



Towards quantitative landscape reconstructions from pollen diagrams – Calibration and simulation approaches

May 17th – 21st 2010, Department of Palynology and Climate Dynamics, Göttingen

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In this course we will give an introduction to pollen based quantitative landscape reconstruction. This will include the extended R-value (ERV) models (Prentice & Parsons 1983, Biometrics; Sugita 1994, Jour. Ecol.) which describe quantitative relationships between pollen vegetation data. Potentials and pitfalls of using pollen accumulation rates to quantify plant abundance will also be explored. We will visit models of pollen dispersal and deposition (Prentice 1985 Quat. Res.; Sugita 1993 Quat. Res.); discuss concepts like pollen productivity estimates (PEE) and the relevant source area of pollen (RSAP); and describe how estimates of these parameters can be obtained for model calibration (e.g. Nielsen & Sugita 2005, Holocene; Broström et al 2008, Veg. Hist. Arch.).

In computer exercises, we will be using the HUMPOL-package of the Hull-University (Bunting & Middleton 2005, Rev. Pal. Pal.), including MOSAIC and POLFLOW. These programmes allow calculation of pollen deposition according to productivity-estimates and landscape models. This can be used for simple thought experiments that help understanding pollen/vegetation relationships in different landscapes, and the effects of vegetation composition and overall landscape structure on the pollen signal (e.g. Bunting et al. 2004, Holocene). The simulation approach can also be used for testing specific hypothesis on patterns and processes of past changes in vegetation cover (e.g. Giesecke 2005, Quat. Sci. Rev.). These approaches have been developed, tested and applied within the POLLANDCAL network (Gaillard et al. 2008, Veg. Hist. Arch.).

Furthermore, we will describe how the models can be used for quantitative landscape reconstruction using either the so-called Multiple Scenario Approach (Bunting & Middleton 2009, Holocene) or the Landscape Reconstruction Algorithm (Sugita 2007, Holocene) which includes the REVEALS model for regional vegetation reconstruction.

The course is aimed at graduate and postgraduate students of palynology, but is also open to post docs. The course will be taught in English. Registration should be done by e-mail to Thomas Giesecke: tgiesec@gwdg.de before April 12th 2010.