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6. Status A = New Project					
7. Title Ecological Disturbance and Multi-Stressors: Their Affect on Louisiana Ants and Other Insects/Spiders					
8. Performing Organization 0910 - 2010 Entomology Agricultural Experiment Sta, Louisiana State Univ				9. Cooperating Departments within State Performing Institution a. School of Renewable Natural Resources	
10. Multistate Project No.				11. Cooperating States MA Massachusetts	
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				17. FY	
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		08/01/2011		07/31/2016	
Goals/Objectives/Expected Outputs There are four projects with multiple objectives each that fit together to examine the overall effect of disturbance and multi-stressors on Louisiana's ants and other insects/spiders. Invasive Ants 1. Investigate, identify and document the effects of invasive ants in Louisiana. Disaster Response 1. Investigate the impacts of natural, man-made, and technological disasters on insects in Louisiana. Storm Surge Associated with Hurricanes 1. Examine ant invasion biology and succession after storm surge as a stressor 2. Examine the effects of saltwater on the red imported fire ant 3. Effects of ant faunal (particularly the red imported fire ant) changes caused by storm surge and other hurricane activity, Northern Gulf of Mexico. Ants and other insects as bioindicators of multistressors on beaches and foredunes in Northern Gulf of Mexico 1. Determine how stressors, such as those arising from hydrocarbon (HC) spills, can have dramatic, visible, and immediate direct impacts on coastal ecosystems due to the physical and toxic effects on land-dwelling invertebrate organisms. 2. Protect, restore, and manage the use of coastal and ocean resources through an ecosystem approach to management, measuring exposure to stressors, and effects of stress on food webs using ants and other insects/spiders as indicator species. 3. Determine indirect effects of hydrocarbons on organisms that can become food sources for ants in higher trophic levels. 4. Determine how major environmental stressors can cascade through the ant community as ants at lower trophic levels undergo changes and as species turnover occurs.					
Methods Widespread flooding in South Louisiana provides an opportunity to measure immediate community changes and later, the impact of those changes on the food web. Previously, my work has focused on diversity and relative abundance (Dash and Hooper-Bui 2005) of ants in Louisiana. Using data from the flooded area (Atchafalaya Basin) and contemporaneous controls (Pearl River Basin), we can assign ant-species functional groups (Andersen 1990, Crist 2009) to test Petchey et al's (2004) hypothesis that "species are lost from higher trophic levels more frequently than lower trophic levels." We expect to gain insight into the functional consequences of species losses by examining sap-feeding insects associated with ants. This catastrophic flooding event provides an opportunity to extend the Petchey et al (2004) work to several ant species, some of which are flood-adapted and others which are not. My recent work (Adams et al in press and Papillion et al 2011) has focused on the physical and behavioral adaptations of ants for survival of inundation. This study would use previous research as a platform to launch the testing of hypotheses of the effects of multi-stressors on ant communities in the					

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Atchafalaya Basin. Focus is collecting ants, beetles, and other invertebrates along 0.25 m² transects by cutting the plants to the soil or water level. Samples will be sorted in the lab and live ants removed and curated. Samples will be dried and any ants or other insects present will be collected. A sweep net will be used to sample invertebrates along a linear transect (25 m x 2 m). These samples are stored in alcohol and sorted by morpho-species in the laboratory.

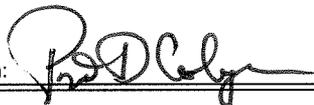
23. Non-Technical Summary

This project has impacts well beyond increased understanding of fundamental science in two critical areas: (1) the delivery of direct policy-relevant information for an emerging environmental problems, such as storm surge and oil impacts in coastal areas and (2) the training of students during the field research and in the analyses. The research will produce an analysis of community metrics of ants that provide critical quantitative analyses where they are lacking. Climate change and anthropogenic changes to the landscape upstream (encroachment of metropolitan areas on landscapes that typically served to return water to the water table) increase the possibility of flooding events, storm surge and oil intrusion being repeated. The nature of our effort transcends a simplistic classification of monitoring by virtue of its sophisticated analyses and testing of hypotheses. This study can become a model for how to exploit socially-relevant catastrophes as laboratories for learning and critical thinking. The trajectory of research supported by this study will be leveraged for long-term support.

24. Keywords

ants; catastrophe; flooding; oil impacts on coast; ants on coastal dunes; environmental problems

**** The Original signed document is on file at this institution. ****

Signature	Title	Date
Dept: Admin: 	Associate Director	7/8/11