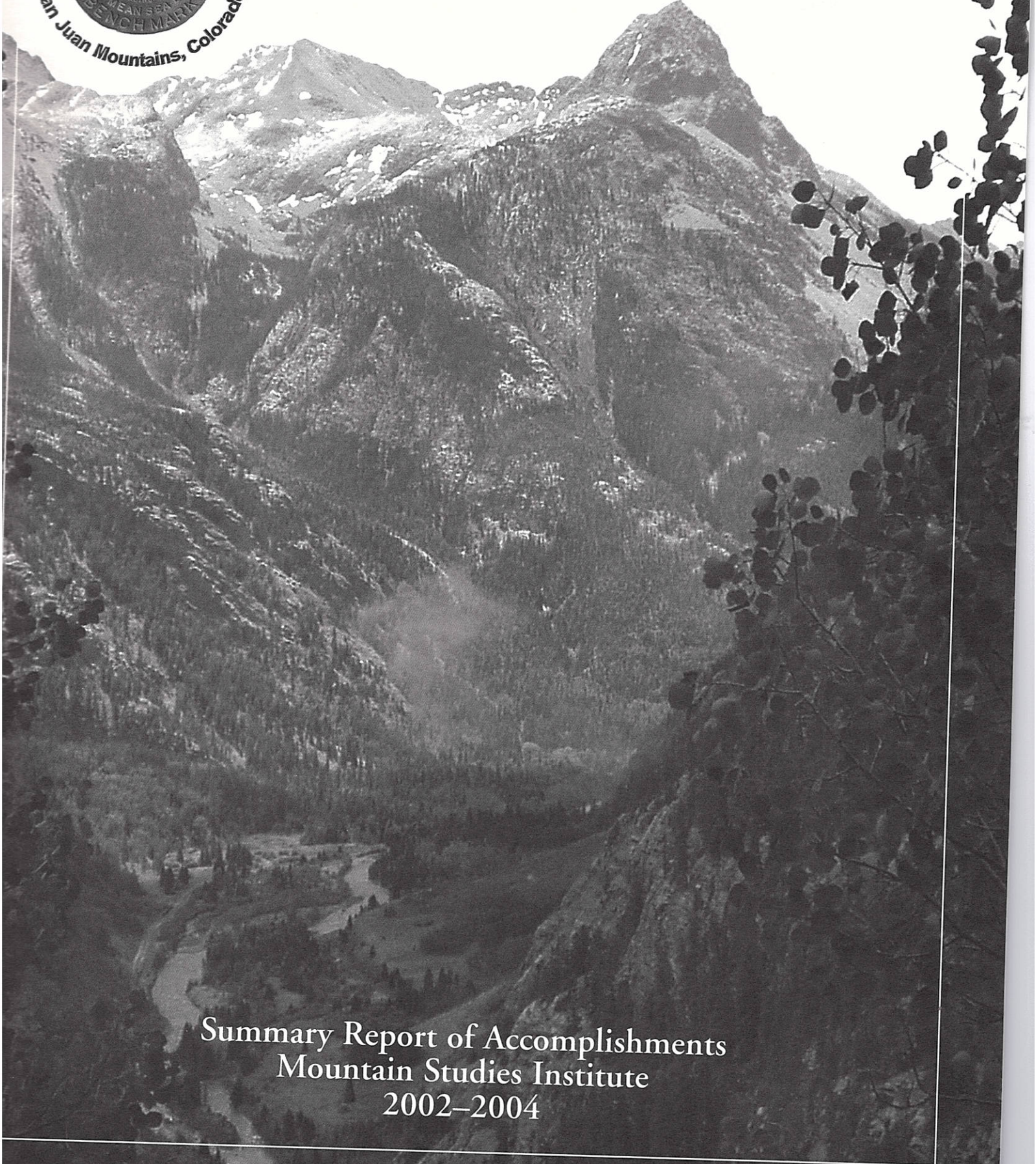




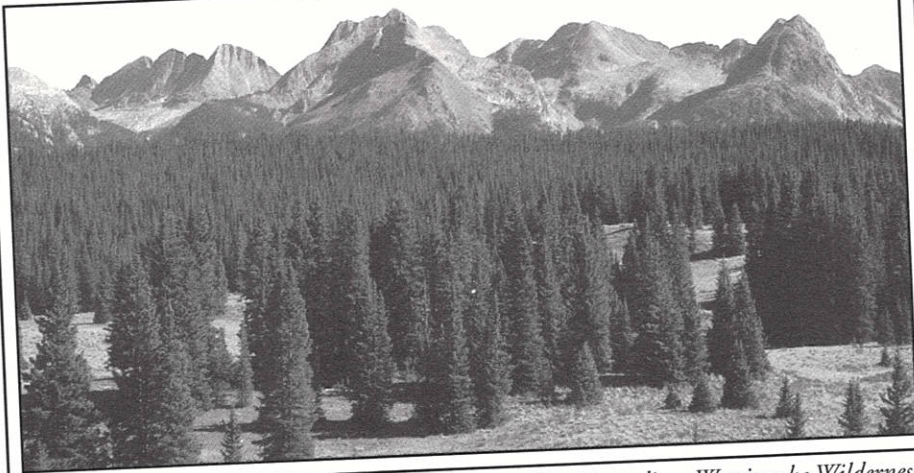
THE BENCHMARK



Summary Report of Accomplishments
Mountain Studies Institute
2002-2004

MISSION

The Mountain Studies Institute, an independent, non-advocacy, not-for-profit 501(c)3 mountain research and education institution and high altitude field station, adopted as its mission: to enhance understanding and sustainable use of the San Juan Mountains through research and education.



Courtesy Photo

The Grenadiers, Weminuche Wilderness

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Mt. Garfield from the Colorado Trail.
(Photo by Bill Ball)

Many thanks to the MSI supporters, board members, advisors and staff who contributed their time and insight to this publication. In particular, thanks goes to Professor Lee Dexter who supplied photos, as well as his invaluable and insightful report "Promoting Mountain Geography in the San Juan Mountains, Colorado." Special thanks also goes to Tyler Erickson and Professor Mark Hildebrandt who went out of their way to provide a number of the photographs used in this publication.

FROM THE PRESIDENT

Welcome to Mountain Studies Institute's first issue of *The Benchmark*, a periodic report to the interested public, our members, our collaborators, and our sponsors about MSI's ongoing research and education activities.

It has been my privilege to lead our nine-member board of directors for the past year. As an academic having taught geology for 30 years, and having retired to Durango from New England about 10 years ago, becoming involved in the embryonic Mountain Studies Institute seemed like an absolutely extraordinary opportunity, especially since MSI intended to focus on supporting and conducting research and education in the San Juan Mountains, undoubtedly one of the most geologically diverse mountain ranges in the world. From the beginning our board has struggled with fundamental decisions facing all new organizations: What is our purpose? How do we most effectively carry out our objectives? What are our short- and long-term priorities? In spite of substantial turnover of members over the past two years, we believe the board has defined a productive path with well thought out goals.

In August 2003, several members of the board visited the Rocky Mountain Biological Laboratory (RMBL) in Gothic, Colorado, on the occasion of its 75th anniversary symposium. Ellen Stein, our visionary Executive Director, had suggested that MSI might want to model itself as a field station for research and education, of which RMBL is an outstanding example. That visit crystallized the board's view that, indeed, this would be "the way to go." We have concentrated on creating an MSI version of that model ever since.

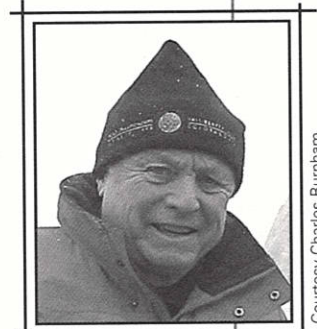
It soon became abundantly clear that to achieve our goals, MSI needed a facility to provide a physical focus for the organization's activities, preferably in Silverton; and it would need a new strategic plan, significantly more pertinent to our current vision than was the initial plan formulated in 2002. In July 2004, we moved into the Avon Hotel in Silverton, which we have leased, and in a period of just a few weeks we have seen that this facility will serve well as a headquarters for our intellectual endeavors. This past June the board and

staff met with scientists on our advisory board and several of their colleagues for two days in Silverton, to discuss at length the relative merits of several approaches to both hosted and sponsored research, and to identify the types of educational efforts most likely to succeed. Those discussions proved to be key sources of critical input to our new strategic plan, which the board adopted in late August 2004.

I want to thank Ellen Stein for her tireless devotion to MSI, and for her commitment to its success. Without her, MSI would still be an organization with recognized potential but no progress toward transforming potential into accomplishment. In addition, thanks are due to Bill Ball, who has worked effectively to create a web site containing an ever growing database of San Juan Mountains scientific information; to Tracy Boeyink, our first business manager who recently left MSI, who created the tools we so desperately needed to carry us into a responsible not-for-profit business mode; and to Ryland Gardner, our first education director, who worked for a year to ensure that newly created educational programs represent quality offerings with unquestioned credibility.

I want also to thank board members, both present and past, for their significant gift of valuable time, and for their visions for the organization. Our advisory board members have proved a valuable resource, and we look forward to their continued involvement. Finally, without the generous efforts of Senator Ben Nighthorse Campbell to provide Federal support, MSI could not possibly be positioned, as it now is, to contribute to the intellectual vitality of the San Juan Mountains region of Southwest Colorado.

- Charles Burnham



Charles Burnham

Courtesy Charles Burnham

FROM THE EXECUTIVE DIRECTOR

Welcome to *The Benchmark*, a summary report of MSI activities of the past two years. This is the first in an ongoing series of communiqués through which MSI will keep its friends and supporters up to date on MSI accomplishments. According to Webster's Dictionary a "benchmark is a mark on a permanent object indicating elevation and serving as a reference in topographical surveys and tidal observations; a point of reference from which measurements may be made; and something that serves as a standard by which others may be measured." Like the permanent topographical benchmarks found in the field, MSI's *Benchmark* tells the story of where MSI is, where we have come from and where we are going.

It also symbolizes MSI's commitment to rigor, scholarship, respect and responsibility, and the desire of MSI's leadership for the institution to become a regionally-respected entity producing work – whether long-term monitoring activities, research supported, education programs delivered, or information produced and made available to the region – that serves "as a standard by which others may be measured."

MSI encourages the interdisciplinary study of the physical, cultural, human and historical aspects of the San Juan Mountain environment. Situated in Silverton, in the heart of the San Juans Mountains, MSI could be in no better place to pursue its mission of "enhancing understanding and sustainable use" of the San Juan Mountains. In fact mountain ecosystems have gained international attention in recent years. The 1992 Rio Summit and the 2002 International Year of Mountains (IYM) in particular have increased awareness of the need to protect mountain ecosystems and improve the well-being of those living in these areas.

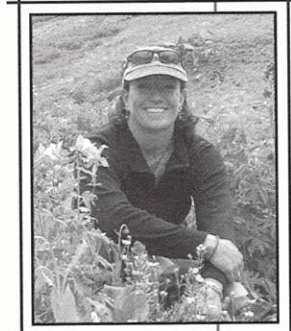
Mountains are an important source of water, energy, cultural and biological diversity. Occupying approximately one-fifth of the world's land surface area and occurring in 75 percent of the world's countries, they supply resources, goods and services to more than half the world's population. In the Western U.S., 50-80 percent of the water supply originates in seasonal mountain snows. Worldwide, mountains provide

up to 60 percent of downstream fresh water in humid regions and up to 95 percent in arid environments. While mountains are critical to the health and well-being of mountain people and ecosystems globally, the information needed to better understand and quantify increasing impacts on these special places is severely lacking. The San Juans are no exception. MSI is perfectly positioned to respond to the need to fill data, research and information gaps in the region.

As such, MSI places great value on sharing information about all aspects of the San Juan mountain environment and its communities, and will continue to seek collaborations with other researchers and organizations in the investigation, collection, analysis and distribution of scientific information in numerous appropriate formats. In addition to facilitating scientific research, MSI will provide opportunities to learn about the mountains they live and work in to professional scientists, graduate and undergraduate students, resource management personnel and policymakers, and the general public, based on knowledge gained from research efforts at MSI and elsewhere in the region.

I am proud and honored to serve as the Institute's first executive director. It is truly in the spirit of a community barn raising in which MSI is being launched. It would not be possible to undertake this endeavor without the numerous individuals and institutions that have contributed their intellectual and financial capital (especially Senator and Mrs. Campbell!), and just plain hard work and elbow grease to our development. It is a privilege to serve along side you.

- Ellen R. Stein



Ellen Stein

Mark Winkworth

A HISTORY OF RESEARCH IN A UNIQUE

The San Juans have several unique attributes when compared with mountain ranges world-wide. The region is known for its geological, ecological, hydrological and climatological diversity. Covering 6.4 million acres, the mountain province has more land above 3,000 meters than any other in the lower 48 states. The mountain range includes seven wilderness areas totaling approximately 800,000 acres and covering about 12 percent of the range, and includes three National Forests, and Bureau of Land Management lands. In addition, more than 2,000 bodies of fresh water and 43 rivers, including the headwaters of the Rio Grande River, and multiple tributaries thought to exceed 2,000 miles of stream frontage are sprinkled throughout the range. Finally, the San Juans provide the most active avalanche control and snow physics study areas in the United States.

The San Juans exhibit a wide diversity of ecological characteristics due to their mid-latitude location, wide range of elevations, and widely varying geologic conditions. The mountain range includes habitats and sensitive species found nowhere else in the world, such as certain arctic mosses, relics of the last ice age, and rare alpine fens. These ecological characteristics combined with a millennial history of human involvement (Anasazi populations, early explorations, extensive mining activities) means that they offer a wealth of scientific questions related to their physical, biological and human environments. It also means there are a host of challenges to land managers and communities, related to resource use, recreation, remediation of past resource extraction, and other ongoing activities in close proximity to hazardous physical environments.

For over a century scientists and adventurers have explored these distinctive mountains, and MSI intends to support and carry that unique tradition into the 21st century. As early as 1870, William Henry Jackson, the official photographer for the U.S. Geological and Geographical Survey, Hayden Expedition 1870-1878, photographed and documented the geology and topography of the Rockies, including the mining communities in the San Juans. In the 1920s San Juan Mountaineers, a club of about a dozen young climbing enthusiasts, including David Lavender and Tom "Melvin" Griffiths, explored the mountains, and in 1933 completed a topo-

graphic mapping survey of the Mt. Sneffels group. Two seminal US Geological Survey publications provide the detailed basic framework for all subsequent geological research in the San Juans: Professional Paper 166 by W. W. Atwood and K. F. Mather (1932) on the Quaternary and glacial geology, and Professional Paper #258 by E. S. Larsen, Jr. and W. Cross (1956) on the bedrock geology.

Studying Snow

In 1971, Dr. Jack Ives – one of the foremost mountain geographers and then director of the Institute of Arctic and Alpine Research (INSTAAR) – arrived in the San Juans to lead the San Juan Avalanche Project. That project was a response to a Bureau of Reclamation plan to seed clouds over the San Juans and demonstrate that cloud seeding would bolster spring run off. INSTAAR was engaged to investigate whether that plan, called Project Skywater, would alter the already highly active avalanche paths in the area.

Ives brought on board Ed LaChapelle, a well-known snow and avalanche expert, as well as avalanche forecaster Don Bachman. Project scientists mapped 214 slide paths from the summit of Coal Bank Pass to Ouray on Hwy. 550, and along Hwy.110, which accessed the then-open Sunnyside Mine. They also developed a number of avalanche forecasting models. By 1979 the avalanche project had filed its last report.

Though INSTAAR had finished its work, the book of research in the San Juans was not closed. Chris George, owner of the St. Paul Lodge on Red Mountain Pass, and Bachman formed the Colorado Institute for Snow Science and Avalanche Research in 1988. Though CISSAR never took off, it laid a foundation for future work.

Bachman was hired as the lead forecaster for the Colorado Avalanche Information Center (CAIC) when it opened a Silverton office in 1992. Though no longer with the CAIC, Bachman is still involved with snow and avalanche research in the area. He, along with Chris George, Lee Dexter, Arthur Ferguson and Jeff Dozier, are board members for the Silverton-based Center for Snow and Avalanche Studies, organized in 2003.

Understanding Geology, Biology and Water Quality

Geological study of the San Juans came alive in the late 1980s when the U.S. Geological Survey began mapping

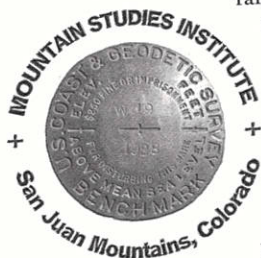
lava flows and documenting water geochemistry. In 1997 the USGS launched the Abandoned Mine Lands Initiative (AML), an investigation into the physical, biological and chemical processes of abandoned mine lands and into what is needed for cost-effective cleanup. Under the leadership of USGS scientist Stan Church, researchers in Silverton began asking what part of the heavy metals loading in the Animas River and its tributaries could be attributed to natural processes and what part could be attributed to historic mining.

Though the AML has ended, research into historic mined areas continues. Recently, post-doctoral student Ra Johnson, under the guidance of USGS scientist Doug Yager, has been working in Prospect Gulch, an area notable for his historic mining activities. During his two year project, Johnson hopes to distinguish between naturally occurring acid leach and acid leached from rock disturbed by mining and exposed to the elements. He will pass his conclusions on to government planners at all levels, as well as private land managers for use in their decision-making.

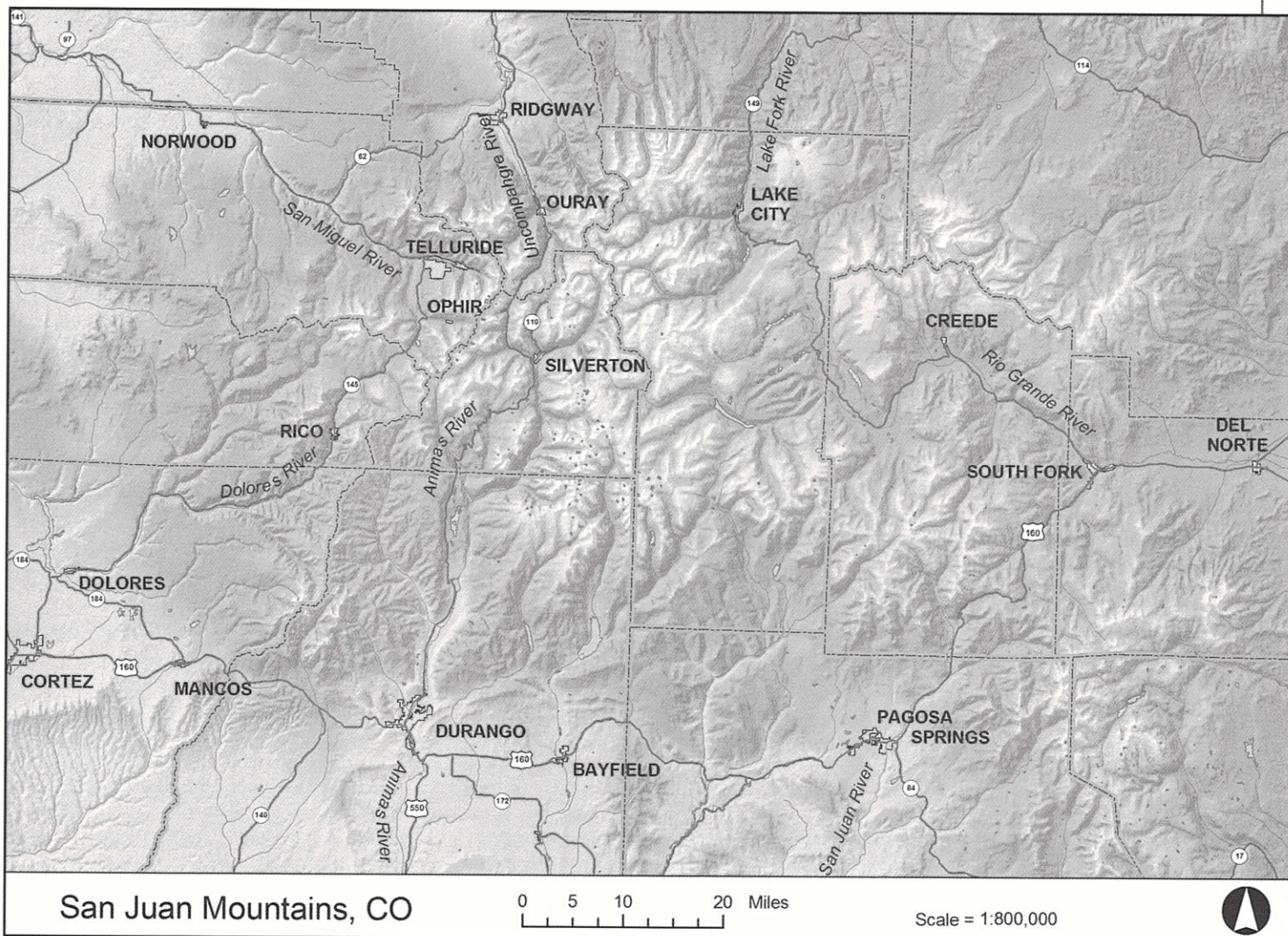
Also at the forefront of research in this area is the Animas River Stakeholder Group (ARSG), a collaboration of local, state, and federal agencies, land owner citizen advocacy groups and mining companies. For over ten years ARSG and participants, coordinated by Bill Sim, have sponsored research into water quality, aquatic habitat and the aquatic biology of the Animas Watershed. Results have been used, for example, to develop logical thresholds for aquatic species to determine biological potentials of streams polluted by trace metals. With these data in hand ARSG participants have remediated dozens of mine sites in the area.

Mapping Sensitive Alpine Areas

MSI is supporting and facilitating a variety of regional research projects. Among those is an investigation into the sensitivity of key alpine areas. Under the guidance of Mark Williams, associate professor of geography at the University of Colorado at Boulder and an INS fellow, this project will document and map sensitive alpine areas in San Juan County. The project is funded by a \$45,000 grant from the Environmental Protection Agency that MSI helped develop and is administering on behalf of Mark Williams and other project partners. San Juan County contributed a \$2,000 to the project. Two parameters in



MOUNTAIN RANGE



lar - levels of acid and nitrate - are effective gauges of how sensitive an area is to change, either natural (e.g. avalanches) or anthropogenic (e.g. road or septic system construction). Measurements of these two parameters will be mapped and used by San Juan County officials to make informed land-use planning decisions about future development, recreation and other land use proposals in the area.

MSI Lends a Hand to Fen Research

Some fens in the San Juans could be 10,000 to 13,000 years old. They support diverse plant life found nowhere else in the mountain range. For many of those plants the San Juans are the southern extent of their range; the next closest range of the species is thousands of miles away, in the northern reaches of Canada and Siberia, says Dr. David Cooper, faculty member of the department of forest,

rangeland and watershed stewardship at Colorado State University in Fort Collins, and principal investigator of a study of fens in San Miguel County.

Cooper's study - begun in 2000 in Prospect Basin and supported by a \$100,000 grant from the Telluride Ski & Golf Co., (Telski, then owners of the Telluride Ski Area) - looked at five major fens in the basin. When Telski funding ended in 2003, the San Juans Fen Partnership searched for ways to continue its work. When MSI offered its services to conduct research on potential grant opportunities, develop proposals and administer secured funds, a new partnership was born.

Under MSI and Cooper's leadership, the fen partnership recently received an Environmental Protection Agency grant for \$65,000 that has been matched by \$5,000 from each of San Miguel County, the Town of Telluride and the

Town of Mountain Village; \$6,000 from Colorado State University for donation of a gas chromatograph to the project; and \$5,400 from the ski company for housing for summer interns.

With the grant and donations Cooper will expand his research to other parts of San Miguel County and west Ouray County. That research will include: 1) hydrologic, geochemical and ecological monitoring of five reference fens in Prospect Basin and development of a fen assessment protocol; 2) identification, mapping, and assessment of fens in San Miguel and western Ouray Counties; and 3) working with all levels of government (town, county, federal) and private land managers to develop and implement fen watershed planning, protection and restoration programs. MSI's director of data and GIS services, Bill Ball, will assist the project providing GIS resources and assembling maps.

A COMMITMENT TO FIELD EDUCATION

A Program for All Levels of Learning

Mountain Studies Institute is dedicated to furthering learning about mountain issues. Whether a class, field project or conference designed for professional scientists,

graduate students, local government planners or the lay person, MSI plans to serve many members of the San Juan community. To that end,

Professor Mark Hildebrandt and class, winter 2002



Mark Hildebrandt

MSI already has fostered relationships with several universities; hosted dozens of graduate students and researchers; and convened all levels of science and education professionals in "A Mountain Summit," MSI's inaugural conference, held September 2002. A celebration of the 2002 International Year of Mountains and kick-off event for MSI, that conference pulled together 100 presenters and participants. In 2004 MSI followed with State of the San Juans Conference, "San Juan Mountains Science and Research: Linking Communities, Researchers, and Practitioners," a gathering of scientists, researchers, policy makers and interested lay

MSI. "They have an excellent vision and attitude about education, and I wish them every success."

Winter Field Camps and the Legend of Mel Marcus

Dr. Mel Marcus, a geography professor at Arizona State University (ASU) from 1974 until his death in 1997, was a giant among mountain geographers. At the time of his death, he was recognized as one of the most accomplished and respected mountain geographers in the world. A mountaineer with notable accomplishments, he also was an enthusiastic teacher who valued field studies, especially for his graduate students studying snow and ice in the Arizona desert.

With the help of his former Ph.D. student Anthony Brazel, also a professor at ASU, Marcus held the first field courses in the mid-70s in the San Francisco Peaks around Flagstaff, Ariz. In 1979 Marcus moved his students north to the St. Paul Lodge on Red Mountain Pass. In 1982 Marcus moved the group to Silverton, and soon thereafter Fritz Klinke, owner of the Pickle Barrel, became the unofficial logistics coordinator, arranging for lodging and providing affordable meals.

Over time other universities joined the field camps. Many students were led by faculty who were former students of Marcus and had become professors in their own right: Don Friend of Minnesota State University, Mark Hildebrandt of Southern Illinois University (SIU) and Fred Chambers of University of Colorado at Denver.

The educational experience was "by far the best learning and teaching experience with which I have ever been involved," said Lee Dexter, geography professor at Northern Arizona University (NAU). (See profile page 7.)

Tragically Marcus suffered a heart attack on Molas Pass in 1997. Though the universities did not return to

Silverton in 1998, the professors called on each other to pick up the banner. In 1999 Brazel, Dexter, Friend, Chambers and Kelly Elder from Colorado State University reconvened the field camps.

Five Universities & MSI Carry On

For the past two winters MSI has become part of the tradition of Silverton

Field Camps. Last winter MSI, with the Center for Snow and Avalanche Studies (CSAS), hosted 30 graduate students and their professors; Friend, Hildebrandt and Dexter, as well as Mark Fonstad, professor of geography at Southwest Texas State University and also a graduate student of Marcus, taught the 2003 and 2004 winter field camps.

In order to meet the needs of students from a variety of backgrounds, MSI and CSAS developed two study tracks – one: intensive course in the study of snow and ice processes, taught by CSAS's Executive Director Chris Landry, and the other study of winter ecology, taught by MSI former Director of Education Ryla Gardner.

This winter three professors Hildebrandt, Brazel and Dexter, will bring students to the San Juans. In addition Mark Williams, professor of geography, University of Colorado at Boulder, will bring eight graduate students.

Prescott College Winter Course Find Home at MSI

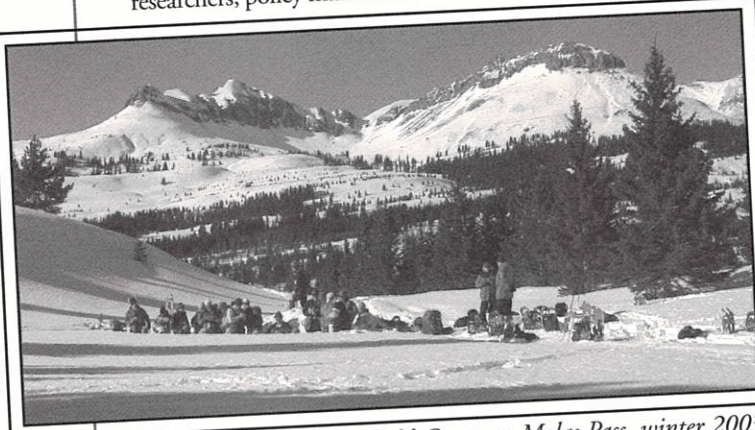
Arizona's Prescott College, a leader in experiential education, found a home for its winter Mountain Leadership course at MSI. After a five-year hiatus, David Lovejoy, a Prescott College Outdoor Education faculty member, returned to the San Juans in February 2004 and taught eight students Wilderness Leadership. The three-class was possible, said Lovejoy, because MSI's Gardner helped with on-the-ground logistics, including finding lodging, designing the field curriculum and arranging guest instructors.

"We had an excellent experience," said Lovejoy.

In addition to receiving logistical support, Prescott drew on the teaching experience of MSI, as well as that of other Silverton resources like Colorado Avalanche Information Center forecasters, the Snow Ranger, CSAS's Landry, and the current director for snow safety at Silverton Mountain. In the first week students completed an intensive study of snow and avalanche patterns. In the second week students studied winter ecology and backcountry skills with Lovejoy and Gardner at Paul Lodge.

The class is part of a long-standing tradition of Prescott students and professors at the San Juans as an outdoor classroom. In the 70s Prescott's Outdoor Action Center has held a winter wilderness leadership course at Silverton. For 20 years Prescott, with

Continued on



Tyler Erickson

Winter Field Camp on Molas Pass, winter 2003

folks who came together to present their work and discuss current issues in the San Juans.

"MSI provides exemplary educational services with some of the smartest people in the field," says Joseph Kerski, geographer and education specialist with the U.S. Geological Survey and Geographic Information Systems (GIS) instructor for

PROFESSOR LEE DEXTER IN THE FOOTSTEPS OF MEL MARCUS

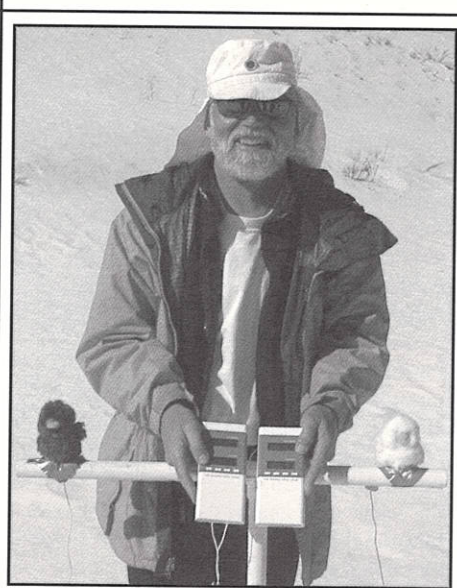
Lee Dexter first stumbled upon Professor Mel Marcus and his graduate students in Silverton in the early 80s when as a graduate student at the University of Colorado at Boulder, Dexter was returning to his home in Flagstaff. Dexter spotted a van with meteorological equipment lashed to the top of the roof. Intrigued, he stopped to find out more. The serendipitous meeting led to a lasting friendship.

Later when Dexter had earned his doctorate and was a newly hired associate professor of geography at Northern Arizona University, "the first thing I did was contact Mel," says Dexter.

Dexter started bringing his own group of undergraduates to Silverton, matching each of them with one of Marcus's graduate students. It was a textbook fit.

"They did a round-robin," said Dexter of the way his undergrads moved from one graduate student and to the other, helping each with his or her particular project. The graduate students appreciated the help, as well as the mentoring opportunity, and the undergrads learned skills from peers they would not have picked up in a classroom.

When Marcus passed away in the field in 1997, Dexter was determined to keep the Silverton fires burning. Though there was no field camp the year after Marcus's death, Dexter joined forces with Don Friend, a Marcus student, now a professor at Minnesota State University, Fred Chambers, a professor at University of Colorado at Denver, Tony Brazel, a professor at Arizona State University and former student of Marcus, and Kelly Elder, a professor at Colorado State University and in 1999 they revived the winter field camps.



Tyler Erickson

*MSI advisor, CSAS board member professor
Lee Dexter, winter 2003*

The camps were popular, and soon they were overflowing with enthusiastic students. When the numbers reached 50 and more, the professors split the camps into two groups, one in February and one in March. At the week-long camps the students engaged in general snow and ice research, focusing on avalanches, snow pits and snow melt among other things.

In alternate years Dexter held a course in mountain winter field studies, a class intended to appeal to all majors.

"A mix of a social experience and academia is the best learning experience," he says of the camps. "These were the best teaching and learning experiences I have been involved with."

The winter field camps, as well as being a professor, are a seamless extension of Dexter's love of the outdoors and fondness for the San Juans.

"I came to be a professor because I hike and I'm a climber and a skier," said Dexter.

As the owner of an outdoor store in Flagstaff many years ago, Dexter traveled to Silverton to climb and to take advantage of avalanche trainings offered every winter. For him the San Juans, a unique mountain range that also has settled communities in the mountains, offer an exceptional opportunity to explore the human, as well as the physical, dimensions of mountain geography.

"If I had my choice of mountain ranges I would go to the San Juans," he said.



Lee Dexter

Lenticular cloud over Molas Pass

THE WORK OF LEE DEXTER

A climbing and ski bum turned academician, Dexter still holds tightly to his roots in the outdoors. As a professor at Northern Arizona University, Dexter's work as a researcher leads him to some of the great mountain ranges around the world. Among other topics, he studies the energy balance of rock glaciers, a glacier with an ice core and rock boulders surrounding that core. Dexter is asking why these remnants have survived when snow and ice glaciers around the world are receding. He has catalogued 600 rock glaciers in the San Juans, one in Senator Beck Basin, a study site developed by the Center for Snow and Avalanche Studies (CSAS) with financial assistance from the Mountain Studies Institute (MSI).

He is undertaking evapo-sublimation studies and measuring the energy flow and

water exchange in the seasonal snow pack. He is also investigating the differences caused by canopy cover as compared to clear sky exposure on rates of evapo-sublimation loss.

While he enjoys his snow and ice research, he is passionate about his teaching, and in particular getting geography students into the field which he did this summer teaching physical geography in MSI's Mountain Geography for Educators, a professional development course for K-12 teachers.

"I love the technical and I love the internet and Geographic Information Systems, but it is being overdone," says Dexter. "You can only learn so much in front of a computer screen."

So Dexter is pursuing what he says is a backlash of sorts; he is taking his students out into the landscape and asking them to get their hands dirty. For him a perfect day of learning is the first third of the day in a lecture and the balance of the day in the field.

Dexter earned an undergraduate degree in geology and a masters in earth science from Northern Arizona University. He received his Ph.D. in geography from the University of Colorado at Boulder.

EDUCATION CONTINUED

From page 6

of avalanche forecaster Jerry Roberts and other local experts, has held a month-long avalanche forecasting class based in Silverton.

"I can imagine all kinds of ... possibilities and ways in which MSI and Prescott College could develop collaborations," said Lovejoy.

One-of-a-Kind Mountain Geography Course for Educators

United States secondary school students rank poorly for their knowledge of geography. In fact, the U.S. trails behind the United Kingdom, Germany, Japan and Canada.

Colorado has not escaped that trend. While there are numerous professional development courses available to secondary school educators, "I have not seen a single one that emphasizes mountain geography," says USGS education specialist Kerski.

This summer MSI took great strides toward closing that gap by offering Mountain Geography for Educators. Seven secondary school teachers from all corners of Colorado took advantage of the class, which looked at the physical, ecological and cultural aspects of mountain geography and emphasized field-based studies.

"I chose this course for its content. With experiential education I am always looking for fresh ideas, and this was another opportunity to network," said Jonathan Houck, a teacher at Gunnison Valley School, an alternative high school.

Native plants and satellite land images will likely find their way into the classroom of Leigh Gozigian, a government and geography high school teacher from Pagosa Springs.

The geography course was taught by experts, including Northern Arizona University geography professor Lee Dexter, Ph.D.; Cathy Kindquist, Ph.D.; Amy Chambers, M.S.; and Joseph Kerski, Ph.D.

The Colorado Geographic Education Fund (COGEF), which is supported by the National Geographic Society, awarded MSI a \$10,000 grant to support the course. COGEF encourages and improves geography education in Colorado. Funding-dependent, MSI plans to offer this course each summer.

From Star Gazing to Preserving Old Buildings

In the skies above Silverton the stars in the night sky are vivid and brilliant. Just ask five secondary school educators who raved about MSI's Astronomy for Wilderness

Educators and Enthusiasts, taught by Mike Zawaski this summer. The class was a great example of expeditionary learning techniques, said Kay Erickson, a teacher at Silverton Public School, an Expeditionary-Learning Outward Bound school. An introduction to the science of astronomy and the practice of sky watching, the course used unique hands-on techniques including kinesthetic activities to model astronomical motions.

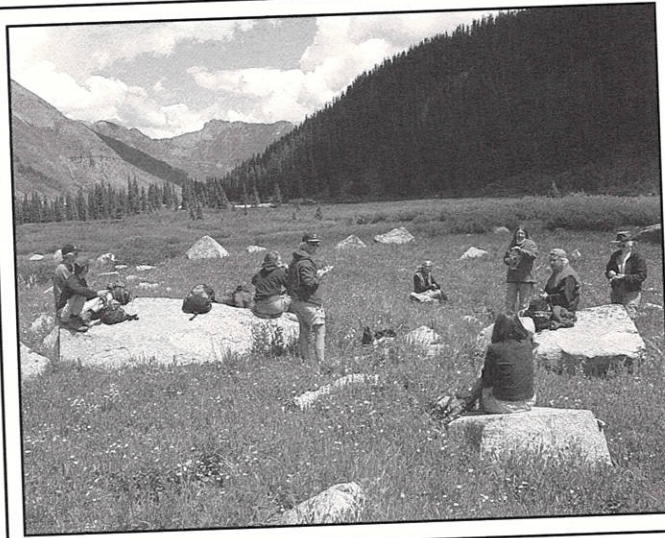
During summer 2003, MSI board member and Fort Lewis College professor emeritus Rob Blair taught Geology and Mining in the San Juan Mountains, a jointly sponsored class between MSI and the Colorado Mountain Club.

The study of historic preservation has also been on the top of MSI's list. MSI hosted a San Juan County Historical Society workshop, Sept. 11-18, that covered all aspects of Historic American Engineering Record (HAER) documentation and historic structure assessment. Led by experts such as Eric DeLony, a leading engineering and industrial heritage consultant; Richard O'Connor, acting chief of the National Park Service HAER Department; and David Singer, owner of Silverton Restoration Consulting, the course was held at the historic Shenandoah-Dives Mill north of Silverton. Over 20 participants lodged at the Avon Hotel.

Working with Colleges & Universities

Through a partnership with Fort Lewis College and Colorado School of Mines, MSI offers college credit for certain courses. Undergraduate and graduate college credit has been available for the Science of Astronomy and the Practice of Skywatching, and Mountain Geography for Educators.

In a unique collaboration MSI is also working with Fort Lewis College faculty in the development of a Mountain Studies Minor, a course of study that will expose students to the physical and human dimensions of mountains. As a complement to the college's strong Southwest Studies program, the minor, a collaborative effort among many departments including anthropology, biolo-



Mountain Geography for Educators field class, summer 2004

gy, geology, history and philosophy, will capitalize on FLC's proximity to the San Juan. MSI staff, who will help teach the course will emphasize field experience.

Base Camp MSI

This fall Bates College student Gabriel Voeller will study water quality under biologist Chester Anderson and will use the Avon Hotel and San Juan Mountains Center as her home base. Additionally during winter 2004 MSI's former education director advised Prescott College masters candidate Chris Maschino with his student practicum: an exploration of cultural history of the San Juan Mountain region.

Students from Goshen College, Indiana and Gettysburg College, Pennsylvania also used the services of MSI this spring. In May 2004 MSI facilitated a field course in historic preservation for Goshen students and professor Jan Shet. MSI supported geography professor Ray Wilson and his Gettysburg student enrolled in "The Rocky Mountain West: cultural and physical geography."

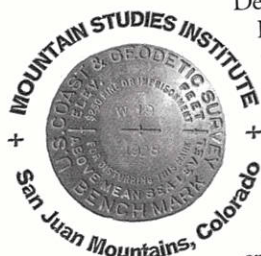
Student Interns

Take Advantage of MSI

MSI already has been home to student interns. Michael Wyngaard, who earned a master's in anthropology from Northern Arizona University, was an intern at MSI, summer of 2002. "My internship proved to be an important part in my professional career," he said.

Katie Brooks, a college senior geography major from Southern Illinois University, was familiar with the San Juan Mountains before she arrived in Silverton, 2004. A student of Professor I. Hildebrandt, Brooks participated in the winter's Silverton Field Camp.

Brooks served as MSI's education intern at the San Juan Mountains C



MARK WILLIAMS FROM THE SIERRAS TO THE SAN JUANS

Though Mark Williams claims there was “no great game plan in becoming a professor,” his job as associate professor of geography at the University of Colorado at Boulder seems in line with some implicit design.

Since earning an undergraduate degree in biological sciences from the University of California at Santa Barbara, Williams has been “combining economics with recreation,” which has led him to “just about every job and business one can have in the mountains.”

The journey to professor and researcher in Boulder began in the Sierra Nevada Mountains, where for more than a decade Williams lived “out of sight of a road” for at least 300 days out of the year. Among other jobs, Williams was a wilderness ranger for the U.S. Forest Service, a wilderness manager for the John Muir and Minaret Wildernesses and an interpretive naturalist with the National Park Service in Glacier Bay, Alaska.

He also owned a backcountry ski business, Rock Creek Winter Lodge, in the eastern Sierra, that went from being a place where the owners (including Williams, by his own account) “did not know how to ski” to being featured in national magazines. In the summer Williams had a trail-building business and for four years built trails for the Forest Service as a private contractor.

After more than a decade of mountain life, Williams ventured back to academia for a single semester when he was asked to work part-time on a research program in Sequoia National Park. That part-time position was expanded to full time, and then he was asked to continue as a graduate student.

“Four years later I woke up at a faculty meeting, and it has been downhill ever since,” says Williams with a wry grin.

Being a professor and fellow at the Institute for Arctic and Alpine Research has not, however, kept him away from mountains. In addition to research projects in snow hydrology and biogeochemistry in the Rocky Mountains, Williams’ work most

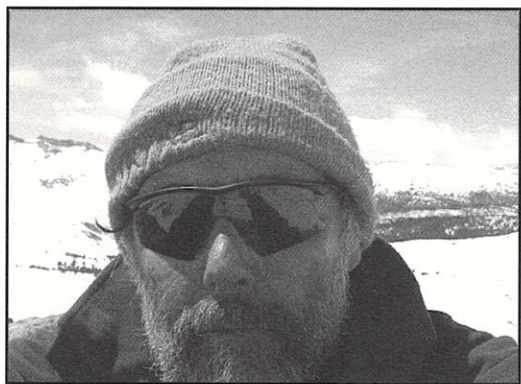
recently has led him to the Himalaya of Tibet and China, where he gave talks and was asked by several Chinese research institutes to study the hydrology and biogeochemistry of mountain catchments.

In assignments like these his passion and profession merge, the former enhanced by the latter.

“I have a pretty intuitive knowledge of the snowpack,” he says. “When you are guiding and putting people’s lives on the line, you come to understand snow.”

But, does he get outside enough?

“Not quite,” he says. “But I’ve got no complaints.”



Courtesy Photo

MSI advisor, professor Mark Williams

THE WORK OF MARK WILLIAMS

A multi-faceted researcher, Williams’ projects involve many areas of science: snow hydrology, alpine and subalpine hydrochemistry and biogeochemistry; surface and groundwater interactions; terrestrial and aquatic interactions snow science; atmospheric deposition and avalanche dynamics.

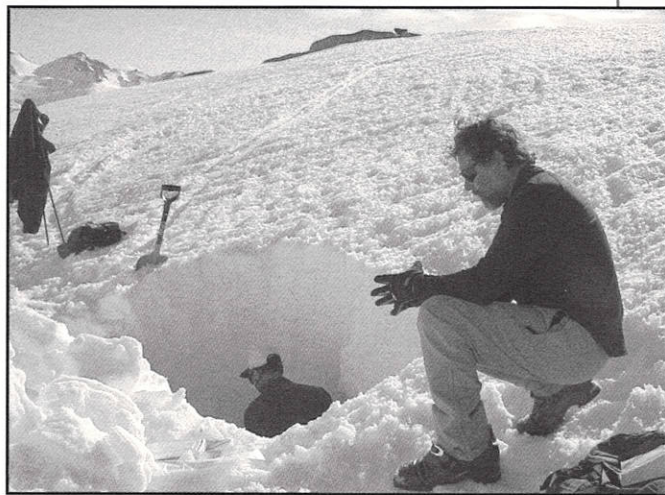
The largest of his projects is as the principal investigator on a National Science Foundation grant to investigate climate change in the alpine regions of Colorado’s Front Range. That major grant—funded at approximately \$1 million a year over five years and powered by 15 participating scientists and 25-to-30 graduate students—looks at every aspect of alpine hydrology and ecology. It also provides the base science principles that Williams applies to other areas of his research, including alpine sensitivity studies, such as the ongoing project in San Juan County (see page 4).

“In places like Silverton we are taking the basic science and using it in an applied fashion,” he says. “We are trying to trans-

late basic science into something that is usable for county planners and others.”

Williams also has a \$100,000 National Science Foundation grant to look at the climate change in the mountains of Central Asia. A \$50,000 National Park Service grant is paying Williams to develop screening procedures and sampling protocols for assessing deposition-sensitive surface waters in the Rocky Mountains. Additionally, he is the principal investigator on a National Park Service-funded project to develop vital signs for the nitrogen status of ecosystems in national parks.

Williams was awarded the Environmental Protection Agency Region VIII Outstanding Environmental Achievement Award for community based work on ecosystem protection



Courtesy Photo

Williams, foreground, sampling snow for chemical content in the Yosemite National Park backcountry, April 2002

in the San Miguel basin.

Williams earned his bachelor’s degree in biological sciences and a doctorate in biological sciences from the University of California at Santa Barbara.

CREATING A SAN JUAN MOUNTAIN

Many Hands Build MSI

Since avalanche forecaster Don Bachman first proposed staging a high-altitude field station in Silverton 20 years ago, the momentum that has made the idea a reality has been rooted in collaboration. Though several informal meetings were held in the late 1990s to talk about various possibilities, it was not until August 2000 when Rob Blair, professor emeritus of geology at Fort Lewis College, convened a group of scientists, researchers and educators from a wide variety of agencies and organizations that the idea gained currency. Blair carried the energy of the 2000 San Juan Mountains Workshop forward and, with the support of Fort Lewis College, the U. S. Forest Service/Bureau of Land Management, San Juan Public Lands, and many others, opened the doors of the Mountain Studies Institute. In 2002 MSI hired Ellen Stein as its first executive director.

Spreading the Wealth: Grants for Local Partners

Recognizing that it cannot pursue its expansive mission on its own, MSI is reaching out to partners in the region who can help. One such partner is the San Juan County Historical Society, a 40-year-old nonprofit that preserves the documents and artifacts representative of San Juan County's history. In 2003 MSI granted \$63,000 to the historical society.

The grant will support the society's archiving project and the creation of new exhibitions in the Mining Heritage Center. The archiving project—a 40-year-and-counting endeavor, says society president Beverly Rich—needed a new computer to handle the volume of materials, documents, maps and photographs the society is cataloging. The society will use a portion of the grant to build the exhibit space and set up the exhibits at the heritage center.

In turn the historical society has opened the office at its Mayflower Mill for lodging for MSI's 2004 summer intern, Katie Brooks. Researcher Ray Johnson of the U.S. Geological Survey and graduate student Kim Raby also stayed at the mill this summer, along with two student interns who worked with Silverton and San Juan County.

To help fulfill its interest in advancing snow and avalanche studies in the area, MSI requested and obtained \$80,000 in Congressional funds on behalf of the

Center for Snow and Avalanche Studies (CSAS) to support the center's general operations and development. The grant has helped the CSAS develop two study sites in Senator Beck Basin, one above tree line at 12,200 feet and the other lower, in a sheltered hollow at 10,050 feet with a stream gauging station at the bottom of the basin. MSI and CSAS researchers and educators will use the sites. Nearly \$40,000 of research equipment, much of it donated, has been installed at the sites by CSAS. Data was collected for the winter of 2003-2004.

In addition CSAS used the MSI grant to provide educational support to winter field camps during the 2003-2004 winter. Development of the Senator Beck Basin sites also enabled CSAS, with a collaborator from the National Snow and Ice Data Center, to prepare and submit a research proposal to the National Science Foundation (NSF). That proposal, to study the effects of desert dust on the timing and intensity of snowmelt in the San Juans, was recently fully funded. CSAS will receive \$123,409 of the \$520,000 grant.

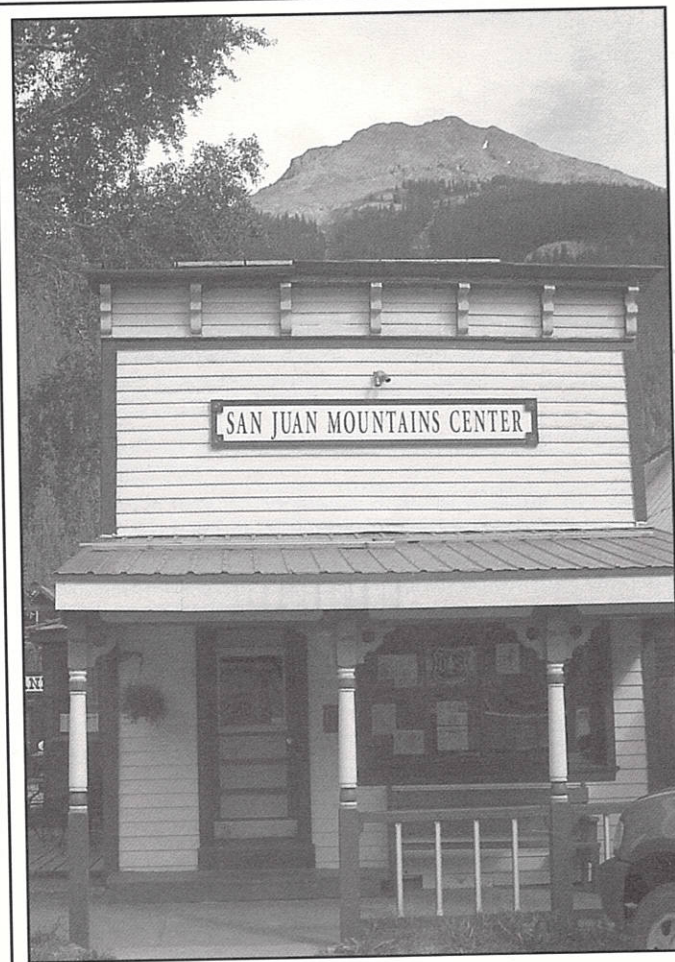
Visitors Flock to San Juan Mountains Center

Visitors to the San Juans from all corners of the globe sought out the San Juan Mountains Center this summer. Between opening in mid-May and Sept. 1, 7,853 folks passed through its doors at 1246 Blair Street in Silverton, (one block north of the railroad disembarking area). By comparison in its 16 weeks of operation last summer (the center opened July 10, 2003) the center welcomed 3,750 visitors.

"They are all coming for public lands

information," said Barbara Hodge, public information specialist for the U.S. Forest Service.

The establishment of the center was a true collaborative effort between MSI, the San Juan Mountains Association, USFS and BLM. As a one-stop shop for public lands information and mountain educa-



San Juan Mountains Center, Silverton

tion, the center provides visitors a mountain environment interpretive center, bookstore that focuses on the region's natural and cultural history, a resource library with large wall maps, and computer access to MSI's database and public lands information. It also offers a daily hike that explores natural history and ecology topics.

"This gave us an opportunity to learn more about the area," said Phil Bossy, father of two visiting from Connecticut. "The boys really liked trying to identify the animal pelts. This way they don't just see things, but understand them more."

In addition to visitor information specialist Hodge, the center also houses a Forest Service and BLM Snow Range



NETWORK

Alpine Loop Backcountry Rangers, and MSI's Director of Education.

The Mountains Center is open from mid-May to the end of October seven days a week. During the winter the center is open by appointment to visiting college groups and field camps.

Opening the Avon Hotel

Taking one step toward fulfilling its commitment to provide regional researchers, educators and students a facility from which to base their work, MSI moved into the historic Avon Hotel on July 15, 2004. Built in 1904 and located in the heart of Silverton at the corner of Tenth and Blair Streets, the hotel has a main floor, which is ready for collegial socializing and which houses MSI's administrative offices and a kitchen for guest use. The basement is open for lectures and meeting space. The second and third floor rooms are available for lodging up to 40 people. In addition the hotel has storage space for research equipment.

Already the hotel and its facilities have been in demand. In August Kim Raby, a University of Colorado graduate, and USGS researcher, Ray Johnson, used the Avon as home base. Three instructors and their seven students, secondary school teachers enrolled in Mountain Geography for Educators, stayed at the hotel in August and used the basement for class lectures. In mid-September, 30 historic preservation professionals gathered for a week-long Historic American Engineering Record and Historic Structures Assessment workshop. In addition students, researchers and other participants stayed at the Avon for the weekend of MSI's fall State of the San Juans Conference and celebrated the Avon's 100th birthday and grand opening with a revival concert of local band "Too Little Oxygen," the same band that opened the Avon in the 1970s. MSI has secured a 22-month lease and option to purchase the building.

Learning from Others

Since coming on board, Executive Director Ellen Stein has been on the road, traveling to conferences and other research and educational field stations to learn about the state of mountain science and research, and to spread the word about MSI.

Most recently in May 2004 Stein presented a poster entitled "Advancing Mountain Research and Education from the Foothills to the Alpine Zone of Southwest Colorado's San Juan



Lee Dexter

Historic Avon Hotel, MSI's new home in Silverton

Mountains" at the Mountain Climate Science Symposium (MCSS) in Lake Tahoe, California. At that symposium Stein learned there is a lack of high-altitude monitoring stations above 2,500 meters. She hopes that MSI, situated in Silverton (2,840 m.), can fill this gap and that mountain climate scientists from around the world will choose to work in the area. Also in May Stein submitted an article about MSI's work in the southern Rockies and participated in a panel discussion at the State of the Rockies conference, sponsored by her alma mater Colorado College in Colorado Springs, Colorado. (The full State of the Rockies report can be found at www.coloradocollege.edu/stateoftherockies/.)

Earlier in the spring Stein met with members of the Mountain Geography Specialty Group and presented her "Advancing Mountain Research and Education" poster at the annual meeting of the Association of American Geographers in Philadelphia, Pennsylvania.

Last year she traveled to Kananaskis, Alberta, Canada to participate in the annual meeting of the Organization of Biological Field Stations where she learned about running a field station from old hands in the business.

Keeping Track of Research

The wealth of scientific and cultural information about the San Juan Mountains and the communities that depend on them is virtually endless, and researchers, historians and others are con-

stantly adding to the documents, papers, photographs and maps already available.

To make that collection more accessible, MSI has created an extensive website of existing data and maps, as well as a list of regional organizations and a bibliography of published works. As of September 2004 over 160 researchers working in the San Juans were listed in the database.

Instructors and researchers have already found the website useful.

"The MSI website and GIS data download page are great," wrote Scott White, a geographic information systems professor at Fort Lewis College. "I look forward to using the site in my classes and research."

"I used the MSI website to download all the base maps (ie., topos, DEMs, DRGs) for my modeling efforts. It saved me a lot of time to be able to get everything at once, especially all with one datum (NAD 27 in this case)," wrote Ray Johnson, a hydrologist with the U.S. Geological Survey.

Over the next five years MSI will add to that database, including among other documents, the ecological assessments of the San Juan Mountains currently being conducted by the Environmental Protection Agency and the U.S. Forest Service. As it does so, MSI will provide students, land managers, scholars and others with the information needed to fill knowledge gaps and facilitate analysis of land, resource and environmental management in the San Juans.

DAVID COOPER: WETLANDS, FENS AND OTHER MUDDY AREAS

"I just love water," says Dr. David Cooper when asked why his life's work is devoted to wetlands, bogs, fens and all things soaked. "I like places that are wet. I am interested in landscapes and how water moves through them."

Sounds simple enough, but in more than two decades as a researcher and scientist, Cooper has elevated the study and protection of saturated places in the West to an art. The San Juans support the richest concentration and diversity of fens anywhere in the western United States and Cooper has made those fens the object of his recent work.

"Fens are sites that are permanently saturated," says Cooper. The fens are typically created from the cold groundwater that comes out of the hillsides and mountain slopes. Leaves, roots and dead plants accumulate in these fens, but don't decompose fully because the saturation deoxygenates the soil. The organic matter accumulates slowly, and over thousands of years, builds an ancient peat body.

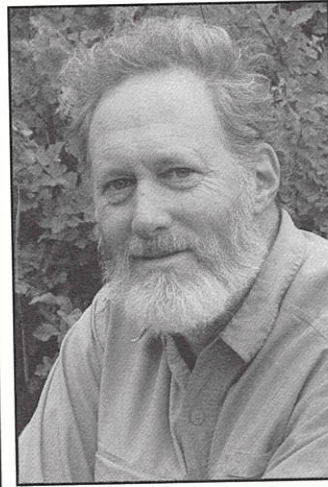
In arid regions like the San Juans, the wet environment supports a large variety of plants, animals and insects not found outside the fens. Many plants are like aspen, says Cooper. They reproduce asexually and thus may be thousands of years old—more ancient than the bristlecone pine or sequoia.

The aridity is also the very characteristic that threatens the life cycle of the fens. Though the San Juans receive a large winter snowpack that in the spring delivers an abundant run-off, the ground water drains quickly and is partially depleted by mid-summer. Late summer monsoon rains in the southern and western San Juan Mountains, some of the strongest and most predictable rain patterns of any high mountain region in the U.S., recharge water levels.

Consequently, hillside aquifers fill and water levels in the fens rises. The bimodal precipitation pattern, snow in the winter and monsoon rains in the summer, produces ideal conditions for fens to form and persist.

And because fens are at the "focal point of groundwater flow, a lot of water moves through them," says Cooper. Through this geo-chemical process, water is filtered and its quality improved.

Recently he led a study of the ancient fens in San Miguel County's



David Cooper

Courtesy Photo

Prospect Basin. Now through the newly renamed San Juans Fen Partnership (the former Prospect Basin Fen Oversight Committee), Cooper is turning his attention to other areas of the San Juan Mountains, including western Ouray County and other high country basins in San Miguel County.

In that study Cooper will monitor the hydrologic, geochemical and ecological properties of five reference fens in Prospect Basin, and develop a fen assessment protocol; identify, map, and assess fens in San Miguel and western Ouray Counties, including mapping the location and watershed of each fen; and work with all levels of government (town, county, federal), and private land managers to develop and implement watershed planning, protection and restoration programs. Ouray and San Miguel County Commissioners and the Town of Ophir wrote letters of support for the project. In addition to mapping the location and watershed of each fen, the study will assess each fen using a region-

based set of reference fens and a quantitative fen assessment protocol to evaluate fen health. Cooper's study will also collect data on hydrologic regime, flora, vegetation, landforms, geochemistry and peat accumulation processes of each fen and determine which fens are impaired. Finally, the study will develop fen and watershed restoration approaches that can be implemented on local and regional scales.

Results from Cooper's study will be folded into a map of the region that will overlay the location and types of fens on ecosystem and watershed layers. With that information in hand, counties and towns will be better able to manage the landscapes under their governance. In particular they will be better equipped to protect existing healthy fens and wetlands and restore those that have been damaged.

Of the fen partnership Cooper says: "We want our research to inform public policy, sound scientific decision making, and the development of fen and wetland protection programs where desired."

THE WORK OF DAVID COOPER

As an expert in wetland and riparian ecosystems studies—as well as wetland restoration, wetland flora and vegetation and wetland hydrology-vegetation interactions—Cooper has spent his career in tall rubber boots.

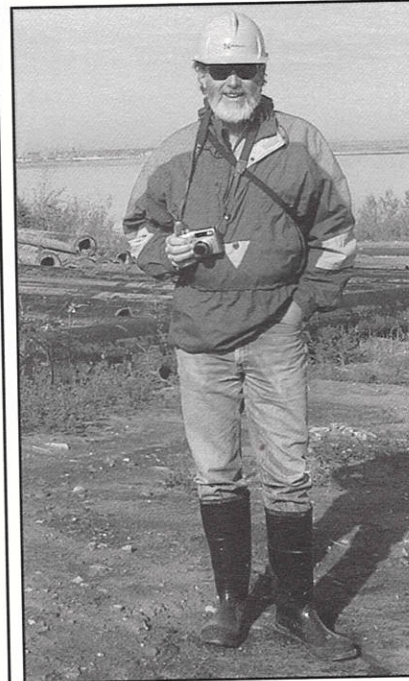
Currently he is a senior research scientist with the department of forest, rangeland and watershed stewardship at Colorado State University in Fort Collins. He also serves as a scientific consultant to numerous federal, state and local government agencies and nonprofit organizations.

Among his many current research projects is developing a restoration plan for the upper Yosemite Valley in Yosemite National Park and studying biodiversity in the fens of Yellowstone National Park. He also is designing, planning and monitoring restoration of the Snake River gravel pit in Grand Teton National Park, Wyoming.

In the San Juans he has focused on analyzing the fens in Prospect Basin above Telluride and now will expand that work to other high basins in San Miguel County and in western Ouray County. He also led the restoration of 18 subalpine wetlands in Telluride Mountain Village from 2000 to 2004.

In 2004 the National Park Service awarded Cooper the Intermountain Regional Director's Award for research to support resource management by a non-federal scientist; he also received a special achievement award from the Great Sand Dunes National Monument.

Cooper earned an undergraduate degree in environmental biology from the University of Colorado in 1975. In 1983 he was awarded a Ph.D. in biology, also from the University of Colorado.



Cooper in the field

WHAT LIES AHEAD

THE VISION

The Mountain Studies Institute has accomplished a lot in the two-and-a-half years since opening its doors. The Avon Hotel is open for lodging, lectures and collegial socializing; projects of alpine scientists Mark Williams, David Cooper and Chris Landry are funded for the near term, and University of Colorado, Goshen, Gettysburg and Prescott Colleges have been welcomed into the fold. Still MSI's board and staff are aware that those milestones are just the beginning.

MSI's vision statement states that "the successful establishment of a central MSI field station facility in Silverton will have a broad impact within and beyond the region. Currently there is a great deal of research and educational activity taking place in a dispersed manner by academic scientists and by public agency personnel. MSI supports research and education by preserving access to study areas and organisms, by providing facilities and equipment in close proximity to those study areas, and by fostering an atmosphere of mutual scientific interest and collaboration."



Hermosa Peak

Bill Bell

Turning vision into action – one that meets identified needs, is financially sustainable, and contributes something tangible to the greater body of knowledge in the region – is the hard part. To reach this vision, MSI's board of directors, with the help of an esteemed advisory board, adopted in August 2004 a new strategic plan. That document contains a five-year plan in which, among other activities, MSI will provide an array of services including: reasonably-priced accommodations, offices and laboratories, meeting rooms, storage, field study site selection and support, instructors, assistance with public land permit acquisition, administration of grants and contracts, and identification of public land and community research opportunities.

MSI intends to position itself as a center of knowledge in mountain research and education in the San Juans, and by extension, to mountain ranges around the world.

Excerpts of MSI's August 2004 strategic plan activities are outlined below.

A GLIMPSE OF WHAT'S TO COME

Spawn Research Projects

MSI's research mission: *MSI provides facilities and administrative services to host research conducted by scientific professionals from around the world. MSI staff also will participate directly in relevant research initiatives. MSI will communicate scientific information gained through its research functions to public agency personnel and policy makers as rapidly as possible.*

Five-year tasks include:

1. Facilitate research efforts by visiting scientists and students interested in appropriate scientific studies in the San Juan region. To this end MSI will advertise availability of MSI for hosting research projects to local and regional colleges and universities

Expected results: Number of outside users increases each year. By Year Five at least 25 research projects use MSI annually.

2. Participate in targeted and successful research initiatives that will establish the scientific credibility of MSI. To further this goal MSI will a) Develop and submit at least one research initiative grant proposal for funding; b) Complete at least two single-field-season focused research projects that respond to urgent needs expressed by regional policy makers. Research can be physical, biological, or social science; c) Complete at least one multi-year interdisciplinary research project that addresses a regional need.

Expected results: Three projects completed within five years

Support Learning and Education

MSI's Learning Mission: *MSI provides learning opportunities to professional scientists, graduate and undergraduate students, resource management personnel and*

policy makers, and the general public, based on knowledge gained from research efforts at MSI and elsewhere. In this context "learning" encompasses traditional and nontraditional educational activities, public outreach activities, and research training activities.

Five-year tasks include:

1. Host college-level courses from around the country. To reach this goal a) MSI will advertise nationally through appropriate journals, faculty newsletters and academic societies, and b) Advisory Board and Board of Directors members will communicate personally with specific known faculty who might be interested in offering a course in the San Juans.

Expected results: At least 10 courses hosted annually by Year Five. Additionally, there is at least a 15 percent

Continued on next page

WHAT LIES AHEAD (CONTINUED)

occupancy rate of MSI housing (e.g. Avon Hotel bed spaces) annually from hosted courses by the end of Year Five.

2. Host conferences. To this end MSI will a) Host at least one scientific conference with expert participants of national reputation and publish and conference proceedings volume; b) Host at least one State of the San Juans conference similar to those held in 2002 and 2004, for a more general audience of scientists, policy makers and the general

dents and b) Develop a mentoring program among visiting scientists for encouraging minority students, especially Native Americans from FLC.

Expected results: At least 10 percent of participants in MSI programs come from backgrounds underrepresented in the sciences by the end of Year Five.

5. As opportunities arise, provide professional development opportunities for K-12 teachers, such as teacher workshops, short summer courses, seminars, etc. In order to accomplish this goal, MSI will a) Offer at least one course each year, based on mountain geography curriculum already developed by MSI; b) Seek collaborations with school districts and teacher organizations; c) Seek funding from National Science Foundation (NSF) or other sources for curriculum development; d) Investigate opportunities to develop expeditionary learning courses; and e) Seek funding from NSF for involving teachers in research.

Expected results: Offering at least one course per summer is a reasonable goal as long as the finances are beneficial.

Managing a Database, Inviting Input

Also over the next five years MSI will continue to develop and maintain a useful website and database to provide easy access to information relating to MSI and the San Juan Mountains. This database will allow researchers and others to identify knowledge gaps. It also will facilitate systems analysis of land, resource and environmental management for mountain issues. The database will house data from MSI-hosted-sponsored research projects, including basic information, reports, associated data and links to geographical extent maps. MSI also will complete archiving the framework layer data for the San Juans to include large-scale, high-quality information about water, transportation, elevation, governmental units, land use, land cover and land ownership. Additionally, the database will contain aerial photos, geographic names and geodetic control points. MSI will design and implement a long-term monitoring program to supplement existing information about the biological and physical parameters of the San Juan Mountain environment.

To make this database work MSI

needs input from members of the San Juan community. Thus MSI invites all of its constituents who see a need for data, research, and information in a particular area to contact MSI.

Fostering Partnerships

MSI will continue to foster and promote partnerships whenever possible. Those partnerships will benefit the specific program goals of MSI and ultimately the development of sound science and public policy by uniting in one place a community of scholars from diverse disciplines and expertise. MSI places great value on sharing information and will continue to seek collaborations with other researchers and organizations in investigating, collecting, analyzing, and distributing scientific information in numerous appropriate formats.

Field Station Facilities

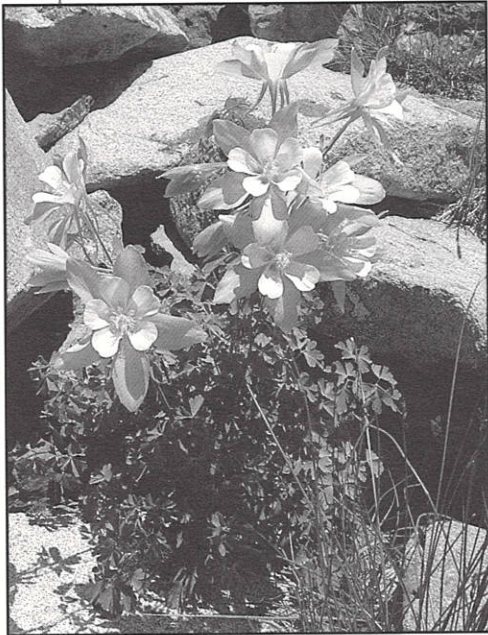
An MSI field station campus should provide the physical and intellectual means of fulfilling the MSI research and education missions. Leasing the Avon Hotel is MSI's start at locating facilities in which intellectual and social relationships can begin to take shape. MSI will develop a five-year and 20-year facility plan. A capital campaign to fund facility development will be initiated.

Achieving Financial Sustainability

Underlying these goals is MSI's commitment to future financial stability through responsible management of MSI as a nonprofit business. As an appendix to the strategic plan, a business plan will be developed. The goal of the MSI business plan is to identify sources of funding and to allocate that funding in such a manner that by the end of year five, MSI operations will be financially sustainable.

A Commitment to Excellence

Finally, MSI remains committed to projects of the highest possible quality. Where appropriate, scientific investigations sponsored by MSI will be peer reviewed by the national scientific community. Efforts to seek understanding of the natural world will be conducted in an ethical and respectful manner. Students and citizens of all backgrounds will be encouraged to participate. Research and learning will emphasize cooperation and the integration of a variety of disciplines.



Lee Dexter

public; and c) Host at least one informal scientific meeting.

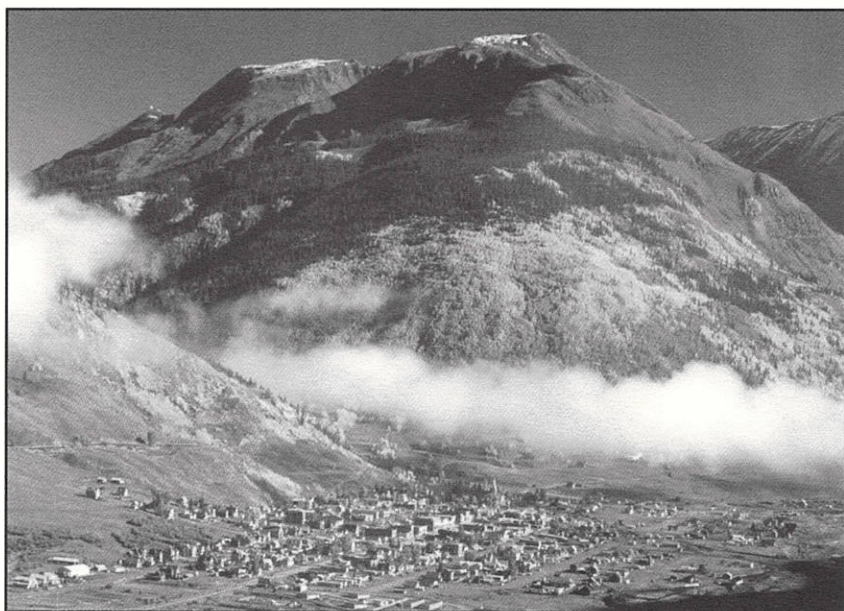
Expected results: Three conferences are held in the five-year period.

3. Develop academic relationships with regional colleges, including Fort Lewis College (FLC) in Durango, to provide students and faculty with field research opportunities. To this end MSI will survey FLC departments to inquire how MSI could serve their teaching needs.

Expected results: FLC faculty and students use MSI resources regularly. At least one other college is developing a relationship with MSI that provides a consistent presence of faculty or students each year.

4. Foster participation by minority students in MSI programs. To this end MSI will a) Pursue grant opportunities targeted toward providing financial support for underrepresented minority stu-

SUPPORTERS OF MOUNTAIN STUDIES INSTITUTE



Courtesy Silverton Chamber of Commerce

Town of Silverton

MSI's leadership wishes to acknowledge the cash and in-kind support of the individuals and institutions who are helping to "raise the barn" of the Mountain Studies Institute.

Grants

- Senator Ben Nighthorse Campbell and staff - \$1,000,000 Federal Appropriation secured by Senator Ben Nighthorse Campbell, administered by the USDA Forest Service/San Juan Public Lands
- Ballantine Family Foundation - \$1,000
- Colorado State Department of Local Affairs/Energy Impact Funds - \$60,000
- Fort Lewis College - \$22,400
- National Geographic Society/Colorado Geography Education Fund - \$10,000
- Rural Community Assistance Program - \$12,000
- San Juan County - \$6,000
- San Juan County Planning Commission - \$1,000
- San Juan Fen Partnership - \$5,000
- San Juan 2000 Development Association - \$4,000
- Telluride Foundation - \$500
- USDA Forest Service/BLM, San Juan Public Lands - \$80,000
- US Environmental Protection Agency, Region VIII - \$45,000

Contributions*

- Animas River Stakeholders Group
- Center for Snow and Avalanche Studies
- Colorado Avalanche Information Center - Silverton Forecast Office
- Fetch's Mercantile
- First National Bank of Durango - State of the San Juans Alpine Sponsor - \$250
- La Plata Open Space Conservancy
- San Juan Backcountry
- San Juan Field School
- San Juan County Historical Society

- San Juan Mountain Mustard
- Silverton Standard and the Miner
- Sugnet Environmental, Inc.
- Telluride Institute
- The Lookout Shop
- Triangle Jeep Rental
- Triangle Motel
- Trust for Public Land - State of the San Juans Summit Sponsor - \$1,000
- Turtle Lake Refuge
- U.S. Environmental Protection Agency, Region VIII - State of the San Juans Summit Sponsor - \$2,000
- U.S. Geological Survey - State of the San Juans Peak Sponsor - \$500
- Villa Dallavalle Bed and Breakfast
- Wingate House Bed and Breakfast/Candle Shop
- ZE Supply

* All contributors, except where indicated, are 2004 State of the San Juans Foothill Sponsors contributing \$75-\$100.

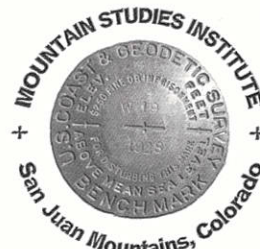
Charter Members

- Rob Blair - Peak**
- Lee Dexter - Upper Montane
- Brian Fowler - Alpine
- Jack Ives - Timberline
- Ken Francis - Upper Montane
- Mark Williams - Woodland

In-Kind

- Alton Byers
- A Theatre Group
- Basin Printing & Imaging
- Beckoning Design
- Camille Richard
- Carver's Restaurant & Brewery
- Cheryl Weiscamp
- Citizens State Bank
- Don Friend
- Denny Ehlers
- Durango Mountain Resort
- Fort Lewis College, Office of Community Services

- Frederick, Zink, Elliot
- Gary Jennings, San Juan Resource Conservation and Development
- Gary Ruggera
- Grand Imperial Hotel
- Handlebars Food & Saloon
- High Country Cleaning & Maintenance
- High Noon Hamburgers
- Hilton Publishing
- Loren Lew
- Marvin & Diana Paioff
- Miners Tavern
- MOUNTAINFILM
- Rocky Mountain Biological Lab
- San Juan County
- San Juan County Historical Society
- San Juan 2000
- Scot Jackson
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- Tisdell, Hockersmith, Mueller and McIntosh PC
- Town of Silverton



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- Chris Nute
- Catherine Ortega
- Kelly Phillips
- Chris Smith
- Jonathan Thompson

** To kick off MSI's Endowment Fund and Capital Campaign Fund, founding board member Rob Blair donated \$1,000 to each fund.

MSI enjoys 100% financial participation from all members of its board of directors.

Apologies in advance - please let us know if your name or institution is not listed here and should be. Thanks for all your hard work and support!

MSI is grateful to Sen. and Mrs. Ben "Nighthorse" Campbell for embracing the vision of MSI and the potential contribution of the Institute to Silverton and the region. Without Campbell's diligent work on Capitol Hill, MSI would not have received much-needed seed money that enabled it to get off the ground, and would not be around today. In 2003 Congress awarded \$500,000 to MSI, through the U.S. Department of Agriculture's Rural Development Through Forestry program. A second grant of \$500,000 was awarded in the federal 2004 budget. That money will see MSI through early 2007, when MSI expects to be financially self-sufficient.

The Board of Directors of the Mountain Studies Institute invites you to support MSI. Join by September 15, 2005 and become a charter member. Your membership will:

- Ensure the continuation of MSI's mountain education programs and MSI facilities at the historic Avon Hotel and the San Juan Mountains Center.
- Sustain MSI's long-term research, education, and outreach goals.
- Support MSI's scientific information gathering, research database, and information dissemination to the region.
- Strengthen the support services MSI provides to land managers, scholars, teachers, students and local San Juan Mountain communities.

Circle your level of membership

Sapling (Student)	\$15	Ponderosa (Family)	\$75	Timberline	\$500
Foothills (San Juan Mountain Resident)	\$25	Upper Montane	\$100	Alpine	\$1,000
Woodland (Adult Individual)	\$40	Subalpine	\$250	Peak	\$2,500

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Type: _____ Number: _____ Exp. Date _____ Amount to be charged now: \$ _____

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Please send this form with payment to Mountain Studies Institute, P.O. Box 426, Silverton, Colorado 81433. For more information on capital campaign, planned giving or giving to MSI's endowment fund, please contact Ellen Stein at 970.387.5161. MSI is a federally recognized 501(c)3 tax-exempt organization. We will promptly send your tax receipt letter. Thank you for your support!

UPCOMING EVENTS

Sept. 23-27, Banff Centre for Mountain Culture Conference, Interdisciplinary Research and Management in Mountain Areas, Banff, Alberta, Canada, www.banffcentre.ca

Oct. 7, "The Great Divide: The Rocky Mountains in the American Mind;" lecture by Gary Ferguson, award-winning nature and science writer. Sponsored by Mountain Studies Institute and Durango Nature Studies, at the Abbey Theatre, Durango. Call 970-387-5161 or 382-9244 for info.

Oct. 15, Animas River Stakeholders Group 10th Anniversary Celebration, Silverton. Contact Bill Simon, wsimon@frontier.net or 970-385-4138.

Oct. 13-16, National Network of Forest Practitioners Annual Meeting, Ouray, www.nnfp.org

Oct. 20-22, ESRI Southwest User Group Conference, Telluride, www.swuggis.org.

Nov. 7-10, Geoscience in a Changing World, Geological Society of America Annual Meeting & Exposition, Denver, www.geosociety.org

Nov. 8-10, Colorado Forest Restoration Workshop, Glenwood Springs, www.cnr.colostate.edu/cfrw/. Call Bill Romme 970-491-2870 or Dan Binkley 970-491-6519.

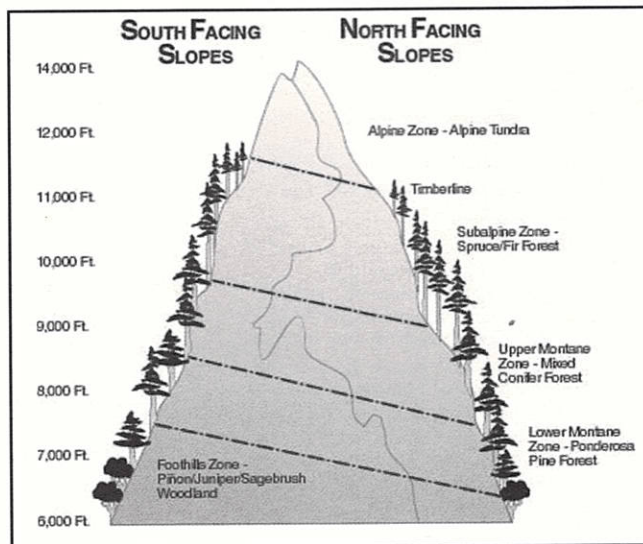
Dec. 2, Aspen Management in Southwestern Colorado: Ecological, Economic, and Aesthetic Considerations. A Community Workshop, Durango. Contact: Carla Harper, 970-565-6061 or charper@co.montezuma.co.us

April 5-9, 2005, Association of American Geographers Annual Meeting, Denver, www.aag.org

June 2005, San Juan National Forest Centennial Celebration. Contact Steve Kelly, 970-564-1463, or skkelly@fone.net

June 2006, Mesa Verde National Park Centennial. <http://www.mesaverde2006.org/>

September 2006, International Snow Science Workshop. Telluride, www.issworkshop.org.



San Juan Mountain Lifezones