Exponent®
Engineering & Scientific Consulting

Judith Gauriau, Ph.D.

Scientist | Civil and Structural Engineering
Oakland
+1-510-268-5030 | jgauriau@exponent.com

Professional Profile

Dr. Gauriau specializes in geomorphology and assessment of geological hazards with strong expertise in the characterization of active faults. She has extensive experience in geological mapping, combining GIS tools and satellite imagery with field investigations and has experience with analysis and interpretation of digital elevation data including LiDAR and photogrammetry-derived products.

Dr. Gauriau conducted her PhD at the University of Southern California where she focused on fault-system mechanics, bringing a breakthrough understanding of plate-boundary fault-system behavior. She studied fault slip rates and developed digital elevation models using GIS for sites located in Turkey, New Zealand and California. She led multidisciplinary field campaigns for geomorphological characterization and in-situ sediment sampling before further analysis in the laboratory, for radiocarbon and luminescence dating. Her field work experience ranges from subsurface geological mapping to paleoseismic trenching. In addition, Dr. Gauriau conducted advanced numerical simulations to explore the mechanical properties behind earthquakes recurrence behavior happening on strike-slip faults.

Her previous engineering background allowed Dr. Gauriau to gain substantial experience in the field of mineral resources exploration, and ore-bearing rock characterization, ranging from the scale of an entire ore deposit (with 3D geomodelling using regional geological mapping and boreholes) to the single-mineral scale (with mineralogical and geochemical analyses). The combination of her geological mapping skillset with her global understanding of geological systems allows Dr. Gauriau to apply her expertise to a wide range of technically challenging projects.

Academic Credentials & Professional Honors

Ph.D., Geological Sciences, University of Southern California, 2024

B.Sc., Geological Engineering, Ecole Nationale Superieure Geologie, France, 2018

M.Sc., Geological Engineering, Ecole Nationale Superieure Geologie, France, 2018

AGU Freilich Data Visualization Competition Grand Prize, 2023

John Stauffer Endowed Fellowship, University of Southern California, Academic year 2023-2024

Best Lightning Talk of the Southern California Earthquake Center (SCEC) Meeting, 2023

Second best innovation startup pitch, Innovate LA Das Family Competition, 2023

Outstanding Student Award, Geological Society of America, Structural Geology and Tectonics division, 2022

Prior Experience

Engineering Researcher, GéoRessources Laboratory, Sep – Dec 2018

Mapping geologist intern, Ministère de l'Energie et des Ressources Naturelles, May – Aug 2018

Engineering geologist intern, Recylex, June – Aug 2017

Engineering geologist intern, Andra, July 2016

Professional Affiliations

Southern California Earthquake Center

Association of Environmental and Engineering Geologists (AEG)

Languages

French (France)

German

Spanish

Publications

Gauriau J, Dolan, JF. Comparison of geodetic slip-deficit and geologic fault slip rates reveals that variability of elastic strain accumulation and release rates on strike-slip faults is controlled by the relative structural complexity of plate-boundary faults systems. Seismica 2024; 3:1.

Gauriau J, Barbot S, Dolan JF. Islands of Chaos in a Sea of Periodic Earthquakes. Earth and Planetary Research Letters 2023; 618:118274.

Ivester AH, Rhodes EJ, Dolan JF, Van Dissen RJ, Gauriau J, Little T, ... & Tuckett PA. A method to evaluate the degree of bleaching of IRSL signals in feldspar: The 3 ET method. Quaternary Geochronology 2022; 101346.

Gauriau J, Dolan JF. Relative structural complexity of plate-boundary fault systems controls incremental slip-rate behavior of major strike-slip faults. Geochemistry, Geophysics, Geosystems 2021; 22(11).

Gauriau J, Harlaux M, André-Mayer AS, Eglinger A, Richard A, Fontaine A, Lefebvre MG, Béziat D, Villeneuve J, Lemarchand D. Chemical and boron isotope composition of tourmaline from the Kiaka orogenic gold deposit (Burkina Faso, West African Craton) as a proxy for ore-forming processes. Mineralium Deposita 2020; 1-20.

Presentations

Gauriau J, Dolan JF, Van Dissen R, Little T, Rhodes E, Ivester A. Earthquake behavior of the Kekerengu fault. Oral presentation, Grand Prize Winner talk of 2023 AGU Michael H. Freilich Student Visualization Competition, AGU Annual meeting, San Francisco, 12 Dec 2023.

Gauriau J, Dolan JF, Van Dissen R, Little T, Rhodes E, Ivester A. Non-characteristic slip behavior on the

Kekerengu fault throughout the past four to five earthquakes at Bluff Station, New Zealand. Poster presentation, AGU Annual meeting, San Francisco,11-15 Dec 2023.

Gauriau J, Dolan JF, Van Dissen R, Little T, Rhodes E, Ivester A. Non-characteristic slip behavior on the Kekerengu fault throughout the past four to five earthquakes at Bluff Station, New Zealand. Poster presentation, SCEC Annual Meeting, Palm Springs, 10-12 Sept 2023.

Gauriau J, Dolan JF. Relative structural complexity of major plate-boundary fault networks: an explanation for time-variable fault loading rates. Invited talk, European Center for Research and Teaching in Environmental Geoscience (CEREGE), Aix-en-Provence, France, 2 May 2023.

Gauriau, J., Dolan, JF. Using the CoCo metric of relative structural complexity of major plate-boundary fault networks to explore potentially time-variable fault loading rates on major strike-slip faults, EGU General Assembly, Vienna, Austria, 24–28 Apr 2023.

Gauriau J, Dolan JF, Van Dissen R, Little T, Rhodes E, Ivester A. Long-term slip rate of the Kekerengu fault and possible range of pre-2016 Kaikoura earthquake displacements at the Bluff Station site, New Zealand. Oral presentation, GSA Connects Meeting, Denver, Colorado, 11 Oct 2022.

Gauriau J, Barbot S, Dolan J. Islands of chaos in a sea of periodic earthquakes: Constraining the allowable friction parameter space for large-magnitude earthquakes using recurrence patterns from the Alpine fault Hokuri Creek paleoseismic record, New Zealand. Poster presentation, SCEC Annual Meeting, Palm Springs,11-14 Sept 2022.

Gauriau J, Dolan JF. Relative Structural Complexity of Plate-Boundary Fault Systems Controls Incremental Slip Rate Behavior of Major Strike-Slip Faults. Poster presentation, SCEC Annual Meeting, online, 12-16 Sept 2021

Gauriau, J., Dolan, J.F. Relative Structural Complexity of Plate-Boundary Fault Systems Controls Incremental Slip Rate Behavior of Major Strike-Slip Faults. Poster presentation, AGU Annual meeting, online,1-17 Dec 2020.