Windstorm Damage Assessment

PURPOSE
As a result of global climate change and rapid growth in the coastal regions, businesses and communities are facing unprecedented challenges in preparing for and recovering from natural disasters. Our effort is aimed at better understanding of both the short and long term impact of windstorms and development of innovative enterprise risk management tools.

RESEARCH FOCUS
The multidisciplinary research team develops remote-sensing based technology for assessing the immediate damages caused by windstorms and for monitoring the subsequent recovery process. Various factors affecting the speed of post-disaster reconstruction are investigated and modeled with time-series functions.

RECENT DEVELOPMENTS
- Developed algorithms for hyperspectral imagery in land cover classification and hurricane damage detection
- Developed statistical models for identifying damage to residential buildings based on satellite and aerial photos
- Collected a comprehensive set of data on the physical and economic impacts of tornadoes in Tuscaloosa and Joplin
- Investigated the utilization of weather derivatives in protecting businesses from future windstorm risk
- Acquired a portable spectrometer for measuring in-situ spectral responses of man-made materials
- Established a graduate course on remote sensing of windstorm damages
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SAMPLE PUBLICATIONS


Lin Cong, Brian Nutter, and Daan Liang (2010) Grid Pattern Based Residential Area Detection from Hyperion Data, Proceedings of IEEE Southwest Symposium on Image Analysis and Interpretation, Austin, TX


MAJOR RESEARCH GRANTS

Development of a Quantitative Model for Measuring Regional Economic Resilience to Hurricanes, NSF, $278,726

HI2: A New Measure of Hurricane Impact for Innovation in Enterprise Risk Management, NSF, $350,398

MRI RAPID: Acquisition of a Field Spectroscopy Environmental Analysis System for Gulf Oil Spill Research, NSF, $102,909

Hyperspectral Imagery: A New Frontier for Windstorm Damage Assessment, NSF, $197,922

RESEARCH TEAM

Dr. Daan Liang – Texas Tech University
Dr. Kishor Mehta – Texas Tech University
Dr. Brian Nutter – Texas Tech University
Dr. Brad Ewing – Texas Tech University
Dr. Arn Womble
4 Ph.D. students

Destruction of a Residential Structure by Tornado in Tuscaloosa, Alabama