Geology of Mountains & Basins Research

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Forest Inventory and Analysis

- **Dr. Brenda J Buck**
- Professor
- Department of Geoscience
- Email: Brenda.Buck@unlv.edu
- Website: https://unlv-fia.github.io/UNLV-FIA-Group/index.html

Expertise

- University partner to USDA-FIA. Area of emphasis is information management research and development to optimize the storage, delivery, and display of forest inventory data.
- The support we provide helps policy makers, land stewards and non-governmental groups base decisions and assessments related to the health, diversity, and productivity of U.S. forests and grasslands on scientifically credible information.

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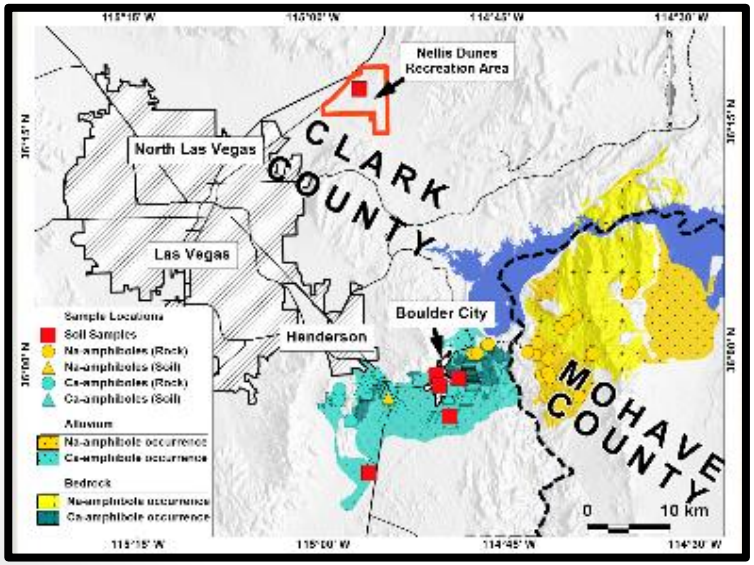
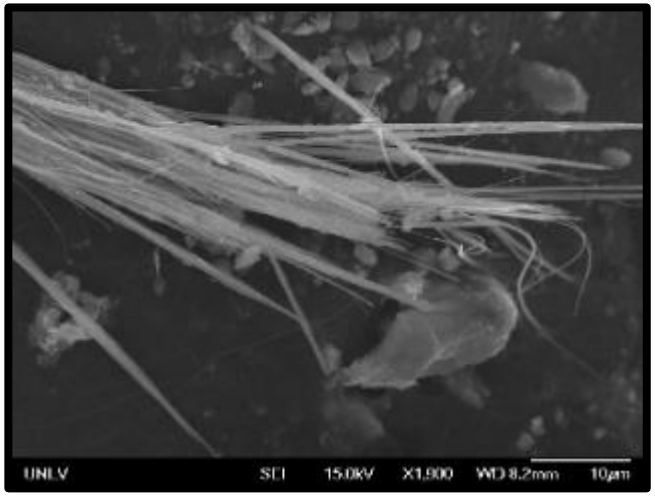
Medical Geology

- **Dr. Brenda J Buck**
- Professor
- Department of Geoscience
- Email: Brenda.Buck@unlv.edu

Expertise

- Expertise: Health effects of mineral dust; Asbestos; Heavy Metals; Soil Science/Geology





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Basin Analysis and Tectonics

- **Dr. Erin Donaghy**
- Assistant Professor
- Department of Geoscience
- Email: erin.donaghy@unlv.edu

Expertise

- Forearc basin processes
- North America Cordilleran tectonics
- Strike-slip basin evolution
- U-Pb zircon geochronology
- Oceanic plateau collision

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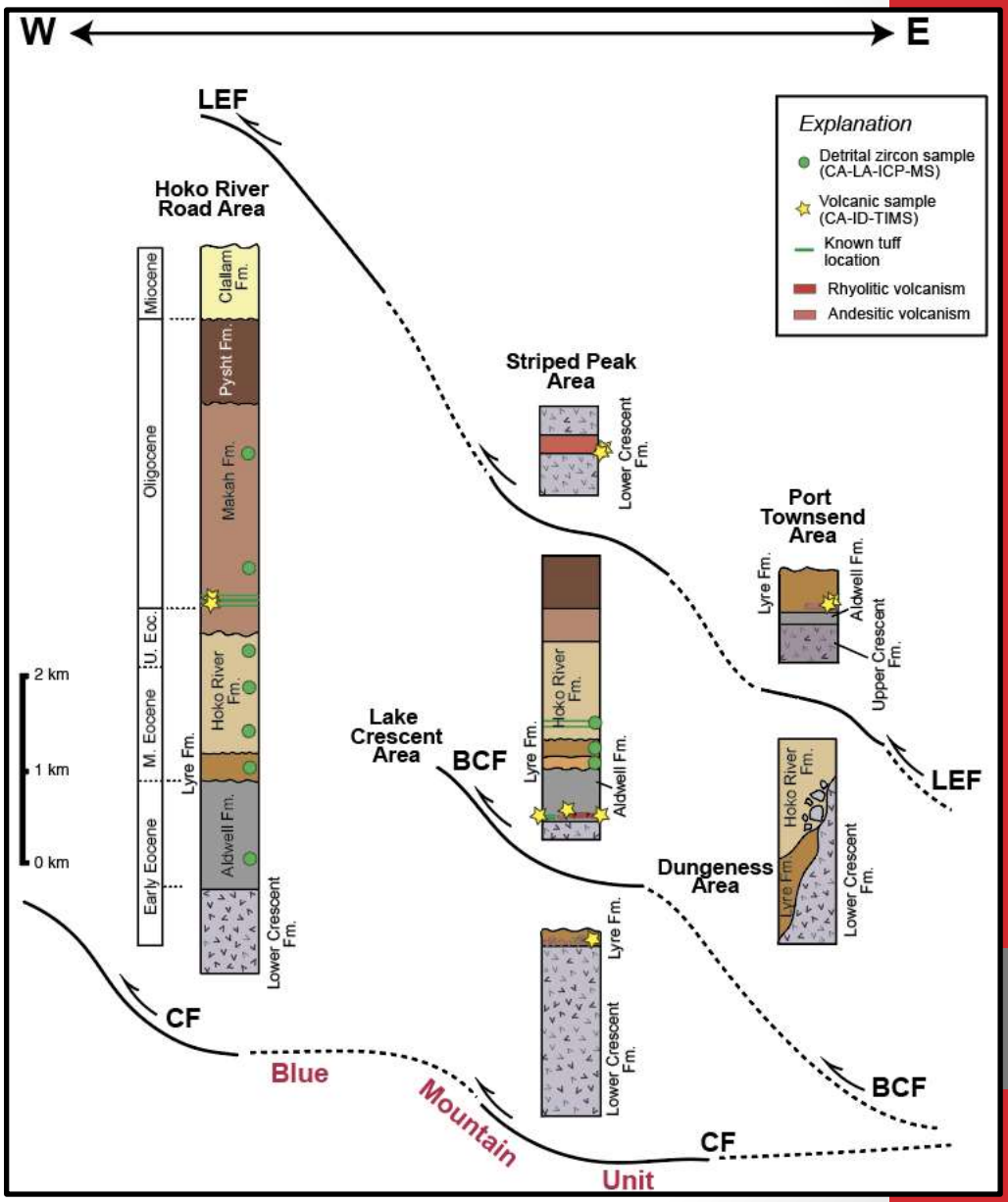
My group uses the sedimentary record to tackle large-scale tectonic questions by integrating both field and analytical methods

- Measured stratigraphic sections and lithofacies mapping are used to reconstruct depositional environments
- U-Pb detrital zircon geochronology to determine sediment provenance
- Establish a high-precision chronostratigraphy for regional stratigraphic correlations



Sedimentary Geology

Dr. Ganqing Jiang
Professor
Department of Geoscience
Phone: (702) 895-2708
Email: Ganqing.Jiang@unlv.edu

Expertise:
Sequence and chemostratigraphy
sedimentology
Carbonate diagenesis

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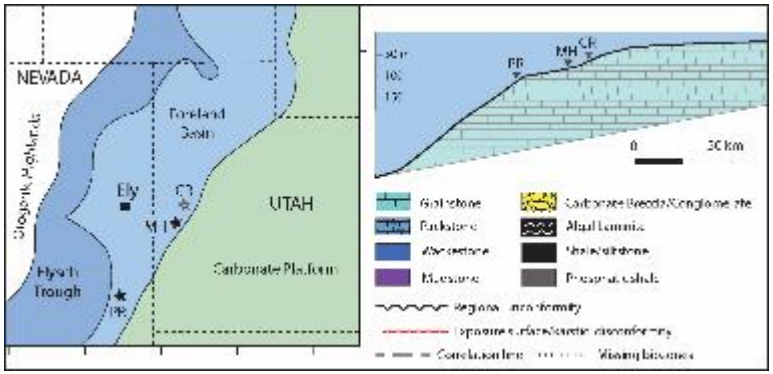
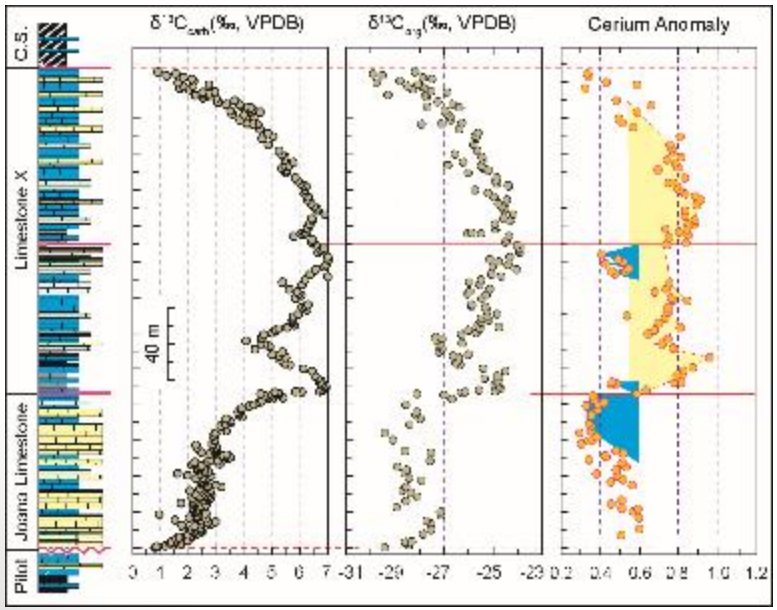
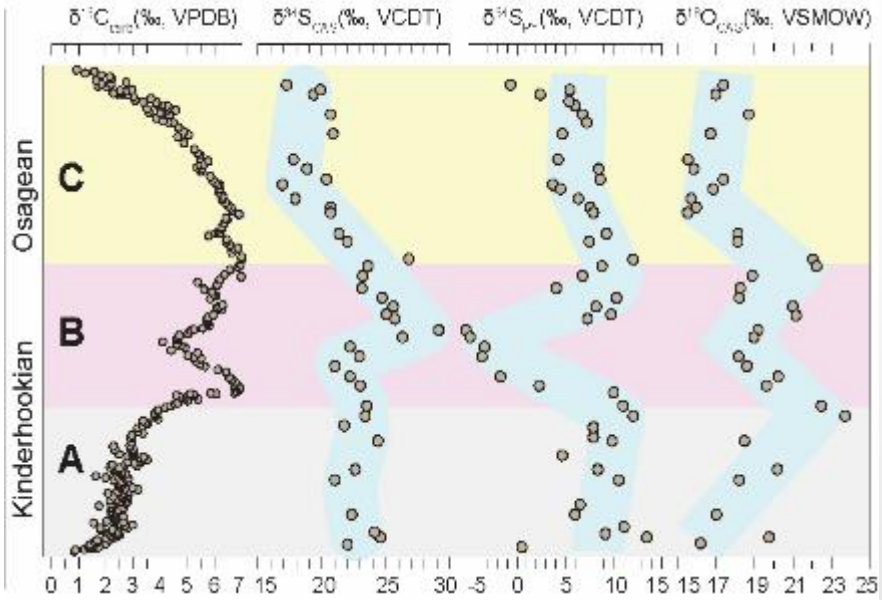
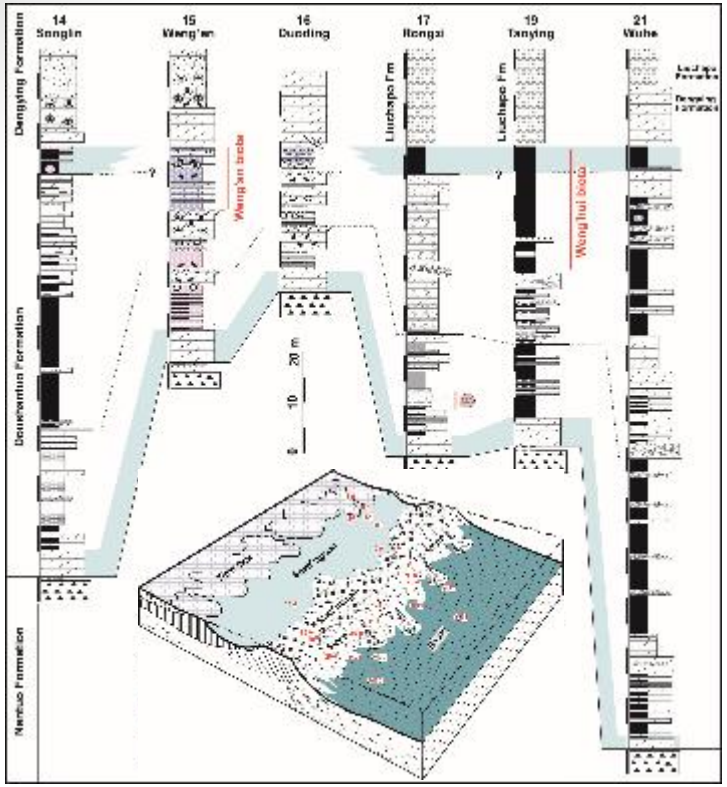


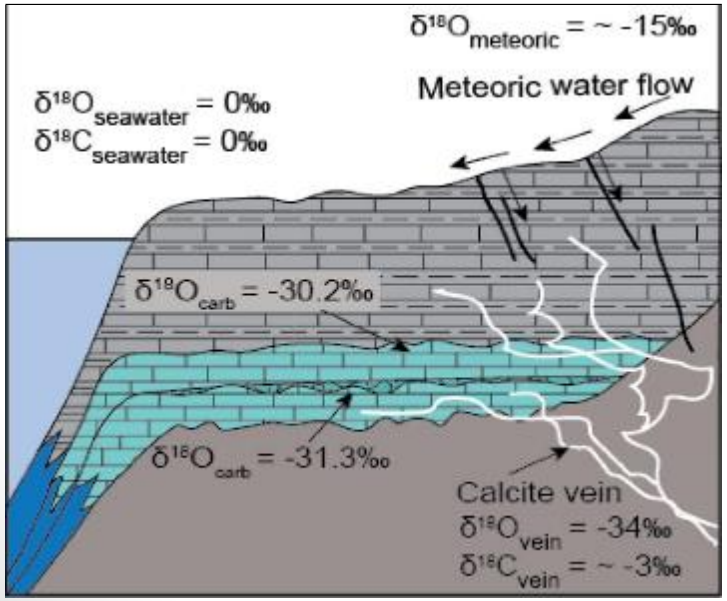
- Sequence and chemostratigraphy
- Paleogeographic reconstruction
- Applications of stable isotopes and rare earth elements
- Paleoenvironmental change across major perturbations of the carbon cycle and mass extinctions







- **Basin analyses and paleoceanography**
- **Fluid migration and carbonate diagenesis**
- **Tracing fluid migration in sedimentary basins using stable isotopes and trace elements**
- **Carbonate aquifer**



Hydrology

Dr. Michael Nicholl
Department of Geoscience
Phone: (702) 895-4616
Email: michael.nicholl@unlv.edu

Expertise:
Unsaturated zone hydrology
Fractured rock hydrology
Environmental fluid mechanics

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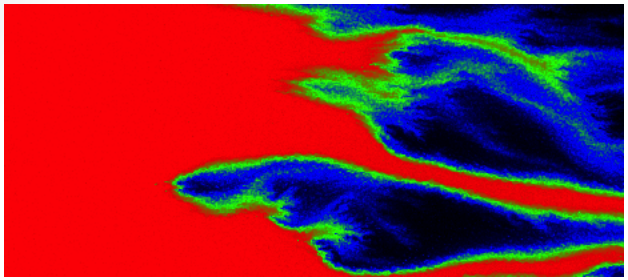
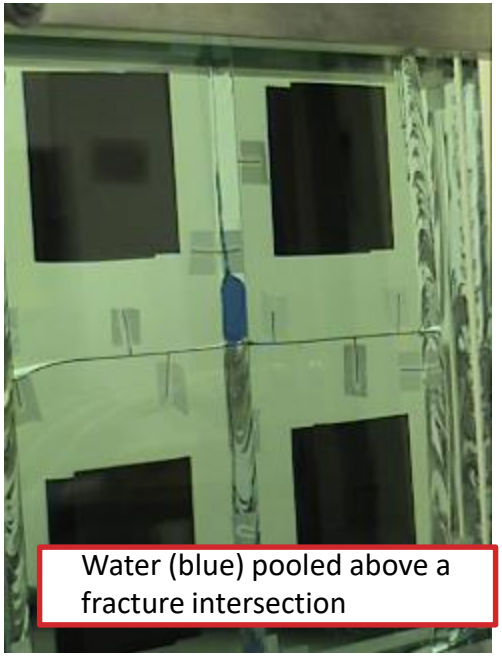
Fractured Rock Hydrology



False color image of a miscible displacement experiment in a single fracture



Water (blue) pooled above a fracture intersection

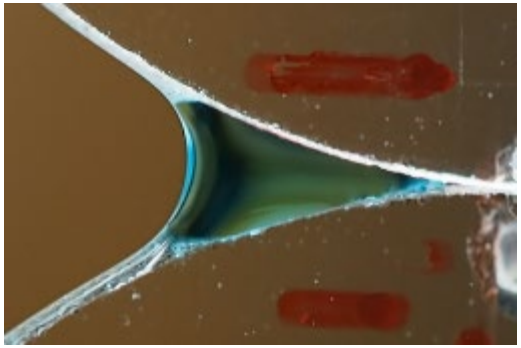
Field mapping of fracture networks
blue dye (right foreground) is from an infiltration test

Isothermal flow across a single rock fracture (matrix-to-matrix flow)

- Two-phase flow and transport in fractured rock
- Laboratory experimentation, field mapping, numerical simulations
- Contaminant transport, geothermal energy, enhanced petroleum recovery

Unsaturated Porous Media

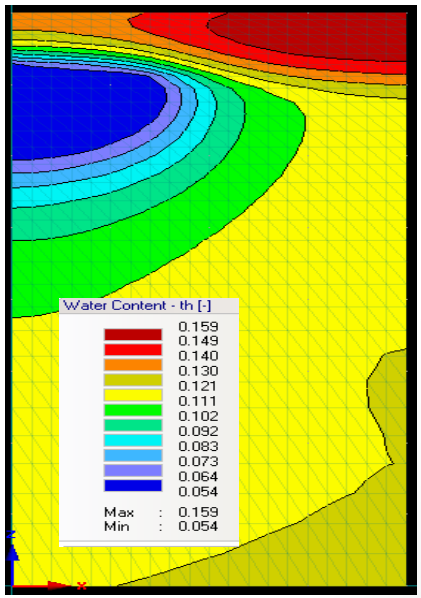
Seepage through gravel-sized capillary barrier materials



Millimeter-scale transport experiment

Hydraulic conductivity of a rock slab

Sampling Chloride as a proxy for root-driven horizontal flow



2D simulation of root-driven transport

- Challenging existing conceptual models for unsaturated and two-phase flow
- Design and execution of critical laboratory/field/numerical experiments

Fluids and Magmas in Ore Systems

- **Dr. Michael Schirra**
- Assistant Professor
- Department of Geoscience
- Email: michael.Schirra@unlv.edu

Expertise

- Economic Geology (with focus on porphyry Cu-Au, epithermal Au, intrusion-related Pb-Zn-Ag deposits)
- Fluid and Melt Inclusion Petrography and Micro-Analysis
- Igneous Petrology (with focus on magma ore-fertility)
- Mineral Exploration (vector minerals for mineralization)
- LA-ICP-MS analyses and method development

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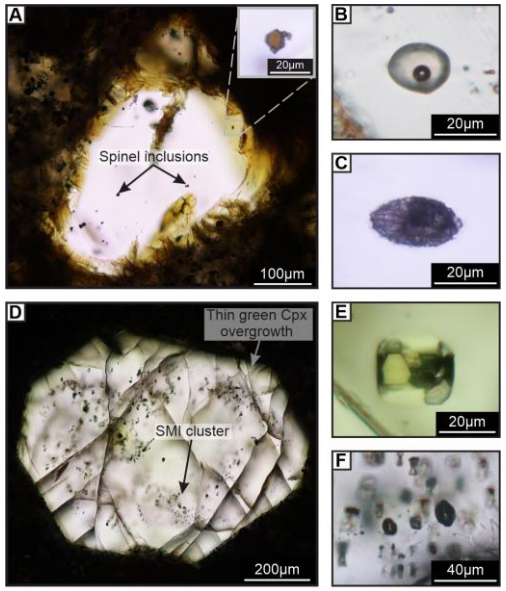
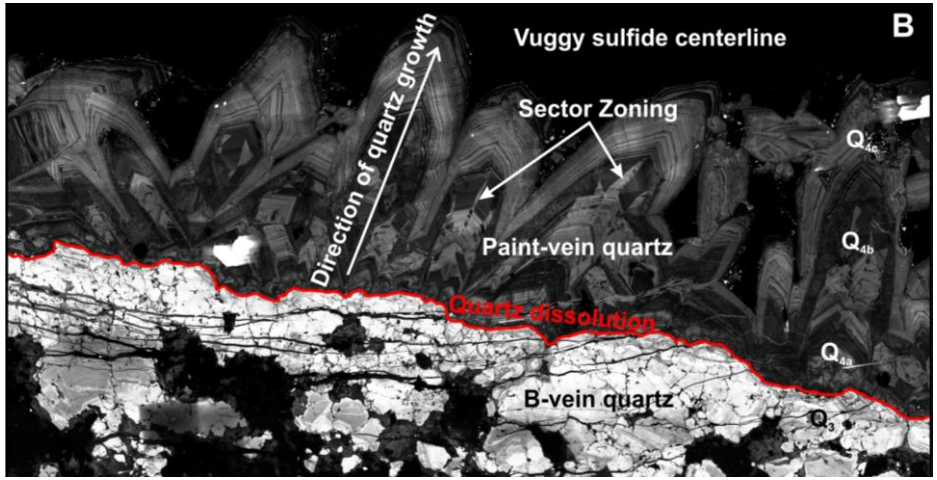
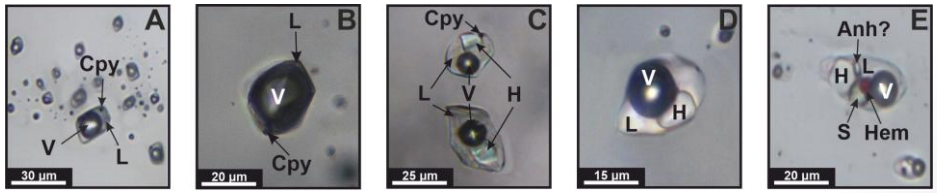
Understanding ore-forming processes at the translithospheric scale with the help of inclusions







Inclusions are the only way to directly sample paleo-fluids and –melts that have produced ore deposits. By integrating detailed petrography, state-of-the-art micro-analysis techniques and geochemical modelling, my research group investigates the fundamental principles of ore deposit formation.

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