

Colorado State University collaborates with the Governor's Energy Office in the State of Colorado to promote research projects

Colorado State University (CSU) has developed a unique collaboration with the State of Colorado's Governor's Energy Office. Dr. Scott Denning and Dr. Michele Betsill are working with faculty and researchers from CSU and Western State College of Colorado on an innovative program to enhance energy efficiency within the operations of state government. Dr. Denning is the Director of Education and Diversity for the Center for Multiscale Modeling of Atmospheric Processes (CMMAP). Dr. Betsill is a Professor of Political Science as well as founder and co-leader of the Environmental Governance Working Group.

The Governor's Greening Government Council was established in 2007 by executive order. The executive order includes mandates to significantly reduce energy usage by state agencies.

Four research projects are currently underway. These projects are:

1. Greening Correctional Facilities: Impacts of Integrated Design for Long-Term Energy Sustainability

Dr. Jennifer Cross, Assistant Professor of Sociology, CSU; **Dr. Tara O'Connor Shelley**, Assistant Professor of Sociology, CSU; **Michael Kirk**, Director of Facilities Service, Larimer County; **Gary Darling**, Criminal Justice Services Director, Larimer County

This project is the initial phase of a multiyear project that will examine the impacts of using the High Performance Building Integrated Design Process (hereafter Integrated Design) for the design and construction of a new correctional facility, the Alternative Sentencing Building (ASB) owned and operated by Larimer County. Researchers will begin by creating a detailed case study that illustrates the social structure of inter-agency relationships, knowledge transfer, innovation, and decision-making in the integrated design process. The results of this study will provide a detailed analysis of how using Integrated Design leads to an improved design that results in reducing energy use, energy costs, and greenhouse gas (GHG) emissions in government buildings. Next, researchers will assess the performance (energy use, energy cost, and conduciveness and support of organizational mission) and evaluate building occupants' (offenders and employees) perceptions of the existing building currently housing alternative sentencing programs for Larimer County. The results of this phase of the study will provide baseline data for comparison of the current facility to the new LEED building (scheduled for completion in December 2012) regarding energy performance and perceptions of the building's function.

2. Assessing and Improving Methods of Waste Diversion

Dr. Scott Cohn, Assistant Professor of Psychology, Western State College of Colorado

This project will conduct a full waste audit of a State of Colorado building to determine diversion rates both before and after structural modifications to improve recycling compliance. Studies suggest a dynamic relationship between behavior and the physical environment and that modifications made to the environment (e.g. making recycling bins more accessible to workers) facilitate new behavior. A team of undergraduate students will work with the building custodial staff that normally collect and dispose of trash to conduct a full waste audit. During the evaluation and modification procedures, custodial staff will hold the trash in a designated area

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where it will then be retrieved daily by two or more members of the research team. The trash will be weighed and sorted at a nearby dumpster location using a portable scale to measure “gross trash weight.” The trash will then be separated from the recycling and weighed again to obtain a “net trash weight.” The recycling taken from the waste stream will be sorted by type, weighed individually and taken to a recycling facility. Recycling from recycling bins will also be collected by members of the research team and weighed before being transported to a recycling facility.

3. Rocky Mountain National Park Campground Recycling and Landfill Waste Diversion Behavioral Change Initiative

Elliot Dale, Masters of Science Candidate (2012), Construction Management, Colorado State University

The purpose of this study is to identify and implement behavioral change strategies aimed at increasing landfill diversion disposal rates at Family Campgrounds in Rocky Mountain National Park, using the Community-based Social Marketing (CBSM) approach to determine the appropriate behavioral change strategies that will foster sustainable solid waste disposal. The investigator has conducted an initial waste audit of multiple location types throughout the park to determine the locations and waste categories that have the potential for the greatest waste and has identified barriers and benefits for landfill diversion activities through surveys and observations. This phase of the research will involve establishing and implementing waste diversion behavioral change strategies based on the identified barriers and benefits working closely with National Park Service staff. The investigator will then conduct a post waste audit for validation of implemented strategies. The results from this second waste audit will be compared with the first waste audit to determine the effectiveness of the waste diversion strategies. This second waste audit will also show where further waste diversion efforts should be focused.

4. Expanding the Total Benefit Pricing of Greenhouse Gas Emission Reduction in the Colorado Electricity Sector

Dr. Catherine M.H. Keske, Assistant Professor of Agricultural Economics, Department of Soil and Crop Sciences, Colorado State University

This project will update a 2010 GEO-funded study, “Designing a Technology-Neutral Benefit-Pricing for the Electric Power Sector in Colorado” (Grant # 10-136), which calculated the marginal damage costs associated with meeting seven environmental targets from electricity generation in the state, including targets associated with reducing greenhouse gas emissions. The investigator will update costs in the spreadsheet to reflect changes in levelized cost of energy with new technologies, and time of delivery benefits. Environmental damage costs will also be modified to provide more specificity at the plant level, for plants that are scheduled for replacement.