Cole M. Speed

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Other Links

Education

May 2024 **Ph.D. Geological Sciences**, Dept. of Earth and Planetary Sciences, University of Texas at Austin
Dissertation topic: Remote Sensing of River Dynamics
Co-advisors: Zoltán Sylvester, David Mohrig
Cumulative GPA: 4.0/4.0

May 2017 **B.S. Geophysics**, Dept. of Earth and Planetary Sciences, University of Texas at Austin
Honors Thesis: *Stratigraphic analysis of the East Texas Inner-continental shelf*
Cumulative GPA: 3.7/4.0 (High Honors)

Relevant Coursework Python for Geoscience Research, Scientific Programming (C++/Fortran), Remote Sensing for Geoscientists, Applied Geocomputation, Scientific/Technical Computing, Machine Learning Applications in Geosciences, High Performance Computational Engineering

Relevant Professional Experience

May 2023 - Feb. 2024 **NASA Jet Propulsion Laboratory**, Pasadena, California
Intern, Observational Products for End-Users from Remote Sensing Analysis (OPERA)

- Developed computational Jupyter Notebook-based workflows for accessing and visualizing cloud-hosted data from the OPERA Surface Disturbance (DIST) product for quantifying vegetation cover dynamics.
- Applied workflows to produce real-time disaster response maps of vegetation cover loss due to Summer 2023 Canadian wildfires.
- Collaborated with JPL engineers and scientists to maintain and expand OPERA Applications Github for use by OPERA stakeholders and the general public.
- Link: OPERA Applications Github

May 2022 - Aug. 2022 **OpenTopography**, Boulder, Colorado
Data Science Intern, EarthScope Consortium

- Developed a suite of Python workflows for programmatically accessing, processing, and visualizing cloud-hosted (AWS) USGS 3DEP lidar point cloud and raster data.
- Deployed workflows on Google Colaboratory (Google's cloud platform) to enhance ease-of-use and accessibility for users regardless of experience level in Python programming language.
- Wrote and tested Python routines for programmatically colorizing USGS 3DEP lidar point cloud data with National Agriculture Imagery Program (NAIP) 1-meter multispectral imagery.
- Links: USGS 3DEP Jupyter Notebooks on Github; Release Announcement

Technical Experience and Skills

- Advanced skills and experience in ArcGIS/QGIS and geospatial data processing/analysis/visualization in Python (GDAL, PDAL, Geopandas, Scipy).
- Experience building programmatic workflows for utilizing cloud-hosted remote sensing data (lidar and optical).

Peer-Reviewed Publications

Speed, C.M., Sylvester, Z., Morris, P.D., Mohrig, D. (2024) The impact of post-cutoff bend curvature on channel kinematics in meandering rivers: An example from the Trinity River, Texas, USA. *Geological Society, London, Special Publications*, 540(1), SP540-2023-118. doi:10.1144/SP540-2023-118

Speed, C.M., Swartz, J.M., Gulick, S.P.S., Goff, J.A. (2022) Seismic expression and stratigraphic preservation of a coastal plain fluvial channel belt and floodplain channels on the Gulf of Mexico inner continental shelf. *Sedimentology*, 70(2), 451-474. doi:10.1111/sed.13044

Presentations

Speed, C.M., *et al.*, 2023, Earth Surface Monitoring using OPERA Products and Open-Source Tools, T53F-0207, AGU Fall Meeting, Dec. 11-15, San Francisco, CA, USA. DOI

Speed, C.M., Sylvester, Z., Morris, P., Mohrig, D., 2023, Quantifying the Spatial and Temporal Impact of Meander Bend Cutoffs on Planform Migration Rates and Patterns: Examples from the Trinity River, Texas, S02.15, ICFS, July 2-7, Riva del Garda, Italy.

Speed, C.M., Beckley, M., Crosby, C.J., Nandigam, V., Stoker, J., 2022, Enhancing Usability of USGS 3D Elevation Program (3DEP) Lidar Data Through Jupyter Notebook-Based Data Access and Processing, IN35A-05, AGU Fall Meeting, Dec. 11-16, Chicago, IL, USA.. DOI

Speed, C.M., Sylvester, Z., Morris, P., Mohrig, D., 2022, Tracking the Spatial and Temporal Impact of Bend Cutoffs on Planform Migration Patterns in Meandering Rivers: Examples from the Trinity River, Texas and Río Mamoré, Bolivia, EP42C-1637, AGU Fall Meeting, Dec. 11-16, Chicago, IL, USA.. DOI

Speed, C.M., Morris, P., Sylvester, Z., Mohrig, D., 2020, The Impact of Fluvial Meander Cutoff on Channel-Bend Migration Patterns: Implications for Predicting River Planform Evolution and Deposit Architecture, EP004-0012 , AGU Fall Meeting, Dec. 1-17, Virtual . DOI

Morris, P., **Speed, C.M.**, Sylvester, Z., Covault, J. A., 2020, Kinematic Evolution of a Deep-Water Channel-Levee System, Eastern Gulf of Mexico, EP005-08, AGU Fall Meeting, Dec. 1-17, Virtual . DOI

Speed, C.M., Sylvester, Z., Flaig, P.P., Durkin, P., Goudge, T.A., 2020, Relating the Geomorphology and Stratigraphy of an Ancient Fluvial Avulsion Node: An example from the Cretaceous Cedar Mountain Formation, Eastern Utah, Oral, SEPM ISGC Meeting, Flagstaff, AZ, USA, April 26-29 (postponed due to COVID-19 concerns).

Speed, C.M., Sylvester, Z., Flaig, P.P., Durkin, P., Goudge, T.A., 2019, Relating the Geomorphology and Stratigraphy of an Ancient Fluvial Avulsion Node: An example from the Cretaceous Cedar Mountain Formation, Eastern Utah, EP21D-2233, AGU Fall Meeting, Dec. 9-13, San Francisco, CA, USA. DOI

Speed, C.M., Sylvester, Z., Flaig, P.P., Durkin, P., Cardenas, B.T., Goudge, T.A., 2019, Stratigraphic Architecture of Exhumed Fluvial Channel-belts: Anatomy of an Avulsion, AAPG ACE Annual Meeting, May 19-22, San Antonio, TX, USA. DOI

Speed, C.M., Swartz, J.M., Gulick, S.P.S, Goff J.A., 2017, New Insights into Valley Formation and Preservation: Geophysical Imaging of the Offshore Trinity River Paleovalley, EP33A-1667, AGU Fall Meeting, Dec. 11-15, San Francisco, CA, USA. DOI

Layton, M.E., **Speed, C.M.**, Shukla, M., Vila, A., Chon, E., Kitamikado, C., Feucht, D.W., Bedrosian, P.,Pellerin, L., 2016, Electromagnetically inferred structure of the Caja del Rio Plateau, New Mexico, GP51A-1375, AGU Fall Meeting, Dec. 12-16, San Francisco, CA, USA. DOI

Speed, C.M., Gulick, S.P.S., Goff, J.A., Swartz, J.M., Fernandez, R., 2016, Characterizing Late Quaternary Paleochannel System Evolution on the East Texas Continental Shelf, EP53A-0924, AGU Fall Meeting, Dec. 12-16, San Francisco, CA, USA. DOI

Research Grants

2019	The Institut Français du Pétrole Grant
2018	Graduate Student Seed Proposal Grant, National Center for Airborne Laser Mapping (NCALM)
2018	University of Texas Provost Supplement Fellowship
2015	Wayne Franklin Bowman Endowed Presidential Scholarship

Teaching Experience

Fall 2023 **Teaching Assistant**, Python for Geoscience Research, UT-Austin

Fall 2022 **Teaching Assistant**, Python for Geoscience Research, UT-Austin

Spr. 2022 **Teaching Assistant**, Introduction to Remote Sensing for Geoscientists, UT-Austin

Fall 2021 **Teaching Assistant**, GIS/GPS Applications in Earth Sciences, UT-Austin

Fall 2020 **Teaching Assistant**, GIS/GPS Applications in Earth Sciences, UT-Austin

Fall 2019 **Teaching Assistant**, Sedimentary Rocks, UT-Austin

Workshops and Short Courses

Oct. 2022 **Field course in river dyanamics and stratigraphy**, Utah, USA (Co-instructor)

Oct. 2019 **From point clouds and full-waveform data to DEM analysis**, Potsdam, Germany (Participant)

Oct. 2019 **Salt and Extensional Tectonics in the Paradox Basin**, Utah, USA (Participant)

May. 2019 **SEPM Deep-water Depositional Environments: Processes and Products**, Austin, Texas (Participant)

Field Experience

Oct. 2018 Stratigraphic section mapping and surveying in the Cedar Mountain Fm., Green River, Utah

Oct. 2018 Shallow marine and continental slope sedimentary systems, Cape Arago, Oregon

Jul. 2016 Geophysical surveying in the Española Basin, New Mexico

Jun. 2016 Marine Geology and Geophysics (MG&G) field course, R/V Manta, Gulf of Mexico

Professional Service

2020-Pres. Peer-reviewer: *Geophysical Research Letters, Computers & Geosciences*

Organizational Leadership

2018-2020 **President**, AAPG Student Chapter