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EARTH OBSERVATION SYMPOSIUM (B1)
International Cooperation in Earth Observation Missions (1)

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THE EVOLUTION OF EARTH OBSERVATION SATELLITES IN EUROPE AND WORLDWIDE AND
ITS IMPACT ON THE PERFORMANCE OF EMERGENCY RESPONSE SERVICES

Abstract

The paper reviews the evolution of the Earth Observation systems in Europe and Worldwide and analyses the potential impact on the performance of emergency response services.

Earth Observation satellites play a significant role in supporting the action of first responders in case of major disasters. The main principle is the coordinated use of satellites in order to ensure a rapid response and the timely delivery of images and geospatial information of the area affected by the event.

The first part of the paper reviews the main instruments and evaluates their performance. The International Charter "Space and Major Disasters", signed in October 2000, was the first international initiative aimed at establishing a unified system for the acquisition of space data. The charter is a cooperation agreement between space agencies and operators of space systems. At regional level, a similar instrument exists in Asia: Sentinel-Asia. In the frame of the European programme Copernicus, the emergency management service was launched in 2009. Geo-information products derived from space imagery are delivered during all phases of the emergency management cycle, in either rush or non-rush mode, free of charge for the users. In both cases, the capacities were historically drawn on national missions, funded with public money and directly operated by the space agencies or by national operators.

The paper focuses on the performance of the space infrastructure (satellites and ground segments). Several trends may have a significant impact on the current performance: - The increasing number of space systems which are privately-owned and managed by commercial operators (e.g. Spot 6/7).

- The emergence in Europe of shared-ownership or community-owned systems. The Sentinel missions (Copernicus) or Eumetsat satellites are two typical examples.
- The development of dual-use capacities and the sovereignty dimension of these systems.
- The development of unmanned airborne vehicles (UAVs) for civil applications.
- The development of social media and crowd-based initiatives in the domain of humanitarian aid and emergency response.

- Possible disruptions, such as large LEO constellations or GEO infrastructures enabling a persistent observation capacity.

A common feature is the increased number of information sources and the higher real time dimension.

The results of creativity sessions based on these evolutions are presented: typical scenarios for the future are described and their likelihood is discussed, including political acceptance and international dimension. Beside fast technological evolutions, the main driving factor is the capacity of national and international stakeholders to agree on governance.