

Lucie Costard

Professional Summary

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Professional Preparation

Academic Background

M.S., Geophysics, University of Kiel, Germany, 2018

B.S., Physics of the Earth System, University of Kiel, Germany, 2014

Professional Appointments

Research Scientist Associate II, Bureau of Economic Geology, The University of Texas at Austin (December 2017-Present)

Develop and apply geophysical methods (ground-penetrating radar, electromagnetic induction) in near-surface geological and archaeological studies, produce geologic maps.

Graduate Research Assistant, Department of Geophysics, University of Kiel, Germany (August 2016-September 2017)

Planned and prepared geophysical surveys for archaeological prospecting.

Collected, processed, and interpreted near-surface geophysical data sets.

Supervised and trained student groups during field work.

Intern/Laboratory Research Assistant II, Bureau of Economic Geology, The University of Texas at Austin (September 2014-June 2015)

Collected, processed, and interpreted near-surface geophysical data for geologic mapping and geohazards studies.

Undergraduate Research Assistant, Department of Geophysics, University of Kiel, Germany (February-August 2013)

Assisted in planning, preparation, and execution of geophysical surveys in archaeological prospecting.

Theses

Geophysikalischer Methodenvergleich in der archaologischen Prospektion am Beispiel Noer in Schleswig-Holstein (Comparison of geophysical methods in archaeological prospecting using the example of Noer in Schleswig-Holstein). Master's thesis, University of Kiel, Germany, 2018.

Geophysikalische Untersuchung des Flussufers einer wikingerzeitlichen Siedlung bei Witsum auf Föhr (Archaeo-geophysical prospection of a harbor site on the German island of Föhr). Bachelor's thesis, University of Kiel, Germany, 2013.

Areas of Expertise

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Archaeo-geophysics

Geophysical data processing (ground-penetrating radar and electromagnetic induction)

Near-surface geophysics

Awards

Awards and Honorary Societies

Career Development Publication Award, Bureau of Economic Geology, The University of Texas at Austin, 2018-2019

Presentations

Invited Presentations

Near-Surface Geophysics at Sewanee: presented to The University of the South, Sewanee, Tenn., February 27, 2020.

Presentations

Applying bathymetric GPR, borehole logging, passive seismic, lidar and structure-from-motion methods in hydrogeologic studies of the Devils River, southwestern Texas: presented at 35th Symposium on the Application of Geophysics to Engineering and Environmental Problems, New Orleans, La., April 4, 2023.

GPR for bathymetry of the Devils River, Texas: presented at 33rd Symposium on the Application of Geophysics to Engineering and Environmental Problems, online, March 18, 2021.

Collaborative geophysical investigations of near-surface strata on the southern Cumberland Plateau, Sewanee, Tennessee: presented at 33rd Symposium on the Application of Geophysics to Engineering and Environmental Problems, online, March 16, 2021.

Multimethod archaeological prospection in Noer, Germany: presented to Environmental and Engineering Geophysical Society (EEGS), presented at Symposium on the Application of Geophysics to Engineering and Environmental Problems (SAGEEP), Portland, Oreg., March 2019.

Characterizing initial-state conductivity distribution at a CO₂ injection site with airborne, surface, and borehole electromagnetic induction methods: presented to Environmental and Engineering Geophysical Society (EEGS), presented at Symposium on the Application of Geophysics to Engineering and Environmental Problems (SAGEEP), Austin, Tex., March 2015.

Near-surface stratigraphy and geophysics: presented to Southeast Regional Carbon Sequestration Partnership (SECARB), presented at SECARB 10th Annual Stakeholders' Briefing, Atlanta, Ga., March 2015.

Activities of a Professional Nature

Professional Societies

Environmental and Engineering Geophysical Society (EEGS)

Funding

Research Support

Researcher: Career Development Publication Support Grant, Bureau of Economic Geology, The University of Texas at Austin (October 2018-February 2019; \$5234.25).

Publications

Peer Reviewed Journal Articles

Saylam, K., Averett, A. R., Costard, L., Wolaver, B. D., and Robertson, S., 2020, Multi-Sensor Approach to Improve Bathymetric Lidar Mapping of Semi-Arid Groundwater-Dependent Streams: Devils River, Texas: Remote Sensing, v. 12, no. 2491, 24 p., <http://doi.org/10.3390/rs12152491>.

Paine, J. G., Collins, E. W., and Costard, L., 2018, Spatial discrimination of complex, low-relief Quaternary siliciclastic strata using airborne lidar and near-surface geophysics: an example from the Texas coastal plain, USA: *Engineering*, v. 4, no. 5, p. 676-684, <http://doi.org/10.1016/j.eng.2018.09.005>.

Costard, L., and Paine, J. G., 2015, Characterizing initial-state conductivity distribution at a CO₂ injection site with airborne, surface, and borehole electromagnetic induction methods: *Environmental Geosciences*, v. 22, no. 3, p. 75-83, <http://doi.org/10.1306/eg.06191515004>.

Peer Reviewed Book Chapters

Paine, J. G., Costard, L., Andrews, J., Averett, A., Saylam, K., and Hupp, J., 2021, Determining annual to decadal subsidence areas and rates using airborne lidar, GPS surveys, and topographic maps at the Wink sinkholes, West Texas, in Johnson, K. S., Land, L., and Decker, D. D., eds., *Evaporite karst in the Greater Permian Evaporite Basin (GPEB) of Texas, New Mexico, Oklahoma, Kansas, and Colorado*: Norman, Oklahoma, Oklahoma Geological Survey, Circular, v. 113, p. 93-103.

Non Peer Reviewed Journal Articles

Costard, L., and Paine, J. G., 2015, Characterizing initial-state conductivity distribution at a CO₂ injection site with airborne, surface, and borehole electromagnetic induction measurements: *Proceedings, 28th Symposium on the Application of Geophysics to Engineering and Environmental Problems*, 9 p.

Paine, J. G., Collins, E. W., and Costard, L., 2015, Airborne lidar and near-surface geophysics: a new approach to discriminating Quaternary depositional units on the Texas Coastal Plain: *GCAGS Transactions*, v. 65, p. 313-322.

Paine, J. G., Collins, E. W., and Costard, L., 2015, Airborne lidar and near-surface geophysics: a new approach to discriminating Quaternary depositional units on the Texas Coastal Plain: *Proceedings, 28th Symposium on the Application of Geophysics to Engineering and Environmental Problems*, 10 p.

Non Peer Reviewed Atlases and Maps

Paine, J. G., and Costard, L., 2022, Geologic map of the Palacios NE quadrangle, Texas Gulf of Mexico Coast: The University of Texas at Austin, Bureau of Economic Geology, Open-File Map, no. 257, 1:24,000.

Paine, J. G., Costard, L., and Caudle, T., 2022, Geologic map of the Palacios SE quadrangle, Texas Gulf of Mexico Coast: The University of Texas at Austin, Bureau of Economic Geology, Open-File Map, no. 258, 1:24,000.

Paine, J. G., and Costard, L., 2021, Geologic map of the Palacios and part of the Palacios Point quadrangles, Texas Gulf of Mexico Coast: The University of Texas at Austin, Bureau of Economic Geology, Open-File Map, no. 250, 1:24,000.

Paine, J. G., and Costard, L., 2021, Geologic map of the Turtle Bay quadrangle, Texas Gulf of Mexico Coast: The University of Texas at Austin, Bureau of Economic Geology, Open-File Map, no. 251, 1:24,000.

Woodruff, C. M., Jr., and Costard, L., 2021, Geologic map of the Lytton Springs quadrangle, Texas: The University of Texas at Austin, Bureau of Economic Geology, Open-File Map, no. 253, 1:24,000, 2 sh.

Paine, J. G., and Costard, L., 2020, Geologic map of the Bloomington quadrangle, Texas Gulf of Mexico coast: The University of Texas at Austin, Bureau of Economic Geology, Open-File Map, no. 246, 1:24,000, 2 sh.

Paine, J. G., and Costard, L., 2020, Geologic map of the Olivia and part of the Keller Bay quadrangles, Texas Gulf of Mexico coast: The University of Texas at Austin, Bureau of

Economic Geology, no. 247, 1:24,000, 2 sh.

Paine, J. G., and Costard, L., 2019, Geologic map of the Placedo quadrangle, Texas Gulf of Mexico Coast: Bureau of Economic Geology, The University of Texas at Austin, Open-File Map, no. 0239, 1:24,000, 2 sh.

Paine, J. G., and Costard, L., 2019, Geologic map of the Port Lavaca West quadrangle, Texas Gulf of Mexico Coast: Bureau of Economic Geology, The University of Texas at Austin, Open-File Map, no. 0240, 1:24,000, 2 sh.

Woodruff, C. M., Jr., Costard, L., and Barnes, V. E., 2019, Geologic Map of the Pedernales Falls quadrangle, Blanco County, Texas: Bureau of Economic Geology, The University of Texas at Austin, Open-File Map, no. 243, 1:24,000.

Paine, J. G., Collins, E. W., and Costard, L., 2018, Geologic map of the Kamey Quadrangle, Texas Gulf of Mexico Coast, Sheet 1: The University of Texas at Austin, Bureau of Economic Geology, Open-File Map, no. 0234, 1:24,000.

Paine, J. G., Collins, E. W., and Costard, L., 2018, Geologic map of the Kamey quadrangle, Texas Gulf of Mexico Coast: Sheet 2, Digital elevation model, time-domain electromagnetic induction soundings, and frequency-domain electromagnetic induction measurements: The University of Texas at Austin, Bureau of Economic Geology, Open-File Map, no. 0234.

Paine, J. G., Collins, E. W., and Costard, L., 2018, Geologic map of the Point Comfort quadrangle, Texas Gulf of Mexico Coast, Sheet 1: The University of Texas at Austin, Bureau of Economic Geology, Open-File Map, no. 0235, 1:24,000.

Paine, J. G., Collins, E. W., and Costard, L., 2018, Geologic map of the Point Comfort quadrangle, Texas Gulf of Mexico Coast: Sheet 2, Digital elevation model and time-domain electromagnetic induction soundings: The University of Texas at Austin, Bureau of Economic Geology, Open-File Map, no. 235.

Paine, J. G., Collins, E. W., and Costard, L., 2015, Geologic map of the Rincon Bend Quadrangle, Aransas River, and Copano Bay Area, Texas Gulf of Mexico Coast: Bureau of Economic Geology, The University of Texas at Austin, Open-File Map, 1:24,000.

Paine, J. G., Collins, E. W., and Costard, L., 2015, Geologic map of the Woodsboro Quadrangle, Aransas and Mission Rivers, and Copano Bay Area, Texas Gulf of Mexico Coast: Bureau of Economic Geology, The University of Texas at Austin, Open-File Map, 1:24,000.

Conference Proceedings

Paine, J. G., Costard, L., Hunt, B., and Kennedy, V., 2022, GPR, EM, and borehole geophysical investigations of the Bee Creek fault zone, Central Texas (abs.), 34th Symposium on the Application of Geophysics to Engineering and Environmental Problems (SAGEEP 2022), Denver, Colo., March 20-24, 1 p.

Ahmadian, M., LaBrecque, D., Liu, Q. H., Kleinhammes, A., Doyle, P., Fang, Y., Paine, J. G., and Costard, L., 2019, Validation of the utility of contrast-agent-assisted electromagnetic tomography method for precise imaging of a hydraulically induced fracture network, Society of Petroleum Engineers, SPE Annual Technical Conference and Exhibition, 30 September, Calgary, Canada, SPE-196140-MS.

Contract Reports

Paine, J. G., Caudle, T., Costard, L., Hunt, B., Woodruff, C. M., Jr., Andrews, J. R., McCall, L., Rogers, H., and Werner, C., 2022, Texas STATEMAP program summary, FY21 (2021-2022): The University of Texas at Austin, Bureau of Economic Geology, Final Technical Report prepared for U.S. Geological Survey, under contract no. G21AC10838, 29 p.

Paine, J. G., Costard, L., and Hunt, B. B., 2022, Geophysical studies of the Bee Creek fault zone, southwestern Travis County, Texas: The University of Texas at Austin, Bureau of

Economic Geology, final report prepared for Travis County, Tex., under contract no. UTA21-000067, 42 p.

Paine, J. G., and Costard, L., 2021, Seismic and EM profiles across known and suspected faults at Essex Bayou, upper Texas coast: The University of Texas at Austin, Bureau of Economic Geology, final report prepared for Texas A&M AgriLife Research, under contract no. M1900742, 10 p.

Paine, J. G., Caudle, T., Costard, L., Hunt, B., Woodruff, C. M., Jr., McCall, L., and Masterson, A. R., 2021, Texas STATEMAP program summary, FY20 (2020-2021): The University of Texas at Austin, Bureau of Economic Geology, final technical report prepared for U.S. Geological Survey, under contract no. G20AC00313, 37 p.

Paine, J. G., and Costard, L., 2020, Collaborative near-surface geophysics at Sewanee: Bureau of Economic Geology, The University of Texas at Austin, final report prepared for The University of the South, under contract no. UTA17-0010210, 87 p.

Paine, J. G., Caudle, T. L., Costard, L., Elliott, B. A., and Woodruff, C. M., Jr., 2020, Texas STATEMAP program summary, FY19 (2019-2020): The University of Texas at Austin, Bureau of Economic Geology, final technical report prepared for U.S. Geological Survey, under contract no. G19AC00225, 19 p.

Paine, J. G., and Costard, L., 2019, Near-Surface Geophysics at Sewanee: Bureau of Economic Geology, The University of Texas at Austin, Field Report 2 prepared for The University of the South, under contract no. UTA17-001021, 26 p.

Paine, J. G., Caudle, T., Elliott, B. A., Woodruff, C. M., Jr., and Costard, L., 2019, Texas STATEMAP program summary, FY18 (2018-2019): Bureau of Economic Geology, The University of Texas at Austin, Final Technical Report prepared for U.S. Geological Survey, under contract no. G18AC00195, 17 p.

Collins, E. W., Paine, J. G., and Costard, L., 2018, Project 1: Geologic mapping of the middle Texas Gulf of Mexico coast and coastal plain (Kamey and Point Comfort quadrangles), 1:24,000, in Collins, E. W., Paine, J. G., Elliott, B. A., Woodruff, C. M., Jr., and Costard, L., Texas STATEMAP Program FY17 (2017-2018): The University of Texas at Austin, Bureau of Economic Geology, Final Report prepared for U.S. Geological survey, under contract no. G17AC00253, 2017, 8-15 p.

Paine, J. G., and Costard, L., 2018, Near-surface geophysics at Sewanee: Field Report 1 prepared for The University of the South, under contract no. UTA17-001021, 15 p.

Paine, J. G., Collins, E. W., Caudle, T., and Costard, L., 2018, Powderhorn Ranch geoenvironmental atlas: Bureau of Economic Geology, The University of Texas at Austin, Final Report prepared for General Land Office, under contract no. 17-186-000-9823, 73 p.

Published Abstracts

Paine, J. G., Hunt, B., Andrews, J. R., Saylam, K., and Costard, L., 2023, Applying bathymetric GPR, borehole logging, passive seismic, lidar and structure-from-motion methods in hydrogeologic studies of the Devils River, southwestern Texas (abs.): Proceedings, 35th Symposium on the Application of Geophysics to Engineering and Environmental Problems, 1 p., <https://www.eegs.org/proceedings-sageep-2023>.

Costard, L., Saylam, K., Averett, A., Wolaver, B., and Robertson, S., 2021, GPR for bathymetry of the Devils River, Texas (abs.): SAGEEP 2021: 33rd Symposium on the Application of Geophysics to Engineering and Environmental Problems, March 14-19, online, p. 177, <http://doi.org/10.4133/sageep.33-088>.

Paine, J. G., Costard, L., Knoll, M. A., Potter, D. B., Sherwood, S. C., Torreano, S., Turner, A., and Van de Ven, C., 2021, Collaborative geophysical investigations of near-surface strata on the southern Cumberland Plateau, Sewanee, Tennessee (abs.): SAGEEP 2021: 33rd Symposium

on the Application of Geophysics to Engineering and Environmental Problems, March 14-19, online, p. 194, <http://doi.org/10.4133/sageep.33-101>.

Costard, L., 2019, Multi-method archeogeophysical prospection in Noer, Germany (abs.): Symposium on the Application of Geophysics to Engineering and Environmental Problems (SAGEEP), Proceedings, Portland, Ore., 2019, "Archaeology: short abstracts", p. 2.

Paine, J. G., Collins, E. W., and Costard, L., 2019, Improving geologic mapping of low-relief Quaternary strata on the Texas Coastal Plain using airborne lidar and near-surface geophysics (ext. abs.): Geologic Mapping Forum, Minneapolis, Minn., April 10-12, 2019, Minnesota Geological Survey Open-File Report OFR-19-1, p. 67-68.

Wunderlich, T., Wolf, F., Costard, L., Grüneberg-Wehner, K., and Erkul, E., 2019, Multimethodische Prospektion von Überresten eines Herrenhauses in Noer (Multimethod prospecting of mansion remains in Noer [Germany]) (abs.): 79. Jahrestagung Deutsche Geophysikalische Gesellschaft, 04.-07. März 2019 in Braunschweig, "Abstracts", p. 52.

Collins, E. W., Paine, J. G., Elliott, B. A., Woodruff, C. M., Jr., and Costard, L., 2018, STATEMAP Program Geologic Mapping In Texas (abs.): Geological Society of America Abstracts with Programs, v. 50, no. 1, <http://doi.org/10.1130/abs/2018SC-309882>.

Paine, J. G., Collins, E. W., and Costard, L., 2017, Discriminating Quaternary coastal-plain strata using airborne lidar and near-surface geophysics: a helpful approach to low-relief geologic mapping (abs.): Geological Society of America, Abstracts with Programs, v. 49, no. 6, <http://doi.org/10.1130/abs/2017AM-305364>.

Costard, L., and Paine, J. G., 2015, Characterizing initial-state conductivity distribution at a CO₂ injection site with airborne, surface, and borehole electromagnetic induction methods (ext. abs.): Symposium on the Application of Geophysics to Engineering and Environmental Problems (SAGEEP), Proceedings, Austin, Tex., 2015, p. 360-368, <http://doi.org/https://doi.org/10.4133/SAGEEP.28-052>.

Published Datasets

Andrews, J. R., Saylam, K., Averett, A. R., and Costard, L., 2022, Topographic and bathymetric lidar, orthophotos, sonar, and GPR data of and along the Devils River from Juno to Lake Amistad, Texas (Pool Data 01 of 01): Hydrogeology of the Devils River Watershed, Val Verde County, Texas, <http://doi.org/10.18738/T8/UUTBB8>.