

UPDATE OF WRB SOIL CLASSES IN FINLAND: EXPRESSION OF WETNESS

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INTRODUCTION

In the cool and humid climate prevailing in Finland, wetness of the soil is a permanent constraint to agriculture and 86% of field area is artificially drained. This self-evident soil characteristic has not been expressed in the WRB [1] names of Finnish soils in the Soil Geographical Database of Europe (SGDE) at scale 1:1000 000, or in the Soil Database of Finland at scale 1:250 000 [2].

Until today, most clay soils of Finland have been classified as *Vertic Cambisols*, and the medium-textured soils as *Eutric/Dystric Cambisols*, none expressing the inherent wetness. Yet, according to Soil Taxonomy, the same soils have been classified as *Aquepts* or *Aquic* subgroups of *Inceptisols* [3].

In Norway soil mapping is actively carried out in the field. There the most common agricultural soils are *Stagnosols* and *Planosols* (Fig. 1), expressing the *stagnic colour pattern* at the reference group level, and *Luvic* and *Albeluvisols*, where the prefixes *gleytic* and *stagnic* appear frequently. Considering the nearly similar geological history and climatic conditions in south-eastern Norway and Southern Finland, a hypothesis was made that the same soils occur in these two Nordic areas.

SOIL EXCURSION

A soil excursion was arranged in 2012 to investigate the major mineral agricultural soils of southern Finland and harmonize soil classification between the two countries.

SIGNS OF WETNESS

Almost all investigated soils of Finland had a *stagnic colour pattern*. Most clay soils were *Stagnosols*, in the lowest positions also *Gleysols*. Stagnic colour pattern was common also in soils with sand over clay, classifying as *Planosols*. Clay eluviation and some *albeluvisol* *tonguing* were observed, but the limitations in our database prevent delineating *Albeluvisols*. Fine silt soils were poorly developed, falling into *Stagnic Regosols* instead of *Eutric/Dystric Cambisols* in SDGE. After this revision,

Cambisols are restricted to medium-textured glacial tills or fine sands, often showing weak podzolization. According to earlier surveys, more coarse-textured soils, mostly under forest vegetation, are dominated by *Histic*, *Gleyic* and *Haplic Podzols*. After these revisions, the Soil Database of Finland at scale 1:250,000 properly reflects the moisture regime attributable to the humid climate.

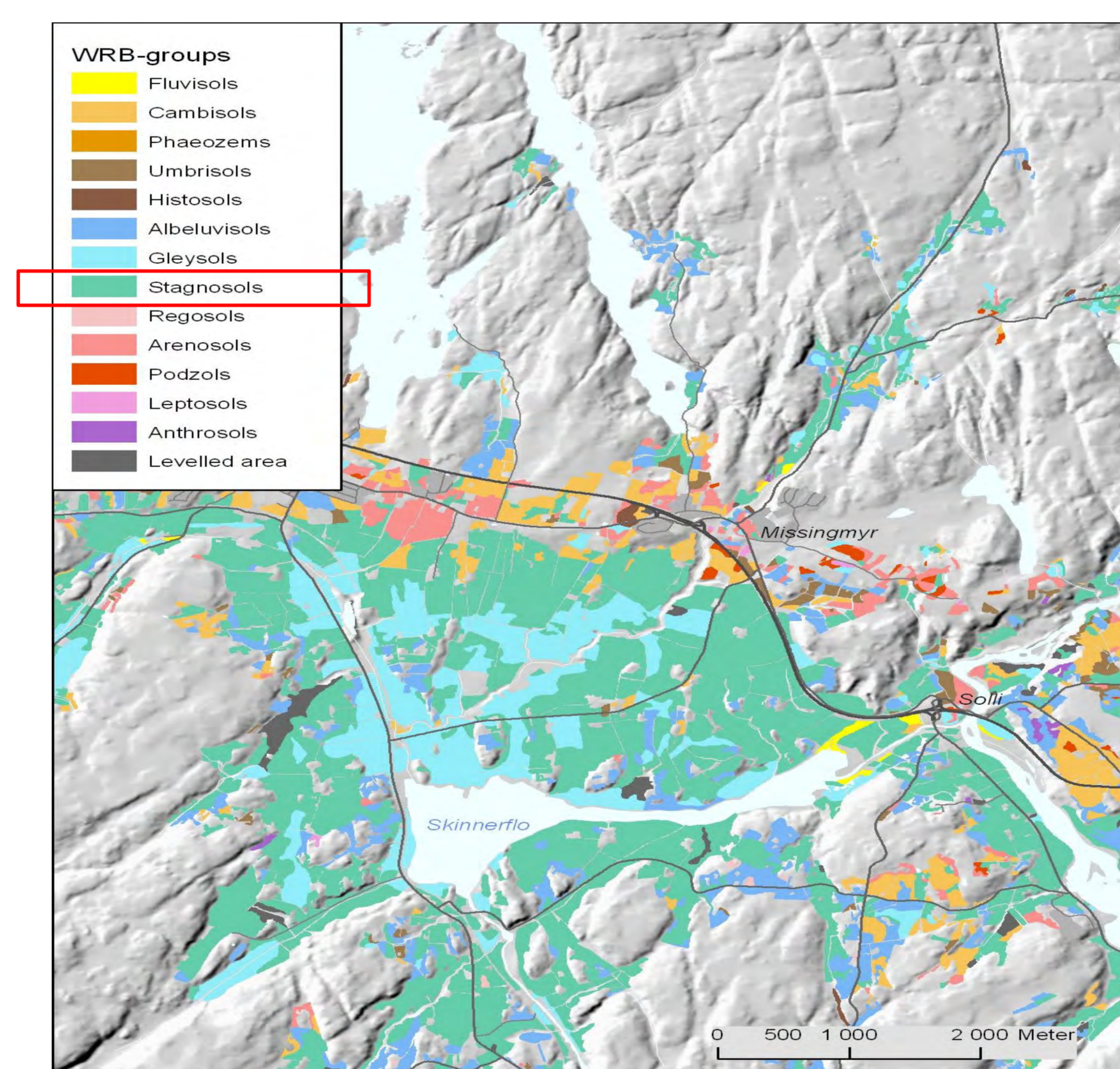


Fig. 1. Soils in south-eastern Norway.



Fig. 2. Weak albeluvisol tonguing in a Luvic Planosol (Albic Ruptic Clayic).

Table 1. Generalized classification of mineral soils of Finland.

Soil texture	Earlier WRB class	Updated WRB class
Clay soils	Vertic Cambisols	Vertic Luvic Stagnosols
Clay soils, depressions	Dystric Gleysols	Luvic Gleysols
Sand over clay	Eutric Cambisols	Luvic Planosols
Fine silt	Eutric Regosols	Stagnic Regosols
Sand or till (non-podzolized)	Dystric Regosols	Endogleyic Cambisols
Clearly podzolized soils	Haplic Podzols	Gleyic Podzols

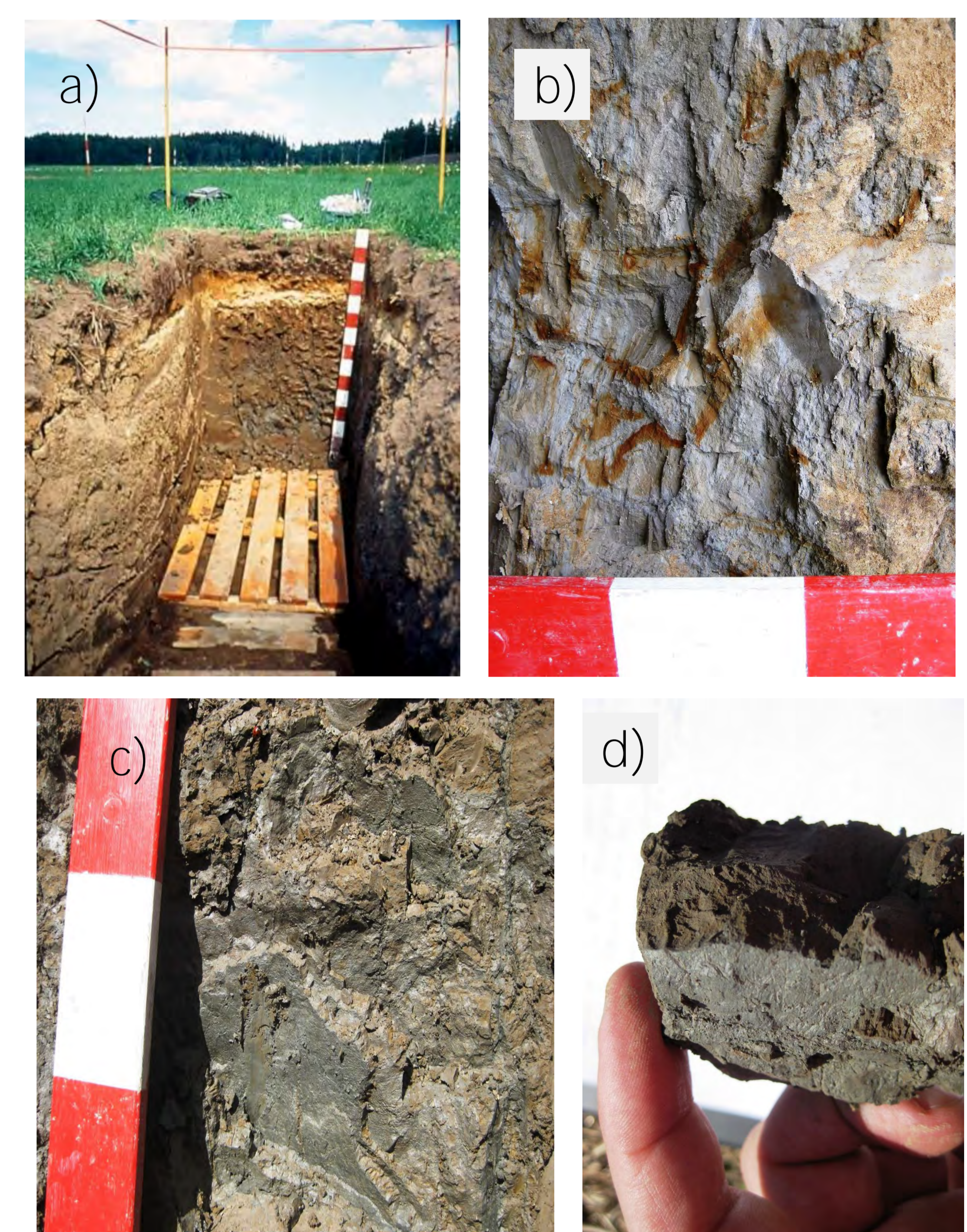


Fig. 3. A Luvic Planosol (a), stagnic colour pattern in a fine sand (b), a Vertic Luvic Stagnosol containing wedge-shaped aggregates (c) and a broken clod of clay with a stagnic colour pattern (d).

Literature

- [1] IUSS Working Group WRB. 2007. WRB 2006, first update 2007. World Soil Resources Reports 103.
- [2] Lilja, H., Nevalainen, R. 2007. Developing a digital soil map for Finland. *Developments in Soil Science* 31: 67-74.
- [3] Yli-Halla, M., Mokma, D.L. 2001. Soils in an agricultural landscape of Jokioinen, south-western Finland. *Agricultural and Food Science in Finland* 10: 33-43.