WHALIN, JSU

DHS Coastal Resilience Center

Education Project Work Plan

1. **Project Title:** PhD in Engineering (Coastal Engineering and Computational Engineering concentrations) at an HBCU.

2. **Principle Investigator:** Robert W. Whalin, Ph.D., P.E., D.CE Professor of Civil Engineering; Co-Director, Coastal Hazards Center of Excellence-Education (July 1, 2008-June 30, 2016); Education Director, Coastal Resilience Center of Excellence (Jan. 1, 2016- June 30, 2020).

3. **Other Participants/Partners**: US Army Engineer Research and Development Center, University of North Florida and Texas A&M University at Galveston

4. **Short Project Description:** This project establishes the first HBCU PhD in Engineering degree with concentrations focusing on coastal natural disasters. It will help increase workforce diversity (over 80% of students are minorities) in the Homeland Security enterprise. The PhD Engineering degree will have two coastal natural disaster related concentrations: Coastal Engineering (focusing on hurricanes and floods) and Computational Engineering (focusing on computational fluid dynamics) and continues to nurture the BS/MS education programs of the Coastal Hazards Center of Excellence (July 1, 2008-Dec. 31, 2015). End user (employers) relationships with ERDC, MDOT, Corps of Engineers Districts, MEMA and local emergency management offices across the southeastern US are strengthened even further.

5. **Abstract:** This project will formulate and implement a concentration in Coastal Engineering for the PhD Engineering degree and will promote the approved Computational Engineering Concentration. These two PhD concentrations will have a pipeline of BS Civil Engineering and MS Engineering (Coastal Engineering and Computational Engineering concentrations) graduates plus government and industry employees within the commuting area as a steady source of students. The MS programs were formulated and implemented during the DHS Coastal Hazards Center of Excellence (July 1, 2008-Dec. 31, 2015) at Jackson State University and will continue to be nurtured and strengthened as part of the academic foundation for the CRC. This is the only natural disaster focused coastal engineering and computational engineering graduate program at an HBCU and is a direct result of DHS Office of University programs support for Centers of Excellence. Jackson State University has a minority student population exceeding 80% which directly supports the DHS Strategic Plan Goal to Enhance the DHS Workforce, especially the Objective to Increase Workforce Diversity and Priority Goal 3 to Enhance Resilience to Disasters. Leverage of federal assets is assured by the

Education Partnership Agreement (authorized by Public Law) between the Engineer Research and Development Center and Jackson State University that facilitates ERDC engineers serving as Adjunct Faculty, providing student internships and potential use of ERDC experimental and computational facilities for graduate research. An outstanding record of DHS End User involvement and transition of graduates to end users has been established during the seven and one-half years of the Coastal Hazards Center of Excellence at Jackson State University and will continue to be strengthened throughout the five year Coastal Resilience Center program. Research staff and graduate students have a direct participation in at least one research partners project and in highly relevant hurricane barrier projects nationwide (funded by others) including the Ike Dike concept for protecting Galveston Island and the greater Houston metropolitan area from devastating, albeit low probability, hurricane surges. Coastal Engineering programs nationwide have been on a decline for the past two decades and United States leadership in the coastal engineering profession has declined relative to other nations. This project will help ameliorate the trend while increasing the supply of minority coastal and computational graduate level engineers focused on the field of coastal natural disasters.