

# **HAZARD MITIGATION and LAND USE PLANNING in COASTAL LOUISIANA: *RECOMMENDATIONS for THE FUTURE***

**LOUISIANA SEA GRANT COLLEGE PROGRAM  
LOUISIANA STATE UNIVERSITY**

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## Chapter 1

# INTRODUCTION

If Hurricane Katrina had been the only storm to strike Louisiana during 2005 it still would have exceeded the worst tropical storm in the state's history.<sup>1</sup> However, Hurricane Rita moved across the state less than a month later. When combined, the two hurricanes surpassed the forecasters' worst-case scenario. The depth and inland extent of storm surge, wind speeds, overtopping of levees, and failure of floodwalls before the design specifications were reached all culminated in a magnitude of suffering beyond the imagination of even the most pessimistic scientists.<sup>2</sup>

Extremes were the norm among the impacts of the two hurricanes: the most National Flood Insurance Program (NFIP) insurance claims from one event (Hurricane Katrina) and combined events (Hurricanes Katrina and Rita); a payout that exceeded all previous flood insurance disbursements of the NFIP from 1968 to August 2005 combined;<sup>3</sup> mass relocations of more than 1.3 million people, a number not approached in any single hurricane season in U.S. history; 350,000 flooded and abandoned vehicles; 60,000 vessels damaged; 217 square miles of wetlands loss, and more (Table 1).

When these figures are considered in the light of global climate change and the rush of people to live as close as possible to the ocean, it becomes clear that the United States has been given a wake-up call like no other before. The ultimate message that can be derived from the 2005 season is one of change and the need for adjustments in the way we live along our coasts and adjacent watersheds. In particular the federal, state, and local governments must rethink their traditional over-dependence on engineering practices in urban areas, a forced reliance on elevation of buildings in smaller communities and less populated regions (brought about by the NFIP requirements), allowing new development to crowd the high tide line, building on shorelines known to be erosion prone, and returning to and rebuilding in high-risk storm surge zones to face a similar fate in the future.

To help the affected Gulf of Mexico states, the federal government has committed more than \$100 billion for response and recovery from the 2005 hurricanes.<sup>4</sup> As could have been anticipated, this generosity came with requirements for accountability and a need to demonstrate that rebuilding practices will reduce damage from future hurricanes and other natural disasters.<sup>5</sup> In response, Louisiana Governor Kathleen Blanco issued Executive Order No. 63 of 2005, which

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**Table 1. Statistical Summary of Hurricanes Rita and Katrina, 2005<sup>6</sup>**

- National Flood Insurance Program (NFIP) claims paid: Total = 134,753
    - Hurricane Katrina: Principal residences = 107,960;
    - Nonprincipal residences = 18,739;
    - Unknown = 1,263.
    - Total = 127,962
  - Hurricane Rita: Principal residences = 5,191;
    - Nonprincipal residences = 1,287;
    - Unknown = 313.
    - Total = 6,791
  - Total deaths: 1,464
  - People displaced: 1.3 million
  - Businesses with physical damage: 20,550
  - Damage to homes: 204,500
  - Debris estimates: 24.6 million tons
  - Flooded and abandoned cars: Nearly 350,000
  - Damaged vessels: Nearly 60,000
  - Units of white goods: Nearly 1.5 million
  - Land loss = 217 sq mi
- 

established the Louisiana Recovery Authority (LRA). The LRA was designated a state agency within the governor's office by Act No. 5 of the 2006 First Extraordinary Session, the Louisiana Recovery Authority Act.<sup>7</sup> The Louisiana Recovery Authority Act provides that the LRA shall "recommend policy, planning, and resource allocation affecting programs and services for the recovery, and to identify duplication of services relative to the recovery where appropriate."<sup>8</sup> Among the LRA's mandates are to develop and promote short-term and long-term priorities and plans for recovery;<sup>9</sup> to propose and promote the implementation of special programs;<sup>10</sup> and to coordinate with local governments and metropolitan planning commissions and organizations to develop community-driven local and regional plans.<sup>11</sup> Through this legislation, the state expanded its base for reducing flood damage from a narrow commitment to structural measures (levees, diversion, pumps, and canals) as proposed by the Coastal Protection and Restoration Authority to a more comprehensive approach that includes plans, policies, and programs, and—most notably—nonstructural measures (Table 2).

These new directions challenge long-held beliefs and raise significant questions. Can Louisiana change the ways in which it addresses land use planning? Are the legislative authorities in place, and do they address the key issues related to flood damage reduction and natural hazards? If not, how should the state modify its existing laws to rebuild more wisely and safely in a post-

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**Table 2. Nonstructural Measures are the “People” Approaches<sup>12</sup>**

- A. Corrective measures address existing problems.
  - B. Preventive measures avoid creating new problems.
  - C. Both measures may address the susceptibility of people to flooding or modify the impacts of flooding.
    - 1. Modify Human Susceptibility to Flooding
      - a. Acquisition and relocation of flood-prone buildings
      - b. Floodplain regulations and building codes
      - c. Development and redevelopment policies
      - d. Floodproofing and elevation in place
      - e. Disaster preparedness and response plans
      - f. Flood forecasting and warning systems
    - 2. Modify The Impacts of Flooding
      - a. Information and education
      - b. Flood insurance
      - c. Tax adjustments
      - d. Flood emergency measures
      - e. Disaster assistance
      - f. Post-flood recovery
      - g. Preservation and restoration strategies to manage natural and cultural resources of the floodplain
- 

Katrina/Rita landscape? This report investigates these uncertainties and makes recommendations for legislative action.

The next chapter places this examination in the context of the university’s role as an intellectual resource in dealing with the natural hazards that affect the 19 parishes in the Louisiana coastal zone.<sup>13</sup> Recognizing that planning has attained a new level of importance during hurricane recovery, the third chapter discusses the role of related federal and state programs and laws in mitigating the adverse impacts of coastal hazards. The fourth chapter assesses the status of comprehensive planning throughout the Louisiana coastal zone in 2006. Chapter five examines particular comprehensive plan requirements, including natural hazards elements from Florida and Oregon, to determine if Louisiana can benefit from the actions and experiences of those states. Chapter six proposes approaches for integrating a natural hazards mitigation element—such as rolling easements—in state and local comprehensive plans and the relationship of such plans to federally mandated hazard mitigation plans. Chapter seven address issues of property rights and government liability that may arise as parishes and communities move more aggressively to implement mitigation measures. The final chapter summarizes the significant points of the investigation and draws conclusions for future action.

## Chapter 2

# PROJECT OVERVIEW

### **Background: The Presidents' Forum on Meeting Coastal Challenges**

For the past several decades, south Louisiana residents and businesses have faced a dilemma that has steadily become more frightening. It is the conflict of their love for a place and a need to be close to the Gulf of Mexico versus the dangers of living south of Interstates 10 and 12. This predicament worries most people and makes them wonder if their culture and way of life can survive the next 50 to 100 years. It is not a new problem. Hurricanes have caused upheavals and diasporas in coastal Louisiana as far back in recorded history as the early 1700s (and undoubtedly for millennia before that)<sup>14</sup> and will continue to visit the state with regularity.

Louisianans have survived and adapted to the great storms and will continue to fight their effects. The assaulted environment, however, has changed significantly so that hurricanes' impacts are now much more devastating. By "environment" we mean both the natural surroundings and the settings constructed by humans. Most people are aware of changes in Louisiana's coastal environment that began with the continuing loss of hundreds of thousands of acres of wetlands since the 1930s<sup>15</sup> and has been exacerbated by the gradual rising of sea levels throughout the world.<sup>16</sup> The loss of these coastal habitats would be tragic in itself, but it assumes apocalyptic proportions for the people who live in and near them. Coastal land loss literally unravels the very foundation of life in the coastal areas, not only because of the direct loss of places to live, but also because it magnifies the intensity of the hurricanes' effects so that much more damage results.<sup>17</sup>

As the storms' potential to do more damage has increased, so has the amount of the built environment that lies in harm's way.<sup>18</sup> With more human habitation in coastal areas, greater loss of property and, occasionally, life, occurs than has been the case for most of the last 100 years.<sup>19</sup> The massive increase in coastal development has relied on the traditional financial institutions of banking and insurance for its existence. Without those twin pillars, collapse is assured.<sup>20</sup> Private insurers discovered some time ago that selling policies for certain risks was not a sound financial strategy and either withdrew from the most dangerous markets or made premiums prohibitively expensive.<sup>21</sup> The federal government has attempted to fill the need for individualized property protection with the NFIP.<sup>22</sup> Several states, including Louisiana with its state-run Citizen's Insurance pool, have taken a similar track for uninsurable property.<sup>23</sup> However, both solutions

are far from satisfactory and will necessitate significant changes, resulting in the loss of coverage for many.<sup>24</sup>

Researchers at Louisiana State University (LSU) and elsewhere have studied the causes and effects of coastal land loss for several decades.<sup>25</sup> In 2005 LSU has begun to offer assistance to the inhabitants of vulnerable coastal areas in the form of expert information on various issues that they will confront in the near future.<sup>26</sup> The LSU System held a series of conferences called “The Presidents’ Forum on Meeting Coastal Challenges,” in conjunction with other institutions of higher learning in the state. The forums invited representatives of coastal parish governments to hear presentations by top researchers on such topics as the predicted effects on coastal communities of coastal land loss, sea level rise, and hurricanes, as well as some associated legal and policy issues. Parish governments that organized a group known as Parishes Against Coastal Erosion (PACE) have been one of the main target audiences.<sup>27</sup>

Although it is crucial for universities to deliver information to coastal decision-makers it is just as important for parish officials to express their concerns and tell the universities how academia can best help them deal with coastal hazards. During the first Presidents’ Forum on Meeting Coastal Challenges, parish leaders expressed concern over the continuing risky development occurring in their parishes, and their lack of knowledge about and authority to control development to protect public safety and maintain fiscal responsibility.<sup>28</sup> In response to that request, the second Presidents’ Forum focused on building codes and land use planning and brought in national experts and representatives of other communities who had faced similar challenges.<sup>29</sup> It became apparent that an updated and more encompassing treatment of land use planning in Louisiana was necessary, especially in the wake of Hurricanes Katrina and Rita. As part of its mission to assist local governments, the Louisiana Sea Grant College Program funded a study on the status of land use planning authority for coastal hazard protection in Louisiana with the intent of recommending improvements that state and local governments could make to enhance their ability to protect life and property within their jurisdictions.<sup>30</sup>

It is well known that discussion of private property rights is sensitive, and that any decisions mandating land use planning will be made at the highest level of government only with the support of the populace. With these concerns in mind, this report provides tools and information that decision makers should consider as they work for the public good.

## Natural Hazards of the Louisiana Coastal Zone

Natural hazards are those extreme or rare geologic, atmospheric, or hydrologic events that adversely affect human life, property, or activity.<sup>31</sup> Scientists describe natural hazards in terms of risk and vulnerability. Risk is the probability of an event's or condition's occurring<sup>32</sup> that will result in injury or damage<sup>33</sup> in a geographic area. Vulnerability is the susceptibility of an area or structure to damage.<sup>34</sup> For example, two houses are at risk because they are in the Special Flood Hazard Area (meaning the area that has a 1 percent chance of flood in a given year), but the slab-on-grade house is more susceptible (vulnerable) to damage from flooding than the house that is elevated on piers.

Fifteen natural hazards may affect all or parts of the United States (Table 3). Eight of these hazards have a significant impact on the Louisiana coastal zone. At the top of the list are hurricanes, whose 74 mph or greater winds may strike Louisiana from June through November.<sup>35</sup>

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**Table 3. Occurrence and Relative Severity of Natural Hazards along the Louisiana Coast.<sup>36</sup>**

SIGNIFICANT OCCURRENCE		RARE TO NEVER
	<i>Greatest impact</i>	
Hurricane		Winter Storm
Storm Surge		Drought
Flood		Earthquake
Subsidence/Sea Level Rise		Landslide
Coastal Erosion		Tsunami
Tornado		Volcano
Windstorm		Avalanche
Wildfire		
	<i>Least impact</i>	

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Cameron and Vermilion parishes in southwest Louisiana and Plaquemines and St. Bernard parishes in southeast Louisiana have the highest potential for hurricane landfall.<sup>37</sup> Hurricane winds and storm surge destroy most of what lies in their paths, with the most intense damage recorded in the forward right quadrant of the storm.<sup>38</sup> Hurricane storm surge is the rapid rise of water above mean sea level.<sup>39</sup> Shoreline retreat may exceed 65 feet per year as a result of storm surge and normal processes.<sup>40</sup> Wetlands disappear to become open water bodies; homes and

businesses that are not demolished may float miles from their foundations. Floodwalls fail, levees are overtopped, cities are flooded. Lives are lost when people fail to evacuate in a timely manner.<sup>41</sup> Highways and bridges are undermined or washed away. Historically significant Louisiana storms include the unnamed hurricanes of 1915 and 1947 that flooded metropolitan New Orleans; Hurricane Audrey in 1957, which killed more than 500 people in Cameron Parish; Hurricane Betsy in 1965, which flooded about one-third of New Orleans; Hurricane Andrew in 1992, which caused widespread damage to central Louisiana coast,<sup>42</sup> and Hurricanes Rita and Katrina in 2005 (see Table 1).

Flooding of yards, roads, and uplands occurs because of persistent south and southeast winds. A secondary effect of onshore winds is backwater flooding when the higher water levels in bays and lakes prevent the runoff from coastal watersheds from discharging into the estuaries.<sup>43</sup> Precipitation results from the storms' accompanying weather fronts, squall lines, thunderstorms, and tropical weather systems. For example, a thunderstorm may release one inch of precipitation on New Orleans in five minutes, a rate of 12 inches per hour.<sup>44</sup> Fortunately, thunderstorms are of short duration and rarely approach these estimates. An extreme event did occur in 1995, when persistent rain and thunderstorms along a stalled front resulted in almost 16 inches of rain in Slidell, Louisiana, in less than 24 hours, the entire event exceeded 20 inches, causing millions of dollars of damage in southeastern Louisiana.<sup>45</sup>

Subsidence, which refers to “the loss of surface elevation due to removal of subsurface support,”<sup>46</sup> is caused by crustal deformation; sediment compaction; withdrawal of groundwater, hydrocarbons, geothermal fluids, or minerals (sulphur); and dewatering of organic soils.<sup>47</sup> Alternatively, this regional subsidence could be the result of south Louisiana slowly sliding into the deeper waters of the Gulf of Mexico, a process several orders of magnitude greater than the offshore slumps that threaten pipelines and drilling platforms.<sup>48</sup> The contribution of faulting, whether naturally occurring or human-caused, is being debated and investigated.<sup>49</sup>

The withdrawal of groundwater, hydrocarbons, geothermal fluids, and minerals has resulted in a lowered ground surface in limited zones.<sup>50</sup> Most subsidence problems in south Louisiana result from the dewatering of unstable soils.<sup>51</sup> When wetland soils—which are very poorly drained, have a mucky surface and underlying material, and are of low strength—are drained, the surface subsides.<sup>52</sup> The subsidence is due to “(1) shrinkage caused by desiccation, (2) consolidation from loss of the buoyant force of ground water or from loading, (3) compaction, and (4) biochemical oxidation.”<sup>53</sup> Initial subsidence takes place during the three years after drainage when

approximately 50 percent of the thickness of the organic material above the groundwater will be lost.<sup>54</sup> For example, in some areas of Jefferson Parish the total subsidence potential is 144 inches,<sup>55</sup> placing severe limitations on urban uses. Pilings must be used to support foundations, driveways, and other hard surfaces to prevent them from cracking and/or tilting.<sup>56</sup>

Complicating the impact of subsidence on coastal Louisiana is sea level rise. Sea level rise is gaining attention as international scientists publish their findings on climate change.<sup>57</sup> A significant rise in sea level combined with geosyncline downwarping, compaction of sediments, consolidation of materials, and fluid withdrawal will have a devastating effect on the state's low lying coastal zone:<sup>58</sup> These impacts will include the inundation of communities, an increase in the frequency and severity of storms and storm surge, accelerated shoreline erosion, drowning of wetlands and their subsequent loss, modification of coastal processes, and damage to shoreline structures and land uses.<sup>59</sup> Even if sea level rises only one foot over the next 100 years, coastal Louisiana will lose vast acreages of wetlands and people will need to relocate inland.<sup>60</sup>

Coastal erosion is a continual process along the Louisiana shoreline.<sup>61</sup> The barrier islands and beaches from the Mississippi state line to Atchafalaya Bay are eroding except for two sections, one at the eastern end of Grand Isle and the second at the western end of Timbalier Island.<sup>62</sup> Along the chenier plain, accretion is occurring from the vicinity of Marsh Island west approximately 25 miles into Vermilion Parish and in Cameron Parish from the Mermantau River to west of the Calcasieu River.<sup>63</sup> Retreating shorelines threaten development on Grand Isle, Fourchon, Rutherford Beach, and Holly Beach, the only Louisiana communities that abut the Gulf of Mexico.<sup>64</sup>

Tornadoes are small (300 to 1500 feet in diameter at their lower end) but intense, destructive low-pressure centers with winds in excess of 250 mph.<sup>65</sup> They are most frequent during the spring and summer in advance of cold fronts or in association with hurricanes.<sup>66</sup> Those tornadoes that cross the coastal zone can uproot trees, demolish sturdy structures such as schools and churches, and devastate manufactured homes. Windstorms result from the migration of weather fronts and presence of thunderstorms.<sup>67</sup> These straight-line winds can be highly destructive and have been mistaken for tornadoes.<sup>68</sup>

Finally, although they are called "wildfires," fires in the coastal zone are usually the result of human actions rather than natural ignition.<sup>69</sup> "Wildfires" are a sign of late fall and winter, when trappers traditionally burn the wetlands to encourage the growth of new vegetation.<sup>70</sup> This

practice is declining as wetland habitat for furbearing animals is lost, state and local laws are more strictly enforced, and most wetlands are acquired for wildlife conservation areas.<sup>71</sup> In addition, farmers historically burned sugar cane during the harvest to remove leaves.<sup>72</sup> As new machinery replaces traditional practices, the burning of sugar cane fields has become less common.<sup>73</sup> Although the fires rarely damage homes or other structures, the smoke combines with fog to create smog. Fire-induced smog in eastern Orleans Parish and St. Tammany and St. Bernard parishes has caused major accidents on Interstate 10. The smoke also contributes to air pollution in an area where air quality is already low.<sup>74</sup>

The remaining natural hazards (shown in Table 3) occur rarely, if ever. However, caution is emphasized. When these events do happen the results could be catastrophic, causing billions of dollars of damage, disrupting economic activities, and killing hundreds if not thousands of people.

In conclusion, the presence of chronic and episodic natural hazards that are not completely understood or defined makes Louisiana's coastal zone a high-risk place in which to live and work. The state's location on the Mississippi River deltaic plain and the chenier plain along the north-central Gulf of Mexico contributes to its heightened likelihood for experiencing hurricanes, storm surge, and record-breaking precipitation, and many of the state's people live on a landscape that is subsiding as sea level rises. Consequently, development is at risk no matter where or how it takes place. New and upgraded levees and river diversions offer potential, but disputed, long-term solutions, but they will take 50 to 70 years to build and become operational (even if their precise locations can be agreed upon and the billions of dollars needed to fund them can be found). Today and in the foreseeable future, Louisiana's coastal zone residents and businesses are in a situation in which they must take action to reduce damage from the impacts of floods and other hazards. If state and local governments are to operate for the next several decades with virtually no enhanced structural protection, they must initiate comprehensive planning and give greater attention to nonstructural measures of hazard loss reduction.

## Chapter 3

# ADDRESSING NATURAL HAZARDS

### **Federal Programs**

Historically, federal, state, and local government responses to natural hazards in the coastal zone occurred without planning or coordination. Many states, including Louisiana, have lacked the committed leadership, institutional will, and foresight to effectively address natural hazards through a comprehensive scheme. Consequently, states and communities defer to federal authorities and in turn blame them for the perceived burdens that result from necessarily generic regulations that directly or indirectly mitigate coastal hazards. Numerous federal initiatives exist and will have a significant effect on parish and community comprehensive planning, for example: the Coastal Zone Management Act of 1972,<sup>75</sup> the Coastal Barrier Resources Act,<sup>76</sup> Section 404 of the Clean Water Act,<sup>77</sup> the NFIP,<sup>78</sup> and the National Pollutant Discharge Elimination System.<sup>79</sup>

### ***The Coastal Zone Management Act***

The Coastal Zone Management Act (CZMA) authorizes coastal and Great Lakes states to establish their own coastal zone management programs, with the federal government retaining oversight responsibility.<sup>80</sup> State participation in the CZMA is voluntary, but significant incentives and a recognition of the need for coastal zone management have induced almost all the coastal and Great Lakes states, including Louisiana, to develop their own coastal management programs. Funding grants from the National Oceanic and Atmospheric Administration are provided for administering the Louisiana State and Local Coastal Resources Management Act (SLCRMA) of 1978, as amended.<sup>81</sup> The state program sets criteria and establishes guidelines for protecting, developing, and restoring the natural resources of the delineated coastal zone while allowing for adequate economic development and growth.<sup>82</sup> A coastal use permit process regulates the issuance, denial, renewal, modification, and revocation of coastal use permits and mitigation of impacts.<sup>83</sup> Coastal activities requiring a permit include, but are not limited to, dredging or discharges of dredged or fill material; levee siting, construction, operation, and maintenance; hurricane and flood protection facilities; urban developments; energy and mining activities; shoreline modification; and recreational and industrial development.<sup>84</sup> Louisiana has delegated selected authority over certain types of activities to parishes that have prepared a local coastal management plan.<sup>85</sup> Parishes with plans

approved by the state and federal coastal management agencies regulate “uses of local concern.”<sup>86</sup> These are uses that directly and significantly affect coastal waters and are in need of coastal management but are not uses of state concern.<sup>87</sup>

Reducing the risks from coastal hazards is a key component of the Louisiana Local Coastal Resources Program (LCRP).<sup>88</sup> However, the LCRP has never addressed storm risk exposure in the placement of single-family homes in the coastal zone because the SLCRMA specifically exempts single-family homes from regulation.<sup>89</sup> Although subdivisions must be responsive to the LCRP guidelines, developers often build only a few houses at a time, avoiding state oversight concerning coastal hazards. This picture may change in the aftermath of the 2005 hurricanes. The Coastal Management Division, Louisiana Department of Natural Resources (LDNR) has expressed its intention to focus more on reducing coastal hazards both in its regulatory and educational programs.<sup>90</sup> To allow for a more aggressive coastal management program, the legislature must amend the SLCRMA to allow regulation or oversight of single-family homes for hazard mitigation purposes.

### ***The Coastal Barrier Resources Act***

Barrier islands and beaches are dynamic and ephemeral features that erode and fill along their unconsolidated length.<sup>91</sup> Because of their low elevation and relief, these barrier systems are subject to overtopping by storm surge or even wind-driven high tides on a regular basis. As such, they are hazardous places, but this does not keep people from wanting to live on them and rebuild after storms.<sup>92</sup> Until recently, federal and state programs encouraged development of barrier islands and beaches.<sup>93</sup> Consequently, people died, and property was flooded or demolished when hazards struck these areas, while valuable renewable habitat was destroyed by development.<sup>94</sup> With increasing development on barrier islands and beaches and growing pressure to confront the problem, Congress passed the Coastal Barrier Resources Act (CBRA) in 1982 to restrict federal subsidies that promote growth where none existed at the time, but not subsidies to identified existing communities.<sup>95</sup> Under the CBRA, the federal government would no longer provide assistance for the construction of sewer and water supply systems; airports, highways and bridges; jetties, seawalls, and piers; flood insurance; U.S. Army Corps of Engineers structural development projects; or federal loans such as from the Veterans Administration or the Federal Housing Administration.<sup>96</sup> The law does not prohibit private financial transactions or building facilities and structures with private funds or state or local

funds.<sup>97</sup> The effectiveness of the CBRA in reducing damage from natural hazards on coastal barriers is limited in Louisiana because the only inhabited barrier island, Grand Isle and parts of the Cameron Parish shore, are not included in the designated Coastal Barrier System.<sup>98</sup> The rest of the Louisiana shorelines are either already under federal or state ownership or are developed, if at all, as private endeavors, which are not restricted under CBRA.

### ***Section 404 of the Clean Water Act***

Section 10 of the Rivers and Harbors Act of 1899 grants the Corps of Engineers the authority to protect navigable waterways, including those in the coastal zone. Section 10 reads:

That the creation of any obstruction not affirmatively authorized by Congress, to the navigable capacity of any of the waters of the United States is hereby prohibited; and it shall not be lawful to build or commence the building of any wharf, pier, dolphin, boom, weir, breakwater, bulkhead, jetty, or other structures in any port, roadstead, haven, harbor, canal, navigable river, or other water of the United States, outside established harbor lines, or where no harbor lines have been established, except on plans recommended by the Chief of Engineers and authorized by the Secretary of War; and it shall not be lawful to excavate or fill, or in any manner to alter or modify the course, location, condition, or capacity of, any port, roadstead, haven, harbor, canal, lake, harbor of refuge, or enclosure within the limits of any breakwater, or of the channel of any navigable water of the United States, unless the work has been recommended by the Chief of Engineers and authorized by the Secretary of War prior to beginning the same.<sup>99</sup>

This limited level of protection remained for more than 70 years.

In 1972, Congress revised the nation's water quality program by expanding the protection of wetlands adjacent to navigable waters through Section 404 of the Clean Water Act (CWA).<sup>100</sup>

The Corps of Engineers was authorized to implement a separate permit program for the placement of dredge and fill material in waters of the United States. Waters of the United States include:

1. Waters subject to the ebb and flow of the tide subject to mean high water mark;
2. All coastal wetlands, mudflats, swamps, and similar areas contiguous to or adjacent to other navigable waters;
3. Traditional navigable waters of the United States;
4. All artificial channels and canals used for recreation and navigation that are connected to other navigable waters;
5. All tributaries up to their headwaters (5 cubic feet per second) including interstate lakes, rivers, and streams;

6. Freshwater wetlands contiguous or adjacent to other navigable waters; and
7. Those other waters determined by the District Engineer necessary to regulate for the protection of water quality.<sup>101</sup>

Although the Corps administers the Section 404 permit program, the Environmental Protection Agency (EPA) has authority through Section 404(c) to veto a Corps permit if the proposed action has unacceptable adverse impacts on municipal water supplies, shellfish beds, or fishery, wildlife, or recreation areas.<sup>102</sup> Decisions on whether to accept or deny a permit are based on the Section 404(b)(1) guidelines.<sup>103</sup> When properly administered, the Section 404 permit process helps mitigate the impact of natural hazards on development in coastal Louisiana.<sup>104</sup> The Section 404 permit program helps reduce the loss of wetlands that buffer communities from storm surge, directs development away from the more exposed and dangerous parts of the coast, and can limit suburban expansion onto wetlands that will ultimately subside when they are drained.<sup>105</sup>

### ***The National Flood Insurance Program***

In 1968, Congress enacted the NFIP in response to the cycle of building, destruction, disaster relief, and rebuilding that was being repeated as populations encroached onto riverine and coastal floodplains.<sup>106</sup> At first, participation in the NFIP was voluntary.<sup>107</sup> However, even though subsidized insurance was available, communities did not join the program and people would not purchase insurance.<sup>108</sup> In 1973, community participation became mandatory to receive any form of federal financial assistance for acquisition or construction purposes in a Special Flood Hazard Area (SFHA).<sup>109</sup> Financial assistance means loans guaranteed, insured or secured by the Department of Veterans Affairs, the Federal Housing Administration, or the Rural Housing Service, and federal disaster assistance for the permanent repair or reconstruction of buildings damaged or destroyed by flooding in a SFHA.<sup>110</sup> So while participation in the NFIP is technically voluntary, there will be very few instances where communities or individuals can afford to forego these financial services and benefits to fuel economic growth. Additionally, even in purely private transactions, lending institutions will require that mortgaged properties in flood hazard areas be insured against flooding and such insurance is only available at an affordable cost through the NFIP.<sup>111</sup> The federal government supplies flood insurance rate maps that identify the elevation of the areas that would be inundated by the flood that has a 1 percent chance of occurrence each year.<sup>112</sup> More than 20,000 communities now participate in the NFIP and have permit programs that ensure that proposed developments comply with minimal practices, such as the use of construction materials that are resistant to flood damage.<sup>113</sup>

Residential structures must be raised above the 1 percent level of flooding.<sup>114</sup> Commercial structures can be flood-proofed to, or elevated above, the 1 percent level of flooding.<sup>115</sup> Building designs must be resistant to water damage, flotation, collapse, or lateral movement.<sup>116</sup> In addition, water supplies must be protected from contamination while sanitary systems must not have a release that may lead to a health risk.<sup>117</sup> In other words, although the NFIP is not a land use directive, it is intended to encourage the wise use of floodplains at the local level in order to reduce losses.<sup>118</sup> The NFIP is implemented by communities, counties, and parishes through their zoning laws, subdivision regulations, building codes, and miscellaneous ordinances.<sup>119</sup>

The Flood Disaster Mitigation Act of 2000 (DMA 2000) amended the NFIP.<sup>120</sup> In response to DMA 2000, Louisiana has prepared a statewide Hazard Mitigation Plan.<sup>121</sup> The plan is organized to parallel the structure provided in the Interim Final Rules (IFR), which set forth the guidance and regulations under which DMA 2000-compliant State Hazard Mitigation Plans are to be developed.<sup>122</sup> The IFR provides detailed descriptions of the planning process that states and localities are required to observe, as well as descriptions of the contents of the resulting plan.<sup>123</sup> The state must propose goals “to guide the selection of activities to mitigate and reduce potential losses.”<sup>124</sup> Also, the state shall identify, evaluate, and prioritize cost-effective, environmentally sound, and technically feasible “mitigation actions and activities the state is considering and an explanation of how each activity contributes to the overall mitigation strategy.”<sup>125</sup>

The state Hazard Mitigation Plan has the following sections:

- Section One: Introduction
- Section Two: Plan Adoption
- Section Three: Planning Process
- Section Four: Hazard Identification and Profiles
- Section Five: Statewide Risk Assessment
- Section Six: Risk Assessment for State-Owned Assets
- Section Seven: Capability Assessment
- Section Eight: Mitigation Action Plan
- Section Nine: Coordination with Local Mitigation Planning
- Section Ten: Plan Maintenance Process.<sup>126</sup>

Most of these sections are written in summary form.

The goals of the Louisiana Hazard Mitigation Plan are:

- Goal 1. Improve outreach and educational efforts;

- Goal 2. Improve data collection, use and sharing;
- Goal 3. Improve the level of interagency coordination;
- Goal 4. Pursue opportunities to reduce impacts to the state's manmade and natural environment through construction projects.<sup>127</sup>

According to the Office of Homeland Security and Emergency Management, the State Hazard Mitigation Plan supports local hazard mitigation planning by improving outreach and education, collecting data, improving interagency coordination, and facilitating cooperation on construction projects.<sup>128</sup> Although the Plan will provide information and technical assistance regarding best practices for mitigation, it does not include land use decisions or requirements.<sup>129</sup>

As a result of DMA 2000, the Federal Emergency Management Agency (FEMA) was able to provide states and local governments with grants to develop plans and implement long-term hazard mitigation measures after a presidentially declared disaster.<sup>130</sup> This financial assistance is used for safer building practices that permanently reduce or eliminate future damage to property and loss of life from natural hazards and improve existing structures and supporting infrastructure.<sup>131</sup> Examples of projects that may be eligible include, but are not limited to:

- Acquisition of real property for willing sellers and demolition or relocation of buildings to convert the property to open space use;
- Retrofitting structures and facilities to minimize damage from high winds, earthquake, flood, wildfire, or other natural hazards;
- Elevation of flood-prone structures;
- Development and initial implementation of vegetative management programs;
- Minor flood control projects that do not duplicate the flood prevention activities of other federal agencies;
- Localized flood control projects that are designed specifically to protect critical facilities;
- Post-disaster building codes related to activities that support building code officials during the reconstruction process.<sup>132</sup>

Although the NFIP has been successful in many ways, it is designed to address a “100-year” flood, that is, the 1 percent annual chance flood event.<sup>133</sup> The risks are calculated using the best available historical data and current technology to predict the likelihood of flooding and its severity in a given area.<sup>134</sup> The Flood Insurance Rate Maps (FIRMs) are only statistical representations of potential flood events and must be updated as additional data become available and the models are refined.<sup>135</sup> Unfortunately, the public too often believes that the floodplain boundaries shown on the FIRMs predict the ultimate extent and depth of flooding,

only to learn differently.<sup>136</sup> The 2005 hurricanes demonstrated the danger of over-reliance on the FIRMs for guiding development. Storm surges from Hurricanes Rita and Katrina swept across the coast at depths never considered possible and extended inland to areas once thought to be high and safe as long as NFIP criteria were met.<sup>137</sup>

Most communities participating in the NFIP do no more than the minimum required for compliance with the federal program and there are always problems with enforcement. In the wake of the new data provided by studies of Hurricanes Katrina and Rita, FEMA has revised the elevation requirements in the Advisory Base Flood Elevations (ABFE) that will form the basis for the new FIRMs.<sup>138</sup> Unfortunately, some homeowners in Louisiana are ignoring the ABFE requirements their communities have adopted and proceeding to build and rebuild at lower elevations. Furthermore, even structures that are built to the ABFE standards and ultimately the new FIRM elevations will quite often be below the storm surge elevations reached by the 2005 hurricanes.<sup>139</sup> Finally, the FEMA flooding models do not take into account a dynamic global climate that could drastically change the conditions in flood-prone areas and produce significantly higher risk.<sup>140</sup>

### ***The National Pollutant Discharge Elimination System***

In 1972, Congress enacted the Clean Water Act as an amendment to the Federal Water Pollution Control Act.<sup>141</sup> Section 402 of the Clean Water Act created the National Pollutant Discharge Elimination System (NPDES)<sup>142</sup> to regulate polluting discharges from point sources (discrete conveyances such as pipes) into the waters of the United States.<sup>143</sup> The EPA became the responsible regulatory agency for setting effluent limits that ensure the quality of the nation's surface water.<sup>144</sup>

The NPDES includes provisions for permitting operators of municipal separate storm sewer systems to discharge pollutants.<sup>145</sup> Municipal separate storm sewer systems (MS4) carry storm water and pollution to rivers and streams without treatment.<sup>146</sup> Phases I and II of the NPDES were transferred to Louisiana in 1996.<sup>147</sup> The state established a storm water management program to reduce the quantity of pollutants reaching the nation's waterways during storms. MS4 programs should regulate activities to reduce the discharge of pollutants to the "maximum extent practicable."<sup>148</sup> Two required program elements are, first, the development, implementation, and enforcement of erosion and sediment control programs for construction activities that are one acre or larger; and second, post-construction runoff control from new or redeveloped areas.<sup>149</sup>

Finally, the MS4 program should eliminate the illegal discharges and improper disposal of waste, such as filling fish and wildlife habitat.<sup>150</sup>

Sediment from construction sites is a common pollutant that can impair the capacity of a watercourse to transfer storm water, thus increasing floods.<sup>151</sup> Similarly, pollutants may interfere with fish and wildlife habitat and wetlands, environments that serve as natural stormwater detention or retention areas and thereby buffer storm surge.<sup>152</sup> If the capacity or ability of these areas is decreased, then flood elevations will peak sooner and higher, inundating parts of the floodplain and shore that would not normally be affected during an event.<sup>153</sup>

### **Local Action—The Comprehensive Plan**

Except on the property it owns, the federal government does not practice land use planning for specific parcels.<sup>154</sup> Planning is the responsibility of local governments<sup>155</sup> who then implement their plans through such actions as zoning and subdivision regulations. Rather, federal guidelines and regulations outline a range of opportunities for compliance with national criteria, such as the NFIP guidelines, Section 404 permits for the release of dredged and fill materials into wetlands, and the CZMA's standards and criteria.<sup>156</sup> The optimal local approach to land use management is to offer a systematic program that clearly describes what is expected from property owners, developers, and others within the boundaries of the community.<sup>157</sup> Comprehensive land use plans often contain hazard mitigation elements to protect life and property from the risks particular to the community.<sup>158</sup> While it is certainly possible to have stand-alone hazard planning requirements, the effectiveness of such planning is greatly increased when it is done in the context of an overall vision of the community's future development.<sup>159</sup>

The vehicle of choice for local governments is the comprehensive plan.<sup>160</sup> A comprehensive plan is synonymous with "general plan" or "master plan," a fact that results in uncertainty to practitioners and the public.<sup>161</sup> The American Planning Association (APA) offers three definitions for comprehensive plan, two definitions for general plan, and two definitions for master plan and they all cross-reference each other.<sup>162</sup> To add to the confusion, states independently define comprehensive plans through their legislation. The APA<sup>163</sup> and the International City/County Management Association<sup>164</sup> describe comprehensive plans and the comprehensive planning process. In 2002 the APA published a generic format for a comprehensive plan (Table 4) with model language and guidance on the scope and content of each section.<sup>165</sup>

A comprehensive (general or master) plan is an official, adopted legal document that describes the long-range or indefinite view of the entire community in its regional context.<sup>166</sup> The plan serves as a guide to decision making by presenting the goals, policies, standards, and guidelines

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**Table 4. Generic Format of a Local Comprehensive Plan** <sup>167</sup>

PURPOSES

PLAN ELEMENTS AND SUPPORTING STUDIES

Economic, Demographic, and Related Assumptions

REQUIRED ELEMENTS

Issues and Opportunities  
 Land Use  
 Transportation  
 Community Facilities  
 Telecommunications  
 Housing  
 Economic Development  
 Critical and Sensitive Areas  
 Natural Hazards  
 Program of Implementation

OPTIONAL ELEMENTS

Agriculture, Forest, and Scenic Preservation  
 Human Services  
 Community Design  
 Historic Preservation

PROCEDURES FOR PLAN REVIEW, ADOPTION, AND AMENDMENT

Public Participation and Public Hearings  
 Comprehensive Plan Appeals Board  
 Approval of Regional and Local Plans by the State  
 Appeal of Urban Growth Area Designation  
 Procedures for Authorizing State and Special District Projects  
 not included in Approved Regional or Local Comprehensive Plan  
 Financial Incentive to Prepare a New Plan  
 Adoption, Amendment, and Recordation of Local Comprehensive Plans  
 Periodic Review and Revision of the Local Comprehensive Plan  
 and Land Development Regulation

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that direct how and where physical development should occur within the boundaries of the jurisdiction.<sup>168</sup> Text, maps, illustrations, and tables describe the setting and issues related to the physical landscape (geology, topography, hydrology, critical areas, and wetlands), social elements (housing, demographic composition, and recreational facilities), and economic systems (transportation; historic, industrial, and business districts; neighborhoods; other land uses; and infrastructure).<sup>169</sup> These sections present the basic information needed to make decisions about future physical development. Finally, a comprehensive plan discusses a process for implementing, monitoring, and revising the plan over time and as circumstances warrant.<sup>170</sup>

Planning commissions are the agencies most commonly charged with preparing the comprehensive plan, either using their staff or by contracting for professional services.<sup>171</sup> The

plan is implemented through zoning ordinances, subdivision regulations, building codes, miscellaneous regulations, guidelines, and policies.<sup>172</sup> The planning commissions tend to follow a generic process:

1. Decision to plan—willingness to commit time, energy, and money;
2. Information gathering;
3. Problem identification;
4. Analysis of problem;
5. Development of goals and objectives;
6. Identification of alternative solutions;
7. Selection of a solution or plan of action;
8. Implementation;
9. Monitoring and feedback; and
10. Adjustment of solution.<sup>173</sup>

## Chapter 4

# STATUS OF COMPREHENSIVE PLANNING IN THE LOUISIANA COASTAL ZONE IN 2006

The Louisiana Legislature has passed enabling statutes for planning, zoning, and subdivision regulations by its parishes and communities.<sup>174</sup> The APA<sup>175</sup> and the Institute for Business & Home Safety (IBHS)<sup>176</sup> note that Louisiana's statute (L.R.S. 33:106) has not been updated and remains similar to the model planning laws used in the 1920s. Louisiana law (Table 5) does not mandate parish or municipal plans unless a planning commission is created<sup>177</sup>—so local governments that wish to avoid planning may merely decline to appoint a planning commission. Moreover, the state provides little leadership to guide local planning nor does it specify the elements that should be included in a local plan.<sup>178</sup>

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**Table 5. L.R.S. 33:106. General Powers and Duties for Comprehensive Planning in Louisiana<sup>179</sup>**

A.(1) A parish planning commission shall make and adopt a master plan for the physical development of the unincorporated territory of a parish.

(2) A municipal planning commission shall make and adopt a master plan for the physical development of the municipality.

B.(1) Any such plan shall provide a general description or depiction of existing roads, streets, highways, and publicly controlled corridors, along with a general description or depiction of other public property within the jurisdiction that is subject to the authority of the commission.

(2) Any such plan, with the accompanying maps, plats, charts, and descriptive matter may include a commission's recommendations for the development of the parish or municipality, as the case may be, including, among other things, the general location, character, and extent of railroads, highways, streets, viaducts, subways, bus, street car and other transportation routes, bridges, waterways, lakes, water fronts, boulevards, parkways, playgrounds, squares, parks, aviation fields, and other public ways, grounds, and open spaces; the general location of public buildings, schools, and other public property; the general character, extent and layout of public housing and of the replanning of blighted districts and slum areas; the general location and extent of public utilities and terminals, whether publicly or privately owned or operated, for water, light, sanitation, communication, power, transportation, and other purposes; and the removal, relocation, widening, narrowing, vacating, abandonment, change of use, or extension of any of the foregoing ways, grounds, open spaces, buildings, property, utilities, or terminals.

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Table 6 shows which parishes and municipalities in the Louisiana coastal zone have comprehensive plans and the extent of the regulatory authority they exert to implement the plan or manage growth, based on the parishes' and municipalities' responses to a survey.<sup>180</sup> The responses were not reviewed to determine whether the parish or municipal "comprehensive plan"

**Table 6. Coastal Louisiana Parishes and Communities with Planning, Zoning, Subdivision Regulations, and I Codes.**

PARISH	COMMUNITY	FORM OF GOV'T	COMPRE-HENSIVE (MASTER) PLAN	ZONING	SUBDIVISION REGULATIONS	I-CODES
ASSUMPTION		Police Jury				2005
CALCASIEU		Police Jury	2006	X	X	2005
CAMERON		Police Jury				2005
IBERIA		Home Rule				2005
	Delcambre	Lawrason				2005
	New Iberia	Legislative	2004	X	X	2005
JEFFERSON		Home Rule	2006	X	X	2005
	Grand Isle	Lawrason				2005
	Gretna	Lawrason		X	X	2005
	Harahan	Lawrason		X	X	2005
	Jean Lafitte	Lawrason				2005
	Kenner	Home Rule	X	X	X	2005
	Westwego	Lawrason	X	X	X	2005
LAFOURCHE		Home Rule			X	2005
	Golden Meadow	Lawrason	X	X		2005
	Lockport		X	X		2005
LIVINGSTON		Home Rule			X	2005
	Denham Springs	Lawrason		X	X	2005
	French Settlement	Lawrason			X	2005
	Killian	Lawrason				2005
	Livingston	Lawrason				2005
	Port Vincent	Lawrason				2005
	Springfield	Legislative				2005
	Walker	Lawrason				2005
ORLEANS		Home Rule (City-Parish)	1999	X	X	2005
PLAQUEMINES		Home Rule	1975	X	X	2005
ST. BERNARD		Home Rule	X	X	X	2005
ST. CHARLES		Home Rule	1990	X	X	2005
ST. JAMES		Home Rule			X	2005
	Gramercy	Lawrason		X		2005
	Lutcher	Lawrason		X		2005
ST. JOHN THE BAPTIST	Home Rule		X	X	2005	
ST. MARTIN		Home Rule				2005
ST. MARY		Home Rule	2002	X	X	2005
	Morgan City	Home Rule	1973	X	X	2005
	Berwick	Home Rule	X	X	X	2005
	Patterson	Home Rule	X	X	X	2005
	Baldwin	Lawrason				2005
	Franklin	Home Rule	1998	X	X	2005

I-CODES = International Building Code (IBC), International Existing Buildings Code (IEBC), International Residential Code (IRC), International Mechanical Code (IMC), and the International Fuel Gas Code (IFGC)

Table 6 (cont.)

PARISH	COMMUNITY	FORM OF GOV'T	COMPREHENSIVE (MASTER) PLAN	ZONING	SUBDIVISION REGULATIONS	I-CODES
ST. TAMMANY		Home Rule	2005	X	X	2005
	Slidell	Home Rule	2005	X	X	2005
	Mandeville	Home Rule	1989	X	X	2005
	Madisonville	Legislative	X	X	X	2005
TANGIPAHOA		Home Rule			X	2005
	Hammond	Home Rule	2006	X	X	2005
	Ponchatoula	Lawrason	X	X	X	2005
TERREBONNE		Home Rule (Consolidated)	2003		X	2005
	Houma	Home Rule (Consolidated)		X	X	2005
VERMILION		Police Jury				2005

I-CODES = International Building Code (IBC), International Existing Buildings Code (IEBC), International Residential Code (IRC), International Mechanical Code (IMC), and the International Fuel Gas Code (IFGC)

corresponded to the model proposed by the APA (see Table 4). One may expect that what passes for a comprehensive plan in the urban parishes of Orleans, Jefferson, St. Tammany, and Calcasieu would be more inclusive and definitive than those of the predominately rural parishes. According to the data displayed in the table, nine of 19 parishes implement their comprehensive plans through zoning, subdivision regulations, and the International Building Code. Only Terrebonne Parish does not use zoning to implement its plan. Lafourche, Livingston, and Tangipahoa parishes have subdivision regulations while St. James Parish has both zoning and subdivision regulations. All the parishes indicate that they use the International Codes (I-Codes) developed by the International Code Council because their use was mandated by the Louisiana Legislature in 2005.<sup>181</sup> The I-Codes include the International Building Code (IBC),<sup>182</sup> the International Existing Buildings Code (IEBC),<sup>183</sup> the International Residential Code (IRC),<sup>184</sup> the International Mechanical Code (IMC),<sup>185</sup> and the International Fuel Gas Code (IFGC).<sup>186</sup> Post-hurricane rebuilding in accordance with these codes will result in stronger and safer structures that are better able to survive natural disasters because they are based on the latest technology and state-of-the-art requirements.<sup>187</sup> For example, new buildings that meet the I-Codes will have impact-resistant windows, better garage and door protection, shutters, and hurricane-resistant roof tie-downs and exterior cladding, among other features.<sup>188</sup>

It can be seen that the comprehensive plans of Plaquemines Parish and Morgan City are more than 30 years old and the St. Charles Parish comprehensive plan is more than 15 years old. The zoning and subdivision regulations in these parishes should be reviewed and updated.

Of 31 communities (incorporated areas that participate in the NFIP), 14 report that they have a comprehensive plan that is implemented through zoning and subdivision regulations. A detailed assessment of the content and effectiveness of these comprehensive plans, although desirable, was beyond the scope, schedule, and budget of this study. Only Lockport indicates that it does not have subdivision regulations. All communities say they use the I-Codes because such use was mandated by the Louisiana Legislature in 2005.<sup>189</sup> The towns of Delcambre, Jean Lafitte, Killian, Livingston, Port Vincent, Springfield, Walker, Gramercy, Lutchter, and Baldwin do not have planning, zoning, or subdivision regulations.

Table 7 shows the participation of parishes and communities in federal programs that may control and direct hazard-related activities and thereby complement local regulations. For example, all parishes and communities participate in the NFIP, which, as noted in Chapter 3, was established by the National Flood Insurance Act of 1968<sup>190</sup> and has been improved and refined by several amendments.<sup>191</sup> The NFIP was designed, in part, to “guide development away from flood hazard areas and require new, substantially improved, and substantially damaged buildings be constructed in ways that would minimize or prevent damage in a flood.”<sup>192</sup> To participate in the NFIP, communities agree to adopt and enforce a floodplain management ordinance that will reduce damage in the SFHA.<sup>193</sup> The SFHA is a high-risk area that would be inundated by a flood having a 1 percent chance of occurring in any given year.<sup>194</sup>

After Hurricane Katrina, FEMA determined that the storm surge far exceeded the base flood elevations (BFEs) on the existing FIRMs which, therefore, no longer reflected the true risk to the community.<sup>195</sup> Consequently, FEMA conducted a new flood frequency analysis that incorporated storm data from the past 35 years, including the most recent hurricane data, engineering studies, subsidence, and degradation of coastal barriers.<sup>196</sup> Based on this analysis, Advisory Base Flood Elevations (ABFE) have been mapped for all or parts of 15 of Louisiana’s 19 coastal parishes. The ABFEs will be used to guide reconstruction until the FIRMs are revised.<sup>197</sup> The ABFEs, based on the 1 percent annual chance flood event, are lower than the flood elevations observed during Hurricanes Katrina and Rita because these were more extreme events than the base flood.<sup>198</sup> Even though the BFEs on the FIRMs are the federal standard for

**Table 7. Participation of Parishes and Communities in Selected Federal Programs**

PARISH	COMMUNITY	NFIP	ABFE MAPPED	HAZARD MITIGATION PLAN	MS4	LCP
ASSUMPTION		1997		2006	X	
CALCASIEU		1995	X	2006	X	X
CAMERON		1998	X	2006		X
IBERIA		1995	X	2006		
	Delcambre	1990				
	New Iberia	1995				
JEFFERSON		1995	X	2005	X	X
	Grand Isle	1993				
	Gretna	1998			X	
	Harahan	1995			X	
	Jean Lafitte	1995				
	Kenner	1994			X	
	Westwego	1994			X	
LAFOURCHE		1995	X		X	X
	Golden Meadow	1997				
	Lockport	1996				
LIVINGSTON		1996		2006	X	
	Denham Springs	1994			X	
	French Settlement	2001				
	Killian	2001				
	Livingston	1994				
	Port Vincent	1996				
	Springfield	1998				
	Walker	1994			X	
ORLEANS		1970	X	2006	X	X
PLAQUEMINES		1995	X	2006	X	X
ST. BERNARD		1995	X		X	X
ST. CHARLES		1992	X	2006	X	
ST. JAMES		1996		2006		X
	Gramercy	1993				
	Lutcher	1995				
ST. JOHN THE BAPTIST		1996	X	2006		
ST. MARTIN		1994		2005	X	
ST. MARY		1992	X	2004		
	Morgan City	1997			X	
	Berwick	1997				
	Patterson	1994				
	Baldwin	1997				
	Franklin	1991				
NFIP = NATIONAL FLOOD INSURANCE PROGRAM ABFE = ADVISORY BASE FLOOD ELEVATION MS4 = MUNICIPAL SEPARATE STORM SEWER SYSTEM LCP = LOCAL COASTAL PROGRAM						

Table 7. (cont.)

PARISH	COMMUNITY	NFIP	ABFE MAPPED	HAZARD MITIGATION PLAN	MS4	LCP
ST. TAMMANY		1991	X	2005	X	X
	Slidell	1996			X	
	Mandeville	1993		2006	X	
	Madisonville	1997				
TANGIPAHOA		1991	X	2006		
	Hammond	1995			X	
	Ponchatoula	1994				
TERREBONNE		1995	X	2006	X	X
	Houma	1995				
VERMILION		1992	X	2005		

NFIP = NATIONAL FLOOD INSURANCE PROGRAM  
 ABFE = ADVISORY BASE FLOOD ELEVATION  
 MS4 = MUNICIPAL SEPARATE STORM SEWER SYSTEM  
 LCP = LOCAL COASTAL PROGRAM

floodplain management, structures meeting only this minimum standard remain vulnerable to larger hurricanes such as Katrina and Rita.

DMA 2000 requires state, local, and tribal governments to prepare a hazard mitigation plan as a condition of obtaining federal mitigation grant assistance.<sup>199</sup> Hazard mitigation plans are prepared by communities to address their own issues and can take many forms and use different organizational frameworks.<sup>200</sup> The important point is the planning process, not the format. FEMA recommends a four step-planning process (a shorter version of the planning process described in Chapter 3): getting organized, understanding the risks, developing a mitigation plan, and implementing the plan.<sup>201</sup>

Twenty-two of the 50 parishes and municipalities have MS4 programs approved by the Louisiana Department of Environmental Quality. This total may be low, because Iberia Parish's MS4 may include both Delcambre and New Iberia. As noted in Chapter 3, the MS4s programs use six elements to reduce the discharge of pollutants and protect water quality:

- Public education and outreach;
- Public participation/involvement;
- Detection and elimination of illicit discharge;

- Construction site runoff control;
- Post-construction runoff control; and
- Pollution prevention/good housekeeping.<sup>202</sup>

Participation in the MS4 reduces sediment deposition from construction activities in channels, thereby maintaining or increasing the capacity of the watercourse to convey floodwaters.<sup>203</sup> The program can include such preventive measures as protecting wetlands and grassy swales that detain water and thereby reduce flood heights downstream.<sup>204</sup>

Finally, 10 of 19 parishes have Local Coastal Programs (LCP) approved by the LDNR and the National Oceanic and Atmospheric Administration. Local Coastal Programs are authorized by the SLCRMA.<sup>205</sup> Parishes with approved local coastal programs have jurisdiction over uses of local concern.<sup>206</sup> The parish has its own permitting authority and fee schedule.<sup>207</sup> The LCPs are important in the overall attempt to reduce the impacts of hazards on the coastal landscape and economy. The LCP serves as a centralized point of communication and contact within the parish. Regular coastal meetings provide a forum for the public to voice its concerns and to learn about coastal issues, including hazards and hazard mitigation.<sup>208</sup> The LCP helps facilitate communications from the government (federal and state) to the public and from the public back to the government.

The IBHS<sup>209</sup> and the APA<sup>210</sup> report that Louisiana currently does not have a hazard element in its state enabling statutes<sup>211</sup> nor does the state require that a post-disaster recovery plan be included in a comprehensive local plan if one is prepared. In fact, the Louisiana Legislature had to pass an enabling statute before its parishes and municipalities could participate in the NFIP.<sup>212</sup> Thus, in a state that is one of the most hurricane-prone in the nation, frequently leads the country in flood insurance claims through the NFIP,<sup>213</sup> and has thousands of repetitively flooded structures,<sup>214</sup> comprehensive planning and consideration of natural hazards is virtually nonexistent except in reaction to federal laws.

To overcome these deficiencies, state statutes on comprehensive planning must be updated and a section on hazards should be added. Enabling legislation should be revised to mandate comprehensive planning by parishes and municipalities—whether they have planning commissions or not. The local comprehensive plans should be required to include a discrete natural hazard element of weight equal to such traditional elements as transportation, housing, recreation, and economic development. In this way, each parish and community would mold and

set the limits of its comprehensive plan (general plan and master plan) but only within a range of legislated parameters and concepts.

Table 8 outlines the potential content of a parish or community comprehensive plan, which is recommended as a replacement for the verbiage in existing L.R.S. 33:106.B(1) and B(2). Local governments could select from what is possible by adjusting the topics to fit the characteristics and needs of their communities.

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**Table 8. Generic Outline for a Parish or Community  
Comprehensive Plan in Louisiana**

Purpose
Historic Setting
Visioning the Future/Public Participation
Goals and Objectives
Inventory and Issues Chapters (not all may apply to every community)
Agriculture and Forest Element
Coastal Management Element
Community Design Element
Conservation Element (critical areas, areas of concern, scenic preservation, wetlands conservation*)
Economic Element
Future Land Use Element
General Sanitary Sewer, Solid Waste, Drainage, Potable Water, and Natural Groundwater Aquifer Recharge Element
Historical and Natural Features Element
Housing Element
Human-related Hazards Element
Intergovernmental Coordination Element
Land Use Element
Natural Hazards Element
Recreation and Open Space Element
Telecommunications Element
Transportation Element
Utilities and Infrastructure Element (capital improvements)
Other elements particular to or necessary for the community
Public Participation in Review
Implementation Process (assignment of responsibilities, strategies, federal, state, and local regulations, guidelines, schedules of milestones and events)
Monitoring
Periodic Review and Assessment
Revisions (in consideration of periodic review and assessment and changing public policies and circumstances)

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## Chapter 5

# COMPREHENSIVE PLAN REQUIREMENTS IN FLORIDA AND OREGON

To help Louisiana move forward and improve protection from natural hazards for its coastal residents, it would be instructive to examine how other states have addressed the problem. Although no state has *solved* all of its hazard mitigation problems, some are much further along than Louisiana.<sup>215</sup> Building on lessons already learned will save time and energy if the Louisiana Legislature applies the best of what has already been implemented to the unique circumstances of the Mississippi delta and chenier plains. Indeed, because of its unique landscape and heritage, Louisiana must reach beyond what other states have done to adequately protect its coastal citizens.

Both Florida and Oregon, to take two examples, mandate comprehensive planning by local governments.<sup>216</sup> Their state legislation provides detailed guidance on what each plan will contain, including a hazard mitigation element.<sup>217</sup> IBHS regards these states' efforts as substantial.<sup>218</sup> The IBHS rating does not mean that the hazard plans are the best they could be but merely among best that have been devised so far. With evolving conditions stemming from global climate change and localized problems such as coastal land loss, much better planning will undoubtedly be needed.

## Florida

Florida faces risks from hurricanes very similar to those faced by Louisiana.<sup>219</sup> This low-lying coastal state in the Gulf of Mexico has “shared” several hurricanes with Louisiana, most notably in recent times Hurricanes Andrew and Katrina. Florida has experienced intense development pressure in its high-hazard coastal areas and has of necessity taken the difficult step of requiring local governments to institute comprehensive planning for a myriad of critical elements, including hazard mitigation.<sup>220</sup> The Florida statutes require local governments to develop and implement comprehensive plans for development within their jurisdictions or to amend their existing plans to comply with certain requirements listed in the statute.<sup>221</sup> The statute requires that the comprehensive plan of all coastal jurisdictions include a coastal zone protection element containing hazard mitigation provisions.<sup>222</sup>

The Florida statutes recognize that the risks and burdens of unsafe development decisions are borne by society as a whole and therefore should not be left solely in the hands of local decision-makers.<sup>223</sup> That was an unpopular decision when it was made by the Florida lawmakers,<sup>224</sup> but it courageously recognizes the inconvenient facts that have led to record massive destruction of property, to significant loss of life, and to great costs for society.<sup>225</sup> Local governments, understandably, focus much of their effort on stimulating economic development and are loath to establish any restrictions that might stifle the use of property.<sup>226</sup> Even though there has been a massive migration to coastal areas (particularly in Florida),<sup>227</sup> many people will not assume the personal responsibility to fully protect themselves and their property.<sup>228</sup> In addition, because everyone wants to be as close to the water as possible, there is now much more “built environment” in harm’s way than there was even a decade ago.<sup>229</sup> When disaster strikes, history shows that the benevolent U.S. society will not turn its back on those in need, even if their suffering is at least in part a result of their own bad decisions.<sup>230</sup> Unfortunately, this generosity tends to allow constant repetitions of the suffering, damage, and social costs of disasters.<sup>231</sup> It is incumbent, therefore, on those who are able to take a longer and more comprehensive view of the situation—especially state and local officials—to attempt to force better planning. The uncertainties of global climate change make planning even more critical so that future risks can be reduced.<sup>232</sup>

The Florida statutes require that local comprehensive plans include a coastal management element that addresses and protects the overall quality of the coastal environment.<sup>233</sup> Factors to be considered include aesthetics, water quality, coastal forms and features, ecology and wildlife, disaster response, protection of human life, open spaces, navigation, and historic and archaeological sites.<sup>234</sup> The plan is also required to address the limitation of public expenditures that subsidize development in hazardous areas, to use disaster events as an opportunity to guide redevelopment away from unsafe areas, and to restrict development in inappropriate areas.<sup>235</sup> The elements of local comprehensive plans in Florida are to be based on the best available information.<sup>236</sup> The Florida comprehensive planning statute is broad in its scope and may be too ambitious a model for Louisiana to embrace fully, but it certainly demonstrates the possibilities for planning in a state whose economy relies heavily on coastal development.<sup>237</sup> The hazard elements of the Florida statute could certainly be emulated and modified for Louisiana.

## ***Excerpts from Florida Statutes***

### Title XI Chapter 163.3167 Scope of Act

(2) Each local government shall prepare a comprehensive plan of the type and in the manner set out in this act or shall prepare amendments to its existing comprehensive plan to conform it to the requirements of this part in the manner set out in this part.

\*\*\*\*\*

163.3177 Required and optional elements of comprehensive plan; studies and surveys

(6)(g) For those units of local government identified in s. 380.24, a coastal management element, appropriately related to the particular requirements of paragraphs (d)\* and (e)\* and meeting the requirements of § 163.3178(2)\*\* and (3)\*\*. The coastal management element shall set forth the policies that shall guide the local government's decisions and program implementation with respect to the following objectives:

1. Maintenance, restoration, and enhancement of the overall quality of the coastal zone environment, including, but not limited to, its amenities and aesthetic values.
2. Continued existence of viable populations of all species of wildlife and marine life.
3. The orderly and balanced utilization and preservation, consistent with sound conservation principles, of all living and nonliving coastal zone resources.
4. Avoidance of irreversible and irretrievable loss of coastal zone resources.
5. Ecological planning principles and assumptions to be used in the determination of suitability and extent of permitted development.
6. Proposed management and regulatory techniques.
7. Limitation of public expenditures that subsidize development in high-hazard coastal areas.
8. Protection of human life against the effects of natural disasters.
9. The orderly development, maintenance, and use of ports identified in § 403.021(9) to facilitate deepwater commercial navigation and other related activities.

Preservation, including sensitive adaptive use of historic and archaeological resources.

\* References to the conservation and recreation and open space elements, respectively

\*\* References to the coastal management statute

### Title XI Chapter 163.3178 Coastal management.

(1) The Legislature recognizes there is significant interest in the resources of the coastal zone of the state. Further, the Legislature recognizes that, in the event of a natural disaster, the state may provide financial assistance to local governments for the reconstruction of roads, sewer systems, and other public facilities. Therefore, it is the intent of the Legislature that local government comprehensive

plans restrict development activities where such activities would damage or destroy coastal resources, and that such plans protect human life and limit public expenditures in areas that are subject to destruction by natural disaster.

(2) Each coastal management element required by § 163.3177(6)(g) shall be based on studies, surveys, and data; be consistent with coastal resource plans prepared and adopted pursuant to general or special law; and contain:

(a) A land use and inventory map of existing coastal uses, wildlife habitat, wetland and other vegetative communities, undeveloped areas, areas subject to coastal flooding, public access routes to beach and shore resources, historic preservation areas, and other areas of special concern to local government.

(b) An analysis of the environmental, socioeconomic, and fiscal impact of development and redevelopment proposed in the future land use plan, with required infrastructure to support this development or redevelopment, on the natural and historical resources of the coast and the plans and principles to be used to control development and redevelopment to eliminate or mitigate the adverse impacts on coastal wetlands; living marine resources; barrier islands, including beach and dune systems; unique wildlife habitat; historical and archaeological sites; and other fragile coastal resources.

(c) An analysis of the effects of existing drainage systems and the impact of point source and nonpoint source pollution on estuarine water quality and the plans and principles, including existing state and regional regulatory programs, which shall be used to maintain or upgrade water quality while maintaining sufficient quantities of water flow.

(d) A component which outlines principles for hazard mitigation and protection of human life against the effects of natural disaster, including population evacuation, which take into consideration the capability to safely evacuate the density of coastal population proposed in the future land use plan element in the event of an impending natural disaster.

(e) A component which outlines principles for protecting existing beach and dune systems from human-induced erosion and for restoring altered beach and dune systems.

(f) A redevelopment component which outlines the principles which shall be used to eliminate inappropriate and unsafe development in the coastal areas when opportunities arise.

(g) A shoreline use component which identifies public access to beach and shoreline areas and addresses the need for water-dependent and water-related facilities, including marinas, along shoreline areas.

(h) Designation of high-hazard coastal areas, which for uniformity and planning purposes herein, are defined as category 1 evacuation zones. However, application of mitigation and redevelopment policies, pursuant to § 380.27(2), and any rules adopted thereunder, shall be at the discretion of local government.

(i) A component which outlines principles for providing that financial assurances are made that required public facilities will be in place to meet the demand imposed by the completed development or redevelopment. Such public facilities

will be scheduled for phased completion to coincide with demands generated by the development or redevelopment.

(j) An identification of regulatory and management techniques that the local government plans to adopt or has adopted in order to mitigate the threat to human life and to control proposed development and redevelopment in order to protect the coastal environment and give consideration to cumulative impacts.

(k) A component which includes the comprehensive master plan prepared by each deepwater port listed in § 311.09(1), which addresses existing port facilities and any proposed expansions, and which adequately addresses the applicable requirements of paragraphs (a)-(k) for areas within the port and proposed expansion areas. Such component shall be submitted to the appropriate local government at least 6 months prior to the due date of the local plan and shall be integrated with, and shall meet all criteria specified in, the coastal management element. “The appropriate local government” means the municipality having the responsibility for the area in which the deepwater port lies, except that where no municipality has responsibility, where a municipality and a county each have responsibility, or where two or more municipalities each have responsibility for the area in which the deepwater port lies, “the appropriate local government” means the county which has responsibility for the area in which the deepwater port lies. Failure by a deepwater port which is not part of a local government to submit its component to the appropriate local government shall not result in a local government being subject to sanctions pursuant to §§163.3167 and 163.3184. However, a deepwater port which is not part of a local government shall be subject to sanctions pursuant to § 163.3184.

(3) Expansions to port harbors, spoil disposal sites, navigation channels, turning basins, harbor berths, and other related inwater harbor facilities of ports listed in § 403.021(9); port transportation facilities and projects listed in § 311.07(3)(b); and intermodal transportation facilities identified pursuant to § 311.09(3) shall not be developments of regional impact where such expansions, projects, or facilities are consistent with comprehensive master plans that are in compliance with this section.

## Oregon

Oregon is another coastal state that receives the highest rating from IBHS for the strength of its state-mandated comprehensive planning requirements.<sup>238</sup> Although Oregon does not experience hurricanes, its coast is often battered by intense winter storms with surges that cause flooding, landslides, and erosion threats to coastal development.<sup>239</sup> Oregon also faces the risk of tsunamis.<sup>240</sup> The Oregon Legislature passed the state’s land use planning law in 1981.<sup>241</sup> The law is based on the Legislature’s findings that uncoordinated use of land within the state threatened, among other things, public safety, and that, while local governments should remain the primary land use planning authorities, they also should be required to comply with goals established by a statewide planning agency.<sup>242</sup> The Oregon Legislature also stated that the use of comprehensive planning is a statewide concern,<sup>243</sup> recognizing, as the Florida Legislature did, that the

consequences of poor planning reach far beyond local jurisdictions.<sup>244</sup> The policy laid out by the Oregon planning law requires comprehensive plans to be developed and adopted by local governments with state oversight and approval.<sup>245</sup>

The Oregon Land Conservation and Development Commission developed a set of statewide planning goals that local governments must follow when developing their comprehensive plans and suggested guidelines.<sup>246</sup> The act defines goals variably as “mandatory statewide planning standards” and guidelines as “suggested approaches” or merely “advisory.”<sup>247</sup>

There are 19 goals and associated guidelines that include preserving agricultural land, providing adequate housing, providing infrastructure, and preserving environmental resources and recreational areas.<sup>248</sup> Two goals in particular are pertinent to the discussion here, Goal 7, “Areas Subject to Natural Hazards” and Goal 17, “Coastal Shorelands.”<sup>249</sup>

Goal 7 states that “Local governments shall adopt comprehensive plans (inventories, policies and implementing measures) to reduce risk to people and property from natural hazards.”<sup>250</sup> The goal further states that local governments must respond to new information that may change the assessment of risks and amend their plans accordingly.<sup>251</sup> Goal 7 states that, in implementing comprehensive plans to protect life and property, local governments should avoid allowing “development in hazard areas where the risk to people and property cannot be mitigated” and should prohibit “the siting of essential facilities, major structures and special occupancy structures in identified hazard areas where the risk to public safety cannot be mitigated” unless it is needed for emergency response.<sup>252</sup> It notes that compliance with the NFIP with respect to coastal and riverine flood hazards will satisfy these requirements,<sup>253</sup> but the associated guidelines state that local governments should “consider measures that exceed the National Flood Insurance Program.”<sup>254</sup> As stated earlier, the NFIP is a minimum standard based on a 100-year average and quite often, as seen from hurricanes Katrina and Rita, does not provide adequate protection. Oregon’s goal recognizes that fact but does not mandate exceeding the NFIP and appears to be a political compromise.

Part of Oregon’s coastal shorelands goal (Goal 17) is “To reduce the hazard to human life and property and the adverse effects upon water quality and fish and wildlife habitat, resulting from the use and enjoyment of Oregon’s shorelands.”<sup>255</sup> The accompanying guidelines state that “the management of uses and development in floodplain areas should be expanded beyond the

minimal considerations necessary to comply with the National Flood Insurance Program and of the Flood Disaster Protection Act of 1973.”<sup>256</sup>

The Oregon statute also contains provisions for providing compensation to property owners who are affected by the comprehensive plan requirements.<sup>257</sup> These provisions appear to track somewhat the current federal law of takings under the U.S. Constitution (see the discussion on takings law in Chapter 6).

## **Lessons Learned**

What may be learned from Florida and Oregon to benefit the effort to promote hazard mitigation planning in Louisiana? Hazard mitigation planning in these two states is not perfect, because some risky development continues to occur there. Nevertheless, some aspects of these programs deserve consideration as Louisiana drafts its approach to natural hazards. In any state, most coastal zone property owners and local governments would prefer not to be constrained by comprehensive plans. But the Florida and Oregon examples make it obvious that comprehensive planning still can be accomplished where valuable coastal property is subject to natural hazards even though it does require some interference with property rights. To overcome inertia and to reduce damage resulting from natural hazards, local comprehensive plans in those states include a hazard mitigation element.<sup>258</sup> The plans must be based on studies, surveys, and data on the physical, biological, economic, and cultural systems that make up the coastal landscape.<sup>259</sup> The plans are to be revised or amended as new information becomes available. Redevelopment in inappropriate and unsafe locations gradually will be eliminated. The NFIP standards, which apply to all states, should be exceeded by local governments because those minimal standards do not offer enough protection.<sup>260</sup>

The lessons are that hazard mitigation can be accomplished but is usually done incrementally and often is met with resistance. This is an area in which elected officials and community leaders must truly lead and show the way because the average person does not have enough information to see the big picture and make rational decisions. In the foreseeable future it is likely that society will rebel against constantly subsidizing risky development and then more of the costs for damage, repair, and rebuilding, will fall on the property owner. Some market sectors, such as insurance companies, are already declining to do business in high-risk-areas.<sup>261</sup> Such decisions will have a snowball effect if financial institutions refuse to loan money on uninsured property or other business investors decide to keep their investments in safer places.<sup>262</sup> Local governments

can spare their constituents much suffering and dislocation by guiding them to a more sustainable way of coexisting with coastal hazards. As the principal actor, the Louisiana Legislature must set the course for local governments to more forcefully mitigate natural hazards in the state's coastal zone.

## Chapter 6

# MITIGATING NATURAL HAZARDS IN THE LOUISIANA COASTAL ZONE

A community's comprehensive plan is an indispensable, written management tool for improving the community's ability to consistently establish and meet its goals for protecting its citizens from hazards. The generic comprehensive plan (Table 8) proposes a natural hazards element that includes these components: natural hazard identification, the process the parish or community will use to achieve its goals, identification of management practices and funding sources, and a process of accountability. Because all comprehensive plans are designed to meet the landscape and needs of a particular community, the hazards element does not venture into specifics on zoning, subdivision regulations, engineering, or other mitigation measures. Instead, it provides a framework within which parishes and communities can develop new, creative solutions for natural hazards protection—based not on turf or political pressure, but on logical and rational reasons for their implementation. Local governments may choose how to integrate a natural hazards element into their local comprehensive plans. Two ways of approaching this task are discussed below, one developed by the APA and one by FEMA. Both suggest similar systematic methods for reducing the adverse impacts of natural hazards.

### **The American Planning Association Approach**

The APA has published guidance on the development of a natural hazard element in a comprehensive plan.<sup>263</sup> Table 9 integrates aspects of the APA model with ideas from other sources to create a natural hazard element that parishes or communities can use as part of their comprehensive plan.

### **The Federal Emergency Management Agency Approach**

Among its many responsibilities, FEMA administers disaster mitigation funds and grants to states and communities.<sup>264</sup> State and local governments must have adopted a hazard mitigation plan to qualify for a grant from the Flood Mitigation Assistance program or a multi-hazard mitigation plan to qualify for funds from the Pre-Disaster Mitigation Program or Hazard Mitigation Grant Program.<sup>265</sup> Most parishes and communities in the Louisiana coastal

**Table 9. APA’s Suggested Natural Hazards Element  
(part of a parish or community comprehensive plan) <sup>266</sup>**

A. Purpose of Natural Hazards Element

- To document the existence of natural hazards such as flooding, storm and tidal surge, subsidence and compaction (regional geologic processes, withdrawal of produced waters, oil, gas, groundwater, sulphur, and drainage within levees), sea level rise, faulting, coastal erosion (shoreline, interior wetlands), wildfires, earthquakes, winds
- Public input and participation on addressing natural hazards.

B. Characteristics of the natural hazards (risk, vulnerability, magnitude, exposure, severity, probability, frequency, causative factors, and geographic extent)

**Risk** identifies the geographic areas most likely to be affected by a given natural hazard, such as the base flood.

1. We usually show risk areas on a map. FEMA has done this for us on the Flood Insurance Rate Map.
2. People can live and work within a risk area and be less **vulnerable** to the hazard. Some buildings within the defined SFHA do not flood because they are flood-proofed, elevated, or in some other way protected.

The people and the infrastructure that serves them are still **vulnerable**.

1. Getting to and from a structure, having power or water, etc. may still present a major problem and cost.
2. Many people and structures in the SFHA are vulnerable. These properties will flood and suffer damage.

The **magnitude** of an event may also be thought of in terms of intensity, the number of people and structures exposed to it, and the effectiveness of pre-event mitigation measures.<sup>267</sup>

**Exposure** means “the number, types, qualities, and monetary values of various types of property or infrastructure and life that may be subject to an undesirable or injurious hazard event.”<sup>268</sup> Mileti summarizes the relation among “exposure,” “risk,” and “vulnerability:”

Exposure is the measure of people, property, or other interests that would be subject to a given risk. Risk means the probability of an event or condition occurring. Vulnerability is the measure of the capacity to weather, resist, or recover from the impacts of a hazard in the long term as well as the short term.<sup>269</sup>

Tracking from the general to the most specific, the sequence is

1. Disaster—extreme event.
2. Natural hazard—extreme event from the normal course of events that adversely impacts people and property, such as a flood.
3. Hazard assessment—characteristics of the hazard, such as severity, temporal distribution, location, and time span of the event.
4. Risk—probability of an event, such as a flood.
5. Risk assessment—estimates of probability of impacts.
6. Vulnerability—susceptibility to damage.
7. Vulnerability assessment - impacts of a range of events (floods) on the existing and future built environment and natural environment at a specific location.

C. Goals, Objectives, Policies, Programs, and Guidelines for the Natural Hazards element

**Table 9. (cont.)**

- D. Linkages between the Natural Hazards Element and other elements of the parish or community Comprehensive Plan
- Define risk by intensity and area for the built and natural environment
  - Define vulnerability by area for the built and natural environment
  - Types and densities of land uses allowed
  - Coordination among agencies, state and local governments, the private sector, and individuals.
- E. Coordination of mitigation projects with other programs, such as nonpoint source pollution abatement, conservation and restoration of wetlands, recreational facilities. Mitigation should build on the approved FEMA and Louisiana Department of Homeland Security Parish or Community Hazard Mitigation Plan.
- F. Conflicts between natural hazards areas and future land use pattern, public improvements (infrastructure, transportation, etc.), capital projects, and other elements of the parish's or community's Comprehensive Plan
- G. Priorities of actions (structural and nonstructural mitigation measures) for eliminating or minimizing inappropriate and/or unsafe development and construction in identified natural hazards areas
- Examples of actions: amending or modifying zoning ordinances, subdivision regulations, and building codes; other capital projects that are intended to mitigate risk to the public; close coordination with other elements of the comprehensive plan such as evacuation, transportation facilities, emergency shelters, continued operation of utilities and telecommunications services; use of open space and low density uses; Exceeding National Flood Insurance Program requirements, prohibiting some uses in natural hazards areas.
- H. Financial plan for implementing mitigation measures
- Possible sources of funding: FEMA programs, Small Business Administration, Special Congressional appropriations, U.S. Department of Agriculture, the Environmental Protection Agency, U.S. Army Corps of Engineers, state programs, and the private sector, for example the American Red Cross, business' foundations, and faith-based organizations.
- I. A plan for managing post-disaster recovery and reconstruction
- Plan content: lines of authority; interagency and intergovernmental coordination measures, process for expedited review, permitting, and inspection of repair and reconstruction of buildings and structures damaged by the hazard; coordination process with other elements and agencies.
- 

area have enacted hazard mitigation plans (Table 7). Table 11 shows the contents of the state hazard mitigation plan.

The Disaster Mitigation Act of 2000<sup>270</sup> sets these criteria, among others, for mitigation plans:

- (b) LOCAL AND TRIBAL PLANS – Each mitigation plan developed by a local or tribal government shall
- (1) describe actions to mitigate hazards, risks, and vulnerabilities identified under the plan; and
  - (2) establish a strategy to implement those actions.

(c) STATE PLANS – The state process of development of a mitigation plan under this section shall

- (1) identify the natural hazards, risks, and vulnerabilities of areas in the state;
- (2) support development of local mitigation plans;
- (3) provide for technical assistance to local and tribal governments for mitigation planning; and
- (4) identify and prioritize mitigation actions that the state will support, as resources become available.<sup>271</sup>

Note that the components of an all-hazards mitigation plan devised according to the FEMA approach (Table 10) offer an option for multi-jurisdictional mitigation planning,<sup>272</sup> something not considered in the APA method.

## **Implementation of Natural Hazards Mitigation Measures**

In most cases, a parish or community must revise its regulations to implement a natural hazards element within its comprehensive plan or as part of its hazard mitigation plan.

### **Zoning**

The zoning component of a community's comprehensive plan can be modified so that zoning is used to reduce flood damage throughout the community. Zoning sets rules on the use of land and buildings by regulating the

- Kinds of uses,
- Densities of activities,
- Heights of buildings,
- Location of buildings on a lot (setbacks), and
- Proportions of the types of space on a lot.<sup>273</sup>

When done correctly, zoning protects the health, safety, and welfare of both the individual and the community. Zoning ordinances are not static, but can be amended, modified, and appealed by the public, because the regulations must be responsive to the need for legitimate changes. When there is a conflict among zoning regulations, the higher standard applies.<sup>274</sup>

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**Table 10. Hazard Mitigation Planning Process Recommended by FEMA<sup>275</sup>****Phase 1. Organize Resources<sup>276</sup>**

- A. Coordination among agencies
  - 1. Define the planning area
  - 2. Assess if the process is understood
  - 3. Education constituents on hazard mitigation
  - 4. Create a planning team
- B. Integration with other planning efforts
  - 1. Comprehensive planning elements
  - 2. Environmental programs such as stormwater management, wetland conservation and restoration, open space/recreation
  - 3. Transportation plans
  - 4. Structural storm and flood protection
- C. Involve the public throughout the planning process
  - 1. Identify the public
  - 2. Schedule public participation activities
  - 3. Organized a public education initiative
- D. State coordination of local mitigation planning
  - 1. Pre-Disaster Mitigation Program
  - 2. Flood Mitigation Assistance Program
  - 3. Community Rating System

**Phase II. Assess Risks<sup>277</sup>**

- A. Identify all hazards
  - 1. (See Table 3 for natural hazards affecting the Louisiana coastal zone)
- B. Profile hazard events
  - 1. Frequency
  - 2. Magnitude
  - 3. Aerial extent
  - 4. Characteristics
- C. Assess vulnerability
  - 1. Land uses
  - 2. Community characteristics (age, mobility, etc.)
- D. Estimate potential losses
  - 1. To structures
  - 2. To economy
  - 3. To humans

**Phase III. Develop the Mitigation Plan<sup>278</sup>**

- A. Documentation of planning process
- B. Capability assessment
- C. Develop hazard mitigation goals
- D. Identification and analysis of mitigation measures
- E. Funding sources

**Phase IV. Implement and Monitor Progress<sup>279</sup>**

- A. Adoption
  - B. Implementation of mitigation measures
  - C. Implementation through existing programs
  - D. Monitoring, evaluation, and updating the plan
  - E. Continued public involvement
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**Table 11. Table of Contents of the  
State of Louisiana Hazard Mitigation Plan<sup>280</sup>**

Section One	Introduction
Section Two	Plan Adoption
Section Three	Planning Process
Section Four	Hazard Identification and Profiles
Section Five	Statewide Risk Assessment
Section Six	Risk Assessment for State-Owned Assets
Section Seven	Capability Assessment
Section Eight	Mitigation Action Plan
Section Nine	Coordination of Local Mitigation Planning
Section Ten	Plan Maintenance Process

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It has been suggested that an ordinance addressing sea level rise, wetlands conservation, or an eroding shoreline could be enacted as an amendment to the parish's or community's existing zoning ordinance or subdivision regulations.<sup>281</sup> The Louisiana enabling statute for local comprehensive planning (L.R.S. 33:111-117) does not clearly state the purpose of subdivision control,<sup>282</sup> so it would be necessary to delineate this purpose in the sea level rise (or wetlands conservation or eroding shoreline) ordinance (see the model ordinance in Appendix B) in order to apprise everyone that the purpose of the amendment is in accordance with the statutory objective of regulation. Planning commissions may adopt amendments or additions to the zoning ordinance or map and, after public notice and hearings, forward the amendments to the local legislative body for its consideration and possible enactment.<sup>283</sup> If a parish does not have zoning, a planning commission can implement a sea level rise (or wetlands conservation or eroding shoreline) ordinance as an amendment to the existing subdivision regulations.<sup>284</sup>

To protect the public health, safety, and general welfare, parishes and communities must carefully and completely state the purpose and policies to be followed. Studies must delineate the exact locations of the sea level rise, wetlands conservation, or coastal erosion zones. Also, the ordinance must enumerate the proposed requirements or restrictions to be placed on the use of private property and include documentation of their necessity. Local governments must establish "that the requirements of the model ordinance will tie into the existing zoning code and map as well as the subdivision regulations."<sup>285</sup> Such linkages must be explicit. Local governments are cautioned that state law and general practice "provides that subdivisions of five lots or less are

exempt from the provisions of many subdivision ordinances even though they are required to meet some planning standards and then to be formally registered.”<sup>286</sup> Local governments must address this issue.

A community can set regulatory standards that

- Restrict the types of uses in a floodplain zone (district), such as designating the floodway for open space (agriculture or conservation);
- Offer alternatives to the standard grid layout, thereby allowing or encouraging flexibility in lot sizes or locations so development can avoid floodplains; or
- Limit the density of development by setting minimum lot sizes of 5 acres vs. 4 lots per acre.<sup>287</sup>

The first variation in zoning approaches is the “overlay zone.” Communities can enact and, for all practical purposes, have enacted overlay zones when choosing to participate in the NFIP.<sup>288</sup> Communities superimpose or overlay the Special Flood Hazard Area (A Zone, V Zone) depicted on the flood maps issued by FEMA for the NFIP on other land uses such as “single-family residential” zones (R-1 or A-1, depending on local designations). That land then becomes encumbered. That means it can be used in a manner permitted in the underlying district only if and to the extent permitted in the overlay zone. Therefore, a parcel would have to meet both the R-1 Single-/Two-Family Residential restrictions and the NFIP requirements. An advantage of the overlay zone is that it can be applied on top of any of the other land use categories used by the community.

Second, a parish or community can reduce flood damage through “performance zoning.” Performance zoning regulates the effects of land use rather than the uses themselves.<sup>289</sup> As such, it allows for greater flexibility in the development of a site. For example, in an R-1 Single-/Two-Family Residential zone, a community could allow in-house businesses as long as the business meets certain standards, such as limitations on the noise generated, air emissions, size of structure, and density.<sup>290</sup> Different performance standards could exist for different zones. Noise and parking requirements would be more stringent in an R-1 zone than in a C-1 commercial, low-density zone. In floodplains, a community could decide not to allow businesses to operate out of residences in the R-1 (A-1) zone.

Third, flood damage can be reduced by revising the local nonconforming land use zone. “Nonconforming land use” refers to a land use, a lot, or a structure that existed before the adoption or amendment of the zoning ordinance.<sup>291</sup> In other words, the land use no longer

conforms to current uses, so it is considered “grandfathered.” These nonconforming uses/structures usually cannot be expanded, changed to another nonconforming use, or moved to another location within the same zone. If the nonconforming structure is destroyed, it may or may not be allowed to be rebuilt, depending on the local practices.<sup>292</sup> On the other hand, if an existing use is subject to unusually severe losses, damage, or disruption during a flood, a community may change its nonconforming ordinance to prohibit reconstruction. For example, a community could prohibit an assisted living facility from being rebuilt in an A Zone or V Zone (Special Flood Hazard Area).

Finally, parishes and communities may create a zone with “setback” requirements. Setbacks establish minimum distances from a hazard such as shoreline erosion or storm surge. For shoreline erosion, a community may calculate the rate of erosion over a period of time, perhaps 50 or 100 years, and not allow construction of structures within that projected area. If storm surge is the issue, a community may choose to prohibit new structures within the storm surge zone for a 50-year or 100-year event or perhaps for the storm surge of record. The storm surge zone is a floating zone that has no specific geographic delineation, but instead carries a descriptive designation that attaches to a land parcel when ordinance conditions are met.<sup>293</sup> Within each setback zone, a community could establish types of uses that are allowed or prohibited, such as prohibiting critical facilities within the area affected by the surge of record. In addition or as an alternative, a community could establish the density of use in the area. For example, in the area between the 100- and 500-year storm surge lines, a community could relax its single-family residential ordinance to allow for conversion of accessory buildings (garages) to living quarters (bedroom, kitchen, bath). This modification makes more affordable units available.

Local governments have a duty to make the community a safe and healthy place to live and work by reducing damage from natural hazards, such as hurricane storm surge or river flooding. Zoning is a major tool for reducing flood damage within a parish or community. To gain maximum benefits from zoning, a comprehensive plan must be enacted by the planning commission or an existing comprehensive plan must be amended to include a natural hazards element.<sup>294</sup> Overlay zones, performance zoning, nonconforming land uses, and setbacks can contribute to making a safer place to live and work. When these changes are made, the amendments should be logical and as simple as possible.

Many communities will not be willing to exert extensive control over development in their jurisdictions by adopting a comprehensive plan with hazard mitigation elements. Their reluctance may come from a long-held distrust of government controls on private property, fear of economic losses, or lack of resources to affect the process. Those communities that will not adopt a comprehensive plan should, at a minimum, be subject to state-mandated hazard mitigation planning and regulation. This is a matter of public safety and it is well within the state's authority to legislate such requirements. It may be an unpopular move, but given the devastation of 2005 it must be done.

### ***Rolling Easements***

Rolling easements are easements placed along shorelines to prevent property owners from “holding back the sea,” but still allow them to develop their land.<sup>295</sup> The purpose of rolling easements is to protect wetlands and beaches that are already public and maintain, expand, or even contract existing public rights. It presents a “happy medium” of protecting coastal land by placing property owners on notice that their land must give way to eroding shores, while preserving their private property rights today.<sup>296</sup> In his article “Rising Seas, Coastal Erosion, and the Takings Clause: How to Save Wetlands and Beaches Without Hurting Property Owners,” James Titus explored the use of rolling easements as one way of protecting coastlines from erosion.<sup>297</sup> He argued that the implementation of rolling easements is likely to succeed because “they do not require lines to be drawn on a map, and their impact on current property values would generally be less than one percent.”<sup>298</sup> Titus recommended using rolling easements in combination with other erosion prevention tools, such as density restrictions and setbacks, rather than alone. He notes these advantages of rolling easements: 1) they allow property owners to decide how to use their property until the land eventually erodes; 2) because of their low impact on property values, any compensation that the government would have to pay such a riparian owner in the future would impose only a minor burden on the public; and 3) developers may believe the technique will cost them nothing because the impact on their development rights would be minor.<sup>299</sup> The next section explores the concept of rolling easements, their practical operation, how they may be viewed under takings law, and whether they are practical for coastal Louisiana.

## Rolling Easements in Theory

In his article, Titus explains the roots of rolling easements in Texas common law, and uses the term “to describe a broad collection of arrangements under which human activities are required to yield the right of way to naturally migrating shores.”<sup>300</sup> In essence, the area protected by the easement “rolls” with the changing shoreline. He elaborates that rolling easements can be implemented via eminent domain purchase, easement, covenant, or defeasible estate that transfers title if a bulkhead is built or the sea rises to a certain level.<sup>301</sup> Alternatively, he says, a state could implement rolling easement by statute. He cites two Texas cases that discuss rolling easements, *Matcha v. Mattox*<sup>302</sup> and *Feinman v. State*.<sup>303</sup> In both cases, the property owners’ dwellings in Galveston suffered hurricane damage. In *Matcha*, the property owners took action to repair their home despite the fact that the state informed them that any such action violated the Open Beaches Act<sup>304</sup> (OBA) because the remains of the dwelling were seaward of the natural vegetation line after the hurricane.<sup>305</sup> In *Feinman*, the attorney general informed the property owners after the hurricane that they were in violation of the OBA because all or portions of their properties then lay seaward of the post-hurricane vegetation line.<sup>306</sup> The property owners then filed suit, challenging the state’s interpretation of the OBA that the post-hurricane vegetation line was the landward boundary of the public’s easement for beach access, and that their property ownership was not altered by the changes wrought by the hurricane.<sup>307</sup>

One issue that was analyzed in *Feinman* that is relevant here was whether the public’s easement to the vegetation line was a rolling easement, and whether the concept of the rolling easement was within the scope of the OBA. The court ruled that, while rolling easements were not specifically mentioned in the statute, they were implicit in the OBA.<sup>308</sup> The court reached this conclusion by analyzing the relevant law, the purposes of the OBA, the consequences of holding that rolling easements were not implicit in the OBA, and public and private interests in the beach.<sup>309</sup> The court considered the importance of the sea for trade and commerce, the need to consider the division between public and private ownership by incorporating the daily ebb and flow of the sea, the permanent changes to shorelines that can occur due to erosion and accretion, and how concluding that the public’s easements do not move with changing tides would “greatly diminish the public’s easement.”<sup>310</sup> Therefore, the court reasoned, rolling easements were implicit within the OBA.<sup>311</sup>

There are various avenues by which rolling easements can be implemented. One mechanism is for the state to prohibit bulkheads or other structure that would interfere with migrating shores.<sup>312</sup>

Other alternatives include 1) government purchase of property rights for possession of private property under certain, specified circumstances; 2) specification in property deeds that the boundary between public land and private land will migrate inland to the “natural high water mark, whether or not human activities artificially prevent the water from intruding”; or 3) state amendment of its property law regime to mandate that “all coastal land is subject to a rolling easement.”<sup>313</sup> It should be noted that rolling easements need not be implemented statewide. Instead, they may be limited geographically to areas needing particular protection from wetland or shoreline loss. Furthermore, if a state implements rolling easements as a policy, private organizations and property owners can play a role by either donating rolling easements to a conservation organization or selling coastal property with the rolling easement retained.<sup>314</sup>

### **Rolling Easements in Other States**

In practice, rolling easements may be a realistic option for states that want to preserve public access, but do not wish to run amok of the takings clause of the Fifth Amendment to the U.S. Constitution or the state’s own takings law. A policy of rolling easements has been instituted in other states, such as Maine and South Carolina. The following is a summary of the policies themselves in those states, and how they have worked in practice.

**Maine**—The Maine Legislature has rendered the state’s coastal sand dune systems as resources of state significance and has stated, “there is a need to facilitate research, develop management programs and establish sound environmental standards that will prevent the degradation of and encourage the enhancement of these resources.”<sup>315</sup> Maine has coastal sand dune rules that presume the mobility of structures that interfere with landward migration of sand dunes and wetlands as sea level rises.<sup>316</sup> Furthermore, the Maine Department of Environmental Protection’s regulations provide separate rules for situations in which a building is severely damaged by waves from an ocean storm and for those in which a building is not severely damaged by them.<sup>317</sup> However, both sections explicitly require that the building must be moved landward away from the beach “to the extent practicable.”<sup>318</sup> “Practicable” is defined as “available and feasible considering cost, existing technology and logistics based on the overall purpose of the project.”<sup>319</sup> The same rule applies to buildings that have already been reconstructed once. The only difference in those situations is that in determining whether moving the structure is practicable, the government may consider “whether the applicant has applied for a variance to reduce the setback required by the municipality; and whether the applicant has

attempted to buy additional land from abutters that would allow the building to be moved farther back.”<sup>320</sup>

**South Carolina**—The South Carolina Coastal Tidelands and Wetlands Act provides for a “Forty-Year Retreat Policy.” According to this policy, if landowners attempt beach nourishment, but the attempt fails to be effective within a reasonable amount of time, the baseline must be moved landward.<sup>321</sup>

South Carolina’s Ocean and Coastal Resource Management Critical Area Permitting regulations also contain provisions relevant to rolling easements.<sup>322</sup> In general, the state discourages new construction and instead encourages those owning existing structures to retreat from the shoreline.<sup>323</sup> In addition, the regulations state that when an existing structure is damaged and requires replacement or rebuilding, it should be moved landward of the setback line if possible. If that is not possible, then it is to be moved as far landward as practicable.<sup>324</sup>

Because structures are not allowed to be located on what is considered an “active beach,” if long-term erosion or a major storm should cause the structure to become located on an active beach, the landowner must either remove it or move it landward outside of what is considered active beach.<sup>325</sup> “Active beach” means “the area seaward of the escarpment or the first line of stable natural vegetation, whichever first occurs, measured from the ocean landward.”<sup>326</sup>

In some situations in which special permits are required, landowners must agree to move the structure if it should become located on an active beach. Special permits are issued in situations in which the property owner would have no reasonable use of his or her property without the permit, or when a public benefit can be shown to be an overriding element.<sup>327</sup> Although structures are not allowed to be initially constructed on primary oceanfront dunes or the active beach, if erosion should cause the structures to become so located anyway, the landowner has to remove it from that area at his or her own expense.<sup>328</sup> Additionally, there are specific regulations pertaining to habitable structures, pools, parking lots, and drainage devices. These regulations explicitly state that the landowner agrees to move such structures should they become located on an active beach.<sup>329</sup>

**North Carolina**—Regulations promulgated under North Carolina’s Coastal Area Management Act (CAMA) include a requirement that creates a situation similar to that of a rolling easement.<sup>330</sup> Specifically, permits granted under CAMA allowing for structures to be

built must be conditioned on the building's being moved or torn down<sup>331</sup> within two years if it becomes imminently threatened by erosion. An exception is provided for instances in which natural shoreline recovery or beach nourishment changes the status of the structure within those two years, so that it is no longer defined as imminently threatened.<sup>332</sup> Another section of the same regulation defines a threatened structure as one whose foundation or septic system is less than 20 feet away from the erosion scarp. A building more than 20 feet away may also be considered threatened if conditions increase the risk of damage to the structure.<sup>333</sup>

Even though several houses in North Carolina have met these criteria in the wake of serious storms, this rule has yet to be enforced.<sup>334</sup> There are two problems with the application of the rule. First, the definition of threatened was "intended to qualify the building for temporary erosion control protection when the vegetation line is 20 feet from the building. A typical piling-supported [building] is not threatened at that distance."<sup>335</sup> Second, there may be problems if the state attempts to enforce the regulation against property owners due to the fact that it is just one of many conditions included in the permits.<sup>336</sup> The original owner or contractor signs the permit, and it is unclear whether the information is always, if ever, transmitted to subsequent owners.<sup>337</sup>

Additionally, North Carolina uses the vegetation line as a type of rolling easement under its regulation for ocean setbacks.<sup>338</sup> The regulation requires that the setback line "be set at a distance of 30 times the long-term annual erosion rate from the first line of stable natural vegetation or measurement line."<sup>339</sup> It is measured at the issuance of the permit and moves landward with long-term erosion.<sup>340</sup> This rule is advantageous in that it allows for sudden adjustments due to such events as storms.

### **How Rolling Easements May Be Viewed Under Takings Law**

According to the Fifth Amendment to the U.S. Constitution, the federal government cannot take private property without due process of law, nor may private property be taken for public use without just compensation. This "takings clause" not only applies to physical invasions of private property (e.g., eminent domain), but also to regulations that deny all beneficial use of private property.<sup>341</sup> According to Titus, it is unlikely that rolling easements would run afoul of the law on physical or regulatory takings, particularly if the easement is included as a condition for a subdivision or building permit, because the easements would not deny all beneficial use of the property.<sup>342</sup> Furthermore, since the easements would go into effect in the future, the present impact on property values would be small.<sup>343</sup> Rolling easements simply prevent landowners from

indirectly creating land for themselves at the expense of the public rather than divesting them of current interest in their private property.<sup>344</sup>

The history of rolling easements in South Carolina is related to takings jurisprudence, so a brief summary of events there is warranted. A rolling easements policy in South Carolina was enacted in response to the seminal takings case *Lucas v. South Carolina Coastal Council*,<sup>345</sup> which involved a takings claim filed in response to the state's setback regulation that denied landowner David Lucas all beneficial use of his property.<sup>346</sup> During the period after the trial court's declaration that the setback was a taking but before Lucas's appeal to the U.S. Supreme Court, the South Carolina Legislature, in response to the trial court decision in *Lucas* and to Hurricane Hugo, repealed the prohibition against development through setbacks and enacted rolling easements for lots seaward of the setback line in its place.<sup>347</sup> Nevertheless, the South Carolina Supreme Court still heard the state's appeal of the trial court ruling and reversed, prompting Lucas to appeal to the U.S. Supreme Court.<sup>348</sup>

The U.S. Supreme Court in turn declared the setback a compensable taking from the time between the enforcement of the setback rule to its conversion to a rolling easement.<sup>349</sup> Titus argues that *Lucas* is an important case in regard to rolling easements because it implies that setbacks will require compensation in certain circumstances, while the fact that South Carolina replaced setbacks with rolling easements when setbacks were likely to be takings "suggests an assumption that rolling easements will not require compensation."<sup>350</sup> However, it is important to note that the Supreme Court did not address rolling easements in this case. Therefore, it is uncertain whether rolling easements will or will not require compensation in the future and, if so, under what circumstances. Nevertheless, Titus makes a strong argument that rolling easements likely would survive a takings analysis.

### **Rolling Easements in Louisiana**

Rolling easements are a viable option for Louisiana. The state historically has regarded property rights as very important, and rolling easements would allow property owners to have beneficial use of their property while putting them on notice that in the future these rights may have to give way if erosion occurs. This may happen sooner rather than later, depending on the coastal area and when another hurricane strikes the state, but it is a more landowner-friendly policy than, for example, setback rules. Implementation and enforcement likely would be simpler for rolling easements than with other land use tools and also be subject to less public opposition, since

landowners can still make use of their property, and since the rolling easement will have minimal immediate financial impact on their land.<sup>351</sup>

According to the Louisiana Civil Code, when alluvion or dereliction (an increase in land) occurs on a bank of a navigable river or stream, the newly formed bank belongs to the riparian landowner, subject to his or her obligation to leave public that portion which is required for public use.<sup>352</sup> However, this rule does not apply on the shores of seas and navigable lakes where the newly formed land belongs to the state.<sup>353</sup> Conversely, when erosion occurs, riparian landowners lose that portion of their land to the state and the public servitude or ownership attaches to the new bank or shore.<sup>354</sup> The Louisiana constitution and statutes allow the riparian landowner to reclaim property lost to erosion by artificial means.<sup>355</sup> That is usually accomplished by erecting a bulkhead or some other structure, which often results in a loss of the bank or shore, the exacerbation of erosion of adjacent land, and the loss of buffer areas thus increasing exposure of people to risks.<sup>356</sup> If the state were to prohibit or discourage artificial hardening of shorelines, the remaining provisions of Louisiana law would essentially amount to a rolling easement. Issues with mineral rights would have to be addressed to accomplish such a change but precedent for that does exist.<sup>357</sup>

Under the Civil Code, landowners in Louisiana may not obstruct the public use of the sea, seashore, the bottom of natural navigable waters, or the banks of navigable rivers.<sup>358</sup> Article 458 may be another basis for implementation of rolling easements since it can be argued that these banks and shores are part of the public trust because they provide, among other things, a buffer to protect people from storms. Because landowners are not allowed to obstruct the public way, this may be a basis for a regulation that holds landowners who do make such constructions in violation of Article 458 responsible for removing the construction or moving it farther landward.

Article 459 of the Civil Code also may be relevant. It states that if a building is encroaching on a public way, it may remain there as long as the public's use is not affected. However, if the building is demolished, the owner cannot rebuild it, which would again encroach on a public way. It must be built to restore the public way.<sup>359</sup>

Although there are existing avenues through which a rolling easements policy could be developed, Louisiana could choose to specifically adopt rolling easements as an individual policy so that there can be no question about its existence in the statutory and regulatory frameworks. However, stringently enforcing current laws and regulations may net a similar

effect. Even so, there would be a significant benefit to expressly adopting a rolling easements policy and explaining to the public how it will benefit them and bring few costs, especially in the short run. Property owners are understandably worried about policies that may affect their land. Therefore, educating them about how rolling easements work in practice, how the policy has worked for other states, and how it is not likely to affect the way in which they develop their land until and unless land is lost to erosion would be a key way to obtain buy-in from the public.

### ***Mitigation Measures***

Zoning and rolling easements are not the only measures that parishes and communities can use to reduce adverse impacts from natural hazards. There are many activities that can be undertaken to mitigate the risks of and damage from floods, hurricanes, and other extreme environmental events. FEMA divides mitigation measures into six broad categories (Table 12), and these may be applied to selected hazardous situations in Louisiana. In those locations where shoreline management is required to reduce the effects of a natural hazard, the National Oceanic and Atmospheric Administration suggests 15 planning, policy, and regulatory approaches (Table 13). Each approach may be used individually or in combination, the latter being more effective in many instances. Each policy, regulatory, and planning tool is described in more detail in studies by the NOAA Coastal Services Center at [http://www.coastalmanagement.noaa.gov/initiatives/shoreline\\_ppr\\_overview.html](http://www.coastalmanagement.noaa.gov/initiatives/shoreline_ppr_overview.html).



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**Table 13. Planning, Policy, and Regulatory Approaches to Shoreline Management<sup>361</sup>**

- Implement Managed Retreat
  - Establish Construction Setbacks
  - Develop Shoreline Management Plans
  - Regulate Erosion Control Structures
  - Develop Mitigation Requirements
  - Establish Zoning and Erosion Overlay Districts
  - Implement a Transfer of Development Rights Program
  - Utilize Land Acquisition
  - Create Erosion Control Easements
  - Provide Insurance Incentives/Disincentives
  - Regulate Type of Development Allowed
  - Establish Restrictive Covenants
  - Disclose High-Risk Erosion Areas
  - Provide Tax Incentives
  - Provide Relocation Assistance/Buy-Backs
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## Chapter 7

# PROPERTY RIGHTS AND GOVERNMENT LIABILITY

Government action in promoting hazard mitigation could be likened to a gauntlet—danger awaits on either side and careful navigation down a narrow path is the only choice. On one side is the problem of stifling economic development and being required to pay for interference with private property. On the other side is the duty of the government (local, state, or federal) to protect the population from hazards—a duty that is accompanied by the potential liability that can result from actions that exacerbate those hazards, or by explicitly or implicitly giving the public false assurances.

The Association of State Floodplain Managers (ASFPM), a professional organization that works to reduce the loss of human life and property damage resulting from flooding and to preserve the natural and cultural values of floodplains,<sup>362</sup> has conducted extensive research into the legal aspects of local government involvement in floodplain management.<sup>363</sup> The ASFPM has concluded that an approach to flooding problems called “no adverse impact (NAI)” is the best way for local governments to both mitigate flood hazards and avoid legal pitfalls.<sup>364</sup> NAI floodplain management is “an approach that ensures that the action of one property owner does not adversely impact the properties and rights of other property owners, as measured by increased flood peaks, flood stage, flood velocity, and erosion and sedimentation in public works projects, development permitting and other activities.”<sup>365</sup>

NAI floodplain management measures undertaken by a state or local government can and should, when necessary, go beyond minimum federal floodplain management requirements. The ASFPM maintains that “Communities which adhere to a No Adverse Impact approach in community decision-making and activities that affect the floodplains will decrease the potential for successful liability suits from a broad range of activities, such as road and bridge building, installation of storm water management facilities, construction of flood control works, grading, construction of public buildings, approving subdivisions and accepting dedications of public works, and issuing permits.”<sup>366</sup>

The report on NAI floodplain management recently released by the ASFPM discusses in detail a wide spectrum of case law in which communities were sued for their roles in contributing to flood damage.<sup>367</sup> Many of these suits were successful. The report also discusses the implications

of NAI floodplain management for property rights law, including takings claims against governmental entities. The NAI report concludes that, “From a Constitutional law perspective, courts are very likely to uphold community regulations which adopt a No Adverse Impact performance standard against claims of unreasonableness or ‘taking’ of private property without payment of just compensation.”<sup>368</sup> That is not to say that there will be no successful challenges to community floodplain regulations under takings or other theories, but courts are generally willing to uphold the regulations when it is clear that public safety is at stake. It would behoove Louisiana’s local government leaders and regulators to examine the NAI report closely for general guidance on floodplain regulation issues.

### **Government Liability in Louisiana**

Louisiana case law has established some parameters for local government responsibility in floodplain management. Undoubtedly these parameters will change under the onslaught of serious disasters such as Katrina and Rita, probably establishing a higher standard for governments’ role in preventing its citizens from placing themselves in harm’s way. In the case of *Eschete v. City of New Orleans*, the plaintiffs sued the city for authorizing the building of new subdivisions in an area that the city knew was subject to flooding, and which resulted in the flooding of the plaintiff’s home.<sup>369</sup> The City of New Orleans asserted that the plaintiffs had no cause of action. The Louisiana Supreme Court disagreed:

The City of New Orleans seeks to avoid the effect of these allegations by asserting that it has no control over drainage and that, under LSA-R.S. 33:4071, such drainage is the sole responsibility of the Sewerage and Water Board. Assuming that the statute does vest the responsibility for drainage in the Sewerage and Water Board, the cause of action against the City is unaffected. The plaintiffs are seeking to hold the City, not for failing to provide adequate drainage, but for fault in adding new subdivisions, thus increasing the volume of water in the drainage area. In effect, according to the petition, the power to grant or withhold consent for new subdivisions in the Pines Village drainage area effectively controlled the volume of water being discharged in that area.<sup>370</sup>

For its fault, the City may be held liable.<sup>371</sup>

The reasoning in *Eschete* has been followed in several other Louisiana cases. In *Stewart v. Schmieder*, the Louisiana Supreme Court cited its decision in *Eschete* and held that the city parish government could be held liable to individuals who were injured because of the government’s failure to perform duties owed to the public, in this case conducting building code inspections.<sup>372</sup> The lower courts have largely followed *Eschete* in finding local governments

liable for actions that cause or increase flooding. In *McCloud v. Parish of Jefferson*, the plaintiffs alleged that the parish approved new subdivisions with the knowledge that they would “overtax” the drainage system and caused flood damage to the plaintiffs’ property.<sup>373</sup> The court said that the plaintiffs had stated a proper cause of action under *Eschete*. In *Pennebaker v. Parish of Jefferson*, where the plaintiffs suffered flooding when the parish approved new subdivisions and performed public works projects that increased surface runoff, the court said there was a cause of action under those facts.<sup>374</sup> In *Sharon v. Connecticut Fire Insurance Co.*, the court found the City of Plaquemine liable for damage to plaintiff’s home when the municipal sewerage system backed up because of faulty design or improper operation.<sup>375</sup> The holding was based in part on the city’s accepting responsibility to maintain the sewerage system, irrespective of a finding of negligence. In *Keich v. Barkley Place*, the plaintiffs sought a preliminary injunction to prevent the City of Baton Rouge from authorizing the development of new subdivisions that would exacerbate flooding of plaintiffs’ homes.<sup>376</sup> The court declined to grant the injunction but stated that the plaintiffs would have a cause of action under *Eschete* if they were damaged by flooding caused by the new development. In *Kemper v. Don Coleman Jr., Builder Inc.*, the City of Shreveport approved a subdivision with the knowledge that the area was subject to flooding and that there were studies underway to determine how the problem could be alleviated.<sup>377</sup> The homes were built to the NFIP’s minimum 100-year flood standards but still were flooded. The plaintiff homeowners alleged that the city was negligent in approving the subdivision with the knowledge of potential flooding and doing nothing to remedy the problem.<sup>378</sup> The appeals court affirmed the trial court’s ruling that the city was not negligent because the houses were built to FEMA standards and the city owed no other duty to the homeowners.<sup>379</sup> The plaintiffs attempted to introduce evidence on appeal that the city’s approval of other subdivisions in the area had exacerbated the flooding problems, and would therefore be liable under *Eschete*, but the appeals court would not accept the evidence because of procedural rules and based its decision on the original petition.<sup>380</sup> Had the plaintiffs proven at the original trial that the city’s approval of other development overtaxed the drainage system, they might have prevailed against the city.

Louisiana case law makes it clear that local governments can be found liable in Louisiana for their actions that cause or increase the severity of flooding. Fine factual distinctions and expert evidence will be very important in these situations. Most local governments in coastal Louisiana have assumed responsibility for protecting their residents from flooding through levee and drainage boards,<sup>381</sup> thereby making implied assurances that their actions will not exacerbate flooding. If they are followed at the parish and community level, the NAI principles laid out by

the Association of State Floodplain Managers can help protect local governments from liability for flooding.<sup>382</sup>

### ***Professional Liability***

Governments are not the only parties that need to be concerned with liability resulting from failure to account for the effects of hazards in their actions. Professionals such as architects, engineers, and surveyors have also been increasingly held responsible for damages from natural hazards when their actions in some way caused or exacerbated the damage by design, siting, etc.<sup>383</sup> We will not go into detail on this topic but mention it as another example of the increasing tendency of courts to cast a wider net in finding parties liable for damage from natural hazards.

### ***See No Evil?***

A question that has yet to be answered definitively in Louisiana is whether governments may be held liable for allowing development in hazardous areas when they know the extent of the risk but have not assumed responsibility for preventing the hazard. For example, after Hurricanes Katrina and Rita, detailed maps were produced that clearly defined the extent of the storm surge from the two storms.<sup>384</sup> That data was conveyed to the affected local governments (or is readily available to them) for planning purposes.<sup>385</sup> If those governments have control over development in the hazardous areas and do not prevent development that threatens life and property, are they liable for damage resulting from well-known and documented hazards? The debate regarding government's duty to protect people from themselves is ongoing nationwide and spans many activities.<sup>386</sup> The NAI research found that, in general, courts have been reluctant to impose an affirmative duty on governments to protect people from entirely natural flooding.<sup>387</sup> The report stated, however, that there are exceptions and that courts are moving in the direction of finding governments liable more often.<sup>388</sup> Increased knowledge and predictive capabilities are likely to change the legal equation, especially as major disasters continue.

Recently the town of Madisonville, Louisiana, entered into a settlement with two homeowners to compensate them for the devaluation of their property because the town had allowed the owners to build below the base flood elevation.<sup>389</sup> Neither house had been flooded but their marketability was diminished partially because of insurance concerns (houses built below flood levels are subject to higher premium rates). Although not a legal precedent (because it was settled out of court), this situation demonstrates some of the potential problems that could arise when government is indifferent to private property owners, thus creating hazards for themselves within

their own jurisdictions. The predicament for governments will undoubtedly be much more precarious when life and property are lost. Of course, minimum compliance with the NFIP standards will be used as a defense by governments, but in light of the massive amounts of information available on storm surge, subsidence, sea level rise, and other factors that tend to exacerbate flood hazards, it will become increasingly difficult for governments to claim they are doing all they can do to foster public safety when it is well known that compliance with the NFIP does not necessarily protect the public adequately.<sup>390</sup> At a minimum, express warnings of the flood hazard should be mandated and the property owners should be required to acknowledge in a legally binding document that they understand and accept the consequences of disregarding the options available to protect themselves from flooding. Full disclosure of the true risks and hold-harmless agreements should be required for all real estate, financing, and insurance transactions affecting the subject property.

## **Property Rights**

The relationship between government and private property is complex—simultaneously symbiotic and adversarial. On the one hand, governments define, create, protect and even encourage private property rights. On the other hand, however, governments often must limit, curtail, damage, or extinguish private rights in the conduct of essential public purposes.

The dual nature of this relationship inevitably leads to tension and instances of confusion and conflict. That is particularly true when the role and scope of governmental action are changing: in other words, in times like these. Though it is probably impossible to eliminate the potential for conflict, good planning and a sound understanding of the applicable laws can go a long way toward reducing both the frequency and severity of conflicts. Any effort to revamp or expand land use planning law and practice in Louisiana should be approached with that firmly in mind.

## **Takings Claims**

The prohibition against governmental taking of private property is rooted in both the federal and state constitutions. The Fifth Amendment to the U.S. Constitution, made applicable to the states via the Fourteenth Amendment, provides that

No person shall...be deprived of life, liberty or property without due process of law; nor shall private property be taken for public purpose, without just compensation.<sup>391</sup>

The Louisiana Constitution states, in pertinent part, that

Every person has the right to acquire, own, use, enjoy, protect and dispose of private property. This right is subject to reasonable statutory restrictions and the reasonable exercise of the police power.

Property shall not be taken or damaged by the state or its political subdivisions except for public purposes and with just compensation paid to the owner or into court for his benefit.

In every expropriation or action to take property pursuant to the provisions of this Section...the owner shall be compensated to the full extent of his loss. Except as otherwise provided in this Constitution, the full extent of the loss shall include, but not be limited to, the appraised value of the property and all costs of relocation, inconvenience and any other damages actually incurred by the owner because of the expropriation.<sup>392</sup>

This provision makes three things very clear. First, there is an affirmative right to own property. Second, property owners are entitled to compensation if their property is taken or damaged by the state or its political subdivisions. And third, the right to own property is subject to reasonable statutory restrictions and exercises of police powers.

Generally speaking, there are two types of governmental takings that would give rise to a legal action on the part of the property owner: those which involve the physical dispossession of the private property owner and those which so reduce the value and use of the property so as to constructively constitute dispossession.<sup>393</sup> This latter class of takings is referred to as “regulatory takings,” “inverse condemnation,” or (at least in Louisiana in certain circumstances) “appropriation.”<sup>394</sup> This is the category of takings that arise from land use controls and regulations of the sort being considered here.<sup>395</sup> For purposes of this discussion, these types of takings are referred to as “regulatory takings.”

Since it is clear that a regulatory land use program can sometimes trigger compensable takings<sup>396</sup> the key questions become, first, when does a given program effect a compensable taking? and second, what amount of compensation is due?

### ***What is an Actionable Regulatory Taking?***

The question of just what constitutes a regulatory taking is surprisingly imprecise. The entire concept of regulatory takings only dates back to 1922 and Justice Holmes’s opinion in *Pennsylvania Coal Co. v. Mahon*.<sup>397</sup> In recapping the legal history of regulatory takings in the majority opinion in the well-known 1992 *Lucas* case, Justice Scalia candidly noted that “we have

generally eschewed any 'set formula' for determining how far is too far, preferring to "engag[e] in ...essentially ad hoc, factual inquiries."<sup>398</sup>

The fact that Louisiana has had, at least since the adoption of its current constitution in 1974, a very different definition of what constitutes a taking does not make things any easier.<sup>399</sup> Because Louisiana now follows its traditional takings laws in some situations and the federal approach in others, it is important to have a basic understanding of both how and when each will be applied.

### **Regulatory Takings under Federal Law**

The basic elements of a regulatory takings claim under federal law are well established if not entirely clear.<sup>400</sup> Two discrete categories of regulatory takings have been recognized that give rise to a categorical obligation to compensate without requiring any specific factual inquiries about the particular case.<sup>401</sup> The first category comprises regulations that require a landowner to suffer a permanent "physical invasion," and the second consists of regulations that deny all economically beneficial or productive use of the land.<sup>402</sup> In these two sorts of cases the government is clearly obligated to compensate the landowner.<sup>403</sup>

A third category of takings involves situations in which some—but not all—of the beneficial or productive use of the land has been denied. In such cases, compensation may be due to the property owner based upon a balancing of the public interest involved, the economic impact of the regulation on the property owner, and the extent to which the regulation interferes with the property owner's investment-backed expectations.<sup>404</sup>

In general, the sort of land use measures being considered here would fall under either the second or third category of situations. Despite the apparent clarity of these rules, they are anything but precise in their application.<sup>405</sup> Questions about the nature and extent of the property interest at issue continue to arise, as do the source and nature of the "police power" being asserted through the land use regulation. Even under the first and second categories, compensation may not be due if the property interest at stake is subject to a constraint that is based on a traditional public interest, such as protection from a nuisance or the need protect public welfare as a matter of necessity.<sup>406</sup> In short, in such cases there is no abridgment of a private property right because, when the private property right was created, the government effectively reserved the right to act in certain situations.<sup>407</sup>

The ASFPM’s research uncovered very few successful takings claims under the Fifth Amendment of the U.S. Constitution for government regulations designed to protect against flooding. The report also found that, when takings claims are made, courts have widely upheld state and local flood protection regulations that exceed the NFIP minimum standards.<sup>408</sup>

### **Regulatory Takings under Louisiana Law**

Although federal jurisprudence relating to the Fifth Amendment has been instructive to Louisiana takings jurisprudence, regulatory takings under Louisiana law usually have been controlled by the distinctive standards of the Louisiana Constitution that govern land use and regulatory actions by the state and its political subdivisions.<sup>409</sup> At least that has been the case until recently. In 2003 and 2006 the Louisiana Legislature amended Article I Section 4 of the Louisiana Constitution and passed attendant legislation to provide that, in the case of property rights “affected by coastal wetlands conservation, management, preservation, creation, or restoration” or “lands and improvements actually used or destroyed in the construction, enlargement, improvement, or modification of federal or non-federal hurricane protection projects, including mitigation related thereto,” compensation shall not exceed that required under the Fifth Amendment.<sup>410</sup>

Louisiana follows the modern rule that the law protects the right to use and enjoy a thing or land, not just the physical sanctity of the object itself.<sup>411</sup> Put another way, under the law the term “property” refers not just to an object but to the rights that exist with respect to the object.<sup>412</sup> When the free use and enjoyment of property is substantially interfered with, compensable taking may arise under Louisiana law whether or not expropriation proceedings have been initiated, as in the regulatory takings context.<sup>413</sup> It is clear that such regulatory land use actions as zoning or rezoning may result in a taking.<sup>414</sup> It is also clear that a compensable taking does not result merely because a property owner is unable to develop his property to its maximum economic potential.<sup>415</sup> Whether a taking has occurred in a given case depends on three factors:

First, is a legally recognized private property right affected?

Second, has that property right been taken or damaged?

Third, was the taking or damaging for a public purpose?

The answer to each of these questions must be “yes” for a compensable taking or damaging to have occurred.<sup>416</sup>

The first prong of this three-part test requires a showing of some legal status that runs with the property.<sup>417</sup> This can be an ownership interest, leasehold, or servitude, although a mere user or possessor of property may not bring an inverse condemnation claim.<sup>418</sup> Under federal law, there is a requirement that the property interest be supported by a “distinct investment-backed expectation” but that is generally not the case under Louisiana law.<sup>419</sup> This can (and does) lead to takings cases being pursued under Louisiana law that would not be allowed under federal law.<sup>420</sup> That disparity is one of the reasons for the recent changes to the Louisiana Constitution that were designed to bring Louisiana and federal takings law into harmony for hurricane protection and coastal conservation and restoration projects—the types of initiatives increasingly likely to be undertaken in partnership with the federal government.<sup>421</sup>

The second prong is a question of fact based on whether the government’s act “destroyed a major portion of the property’s value or eliminated the practical economic uses of the property.”<sup>422</sup>

The third prong is also fact-dependent but jurisprudence indicates that actions taken to reduce flooding risk are “manifestly evident” to be a valid public purpose. In a very recent case, the court’s holding seemed to leave little doubt that regulatory actions taken to avoid or abate flooding or other risks would be evident as a public purpose, even though the case actually involved a drainage project.<sup>423</sup> This conclusion is supported by the well-established principle that the authority to zone flows from the government’s police power and that there is a presumption that zoning ordinances are valid.<sup>424</sup> Given the statements made in the State Coastal Master Plan about the importance of land use planning and nonstructural approaches to managing risk in coastal Louisiana, it seems apparent that the enhanced use of zoning and similar development controls under the Coastal Zone Management program for the purpose of safeguarding life and property and in facilitating the conservation and restoration of the coastal landscape would be a manifestly evident public purpose.<sup>425</sup>

Louisiana courts have generally upheld zoning regulations against takings claims, especially when those regulations are related to public safety. However, a landowner who is deprived of all economic value of the property affected by the regulation will have a much stronger argument for a taking.<sup>426</sup>

Some longstanding principles of Louisiana law coincide quite closely with federal takings law. As noted above, Article I Section 4 of the Louisiana Constitution expressly notes that private property rights are not absolute but subject to reasonable exercises of police power and also to

statutory restrictions.<sup>427</sup> Further, the notion that some property rights have been reserved by the state, at least in some situations, is fully consistent with Louisiana’s doctrine of appropriation, which has been explained as “the exercise of a pre-existing but previously unexercised public right.”<sup>428</sup>

In coastal Louisiana the application of hazard mitigation-driven zoning laws would fall largely on the wetter regions of the coast—its swamps and marshes. In that context the potential for triggering compensable takings claims seems very limited for three reasons. First, it seems doubtful that such rules would result in a complete denial of the economic uses of the land. Since most of these areas are not readily amenable to residential or commercial development without extensive leveeing and drainage, their economic value has been rooted more in hunting, fishing, timbering, mineral extraction, and eco-tourism—all of which are activities that, within certain boundaries, would still be pursuable.

Second, most of this area is already pervasively regulated under the Clean Water Act, the Rivers and Harbors Act of 1899, and the Coastal Zone Management Act.<sup>429</sup> Therefore, the degree to which there is a reasonable investment-backed development expectation would be limited.

Finally, there is a strong case that the importance of reducing risk exposure and restoring the coast has become a matter of such pressing urgency that hazard mitigation-driven land use controls are a matter of public necessity under Louisiana’s police power. This was addressed by the Louisiana Supreme Court in *Avenal v. State* in response to a claim that the operation of the Caernarvon coastal restoration project had resulted in a taking under the Fifth Amendment of the U.S. Constitution.<sup>430</sup> The court dispensed with that claim, noting that even if the project “did entirely deprive them of all economically beneficial and productive use of their property rights, the plaintiffs are not entitled to compensation as Caernarvon was a valid exercise of the state’s police power under federal law” (citing *Lucas*).<sup>431</sup> In the context of the state and federal efforts to develop comprehensive programs to restore the coast and protect lives, property, and vital infrastructure—programs that emphasize land use controls—there seems to be no basis for distinguishing between a river reintroduction project and land use controls that are part and parcel of the same program.

## ***How Much Compensation is Due?***

Assuming that a land use regulation has caused a taking, the question becomes one of how much compensation is due to the property owner. The answer depends on whether Louisiana is applying its general takings law or federal law, and on the facts of each case. The difference can be significant.<sup>432</sup>

In general, federal law requires only that “just compensation” be paid, which has come to mean the fair market value of the “taken” property right.<sup>433</sup>

Louisiana law is different and has changed over time. At present, the Louisiana law provides not only for “just compensation” but also for the affected property owner to be compensated to the “full extent of his loss.”<sup>434</sup> As noted earlier, the Louisiana Constitution makes it clear that this is more than just the fair market value of the property. It also includes all costs of relocation, inconvenience, and any other damages actually incurred, and this has been supported in the courts.<sup>435</sup> This clearly goes beyond what is required by the U.S. Constitution and even beyond what would be recoverable under Louisiana tort law.<sup>436</sup>

Recent amendments to the Louisiana Constitution have established exceptions to the general constitutional requirement of compensation to the full extent of the loss. Government actions in the course of coastal restoration or hurricane protection that take or damage property rights have been determined to warrant compensation only to the extent of fair market value. Therefore, whether land use controls will be judged under the federal standard or the general Louisiana standard really depends on whether those controls are found to be an integral part of the state’s hurricane protection efforts or its coastal wetlands conservation, management, preservation, creation, or restoration program. If either of these is the case, then the federal standard would be used, through the application of Louisiana Constitution Articles 1 Section 4 (F) and (G) and 6 Section 42, and R.S. 49:213.10.<sup>437</sup> Given the priority Louisiana has placed on reducing risk to life and property in its coastal region and on preserving and restoring its coastal environment as set forth in the Coastal Master Plan (adopted unanimously by the Legislature), a very strong case exists for concluding that hazard mitigation-focused land use regulations are to be analyzed under the federal standard. A strong case also could be made that, in some instances, the need for such regulation is a matter of public necessity so that compensation is not required regardless of which standard is applied. Of course, the facts of each case will be largely determinative.

## Chapter 8

# RECOMMENDATIONS

This report has focused on natural hazards protection measures that can be incorporated into the local comprehensive plans that can be developed by parishes and incorporated areas. On the most basic level, Louisiana citizens must accept the realities of their unusual coastal environments and more responsibilities for their own actions. State and local officials and the public must be realistic about the ability and the will of government institutions to protect people in high-risk areas. The Interagency Performance Evaluation Task Force (IPET) released its draft Risk & Reliability Report for southeast Louisiana in June 2007. Information from this report and similar modeling studies from universities or professional organizations should be factored into future decisions.

The common refrain in the aftermath of Katrina has been, “if the levees hadn’t failed, then everything would have been all right.” It must be obvious that human-made structures are no more infallible than humans themselves, and that putting absolute faith in them simply courts disaster. Individuals can protect themselves by choosing safer locations and building practices appropriate for living in our dynamic coastal zone rather than continuing the failed policy of meeting minimal development standards in coastal high hazard areas. The federal government’s willingness to pour huge amounts of taxpayer money into rebuilding in the same risky way and constructing fallible protective measures that led to the destruction in the first place will be short lived.<sup>438</sup> Risky development is not a problem unique to Louisiana, but the state’s responses and its actions are under scrutiny by the rest of the country. We must demonstrate the willingness to modify what has not—and will not—work and adopt effective, far-reaching solutions instead.

Some decisions will not be easy or pleasant. Louisiana’s coastal culture is unique and rich and it is understandable that significant dislocation of coastal residents is anathema to many, and to be avoided if at all possible. But ignoring the facts will only cause long-term losses and increasing sorrow. Cultures can endure if the people survive, as has been well illustrated by the Acadians of coastal Louisiana. Repeated disruption and destruction from events such as Katrina and Rita pose a greater threat of dispersing people and diluting culture than would an organized, purposeful, gradual relocation. Incentives to build in safer areas and in a safer way should be strongly considered.

Past experience in Louisiana and other coastal states proves that leaving hazard mitigation solely in the hands of local government is not wholly effective. The early years of the National Flood Insurance Program exemplified the failure of relying on general participation in a voluntary program for reducing flood damage. Louisiana must now require mandatory hazard mitigation measures for its coastal zone if its coastal communities and cultures are to remain viable.

Louisiana can craft state laws and policies to protect its coastal citizens from disasters, as did the states of Florida and Oregon. Specific recommendations for mitigating the adverse impacts of coastal-area natural hazards follow.

## PLANNING

- The Louisiana Legislature should revise the state statutes to require a comprehensive plan from each parish and municipality.
- The Legislature should mandate that each parish and municipality prepare a hazard element as part of its comprehensive plan. The parish or municipality should set its natural hazard mitigation element within the context of its own local landscape, and it should meet strict criteria designed to sufficiently protect life and property.
- The American Planning Association's model for hazard mitigation planning should be used by the Legislature to ensure that all issues significant to effective hazard mitigation in Louisiana are addressed.
- The Louisiana Hazard Mitigation Plan (HMP)<sup>439</sup> should be used as a start, but the strategies in the state's 2005 HMP are passive and do not demonstrate foresighted leadership in reducing the adverse impacts of natural hazards. The Louisiana Legislature should cause the state's HMP to be significantly upgraded to give a clearer vision and purpose, to require more definitive land use controls focused on reducing damage from natural hazards in the parish and local hazard mitigation plans, and to present specific mitigation measures beyond what is required by federal regulations.<sup>440</sup> Finally, the HMP must direct parishes and communities to use all mitigation measures available.
- The information in the State of Louisiana Hazard Mitigation Plan should be updated to include the most recent scientific predictions of changing global conditions that will directly and indirectly affect coastal safety in the state.
- An effective natural hazard mitigation plan must exceed the minimum requirements of the National Flood Insurance Program and include—but not be limited to—setbacks on eroding areas and application of freeboard to account for subsidence and sea level rise.

## SETBACKS

- If development is taking place along eroding shorelines or in subsiding areas, the parish or community should specify a setback requirement that takes into account the rate of shoreline retreat or subsidence and sea level rise. No development or rebuilding should be allowed seaward of this line.

## ELEVATION

- Any new development south of I-10 and I-12 should factor in natural and human-caused subsidence and sea level rise. For example, if subsidence in a community is calculated to be 1 foot and sea level rise is projected to be 0.5 feet in the next 50 years, then the *relative sea level rise* over that period is 1.5 feet and the local ordinance should be amended to add that amount to required building elevations.
- Within the zones subject to surge from the storms of record, the areas flooded by Hurricanes Katrina and Rita in southeast and southwest Louisiana, and other hurricane landfalls in south central Louisiana, homes and businesses should be constructed or rebuilt with the first habitable floor set above the surge elevation of record by an amount equal to the projected relative sea level rise plus a voluntary freeboard of at least 1 foot. The relative sea level rise factor should be adjusted each time a new Flood Insurance Rate Map is published or every 25 years, whichever is sooner.
- Construction within a certified levee system should be the sum of the base flood elevation, plus the community-identified freeboard (a minimum of 1 foot), plus the amount of projected relative seal level rise.

## INSURANCE

- Parishes and communities should require flood insurance for existing and proposed development within the mapped, maximum storm surge zones even if the development lies outside the Special Flood Hazard Area. There are studies that show the historic storm surge zones, including the inland extent of areas flooded by Hurricanes Katrina and Rita in southeast and southwest Louisiana.
- The Louisiana Legislature should mandate the purchase of flood insurance by everyone whose property is protected by a certified levee system as well as those whose property lies within the benefited areas below dams and diversions. Areas protected by levees have been—and will continue to be—flooded repeatedly.<sup>441</sup> Dams have failed and diversions may not achieve expectations. Flood insurance is the last line of defense, assures property owners prompt financial compensation, and relieves taxpayers of some of the burdens of disaster relief.

## STATE OVERSIGHT OF SINGLE-FAMILY HOMES

The Louisiana State and Local Coastal Resources Management Act of 1978, as amended (L.R.S. 49:214.5 *et seq.*) “recognizes that some areas of the coastal zone are more suited for development than other areas” (L.R.S. 49:214.27.C.(2)) but exempts single-family homes from coastal use permit requirements.<sup>442</sup> The Louisiana Legislature should amend the Act to allow the state to regulate or have input into the placement of single-family homes in hazardous coastal areas for public safety purposes. The Coastal Management Division of the Louisiana Department of Natural Resources is in the best position to determine the safety horizon for areas that are subject to subsidence and sea level rise.

## APPENDIX A: GLOSSARY

**GOALS**—a broad statement reflecting a community’s desires;<sup>443</sup> value-based statements that are not necessarily measurable;<sup>444</sup> the general end purposes to which the effort is directed.<sup>445</sup>

**GUIDELINES**—an official recommendation indicating how something should be done or what sort of action should be taken in a particular circumstance; an indication or outline (as by a government) of policy or conduct<sup>446</sup> avoiding development in hazardous areas where mitigation is not possible. Example: prohibition of critical facilities or major structures in hazard areas; allowing only essential facilities for emergency response.

**OBJECTIVES**—statements that spell out specific ways in which goals can be attained;<sup>447</sup> more specific, measurable statements of desired ends;<sup>448</sup> specific, measurable targets for accomplishment.<sup>449</sup>

**100-YEAR FLOOD**—A term commonly used to refer to the 1 percent annual chance flood. The “100-year” flood is the flood that is equaled or exceeded, on average, once in 100 years, but the term should not be taken literally as there is no guarantee that the “100-year” flood will occur at all within the 100-year period or that it will not recur several times.

**ONE-PERCENT ANNUAL CHANCE FLOOD**—A flood of the magnitude that has a 1 percent chance of being equaled or exceeded in any given year. Often referred to as the “100-year” flood or base flood, the 1 percent annual chance flood is the standard most commonly used for minimum floodplain management and regulatory purposes in the United States.

**POLICIES**—rules or courses of action that indicate how the goals and objectives of a plan should be realized.<sup>450</sup>

**PROGRAMS**—a series of related, mission-oriented activities aimed at carrying out a particular policy or group of policies.<sup>451</sup>

**RISK**—has two measurable components: (1) the magnitude of the harm that may result (including damage, injuries, and other costs), and (2) the likelihood or probability of the harm’s occurring at a given location within a specific period of time (risk = magnitude x probability)<sup>452</sup>

**RISK ANALYSIS**—makes “a quantitative estimate of damage, injuries, and costs likely to be experienced within a specified geographic area over a specific period of time.”<sup>453</sup>

1. Risk = magnitude X probability.
2. Magnitude is defined through the vulnerability assessment.

**VULNERABILITY**—the measure of the capacity to weather, resist, or recover from the impacts of a hazard in the long term as well as in the short term.<sup>454</sup>

# APPENDIX B: MODEL SEA LEVEL RISE ORDINANCE FOR LOUISIANA

In 1992 the Coastal Management Division, Louisiana Department of Natural Resources, received a grant from the National Oceanic and Atmospheric Administration to conduct a workshop on sea level rise and to prepare a model local ordinance that could be adopted by parishes and communities. The outline of a model ordinance appears below, and the next section presents some comments and explanation of the various components of the ordinance.

## OUTLINE OF A MODEL SEA LEVEL RISE ORDINANCE FOR LOUISIANA LOCALITIES

Ordinance No. \_\_\_\_\_

SEA LEVEL RISE REGULATIONS

\_\_\_\_\_ PARISH

### SECTION 1. GENERAL PROVISIONS

- 1.1 Title
- 1.2 Purpose

### SECTION 2. DEFINITIONS

- 2.1 Usage
- 2.2 Words and Terms Defined
- 2.3 Boundaries of Sea Level Rise Area
- 2.4 Activities Not Requiring a Sea Level Rise Permit

### SECTION 3. ADMINISTRATION AND ENFORCEMENT

- 3.1 Designation and Powers of Department Administering the Program
- 3.2 Sea Level Rise Permit Requirement
- 3.3 Activities Not Requiring a Sea Level Rise Permit
- 3.4 Permit Application Procedure - Application, Fees, Reports on Decisions
- 3.5 Permit Procedure - Administrative Action
- 3.6 Public Hearings on Permit Applications
- 3.7 Criteria for Sea Level Rise Permit
- 3.8 Term of Permits
- 3.9 Conditions of Permit
- 3.10 Appeals
- 3.11 Modifications
- 3.12 Monitoring
- 3.13 Emergency Permits
- 3.14 Suspensions
- 3.15 Revocation
- 3.16 Enforcement
- 3.17 Penalties

### SECTION 4. PERMIT FOR NON-CONFORMING USES AND MAINTENANCE

- 4.1 Definition of Classification
- 4.2 General Sea Level Rise Permits

### SECTION 5. SCOPE OF COVERAGE

### SECTION 6. VARIANCE

### SECTION 7. SEPARABILITY CLAUSE

# COMMENTARY

## MODEL SEA LEVEL RISE ORDINANCE\*

Ordinance No. \_\_\_\_\_  
SEA LEVEL RISE REGULATIONS  
\_\_\_\_\_ PARISH

### SECTION 1. GENERAL PROVISIONS

#### 1.1 Title

Gives the name of the ordinance, i.e., how it shall be known, cited, and hereinafter referred to.

#### 1.2 Purpose

Presents the rationale for the ordinance; identifies the authorities for the ordinance; and introduces the procedures that shall be followed.

#### ***Rationale for Sea Level Rise Ordinance***

*The purposes of the Sea Level Rise Ordinance are to maintain safe and healthful conditions; to assist developers and individuals in taking advantage of the state-of-the-art construction techniques that are compatible with the natural environment; to protect structures from flooding and accelerated erosion due to sea level rise; and to anticipate impacts of sea level rise on uses throughout the coastal zone.*

### SECTION 2. DEFINITIONS

#### 2.1 Usage

Explains how words shall be construed, interpreted, and defined as they apply to the ordinance and the implementing regulations. For example, the word “shall” is always mandatory, while the word “will” indicates a possible option.

#### 2.2 Words and Terms Defined

An alphabetical listing of words and terms followed by a statement of the meaning of the word or term. In some cases, the explanations may include a reference to sections of the ordinance, laws, or regulations. This section establishes how the words and terms shall apply to the ordinance. Possible sources for commonly used terms include the Code of Federal Regulations, the U. S. Code, glossaries published by professional organizations, and documents issued by federal agencies.

#### 2.3 Boundaries of Sea Level Rise Area

Defines and identifies the limits of the jurisdiction to which the ordinance applies. The subsection may include both a map and written description of the limits of the area. In addition, this section may include a discussion of the procedures used for setting the boundaries, such as a reference to the accepted federal definition of wetlands, the area impacted by sea level rise, or eroding shorelines. Erosion zones may anticipate federal requirements, such as 30 and 60 year setbacks, thereby satisfying more than one program.

#### 2.4 Activities Not Requiring a Sea Level Rise Permit

Lists those projects and programs occurring within the areas affected by Sea Level Rise (Wetlands Conservation or Shoreline Erosion) that are exempt from a Sea Level Rise (Wetlands Conservation or Shoreline Erosion) Permit. For example, some projects and programs may be “grandfathered” for a reasonable period of time (sometimes called an amortization period) because they were in place before

the effective date of the ordinance; or, the project or program may be of such a size as to have minimal or no adverse impact on these areas.

### **SECTION 3. ADMINISTRATION AND ENFORCEMENT**

#### **3.1 Designation and Powers of Program Administrator**

Specifies who appoints (probably the police jury or city council) the Program Administrator; where the Program Administrator (PA) is domiciled in the local government; and the enumerated powers and duties of the PA. The subsection may include provisions for an advisory committee to assist the PA and specify how the advisory committee shall function.

#### **3.2 Sea Level Rise Permit Requirement**

Specifies who must obtain a Sea Level Rise permit. This is usually any seeking to commence any use not exempted in Subsection 2.4.

#### **3.3 Activities Requiring a Sea Level Rise Permit**

Lists those projects and programs occurring within the areas affected by Sea Level Rise (that shall acquire a Sea Level Rise Permit before they can be implemented. Provisions are made for adding projects or programs which do not appear in the list, but that would have a detrimental affect if allowed to take place without modification.

#### **3.4 Permit Application Procedure - Application, Fees, Reports on Decisions**

Identifies the forms that shall be used when making an application for a Sea Level Rise permit. Specifies where and to whom applications shall be submitted and sets the supportive information that must accompany the form.

The range of fees and controlling factors are specified.

Requires that the PA prepare written reports on all decisions and make these available to the public during normal business hours at an appropriate public location within the community. Annual summaries may be prepared by the PA.

#### **3.5 Permit Procedure - Administrative Action**

Presents the path or methodology for processing a Sea Level Rise permit application. The process begins with receipt of the application and review for completeness. Times are set for internal processing and issuing decisions. Provisions are made for public notices of all applications, notifying adjacent landowners, and anyone requesting a copy of the application. Costs may be assessed for all reasonable fees to cover publication in the official community journal, or copying, handling, and mailing of single copies.

Procedures for making decisions and notifying everyone of the decisions are described.

#### **3.6 Public Hearings on Permit Applications**

Provides when public hearings shall be held and when public hearings are optional. Presents ways an individual or group may request a public hearing. Establishes the public notice schedule and location for the hearing; who conducts the hearing; the rules and procedures for the hearing; the receipt of information and comments, both written and oral; and the length of the comment period for inclusion of material into the official record. Finally, the subsection sets a limit for the PA to make a decision after the public hearing and the method for notifying the public and applicant of the decision.

#### **3.7 Criteria for Sea Level Rise Permit**

Sets the standards that shall be used to judge whether a Sea Level Rise permit should be issued.

#### **3.8 Term of Permits**

Sets the time when a project or program must begin after the issuance of a permit and when the project or program must be complete. Makes provisions for extensions of the times, usually when a delay is beyond the control of the applicant or if the project is substantially complete or in progress.

### **3.9 Conditions of Permit**

Sets standard conditions that apply to all Sea Level Rise permits. Provides that special conditions can be attached to any permit, such as a performance bond or onsite mitigation. These special conditions may allow for the project or program implementation even though the proposed action does not completely meet a particular standard.

### **3.10 Appeals**

Indicates who may appeal a decision by the PA; to whom they may appeal; the form of the appeal (usually in writing); the time frame for the appeal; the hearing process and schedule; the decisionmaking body; and the rendering of the decision and publication of the decision in the official journal and a notice to the one who appealed.

### **3.11 Modifications**

Indicates that permit conditions may be modified within certain limits, but that any significant increase in impacts shall result in a new permit application. Sets the reasons why a permit may be modified.

### **3.12 Monitoring**

Directs the PA to monitor the progress of all permitted uses for compliance with standard and special permit conditions. The PA may undertake onsite inspections and shall prepare a report on each permit.

### **3.13 Emergency Permits**

Sets the criteria for issuing emergency permits, such as where public safety is endangered or in situations requiring immediate action to protect the general welfare of the community. Specifies who the PA shall consult before issuing a emergency permit.

### **3.14 Suspensions**

List the reasons the PA may suspend a permit. Sets the notification procedures the permittee and a schedule for the permittee to respond to the suspension order. Limits the PA decision time on a permit suspension to a specified number of days.

### **3.15 Revocation**

Sets the revocation process.

### **3.16 Enforcement**

PA may seek appropriate civil and/or criminal relief if necessary to implement the provisions of the Sea Level Rise (Wetlands Conservation or Shoreline Erosion) program.

### **3.17 Penalties**

Sets the fine and penalties for violations or failure to comply with the provisions of the ordinance or the terms or conditions of the permit.

## **SECTION 4. NON-CONFORMING USES AND MAINTENANCE**

### **4.1 Definition of Classification**

Establishes the date for "grandfathered" projects or programs that do not require a Sea Level Rise permit.

List the criteria the PA shall use to determine what is normal repair, rehabilitation, replacement, or maintenance of existing uses that do not require a Sea Level Rise permit.

### **4.2 General Sea Level Rise Permits**

Provides for General Sea Level Rise permits. Sets the procedure for General permits; the procedure for obtaining such as permit; conditions that apply to general permits; and the reporting process.

**SECTION 5. SCOPE OF COVERAGE**

Describes the relationship of the local ordinance to federal and state regulations, guidelines, and standards.

**SECTION 6. VARIANCE**

Sets the criteria for any variances from the ordinance. Provides for a public notice and a decision process.

**SECTION 7. SEPARABILITY CLAUSE**

Standard clause on separability.

## APPENDIX C: END NOTES

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- <sup>1</sup> COMM. ON HOMELAND SECURITY AND GOV'TAL AFFAIRS, HURRICANE KATRINA: A NATION STILL UNPREPARED, S. REP. NO. 109-322 (2006).
- <sup>2</sup> *Id.*
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- <sup>172</sup> ICMA & APA, *supra* note 162; ICMA, *supra* note 162.
- <sup>173</sup> DANIELS *ET AL.*, *supra* note 158, at 6.
- <sup>174</sup> U.S. WATER RES. COUNCIL, 1 REGULATION OF FLOOD HAZARD AREAS TO REDUCE FLOOD LOSSES, PARTS I-IV (1971); U.S. WATER RES. COUNCIL, 2 REGULATION OF FLOOD HAZARD AREAS TO REDUCE FLOOD LOSSES, PARTS V-VI (1972); Department of Housing and Urban Development, *State of Louisiana, in* Statutory Land Use Control Enabling Authority in the Fifty States. Special Reference to Flood Hazard Regulatory Authority 173-180 (HUD-FIA-79, 1976); J.A. KUSLER, 3 REGULATION OF FLOOD HAZARD AREAS TO REDUCE FLOOD LOSSES (prepared for the U.S. Water Res. Council, 1982); R.E. Emmer *et al.*, Mineral Mgmt. Services, Offshore Petroleum Development and the Comprehensive Planning Process (OCS Study MMS 92-0064, 1992); D.M. MOORE, PLANNING POLICY IN THE LOWER MISSISSIPPI RIVER INDUSTRIAL CORRIDOR (La. Urban Tech. Asst. Ctr., Univ. of New Orleans, Working Paper No. 19, 1994); INSTITUTE FOR BUSINESS & HOME SAFETY, SUMMARY OF STATE LAND USE PLANNING LAWS (1998) [hereinafter IBHS 1998]; INSTITUTE FOR BUSINESS & HOME SAFETY,

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- SUMMARY OF STATE LAND USE PLANNING LAWS, (2006), <http://www.ibhs.org/publications/view.asp?id=302> [hereinafter IBHS 2006]; INSTITUTE FOR BUSINESS & HOME SAFETY, COMMUNITY LAND USE EVALUATION 2006, Matrix 1: General Planning Provisions, Matrix 2: Hazard Mitigation Provisions: State Enabling Statutes with Natural Hazard Content (through December 2005), [hereinafter IBHS, Community Land Use Evaluation]; S.D. Villavaso, *Planning Enabling Legislation in Louisiana: A Retrospective Analysis*, 45 LOY. L. REV. 655-667; APA, *supra* note 152.
- <sup>175</sup> APA, *supra* note 152.
- <sup>176</sup> IBHS 1998, *supra* note 172; IBHS 2006, *supra* note 172; IBHS, Community Land Use Evaluation, *supra* note 172.
- <sup>177</sup> Water Res. Council 1971, *supra* note 172; Water Res. Council 1972, *supra* note 172; Department of Housing and Urban Development, *supra* note 172; Kusler, *supra* note 172; Emmer, *et al.*, *supra* note 172; Moore, *supra* note 172; IBHS 1998, *supra* note 172; IBHS 2006, *supra* note 172; IBHS, Community Land Use Evaluation, *supra* note 172; Villavaso, *supra* note 172; APA, *supra* note 152; LA. REV. STAT. § 33:106.
- <sup>178</sup> *Id.*; VILLAVASO, *supra* note 172; APA, *supra* note 152.
- <sup>179</sup> LA. REV. STAT. § 33:106.
- <sup>180</sup> LA. REV. STAT. § 49:214.24.
- <sup>181</sup> Bookmark Inc, Governor Blanco Signs Louisiana Building Code Bill (December 2005), <http://www.bookmarki.com/Blanco-Signs-Louisiana-Building-Code-Bill-s/190.htm>.
- <sup>182</sup> *Id.*
- <sup>183</sup> *Id.*
- <sup>184</sup> *Id.*
- <sup>185</sup> *Id.*
- <sup>186</sup> *Id.*
- <sup>187</sup> *Id.*
- <sup>188</sup> *Id.*
- <sup>189</sup> *Id.*
- <sup>190</sup> Pub. L. No. 90-448, 41 U.S.C. § 4001 (2005).
- <sup>191</sup> 33 U.S.C. § 1344
- <sup>191</sup> FEMA 2004, *supra* note 106.
- <sup>192</sup> FEMA & LDOT, *supra* note 134 at 3-3.
- <sup>193</sup> FEMA 2004 *supra* note 106.
- <sup>194</sup> *Id.*; FEMA & LDOT, *supra* note 134, at 30-1.
- <sup>195</sup> FEMA 2006, *supra* note 136.
- <sup>196</sup> *Id.*
- <sup>197</sup> *Id.*
- <sup>198</sup> *Id.*
- <sup>199</sup> Pub. L. 106–390, § 1(a), Oct. 30, 2000, 114 Stat. 1552, provided that: “This Act [enacting sections 5133, 5134, 5165 to 5165c, 5205, and 5206 of this title, amending sections 3796b, 5122, 5154, 5170c, 5172, 5174, 5184, 5187, and 5192 of this title, repealing sections 5176 and 5178 of this title, and enacting provisions set out as notes under this section and sections 3796b, 5133, 5165b, 5172, 5174, and 5187 of this title] may be cited as the ‘Disaster Mitigation Act of 2000’.”
- <sup>200</sup> FEMA & LDOTD, *supra* note 134.
- <sup>201</sup> *Id.*
- <sup>202</sup> 33 U.S.C. § 1251-1387; EPA, *supra* note 139.
- <sup>203</sup> 33 U.S.C. § 1251-1387; EPA, *supra* note 139.
- <sup>204</sup> 33 U.S.C. § 1251-1387; EPA, *supra* note 139.
- <sup>205</sup> LA. REV. STAT. § 49:214.21 *et seq.*
- <sup>206</sup> *Id.* § 49:214.25.A(2).
- <sup>207</sup> *Id.* § 49:214.25.A(2).
- <sup>208</sup> *Id.* § 49:214.25.A(2).
- <sup>209</sup> IBHS, Community Land Use Evaluation, *supra* note 172.

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- <sup>210</sup> APA, *supra* note 152.
- <sup>211</sup> LA. REV. STAT. § 33:107.
- <sup>212</sup> LA. REV. STAT. § 38:84, as amended.
- <sup>213</sup> COMM. ON HOMELAND SECURITY AND GOV'TAL AFFAIRS, *supra* note 1.
- <sup>214</sup> *Id.*
- <sup>215</sup> IBHS 2006, *supra* note 171; OR. REV. STAT. § 197 (2005); FLA. STAT. § 163.3167 (2006).
- <sup>216</sup> FLA. STAT. § 163.3167 (2006); OR. REV. STAT. § 197.010, § 197.250 (2005).
- <sup>217</sup> FLA. STAT. § 163.3177(6)(g), § 163.3178(1), (2)(d),(f),(h),(j); OR. REV. STAT. § 197.175; Oregon Department of Land Conservation and Development, Goal 7: Areas Subject to Natural Hazards, Oregon's Statewide Planning Goals, (A)(1) (2001), *available at* <http://www.lcd.state.or.us/LCD/docs/goals/goal7.pdf>.
- <sup>218</sup> IBHS, Community Land Use Evaluation, *supra* note 172.
- <sup>219</sup> Hurricane Andrew–1992, Erin–1995, Danny–1997, Earl–1998, Irene–1999, Gordon–2000, Gabrielle–2001, Charley–2004, Frances–2004, Jeanne–2004, Ivan–2004, Dennis–2005, Wilma–2005, Katrina–2005, <http://www.nhc.noaa.gov/pastall.shtml>.
- <sup>220</sup> FLA DEPT. OF COMMUNITY AFFAIRS, FLORIDA ASSESSMENT OF COASTAL TRENDS 55-57 (2000); FLA. STAT. § 163.3178(1), (2)(h) (2006).
- <sup>221</sup> FLA. STAT. § 163.3161, § 163.3177 (2006).
- <sup>222</sup> *Id.* § 163.3177 (6)(g), (8), § 163.3178(1), (2)(d),(f),(h),(j) (2006).
- <sup>223</sup> *Id.* § 163.3161, § 163.3178(1) (2006).
- <sup>224</sup> Thomas Pelham, 2nd Presidents' Forum on Meeting Coastal Challenges: Planning on Safer Growth in Coastal Louisiana at 225 (2006).
- <sup>225</sup> FLA. STAT. § 163.3161, § 163.3178(1) (2006).
- <sup>226</sup> Raymond J. Burby, *Hurricane Katrina and the Paradoxes of Gov't Disaster Policy: Bringing About Wise Gov'tal Decisions for Hazardous Areas*, 604 THE ANNALS OF THE AMERICAN ACADEMY OF POLITICAL AND SOCIAL SCIENCE 171, 178-80 (2006).
- <sup>227</sup> FLA DEPT. OF COMMUNITY AFFAIRS, FLORIDA ASSESSMENT OF COASTAL TRENDS 53-57 (2000); Pelham, *supra* note 222.
- <sup>228</sup> FED. EMERGENCY MGMT. AGENCY, NAT'L FLOOD INSURANCE POLICY STATISTICS COUNTRY-WIDE AS OF 06/30/2007, *available at* [http://bsa.nfipstat.com/reports/1011\\_200706.htm](http://bsa.nfipstat.com/reports/1011_200706.htm). With more than three times the number as the next closest state (Texas), Florida has 2.2 million FEMA flood insurance policies in force even though there are approximately 16 million residents in Florida and 80% of those live in coastal areas. There is an obvious discrepancy between the number of citizens at risk and the number who protect themselves with flood insurance policies. (Louisiana has fewer than 500,000 policies.)
- <sup>229</sup> JULIE HAUSERMAN, FLORIDA'S COASTAL AND OCEAN FUTURE: A BLUEPRINT FOR ECONOMIC AND ENVIRONMENTAL LEADERSHIP at 3 (2006).
- <sup>230</sup> Louisiana Office of Community Development, Division of Administration, Disaster Recovery Initiative: Louisiana Recovery Authority: The Road Home Housing Programs Action Plan Amendment for Disaster Recovery Funds (2006); U.S. Department of Housing and Urban Development [Docket No. FR-5051-N-01]. 71 *Fed. Register* 29, Department of Defense Appropriations Act (2006).
- <sup>231</sup> Burby, *supra* note 224.
- <sup>232</sup> James B. Elsner, *Evidence in Support of the Climate Change: Atlantic Hurricane Hypothesis*, GEOPHYS. RES. LETT., 33 (2006).
- <sup>233</sup> FLA. STAT. § 163.3177 (6)(g), § 163.3178 (2006).
- <sup>234</sup> *Id.* § 163.3177 (6)(g).
- <sup>235</sup> *Id.* § 163.3178 (1).
- <sup>236</sup> *Id.* § 163.3178 (2).
- <sup>237</sup> Pelham, *supra* note 222.
- <sup>238</sup> IBHS, Community Land Use Evaluation, *supra* note 172.
- <sup>239</sup> OREGON DEPARTMENT OF LAND CONSERVATION AND DEVELOPMENT, *supra* note 215, at (A)(2).
- <sup>240</sup> *Id.*
- <sup>241</sup> OR. REV. STAT. § 197.013 (2005).

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- <sup>242</sup> OR. REV. STAT. § 197.005, 197.225 (2005).
- <sup>243</sup> *Id.* § 197.013.
- <sup>244</sup> *Id.*; FLA. STAT. § 163.3161, § 163.3178(1) (2006).
- <sup>245</sup> OR. REV. STAT. §§ 197.010, 197.175, 197.225.
- <sup>246</sup> *Id.* § 197.225; OREGON DEPARTMENT OF LAND CONSERVATION AND DEVELOPMENT, A SUMMARY OF OREGON'S STATEWIDE PLANNING GOALS, (2006), *available at* <http://www.oregon.gov/LCD/docs/goals/goalssummary.PDF>.
- <sup>247</sup> OR. REV. STAT. § 197.015 (9)(10).
- <sup>248</sup> OREGON DEPARTMENT OF LAND CONSERVATION AND DEVELOPMENT, *supra* note 215.
- <sup>249</sup> *Id.*
- <sup>250</sup> *Id.*
- <sup>251</sup> *Id.* at (B),(C).
- <sup>252</sup> *Id.* at (C)(3)(a-b).
- <sup>253</sup> *Id.* at (C)(4).
- <sup>254</sup> *Id.*
- <sup>255</sup> OREGON DEPARTMENT OF LAND CONSERVATION AND DEVELOPMENT, GOAL 17: COASTAL SHORELANDS, OREGON'S STATEWIDE PLANNING GOALS, Guideline (B) (1999), *available at* <http://www.lcd.state.or.us/LCD/docs/goals/goal17.pdf> .
- <sup>256</sup> *Id.*
- <sup>257</sup> OR. REV. STAT. § 197.352 (2005).
- <sup>258</sup> FLA. STAT. § 163.3177(6)(g), § 163.3178(1), (2)(d),(f),(h),(j); OR. REV. STAT. § 197.175; OREGON DEPARTMENT OF LAND CONSERVATION AND DEVELOPMENT, *supra* note 215.
- <sup>259</sup> FLA. STAT. § 163.3177(6)(a), (8), § 163.3178(2); OR. REV. STAT. § 197.230 (2005)
- <sup>260</sup> Burby, *supra* note 224.
- <sup>261</sup> See A "Mega-Cat" Hurricane Would be Fatal to Some Insurers, Insurance Journal, June 1, 2006, at <http://www.insurancejournal.com/news/national/2006/06/01/69024.htm> (last visited Dec. 11, 2007); Liam Plevin, *Bracing for the Worst: Believed at Risk of a Major Hurricane, Northeast Chafes as Insurers Pull Out*, TBR News, May 31, 2006, at <http://www.tbrnews.org/Archives/a2373.htm> (last visited Dec. 11, 2007); Ken Crerar, *Revamp Natural-Disaster Insurance: In Katrina's Wake*, Providence Journal, May 30, 2006; *Cape Code Home Rates Continue to Rise, Another Insurer Exits*, Insurance Journal, June 4, 2006, at <http://www.insurancejournal.com/news/east/2006/06/04/69132.htm> (last visited Dec. 11, 2007); *Northeast Ripe for Major Hurricane*, Newport Daily News, May 20, 2006.
- <sup>262</sup> Milling, *supra* note 29.
- <sup>263</sup> J. SCHWAB, K.C. TOPPING, C.C. EADIE, R.E. DEYLE & R.A. SMITH, AMERICAN PLANNING ASS'N, PLANNING FOR POST-DISASTER RECOVERY AND RECONSTRUCTION (Planning Advisory Service Rept. No. 483/484, 1998); APA, *supra* note 152, at 7-144 to 7-150.
- <sup>264</sup> Louisiana Office of Homeland Security, Grants Index (2007), <http://www.ohsep.louisiana.gov/grants/grantindex.htm>.
- <sup>265</sup> FEMA & LDOTD, *supra* note 134.
- <sup>266</sup> Table 9 modified from SCHWAB ET AL., *supra* note 261, at 341.
- <sup>267</sup> D.R. GODSCHALK, T. BEATLEY, P. BERKE, D.J. BROWER, & E.J. KAISER, NATURAL HAZARD MITIGATION, RECASTING DISASTER POLICY AND PLANNING 4 (Island Press, 1999).
- <sup>268</sup> SCHWAB ET AL., *supra* note 261, at 326.
- <sup>269</sup> MILETI, *supra* note 32, at 105.
- <sup>270</sup> Pub. L. No. 106-390, 42 U.S.C. § 5165
- <sup>271</sup> *Id.*
- <sup>272</sup> FED. EMERGENCY MGMT. AGENCY, MULTI-JURISDICTIONAL MITIGATION PLANNING (FEMA 386-7, State and Local Mitigation Planning How-To Guide No. 8 CD-ROM, 2006).
- <sup>273</sup> DANIELS ET AL., *supra* note 158.
- <sup>274</sup> APA, *supra* note 152; ICMA & APA, *supra* note 162.
- <sup>275</sup> Table 10 modified from Fed. Emergency Mgmt. Agency, Getting Started with the Mitigation Planning Process (FEMA 386-1, CD-ROM 2002).
- <sup>276</sup> *Id.* at xi.

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- <sup>277</sup> FEMA 2001, *supra* note 33.
- <sup>278</sup> Fed. Emergency Mgmt. Agency, Setting Mitigation Priorities and Goals for Your Community, State, or Tribe and Writing the Plan (FEMA 386-3, CD-ROM 2003) [hereinafter FEMA 2003].
- <sup>279</sup> Fed. Emergency Mgmt. Agency, Implementing the Mitigation Plan, Including Project Funding and Maintaining a Dynamic Plan that Changes to Meet New Developments (FEMA 386-4, CD-ROM 2006).
- <sup>280</sup> Louisiana Hazard Mitigation Plan, *supra* note 119; *see* [http://www.ohsep.louisiana.gov/hlsmitigation/statehazmitplan\\_Q&A.htm](http://www.ohsep.louisiana.gov/hlsmitigation/statehazmitplan_Q&A.htm).
- <sup>281</sup> R.E. THAYER, *Guidelines for Implementation for Model Sea Level Rise or Wetlands Conservation or Eroding Shoreline Ordinance*, in Grant #25103-92-01, PLANNING FOR SEA LEVEL RISE ALONG THE LOUISIANA COAST, A WORKBOOK OF IDEAS, MODEL ORDINANCES, RESIDENT AND PUBLIC OFFICIAL SURVEY FINDINGS, AND REFERENCES 69-73 (R.E. Emmer *et al.* eds., Coastal Mgmt. Division, La. Dept. of Natural Res., U.S. Dept. of Commerce, 1992).
- <sup>282</sup> LA. REV. STAT. § 33:111-117
- <sup>283</sup> APA, *supra* note 152; ICMA & APA, *supra* note 162.
- <sup>284</sup> *Id.*; LA. REV. STAT. § 33:112-113.
- <sup>285</sup> THAYER, *supra* note 279, at 72.
- <sup>286</sup> *Id.* at 73.
- <sup>287</sup> FEMA & LDOTD *supra* note 134; DANIELS ET AL., *supra* note 158.
- <sup>288</sup> APA, *supra* note 152; ICMA & APA, *supra* note 162; PLANNING ADVISORY SERVICES, *supra* note 160.
- <sup>289</sup> APA, *supra* note 152; ICMA & APA, *supra* note 162; PLANNING ADVISORY SERVICES, *supra* note 160.
- <sup>290</sup> *Id.*
- <sup>291</sup> APA, *supra* note 152; ICMA & APA, *supra* note 162; PLANNING ADVISORY SERVICES, *supra* note 160.
- <sup>292</sup> APA, *supra* note 152; ICMA & APA, *supra* note 162; PLANNING ADVISORY SERVICES, *supra* note 160.
- <sup>293</sup> PLANNING ADVISORY SERVICES, *supra* note 160.
- <sup>294</sup> APA, *supra* note 152; ICMA & APA, *supra* note 162
- <sup>295</sup> James G. Titus, *Rising Seas, Coastal Erosion, and the Takings Clause: How to Save Wetlands and Beaches Without Hurting Property Owners*, MARYLAND LAW REVIEW 1279, 1285 (1998).
- <sup>296</sup> *Id.* at 1318.
- <sup>297</sup> Titus, *supra* note 293.
- <sup>298</sup> *Id.* at 1285.
- <sup>299</sup> *Id.*
- <sup>300</sup> *Id.* at 1313
- <sup>301</sup> *Id.*
- <sup>302</sup> 711 S.W.2d 95 (Tex. Ct. App. 1986).
- <sup>303</sup> 717 S.W.2d 106 (Tex. 1st District Ct. App. 1986).
- <sup>304</sup> TEX. NAT. RES. CODE ANN. § 61.001 *et seq.*
- <sup>305</sup> *Matcha*, *supra* note 300, at 96.
- <sup>306</sup> *Feinman*, *supra* note 301, at 107.
- <sup>307</sup> *See id.*
- <sup>308</sup> *Id.* at 110.
- <sup>309</sup> *Id.*
- <sup>310</sup> *Id.*
- <sup>311</sup> *See id.*
- <sup>312</sup> Titus, *supra* note 293, at 1313. However, in the alternative, the property owner may be able to haul in gravel or elevate the driveway. Titus explained that this alternative, by way of example, would allow the property owner to maintain the livability and usefulness of the property while not impairing the ability of wetlands to migrate inland. *Id.* at 1315.
- <sup>313</sup> *Id.*

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<sup>314</sup> Titus, *supra* note 293, at 1314.

<sup>315</sup> ME. REV. STAT. ANN. tit. 38 § 480-A.

<sup>316</sup> In his article, Titus cited the rolling easements policies of Maine and South Carolina. *See* Titus, *supra* note 293, at 1378. Maine’s regulation states: “If the shoreline recedes such that a coastal wetland, as defined under 38 M.R.S.A. § 480-B(2), extends to any part of the structure, including support posts, but excluding seawalls, for a period of six months or more, then the approved structure along with appurtenant facilities must be removed and the site must be restored to natural conditions within one year.” 06-096 355 ME. CODE R. § 10(A).

<sup>317</sup> *See* Maine Dep’t of Environmental Protection, 06-096-355 ME. CODE R. §§ D, E.

<sup>318</sup> *Id.* at 06-096-355 ME. CODE R. §§ 6(D)(1) and 6(E)(1).

<sup>319</sup> *Id.* at 06-096-355 ME. CODE R. § 3(CC).

<sup>320</sup> *Id.* at 06-096-355 ME. CODE R. § 6(F).

<sup>321</sup> S.C. CODE ANN. § 48-39-280.

<sup>322</sup> *See, generally*, S.C. CODE REGS. §§ 30-1 through 30-18.

<sup>323</sup> S.C. CODE REGS. § 30-11(D)(1).

<sup>324</sup> *Id.* § 31-13(E)(4).

<sup>325</sup> *Id.* § 30-14(I).

<sup>326</sup> *Id.* § 30-1(D)(2).

<sup>327</sup> *Id.* § 30-15(F).

<sup>328</sup> *Id.*

<sup>329</sup> *See id.* §§ 30-15(F)(6)(a)(iii), (6)(b)(iii), (6)(c)(iii).

<sup>330</sup> *See* 15A N.C.ADMIN.CODE 7H.0306(1).

<sup>331</sup> *Id.* 7H.0306(1).

<sup>332</sup> *Id.* 7H.0308(a)(2)(B).

<sup>333</sup> E-mail from Spencer Rogers, Coastal Construction and Erosion Specialist, North Carolina Sea Grant (March 27, 2007) (on file with the Louisiana Sea Grant Law and Policy Program).

<sup>334</sup> *See id.*

<sup>335</sup> 15A N.C.ADMIN.CODE 7H.0306(a)(1).

<sup>336</sup> Rogers, *supra* note 331.

<sup>337</sup> Rogers, *supra* note 331.

<sup>338</sup> *See* 15A N.C.ADMIN.CODE 7H.0306.

<sup>339</sup> *Id.* 7H.0306(a)(1).

<sup>340</sup> *See id.* 7H.0306.

<sup>341</sup> Lucas v. South Carolina Coastal Council, 505 U.S. 1003, 1015 (1992).

<sup>342</sup> Denial of all beneficial use of private property may trigger a takings claim. *See, e.g., Lucas*, 505 U.S. 1003. Although productive use eventually would be limited if sea level were to rise to a certain point, a rolling easement nevertheless would not deny productive use of the property at the time it is instituted. *See* Titus, *supra* note 293, at 1357-1358.

<sup>343</sup> Titus, *supra* note 293 at 1357.

<sup>344</sup> *Id.* at 1378. Titus points out that most courts have held, under common law principles, that landowners typically do not get title to new land created by accretion, if the landowner caused the accretion. *See id.* at 1368. Titus cited the general rule that riparian landowners cannot gain title to land created by accretion or formed by reliction, if the landowner caused the accretion or reliction by artificial conditions, although this general rule can be restricted by statute. *Water: Rights in Respect of Changes by Accretion or Reliction Due to Artificial Conditions*, 134 A.L.R. 467, 472 (1941). Note that “accretion” means a gradual increase of land due to a deposit, by water, of solid material that causes land previously covered by water to become dry land. “Reliction” means “land made by the withdrawal of waters by which it was previously covered instead of the building up of the bottom by deposits causing the water to recede.” *Id.*

<sup>345</sup> *Lucas*, 505 U.S. 1003.

<sup>346</sup> *Id.* at 1009-1010.

<sup>347</sup> *See* Titus, *supra* note 293, at 1336, citing S.C. CODE REGS. § 48-39-290(D)(1).

<sup>348</sup> *See id.*

- <sup>349</sup> The South Carolina Supreme Court had ruled there was no compensable taking of Lucas' property because the regulation was designed to prevent a serious public harm. *See Lucas*, 505 U.S. at 1009. The U.S. Supreme Court in response ruled that the regulation nevertheless was a compensable taking, unless the State could show that background principles in its own property and nuisance laws that prohibited the uses proscribed in the regulation. *See id.* at 1031.
- <sup>350</sup> Titus, *supra* note 293, at 1337.
- <sup>351</sup> Titus, *supra* note 293, at 1285.
- <sup>352</sup> LA. CIV. CODE art. 450, 451, 455, 456, 499, 500.
- <sup>353</sup> LA. CIV. CODE art. 500; J.G. Wilkins & Michael Wascom, *The Public Trust Doctrine in Louisiana*, 52 *LOUISIANA LAW REVIEW* 861-905 (1992).
- <sup>354</sup> *Miami Corp. v. State*, 186 La. 784, 809, 173 So. 315, 323 (1936), *cert. denied* 302 U.S. 700, 58 S.Ct. 19, 82 L. Ed. 541 (1937); Wilkins & Wascom, *supra* note 351.
- <sup>355</sup> LA. CONST. art. IV § 8, LA. REV. STAT. § 41:1702.
- <sup>356</sup> DENNIS J. HWANG, HAWAII COASTAL ZONE MGMT. PROGRAM, HAWAII COASTAL HAZARD MITIGATION GUIDEBOOK (NOAA Award No. NA07OZ0115, 2005).
- <sup>357</sup> LA. CONST. art. IV § 4.
- <sup>358</sup> LA. CIV. CODE art. 458.
- <sup>359</sup> LA. CIV. CODE art. 459.
- <sup>360</sup> Table 12 *modified from* FEMA 2003, *supra* note 276.
- <sup>361</sup> *See* Office of Ocean and Coastal Res. Mgmt., Planning, Nat'l Oceanic and Atmospheric Admin., Planning, Policy and Regulatory Approaches to Shoreline Mgmt., [http://www.coastalmanagement.noaa.gov/initiatives/shoreline\\_ppr\\_overview.html](http://www.coastalmanagement.noaa.gov/initiatives/shoreline_ppr_overview.html) (last visited Nov. 4, 2007).
- <sup>362</sup> Ass'n of State Floodplain Managers, What is ASFPM? <http://www.floods.org/TheOrganization/aboutasfpm.asp> (last visited May 21, 2007).
- <sup>363</sup> JON KUSLER & EDWARD A. THOMAS, ASS'N OF STATE FLOODPLAIN MANAGERS, NO ADVERSE IMPACT AND THE COURTS: PROTECTING THE PROPERTY RIGHTS OF ALL (2007), *available at* [http://www.floods.org/PDF/ASFPM\\_NAI\\_Legal\\_Paper\\_1107.pdf](http://www.floods.org/PDF/ASFPM_NAI_Legal_Paper_1107.pdf)
- <sup>364</sup> *Id.* at 4.
- <sup>365</sup> *Id.* at 4; *see* ASS'N OF STATE FLOODPLAIN MANAGERS, NO ADVERSE IMPACT: A TOOLKIT FOR COMMON SENSE FLOODPLAIN MGMT. (2003), *available at* [http://www.floods.org/NoAdverseImpact/NAI\\_Toolkit\\_2003.pdf](http://www.floods.org/NoAdverseImpact/NAI_Toolkit_2003.pdf). ; *see also* THOMAS EDWARD A., ASS'N OF STATE FLOODPLAIN MANAGERS, LIABILITY FOR WATER CONTROL STRUCTURE FAILURE DUE TO FLOODING (2006) *available at* [http://www.floods.org/PDF/NAI\\_Liability\\_Failure\\_Facilities\\_0906.pdf](http://www.floods.org/PDF/NAI_Liability_Failure_Facilities_0906.pdf)
- <sup>366</sup> Kusler & Thomas, *supra* note 361, at 4.
- <sup>367</sup> *Id.* at 9.
- <sup>368</sup> *Id.* at 4.
- <sup>369</sup> 245 So.2d 383 (La. 1971).
- <sup>370</sup> *Id.* at 385.
- <sup>371</sup> *Id.*
- <sup>372</sup> 386 So. 2d 1351 (La. 1980).
- <sup>373</sup> 383 So. 2d 477 (La. App. 4th Cir. 1980).
- <sup>374</sup> 383 So. 2d 484 (La. App. 4th Cir. 1980).
- <sup>375</sup> 275 So. 2d 788 (La. 1973).
- <sup>376</sup> 424 So. 2d 1194 (La. App. 1st Cir. 1982).
- <sup>377</sup> 31,576 (La. App. 2 Cir. 07/29/99), 746 So. 2d 11.
- <sup>378</sup> 746 So. 2d at 15.
- <sup>379</sup> *Id.* at 16.
- <sup>380</sup> *See id.* at 16.
- <sup>381</sup> *See* LA. CONST. art. VI, § 38(A) (2006); LA. REV. STAT. § 49:220.4(A)(1) (2006).
- <sup>382</sup> KUSLER & THOMAS, *supra* note 361.
- <sup>383</sup> KUSLER, JON, ASSOCIATION OF STATE FLOODPLAIN MANAGERS, PROFESSIONAL LIABILITY FOR CONSTRUCTION IN FLOOD HAZARD AREAS (2007), *available at* [http://www.floods.org/PDF/ASFPM\\_Professional\\_Liability\\_Construction.pdf](http://www.floods.org/PDF/ASFPM_Professional_Liability_Construction.pdf)

<sup>384</sup> See Fed. Emergency Mgmt. Agency, Hurricane Maps, <http://www.fema.gov/hazard/map/hurricane.shtm> (last visited Oct. 8, 2007).

<sup>385</sup> See *id.*

<sup>386</sup> See, generally, KUSLER & THOMAS, *supra* note 361.

<sup>387</sup> KUSLER & THOMAS, *supra* note 361, at 16.

<sup>388</sup> *Id.* at 12.

<sup>389</sup> Cindy Chang, *Town Opts to Finance Razing, Raising*, TIMES PICAYUNE, Mar. 30, 2007, at B1, B2.

<sup>390</sup> KUSLER & THOMAS, *supra* note 361, at 13.

<sup>391</sup> U.S. CONST. amend. V.

<sup>392</sup> LA CONST. Art. 1, Sec 4.

<sup>393</sup> *Id.* at 25.

<sup>394</sup> Although it might not be clear from the language of Section 4 of the Louisiana Constitution, the jurisprudence leaves no doubt that in cases when governmental bodies take or damage private property without first exercising eminent domain they can be sued to recover compensation for that taking. Such situations are called “inverse condemnation” or “appropriation” to distinguish them from direct expropriation via eminent domain. It is this aspect of the law that often comes into play when zoning or other governmental land use controls are put to use.

The authority of government (and certain corporations and limited liability companies) to take or expropriate property is implicit in the Louisiana Constitution (art. 1 § 4) and explicit in statute, (LA. REV. STAT. § 19:2) and specific procedures are set forth for exercising that authority (LA. REV. STAT. § 19.2.2; LA. REV. STAT. § 48: 442, 441). Because there are instances in which public bodies in fact take or damage private property without having first gone through an expropriation proceeding, the courts have created the concept of inverse condemnation to ensure that there is some procedure by which the affected property owner may seek redress. See *State, Through the DOTD v. Chambers Inv. Co.*, 595 So.2d. 598,602 (La. 1992), *Reymond v. State DOTD*, 231 So.2d 375,383 (La. 1970); *Roy v. Belt*, 868 So.2d 209 (2004).

Despite the fact that inverse condemnation is not defined or expressly provided for in either the Civil Code or the Louisiana Revised Statutes, it is clear that the right of action is not a mere judicial construction. Rather, state courts have recognized that the action for inverse condemnation is an attribute of the self-executing nature of the Louisiana Constitution’s requirement that the government pay just compensation when it takes or damages private property. See *State, Through the DOTD v. Chambers Inv. Co.*, 595 So.2d. 598,602 (La.1992); *St. Tammany Parish Hospital Service Dist. No. 2 v. Schnieder*, 808 So.2d 576 (2001). It is also clear that the elements of an inverse condemnation (or appropriation) case are the same as those in an expropriation case. These are: (1) a recognized species of property right must have been affected; (2) the property right must have been taken or damaged in a constitutional sense; and (3) the taking or damaging must be incidental to acts by the public body in pursuit of a public purpose. See *Chambers and Holzenthal v. Sewerage and Water Board of New Orleans*, 950 So.2d 55 (La. App. 4 Cir 2007).

<sup>395</sup> *Id.*

<sup>396</sup> *Lucas*, 505 U.S. 1003.

<sup>397</sup> 260 U.S. 322 (1922).

<sup>398</sup> *Lucas*, 505 U.S. at 1015, quoting *Goldblatt v. Hempstead*, 369 U.S. 590, 594 (1962) and *Penn Central Transportation Co. v. New York City*, 438 U.S. 104, 124 (1978).

<sup>399</sup> LA. CONST. art. I § 4; see *Avenal, et al. v. State*, 03-2521, (La. 10/19/04), 886 So.2d 1085 [hereinafter *Avenal III*].

<sup>400</sup> See *Lucas*, 505 U.S. at 1015.

<sup>401</sup> See *id.*

<sup>402</sup> See *id.*

<sup>403</sup> See *id.*

<sup>404</sup> See *Lucas*, 505 U.S. at 1015, 1019; *Layne v. City of Mandeville*, 633 So.2d 608, 611 (La. App. 1st Cir. 1993) [hereinafter *Layne I*].

- <sup>405</sup> The majority opinion in *Lucas* admitted as much. In a footnote, Justice Scalia noted, “Regrettably the rhetorical force of our ‘deprivation of all economically feasible use’ rule is greater than its precision” and that “Unsurprisingly, this uncertainty...has produced inconsistent pronouncements by the Court.” *Id.* at 1016 n.7.
- <sup>406</sup> *Lucas*, 505 U.S. at 1027.
- <sup>407</sup> *See id.*
- <sup>408</sup> KUSLER & THOMAS, *supra* note 361, at 31.
- <sup>409</sup> LA. CONST. art. I § 4; *see Avenal III*, 886 So.2d 1085.
- <sup>410</sup> See Article 1 Section 4 (F) and (G), Article 6 Section 42, and LA. REV. STAT. 49:213.10. Although the effect of these changes is largely the same, they are not identically created. The requirement that compensation arising in the hurricane protection levees “not exceed the compensation required by the Fifth Amendment...” is made explicit in Article 6 Section 42 (adopted in 2006) and Article I Section 4(G). The compensation limits for coastal restoration, etc., are enabled by Article I Section 4(F) but spelled out in LA. REV. STAT. 49:213.10 (adopted in 2003), which provides that “Compensation...shall be governed by and strictly limited to the amount and circumstances required by the Fifth Amendment.”
- <sup>411</sup> . State, Through the DOTD v. Chambers Inv. Co., 595 So.2d 598, 602 (La. 1992).
- <sup>412</sup> *Id.* at 601
- <sup>413</sup> *Id.* at 603.
- <sup>414</sup> *See Layne I*, 633 So.2d 608; *Standard Materials Inc. v. City of Slidell*, 96-0684, at 21 (La. App. 1 Cir. 09/23/97), 700 So.2d 975, 984.
- <sup>415</sup> *See, State, Dep’t of Social Services v. City of New Orleans*, 676 So.2d 149, 154 (La. App. 1 Cir. 1996); *Standard Materials*, 700 So.2d at 984, citing *Dolan v. City of Tigard*, 512 U.S. 374, 385 (1994).
- <sup>416</sup> *Chambers*, 595 So.2d at 603.
- <sup>417</sup> *Layne v. City of Mandeville*, 98-2271, at 11 (La. App. 1 Cir. 11/05/99) [hereinafter *Layne III*]; 743 So.2d 1263, 1268.
- <sup>418</sup> *Layne II*, 743 So.2d at 1268.
- <sup>419</sup> *Cf. Penn Central Transportation Co. v. City of New York*, 438 U.S. 104 (1978); *Avenal v. State of Louisiana*, 99-0127 (La.App. 4 Cir. 03/03/99), 757 So.2d 1 [hereinafter *Avenal I*].
- <sup>420</sup> *See Avenal I*, 757 So.2d 1.
- <sup>421</sup> LA. CONST. art. I, § 4(F),(G), art. VI § 42 (2006); LA. REV. STAT. § 49:213.10 (2006).
- <sup>422</sup> *See Layne I*, 633 So.2d at 612, citing *Lakeshore Harbor Condominium v. City of New Orleans*, 603 So.2d 192 (La.App 4 Cir. 1992).
- <sup>423</sup> *See Hozenthal v. Sewerage and Water Board of New Orleans*, 06-0796, at 17-18 (La.App. 4 Cir. 01/10/07), 950 So.2d 55, at 64.
- <sup>424</sup> *See Palermo Land Co. v. Planning Commission of Calcasieu Parish*, 561 So.2d 482, 491 (1990).
- <sup>425</sup> *See, e.g., Coastal Restoration and Protection Auth., Louisiana’s Comprehensive Master Plan for a Sustainable Coast* 68, 105 (2007).
- <sup>426</sup> *See Lucas*, 505 U.S. 1003.
- <sup>427</sup> LA. CONST. art. I, § 4 (2006).
- <sup>428</sup> *See Vela v. Plaquemines Parish Gov’t*, 811 So.2d 1263, 1268 (La.App 4 Cir 2002).
- <sup>429</sup> COASTAL ZONE MGMT. ACT, 16 U.S.C. § 1451 *ET SEQ.* (2000); RIVERS AND HARBORS ACT OF 1899, 33 U.S.C. § 403; CLEAN WATER ACT, 33 U.S.C. § 1344 (2000).
- <sup>430</sup> *Avenal III*, 886 So.2d 1085, 1108 n.28.
- <sup>431</sup> LA. CONST. art. I § 4(A).
- <sup>432</sup> *See, e.g., Chambers*, 595 So.2d 598; *Avenal III*, 886 So.2d 1085; *Vela*, 811 So.2d 1263.
- <sup>433</sup> U.S. CONST. amend. V; *see, e.g., Mugler v. Kansas*, 123 U.S. 623 (1987); *Keystone Bituminous Coal Ass’n v. DeBenedictis*, 480 U.S. 470 (1987); *Pennsylvania Coal Co. v. Mahon*, 260 U.S. 393, 417 (1922).
- <sup>434</sup> LA. CONST. art. I § 4; *see Avenal III*, 886 So.2d 1085.
- <sup>435</sup> *See, e.g., West Jefferson Levee Dist. v. Coast Quality Constr. Corp.*, 93-1718, at 30, n.20 (La. 5/23/94), 640 So. 2d 1258, 1271, n.20; *State ex rel. Dep’t of Highways v. Constant*, 369 So. 2d 699, 702 (La. 1979); *Avenal v. State of Louisiana*, 01-0843, at 8-9 (La. App. 4 Cir. 10/15/03), 858 So.2d

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697, 702; *See, e.g.*, *State Through the Dep't of Transp. & Dev. v. Chambers Inv. Co.*, 595 So. 2d 598,602 (La. 1992).

<sup>436</sup> *See State, Through the DOTD v. Chambers Inv. Co.*, 595 So.2d 598, 602 (La. 1992) (for a discussion of this shifting standard and the intention of the framers of the 1974 Constitution to increase the level and scope of compensation in takings cases); *Standard Materials Inc. v. City of Slidell*, 96-0684, at 21 (La. App. 1 Cir. 09/23/97), 700 So.2d 975, 984.

<sup>437</sup> LA. CONST. art. I, § 4(F),(G), art. VI § 42 (2006); LA. REV. STAT. § 49:213.10 (2006).

<sup>438</sup> As witnessed by the growing “Katrina fatigue” in Congress. Consider also, for example, the decision by the U.S. Army Corps of Engineers to provide only Category 3 hurricane protection to New Orleans.

<sup>439</sup> Louisiana Office of Homeland Security and Emergency Preparedness, 2005.

<sup>440</sup> Mitigation Actions per Requirement § 201.4(c)(3)(iii) require that: “[State plans shall include an] identification, evaluation, and prioritization of cost-effective, environmentally sound, and technically feasible mitigation actions and activities the State is considering and an explanation of how each activity contributes to the overall mitigation strategy.”

<sup>441</sup> The state of California Department of Water Resources Floodplain Management Branch has recently examined efficacy of requiring flood insurance in areas protected by levees in a report “Alternatives For Increasing Flood Insurance Participation For Communities Protected By Levees.” A copy of the report is on file at the offices of the Louisiana Sea Grant Law and Policy Program. [sglegal@lsu.edu](mailto:sglegal@lsu.edu) 225-578-5936.

<sup>442</sup> LA. REV. STAT. 49 § 214.34(7) (2006).

<sup>443</sup> T. Daniels & K. Daniels, American Planning Ass’n, *Planning for Natural Hazards and Natural Disasters*, in THE ENVIRONMENTAL PLANNING HANDBOOK FOR SUSTAINABLE COMMUNITIES AND REGIONS 26 (2003).

<sup>444</sup> ICMA, *supra* note 43, at 81.

<sup>445</sup> Office of Planning and Budget, *Strategic Planning. Planning for Results*, in MANAGEWARE. A PRACTICAL GUIDE TO MANAGING FOR RESULTS, at SP-5 (Megaaware Version 2.0. Division of Administration, 1996).

<sup>446</sup> Webster’s Ninth New Collegiate Dictionary 541 (Merriam-Webster, 1984).

<sup>447</sup> DANIELS & DANIELS, *supra* note 439, at 26.

<sup>448</sup> ICMA, *supra* note 162, at 81.

<sup>449</sup> Office of Planning and Budget, *supra* note 441.

<sup>450</sup> ICMA, *supra* note 162, at 82.

<sup>451</sup> *Id.*

<sup>452</sup> DEYLE, ET AL., *supra* note 449, at 133-34.

<sup>453</sup> DEYLE, ET AL., *supra* note 449, at 133-34.

<sup>454</sup> MILETI, *supra* note 9, at 106.