Diplomarbeitspräsentation

Masterstudium: Medieninformatik

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User-driven Manipulation of Geospatial Data

Problem Statement
This work proposes an approach for manipulating the visualization of geospatial data in real-time. As a part of the ESA DUE Permafrost project this work introduces methods to change the visualization of the raster data within a Web Geographic Information System (WebGIS) by assigning different style profiles. Based on the Styled Layer Descriptor specification and the parameters of the permafrost data, control elements are unified in one user interface. This elements allow the users of the WebGIS to explore and analyze the underlying data.

Contribution
The implementation of this works extends the WebGIS of the ESA DUE Permafrost project by the following functions:
- The visualization can be adapted per layer and user without affecting the visualization of other users.
- Control elements for manipulating the layer visualization are introduced which are unified in one user interface.
- An interactive color legend is introduced which controls the values to be displayed in the layer visualization.

User Interface

Settings Box
- Range
- Classification
- ColorMap
- Classes
- Unit
- Show no-data values
- Reset modifications
- Apply changes

Color Legend
- Meter
- Class 10
- Class 9
- Class 8
- Class 7
- Class 6
- Class 5
- Class 4
- Class 3
- Class 2
- Class 1
- -100

Settings of the user interface are transformed into a layer style according to the Styled Layer Descriptor specification. Every time a layer is requested, the corresponding layer style is applied and the visualization is rendered.

Results

Different Colormaps
According to the permafrost data, a set of colormaps was specified. Using the colormap of the Remote Sensing Product Surface Soil Moisture, soil of high moisture is colored in blue while soil with low moisture is colored in red.

Applying a different colormap to the same data can help to highlight interesting characteristics of the data.

Classification
Values of the permafrost data can be classified and colored in a specific color. Areas of interest can easily be determined in the layer visualization.

Areas without data
Data is not provided for all areas since errors occured in the remote-sensing process. These areas can be colored and highlighted from the actual data.

Overlapping Layers
Layers of different Remote Sensing Products like the Digital Elevation Model or the Surface Soil Moisture can be overlapped. This enables to compare characteristics of these Remote Sensing Products. The appearance of each layer can be adapted to emphasize interesting values.

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