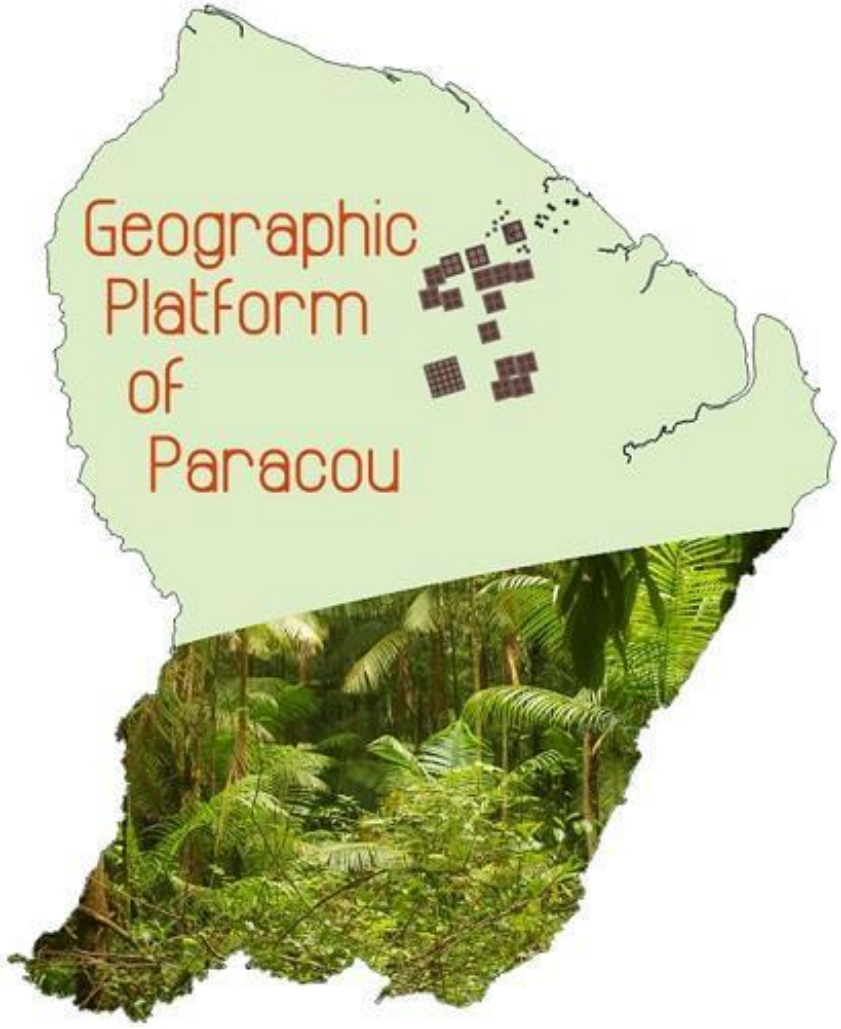
Paracou Forest Research Station
French Guiana



GIS DATA DICTIONARY

V 7.0

Layers and attribute tables

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Geographic platform of Paracou

➢ Summary

Paracou research station is a large-scale forest disturbance experiment set up by the Cirad in 1984 on which trees, in more than 125 ha of permanent plots, have been periodically censused since then. Paracou hence offers a unique setting for studying long-term dynamics of tropical rainforest. The censuses data are available on an online platform and in a dedicated data repository. Paracou is part of the Guyafor network: permanent plots dedicated to long-term studies about forest dynamics and biodiversity.

The Paracou geographic platform provides access to a broad collection of environmental and biodiversity datasets and spatial layers, with some downloadable spatial layers (GeoJson format). The present data dictionary covers the metadata related to:
- Data sources and contacts (see Appendix 2);
- Access rights;
- Data description;
- Geometric accuracy;

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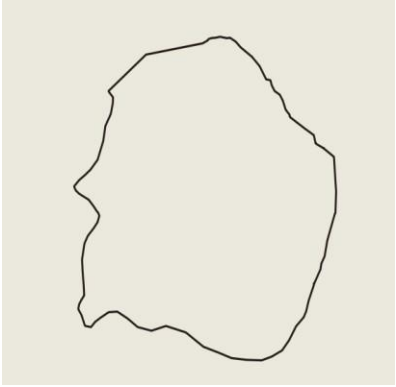
Paracou research station: https://paracou.cirad.fr/
Unité Mixte de Recherche Ecologie des Forêts de Guyane: http://www.ecofog.gf/
Cirad: https://www.cirad.fr/en/home-page
Projection: EPSG: 32622 – WGS 1984 UTM 22N
Spatial extent: -5900718.8, 584319.6, -5883349.0, 593614.3

GEO units

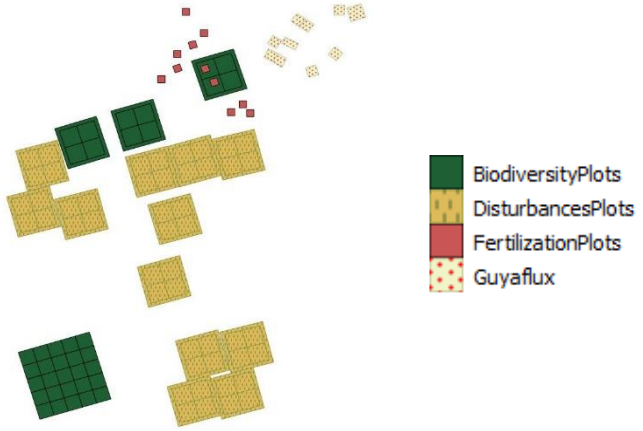
- **Source:** CIRAD, team “Forest” - Dourdain, A., 2017
- **Projection:** EPSG: 32622 – WGS 1984 UTM 22N
- **Rights of use:** Open data
- **Reference contact:** Proux, L. – CIRAD, UMR EcoFoG

Name	Summary	Geographical Entity		Illustration
		Spatial format	Quantity	
taCIRADConcession.shp	Boundaries of the CIRAD concession on the territory of the Guyanese Space Center in Sinnamary. The station is located in the coastal part of French Guiana, about 50 km NW of the European Space Center of Kourou. The site is part of a private domain of about 40,000ha, owned by the Centre National d'Etudes Spatiales, granted to the Cirad.	POLYGON	1	

- **Attribute Table**

Variable name	Type	Description	Attributes of the variable
idConc	Integer	*Unique identifier*	1
NameConc	Varchar	*Name of the concession*	CIRADConcession
Geom	Geometry	*Geometry of the objects*	POLYGON

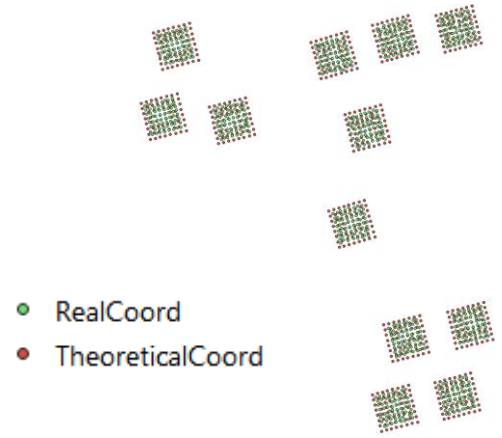
- **Source:** CIRAD, team "Forest" - Petronelli, P., 19XX
- **Rights of use:** Open data
- **Projection:** EPSG: 32622 – WGS 1984 UTM 22N
- **Referent contact:** Petronelli, P. – CIRAD, UMR EcoFoG

Name	Summary	Geographical Entity		Illustration
		Spatial format	Number	
taOverallPlots.shp	Boundaries of the plots, subplots and buffer zones (25m) positioned thanks to topographical survey instruments (compass, clinometer, measuring tape). There are different experiments/types of plots: the Disturbance experiment, Guyaflux tower plots, Biodiversity plots and Fertilization plots.	POLYGON	122	

Attribute Table

Variable name	Type	Description	Attributes of the variable
idAllPlot	Integer	*Unique identifier*	1-122
idPlot	Integer	*Unique plot identifier (Guyafor network)*	-
idSubplot	Integer	*Unique subplot identifier (Guyafor network)*	-
Plot	varchar	*Number or name of the plot*	1 – 16, ImbXX, GfxX
TypePlot	varchar	*Type of plot*	BiodiversityPlots, DisturbancesPlots, Fertilization-Plots, Guyaflux
Subplot	Integer	*Number or name of the subplot*	-
TypeSub	varchar	*Type of SubPlot*	Subplots, SubplotsP16, PlotsImbP, PlotsGuyaflux, Buffer25m
Treatment	varchar	*Applied sylvicultural treatment or type of topography.*	T0: control, T1: selective logging (SL), T2: SL + Timber Stand Improvement (TSI), T3: SL + TSI + fuelwood, Bottom, Slope, Top
Geom	Geometry	*Geometry of the objects*	POLYGON

- **Source:** Montpied (1992), Jounieaux, (2016)
- **Rights of use:** Under conditions
- **Projection:** EPSG: 32622 – WGS 1984 UTM 22N
- **Referent contact:** Traissac, S. – AgroParisTech, UMR EcoFoG

Name	Summary	Geographical Entity		Illustration
		Spatial format	Quantity	
taRegenerationPlots.shp	Coordinates of the centers of the natural Regeneration plots for trees≤10cm DBH[1]. Two options of representation: theoretical coordinates of the plot's centers (from GIS software) or real coordinates after fieldwork (taken using GPS).	POINT	1536	

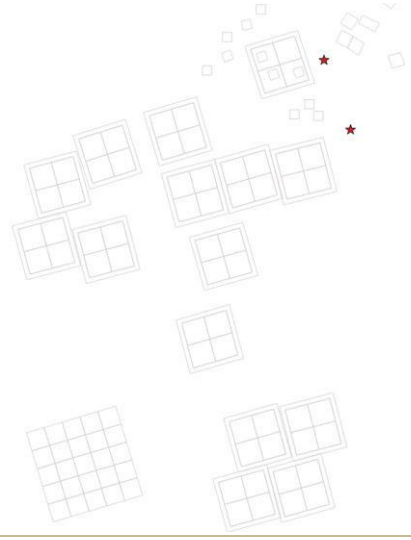
- **Attribute Table**

Variable name	Type	Description	Attributes of the variable
idRegePlot	Integer	*Unique identifier*	1-1536
Plot	Integer	*Number or name of the Paracou plot*	1-12
Line	Integer	*Line containing the RegePlot in the Plot*	0-10
Column	Integer	*Column containing the RegePlot in the Plot*	0-10
CoordType	String	*GIS (theoretical) or GPS (real) coordinates*	TheoreticalCoord/RealCoord
Geom	Geometry	*Geometry of the objects*	POINT

[1] DBH= Diameter at Breast Height, 1.30m

FACILITIES

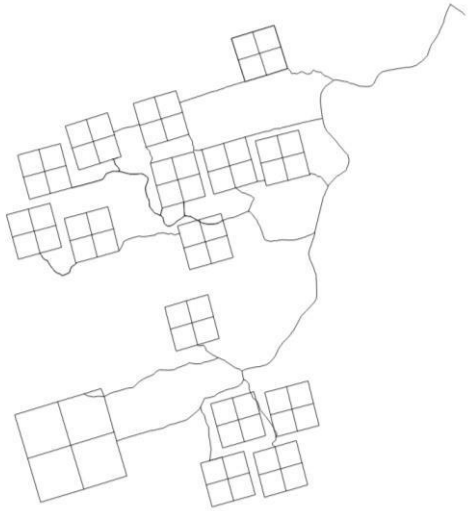
- **Source:** CIRAD forest team - Dourdain, A., 2016
- **Rights of use:** Open data
- **Projection:** EPSG: 32622 – WGS 1984 UTM 22N
- **Referent contact:** Proux, L. – CIRAD, UMR EcoFoG

Name	Summary	Geographical Entity		Illustration
		Spatial format	Number	
taFacilities.shp	Location of the infrastructure (open shelter, Guyaflux tower, AgroClim meteorological station) of the Para-cou station.	POINT	3	

- **Attribute Table**

Variable name	Type	Description	Attributes of the variable
idFacility	Integer	*Unique identifier*	3
NameFacility	varchar	*Name of the objects*	BaseCamp, GuyafluxTower, AgroClim
Geom	Geometry	*Geometry of the objects*	POINT

- **Source:** CIRAD forest team - Petronelli, P., 19XX
- **Rights of use:** Open data
- **Projection:** EPSG: 32622 – WGS 1984 UTM 22N
- **Referent contact:** Petronelli, P. – CIRAD, UMR EcoFoG

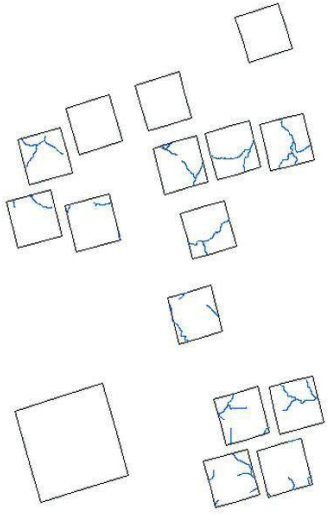
Name	Summary	Geographical Entity		Illustration
		Spatial format	Number	
taRoadPaths.shp	Main access road to the station, and tracks around the entire perimeters of the plots. A surveyor positioned the tracks with topographical survey instruments (compass, clinometer, and measuring tape) in 1996.	LINESTRING	49	

- **Attribute Table**

Variable name	Type	Description	Attributes of the variable
idRoad	Integer	*Unique identifier*	49
TypeRoad	varchar	*Name object*	Main road, Plot Path, Forest path
Geom	Geometry	*Geometry of the objects*	LINESTRING

Hydrography / Topography

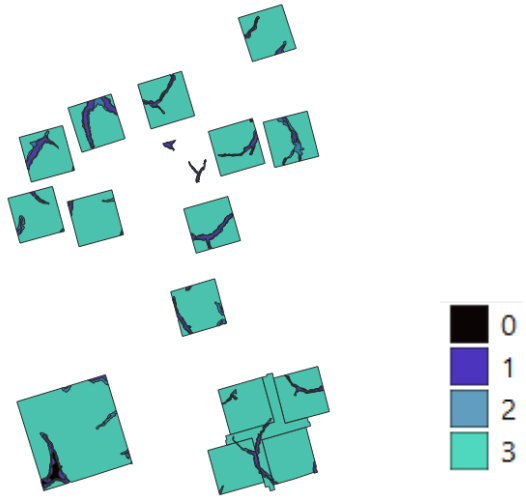
- **Source:** Unknown, 1983-1984
- **Projection:** EPSG: 32622 – WGS 1984 UTM 22N
- **Rights of use:** Open data
- **Referent contact:** Petronelli, P. – CIRAD, UMR EcoFoG

Name	Summary	Geographical Entity		Illustration
		Spatial format	Number	
taCreek.shp	Various creeks for plots 1 to 12 in Paracou.	LINESTRING	46	

- **Attribute Table**

Variable name	Type	Description	Attributes of the variable
idCreek	Integer	*Unique identifier*	1 - 46
idPlot	Integer	*Unique plot identifier (Guyafor network)*	-
Plot	Integer	*Number or name of the plot*	-
Geom	Geometry	*Geometry of the objects*	LINESTRING

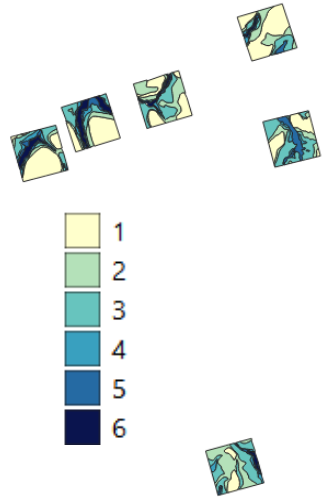
- **Sources:** Gourlet-Fleury (2004) (Chapter 1.3.1)
- **Projection:** EPSG: 32622 – WGS 1984 UTM 22N
- **Rights of use:** Open data
- **Referent contact:** Ferry, B. – AgroParisTech, UMR Silva

Name	Summary	Geographical Entity		Illustration
		Spatial format	Number	
taWaterTable.shp	Depth of the water table during the dry season thanks to four consecutive studies undertaken in late September (the middle of the dry season) in order to obtain a precise mapping of bottomland soils in all the Paracou plots. The measurements were made with an auger. WTDDS = 0: Accompanying WaterTable of the stream ; 1: WaterTable between 0 and 60cm ; 2: WaterTable between 60 and 100cm ; 3: WaterTable deeper than 100cm.	POLYGON	99	

- **Attribute Table**

Variable name	Type	Description	Attributes of the variable
idWTDDS	Integer	*Unique identifier*	1 - 99
WTDDS	Integer	WaterTable Depth in Dry Season (WTDDS)	0-3
AREA	REAL	*Area of the entity*	3.34 - 228802.89m²
PLOT	Integer	*Number or name of the plot*	0 (OffPlots), 1-16
Geom	Geometry	Geometry of the objects	POLYGON

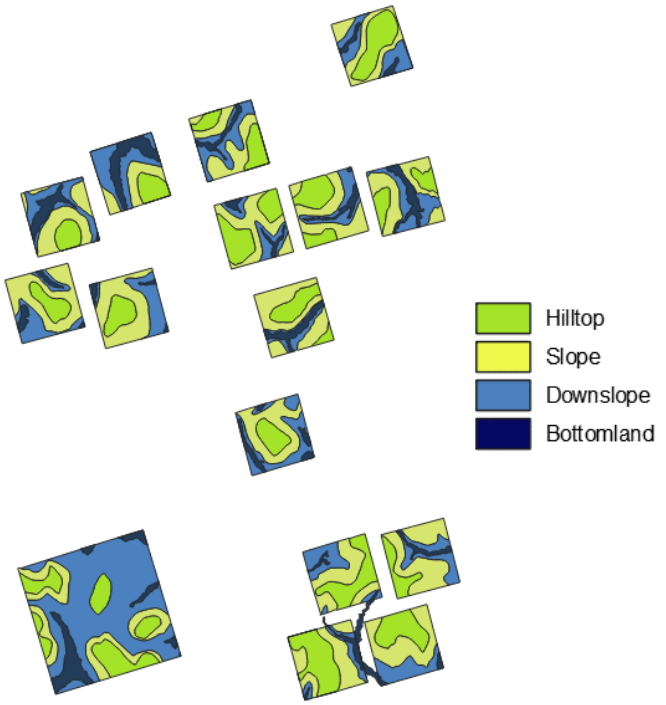
- **Sources:** Cantet (2005), Morneau (2007)
- **Projection:** EPSG: 32622 – WGS 1984 UTM 22N
- **Rights of use:** Open data
- **Referent contact:** Morneau, F., IFN

Name	Summary	Geographical Entity		Illustration
		Spatial format	Number	
taHydromorphy.shp	Six levels of hydromorphy for the biodiversity and control plots (1, 6, 11, 13, 14 and 15). The hydromorphy is based on the soil color 20cm underground given by the Munsell code, crossed with the floristic composition. This defines the 4 first levels. Hydromorphy5 corresponds to levels 1 and 2 of WTDDS (see WaterTable above) and Hydromorphy6 corresponds to levels 0 of WTDDS. See Cantet (2005) and Morneau (2007) for the detailed explanation.	POLYGON	119	

- **Attribute Table**

Variable name	Type	Description	Attributes of the variable
idHydro	Integer	*Unique identifier*	1 - 131
HydroCat	Varchar	*Hydromorphy Category*	1-6
AREA	Real	*Area of the entity*	28-28821
Plot	Integer	*Number or name of the plot*	1, 6, 11, 13, 14, 15
Geom	Geometry	Geometry of the objects	POLYGON

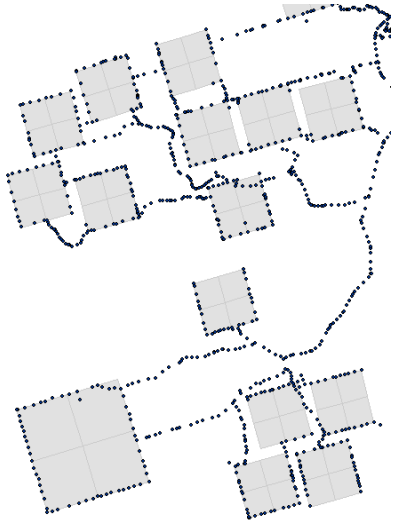
- **Source:** F. Morneau (2007), B. Ferry et al. (2010)
- **Projection:** EPSG: 32622 – WGS 1984 UTM 22N
- **Rights of use:** Open data
- **Referent contact:** Ferry, B. - AgroParisTech, UMR Silva

Name	Summary	Geographical Entity		Illustration
		Spatial format	Number	
taTopography.shp	Subdivision of Paracou plots into 4 topographic levels identified with regard to their conditions in slope angle and soil waterlogging: "**Hilltop**: flat to gentle slope, soil waterlogging very rare, **Slope**: medium to steep slope, low-intensity waterlogging, **Downslope**: flat to gentle slope, medium-intensity waterlogging, **Bottomland:** flat, high-intensity waterlogging. The limits between hilltop, slope and downslope were manually delineated on a topographic map, the slope habitat covering plateau with a slope angle above c.25%. The limit between downslope and bottomland was determined by the presence of a permanent WaterTable in swamp, no deeper than 1m in the middle of the dry season (see "WaterTable" above)." Ferry et al. (2010)	POLYGON	65	

- **Attribute Table**

Variable name	Type	Description	Attributes of the variable
idTopo	Integer	*Unique identifier*	1 - 65
Plot	Integer	*Number or name of the plot*	0-16
TopoTypeFr	Varchar	*Topographic type in french*	BasFond, BasDePente, Pente, Plateau
TopoTypeEn	Varchar	*Topographic type in english*	Bottomland, Downslope, Slope, Hilltop
Geom	Geometry	*Geometry of the objects*	POLYGON

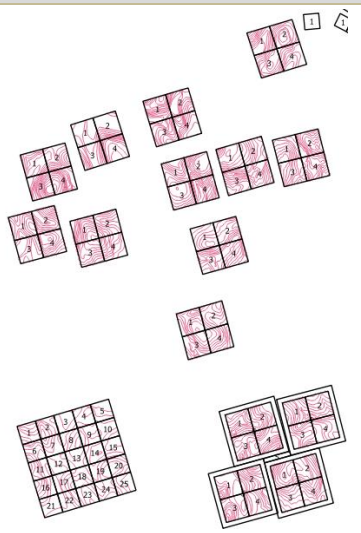
- **Source:** CIRAD team “Forest” - Petronelli, P., 1983-84
- **Projection:** EPSG: 32622 – WGS 1984 UTM 22N
- **Rights of use:** Open data
- **Referent contact:** Petronelli, P. – CIRAD, UMR EcoFoG

Name	Summary	Geographical Entity		Illustration
		Spatial format	Number	
taAltitude.shp	Dots characterized by their elevation and coming from the topographic survey that was made to install the Paracou device.	POINT	1026	

- **Attribute Table**

Variable name	Type	Description	Attributes of the variable
idAltitude	Integer	*Unique identifier*	1 - 1026
Xutm	Double	*Longitude: geographic and projected coordinates (in meters) (projection : WGS84, UTM22N)*	28 5015 - 28 7606
Yutm	Double	*Latitude: geographic and projected coordinates (in meters) (projection : WGS84, UTM22N)*	581 174 – 584 074
Altitude	Double	*Elevation*	2.60 – 39 m
Geom	Geometry	*Geometry of the objects*	POINT

- **Source:** CIRAD team “Forest” - Petronelli, P., 1983-84
- **Projection:** EPSG: 32622 – WGS 1984 UTM 22N
- **Rights of use:** Open data
- **Referent contact:** Petronelli, P. – CIRAD, UMR EcoFoG

Name	Summary	Geographical Entity		Illustration
		Spatial format	Number	
taContLines.shp	Contour lines, equidistant of 2.5 m, which have been calculated from topographic surveys, 1 per are. Each curve is characterized by its absolute elevation and its relative elevation with respect to the lowest point of the plot.	LINESTRING	407	

- **Attribute Table**

Variable name	Type	Description	Attributes of the variable
idContLine	Integer	*Unique identifier*	1 - 407
NumContLine	Integer	*Number naming the Contour Line in each plot*	1-36
PLOT	Integer	*Number or name of the plot*	1-16
ContLineLg	Real	*Contour Line length*	3.39-829.87m
ElevReal	Real	*Absolute elevation of the contour line*	3.1-40.2
ElevRel	Real	*Relative elevation of the contour line with respect to the lowest point of the plot*	0-32.5
Geom	Geometry	*Geometry of the objects*	LINESTRING

Pedology

Since the creation of Paracou, ecologists have regularly expressed the need for a soil map of the site. Soils are known to have a role in forest dynamics and/or species distribution (Paoli (2006), Baribault et al. (2012)). The soil map was initiated in 1991 and completed in 2012 as detailed in Appendix 1: Inventory of soil mapping studies in Paracou. However, to date, no synthesis or reference article has been written on this soil mapping, unlike other tropical forest systems of French Guiana (Piste de St Elie (Sabatier et al., 1997)). There were several internships about the creation of the Paracou soil map: (i) soil mapping in the field to delineate soil units according to the type of drainage; (ii) soil sampling for physio-chemical analysis; (iii) digitization of this soil mapping within the Paracou Geographic Information System (GIS).

- **Source:** Soucemarianadin (2004), Weigel (2006), Freycon (2009) et Roelens (2007)
- **Projection:** EPSG: 32622 – WGS 1984 UTM 22N
- **Rights of use:** Open data
- **Referent contact:** Freycon, V. - CIRAD

Name	Summary	Geographical Entity		Illustration
		Spatial format	Number	
taDrainages.shp	The different types of drainage according to IRD classification (Sabatier et al., 1997) for plots 1 to 15. This map is the third version.	POLYGON	195	

Dourdain, A. (UMR EcoFoG – CIRAD), Jaouen, G. (UMR EcoFoG - AgroParisTech), Derroire, G. (UMR EcoFoG - CIRAD) October 2022

➢ Attribute Table

Variable name	Type	Description	Attributes of the variable
idDrainage	Integer	*Unique identifier*	1 - 195
TypeDrainage	Varchar	*Type of drainage : 6 attributes (see below)*	Alt, DhS, DVD, SH, SLD, UhS
TypeDrainageEN	Varchar		
idPlot	Integer	*Unique plot identifier (Guyafor network)*	-
Plot	Integer	*Number or name of the plot*	-
Geom	Geometry	*Geometry of the objects*	POLYGON

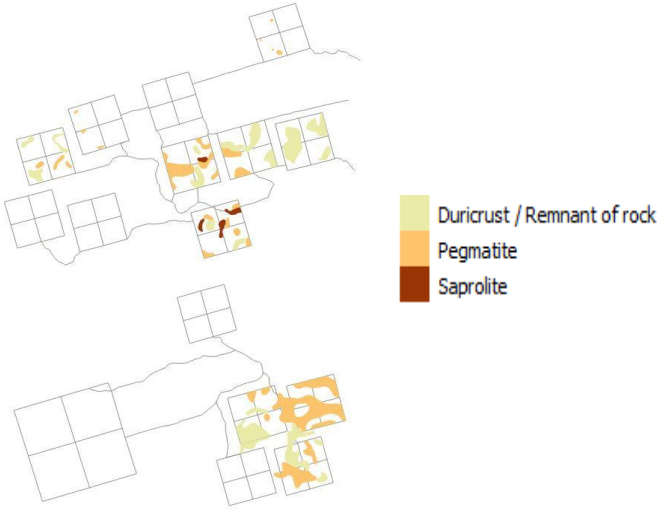
- **Alt**: Slow vertical drainage: the appearance of this soil is characterized by a silty red alloterite to a depth greater than 1.2m. This is a transitional soil between DVD and SLD soil types. Water circulation is slow and always vertical. It can be found at the top of low slopes.
- DLS or **SLD**: Superficial Lateral Drainage: the appearance of this soil is characterized by silty alloterite to a depth of less than 1.2m. The alloterite characteristically seems 'dry to the touch'. Water circulation is lateral.
- DVL or **DVD**: Deep Vertical Drainage: This soil is characterized by a thick horizon (greater than 2 m) by red clay, with microaggregated structure, ensuring good infiltration and water retention. Rainwater seeps vertically and deeply; This soil corresponds to the initial ferralitic cover.
- SAm or **UhS**: Uphill hydromorphic system: in these soils, the dark red horizon of the alloterite becomes pale red. This system has a perched water table that generally corresponds to a top layer that promotes the accumulation of water, inducing hydromorphic conditions.
- SAv or **DhS:** Downhill hydromorphic system: this soil is characterized by the appearance of a mottled horizon less than 1.2 m deep. It is a 'à battement' water table system found at the bases of slopes, near the permanent water table of lowlands.
- **SH** or HS: Lowland Hydromorphic Soils: this soil is characterized by a gray and often sandy surface horizon. It corresponds more or less to lowlands.

➢ **Source:** Soucemarianadin (2004), Weigel (2006), Freycon (2009) et Roelens (2007)

➢ **Projection:** EPSG: 32622 – WGS 1984 UTM 22N

➢ **Rights of use:** Open data

➢ **Referent contact:** Freycon, V. - CIRAD

Name	Summary	Geographical Entity		Illustration
		Spatial format	Number	
taCoarseElements.shp	Spatial distribution of coarse material (duricrust, remnant of rock, pegmatite) and saprolite.	POLYGON	59	

➢ **Attribute Table**

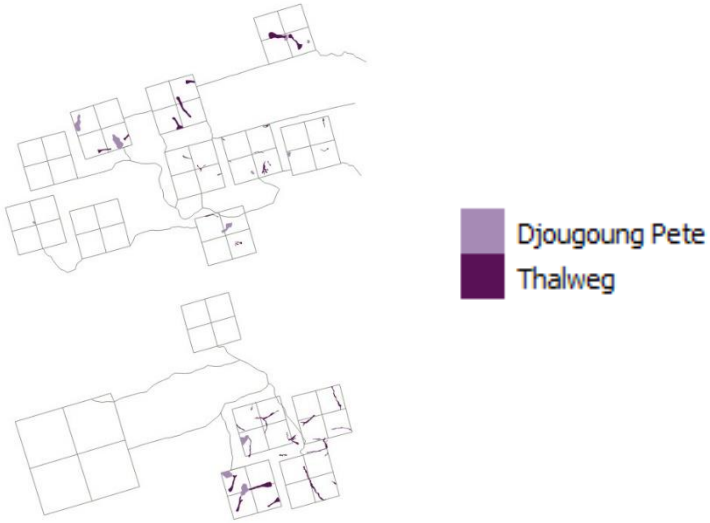
Variable name	Type	Description	Attributes of the variable
idElement	Integer	*Unique identifier*	1-59
TypeElement	varchar	*Type of coarse elements in French: 3 attributes*	Lithorelique, Pegmatite, Saprolite
TypeElementEN	varchar	*Type of coarse elements in English: 3 attributes*	Duricrust, Remnant of rock, Pegmatite, Saprolite
idPlot	Integer	*Unique plot identifier (Guyafor network)*	-
plot	Integer	*Number or name of the plot*	-
Geom	Geometry	*Geometry of the objects*	POLYGON

➢ **Source:** Soucemarianadin (2004), Weigel (2006), Freycon (2009) et Roelens (2007)

➢ **Projection:** EPSG: 32622 – WGS 1984 UTM 22N

➢ **Rights of use:** Open data

➢ **Referent contact:** Freycon, V. - CIRAD

Name	Summary	Geographical Entity		Illustration
		Spatial format	Number	
taThalwegs.shp	Thalwegs and Djougoungs-Pétés (Extension of small circular depressions and temporarily waterlogged (Blancaneaux & Pouyllau, 1977)).	POLYGON	18	

➢ **Attribute Table**

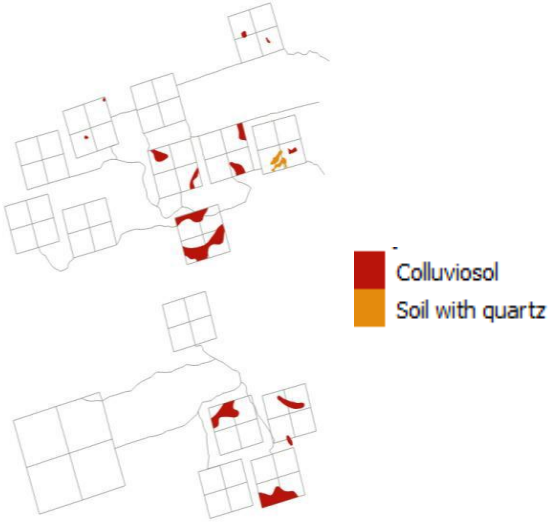
Variable name	Type	Description	Attributes of the variable
idThalweg	Integer	*Unique identifier*	1-18
TypeThalweg	varchar	*Topographic type (2 attributes and no English translation for Djougoung Pété (Sara-maka language)*	Thalweg, Djougoung Pété
idPlot	Integer	*Unique plot identifier (Guyafor network)*	-
Plot	Integer	*Number or name of the plot*	-
Geom	Geometry	*Geometry of the objects*	POLYGON

➢ **Source:** Soucemarianadin (2004), Weigel (2006), Freycon (2009) et Roelens (2007)

➢ **Projection:** EPSG: 32622 – WGS 1984 UTM 22N

➢ **Rights of use:** Open data

➢ **Referent contact:** Freycon, V. - CIRAD

Name	Summary	Geographical En-		Illustration
		Spatial format	Number	
taSpecificSoils.shp	Specific soils: Colluviosol or Soil with quartz	POLYGON	18	

➢ **Attribute Table**

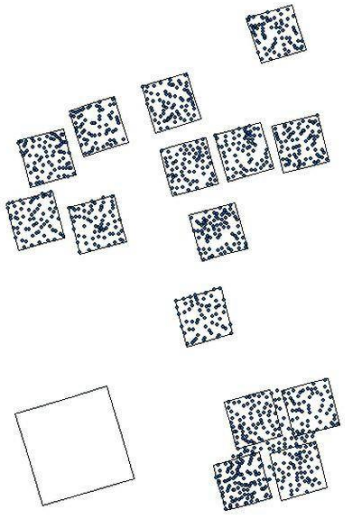
Variable name	Type	Description	Attributes of the variable
idSpecSoil	Integer	*Unique identifier*	1-18
TypeSpecSoil	varchar	*Type of specific soil in French: 2 attributes*	Soil contribution, Soil quartz
TypeSpecSoilEN	varchar	*Type of specific soil in English: 2 attributes*	Colluviosol, Soil with quartz
idPlot	Integer	*Unique plot identifier (Guyafor network)*	-
plot	Integer	*Number or name of the*	-
Geom	Geometry	*Geometry of the objects*	POLYGON

➢ **Source:** Soucemarianadin (2004), Weigel (2006), Freycon (2009) et Roelens (2007)

➢ **Projection:** EPSG: 32622 – WGS 1984 UTM 22N

➢ **Rights of use:** Under conditions

➢ **Referent contact:** Freycon, V. - CIRAD

Name	Summary	Geographical Entity		Illustration
		Spatial format	Number	
taSoilSurvey.shp	Auger survey location.	POINT	1094	

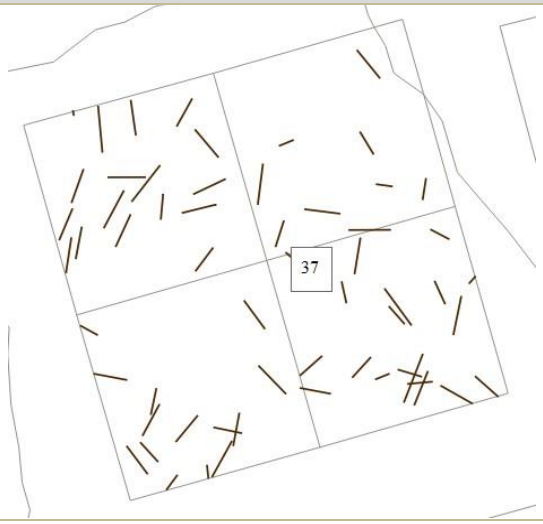
➢ **Attribute Table**

Variable name	Type	Description	Attributes of the variable
idSoilSurvey	Integer	*Unique identifier*	1 - 419
idPlot	Integer	*Unique plot identifier (Guyafor network)*	-
Plot	Integer	*Number or name of the plot*	-
0-10	Integer	*Charcoal, Depth = 0-100 cm*	*0=absent; 1=present*
10-20	Integer	*Charcoal, Depth = 10-20 cm*	*0=absent; 1=present*
20-40	Integer	*Charcoal, Depth = 20-40 cm*	*0=absent; 1=present*
40-60	Integer	*Charcoal, Depth = 40-60 cm*	*0=absent; 1=present*
60-80	Integer	*Charcoal, Depth = 60-80 cm*	*0=absent; 1=present*
80-100	Integer	*Charcoal, Depth = 80-100 cm*	*0=absent; 1=present*
NumSurvey	Varchar	*Number of the auger survey as: PLOT-N° auger survey*	Ex. 8-28

idFieldWk	Varchar	*Unique sampling identifier from fieldwork. This variable matches NUM_SONDAG NumSurvey in order to understand the link between the spatial data and the attribute table of the chemical analyses.*	-
Refus	Float	*Coarse element (%)*	0 – 9.54
MO	Float	*Organic matter (%)*	0.62 – 7.84
C	Float	*Organic Carbon (%)*	0.36 – 4.55
N	Float	*Nitrogen (‰)*	0.24 – 3.22
C_N	Float	*C/N ratio*	12.02 – 20.44
Polsen	Float	*Phosphorus (mg/kg) extracted using Olsen method*	1.06 – 11.4
PBray2	Float	*Phosphorus (mg/kg) extracted using Bray2 method*	0.66 – 25.78
Al_KCl	Float	*Al exchangeable in KCl ($cmol^+/kg$)*	0.04 - 2.79
H_KCl	Float	*H exchangeable in KCl ($cmol^+/kg$)*	0
Ca_ech	Float	*Ca exchangeable by Metson method ($cmol^+/kg$)*	0.03 - 4.66
Mg_ech	Float	*Mg exchangeable by Metson method ($cmol^+ / kg$)*	0.04 – 0.89
K_ech	Float	*K exchangeable by Metson method ($cmol^+/ kg$)*	0.02 - 0.37
Na_ech	Float	*Na exchangeable by Metson method ($cmol^+ / kg$)*	0.01 – 0.18
S	Float	*Sum of exchangeable bases by Metson method ($cmol^+/ kg$)*	0.14 - 5
CEC	Float	*cation exchange capacity by method Metson ($cmol^+/ kg$)*	1.52 – 12.65
TS	Float	*Saturation rate (%)*	2.16 – 93.4
Geom	Geometry	*Geometry of the objects*	POINT

Logging

- **Source:** : CIRAD team “Forest” - Petronelli, P., 1987
- **Projection:** EPSG: 32622 – WGS 1984 UTM 22N
- **Rights of use:** Open data
- **Referent contact:** Petronelli, P. – CIRAD, UMR EcoFoG

Name	Summary	Geographical Entity		Illustration
		Spatial format	Number	
taLoggingDirection.shp	Logging direction on plot 9 during the 1987 logging operation at Paracou.	LINESTRING	59	

- **Attribute Table**

Variable name	Type	Description	Attributes of the variable
idDirection	Integer	*Unique identifier*	1 - 59
idTree	Integer	*Unique tree identifier*	-
Tree	Integer	*Number of the fallen tree*	0 - 2004
idPlot	Integer	*Unique plot identifier (Guyafor network)*	99
plot	Integer	*Number or name of the plot*	9
Geom	Geometry	*Geometry of the objects*	LINESTRING

- **Source:** Forest CIRAD team - Petronelli, P., 1987
- **Projection:** EPSG: 32622 – WGS 1984 UTM 22N
- **Rights of use:** Open data
- **Referent contact:** Petronelli, P. – CIRAD, UMR EcoFoG

Name	Summary	Geographical Entity		Illustration
		Spatial format	Number	
taDisturbedAreas.shp	Disturbed areas after the 1987 logging operation at Paracou.	POINT	405	

- **Attribute Table**

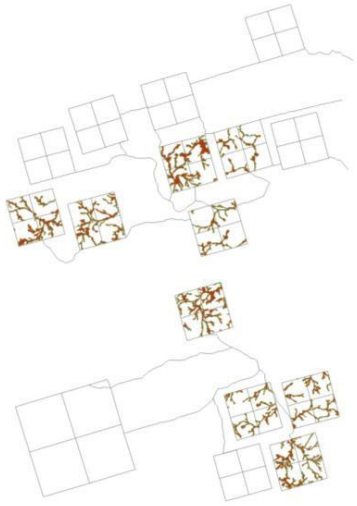
Variable name	Type	Description	Attributes of the variable
idDist	integer	*Unique identifier*	1-405
TypeDist	varchar	*Type of object*	DisturbedAreas
idPlot	integer	*Unique plot identifier (Guyafor network)*	
plot	Integer	*Number or name of the plot*	
Geom	Geometry	*Geometry of the objects*	POINT

➢ **Source:** Forest CIRAD team - Petronelli, P., 1987

➢ **Projection:** EPSG: 32622 – WGS 1984 UTM 22N

➢ **Rights of use:** Open data

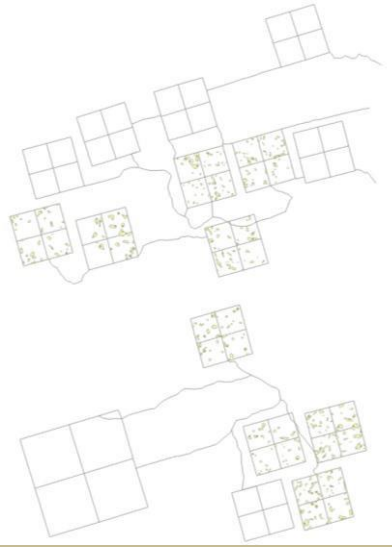
➢ **Referent contact:** Petronelli, P. – CIRAD, UMR EcoFoG

Name	Summary	Geographical Entity		Illustration
		Spatial format	Number	
taSkidTrails.shp	Skid trails created during the 1987 logging operation at Paracou	POLYGON	42	

➢ **Attribute Table**

Variable name	Type	Description	Attributes of the variable
idSkid	Integer	*Unique identifier*	1-42
type	varchar	*Type of object*	SkidTrails
idPlot	Integer	*Unique plot identifier (Guyafor network)*	-
Plot	Integer	*Number or name of the plot*	-
Geom	Geometry	*Geometry of the objects*	POLYGON

- **Source:** CIRAD forest Team - Petronelli, P., 1987
- **Projection:** EPSG: 32622 – WGS 1984 UTM 22N
- **Rights of use:** Open data
- **Referent contact:** Petronelli, P. – CIRAD, UMR EcoFoG

Name	Summary	Geographical Entity		Illustration
		Spatial format	Number	
taGaps.shp	Gaps created during the 1987 logging operation in Paracou	POLYGON	412	

- **Attribute Table**

Variable name	Type	Description	Attributes of the variable
idGap	Integer	*Unique identifier*	1-42
TypeGap	varchar	*Type of object*	Gaps
idPlot	Integer	*Unique plot identifier (Guyafor network)*	-
Plot	Integer	*Number or name of the plot*	-
Geom	Geometry	*Geometry of the objects*	POLYGON

LIDAR (Rasters)

➢ **Projection:** EPSG: 32622 – WGS 1984 UTM 22N

Name	Summary	Provider	Date	Right of use	Referent contact	Miscellaneous
DEM2004.tif	***DEM, DSM and DCM of Paracou in 2004*** *The aerial laser scanning (ALS) dataset, acquired in October 2004, covers the Paracou experimental station in French Guiana. More precisely, the dataset covers all the whole Paracou plots, except plot 15 that is only covered partially. The area includes logged and unlogged forest and Pinot palm. Ground echoes are available as well as a digital terrain model (DTM), a digital surface model (DSM), and a digital canopy model (DCM) with a 1 meter resolution. These LIDAR data were acquired as part of the program CAREFOR (ERDF) under the aegis of Daniel Sabatier.*	Sabatier, D.	2005	Open data	Vincent, G. - IRD	**Pixel size:** 1 -1 m **Dimension** X: 2339, Y: 2809 **Band:** 1 **Min value:** 6.25 **Max value:** 39.7
DSM2004.tif		Sabatier, D.	2005	Open data	Vincent, G. - IRD	**Pixel size:** 1-1 m **Dimension:** X: 2339;Y: 2809 **Band:** 1 **Min value:** 19.16 **Max value:** 66.80
DCM2004.tif		Sabatier, D.	2005	Open data	Vincent, G. - IRD	**Pixel size:** 1-1 m **Dimension:** X: 2339;Y: 2809 **Band:** 1 **Min value :** 3.45 **Max value:** 36.4
DEM2009.tif	***DEM, DSM and DCM of Paracou in 2009*** *The aerial laser scanning (ALS) dataset, acquired on September 11th, 2009, covers the Paracou experimental station in French Guiana. The area includes logged-over and unlogged forest, various forest heights and Pinot palm swamp forest.*	Altoa	2009	Open data	Vincent, G. - IRD	**Pixel size:** 5-5 m **Dimension:** X: 591 ; Y: 875 **Band:** 1 **Min value:** 0 **Max value:** 36.56
DSM2009.tif		Altoa	2009	Open data	Vincent, G. - IRD	**Pixel size:** 1 -1 m **Dimension:** X: 2996; Y:4384 **Band:** 1 **Min value:** 0 **Max value:** 69.06
DCM2009.tif		Altoa	2009	Open data	Vincent, G. - IRD	**Pixel size:** 1 -1 m **Dimension:** X: 2996; Y:4384 **Band:** 1 **Min value:** 0.057 **Max value:** 40.52

DEM2013.tif	***DEM, DSM and DCM of Paracou in 2013*** *The aerial laser scanning (ALS) dataset acquired on September 23rd 2013 covers the Paracou experimental station in French Guiana. The coverage includes all Guyafor and Guyaflux plots completely with logged- over, unlogged and swamp forests ("Pinot" or "Açai").*	Altoa	2013	Open data	Vincent, G. - IRD	**Pixel size:** 1-1 m **Dimension:** X: 4313; Y:4577 **Band:** 1 **Valeur min :** 2.42 **Valeur max :** 36.77
DSM2013.tif		ltoa	2013	Open data	Vincent, G. - IRD	**Pixel size:** 1-1 m **Dimension:** X: 4313; Y:4577 **Band:** 1 **Min value:** 20.73 **Max value:** 69.84
DCM2013.tif		Altoa	2013	Open data	Vincent, G. - IRD	**Pixel size:** 1 -1 m **Dimension:** X: 4313; Y:4577 **Band:** 1 **Min value:** 3.59 **Max value :** 40.77
DEM2015.tif	***DEM, DSM and DCM of Paracou in 2015*** *The aerial laser scanning (ALS) dataset acquired on October 20th 2015 covers the Paracou experimental station in French Guiana. The coverage includes all Guyafor and Guyaflux plots completely with logged- over, unlogged and swamp forests ("Pinot" or "Açai").*	Altoa	2015	Open data	Vincent, G. - IRD	**Pixel size:** 1-1 m **Dimension:**X:3008;Y:3499 **Band:** 1 **Min value:** 2.68 **Max value:** 37.01
DSM2015.tif		Altoa	2015	Open data	Vincent, G. - IRD	**Pixel size:** 1-1 m **Dimension:** X:3008 ; Y:3499 **Band:** 1 **Min value:** 21.32 **Max value :** 69.54
DCM2015.tif		Altoa	2015	Open data	Vincent, G. - IRD	**Pixel size:** 1-1 m **Dimension:** X:3008 ; Y:3499 **Band:** 1 **Min value:** 2.93 **Max value:** 40.37

LIDAR: Remote sensing by **laser or LIDAR (LIght Detection And Ranging *or* Laser Detection And Ranging)** is a long distance, active remote sensing technique based on the analysis of a coherent laser beam reflected back towards its emittor. Lidar has applications in topography (geomorphology, altimetry and bathymetry), geosciences (seismic risk, meteorology, atmospheric physics) and environmental sciences (atmospheric pollution studies, agronomy and forestry), not to mention in archaeology, meteorology, air traffic control, automatic guidance of terrestrial or aerial vehicles, road safety, or defense.

Digital Terrain Model (DTM): A DTM is a 3D representation of the topography of a terrain, not including surface objects such as plants and buildings, created using

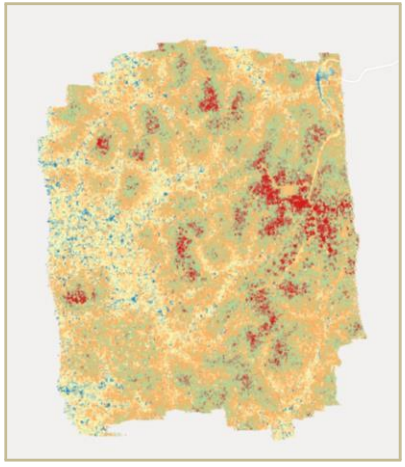
altitude data.

Uses of DTMs: Topography: A 3D layout of the ground surface, without construction or vegetation, is a very precise topographic reference tool. **Hydrology** : DTMs are a reliable tool for understanding hydrological forms and movements. They can be used to identify watercourses, wetlands,... They can also be used to create Flood Risk Management Plans (FRMP), by identifying watersheds, the direction of water flows, hydraulic modeling, and flood simulations. **Geology** : DTMs can be used to characterize open-pit geological zones such as quarries, mining and gold-bearing areas, etc. Topographic data analysis allows operators to calculate extraction volumes and create development strategies for these areas. **Archeology**: DTMs can highlight microreliefs related to ancient human activities (old roads, walls, remains of buildings ...)

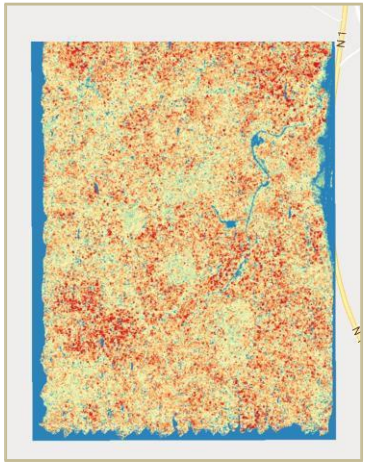
Digital Surface Model (DSM): A DSM is a 3D representation of a terrain and its supersurface, namely vegetation and buildings.

Uses of DSM: **Forest management**: DSMs enable precise characterization of the surface of canopies. Using both DTM and DSM a digital canopy model (DCM) can be created (DCM = DSM-DTM). DCMs allow calculations of forest populations and biomass volumes. These tools are becoming more and more central for the work of environmental and agroforestry professionals. **Urban planning**: DSMs can equally be used to identify anthropogenic features of a landscape. The creation of models of urban landscapes and their surrounding environments can be useful to urban planners for analyzing the existing urban fabric and planning future developments (e.g. road building, town planning). **Telecommunications**: DSMs are used in the management of aerial networks (electric pylons, antennas ...). By identifying physical or aesthetic obstacles, DSMs are a suitable tool in the planning and development of networks.

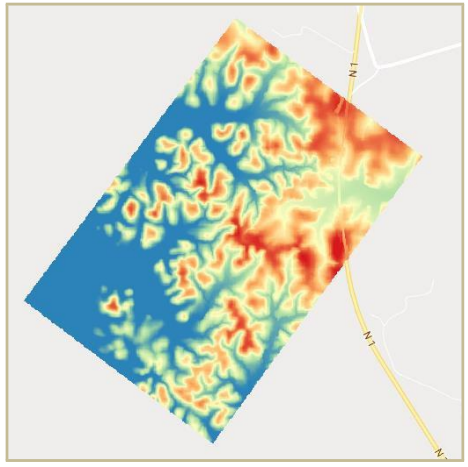
Formats and resolution: DTMs and DSMs can have many file extensions. Vectorial, e.g. .xyz, .dwg, .dxf, .shp, .las. Or raster, e.g. ASCII Grid, Mapinfo Grid, .tif, .kmz, .png.



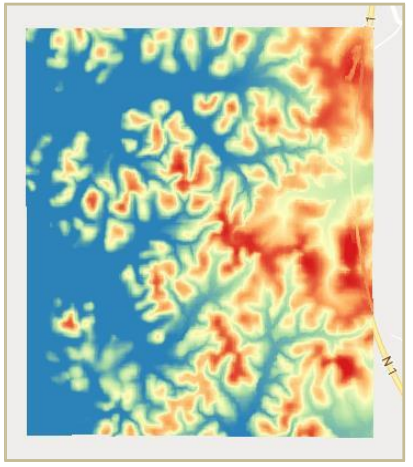
DSM 2004



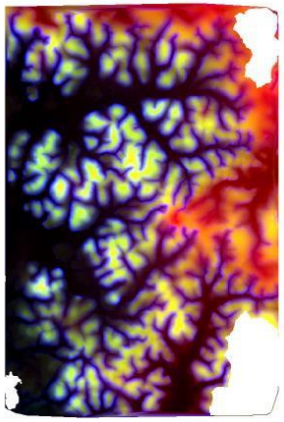
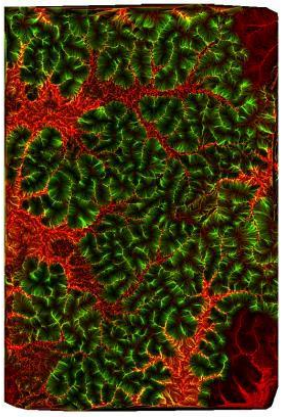
DCM 2009



DEM 2013



DEM 2015

Name	Summary	Provider	Date	Right of use	Referent contact	Miscellaneous
Maps_of_topography.tif 	*Raster maps of topography are stored in a multi-layers raster that contains:* *(i) a raster layer of absolute elevation corresponding to the Digital terrain model (DTM) derived from LIDAR (*Light Detection And Ranging : data acquired across the Paracou site in October 2009 from the provider Altoa*) data (in m); (ii) a raster layer of relative elevation corresponding to the relative altitude above the nearest stream (in m);* *(iii) a raster layer of local slope angle corresponding to the estimation of slope angle deviation from the horizontal plane (in degrees).* ***To download the raster and for detailed methods:*** ***https://doi.org/10.1371/journal.pone.0141488.s001*** ***To download the scientific article :*** ***https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0141488#sec016***	Allié, E.	2015	Open data	Allié, E.	**Pixel size:** 5-5m **Dimension** X: 576, Y: 873 **Band:** 3
Maps_soil_hydrology.tif 	*Raster maps of soil hydrology are stored in a multi-layers raster that contains:* *(i) a layer of wetness index corresponding to the estimation of soil moisture;* *(ii) a layer of flow accumulation corresponding to the estimation of surface run-off.* *This raster derived from LIDAR (Light Detection And Ranging : data acquired across the Paracou site in October 2009 from the provider Altoa) data (in m).* ***To download the raster and for detailed methods:*** ***https://doi.org/10.1371/journal.pone.0141488.s002*** ***To download the scientific article :*** ***https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0141488#sec016***	Allié, E.	2015	Open data	Allié, E.	**Pixel size:** 5-5m **Dimension:** X: 576, Y: 873 **Band:** 2

Maps_soil_fertility.tif 	*Raster maps of soil fertility are stored in a multi-layers raster that contains: (i) a layer of total C content (in g.kg-1);* *(ii) a layer of available P content (in mg.kg-1);* *(iii) a layer of Al exchangeable (in cmolc.kg-1); (iv) a layer of H exchangeable (in cmolc.kg-1); (v) a layer of exchange bases soil-saturation (BS in %).* *This raster derived from LIDAR (Light Detection And Ranging : data acquired across the Paracou site in October 2009 from the provider Altoa) data (in m)* ***To download the raster and for detailed methods:*** ***https://doi.org/10.1371/journal.pone.0141488.s003*** ***To download the scientific article :*** ***https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0141488#sec016***	Allié, E.	2015	Open data	Allié, E.	**Pixel size:** 5-5m **Dimension:** X: 592, Y: 876 **Band:** 5

Appendix 1: Inventory of soil mapping studies in Paracou and related studies (geomorphology ...)

(Adapted from Weigel (2006), simplified and completed)

Study	Referent	Plot	Comments
Boulet & Brunet (1983)			Soil sampling to implement the site map
Barthès (1991)		P1, P6, P11	Soils mapping
Lhériteau (1994)	**B. Ferry**	P16	Soils mapping
Ferry 1998 à 2001		All	Map of bottomlands according to water table depth
Le Fol (2002)	**V. Freycon**	All	Geomorphological survey
Malherbe (2002)	**V. Freycon**		Geomorphological survey (toposequences)
Soucémarianadin 2004[2]	**V. Freycon**		Description of 15 reference profiles
Soucémarianadin (2004)	**V. Freycon**	P1, P6	Soils mapping
Cantet (2005)	**B. Ferry**	Control plots (P1, 6, 11-15)	Map of water logging, based on color
Weigel (2006), *Freycon* (2009)	**V. Freycon**	P11, P13, P14, P15	Soils mapping
Roelens (2007)	**V. Freycon**	P4, P5, P7, P9, P10, P12	Soils mapping
Freycon (2009)	**V. Freycon**	P2, P3, P8	Soils mapping
Freycon (2009)		All	A printed synthesis report on soil mapping

[2] Pers. comm.

Appendix 2: Contacts

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