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Effort Survey Designs

Explaining Differences Between the Coastal Household Telephone Survey and the Fishing Effort Survey

I. The FES: A Different Design

The FES addresses known limitations of the CHTS



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- Random-digit dialing survey of households in coastal counties.

FES

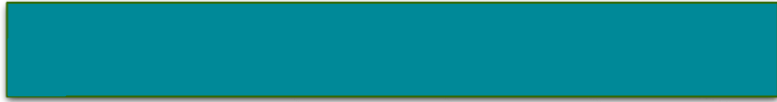


- Residential mail survey of addresses in coastal states.



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- Random-digit dialing survey of households in coastal counties.
- Asks initial respondent a series of questions about household-level fishing activity.

FES



- Residential mail survey of addresses in coastal states.
- Gives respondents time to consider request, determine who should respond, and consult others.



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- Random-digit dialing survey of households in coastal counties.
- Asks initial respondent a series of questions about household-level fishing activity.
- Contacts households with no prior notice and expects immediate response.

FES



- Residential mail survey of addresses in coastal states.
- Gives respondents time to consider request, determine who should respond, and consult others.
- Includes cues that support cognitive processing and recall.



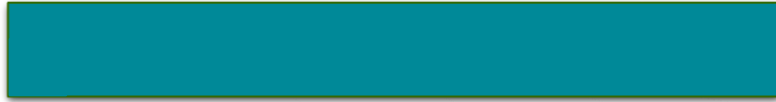
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- Random-digit dialing survey of households in coastal counties.
- Asks initial respondent a series of questions about household-level fishing activity.
- Contacts households with no prior notice and expects immediate response.
- Requires trip-level reporting.

FES



- Residential mail survey of addresses in coastal states.
- Gives respondents time to consider request, determine who should respond, and consult others.
- Includes cues that support cognitive processing and recall.
- Requires summary reports.



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- Random-digit dialing survey of households in coastal counties.
- Asks initial respondent a series of questions about household-level fishing activity.
- Contacts households with no prior notice and expects immediate response.
- Requires trip-level reporting.
- Suffered from declining rates of coverage and response.

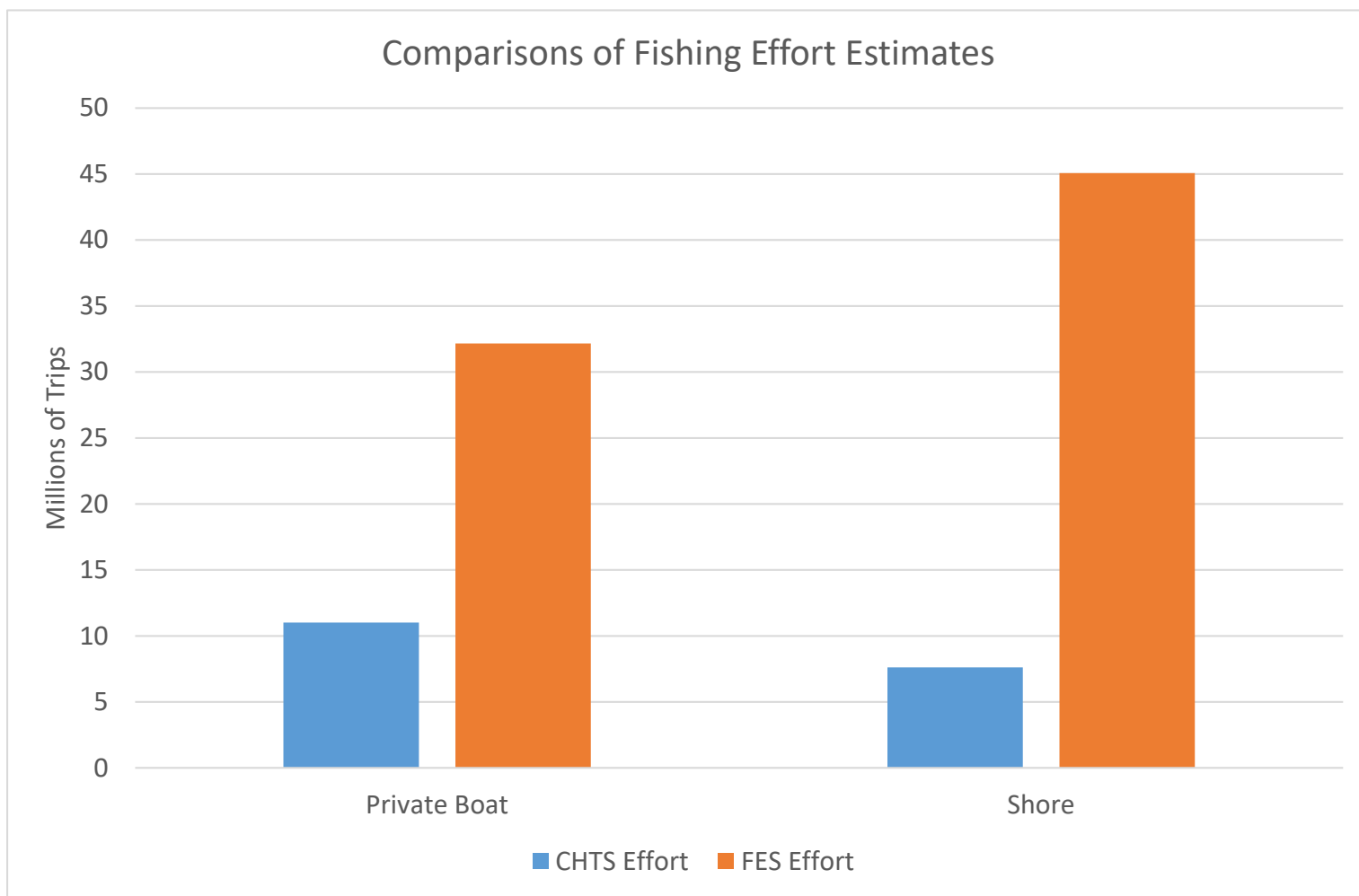
FES



- Residential mail survey of addresses in coastal states.
- Gives respondents time to consider request, determine who should respond, and consult others.
- Includes cues that support cognitive processing and recall.
- Requires summary reports.
- Designed to maximize coverage and response rates.

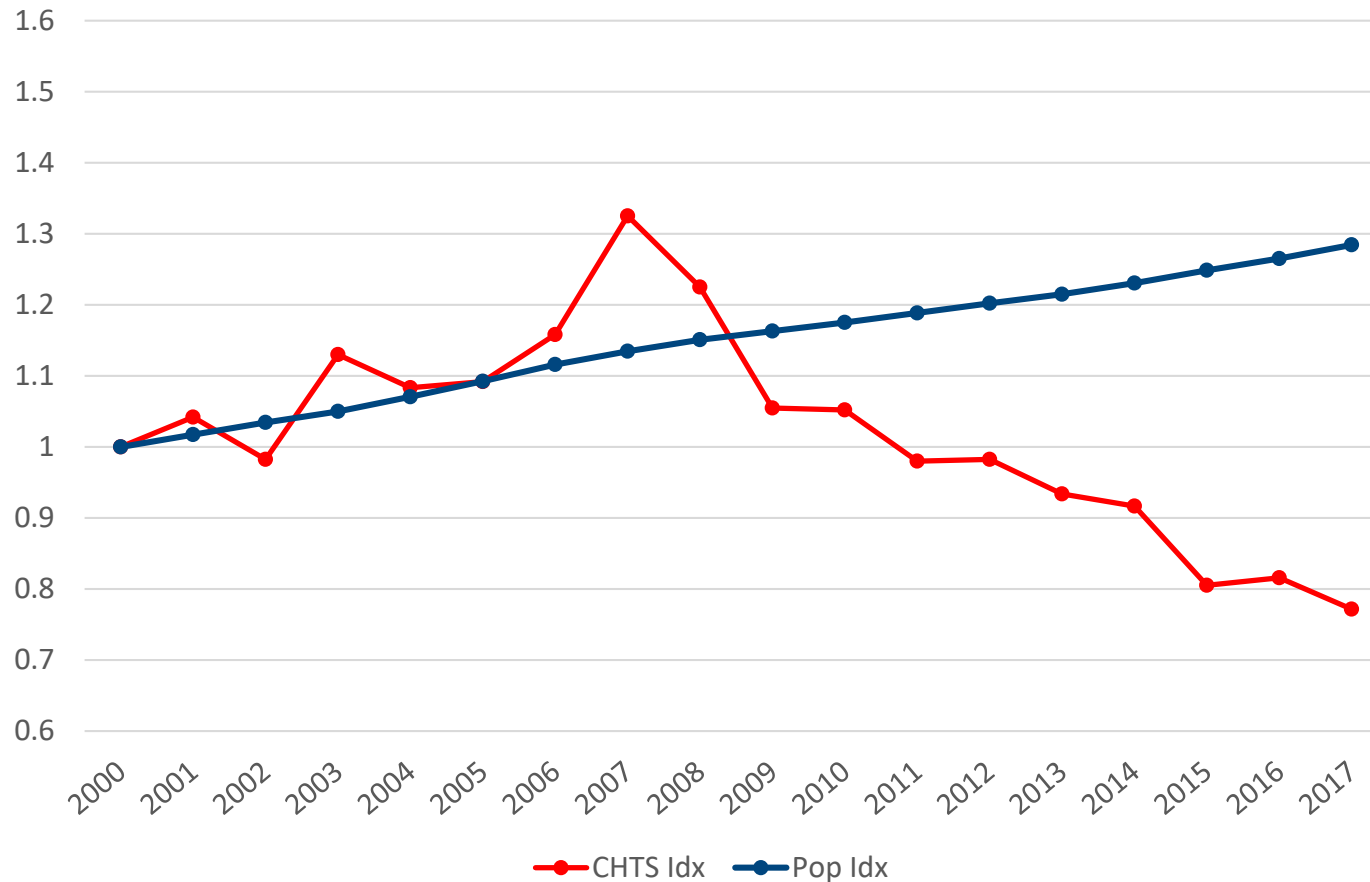


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Differences between CHTS and FES designs resulted in large differences in survey estimates

CHTS Estimates of Private Boat Effort in the South Atlantic

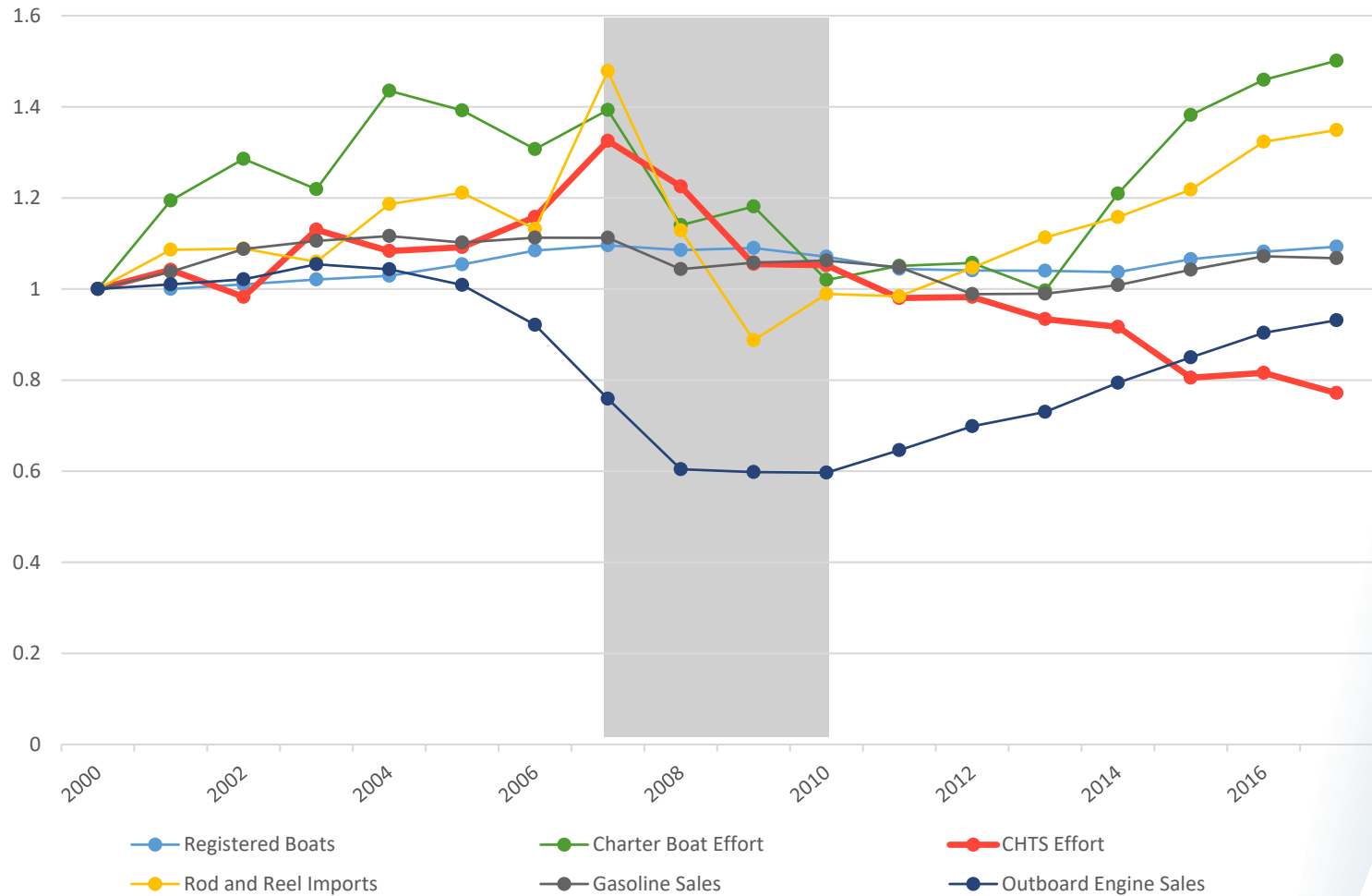


Through the mid 2000's, CHTS effort tracked very closely with population



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Indicators of Fishing Activity



Other indicators of fishing activity—charter boat trips, imported fishing tackle, registered boats, and outboard engine and gasoline sales—decreased during the economic downturn but have since recovered



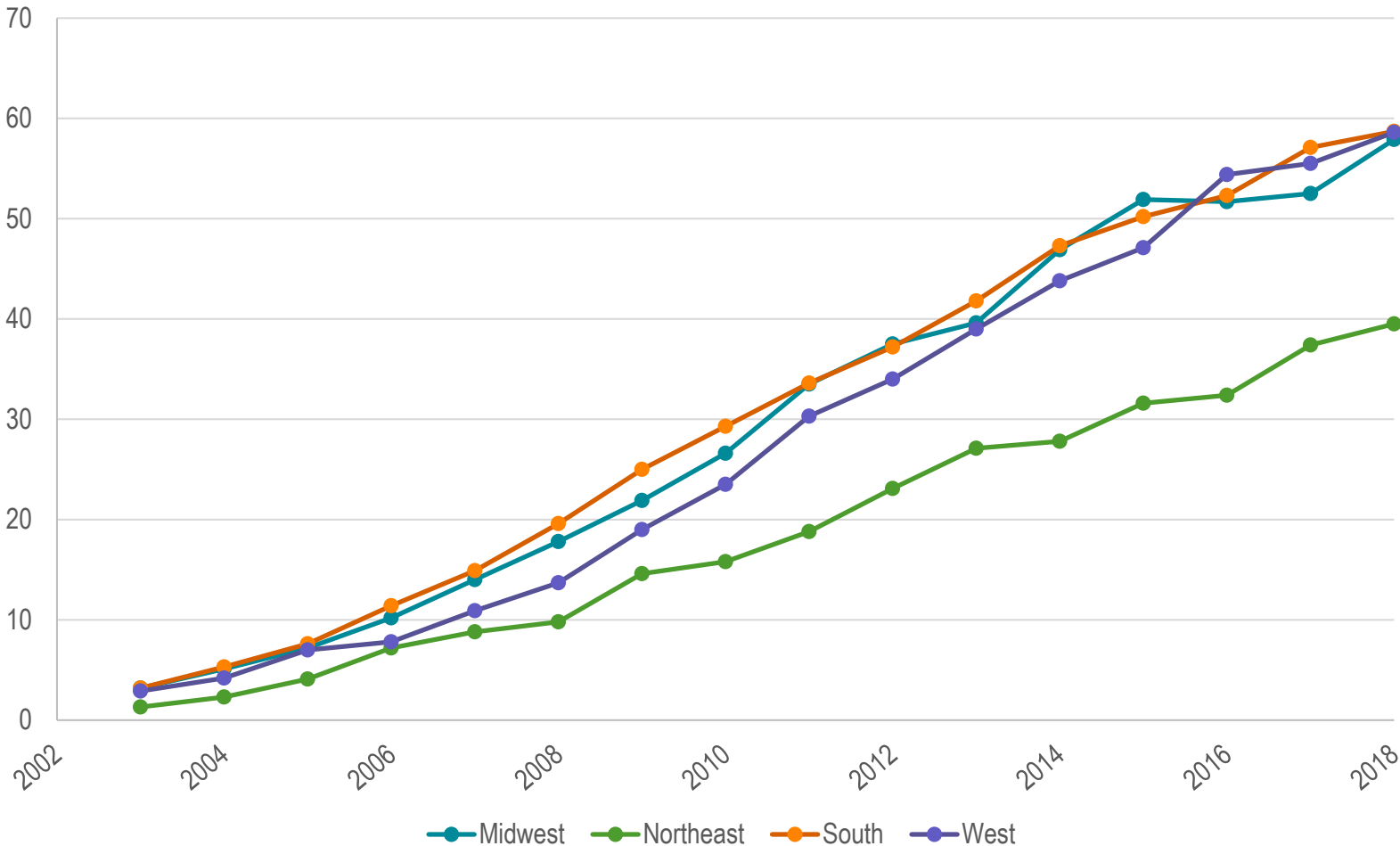
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II. Coverage Error



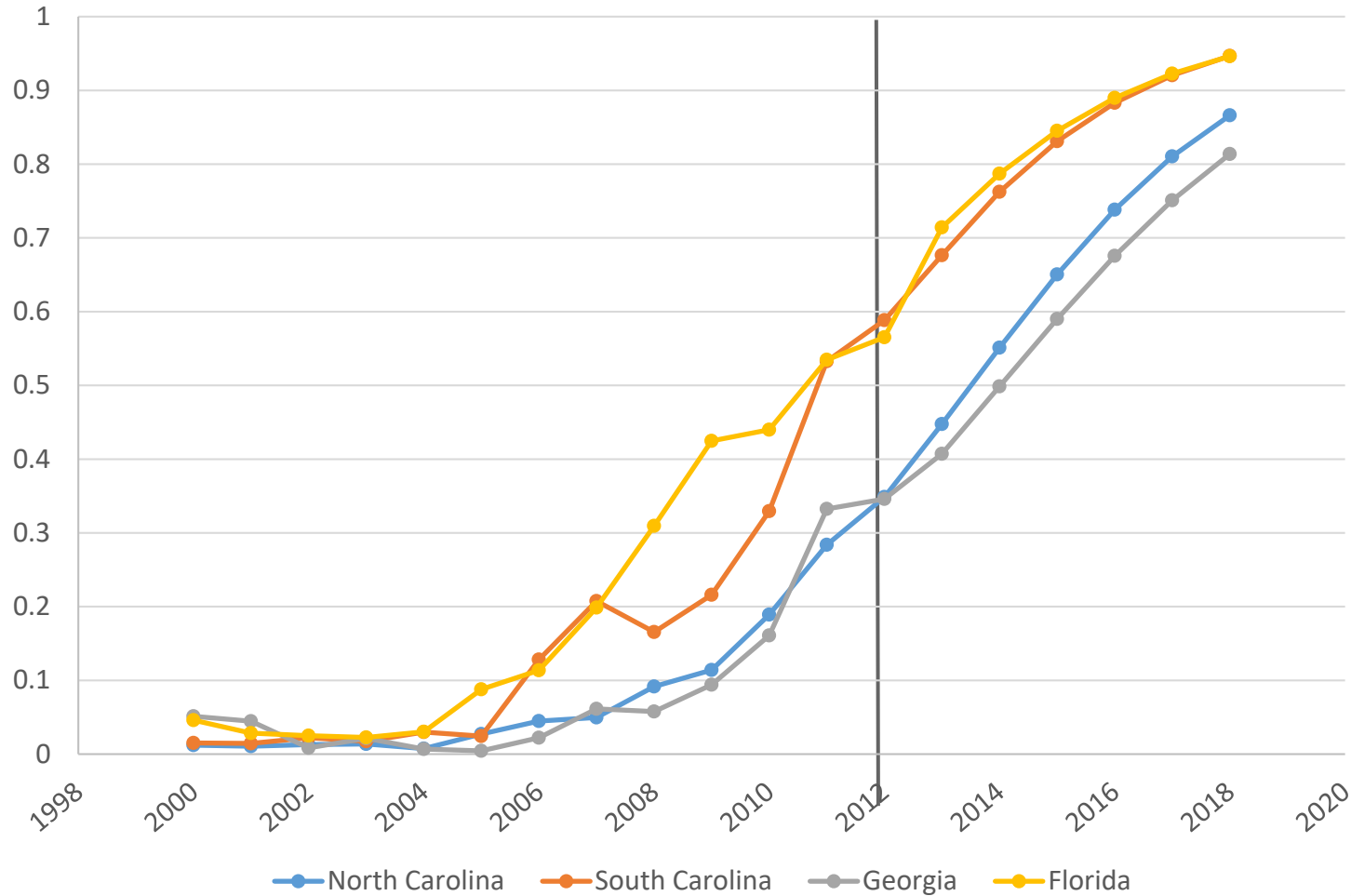
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Percent of Adults Living in Wireless Only Households (NHIS)



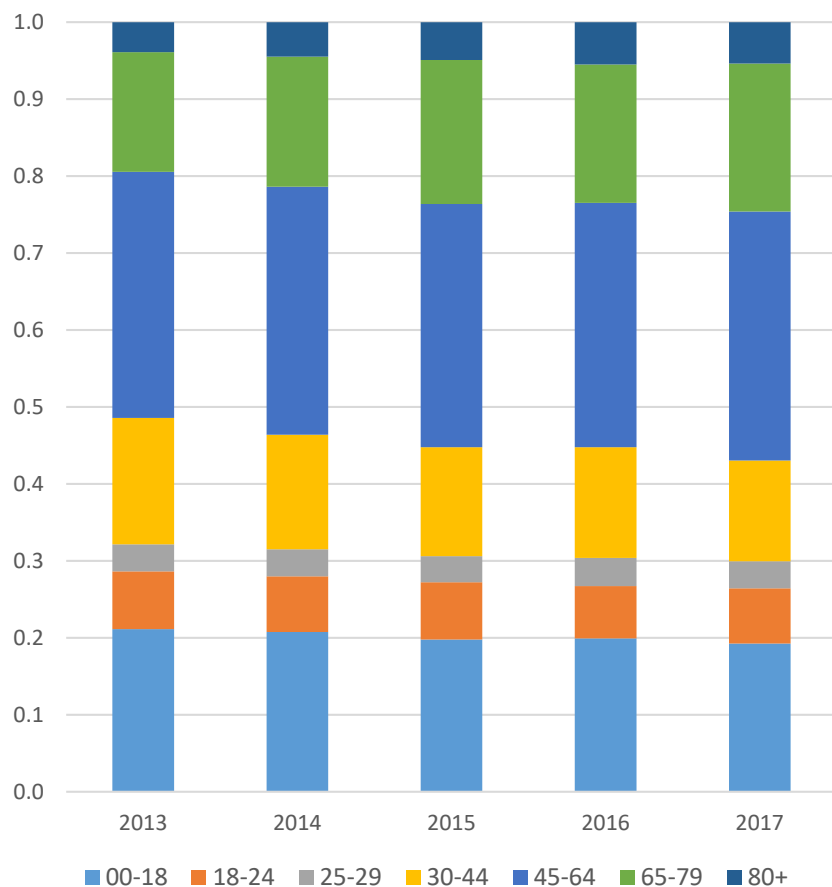
Instead, the declining trend in CHTS estimates reflects the declining number of households with landline phones.

Proportion of Anglers in Wireless-Only Households

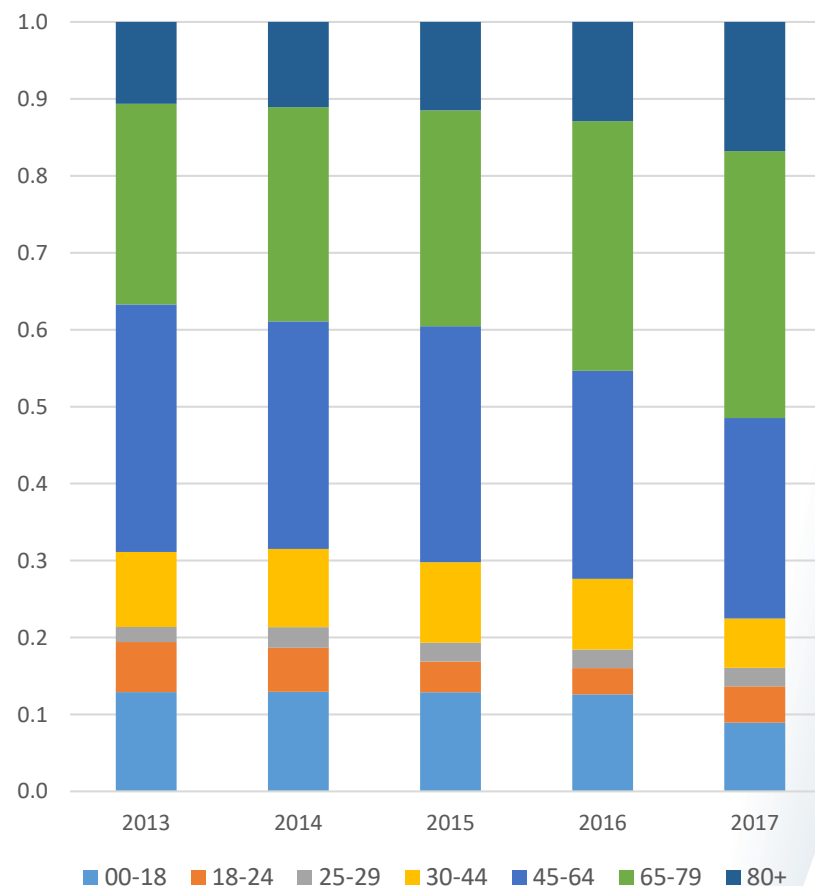


The proportion of anglers with a landline at home has also decreased.

Age Distribution: Full Population



Age Distribution: Landline Only/Mostly

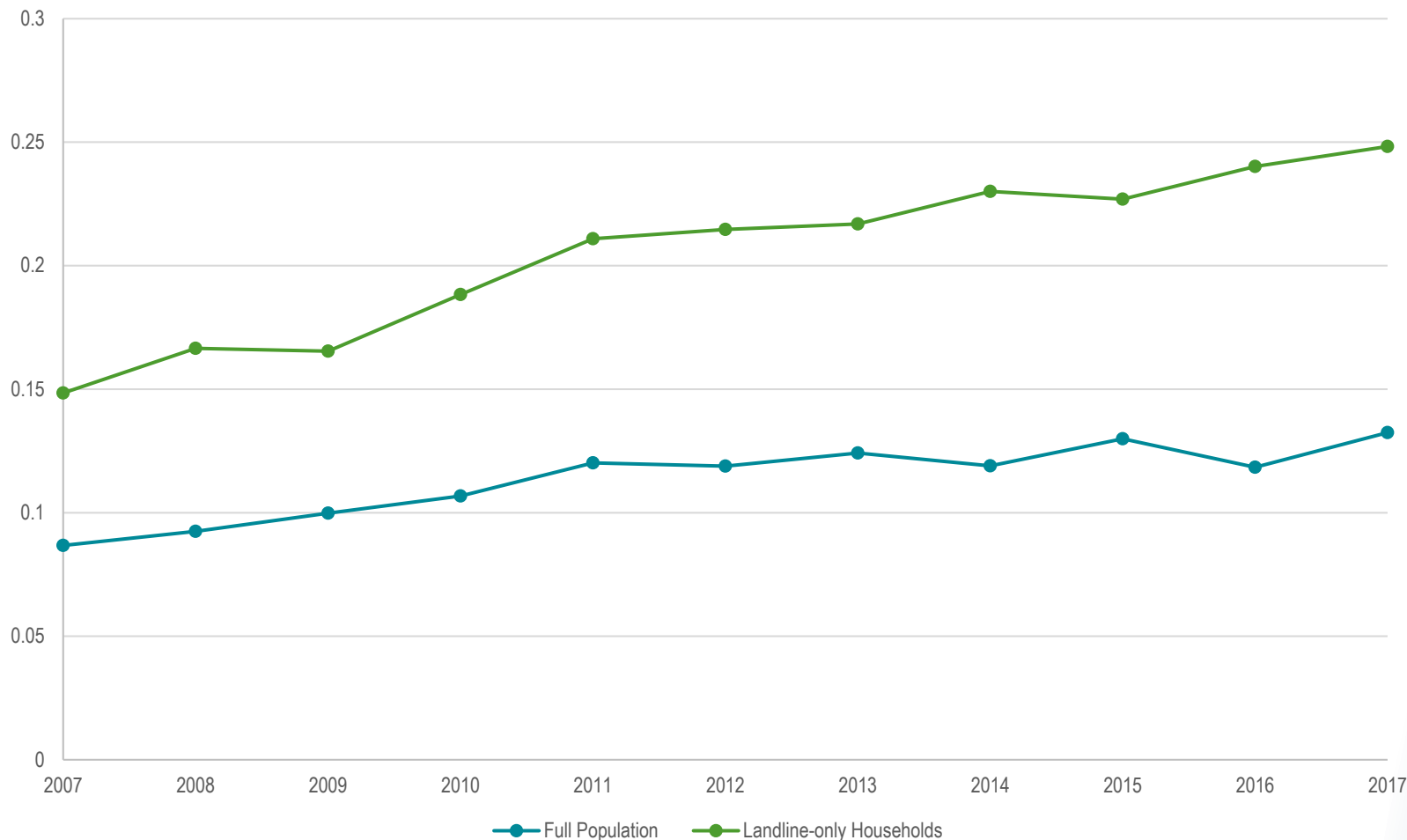


In 2017, more than 50% of the landline population was estimated to be aged 65+, compared with 25% of the full population.



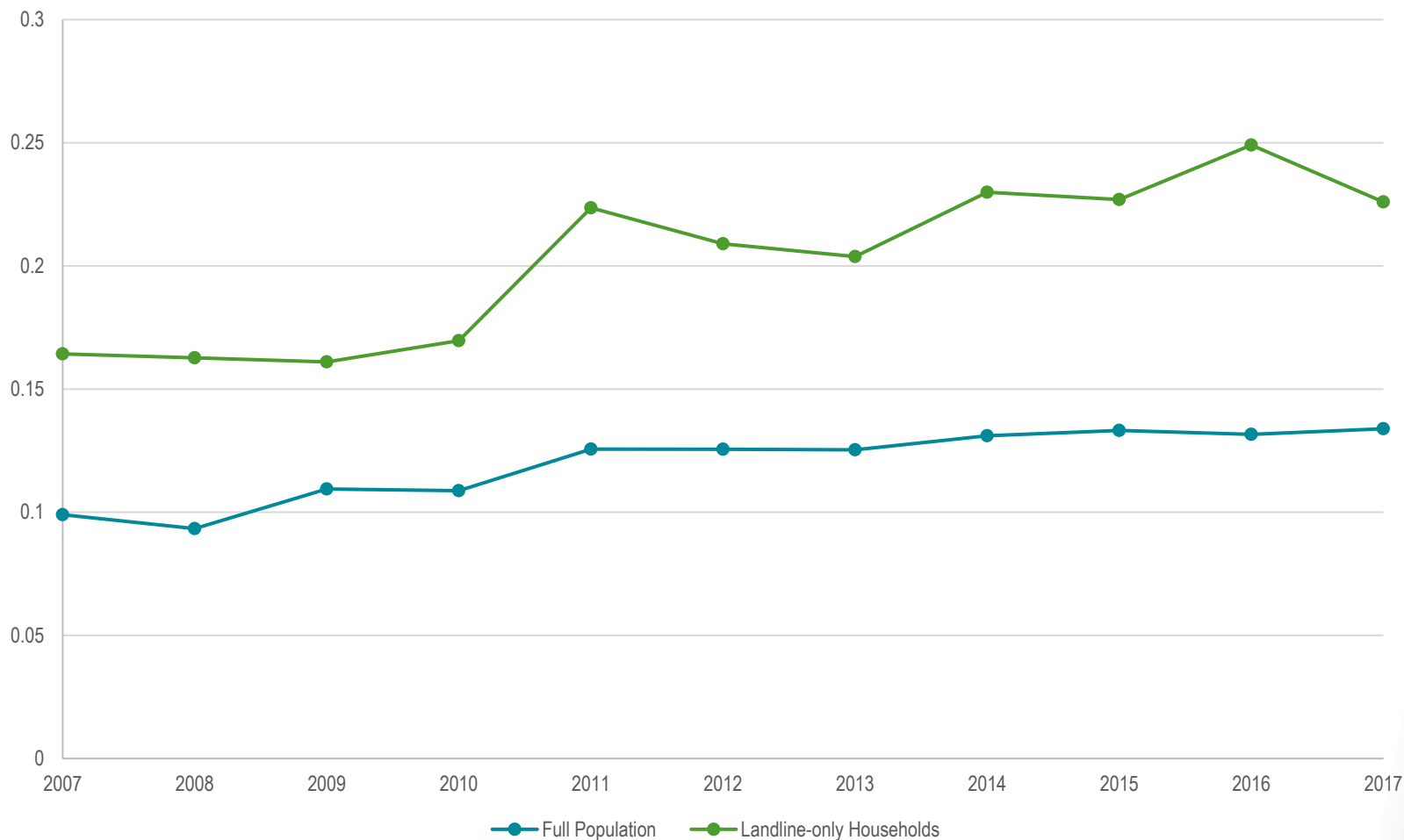
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Proportion of Adults Who Can't Walk One-Quarter Mile, or Find the Task Very Difficult



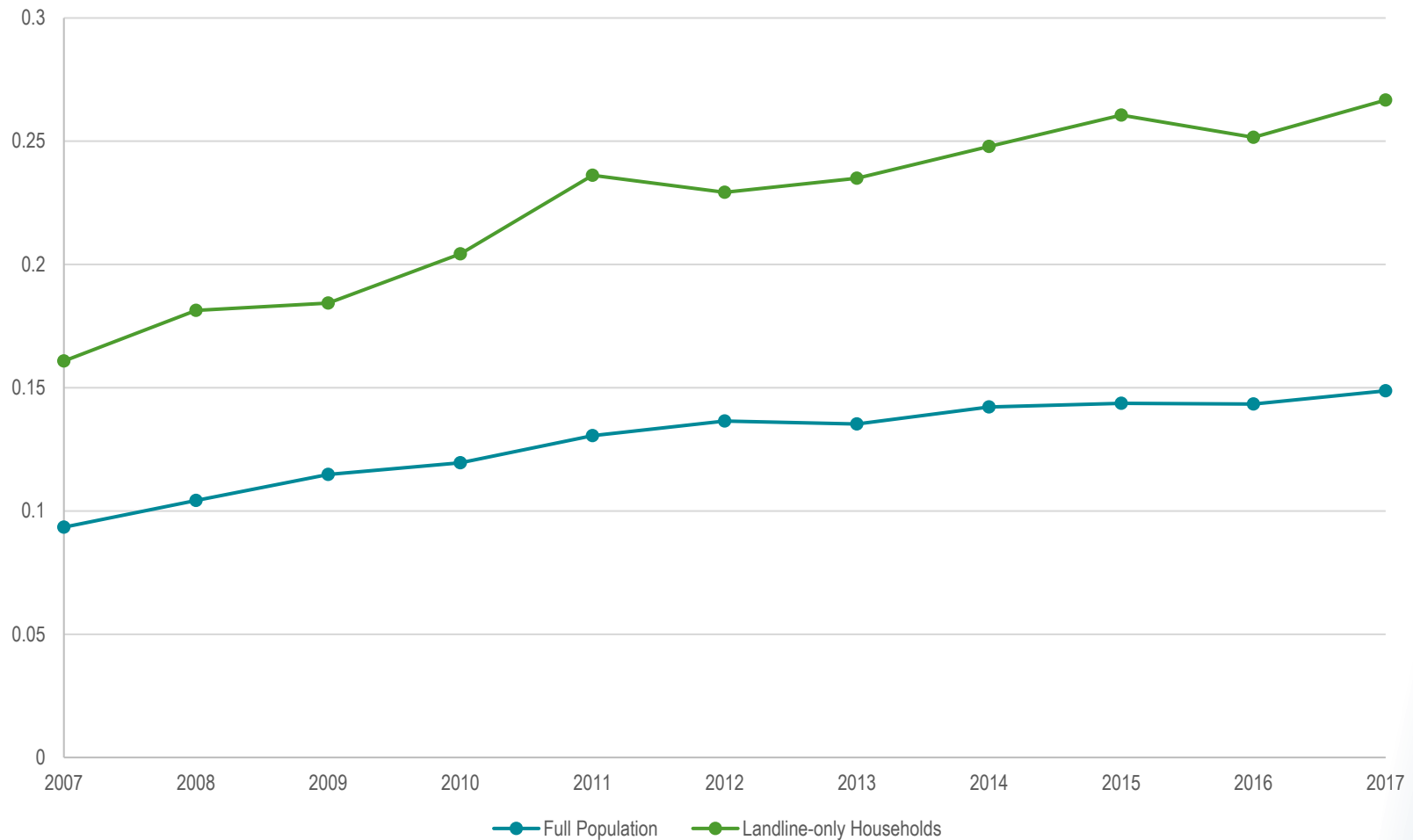
The landline population is more likely to report that walking one-quarter mile, standing for two hours, and stooping, bending, or kneeling are very difficult, or tasks they can't do.

Proportion of Adults Who Can't Stoop, Bend, or Kneel, or Find the Task Very Difficult

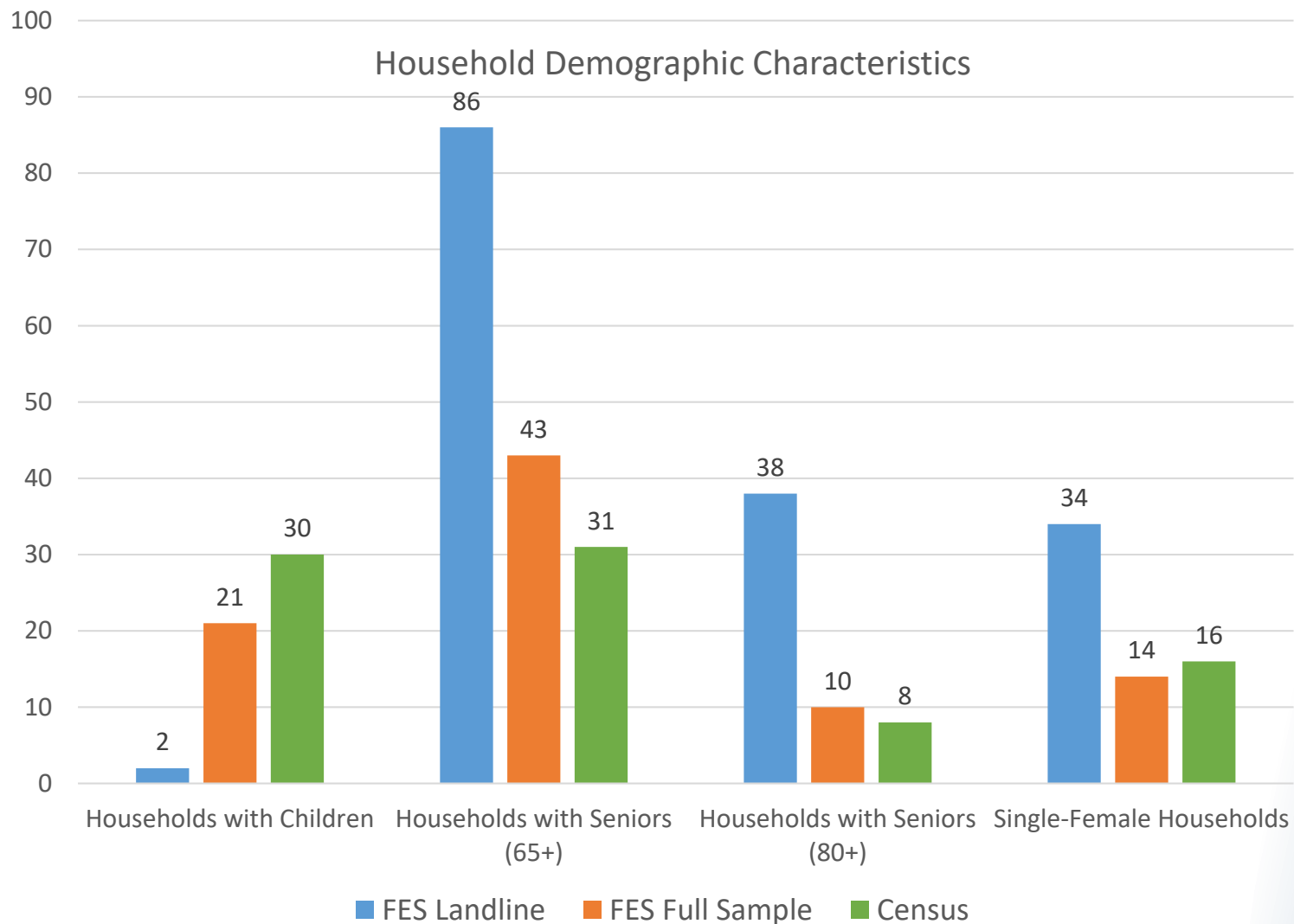


The landline population is more likely to report that walking one-quarter mile, standing for two hours, and stooping, bending, or kneeling are very difficult, or tasks they can't do.

Proportion of Adults Who Can't Stand for Two Hours, or Find the Task Very Difficult

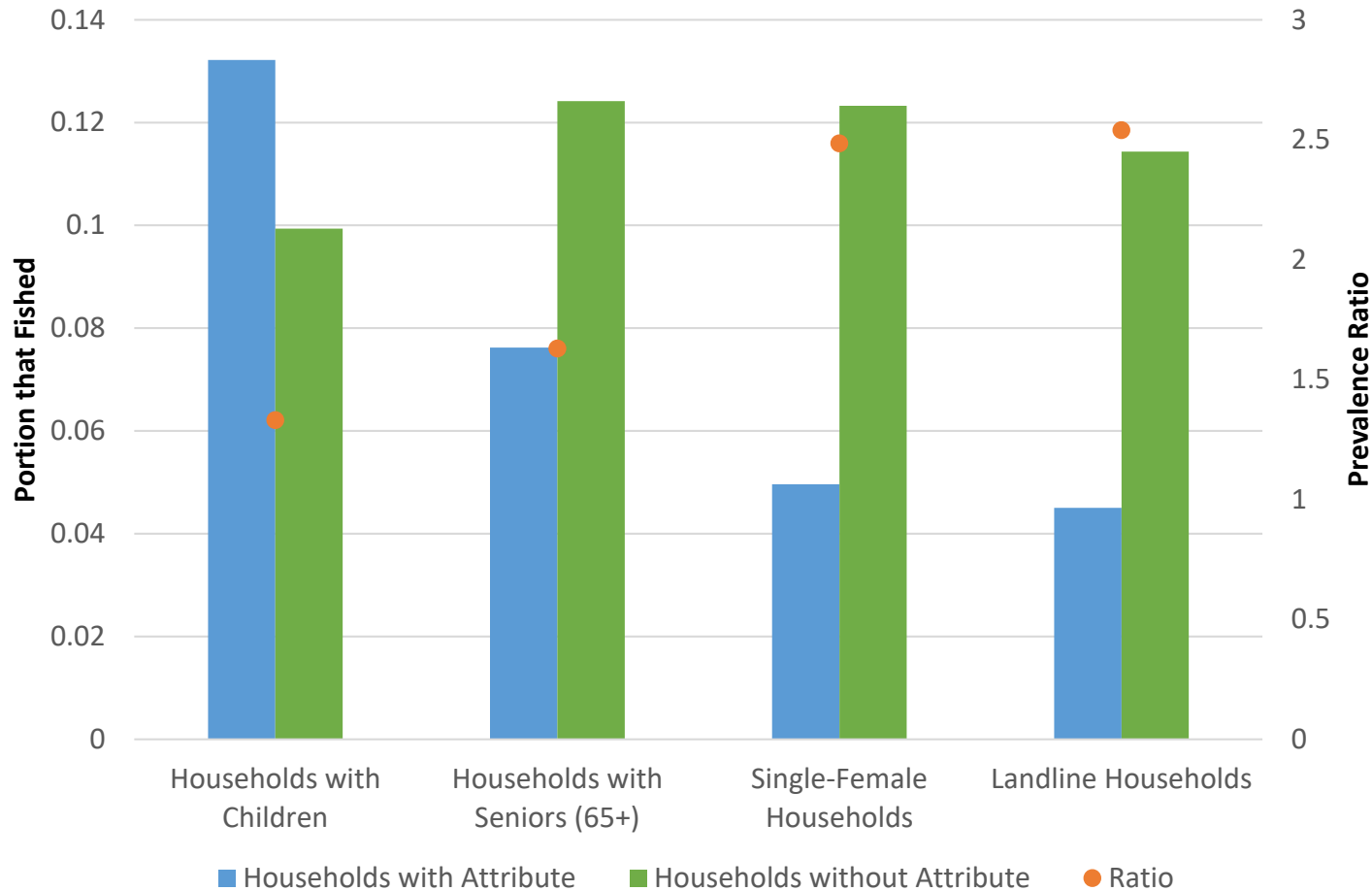


The landline population is more likely to report that walking one-quarter mile, standing for two hours, and stooping, bending, or kneeling are very difficult, or tasks they can't do.



FES full sample estimates are similar to census estimates for demographic characteristics, while FES landline estimates severely over- or under-represent certain segments of the population

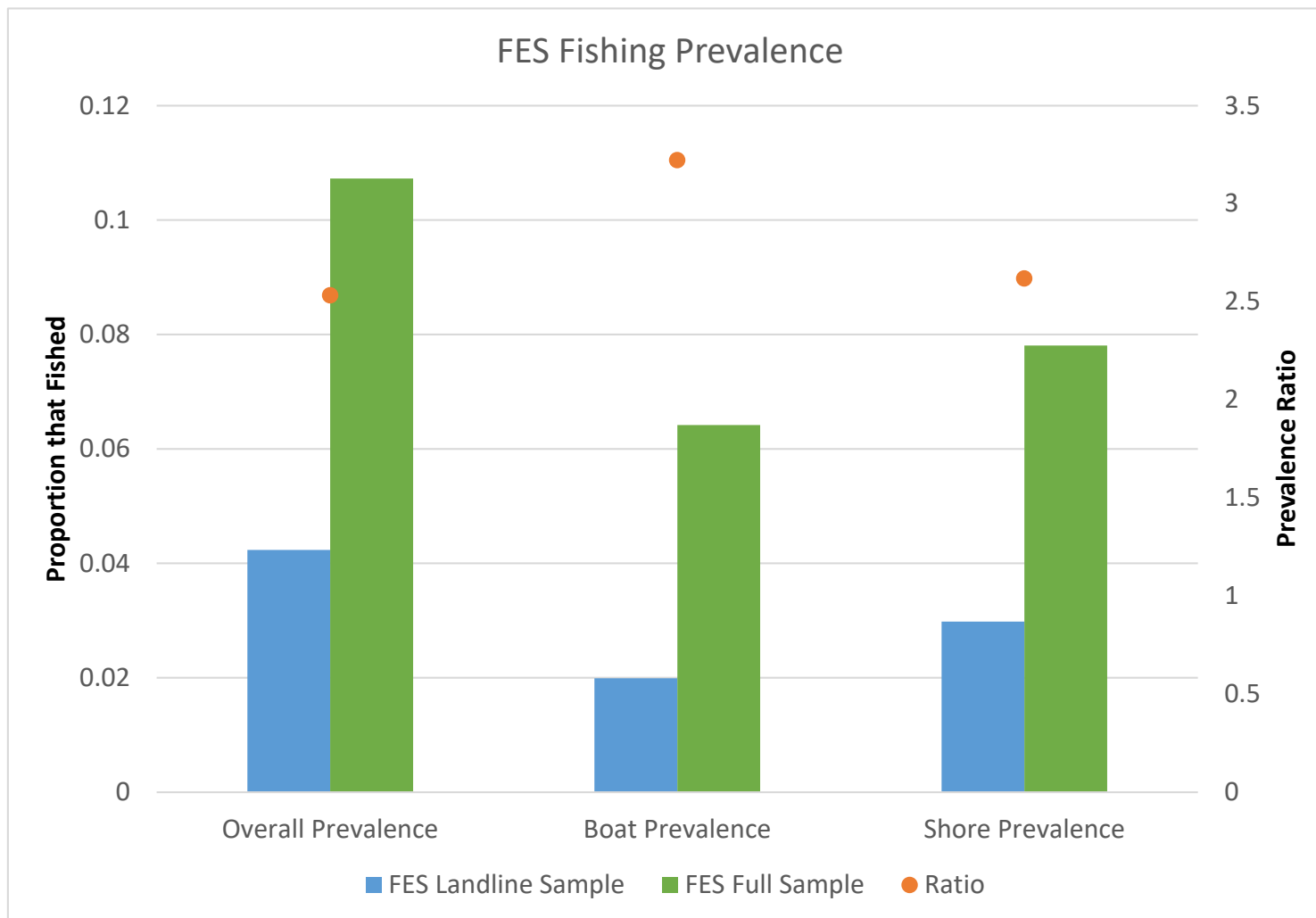
Fishing Prevalence by Household Attribute



Demographic groups represented by landline samples are unlikely to participate in recreational fishing.



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FES estimates derived from landline samples under-estimate fishing activity



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Older residents.

Fewer children.

Smaller household sizes.

More households comprised of single females.

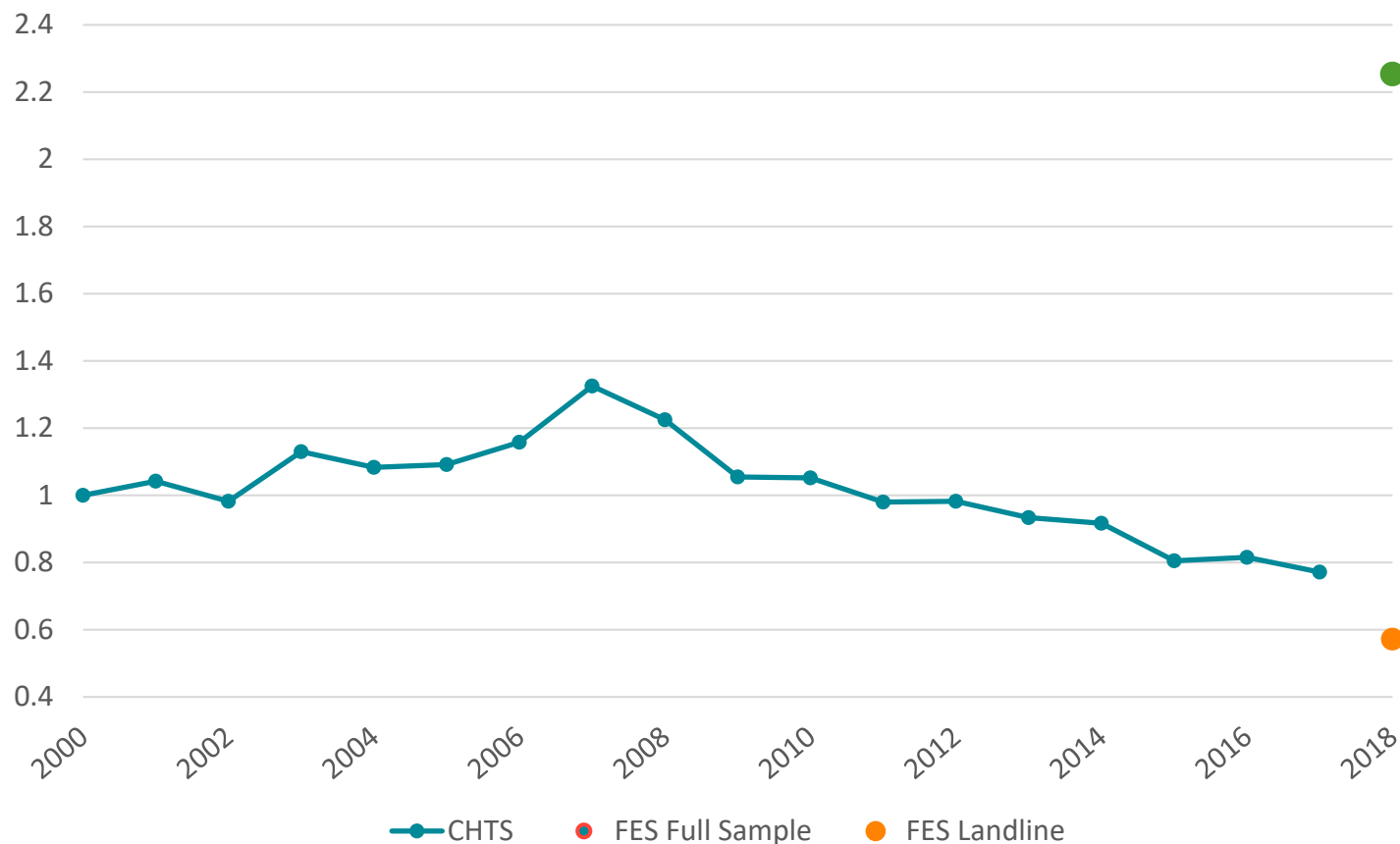
Poorer health.

Less leisure-time physical activity.

Less fishing activity.

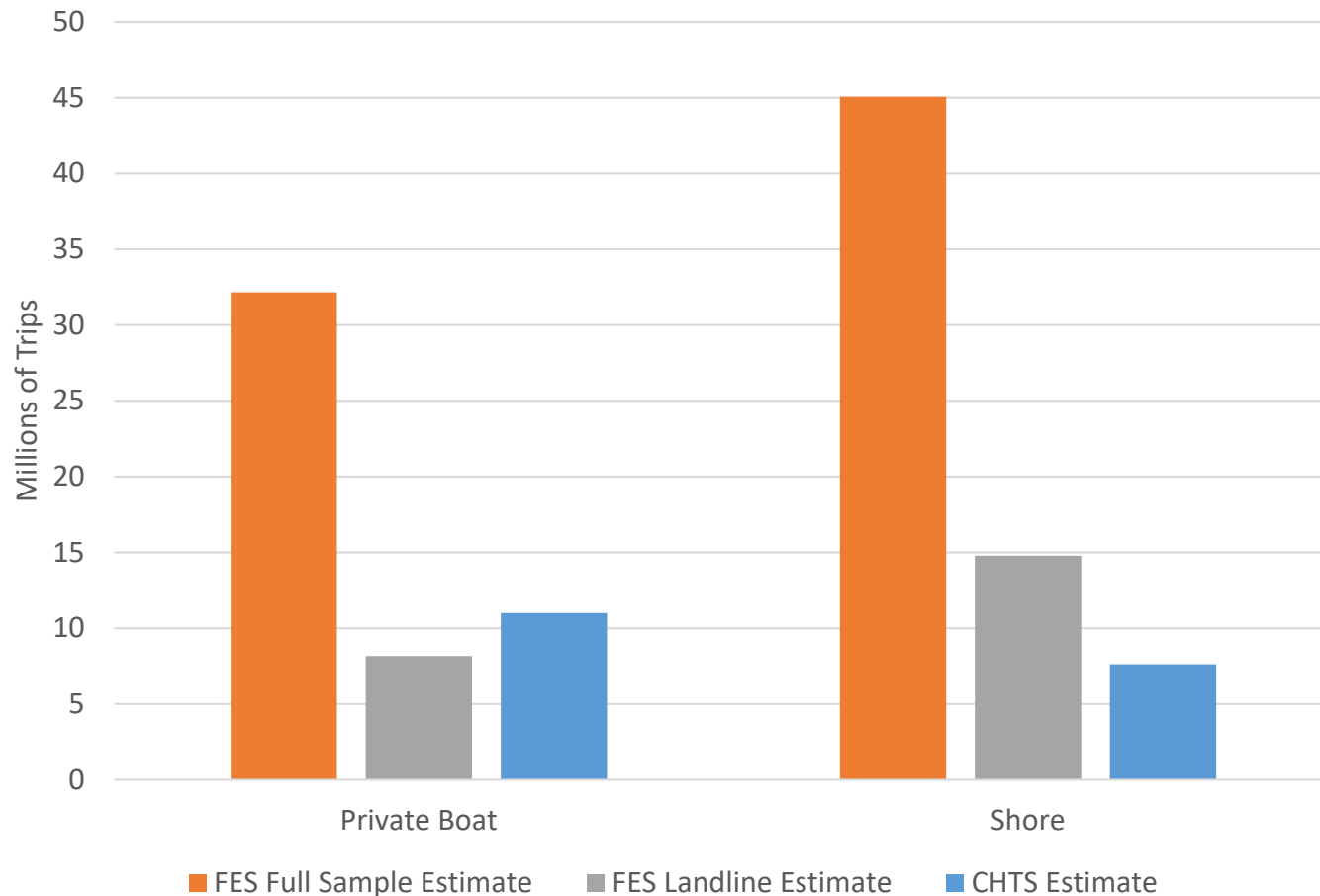
Landline-only/mostly households have become increasingly different from the rest of the United States population.

CHTS Estimates of Private Boat Effort in the South Atlantic



Fishing effort may have declined slightly during the economic downturn, but the continued collapse of effort beyond the economic recovery is a function of eroding survey coverage

Comparisons of Fishing Effort Estimates



Coverage error in the CHTS explains the majority of difference between FES and CHTS estimates



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III. Gatekeeper Effect

CHTS Screening

- How many people in this household go fishing?
- How many people in your household, including children and adults, have been recreational saltwater fishing in the past 12 months anywhere in the U.S. or in a U.S. territory?
- Thinking just about the past two months, how many people living in your household have been recreational saltwater fishing in the past two months in the U.S. or U.S. territory?

In the CHTS, screening questions are administered to whomever answers the telephone. About 2/3 of the time, this household “Gatekeeper” is female



Gatekeeper Experiment

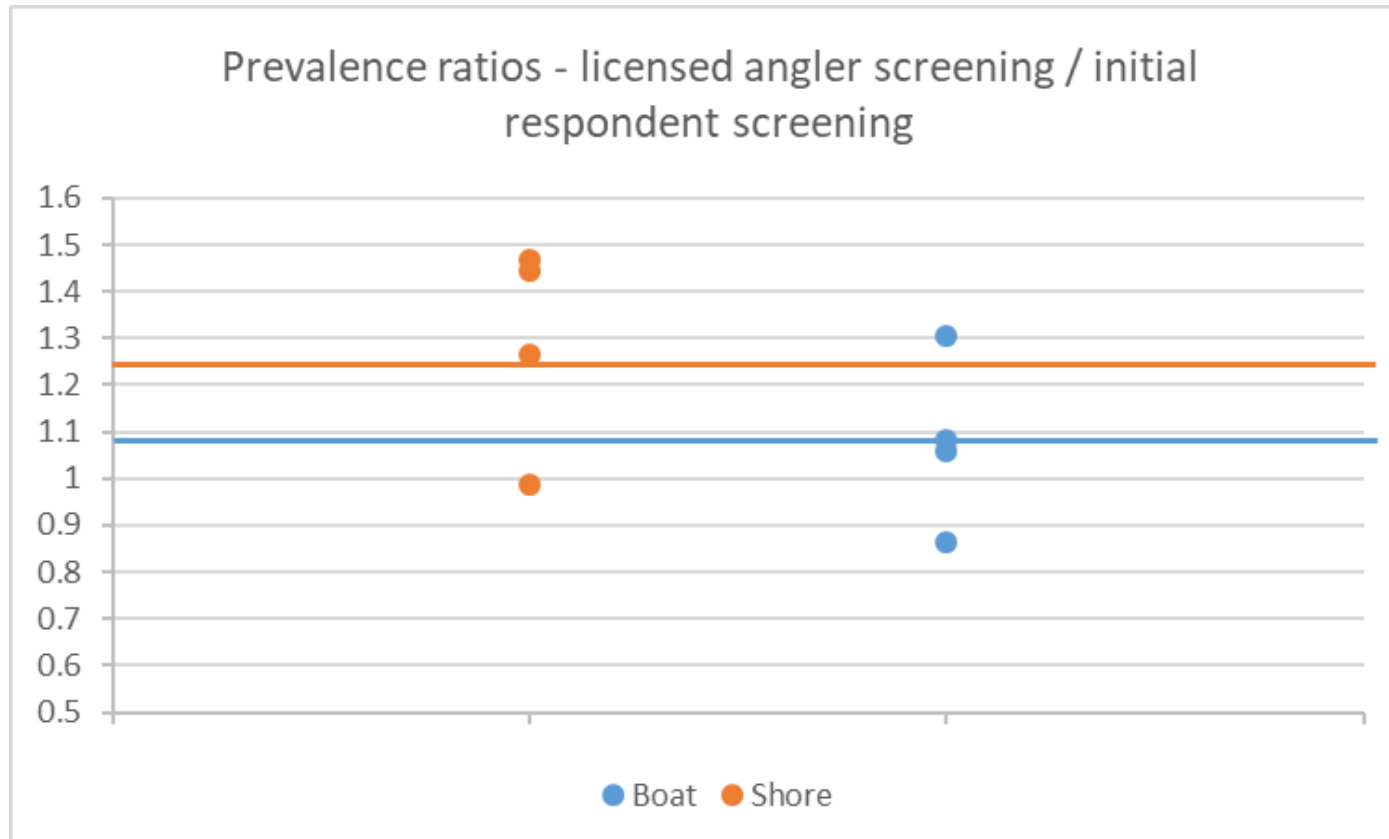
- Sampled from lists of licensed saltwater anglers in NC
- Allocated sample into two treatments
 1. Asked for sampled angler by name prior to administering CHTS screening questions
 2. Administered CHTS screening questions to whomever answered phone

In 2012, MRIP initiated an experiment to try and measure the impact of the Gatekeeper Effect



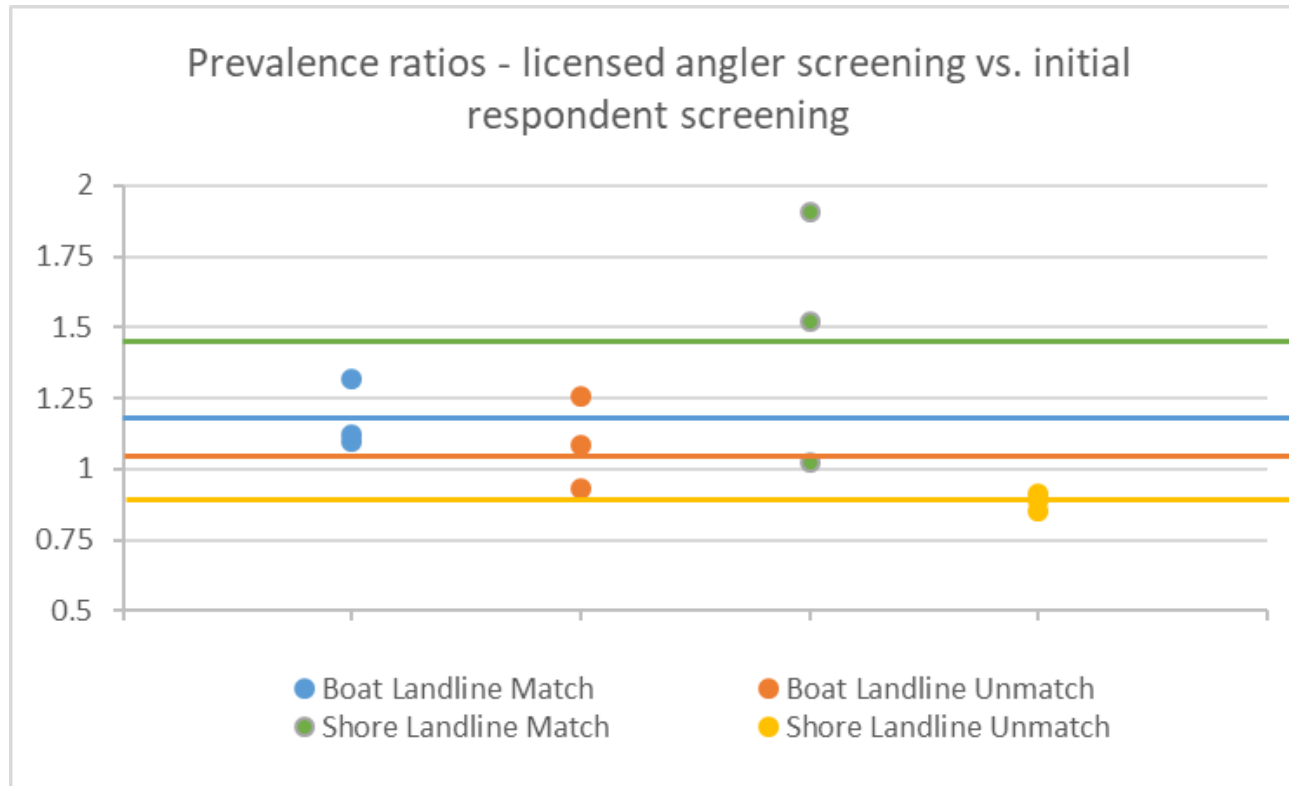
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Gatekeeper Experiment



The experiment demonstrated that the initial respondent – the Gatekeeper – under reported household fishing activity by as much as 20%

Gatekeeper Experiment



Because the experimental sample frame included cell phone numbers, the experimental results are likely a minimum effect. The magnitude of the Gatekeeper effect on landline samples is likely much larger

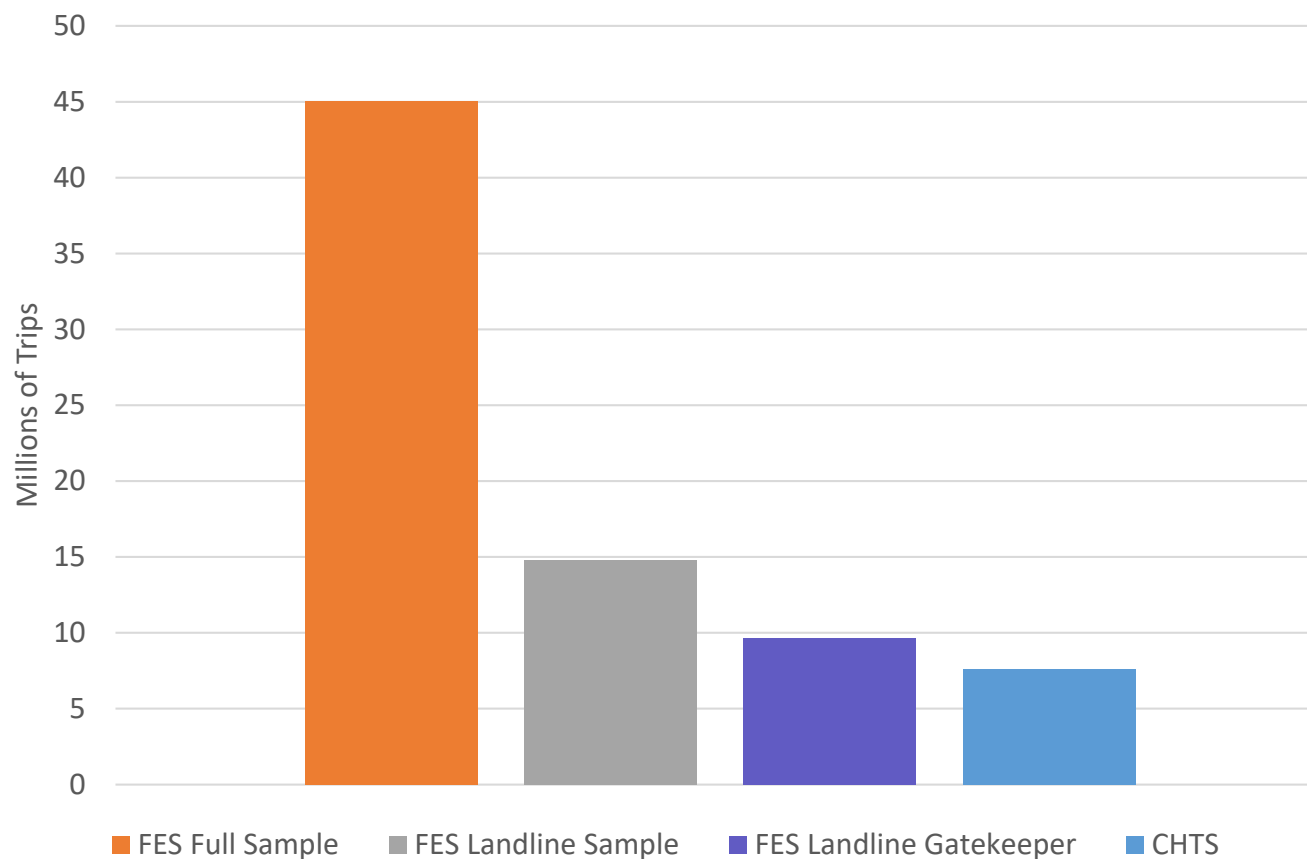
Gatekeeper Summary

- Females are more likely than males to answer a landline telephone
- Females are much less likely to report household fishing activity than males
- Results from the Gatekeeper Experiment confirmed a Gatekeeper Effect – the screening respondent matters
- The Gatekeeper Effect is larger for shore fishing than boat fishing
- The Gatekeeper Effect results in an underestimate of fishing effort by as much as 30%

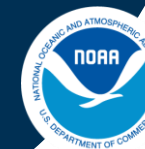


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Comparisons of Shore Fishing Effort Estimates



For shore fishing, coverage error and the gatekeeper effect account for 95% of the total difference between FES and CHTS estimates



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IV. Plausibility

The FES design is less susceptible to bias than the CHTS design – estimates are more accurate!



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Effort in the South Atlantic

In July and August of 2018:

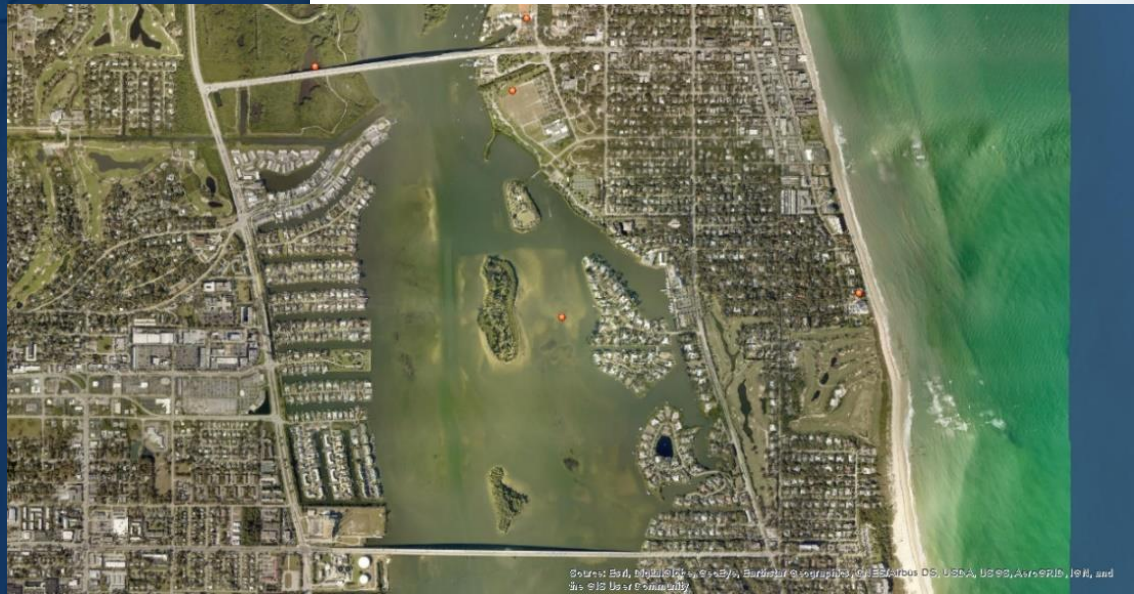
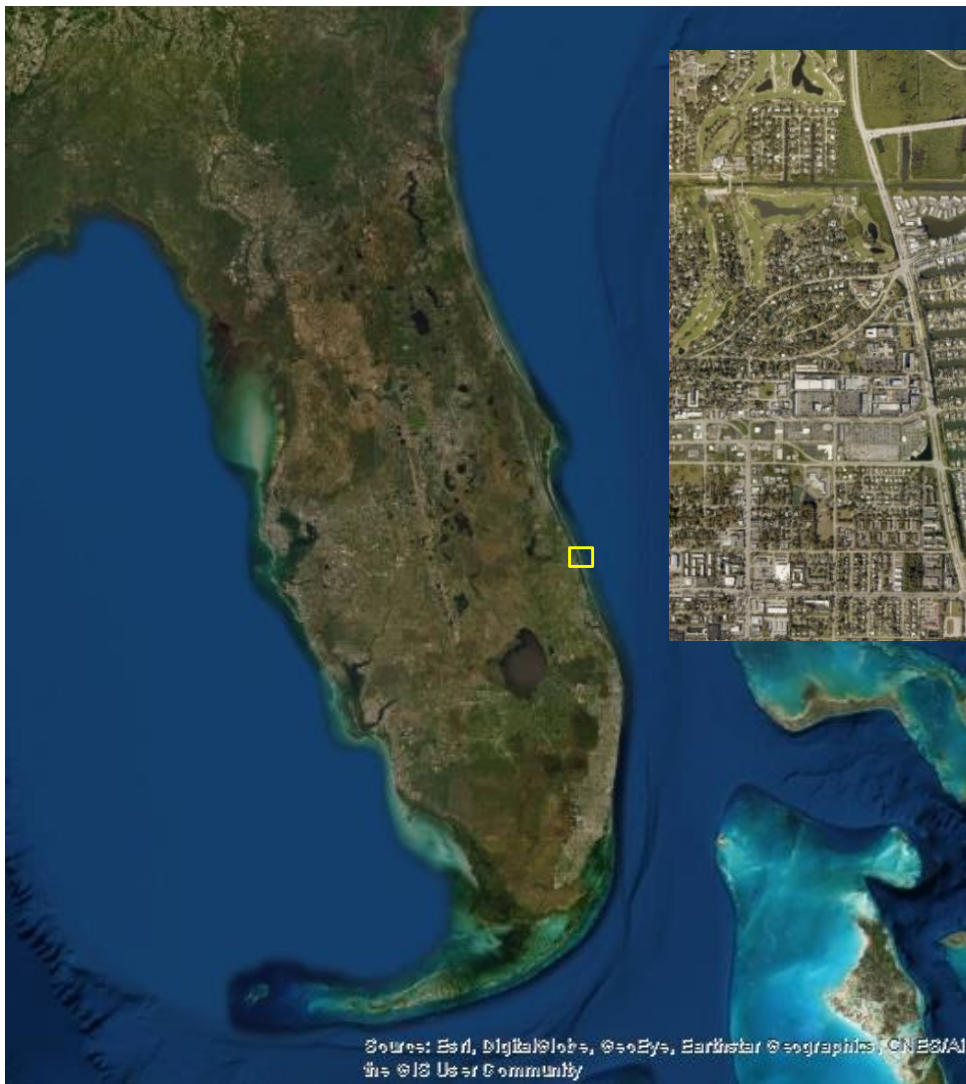
- About 3% of Georgia residents reported fishing. The average angler took three trips.
- About 5% of North Carolina residents reported fishing. The average angler took five trips.
- About 5% of South Carolina residents reported fishing. The average angler took six trips.
- About 10% of Florida residents reported fishing. The average angler took fewer than seven trips.



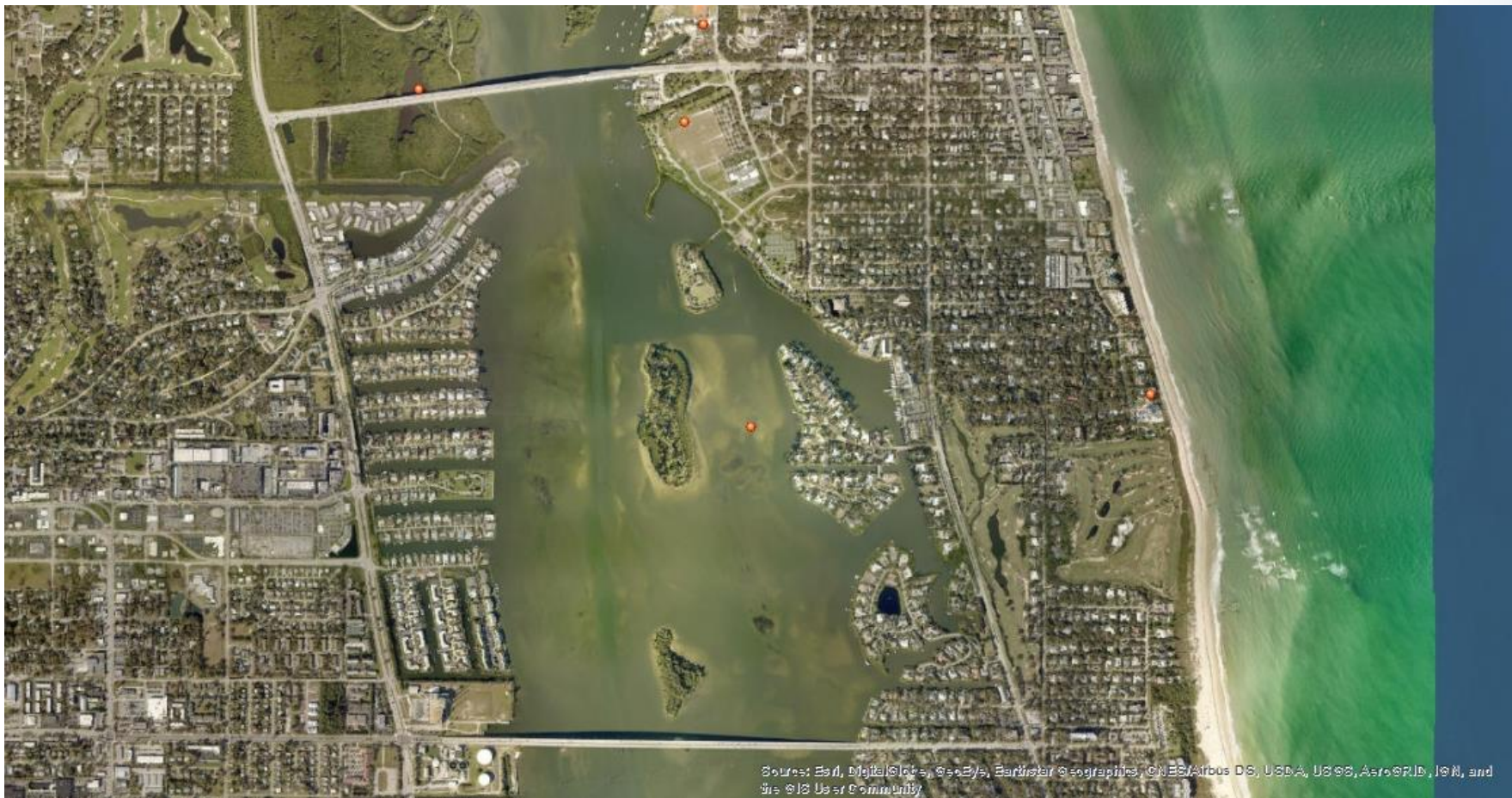
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Florida has approximately 1,500 intercept sites



Vero Beach



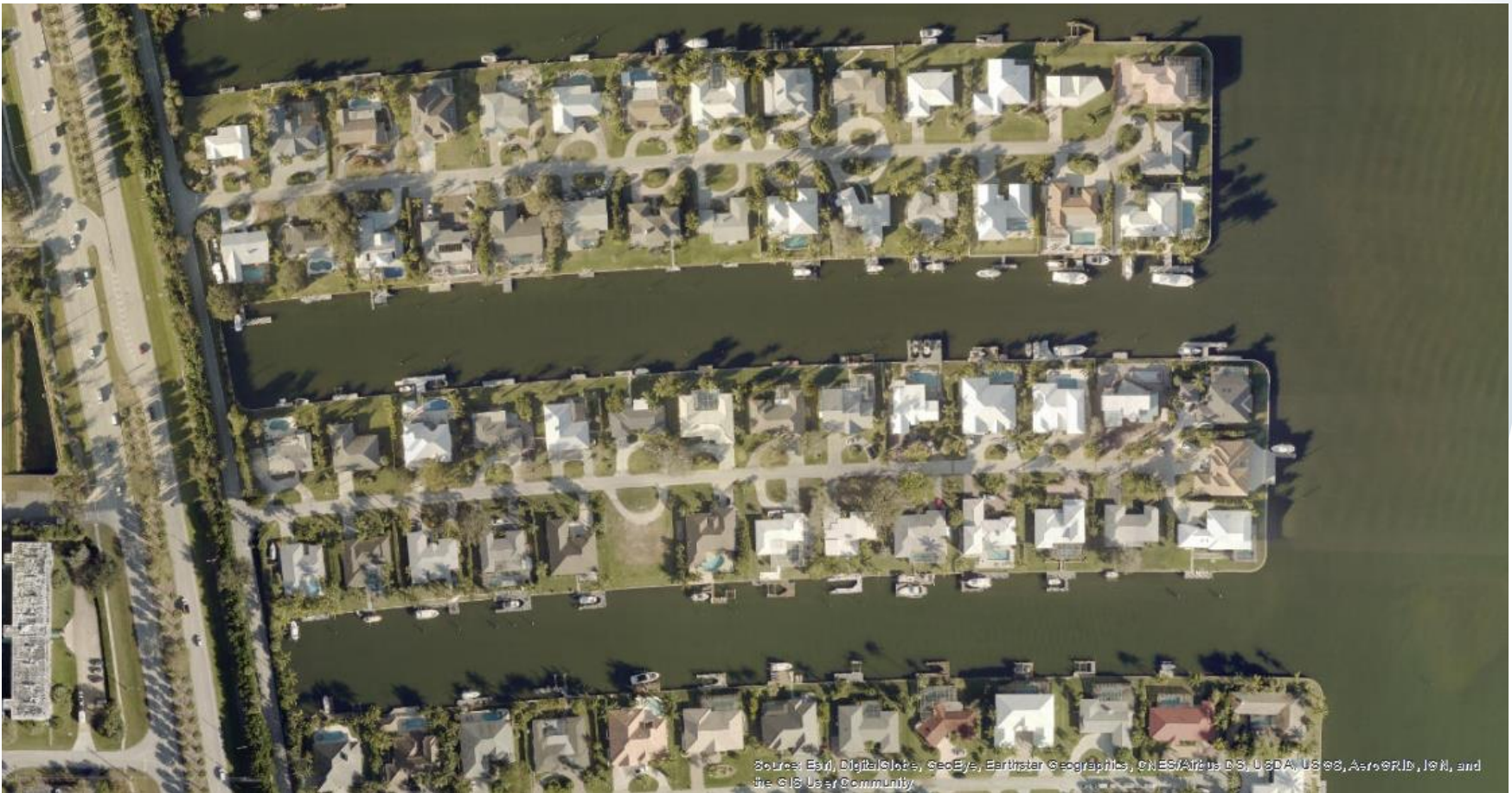
The map includes a land area of less than 5 square miles and includes 5 APAIS intercept sites



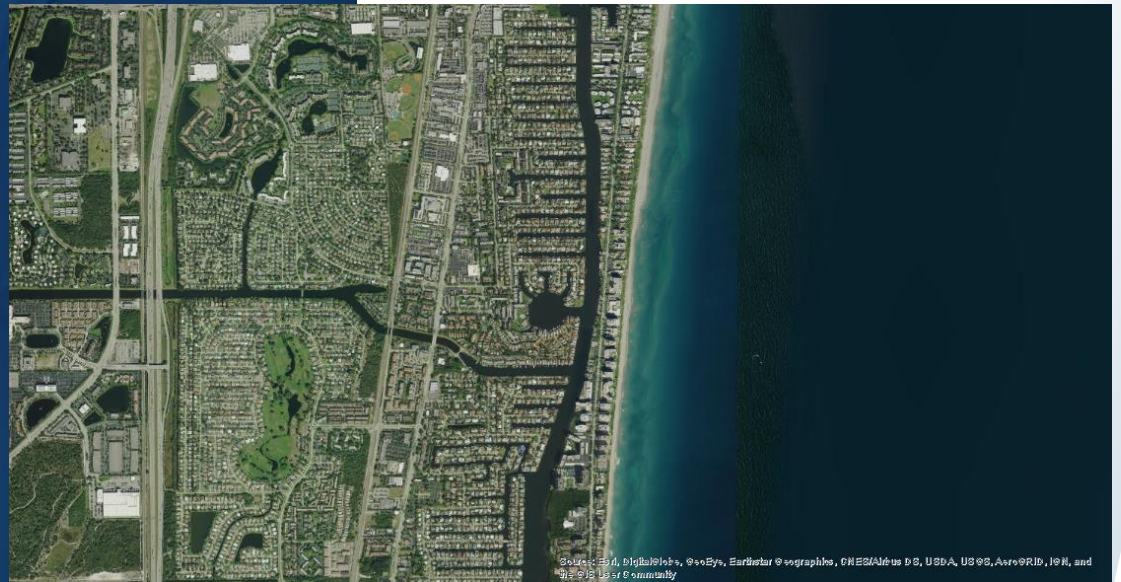
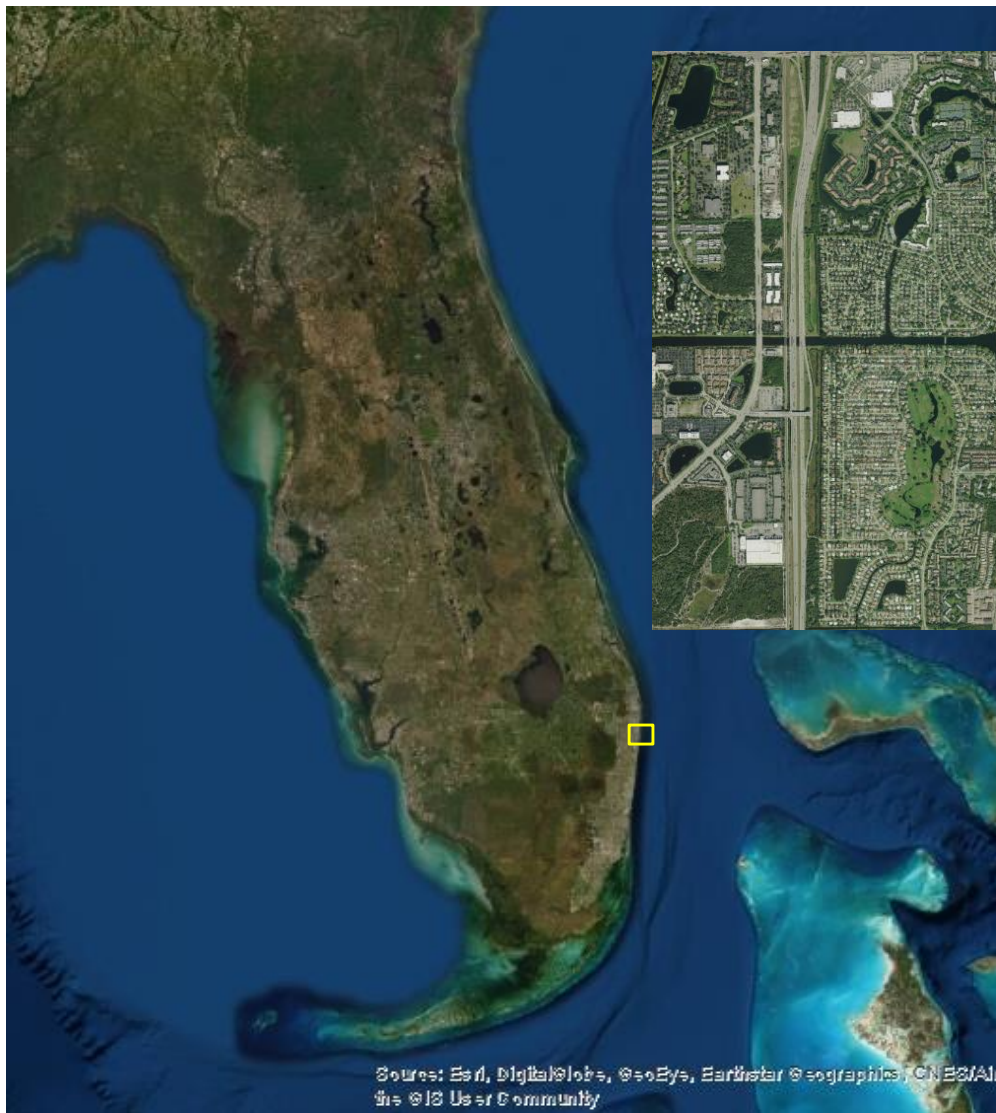
This area of Vero Beach includes 1,300 waterfront properties



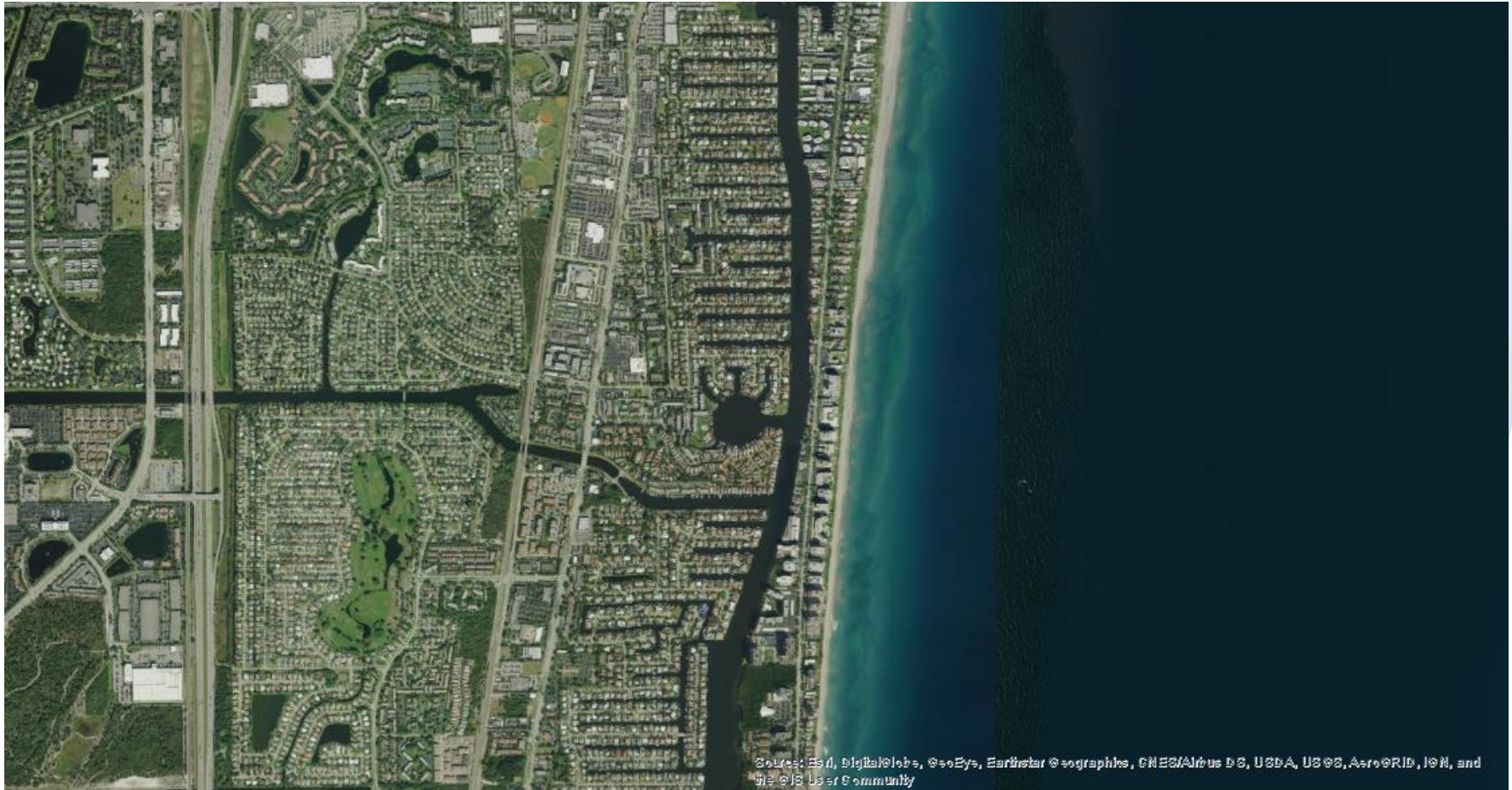
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Waterfront properties are a source of “hidden fishing trips”



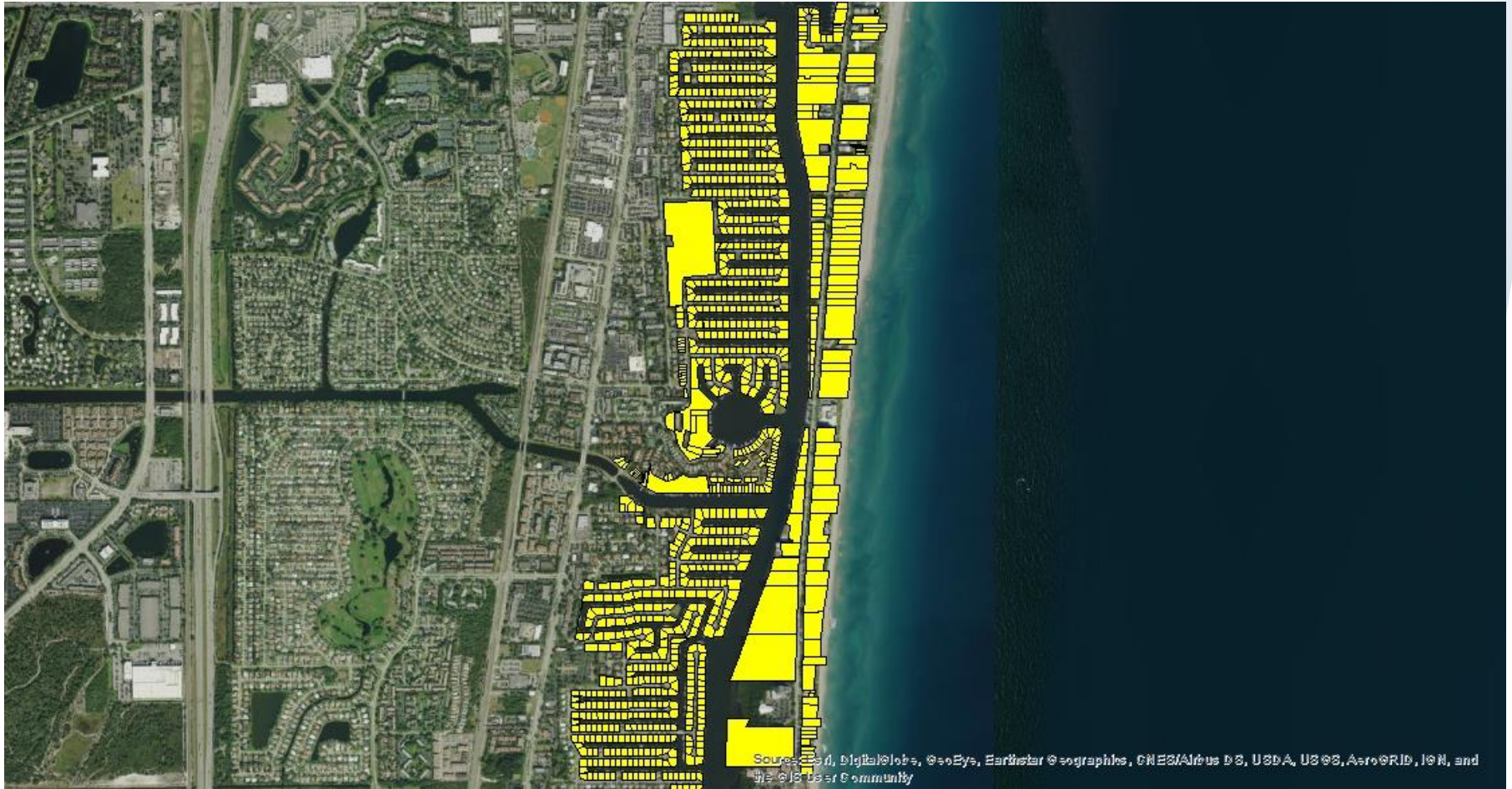
Delray Beach



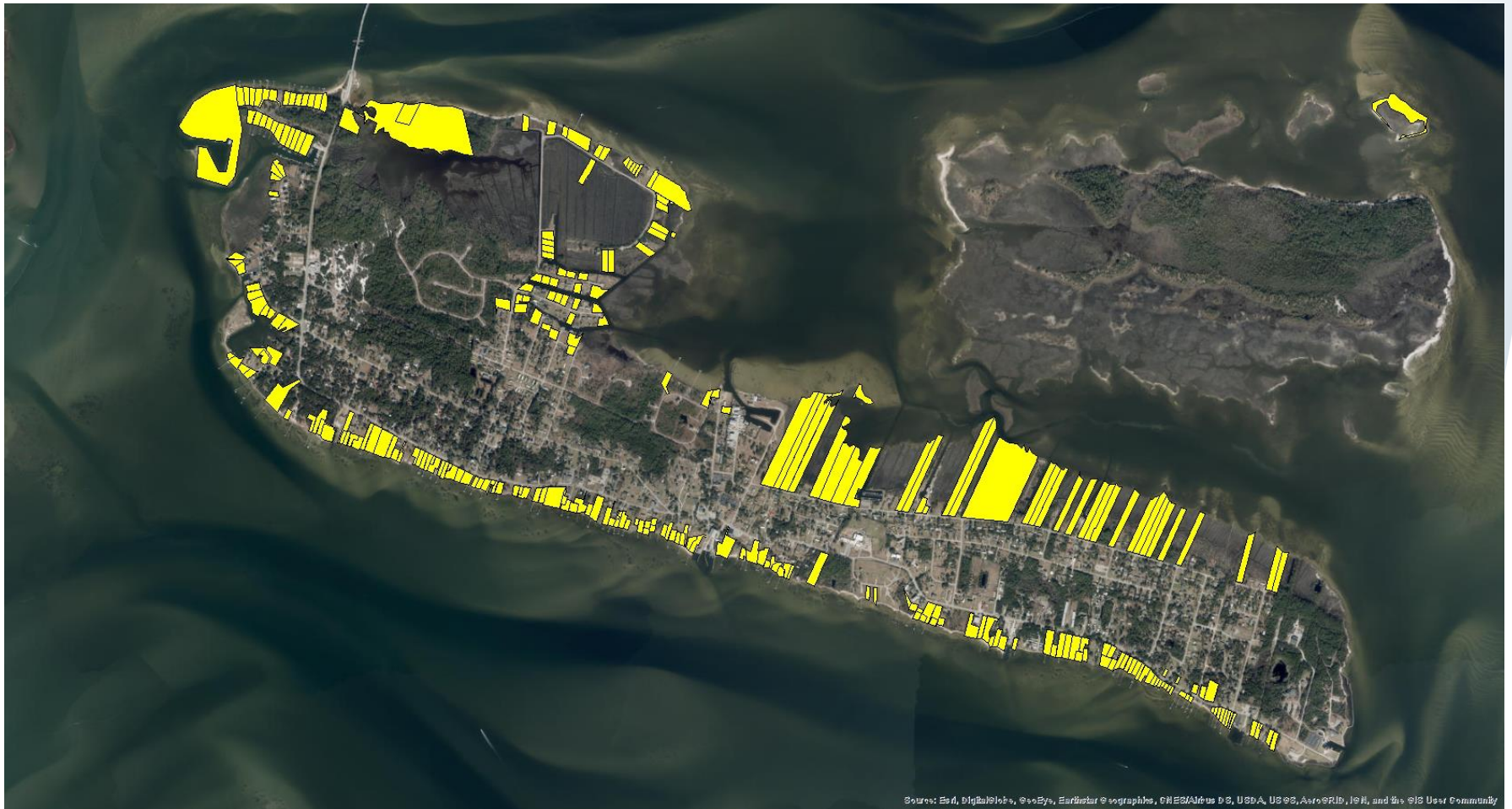
The map includes a land area of 4 square miles and there are no AP AIS intercept sites



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This area of Delray Beach includes 4,361 waterfront properties



Harker's Island, NC



Elizabeth City, NC

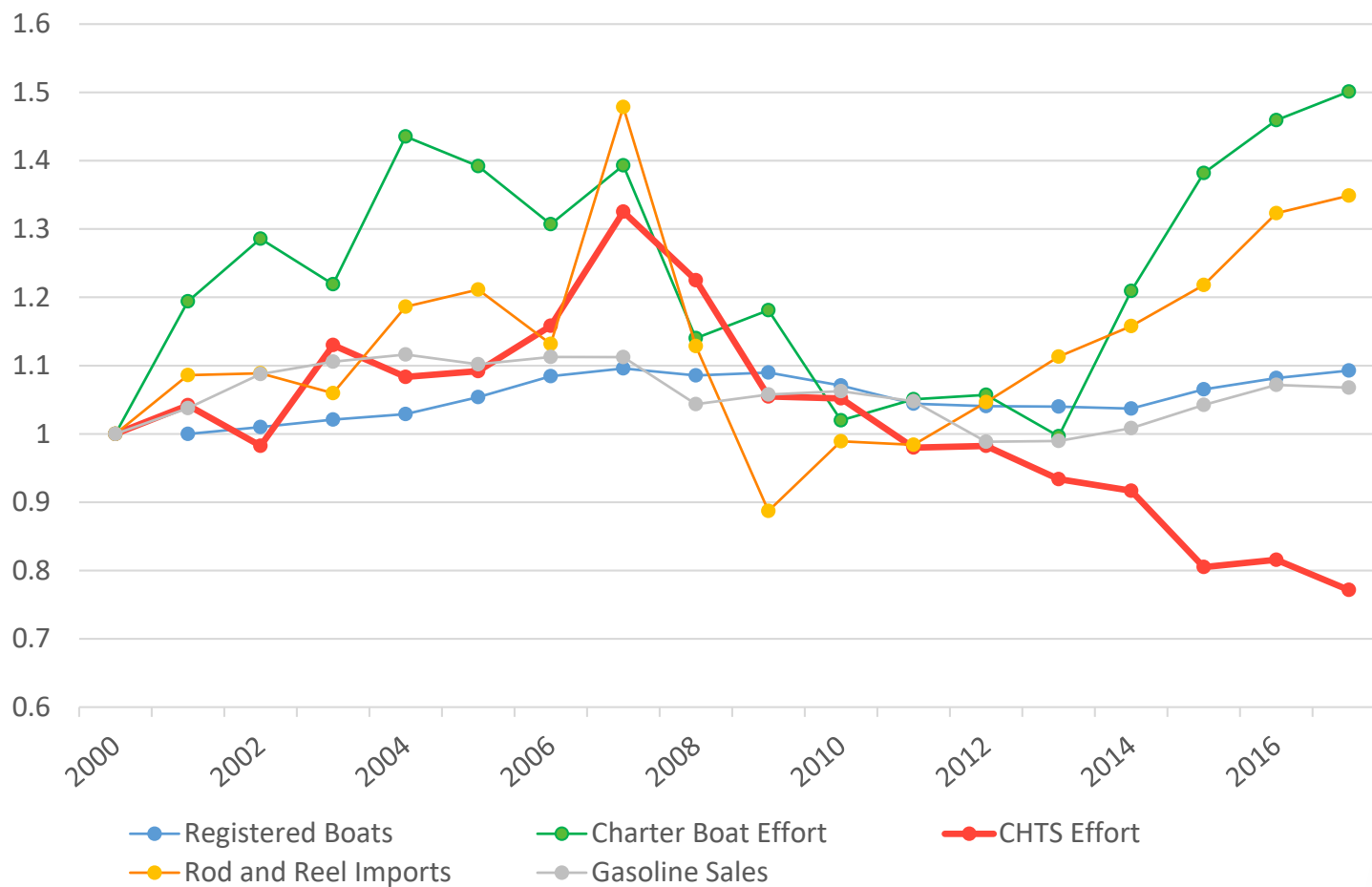
V. Trends in CHTS Estimates

Evidence suggests the declining trend in CHTS estimates reflects the growing impact of non-sampling errors on estimates



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Indicators of Fishing Activity

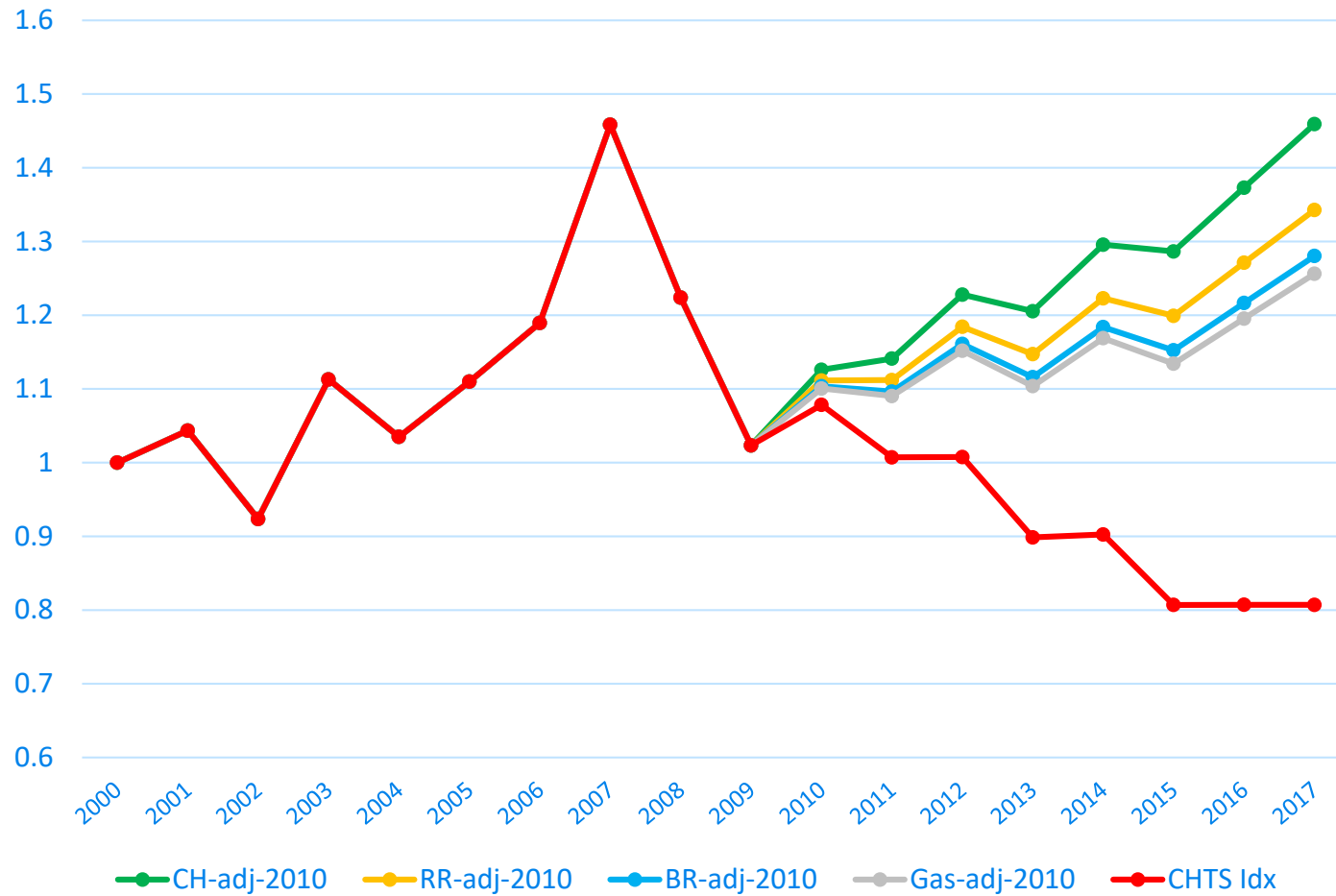


Other indicators of fishing activity—charter boat trips, imported fishing tackle, registered boats, and outboard engine and gasoline sales—decreased during the economic downturn but have since recovered

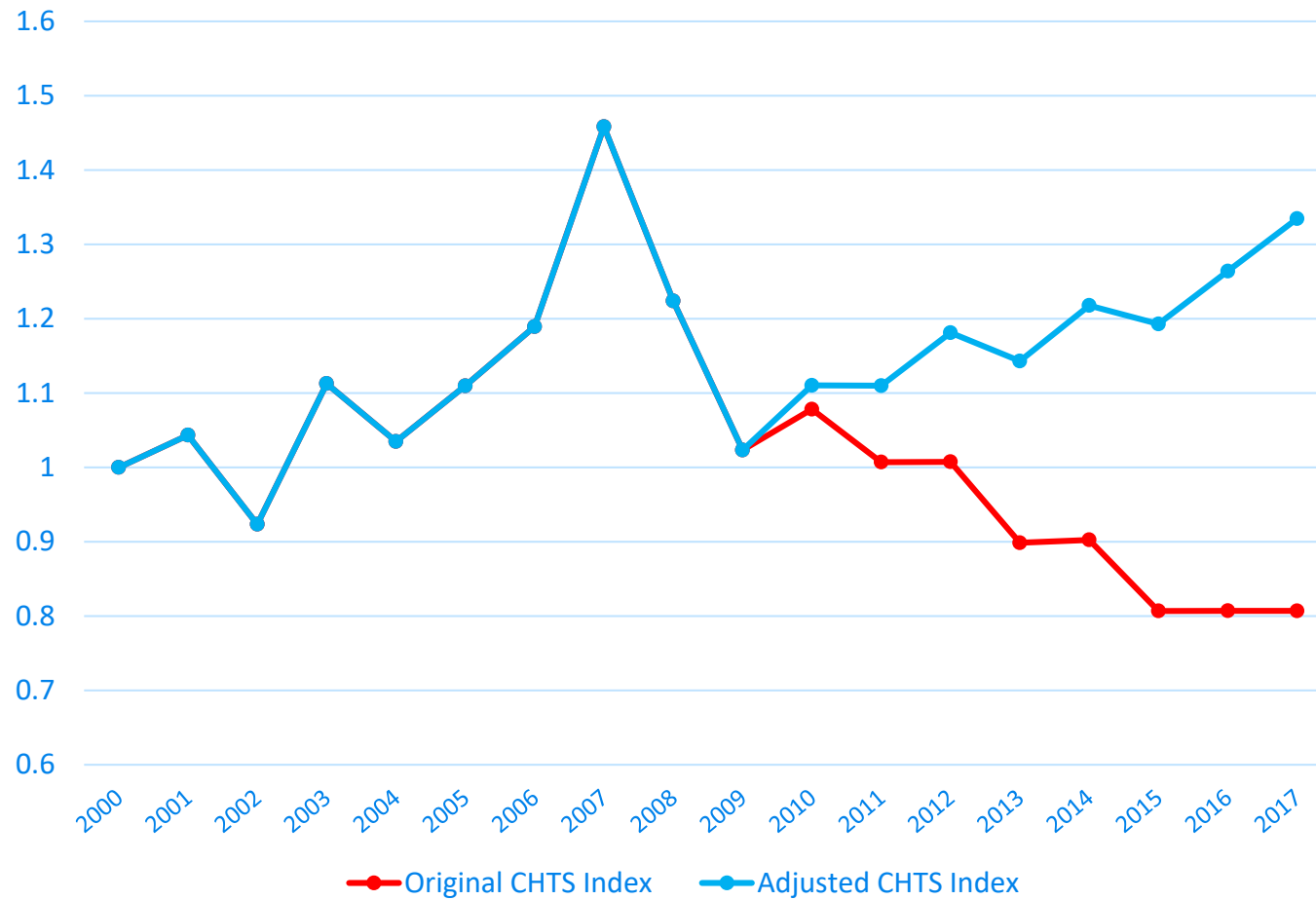


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Adjusted CHTS Estimates



Average Adjusted CHTS Estimates



Summary

- Over the past 15 years, CHTS samples have become increasingly biased as a result of declining coverage
- This bias resulted in a severe under-estimate of fishing effort
- Screening errors in the CHTS – the “Gatekeeper Effect” – also resulted in an under-estimate of fishing effort
- Coverage error and the Gatekeeper effect explain nearly all of the difference between FES and CHTS estimates
- Despite larger FES estimates, fishing is still a rare event
- The potential magnitude of “hidden fishing trips” is enormous



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Questions?

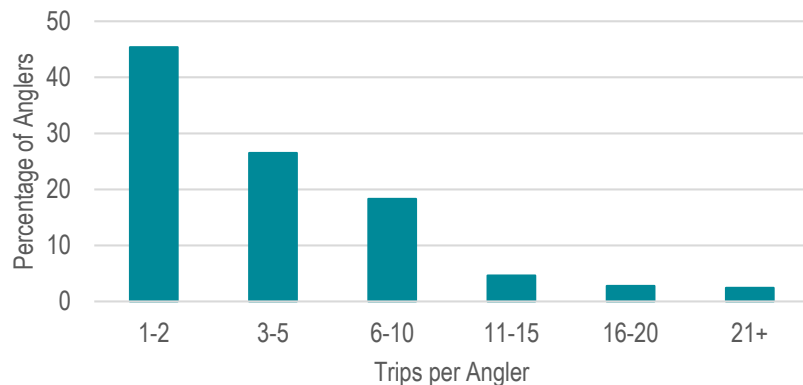


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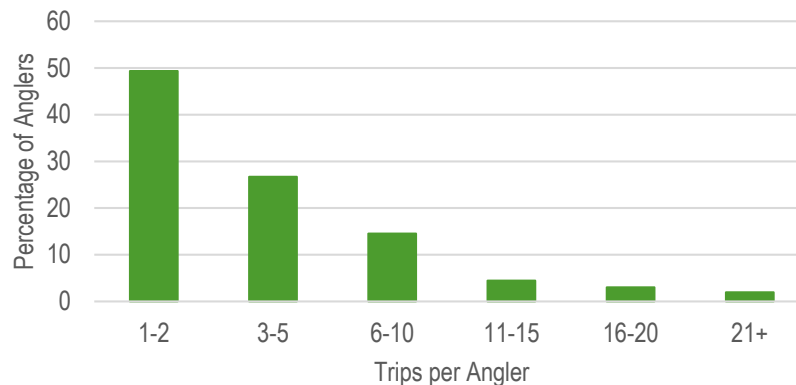


Even during periods of high fishing activity, the FES shows a relatively small proportion of the population reporting fishing.

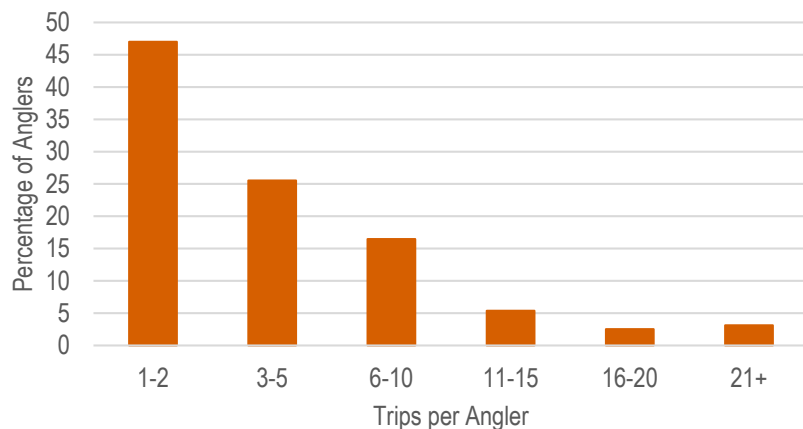
North Carolina Boat Trips per Angler During Wave 4



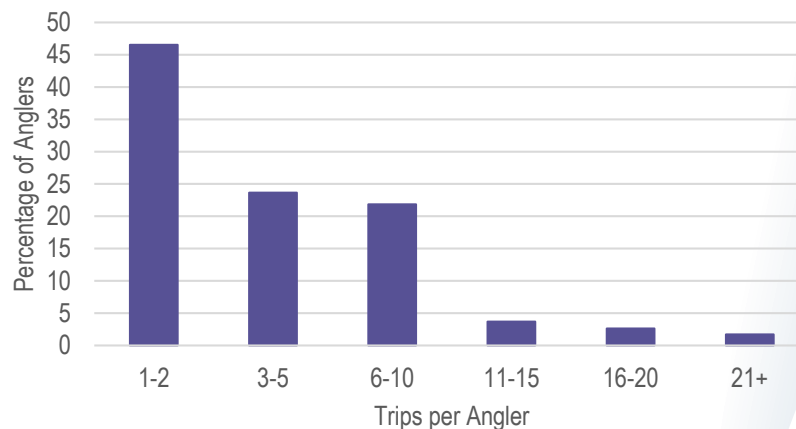
South Carolina Boat Trips per Angler During Wave 4



Georgia Boat Trips per Angler During Wave 4

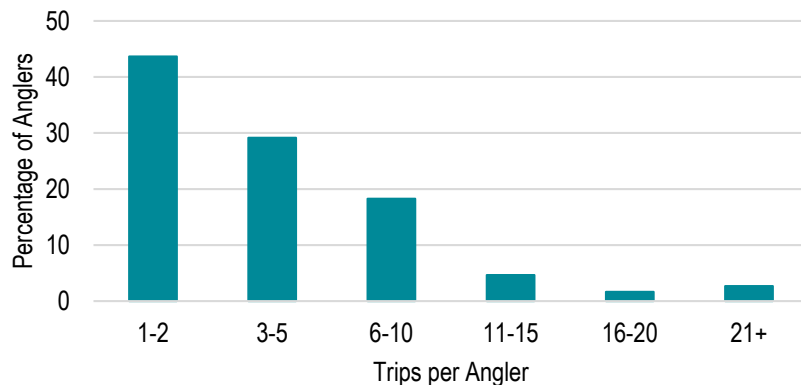


Florida Boat Trips per Angler During Wave 4

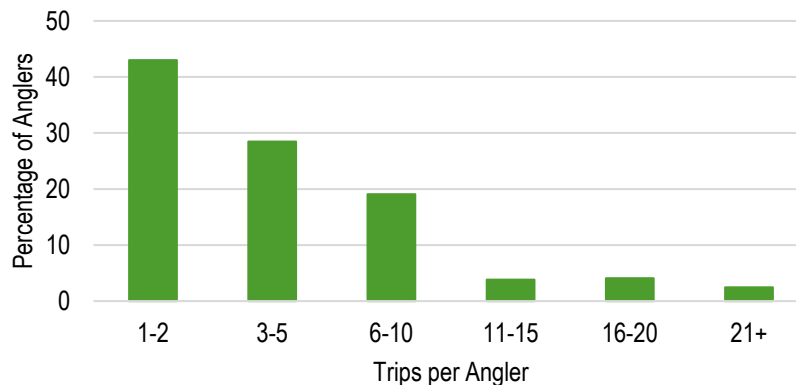


During this time, most anglers fishing from private boats took five or fewer trips.

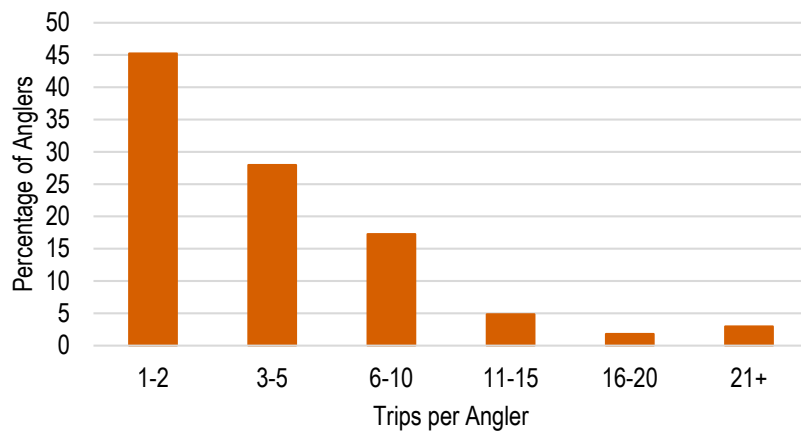
North Carolina Shore Trips per Angler During Wave 4



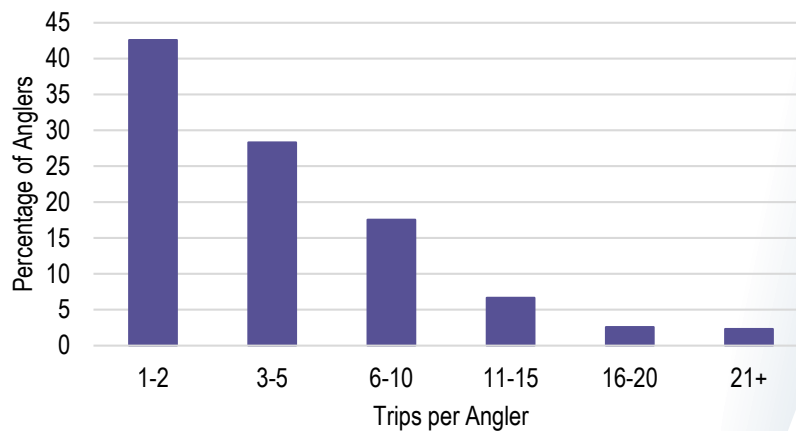
South Carolina Shore Trips per Angler During Wave 4



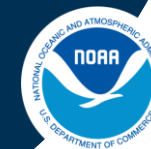
Georgia Shore Trips per Angler During Wave 4



Florida Shore Trips per Angler During Wave 4

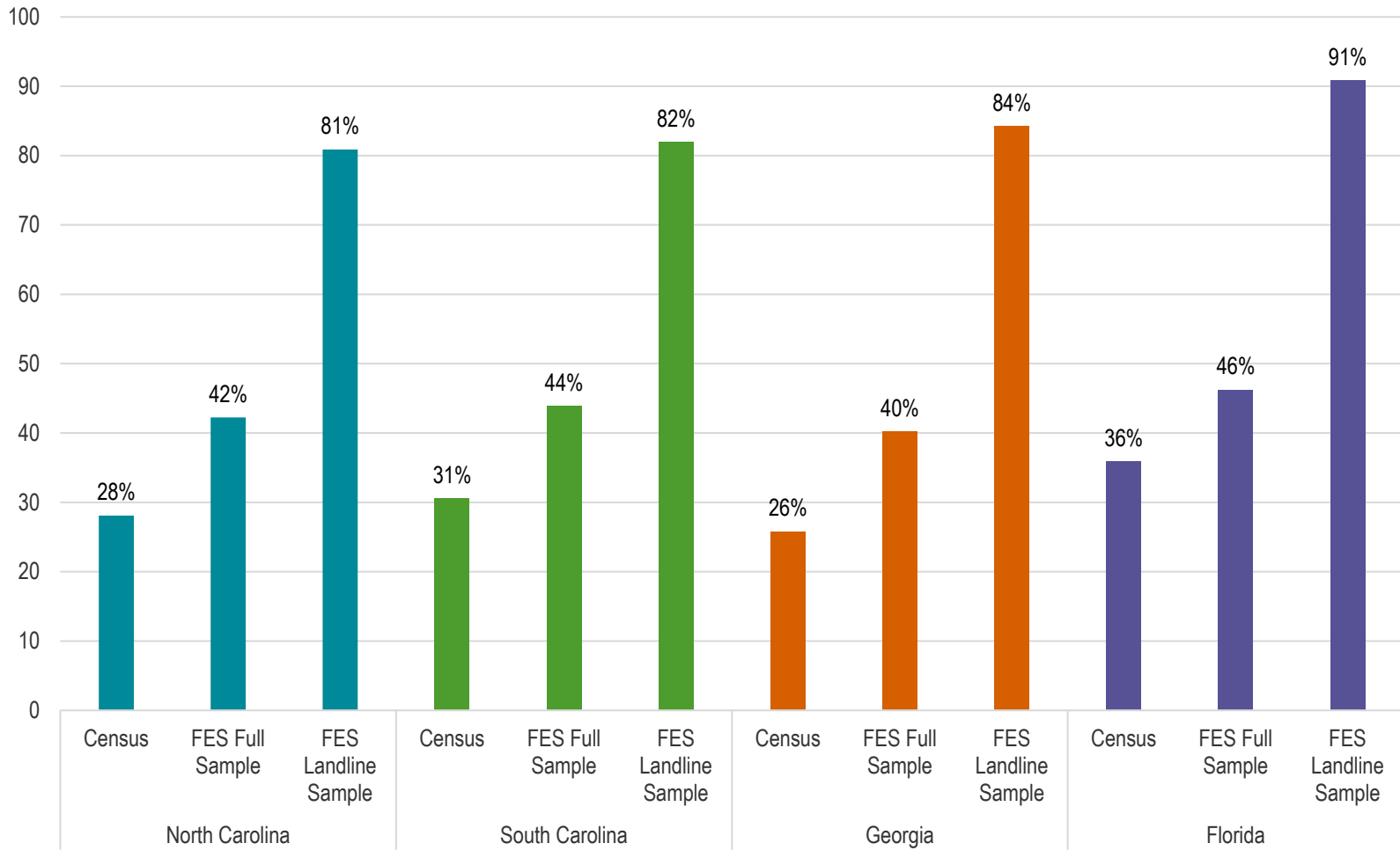


This trend is also reflected in the distribution of trips from shore.



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Percent of Households with Seniors (65+)

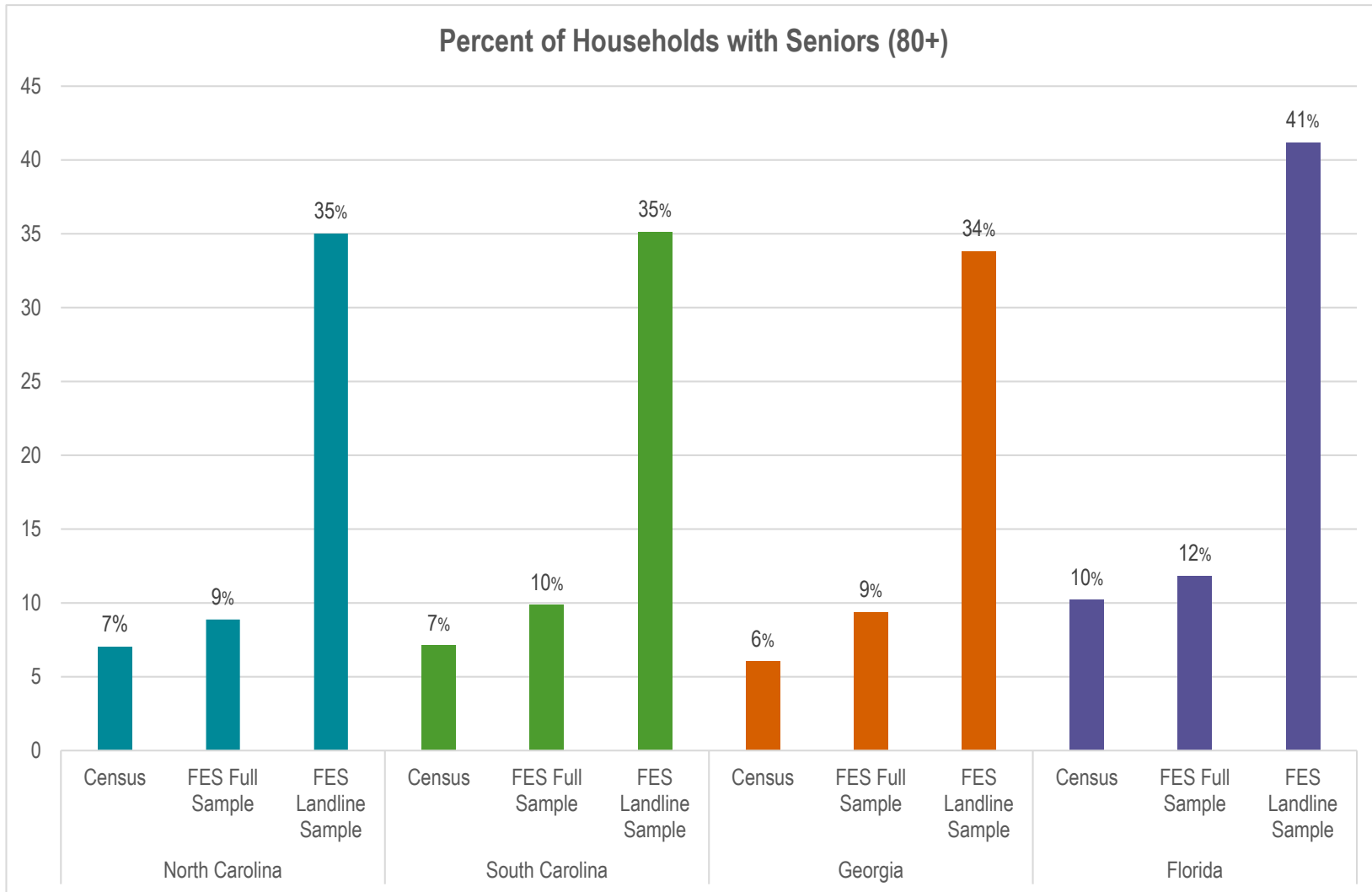


In South Atlantic states, the difference in age between the full population and the landline population is clear.



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Percent of Households with Seniors (80+)

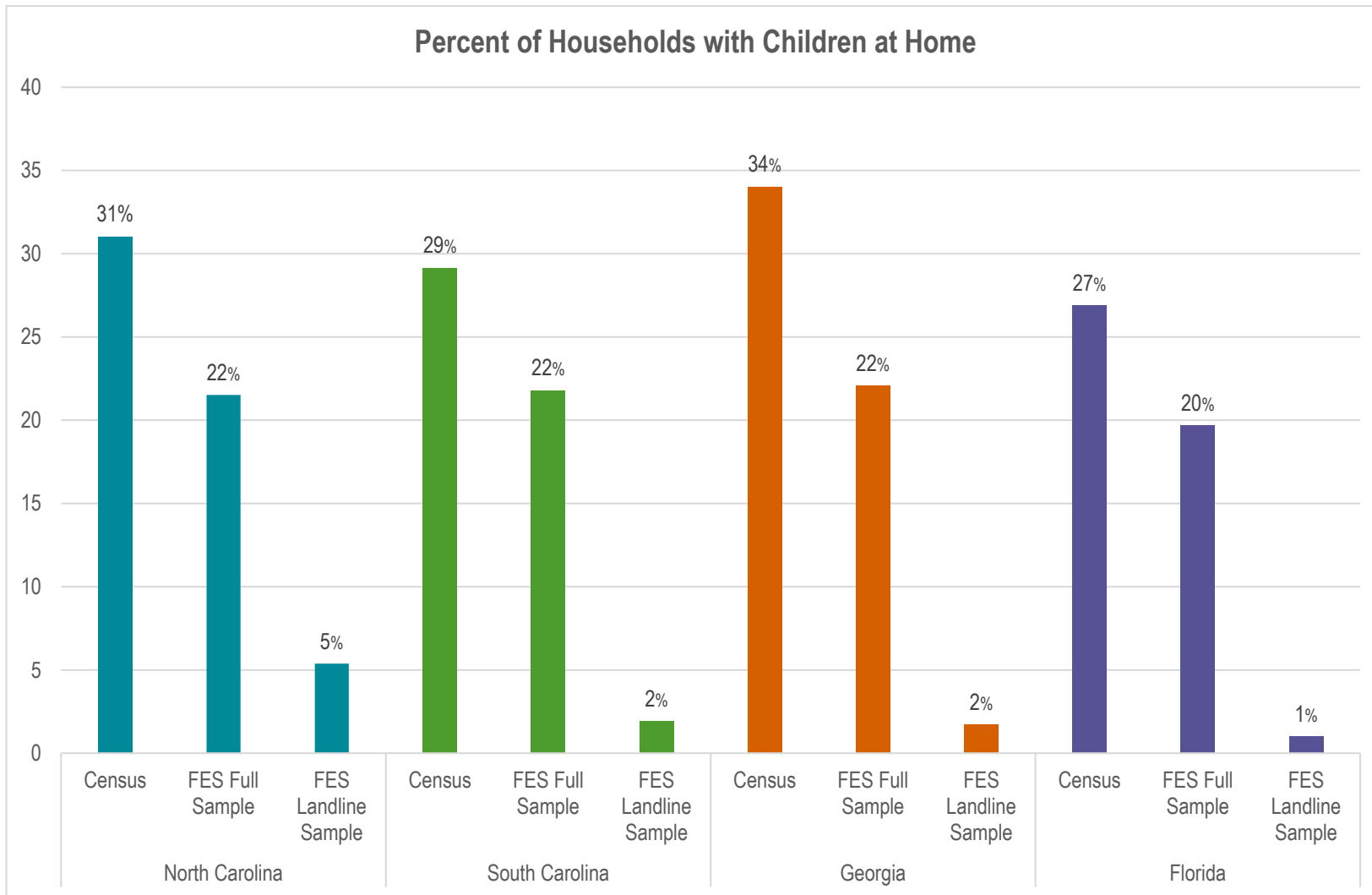


Between 34 and 41% of landline-only and landline-mostly households are home to seniors aged 80 and up.



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Percent of Households with Children at Home

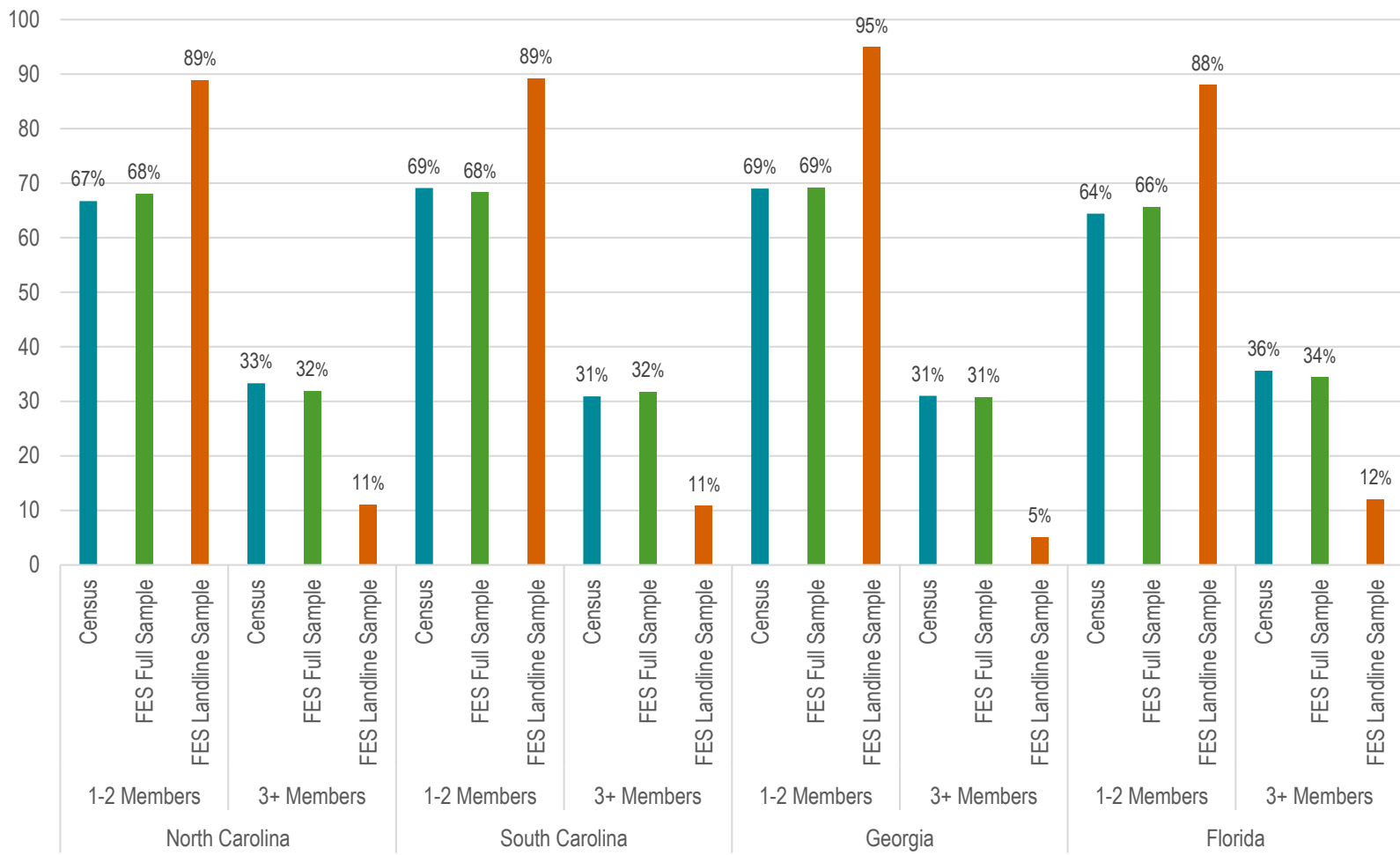


Landline-only households are less likely to report children at home.



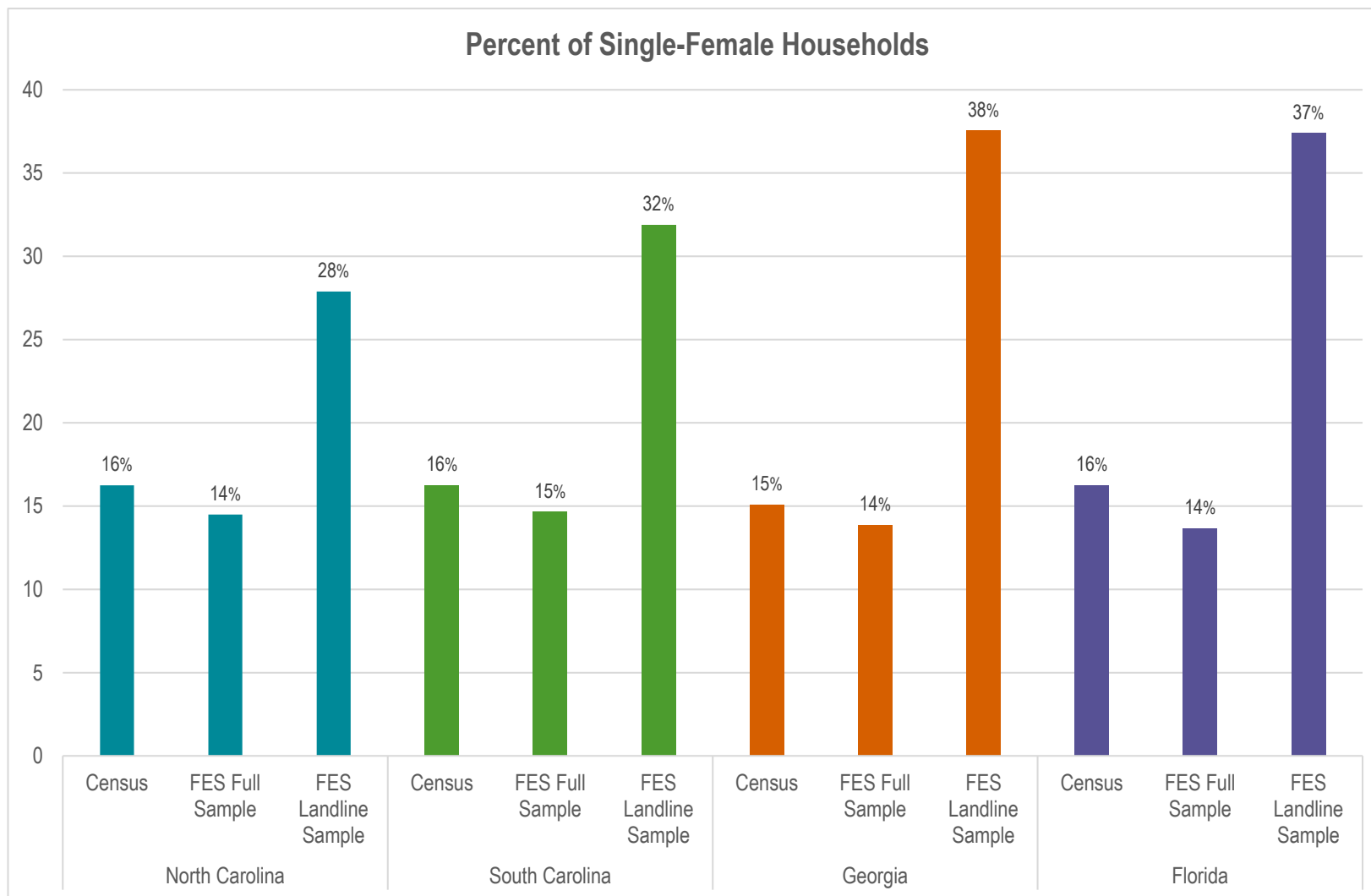
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Percent of Households with 1-2 vs. 3+ Members

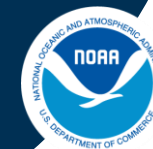


Landline-only households also report fewer household members overall: more of these households have one or two members, and less have three or more members.

Percent of Single-Female Households

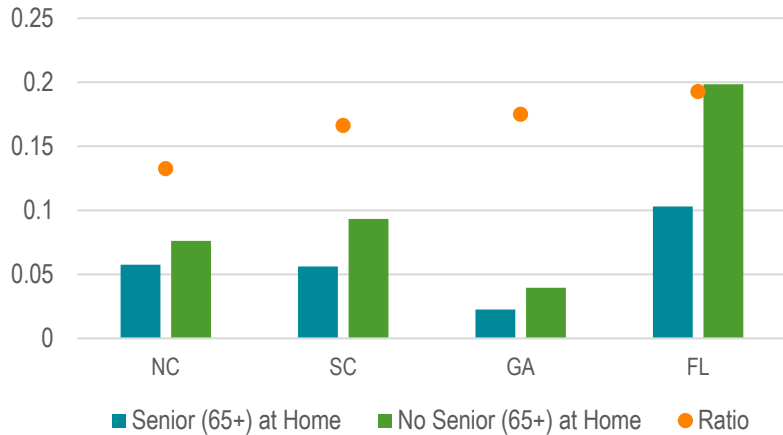


In 2017, about one-third of the landline-only population in the South Atlantic consisted of single-female households, compared with about 15% of the region's full population.

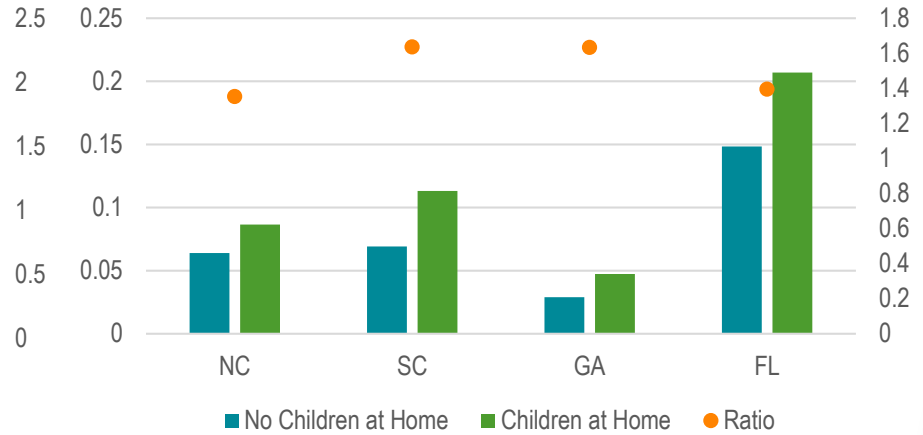


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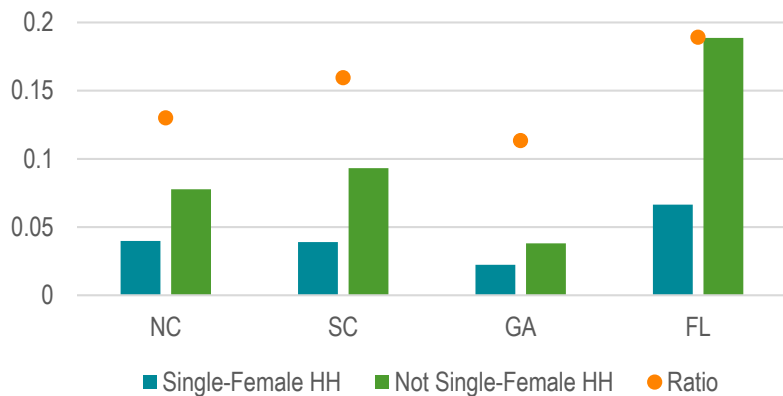
Fishing Prevalence: Senior (65+) at Home



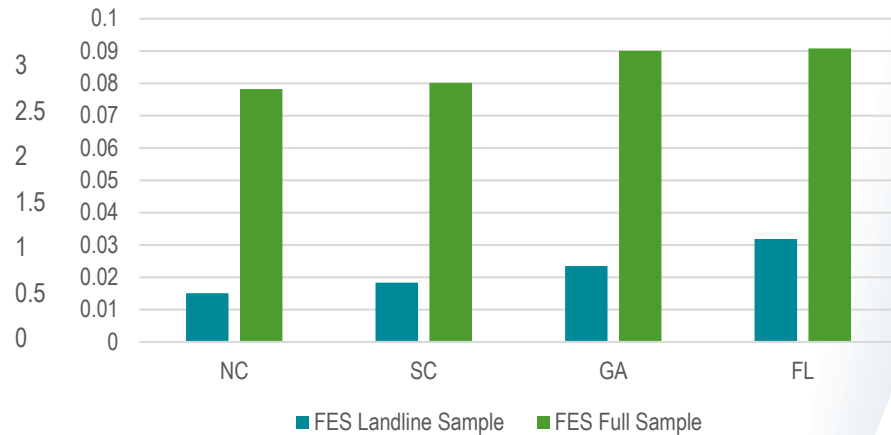
Fishing Prevalence: Children at Home



Fishing Prevalence: Single-Female Households



Overall Fishing Prevalence



The people who reflect the CHTS sample frame report less fishing activity.



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Sources: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



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Example: Shore Fishing in Georgia

In 2018, the FES indicated Georgia anglers took **almost three million shore trips** over the course of **306 days (waves 2-6)**.

Can **9,674 daily fishing trips** take place in a state with such a small coast?



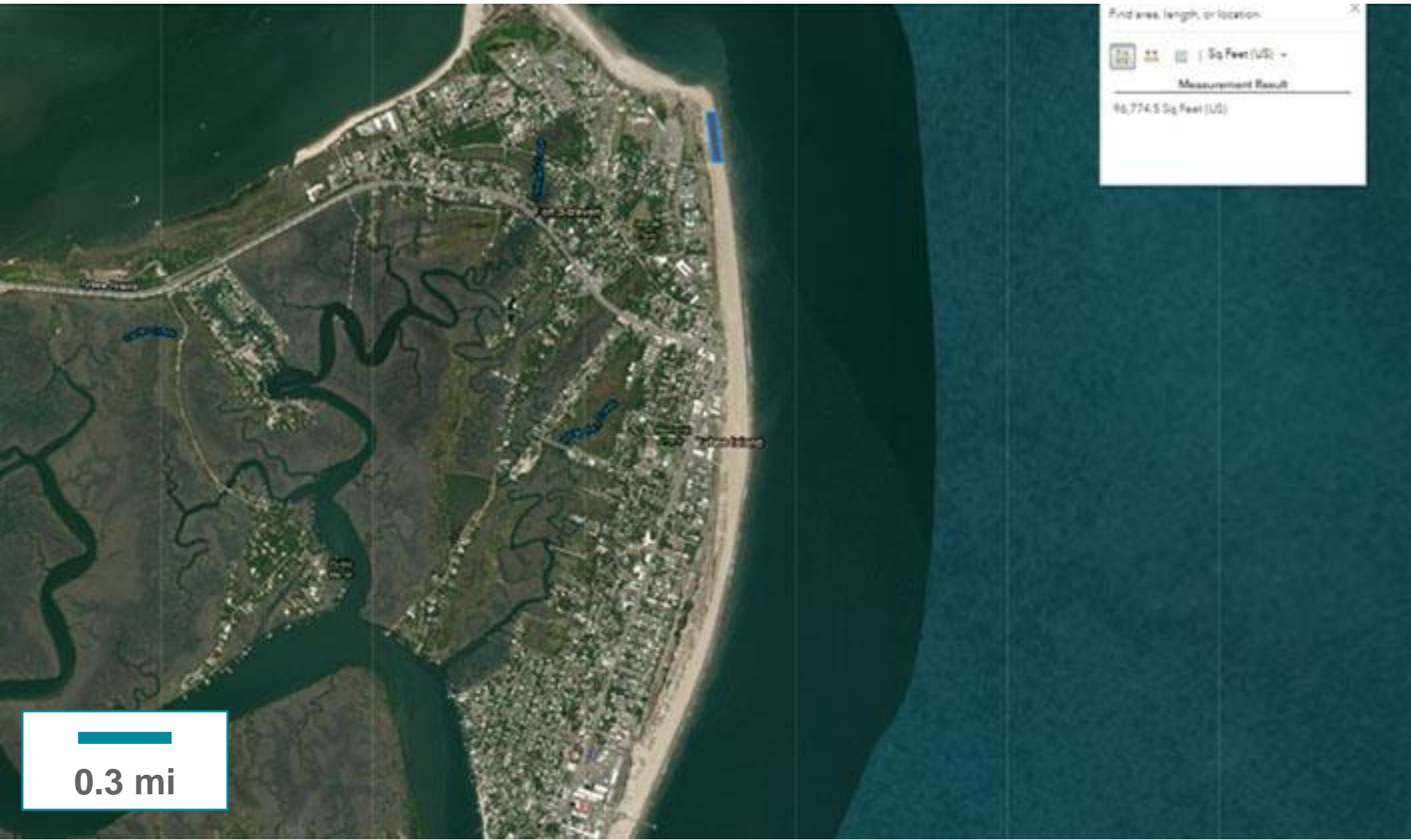
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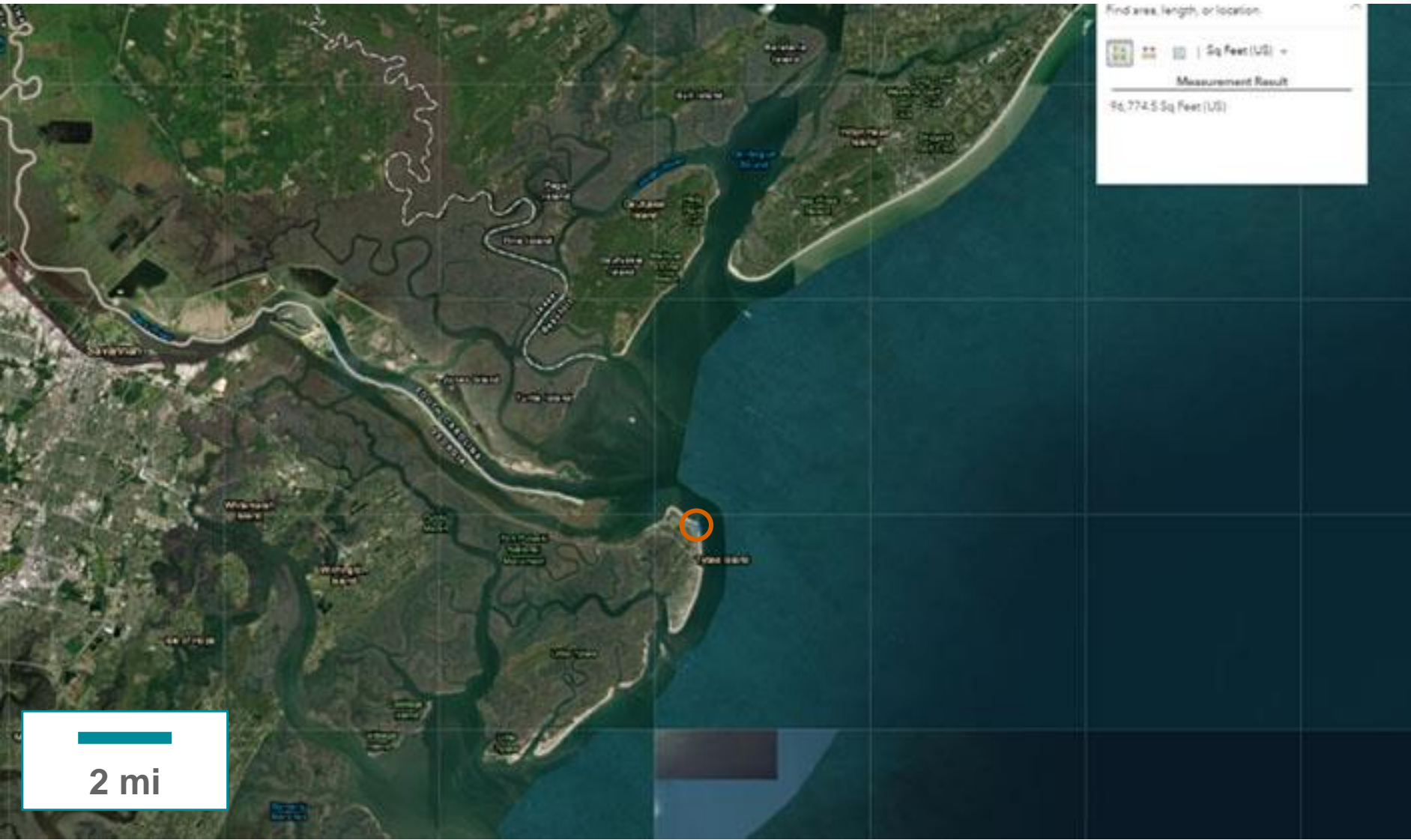
If a different angler took each one of Georgia's daily fishing trips, and if all of these trips took place at once, what would they look like?



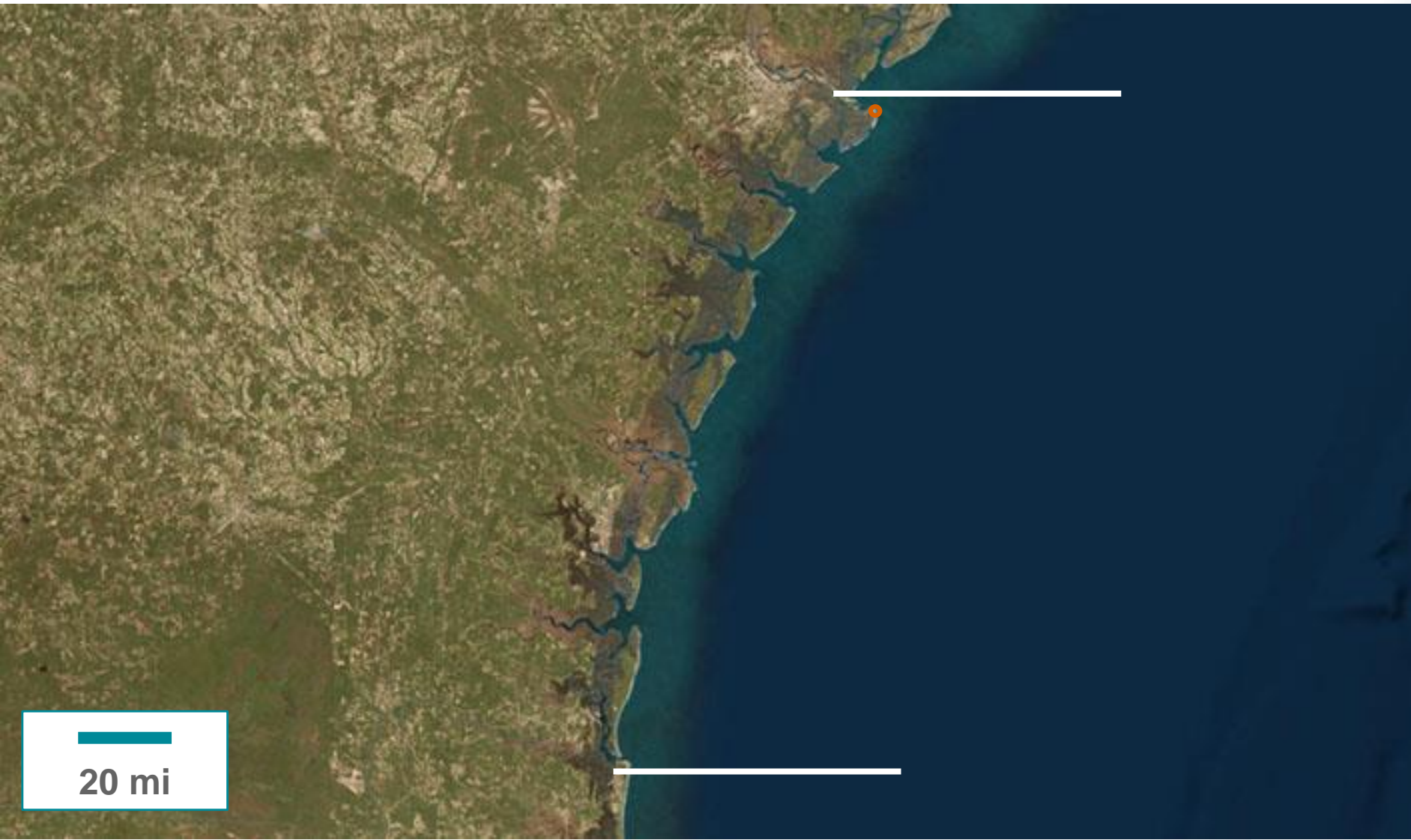
All 9,674 anglers could fit on this beach. How does this area compare with Georgia's coast?



This image shows Tybee Island.



This image shows Tybee Island and Savannah.



Even if all of an average day's trips took place at once, angler densities across the state would be low.

