

Summer School on Geomorphology: Complex Response of Earth Surface Processes to Environmental Change

Program and time table



Date and duration: 2010, 6 days

September 26 to October 2, 2010

Venue: Kernsmühle, historical mill (1560 AD) with conference facilities

City: Heimbuchenthal (70 km from Frankfurt International Airport)

Program and time table

Comment: Coffee and cookies will be served in all 15 minute breaks at the Kernsmühle

Day 0 (26.9.2010): Arrival

- Arrival (bus shuttle from Frankfurt International airport and train station)
- The reader is available for every participant and lecturer at the reception of the Hotel
- 18:15-18.45 Transfer by mini busses or walking to the Kernsmühle (20 minutes)
- 18.30 Ice breaker in the historical "Kernsmühle" mill

Day 1 (27.9.2010): Keynote talks on complexity science and geomorphology

Breakfast:

7.00 Hotel zur Linde

Transfer to Kernsmühle:

8.00-8.20 by mini busses or walking (20 minutes)

Introduction:

8.30-9.00: Motivation, aims and perspectives of the SSOG (Krautblatter, Schwanghart, Heckmann, Kranz)

Theory:

9.15-10.30 Climate, chaos and catastrophes (K. Fraedrich)

10.30-11.45 The role of complexity in process geomorphology and geochronology (R. Dikau)

11.45-12.30 Open discussion

Lunch at the Kernsmühle

12.30-13.30

Data analysis/interpretation – best practice examples:

13.30-15.00 Temporarily changing Holocene sediment budgets (G. Verstraeten)

15.00-16.00 Event-based interpretation of complex fluvial and hillslope archives in the Kirschgraben Catchment: (H.-R. Bork)

16.00-16.45 Open discussion

Methodological approaches to complex sedimentary archives:

17.00-17.30 Event-based sediment stratigraphy exploiting the anthracological record (V. Robin).

17.30-18.00 Event-based sediment stratigraphy exploiting the luminescence record (M. Fuchs).

18.00-18.30 Open discussion

Transfer to Hotel zur Linde:

18.30-18.50 by mini busses or walking (20 minutes)

Day 2 (28.9.2010): Data gathering in a complex system

Breakfast:

7.00 Hotel zur Linde

8.30-12.30: Guided field tour to key locations and sediment exposures in the Kirschgraben catchment (A. Kranz, H.-R. Bork)

Lunch

12.30-14.00 Lunch boxes will be provided for all participants

14.00-18.00: Field work on present process activity and geomorphologic reconstruction, sediment budget and dating methods (*activities are located at several bases in a walking distance in the catchment; small groups of ca. 6 participants rotate from one activity to the next*):

- Introduction the environmental history of the Kirschgraben Catchment (A. Kranz and H.-R. Bork)
- Methods for the event-based interpretation of complex fluvial and hillslope archives (H.-R. Bork)
- Enhanced dating and geochemical approaches for complex, multiphase and multiprocess hillslope sediments (M. Fuchs)
- 3D-quantification of sediment bodies with different geophysical approaches to reveal complex internal structures (M. Krautblatter)
- High-resolution terrestrial laserscanning (T. Heckmann)
- Event-based stratigraphy using anthracology (V. Robin)

Day 3 (29.9.2010): Data analysis, processing and interpretation

Breakfast:

7.00 Hotel zur Linde

Transfer to Kernsmühle:

8.00-8.20 by mini busses or walking (20 minutes)

8.30-12.30 Data analysis of terrestrial laser scanning and near surface geophysics (*all 3 topics perform a 80 minutes "hands on" tutorial for 10 participants each*)

- Digital relief analysis of LiDAR data (T. Heckmann)
- 3D near surface geophysics (M. Krautblatter)
- Fundamentals of anthracology (V. Robin)

Lunch at the Kernsmühle

12.30-14.00

14.00-18.00: Spatial prediction of soil properties (A. Papritz)

- Key lecture: Nonlinear spatial prediction of soil properties from point samples (A. Papritz)
- Discussion: Spatial predictive modeling and interpolation techniques
- Tutorial: Spatial analyses and prediction using SAGA GIS and R

Transfer to Hotel zur Linde:

18.00-18.20 by mini busses or walking (20 minutes)

Day 4 (30.9.2010): From observations to modeling

Breakfast:

7.00 Hotel zur Linde

Transfer to Kernsmühle:

8.00-8.20 by mini busses or walking (20 minutes)

8.30-12.30 Spatial prediction of soil properties ("hands on" tutorials continued in small groups, supervision by A. Papritz, W. Schwanghart, T. Heckmann)

Lunch at the Kernsmühle

12.30-14.00

14.00-18.00: Deriving a conceptual model

- Key lecture: On the knife's edge between overwhelming complexity and undue simplicity (T. Coulthard)
- Discussion: Conceptual models - finding simplicity in complex systems
- Tutorial: Formulating the basic equations required for a numerical model based on the conceptual models

Transfer to Hotel zur Linde:

18.00-18.20 by mini busses or walking (20 minutes)

Day 5 (1.10.2010): Modeling and validation strategies

Breakfast:

7.00 Hotel zur Linde

Transfer to Kernsmühle:

8.00-8.20 by mini busses or walking (20 minutes)

8.30-12.30: Assessment of model sensitivity to uncertainties of input data and error propagation

- Key lecture: Introduction to CAESAR*, a geomorphologic, numerical model of landscape evolution. Scopes and limitations (T. Coulthard)
- Tutorial: Simulations of the sensitivity of the CAESAR model to uncertainties in the input parameters

Lunch at the Kernsmühle

12.30-14.00

14.00-18.00: CAESAR model runs and assessment

- Tutorial: Event-based and spatially distributed hydrological and geomorphological model of coarse sediment transport
- Discussion: Nonlinear model results vs. findings gained in the field, available data and prior interpretations.

(*The Cellular Automaton Evolutionary Slope and River model is an event-based and spatially distributed hydrological and geomorphological model of coarse sediment transport. The numerical engine of the model uses time steps of different lengths and is thus capable of simulating sequences of extreme events on time scales of tens to thousands of years. Catchments tend to respond in a spatially heterogeneous manner and non-linearly to environmental changes owing to the passage of sediment waves, variable local sediment storage and availability, and large- and small-scale thresholds for sediment transfer within each catchment.)

Transfer to Hotel zur Linde:

18.00-18.20 by mini busses or walking (20 minutes)

Day 6 (2.10.2010): Plenary session: Process and archive geomorphology in a complex world

Breakfast:

7.00 Hotel zur Linde

Transfer to Kernsmühle:

8.00-8.20 by mini busses or walking (20 minutes)

8.30-12.30: Plenary session I

- Discussion: The explanatory power of the complex system theory with respect to theory building, the derivation of hypotheses, data gathering/analysis and modelling strategies (R. Dikau).

Lunch at the Kernsmühle

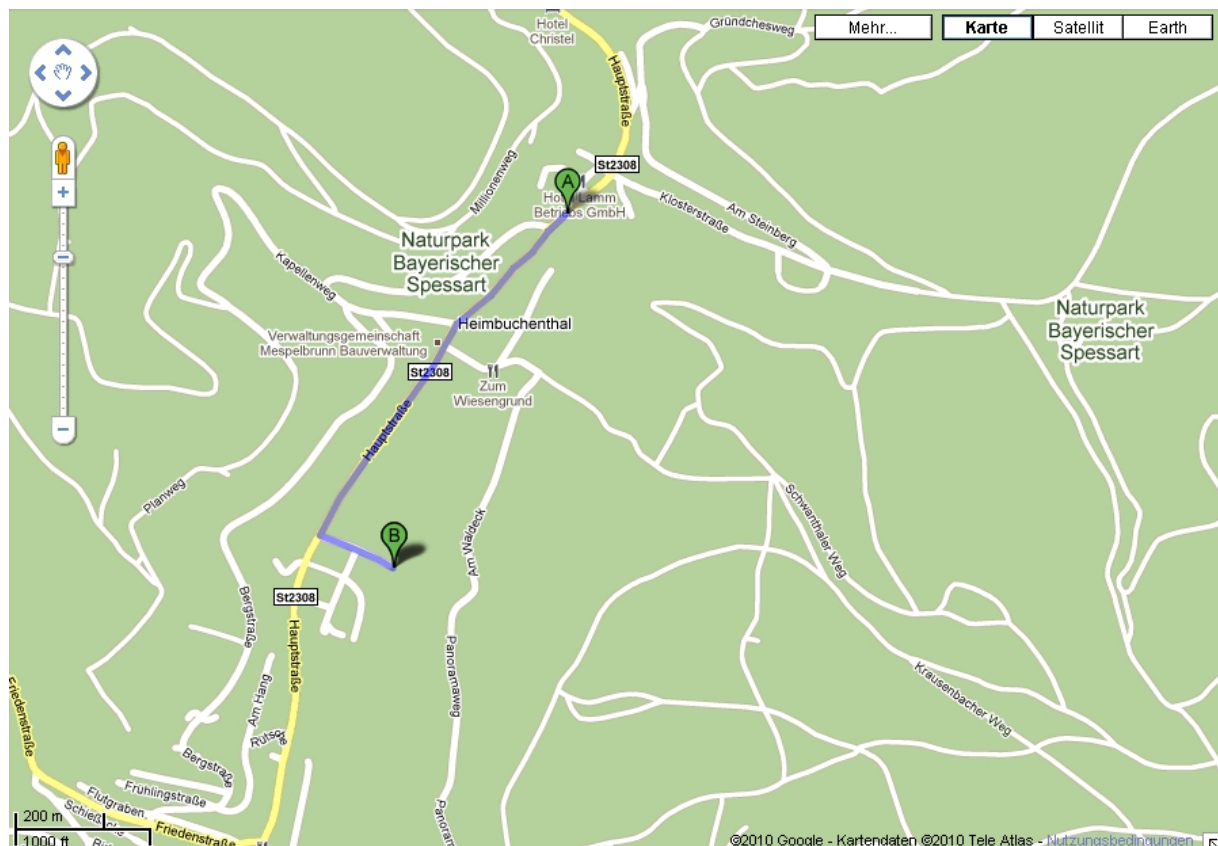
12.30-13.30

13.30-14.30: Plenary session II: Joint output

- Discussion: Joint article (geomorphology or so) on the topic of the summer school based on the theoretical advances achieved and supported by best practice examples collated during the course of the summer school.

Departure from the venue will be after the coffee break.

Conference locations:



Hotel zur Linde (Point “A”, Hauptstraße 37)
and the Kernsmühle (Point “B”, Raiffeisenstraße)