Testimony before the Committee on Transportation and Infrastructure, U.S. House of Representatives

RE: Restoring Jobs, Coastal Viability, and Economic Resilience in the Gulf of Mexico: H.R. 3096, the Resources and Ecosystems Sustainability, Tourist Opportunities, and Revived Economics of the Gulf Coast States Act of 2011.

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Honorable Committee Members and guests, it is my privilege to comment today on H.R. 3096.

While the Deepwater Horizon spill continues to be costly, I concur with the recent NRC report that the full impacts of the spill are unknown and will be expressed over years to decades. I also question whether H.R. 3096 will facilitate definitive answers to the questions being posed. I will attempt to explain shortcomings and offer suggestions for improvements.

H.R. 3096 is precise administratively, but imprecise on how the ocean system works. For instance, fish neither organize like Regional Councils, nor by state and federal water boundaries. The Caribbean, Gulf of Mexico and the Southeastern United States are not separate marine ecosystems because they are connected by the Loop Current, Florida Current, and Gulf Stream. Similarly, while three (or nine) mile limits distinguish state from federal waters, fish spend their life histories in both of these regions. Ecology is therefore all about connectivity, connectivity in space, time and across trophic levels.

Ecology begins with the ocean circulation, uniting nutrients with light, fueling primary productivity and distributing water properties. This demands that the Gulf of Mexico be studied as a system if we are to better understand how it works, assess damages to it and facilitate improved environmental stewardship. An automobile provides an analogy. With mechanical, electrical, and fuel systems, an automobile cannot be fixed if one does not know how its pieces work, individually and together as a system.

Referenced throughout H.R. 3096 are "projects and programs that would restore and protect natural resources, ecosystems, fisheries, etc." Toward this end, the plan is to incorporate the President's Gulf Coast Restoration Task Force report, which lists four

goals and actions. These actions, however, are mostly directed toward regions peripheral to the Gulf of Mexico, versus the Gulf of Mexico itself. As such, the actions cannot achieve the goals. For instance, beach water quality may have nothing to do with local inputs. Instead, water quality may be due to the transport of materials from points distant from the beach. Red tide offers a case in point; as does the movement of Gag Grouper larvae. The reality is that few coastal ocean processes are local; most entail remote connections. If these connections are not understood, then the goals cannot be met. Even the progression of oil deposition on the Gulf beaches followed predictable connectivity rules. But these concepts are neither included in the Task Force Report, nor in H.R. 3096. Whereas a "robust scientific foundation" is referenced, the basis for that foundation is missing.

The shortcomings discussed above are echoed in the NRC report, which states: "A mechanistic understanding of and model for the complex linkages and interdependencies of the ecosystem being studied would be of immense value in analyzing ecosystems services."

The coastal ocean is particularly important because that is where society meets the sea. How it works must be understood if we are to predict the consequences of human actions and distinguish these from natural occurrences. Such understanding comes through observations and hypothesis testing; hence the need for a coordinated program of ocean observing and modeling. Only in this manner will we be better environmental stewards and better prepared for future accidents.

Fisheries provide a focal point. If we can understand fisheries well enough, then we can also make application to other topics. In other words, to do fisheries right we must do all else right. All is predicated on understanding how the ocean system works and the connections thereof.

The problem is big, requiring the coordination between observations with science-based models, many of which already exist. Benefit will derive from empowering those who actually pioneered such studies and who have demonstrated performance through peer reviewed publications. We should sustain and systematically build upon what is scientifically defensible, but I am concerned about the level of funding.

5% of the Trust Fund is to be split between the "Program" and the "Fisheries and Ecosystems Endowment." The Program will have five Centers of Excellence, each with foci within at least one of five enumerated topics. But of these five topics, only one addresses how the Gulf of Mexico works. Such dilution will negate having enough funding.

The Fisheries and Ecosystem Endowment is also troublesome. We cannot understand the fish by merely studying fish. Instead, the fish must be viewed in the context of the system in which they live. The problem is one of state variable estimation with the fish being but one of many variables and dependent on all of them.

Two modifications are suggested. The first is to increase the percentage of money targeted at sustaining and building coordinated observing and modeling elements aimed at determining how the Gulf of Mexico works. The second is to remove preconditions, other than mandating that monies be used in a scientifically defensible manner to be developed by a science steering committee selected from the academic community (and organized through the NRC), with input from the agencies. Plans must be generated by those most familiar with the science.

I appreciate the laudable intent of the Task Force, the agencies and the drafters of H.R. 3096. With modification we can provide a lasting legacy of benefit to the Gulf states and the nation.

I thank you for your invitation to speak and for your attention.