

Flood monitoring from space

The ability of CryoSat-2 to detect flood events is presented in this study. The data used here are L1b 20Hz SAR waveforms retracked with a primary peak threshold retracker as well as the ESA L2 backscatter coefficients.

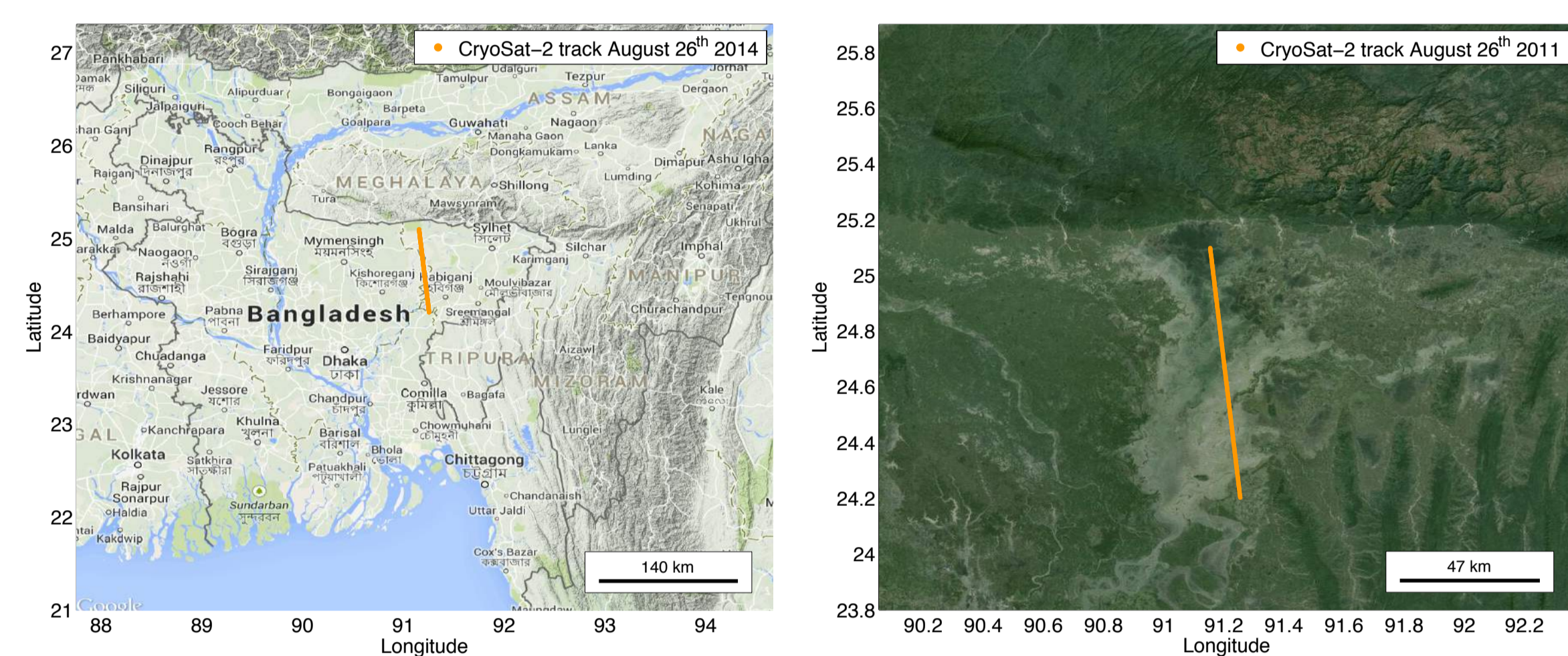
This study focuses on two major flood events:

- 1) **The recent flood event in Bangladesh in August 2014.** Here, the flooding was detected both as an elevation change, and as a change in waveform characteristics compared to the corresponding track in 2011 and 2013.
- 2) **The prolonged flood event in Thailand in 2011.** The southward flood progression that occurred during the fall is detected by looking simply at changes in the retracked surface height compared to corresponding tracks in 2013.



Photograph taken during the flood in Thailand in 2011. A United States Navy helicopter surveys flooded areas in the outskirts of Bangkok. As seen, populated areas are inundated to an extent where people were severely affected.

Photograph borrowed from Wikipedia website.

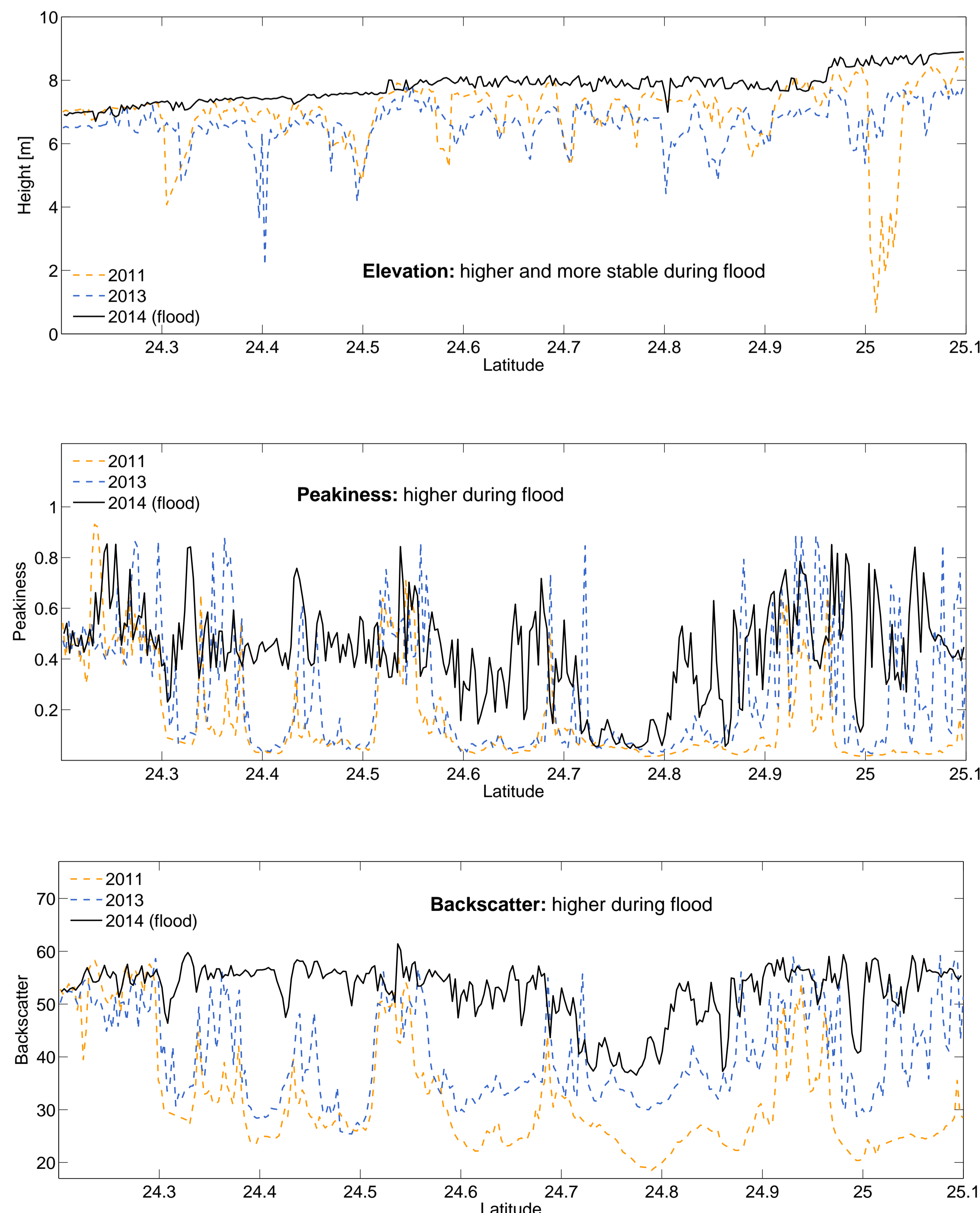


Bangladesh August 2014

In August 2014, continuous rainfall and onrush of upstream waters in north and northeastern Bangladesh caused flash floods. Several low-lying and densely populated areas were totally inundated, forcing the local population to relocate.

The figures below show the elevation, peakiness and backscatter along the same satellite track crossing the border between the Sylhet and Sunamganj Districts every August.

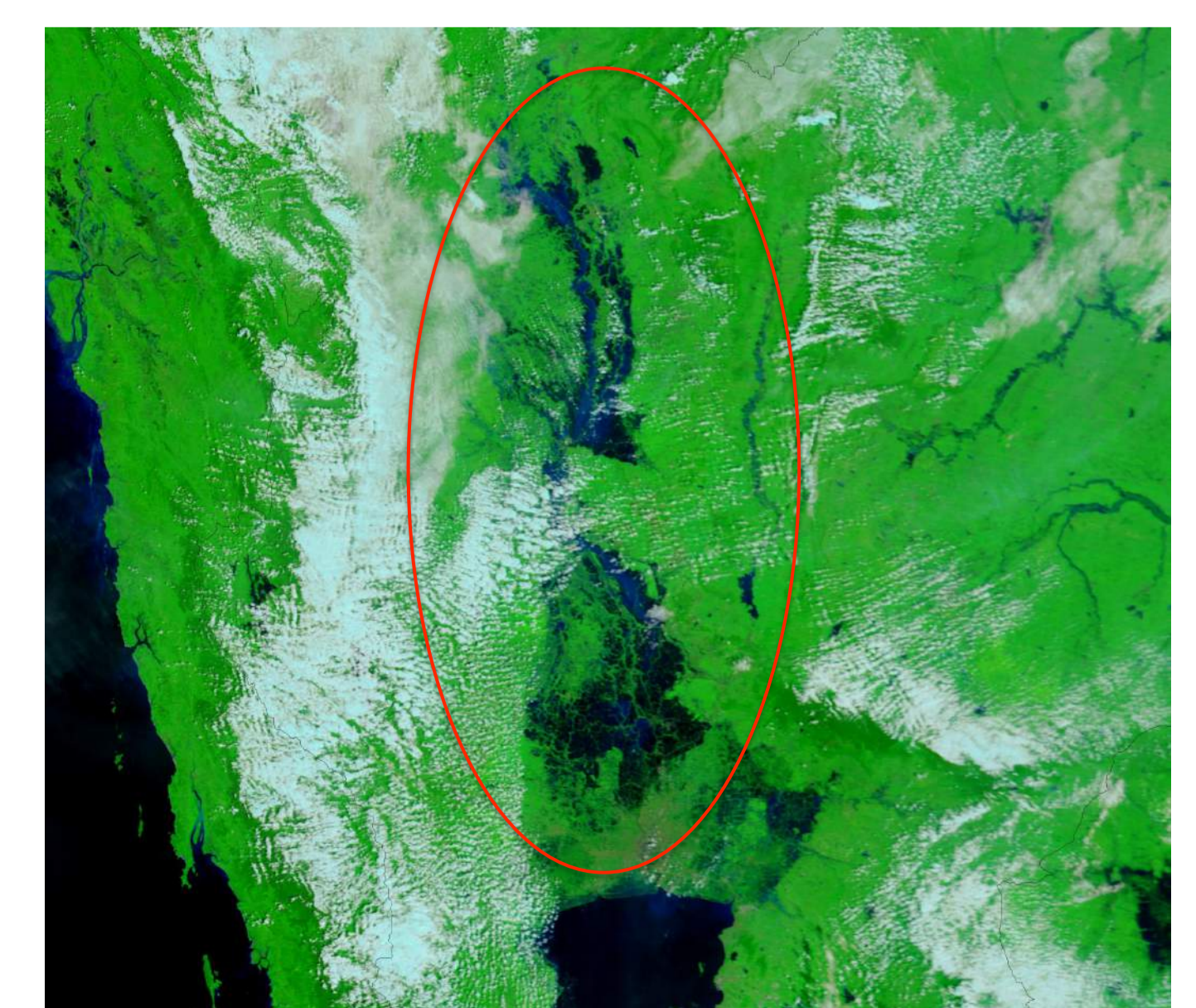
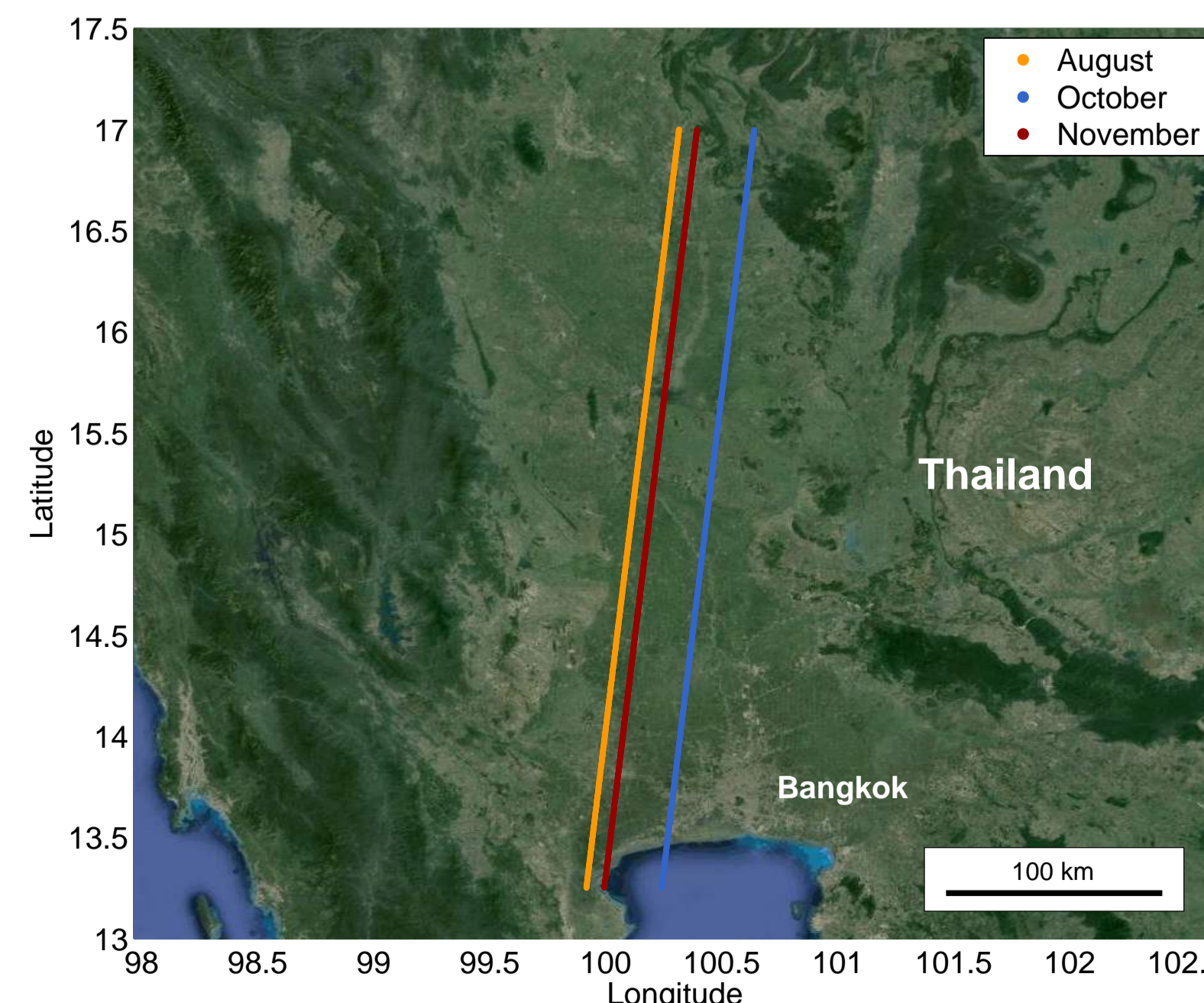
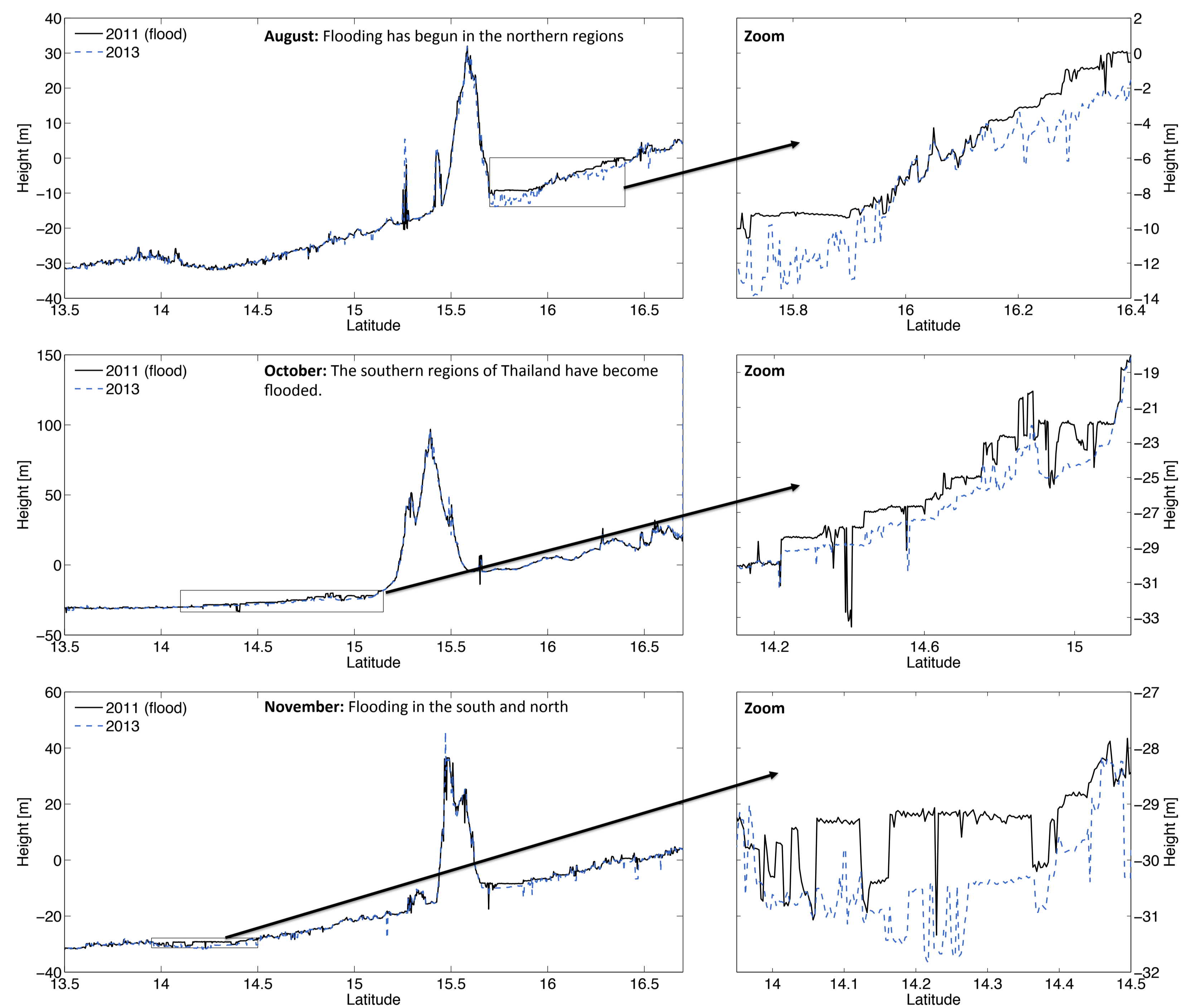
The effect of the flood is seen not only as higher surface elevations, but also as a change in the general characteristics of the waveforms.



2011 Thailand Floods

In the second half of 2011 major parts of Thailand were affected by severe flooding. The flooding was caused by heavy rainfall in the north and northeastern parts of Thailand in late July. During August and September the floodwater migrated along the Mekong and Chao Phraya river basins. In October the flooding reached the city of Bangkok. In total, 65 of Thailand's 77 provinces were flooded, and approximately 13.6 million people were affected.

Here we show the progression of the flood during the fall. For August, October and November we show the retracked heights in 2011 and for 2013, revealing that the flooded areas have higher and more stable elevations compared to 2013.



MODIS image showing the flooded area.