

## Tropical-Extratropical Climatic Teleconnections: A Long-Term Perspective

CHAPMAN CONFERENCE, HONOLULU, HAWAII, 8-11 FEBRUARY 2005

Climatic teleconnections link regional variations to global phenomena. An excellent example of this is the impact that variations in El Niño Southern Oscillation (ENSO) have on global climatic anomalies.

The purpose of this conference was to bring together atmospheric scientists, oceanographers and paleoclimatologists in order to provide modern climate scientists with a better understanding of paleoclimate records, and paleoclimatologists with the opportunity to place their records into the larger context of climate processes. Climate periods reconstructed using proxy records from ocean, lake and peat sediments, fossil corals, ice cores, speleothems, paleosols and tree rings included the last millennium, the Quaternary, and the Pliocene-Miocene. Variability on millennial and orbital time scales is apparent in many of these records and they show tropical-extratropical connections but forcings can be different. Millennial variability in tropical SST records corresponds to prominent features in the North Atlantic (e.g. Younger Dryas) but have a muted response in the western tropical Pacific. Well-preserved corals in eastern Indonesia record a cooling event over ~100 years synchronous with the 8.2 ka cold event in the North Atlantic, supporting the role of atmospheric teleconnections in rapidly propagat-

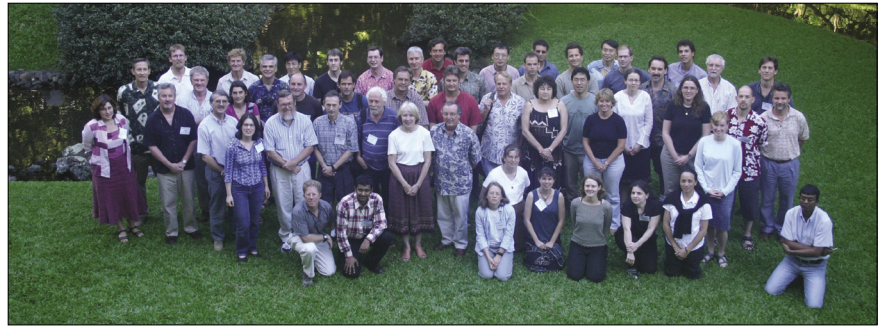


Fig. 1: The conference brought together experts in observation, theory and modeling of modern teleconnections, and in analysis of past records of climate variability.

ing this signal to the tropics. The paleoclimate record of the Asian summer monsoon winds shows robust teleconnections with ENSO and North Atlantic climate. Antarctic ice cores show variability that may be tied to variability of moisture sources at low latitudes.

The reports on modern climate using observational diagnostic analysis and modeling results provided a basis for understanding the paleoclimate records. The global heat budget provides strong constraints on the climate system by requiring systematic movement of energy. Latent heating in precipitation dominates the patterns of atmospheric heating and teleconnections. Monsoons are a coupled atmosphere-ocean-land phenomena and are characterized by a strong cross-equatorial pressure gradient. Teleconnections originating from patterns of tropical SST change and variability are sensitive to a change

of ENSO variance and to the patterns of warming in the tropical Pacific and Indian Oceans. Oceanic thermohaline circulation was also shown to be important.

The interdisciplinary mix of researchers from eight countries led to lively discussions and provocative questions, and new collaborations have already been forged to study the climate system from a longer-term perspective. Future meetings are being planned to continue to bring paleo-proxy and instrumental data, and climate modeling of the past, present and future to bear on the nature of climate change.

### ACKNOWLEDGMENTS

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**BETTE OTTO-BLIESNER**  
NCAR, Boulder, USA  
ottobli@ucar.edu



## An Overview of the Swiss Contribution to the HITE Project

HITECH WORKSHOP 2004, ZURICH, SWITZERLAND, 18 OCTOBER 2004

Human Impacts on Terrestrial Ecosystems (HITE)—an initiative of IGBP-PAGES—is an international network of projects devoted to the study of ecosystem changes on decadal-to-millennial time scales. The Swiss contribution to HITE comprises a cluster of five projects, the "HITECH-Net", where "CH" stands for *Confoederatio Helvetica*, Latin for "Swiss Federation".

A major HITECH workshop entitled "Using modeling, paleo archives, historical and contemporary information to assess present

and future ecosystem dynamics" took place in mid-October 2004 at ETH Zurich. This one-day workshop comprised four keynote lectures, eleven contributed presentations and several posters. Participants were mostly from Switzerland but also included scientists from the UK, Germany, France, Austria and Italy. Presentations were grouped into four chronological sessions, each beginning with a keynote lecture.

The first session focused on long time scales and the early history of human impacts on ecosystems.



Fig. 1: Studying the human impact on terrestrial ecosystems requires an interdisciplinary approach!

