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An Assessment Of Flood Damage In North Carolina Using A High Resolution Digital Airborne Imaging System

Abstract (399 words):

An Assessment of Flood Damage In North Carolina Using A High-Resolution Digital Airborne Imaging System

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ABSTRACT

In September 1999, Hurricane Floyd caused extensive damage to the eastern seaboard of the United States. In North Carolina, the Tar and Neuse Rivers overflowed their banks displacing thousands of people from their homes. Potentially more devastating and long term than the human tragedy however, was the impact the floodwaters had on agriculture in the region, in particular the interaction of the flood with the large number of hog farms situated alongside the rivers.

In North Carolina, pig farmers are allowed to store waste in open lagoons. After anaerobic breakdown of the waste in the lagoons, the waste is used as fertilizer for crops. During Floyd, a number of these lagoons were flooded or breached and waste was spread over a significant area of the river floodplains in the Coastal Plain region of the state.

GER and Flight International, in a collaborative effort with the state Division of Emergency Management and the Federal Emergency Management Agency (FEMA), deployed a high-resolution airborne imaging system to the region to help assess the impact of the flood and to investigate whether pig waste contamination could be detected spectrally from the air.

The imaging system, the EPS A 31T, has been recently developed by GER. It uses GER's mid-size Kennedy Scan Head coupled to four spectrometers. The instrument collects spectral data in 31 bands, in the visible, short wave infrared and thermal, at resolutions up to 1-meter, or 11 bands at up to 0.5-meter resolution.

The system was deployed in a Piper Navajo aircraft and a large area (approximately 200 square km.) of multispectral imagery was collected in the region. The imagery was processed to spectrally differentiate the contaminated areas over the land and in the water. Ground truth data, including both soil and water samples, were collected to verify, to the extent possible, that the processed imagery was correctly identifying coliform (fecal bacteria) contamination.

The paper will describe the imaging system and present results of the image analysis.