

EARTH OBSERVATION SYMPOSIUM (B1)  
Earth Observation Applications and Economic Benefits (5)

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ADDING RISK INFORMATION FROM EARTH OBSERVATION SYSTEMS AND GIS TO DISASTER  
EARLY WARNING AND MANAGEMENT

**Abstract**

Disaster can be defined as a horrific event which causes the loss, decline, deterioration of production and ability to use an asset to its full economic potential and which often results in the loss of human life. Natural disasters can not be eliminated from the earth. In the face of disasters, the weakness and vulnerability in man's preparation work and its disaster defense systems are often revealed and found lacking. Disaster is caused by the sharp changes in one or some environmental parameters. It is recognized by all that disaster early warning is more important than later treatments. It is easier and cheaper in terms of effort, money, resources, lives lost to prevent a disaster than to clean up, reconstruct after a disaster. Disaster management experts recognize that the application of Earth Observation Systems and GIS is of great help to natural disaster early warning and management. Ideal Earth observation systems have the capacity of providing timely and effective information about disaster risks. Practically, some chains are weak or missing in disaster early warning and management. This paper analyses the existing weak points in Earth observation systems in hydrometeorological hazards, such as floods, mudflows, tropical cyclones, storms, extreme temperatures and droughts; geological hazards, such as earthquakes, tsunamis, volcanic activity and emissions, and mass movements including landslides; as well as biological hazards, such as epidemics, plant and animal contagion and infestations; environmental degradation processes that contribute to an increase in vulnerability and frequency and intensity of natural hazards, such as desertification and wildland fires, are considered, and also near-Earth space objects. The development of effective, stable and reliable Earth observation platforms and fit sensors to meet the needs of monitoring of all Earth spaces, omnibearingly, at all weather and day and night is emphasized. This paper addresses the issue of disaster early warning monitoring and management in a systemic manner and offers a general approach to a management solution. It depicts the disaster early warning monitoring and management as an information chain which has five links: disaster model bank link, disaster monitoring network link, disaster transmission channel, disaster analysis and management link and decision making and commanding link. GIS, being the perfect tool to manage the different data, scenarios, time frames of the disaster evaluation and location, is utilized to extract and analyze risk information in geo-related context.