

## Team



Dr. Tom Gill



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Dr. Rip Langford



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## Associates

Dr. Oscar Dena Ornelas, Director del Centro de Información Geológica de la UACJ

## Focus

The U.S. Department of Labor identifies **geospatial technology as a high-growth, high-demand, and economically vital sector of the economy**. Our vision is to be on the cutting edge of this sector, world renowned for our expertise and for **producing high quality students with a 21<sup>st</sup> century demographic**.

Our mission is to target key research areas where we have strength and experience, and develop first-rate curricula and research portfolios in these areas. These include: **field technologies; modeling and analysis of landscape interactions; geospatial science and health; and cyber-GIS**.



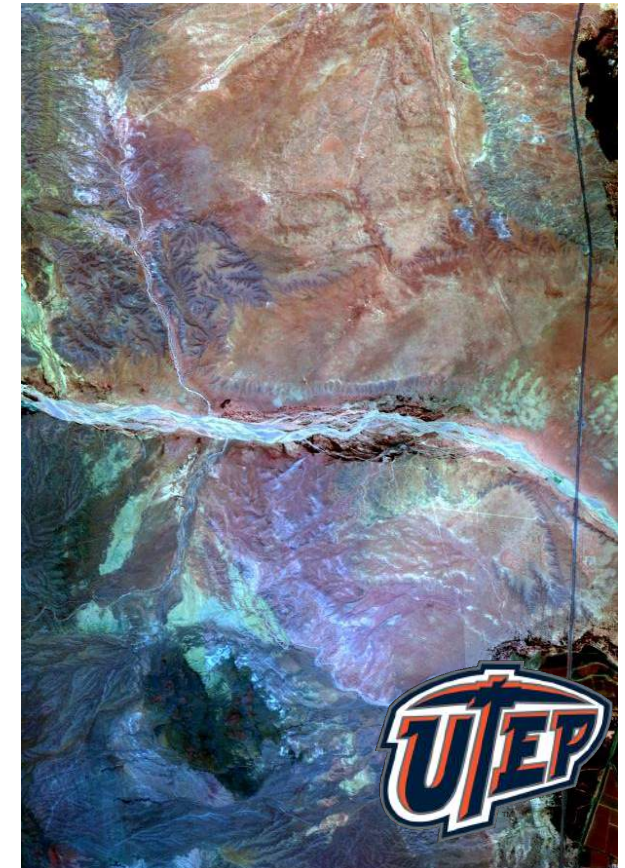
## UTEP Geospatial Analytics Crosscutting Research

Geospatial analytics has been identified by the Office of Research and Sponsored Projects at UTEP as a key university crosscutting research thrust. Significant resources are being invested towards engaging the university-wide faculty with research in this area; creating new facilities and infrastructure to support their efforts; and creating a synergistic atmosphere that facilitates the exchange of data, information and knowledge among these faculty. This effort, led by Dr. Deana Pennington, will bring together faculty and students who are applying geospatial techniques in innovative ways to a wide range of problems. We expect the geospatial analytics community to become a vibrant community, exchanging ideas and cooperatively engaging in problem solving at the forefront of these rapidly evolving technologies.

# Geospatial Research

*Geospatial field techniques •  
Geospatial analysis and modeling •  
Geo-computation • Remote sensing •  
Geoinformatics*

Thanks to groundbreaking technical equipment and unprecedented computing power, the work of geologists has undergone a rapid and fundamental change. We are at the forefront of this development – shaping the change instead of reacting to it.

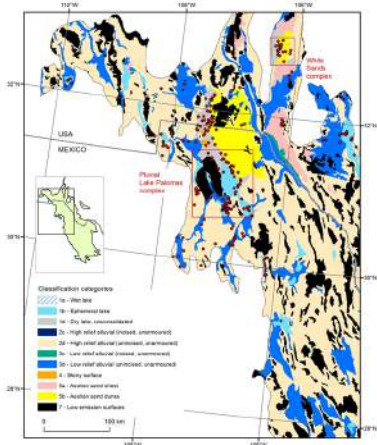


## Current Areas of Research

### Field Technologies

Field geology is being revolutionized by mobile computing technologies and UTEP is in the forefront of this effort (e.g. Pavlis et al., 2010). We are presently perfecting our field data collection systems to include live, 3D mapping capabilities through construction of 3D surface models from terrestrial LiDAR and photogrammetry as well as experiments with drones to obtain rapid aerial surveys to construct high resolution DEM's and birds-eye view exploration of cliff faces. We have

also used this technology in our educational mission with full student involvement in digital mapping as well as experiments with augmented reality for development of virtual field trips.



### Modeling and Analysis of Landscape Interactions

A wide variety of geoscience applications require modeling and analysis of landscapes -- on Earth and on other planetary bodies. Our research in this area includes: 3D models of landscape deformation, sedimentation and tectonic processes; spatiotemporal studies of climate change impacts on water, flooding, and drought; atmospheric dust and aerosol source detection and transmission paths; land-atmosphere-soil interactions and disease; and identification of in-situ resources on the lunar surface.

## Recent Publications and Presentations

**Gill T., et al.** "The White Sands as a Dust Emission Hotspot." National Park Service, 2013.

**Pavlis, T.L., Langford, R., Hurtado, J., and Serpa, L.** Computer-based data acquisition and visualization systems in field geology: Results from 12 years of experimentation and future potential: *Geosphere*, 6, 275-294, doi: 10.1130/GES00503.1, 2010.

**Pingitore N, et al.** The Geography of Disease Seasonality in Texas: A Fourier Transform Approach. 5<sup>th</sup> International Conference on Medical Geology. 25-29 August, Hilton Crystal City Hotel, Arlington, Virginia (13-4 BTH 42), 2013.

**Pennington D., et al.** Earth, Life, and Semantic Web (ELSEWeb): Provenance in distributed geospatial workflows. Annual Meeting of the American Association of Geographers (AAG), April 8-12, 2014, Tampa, FL, USA, 2014.



## Future of Geospatial Research

Geospatial applications will be key to the future of many sciences. We are currently developing the capacity to integrate heterogeneous data from disparate sources in real time with less effort. Our research areas together with new curricula and the new university-wide geospatial analytics research thrust will position us as leaders in enabling and testing techniques that will transform the geosciences.



### JOIN US!

Our department offers B.S. degrees in Geological Sciences and Environmental Science, M.S. degrees in Geological Sciences, Geophysics, and Environmental Science, and the Ph.D. in Geological Sciences.

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