Alex J. Rinehart

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Academic Positions

Associate Professor of Hydrology, Earth and Environmental Science Department (EES), New Mexico Tech, 2024-present.

ORISE Faculty Fellow, Oakridge Institute for Science and Technology, NETL-Morgantown, 2025-present

Fellow, Hantush-Deju National Center for Hydrologic Innovation (HDNCHI), New Mexico Tech, 2023-present.

Affiliate, University of Alaska-Fairbanks, 2020 - present.

Adjunct Researcher, New Mexico Bureau of Geology and Mineral Resources, New Mexico Tech, 2019 - present.

Assistant Professor of Hydrology, EES, New Mexico Tech, 2019 - 2024.

Adjunct Professor, EES, New Mexico Tech 2014-2019.

Professional Preparation

Ph.D. (Geophysics; 3.74 GPA). January 2015. New Mexico Tech.

M.S. (Hydrology; 3.76 GPA). August 2008. New Mexico Tech.

B.S. (Mathematics, Distributed, Department and General summa cum laude; 3.98 GPA). May 2004. University of New Mexico. Thesis: On the bifurcations of the delayed logistic map.

Work Experience

Mar 2026 to present. Coowner and Lead Scientist, Magni Research, LLC, Socorro, NM

Sept 2025 to present. ORISE Faculty Fellow, Oak Ridge Institute of Science and Education, Morgantown, WV

Aug 2025 to present. Consultant, Drummond and Carpenter, PLLC

July 2024 to present. Associate Professor of Hydrology, EES, New Mexico Tech.

July 2023 to present. Fellow, HDNCHI, New Mexico Tech.

July 2019 to July 2024. Assistant Professor of Hydrology, EES, New Mexico Tech.

December 2014 to July 2019. Hydrogeologist. Aquifer Mapping Program. New Mexico Bureau of Geology, New Mexico Tech. Awarded John C. Frye award for best environmental geology GSA paper or peer-reviewed state geologic survey publication. 2021.

May 2013 to July 2014. Field assistant. STATEMAP. NM Bureau of Geology and Mineral Resources, New Mexico Tech.

May 2010 to January 2015. Intern. Geomechanics Department (06914). Sandia National Laboratories.

May 2007-May 2010. NSF Graduate Research Fellow. New Mexico Tech.

2005-2010. Teaching assistant. EES. New Mexico Tech. 2006, 2007, 2009, 2010. Was awarded Departmental TA of the Year in 2006 and 2007.

May 2004-Dec. 2008. Research assistant. EES. New Mexico Tech. 2004 - 2007

Aug. 2002 to Dec. 2003. Tutor (Physics). CAPS. University of New Mexico.

May 2001 to Aug. 2002. Technician. Shock Physics. Applied Research Associates. Albuquerque, NM.

Skills

Design. Flow-through systems for corroding chemistries, high-pressure and high temperature fluid systems, core holders, customized fixturing for chemomechanical testing, static capillary pressure curve systems, custom laboratory and field data acquisition systems, small-scale mechanical loading system controls.

Laboratory. High-pressure and high temperature chemical, mechanical, hydraulic and thermal rock/material property measurement, including flow-through and batch reactor measurements with coupled permeability, stiffness and deformation monitoring; creep to quasistatic constitutive and fracture testing in chemically active systems using screw-driven and hydraulic presses; and multiphase flow testing including steady relative permeability and gas break-through testing. Sample preparation of standard, water-sensitive and delicate materials. Non-destructive testing and monitoring including acoustic emission (up to 600°C), ultrasonic, visual DCA of strain, and X-ray computed tomography. Expertise in CO2 and saline systems.

Field and Petrography. Visual petrographic description of sedimentary rocks with an emphasis on diagenesis and on formation damage from testing. Use of XRCT, SEM, microprobe and other microscopic techniques for imaging formation damage and corrosion. Rock core, facies mapping at outcrop scale, and section description with focus on hydrogeologically important features. Field assessment of rock quality factors, permeability with air permeameters, hardness with rebound hammers, and ultrasonic velocities with field sensors. Design and fielding of potential field surveys, including regional and repeat relative microgravity surveys. Mapping of Quaternary deposits and geomorphic surfaces at 1:10k to 1:24k.

Analysis. ArcGIS mapping and analysis, including ArcPy programming. Analysis of stress-strain, failure, fracture propagation, pressure and temperature data during laboratory testing. Digital correlation and image analysis in 2D and 3D. General analysis of time series and other data in Matlab, Python and R. Geostatistical modeling in R. Experience in modeling of coupled mechanical and hydro-mechanical processes in COMSOL and Python. Multiphase flow modeling in COMSOL and in HYDRUS 1D. Geochemical simulation of stability and kinetic factors in PHREEQC.

Funding

National Science Foundation, Long Term Ecological Research Network. *Sevilleta Site: Environmental variability at dryland ecotones*. $7M with $5M of NM State match. **Co-I.** Begins Jan 2025.

Department of Energy, Office of Basic Energy Science Early Career Award. *Chemistry and rate effects on rock fracture: Toward a universal 'phase diagram' of factors controlling fracture networks from creep to dynamic failure*. $923,000. **PI.** In progress.

Bureau of Reclamation, WaterSmart Applied Science Grant. *Collecting groundwater flux and geophysical data to improve operational integrated modeling in the Socorro reach of the MIddle Rio Grande*. $197k. **PI**. In progress.

Department of Energy, Office of Carbon Management and Fossil Fuels, *CarbonSafe CarbonHub Four Corners*. ~$42M. **Senior personnel**. In progress.

Department of Energy, Office of Carbon Management and Fossil Fuels DE FOA-0002799: *CUSP Four Corners Regional Initiative to accelerate carbon capture, utilization and storage deployment: Technical assistance for large-scale storage facilities and regional carbon management hubs (AOI-1).* $3.1M. **Senior personnel.** Completed.

Department of Energy, Office of Fossil Fuels and Carbon Management: Regional resource assessment for CO2 storage in New Mexico and surrounding areas: Identification, characterization and evaluation of in-situ mineralization site/complex. $1.2M. **Co-I.** In progress.

USDA National Institute of Food and Agriculture: *Addressing agricultural drought in the New Mexico High Plains through soil and groundwater management and climate adaptation.* $350k. **Co-I.** In progress.

Department of Energy: *Advancing Characterization of Faults through Deployment of Novel Geophysical, Geochemical and Geomechanical Technologies at the San Juan Basin CarbonSAFE Site.* DE-FE0032064. $1M. **Co-I**. *Completed 2022.*

Middle Rio Grande Conservation District: *Understanding lateral and axial groundwater contributions to return flows in the southern Albuquerque Basin.* $70,000. **PI**. Supported a M.S. student who raised ~$10,000 in additional funding. *Completed 2022.*

Department of Energy: CarbonSafe Program: *San Juan Basin CarbonSAFE Phase III: Ensuring Safe Subsurface Storage of CO_2 in Saline Reservoirs, Funding Opportunity Number: DE-FOA-0001999*. $20M. **Senior personnel.** In progress.

National Science Foundation contract: *Controls of subcritical fracture properties on erosion rates in the Dry Valleys, Antarctica*. $30k. **Senior personnel**. In progress.

DOE Office of Fossil Fuel and Carbon Management: *DOE Southwest Partnership in CO2 Sequestration Budget Period 4: Characterization task, Chemomechanical characterization of the Morrow B and Morrow Shale subtask*. $20M. **Senior personnel**. Completed Dec 2024.

Albuquerque-Bernalillo County Water Utility Authority: Mapping and interpretation of 2019/2020 aquifer potentiometric surface. $42k. **PI.** *Completed*.

New Mexico Water Resources Research Institute: *Compilation of Produced Water Production and Injection for the State of NM*. $25k. **Co-I.** Completed 2021.

New Mexico Water Resources Research Institute: *New Mexico University Collaboration on Produced Waters: Seismic and geodetic modeling in conjunction with 3D geologic model construction*. $30k. **PI**. Completed October 2020.

New Mexico Water Resources Research Institute: *Year 4 Statewide Water Assessment: Groundwater level and storage change in western, northeastern and southeastern New Mexico*. $27k. **PI**. Completed August 2019.

Sandoval County: *Assessment of oil and gas potential and risks of groundwater contamination from unconventional oil and gas development*. $150k. **Co-I.** Completed Jan 2019.

New Mexico Department of Homeland Security and Emergency Management Hazard Mitigation Project: *State-wide susceptibility maps for landslide, rock fall and collapsible soils hazards.* $107k. **Co-I**. Completed Oct 2017.

New Mexico Environment Department: *Gold King Mine Water Spill Long Term Monitoring Plan*. $100k. **Co-I**. Completed Spring 2020

New Mexico Water Resources Research Institute: *Year 3 Statewide Water Assessment: Groundwater level and storage change in the Southern High Plains and in two variably confined aquifers*. $36k. **PI.** Completed July 2016.

Sandia National Laboratories: Automatic phase arrival estimation for fracture characterization. June 2016. $7k. **PI.**

City of Clovis: *Map of aquifer lifetimes in Clovis-Portales region.* $60k. **Co-I**. Completed July 2016.

NM Office of the State Engineer. *San Agustin Plains sampling and measurement.* $25k. **PI.** Completed January 2016.

New Mexico Water Resources Research Institute. *Year 2 Statewide Water Assessment: New Mexican alluvial aquifer storage changes*. $41k. **PI**. Completed July 2015.

New Mexico Water Resources Research Institute: *Year 2 Statewide Water Assessment: Recharge data compilation and recharge area identification for the state of New Mexico*. $35k. **PI.** Completed July 2015.

New Mexico Bureau of Geology and Mineral Resources: *High precision gravimeter and geodetic-grade GPS equipment.* Strategic acquisition for long-term program. $100,000. **PI.** Completed Fall 2015.

NM NASA SpaceGrant Fellow. $10k. **Student PI**. Completed May 2009.

NSF Graduate Research Fellowship. $120k. **Student PI**. Completed May 2010.

New Mexico Water Resources Research Institute Student Research Grant. $5k. **Student PI**. Completed Summer 2005.

Academic Honors

ORISE Faculty Fellow, NETL, Morgantown, WV, 2025-present

Keynote speaker, Taiwan Geoscience Assembly. 2025.

John C. Frye award for best environmental geology GSA paper or peer-reviewed state geologic survey publication. 2021.

Student Intern Recognition for Outstanding Service, Geomechanics Department, Sandia National Labs. 2011 and 2012.

NSF Graduate Research Fellow. 2007-2010.

TA of the Year. Hydrology Program, EES Department NMT. 2006, 2007.

Summa cum laude, Departmental Honors, Mathematics Department, University of New Mexico. 2004.

Summa cum laude, University Honors, University of New Mexico. 2004.

Teaching Experience

Professor, EES Department, NMT.

Hydrological Theory and Field Methods in Hydrology (GEOL 4040), Fall 2021 through 2024
Time Series Analysis (MATH 5087/GEOP 5005), Spring 2022, 2024
Vadose Zone Hydrology (HYDR 5014), Fall 2020, Spring 2023
Natural Complexity (HYD 5072, now HYDR 556)), Spring 2022.
Philosophy for Scientistss (HYDR 5072 / PHILO 4/5089), Spring 2025.
Environmental Tracers (HYD 5048), Spring 2021.
Fracture in Geologic Settings (HYDR 5072, now HYDR 5055), Spring 2021, Spring 2025.
Hydrogeochemistry (HYDR 5007), Fall 2019.

Instructor.

Directed Study in Rock Fracture in Geologic Settings (HYD 572), EES, NMT, Fall 2018.
Complexity (HYD/GEOP/BIO 572), EES, NMT, Spring 2017.
Quantitative Methods in Hydrology, EES, NMT, Fall 2009.

Guest lecturer.

Watershed Dynamics (HYDR 5013, Fall 2022; lectured on snow dynamics).
Petroleum Exploration Geophysics (GEOL 4045/GEOP 4045, EES, NMT. Fall 2017-2020. Lectured on gravity methods for one week each year.
Geodetic Methods and Modeling (ERTH 4055/GEOP 5055) . EES, NMT, Fall 2016. Lectured on gravity methods.

Mentor. Machine shop and laboratory methods. Geomechanics Laboratory, Geomechanics Department, Sandia National Laboratories. 2011-2014. Taught students and junior technical staff (researchers) to describe rock core, make ultrasonic velocity measurements, perform high pressure experiments, and machine metal parts. Ran informal course on rock mechanics for technologists.

Laboratory instructor. Introduction to Soils (GEOL 4003/5003). EES, NMT, Spring 2010.

Teaching assistant. Flow and Transport in Geologic Media (HYD 5008). EES, NMT. Spring 2006 and 2007. Department TA of the Year, both years.

Master tutor. Physics. CAPS and SSS programs, UNM, Fall 2003 – Fall 2004.

Advised, Graduate Committees and Managed in Lab

Advised

Kylie Brinza (M.S., Hydrology, incoming)

Vida Oma Bodi (M.S., Materials Engineering, co-advisor with D. Choudhuri, current)

Joseph Osei Nsankyire (M.S., Petroleum Engineering, advisor, current)

Lily Newton (Ph.D., Hydrology, advisor, current)

Abdul-Salam Abdallah (M.S., Mineral Engineering, advisor, current)

Gideon Osei Faaho (M.S., Mineral Engineering, advisor, current)

Ethan Williams (M.S., Hydrology, graduated 2023, advisor; hydrology consultant)

Samuel Otu (M.S., Hydrology, graduated 2022, advisor; hydrology consultant)

Jason Simmons (M.S., Hydrology, graduated 2021, advisor; NMT-PRRC research associate).

Graduate committee

Madeline Fresonke (Ph.D., Geophysics, current)

Jessica George (M.S., Physics, completed)

Emily Graves (Ph.D., Geophysics, UAF, current)

Stephanie Rousell (M.S., Hydrology, current)

Stephen Albrichton (M.S., MechE, graduated 2025, design engineer at Halliburton)

Harriett Tetteh (M.S., MinE, graduated 2025, mining engineer at Freeport-McMoran)

Jacob Gouchenhour (Ph.D., Geophysics, graduated 2023, seismologist at NNSA)

Lindsey Rasmussen (M.S., Petroleum Engineering, graduated 2020, lab manager; Sandia National Labs staff)

Beth Ann Eberle (M.S., Hydrology, 2021, graduated 2021; pursuing PhD in hydrology at PennState)

Madeline Richards (M.S., Hydrology, 2020, graduated; environmental consultant)

Michael Berry (Ph.D., Geophysics, 2020, graduated; Sandia National Labs staff).

Zhidi Wu (M.S., Hydrology, 2018, graduated; Los Alamos National Labs staff).

Lani Tsinnajinnie (Ph.D., Hydrology, 2018, graduated; associate professor at UNM).

Heather Barnes (M.S., Geophysics, 2017, graduated; environmental consultant).

Joseph Grigg (M.S., Geology, 2016, graduated; high school chemistry teacher).

Undergraduate Research Advisees

Alexander Hamilton (B.S., Mechanical Engineering, now plant engineer at Intel)

Katie Jansson (REU. B.S., Environmental, Soils and Water Science, University of Arkansas, Fayetteville, M.S. student at UA-Fayetteville)

Anne Dunne (B.S., Materials Engineering, MS student, Materials Engineering, NMT).

Antonio Chavez (B.S., Environmental Science, currently pursuing M.S. in hydrology).

Kyle Gallant (B.S. Geology, currently pursuing Ph.D. in structural geology)

Service and Synergistic Activities

Local service

Member, New Mexico Water Conference organizing committee, 2025 - present

Reviewer. NMWRRI Student Research Grants. 2019-present.

Reviewer. NMWRRI Faculty Research Grants. 2021-present

Member. NMWRRI Executive Advisory Committee. 2021-present.

Reviewer for Sevilleta National Wildlife Refuge Research Permits. 2014-present.

Member, Organizing committee, New Mexico Geological Society Spring Meeting 2025 (200 attendees), Socorro, NM, 2025.

Reviewer, USEPA contracted hydrogeologic reports on Gold King Mine Spill, 2022.

Lead. Survey of stable isotopes of groundwater on private ranch west of Socorro to assess resilience of supply. Feb. 2020.

Technical Chair. New Mexico Geological Society Spring Meeting 2019 (160 attendees), Recent Advances in Geophysics.

Institutional service

Member, Institutional Curriculum Committee, 2023 - 2026

Member, EES Curriculum Committee, 2019 - present

Member, EES DEI committee, 2024-present

Supported the formation and advancement of the Hantush-Deju National Center for Hydrological Innovation. Organized initial strategic plan and naming. Wrote the initial scoping and white papers, including budget scoping, vision development, communication to alumni sponsor and higher administration, and EES department relations. Assisted eventual interim director with institutional context, strategy, website design, space design and outreach. 2019 - 2024

EES Department representative, Library Committee. 2021-present

Member. NMT EES Curriculum Committee. 2019-present

Seminar co-coordinator. EES Department and New Mexico Bureau of Geology. 2017-2018 academic year.

Editor and reviewer for NMBG internal publications, proposals and public outreach materials. 2014-2019.

Committee member. Aquifer mapping server file structure. Fall 2016 to Spring 2017.

Hydrology program student representative, EES Department, NMT. 2005-2006.

Undergraduate member, UNM Campus Planning Committee and Curriculum Committee. 2003-2004.

"Dynamic Planet" Event Coordinator, 2013-2016. Volunteer, 2017-2018. NM Science Olympiad.

National/International Service

Member, Local organizing committee, InterPore 2025 (600 attendees), 2025

Lead, InterPore2025 field trip to ABCWUA Bear Canyon Recharge facility, 2025

Co-organizer. Geological Society of America 2022 Penrose Conference on Progressive Rock Damage. June 2022

NSF reviewer, 2022, 2025.

Associate editor. Hydrogeology Journal. 2021-2025

Reviewer for

Scientific Reviews, Experimental Mechanics, Geophysical Journal International, Groundwater, Human Evolution, Hydrogeology, Journal of Geophysical Research (Solid Earth), Journal of Geophysical Research (Earth Surface), Journal, Hydrological Processes, Journal of Hydrology, Journal of Petroleum Science and Engineering, Journal of Seismology, and Mining, Metallurgy and Exploration, Water Resources Research. Also reviewer of U.S. Geological Survey New Mexico Water Science Center professional and scientific reports, and New Mexico Geological Society Fall Field Conference Guidebook,.

Community, Student and Decision-Maker Outreach

Presenter to ABCWUA staff on appropriate techniques for mapping groundwater tables in space and time, and change detection. June 2021, Spring 2025.

Met with concerned citizens about proposed zoning changes in Valencia County, NM regarding horizontal drilling with hydraulic fracturing of oil and gas wells along the Rio Grande flood plain. April 2023.

Outreach with La Cienega and City of Santa Fe community, June 2021, presenting on the connection between Espanola Basin and Albuquerque Basin groundwater. With Stacy Timmons.

Ongoing outreach with community members of San Agustin Plains region. Community and household meetings and phone calls with community members and other interested parties to discuss implications of water rights permit application. Presented preliminary results as community meeting with San Agustin Plains Water Coalition (Summer, 2018).

Presenter on liquefaction hazards of New Mexico at NM DHSEM 2018 QuakeSmart Conference to audience of first responders, emergency managers and engineers. Albuquerque, NM.

Presenter at meetings with *ABCWUA Water Quality Advisory Board*, community water organizations, NM Office of the State Engineer, NM Interstate Stream Commission, USGS (Albuquerque Water Science Center), irrigation districts, and county and municipal governments to communicate findings of NMBG hydrogeologic studies, critical data needs, and about new hydrologic techniques and instrumentation. Presented at USGS Upper Rio Grande Project meeting at USGS (ABQ WSC), Sandoval County Commission and Planning and Zoning Board Meeting (July 2018), Albuquerque-Bernalillo County Water Utility Authority (Water Quality Board; August 2018), Sandoval County Commission regular meeting (September 2018).

Co-leader of geologic hazards workshop with NM Department of Homeland Security and Emergency Management, NM Department of Transportation, HSEM, NM DOT, tribal, community and county planners, and academic researchers. Nov 2017.

Co-leader for San Agustin Plains hydrogeology field trip at 2017 NM Water Conference. Discuss and describe hydrogeology of San Agustin Plains and possible impacts of proposed water development with range of community members, decision makers, consultants and scientists. Coordinated with local community members for land access, history and commentary. Aug 2017.

Leader of community meetings in Peña Blanca, NM to understand reasons for, explain preliminary geochemical results of, and describe final conceptual model and results of hydrogeology study of the community. Included household-to-household conversations during field measurements. May 2016 – Sept 2016.

Field trip co-leader for undergraduate IRIS intern program. Describe geology in the field to diverse undergraduates from a range of academic backgrounds. May 2017.

Field mentor for undergraduate student from UTEP/IRIS FieldXP program for field experience for underrepresented minority students. Summer 2016.

Publications

Peer Reviewed Journals (accepted or published)

Google Scholar Profile: 358 citations from last 5 years (761 citations total), 12 h-index, 14 i10-index, *13 July 2025*

Italicized names are graduate students. Underlined names are undergraduate students.

1. Chilaka, C., **Rinehart, A. J.**, Wang, H., and Ward, F. A. (2025). Optimizing the economic cost of sustainable pumping in the Southern High Plains aquifer. Journal of Hydrology, 134006.
2. Czarnota, R., Crandall, D., Isom, S., Simmons, J., Luhmann, A., **Rinehart, A**., and Ampomah, W. (2025). Unsteady-and Steady-State Relative Permeability Study with X-ray and Acoustic Monitoring for CO2 Storage in Deep Saline Aquifers. Energy & Fuels, 39(24), 11821–11831.
3. Noras, M. A., Mathis, H., Joshi, J., **Rinehart, A.**, Fichera, M., & Eppes, M.-C. (2025). Subcritical crack monitoring in rocks using combined electromagnetic and acoustic emission analysis. Journal of Electrostatics, 138, 104180.
4. Rasmussen, M., Eppes, M. C., Yuan, Y., Meredith, P. G., Apostolidis, K. H., Mitchell, T., **Rinehart, A. J**., Mushkin, A., Webb, P., and Reynolds, V. (2025). Evolving physical and mechanical rock properties during exposure at Earth's surface. Geomorphology, 109943.
5. Simmons, J., **Rinehart, A**., Ulmer-Scholle, D., Wang, S., Luhmann, A., and Ampomah, W. (2025). Delineation of underground sources of drinking water in the San Juan Basin, USA to support a UIC class VI permit application. Water Resources Research, 61(10), e2024WR039704.

6. Waters, L. E., Wang, S., **Rinehart, A**., Zimmerer, M., Hurtig, N., Scholten, O., and Adams, J. (2026). Major and trace element geochemistry for mafic volcanic rocks in NM collected for assessment for CO2 sequestration potential. Interdisciplinary Earth Data Alliance (IEDA) Dataset, 54.
7. White, M., **Rinehart, A**., Rose, P., Mella, M., Esser, R., and Ampomah, W. (2025). Modeling approaches for addressing enigmatic migration patterns for aqueous-and nonaqueous-soluble tracers in an enhanced oil recovery field. International Journal of Greenhouse Gas Control, 140, 104295.
8. *Rasmussen, M.,* Eppes, M.C., *Mushkin, A.*, Meredith, P.G., Mitchell, T. M., Keanini, R., Aldred, J., Andričević , P. , Berberich, S., Dahlquist, M.P., Evans, S.G., Jain, M., Morovati, M., Layzell, A., Nara, Y., **Rinehart, A.**, Sellwood, E. L., and Shaanan, U. *(*accepted with major revisions) Journal of Geophysical Research (Earth Surface).
9. *Gochenour, J. A.,* **Rinehart, A.J**, Luhmann, A. J., Grapenthin, R., & Bilek, S. L. (2024). Poroelastic response to karst conduit pressurization: A finite element modeling exercise toward the use of tiltmeters in karst aquifer monitoring applications. *Water Resources Research*, 60, e2022WR034293. https://doi.org/10.1029/2022WR034293
10. Choudhuri, C, **Rinehart, AJ**; Interaction between water and point defects inside volume-constrained α-quartz: An ab initio molecular dynamics study at 300 K. J. Appl. Phys. 28 April 2024; 135 (16): 165103. https://doi.org/10.1063/5.0190356
11. Wu Z, Simmons JD, Otu S, **Rinehart A,** Luhmann A, Heath J, Mozley P, Majumdar BS. 2023. Control of Cement Timing, Mineralogy, and Texture on Hydro-chemo-mechanical Coupling from CO_2 Injection into Sandstone: A Synthesis. *Energies*. 16(24):7949. https://doi.org/10.3390/en16247949
12. *Graves, E.J.,* Rinehart, A., Grapenthin, R., Angarita, M.F., Grigg, J., 2023. InSAR-observed surface deformation in New Mexico's Permian Basin shows threats and opportunities presented by leaky injection wells. Sci Rep 13, 17308. https://doi.org/10.1038/s41598-023-42696-9
13. *Chilaka, C.*, **Rinehart, A.J.**, Wang, H., Ward, F.A., 2024. Sustaining aquifers hydrologically, economically, and institutionally: Policy analysis of the Ogallala in New Mexico. Science of The Total Environment 921, 170727. https://doi.org/10.1016/j.scitotenv.2024.170727
14. *Wu Z*, Simmons JD, Otu S, Rinehart A, Luhmann A, Heath J, Mozley P, Majumdar BS. Control of Cement Timing, Mineralogy, and Texture on Hydro-chemo-mechanical Coupling from CO_2 Injection into Sandstone: A Synthesis. *Energies*. 2023; 16(24):7949. https://doi.org/10.3390/en16247949
15. Simmons, J.D., Wang, S., Luhmann, A.J., Rinehart, A.J., Heath, J.E., Majumdar, B.S., 2023. Paragenetic controls on CO2-fluid-rock interaction and weakening in a macroporous-dominated sandstone. Applied Geochemistry 156, 105744. https://doi.org/10.1016/j.apgeochem.2023.105744
16. Rudgers, J.A., Luketich, A., Bacigalupa, M., Baur, L.E., Collins, S.L., Hall, K.M., Hou, E., Litvak, M.E., Luo, Y., Miller, T.E.X., Newsome, S.D., Pockman, W.T., Richardson, A.D.,

Rinehart, A., Villatoro-Castañeda, M., Wainwright, B.E., Watson, S.J., Yogi, P., Zhou, Y., 2023. Infrastructure to factorially manipulate the mean and variance of precipitation in the field. Ecosphere 14, e4603. https://doi.org/10.1002/ecs2.4603

17. Otu, S., Rinehart, A.J., Luhmann, A.J., Simmons, J., Mozley, P., 2023. Effects of CO2 on creep deformation in sandstones at carbon sequestration reservoir conditions: An experimental study. International Journal of Greenhouse Gas Control 129, 103970. https://doi.org/10.1016/j.ijggc.2023.103970
18. Eppes, M.C., Aldred, J., Berberich, S., Dahlquist, M., Evans, S.G., Keanini, R., Moser, F., *Morovati, M.*, Porson, S., *Rasmussen, M.*, **Rinehart, A.,** Shaanan, U., in press. Standardized field methods for fracture-focused surface processes, Earth Surface Processes.
19. *Wilkinson, H.*, *Boyd, B.*, O'Connell, J.M., *Knox, R.*, **Rinehart, A.J.**, Majumdar, B.S., and Choudhuri, D., submitted. Factors controlling heteroepitaxial phase formation at intermettalic-Al3Sc/liquid interfaces. Journal of Applied Physics. 133, 124902 (2023). https://doi.org/10.1063/5.0142117
20. *Simmons*, J., **Rinehart, A.**, Luhmann, A., Mozley, P., Heath, J., and Majumdar, B. 2022. Using petrographically observable microstructure to predict hydromechanical changes in a complex siliciclastic storage site during CO_2 injection. International Journal of Greenhouse Gas Control 119, p. 103724. https://doi.org/10.1016/j.ijggc.2022.103724
21. Czarnota, R., **Rinehart, AJ,** Luhmann, A, Wang, S, and Grigg, R. 2022 . Acoustic response during brine-CO2 relative permeability testing of Bluff and Entrada Sandstone, paper presented at *56th U.S. Rock Mechanics/Geomechanics Symposium*, Santa Fe, June 2022.
22. *Fichera, M*, **Rinehart, AJ.** 2022. Regional hydrogeochemistry of La Jencia and Socorro Basins, Central New Mexico. *in* New Mexico Geological Society 72nd Annual Fall Field Conference Guidebook, D. Koning, K.J. HObbs, F.M., Phillips, J.W. Nelson, S.M. Cather, A.C. Jakle, B. van der Werff, p. 385-398, https://doi.org/10.56577/FFC-72.385
23. Gallant, K, Koning D, and **Rinehart AJ.** 2022. Elucidating the structural geometry of the San Marcial basin, Sierra County, using newly collected terrain-corrected Bouguer anomaly gravity data. *in* New Mexico Geological Society 72nd Annual Fall Field Conference Guidebook, D. Koning, K.J. HObbs, F.M., Phillips, J.W. Nelson, S.M. Cather, A.C. Jakle, B. van der Werff, p. 341-356, https://doi.org/10.56577/FFC-72.341
24. Love, D.W., McCraw, D.J., Chamberlain, R.M., Heizler, M., and **Rinehart, A.**, 2022. The structural and depositional context and a new age estimate of the type Sierra Ladrones Formation in the southern Albuquerque Basin and vicinity, central New Mexico, *in* New Mexico Geological Society 72nd Annual Fall Field Conference Guidebook, D. Koning, K.J. HObbs, F.M., Phillips, J.W. Nelson, S.M. Cather, A.C. Jakle, B. van der Werff, p. 239-251, https://doi.org/10.56577/FFC-72.239
25. Robertson, AJ, Kennedy, J, Wildermuth, LM, Meghan, B, Fuchs, EH, **Rinehart, AJ**, and Fernald, I. *2022.* Determining seasonal recharge, storage changes, and specific yield using

repeat microgravity and water-level measurements in the Mesilla Basin alluvial aquifer, New Mexico, 2016-208. *Journal of Applied Geophysics*.

26. *Wu Z*, Luhmann AJ, **Rinehart AJ**, Mozley PS, Dewers TA, Heath JE, and Majumdar BS. 2020. Chemo-mechanical alterations induced from CO2 injection in carbonate-cemented sandstone: An experimental study at 71ºC and 290 bar, *Journal of Geophysical Research*.
27. *Rasmussen, L*, Fan, T, **Rinehart AJ**, Luhmann, A, Ampomah, W., Dewers, T, Heath, J, Cather, M, and Grigg, R. 2019. Carbon storage and enhanced oil recovery in Pennsylvanian Morrow Formation Clastic Reservoirs: Controls on oil-brine and oil-CO2 relative permeability from diagenetic heterogeneity and evolving wettability, *Energies 12*, 3663, https://doi/10.3390/en12193663
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Technical Reports

1. Pepin, J.D., Travis, R.E., Blake, J.M., **Rinehart, A.**, and Koning, D. 2023. Hydrogeology and groundwater quality in the San Agustin Basin, New Mexico, 1975-2019. U.S. Geological Survey Scientific Investigations Report 2022-5029.
2. **Rinehart AJ**, Grigg J, Litherland M, Graves E, Grapenthin R, and Martin L. 2021. Geologic and operational controls on injection of produced waters and well stimulation on earthquakes and surface deformation between 2016 and 2020, Permian Basin, NM: *NMWRRI Technical Report. 58 p.*
3. **Rinehart, A.J.**, Koning, D.J., and Timmons, S., 2020. A summary of the hydrogeology of the San Agustin Plains, New Mexico: *New Mexico Bureau of Geology Open-File Report OFR 615, 23 p.*
4. Koning, D.J., and **Rinehart, A.J**., 2021. Geology of the Eastern Plains of San Agustin and Upper Alamosa Creek. New Mexico Bureau of Geology and Mineral Resources. https://doi.org/10.58799/OFR-611

5. Broadhead RF, and **Rinehart AJ.** 2018. Assessment of oil and gas potential and groundwater contamination from unconventional oil and gas operations risks for Sandoval County. *Completion Report to be replaced by OFR.* 112 p.
6. Rawling, GC, and **Rinehart AJ**. 2017. Lifetime projections for the High Plains Aquifer in east-central New Mexico. *New Mexico Bureau of Geology and Mineral Resources Open-file report OFR 591*. 42 p.
7. Knox HA, Ajo-Franklin J, Johnson, T, Morris, J, Grubelich, MC, James, S, **Rinehart A**, Preston L, Vermeul V, Strickland C, Knox JM, King D, Ulrich C. 2017. Imaging Fracture Networks Using Joint Seismic and Electrical Change Detection Techniques - Final Report. *Sandia National Laboratories SAND2017-1652*. February 2017.
8. Kennedy JR, Robertson AJ, Carruth RL, and **Rinehart AJ**. 2017,. Repeat microgravity data from Mesilla Valley, New Mexico, 2016-2017, *U.S. Geological Survey data release*, doi: 10.5066/F7BV7F3Q.
9. **Rinehart, AJ**, Mamer, E, Rawling, G, Broadhead, R, Kludt, T, Felix, B, and Pokorny, K. 2017. Groundwater storage change in New Mexico aquifers, Part 1: Method for estimating groundwater storage change in variably confined aquifers in New Mexico, and Part 2: Estimates for groundwater storage change in the New Mexico Southern High Plains aquifer. *New Mexico Water Resources Research Institute Technical Completion Report.* 58 p.
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11. **Rinehart AJ**, Mamer E, Kludt T, Felix B, Pokorny C, and Timmons S. 2016. Groundwater level and storage changes in alluvial basins in the Rio Grande Basin, New Mexico. *New Mexico Water Resources Research Institute Technical Completion Report.* 41 p.
12. **Rinehart AJ**, Timmons S, Felix B, and Pokorny C. 2015. Groundwater level and storage changes—Regions of New Mexico. *New Mexico Water Resources Research Institute Technical Completion Report.* 40 p.

Geologic Maps

1. **Rinehart AJ**. Love DW and Miller P. 2014. Geologic map of Black Butte Quadrangle, Socorro and Valencia Counties, New Mexico. New Mexico Bureau of Geology and Mineral Resources. *Open-file Geologic Map OF-GM 235.* Scale 1:24,000.
2. Allen BD, Love DW, McCraw DJ, and **Rinehart AJ**. 2013. Geologic map of Becker SW Quadrangle, Socorro County, New Mexico. New Mexico Bureau of Geology and Mineral Resources. *Open-file Geologic Map OF-GM 233*. Scale 1:24,000.

Invited Presentations

1. Rinehart AJ, 2025, keynote, What is repeat gravity good for? Examples of mapping storage change and aquifer properties across the USA2025 Taiwan Geoscience Assembly, Taipei, Taiwan.

2. Rinehart AJ, 2025, Geodetic methods for understanding focused recharge in rivers and karst, 2025 Taiwan Geoscience Assembly, Taipei, Taiwan.

3. Rinehart AJ, 2024, panelist, Water Energy Nexus, Consortium for Energy Sustainability and Advancement Management, inaugural workshop, Socorro, NM.

4. Rinehart, AJ., 2024, Role of progressive rock fatigue and failure in fluid flow self-focusing and associated weathering in the Critical Zone. GSAConnect 2024, Anaheim, CA.

5. Rinehart AJ, Gochenour J, Graves E, and Grapenthin R, 2022, Using hydrogeodetic methods to understand dynamics of water storage across scales, University of Texas, El Paso, Department of Earth, Environmental and Resource Sciences seminar.

6. Rinehart AJ, 2021, Scaling hydrologic problems via geodetic measurements, Artificial Intelligence Conference: How AI is helping to secure water for the future, Santa Fe, NM.

7. Rinehart AJ, 2020, Produced waters and seismicity in New Mexico, NMWRRI 65th Annual Water Conference.

8. Rinehart AJ, 2018, Geologic context and coupled processes: examples from ephemeral catchments, CO2 storage and resilience of groundwater basins, New Mexico Tech EES Department Seminar.

9. Rinehart AJ, 2018, Long-term trends in New Mexico groundwater storage: Examples and lessons for planning, NMWRRI 63rd Annual Water Conference, Las Cruces, NM.

10. Rinehart AJ, Cikoski C, Mansell M, and Koning D, 2018, Statewide Susceptibility to Collapsible Soils for New Mexico. New Mexico Homeland Security and Emergency Management Conference 2018.

11. Rinehart AJ, Mamer, E, and Rawling G. 2017. Long-term trends in groundwater storage: Examples and lessons from New Mexico, USA. 2nd Forum on Water Security and Sustainable Development Under Changing Environment, Hohai University, Nanjing, China.

12. Rinehart AJ, Koning D, and Timmons S. 2017. Hydrogeology of the San Agustin Plains, 62nd Annual New Mexico Water Conference, Socorro, NM.

13. Rinehart AJ, Dewers T, Bishop J, and Broome ST. 2014. Cohesive model applied to fracture propagation in Indiana Limestone, EES Department Seminar, EES Department, New Mexico Tech.

14. Rinehart AJ, Vivoni ER, and Brooks PD. 2008. The controls of shading and scattering of solar radiation on the distribution of snow in the Valles Caldera, New Mexico. Hydrology Program Seminar, EES Department, New Mexico Tech.

15. Rinehart AJ, Musselman K, Brooks PD, Vivoni ER, and Molotch N. 2006. Integrating observations and modeling of snow-vegetation interactions: A progress report. SAHRA Annual Conference, Scottsdale, AZ.

Conference Presentations

Italicized names are graduate students. Underlined names are undergraduate students.

1. *K Jansson*, A Rinehart, *K Gallant*, JB Harrison, 2025, Correlation of Arid Soil Properties and Vegetative Cover on Stand and Ecotonal Scales, CANVAS 2025.

2. *R Berjaoui*, RM Coyte, A Rinehart, Quantifying Surface and Groundwater Interactions in the San Acacia Reach, New Mexico, Goldschmidt 2026 Conference, 2026

3. Rinehart, AJ, Bilek, S., Cadol, D., Grapenthin, R,, Luhmann, AJ, 2025, Geodetic methods for understanding focused recharge in rivers and karst, 2025 Taiwan Geoscience Assembly, Taipei, Taiwan.

4. *Tetteh, H*, Li, WF, McLemore, VT, Rinehart, AJ, Razahvi, M, 2025, Structural design improvements to mitigate blast-induced ground vibration. Mine Exchange 2025 SME Annual Conference and Expo., Denver, CO.

5. Eppes, MC., David, Christian, Heap, MJ, Baud, P, Bonami, T, Dahlquist M, Keanini R, Lacroix, C., *Rasmussen, M*, Rinehart, AJ, Lang, KA, Reynolds, A, Saussi-El-Alaoui, Y, Windenbirger, A. Rocks have memories of extreme temperatures: progressive fracturing in response to warming climates. 2024. AGU24, Washington, D.C.

6. Lamp, JL, Eppes, MC, Swanger, KM, Balter-Kennedy, A, Rinehart, AJ, Schaefer, JM. 2024. An investigation of rock breakdown processes in the McMurdo Dry Valleys, Antarctica. AGU24, Washington, D.C.

7. Morovati, M., Eppes, MC, Rinehart, AJ, Fichera, M, Rasmussen, M, Meredith, P, Nara, Y, Dahlquist, M, Keanini, R. 2024. Investigating thermal microcracking in rocks: Insights into equilibrium statistical and simultaneous fracture mechanisms. ASME IMECE2024, Portland OR.

8. Morovati, M., Eppes, MC, Rinehart, AJ, Fichera, M, Rasmussen, M, Meredith, P, Nara, Y, Dahlquist, M, Keanini, R. 2024. Dimensionless analysis of rock fracture propagation and physical meaning of slow and fast subcritical cracking. ASME IMECE2024, Portland OR.

9. Rinehart, AJ, Simmons, J, Heath, J, Luhmann, AJ, Wu, Z, Dewars, TA, and Wang S. 2024. Quantifying microtextural controls on changes in absolute permeability interactions using lattice Boltzmann simulations of XRCT-measured sandstone pore network. GSA Connects 2024. Anaheim, CA

10. *Tetteh, H.,* Li, W, McLemore, VT, Rinehart AJ. 2024. Dynamic rock testing and implications for blast-induced ground vibration mitigation. 58th Roch Mechanics / Geomechanics Symposium (ARMA), Golden, CO.

11. *Graves, EJ*, Grapenthin, R, and Rinehart, AJ. 2024. Remote sensing of subsurface fluid dynamics via InSAR Observations of the arid Soutwestern USA, WaterSciCon24, Minneapolis, MN.

12. Eppes, MC, David, C, Heap, M, Baud, P, Bonami, T, Dahlquist, M, Keanini, R, Lacroix, C, *Rasmussen, M*, Rinehart, A, El Alaoui, Y, Windenberger, A, 2024, Temperature 'memory' and natural rock fractures at the Earth's surface. EGU General Assembly 2024, Vienna, Austria.

13. *Rasmussen, M*, Eppes, MCC, Meredith, PG, Keanini, R, Mushkin, A, Yoshitaka N, Rinehart AJ, Shanaan U, and Dahlquist M. 2023. The influence of rock and environmental parameters on natural rock and fracturing rates and characteristics. AGU Annual Meeting 2023, San Francisco, CA.

14. Meredith, P, Yuan Y, Rasmussen M, Apostilidis KH, Yoshitaka N, Eppes MCC, Mitchel ™, Webb P, Xu T, Keanini R, Mushkin A, Shaanan U, Dahlquist M, RInehart AJ. 2023. Evidence for increase in crack damage in rocks with duration of exposure at Earth's surface. AGU Annual Meeting 2023. San Francisco, CA

15. Rinehart, AJ., *Fichera, M.*, Eppes, MCC, Marshall JA, Dahlqhuist M, Lamp JL. 2023. Design and testing of a rapid sample preparation and double torsion stress corrosion fracture testing under controlled environmental conditions. AGU Annual Meeting 2023, San Francisco, CA.

16. Morris, IM, Cadol DD, Rinehart, AJ, Spinelli GA, 2023. Ground penetrating radar monitoring of stratification in an ephemeral channel. AGU Annual Meeting 2023, San Francisco, CA

17. RInehart AJ, Grapenthin R, Cadol DD, Stephens, DB, 2023. Balancing basic science and applied research in hydrology at the Hantush-Deju National Center of Hydrological Innovation. AGU Annual Meeting 2023, San Francisco, CA

18. Simmons, J, Rinehart A, Ulmer-Scholle, D, Wang, W, Amphomah W. 2023. Delineation of underground sources of drinking water - CarbonSAFE Phase III San Juan Basin. 68th Annual New Mexico Water Conference, Albuquerque, NM

19. *Williams, E*., Rinehart A., Cadol, D., Ma L. 2023. Quantifying groundwater to surface water exchanges in the Belen reach of the MRGCD. 68th Annual New Mexico Water Conference, Albuquerque, NM

20. Rinehart, A, Jansson K, Hallmark, A, *Gallant K*, Harrison, JB, Collins S. Deep soil property and infiltration capacity variations at multiple scales across creosote and black grama ecotones, Sevilleta National Wildlife Refuge, NM, 68th Annual New Mexico Water Conference, Albuquerque, NM.

21. Luhmann, A, *Wu, Z*, Simmons, J, *Otu, S*, Heath, J, and Rinehart, A. 2023. Control of the diagenetic sequence and burial history on chemomechanical responses during CO2 injection into sandstone. GSA Connect 2023.

22. Marshall, J., Eppes, MC, Meredith, P, Rinehart, A, Roering JJ, Sklar, L., 2023. Middle Earth - A speculative (sub)critical reconsideration of the soil production function. GSA Connects 2023.

23. Eppes, MC, Rasmussen, M, Mitchell, TM, Apostolidis, KH, Rinehart, A, Xu, T, Mushkin, A, Dahlquist, M, Meredith, P, Yuan Y, Yoshitaka N, Webb P, Keanini R., Shaanan, U. Quantifying the last steps in the chronology of rock deformation. GSA Connects 2023.

24. Eppes, M.C., Heap, M., Baud, P., Bonami, T., Dahlquist, M., Keanini, R., LaCroix, C., *Rasmussen, M.*, Rinehart, A., El Alaoui, Y., and Windenberger, A. 2023. Testing natural fracture growth-fracturing resilience feedbacks in rock. EGU General Assembly 2023.

25. Meredith, P., Yuan, Y., *Rasmussen, M.*, Apostolidis, K.H., Nara, Y., Webb, P., Mitchell, T., Xu, T., Keanini, R., Mushkin, A., Shaanan, U., Dahlquist, M., Rinehart, a., and Eppes, M. 2023. Evidence for increase in crack damage in rocks with duration of exposure at Earth's surface. EGU General Assembly 2023.

26. Marshall, J., Rinehart, A., Eppes, M.C., and Meredith, P., 2023. Should we? Can we? apply experimental rock physics knowledge to reconsidering soil production function: EGU General Assembly 2023.

27. *Graves, E.J.*, Rinehart, A., Grapenthin, R. 2022. Plane strain analytical models of InSAR-observed enhanced oil recovery injection wellsite deformation, NM, USA. AGU Fall Meeting, Chicago, IL., 12-16 December.

28. *Williams, E.*, Cadol, D., Ma., L., and Rinehart, A. 2022. Quantifying seasonal and spatial variability of groundwater contributions to the Rio Grande in the Southern Albuquerque Basin. AGU Fall Meeting, Chicago, IL., 12-16 December.

29. *Kranendonk, E.A.*, Luhmann, A.J., Woo, H.B., *Gochenour, J.A.*, Rinehart, A.J., Bilek, S.L., Grapenthin, R., Martin, J.B., Flint, M., and Covington, M. 2022. Three-dimensional hydraulic characterization in a karst aquifer using cross-correlation analysis of water level data. AGU Fall Meeting, Chicago, IL., 12-16 December.

30. Morris, I.M., Cadol, D., Rinehart, A.J., and Laronne, J.B. 2022. Repeatability of ground penetrating radar measurements of sedimentary layers in dry streambeds. AGU Fall Meeting, Chicago, IL., 12-16 December.

31. Simmons, J., Wang, S., Luhmann, A., Rinehart, A., Dustin, C., and Moore, J., 2022. Geochemical and mechanical evolution of Bluff and Entrada Sandstone due to CO2-fluid-rock interactions: GSA Connects 2022, Denver, Colorado and online, 9 - 12 October.

32. Gallant, *K.*, Koning, D., Jochems, A., and Rinehart, A., 2022. Elucidating the structural geometry and major faults of the San Marcial Basin, Socorro County, using complete Bougeur gravity anomaly data: GSA Connects 2022, Denver, Colorado and online, 9 - 12 October.

33. Gallant, K., Rinehart, AJ., Koning, DJ, and Jochems, AP., 2022, Elucidating the structural geometry and major faults of the San Marcial Basin, Socorro County, using total Bougeur gravity anomaly data. New Mexico Geological Society Annual Spring Meeting & Ft. Stanton Cave Conference, Socorro, NM. April 7-9.

34. *Williams, E*, Cadol, D., Ma, L., and Rinehart, A., 2022, Quantifying groundwater to surface water exchanges in the Belen reach of the MRGCD. New Mexico Geological Society Annual Spring Meeting & Ft. Stanton Cave Conference, Socorro, NM. April 7-9.

35. Simmons J, Wang S, Luhmann AJ, Rinehart AJ, and Heath JE, 2021 Coupled chemomechanical feedbacks from experimental CO2-rich fluid-rock interaction in uncemented lithofacies of Morrow B sandstone: AGU Fall Meeting, New Orleans and online, 13 - 17 December.

36. Rinehart AJ, *Richards, M, Stark K*, Kennedy J, Kelley S, Cadol D. 2021. Combined repeat microgravity and flow discharge estimates to understand focused recharge dynamics along a flooding ephemeral wash, Arroyo de los Pinos, Socorro County, NM: AGU Fall Meeting, New Orleans and online, 13 - 17 December.

37. *Gochenour JA*, Rinehart AJ, Luhmann AJ, Grapenthin R, Bilek, SL. 2021. Finite element modeling of poroelastic response to karst conduit pressurization and subsequent change in groundwater storage: Toward the use of high precision tiltmeters in karst aquifer monitoring applications: AGU Fall Meeting, New Orleans and online, 13 - 17 December.

38. *Otu S*, Rinehart A, Luhmann AJ, Mozley P. 2021. Exploring the link between petrographic characteristics and chemically enhanced creep deformation at carbon sequestration reservoir conditions: An experimental study: AGU Fall Meeting, New Orleans and online, 13 - 17 December.

39. *Williams E*, Cadol D, Ma L, and Rinehart A. 2021. Quantifying groundwater to surface water exchanges in the Belen reach of the MRGCD. 66th Annual New Mexico Water Conference. Virtual. 26 - 28 October.

40. *Williams, E*, Cadol, D., Ma, L., and Rinehart, A. 2021. EMMA and volumetric stream gauging reveal multiple time-varying contributions to agricultural drains along Rio Grande, Central NM: Geological Society of America CONNECTS 2021 Annual Meeting, 10 - 13 October, Portland OR.

41. Rinehart A, Grigg, J, Litherland M, Graves E, Martin L, Grapenthin R, 2021, Spatial and temporal patterns of salt water disposal by formation and correlation with seismicity, 2010 to 2020, Delaware Basin and Central Basin Platform, Southeastern NM: Geological Society of America CONNECTS 2021 Annual Meeting, 10 - 13 October, Portland OR.

42. *Simmons, J.*, Rinehart, A., Luhmann, A.J., Heath, J.E., and Mozley, P., 2020, Quantifying chemomechanical reservoir sensitivity to CO2 injection using paragenesis, flow-through experiments and strength testing at in situ conditions, Farnsworth Unit, Texas: American Geophysical Union Annual Fall Meeting 2020, Online.

43. Rinehart, A.J., Rawling, G.C., and Mamer, E., 2020, Seventy years of drought impacts on resilience and groundwater storage across New Mexico, USA: American Geophysical Union Annual Fall Meeting 2020, Online.

44. *Beene, D.*, Fuchs, E., Rinehart, A., 2020, Feedbacks of irrigator decisions, hydrologic change and long-term water planning, Mesilla Valley, NM: NGWA Conference on Water, Energy and Policy in a Changing Climate, Albuquerque, NM.

45. Grapenthin, R., *Graves, EJ*, and Rinehart AJ., 2019, A space-based geofluids observatory for New Mexico: American Geophysical Union Annaul Fall Meeting 2019, San Francisco, CA.

46. *Berry, M.A.*, van Wijk, J., Rinehart, A.J., Cadol, D., Garcia-Castellanos, D., Lin, Y., Coblentz, D.D., 2019, Landscape evolution modeling of endorheic-exorheic transitions in active continental rifts: American Geophysical Union Annual Fall Meeting 2019, San Francisco, CA.

47. *Graves, E.J.*, Grapenthin, R., Rinehart A.J., and Person, M.A., 2019, Transient injection well deformation observed by InSAR and explained with poroelastic modeling: American Geophysical Union Annual Fall Meeting 2019, San Francisco, CA.

48. *Simmons, J.*, Rinehart, A.J., Luhmann, A.J., Mozley, P., and Heath, J.E., 2019, Quantification of paragenetic controls on chemomechanical sensitivity of the Morrow B sandstone during CO2 injection, Farnsworth Unit, TX, American Geophysical Union Annual Fall Meeting 2019, San Francisco, CA.

49. Rawling, G.C., and Rinehart, A.J., 2019, Lifetime projections for the High Plains Aquifer in east-central New Mexico: Geological Society of America Annual Meeting 2019, Phoenix, AZ.

50. Rinehart, A.J., and Koning, D.J., Hydrogeology of San Agustin Plains, NM: A comprehensive geologic, geochemical and geophysical approach to understanding the hydrology of an enigmatic extensional basin: Geological Society of America Annual Meeting 2019, Phoenix, AZ.

51. Rinehart, A.J., Mamer, E., Rawling, G., Kludt, T., and Felix, B., 2019, Groundwater level storage changes across New Mexico from the 1950s to 2010s: NMWRRI 63rd New Mexico Water Conference, Pojuaque, NM.

52. Rinehart, A.J., and Mamer, E., 2019, Possible groundwater connection between Espanola and Albuquerque basins through preserved Santa Fe Group deposits reveals at Pena Blanca and La Cienega, NM: NMWRRI 63rd New Mexico Water Conference, Pojuaque, NM.

53. Rinehart AJ, and Broadhead R, 2018, Susceptibility and risk assessment of groundwater contamination from unconventional oil and gas development, Sandoval County, New Mexico, NMWRRI 63rd Annual New Mexico Water Conference, Las Cruces NM.

54. Rinehart AJ, Cikoski C, Love D, Mansell M, and Koning DJ. 2018. Collapsible soil subsidence susceptibilities across New Mexico at 1:750,000 scale, New Mexico Geological Society 2018 Annual Spring Meeting, Socorro, NM.

55. Koning DJ, and Rinehart AJ. 2018. Preliminary basin model for the northeastern San Agustin Plains, New Mexico, New Mexico Geological Society 2018 Annual Spring Meeting, Socorro, NM.

56. *Wu Z*, Luhmann AJ, Rinehart AJ, Mozley PS, Dewers TA, Heath JE, Majumdar BS. 2018. Chemo-mechanical alterations during geologic carbon sequestration in sandstone: Experimental observations, New Mexico Geological Society 2018 Annual Spring Meeting, Socorro, NM.

57. Rawling G, and Rinehart AJ. 2018. Lifetime projections for the High Plains Aquifer in East-Central New Mexico, . New Mexico Geological Society 2018 Annual Spring Meeting, Socorro, NM.

58. Rinehart AJ, Mamer, E, and Rawling, G. 2018. Groundwater in unconfined New Mexican aquifers, NGWA Groundwater Issues and Science Affecting Policy and Management in the Southwest, Albuquerque, NM.

59. Rawling G, and Rinehart AJ. 2018. Lifetime projections for the High Plains Aquifer in east-central New Mexico, NGWA Groundwater Issues and Science Affecting Policy and Management in the Southwest, Albuquerque, NM.

60. Koning, D, and Rinehart AJ. 2017. Structure and preliminary Santa Fe Group stratigraphy under eastern San Agustin Plain--Implications for groundwater flow, 62nd Annual New Mexico Water Conference, Socorro, NM.

61. Mamer, E, Rinehart AJ, Broadhead RF, Kludt T, Felix B, and Pokorny C. 2017. Method for estimating groundwater storage change in variably confined aquifers in New Mexico, 62nd Annual New Mexico Water Conference, Socorro, NM.

62. Rinehart AJ, Rawling GC, Mamer E, Felix B, Kludt T, Pokorny C. 2017. Groundwater saturated thickness and storage changes in the New Mexican Southern High Plains Aquifer, 62nd Annual New Mexico Water Conference, Socorro, NM.

63. Love DW, Rinehart AJ, Chamberlin R, Celep E, Koning D, 2017, Implications of past events of Rio Salado and Rio Puerco deposits in the southwestern corner of the Albuquerque Basin, New Mexico, New Mexico Geological Society Annual Spring Meeting 2017, Socorro, NM.

64. Bilek S, Luhmann AJ, *Diniakos RS, Morton EA*, Rinehart AJ, Alexander Jr. EC, Alexander SC, Larsen M, and Green, JA. 2016. Delineating karst conduit location using geophysical signals generated during recharge events. AGU 2016 Annual Fall Conference, San Francisco, CA.

65. Dewers T, Eichhubl P, Ganis B, Wheeler M, Deandra W, Jonathan M, Heath, J, Jammoul J, Kobos P, Ruijie L, Matteo E, Rinehart A, Sobolik S, Stormont J, Taha M, and Newell P, 2016, Control of process for subsurface science and engineering: examples from geologic carbon storage. GSA 2016 Annual Meeting, Denver, CO.

66. Luhmann AJ, Bilek SL, *Diniakos RS, Morton EA,* Rinehart, A, Alexander Jr., EC, Alexander SC, Larsen M, Green JA, Grapenthin R, and Spinelli GA. 2016. Delineating karst conduit location using geophysical signals generated during recharge events. GSA 2016 Annual Meeting, Denver, CO.

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