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Editor's Introduction

This special issue of *Space Communications* is focused on the important new problem of the role of communications in disaster prevention, detection, and response. We have taken a *holistic*, inclusive approach to the definition of disasters and responses to them. This necessarily leads to a departure from a strictly space-communications-oriented discussion. It is hoped that in this departure, we have gained more in overall comprehension than we may have lost in not following a more rigid, limited or doctrinaire view from space.

In an introductory paper, a discussion of natural threats and recent history will show the global nature of disasters and introduce some problems and issues. This paper is both introduction and context for the papers that follow, but is not a summary of them. Communications interoperability, roles for satellite systems, and an overall systems response to the problems will be briefly discussed. Some progress at organization for meeting the challenge of disasters is noted.

A paper on the satellite based COSPAS-SARSAT search and rescue system describers the current state and evolutionary path. This operational system exemplifies international cooperation in space and provides initial detection (i.e., earliest phase) of a disaster. The system has been used for disasters on both land and sea and provides coverage of the whole earth.

A paper on IRIDIUM outlines how such a system may be used for first responders to a disaster scene at any global location. This paper provides the most current description of the IRIDIUM system and operations, a subject of more general interest. The paper also provides insight into a global data network for continuous collection of data on oceans, that is being implemented using IRIDIUM. Such data may enhance prediction accuracies for weather phenomena, leading to advanced warning for weather-related threats.

Our fourth paper outlines an airborne capability for acquiring visual data or imagery from a disaster scene. The paper also describes a new airborne high data rate Ka-band satellite terminal that frees the aircraft from line of sight limitations. The system incorporates many innovations, both time tags and spatially registers data for storage in a disaster management database at the Asian Disaster Reduction Center (see introductory paper).

A fifth paper describes an important emerging developmental communications system, being developed at Virginia Tech, that provides wide bandwidth communications, opening for the first time, the possibility of presenting and displaying on laptop computers, graphics and imagery to first or front line responders in near real time. The paper includes concepts for direct interface with Ka-band satellite communications systems, providing regional or international interface capabilities.

The immense obstacle of achieving interoperability among disparate systems is partially addressed in the sixth paper describing a new message standard under development. The paper shows the scope of the problems in interoperability and in creating a responsive standard.

The seventh and final paper describes approaches and capabilities achieved by Canada for response to emergencies and disasters. A robust capability has been achieved through three separate projects with varied objectives. The three systems use existing satellite communications, with an evolutionary path to Ka-band. One of the systems is based at a facility that also serves as the center for further development.

Taken together, these papers provide an overview of current capabilities and problems; and show by examples, approaches to achieving emergency and disaster communications that appear urgently needed for the coming century. Based on these selected papers, the way ahead appears to be development of a few regional disaster management centers; creation of continuously updated data bases; institutionalizing space-based and airborne data acquisition for the data bases; movement towards high data rate communications, especially for "the last mile" with wideband line of sight performance; and mobile and transportable communi-

cations for global reach, generality for any disaster, and agility of response; and emphasis on interoperability with expansion of standardization from message sets to the full range of data products, file sizes and waveforms.

While there is much to be done, the recent progress, shown briefly in the examples of this issue, is highly encouraging. We think that Geoff Hyde, who envisioned this special issue, would be pleased.

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