

IAF EARTH OBSERVATION SYMPOSIUM (B1)
Earth Observation Applications, Societal Challenges and Economic Benefits (5)

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ROLES OF SPACE-RELATED NON-GOVERNMENTAL ORGANIZATIONS IN DISASTER
MANAGEMENT

Abstract

Without the support of space-related non-governmental organizations (NGOs), disaster relief for destructive storms, such as hurricane Harvey in 2017, and earthquakes, such as the Mw7.8 Ecuador earthquake in 2016, would not be as successful as it has been. In this paper, we review the roles of space-related NGOs in disaster management through various case studies and analyze the effectiveness of their approaches. We have found that the role of space-related NGOs in disaster management can be divided into two distinct facets. The first facet involves the use of citizen science platforms to assist with the rescue missions. Following natural disasters, affected regions frequently lose communications, which poses challenges for managing the rescue workforce. Real-time satellite imagery is then often used to assess the extent of damage, but the excessive amount of data can make it impossible for the rescue workforce to complete the analysis in a timely manner in order for it to be of use for disaster relief. As a result, Humanitarian OpenStreetMap (HOT), Zooniverse Planetary Response Network, GIS Corps, Code for America, and Humanity Road utilize online citizen science platforms, allowing thousands of volunteers to contribute, making the task more manageable. The second facet involves the legislative framework. Here, space-related NGOs advocate for a more efficient disaster management strategy. We are now in an era in which Earth Observation (EO) technologies and methodologies have been tested and their capacities are understood in operation environments. Near real-time data are often available through downstream services. The uses of such data can be integrated into current legislative framework for emergency management. For countries without advanced EO technologies, the Space Technology for Disaster Management project group (STDM) of the Space Generation Advisory Council (SGAC) advocates for the needs of space

technology development through reports and recommendations submitted to national space agencies and related organizations. We additionally interview members from selected space-related NGOs that have taken part in disaster relief efforts, to gain their firsthand perspectives on their roles and the prospects of space-related NGOs. To cope with increasing natural disasters, we propose a new comprehensive framework for disaster management which allows NGOs to contribute further through collaborations with the public sector, research institutes, and industry.