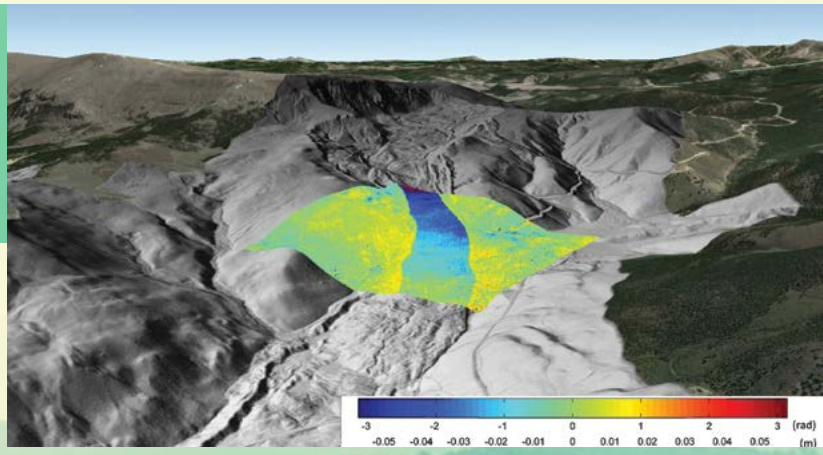
GEOSENSING SYSTEMS ENGINEERING AND SCIENCES

GRADUATE EDUCATION AND RESEARCH



GoogleEarth image, overlain with 'bare earth' shaded relief image derived from airborne LiDAR observations, with a false color inset of the surface displacement of the continuously moving Slumgullion landslide in Colorado, between July 3, 2015 and July 7, 2015, derived from airborne L-band (λ = 23.9 cm) InSAR. The LiDAR and supporting GPS observations were collected by NCALM personnel and the InSAR observations were collected by Artemis Inc., under a contract with NCALM.

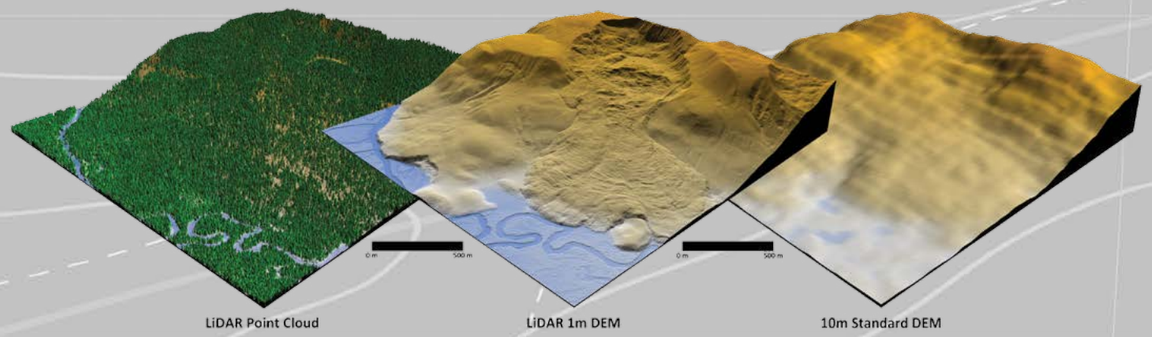
CHARTING THE FUTURE OF GEOSPATIAL TECHNOLOGY

UNIVERSITY of HOUSTON | ENGINEERING

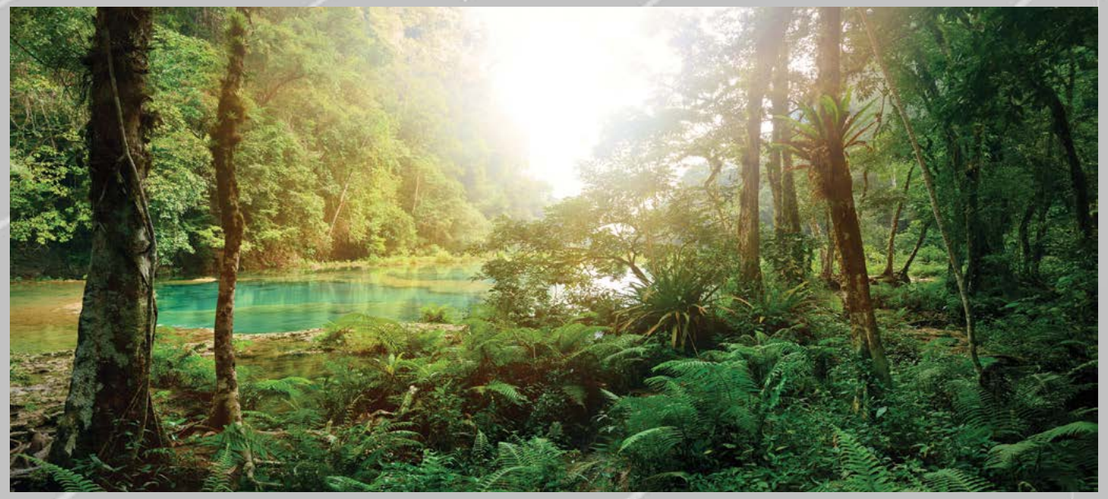
ABOUT THE GEOSENSING SYSTEMS ENGINEERING AND SCIENCES PROGRAM

Geosensing Systems Engineering and Sciences (GSES) is an interdisciplinary graduate education and research program that provides graduates with skills to successfully embark on careers in academia, government and industry. The program offers both an M.S. and Ph.D. degree in Geosensing Systems Engineering and Sciences.

The program prepares students to conduct research in GSES with the flexibility and knowledge base to respond to the rapidly changing field of geospatial engineering using state-of-the-art sensors at the National Center for Airborne Laser Mapping (NCALM), which is funded by the National Science Foundation (NSF). Cross-disciplinary collaboration is a cornerstone of the program due to the broad spectrum of research disciplines involved in GSES research. As a result, students in the program will interact and conduct research with non-engineering research scholars.



False color geodetic images of a landslide hidden beneath the forest near the Flathead River in Montana, derived from airborne LiDAR observations collected by NCALM.



WHY THE UNIVERSITY OF HOUSTON?

The Geosensing Systems Engineering and Sciences program at UH is the only graduate program of its kind in the world. It was established in direct response to academic, government and private sector workforce needs. As the geospatial technology sector continues to grow, so does the demand for graduates of the program. Recent estimates by the Department of Labor show the shortfall in advanced level of geospatially-trained individuals to be approximately 4,000 in the U.S. alone.

GSES students have the advantage of being taught by the world's leading experts on the application of airborne laser mapping, inter-ferometric synthetic aperture radar, hyperspectral imaging and other remote sensing technologies to geodesy, geomatics and related branches of science. Students in the program have direct access to all NCALM equipment.

NCALM is funded by the NSF and is jointly operated with the University of California, Berkeley. To learn more about NCALM, please visit NCALM.cive.uh.edu.

900 kHz total PRF: Topography & Bathymetry Simultaneously
Three wavelengths: 532 nm, 1064 nm & 1550 nm
Pulse rate frequency: Up to 300 kHz full waveform for each wavelength
Operating altitude: 300 – 2500 m
DiMAC D-8900: 60 MP Aerial Camera

WHAT CAN I DO WITH A GSES DEGREE?

Geosensing Systems Engineering and Sciences graduate studies provide opportunities to students in a wide assortment of disciplines that cross traditional areas of engineering and scientific specialties to produce the next-generation of global engineers and scientists. To prepare graduates for successful careers in the broader geospatial community, a variety of courses, organized into three focus areas are:

GEOSENSING ENGINEERING

- LiDAR Systems and Applications
- Satellite Altimetry and InSAR
- Introduction to Stochastic Processes
- Digital Signal Processing
- Digital Image Processing
- Multi-Dimensional Image Processing
- Digital Video

GEODESY/GEOMATICS

- Introduction to Geomatics and Geosensing
- Survey Measurement and Analysis
- GNSS/INS, and Augmented Systems for Positioning and Navigation
- Physical Geodesy
- Engineering GIS
- Geostatistics

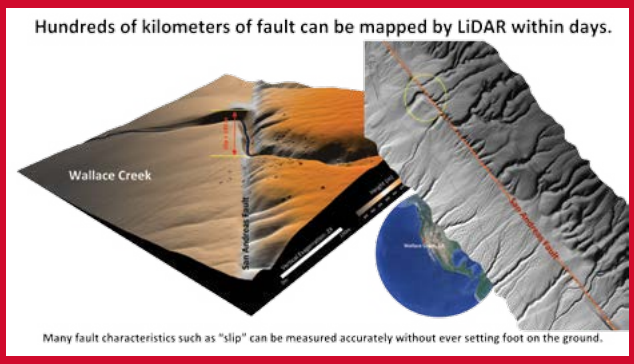
EARTH SCIENCES

- Geoscience Applications of GPS and LiDAR
- Satellite Positioning and Geodesy
- Remote Sensing
- Applications of GIS
- Petroleum Geology
- Plate Tectonics

MEET THE GSES STUDENTS!

GSES Graduate Students. 3 M.S. and 15 Ph.D. candidates were enrolled in the GSES program as of September, 1, 2015. An additional 9 Ph.D. students are under direct supervision of GSES/NCALM faculty members.

RESEARCH IMAGES



False color geodetic image of the San Andreas Fault at Wallace Creek, California, showing the displacement of the surface caused by motion along the fault. The image was derived from airborne LiDAR observations collected by NCALM, as part of mapping all of the known major faults in California.

Archaeological ruins of an ancient city discovered in the La Mosquitia Rainforest in Honduras using LiDAR collected by NCALM in 2012 (right). Gray image is a 'bare earth' shaded relief image derived from the LiDAR observations by classifying and removing returns from the dense rainforest canopy (green). At the left is an artist's rendition of the yet to be named ancient city, based on the LiDAR observations and the findings of an archaeological ground team that visited the site in February 2015 (left).

FOR MORE INFORMATION

For more information on eligibility and admission requirements, please visit
ncalm.cive.uh.edu/gses/geosensing

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