2016 Fall Newsletter

GEOGRAPHY

University of Colorado, Boulder

Tom Veblen Awarded Distinguished Research Lectureship

The Distinguished Research Lectureship is among the highest honors bestowed by the faculty upon a faculty member at CU Boulder. *pg 11.*

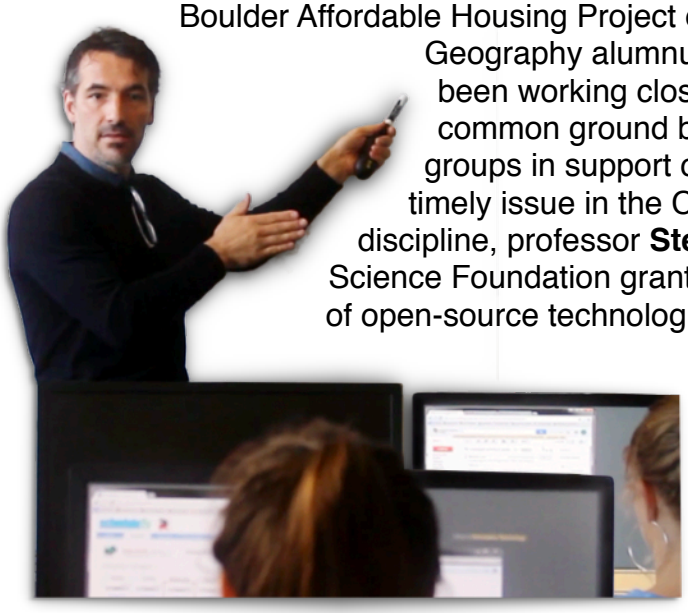
Profiles of Scholarship Winners

Students are at the heart of what makes CU Geography a great place to be, and this year we were fortunate to award six fellowships to undergraduate students. Read the student articles starting on *pg 5.*

Emily Yeh, Department Chair

In this turbulent aftermath of the November election and continued uncertainty about what the new administration will bring, it is important to reaffirm our fundamental commitments to free, thoughtful expression, mutual respect, evidence-based inquiry, and academic freedom. Our faculty and students research and study many pressing issues of our time, including anthropogenic climate change, transnational migration, human rights, and violent conflict. The tools and findings of geographic research are more critical than ever in forging a collective path toward a more sustainable and just world.

Here are just a few of many examples of recent research done by members of the Geography department. Professor **Noah Molotch**, geography graduate students **Sean Burns**, **Theo Barnhart, Dominik Schneider**, and geography alumnus **John Knowles** recently published studies demonstrating that earlier snowmelt periods associated with global warming could result in a 45% reduction of snowmelt period forest carbon uptake by mid-century, as well as reducing the amount of streamflow, which could have potentially drastic consequences for agriculture, municipal water supplies, and recreational opportunities in Colorado as well as other parts of the western United States. The Boulder Affordable Housing Project directed by Professor **Jennifer Fluri** and Geography alumnus and CU instructor **Abby Hickcox** has been working closely with community members to find common ground between land owners and investors and groups in support of, and living in, affordable housing, a very timely issue in the City of Boulder. On the GIS side of the discipline, professor **Stefan Leyk** was recently awarded a National Science Foundation grant for collaborative research to develop a set of open-source technologies and tools that will allow users to extract map features from a large number of map sheets and track changes of features between map editions in a Geographical Information System. The resulting open-source tools will enable exciting new forms of research and learning not only in geography, but also in history, demography, economics, sociology, ecology, and other disciplines.



Stefan Leyk giving class lecture

Professor **Jennifer Balch** was elected an Early Career Fellow by the Ecological Society of America for her exceptional work and novel discoveries on fire risk, proliferation, and consequences in both tropical and temperate ecosystems. In addition to her own long-term research on fire, Professor Balch also directs Earth Lab, a major initiative to integrate and harmonize Earth observations from aerospace and other sources to address scientific challenges in understanding the pace and pattern of global change. Professor **Tom Veblen** has been named the CU Boulder 2016 Distinguished Lecturer in recognition of his world-

renowned leadership in the fields of forest and fire ecology and tree ring research. Professor Veblen's extensive research on the ecology of temperate forests in Chile and Argentina has been paradigm shifting, and his work on the fire risk of bark beetle outbreaks in the western US has had enormous implications for forest conservation and land management in the context of global climate change.

Shae Frydenlund

Like our faculty, our graduate students are also recognized for their excellent work. Among other honors (see page 13), doctoral student **Shae Frydenlund** was awarded the Dor Bahadur Bista Prize for best graduate paper by the Association of Nepal and Himalayan Studies, for her article, "Labor, racialization and territory in Nepal's indigenous nationalities discourse: Moving beyond 'tribal' vs. 'peasant' categories." Doctoral student **Xi Wang** was awarded a Fulbright fellowship to support her dissertation research about how the political economy of planning in China's electricity sector affects the country's ability to integrate large-scale renewable energy and ultimately transition to a low-carbon future.

Geography undergraduates have recently formed a Geography Club, which we hope will lead to more events, activities and opportunities for all of our majors and minors. The department marked Geography Awareness Week this November 13-19 with a Mapathon. Graduate student instructor **Galen Murton** organized students to use OpenStreetMap to make and edit maps for the Ger Community Mapping Project in Ulanbaatar, Mongolia. This work assisted local groups in Mongolia to address environmental and social concerns in the rapidly growing ger (yurt) settlement areas of Mongolia's capital. Let us know if you have other ideas for future Geography Awareness Weeks!

We're very proud of all of our undergraduate students, particularly our scholarship winners (see pages 5-7). Our four Von Dreden Stacey Fellowship recipients were able to conduct faculty- mentored research this past summer and each gave a fantastic presentation about their work at our September 9 colloquium this year, with the following presentation titles:

"The Hydrology of Betasso, a closer look at an intermittent tributary to Boulder Creek" presented by **Kristina Cowell**

"Queering Spaces: Being Gay in Rio de Janeiro" presented by **Brooke Long**

"Lenin Down, a look at Ukraine's Nationalist Revival" presented by **Jasper Schneider**

"Understanding the spread of medical cultures through U.S. Caesarean section rates" presented by **Kathleen Weimer**

As always, our aim is to support our undergraduate and graduate students, as well as to continue significant research in a declining and indeed precarious funding environment. Thank you to those who have contributed generously to the department – we quite literally could not do many of these things without you. To our alumni: regardless of whether you are able to or thinking of contributing, we would love to hear from what you have been doing since graduation. Please keep in touch.

Happy holidays!

Colleen Reid, PhD 2014, University of California, Berkeley

My research focuses on how environmental and social exposures interact to influence health with a particular focus on exposures caused by global climatic changes and society's responses to those changes. I have a PhD and Masters of Public Health in Environmental Health Sciences from the University of California, Berkeley and a BS in Environmental Science from Brown University. Just prior to coming to CU, I did a post-doc at Harvard University through the Robert Wood Johnson Health and Society Scholars program.

My dissertation research assessed exposure to wildfire smoke and the associated health impacts from a large wildfire episode in northern California in the summer of 2008. To improve spatiotemporal estimates of exposure to wildfire smoke, I used machine learning methods to combine spatially continuous daily data from remote sensing, chemical transport models, meteorological models and other spatiotemporal datasets using novel machine learning statistical methods. I then applied exposure estimates from this model to evaluate health impacts of these wildfires and then analyzed effect modification by socio-economic status to better understand which subpopulations were most affected. I have since received funding to continue research into the health impacts of wildfire smoke exposure in California and hope to further investigate the effects of wildfires on health along the Front Range.

Colleen Reid

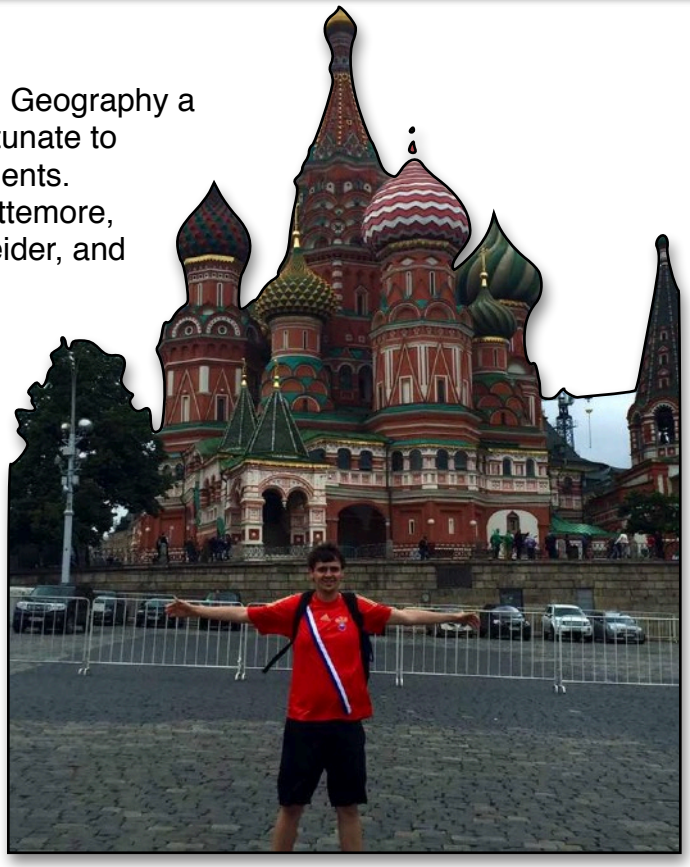
I have also led studies to understand and map community-level vulnerability to extreme heat events across the US. I piloted a composite index of heat vulnerability by census tracts for cities in the US and found higher heat vulnerability in the western and northeastern US, with clusters of higher heat vulnerability within all municipal areas, regardless of overall heat vulnerability.

During my post-doctoral research, I began a line of work examining the interactions between environmental exposures and measures of economic and social deprivation on health outcomes. Specifically, I am interested in the role of urban vegetation, often referred to as green space or greenness, because it is highly socio-economically patterned and a growing literature documents its positive impacts on health. An open question, however, is whether increased exposure to vegetation in urban areas can buffer against the health risks associated with socio-economic disadvantage. This line of research also intersects with my interest in climate change and health because many cities are undergoing tree planting and other urban greening programs to both mitigate (by sequestering carbon dioxide in trees) and adapt (by decreasing the urban heat island effect) to climate change.

I am very excited to join the Geography Department at the University of Colorado Boulder. I am very excited to find collaborative opportunities with the physical and human geographers in the department, as well as across campus. Boulder is also proving itself to be a wonderful happy medium, both geographically and climatically, between the two coastal regions I have previously called home.

Profiles of Scholarship Winners

Students are at the heart of what makes CU Geography a great place to be, and this year we were fortunate to award six fellowships to undergraduate students. Congratulations to Joshua Temes, Nick Whittemore, Kristina Cowell, Brooke Long, Jasper Schneider, and Kathleen Weimer!



Jasper Schneider

Jasper Schneider, Von Dreden Stacey Research Fellowship: Upon graduating from high school, I had no clue what I wanted to do with my life. I had gotten as far as deciding to attend college, but as to what I wanted to study, I was at a loss. I had always been fascinated with how the world works, and why things are the way they are. I had a wide range of interests, from natural sciences to politics, and could not narrow it down on my own. So I chose not to, and became a geography major. For me the wonder of geography is the scope of the field. From human geography to hydrology and climate sciences, I felt that I could do anything with a Geography major. But, I'm not just studying Geography here at CU as I am also double majoring in Russian. For as long as I can remember, I have always wanted to learn Russian and so I took the first opportunity to do so upon enrolling at CU. Naturally with two majors, I strove to combine them to the best of my ability, and in turn I soon found myself focusing on the political side of Geography, Russian area studies in particular. After taking his World Regional Geography course my freshman year, I sought out **Professor John O'Loughlin** and have been working with him ever since. The experience I got helping Professor O'Loughlin on his various projects proved invaluable in shaping my college career. Over the course of the past summer, I worked with Professor O'Loughlin on a project mapping the fall of Lenin statues across Ukraine, and how the spread of fallen statues correlates to issues of Ukraine nationalism and the wider conflict as a whole. The war in Ukraine is rapidly becoming one of my areas of specialization and I am considering writing a thesis on it. Despite being in my fourth year at CU, I still don't know what I want to do with my life, so in an effort to delay the inevitable I have entered a congruent enrollment BA/MA program and am currently working towards a Master's degree in Russian.

Jasper Schneider

Kathleen Weimer, Von Dreden Stacey Research Fellowship: I'm stoked on geography! I completely lucked into this department and could not be happier about it. In my short time in the program I've been able to pursue research opportunities thanks to **Carson Farmer** and the Von Dreden Stacey Research Fellowship, present a poster at GIS in the Rockies, help out with tasks for a number of ongoing research projects in the department and am now working on a paper with Carson and **Colleen Reid**. Geography is the best field because of the diversity of topics studied within a cohesive community. Although my research is on cesarean sections through a medical geography lens, I've been able to volunteer with projects on invasive grasses and Colorado fires. While these topics vary widely, they share unique methodologies and theoretical frameworks which allow for learning opportunities beyond what one would expect from a specific focus or even the field of geography. My paper is on interactions between counties during the surge in US cesarean rates over the last 25 years, but some of my most formative educational experiences in this department have been looking at Mt Everest or tracking house-cats. These have been integrated into my project by learning about risk assessment in changing environments and spatial temporal methods for understanding interactions in a quantitative framework. The Geography Department is one of the most supportive communities I've ever experienced and I am incredibly grateful to all of the experiences that being a member has afforded me. Thank you all so much!

Katie Weimer

Joshua Temes, A. David Hill Scholarship: Geography has enriched my life in so many ways. Growing up in California and frequently heading to the mountains, I developed a deep passion for the wilderness and exploration. Boy Scouts piqued my interest in cartography. As soon as I discovered the Geography program at CU, I knew I found the perfect fit for me. I have a lot of different focuses, and am currently working on how to further my academic passions! I am particularly interested in the human-environmental interactions in the West, whether it be about land or water rights, Native American issues, or other topics. The mysticism of the "wild west" captures my imagination and academic curiosities — Geography has supported this with wonderful classes about water rights, hydrology, and the human geography of the West. This semester has found me studying abroad and conducting research in Australia. It's a bit of a change, but I'm looking at another important issue of our times: plastic in the oceans. I'm conducting a month long study of the plastic and rubbish distributions on a remote island along the Great Barrier Reef.

Kristina Cowell, Von Dreden Stacey Research Fellowship: I am pursing a degree in Geography to gain a better understanding of our world and the spatiality of its physical processes. I am from Englewood, Colorado and grew up with the idea that I would choose a track that would allow me to work in the places I love. I am doing the hydrology certificate through the geography track and have loved learning about everything water related. Through Geography **Professor Suzanne Anderson**, I work with the Boulder Creek Critical Zone Observatory at the water analysis lab. This job has showed me the possibilities of working in environmental research, specifically within the field of hydrology. My research is titled, *The hydrology and hydrochemistry of an intermittent stream: Mapping the extent of an intermittent stream.* I will be looking at the hydrochemistry and other geomorphological changes of a semi-arid stream located within the Betasso Preserve in Boulder Canyon. Through comparing ground water, precipitation, and surface water we can better understand the interactions and their effects on stream flow. Sitting at a lower elevation (average elevation at 1950m) than most tributaries of the Boulder Creek, I believe that this stream is dependent on groundwater and flashy precipitation events.

Kristina Cowell research: Sediment Deposition where E/W gullies meet after flash flood event

Nick Whittemore, Albert W. Smith Scholarship**:** I entered the department as a transfer student seeking a second bachelor's degree. While I was originally interested in pursuing Geographic Information Science to help plan for natural disasters, I have found other extraordinary opportunities. One of my life's mottos is "Adventure with Purpose" and being a field research assistant for a fire ecology project in northern Nevada over the summer helped me fulfill this dream. I have found the geography department to be warm and welcoming with the opportunity to pursue projects in GIS and continue as a research assistant. After taking a course called Earth Analytics in the spring of 2016, I decided to add the new Space Minor to my degree. In the future I hope to pursue a career in environmental planning using my GIS skills as well as the possibility of pursuing graduate work. I am also the student representative for the Wesley Fellowship on campus and I'm an active member of the sustainability team with Engineers without Borders Nepal.

Nick Whittemore

Peter Blanken
Surprises in the Great Lakes: What new research has discovered hidden beneath the Lakes' surface.

The North American, or Laurentian Great Lakes, play a vital role in the water and economic resources of the region. Shared between Canada and the United States, Lakes Superior, Michigan, Huron, Erie and Ontario contain 21% of the world's volume of accessible freshwater, the largest on Earth. The region's population is expected to reach 65 million and account for two-thirds of the economic growth in the United States over the next four decades. The economy is one of the world's largest at an estimated $4.5-trillion gross regional product. The recreational fishing industry alone accounts for an estimated annual expenditure from $393 million to $1.47 billion.

Graduate student Pakorn Petchprayoon working on White Shoal Lighthouse, Sep 2013

Given the Lakes' importance as a water resource, I was funded by the International Joint Commission, a Canada-US commission with the responsibility of regulating shared water use and recommending solutions for trans-boundary water issues. The research objectives were to directly measure evaporation from the Great Lakes in order to understand how lake water levels are affected by evaporation, and how evaporation, thus water levels, will change with climate change. Meteorological instruments were installed on several offshore historic lighthouse locations, where we continue to measure over-lake evaporation and the factors that control it. Despite the immense size and volume of water, several "surprises" were found that are counter-intuitive.

Evaporation is largest in the winter, not the summer?

Standing on the shore of Lake Michigan on a warm summer day, and telling someone that there is no evaporation occurring from the Lake, always results in strange looks and comments. Our measurements show that evaporation is at its maximum rates in November and December, and is close to zero in July and August. This is because in the summer, the Lake surfaces are cooler than warm summer air so the solar energy is used to warm instead of evaporate the water. If fact, condensation resulting in dense fog often occurs, similar to when you see condensation on a cold drink in the summertime. In the winter, the air is much cooler and drier, and air at the lakes' surface relatively warmer and more humid, perfect conditions for large evaporation. It is the winter evaporation that results in the

famous lake-effect snow that many communities experience. Only when complete ice cover forms (which is seldom except for Lake Erie), does evaporation begin to decrease.

The water is warmer under the ice?

Ice formation is common on the western side of the Straits of Mackinac due to the wind and currents that funnel water from Lake Michigan to Huron. The eastern side of the Straits is usually ice-free. Simultaneous measurements at both locations show that the water temperatures in the Spring after the ice melts is much warmer (by 5 ^{o}C), and extends much deeper (to 15 m) in the western, ice-covered side of the Straits. This is because evaporation stops under a complete ice cover, and evaporation requires energy, which cools the water, so areas that keep evaporating all winter long are also cooler. Heat is also lost to the atmosphere from these open water areas, but not from the ice-covered regions.

The deepest waters are warming at the fastest rate?

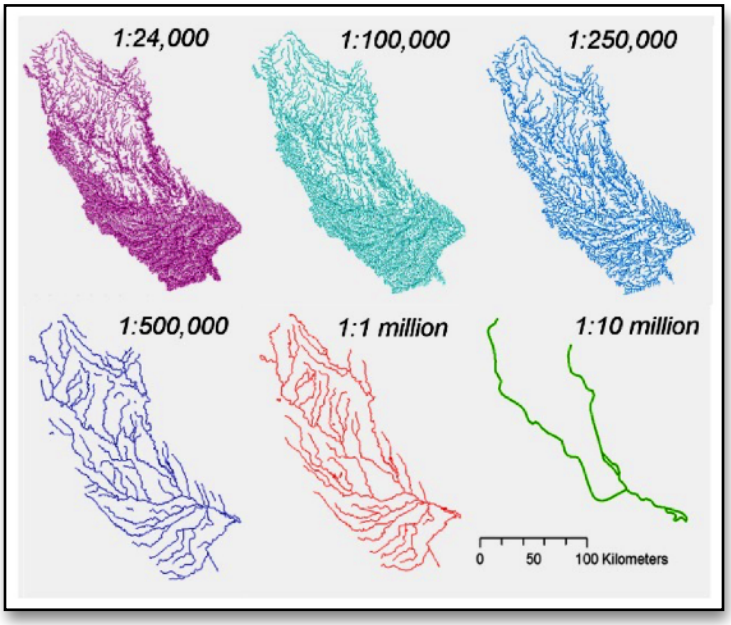
The deepest regions of the Lakes are also the coolest. When we compared the rate of temperature change with the lake depths, however, we found a very good relationship. The bathometric maps looks just like the temperature change maps. Once the water exceeds 4 ^{o}C, the temperature of maximum water density, the warm surface layers are less dense than the deeper water, so the warm water stays at the surface. This warm shallow layer does not mix well with the cooler layers below, and therefore warms at a fast rate. With continued global warming, the vast cooler, deeper regions are exceeding 4 ^{o}C early in the year, thus warming at the fastest rate. This rapid warming of areas that have previously been cool could have large implications for the cold-water species that inhabit these regions.

The team on White Shoal Lighthouse, Lake Michigan

These findings are a surprise because we tend to think of such a tremendous volume of water as being resistant and resilient to climate change with little inter-annual variably in water temperature, ice cover, evaporation, and water levels. Instead, we have observed large spatial and temporal variation in all of these properties. Over the past eight years of measurements, no two years have been alike, and there will likely be many more surprises revealed as we continue this research.

Barbara "Babs" Buttenfield
Scientific and Societal Applications of Geospatial Science

My research is known primarily for developing methods for building geospatial data that scientists and laypeople can use for mapping and analysis at multiple scales and resolutions. I design algorithms that modify levels of detail in data content, geometry, and appearance, especially in terrain and hydrography. The challenge is to simplify details without corrupting geographic meaning, for example, to protect evidence of erosion or glaciation in stream channel geometries, and to protect geomorphologic structures (ridges and valleys) in terrain. Because rainfall and terrain roughness vary from one landscape to the next, the algorithms we design are tailored to account for variations that can affect stream characteristics, protecting stream sinuosity in hilly regions, density of swamps and small lakes in flatter areas, the right-angled canals and irrigation ditches in the agricultural Midwest, and channel connectivity in drier parts of Utah and Colorado. I work with hydrologists, geologists, and geostatisticians in most projects, and increasingly work with software engineers using parallel processing on high-performance ("super") computers. It would be impossible to build these data by myself. Since 2008, I've worked with USGS to develop multi-scale versions of the National Hydrography Dataset (NHD), an open-source vector database representing all of the surface water (streams, canals, flumes and rapids, lakes, ponds, reservoirs, swamps and marshes) in the U.S. 48 states. Any newsletter readers who use topographic maps have used NHD data.



NHD data generalized from 1:24,000 (the scale of a common topographic map) down through a sampling of smaller scales, reaching 1:10 million (the scale of a state atlas). The data shows an area around Des Moines, Iowa. Naturally occurring density differences are apparent, and higher in the glacial till terrain in the south as compared to the glacial lake bed to the north. The data processing preserves density across larger scales, for realistic analysis and mapping.

I also do research on integrating and harmonizing demographic databases such as the American Community Survey (ACS) data with the Public Use Microdata Sample (PUMS). Here again, my collaborators include domain experts (demographers and geostatisticians). ACS data is aggregated to fine spatial scales, but lacks the rich socioeconomic attributes contained in PUMS data. We perform a probabilistic method to allocate attributes to ACS tracts or block groups while preserving anonymity of individuals. We are also working to project census population counts through time, accounting for inevitable changes in census enumeration boundaries. This work attracted the attention of the

U.S. Census Bureau, who asked me to join the Census Scientific Advisory Committee, consisting of 20 demographers, economists, geospatial scientists, statisticians, and business leaders, who advise the Census senior management about emerging trends and methods that can facilitate and automate collection of census information nationally. I am in my second three year term now; we meet twice per year in Washington and participate in monthly web conferences to hear briefings and see software demonstrations about ongoing efforts with demographic, economic, labor and health statistics data collection and processing for the United States.

Members of Census Scientific Advisory Committee meeting attending a meeting at the U.S. Census Bureau, Washington D.C., April 2016. Dr. Buttenfield, left/front row.

Tom Veblen has been recognized as one of two 2016 Distinguished Research Lectureship honorees. The Distinguished Research Lectureship is among the highest honors bestowed by the faculty upon a faculty member at CU Boulder. Each year, the Research & Innovation Office requests nominations from faculty for this award, and a faculty review panel recommends one faculty member as a recipient. The lectureship honors a tenured faculty member widely recognized for a distinguished body of academic or creative achievement and prominence, as well as contributions to the educational and service missions of CU Boulder.

Tom Veblen conducting a class field trip

Thomas T. Veblen is a College of Arts & Sciences Professor of Distinction in the Geography Department at the University of Colorado Boulder, where he has graduated 30 PhDs since joining CU in 1981. From 1975 to 1979 he was on the faculty of the Forestry School of Universidad Austral de Chile, and from 1979 to 1981 he was a Research Fellow at the Forest Research Institute in New Zealand. His research focuses on disturbance

ecology in the context of climate change and human impacts on temperate forest ecosystems in North America and South America. Since 1975 he has conducted field-based research on the dynamics of Patagonian-Andean forests in Chile and Argentina and comparative studies of similar forests in New Zealand.

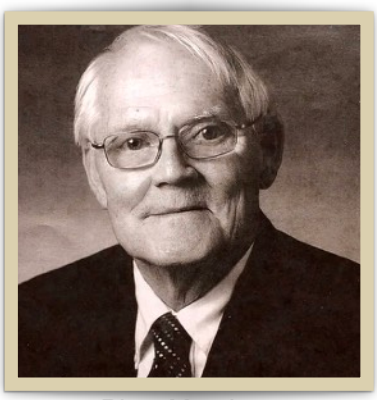
Tom Veblen coring on a class field trip

In the U.S. Rocky Mountains his research uses tree-ring reconstructions to examine the long-term history of wildfire and bark beetle outbreaks in the context of changing climate. He was awarded a John Simon Guggenheim Memorial Fellowship in 1985, elected an Honorary Fellow of the Royal Society of New Zealand in 1991, and named a Fellow of the American Association for Advancement of Science in 2008. He has long been engaged in extensive public outreach efforts to promote science-based decision making in forest management policy and adaptation to climate change.

Title of talk: "Wildfire regime shifts in Patagonian-Andean forest ecosystems: feedbacks and consequences in the face of climate and land-use changes" April 25, 2017 4-5 PM, Glenn Miller Ballroom, UMC.

Dr. Seth Spielman, a recently tenured member of the Geography Department, recently received an award for distinguished scholarship from the American Association of Geographers, Regional Development and Planning Specialty Group. Seth received the award for his work on the national statistical system. Seth spent the past few years working on the American Community Survey (ACS), which measures things like household income, education, family structure, etc. As the largest national demographic and economic survey the ACS is used by the Federal government to allocate $400-500 Billion in spending each year. The ACS is also used by state and local governments to plan and allocate resources. Businesses use the ACS for a variety of purposes branding from site location to marketing. The ACS is a data set that has direct impact on people's lives. However the ACS has some data quality problems that Seth and his colleagues are working to address.

Seth and an international research team have developed open source algorithms to improve the estimates from the ACS, developed new derived data sources that make it easier to use the data, and written papers that provide guidance to users of the ACS data. Seth's work is getting national and international attention as he's been invited to speak about his work on the ACS at the Royal Society in London and the National Academy of Science in Washington, DC. To see some of the Seth's work, check out an open source market segmentation based on the ACS that is now being distributed by carto.com (https://carto.com/blog/demographic-clusters-segmentation-data-observatory/) or check out his team's software on GitHub (https://github.com/geoss/ACS_Regionalization).



Risto Marttinen
CU Geography 1962

An update from alumnus **Risto Marttinen**, CU '62, M.A. Kansas State University '65, Russian & Soviet Studies, Washington University 1980's: Thank you for the letter on department progress. I expected some improvements since I graduated from CU in 1962. Well done! Since coming to America from Finland and Sweden as a war refugee in 1947, I too have made some progress. We, a family of 5, arrived with excellent winter clothing (not much else) to Brooklyn NY. I revisited Finland this summer for a month, saw my relatives' and grandparents' graves. We left in 1945 due to Stalin and Soviet pressure. Today it amazes me there is another Russian cause and worry in Finland, Vladimir Putin. He visited also in a continuing effort against Finland joining NATO. The Finns are quite accustomed to this from thousands of years acquaintance with their unruly neighbor of great size. I have a daughter and grandchildren here. The oldest boy is an Eastern Kentucky University grad and in Police Academy. The younger boy, 19, is into electronics, and the 16-year old girl has been driving my car with her learner's license and is doing well. Recently, I competed in Kentucky Senior Games at Centre College, Danville. I threw javelin, discus and shot. I recommend senior games to all men and women age 77.

Mehran Ghandehari, doctoral student, has been selected to receive a $1500 GIS Colorado Scholarship for 2016.

Robbie Andrus was awarded a National Science Foundation Doctoral Dissertation Research Improvement (DDRI) grant. The award will support his dissertation research project titled "Assessing regeneration niche limitations to upslope migration of subalpine forests: Implications of a changing climate and shifting disturbance regimes".

Geography students conducted water sampling and offer training in Central Asia this past summer. Graduate students **Alice Hill** and **Alana Wilson** conducted physical hydrologic field methods training and data collection in Tajikistan and Kyrgyzstan, Central Asia, in summer 2016. The objective of the water sampling field methods is to use the unique chemistry signatures of different source waters to estimate how much snowmelt and glacier melt each contribute to river discharge.

Aaron Malone, doctoral student, was awarded Community Based Research Fellowship through CU Engage. The Community Based Research fellowship through CU Engage supports a cohort of graduate students doing collaborative research with community partners for mutually beneficial exchange of knowledge and resources in a context of partnership and reciprocity. Aaron will partner with the Denver Federation of Zacatecan Clubs for research titled: "Hometown associations and transnational engagement in Denver's Mexican immigrant community."

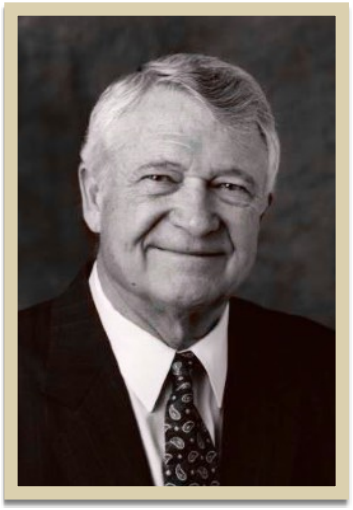
Eric Lovell, doctoral student, received the Daniel E. Salmon Scholarship. The scholarship supports non-veterinary students to work with the Animal and Plant Health Inspection Service Veterinary Services (APHIS-VS) of the U.S. Department of Agriculture. As a scholarship recipient, Eric will work with the APHIS-VS Sheep, Goat, Equine and Cervid Health Center to manage endemic and emerging livestock diseases and diseases in wildlife that impact livestock and to analyze and respond to animal health emergencies.

Thank You! The Department of Geography is grateful to its alumni and friends for their financial support over the years. Our donors have had a big impact, making a difference not only to the Department as a whole, but to the lives of many individual students. There is always a real need for funds to support academic departments. As we strive for higher standards and more and better opportunities for our students, we depend on the caring and generous nature of alumni and friends like you to meet these ever increasing financial needs. Your gift to the Department of Geography can take many different shapes. The information below may help you find the type of gift that best meets your needs, the impact you want, and the way you want to give. The CU Foundation can also assist you with your needs, be they for targeted or unrestricted programs.

Geography Department Fund

This fund is for academic support in the broad sense. If giving online and you want your gift to go to a specific scholarship, please provide scholarship name in the "Comments" section.

GIVE NOW Go online to: giving.cu.edu/fund/geography-department



A. David Hill

Undergraduate Scholarship Programs

A. David Hill Scholarship Fund

Established by Richard L. Knowlton, Professor Hill's former teammate and friend, and recently endowed by Myhra and Graham Hill, his wife and son. Applicant must be a Geography major, and have a minimum GPA of 3.0 in Geography, with a preference for those with interests in the environment-society relationship. Award is based on merit and demonstrated financial eligibility.

GIVE NOW Go online to: giving.cu.edu/fund/david-hill-endowed-scholarship-fund

Albert W. Smith Geography Scholarship

Established in 1983 to honor Professor Smith at his retirement from the Geography Department faculty after thirty-one years of service to the University. Applicant must be a full-time senior majoring in Geography. Award is based on academic performance.

GIVE NOW Go online to: giving.cu.edu/fund/albert-w-smith-geography-scholarship-fund

Karl and Barbara von Dreden Stacey Scholarship

Established by Katherine and Frank Baxter in honor of Katherine's parents, Barbara von Dreden (CU class of 1940) and Karl Stacey (CU class of 1936). This scholarship supports undergraduate students to engage in summer research with faculty. Preference given to applicants who are juniors or seniors majoring in Geography, and graduates from Colorado high schools. Award is based on academic performance.

GIVE NOW Go online to: giving.cu.edu/fund/karl-and-barbara-von-dreden-stacey-scholarship-fund

Theodore C. Myers Memorial Scholarship

Named in honor of long-time geography instructor Ted Myers. Scholarship is awarded to the undergraduate student with the most exceptional honors thesis.

GIVE NOW Go online to: giving.cu.edu/fund/theodore-c-myers-memorial-fund

Mable B. Duncan Scholarship Fund

To support scholarships for Geography majors at the University of Colorado Boulder, based on financial need.

GIVE NOW Go online to: giving.cu.edu/fund/mable-b-duncan-scholarship-fund

Graduate Scholarship Programs

Gary L. Gaile DART Graduate Fellowship in Geography

This fund, in memory of Professor Gary Gaile, provides a fellowship/scholarship for Geography MA and PhD students doing field research addressing social and environmental concerns in developing areas.

GIVE NOW Go online to: giving.cu.edu/fund/gary-l-gaile-dart-graduate-fellowship-geography

James A. and Jeanne B. DeSana Graduate Research Scholarship Fund

This fund provides invaluable support for graduate student research.

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Gilbert F. White Dissertation Fellowship

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Geography Graduate Student Support Fund

To provide support for graduate students in the Department of Geography at the University of Colorado Boulder. Support may include research support and equipment purchases. Gifts to this fund can be made in memory of (IMO) **Jennifer Dinaburg**. Jennifer, a vibrant, active doctoral candidate in the Geography department, passed away on April 26, 2012 at the age of 31. In her memory, the department has established a small, named fellowship for doctoral field research.

Jenn was passionate about geography in many forms: through the environment, the outdoors, and through learning about China. After studying Chinese language and literature at Connecticut College, she traveled and worked extensively on the Tibetan Plateau. After a degree in environmental studies at Prescott College, her journey brought her to the Geography PhD. program in 2008 to study the commercialization of Tibetan medicinal plants in China's northwest Yunnan province. Jenn brought a love of mountains, travel, and unconventional learning to the department, where she was well loved for her sense of humor, wit and spirit.

Jennifer Dinaburg

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