

Status and priorities of soil management in Russia

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Global Soil Partnership

Pillar 1

- Promoting sustainable management of soil resources and improved global governance for soil protection and sustainable productivity



Land tenure in Russia

- Since 1990 the system of land tenure in Russia changed radically: instead of large farms of common use we have now a complex system of state, collective and private tenures of various sizes that have different status (property, ownership, use, and rent)



Land use in the USSR and nowadays Russia

USSR

- **Economical situation:** low productivity , residual principle of finding
- **Social situation:** discrimination of rustic population, poor rural infrastructure
- **Technological situation:** weakness of technology, low priority of agrotechnology for the state

Russian Federation

- **Economical situation:** economic freedom, weakness of producers, “wild market”
- **Social situation:** social freedom, weak social protection, “social desertification”
- **Technological situation:** dependence on imported technologies, the loss of scientific background

Processes of soil degradation in Russia

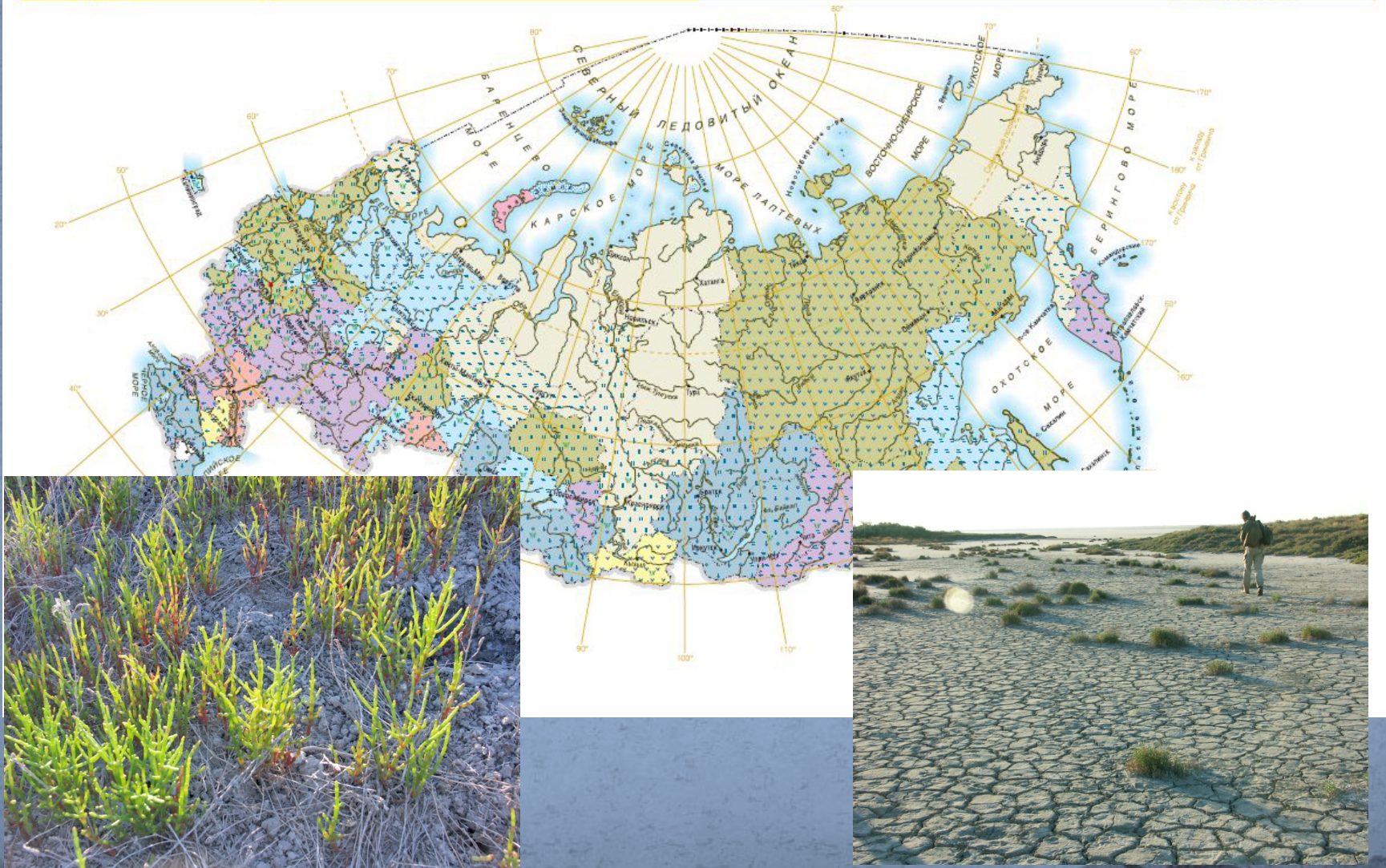
| Processes of degradation | Area, million ha |
|-----------------------------|------------------|
| Water erosion and deflation | ~ 70 |
| Various degrees of salinity | > 40 |
| Excessive stoniness | 12 |
| Desertification | > 1 |
| Low organic carbon content | 56 |
| Gullies | 1.7 |
| Wind-blown sands | 6.3 |



Processes of soil degradation in Russia

ПРЕОБЛАДАЮЩИЕ НЕГАТИВНЫЕ ПРОЦЕССЫ НА ЗЕМЛЯХ СЕЛЬСКОХОЗЯЙСТВЕННОГО НАЗНАЧЕНИЯ

МАСШТАБ 1:30 000 000



Humus balance in the plough layer in the soils of Russia



Minimization of soil management

Benefits

- Energy and resources economy
- Soil conservation
- Additional snow accumulation
- Water accumulation
- Decreasing the rate of organic matter mineralization
- Decreasing the loss of mineral nitrogen
- Mulching effect
- Improving soil structure
- Perspectives for “green” agriculture

Limitations

- Deterioration of phytosanitary situation
- The necessity for the pesticides application
- Mineral nitrogen deficit
- Limitations for sodic, excessively wet and compact soils
- Differentiation of topsoil layers
- Limitations for the use of organic fertilizers and

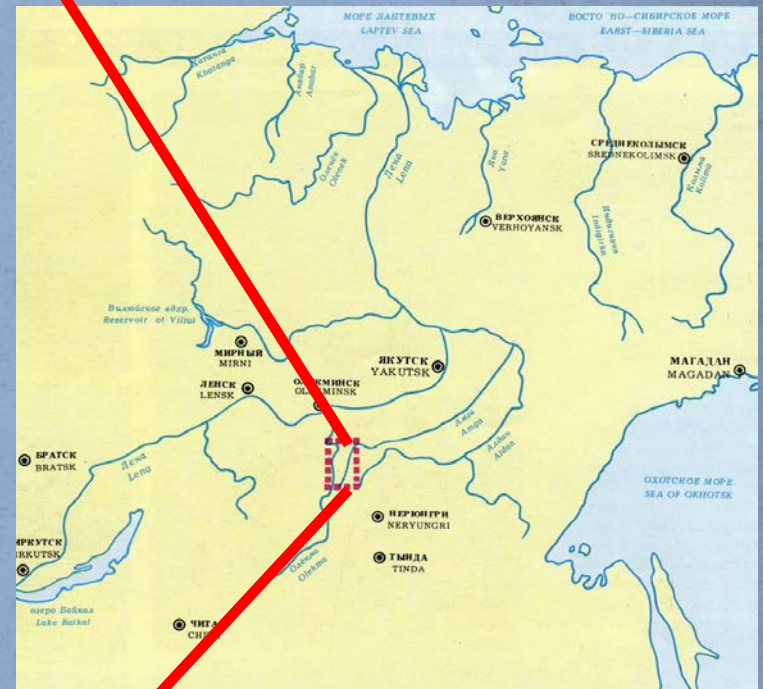
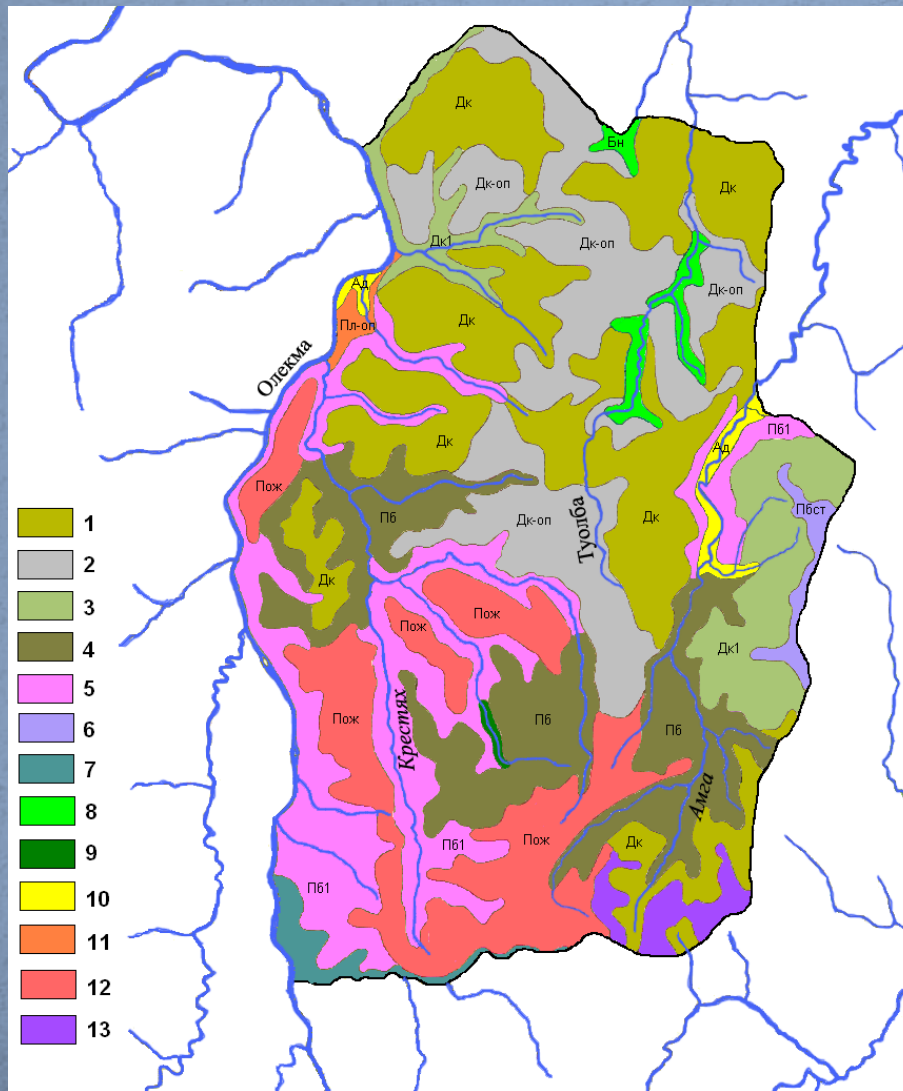
Challenges for “biological” soil management

- Maintaining soil surface under the cover of plants and their residues, soil mulching;
- Providing the optimal content of labile organic matter in soils;
- Increasing the contribution of biological nitrogen by increasing the proportion of legumes and by stimulating the nitrogen fixation processes;
- Reducing the mechanical impact on soil, providing conditions for biological loosening of the soils;
- Optimization of the biological cycling of matter in the agro-landscape;
- Creating an optimal infrastructure of agro-landscapes;
- Increasing productivity and ecological sustainability of agrocenoses by improving the genetic potential of the plants and optimization of the connections within the biocenosis;
- Regulation of the number of pests using biological and “green” chemical methods

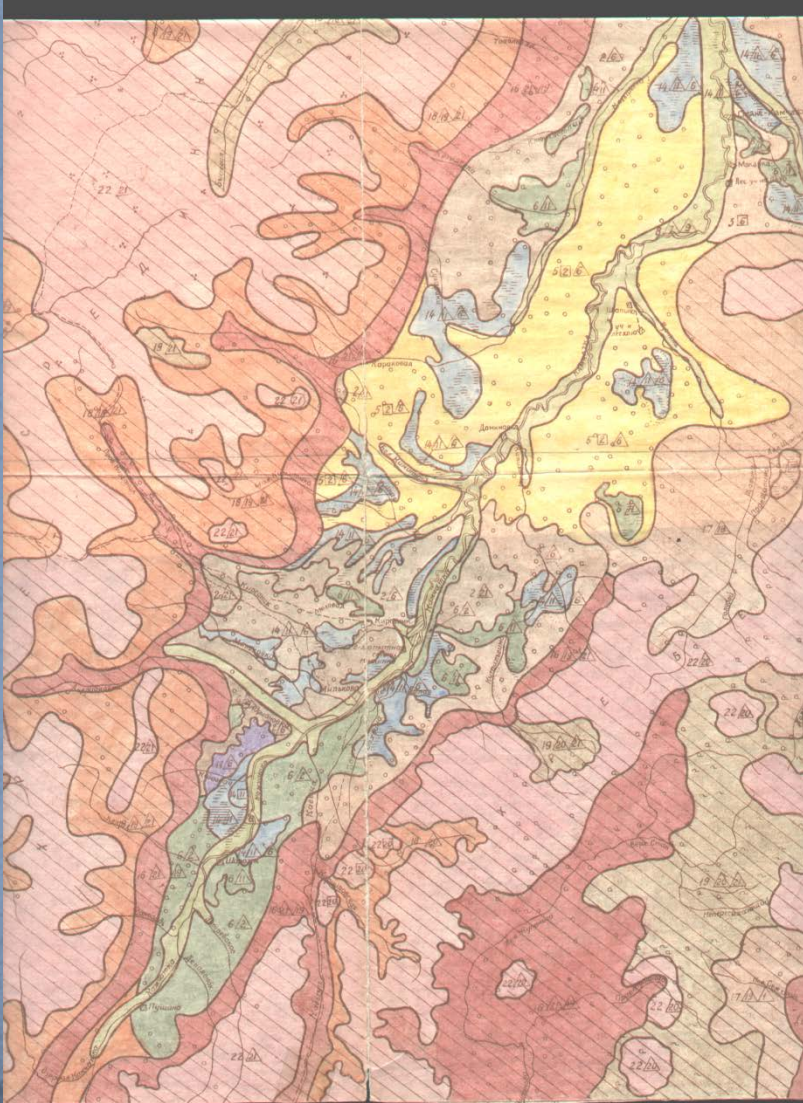
Soil mapping in Russia and adjacent countries

- Soil mapping has been always a basis for soil inventory in Russia and adjacent countries
- The soil mapping had four basic levels:
 - Large-scale soil maps of particular farms and enterprises (1:10,000 – 1:25,000)
 - Medium-scale maps of regions and districts (1:100,000 – 1:300,000)
 - Small-scale maps of extensive regions and republics (1:500,000 – 1:2,000,000)
 - Synoptic maps of the country (1:2,500,000 and smaller)

Soil mapping in Russia: Large-scale maps



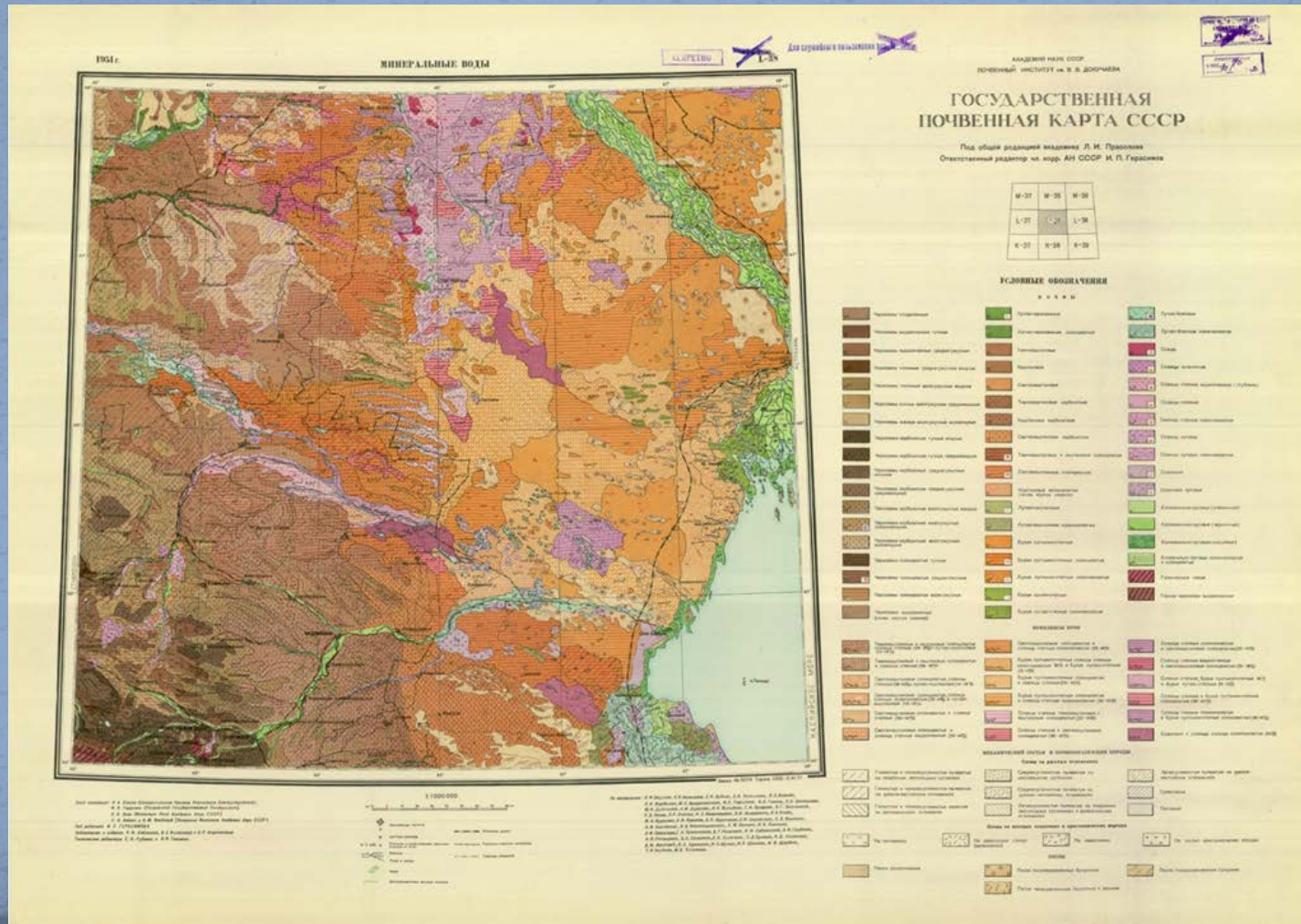
Soil mapping in Russia: Medium-scale maps



Medium-scale soil map
of Kamchatka peninsula
1:200:000

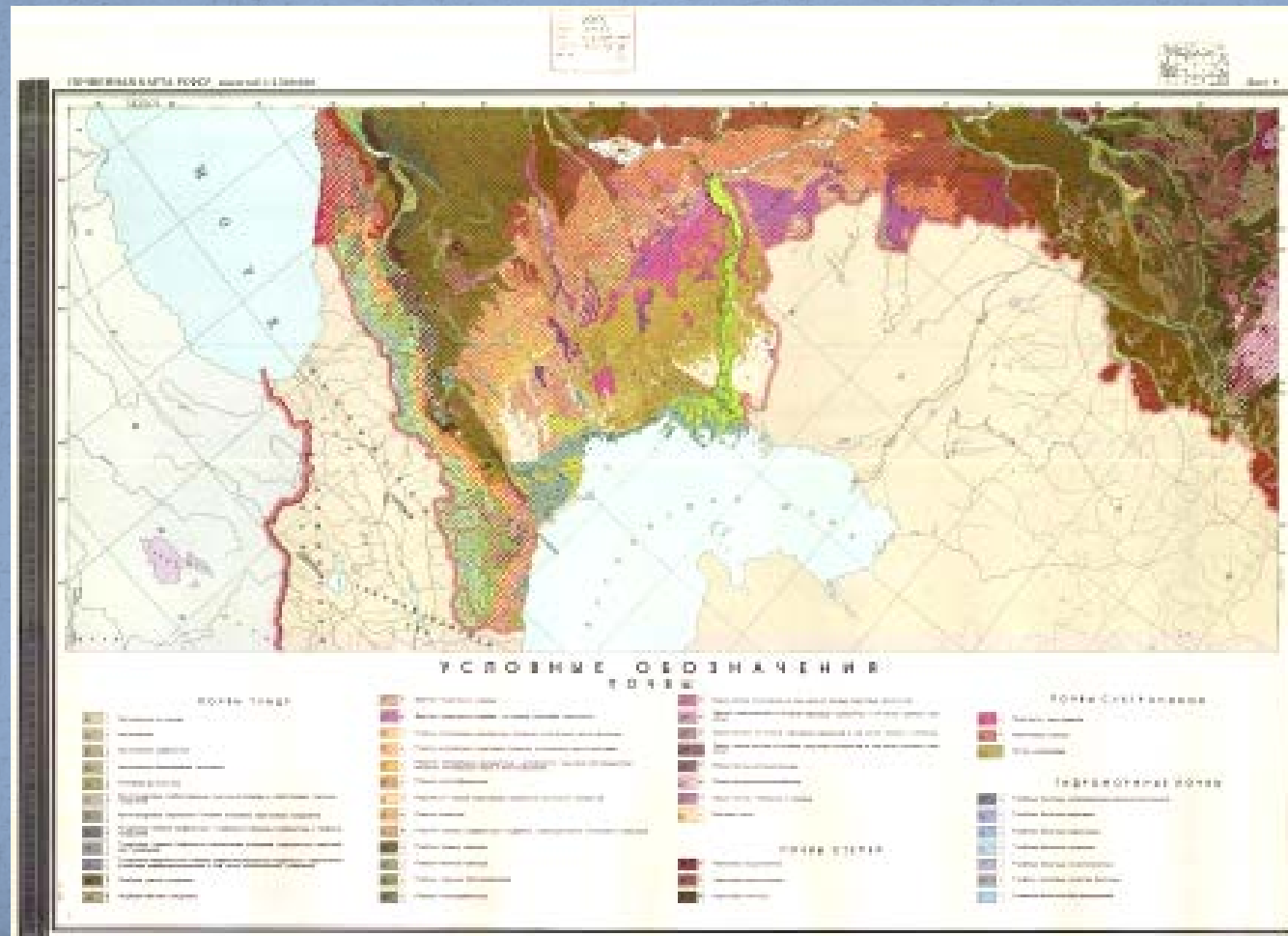
The map was prepared
for environmental
management purposes

The State Soil Map of the USSR (fragment)



Soil mapping in Russia: Synoptic maps

The Soil Map of the Russian Federation 1:2,500,000 (fragment)



Soil Atlas of Russian Federation

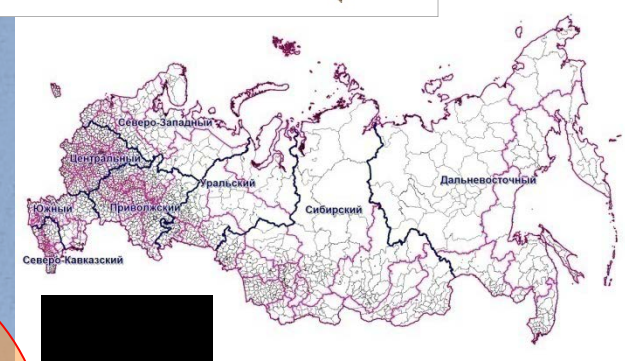
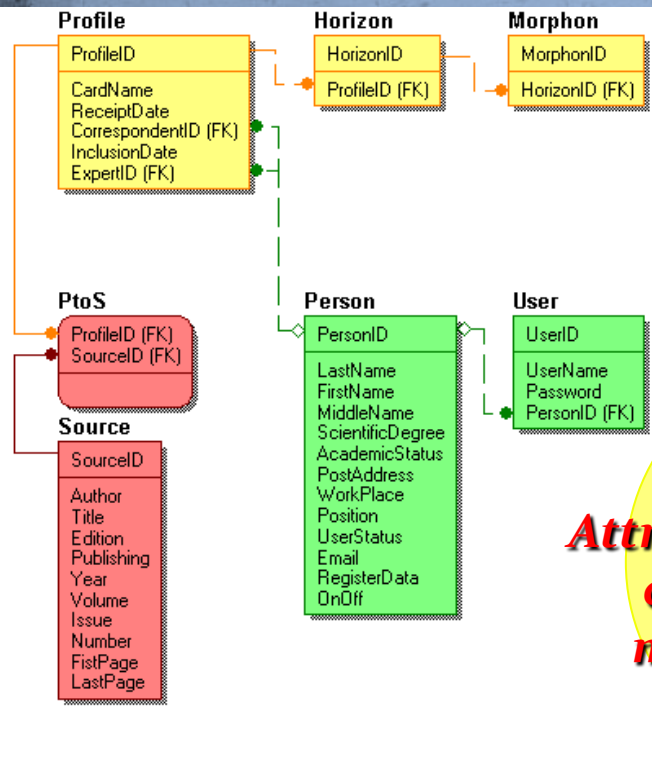


- Shoba S.A. (Editor-in-Chief), (2011). *National Soil Atlas of Russia*. Moscow, Astrel. 600 p. (In Russian)
- *More than 80 authors from 18 institutions*
- *More than 290 maps and cartographic products*
- *Mapping scales from 1:2,500,000 to 1:60,000,000*

Atlas sections

- Section **1**. The history of soil mapping
 - Section **2**. Factors of soil formation
 - Section **3**. The soils of Russian Federation
 - Section **4**. Soil horizons
 - Section **5**. Soil cover
 - Section **6**. Environmental soil functions
 - Section **7**. Anthropogenic transformation of soils and soil cover
 - Section **8**. Land and soil resources use and management
 - **8.1**. Russian Federation overview
 - **8.2**. The regions of Russian Federation
 - Section **9**. Soil and soil cover conservation
- Glossary of terms
- Bibliography

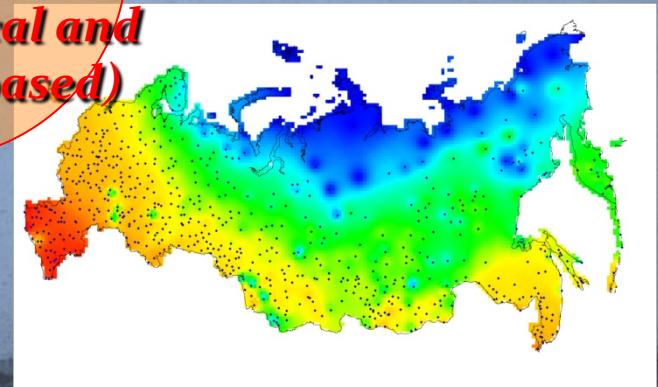
The structure of SGDB



Geographical database

Attributive profile database of modified soil properties

Calculated parameters (statistical and model-based)



**THANK YOU
FOR YOUR ATTENTION**

