As the University of Colorado Boulder’s oldest institute, INSTAAR has a long history of responding to pressing environmental issues. Traditionally focused on polar and alpine regions, where effects of global change are especially pronounced, INSTAAR has broadened to address environmental challenges that span local, regional and global scales.

**Forecasting Fires in the West**

*Tania Schoennagel* analyzes the increase in wildfires in the American West over the past 30 years. Her work projects how climate change will affect the trend in coming decades, particularly with regard to the wildland-urban interface. In Congress and elsewhere, she advocates for policies that promote adaptive resilience in response to changing fire regimes.

**Fast Action on Floods**

Using satellite imagery and mapping software, *Bob Brakenridge and Albert Kettner* create near-real-time maps of flood extents and river levels that help guide emergency responders around impassable areas and identify the shortest possible path to people in need.

**Improving Water Management**

The *Mountain Hydrology Group* led by *Noah Molotch* studies the complicated relationships between snow and terrain to better estimate the amount of water held in snowpack. Their work has helped improve water resource management for the Upper Colorado River Basin and California.

**Real-Time, Public Data on Air Quality**

Scientists in the *Atmospheric Research Lab* measure the volatile organic compounds that form ozone in Boulder County. The measurements, which are updated and automatically published in near-real-time, disentangle the sources of these gases, differentiating between oil and gas production, vehicle exhaust and other sources.
Sarah Crump extracts and sequences ancient DNA from the bottom of lakes on Baffin Island to get a complete picture of how plant communities responded to past climates. She is part of a team led by Gifford Miller that focuses on quantifying the Arctic’s rapid changes and predicting how they will impact lower latitudes over the next century.

Kimberly Rogers investigates how climate, river and marine processes, and environmental governance interact to shape deltas and coastal environments that are home to millions of people. Her work in understanding how agriculture and aquaculture modify the flow of sediment through heavily populated deltas has far-reaching implications for responses to climate-related coastal flooding.

Grad students conducted research on 6 continents.

Students co-authored more than 60 papers in scientific journals.

Researchers in the Organic Geochemistry Lab are looking into the deep past of the world’s oceans to find glimpses of what future oceans might be like. By analyzing molecular traces of lipids, components of fats left from environments that can be millions of years old, researchers can decode and reconstruct ancient ecosystems.