Purpose:
This is the readme file for the Soil Water Index product delivered by IPF for the geoland/CSP project.

Date:
This file was created on 08-08-2004

Parameter name: Soil Water Index

Physical Definition: Soil moisture content in the 1st meter of the soil in relative units ranging between wilting level and field capacity

Unit: percent [%]

Physical range of the parameter values: 0 - 100

Sensor name: ERS Scatterometer

Summary of the retrieval methodology:
To retrieve a relative measure of soil moisture, instantaneous ERS scatterometer measurements are corrected for the influence of vegetation phenology (by exploiting the multi-incidence angle measurements of the sensor) and relating the vegetation corrected measurement to a dry and wet backscatter reference. The moisture content in the profile is then estimated from the surface measurements using a red noise filtering approach.

Ref:
1. Wagner, W., G. Lemoine, H. Rott (1999) A Method for Estimating Soil Moisture from ERS Scatterometer and Soil Data, Remote Sensing of Environment, Vol. 70, pp. 191-207.
2. Ceballos, A., K. Scipal, W. Wagner, J. Martinez-Fernandez, Validation and downscaling of ERS Scatterometer derived soil moisture data over the central part of the Duero Basin, Spain, Hydrological Processes, in press.

Summary of the validation procedure:
Global SWI data has been compared to model data and in-situ soil moisture measurements of 360 stations in Russia, Ukraine, India, Illinois, China and Spain.

Ref:
1. W. Wagner, K. Scipal, C. Pathe, D. Gerten, W. Lucht, B. Rudolf (2003) Evaluation of the agreement between the first global remotely sensed soil moisture data with model and precipitation data, Journal of Geophysical Research - Atmospheres, Vol. 108, No. D19, 4611, doi: 10.1029/2003JD003663
2. Ceballos, A., K. Scipal, W. Wagner, J. Martinez-Fernandez, Validation and downscaling of ERS Scatterometer derived soil moisture data over the central part of the Duero Basin, Spain, Hydrological Processes, in press.

Accuracy of the parameter (in physical unit): 10 %

More details about the retrieval algorithms can be found in the document CSP-

0350-ATBD_SoilMoisture_ERS-I1.00.pdf

Product format:

The products are binary encoded lists of byte values. For each point of a
predefined grid one number is stored. In total the grid consists of 143399
points (note that over dense tropical forest, Greenland, Antarctica and sand
desert areas the grid is not defined). The centre coordinates of the grid cells
are stored in an extra file named latlon.txt.

Data encoding (for binary files):
* scaling factors (offset and slope): offset=0, slope=0.5 (i.e. multiply the
values by a factor of 0.5 to receive the original values)

* special values:
frozen soil - 110
missing data - 120

Time coverage:
* beginning: 01-01-1992
* end: 01-01-2001

Time resolution:
10 days
The temporal resolution is based on the specifications of the infiltration model
used to derived the Soil Water Index and is set to 10 days. The model integrates
all measurements from an interval prior to the SWI sample time. The interval is
set to 100 days (due to a weighting procedure however only the most recent
measurements will contribute significantly to the respective SWI sample)

Spatial coverage of the product:
global

Spatial resolution:
50 km

Projection:
no projection - coordinates are geographic (lon/lat)
The grid is defined such that the point spacing in metric units is constant (28
km). This definition results in a 0.25° spacing in latitude, and a latitude
dependent spacing in longitude direction (i.e. in geographic coordinates the
grid is irregular, the point density in longitude direction decreases with
latitude).

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