



EOSDIS

NASA'S EARTH OBSERVING SYSTEM
DATA AND INFORMATION SYSTEM

Google Dataset Search & CMR

ESIP Winter 2019

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**July 9th 2013, Chapel Hill NC –
around 3:30pm**

What was at stake

Traditionally it has been difficult to get your collection landing pages near the top of a Google search.

First exposure

‘Facilitating Dataset Discovery using new developments within schema.org’ @ Summer ESIP 2013, Peter Fox

Adding schema.org ‘Dataset’ markup to your collection landing pages *might* solve the problem

Nothing (for 5 years)...

But...

- RDFa markup carried over from ECHO to CMR
- Refined markup based on schema.org changes and ESIP semantic web recommendations
- Waited patiently.

**2013-2018 CMR and
schema.org**

Landing Page Markup (1 of 3)

```
<div itemscope itemtype="http://schema.org/Dataset">
  <meta itemprop="name" content="MODIS/Terra Calibrated Radiances 5-Min L1B Swath 250m V006"/>
  <meta itemprop="alternateName" content="MOD02QKM_6"/>
  <meta itemprop="version" content="6"/>
  ...
</div>

<span itemprop='description'>The MODIS/Terra Calibrated Radiances 5-Min L1B Swath 250m...</span>

<meta itemprop="spatialCoverage">
  <div vocab="http://schema.org/" typeof="Place">
    <div property="geo" typeof="GeoShape">
      <meta property="box" content="90.0 -180.0 90.0 180.0" />
    </div>
  </div>
</meta>

<time itemprop="temporalCoverage" datetime="2000-02-24T00:00:00.000Z/..">2000-02-24 to present</time>

<meta itemprop="keywords" content="EARTH SCIENCE,SPECTRAL/ENGINEERING,INFRARED WAVELENGTHS"/>
```

Landing Page Markup (2 of 3)

```
<li itemprop="identifier" itemscope="" itemtype="http://schema.org/PropertyValue">
  <h5>DOI</h5>
  <p>
    <meta itemprop="propertyID" content="DOI">
    <span itemprop="value">10.5067/MODIS/MOD02QKM.006</span>
  </p>
</li>

<li itemprop="citation" itemtype="http://schema.org/CreativeWork" itemscope>
  <h5 itemprop="headline">MODIS/Terra Calibrated Radiances 5-Min L1B Swath 250m V006</h5>
  <span itemprop="author">MCST Team</span>
  <span itemprop="publisher">L1 and Atmosphere Archive and Distribution System (LAADS)</span>
  <a itemprop="url" href="http://example.com">https://dx.doi.org/10.5067/MODIS/MOD02QKM.006</a>
</li>

<time itemprop='dateCreated' datetime='2012-11-05T00:00:00.000Z'>2012-11-05T00:00:00.000Z</time>
<time itemprop='dateModified' datetime='2017-12-28T00:00:00.000Z'>2017-12-28T00:00:00.000Z</time>

<h5 itemprop='provider'>GSFC</h5>
```


Landing Page Markup (3 of 3)

The following markup allows a search engine to visualize aspects of the CMR result to the user and facilitate acquisition of data related to that result,

- Browse images
- Data download

```
<a href="https://modaps.nascom.nasa.gov/services/about/product_descriptions_terra.html" itemprop="url">
  https://modaps.nascom.nasa.gov/services/about/product_descriptions_terra.html
</a>
<a href="https://ladsweb.modaps.eosdis.nasa.gov" itemprop="distribution" itemscope="itemscope" itemtype="http://schema.org/DataDownload">
  <meta itemprop="contentUrl" content="https://ladsweb.modaps.eosdis.nasa.gov"/>
  https://ladsweb.modaps.eosdis.nasa.gov
</a>
```

2018 GOOGLE DATASET SEARCH

Structured data testing tool

https://cmr.earthdata.nasa.gov/search/concepts/C203234490-LAADS NEW TEST

<pre> 1 <!DOCTYPE html> 2 <!--[if lt IE 7]> <html class="no-js lt-ie9 lt-ie8 lt-ie7" lang="en"> <![endif]--> 3 <!--[if IE 7]> <html class="no-js lt-ie9 lt-ie8" lang="en"> <![endif]--> 4 <!--[if IE 8]> <html class="no-js lt-ie9" lang="en"> <![endif]--> 5 <!--[if gt IE 8]><!--> <html class="no-js" lang="en"> <!--<![endif]--> 6 <head> 7 <meta charset="utf-8"> 8 <meta http-equiv="X-UA-Compatible" content="IE=edge"> 9 <title>MODIS/Terra Calibrated Radiances 5-Min L1B Swath 500m V006</title> 10 <meta name="description" content=""> 11 12 <!-- Open Sans Font - Google Font --> 13 <link rel="stylesheet" href="https://fonts.googleapis.com/css?family=Open+Sans:400,700"> 14 <!-- Font Awesome: Use this link for development since icons do not show up properly on local dev --> 15 <!-- TODO huh? fix this ^ --> 16 <link rel="stylesheet" href="https://maxcdn.bootstrapcdn.com/font-awesome/4.3.0/css/font-awesome.min.css"> 17 <!-- Font Awesome: Local file linked below for production --> 18 <!--<link rel="stylesheet" href="/dist/stylesheets/font-awesome.min.css">--> 19 <!--link rel="stylesheet" href="/dist/stylesheets/smt.css"--> 20 <link rel="stylesheet" media="all" href="/search/stylesheets/application.css" /> 21 <script src="/search/javascripts/application.js"></script> 22 </head> 23 <body class=""> 24 <main class="internal record" role="main"> 25 <header> 26 27 <div class="row content"> 28 <div class="collection-basics"> 29 30 <h2 >MOD02HKM_6</h2> 31 32 <p class="subtitle">MODIS/Terra Calibrated Radiances 5-Min L1B Swath 500m V006</p> 33 </div> 34 35 <div class="collection-details"> 36 <!-- Only display version if one exists. --> 37 38 Version 6 39 40 <!-- Only display data language if one exists. --> 41 42 eng 43 44 <!-- Only display CollectionDataType if it is NRT. --> 45 46 </div> 47 48 </div> </pre>	<table border="1"> <tr> <td>dateCreated</td> <td>https://modis.gsfc.nasa.gov/data/dataproduct/2012-11-05T00:00:00+00:00</td> </tr> <tr> <td>url</td> <td>https://modaps.nascom.nasa.gov/services/about/product_descriptions_terra.html</td> </tr> <tr> <td>sameAs</td> <td>https://mcst.gsfc.nasa.gov/11b/product-information</td> </tr> <tr> <td>keywords</td> <td>EARTH SCIENCE,SPECTRAL/ENGINEERING,INFRARED WAVELENGTHS,INFRARED RADIANCE,REFLECTED INFRARED,VISIBLE WAVELENGTHS,VISIBLE RADIANCE,IMAGERY/BASE MAPS/EARTH COVER</td> </tr> <tr> <td>dateCreated</td> <td>2012-07-02T00:00:00+00:00</td> </tr> <tr> <td>dateModified</td> <td>2018-09-27T00:00:00+00:00</td> </tr> <tr> <td>temporalCoverage</td> <td>2000-02-24T00:00:00.000Z/</td> </tr> <tr> <td>potentialAction</td> <td></td> </tr> <tr> <td> @type</td> <td>SearchAction</td> </tr> <tr> <td> target</td> <td></td> </tr> <tr> <td> @type</td> <td>EntryPoint</td> </tr> <tr> <td> urlTemplate</td> <td>https://search.earthdata.nasa.gov/search/granules?p=C203234490-LAADS&q={query}</td> </tr> <tr> <td>distribution</td> <td></td> </tr> <tr> <td> @type</td> <td>DataDownload</td> </tr> <tr> <td> contentUrl</td> <td>https://ladweb.modaps.eosdis.nasa.gov</td> </tr> <tr> <td>distribution</td> <td></td> </tr> <tr> <td> @type</td> <td>DataDownload</td> </tr> <tr> <td> contentUrl</td> <td>https://ladweb.modaps.eosdis.nasa.gov/archive/allData/6/MOD02HKM/</td> </tr> <tr> <td>provider</td> <td></td> </tr> <tr> <td> @type</td> <td>Thing</td> </tr> <tr> <td> name</td> <td>NASA/GSFC/SED/ESD/HBSL/BSB/MCST</td> </tr> <tr> <td>provider</td> <td></td> </tr> <tr> <td> @type</td> <td>Thing</td> </tr> <tr> <td> name</td> <td>NASA/GSFC/SED/ESD/HBSL/BISB/MODAPS</td> </tr> <tr> <td>provider</td> <td></td> </tr> <tr> <td> @type</td> <td>Thing</td> </tr> <tr> <td> name</td> <td>NASA/GSFC/SED/ESD/HBSL/BISB/LAADS</td> </tr> <tr> <td>citation</td> <td></td> </tr> </table>	dateCreated	https://modis.gsfc.nasa.gov/data/dataproduct/2012-11-05T00:00:00+00:00	url	https://modaps.nascom.nasa.gov/services/about/product_descriptions_terra.html	sameAs	https://mcst.gsfc.nasa.gov/11b/product-information	keywords	EARTH SCIENCE,SPECTRAL/ENGINEERING,INFRARED WAVELENGTHS,INFRARED RADIANCE,REFLECTED INFRARED,VISIBLE WAVELENGTHS,VISIBLE RADIANCE,IMAGERY/BASE MAPS/EARTH COVER	dateCreated	2012-07-02T00:00:00+00:00	dateModified	2018-09-27T00:00:00+00:00	temporalCoverage	2000-02-24T00:00:00.000Z/	potentialAction		@type	SearchAction	target		@type	EntryPoint	urlTemplate	https://search.earthdata.nasa.gov/search/granules?p=C203234490-LAADS&q={query}	distribution		@type	DataDownload	contentUrl	https://ladweb.modaps.eosdis.nasa.gov	distribution		@type	DataDownload	contentUrl	https://ladweb.modaps.eosdis.nasa.gov/archive/allData/6/MOD02HKM/	provider		@type	Thing	name	NASA/GSFC/SED/ESD/HBSL/BSB/MCST	provider		@type	Thing	name	NASA/GSFC/SED/ESD/HBSL/BISB/MODAPS	provider		@type	Thing	name	NASA/GSFC/SED/ESD/HBSL/BISB/LAADS	citation	
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Google dataset guidelines

<https://developers.google.com/search/docs/data-types/dataset>

The screenshot shows the Google Search guidelines page for datasets. The page is titled "Google Search" and has a navigation bar with links for HOME, GUIDES, REFERENCE, TOOLS, and HELP. A search bar and "ALL PRODUCTS" link are also visible. The main content is divided into three sections: Overview, Required properties, and Recommended properties.

Overview

- Structured data
- Article
- Breadcrumb
- Book
- Carousel
- Corporate contact
- Course
- Dataset**
- Employer Aggregate Rating
- Event
- Fact Check
- Job Posting
- Local Business
- Logo
- Media
- Occupation
- Product
- Recipe
- Review
- Sitelinks searchbox
- Social profile
- Software App
- Speakable
- Subscription and paywalled content
- Top Places List
- Video

Required properties

Property	Type	Description
description	Text	A short summary describing a dataset.
name	Text	A descriptive name of a dataset. For example, "Snow depth in Northern Hemisphere".

Recommended properties

Property	Type	Description
citation	Text or CreativeWork	A citation for a publication that describes the dataset. For example, "J. Smith 'How I created an awesome dataset', Journal of Data Science, 1966".
identifier	URL, Text, or PropertyValue	An identifier for the dataset, such as a DOI.
keywords	Text	Keywords summarizing the dataset.
license	URL, Text	A license under which the dataset is distributed.
sameAs	URL	A link to a page that provides more information about the same dataset, usually in a different repository.
spatialCoverage	Text, Place	You can provide a single point that describes the spatial aspect of the dataset. Only include this property if the dataset has a spatial dimension. For example, a single point where all the measurements were collected, or the coordinates of a bounding box for an area.

Points

```
"spatialCoverage": {  
  "atype": "Place",  
  "name": "Point 1"
```

Google Dataset Search

Google Dataset Search

MOD02QKM

About

Feedback

- MOD02QKM**
gcmd.gsfc.nasa.gov
Updated Jun 10, 2013
- MOD021KM_C6_NRT**
gcmd.gsfc.nasa.gov
Updated Jan 27, 2016
- MOD02HKM_C6_NRT**
gcmd.gsfc.nasa.gov
Updated Sep 23, 2015
- MOD02HKM**
gcmd.nasa.gov
Updated Jun 10, 2013

MODIS/Terra Calibrated Radiances 5-Min L1B Swath 500m V006
MOD02HKM_6

cmr.earthdata.nasa.gov catalog.data.gov

DOI link
<https://doi.org/10.5067/MODIS/MOD02HKM.006>

Dataset created Nov 5, 2012
Dataset updated Sep 27, 2018

Dataset provided by
NASA Goddard Space Flight Center

Time period covered 2002-24T00:00:00Z - 2018-09-27T00:00:00Z

Area covered
Global

Description

The MODIS/Terra Calibrated Radiances 5-Min L1B Swath 500m (MOD02HKM) data set contains calibrated and geolocated at-aperture radiances for 7 discrete bands located in the 0.45 to 2.20 micron region of the electromagnetic spectrum. These data are generated from the MODIS Level 1A scans of raw radiance and in the process converted to geophysical units of $W/(m^2 \text{ um sr})$. In addition, the Earth Bi-directional Reflectance Distribution Function (BRDF) may be determined for these solar reflective bands through knowledge of the solar irradiance (e.g., determined from MODIS solar diffuser data, and from the target illumination geometry). Additional data are provided including quality flags, error estimates and calibration data. Visible, shortwave infrared, and near infrared measurements are only made during the daytime, while radiances for the thermal infrared region (bands 20-25, 27-36) are measured continuously. Channels 1 and 2 have 250 m resolution, channels 3 through 7 have 500 m resolution. However, for the MODIS L1B 500 m product, the 250 m band radiance data and their associated uncertainties have been aggregated to 500m resolution. Thus the entire channel data set has been co-registered to the same spatial scale in the 500 m product. Separate L1B products are available for the 250 m resolution channels (MOD02QKM) and 1 km resolution channels (MOD021KM). For the latter product, the 250 m and 500 m channel data (bands 1 through 7) have been aggregated into equivalent 1 km pixel values. Spatial resolution for pixels at nadir is 500 km, degrading to 2.4 km in the along-scan direction at the scan extremes. However, thanks to the overlapping of consecutive swaths and respectively pixels there, the resulting resolution at the scan extremes is about 1 km. A 55 degree scanning pattern at the EOS orbit of 705 km results in a 2330 km orbital swath width and provides global coverage every one to two days. A single MODIS Level 1B 500 m granule will contain a scene built from 203 scans sampled 2708 times in the cross-track direction, corresponding to approximately 5 minutes worth of data; thus 288 granules will be produced per day. Since an individual MODIS scan will contain 20 along-track spatial elements for the 500 m channels, the scene will be composed of (2708 x 4060) pixels, resulting in a spatial coverage of (2330 x 4060) km².

DEMO!

2019 GOING FURTHER

Improving data.nasa.gov

Google Dataset Search

MOD02QKM



About



Feedback

data.nasa.gov

Updated Jun 26, 2018



MODIS/Terra Calibrated Radiances 5-Min L1B Swath 500m V006

cmr.earthdata.nasa.gov
catalog.data.gov
+1more

Updated Sep 27, 2018



Multi-Spectral Clear-Sky Composites of MODIS/Terra Land Channels (B1 - B7)...

open.canada.ca

Updated Sep 14, 2018



MODIS/Terra Calibrated Radiances 5-Min L1B Swath 250m V006

data.wu.ac.at
data.nasa.gov
+2more

Updated Jul 2, 2012



MODIS/Terra Calibrated Radiances 5-Min L1B Swath 250m V005

data.nasa.gov

Updated Jun 26, 2018

MODIS/Terra Calibrated Radiances 5-Min L1B Swath 500m V006
MOD02HKM_6

cmr.earthdata.nasa.gov

catalog.data.gov

data.wu.ac.at

DOI link

<https://doi.org/10.5067/MODIS/MOD02HKM.006>

Dataset created Nov 5, 2012

Dataset updated Sep 27, 2018

Dataset provided by

[NASA Goddard Space Flight Center](#)

Time period covered 2000-02-24T00:00:00.000Z/

Area covered

Global

Description

The MODIS/Terra Calibrated Radiances 5-Min L1B Swath 500m (MOD02HKM) data set contains calibrated and geolocated at-aperture radiances for 7 discrete bands located in the 0.45 to 2.20 micron region of the electromagnetic spectrum. These data are generated from the MODIS Level 1A scans of raw radiance and in the process converted to geophysical units of $W/(m^2 \text{ um sr})$. In addition, the Earth Bi-directional Reflectance Distribution Function (BRDF) may be determined for these solar reflective bands through knowledge of the solar irradiance (e.g., determined from MODIS solar diffuser data, and from the target illumination geometry). Additional data are provided including quality flags, error estimates and calibration data. Visible, shortwave infrared, and near infrared measurements are only made during the daytime, while radiances for the thermal infrared region (bands 20-25, 27-36) are measured continuously. Channels 1 and 2 have 250 m resolution, channels 3 through 7 have 500 m resolution. However, for the MODIS L1B 500 m product, the 250 m band radiance data and their associated uncertainties have been aggregated to 500m resolution. Thus the entire channel data set has been co-registered to the same spatial scale in the 500 m product. Separate L1B products are available for the 250 m resolution channels (MOD02QKM) and 1 km resolution channels (MOD021KM). For the latter product, the 250 m and 500 m channel data (bands 1 through 7) have been aggregated into equivalent 1 km pixel values. Spatial resolution for pixels at nadir is 500 km, degrading to 2.4 km in the along-scan direction at the scan extremes. However, thanks to the overlapping of consecutive swaths and respectively pixels there, the resulting resolution at the scan extremes is about 1 km. A 55 degree scanning pattern at the EOS orbit of 705 km results in a 2330 km orbital swath width and provides global coverage every one to two days. A single MODIS Level 1B 500 m granule will contain a scene built from 203 scans sampled 2708 times in the cross-track direction, corresponding to approximately 5 minutes worth of data; thus 288 granules will be produced per day. Since an individual MODIS scan will contain 20 along-track spatial elements for the 500 m channels, the scene will be composed of (2708 x 4060) pixels, resulting in a spatial coverage of (2330 km x 2040 km). Due to the MODIS scan geometry, there will be increasing scan overlap beyond about 20 degrees scan angle. Environmental information derived from MODIS L1B measurements will offer a comprehensive and unprecedented look at terrestrial, atmospheric, and ocean phenomenology for a wide and diverse community of users throughout the world. See the MODIS Characterization Support Team webpage for more C6 product information at: <https://mcst.gsfc.nasa.gov/l1b/product-information> or visit Science Team homepage at: <https://modis.gsfc.nasa.gov/data/dataproduct/>

Smart handoffs from Google

- If we have a collection with granules the landing page will provide a link to Earthdata Search constrained to that collection.
- That link is tagged as a schema.org search action

```
<li itemprop="potentialAction" itemscope itemType="http://schema.org/SearchAction" typeof="WebSite">  
  <meta property="url" href="https://search.earthdata.nasa.gov"/>  
  <a rel="search" href="https://search.earthdata.nasa.gov/search/granules?p=C203234510-LAADS">Search for granules from this collection  
    <meta itemprop="target" content="https://search.earthdata.nasa.gov/search/granules?p=C203234510-LAADS&q={query}"/>  
    <meta property="query-input" type="text" name="query">  
  </a>  
</li>
```


For example

The screenshot shows the EarthData Search interface. The search bar contains 'MOD02QKM Beijing summer 2010'. The start and stop dates are '2010-06-01 00:00:00' and '2010-10-01 23:59:59' respectively. The search rectangle is defined by SW: 39.463175993293206, 1 and NE: 40.3518194895878, 116. The map shows a satellite view of China with a cyan rectangle highlighting the Beijing region. The search results list shows 4 matching collections, with the first one being 'MOD02QKM (v1) - NASA/GSFC/SED/ESD/HSR/BISS/LAADS'.

```
<li itemprop="potentialAction" itemscope itemtype="http://schema.org/SearchAction" typeof="WebSite">
  <meta property="url" href="https://search.earthdata.nasa.gov"/>
  <a rel="search" href="https://search.earthdata.nasa.gov/search/granules?p=C203234510-LAADS">Search for granules from this collection
    <meta itemprop="target" content="https://search.earthdata.nasa.gov/search/granules?p=C203234510-LAADS&q={query}"/>
    <meta property="query-input" type="text" name="query">
  </a>
</li>
```

The screenshot shows a search result entry for 'MODIS/Terra Calibrated Radiances 5-Min L1B Swath 500m V006'. The entry includes a thumbnail, the collection name, and a description: '163 Granules - 2000-02-24 ongoing - The MODIS/Terra Calibrated Radiances 5-Min L1B Swath 500m (MOD02HKM) data set contains calibrated and geolocated at-aperture radiances for 7 discrete bands located in the 0.45 to 2.20 micron region of the electromagnetic spectrum. These data are generated from the MODIS Level 1A...'

Search to Dataset Search

Google Dataset Search

MOD02QKM

About

Feedback

MODIS/Terra Calibrated Radiances 5-Min L1B Swath 500m V006
cmr.earthdata.nasa.gov
catalog.data.gov
+1more
Updated Sep 27, 2018

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open.canada.ca
Updated Sep 14, 2018

MODIS/Terra Calibrated Radiances 5-Min L1B Swath 250m V006
data.wu.ac.at
data.nasa.gov
+2more
Updated Jul 2, 2012

MODIS/Terra Calibrated Radiances 5-Min L1B Swath 250m V005
data.nasa.gov
Updated Jun 26, 2018

MODIS/Terra Calibrated Radiances 5-Min L1B Swath 500m V006 MOD02HKM_6
cmr.earthdata.nasa.gov catalog.data.gov data.wu.ac.at

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Time period covered 2000-02-24T00:00:00.000Z/

Area covered
Global

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The MODIS/Terra Calibrated Radiances 5-Min L1B Swath 500m (MOD02HKM) data set contains calibrated and geolocated at-aperture radiances for 7 discrete bands located in the 0.45 to 2.20 micron region of the electromagnetic spectrum. These data are generated from the MODIS Level 1A scans of raw radiance and in the process converted to geophysical units of $W/(m^2 \text{ um sr})$. In addition, the Earth Bi-directional Reflectance Distribution Function (BRDF) may be determined for

QUESTIONS

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Raytheon

*in partnership
with*

