

Structural features such as sills or plugs also carry minimal risk from sea-level rise uncertainty. They are designed to function over a wide variation of tidal stage, and the sea-level rise uncertainty is small compared to the tidal range. It is possible that a structure's effectiveness could be reduced slightly with greater than projected sea-level rise rates, but this could be readily addressed through adaptive management of the mitigation features.

Sea-level rise uncertainty results in a minor level of risk. A different rate of sea-level rise could affect the purchase of mitigation wetlands and the mitigation for chloride impacts to the City of Savannah Abercorn Creek water supply intake. A higher rate of sea-level rise than that assumed would result in a lesser need for mitigation. This is due to the without-project condition, which also includes sea-level rise, impacting the same freshwater wetlands that are projected to be impacted by the harbor deepening project. The mitigation based on the recommended sea-level rise assumptions result in the lowest risk to the resources impacted by the project. That is, the sea-level rise uncertainty could result in more mitigation lands being acquired than are actually necessary, which is preferable to the alternative of assuming too much sea-level rise and then finding that less sea-level rise resulted in unmitigated ecosystem damage from a harbor deepening project. Similarly, if sea-level rise is greater than assumed, then impacts from the project on the water supply intake would be reduced. That is not to say that chlorides would not impact the intake, but that the cause of the chloride increase would be sea-level rise rather than harbor deepening. The risk, then, is that the project may have over-mitigated.

13 Public Involvement, Review, and Consultation

13.1 Public Involvement Program

This study was conducted as a partnership between the USACE Savannah District, as the lead Federal agency, representatives of three other Federal agencies that need to approve the project (EPA Region 4, NMFS-Southeast Regional Office, and the USFWS-Southeast Region), and the Georgia Ports Authority (for their shipping expertise). Representatives from the Cooperating Agencies met on a regular basis to reach decisions on technical work to be conducted and review results of evaluations.

Savannah District coordinated technical aspects of the project with technical staff of Federal and State resource agencies through a series of Interagency Coordination Teams. The Savannah District generally developed those groups around specific natural resources, as follows:

- Wetlands;
- Water Quality;
- Fisheries;

- Sediment Placement; and
- Groundwater.

The agencies involved in the technical aspect of project-related studies were those with approval or certification authority. Agencies included the SC Department of Health and Environmental Control and the GA Department of Natural Resources because of their review of the Project's effects on water quality and coastal zone consistency. The intent of that coordination was to obtain incremental approval of the technical work conducted on the project. Through this approach, the Corps attempted to (1) use predictive tools that the agencies agreed are appropriate, (2) use those tools in the manner the agencies specified, and (3) produce output formats the agencies stated were needed for them to identify impacts to each resource.

The results of impact evaluation modeling runs and other analyses were shared with the interagency teams as they became available. After the agencies had a chance to review the information, the Corps shared the results with the public. The public coordination was usually accomplished through the SEG, further discussed below. One of the original purposes of the SEG was to develop a consensus mitigation plan for USACE and GPA consideration. Therefore, USACE shared the results of the technical studies with this group as they became available.

In response to the Draft EIS on the Feasibility Report in 1997, many concerns were raised by State and Federal agencies and the interested public regarding the economic and environmental evaluation. After a series of meetings among GPA and State and Federal agencies, an agreement was reached that the EIS for the 1997 Feasibility Report would be considered a Tier I EIS with another EIS to be prepared during the design phase of the project. As part of the Final EIS preparation, GPA and the agencies would form an SEG to advise GPA on appropriate environmental issues and to identify studies necessary to address those issues. During the process of obtaining Congressional approval in the Water Resources Development Act of 1999, the composition of the SEG was expanded to include the interested public.

The first meeting of the SEG was held on January 12, 1999. During that meeting, participants identified 49 issues of interest, some of which were procedural for operating the SEG and others were specific to the proposed project. Meetings were held monthly until July 2000. After that date, the meetings have been held bi-monthly and occasionally tri-monthly. To date, 70 full SEG meetings have been held. For the first several meetings, the facilitator published meeting minutes which were subject to review and approval by the full SEG. Subsequently, verbatim taped transcripts were made and eventually transcribed transcripts were made by a contract court reporter. All minutes, taped and transcribed records, and other project material can be found on the Savannah Harbor Expansion Project web site, <http://www.sav-harbor.com>.

Fifty-nine people attended the first SEG meeting and attendance at subsequent meetings has been generally in the range of 40 to 50 people. Attendance records can also be found on the web site. The SEG developed operating guidelines and formed itself into various committees to oversee different aspects of the project. The SEG recommended 21 areas of additional investigation that resulted in 31 additional studies. The results of the various studies were presented to the SEG as they became available. The SEG accepted the results and acknowledged the individual studies as being complete. All study results are included in the GRR and EIS evaluations. Copies of the study recommendation, scopes of work and final reports of each of the areas of study can be found on the harbor deepening web site.

In addition to the SEG, the Corps used other methods to ensure the entire public was aware of the GRR and EIS activities. This began with the NEPA scoping meeting held in 2002. The District prepared and distributed brochures that described the environmental field work that was being conducted; discussed the project at local professional and community groups such as the American Society of Civil Engineers. The hydrodynamic modeling approach, wetland impact evaluation approach, and the project in general has been the subject of presentations at the Georgia Water Resources Conference in 2001, 2003, 2005, and 2007. Interim plan formulation results (Formulation of Alternatives report) were distributed for public comment in 2005.

The Georgia Ports Authority conducted a demonstration project during the summer of 2007 of the dissolved oxygen injection system that was being considered in the project. The full-scale system was operated within sight of City Hall for a period of about six-weeks. GPA arranged for representatives of natural resource agencies and the general public to tour the facility at specified times and the demonstration project was covered on the front page of the local newspaper.

13.2 USACE Environmental Operating Principles

The Savannah District is committed to implementing the USACE environmental operating principles. The following discussion presents the implementation of these principles in the study and planning process for the Savannah Harbor deepening:

1. Strive to achieve environmental sustainability. An environment maintained in a healthy, diverse, and sustainable condition is necessary to support life.

The project considered the sustainability of both the existing deep-draft navigation project in Savannah and the natural resources located within the estuary. The proposed harbor deepening would allow the port to serve its customers in a more cost effective manner by reducing the cost of transporting goods through the port while assuring the sustainability of the Savannah National Wildlife Refuge. The Corps considered the long-term needs of the harbor for sediment placement sites and found the existing sites to be adequate for the life of the project. The mitigation plans incorporate flow-rerouting features, which will provide benefits with low long-term

maintenance requirements. Several of the mitigation features were specifically designed to minimize long term O&M costs, to ensure their sustainability. Continued operation of the oxygen injection systems over the long term will ensure the project's effects are managed and sustainable. The project also includes mitigation for Shortnose sturgeon, Striped bass, water supply, cultural resources, and wetlands to also ensure sustainability.

2. Recognize the interdependence of life and the physical environment. Proactively consider environmental consequences of Corps programs and act accordingly in all appropriate circumstances. Coordination with environmental agencies and their inclusion as part of the Project Development Team (PDT).

The project PDT worked closely with environmental agencies, both State and Federal, to review proposed project requirements and how those requirements will impact the environment and what can be done to mitigate or prevent this from happening.

3. Seek balance and synergy among human development activities and natural systems by designing economic and environmental solutions that support and reinforce one another.

The project has been designed to allow sustainability for both mankind and the natural environments. The mitigation plan constitutes approximately half of project costs.

4. Continue to accept corporate responsibility and accountability under the law for activities and decisions under our control that impact human health and welfare and the continued viability of natural systems.

The District acknowledged differences between itself and the Savannah National Wildlife Refuge in the responsibility for maintenance of some project mitigation features. The Corps and the Refuge signed a Memorandum of Agreement in 2009 that defines the responsibilities of the agencies in the future. In 2011, the Corps completed rehabilitation of the portion of the water control system located on the Refuge, restoring those structures to their original condition. That rehabilitation will enable the USFWS to operate the system that allows them to manage freshwater within the Refuge impoundments in a safer and more cost-effective manner.

5. Seek ways and means to access and mitigate cumulative impacts to the environment; bring systems approaches to the full life cycle of our processes and work.

The Corps considered cumulative impacts in its assessment of the ecological and social value of resources that the project would impact. The project features were designed recognizing the present and expected future status of specific environmental resources, how those resources function in the estuary, and how those resources are influenced by man's activities.

6. Build and share an integrated scientific, economic and social knowledge base that supports a greater understanding of the environment and impacts of our work.

The Savannah Harbor estuary is a complicated natural environment that has been altered by the activities of man since the 1700's. In order to study the impacts of a project which further alters the natural ecosystem, comprehensive planning and design of technical data gathering and interpretation is required. This has been accomplished on the SHEP with little spared in terms of cost or personnel resources. The adoption of stakeholder input through Stakeholder Evaluation Group meetings resulted in numerous studies that were undertaken to insure that every possible impact from the additional project depth was investigated.

7. Respect the views of individual and groups interested in Corps activities; listen to them actively, and learn their perspective in the search to find innovative win-win solutions to the Nation's problems that also protect and enhance the environment.

One major way in which the Corps sought the views of the public was through its 12-year participation in the Stakeholders Evaluation Group, a body which GPA formed to provide the public with a means to receive project information and provide their concerns and suggestions about the project. The group provided its views regarding possible studies to be performed and possible mitigation measures.

13.3 Application of USACE Campaign Plan

I. Engineering Sustainable Water Resources.

Deliver enduring and essential water resource solutions through collaboration with partners and stakeholders. USACE will deliver enduring and essential water resources solutions. The Corps will collaborate with partners and stakeholders to find holistic and sustainable solutions.

1. Employ integrated, comprehensive and systems-based approach

The Savannah Harbor estuary is a complicated natural environment that has been altered by the activities of man since the 1700's. To study the impacts of a project which further alters the natural ecosystem, comprehensive planning, technical analysis and interpretation were required. This was accomplished on the Savannah Harbor Expansion Project with little spared in terms of cost or personnel resources. The Corps conducted the evaluation in a cooperative manner with the regional offices of critical federal agencies (EPA, USFWS, and NOAA Fisheries). The Corps also established and used Interagency Coordination Teams to discuss potential project effects on important natural resources. The Corps sought the views of local stakeholders through a Stakeholder Evaluation Group that was organized by the Georgia Ports Authority. As a result of input from the natural resource agencies and the Stakeholder Evaluation Group, the Corps conducted numerous studies to insure that all potential project impacts were identified and evaluated.

The project team used a systems approach in its assessments of environmental and economic effects. In the systems approach, the project's physical impacts were modeled to identify resulting changes in the chemical and biological characteristics of the estuarine system. The expected effects of a potential feature were identified across all the natural resources in the estuary.

From an economic perspective, the team assessed the effects of a project in terms of the international system of containerized cargo transport. The systems approach to channel deepening in Savannah accounted for depths and capacities at other ports, deepening of the Panama Canal, and incorporated evaluation of a broad range of alternatives, including improvements at locations other than Savannah.

2. Employ risk-based concepts in planning, design, construction, operations, and major maintenance

The planning of the project, the incorporation of design elements and the consideration of future contingencies to account for risk during the construction and operations and maintenance phase was accomplished as the project was developed. Investigation of the Floridan Aquifer is a prime example of the risk-based approach to determining what impacts further deepening would have on the harbor and its environs. The same applies to hurricane surge studies, bank erosion and stability investigations, coastal erosion investigations, and the myriad model runs conducted to determine possible detrimental impacts to natural resources within the estuary. A risk and uncertainty analysis was performed for the critical investigations performed during the study. The risk and uncertainty analysis for the construction consisted of (1) an in-depth cost estimating effort to account for unknowns such as dredge plant availability, production estimates, material variations and disposal area availability, and (2) inclusion in the project of a monitoring and adaptive management plan to ensure the expected project impacts are not exceeded and the mitigation features perform as intended. An important example of the risk-based analysis of long term O&M was the determination that proposed changes to the current configuration of the harbor will require an increase in O&M funding.

3. Continuously reassess and update policy for program development, planning guidance, design, and construction standards

Through the years of this project's planning and formulation, numerous policy changes have been determined to apply to this project, including application of the 12 Actions for Change. Cost Estimating Risk Analyses, Agency Technical Review and Independent External Peer Review of all documents, and consideration of sea-level rise, are examples where updated policy has been incorporated to provide Congress with confidence in the US Army Corps of Engineers' work.

4. Employ dynamic independent review

Every work product on this report has been reviewed in-house before being released by the Project Delivery Team and either has been subjected to both internal and external peer review. Most products have been researched and developed outside the Savannah District, lending even more credence to the independent nature of the study's components. The Regional Project Delivery Team consisted of Mobile, Charleston, Wilmington, Omaha, Philadelphia, and San Francisco Districts; the Engineer Research and Development Center in Vicksburg; the Cost Center of Expertise in Walla Walla; the Deep Draft Navigation Center of Expertise in Mobile; and the Institute for Water Resources in Fort Belvoir. The Federal Cooperating Agencies, the US Fish and Wildlife Service, the National Marine Fisheries Service and the US Environmental Protection Agency, were also deeply involved in the review process. The Corps developed the project plans in an iterative design/review/redesign manner with interagency coordination teams (including the States of Georgia and South Carolina) to ensure the plans would meet the needs of the natural resource agencies that would be asked to provide environmental clearances for the project.

5. Employ adaptive planning and engineering systems

The very nature of this project required the application of adaptive management in the engineering and environmental arenas. The project includes monitoring (before, during and after construction) and adaptive management (10 years after construction) to ensure the expected project impacts are not exceeded and the mitigation features perform as intended. This includes detailed data collection efforts prior to, during, and after construction. Adaptive management in the form of alterations to the monitoring plan and modification of the mitigation features is included to insure that degradation of environmental resources is prevented over the long term.

6. Focus on sustainability

The project considered the sustainability of both the existing deep-draft navigation project in Savannah and the natural resources located within the estuary. The proposed harbor deepening would allow the port to serve its customers in a more cost effective manner by reducing the cost of transporting goods through the port while assuring the sustainability of the Savannah National Wildlife Refuge. The Corps considered the long-term needs of the harbor for sediment placement sites and found the existing sites to be adequate for the life of the project. The mitigation plans incorporate flow-rerouting features, which will provide benefits with low long-term maintenance requirements. Several of the mitigation features were specifically designed to minimize long term O&M costs, to ensure their sustainability. Continued operation of the oxygen injection systems over the long term will ensure the project's effects are managed and sustainable. The project also includes mitigation for Shortnose sturgeon, Striped bass, water supply, cultural resources, and wetlands to also ensure sustainability.

7. Review and inspect completed works

The monitoring and adaptive management plan is a major component of the project. The Corps will monitor the project's effects for 10 years after construction is complete. It will also perform adaptive management to ensure the mitigation features perform as intended. A limited monitoring program – including annual inspection of the mitigation features -- will be performed for the life of the project to ensure the mitigation features continue to perform as intended.

8. Assess and modify organizational behavior

The Savannah District conducted this study in a regional manner to better use Corps talents and expertise. Ship simulation was performed by the Corps' Engineer Research and Development Center in Vicksburg, MS. The economic analysis was performed by the Corps' Deep-Draft Navigation Center of Expertise in Mobile, AL. Cost estimating work was performed by the Wilmington District in Wilmington, NC. The Agency Technical Review was conducted to provide a review by Corps experts who did not participate in development of the project by Corps employees outside the South Atlantic Division. An Independent External Peer Review was conducted by experts in various fields from the private sector.

II. Delivering Effective, Resilient, Sustainable Solutions.

Deliver innovative, resilient, sustainable solutions to the Armed Forces and the Nation. USACE will deliver innovative, resilient, sustainable solutions to the Armed Forces and the Nation. We will use innovative tools to efficiently and effectively, deliver high quality facilities. We will improve reliability and resiliency of critical infrastructure and reduce risks related to water resources and other DOD infrastructure.

9. Effectively communicate risk

Risk and uncertainty was routinely communicated within the Corps of Engineers, and to its customers and the public. Communication outlets included the Stakeholder Evaluation Group meetings, periodic meetings of five Interagency Coordination Teams, one-on-one meetings with affected municipalities, the local newspaper, project web sites and numerous briefings by the District Commander and his staff to civic organizations.

10. Establish public involvement risk reduction strategies

The major risk reduction strategy involving the general public consisted of three major components: (1) scoping of the issues to be considered during the course of the study, (2) participation in the Stakeholder Evaluation Group (a group sponsored by the Georgia Ports Authority as a means for the public to receive project information, and provide concerns and suggestions to the Georgia Ports Authority), and (3) public review of the Draft GRR and Draft EIS.

III. Recruit and Retain Strong Teams.

Build and cultivate a competent, disciplined, and resilient team equipped to deliver high quality solutions. USACE will build and cultivate a competent, disciplined, and resilient team equipped to deliver high quality solutions. We will strengthen critical core technical competencies. We will communicate strategically with employees, stakeholders and the public. We will improve our efficiency and effectiveness by increasing the use of standardized processes.

11. Manage and enhance technical expertise and professionalism

Through a regional approach, Savannah District was able to obtain the talents and skills of technical experts located both within and outside the District. This approach afforded unparalleled professional development opportunities for Corps personnel. The collaborative manner in which the District conducted the study also provided multiple opportunities for its technical experts to interact with scientists from sister state and federal agencies, such as when they jointly determined the means of identifying project impacts and evaluating measures to reduce and mitigate those impacts.

12. Invest in research

The project expended considerable expense in researching the potential impacts of the project and potential mitigation features. State-of-the-art techniques were employed in several technical areas – aquifer impact assessment, wetland monitoring, fishery monitoring, coastal engineering, hydrogeology explorations along the Savannah River, hydrodynamic modeling of estuarine systems, sediment characterization, and predicted chloride levels at the City of Savannah’s water intake. These investigations substantially increased the body of knowledge for how the Savannah River estuary functions. This knowledge has already been used by others in their research efforts to enhance the sustainability of development along the coastal plain.

13.4 Scoping and Draft EIS

A Notice of Intent (NOI) was published in the Federal Register on January 22, 2002 announcing the Savannah District, USACE intended to prepare a Draft Environmental Impact Statement (DEIS) for the Savannah Harbor Expansion Project Feasibility Study. (Within the NOI, the public and agencies were notified that a scoping meeting would be conducted for the proposed project. On February 21, 2002, a scoping meeting was held for the proposed action at the Savannah International Trade and Convention Center. Additionally, on April 12, 2002, a NEPA scoping meeting was convened. GPA received 178 comments as a result of the meeting which can be found on the SHEP web site: <http://www.sav-harbor.com/public%20information.htm>. All comments and pertinent correspondence and scoping documents are included in the Environmental Appendix: Scoping Documents and Correspondence.

A Notice of Availability of the DEIS was published in the Federal Register on November 15, 2010 for 45-day period and advertised in local newspapers in both Georgia and South Carolina. In response to several requests, the District extended the review and comment period an additional 15 days until January 25, 2011 to provide the agencies and the public additional time to review the document. In addition, copies of the DEIS were made available at public libraries, and the documents were posted on the Savannah District website. A public information meeting on the project was also held at the Savannah Civic Center on December 15, 2010. Participants were provided detailed information on the project and its associated mitigation plan and provided the opportunity to ask questions and submit oral or written comments.

For the Final EIS, a Notice of Availability will be published in the Federal Register and advertised in local newspapers. The Final EIS will also be made available in public libraries and on the Savannah District website.

13.5 Agency and Public Coordination

Coordination with Federal, State, and local agencies has been extensive during the course of the SHEP nearly 13-year study. Savannah District engaged representatives of the U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service, National Park Service, US Geological Survey, National Marine Fisheries Service, US Navy, Georgia Department of Natural Resources, South Carolina Department of Health and Environmental Control, the South Carolina Department of Natural Resources, Georgia Ports Authority, Georgia Department of Transportation, and City of Savannah to aid in evaluating the project alternatives. The public's views were sought through initial scoping meetings, periodic newsletters, and regular coordination with the Stakeholders Evaluation Group, a group that the Georgia Ports Authority formed to provide a forum for interested citizens to meet and discuss the project.

Cultural resources investigations and reconnaissance were coordinated with the Georgia and South Carolina Division of Archives and History, Underwater Archaeology Unit, and with the Georgia and South Carolina State Historic Preservation Officers, pursuant to the Abandoned Shipwreck Act of 1987 and the National Historic Preservation Act of 1966, as amended. The State Historic Preservation Offices (SHPO) have reviewed reports that have been prepared that assess the condition of cultural and historic resources that could be impacted by the proposed project. A Programmatic Agreement has been developed that describes the actions the Corps would take to comply with the National Historic Preservation Act. That Agreement is included as Appendix G of the Final EIS. Savannah District would undertake further coordination with the SHPOs as further investigations are conducted.

The Final EIS contains Savannah District's Consistency Determination with the Georgia Coastal Management Program. The determination was provided to the GA DNR Coastal Resources Division, which administers the Georgia CZM Program, for review and concurrence, in compliance with the Coastal Zone Management Act (CZMA), 16 U.S.C. 1451 et seq., as amended, as part of GA DNR-CRD's review of

the Draft EIS. GA DNR-CRD stated that in general the project complied with GA's Coastal Management Program.

The Final EIS contains Savannah District's Consistency Determination with the South Carolina Coastal Management Program. The determination was provided to the Office of Ocean and Coastal Resource Management of the SC DHEC, which administers the South Carolina CZM Program, for review and concurrence, in compliance with the Coastal Zone Management Act (CZMA), 16 U.S.C. 1451 et seq., as amended, as part of their review of the Draft EIS. SC DHEC initially disagreed with the Corps determination; however, upon the Corps providing additional information, SC DHEC removed their objection to the Corps determination that the project is fully consistent with the enforceable policies of the South Carolina Coastal Management Program.

The Final EIS contains Savannah District's Section 404(b)(1) Evaluation on the selected plan. That evaluation was provided to the GA DNR-EPD and SC DHEC, which administer the Section 401 water quality certification programs in their states under the authority of the Clean Water Act. The water quality certifications from Georgia and South Carolina are included in Appendix Z of the Final EIS.

Most of the entrance channel sediments would be deposited in the Savannah ODMDS. Transport and deposition of sediments into the ODMDS requires approval from Environmental Protection Agency Region 4, who administers the Section 103 ocean disposal program in the southeast under the Marine Protection, Research, and Sanctuaries Act. EPA previously approved the transport and deposition of maintenance sediments from the entrance channel into the ODMDS. Sediment testing of the new work entrance channel sediments did not identify any contaminants of concern that would preclude use of the ODMDS. Based on both historic sampling results and information obtained for this project, Savannah District believes that the new work sediments would be suitable for deposition in the ODMDS. The District will provide a Section 103 Evaluation to EPA Region 4 for review and approval prior to use of the Savannah ODMDS.

Consultation under Section 7(c) of the Endangered Species Act of 1973, as amended, was performed with the US Department of the Interior, USFWS and the US Department of Commerce, NMFS. The Biological Assessment (BA) addressing these issues is included in Appendix B of the Final EIS. Appendix Z of the Final EIS contains the USFWS concurrence of the Corps' BA. NOAA Fisheries Service prepared a Biological Opinion, which is included in Appendix Z.

The Corps coordinated with the federal and state natural resource agencies as required under the Fish and Wildlife Coordination Act, as amended (16 U.S.C. 661, et seq.). A Draft Coordination Act Report provided by the USFWS was included in the November 2008 Draft EIS. Appendix E of the Final EIS contains the Final Coordination Act Report, as well as the Corps' response to the recommendations included in that report.

13.6 Summary of Comments on November 2010 Draft GRR and Draft EIS

Upon distribution of the Draft EIS (DEIS) and Draft GRR on November 15, 2010, the Savannah District received over 1,100 written letters, e-mails, and dictated responses from Federal and state agencies, environmental groups, civic organizations, and private citizens. The comment letters and the Corps' responses are included as Appendix A to the Final EIS.

The majority of the commenters (684) provided general statements supporting the harbor deepening project. The remainder of the commenters submitted comments related to the environmental impacts, the economic analyses, and engineering studies associated with the proposed project. The comments contained in the letters were generally grouped into three broad categories (despite some overlap) as follows: Environmental (1,247), Economics (356), and Engineering (258). A summary of the comments by subject area including the 684 comments in support of the project is provided below in Figure 13-1.

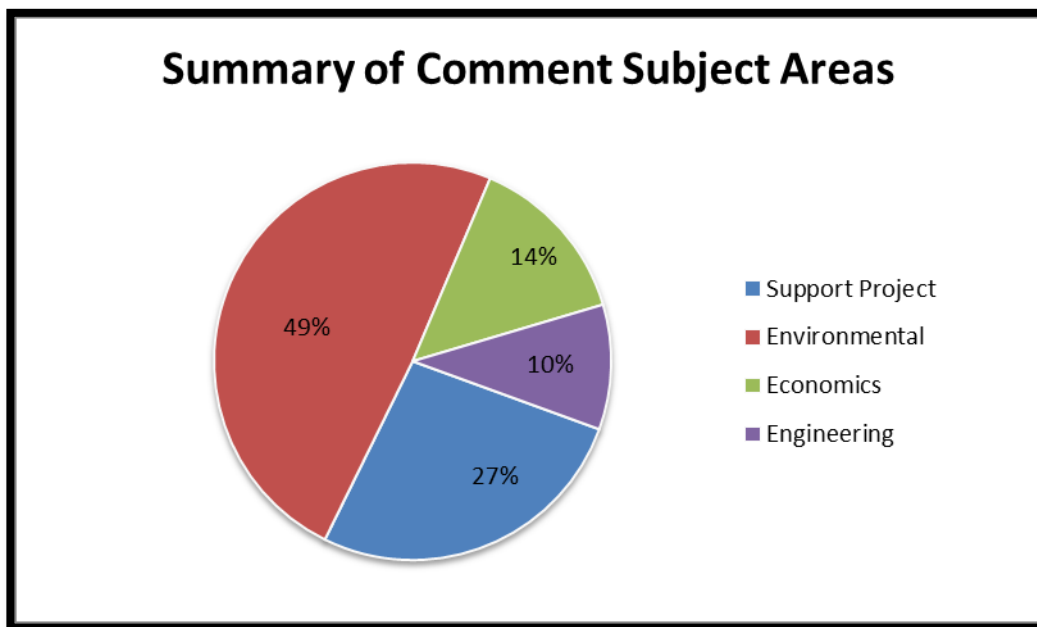


Figure 13-1: Summary of Comment Subject Areas

The majority of the comments were related to the environmental analyses and predicted impacts associated with the proposed project. In general, the environmental comments focused on two major issues: the proposed monitoring and adaptive management plan and the impacts to endangered species, specifically the Shortnose sturgeon. The District received comments from all the Federal Cooperating Agencies (Department of Interior (DOI), Department of Commerce (DOC), and the Environmental Protection Agency (EPA)) regarding the post-construction monitoring

period. Both the DOI and EPA requested that the monitoring period be extended to as much as 10 years. The Federal Cooperating Agencies and the State resource agencies, GA DNR-EPD in particular, requested additional elements be included in the monitoring plan to ensure the actual impacts of the project do not exceed those expected for a particular resource.

Several resource agencies expressed concern that a 5-year monitoring period may be too short to adequately test the performance of the mitigation features. Some of the mitigation features are designed to address impacts that only become evident during low river flows. River flows are entirely dependent upon climate conditions, and it is possible to go through a 5-year monitoring period without experiencing low flows that would test the performance of the mitigation features. The risk of not observing significant low-flow data during a 10-year monitoring period is greatly reduced. Historic records from the Savannah River at the Clyo streamflow gage indicate that 5 years of above-average flows are not uncommon, but even during so-called "wet decades" there have always been a few years of below normal flow.

To address these concerns, the Corps added elements to the monitoring plan and lengthened the monitoring period for some elements to as much as 10 years. Elements added to the plan include determination of the freshwater interface, addition of a wetland monitoring site, expanded monitoring of MCDAs effluent, and additional biological monitoring in the MCDAs. The Corps believes the adaptive management plan, as proposed, would allow for any necessary changes to the project should the environmental impacts exceed what is predicted or mitigation features do not function as intended.

A number of commenters expressed concern about funding assurance for both the construction and operation and maintenance of the proposed mitigation features and any adaptive management features. To address their concerns, the State of Georgia has indicated that it would place its share of the adaptive management funding in an escrow account so funds would be available if/when needed. The District intends to obtain its share of the adaptive management costs at the same time as the funds for the dredging work are obtained. By obtaining the funds as the construction progresses, they would be available to make adjustments to the project's mitigation if/when needed. In this way, all the funds identified in the final project documents for adaptive management would be obtained by the time the dredging is complete. With regard to operation and maintenance of the mitigation features, the Corps' highest budget priority is given to funding requests for operation of mitigation features.

In addition to the monitoring plan, a large number of comments, particularly from the DOC, were concerned with the proposed mitigation for impacts to Shortnose sturgeon habitat. A mitigation feature proposed in the DEIS to compensate for adverse impacts to Shortnose sturgeon habitat was construction and operation of a horseshoe rock ramp fish bypass around the New Savannah Bluff Lock and Dam near Augusta, Georgia. In their comments, the DOC indicated that the proposed design was inadequate because the percentage of river flow passing through the structure (5%) did not provide

adequate assurance that Shortnose sturgeon could find or use the structure. Based on these comments, the Corps held a fish passage workshop and invited representatives from the Federal and State natural resource agencies, fishway engineers, and academic experts to review the design. As a result of the input provided at the workshop and a follow-up site visit arranged by NMFS, the Corps revised the rock ramp design to accommodate 100% of the river flow a majority of the spring spawning season, while not increasing flooding upstream and maintaining an acceptable pool level.

Both the GA DNR-CRD and the City of Tybee Island submitted comments regarding the proposed beneficial use of dredged materials, i.e. nearshore placement of new work sediments from the entrance channel. GA DNR-CRD's initial finding was that the SHEP is generally consistent with the enforceable provisions of the Georgia Coastal Management Program. However, certain changes were requested regarding the dredged sediment placement plan, viz., the State expressed concern about the proposed deposition in the nearshore sites and the two offshore [fish enhancement] sites. In light of GA DNR-CRD and the City of Tybee Island's concerns about the quality of the sediments, the Corps revised the dredged sediment placement plan and now intends to deposit all sediments from the entrance channel in either the Ocean Dredged Material Disposal Site or approved upland confined sediment placement sites. Consequently, proposed dredged sediment placement areas: Site MLW 200, Site MLW 500, ERDC Nearshore, Site 2, Site 2 Extension, and Sites 3, 4, 5, 6, 11, and 12, were deleted from the proposed action, and the Corps would not deposit new work sediments in those locations as part of the Savannah Harbor Expansion Project.

The City of Savannah submitted comments concerning the potential impacts of increased chlorides to their water supply intake on Abercorn Creek. As a result of their comments, the Corps, Georgia Ports Authority, and the City of Savannah closely coordinated to perform additional impact analyses. The analyses indicated that during drought conditions and high tide, the increased chloride concentrations would cause an increase in lead corrosion and disinfection byproducts, both of which are regulated by the EPA, at the City's municipal and industrial plant. Based on the outcome of the updated studies, the Corps has added a raw water storage impoundment to mitigate for these expected impacts.

A number of comments were also submitted concerning to the engineering and design of the channel, in particular the Ocean Bar Channel (entrance channel) and channel extension. Respondents were concerned that the channel design presented in the Draft documents was not adequate to allow safe transit of the larger ships expected to call after the harbor is deepened. The preliminary channel design was determined using the Corps of Engineers' design standards and procedures outlined in EM-1110-2-1613, Hydraulic Design of Deep Draft Navigation Projects. In accordance with ER-1110-2-1403, final channel dimensions and navigation requirements were developed using the Corps state-of-the-art ship simulator with input from the Savannah Harbor Pilots Association (SHPA).

The use of ship simulators to establish final design parameters for deep draft navigation channels is the standard practice worldwide and ensures that channels are safe and economical and result in minimal environmental impact and long term maintenance requirements. The use of ship simulators also provides the Savannah Harbor Pilots that work the channel on a daily basis with the opportunity to provide input into the design and ensure the navigability and safety of the channel. The ship simulation study verified that the channel could be deepened and widened at three bends to maintain two-way traffic capability for the design vessel and a smaller vessel. Two meeting areas are also included to provide for meeting of two design vessels.

Currently, the Savannah Harbor Pilots safely bring in vessels with a minimum of 4 feet of underkeel clearance. The Corps expects this practice to continue with the deepened channel. The vertical motion study, which included the channel extension out to a maximum of Station -98+600B, showed that the pilots can safely navigate the design vessel through the deepened Ocean Bar Channel at a ship speed of 14 knots or less. Documentation for both the ship simulation and vertical motion studies can be found in Engineering Appendix Supplemental Materials.

With respect to economics, most respondents commented or asked questions about how deepening the harbor is economically justified if the cargo volume growth rate remains the same in both the with- and without- project conditions. As indicated by the commodity forecast discussed in Section 5 of the GRR, under both the without- and with-project conditions, the District expects the Garden City Terminal to reach its build-out capacity near 2030 when the total number of TEUs processed reaches 6.5 million. The Corps anticipates that without deepening, more vessels would be required to transport a given volume of cargo, when compared to the with-project condition in which vessels could load more completely (thereby requiring fewer vessels).

No increase in cargo is expected to occur as a result of the proposed harbor deepening. As a result, the number of containers that transit the areas that surround the port would not change as a result of a deeper harbor. The project's economic benefits accrue from the use of larger, more cost-effective container ships, not an increase in the number of containers moving through the port. These transportation cost savings are predicted to result in an average net benefit of over \$170 million annually to the Nation.

14 Selected Plan

The current Savannah Harbor Expansion Project authorization in Section 101(b)(9) of the Water Resources Development Act of 1999 authorized a deep-draft navigation project up to a depth of -48 feet subject to further evaluation and concurrence by the Secretaries of the Army, Commerce and Interior, and the Administrator of the Environmental Protection Agency (EPA). Given the unique authorization of this project, any final recommendation of a preferred plan must meet the requirements of