

# Flooding and severe weather risk analysis for Louisiana

## Background

Heavy rain in southern parishes of Louisiana in August 2016 caused catastrophic flooding that killed at least 13 people and damaged over 146,000 homes and several thousand businesses [1]. More than 10 rivers reached moderate, major or record level flood stage. In Ascension Parish about one-third of all homes (around 15,000) were flooded after a levee along Amite River was overtopped [1]. One of the hardest hit areas was Livingston Parish where an estimated 75% of homes were destroyed by flooding [1]. To make matters worse for the home owners, many areas that flooded were not designated as “high flood risk areas”. Therefore, the majority of homeowners affected by the flood do not have flood insurance [1].

Statistically, this may have been a storm that only is likely to occur once in a 1,000 years. However, residents should have been warned, especially in regard that many of the affected parishes today were also affected by the catastrophic flood in 1983. Furthermore, just because an event has only a small chance to occur in a given year, it does not mean that it will happen only every 1,000 years. No, it can happen any time. In addition, global warming has been linked to an increase in severe weather events not only in number but also in impact. Meaning, it is actually more likely that such events occur. Therefore, it is important to prepare for such unlikely events and implement projects intended to protect the population from river floods. However, many of the federal projects planned for the Amite River Basin were never realized leaving the population unprotected [1].

## Project Outline

Based on those recent events, I find it important to perform a thorough risk assessment for Louisiana parishes in regard to flooding and severe weather events. The assessment will give an overview on the extent of parishes at risk for such events and which parishes are most at risk. I will collect historical gage level data for all parishes of Louisiana from the United States Geological Survey (USGS) National Water Information System (<http://waterdata.usgs.gov/nwis>). I will use the available daily gage level data to determine monthly and yearly averages in order to determine the number of flood days per year and the distribution of flood days for each parish. Using this data, I will try to answer among others the following questions:

1. Which months have the most flood risk in each parish?
2. Did the number of flood days change over the years?
3. Which counties have the most flood days?
4. Where are those counties located?
5. How many people are at risk in those counties?

I will also collect data on severe weather events in Louisiana from the NOAA National Centers for Environmental Information Storm Events database (<http://www.ncdc.noaa.gov/stormevents/>). I will

focus on events with reported damages (cost in \$, number of injured people and number of deaths). I plan to answer the following questions with the collected data:

1. When and in which parishes did the severe weather events occur?
2. Did the number of severe weather events or their impact change over the years?
3. Which parishes were most affected by severe weather events?
4. In combination with the gage level data, which parishes are most at risk especially if the frequency and impact of severe weather/flooding increases due to climate change?

Clients for my risk analysis could be local and state government to help them obtain federal funding for projects to improve protection against flooding and other severe weather events. In addition, the assessment will be interesting for Fire and Rescue Services to know the most vulnerable areas when a severe weather event occurs. In addition, it will be useful for home and business owners to determine whether they should obtain insurance against potential flood damage.

**References:**

1. Wikipedia: 2016 Louisiana floods. Retrieved on September 15, 2016.
2. Steve Hardy & David J. Mitchell: Planned, forgotten: Unfinished projects could've spared thousands from Louisiana flood. The Advocate. Retrieved September 15, 2016