Tree Cover Dynamics CONUS Dataset

Description

The Tree Cover Dynamics (TCD) Conterminous United States (CONUS) dataset is a suite of 30 m wall-to-wall products, derived from USGS Landsat-4, Landsat-5 and Landsat-7 Collection 1 Analysis Ready Data (ARD), defining for each year: (i) the estimated percent tree cover (PTC), (ii) if tree cover loss is detected, the estimated percent tree cover decrease from the previous year (ΔPTC), (iii) if tree cover loss is detected, the Landsat acquisition dates bounding the tree cover loss event (i.e., the last valid observation before the loss, and the first valid observation after the loss) and (iv) a forest status thematic map (three thematic classes: stable forest, stable non-forest, forest cover loss). The products are available for every year from 1985 to 2019. The dataset is provided as georeferenced GeoTIFF images, defined in the CONUS Albers Equal-Area Conic map projection at 30m resolution.

Algorithm Description and Quality Assessment

The detailed description of the algorithm and validation of the TCD CONUS products, including precision and accuracy estimated through comparison with an independent reference dataset derived from the interpretation of high resolution aerial imagery, are reported in:

Egorov, A., Roy, D. P., & Boschetti, L. (2023). Generation and comprehensive validation of 30 m conterminous United States Landsat percent tree cover and forest cover loss annual products. Science of Remote Sensing, 7, 100084

Authors and Credits

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Dataset Metadata

Characteristic	Description
Collection	TCD CONUS
Number Layers	5
DOI	
File Format	Georeferenced Tagged Image File Format (GeoTIFF), internally DEFLATE compressed
File Size	68 Mb – 3.3 GB
Columns × Rows	165,000 × 105,000
Pixel Size	30 m
Temporal Resolution	1 year
Temporal Extent	1985 to 2019
Spatial Extent	CONUS
Geographic Dimensions	66°52'58.54"W – 124°51'5.88"W 24°23'40.12"N – 49°23'25.43"N
Datum	World Geodetic System (WGS84)
Projection	Albers Equal Area
First standard parallel	29.5°
Second standard parallel	45.5°
Longitude of central meridian	−96.0°
Latitude of projection origin	23.0
False easting (meters)	0.0
False northing (meters)	0.0

Product Specification

Product Name	Description	Units	Data Type	Fill Value	Valid Range
TCD.CONUS.*YYYY*.PTC.v1.tif	PTC – Estimated Percent Tree Cover in the reporting year (*YYYY*). 0-100: percent tree cover [%], 0 corresponds to all treeless areas	percent	uint8	255	0 – 100
TCD.CONUS.*YYYY*.DPTC.v1.tif	ΔPTC – Estimated decrease in PTC due to a tree cover loss event detected in the reporting year (*YYYY*). 1-100: PTC decrease [%] 0: no tree cover loss events detected in the reporting year.	percent	uint8	255	0 – 100
TCD.CONUS.*YYYY*.DPTC.PRE.DATE.v1.tif	t_{pre} – date of the last cloud-free Landsat acquisition before a tree cover loss event detected in the reporting year (*YYYY*). t_{pre} is expressed in YYYYMMDD format 0: no tree cover loss event detected in the reporting year.	date	uint32	4294967295	0, 19821111 – 20211231
TCD.CONUS.*YYYY*.DPTC.POST.DATE.v1.tif	t_{post} – date of the first cloud-free Landsat acquisition after a tree cover loss event detected in the reporting year (*YYYY*). t_{post} is expressed in YYYYMMDD format 0: no tree cover loss event detected in the reporting year.	date	uint32	4294967295	0, 19821111 – 20211231
TCD.CONUS.*YYYY*.FORESTMAP.v1.tif	Categorical map, describing the forest cover status in the reporting year (*YYYY*). 1: forest cover loss detected in the year (ΔPTC > 10%) 2: stable forest (PTC > 10%, no forest cover loss) 3: stable non-forest (PTC ≤10%, no forest cover loss)	categories	uint8	255	1 – 3

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