Natural t lazard Monitoring and Mitigation using Remote Sensing

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ABSTRACT

'1 he paper will review the application of NASA developed remote sensing technology towards the monitoring and mitigation of Natural t lazards. T he overview will be followed by recent data on three specific natural hazard applications.

The first of these is a compact fire mapping system mounted in a US Forest Service aircraft which integrates multichannel infrared images from its sensor with location data from the airplane's navigation system producing precise mapping information on the fire's perimeter, intensity and associated hot spots. T he information is transmitted in near real-time to a portable field computer system where maps are constructed while the flight continues.

1 he second application is that of the Global Positioning System (GPS) to the study of Earthquakes. 1 he Southern California Integrated GPS Network (SCIGN) is a continuously recording GPS array in Southern California, T he network is used for measuring crystal deformation associated with the numerous faults that affect greater Los Angeles. the Southern California Earthquake Center (SCEC) is coordinating efforts and implement the 250 station network. There are currently over 35 operational stations in the network and an additional 30 stations will be implemented in 1996.

T he third application is the usc of SAR for flood hazards. Recent flooding in the midwest United States and California not only caused billions of dollars in damage, but also modified the landscape in ways that will impact future drainage pathways. Key parameters of interest include surface roughness, topography and topographic change, all of which are amenable to study using SAR data. T opography and surface roughness serve as boundary conditions for flood routing models and assessment of flash flood potential. T opography at large scales influences the runoff period and peak water flow, anti determines direction of flow. Small scale roughness of a surface also controls flow in channels and streams. Future work will focus on airborne and SAR data acquisition to both monitor ongoing flood events as well as identifying vulnerable areas.