

Exploring Gulf restoration issues with individuals working on the ground and in the water



## Dr. R. Eugene Turner, Louisiana State University

Dr. Turner is a Chaired Professor and Distinguished Research Master in the Coastal Ecology Institute and Department of Oceanography and Coastal Sciences at Louisiana State University. A 'hybrid' oceanographer and wetland ecologist, he is active in the scientific aspects of coastal environmental management.

### A SCIENTIFIC PERSPECTIVE ON THE SPILL

#### **ELI: How has the BP oil spill impacted the Gulf of Mexico ecosystem?**

**Gene:** We have already seen many impacts from the BP spill. Oil on the water's surface has injured or killed seabirds, sea turtles and dolphins, and put at risk many commercially valuable marine organisms, such as blue-fin tuna, blue crabs, and shrimps, among others. Seafood was contaminated and oyster reefs destroyed. Deep-sea organisms like iconic corals and sponges died from apparent oil deposition. Fishers and tourists were also harmed.

At the same time, many impacts of the spill are still unknown. For example, it is still unclear what effect the exposure to and incorporation of oil (and its byproducts) at the bottom of the food chain and the massive infusion of carbon to the shallow and deep ocean will have. We will need advances in oil spill oceanography before we can assess these. In addition, the indirect impacts of the spill are likely to play out over longer time frames.

#### **ELI: How do the oil spill impacts relate to the broader ecosystem conditions in the Gulf?**

**Gene:** The oil spill took place in an ecosystem and socio-political system that already had significant 'stressors.' These include hurricanes

that are expected to increase in intensity due to global climate change; petroleum industry activities that have exposed the Gulf Coast to greater risks of catastrophic flooding, shoreline erosion, sea-level rise, and marsh channelization; excessive nutrient loading from agriculture and other man-made sources; exploitation of top-level predators like sharks and blue-fin tuna; bottom trawling and dredging; industrial development; and failure to treat and control stormwater and atmospheric emissions, which have introduced heavy metals and organic pollutants into the Gulf.

In addition, the development of low-lying lands and coastal barriers has degraded and destroyed shoreline habitats. This has led to the construction of dredge-and-fill projects and structures to protect housing and other infrastructure that are at risk, which interferes with the natural systems that protect shoreline habitats. Added to this, sea-level rise puts major Gulf cities like New Orleans and Houston at risk of flooding. This, in combination with hurricanes, makes the long-term human occupation of the Mississippi delta and coastal barrier shorelines of all Gulf states problematic — if not unsustainable.

These expected conditions create extreme socio-economic challenges: how can we sustain

or create the resilience of human communities, culture, and ecosystems when continuing to live on the coast increasingly risks property and life? Yet, community retreat inland challenges the fabric and glue of social cohesion and place-based history.

So, the oil spill might be seen as yet another stressor to this already-stressed system.

**ELI: The trustees plan to start implementing early restoration projects before the natural resource damage assessment (NRDA) is complete. Are there potential benefits to starting restoration before a full assessment of the injuries is complete? Potential disadvantages?**

**Gene:** Early restoration could be beneficial *if* the restoration is actually helpful. The problem is that we don't know some of the impacts, and we don't know what *should* be done to specifically address the impacts of the spill on ecosystems.

**ELI: What types of restoration projects should be implemented during early restoration to prevent irreversible loss?**

**Gene:** The major task in Louisiana coastal systems is to reduce the rate of wetland loss. In my opinion, these losses are primarily due to permitting and the chronic long-term impacts of previous permitting decisions. They are not due to the dramatic impacts of the oil spill. Further, some activities billed as 'restoration' are actually causing more loss of wetlands (for example, river diversions into the organic soils along the flanks of the lower Mississippi River).

**ELI: Are there ways to address the impacts of the oil spill while also improving the health of the Gulf of Mexico more broadly?**

**Gene:** We need to consider the impacts of the oil spill along with all other stressors in the Gulf, so that we have a complete understanding of how all stressors may potentially combine to affect the ecosystem. Restoration should be holistic, not piecemeal, and should be durable and sustainable under the dynamic conditions expected in the Gulf over the next century and beyond. Traditional tests of restoration appropriateness of "in-place" and "in-kind" are likely to fail the criteria for sustainability under a changing climate, rising sea level, and more intensely stormy system.

**ELI: What are some of the actions that can be taken to restore the Gulf holistically?**

**Gene:** There are many recommendations being floated around right now. I am a member of a Pew Workshop (chaired by Pete Peterson) that has proposed several restoration actions under three main themes. The first theme is that we need to restore water quality and damaged habitats. The second theme is that we need to protect habitat functions in order to rebuild fish stocks and wildlife populations. The third theme is that we need to make the Gulf Coast resilient by creating a single, integrated human and natural system. We have proposed various actions to achieve these goals, including restoring habitats that were directly and indirectly damaged by the oil spill, sustaining and enforcing existing federal legislative protections for habitat, fish, and wildlife, and communicating within communities to inspire informed environmental decisions.