

MODIS Atmosphere

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AEROSOL H₂O VAPOR CLOUD PROFILE CLD. MASK JOINT (Level-2 Products)
 DAILY EIGHT DAY MONTHLY (Level-3 Products) | ALBEDO NDVI ECOSYSTEM
 (Level-3 Ancillary)

CLOUD MASK

Introduction

Product Description

The MODIS Cloud Mask product is a Level 2 product generated at 1-km and 250-m (at nadir) spatial resolutions. The algorithm employs a series of visible and infrared threshold and consistency tests to specify confidence that an unobstructed view of the Earth's surface is observed. An indication of shadows affecting the scene is also provided. The 250-m cloud-mask flags are based on the visible channel data only.



Detection of cloud shadows and thin clouds over snow and ice can be quite difficult.

Radiometrically accurate radiances are required, so holes in the Cloud Mask will appear wherever the input radiances are incomplete or of poor quality. There are two MODIS Cloud Mask data product files: MOD35_L2, containing data collected from the Terra platform; and MYD35_L2, containing data collected from the Aqua platform.

Research and Application

A determination of the presence of global cloudiness is essential to the MODIS mission for two reasons. First, clouds play a critical role in the radiative balance of the Earth and must be accurately described to assess climate and potential climate change. Second, the presence of cloudiness must be accurately determined to retrieve properly many atmospheric and surface parameters. For many of these retrieval algorithms even thin cirrus represents contamination.

Data Set Evolution

The MODIS cloud-mask algorithm employs a battery of spectral tests, which use methodology applied for the AVHRR Processing scheme Over cLOUDy Land and Ocean (APOLLO), International Satellite Cloud Climatology Project (ISCCP), CLOUD Advanced Very high resolution Radiometer (CLAVER), and Support of Environmental Requirements for Cloud Analysis and Archive (SERCAA) to identify cloudy FOVs. From these a clear-sky confidence level (high confident clear, probably clear, undecided, cloudy) is assigned to each FOV. For inconclusive results, spatial- and temporal-variability tests are applied. The spectral tests rely on radiance (temperature) thresholds in the infrared and reflectance thresholds in the visible and near-infrared. Thresholds vary with surface type, atmospheric conditions (moisture, aerosol, etc.), and viewing geometry. Along with MOD02 calibrated radiances, a 1-km land/water mask, DEM, ecosystem analysis, snow/ice cover map,

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★ for the developer

NCEP analysis of surface temperature and wind speed, and an estimate of precipitable water will be required as inputs.

Cloud-mask validation will be conducted using MAS data from several field campaigns, all-sky cameras, and comparison with NOAA operational instruments and, possibly, Terra instruments such as ASTER (see Volume 1).

Additional Information

Coverage: Global

Spatial/Temporal Characteristics: 250 m and 1 km/daily

Key Science Applications: Cloud determination and screening, climate modeling, climate monitoring, increasing accuracy of other MODIS retrievals

Key Geophysical Parameters: Presence of cloud or shadow

Processing Level: 2

Product Type: Standard, at-launch

Maximum File Size: 48 MB

File Frequency: 288/day

Primary Data Format: HDF-EOS

