The Mountain Research Initiative

MRI Key Contact Workshop prior to the 2014 General Assembly of the European Geophysical Union

26 April 2014, Vienna, Hotel Kaiserwasser

Table of Contents

Report:
The Mountain Research Initiative

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photos front cover: (from left to right): SwissEx, by Nick Dawes, WSL, Switzerland; Inspiring discussions at the KCWs by Claudia Drexler; Morning view of the Berner Oberland, by Chris Ritter.

Global Change Research in Mountain Regions:
MRI Key Contact Workshop preceding the EGU General Assembly 2014

Background

A Key Contact Workshop (KCW) is a 1-day event facilitating and fostering the dialogue between scientists with various backgrounds. The three tools, namely written research summaries, snapshot presentations, and small working groups, stimulate interdisciplinary thinking and allow peers to take a fresh look at your research.

The workshop accommodates a maximum of 24 speakers/workgroup chairs, and a few additional participants from a broad range of fields and disciplines from both natural and social sciences. KCWs usually precede major conferences that mountain researchers attend anyway, in this case the 2014 General Assembly of the European Geophysical Union. They offer an additional platform to scientists interested in the dialogue with peers from other disciplines.

Objectives

The KCW brings together active researchers from around the world working on global change in mountain regions to:

1. present a brief overview of their research programs,
2. comment on fellow participants' research, and
3. discover opportunities for new interdisciplinary research collaborations.

Procedure and Tools

Participants

1. prepare a 1-2 page contribution to the Catalogue of Research Summaries (containing information on their re search activities and future plans) prior to the workshop,
2. outline current and, especially, future research programs in 5 minute presentations during the KCW,
3. chair a working group during the event to discuss their research programs in depth (30-40'), and
4. actively participate in other working groups during the KCW.

Fees

No fees apply to workshop participation. Participants are expected to organize their travel and accommodation themselves and to cover their own expenses.

Evaluation

Please use this link to access an online evaluation form:
http://mri.scnatweb.ch/mri-key-contact-workshops/kcw-evaluation
There are only five short questions, and you can help us to improve our workshops by taking some minutes to fill them out!

Workshop Leader

Claudia Drexler
Communication and Event Manager
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Venue

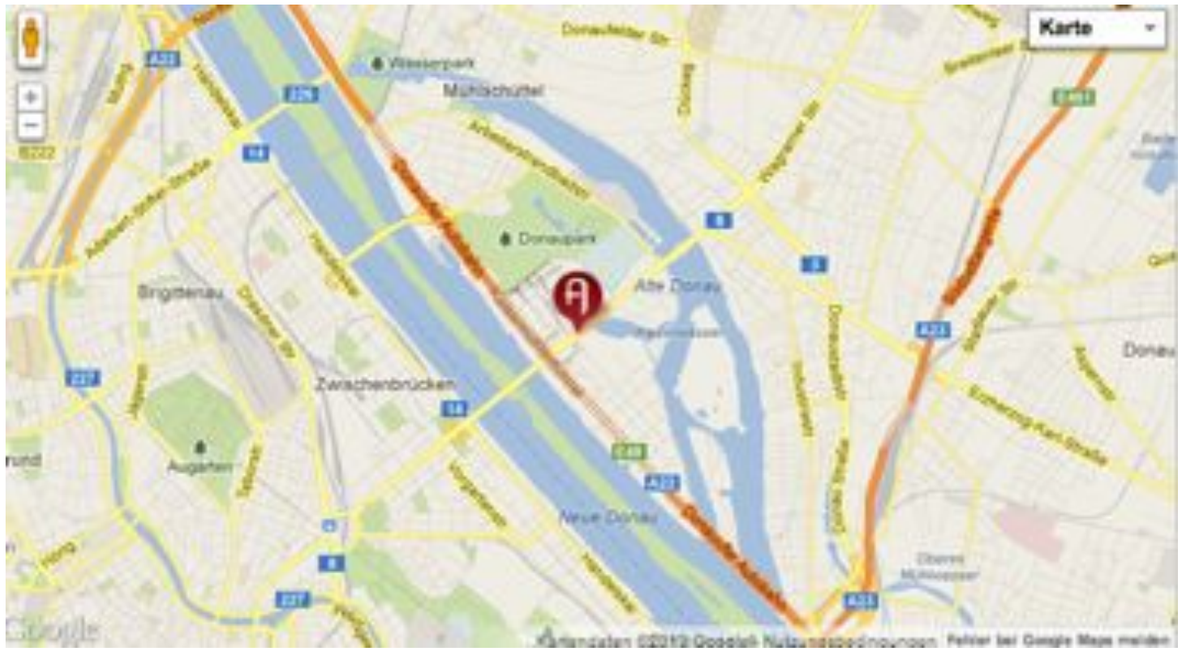
Hotel Kaiserwasser, Wagramerstr. 8, 1220 Vienna, Austria www.arcotelhotels.com

How to reach Hotel Kaiserwasser
By car:
From the west: Leave the A1 at the exit "Wien-Auhof" and continue straight ahead to Margaretengürtel where you turn left following the sign to "Praha" up to Heiligenstädterstrasse where you keep right, again following the signs to "Praha". You cross the Danube on Floridsdorferbrücke and take the A22 in the direction "Graz/Linz/Budapest" up to the exit "Kagran". From the south: Coming to Vienna on the A2, you change to A23 in the direction "Praha". At the Kaisermühlen intersection, you take the A22 in the direction "Praha/Brno/Vienna International Centre/Kaisermühlen". Leave the A22 at the exit "Reichsbrücke".

From the east: Coming to Vienna on the A4, you take the A23 in the direction "Praha/Brno" at the Erdberg intersection. At the Kaisermühlen intersection, you take the A22 in the direction "Praha/Brno/Vienna International Centre/Kaisermühlen". Leave the A22 at the exit "Reichsbrücke".
From the north-west: Take the A22 in the direction "Graz/Linz/Budapest" and leave it at the exit "Kagran".

By train:
From the Südbahnhof Railway Station: Take a train of the S-Bahn lines S1, S2 or S15 to Südtiroler Platz where you change to the underground U1 taking a train to Kagran and get off at the stop "Vienna International Centre/Kaisermühlen". From the Westbahnhof Railway Station: Take the underground line U3 going to Simmering and change at the stop "Stephansplatz" to the underground line U1 taking a train to Kagran and get off at the stop "Vienna International Centre/Kaisermühlen".

From the airport:
Take the public bus of the Vienna Airport Lines to the ARCOTEL Kaiserwasser - the bus stop is located in front of the hotel.



Program

Time	Activity
8.30	Coffee
9:00	Welcome and Introduction
9:30	Panel 1
10.40	Break
11:00	Panel 2
12:00	Panel 3
13:00	Lunch
14:15	Input MRI
14:30	Panel 4
15:30	Break
16:00	Open discussion and Evaluation
16:30	End

Please note that both the program and the assignement to the panels are not yet fixed.
We will assign participants timeslots as presenters and arrange the working groups shortly before the event, when the final number of participants and their and interests are known.

Panels

1	9:30	Presenter A1: 5‘ **David Finger**			
		Presenter B1: 5‘ **Agata Warchalska -Troll**			
		Presenter C1: 5‘ **Joan O. Grimalt**			
		Presenter D1: 5‘ **Ashutosh Mohanty**			
		Working Group A1 **Chair: David Finger** 3-4 participants	Group B1 **Chair: Agata Warchalska-Troll** plus 3-4 part.	Group C1 **Chair: Joan O. Grimalt** plus 3-4 part.	Group D1 **Chair: Ashutosh Mohanty** plus 3-4 part.
2	11:00	Presenter A2: 5‘ **Thorunn Péturs-dóttir**			
		Presenter B2: 5‘ **Manfred Perlik**			
		Presenter C2: 5‘ **Jim Miller**			
		Working Group A2 **Chair: Thorunn Pétursdóttir** 4-5 participants	Working Group B2 **Chair: Manfred Perlik** 4-5 participants	Working Group C2 **Chair: Jim Miller** 4-5 participants	
3	12:00	Presenter A3: 5‘ **Bolívar Cáceres**			
		Presenter B3: 5‘ **Georg Gratzer**			
		Presenter C3: 5‘ **Alexander Arpaci**			
		Working Group A3 **Chair: Bolívar Cáceres** 4-5 participants	Working Group B3 **Chair: Georg Gratzer** 4-5 participants	Working Group C3 **Chair: Alexander Arpaci** 4-5 participants	
4	14:30	Presenter A4: 5‘ **Grzegorz Durlo**			
		Presenter B4: 5‘ **Bernat Claramunt i López**			
		Presenter C4: 5‘ **Scott Williamson**			
		Working Group A4 **Chair: Grzegorz Durlo** 4-5 participants	Working Group B4 **Chair: Bernat Claramunt i López** 4-5 participants	Working Group C4 **Scott Williamson** 4-5 participants	

The Workshop Procedure

Each participant will have 5 minutes to present the highlights of his or her research program using up to 4 slides. No PowerPoint is a fine solution, too; you may use a flip chart if you prefer. Presentations should address current and future research in hopes of triggering questions and input from your colleagues.

You should also include a project idea you would like to develop during the workshop. The presentation can go beyond your own personal research interest, targeting the strategic aims of an entire research group or institution. You are not expected to promote your institution *per se,* but advocate priority research themes and activities that could benefit from the different perspectives the other participants can bring to it. In general your presentation should be forward-looking, targeted at future projects (vs. past achievements), and brief.

After all three panel members have made their presentation, everyone will gather around three flip charts for up to 30 minutes of interdisciplinary thinking. Presenters will turn into work group leaders who will lead the discussion of their research ideas or of topical questions. All participants should stay with their assigned group for the first five or ten minutes, but thereafter participants can move to another other panels. The cycle then repeats. We will have three sessions before lunch, and one or two after.

MRI has run Key Contact Workshops in Europe and the US. The MRI Events webpage http://mri.scnatweb.ch/events/ provides more information on these workshops, along with research summaries. This workshop will be similarly organized, taking stock of suggestions from recent workshop evaluations.

Instructions to Work Group Leaders

Role of the Chair

- Introduce your specific topic for discussion.
- Facilitate a focused discussion that meets your needs.

Setting

- The group stands around a flip chart.
- Everyone is active and notes keywords for his or her ideas on cards during the discussion. The cards are put up close to similar ones. Make a space for “other ideas” or “no-goes”.
- When the group is ready it produces the final flip chart. It includes the main points of discussion and the answers to the chair’s original questions.

Material for Working Groups

- Flip charts or table with flip chart paper
- White and colored cards 1/3 of A4 (ca. 20 x 10cm)
- Markers

Please note

- Every idea counts!
- The group should work together to produce one final flip chart.

For the cards

- One idea per card
- Max. three lines per card
- No CAPITAL letters

Alexander Arpaci

Department of Forest - and Soil Sciences
Institute of Silviculture, BOKU, Vienna

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http://fire.boku.ac.at

What are your central research objectives?

Forestry ,Cliamte Change, Natural disturbances

On what do you take data?

Forets structure.

What are you attempting to predict or characterize using those data?

Forest fire, Drought stress.

What is the geographic scope of your research?

European Alps.

Geographic scope: Where do you gather data?

Austria.

Over what geographic domain do your conclusions hold?

Alps.

What agencies and foundations fund your research?

FWF, ACRP.

Funding: What are the time horizons for your funding?

Yearly.

What kinds of resources will your funding support?

All kind of resources.

The future: How you would like to see your research program evolve over the next 5-10 years?

Installation within a fixed frame work for mountain hazards , forest threads and climate change.

New methodologies for data analysis?

RS, Lidar.

Incorporation of new disciplines into your program?

Geostatistics.

Expansion to new geographic areas?

Maybe.

What other new challenges are you thinking about?

Natural hazards interactions.

Bolívar Cáceres

INAMHI - Instituto Nacional de Meteorología e Hidrología,
Quito, Ecuador

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www.serviciometeorologico.gob.ec

What are your central research objectives?

Show the climate change in the mountains in Ecuador (if is posible determinate gradients).

On what do you take data?

Precipitation, temperature.

What are you attempting to predict or characterize using those data?

If it is possible to find a variation in precipitation and temperature near the mountains in Ecuador.

What is the geographic scope of your research?

Ecuadorian Andes.

Geographic scope: Where do you gather data?

Andes Ecuador (3000- 4800 m.a.s.l.)

Over what geographic domain do your conclusions hold?

Ecuadorian Andes.

What agencies and foundations fund your research?

INAMHI.

Funding: What are the time horizons for your funding?

Three years.

What kinds of resources will your funding support?

Facilities, instrumenation,technicians.

The future: How you would like to see your research program evolve over the next 5-10 years?

Developing a strong network to get data in the mountains in Ecuador.

New methodologies for data acquisition?

Not yet.

New methodologies for data analysis?

Not yet.

Incorporation of new disciplines into your program?

Climate modelation, statistical analyses.

Expansion to new geographic areas?

Maybe low altitudes (1500-3000 m.a.s.l.).

What other new challenges are you thinking about?

Get financial support to develop the network.

Bernat Claramunt López

Centre de Recerca Ecologica i Applicacions Forestals
CREAF - UAB

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www.creaf.uab.cat

What are your central research objectives?

Understanding how alpine species will respond to global change.

On what do you take data?

Presence/absence data, and trophic interactions among vertebrates.

What are you attempting to predict or characterize using those data?

Id like to know if, as theory predicts and some individual species' studies suggest, changes in the phenology and/or in the distribution ranges of some species, will casue an assembly or disassembly of interactions and will finally result in novel communities.

What is the geographic scope of your research?

Mountain ecosystems.

Geographic scope: Where do you gather data?

The Pyrenees.

Over what geographic domain do your conclusions hold?

Hopefully, over mountain regions !!

What agencies and foundations fund your research?

Spanish agencies, Catalan agencies, and EarthWatch Institute.

What are the time horizons of your funding?

3-5 years.

What kinds of resources will your funding support?

Field work, PhD students.

The future: How you would like to see your research program evolve over the next 5-10 years?

I'd like to be able to build a network as large as possible of biodiversity permanent plots, both in the Pyrenees and other mountain systems in the world. I also want to incorporate a citizen-science approach in my research.

New methodologies for data acquisition?

UAVs

New methodologies for data analysis?

Next generation sequencing for diet analysis, GIS.

Incorporation of new disciplines into your program?

Technology (UAVs), GIS, and mobile apps.

Expansion to new geographic areas?

Why not?

What other new challenges are you thinking about?

(1) Incorporate the society in research programs; (2) Using new technology to gather biodiversity data.

Grzegorz Durlo

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What are your central research objectives?

Mountain Climatology.

On what do you take data?

Forest monitoring operational system.

What are you attempting to predict or characterize using those data?

Weather impact on forest stability.

What is the geographic scope of your research?

West Carpathians.

Geographic scope: Where do you gather data?

Regional Monitoring System Server.

Over what geographic domain do your conclusions hold?

Climate of the mountains.

What agencies and foundations fund your research?

The Polish State Forests National Forest Holding.

What are the time horizons of your funding?

5 years.

What kinds of resources will your funding support?

Instrumentation mainly,

The future: How you would like to see your research program evolve over the next 5-10 years?

International cooperation within the big geographical unit.

New methodologies for data acquisition?

Radiotelemetry techniques, Web technology.

New methodologies for data analysis?

Analysis platform in cloud.

Incorporation of new disciplines into your program?

Geostatistics.

Expansion to new geographic areas?

Environmental planning.

The future: What other new challenges are you thinking about?

Cloud computing for short term forecasts.

David Finger

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What are your central research objectives?

Sustainable water management and ecosystem resilience.

On what do you take data?

Hydrology, climate, water quality, aquatic ecosystems.

What are you attempting to predict or characterize using those data?

Water availability, ecosystem functioning under climate change and anthropogenic impacts.

What is the geographic scope of your research?

Iceland, Austria, Switzerland, mountain areas worldwide.

Geographic scope: Where do you gather data?

Iceland, Austria, Switzerland, mountain areas worldwide.

Over what geographic domain do your conclusions hold?

Worldwide.

What agencies and foundations fund your research?

EU, hydro power companies, national funding agencies.

The future: How you would like to see your research program evolve over the next 5-10 years?

Establish methods for sustainable water management to secure ecosystem functioning.

New methodologies for data acquisition?

Remote sensing, water quality analysis, precipitation radar.

New methodologies for data analysis?

Remote sensing, water quality analysis, precipitation radar.

Incorporation of new disciplines into your program?

linking modeling results to social-ecological system analysis.

Expansion to new geographic areas?

Iceland, Scandinavia, Austria, Switzerland, mountainous areas worldwide,

The future: What other new challenges are you thinking about?

Implementing the Water Framework Directive.

Georg Gratzer

Professor, Institute of Forest Ecology, BOKU University

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http://www.wabo.boku.ac.at/ife.html

What are your central research objectives?

The adaptation potentials of main Bhutanese forest types are characterised and land users are able to adopt climate sensitive land use management schemes.

On what do you take data?

Roof experiment - drought stressed trees; Biotic and abiotic disturbance agents: susceptibility models for bark beetles and fire: trees and landscapes.

What are you attempting to predict or characterize using those data?

Roof experiment - drought stressed trees; Biotic and abiotic disturbance agents: susceptibility models for bark beetles and fire: trees and landscapes.

What is the geographic scope of your research?
Eastern Himalayas.

Where do you gather data?

Bhutan.

Over what geographic domain do your conclusions hold?

Eastern Himalayas.

What agencies and foundations fund your research?

Austrian Government, Bhutanese Government.

What are the time horizons for your funding?
Mid 2013 - end 2016.

What kinds of resources will your funding support?

Grants for master students and doctoral students; post-docs, instruments and analysis costs.

The future: How you would like to see your research program evolve over the next 5-10 years?

Extend to other forest types and disturbance agents in the region.

New methodologies for data acquisition?

First roof experiment in the Eastern Himalayas.

New methodologies for data analysis?

Tests of new methods in root and mycorrhiza research, NSC.

Incorporation of new disciplines into your program?

Isotope analysis.

Expansion to new geographic areas?

The whole Himalayas.

What other new challenges are you thinking about?

Livelihoods and climate change in mountain regions, SDGs.

Joan Grimalt

Consell Superior d'Investigacions Científiques,
Director of the Institute of Environmental Assessment
and Water Research, IDAEA-CSIC

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http://www.cid.csic.es/homes/grimalt/

What are your central research objectives?

Organic pollution.

On what do you take data?

Water, air, soils, organisms, atmospheric precipitation.

What are you attempting to predict or characterize using those data?

The impact of organic pollutants on high mountain ecosystems.

What is the geographic scope of your research?

All European mountains.

Geographic scope: Where do you gather data?

All European mountains.

Over what geographic domain do your conclusions hold?

All European mountains.

What agencies and foundations fund your research?

European.

What are the time horizons of your funding?

5 years.

What kinds of resources will your funding support?

Graduate students, lab facilities, sampling and sample processing.

The future: How you would like to see your research program evolve over the next 5-10 years?

New methodologies for data acquisition?

yes!

New methodologies for data analysis?

yes!

Incorporation of new disciplines into your program?

yes!

Expansion to new geographic areas?

yes!

Jim Miller

Professor, Climate modeling and climate change, Rutgers Institute of Marine and Coastal Sciences
www.ceedasia.org
miller@marine.rutgers.edu

What are your central research objectives?

Primary objective is to understand the processes and mechanisms that contribute to elevation dependent warming in mountains.

On what do you take data?

Various climate variables.

What are you attempting to predict or characterize using those data?

We are trying to predict how and why climate will change at high elevations.

What is the geographic scope of your research?

We are trying to predict how and why climate will change at high elevations.

Where do you gather data?

We are trying to predict how and why climate will change at high elevations.

Over what geographic domain do your conclusions hold?

We seek to put our conclusions into a global context.

What agencies and foundations fund your research?

US NSF.

What are the time horizons for your funding?

We are seeking three-years of funding to continue our current project that expires this year.

What kinds of resources will your funding support?

Our funding has supported post-docs, undergraduate students, and development of educational resources.

The future: How you would like to see your research program evolve over the next 5-10 years?

We would like to see an extension of current high-elevation data sets to better understand the processes and mechanisms that affect high-elevation climate change.

New methodologies for data acquisition?

Satellites and improved reanalyses of climate variables.

New methodologies for data analysis?

Improved statistical methodologies for isolating roles of specific climate feedbacks.

Incorporation of new disciplines into your program?

Water resources, education.

Expansion to new geographic areas?

Global.

What other new challenges are you thinking about?

Potential impacts of high-elevation climate change on water resources and ecosystems.

Ashutosh Mohanty

Center for Environment and Economic Development

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What are your central research objectives?

Resilience to Mountain Communities through indegenous technology.

On what do you take data?

Mountain Research Network.

What are you attempting to predict or characterize using those data?

Mountain Hazard predictions.

What is the geographic scope of your research?

Hindukush Himalaya

Over what geographic domain do your conclusions hold?

Himalaya Hindu Kush Mountain Region.

What agencies and foundations fund your research?

IDRC,USAID and World Bank and MMRD,Afghanistan.

What are the time horizons for your funding?

For 2 fiancial years.

What kinds of resources will your funding support?

Short term training , Master students.

The future: How you would like to see your research program evolve over the next 5-10 years?

We see if we could develop a Mountain Research Network and Mountain Consortium we could develop a large network and work for more than next 5- 10 years.

New methodologies for data acquisition?

Mountain Research Network and Consortium.

New methodologies for data analysis?

ITC and RS GIS data analyses.

Incorporation of new disciplines into your program?

Mountain basin management.

Expansion to new geographic areas?

Glacier fed regions.

What other new challenges are you thinking about?

More hazard prone fragile regions.

Manfred Perlik

EURAC Bolzano,
CDE, Universität Bern,
UMR PACTE Grenoble

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http://www.eurac.edu/staff/mperlik

What are your central research objectives?

Mountains as suppliers for metropolitan areas, providing landscapes, raw materials,and investment options.

On what do you take data?

Socio-demographic and socio-economic development, specialised residential use.

What are you attempting to predict or characterize using those data?

Emerging of new functional disparities in mountain areas.

What is the geographic scope of your research?

European mountains and beyond.

Geographic scope: Where do you gather data?

Statistical data; data collected within the frame of projects/case studies.

Over what geographic domain do your conclusions hold?

Periurban mountain regions; multilocally used habitats.

What agencies and foundations fund your research?

National Science Foundations, European projects.

What are the time horizons of your research?

2-3 years.

What kinds of resources will your funding support?

Graduate students.

The future: How you would like to see your research program evolve over the next 5-10 years?

A higher significance of socio-economic research in mountains.

New methodologies for data acquisition?

Better cooperations to buy and share relevant statistical data; enough budget to be able to use ethnographic methods.

New methodologies for data analysis?

Combinations of statitical analysis and ethnographic methods.

Incorporation of new disciplines into your program?

Ethnographic methods.

Expansion to new geographic areas?

From Europe to a global level; from mountains to other extreme locations (e.g. tropical areas).

What other new challenges are you thinking about?

Enlarging to other peripheral areas (e.g. tropical areas). New spatial disparities in general; specific forms and trajectories of urbanization.

Thorunn Petursdottir

Soil Conservation Service of Iceland

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www.land.is

What are your central research objectives?

Ecological restoration, social-ecological system analysis, resilience-based management of natural resources.

On what do you take data?

Vegetation,soil, land use practices, human attitude and behaviour.

What are you attempting to predict or characterize using those data?

How to maintain or increase the resilience of social-ecological systems.

What is the geographic scope of your research?

Mountainous areas and extensive agricultural systems.

Where do you gather data?

Iceland.

Over what geographic domain do your conclusions hold?

Mountainous areas and extensive agricultural systems.

What agencies and foundations fund your research?

European Union, Hydropower company, governmental institutes and national funding agencies.

The future: How you would like to see your research program evolve over the next 5-10 years?

Greater emphasis on integrative and transdisciplinary research to support resilience-based management of natural resources.

New methodologies for data acquisition?

Multi-level data collection based on a social-ecological system analysis.

New methodologies for data analysis?

Merging of quantitative and qualitative data results.

Incorporation of new disciplines into your program?

Emphasize on the role of physical geography within social-ecological system analysis.

Expansion to new geographic areas?

Open worldwide.

What other new challenges are you thinking about?

Linking resilience-based management of natural resources to the Sustainable Development Goals of the United Nations.

Agata Warchalska-Troll

Jagiellonian University in Krakow, Institute of Geography and Spatial Management

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What are your central research objectives?

My main research project is called 'Impact of protected areas on local and regional development. On the example of Polish Carpathians'. Its central objective is to give an insight into large protected areas' influence on adjacent communities, in four major aspects: infrastructure development, economic activity (including its structure), residential land attractiveness as well as quality of life and social development. This research project is strictly connected with my PhD thesis and is currently in its early stages. At the moment I am also finishing a research project (in cooperation with Mateusz Troll) on summer animal farming in the Chornohora mountain range (Eastern Carpathians, Ukraine), aimed at providing a complex portrait of summer farming practices and its environmental and social aspects in the changing context of institutional and political.

On what do you take data?

My research in the Polish Carpathians covers investigation of regional and local development in the surroundings of large protected areas, namely national parks and NATURA 2000 sites. In particular, I take data on social and demographical situation of the communities and regions, economic activity and unemployment rates, technical infrastructure, land use as well as promotion and marketing of regional/local products. My research in the Chornohora mountain range covers aspects connected with summer animal farming on mountain pastures: land use change, environmental and social aspects, land management policy etc.

What are you attempting to predict or characterize using those data?

I aim at characterizing the model(s) of relationships between large protected areas of high status as well as local and regional stakeholders. As for the issue of summer farming, my objective is most of all to show this traditional activity as a key factor of sustainable use of semi-natural mountain meadows, as well as sustainable development of local communities.

What is the geographic scope of your research?

Polish and Ukrainian Carpathians.

Where do you gather data?

Polish Carpathians: selected communities located within or bordering large protected areas. Ukrainian Carpathians: Chornohora mountain range.

Over what geographic domain do your conclusions hold?

My main fields of interest are regional and local development as well as nature protection.

What agencies and foundations fund your research?

Apart from my home institution, my research is supported by Małopolska Regional Development Agency within 'DOC-

TUS Małopolski fundusz stypendialny dla doktorantów' scholarship programme, financed.

What are the time horizons for your funding?

Two years (my current research project is strictly connected with my PhD thesis).

What kinds of resources will your funding support?

Field works, queries, data acquisition, participation in conferences and workshops.

The future: How you would like to see your research program evolve over the next 5-10 years?

My current research project is scheduled for a shorter period of time, but I very much hope I will continue it afterwards. It would be perfect if the topic of protected areas' influence on local and regional development in the Polish Carpathians and beyond, was further investigated by an interdisciplinary team.

New methodologies for data acquisition?

Time will tell.

New methodologies for data analysis?

In my analyses, I will probably use spatial regression models based on spatial autocorrelation. They are obviously already widely known, although relatively rarely used by geographers in data analyses such as mine.

Incorporation of new disciplines into your program?

Yes, I find that my research project, if developed in future, would definitely need cooperation with specialists of other disciplines – especially economics, sociology and nature protection/biology.

The future: Expansion to new geographic areas?

In the short-term perspective, I will try to give my project a broader context, e.g. by comparing my results with findings made in other parts of the Carpathians (especially in Ukraine and Romania) or in the Alps. In the long term, I hope to continue my research beyond Carpathians.

What other new challenges are you thinking about?

The possibility to turn research results into practice, e.g. by including them in local and regional development strategies, would be the biggest challenge! The possibility to turn research results into practice, e.g. by including them in local and regional development strategies, would be the biggest challenge!

Scott Williamson

David Hik (Professor, Department of Biological Sciences) and Scott Williamson (PhD student, Department of Biological Sciences)

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www.biology.ualberta.ca/faculty/david_hik/

What are your central research objectives?

1. Dynamics of ecological interactions between plants and herbivores (vertebrate and invertebrate) in alpine environments.
2. Processes of landscape change and plant succession across alpine ecotones (treeline, shrubline, tundra).
3. Influences of environmental variability and change, specifically snow cover, on the resilience of 1 and 2 above.
4.Scaling from plot level studies to entire ecosystems.

On what do you take data?

Basic meteorological data at 8 stations located along an elevational gradient, with emphasis on snow cover; abundance and distribution of mammalian herbivores (marmot, pika, mountain sheep, ground squirrels, caterpillars); primary productivity and composition of alpine plant communities; experimental studies of plant-animal interactions; analysis and improvement of remote sensing observations in mountains (MODIS, hyperspectral).

What are you attempting to predict or characterize using those data?

1. Quantify the processes that regulate plant-herbivore interactions, by concurrently studying reciprocal positive and negative feedback processes in plant and animal populations through detailed experimental studies and ecosystem monitoring;
2. Assess the influence of climate change, variability and oscillations (ENSO, Pacific Decadal Oscillation, seasonal phenology, etc) on the dynamics of terrestrial ecosystems in subarctic mountains;
3. Develop methods for scaling from individual to population/community to regional ecosystem dynamics using complementary experimental and modeling approaches.

What is the geographic scope of your research?

Yukon: St. Elias Mountains, Kluane Front Ranges, Ruby Range Northern Rocky Mountains: focused on Jasper National Park region.

Where do you gather data?

Yukon: St. Elias Mountains, Kluane Front Ranges, Ruby Range Northern Rocky Mountains: focused on Jasper National Park region.

Over what geographic domain do your conclusions hold?

High latitude mountains in Alaska and Yukon, northern BC and Northwest Territories most specifically, but some general ecological principles should apply more globally. Methodological work is also broadly applicable.

What agencies and foundations fund your research?

NSERC Canada; other small grants from northern agencies. Students and postdocs are supported from diverse sources through fellowships and scholarships.

What are the time horizons of your funding?

Core funding from NSERC is for 5 year periods. Other funding from diverse sources is opportunistic often just for one year.

What kinds of resources will your funding support?

Mostly students, instrumentation and field work. Infrastructure needs to be funded separately, and limited funding is available for collaboration (workshops, etc). Data management costs are increasing too.

The future: How you would like to see your research program evolve over the next 5-10 years?

Focus will be on scaling, for example from leaf (physiology) to whole plant (demography) to plot (community) to variation across sites (aspect, topography, latitude, etc) to regional and global comparisons.

New methodologies for data acquisition?

Need better way to collect data in winter. For example, nano-membranes and wireless networks for recording fine-scale temperature variation.

New methodologies for data analysis?

Need better way to collect data in winter. For example, nano-membranes and wireless networks for recording fine-scale temperature variation. Drones fitted with imaging systems (hyperspectral, broadband, thermal).

Incorporation of new disciplines into your program?

Cellular automata – mathematical and computational biology in general.

Expansion to new geographic areas?

Continuing efforts to establish a community based monitoring program in partnership with local aboriginal organizations, regional government agencies, and NGO's.

What other new challenges are you thinking about?

Beginning to design a parallel research program in the Northern Rocky Mountains (Jasper National Park region). Interested in other mountain areas with possibilities for collaboration with research groups working in Alps, central Asia, Andes (for example).

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