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21st Anniversary of the Disaster Charter: History, Status and Future of this Powerful and Productive International Cooperation (6)

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HOW THE CHARTER SUPPORTS EMERGENCY RESPONSE TO LARGE FLOOD DISASTERS

Abstract

In this presentation we will demonstrate how activating the International Charter 'Space and Major Disasters' ("Charter") supports emergency response efforts related to different types of flood disasters, by making use of a variety of optical and radar satellites. The Charter covers more than 40 emergencies caused by major disasters every year. About 50% of those Charter activations are related to flooding, stemming from either hydrometeorological events or from earthquakes triggering a tsunami. In order to efficiently respond to major flood events, a quick and reliable overview of the situation is required: Which settlements are flooded or destroyed? Are people disconnected from the outside world? How many people are affected? Which roads or railways are impassable or unusable? Have bridges or dams been damaged or destroyed? The Charter observes two main situations when activated for flood disasters. In one scenario, there is standing water over several days so that the extent of flooded and inundated areas can be mapped from satellite imagery. In another scenario, water masses come and go rapidly and lead to extreme destruction, e.g. in mountainous areas. In the latter case, satellite imagery is primarily used for post-event damage assessment. For both situations, a large number of optical and radar satellite sensors are available within the Charter. Under clear-sky conditions, optical imagery is primarily used in the Charter to map flooded areas and/or damages. When cloud cover prevents successful observations with optical satellite sensors, radar sensors are leveraged to obtain a clear view of the ground. Radar is advantageous because the signal penetrates clouds, and is not dependent on daylight conditions. Thus, radar satellite data allow accurate distinction between standing water surfaces and non-flooded areas independent of the weather situation. Pre- and post-event comparison of such water mask products delivers important information on the spatial extent of flood waters. Information derived from the satellite data is generated in user-friendly formats such as maps and shapefiles. The products are published to the Charter website, where they are accessible to users. In flooding events, maps of inundation extent and/or damages are created in order to support disaster response activities in the country or region of the disaster.