John Michael Rekoske

Geophysics Ph.D. Candidate
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Education

- **University of California, San Diego** — La Jolla, CA
  Ph.D. Earth Science (expected) — *2021 - 2026 (expected)*
- **Colorado School of Mines** — Golden, CO
  B.S. Geophysical Engineering (summa cum laude), minor in Data Science — *2020*

Experience

- **Scripps Institution of Oceanography, University of California, San Diego** — La Jolla, CA
  Graduate Research Fellow in Geophysics — *2021 - present*
  - **Research activities**: Uses machine learning and reduced-order modeling techniques to simulate earthquake ground motion and understand source physics. I am interested in understanding earthquake source mechanics and the propagation of seismic waves, focusing on seismic hazard and earthquake early warning using both physics-based simulations and machine learning optimizations, achieving computational speed-ups of 10^6. Advised by Prof. Alice-Agnes Gabriel and Prof. Dave A. May.
- **United States Geological Survey, Department of Interior** — Golden, CO
  Physical Scientist — *2018 - 2021*
  - **Ground motion processing software development and database construction**: Compiled ground motion datasets, developed automated ground motion processing software, and analyzed ground motion models to better understand seismic hazard in the Pacific Northwest, Southern California, Alaska, and Hawaii. Supervised by Dr. Morgan Moschetti and Dr. Eric Thompson.
- **Colorado School of Mines** — Golden, CO
  Undergraduate Research Fellow — *2018 - 2020*
  - **Exploring Earth's interior using 3D seismic wave simulations**: Performed 3D global seismic wave simulations using Mines' high-performance computing resources and the SPECFEM3D_GLOBE software. Examined the effects that various models proposed for the Earth's outer core and mantle can have on recorded seismograms. Supervised by Dr. Ebru Bozdag.
- **Colorado School of Mines** — Golden, CO
  Teaching Assistant, Department of Physics — *2018 - 2020*
  - **TA experience**: Worked as a Teaching Assistant for the Introductory Mechanics class in the Physics Department. Guided students through lectures and taught physics concepts during the studio time when students worked together to solve problems. Demonstrated how to perform physics experiments, held TA help hours to answer questions, and helped students study effectively for exams.

Publications (h-index=11)

1. (in preparation) Rekoske, J. M., Callaghan, S., Milner, K., May, D. A. & Gabriel, A.-A. CyberShake physics-based seismic hazard maps using reduced-order models: results from Southern San Andreas earthquakes. *Bulletin of the Seismological Society of America.*
2. Rekoske, J. M., May, D. A. & Gabriel, A.-A. Reduced-order modelling for complex three-dimensional seismic wave propagation. *Geophysical Journal International* **241,** 526–548. doi:10.1093/gji/ggaf049 (2025).
3. Rekoske, J. M., Gabriel, A.-A. & May, D. A. Instantaneous Physics-Based Ground Motion Maps Using Reduced-Order Modeling. *Journal of Geophysical Research: Solid Earth* **128,** e2023JB026975. doi:10.1029/2023JB026975 (2023).
4. Rekoske, J. M., Moschetti, M. P. & Thompson, E. M. Basin and Site Effects in the U.S. Pacific Northwest Estimated from Small-Magnitude Earthquakes. *Bulletin of the Seismological Society of America* **112,** 438–456. doi:10.1785/0120210029 (2022).

5. Rekoske, J. M., Thompson, E. M., Moschetti, M. P., Hearne, M. G., Aagaard, B. T. & Parker, G. A. The 2019 Ridgecrest, California, Earthquake Sequence Ground Motions: Processed Records and Derived Intensity Metrics. *Seismological Research Letters* **91,** 2010–2023. doi:10.1785/0220190292 (2020).
6. Rekoske, J. & Walton, G. *Estimating Mechanical Properties of Sandstone from Petrographic and Physico-Mechanical Indices* **in**. 53rd US Rock Mechanics/Geomechanics Symposium (New York, NY, USA, 2019).
7. Thompson, E. M., Hearne, M., Aagaard, B. T., Rekoske, J. M., Worden, C. B., Moschetti, M. P., Hunsinger, H. E., Ferragut, G. C., Parker, G. A., Smith, J. A., Smith, K. K. & Kottke, A. R. Automated, Near Real-Time Ground-Motion Processing at the US Geological Survey. *Seismological Research Letters* **96,** 538–553. doi:10.1785/0220240021 (2024).
8. Kilb, D., Gabriel, A., Rekoske, J. & Agnew, D. *Knock, knock, knocking on your door–the Julian earthquake in southern California issues reminder to be prepared, Temblor* 2025. doi:10.32858/temblor.362.
9. Nayak, A., Rodríguez Tribaldos, V., Ajo-Franklin, J., Miranda, B., Chien, C.-C., Mellors, R., Robertson, M., Brandin, M., Rekoske, J., Wood, T., Dobson, P., Cladouhos, T., Madera, N., Shmagin, E., Duran, E., Duran, S. & The Imperial Valley Dark Fiber Team. Nodal and Broadband Seismometer Complement to the Imperial Valley Dark Fiber DAS Array. *Seismological Research Letters* **94,** 2852–2867. doi:10.1785/0220230081 (2023).
10. Gabriel, A.-A., Ulrich, T., Marchandon, M., Biemiller, J. & Rekoske, J. 3D Dynamic Rupture Modeling of the 6 February 2023, Kahramanmaraş, Turkey Mw 7.8 and 7.7 Earthquake Doublet Using Early Observations. *The Seismic Record* **3,** 342–356. doi:10.1785/0320230028 (2023).
11. Jia, Z., Jin, Z., Marchandon, M., Ulrich, T., Gabriel, A.-A., Fan, W., Shearer, P., Zou, X., Rekoske, J., Bulut, F., Garagon, A. & Fialko, Y. The Complex Dynamics of the 2023 Kahramanmaraş, Turkey, Mw 7.8-7.7 Earthquake Doublet. *Science* **381,** 985–990. doi:10.1126/science.adi0685 (2023).
12. Kleckner, J. K., Withers, K. B., Thompson, E. M., Rekoske, J. M., Wolin, E. & Moschetti, M. P. Automated Detection of Clipping in Broadband Earthquake Records. *Seismological Research Letters* **93,** 880–896. doi:10.1785/0220210028 (2021).
13. Moschetti, M. P., Thompson, E. M., Rekoske, J., Hearne, M. G., Powers, P. M., McNamara, D. E. & Tape, C. Ground-Motion Amplification in Cook Inlet Region, Alaska, from Intermediate-Depth Earthquakes, Including the 2018 Mw 7.1 Anchorage Earthquake. *Seismological Research Letters* **91,** 142–152. doi:10.1785/0220190179 (2019).
14. McNamara, D. E., Wolin, E., Powers, P. M., Shumway, A. M., Moschetti, M. P., Rekoske, J., Thompson, E. M., Mueller, C. S. & Petersen, M. D. Evaluation of Ground-Motion Models for U.S. Geological Survey Seismic Hazard Forecasts: Hawaii Tectonic Earthquakes and Volcanic Eruptions. *Bulletin of the Seismological Society of America* **110,** 666–688. doi:10.1785/0120180336 (2020).
15. McNamara, D. E., Wolin, E., Powers, P. M., Shumway, A. M., Moschetti, M. P., Rekoske, J., Thompson, E. M., Mueller, C. S. & Petersen, M. D. Evaluation of Ground-Motion Models for U.S. Geological Survey Seismic Hazard Models: 2018 Anchorage, Alaska, Mw 7.1 Subduction Zone Earthquake Sequence. *Seismological Research Letters* **91,** 183–194. doi:10.1785/0220190188 (2019).
16. Moschetti, M. P., Churchwell, D., Thompson, E. M., Rekoske, J. M., Wolin, E. & Boyd, O. S. Seismic Wave Propagation and Basin Amplification in the Wasatch Front, Utah. *Seismological Research Letters* **92,** 3626–3641. doi:10.1785/0220200449 (2021).
17. Parker, G. A., Baltay, A. S., Rekoske, J. & Thompson, E. M. Repeatable Source, Path, and Site Effects from the 2019 M 7.1 Ridgecrest Earthquake Sequence. *Bulletin of the Seismological Society of America* **110,** 1530–1548. doi:10.1785/0120200008 (2020).

Invited Presentations

18. Rekoske, J. M. *Rapid, Physics-Informed Seismic Wavefields Using High-Performance Computing and Reduced-Order Models* USGS Earthquake Science Center Seminar Series. Presentation. Moffett Field, CA, 2024.

19. Rekoske, J. M. *Improving Physics-based Seismic Hazard Analysis using Reduced-order models: Results from Southern San Andreas Ruptures* Scripps Institution of Oceanography GAIA Seminar Series, Artificial Intelligence for Earth and Ocean Systems. Presentation. La Jolla, CA, 2025.
20. Rekoske, J. M., Kuratle, L., Kilb, D. & Gabriel, A.-A. *Improving Scientific Communication using Earthquake Simulations: Insights from A Public Survey* American Geophysical Union Fall Meeting. New Orelans, LA, 2025.

Software Release

21. Hearne, M., Thompson, E., Schovanec, H., Rekoske, J., Aagaard, B. T. & Worden, B. C. *USGS Automated Ground Motion Processing Software* 2019.

Honors and Awards

- Scripps Institution of Oceanography Department Student Award
- NSF Graduate Research Fellowship
- Scripps Institutional Fellowship
- Seismological Society of America Student Travel Grant
- Colorado School of Mines Cecil H. Green Gold Medal Award
- Colorado School of Mines Undergraduate Research Scholar Distinction
- Colorado School of Mines President's Scholarship
- Herb Kohl Student Excellence Scholarship
- SECURA All-College Scholarship
- Ernest F. Hollings Undergraduate Scholarship
- Earl D. & Reba C. Griffin Memorial Scholarship
- Debra & Mark Gregg Scholarship
- Anadarko/SEG Scholarship
- Shirley A. & Stanley H. Ward Scholarship
- SEG/Denver Geophysical Society Scholarship

Service to the Scientific Community

- Peer reviewer for *Journal of Geophysical Research: Solid Earth* and *Seismological Research Letters*.
- Convener at the American Geophysical Union 2023 Annual Meeting.
- Quakeworx instructor at the Statewide California Earthquake Center 2025 Annual Meeting.