



Rates of soil forming processes - the RAISIN initiative

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Soil chronosequence studies are a valuable tool to assess soil development with time in different landscapes and climatic environments. Numerous soil chronosequences have been studied in the last decades in different parts of the world, so that it is the right time to analyze and summarize what has been achieved so far and to identify remaining challenges and research gaps. This is the main goal of the initiative RAISIN (Rates of soil forming processes obtained from soils and paleosols in well-defined settings) supported by the International Union for Quaternary Research (INQUA) as an INQUA project.

This main goal of RAISIN can be subdivided into four objectives:

1. Reviewing and compiling existing studies

The first objective is to provide thoroughly reviewed and checked knowledge on directions and rates of soil forming processes in different climates. In a first step, existing soil chronosequence data will be compiled within the International Soil Carbon Database (<http://www.fluxdata.org/NSCN/SitePages/ISCN.aspx>) which is currently modified to enable inclusion of the RAISIN data. These data will then be reviewed, discussed and combined to obtain a present state of the art in terms of rates of soil forming processes in different environments.

2. Defining soil properties indicative of progressive soil development and standardized methods

Soil properties that are most closely linked to soil age are identified and are recommended to be used for estimating time-spans of soil development. Standardized field and laboratory methods that are useful for assessing the stage of soil development will be recommended as well. A standard and minimum set of field and laboratory analyses to be performed on soil chronosequences and paleosols will be defined in order to ensure that new studies will be carried out in a way that permits for comparison of the newly produced data with existing data to achieve the best possible overall scientific progress.

3. Identifying challenges and knowledge gaps

A number of challenges and knowledge gaps has already been identified during the first RAISIN Workshop in November 2013 in Charlotte, USA. The major ones will be addressed in this talk. Based on the identified gaps, recommendations will be given in terms of special foci (by topic and region) suggested for future research, in order to close these gaps step by step.

4. Establishing a network and stimulating new research

The fourth objective is to bring experts with various background and experiences in studying soil development with time in different regions of the world together and to stimulate the development of future projects through other international or national funding sources. Up to now, studies on soil formation rates and well-analyzed sediment-paleosol sequences in tropical climates (tropical rain forest, savanna and desert regions) are rare, particularly in developing countries. Involving colleagues from these countries will help to identify existing knowledge gaps and suitable objects for future research especially in these countries and will stimulate the development of future collaborative projects that could significantly improve the world-wide coverage of pedological and paleopedological knowledge.