for headboats reporting red snapper from the Southeast region Headboat Survey.



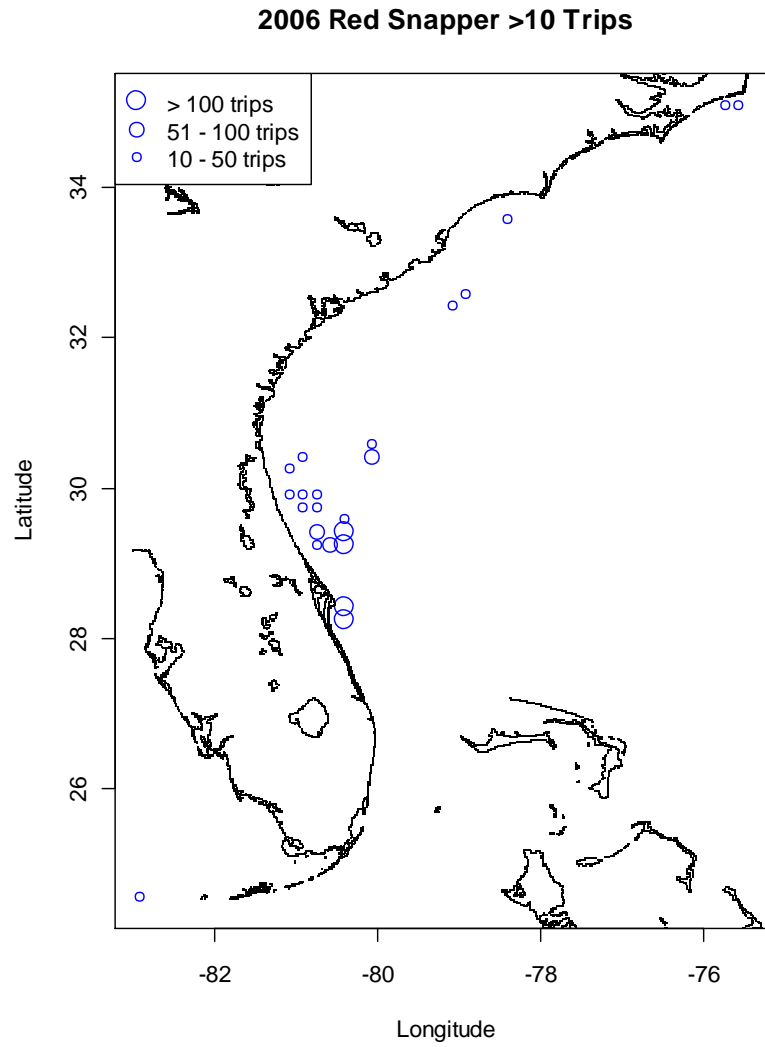
**Figure 2.** Location and relative size (circles) of the number of trips catching red snapper from completed location fields in the Southeast Region Headboat Survey catch records for 2004 from vessels reporting more than ten trips with red snapper.



**Figure 3.** Location and relative size (circles) of the number of trips catching red snapper from completed location fields in the Southeast Region Headboat Survey catch records for 2005 from vessels reporting more than ten trips with red snapper.

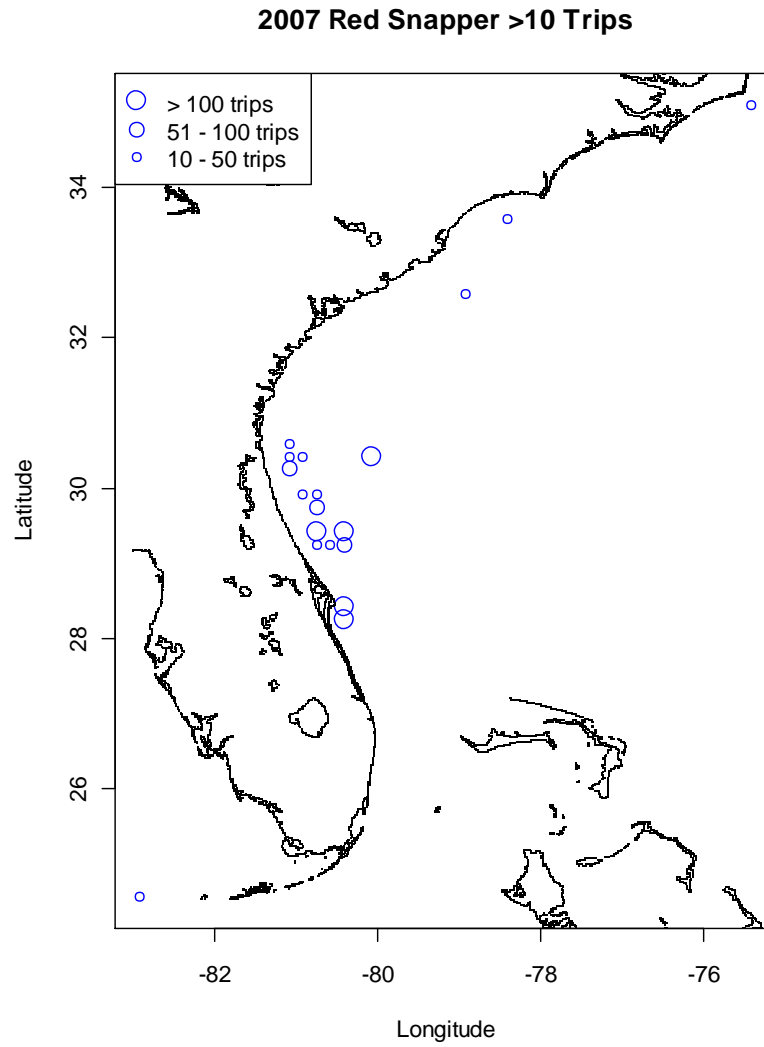


**Figure 4.** Location and relative size (circles) of the number of trips catching red snapper from completed location fields in the Southeast Region Headboat Survey catch records for 2006 from vessels reporting more than ten trips with red snapper.

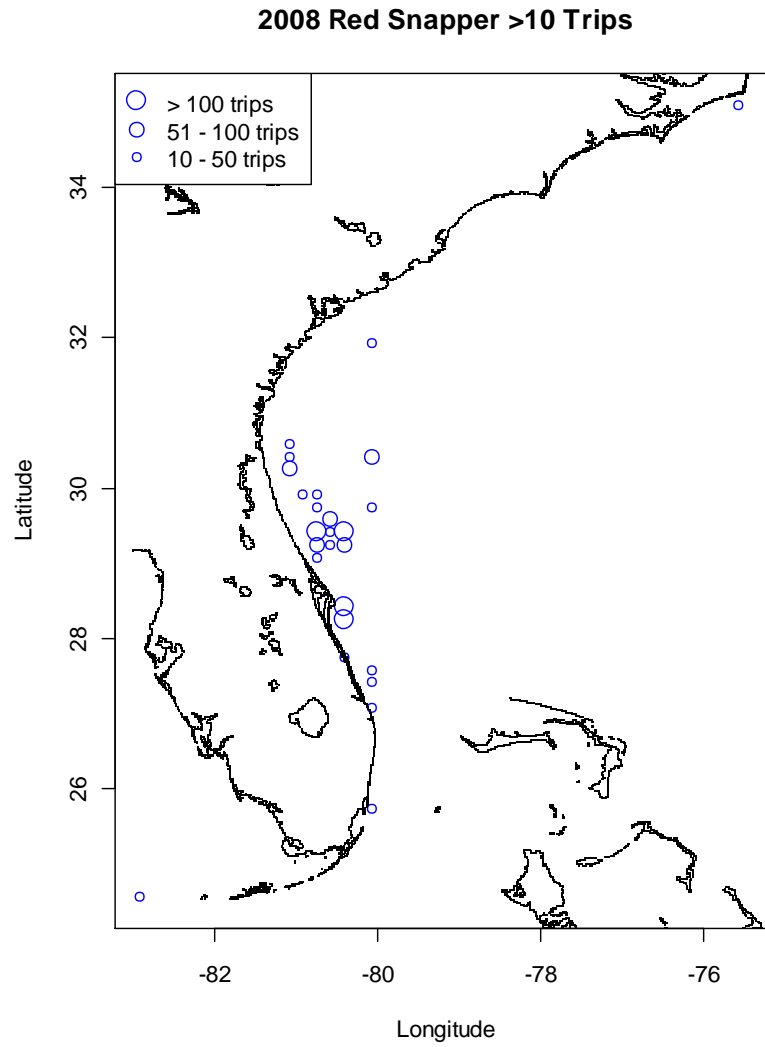




**Figure 5.** Location and relative size (circles) of the number of trips catching red snapper from completed location fields in the Southeast Region Headboat Survey catch records for 2007 from vessels reporting more than ten trips with red snapper.



**Figure 6.** Location and relative size (circles) of the number of trips catching red snapper from completed location fields in the Southeast Region Headboat Survey catch records for 2008 from vessels reporting more than ten trips with red snapper.



**Figure 7.** Location and relative size (circles) of the number of trips catching red snapper from completed location fields in the Southeast Region Headboat Survey catch records for 2009 from vessels reporting more than ten trips with red snapper.

