

Peaks and Vistas



Research at the University of Colorado



The University of Colorado's four campuses boast vistas that embrace Colorado's Front Range from Pike's Peak to Long's Peak. This report on sponsored research at CU focuses on different kinds of peaks—outstanding disciplines, centers, and people—and on the broad range of research vistas that make this university a spectacular research environment. The following pages tell the condensed story of large and small research projects that are helping to map new frontiers of knowledge.

CU's strength as a research university derives from several factors: stellar faculty in every field, the synergy made possible by our four-campus system, cooperative relationships with numerous federal laboratories and agencies, and profitable partnerships with corporations. Although the majority of CU's

sponsored research happens within individual departments, we have chosen to emphasize centers, institutes, and other partnerships in this report to demonstrate the ways in which such arrangements can facilitate ambitious research agendas, enable interdisciplinary investigations, and provide the foundation for mutually rewarding long-term relationships with non-university partners.

Whether they work within a department or a center, visionary researchers require financial and infrastructure support to test hypotheses and to transform theories into applications. We are most grateful for the federal, state, and private sector support that has helped us attract nationally and internationally renowned individuals to this institution, and we are dedicated to continually raising

our goals and broadening our areas of expertise.

Research at the University of Colorado supports every aspect of life—our health, environment, culture, society, arts, technology, and future. As you will see from this report, research is an essential, integrated component of CU's total learning environment—one that expands vistas for our students, our state, and our world.

For additional information about sponsored research at CU, please consult the directory of institutes, centers, and other research-related offices that you'll find in the back pocket of this brochure.

We invite you to become a partner with us in mapping the future, and we welcome your support of research at CU.

environment



The University of Colorado's prolific environmental research programs owe their success in part to the university's location in the West, where issues of water, weather, and atmospheric conditions loom large and the conditions for studying the environment are ideal. Geographic location and proximity to CU have also attracted national research laboratories such as NOAA's Environmental Research Laboratories; clear air made Boulder the perfect place for the National Center for Atmospheric Research; high altitude made it ideal for the Mountain Research Station. Partnerships with federal researchers have been mutually beneficial and have helped CU develop preeminent graduate programs and research institutes such as the Cooperative Institute for Research in Environmental Sciences. CU-Boulder's geography department, for example, ranks at the top in a 1997 national survey by Michigan State University professors measuring teaching and research productivity, and *U.S. News & World Report* ranked CU's environmental law program fifth in the nation in 1997.



Interdisciplinary Partnership Serves Students and Researchers

Since 1967 the Cooperative Institute for Research in Environmental Sciences (CIRES) at **CU-Boulder** has collaborated with the National Center for Atmospheric Research (NCAR) and the National Oceanic and Atmospheric Administration (NOAA) to conduct collaborative research and teaching. CIRES research areas include environmental chemistry, seismology, geophysics, climate studies, microbiology, and polar studies. The institute has a strong research program in remote sensing and a pacesetter effort in instrument development as well as newer programs in climate modeling and water quantity and quality.

The institute serves as an umbrella for several specialized research centers and programs, including the Center for the Study of Earth from Space, the National Snow and Ice Data Center, the Colorado Center for Chaos and Complexity, and the World Data Center for Glaciology.

CIRES includes research scientists from eight university departments and several government laboratories within NOAA as well as approximately 90 graduate students, who conduct research with CIRES sponsorship. In addition to funding from NOAA, CIRES receives support from NASA and the NSF, DOE, DOD, EPA, and USGS.

CU Helps Feds, State, and Businesses Study Environmental Issues

CU-Denver's Center for Environmental Sciences supports a variety of faculty research projects and does contractual work, such as analyzing water samples, for selected local organizations. One of its major projects, funded by the National Renewable Energy Laboratory, involves building an instrument to measure the degradation of solar cells.

Technology to Meet Multiple Demands

Software developed by the Center for Advanced Decision Support for Water and Environment (CADSWES) is helping federal agencies, private utilities, and other water resource managers optimize water resources.

RiverWare

RiverWare, the most sophisticated river basin modeling tool available, was developed under the joint sponsorship of the Bureau of Reclamation and the Tennessee Valley Authority (TVA) and enables water managers to balance multiple demands on water resources.

For example, the TVA is using RiverWare for daily scheduling of more than 40 reservoirs and hydro plants. TVA operating considerations include controlling floods, maintaining navigable depths, protecting aquatic communities, providing suitable levels and releases for recreation, and achieving economical hydropower generation schedules.

CADSWES is part of the **CU-Boulder** Department of Civil, Environmental, and Architectural Engineering.

Following Water's Run

Water is the most vital requirement for human survival—especially in the arid West. Yet, even at the turn of the 21st century, the field of water science is poorly configured to enable the multidimensional evaluation of water resources. The new Western Water Initiative, sponsored by the Climate Diagnostics Center and funded by NOAA, seeks to change the model of water science to an interdisciplinary one.

CU-Boulder researchers from meteorology, hydrology, aquatic ecosystem science, water resource economics, and other disciplines will collaborate with other federal, state, and academic researchers in water science as it relates to the western United States. The initiative's general strategy is to follow the water as it moves into the interior West through the atmosphere, is deposited on and passes over the landscape, and returns to the atmosphere or leaves the region as surface flow. Enhanced water management and resource planning are the ultimate goals of this research.



Restoring the Waters, a Natural Resources Law Center publication, targets professionals as well as legislators and policy makers. The award-winning report portrays innovation in water use and management that have provided important environmental benefits. It was produced by CU's law school with funding from the Ford Foundation in cooperation with the Natural Heritage Institute, the Natural Resources Defense Council, and the Northwestern School of Law of Lewis and Clark College.