

## Appendix A

### Calcasieu Parish Police Jury

#### Hydrodynamic Simulation on the SWLA coastal watershed incorporating Coastal Vegetation Effects

##### Phase I Scope of Work

### **Background**

Hydrodynamic models can provide information about storm-surge flood, salinity and sediment transport, predict erosion, and determine the effect of hurricanes on these important issues. The accuracy of a model is determined by the scale of the project and the quality of data entered into the model. The hydrodynamic model developed specifically for the Calcasieu watershed can more accurately predict the impact of local projects on local watersheds and coastal landscapes by incorporating data about the friction provided by our existing coastal vegetation in flood events. Once friction maps are developed, flood control project design information can be incorporated into the model to more accurately simulate the impact of a proposed project.

### **Objective**

To collect the information necessary for the development of vegetative friction maps to increase the accuracy of a hydrodynamic model of the Calcasieu watershed.

### **Scope of Work**

1. Conduct an extensive literature review of research on the friction potential of coastal vegetation and methods to establish the vegetation/friction relationship.
  - a. Existing research on the Gulf Coast
  - b. Existing research on the Southwest Louisiana Coast
  - c. Existing research from other coastal areas.
2. Develop a comprehensive, detailed, up-to-date vegetative map of the Calcasieu River Basin coastal Area of Interest (see Appendix B Map of Area of Interest).
  - a. Bring together all available up-to-date vegetative data into one map
  - b. Determine if there are areas lacking up-to-date vegetative information within the Area of Interest
3. Evaluate existing friction values in relation to existing vegetation in the Area of Interest.
  - a. Determine predominant vegetative communities that have established friction values in the literature

- b. Determine predominant vegetation communities that do not have published friction values and determine if lab experimentation or field measurements are required to establish these values
  - c. Identify protocols for establishing friction values for the plant communities without current values
  - d. If friction values for existing plant communities are available, conduct preliminary work on the friction map
4. With the PROVIDED flood control design, and using the existing friction data, conduct a test simulation to study the effectiveness of flood control design.

#### **Deliverables**

1. Quarterly reports detailing relevant research and progress on vegetative maps and friction map.
2. Up-to-date vegetative map of the Area of Interest (see Appendix B). This information could aide in the update of the vegetation information in the Coastal Management Plan for Calcasieu Parish.
3. Literature Review of significant research
4. Results of test simulation for the provided flood control design.

#### **Future Work**

Gathering of the appropriate information and using proven protocols is essential in the development of an accurate model. The information gathered through this agreement will lay the ground work for the development of a vegetative friction map. This friction map, when incorporated into the existing model with the detailed designs of proposed coastal projects, will more accurately simulate the impacts of the proposed project on local watersheds and coastal landscapes.