Table 3.1 Projected global average surface warming and sea level rise at the end of the 21st century (IPCC, 2007). These estimates are assessed from a hierarchy of models that encompass a simple climate model, several Earth Models of Intermediate Complexity (EMIC), and a large number of Atmosphere-Ocean Global Circulation Models (AOGCM). Sea level projections do not include uncertainties in carbon-cycle feedbacks, because a basis in published literature is lacking (IPCC, 2007).

	Temperature Change (°C at 2090 -2099 Relative to 1980-1999)		Sea Level Rise (M at 2090-2099 Relative to 1980-1999)
Case	**Best Estimate**	**Likely Range**	**Model-Based Range, Excluding Future Rapid Dynamical Changes in Ice Flow**
Constant Year 2000 Concentrations	0.6	0.3-0.9	NA
B1 Scenario	1.8	1.1-2.9	0.18-0.38
A1T Scenario	2.4	1.4-3.8	0.20-0.45
B2 Scenario	2.4	1.4-3.8	0.20-0.43
A1B Scenario	2.8	1.7-4.4	0.21-0.48
A2 Scenario	3.4	2.0-5.4	0.23-0.51
A1F1 Scenario	4.0	2.4-6.4	0.26-0.59

Table 3.2 United States Historical Climatology Network (USHCN) stations within the seven Climate Divisions of the central Gulf Coast region.

Climate Division	USHCN Stations
Texas CD 8	Danevang, Liberty
Louisiana CD 7	Jennings[a]
Louisiana CD 8	Franklin, Lafayette
Louisiana CD 9	Donaldsonville, Houma, New Orleans, Thibodaux
Louisiana CD 6	Amite, Baton Rouge, Covington
Mississippi 10	Pascagoula, Poplarville, Waveland
Alabama CD 8	Fairhope

[a] The Jennings climate record only dates back to the late 1960s. As a result, LA-CD 7 is made up of an average of Liberty, Texas to the west and Lafayette, Louisiana to the east.

Table 3.3 List of GCMs run with the three SRES emission scenarios (A1B, A2, and B1) for this study. Not all model runs were available from the IPCC Data Centre for each SRES scenario.

A1B		A2		B1	
Temperature	**Precipitation**	**Temperature**	**Precipitation**	**Temperature**	**Precipitation**
CCCMA	CCCMA.T63	BCCR	BCCR	BCCR	BCCR
CCCMA.T63	CNRM	CCCMA	CNRM	CCCMA	CCCMA.T63
CNRM	CSIRO	CNRM	CSIRO	CCCMA.T63	CNRM
CSIRO	GFDL0	CSIRO	GFDL0	CNRM	CSIRO
GFDL0	GFDL1	GFDL0	GFDL1	CSIRO	GFDL0
GFDL1	GISS.AOM	GFDL1	GISS.ER	GFDL0	GFDL1
GISS.AOM	GISS.EH	GISS.ER	INMCM3	GFDL1	GISS.AOM
GISS.EH	GISS.ER	INMCM3	IPSL	GISS.AOM	GISS.ER
GISS.ER	IAP	IPSL	MIROC.MEDRES	GISS.ER	IAP
IAP	INMCM3	MIROC.MEDRES	ECHAM	IAP	INMCM3
INMCM3	IPSL	ECHO	MRI	INMCM3	IPSL
IPSL	MIROC.HIRES	ECHAM	CCSM3	IPSL	MIROC.HIRES
MIROC.HIRES	MIROC.MEDRES	MRI	PCM	MIROC.HIRES	MIROC.MEDRES
MIROC.MEDRES	ECHAM	CCSM	HADCM3	MIROC.MEDRES	ECHAM
ECHO	MRI	PCM	HADGEM1	ECHO	MRI
ECHAM	CCSM3	HADCM3		ECHAM	CCSM3
MRI	PCM	HADGEM1		MRI	PCM
CCSM	HADCM3			CCSM	HADCM3
PCM				PCM	
HADCM3				HADCM3	
HADGEM1					

Table 3.4 Scenarios of temperature change from an ensemble of GCMs for the 5th, 25th, 50th, 75th, and 95th percentiles for the A1B scenario for 2050 relative to 1971-2000 means, in degrees Celsius.

	5th	**25th**	**50th**	**75th**	**95th**
Winter	0.18	0.95	1.42	1.89	2.56
Spring	1.22	1.55	1.80	2.04	2.38
Summer	1.24	1.66	1.94	2.23	2.70
Autumn	1.31	1.69	1.93	2.22	2.62

Table 3.5 Scenarios of precipitation change from an ensemble of GCMs for the 5th, 25th, 50th, 75th, and 95th percentiles for the A1B scenario for 2050 relative to 1971-2000 means, in percent.

	5th	**25th**	**50th**	**75th**	**95th**
Winter	-13.30	-5.95	-1.79	2.49	9.01
Spring	-21.07	-11.04	-5.04	1.80	10.17
Summer	-36.10	-17.77	-6.39	6.25	26.24
Autumn	-8.20	0.46	5.97	12.05	21.50

Table 3.6 Scenarios of temperature change from an ensemble of GCMs for the 5th, 25th, 50th, 75th, and 95th percentiles for the A2 scenario for 2050 relative to 1971-2000 means, in degrees Celsius.

	5th	**25th**	**50th**	**75th**	**95th**
Winter	0.2	1.0	1.5	2.0	2.9
Spring	0.8	1.3	1.7	2.0	2.6
Summer	1.1	1.5	1.8	2.1	2.5
Autumn	1.0	1.5	1.8	2.1	2.6

Table 3.7 Scenarios of precipitation change from an ensemble of GCMs for the 5th, 25th, 50th, 75th, and 95th percentiles for the A2 scenario for 2050 relative to 1971-2000 means, in percent.

	5th	**25th**	**50th**	**75th**	**95th**
Winter	-12.7	-5.7	0.4	5.6	13.6
Spring	-22.9	-12.8	-6.0	0.5	10.3
Summer	-31.2	-15.0	-5.2	5.9	21.3
Autumn	-7.3	1.3	7.0	12.7	22.1

Table 3.8 Scenarios of temperature change from an ensemble of GCMs for the 5th, 25th, 50th, 75th, and 95th percentiles for the B1 scenario for 2050 relative to 1971-2000 means, in degrees Celsius.

	5th	**25th**	**50th**	**75th**	**95th**
Winter	-0.31	0.44	1.02	1.53	2.32
Spring	0.67	1.05	1.32	1.62	2.03
Summer	0.64	1.09	1.35	1.63	2.03
Autumn	0.62	1.04	1.33	1.62	2.07

Table 3.9 Scenarios of precipitation change from an ensemble of GCMs for the 5th, 25th, 50th, 75th, and 95th percentiles for the B1 scenario for 2050 relative to 1971-2000 means, in percent.

	5th	**25th**	**50th**	**75th**	**95th**
Winter	-9.77	-4.37	-0.52	3.36	9.51
Spring	-16.94	-7.96	-2.94	2.41	11.38
Summer	-27.06	-14.16	-3.36	7.43	24.19
Autumn	-7.83	-0.06	5.63	11.13	19.40

Table 3.10 Days above 32.2°C (90°F) and mean daily temperature in the study area for datasets running through 2004. The start date varies by location (note the number of years of observed data).

Station	Years of Observed Data	Annual Days Above 90°F	Normal Mean Daily (°F)	
			Annual	July
Mobile, Alabama	42	74	66.8	81.5
Baton Rouge, Louisiana	45	84	67.0	81.7
Lake Charles, Louisiana	40	76	67.9	82.6
New Orleans, Louisiana	58	72	68.8	82.7
Meridian, Mississippi	40	80	64.7	81.7
Houston, Texas	35	99	68.8	83.6
Port Arthur, Texas	44	83	68.6	82.7
Victoria, Texas	43	106	70.0	84.2

Table 3.11 Potential temperature increase scenarios for August. Modeled outputs shown in Celsius and Fahrenheit.

Mid-Term Potential (2050 Scenarios) Temperature Increase by Scenario Percentile: °C (°F)				Long-Term Potential (2100 Scenarios) Temperature Increase by Scenario Percentile: °C (°F)			
Scenario	**5th**	**50th**	**95th**	**Scenario**	**5th**	**50th**	**95th**
A1B	1.6 (2.9)	2.5 (4.5)	**3.4 (6.1)**	**A1B**	3.0 (5.4)	3.9 (7.0)	5.0 (9.0)
B1	**0.9 (1.6)**	1.8 (3.2)	2.6 (4.7)	**B1**	**1.8 (3.2)**	2.7 (4.9)	3.6 (6.5)
A2	1.1 (2.0)	2.3 (4.1)	**3.4 (6.1)**	**A2**	3.3 (5.9)	4.7 (8.5)	**6.0 (10.8)**

Note: Lowest/highest changes in bold.

Table 3.12 Saffir-Simpson Scale for categorizing hurricane intensity and damage potential. Note that maximum sustained wind speed is the only characteristic used for categorizing hurricanes.

Saffir-Simpson Scale and Storm Category	Central Pressure (MB)	Maximum Sustained Wind Speed (MPH)	Damage Potential
1	980	74-95	Minimal
2	965-979	96-110	Moderate
3	945-964	111-130	Extensive
4	920-944	131-155	Extreme
5	< 920	>155	Catastrophic

Table 3.13 GCM model selection options based on data availability for the USGS SLRRP model and CoastClim model for generating future sea level rise projections. There are 3 GCM model data sets shared between SLRRP and CoastClim and a total of 11 GCM models and data sets altogether.

SLRRP GCM Listing	CoastClim GCM Listing
CSIRO_Mk2	CGCM1
CSM 1.3	CGCM2
ECHAM4/OPYC3	CSIRO_Mk2
GFDL_R15_a	GFDL_R15_b
HadCM2	GFDL_R30_c
HadCM3	HadCM2
PCM	HadCM3

Notes: Canadian Global Coupled Model – CGMC1, CGCM2.

CSIRO: Commonwealth Scientific and Industrial Research Organisation [Australia] – CSIRO_Mk2.

Geophysical Fluid Dynamics Laboratory – GFDL_R15a, R15b, R30c.

Hadley Centre Coupled Model – HADCM2, HADCM3.

Parallel Climate Model – DOE/NCAR, PCM.

Table 3.14 USGS SLRRP model results showing the mean land surface elevations subject to coastal flooding for the Gulf Coast region by 2050 and 2100 under a high, mid, and low scenario based on combined output for all 7 GCM models for the A1F1, B1, A1B, and A2 emission scenarios, in centimeters (NAVD88).

Year 2050	Low				Year 2100	Low			
	A1FI	B1	A1B	A2		A1FI	B1	A1B	A2
Galveston, Texas	83.0	80.9	83.4	83.4	Galveston, Texas	130.7	117.0	124.9	127.0
Grand Isle, Louisiana	107.5	106.0	108.8	106.3	Grand Isle, Louisiana	171.2	159.7	168.7	167.6
Pensacola, Florida	48.0	47.8	48.4	53.7	Pensacola, Florida	83.9	70.1	78.2	75.2
Year 2050	**Mid**				**Year 2100**	**Mid**			
	A1FI	**B1**	**A1B**	**A2**		**A1FI**	**B1**	**A1B**	**A2**
Galveston, Texas	88.9	86.7	88.7	88.8	Galveston, Texas	146.0	129.5	137.1	140.8
Grand Isle, Louisiana	113.6	111.8	114.2	111.8	Grand Isle, Louisiana	185.3	171.4	180.2	181.3
Pensacola, Florida	53.9	53.6	53.7	60.0	Pensacola, Florida	99.2	82.6	90.3	89.3
Year 2050	**High**				**Year 2100**	**High**			
	A1FI	**B1**	**A1B**	**A2**		**A1FI**	**B1**	**A1B**	**A2**
Galveston, Texas	94.8	92.5	93.9	94.3	Galveston, Texas	161.3	142.0	149.3	154.5
Grand Isle, Louisiana	119.6	117.6	119.6	117.3	Grand Isle, Louisiana	199.6	183.1	191.7	195.1
Pensacola, Florida	59.8	59.4	58.9	66.3	Pensacola, Florida	114.5	95.0	102.5	103.5

Table 3.15 Regional grid cell counts and normalized indices of sea level rise relative to global mean sea level projections for northern Gulf Coast tide gage locations by different GCM models used in CoastClim simulations.

		Normalized SLR Index		
CoastClim Models	**Gulf Coast Grid Cell Count**	**Galveston, Texas**	**Grand Isle, Louisiana**	**Pensacola, Florida**
CGCM1	5	0.89	0.89	0.89
CGCM2	5	1.04	1.04	0.95
CSIRO_Mk2	3	0.90	0.94	0.94
GFDL_R15_b	2	0.94	0.88	0.89
GFDL_R30_c	6	0.98	1.01	1.01
HadCM2	2	1.02	1.02	1.02
HadCM3	7	1.03	1.00	0.96

Table 3.16 CoastClim model results showing the mean sea level rise for the Gulf Coast region by 2050 and 2100 under a high, mid, and low scenario based on combined output for all 7 GCM models for the A1F1, B1, A1B, and A2 emission scenarios, in centimeters.

Year 2050	Low				Year 2100	Low			
	A1FI	B1	A1B	A2		A1FI	B1	A1B	A2
Galveston, Texas	40.5	39.2	40.2	39.6	Galveston, Texas	81.8	72.4	76.3	78.6
Grand Isle, Louisiana	60.6	59.3	60.3	59.8	Grand Isle, Louisiana	118.8	109.3	113.3	115.6
Pensacola, Florida	14.2	13.0	14.0	14.2	Pensacola, Florida	33.6	24.3	28.2	32.0
Year 2050	**Mid**				**Year 2100**	**Mid**			
	A1FI	B1	A1B	A2		A1FI	B1	A1B	A2
Galveston, Texas	46.2	44.3	45.8	44.8	Galveston, Texas	101.8	84.9	92.2	95.4
Grand Isle, Louisiana	66.4	64.4	66.0	64.9	Grand Isle, Louisiana	138.9	121.8	129.3	132.4
Pensacola, Florida	20.0	18.1	19.6	19.8	Pensacola, Florida	53.5	36.8	44.1	49.3
Year 2050	**High**				**Year 2100**	**High**			
	A1FI	B1	A1B	A2		A1FI	B1	A1B	A2
Galveston, Texas	54.3	51.6	53.8	52.1	Galveston, Texas	130	103.7	115.5	119.3
Grand Isle, Louisiana	74.5	71.7	73.9	72.3	Grand Isle, Louisiana	167.3	140.7	152.5	156.4
Pensacola, Florida	28.1	25.3	27.5	27.5	Pensacola, Florida	81.6	55.6	67.2	73.9

Table 3.17 Seven SLOSH basin codes, name descriptions, and storm categories included in the central Gulf Coast study region and simulation trials from Mobile, Alabama to Galveston, Texas.

Basin Code	Basin Name	Storm Category
EMOB	Elliptical Mobile Bay	Cat2, Cat3, Cat4, Cat5
NBIX	MS – Gulf Coast	Cat2, Cat3, Cat4, Cat5
MS2	New Orleans	Cat2, Cat3, Cat4, Cat5
LFT	Vermillion Bay	Cat2, Cat3, Cat4, Cat5
EBPT	Elliptical Sabine Lake	Cat2, Cat3, Cat4, Cat5
EGL2	Elliptical Galveston Bay (2002)	Cat2, Cat3, Cat4, Cat5
PSX	Matagorda Bay Texas	Cat2, Cat3, Cat4, Cat5

Table 3.18 SLRRP model parameters and results showing the mean sea level rise projections for the Gulf Coast region by 2050 and 2100 under a high, mid, and low scenario based on combined output for all 7 GCM models for the A1F1 emission scenario.

Model Parameters	Scenarios	Louisiana-Texas Chenier Plain	Louisiana Deltaic Plain	Mississippi-Alabama Sound
Tide Gage		Galveston, Texas	Grand Isle, Louisiana	Pensacola, Florida
Sea Level Trend (mm/yr)		6.5	9.85	2.14
Subsidence (mm/yr)		4.7	8.05	0.34
Sea Level Rise by 2050 (cm, NAVD88)	High	94.8	119.6	59.8
	Mid	88.9	113.6	53.9
	Low	83.0	107.5	48.0
Sea Level Rise by 2100 (cm, NAVD88)	High	161.3	199.6	114.5
	Mid	146.0	185.3	99.2
	Low	130.7	171.2	83.9