Focus Area Report - 2015 Annual Meeting

Forecasting and Modeling

Section 1. Summary Statement

The Forecasting and Modeling focus area is small with only three faculty members (Paul Montagna, TAMUCC, area lead; Wenrui Huang, FAMU; and Elijah Johnson, FAMU). These faculty conduct research in the areas of ecological modeling, hydrodynamic modeling, and water quality modeling. These faculty members currently supervise four ECSC students (Brittany Blomberg, TAMUCC; Elizabeth Del Rosario, TAMUCC; Duc Le, FAMU; and Daryl Sibble, FAMU). Two students graduated in 2014: Amy Edwards, Ph.D. FAMU; and Maria Pillado, M.S. TAMUCC. Ms. Pillado currently works for the Texas Commission on Environmental Quality.
Section 2. Body of Report

2.1. Name of Focus Area
Forecasting and Modeling

2.2 List Focus Area Objectives

To perform research to extend our capabilities to forecast change in marine and coastal environments.
To predict ecological responses to changes that occurs both naturally and due to human activities.
To train students in forecasting and modeling skills.

2.3 Activity from (September 2014-February 2015)

Faculty and students identified to date participating in the forecasting and modeling focus area.

<table>
<thead>
<tr>
<th>Name</th>
<th>Institution, role</th>
<th>NOAA Collaborator</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paul Montagna</td>
<td>TAMU-CC</td>
<td></td>
</tr>
<tr>
<td>Elijah Johnson</td>
<td>FAMU</td>
<td></td>
</tr>
<tr>
<td>Wenrui Huang</td>
<td>FAMU</td>
<td></td>
</tr>
<tr>
<td>Amy Edwards</td>
<td>FAMU Ph.D. Student w EJ, Graduated 12/2014</td>
<td></td>
</tr>
<tr>
<td>Brittany Blomberg</td>
<td>TAMUCC Ph.D. Student w PM, plans to graduate 8/2015</td>
<td>John Foret, NMFS/SEFSC/EHCFC</td>
</tr>
<tr>
<td>Daryl Sibble</td>
<td>FAMU w EJ, plans to graduate 5/2015</td>
<td>Latoya Miles</td>
</tr>
<tr>
<td>Duc Le</td>
<td>FAMU Ph.D. Student w WH</td>
<td></td>
</tr>
<tr>
<td>Elizabeth Del Rosario</td>
<td>TAMU-CC M.S. student w PM plans to graduate 5/2016</td>
<td>Hae-Cheol Kim, NWS/NCEP/EMC</td>
</tr>
</tbody>
</table>

Research projects that have been developed and submitted to our technical monitors to assure alignment with NOAA goals and interests in this focus area to date are:

Brittany Blomberg is completing the chapters of her dissertation, entitled “Measuring Ecosystem Services To Assess Functionality of a Restored Oyster Reef.” The dissertation includes three chapters: “Assessing functionality of a restored oyster reef,” “Developing emergy models to quantify ecosystem services,” and “Developing a framework for oyster reef restoration planning.”
Elizabeth DelRosario is working on a masters thesis proposal entitled “A Decision Support Tool for Determining Optimal Inflow Strategies for the Nueces Delta.”

Duc Le is working on developing a neural network model to correlate long-term salinity at an oyster bar in Apalachicola Bay to the river inflow and winds. Results are encouraging, and his continue to improve the model. The model can be used as a cost-effective tool for researchers and water resources managers to evaluate water management scenarios on salinity at oysters at oyster bars.

Daryl Sibble is analyzing ammonia flux data from an Illinois cornfield using two computer programs: SurfAtm and BigLeaf. Assistance with SurfAtm was provided by Dr. Erwan Personne of France and BigLeaf was provided by Dr. L. Zhang. BigLeaf was modified in the NOAA ECSC to allow it to handle the big data sets being treated.

Publications:


Presentations:
Montagna, P. “Coastal and Marine System Science” presentation to Tuloso Midway Middle School Science Club. 2 February 2015.

Wenrui Huang was - Served as a Guest Editor, edited a special issue for Journal of Coastal Research: Climate Change Impacts on Surface Water Systems.
2.4. Proposed Activity –Next two years

Faculty:

Elijah Johnson will perform watershed modeling in the Apalachicola National Forest. The HSPF (Hydrological Simulation Program-Fortran) computer program will be calibrated using sediment nutrient data and water flux data for from terrestrial regions to streams. The data will be gathered during the project. The project involves the FAMU Institute of Public Health, the FAMU School of the Environment, the FAMU College of Agriculture and Food Sciences, the University of Florida, and the United States Forestry Service. A new student, Andrea Bain, will join the Forecasting and Modeling Focus Area at FAMU and be active by the summer of 2015.

Wenrui Huang will apply hydrodynamic and oyster models to evaluate flow scenarios on oyster growth in Apalachicola Bay, apply hydrodynamic and oyster models to evaluate climate-change impacts on oyster growth in Apalachicola Bay, complete river hydrodynamic and water quality model in Apalachicola River network, and complete neural network model for salinity-flow responses in oyster bars.

Paul Montagna will continue work on the Deepwater Horizon NRDA, begin work on a new GOMRI funded project looking at the recovery since the Ixtoc oil spill in 1979, and continue work on freshwater in flow effects in Texas and Florida.

Students:

Brittany Blomberg plans to defend her dissertation in July 2015.

Elizabeth Del Rosario will finish proposal by May 2015, perform research in summer and fall 2015, and defend a thesis in April 2016.

Duc Le will complete dissertation research.

Daryl Sibble plans to defend his dissertation in March 2015.