3D FLOOD-INUNDATION MODEL OF THE AMITE RIVER IN BATON ROUGE PARISH IN 2016, LOUISIANA STATE

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Background/Problem

In 2016, a catastrophic flood devastated part of South Louisiana after receiving rainfall more than 20 inches. The heavy rainfall led to widespread flash flooding and recorded river flooding across multiple parishes. The flooding comes from Amie river level raise and many creeks and bayous flow to the Baton Rouge parish. This project purposes first is a simulation of the Amite River in 3D modeling to provide an analysis and understanding of the risk of 2016 flood on the urban and natural environment in East Baton Rouge Parish. Second, modeling the Amite river floodplain delineation, drainage basin, and to lead the decision-maker to better plan the urban area and manage the natural environment suitability.

Data

To achieve the aims stated above, several datasets required to be collected and pre-processed from diverse sources:

I. **Spatial data:**
Baton Rouge parish boundary, footprint buildings shapefile of the building in Baton Rouge Parish derived from EBRGIS Program to display building footprints for East Baton Rouge Parish in 2014. The shapefile contains the highest of the year of the build buildings which is a good indicatorid of the building's vulnerability. Furthermore, Imagery of Baton Rouge parish in 2016 to determine the land use need to be collected that could be challenging, because the data from EBRGIS is monthly updating of the land use.

II. **Digital elevation models (DEM) data:**
DEM is essential input that provides topographical data in flood inundation modeling. Digital elevation models (DEMs) use as geometrical input. Significantly affect the results of flood inundation modeling. This project would use DEM data derived from the US Geological Survey (USGS) with 30 meters resolution.

III. **Hydro Data:**
Bathymetric data need to be collected because the DEM data shows the elevation of landforms above sea level. However, the bathymetric maps show the depths of landforms below sea level, which an essential step to consider when analyzing and simulation the 2016 flood.

Method

In the method section, further steps would be performed to provide an accurate analysis of the affected areas in Baton Rouge parish flood in 2016.

I. **The Classification of Land Use**

I am using supervised classification to class the land use in Baton Rouge parish. This step is to explore the type of land use that affected most by flood in 2016. In case the data not available online, a furthered performance would be a procedure in **Fig**1.

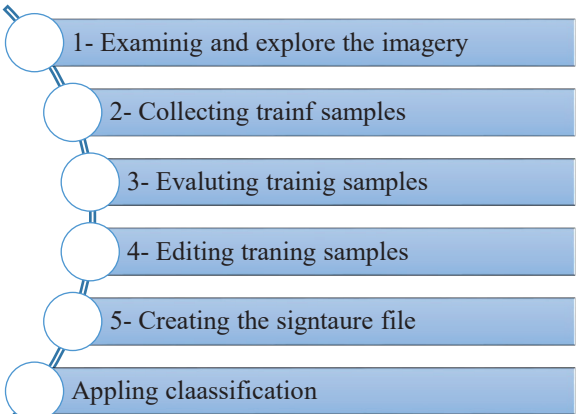

Fig1.Supervised Classification Land Use

II. Hydrological Molding

This step is crucial to molding the watershed and delineated the floodplain and drainage of the Amite river basin. In this step, the Hydrology toolset would use under a spatial analysis tool. The input data would be the DEM data in **Fig**2**.**

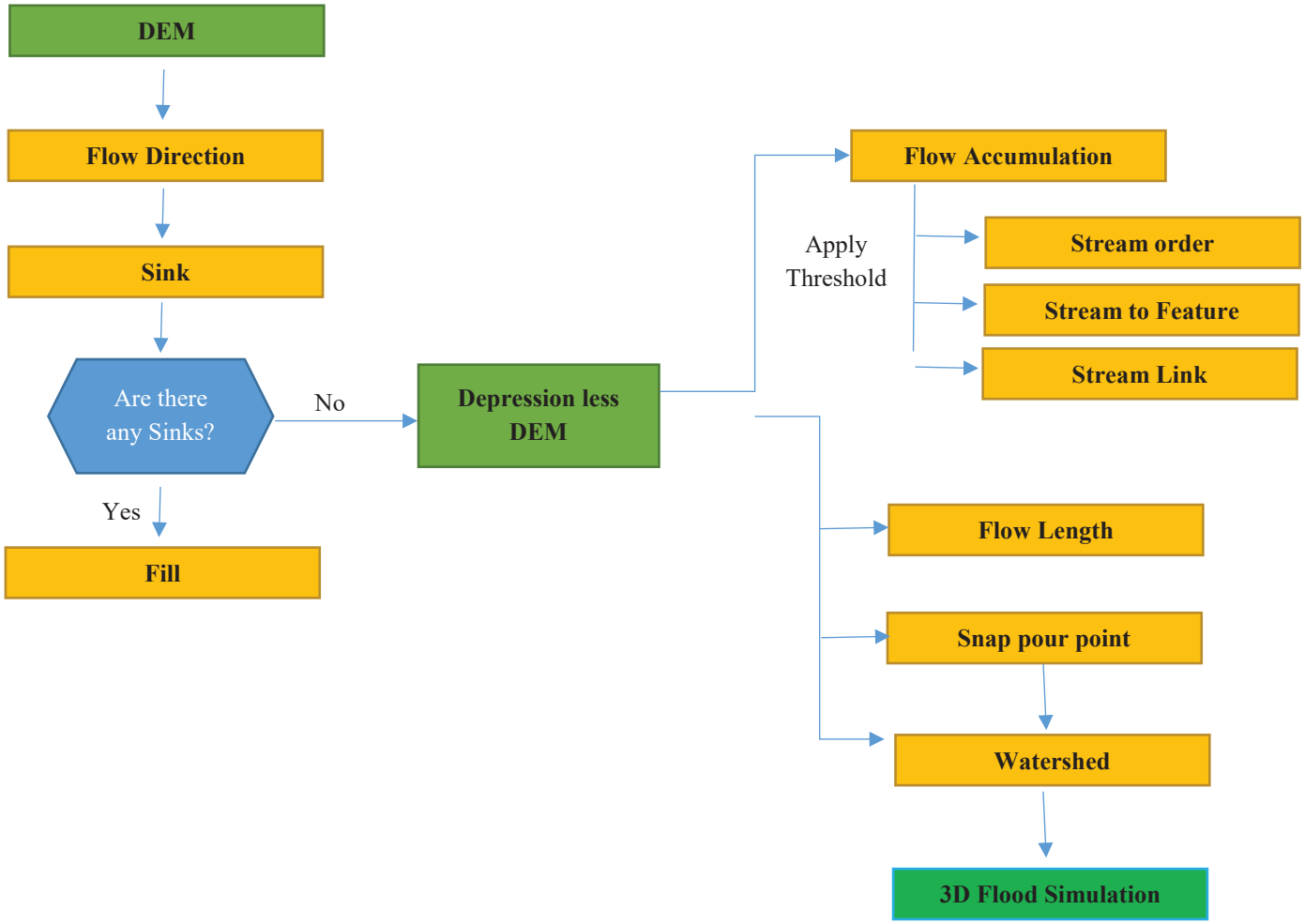

Fig2. Hydrological Analysis

Expected Results

The outcomes of this project would include the Amie river watershed and 3D flood simulation to simulate the 2016 flood to illustrate the affected areas by the2016 flooding based on the Bathymetric map. Land uses classification map to investigate the land class that affected more via 2016 flooding. Finally, Animation movie would be performed to illustrate the flood and the effected buildings by 2016 flood in Baton Rouge Parish, Louisiana state