

## German Academy of Sciences (Leopoldina)-Symposium



### Earth surface shaping by biotic processes



**21-24 February 2018, Leopoldina Nationale Akademie der Wissenschaften, Halle, Germany**

In this symposium international speakers will review how organisms not only respond to the Earth's surface, but also directly modify and control it to promote their own persistence. Plants and animals can directly control the fluxes of energy and matter that underlie biogeochemical cycles, gas fluxes, sediment transport and form new habitats. Recent recognition of biotic interactions with Earth surface processes has led to a new Geoscience paradigm: The Earth's surface is not only the product of tectonic forces (mountain building) and climate (destroying relief by weathering and erosion), but also through biotic processes that are active over micro- to macroscopic scales. Biota moderates tectonic and climate controls on surface processes and is an equally important player in shaping the Earth.

This symposium will review the findings that triggered this paradigm shift, for example that 1) the activity of biota extends to great depth (the "deep biosphere"); 2) soil development is related to plant diversity and burrowing animals; 3) plants diverge the flow and evaporation of water; 4) higher plants can induce the uptake of mineral nutrients that vastly exceeds the rock weathering of these elements; 5) vegetation moderates soil erosion; 6) large river floodplains are stabilized by plants.

The symposium will combine geoscience, soil, ecology, hydrology, and geobiology research to discuss how new developments in each of these fields should be employed to quantify the entire chain of Earth surface processes influenced by biotic activities, and how these developments can be used to form predictions of global change.

#### ***Tentative list of invited Speakers:***

**Steeve Bonneville** (Univ. Libre de Bruxelles): Biogenic nano-scale weathering  
**Sue Brantley** (Pennsylvania State Univ., USA): Biotic influence on rock weathering  
**William E. Dietrich** (Univ. of California, Berkeley, USA): Landscape evolution  
**Yin Fan** (Rutgers Univ., USA): Groundwater & tree interaction  
**Dror Hawlena** (Hebrew Univ., Jerusalem): Predation and ecosystem nutrient dynamics  
**Marcel van der Heijden** (Univ. Zürich, Switzerland): Soil biodiversity & ecosystem functioning  
**Thomas Hickler** (Senckenberg, Frankfurt, Germany): Models of biotic response to climate change  
**Steve Holbrook** (VirginiaTech, USA): Geophysical imaging of the Critical Zone  
**Erkan Istanbuluoglu** (Univ. of Washington, USA): Ecohydrologic processes & landscape evolution  
**Kate Maher** (Stanford Univ. USA): Global weathering & climate feedbacks  
**Bernhard Schmid** (Univ. of Zürich, Switzerland): Ecology of plant populations  
**Detlef Schulze** (MPI Biogeochem., Jena, Germany): The biospheric carbon sink & climate mitigation  
**Alexia Stokes** (INRA France): Role of plants, roots & fungi for slope stability  
**Veerle Vanacker** (Catholic Univ. of Louvain, Belgium): Vegetation control over erosion

#### ***Symposium Organizers and speakers:***

**Friedhelm von Blanckenburg** (GFZ, Potsdam): Linking nutrient cycles and weathering  
**Todd Ehlers** (Univ. Tübingen, Germany): Tectonics, climate and biota interactions  
**Katja Tielbörger** (Univ. Tübingen, Germany): Space for time substitution in ecology  
**Jörg Bendix** (Univ. Marburg, Germany): Remote sensing of biodiversity

Please register your expression of interest and view further details at:

<https://esdynamics.geo.uni-tuebingen.de/leopoldina>

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