Final Independent External Peer Review Report Collier County Coastal Storm Risk Management Feasibility Study

Prepared by
Battelle Memorial Institute

Prepared for
Department of the Army
U.S. Army Corps of Engineers
Coastal Storm Risk Management Planning Center of Expertise
Baltimore District

Contract No. W912HQ-15-D-0001
Task Order: W912HQ20F0018

October 6, 2020

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It can be done

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Columbus, Ohio 43201

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Executive Summary

Project Background and Purpose

Collier County is located on the southwest coast of Florida, approximately 120 miles south of the entrance to Tampa Bay and 100 miles north of Key West. Naples, which is located along the shoreline, is the largest city in the county. Collier County comprises nearly 200 square miles of landmass and roughly 300 square miles of water. It is the largest county in Florida by land area and the fourth largest by total area (land and water). The estimated population for 2017 was nearly 373,000, which includes a dense population of people who require more time and assistance for evacuation. A large portion of the southeast section of the county lies within the Big Cypress National Preserve, and the southern coastal section of the county is home to parts of Everglades National Park.

There is a high risk of coastal storms causing significant damage to shorefront and inland bay area development in Collier County. The area is densely developed with a mix of residential, commercial, and recreational uses. During Hurricane Irma in September 2017, the area experienced damage to existing development, but if the storm track had been perpendicular to the coastline, then the damage would have been significantly worse. The proposed Coastal Storm Risk Management (CSRM) project could take the form of widening the existing beaches, raising existing dunes, constructing seawalls, offering buyouts, floodproofing, or any possible combination of CSRM risk reduction measures that meet study objectives.

The study area includes all land and water resources reasonably deemed to be within the vicinity of Vanderbilt, Park Shore, and Naples beaches and inland bay areas, as well as Marco Island, provided they are located entirely within the jurisdictional boundary of Collier County, Florida. The study area comprises two main components: the North County and Marco Island. These two areas are geographically noncontiguous and hydrologically separable; however, they were formulated using the same strategy and management measures. There is dense development in the study area, and it is anticipated the Federal interest in a CSRM project will be justified. The non-Federal sponsor is interested in developing and improving the beach areas to provide protection of adjacent structures and critical infrastructure.

Independent External Peer Review Process

Independent, objective peer review is regarded as a critical element in ensuring the reliability of scientific analysis. The U.S. Army Corps of Engineers (USACE) is conducting an Independent External Peer Review (IEPR) of the Collier County Coastal Storm Risk Management Feasibility Study (hereinafter: Collier County CSRM IEPR). As a 501(c)(3) non-profit science and technology organization, Battelle is independent, is free from conflicts of interest (COIs), and meets the requirements for an Outside Eligible Organization (OEO) per guidance described in USACE (2018). Battelle has experience in establishing and administering peer review panels for USACE and was engaged to coordinate this IEPR. The IEPR

was external to the agency and conducted following USACE and Office of Management and Budget (OMB) guidance described in USACE (2018) and OMB (2004). This final report presents the Final Panel Comments of the IEPR Panel (the Panel). Details regarding the IEPR (including the process for selecting panel members, the panel members' biographical information and expertise, and the charge submitted to the Panel to guide its review) are presented in appendices.

Based on the technical content of the decision documents and the overall scope of the project, Battelle identified potential candidates for the Panel in the following key technical areas: planning formulation/ economics; environmental law compliance; hydrology, hydraulic, and coastal engineering; and geotechnical engineering. Battelle screened the candidates to identify those most closely meeting the selection criteria and evaluated them for COIs and availability. USACE was given the list of all the final candidates to independently confirm that they had no COIs, and Battelle made the final selection of the four-person Panel from this list.

The Panel received electronic versions of the decision documents (1,620 pages in total), along with a charge that solicited comments on specific sections of the documents to be reviewed. Following guidance provided in USACE (2018) and OMB (2004), USACE prepared the charge questions, which were included in the draft and final Work Plans.

The USACE Project Delivery Team (PDT) briefed the Panel and Battelle during a kick-off meeting held via teleconference at the start of the review to provide the Panel an opportunity to ask questions of USACE and clarify uncertainties. Other than Battelle-facilitated teleconferences, there was no direct communication between the Panel and USACE during the peer review process.

IEPR panel members reviewed the decision documents individually and produced individual comments in response to the charge questions. The panel members then met via teleconference with Battelle to review key technical comments and reach agreement on the Final Panel Comments to be provided to USACE. Each Final Panel Comment was documented using a four-part format consisting of (1) a comment statement; (2) the basis for the comment; (3) the significance of the comment (high, medium/high, medium, medium/low, or low); and (4) recommendations on how to resolve the comment. Overall, 18 Final Panel Comments were identified and documented. Of these, five were identified as having medium/high significance, three had medium significance, eight had medium/low significance, and two had low significance.

Battelle received public comments from USACE on the Collier County CSRM (203 pages of comments) and provided them to the IEPR panel members. The panel members were charged with determining if any information or concerns presented in the public comments raised any additional discipline-specific technical concerns with regard to the Collier County CSRM review documents. After completing its review, the Panel confirmed that no new issues or concerns were identified other than those already covered in the Final Panel Comments.

Results of the Independent External Peer Review

The panel members agreed on their "assessment of the adequacy and acceptability of the economic, engineering, and environmental methods, models, and analyses used" (USACE, 2018) in the Collier County CSRM review documents. Table ES-1 lists the Final Panel Comment statements by level of significance. The full text of the Final Panel Comments is presented in Section 4.2 of this report. The following summarizes the Panel's findings.

The Panel noted that a number of benefits and impacts remain to be identified, clarified, and addressed. The Final Panel Comments provided by the Panel take into account USACE's statements that the Draft Integrated Feasibility Report/Environmental Impact Statement (DIFR/EIS) is based on a 10 percent design. The Panel recognized that once additional details regarding the project have been determined, USACE will conduct the appropriate modeling and impact analyses to complete an assessment that complies with all USACE guidance and National Environmental Policy Act (NEPA) requirements as noted throughout the documents.

Based on the Panel's review, the DIFR/EIS is well-written, is concise, and provides excellent supporting documentation on engineering, environmental, economic, and plan formulation issues. The report provided a balanced assessment of the economic, engineering, and environmental issues of the overall project; however, the Panel identified several elements of the report that should be clarified or revised.

Plan Formulation/Economics: The decision document addresses a very complex coastal storm risk problem by developing and evaluating alternatives intended to increase coastal resiliency against both erosion and flooding. USACE did a skillful job of formulating and evaluating alternatives that included structural and non-structural measures and selecting a tentative plan that manages coastal storm risk and maximizes benefits in Collier County, Florida. However, the Panel observed that the models used in the study analysis relied upon first-floor elevation data with uncertain accuracy, potentially resulting in over- or understated benefits from this analysis. Given the flat topography within the project area, differences in elevation of tenths of a foot could mean large changes in benefits or impacts of the project. The Panel also believes that the calculated land-loss benefits are underestimated due to the use of land values derived from the Norfolk, Virginia, area instead of the Collier County real estate market. Given that both of these items potentially impact the assessment of the calculated benefits, the use of accurate data is important to ensure the overall accuracy of the benefit-to-cost ratio (BCR) calculated for each alternative.

Engineering: The DIFR/EIS summarizes a large amount of existing engineering-related background data and information. During the review, the Panel noted that application of the EurOtop 2018 software, in addition to the Automated Coastal Engineering System (ACES) software, for wave overtopping analysis increased the reliability of the results. However, several concerns that could lead to increased project costs or scheduling delays were identified.

USACE used the SBEACH model to estimate the cross-shore sediment transport and beach profiles. The Panel noted that SBEACH does not account for longshore sediment transport (LST), a point that was reiterated by local coastal and marine professionals in the public comments. Therefore, the Panel is concerned that the impacts to some shoreline profiles from LST are underestimated. The Panel also noted that the engineering assumptions for interior drainage do not consider actual conditions and real-world scenarios found in the study area, which could result in underestimated pump station sizing. The DIFR/EIS does not report the extent of impacts to real estate and recreation within the T-wall right-of-way (ROW) or impacts to floodwalls from erosion. Furthermore, the DIFR/EIS reports a deficit of suitable sand for beach construction and renourishment projects, which has possible implications to both cost and scheduling. The Panel observed that these concerns, taken as a whole, could significantly impact overall project costs.

The Panel also noted that the approximate one-year construction schedule per planning area to address non-structural measures may be overly optimistic given the number of buildings (1,000 or more) to be addressed through a voluntary participation process. In addition, the Panel identified a concern regarding

the amount of detail provided for the construction, implementation, and operation of about 62 gate closure structures planned as part of the Tentatively Selected Plan (TSP).

Environmental: The environmental documentation was found to be well organized and well written. However, given the limited information provided, the Panel believes that the methodology used to evaluate cumulative effects is not currently NEPA-compliant. The DIFR/EIS lacks information on specific past and future projects that may result in impacts to resources within the project area or that could directly affect the Federal project. A hard look at actions that may be undertaken by others is required. Another concern of the Panel is a lack of documentation of impacts to vulnerable populations (elderly, disabled, special needs) who may not be able to access non-structural measures without additional assistance. The general public, and certainly vulnerable populations, may not be able to access the voluntary non-structural measures because of the highly complex nature, and sometimes the expense, of the process. Finally, the Panel believes that the environmental impacts may be underestimated at this early stage of analysis, potentially affecting project acceptance, schedule, and cost. There are schedule and cost risks associated with performing environmental studies at a later time, as well as the risk that the public or natural resource agencies may not find the TSP, or portions of it, acceptable. Because site-specific, detailed studies will not be performed until the pre-construction engineering and design (PED) phase, the discussion in the DIFR/EIS and its appendices underemphasizes the potential risks of schedule delays, cost increases, and public/agency acceptance of site-specific project elements.

Table ES-1. Overview of 18 Final Panel Comments Identified by the Collier County CSRM IEPR Panel

No.	Final Panel Comment
Significance – Medium/High	
1	The TSP in the DIFR/EIS was selected based primarily on benefits calculated by models dependent on first-floor elevation data with uncertain accuracy, potentially resulting in over- or understated benefits.
2	The engineering assumptions regarding interior drainage do not consider actual conditions and real-world scenarios found in the study area.
3	Estimated sand borrow quantities may not be sufficient for the proposed project.
4	The one-year construction schedule per planning area to address non-structural measures seems optimistic given that there are over 1,000 buildings to consider and that participation would be voluntary.
5	The land-loss benefits are likely underestimated due to the questionable assumption that base rates derived from the Norfolk, Virginia, area are representative of the Collier County real estate market.
Significance – Medium	
6	The extent of potential impacts to real estate and recreation is unclear due to limited information on the estimated T-wall ROW in this highly urbanized area.
7	Erosion protection of floodwalls is not fully discussed and evaluated in the DIFR/EIS documents, which could affect the project costs.
8	The DIFR/EIS does not document the limitations of the SBEACH model calibration regarding shoreline storm response, particularly with respect to the impact of LST on shoreline profiles.
Significance – Medium/Low	
9	The economic analysis does not fully address the uncertainty and residual risk associated with the potential for loss of life after TSP implementation.
10	The DIFR/EIS does not explain how the number of structures used to calculate storm risk reduction benefits for non-structural measures was determined, given that participation would be voluntary.

Table ES-1. Overview of 18 Final Panel Comments Identified by the Collier County CSRM IEPR Panel (continued)

No.	Final Panel Comment
Significance – Medium/Low (continued)	
11	Appendix B does not document whether historical wave data from nearby Wave Information Studies (WIS) stations were used to verify or validate the calibration of the SBEACH model's significant wave height (H_s) estimated from an empirical equation.
12	The Hydrologic Engineering Center - River Analysis System (HEC-RAS) analysis does not appear to assess the risk of loss of life or property damage resulting from floodwater velocities in interior areas.
13	The DIFR/EIS does not address the timeframe or resources needed to construct, deploy, and then operate 62 gate closures to block roads during an impending storm event.
14	The methodology used to evaluate cumulative effects is not currently NEPA-compliant considering the incompleteness of many studies and the significant data gaps.
15	The ability of vulnerable populations to access non-structural measures without additional technical or financial assistance is not adequately discussed in the DIFR/EIS.
16	Environmental impacts may be underestimated because required studies have not yet been performed, potentially affecting project acceptance, schedule, and cost.
Significance – Low	
17	Assumptions regarding the interest during construction (IDC) are not documented in the DIFR/EIS.
18	Appendix B does not explain the selection of a 3-foot cutoff point for significant wave heights for extra-tropical storms.

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LIST OF ACRONYMS

ACES	Automated Coastal Engineering System
ADM	Agency Decision Milestone
ASCE	American Society of Civil Engineers
ATR	Agency Technical Review
BCR	Benefit-to-Cost Ratio
CMS	Coastal Modeling System
COI	Conflict of Interest
CSRM	Coastal Storm Risk Management
DIFR/EIS	Draft Integrated Feasibility Report/Environmental Impact Statement
DMMP	Dredge Material Management Plan
DrChecks	Design Review and Checking System
EC	Engineer Circular
ER	Engineer Regulation
ERDC	Engineer Research and Development Center
ESA	Environmental Site Assessments
FEMA	Federal Emergency Management Agency
ft^2/s	Square Foot per Second
FWCA	Fish and Wildlife Coordination Act
G2CRM	Generation 2 Coastal Risk Management (model)
H&H	Hydrology and Hydraulics
HEC-HMS	Hydrologic Engineering Center - Hydrologic Modeling System
HEC-RAS	Hydrologic Engineering Center - River Analysis System
H_s	Significant Wave Height
ICA	Incremental Cost Analysis
IDC	Interest During Construction
IEPR	Independent External Peer Review
IWR	Institute for Water Resources
LIDAR	Light Detection and Ranging
LST	Longshore Sediment Transport
LSU	Louisiana State University

m/s	Meters per Second
NEPA	National Environmental Policy Act
NSI	National Structural Inventory
OEO	Outside Eligible Organization
OMB	Office of Management and Budget
OMNR	Ontario Ministry of Natural Resources
PCX	Planning Center of Expertise
PDT	Project Delivery Team
PED	Pre-construction Engineering and Design
ROW	Right of Way
SAR	Safety Assurance Review
SLR	Sea Level Rise
TSP	Tentatively Selected Plan
UNF	University of North Florida
USACE	United States Army Corps of Engineers
USBR	United States Bureau of Reclamation
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
UNSW	University of New South Wales
WIS	Wave Information Studies
WRL	Water Research Laboratory (UNSW, Australia)
WVA	Wetlands Value Assessment

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1. INTRODUCTION

Collier County is located on the southwest coast of Florida, approximately 120 miles south of the entrance to Tampa Bay and 100 miles north of Key West. Naples, which is located along the shoreline, is the largest city in the county. Collier County comprises nearly 200 square miles of landmass and roughly 300 square miles of water. It is the largest county in Florida by land area and the fourth largest by total area (land and water). The estimated population for 2017 was nearly 373,000, which includes a dense population of people who require more time and assistance for evacuation. A large portion of the southeast section of the county lies within the Big Cypress National Preserve, and the southern coastal section of the county is home to parts of Everglades National Park.

There is a high risk of coastal storms causing significant damage to shorefront and inland bay area development in Collier County. The area is densely developed with a mix of residential, commercial, and recreational uses. During Hurricane Irma in September 2017, the area experienced damage to existing development, but if the storm track had been perpendicular to the coastline, then the damage would have been significantly worse. The proposed Coastal Storm Risk Management (CSRM) project could take the form of widening the existing beaches, raising existing dunes, constructing seawalls, offering buyouts, floodproofing, or any possible combination of CSRM risk reduction measures that meet study objectives.

The study area includes all land and water resources reasonably deemed to be within the vicinity of Vanderbilt, Park Shore, and Naples beaches and inland bay areas, as well as Marco Island, provided they are located entirely within the jurisdictional boundary of Collier County, Florida. The study area comprises two main components: the North County and Marco Island. These two areas are geographically noncontiguous and hydrologically separable; however, they were formulated using the same strategy and management measures. There is dense development in the study area, and it is anticipated the Federal interest in a CSRM project will be justified. The non-Federal sponsor is interested in developing and improving the beach areas to provide protection of adjacent structures and critical infrastructure.

Independent, objective peer review is regarded as a critical element in ensuring the reliability of scientific analysis. The objective of the work described here was to conduct an Independent External Peer Review (IEPR) of the Collier County Coastal Storm Risk Management Feasibility Study (hereinafter: Collier County CSRM IEPR) in accordance with procedures described in the Department of the Army, U.S. Army Corps of Engineers (USACE), Engineer Circular (EC) *Review Policy for Civil Works* (EC 1165-2-217) (USACE, 2018) and the Office of Management and Budget (OMB), *Final Information Quality Bulletin for Peer Review* (OMB, 2004). Supplemental guidance on evaluation for conflicts of interest (COIs) was obtained from the *Policy on Committee Composition and Balance and Conflicts of Interest for Committees Used in the Development of Reports* (The National Academies, 2003).

This final report presents the Final Panel Comments of the IEPR Panel (the Panel) on the existing engineering, economic, environmental, and plan formulation analyses contained in the Collier County CSRM IEPR documents (Section 4). Appendix A describes in detail how the IEPR was planned and conducted, including the schedule followed in executing the IEPR. Appendix B provides biographical information on the IEPR panel members and describes the method Battelle followed to select them. Appendix C presents the final charge to the IEPR panel members for their use during the review; the final charge was submitted to USACE in the final Work Plan according to the schedule listed in Table A-1.

Appendix D presents the organizational COI form that Battelle completed and submitted to the Institute for Water Resources (IWR) prior to the award of the Collier County CSRM IEPR.

2. PURPOSE OF THE IEPR

To ensure that USACE documents are supported by the best scientific and technical information, USACE has implemented a peer review process that uses IEPR to complement the Agency Technical Review (ATR), as described in USACE (2018).

In general, the purpose of peer review is to strengthen the quality and credibility of the USACE decision documents in support of its Civil Works program. IEPR provides an independent assessment of the engineering, economic, environmental, and plan formulation analyses of the project study. In particular, the IEPR addresses the technical soundness of the project study's assumptions, methods, analyses, and calculations and identifies the need for additional data or analyses to make a good decision regarding implementation of alternatives and recommendations.

In this case, the IEPR of the Collier County CSRM was conducted and managed using contract support from Battelle, which is an Outside Eligible Organization (OEO) (as defined by EC 1165-2-217). Battelle, a 501(c)(3) organization under the U.S. Internal Revenue Code, has experience conducting IEPRs for USACE.

3. METHODS FOR CONDUCTING THE IEPR

The methods used to conduct the IEPR are briefly described in this section; a detailed description can be found in Appendix A. The IEPR was completed in accordance with established due dates for milestones and deliverables as part of the final Work Plan; the due dates are based on the award/effective date and the receipt of review documents.

Battelle identified, screened, and selected four panel members to participate in the IEPR based on their expertise in the following disciplines: planning formulation/economics; environmental law compliance; hydrology, hydraulic, and coastal engineering; and geotechnical engineering. The Panel reviewed the Collier County CSRM documents and produced 18 Final Panel Comments in response to 16 charge questions provided by USACE for the review. This charge also included two overview questions and one public comment question added by Battelle, for a total of 19 questions. Battelle instructed the Panel to develop the Final Panel Comments using a standardized four-part structure:

1. Comment Statement (succinct summary statement of concern)
2. Basis for Comment (details regarding the concern)
3. Significance (high, medium/high, medium, medium/low, or low; in accordance with specific criteria for determining level of significance)
4. Recommendation(s) for Resolution (at least one implementable action that could be taken to address the Final Panel Comment).

Battelle reviewed all Final Panel Comments for accuracy, adherence to USACE guidance (EC 1165-2-217), and completeness prior to determining that they were final and suitable for inclusion in the Final IEPR Report. There was no direct communication between the Panel and USACE during the preparation of the Final Panel Comments. The Panel's findings are summarized in Section 4.1; the Final Panel Comments are presented in full in Section 4.2.

4. RESULTS OF THE IEPR

This section presents the results of the IEPR. A summary of the Panel's findings and the full text of the Final Panel Comments are provided.

4.1 Summary of Final Panel Comments

The panel members agreed on their "assessment of the adequacy and acceptability of the economic, engineering, and environmental methods, models, and analyses used" (USACE, 2018) in the Collier County CSRM IEPR review documents. The following summarizes the Panel's findings.

The Panel noted that a number of benefits and impacts remain to be identified, clarified, and addressed. The Final Panel Comments provided by the Panel take into account USACE's statements that the Draft Integrated Feasibility Report/Environmental Impact Statement (DIFR/EIS) is based on a 10 percent design. The Panel recognized that once additional details regarding the project have been determined, USACE will conduct the appropriate modeling and impact analyses to complete an assessment that complies with all USACE guidance and National Environmental Policy Act (NEPA) requirements as noted throughout the documents.

Based on the Panel's review, the DIFR/EIS is well-written, is concise, and provides excellent supporting documentation on engineering, environmental, economic, and plan formulation issues. The report provided a balanced assessment of the economic, engineering, and environmental issues of the overall project; however, the Panel identified several elements of the report that should be clarified or revised.

Plan Formulation/Economics: The decision document addresses a very complex coastal storm risk problem by developing and evaluating alternatives intended to increase coastal resiliency against both erosion and flooding. USACE did a skillful job of formulating and evaluating alternatives that included structural and non-structural measures and selecting a tentative plan that manages coastal storm risk and maximizes benefits in Collier County, Florida. However, the Panel observed that the models used in the study analysis relied upon first-floor elevation data with uncertain accuracy, potentially resulting in over- or understated benefits from this analysis. Given the flat topography within the project area, differences in elevation of tenths of a foot could mean large changes in benefits or impacts of the project. The Panel also believes that the calculated land-loss benefits are underestimated due to the use of land values derived from the Norfolk, Virginia, area instead of the Collier County real estate market. Given that both of these items potentially impact the assessment of the calculated benefits, the use of accurate data is important to ensure the overall accuracy of the benefit-to-cost ratio (BCR) calculated for each alternative.

Engineering: The DIFR/EIS summarizes a large amount of existing engineering-related background data and information. During its review, the Panel noted that application of the EurOtop 2018 software, in addition to the Automated Coastal Engineering System (ACES) software, for wave overtopping analysis increased the reliability of the results. However, several concerns that could lead to increased project costs or scheduling delays were identified.

USACE used the SBEACH model to estimate the cross-shore sediment transport and beach profiles. The Panel noted that SBEACH does not account for longshore sediment transport (LST), a point that was reiterated by local coastal and marine professionals in the public comments. Therefore, the Panel is concerned that the impacts to some shoreline profiles from LST are underestimated. The Panel also noted that the engineering assumptions for interior drainage do not consider actual conditions and real-world scenarios found in the study area, which could result in underestimated pump station sizing. The

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The Panel also noted that the approximate one-year construction schedule per planning area to address non-structural measures may be overly optimistic given the number of buildings (1,000 or more) to be addressed through a voluntary participation process. In addition, the Panel identified a concern regarding the amount of detail provided for the construction, implementation, and operation of about 62 gate closure structures planned as part of the Tentatively Selected Plan (TSP).

Environmental: The environmental documentation was found to be well organized and well written. However, given the limited information provided, the Panel believes that the methodology used to evaluate cumulative effects is not currently NEPA-compliant. The DIFR/EIS lacks information on specific past and future projects that may result in impacts to resources within the project area or that could directly affect the Federal project. A hard look at actions that may be undertaken by others is required. Another concern of the Panel is a lack of documentation of impacts to vulnerable populations (elderly, disabled, special needs) who may not be able to access non-structural measures without additional assistance. The general public, and certainly vulnerable populations, may not be able to access the voluntary non-structural measures because of the highly complex nature, and sometimes the expense, of the process. Finally, the Panel believes that the environmental impacts may be underestimated at this early stage of analysis, potentially affecting project acceptance, schedule, and cost. There are schedule and cost risks associated with performing environmental studies at a later time, as well as the risk that the public or natural resource agencies may not find the TSP, or portions of it, acceptable. Because site-specific, detailed studies will not be performed until the pre-construction engineering and design (PED) phase, the discussion in the DIFR/EIS and its appendices underemphasizes the potential risks of schedule delays, cost increases, and public/agency acceptance of site-specific project elements.

4.2 Final Panel Comments

This section presents the full text of the Final Panel Comments prepared by the IEPR panel members.

Final Panel Comment 1

The TSP in the DIFR/EIS was selected based primarily on benefits calculated by models dependent on first-floor elevation data with uncertain accuracy, potentially resulting in over- or understated benefits.

Basis for Comment

Inaccurate first-floor elevation data in a coastal area with such flat topography could yield very small differences in elevation that result in very large differences in project benefits. Differences in elevation of tenths of a foot could mean that large segments of the entire structure inventory in the study area are benefited (or not benefited) by the project.

Appendix C, Economics Appendix, Section 1.7.9.3, states "There are two sources of uncertainty surrounding the first floor elevations: the use of the 3m, or 10ft National Elevation Dataset, dated December 2017, and the use of parcel data, National Structural Inventory (NSI) Version 2 and Google Street View to determine the foundation heights above ground elevation. The error implicit in using [Light Detection and Ranging (LIDAR)] data is normally distributed with a mean of zero and a standard deviation of 0.377 feet. The error implicit in the use of parcel data is also normally distributed with a mean of zero and a standard deviation of 0.5 feet for residential structures…" (pages C-22 and C-23).

The first-floor elevation project evaluation data used in the study analyses are based on elevation certificates for 10 percent of the structure inventory, with the remaining 90 percent of the structure inventory elevation data coming from the NSI (Appendix A, Plan Formulation Appendix, Table 1, page A-3). The NSI Version 2 (NSI2) data used (NSI, 2019) are the "Base" level of quality, since the "High" level of quality data are not yet available. As stated in NSI2: "Base data has quality issues, but provides a consistent dataset characterized by nationally appropriate data sources and assumptions. For regional analyses, users should review the Base data for quality assurance prior to use."

Significance – Medium/High

The sensitivity of the BCR to the accuracy of the first-floor elevation data could significantly impact the technical quality of the analysis presented in the decision documents.

Recommendation for Resolution

1. Conduct elevation surveys of a sample of the structures in the structure inventory to confirm the degree of accuracy of the first-floor elevation data used as input for the models in the analysis prior to the PED phase.

Literature Cited:

National Structural Inventory Version 2 (2019). Hydrologic Engineering Center/NSI database. Available at https://github.com/HydrologicEngineeringCenter/NSI#overview-of-the-national-structure-inventory. March. Accessed October 2, 2020.

Final Panel Comment 2

The engineering assumptions regarding interior drainage do not consider actual conditions and real-world scenarios found in the study area.

Basis for Comment

Estimates of interior drainage quantity are important when determining the appropriate pump station size and configuration. The engineering assumptions regarding interior drainage may need to be re-evaluated. The Hydrologic Engineering Center – Hydrologic Modeling System (HEC-HMS) simulations completed for the DIFR/EIS utilize the United States Department of Agriculture (USDA) Curve Number Method to estimate runoff quantity and timing. Most of the land area was assigned a hydrologic soil group "A," which would be well-drained and allow for much infiltration. However, the Panel's experience in South Florida is that many of these soils actually are water-logged during the wet season, so a group "D" designation would be a better assumption. Under this assumption, estimated runoff would be considerably higher using the Curve Number Method. In addition, besides direct runoff generated from rain events, groundwater seepage must also be considered in the interior drainage estimates due to the presence of highly transmissive sand and limestone close to ground surface. Surface water/groundwater interaction must be evaluated since seepage beneath floodwalls that terminate above the various limestone layers will likely occur within the limestone layers.

Significance – Medium/High

The size of the pump stations designed to remove interior drainage may be underestimated, which could result in increased project costs and schedule delays.

Recommendations for Resolution

1. Revise HEC-HMS model simulations as necessary to incorporate "D" type soils where appropriate.
2. Conduct an analysis of potential seepage beneath the floodwalls to determine the magnitude of induced seepage flowing into the protected area that must be removed by interior pump stations.
3. Revise pump station sizes as necessary to account for increased pumping quantities in order to provide adequate interior drainage.
4. Revise project cost estimates to include larger pump stations as required.

Final Panel Comment 3

Estimated sand borrow quantities may not be sufficient for the proposed project.

Basis for Comment

A major assumption is that enough suitable sand material would be available for beach construction and subsequent renourishment over 50 years. Collier County states that at least 10 million cubic yards should be available in borrow area T1 along with an expanded T1 area and borrow area T2. However, the needs for the project greatly exceed that amount (see Appendix B, Engineering Appendix, Table 5.14), which indicates a potential risk of material shortfall. A shortfall may also indicate a change to the overall project cost.

Significance – Medium/High

Project implementation could be hindered if sufficient sand borrow is not available, resulting in potential cost implications and schedule delays.

Recommendations for Resolution

1. Demonstrate that the required TSP sand borrow areas and other possible sand source areas (e.g., navigation channel shoals, sand quarries) are available to support the anticipated project needs.
2. Discuss the proposed explorations and evaluations that will be completed in the PED phase to reduce the risk of possible material shortfall.
3. Consider revising the cost estimate contingency percentage for the shore protection portions of the project.

Final Panel Comment 4

The one-year construction schedule per planning area to address non-structural measures seems optimistic given that there are over 1,000 buildings to consider and that participation would be voluntary.

Basis for Comment

Section 6.15.5 of the DIFR/EIS applies a construction schedule for non-structural measure modifications that assumes completion within one year per planning area, even though the number of structures to be considered is different for each area. Appendix G, Non-Structural Implementation Plan, indicates that a 5-year period for all non-structural measure modifications would be appropriate. In addition, since participation is voluntary and each homeowner may have to remove asbestos or other items to be eligible for the program, one year for the larger planning areas may be too short.

Significance – Medium/High

The assumed duration of construction for non-structural measures may be underestimated, which may result in increased project costs and schedule delays.

Recommendations for Resolution

1. Revise the assumed construction schedule in the DIFR/EIS for non-structural measures, with strong consideration given to planning areas with the largest number of structures to be modified.
2. Revise the project construction cost estimate as required.

Final Panel Comment 5

The land-loss benefits are likely underestimated due to the questionable assumption that base rates derived from the Norfolk, Virginia, area are representative of the Collier County real estate market.

Basis for Comment

Appendix C, Economics Appendix (Section 3.3.6, Land Loss Benefits) states: "As the second component of the land-loss benefits calculation, ER 1105-2-100 instructs that nearshore land values be used to estimate the value of land lost." (page C-101). Per USACE's oral and written responses to a mid-review Panel question, a nearshore land value of $12.42 per square foot, estimated from the Norfolk, Virginia, CSRM study, was used for the analysis, since real estate specialists for Collier County did not have available data on vacant lot sales.

USACE also noted in its responses to mid-review Panel questions that the Pinellas County, Florida, CSRM study (north of Collier County) estimated the nearshore land value to be $90 per square foot, over seven times higher than the Norfolk value. Based on that analysis, the use of the $12.42-per-square-foot nearshore land value understates the land-loss benefits calculation for Collier County.

Significance – Medium/High

Understating the nearshore land value for Collier County in the calculation of land-loss benefits likely distorts the analysis outcomes from land loss.

Recommendation for Resolution

1. Conduct a nearshore land value study for Collier County, Florida, or use values from an area more representative of the Collier County, Florida, real estate market, prior to the PED phase.

Final Panel Comment 6

The extent of potential impacts to real estate and recreation is unclear due to limited information on the estimated T-wall ROW in this highly urbanized area.

Basis for Comment

While the Appendix B, Engineering Appendix (Structural Engineering Sub-Appendix), appears mostly complete for a 10% engineering design effort, it would be useful to develop T-wall ROW maps for the TSP. The construction ROW for the larger T-wall sections may be 40 to 50 feet wide. And, since the T-walls would be placed in highly urbanized areas, many homes would probably have to be acquired. It is not clear if the real estate estimates include these homes in the acquisition estimate or if they are accounted for in the project cost estimate. In addition, there is no discussion or estimate of the number of homes that would be disconnected from recreational dock structures. Where this will be necessary, USACE would need to provide homeowner access. This issue does not appear to be discussed in the DIFR/EIS.

Significance – Medium

The issue of T-wall ROW is not likely to affect the final project justification, but it may affect project costs.

Recommendations for Resolution

1. Include further discussion of the T-wall construction ROW needs in Appendix B.
2. Prepare more detailed ROW maps along T-wall alignments to assess property acquisition requirements in these areas.
3. Discuss recreational dock access for those properties that might not need to be acquired but may be cut off from water access due to T-wall construction.

Final Panel Comment 7

Erosion protection of floodwalls is not fully discussed and evaluated in the DIFR/EIS documents, which could affect the project costs.

Basis for Comment

Many of the anticipated floodwalls included in the TSP appear to be susceptible to erosion. It is possible that an extreme storm event, with increased wind speeds and large waves, would cause erosion of the foundation of the floodwalls until they collapsed. Modeling efforts should consider what this trigger point may be. Measures such as armoring to minimize soil erosion may reduce this risk, but such measures were only mentioned briefly in Appendix B, Engineering Appendix.

Significance – Medium

Possible erosion that could occur under the current floodwall conceptual design could influence the ability to implement the TSP.

Recommendations for Resolution

1. Provide an expanded section in the geotechnical or civil engineering portions of Appendix B that discusses conceptual armor design for the T-wall sections.
2. Update the T-wall cost estimate and construction schedule as required.

Final Panel Comment 8

The DIFR/EIS does not document the limitations of the SBEACH model calibration regarding shoreline storm response, particularly with respect to the impact of LST on shoreline profiles.

Basis for Comment

According to Section 3.7, "Sediment Transport", of Appendix B (Engineering Appendix), shoreline erosion and accretion due to littoral drift (predominantly southward) seem to have a significant role in the sediment budget at several shoreline locations (see Figure 3.22 of Appendix B). Therefore, LST must have been a factor in shaping the beach profiles before or after any hurricane.

However, the SBEACH model was used to estimate the cross-shore sediment transport (Appendix B, Section 5.4.1.4, subsection SBEACH Methodology) and beach profile. Appendix B states that information from Hurricane Irma and "pre- and post-storm shoreline profiles…obtained from Collier County Monitoring Surveys" (Section 5.4.1.4, subsection SBEACH Calibration) were used to calibrate SBEACH. Appendix B (Section 5.4.1.4, subsection SBEACH Methodology) also states that the 2-D model SBEACH does not include "longshore wave, current, and sediment transport processes." Therefore, it appears that shoreline profiles with LST influence were used to calibrate a model which ignores LST.

It is worth mentioning that a public comment from two Coastal and Marine professionals (Dr. M. Savarese and Dr. F. Jose, faculty members at Florida Gulf Coast University) with local knowledge reflects a similar concern because the use of the SBEACH model has ignored the significant LST along the shoreline simulated.

"Historical" and "calibrated" erosion rates for the model reaches of North County beaches are given in Table 5.11 of Appendix B (subsection Applied Shoreline Changes), and a few of the profiles evaluated during the calibration are shown in Figure 5.27. However, for any model calibration and validation, various goodness-of-fit statistics (e.g., coefficient of determination, cross correlation coefficient) typically are presented to demonstrate the ability of the model to make reliable predictions. These statistics are not presented in Appendix B.

Significance – Medium

The use of shoreline profiles with LST influence to calibrate a model which ignores LST may have led to large approximations at the 10% design stage presented in Appendix B.

Recommendations for Resolution

1. Describe the impact of such model calibration on the accuracy of the analysis of the shoreline storm response, in order to show that, in the context of the present 10% design study, the use of shoreline data with LST influence for calibration of a model which ignores LST is justified.
2. Provide goodness-of-fit statistics for the calibration/validation efforts for the SBEACH model.

Final Panel Comment 9

The economic analysis does not fully address the uncertainty and residual risk associated with the potential for loss of life after TSP implementation.

Basis for Comment

Appendix C, Economics Appendix, correctly describes the flood risk that would remain in the study area after TSP implementation by identifying the economic damages the design level of protection project would (and would not) prevent. The discussion (Section 5.3, Residual Risk, page C-118) indicates that residual risk includes the consequence of capacity exceedance but does not address the potential for loss of life.

With respect to social effects (considering community "systems"), residual risk for loss of life from capacity exceedance is not explained, and no plan is presented to convey the remaining risk to the public. The public could easily misunderstand the level of protection afforded by a significant USACE storm damage reduction project, and individuals may make decisions based on a false confidence if the risks of loss of life from capacity exceedance are not clearly communicated.

Significance – Medium/Low

Including potential loss of life in the analysis of residual risk would increase the completeness and understanding of the economic analysis.

Recommendation for Resolution

1. Develop and include in the decision documents language clearly explaining residual risk to the public for potential loss of life from capacity exceedance.

Final Panel Comment 10

The DIFR/EIS does not explain how the number of structures used to calculate storm risk reduction benefits for non-structural measures was determined, given that participation would be voluntary.

Basis for Comment

The Draft IFR/EIS main report (Section 7.5, Implementation of the Selected Plan, page 243) states that "Participation in elevation and floodproofing as recommended in the authorized plan is voluntary." Calculating storm risk reduction benefits for the non-structural measures without knowing the number of structures that would voluntarily participate in elevation and floodproofing is likely to result in a miscalculation of such benefits.

Significance – Medium/Low

Without a description of how the number of structures used to calculate the storm risk reduction benefits from non-structural measures was determined, the report (and, more specifically, the understanding of how the TSP was identified) is incomplete.

Recommendation for Resolution

1. Provide the number of structures used in the non-structural benefit calculations under each alternative and document how the numbers were determined.

Final Panel Comment 11

Appendix B does not document whether historical wave data from nearby Wave Information Studies (WIS) stations were used to verify or validate the calibration of the SBEACH model's significant wave height (H_s) estimated from an empirical equation.

Basis for Comment

Appendix B, Section 5.4.1.4, subsection SBEACH Methodology, uses empirical equations to estimate H_s and the dominant wave period, T_p, as needed for calibration of the SBEACH model. The equations use the maximum hurricane speed, U_{max} in meters per second (m/s), as the main variable.[1] The equations calculate estimates for H_s and T_p of hurricane waves in deep water. However, the report does not make appropriate use of the historical wave data of the nearby WIS stations (Figure 3.1 of Appendix B) to estimate H_s from the actual statistics or to show how the results from the empirical equation compare with the prediction based on the actual statistic (e.g., with Figure 3.5 on page 25 of Appendix B).

Significance – Medium/Low

The unstated magnitude chosen for U_{max}, combined with the fact that the H_s value was not compared with the results of a statistical analysis of the actual historical wave data, may have resulted in a misrepresentation of the estimated significant wave height, H_s.

Recommendation for Resolution

1. Give the value of U_{max} used in the empirical equation and show how the estimate for H_s is close enough to that resulting from the actual wave statistics (such as those shown in Figure 3.5 of Appendix B).

[1] These equations are mistakenly attributed in the Engineering Appendix to Maynord et al. (2011). They are actually adopted from Young (1988) and USACE's 1984 Shore Protection Manual [cited in Appendix B]. The Panel does not consider this editorial error to be consequential.

Literature Cited:

Young, I.R. (1988). Parametric Hurricane Wave Prediction Model, Journal of Waterway, Port, Coastal, and Ocean Engineering, ASCE, Vol. 114 (5). September.

Final Panel Comment 12

The Hydrologic Engineering Center–River Analysis System (HEC-RAS) analysis does not appear to assess the risk of loss of life or property damage resulting from floodwater velocities in interior areas.

Basis for Comment

Peak elevations from the 100-year events were used as boundary conditions in the HEC-RAS simulations for the interior areas (Appendix B, Section 7.4, HEC-RAS Results), and the simulated water elevations are reported. Figures 7.3 to 7.6 show the reduction in flooding provided by the structural measures. However, it should be noted that water velocities, in addition to water levels, are of concern for urban floods. For example, according to a rule of thumb (the so-called "3 x 3 rule" based on a 3-foot depth and 3 feet per second velocity values), people would be at risk if the product of the velocity and the depth exceeded 9 square feet per second (ft^2/s) for only a couple of hours (USACE, 1998; OMNR, 2002). In addition, Federal Emergency Management Agency (FEMA) recommendations for various degrees of protection (Low, Moderate, High) for building utility systems exposed to flood damages depend on a combination of flood depths and flood velocities (FEMA, 2017). The velocities resulting from the HEC-RAS modeling are not reported in the DIFR/EIS or in Appendix B.

Several public comments (e.g., those by Victor Tommarchi, June Kelley, and Peter J. Hill) have emphasized the risk of flooding due to rain in specific interior areas, seeking assurance that their properties are protected against rain-induced flooding which occasionally coincides with wave-induced storms.

Significance – Medium/Low

HEC-RAS simulations that do not assess the safety of people and properties under the combined impact of flood levels and velocities may underestimate the potential for loss of life or property damage.

Recommendations for Resolution

1. Report maximum velocities around sensitive residential areas or near structures (roads, etc.) that are prone to erosion for the interior areas.
2. Discuss the implications of the combination of flood levels and floodwater velocities for both life safety and property damage for the sensitive areas and erosion-prone structures identified.
3. Add a more detailed discussion of Figures 7.3 through 7.6 of Appendix B that takes into account the context of safety.

Literature Cited

FEMA (2017). Protecting Building Utility Systems from Flood Damage: Principles and Practices for the Design and Construction of Flood Resistant Building Utility Systems. Federal Emergency Management Agency (FEMA) P-348, Edition 2. February. Available at https://www.fema.gov/media-library-

data/1489005878535-dcc4b360f5c7eb7285acb2e206792312/FEMA_P-348_508.pdf. Accessed September 17, 2020.

OMNR (2002). River & Stream Systems: Flooding Hazard Limit. Technical Guide. Ontario Ministry of Natural Resources, Water Resources Section, Peterborough, Ontario. Available at http://www.renaud.ca/public/Environmental-Regulations/MNR%20Technical%20Guide%20Flooding%20Hazard%20Limit.pdf. Accessed September 17, 2020.

USACE (1998). Flood Proofing Performance: Successes & Failures. Omaha District, Public Affairs Office, USACE Digital Library. Available at https://usace.contentdm.oclc.org/digital/collection/p16021coll11/id/357/. Accessed September 17, 2020.

Final Panel Comment 13

The DIFR/EIS does not address the timeframe or resources needed to construct, deploy, and then operate 62 gate closures to block roads during an impending storm event.

Basis for Comment

Under the TSP, up to 62 road closure structures may need to be constructed, deployed, and subsequently operated during an impending storm event. Some details regarding the proposed road closures are provided in Section 5.5.2 of Appendix B, Engineering Appendix. Based on the Panel's experience with similar projects throughout the United States, the number of road closure structures seems high, potentially requiring a large number of local sponsor resources to operate. While Appendix B provides potential engineering specifications for construction, it does not explain how long it would take, and what resources are required, to deploy and then operate the 62 gate closure structures when it is necessary to engage them.

Significance – Medium/Low

Because detailed information regarding the construction, deployment, and operation of road closure structures is not provided, the feasibility of implementation could not be assessed.

Recommendations for Resolution

1. Add further discussion of the anticipated deployment and operation of the proposed road closure structures to Appendix B.
2. Include a discussion in Appendix B that describes the expectations of the local sponsor in the ultimate deployment and operation of the closure structures.

Final Panel Comment 14

The methodology used to evaluate cumulative effects is not currently NEPA-compliant considering the incompleteness of many studies and the significant data gaps.

Basis for Comment

Cumulative effects are defined by Code of Federal Regulations, Title 40, Part 1508.7 as: "The impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such actions." Cumulative impacts can result from individually minor, but collectively significant, actions performed by other agencies or individuals taking place over a period of time.

The DIFR/EIS considers cumulative effects very briefly and very broadly; there is no specific list or discussion of past or future projects, nor are there examples/types of projects that could affect (positively or adversely) the Federal project (i.e., the TSP). The DIFR/EIS also does not discuss potential adverse or beneficial effects that the Federal project could have regionally on existing, planned, or ongoing efforts that could work in concert with the project. Mitigation of cumulative effects is also not discussed.

The cumulative effects analysis mandated by the NEPA requires a more comprehensive "hard look" inclusive of actions that may be undertaken by others. This analysis requires some recognition of and envisioning of future actions, or even types of actions, that may be undertaken in the project area unrelated to, but potentially affected by, the TSP.

Significance – Medium/Low

A cumulative effects analysis that addresses the incremental impact under the TSP that would result when combined with other past, present, and reasonably foreseeable future actions would provide the level of analysis required to comply with NEPA.

Recommendations for Resolution

1. Include a more comprehensive list of reasonably foreseeable future actions (based on known future or ongoing projects, planned and proposed projects, and past/predicted regional and local patterns) that may be undertaken in the project area.
2. Forecast and provide a general discussion of the potential cumulative effects, both adverse and positive, that the TSP may have on those types of activities or actions, as well as the potential effects that those activities may have on the TSP itself.
3. Describe any anticipated measures to mitigate adverse cumulative effects, including those that may be adverse under the TSP.

Literature Cited:

Code of Federal Regulations, Title 40, Protection of Environment, Chapter V: Council on Environmental Quality. CFR §§1500-1508.

Final Panel Comment 15

The ability of vulnerable populations to access non-structural measures without additional technical or financial assistance is not adequately discussed in the DIFR/EIS.

Basis for Comment

The proposed non-structural measures may present obstacles for some portions of the population in the project area. Some of the requirements for participation are onerous, and some of the permanent relocations are mandatory. The general public, and certainly vulnerable populations, may not be able to access the voluntary non-structural measures because of the highly complex nature, and sometimes the expense, of the process. If homeowners or business owners are not able to navigate the requirements, the benefits calculated for the non-structural measures will be fewer. As they stand, the project documents may present a false impression of projected overall project benefits.

Access to the non-structural benefits for vulnerable populations such as the elderly, disabled, and special needs is not described. For example, illiterate and elderly individuals may have difficulty navigating processes that require completion of forms (especially online) and performing steps they must take themselves to be eligible for the benefits, especially when costs are involved. Another example is the difficulty some individuals with special needs (immobility, illiteracy, low income) may have with making any type of claim (such as for relocation assistance) that requires completion of multiple forms or acquisition of an appraisal or environmental study to be considered for elevating their structure.

Significance – Medium/Low

A more comprehensive discussion describing vulnerable populations with respect to their potential inability to access or benefit from the non-structural measures would address NEPA compliance issues and ensure that benefits have not been overcalculated.

Recommendations for Resolution

1. Describe how the general public, and vulnerable populations, will be informed regarding the availability of non-structural measures, and how they will be assisted in performing the steps required to avail themselves of these benefits.

2. Describe how benefits were calculated considering that the non-structural measures may not be fully implemented.

Final Panel Comment 16

Environmental impacts may be underestimated because required studies have not yet been performed, potentially affecting project acceptance, schedule, and cost.

Basis for Comment

Environmental studies required to comply with NEPA will not be performed until the PED phase of the project. While potential impacts have been described in a general way, they cannot yet be fully assessed.

There are schedule and cost risks associated with performing these studies at a later time, as well as the risk that the public or natural resource agencies may not find the TSP, or portions of it, acceptable. NEPA requires a “hard look” at environmental impacts, including indirect or secondary effects. Because site-specific, detailed studies will not be performed until the PED phase, the discussion in the DIFR/EIS and its appendices underemphasizes the potential risks of schedule delays, cost increases, and public/agency acceptance of site-specific project elements.

Significance – Medium/Low

Environmental impacts may be underestimated, and the discussion of impacts may not be compliant with NEPA, potentially leading to schedule delays and additional cost of TSP implementation.

Recommendations for Resolution

1. Describe the risks associated with schedule delays and costs (e.g., for mitigation) should environmental effects be determined to be more complex and significant than expected.
2. Describe the risk to TSP implementation that could be associated with agency and public acceptance once the PED phase is completed.

Final Panel Comment 17

Assumptions regarding the interest during construction (IDC) are not documented in the DIFR/EIS.

Basis for Comment

In Appendix C, Economics Appendix, the only reference to IDC states: "…the cost of interest during construction (IDC) was calculated based on the estimated length of construction and added to each first cost to determine the investment cost of each alternative" (Section 4.1.1, Estimation of Costs, page C-111). No details of IDC calculations, such as length of construction and amounts added to each first cost, to determine the investment cost under each alternative are presented in the DIFR/EIS.

Significance – Low

This technical discrepancy is an accounting issue that could minimally influence the BCR, but it is not likely to influence the selection of the TSP.

Recommendation for Resolution

1. Provide the length of construction and amounts added to each first cost in the DIFR/EIS and/or Appendix C, and calculate the investment cost under each alternative.

Final Panel Comment 18

Appendix B does not explain the selection of a 3-foot cutoff point for significant wave heights for extra-tropical storms.

Basis for Comment

According to Section 5.4.1.3, Meteorological Driving Forces, of Appendix B (Engineering Appendix), extra-tropical storms are defined as those events which produce H_s greater than 2 meters (~6.5 feet). However, 3 feet is chosen as the criterion for the extra-tropical storms in the Gulf. As a result, 49 extra storms were identified, as shown in Figure 5.20, to be added to the "plausible storm dataset" for Beach-*fx* model application. The model randomly selects from the resulting storm dataset to estimate the changes in coastal morphology (Section 5.4.1.3, last paragraph). A cutoff point other than 3 feet would result in inclusion of storms different from the 49 extra storms. This method may impact the modeling outcome.

Significance – Low

The arbitrary choice of the cutoff point for the significant wave height may arbitrarily change the Beach-*fx* modeling outcome for estimation of coastal morphological changes.

Recommendation for Resolution

1. Justify or explain the choice of 3 feet to ensure that the modeling outcome is not overly sensitive to this number.

5. REFERENCES

Code of Federal Regulations, Title 40, Protection of Environment, Chapter V: Council on Environmental Quality. CFR §§1500-1508.

FEMA (2017). Protecting Building Utility Systems from Flood Damage: Principles and Practices for the Design and Construction of Flood Resistant Building Utility Systems. Federal Emergency Management Agency (FEMA) P-348, Edition 2. February. Available at https://www.fema.gov/media-library-data/1489005878535-dcc4b360f5c7eb7285acb2e206792312/FEMA_P-348_508.pdf. Accessed September 17, 2020.

National Structural Inventory Version 2 (2019). Hydrologic Engineering Center/NSI database. Available at https://github.com/HydrologicEngineeringCenter/NSI#overview-of-the-national-structure-inventory. March. Accessed October 2, 2020.

OMB (2004). Final Information Quality Bulletin for Peer Review. Executive Office of the President, Office of Management and Budget, Washington, D.C. Memorandum M-05-03. December 16.

OMNR (2002). River & Stream Systems: Flooding Hazard Limit. Technical Guide. Ontario Ministry of Natural Resources, Water Resources Section, Peterborough, Ontario. Available at http://www.renaud.ca/public/Environmental-Regulations/MNR%20Technical%20Guide%20Flooding%20Hazard%20Limit.pdf. Accessed September 17, 2020.

The National Academies (2003). Policy on Committee Composition and Balance and Conflicts of Interest for Committees Used in the Development of Reports. The National Academies (National Academy of Science, National Academy of Engineering, Institute of Medicine, National Research Council). May 12.

USACE (2018). Water Resources Policies and Authorities: Review Policy for Civil Works. Engineer Circular (EC) 1165-2-217. Department of the Army, U.S. Army Corps of Engineers, Washington, D.C. February 20.

USACE (2000). Planning – Planning Guidance Notebook. Engineer Regulation (ER) 1105-2-100. Department of the Army, U.S. Army Corps of Engineers, Washington, D.C. April 22.

USACE (1998). Flood Proofing Performance: Successes & Failures. Omaha District, Public Affairs Office, USACE Digital Library. Available at https://usace.contentdm.oclc.org/digital/collection/p16021coll11/id/357/. Accessed September 17, 2020.

Young, I.R. (1988). Parametric Hurricane Wave Prediction Model, Journal of Waterway, Port, Coastal, and Ocean Engineering, ASCE, Vol. 114 (5). September.

APPENDIX A

IEPR Process for the Collier County CSRM Project

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A.1 Planning and Conduct of the Independent External Peer Review (IEPR)

Table A-1 presents the major milestones and deliverables of the Independent External Peer Review (IEPR) of the Collier County Coastal Storm Risk Management Feasibility Study (hereinafter: Collier County CSRM IEPR). Due dates for milestones and deliverables are based on the award/effective date listed in Table A-1. The review documents were provided by U.S. Army Corps of Engineers (USACE) on July 30, 2020. Note that the actions listed under Task 6 occur after the submission of this report. Battelle anticipates submitting the pdf printout of the USACE's Design Review and Checking System (DrChecks) project file (the final deliverable) on December 10, 2020. The actual date for contract end will depend on the date that all activities for this IEPR are conducted and subsequently completed.

Table A-1. Major Milestones and Deliverables of the Collier County CSRM IEPR

Task	Action	Due Date
1	Award/Effective Date	1/15/2020
	Review documents available	7/30/2020
	Public comments available	9/21/2020
	Battelle submits draft Work Plan[a]	1/27/2020
	USACE provides comments on draft Work Plan	2/3/2020
	Battelle submits final Work Plan[a]	2/6/2020
2	Battelle submits list of selected panel members[a]	2/3/2020
	USACE confirms the panel members have no conflict of interest (COI)	2/11/2020
3	Battelle convenes kick-off meeting with USACE	2/11/2020
	Battelle convenes kick-off meeting with panel members	6/24/2020
	Battelle convenes kick-off meeting with USACE and panel members	6/29/2020
4	Panel members complete their individual reviews	8/31/2020
	Panel members provide draft Final Panel Comments to Battelle	9/15/2020
	Battelle sends public comments to Panel	9/22/2020
	Panel confirms no additional Final Panel Comment is necessary with regard to the public comments	9/25/2020
	Panel finalizes Final Panel Comments	9/25/2020
5	Battelle submits Final IEPR Report to USACE[a]	10/6/2020
6[b]	Battelle convenes Comment Response Teleconference with panel members and USACE	11/23/2020
	Battelle submits pdf printout of DrChecks project file[a]	12/10/2020
ADM	Agency Decision Milestone (ADM) Meeting[c]	11/17/2020
	Contract End/Delivery Date	2/2/2021

[a] Deliverable.
[b] Task 6 occurs after the submission of this report.
[c] The ADM meeting was listed in the Performance Work Statement under Task 3 but was relocated in this schedule to reflect the chronological order of activities.

At the beginning of the Period of Performance for the Collier County CSRM IEPR, Battelle held a kick-off meeting with USACE to review the preliminary/suggested schedule, discuss the IEPR process, and address any questions regarding the scope (e.g., terminology to use, access to DrChecks, etc.). Any identified revisions were submitted as part of the final Work Plan. Due to delays in the availability of the review documents, additional changes to the schedule occurred to accommodate the delay. These schedule changes were communicated directly to USACE; thus, the final Work Plan does not reflect the actual schedule followed. The final charge consisted of 16 charge questions provided by USACE, two overview questions and one public comment question added by Battelle (all questions were included in the draft and final Work Plans), and general guidance for the Panel on the conduct of the peer review (provided in Appendix C of this final report).

Prior to beginning their review and after their subcontracts were finalized, all the members of the Panel attended a kick-off meeting via teleconference planned and facilitated by Battelle in order to review the IEPR process, the schedule, communication procedures, and other pertinent information for the Panel. Battelle planned and facilitated a second kick-off meeting via teleconference during which USACE presented project details to the Panel. Before the meetings, the IEPR Panel received an electronic version of the final charge, as well as the review documents and reference/supplemental materials listed in Table A-2.

Table A-2. Documents to Be Reviewed and Provided as Reference/Supplemental Information

Review Documents	No. of Review Pages
Draft Integrated Feasibility Report and Environmental Impact Statement (DIFR/EIS)	476
Appendix A – Plan Formulation	12
Appendix B – Engineering	576
Appendix C – Economics	126
Appendix D – Environmental	296
Appendix E – Real Estate Plan	74
Appendix F – Public Use Plan	15
Appendix G – Nonstructural Implementation Plan	14
Appendix H – Cultural Resources	31
Total Number of Review Pages	**1,620**
Public Comments	**203**

In addition to the materials provided in Table A-2, the panel members were provided the following USACE guidance documents.

- Review Policy for Civil Works (EC 1165-2-217, February 20, 2018)

- Office of Management and Budget's Final Information Quality Bulletin for Peer Review (December 16, 2004)
- Foundations of SMART Planning
- Feasibility Study Milestones (PB 2018-01, September 30, 2018 and PB 2018-01(S), June 20, 2019)
- SMART – Planning Overview
- Planning Modernization Fact Sheet
- USACE Climate Change Adaptation Plan (2015)
- Procedures to Evaluate SLR Change Impacts Responses Adaptation (ETL 1100-2-1 – June 30, 2014)
- Incorporating SLR Change in CW Programs (ER 1100-2-8162 – December 31, 2013).

About halfway through the review, a teleconference was held with USACE, Battelle, and the Panel so that USACE could answer any questions the Panel had concerning either the review documents or the project. Prior to this teleconference, Battelle submitted 22 panel member questions to USACE. USACE was able to provide written responses to all the questions prior to the end of the review. During the Final Panel Comment development, one additional clarifying question was asked by the Panel. Battelle sent a follow-up question to USACE, and a written response to the question was provided by USACE.

A.2 Review of Individual Comments

The Panel was instructed to address the charge questions/discussion points within a charge question response form provided by Battelle. At the end of the review period, the Panel produced individual comments in response to the charge questions/discussion points. Battelle reviewed the comments to identify overall recurring themes, areas of potential conflict, and other overall impressions. At the end of the review, Battelle summarized the individual comments into a preliminary list of overall comments and discussion points. Each panel member's individual comments were shared with the full Panel.

A.3 IEPR Panel Teleconference

Battelle facilitated a teleconference with the Panel so that the panel members could exchange technical information. The main goal of the teleconference was to identify which issues should be carried forward as Final Panel Comments in the Final IEPR Report and decide which panel member should serve as the lead author for the development of each Final Panel Comment. This information exchange ensured that the Final IEPR Report would accurately represent the Panel's assessment of the project, including any conflicting opinions. The Panel engaged in a thorough discussion of the overall positive and negative comments, added any missing issues of significant importance to the findings, and merged any related individual comments. At the conclusion of the teleconference, Battelle reviewed each Final Panel Comment with the Panel, including the associated level of significance, and confirmed the lead author for each comment.

A.4 Preparation of Final Panel Comments

Following the teleconference, Battelle distributed a summary memorandum for the Panel documenting each Final Panel Comment (organized by level of significance). The memorandum provided the following

detailed guidance on the approach and format to be used to develop the Final Panel Comments for the Collier County CSRM IEPR:

- Lead Responsibility: For each Final Panel Comment, one panel member was identified as the lead author responsible for coordinating the development of the Final Panel Comment and submitting it to Battelle. Battelle modified lead assignments at the direction of the Panel. To assist each lead in the development of the Final Panel Comments, Battelle distributed a summary email detailing each draft final comment statement, an example Final Panel Comment following the four-part structure described below, and templates for the preparation of each Final Panel Comment.

- Directive to the Lead: Each lead was encouraged to communicate directly with the other panel members as needed and to contribute to a particular Final Panel Comment. If a significant comment was identified that was not covered by one of the original Final Panel Comments, the appropriate lead was instructed to draft a new Final Panel Comment.

- Format for Final Panel Comments: Each Final Panel Comment was presented as part of a four-part structure:

  1. Comment Statement (succinct summary statement of concern)
  2. Basis for Comment (details regarding the concern)
  3. Significance (high, medium/high, medium, medium/low, and low; see description below)
  4. Recommendation(s) for Resolution (see description below).

- Criteria for Significance: The following were used as criteria for assigning a significance level to each Final Panel Comment:

  1. **High:** There is a fundamental issue within study documents or data that will influence the technical or scientific basis for selection of, justification of, or ability to implement the recommended plan.

  2. **Medium/High:** There is a fundamental issue within study documents or data that has a strong probability of influencing the technical or scientific basis for selection of, justification of, or ability to implement the recommended plan.

  3. **Medium:** There is a fundamental issue within study documents or data that has a low probability of influencing the technical or scientific basis for selection of, justification of, or ability to implement the recommended plan.

  4. **Medium/Low:** There is missing, incomplete, or inconsistent technical or scientific information that affects the clarity, understanding, or completeness of the study documents, and there is uncertainty whether the missing information will affect the selection of, justification of, or ability to implement the recommended plan.

  5. **Low:** There is a minor technical or scientific discrepancy or inconsistency that affects the clarity, understanding, or completeness of the study documents but does not influence the selection of, justification of, or ability to implement the recommended plan.

- Guidelines for Developing Recommendations: The recommendation section was to include specific actions that USACE should consider to resolve the Final Panel Comment (e.g., suggestions on how and where to incorporate data into the analysis, how and where to address insufficiencies, areas where additional documentation is needed).

Battelle reviewed and edited the Final Panel Comments for clarity, consistency with the comment statement, and adherence to guidance on the Panel's overall charge, which included ensuring that there were no comments regarding either the appropriateness of the selected alternative or USACE policy. At the end of this process, 18 Final Panel Comments were prepared and assembled. There was no direct communication between the Panel and USACE during the preparation of the Final Panel Comments. The full text of the Final Panel Comments is presented in Section 4.2 of this final IEPR report.

A.5 Conduct of the Public Comment Review

Following the schedule in Table A-1, Battelle received from USACE approximately 203 pages of public comments on the Collier County CSRM in Excel and PDF formats. Battelle then sent the public comments to the panel members in addition to the following charge question:

1. **Do the public comments raise any additional discipline-specific technical concerns with regard to the overall report?**

The Panel produced individual comments in response to the charge question. Each panel member's individual comments for the public comment review were shared with the full Panel. Battelle reviewed the comments to identify any new technical concerns that had not been previously identified during the initial IEPR. Upon review, Battelle determined and the Panel confirmed that no new issues or concerns were identified other than those already covered in the Final Panel Comments.

A.6 Final IEPR Report

After concluding the review and preparation of the Final Panel Comments, Battelle prepared a final IEPR report (this document) on the overall IEPR process and the IEPR panel members' findings. Each panel member and Battelle technical and editorial reviewers reviewed the IEPR report prior to submission to USACE for acceptance.

A.7 Comment Response Process

As part of Task 6, Battelle will enter the 18 Final Panel Comments developed by the Panel into USACE's DrChecks, a Web-based software system for documenting and sharing comments on reports and design documents, so that USACE can review and respond to them. USACE will provide responses (Evaluator Responses) to the Final Panel Comments, and the Panel will respond (BackCheck Responses) to the Evaluator Responses. All USACE and Panel responses will be documented by Battelle. Battelle will provide USACE and the Panel a pdf printout of all DrChecks entries, through comment closeout, as a final deliverable and record of the IEPR results.

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APPENDIX B

Identification and Selection of IEPR Panel Members for the Collier County CSRM Project

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B.1 Panel Identification

The candidates for the Independent External Peer Review (IEPR) of the Collier County Coastal Storm Risk Management Feasibility Study (hereinafter: Collier County CSRM IEPR) Panel were evaluated based on their technical expertise in the following key areas: planning formulation/ economics; environmental law compliance; hydrology, hydraulic, and coastal engineering; and geotechnical engineering. These areas correspond to the technical content of the review documents and overall scope of the Collier County CSRM project.

To identify candidate panel members, Battelle reviewed the credentials of the experts in Battelle's Peer Reviewer Database, sought recommendations from colleagues, contacted former panel members, and conducted targeted Internet searches. Battelle evaluated these candidate panel members in terms of their technical expertise and potential conflicts of interest (COIs). Of these candidates, Battelle chose the most qualified individuals, confirmed their interest and availability, and ultimately selected four experts for the final Panel. The remaining candidates were not proposed for a variety of reasons, including lack of availability, disclosed COIs, or lack of the precise technical expertise required.

Candidates were screened for the following potential exclusion criteria or COIs. These COI questions were intended to serve as a means of disclosure in order to better characterize a candidate's employment history and background. Battelle evaluated whether scientists in universities and consulting firms that are receiving USACE-funding have sufficient independence from USACE to be appropriate peer reviewers. Guidance in OMB (2004, p. 18) states,

> "…when a scientist is awarded a government research grant through an investigator-initiated, peer-reviewed competition, there generally should be no question as to that scientist's ability to offer independent scientific advice to the agency on other projects. This contrasts, for example, to a situation in which a scientist has a consulting or contractual arrangement with the agency or office sponsoring a peer review. Likewise, when the agency and a researcher work together (e.g., through a cooperative agreement) to design or implement a study, there is less independence from the agency. Furthermore, if a scientist has repeatedly served as a reviewer for the same agency, some may question whether that scientist is sufficiently independent from the agency to be employed as a peer reviewer on agency-sponsored projects."

The term "firm" in a screening question referred to any joint venture in which a firm was involved. It applied to any firm that serves in a joint venture, either as a prime or as a subcontractor to a prime. Candidates were asked to clarify the relationship in the screening questions.

Panel Conflict of Interest (COI) Screening Statements for the IEPR of the Collier County Coastal Storm Risk Management Feasibility Study
1. Previous and/or current involvement by you or your firm in the Collier County Coastal Storm Risk Management Feasibility Study (hereinafter: Collier County CSRM) and related projects.
2. Previous and/or current involvement by you or your firm in coastal storm risk management or similar studies in Collier County, Florida, or southwestern Florida.

Panel Conflict of Interest (COI) Screening Statements for the IEPR of the Collier County Coastal Storm Risk Management Feasibility Study
3. Previous and/or current involvement by you or your firm in the conceptual or actual design, construction, or operation and maintenance (O&M) of any projects in the Collier County CSRM related projects.
4. Current employment by the U.S. Army Corps of Engineers (USACE).
5. Previous and/or current involvement with paid or unpaid expert testimony related to the Collier County CSRM project.
6. Previous and/or current employment or affiliation with the non-Federal sponsors or any of the following cooperating Federal, State, County, local and regional agencies, environmental organizations, and interested groups *(for pay or pro bono):* • Collier County • APTIM Environmental & Infrastructure, Inc. • Coastal Protection Engineering • Bureau of Ocean Management • National Marine Fisheries • Environmental Protection Agency
7. Past, current, or future interests or involvements (financial or otherwise) by you, your spouse, or your children related to Collier County, Florida, or southwestern Florida.
8. Current personal involvement with other USACE projects, including whether involvement was to author any manuals or guidance documents for USACE. If yes, provide titles of documents or description of project, dates, and location (USACE district, division, Headquarters, Engineer Research and Development Center [ERDC], etc.), and position/role. Please highlight and discuss in greater detail any projects that are specifically with the Jacksonville or Norfolk Districts.
9. Previous or current involvement with the development or testing of models that were used for, or in support of, the Collier County CSRM project.
10. Current firm involvement with other USACE projects, specifically those projects/contracts that are with the Participating District. If yes, provide title/description, dates, and location (USACE district, division, Headquarters, ERDC, etc.), and position/role. Please also clearly delineate the percentage of work you personally are currently conducting for the Jacksonville or Norfolk Districts. Please explain.
11. Any previous employment by USACE as a direct employee, notably if employment was with the Jacksonville or Norfolk Districts. If yes, provide title/description, dates employed, and place of employment (district, division, Headquarters, ERDC, etc.), and position/role.
12. Any previous employment by USACE as a contractor (either as an individual or through your firm) within the last 10 years, notably if those projects/contracts are with the Jacksonville or Norfolk Districts. If yes, provide title/description, dates employed, and place of employment (district, division, Headquarters, ERDC, etc.), and position/role.

Panel Conflict of Interest (COI) Screening Statements for the IEPR of the Collier County Coastal Storm Risk Management Feasibility Study
13. Previous experience conducting technical peer reviews. If yes, please highlight and discuss any technical reviews concerning coastal storm risk management studies and include the client/agency and duration of review (approximate dates).
14. Pending, current, or future financial interests in contracts/awards from USACE related to the Collier County CSRM project.
15. Significant portion of your personal or office's revenues within the last three years came from USACE contracts.
16. Significant portion of your personal or office's revenues within the last three years came from Collier County contracts.
17. Any publicly documented statement (including, for example, advocating for or discouraging against) related to the Collier County CSRM project.
18. Participation in relevant prior and/or current Federal studies related to the Collier County CSRM project.
19. Previous and/or current participation in prior non-Federal studies related to the Collier County CSRM project.
20. Has your research or analysis been evaluated as part of the Collier County CSRM project?
21. Is there any past, present, or future activity, relationship, or interest (financial or otherwise) that could make it appear that you would be unable to provide unbiased services on this project? If so, please describe.

Providing a positive response to a COI screening question did not automatically preclude a candidate from serving on the Panel. For example, participation in previous USACE technical peer review committees and other technical review panel experience was included as a COI screening question. A positive response to this question could be considered a benefit.

B.2 Panel Selection

In selecting the final members of the Panel, Battelle chose experts who best fit the expertise areas and had no COIs. Table B-1 provides information on each panel member's affiliation, location, education, and overall years of experience. Battelle established subcontracts with the panel members when they indicated their willingness to participate and confirmed the absence of COIs through a signed COI form. USACE was given the list of candidate panel members, but Battelle selected the final Panel.

Table B-1. Collier County CSRM IEPR Panel: Summary of Panel Members

Name	Affiliation	Location	Education	P.E.	Exp. (years)
Planning Formulator / Economist					
Don Ator	Independent consultant	Baton Rouge, LA	M.S., Economics and Agriculture Economics; M.B.A., Concentration in Finance and Accounting	No	40+
Environmental Law Compliance Specialist					
Kay Crouch	Independent consultant	Santa Fe, NM	M.S., Biology and Aquatic Ecology	No	40+
Hydrology, Hydraulic, and Coastal Engineer					
Saied Saiedi	Bergmann Associates	Rochester, NY, and Lansing, MI	Ph.D., Civil Engineering	Yes	32
Geotechnical Engineer					
Chris Brown	University of North Florida	Jacksonville, FL	Ph.D., Civil Engineering/Hydrology	Yes	30

Table B-2 presents an overview of the credentials of the final four members of the Panel and their qualifications in relation to the technical evaluation criteria. More detailed biographical information on the panel members and their areas of technical expertise is given in Section B.3.

Table B-2. Collier County CSRM IEPR Panel: Technical Criteria and Areas of Expertise

Technical Criterion	Ator	Crouch	Saiedi	Brown
Planning Formulator / Economist				
At least 10 years of demonstrated experience in public works planning	X			
Minimum M.S. degree or higher in economics	X			
Demonstrated experience in public works planning, with a minimum of five years of experience directly dealing the U.S. Army Corps of Engineers (USACE) SMART Planning process and risk-informed planning as outlined in the Planning Manual Part II: Risk-Informed Planning, and Engineer Regulation (ER) 1105-2-100, Planning Guidance Notebook	X			

Table B-2. Collier County CSRM IEPR Panel: Technical Criteria and Areas of Expertise (continued)

Technical Criterion	Ator	Crouch	Saiedi	Brown
Planning Formulator / Economist (continued)				
Familiarity with the USACE plan formulation process, procedures, and standards, as they relate to CSRM projects and dredged material placement plans	X			
Knowledge of and experience with tools employed for economic analysis, risk analysis, and trade/fleet forecasts	X			
Familiarity with computing modeling tools such as BEACH-FX	X			
Familiarity with Generation 2 Coastal Risk Model (G2CRM) and Hydrologic Engineering Center (HEC) – LifeSim modeling	X			
Environmental Law Compliance Specialist				
At least 10 years of demonstrated experience in evaluating and conducting National Environmental Policy Act (NEPA) impact assessments		X		
Experience in estimating the impacts associated with CSRM and dredging projects		X		
Extensive knowledge of estuarine and coastal ecology		X		
Expertise in compliance requirements of environmental laws, policies, and regulations, including the Fish and Wildlife Coordination Act (FWCA) and the Endangered Species Act		X		
Knowledge of construction impacts on marine and coastal regions		X		
Hydrology, Hydraulic and Coastal Engineer				
Registered professional engineer			X	
At least 15 years of experience in civil engineering and design			X	
Minimum B.S. degree or higher in engineering			X	
Expertise in the field of coastal hydrology and hydraulics and have a thorough understanding of wave dynamics, and experience in CSRM projects			X	
Familiarity with computing modeling tools such as SBEACH, BEACH-FX, and HEC – Hydrologic Modeling System (HMS)			X	
Geotechnical Engineer				
Registered professional engineer				X
Minimum B.S. or higher in engineering				X
At least 15 years of experience in geo-civil design and geotechnical evaluation of CSRM projects				X
Familiarity with geotechnical risk analysis				X

Table B-2. Collier County CSRM IEPR Panel: Technical Criteria and Areas of Expertise (continued)

Technical Criterion	Ator	Crouch	Saiedi	Brown
Geotechnical Engineer (continued)				
Familiarity with the geotechnical requirement of structural measures and beach nourishment borrow sources				X
Experience with USACE Safety Assurance Review (SAR)				X

B.3 Panel Member Qualifications

Detailed biographical information on each panel member's credentials, qualifications, and areas of technical expertise is provided in the following paragraphs.

Name	**Don Ator**
Role	**Planning Formulator / Economist**
Affiliation	**Independent Consultant**

Mr. Ator is an independent consultant who serves as a Research Associate, Instructor, and Undergraduate Advisor in the Department of Agriculture Economics and Agribusiness at Louisiana State University (LSU). He earned his M.S. in economics and agriculture economics and his M.B.A. with a concentration in finance and accounting from LSU. His current research is in financial resiliency analysis and planning for local governments in Louisiana, Texas, Alabama, Mississippi, Florida, Georgia, Kentucky, and Nebraska.

Mr. Ator has more than 40 years of experience providing plan formulation and economic analysis expertise for 29 USACE districts. He has demonstrated experience directly dealing with the USACE SMART planning process as outlined in the Planning Manual Part II: Risk-Informed Planning, and ER 1105-2-100, Planning Guidance Notebook (USACE, 2000). Mr. Ator served as a team leader in the Plan Formulation Branch, USACE New Orleans District, directing the activities of plan formulators and providing project oversight and review to ensure compliance with the USACE plan formulation process, procedures, and standards as they relate to CSRM projects and dredged material placement plans. He has extensive knowledge and experience with tools employed for economic analysis, risk analysis, and trade and fleet forecasts and is familiar with computing modeling tools such as BEACH-*fx*, G2CRM, and Hydrologic Engineering Center Life Loss Simulation. Selected examples of his relevant project experience follow.

Mr. Ator has considerable experience with CSRM USACE projects, including the following: Reconnaissance Report for Beach Restoration Studies and Restoration Benefits Analyses, Tybee Island, Georgia, and Mission Bay San Diego, California; Shore Protection Alternative Analysis, Section 222 National Shoreline Erosion Control Demonstration Project, Jefferson County, Texas; Hurricane and Storm Damage Risk Reduction System Feasibility Study for Lake Pontchartrain & Vicinity, Louisiana; and Storm Erosion and Storm Damage Study for the Rolling Hills Shoreline, California.

Mr. Ator's experience with economic analysis, risk analysis, and trade and fleet forecasts is wide-ranging. Key projects include the Sensitivity Analysis of Benefit and Cost Evaluation Criteria to Risk and Uncertainty Associated with Study Parameters, Passaic River, New Jersey and Charleston Harbor in South Carolina; Deep Draft Channel Improvement Economic Analysis, La Quinta Ship Channel, Texas; Savannah Harbor Expansion Project Economic Analysis, Phase III Benefits Calculation Methodology and Model, Multiport Analysis and Regional Port Analysis in Georgia; Channel Deepening Study, Port of Iberia, Louisiana; Panama City Harbor Improvements to Bay Harbor Channel Limited Reevaluation Report with Integrated Environmental Assessment in Florida; Initial Appraisal of Rock Removal at San Francisco Bar Channel, California; Navigation Improvements Economic Feasibility Report , San Diego Harbor, California; Feasibility Study and Revitalization Study Report, Buffalo Harbor, New York; Forecast of Commodity Flows, Northern Sea Route Reconnaissance Study in Alaska; Commodity and Fleet Forecasts, Lower Columbia River Channel Improvement Project in Oregon and Washington; and General Cargo Analysis, Coos Bay Channel Deepening Study in Oregon.

Mr. Ator's relevant project experience includes dredged material management plans (DMMPs) for the following USACE projects: Preliminary Project Assessments for DMMPs for 42 Ports along the Texas Coast; DMMP Analysis of Operations and Maintenance Dredging Economic Benefits for the Miami River, Florida; DMMP, Economic Feasibility Report for Marina Del Rey Harbor/Ballona Creek Watershed in California; Economic Evaluation of Benefits from Beneficial Use Disposal Alternatives of Dredged Material for Consistency with State of Texas Coastal Management Plan; and Chocolate Bayou DMMP Economic Analysis in Texas.

Mr. Ator has also served as a panelist for the following relevant IEPRs since 2014: South Central Coast, Louisiana, CSRM Feasibility Study; Mobile Harbor, Alabama, Draft Integrated General Reevaluation Report and Supplemental Environmental Impact Statement; Section 216 Matagorda Ship Channel, Texas, DIFR/EIS; Beneficial Use of Dredged Material for the Delaware River Feasibility Study, New Jersey & Delaware; DIFR and Environmental Assessment for the Rahway River Basin in New Jersey; and Grays Harbor Navigation Improvement Project, General Investigation Feasibility Study and Limited Reevaluation Report in Washington.

Mr. Ator is actively involved in professional engineering and scientific societies, including the Society of American Military Engineers and the American Society of Civil Engineers (ASCE).

Name	**Kay Crouch**
Role	**Environmental Law Compliance / Cultural Resources Specialist**
Affiliation	**Independent Consultant**

Ms. Crouch is an independent environmental consultant and is the founder of Crouch Environmental Services, Inc. of Houston, Texas. She specializes in NEPA analysis, environmental site assessment (ESAs), permitting, wetlands delineation, and natural resource mitigation for projects with high public and interagency interests. Her experience is particularly related to flood damage reduction and eco-restoration. Ms. Crouch has significant experience in compliance with the Florida Water and Climate Alliance. Almost every project she has completed in the past 25 years has required the U.S. Fish and Wildlife Service (USFWS) coordination with regard to listed species, critical habitat protection, and natural resource mitigation.

Ms. Crouch earned her M.S. in biology/ecology in 1978 from Stephen F. Austin State University and has received additional academic training in the NEPA process from the Duke University Nicholas School of Environmental and Earth Sciences (2004-2005). She has more than 40 years of nationwide experience conducting ESAs and NEPA impact assessments for complex multi-objective public works projects with competing trade-offs. Her experience includes performing wetlands delineations, endangered species surveys, and ESAs in California.

Ms. Crouch has assessed NEPA impacts for large flood damage reduction projects in urban areas as well as remote locations and has evaluated related ecosystems, species, and habitats. She has done extensive work in the coastal marsh habitats that span the Gulf Coast and in a wide variety of habitat types throughout the nation. She has experience in inland wetlands as well as high and low tidal marsh restoration and evaluation. In the mid-1990s, Crouch Environmental Services designed and constructed the several-hundred-acre Baytown Nature Center, in Baytown, Texas. For that coastal marsh creation project, the company received the 1998 Award of Excellence from the National Association of Landscape Architects. She also has experience restoring upland habitats such as forests and coastal prairies.

Ms. Crouch is familiar with USACE calculations of environmental benefits and routinely performs cumulative effects analyses on high-visibility public works projects as part of her extensive NEPA practice. She is also familiar with several types of habitat models used nationwide. Habitat modeling has been required on every flood damage reduction and ecosystem restoration project she has worked on relating to USACE, including the Bayport Container Terminal, the Clear Creek Flood Damage Reduction Project, and the Addicks and Barker Dams and Reservoirs in Harris County, Texas. Other nationwide NEPA projects have consisted of flood damage reduction projects, dams, ports, parks, offshore activities, linear transportation corridors, power plants, and other types of projects involving Federal funding.

Ms. Crouch has extensive knowledge of endangered species surveys and impact analysis. She has completed numerous projects that involve compliance with the Endangered Species Act. The evaluation of the presence or absence of listed species has been required for almost every project in which she has been involved. These evaluations have involved USACE Section 404 permit applications requiring field investigations for listed species in numerous states, including California. She also has completed the USFWS Section 7 consultation process for several species.

In addition, almost every project Ms. Crouch has worked on has involved investigating and evaluating cultural resource issues. She is intimately familiar with the record search step as well as field survey techniques for cultural resources. She also has supervisory experience related to USACE Section 404 permits and NEPA documentation and National Historic Preservation Act Section 106 experience for the analysis of historical issues. She has demonstrated experience conducting biological assessments, including wetlands delineations, compilation of biological assessments for Section 404 permitting, and NEPA documentation.

Ms. Crouch’s skills include knowledge of the USACE planning process, SMART planning, and calculation and application of environmental impacts and benefits. She is well versed in various modeling types and in the performance of incremental cost analysis (ICA). She has experience reviewing the application of Wetland Value Assessment (WVA) methodology and has calculated the environmental losses and benefits of USACE projects using the hydrogeomorphic approach, habitat evaluation procedures, and WVA, as well as other models. Most recently, she performed a WVA analysis for the Addicks and Barker Dams Environmental Assessment in Harris County, Texas (USACE, Galveston District).

Ms. Crouch has performed IEPR reviews for numerous USACE projects in several USACE districts, including the Mississippi River Gulf Outlet (2011); Southwest Louisiana (2013 and 2015); Louisiana West Bank (2014); Morganza (2012); New Orleans to Venice (2011); and Barataria Basin (2011). She also performed IEPR reviews for projects in Tennessee (Center Hill Dam, 2013); Missouri (Alton to Gale Levees, 2010, and East St. Louis Levees, 2010); Princeville, North Carolina (2014); Norfolk (2018); and the Brazos River Floodgates (2018), and for ongoing IEPRs, including review of an eco-restoration project in Southern California and a flood risk management study in Arizona.

Ms. Crouch is also an expert in NEPA public engagement. In 2001, Ms. Crouch was selected to receive a Telly Award for a video presentation she produced for the USACE Galveston District that describes, via interviews with staff and the use of sophisticated graphics, the USACE planning process. In 2010, Ms. Crouch and her staff were recognized as the “National Best Practice Standard” for USACE for public engagement work performed for the Addicks and Barker Dams and Reservoirs dam safety project.

Name	**Saied Saiedi, Ph.D.**
Role	**Hydrology, Hydraulic, and Coastal Engineer**
Affiliation	**Bergmann Associates**

Dr. Saiedi is a civil engineer at Bergmann Associates. He has 32 years of experience in civil engineering, with a focus on hydrology and hydraulic (H&H) engineering in coastal areas. His engineering background includes coastal structures and processes, marine structures, free surface flow engineering, floating offshore structures, navigation waterways, hydrodynamics, surface hydrology and flood studies, and dam safety review. He has developed, managed, and reviewed several numerical and physical modeling works. He earned his Ph.D. in civil engineering from the University of New South Wales (UNSW), Sydney, Australia, and M.Sc. and B.Sc. in Civil Engineering from the University of Tehran in Iran. Dr. Saiedi is a registered engineer in Ontario and British Columbia, Canada.

Dr. Saiedi’s expertise includes conducting wave and coastal process analyses. For the Port Bay Barrier Bar, Wayne County, New York, comprehensive assessment, Dr. Saiedi led the investigations related to waves and water levels analyses, coastal processes, sediment transport, and design of a “green” revetment. The project involved extensive field investigations (shore bathymetry surveying, sediment sampling, survey of the damages to private properties and public roads, environmental assessment of the aquatic species), development of viable repair and protection alternatives, technical and economic comparison of the alternatives, and public engagement and consultation.

In addition, to meet compliance requirements for mine tailings dams in British Columbia, Canada, Dr. Saiedi prepared more than 50 reports for all hydraulics aspects of the dams, including flood inundation, erosion, dam breach, emergency preparedness planning, and emergency preparedness response. The reviews resulted in a series of instructions and recommendations with respect to supplementary geotechnical investigations, operation and maintenance procedures, and emergency preparedness and response.

As the Hydrotechnical Lead for engineering design and investigation projects on tens of hydropower and dam safety projects in Canada during 2012-2015, Dr. Saiedi applied modeling software such as Hydrologic Engineering Center – Hydrologic Modeling System (HEC-HMS) and HEC-River Analysis System (HEC-RAS) to perform H&H analyses of surface runoff, flood inundation, erosion, and sediment transport.

Dr. Saiedi also led the field inspections and design team to address operational issues from upstream river erosion and sedimentation in a small reservoir for a private energy company in British Columbia, Canada. He led the field inspections (river, erosion, and sedimentation), analyses of river erosion and reservoir siltation, simulation of sediment transport, and investigations into the turbine wear. He designed a sediment exclusion facility to address causes of erosion and sedimentation that affected operations for the intake structures and turbines in the powerhouse.

Dr. Saiedi developed in-house software for the stability of concrete gravity dams in 1989 in accordance with U.S. Bureau of Reclamation (USBR) standards as reflected in such seminal publications as “Design of Gravity Dams” (1976) and “Design of Small Dams” (1987). The software has been used for stability analysis of several dams in Iran (1990s), Malaysia (e.g., Kinta Dam, 2000s), and Canada (e.g., Skaha and McIntyre Dams, 2010s) for dam safety review or new design works.

As the lead coastal engineer, Dr. Saiedi led a project that was part of Lake Michigan’s shore protection project. Mitigation was conducted using his design to repair a slope failure and damages to beach protection structures adjacent to the railroad tracks that run parallel to the lake. The field data collected to determine the limits of the stone revetment included shore bathymetry surveys and coastal engineering analyses of waves and water level.

Dr. Saiedi also directed investigations for the Iranian Fisheries Department to address breakwater sedimentation at a Persian Gulf fishing port, Pozm Bay. He led the coastal engineering investigations (which included data collection on waves, currents, and wind) and simulation of hydrodynamics of the bay using MIKE21. The results proved the necessity of structural measures at or near the existing breakwater, which were ultimately installed.

Dr. Saiedi has extensively utilized coastal engineering software such as Coastal Modeling System (CMS), MIKE21, and SBEACH to model nearshore wave transformation, the impact of waves and currents on costal structures, and beach morphology.

Dr. Saiedi has considerable coastal and marine modeling experience. He designed and oversaw the construction of a flume for river, wave, and sediment studies at the UNSW Water Research Laboratory (WRL). The facility has since been used for many projects involving riverine flows and coastal waves. Also, while working as a research assistant at the UNSW WRL, he assisted several consultancy projects (river, coastal) involving scale modeling. Dr. Saiedi conceptually designed a large wave flume and a large wave basin for an offshore engineering laboratory in Petronas, Malaysia, for applied research projects. He has also designed and performed several tests on applied research into marine engineering.

Dr. Saiedi is a member of the ASCE, the Engineers and Geoscientists of British Columbia, and Professional Engineers Ontario, Canada. He has developed and taught over 10 courses to professional engineers and geoscientists in the United States and Canada on the topics of coastal and marine structures, hydraulic structures, hydropower, hydrotechnical design of tunnels, sediment engineering, and more.

Name	**Christopher Brown, Ph.D., P.E.**
Role	**Geotechnical Engineer**
Affiliation	**University of North Florida**

Dr. Brown is a professor at the University of North Florida (UNF), teaching courses in civil engineering, fluid mechanics, hydraulics, senior design, foundation engineering, and engineering geology. He earned his Ph.D. in civil engineering in 2005 from the University of Florida; an M.A. in civil engineering (geo-environmental concentration) in 1997 from Villanova University; and a B.S. in civil engineering from Temple University in 1991. Dr. Brown is a licensed, practicing P.E. in Florida and Pennsylvania focusing on water resources and geotechnical engineering. He has 30 years of civil and geotechnical engineering experience, which includes planning, design, construction, inspection, and teaching. He has worked with and for USACE as a civilian geotechnical engineer (Philadelphia District, 1991-1999, and Jacksonville District, 1999-2006), as well as municipal governments and private engineering firms.

Dr. Brown has previously worked on all manner of flood mitigation projects, including channel modifications, levees, retention/detention areas, dams, dry impoundments, flood walls, and tunnels as well as non-structural measures such as buyouts or house raising. He has also worked as a construction inspector and manager on the Molly Ann's Brook flood mitigation project in Patterson and Haledon, New Jersey (part of the Passaic River Mega project). In addition, he has considerable experience working on geotechnical and hydraulic aspects of flood mitigation projects, including soil mechanics, site explorations, engineering geology, channel stability/erosion, grading/earthwork, slope stability, and channel grading. His considerable software knowledge includes design experience and research work with Slope/W, SBEACH, MODFLOW, HEC-RAS, and HEC-HMS model simulations. In addition, Dr. Brown has extensive experience with geotechnical and civil engineering risk analysis and teaches the theory and practice of risk analysis in his graduate course "Water Resources Systems." He has also recently completed an entire risk analysis and forensic engineering study of a failed dam in Northeast Florida.

Dr. Brown has extensive experience with CSRM projects. He was a team member of the New Jersey Shore Protection, Townsends Inlet to Cape May Inlet, New Jersey Feasibility Study, which included beach fill, dune restoration, and seawalls for a 12-mile portion of the New Jersey coast. Dr. Brown was also the lead designer for the rehabilitation of the Canaveral Harbor South Jetty located on the Atlantic Coast of Florida. This project included lengthening and widening the existing jetty with 8- to 13-ton armor stone. Specific challenges included working near an active harbor entrance and difficult access for construction barges. Dr. Brown is currently working on a combined inland-coastal storm protection modeling study of the Lower St. Johns River in Jacksonville, Florida, where combined floods from river flows, tides, and storm surge are being evaluated. This model study also incorporates the effects of sea level rise over a 50-year design period to 2070. For this feasibility-level study, he is working in cooperation with the City of Jacksonville, Environmental Protection Board.

While working for Philadelphia and Jacksonville Districts USACE, Dr. Brown was an engineering team member for various flood mitigation and CSRM projects, including Little Mill Creek, North Branch Newton Creek, Cape May Coast Guard Base, Ocean City, New Jersey, and the Everglades Water Preserve Area Feasibility Study. Dr. Brown also was the geotechnical engineering technical lead for the Everglades Agricultural Area Reservoir project, the largest of the planned eight reservoirs to be implemented as part of the Everglades Restoration and the Modified Water Deliveries to Everglades National Park project (one

of the most important “pre-Central Everglades Restoration Plan” Everglades projects). In addition, Dr. Brown is an experienced IEPR expert, having worked on projects in more than 10 USACE districts over the last 12 years, including recently working on two large CSRM projects in New York City and the Coast of Texas.

Since leaving USACE in 2006, Dr. Brown has continued working on water resources and CSRM projects throughout the United States and internationally, both in consulting and as an engineering faculty member of UNF. He has extensive modeling experience and has worked with past renditions of the South Florida Water Management District model (2 X 2 model). Dr. Brown has also developed HEC-HMS and HEC-RAS models, including a recent project where he developed a HEC-HMS model of the entire Fisheating Creek Basin north of the Lake Okeechobee study area.

Dr. Brown has worked on traditional geotechnical designs of large buildings, structures, and coffer dams. He was the lead geotechnical engineer for the design of two massive liquefied natural gas storage tanks in Florida. The design included completion of standard penetration test borings, downhole seismic investigations, and ground-penetrating radar studies. Dr. Brown used both GeoStudio Sigma/W and Plaxis to develop the final mat foundation design for each tank to minimize differential settlement and angular distortion, and also to ensure adequate bearing capacity.

Dr. Brown has worked as an expert witness, testifying in multiple trials involving differing site condition claims, foundation failures, and deficient designs. He has testified in arbitration proceedings and in the International Court of Settlements. Dr. Brown has planning and design experience in Florida, Georgia, Delaware, Virginia, West Virginia, New Jersey, Delaware, Pennsylvania, and Puerto Rico. He has IEPR experience in California, Washington, Idaho, Arizona, Nebraska, Illinois, Nevada, New York, Texas, Louisiana, North Carolina, Florida, Kentucky, West Virginia, and Missouri.

Dr. Brown is fully capable of addressing relevant Safety Assurance Review (SAR) issues and has fulfilled this requirement for at least four other IEPR projects, including the Olmsted Locks and Dam 52 and 53 Replacement Project Post Authorization Change Report and the Dallas Floodway Feasibility Report and Environmental Impact Statement, Dallas, Texas.

APPENDIX C

Final Charge for the Collier County CSRM IEPR

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Charge Questions and Guidance to the Panel Members for the Independent External Peer Review (IEPR) of the Collier County Coastal Storm Risk Management Feasibility Study

This is the final Charge to the Panel for the Collier County CSRM IEPR. This final Charge was submitted to USACE as part of the final Work Plan, originally submitted on February 6, 2020. The dates and page counts in this document have not been updated to match actual changes made throughout the project.

BACKGROUND

Collier County is located on the southwest coast of Florida, approximately 120 miles south of the entrance to Tampa Bay and 100 miles north of Key West. Naples is the largest city located along the shoreline in the county. Collier County is comprised of nearly 200 square miles of landmass and roughly 300 square miles of water. It is the largest county in Florida by land area and fourth largest by total area (land and water). The estimated population for 2017 was nearly 373,000, which includes a dense population of people who require more time and assistance for evacuation. A large portion of the southeast section of the county lies within the Big Cypress National Preserve, and the southern coastal section of the county is home to parts of Everglades National Park.

There is a high risk of coastal storms causing significant damage to shorefront and inland bay area development in Collier County. The area is densely developed with a mix of residential, commercial, and recreational uses. During Hurricane Irma, the area experienced damage to existing development, but if the storm track had been perpendicular to the coastline, then the damage would have been significantly worse. The CSRM project could take the form of widening the existing beaches, raising existing dunes, constructing seawalls, buyouts, floodproofing, or any possible combination of CSRM risk reduction measures that meet study objectives.

The study area includes all land and water resources reasonably deemed to be within the vicinity of Vanderbilt, Park Shore, and Naples beaches and inland bay areas, as well as Marco Island, provided they are located entirely within the jurisdictional boundary of Collier County, Florida. The study area is comprised of two main components: the North County and Marco Island. These two areas are geographically noncontiguous and hydrologically separable; however, they were formulated using the same strategy and management measures. There is dense development in the study area and it is anticipated the Federal interest in a CSRM project will be justified. The non-Federal Sponsor is interested in developing and improving the beach areas to provide protection of adjacent structures and critical infrastructure.

OBJECTIVES

The objective of this work is to conduct an independent external peer review (IEPR) of the Collier County Coastal Storm Risk Management Feasibility Study (hereinafter: Collier County CSRM IEPR) in accordance with the Department of the Army, U.S. Army Corps of Engineers (USACE), Water Resources Policies and Authorities' *Review Policy for Civil Works* (Engineer Circular [EC] 1165-2-217, dated February 20, 2018), and the Office of Management and Budget's (OMB's) *Final Information Quality Bulletin for Peer Review* (December 16, 2004). Peer review is one of the important procedures used to ensure that the quality of published information meets the standards of the scientific and technical

community. Peer review typically evaluates the clarity of hypotheses, validity of the research design, quality of data collection procedures, robustness of the methods employed, appropriateness of the methods for the hypotheses being tested, extent to which the conclusions follow from the analysis, and strengths and limitations of the overall product.

The purpose of the IEPR is to "assess the adequacy and acceptability of the economic and environmental assumptions and projections, project evaluation data, economic analyses, environmental analyses, engineering analyses, formulation of alternative plans, methods for integrating risk and uncertainty, models used in evaluation of economic or environmental impacts, and any biological opinions" (EC 1165-2-217; p. 39) for the decision documents. The IEPR will be limited to technical review and will not involve policy review. The IEPR will be conducted by subject matter experts (i.e., IEPR panel members) who meet the technical criteria and areas of expertise required for and relevant to the project.

The Panel will be "charged" with responding to specific technical questions as well as providing a broad technical evaluation of the overall project. Per EC 1165-2-217 (p. 41), review panels should identify, explain, and comment upon assumptions that underlie all of the analyses, as well as evaluate the soundness of models, surveys, investigations, and methods. Review panels should be able to evaluate whether the interpretations of analysis and the conclusions based on analysis are reasonable. Reviews should focus on assumptions, data, methods, and models. The panel members may offer their opinions as to whether there are sufficient analyses upon which to base a recommendation.

DOCUMENTS PROVIDED

The following is a list of documents, supporting information, and reference materials that will be provided for the review. The review assignments for the panel members may vary slightly according to discipline.

Review Documents	No. of Review Pages	Subject Matter Experts			
		Planning Formulator/ Economist	Environmental Law Compliance Specialist	Hydrology, Hydraulic and Coastal Engineer	Geotechnical Engineer
Draft Integrated Feasibility Report and Environmental Impact Statement	500	500	500	500	500
Appendix A – Plan Formulation	80	80	80	80	80
Appendix B – Engineering	1200			1200	1200
Appendix C – Economics	250	250			
Appendix D – Environmental	600		600		
Appendix E – Real Estate Plan	50		50		
Appendix F - Correspondence	15	15	15		

Review Documents	No. of Review Pages	Subject Matter Experts			
		Planning Formulator/ Economist	Environmental Law Compliance Specialist	Hydrology, Hydraulic and Coastal Engineer	Geotechnical Engineer
Appendix G – Review Certifications	10	10	10		
Total Number of Review Pages	**2,705**	**855**	**1255**	**1780**	**1780**
Public Comments[ab]	**200**	**200**	**200**	**200**	**200**

a. USACE will submit public comments to Battelle, which will in turn submit to the IEPR Panel.

b. The Public Comment page count was not included in the overall review pages due to the hours being considered separately and Options 1 or 3 being implemented if the page count increases.

Documents for Reference

- Review Policy for Civil Works, (EC 1165-2-217, February 20, 2018)
- Office of Management and Budget's Final Information Quality Bulletin for Peer Review (December 16, 2004)
- Foundations of SMART Planning
- Feasibility Study Milestones (PB 2018-01, September 30, 2018; PB 2018-01(S), June 20, 2019)
- SMART – Planning Overview
- Planning Modernization Fact Sheet
- USACE Climate Change Adaptation Plan (2015)
- ETL 1100-2-1 – Procedures to Evaluate SLR Change Impacts Responses Adaptation
- ER 1100-2-8162 – Incorporating SLR Change in CW Programs.

SCHEDULE

This schedule is based on the receipt date of the final review documents and may be revised if review document availability changes. This schedule may also change due to circumstances out of Battelle's control, such as changes to USACE's project schedule and unforeseen changes to panel member and USACE availability. As part of each task, the panel member will prepare deliverables by the dates indicated in the table (or as directed by Battelle). All deliverables will be submitted in an electronic format compatible with MS Word (Office 2003).

Task	Action	Due Date
Meetings	Subcontractors complete mandatory Operations Security (OPSEC) training	3/19/2020
	Battelle sends review documents to panel members	5/19/2020
	Battelle convenes kick-off meeting with panel members	5/20/2020

Task	Action	Due Date
	Battelle convenes kick-off meeting with USACE and panel members	5/21/2020
	Battelle convenes mid-review teleconference for panel members to ask clarifying questions of USACE	6/2/2020
Review	Panel members complete their individual reviews	6/17/2020
	Battelle provides talking points for Panel Review Teleconference to panel members	6/19/2020
	Battelle convenes Panel Review Teleconference	6/22/2020
	Battelle provides Final Panel Comment templates and instructions to panel members	6/23/2020
	Panel members provide draft Final Panel Comments to Battelle	6/30/2020
	Battelle provides feedback to panel members on draft Final Panel Comments; panel members revise Final Panel Comments	7/01/2020 - 7/08/2020
	Panel finalizes Final Panel Comments	7/9/2020
Public Comment Review	Battelle receives public comments from USACE	7/7/2020
	Battelle sends public comments to Panel**	7/9/2020
	Panel completes its review of public comments	7/14/2020
	Battelle and Panel review the Panel's responses to the charge question regarding the public comments	7/15/2020
	Panel drafts Final Panel Comment for public comments, if necessary	7/17/2020
	Panel finalizes Final Panel Comment regarding public comments, if necessary	7/21/2020
Final Report	Battelle provides Final IEPR Report to panel members for review	7/23/2020
	Panel members provide comments on Final IEPR Report	7/27/2020
	*Battelle submits Final IEPR Report to USACE	7/29/2020
	USACE Planning Center of Expertise (PCX) provides decision on Final IEPR Report acceptance	8/5/2020
Comment Response Process	Battelle inputs Final Panel Comments to Design Review and Checking System (DrChecks) and provides Final Panel Comment response template to USACE	8/7/2020
	Battelle convenes teleconference with Panel to review the Comment Response process	8/7/2020
	USACE Project Delivery Team (PDT) provides draft Evaluator Responses to USACE PCX for review	8/28/2020
	USACE PCX reviews draft Evaluator Responses and works with USACE PDT regarding clarifications to responses, if needed	9/3/2020

Task	Action	Due Date
	USACE PCX provides draft PDT Evaluator Responses to Battelle	9/4/2020
	Battelle provides draft PDT Evaluator Responses to panel members	9/9/2020
	Panel members provide draft BackCheck Responses to Battelle	9/14/2020
	Battelle convenes teleconference with panel members to discuss draft BackCheck Responses	9/15/2020
	Battelle convenes Comment Response Teleconference with panel members and USACE	9/16/2020
	USACE inputs final PDT Evaluator Responses to DrChecks	9/23/2020
	Battelle provides final PDT Evaluator Responses to panel members	9/24/2020
	Panel members provide final BackCheck Responses to Battelle	9/29/2020
	Battelle inputs panel members' final BackCheck Responses to DrChecks	9/30/2020
	*Battelle submits pdf printout of DrChecks project file	10/1/2020
ADM	Agency Decision Milestone (ADM) Meeting	**10/19/2020**

* Deliverables

** Battelle will provide public comments to panel members after they have completed their individual reviews of the project documents to ensure that the public comment review does not bias the Panel's review of the project documents.

CHARGE FOR PEER REVIEW

Members of this IEPR Panel are asked to determine whether the technical approach and scientific rationale presented in the decision documents are credible and whether the conclusions are valid. The Panel is asked to determine whether the technical work is adequate, competently performed, and properly documented; satisfies established quality requirements; and yields scientifically credible conclusions. The Panel is being asked to provide feedback on the economic, engineering, environmental resources, and plan formulation. The panel members are not being asked whether they would have conducted the work in a similar manner.

Specific questions for the Panel (by report section or appendix) are included in the general charge guidance, which is provided below.

General Charge Guidance

Please answer the scientific and technical questions listed below and conduct a broad overview of the decision documents. Please focus your review on the review materials assigned to your discipline/area of expertise and technical knowledge. Some sections have no questions associated with them; however, you may still comment on them. Please feel free to make any relevant and appropriate comment on any of the sections and appendices you were asked to review. In addition, please note that the Panel will be asked to provide an overall statement related to 2 and 3 below per USACE guidance (EC 1165-2-217).

1. Your response to the charge questions should not be limited to a “yes” or “no.” Please provide complete answers to fully explain your response.

2. Assess the adequacy and acceptability of the economic and environmental assumptions and projections, project evaluation data, and any biological opinions of the project study.

3. Assess the adequacy and acceptability of the economic analyses, environmental analyses, engineering analyses, formulation of alternative plans, methods for integrating risk and uncertainty, and models used in evaluating economic or environmental impacts of the proposed project.

4. If appropriate, offer opinions as to whether there are sufficient analyses upon which to base a recommendation.

5. Identify, explain, and comment upon assumptions that underlie all the analyses, as well as evaluate the soundness of models, surveys, investigations, and methods.

6. Evaluate whether the interpretations of analysis and the conclusions based on analysis are reasonable.

7. Please focus the review on assumptions, data, methods, and models.

Please **do not** make recommendations on whether a particular alternative should be implemented, or whether you would have conducted the work in a similar manner. Also, please **do not** comment on or make recommendations on policy issues and decision making. Comments should be provided based on your professional judgment, **not** the legality of the document.

1. If desired, panel members can contact one another. However, panel members **should not** contact anyone who is or was involved in the project, prepared the subject documents, or was part of the USACE Agency Technical Review (ATR).

2. Please contact the Battelle Project Manager (Project Manager; Patti Connaughton-Burns; burnsp@battelle.org) or Program Manager Lynn McLeod; mcleod@battelle.org for requests or additional information.

3. In case of media contact, notify the Battelle Program Manager, Lynn McLeod (mcleod@battelle.org) immediately.

4. Your name will appear as one of the panel members in the peer review. Your comments will be included in the Final IEPR Report but will remain anonymous.

Please submit your comments in electronic form to the Project Manager, no later than 10 pm ET by the date listed in the schedule above.

Independent External Peer Review of the Collier County Coastal Storm Risk Management Feasibility Study

Charge Questions and Relevant Sections as Supplied by USACE

The following Review Charge to Reviewers outlines the objectives of the Independent External Peer Review (IEPR) for the subject study and identifies specific items for consideration for the IEPR Review Panel.

The objective of the IEPR is to obtain an independent evaluation of whether the interpretations of analysis and conclusions based on analysis are reasonable for the subject study. The IEPR Review Panel is requested to offer a broad evaluation of the overall study decision document in addition to addressing the specific technical and scientific questions included in the Review Charge. The Review Panel has the flexibility to bring important issues to the attention of decision makers, including positive feedback or issues outside those specific areas outlined in the Review Charge. The Review Panel can use all available information to determine what scientific and technical issues related to the decision document may be important to raise to decision makers. This includes comments received from agencies and the public as part of the public review process.

The Panel review is to focus on scientific and technical matters, leaving policy determinations for USACE and the Army. The Panel should not make recommendations on whether a particular alternative should be implemented or present findings that become “directives” in that they call for modifications or additional studies or suggest new conclusions and recommendations. In such circumstances the Review Panel would have assumed the role of advisors as well as reviewers, thus introducing bias and potential conflict in their ability to provide objective review.

Panel review comments are to be structured to fully communicate the Panel’s intent by including the comment, why it is important, any potential consequences of failure to address, and suggestions on how to address the comment.

The Review Panel is asked to consider the following items as part of its review of the decision document and supporting materials.

1. Is the need for and intent of the decision document clearly stated?
2. Does the decision document adequately address the stated need and intent relative to scientific and technical information?
3. Given the need for and intent of the decision document, assess the adequacy and acceptability of the project evaluation data used in the study analyses,
4. Given the need for and intent of the decision document, assess the adequacy and acceptability of the economic, environmental, social, and engineering assumptions that underlie the study analyses,
5. Given the need for and intent of the decision document, assess the adequacy and acceptability of the economic, environmental, social, and engineering methodologies, analyses, and projections,

6. Given the need for and intent of the decision document, assess the adequacy and acceptability of the models used in the evaluation of existing and future without-project conditions and of economic or environmental impacts of alternatives,

7. Given the need for and intent of the decision document, assess the adequacy and acceptability of the methods for integrating risk and uncertainty,

8. Given the need for and intent of the decision document, assess the adequacy and acceptability of the formulation of alternative plans and the range of alternative plans considered,

9. Given the need for and intent of the decision document, assess the adequacy and acceptability of the quality and quantity of the surveys, investigations, and engineering sufficient for conceptual design of alternative plans, and

10. Given the need for and intent of the decision document, assess the adequacy and acceptability of the overall assessment of significant environmental impacts, social justice, and any biological analyses.

11. Evaluate whether the interpretations of analysis and the conclusions based on analysis are reasonable, and

12. Assess the considered alternatives and tentatively selected plan from the perspective of systems, including systemic aspects being considered from a temporal perspective, including the potential effects of climate change.

13. For the tentatively selected plan, assess whether the models used to assess life safety hazards are appropriate,

14. For the tentatively selected plan, assess whether the assumptions made for the life safety hazards are appropriate,

15. For the tentatively selected plan, the quality and quantity of the surveys, investigations, and engineering are sufficient for a concept design considering the life safety hazards and to support the models and assumptions made for determining the hazards, and

16. For the tentatively selected plan, assess whether the analysis adequately addresses the uncertainty and residual risk given the consequences associated with the potential for loss of life for this type of project.

Battelle Summary Charge Questions to the Panel Members[2]

Summary Questions

17. Please identify the most critical concerns (up to five) you have with the project and/or review documents. These concerns can be (but do not need to be) new ideas or issues that have not been raised previously.

18. Please provide positive feedback on the project and/or review documents.

Public Comment Questions

19. Do the public comments raise any additional discipline-specific technical concerns with regard to the overall report?

[2] Questions 17 through 19 are Battelle-supplied questions and should not be construed or considered part of the list of USACE-supplied questions. These questions were delineated in a separate appendix in the final Work Plan submitted to USACE.

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APPENDIX D

Conflict of Interest Form

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David Kaplan
USACE, Institute for Water Resources
January 8, 2020
C-2

Conflicts of Interest Questionnaire

Independent External Peer Review

Collier County Coastal Storm Risk Management (CSRM) Feasibility Study

The purpose of this document is to help the U.S. Army Corps of Engineers identify potential organizational conflicts of interest on a task order basis as early in the acquisition process as possible. Complete the questionnaire with background information and fully disclose relevant potential conflicts of interest. Substantial details are not necessary; USACE will examine additional information if appropriate. Affirmative answers will not disqualify your firm from this or future procurements.

NAME OF FIRM: **Battelle Memorial Institute Corporate Operations**
REPRESENTATIVE'S NAME: **Courtney Brooks**
TELEPHONE: **614-424-5623**
ADDRESS: **505 King Avenue, Columbus, Ohio 43201**
EMAIL ADDRESS: **brooksc1@battelle.org**

I. INDEPENDENCE FROM WORK PRODUCT. Has your firm been involved in any aspect of the preparation of the subject study report and associated analyses (field studies, report writing, supporting research etc.) **No** Yes (if yes, briefly describe):

II. INTEREST IN STUDY AREA OR OUTCOME. Does your firm have any interests or holdings in the study area, or any stake in the outcome or recommendations of the study, or any affiliation with the local sponsor? **No** Yes (if yes, briefly describe):

III. REVIEWERS. Do you anticipate that all expert reviewers on this task order will be selected from outside your firm? No **Yes** (if no, briefly describe the difficulty in identifying outside reviewers):

IV. AFFILIATION WITH PARTIES THAT MAY BE INVOLVED WITH PROJECT IMPLEMENTATION. Do you anticipate that your firm will have any association with parties that may be involved with or benefit from future activities associated with this study, such as project construction? **No** Yes (if yes, briefly describe):

V. ADDITIONAL INFORMATION. Report relevant aspects of your firm's background or present circumstances not addressed above that might reasonably be construed by others as affecting your firm's judgment. Please include any information that may reasonably: impair your firm's objectivity; skew the competition in favor of your firm; or allow your firm unequal access to nonpublic information.

No additional information to report.

Courtney M. Brooks — January 8, 2020
Courtney Brooks — Date

Use or disclosure of data contained on this sheet is subject to the restriction on the title page of this proposal

BATTELLE

It can be done