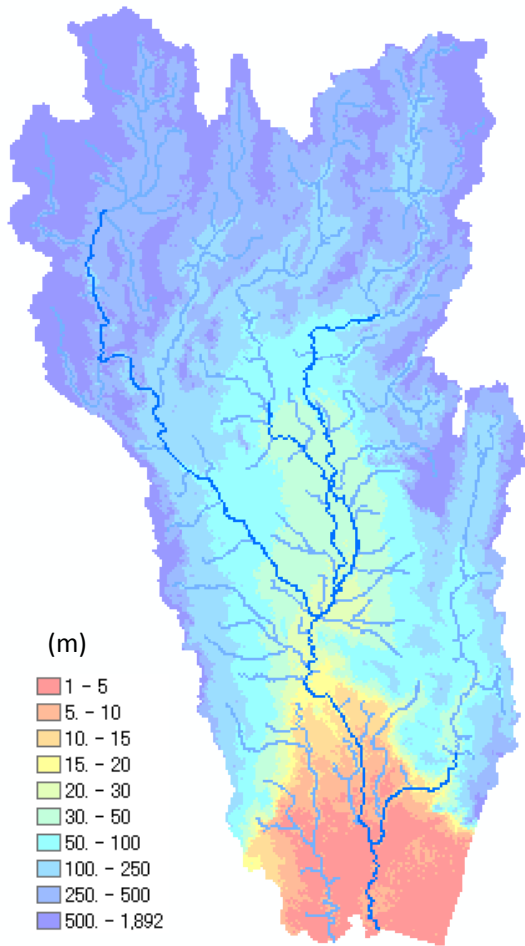


# Rainfall-Runoff-Inundation Forecasting in the Chaophraya River

(ICHARM, as of Oct 23)



Topographic Data by HydroSHEDS

- Purpose: Understanding and predicting the flooding in Thailand at the entire Chao Phraya River Basin with RRI (Rainfall-Runoff-Inundation) Model.
- The simulation is conducted with globally available topography and satellite based rainfall data without parameter calibrations; therefore, more detailed analysis is necessary by including effects of reservoirs, tides, embankment, etc.

Simulation Domain : 163,293 km<sup>2</sup>

Simulation Period :

2011/07/01 0:00 (UTC) – 2011/11/30 0:00 (UTC)

Input Rainfall:

✓ 2011/07/01 0:00 (UTC) – 2011/10/21 0:00 (UTC)

3B42RT (Satellite Based Rainfall)

(Every 3 hours, Spatial Resolution: 0.25 deg)

✓ 2011/10/21 0:00 (UTC) – 2011/10/28 12:00 (UTC)

JMA- GSM Weekly Weather Forecasting

(Forecasting Lead Time: 8 days, Update every 12 hours)

✓ 2011/10/28 12:00 (UTC) – 2011/11/30 0:00 (UTC)

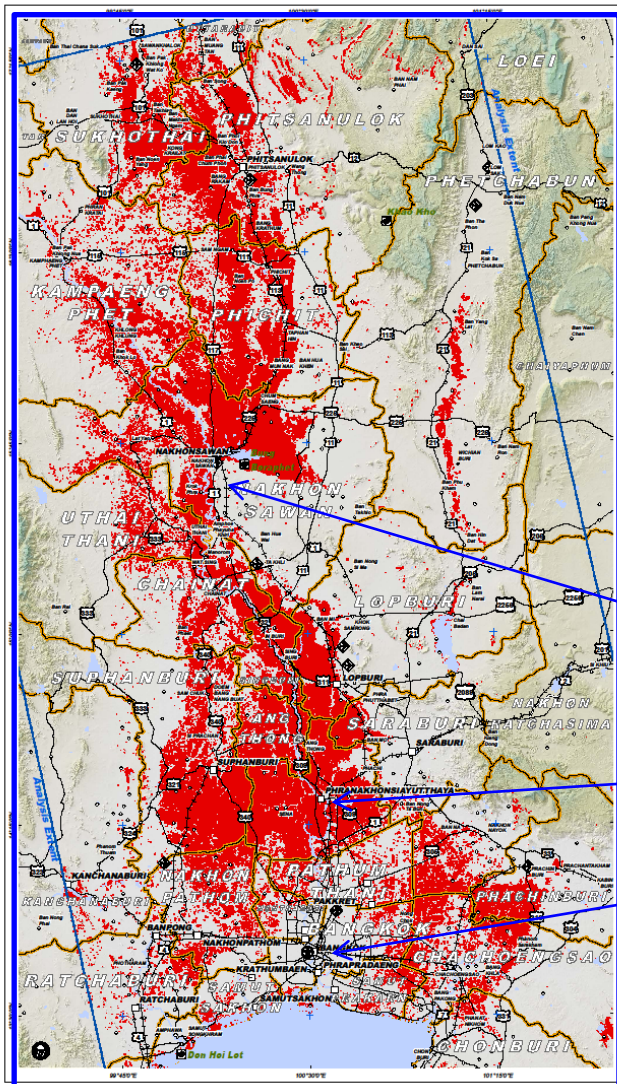
(Last year's 3B42RT rainfall in the same period)

# Inundation Extent by Satellite (as of Oct 13)

# Simulated Water Depths on Oct 13

## UPDATE2: OVERVIEW OF FLOOD WATERS OVER CENTRAL PROVINCES, THAILAND

Flood Analysis with Envisat ASAR W3 Radar Data recorded from the 13 October 2011 centered on Phra Nakhon Si Ayutthaya Province, Thailand



**Tropical Cyclone & Flooding**  
Production Date: 13/10/2011  
Version 4.0  
Globe Number: FL-2011-00035-THA



This map presents the standing flood waters over the affected Central Provinces of Thailand based on analysis of satellite data recorded 13 October 2011. A preliminary analysis shows extensive flooding over the provinces of Phra Nakhon Si Ayutthaya, Nakhon Sawan, Chanthaburi, Pathum Thani, Nakhon Phanom, Ang Thong, Lopburi, Singburi and Suphanburi. This analysis has not yet been validated in the field. Please send ground feedback to UNSTAR/UNOSAT.

**Legend**  
□ Major Towns/City  
□ Towns/Villages  
□ Airport/Airfield  
□ Protected Areas  
— International Boundary  
— Province Boundary  
— Primary & Secondary Roads  
— Railway Line  
■ Probable Flood Waters as on 13 October 2011 (Envisat ASAR W3)  
■ Pre-Crisis Water Extent (2007)

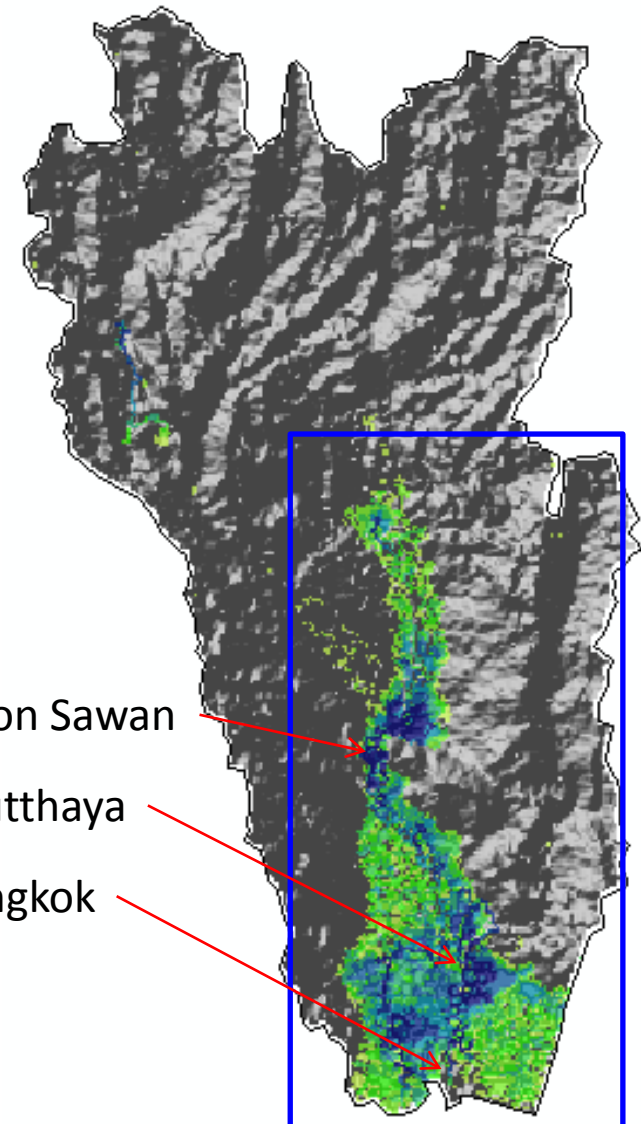
geopictures

Satellite Date(s): Envisat ASAR W3-HV  
Imagery Date: 13 October 2011  
Resolution: 126 m  
Source: European Space Agency  
Processor: GeoPictures/ASAT  
Satellite Data: Envisat/ASAR  
Road Data: ESR  
Other Data: OCHA, USGS  
Analysis: UNSTAR/UNOSAT  
Production: UNSTAR/UNOSAT  
Analysis conducted with ArcGIS v10  
This work by UNSTAR/UNOSAT is licensed under a Creative Commons Attribution-NonCommercial-ShareAlike 3.0 Unported License.

Map Scale for A3: 1:1,250,000  
20 10 0 20 40 Km  
Coordinate System:  
WGS 1984 UTM Zone 47N  
Projection: Transverse Mercator  
Datum: WGS 1984  
False Easting: 500,000.0000  
False Northing: 0.0000  
Central Meridian: 101.0000  
Scale Factor: 0.9993  
Latitude Of Origin: 0.0000

The depiction and use of boundaries, geographic names and related data shown here are not intended to be authoritative nor do they reflect endorsement or disapproval by the United Nations. UNOSAT is a project of the United Nations Institute for Training and Research (UNITAR), providing satellite imagery and related geographic information, research and analysis to UN humanitarian & development agencies & their implementing partners.

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(m)  
0.0 - 0.5  
0.5 - 1.0  
1.0 - 1.5  
1.5 - 2.0  
2.0 - 2.5  
2.5 - 3.0  
3.0 - 3.5  
3.5 - 4.0  
4.0 - 4.5  
4.5 - 5.0

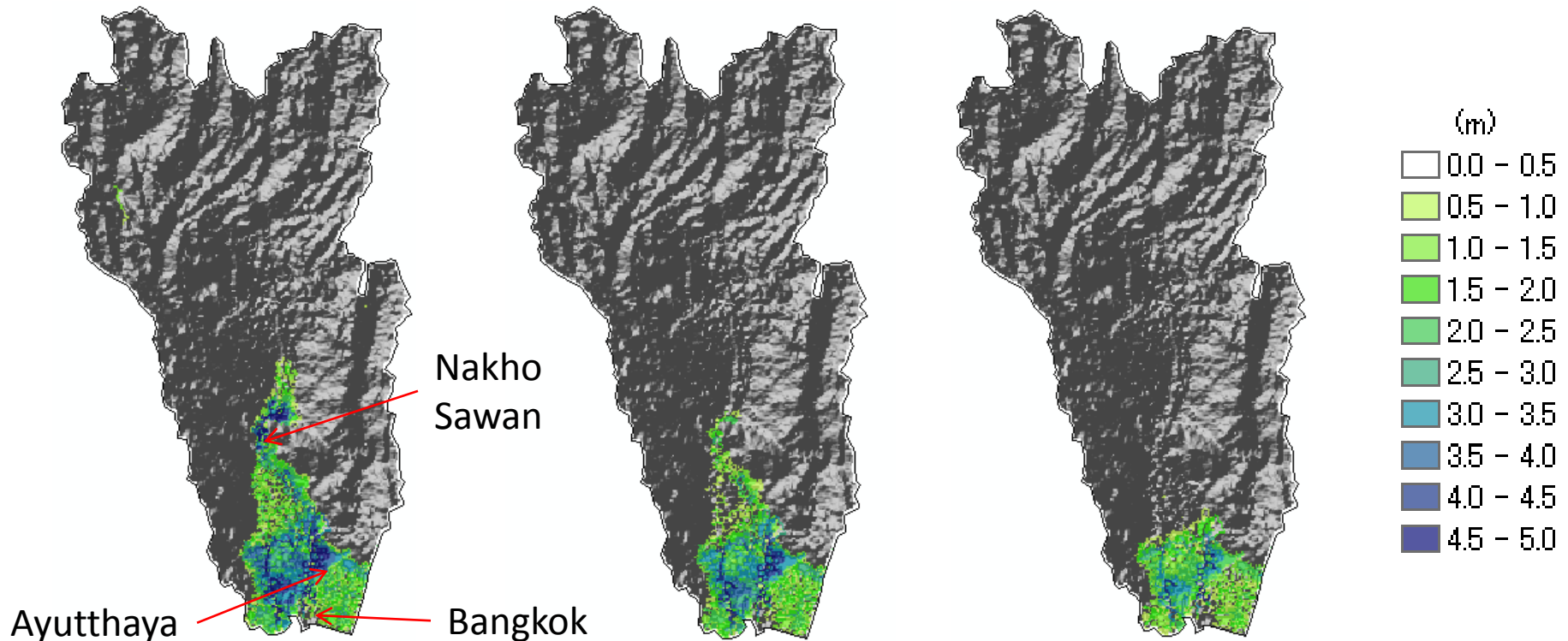
- The simulated inundation extent roughly agrees with the remote sensing image
- Large degree of uncertainty in the simulation in Bangkok due to no tidal effect consideration

# Forecasted Inundation Depths

Nov. 1

Nov. 15

Nov. 30



\*The images are based on the simulation results from the RRI model by ICHARM (The inundation depth is simulated based on the rainfall during Oct. 28-Nov.30 in 2011 estimated by using the actual rainfall during the same period in 2010).

\*The simulation is not capable of highly accurate reproduction of the inundation, especially, around Bangkok located in the lower Chaophraya River since the effects of dams, levees and estuary tide levels are not taken into consideration.

\*The topographic map was created by ICHARM based on HydroSHEDS (USGS).

\*There is serious concern for further expansion of the inundation towards Sunday, 30 October, when the next spring tide is expected.