Third Annual Meeting of the Coordinated Energy and Water Cycle Observations Project (CEOP)

Regional Climate Foci Special Session

CEOP High Elevations

Gianni Tartari[1,2] and Elisa Vuillermoz[1]

[1]Ev-K2-CNR Committe, Bergamo
[2]Istituto di Ricerca Sulle Acque, Consiglio Nazionale delle Ricerche, Brugherio, MB

Melbourne, Australia 19–21 August 2009
Bureau of Meteorology (BoM), 700 Collins Street. Melbourne, VIC 3001, Australia

Outline

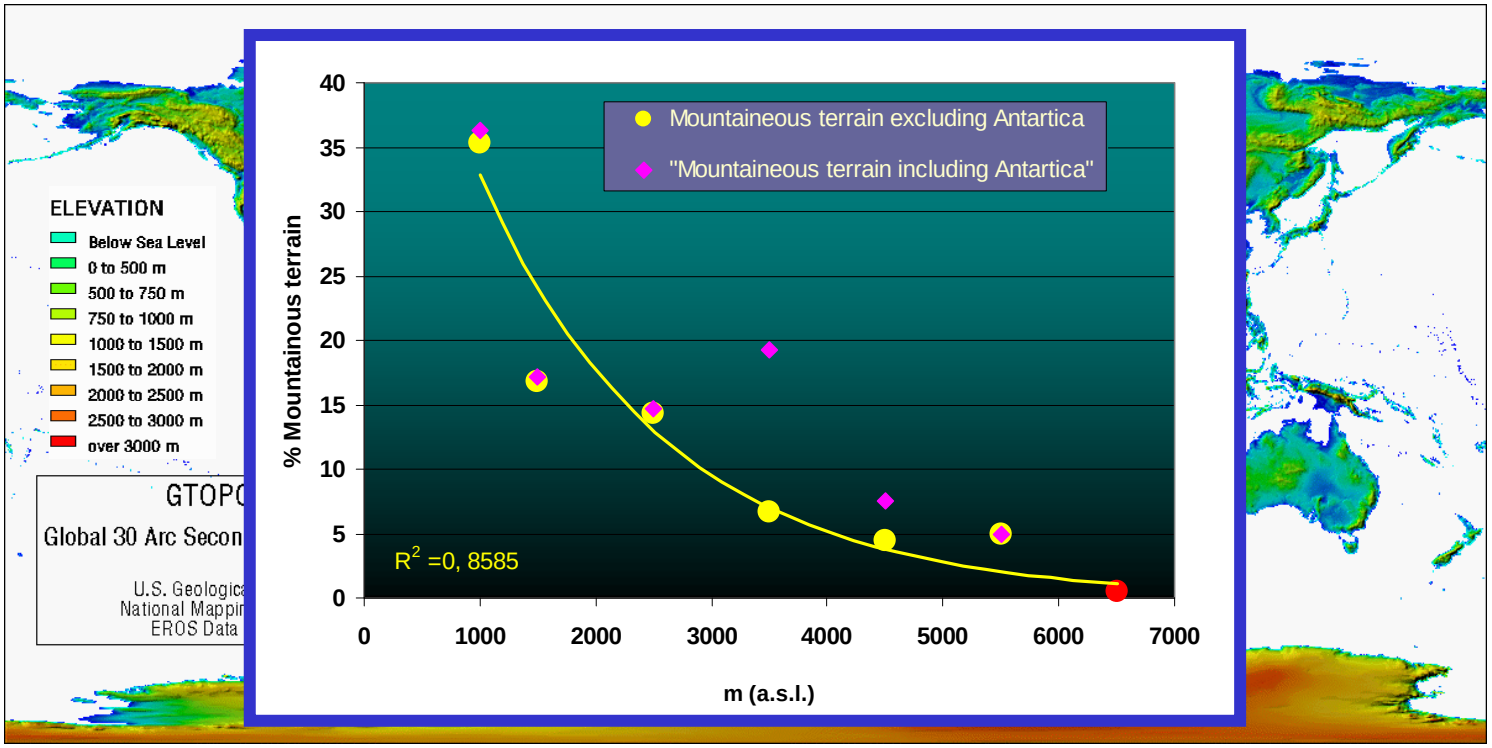
1. Role of HE
2. Objectives
3. Recent updates
4. Contributions/Benefits
5. Future plans

CEOP-HE is coordinated by Ev-K2-CNR Committee
as a component of
SHARE (Stations at High Altitude for Research on the Environment) Project
financed by the Italian Government (Ministry of Foreign Affairs, Ministry of Environment, Ministry of Research) and by the Italian National Research Council

SHARE
Stations at High Altitude for Research on the Environment

Role of HE

Mountains occupy 24% of the global land surface covering all altitudinal belts and encompassing within them all the Earth's climatic zones (Meybeck et al., 2001).



High elevation areas (above 2,500 m a.s.l.) represent about 20% of the total mountain area (not counting Antarctica).

http://www.unep-wcmc.org/habitats/mountains/region.html

Objectives

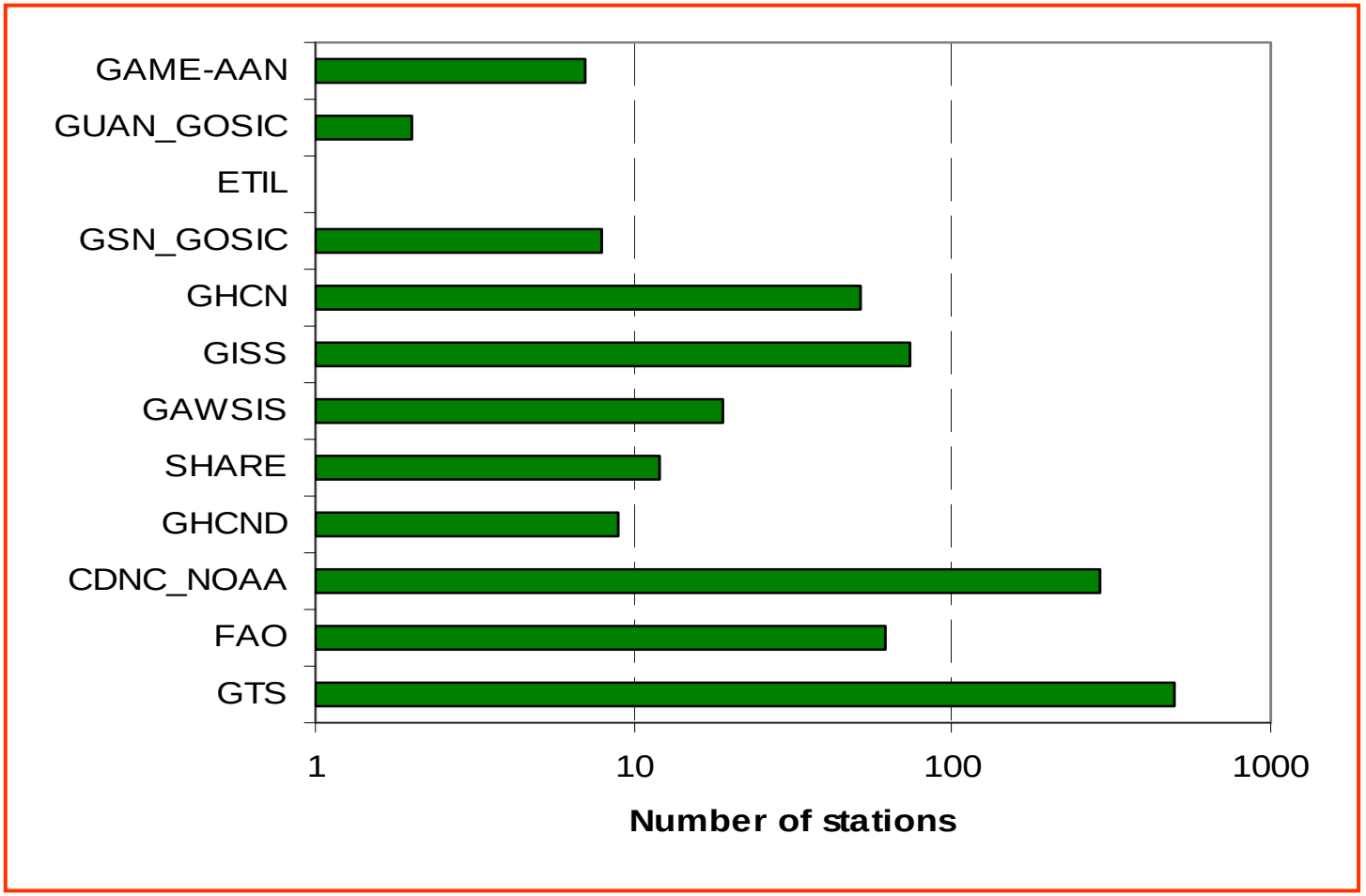
Goal: to study multi-scale variability in hydro-meteorological and energy cycles in high elevation areas, while improving observation, modeling and data management.

Objectives:

- **promote a network of monitoring of climatic data in high elevation regions**,
- **develop a database and a mechanism for sharing the data collected at high elevation monitoring stations,**
- **improve the studies on energy and water budget at high altitude to optimize the benefits in water resources management**,
- **improve understanding of the influence of aerosols and other atmospheric components on the water cycle in high elevation areas.**

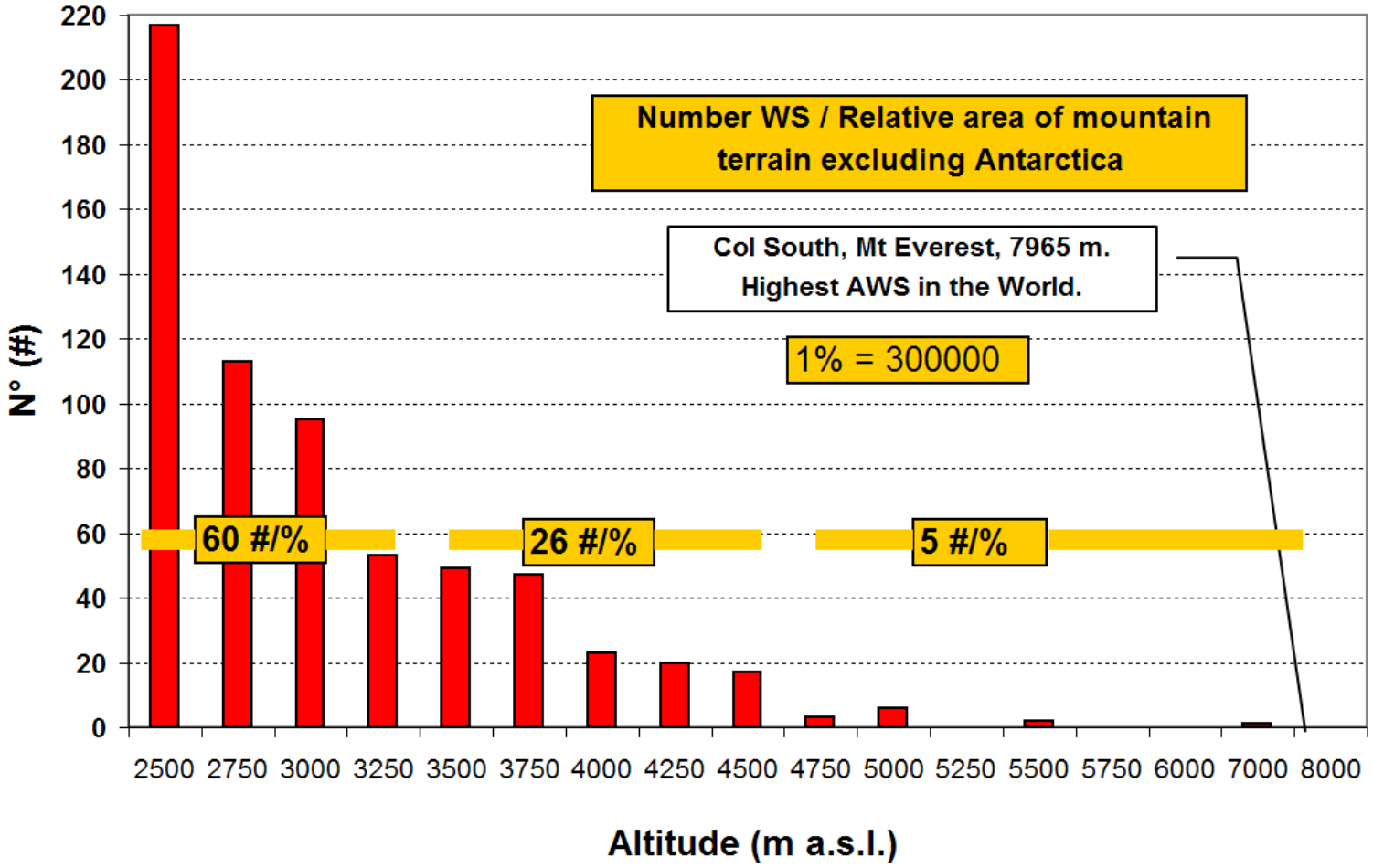
Recent updates

Survey of permanent monitoring sites in the major international networks



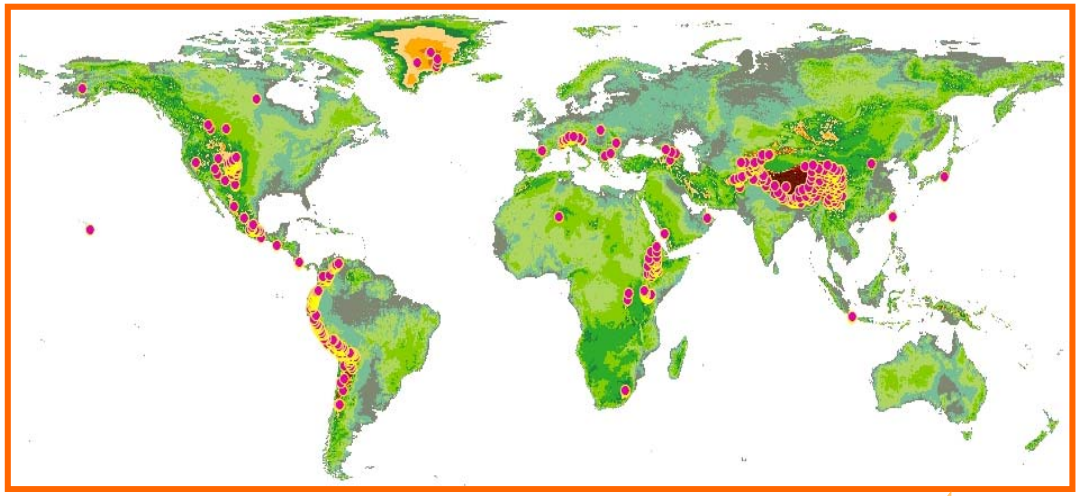
Recent updates

Altitude distribution of monitoring sites

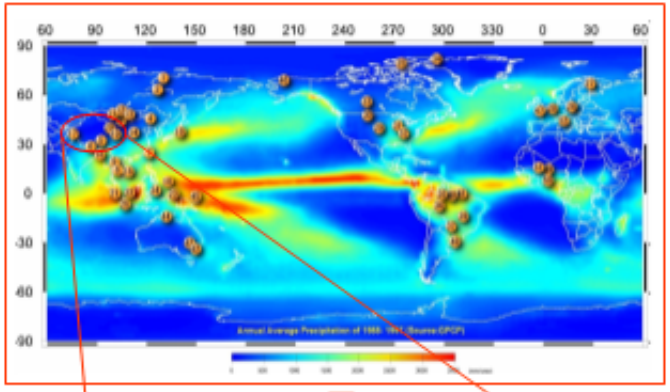


Recent updates

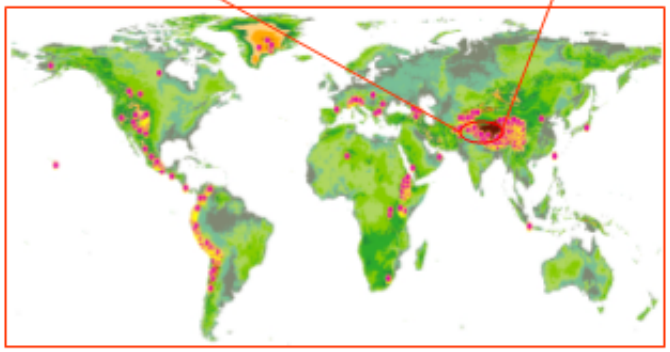
Permanent monitoring sites distribution in the HE



CEOP Reference sites Network: 52



CEOP-HE Reference Sites: 3
1 -CAMP/Tibet
2 - Camp/Himalayas Network
3 - Pakistan Karakorum Network



Total Stations ≥ 2500 m a.s.l.: 645

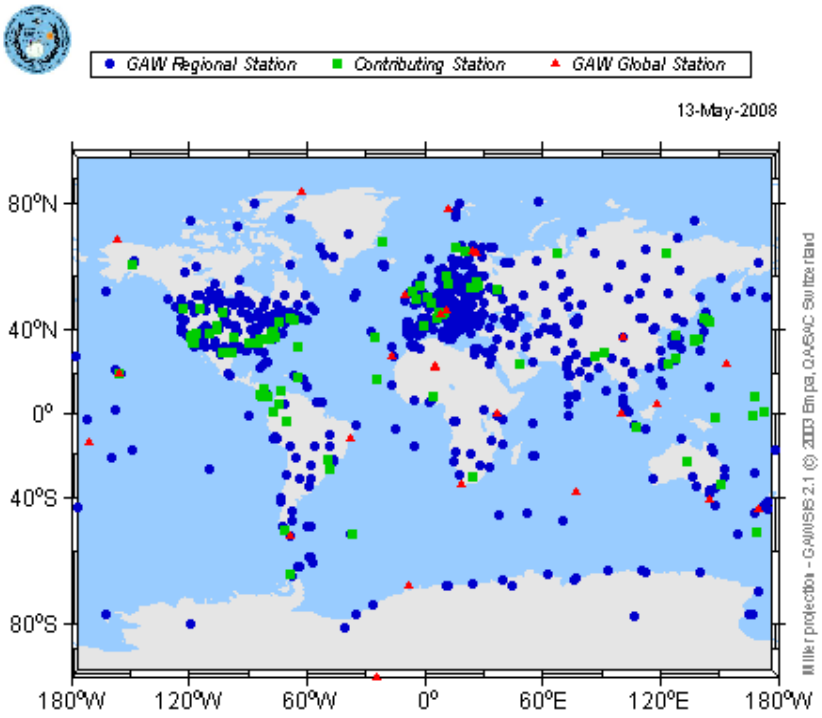
Objective:

to create a global network based on 30-40 sites and to increase up to 10-12 the number of reference sites.

Recent updates

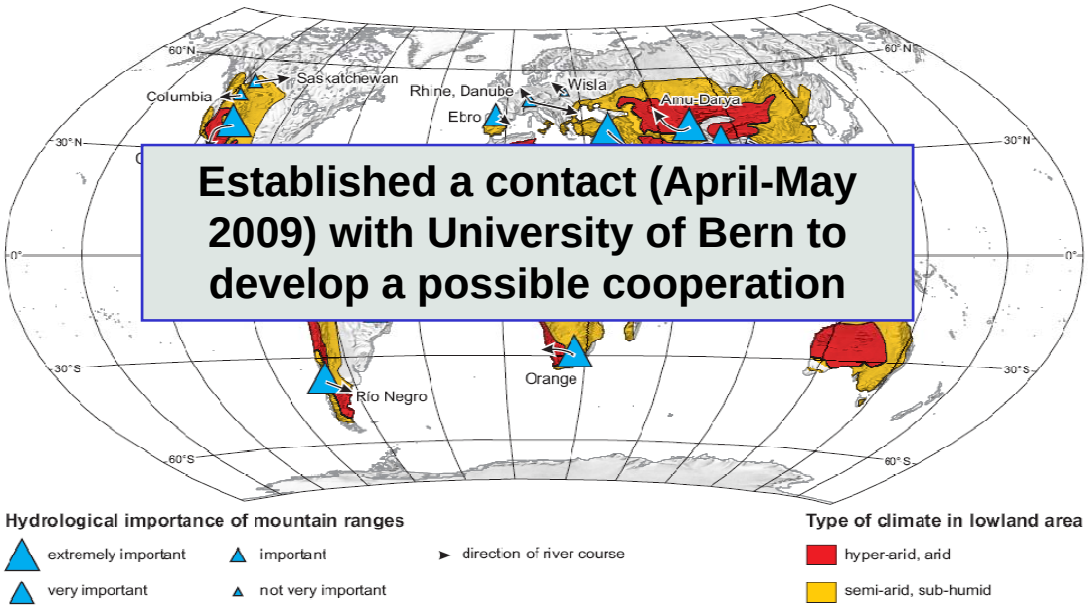
Variables	Number of sites
Temperature	638
Total Precipitation	638
Pressure	369
Relative Humidity	27
Dewpoint	289
Wind Speed	86
Wind Direction	26
Snow Depth	296
UV Radiation	**24**
Soil Temperature	**8**
Ozone	**12**
Aerosol	**9**
Greenhouse Gas	**12**
Reactive Gas	**11**
Precipitation Chemistry	**4**

Preliminary survey of main variables measured in the sites



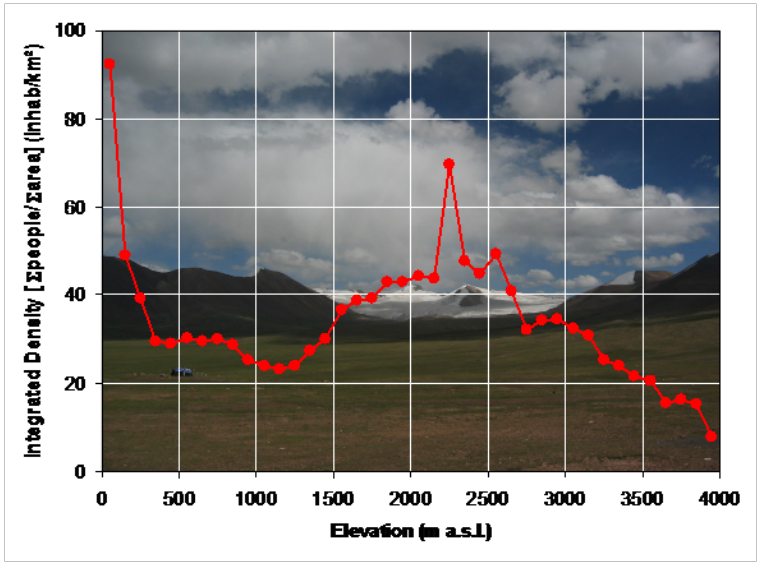
Recent updates

Hydrological significance of mountain range for the river basins (Viviroli et al., 2003).

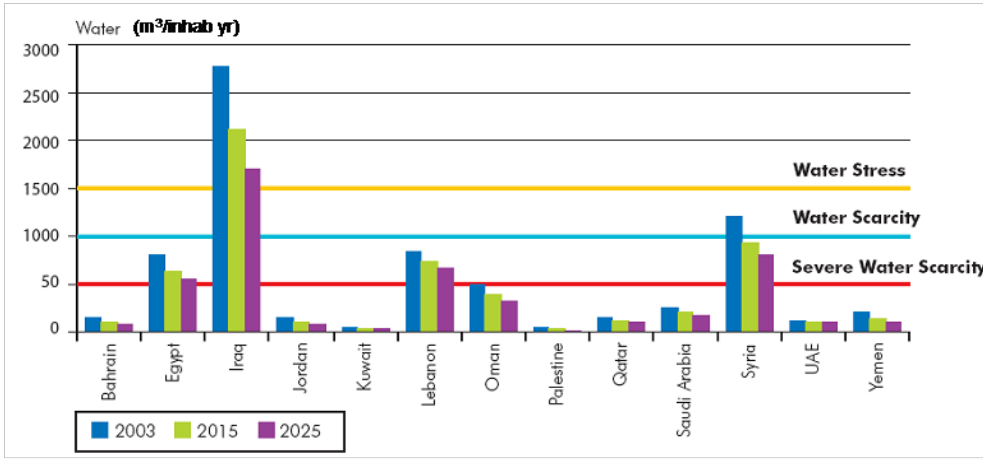


Established a contact (April-May 2009) with University of Bern to develop a possible cooperation

Integrated density of people at each elevations (Cohen & Small, 1998)



Water scarcity in the Arab Countries in the years 2003, 2015 and 2025 (Tolba & Saab, 2008)



Recent updates

Improving the environmental Network in Himalaya-Karakorum (HK) to establish in this area the first HE-Case Study

Recent updates

Dissemination

Web site: www.ceop-he.org

Thematic workshops/conference:

- NAST Conference, Kathmandu (November 2008);
- WCRP/Clic, Genève (December 2008);
- Tsukuba University (March 2009);
- RIHN, Kyoto University (March, 2009);
- NAST High-Elevations Conference, Kathmandu (April, 2009);
- EGU, Vienna (April 2009);
- SHARE International Conference, Milan (May 2009);
- CEOP-AEGIS, Milan (June 2009);
- Third Pole Environment Conference, Beijing (August 2009).

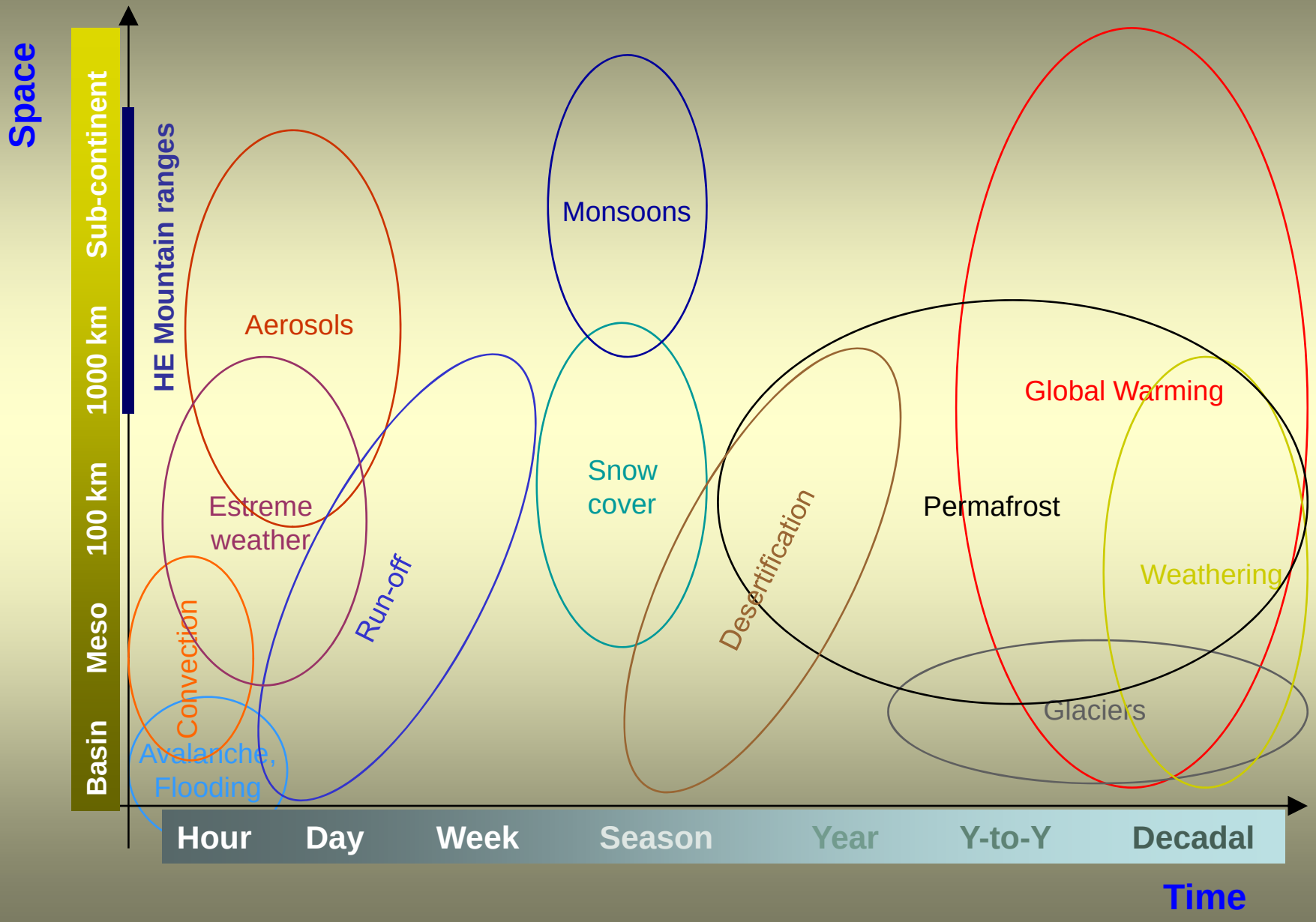
GEWEX Newsletter (August 2009)

Contributions/Benefits:

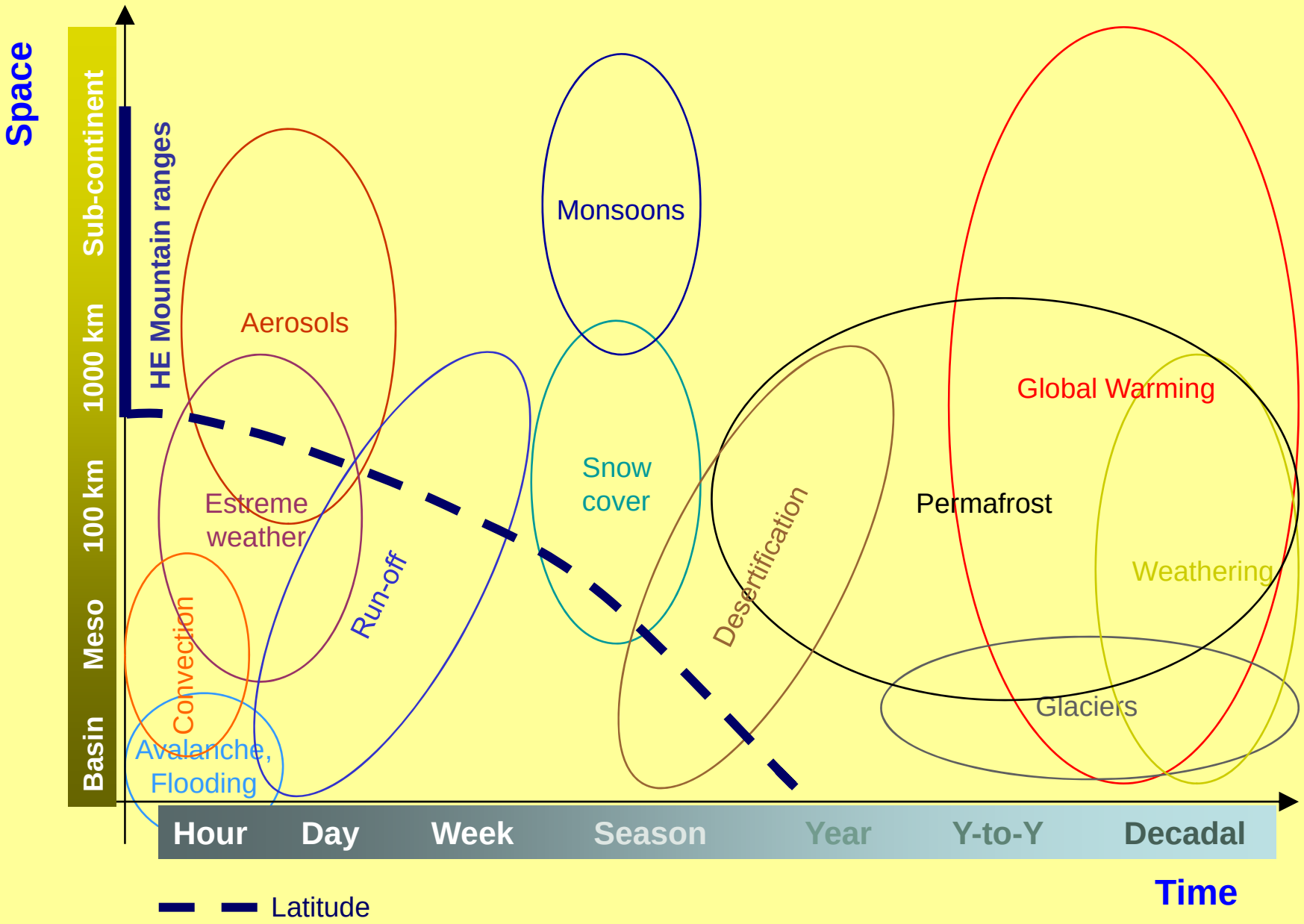
a conceptual approach

Various scales to treat in CEOP-HE

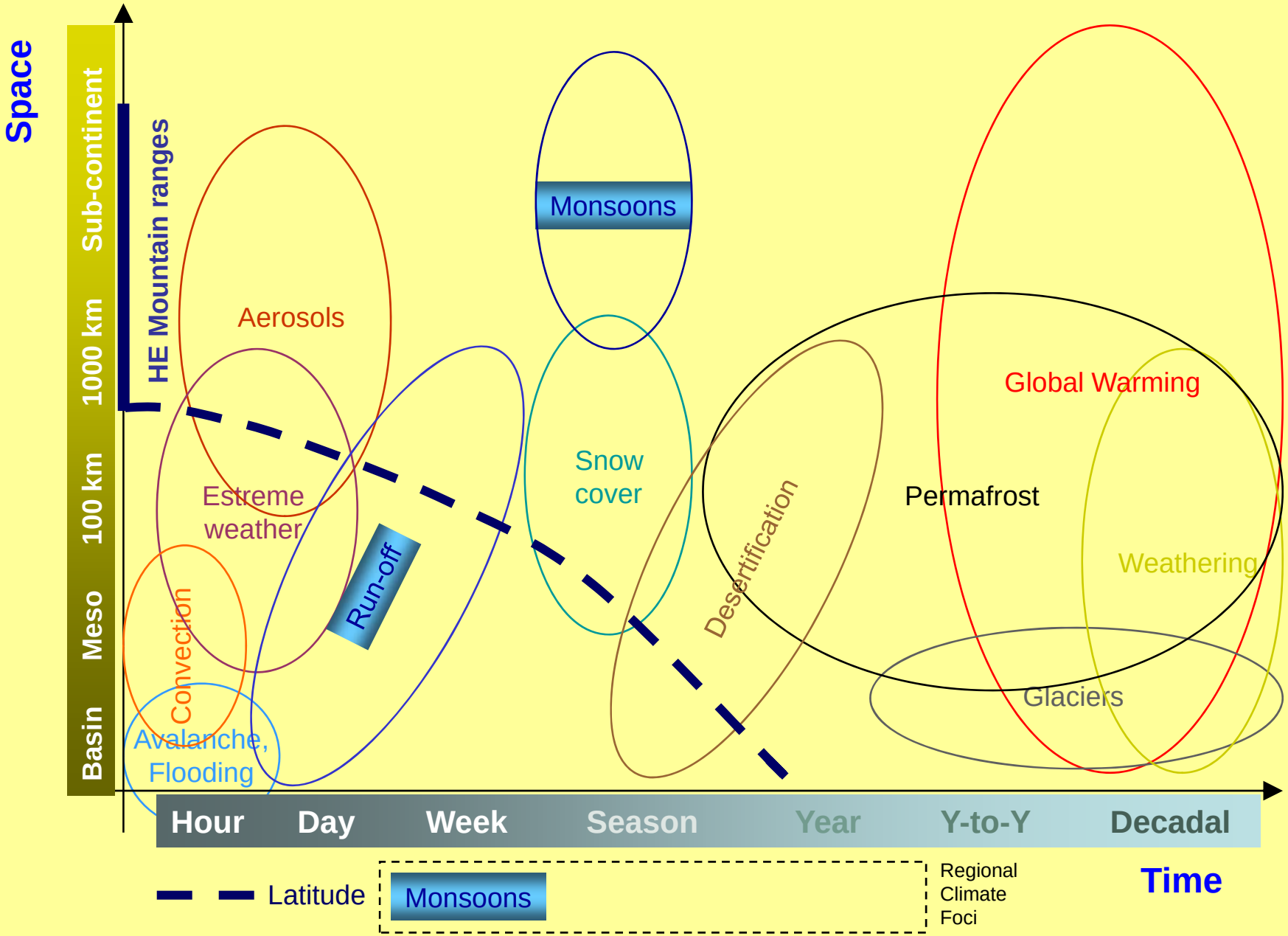
Conceived by K.Ueno, modified by G.Tartari



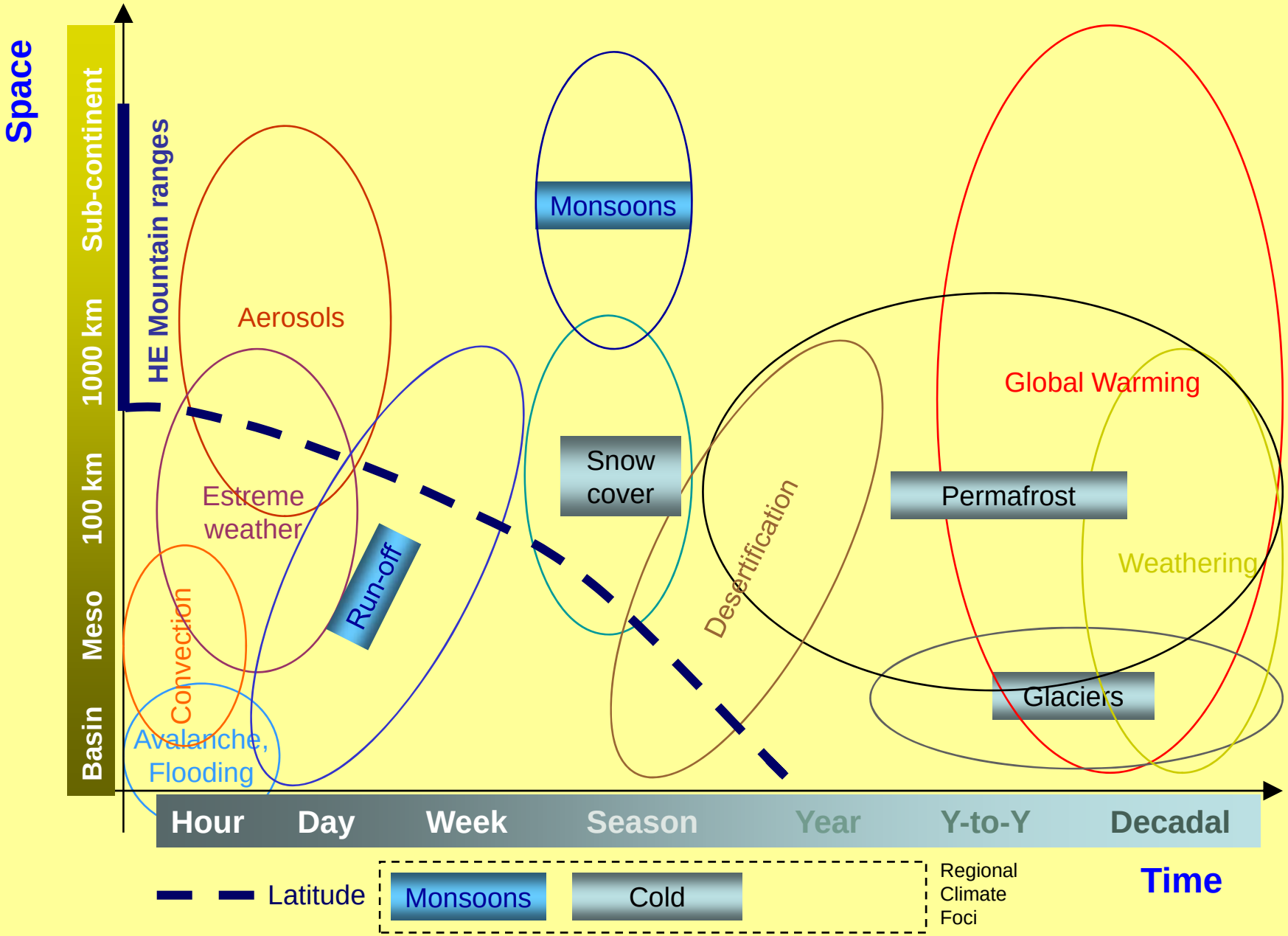
HE and latitude



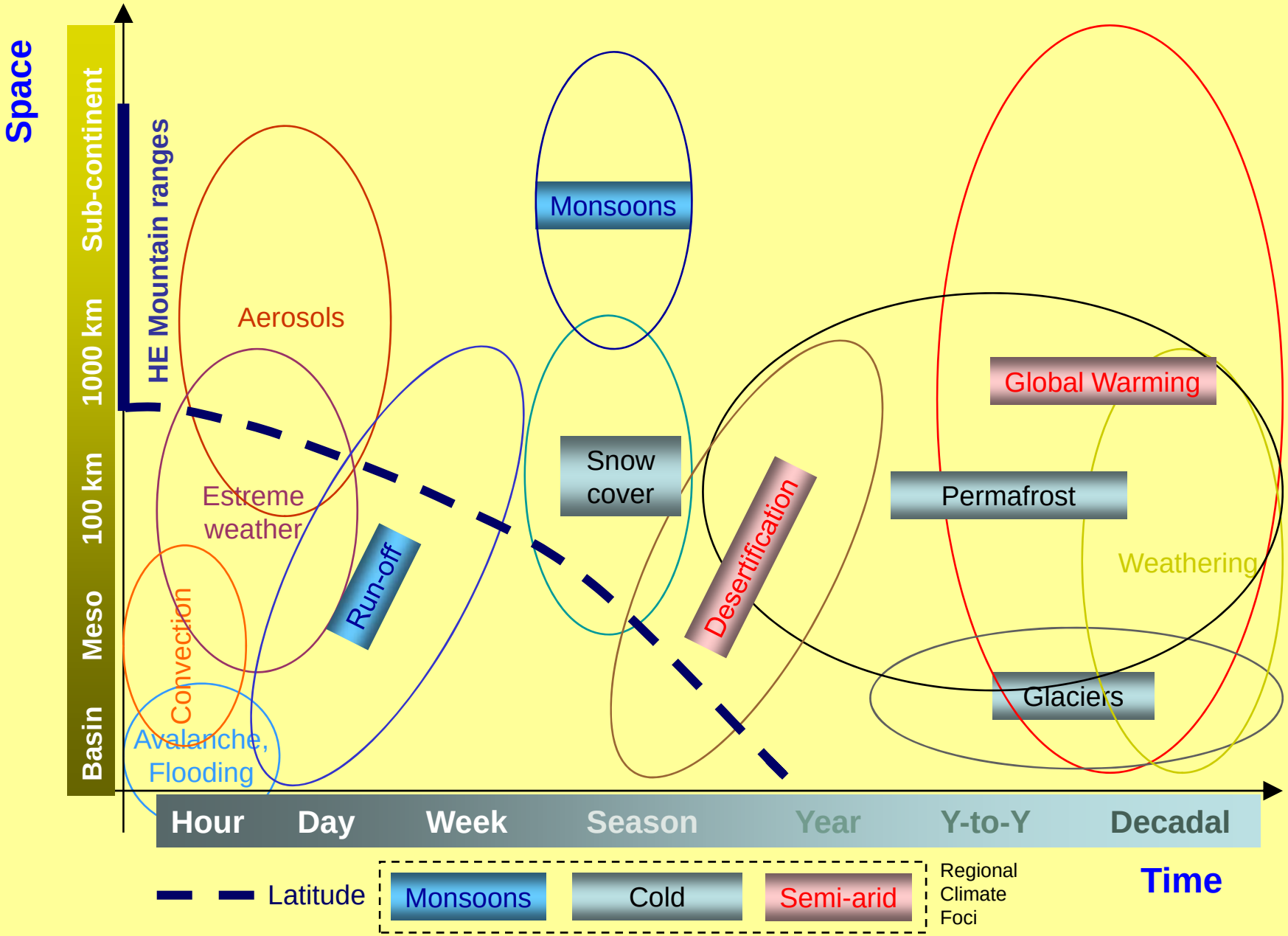
Linking with other Regional Climate Foci



Linking with other Regional Climate Foci



Linking with other Regional Climate Foci



Future plan

Dissemination (2009-2010)

Thematic workshops/conference:

- GEWEX, Poster Session on HE (August 2009);
- NEESPI, Bishkek (September 2009);
- EGU, Vienna (May 2010);
- 2nd CEOP-AEGIS, Lhasa (July 2010);
- 2nd International Workshop on Energy and Water Cycle over the Tibetan Plateau and High Elevations, Lhasa (July 2010);
- Global Change and the World's Mountains, Perth, Scotland (October 2010);
- …

MRD Special Issue (2010)

Future plan

Development of the HE Database 2009-2011

Data collected both from CEOP-HE Research Stations and other HE environmental monitoring stations will be organized in a synergic database with the final aims of sharing useful information to carry out studies in the field of hydrology, glaciology, ecology and paleolimnology.

Future plan

Improvement of the HE Organization (2009)

- Revision of the organization of the Steering Committee according to:
  - ✓ Regional Competences;
  - ✓ Specific Scientific Issues Competences.

- Revision of the issues:
  - ✓ Insertion of new issues: i.e. modeling, GIS remote sensing …;
  - ✓ Reinforcement of specific issues: atmospheric chemistry; ecology of high altitude ecosystems, paleolimnology …

HE Network (2009-2011)

- Complete the catalog HE Existing sites (HE-ES);
- Identify the CEOP-HE Network of Reference Sites;
- Define the activities in HE-Key Studies Areas (HK, etc.).

Future plan (Next week!!!)

HIGH ELEVATIONS

Poster Session "High Elevations Science"

at the

GEWEX/iLEAPS Conference

24-29 August 2009

Melbourne (Australia)

GP1: 33 posters

Many thanks for your attention

HE and latitude