Blended Vegetation Health Product (Blended-VHP)

User Guide

Version 2.0

July 27, 2018

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1. Introduction

This document describes the data format of Blended Vegetation Health Indices Product (blended VIIRS (2013-present) and AVHRR (1981-2012), below, referred as Blended-VHP or VHP). It is the improved version of previous AVHRR-VHP data set.

Blended-VHP products are generated by program VHsuite.exe (C++ program developed by Wei.Guo@noaa.gov). The input of this software package is VIIRS and/or AVHRR GAC data, outputs are VH products in NetCDF format. For convenience, 16km sampled data files are also available in HDF format. The file structure is almost the same.

There are 3 weekly files will be released to users:
ND file: (*ND.nc) raw NDVI and Brightness Temperature (channel 4 for AVHRR, or I5 for VIIRS).
    SDS names: NDVI and BT4
SM file: noise reduced (smoothed) NDVI and BT4 data.
    SDS names: SMN and SMT.
VH file: vegetation health indices.
    SDS names: VCI, TCI and VHI.

Table 1 variables of AVHRR VHP products

Data type	content
NDVI	NDVI ,
BT4	Brightness Temperature,
SMN	Smoothed NDVI,
SMT	Smoothed Brightness Temperature,
VCI	Vegetation Condition Index,
TCI	Temperature Condition Index
VHI	Vegetation Health Index

 The Blended-VHP products are self-explained NetCDF files. Please refer the attributes of the file and SDS for detail.

2. File name convention

Example 1: VHP.G04.C07.NP.P2012018.ND.nc
Example 2: VHP.G16.C07.npp.P2013001.VH.nc
Format: Vzz.Grr.Ccc.xx.Pyyyywww.pp.nc

where,

Vzz	Prefix of the file name, example: VHP – observations from AVHRR and VIIRS
rr	Resolution in km
xx	Satellite ID, example: NC – NOAA 7 NF – NOAA 9 NH – NOOA 11 NJ – NOAA 14 NL – NOAA 16 NN – NOAA 18 NP – NOAA 19 npp – National Polar-orbiting Partership j01 – JPSS 1
cc	two-digits, number of days per composite period; 07: for weekly (i.e. 7 days)composite
yyyy	four-digits, year number of the processed period;
www	Three-digits, period number;
pp	Product file type: ND: raw NDVI and BT4 SM: smoothed (noise removed) data, including SMN and SMT VH: vegetation health indices including VCI, TCI and VHI

3. File Attributes

VHP file contains the following file attributes (table 2). They provide general information about the product.

Table 2 File attributes of VHP ND file

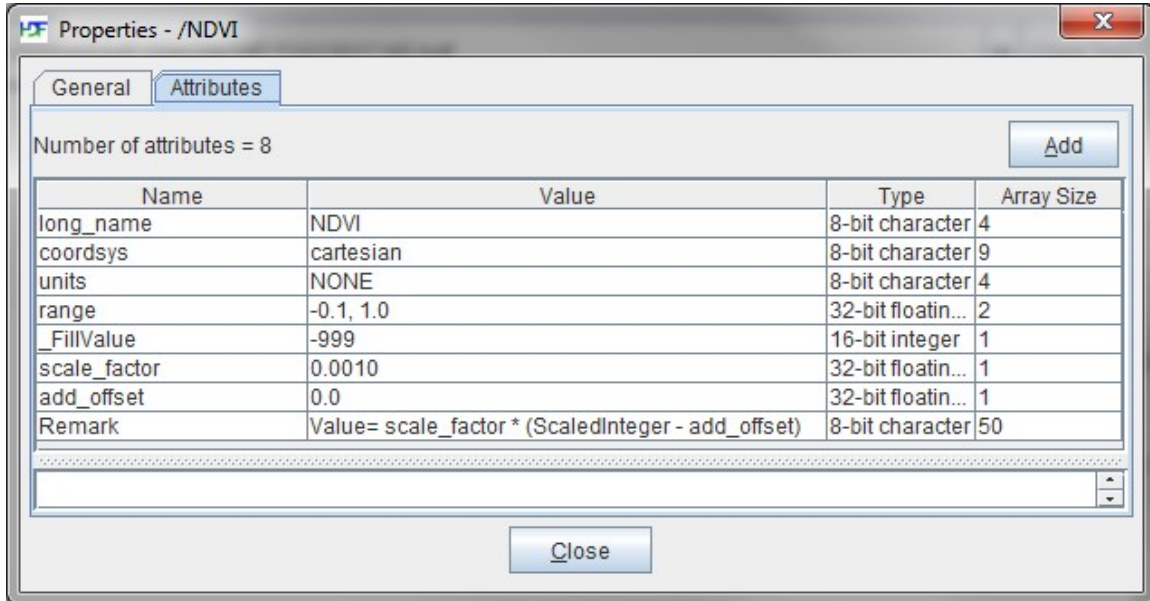| Properties - VHP.G04.C07.NP.P2013017.ND.hdf			
General **Attributes**			
Number of attributes = 22			Add
Name	Value	Type	Array Size
PRODUCT_NAME	Vegetation Health	8-bit charact...	17
VERSION	VH (vh.exe,version 1.3, March 21 2012)	8-bit charact...	38
SATELLITE	NP	8-bit charact...	2
INSTRUMENT	AVHRR	8-bit charact...	5
DATE_BEGIN	113	8-bit charact...	3
DATE_END	119	8-bit charact...	3
TIME_BEGIN	00:00 UTC (use day time data only)	8-bit charact...	34
TIME_END	23:59 UTC (use day time data only)	8-bit charact...	34
ANCILLARY_FILES	FILE_CONFIGURE:vh.config_NP2FILE_PR...	8-bit charact...	466
CITATION_TO_DOCUMENTS	User Guide of Vegetation Health(VH) syste...	8-bit charact...	71
CONTACT	NOAA/NESDIS/STAR/EMB	8-bit charact...	20
CONFIGURE_FILE_CONTENT	[Options for vh.exe]DIR_Ancillary= ...	8-bit charact...	1605
PROJECTION	Plate_Carree	8-bit charact...	12
YEAR	2013	32-bit integer	1
PERIOD_OF_YEAR	17	32-bit integer	1
DAYS_PER_PERIOD	7	32-bit integer	1
END_LATITUDE_RANGE	-55.152	32-bit floatin...	1
START_LONGITUDE_RANGE	-180.0	32-bit floatin...	1
START_LATITUDE_RANGE	75.024	32-bit floatin...	1
END_LONGITUDE_RANGE	180.0	32-bit floatin...	1
INPUT_FILES	1	32-bit integer	1
INPUT_FILENAMES	data/AVHRR_VHP/4km/weekly/VHP.G04.C...	8-bit charact...	63
PRODUCT_NAME			
Close			

4. Scientific dataset

The variables in the VHP file are saved as scaled 16-bits integers.
The scaling parameters and equations are attached to the scientific
dataset (SD) as attributes.

Table 3 SDS attributes of VHP NDVI.

Data arrays are in geographic projection (grid with equal latitude
and longitude interval). The size of data array can be found by
calling NETCDF function or using interactive tools such as HDFview.
The array is in row major order. The first point of array is at the
north-west corner of the grid. Then it goes eastward and then
southward.

For 4km VHP product, the arrays are with size 10000x3616, Covers
latitude [-55.152 to 75.024], longitude [-180.0, 180.0] (outside
border of the spatial area of VHP product).
The size of grid pixel:
    dLon= dLat = (360.0/10000)
For any pixel [i,j] in the array, the position of pixel's center
is calculated as:
    Latitude = (75.024 - (j+0.5) *dLat) (j: counts from 0 to 3615)
    Longitude = (-180.0 + (i+0.5)* dLon) (i: counts from 0 to 9999)
In data of 2018, the latitude and longitude fields are added into
the dataset.

The spatial coverage of data array are described by the file
attributes of NETCDF file, example:
        START_LATITUDE_RANGE = 75.024
        START_LONGITUDE_RANGE = -180.0
        END_LATITUDE_RANGE = -55.152
        END_LONGITUDE_RANGE = 180.0

In the new version (data of 2014), these attributes' names were changed as below (example):

```
geospatial_lat_min = -55.152
geospatial_lon_min = -180.0
geospatial_lat_max = 75.024
geospatial_lon_max = 180.0
```

(End)