Historical Gridded Meteorological Dataset in Japan

1. IDENTIFICATION INFORMATION

Name	Historical Gridded Meteorological Dataset in Japan
Abbreviation	HGMD_Japan
DOI	doi:10.20783/DIAS.670 [https://doi.org/10.20783/DIAS.670]
Metadata Identifier	HGMDJ_NARO20250515090452-DIAS20221121113753-en

2. CONTACT

2.1 CONTACT on DATASET

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2.2 CONTACT on PROJECT

2.2.1 Data Integration and Analysis System

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5. DATE OF THIS DOCUMENT

2025-05-15

6. DATE OF DATASET

publication : 2024-10-01

creation : 2010-04-01

7. DATASET OVERVIEW

7.1 Abstract

The Historical Gridded Meteorological Dataset in Japan (HGMD-Japan) is a grided high-resolution (1km x 1km, approximately) daily (and in some cases hourly or yearly) meteorological datasets, intended for use in agricultural climate change analysis, created from 1978 to the latest year continuously.

The daily data were created by overlaying the spatially interpolated differences between observed and climate normal at the meteorological observation stations onto the 1km resolution gridded climate data. In this process, in order to maintain time-series homogeneity in each variable, possible source of time-series heterogeneities unrelated to climate change, such as changes in statistical methods and instrument types, were corrected as much as possible.

The details of this dataset are described as follows.

■ Common items

Projection: Geographic

Geodetic system: Tokyo Datum

◆ Daily data

Directory structure:

HGMDJ_NARO(YYYY)daily[file]

File name:

(YYYY)_d_(element).bin

Element name (element):

Mean temperatures (tmp) [0.1 ° C]

Maximum temperatures (hourly) (tmx) [0.1 ° C]

Minimum temperatures (hourly) (tmn) [0.1 ° C]

Precipitation (pre) [0.1 mm]

Solar radiation (srd) [0.1 MJ/m2/d]

Sunshine duration (sdr) [0.1 hour]

Relative humidity (rhu) [0.1 %]

Wind speed at 2.5m height (wsd) [0.1 m/s]

Downward long wave radiation (lrd) [0.1 MJ/ m2/d]

Potential evapotranspiration (pet) [0.1 mm]

FAO reference evapotranspiration (eto) [0.1 mm]

Paddy water temperature (LAI=0) (tw0) [0.1 ° C]

Paddy water temperature (LAI=∞) (twi) [0.1 ° C]

Error value:

-999

Record format:

Data format: Binary format (little endian)

Data size: 278,237,440 bytes

Record length: 736 bytes (4+366*2: see below)

Number of rows (meshes): 378040

Structure:

1) 3rd mesh code (4 byte long), data (2 byte short) x 366 days

2) 3rd mesh code (4 byte long), data (2 byte short) x 366 days

. . .

378040) 3rd mesh code (4 byte long), data (2 byte short) x 366 days

* Dummy (-999) for the 366th day in no-leap years

◆ Hourly data

Directory structure:

HGMDJ_NARO(YYYY)hourly[element][file]

File name:

(YYYYMMDD)_h_(element).bin

Element name (element):

Rice panicle temperatures (tp) [0.1 ° C]

Air temperatures (ta) [0.1 ° C]

Error value:

-999

Record format:

Data format: Binary format (little endian)

Data size: 19,658,080 bytes

Record length: 52 bytes (4+24*2: see below)

Number of rows (meshes): 378040

Structure:

1) 3rd mesh code (4 byte long), data (2 byte short) x 24 hours

2) 3rd mesh code (4 byte long), data (2 byte short) x 24 hours

. . .

378040) 3rd mesh code (4 byte long), data (2 byte short) x 24 hours

◆ Yearly data

Directory structure:

HGMDJ_NARO(YYYY)yearly[file]

File name:

(YYYY)_y_(element).bin

Element name (element):

Heat-dose of daily maximum temperature above 35 ℃ (HD_x35) (hdx35) [0.1 ° C day]

Heat-dose of daily minimum temperature above 25 ℃ (HD_n25) (hdn25) [0.1 ° C day]

Heat-dose of daily mean temperature above 26 ℃ (HD_m26) (hdm26) [0.1 ° C day]

Mean air temperature during 20 days after heading date (hed20atm) [0.1 ° C]

HD_m26 during 20 days after heading date (hed20hdm26) [0.1 ° C day]

Mean panicle temperature during daytime within 5 days around heading date (ptm5dc) [0.1 ° C]

Mean panicle temperature during daytime within 7 days around heading date (ptm7dc) [0.1 ° C]

Error value:

-999

Record format:

Data format: Binary format (little endian)

Data size: 2,268,240 bytes

Record length: 6 bytes (4+2: see below)

Number of rows (meshes): 378040

Structure:

1) 3rd mesh code (4 byte long), data (2 byte short)

2) 3rd mesh code (4 byte long), data (2 byte short)

. . .

378040) 3rd mesh code (4 byte long), data (2 byte short)

7.2 Topic Category(ISO19139)

climatologyMeteorologyAtmosphere

7.3 Temporal Extent

Begin Date	1978-01-01
End Date	Under Continuation
Temporal Characteristics	Daily

7.4 Geographic Bounding Box

North bound latitude	46
West bound longitude	122
Eastbound longitude	146
South bound latitude	24

7.5 Grid

Dimension Name	Dimension Size (slice number of the dimension)	Resolution Unit
row	2640	30 (second)
column	1920	45 (second)
time		1 (hour)

7.6 Geographic Description

7.7 Keywords

7.7.1 Keywords on Dataset

Keyword Type	Keyword	Keyword thesaurus Name
theme	GLOBAL CHANGE > Climate variability	AGU

7.7.2 Keywords on Project

7.7.2.1 Data Integration and Analysis System

Keyword Type	Keyword	Keyword thesaurus Name

theme	DIAS > Data Integration and Analysis System	No_Dictionary

7.8 Online Resource

file download : https://data.diasjp.net/dl/storages/filelist/dataset:670

7.9 Data Environmental Information

7.10 Distribution Information

name	version	specification
binary (original format)	no information	

8. DATA PROCESSING

8.1 Data Processing (1)

8.1.1 General Explanation of the data producer's knowledge about the lineage of a dataset

8.1.2 Data Source

Data Source Citation Name	Description of derived parameters and processing techniques used

9. DATA REMARKS

10. DATA POLICY

10.1 Data Policy by the Data Provider

Do not provide this data to third parties without permission.

Use of this dataset is limited to non-commercial use.

Data provider creator is not responsible for any damages resulting from the use of this data.

It is requested to cite references if the data are used.

10.2 Data Policy by the Project

10.2.1 Data Integration and Analysis System

If data provider does not have data policy, DIAS Terms of Service (https://diasjp.net/en/terms/) and DIAS Privacy Policy (https://diasjp.net/en/privacy/) apply.

If there is a conflict between DIAS Terms of Service and data provider's policy, the data provider's policy shall prevail.

11. LICENSE

12. DATA SOURCE ACKNOWLEDGEMENT

12.1 Acknowledge the Data Provider

12.2 Acknowledge the Project

12.2.1 Data Integration and Analysis System

If you plan to use this dataset for a conference presentation, paper, journal article, or report etc., please include acknowledgments referred to following examples. If the data provider describes examples of acknowledgments, include them as well.

” In this study, [Name of Dataset] provided by [Name of Data Provider] was utilized. This dataset was also collected and provided under the Data Integration and Analysis System (DIAS), which was developed and operated by a project supported by the Ministry of Education, Culture, Sports, Science and Technology. ”

13. REFERENCES

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Ishigooka, Y., T. Kuwagata, M. Yoshimoto, T. Hasegawa, M. Nishimori, T. Takimoto, H. Wakatsuki and Y. Toda (2025): A high-resolution historical long-term gridded daily meteorological data set for agricultural climate change analysis. Data in Brief (under review).