NASA LANCE MODIS Global Flood Product — LAADS Product Description

Reprocessed Historical Archive (2003-2025): MCDWD_L3

Ongoing NRT Archive (2026 –): MCDWD_L3_NRT

Overview

NASA's Land Atmosphere Near-Real-Time (NRT) Capability for Earth observation (LANCE) produces daily global surface water and flood maps from MODIS (Terra/Aqua) images. The MODIS flood product is provided as a daily Level-3 (L3) 250-m gridded composite on a global tile grid in a Linear Latitude/Longitude (LLL) projection.

This LAADS release provides two MODIS collections:

- **Reprocessed historical archive (2003 – 2025):** shortname **MCDWD_L3**
- **Forward-processed NRT archive (2026 – present):** shortname **MCDWD_L3_NRT**

Please note that the reprocessed historical datasets before 2003 (i.e., 2000-055 – 2002-365) are undergoing further quality evaluation before release.

A detailed algorithm description, layer definitions, evaluation, and usage guidance are provided in the full **MCDWD/VCDWD User Guide (Rev F),** that is available from the product homepage: https://earthdata.nasa.gov/global-flood-product

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Data access (LAADS)

LAADS directories (Collection 6.1):

- **MCDWD_L3 (reprocessed historical archive, 2003–2025):** https://ladsweb.modaps.eosdis.nasa.gov/archive/allData/61/MCDWD_L3/
- **MCDWD_L3_NRT (ongoing archived NRT record, 2026–present):** https://ladsweb.modaps.eosdis.nasa.gov/archive/allData/61/MCDWD_L3_NRT/

Earthdata Login required: Users must be logged in with a free NASA Earthdata Login account to access LAADS directories and files. Register at: **https://urs.earthdata.nasa.gov/users/new**

Note on NRT distribution: Current NRT products remain available via the LANCE NRT download sites (primary: **nrt3.modaps.eosdis.nasa.gov**, backup: **nrt4.modaps.eosdis.nasa.gov**), for about 1 week. LAADS distribution is intended to provide stable access to archive holdings.

The reprocessed historical products (MCDWD_L3) are produced with standard (science-quality) inputs while the forward-processed NRT products (MCD_L3_NRT) are generated using only NRT inputs. Consult the LANCE NRT versus Standard products' comparison (specifically for MODIS) to better understand the differences. In this case, the reprocessed historical products, available as a single HDF file per tile, per day from LAADS, are not strictly considered "standard" products by NASA's definition, but they do have a qualitative edge over the forward-processed NRT products (see "Key Differences" section below). The operational LANCE NRT download sites also offer GeoTIFF files for each of the four flood layers in the primary HDF product file; however, no flood product GeoTIFFs are distributed by LAADS. The User Guide provides examples of how to extract layers from the HDF product files to GeoTIFF using GDAL (Geospatial Data Abstraction Library) tools.

What the product represents

For each date and tile, the product composites water detections from MODIS surface reflectance observations over short time windows (1, 2, or 3 days), and classifies detected water relative to a reference water mask.

Flood layer class values (per pixel):

- 0 = No water detected
- 1 = Surface water
- 2 = Recurring flood
- 3 = Flood
- 255 = Insufficient data. 255 indicates that there were insufficient valid surface observations to meet threshold requirements to label a pixel as water. Typically, this is due to cloud cover, but other missing observations and data gaps may also contribute to this condition.

Key layers

The MODIS flood product is distributed as **one HDF file per tile, per day**, containing multiple flood composites and supporting layers. The file format is HDF4 (EOS-HDF / HDF-EOS2 Grid).

Flood composites included:

- **FloodCS_1Day_250m:** 1-day composite with cloud-shadow screening applied
- **Flood_1Day_250m:** 1-day composite without cloud-shadow screening
- **Flood_2Day_250m:** 2-day composite
- **Flood_3Day_250m:** 3-day composite

Cloud-shadow screening is applied only to the **FloodCS_1Day** layer (see User Guide for more details).

Counts/ancillary layers (interpretation aids)
Counts layers summarize observation availability (e.g., total possible observations, valid clear-sky observations, and total water detections) during each compositing window. These layers can be used for more detailed investigation of a product, or for potentially developing custom decision-rules/composites with different threshold requirements.

Key differences: Reprocessed historical archive (MCDWD_L3) vs Forward-processed NRT archive (MCDWD_L3_NRT)

Why two holdings: The daily operational production yields the NRT (near-real-time) flood product (MCDWD_L3_NRT). The historical archive (MCDWD_L3, 2003-2025) was generated retrospectively using the standard (science-processing) MODIS input stream to produce a consistent long-term record and to minimize potential artifacts that can arise from latency-optimized NRT processing. Both holdings provide the same MODIS flood-map layers and use the same underlying science approach. The NRT vs standard processing differences primarily affect (1) **geolocation**, and (2) **atmospheric correction / surface reflectance quality**, both of which can propagate into the flood product. See the MODIS LANCE NRT processing documentation for details on NRT vs standard processing: https://www.earthdata.nasa.gov/learn/earth-observation-data-basics/near-real-time-versus-standard-products

1) Geolocation inputs (attitude/ephemeris differences)
To meet latency requirements, NRT processing uses expedited geolocation inputs (e.g., Terra uses attitude/ephemeris information embedded in Level-0 data rather than the standard flight-dynamics products, and Aqua relies on predicted ephemeris/attitude that are later refined in standard processing). As a result, NRT flood maps can occasionally exhibit small geolocation-related artifacts or offsets, potentially resulting in localized flood false-positives or false-negatives. Although uncommon, these artifacts are eliminated in the reprocessed archive.

2) MOD09 surface reflectance inputs

The flood product is primarily derived from MODIS surface reflectance (MOD09), an atmospherically corrected product. The NRT processing stream uses expedited inputs and modified upstream production rules, including, for some atmosphere-related inputs, allowing use of ancillary datasets from earlier time periods when best same-day ancillaries are not yet available. These differences can propagate into the flood product through reflectance values and QA screening, typically as subtle differences in detected water/flood extent or the spatial pattern of "insufficient data," which is largely dependent on cloud flags.

Recommended use:

- **Operational monitoring / rapid response:** use **MCDWD_L3_NRT**
- **Historical mapping, validation, and time-series purposes (2003–2025):** use the **reprocessed historical archive (MCDWD_L3)** for improved geolocation consistency and more stable atmospheric/ancillary inputs.

File naming

MODIS product filenames follow the pattern:
<SHORTNAME>.A<YYYYDOY>.<TILE>.<COLLECTION>.<PRODTIMESTAMP>.<FILEFORMAT>
Where:

- <SHORTNAME>: MCDWD_L3 for the reprocessed 2003-2025 archive, and MCDWD_L3_NRT for the NRT archive (2026-).
- <YYYYDOY>: Year-DOY. E.g., 2025361 = 12/27/2022
- <TILE>: Linear latitude/longitude grid (10x10 degree tiles), in h-v nomenclature. See User Guide for map of product tiles (figure 1), or https://modis-land.gsfc.nasa.gov/MODLAND_grid.html for description.
- <COLLECTION>: 061 for MODIS Collection 6.1.
- <PRODTIMESTAMP>: production time-stamp.

Example (NRT): **MCDWD_L3_NRT.A2022361.h19v06.061.2022362024142.hdf**

Support

Please see the full User Guide for additional information on product usage, caveats, and other details. The product homepage contains summary information, including a tile map and FAQs: https://www.earthdata.nasa.gov/global-flood-product

Contact Earthdata Support for product support: earthdata-support@nasa.gov

A low-volume distribution-only mailing list is also maintained for flood product announcements. To subscribe, send an e-mail to floodmap-join@lists.nasa.gov, and to unsubscribe, send an e-mail to floodmap-leave@lists.nasa.gov.

Citations

NRT product:

MODIS Aqua+Terra Global Flood Product MCDWD_L3_NRT distributed from NASA LAADS DAAC. Available on-line [https://www.earthdata.nasa.gov/global-flood-product]. DOI: 10.5067/MODIS/MCDWD_L3_NRT.061

Reprocessed archive product:

MODIS Aqua+Terra Global Flood Product MCDWD_L3 distributed from NASA LAADS DAAC. Available on-line [https://www.earthdata.nasa.gov/global-flood-product]. DOI: 10.5067/MODIS/MCDWD_L3.061