



Modis Product Extractor

▪ Buy a license and Installing

The installation process for the tool is simple and hassle-free. Upon acquiring a license, you will be provided with a utility called "ID Finder." Share your ID with us, and in return, you will receive the installer for the registered version. Execute the installer and the tool will be installed effortlessly, requiring no additional activation key. After installation, you can easily access the tool either by clicking on the desktop shortcut or by searching for "Modis Product Extractor" in your computer's program list.

Using Modis Product Extractor

MODIS, which stands for "Moderate Resolution Imaging Spectroradiometer," is a key instrument aboard two NASA satellite missions: the Terra satellite (launched in 1999) and the Aqua satellite (launched in 2002). MODIS is designed to provide a wide range of Earth observation data, making it a vital tool for monitoring our planet's environment and climate. MODIS products refer to the various datasets and information derived from the data collected by MODIS instruments on NASA's Terra and Aqua satellites. MODIS products provide a wide range of Earth



observation data that cover various aspects of the Earth's surface, atmosphere, and oceans. These products are valuable for researchers, scientists, environmentalists, and policymakers, as they offer insights into our planet's environmental and climatic conditions. You can find the list of products in appendix (below of this article).

[Modis Product Extractor](#) is a user-friendly tool created to extract data from HDF files for various Modis products. The tool comprises two tabs: the first one labeled 'Extract Data' and the second one 'Specify Regions.' To utilize the second tab, you need to select files and input Groups and variable names in the first tab.

Begin by selecting the HDF files using the first icon in the top bar. To view the Groups and variables of the files, click the third icon on the top bar.

You have three options for data extraction:

1. Extract data for saved regions, which is suitable for regions saved in the second tab.
2. Extract data for a list of stations. You can input the station list manually or by using a file.
3. Extract data for a specific point or station. You can enter latitude and longitude as a decimal value or in degrees, minutes, or seconds.



There is a combobox available for changing the time (the time based on each file), but it becomes active after the extraction is completed.

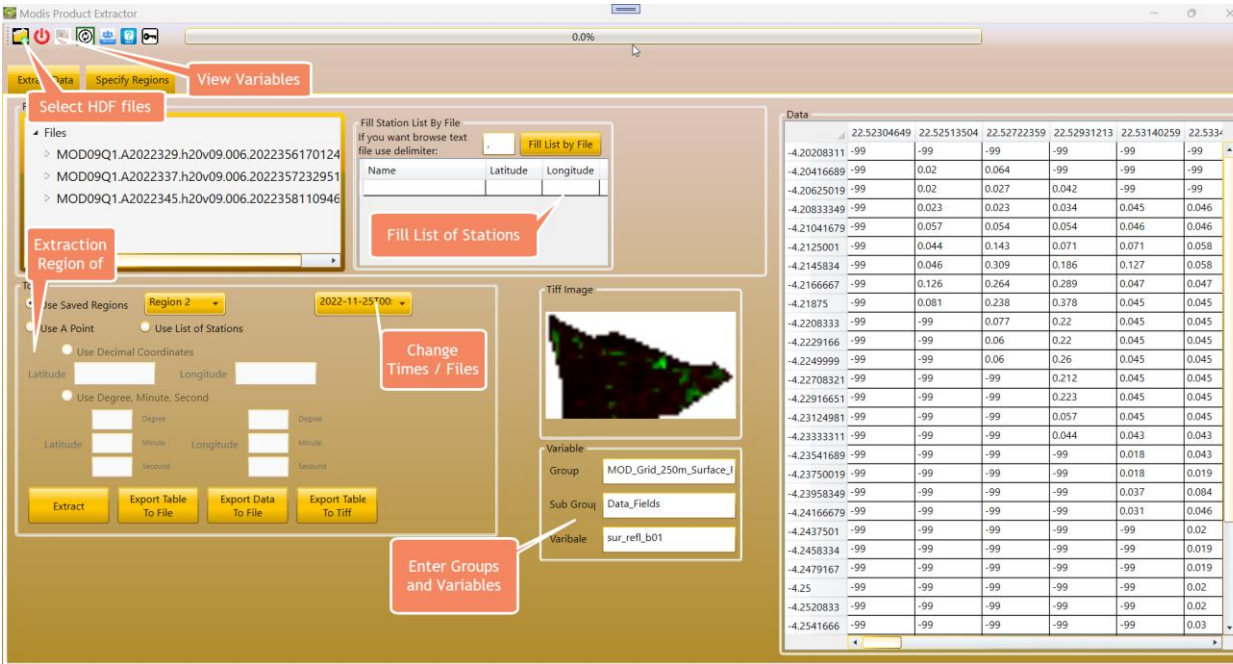


Fig1 – Extract Data from HDF file

The crucial step is to provide the Group, SubGroup, and variable names, which can be found using the third icon at the topbar (Fig2). Typically, in [Modis HDF files](#), the subgroup is named 'Data_Fields'.

After clicking the 'Extract' button, three buttons will become active. By clicking 'Export Table to File,' you can save the current table to a file. Clicking 'Export Data to File' allows you to save the extracted data for all files to a file. 'Export Table to



TIFF' enables you to save the current table to a file in TIFF format. After saving, you can view the TIFF file in Windows or within the tool.

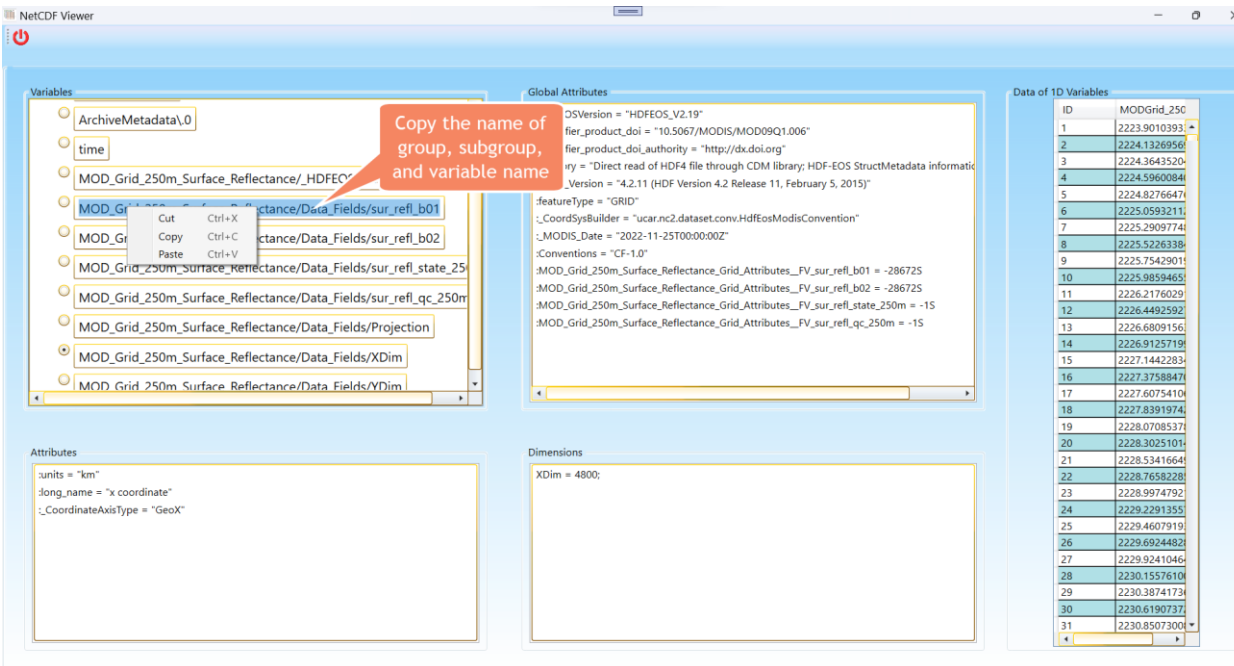


Fig2 – View Variable of HDF File

In the second tab, you can define a region. To begin, select the boundary points of your region by double-clicking on the map. It's important to ensure that the boundary points are continuous and consecutive. The Modis dataset is a small-scale data source, and if you choose a large region, you will be dealing with a substantial number of cells. Consequently, saving and extracting such a large dataset can be time-consuming.



Once you've defined the boundary points, the next step is to create a region. During this process, the tool's underlying code will generate an enclosed rectangle for your specified region and then check all the Modis cells within this rectangular area to determine whether they fall within your defined region or not. During extraction, all cells outside your designated region will be assigned a value of -99, while cells within the region will retain the values retrieved from the HDF file, which may include numeric values or NaN, depending on your HDF files.

If you check the 'Show Grids' checkbox before creating the region, the tool will display the Modis grids (cells) after the region is created.

You can utilize all the saved regions here in the first tab for extraction. Additionally, you have the option to view or delete saved regions or use ESRI shapefiles to create regions within this tab.

Important to note, all the HDF files used as input should have similar tiles and variables. Users can find the tiles corresponding to their region of interest through the [provided link](#), ensuring consistency in the extraction process.

The HDF files of Modis products are available on this [FTP server](#)



Fig3 – Specify regions

Appendix

What are Modis products?

MODIS (Moderate Resolution Imaging Spectroradiometer) is a key instrument onboard two NASA satellites: Terra and Aqua. MODIS collects data about the Earth's surface and atmosphere, providing valuable information for various applications such as climate modeling, land cover analysis, and environmental monitoring.



MODIS data is processed into different products, which are derived from the sensor's measurements and contain information about various Earth system parameters. Some common MODIS products include:

Surface Reflectance: These products provide measurements of the amount of solar radiation reflected by the Earth's surface at different wavelengths. Surface reflectance data can be used to analyze land cover, vegetation health, and surface properties.

Land Surface Temperature: This product provides information about the temperature of the Earth's land surface. It helps in studying urban heat islands, monitoring fires, and analyzing thermal patterns in different regions.

Vegetation Indices: MODIS offers several vegetation indices, such as the Normalized Difference Vegetation Index (NDVI) and Enhanced Vegetation Index (EVI). These indices provide insights into vegetation growth, health, and phenology. They are widely used for studying vegetation dynamics, crop monitoring, and assessing ecosystem productivity.

Aerosol Optical Depth: This product measures the number of atmospheric aerosols, such as dust, smoke, and pollutants, present in the atmosphere. It helps in



monitoring air quality, studying aerosol transport, and assessing the impact of aerosols on climate.

Sea Surface Temperature: MODIS measures the temperature of the Earth's oceans, providing valuable data for oceanographic research, monitoring of marine ecosystems, and studying ocean currents and heat transfer.

Cloud Properties: MODIS products include information about cloud cover, cloud-top temperature, and cloud optical properties. These data are used in weather forecasting, climate modeling, and studying cloud dynamics.

These are just a few examples of the wide range of MODIS products available. Each product provides specific information about different Earth system parameters and is used for diverse scientific and environmental applications. The availability and specific details of MODIS products can be obtained from NASA's Earth Observing System Data and Information System (EOSDIS) or other authorized data distribution centers.

Modis Scales



MODIS (Moderate Resolution Imaging Spectroradiometer) is a sensor on board NASA's Terra and Aqua Earth-observing satellites. MODIS products are known for their diverse spatial and temporal scales, allowing for a wide range of applications in Earth science. Here's a general overview of the spatial and temporal scales of MODIS products:

1. Spatial Scale:

- Moderate Resolution: MODIS provides imagery at moderate spatial resolution, which means it can capture details over relatively large areas. The spatial resolutions for most MODIS products are approximately 250 meters, 500 meters, and 1,000 meters, depending on the specific band or product. These resolutions are suitable for a variety of applications, including land cover classification, vegetation monitoring, and cloud detection.

2. Temporal Scale:

- High Temporal Frequency: One of the key strengths of MODIS is its high temporal frequency. It captures data on a daily basis, allowing for the monitoring



of Earth's dynamic processes with high temporal resolution. This daily revisit time is especially valuable for studying changes in land cover, vegetation health, and atmospheric conditions.

- Long-Term Record: MODIS has been in operation since the launch of the Terra satellite in 1999 and the Aqua satellite in 2002. This long-term record provides valuable time series data for climate studies, trend analysis, and long-term environmental monitoring.

- Global Coverage: MODIS covers the entire Earth's surface on a daily basis, providing a truly global perspective on various Earth science variables.

MODIS products encompass a wide range of Earth science parameters, including land surface temperature, vegetation indices, sea surface temperature, atmospheric aerosols, cloud properties, and more. Researchers and scientists utilize these products to monitor and analyze Earth's physical and biological systems at various spatial and temporal scales, making MODIS a vital tool in Earth observation and climate studies.

What is the file format of Modis products?



MODIS products are typically distributed in specific file formats that are optimized for storing and organizing the satellite data. The two primary file formats used for MODIS products are:

- 1- Hierarchical Data Format (HDF): HDF is a flexible and self-describing file format commonly used in Earth science data. MODIS products are often distributed in HDF-EOS (Hierarchical Data Format - Earth Observing System) or HDF5 format. HDF files can store multiple data layers, metadata, and geospatial information, making them suitable for multidimensional and georeferenced data.
- 2- Network Common Data Form (NetCDF): NetCDF is another widely used file format in Earth science. It provides a framework for storing and sharing scientific data in a platform-independent manner. NetCDF files can store multidimensional arrays, metadata, and coordinate information, making them suitable for MODIS products that have spatial and temporal dimensions.

Both HDF and NetCDF formats offer advantages for managing large and complex datasets, such as those generated by MODIS. They support efficient data access,



compression, and metadata organization, which are crucial for handling the high-resolution and high-volume data produced by MODIS instruments.

It's important to note that MODIS data can be distributed in different subsets or levels of processing, such as Level-1 (raw) data, Level-2 (geophysical parameters), or Level-3 (aggregated or gridded) data. Each level of processing may have its own specific file format, but HDF and NetCDF remain common choices for storing and distributing MODIS products across different processing levels.

When accessing MODIS data, it is advisable to consult the specific data provider or NASA's Earth Observing System Data and Information System (EOSDIS) to determine the file format and access methods for the desired MODIS products.

Brief Description of MODIS Products

Certainly, here's a brief description of the MODIS products you've listed:

1. MOD09A1: MODIS Surface Reflectance, providing information about surface reflectance in various spectral bands.



2. MOD09CMG: MODIS Climate Modeling Grid (CMG) Surface Reflectance, used for climate modeling purposes.

3. MOD09GA: MODIS Surface Reflectance for Global Agriculture, offering data suitable for agricultural applications.

4. MOD09GQ: MODIS Surface Reflectance for Global Agriculture (Quickview), a version optimized for quick viewing.

5. MOD09Q1: MODIS Surface Reflectance, similar to MOD09A1 but with a reduced temporal resolution.

6. MOD11A1: MODIS Land Surface Temperature and Emissivity at 1 km spatial resolution.



7. MOD11A2: MODIS Land Surface Temperature and Emissivity at 5 km spatial resolution.

8. MOD11B1: MODIS Land Surface Temperature and Emissivity (Collection 6) at 1 km spatial resolution.

9. MOD11B2: MODIS Land Surface Temperature and Emissivity (Collection 6) at 5 km spatial resolution.

10. MOD11B3: MODIS Land Surface Temperature and Emissivity (Collection 6) at 10 km spatial resolution.

11. MOD11C1: MODIS Land Surface Temperature and Emissivity Climate Modeling Grid (CMG) at 1 km spatial resolution.



12. MOD11C2: MODIS Land Surface Temperature and Emissivity Climate Modeling

Grid (CMG) at 5 km spatial resolution.

13. MOD11C3: MODIS Land Surface Temperature and Emissivity Climate Modeling

Grid (CMG) at 10 km spatial resolution.

14. MOD11_L2: MODIS Level 2 Land Surface Temperature and Emissivity data.

15. MOD13A1: MODIS Vegetation Indices product, including the Normalized Difference Vegetation Index (NDVI) and Enhanced Vegetation Index (EVI).

16. MOD13A2: MODIS Vegetation Indices (2 km), providing NDVI and EVI at a lower spatial resolution.

17. MOD13A3: MODIS Vegetation Indices gridded to a 16-day interval (Collection 6).



18. MOD13C1: MODIS Vegetation Indices Climate Modeling Grid (CMG).

19. MOD13C2: MODIS Vegetation Indices Climate Modeling Grid (CMG) at a 0.05-degree resolution.

20. MOD13Q1: MODIS Vegetation Indices at a 16-day interval (Collection 6).

21. MOD14: MODIS Fire and Thermal Anomalies product, used for detecting active fires and thermal anomalies.

22. MOD14A1: MODIS Fire and Thermal Anomalies product, providing detailed information on fire characteristics.

23. MOD14A2: MODIS Fire and Thermal Anomalies (5-minute) product.



24. MOD15A2H: MODIS Leaf Area Index and Fraction of Photosynthetically Active Radiation (PAR) Absorbed by Vegetation.

25. MOD16A2: MODIS Evapotranspiration and Gross Primary Productivity product.

26. MOD16A2GF: MODIS Evapotranspiration and Gross Primary Productivity (Global Fire-Energy) product.

27. MOD16A3GF: MODIS Evapotranspiration and Gross Primary Productivity (Global Fire-Energy) product (3-day).

28. MOD17A2H: MODIS Net Primary Productivity (NPP) product.

29. MOD17A2HGF: MODIS Net Primary Productivity (NPP) product with Global Fire-Energy.



30. MOD17A3HGF: MODIS Net Primary Productivity (NPP) product with Global Fire-Energy (3-day).

31. MOD21: MODIS Land Cover Type product.

32. MOD21A1D: MODIS Land Cover Dynamics product.

33. MOD21A1N: MODIS Land Cover Dynamics Normalized Difference Vegetation Index (NDVI) product.

34. MOD21A2: MODIS Land Cover Dynamics Gridded to a 5-minute spatial resolution.

35. MOD21C1: MODIS Land Cover Dynamics Climate Modeling Grid (CMG) product.



36. MOD21C2: MODIS Land Cover Dynamics Climate Modeling Grid (CMG) at 5 km spatial resolution.

37. MOD21C3: MODIS Land Cover Dynamics Climate Modeling Grid (CMG) at 10 km spatial resolution.

38. MOD28C2: MODIS Snow and Ice Cover product.

39. MOD28C3: MODIS Snow and Ice Cover product (Collection 6).

40. MOD44B: MODIS Vegetation Continuous Fields (VCF) product.

These MODIS products cover a wide range of Earth science parameters and are used for various research and monitoring purposes. The product names typically include information about the parameters measured and the data processing level.