1.3 Böden: Bodengesellschaften mit Leitbodentypen und ihren Ausgangsgesteinen

Böden der Küstenregion und Moore

1 **Podsol-Regosol / Lockersyrosem** aus trockenen Sanden

2 **Mariner Wattboden** im Gezeitenbereich der Nordsee

3 **Kalkmarsch** aus marinen Ablagerungen

4 **Kleimarsch** aus brackischen und fluviatilen Ablagerungen

5 **Niedermoorboden**

6 **Hochmoorboden**

Böden der Flußlandschaften und Niederungen

7 **Auenboden / Gley** aus lehmigen bis tonigen Auensedimenten; im Schwarzerdegebiet **Gley-Tschernosem** aus kalkhaltigen, tonig-schluffigen Ablagerungen

8 **Auenboden / Gley** aus sandigen bis tonigen Flußsedimenten in kleinflächigem Wechsel

9 **Gley** der sandigen Urstromtäler und Niederungen

10 **Pararendzina / Auenrendzina** aus kalkhaltigen, sandig-lehmigen Hochflut- und Auenablagerungen

11 **Parabraunerde** aus schluffig-lehmigen Deckschichten auf eiszeitlichen Schotterplatten

12 **Parabraunerde** aus lößbedeckten, lehmig-sandigen Terrassenablagerungen

13 **Podsol-Braunerde** aus sandigen Terrassenablagerungen

14 **Podsol / Braunerde-Podsol / Gley-Podsol** aus sandigen Flußablagerungen

Böden der Glaziallandschaften, einschließlich der Tertiärhügelländer im Alpenvorland

15 **Braunerde / Parabraunerde / Pararendzina** aus lößvermischten Tertiärablagerungen

16 **Parabraunerde / Fahlerde / Pseudogley-Parabraunerde**; örtlich **Parabraunerde-Tschernosem** oder **Pseudogley-Tschernosem** aus Geschiebelehm

17 **Braunerde / Parabraunerde / Pararendzina** aus lehmig-sandigen, kalkhaltigen Moränenablagerungen

18 **Pseudogley / Braunerde-Pseudogley / Podsol-Pseudogley** aus Geschiebedecksand über Geschiebelehm

19 **Pseudogley** aus lehmig-sandigem Geschiebemergel

20 **Podsol-Parabraunerde / Podsol-Fahlerde** aus sandigen Deckschichten über Geschiebelehm

21 **Fahlerde / Bänder-Parabraunerde / Braunerde** aus sandigen Deckschichten über Geschiebelehm

22 **Pararendzina / Regosol / Bänder-Parabraunerde** im engräumigen Wechsel aus sandigen bis lehmigen Bildungen der Endmoränen

23 **Pseudogley-Braunerde / Pseudogley-Fahlerde** aus Geschiebedecksand über Geschiebelehm

24 **Braunerde / Pseudogley** aus kalkhaltigen, lehmig-sandig-kiesigen, lößvermischten Moränenablagerungen

25 **Braunerde-Podsol / Podsol-Braunerde** aus trockenen, nährstoffarmen Sanden

26 **Braunerde / Bänder-Parabraunerde** aus nährstoffreichen Sanden

27 **Eisenhumus-Podsol / Podsol-Regosol** aus trockenen, nährstoffarmen Sanden

28 **Regosol / Lockersyrosem** aus trockenen, nährstoffarmen Sanden

Böden der Lößgebiete

29 **Pararendzina / Tschernosem / Braunerde** aus Löß im Wechsel mit **Rendzina** aus Mergel und Kalkstein

30 **Tschernosem** aus Löß und **Tschernosem / Pseudogley - Tschernosem** aus Löß über Ton- und Mergelgesteinen

31 **Tschernosem** aus Löß und lößähnlichen Ablagerungen

32 **Tschernosem-Parabraunerde / Parabraunerde-Tschernosem** aus Löß oder Lößlehm

33 **Tschernosem-Parabraunerde / Parabraunerde** aus sandigen Lößdecken über Schmelzwassersedimenten oder Geschiebelehm

34 **Parabraunerde / Fahlerde / Pseudogley** aus Löß oder Lößlehm über verschiedenen Gesteinen

35 **Parabraunerde-Pseudogley** aus Löß oder Lößlehm über verschiedenen Gesteinen

36 **Parabraunerde / Fahlerde / Braunerde-Pseudogley** aus lößvermischten Verwitterungsprodukten verschiedener Silikatgesteine

37 **Parabraunerde / Fahlerde / Braunerde** aus Sandlöß über Sand oder Lehm und aus sandvermischtem Löß oder Lößlehm

38 **Braunerde / Pseudogley** aus basaltgrushaltigem Lößlehm

39 **Pseudogley / Braunerde / Parabraunerde** aus Löß oder Lößlehm

Böden der Berg- und Hügelländer aus Festgestelnen, deren Verwlttenungsmaterlal und Umlagerungsdecken

40 **Rendzina / Braunerde-Rendzina / Pararendzina** aus Hangschutt über Kalk-, Mergel- und Dolomitgesteinen im Wechsel mit **Terra fusca-Braunerde / Terra fusca-Parabraunerde** aus schluffig-tonigen Umlagerungsprodukten der Kalksteinverwitterung

41 **Braunerde / Terra fusca** aus Umlagerungsprodukten der Kalk-, Mergel- und Dolomitstein-Verwitterung sowie **Rendzina** aus Kalkstein

42 **Pelosol-Braunerde / Pelosol-Pseudogley** aus Verwitterungsprodukten von Mergel- und Tongesteinen

43 **Braunerde** aus Mergelgesteinen und kalkhaltigen Schottern

44 **Braunerde** aus basischen und intermediären magmatischen Gesteinen; örtlich aus basenreichen Tuffen

45 **Braunerde** aus sauren magmatischen und metamorphen Gesteinen

46 **Braunerde / Braunerde-Pseudogley** aus lößvermischten Verwitterungsprodukten von kristallinen Schiefern, Sandstein, Quarzit und sauren bis intermediären magmatischen Gesteinen

47 **Podsol-Braunerde** aus sauren magmatischen und metamorphen Gesteinen

48 **Braunerde / Podsol-Braunerde** aus Schluff-, Sand- und Tonsteinen

49 **Braunerde / Podsol-Braunerde** aus harten Ton- und Schluffschiefern mit Anteilen von Grauwacke, Sandstein, Quarzit und Phyllit

50 **Podsol-Braunerde** aus harten Ton- und Schluffschiefern, Grauwacken und Phyllit

51 **Braunerde** aus basenarmen quarzitischen Sandsteinen und Konglomeraten

52 **Braunerde** aus lößhaltigen Deckschichten über Sandstein und Quarzit

53 **Braunerde-Podsol / Podsol** aus basenarmen Sandsteinen und Quarziten

54 **Pseudogley / Podsol-Pseudogley** aus lößvermischten, grusig-lehmigen Deckschichten über Sandstein und Quarzit

55 **Braunerde / Podsol-Braunerde / Braunerde-Rendzina / Parabraunerde** im engräumigen Wechsel aus Tonschiefer, Grauwacken und Kalkgesteinen sowie Lößlehm über verschiedenen Gesteinen

56 **Rendzina / Pararendzina / Ranker / Podsol-Braunerde / Pelosol-Braunerde / Parabraunerde / Pseudogley** im engräumigen Wechsel aus Kalk- und Mergelgesteinen, Sand-, Schluff- und Tonsteinen sowie Lößlehm über verschiedenen Gesteinen; örtlich **Fersiallit / Ferrallit-Rellkte** der tertiären Bodenbildung

Böden der Alpen

57 Böden der montanen und subalpinen Höhenstufen der Alpen aus Kalk- und Dolomitgesteinen (z.B. **Rendzina, Kalkbraunerde**) sowie aus kalkfreien Silikatgesteinen (z.B. **Ranker, Podsol-Braunerde, Pseudogley**)

58 Rohböden (**Syrosem**) der alpinen, subnivalen und nivalen Fels- und Frostschuttgebiete

Anthropogen veränderte Böden, Siedlungsgebiete und Gewässerflächen

59 Versiegelte Flächen in größeren Städten

60 Technogen gestaltete Böden, große Abbauflächen und Halden

61 Gewässer

1.3 Soils: Soil Associations with Main Soil Types and Parent Materials

Soils of the coastal area and bog soils

1 **Dystric Regosols** from sand dunes

2 **Salo-Thionic Gleysols** in the tidal areas of the North Sea

3 **Calcaric and Eutric Gleysols** from marine sediments (tidal marsh)

4 **Eutric Fluvisols** from brackish and tidal sediments (tidal marsh)

5 **Eutric Histosols**

6 **Dystric Histosols**

Soils of the fluvial plains and lowlands

7 **Fluvisols / Gleysols** from loamy to clayey fluviatile sediments; in the chernozem area **Gleyic Chernozems** from calcareous silty to clayey sediments

8 **Fluvisols / Gleysols** from frequently alternating sandy to clayey fluviatile sediments

9 **Gleysols** from sandy sediments of the ice-marginal valleys and lowlands

10 **Calcaric Regosols / Calcaric Fluvisols** from calcareous sandy to loamy sediments of river terraces

11 **Haplic Luvisols** from silty to loamy periglacial sediments overlying glacial gravels

12 **Haplic Luvisols** from loess-covered loamy to sandy river-terrace deposits

13 **Dystric Cambisols** from sandy river-terrace deposits

14 **Haplic Podzols / Cambic Podzols / Gleyic Podzols** from sandy fluviatile sediments

Soils of the glacial drift areas including the Tertiary hills of the Alpine foreland

15 **Eutric Cambisols / Haplic Luvisols / Calcaric Regosols** from Tertiary loess-bearing sediments

16 **Haplic Luvisols / Eutric Podzoluvisols / Stagnic Luvisols**; local **Luvic Chernozems / Stagnic Chernozems** from boulder clay

17 **Eutric Cambisols / Haplic Luvisols / Calcaric Regosols** from calcareous loamy to sandy morainic deposits

18 **Stagnic Gleysols / Spodic Gleysols** from boulder clay with a loamy to sandy cover

19 **Stagnic Gleysols** from loamy to sandy till

20 **Spodic Luvisols / Spodic Podzoluvisols** from sandy sediments overlying boulder clay

21 **Dystric Podzoluvisols / Luvic Arenosols / Dystric Cambisols** from sandy sediments overlying boulder clay

22 **Calcaric and Umbric Regosols / Luvic Arenosols** from sandy to loamy end moraine deposits (alternating patches)

23 **Stagnic Cambisols / Stagnic Podzoluvisols** from loamy to sandy deposits overlying boulder clay

24 **Eutric Cambisols / Stagnic Gleysols** from calcareous loamy and sandy to gravelly morainic deposits mixed with loess

25 **Cambic Podzols / Spodic Arenosols** from dry dystrophic sand deposits

26 **Eutric Cambisols / Luvic Arenosols** from eutrophic sand deposits

27 **Haplic Podzols / Dystric Regosols** from dry dystrophic sand deposits

28 **Dystric Regosols** from dry dystrophic sand deposits

Soils in loess areas

29 **Calcaric Regosols / Haplic Chernozems / Eutric Cambisols** from loess alternating with **Rendzic Leptosols** from marlstone and limestone

30 **Haplic Chernozems** from loess from marlstone and **Haplic Chernozems / Stagnic Chernozems** from loess overlying claystone and marlstone

31 **Chernozems** from loess and loess-like sediments

32 **Phaeozemic Luvisols / Luvic Phaeozems** from loess or loessic loam

33 **Phaeozemic and Haplic Luvisols** from sandy loess overlying sandy glacial sediments or boulder clay

34 **Haplic Luvisols / Eutric Podzoluvisols / Stagnic Gleysols** from loess or loessic loam overlying various rocks

35 **Stagnic Gleysols** from loess or loessic loam overlying various rocks

36 **Haplic Luvisols / Eutric Podzoluvisols / Stagnic Gleysols** from various siliceous weathering products mixed with loess

37 **Haplic Luvisols / Eutric Podzoluvisols / Eutric Cambisols** from sandy loess overlying sand or loam and from sandy loess or loessic loam

38 **Eutric Cambisols / Stagnic Gleysols** from loessic loam with fragments of basalt

39 **Stagnic Gleysols / Eutric Cambisols / Haplic Luvisols** from loess or loessic loam

Mountain and hill soils from solid rocks, their weathering products, and redeposited material

40 **Rendzic Leptosols** from slope deposits over limestone, marlstone, and dolomite alternating with **Chromic Cambisols** and **Chromic Luvisols** from silty and clayey material derived from limestone weathering

41 **Eutric and Chromic Cambisols** from redeposited material derived from limestone, marlstone, and dolomite weathering and **Rendzic Leptosols** from limestone

42 **Vertic Cambisols / Stagnic Gleysols** from marlstone and claystone weathering

43 **Eutric Cambisols** from marlstone and calcareous gravels

44 **Eutric Cambisols** from basic and intermediate igneous rocks; local from tuffs rich in bases

45 **Dystric Cambisols** from acid igneous and metamorphic rocks

46 **Dystric Cambisols / Stagnic Gleysols** from weathered metamorphic rocks, sandstone, quartzite, and acid to intermediate igneous rocks

47 **Spodic Cambisols** from acid igneous and metamorphic rocks

48 **Haplic and Spodic Cambisols** from siltstone, sandstone, and claystone

49 **Haplic and Spodic Cambisols** from hard argillaceous and silty slates with greywacke, sandstone, quartzite, and phyllite

50 **Spodic Cambisols** from hard argillaceous and silty slates, greywacke, and phyllite

51 **Dystric Cambisols** from quartzitic sandstones and conglomerates with low base status

52 **Cambisols** from loess-bearing sediments overlying sandstone and quartzite

53 **Cambic and Haplic Podzols** from sandstone and quartzite with low base status

54 **Stagnic and Spodic Gleysols** from loamy and gritty cover sediments mixed with loess overlying sandstone and quartzite

55 Frequently alternating **Dystric and Spodic Cambisols / Rendzic Leptosols / Haplic Luvisols** from slate, greywacke, and limestone, and loessic loam overlying various rocks

56 Frequently alternating **Rendzic and Umbric Leptosols / Spodic** and **Vertic Cambisols / Haplic Luvisol / Stagnic Gleysols** from limestone and marlstone, sandstone, siltstone and claystone and loessic loam overlying various rocks; local relics of **Acrisols / Ferralsols** formed during the Tertiary

Alpine soils

57 Soils of different altitudes of the Alps from limestone and dolomite (e.g. **Rendzic Leptosols / Calcaric Cambisols**), and non-calcareous silicate rocks (e.g. **Umbric Leptosols / Spodic Cambisols / Stagnic Gleysols**)

58 **Lithic Leptosols** of the higher altitude zones of the Alps

Anthrosols, settlements, and surface water

59 Sealed areas in larger cities **(Urbic Anthrosols)**

60 Soils redeposited by man and large open-cast mines **(Cumulic Anthrosols)**

61 Surface water

1.3 Soils

Soil is defined as the layer consisting of mineral and organic matter generated at the Earth's surface by weathering. In addition to air and water, soil represents a necessity of life for man, animals and plants. Soil is inhabited by living organisms, contains varying amounts of air and water, and varies in nature depending on the parent material, relief, groundwater conditions, and climate. The soil influences how precipitation is distributed between evaporation and surface and/or underground runoff. In fact soil is one of the main factors controlling the water balance of a given area.

Vegetation and anthropogenic factors also affect soil formation. A soil profile consists of several horizons, which are formed as a consequence of weathering, the neoformation of minerals, the generation of humus, and the development of soil structure, as well as water movement and solute transport. Depending on the stage of development of the soil and the sequence of horizons associated with it, it can be classified according to a genetic system and is characterised by the *soil type*. The characteristics of the soil may be homogeneous over wide areas or may vary over short distances, depending on whether the soil-forming factors remain constant or change.

Soil maps integrate point data into areas occupied by soil map units that depend on the required degree of generalisation or scale. They display soil areas whose soils possess similar profile morphology or are related to each other in a certain way. These soils are characterised by a dominant soil, which is the soil occupying the largest area, accompanied by a number of associated soils. Soil maps show the regional distribution of the soils and, in general, document the nature of the soil down to 2 m below the surface. Soil maps at scales of 1 : 100 000 or smaller often only provide information on the dominant soils and their parent materials. The map units are described using typical profiles with information related to the various horizons and a number of physical and chemical properties. The most important physical property is the grain size distribution, which is reflected by the *soil texture*.

Soil maps of Germany at medium and small scales

As the state of soil mapping differs considerably in the individual federal states of Germany (ZITZMANN 1994, ECKELMANN & HARTWICH 1996), a map covering the entire Federal Republic of Germany cannot yet be compiled by generalizsing large- and medium-scale soil maps. After the reunification of Germany in 1990, the former GDR and the former FR of Germany already possessed small-scale soil maps of their territories in digital form, i.e. the 1 : 750 000 soil map (HAASE & SCHMIDT 1985) compiled in the 1970s for the "Atlas of the GDR" and the 1 : 1 000 000 soil map of the pre-unification FR of Germany (ROESCHMANN 1986) compiled jointly by the soil divisions of the State Geological Surveys and the Bundesanstalt für Geowissenschaften und Rohstoffe (BGR, Federal Institute for Geosciences and Natural Resources). These were used to compile a soil map of the Federal Republic of Germany at the scale 1 : 1 000 000 (BÜK 1000: HARTWICH et al. 1995).
The 4th edition of the soil mapping guide (AG BODEN 1994) provides a hierarchical classification system consisting of seven stages of aggregation of soil map units designed for the first time to apply to the entire Federal Republic of Germany:

1	soil forms	uniform soil type and parent material
2	soil groups	combination of several similar soils
3	main soil groups	the dominant soil type together with soil types of minor importance
4	main soil associations	combination of dominant soils having several dominant factors of soil genesis in common
5	soil landscapes	areas with very similar geology and soil genesis
6	soilscapes	combination of several soil landscapes with the same geology and paleogeography, but with different soils
7	soil regions	very general characterisation of the soils on regional and international maps

On Map 1.3 a 1 : 2 000 000 soil map of Germany is shown. Soil associations are shown up to the level of main soil associations (stage of aggregation 4). They usually consist of a great number of pedogeographic areas varying considerably in size and distribution. On maps, however, they are represented as homogeneous, sometimes over large areas. Particularly in mountainous areas the extremely heterogeneous associations of soils are predominant; it would not be possible to accommodate the great variety of these soils in the legend (Map 1.3) without considerable simplification. In addition, Figure 1 shows Germany's geographic structure of soil regions (stage of aggregation 7).

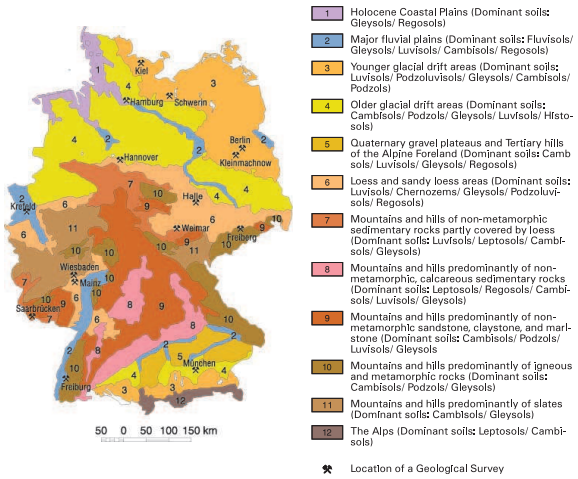

Fig. 1 Soil Regions in Germany

Soils in Germany

As a result of the climatic conditions in Western and Central Europe, soil genesis is dominated by leaching of basic cations and acidification, as well as a moderate degree of weathering of silicate minerals, formation of clay, and generation of humus. Provided percolation is not impeded, this leads to the formation of cambisols, luvisols, and podzols, depending on the chemical composition of the parent rock. If the substratum is impermeable or in lowland, stagnic gleysols and gleysols are formed. The distribution pattern of the soils of Western and Central Europe does not correspond to any zonal succession from north to south, but is primarily determined by the parent material and the relief. This general pattern is dissected by the major river systems and locally interspersed with organic soils (mainly in moors) and areas formed by man (builtup areas, mining deposits, opencast pits, etc.). The climatic conditions, i. e. the transition from submaritime to subcontinental climate from west to east, cause further differences.

The coastal Holocene soil region is primarily characterised by tidal-flat and coastal-marsh soils and, near sandy beaches and dunes, by podzol-regosols and loose syrozems.

The parent materials of the soils in the North German lowlands and the Alpine foreland are predominantly Pleistocene deposits (in old and young moraine landscapes), and in the Alpine foreland additionally by gravels and different Tertiary sediments of the northern foothills of the Alps. The grain-size distribution (texture) of the parent rocks is particularly important in soil formation: On loamy substrata, luvisols or gleysols are predominant, whereas cambisols, podzol-cambisols or podzols prevail on sandy sites. The young and old morainic areas are distinguished by differences in local relief and duration of soil formation, so that the soils covering the strongly planated features of the old moraine topography have been subject to extensive decalcification, eluviation, and podzolation.

The transition from lowlands to hilly and mountainous areas is characterized by a loess belt (loess and sandy loess), where luvisols, podzoluvisols, and gleysols prevail. Chernozems and (luvic) phaeozems developed instead of luvisols in the dry basin landscapes on the lee side of the mountains, mainly in the fertile loess plains and in the Upper Rhine area.

In hilly and mountainous country loess soils are also very common; often, small areas covered with these soils alternate with areas covered with soils consisting of weathering products and solifluxion material composed of fragments of bedrock. The predominant soil associations are those derived from the periglacial cover, in which small-scale variations are caused by the petrography of the underlying parent rock, the proportion of loess present, as well as the relief. Limestones, dolomites, and marlstones are invariably overlain by leptosols and calcareous regosols, and sometimes gleysols and pelosols. Sandstones and similar clastic rocks, and also igneous and metamorphic rocks, tend to develop cambisols, podzol-cambisols, and podzols. Cambisols are also predominant on claystones and on argillaceous and silty slates. However, in this case they are often associated with gleysols.

In the Alps exceptional kinds of soils occur. Due to the typical relief of the Alps, the proportion of immature soils or rock exposures without soil cover is much higher than in other parts of Germany, and rendzinas, rankers and lithosols are quite common.

Map and legend

Each map unit in the legend is characterised by one or several dominant soils and the parent material in accordance with the German soil classification system as well as the revised FAO legend (FAO-UNESCO 1990). The sequence of map units in the legend is based primarily on the substratum, i.e. parent material, and within one substratum on the soil types according to the German soil mapping guide. The soil map units are divided into groups in the legend reflecting the areas of soil distribution (e.g. Soils in loess areas); these groups almost correspond to the soil regions.

The colours used for the soil map units are in accordance with the German soil mapping guide, in which the basic map colours for the various soil types in the Federal Republic of Germany have been laid down. The numbers used on the map correspond with those in the legend. The guide only defines the basic colours. On the map, however, various shades of the basic colours are used to reflect soil attributes, for example, a darker shade of the basic colour for a soil typical of high relief energy, or a blend of more blue with the basic colour for a soil with high water content.

Map 1.3 is based on the BÜK 1000 map, which includes details of each of the 72 map units in the legend, a profile description of one selected dominant soil per map unit, as well as a short legend in German and English. The soil map was compiled from the BÜK 1000 map by a process of generalisation. The number of soil mapping units in the legend was reduced to 60 by aggregation of those units showing similar dominant soils into single units. In addition, the generalisation succeeded in eliminating the smallest areas on the map.

Each map unit in the legend of the 1 : 2 000 000 soil map has a dominant soil, which is depicted in a separate diagram showing soil type (represented by colours), the horizons (indicated by symbols), and the soil texture of each horizon (indicated by hatchings). The soil map is accompanied by photographs of characteristic soil profiles in Germany, in which the sequence and thicknesses of the horizons do not necessarily agree in detail with the corresponding reference profiles in the profile diagram mentioned above.

It is important to point out that the BÜK 1000 map, on which the 1 : 2 000 000 soil map was based, was in turn derived from maps compiled from incomplete-coverage mapping data. This means that the information included in the legend of Map 1.3 on the dominant soils and the proportion of area covered by them is partly estimated. Another aspect is that, for most of the map units that refer to the mountain areas, it must be assumed that the corresponding dominant soil mentioned in the legend covers much less than 35 % of the area of the map unit.

Only one dominant soil in each main soil association given in the digital map version is documented by a representative profile, although all members of the association are known. In the "old" federal states of Germany, these reference profiles were selected from a master list of about 675 profile descriptions, and in the "new" federal states from about 1000 profile descriptions. In both cases the representative profiles were selected on the basis of soil type, main groups of soil texture, and location.

This is the first attempt to provide a list of reference profiles for the 1 : 2 000 000 soil map, but it has the following potential disadvantages: Firstly, the "old" and "new" federal states of Germany are unequally represented. Secondly, in individual cases, the profile descriptions may contain information on taxonomic nomenclature, thickness of characteristic horizons, soil texture, mean depth of groundwater etc. that does not fully apply to the dominant soil of the corresponding map unit. The master list of reference profiles is continuously updated and optimised with the help of the profile and laboratory databases of the Soil Information System of the BGR (FISBo BGR; ECKELMANN et al. 1995). On this basis, soil maps can be checked and improved.

Practical Information

The digital data of Map 1.3 are part of the spatial database of FISBo BGR. This database contains geometric and topological data relevant to soil maps within the Federal Republic of Germany at scales of 1 : 200 000 and smaller, as well as the descriptions of the individual map units in terms of geometric, graphic and pedological data. More detailed data on soil distribution is held in the soil information systems of the Geological Surveys of the individual Federal States of Germany. The State Geological Surveys are responsible for producing soil maps of their particular states at scales of 1 : 100 000 and larger. Where necessary, information on soil water-regime, depth of solum, and sometimes on characteristic relief positions of the soil map units can also be obtained by using the data of the spatial database of FISBo BGR. Map 1.3 also serves as a basis for thematic maps showing several parameter of soil water regime (see Maps 4.1-4.5 in this Atlas).