The background of the slide is a satellite image from the ASTER instrument, showing a topographic view of a region in Nepal. The terrain is rugged and mountainous, with a color palette where red and brown represent higher elevations and green/blue represent lower elevations and vegetation. White patches indicate snow or ice. The text is overlaid on this image.

ASTER Expedited Data Collection for 2015 Nepal M 7.8 Lamjung Earthquake

K. A. Duda, L. Maldonado
duda@usgs.gov

Last update
25 June 2015

ASTER Expedited Collection Summary: 2015 Nepal M 7.8 Lamjung Earthquake

Date	Scenes	Bands	Comment
Phase I		V = VNIR T = TIR	Gain optimized for land surfaces
29 April	1	V	Epicenter
1 May	4	V, T	Bhimeshwar
3 May	4	V	Mt. Everest, Pokari
6 May	5	V	Thulagi-Tal
8 May	1	V, T	Epicenter
10 May	4	V	Rolpa
15 May	4	V	Langtang, Kathmandu
Phase II			Gain optimized for snow and ice
17 May	5	V, T	Mt. Everest, Pokari
22 May	4	V	Thulagi-Tal
24 May	5	V, T	Saurpani
26 May	4	V	Rolpa
31 May	4	V	Langtang, Kathmandu
2 June	5	V, T	Bhimeshwar
3 June	5	T	Gandaki River Dam; NIGHT
4 June	5	V	Dharan
7 June	5	V, T	Gandaki River Dam
Phase III			Gain optimized for snow and ice (repeat coverage)
16 June	5	V, T	Thulagi-Tal
18 June	5	V	Saurpani-Ghap landslide
20 June	5	V	Dharan
25 June	4	V, T	Langtang, Kathmandu
27 June			Mt. Everest, Pokari; 4 scenes scheduled
I+II+III =	84		302,400 square kilometers of coverage

*Scenes each
60 x 60 km.*

*All are day scenes
except as noted.*

VNIR
Band 1: 0.52 - 0.60 μm Nadir looking
Band 2: 0.63 - 0.69 μm Nadir looking
Band 3: 0.76 - 0.86 μm Nadir looking
Band 3: 0.76 - 0.86 μm Backward looking

TIR
Band 10: 8.125 - 8.475 μm
Band 11: 8.475 - 8.825 μm
Band 12: 8.925 - 9.275 μm
Band 13: 10.25 - 10.95 μm
Band 14: 10.95 - 11.65 μm

Nepal M 7.8 2015 Lamjung Earthquake

USGS ShakeMap : NEPAL

Apr 25, 2015 06:11:26 UTC M 7.8 N28.15 E84.71 Depth: 15.0km ID:us20002926

M 7.8

2015-04-25 06:11:26 (UTC)

28.15 N, 84.71 E

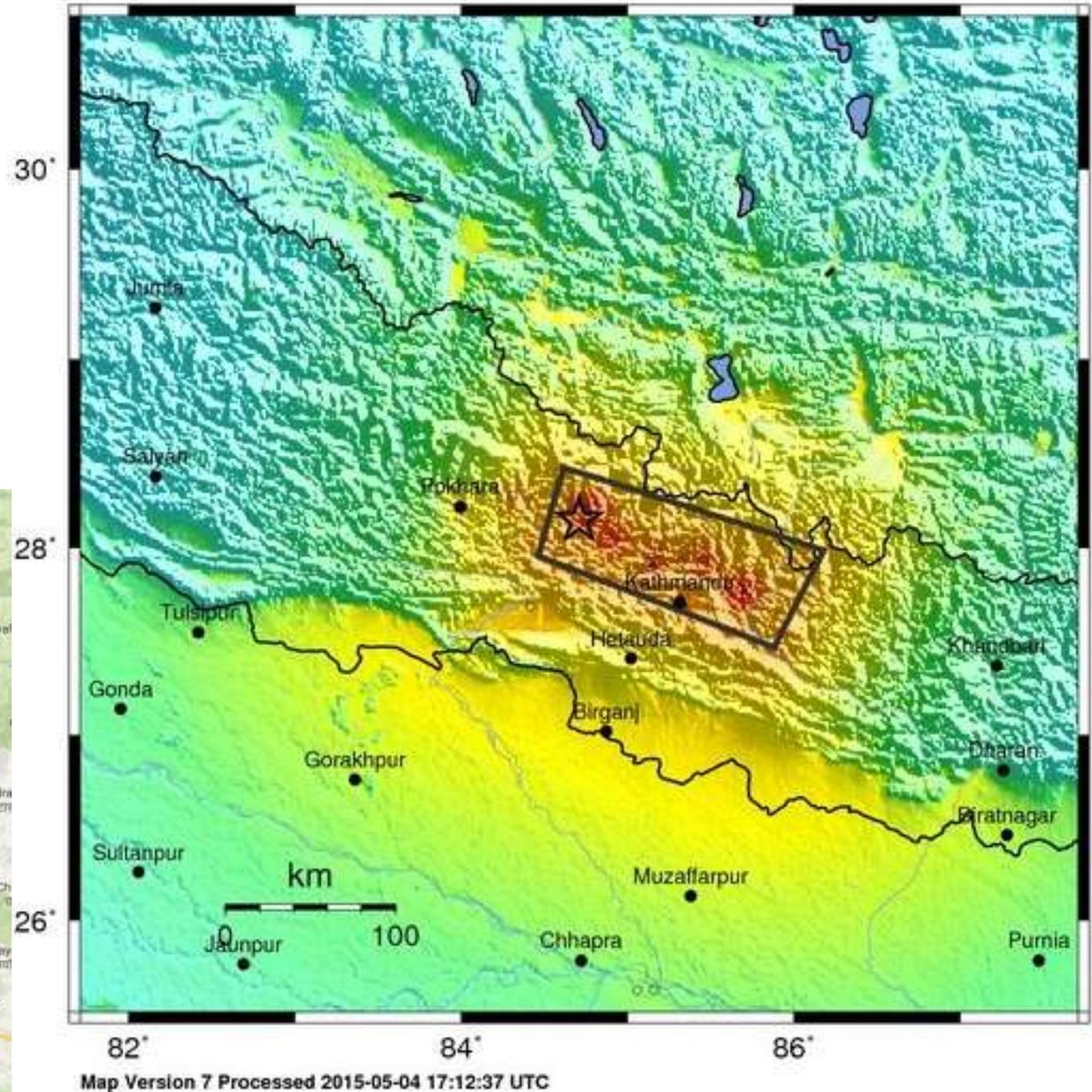
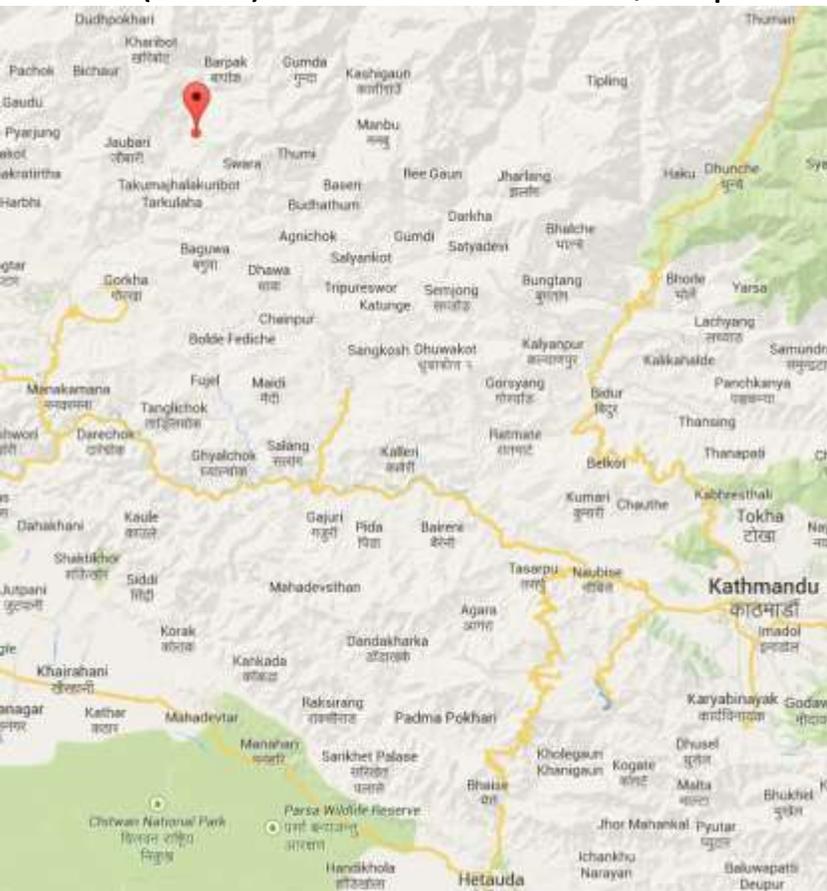
34km (21mi) ESE of Lamjung, Nepal

58km (36mi) NNE of Bharatpur, Nepal

73km (45mi) E of Pokhara, Nepal

76km (47mi) NW of Kirtipur, Nepal

77km (48mi) NW of Kathmandu, Nepal



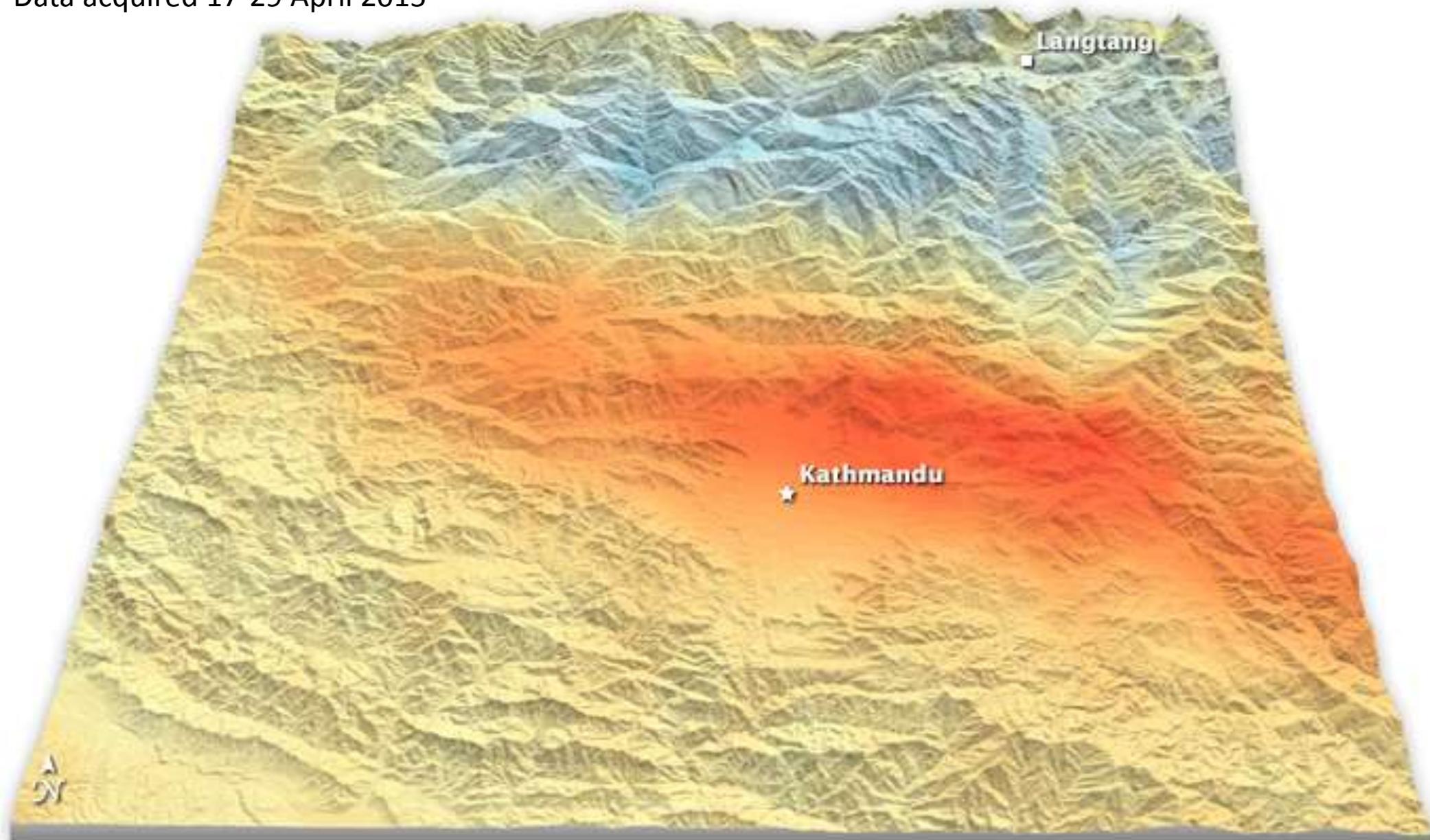
PERCEIVED SHAKING	Not felt	Weak	Light	Moderate	Strong	Very strong	Severe	Violent	Extreme
POTENTIAL DAMAGE	none	none	none	Very light	Light	Moderate	Mod./Heavy	Heavy	Very Heavy
PEAK ACC.(%g)	<0.05	0.3	2.8	6.2	12	22	40	75	>139
PEAK VEL.(cm/s)	<0.02	0.1	1.4	4.7	9.6	20	41	86	>178
INSTRUMENTAL INTENSITY	I	II-III	IV	V	VI	VII	VIII	IX	X+

Scale based upon Worden et al. (2012)

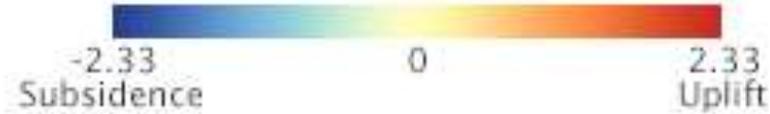
Nepal Ground Displacement

Sentinel-1A SAR measurements

Data acquired 17-29 April 2015



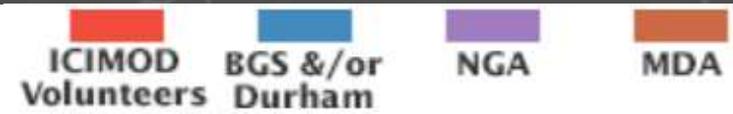
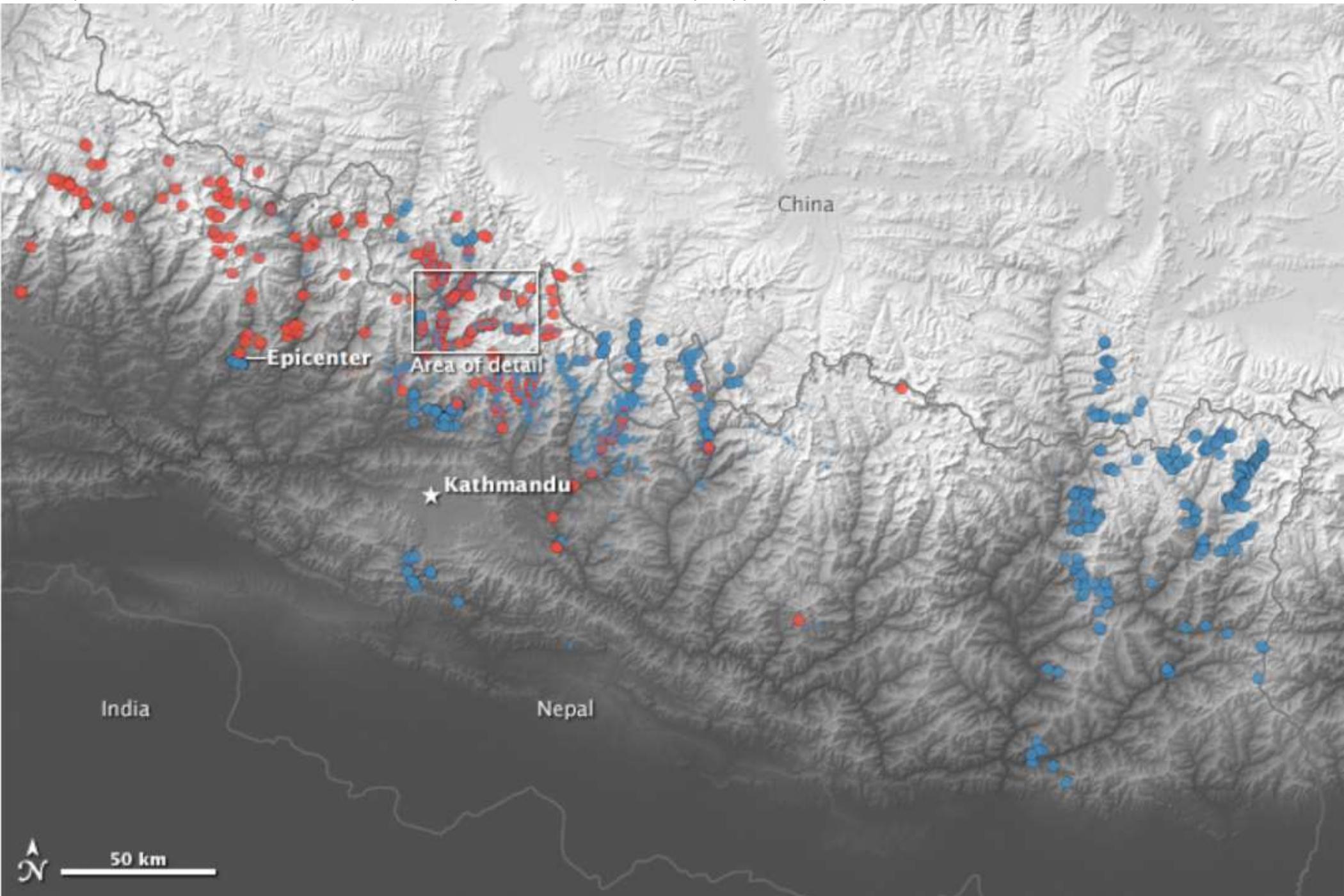
Ground Displacement (meters towards Sentinel-1)



Scientist-Volunteer Landslide Mapping

From April 25, the date of the first earthquake, to May 20, the team has collectively mapped nearly 1,000 landslides.

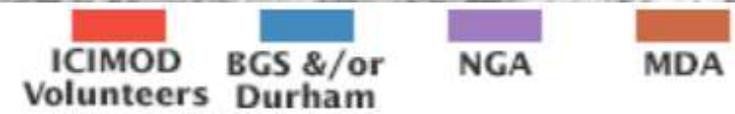
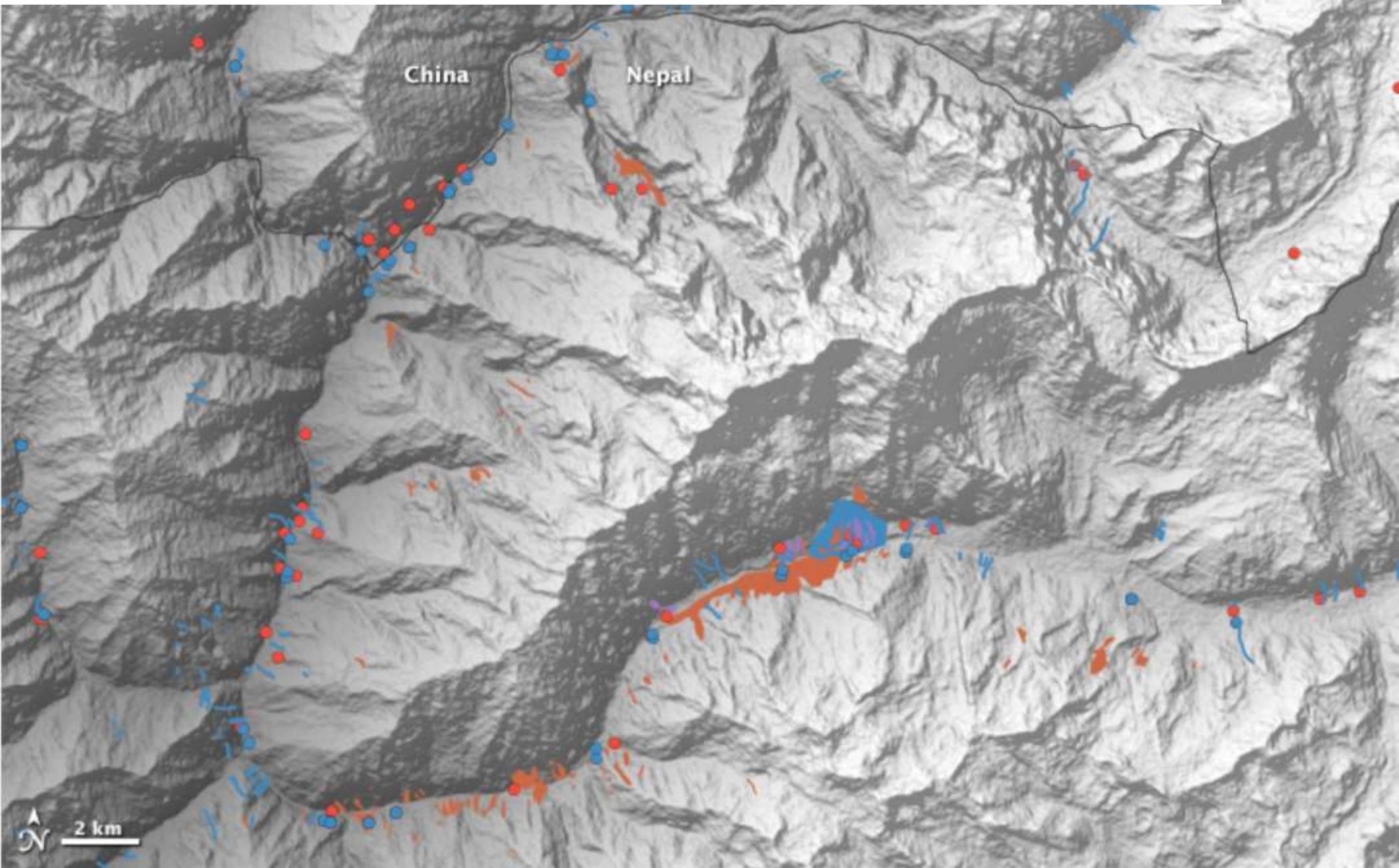
Regional Overview



Scientist-Volunteer Landslide Mapping

Local Detail

Data sources include the Landsat satellites, the Earth Observing-1 satellite, the Advanced Spaceborne Thermal Emission and Reflection Radiometer (ASTER) instrument on the Terra satellite, the WorldView and GeoEye satellites operated by Digital Globe, and image mosaics and topographic information accessible in Google Earth.



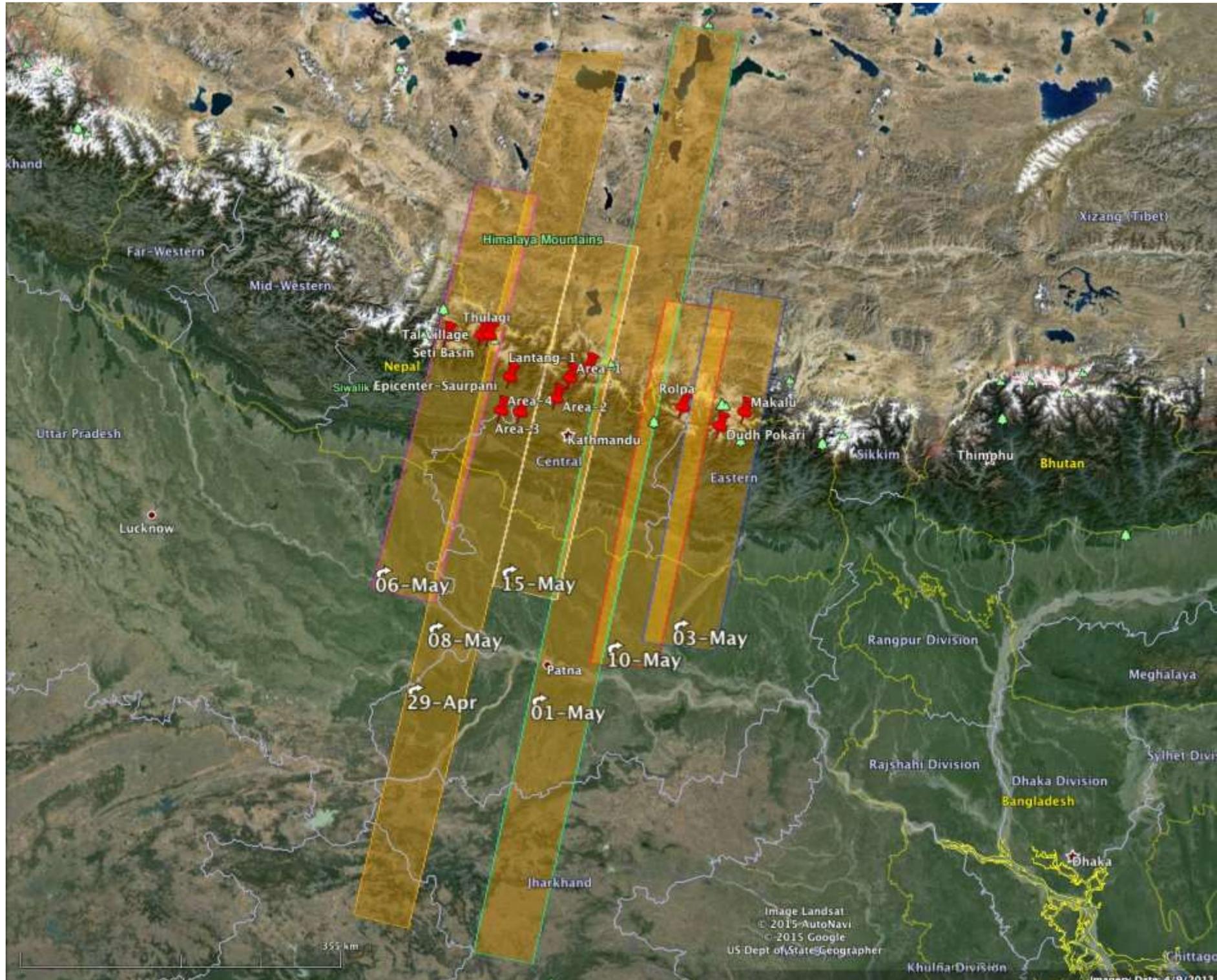
ASTER Tasking Plan – Nepal Lamjung Earthquake

Gains optimized for land surfaces

ASTER Imaging Phase I

Dates

- 29 April
- 1 May
- 3 May
- 6 May
- 8 May
- 10 May
- 15 May



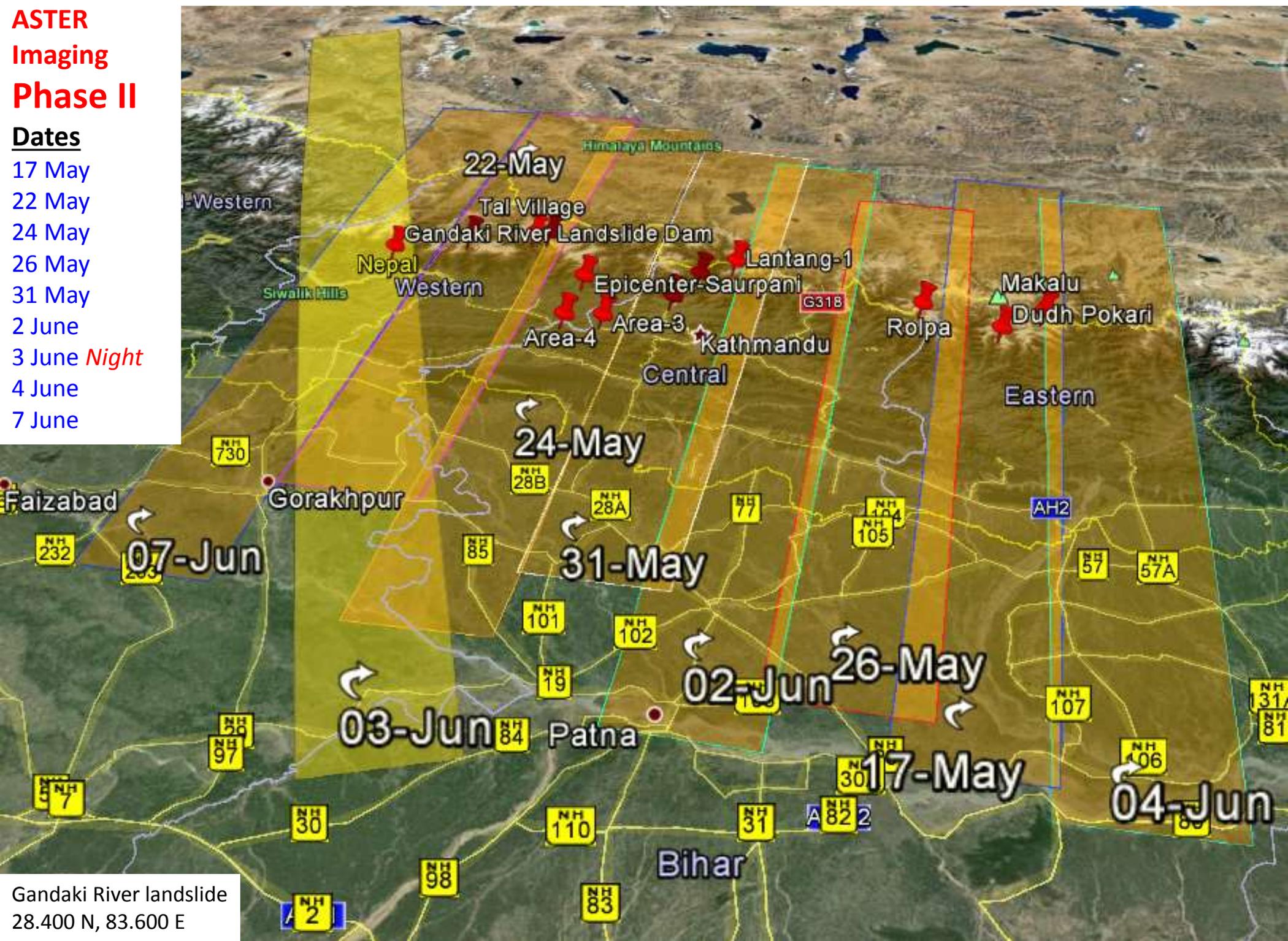
ASTER Tasking Plan – Nepal Lamjung Earthquake

Gains optimized for snow and ice

ASTER Imaging Phase II

Dates

- 17 May
- 22 May
- 24 May
- 26 May
- 31 May
- 2 June
- 3 June *Night*
- 4 June
- 7 June



Gandaki River landslide
28.400 N, 83.600 E

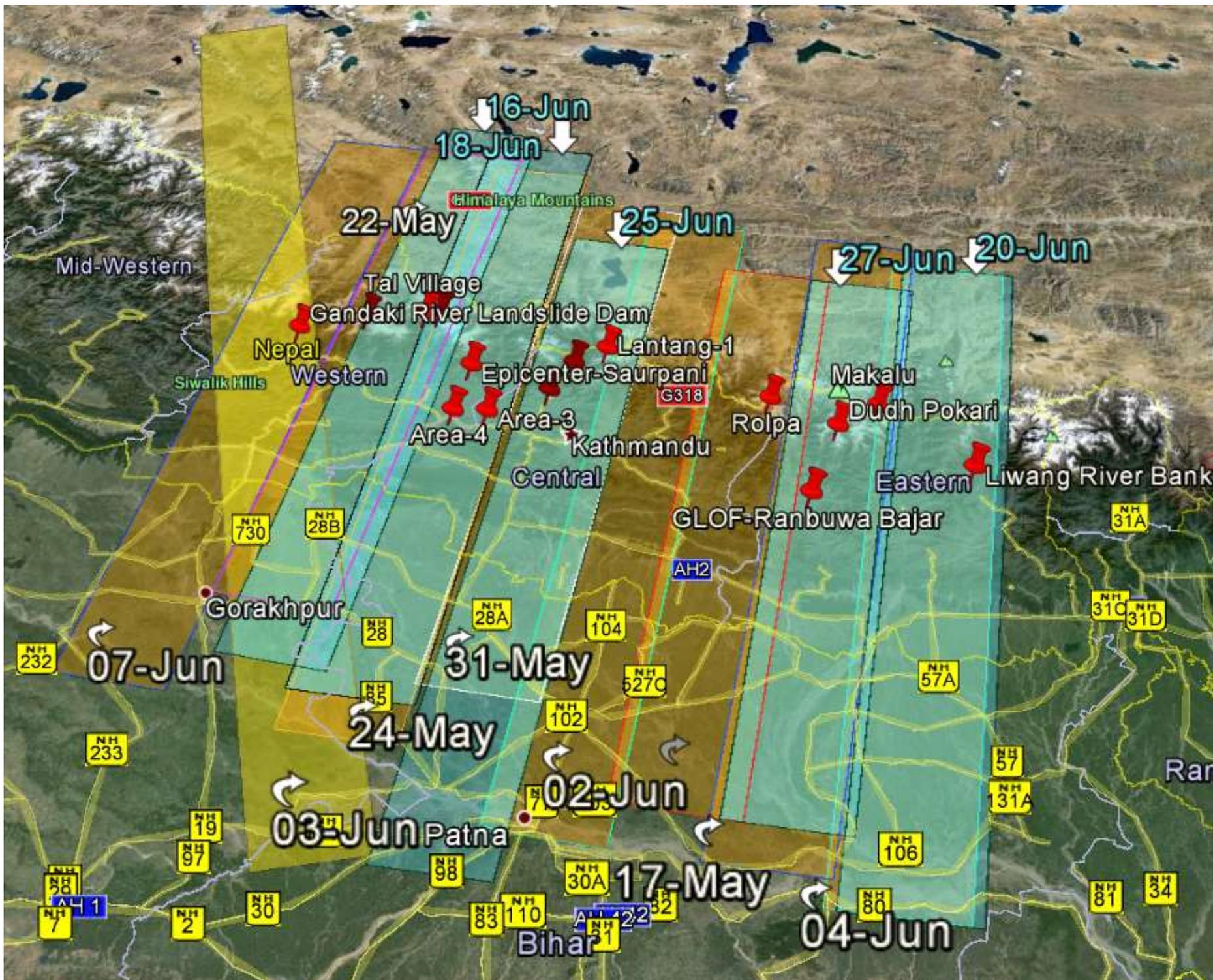
ASTER Tasking Plan – Nepal Lamjung Earthquake

Gains optimized for snow and ice

ASTER Imaging Phase III

Dates

- 16 June
- 18 June
- 20 June
- 25 June
- 27 June



ASTER Data Access Portals

LP DAAC ASTER EDS

Expedited data, 30-day retention

https://astereds.cr.usgs.gov/eds_archive.php

LP DAAC ASTER Expedited Directory

Expedited data, 30-day retention

http://e4ftl01.cr.usgs.gov/aster/AST_L1

NASA Reverb

Expedited and subsequent standard scenes

<http://reverb.echo.nasa.gov/>

LP DAAC GDEX

ASTER GDEM v2

<http://gdex.cr.usgs.gov/gdex/>

NASA Gorka (Nepal) Earthquake Response Summary

<http://weather.msfc.nasa.gov/sport/disasters/gorkha/>

Links to ASTER Expedited data at ASTER EDS:

<http://weather.msfc.nasa.gov/sport/disasters/gorkha/opticalImagery/>

USGS HDDS

Expedited data

<http://hddsexplorer.usgs.gov/>

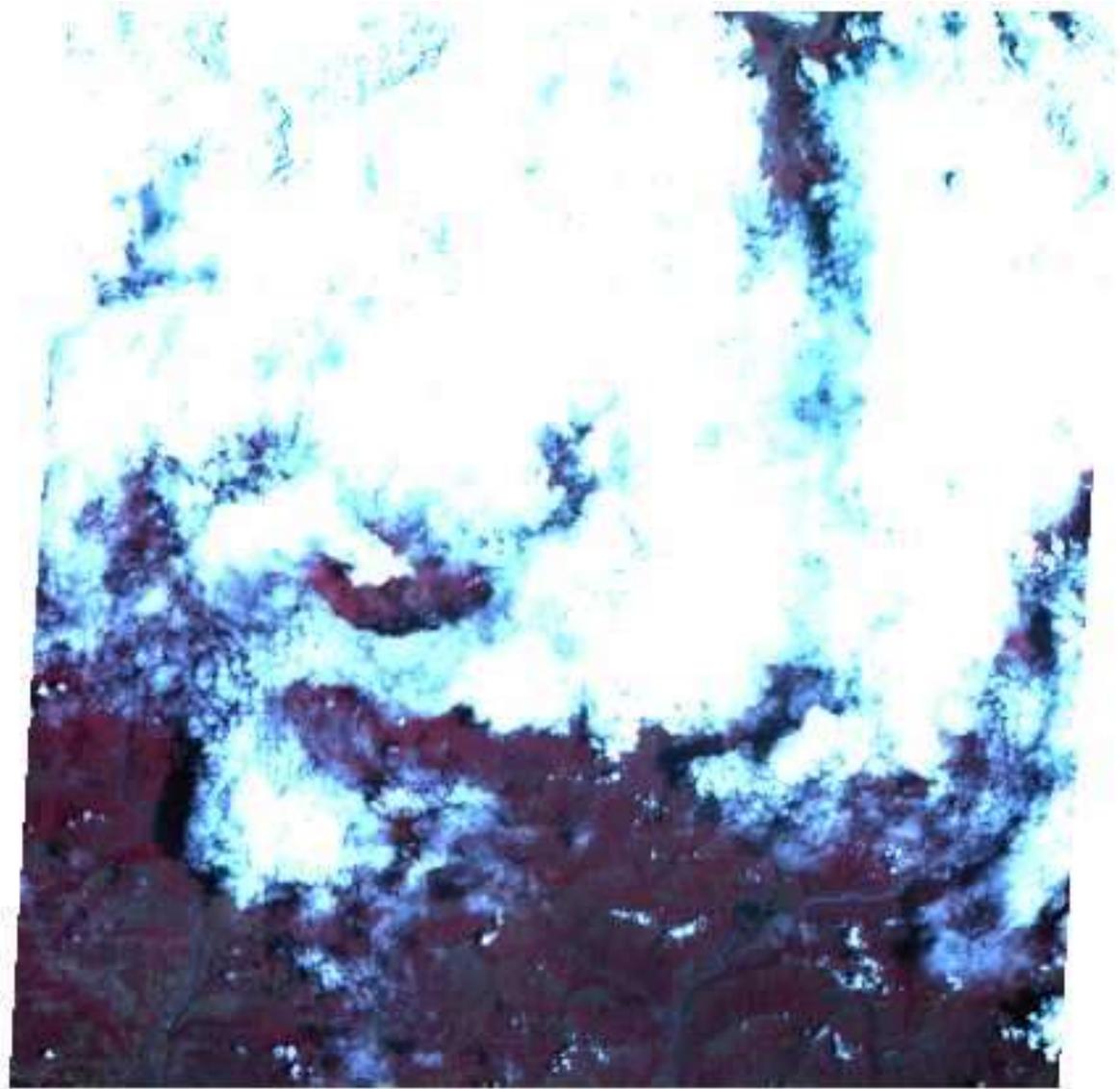
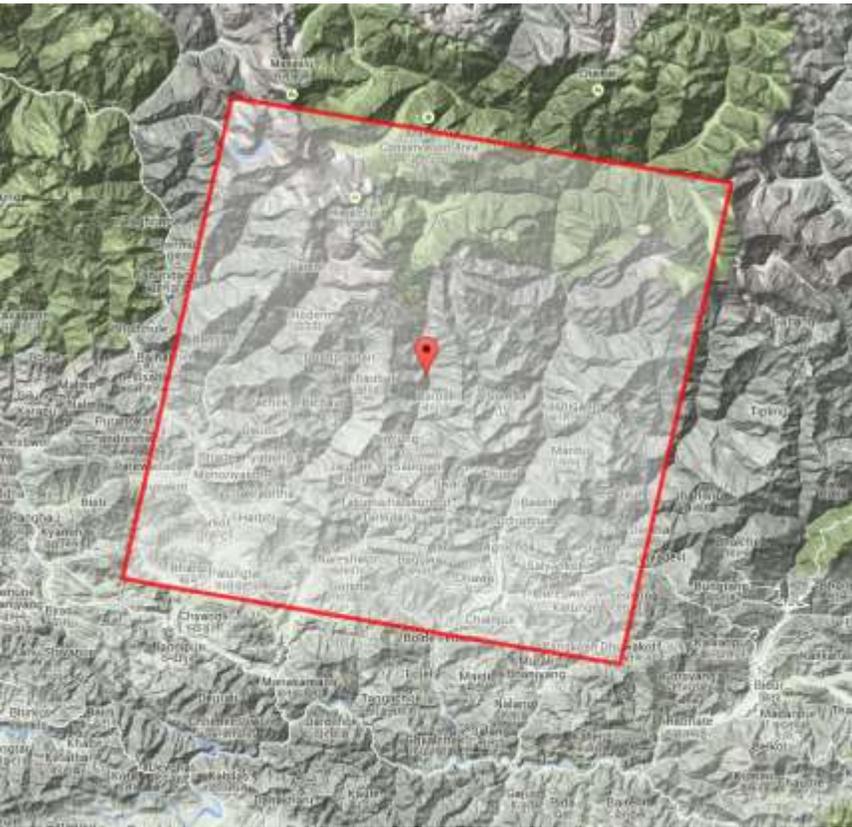
USGS GloVis

Standard products

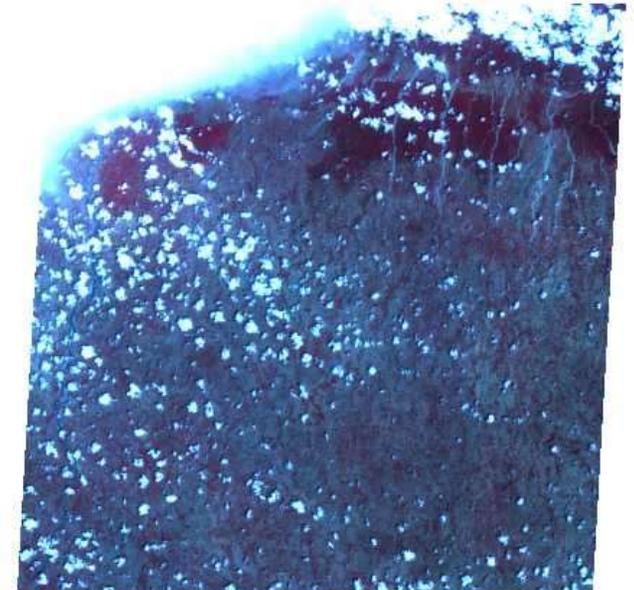
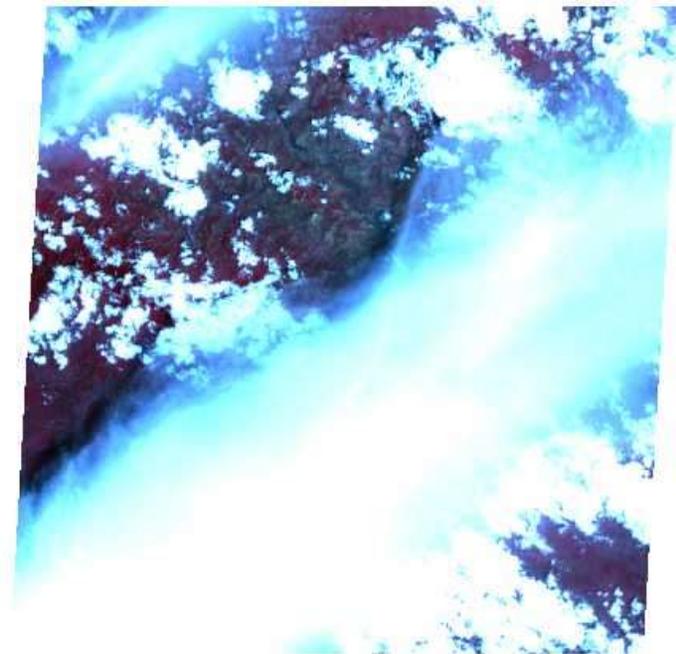
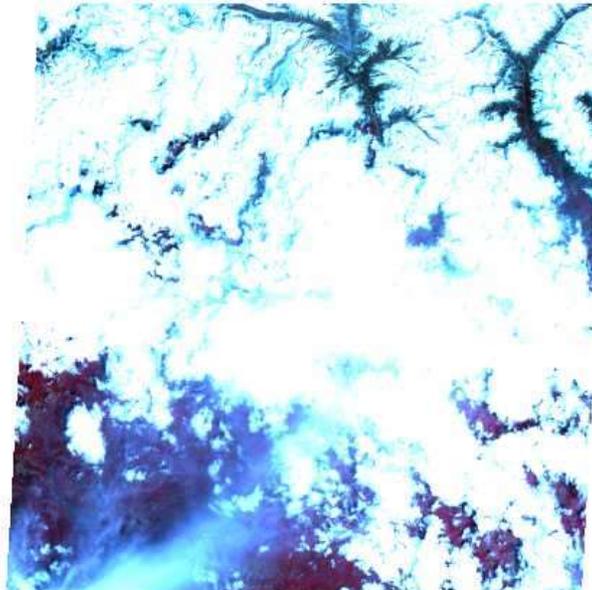
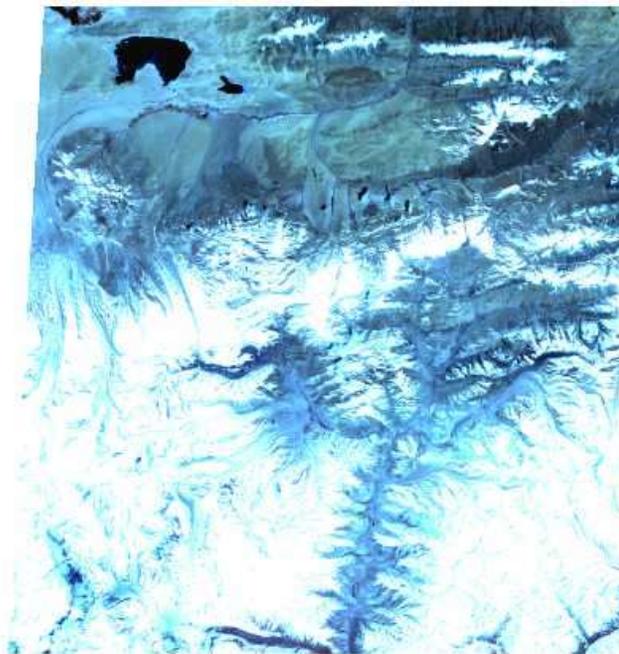
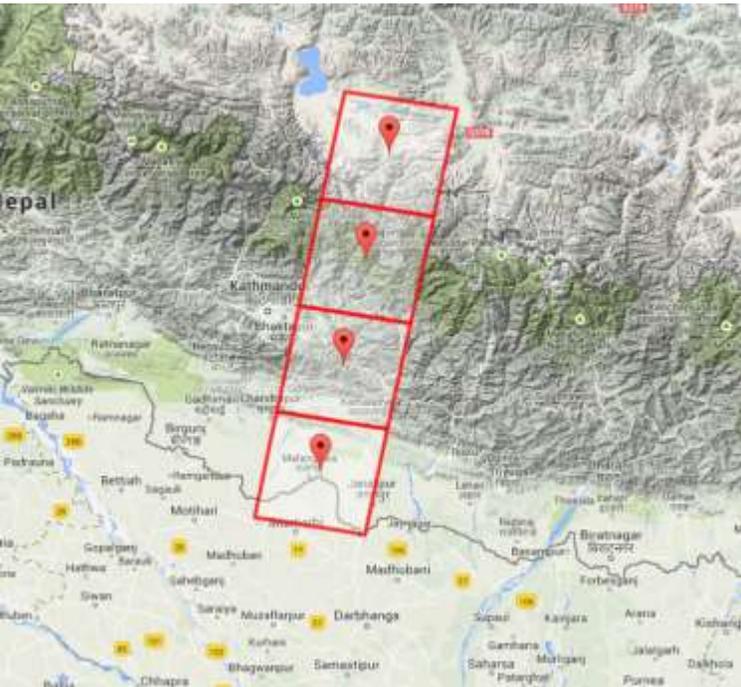
<http://glovis.usgs.gov/>

ASTER Expedited Data

29 April 2015

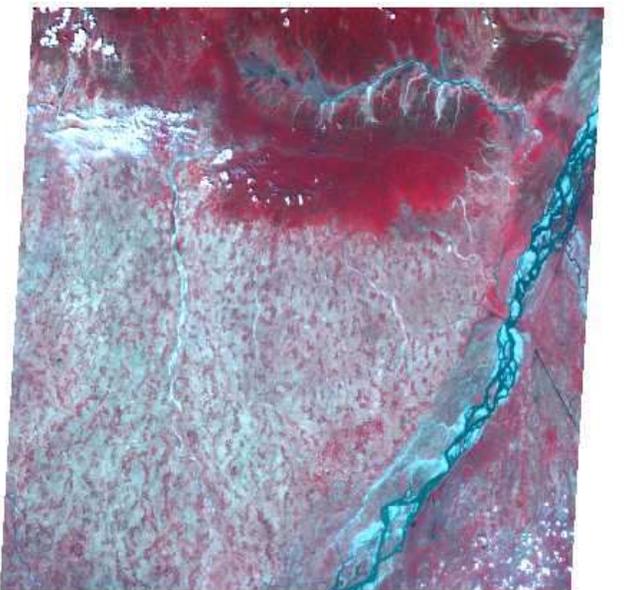
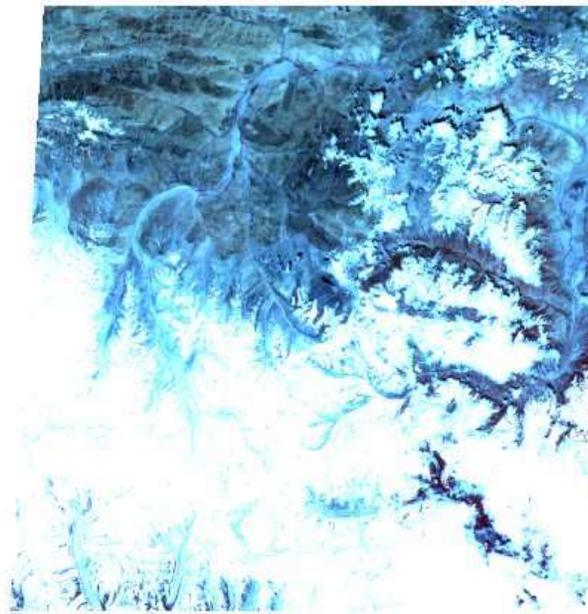
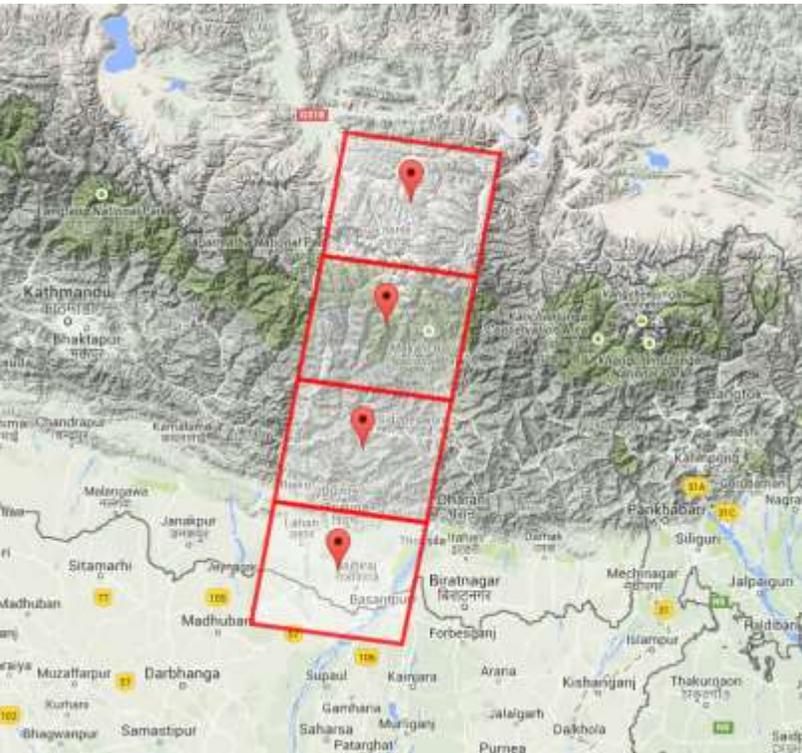


ASTER Expedited Data 1 May 2015



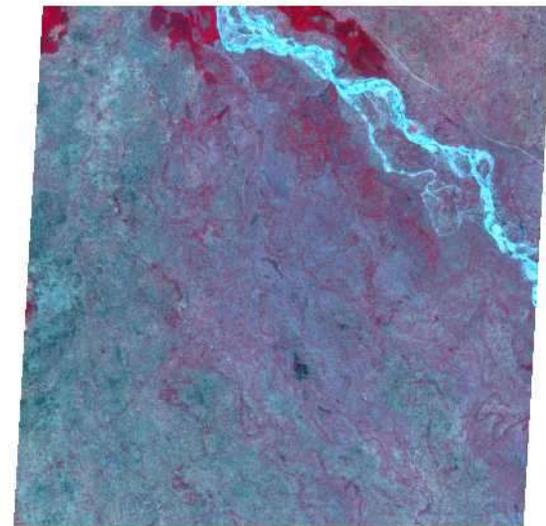
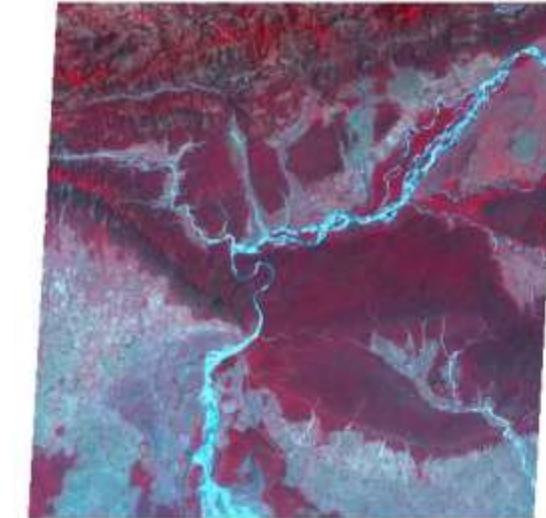
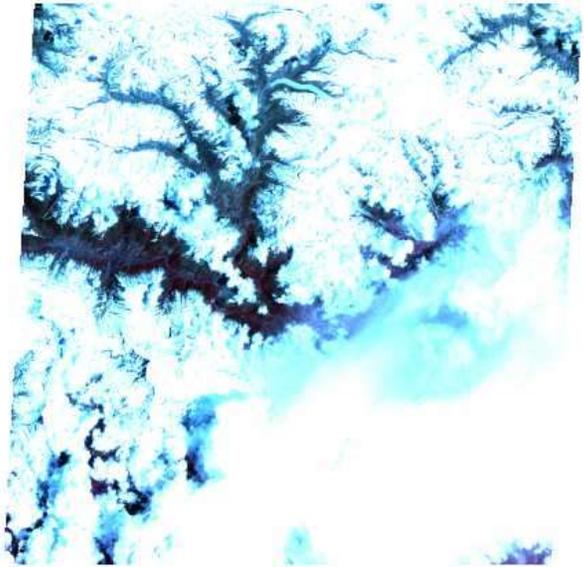
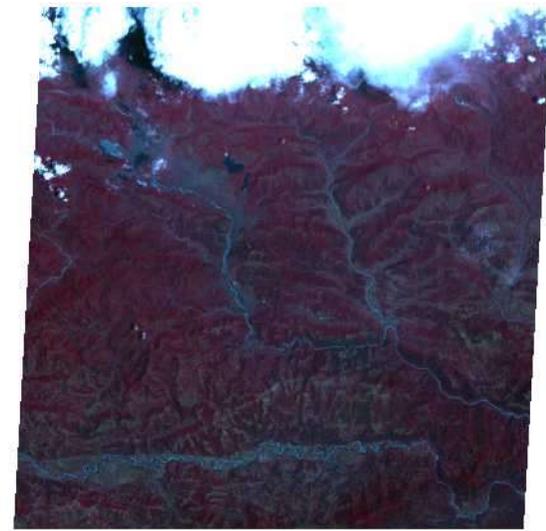
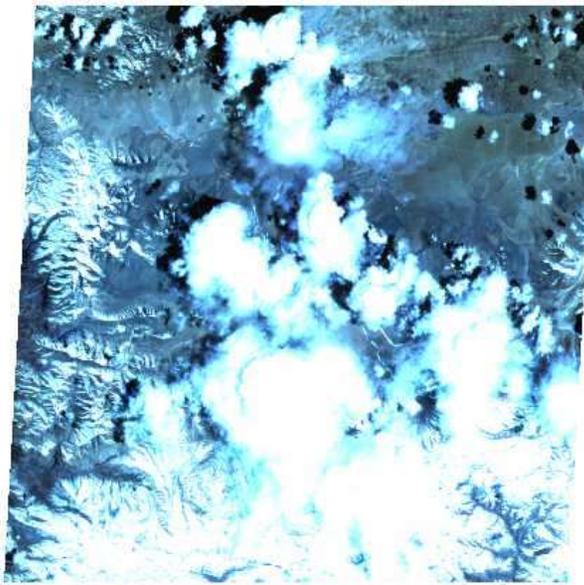
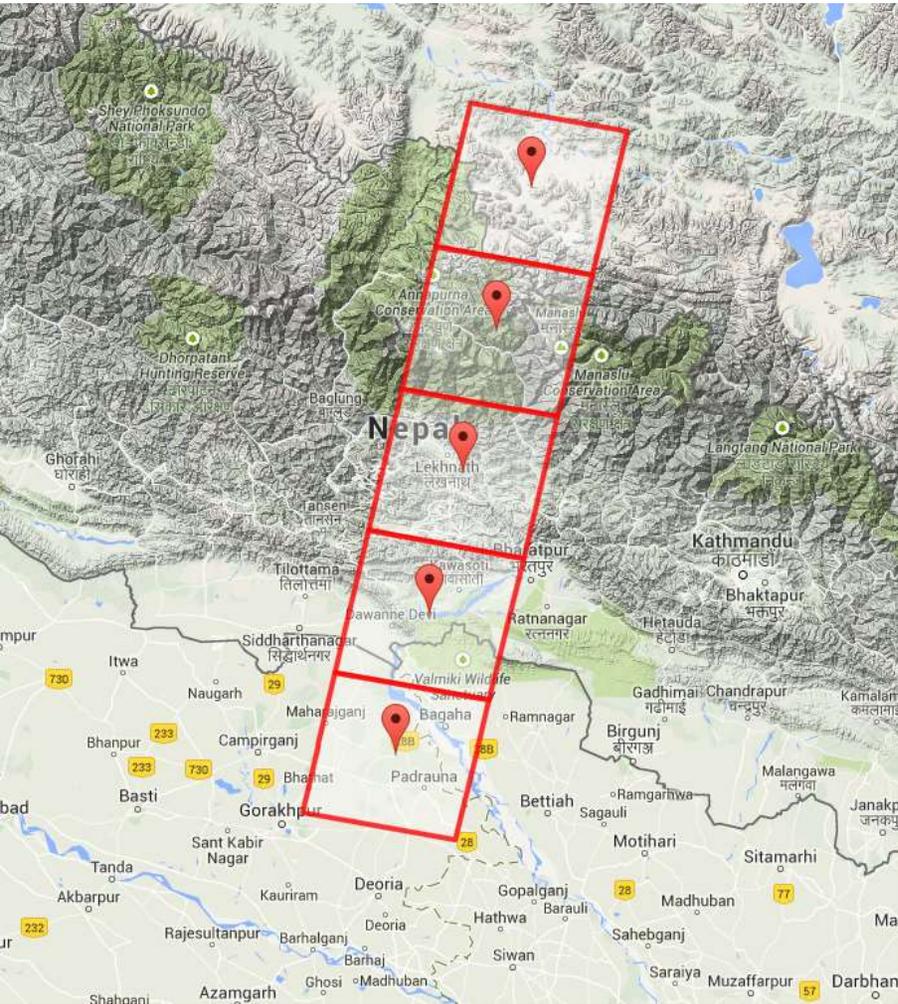
ASTER Expedited Data

3 May 2015



ASTER Expedited Data

6 May 2015

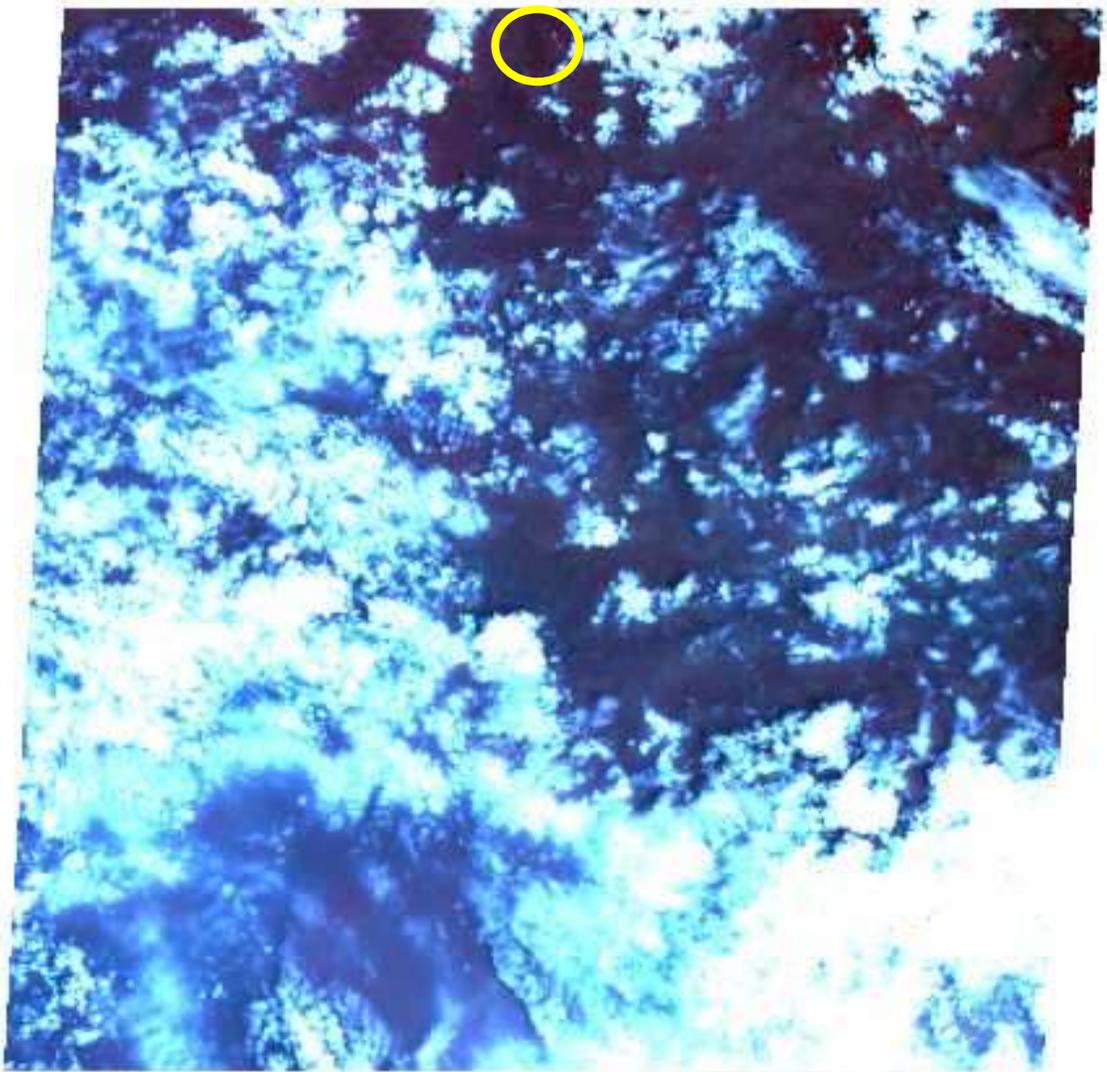


ASTER Expedited Data

8 May 2015



Epicenter 28.15 N, 84.71 E



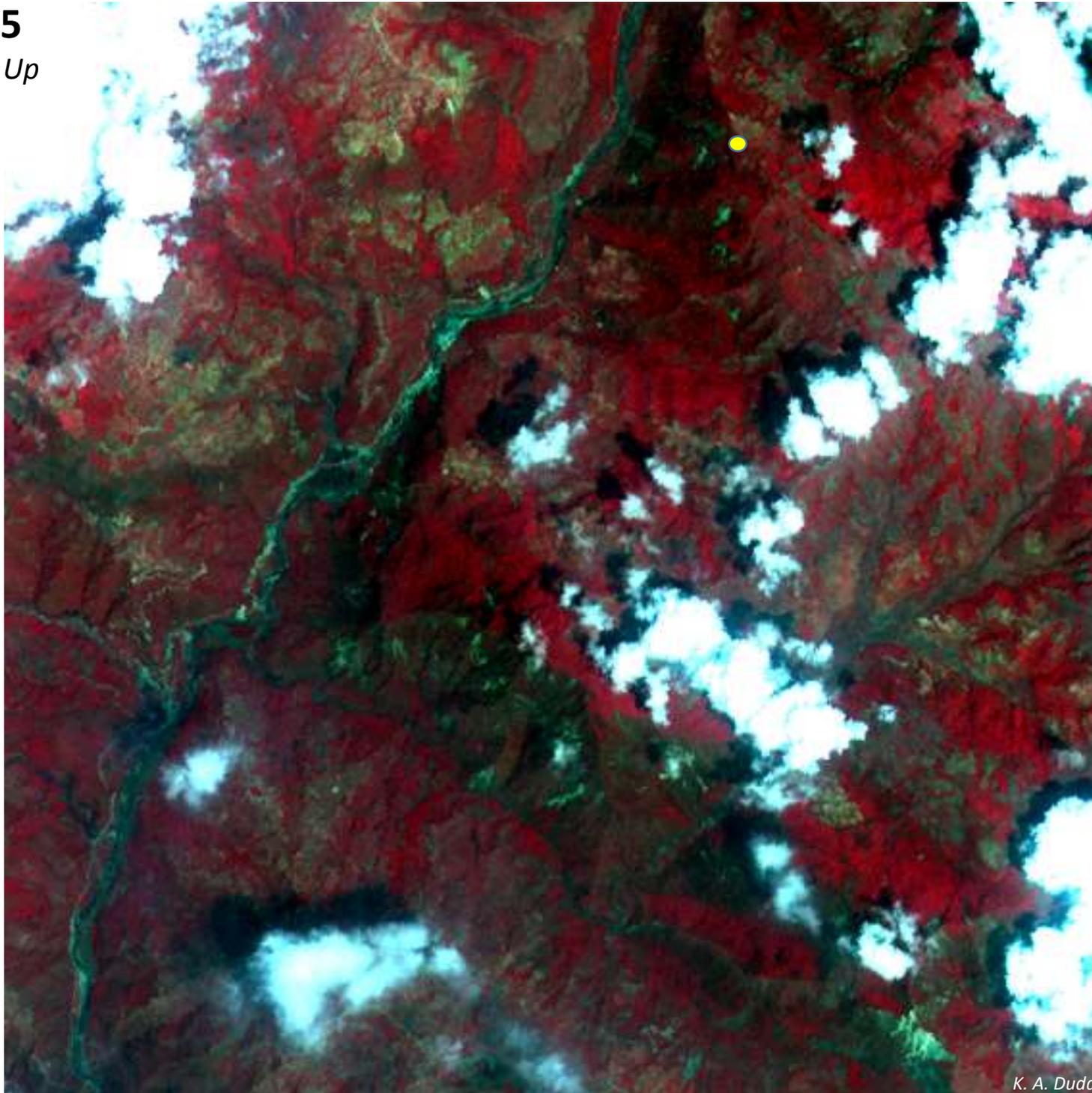
Subset



ASTER Expedited Data Subset

8 May 2015

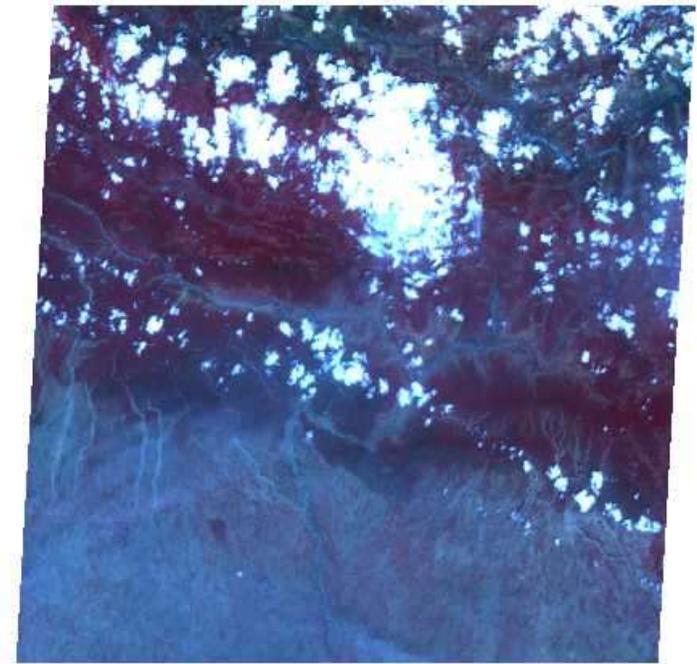
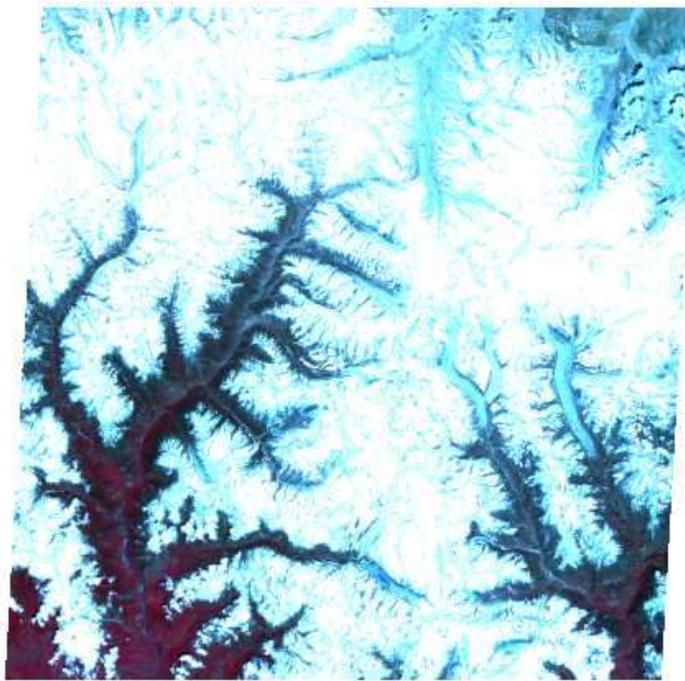
Rotated North Up



Epicenter
28.15 N, 84.71 E

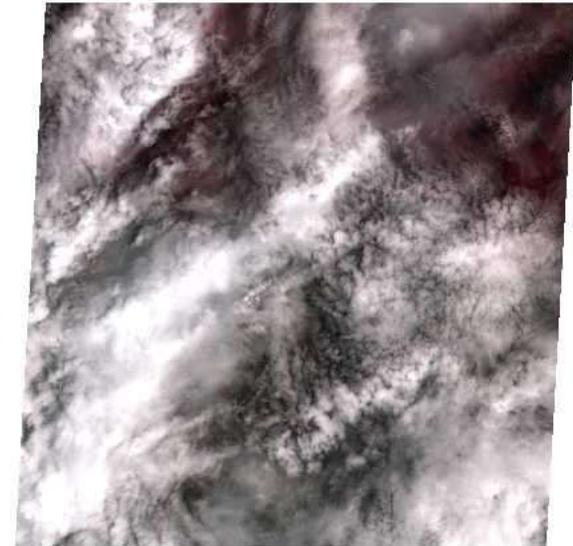
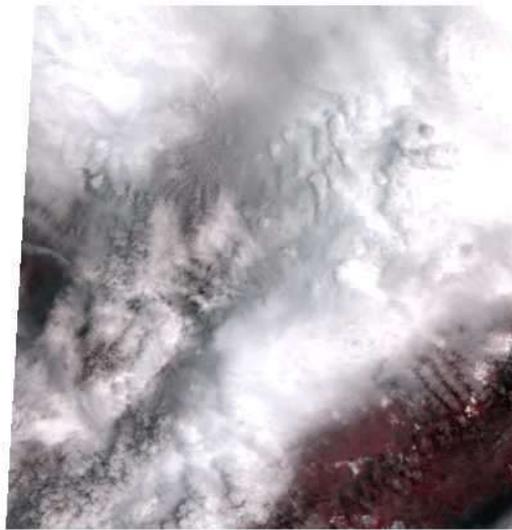
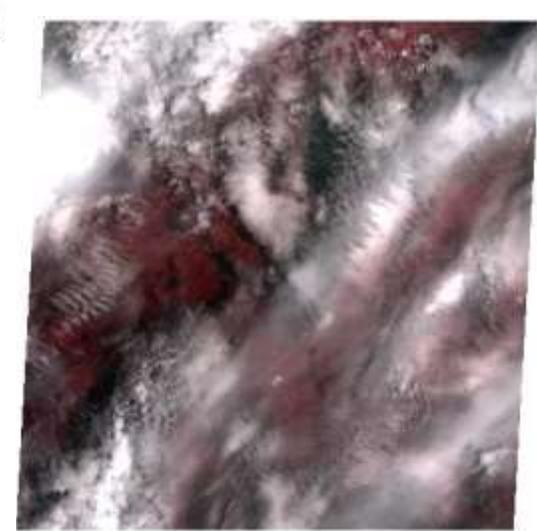
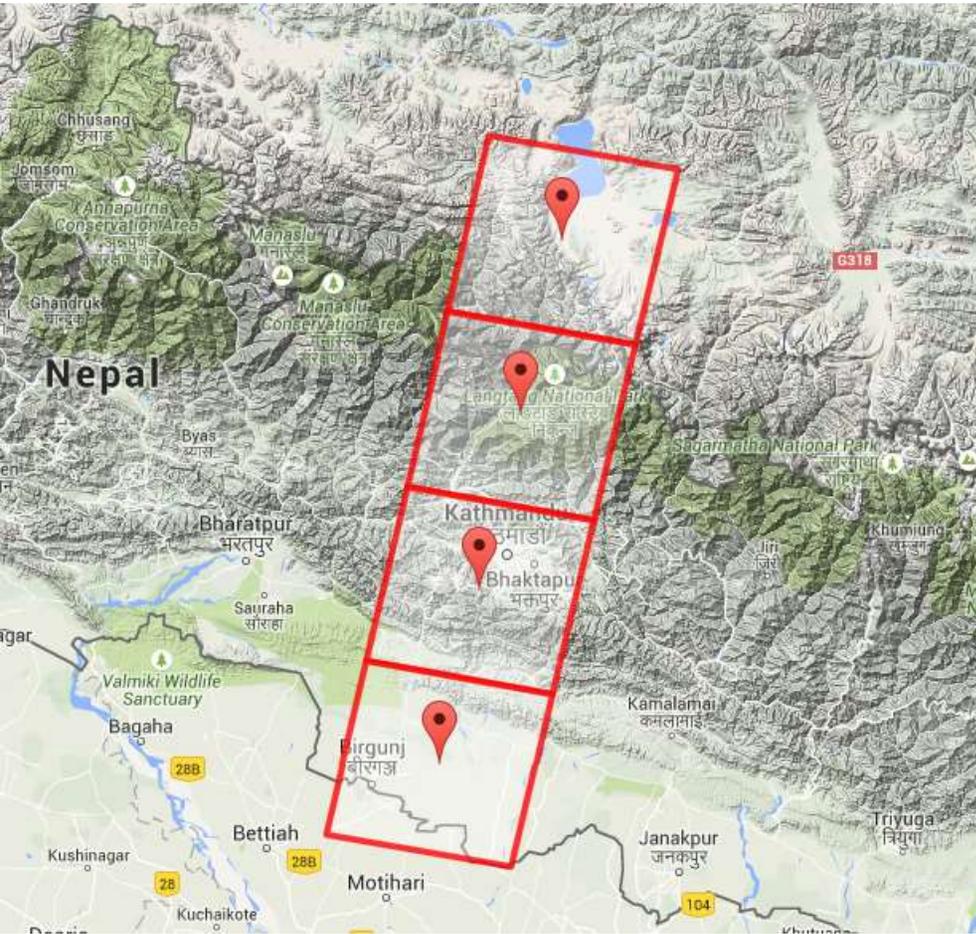
K. A. Duda

ASTER Expedited Data 10 May 2015



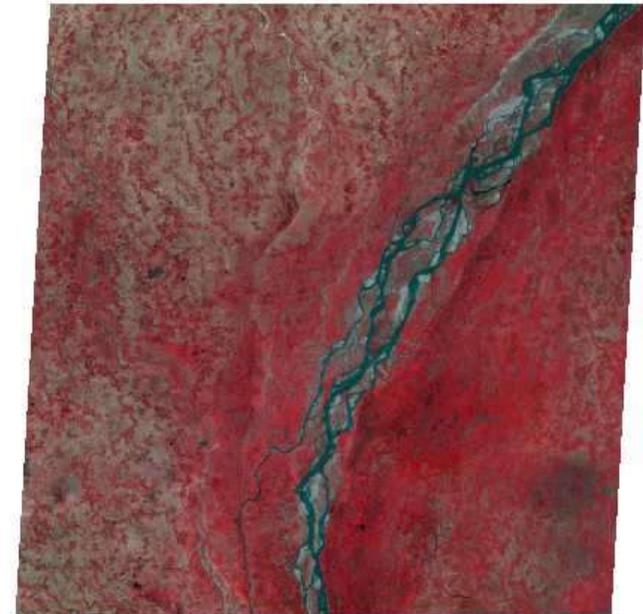
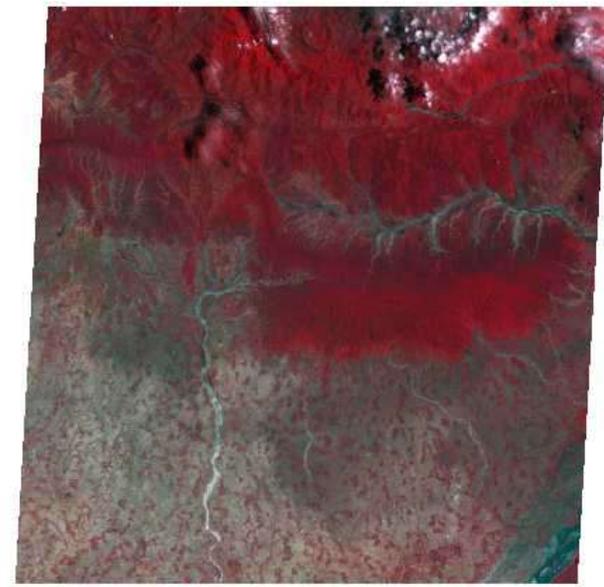
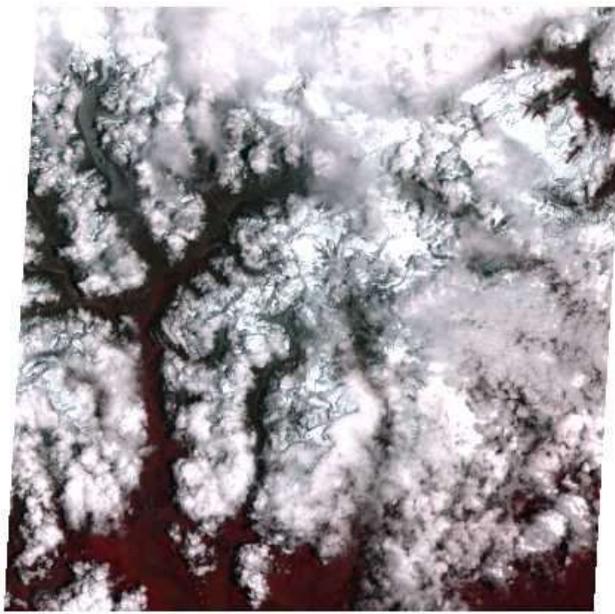
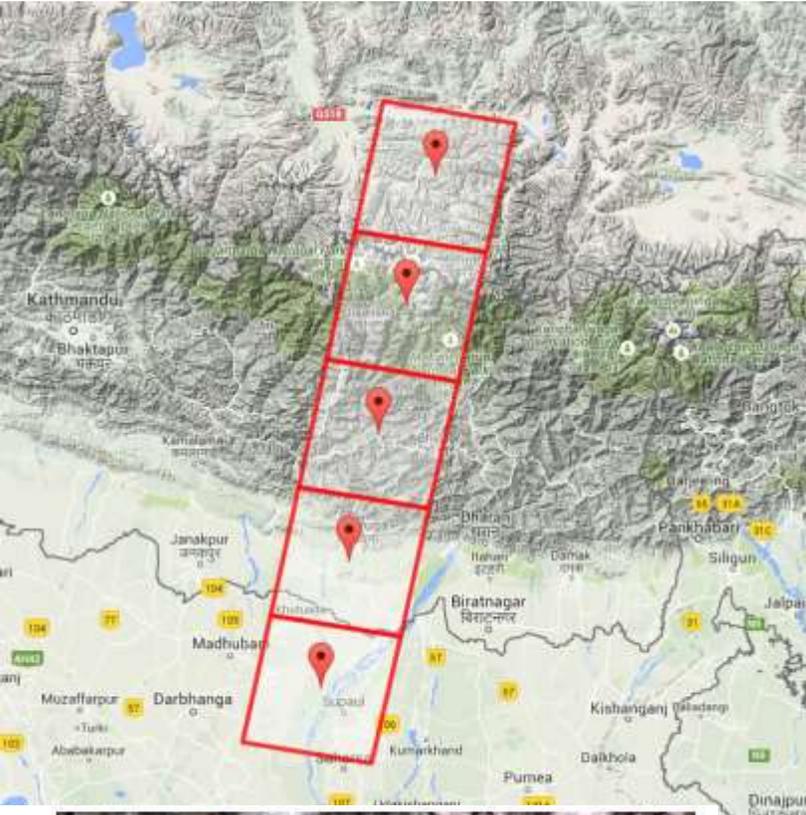
ASTER Expedited Data

15 May 2015



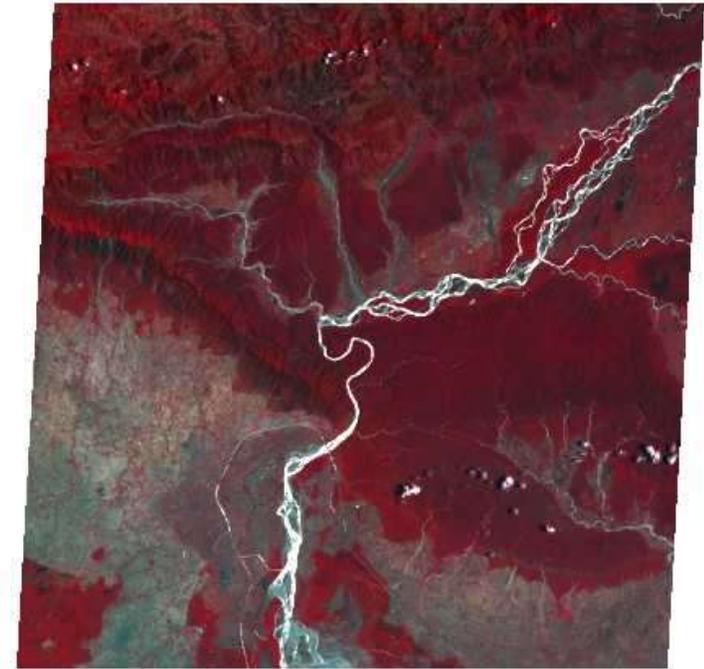
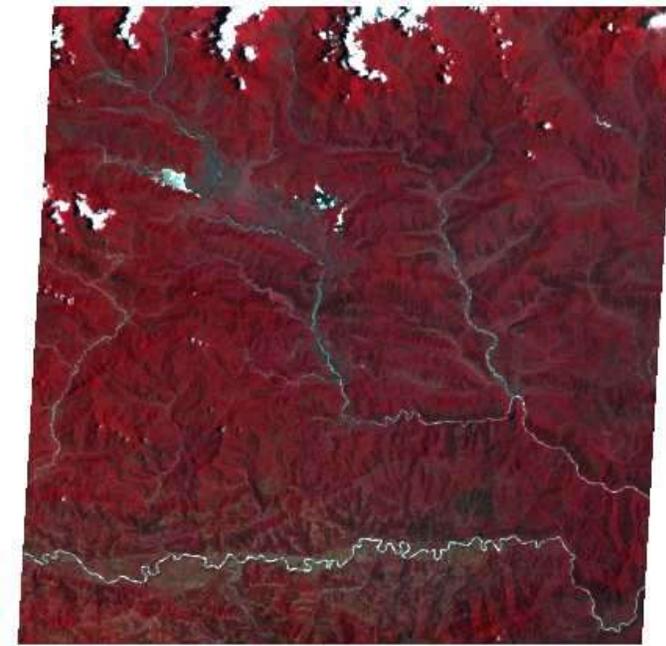
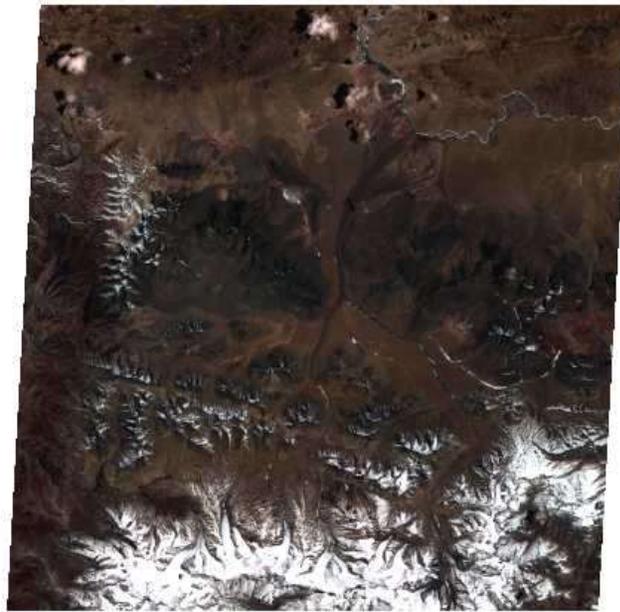
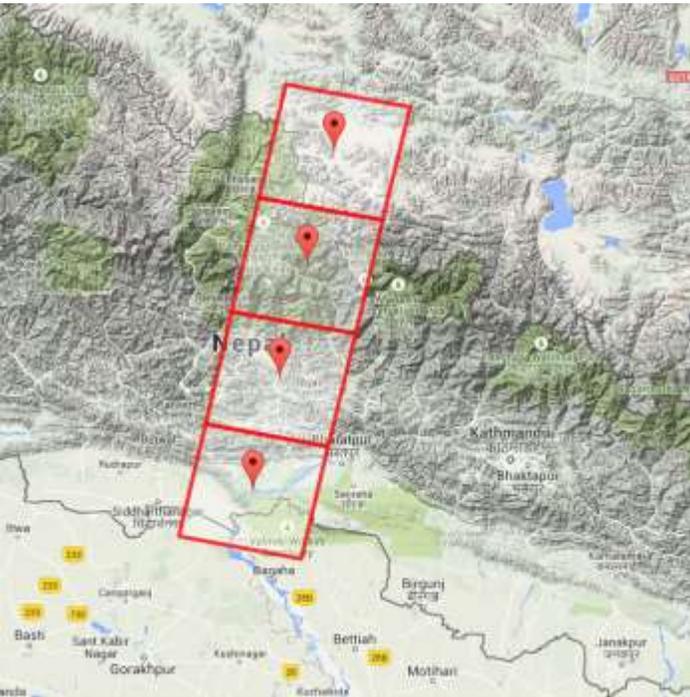
ASTER Expedited Data

17 May 2015



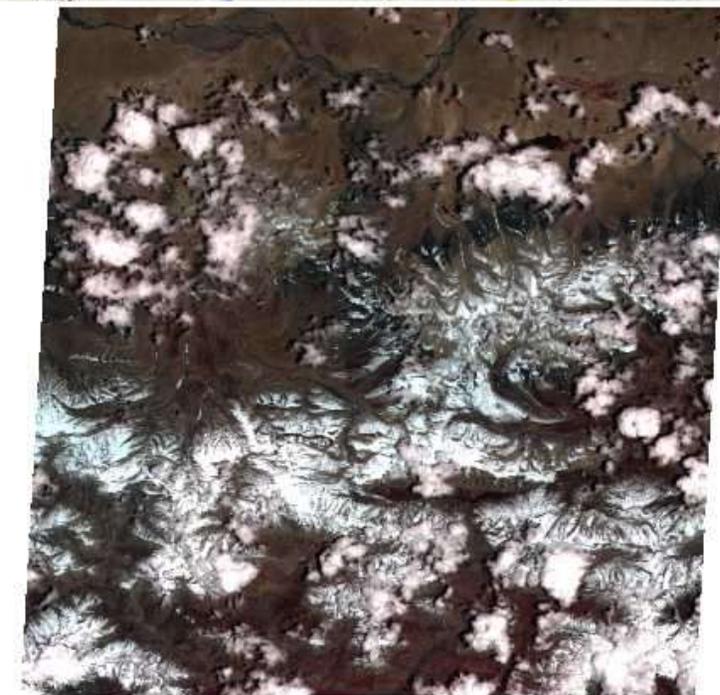
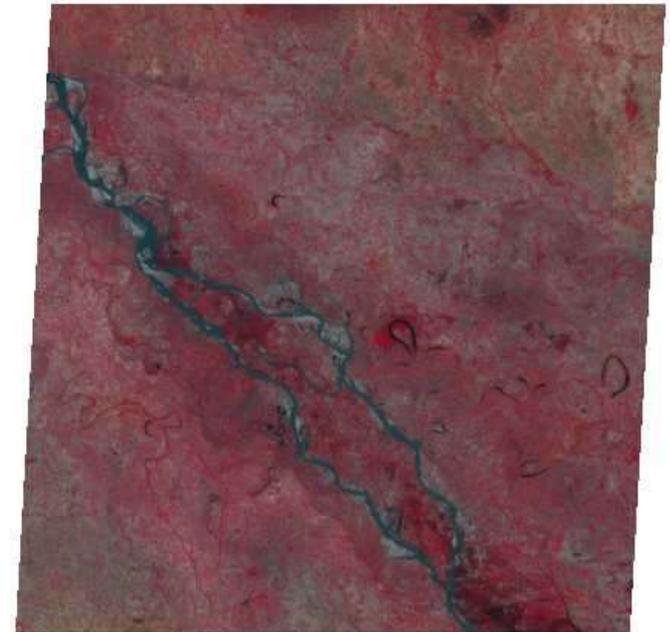
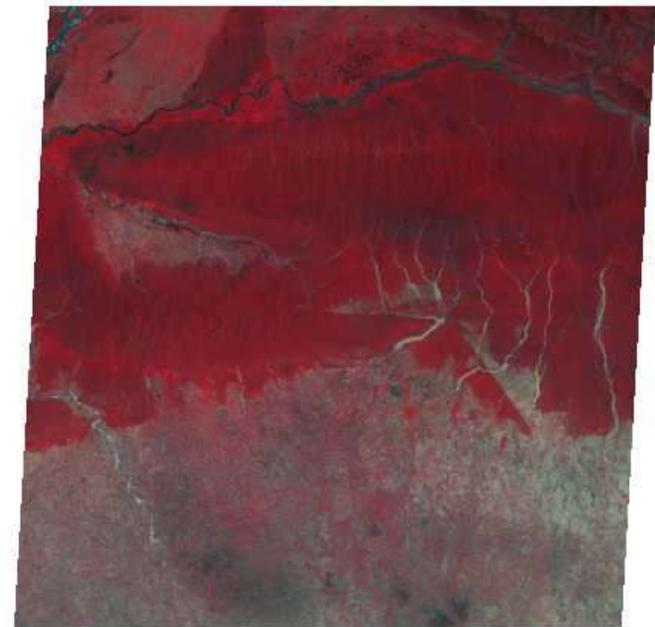
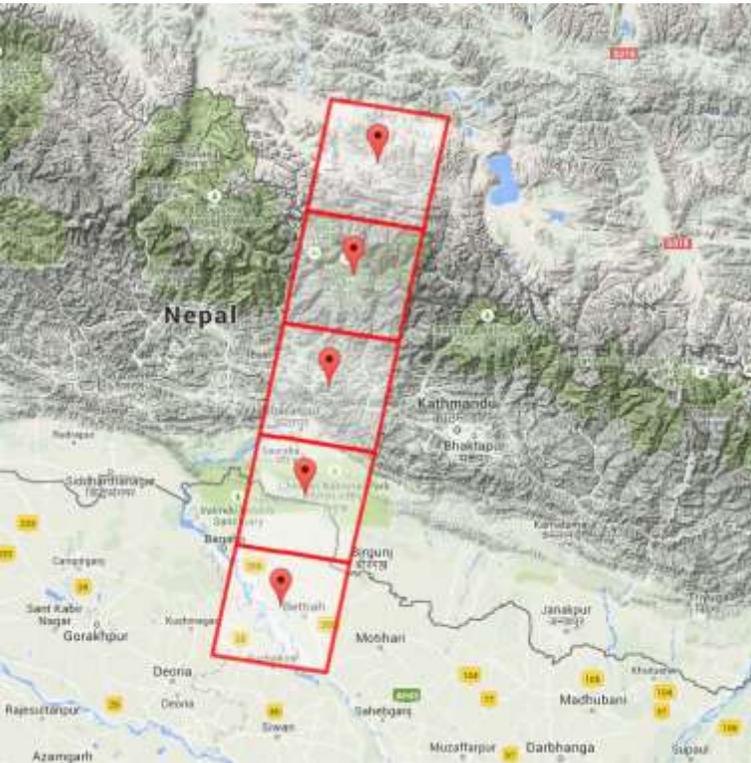
ASTER Expedited Data

22 May 2015



ASTER Expedited Data

24 May 2015



ASTER Expedited Data Subset 24 May 2015

"Ghap" Landslide, Tom Khola River

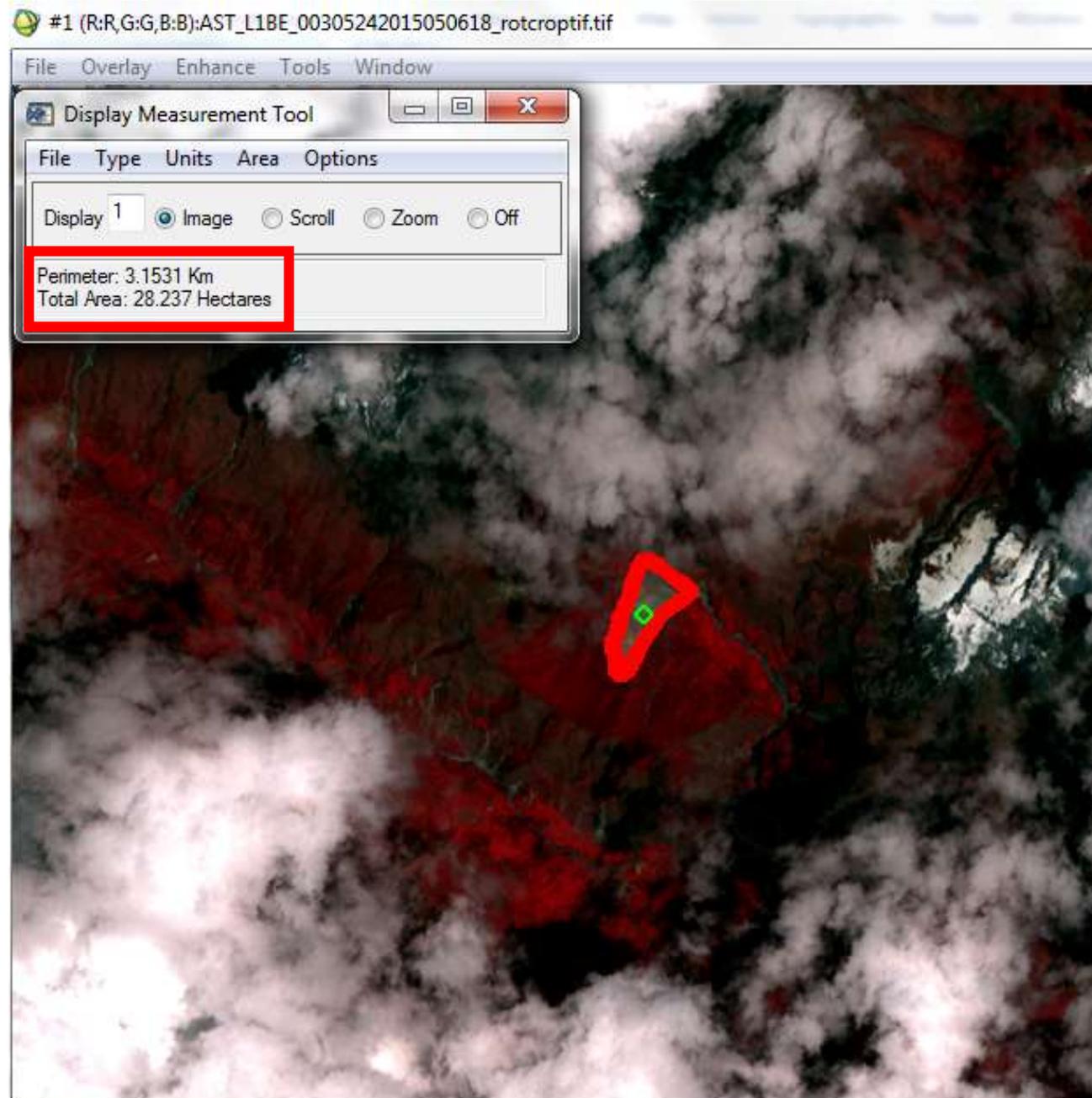


Scene subset for vicinity of
a landslide reported at
 $28^{\circ}33'32.40''\text{N}$
 $84^{\circ}47'34.80''\text{E}$

Views are rotated north up.

Measurement of perimeter and area.

AST_L1BE_00305242015050618_20150524005218_1356.hdf



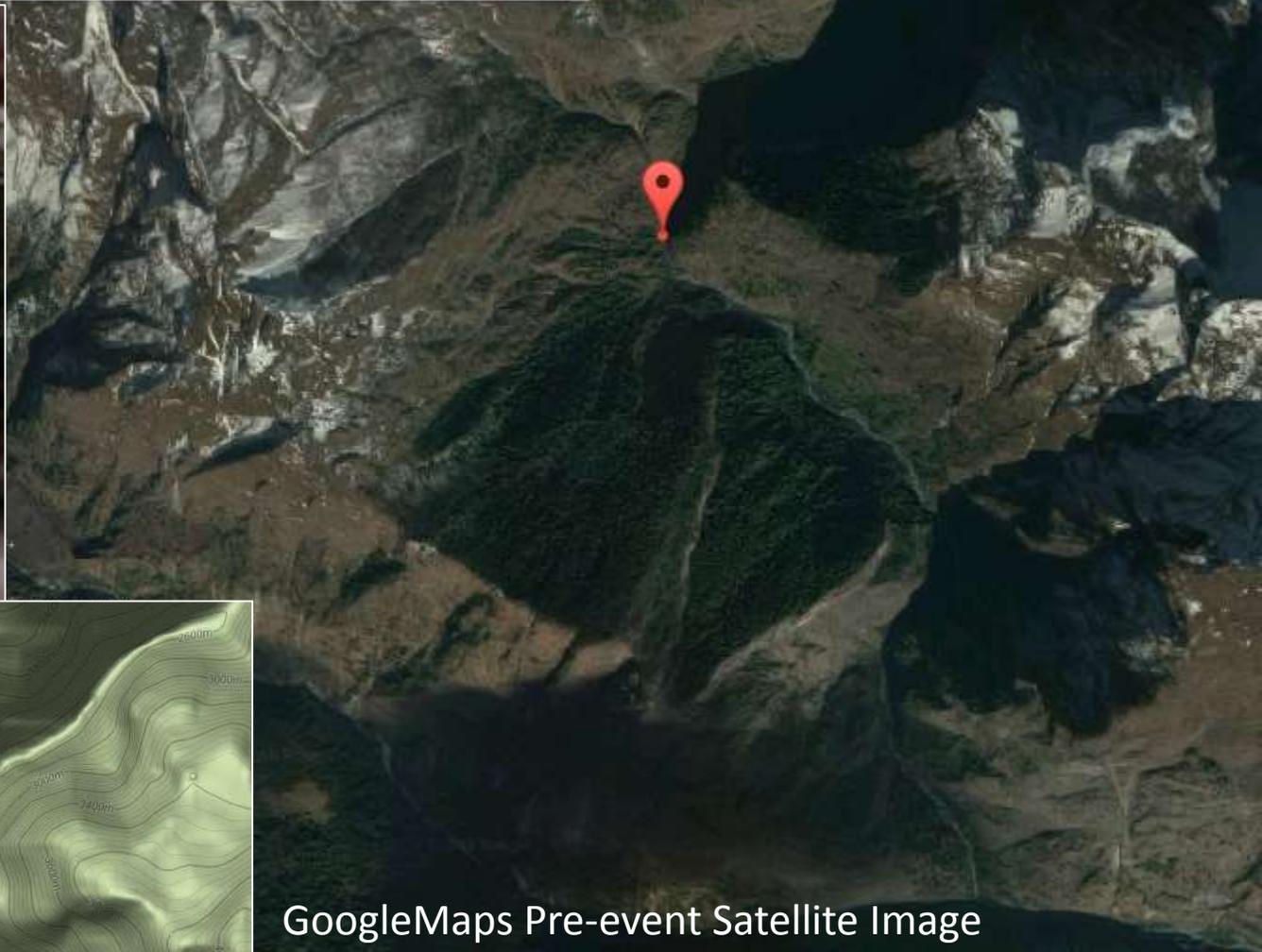
ASTER Expedited Data Subset 24 May 2015

28.559,84.7929999999999999

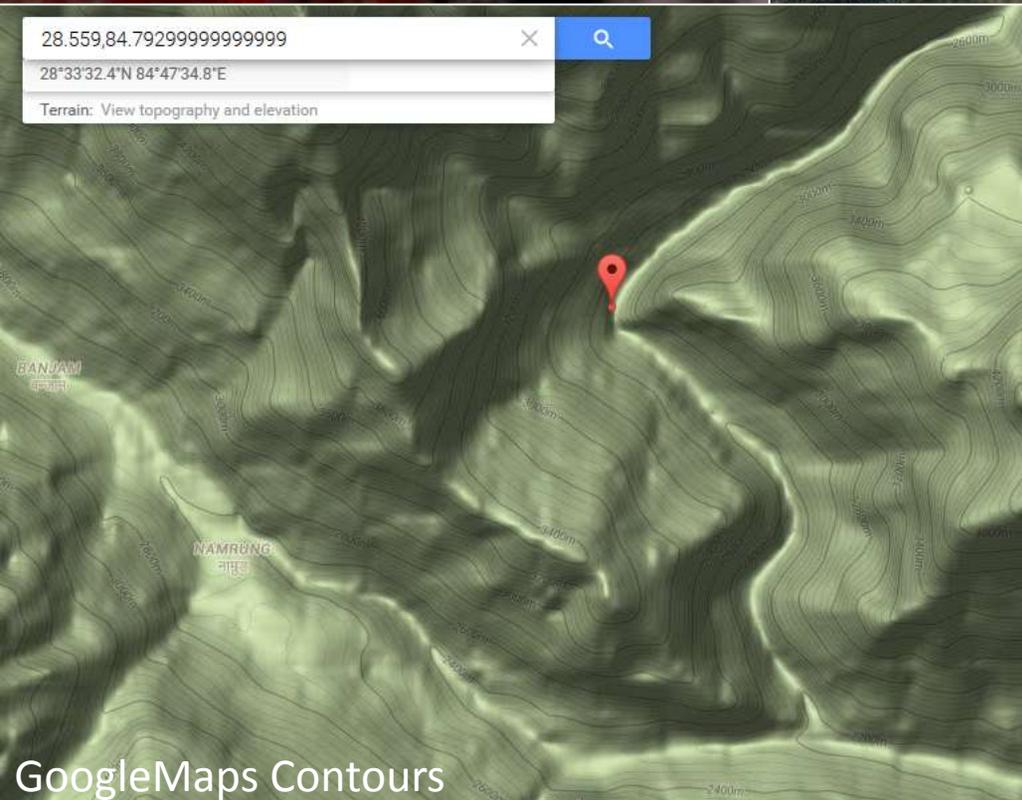
28°33'32.4"N 84°47'34.8"E

Terrain: View topography and elevation

"Ghap" Landslide, Tom Khola River



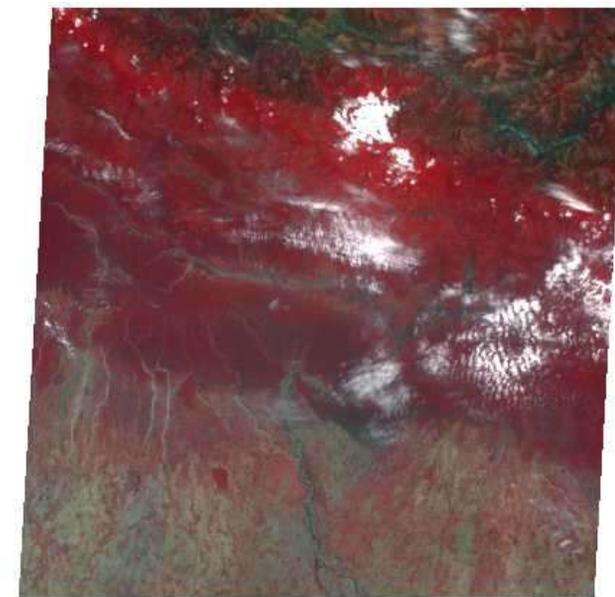
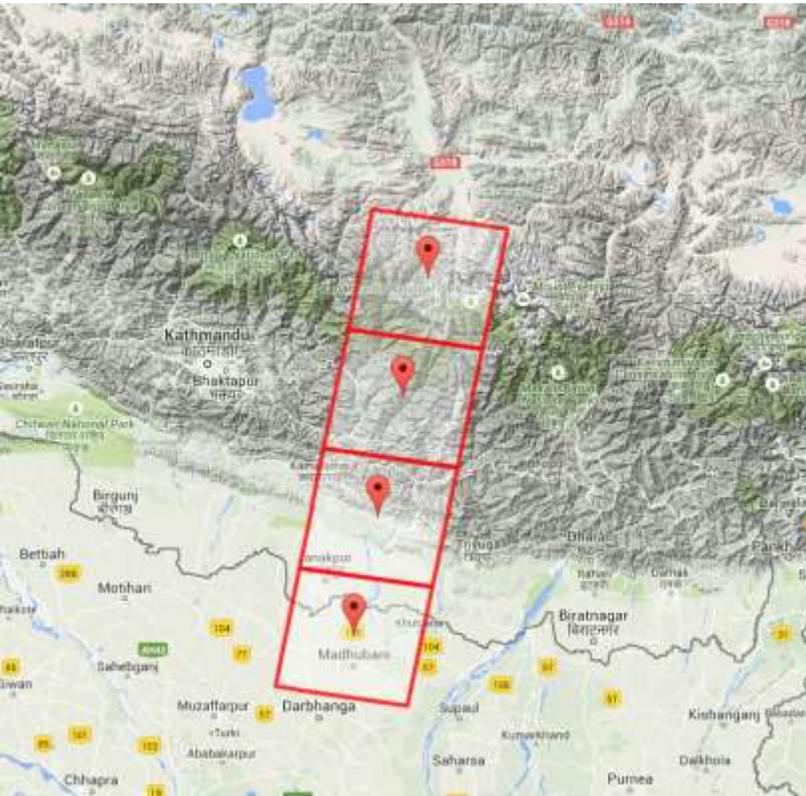
GoogleMaps Pre-event Satellite Image



GoogleMaps Contours

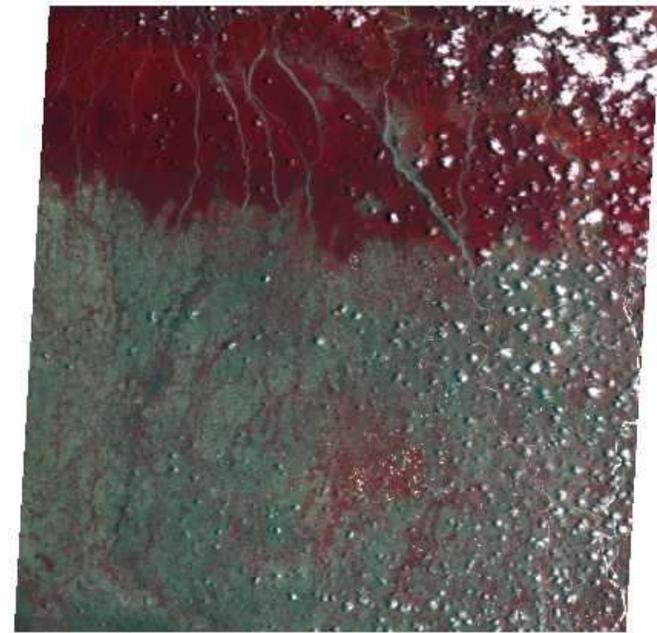
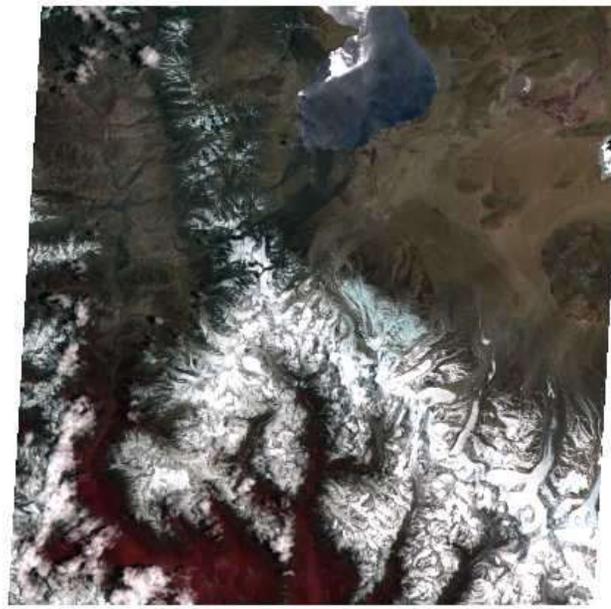
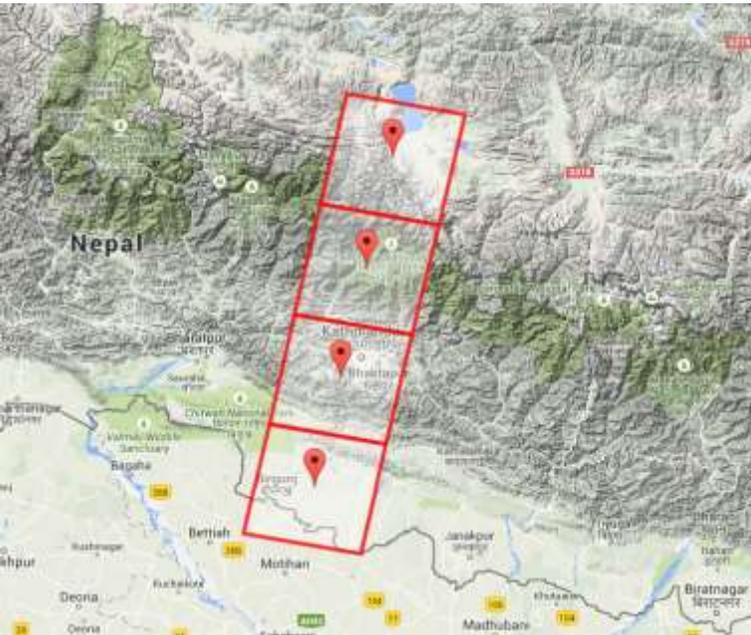
ASTER Expedited Data

26 May 2015



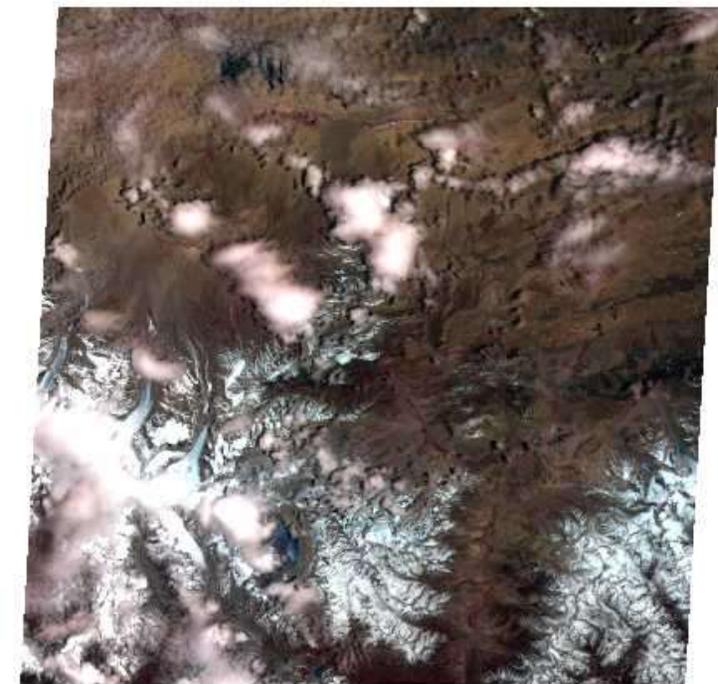
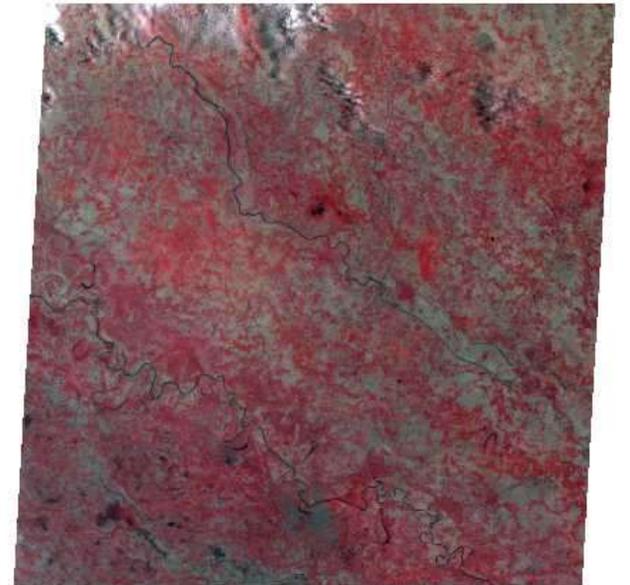
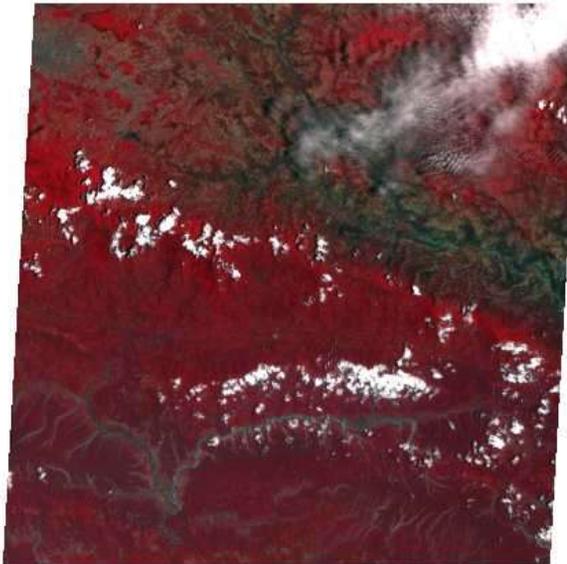
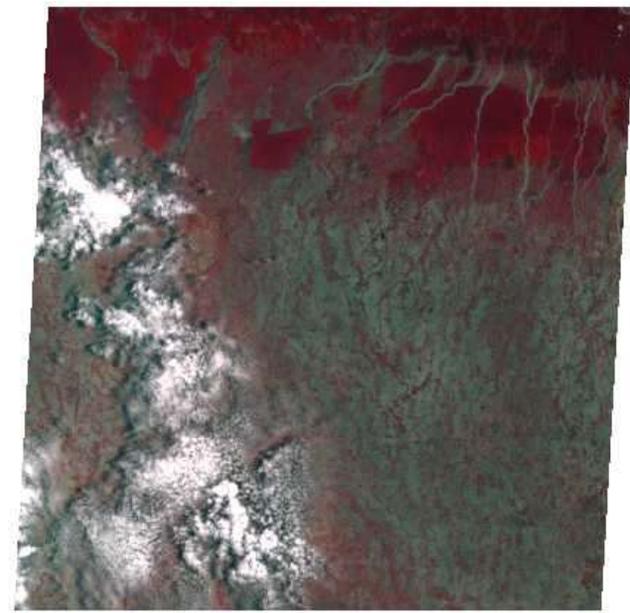
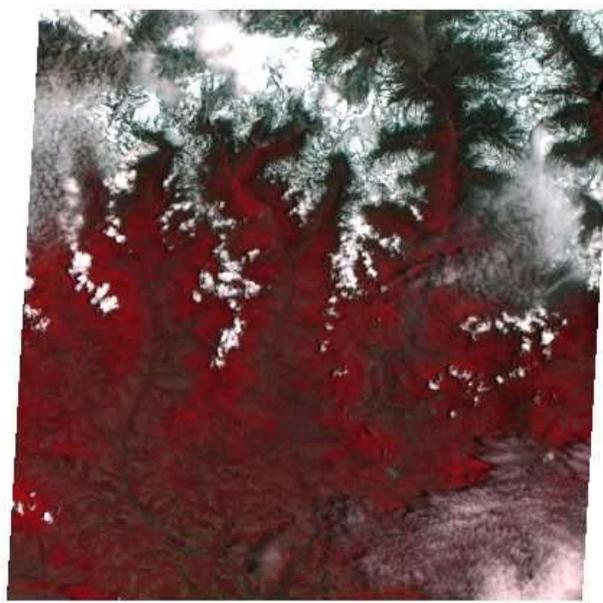
ASTER Expedited Data

31 May 2015



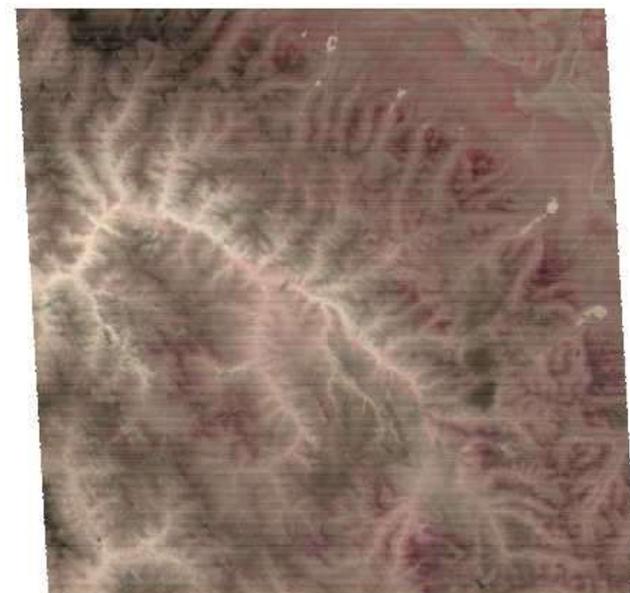
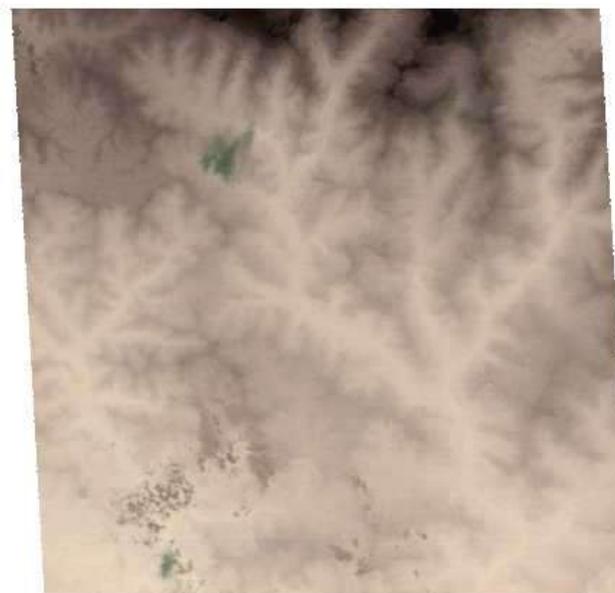
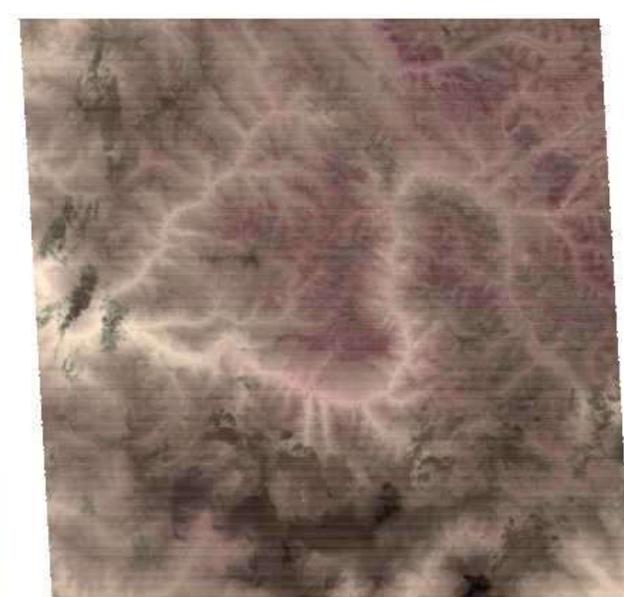
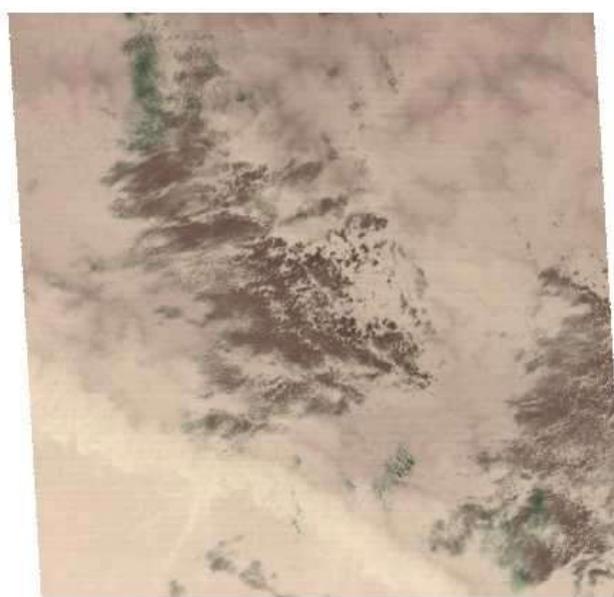
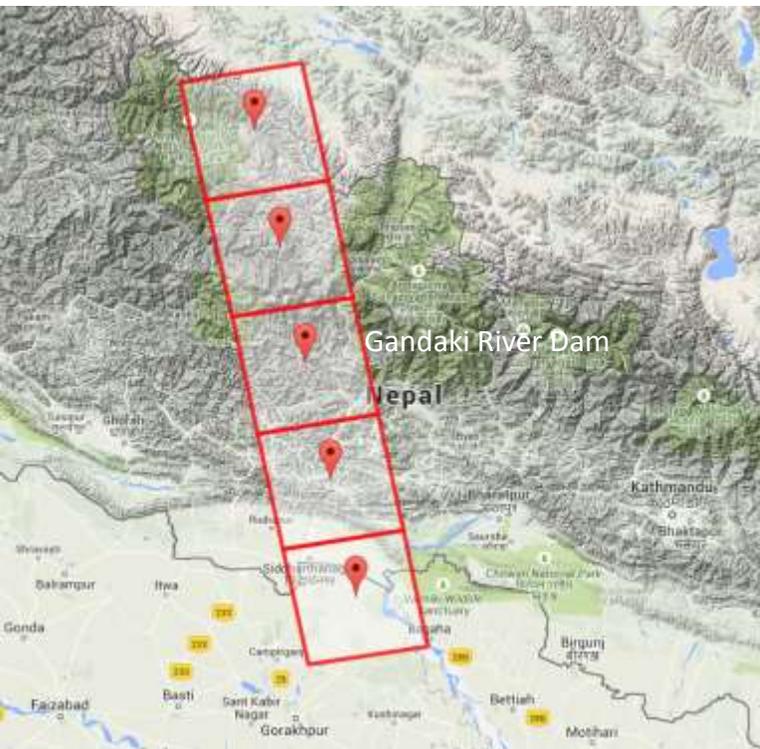
ASTER Expedited Data

2 June 2015



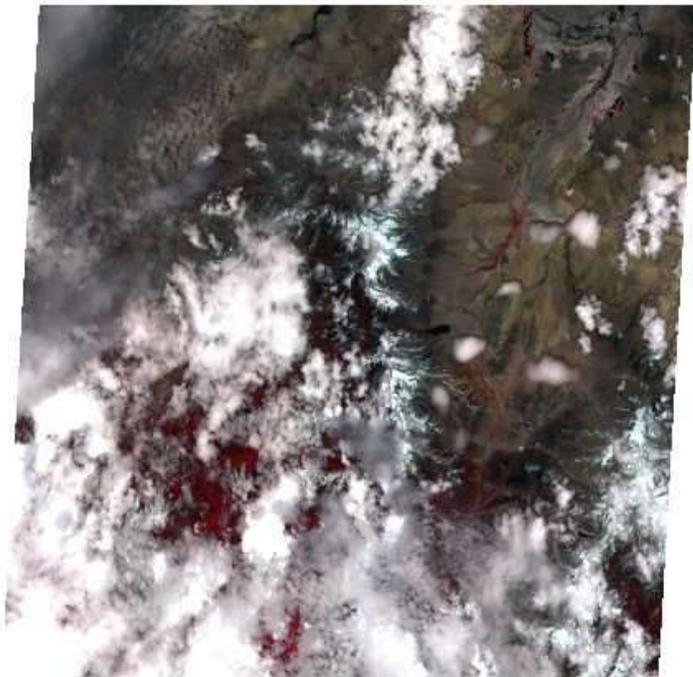
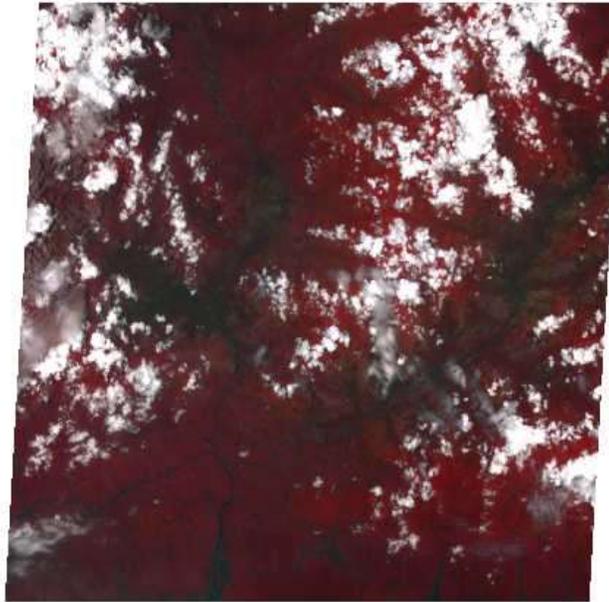
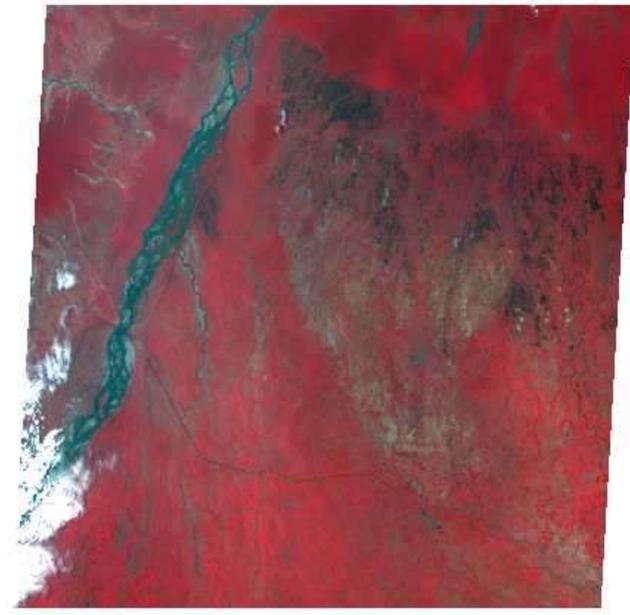
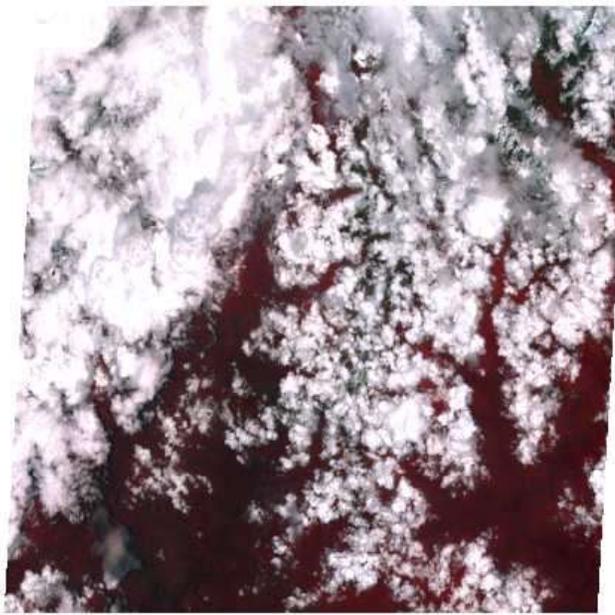
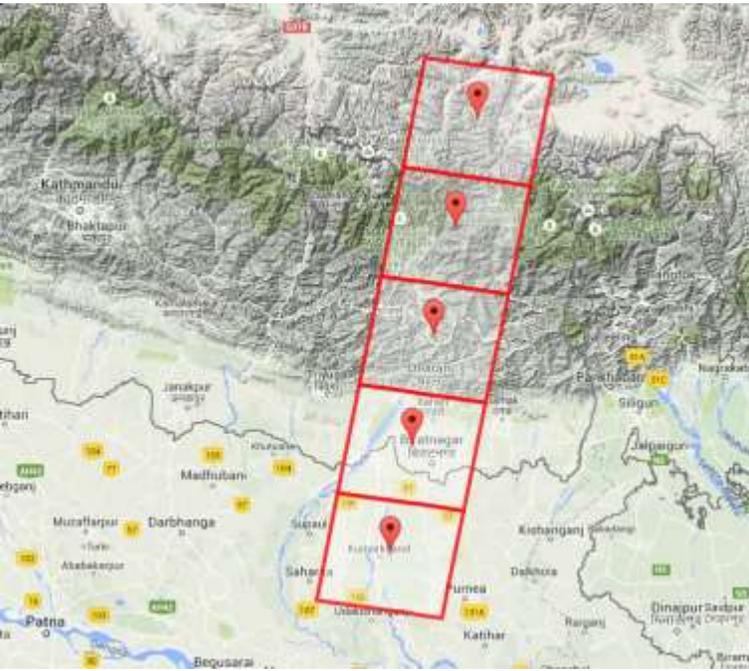
ASTER Expedited Data

3 June 2015
NIGHT, TIR ONLY



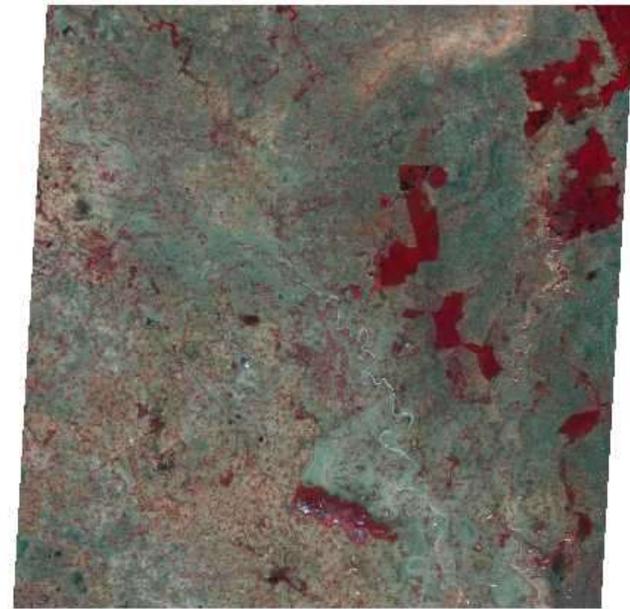
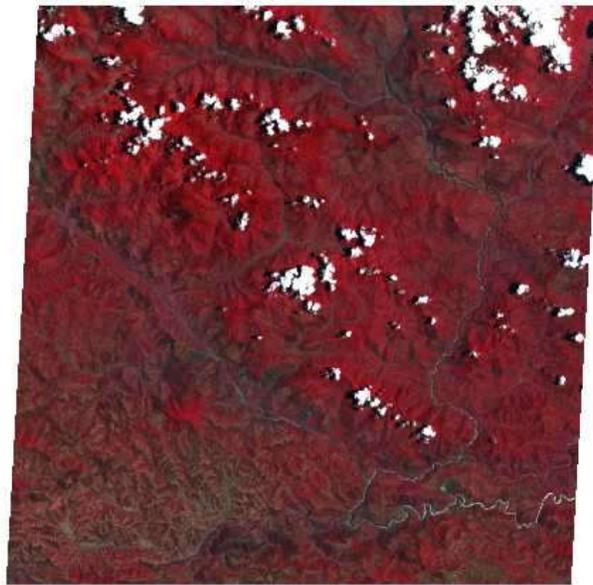
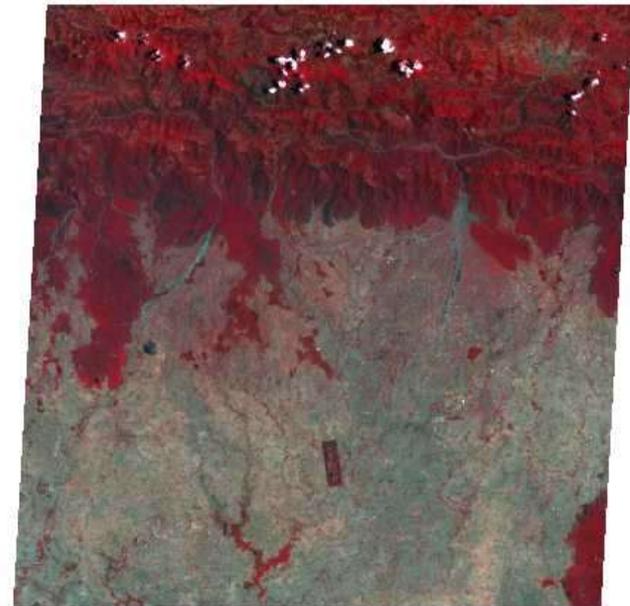
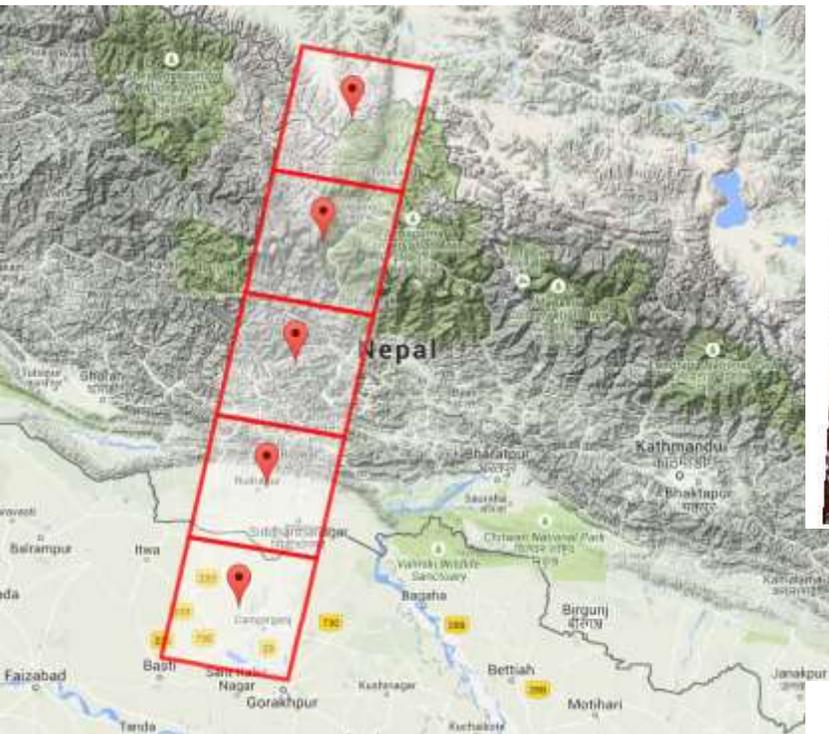
ASTER Expedited Data

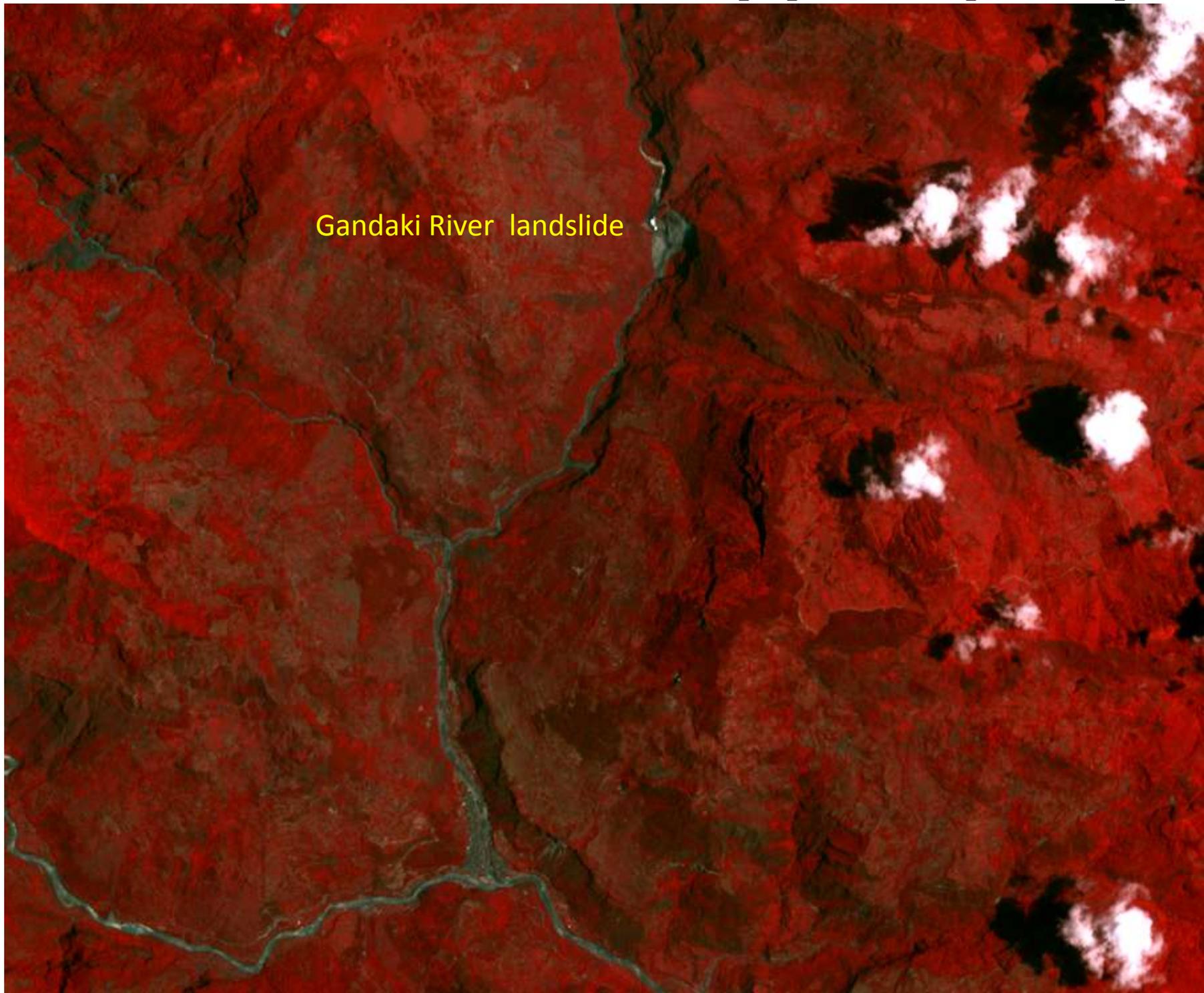
4 June 2015



ASTER Expedited Data

7 June 2015

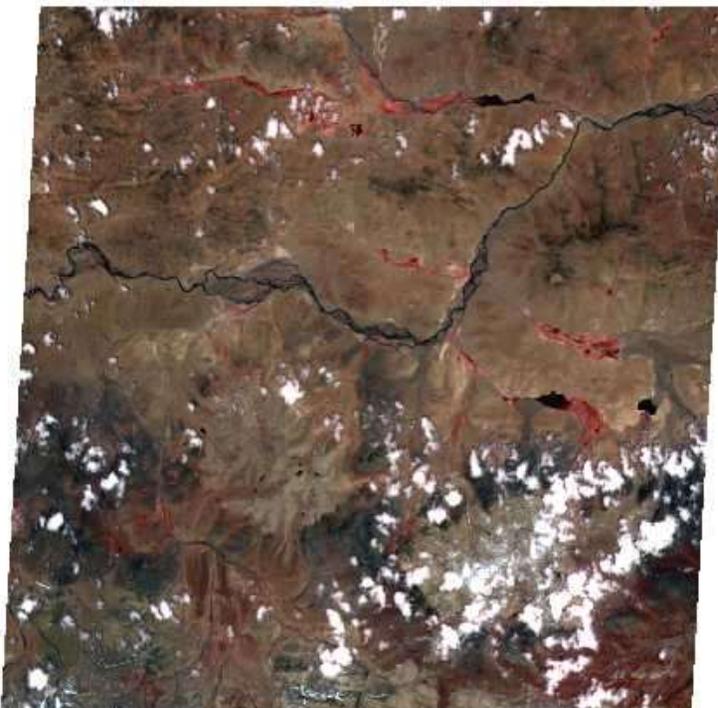
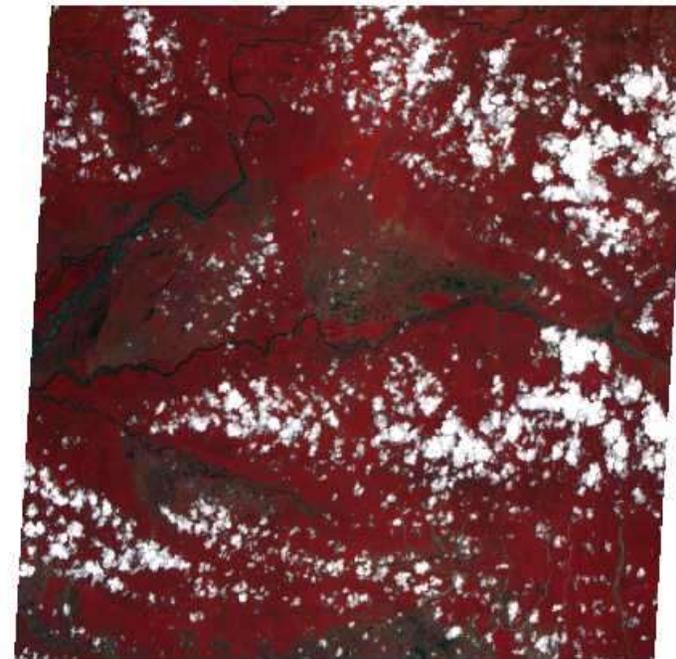
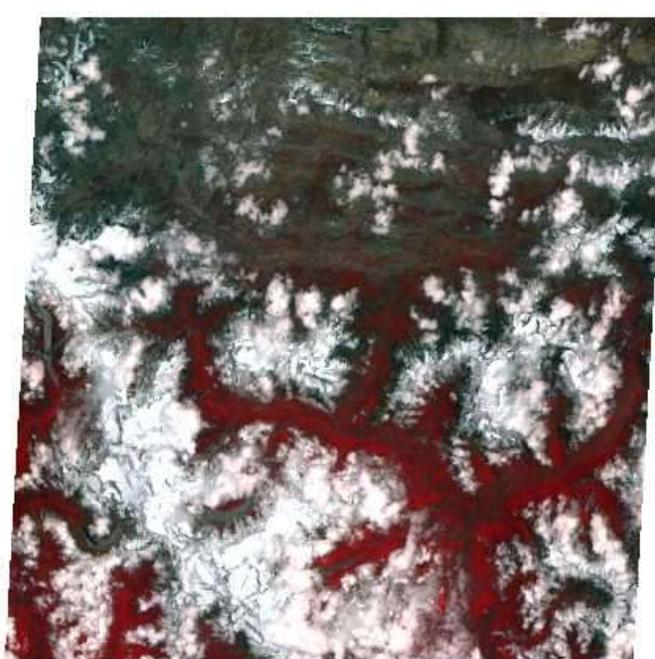
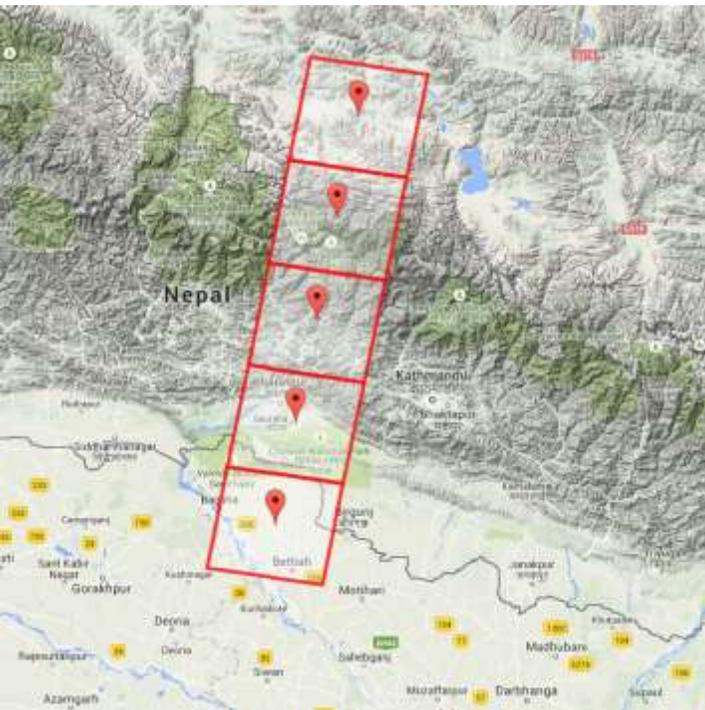




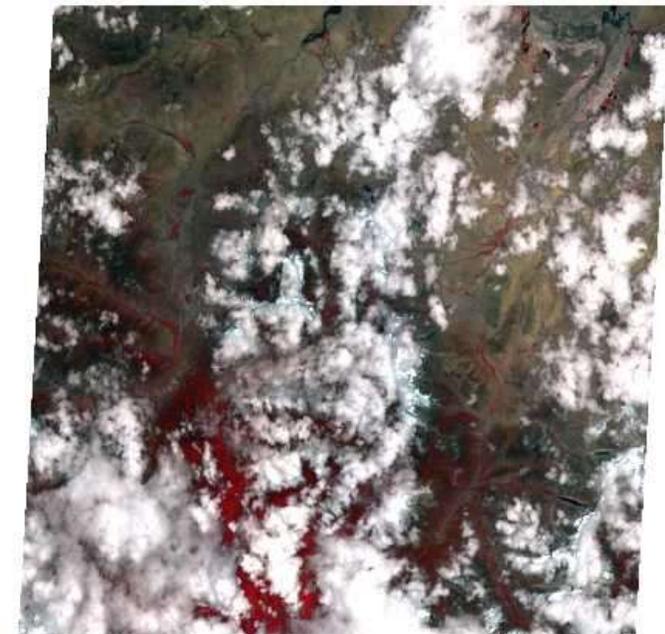
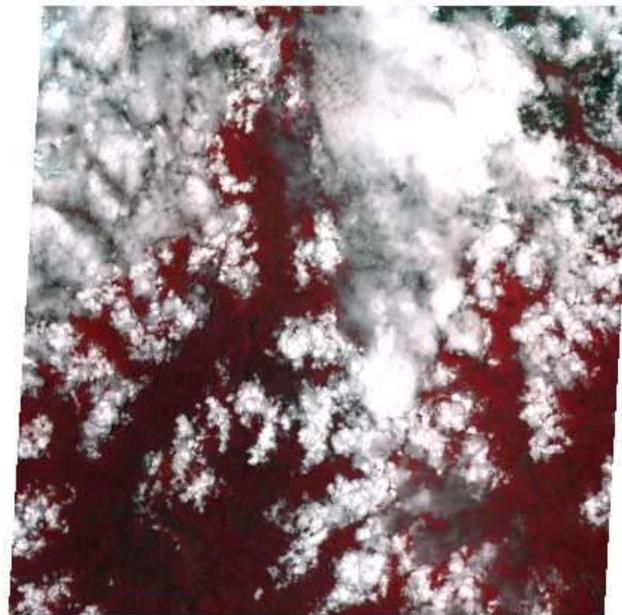
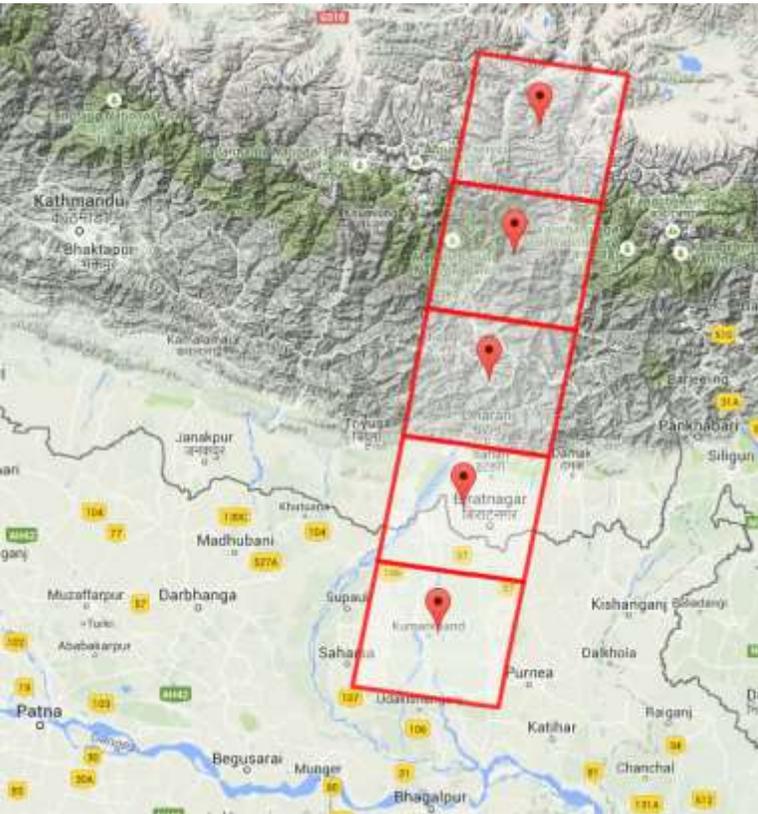
Gandaki River landslide

ASTER Expedited Data

18 June 2015



ASTER Expedited Data 20 June 2015



ASTER Expedited Data

25 June 2015

