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Goals/Objectives/Expected Outputs				
<p>The primary goal of this project is to evaluate how management decisions affect agricultural production, net farm income and ecosystem services in Louisiana and the Mississippi River Basin - the resources upon which agriculture and the state's economy depends. Specific objectives are: 1. Develop budgets for relevant production enterprises in Louisiana that include estimated values of a set of specific ecosystem services. 2. Evaluate how agricultural and environmental policies influence management and enterprise selection decisions of farmers, whole farm profitability, and provision of ecosystem goods and services. 3. Evaluate how diversification of farming (land management) operations affects whole farm profitability and the provision of ecosystem services. Outputs: Activities: Conduct and analyze surveys of producers regarding cost and return information for conventional and alternative systems that include suite of ecosystem services. Develop mathematical programming models that integrate economic and agro-ecological or agro-environmental systems in watersheds in Louisiana and Mississippi River Basin. Analyze current and future policy directed at increasing ecosystem services. Products: Research will result in integrated mathematical programming models useful for state, regional and national policy analysis regarding ecosystem services from and profitability of agro-ecological systems. Research findings and related information will be disseminated in scientific and nonscientific venues (journals, websites, using social media, print media, etc.).</p>				
Methods				
<p>Method for Objective 1: Using standard enterprise budgeting procedures, I will gather necessary information to modify existing budgets for crops and livestock enterprises in the study area (Louisiana and Mississippi River Basin) to include estimated values of a set of ecosystem services. These will be modified based on interviews with producers from either commodity groups or individuals identified by collaborators of this research project, including state extension agents and specialists. When no budgets exist in the area for commodities or enterprises of interest, I will develop new enterprise budgets. To incorporate effects on specific ecosystem services that result from specific crop or livestock practices or systems, I will work with other research scientists to determine the best way to define these (size or scale, temporal duration) so that the linkages remain between the enterprise and the effect. Method for Objective 2: To analyze agricultural, environmental and economic effects of specific programs or policies, on a local, watershed-basis in the Mississippi River Basin in Louisiana, a bio-economic model using positive mathematical programming techniques will be developed. Positive mathematical programming uses physical and economic data, as well as behavioral responses that conform to neoclassical economic theory, to calibrate and validate the economic model to some baseline activity levels,</p>				

before any analysis of policies or other shocks to the existing set of activities. To populate the biophysical process component of the bio-economic model, available published data (output or input) will be identified from existing sources: USDA/NRCS soils data, local weather information, crop rotations (NRI) and production practices, and any other information necessary to simulate the biophysical processes of agricultural systems (plant and animal production) occurring within the watershed. The integrated bio-economic model incorporates output from the biophysical process model into the economic model and it also contains information about the relevant policies and economic instruments being analyzed. Method for Objective 3: To evaluate how diversification of farming or land management operations in Louisiana affects whole farm profitability, various measures of diversification will be calculated and compared, statistically and econometrically. This research will use various scalar measurements of diversification that calculate the proportion of acres, number of enterprises, net income and gross revenues, among others, devoted to each activity in the farming operation. A novel approach to be used in this research is to include on-farm, nonfarming related activities, like hunting leases (cultural and provisioning services not currently included in enterprise budgets), in calculating scalar measures of diversification. When available, nonfarm income will be included and compared with these other metrics, which in the past have excluded such income. Data from existing USDA sources will supplement or complement primary data gathered from producers.

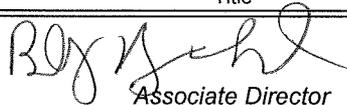
23. Non-Technical Summary

At a very fundamental level, production economics and farm management are focused on the choices producers make when they consider how to combine or use their scarce resources or capital (natural, physical, financial, human and social) in the most economically efficient way. It is generally assumed that producers use resources available within their choice set as efficiently as possible so as to maximize expected profit or utility of income. Or considered from the dual perspective, producers seek to minimize the costs of producing a given level of output or minimize risk of attaining a given level of income from farming. Like all economic agents, producers balance competing desires and needs, many of which may not be financial in nature. Ideally, the outcomes of an individual's private actions are harmonized with or do not detract from society's welfare. However in reality this rarely happens; there is usually some externality created by individual behavior, no matter how slight that externality may be. Depending on the severity of the externality created by individual instances or the cumulative effects of multiple agents, the situation may result in government action (policies or programs) that attempts to balance an individual's private competing needs with the societal welfare interests. This situation is relevant to agriculture because farmers manage natural resources or ecosystems to produce food, fiber and energy (fuel) as their primary outputs. However, other "outputs" result from agricultural producers manipulating the landscape or ecosystem in which they operate. This set of outputs, which economists traditionally consider goods and services, can also be considered within the framework of ecosystem goods and services (Millennium Ecosystem Assessment). Ecosystem goods are tangible products resulting from ecosystem processes - seafood, forage, timber, biomass, fiber, raw materials for production, pharmaceuticals, etc; essentially the natural resources consumed directly or after transformation and processing by humans. Ecosystem services are the conditions and processes through which those underlying ecosystems and the species resident in them support (sustain and fulfill) human well-being -- the functions provided by ecosystems that support human well-being. This ecosystem framework has two benefits from an economic perspective. First, the focus on ecosystem services is anthropocentric - how do ecosystem services sustain and fulfill human life. This focus on the human dimension, as both recipient of goods and services from ecosystems, and as a primary agent acting on and within the ecosystem, conforms well to some of the basic precepts of neoclassical economic theory. Second, the ecosystem framework implies and focuses on linkages between or coupling of human and natural systems - the reciprocal, dynamic, and complex interacting among plant, animal, microorganism communities and nonliving environment. Such a framework is compatible with (requires) an integrated approach to analyzing agro-ecosystem problems from an economic perspective.

24. Keywords

ECONOMIC; ENVIRONMENTAL; WHOLE FARM PROFITABILITY; ECOSYSTEM SERVICES; LAND MANAGEMENT; WATER QUALITY; MATHEMATICAL PROGRAMMING; LOUISIANA; MISSISSIPPI RIVER BASIN; AGRICULTURAL POLICY; DIVERSIFICATION; ECONOMIC MODELING;

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

Signature	Title	Date
Dept: Admin:	 Associate Director	1/10/12