

Implementation of Electronic Logbooks on Headboats Operating in the U.S. South Atlantic

FY 2009 Proposal

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1. Overview

1.1. Sponsor

1.2. Focus Group

Survey Design and Evaluation

1.3. Background

The National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NMFS) is required to collect statistics on marine recreational fishing. One of the current data collection programs in the southeastern United States is the Southeast Region Headboat Survey (SRHS). This survey uses paper logbook forms, also called 'catch records', for captains and operators to record trip level catch and discards for each fish species. Logbook reporting by owners and operators of all headboats that fish in state and/or Federal waters of the Atlantic Ocean south of Virginia has been mandatory, in accordance the Code of Federal Regulations (CFR) Title 50, Part 622, since 1986. Prior to that, the survey collected logbook data on a voluntary basis since 1972, making this survey the longest continuous marine recreational fishing data collection program in the southeast. Annual headboat permit renewals in the U.S. South Atlantic are currently contingent upon compliance with submitting a catch record for each trip made. Submission requirements for logbooks in the SRHS are currently once a month. When collected, the logs must be key-punched and run through various QA/QC measures. It currently takes about 3-4 months past the end of the calendar year to produce final catch, effort, and discard estimates and other data for use in stock assessments and quota monitoring. By changing over to an electronic log with more frequent reporting (weekly or bi-weekly), we can save money and time in turning out catch, effort, discard, and other data from the headboat sector of fishing. As fisheries move toward quota-based management systems, the need for timely catch and discard estimates is critical. The proposal is to initiate a one year pilot program in the U.S. South Atlantic, with hopes of extending the program coast-wide and into the Gulf of Mexico, ultimately making it permanent in both areas in the long run. As an extension of the existing survey, the results of the pilot project will be used to demonstrate the effectiveness, timeliness, and accuracy of electronic reporting as compared to the current paper log process. This project will open the door to full implementation of electronic reporting in the SRHS, allowing for timely and accurate reporting of catch, effort, and discards for many species. Similar to electronic dealer reporting (SAFIS), data will be transferred via the logbook contractor directly to a central data depository. Electronic submission of these catch records would greatly enhance the ability to monitor catch record compliance of headboats to confirm eligibility for permit renewal. The SRHS encompasses a sector of fishing that covers a large amount of area (Cape Hatteras to the Florida Keys, from 1 to over 40 miles offshore (see Figure 1 attached) with approximately 80 vessels capturing more than 280 fish species. These species and fishing areas are important to the individual states and National Marine Fisheries Service. Data from the SRHS is important in addressing policy issues related to the Atlantic Coastal Fisheries Cooperative Management Act, the reauthorized Magnuson-Stevens Fishery Conservation and Management Act, and the Endangered Species Act. The primary goal of this pilot project is to lay the groundwork for establishing electronic reporting for all headboats operating in the U.S. South Atlantic. Another benefit of this project is that it will lead to an improvement in the monitoring of logbook submission to confirm eligibility for permit renewal.

1.4. Project Description

The project will commence in May 2009 with the contracting of a suitable software developer for the electronic (web-based) logbook. This software development is expected to take approximately three months. During this time eight headboats will be selected for voluntary participation in the pilot project. Two boats each from North Carolina, South Carolina, Georgia, and the east coast of Florida will be solicited for the project. This is equivalent to 10% of the east coast fleet and assures a good geographic coverage to the study. Participating vessel personnel will complete both the mandatory paper logbook as well as the electronic logbook for comparison purposes. Upon development of the software, the electronic logbook will be implemented in the field and deployed for a period of one year (August 2009-July 2010). Final analyses will include comparison of results from the paper and electronic reporting systems to determine reliability, accuracy, compliance, timeliness and cost of both methods. Final analyses are expected to take three months (August-October 2010).

1.5. Public Description

1.6. Objectives

The products of this project will be 1) Effective field testing of electronic reporting for a subset of headboats in the southeast, and information about the implementation of this system in collecting data for all headboats in the SRHS. 2) Headboats will be brought into compliance with current ACCSP standards by improving the collection methodology for estimates of participation, effort, catch and discards of recreational anglers fishing. 3) A written report prepared by project coordinators evaluating the utility of this project, with statistical comparisons of data from electronic and paper logbooks, and an analysis of reporting reliability, accuracy of data, timeliness of both data entry and final estimate development, and compliance with reporting requirements

1.7. References

2. Methodology

2.1. Methodology

2.2. Region

South Atlantic

2.3. Geographic Coverage

2.4. Temporal Coverage

2.5. Frequency

2.6. Unit of Analysis

2.7. Collection Mode

3. Communication

3.1. Internal Communication

Project status reports will be provided to the Operations Team on a bi-monthly basis. Number of vessels, logbook reports collected by method, compliance, etc.

3.2. External Communication

4. Assumptions/Constraints

4.1. New Data Collection

4.2. Is funding needed for this project?

4.3. Funding Vehicle

Transfer to SEFSC (Beaufort)

4.4. Data Resources

One assumption is that vessels selected to participate in this pilot project will act in good faith and complete the electronic logbooks as promised. Currently there is very limited validation of logbook forms by the SRHS. This pilot will allow us to more thoroughly validate a proposed new method, e-logs, with mandatory paper log forms, as well as with dockside intercept sampling data. One possible constraint is that the reporting of catch data in the headboat sector by an electronic logbook form is not mandatory, and should a cooperator decide to become uncooperative at some time period into the pilot project, there is no recourse to compel compliance. However, the SRHS management has already been in discussions with willing cooperators, and there should be limited problems.

4.5. Other Resources

4.6. Regulations

4.7. Other

5. Final Deliverables

5.1. Additional Reports

5.2. New Data Set(s)

5.3. New System(s)

6. Project Leadership

6.1. Project Leader and Members

First Name	Last Name	Title	Role	Organization	Email	Phone 1	Phone 2
Kenneth	Brennan		Team Leader	NOAA\NMF S\SEFSC			
David	Gloeckner		Team Member	NOAA\NMF S\SEFSC			
Erik	Williams		Team Member	NOAA\NMF S\SEFSC			

7. Project Estimates

7.1. Project Schedule

Task #	Schedule Description	Prerequisite	Schedule Start Date	Schedule Finish Date	Milestone
2	Secure contractor		05/01/2009	06/30/2009	
6	Deploy electronic logbook to field, contractor and SRHS staff meet with vessel personnel at start.		08/01/2009	08/31/2009	
8	Bi-monthly processing of electronic and paper logbook data, ongoing activity.		10/01/2009	07/31/2010	Y
10	Final analysis of logbook data from pilot project		08/01/2010	10/31/2010	Y
12	Validation of logbooks using intercept data		08/01/2010	10/31/2010	
1	Develop electronic logbook		05/01/2009	06/30/2009	Y
3	Select data elements for inclusion in elogbook. SRHS staff meet with contractor.		05/01/2009	06/30/2009	
5	Implementation of logbook reporting		08/01/2009	08/31/2009	Y
9	Hire data analysis contractor		04/01/2010	10/31/2010	
13	Preparation of Final Report		10/01/2010	10/31/2010	Y

Task #	Schedule Description	Prerequisite	Schedule Start Date	Schedule Finish Date	Milestone
14	discuss the degree of success of the pilot program, suggestions for improvement and recommendations		10/01/2010	10/31/2010	
4	Select headboats to participate in pilot project.		05/01/2009	07/31/2009	
7	continual data collection via electronic logbook and paper logbooks from selected participants.		08/01/2009	07/31/2010	
11	Completion of catch and effort estimates, compare two logbook methods		08/01/2010	10/31/2010	

7.2. Cost Estimates

Cost Name	Cost Description	Cost Amount	Date Needed
Software	Electronic reporting program development and implementation	\$25000.00	
Data processing and analysis contract position	Contract/graduate student position (6 months) for analysis and report write-up	\$25000.00	
Service Contract or Maintenance Fees	Cost of contractor to maintain the website, compile and deliver the data (included in first yr cost)	\$0.00	
Federal Travel	Travel for PI to deliver final report to MRIP OT	\$1000.00	
TOTAL COST		\$51000.00	

8. Risk

8.1. Project Risk

Risk Description	Risk Impact	Risk Probability	Risk Mitigation Approach
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9. Supporting Documents

"Final Report", page 1

1	MARINE RECREATIONAL INFORMATION PROGRAM
2	Implementation of Electronic Logbooks on Headboats
3	Operating in the U.S. South Atlantic
4	
5	Mr. Kenneth Brennan, NOAA\NMFS\SEFSC, Beaufort, NC
6	Mr. Warren Mitchell, NOAA\NMFS\SEFSC, Beaufort, NC
7	Dr. Erik Williams, NOAA\NMFS\SEFSC, Beaufort, NC
8	Dr. David Gloeckner, NOAA\NMFS\SEFSC, Miami, FL
9	
10	

11 SUMMARY

12 The NOAA Fisheries Southeast Region Headboat Survey (SRHS) currently distributes
13 paper logbook forms for vessel owners/operators to record trip-level catch and effort data (i.e.,
14 catch records). Historically, the time between in-season generation and delivery for paper form
15 data is 3-5 months, and end-of-fishing-year estimates are subject to similar delays. Between
16 October 2009 and October 2010, both paper and electronic logbook submissions were received
17 voluntarily from seven (7) headboat vessels in North Carolina, South Carolina, Georgia, and
18 Florida. Study participants were requested to submit two forms of identical data. Paper form
19 reporting was executed per standard SRHS protocols. Electronic reporting was executed on
20 computers owned by vessel owners/operators via a novel software application; data were
21 transmitted to a secure digital storage facility via the Internet.

22 Electronic logbooks were effectively tested for a subset of headboats located along the
23 southeastern U.S. Atlantic coast. A total of 4,859 species records were transmitted
24 electronically, describing the fishing activity of 14,900 anglers on 719 trips. Electronic reporting
25 methods were evaluated for potential advantages in reliability, accuracy, compliance, timeliness,
26 and cost.

27 Electronic logbook methods and software developed for this project were reliable and
28 functioned as expected. In a few cases (<5% of trips) electronic data were unreported for
29 corresponding paper records; missing entries were attributed to random data-entry omissions by
30 study participants, and not software errors. To assess reporting accuracy, biological samples
31 (i.e., dockside samples) were examined from 77 trips where corresponding electronic logbook
32 records were available. In 328 of 486 species-specific cases (67%), retained species sampled by

33 headboat port agents had also been reported via electronic logbooks. When summary statistics
34 were restricted to species in the Snapper-Grouper Management Complex, reporting accuracy was
35 higher (74%). To assess compliance, reported fishing dates were compared between the SHRS
36 and electronic logbooks; vessel owners/operators reported 93% of the fishing activity
37 documented by port agents. To assess timeliness, delays between fishing date and availability of
38 electronic data were calculated. The average delay for electronic-form data was 20 days; the
39 median was 9 days. For 2009, the programmatic cost of the current paper logbook system was
40 \$81K. If operated as a contract, the one-time cost of implementing a region-wide electronic
41 logbook system (approximately 160 boats) is estimated to be \$96K. Also, IT support and
42 maintenance is estimated to be \$36K annually.

43 Electronic logbooks improved the timeliness of data delivery and yielded inherent
44 improvements over paper logbooks, including: better quality control, reduced data handling, and
45 more secure data delivery. Time and effort by SRHS staff to develop annual catch summaries
46 would be positively affected by increased efficiency of electronic logbooks. We estimated that
47 annual data summaries would be available to managers approximately 2 months earlier than can
48 be produced with the current paper-based system.

49 General recommendations: (1) Implement electronic logbooks for headboats in the entire
50 southeastern U.S. (2) Fund support services during the transition from paper reporting to
51 electronic reporting, with additional support into out-years. (3) Support development of an
52 Internet-based software interface for electronic reporting. (4) Utilize the expertise of SRHS staff
53 to provide a local level of training and quality control to vessel owner/operators to improve data
54 quality. (5) Review and implement effective regulatory infrastructure for transitioning to
55 electronic reporting, with further emphasis on electronic logbook reporting compliance.

56 Software recommendations: Vessel owner/operators, software designers, port agents and
57 SRHS staff made numerous suggestions for improving the electronic logbook. Technical
58 recommendations include: (1) An Internet-based portal to submit headboat data. (2) An
59 expansion of visual aids for electronic logbook applications (e.g., maps of fishing area, species
60 identification aids). (3) “Smart menus” which track users’ past entries to adaptively simplify
61 future data entry. (4) A query function allowing effort and catch to be summarized according to a
62 user’s needs. Based on input from stock assessment scientists and SRHS staff, future software
63 versions should include a data field for fishing depth, more precise location data, and a field
64 declaring target species.

65

66

67 INTRODUCTION

68 *Project Background*

69 The National Oceanic and Atmospheric Administration, National Marine Fisheries
70 Service (NOAA Fisheries) is required to collect statistics on marine recreational fishing. One of
71 the oldest data collection programs in the southeastern United States is the Southeast Region
72 Headboat Survey (SRHS). The headboat sector is considered a subset of recreational fishing,
73 from which the collection of timely and accurate fisheries data has been historically challenging.
74 The SRHS is the longest, continuous marine recreational fishing data collection program in the
75 southeastern U.S. Since 1972, the Survey has relied upon paper logbook forms (i.e., catch
76 records) completed by each vessel to record trip-level catch and fishing effort for individual fish
77 species. In accordance with Code of Federal Regulations (CFR) Title 50, Part 622, logbook
78 reporting for all headboats that fish in state and Federal waters of the Atlantic Ocean south of
79 Virginia, has been mandatory since 1986. In March 2008, a letter was issued to all headboat
80 permit holders indicating catch record submission would be monitored for compliance. In the
81 U.S. South Atlantic, failure to submit a catch record for each trip can result in monetary civil
82 penalties or non-renewal of federal fishing permits.

83 The SRHS is responsible for monitoring headboat fishing activity from Cape Hatteras to
84 the Florida Keys in the South Atlantic (Figure 1), where approximately 80 headboats operate. A
85 nearly equal number operate in the Gulf of Mexico (GOM). Over time, the SRHS has reported
86 the catch or harvest of more than 350 fish species, and data from the SRHS are routinely
87 provided to both the South Atlantic and Gulf of Mexico Fishery Management Councils. Data
88 have also been used to address policy issues related to the Atlantic Coastal Fisheries Cooperative

89 Management Act, the reauthorized Magnuson-Stevens Fishery Conservation and Management
90 Act, and the Endangered Species Act. Additionally, SRHS data have been cited in academic
91 research and numerous scientific publications.

92 Self-reported paper logbook forms are currently submitted by vessel owners/operators to
93 NOAA Fisheries headboat port agents on a mandated monthly schedule. Data are then centrally
94 collected, shipped to a private contractor for key-entry, returned to SRHS staff in electronic
95 form, and examined for quality control before use. Availability of data is variable due to several
96 factors: submission delays, processing time, mailing time key-entry delays, all of which
97 combined may take three to five months past a fishing trip. This information is therefore not
98 immediately available for in-season fisheries management. Similarly, it requires three to five
99 months past the end of the calendar year to calculate final annual estimates for use in stock
100 assessments and quota monitoring. As fisheries managers continue to develop quota-based catch
101 limits and accountability measures, it has become more critical to optimize data collection from
102 the headboat sector. To reduce these delays, the use of electronic logbook methods is considered.

103 We initiated a one-year pilot project to assess the use and potential advantages of
104 electronic logbook reporting vs. paper logbook forms for a subset of vessels in the U.S. South
105 Atlantic headboat fishery, with resultant recommendations to be discussed in terms of whether or
106 not to permanently extend the project coast-wide and into the GOM. Results are described from
107 a test of simultaneous paper and electronic reporting. Potential improvements to methodology
108 currently used to generate trip-specific catch and effort of recreational anglers were evaluated.
109 Analyses compared reporting systems and quantified differences in reliability, accuracy,
110 compliance, timeliness and cost.

111 *Scope and Assumptions*

112 Simultaneous paper and electronic catch records were requested from vessel
 113 owners/operators over a period of 13 months (October 2009 - October 2010, inclusive).
 114 Involving vessels from all states along the U.S. South Atlantic coast, the project period was
 115 assumed to generically reflect a year of headboat vessel operations in the fishery. The
 116 participation of vessel owners/operators in this study was voluntary. No incentives to participate
 117 in the project or computer equipment were provided to vessel owners/operators. We assumed
 118 that paper and electronic catch records would be identical for the same trip. We also assumed
 119 that participating vessel owners/operators would submit data in good faith and comply with
 120 electronic logbook reporting for the duration of the study period. Where vessel activity records
 121 and species identifications are considered, the observations of headboat port agents are assumed
 122 to be error free. Data are presented anonymously to comply with confidentiality requirements of
 123 the Magnuson-Stevenson Act.

124 *Project Closure*

125 Three products were developed:

- 126 (1) Effective field testing of electronic-form reporting, which included four software
 127 program updates incorporating user comments and software improvements.
- 128 (2) Comparative analyses to assess improvements in methodology currently used to
 129 collect effort and catch data for recreational anglers fishing on headboats.
- 130 (3) A report prepared by project coordinators summarizing the results and utility of the
 131 project (this report).

132

133

134 METHODS

135 Study participants were requested to submit two forms for each trip. On both paper and
136 electronic logbook forms, vessel owners/operators fill out separate sections for trip-effort and
137 catch data (Figures 2-4).

138 Trip-effort data consisted of two vessel identity fields, date of trip, departure and arrival
139 time, fishing location, two fields accounting for angler numbers, declared trip type (e.g., ½ day,
140 full day), fishing distance from shore, and pay type (e.g., per person, per group). Port agents
141 retrieved paper logbook forms on a monthly schedule. Specifically, as defined by the Code of
142 Federal Regulations, catch records are due "no later than 7 days after the end of each month"
143 (i.e., approximately 37 days can lapse before data from a trip on the first day of a month are
144 collected). Port samplers then transcribed hand-written trip information by entering
145 corresponding categorical codes into "AGENCY" fields on each paper catch record (Figure 2).
146 For electronic logbook reporting, vessel owners/operators enter trip-effort data into the SE
147 Logbook Application computer program in the top portion of the computer form (Figure 4).

148 Catch information is entered similarly on paper and electronic forms. Catch data requires
149 no immediate transcription effort from port agents. For species encountered, vessel
150 owners/operators entered the following information on both forms: species, number kept, an
151 estimated total retained weight in pounds, and two fields reporting a count of live and dead
152 released fish. Within summary data files, trip-effort and catch data are combined into unique
153 species-specific rows (i.e., multiple rows describe a single trip).

154 As summarized above, paper catch records were collected monthly, sent by courier to
155 Beaufort, NC, relayed in bulk to a commercial contractor for key-punch data entry services, and
156 returned in digital and paper form by courier to the SRHS in Beaufort, NC (see Figure 5).
157 Electronic catch records were available to transmit to the SRHS immediately following data
158 entry. When a trip record was closed, data were saved to a personal computer. At the users'
159 discretion, data were transmitted by Secure File Transfer Protocol (SFTP) to a data storage
160 facility. For this study, electronic catch records were transmitted in bulk to the SRHS in
161 Beaufort, NC on a monthly schedule, and arrived in the summary, species-specific row format
162 described above.

163 *Reliability*

164 For the purpose of this report, "reliability" was strictly defined as the successful delivery
165 of self-reported information to the SRHS by both paper and electronic methods. Reliability was
166 assessed on a gross scale by summing the number of individual trips reported. Specifically,
167 reliability was calculated as a percentage, dividing the sum of electronic form reported trips by
168 the sum of paper form reported trips,

169
$$(\# \text{ electronic form reported fishing trips} / \# \text{ paper form reported fishing trips}) * 100,$$

170 where corresponding trips were examined individually to confirm that descriptive data matched
171 (e.g., number of anglers were equal). Summed paper form records were the denominator, as it
172 was assumed vessel owners/operators would appropriately adhere to legal reporting requirements
173 more so than voluntary electronic submissions. Results were generated for each vessel and for
174 all vessels. If data transmissions were reliable by both methods, differences should be explained

175 by negligible instances of random error. Data were also examined for any systematic pattern of
176 error across all vessels to detect software-generated problems.

177 *Accuracy*

178 The accuracy of self-reported fish catches was assessed by examining species recorded in
179 SRHS program dockside bioprofile samples to verify that species were also reported as caught
180 and kept in electronic catch records. Since port agents are not required to sample all fish landed
181 on a trip, comparisons of species abundance were not meaningful. Therefore, the term
182 “accuracy” is restricted here to a comparison between species presence in both sets of records. If
183 accurate, species encountered in a bioprofile sample would also be present in a vessel-reported
184 catch record from the same trip. Accuracy of self-reported fish catches (BIO%) was calculated
185 as the number of species present in electronic form data divided by the number of corresponding
186 species present in the bioprofile sample,

187
$$(\# \text{ electronic reported species} / \# \text{ of corresponding species present in a bioprofile}) * 100.$$

188 Anomalous records were examined for patterns of inaccuracy. Calculations of accuracy were
189 presented as a form of validation since bioprofile samples and vessel-reported catch record data
190 were independent. Species-specific validations were tabulated to examine patterns common
191 across multiple taxa. The published species list for the South Atlantic Fishery Management
192 Council snapper grouper management complex (n = 73 species) was examined to determine a
193 reporting accuracy for the complex, and collectively for species that fall outside of that complex
194 (<http://www.safmc.net/Portals/6/Library/FMP/SnapGroup/SnapperGrouperSpecies.pdf>).

195

196 *Compliance*

197 “Compliance” was strictly defined to represent a validation of electronic logbook
198 reporting. The self-reporting of fishing activity was assessed by examining headboat activity
199 reports (HARs) recorded by port agents. Specifically, records were examined to verify that catch
200 records were received on days when vessels were known to be fishing. Paper form data were not
201 examined because port agents rectify HARs with available paper records before submission to
202 the SRHS; thus, the presence of a paper record was used in creating a HAR. However, as
203 standard practice port agents are additionally directed to report fishing activity detected outside
204 of the paper catch records submitted by vessel owners/operators. For all fishing trips entered on
205 a HAR, electronic form data were searched for matching catch records (e.g., number of anglers
206 were equal) from the same day. Compliance (HAR%) was calculated as a percentage, dividing
207 the sum of electronic form trip records by the sum of HAR estimated trips,

208 $(\# \text{ electronic reported fishing trips} / \# \text{ HAR- estimated fishing trips}) * 100.$

209 Anomalous records were examined for patterns of inaccuracy. Vessel-specific HAR% was
210 plotted against total electronic logbook submissions to examine any relationship between
211 compliance and the volume of records submitted.

212 *Timeliness*

213 Except for complying with the federal statute-required “first week of the following
214 month” schedule, study participants were issued no instructions on how often to transmit
215 electronic data. Therefore, the frequency of electronic logbook reporting provides information
216 on how comprehensively study participants submitted data to NOAA Fisheries. “Timeliness” is
217 defined here as the delay between fishing date and data availability. Catch records data were

218 considered available for scientific use (e.g., proofing, summarization) on the date records were
219 delivered to the SRHS. For comparison, an idealized delay for paper form data was assumed to
220 be no more than 37 days. For electronic form data, delay was calculated by subtracting the
221 fishing date from the date of self-reported, electronic delivery (i.e., delivery over the Internet to
222 SFTP servers), and is reported in units of whole days. The minimum, maximum, mean, and
223 median time delays are reported for individual vessels, and for all vessels combined.

224 *Costs*

225 Costs to initiate this project are discussed in the context of a permanent survey-wide
226 switch to electronic reporting. Annual operating costs of the current paper-based system are
227 presented for the most recent year available (2009). Costs of this pilot project are compared
228 with projected costs for a region-wide implementation of electronic reporting. The cost of
229 additional software development and a data delivery maintenance contract is based upon the
230 costs incurred to fund this project. Projected costs to implement electronic reporting survey-
231 wide in the SRHS are based on estimates provided by the software developer. Headboat port
232 agent paper form handling costs were calculated through interviews with SRHS staff. A
233 fraction of 40 weekly hours for six staff were multiplied by a generalized hourly labor cost
234 provided by SRHS program managers. Anticipated costs for training and teaching tool
235 development are presented, as well as labor and training costs for electronic logbook program
236 administration.

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240 RESULTS

241 This project commenced in summer 2009. Initial software development required
242 approximately three months. During that time, eight headboats from four southeastern U.S
243 Atlantic coastal states (i.e., approximately 10% of the U.S. south Atlantic fleet) were approached
244 and agreed to voluntarily participate in the project. Vessel owners/operators were asked to
245 complete both the mandatory paper logbook and electronic logbook between October 2009 and
246 October 2010. The system of paper form collection and delivery to the SRHS was not altered for
247 this project. Electronic logbook program software was uploaded during October 2009.

248 The fishing activity of seven vessels is presented; three vessels reported data throughout
249 the entire project period. One vessel was sold before seasonal fishing trips began, and the new
250 vessel owners declined participation, and a replacement vessel was added six months into the
251 project period. In a second case, a vessel owner withdrew after many months of non-
252 participation and a replacement vessel was added five months into the project period. In both
253 instances of substitution, the replacement vessels came from the same state. One replacement
254 vessel was sold and exited the fishery four months before the end of the project period; it was not
255 replaced. In a third case, a vessel operator stated his intentions to participate, but following the
256 commencement of seasonal fishing and initial data transmissions (two trips reported), he ceased
257 communications with project staff. The vessel was removed from analysis; a replacement was
258 not available. In a fourth case, a vessel owner suffered an acute computer failure during the
259 height of the fishing season. Unable to acquire a replacement computer, the vessel stopped
260 participating four months before the end of the project.

261 *Pilot testing of electronic logbook reporting*

262 Over 13 months, a total of 4,859 species records were transmitted by vessel
 263 owners/operators from seven headboats. These records describe the fishing activity of 14,900
 264 anglers on 719 trips. Trips are not tallied by vessel to protect confidentiality.

265 *Reliability*

266 Data were delivered reliably to the SRHS, with 95% of all trips accounted for by both
 267 paper and electronic methods (Table 1). Reliability ranged by vessel from 93% to 100%.
 268 Instances of mismatch (n = 30 trips) were examined individually and attributed to random
 269 sources of error (e.g., single trips accidentally omitted). Four of seven vessels reported 100% of
 270 catch records by both methods.

271 *Accuracy*

272 Bioprofile records were examined from 77 trips where electronic catch records were also
 273 submitted by vessel owner/operators. A total of 47 fish species and one family (Trichiuridae:
 274 cutlassfishes) were reported in 486 bioprofile records (i.e., fish identifications and lengths were
 275 recorded by headboat port agents; Tables 3). If species identifications are assumed here to be
 276 error free, than instances where accuracy is < 100% denotes trips where specimens were sampled
 277 by port agents but not accurately reported by vessel owners/operators. Overall, species reporting
 278 by vessel owner/operators was 67% accurate (Table 2). Accuracy ranged by vessel from 62% to
 279 100%. Species-specific accuracy ranged from 0% to 100%. Several species (n = 15) were
 280 sampled only once by port agents and were not present in electronic form reporting. Reporting
 281 was 74% accurate for species listed in the Snapper Grouper Management Complex. Reporting
 282 was 44% accurate for species that are unmanaged or managed separately (e.g., spottail pinfish,
 283 dolphin fish).

284 *Compliance*

285 Comparing trips reported by electronic logbook to available, matching HARs resulted in
286 93% compliance (Table 4). Compliance ranged by vessel from 89% to 100%. For one vessel,
287 the number of trips reported by electronic logbook exactly matched the tally of trips recorded by
288 a port agent. Vessels reporting more individual trips generally exhibited lower compliance rates
289 (Figure 6).

290 *Timeliness*

291 Electronic logbook reporting was timelier than the current paper form reporting system
292 (Table 5). Minimum time delay was zero days for six of seven vessels, meaning it was feasible
293 to transmit data to the SRHS program on the same day fish were caught. The longest delay
294 between data entry and availability was 107 days between fishing date and the receipt of
295 electronic records, which would fall outside reporting compliance statutes. Mean and median
296 time delay were both less than 37 days for all but one vessel. For all vessels, the mean and
297 median time delays were 20 and 9 days, respectively.

298 *Cost*

299 For 2009, the cost of a paper record system was approximately \$81K (Table 6). Funding
300 for this project (\$51K) was allocated for initial software development, field test support for
301 seven vessels, data analysis and report writing. Primary pilot project labor was provided by two
302 contractors, but in-kind costs (e.g., man hours) were incurred by eight SRHS program staff,
303 especially in support of project-specific data. Vessel owners/operators have not informed
304 NOAA Fisheries of costs incurred while providing data to this project, but it is assumed that an

305 unknown amount of in-kind costs were necessary to fill out both paper and electronic catch
306 records.

307 The one-time cost of implementing a region-wide electronic logbook system
308 (approximately 160 boats), on a contract basis, is estimated to be \$96K. Further savings on
309 software improvements may come from recently completed pilot projects that tested electronic
310 reporting (e.g., GOM charter boat survey, run by FWCC. Post-implementation, the annual
311 cost of continuing electronic reporting is estimated to be \$36K, primarily for support of secure
312 server maintenance and technical support. If technical support is adequately funded (e.g., a
313 daily-staffed phone support system, consistent Internet site updates) it is expected that
314 programmatic objectives can be achieved with minimal remote site visits from SRHS staff. Port
315 agent paper form handling costs are calculated as 3,200 annual labor hours x \$20 / hr = \$64K
316 (Table 6). Development of a training manual and supplies (\$3K), and orientation materials for
317 port agents (\$1K), would assist a successful, permanent transition from paper to electronic catch
318 record reporting.

319 *Correspondence with project participants*

320 Following the initiation of electronic data collection, correspondence was sent to the
321 group of project participants on three occasions. A letter was sent on 13 May 2010 to notify
322 participants that data collection was progressing well. A letter was sent on 8 September 2010 to
323 thank participants for their continued input and remind them that the project period would end on
324 31 October 2010. On 1 November 2010, a final letter was sent to thank participants and solicit
325 feedback to improve both the electronic logbook computer program and this pilot project (see
326 Appendices A and B)

327

328 CONCLUSIONS AND RECOMMENDATIONS

329 Electronic reporting was effectively tested for a subset of headboats fishing along the
330 southeastern U.S. Atlantic coast. We recommend a headboat fleet-wide implementation of
331 electronic logbook methods. We further recommend that technical support services be strongly
332 supported during a transition to electronic reporting, and moderately supported into foreseeable
333 out-years.

334 *Electronic logbook performance and SRHS programmatic reporting*

335 Electronic logbook methods were reliable and improved upon on the timeliness of data
336 delivery. As four of seven vessels delivered 100% of trip records in both paper and electronic
337 form, it was concluded that systematic, software-created sources of error were not a concern.
338 When data delivery is timelier, compliance and accuracy may be assessed more often than is
339 currently achieved, and procedures for in-season quota monitoring can be further developed.
340 Regarding the development of annual catch and effort estimates, we believe that the electronic
341 logbook will allow for more timely completion. We conservatively estimate that annual
342 summaries could be completed by the end of March of the following year, a savings of 1-3
343 months.

344 *Intrinsic improvement: quality control, less handling, more secure delivery*

345 Electronic logbook reporting yielded three inherent improvements over paper form
346 reporting. First, unlike paper records, electronic forms were designed with quality control
347 features that reduce simple mistakes. For example, some data entry fields were restricted to a

vetted range of values (e.g., specific combinations of longitude and latitude along the U.S. south Atlantic coastline), or qualified relative to other fields (e.g., *# of Anglers Who Fished* cannot be entered greater than *# Anglers*). Additionally, trip type (e.g., ½ day, full day) is automatically determined within the electronic forms, as calculated with submitted departure time and arrival time. Such controls are not possible with paper form reporting.

Secondly, electronic data transmission achieved delivery to the SRHS with less intermediary steps, reducing opportunities for handling error. Noting that compliance was lowest for the busiest vessels, eliminating a delayed paper form retrieval schedule should reduce opportunities for paper forms to be mishandled between creation and delivery to the SRHS program, and reduce opportunities for recall bias. Electronic transmissions also eliminate handling and verification steps associated with key-punch services. Given that some vessels reported catches on the day fishing occurred, the timely transmission of electronic form data to the SRHS appears most limited by a participant's access to the Internet for transmission.

Finally, reduced intermediary steps make delivery of electronic data more secure. Eliminating three instances where confidential paper form data are shipped by courier reduced security risks. Upon electronic transmission, permanent electronic catch records were stored both on local computer memory and at the remote server site. Vessel owners/operators also had the opportunity to voluntarily back up their entire database to remote servers (Figure 3: "send DB backup"), such that all data could be archived to a remote site at will.

Regarding voluntary participation

Vessel participation in this project was neither mandatory nor rewarded. Indeed, monetary compensation in exchange for participation was judged inappropriate. In five of eight

370 original cases, vessel owners or operators ended cooperation before the end of the 13-month
371 study period. Should electronic reporting be designated the primary method to monitor
372 compliance in the headboat fleet, effective regulatory and enforcement infrastructure should be
373 instituted before mandating a transition from paper reporting.

374 *Internet-based software interface*

375 Throughout this project, electronic catch records were entered into a stand-alone software
376 application. Software updates ($n = 4$) were distributed by coordinating remote downloads with
377 individual vessel owners/operators or by prompting the use of update applications within the
378 software environment. An Internet-based software interface was requested by study participants
379 and is strongly recommended for future consideration, as is the development of mobile software
380 applications. Internet submissions may be remotely and continually monitored. Software
381 applications may be universally updated during scheduled maintenance periods, and public
382 message postings offer an efficient method of communicating with vessel owners/operators.
383 Further, data archiving can be more secure in an Internet-based application, as data are not
384 exclusively stored locally. A computer failure, as experienced by one vessel owner (see
385 Appendix B), would only be an obstacle until replacement equipment is found. Fleet-wide
386 compliance, however, would require the availability of adequate computer resources and widely
387 available Internet access.

388 *Training of vessel owners/operators and data proofing by headboat port agents*

389 The comparison of electronic catch records and bioprofile data was moderately affected
390 by mistaken data entry and missing information, notably trip date mismatches and species
391 identification inconsistencies between vessel owners/operators and port agents. Improvements

392 are recommended to increase the quality of information. Instances where infrequently-caught
393 species were present in bioprofile samples but not included on catch records, as well as lower
394 accuracy rates for species managed outside the Snapper Grouper Management Complex, indicate
395 that vessel owners/operators are not fully aware of their reporting responsibilities and may be
396 ignoring some fish species. The calculation of “accuracy” in this study could be strongly
397 affected by species misidentification. Though it is likely that commonly caught fish species are
398 identified correctly, disagreement on the identity of more rarely-caught species appears
399 problematic (e.g., whitebone porgy records were in agreement for only one of 16 trips where port
400 agents recorded the species, resulting in 6% accuracy for the species). We recommended the
401 coupling of large-scale implementation of an electronic logbook with a restatement of SRHS
402 objectives, enhanced training, and vigorous orientation to new data entry methods. Additionally,
403 the creation of supporting reference materials is recommended (e.g., Internet site, instruction
404 manuals, species ID guides).

405 Though electronic logbook methods are reliable, 7% of trips documented on HARs were
406 unreported, suggesting that underreporting exists and the role of port agents to verify headboat
407 activity is crucial. It is recommended that the expertise of port agents be further utilized to
408 provide a local level of quality control and training. Species identification mistakes would be
409 efficiently addressed at the local level if, for example, known and consistent species omissions
410 and misidentification could be addressed promptly and in person. Headboat port agents could be
411 directed to proof and correct data from local vessels prior to use by the SRHS. Vessel
412 representatives have requested that future electronic reporting software include species pictures
413 and interactive location maps. Port agents are ideal NOAA Fisheries representatives to carry out
414 localized software training.

415 *Law enforcement*

416 In this study, electronic logbook records were transferred directly to a central data
417 depository. An adoption of fleet-wide electronic logbook could greatly enhance monitoring to
418 confirm the status of reporting compliance. The time needed for compliance review could be
419 considerably reduced.

420 *Cost and Benefit*

421 If fleet-wide paper and electronic reporting are not operated concurrently, the most
422 significant cost is the one-time software design and implementation effort. Anticipated costs to
423 institute an electronic logbook (\$96K) compare favorably with 2009 programmatic costs to
424 operate a paper system (\$80K). If electronic logbooks were operated as a contract in follow-on
425 years, annual costs are reduced considerably (estimated \$36K per year) to maintain and update
426 an electronic logbook system. Significant program savings is expected by lessening paper form
427 handling duties for port agents, freeing shipping and printing costs and a significant fraction of
428 3,200 annual labor hours as reclaimed opportunity costs (estimated 25-35% of labor hours). Port
429 agents could reallocate time for evaluating electronic records from individual vessels, biological
430 sampling and additional exercises to validate self-reported data.

431 Intrinsic improvements resulting from electronic logbook use, as described above, should
432 also benefit programmatic quality assurance and quality control efforts. Cost benefits are
433 especially expected as a result of more timely data delivery. Increased speed in the generation of
434 in-season and annual harvest estimates should allow the redirection of labor for data analysts and
435 program managers.

436 The scope of this study is not adequate to fully quantify potential costs or cost savings to
 437 the headboat industry in the southeastern U.S. However, it is clear that an exclusively electronic
 438 logbook program would require that vessel owners/operators maintain capable computer
 439 equipment and reliable Internet access; initial capital investment and Internet provider costs may
 440 be incurred by vessel owners. However, based on feedback (see answers to question two,
 441 Appendix B), an increase in reporting effort would not be experienced as the result of a transition
 442 in logbook form; savings in the form of time and effort are expected. Additionally, collaborative
 443 efforts between the SRHS and vessel owners/operators may continue to yield innovative time
 444 savings into the future.

445 *Technical recommendations for improving the SE Logbook Application computer program*

446 Aside from documented suggestions (Appendix B), comments intended to improve the
 447 form and function of the SE Logbook Application computer program were received informally
 448 throughout the study period. Vessel owners/operators, contracted software designers, port agents
 449 and SRHS staff all contributed ideas. The most-received suggestion was an Internet-based portal
 450 to enter catch records, as discussed above. Vessel owners/operators and port agents also
 451 proposed an expansion in use of visual aids within the electronic logbook application (e.g., maps
 452 of fishing area, species identification aids). Several vessel representatives requested that future
 453 data entry efforts be made more efficient. Specifically, “smart menus” were suggested to track a
 454 user’s past entries and save time on future entries (e.g., given past entries, a list of the most
 455 common species entered for a particular vessel are featured first in drop-down menus). Multiple
 456 SRHS staff requested that the SE Logbook Application exhibit a query function so that effort and
 457 catch could be summarized according to a user’s needs. The addition of fishing depth
 458 information to positional data was suggested by stock assessment scientists and SRHS staff, as

459 was an increase in the precision of positional data, and the addition of a field where a target
460 species are designated by vessel owners/operators.

461

462 ACKNOWLEDGMENTS

463 Funding for this project was provided by a MRIP For-Hire Workgroup grant for \$51,000 to the
464 Sustainable Fisheries Branch, Southeast Fisheries Science Center, NOAA Beaufort Laboratory.
465 K. Fitzpatrick, J. Hackney and T. Kolkmeyer coordinated many communications with remotely
466 located port agents, responded to data requests and provided SRHS documentation. The
467 dedicated work of SRHS headboat port agents greatly assisted this project, in particular, E.
468 Corpeno, P. Kirwin, E. O'Neal-Morie, and A. Poholek. C. Petersen and A. Petersen provided
469 technical support and consultations in regards to the Southeast Logbook Application computer
470 program.

471

472 TABLES AND FIGURES

473 Table 1. Summary statistics describing the reliability of data voluntarily transmitted by
 474 participants in a pilot electronic logbook project. "Reliability" is presented as a percentage,
 475 dividing the sum of electronic reported fishing trips by the sum of matching paper reported
 476 fishing trips. Reliability is reported for seven (7) individual headboat vessels, and for all vessels
 477 combined.

Vessel	Reliability (%)
A	100
B	94
C	100
D	100
E	93
F	97
G	100
All	95

478

479

480 Table 2. Summary statistics describing the accuracy of data voluntarily transmitted by
 481 participants in a pilot electronic logbook project. "Accuracy" (Bio%) is presented as a
 482 percentage, dividing the numbers of species present in electronic data by the numbers of
 483 matching specimens present in bioprofile samples. Accuracy is reported for seven (7) individual
 484 headboat vessels, and for all vessels combined.

Vessel	Bio%
A	100
B	63
C	77
D	67
E	62
F	64
G	70
All	67

485

486

"Final Report", page 25

487 Table 3. Species present in corresponding bioprofile and electronic logbook catch records. These data were used to calculate the
 488 accuracy of self-reported electronic catch records. Records were aggregated here for all vessels. Instances where Accuracy is < 100%
 489 denotes trips where specimens were sampled by headboat port agents but not reported by vessel owners/operators.

Common Name	Genus	species	Trips spp. present in both		Total	Accuracy
			bioprofiles and catch records	but not in catch records		
Red Porgy	Pagrus	pagrus	12	2	14	86
Whitebone Porgy	Calamus	leucosteus	1	15	16	6
Knobbed Porgy	Calamus	nodosus	1	2	3	33
Spot tail Pinfish	Diplodus	holbrooki	17	11	28	61
Jolthead Porgy	Calamus	bajonado	1	4	5	20
Littlehead Porgy	Calamus	providens	0	1	1	0
Scup	Stenotomus	chrysops	4	9	13	31
Vermilion Snapper	Rhomboplites	aurorubens	27	6	33	82
Red Snapper	Lutjanus	campechanus	6	0	6	100
Silk Snapper	Lutjanus	vivianus	1	0	1	100
Yellowtail Snapper	Ocyurus	chrysurus	8	2	10	80
Lane Snapper	Lutjanus	synagris	8	3	11	73
Gray Snapper	Lutjanus	griseus	20	0	20	100
Mutton Snapper	Lutjanus	analis	15	0	15	100
Red Grouper	Epinephelus	morio	6	1	7	86
Warsaw Grouper	Epinephelus	nigritus	2	0	2	100
Rock Hind	Epinephelus	adscensionis	0	1	1	0
Gag	Mycteroperca	microlepis	33	2	35	94
Scamp	Mycteroperca	phenax	2	1	3	67
Yellowmouth Grouper	Mycteroperca	interstitialis	0	1	1	0
Black Sea Bass	Centropristis	striatus	60	8	68	88
Bank Sea Bass	Centropristis	ocyrus	1	11	12	8
Sand Perch	Diplectrum	formosum	0	1	1	0
490 White Grunt	Haemulon	plumieri	17	8	25	68

"Final Report", page 26

491 Table 3 – continued. Species present in corresponding bioprofile and electronic logbook catch records. These data were used to
 492 calculate the accuracy of self-reported electronic catch records. Records were aggregated for all vessels. Instances where Accuracy is
 493 < 100% denotes trips where specimens were sampled by headboat port agents but not reported by vessel owners/operators.

Common Name	Genus	species	Trips spp. present in both		Total	Accuracy
			bioprofiles and catch records	but not in catch records		
Tomtate	Haemulon	aurolineatum	9	7	16	56
Cobia	Rachycentron	canadum	6	1	7	86
Spanish Mackerel	Scomberomorus	maculatus	1	0	1	100
Greater Amberjack	Seriola	dummerili	7	1	8	88
Lesser Amberjack	Seriola	fasciata	0	1	1	0
Almaco Jack	Seriola	rioliana	1	1	2	50
King Mackerel	Scomberomorus	cavalla	6	2	8	75
Ocean Triggerfish	Canthidermis	sufflamen	0	1	1	0
Gray Triggerfish	Balistes	capriscus	43	10	53	81
Bluefish	Pomatomus	saltatrix	0	1	1	0
Queen Triggerfish	Balistes	vetula	0	1	1	0
Pinfish	Lagodon	rhomboides	0	3	3	0
Graysby	Epinephelus	cruentatus	2	0	2	100
Coney	Cephalopholis	fulva	0	1	1	0
Bigeye	Priacanthus	arenatus	0	2	2	0
Little Tunny	Euthynnus	alletteratus	2	6	8	25
Dolphin	Coryphaena	hippurus	5	7	12	42
Great Barracuda	Sphyraena	barracuda	2	3	5	40
Banded Rudderfish	Seriola	zonata	1	3	4	25
Carolina Hake	Urophycis	earli	0	1	1	0
Cutlassfish, Unidentified	Trichiuridae		0	1	1	0
Sharpnose Shark	Rhizoprionodon	terraenovae	1	7	8	13
Southern Flounder	Paralichthys	lethostigma	0	3	3	0
Gulf Flounder	Paralichthys	albigutta	0	1	1	0

495 Table 4. Summary statistics describing the compliance rate exhibited by participants in a
 496 voluntary, pilot electronic logbook project. "Compliance" (HAR%) is presented as a percentage,
 497 dividing the sum of electronic trip records by the sum of HAR-estimated trips. Compliance is
 498 reported for seven (7) individual headboat vessels, and for all vessels combined.

499

Vessel	HAR%
A	96
B	92
C	94
D	100
E	92
F	98
G	89
All	93

500

501

502

503 Table 5: Summary statistics describing the timeliness of data voluntarily transmitted by
 504 participants in a pilot electronic logbook project. Delay was calculated by subtracting fishing
 505 trip date from the date of self-reported, electronic delivery (i.e., delivery over the Internet to
 506 secure FTP servers), and is reported in units of whole days. The minimum, maximum, mean,
 507 and median time delays are reported for seven (7) individual headboat vessels, and for all vessels
 508 combined.

Vessel	Min	Max	Mean	Median
A	0	32	7	5
B	0	41	7	5
C	0	13	1	0
D	2	37	17	16
E	0	107	59	64
F	0	31	10	9
G	0	70	25	22
All	0	107	19	9

509

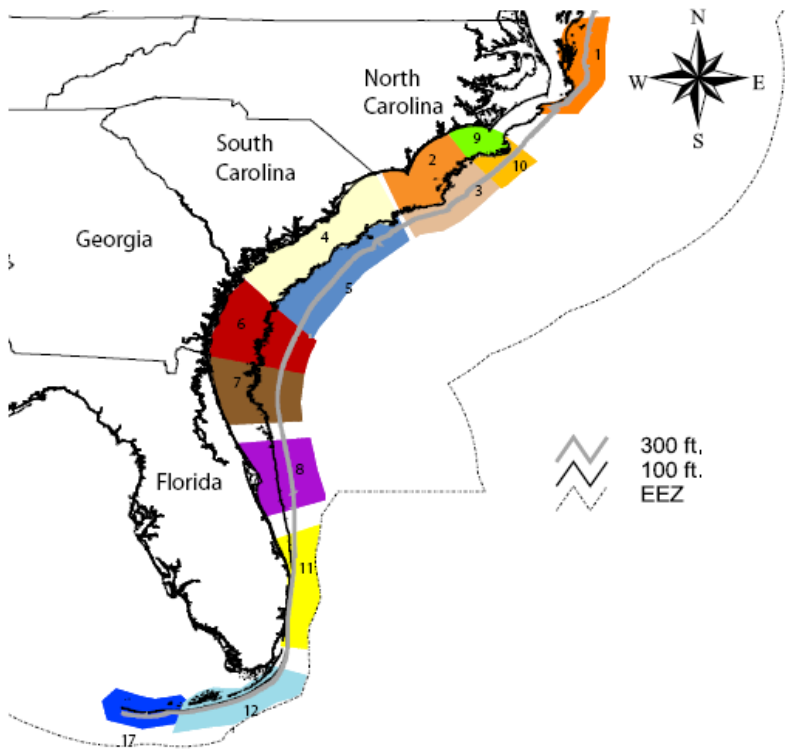
"Final Report", page 28

510 Table 6: Itemized costs of paper logbook submissions to the SRHS. Data are from 2009.

Item	Cost
Port agent paper form handling costs	\$64,000
Contracted paper form data entry	\$14,000
Paper form printing	\$1,000
Port agent-related shipping	\$1,500
Data entry-related shipping	\$500
	\$81,000

511

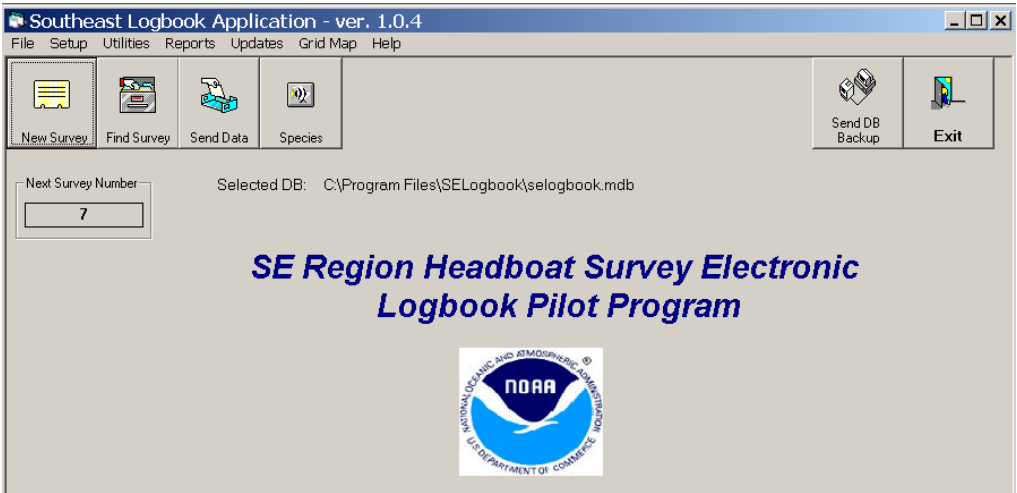
512



513

514 Figure 1: Study area used in the Southeast Region Headboat Survey. Colored boxes display
515 standard statistical reporting areas based on the coastline and boundaries of four southeastern
516 U.S. Atlantic coastal states. Two ocean depth contours are illustrated (100-ft, 300-ft), as well as
517 the boundary of the U.S. exclusive economic zone.

518



525
526 Figure 3: Appearance of the initial entry screen within the electronic Southeast Logbook Application computer program (version
527 1.0.4).

Trip-effort Information

Southeast Logbook Application - ver. 1.0.4 - [SE Logbook Survey Form]

Survey Number: 1 Vessel: Test Vessel - 123456 Captain: TEST, CAPTAIN Depart Date: 4 / 5 / 2010

Depart Time: 8 : 00:00 AM Arrive Date: 4 / 5 / 2010 Arrive Time: 4 : 00:00 PM Lat/Long Deg: 3279 Long Minutes: D (20 - 29) Lat Minutes: 3 (30 - 39)

Anglers: 22 # Anglers Who Fished: 20 Distance From Shore: Greater Than 3 Miles Pay Type: Per Person

Catch Information

Catch Info

Species Code: Species Description: Number Kept: Total Weight: Released Alive: Released Dead:

Total # of Fish: 13

Spec Code	Species Description	Number Kept	Total Weight	Released Alive	Released Dead
077	GRAY TRIGGERFISH	10	20	2	0
074	KING MACKEREL	3	30	0	0
230	ATLANTIC SHARPNOSE	0	15	5	0

528

529 Figure 4: Appearance of the data entry screen within the electronic Southeast Logbook Application computer program (version 1.0.4).
530 After the application is used once, yellow shaded boxes are automatically populated. Trip information is entered once at the start of a
531 particular data entry session. Catch information is entered in row format for each species caught on a trip.

532

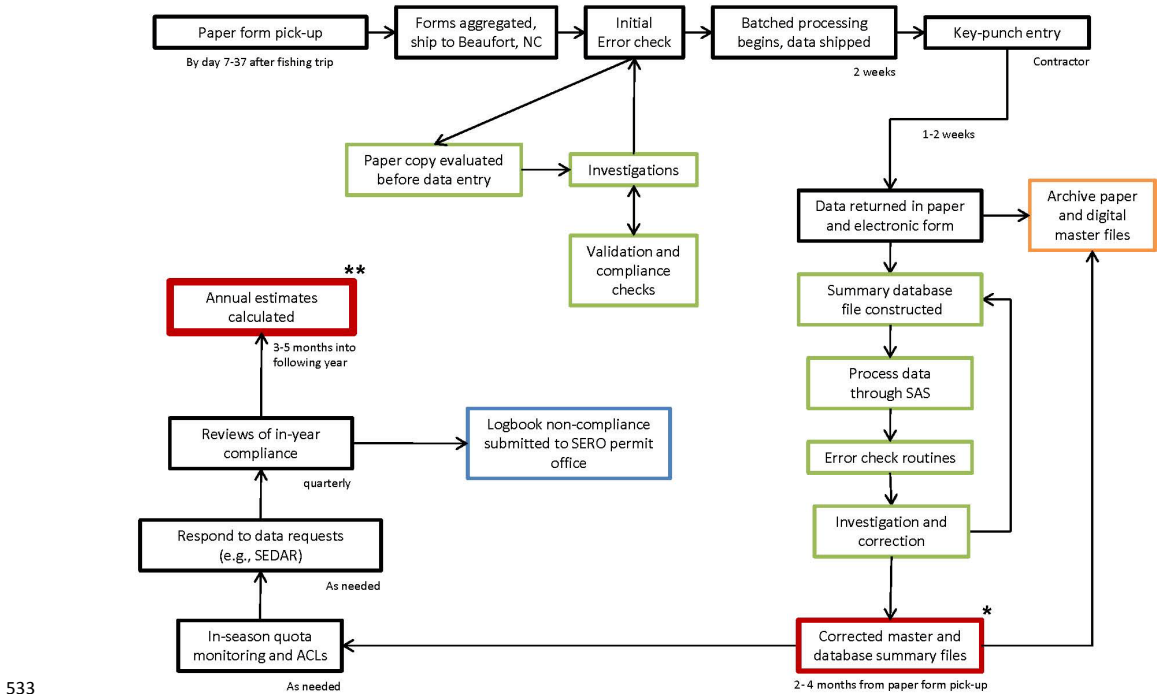
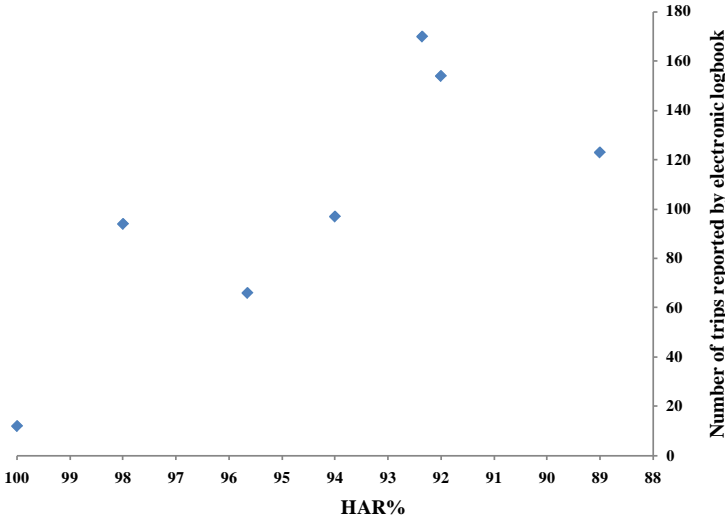


Figure 5. SRHS data flowchart for paper logbook data. The figure displays a conceptual flow of information from creation (paper form pick-up of an individual catch record by a headboat port agent) to in-season availability (*), to annual summary file availability (**). Steps are based on 2010 SRHS program procedures.

537



538

539 Figure 6: Scatter plot of compliance and number of trips reported by electronic logbook. Each data point represents a vessel.
540 Compliance (HAR%) is calculated as, (# electronic reported fishing days / # HAR estimated fishing days) * 100.

541 Appendix A. Letter mailed to participating vessel owner/operators on 3 November 2010.
 542 Following the close of data collection on 31 October 2010, positive and negative criticisms were
 543 solicited regarding the electronic logbook computer application implemented during this pilot
 544 project.

545

546 Pilot Study: Implementation of Electronic Logbooks on Headboats

547 Operating in the U.S. South Atlantic

548 01 November 2010

549

550 Dear pilot study participants:

551 Once your trips through October 31, 2010 are entered and sent electronically, headboat reporting
 552 can return to paper forms only. Thank you. We are grateful for the time and effort you all have
 553 put into this project.

554 Additionally, please find a questionnaire and stamped envelope included with this letter. We are
 555 seeking positive and negative criticism to improve both the electronic logbook computer
 556 program and this pilot study. **We hope you'll take a few moments to let us know what you**
 557 **think.** As with all data, feedback from participants is valuable and is considered confidential.
 558 Comments will be summarized and included in final reporting to NOAA leadership.

559 Again, all participants will receive a copy of final reports. Thank you very much for your work,
 560 and please contact us with any questions. [edit: contact information was provided]

561

562

563 Please provide us with your honest feedback and return your answers to Ken Brennan.

564 **Have you noticed any software "bugs" we should know about?**

565 **Please list three (3) features of the electronic SE Logbook Application you find positive /**
 566 **helpful in fulfilling federal reporting requirements:**

567 **Please list three (3) features of the electronic SE Logbook Application you find negative /**
 568 **annoying in fulfilling federal reporting requirements:**

569 **If the headboat fleet made a transition to electronic reporting ONLY, what aspect(s) of**
 570 **electronic reporting do you predict new users would find confusing?**

571 **Other suggestions or comments?**

572 Appendix B. Voluntary, anonymous feedback received from participating vessel owner/operators
 573 within this pilot study. A letter was mailed to participating vessel owner/operators on 3
 574 November 2010. Replies received to date are listed in the order received (n=7).

575

576 **Have you noticed any software “bugs” we should know about?**

577 “It was either the pay type or the distance from shore that slowed me down a little.
 578 Most of the application you could breeze through with the tab button and type a letter
 579 or two and it would come up.”

580 “Would be nice to be able to report more specific locations in the [comment redacted
 581 for confidentiality].”

582 “No.”

583 “No, system works well.”

584 [Blank]

585 “The software was easy to use. Do not notice any bugs. When we needed updates
 586 there was plenty of support.”

587 “It does not transmit the information.”

588

589

590 **Please list three (3) features of the electronic SE Logbook Application you find**
 591 **positive / helpful in fulfilling federal reporting requirements:**

592 “Fast once you got educated and figured it out! I even enjoyed using it!”

593 “Quick. Easy. Logical.”

594 “Easy entry. Quick to update if you make an effort. Good [unreadable] report.”

595 “Simple. Efficient. User friendly.”

596 [Blank]

597 “At the dock it is easy to use and what we really liked was the reports that we could
 598 generate.”

599 “It is faster than hand writing. Easy to keep up with.”

600

601

602

603 **Please list three (3) features of the electronic SE Logbook Application you find**
 604 **negative / annoying in fulfilling federal reporting requirements:**

605 Just the learning curve at the beginning which really wasn't bad at all. The help from
 606 Claude was great!"

607 "None, really."

608 "None."

609 "Double reporting – electronic and then paper. Computer crashed and lost all data –
 610 need backup system? So, if I hadn't kept records in my log, I would have no idea of
 611 data for 2010 season."

612 [Blank]

613 "Nothing too negative."

614 "Fish codes. Need a clickable map. Should prefill #'s."

615

616

617 **If the headboat fleet made a transition to electronic reporting ONLY, what aspect(s)**
 618 **of electronic reporting do you predict new users would find confusing?**

619 "As I said before, a small learning curve that would be worth the investment to me to
 620 get faster and better data."

621 "Nothing, easy system!"

622 "None."

623 "Initial start-up, I believe it would take someone like Claude to set-up the system for
 624 each headboat operator. Once system is running then it's straight forward."

625 [Blank]

626 "Easy to use. The only thing that may hinder reporting is if it has to be done off shore
 627 there may not be connections (however I guess info could be entered then sent once
 628 the boat returns to the dock). Commercial fishermen may find it more difficult
 629 because of the salt air damage that may occur to computers. Headboats generally
 630 have dryer conditions in the captain's quarters."

631 "Most fishermen have a hard time with computers."

632

633

634

635 **Other suggestions or comments?**

636 “This program could be integrated easily into the private recreational sector too,
637 which would close a huge gap in the data collection needed to gain a better
638 understanding of our resources!”

639 “None.”

640 “If we could provide data on releases that differentiated between keepers and
641 ‘shorts’?”

642 “I would suggest expanding the program from the headboat fleet to the entire for hire
643 sector.”

644 [Blank]

645 [Blank]

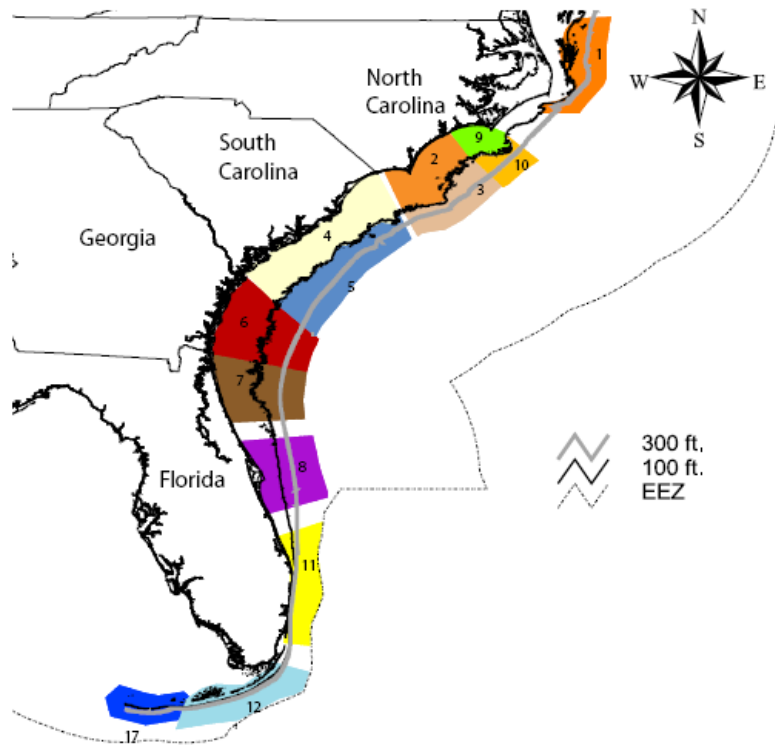
646 [Blank]

647

Project Plan

U.S. South Atlantic. Another benefit of this project is that it will lead to an improvement in the monitoring of logbook submission to confirm eligibility for permit renewal.

Figure 1. Reporting areas used in the Southeast Region Headboat Survey.



1.2 Scope

The project will commence in May 2009 with the contracting of a suitable software developer for the electronic (web-based) logbook. This software development is expected to take approximately three months. During this time eight headboats will be selected for voluntary participation in the pilot project. Two boats each from North Carolina, South Carolina, Georgia, and the east coast of Florida will be solicited for the project. This is equivalent to 10% of the east coast fleet and assures a good geographic coverage to the study. Participating vessel personnel will complete both the mandatory paper logbook as well as the electronic logbook for comparison purposes.

Upon development of the software, the electronic logbook will be implemented in the field and deployed for a period of one year (August 2009-July 2010). Final analyses will include comparison of results from the paper and electronic reporting systems to determine