

**B1: Proposal Title:**

Event Supersite: 2014 San Andreas Fault earthquake, USA.

**B2: Persons proposing the Event Supersite**

Chuck Wick, USGS

Kenneth Hudnut, USGS

**B3 Earthquake Supersite Point-of Contact (PoC)**

Name: Chuck Wicks

Affiliation: U.S. Geological Survey

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**B4: Event Supersite Research Team**

The following research groups have expressed interest in the SAR data of the earthquake:

China

- Prof. Sidao Ni, Director, State Key Laboratory of Geodesy and Earth's Dynamics  
Institute of Geodesy and Geophysics, Chinese Academy of Science.

Saudi Arabia

- Teng Wang (KAUST)

United States

- Donald V. Helmberger (Caltech)

- Roland Bürgmann (Univ. of Calif., Berkeley)
- Zhong Lu, (Southern Methodist University)
- William Barnhart (USGS)
- Eric Fielding (JPL)

### **B5: Event Supersite description and justification**

The magnitude 6.0 earthquake struck on the early morning of August 24, 2014 (at 10:20:44 UTC), near the city of Napa, California (USA). The earthquake lies within a 70-km-wide set of major faults of the San Andreas Fault system that forms the boundary between the Pacific and North American tectonic plates. Although the earthquake hypocenter was 11.3 km, over 10 km of surface rupture has been mapped in the days immediately following the earthquake. This observation indicates sizable shallow slip, which is anomalous for this size earthquake with an 11.3 km hypocenter. The continuous GPS network is not dense enough to measure the shallow movement on the fault, however SAR imagery should be ideal for studying this feature of the earthquake. Using SAR imagery from before and after the earthquake, interferometry and pixel tracking should both be very useful for mapping surface deformation and modeling shallow slip on the fault. High resolution optical imagery from before and after the earthquake might also be useful for constraining surface movement using pixel tracking. The nearest GPS instruments are indicating substantial afterslip on the earthquake fault. Several cycles of SAR acquisitions after the earthquake could prove valuable for tracking the afterslip, especially the shallow afterslip.

The research groups will share their results and models via the supersites website. As such, within the San Andreas Fault event Supersite, we are able to provide an enormous quantity of extremely high quality data from in-situ networks such as the California Integrated Seismic San Andreas Fault Supersite Network and the Plate Boundary Observatory (Fig. 1). Data are available from the Northern and Southern Earthquake Data Centers, as well as from IRIS and UNAVCO, Inc. and the USGS. In our work environment, free access to openly available data is the expectation and the norm, and we offer this to all because of our belief that open data are an important aspect of scientific repeatability, which is of fundamental importance. Through the San Andreas Fault event Supersite, we will make all in-situ data and products available from GPS, seismic (broadband, strong-motion, etc.), and borehole strain networks that are state-of-the-art, very dense, and of high quality installation.

#### **B6: Current or future use of requested data**

Post-event images are requested with respect to each archived pre-event images (for interferometry and pixel tracking) in the area around the epicenter.

#### **B7: Schedule**

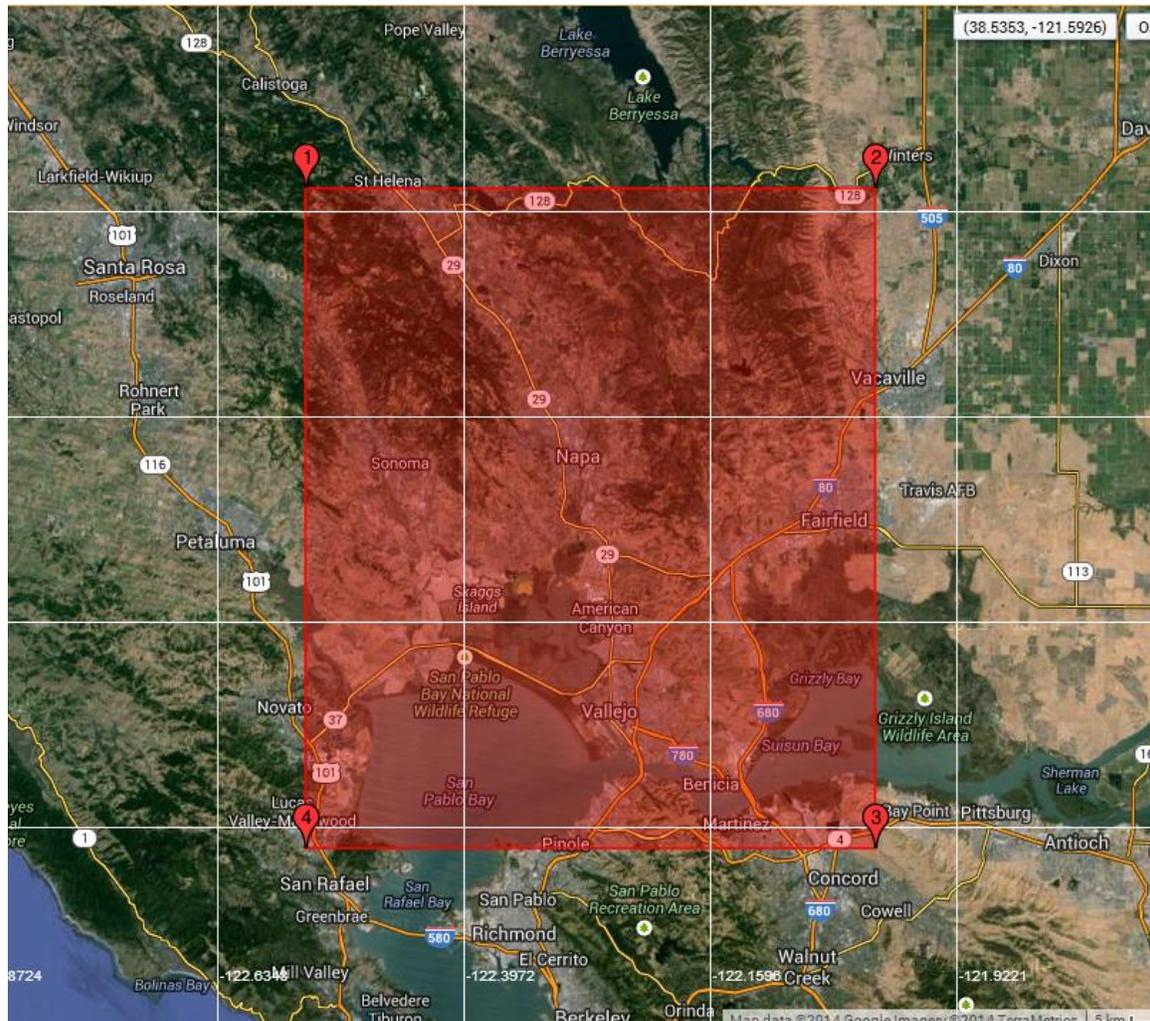
Data provision should initiate as soon as possible.

#### **B8: Detailed geographic region of interest**

The area of interest for the Napa Earthquake is within this Lat/Long box:

Upper Left Corner: 38.5 N, 122.55 W

Lower Right Corner: 38 N, 122 W



## B9: Data Requirements

We request pre- and post-event image pairs from all available satellites (Cosmo-Skymed, TerraSAR-X and Radarsat-2). We also request possible pre-operational images from Sentinel-1 and ALOS-2 satellites. The imagery will be used for deriving near-field coseismic and possible postseismic displacement fields. We will use SAR interferometry and offset tracking techniques to resolve the surface displacement. To map the coseismic and postseismic deformation we request post-event imagery

corresponding to the pre-event imagery to November of 2014. We listed the images for all the three satellites below.

RADARSAT-2 Extra-Fine Beam Mode (XF0W3), descending HH Polarization

- 2014-07-21
- 2014-08-14
- 2014-09-07 (future acquisition)
- 2014-09-31 (future acquisition)
- 2014-10-24 (future acquisition)

COSMO-SkyMED STR\_HIMAGE, H4-03

- 2014-07-26
- 2014-08-27
- 2014-09-12 (future acquisition)
- 2014-09-28 (future acquisition)
- 2014-10-14 (future acquisition)
- 2014-10-30 (future acquisition)

TERRASAR-X Stripmap

- 2013-09-13 RelOrbit 76, strip\_008
- 2011-03-15 RelOrbit 76, strip\_008
- 2009-06-04 RelOrbit 76, strip\_008
- 2009-05-15 RelOrbit 76, strip\_009
- 2014-08-31 RelOrbit 76, strip\_009R (future acquisition)
- 2014-09-11 RelOrbit 76, strip\_009R (future acquisition)
- 2014-09-22 RelOrbit 76, strip\_008R (future acquisition)
- 2014-10-03 RelOrbit 76, strip\_008R (future acquisition)
- 2011-03-12 RelOrbit 38, strip\_003
- 2008-05-12 RelOrbit 38, strip\_003
- 2014-08-17 RelOrbit 38, strip\_003
- 2014-08-28 RelOrbit 38, strip\_003
- 2014-09-08 RelOrbit 38, strip\_003R (future acquisition)
- 2014-09-19 RelOrbit 38, strip\_003R (future acquisition)
- 2014-09-30 RelOrbit 38, strip\_003R (future acquisition)
- 2014-10-11 RelOrbit 38, strip\_003R (future acquisition)
- 2008-03-13 RelOrbit 129, strip\_011
- 2008-03-02 RelOrbit 129, strip\_011
- 2014-09-03 RelOrbit 129, strip\_011R (future acquisition)
- 2014-09-14 RelOrbit 129, strip\_011R (future acquisition)
- 2014-09-25 RelOrbit 129, strip\_011R (future acquisition)
- 2014-10-06 RelOrbit 129, strip\_011R (future acquisition)

In summary, we request

***TerraSAR-X, 10 archived scenes, 12 future acquisitions .***

***Radarsat-2, 2 archived scenes, 4 future acquisitions.***

***Cosmo-Skymed , 2 archived image, 3 future acquisitions.***

**B10: Comments.**

1. This event Supersite will provide images for scientists who are interested in studying this important earthquake in the San Andreas Fault system. Studies using these data will not only help understand this understudied part of the San Andreas Fault system, but they will probably prove essential in mapping the faults in this area.