

GSNL Event Supersite Proposal

A.1 Proposal Title

2015 Nepal Earthquake Supersite

A.2 Supersite Point-of-Contact/Principal Investigator

Email (Organization only)	Eric.J.Fielding@jpl.nasa.gov
Name	Eric Jameson Fielding
Position	Principal Scientist
Organization	Jet Propulsion Laboratory, California Institute of Technology
Organization Type (Government, Education, or Industry)	Government-funded research center
Address	Pasadena, California
Country	USA
Phone Number	+1-818-203-1346

A.3 Event Supersite Team

Email (Organization only)	william-barnhart-1@uiowa.edu
Name	William (Bill) Barnhart
Position	Assistant Professor
Organization	Department of Earth and Environmental Sciences University of Iowa
Organization Type (Government, Education, or Industry)	Education
Address	
Country	USA
Phone Number	+1 319-384-4732

Email (Organization only)	motagh@gfz-potsdam.de
Name	Mahdi Motagh
Position	Senior Scientist
Organization	Department of Geodesy and Remote Sensing Helmholtz Center Potsdam, GFZ German Research Center for Geosciences
Organization Type (Government, Education, or Industry)	Government
Address	Telegrafenberg Haus A17 14473 Potsdam
Country	Germany
Phone Number	+49 331 2881197

Email (Organization only)	shirzaei@asu.edu
Name	Manoochehr Shirzaei
Position	Professor
Organization	Arizona State University School of Earth and Space Exploration
Organization Type	Education

(Government, Education, or Industry)	
Address	Tempe, AZ, 85287
Country	USA
Phone Number	+1 480-727-4193

Email (Organization only)	Cristiano.tolomei@ingv.it
Name	Cristiano Tolomei
Position	Researcher
Organization	Istituto Nazionale di Geofisica e Vulcanologia
Organization Type (Government, Education, or Industry)	Government
Address	Via di Vigna Murata, 605
Country	Italy
Phone Number	+39 06 51860384

Email (Organization only)	Christian.bignami@ingv.it
Name	Christian Bignami
Position	Researcher
Organization	Istituto Nazionale di Geofisica e Vulcanologia
Organization Type (Government, Education, or Industry)	Government
Address	Via di Vigna Murata, 605
Country	Italy
Phone Number	+39 06 51860659

A.5 Supersite Description, Justification/Project Objectives and Benefits

The April 25, 2015 M 7.8 Nepal earthquake occurred as the result of thrust faulting on or near the main frontal thrust between the subducting India plate and the overriding Eurasia plate to the north. At the location of this earthquake, approximately 80 km to the northwest of the Nepalese capital of Kathmandu, the India plate is converging with Eurasia at a rate of 45 mm/yr towards the north-northeast, driving the uplift of the Himalayan mountain range. The preliminary location, size and focal mechanism of the April 25 earthquake are consistent with its occurrence on the main subduction thrust interface between the India and Eurasia plates. Although a major plate boundary with a history of large-to-great sized earthquakes, large earthquakes on the Himalayan thrust are rare in the documented historical era. Just four events of M6 or larger have occurred within 250 km of the April 25, 2015 earthquake over the past century. One, a M 6.9 earthquake in August 1988, 240 km to the southeast of the April 25 event, caused close to 1500 fatalities. The largest, an M 8.0 event known as the 1934 Nepal-Bihar earthquake, occurred in a similar location to the 1988 event. It severely damaged Kathmandu, and is thought to have caused around 10,600 fatalities.

The event has caused heavy damage and many thousands of casualties, strong ground deformation is expected, and many landslides have already been reported.

SAR data will be used for ground deformation mapping during the co- and post-seismic periods. Depending on coverage and resolution (in both space and time) the ground deformation may be used for fault modeling (and stress transfer calculations), fault scarp mapping, building and infrastructure damage mapping, landslide mapping and monitoring, aftershock co-seismic deformation mapping, afterslip inversion.

Optical data will be used for the mapping of ground deformation, damage and environmental effects.

Given the low density of geodetic of monitoring networks, difficult ground observations, especially in high topography areas, satellite data are an important asset.

We will try to address the needs of the local agencies responding to the emergency, providing scientific products on a voluntary basis.

A.6 Availability to share research results

We agree to collaborate with other teams to provide synthetic consensus reports to the local emergency management agencies, where possible.

A.7 Project Schedule

We would like to extend the coverage to 1-2 years of postseismic deformation. Depending on sensor, and type of acquisition, the temporal coverage requested may vary from few months to 2 years.

Data will be processed as fast as possible on the high priority areas.

A.8 Detailed Geographic Region of Interest

Nepal and southern Tibet.

Preliminary coordinates of area of interest:

	[°]	[']	
Upper Left Corner Lat	28	28	N
Upper Left Corner Lon	83	50	E
Upper Right Corner Lat	27	46	N
Upper Right Corner Lon	86	55	E
Bottom Right Corner Lat	26	47	N
Bottom Right Corner Lon	86	27	E
Bottom Left Corner Lat	27	31	N
Bottom Left Corner Lon	83	34	E

A.9 Data Requirements

SAR X-band: first estimate is 200 images per orbit to cover first two months of post-seismic period

Radarsat 2: first estimate is 15 images to cover the first two month of post-seismic period (including archive pre-event data)

Pleiades: first estimate is 5 images to cover specific areas for landslide and damage studies

More requirements may arise as further scientists will join.

A.10 Scene details

Details will be agreed with the single agencies based on what is available before the event.

For COSMO we request Stripmap data, as for TerraSAR X (possibly also ScanSAR data)

A.11 Available data and resources

Analysis and modeling resources are available at the premises of the participating researchers.

Specific in situ data, other than global seismic and GPS data, are not available at this stage.

A.12 Additional Comments

Depending on resources and data, some researchers will try to support requests for specific scientific products on specific areas/themes.

Scientific products will be disseminated independently by all researchers using their websites, but links will be provided to the GEO GSNL web pages for this event.