geoDISKURSE

γεωγραφία (geographia): Earth Description – Earth Observation

Prof. Claudia Künzer (University of Würzburg, German Aerospace Center, Germany)
The potential of earth observation for the analyses of land surface dynamics (9.3.2021, 12:00-13.30)

Prof. Lars Eklundh (Lund University, Sweden)
Characterizing vegetation phenology and productivity using remotely sensed data at different scales (13.4.2021, 12:00-13.30)

Assoc. Prof. Noah Molotch (University Boulder, US)
Challenges in remote sensing of snow-vegetation interaction (11.5.2021, 16:30-18:00)

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γεωγραφία (geographia): Earth Description – Earth Observation

9th of March 2021:

Prof. Claudia Künzer (University of Würzburg, German Aerospace Center, Germany)

The Potential of Earth Observation for the Analyses of Land Surface Dynamics

At present an unrivalled amount of remotely sensed earth observation data is globally available in satellite data archives. Imagery from medium-, high- and highest resolution optical, multispectral, and radar sensors is waiting to be exploited to reveal its full potential. The USA and Europe have set the pace in sharing earth observation resources; amongst others via the free and open Landsat data archives spanning nearly four decades, as well as data of the European Sentinel missions in orbit since 2014. Along with this go increasing capabilities to handle and explore big data of dense temporal coverage. Comprehensive geographic analyses combining the findings of earth observation data analyses with ancillary data and in-situ ground knowledge propel earth observation beyond simple mapping activities. Whereas in past decades remote sensing data were analysed based on the spectral-reflectance-defined 'finger print' of individual surfaces, it is now the 'temporal fingerprints' of our land surface which open up novel pathways of data analyses. Nowadays – more than ever – remote sensing as a methodological discipline can contribute to addressing society-relevant challenges. Especially in highly dynamic regions earth observation can support the sustainable management of natural resources via long-term monitoring schemes and the provision of sophisticated, planning-relevant information. The talk will present related examples from recent analyses of land surface dynamics globally, and will also shed light on the potential of future prognosis based on long term trends, as well as a completely new analyses sphere enabled via deep learning and object extraction methods in very highest resolution data archives.

12:00-13.30 @ uibk.ac.at/globalchange/diskurse

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13th of April 2021:

Prof. Lars Eklundh (Lund University, Sweden)

Characterizing vegetation phenology and productivity using remotely sensed data at different scales.

Remotely sensed data provide opportunities to map vegetation phenology and productivity from local to global scales. These can provide useful information on responses and sensitivities to climate drivers. However, differences in remotely sensed data and processing methodologies may lead to different results, and the interpretation of the derived metrics are not always straight forward. Field measurements and observations are necessary for developing methodology and understanding the remotely sensed observations. Increased process understanding and improved data sets provide new opportunities for better mapping and understanding of spatial and temporal variations in vegetation.

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11th of May 2021:

Assoc. Prof. Noah Molotch (University of Colorado Boulder, United States)

Challenges in remote Sensing of Snow-Vegetation Interaction

Interactions between snow and vegetation directly influence Earth's water, energy, and carbon cycles. Combinations of in-situ measurements and remotely sensed forest greenness information have been used to identify elevation-dependent tipping points in which forests shift from water to energy limitation. Recent works have shown that statistically significant relationships exist between winter snow accumulation and summer forest greenness. Through this relational approach one can identify the elevation where forests shift from water limitation (lower elevations) to energy limitation (higher elevations). This work has important implications for the forest vulnerability to wildfire and insect-related forest mortality. For example, relationships between snow accumulation and forest greenness have been used to reveal spatio-temporal variability in onset of, and recovery from insect and drought-related forest mortality. While recent works that link snowpack-water availability to forest productivity using optical satellite observations, significant limitations exist in measuring snow mass and biomass from optical systems. Promising observations from Light Detection and Ranging (LiDAR), thermal infrared sensors, and microwave systems are enabling a more mechanistic approach than the aforementioned studies. Hence, a future challenge in snow-vegetation interactions regards the merging of historical data with emerging technologies.

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