Geoland2 SDI
A Spatial Data Infrastructure component for the GMES Land Monitoring Core Service

Erwin Goor, VITO
geoland2 SDI task
geoland2 Key Facts
Project Start: September 2008
Project Duration: 4 years
Project Partner: 52 European partners
Project Lead: Astrium/Infoterra GmbH
Financing: EC 7th Framework Program

geoland2 Products & Services
70 Product Lines
3 CMS (Core Mapping Services)
7 CIS (Core Information Services)
Composition of the team

- VITO, Belgium (Lead & Operations)
- SPACEBEL, Belgium
- Infoterra, Germany
- EOX IT Services, Austria
- AGI, Lithuania

Mission

- SDI to ensure online product discovery and dissemination between users and providers; where users themselves are often providers to other users.
  - Steer the process: architecture & interfaces
  - Implement & operate centralized components
  - Support service providers: support with recommended OSS
  - Establish relations on technical level regarding EO-data / in-situ data / reference data / INSPIRE / GEOSS
LMCS and the wider community service context
Geoland2 SDI architecture

- Portal
- Interoperability Layer
- Production Center
- External Clients

Interoperability Layer

Interfaces provided by SDI

CMS/CIS Service Provider Systems
Geoland2 SDI – Services at production centers

Production center

IAuthentication

Authentication

IDatasetDiscovery

Catalogue

Authorisation

IOrdering

Ordering

<<INSPIRE>>

Viewing

IOnlineDataAccess

<<INSPIRE>>

Download
Geoland2 SDI – Centralised services
Land Geo portal & Geoland2 Expert portal

- [www.land.eu](http://www.land.eu)

- [www.gmes-geoland.info](http://www.gmes-geoland.info) Geoland2 project web portal (in a few weeks)
  - ‘promotional use’
  - Service portfolio links to ‘Geo Expert Portal’

- [www.geoland2.eu](http://www.geoland2.eu) Geo Expert portal
  - Clients for expert users with access to the real data
  - Geoland2 ‘dataset series’ and ‘service’ catalogue client as a starting point
  - Fast access to all Geoland2 services
The project is structured into the Core Mapping Services (inner circle) and the Core Information Services (outer circle), each providing a dedicated set of geo-information products and services, that support users and decision makers in their obligations to manage our natural resources sustainably and report regularly on the state of the environment.

Please select the service of interest in the menu on the left side.
Biogeophysical Parameters

The goal of the Biogeophysical Parameters Service (BioPar) is to set up pre-operational infrastructures for providing an extensive range of biogeophysical parameters on regional, European, and global scale, both in near-real-time (NRT) and off-line mode. These variables describe:

- **The continental vegetation:** Leaf Area Index (LAI), Fraction of Absorbed PAR (FAPAR), Fraction of vegetation cover, Dry Matter Productivity (DMP), Normalised Density Vegetation Index (NDVI), Phenology, Burnt Areas;
- **The energy budget:** albedo, downwelling shortwave and longwave fluxes, Land Surface Temperature (LST);
- **The water cycle:** Soil Water Index (SWI), freeze and thaw conditions, small water bodies.

The BioPar concept relies on research actions (definition, improvement and customisation of algorithms to match user requirements, development activities), development activities (implementation of these algorithms in processing lines) and demonstration operations (generation of test data sets for validation and user utility assessment). Independent teams perform the product validation following guidelines defined by the Land Product Validation (LPV) group of the GECOS (Committee on Earth Observation Satellites). The operation centres perform the pre-operational production in NRT and the resulting biogeophysical products are disseminated to the users via the Spatial Data Infrastructure (SDI).

**Key Benefits**

- Bio-geophysical parameters provided on regional, European and global scale in NRT and off-line;
- Indicators cover vegetation state, energy budget at surface level and water cycle;
- Support of European policies on environment and water management, agriculture and food security.

For further details please consult the BioPar flyer or contact the BioPar team by Email.

**Access to BioPar Services**

The BioPar products and services are accessible on the geoland2 SDI Expert portal.
Geo Expert Portal: overview

Dataset series and service catalogue:
Find metadata of dataset series (collections) and services matching your requirements. The metadata available comprise both Geoland2 Core Mapping Service and Core Information Service series and services.

Geoland2 Services:
Find data and services from the Geoland2 Core Mapping and Core Information Services.

Input datastream Services:
Find EO-data, in-situ data and reference data access services, used in Geoland2.

News:
2009-11-16: Geoland2 SDI server maintenance at Wednesday Nov. 18th
Due to maintenance on the operational Geoland2 SDI environment at VITO, the SDI will be unavailable from Wednesday 18/11/2009 at 9:00 for at least one hour. We apologize for this inconvenience.
‘Dataset Series’ discovery: centralised catalogue
‘Dataset Series’ discovery: getRecords
‘Dataset Series’ discovery: getRecordById

Identification

Data Identification

Citation

Resource Title
Global 10-days SPOT-VEGETATION Normalized Difference Water Index (NDWI)

Resource Identifier
4f221470-5336-11e0-8239-080020029666

Modified Date
2009-10-01T00:00:00.000

Date Type
revision

URL Documents
http://www.devocast.eu/Documents.do

Resource Abstract

NDWI, or Normalized Difference Water Index, is a dimensionless index that indicates the presence or absence of water on the surface and is calculated by comparing the shortwave and near-infrared sunlight reflected by the surface (reflectance). NDWI is also sensitive to changes in liquid water content of vegetation canopies. The NDWI dataset is calculated by combining the Near-InfraRed (NIR) and Shortwave-InfraRed (SWIR) measurements of the VEGETATION instruments on board the SPOT satellites. The NDWI values are complemented with browse encoded quality information, commonly called the Status Map. This quality information includes indications of the presence or absence of clouds and snow and of the radiometric quality. For this reason, it is important to take into account the Status Map when interpreting the NDWI dataset. Both datasets, NDWI and Status Map, are provided inside a single data file. The NDWI product is generated every 10 days over the whole globe split in tiles of 10x10°.

Purpose

This product is first designed to fit the requirements of the Core Information Services of the geoland2 project. It can be also useful for all applications related to the environment monitoring.

Status
ongoing

Language
en

Character Set
utf8

Dataset Language
en

Projection
World Geodetic System 1984

Resource Locator

Format
ZIP archive

Version
v3.2

Costs
Free by ftp and EUMETCast; cost of medium by DvD or tape

Instructions

Products can be downloaded on-line via HTTP (or FTP) or can be received through EUMETCast satellite reception in Africa and Latin-America. Users can also get the latest datasets in near-real time via FTP after subscription. To subscribe, please send an email to mailto:helpdesk@eumetsat.de, with subject 'geoland2 Bigpar subscription' and the name of this dataset series. You will be contacted in a few days. When the subscription is accepted, you will be informed by e-mail whenever new products are available on the FTP-server.

Service Name:

Distributed Dataset Catalogue Service

Show service metadata
‘Service’ discovery: centralised catalogue
‘Service’ discovery: centralised catalogue

The Portal - Search Process - Windows Internet Explorer
http://www.geoland2.euportal/order/propan/operation.do?servicid=82388386&operation=Search

Page: 2 of 2
Results: 11 - 15 of 15

Filter by:

Identifier
Title
Abstract
Show On Map
Metadata

SOSI-GZ-Download-Service
SOSI Land Cover Service - SLCS Czech Republic
This service is part of the SOSI (Spatial Observation Services and Infrastructure) project’s Demonstration System. SOSI aims at the verification of SEIS concepts for infrastructure and services in the context of Land Cover Monitoring & Earth Observation via the demonstration of distributed data and processing services. Data and services are shared at European and Member States levels. SOSI Land Cover Service (SLCS) for Czech Republic available data set: * GMES Fast Track Service Precursor on Land Monitoring High-resolution core land cover data built-up areas including degree of soil sealing, 2006 * Corine Land Cover 2000

SOSI-A-View-Service
SOSI Land Cover Service - SLCS Austria
This service is part of the SOSI (Spatial Observation Services and Infrastructure) project’s Demonstration System. SOSI aims at the verification of SEIS concepts for infrastructure and services in the context of Land Cover Monitoring & Earth Observation via the demonstration of distributed data and processing services. Data and services are shared at European and Member States levels. SOSI Land Cover Service (SLCS) for Austria available data set: * GMES Fast Track Service Precursor on Land Monitoring High-resolution core land cover data built-up areas including degree of soil sealing, 2006 * Corine Land Cover 2000

SOSI-L-View-Service
SOSI Land Cover Service - SLCS Luxembourg
This service is part of the SOSI (Spatial Observation Services and Infrastructure) project’s Demonstration System. SOSI aims at the verification of SEIS concepts for infrastructure and services in the context of Land Cover Monitoring & Earth Observation via the demonstration of distributed data and processing services. Data and services are shared at European and Member States levels. SOSI Land Cover Service (SLCS) for Luxembourg available data set: * GMES Fast Track Service Precursor on Land Monitoring High-resolution core land cover data built-up areas including degree of soil sealing, 2006 * Corine Land Cover 2000
Discovery services

- Metadata editor
  - Ensure Geoland2 profile
  - Integrated with catalogues at SDI
On-line Data Access Services

■ View service
  ■ Web Mapping Service OGC WMS 1.1.1, OGC WMS 1.3.0

■ Download service
  ■ Web Feature Service: OGC WFS 1.0.0 and 1.1.0
  ■ Web Coverage Service (WCS) 1.0.0 (GeoTIFF)
  ■ FTP Push/Pull
  ■ Satellite multicast: Eumetcast

■ Ordering Service
  ■ OGC 06-141, Ordering Services for Earth Observation Products, Version 0.9.4
Authentication service

- OGC 07-118, User management for Earth Observation services, Issue 0.3.0
- Describes how user and identity management information can be included in the protocol specifications for EO services for e.g.:
  - Discovery services
  - Ordering services
- Assumes usage of SOAP over HTTP(S)
- Identity assertion (SAML token) is included in Web service requests

Authorisation service

- Service providers accept service requests only via a "policy enforcement point“ ➔ authorisation checks
Best practices …

- Biopar – service provider VITO
  - Dataset catalogue
  - Direct URL to the dataset resource in the metadata records
  - Ordering service (to be released soon)
  - Subscriptions
  - Authentication & authorisation (to be released soon)

- Spatial Planning – service provider Geoville
  - WMS viewing services

- Forest (CMS Euroland, CIS Forest) – multiple service providers
  - WMS viewing services

- … many in preparation (as soon as products become available)

- Support for production teams
  - E.g. Pan-European wall-to-wall coverage (image2009)
    - Dataset catalogue
    - WMS viewing services
Access to first released bio-physical datasets:

- **NDWI - Normalized Difference Water Index**
  - Geographical extent: Global
  - Temporal extent: 10-daily near realtime datasets from 1/10/2009

- **DMP - Dry Matter Productivity**
  - Geographical extent: Global
  - Temporal extent: 10-daily near realtime datasets from 1/10/2009

- **LAI – Leaf Area Index**
  - Geographical extent: Global
  - Temporal extent: 10-daily near realtime datasets from 1/11/2009

- **FCOVER – Fraction of Vegetation Cover**
  - Geographical extent: Global
  - Temporal extent: 10-daily near realtime datasets from 1/11/2009

- **ALBEDO – Directional Hemispheric Reflectance**
  - Geographical extent: Global
  - Temporal extent: 10-daily near realtime datasets from 1/11/2009
‘Dataset Series’ discovery ➔ Biopar Dataset Series found!
‘Dataset’ discovery: distributed search

- Search process:
  - Dataset series:
    - NDWI
    - DMP
    - LAI
    - FCOVER
    - ALBEDO
    - CROP
    - IMAGE2009
  - Make your choices:
    - Titles: [X]
    - Max Records: 200
    - Start Date: 01 Jun. 2010
    - End Date: 10 Jun. 2010

- Map of the world with a focus on Africa.
‘Dataset’ discovery: getRecords

Dataset Series:
- NDWI
- DMP
- LAI
- FCCOVER
- ALBEDO

Make your choice:
- Title:
- Max Records: 200
- Start Date: 01 Jun, 2010
- End Date: 10 Jun, 2010

Search

Page: 1 / 1
Page: 1 / 1
Records: 1 - 34 of 34

Results

Title: Global 10-days SPOT-VEGETATION Normalized Difference Water Index (NDWI): H11V6 2010-06-01
Temporal extent and position:
- Begin position: Thu Jun 10 11:35:59 CEST 2010
- End position: Thu Jun 10 11:35:59 CEST 2010

Metadata details | Hide on map | Access data

24/06/2010
‘Dataset’ discovery: getRecords → Access Data

Results

Title: Global 15-days SPOT-VEGETATION Normalized Difference Water Index (NDWI) + H16V6 2010-06-01
Temporal extent
begin position: Tue Jun 01 12:00:00 CEST 2010
Temporal extent end position: Thu Jun 11 11:59:59 CEST 2010

Metadata details → Hide on map → Access data

File Download

Do you want to open or save this file?

- Name: ...
- Type: WinZip file, 390K
- From: web.vgt.vito.be

Open | Save | Cancel

While files from the Internet can be useful, some files can potentially harm your computer. If you do not trust the source, do not open or save the file. What's the risk?
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**Results**

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EO based products describing, explaining & forcasting urban land use changes to support Spatial Planning

Regional & European scale

Available datasets as WMS layers:

- Population per 10km grid cell
- Population per 500m grid cell
- SP-03.I01 Average sealing intensity of (new) urban areas
- SP-03.I02 Productivity of land consumption
- SP-03.I04 Population density within urban areas
- SP-03.I05 Agricultural Intensity
- SP-03.I06 Agricultural heterogeneity: Spatial composition of arable land / grassland / mixed areas
- SP-03.I07 Dominant type of land use changes in the surroundings of protected areas
- SP-03.I07 Intensity of land use changes in the surroundings of protected areas
- SP-03.I08 Fragmentation
- SP-03.I09 Exposure of population to air pollution
- SP-03.I09 Exposure of population to flood hazard
- SP-03.I10 Exposure of population to temperature increase
- SP-03.I11 Road network density
- SP-03.I12 Accessibility of urban centres
WMS Forest Area from GAF

P-EL-04a Forest Area (WMS)

Abstract
Forest Area comprises all Forests in 2006 with a crown closure of >= 10%, and currently unstocked Forest Areas in 2006.

Sleutelwoorden
GAF, AG, GeoLand2, Forest, Area

Ruimtelijke extensie
Huidig coördinatensysteem is EPSG:4326
N 52.242900 *
W 11.559000 *
Z 50.584100 *
Growing in excellence …

- **Adopt recommendations by FP7 GIGAS Support Action**
  - Discovery & metadata – Ordering – overall architecture
  - Choices made by Geoland2 were confirmed

- **Strong involvement in adopting new standards**

- **INSPIRE**
  - Dataset series discovery service integrated in INSPIRE Geoportal: successful test

- **GSC-DA**
  - Participation in review process
  - Technical follow-up

- **GEOSS**
  - Integration activity in AIP-3
Thank you!

Erwin Goor

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