Section Six
Risk Assessment for State-Owned Assets

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6.1 IFR Requirement for Risk Assessment for State-Owned Assets

The IFR includes two specific requirements regarding risk assessments for State-owned assets:

- Vulnerability Assessment per Requirement §201.4(c)(2)(ii): "[The State risk assessment shall include an] overview and analysis of the State's vulnerability to the hazards described in this paragraph (c)(2), …State-owned critical or operated facilities located in the identified hazard areas shall … be addressed."
- Estimated Losses per Requirement §201.4(c)(2)(iii): "[The State risk assessment shall] estimate the potential dollar losses to State-owned or operated buildings, infrastructure and critical facilities located in the identified hazard areas."

Note: Portions of these same provisions were also cited in Section Five as the IFR Requirements for the Statewide Risk Assessment.

6.2 Introduction

Hazard vulnerability assessments and loss estimates for State-owned buildings and critical facilities in Louisiana were prepared for the hazards listed below.

- Flood
- High Wind (Hurricane)
- Ice Storm
- Storm Surge
- Subsidence (Land Loss)
- Wildfire
- Dam Failure
- Levee Failure
- Hazardous Material Incident

Introductory maps (Maps 4-1 and 6-1 thru 6-3) are provided as a reference for the analysis of these hazards. Map 4-1 (see page 4-2) shows the State of Louisiana and the political boundaries for the individual parishes. The locations of State-owned assets and critical facilities in the State of Louisiana are presented in Maps 6-1 and 6-2 respectively. Finally, Map 6-3 reflects the ranking of State-owned critical facilities in the State of Louisiana.

A general overview of the hazard vulnerability assessment and loss estimation methodologies, combined loss estimate results for all nine hazards, and hazard vulnerability assessment and loss estimate results for each hazard, are presented in the sections that follow. Detailed hazard vulnerability assessments and loss estimates for each of the nine hazards, along with related maps and tables, are presented in Appendix F.

This section concludes with a summary that includes combined loss estimates for State-owned facilities and limitations regarding use of these results.

6.3 Methodology

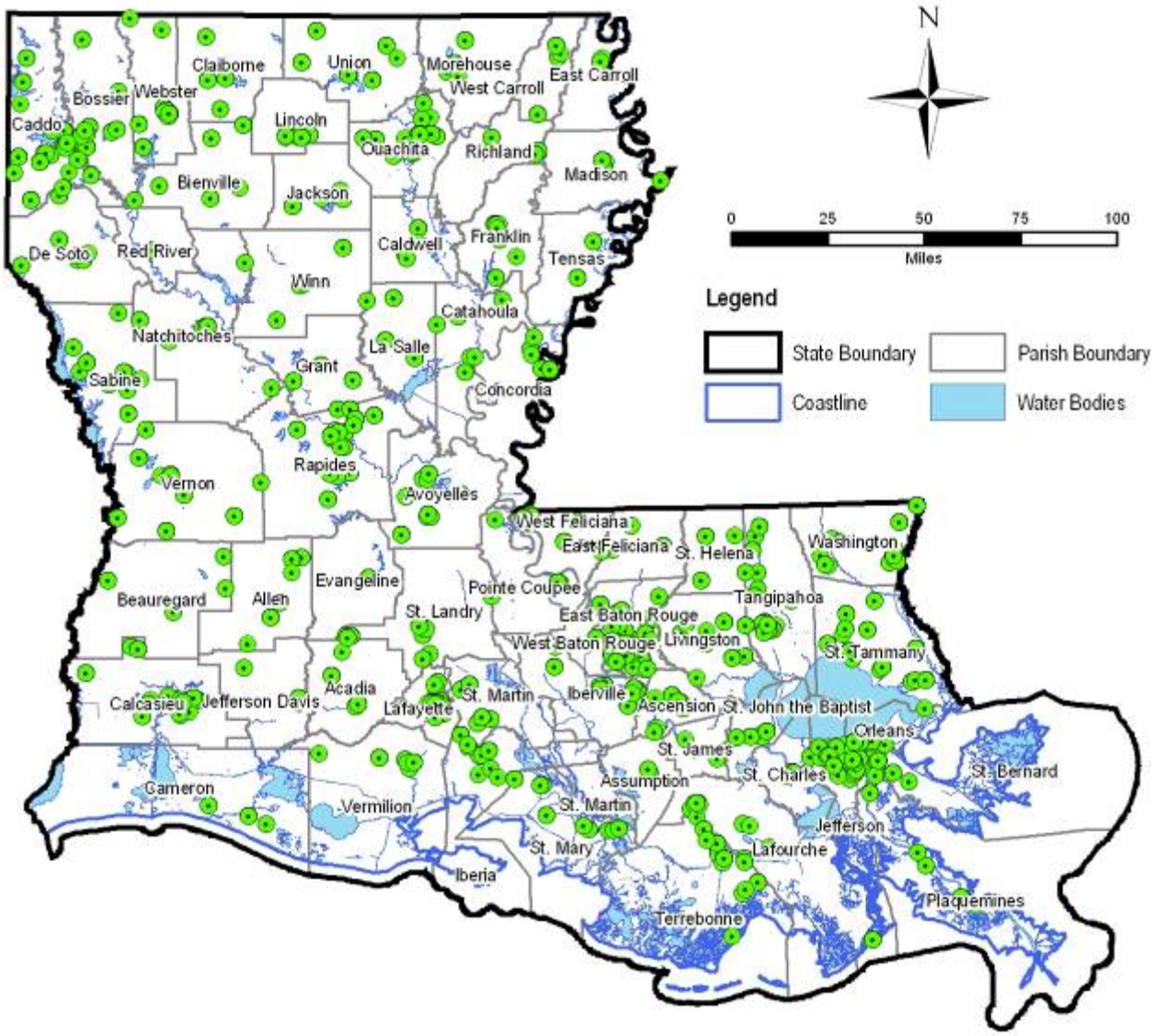
The OHSEP and SHMPC undertook the risk assessment for State-owned assets in three stages:

- Identification of Critical Facilities;
- Vulnerability Assessment; and
- Loss Estimation.

Identification of Critical Facilities

The State of Louisiana maintains a database of State-owned assets (buildings, infrastructure, and critical facilities) that is called the Facilities Management database. The assets listed in the database range from structures as large as the Superdome in New Orleans to individual shelters in state parks. The attributes in the database include the age, size, value and use of the assets as well as the responsible state agency. The total number of assets included in the database is 11,556. The general locations of these assets are shown in Map 6-1.

Map 6-1: State Owned Assets



State-Owned Facilities

Source: Louisiana Facility Management Database

OHSEP and the SHMPC determined that it was impractical to perform a risk assessment for the entire listing for two reasons:

1. The list includes a large number of assets that do not play a critical role in the operation of the State. It was assumed that damage or loss of use for these assets would not endanger the citizens of Louisiana or adversely affect the economic stability of the State; and
2. There is only so much that can be done in any set amount of time. For State Hazard Mitigation Plans, the relevant planning horizon is three years; the time interval between updates required by DMA 2000. In any three-year period, OHSEP and other state agencies will only reasonably be able to address hazard mitigation issues for a fraction of the total number of assets.

Therefore, it was decided that the building use information in the database should be used to identify the State-owned assets that could be described as the most important to the State of Louisiana, referred to in the rest of this document as the "critical facilities". It was assumed that this would reduce the sheer number of State facilities to be considered for further analysis.

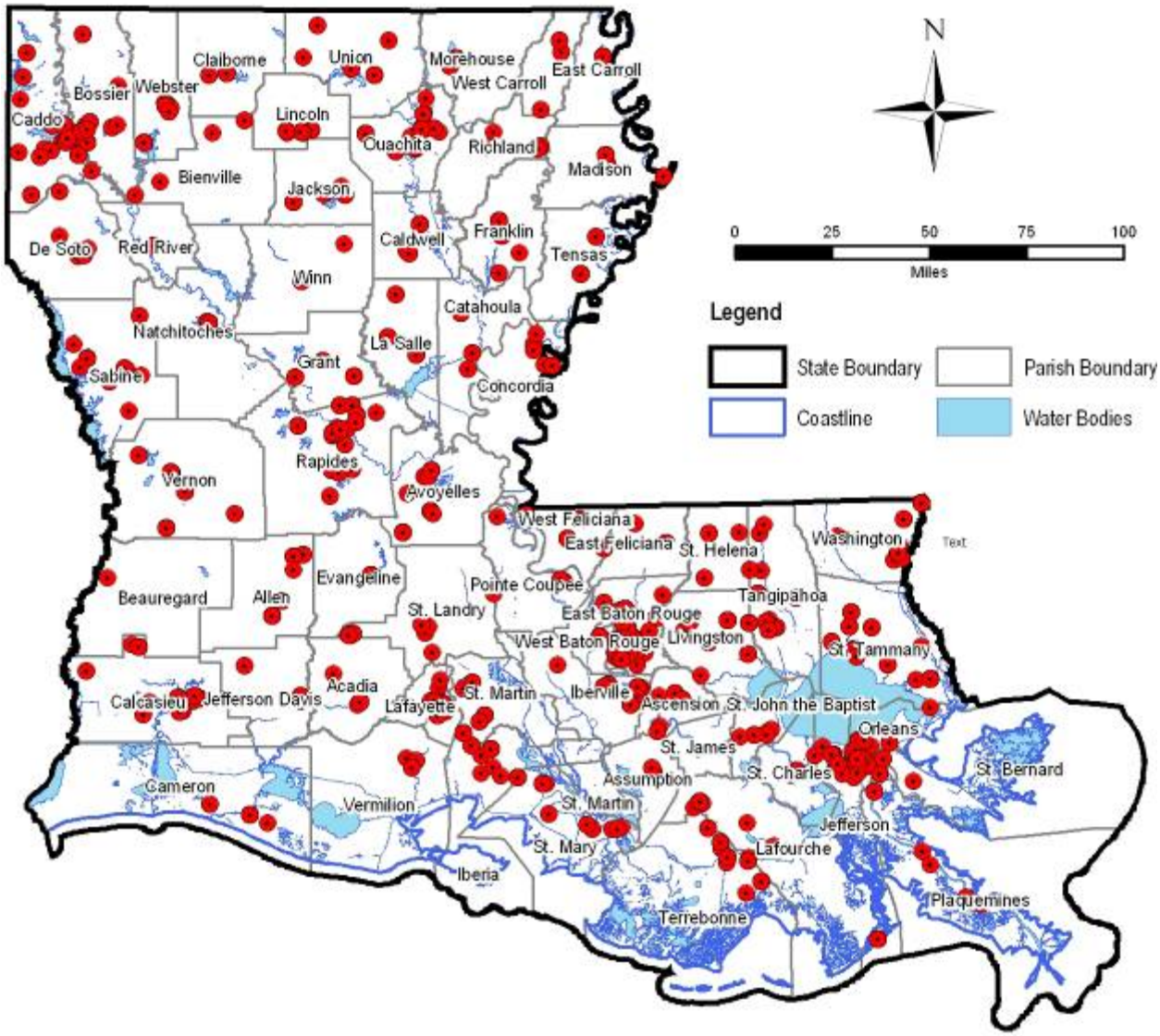
The process by which OHSEP and the SHMPC identified these critical facilities started before the planning process described in Section Three. In 2003, OHSEP received assistance from FEMA via the federal Hazard Mitigation Technical Assistance Program (HMTAP) to develop and apply definitions of "criticality". This work, referred to as the "Task Order 208 Study", provided definitions that became the basis for a ranking system for State-owned assets that placed the highest priority on facilities such as emergency services serving large population centers. The different levels that were developed by OHSEP under this study are shown in Table 6-1.

Table 6-1: State-Owned Assets Criticality Level Descriptions

Criticality Level	Description
Level 1 - High importance/Most critical	emergency medical services, fire, police and EOCs serving large population centers (Metropolitan)
Level 2 - Medium-high importance	emergency medical services, fire, police and EOCs serving small to medium population centers (Micro); shelters serving large populations (Metropolitan)
Level 3 - Medium importance	shelters serving small to medium populations (Micro), essential government services (i.e., public works departments, schools) serving large population centers (Metropolitan)
Level 4 - Medium-low importance	essential government services (i.e., public works departments, schools) serving small to medium population centers (Micro), non-essential government service buildings (i.e., museums, parks and recreation) serving large population centers (Metropolitan)
Level 5 - Low importance	non-essential government service buildings (i.e., museums, parks and recreation) serving small to medium population centers (Micro)

Applying the ranking system to the Facilities Management database resulted in the identification of 3,804 State-owned assets that met one of these five descriptions. The general locations of these facilities are shown on Map 6-2.

Map 6-2: State-Owned Critical Facilities and Infrastructure



State-Owned Critical Facilities

Source: Louisiana Facility Management Database

Table 6-2 shows the numbers of State-owned critical facilities per criticality ranking; this information is also illustrated in Map 6-3.

Table 6-2: Number of State-owned Assets (Critical Facilities) by Criticality Ranking

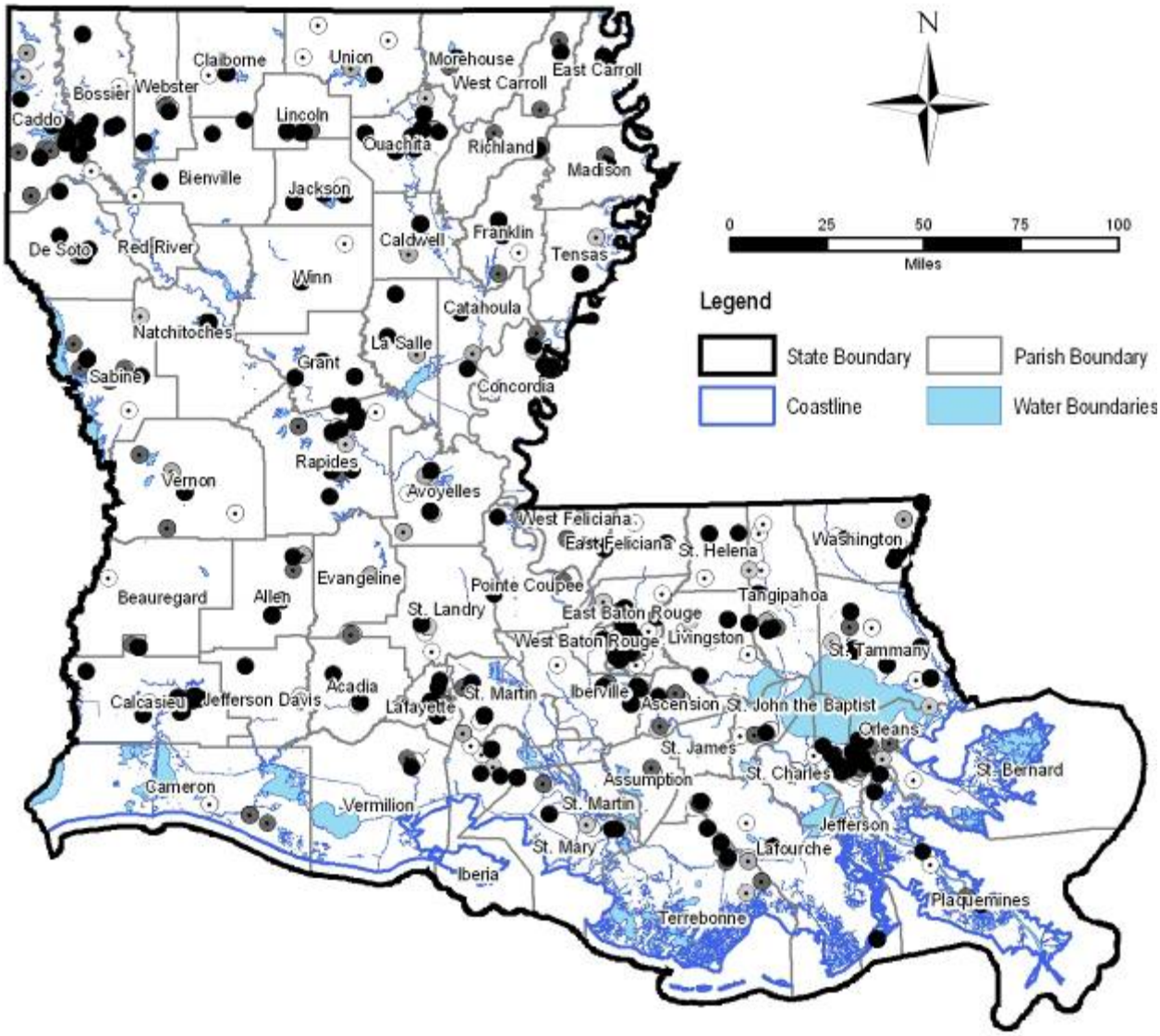
Criticality Level	Number of Assets (Critical Facilities)
1 – High	460
2 – Medium High	511
3 – Medium	294
4 – Medium Low	447
5 - Low	2,092
Total	3,804

Vulnerability Assessment Methodology for State-owned Critical Facilities

Hazard vulnerability assessments are intended to provide a means of indicating whether a given building or facility in Louisiana is at a low, medium or high vulnerability to damage from a given hazard. Although there are a variety of potential hazards, the hazard vulnerability assessments for State-owned buildings and critical facilities in Louisiana adopted the same general approach for all hazards. This general approach is outlined by the three-step methodology listed below.

- Step 1 – Review Hazard Profile Maps: The first step in the hazard vulnerability assessments was to review the hazard profile map for the hazard under consideration. The hazard profile maps helped identify and establish which parishes or areas in the State of Louisiana have historically been the most prone to a given hazard, and provided a useful means of establishing hazard vulnerability levels (Step 2). The hazard profile maps for each hazard may be found in Section Four of this Plan.
- Step 2 – Establish Hazard Vulnerability Levels by Location: Using information from Step 1, two or more hazard vulnerability levels were established for State-owned critical facilities based on location. In general, structures located outside established hazard zones were designated as having a low hazard vulnerability level, while structures located within the established hazard zones were designated with a medium or high hazard vulnerability level. The basis for the medium and high distinctions is described for each hazard in the materials starting with Subsection 6.4.
- Step 3 – Establish Hazard Vulnerability Levels using Additional Parameters if Needed: In some cases, the location of a building or facility is not sufficient to specify a low, medium or high vulnerability level. For example, most of the State can experience hurricane force winds from time to time. For these hazards, physical location is not as important in determining vulnerability as the condition of the structure. In these situations, the next step was to establish additional parameters to make a more specific determination. Examples of parameters used to establish hazard vulnerability levels include the age of the structure relative to the adoption of an established building code or floodplain ordinance. The assumption is that in general terms, buildings constructed after the establishment of a building code or an ordinance is designated have a lower hazard vulnerability level than those that were constructed before it was established, since the code or ordinance would require construction that is more resistant to these hazards.

Map 6-3: State-Owned Critical Facilities and Infrastructure, Ranked



State-Owned Critical Facilities - Criticality Ranking

● 1 (High) ● 2 (Medium-High) ● 3 (Medium) ● 4 (Medium-Low) ● 5 (Low)

Source: Louisiana Facility Management Database

Loss Estimation Methodology for State-owned Critical Facilities

Loss estimations are intended to provide a means of quantifying the potential dollar losses from a given hazard in terms of combined physical (building) damage, contents damage, and loss of function (LOF) costs. As described for the vulnerability assessment methodology above, although there are a variety of potential hazards, the loss estimations for State-owned critical facilities in Louisiana adopted the same general approach for all hazards. This general approach is outlined by the three-step methodology listed below.

- Step 1 – Estimate Damage Levels by Hazard Vulnerability Level: The first step in preparing loss estimates for individual structures was to establish a magnitude or level of damage from a given hazard. The three hazard vulnerability levels established by the hazard vulnerability assessment for each facility provided a useful indication of the potential levels of damage that may occur from a given hazard. In general, structures with a low hazard vulnerability level are expected to experience a low level of damage or no damage, structures with a medium hazard vulnerability level are subject to a moderate level of damage, and structures with a high hazard vulnerability level will likely experience a high level of damage. In addition, for some hazards, data provided in the hazard profiles (Section Four) was used to estimate potential design wind speeds or flood depths associated with a given hazard vulnerability level in order to estimate damage levels with greater accuracy.

- Step 2 – Assume an Average Building Type: Once the three damage levels were established, the next step was to assume an average building type to use as a basis for uniformly applying damage functions (Step 3) to individual State-owned critical facilities. An average building type was typically assumed based on engineering judgment and experience with basic building types in various parts of Louisiana. Examples of average building types assumed for various loss estimates include using a single story structure without a basement for water-related hazards and using a lightly engineered building type for wind-related hazards.

- Step 3 – Establish Damage Functions: The final step in preparing loss estimates was to establish a series of damage functions to estimate physical damage, contents damage, and LOF costs associated with a given hazard. The damage functions allowed damages to be estimated for the three potential damage levels established in Step 1 using the average building type assumed in Step 2. The damage functions were applied to individual structures based on the Building Replacement Value (BRV) and the square footage of the building. The BRV and square footage values were taken directly from the information in the Facilities Management database.

  In general, physical and contents damage functions are expressed as a percentage of the BRV, while LOF costs were determined as a function of the number of days a facility would be out of use. Therefore, physical and contents damages were estimated by multiplying the BRV by the corresponding physical and contents damage functions, while LOF costs were estimated as a proportion of the annual operating budget for each structure.

  The annual operating budgets for each facility were determined as a proportion of the current annual operating budget for the State of Louisiana. This annual operating budget, currently estimated at approximately $16.0 billion, is distributed to individual State-owned buildings and critical facilities based on the factored square footage of each structure.

  The factored square footage for each structure was determined by multiplying the actual square footage by a Criticality Factor (CF) based on the criticality level assigned to each structure; the relationship of the criticality level to the CF is shown in Table 6-3.

Table 6-3: Relationship of Criticality Level to Criticality Factor

Criticality Level	Criticality Factor (CF)
1 – High	10
2 – Medium High	8
3 – Medium	6
4 – Medium Low	4
5 - Low	2
All Others	1

Note that applying the CF to the square footage of each structure allows higher criticality facilities such as fire stations to obtain a larger proportion of the statewide annual budget, thereby increasing their annual budget values and LOF costs to reflect their importance.

Once the annual operating budget was obtained for each structure, the LOF costs were computed by dividing the annual operating budget by 365 (to convert the annual budget to a daily budget) and multiplying by the corresponding damage function for LOF (measured in days).

For each structure, the physical damage, contents damage and LOF costs were added together to produce a combined loss estimate per structure for each hazard.

The subsections that follow provide a summary of information about the risk assessment for state-owned assets for each hazard type. More detailed discussions of the methodologies and the results for each hazard are contained in Appendix F.

6.4 Flood

The flood hazard vulnerability assessment of State-owned critical facilities was based on: 1) location of the facility within the 100-year floodplain; and 2) the date of facility construction relative to the issuance of Flood Insurance Rate Maps (FIRMs) in Louisiana. The criteria used to determine specific vulnerability rankings for each facility and the results of applying this ranking to the State-owned critical facilities are shown in Table 6-4. These results are shown on Map F-2.

Table 6-4: Flood Vulnerability Criteria and Ranking Results

Ranking	Criteria	Number of Critical Facilities
High	Structure within floodplain / pre-FIRM construction date	713
Medium	Structure within floodplain / post-FIRM construction date	199
Low (or None)	Structure not within floodplain	2,892

The flood loss estimate of State-owned critical facilities in Louisiana involved an analysis of the following parameters (that are described in more detail in Appendix F.1).

- Flood Hazard Vulnerability Ranking
- Average Flood Depth
- Average Building Type
- Depth-Damage Functions (DDFs)

Table 6-5 shows the ranking results according to high / medium / low ranges of estimated losses.

Table 6-5: Flood Loss Estimate Ranges and Ranking Results

Ranking	Total Loss Estimate Ranges	Number of Critical Facilities
High	$20,001 - $205,000,000	444
Medium	$251 - $20,000	467
Low	$0 -$250	2,893

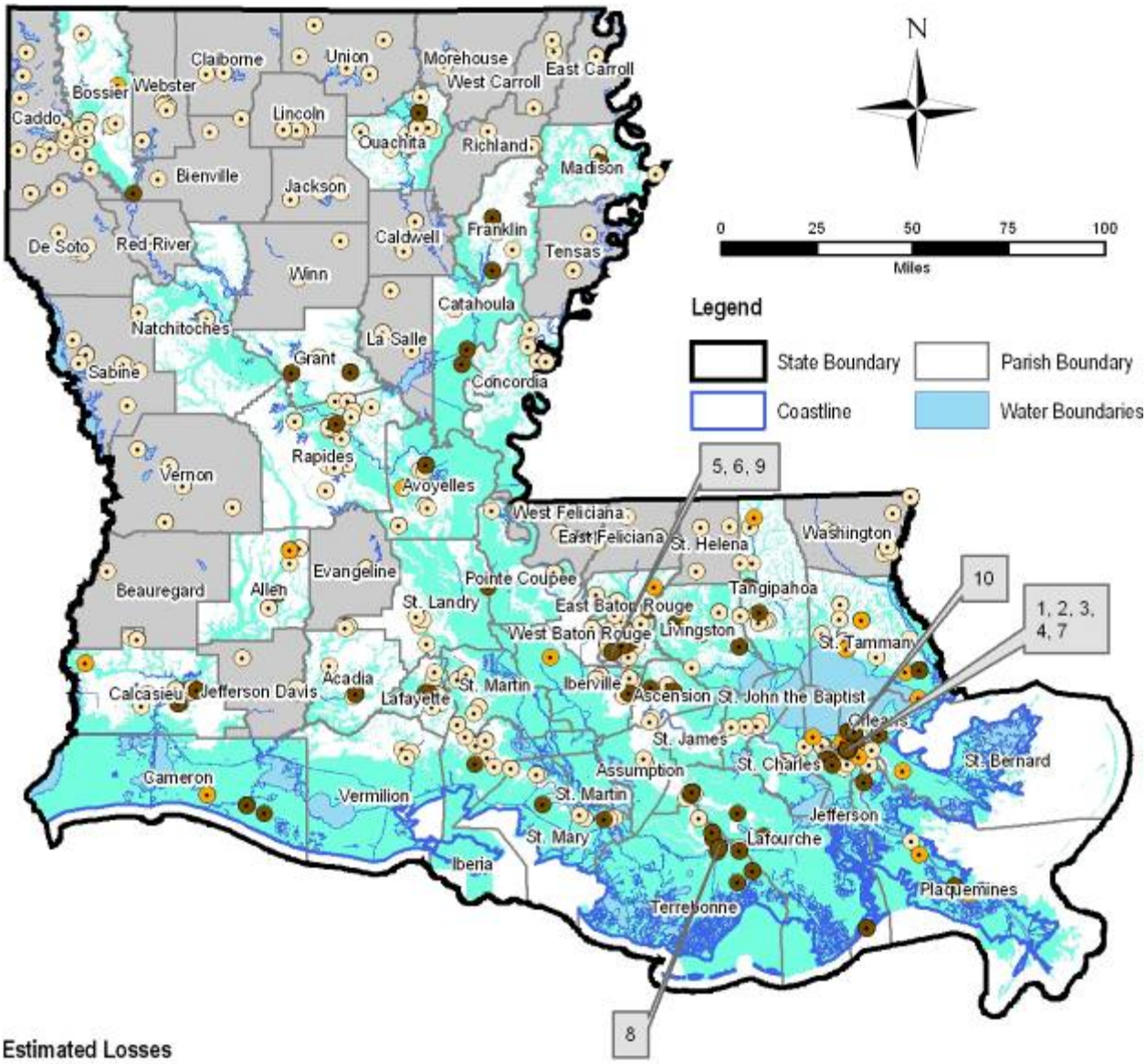
Table 6-6 shows the ten highest ranked critical facilities in terms of the computed loss estimates.

Table 6-6: Top Ten Critical Facilities at Risk from Flood Hazard

Flood Loss Rank	Building Name	Parish	Physical Damage	Contents Damage	LOF	Combined Loss
1	Louisiana Superdome	Orleans	$77,600,859	$58,919,171	$66,826,751	$203,346,782
2	Charity - Main Hospital	Orleans	$46,175,742	$35,059,360	$43,906,178	$125,141,280
3	Main Hospital	Orleans	$17,521,011	$13,302,990	$16,604,970	$47,428,971
4	Lions-LSU Clinics Bld-Eye Cent	Orleans	$3,009,916	$2,341,046	$30,187,537	$35,538,499
5	Veterinary Medicine	East Baton Rouge	$14,420,592	$10,948,968	$2,836,946	$28,206,507
6	Assembly Center	East Baton Rouge	$11,054,963	$8,393,583	$5,872,562	$25,321,107
7	Medical School	Orleans	$6,570,144	$4,988,443	$13,407,938	$24,966,524
8	Leonard J. Chabert Medical Center	Terrebonne	$8,794,158	$6,677,046	$8,207,243	$23,678,446
9	LSU Union	East Baton Rouge	$9,467,818	$7,188,528	$1,999,776	$18,656,122
10	Kieffer Lakefront Arena	Orleans	$6,159,905	$4,791,037	$1,735,910	$12,686,852

Map 6-4: Loss Estimate – Flood – Total; shows the area of the 100-year floodplain in the State of Louisiana based on Q3 data (same as Map 4-4); flood loss estimate rankings according to high / medium / low ranges of estimated losses (per Table 6-5); and the locations of the ten highest ranked facilities per Table 6-6.

Map 6-4: Loss Estimate - Flood - Total



Estimated Losses

Low: $0 - $250 Medium: $251 - $20001 High: $20,001 - $205,000,000

Source: Louisiana Facility Management Database

Q3 Flood Data No Q3 Flood Data Available

Source: FEMA Q3 Flood Data

6.5 High Wind (Hurricane)

The hurricane wind hazard vulnerability assessment of State-owned critical facilities was based on: 1) the design wind speed zone; and 2) the date of facility construction relative to the assumed enactment of building codes in Louisiana. The criteria used to determine specific vulnerability rankings for each facility and the results of applying this ranking to the State-owned critical facilities are shown in Table 6-7. These results are shown on Map F-22.

Table 6-7: High Wind Vulnerability Criteria and Ranking Results

Ranking	Criteria	Number of Critical Facilities
High	Design wind = ≥ 110 mph & pre-adoption of building (wind) code	444
Medium	Design wind = ≥ 110 mph & post-adoption of building (wind) or Design wind = 91 – 110 mph; pre- code	2,118
Low (or None)	Design wind = 91 – 110 mph; post- code or Design wind = < 90 mph	1,242

The high wind loss estimate of State-owned critical facilities in Louisiana involved an analysis of the following parameters (that are described in more detail in Appendix F.3).

- Hurricane Wind Hazard Vulnerability
- Average Building Type
- Hurricane Wind Damage Functions (WDFs)

Table 6-8 shows the ranking results according to high / medium / low ranges of estimated losses.

Table 6-8: High Wind Loss Estimate Ranges and Ranking Results

Ranking	Total Loss Estimate Ranges	Number of Critical Facilities
High	$30,001 to $225,000,000	1,269
Medium	$4,001 to $30,000	1,238
Low	$0 to $4,000	1,297

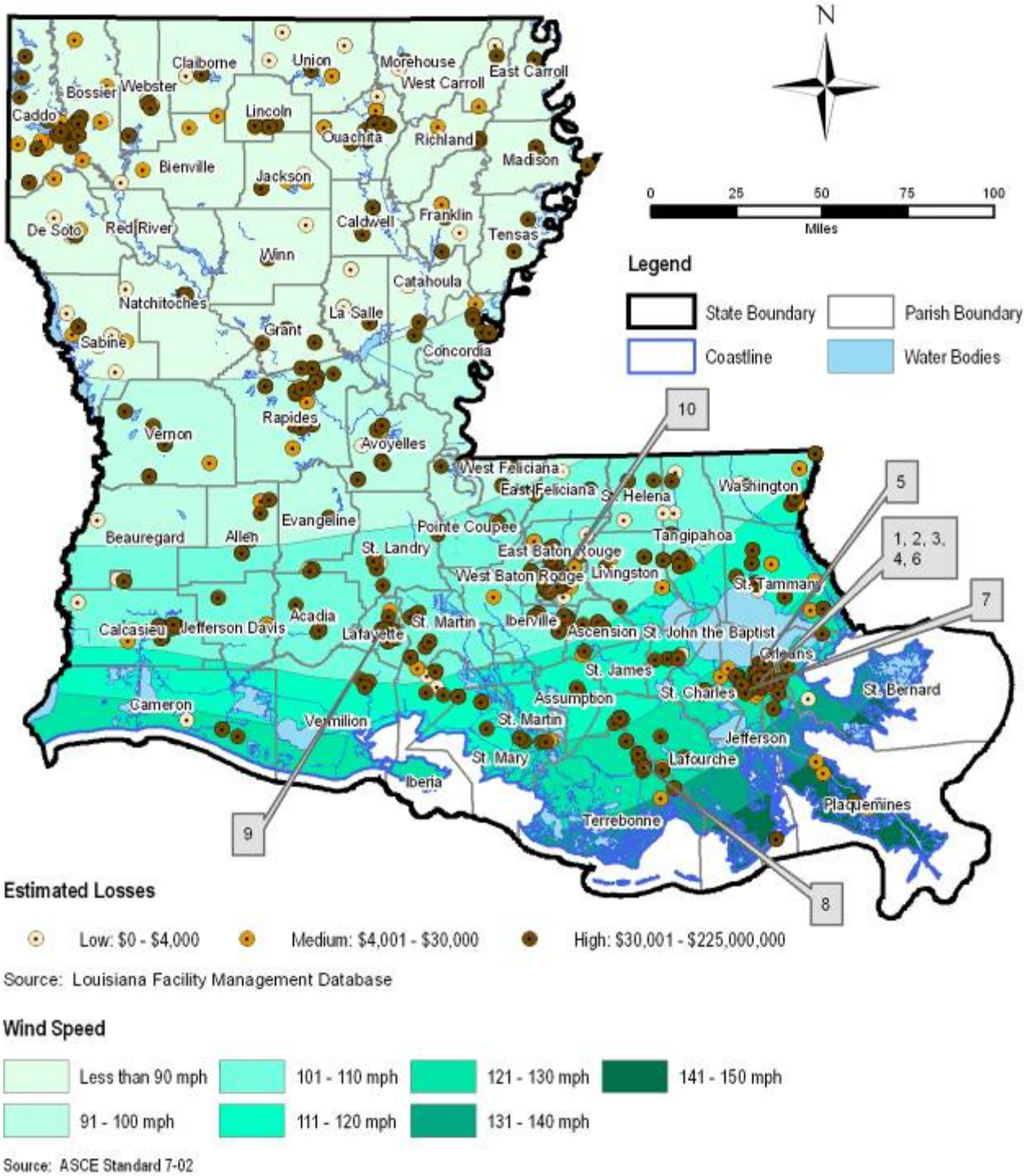
Table 6-9 shows the ten highest ranked critical facilities in terms of the computed loss estimates.

Table 6-9: Top Ten Critical Facilities at Risk from Hurricane Wind Hazard

High Winds Loss Ranking	Building Name	Parish	Physical Damage	Contents Damage	LOF	Combined Loss
1	Louisiana Superdome	Orleans	$86,223,177	$57,482,118	$74,251,946	$217,957,241
2	Charity - Main Hospital	Orleans	$51,306,380	$34,204,254	$48,784,642	$134,295,276
3	Lions-LSU Clinics Bld-Eye Cent	Orleans	$10,033,054	$6,688,703	$100,625,123	$117,346,880
4	Main Hospital	Orleans	$19,467,790	$12,978,526	$18,449,967	$50,896,283
5	Kieffer Lakefront Arena	Orleans	$20,533,017	$13,688,678	$5,786,365	$40,008,060
6	Medical School	Orleans	$7,300,160	$4,866,773	$14,897,709	$27,064,642
7	Main Hospital	Orleans	$9,521,078	$6,347,385	$10,503,790	$26,372,253
8	Leonard J. Chabert Medical Center	Terrebonne	$9,771,286	$6,514,191	$9,119,159	$25,404,636
9	Hospital	Lafayette	$8,192,658	$4,096,329	$7,163,717	$19,452,704
10	Veterinary Medicine	East Baton Rouge	$8,011,440	$4,005,720	$1,576,081	$13,593,242

Map 6-5 (Loss Estimate – High Wind – Total) shows the design wind speed zones from ASCE 7-02 (same as Map 4-5) for Louisiana, high wind loss estimate rankings according to high / medium / low ranges of estimated losses (per Table 6-8); and the locations of the ten highest ranked facilities from Table 6-9.

Map 6-5: Loss Estimate - High Winds - Total



6.6 Ice Storm

The ice storm hazard vulnerability assessment of State-owned critical facilities was based on the number of recorded ice storms within each parish based on data provided by the National Climatic Data Center (NCDC). The criteria used to determine specific vulnerability rankings for each facility and the results of applying this ranking to the State-owned critical facilities are shown in Table 6-10. These results are shown on Map F-45.

Table 6-10: Ice Storm Vulnerability Criteria and Ranking Results

Ranking	Criteria	Number of Critical Facilities
High	Structures in parishes with > 4 recorded ice storms	650
Medium	Structures in parishes with from 1 to 4 recorded ice storms	1,150
Low (or None)	Structures in parishes with no recorded ice storm	2,004

The ice storm loss estimate of State-owned critical facilities in Louisiana involved an analysis of the following parameters (that are described in more detail in Appendix F.5).

- Ice Storm Hazard Vulnerability
- Average Building Type
- Ice Storm Damage Functions (ISDFs)

Table 6-11 shows the ranking results according to high / medium / low ranges of estimated losses.

Table 6-11: Ice Storm Loss Estimate Ranges and Ranking Results

Ranking	Total Loss Estimate Ranges	Number of Critical Facilities
High	$1,501 to $2,000,000	914
Medium	$1 to $1,500	886
Low	$0	2,004

Table 6-12 shows the ten highest ranked critical facilities in terms of the computed loss estimates.

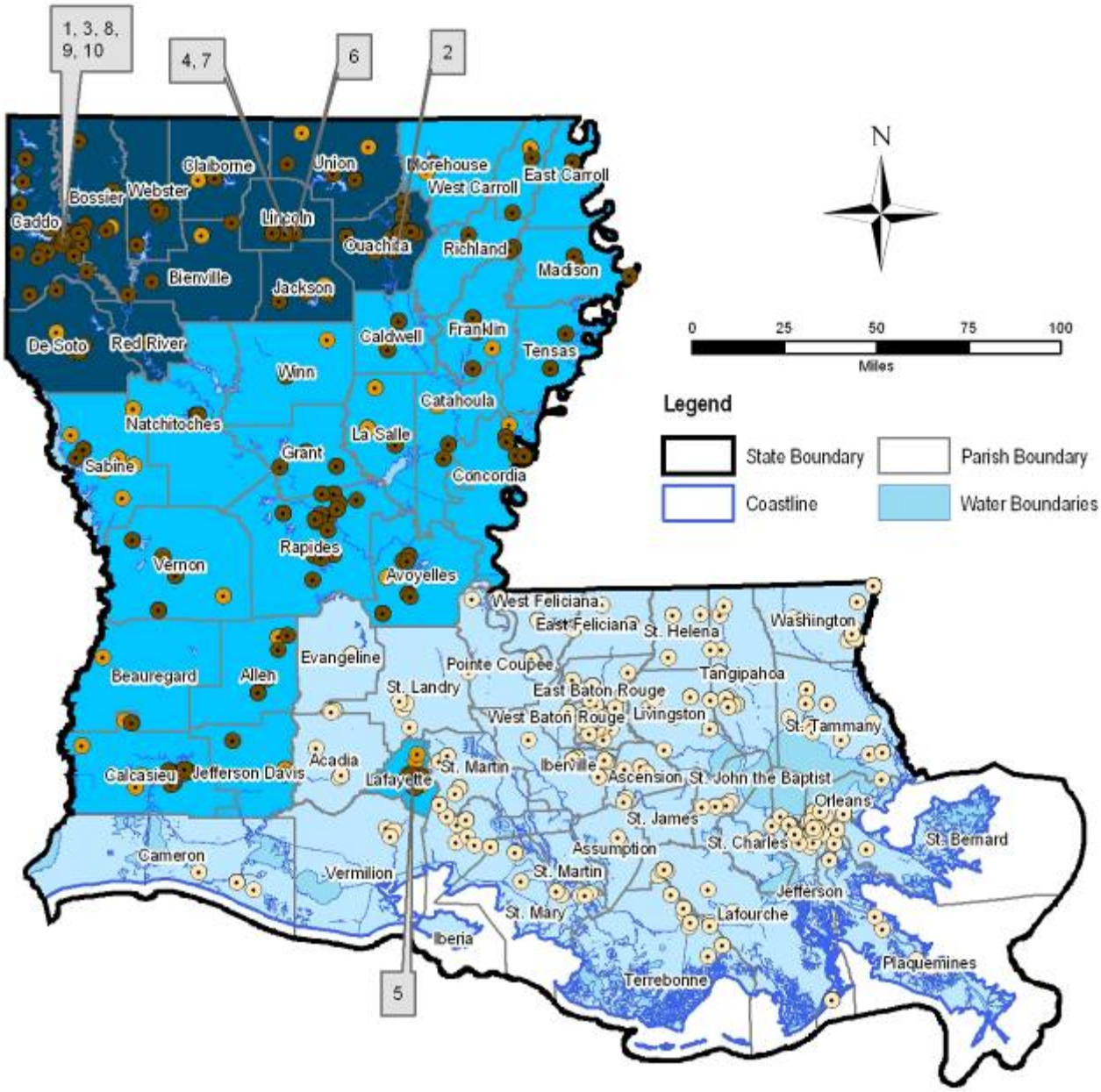
Table 6-12: Top Ten Critical Facilities at Risk from Ice Storm Hazard

Ice Storm Loss Ranking	Building Name	Parish	Physical Damage	Contents Damage	LOF	Contents Damage
1	S'Port LSUMC Hospital	Caddo	$6,748	$0	$1,807,405	$1,814,153
2	Main Hospital Building	Ouachita	$9,976	$0	$1,519,049	$1,529,025
3	S'Port LSUMC Medical School	Caddo	$5,901	$0	$1,169,260	$1,175,160
4	Thomas Assembly Center	Lincoln	$8,555	$0	$536,283	$544,839
5	Hospital	Lafayette	$4,094	$0	$477,581	$481,675
6	Ruston Warehouse	Lincoln	$10,237	$0	$255,967	$266,205
7	Howard Center for the Performing Arts	Lincoln	$6,735	$0	$249,266	$256,001
8	Women's and Children's Center	Caddo	$6,245	$0	$238,123	$244,368
9	Comprehensive Care-043	Caddo	$3,967	$0	$240,194	$244,161
10	Lee Dry Goods Warehouse	Caddo	$9,580	$0	$224,155	$233,735

Map 6-6 (Loss Estimate – Ice Storm – Total) shows the number of recorded ice storms for each parish in the State of Louisiana based on NCDC data (same as Map 4-6); ice storm loss estimate rankings according to high / medium / low ranges of estimated losses (per Table 6-11) for Option A (LOF, not including physical damage)[1]; and the locations of the ten highest ranked facilities from Table 6-12.

[1] For results of Option B (i.e., LOF including physical damage), see Appendix F.3.

Map 6-6: Loss Estimate - Ice Storms - Total



Estimated Losses

Low: $0 Medium: $1 - $1,500 High: $1,501 - $2,000,0000

Source: Louisiana Facility Management Database

Previous Ice Storms

No Storms 1 - 4 Storms 5 - 10 Storms

Source: NOAA

6.7 Storm Surge

The storm surge hazard vulnerability assessment of State-owned critical facilities was based on sea, lake, and overland surges from hurricanes (SLOSH) models for category 1-5 hurricanes in Louisiana. The criteria used to determine specific vulnerability rankings for each facility and the results of applying this ranking to the State-owned critical facilities are shown in Table 6-13. These results are shown on Map F-62.

Table 6-13: Storm Surge Vulnerability Criteria and Ranking Results

Ranking	Criteria	Number of Critical Facilities
High	Structures within hazard zone with inundation depths > 12 feet	112
Medium	Structures within hazard zone with inundation depths < 12 feet	570
Low (or None)	Structures outside the hazard zone	3,122

The storm surge loss estimate of State-owned critical facilities in Louisiana involved an analysis of the following parameters (that are described in more detail in Appendix F.7).

- Storm Surge Hazard Vulnerability
- Average Surge Depth
- Average Building Type
- Storm Surge Damage Functions (SSDFs)

Table 6-14 shows the ranking results according to high / medium / low ranges of estimated losses.

Table 6-14: Storm Surge Loss Estimate Ranges and Ranking Results

Ranking	Total Loss Estimate Ranges	Number of Critical Facilities
High	$100,001 to $402,000,000	282
Medium	$1 to $100,000	400
Low	$0	3,122

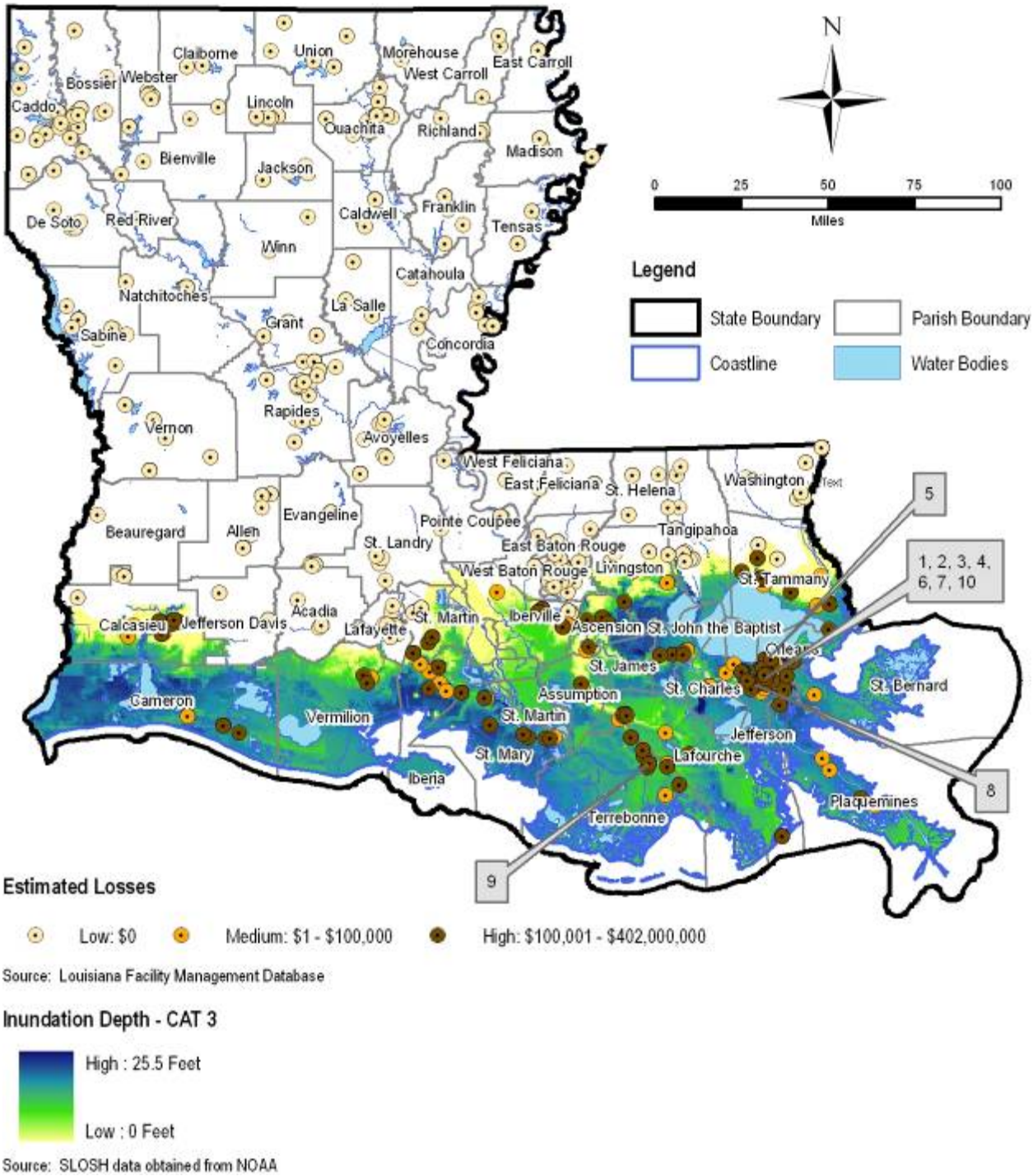
Table 6-15 shows the ten highest ranked critical facilities in terms of the computed loss estimates.

Table 6-15: Top Ten Critical Facilities at Risk from Storm Surge Hazard

Storm Surge Loss Ranking	Building Name	Parish	Physical Damage	Contents Damage	LOF	Combined Loss
1	Louisiana Superdome	Orleans	$218,432,048	$109,216,024	$74,251,946	$401,900,018
2	Charity - Main Hospital	Orleans	$129,976,164	$64,988,082	$48,784,642	$243,748,888
3	Lions-LSU Clinics Bld-Eye Cent	Orleans	$25,417,071	$12,708,535	$100,625,123	$138,750,729
4	Main Hospital	Orleans	$49,318,400	$24,659,200	$18,449,967	$92,427,568
5	Kieffer Lakefront Arena	Orleans	$52,016,976	$26,008,488	$5,786,365	$83,811,830
6	LSU Clinical Sciences Building	Orleans	$22,575,355	$11,287,677	$9,852,871	$43,715,903
7	Medical School	Orleans	$18,493,738	$9,246,869	$14,897,709	$42,638,316
8	Main Hospital	Orleans	$18,407,417	$9,203,709	$10,503,790	$38,114,915
9	Leonard J. Chabert Medical Center	Terrebonne	$18,891,153	$9,445,577	$9,119,159	$37,455,889
10	Library/Admin/Resource Center	Orleans	$10,403,576	$5,201,788	$1,490,714	$17,096,078

Map 6-7 (Loss Estimate –Storm Surge – Total) shows the storm surge hazard zones and potential surge inundation depths throughout the State) (same as Map 4-7; storm surge loss estimate rankings according to high / medium / low ranges of estimated losses (per Table 6-14); and the locations of the ten highest ranked facilities from Table 6-15.

Map 6-7: Loss Estimate - Storm Surge - Total



6.8 Subsidence (Land Loss)

The subsidence (land loss) hazard vulnerability assessment of State-owned critical facilities was based on land loss studies such as the *Coast 2050* report prepared by the Louisiana Coastal Wetlands Conservation and Preservation Task Force. The criteria used to determine specific vulnerability rankings for each facility and the results of applying this ranking to the State-owned critical facilities are shown in Table 6-16. These results are shown on Map F-80.

Table 6-16: Subsidence (Land Loss) Vulnerability Criteria and Ranking Results

Ranking	Criteria	Number of Critical Facilities
High	Structures located in the identified basins with highest projected rates	169
Medium	Structures located in the identified basins with lowest projected rates	265
Low (or None)	Structures outside the identified basins	3,370

The subsidence loss estimate of State-owned critical facilities in Louisiana involved an analysis of the following parameters (that are described in more detail in Appendix F.9).

- Land Loss Hazard Vulnerability
- Average Land Loss
- Average Building Type
- Land Loss Damage Functions (LLDFs)

Table 6-17 shows the ranking results according to high / medium / low ranges of estimated losses.

Table 6-17: Subsidence (Land Loss) Loss Estimate Ranges and Ranking Results

Ranking	Total Loss Estimate Ranges	Number of Critical Facilities
High	$50,001 to $145,000,000	71
Medium	$1 to $50,000	359
Low	$0	3,374

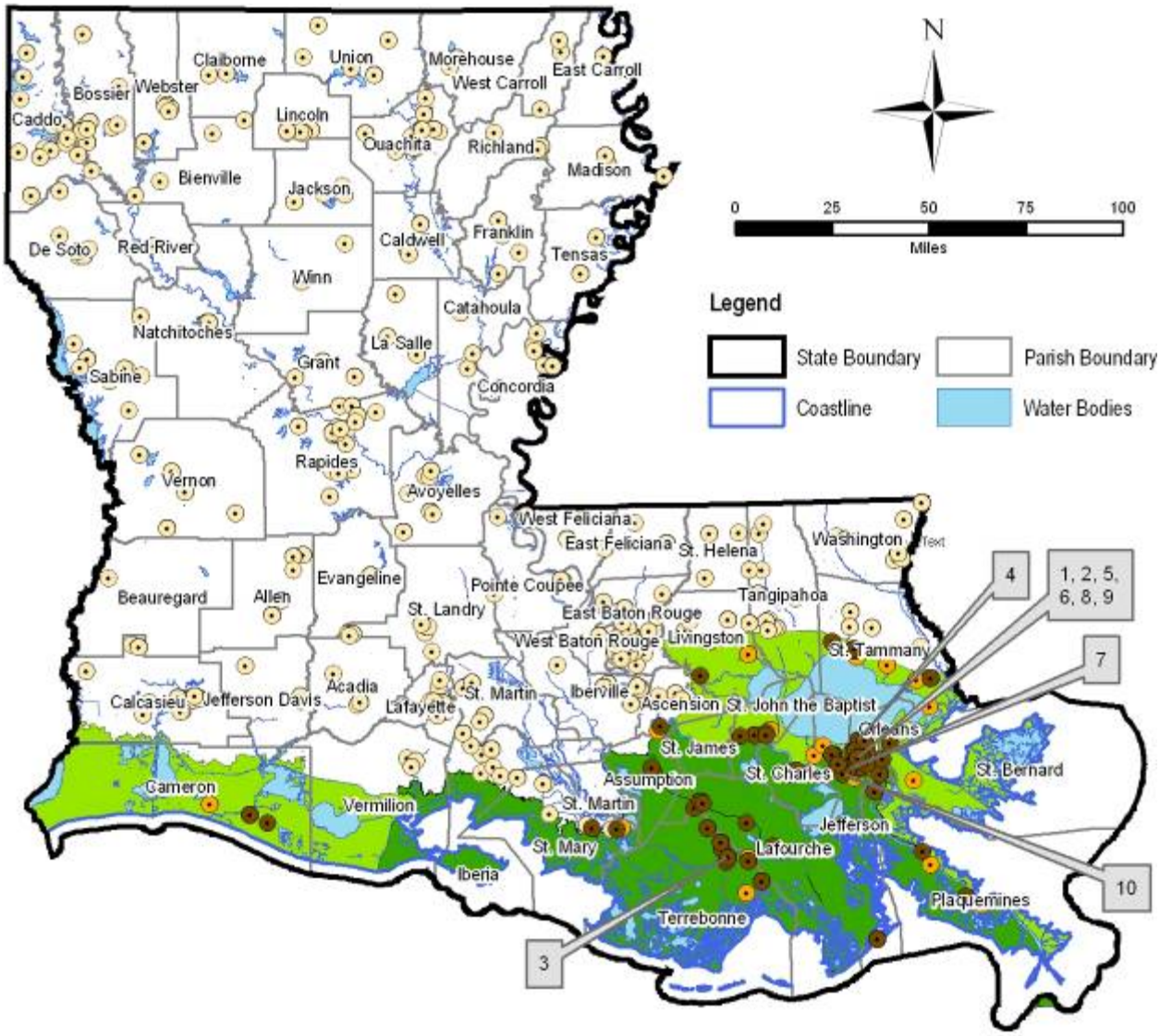
Table 6-18 shows the ten highest ranked critical facilities in terms of the computed loss estimates.

Table 6-18: Top Ten Critical Facilities at Risk from Subsidence (Land Loss) Hazard

Land Loss Ranking	Building Name	Parish	Physical Damage	Contents Damage	LOF	Combined Loss
1	Louisiana Superdome	Orleans	$143,705,295	$0	$0	$143,705,295
2	Charity - Main Hospital	Orleans	$85,510,634	$0	$0	$85,510,634
3	Leonard J. Chabert Medical Center	Terrebonne	$32,570,954	$0	$9,119,159	$41,690,113
4	Kieffer Lakefront Arena	Orleans	$34,221,695	$0	$0	$34,221,695
5	Main Hospital	Orleans	$32,446,316	$0	$0	$32,446,316
6	Lions-LSU Clinics Bld-Eye Cent	Orleans	$16,721,757	$0	$0	$16,721,757
7	Main Hospital	Orleans	$15,868,463	$0	$0	$15,868,463
8	LSU Clinical Sciences Building	Orleans	$14,852,207	$0	$0	$14,852,207
9	Medical School	Orleans	$12,166,933	$0	$0	$12,166,933
10	Alario Center	Jefferson	$11,111,655	$0	$703,017	$11,814,672

Map 6-8 (Loss Estimate –Subsidence (Land Loss) – Total) shows the land loss hazard zones and the extent of potential land loss areas throughout the State (same as Map 4-8); subsidence loss estimate rankings according to high / medium / low ranges of estimated losses (per Table 6-17); and the locations of the ten highest ranked facilities from Table 6-18.

Map 6-8: Loss Estimate - Subsidence (Land Loss) - Total



Estimated Losses

Low: $0 Medium: $1 - $50,000 High: $50,001 - $145,000,000

Source: Louisiana Facility Management Database

Subsidence (Land Loss)

High Projected Losses Medium Projected Losses

Source: USGS National Wetlands Research Center

6.9 Wildfire

The wildfire hazard vulnerability assessment of State-owned critical facilities was based on the number of recorded wildfires and the number of acres burned by wildfires within each parish based on data provided by the State of Louisiana. The criteria used to determine specific vulnerability rankings for each facility and the results of applying this ranking to the State-owned critical facilities are shown in Table 6-19. These results are shown on Map F-95.

Table 6-19: Wildfire Vulnerability Criteria and Ranking Results

Ranking	Criteria	Number of Critical Facilities
High	Structures in parishes with > average burned area	1,217
Medium	Structures in parishes with < average burned area	1,775
Low (or None)	Structures in parishes with no recorded wildfires	812

The wildfire loss estimate of State-owned critical facilities in Louisiana involved an analysis of the following parameters (that are described in more detail in Appendix F.11).

- Wildfire Hazard Vulnerability
- Average Building Type
- Wildfire Suppression Cost Functions (WSCFs)

Table 6-20 shows the ranking results according to high / medium / low ranges of estimated losses.

Table 6-20: Wildfire Loss Estimate Ranges and Ranking Results

Ranking	Total Loss Estimate Ranges	Number of Critical Facilities
High	$1,501 to $2,000,000	1,515
Medium	$1 to $1,500	1,477
Low	$0	812

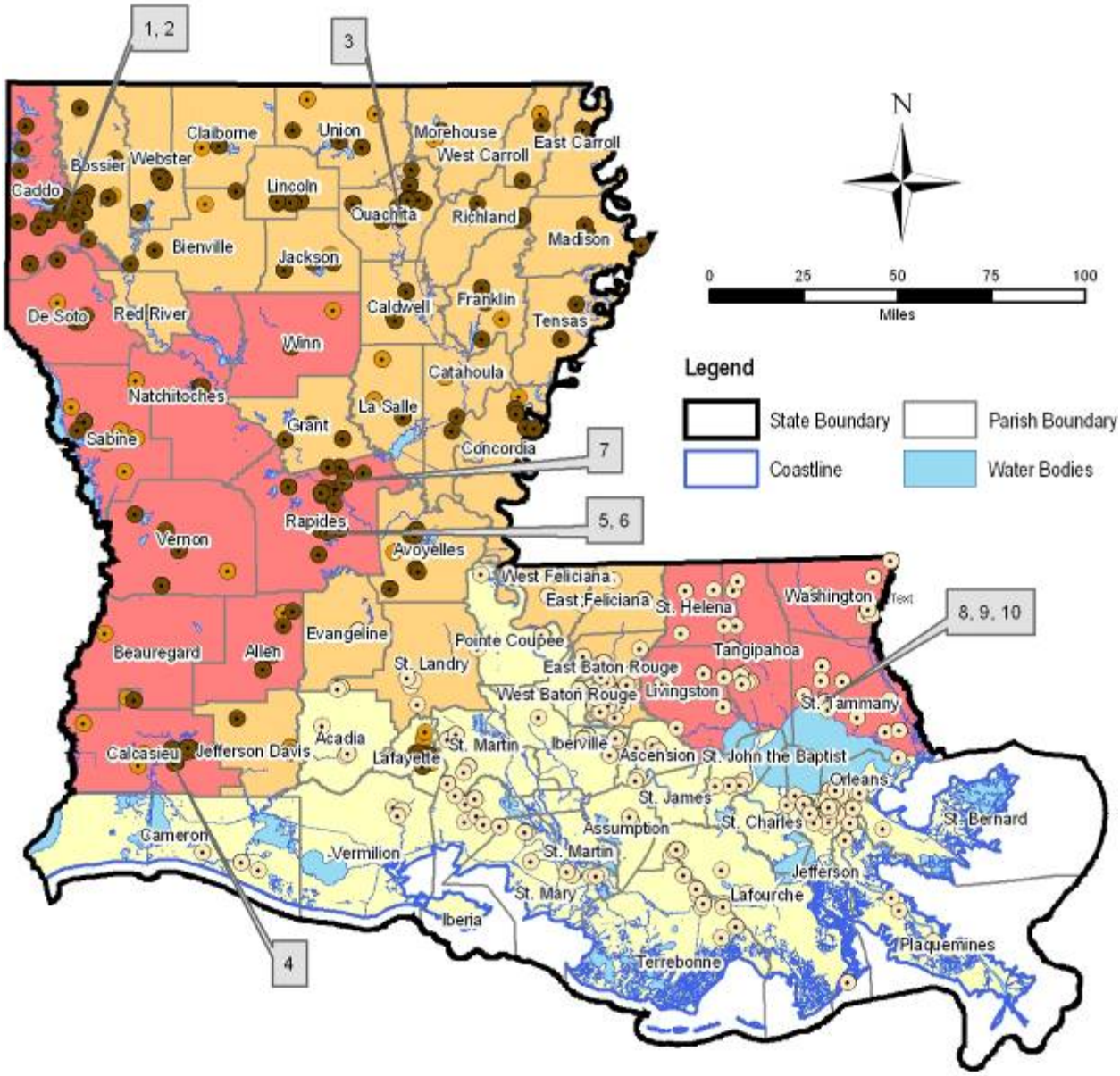
Table 6-21 shows the ten highest ranked critical facilities in terms of the computed loss estimates.

Table 6-21: Top Ten Critical Facilities at Risk from Wildfire Hazard

Wildfire Loss Ranking	Building Name	Parish	Physical Damage	Contents Damage	LOF	Combined Loss
1	S'Port LSUMC Hospital	Caddo	$10,670	$0	$1,807,405	$1,818,075
2	S'Port LSUMC Medical School	Caddo	$9,330	$0	$1,169,260	$1,178,590
3	Main Hospital Building	Ouachita	$7,887	$0	$506,350	$514,236
4	Main Hospital Building	Calcasieu	$10,097	$0	$497,948	$508,045
5	Hangar	Rapides	$18,235	$0	$406,064	$424,300
6	Hangar	Rapides	$18,235	$0	$406,064	$424,300
7	Main Hospital Building A	Rapides	$9,626	$0	$339,468	$349,094
8	Wards B,C,G,& Treatment Bldg	St. Tammany	$16,011	$0	$313,052	$329,064
9	Wards A, D & E Hall	St. Tammany	$16,011	$0	$313,052	$329,064
10	Wards L,M,N,O,P & Q	St. Tammany	$15,811	$0	$305,286	$321,097

Map 6-9 (Loss Estimate –Wildfire – Total;) shows the average number of acres burned by wildfires for each parish in the State of Louisiana based on State data (same as Map 4-9); wildfire loss estimate rankings according to high / medium / low ranges of estimated losses (per Table 6-20); and the locations of the ten highest ranked facilities from Table 6-21.

Map 6-9: Loss Estimate - Wildfire - Total



Estimated Losses

Low: $0 — Medium: $1 - $1,500 — High: $1,501 - $2,000,0000

Source: Louisiana Facility Management Database

Wildfire Risk

High Risk — Medium Risk — Low Risk

Source: Louisiana Department of Agriculture and Forestry

6.10 Dam Failure

The dam failure hazard vulnerability assessment of State-owned critical facilities was based on the potential inundation areas in proximity to low, significant and high hazard dams statewide. The criteria used to determine specific vulnerability rankings for each facility and the results of applying this ranking to the State-owned critical facilities are shown in Table 6-22. These results are shown on Map F-117.

Table 6-22: Dam Failure Vulnerability Criteria and Ranking Results

Ranking	Criteria	Number of Critical Facilities
High	Structures with 50% of dam failure hazard radius	198
Medium	Structures in area 50% to 100% of dam failure hazard radius	403
Low (or None)	Structures outside dam failure hazard radius	3,203

The dam failure loss estimate of State-owned critical facilities in Louisiana involved an analysis of the following parameters (that are described in more detail in Appendix F.13).

- Dam Failure Hazard Vulnerability
- Average Inundation Depth
- Average Building Type
- Inundation Depth-Damage Functions (IDDFs)

Table 6-23 shows the ranking results according to high / medium / low ranges of estimated losses.

Table 6-23: Dam Failure Loss Estimate Ranges and Ranking Results

Ranking	Total Loss Estimate Ranges	Number of Critical Facilities
High	$50,001 to $60,000,000	262
Medium	$1 to $50,000	339
Low	$0	3,203

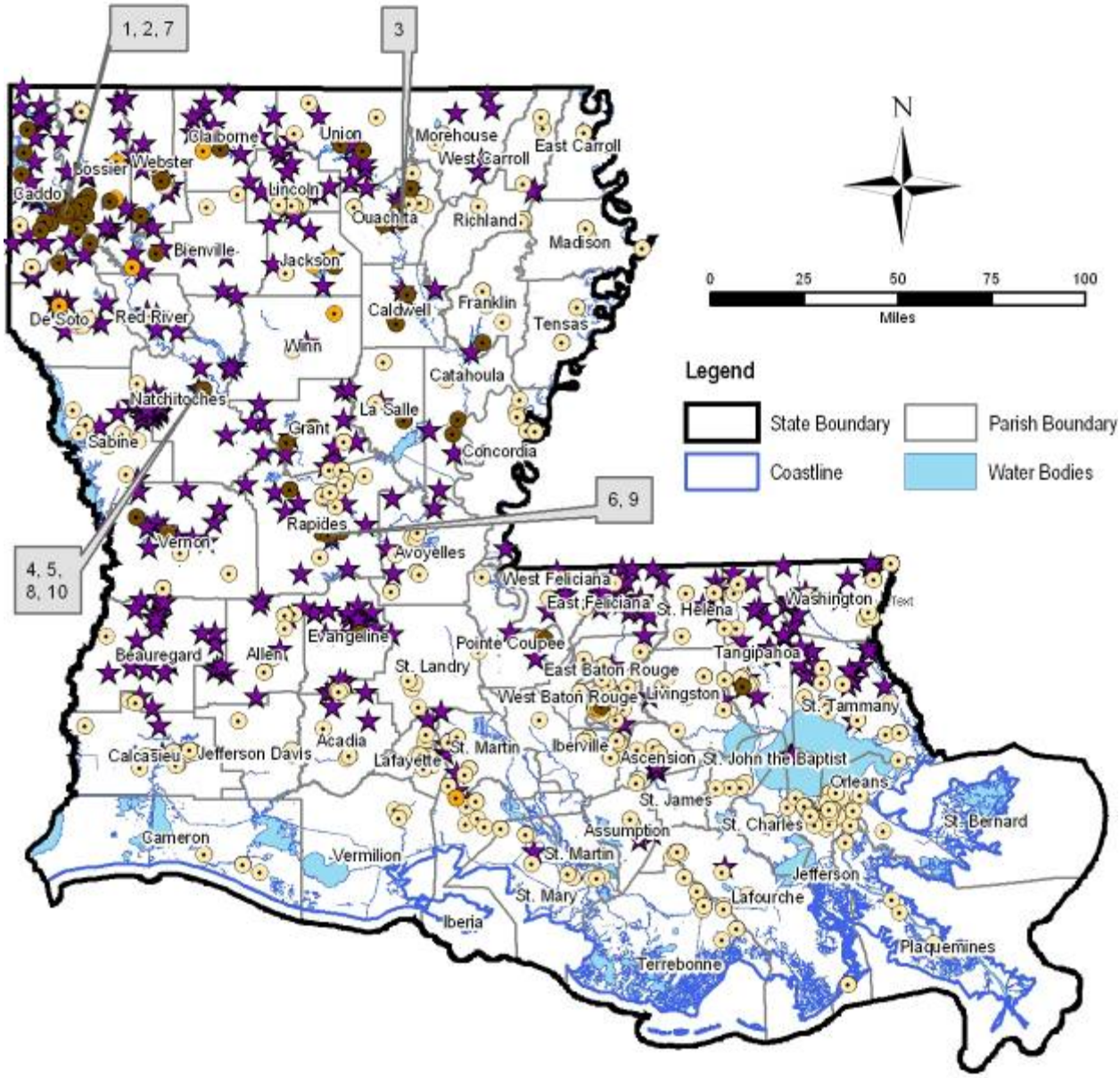
Table 6-24 shows the ten highest ranked critical facilities in terms of the computed loss estimates.

Table 6-24: Top Ten Critical Facilities at Risk from Dam Failure Hazard

Dam Failure Loss Ranking	Building Name	Parish	Physical Damage	Contents Damage	LOF	Combined Loss
1	S'Port LSUMC Hospital	Caddo	$27,606,306	$13,803,153	$18,074,050	$59,483,509
2	S'Port LSUMC Medical School	Caddo	$19,530,689	$9,765,345	$11,692,598	$40,988,631
3	Main Hospital Building	Ouachita	$11,622,068	$8,824,162	$13,671,441	$34,117,671
4	Teacher Education Center	Natchitoches	$4,172,794	$2,086,397	$2,877,669	$9,136,860
5	Prather Coliseum	Natchitoches	$4,086,607	$2,043,303	$2,384,014	$8,513,924
6	Hangar	Rapides	$2,020,584	$1,010,292	$4,060,645	$7,091,520
7	Women's and Children's Center	Caddo	$3,046,633	$1,523,317	$2,381,230	$6,951,180
8	Warren Easton Hall	Natchitoches	$3,333,668	$1,666,834	$1,944,960	$6,945,462
9	Hangar	Rapides	$1,889,959	$944,979	$4,060,645	$6,895,582
10	Classrooms/Labs/Administration	Natchitoches	$2,850,571	$1,425,286	$1,861,492	$6,137,348

Map 6-10 (Loss Estimate –Dam Failure – Total) shows the locations of various dams in parishes throughout the State of Louisiana (same as Map 4-10); dam failure loss estimate rankings according to high / medium / low ranges of estimated losses (per Table 6-23); and the locations of the ten highest ranked facilities from Table 6-24.

Map 6-10: Loss Estimate - Dam Failure - Total



Estimated Losses

Low: $0 Medium: $1 - $50,000 High: $50,001 - $60,000,000

Source: Louisiana Facility Management Database

Dam Locations

Source: U.S. Army Corp of Engineers National Inventory of Dams

6.11 Levee Failure

The levee failure hazard vulnerability assessment of State-owned critical facilities was based on the potential inundation areas from levees compiled by the U.S. Army Corps of Engineers (USACE). The criteria used to determine specific vulnerability rankings for each facility and the results of applying this ranking to the State-owned critical facilities are shown in Table 6-25. These results are shown on Map F-133.

Table 6-25: Levee Failure Vulnerability Criteria and Ranking Results

Ranking	Criteria	Number of Critical Facilities
High	Structures with ½ mile of levee	190
Medium	Structures from ½ to 2 miles from levee	776
Low (or None)	Structures > 2 miles from levee	2,838

The levee failure loss estimate of State-owned critical facilities in Louisiana involved an analysis of the following parameters (that are described in more detail in Appendix F.15).

- Levee Failure Hazard Vulnerability
- Average Inundation Depth
- Average Building Type
- Inundation Depth-Damage Functions (IDDFs)

Table 6-26 shows the ranking results according to high / medium / low ranges of estimated losses.

Table 6-26: Levee Failure Loss Estimate Ranges and Ranking Results

Ranking	Total Loss Estimate Ranges	Number of Critical Facilities
High	$50,001 to $215,000,000	455
Medium	$1 to $50,000	511
Low	$0	2,838

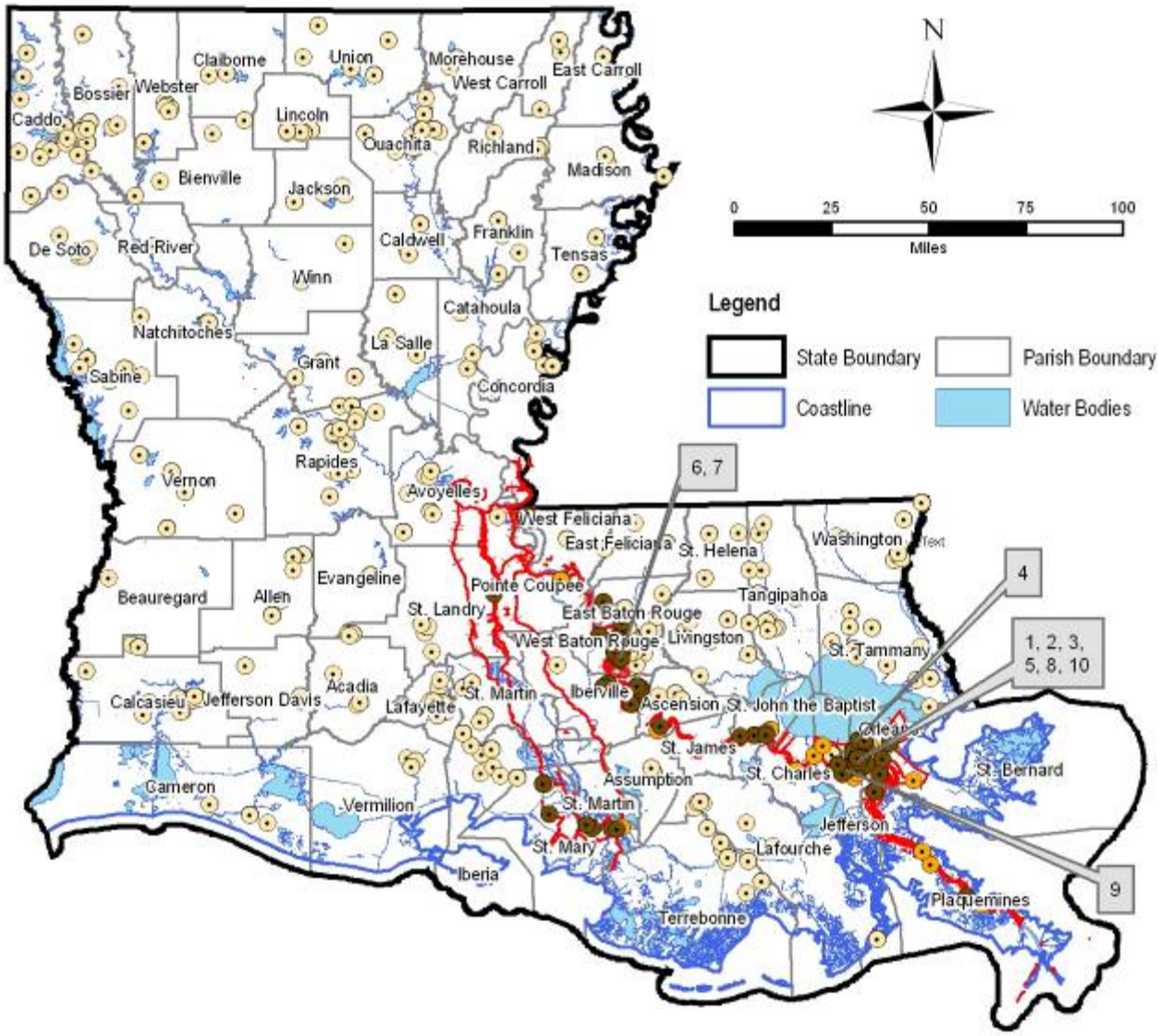
Table 6-27 shows the ten highest ranked critical facilities in terms of the computed loss estimates.

Table 6-27: Top Ten Critical Facilities at Risk from Levee Failure Hazard

Levee Failure Loss Ranking	Building Name	Parish	Physical Damage	Contents Damage	LOF	Combined Loss
1	Louisiana Superdome	Orleans	$77,600,859	$58,919,171	$66,826,751	$203,346,782
2	Charity - Main Hospital	Orleans	$46,175,742	$35,059,360	$43,906,178	$125,141,280
9	Main Hospital	Orleans	$8,568,970	$6,506,070	$90,562,611	$106,448,280
4	Main Hospital	Orleans	$17,521,011	$13,302,990	$5,786,365	$57,118,908
8	Assembly Center	East Baton Rouge	$11,054,963	$8,393,583	$16,604,970	$47,428,971
3	Lions-LSU Clinics Bld-Eye Center	Orleans	$9,029,749	$6,855,920	$2,836,946	$28,206,507
7	Medical School	Orleans	$6,570,144	$4,988,443	$5,872,562	$25,321,107
5	Kieffer Lakefront Arena	Orleans	$34,221,695	$17,110,848	$13,407,938	$24,966,524
6	Veterinary Medicine	East Baton Rouge	$14,420,592	$10,948,968	$9,453,411	$24,528,451
10	LSU Clinical Sciences Building	Orleans	$8,020,192	$6,089,405	$8,867,584	$22,977,181

Map 6-11 (Loss Estimate – Levee Failure – Total; Map 4-11) shows the location of State-owned critical facilities in the State in relation to the levee locations ; levee failure loss estimate rankings according to high / medium / low ranges of estimated losses (per Table 6-26); and the locations of the ten highest ranked facilities from Table 6-27.

Map 6-11: Loss Estimate - Levee Failure - Total



Estimated Losses

Low: $0 Medium: $1 - $50,000 High: $50,001 - $215,000,000

Source: Louisiana Facility Management Database

Levee Locations

Source: U.S. Army Corp of Engineers

6.12 Hazardous Material Incident

The hazardous material incident hazard vulnerability assessment of State-owned critical facilities was based on potential impact areas from a hazardous materials (HAZMAT) release from a fixed site. The criteria used to determine specific vulnerability rankings for each facility and the results of applying this ranking to the State-owned critical facilities are shown in Table 6-28. These results are shown on Map F-154.

Table 6-28: Hazardous Material Incident Vulnerability Criteria and Ranking Results

Ranking	Criteria	Number of Critical Facilities
High	Structures located within 1 mile of a HAZMAT site	217
Medium	Structures located between 1 and 2 mile radius of a HAZMAT site	1,090
Low (or None)	Structures located > 2 miles from a HAZMAT site	2,497

The hazardous material incident loss estimate of State-owned critical facilities in Louisiana involved an analysis of the following parameters (that are described in more detail in Appendix F.17).

- Hazardous Material Incident Hazard Vulnerability
- Average Building Type
- Hazardous Material Incident Damage Functions (HIDFs)

Table 6-29 shows the ranking results according to high / medium / low ranges of estimated losses.

Table 6-29: Hazardous Material Incident Loss Estimate Ranges and Ranking Results

Ranking	Total Loss Estimate Ranges	Number of Critical Facilities
High	$2,501 to $17,000,000	621
Medium	$1 to $2,500	686
Low	$0	2,497

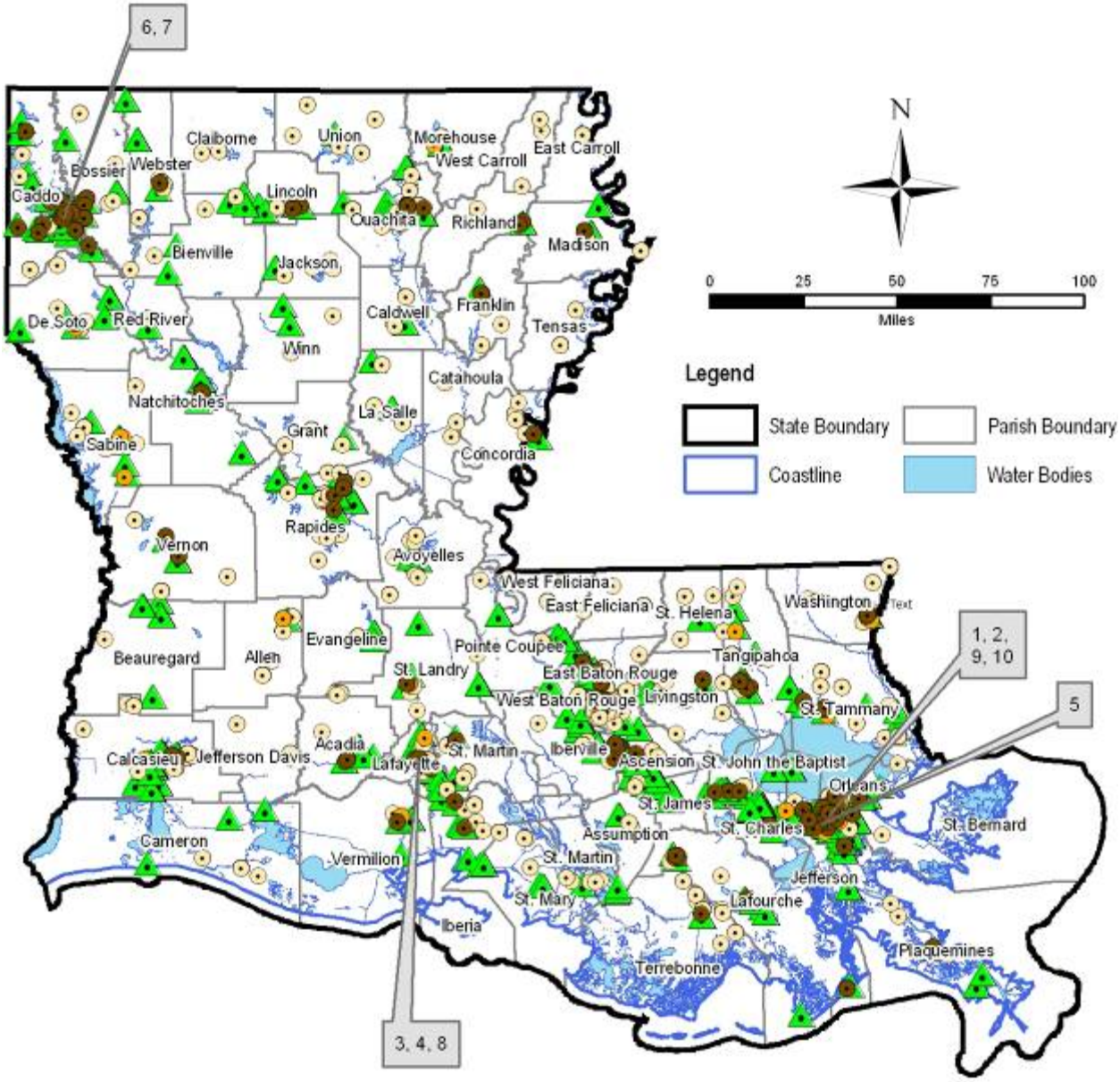
Table 6-30 shows the ten highest ranked critical facilities in terms of the computed loss estimates.

Table 6-30: Top Ten Critical Facilities at Risk from Hazardous Materials Incident Hazard

HAZMAT Incident Loss Ranking	Building Name	Parish	Physical Damage	Contents Damage	LOF	Combined Loss
1	Louisiana Superdome	Orleans	$14,370,530	$0	$2,475,065	$16,845,594
2	Charity - Main Hospital	Orleans	$8,551,063	$0	$1,626,155	$10,177,218
3	Hospital	Lafayette	$5,461,772	$0	$955,162	$6,416,934
4	Cajun Dome (Section I)	Lafayette	$5,114,121	$0	$228,522	$5,342,643
5	Main Hospital	Orleans	$3,173,693	$0	$700,253	$3,873,945
6	S'Port LSUMC Hospital	Caddo	$2,760,631	$0	$602,468	$3,363,099
7	S'Port LSUMC Medical School	Caddo	$1,953,069	$0	$389,753	$2,342,822
8	Cajundome Conference Center	Lafayette	$1,917,020	$0	$63,514	$1,980,534
9	LSU Clinical Sciences Building	Orleans	$1,485,221	$0	$328,429	$1,813,650
10	Medical School	Orleans	$1,216,693	$0	$496,590	$1,713,284

Map 6-12 (Loss Estimate – Hazardous Material Incident – Total) shows the location of State-owned critical facilities in Louisiana in relation to HAZMAT sites (same as Map 4-12); hazardous material incident loss estimate rankings according to high / medium / low ranges of estimated losses (per Table 6-29); and the locations of the ten highest ranked facilities from Table 6-30.

Map 6-12: Loss Estimate - Hazardous Material Incidents - Total



Estimated Losses

Low: $0 Medium: $1 - $2,500 High: $2,501 - $17,000,000

Source: Louisiana Facility Management Database

HAZMAT Locations

Source: EPA Toxic Release Inventory 2002

6.13 Summary

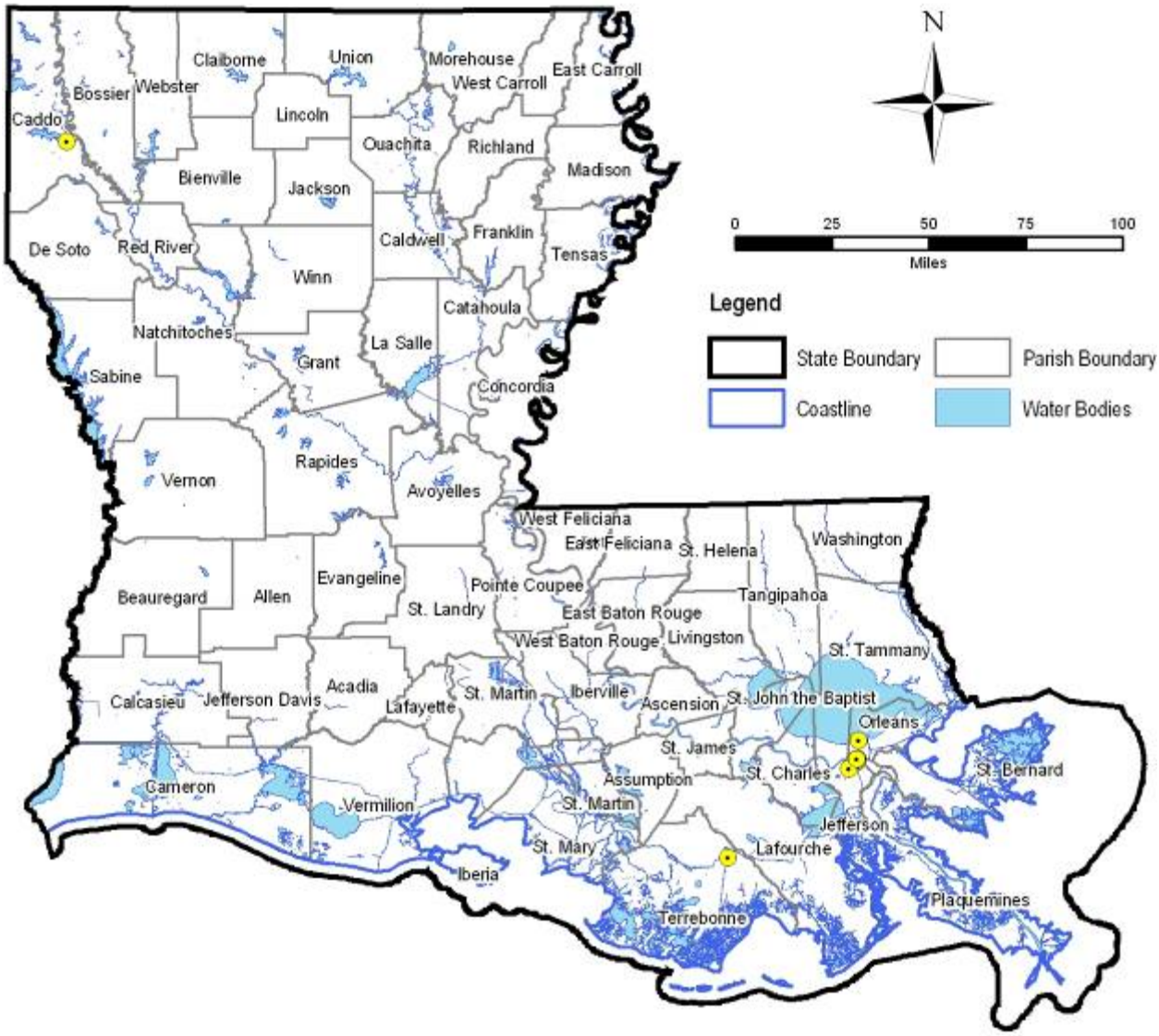
The ten critical facilities in Louisiana with the highest total combined loss estimates for all hazards – flood, high wind (hurricane), ice storm, storm surge, subsidence (land loss), wildfire, dam and levee failure, and hazardous materials incident - are shown in Table 6-31 and displayed on the following page on Map 6-13.

It is important to note that this is a "one of a kind" analysis that does not fully account for probability, discounting of value over time or the real potential for any particular structure to get damaged. The real intent is to narrow the focus to buildings that may have a higher likelihood of being damage per the methodology. As outline in Section Eight, the Plan includes recommendations for follow-up "ground-truthing efforts to validate the methodology, confirm or refine the results and lead to the identification of meaningful mitigation projects.

Table 6-31: Combined Hazard Loss Estimate ($millions)

Total Loss Ranking	Building Name	Parish	Flood	High Wind (Hurricane)	Ice Storm	Wildfire	Levee Failure	Dam Failure	HazMat Incident	Storm Surge	Subsidence	Totals
1	Louisiana Superdome	Orleans	203.3	218.0	0	0	210.8	0	16.8	402.0	143.7	1,194.5
2	Charity – Main Hospital	Orleans	125.1	134.3	0	0	130.0	0	10.2	243.7	85.5	728.9
3	Lions – LSU Clinics BLD-Eye Center	Orleans	35.5	117.3	0	0	116.5	0	0	138.8	16.7	424.9
4	Main Hospital	Orleans	47.4	50.9	0	0	49.3	0	0	92.4	32.5	272.5
5	Kieffer Lakefront Arena	Orleans	12.7	40.0	0	0	34.2	0	0	83.8	34.2	204.9
6	Medical School	Orleans	25.0	27.1	0	0	26.5	0	1.7	42.6	12.2	135.0
7	Leonard J. Chabert Medical Center	Terrebonne	23.7	25.4	0	0	0	0	0	37.5	41.7	128.2
8	Main Hospital	Orleans	0	26.4	0	0	25.6	0	3.9	38.1	15.9	109.8
9	LSU Clinical Sciences Building	Orleans	7.7	12.3	0	0	24.0	0	1.8	43.7	14.8	104.4
10	S'port LSUMC Hospital	Orleans	0	6.5	0	0	0	59.5	3.4	0	0	73.0

Map 6-13: Loss Estimate - All Hazards - Top 10



Highest Loss Facilities

Source: Louisiana Facility Management Database

The number of State-owned critical facilities with the highest hazard vulnerability rankings for each hazard – flood, high wind (hurricane), ice storm, storm surge, subsidence (land loss), wildfire, dam and levee failure, and hazardous materials incident – is identified by agency (as listed in the Facilities Management database) in Table 6-32.

Table 6-32: Critical Facilities with Highest Vulnerability Rankings per Hazard per State Agency

Agency	Flood	High Wind	Ice Storm	Storm Surge	Land Loss	Wildfire	Dam Failure	Levee Failure	Hazard Materials	Totals
Ancillary Funds	1	0	0	0	0	0	0	1	0	2
Dept. of Culture, Recreation and Tourism	6	24	35	7	7	44	8	5	5	141
Dept. of Education	440	155	297	48	56	346	79	32	97	1550
Dept. of Health and Hospitals	36	46	33	12	20	176	8	11	27	369
Department of Labor	1	0	0	0	0	0	0	0	0	1
Dept. of Public Safety and Corrections	7	24	73	3	19	129	1	22	29	307
Dept. of Social Services	0	0	0	0	0	1	0	0	0	1
Dept. of Transportation and Development	73	57	74	21	26	161	37	13	17	479
Dept. of Wildlife and Fisheries	25	40	23	1	22	26	14	1	1	153
Elected Officials	25	10	33	1	2	75	25	1	5	177
Executive Department	56	76	44	1	10	218	18	90	24	537
Legislative Department	0	0	0	0	0	0	0	1	0	1
Non-Appropriated Requirements	0	0	0	0	0	0	0	0	0	0
Retirement Systems	0	0	0	0	0	0	0	0	0	0
Unknown Departments	18	12	25	15	7	41	8	11	12	149
Other	2	0	13	0	0	0	0	2	0	17
Total	690	444	650	109	169	1217	198	190	217	3884

Table 6-33 indicates which agencies have critical facilities that are considered among the top ten on a hazard-by-hazard basis.

Table 6-33: Top Ten Critical Facilities per Hazard per State Agency

Agency	Flood	High Wind	Ice Storm	Storm Surge	Land Loss	Wildfire	Dam Failure	Levee Failure	Hazard Materials	Totals
Ancillary Funds	0	0	0	0	0	0	0	0	0	0
Dept. of Culture, Recreation and Tourism	0	0	0	0	1	0	0	0	0	1
Dept. of Education	9	9	9	9	8	5	8	9	9	75
Dept. of Health and Hospitals	0	0	0	0	0	3	0	0	0	3
Department of Labor	0	0	0	0	0	0	0	0	0	0
Dept. of Public Safety and Corrections	0	0	0	0	0	0	0	0	0	0
Dept. of Social Services	0	0	0	0	0	0	0	0	0	0
Dept. of Transportation and Development	0	0	0	0	0	0	0	0	0	0
Dept. of Wildlife and Fisheries	0	0	0	0	0	0	0	0	0	0
Elected Officials	0	0	0	0	0	1	1	0	0	2
Executive Department	1	1	1	1	1	0	0	1	1	7
Legislative Department	0	0	0	0	0	0	0	0	0	0
Non-Appropriated Requirements	0	0	0	0	0	0	0	0	0	0
Retirement Systems	0	0	0	0	0	0	0	0	0	0
Unknown Departments	0	0	0	0	0	1	1	0	0	2
Other	0	0	0	0	0	0	0	0	0	0
Total	10	10	10	10	10	10	10	10	10	90

More detailed tabulations for State-owned critical facilities for each agency in Louisiana with the highest combined loss estimates for the nine combined hazards are presented in Appendix F. Mapping of the top ten facilities for combined estimated losses are included as Maps F-172-F188.

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