CEOS DRM Thematic Pilots
Semestrial Report for DRM Flood Pilot

Date: 1 March 2016	**PIs:** Stu Frye and Bob Kuligowski
Collaborating organizations: - <u>CEOS Agencies</u> - NASA, NOAA, USGS, CSA, ESA, JAXA, CNES, ASI, SANSA - <u>Local/National/Regional Agencies</u> - RCMRD, Namibia Department of Water Affairs, CIMH, Mekong River Commission, Kavango/Okavango River Commission - <u>Research Centers/Institutes</u> - CIMA, SERTIT, Deltares, JRC, ACRI, HRC, Luxembourg Institute of Science and Technology, Athena Global - <u>International Organizations</u> – Red Cross/Red Crescent, UNESCO, WFP, World Bank GFDRR - <u>Universities</u> - University of Maryland, University of Colorado, University of Oklahoma, University of West Indies	
Achievements: - Arrangement with the International Disaster Charter to access Charter data for the Flood Pilot for five recent flood events plus future activations - Found a host for the Global Flood Dashboard and developed initial design - Installed open GeoSocial API to publish flood modeling and monitoring products for Central America; currently working with them to develop an interface to receive the data. Currently writing a proposal to the NASA SERVIR program to provide the same services to the Asia Disaster Preparedness Center in Bangkok. - Began serving iMERG products and Global Flood Monitoring System (GFMS) products under Open GeoSocial API - Demonstrated significant impacts on modeled flood extent when using stream network information derived from Landsat-8.	
Activities: one or two paragraphs describing main activities The team continued to distribute EO data to partner organizations for both real-time flood monitoring andrisk analysis. The former included both the regional Pilot areas (e.g., Hurricane Joaquin in the Bahamas) and areas outside of that covered by the Global Pilot (Argentina, Mississippi River, Yemen, Somalia, Chile, Brazil, Philippines). The team also continued to help with capacity building, collaborating with the International Water Management Institute to develop flood monitoring products for Southeast Asia, with the Namibia Department of Hydrology and RCMRD to integrate local flood implementations of the CREST and EF5 models in Southern Africa, and worked with CIHHM, CATHALAC, and DAI (Costa Rica) to establish a disaster node under the Regional Climate Change program. Consulted with the World Bank in December 2015 on potential new Pilot products.	
Data accessed this Q (#images /satellite) - 40 ALOS-2 - 70 Landsat-8 - 28 EO-1 - 15 Sentinel-1A	**Total data accessed to date** (#images /satellite) - 40 ALOS-2 - 70 Landsat-8 - 70 EO-1 - 15 Sentinel-1A

- 108 Radarsat-2 - 53 COSMO SkyMed	- 200 Radarsat-2 - 103 COSMO-SkyMed	
Products: (delivered this quarter) 1. ALOS-2 flood maps for the Mississippi River 2. Assessment of flood impacts from irrigation ditch breaches from the September 2015 Chilean earthquake 3. Monitored earthquake-induced landslide lakes in Nepal and Pakistan 4. Imagery for December 2015 Chennai floods	**User** (by product) 1. FEMA 2. University of Serena (Chile) 3. ICOMOD and Army Corps of Engineers 4. ISRO and International Water Management Institute	==**User or practitioner endorsement**==/opinion/outcomes

List any publications directly stemming from pilot work
- Frye S., Wells G., Adler R., Brakenridge R., Bolten J., Murray J., Slayback D., Green D., Wu, H., Kirschbaum D., Howard T., Flamig Z., Clark R., Chini M., Matgen.P., Stough T., "User-Driven Workflow for Modeling, Monitoring, Product Development, and Flood Map Delivery Using Satellites for Daily Coverage Over Texas May-June 2015", Poster presentation at the American Geophysical Union 2015 annual meeting, December 2015 San Francisco, CA
- Schumann G. J-P., Frye S., Wells G., Adler R., Brakenridge R., Bolten J., Murray J., Slayback D., Green D., Wu H., Kirschbaum D., Howard T., Flamig Z., Clark R., Chini M., Matgen.P., Stough T., B. Jones, "Unlocking the Full Potential of Earth Observation during the 2016 Texas Flood Disaster", *Water Resources Research,* in review.
- Schumann, G. J-P and K. M. Andreadis (2016). A method to assess localized impact of better floodplain topography on flood risk prediction, *Advances in Meteorology*, in review.
- Wu, H. and Adler, R., "Evaluation of Quantitative Precipitation Estimations (QPE) and Hydrological Modeling at the Iowa Flood Studies Focal Basins.", 2016 *Journal of Hydrometeorology*, in review.

List objective milestones and state progress to date (%)
- Objective A: Global Component **75%** - Global Flood Dashboard will initially be sited on the Matsu cloud using a copy of the Southern Africa Flood Dashboard as a platform, retrieving data anywhere requested by the user. Completion expected by mid-March. Will share requirements and prototype implementations with ESA afterward.
- Objective B: Regional Pilots
  - Caribbean / Central American component **50%** - Regional Flood Dashboard continues to operate. Provided imagery for the Bahamas in October (Hurricane Joaquin) and supplied COSMO-SkyMed data to the RASOR team for flood and landslide risk work in Haiti. Deltares has ceased collaboration with the Flood Pilot on developing a 10-year flood archive.

- Southern Africa component **75%** - Regional Flood Dashboard continues to operate. Provided imagery from January 2015 Malawi charter activation. Deltares has ceased collaboration with the Flood Pilot on developing a 10-year flood archive.
- Southeast Asia component **80%** - Regional Flood Dashboard is not being updated due to lack of funding; awaiting additional funding from ADPC to cover. GFMS test of 1-km product over Lower Mekong Basin remains on hold because gauge data could not be obtained. RASOR working on Phase 2 proposal to extend previous risk mapping work in Java. Developing full proposal for ADPC to host Open GeoSocial API flood monitoring software and integrate the products into the Regional Flood Dashboard; in the meantime, iMERG and GFMS products are being served under Open GeoSocial API. Deltares has ceased collaboration with the Flood Pilot on developing a 10-year flood archive.

Issues identified and risk management approach

Pilot management support for coordination, documentation, and meetings is short of what is needed for the level of effort required. Actively seeking funding for Pilot management from ESA, NASA, and NOAA.