

NCITEC Project Information

Principal Investigator: Charles Swann (P.I.) , Chris Mullen (Co-P.I.)

Title: Predicting Erosion Impact on Safety of Highway and Railroad Bridge Substructures

Abstract: Long-term bridge functionality is dependent on a number of factors including engineering components as well as the geological substrate on which the bridge is founded. This study investigates the scour vulnerability in regards to bridges within a 250 square mile study area centered on the town of Blue Springs, Mississippi, home of Toyota Motor Manufacturing, Mississippi (also including a portion of the future I-22 corridor). The study will consider the extent of stream scour beneath existing bridges, bridge age, substrate characteristics and erosion rates. Select bridges with evidence of significant scour will be modeled in detail to better evaluate the stability of the structure by integrating geological conditions at the bridge with the structure itself and vulnerability to natural hazards. Erosion rates will also be compared to the geological unit on which the bridge is constructed in order to test the hypothesis that scour severity can be predicted on the basis of the geological unit. These data should be useful to better define geographic areas of increased erosion rates that bridge engineers can incorporate into future bridge design, aid in formulating a strategy for protection from this natural hazard, and to evaluate the need for enhanced bridge inspection practices. The goal of the project is to ensure safety and long term performance of the multimodal transportation system.

Start Date: June 1, 2013

End Date: December 31, 2015

Project URL (if applicable):

Subject Categories (select at least one and at most five categories):

- | | | |
|--|--|---|
| <input type="checkbox"/> Administration and Management | <input type="checkbox"/> Highways | <input type="checkbox"/> Planning and Forecasting |
| <input type="checkbox"/> Aviation | <input type="checkbox"/> History | <input type="checkbox"/> Policy |
| <input checked="" type="checkbox"/> Bridges and other structures | <input type="checkbox"/> Hydraulics and Hydrology | <input type="checkbox"/> Public Transportation |
| <input type="checkbox"/> Construction | <input type="checkbox"/> Law | <input checked="" type="checkbox"/> Railroads |
| <input type="checkbox"/> Data and Information Technology | <input checked="" type="checkbox"/> Maintenance and Preservation | <input type="checkbox"/> Research |
| <input type="checkbox"/> Design | <input type="checkbox"/> Marine Transportation | <input type="checkbox"/> Safety and Human Factors |
| <input type="checkbox"/> Economics | <input checked="" type="checkbox"/> Materials | <input type="checkbox"/> Security and Emergencies |
| <input type="checkbox"/> Education and Training | <input type="checkbox"/> Motor Carriers | <input type="checkbox"/> Society |
| <input type="checkbox"/> Energy | <input type="checkbox"/> Operations and Traffic Management | <input type="checkbox"/> Terminals and Facilities |
| <input type="checkbox"/> Environment | <input type="checkbox"/> Passenger Transportation | <input type="checkbox"/> Transportation (General) |
| <input type="checkbox"/> Finance | <input type="checkbox"/> Pavements | <input type="checkbox"/> Vehicles and Equipment |
| <input type="checkbox"/> Freight Transportation | <input type="checkbox"/> Pedestrians and Bicyclists | |
| <input checked="" type="checkbox"/> Geotechnology | <input type="checkbox"/> Pipelines | |