

# Climate change in Louisiana



While climate change is often talked about in the future tense, our climate is already changing in both averages and the number and intensity of extremes. Louisiana experienced record-breaking heat, increased drought and flooding, and rapid sea level rise in recent years. As global temperatures continue to rise, Louisiana is expected to experience more heat waves, droughts and floods, continued sea level rise and intensified hurricanes. The Southern Climate Impacts Planning Program (SCIPP) is a climate hazards research program whose mission is to help Louisiana residents increase their resiliency and level of preparedness for weather extremes now and in the future.

## Climate Change: Observations

### Temperature

While “global warming” implies rising temperatures, climate change isn’t quite that simple. In Louisiana, temperatures have risen in recent decades, but not as steadily as in the rest of the country. For Louisiana, climate change has created a trend of fewer freezing days in winter, hotter nights in summer, and less relief from long-lasting heat waves (NCA).

Mosquito-borne illnesses, like Malaria and Dengue fever, spread in the southeast during the last decade as freezing days and annual frosts gradually decreased (CDC). Since 1970, freezing days have declined by an average of 10-20 days per year in some parts of Louisiana (NCA)



 The rate of annual heat-related illnesses and deaths in the U.S. has tripled in the last 20 years as heat waves have become more common and more intense. Each year, high temperatures kill more people than hurricanes, floods, tornadoes, blizzards, and lightning combined (CDC).

All of the environmental changes observed in the last 150 years resulted from a 2 degree global temperature rise. Temperatures in the U.S. Southeast are projected to increase another 4-8 degrees by 2100 (NCA).



#### Quick Fact:

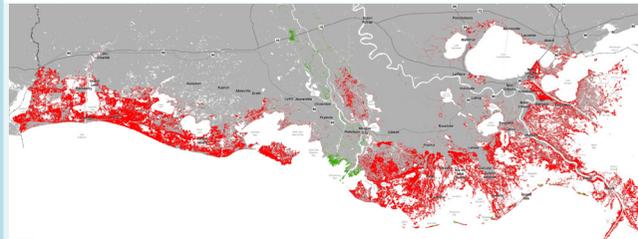
Subsidence is a term used to describe what happens when land begins to sink or lose elevation as the result of natural and human processes (USGS).

### Sea Level Rise

Coastal land loss, due largely to subsidence, has been a growing problem in Louisiana for more than a century - with sea level rise tipping the scale toward more drastic coastal erosion.

Louisiana lost 1,900 square miles of coast during the last century - or enough land area to cover the entire state of Delaware (NCA). Today, Louisiana loses a football-field-sized piece of wetlands every 35 minutes (USGS).

Global sea level has risen about 8 inches during the last 100 years (NCA). Sea level rise at Grand Isle, Louisiana averaged 36 inches in the last 100 years - more than four times the global average and one of the fastest rates in the world. (NOAA).



Observed Sea level rise - 1930-2012



Barrier islands are experiencing up to 100 feet of shoreline retreat each year in some areas due to sea level rise, storm surge and drilling activities (USGS).

Louisiana’s Coastal Master Plan addresses many infrastructure-related issues resulting from sea level rise, including raising roads, building sea walls and restoring the delta. Go to: [www.coastalmasterplan.louisiana.gov](http://www.coastalmasterplan.louisiana.gov) to learn more.

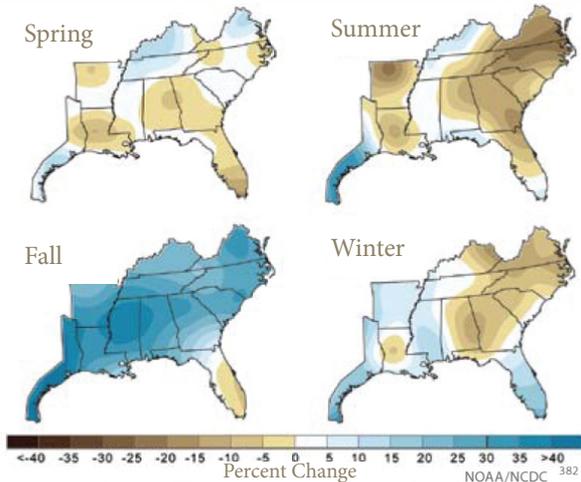
### Precipitation

The average amount of rain Louisiana receives each year has increased 20-30 percent in the last 100 years. Another important change is how Louisiana gets rain.



More intense downpours in shorter time periods are becoming more frequent, meaning more flash flooding and infrastructure damage, and longer periods of drought between downpours (NCA).

Observed seasonal changes in precipitation (below) show much drier spring and summer months than in previous years, slightly drier winter months, and an increase in precipitation in the fall. (NCA).



Observed Change in precipitation, 1900-2007 (NCA)

# Overview

The models scientists use to project future climate change are extremely thorough, consider the unique geography and climate of every region, and look forward 25 and 100 years (NOAA).

In Louisiana, models show increased hurricane intensity and storm surge, and continued sea level rise, and changes in rainfall that will likely create more periods of heavy precipitation between long dry spells (NCA).

Climate change acts as a threat-multiplier, loading the dice for more intense hurricanes, heat waves, floods, droughts and extreme weather.

Droughts will likely become more frequent, last longer and be more intense. Rains following droughts may often be quick and heavy, causing flash-flooding and destroying aging and vulnerable infrastructure (NCA).



With more dry periods, higher temperatures and more lightning, large wildfires are expected to become more common (Price 2012, NCA).

Warmer ocean temperatures mean stronger hurricanes (NASA). A recent study suggests that hurricanes may become more frequent and more intense - meaning more category 4 and 5 hurricanes forming each year (Emanuel 2013, NCA). Storm surge is also expected to become more severe as sea level rises and hurricanes become more intense (NOAA).



 Global sea level is expected to rise between 1 and 6 feet in the next century (NOAA).

Plant growing seasons will likely become longer, the types of plants that can survive in Louisiana will likely begin to change, and precipitation events will become more intense causing more flooding of agricultural areas (USDA).



**Q:** What do sea level rise and subsidence mean for Louisiana's coastal communities?

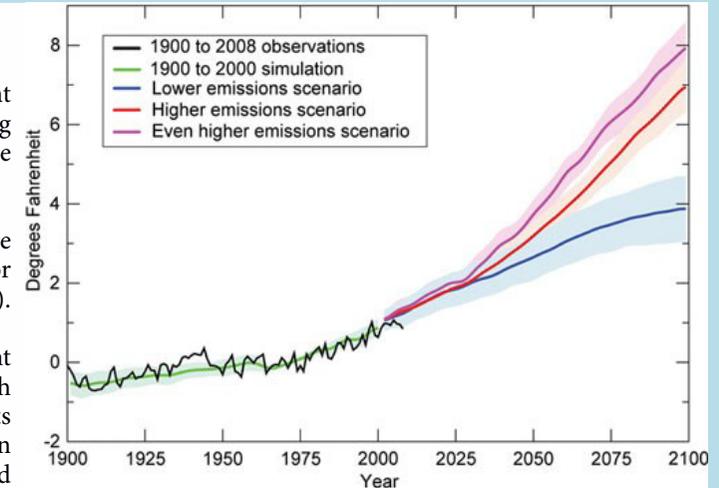
**A:** Many communities already affected by sea level rise and subsidence have started planning for future land loss by building sea walls and levees, raising roads, highways and buildings, and retreating from low-lying areas altogether. The state has already raised a portion of LA Highway 1 toward Port Fouchon in response to more frequent flooding (NCA).

## Temperature

Future temperature rise depends partly on the amount of greenhouse gasses added to the atmosphere in coming decades. Global temperatures are expected to increase another 3-12 degrees Fahrenheit by 2100 (IPCC).

Projections for the U.S. Southeast show a temperature increase of 4-8 degrees by 2100, with projected increases for interior states 1-2 degrees higher than coastal areas (NCA).

Major consequences of warming include a significant increase in the number of hot days (above 95 degrees) each year and an overall decrease in freezing events and frosts (NCA). More heat and less cooling are expected to result in more heat-related deaths, more vector-borne illnesses and a major shift in plant species (EPA).



Global temperature rise depends largely on future emissions scenarios, which range from low, 3°F increase, to high, 12°F or higher (IPCC).

### New Orleans

The New Orleans City Master Plan calls for improved and expanded levees, elevated homes, floating homes, a surge barrier, more gates and pumps for flooding, and wetland restoration in anticipation of future sea level rise (EPA).

### Morgan City

Officials in Morgan City are now considering alternative flood-mitigation methods, like levee-breaching on the Atchafalaya, delta restoration, and realigning the Mississippi River to build land in the face of sea level rise (EPA).

### Lake Charles

Lake Charles has initiated a carbon capture and sequestration project to offset the emissions of local industry (EPA). Major oil and gas infrastructure in and around Lake Charles are vulnerable to sea level rise and storm surge (NOAA).

### Alexandria

As flooding along the Mississippi River becomes more frequent and more severe, proximity to major waterways can complicate updating infrastructure in the wake of a stronger wetter-drier climate (EPA).

### Shreveport

Nestled on the Texas border, areas like Shreveport are likely to experience greater rates of temperature rise and drought compared to most other areas of Louisiana, causing loss of agriculture and an increase of heat-related illness (USDA).

### Monroe

Between intense periods of drought and intense rainfalls, agricultural and forestry-related industries in northern Louisiana, like Monroe, may face severe losses due to heat and floods (EPA).