



High Mountain Asia MAR V3.5 Regional Climate Model Output, Version 1

USER GUIDE

How to Cite These Data

As a condition of using these data, you must include a citation:

Tedesco, M. 2019. *High Mountain Asia MAR V3.5 Regional Climate Model Output, Version 1*.

[Indicate subset used]. Boulder, Colorado USA. NASA National Snow and Ice Data Center Distributed Active Archive Center. <https://doi.org/10.5067/4DISDZEYDMGT>. [Date Accessed].

FOR QUESTIONS ABOUT THESE DATA, CONTACT NSIDC@NSIDC.ORG

FOR CURRENT INFORMATION, VISIT https://nsidc.org/data/HMA_MAR3_5



National Snow and Ice Data Center

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1 DATA DESCRIPTION

1.1 Parameters

This data set provides modeled surface and atmospheric fields from the Modèle Atmosphérique Régionale (MAR) regional climate model. To easily access metadata information about the modeled parameters, use the `ncdump` (or `ncdump -h`) command from the terminal window. For more detailed information about the individual modeled parameters, see the [Model Parameters spreadsheet](#).

1.2 File Information

1.2.1 Format

The data files are provided in netCDF (.nc) format.

1.2.2 Naming Convention

There is one data file for each year from 2000 to 2015. Example file names include:

HMA_MAR3_5_ICE.2000.01-12.h22.nc

HMA_MAR3_5_ICE.2015.01-12.h37.nc

The files are named according to the following convention, which is described in Table 1:

HMA_MAR3_5_ICE_[yyyy].[mm-MM].[hnn].[ext]

Table 1. File Naming Convention

Variable	Description
HMA_MAR3_5	Data set ID
ICE	Code for MAR files containing surface and near surface output
yyyy	Year of simulation output
mm-MM	Month range for simulation output
hxx	Simulation code
.ext	Indicates file type: .nc = netCDF data file

1.3 Spatial Information

1.3.1 Coverage

Spatial coverage includes the Himalayas, as noted by the spatial extents below.

Northernmost latitude: 38.84° N
 Southernmost latitude 22.41° N
 Easternmost longitude: 87.92 ° E
 Westernmost longitude: 65.20 ° E

1.3.2 Resolution

The model's horizontal resolution is 10 km by 10 km.

1.3.3 Geolocation

Table 2 provides geolocation information for this data set.

Table 2. Geolocation Details

Geographic coordinate system	WGS 84
EPSG code	4326
PROJ4 string	+proj=longlat +datum=WGS84 +no_defs
Reference	https://epsg.io/4326

1.4 Temporal Information

1.4.1 Coverage

01 January 2000 to 31 December 2015

1.4.2 Resolution

Daily

2 DATA ACQUISITION AND PROCESSING

2.1 Background

This data set provides daily output of modeled surface and atmospheric fields simulated by the Modèle Atmosphérique Régionale (MAR) regional climate model (version 3.5). The model output includes surface mass and energy balance components, near-surface atmospheric properties, and snowpack properties, including profiles of snow temperature, density, liquid water content, and snow depth.

2.2 Model Details

MAR v3.5 is forced every six hours at the lateral boundaries and ocean surface with data from the European Center for Medium-Range weather forecasts (ECMWF) interim reanalysis (ERA-Interim; Dee et al., 2011). MAR is a coupled land-atmosphere regional climate model that contains the atmospheric model of Gallée and Schayes (1994) and the Soil Ice Snow Vegetation Atmosphere Transfer scheme (SISVAT) surface model of De Ridder and Schayes (1998). SISVAT contains a multi-layer snow model based on the Crocus model of Brun et al. (1989; 1992) that computes the transfer of mass and energy between individual snow layers, as well as between the surface and the atmosphere; SISVAT also computes the compaction of layers. Albedo is computed as a function of snow grain properties, which in turn are empirically related to snow temperature, temperature gradient, and liquid water content. The model setup is similar to that described by Fettweis et al. (2017), who evaluated MAR v3.5 over the Greenland ice sheet.

MAR topography is interpolated onto the MAR grid from the ETOPO1 1-arc minute global relief model of Amante (2009).

Details of MAR regional climate model algorithms are provided in the various publications mentioned in the References section. No additional algorithms were used to process MAR model outputs.

2.3 Acquisition and Processing

Raw MAR model output was aggregated into annual files with daily fields. No other data post-processing was performed.

2.4 Quality, Errors, and Limitations

A publication validating simulation output against in-situ and satellite data is in preparation.

3 SOFTWARE AND TOOLS

The data files can be opened using netCDF-visualization software such as Panoply.

4 RELATED DATA SETS

[High Mountain Asia at NSIDC | Data Sets](#)

5 RELATED WEBSITES

[High Mountain Asia at NSIDC | Overview](#)

[NASA High Mountain Asia Project](#)

[NASA Research Announcement: Understanding Changes in High Mountain Asia](#)

[Modèle Atmosphérique Régional \(MAR\) website](#)

[Homepage of Dr. Xavier Fettweis, MAR developer](#)

6 CONTACTS

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7 ACKNOWLEDGEMENTS

The data were produced at the University of Liège, Belgium.

8 REFERENCES

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9 DOCUMENT INFORMATION

9.1 Publication Date

16 January 2019

9.2 Date Last Updated

7 August 2020