Joint Research Centre

Tropical Moist Forest - Data Users Guide (v1)

Introduction

This document provides a detailed technical description of the datasets that are being made available as part of the Joint Research Centre's Tropical Moist Forest Dataset. For each of the data layers it provides a purpose, description, bands and symbology so that users can understand each of the data layers and use them efficiently and appropriately. Much of the information in this document is taken directly from the following paper which provides a detailed description of the method that was used to create this dataset:

C. Vancutsem, F. Achard, J.-F. Pekel, G. Vieilledent, S. Carboni, D. Simonetti, J. Gallego, L.E.O.C. Aragão, R. Nasi. Long-term (1990-2019) monitoring of forest cover changes in the humid tropics. Science Advances 2021

The technical descriptions given here relate to both the data that is available for download from the data access section of the website and the data that is in Google Earth Engine (GEE). The data access section also has ancillary files available which will help when working with the data, such as symbologies, metadata files and other files. The datasets that are provided are intended to show different facets of forest cover changes in tropical moist forests (TMF) over the past **33** years at 0.09 ha resolution (30m).

The *transition map* shows the spatial distribution of the tropical moist forest at the end of the year **2022**. It depicts the sequential dynamics of changes by providing transition stages from the *first year of the monitoring period* to the end of the year **2022** (undisturbed forest, degradation, deforestation, regrowth, conversion to plantations) and subclasses for each transition class (period of disturbance, age of regrowth, several types of forest, several types of degradation and deforestation, change types within the mangroves and tree plantations). The *undisturbed and degraded tropical moist forest* shows the coverage of undisturbed and degraded tropical moist forests remaining at the end of the year **2022**. The *annual change dataset* is a collection of **33** maps depicting - for each year between 1990 and **2022** - the spatial extent of undisturbed forest and changes (deforestation, degradation and regrowth). Each disturbed pixel (degraded forest, deforested land, or forest regrowth) is characterized by the timing (*year of deforestation*, *year of degradation*, and *duration*), *number of annual disruption observations* and *intensity* (total number of disruption observations over the full observation period). A disruption observation is defined as an absence of tree foliage cover within a Landsat pixel for a single-date observation. The intensity combined with the duration constitute a proxy for the change intensity and the impact level. In addition, we provide two metadata information: (i) *the number of annual valid observations*, and (ii) *the first year of the monitoring period*.

The following sections describe the **map products**, different **metrics** on the characterization of the timing and intensity of the disturbances and the **metadata datasets**.

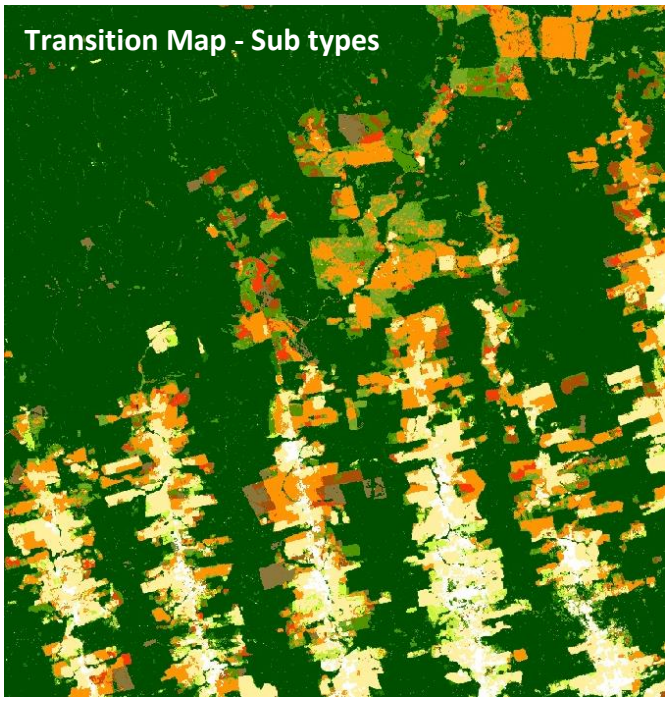
Map products

Transition map

Purpose

The transition map shows the spatial distribution of the moist forest at the end of the year **2022**. It depicts the sequential dynamics of changes by providing transition stages from the *first year of the monitoring period* to the end of the year **2022**.
Two maps are proposed and described for the transition map: (i) a first version entitled "*Transition Map - Main Classes*" with the main transition classes, and (ii) a detailed version entitled "*Transition Map - Sub types*" with sub-classes (period of disturbance, age of regrowth, several types of forest, several types of degradation and deforestation, change types within the mangroves and tree plantations). Both versions of the transition map are available for download from the data access section of the website and in Google Earth Engine (GEE).
The user is free to create other maps by recoding the classes according to his interest and needs. Some support is provided on this purpose at the GEE tutorial page.

An example of the two versions of the transition map is shown below for the Santarém region in Brazil.



Description of the *Transition Map - Main Classes*

Class 10. Undisturbed tropical moist forest

We define an undisturbed TMF as a closed evergreen or semi-evergreen forest without any disturbance (degradation or deforestation) observed over the full observation period defined by the Landsat data availability. We do not intend to map specifically intact or primary forest as the Landsat observation period is too short to discriminate between never-cut primary forest and secondary forest older than the observation period. However, by documenting all the disturbances observed over the past three decades, the remaining undisturbed TMF in **2022** is getting closer to the primary forest extent.

Class 20. Degraded tropical moist forest

A degraded forest is a closed evergreen or semi-evergreen forest (covered by existing or regrowing trees) that has been temporary disturbed during a period of maximum 2.5 years (900 days) with the last disruption observation observed at the latest in year **2021** (Degradation that started in **2022** is mapped in class 50). It includes different types of degradation such as selective logging, fires, and unusual weather events (hurricane, drought, blowdown).

Class 30. Forest regrowth

This class refers to a two-phase transition from moist forest to (i) deforested land and then (ii) vegetative regrowth. A minimum 3-years duration (**2020**-**2022**) of permanent moist forest cover presence is needed to classify a pixel as forest regrowth (to avoid confusion with agriculture).

Classes 41-43. Deforested land

These classes refer to the permanent conversion of forest into non-forested land that started before **2020** (recent deforestation is mapped in class 50). Disruptions were observed over more than 2.5 years and no vegetative regrowth was detected over the last 3 years (**2020**-**2022**). It includes three subcategories of converted land cover: forest converted to tree plantations (Class 41); forest converted to water bodies such as new dams and river flow changes (Class 42); and forest converted to other land cover that includes infrastructure, agriculture, mining and deforestation areas that follow degradation (Class 43). Commodities or tree plantations areas have been identified thanks to external data sources (1,2,3,4,5,6) and to a visual delineation by photo interpretation of high-resolution imagery.

Class 50. Deforestation/degradation ongoing (2020-2022)

This class refers to the disturbances that initiated between **2020** and **2022** and that cannot yet be attributed with high certainty to a temporary disturbance (degradation) or to a long-term conversion to a non-forest cover (deforestation) due to a limited historical period of observation. Disturbances that initiated in **2020** or **2021** but that do not show disruption observations in **2022** are classified as degraded forest (Class 20).

Class 60. Permanent and seasonal water

These classes come from the Joint Research Centre's Global Surface Water (GSW) dataset (7) and the GSW updates for the period 2016–2021.

Class 70. Other land cover

This class refers to non TMF cover and includes savannah, deciduous forest, agriculture, evergreen shrubland, non-vegetated cover and afforestation.

Bands

The *Transition Map - Main Classes* dataset has the following band:

Name	Data type	Description
TransitionMap_MainClasses	Unsigned int8	The type of transition over the monitoring period

Symbology

The *Transition Map - Main Classes* dataset has the following values and symbology.

Value	Symbol	Color code (RGB)	Label
10		0,80,0	Undisturbed tropical moist forest
20		100,135,35	Degraded tropical moist forest
30		210,250,60	Tropical moist forest regrowth
41		255,200,148	Deforested Land - Forest converted to tree plantations
42		0,200,150	Deforested Land - Forest converted to water
43		255,230,100	Deforested Land - Forest converted to other land cover
50		250,140,10	Ongoing deforestation or degradation (**2020**-**2022**)
60		0,70,160	Permanent and seasonal water
70		255,255,255	Other land cover (including afforestation)

Description of the *Transition Map - Sub types*

For each main transition class described in the section above, sub-types are identified and mapped.

The **Undisturbed TMF** class is divided in three sub-classes:

10. Undisturbed tropical moist forests

This class refers to all TMF excluding the bamboo-dominated forest in South America and the undisturbed mangroves.

11. Bamboo-dominated forests

This class refers to two specific zones where bamboo-dominated forest is present over large areas: the Brazilian state of Acre, and the eastern Peru.

12. Undisturbed mangroves

This class refers to the undisturbed forests that have been identified within the mangrove maximum extent (1996-2020) mapped in the Global Mangrove Watch (GMW) dataset (6).

The **degraded forest** class is divided first in three degradation types:

(i) with short-duration disturbance: degradation with short-duration impacts (disruptions observed within one year), which includes most logging activities, natural events and minor fires

(ii) with long-duration disturbance: degradation with long-duration impacts (disruptions observed between one and 2.5 years), which mainly corresponds to strong fires (burned forests)

(iii) with 2/3 degradation periods: succession of two, three or four stages of short-duration degradation (separated by at least 2 years with no detection of forest disturbances) over the full observation period

These degradation types have been in turn divided into 2 sub-classes based on the degradation period: (i) before 2013, and (ii) in 2013-2021.

21. Degraded forest with short-duration disturbance (started before 2013)

22. Degraded forest with short-duration disturbance (started in 2013-2021)

23. Degraded forest with long-duration disturbance (started before 2013)

24. Degraded forest with long-duration disturbance (started in 2013-2021)

25. Degraded forest with 2/3 degradation periods (last degradation started before 2013)

26. Degraded forest with 2/3 degradation periods (last degradation started in 2013-2021)

The **forest regrowth** class is divided into three sub-classes based on the date of the last disruption observation: (i) before 2003, (ii) in 2003-2012, and (iii) in 2013-2019. These classes correspond to forest regrowth with different ages, from the oldest to the youngest forest regrowth:

31. Old forest regrowth (disturbed before 2003)

32. Young forest regrowth (disturbed in 2003-2012)

33. Very young forest regrowth (disturbed in 2013-2019)

The **deforested land** (1990-2019) class is divided into two sub-classes based on the deforestation period: (i) before 2012, and (ii) in 2012-2019:

41. Deforestation started before 2012

42. Deforestation started in (2012-2019)

Specific classes of conversion to water and of deforested mangroves are mapped in classes **73-74** and **65-67**, respectively.

Recent degradation or deforestation (2020-2022) class is divided in 4 sub-classes based on the first year of disturbance(s) (2020, 2021, or 2022). Within this class, we separated degradation from deforestation by taking a duration of at least 366 days for the years 2020–2021. A threshold of more than 45% in the ratio between the number of disruption observations and the number of valid observations for the last year (2022) was used to consider deforested land over degradation (if the date of the 2022 disturbances is observed after the second half of the year, the threshold was set to 20%). Owing to the limited historical period of observation, the separation between deforested land and degraded forest is more uncertain than for other classes of deforestation and degradation. In particular, the risk is to under-estimate deforestation in 2022 as class 54 may include deforestation that recently started with a low intensity.

51. Deforestation started in 2020

52. Deforestation started in 2021

53. Deforestation started in 2022

54. Degradation started in 2022

Specific classes of changes within the mangrove have been mapped by combining the TMF classes of changes (degraded, deforested, regrowing, and recent disturbance) with the GMW dataset (8):

61. Degraded Mangroves (> 10 years ago (<2013)

62. Mangrove recently degraded (2013 -2021)

63. Mangrove regrowing (at least 10 years - 2013-2022)

64. Mangrove regrowing (at least 3 years - 2020-2022)

65. Mangrove deforested (started before 2012)

66. Mangrove deforested (started in 2013-2019)

67. Mangrove recently disturbed (started in 2020-2022)

The **permanent and seasonal water** classes (71 and 72) remain unchanged, but we have added specific classes of forest conversion into permanent or seasonal water (73 and 74) by combining the TMF deforested classes with the GWS classes (7):

73. Deforestation to Permanent Water

74. Deforestation to seasonal water

The **tree plantations** or commodities class is divided into 6 sub-classes based on the type of changes and period of deforestation:

81. Old Plantation: no disturbance has been detected but the pixels are located in the tree plantation mask.

82. Plantation regrowing (disturbed before 2013): disturbances have been detected before 2012 and no disturbances has been observed at least during the past 10 years.

83. Plantation regrowing (disturbed in 2013-2019): disturbances have been detected before 2020 and no disturbances has been observed in the past three years (2020-2022).
84. Conversion to plantation (deforestation started before 2012): deforestation started before 2012 and no regrowing period has been observed.
85. Conversion to plantation (deforestation started in 2013-2019): deforestation started in 2013-2019 and no regrowing period has been observed.
86. Recent Conversion to plantation (started in 2020-2022): deforestation started in the past 3 years.

The **other land cover** class is divided in 4 sub-classes based on the occurrence of an afforestation/regrowing period and on the type of conversion (from non-TMF cover or from water):

91. Other LC without afforestation: This class refers to non TMF cover types and includes savannah, deciduous forest, agriculture, evergreen shrubland, non-vegetated cover.
92. Young afforestation (between 3 and 9 years of regrowth): This class refers to a transition from non TMF cover to a vegetation regrowth that lasted between 3 and 9 years.
93. Old afforestation (between 10 and 20 years of regrowth): This class refers to a transition from non TMF cover to a vegetation regrowth that lasted between 10 and 20 years.
94. Water converted recently into forest regrowth (at least 3 years): This class refers to a transition from water to a vegetation regrowth that lasted at least 3 years.

Bands

The *Transition Map - Sub types* dataset has the following band:

Name	Data type	Description
TransitionMap_Subtypes	Unsigned int8	The type of transition over the monitoring period and sub-classes

Symbology

The *Transition Map - Sub types* dataset has the following values and symbology. The values from 10 to 94 are discrete.

Value	Symbol	Color code (RGB)	Label
10		0,80,0	Undisturbed tropical moist forest
11		10,100,10	Bamboo-dominated forest
12		10,90,60	Undisturbed mangrove
21		30,120,0	Degraded forest with short-duration disturbance (started before 2013)
22		80,150,0	Degraded forest with short-duration disturbance (started in 2013-2021)
23		100,160,40	Degraded forest with long-duration disturbance (started before 2013)

24		120,170,40	Degraded forest with long-duration disturbance (started in 2013-2021)
25		100,160,40	Degraded forest with 2/3 short degradation periods (last degradation started before 2013)
26		120,170,40	Degraded forest with 2/3 short degradation periods (last degradation started in 2013-2021)
31		185,200,60	Old forest regrowth (disturbed before 2003)
32		200,230,60	Young forest regrowth (disturbed in 2003-2012)
33		210,250,60	Very young forest regrowth (disturbed in 2013-2019)
41		255,240,160	Deforestation started before 2012
42		255,150,8	Deforestation started in 2012-2019
51		250,60,10	Deforestation started in 2020
52		170,80,10	Deforestation started in 2021
53		140,100,30	Deforestation started in 2022
54		140,120,60	Degradation started in 2022
61		40,100,50	Degraded mangrove (started before 2013)
62		80,150,0	Mangrove recently degraded (2013 -2021)
63		200,230,60	Mangrove regrowing (at least 10 years - 2013-2022)
64		210,250,60	Mangrove regrowing (at least 3 years - 2020-2022)
65		255,230,110	Mangrove deforested (started before 2012)
66		255,60,10	Mangrove deforested (started in 2013-2019)
67		155,105,70	Mangrove recently disturbed (started in 2020-2022)
71		0,50,150	Permanent Water
72		0,150,200	Seasonal Water
73		0,160,150	Deforestation to permanent Water
74		0,210,210	Deforestation to seasonal water

81		51,99,51	Old plantation
82		98,161,80	Plantation regrowing (disturbed before 2013)
83		188,209,105	Plantation regrowing (disturbed in 2013-2019)
84		255,228,148	Conversion to tree plantation (deforestation started before 2012)
85		250,180,150	Conversion to tree plantation (deforestation started in 2013-2019)
86		204,163,163	Recent conversion to plantation (started in 2020-2022)
91		255,255,255	Other LC without afforestation
92		237,255,215	Young afforestation (between 3 and 9 years of regrowth)
93		224,250,157	Old afforestation (between 10 and 20 years of regrowth)
94		214,250,188	Water converted recently into forest regrowth (at least 3 years)

Undisturbed and degraded tropical moist forest

Purpose

The Undisturbed and degraded tropical moist forest is a simplification of the *Transition Map - Main Classes* and shows the spatial distribution of undisturbed and degraded tropical moist forests remaining at the end of the year 2022. Forests include mangroves and bamboo-dominated forest types.

Description of classes

Class 1. Undisturbed tropical moist forest

We define an undisturbed TMF as a closed evergreen or semi-evergreen forest without any disturbance (degradation or deforestation) observed over the full observation period defined by the Landsat data availability.

Class 2. Degraded tropical moist forest

A degraded forest is a closed evergreen or semi-evergreen forest (covered by existing or regrowing trees) that has been temporary disturbed during a period of maximum 2.5 years (900 days) with the last disruption observation observed in year 2022. It includes different types of degradation such as selective logging, fires, and unusual weather events (hurricane, drought, blowdown).

Class 3. Other land cover

This class includes forest regrowth, deforested land, water, plantations and other conversion.

Bands

The *Undisturbed and degraded tropical moist forest* dataset has the following band:

Name	Data type	Description
Undisturbed_degraded	Unsigned int8	Extent of the undisturbed and degraded TMF at the end of year 2022

Symbology

The *Undisturbed and degraded tropical moist forest* dataset has the following values and symbology.

Value	Symbol	Color code (RGB)	Label
1		0,90,0	Undisturbed tropical moist forest
2		100,155,35	Degraded tropical moist forest
3		255,255,255	Other land cover

Annual change collection

Purpose

The annual change collection depicts the extent and status of the TMF (degraded, deforested, regrowing) for each year between 1990 and 2022). The timeline allows seeing how the TMF is changing over the past 3 decades.
The user is free to create other maps by combining different years according to his interest and needs, e.g. assessing deforestation between two years/periods. Some support is provided on this purpose at the GEE tutorial page.

Description of classes

The following classes were mapped for each year between 1990 and 2022:

Class 1. Undisturbed tropical moist forest

We define an undisturbed TMF as a closed evergreen or semi-evergreen forest without any disturbance (degradation or deforestation) observed on the Landsat valid observations up to the year of analysis. This class includes the mangroves and the bamboo-dominated forest.

Class 2. Degraded tropical moist forest

A degraded forest is a closed evergreen or semi-evergreen forest (covered by existing or regrowing trees) that has been temporary disturbed during a period of maximum 2.5 years (900 days) and that started at the latest during the current year. It includes different types of degradation such as selective logging, fires, and unusual weather events (hurricane, drought, blowdown).

Class 3. Deforested land

This class refers to the permanent conversion of forest into non-forested land that started at the latest the current year. Disturbances were observed over more than 2.5 years and no vegetative regrowth was detected. It includes three subcategories of converted land cover: (a) water bodies (new dams and river flow changes); (b) tree plantations; and (c) other land cover that includes infrastructure, agriculture and mining. It also includes deforestation areas that follow degradation.

Class 4. Forest regrowth

This class refers to a pixel that has been deforested before the current year and that is currently regrowing. A minimum 3-years duration (2020-2022) of permanent moist forest cover presence is needed to classify a pixel as forest regrowth (to avoid confusion with agriculture). It also includes in TMF-2022 afforestation of at least 3 years of regrowth (classes 92-94 from the Transition Map - Sub types.

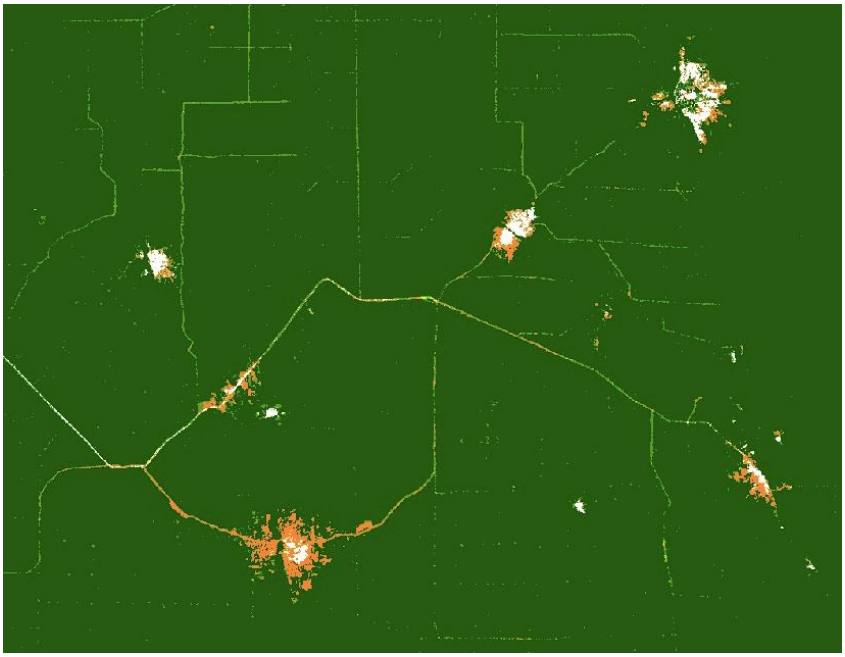
Class 5. Permanent and seasonal water

This class includes permanent and seasonal water from the GWS dataset (5)

Class 6. Other land cover

No data and non TMF cover which includes savannah, deciduous forest, agriculture, evergreen shrubland, non-vegetated cover and afforestation.

An example of the 2010 annual change map is shown below at the border of the Republic of the Congo and the Central African Republic. Deforestation areas in 2010 are represented in orange while degraded forests from selective logging activities (logging gaps and logging roads) appear in light green.



Bands

The *Annual change collection* dataset has the following band (e.g. year 2010):

Name	Data type	Description
AnnualChange	Unsigned int8	TMF extent, related disturbances and post-disturbances for year 2010

Symbology

The *Annual change collection* dataset has the following values and symbology. The values from 1 to 6 are discrete.

Value	Symbol	Color code (RGB)	Label
1		0,90,0	Undisturbed tropical moist forest
2		100,155,35	Degraded tropical moist forest
3		255,135,15	Deforested land
4		210,250,60	Tropical moist forest regrowth
5		0,140,190	Permanent and seasonal water
6		255,255,255	Other land cover

Metrics of timing and intensity of the disturbances

Degradation year

Purpose/Description

The degradation year is the year when the forest cover has been degraded for the first time. It concerns all the degraded forest classes of the *transition map* including the mangroves and the recent degradation (2022).

Bands

Name	Data type	Description
DegradationYear	Unsigned int16	Date of degradation

Symbology

The *degradation year* dataset has the following range values and symbology (color ramp). The values from 1982 to 2022 are discrete.

Value	Symbol	Color code (RGB)
Range between 1982 to 2022		(40,146,199) to (179,8,0)

Deforestation year

Purpose/Description

The deforestation year is the year when the forest cover has been deforested for the first time (followed or not by a regrowth). It concerns all the deforested classes of the *transition map* including the mangroves that have been deforested, the conversion into tree plantation, the conversion into water and the recent deforestation (2020-2022).

Bands

Name	Data type	Description
DeforestationYear	Unsigned int16	Date of deforestation

Symbology

The *deforestation year* dataset has the following range of values and symbology (color ramp). The values from 1982 to 2022 are discrete.

Value	Symbol	Color code (RGB)
Range between 1982 to 2022		(40,146,199) to (179,8,0)

Deforestation after degradation year (only available on GEE)

Purpose/Description

The deforestation after degradation year is the year when the forest cover that was previously degraded has been deforested (followed or not by a regrowth). It concerns all the deforested classes of the *transition map* including the mangroves that have been deforested, the conversion into tree plantation and the recent deforestation (2020-2022).

Bands

Name	Data type	Description
DeforestationAfterDegradationYear	Unsigned int16	Date of deforestation after degradation

Symbology

The *deforestation after degradation year* dataset has the following range of values and symbology (color ramp). The values from 1982 to 2022 are discrete.

Value	Symbol	Color code (RGB)
Range between 1982 to 2022		(40,146,199) to (179,8,0)

Duration (only available on GEE)

Purpose/Description

The *duration* corresponds to the number of days between the first and last disruptions detected for all the areas classified as TMF change in the *transition map*. Combined with the *intensity* metric, they constitute a proxy for characterizing the change intensity and impact level of forest disturbances.

Bands

Name	Data type	Description
Duration	Unsigned int16	Duration (n days)

Symbology

The *duration* dataset has the following range of values and symbology (color ramp). The values from 1 to 6000 are discrete.

Value	Symbol	Color code (RGB)
Range between 1 to 6000		(0,128,0) to (255,0,0)

Number of annual disruption observations (only available on GEE)

Purpose/Description

This dataset provides the number of disruption observations on an annual basis. A disruption observation is defined as an absence of tree foliage cover within a Landsat pixel for a single-date observation. Users can click anywhere on the explorer within the TMF cover to see this dataset (shown as a pixel based temporal profile) for a particular place.

The *Number of annual disruption observations* dataset is available in Google Earth Engine as an image collection with 41 images. Each image contains the following band:

Bands

Name	Data type	Description
AnnualDisruptionObs	Unsigned int16	Number of annual disruption observation

Intensity (only available on GEE)

Purpose/Description

The *intensity* of the disturbance documents the total number of disruptions detected over the full observation period (from *the first year of the monitoring period* to 2022) for all the areas classified as TMF change in the *transition map*. Combined with the *duration* metric, they constitute a proxy for characterizing the change intensity and impact level of forest disturbances.

Bands

Name	Data type	Description
Intensity	Unsigned int16	Intensity of the disturbance

Symbology

The *intensity* dataset has the following range of values and symbology (color ramp). The values from 1 to 500 are discrete.

Value	Symbol	Color code (RGB)
Range between 1 to 500		(0,128,0) to (255,0,0)

Areas of deforestation after degradation (only available on GEE)

The *Areas of deforestation after degradation* groups all pixels that have been first degraded and then deforested (followed or not by regrowth).

Areas of deforestation after regrowth (only available on GEE)

The *Areas of deforestation after regrowth* groups all pixels of forest regrowth of minimum 10 years old that have been deforested later on.

Metadata datasets

The full Landsat archive covers the period 1982-2022 but the Landsat archive coverage presents large geographical and temporal unevenness (5,7). We have addressed these geographic and temporal discontinuities of the Landsat archive by determining at the pixel level (i) a reference initial period (baseline) of at least four years (increasing when the annual number of valid observations is low) for mapping the initial TMF extent and (ii) a monitoring period for detecting the changes. These two periods vary at the pixel level. Two metadata are provided in GEE: (i) *the first year of the monitoring period*, and (ii) *the annual number of valid observations* from 1982 to 2022. Users can click anywhere on the explorer within the study area to see the metadata datasets (shown as pixel based temporal profiles) for a particular place. These statistics can be used as a proxy measure of confidence as the precision of the metrics at any location improves as the number of valid observations increases.

Bands

Name	Data type	Description
StartMonitoringPeriod	unsigned int16	The first year of the monitoring period
ValidObs	unsigned int8	The annual number of valid observations

Using Symbology Files

To use the *.qml file in QGIS 2.18.15:

Double click on the layer to open the Layer properties dialog

At the bottom of the dialog, click Style | Load Style…

Navigate to the location of the *.qml file and click Open

To use the *.lyr file in ArcGIS 10.4:

Double click on the layer to open the Layer properties dialog

Click on the Symbology tab and change the rendered to Unique Values

Click ‘Yes’ when prompted to build an attribute table

Click on the Import Symbology button in the top right

Navigate to the location of the *.lyr file and click Add

Procedures for earlier versions of the software are similar. For more information see the online documentation for QGIS (here) and for ArcGIS (here).

Using the Metadata files

The metadata files contain minimal information on the associated datasets. Much more information on the method, derivation of data and technical specification is given in the Science Advances paper and in this user guide.

To use the *.xml metadatafiles in QGIS 2.18.15:

Install the Metatools Plugin

Select the dataset you want to import the metadata into

Click Plugins | Metatools | Import Metadata

Select the *.xml metadata file

To use the *.xml metadatafiles in ArcGIS 10.4:

Open ArcCatalog and click on the dataset that you want to import metadata into

Click on the Description tab and then Import

In the Source Metadata box, enter the location of the *.xml metadata file

Set the Import Type as FROM_ARCGIS and click OK

Using Web Map Tiled Services (WMTS)

The Tropical Moist Forest data can also be used within other websites or GIS clients by using what are called 'Web Map Services'. These services provide a direct link to the cached images that are used in the Tropical Moist Forest Explorer and are the best option if you simply want to map the data and produce cartographic products. They are not suitable for analysis as the data are represented only as RGB images. The WMS url is: https://ies-ows.jrc.ec.europa.eu/iforce/tmf_v1/wms.py?

License

The TMF data described are provided free of charge and, without restriction of use. They were produced under the Roadless-For pilot project (Making efficient use of EU climate finance: Using roads as an early performance indicator for REDD+ projects) and the Lot 2 ('TroFoMo' - Tropical moist Forest Monitoring) of the ForMonPol Administrative Arrangement (Forest Monitoring for Policies) funded by the Directorate-General for Climate Action of the European Commission (DG-CLIMA).

Citation

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If you are using the data as a layer in a published map, please include the following attribution text: 'Source: EC JRC'

Contact

If you have any feedback on the Tropical Moist Forest data please contact:
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Cited references

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