

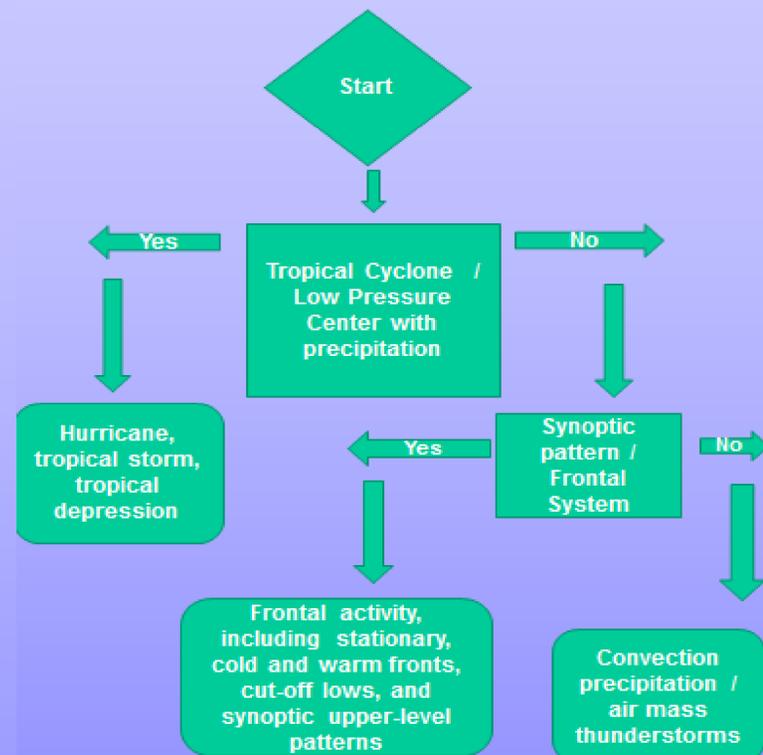
INTRODUCTION

This project compares and contrasts the underlying causes of variability in flooding in a humid subtropical region and an arid region by updating a previous study of Louisiana gauged flood records and comparing it to a new flood database for Southern Arizona being developed by the Climate Assessment of the Southwest (CLIMAS). The CLIMAS study shows that some of the largest inland floods in southern Arizona have been due to moisture from eastern North Pacific tropical storms and hurricanes. Louisiana is a state that is regularly affected by Atlantic Ocean and Gulf of Mexico tropical storms and hurricanes, such as Katrina and Rita in 2005. These events produce major flooding in coastal regions, but do they also produce the largest floods further inland, as in southern Arizona? The purpose of this study is to determine how important tropical storms and hurricanes are in producing inland flooding in Louisiana.

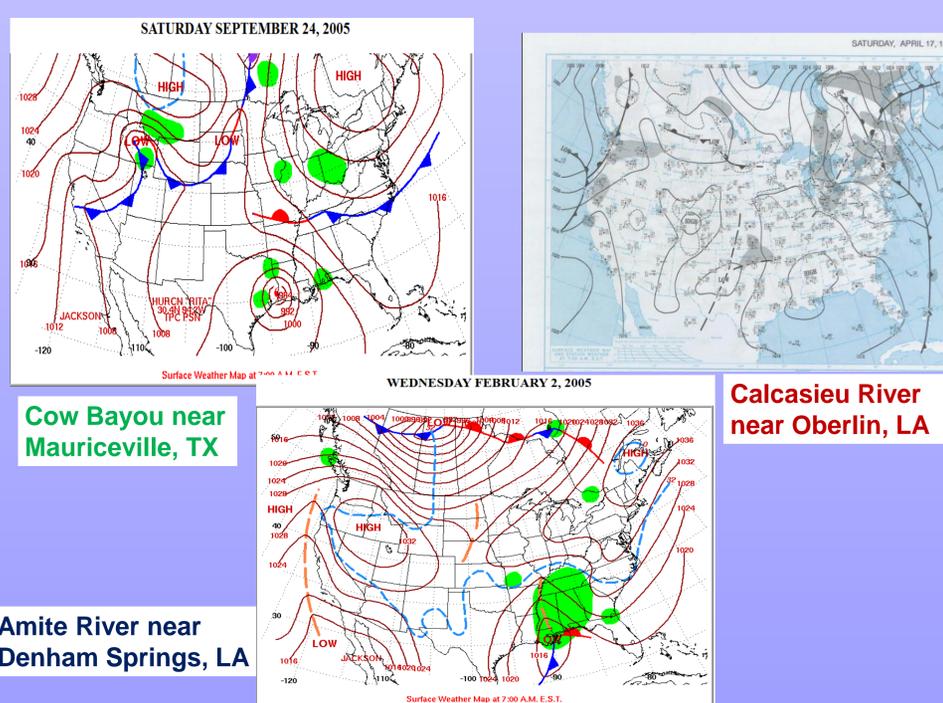
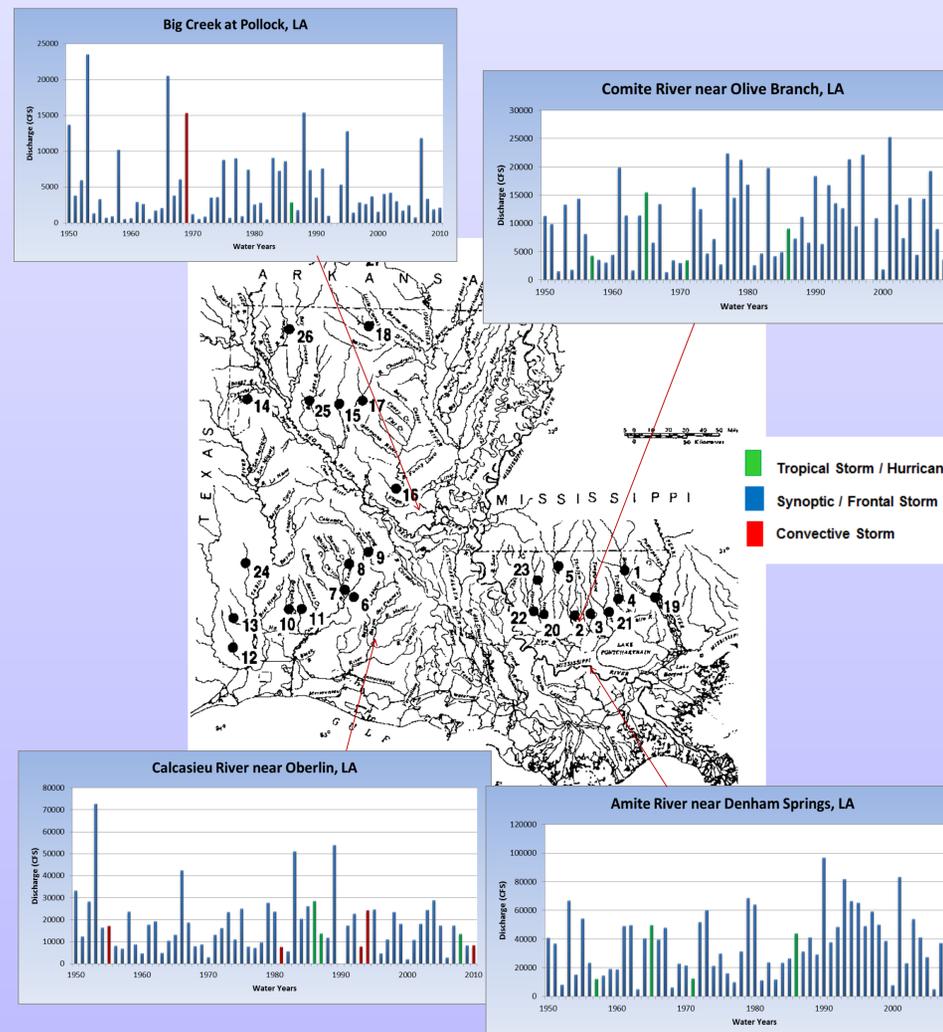
METHODS

To determine the cause of recent floods in Louisiana, updated annual peak discharge records were compiled for selected USGS gauging stations. The type of storm that generated each flood event was then classified using a “decision tree” approach based on analyzing synoptic weather maps, examining precipitation data, and reviewing tropical storm tracks.

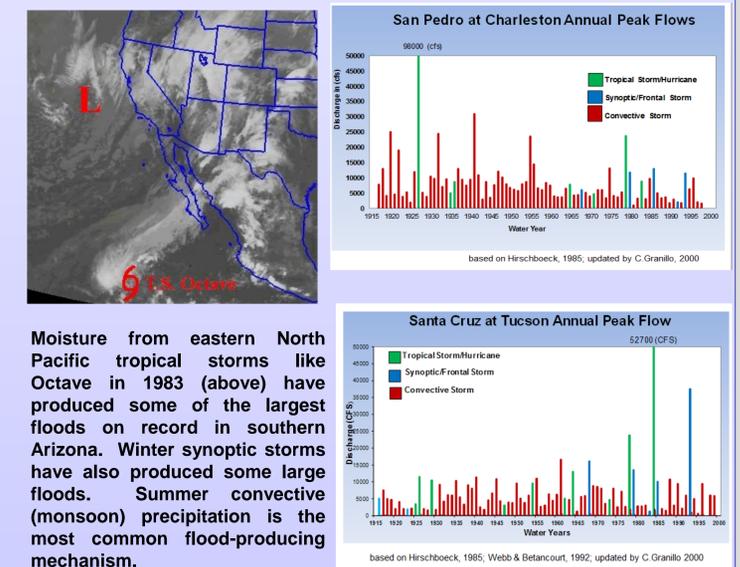
- Updated peak discharge records for selected USGS gauging stations in Louisiana
- Organized station data and compiled a master data set of all annual floods sorted by water year
- Classified the type of storm that generated each flood using a decision tree approach



MAIN MECHANISMS OF FLOODING IN LOUISIANA



MAIN MECHANISMS OF FLOODING IN SOUTHERN ARIZONA



Moisture from eastern North Pacific tropical storms like Octave in 1983 (above) have produced some of the largest floods on record in southern Arizona. Winter synoptic storms have also produced some large floods. Summer convective (monsoon) precipitation is the most common flood-producing mechanism.

CONCLUSIONS

In both Louisiana and Arizona, three main types of storms produce floods: (1) tropical storms and hurricanes, (2) extratropical cyclones and their associated fronts, and (3) convective thunderstorms. This study demonstrates that tropical storms affecting Louisiana, including the recent major hurricanes of Katrina and Rita, do not have a major impact on inland flooding in Louisiana. In contrast some of the largest inland floods in Southern Arizona were due to tropical storms. Overall, synoptic/frontal events have consistently produced the largest annual floods in non-coastal Louisiana river basins.



Based on Hirschboeck, K.K., 1991, Climate and floods, in USGS Water Supply Paper 2375

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