Product Specification Sheet Creation date: 12/10/2009

COMPARISON OF VEGETATION INDEX TO PREVIOUS PERIOD (SPOT-VEGETATION)

1. OUTLINE

• ***Information of spatial data product specification***	
Title	Specifications for the relative difference of an index, calculated between the actual image and the image from the preceding period. The difference is derived from data originating from the SPOT-VEGETATION sensor
Date	22/10/2008
Implementer	ENDELEO project VITO, Dr. Else Swinnen
Language	English
Engineering field	Environmental monitoring
Document data format	PDF

• ***Purpose***

The relative difference of an index with respect to the previous period is used to assess the difference between the vegetation condition at a certain time to the previous time step. It expresses the evolution of the indicator in a short period of time.

It is calculated as : relative difference = (present period – previous period)/previous period

It can be calculated on any index. In the frame of the ENDELEO project, the difference is calculated based on the NDVI and on the DMP.

Based on the NDVI, it expresses the relative difference in vegetation health and density compared to the preceding period. Based on the DMP, it expresses the relative difference in vegetation growth rate compared to the preceding period.

• ***Spatial extent***

ULX	-113550m	**LRX**	834381m
ULY	10556023m	**LRY**	9444577m

Kenya

• ***Temporal extent***

April 1998 – present; update each 10 days.

• ***Reference standards***

• ***Terminology and definitions***

The following technical terms and definitions are used with this data product specification:
Kenya profile for geographic standards (KPGIS) ver. 1

• ***Abbreviations***

DMP: Dry Matter Productivity
NDVI: Normalized Difference Vegetation Index
ULX: Upper left X coordinate
ULY: Upper left Y coordinate
LRX: lower right X coordinate
LRY: lower right Y coordinate

2. DOMAIN OF VALIDITY

• ***Domain of validity identification***

Data product specification of the relative difference to the previous period of NDVI or DMP for the territory of Kenya
• ***Hierarchical level***
Dataset

3. DATA PRODUCT IDENTIFICATION

• ***Name of spatial data product***
The relative difference to the previous period of NDVI or DMP derived from SPOT-VEGETATION
• ***Date***
Produced each 10 days since April 1998, update still ongoing
• ***Contact Information***
Dr. Else Swinnen VITO Boeretang 200 B-2400 Mol Belgium e-mail: else.swinnen@vito.be
• ***Geographical description***
The territory of Kenya

4. DATA CONTENTS AND STRUCTURE

• ***Application schema class diagram***
Not applicable

• ***Application schema class document***			
Feature	Image		
Definition	The relative difference to the previous period of NDVI or DMP		
Parent class	None		
Abstract/Concrete	Abstract		
Attributes			
Name	**Definition**	**Collection condition**	**Domain**
	-	-	Within geographical extent

Feature	Image		
Definition	The relative difference to the previous period of NDVI or DMP		
Parent class	-		
Abstract/Concrete	Concrete		
Attributes			
Name	**Definition**	**Collection condition**	**Domain**
Data format: GeoTiff	-	-	Within Geographical extent

5. REFERENCE SYSTEM

• ***Spatial reference system***	
Compound coordinates reference system	
Identical name	Clarke 1880, Mean sea level (Mombasa), UTM zone 37

Coordinates reference system 1 (Horizontal component)	
Identical name	Clarke 1880, UTM zone 37
Domain of validity	Nairobi
Datum	
Identical name	New (1960) Arc
Type	Geodetic
Fixed origin	500,000m Easting, 10,000,000m Northing
Ellipsoid	
Identical name	Clarke 1880, (Modified)
Semi major axis	6378249.145
Inverse flattening	1 / 293.465
Prime meridian	
Identical name	Greenwich meridian
Greenwhich longitude	39deg 00min East of Greenwich
Coordinate system	
Identical name	UTM zone 37
Type	Projected
Number of dimensions	2
Coordinate axis	
Name	Northing
Direction	Positive to true north at origin
Unit identifier	Meter
Coordinate axis	
Name	Easting
Direction	Positive to true east at origin
Unit identifier	Meter

- ***Temporal reference system***

A new image is produced on the 2nd, the 12th and the 22nd of each month. Each image represents the maximum value of the relative difference to the previous period of NDVI or DMP within the periods 1-10, 11-20 and 21-end of the month.

6. DATA QUALITY

- ***Quality requirements and quality evaluation procedure***

COMPLETENESS: not applicable		
LOGICAL CONSISTENCY		
(1) Formal consistency		
Domain of validity	**Data quality evaluation index**	
All imagery	**Name**	Omission percentage
	Definition	Data can be opened by ArcGIS as GeoTiff format with no opening error
	Quality conformity level	Error: 0%
(2) Domain consistency		
Domain of validity	**Data quality evaluation index**	
All imagery	**Name**	Geographical extent error percentage
	Definition	Check dataset is only inside map sheet border
	Quality conformity level	Geographical extent error: 0%
POSITIONAL ACCURACY		

(1) Gridded data positional accuracy		
Domain of validity	**Data quality evaluation index**	
	Name	Gridded data positional accuracy
	Definition	
	Quality conformity level	300m
Quality evaluation procedure		
The SPOT-VEGETATION image quality center (QIV) ensures the data quality of the input data for the relative difference to the previous period of NDVI or DMP.		
TEMPORAL ACCURACY: not adopted		
THEMATIC ACCURACY: not applicable		

7. DATA PRODUCT DISTRIBUTION

Distribution format information
• ***Format name***
GeoTiff
• ***Encoding rules***
http://trac.osgeo.org/geotiff/
• ***Language encoding method***
UTF-8
• ***Language***
English
Distribution media information
• ***Unit of product***
Image of the relative difference to the previous period of NDVI or DMP derived from SPOT-VEGETATION for Kenya
• ***Media name***
FTP

8. METADATA

• ***Direction of metadata creation***
Metadata must be produced together with spatial data
• ***Format of metadata***
KSISO19115 metadata is adopted
• ***Indication of metadata elements***
• ***Direction of unit of metadata creation***
Metadata is provided for each spatial data product dataset unit.

9. OTHERS

• ***Spatial resolution***
1km x 1km

• ***Values***

Physical values of the relative difference to the previous period of NDVI or DMP range between -1.0 and 1.0. The indicator is unitless; when multiplied by 100 it expresses percentages (%).

Scaling of the values

The relative difference to the previous period of NDVI or DMP values are rescaled such that they only occupy a byte. The physical range -1.0 to 1.0 is rescaled to the range 0 – 250, using the following formula:

Image value = (physical value + 1.25)*100

To convert the image values back to physical values, the following formula is used:

Physical value = image value*0.01 – 1.25

- ***Flags***

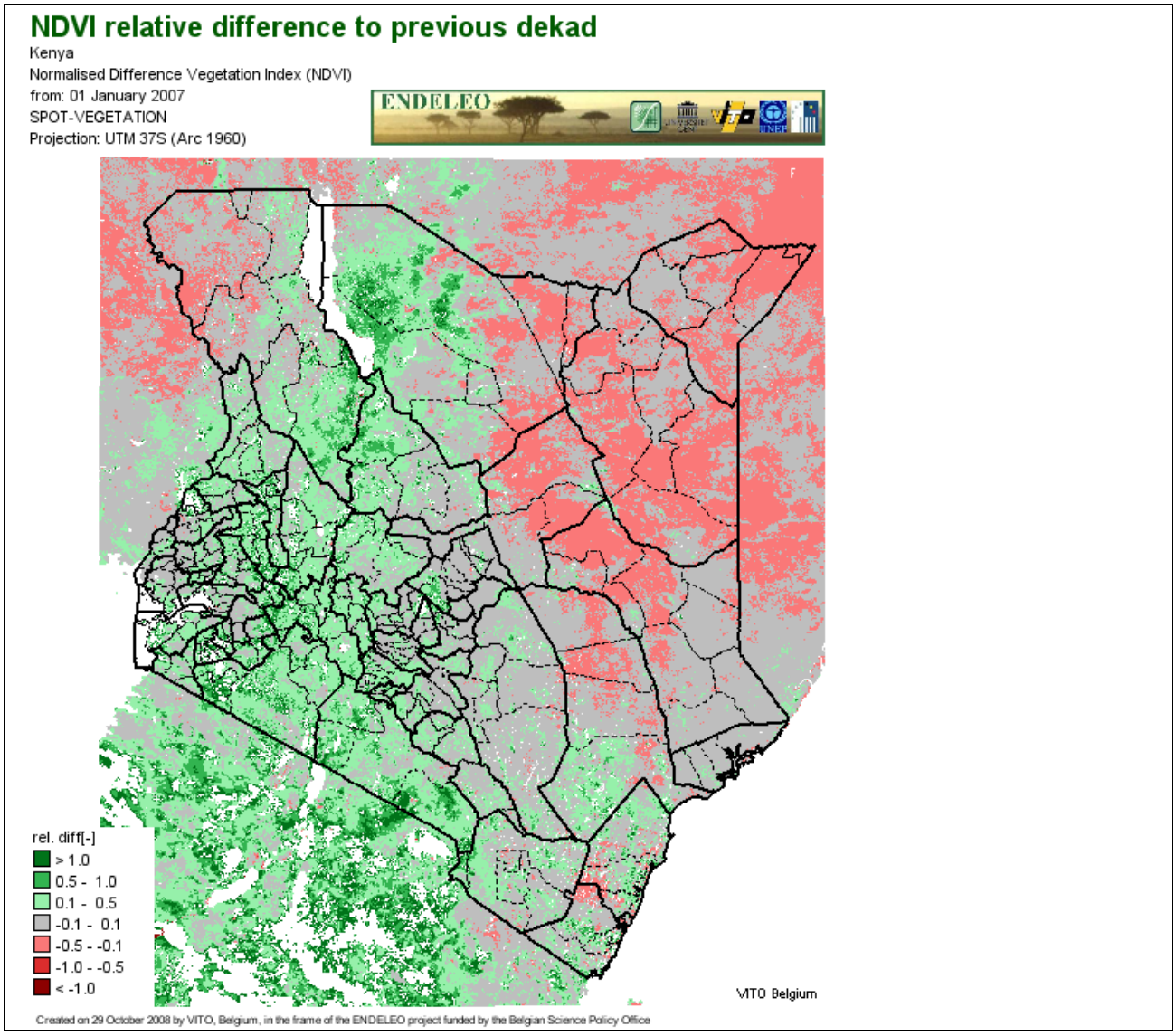
The image value 255 corresponds to a flag.
This can indicate missing data, cloud observations, or water body. The status map that is delivered with the SPOT-VEGETATION data is used to identify the missing data and clouds. These pixels are then flagged directly in the VPI image.

- ***Interpretation***

The relative difference to the previous period of NDVI or DMP is used to qualitatively compare the vegetation development between two successive periods. If the relative difference is based on the NDVI, it is possibly linked to a difference in vegetation condition between years. If the relative difference is based on the DMP, it is possibly linked to a difference in vegetation productivity as compared to the same period during the previous year.

The values vary between -1.0 and 1.0. If the value 0 is obtained, then there is no difference between the NDVI or DMP of the two successive periods. If a negative value is obtained, then the vegetation health and density or growth rate was higher during the previous period. If a positive value is obtained, then the vegetation health and density or growth rate is higher during the current period.

- ***Example***



- ***More information***

SPOT-VEGETATION mission
http://www.spot-vegetation.com
http://www.vgt.vito.be

SPOT-VEGETATION data for Africa
http://www.vgt4africa.org

ENDELEO project
http://dfwm.ugent.be/endeleo
http://endeleo.vgt.vito.be

Related projects
http://www.gmfs.info
http://www.marsop.info/