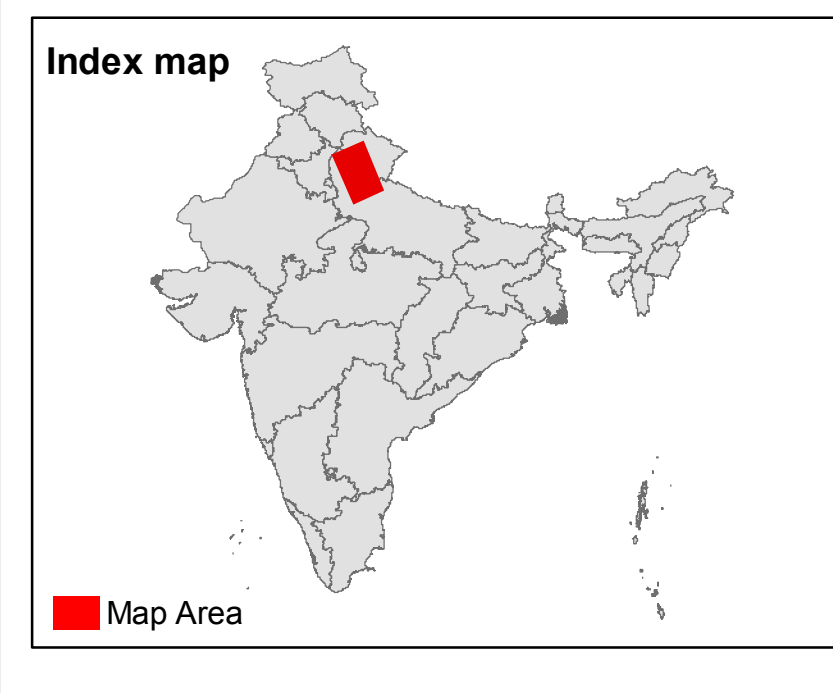


Mapping Floods in Northern India : States of Uttarakhand and Uttar Pradesh using NASA's Satellite Images



In June 2013, North India experienced heavy rainfall that triggered devastating floods and landslides in the states of Uttarakhand, Uttar Pradesh and Himachal Pradesh. As of 20 June 2013, official figures state that more than 190 people have died and with thousands missing and homeless. Damage to bridges and roads left almost 73,000 people trapped in various places.

Swollen river width with an average of 15-20km along the banks of major Yamuna river as viewed by NASA's MODIS Terra/Aqua images explains the scale of flooding particularly in the highly flood affected states of Uttarakhand and Uttar Pradesh. On 17 June 2013 the state of Uttarakhand received more than 340 millimetres (13 in) of rainfall, which is 375 percent above the normal benchmark of 65.9 mm rainfall during a normal monsoon. This cloudburst caused heavy floods in Uttarakhand as well as the neighbouring state of Himachal Pradesh. In the city of Dehra Dun, capital of Uttarakhand, this was the wettest day during the month of June in over five decades. Heavy rainfall for four consecutive days as well as melting snow during summer aggravated the floods further. Major flood affected districts in Uttarakhand includes Haridwar and in U.P. districts of Meerut, Muzaffarnagar, Aligarh, Badaun, Lakhimpur Kheri, Bahraich, Ramnagar. This map shows recent flooding in the States of Uttarakhand and Uttar Pradesh on the river Ganga which were mapped using MODIS Terra /Aqua satellite data (19th June and 20th June, 2013). For the past few days approx. 530 million Indian Rupees worth of crop loss due to flooding.

This analysis also used Pre river line MODIS data from 2012 to show identify flood water only. Please note that water bodies likely reflect an underestimation of all flood-affected areas within the map extent due to cloud, atmospheric variations and other reasons. This analysis has not yet been validated in the field.

Crisis Satellite data : MODIS Terra / Aqua
 Resolution : 250m
 Image date : June 19 - 20, 2013
 Source : NASA
 Pre-flood Image : MODIS Terra / Aqua
 Resolution : 250m
 Image date : May 2013
 Source : NASA

Baseline Imagery : MODIS Terra May 28, 2013
 Source : NASA
 GIS Data : IWMI Water Data Portal
 Flood Analysis : IWMI
 Projection : Geographic, WGS84

Please send ground feedback to IWMI.

Legend

- Flood Water extent (20 June 2013)
- Pre-Flood River Line (2013)
- Airport
- Villages/towns
- Rivers
- Rural road
- Urban road
- Urbanized area
- Administration boundary

Map prepared by: **IWMI**
 International Water Management Institute

Data Provided by: **NASA**

0 10 20 40 60 80 Kilometers

The depiction and use of international boundaries, geographic names and related data shown in these maps are based on the sources they have been drawn from and quoted; these are neither error-free nor do they imply official endorsement or the position of IWMI

