CARBON SINKS ATLAS FOR SOUTH AFRICA
Gross Primary Production (gC/m^2/yr)

Metadata Date Stamp:
25 October 2015

DATASET DESCRIPTION

File Names:
 Data:
 GrossPrimaryProduction_gC_sq.m_yr_DEA_CSIR_1.1.9-2015-10-06
 Metadata:
 GPP_gC_per_sq.m_per_yr_OR_2015_Q4_METADATA

Dataset Reference Date:
 2015/09/23

Data quality:
 Good – data modelled in Carbon Flux Model and accuracies of this layer is dependent on the accuracies of various base layers used in modelling

Dataset Responsible Party:
 Department of Environmental Affairs / Director Enterprise Geospatial Information Management

Geographic Location of the Dataset: *RSA*
 West 15.637661
 East 33.655553
 North -21.918463
 South -35.027407

Keywords:
 Carbon flux, GPP, Gross Primary Production

Dataset Language:
 English (SOUTH AFRICA)

Dataset Character Set:
 utf8 - 8 bit UCS Transfer Format

Dataset Topic Category:
 007 = Environment (ISO 19115 Topic category)

Dimensions:
 X: 1406 Y:1207 Bands: 1

Spatial Resolution of the Dataset:
 1189.318433 Meter

No Data Value:
 -1

Data Type:

Float32 – Thirty two bit floating point

Raster Format:

GeoTiff

Data Release classification:

Release classification	Description	Time frame	Example
OR	*Official release*	**Quarter 4** *30 November 2015*	*GPP_gC_per_sq.m_per_yr_OR_2015_Q4*

Citation Information:

Originator: *Department of Environmental Affairs*
Publication Date: *May 2015*
Title: *South African National Terrestrial Carbon Sink Assessment*
Location: *Pretoria, South Africa*
Geospatial Data Presentation Form*: Raster digital data*

Other Citation Details: *Data of the South African National Terrestrial Carbon Sink Assessment is published on the SAEON shared platform. Link to detailed report: https://www.environment.gov.za/sites/default/files/docs/nationalterrestrial_carbon sinksassessment_sect1.pdf*

Abstract:

Gross Primary Production (GPP) is the amount of biomass (units: $gC/m^2/yr$) that plants create in a one year by capturing sunlight and CO2 during photosynthesis. A production efficiency model was used to estimate GPP across South Africa. Carbon fluxes were calculated to represent the long-term mean conditions. The Gross and Net Primary Production (GPP, NPP) was calculated monthly and summed to a year using climatology of monthly weather for the period 1960 to 1990, and mean monthly FAPAR and PAR for period 2000 to 2012. There are thus 12 input files for each term, corresponding to the twelve months. The climatology averaging periods for climate and satellite data are different. For Fraction of Absorbed Photosynthetically Active Radiation (FAPAR), the MEdium Resolution Imaging Spectrometer (MERIS sensor) dataset covers the period 2000 to 2012, and the Photosynthetically Active Radiation (PAR) dataset is also for this period.

Units: $gC/m^2/yr$

Purpose:

This data set is part of a series of output data layers generated by CSIR for DEA as part of the South African National Terrestrial Carbon Sink Assessment.
Link to detailed report:
https://www.environment.gov.za/sites/default/files/docs/nationalterrestrial_carbonsinksass essment_sect1.pdf.
Link to synopsis report:
https://www.environment.gov.za/sites/default/files/reports/nationalterrestrial_carbonsinks_ synopsisreport.pdf

Supplemental Information:

GPP = ϵ_{biome} PAR*FAPAR * $\int(H2O)$*$\int(t)$*$\int(CO2)$

ϵ_{biome} is also known as the Light Use Efficiency (epsilon) a constant estimated per biomes, based on literature. $\int(H_2O)$ is the fractional constraint applied due to the closure of stomata. At the monthly mean temporal scale we apply here, where P=mean monthly rainfall and E is the monthly open-water potential evaporation. $\int(t)$ is the functional constraint of temperature on production. $\int(CO^2)$ is a saturating function of increasing atmospheric CO^2 concentration. All of these functions are described in detail in the report – link to report.

Lineage Statement:

The first version of the data was generated in 2013, but not released.
The data were released on-line for the first time in Nov 2015

ATTRIBUTE INFORMATION

Attribute Description:

Field name	Alias Name	Data Type	Description	Example
Cell value	*Cell value*	*32-bit Floating point*	*This field contains a Gross Primary Production (GPP) value of carbon flux as measured in gC_per_sq.m_yr*	*757.26*

SUPPLEMENTARY INFORMATION

None

DATA MAINTENANCE

Dataset last updated:
2015/10/06

Time Period of Content:

Carbon fluxes were calculated to represent the long-term mean conditions. The Gross and Net Primary Production (GPP, NPP) was calculated monthly and summed to a year using climatology of monthly weather for the period 1960 to 1990, and mean monthly FAPAR and PAR for period 2000 to 2012.

Maintenance and update frequency:

No updates

DISTRIBUTION AND CONSTRAINTS

On/line Resource:

The Environment GIS (EGIS) Website
http://egis.environment.gov.za/
The Department of Environmental Affairs (DEA) must be acknowledged in the use of the data as per citation information.

The South African Environmental Observation Network (SAEON)
http://www.saeon.ac.za/

Distribution Format:

GeoTIFF

METADATA INFORMATION

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Additional Extent information for the Dataset (Vertical & Temporal):
N/A

Spatial Representation Type:
Raster – Area

Spatial Reference:
Coordinate Reference: GCS_WGS_1984
Projection - Albers_Conic_Equal_Area

Projection:
PROJCS["Albers_Equal_Area_Conic_South_Africa",
GEOGCS["GCS_WGS_1984",
DATUM["D_WGS_1984",
SPHEROID["WGS_1984",6378137,298.257223563]],
PRIMEM["Greenwich",0],
UNIT["Degree",0.0174532925199433]],
PROJECTION["Albers"],
PARAMETER["False_Easting",0],
PARAMETER["False_Northing",0],
PARAMETER["central_meridian",25],
PARAMETER["Standard_Parallel_1",-12],
PARAMETER["Standard_Parallel_2",-31],
PARAMETER["latitude_of_origin",0],

Metadata File Identifier:
GPP_gC_per_sq.m_per_yr_OR_2015_Q4_METADATA

Metadata Standard Name:
SANS 1878

Metadata Standard Version:
SANS 1878/1:2005

Metadata Language:
English

Metadata Character Set:
US/Ascii