

Numerical Simulations of Hurricane Ida (2009) to Nor'Ida, Orographic Effects on the Rainfall and Storm Surge Across the Mid-Atlantic Coast

Percy Williams¹ Yuh-Lang Lin^{1,2}

¹Department of Physics

²Department of Energy and Environmental Systems
North Carolina A&T State University

Abstract

Hurricane Ida was the strongest landfalling storm of the 2009 Atlantic Hurricane Season. It formed in the Gulf of Mexico on November 4th and dissipated on November 12th. After November 10th it was classified as an extratropical system. It made landfall as a category 2 storm. Once it made landfall, a reorganization occurred along the North Carolina and the remnants developed into a new cyclone nicknamed Nor' Ida and caused \$300 million dollars in damage along the Mid Atlantic, which included the damage associated with the storm surge which was the 4th largest on record.

This study has three parts. The first part involves an analysis of the transition from a hurricane (Ida) to an extratropical system (Nor'Ida) which then reformed as an extratropical cyclone. The second part is focused on the orographic effect on the heavy rainfall over the Appalachian Mountains. The third part is to simulate the storm surge associated with Nor'Ida along the Mid-Atlantic coast. We will use the Weather Research and Forecasting (WRF) model which will be initiated by the Final Operational Global Analysis (FNL) data for the control simulation from November 8th to November 15th. The simulation is meant to (1) replicate the atmospheric environment, (2) understand the dynamics of the formation of the extratropical system Nor'Ida, (3) study orographic effects on heavy rainfall, and then (4) provide the input data for the extratropical cyclone version of the Sea, Lake and Overland Surge from Hurricanes (SLOSH) model.