



**US Army Corps
of Engineers®**

Charleston District

**ATLANTIC INTRACOASTAL WATERWAY
in SOUTH CAROLINA**

**APPENDIX A: PRIOR STUDIES, REPORTS,
and EXISTING WATER PROJECTS**

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Prior Studies, Reports and Existing Water Projects

1. Two reports prepared by the Corps of Engineers in November 1940 and January 1948 give a detailed description of the AIWW complete with pictures. These reports give a general history of how the AIWW evolved from isolated local efforts to the present day waterway. The reports mention local tourist attractions and interconnecting waterways encountered along the AIWW from Boston, Massachusetts to Florida Bay, located 63 miles south of Miami, Florida. These reports primarily address the history of the AIWW and its recreational benefits, and to a lesser extent the commercial tonnage and commodities carried.

2. In November 1947, Charleston District prepared a preliminary review report for construction of a boat basin on the AIWW in the vicinity of Ocean Drive Beach, SC (now part of North Myrtle Beach, SC). Local interests desired a small boat basin on the east side of the AIWW for recreational craft and as a terminal for handling freight and loading pulpwood. Due to similar developments in the area by other local interests, the report concluded there was no Federal interest at that time in building a small craft boat basin.

3. In April 1976, an Environmental Statement for maintenance dredging of the AIWW was completed by Charleston District. This Environmental Statement describes the waterway, placement area easements, environmental settings through which the project passes, environmental impacts caused by the project, and alternatives to reduce some of the environmental impacts. Identified adverse environmental impacts associated with maintenance dredging of the AIWW consisted of temporary increases in turbidity and siltation, temporary decreases in primary production due to increased turbidity, possible reduction in dissolved oxygen levels as a result of dredged materials undergoing anaerobic decomposition, possible displacement of wildlife species, alteration of existing vegetation in placement areas, destruction of some benthic organisms, and increases in local mosquito populations. Alternatives to the current method of operation consisted of conveying dredged material to offshore placement areas, alternate upland placement sites, use of dredged material in a marsh-building program, and no action. No actions have been taken to date on any of the identified alternatives.

4. A report prepared by Charleston District titled "Comprehensive Study of Maintenance Problems of The Atlantic Intracoastal Waterway Phase I Report" was completed in June 1976. The report discusses project maintenance history and analyzes placement area availability and use, vessel traffic, and problems associated with dredging and placement of the dredged material. The report summarizes possible solutions and recommends further studies.

5. In 1978, The Citadel, under contract to Charleston District, investigated mosquito-breeding issues in AIWW placement areas and prepared a report titled "Investigation of Comparative Mosquito Breeding in Dredged Material Disposal Sites Used in the Maintenance Dredging of the Atlantic Intra-coastal Waterway in South Carolina". During the course of this investigation, mosquito and soil samples were collected and analyzed. Aerial and ground inspection of each placement area was also conducted, and each site was inventoried. During the course of the study it was noted that communication channels with county mosquito abatement agencies needed improving as there were differing ideas concerning definition of responsibilities regarding the placement areas. Suggestions were also made as to how the placement areas could be finish graded and ditched for dewatering purposes, which would also aid in the reduction of potential mosquito breeding.

6. South Carolina Wildlife and Marine Department (SCWMD) prepared a report in February 1979 under contract to Charleston District titled "Atlantic Intracoastal Waterway

Environmental Studies at Sewee Bay and North Edisto River". Under the contract, SCWMD evaluated environmental impacts at two sites where maintenance material removed from the AIWW was disposed in open water. The two shoal areas under investigation were situated a considerable distance from suitable diked placement areas. The placement area in Sewee Bay was an intertidal mud flat adjacent to the AIWW but separated from it by several small barrier islands. This area has infrequently received dredged material in the past, with the last operation prior to this contract occurring in 1964. The placement area for material removed from Dawho River was a deep-water site near the head of North Edisto River. The analysis of these two placement sites showed that, depending upon the timing and frequency of disturbance, placement of dredged material in the estuarine environment could be managed in such manner as to minimize adverse effects.

7. A report prepared by Charleston District titled "An Initial Investigation of the Archaeological and Historic Resources Which Would be Affected by the Continued Operation and Maintenance of the Atlantic Intracoastal Waterway, Little River to Port Royal Sound, South Carolina" was completed in May 1980 by Soil Systems, Inc from Marietta, GA under contract number DACW60-78-C-0025 to Charleston District. This report investigated and inventoried potential archaeological and historical sites along the AIWW in South Carolina and identified those that may be threatened by continued bank erosion. The report classified sites into two priorities (pg 146) based on perceived National Register eligibility of the site and threat from impact due to O&M activities. Priority One required immediate survey or mitigation while Priority Two recommended further research. To date, no additional action has been taken on any of the report's recommendations.

8. A report prepared by Charleston District titled "A Comprehensive Study of Maintenance Problems of The Atlantic Intracoastal Waterway in Horry County" was completed in October 1980. This study examined past dredging requirements and evaluated the need for placement areas in Horry County. It determined that nearly 66 percent of the land then in easement in Horry County could be considered excess to project needs and proposed a relinquishment program. In August 1981, the South Carolina Coastal Council (now South Carolina Department of Health and Environmental Control, Office of Ocean and Coastal Resource Management), the state agency which acts on behalf of the State of South Carolina on matters related to the AIWW, signed an agreement with Horry County which would allow Horry County to act as co-sponsor for that portion of the AIWW lying within Horry County. The county was unsuccessful in implementing the 50-year placement plan due to the amount of real estate needed and, in December 1983, a tri-party agreement was signed between the Department of the Army, Horry County, and the South Carolina Coastal Council that further reduced the placement area acreage. This plan, called the ten-year plan, provides for small permanent placement areas, which will be emptied by Horry County as they are filled. When fully implemented, only about 600 acres of the original 5,754 acres of placement area easement in Horry County will be retained.

9. A report prepared by Charleston District titled "An Interim Final Report for the Comprehensive Study of Maintenance Problems of the Atlantic Intracoastal Waterway from Winyah Bay to Port Royal Sound" was completed in May 1983. This study analyzed the available placement areas along the AIWW from Winyah Bay, located near Georgetown, South Carolina, to Beaufort, South Carolina to determine if the existing areas were sufficient to accommodate dredged material over the next 50 years. The study examined alternative methods of disposal to determine if there were some more economical means of maintaining the AIWW. The study found that placement areas in the southern segment between Charleston, South Carolina and Beaufort were sufficient for the next 50 years. For the heavily

shoaled central segment between Winyah Bay and Charleston, the study showed that adequate placement areas existed only by pumping greater distances, which would increase maintenance costs. Alternative disposal methods evaluated for the central segment proved to be more costly than current operations.

10. An information bulletin on the Charleston District portion of the Atlantic Intracoastal Waterway, Norfolk, Va., to St. Johns River, Fla. was published in October 1983 under authority of PL 85-480. This bulletin described the AIWW and its present controlling depths. It also described available facilities along the AIWW, locations of bridges, cables, and overhead wires by mile marker, and dangerous current conditions at four of the bridge crossings.

11. A Preliminary Design Report titled Soil Bioengineering/Biotechnical Means of Correction Bank Erosion Along the Atlantic Intracoastal Waterway, in the Briarwood Subdivision, North Myrtle Beach South Carolina dated March 16, 1984 was prepared by Soil Bioengineering Corporation, Marietta, Georgia under contract to Charleston District to evaluate and recommend various bioengineering alternatives to address corrective measures to the bank erosion occurring at Briarwood Subdivision. The subdivision fronts the AIWW in the Myrtle Beach land cut where bank erosion was impacting lawns of private property owners. The report recommended several bioengineering alternatives to arresting the erosion occurring in this area.

12. A letter report dated 22 June 1984 was prepared by Charleston District titled Construction of Erosion Control Project, Vicinity of Briarwood Subdivision, Atlantic Intracoastal Waterway, North Myrtle Beach, South Carolina. This report describes the bank erosion occurring in the vicinity of Briarwood Subdivision and recommends a bioengineered project to arrest bank erosion along a 2,125 foot reach of the AIWW. This investigation and report was prepared as result of Congressional inquiry on behalf of the property owners.

13. The prehistoric Minim Island shell midden site located on the AIWW in Georgetown County, South Carolina was investigated in 1983 following its placement on the National Register of Historic Places in 1982. The investigation and report, dated 1989, were conducted for Charleston District by Brockington and Associates of Atlanta, GA under contract number DACW60-87-C-0005 for Charleston District. At the time of placement on the register, the site had undergone severe erosional attrition due primarily to dredging of the AIWW through the island in the late 1920s. Site excavations and radiocarbon dating places occupation of the site from 1,000 B.C. to A.D. 200. The major midden accretion at Minim Island consists of densely packed oyster shells, food remains from aquatic and terrestrial environments, and ceramics of the Deptford and Deep Creek series. Very few lithic tools appear to have been discarded at the midden site. Dietary patterns from this Early Woodland site have provided interesting information concerning food procurement behavior within the North Santee River estuary. The report recommended protection of the shell midden by means of placing riprap or an anchored fabric "floor" accompanied by shallower grading of the AIWW channel. Details of the site investigation are contained in the 1984 report titled "Shell in Motion: An Archaeological Study of the Minim Island National Register Site, Georgetown County, South Carolina". To date, no action has been taken to protect the site.

14. In June 1986, Charleston District prepared a report titled "An Operation and Maintenance Special Report on Erosion Control" following a request for assistance from the City of Myrtle Beach, South Carolina. Bank erosion was occurring along the land cut in the vicinity of the Myrtle Beach sewage treatment lagoon. This report recommended placing 1200 feet of granite riprap over 9 inches of bedding material and filter fabric placed on backfilled materials. As a result of the Federal Court of Appeals ruling in Ballam vs. United States, which stated the

Federal Government does have the responsibility to protect the plaintiff's private property, this report was revised in July 1987 as a Section 14 Emergency Streambank Erosion project. The revised design recommended placement of 1200 feet of rubble-filled gabions and erosion control matting on compacted backfill. The project was not constructed because the City of Myrtle Beach constructed their own project.

15. In January 1988, Georgetown County Council requested assistance in evaluating bank erosion at Laurel Hill Bluff. Laurel Hill Bluff is located on the east bank of the Waccamaw River (AIWW) just north of marker #63 on lands owned and maintained by Brookgreen Gardens. Laurel Hill Bluff is the site of the ruins of a historic plantation and is listed on the National Register of Historic Places. The Section 14 report prepared by Charleston District dated July 1989 states that the foundation of the plantation house and other associated structures were significantly removed from the riverbank such that loss of the former building sites to erosion was not an immediate threat.

16. US Geological Survey (USGS) prepared a report in 1988 titled "Freshwater Supply Potential of the Atlantic Intracoastal Waterway Near Myrtle Beach, South Carolina". The demand for water supply in Horry and Georgetown Counties is steadily increasing with population growth and development. Water supply is currently obtained in this area from a system of wells, some of which have lowered the ground-water table to 150 feet below sea level. The City of Myrtle Beach proposed locating a 30 MGD (45 cfs) water treatment plant and intake in the vicinity of AIWW mile marker 363.3. USGS used an unsteady flow model to simulate daily discharge in the AIWW from October 1981 to September 1986 to assess the likelihood of saltwater intrusion into the vicinity of the proposed intake. Under the worse case scenario, USGS determined that the AIWW has a water supply potential of 139 cfs and that the freshwater/saltwater interface would migrate to mile marker 358.2, which is 5.1 miles downstream (i.e. northward toward Little River) of the proposed withdrawal point. This report assumes that freshwater supply potential from tributary streams and the AIWW will continue to respond as they have during the period 1954 - 1986.

17. South Carolina Department of Health and Environmental Control (SCDHEC) prepared a report titled "Watershed Water Quality Management Strategy Savannah - Salkehatchie Watershed" in 1993 (Technical Report No. 002-93), addressing water quality within the basin. The AIWW passes through this basin via the Beaufort River, Brickyard Creek, Coosaw River, and St. Helena Sound. Water quality in these streams has become degraded due to point source and non-point source discharges. Numerous excursions have been recorded by SCDHEC on these streams for dissolved oxygen and elevated nutrient levels. Shellfish harvesting in Beaufort River and adjacent wetlands (8,150 acres) is prohibited and is included on EPA's Section 304(l) long list of water bodies impacted by non-point source nontoxic pollution. St. Helena Sound is listed in the EPA's National Estuarine Inventory of polluted water bodies. All waters of Brickyard Creek (1,612 acres) are prohibited to shellfish harvesting due to adjacent point source pollutants and effluents from the US Marine Corps Air Station and Marsh Harbor Wastewater Treatment Plants.

18. In April 1994, a Section 107 Reconnaissance report was completed by Charleston District for the City of Beaufort and Beaufort County. The city requested evaluation of realigning the AIWW at S.C. Highway 21 (Woods Memorial Bridge) as the city and county was evaluating options for decreasing downtown vehicular congestion caused by bridge openings. The report shows that the channel relocation could remain in the natural deep water of the Beaufort River at minimal cost to the Federal Government and recommended further study and coordination with SC Department of Transportation during preliminary design of the bridge. To date, SC

Department of Transportation has not initiated preparation of plans for replacement of the bridge.

19. A Project Modification Report (PMR) was prepared by Charleston District under authority of Section 1135 for Murphy Island in February 1995. Murphy Island is adjacent to the AIWW in Charleston County and is part of the Santee Coastal Reserve, a wildlife preserve owned and operated by the South Carolina Department of Natural Resources (SCDNR). Since the AIWW was completed in 1940, the salt marsh buffer between the navigational channel and the impoundment dikes on Murphy Island has disappeared. Loss of the marsh buffer has allowed spring high tides, storm surge, and boat wakes to attack and erode the impoundment dikes. The recommended plan consists of constructing 5,400 feet of setback dikes, raising portions of the existing dike, and installing seven additional water control structures to restore water level management. Project construction was completed in June 1997.

20. An Initial Appraisal and Scope of Work of the AIWW dated June 1995 was prepared by Charleston District under Section 216 authority. This report identified problems/ issues to be addressed during a reconnaissance study. Problems/issues identified were maintenance dredging and placement area needs, encroachment into placement area easements, bank erosion, bridge clearances/approaches, and environmental degradation. The report recommended further evaluation by means of a comprehensive matrix analysis during a reconnaissance study.

21. An economic analysis titled "The Importance of Inland and Intracoastal Waterways to State Economies" dated August 7, 1995 was prepared by Mercer Management Consulting for the American Waterways Operators. This report reviewed the importance of waterway transportation on local economies. The report evaluated the importance of various commodity groups to the nation as a whole and individually by state.

22. A Preliminary Restoration Plan (PRP), dated 6 October 1995, was prepared by Charleston District for Old Dominion Plantation under authority of Section 1135. Old Dominion Plantation is located on Edisto Island adjacent to the AIWW in Charleston County. The PRP recommends construction of 2,000 linear feet of riprap along the most heavily eroded areas of the impoundment dike fronting the AIWW, which lies within the AIWW easement. Preparation of plans and specifications for this project was terminated in 1998 due to lack of obtaining a signed PCA from the sponsor.

23. A Preliminary Restoration Plan (PRP), dated 17 July 1996, was prepared by Charleston District for Hamlin Creek Extension under authority of Section 1135. Hamlin Creek Extension is located off Hamlin Creek and adjacent to the AIWW behind the Isle of Palms in Charleston County. Prior to 1931, Hamlin Creek Extension, then referred to as Meeting Reach, was part of the AIWW. Enlargement and relocation of portions of the AIWW in 1940 left Hamlin Creek Extension as an abandoned channel. Over time, this channel has shoaled in and has become stagnant. The PRP recommended reopening Hamlin Creek Extension to the AIWW by means of constructing a shallow channel to allow for tidal flushing, improved water quality, and establishment of oyster beds. During review of the Environmental Assessment (EA), numerous objections to the project were voiced by the resource agencies. Therefore, the project was terminated.

24. The South Carolina Department of Health and Environmental Control (SCDHEC) prepared a report titled "Watershed Water Quality Management Strategy Catawba - Santee Basin" in 1996 (Technical Report No. 002-96), addressing water quality within the basin. This

basin encompasses Charleston County, through which the AIWW passes. Restricted shellfish harvesting within the watershed include all waters of the AIWW northeast of Charleston Harbor, Conch Creek, Hamlin Creek, the waters of Alligator Creek (from its confluence with the AIWW to its confluence with Ramhorn Creek), the waters of Ramhorn Creek, and the waters of Casino Creek, Skrine Creek, and Dupree Creek, extending 1,000 feet from its confluence with the AIWW. The primary factor affecting these streams is the introduction of fresh water with sustained, elevated fecal coliform levels as a result of the Corps' Cooper River Rediversion project. Shellfish harvesting in Jeremy Creek is prohibited due to wastewater treatment discharges and the numerous commercial docking facilities at McClellanville, South Carolina. Recreational use of Elliot Cut, located along the AIWW south of Charleston Harbor, is impaired due to elevated fecal coliform bacteria concentrations from non-point sources. Additionally, Wappoo Creek, through which the AIWW passes, has a declining trend in dissolved oxygen concentrations due to unknown sources.

25. The South Carolina Department of Health and Environmental Control (SCDHEC) prepared a draft report in 1996 titled "Watershed Water Quality Management Strategy Pee Dee Basin", addressing water quality within the basin. This basin encompasses Horry and Georgetown Counties, through which the AIWW passes. Restricted shellfish harvesting include all waters of Dunn Sound and all waters of Little River Inlet south and east of the southeastern point of Little River Neck (Tighlman Point). Prohibited shellfish harvesting includes all waters of the AIWW, Little River, Calabash Creek, Milliken Cove, and Little River Inlet north of the southeastern point of Little River Neck (Tighlman Point). Storm water runoff is a substantial problem in this portion of the watershed due to the dense development in the Myrtle Beach area. Large portions of the Little River Neck and residences along the AIWW are serviced by individual sewage treatment and disposal systems (ISTDS). Little River, the AIWW, and other areas in Horry and Georgetown Counties, are included on EPA's high priority list of the Non-point Source Management Program. Concerns for dissolved oxygen, fecal coliform, and pH place the AIWW on the Section 319 list and the Section 303(d) primary list. Little River is included on the Section 319 list and Section 303(d) secondary list due to concerns for pH and fecal coliform.

26. A Preliminary Restoration Plan (PRP), prepared by Charleston District dated 6 December 1996, was prepared for Miller Corner Placement Area and adjacent Tom Yawkey Wildlife Center under authority of Section 1135. The Miller Corner Placement Area is located on Cat Island within the Tom Yawkey Wildlife Center at the intersection of Winyah Bay and the AIWW in Georgetown County. The placement area is used for placement of maintenance-dredged material removed from the AIWW. The placement area and portions of the Tom Yawkey Wildlife Center have become infested with a noxious common reed plant, *phragmites*. This plant has little wildlife food value. It out-competes, and subsequently replaces, more desirable emergent plants. The plant propagates through subsurface rhizomes and produces large, monotypic, impenetrable stands that reduce overall diversity of plant species. The PRP recommends a treatment program consisting of a combination of chemical, mechanical, and physical control methods by means of raising the existing levees and improving water level management and salinity control in the wildlife impoundments. Project construction was completed in July 2000.

27. On September 8, 1997, the judge's ruling on lawsuits regarding bank erosion in the Myrtle Beach area was filed in the United States Court of Federal Claims. Owners of thirty-one (31) properties adjoining the AIWW had filed suit against the U.S. Government for erosion-caused takings of their properties. Nineteen (19) of the properties were barred by the statute of limitations and an additional three (3) parcels were dismissed because they had not yet suffered

erosion. The court further held that the plaintiffs do not have separate rights to compensation for costs of bank protection. The remaining nine (9) plaintiffs have contested this ruling. Department of Justice has hired an appraisal firm to determine the value of the lost property.

28. A Preliminary Restoration Plan (PRP), prepared by Charleston District dated 19 December 1997, was prepared for the Cape Marsh Management Area of the Santee Coastal Reserve under authority of Section 1135. Cape Marsh Management Area is adjacent to the AIWW in Charleston County and is owned and managed by the South Carolina Department of Natural Resources as a wildlife preserve. Since the AIWW was completed in 1940, the salt marsh buffer between the navigational channel and the impoundment dike has been eroded by boat wake. Loss of the buffer allows spring high tides, storm surge, and boat wake to attack and erode the impoundment dikes. The recommended plan consisted of raising 35,000 linear feet of dike and installation of three water control structures. Project construction was completed in April 2000.

29. A Section 905(b) Analysis report of the AIWW was completed in September 1997 by Charleston District under Section 216 authority. This report identified several areas that needed further investigation during a feasibility-level study. These areas included bank stabilization, reduction of navigational hazards, development of measures to reduce maintenance-dredging requirements, and environmental restoration through multi-use management of the placement area easements.

30. Zapata Engineering prepared the "Report of Vibracore Sampling, Atlantic Intracoastal Waterway, Myrtle Beach, South Carolina" dated October 2000 under Contract Number DACW60-00-D-0002 for Charleston District. The report examined subsurface soil conditions at 26 locations along the Myrtle Beach land cut portion of the AIWW. Results of this investigation were used in identifying potential passing lane reaches along the AIWW through Myrtle Beach, as described in the Engineering Appendix.

31. Coastal Science & Engineering prepared a report titled "Updated Bank Erosion Analysis, Atlantic Intracoastal Waterway, Horry County, South Carolina, dated May 2003. The report was prepared in connection with Kingsport Horizontal Property Regime et al vs United States. The report is an updated analysis of erosion along tracts of property in the class action lawsuit regarding erosion along the AIWW proceeding beyond the channel easement line.

32. USACE prepared a "Atlantic Intercoastal Waterway 216 Technical Summary Report" describing efforts involved in a general investigation study of the AIWW under Section 216 of the Flood Control Act of 1970. The primary focus of the study was to address and provide recommendations concerning the navigation and environmental problems and opportunities that existed at that time throughout the AIWW in South Carolina. Specific improvement opportunities that were investigated as part of the study included passing lanes, streambank protection, and storm water discharge management along the Myrtle Beach land cut, and placement area inventory and forecasting of future placement area requirements.

The study was terminated before the full analysis was complete due to lack of funding support. The summary report was developed to document the findings and preliminary recommendations identified during the course of the GI study. The report documents the results of analyses conducted throughout the AIWW in South Carolina and provides suggestions on additional study requirements that would be necessary to develop recommendations for improvements for the AIWW.