# Using WRB to produce map legends

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# WRB


IUSS Working Group WRB (2006):
World Reference Base for Soil Resources 2006.
Edited by Erika Micheli, Peter Schad and Otto Spaargaren.
FAO World Soil Resources Reports 103, Rome.
ftp://ftp.fao.org/agl/agll/docs/wsrr103e.pdf

WRB: electronic Update, 2007
http://www.fao.org/ag/agl/agll/wrb/doc/wrb2007_corr.pdf
http://www.wzw.tum.de/bk/pdfs/uebungen/WRB_update07.pdf

# Classification of individual soils: example Luvisol

lists of qualifiers (qualifiers which apply in this example: red):

**Prefix qualifiers**

Lamellic
Cutanic
Albic
Escalic
Technic
Leptic
Vertic
Gleyic
Vitric
Andic
Nitic
Stagnic
Calcic
Haplic

*typical*
*intergrade*
*Haplic*

**Suffix qualifiers**

Anthric
Fragic
Manganiferric
Ferric
Abruptic
Ruptic
Humic
Sodic
Epidystric
Hypereutric
Turbic
Gelic
Oxyaquic

Greyic
Profondic
Hyperochric
Nudiargic
Densic
Skeletic
Arenic
Siltic
Clayic
Rhodic
Chromic
Transportic
Novic

-> Stagnic Albic Cutanic Luvisol (Ferric, Greyic, Clayic)

# WRB: Classifying soils versus making maps

classification of individual soils:

- all applying qualifiers have to be used
- there is no hierarchy of the qualifiers

map legends:

- the number of used qualifiers depends on the scale
- at least some of the qualifiers have to be in a hierarchical order

# Guidelines for constructing small-scale map legends using the WRB

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scales of 1 : 250 000 and smaller

http://www.fao.org/nr/land/soils/soil/wrb-documents/en/

qualifiers arranged in a different manner:

main map unit qualifiers:
- ranked

optional map unit qualifiers:
- not ranked (alphabetical)

no changes in the definitions of qualifiers

no qualifiers abolished

no qualifiers newly introduced

-> besides the sequences: all according to WRB 2007

# Map unit qualifiers: example Luvisol

main

Leptic/Skeletic
Gleyic
Stagnic
Albic
Vertic
Calcic
Manganiferric/Ferric
Rhodic/Chromic
Haplic

optional

Abruptic
Andic
Anthric
Arenic
Clayic
Cutanic
Densic
Epidystric
Escalic
Fragic
Gelic
Greyic
Humic
Hypereutric
Hyperochric
Lamellic
Nitic
Novic
Nudiargic
Oxyaquic
Profondic
Ruptic
Siltic
Sodic
Technic
Transportic
Turbic
Vitric

# Map unit qualifiers: example Luvisol

main

Leptic/Skeletic
Gleyic
Stagnic
Albic
Vertic
Calcic
Manganiferric/Ferric
Rhodic/Chromic
Haplic

optional

Abruptic
Andic
Anthric
Arenic
Clayic
Cutanic
Densic
Epidystric
Escalic
Fragic
Gelic
Greyic
Humic
Hypereutric
Hyperochric
Lamellic
Nitic
Novic
Nudiargic
Oxyaquic
Profondic
Ruptic
Siltic
Sodic
Technic
Transportic
Turbic
Vitric

red: prefix qualifiers for classification of individual soils

blue: suffix qualifiers for classification of individual soils

# Scale levels (recommendation)

First scale level: Reference Soil Group (RSG) only:

1 : 5 000 000 and smaller

Second scale level: RSG with 1 main map unit qualifier

1 : 5 000 000

Third scale level: RSG with 2 main map unit qualifiers

1 : 5 000 000 to 1 : 1 000 000

Fourth scale level: RSG with 3 main map unit qualifiers

1 : 1 000 000 to 1 : 250 000

# Map units

- before the name of the RSG, the recommended number of **main map unit qualifiers** is placed
  if there is more than one: a qualifier further up in the list stands closer to the name of the RSG
- behind the name of the RSG, **additional map unit qualifiers** may be placed
  in brackets and separated by commas
  these may be
  -- additional *main map unit qualifiers* further down in the list
  -- *optional map unit qualifiers*
  additional main map unit qualifiers are placed first
  and out of them a qualifier further up in the list stands first
  the sequence of the optional map unit qualifiers
  is according to the preference of the soil scientist who makes the map
- if less qualifiers apply than described above, the smaller number is used
- redundant qualifiers are not used
- if two or more main map unit qualifiers are listed separated by a slash (/), only the dominant one is used
- the use of specifiers is encouraged:
  Epi-: the qualifier applies only from 0 to 50 cm
  Endo-: the qualifier applies from 50 to 100 cm (and not above 50 cm)

# Dominant soils, co-dominant soils and associated soils

dominant soils: > 50 % of the soil cover

co-dominant soils: 25 – 50 % of the soil cover

associated soils: 5 – 25 % of the soil cover

map units:

- dominant soil only
- dominant soil and a co-dominant soil and/or one or more associated soils
- up to three co-dominant soils (and associated soils)

co-dominant soils and associated soils:

may have less qualifiers than indicated for the respective scale level

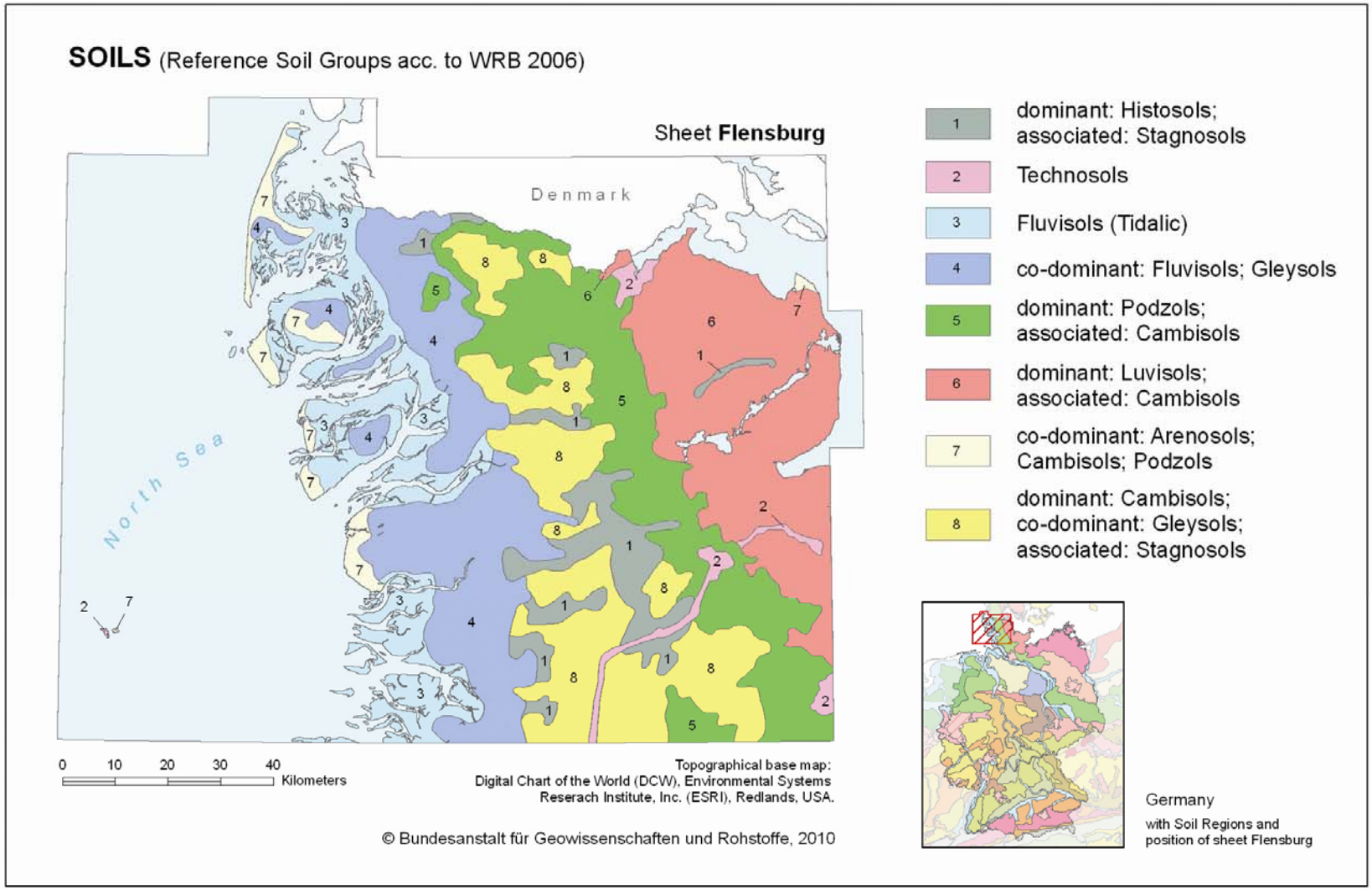
# Map units: example Luvisol

classification of individual soil: Stagnic Albic Cutanic Luvisol (Ferric, Greyic, Clayic)

| main | optional | | |
|---|---|---|---|
| Leptic/Skeletic | Abruptic | Gelic | Oxyaquic |
| Gleyic | Andic | Greyic | Profondic |
| Stagnic | Anthric | Humic | Ruptic |
| Albic | Arenic | Hypereutric | Siltic |
| Vertic | Clayic | Hyperochric | Sodic |
| Calcic | Cutanic | Lamellic | Technic |
| Manganiferric/Ferric | Densic | Nitic | Transportic |
| Rhodic/Chromic | Epidystric | Novic | Turbic |
| Haplic | Escalic | Nudiargic | Vitric |
| | Fragic | | |

| | map unit | additional qualifiers (examples) |
|---|---|---|
| first scale level: | Luvisol | |
| second scale level: | Stagnic Luvisol | (Albic) |
| third scale level: | Albic Stagnic Luvisol | (Ferric, Greyic) |
| fourth scale level: | Ferric Albic Stagnic Luvisol | (Greyic, Clayic) |

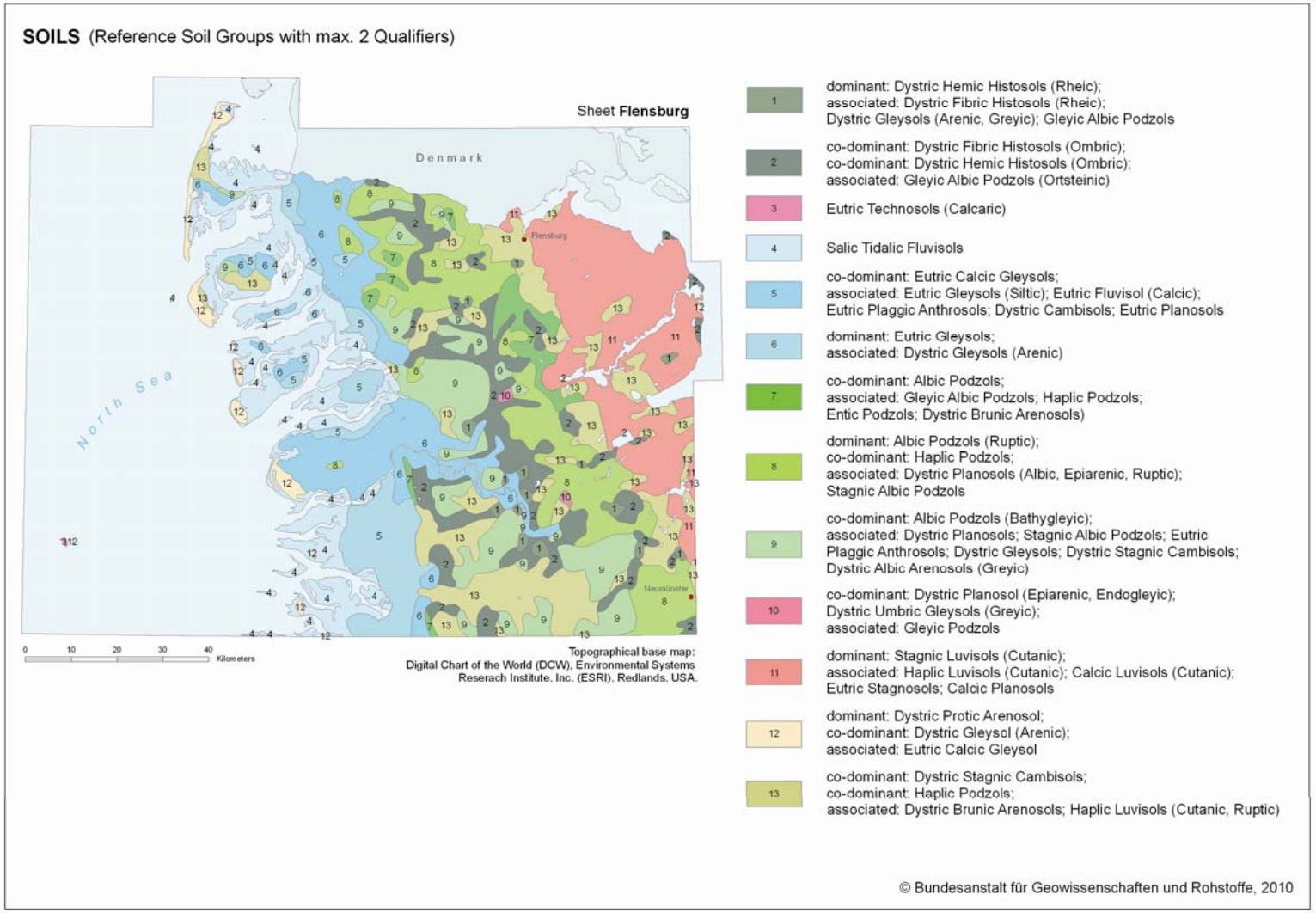
# First scale level: RSG




sheet Flensburg (draft), German Federal Institute for Geosciences and Natural Resources

recommended scale : 1 : 5 000 000 and smaller

# Third scale level: RSG plus 2 main qualifiers




sheet Flensburg (draft), German Federal Institute for Geosciences and Natural Resources

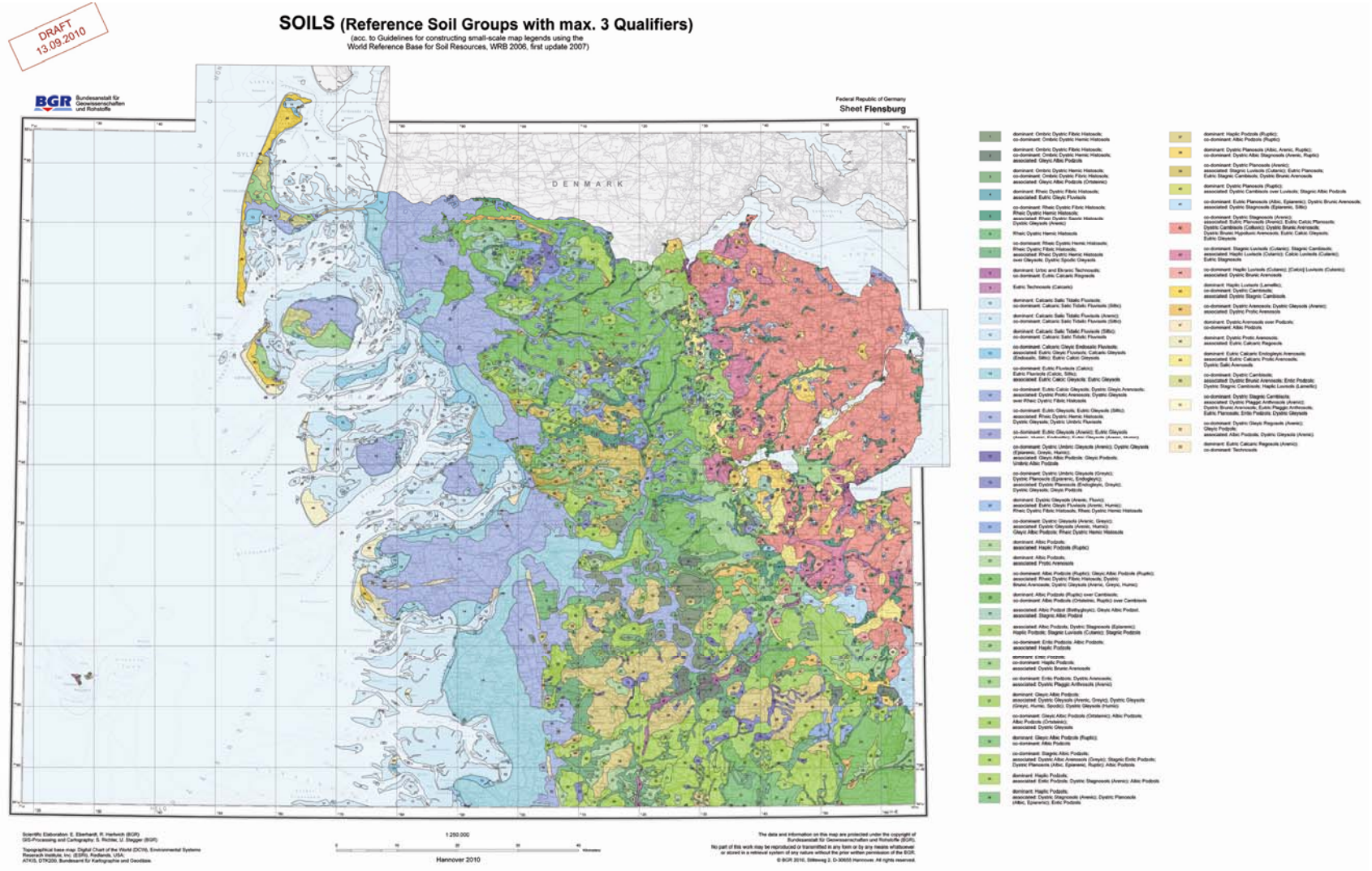
recommended scale : 1 : 1 000 000 to 1 : 5 000 000

# Third scale level: RSG plus 2 main qualifiers


sheet Flensburg (draft), German Federal Institute for Geosciences and Natural Resources

recommended scale : 1 : 1 000 000 to 1 : 5 000 000

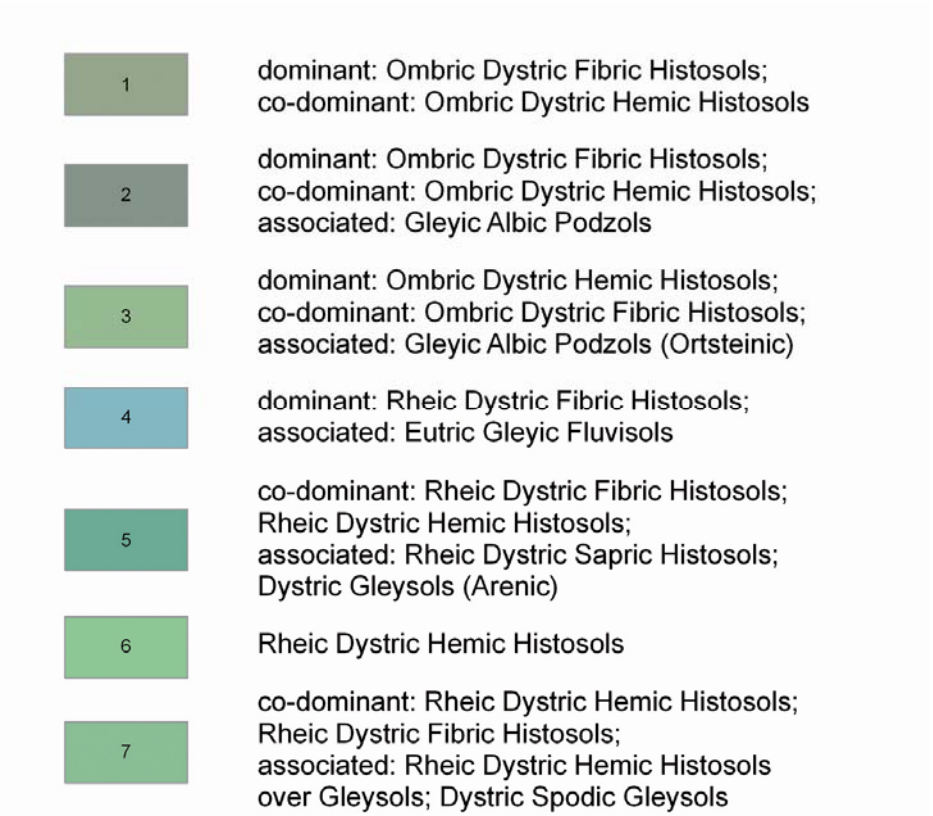
# Fourth scale level: RSG plus 3 main qualifiers




sheet Flensburg (draft), German Federal Institute for Geosciences and Natural Resources

recommended scale : 1 : 250 000 to 1 : 000 000

# Fourth scale level: RSG plus 3 main qualifiers




sheet Flensburg (draft), German Federal Institute for Geosciences and Natural Resources

recommended scale : 1 : 250 000 to 1 : 000 000

# Example Histosols

| *Main map unit qualifiers* |
| --- |
| Cryic |
| Thionic |
| Folic |
| Fibric/Hemic/Sapric |
| Technic |
| Hyperskeletic/Leptic |
| Vitric/Andic |
| Dystric/Eutric |
| Rheic/Ombric |

# Example Histosols: second scale level

Sheet Flensburg:

Fibric Histosols (Rheic)
Fibric Histosols (Ombric)
Hemic Histosols (Rheic)
Hemic Histosols (Ombric)

| *Main map unit qualifiers* |
|---|
| Cryic |
| Thionic |
| Folic |
| Fibric/Hemic/Sapric |
| Technic |
| Hyperskeletic/Leptic |
| Vitric/Andic |
| Dystric/Eutric |
| Rheic/Ombric |

added at the second scale level

# Example Histosols: third scale level

Sheet Flensburg:

Dystric Fibric Histosols (Rheic)
Dystric Fibric Histosols (Ombric)
Dystric Hemic Histosols (Rheic)
Dystric Hemic Histosols (Ombric)

| *Main map unit qualifiers* |
|---|
| Cryic |
| Thionic |
| Folic |
| Fibric/Hemic/Sapric |
| Technic |
| Hyperskeletic/Leptic |
| Vitric/Andic |
| Dystric/Eutric |
| Rheic/Ombric |

added at the second scale level

added at the third scale level

# Example Histosols: fourth scale level

Sheet Flensburg:

Rheic Dystric Fibric Histosols
Ombric Dystric Fibric Histosols
Rheic Dystric Hemic Histosols
Ombric Dystric Hemic Histosols
Rheic Dystric Sapric Histosols

| *Main map unit qualifiers* |
|---|
| Cryic |
| Thionic |
| Folic |
| Fibric/Hemic/Sapric |
| Technic |
| Hyperskeletic/Leptic |
| Vitric/Andic |
| Dystric/Eutric |
| Rheic/Ombric |

added at the second scale level

added at the third scale level

added at the fourth scale level

# Example Fluvisols

| *Main map unit qualifiers* |
| --- |
| Subaquatic/Tidalic |
| Thionic |
| Skeletic |
| Salic |
| Gleyic |
| Stagnic |
| Folic/Histic |
| Mollic/Umbric |
| Calcaric |
| Dystric/Eutric |

# Example Fluvisols: second scale level

Sheet Flensburg:

Tidalic Fluvisols

Eutric Fluvisols

| *Main map unit qualifiers* |
|---|
| Subaquatic/Tidalic |
| Thionic |
| Skeletic |
| Salic |
| Gleyic |
| Stagnic |
| Folic/Histic |
| Mollic/Umbric |
| Calcaric |
| Dystric/Eutric |

added in the second scale level

# Example Fluvisols: third scale level

Sheet Flensburg:

Salic Tidalic Fluvisols

Eutric Fluvisols (Calcic)

| *Main map unit qualifiers* |
|---|
| Subaquatic/Tidalic |
| Thionic |
| Skeletic |
| Salic |
| Gleyic |
| Stagnic |
| Folic/Histic |
| Mollic/Umbric |
| Calcaric |
| Dystric/Eutric |

| *Optional map unit qualifiers* |
|---|
| ... |
| Calcic |
| ... |

added in the second scale level

added in the third scale level

# Example Fluvisols: fourth scale level

Sheet Flensburg:

Calcaric Salic Tidalic Fluvisols

Calcaric Salic Tidalic Fluvisols (Arenic)

Calcaric Salic Tidalic Fluvisols (Siltic)

Calcaric Gleyic Endosalic Fluvisols

Eutric Gleyic Fluvisols

Eutric Gleyic Fluvisols (Arenic, Humic)

Dystric Umbric Fluvisols

Eutric Fluvisols (Calcic)

Eutric Fluvisols (Calcic, Siltic)

| *Main map unit qualifiers* |
|---|
| Subaquatic/Tidalic |
| Thionic |
| Skeletic |
| Salic |
| Gleyic |
| Stagnic |
| Folic/Histic |
| Mollic/Umbric |
| Calcaric |
| Dystric/Eutric |

| *Optional map unit qualifiers* |
|---|
| ... |
| Arenic |
| Calcic |
| Humic |
| Siltic |
| ... |

added in the second scale level

added in the third scale level

added in the fourth scale level


Thank you very much