TOPO-EUROPE:
4D Topography Evolution in Europe:
Uplift, Subsidence and Sea Level Rise

Exploratory workshop

Budapest, Hungary
17-18 March 2005
TOPO-EUROPE
4D Topography Evolution in Europe:
Uplift, Subsidence and Sea Level Rise

TOPO-EUROPE
Geoscience of coupled lithosphere/mantle and surface processes of continental Europe and its margins
Rationale for TOPO-EUROPE

- Continental topography is a product of the interaction between processes taking place deep in the Earth, on its surface and in the atmosphere.

- Topography influences society, not only in terms of slow processes of landscape change but also in terms of how it affects climate.

- The present state and behaviour of the Shallow Earth System is a consequence of processes on a wide range of time scales, including:
  - tectonic long term effects on uplift, subsidence
  - river systems
  - residual effects of the ice ages on crustal movement
  - natural climate and environmental changes
  - powerful anthropogenic impacts of the last century.

- The impact of mantle- and lithospheric-scale processes affecting intraplate areas has only recently been recognised.
General objectives of TOPO-EUROPE

- To integrate national research programmes in a common European framework
- To promote Europe as the international scientific leader in the field of continental topography research
- To provide interdisciplinary forum to share knowledge and information in the field of the topography evolution of Europe
Specific objectives of TOPO-EUROPE

- 4D picture of topography evolution of Europe
- Quantification of source-to-sink relations to quantify sediment budgets
- Quantification of land subsidence in the basins and deltas of Europe
- Quantification of land uplift in orogens
- Quantification of river tectonics
TOPO-EUROPE aims to integrate distributed facilities and know-how

- Comprehensive monitoring programs including satellite, surface and borehole monitoring instruments
- Large-scale geomechanical, geochemical and geobiological laboratory facilities
- Top quality geoinformation databases containing historical data on global and regional changes in combination with the vulnerability of natural and human habitats
- Know-how base on geo-motion modelling and simulation, as well as on risk and impact assessment
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TOPO-EUROPE promotes the natural laboratory concept from orogen through platform to continental margin

EXAMPLES

Within the orogen: Alps/Carpathians – Pannonian basin system

In front of the orogen: North European platform, Iberia

Far-field studies: Atlantic continental margin
Examples for the natural laboratory concept of TOPO-EUROPE
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Scientific concept of TOPO-EUROPE

- Lithosphere - upper mantle dynamics
- Source-carrier-sink systems
- Theme 1: Deglaciated topography
- Theme 2: Neotectonics, basin topography, river dynamics
- Theme 3: Coastal topography, climate forcing
- Climate
- Hazard, environment
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Methodology of TOPO-EUROPE
Societal relevance of TOPO-EUROPE: Land, water and sea level changes and the European habitat
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Preliminary programme of workshop

Location
Eötvös L. University, Budapest, Hungary

Dates
17-18 March, 2005

Organisation
European Science Foundation (ESF)
Academia Europaea
Eötvös L. University, Budapest, Hungary (ELTE)
Netherlands Research Centre for Integrated Solid Earth Science (ISES)
Hungarian Academy of Sciences
International Lithosphere Program (ILP)
GeoForschungsZentrum Potsdam (GFZ)
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Preliminary programme of workshop

Scientific Committee:

Prof. Sierd CLOETINGH (Amsterdam, Netherlands)
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Dr. Gábor BADA (Amsterdam, Netherlands)
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Prof. Domenico GIARDINI (Zürich, Switzerland)
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Prof. Hans THYBO (Copenhagen, Denmark)
Prof. Peter ZIEGLER (Basel, Switzerland)
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Preliminary programme of workshop

16 March, 2005: Arrival

17 March, 2005: Day 1

MORNING SESSION
Key note – TOPO-EUROPE objectives
Key notes, theme 1 – Coupled Lithosphere/mantle and surface processes

LUNCH

AFTERNOON SESSION
Working group meetings (themes 1, 2, 3)
Plenary session - reports on working group meetings

DINNER

18 March, 2005: Day 2

MORNING SESSION
Key notes, theme 2 – Hazards
Key notes, theme 3 – Coupled climate and surface processes
Working group meetings (themes 1, 2, 3)

LUNCH

AFTERNOON SESSION
Plenary session - reports on working group meetings
Plenary session - summary, conclusions, next steps

DINNER
What’s in it for us?

- European network (competence and infrastructure)
- Easier access to ESF and EU funding of programs
- Topo-Europe as “an entrance” to national research programs
- Increased focus on processes-oriented research at NGU
- Increased cooperation between the different NGU teams
T819 4D topographic evolution in Europe: Uplift, subsidence and sea level rise (TOPO-EUROPE) (co-listed in GD & GM)

**Information**

Continental topography is at the interface of processes taking place at depth in the Earth, at its surface, and above it. Topography influences society, not only in terms of slow processes of landscape change but also in terms of how it affects climate. Topography evolution in the form of land, water and sea level changes can seriously affect the sustainability of ecological and human habitats in Europe. These changes are caused by both natural processes and human activities, whereas the absolute and relative contributions of these processes are still little understood. The impact of mantle- and lithospheric-scale processes affecting continental lithosphere has only recently been recognised, leading to the development of the "Environmental Earth System Dynamics" concept. In this context, this session addresses the 4D topographic evolution of Europe through a multidisciplinary approach linking geology, geophysics and geotechnology. The focus is on monitoring, imaging, reconstruction and modelling of the interplay of processes controlling continental topography and related natural hazard in various natural laboratories in Europe. From orogen through platform to continental margin, these natural laboratories include the Alps/Mediterranean collision zone, the NW European platform and the Atlantic continental margin. Contributions are welcome addressing several scientific issues of key relevance such as the 4D picture of topography evolution of various parts of Europe through the quantification of source-to-sink relations for the sediment budgets, land subsidence in the basins and deltas of Europe, quantification of land uplift and erosion in the orogens and characterisation of river and coastal tectonics.

**Preliminary List of Solicited Speakers**

**Co-Sponsorship**

**General Statement**

The information contained hereafter has been compiled and uploaded by the Session Organizers via the "Organizer Session Form". The Session Organizers have therefore the sole responsibility that this information is true and accurate at the date of publication, and the conference organizer cannot accept any legal
A 4D view of the Norwegian margin:
From glaciated mountains to the deep sea floor

- Mesozoic and Cenozoic tectonostratigraphic framework
- Post mid-Jurassic depositional megacycles
- Neogene uplift and erosion
- Recent processes and geohazards