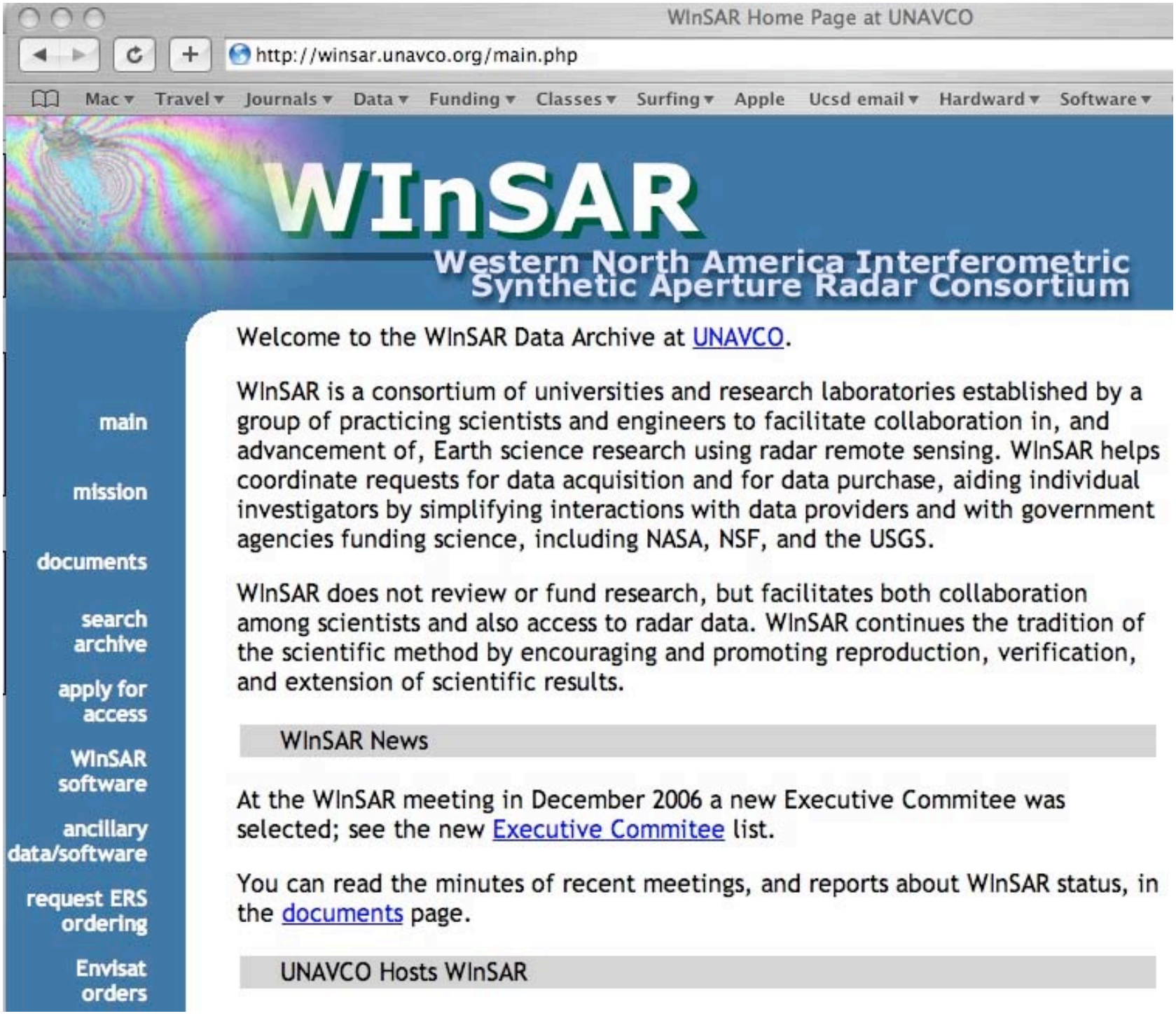
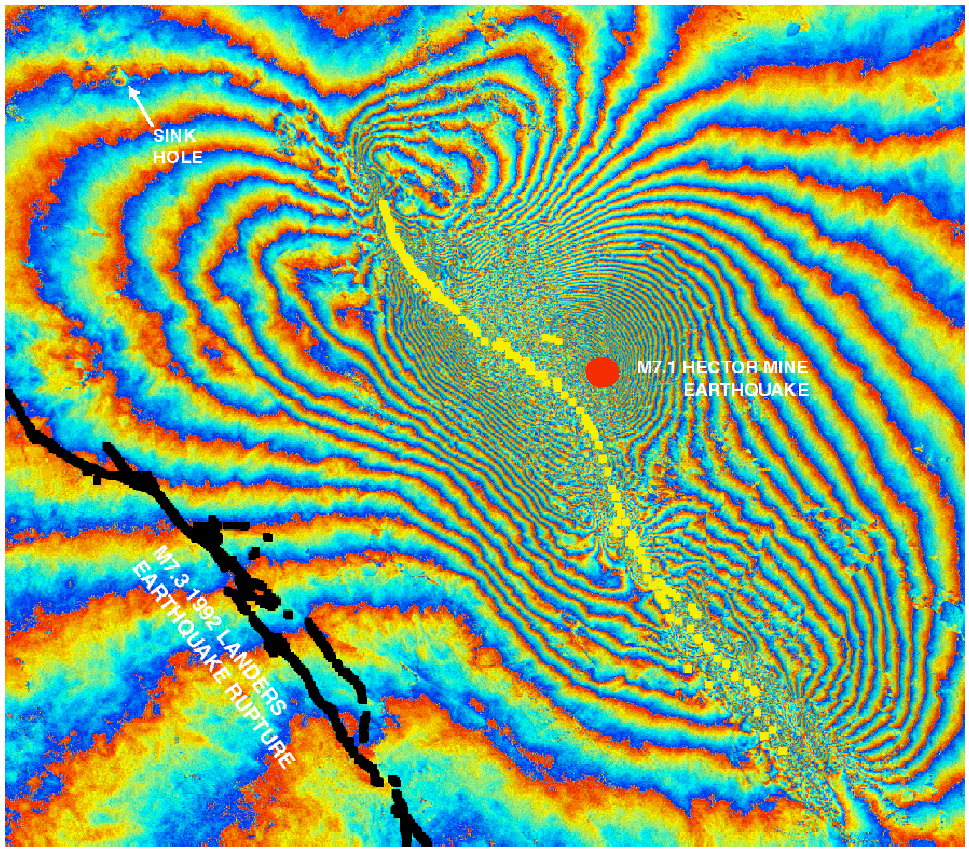

WInSAR Home Page at UNAVCO
http://winsar.unavco.org/main.php
Mac
Travel
Journals
Data
Funding
Classes
Surfing
Apple
Ucsd email
Hardward
Software
WInSAR
Western North America Interferometric Synthetic Aperture Radar Consortium
main
mission
documents
search archive
apply for access
WInSAR software
ancillary data/software
request ERS ordering
Envisat orders
Welcome to the WInSAR Data Archive at UNAVCO.
WInSAR is a consortium of universities and research laboratories established by a group of practicing scientists and engineers to facilitate collaboration in, and advancement of, Earth science research using radar remote sensing. WInSAR helps coordinate requests for data acquisition and for data purchase, aiding individual investigators by simplifying interactions with data providers and with government agencies funding science, including NASA, NSF, and the USGS.
WInSAR does not review or fund research, but facilitates both collaboration among scientists and also access to radar data. WInSAR continues the tradition of the scientific method by encouraging and promoting reproduction, verification, and extension of scientific results.
WInSAR News
At the WInSAR meeting in December 2006 a new Executive Commitee was selected; see the new Executive Commitee list.
You can read the minutes of recent meetings, and reports about WInSAR status, in the documents page.
UNAVCO Hosts WInSAR

WInSAR Members (more than 50)

Arizona State Univ.	Jonathan Fink
Calif. Inst. of Technology	Mark Simons
Central Washington Univ.	Tim Melbourne
Cornell University	Matthew Pritchard
George Mason Univ.	Genong (Eugene) Yu
Georgia Institute of Technology	Andrew Newman
Idaho State	Nancy Glenn
Indiana University	Marlon Pierce
INGEOMINAS	Hector Mora-Paez
Jet Propulsion Lab.	Paul Rosen
Lawrence Livermore Nat.	Dennise Templeton
Los Alamos National Laboratory	Christopher Jeffreys
MIT	Bob King
Ohio State Univ.	C. K. Shum
Oregon State University	Paul Vincent
PHIVOLCS (Philippine Institute of Vol	Dr. Arturo S. Daag
Purdue University	Eric Calais
San Diego State Univ.	Rob Mellors
Simon Fraser University	Glyn Williams-Jones
Stanford Univ.	Howard Zebker
Univ. of Alaska	Jeffery Freymueller
Univ. of Calif., Berkeley	Roland Burgmann
Univ. of Calif., Davis	John Rundle
Univ. of Calif., Los Angeles	Gilles Peltzer
Univ. of Calif., San Diego	David Sandwell
Univ. of Calif., Santa Barbara	Chen Ji
Univ. of Calif., Santa Cruz	Susan Schwartz
Univ. of Hawaii	Benjamin Brooks
Univ. of Memphis	Mike Ellis
Univ. of Miami	Tim Dixon
Univ. of Missouri	Francisco "Paco" Gom
Univ. of Nevada, Reno	John W. Bell
Univ. of Southern Calif.	John McRaney
Univ. of Texas, Austin	Sean M. Buckley
Univ. Wisconsin at Madison	Kurt Feigl
University College London	Paul Cross
University of Arkansas	Glen Mattioli
University of California, Riverside	Elizabeth Cochran
University of Colorado	John Wahr
University of Kansas	Mike Taylor
University of Oregon	David Schmidt
University of Utah	Bob Smith
University of Western Ontario	Kristy F. Tiampo
US Geological Survey	Zhong Lu
Western Michigan University	Richard Becker
Western Washington Univ.	Juliet Crider
Woods Hole (WHOI)	Rowena Lohman

WInSAR Science Objectives - 2000 proposal

- Monitor strain accumulation and release along the North American/Pacific Plate Boundary with an emphasis on the San Andreas Fault Zone.
- Monitor the deformation of volcanic systems in the western US.
- Monitor crustal deformation at selected sites in the Basin and Range province and along the Baja California peninsula.



Tasks from original 2000 proposal

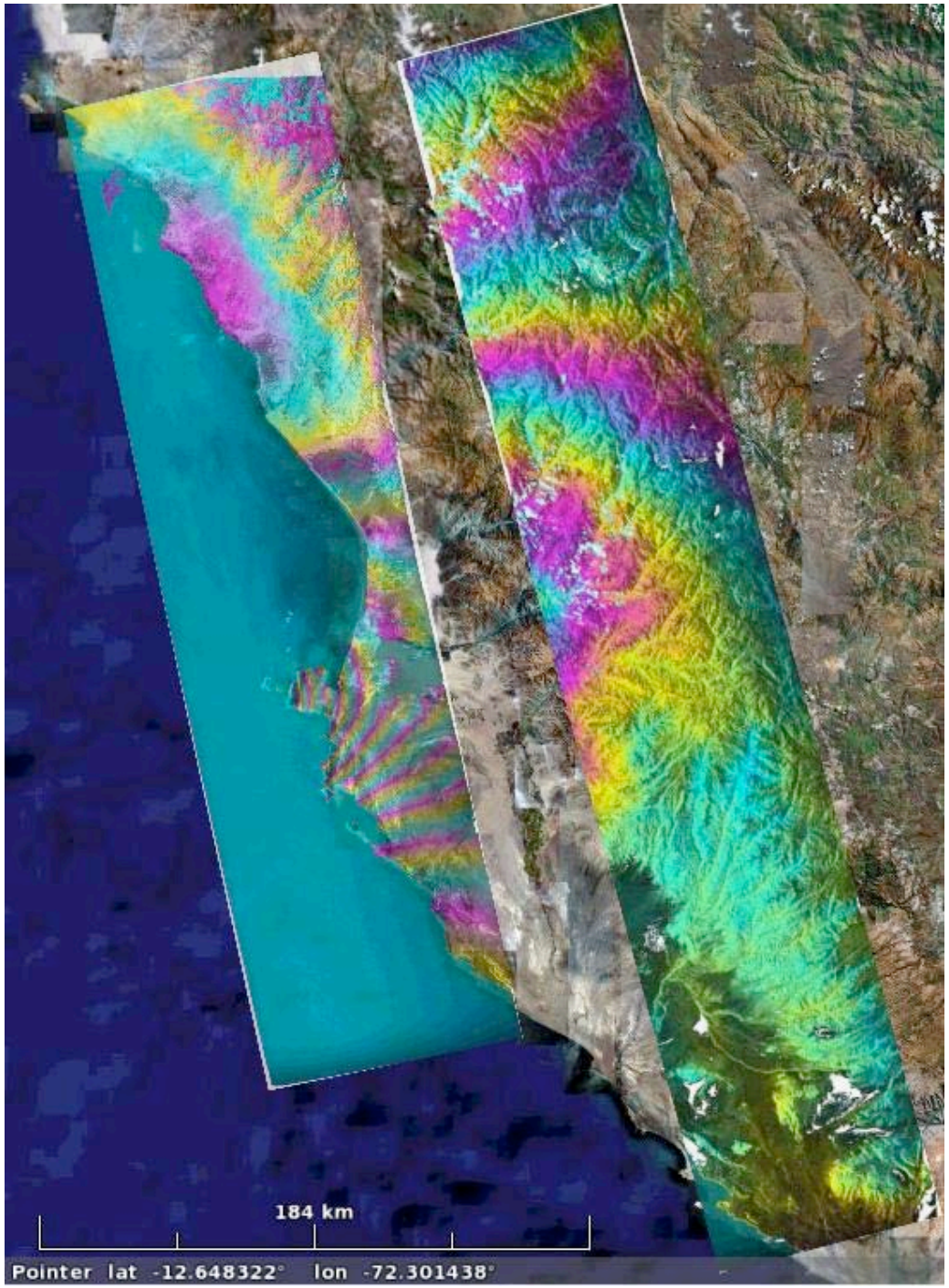
- Modify existing InSAR processing algorithms to accommodate PALSAR data for change detection and DEM generation **(done - Mellors, Sandwell, Fielding).**
- Work with the ALOS team to schedule PALSAR data acquisitions over western North America. Both ascending (nightime) and descending (daytime) passes are needed to distinguish between vertical and strike-slip motions **(in progress).**
- Pending an agreement with NASDA and NOAA, we hope to manage and downlink PALSAR data over Western North America **(not necessary).**
- Compare L-band PALSAR-derived interferograms with C-band interfereograms from ERS/Envisat as well as GPS measurements **(in progess).**
- Reduce the errors in PALSAR interferograms by modeling ionospheric and atmospheric artifacts **(to do).**
- Publish and present scientific results in journals, scientific meetings, and at ALOS team meetings **(in progress).**

WInSAR ALOS Activities

- pre_processor - Mellors and Sandwell
- ROI_PAC - Fielding, Rosen, and Fialko
- Peru earthquake - Fielding and Spelling
- Various interferometry/plarimetry - Zebker
- Kilauea - Sandwell, Myers, Shimada, Brooks, Foster
- Ordering data through ASF/UPASS

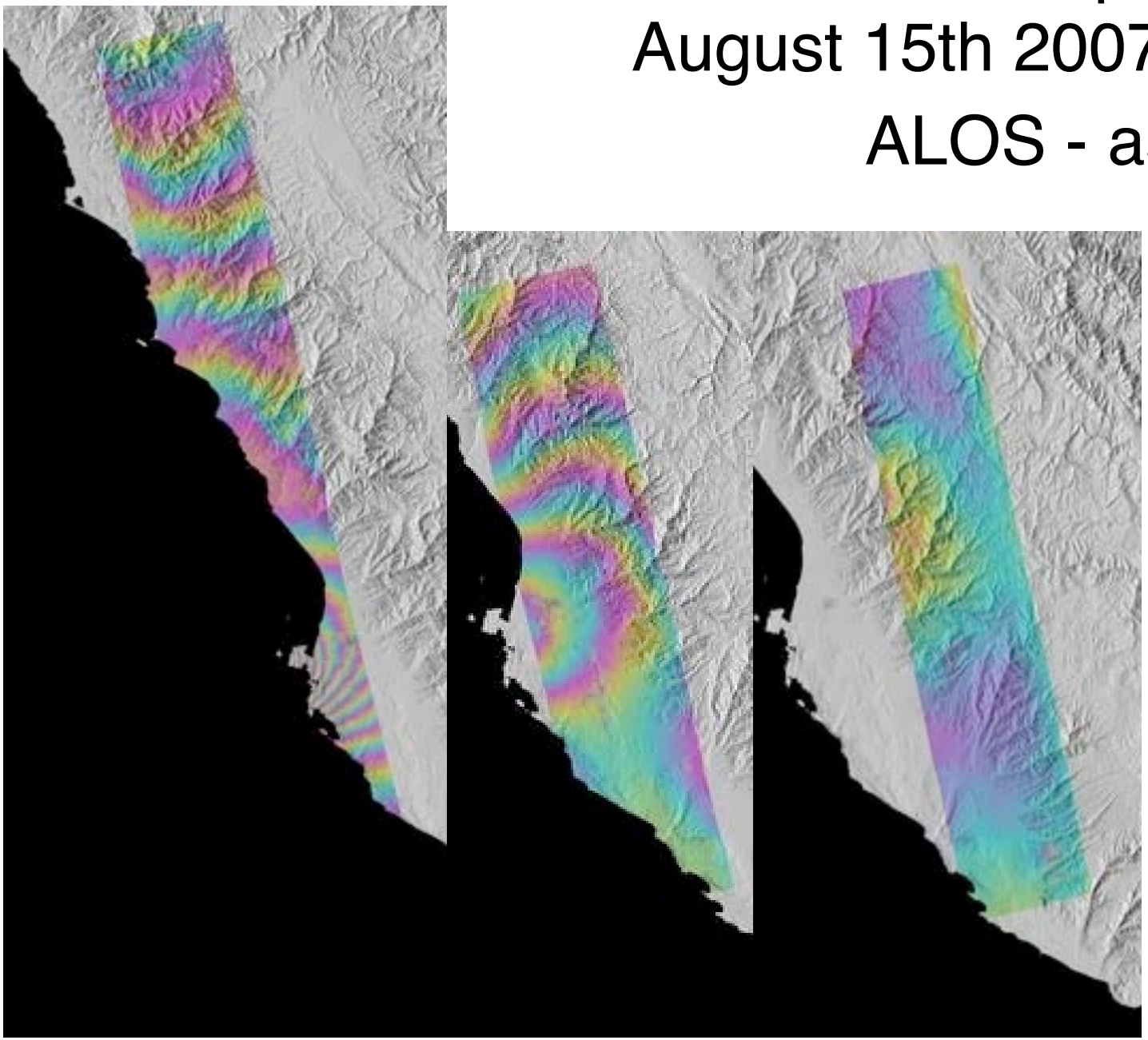
Pisco, Peru Earthquake August 15th 2007

[Eric Fielding and Anthony Sladen, 2007]



[Falk Amelung, 2007]

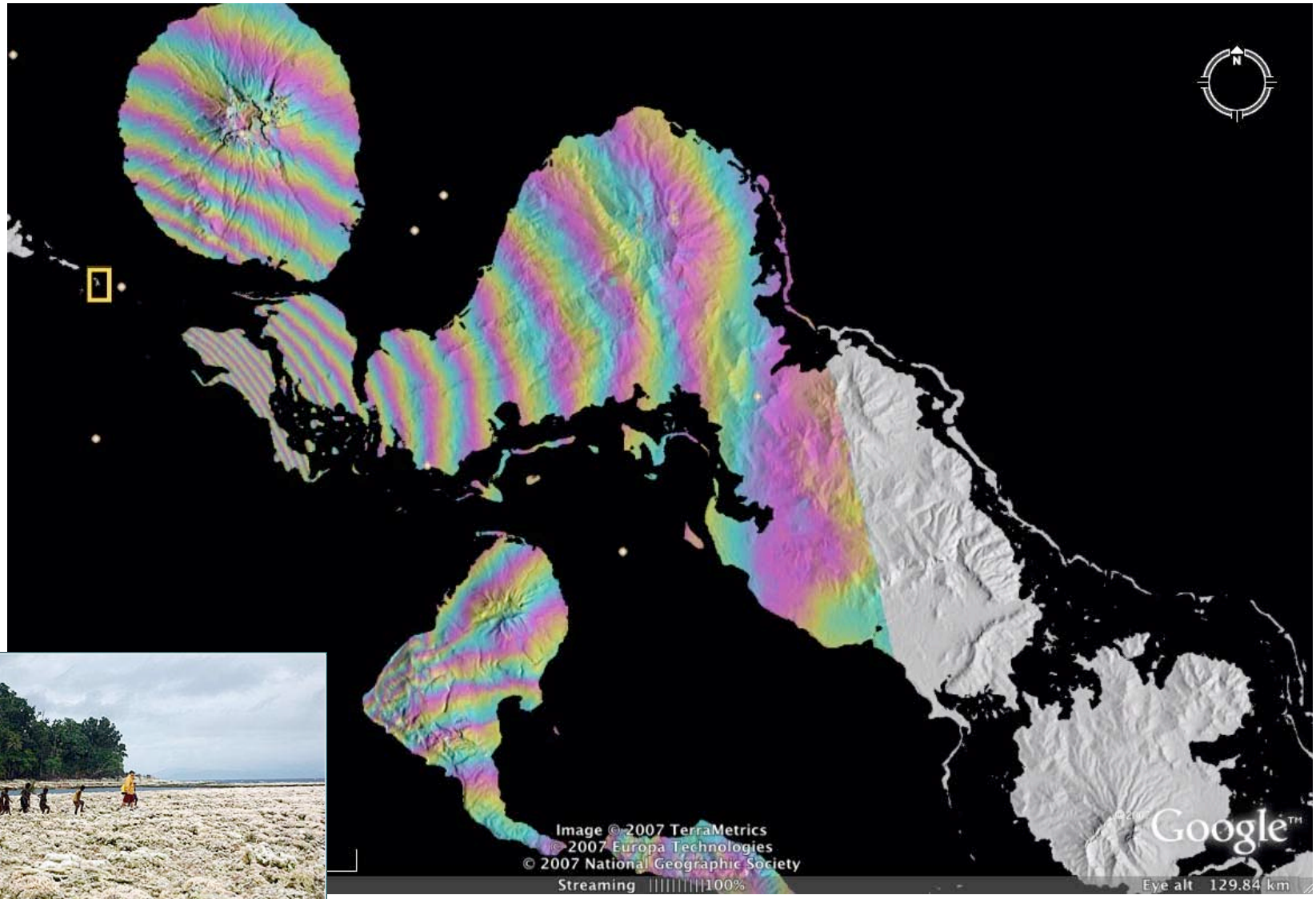
Pisco, Peru Earthquake
August 15th 2007
ALOS - ascending



CSTARS
UNIVERSITY OF MIAMI
CENTER FOR SOUTHEASTERN TROPICAL ADVANCED REMOTE SENSING

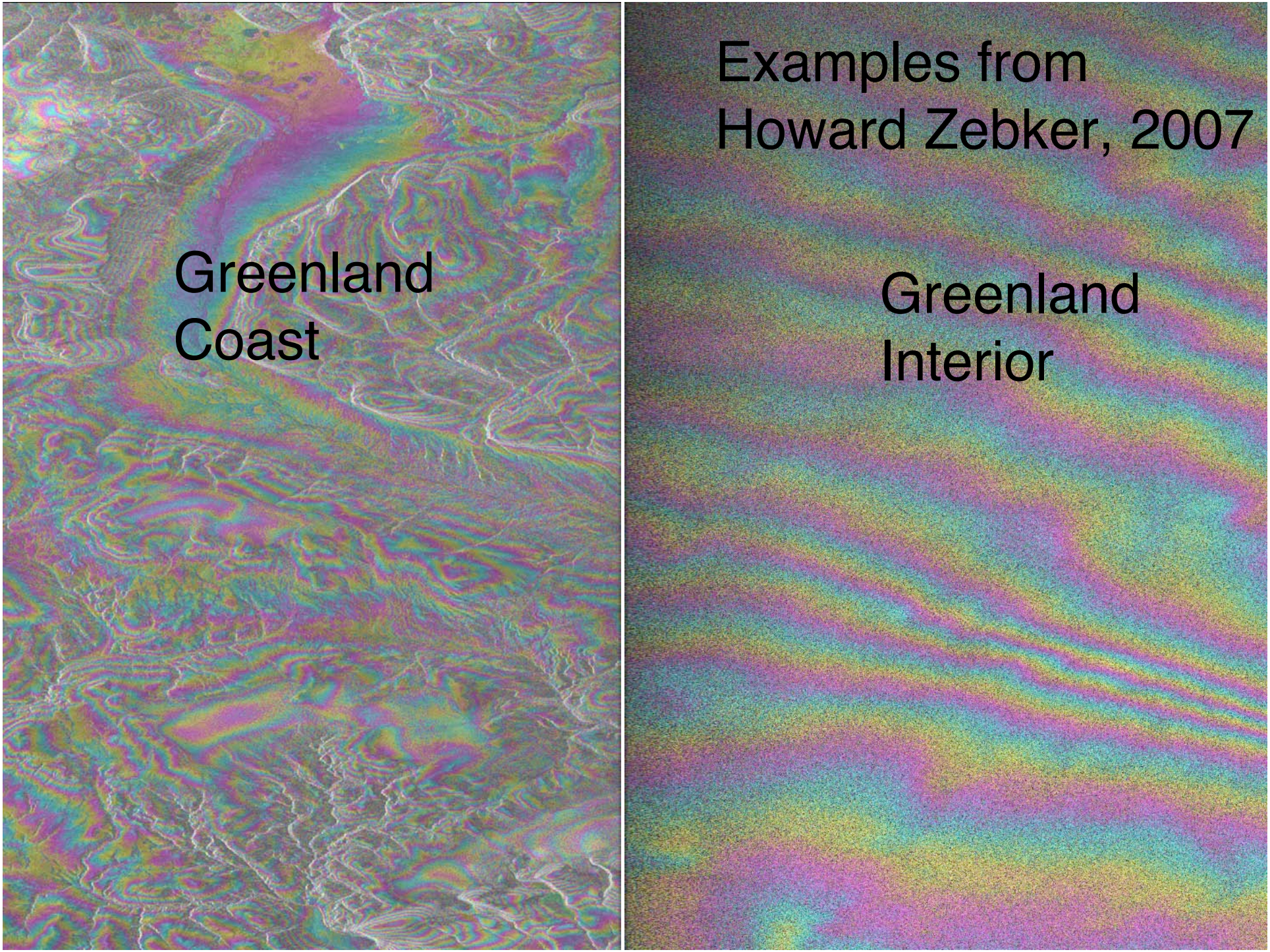
[Falk Amelung, 2007]

Solomon islands M8.1 April 2007



Examples from
Howard Zebker, 2007

Amazon

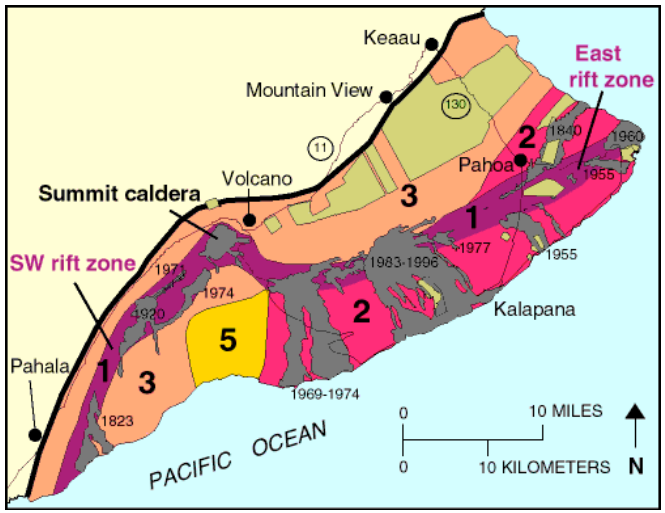

Examples from
Howard Zebker, 2007
Greenland
Coast
Greenland
Interior

Kilauea Southeast Flank

Dike injection/inflation

Sliding and earthquakes

Tsunami Hazard

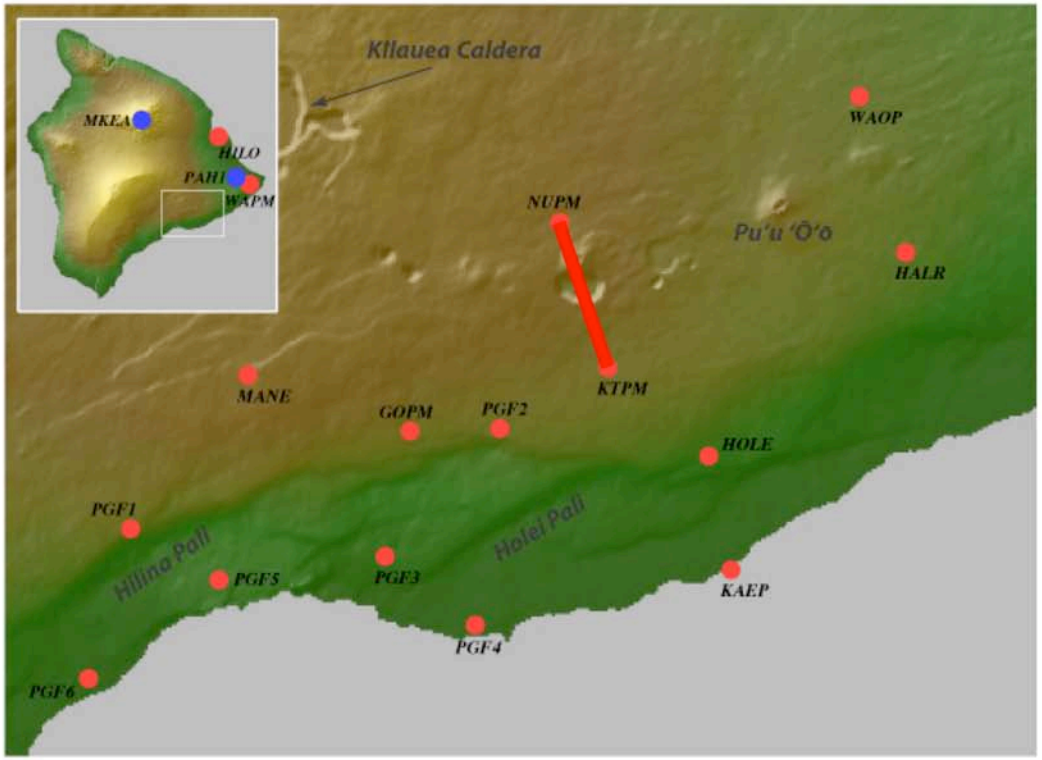


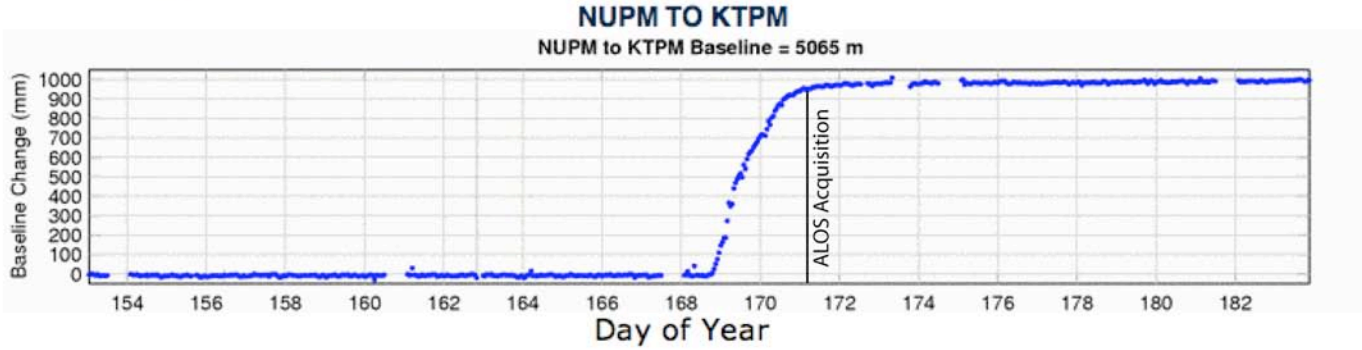
news and views

[Ward, *Nature*, 2002]

Figure 1 Computer simulation[7] of the tsunami waves that might be set off in a collapse of Kilauea's southeast flank. The simulation assumes that a block 40 km long, 20 km wide and 2,000 m thick (blue, inset) slides for 60 km at 70 m s^{-1}. The tsunami wave fronts are pictured at two-hour intervals from 2 to 14 hours. Red and blue contours are wave elevations and depressions, respectively, and the numbers are sample wave heights in metres. Tsunamis from this collapse would have $1.72\ 10^{19}$ J of energy (equivalent to about 4,100 megatons of TNT), and focus slightly towards the southeast. The waves span 280° of arc, sparing only locations to Hawaii's north and west. Tsunamis from volcanic flank collapses can dwarf those generated by earthquakes of any plausible magnitude. The model predicts potentially devastating 30-m waves beaching on the west coast of North America. These decay to 10 m in height by the time of their arrival at the tip of South America.

Kilauea - East Rift Zone, Dike Event
June 17 - June 21, 2007

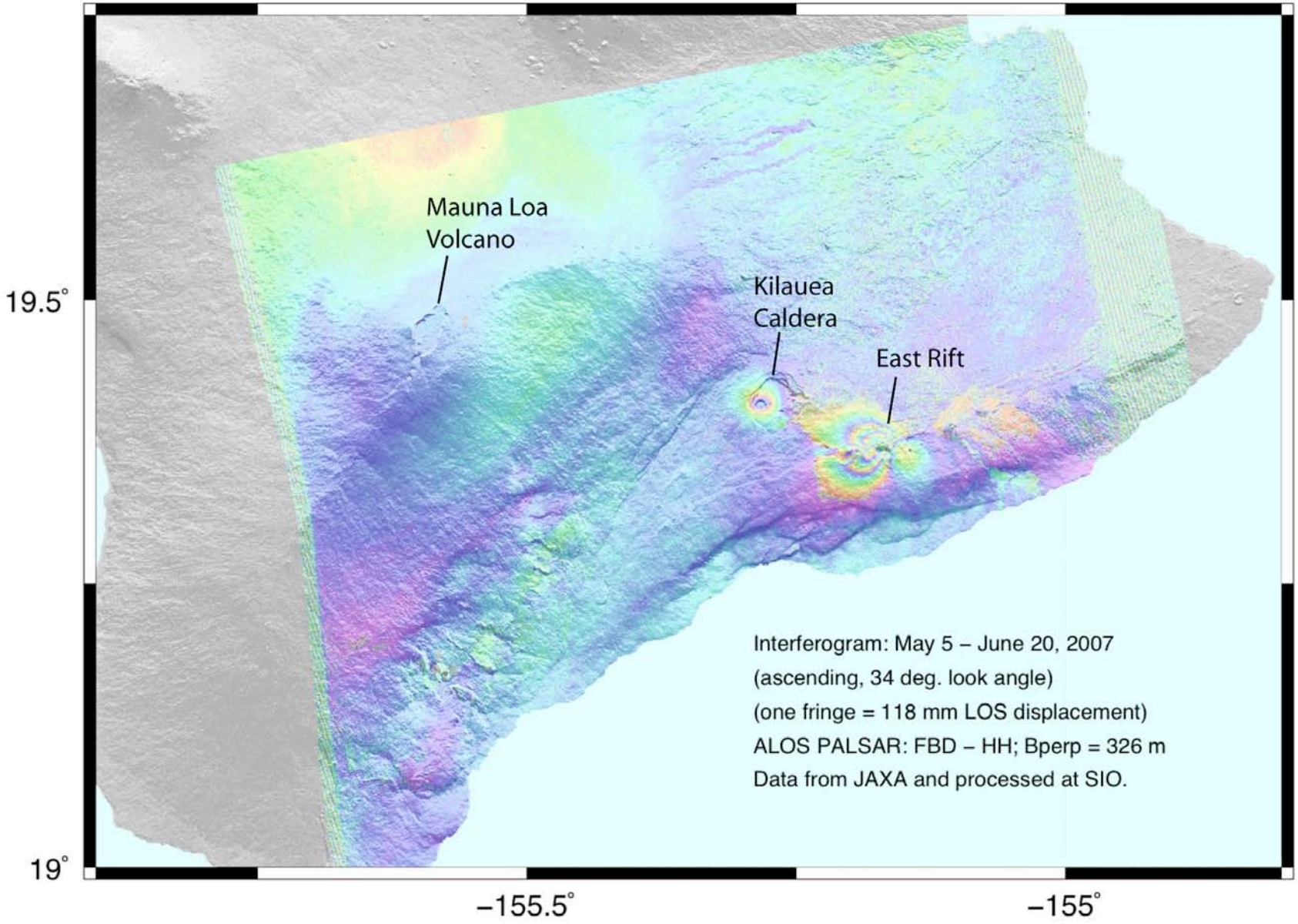




data from: http://www.soest.hawaii.edu/pgf/SEQ/

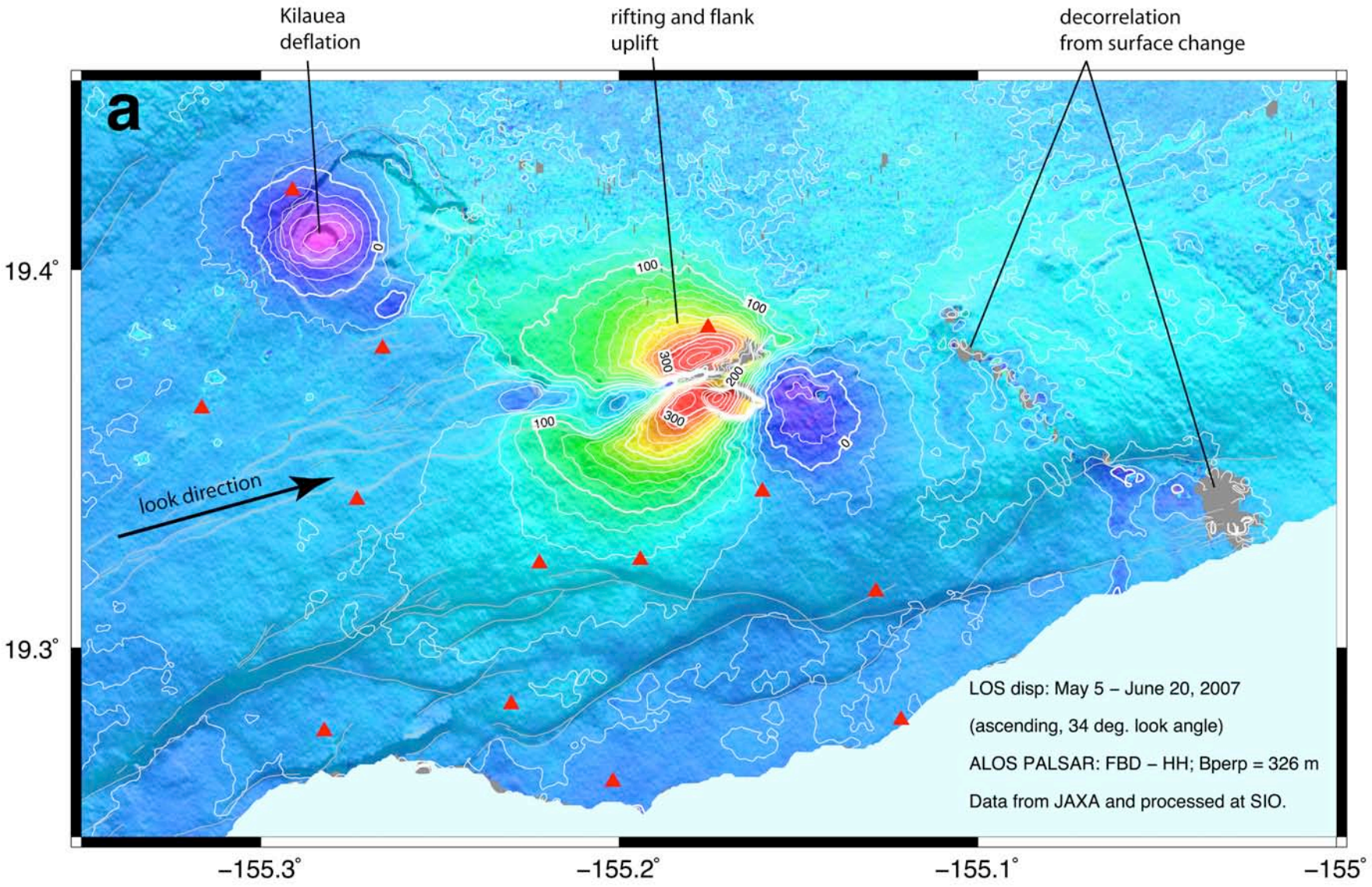
Kilauea - East Rift Zone: Dike event

(no trend removed from interferogram)



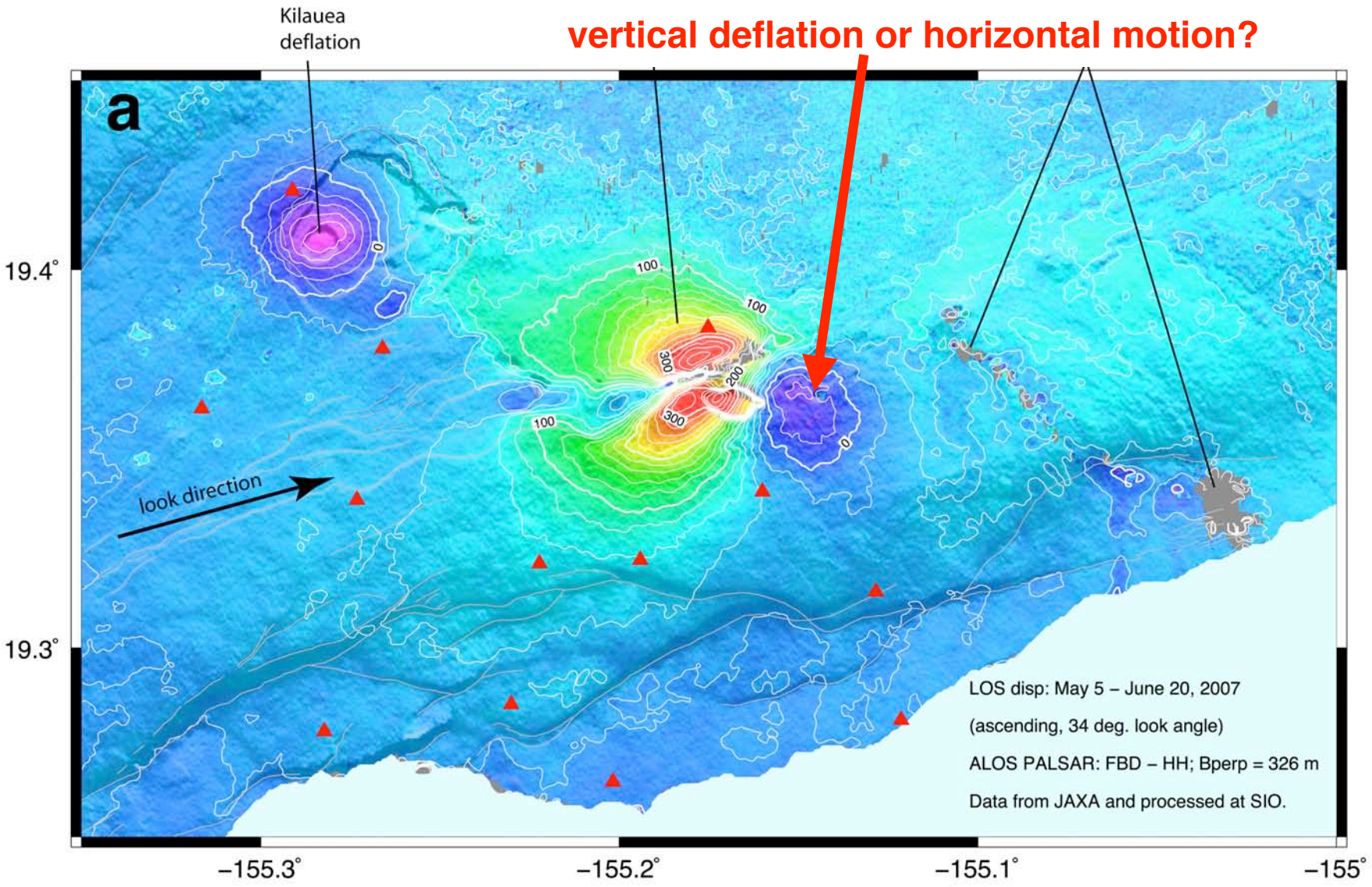
Dike event - LOS ascending

(phase unwrapped with single seed)



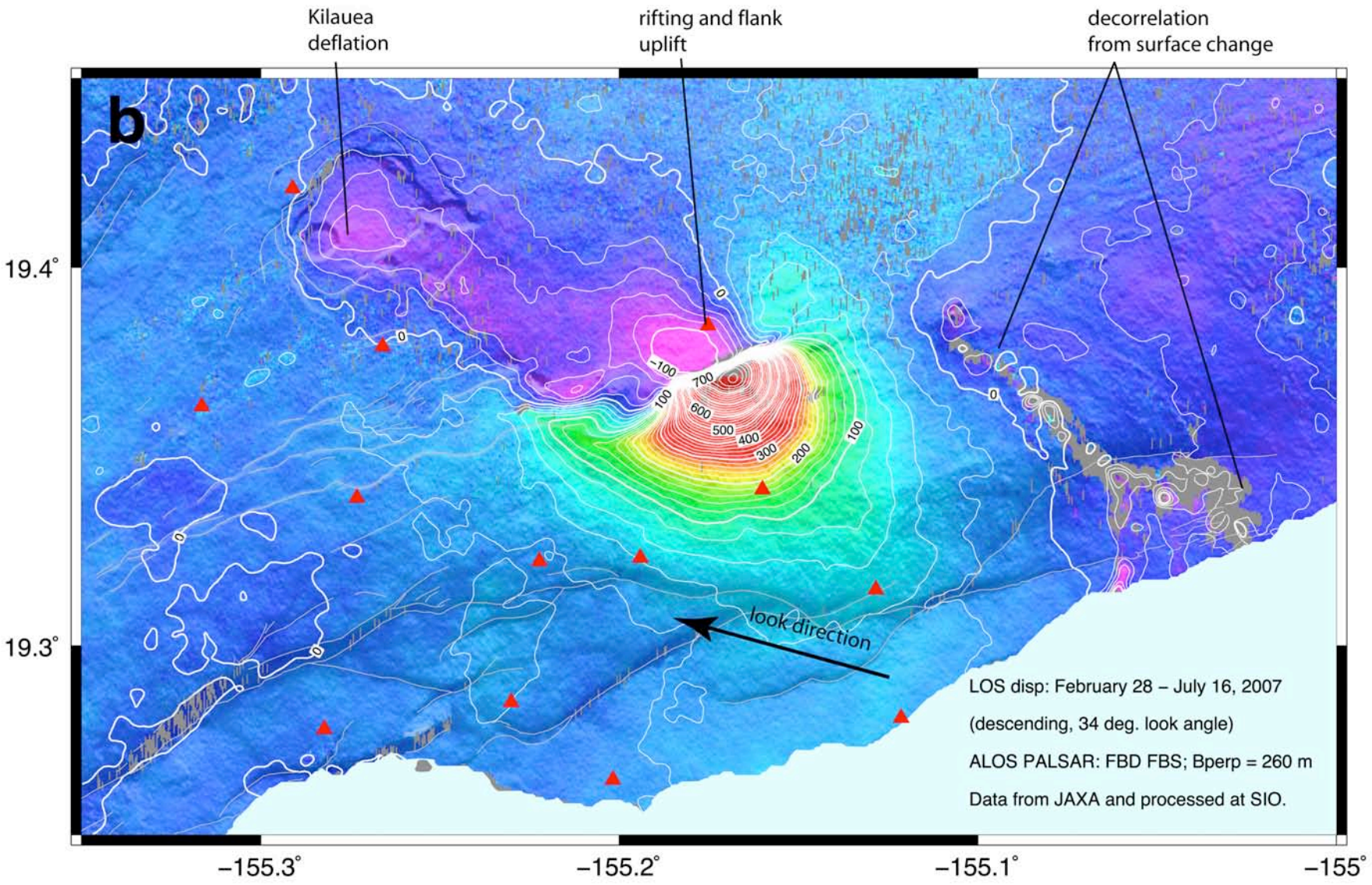
Dike event - LOS ascending

(phase unwrapped with single seed)



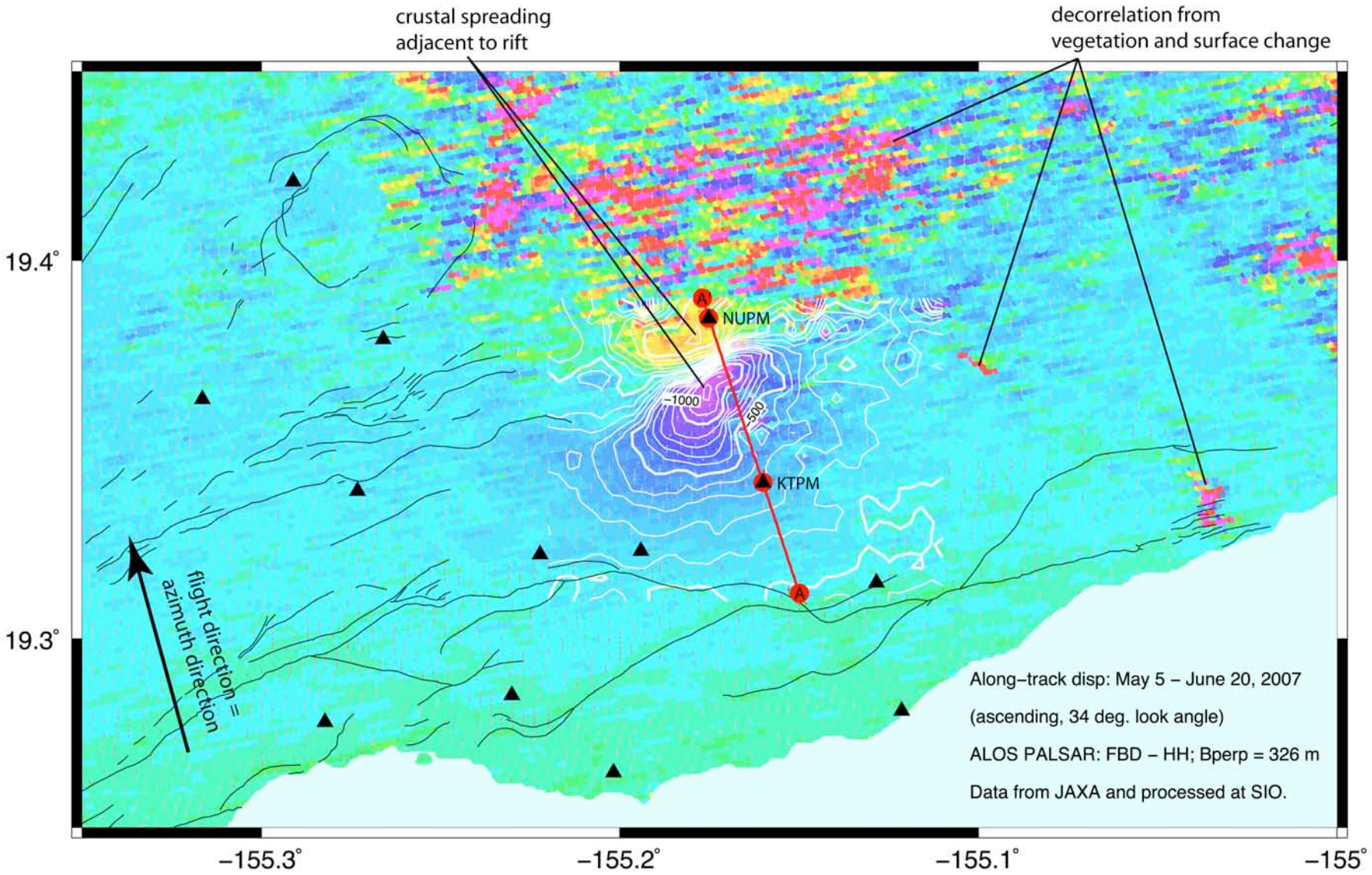
Dike event - LOS descending

(phase unwrapped with single seed)

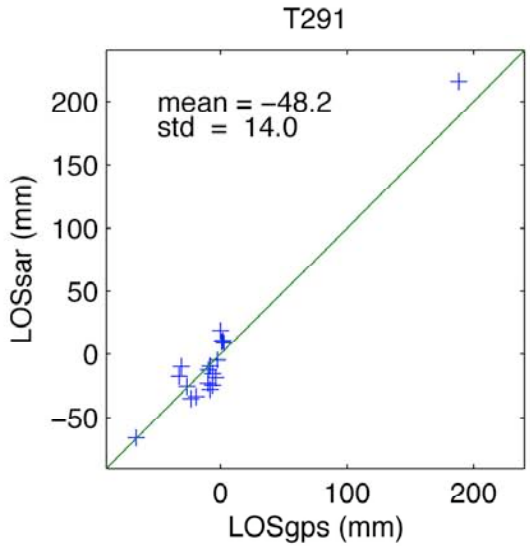


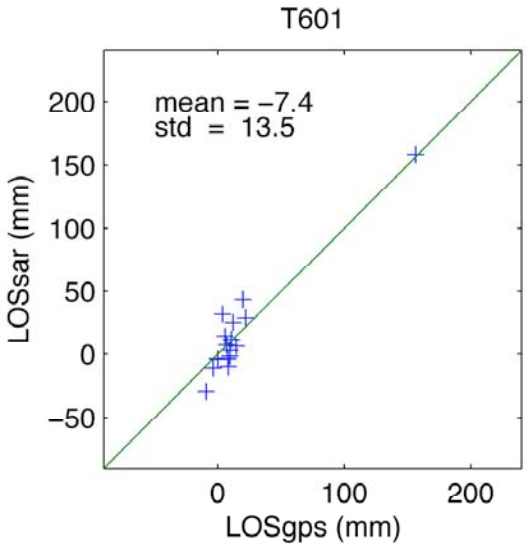
Dike event - azimuth ascending

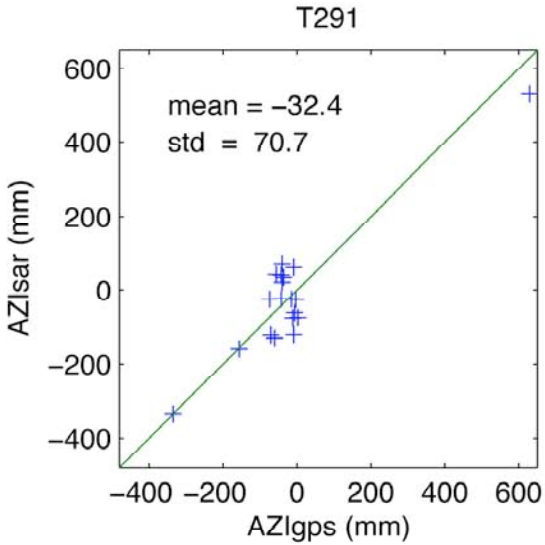
(azimuth pixel cross correlation)



Vector comparison with 19 GPS



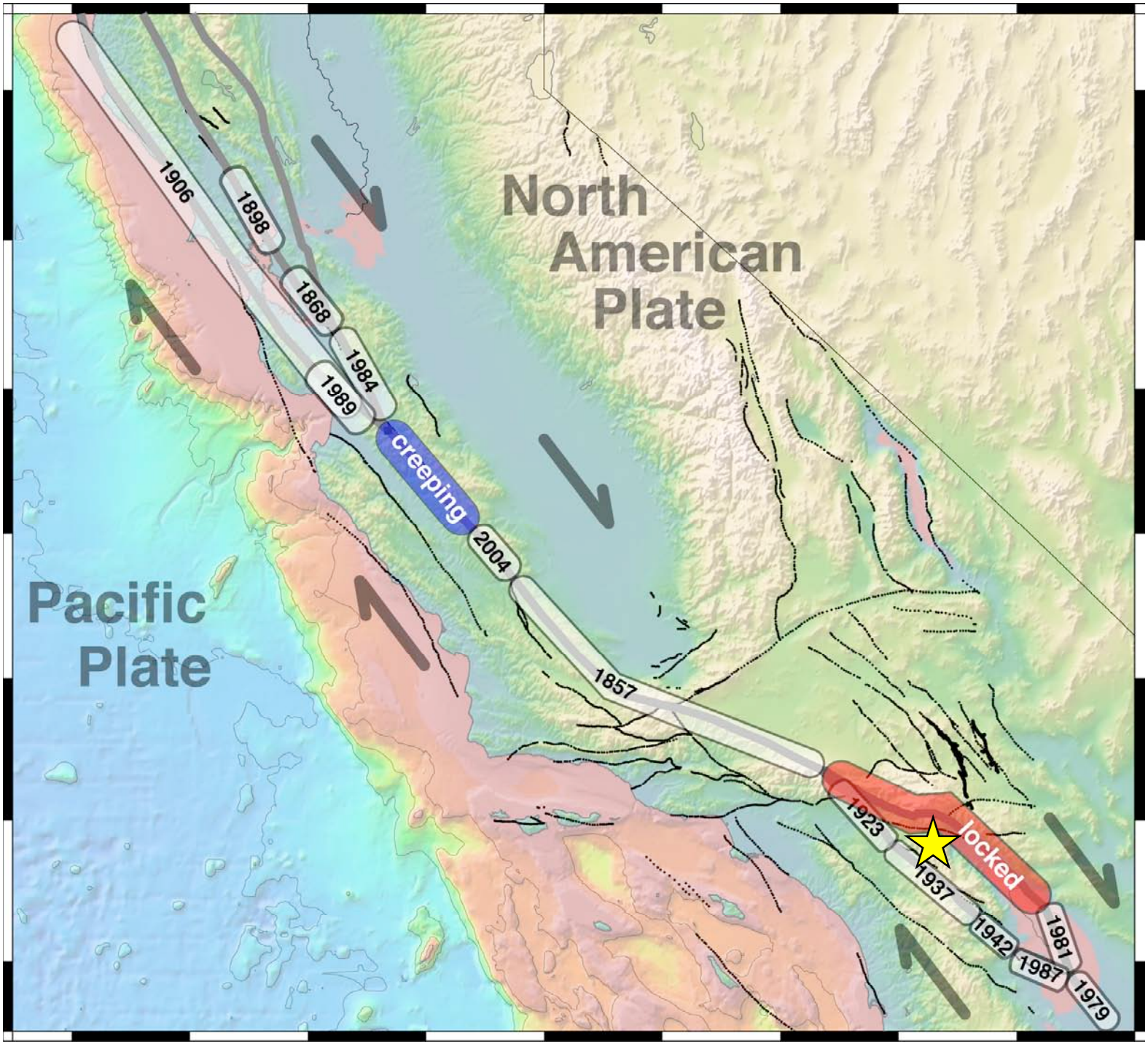


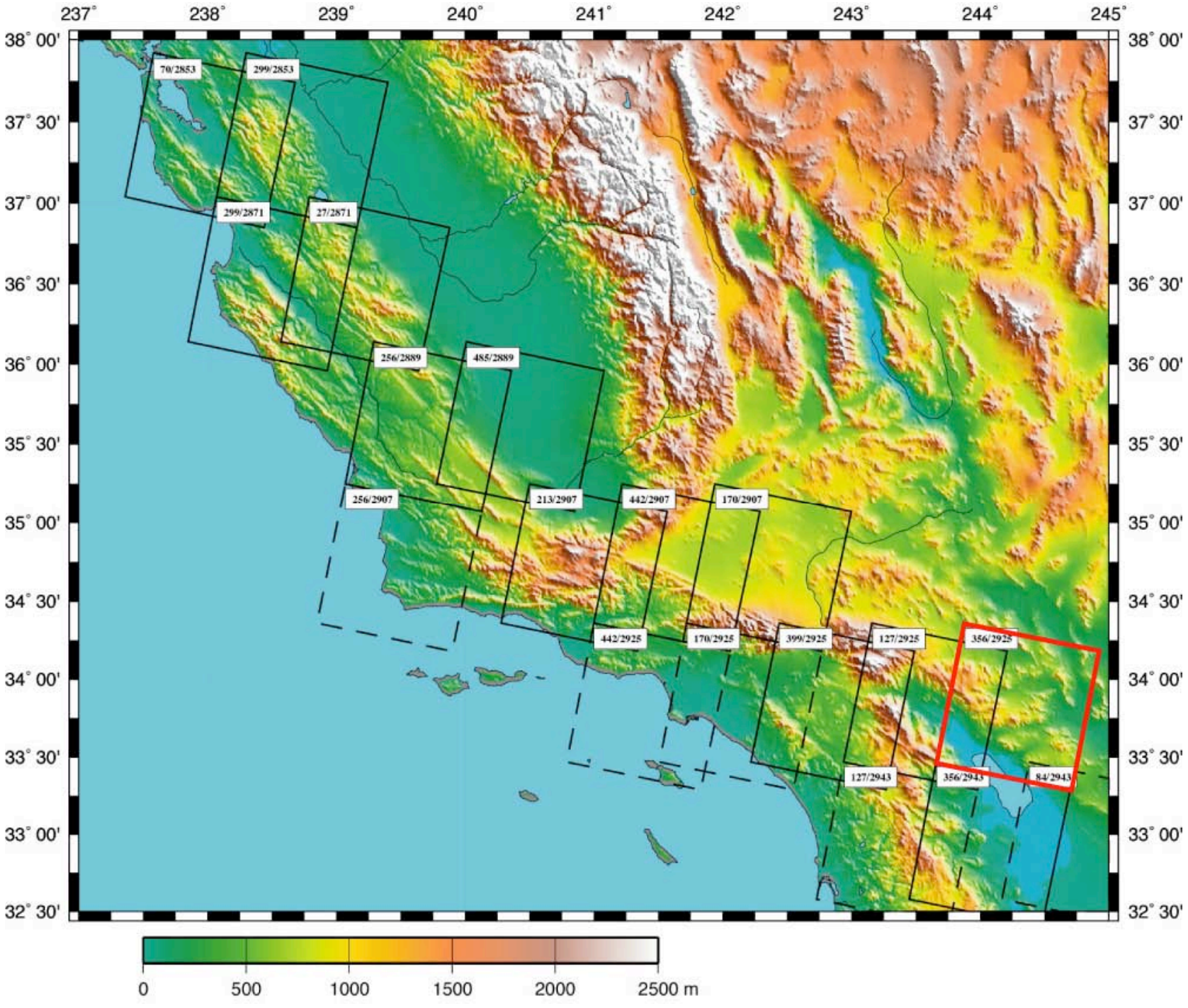


rms LOS = 14 mm

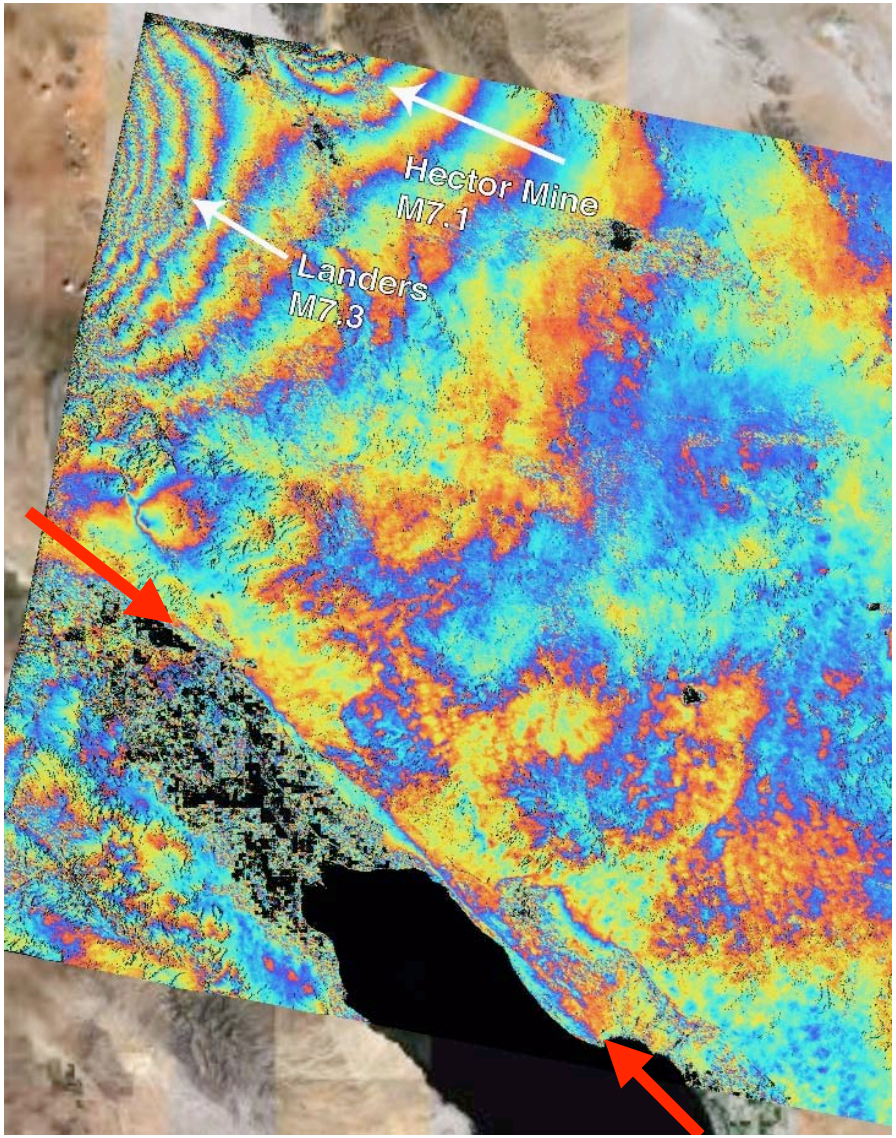
rms azimuth = 71 mm

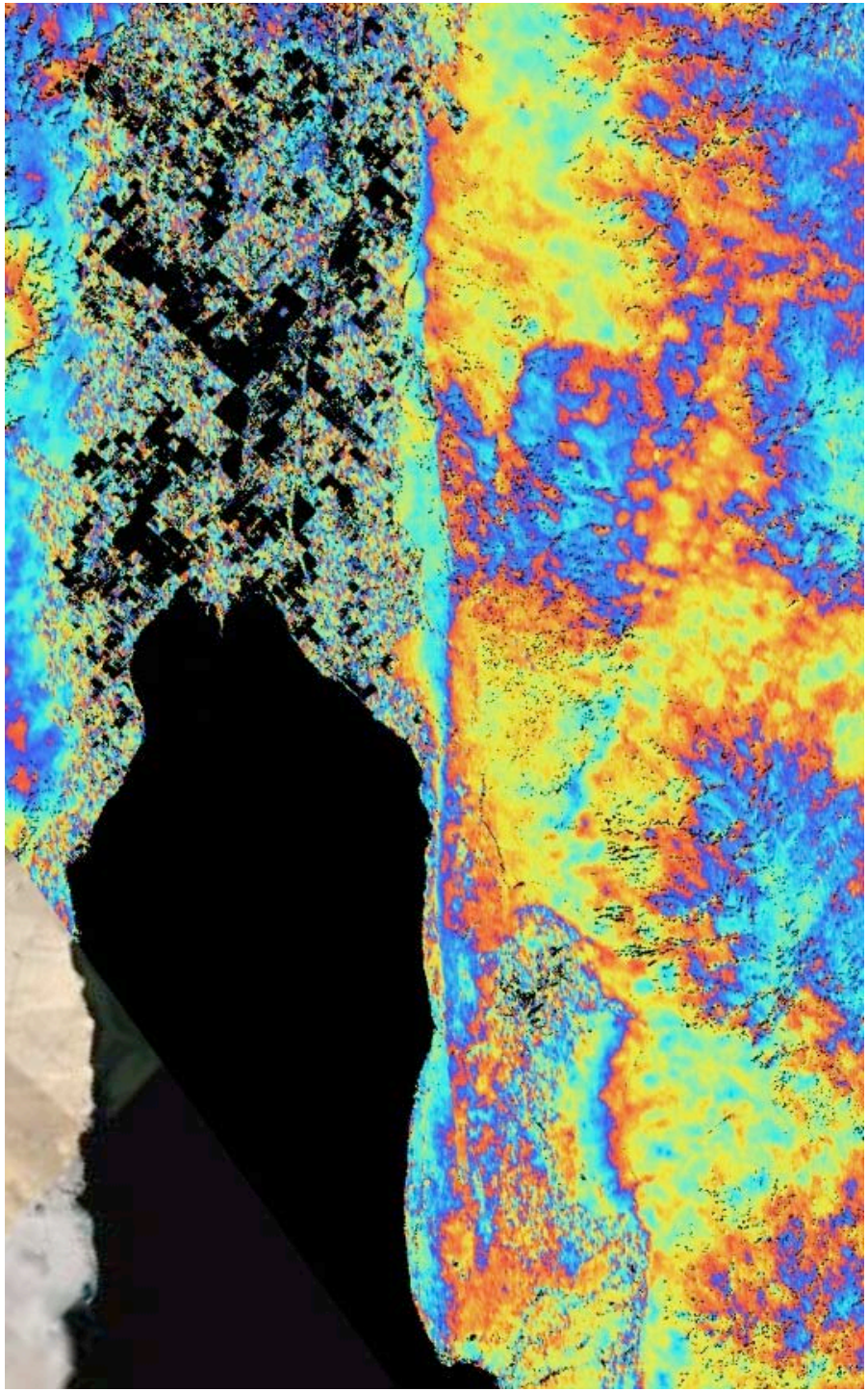
Can recover **full displacement vector** from just 2 interferograms when deformation is large.

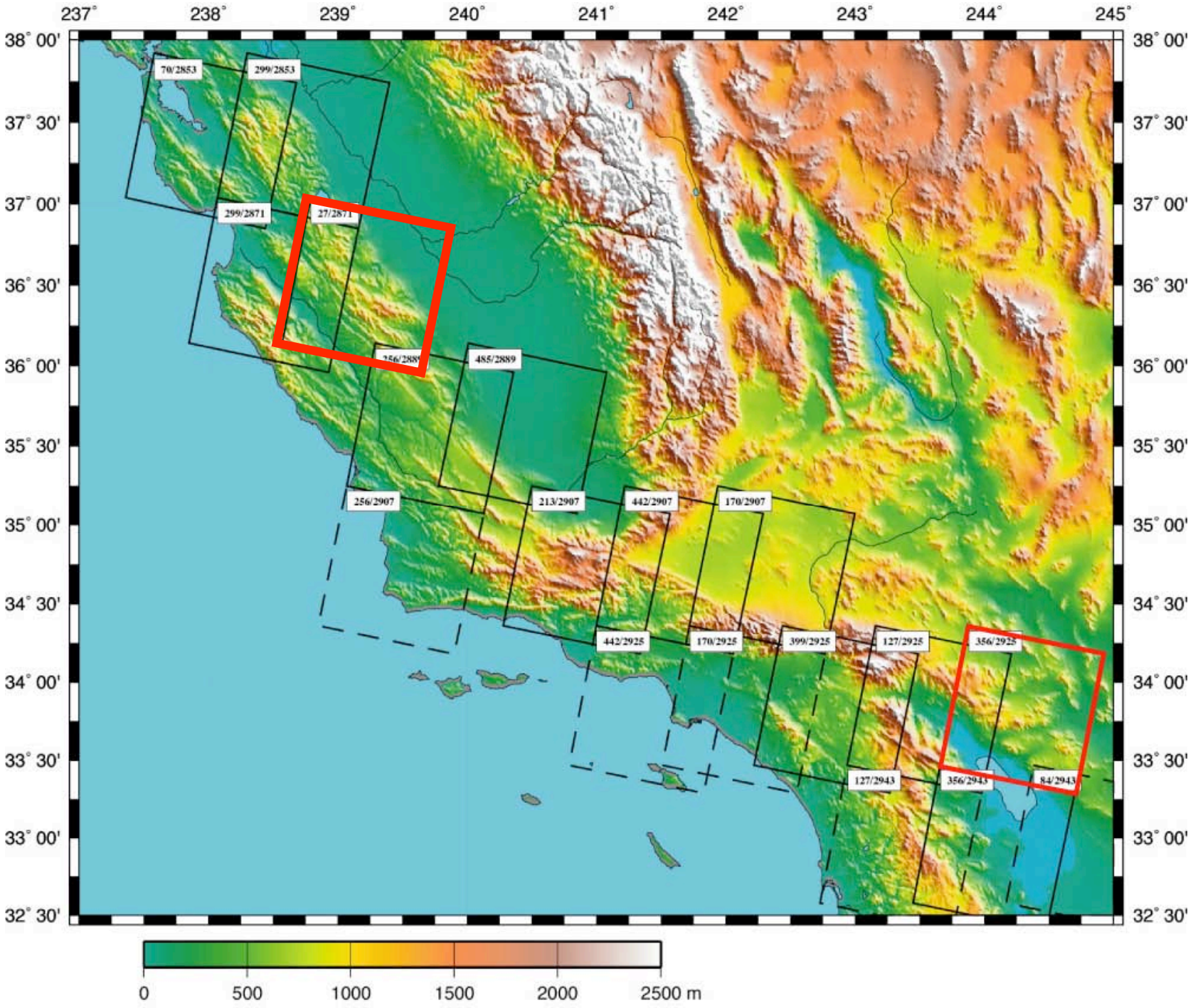

North American Plate
Pacific Plate
1906
1898
1868
1984
1989
creeping
2004
1857
1923
locked
1937
1942
1987
1981
1979


237°
238°
239°
240°
241°
242°
243°
244°
245°
38° 00'
37° 30'
37° 00'
36° 30'
36° 00'
35° 30'
35° 00'
34° 30'
34° 00'
33° 30'
33° 00'
32° 30'
70/2853
299/2853
299/2871
27/2871
256/2889
485/2889
256/2907
213/2907
442/2907
170/2907
442/2925
170/2925
399/2925
127/2925
356/2925
127/2943
356/2943
84/2943
0
500
1000
1500
2000
2500 m

7.8 year ERS interferogram reveals shallow creep on Southern San Andreas Fault triggered by 1992 M7.8 and 1999 M7.1 earthquakes.



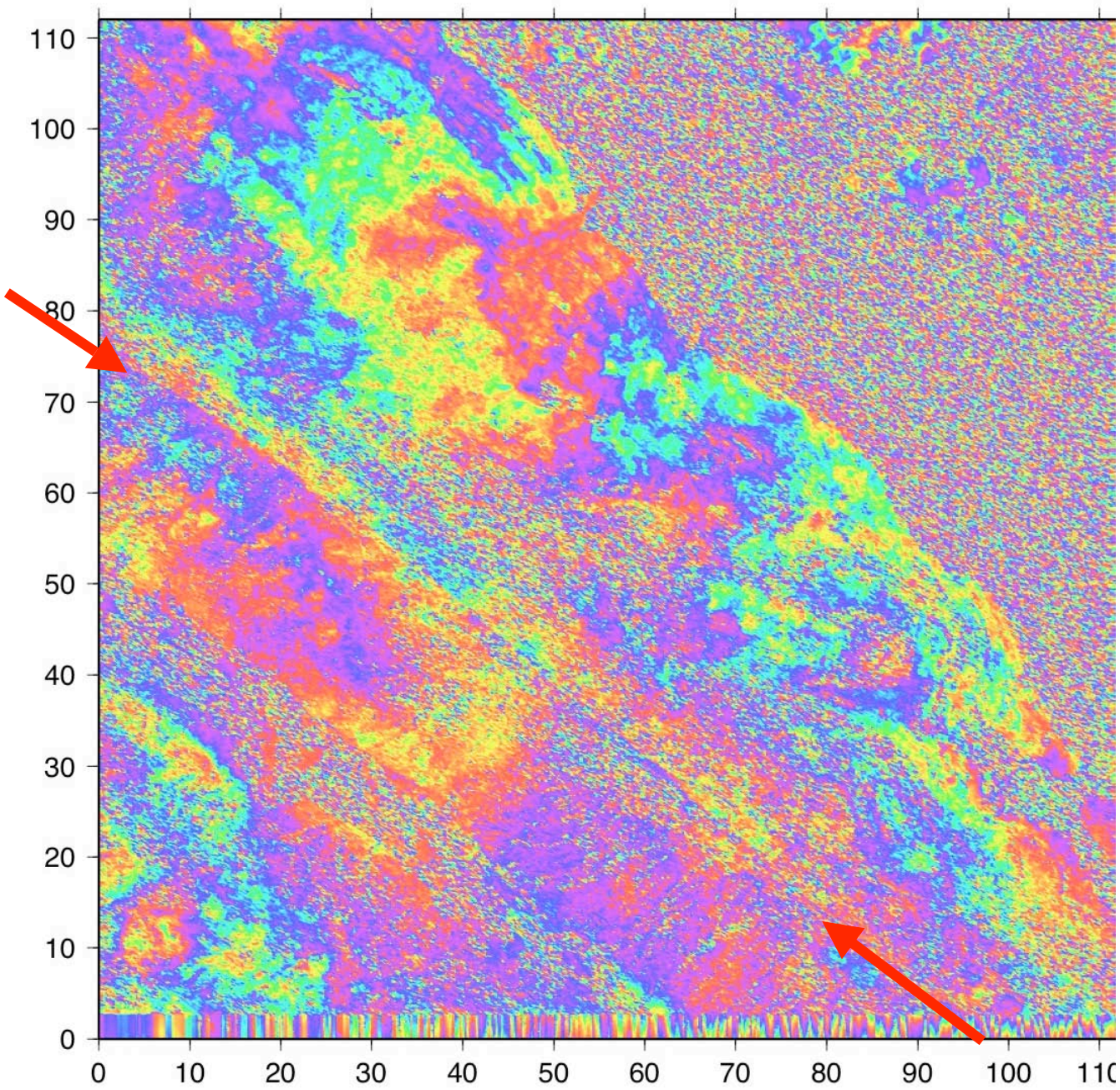



237°
238°
239°
240°
241°
242°
243°
244°
245°
38° 00'
37° 30'
37° 00'
36° 30'
36° 00'
35° 30'
35° 00'
34° 30'
34° 00'
33° 30'
33° 00'
32° 30'
70/2853
299/2853
299/2871
27/2871
485/2889
256/2907
213/2907
442/2907
170/2907
442/2925
170/2925
399/2925
127/2925
356/2925
127/2943
356/2943
84/2943
0
500
1000
1500
2000
2500 m

Creeping section of San Andreas Fault

Best available C-band ERS interferogram has poor coherence after only 1.1 years.

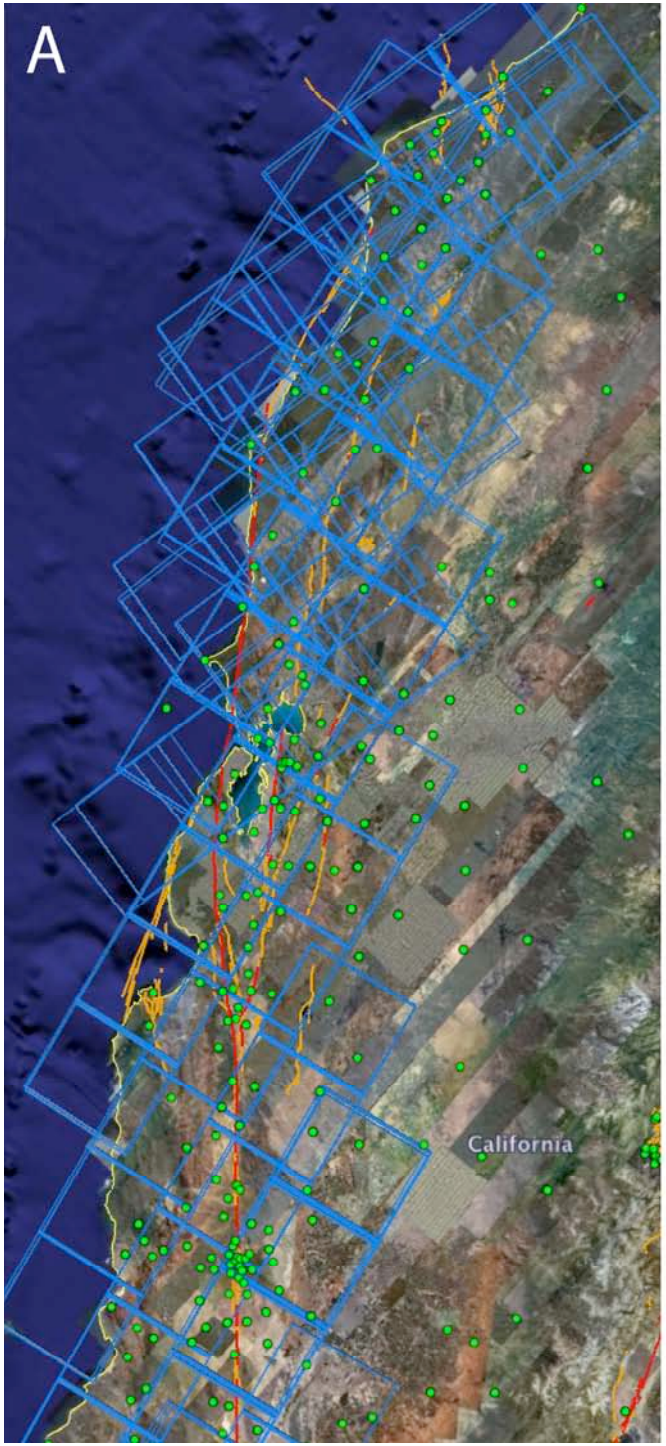
Need L-band to maintain coherence.

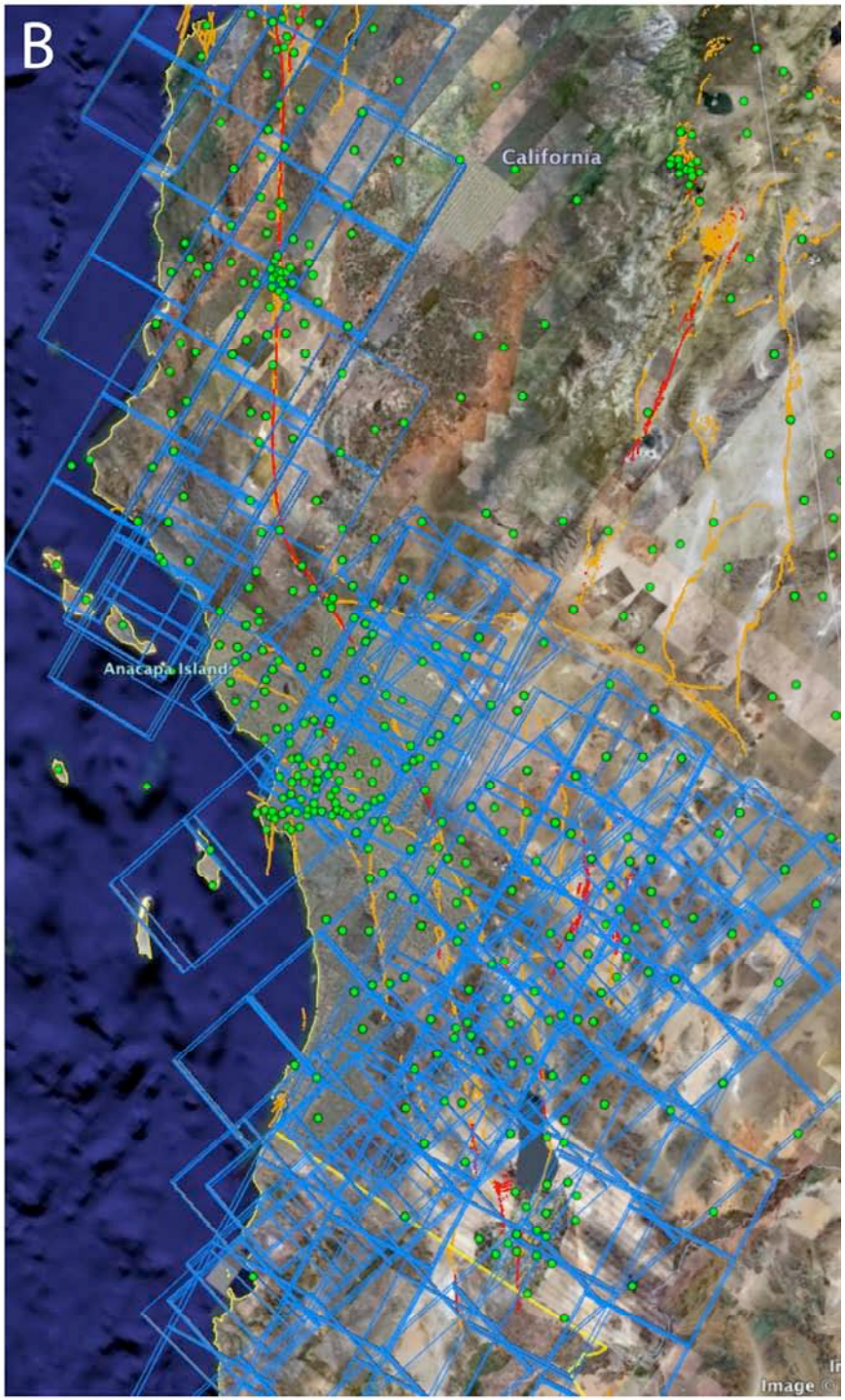


658 repeat ALOS images available at ASF in the L1 data pool.

No descending passes along the central SAF.

If there is a large Earthquake today vector deformation from ALOS will not be possible.





Conclusions and Discussion

- WInSAR members are only beginning to use PALSAR.
- ALOS preprocessor became available in June, 2007.
- ROI_PAC processing of ALOS started in September.
- Data access for non-PI was poor until about July 2007 when the ASF UPASS system started delivery.
- Currently data access is quite good and still improving with growing L1 data pool (~2000 scenes).
- Need both ascending and **descending** passes to measure vector crustal deformation especially across SAFS.