Geospatial analysis of flooding from hurricane Florence in the coastal South Carolina using Google Earth Engine

H. A. Zurqani
Clemson University

C. J. Post
Clemson University

E. A. Mikhailova
Clemson University

K. Ozalas
Clemson University

J. S. Allen
Clemson University

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RESULTS AND DISCUSSION

Flooding is one of the main natural disasters that can occur in South Carolina, particularly during hurricanes. The objective of this study was to: (1) develop a framework to identify flood-affected areas after storm impact; (2) map the flooded areas caused by the hurricane Florence; and (3) assess the major effect of the hurricane on the land cover and agricultural crops in the coastal South Carolina during the flood period. The coastal South Carolina regions are recognized as the most important agricultural area in the state. The developed framework identified and mapped the affected areas during the hurricane season. Based on the results, the hurricane-flooded areas were approximately 681 km², and the major affected counties in both analysis flood frequency and flooded areas are Charleston, Georgetown, Berkeley, Florence, Marlboro, Marion, Horry, Chesterfield, Sumter, Clarendon, and Darlington. These results not only indicate flood risk on the land cover but also demonstrate the advantage of utilizing Google Earth Engine and the public archive database in its platform to track and monitor the natural hazards over time.

INTRODUCTION

Flood is one of the main natural disasters that can cause loss of human life, damage to property, destruction of vegetation and animals (Samuuel, 2019). Figure 1 shows rapid water levels rise as a result of Hurricane Florence.

There are various techniques used in analyzing flood risk on the land cover. Remotely sensed data holds an advantage in monitoring and observing the change on earth surface because of the large spatial coverage, high temporal resolution, and wide availability (Zurqani et al., 2018).

OBJECTIVES

Develop a framework to identify flood-affected areas after storm impact;
Map the flooded areas caused by the hurricane Florence;
Assess the major effect of the hurricane on the land cover and agricultural crops in the coastal South Carolina during the flood period.

RESULTS AND DISCUSSION

Flooding before and after hurricane Florence

Counties with highest flood frequency and flooded areas in 2018 are: Charleston, Georgetown, Berkeley, Florence, Marlboro, Marion, Horry, Chesterfield, Sumter, Clarendon, and Darlington (Fig 4, and Table 2).

CONSCLUSIONS

Most of flooded areas identified with Sentinel-1 data were matched with the flood occurrence results using the Joint Research Centre (JRC) data (Fig. 5).

REFERENCES