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Mr. Chairman and members of the commission. My name is John Barry. I'm a writer and historian, but in the past six years have become actively involved in two areas that relate to homeland security. Today I'd like to discuss one of them, the Gulf Coast. Thank you for the opportunity to present my views. They are my personal views only. I am not speaking for any of the organizations with which I am associated.

Currently I'm vice president of the Southeast Louisiana Flood Protection Authority East, a board which oversees several levee districts protecting most of metropolitan New Orleans. I also represent this board on the Louisiana Coastal Restoration and Protection Authority, which is responsible for hurricane protection for the entire state. I'm Distinguished Scholar at the Center for Bioenvironmental Research of Tulane and Xavier Universities, and I serve on advisory boards and committees at MIT's Center for Engineering Systems Fundamentals and Johns Hopkins Bloomberg School of Public Health's Center for Refugees and Disaster Response.

I'd like to step back from the spill itself and give you a somewhat broader perspective on the situation on the Gulf Coast.

As you all know, Louisiana has lost 2300 square miles of barrier islands, coastal marsh, and once seemingly-solid land on the coastal, which is an area larger than Delaware. If you place Delaware between New Orleans and the sea, it wouldn't need any levees. The land loss had made populated areas in Louisiana and Mississippi vastly more vulnerable than did nature. They are vastly more vulnerable than they were even 50-60 years ago. And that land loss is continuing; as you also have all heard by now, a football-field size chunk of coast melts into the ocean every 45-50 minutes, constantly increasing the vulnerability.

I want to cover four points: How we got here, what can be accomplished, how to accomplish it, and what happens if we fail.

Let me take the last point first.

### **I. What happens if we fail.**

The majority of all domestic oil and gas off shore production occurs in Louisiana. 19 refineries and 15% of the nation's refining capacity is in Louisiana, all of it within reach of hurricane storm surge. The life cycle of over 90% of all fish and 98% of all commercial species in the Gulf of Mexico depend on Louisiana marshes. By weight, 40% of all commercial fish caught in the US is caught in Louisiana waters. 5 of the 15 largest ports in the country are in Louisiana, and 18% of all waterborne commerce in the US passes through Louisiana waters. 20% of all US exports go down the Mississippi River,

and 56% of all grain exports. The Gulf Intracoastal Waterway (GIWW) was built for national security in the 1930s and 40s; it still serves that role in addition to generating enormous commercial benefits.

The continued erosion of the Louisiana coast threatens all of that. The national economy, and national security, depends on protecting and preserving the economic infrastructure currently in place. Proof of that assertion: after Katrina interrupted Gulf supplies and refining, gasoline prices jumped roughly \$1 a gallon.. And, incidentally, Katrina knocked out access to the Strategic Petroleum Reserve. Continued erosion of land threatens all that energy infrastructure. That's just the impact on national energy supplies, not the port system.

There is no substitute for Louisiana's port system. Tulsa and Pittsburgh and cities in between are all ports with direct access to the ocean because of it. There is simply no other way to give the interior of the nation, the body of the nation, cheap, efficient access to the sea. The GIWW carries barge traffic east west connecting other great ports from Florida to Texas, and the existence of that waterway is at risk. So, what's at stake is the well-being of the entire nation.

400 years ago John Donne described what is in effect our situation: "No man is an island, entire of itself; every man is a piece of the continent, a part of the main. If a clod be washed away by the sea, Europe is the less, as well as if a promontory were, as well as if a manor of thy friend's or of thine own were: any man's death diminishes me, because I am involved in mankind, and therefore never send to know for whom the bells tolls; it tolls for thee."

## **II. How we got here**

Our present circumstances were created by a combination of geology and too-narrow a view held by those who made political decisions. Those political decisions translated into engineering decisions with unintended consequences,.

To understand the problem, you need first to understand the role of the Mississippi River. The Gulf of Mexico once reached north to Cape Girardeau, Missouri. Through a combination of falling sea level and the deposit of sediment, the Mississippi River created almost 35,000 square miles of land in 7 states. Coastal currents carrying sediment horizontally from the river's mouth made several thousand additional square miles of land outside of the river's flood plain; to the west this land goes to the Texas border. In total, river sediment created roughly 40,000 square miles, including about 8,000 square miles on the coast.

Engineering has reversed the natural process and transformed land-making into land loss. Virtually all of this engineering benefits the entire nation. But the Gulf Coast, and mostly the Louisiana coast, bears all the costs. Let me give you a few lesser-known obvious factors.

1. The Mississippi River now carries less than half its historic natural sediment load, and some scientists believe it carries less than 30% of that load. The river once carried close to 400 million tons a year. Now it carries between 125 and 140 million tons a year. This decline is a major factor in land loss.

The decline occurred because of literally tens of thousands of engineered interventions throughout the entire system, from putting riprap on river banks to development. All of these interventions benefited people far from upriver, often more than 1,500 miles or even more from the Gulf. But more than half the total sediment decline is caused by just six dams on the upper Missouri River.

These six dams in Montana and North and South Dakota—the last dam sits just above the Nebraska line-- provide hydro-electric power, irrigation, and, ironically, flood protection along the Missouri River. Construction began in the 1940s, the first dam was completed in 1952, and construction ended in 1963. According to the Corps of Engineers, after completion sediment at Omaha dropped from 175 million tons annually to 25 million tons.

In other words, these six dams, built entirely with federal dollars, alone retain 150 million tons of sediment, while the entire river system currently delivers 125-140 million tons to the Gulf.

These dams may well have provided tremendous benefits to people from St. Louis to the Rockies. They have produced tremendous damage and greatly increased the danger to the Gulf Coast.

2. At least half the sediment still available to the Gulf is now wasted, prevented from replenishing the Louisiana and Mississippi coasts and barrier islands, again to benefit the entire nation. This is what happened:

In the natural land-building process, when the river hit the ocean it dropped its sediment load. This created massive sandbars which blocked shipping. To solve that problem, engineers built jetties extending more than two miles out into the Gulf of Mexico, dropping most of the sediment remaining in the river into deep water off the continental shelf.

The benefits have clearly been enormous. For example, in 1875, the year construction on the jetties started, 6,500 tons of shipping went from St. Louis out into the Gulf. Just four years later, the year the jetties were finished, St. Louis sent 456,000 tons out the same route. A similar explosion of trade occurred throughout the entire Mississippi Valley, on the Ohio, Missouri, and Arkansas rivers.

Today, jetties continue to carry most of the sediment in the river out into the Gulf and drop it into deep water. This waste benefits the national economy but increased the danger to the Gulf Coast. When more sediment was available in the whole system, when

there were no other insults to the natural order, this waste was not a major factor. Now, when every particle matters, it is.

3. Levees that prevent river flooding in Louisiana and Mississippi interfere with the replenishment of the land locally as well. To the extent they protect populated areas from floods, that is a local benefit. But the levees in the areas of greatest land loss are well down river from populated areas, and they were not built to protect people-- much of the area is entirely unpopulated. The levees in this region were built to help control the shipping channel; they benefit interstate and international commerce. Again, the benefits to the national economy have increased the danger to Louisiana.

4. Benefits to the shipping industry in other areas have also caused enormous damage. The Mississippi River Gulf Outlet has been much discussed. It never delivered the promised benefits. It did deliver all the damage warned against by its opponents. It destroyed tens of thousands of acres of natural buffer, and it did so right on the edge of an urban area. In addition, the federal government through the Corps of Engineers maintained this channel—or, more accurately, failed to maintain it-- with reckless disregard for life and property. A federal judge spent weeks listening to expert testimony and ruled that—not even considering the impact of the lost buffer, just on the basis of direct engineering maintenance failures on MRGO—the Corps was directly responsible for the destruction of the homes of 90,000 people in St. Bernard Parish and the Lower 9<sup>th</sup> Ward. I might add, the Corps and the state of Louisiana are now in dispute over whether the state needs to share the cost of fixing the damage to wetlands which MRGO caused.

MRGO has received much publicity because of its direct role in bringing storm surge to metropolitan New Orleans, yet MRGO has not caused as much damage to coastal marsh as the Gulf Intra-coastal Waterway. The GIWW was originally built to protect shipping from German submarines, and it still contributes to national security. But it and other shipping channels have brought much salt water into coastal marsh, generating significant erosion. Are there local benefits from the GIWW? Yes, it does benefit the port of New Orleans, but it provides far greater benefit to the ports of Houston, Gulfport, Biloxi, Mobile, and even Tampa by giving them access to the Mississippi system.

5. Louisiana is by far the country's largest producer of off shore oil and gas, and the extraction of oil and gas has itself contributed to subsidence. The industry has also dredged more than 10,000 miles of canals and pipelines through the marsh to service that production. Every inch of those 10,000-plus miles lets salt water penetrate and eat away at, the land. The Mineral Management Service has never been accused of favoring environmentalists, yet even it concluded the energy industry is responsible for 60% of the land loss directly attributable to a cause. (Not 60% of all land-loss; 60% of all the loss with direct causes). These canals and pipelines have enormously accelerated what was a slow degradation, transforming a long-term problem into an immediate crisis.

A good analogy is that the decline of sediment in the river, the jetties and other engineered factors that benefit shipping, and the levees created a situation akin to taking a big block of ice out of the freezer so it begins to melt. The impact of the canals and

pipelines is akin attacking that block of ice with an ice pick, breaking it up far rapidly.

Given all these facts, there is no other possible conclusion but that benefits accruing to the entire nation have dramatically increased the danger to the Gulf Coast.

### **III. What can be accomplished**

The bulk of the land lost *cannot* be rebuilt. Rebuilding is impossible because the river no longer carries enough sediment to do it. The National Academy of Science's review team of the Corps's Louisiana Coastal Protection and Restoration (LACPR) study of a system that would protect against major hurricanes made this point, and no expert disagrees. And unfortunately the sediment load in the river is still trending downward.

Nonetheless, the scientific community does support the proposition that if the right decisions are made we can achieve no net loss of coastal lands, rebuild land in strategic places to protect densely populated regions, and do so in a sustainable way.

We have a chance to succeed even with rising sea level. The delta of the Mississippi River is a dynamic, living system. It's alive. Like everything living, it will fight for life. If supplied with sediment and fresh water, it will adjust to and rise with the consensus predictions for rising sea level.

Unfortunately, even in a best case, not all areas can be protected. In some cases the cost will be too great. In others, choices will have to be made to sacrifice some areas in order to make others safer. The LACPR report recognizes this: the greatest expense in several of their alternative strategies is not for construction; it's for buy-outs for people whose homes will become untenable. Mississippi has at least begun to address some of the buy-out issues. Louisiana has not yet done so. This is important and worth mentioning because, right now, people who have already had their lives disrupted live in the most vulnerable areas. The disruption could make them receptive to a fair buy-out that might be good for them, good for the region, and good for the country. They should have that option.

### **IV. How to Accomplish the Goal**

Do I believe the dams on the Missouri should come down, oil production in the Gulf should cease, and international shipping interrupted? No, of course not. I do not believe any of those things. The nation needs the benefits it gets. But I do believe that educating the nation about the trade-offs and unintended consequences which have created dangers on the Gulf Coast is essential. Otherwise restoration efforts will not get sustained support

from the Congress in future years. If people in the Dakotas, Nebraska, and Missouri understood that their profits and even their safety have endangered the lives and property of people in the Gulf, they would support rather than oppose national policies to help the Gulf. They would see them as a responsibility, not a hand-out.

There is urgency. Two years ago a group of highly respected coastal scientists stated that if within a decade major steps weren't taken to restore the coast, it would be too late, that we would pass a tipping point. We have already started, but we need to scale up our efforts dramatically, and soon. So what should we do?

The easy part is to identify specific policies and legislation that need to be acted upon. To give just one example, let me describe some of the issues associated with dredging, and this is by no means are they an inclusive list even regarding dredging:

... The Corps's interpretation of current law requires them to waste some sediment they do dredge from the river; we have to absolutely maximize the beneficial use of dredged material.

... Foreign dredges operate on an entirely different scale than U.S. dredges; it may be necessary to change the Jones Act to use their capabilities.

... River diversions—cutting the levee to let some of the river run where nature put it-- will be necessary to get sediment where needed, but diversions also create dredging costs to keep the shipping channel open. The Corps seems to want the state to pay a full cost share for this, just as it wants the state to pay to restore the marsh destroyed by MRGO.

Frankly, I consider the idea of requiring local cost share for such dredging ludicrous. It's like having a tractor trailer drive over your lawn and crash through your living room, and then having the trucking company send you a bill to fix not only your lawn and house but the truck too.

But identifying a few specific things which need to be done is the easy part. The harder part is to devise a governance structure that can accomplish the goal, that can restore as much of the coast as can be restored, and to get the money for it.

Governance needs to operate in a decisive, flexible, disciplined, and science-based manner. Those last two points—it has to be disciplined and science-based-- are crucial because sediment is more important even than money. We can at least in theory always get more money. But even in theory we cannot get more sediment. There is a saying that when you mix religion and politics you get politics. It's also true that when you mix science and politics you get politics. Only science can determine the best use of sediment. And the structure must have the discipline to, as much as possible, insulate science from politics.

The governance structure has to do three things:

**1. First, it has to coordinate efforts of many federal agencies and get rapid response.**

**2. Second, it has to involve the states, local government entities, and possibly non-profits.** Each state should be able to identify its priorities, and considerable deference should be given to those choices, but I don't think they should automatically be acceded to. The federal government should also define certain priorities which may or may not be the same as a governor's.

I think whatever governance structure is set up, it should function like the grant process at the National Institutes of Health, or perhaps the Small Business Innovation and Research Act, with projects scored and prioritized. If the idea is good, it shouldn't matter where it comes from. Not only the states but counties, parishes, municipalities, levee districts, and possibly non-profits should be able to compete for funds. This should generate maximum speed and maximum activity, with projects fully integrated in concept and when completed and underway simultaneously, not sequentially. The Coastal Impact Assistance Program gives money directly to counties and parishes, for example, and that money has been well spent. Similarly, the flood protection authority with which I am associated has some coastal restoration projects identified and ready to go, but no money to spend.

An assessment is not an excuse for delay. And we do not need to reinvent the wheel. I'm familiar only with planning in Louisiana, and we have spent nearly 20 years planning. We created a Coastal Protection and Restoration Authority which has written a master plan, and every entity in the state has to conform to that master plan. Right now the master plan is conceptual, but it is an important and quality first step. CPRA has also identified a number of projects already authorized by the Congress and engineered; these projects lack only funding for construction to start. The state should get the funding.

**3. Third, the governance has to foster scientific research and integrate both existing and new science immediately into projects.** Senator Landrieu has proposed creating a science institute. That is an excellent idea. Too much of what needs to be done involves science that is not yet fully worked out, or engineering that has never been applied to the scale now needed. For example, we don't know the best way to maximize benefits of river diversions, and to compensate for the decline of sediment in the river, we need to improve our ability to harvest what remains. We also need to maximize benefits from any technical advances. There may be a model in medicine, where in the last decade or so an entire field has developed called "translational medicine." This is designed to move laboratory advances to patient care as rapidly as possible. There may be a medical model that's useful.

**The best means to accomplish these things is to use an inter-agency and inter-governmental group-- several now exist that could be adapted to the task-- headed by a single chair person with accountability, as much authority as an executive order can provide, legislation to augment the chair's authority, and direct access to the president.** Once a decision is made, OMB and other agencies should not be able to re-litigate it. In other words, I believe we need a czar. The post-Katrina federal effort

demonstrates that a "coordinator," even one personally close to the president, lacks the power to do what was necessary and what he seemed to want to do.

I am not convinced that the various review processes of projects, for example of environmental impacts, need to be scrapped, but restoration projects do need to be fast-tracked. They need to jump to the front of the line in various agencies. This is where White House leadership is essential.

Finally, where should the money come from? There are two obvious sources: BP and off shore oil revenues. We need both.

The Natural Resource Damage Assessment process will generate billions of dollars. Normally that process takes years. BP should provide funding up front for restoration and simply deduct this from any final agreement. EPA fines will generate billions more. The administration has already stated 80% of this money should go to restore the coast. But this requires legislation. Obviously, I believe Congress should accept this recommendation.

Another source is off shore oil revenues. Since the 1920s national policy has recognized that oil and gas production comes at a price. To "relieve social or economic impacts occasioned by" this production, the federal government gives inland states 50% of revenues from such activities on federal land. Last year Wyoming alone received \$1.3 billion from this source.

Louisiana has suffered immense damage from oil and gas production on off-shore federal land, and the federal government has received \$165 billion in off-shore drilling revenues over the years. Yet until 2006 the federal government gave Louisiana nothing. After Katrina, Congress did give Alabama, Mississippi, Louisiana, and Texas, the Gulf states which allow off-shore drilling, a 37.5% share of revenue from new off-shore wells. But it capped the total at \$500 million divided by those four states and delayed any substantial money until 2017; this year Louisiana, which passed a state constitutional amendment requiring all this money to go to coastal restoration or flood protection, will get only \$400,000 to 600,000 from this source. Congress should treat all states the same and lift the cap, cancel the delay, equalize the revenue share, and give it on existing wells, not just new ones. Off shore oil and gas production has contributed greatly toward creating the problem; treating coastal states the same as inland states would provide the revenue to address it.

There is also a third source, although it's impossible to say at this point how much money it would generate. This involves the private sector. Some investment bankers are looking at ways to monetize mitigation banks. If building marsh in the Gulf could turn a profit for someone besides companies building it, it would be useful both politically—bringing the private sector in—and substantively in building land.

Thanks for your attention. I welcome any questions.