

INTERNATIONAL CONFERENCE ON
MOUNTAINS AND CLIMATE CHANGE

Living with environmental change on the Tibetan plateau

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High Summit
LECCO 2013

“The honour of the mountains is the snow”

(song from the Everest Region)

"Himalayan glaciers disappear as world warms up" (the Guardian, 4 June 2009)



Imja Glacier 1950-2007
Photos: Schneider and Beyers



1994/5 snow disaster





“[there is] a wide gulf...between the positivist, computer-generated, quantitative methods of research and global scales of analysis among climate change scientists and the more contextual interpretive and qualitative approaches that characterize much of social science research.”

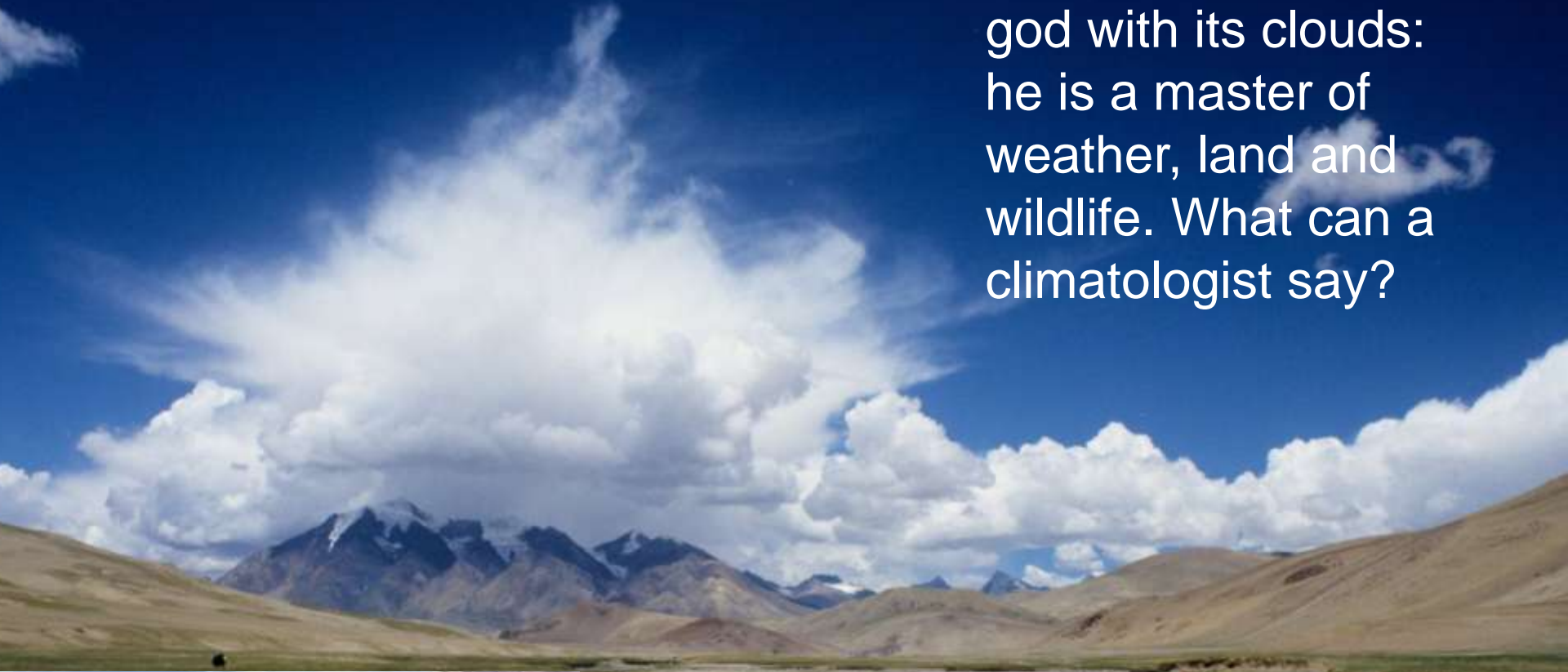
“...localized scales of analysis, that have been the hallmark of anthropology, can complement global modeling exercises that cannot fully capture the complexities of real life decisions” (Magistro and Roncoli 2001:91)”



Holy mountains: traditional indicator of changing climate



Chang Targo, a powerful mountain god with its clouds: he is a master of weather, land and wildlife. What can a climatologist say?

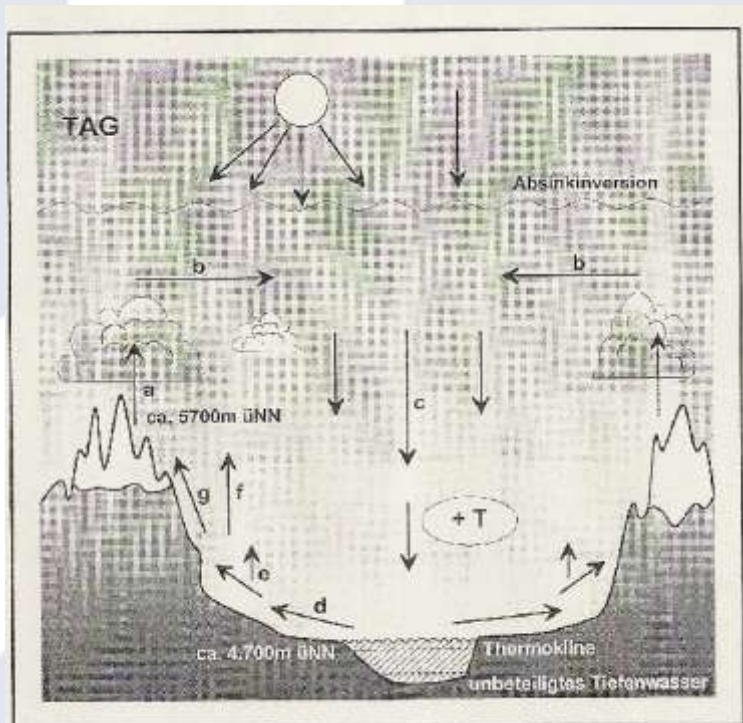




Nyenchen Thanglha with overshooting cumulus nimbus



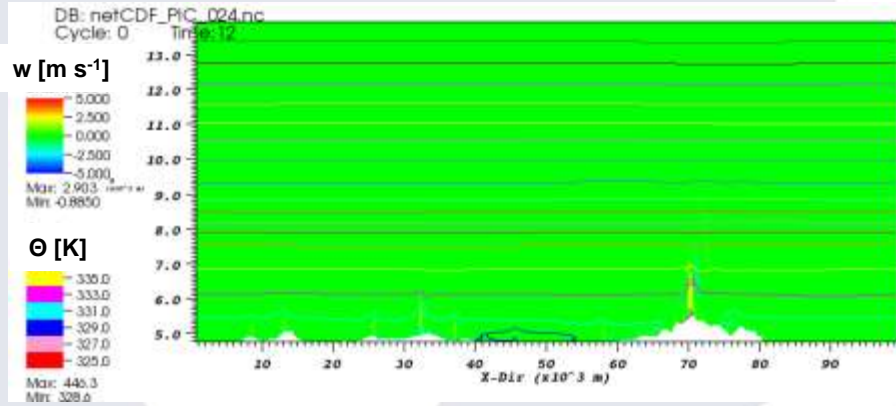
Hans Graf
Institute of Atmospheric Sciences
University of Cambridge



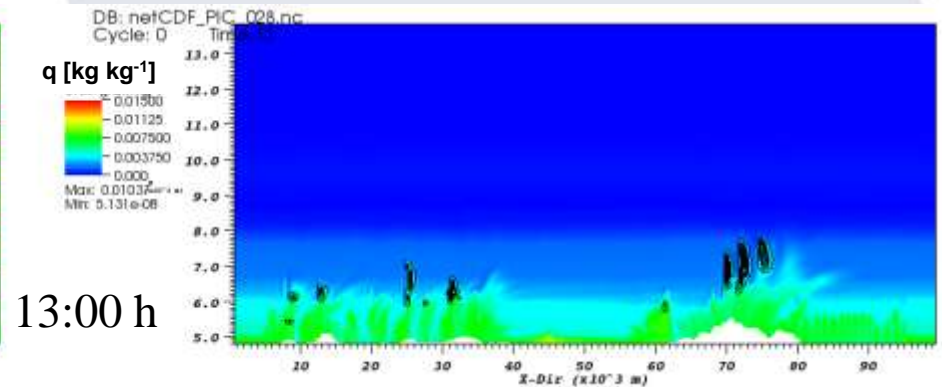
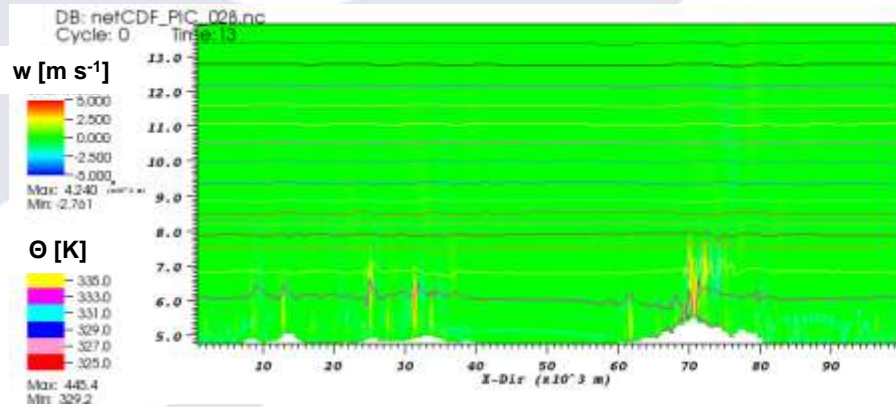
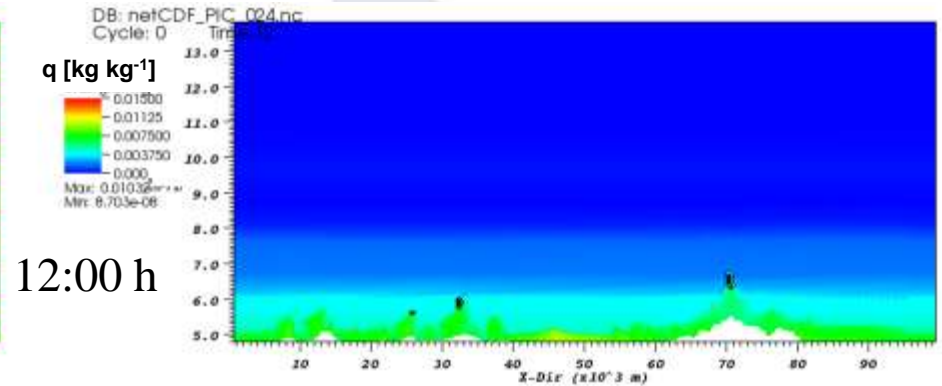
The first sketch of an idea ... Why do we get rain and snow mainly over the mountains?

Development of Convection and Clouds (I)

Vertical wind, pot. temperature



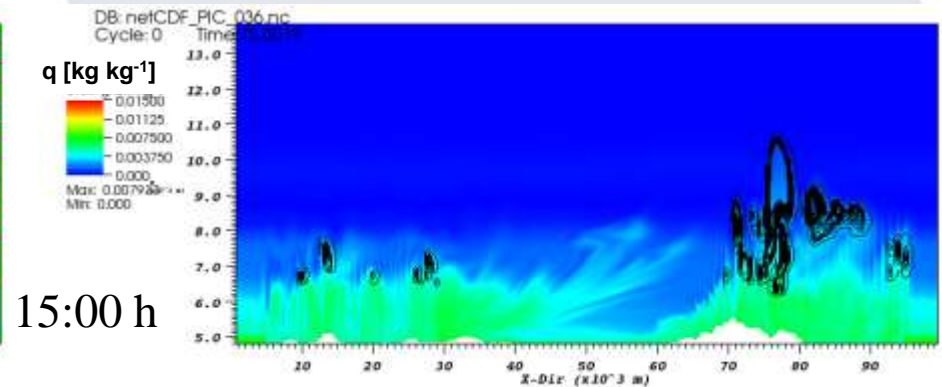
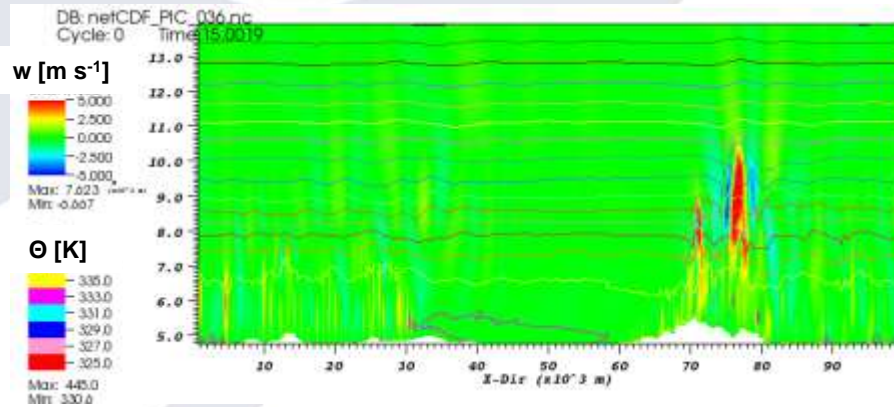
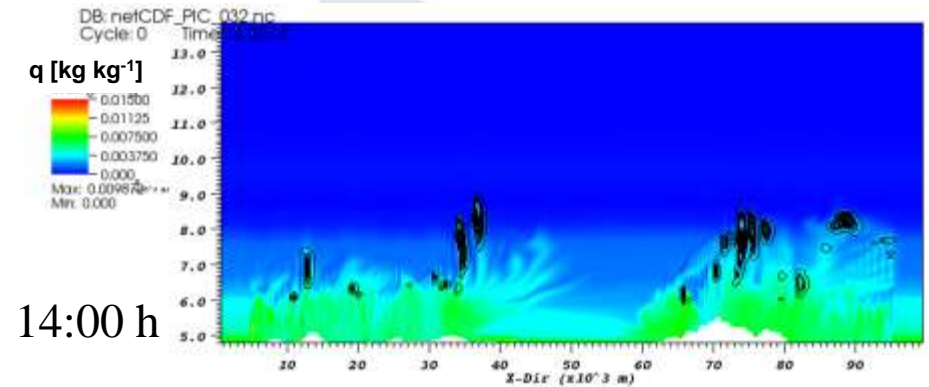
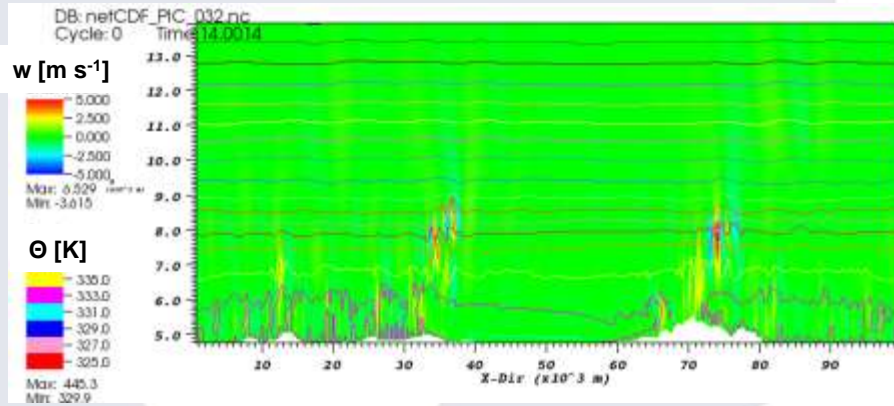
Moisture and clouds



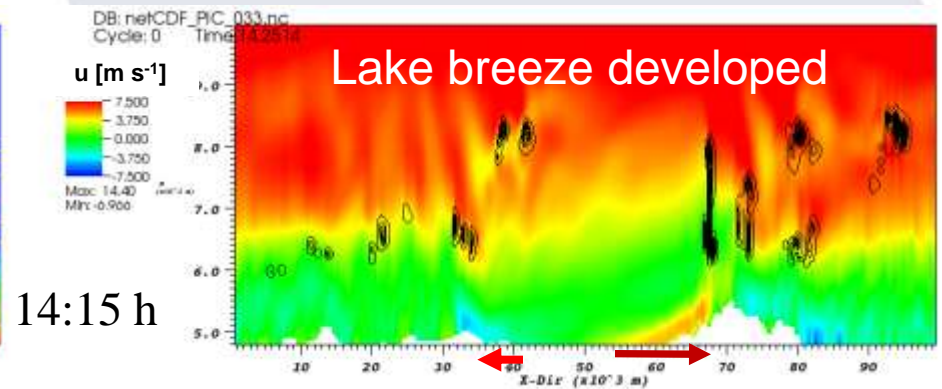
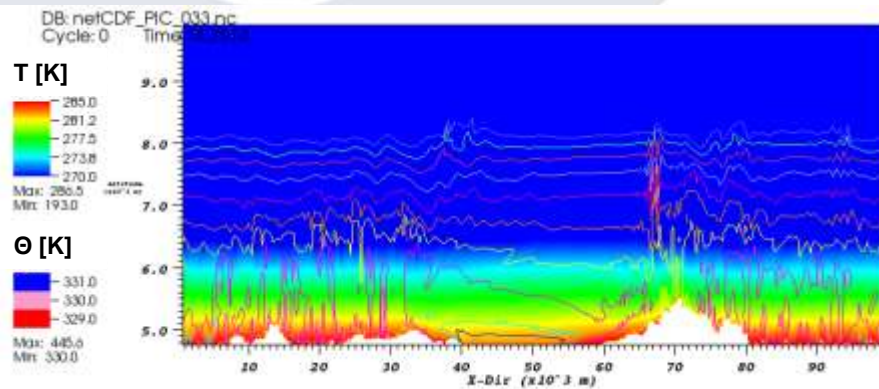
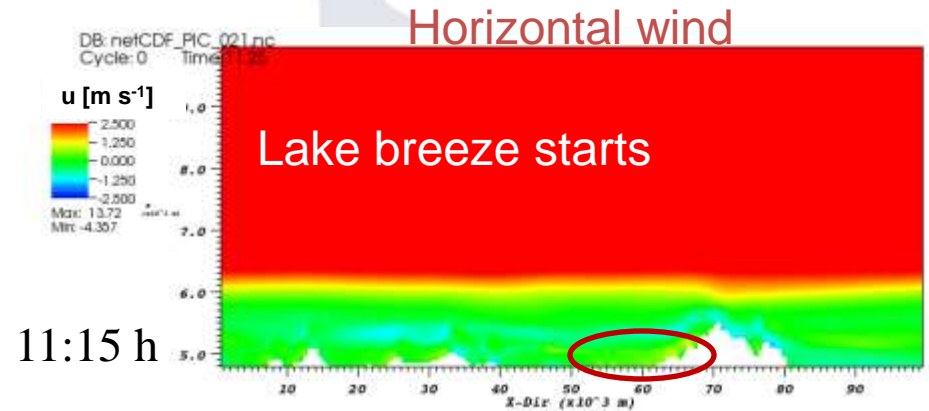
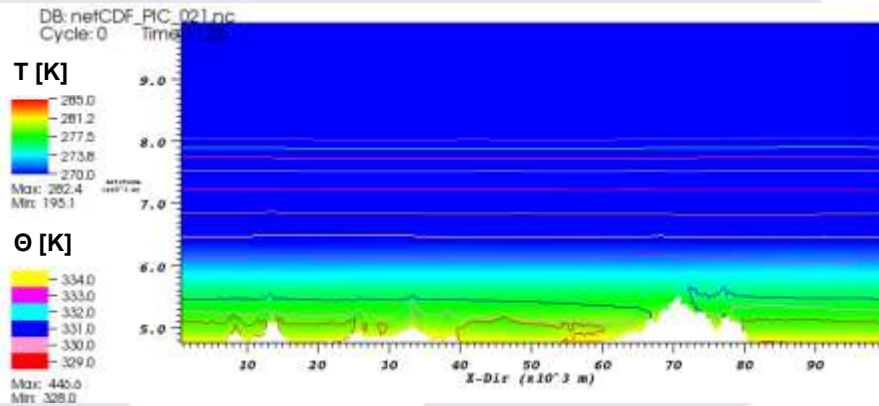
Development of Convection and Clouds(II)

Vertical wind, pot. temperature

Moisture and clouds



Thermally driven circulation at Nam Co lake



Ancient strategies

Documents show local strategies:

- high mobility
- high flexibility
- timed management of different water resources
- water-channels in strategic locations

The system is called *kyusa* and presents parallels with the *marke* system described by Goldstein and Beal 1990

New strategies: fencing, sedentarization, sometimes relocation and search for new sources of income





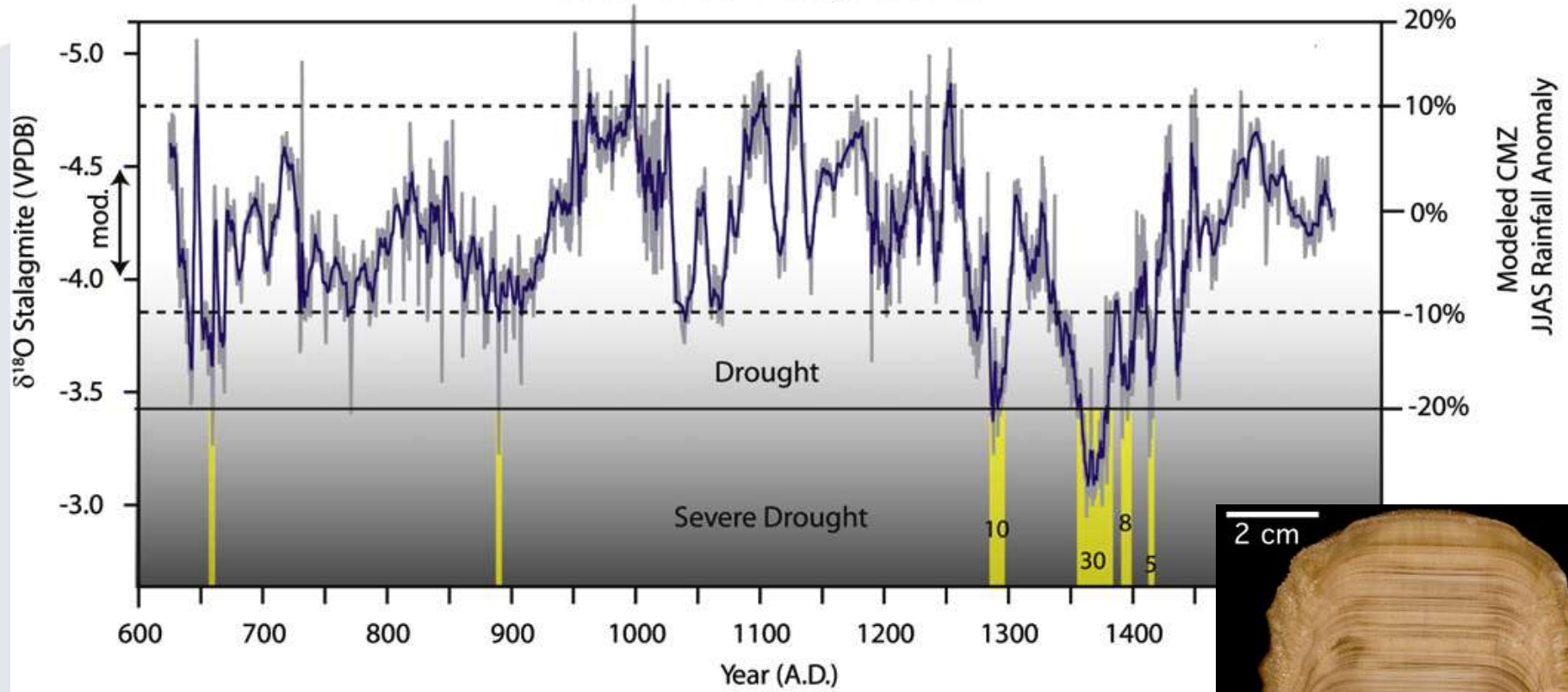
Chokyi Dronma's
Channel



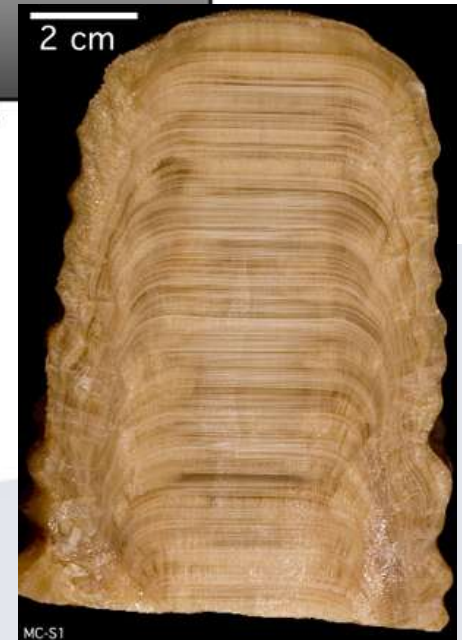
Ancient
fields



Dandak Cave $\delta^{18}\text{O}$ Stalagmite Series



(Simha et al 2007)



“After 1200 AD... the [Western Tibetan] polity began a slow decline, and by ca AD 1350, it had collapsed. Although the historical documents describe this collapse in primarily political terms, other evidence points to significant environmental deterioration.... Tibetan-speaking peoples apparently fled the plateau in large numbers in search of food after constant crop failure, with some traveling as far south as the Kathmandu Valley [...] Archaeological evidence from the Sutlej Valley near the former Guge capitol of Tsaparang provide evidence of village abandonment, which was apparently caused by a significant drop in the water table that left stranded major irrigation systems upon which these villages depended” (Simha et al 2007:3)

Jessica Conroy (School of Earth and Atmospheric Sciences, Georgia Institute of Technology) presented at the conference of the International Association for Tibetan Studies (Ulaan Baatar, July 2013) results from a new lake sediment record from Kiang Co, a lake located in southwestern Tibet, spanning the last millennium indicating periods of warmth, and dustiness, from 1250-1400 AD, 1600-1750 AD and 1900-2007 AD



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经济发展、社会和谐、人民幸福。



孔木村圆貌

吉隆县农牧民安居工程领导小组办公室宣

二〇〇九年四月







Se ba'l brgyud

“The **look into the past** is one essential tool that can testify as to whether the present changes are exceptional. Yet the earliest measurements started only in the mid-nineteenth century, and reconstructions based on the observations of approximate climate indicators—proxies—are essential.

These **proxies are of different kinds**, their links to climate drivers are complex, and each proxy tells just part of the climate story. Only a few proxies are of a purely physical nature; the great majority involve chemical and even biochemical processes. The retrieval of related climate signals is never straightforward, and only the combination of a series of proxies gives confidence in a reconstructed climate history... “ (Kaser 2012:14)

UNUSUAL/UNUSED PROXIES

“...Can different forms of knowledge, including some that so far have been little considered in climate science, contribute to our understanding of past and future climates? If so, how can they be used?

These so-far-unused proxies may become precious bits to be added to the puzzle of climate reconstruction if rules can be developed on how to interpret them. The rules have to be jointly developed by both the social and the physical scientists involved”

(Kaser 2012:14)



the government's message



- Du Fachun, Researcher of the Chinese Academy of Social Sciences (paper given at the Beijing International Seminar on Tibetan Studies, August 3, 2012)
- Basing himself on fieldwork among herders in Yushu (Qinghai, PRC) observed that grassland degradation is due to a number of factors (including global warming, unsustainable mining, improper management adopted after the introduction of household responsibility system and loss of mobility) and concluded that:
- “Local herders are protectors of the grassland, not destroyers. Herders should be consulted in the process of the development projects... and their different ideas and suggestions should be seriously considered””



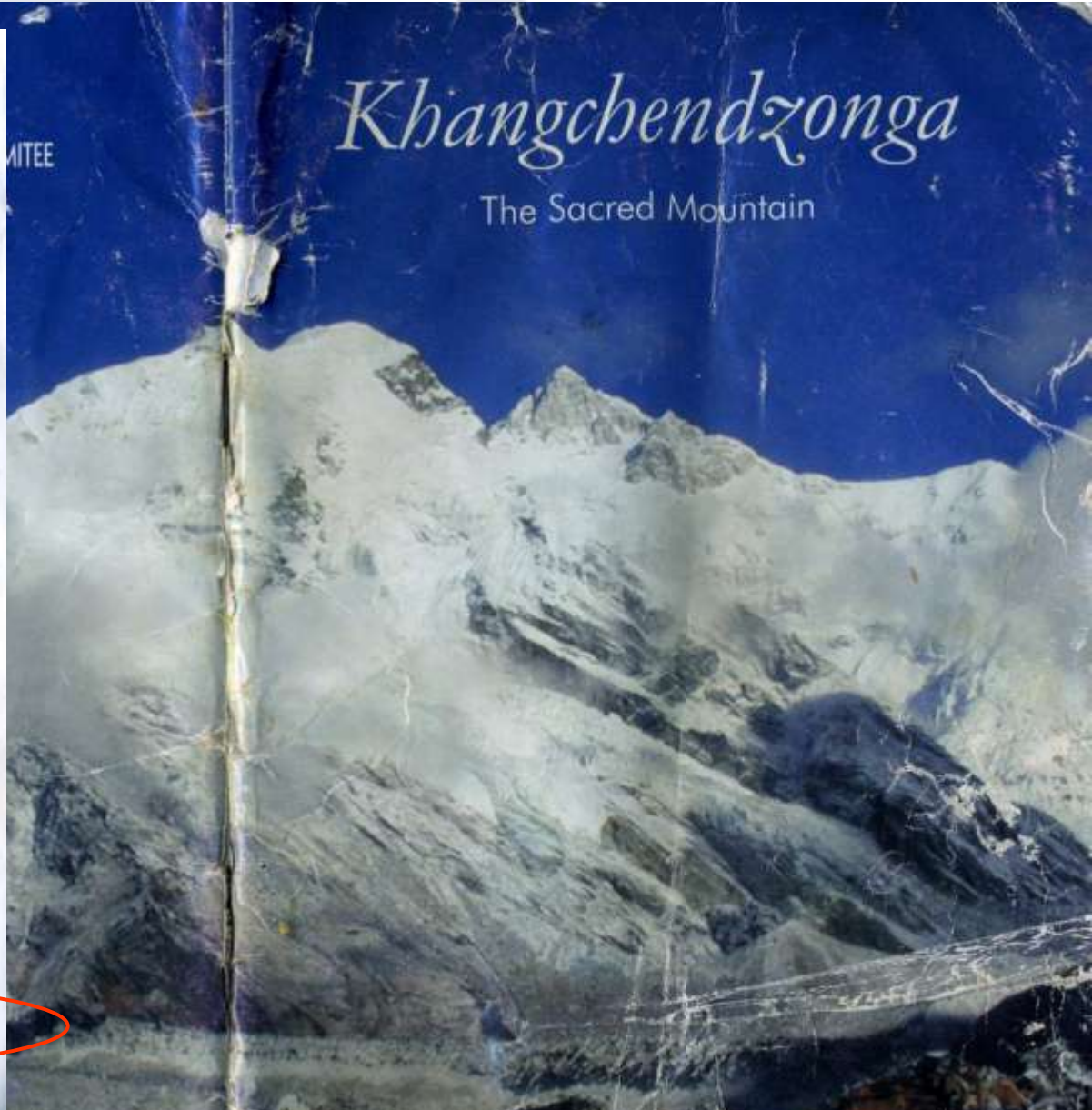


Biodiversity as Kanchendzonga's treasure

The Chief Country God of Sikkim
The Khangchendzonga



Khang-chen-dzo-nga – The chief country god of Sikkim, of red colour, carrying a Gyaltsen or banner of victory, and mounted on a snow lion. His dwelling place is the mountain from which he takes his name and is an object of worship. Khangchendzonga literally means five repositories of God's treasure, namely that of gold, silver, gems, grains and holy books. This handbook dwells on His most valuable treasure namely Biodiversity.



Changing climate on the Tibetan plateau: Environmental Histories and Contemporary Challenges

Panel at IATS, Ulaanbaatar 2013

Speakers included:

- Astrid Hovden (University of Oslo): showed how the village community coped with the glacial lake outburst flood (GLOF), which struck the village in the summer of 2011 in Humla district of north western Nepal relying on traditional mechanism of decision making and new knowledge
- Pasang Sherpa (Washington State University) discussed how for Sherpas, followers of Nyingma Buddhism, climate change issues are spiritual as well as institutional and drew attention to a wider range of phenomena linked to the changing climate beyond the risk of GLOFs
- Du Fachun (Chinese Academy of Social Sciences) explored the effects of climate change on alpine grassland degradation and discussed the Chinese government strategies to address environmental and social issues among Tibetan communities
- Emily Yeh (University of Colorado) presented the study of coping strategies of herding households in northern Tibet introducing a vulnerability index that may help informing policy makers and the taking of decisions at large. This is particularly important as according to empirical evidence and climate models with global climate change the magnitude and frequency of extreme snowstorms is likely to increase on the Tibetan Plateau.