Methods

General Statistics Used

Mean & Median: For a set of data, the mean and median were both used to approximate the value that will be most similar to all data in the set. The mean is the average of the dataset. The median is the middle value of the dataset, if all values are put in order. Depending on the values in the dataset, one method may have been deemed more appropriate than the other.

Standard Deviation: The standard deviation is a measure of the dispersion of a dataset, or how spread out or tightly centered the data is, and was used as part of the method for comparing and combining different sets of data as detailed in the Indicator Rankings method above.

Indicator Rankings

For a given indicator, counties are ranked according to the following methodology:

Each county is assigned a Z-Score for each variable that makes up the indicator in order to normalize and compare numerically different variables. The Z-Score for a county and for a given variable is equal to the value of the variable for that unit minus the mean value of the variable for all counties all divided by the standard deviation of the variable for the group.

$Z = (X - X_{mean})/S_x$, where Z is the Z-Score, X is the value of a variable for a geographic unit, X_{mean} is the mean value of the variable for all units in the group, and S_x is the standard deviation of the variable for all units in the group.

After each county is assigned a Z-Score for each variable that makes up the indicator, each county is assigned an overall Z-Score by averaging the county's different Z-Scores. Sometimes different Z-Scores are given different weight as indicated in that section of the *Report Card*. Then, each unit is ranked in order of its overall Z-Score for the indicator.

Indicator Grades

After the units are ranked for the indicator as outlined above, the following percentage distribution is applied to assign grades to each geographic unit:

Percentile Earning Grade	% of Counties Earning Grade	Letter Grade Earned
100% to 93%	8%	A
92% to 85%	8%	A-
84% to 77%	8%	B+
76% to 70%	7%	B
69% to 64%	6%	B-
63% to 54%	10%	C+
53% to 44%	10%	C
43% to 36%	8%	C-
35% to 28%	8%	D+
27% to 0%	7%	D

County Groups: Metro, Micro, and Rural

The State of the Rockies uses the rural-urban continuum codes developed by the Economic Research Service at the U.S. Department of Agriculture in 2003 based on their metropolitan-nonmetropolitan status and size of their metropolitan or urban populations.Beginning in June 2003, the Office of Management and Budget (OMB) has instructed the Census Bureau to track "micropolitan" areas as well as metropolitan areas. Micropolitan statistical areas must have an urban cluster of at least 10,000 people but fewer than 50,000 people. The designation includes the county where the urban cluster is plus adjacent counties linked by commuting ties. For more information http://www.census.gov/population/www/estimates/metrodef.html and http://www.ers.usda.gov/briefing/rurality/RuralUrbCon/.

Note: Because it was so recently created, and most data sets do not yet include it, Broomfield County, Colorado is not included in our analyses.

State of the Rockies County Label	Code	Census/ USDA Label	Definition	Number of Counties in the Rockies
Metro	1	Metro	County in metro area with 1 million population or more	12
Metro	2	Metro	County in metro area of 250,000 to 1 million population	24
Metro	3	Metro	County in metro area of fewer than 250,000 population	25
Micro	4	Non Metro	Nonmetro county with urban population of 20,000 or more, adjacent to a metro area	14
Micro	5	Non Metro	Nonmetro county with urban population of 20,000 or more, not adjacent to a metro area	14
Micro	6	Non Metro	Nonmetro county with urban population of 2,500-19,999, adjacent to a metro area	38
Micro	7	Non Metro	Nonmetro county with urban population of 2,500-19,999, not adjacent to a metro area	72
Rural	8	Non Metro	Nonmetro county completely rural or less than 2,500 urban population, adj. to metro area	25
Rural	9	Non Metro	Nonmetro county completely rural or less than 2,500 urban population, not adj. to metro area	56

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Cover photo by Stephen G. Weaver. Photo contributions for this report, unless otherwise noted, were made by the Colorado College State of the Rockies staff and the Colorado College Office of External Relations. Other photos came from a contract with Shutterstock.com.

State of the Rockies Contributors

Angela Banfill is a 2005-06 student researcher for the Colorado College State of the Rockies Project. She will graduate in May 2006 with a B.A. degree in environmental science. Her interest in environmental policy and environmental justice, combined with a passion for international travel, suggest future education and involvement in international environmental protection. Immediately after graduation she will begin her fourth season as a wildland firefighter in the Rockies region, promoting minimum-impact suppression tactics and the use of wildfire and prescribed fire to restore forest health.

Walter E. Hecox is professor of economics, director of the Slade Sustainable Development Workshop, and project director for the 2005-06 State of the Rockies Project at Colorado College. Walt received his B.A. degree from Colorado College in 1964 and an M.A. (1967) and Ph.D. (1970) from Syracuse University. He teaches courses in international economics, ecological economics, and sustainable development. He has conducted research and taken leave to work for the World Bank, U.S. Agency for International Development, U.S. Department of Energy, and Colorado Department of Natural Resources. He is author of "Charting the Colorado Plateau: An Economic and Demographic Exploration" (The Grand Canyon Trust, 1996), co-author of "Beyond the Boundaries: The Human and Natural Communities of the Greater Grand Canyon" (Grand Canyon Trust, 1997), and co-editor of the *2004 and 2005 Colorado College State of the Rockies Report Cards*.

Bryan Hurlbutt is 2005-2006 program coordinator of the Colorado College State of the Rockies Project. He co-edited and authored portions of the *2005 State of the Rockies Report Card* while working as 2004-2005 research manager of State of the Rockies. Bryan was born and raised in southern Idaho. He graduated as a trustee scholar from Colorado College with a B.A. degree in May 2004, majoring in physics. During his undergraduate years, he conducted research on supernova luminosity at Colorado College, solar flares at Montana State University, and underwater acoustics for Colorado College in the San Juan Islands, Washington. In his spare time, Bryan enjoys playing classical guitar, recreating in the outdoors, teaching and practicing yoga, and working on Sudoku puzzles. In fall 2006, Bryan will begin law school at Columbia University in New York City.

Chris Jackson is a 2005-06 student researcher for the Colorado College State of the Rockies Project. He will graduate in May 2006 with a major in international political economy. His senior thesis research focuses on the viability of tar sand oil extraction in Canada and the subsequent impacts on relations between the U.S. and Canada. Chris's interest in international relations stems from his extensive travel through central Europe while studying in the Czech Republic in 2004. Growing up in the mountains of Colorado, Chris gained a particular interest in exploring ways to maintain the unique character of the region.

Jared Kapela is a 2005-06 student researcher for the Colorado College State of the Rockies Project. Jared will graduate in May 2006 with a double major in economics and environmental science and has continued his Rockies research into his senior year, working to complete a thesis in economics. Since matriculating to Colorado College from his high school in Hunting Valley, Ohio, Jared has been an intern with the Environmental Protection Agency in Washington, D.C., and has worked on campus to promote various environmental initiatives with students and faculty. After graduation, he plans to pursue a master's degree in business administration and work in the private sector to promote market approaches for solving environmental problems.

Caitlin O'Brady is 2005-06 research manager for the Colorado College State of the Rockies Project research team after working as a student researcher for the Rockies Project during the 2004-05 school year. She graduated *cum laude* from Colorado College in May 2005 with distinction in environmental science. She has a keen interest in social and environmental issues of different regions which she has explored while studying sustainable development and social change in Central America and working for a bioregional nonprofit in the Pacific Northwest. In her time at CC, Caitlin participated in various projects with campus environmental groups, and was awarded several grants to complete and present her senior thesis research on the effects of an invasive, nitrogen-fixing tree on Hawaiian ecosystems. In her spare time, Caitlin enjoys making ice cream, practicing and teaching yoga, and exploring Colorado.

Matthew Reuer serves as the technical liaison for the Colorado College State of the Rockies Project, overseeing tasks including data assimilation, GIS analysis, and logistics management. He received his doctorate from MIT in 2002 and was a Harry Hess postdoctoral research fellow at Princeton University from 2002 to 2004, focusing on global carbon cycle research. Matt's scientific interests in this region include the environmental chemistry of western rivers and watersheds as well as global change impacts on alpine biogeochemical cycles. He is also highly interested in western development issues and the creation of innovative energy policies in the Rocky Mountain West.

Amanda Strauss is a 2005-06 student researcher for the Colorado College State of the Rockies Project. She will graduate from Colorado College in May 2006 with a major in biology. While studying ecology across Ecuador's diverse terrain, she developed a greater understanding and interest in global and regional environmental issues. As an intern for the State of the Rockies Project, she is pursuing her interest and gaining a greater understanding of the interface between biology and economics at the regional level.

Andrew Yarbrough is a 2005-06 student researcher for the Colorado College State of the Rockies Project. He is from Roxbury, Connecticut, and graduated from Taft High School, Watertown, Connecticut, in 2002. Andrew is a senior international political economy major at CC, and recently completed his senior thesis entitled "East Asian Economic Regionalism: A Proposal for Sustained Economic Growth and Stability." After spending his junior year at the London School of Economics and a summer studying at the Universidad de Salamanca in Spain, Andrew focused this year on his thesis research and helping to publish the *State of the Rockies Report Card*. He is passionate about environmental protection and land conservation in the Rocky Mountain region.

Gregory Zimmerman is a 2005-06 student researcher for the Colorado College State of the Rockies Project. He is currently a senior environmental science major at Colorado College interested in water management and water law, specifically how water management shapes development in the American West. Greg spent the summer researching the effects of climate change in the Rocky Mountain region. He is working on his senior thesis about the consequences of climate change on the hydrology of the Arkansas Headwaters Watershed. After graduation, Greg plans to take some time off from academics, after which he expects to return to school and continue his studies in environmental science or environmental law.

Guest Contributors

Tyrone Guthrie manages and develops conservation and geographic information systems (GIS) information for The Nature Conservancy's worldwide and the Rocky Mountain regional offices. He has been with The Nature Conservancy for three years. Tyrone has a Master of Science degree from the University of Victoria, British Columbia, where his research focused on the development of landscape ecology-based indicators to measure the environmental performance of local government. Before joining The Nature Conservancy, Tyrone worked with the Province of British Columbia, managing GIS data and applications for land use and conservation planning.

F. Patrick Holmes served as the program coordinator of the Colorado College State of the Rockies Project from 2003 to 2005. A graduate of Colorado College in May 2003 with a liberal arts and sciences major: environmental economics and policy, he was research assistant at the Sonoran Institute in Montana during the summer of 2003 and involved with the Colorado College Sustainable Development Workshop as an undergraduate. Patrick is co-author of the "Changing Economy of the West," Sonoran Institute, September 2003, "The Colorado Plateau Economy: Shifting Patterns and Regional Disparities," in The Colorado Plateau II, "Does Wilderness Impoverish Rural Regions?" *International Journal of Wilderness*, December 2004, as well as co-editor of the *2004 and 2005 Colorado College State of the Rockies Report Cards*.

Phillip M. Kannan is distinguished lecturer and legal-scholar-in-residence, Colorado College. His education includes a B.S. (1961) and M.A. (1963) in mathematics at the University of North Carolina, Chapel Hill, N. Carolina; and a JD degree (1974) from the University of Tennessee College of Law, Knoxville, Tennessee. He has practiced law for over 30 years as the general counsel for nonprofit and public corporations and has published many articles in the fields of administrative and environmental law. Since 1997 he has taught a variety of courses at Colorado College in the environmental science and Southwest studies programs and the master of arts in teaching program, focusing on environmental policy nationally, internationally, and in the Southwest.

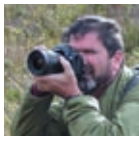
Tass Kelso has been a professor of biology at Colorado College since 1987, after receiving an undergraduate degree from Dartmouth College, and graduate degrees from the University of Colorado and the University of Alaska. She specializes in plant biology and conservation of mountain and plains ecosystems of Colorado and does additional research on issues relating to rare plants and connections between the floras of western North America, the Arctic, and Eurasia. She has been a longtime collaborator with organizations such as The Nature Conservancy, The Palmer Foundation Land Trust, the Colorado Natural Heritage Program, and the U.S. Forest Service on studies about biodiversity in the Pikes Peak region, southeastern Colorado, and the southern Rocky Mountains.

Chris Pague brings 27 years of experience in the study of natural history, conservation planning, and conservation biology to his position as senior conservation ecologist at The Nature Conservancy of Colorado. BS and MS degrees in biology and zoology and advanced training in ecosystem ecology and evolutionary biology, combined with 24 years of field experience, provided him with a strong background for conservation inventory and planning efforts. After working as the zoology team leader in the Virginia Natural Heritage Program, Chris arrived in Colorado in 1992 to revitalize the Colorado Natural Heritage Program, first at the University of Colorado and now a sponsored program at Colorado State University. Chris moved to The Nature Conservancy's Colorado Program in 1997. Chris is the lead for the Colorado Nature Conservancy's Measures of Success Initiative and he provides science guidance on global, regional, state, and local conservation efforts for the Colorado chapter and its partner organizations. Other foci include regional conservation, planning, and strategies for conservation of Colorado's eastern plain and on Colorado's public lands.

Anna Sher is a plant ecologist with a particular interest in conservation issues. She holds a joint position as an assistant professor in the department of biological sciences at the University of Denver and as the director of research, herbaria, and records at the Denver Botanic Gardens. Her area of research expertise is invasive species and ecological restoration of riparian zones. Past work has included a Fulbright Award to do desert research in Israel, and she has taught and done research in Kenya. Currently funded research includes development of IPM for tamarisk removal, use of commercial mycorrhiza for revegetation after weed control, and development of models for predicting invasion impact and restoration success. At DU, she teaches conservation biology and seminars in specialized topics, including ethics in science. She has published her research in such journals as *Ecological Applications* and *Conservation Biology* and to date has been cited over 70 times in the peer-reviewed literature. She currently enjoys supervising three graduate students and five undergraduates working in her lab and a staff of nine at the Denver Botanic Gardens.

Randy T. Simmons is professor and department head of political science and director of the Institute of Political Economy at Utah State University. He is also senior fellow at the Property and Environment Research Center (PERC). He received his Ph.D. in political economy from the University of Oregon. He was a policy analyst in the Office of Policy Analysis at the U.S. Department of the Interior and is mayor of Providence, Utah. He specializes in applying the assumptions and methods of economics to policy questions, especially to environmental and natural resource policy. Simmons is co-author of "Beyond Politics: Markets, Welfare, and the Failure of Bureaucracy" (2nd edition to be published in 2006), author of "Critical Thinking about Endangered Species" (2003), and co-editor of "Wilderness and Political Ecology" (2002). He contributed chapters to the 2005 edition of the *Oxford Companion to the Supreme Court* on "City of Monterey v. Del Monte Dunes at Monterey" and the Fifth Amendment. His articles and op-eds have appeared in *American Political Science Review*, *BYU Law Review*, *Contemporary Policy Issues*, *Journal of Contemporary Studies*, *Policy Review*, *Public Choice*, *The Baltimore Sun*, *Desert Morning News*, *Los Angeles Daily News, Salt Lake Tribune*, and *Washington Post*.

Christina Supples is the conservation science research coordinator for The Nature Conservancy's Colorado field office in Boulder, Colorado. Focusing on landscape-scale ecological issues, Christina uses her knowledge of western ecosystems and their socio-economic context to guide and build technical and scientific leadership, supporting The Nature Conservancy's science-based conservation efforts. Christina comes to The Nature Conservancy as a recent graduate from the Duke University's Nicholas School of the Environment where her master's research focused on the applications of landscape ecology to the conservation of western fire-adapted ecosystems. She brings her combined experience as a researcher and ecologist at the Colorado Natural Heritage Program, Montana State's Big Sky Institute of Science and Natural History, and the Duke University Center for Tropical Studies and Landscape Ecology Laboratory to her current position.



Stephen G. Weaver is an award-winning photographer with over 30 years experience making images of the natural world and serves as technical director for the Colorado College geology department. Educated as a geologist, Steve combines his scientific knowledge with his photographic abilities to produce stunning images that illustrate the structure and composition of the earth and its natural systems. As an undergraduate geology student, he first visited the Rocky Mountains, where he fell in love with the mountain environment and the grand landscapes of the West. Steve currently photographs throughout North America with a major emphasis on mountain and desert environments. His use of a 4x5 large format view camera allows him to capture images with amazing clarity and depth.