Soil of the Year 2011:
Fluvisols

Proposal for 2011:
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Curatorship Soil of the Year

Vegen developed from alluvial sediments of the Rhine River; left: autochthonous Vega close to Bietigheim near Rastatt; right: allochthonous Vega near Mannheim.

Author of all figures: Otto Ehrmann.www.bildarchiv-boden.de

International classification (WRB): Fluvic Cambisols or Fluvisols

German classification: Vega (pl. Vegen) – Brown Alluvial Soil

Characteristics:

What are Fluvisols and what do they look like?

Fluvisols are brown, fertile soils within the flood plains of rivers; they are also known as brown alluvial soils. The name Vega originates from Iberia and means “floodplain” or “fertile plain”.
Characteristic properties: dark top soil rich in humus, and a grey-brown, fine-textured sub soil; the latter is layered and often contains organic matter. Below, gravel layers of earlier fluvial sedimentation or topsoils of former alluvial soils may be present. Fluvisols are flooded only sporadically and are not influenced much by groundwater in their upper part. Thus, they exhibit neither rust-colored iron oxide accumulations nor gray-bluish colors.

How do Fluvisols develop and where do they occur?

Fluvisols are brown alluvial soils that exist along large river systems world-wide. They also occur along small and middle-sized rivers, particularly in hilly landscapes in which translocation of soil material by water erosion takes place. Loess regions, which are prone to erosion, are the main sources of the soil material establishing the present Fluvisols. Due to forest clearance and subsequent agricultural land use – locally already since the Neolithic period – large amounts of soil material has been eroded.
Changing sedimentation environments and varying groundwater levels produced a small-scale spatial pattern of diverse soils on the alluvial plains. Besides Fluvisols, also groundwater-affected soils (Gleysols), and bogs occur with increasing groundwater influence. If the groundwater influence decreases and episodic flooding does not continue, Cambisols (Braunerden) and Luvisols (Parabraunerden) develop. In the German classification, Fluvisols (Vegen) are distinguished according to their development. The characteristic brown color of the “allochthonous Vega” is derived from pre-weathered brown soil material originating in alluvial sediments. If the brown color develops in place, the soil is named “autochthonous Vega”.

How are Fluvisols used and what functions do they fulfill?

The soil properties of Fluvisols vary according to the source area of the sediments in which they have formed. A loose, crumby top soil with rich active soil fauna is mostly followed by a well rootable sub soil. Usually, Fluvisols have a high capability for chemical absorption. Thus, nutrients are stored in a form in which they are well available for plant roots, and more pollutants are kept from being leached into the groundwater. Along with the purification effect in the course of groundwater renewal, Fluvisols also contribute to flood prevention because of their high water storage capability.
Because of the great natural fertility of the Fluvisols and their generally sufficient water supply they are preferably used for agricultural production.
Sediment layers of alluvial soils tell, similar to historical archives, about the landscape and its use. The influence of the industrial era and historic mining is locally recorded in alluvial soils by increased values of heavy metals or organic pollutants.

Which habitat functions do Fluvisols fulfil?

Under natural conditions, a species-rich riparian forest composed of ash, elm, linden, British oak, hornbeam, and a diverse herbal layer develops on Fluvisols. Alluvial soils are unique habitats for animals. For instance, earthworm population density is usually very high, and river bank break-off events create ideal hatchery sites for kingfishers.

Which dangers threaten Fluvisols?

Fluvisols are disproportionally highly affected by land consumption because of their location on flood plains, which are generally densely populated. In addition, embankment and draw down of the groundwater table in the frame of river training, gravel mining, water catchment and intensification of agriculture bring natural alluvial dynamics to an end and hence endanger the natural soil inventory in the eco system. Projects along all major rivers, such as the Integrated Rhine Program (IRP) try to reconcile the various users, flooding prevention and flood plain restoration.

Who provides more information?

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* Bundesverband Boden: www.bvboden.de, www.bodenwelten.de
* Einschlägige Ämter in der Ad-hoc-AG Boden: www.bgr.bund.de
* Bodenkundlich orientierte Institute an Hoch- und Fachschulen

Where you can get material (Flyers, CD's)?

* Kuratorium Boden des Jahres, ZALFMüncheberg, Prof. Dr. Monika Frielinghaus, Tel.: 033432-82316; frielinghaus@zalf.de