

A New Frontier

If Louisiana would invest in higher education programs in coastal restoration, it could be at the forefront of a fledgling industry that could rival the oil boom.

By Troy Gilbert

University of New Orleans Chancellor Tim Ryan and researcher Shea Penland have a vision of their school and others in Louisiana becoming a nucleus for coastal restoration research and engineering, an industry they believe could, in the near future, rival the heyday of the oil boom. The challenge is to get everything in place before the billions of dollars in current and future restoration funds and research grants are snapped up by international and national engineering firms and universities in other states.

"Coastal wetlands loss is clearly the No. 1 problem facing Louisiana," says Ryan, who also is an economist. "You would think that the state of Louisiana would say, 'Lets look at what we need to do in order to have the leading position in this industry both in training students and doing the research.' Somebody else is going to do this, so these people are going to be trained in South Carolina, where they have a focus on the coastal industry, or they'll be trained at Texas A&M. How often do we have to make this mistake where we see other states, other universities, other areas take advantage?"

"You're talking about billions of dollars of federal money, of state money and private money, and that's going to attract businesses and spin off businesses, but where are these companies going to be located? Are they going to be here? Maybe not if the research is going to be done in Florida or Texas or South Carolina. They are going to set up their operations close to where the faculty researchers and the scientists and the students are. ... This is an industry that has applications all around the world."



Photo by Cheryl Gerber

Shea Penland looks at maps of the wetlands in his office at the UNO Research Park, which looks out onto wetlands.

Louisiana officials are asking the federal government to pony up billions of dollars to help restore Louisiana's coastline, protect energy-producing interests and save the region from catastrophic floods like the one that followed Hurricane Katrina. Without the proper planning and resources, the projected \$60 billion in funding that's expected to pour into southeast Louisiana for coastal restoration and hurricane protection over the next two decades could just as rapidly flow right out of the state to firms and universities with resources, research and professional manpower headquartered elsewhere.

"This is something that the state should be looking into in terms of a priority," says U.S. Sen. Mary Landrieu, who along with Sen. David Vitter and the state's other congressional members have already helped get millions of dollars in funding in the pipeline to Louisiana. "We've got to not only develop an overall comprehensive plan for coastal restoration, the building of levee structures and other flood control. We're also going to have to develop the capacity and the human capability to do that. It's really going to be one of the largest public civil works projects in the last 50 years, maybe in the last 100 years. We cannot stand here twiddling our thumbs."

Penland, a coastal restoration researcher and director of UNO's Pontchartrain Institute of Environmental Science, says the potential for growth in the area of coastal restoration will be exponential in the near future, pointing out that in 1990 there were only about 50 people working on coastal restoration whereas now there are about 1,000 and the field is still expanding rapidly.

"We need to train geologists, geographers, fish scientists, plant scientists, computer modelers, ecologists, economists and engineers," he says. "The Army Corps is already asking for civil engineers with backgrounds in ecology and also for ecologists who understand civil engineering. These are big challenges to find these people because it's rare for any one individual to have these skill sets."

UNO already has taken the lead in developing these new educational programs even while it operates on static funding and is still understaffed by almost 50 percent. The university has created the state's first undergraduate, master's and doctoral programs in coastal restoration and has students who are interested in working in the field.

"We designed UNO's curriculum based on what we heard from the State Department of Natural Resources [about what expertise was needed]," Penland says. "There are several federal agencies that are involved with coastal restoration -- National Marine and Fisheries, the Army Corps, the U.S. Natural Resources Conservation Service, the EPA -- and they are all hiring students."

The Army Corps of Engineers is outlining a master plan for restoration along Louisiana's coast that is due out later this year. The state has the unique opportunity to rise from the encroaching waters of the Gulf of Mexico as the leading global research center and headquarters for the top thought leaders and their offshoot environmental engineering companies for coastal restoration and preservation. According to some top scientists and engineers, if the state would make a relatively small investment for the future, this new industry could become a silver lining to the dark cloud that was Hurricane Katrina, an event many consider to be the opening salvo in a major environmental assault on coastal areas worldwide due to the effects of global warming.

So far, however, state officials have put far more energy into local issues such as banning cockfighting and a failed attempt to lure a German steel mill to Louisiana than they have into what many consider the No. 1 issue facing the state and one that is a matter of life and death for its citizens.

Carlton Dufrechou, president of the Lake Pontchartrain Basin Foundation (LPBF) and a longtime advocate for saving the wetlands says, "It is going to start ramping up very soon and it will be a progressive climb for a decade, maybe 20 years. However, if the state invests money now in research, education and scientific infrastructure, New Orleans and the region could come out as the leader internationally in this new industry."

The state now has the opportunity to fund a higher education research infrastructure to study, plan and implement these coastal preservation and restoration programs. That funding not only would create the science necessary to free up federal money for coastal restoration but also to build the large, highly specialized workforce necessary for this long-term project.

"We're really talking about a five-year ramp up phase right now, UNO's Ryan says, "but the key is ... the science. At some point it becomes an engineering problem, but ... right now it's a science problem. Seed this path and it will pay tremendous dividends."

"I think this would be extraordinary," Landrieu says. "Louisiana could be the leader in the world for delta coastal plain management. In our work to save ourselves, Louisiana could become a beacon of technology for other places in the world. It would send a very positive signal to the federal government and the people of the United States to do this. It would be an extraordinarily foresighted step. Our universities throughout the state need to be poised to lead in this effort."

Much of this science and research currently is funded by federal and private grants, and a large percentage of this money is now going to universities outside of Louisiana -- to study Louisiana.

The time for the state to act is now, Penland says, because the federal government won't wait until all of the science is complete to begin implementing the projects. "We're talking about designing things that have never been designed before," he says. "We're talking about building barrier islands, building marshes and cypress swamps. We've been talking about it for years, but now we've got to start building projects and we have to monitor these projects to see how successful they are. We need to figure out what makes a project work and what didn't go right, if it doesn't, in order to improve for the future."

The demand for the workforce is already materializing. "We're already seeing that employment sector grow, and it's growing not only in white-collar jobs, but its going to be growing hugely into blue-collar jobs," Penland says. "For example just take nurseries, places that grow and sell salt marsh grass used to stabilize eroding marshland. There used to be only five in the state, now there are 30 in Louisiana alone. We can't grow enough plants yet to even meet the demand."

National and international engineering firms are moving into New Orleans because it is closer to the coast where the work will be performed. The United States Geological Service recently opened a Gulf of Mexico Science office at UNO to coordinate its own research in coastal restoration. Other public and private entities also are bulking up their

employee numbers so they will be ready when money starts coming into the state for coastal restoration projects.

"We're already picking up students even before they've graduated," says Jimmy Johnston, Louisiana manager for Omaha-based HDR Engineering, a major national firm working on several levee management projects for the Army Corps of Engineers. "Since the storm, we've gone from four people to over 20. Over the next couple of years, I would expect that to grow by three to four times that number. Most of the folks we're hiring though are coming in from Texas A&M and the University of Florida, and to a lesser extent from LSU. But we want to find local talent who will have some kind of possession over the necessity of these projects. With all of the programs coming up and about to be funded, there's a dire need for more folks than are available. And trust me, these salaries are excellent."

Dufrechou has turned down numerous job offers from private engineering firms to maintain his expanding role with the LPBF. "Where the feeding frenzy is starting to hit is that we've got more national engineering firms in the region now than we've ever had," he says. "These are engineering firms that have expanded out into the environmental sciences. They are placing themselves into a potentially very lucrative market. These are multi-million-dollar companies moving in and scarfing up people that know the system and the wetlands."

"This is really the future," Penland says. "What's happened in Louisiana today is going to start happening elsewhere around the country, but for now, no other coast has the restoration programs of the magnitude that we're proposing. At one point, we were talking about a \$14 billion restoration. Now we're talking about \$50 billion."

As director for UNO's restoration and engineering departments, Penland knows firsthand of the needs for building this workforce and how to take advantage of the research grants. That's where the state comes in.

"We need assistance to hire the faculty that we need," he says. "The 1970s saw the last big push of coastal scientists out there, so we need to create a whole new generation of scientists and that's going to really come out of New Orleans and UNO. We need faculty, we need facilities and we need scholarship money to find the best students not only locally but nationally in order to compete.

"We need the tools. The tools are boats, computer systems that can analyze patterns of erosion or analyze programs that were designed to counter-effect erosion in order to see if they're being successful or not. We need to develop geochemical laboratories to go out and look at soil chemistry to see if we're building the right kind of marsh, what kind of fertilizers you need. We need to teach students the design side, the planning side, implementation, engineering, project management for all of these projects. The state needs the best-trained undergrad and graduate students that we can deliver. We're moving from the \$10 million projects into the hundreds of million-dollar projects. The only way to save the city and the state of Louisiana is to move towards those really huge projects

that rebuild ecosystems that protect the city from hurricanes. That's what this is all about.
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The universities of south Louisiana are positioned to capitalize on these needs because of their existing foundations in biology, engineering, research, computer modeling and geology. The University of Louisiana at Lafayette (ULL), Southeastern, LSU and UNO all have different strengths that, if properly funded, could be brought together for these massive projects. UNO, however, is the most strategically positioned in terms of its proximity to the areas actually losing coastal wetlands. It also would spur the economy in the slowly recovering city as additional jobs would spread money through areas ranging from residential property to retail sales to restaurants.

"If this were the major problem facing California or New York, they would probably have already said, 'OK, we need to have an additional fund for higher education so that we can develop an expertise there,'" says UNO's Ryan. "And this is relatively cheap. We're not talking about billions of dollars here. If you put in a size fund, like the state did in the area of Information Technology in the '90s, which was \$25 million recurring, add some money for facilities and labs, bump it up for inflation and divide it up between UNO, LSU, Southeastern and ULL in order to hire the best faculty in the country, we could bring in the top people in these fields, give them the resources that they need in terms of post docs and graduate students and the lab equipment and let them go.

"This should be a no-brainer for the state to say let's invest in our universities. The additional resources that we would bring into the state in terms of federal grants would be 10 times that money, grants that we wouldn't get otherwise, because they would be gathered by some Texas researcher. With this money recurring we could build the best programs in the country."

The state could literally build a whole new industry around coastal restoration, water management, water control, and other civil engineering opportunities with Louisiana as the laboratory.

"At some point," Ryan says, "we need to say, 'OK, let's look strategically. Let's focus. Let's see what opportunities are out there.' This is one you almost don't even have to think about that hard it hits you on the head immediately."

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