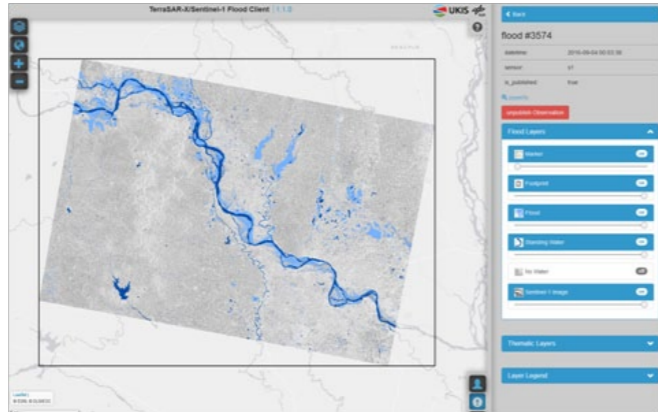


Automatic Rapid Flood Mapping by Means of Sentinel-1 and TerraSAR-X Imagery

Global target a, b, c; Priority for Action 1 – Hazard Characterization.



Application field: This fully automated processing chain for flood mapping is based on radar data of the German satellite mission TerraSAR-X and the Sentinel-1 mission, which is operated by the European Space Agency (ESA) in the frame of the European Union Copernicus Programme. It is used to support flood rapid mapping activities by providing fast-paced information on the extent of a flood situation.

Methodology and workflow: Radar sensors provide useful data of the Earth's surface both during the day and night, and amid all weather conditions. This makes SAR satellite remote sensing an ideal tool for the rapid mapping of floods. The developed TerraSAR-X and Sentinel-1 flood services consist of fully automated processing chains, containing the following steps: automatic data ingestion, pre-processing of the Earth Observation data, computation and adaption of global auxiliary data (digital elevation models, topographic slope information and topographic indices, as well as reference water masks), unsupervised initialization of the classification, post-classification refinement, and dissemination of the crisis information via a web-client.

Key results: The derived flood masks can be used to support decision making processes regarding emergency response.

Innovative impact: To support the rapid mapping activities of the Center for Satellite Based Crisis Information (ZKI) of the German Aerospace Center (DLR), e.g. within the International Charter 'Space and Major Disasters', automatically computed flood masks can be delivered to the users of the Charter less than one hour after the satellite data is received at DLR.

GP-STAR Factsheet

Automatic Rapid Flood Mapping by Means of Sentinel-1 and TerraSAR-X Imagery

Application status: Operational.

Area of application: Global Level



Background: The automatically derived flood masks are based on Sentinel-1 and TerraSAR-X radar data. TerraSAR-X data can be accessed free of cost via scientific data proposals or are provided by DLR during activations of the International Charter 'Space and Major Disasters'. Data from Sentinel-1 is accessible free of cost via ESA's Copernicus Open Access Hub.

Key publications:

Martinis, S., Kersten, J. & Twele, A., 2015: A fully automated TerraSAR-X based flood service. – ISPRS Journal of Photogrammetry and Remote Sensing 104: 203–212.

Twele, A., Cao, W., Plank, S. & Martinis, S., 2016: Sentinel-1 based flood mapping: a fully automated processing chain. – International Journal of Remote Sensing, 27 (13): 2990-3004.

http://www.dlr.de/eoc/en/desktopdefault.aspx/tabid-5290/9370_read-18028/<contact

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