Course Description

Geochemistry studies the chemical composition and transitions within the Earth system over a range of pressures and temperatures, from chemical reactions occurring at the Earth’s surface (weathering, mineral precipitation) to reactions occurring at great depths (mineral melting, metamorphism). We use thermodynamics to understand these reactions and predict what mineral phases or aqueous ions are stable at given temperature and pressure conditions. So, the objectives of the course are two-fold. The first goal is to understand the laws of thermodynamics as a mathematical model, and how that model can be used to develop hypotheses about how the real world works. The second goal is to learn how to construct a variety of phase diagrams to better understand geochemical processes and test the thermodynamic-based hypotheses.

Figure Caption

(Top) A thermodynamic model for the stability fields of ferrihydrite and aqueous ferrous iron. (Bottom) Bacterially precipitated iron in creek below dam on Furman Lake.