New Geological Sciences Facilities:
CU Boulder Earth Systems Stable Isotope Laboratory

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CUBES Stable Isotope Laboratory

Benson Earth Sciences

Focus:

- Measurement of small abundance isotopologues (e.g. carbonate "clumped" isotope thermometry and method development) for numerous modern and paleo-environmental applications

- C,H,N,O,S stable isotope ratios of a wide variety of earth materials for applications, including geology, ecology, forensics, microbiology

Instrumentation

- Gas source, dual-inlet stable isotope ratio MS
  - High-precision measurement of small abundance isotopologues
    - Primary application: mass-47 of CO_2 for determining ancient temperatures of carbonate mineral formation
      - Applications for paleoclimate, tectonics, subsurface fluid flow

Thermo MAT253 Plus with custom designed on-line and off-line vacuum CO2 extraction systems

Instrumentation

- Gas source, continuous flow stable isotope ratio MS
  - Elemental Analyzer:
    - wgt % C, N, $\delta^{13}C$ & $\delta^{15}N$ of organic matter in sediments, soil, plants and animals; both natural and labeled abundances
  - Headspace Analyzer:
    - Carbonate $\delta^{13}C$ & $\delta^{18}O$; Waters – $\delta^{13}C$ of DIC; $\delta^{15}N$ & $\delta^{18}O$ of nitrates/nitrites
  - High-temperature conversion EA:
    - $\delta^{18}O$ & δD of bone, fossils, methane and hydrogen gas, & bulk organic matter, volcanic glass

Thermo Delta V Plus with Gasbench, EA and TCEA

Come up and see the Lab

- Room 345