

Global Change and the World's Mountains

Perth • Scotland • 26-30 September 2010



UNESCO Chair
in Sustainable Mountain Development

Global Change and the World's Mountains

Perth Concert Hall – Horsecross

Perth, Scotland, UK

27-30 September 2010

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Programme overview

Monday 27 September

Plenary Session

Chair: James Fraser, Principal, UHI Millennium Institute, UK

09.30	Welcome to the Highlands & Islands	Rhythm Wave and Aileen Ogilvie	
09.40	Welcome to Perth	Martin Price, Perth College UHI, Scotland	&PTHPL11
09.55	Introductory Remarks	Rolf Weingartner, Chair, Mountain Research Initiative	&PTHPL11
10.10	Opening Speech	Roseanna Cunningham MSP, Minister of Environment, The Scottish Government	&PTHPL11
10.30	Coffee		

Chair: Thomas Hofer, Food and Agriculture Organization of the United Nations

11.00	The role of mountains in atmospheric circulation	Toshio Koike, University of Tokyo, Japan	&PTHPL12
11.30	Water connects all: Mountain hydrology in a watershed context	Anne Nolin, Oregon State University, USA	&PTHPL12
12.00	Questions		&PTHPL12
12.15	Lunch		
13.45	Parallel sessions 1		
15.45	Coffee		
16.15	Parallel sessions 2		
18.30	Poster session and reception		

Parallel sessions 1

<i>Location</i>	<i>Session Title</i>
Tilt	1.1 Progress in multiproxy climatic reconstructions in the mountains
Museum	1.2 Changes in mountain biodiversity 1
Gannochy	1.3 Plant invasions in mountains 1

Norie-Miller 1	1.4 Integrated mountain observing systems
Norie-Miller 2	1.5 Impacts of global change on mountain hydrology 1
Earn	1.6 Amenity-based mountain change and development in an era of increased global uncertainty
RSGS	1.7 Resilience and adaptation of socio-ecological mountain systems to global change

Parallel sessions 2

<i>Location</i>	<i>Session Title</i>
Tilt	2.1 High-elevation climate
Norie-Miller 1	2.2 Effects of climatic change on natural disturbance regimes
Museum	2.3 Changes in mountain biodiversity 2 – Focus on climate change drivers
Gannochy	2.4 Plant invasions in mountains 2
Norie-Miller 2	2.5 Impacts of global change on mountain hydrology 2
Earn	2.6 Sustainable tourism and resort development in mountain environments
RSGS	2.7 Mountain biocultural diversity: social scientific approaches to change

Tuesday 28 September

Plenary Session

Chair: Axel Borsdorf, University of Innsbruck / Austrian Academy of Sciences

08.45	Mountains as global common goods?	Bernard Debarbieux, University of Geneva, Switzerland; Martin Price, Perth College UHI, UK	&PTHPL21
09.15	Economic globalisation in mountain regions	David Barkin, Universidad Autónoma Metropolitana, Mexico	&PTHPL21
09.45	Slow mountains: Bridging the gap between contextuality and globalised agendas in mountain development	Peter Messerli, University of Bern, Switzerland	&PTHPL21
10.15	Questions		&PTHPL21
10.30	Coffee		

Chair: Olga Solomina, Institute of Geography, Russian Academy of Sciences

- 11.00** Water shortages in arid central Eurasia - a consequence of climate change or human activities? Masayoshi Nakawo National Institutes for the Humanities, Japan &PTHPL22
- 11.30** Changes in climate over the last several hundred years based on ice cores in Asia, South America, Yukon Territory, Antarctica and Greenland Paul Mayewski, University of Maine, USA &PTHPL22
- 12.00** Questions &PTHPL22
- 12.15** Lunch
- 13.45** Parallel sessions 3
- 15.45** Coffee
- 16.15** Parallel sessions 4
- 19.30 Public event and reception:
Scotland's National Parks: Whose Parks are they anyway?**

Parallel sessions 3

<i>Location</i>	<i>Session Title</i>
Tilt	3.1 Changes in climate along altitudinal transects
Gannochy	3.2 Impacts of climate change on mountain ecosystems 1
Museum	3.3 Changes in mountain biodiversity 3 – Focus on land use change drivers
Norie-Miller 1	3.4 Changes in and responses to mountain hazards
Norie-Miller 2	3.5 Impacts of global change on mountain hydrology 3
RSGS	3.6 Mountain Biosphere Reserves as learning sites for research, adaptation and mitigation in the context of global change
Earn	3.7 The consequences of economic and cultural globalisation

Parallel sessions 4

<i>Location</i>	<i>Session Title</i>
Gannochy	4.1 Impacts of climate change on mountain ecosystems 2
Museum	4.2 Past, present and future land use in mountain regions 1: Land use, biodiversity and ecological processes

Parallel sessions 5

<i>Location</i>	<i>Session Title</i>
Tilt	5.1 Changes in the mountain cryosphere 1
Gannochy	5.2 Impacts of climate change on mountain ecosystems 3
Norie-Miller 1	5.3 Changes in mountain soils
Museum	5.4 Past, present and future land use in mountain regions 2: Socio-economic and governance aspects; climate feedback
Norie-Miller 2	5.5 Integrated water resource management in mountain regions 2
Earn	5.6 Demographic changes in mountain regions
RSGS	5.7 Knowledge systems and mountain sustainability concerns

Parallel sessions 6

<i>Location</i>	<i>Session Title</i>
Tilt	6.1 Changes in the mountain cryosphere 2
Gannochy	6.2 Impacts of climate change on mountain ecosystems 4
Norie-Miller 1	6.3 Changes in aquatic mountain ecosystems
Museum	6.4 Past, present and future land use in mountain regions 3: Reconstructing land use and its implications at various time scales
Norie-Miller 2	6.5 Adaptations of mountain communities to changing hydrologies
Earn	6.6 Urban-rural linkages in and around mountain areas
RSGS	6.7 Approaches to change: The potential of regionalized analyses for mountain development and policy support

Thursday 30 September

Plenary session

Chair: Greg Greenwood, Mountain Research Initiative

09.00	Emerging themes for global change research and sustainable development		&PTHPL41
	Introduction	Thomas Kohler, University of Bern, Switzerland	
	The 'State of the Art' of Global Change Research in mountains	Martin Price, Perth College UHI, UK	
	Emerging themes for future research:		
	• Ecological perspective	Eklabya Sharma, ICIMOD, Nepal	
	• Socio-economic perspective	Jörg Balsiger, ETH Zurich, Switzerland	
	• Integrative perspective	Jill Baron, US Geological Survey	
	Finding the high ground in global change research	Richard Aspinall, Macaulay Land Use Research Institute, UK	
	Closing comments	Greg Greenwood, Mountain Research Initiative	

10.00 Coffee

Chair: Martin Price, Perth College UHI, Scotland

10.30	Global Concerns in a time of Global Change: Where are we coming from, where are we going to?	Bruno Messerli, University of Bern, Switzerland	&PTHPL42
11.00	Mountains on the road to Rio+20 and beyond		&PTHPL42
	The Rio+20 process and the inclusion of mountain issues		
	Panel discussion, leading to specific proposals on the way forward		
	Discussion		
	Conclusions		
12.00	Closing remarks		&PTHPL42

Parallel sessions

Monday 27 September, 13:45 – 15.45

1.1 PROGRESS IN MULTIPROXY CLIMATIC RECONSTRUCTIONS IN THE MOUNTAINS

Venue: Tilt – Twitter Code: &PHTPA115

Chair: Olga Maximova, Russian Academy of Sciences

Rosanne D'Arrigo	Tree-ring indicators of temperature from Mongolia's elevational treeline
Ivan Kalugin	Annual climate time series reconstructed by combined geochemistry of lake sediments and tree-ring width data in the Altai Mountains
Brian H. Luckmann	Glacier fluctuations in the southern Andes (17°-55°S) during the past millennium
Atle Nesje	Holocene fluctuations of mountain glaciers in Scandinavia
Kurt Nicolussi	Evidence for long lasting glacier retreat periods in the European Alps during the early and middle Holocene
Lothar Schulte	Floods and Global Change in high mountain environments: a 4500-year multi-proxy record from the Swiss Alps.
Olga Solomina	Holocene glacier fluctuations and their potential forcings
Marc Oliva	Late Holocene reconstruction of landscape changes in Sierra Nevada from sedimentary records and documentary sources

1.2 CHANGES IN MOUNTAIN BIODIVERSITY I

Venue: Museum – Twitter Code: &PHTPA116

Chair: Eva Spehn, Global Mountain Biodiversity Assessment

Anne Dubuis	Predicting Spatial Patters of plant species richness: A comparison of direct and indirect and species assembly approaches
Sonja Wipf	Increasing plant biodiversity on summits at the upper limit of alpine grasslands and heaths
Pablo Gonclaves	Quaternary climatic changes and diversification on mountaintops in the Brazilian Atlantic forest: the case of Neotropical small rodents
Markus Didion	Ungulate herbivory modifies the effects of climate change on mountain forests
Louisa Willcox	The Collapse of a Foundational Species: Whitebark Pine and the Future of Rocky Mountain Ecosystems
Jalil Noroozi	The subnival-nival vascular plant species of Iran: a unique high-mountain flora and its threat from climate warming
Ghazala Nasim	Mapping of mycorrhizal mushrooms in Himalayan Mountain ranges

1.3 PLANT INVASIONS IN MOUNTAINS

Venue: Gannochy – Tweet: &PHTPA111

Chair: Christoph Kueffner, ETH, Switzerland

Catherine Parks	Plant Invasions in Mountains
Tim Seipel	Biogeographic comparisons of non-native plant invasions in mountains: Processes at multiple spatial scales influence richness and similarity
Keith McDougall	Management of plant invasions in mountains in a changing world
Jeanne Chambers	Resistance of semi-arid mountain landscapes of the western USA to invasion by the non-native annual grass, <i>Bromus tectorum</i>
Richard Mack	Naturalization/invasion of ornamental bamboos in montane forests in the Western United States: the potential for multiple environmental hazards
Fred Pollnac	Factors affecting the current range limits of <i>Linaria dalmatica</i> in a mountainous area of the Northwest United States
Pervaiz Dar	Assessment of richness and abundance of native and non-native plant species across different habitats in the Kashmir Himalaya, India
Katherine Pickering	Plant invasions, tourists and climate change

1.4 INTEGRATED MOUNTAIN OBSERVING SYSTEMS

Venue: Norie-Miller 1 – Twitter Code: &PHTPA112

Chair: Heidi Stelzer, Natural Resource Ecology Laboratory, USA

Emil Wielgolaski	Effects of climate change in Fennoscandia on phenology, growth and survival of mountain birch populations and on vegetation change above tree line
Patrick Fritzmann	Airborne LiDAR based surface classification of the high mountain region at Hintereisferner, Tyrol
Heidi Stelzer	Seasons and life cycles: a conceptual framework and low-cost instrumentation for automated monitoring of plant community life histories in alpine landscapes
Helmut Franz	Berchtesgaden National Park and Biosphere Reserve – Observatory for Climate Change Research (Bavaria, Germany)
Rob Blair	Earth System Observation Network (ESON)
Linda McMillan	Citizen Scientists: Helping to Transform the Mountain Protection Paradigm
Jordan Stamenov	Complex Environmental Studies at BEO

1.5 IMPACTS OF GLOBAL CHANGE ON MOUNTAIN HYDROLOGY 1

Venue: Norrie-Miller 2 – Twitter Code: &PHTPA113

Chair: Daniel Viviroli, University of Bern, Switzerland

Wolfgang Schoener	Glaciers in the water cycle of the European Alps under a changing climate
Francesca Pellicciotti	Effect of glaciers on streamflow trends
Antoine Bard	Observed trends in the hydrologic regime of Alpine catchments
Luzi Bernhard	Assessing daily climate model simulations across Switzerland
Gabriele Kraller	Modelling the water balance in the Berchtesgaden Alps (Bavaria, Germany)
Andreas Gobiet	Climate Scenarios for Small-Scale Climate Change Impact Studies in the European Alpine Area: How Reliable are They?
David Finger	The value of glacier mass balances, satellite snow cover images and hourly discharge on calibration of a physically based, fully distributed hydrological model
Bodo Ahrens	Regional Climate Projections in Alpine River Basins: Upper Danube and Upper Brahmaputra

1.6 RESILIENCE AND ADAPTATION OF SOCIO-ECOLOGICAL MOUNTAIN SYSTEMS TO GLOBAL CHANGE

Venue: RSGS – Twitter Code: &PHTPA117

Chair: Julia A Klein, Colorado State University, USA

Claudia Binder	Transitions in pasture management in mountainous regions: a socio-ecological systems perspective.
Michelle Haynes	Tibetan Yak Herders - A Tale of Changing Traditions and Changing Climates
Julia Klein	Vulnerability on the Roof of the World: Social-Ecological Resilience to Climate Change and Grassland Policies on the Tibetan Plateau
Henri Rueff	Coping with Uncertain Livelihoods in Mountains: Landless Mobile Pastoralists Adaptation to Climate Change in the Himalayan Hindukush Mountains of Northern Pakistan
Swati Thakur	Climatic variability and agricultural land use change: A case study of Doon valley, India
Ian Soane	Using Panarchy models to compare the nature conservation dynamics of upland, sub-alpine and alpine pastures in case study areas in Cumbria, England and Trentino, Italy.

1.7 AMENITY-BASED MOUNTAIN CHANGE AND DEVELOPMENT IN AN ERA OF INCREASESD GLOBAL UNCERTAINTY

Venue: Earn – Twitter Code: &PHTPA114

Chairs: Romella S. Glorioso & Laurence A.G. Moss, International Amenity Migration Centre (IAMC),
Canada & USA

Romella Glorioso	Values, Behaviour & Motivations for Mountain Eco-living: The Amenity Migrants
Niels Martin	Amenity migration and post-tourism in the French Alps: a basis for reconversion and transition for tourist and rural regions?
Peter Klepeis	‘Amenity Migration’ and Hobby Ranching in Southern Patagonia
Rodrigo Gonzales	Understanding and managing sustainable competitiveness and amenity led migration in mountain tourist destinations. A comparative study of Canadian and Argentinean mountain destinations
Paulina Chaverri	Good deeds gone bad? Understanding failure, promoting success in local land use policy and systems: a comparative case study Costa Rica and Bath County, VA
Jerry Johnson	Destination mountain resorts sustainability after global financial collapse
Ryan Bergstrom	Conceptualizing Sustainability in Two Amenity-driven Communities of the Greater Yellowstone Ecosystem, North America.
LornaStefanick	The path to progress lost? Planning for amenity migration in Canadian mountain communities

Monday 27 September, 16:15 – 18:15

2.1 HIGH ELEVATION CLIMATE

Venue: Tilt – Twitter Code: &PHTPA125

Chair: Gianni Tartari, Ev-K2-CNR, Italy

Mikhail Makarov	Micro-climate in alpine ecosystems of the Northern Caucasus
Peter Nojarov	Variations in precipitation and atmosphere circulation in high mountainous parts of Bulgaria for the period 1947 – 2008
Margarita Syromyatina	Climate changes in the Altai Mountains and mountain landscapes response
Maria Shahgedanova	High elevation climate change in the Caucasus and in the mountains of Siberia: observations and projections using PRECIS RCM
Jose Vergara	Climate Change in the Chilean Andes mountains
Emma Ward	Spatial variability of rainfall in a tropical, data sparse, mountainous region
Gianni Tartari	How to establish whether the global climate is changing with few reliable measurements from mountain regions?

2.2 EFFECTS OF CLIMATIC CHANGE ON NATURAL DISTURBANCE REGIMES

Venue: Norie-Miller 1 – Twitter Code: &PHTPA122

Chair: Don McKenzie, US Forest Service

Jeremy Littell	Climate and wildfire: an integration of vegetation, hydrology, and fire disturbance
Crystal Raymond	The Effects of Climate-driven changes in fire regimes on carbon dynamics in a forested region of Washington, U.S.A.
William McFarlane	2009 Assessment of whitebark pine overstory mortality in the mountain areas of the Greater Yellowstone Ecosystem and the associated ecological implications
Dan Fagre	Snow avalanches and disturbance in a changing climate
Craig Allen	Climate and Synergistic Interactions Among Forest Die-off, Fire, and Erosion in Southwestern Mountains (USA)
Paul Hessburg	Resilience in Natural Wildfire Systems: Relevance for Climate Change and Future Mountain Landscapes
Jesus Ramirez	Levels of tropospheric ozone in some mountainous and non-mountainous areas of the Caribbean and Central America linked with climatic change
Douglas Fox	Climate, MegaFires and MegaCity Air Quality

2.3 CHANGES IN MOUNTAIN BIODIVERSITY II – FOCUS ON CLIMATE CHANGE DRIVERS

Venue: Museum – Twitter Code: &PHTPA126

Chair: Katherine Dickinson, University of Otago, New Zealand

Robin Engler	Climate change threatens mountain flora unequally across Europe
Antoine Guisan	Can we predict communities from the individual response of species to climate?
Daniel Scherrer	Topography controlled niche differentiation buffers alpine biodiversity against climate warming impact
Rory Hodd	Climate change impacts on montane heath and bryophyte communities of the mountains of western Ireland
Ramona Maggini Lehmann	Predicting future ranges for breeding birds in Switzerland as a consequence of climate and land use change
John Calladine	Seasonal variation in the apparent abundance of breeding birds in arctic-alpine habitats in Scotland: Implications for monitoring the effects of environmental change
Thomas Wohlgemuth	Post-fire vegetation dynamics along a 1200 m long elevational gradient in central-Alpine Switzerland
Diane Debinski	Montane Meadow Biodiversity Changes During Drought: A Window into the Future?

2.4 PLANT INVASIONS IN MOUNTAINS

Venue: Gannochy - Twitter Code: &PHTPA121

Chair: Lisa J. Rew, Montana State University, USA

Chritoph Kueffner	Will the risk of plant invasions into the European Alps increase with climate change?
Sylvia Haider	Climatic limits of non-native plant distributions along elevation gradients
Jake Alexander	Genetic and plastic responses of non-native plants along altitudinal gradients
Eric Meineri	Effect of alpine/lowland species interactions on the current and projected geographical distributions of alpine plants
Susanne Venn	Marching up the mountain? Mechanisms of high altitude woodland expansion into the Australian alpine zone
Isla Myers-Smith	Ecological Impacts of Shrubline Advance in Alpine Tundra
Ann Milbau	Invasibility of subarctic plant communities along an altitudinal gradient in northern Sweden

2.5 IMPACTS OF GLOBAL CHANGE ON MOUNTAIN HYDROLOGY 2

Venue: Norrie-Miller 2 – Twitter Code: &PHTPA123

Chair: Daniel Viviroli, University of Bern, Switzerland

Jean-Pierre Dedieu	Snow cover monitoring in upper Rhone and Po river basins: Retrieval and Validation from 10-years of MODIS data for hydrological modeling
Abdul Laghari	Climate change and future water availability: a sensitivity analysis of ground water recharge and stream flow to regional climate change scenarios
Annett Wolf	Impacts of global change on mountain hydrology – the consequences of tree species-specific drought responses
Hayley Fowler	A vertical hydroclimatology of the Upper Indus Basin and the potential for hydrological change
Mark Williams	Assessing the current contribution of snow- and ice-melt to streamflow in the Eastern Himalaya using remote sensing and isotopic analysis
Zhongqin Li	Study on recent glacier changes and their impact on water resource in Xinjiang, northwestern China

2.6 SUSTAINABLE TOURISM AND RESORT DEVELOPMENT IN MOUNTAIN ENVIRONMENTS

Venue: Earn – Twitter Code: &PHTPA124

Chair: Harry Measure, Harry Measure Associates, Canada

Sahana Bose	Problem of Sustainable Tourism and Development of Resorts in Darjeeling Town, India: A perspective.
Venugopal Dharmalingam	Tourism and Tourist Resorts Conflict in the Nilgiri Mountains of South India
Bruno Abegg	The challenge of sustainable climate change adaptation in Alpine winter tourism
Carla Silva	Tourist's perception of mountain destinations
Nilufer Gurer	The Tourism Potentials of Mountain Regions and the Insufficiency of Valuing Them
Stella Giannakopoulou	Valuing vernacular architecture: An innovative tool in sustainable tourism and development in mountain regions
Cesare Micheletti	Negotiating landscape diversity and tourism development. Two projects into the Dolomites'
Harry Measure	Planning and Development Considerations to Achieve Mountain Resort Sustainability

2.7 MOUNTAIN BIOCULTURAL DIVERSITY: SOCIAL SCIENTIFIC APPROACHES TO CHANGE

Venue: RSGS – Twitter Code: &PHTPA127

Chair: Will Tuladhar-Douglas, Scottish Centre for Himalayan Research, University of Aberdeen, UK

Fausto Sarmiento	Páramo Onomastics and other Misnomers in the Construction of Faulty Andeanity and Weak Andeaness during changing times
Constanza Ceruti	Global Change and the Sacred Andes Mountains
Cristina Orsatti	Adaptation strategies in mountain regions. The relation between local knowledge, development practices and global survival in Val di Ledro, Trentino: towards a sustainability” assessment
Natalia Shovkolpias	The Methodology of Cultural, Historical and Social Topography (CHST) as a precondition for the preservation and maintaining of natural, historical and cultural identity and diversity in the mountain areas
Jan Salick	Himalayan Climate Change and Ethnobotany
Maitreyee Choudhury	Common resources and culture of shifting cultivation among the Himalayan tribes
Ranju Pandey	Climate Change and Its Impact on Child Health
Manohara Khadka	Food Security Discourse in Nepal: Missing Social Realities

Tuesday 28 September 13:45 – 15.45

3.1 CHANGES IN CLIMATE ALONG ALTIDUDINAL RANGES

Venue: Tilt – Twitter Code: &PHTPA235

Chair: Ray Bradley, University of Massachusetts, USA

John Coll	Climate change and Europe's mountain regions: an overview and case studies at the edge
Nick Pepin	Changing Climate at High Elevation Stations: A Global Perspective
David Schimel	NEON: Not just the National Flat Places Network
Bente Jessen Graae	Do weather station generated data reflect the microclimate along an altitudinal gradient?
Intiaz Rangwala	Examining climate change in the Colorado Rocky Mountains from high resolution climate models
Fabia Huesler	A 25 year snow cover time series over the European Alps derived from AVHRR satellite data.
Ninglian Wang	Study on the Zone of Maximum Precipitation in the North Slope of the Central Qilian Mountains, China
Raphael Dulhoste	Effects of temperature-radiation interactions on CO ₂ assimilation in tropical treeline species.

3.2 IMPACTS OF CLIMATE CHANGE ON MOUNTAIN ECOSYSTEMS 1

Venue: Gannochy – Twitter Code: &PHTPA231

Chair: Georg Grabherr, IGF and GLORIA, Austria

George Malanson	Descriptive and theoretical contexts for alpine plant community dynamics
Thomas Fickert	Myths and facts from glacier forelands - A survey of primary succession on recently deglaciated terrain in the Eastern Alps
Brigitta Erschbamer	Short-term signals of climate change in the Dolomites (SAIps, Italy)
Michael Gottfried	European high mountain vegetation shifting towards more thermophilic species compositions
Leopold Füreder	Alpine river ecosystems – indicators of climate change
Willem Ferguson	Long term altitudinal change in vegetation at Mariepskop, South Africa, over 70 years and botanical indicators for detecting global change.
Ho-Yih Liu	High Mountain Vegetation Change in Taiwan
Christophe Randin	Modelling the effect of changing snow cover regimes on alpine plant species distribution

3.3 CHANGES IN MOUNTAIN BIODIVERSITY III – FOCUS ON LAND USE CHANGE DRIVERS

Venue: Museum – Twitter Code: &PHTPA236

Chair: Thomas Wohlgemuth, Swiss Federal Institute for Forest, Landscape and Snow Research

Andrea Britton	Drivers of biodiversity change in British alpine habitats
Lita Patty	Effects of grazing and fire on biomass productivity and diversity of herbaceous species in the Bolivian Altiplano
Martin Dovčiak	Forest management changes microclimate and bryophyte diversity in the Cascade Mountains of western Washington
Bob Nakileza	Changes in alpine plant species composition and distribution in the Rwenzoris, Uganda
Fang Zhengdong	Turbid water effect of plant communities
Peter Gajdos	Changes in composition of epigeic invertebrate communities (with accent on spiders) in Carpathian alpine meadows influenced by added nitrogen and phosphorus
Annapaola Rizzoli	Climate change and biodiversity loss as drivers

3.4 CHANGES IN AND RESPONSE TO MOUNTAIN HAZARDS

Venue: Norie-Miller 1 – Twitter Code: &PHTPA232

Chairs: Ibrahim Gurer, GAZI University, Turkey & Christian Huggel, University of Zurich, Switzerland

Gordon Grant	From Atmospheric Rivers To Rivers Of Debris: Coupling Extreme Precipitation Events, Glacial Retreat, Debris Flows, And Channel Changes On Mount Rainier, Washington
Bill McGuire	Climate change as a driver of volcano lateral collapse
Martin Mergili	Glacier changes and related high mountain hazards in Tajikistan
Monique Fort	Natural hazards, road construction, increased vulnerability in the Nepal Himalayas: what future for a developing country?
Stefan Kienberger	Comparison of flood vulnerability indicators in the Salzach catchment – Scale issues, relevance for spatial planning and climate change adaptation
Jeff Zukiwsky	Conducting Climate Change Risk and Vulnerability Assessments in Rural Mountain Communities in the Columbia Basin Region of Canada

3.5 IMPACTS OF GLOBAL CHANGE ON MOUNTAIN HYDROLOGY 3

Venue: Norie-Miller 2 – Twitter Code: &PHTPA233

Chair: Daniel Viviroli, University of Bern, Switzerland

Iris Stewart	Is there acceleration in streamflow timing trends across western North American mountains?
Thomas Caine	Recent hydrologic change in a Colorado alpine basin: an indicator of permafrost thaw?
Brian Luckman	Changes in 20th century streamflow regimes of the Bow and Athabasca Rivers, Alberta, Canada
David Clow	Influence of windblown dust on snowmelt timing in the Rocky Mountains, USA
Andrew Fountain	Variations in glacier retreat in the American West, implications for water resources
Stephanie Kampf	Sensitivity of soil moisture to terrain and snow cover at watershed to plot scales in the Rocky Mountain Front Range, Colorado, USA
Margaret Matter	Effects of changes in climate and modifications to land and water use over the 20th Century on complementary temperature and precipitation patterns for tributaries of the Upper Colorado River Basin
İbrahim Gürer	Hydroclimatology Of Sariz Creek Watershed, Located In Seyhan Basin, And Simulation Of The Snowmelt Runoff Using Remote Sensing And Geographic Information Systems (Mountain Watershed Case Study)

3.6 MOUNTAIN BIOSPHERE RESERVES AS LEARNING SITES FOR RESEARCH, ADAPTIATION, AND MIGITATION IN THE CONTEXT OF GLOBAL CHANGE

Venue: RSGS – Twitter Code: &PHTPA237

Chair: Yuri Badenkov, Russian Academy of Sciences

Rakesh Kumar Maikhuri	Climate Change Impact and Mitigation/Adaptation Strategies in Nanda Devi Biosphere Reserve (NDBR), Central Himalaya, India
Tatjana Yashina	Global Change in Katunskiy Biosphere Reserve: Vulnerability of ecosystems and Adaptation Strategy
Juliane Geyer	Carpathian Biosphere Reserve, Ukraine: proactive and strategic conservation planning under regional and global change
Mark Williams	The Niwot Ridge Mountain Biosphere Reserve: Tipping points in high-elevation ecosystems in response to changes in climate and atmospheric deposition

Yasmine Antonini	The conservation function of the Biosphere Reserve: the case of Espinhaço Mountain Range in Brazil
Luis Alfonso Ortega	Lessons learned on the achievement of the Joint Program of Climate Change Adaption in the Colombian Massif (Andean Belt Constellation Biosphere Reserve - Cauca Basin) with indigenous and peasant communities to affront the effects of climate change.
Karen Steenkamp	Initiatives from Biosphere reserves in South Africa to promote sustainable development
Yuri Badenkov	Biosphere Reserves as abutment piers in connectivity conservation and development in the Altai-Sayan ecoregion

3.7 CONSEQUENCES OF ECONOMIC AND CULTURAL GLOBALISATION

Venue: Earn – Twitter Code: &PHTPA234

Chair: Bernard Debarbieux, University of Geneva, Switzerland & Douglas McGuire, Mountain Partnership Secretariat

Joerg Balsiger	Varieties of sustainability: The local expression of a global norm
Jon Marco Church	The Ideology of Environmental Regionalism: the Challenge of the Alpine Convention and the “Strange Case” of the Andean Community
Fatima Gebrati	Globalisation begins with tourism in the marginalised area: the case study of the High-Atlas of Marrakech.
Gilles Rudaz	“Mountain Women”: Limits and hopes to their participation in the global mountain agenda
Mathilde Schmitt	Acceptance and relevance of gender (mainstreaming) aspects in Alpine protected areas
Deepak Khadka	Participatory Market Systems Development: Helping smallholder farmers in the mountains of Nepal and Perú access markets
Michael Kollmair	A Specific Value Chain Framework for Mountain Products in a Globalised Market
Kenny Lahcen	The Saffron of Taliouine: A miracle crop for small farmers in the Atlas Mountains of Morocco

Tuesday 27 September 16:15 – 18:15

4.1 IMPACTS OF CLIMATE CHANGE ON MOUNTAIN ECOSYSTEMS 2

Venue: Gannochy – Twitter Code: &PHTPA241

Session Chair: Brigitta Erschbamer, University of Innsbruck, Austria

David Butler	The Effects of Climate Change on the Zoogeomorphic Effects and Zoogeographic Distribution of Animals in the Alpine
Martha Apple	Phenology, the Seasonal Appearance of Plant Species, and Nitrogen-Fixing Microbes at the GLORIA Site in Southwestern Montana, USA
Mikhail Makarov	Nitrogen turnover in alpine lichen heath of the Northern Caucasus
Christian Rixen	Reduced early growing season freezing resistance in alpine treeline plants under experimental warming and elevated atmospheric CO ₂
Graziano Rossi	Seed banking conservation of alpine plants as a mitigation tool against the impacts of climate change
Ruth Toechterle	Using topographic and temperature data to model snow distribution at the alpine-nival ecotone

4.2 PAST, PRESENT AND FUTURE LAND USE IN MOUNTAIN REGIONS 1: LAND USE, BIODIVERSITY AND ECOLOGICAL PROCESSES

Venue: Museum – Twitter Code: &PHTPA246

Chair: Harald Bugmann, ETH-Zurich, Switzerland

Jonathan Mitchley	Biodiversity consequences of agricultural liberalization in Europe's mountain areas
Peter Bezák	Land use changes of different mountain landscapes in Slovakia
Kenneth Masuki	Integrated Natural Resource Management and its Implications to Agro-biodiversity Conservation in the Highlands of Eastern Africa
Annett Wolf	The relative importance of land use and climatic change in Alpine catchments
Ihor Soloviy	Towards sustainability in the Carpathian Mountains: some implications from Ukraine
Christine Wanker	Cultural landscape in South Tyrol (Italy) – An analysis of the changes and the perception of these changes since the 1950s

4.3 INTEGRATED WATER RESOURCE MANAGEMENT IN MOUNTAIN REGIONS 1

Venue: Norie-Miller 2 – Twitter Code: &PHTPA243

Chair: Wouter Buytaert, Imperial College London, UK

Chris Soulsby	Using tracers and transit times as tools in classifying and managing montane catchments
Roland Koeck	Hydro-meteorological dynamics at the tree line of a karstic drinking water protection zone
Bert de Bievre	A regional initiative for hydrological monitoring of high Andean ecosystems
Jean Christophe Pouget	High Mountain Catchments Modelling and Water Resources Planning in Quito (Ecuador) - Comparisons between different glaciohydrological models on Antizana stratovolcano
Nathan Forsythe	Avenues for improved assessment of accumulated snowpack in the Upper Indus Basin for use in operational forecasting
Amir Khan	Water resource development and conservation in Khari Gandhghar area tehsil Ghazi; Pakistan
Boplob Chakma	Impact of Climate Change and Scarcity of Water Resources in Rural Hilly Areas: Experiences from Project Implementation in Chittagong Hill Tracts, Bangladesh
Mushtaque Ahmed	Groundwater Demand Management in Al Jabal Al Akhdar Region of Oman by Utilization of Low Quality Surface Water

4.4 THE WESTERN MOUNTAIN INITIATIVE

Venue: Earn – Twitter Code: &PHTPA244

Chair: Dan Fagre, US Geological Survey

Jill Baron	Framework and Principles of the Western Mountain Initiative
Jeffery Hicke	Climate change in mountain ecosystems: Results from the Western Mountain Initiative
Don McKenzie	The Western Mountain Initiative III: Interactions, thresholds, and cumulative effects: how, when, and why might mountain ecosystems change rapidly or irreversibly?
Christina Tague	Forecasting and Futures: Spatial-complexity in scenarios of eco-hydrologic responses to warming in the Western US
David Peterson	Adapting to climate change through science-management partnerships

4.5 GLOBAL CHANGE IN THE AMERICAS CORDILLERA

Venue: RSGS – Twitter Code: &PHTPA247

Chair: Fausto Sarmiento, University of Georgia, USA

Lenkiza Angulo	Climate change impacts and adaptation in the Andes: integrating local perceptions
Brandilyn Gordon	Sustainability Education and Impending Climate Change: The Appropriation of Rurality by Globalized Migrants of Costa Rica
David Cotacachi	Assessing the economic value of water: a Contingent Valuation Approach in Tropical Mountains in Costa Rica
Eric Enrique Flores De Gracia	Importance of vegetation type on soil properties and water fluxes in a tropical mountain area, Panama
Dirk Hoffmann	Glacier monitoring in the Cordillera Apolobamba, Bolivia, by means of repeat photography
Karina Yager	Interpreting and monitoring dynamics of Andean peat bogs ...
Alejandra Martinez	Extreme meteorological events and risk management in the Andes of Peru
Elsa Nickl	Variability of land-surface precipitation estimates in the Central Peruvian Andes and Western United States

4.6 MONITORING GLOBAL CHANGE IN THE ASIAN MOUNTAINS

Venue: Norie-Miller 1 – Twitter Code: &PHTPA242

Chair: Eklabya Sharma, ICIMOD, Nepal

Eklabya Sharma	The HKH Transect Initiative: A regional framework for developing long-term environmental monitoring capacity
Daniel Maselli	Central Asian Mountains Monitoring Network: A Novel Initiative of the University of Central Asia
Lok Palni	Ecological Research and Long-term Environmental Monitoring in the Indian Himalayan Region
Shi Peili	Environmental monitoring and climate change research on the Tibetan Plateau of China
Gopal Rawat	Rangelands of Indian Trans-Himalaya: changing land use, conservation issues and monitoring strategies
Robert Zomer	Potential for Carbon Finance and Environmental Monitoring Requirements in the Landuse Sector for Mitigation and Adaptation in the Hindu Kush – Himalaya Region
Molly Brown	HIMALA: Climate Impacts on Glaciers, Snow and Hydrology in the Himalayan Region
Inam-ur-Rahim	From a Technocratic to a Custodianship Approach: Putting Herders at the Centre of Pasture Monitoring and Management in Kyrgyzstan

4.7 GLOBAL CHANGE IN THE ALPS: IMPACTS AND ADAPTATION

Venue: Tilt – Twitter Code: &PHTPA245

Chair: Daniela Hohenwallner, Institut de la Montagne, France

Wilfried Haerberli	New lakes in deglaciating high-mountain areas: climate-related development and challenges for sustainable use in the Swiss Alps
Hermann Klug	Experiencing regional impacts of climate change on the alpine mountain ecosystems using Geo Web Processing Services - Towards a Web GIS decision support tool for regions prone to water scarcity
Sylvia Kruse	Assessing the adaptive capacity of spatial planning to climate change impacts in Alpine countries.
Wolfgang Lexer	Concept and Process Design for Participatory Regional Vulnerability Assessments: Lessons learnt from Analysing Model Projects
Christian Reszler	Variations of groundwater recharge due to climate change in Southern Austria, case studies in mountainous areas and Alpine valleys
Stefan Schneiderbauer	A field-tested new approach for the evaluation of adaptive capacities within climate change vulnerability assessments
Klaus Wagner	Adaptation of agriculture to water scarcity in the alpine space – risk assessment
Marc Zebisch	From climate change scenarios to regional impact assessments – can climate impact research really help local decision makers in the Alps?

Wednesday 29 September 13:45 – 15:45

5.1 CHANGES IN THE MOUNTAIN CRYOSPHERE 1

Venue: Tilt – Twitter Code: &PHTPA355

Chair: Vladimir Aizen, University of Idaho, USA

Vladimir Aizen	The World Mountain Glaciers and Seasonal Snow Cover Changes after the “Little Ice Age”
Shiyin Liu	Glacier change in Tibetan Plateau during 1960s-2008
Byran Mark	Glacier Hydrological Transformation and Livelihood Vulnerability in the Cordillera Blanca, Peru: An Integrated Assessment
Pascal Bohleber	High elevation Alpine glaciers: A repository for long-term climate and environmental changes?
Maria Shahgedanova	Glacier change in the mountains of northern Eurasia: from the Polar Urals to eastern Siberia.
Eliza Vuillermoz	Contribution to the comprehension of climate change towards cryosphere and atmospheric analysis: the cases study of Changri Nup Glacier, Nepal Himalayas and of Forni Glacier, Italian Alps
Qinghua Ye	Monitoring glacier and lake changes from space in the Mt. Naimona’Nyi region of the Western Himalayas on the Tibetan Plateau.
Ben Brock	Investigating the melt response of debris-covered glaciers to 21st Century climate change.

5.2 IMPACTS OF CLIMATE CHANGE ON MOUNTAIN ECOSYSTEMS 3

Venue: Gannochy – Twitter Code: &PHTPA351

Session Chair: George Malanson, University of Iowa, USA

John-Arvid Grytnes	Upward elevational shifts in plants over an 86-year period in Sikkilsdalen, central Norway
Sebastian Leuzinger	A sink limitation module in a regional dynamic vegetation model to better predict the future alpine tree line
Joerg Löffler	Uncertainties in the use of treeline responses as an indicator for climatic change impacts
Kerstin Potthoff	Grazing history affects the tree-line ecotone: a case study from Hardanger, Western Norway
Roberto Tognetti	Climate vs. land-use changes affecting stand dynamics of mountain pine populations in southern Europe mountain ecosystems
Jean-Paul Theurillat	Climate change and upward shift of tree-line: the case study of the cembran pine (<i>Pinus cembra</i> L.) of the Val d’Arpette (Valais, Switzerland)
Teresa Schwarzkopf	A characterization of the woody vegetation at the treeline in the Venezuelan Andes

5.3 CHANGES IN MOUNTAIN SOILS

Venue: Norie-Miller 1 – Twitter Code: &PHTPA352

Chair: Willie Towers, Macaulay Institute, UK

Clemens Geitner	Soil Evaluation in a Changing World – A case study from the Austrian Alps
Boštjan Mali	Land use evaluation according to soil and vegetation properties at the alpine ski resort Krvavec
Rachel Helliwell	The interactive effects of N deposition and land management on nutrient fluxes in a Scottish alpine heathland
Michele Freppaz	Effects of snow manipulation on nutrient concentrations in a forest soil (NW-Italy)
Susmita Dhakal	Effects of Land Use Change on Soil Organic Carbon Stock in Balkhu Khola Watershed Southwestern Part of Kathmandu Valley, Central Nepal
Darren Grafius	Carbon distribution at treeline in Glacier National Park, USA
Frank Hagedorn	Cold ecosystems in a warmer climate: carbon fluxes at the alpine treeline under experimental soil warming
Sonja Wipf	Controls over winter carbon efflux from an alpine treeline ecosystem

5.4 PAST, PRESENT AND FUTURE LAND USE IN MOUNTAIN REGIONS 2: SOCIO-ECONOMIC AND GOVERNANCE ASPECTS; CLIMATE FEEDBACK

Venue: Museum – Twitter Code: &PHTPA356

Chair: Urs Gimmi, WSL Birmensdorf, Switzerland

Nevelina Pachova	Community-Based Land Use and Management in the Pamir-Alai Mountains in Central Asia
Agnieszka Latocha	Contemporary changes of socio-env systems
Heidi Förster	Energy and land use in the Pamir-Alai Mountains
Ivo Baur	Decreasing Rivalry in a Transhumant Social-Ecological System: The Alps of Grindelwald
Philip Jones	The impact of an improved diet on agricultural land use in the uplands of England & Wales
Ariane Walz	Do all mountain regions react upon the same drivers of change? Or how to customise IPCC scenarios to regional level analysis?
Barbara Tomassetti	Meteorological effects induced by land use changes in the Abruzzo Region

5.5 INTEGRATED WATER RESOURCE MANAGEMENT IN MOUNTAIN REGIONS 2

Venues: Norie-Miller 2 – Twitter Code: &PHTPA353

Chair: Robert Hofstede, Mountain Forum

Peter Greminger	Risk dialogue - A way to improve sustainability in alpine areas
Govinda Basnet	Reciprocal relationship between struggle for water rights and social institutions: An ethnographic study of change in upper Mustang, Nepal
Anil Kumar	Hydrological concerns for livelihood sustainability under changed climate in Indian central Himalayan region
Sushil Singla	Innovative Management of Traditional Water Resources in Mountain Himalayan Areas: Indigenous Models of Inclusive Growth and Sustainable Development through Community Participation
Prakash Tiwari	Changing Monsoon Pattern and its Impact on Food & Livelihood Security in Himalaya: Responses & Adaptation
Margot Hill	Assessing adaptive governance to manage climatic uncertainty in the context of mountain basins: Case studies from the Aconcagua Basin, Chile & Rhone Basin, Switzerland
Lindsay Macmillan	Hydrological Challenges in Implementing the Water Framework Directive to the public water supply sources of Scotland

5.6 DEMOGRAPHIC CHANGES IN MOUNTAIN REGIONS

Venue: Earn – Twitter Code: &PHTPA354

Chair: Manfred Perlik, ETH-Zurich, Switzerland

Helen Adams	Altitude, changing hydrologies and the decision to migrate
Ernst Steinicke	New Demographic Processes in the Italian Alps – Old Problems for Autochthonous Linguistic Minorities?
Karubaki Datta	Demographic changes and environmental degradation in the Eastern Himalaya A focus on Darjeeling
Olga Glezer	Population Dynamics in Central North Caucasus in 1990–2000-s: New Tendencies of Migration
Axel Borsdorf	The changing Alps – structures and processes under global change conditions
Tor Arnesen	The Third Man
Alessandro Gretter	Processes of depopulation related to local assets variations
John Provo	The challenge of reconciling sustainable development objectives in the context of

5.7 KNOWLEDGE SYSTEMS AND MOUNTAIN SUSTAINABILITY CONCERNS

Venue: RSGS – Twitter Code: &PHTPA357

Chair: Calum MacLeod, Perth College UHI, UK

Cristina Orsatti	How do alpine mountain communities adapt to the environment in an era of resource scarcity and constraints? Forest and pasture management, socio economic practices and development models in Val di Ledro, Trentino
Jayne Glass	Beyond the usual suspects? The role of expert knowledge in sustainability indicator development for Scotland's upland estates
Rosa Isela Meneses	Pastoralists of the high puna of Bolivia: local perceptions of climate change and the challenges of maintaining tradition
Krishna Prasad Oli	Implementation of Access and Benefit sharing mechanism for biological resources and associated traditional knowledge in the Hindu Kush - Himalaya region – key challenges
Guillermo Ospina	Rebel Mountains: A classification attempt to conflicts in mountain regions
Liliya Vakhitova	The potential for the implementation of an effective mechanism for improving knowledge of mountain communities

Wednesday 29 September 16:15 – 18:15

6.1 CHANGES IN THE MOUNTAIN CRYOSPHERE 2

Venue: Tilt – Twitter Code: &PHTPA365

Chair: Paul Mayewski, University of Maine, USA

Maria Ananicheva	The Koryak Upland glaciers change: new data after 60 years.
Ulrich Kamp	Documenting 100 Years of Glacier Variations in the Mongolian Altai Mountains – Preliminary Results
Erik Bollmann	Evaluation of airborne laser scanning glacier mass balance calculations at Hintereisferner (Tyrol, Austria)
Markus Wagner	New aspects on the late to post glacial deglaciation around the Nilgiri Himal and the southern Thakkola (Nepal Himalaya)
Alton Byers	Building Resilience to Climate Change in Glacially Dominated Areas in the Hindu Kush-Himalaya through South-South Collaboration and Exchange
Stansilav Kutuzov	Changes in glacier volume and surface area in Terskey-Ala-Too, Tien Shan.
Pablo Lagos	Adaptation to the effects of glacier retreat in the Mantaro Valley, Perú
Etienne Cossart	Rockglaciers genesis and growth in a degrading mountain cryosphere

6.2 IMPACTS OF CLIMATE CHANGE ON MOUNTAIN ECOSYSTEMS 4

Venue: Gannochy – Twitter Code: &PHTPA361

Session Chair: Jean-Paul Theurillat, University of Geneva, Switzerland

Che Elkin	Assessing the impact of climate change on the spatial distribution of multiple ecosystem goods and services in mountain forests
Jeremy Littell	Climate and 20th century establishment in alpine treeline ecotones of the western US
Alison Macalady	Pattern and process of large-scale tree mortality waves in the mountains of the southwestern United States
Wally Macfarlane	An assessment of mountain pine beetle-caused mortality of whitebark pine forests of mountain areas of the Greater Yellowstone Ecosystem
Louis Scuderi	Evaluating links between climate change and recent enhanced tree growth at upper altitude sites in the western United States
Emily Smith	Assessing the Impact of Blister Rust Infected Whitebark Pine in the Alpine Treelines of Glacier National Park and the Beartooth Plateau, U.S.A
Heidi Steltzer	Biological consequences of earlier snowmelt from desert dust deposition in alpine landscapes

6.3 CHANGES IN AQUATIC MOUNTAIN ECOSYSTEMS

Venue: Norie-Miller 1 – Twitter Code: &PHTPA362

Chair: Craig Williamson, Miami University, Ohio, USA

Craig Williamson	Water transparency to UV radiation in mountain lakes: Consequences of climate-driven changes in terrestrial inputs for regulation of trophic interactions.
Manuel Villar-Argaiz	Propagation of global stressors at the algae-consumer interface: From short-to long-term scales of observations
Beatriz Modenutti	Environmental changes affecting light climate in Andean Patagonian mountain lakes: implications for the plankton community
Janet Fischer	Factors influencing the distribution of <i>Daphnia middendorffiana</i> in alpine lakes of the Canadian Rockies
Hilde Eggermont	Limnological and ecological sensitivity of Rwenzori mountain lakes (Uganda – DR Congo) to climate warming
Neil Rose	Lake sediment evidence for long-range transported atmospheric pollutants on the Tibetan Plateau
David Hannah	Climate-hydrology-ecology interactions in glacierized river systems
Alexander Milner	Changes in stream macroinvertebrate biological traits with changes in glacierization

6.4 LAND USE IN MOUNTAIN REGIONS 3: RECONSTRUCTING LAND USE & ITS IMPLICATIONS AT VARIOUS TIME SCALES

Venue: Museum – Twitter Code: &PHTPA366

Chair: Ariane Walz, Potsdam Institute for Climate Impact Research, Germany

Raisa Gracheva	Pastoral land use changes in the North Caucasus
Sebastian Eiter	Monitoring mountain summer farming landscapes in Norway: Temporal and regional patterns of continued farming, leisure use, and abandonment
Getachew Simegn Eshetu	An upland farming system under transformation
Marcel Török-Oance	Recent changes of the timberline and treeline in the southern Carpathians (Romania)
Urs Gimmi	Effects of management and natural disturbances on vegetation carbon pools in mountain forests
Eric Higgs	Repeat photography, historical ecology and climate change in the western Canadian cordillera
Helen Shaw	Post Medieval land use and vegetation change in upper Ribblesdale, Yorkshire Dales, UK
Elodie Faure	Holocene landscape construction and land use of the aubrac mountain (Massif Central, France) – A cross approach between pollen and archaeological data

6.5 ADAPTATION OF MOUNTAIN COMMUNITIES TO CHANGING HYDROLOGIES

Venue: Norie-Miller 2 – Twitter Code: &PHTPA363

Chair: Hans Schreier, University of British Columbia, Canada

Kindy Gosal	Mountain Communities
David Kraybill	Farm Household Adaptation to Climate Change on Mount Kilimanjaro
Christian Huggel	Extreme climatic events in the Andes: impacts and adaptation
Cecilia Roa-Garcia	Headwater conservation and water flow regulation in headwater catchments of the Andes
Nathan Forsythe	Investigation of means to meet information needs for local decision makers for water resources management in the Upper Indus Basin
Beatrice Mosello	Water governance in Alpine Valleys: Using the past to understand the present
Thomas Grothmann	Regional Climate Change – The Alps facing the challenges of changing water resources
Hans Schreier	How to Reduce the Water Footprint and Improve Food Security in Mountain Communities

6.6 URBAN-RURAL LINKAGES IN AND AROUND MOUNTAIN AREAS

Venue: Earn – Twitter Code: &PHTPA364

Chair: Bernard Charlery de la Masseliere, University of Toulouse, France

François Bart	Changing East African Volcanic Mountains: Rural dynamics and growing urbanization
Alain Cazenave-Piarrot	Vegetables marketing chains and town supply from East African Mountains
Jan Dick	An ecosystem service assessment of mountains in the UK: case study of the ECN
Alexander Drozdov	Central-North-Caucasian Cities in the Field of Attraction between Uplands and Lowlands
Helene Mainet	Urban-Rural Linkages in East African Mountains: the Role of Secondary Towns
Bob Nakileza	Urban land use/cover changes and sustainability implications for rural landscapes in the Mountain areas of East Africa
Manfred Perlik	Metropolises and Parks – Uneven spatial development in mountain regions. How to renew the regional actor's loyalty with the territory?
Kashinath Vajpai	Environmental Indicators: Measuring Urban Development in Mountains of India

6.7 APPROACHES TO CHANGE: THE POTENTIAL OF REGIONALISED ANALYSIS FOR MOUNTAIN DEVELOPMENT AND POLICY SUPPORT

Venue: RSGS – Twitter Code: &PHTPA367

Chair: Thomas Köhler, University of Bern, Switzerland

Asylbek Aidaraliev	Global warming and sustainable development of the mountain regions of the Central Asia.
Bettina Wolfgramm	A Transboundary Strategy and Action Plan for SLM in the Pamir-Alai Region
Juliane Dame	Visions and interventions: Regional policies and development programmes in Ladakh, Northern India
Sebastian Boillat	Parks, people and traditional knowledge: a challenge for regionalized development
Reginald Victor	Al Jabal Al Akhdar Initiative 2004 -2007 – A post project analysis
Boniface Kiteme	Impact of 30 Years of Research: Assessing the impacts on and tracing the flow of benefits among the human, economic, and ecological contexts. The Example of the Laikipia plateau of Mt. Kenya Region.
Katarzyna Ostapowicz	Integrating nature and society towards sustainability – current status of global change research in the Carpathian Mountains
Karina Liechti	Meaningful spaces in regional planning – the example of the Swiss Alps Jungfrau-Aletsch World Heritage Site

Posters

Bulent	Acma	Developing Hydro-Sources for Environment and Sustainability in Turkey: The Southeastern Anatolia Project (GAP) As a Case Study
Fernando	Aguero Contreras	The Role of Culture in the Mountain Quality of Life. (Cuba)
Gulpinar	Akbulut	A Suggested Geopark Site: Kapodokya
Paramanandan	Anandan	Impacts of invasive species on mountain ecosystem
Lenka	Balounova	Systematic collection of worldwide special catastrophic events from glacial and periglacial environment by GAPHAZ
Esteban	Balseiro	Oxidative stress in the copepod boeckella gracilipes in andean lakes: intraspecific differences
Peter	Barancok	Changes of alpine vegetation in the Tatry Mts. (Western Carpathians)
Marta	Baró	The influence of climate on historical floods and aggradation processes of the Lütshine fan delta, Swiss Alps
Sophie	Biskop	Hydrological system analysis and modelling of the Nam Co basin in Tibet
Francisco	Bonet Garcia	Linaria: An information system to implement GLOCHAMORE
Francisco	Bonet Garcia	Relationship of snow cover and vegetation structure in Sierra Nevada (Spain), a Mediterranean mountain.
Stanislav	Brezina	The changes in diversity of vascular plants at the landscape level in the Krkonoše Mts. during the last 30 years
Simon	Briner	Change of land-use under different climate and policy scenarios: A case study in the municipality of Davos
Ben	Brock	A Midwinter Mid-troposphere High-temperature Event Over Southern Chile and Argentina
Sibyl H	Brunner	Spatially explicit valuation of ecosystem services for forest management in Alpine regions
Daniele	Cane	Multimodel SuperEnsemble on Regional Climatic Scenarios in the Alpine Region
Marc o	Carenzo	Modelling distributed glacier ablation for future climate change simulations: which models are more appropriate?
	Chalova	Volcanoes effects on downstream river dynamics: hazards to human
Brittany	Cranston	How does leaf morphology of the alpine cushion <i>Donatia novae-zealandiae</i> differ at high elevation mosaic and discrete sea level populations?
Rachel	Danemann	Sustainable Affordable Housing Provision in areas of High Landscape Value

Thomas	Dax	From compensation for disadvantages to harnessing regional potential: place-based policies in mountain areas of Europe
Dusan	Djordjevic	Towards a common strategy for the Balkans mountain region - A multilevel network analysis. Research needs and prospects.
Eguiguren	Velepucha	Monitoring the impact of climate change on the floristic diversity of the target region Podocarpus National Park (Loja-Ecuador)
Murray	Ferguson	Challenges in developing a sustainable approach to mountain recreation and tourism in the Cairngorms National Park, Scotland
Rosa	Fernández Calzado	Sierra Nevada as observatory of the climatic change: GLORIA project
Stefan	Fleck	Long-term changes in water availability and growth of spruce and beech in mountainous regions of Lower Saxony
Bogdan	Gadek	Contemporary changes in the tatra mountains cryosphere, poland and slovakia
Uday	Gaur	Consequences of climate change on mountain life and ecosystem functioning: A case study of a Nagtibba mountain in central Garhwal Himalaya, India
Urs	Gimmi	Wetland loss in Switzerland since 1850: spatial patterns and ecological implications
Raisa	Gracheva	Landslides in mountain regions as hazard, resource and information storage
Alessandro	Gretter	Beyond commons: new perspectives and roles for environmental conservation
Yves	Guillermou	Water, environment and social relations in western cameroon (town of dschang and bordering rural areas)
Wanqin	Guo	Glacier change of Qilian Mountains of China during 1960s-2008.
Robert	Hart	Climate change impacts on distribution, phenology and usage of Himalayan rhododendrons
Catherine	Hein	Barriers to dispersal: a missing link in predicting climate-driven range expansions of fishes
Nadine	Hilker	Modelling Future Water Resources in the Context of the Climate Change Adaptation Plan (PACC) in Peru
Margot	Hill	Incorporating uncertainty to climate change into water governance assessments
Leah	Jackson-Blake	Can environmental traits be used to understand nitrogen leaching at an upland Scottish catchment?
Nikos	Katsoulakos	Optimizing biomass utilization in mountainous areas
Shazia Tabassum	Khan	Role of riparian habitats in alien plant invasion in the Kashmir Himalaya, India
Martin	Kirkbride	Debris cover variation as a function of glaciological environment

Kari	Klanderud	Seedclim: the role of seeds in a changing climate - linking germination ecophysiology to population and community ecology
Guenther	Köck	Global Change Research in the Alps: Research funded by the Austrian Academy of Sciences
Guenther	Köck	Fish from sensitive ecosystems as bioindicators of global climate change (High-Arctic 1997-2010)
Markus	Konzetal	TOPKAPI-ETH, a distribute modelling tool for integrated water cycle and hazard simulation
Annika	Korsten	Plant functional shifts along snowmelt gradients in Southern Hemisphere alpine snowbanks
Martin	Kralik	Has Global Change an impact on our Alpine groundwater resources? Water temperature studies in the framework of the “Alp Water Scarce”-program.
Reinhard	Lackner	Permafrost Melting and Nickel Toxicity to Fish, <i>Phoxinus phoxinus</i> , in high mountain lakes
Steffen	Link	Communication in Alpine Risk Management
Jeremy	Littell	Paleoproxy reconstructions of hydroclimatic variation in the Pacific Northwest, USA: the role of snow-sensitive trees in improving streamflow reconstructions
Jesse	Logan	Whitebark pine vulnerability to climate driven mountain pine beetle disturbance in the Greater Yellowstone Ecosystem
Carla	Marchant	Sustainable development in Chilean Andes Partial results: Geographical profile of the northern Chilean Andes. Key issues for its sustainable development.
Jan	Materna	Experimental verification of changes in <i>Ixodes ricinus</i> altitudinal distribution in Central European mountains: What can the common tick say about climate change?
Luis	Matias-Resina	Biodiversity and demographic consequences
Katherine	Matthews	High-elevation Wilderness Freshwater Reserves
Christian	Maurer	A physical model for describing local snow distribution at the alpine-nival ecotone
John	McClatchey	Climate change and the skiing industry in the Cairngorms, Scotland
Barbara	McNicol	Canadian Rocky Mountain Landscapes, amenity migrants and recreation
Carlos	Mendonca	Phenology of a shrubby legume species in the Espinhaço Mountain range in Diamantina-MG, Brazil
Irina	Merzlyakova	Mountain biosphere reserves as elements of the regional social-ecological systems - Russian experience in study and adaptation to global changes
Abderrahmane	Merzouki	Presentation of Moroccan Target Region (Atlas Mountain): expanding Gloria project to North Africa

Pavel	Moiseev	Climate change and site-specific treeline ecotones dynamics on the Ural mountains
George	Nakhutsrishvili	High mountain interglacial vegetation of the Caucasus on the background of the global warming
Ulrike	Nickus	Impact of active rock glaciers on high mountain stream water quality.
Ernst	Nordtveit	Legal frameworks for Conservation of Biodiversity and Ecosystem Services in the Himalayas
Claudia	Notarnicola	Monitoring snow cover changes in the Alpine Regions through MODIS and Landsat time series
Marie	Oiry-Varraca	Global discourses on identity and networks of actors, emerging opportunities for Moroccan mountains to get out of marginalisation.
Dennis	Ojima	Downscaled Climate Projections for Consideration in Complex Terrain of the Western Mountain Initiative: A Colorado Example
Brooke	Osborne	Microbial Linkages between Climate-Induced Glacier Melt, Nitrogen Deposition, and Variable Nitrate Concentration Trends in Alpine Catchments of Colorado
Ashok Kumar	Patra	Changes in carbon sequestration in the North-Western Himalayan region
Anibal	Pauchard	Global database of potentially invasive non-native plants in mountains
Loic	Pellissier	Predicting future land use changes and threats to biodiversity from past transitions
Emilie	Ploquin	Changes in altitudinal range in Bumblebees
Dinesh	Pratap	Forest councils of uttarakhand: an important forest management institution
Timothy	Reid	Quantifying the effects of debris on a glacier surface.
Elektra	Remoundou	Monitoring plant species changes in Lefka Ori massif: observations along an altitudinal gradient from 2001-2008
Lisa	Rew	Quantifying and predicting seed dispersal from vehicles
Alon	Rimmer	Climate Change impacts on Mt. Hermon springs: Downscaling application from a Regional Climate Model
David	Rodriguez	How much of the world's mountains is protected?
Ole	Roessler	Droughts will occur in the Swiss Alps under a warmer future climate – A modeling approach focusing on high mountain soil moisture
Carolina	Roman	A problem-oriented adaptive governance approach to adaptation: a case study of Alpine Shire, Victoria, Australia
Hugo Ivan	Romero	Socioeconomic, institutional and environmental consequences of large mining and hydropower developments in Southern Andes.
Samuel	Schmid	Impacts of experimentally induced summer drought on ecosystem functioning in alpine grasslands

Stefan	Schörghuber	A large-scale evaluation of a hybrid forest model across ecological gradients in mountain forests
Claudia	Seabra	Tourists' place attachment and involvement with mountains as tourism nature-based destinations
Igor	Severskiy	Modern and prognoses changes of glaciation and river runoff in central asia as a consequence of climate change
Rob	Smith	Temperature variation and plant flowering time recorded over 38 years in the Blue Mountains, Australia
Pascalie	Smith	Comparing the water fluxes simulated by three models in the Swiss Alps: Towards catchment-scale estimates of climate change impacts
Mehmet	Somuncu	From the mountain pasture to the mountain resort: Land use change in Eastern Black Sea mountains, Turkey
Chris	Soulsby	Influence of climate change on thermal regimes in montane rivers: the role of riparian forests in ameliorating ecological impacts.
Jean-Paul	Theurillat	Elevation gradient of vascular plant diversity in the Central Apennines, Italy: a long-term project
Yann	Vitasse	Assessing the effects of climate change on the phenology of European temperate trees
Wenbin	Wang	Glacier recession in Tomor region, central Tianshan, and its impact on Tarim River.
Christoph	Wiegand	Detection and multi-temporal analysis of shallow erosion events in the Alps
Bruno	Wilhelm	An assessment of centennial to millennial-scale torrential flood activity in mountain areas: toward a better understanding of the temperature – flood activity relationship
Dragos	Zaharescu	Enhanced deposition of trace elements driven by climate change in a mountain catchment
Anne	Zimmermann	Sound knowledge for local to global sustainable mountain development: MRD's role as a journal with a global community of peers and readers
Jeff	Zukiwsky	Benefits, Challenges and Planning Implications of Residential Tourism in the Mountain Community of Fernie, Canada
Natalie	Zurbriggen	Effects of climatic and land use change on avalanche-forest feedbacks in a temperature sensitive valley of the Swiss Alps

Working Lunches

Monday 27 September, 12.30 – 13.30

Venue: Norie-Miller 1
Title: The South Eastern European Mountain Research network (SEEmore)
Convenors: Astrid Björnsen Gurung and Mariyana Nikolova

Venue: Earn
Title: Mountain amenity migration & urbanization
Convenors: Laurence A.G.Moss, Manfred Perlik, and Romella S. Glorioso

Venue: Norie-Miller 2
Title: Mountain Sustainability - Transforming research into practice
Convenors: Claudia Drexler and Fides Braun

Tuesday 28 September, 12.30 – 13.30

Venue: Tilt
Title: Use of multiple scenarios futures analysis for research and policy formulation
Convenors: Laurence A.G.Moss and Romella S. Glorioso

Venue: Earn
Title: *Mountain Research and Development* (MRD): Strengthening the journal's new position and scope
Convenors: Ted Wachs and Susanne Wymann von Dach

Venue: Norie-Miller 1

Title: Greater Himalaya group side session – Traditional knowledge workshop

Convenors: Jan Salik, Harald Pauli, Georg Grabherr

Venue: **Norie-Miller 2**

Title: The Mountain Invasion Research Network: future research partnerships and priorities

Convenors: Christoph Kueffer, Anibal Pauchard and Keith McDougall

Wednesday 29 September, 12.30 – 13.30

Venue: **Earn**

Title: Business Meeting of the IGU Commission C08.29 'Mountain Response to Global Change'

Convenors: Kerstin Anschlag and Joerg Loeffler

Venue: **Tilt**

Title: Construction of Global Knowledge on mountains: About two recent books on the topic

Convenors: Bernard Debarbieux and Jon Mathieu

Venue: **Norie-Miller 1**

Title: Practical examples of ecosystem-based adaptation in mountains

Convenors: Walter Vergara and Christian Huggel

Evening Events

Monday 27 September

18.30 – 20.00

Poster session and civic reception

The reception will be hosted by Provost John Hulbert of Perth and Kinross. As well as being an opportunity for refreshment and networking, it will provide an opportunity for authors of posters to discuss them with other participants – so poster authors are encouraged to stand near their posters!

Tuesday 28 September

19.30 – 21.00

Public event: Scotland's National Parks: Whose Parks are they anyway?

This is hosted by Cairngorms National Park Authority and Loch Lomond and the Trossachs National Park, and will be chaired by David Green, convener of the CNPA and Grant Moir, Director of Conservation & Visitor Experience, Loch Lomond and the Trossachs National Park.

Scotland's two National Parks are home to some of the most special and protected landscapes, habitats and species in Scotland and offer excellent opportunities for people of all backgrounds, interests and abilities to enjoy, learn and benefit from these special areas. There are also thriving businesses and communities, supporting the local and national economy. This event will bring together representatives from these diverse sectors to celebrate what National Parks have and can deliver for Scotland and its people and the challenges and opportunities facing National Parks and the people involved in them.

The panel will consist of and discuss:

- **Andrew Bruce Wootton, General Manager, Atholl Estates** - What National Parks add in terms of tourism, business and the economy; the role of business and tourism in National Parks
- **Linda McMillan – Deputy Vice-Chairman, World Commission on Protected Areas, International Union for Conservation of Nature (IUCN) and President, Mountain Protection Commission, International Mountaineering and Climbing Federation (UIAA)** - Citizen Scientists, a project which engages all stakeholders in the stewardship and management of National Parks and to use their skills to protect the places they cherish
- **Bill Wright – Vice President, Association for the Protection of Rural Scotland.** Why Scotland needs its National Parks and how the two Parks are protecting the country's most special landscapes
- **Paul Corrigan MBE, Chair, the Cairngorms Local Outdoor Access Forum and senior fundraiser for Chest, Heart and Stroke Scotland.** The benefits and enjoyment of National Parks and how they are helping to deliver a healthier and active Scotland
- **Pete Wishart, MP for Perth and North Perthshire.** The role of National Parks in Scotland and how they are helping to deliver the Scottish Government's strategic objectives

Following the panel discussion, there will be a question and answer session.

Wednesday 29 September

19:30 - ???

Conference dinner

Dewars Centre: We will let you know where it is!

Perth Conference Tweets

On the morning of the last day of the Conference (Thursday, 30 September), the Mountain Research Initiative (MRI) will attempt to provide an overview of themes emerging from both the plenary and parallel sessions of the Conference. As no one person can possibly listen to all sessions, much less provide a balanced assessment of themes emerging from multiple disciplines, this overview effort necessarily involves the active participation of multiple participants, including YOU!

The managers of this overview encourage you to send to the website www.twitter.com your observations on interesting ideas, novel approaches and emerging themes. You can send messages of up to 140 characters at any time to the website.

We encourage you to submit your thoughts whenever they occur to you, during the talks or afterward: feel free to "tweet" the Perth Conference! There are wi-fi connections in all meeting rooms in the Perth Conference Center, so that you will be able to send messages from those venues at any time. The two venues outside the Conference Center do not have wi-fi and therefore you need to save your ideas when you participate in those sessions, and send tweets when you return to the Conference Center. The managers will review the tweets and consider them as a major data stream associated with overview effort.

To participate in this effort, you will require a Twitter account. Obtaining a account is very simple: go to www.twitter.com for complete instructions.

In the programme, every session has a "hash" name. When you send a tweet on a session, you should include the hash name for that session somewhere in the text of your message, so that we will be able to find your tweet later when we develop the overview. As many European keyboards do not include the hash mark (#), our hash names are in fact denoted with an ampersand (&). All the hash names have the format "&PTH" (for Perth) followed by either "PL" (for plenary sessions) or "PA" (for parallel sessions) followed by a numerical identifier.

If you wish to see what others have said about particular sessions, you can search on the hash name on www.twitter.com and find all the tweets generated by that session.

Thanks in advance for your tweets!

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