BELMONT FORUM
Scoping Workshop

CRA 2015
Mountains as sentinels of change

Proposers

CNR-DTA (NextData Project), Italy

National Science Foundation (NSF), USA

Ceresole Reale (TO), June, 10-11 2014

Participants

ITALY

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Venue

Ceresole Reale (TO)
Gran Paradiso National Park

Organizing Committee

Elisa Palazzi, Antonello Provenzale, CNR-ISAC
Maria Uhle, Kelly Watson, NSF

Local Organizing Committee

Elisa Palazzi, Antonello Provenzale,
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Workshop objectives

- Review the priorities the CRA should include
- Identify a list of topics/key questions the CRA will focus on
- Identify the best mechanisms/activities to deliver the desired results
- Develop strategy and options for coordination among activities
- Identify key communities for collaboration

Workshop outcomes

Identification of two separate activities/ mechanisms

1. Research projects

2. Community-driven assessment on Mountain Observing systems/Monitoring activities (working group)

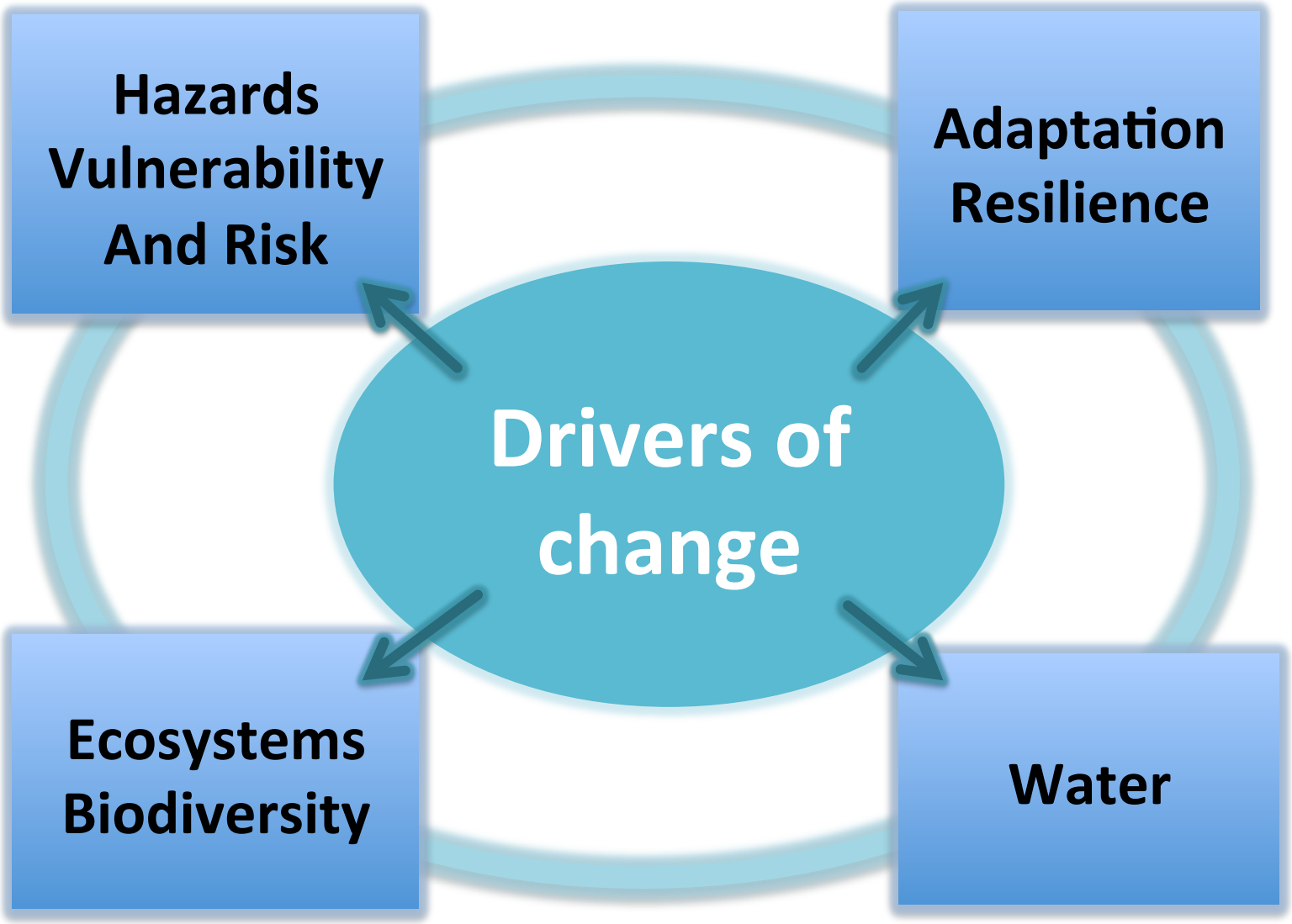
1. Research projects

A CRA on Mountains
Introduction and Motivation

- Why are mountains so sensitive to change? (EDW, spatialized ecosystems, etc.)
- Why are the themes chosen relevant to Belmont challenge?
- Unique characteristics to mountains:
  - Benefits and dependencies to downstream – water case very clear
  - Potentially large changes in small spatial scale (mountains – altitudinal ranges, vegetation, land use – use of complementary areas, vertical structures, high relief energy)
  - Specialized biodiversity and ecosystems that are vulnerable to change drivers
  - Mountains are bell-weathers
  - Tipping elements
  - Lack of research, especially integrated systems approaches; the community is fragmented (mostly national approaches and not interdisciplinary)
  - Socio-economic characteristics – disconnect between mountain and valley societies
  - Greater uncertainty in observations and models
  - Global policy drivers (IPCC)

Themes of the Proposal: schematic

Mountains as Sentinels of Change



Hazards Vulnerability And Risk

- Changes in frequency/magnitude/location/duration/ nature of the hazards and relationship to changes in drivers
- Socio-economic impact of hazards: natural or man-made – past, current and/or future
- Vulnerability of natural and human systems to drivers of change and impacts on society
- Perception and communication of risk
- Cascading effects of multiple factors (Landslides, pollution, fire, technological risk)
- Uncertainty assessment

Adaptation, Resilience

- Natural and human systems
- Mountains socio-ecological systems evolution
- Governance – formal to informal
- Public policy evaluation
- Impact of conservation policies and design of future protected areas in light of changes
- Regional planning issues – built environments, natural environment tradeoff and restoration of degraded areas
- Agriculture/Forestry/Pastoralism and other land uses (bio-energy) – renewable energies (wind farm)
- Tourism
- Hydropower – other utilities (distribution and supply)
- Infrastructures – tunnels, roads, cable cars, rails, communication networks, etc.
- Managing probability and uncertainty

Ecosystems and Biodiversity

- Potential changes in ecosystem functioning in response to drivers
- Long-term effects of extreme events on ecosystems
- Cross scale interactions with the drivers
- Relationships between biodiversity and ecosystem services
- Indicators of functional biodiversity
- Detection of hotspots and biodiversity dynamics
- Invasive species (allochthonous)
- Restoration and remediation
- Tradeoffs between conservation and resources/ development

Water

- Mesoscale atmospheric dynamics over complex terrain – observation and modeling
- Linkage to processes controlling water storage and fluxes, flows (surface, ice and groundwater)
- Relation of mountain hydrology to foreland (down stream impacts)
- Impact on society – water security - governance, management, access and availability of natural resource, protection from hazards
- Resource management and conflict and management compromises
- Tradeoffs between conservation and resource use/ demand/development

Drivers of change

- Changes in frequency/magnitude/location/duration/ nature of the hazards and relationship to changes in drivers
- Climate downscaling – synoptic to mesoscale to local scale
- Upscaling effects and feedbacks
- Socio-economic drivers (migration, urbanisation, land-use, natural capital)
- Political drivers (government policies..)
- Local socio-economic scenarios for impact models
- Interaction of multiple drivers and avoiding unintended consequences of adaptation/mitigation strategies

The call – initial ideas

- Two-Stage call
  - Pre-proposal (~ 4 pages)
  - Full-Proposal (~ 20 pages)
- Three-years projects
- Coordination mechanisms: meetings among PIs (at the beginning and in the middle); Final Conference; young scientists network
- …

2. Working Group on monitoring

Mountain Observing System

- A community driven exercise – outcome will be a report (e.g. BF e-Infrastructure)
- Collection of existing data sets – what do we have?
- What do we need? (gaps in observations and capabilities; what places)
- Raw data (sats, sensors) – processed for usage – new information
- Bio, water and hazards data – community monitoring
- Socio-economic issues
- Essential variables – is this important for mountains?
- Links to other systems (mountain to lowlands)
- Links with other CRAs including e-Infrastructures

Mountain Observing System
Links with other initiatives/programmes/etc.

- GEO-GNOME
- MRI – IGBP and IHDP
- ICIMOD
- World Bank – Regional Development Banks
- Development aid agencies
- EU-GEO and Copernicus
- SERVIR (NASA, USA)
- ISSC
- FEWSNET
- CEOS - Space Agencies – Space arm of GEO
- Academic networks
- ECRA (European Climate Research Alliance)
- GFCS (Global Framework for Climate Services –WMO)