

IAF EARTH OBSERVATION SYMPOSIUM (B1)
Interactive Presentations - IAF EARTH OBSERVATION SYMPOSIUM (IP)

Author: Dr. Mitchell Goldberg
NOAA/NESDIS, United States, mitch.goldberg@noaa.gov

A NEW FLOOD MAPPING SERVICE FROM OPERATIONAL POLAR AND GEOSTATIONARY
ORBITING SATELLITES.

Abstract

Globally impacting human lives and properties, floods are the most frequent natural disasters. The new generation of operational low earth orbiting (LEO) satellites from the NOAA Joint Polar Satellite System (JPSS) and geostationary (GEO) orbiting weather satellites from NOAA GOES-R and HIMAWARI (JAPAN) for the very first time have the spectral bands for inundation mapping covering large geographic areas with excellent temporal coverage. These satellites also have real-time distribution capabilities through direct broadcast and/or cloud services allowing fast generation and utilization of disaster products for timely critical decision making. While the higher spatial resolution (375m) and daily global data coverage, imagery from the LEO satellites such as Suomi-NPP/VIIRS and NOAA-20/VIIRS remains critical for flood mapping, the LEO satellite imagery are easily affected by clouds and cloud shadows due to the data availability once a day in mid to low latitudes. In comparison to LEO satellite imagery, imagery from the new-generation geostationary satellites such as the GOES-16/ABI and Himawari-8/AHI are available every 5 to 15 minutes. The high temporal resolution allows more clear-sky views for flood mapping, although the spatial resolution is as relatively low as 1km. Combining utilization of the LEO and GEO satellite imagery shows great advantages in flood mapping. Under clear-sky coverage, the floodwater detected in LEO satellite imagery shows rich inundation detail; while under non-clear-sky conditions, composition from multiple GEO satellite images provides more clear-sky coverage for flood detection and the clear-sky information can be used to fill the gaps of clouds and cloud shadows in LEO imagery. This new integrated LEO-GEO flood mapping (inundation) service are available through University of Wisconsin (UW)'s RealEarth webpage and Iphone/Android app. The service is also provided using the NOAA/UW Community Satellite Processing Package (CSPP) installed at X-band direct readout sites collecting data from JPSS polar orbiting satellites in real-time. In the United States our major users include the National Weather Service (NWS) and the Federal Emergency Management Agency (FEMA). Internationally, NOAA provide flood maps when the International Disaster Charter is activated. At the interactive session we will demonstrate the generation, visualization and applications of flood inundation mapping for decision making.