ENERGY, ENVIRONMENT & SENSORS FRONTIERS

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Publications

1. Albright, Andrea*, and Craig Glennie. "Nearshore Bathymetry From Fusion of Sentinel-2 and ICESat-2 Observations." IEEE Geoscience and Remote Sensing Letters (2020). doi: 10.1109/LGRS.2020.2987778.

2. Okyay, Unal, Jennifer Telling, Craig L. Glennie, and William E. Dietrich. "Airborne Lidar Change Detection: An Overview of Earth Sciences Applications." Earth-Science Reviews 198 (November 2019): 102929. doi: j.earscirev.2019.102929.

3. Ekhtari, Nima*, and Craig Glennie. "High-Resolution Mapping of Near-Field Deformation With Airborne Earth Observation Data, a Comparison Study." IEEE Transactions on Geoscience and Remote Sensing 56, no. 3 (March 2018): 1598-1614. doi: 10.1109/TGRS.2017.2765601.

4. Glennie, Craig. "Arctic High-Resolution Elevation Models: Accuracy in Sloped and Vegetated Terrain." Journal of Surveying Engineering 144, no. 1 (February 2018): 06017003. doi: 10.1061/(ASCE)SU.1943-5428.0000245.

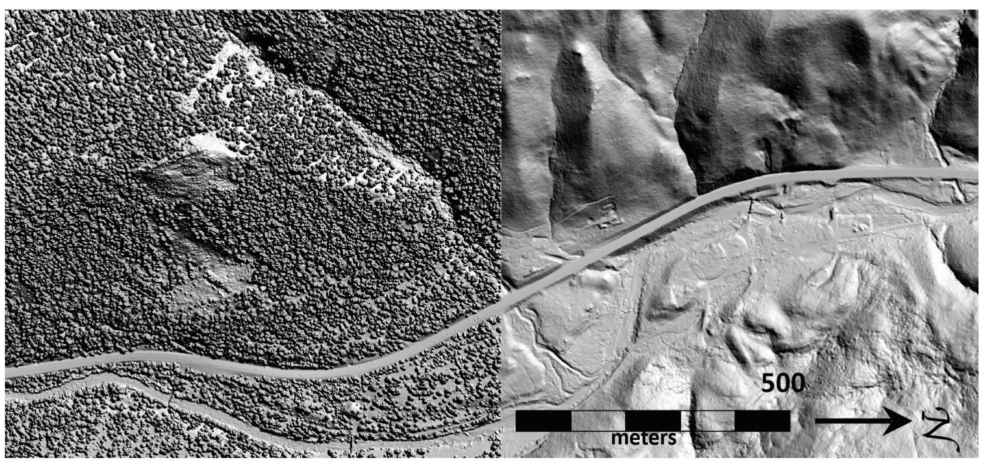
5. Brooks, Benjamin A., Sarah E. Minson, Craig L. Glennie, Johanna M. Nevitt, Tim Dawson, Ron Rubin, Todd L. Ericksen, David Lockner, Kenneth Hudnut, Victoria Langenheim, Andrew Lutz, Maxime Mareschal, Jessica Murray, David Schwartz, and Dana Zaccone. "Buried Shallow Fault Slip from the South Napa Earthquake Revealed by Near-Field Geodesy." Science Advances 3, no. 7 (5 July 2017): e1700525. doi: 10.1126/sciadv.1700525.

6. Minson, Sarah E., Benjamin A. Brooks, Craig L. Glennie, Jessica R. Murray, John O. Langbein, Susan E. Owen, Thomas H. Heaton, Robert A. Iannucci, and Darren L. Hauser. "Crowdsourced Earthquake Early Warning." Science Advances 1, no. 3 (10 April 2015): e1500036. doi: 10.1126/sciadv.1500036.

Dr. Glennie received his doctoral degree in Geomatics Engineering from the University of Calgary. He has extensive academic and industry experience in LIDAR remote sensing. At the Cullen College of Engineering, Dr. Glennie's research interests include kinematic remote sensing system integration and calibration, lidar processing and analysis, 3D change detection, and open source software development.

THE NATIONAL CENTER FOR AIRBORNE LASER MAPPING (NCALM)

NCALM was created in 2003 with the funding received from the National Science Foundation. The mission of NCALM is to support the use of airborne laser mapping technology for the scientific community. This research center is operated jointly by the Department of Civil and Environmental Engineering at the Cullen College of Engineering and the Department of Earth and Planetary Science at University of California, Berkeley. NCALM uses an Airborne Laser Swath Mapping (ALSM) system to collect data of areas on land which is then used to produce a highly accurate, three-dimensional geodetic image. Dr. Glennie, an expert in kinematic remote sensing system integration and calibration, lidar processing and analysis, 3D change detection, and open source software development, is the Principal Investigator and Director of NCALM.

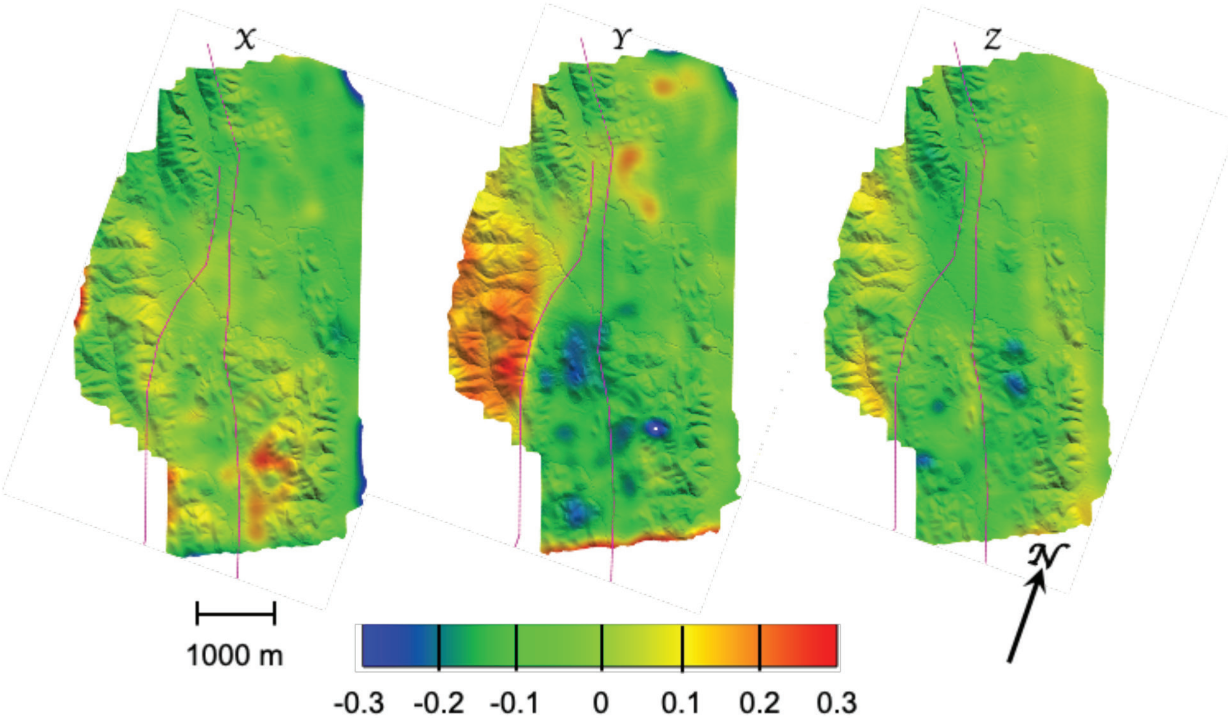


High Resolution Topography Collected by NCALM near Truckee, California

CHANGE DETECTION AND ANALYSIS FOR RESPONSE TO NATURAL HAZARDS

Hurricanes and earthquakes are two of the most destructive natural disasters that impact communities in the United States. Emergency response in the aftermath of a major event requires the immediate assembly and dissemination of information on the size, shape, scale and nature of the devastation caused by the natural disaster.

Increasingly, accurate mapping data and GIS software are being used to plan, coordinate and respond to a disaster using airborne or satellite reconnaissance as the primary geospatial data source. Currently, however, the primary difficulty with geospatial response is that the mapping and situational data being collected are not immediately available, and there is often no quantitative change assessment of the geospatial data with respect to reference models (i.e., pre-event information) to efficiently determine significant areas of disaster event impact. Dr. Glennie's specific research objectives are to develop methods for: (1) real-time georeferencing of geospatial data (along with an analysis of the obtainable accuracy): (2) rapidly (near real-time) quantitative determination of change post-event using pre-event geospatial data as a benchmark, and (3) dissemination of the detected change into actionable intelligence for emergency responders using infrastructure models and disaster response tools.



Three-Dimensional Surface Deformation as a Result of the Mw 6.0 August 24, 2014 Napa Valley Earthquake Using Differential Airborne Lidar

EARTHQUAKE EARLY WARNING

Dr. Glennie, in partnership with colleagues at the United States Geological Survey (USGS) is also interested in the design, development and analysis of low cost earthquake early warning systems. Earthquake early warning systems (EEW) have the ability to reduce harm to people and infrastructure from natural hazards such as earthquake and tsunamis. However, EEW systems are not prevalent in earthquake prone areas due to their prohibitive cost. Although less accurate than scientific-grade EEW, smartphones contain low-cost versions of EEW sensors and are ubiquitous. This research seeks to use crowd-sourced observations from participating users' smartphones to detect and analyze earthquakes, and generate customized near real-time earthquake warnings.