Atmospheric and Environmental Research, Inc.

AER Memo

AMSR-E_emissivity_database_descrip_v1.1.doc
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SUBJECT: AMSR-E emissivity database product

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1. Summary

The AMSR-E emissivity database is composed of two datasets: a multi-product database containing multiple AMSR-E channel emissivity products retrieved by three main algorithms, and a merged database derived from the multi-product database to provide the "best" available estimates of the average effective emissivities.

The databases contain monthly emissivity products at AMSR-E 10.7 GHz, 18.7 GHz, 23.8 GHz, 36.5 GHz, and 89.0 GHz vertically (V) and horizontally (H) polarized channels. In the data field descriptions, "day" and "night" refer to data from the ascending and descending parts of the Aqua orbit, respectively at nominal equatorial crossing local times of 13:30 and 01:30. Data are available via FTP.

Overview table

Category	Description
Data format	Network Common Data Form (NetCDF)
Spatial coverage and resolution	Global Sinusoidal grid of 27.79km
Temporal coverage and resolution	Temporal coverage is year of 2003, monthly average files
File size	Multi-product file is approximately 440 MB Merged product is approximately 75 MB
Parameters	Mean emissivity and variance and ancillary data
Procedures for obtaining data	Please see contact for order option.

2. Contacts and Acknowledgments

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3. Detailed Data Description

3.1 Algorithm products

The algorithms by which emissivity data were produced, called 1a, 1b, and classification, are described briefly in Sec. 4.5.

3.2 Data field name element definitions

- Day: From ascending orbit
- Night: From descending orbit
- 1a: Produced by the 1a retrieval process
- 1b: Produced by the 1b retrieval process
- class: Produced by the classification process
- EmMw: Mean of footprint samples of emissivity
- EmMw_Var: Variance of all footprint samples included in the computation of EmMw
- EmMw_N: Number of footprint samples included in the computation of EmMw
- fclear: Number of clear (passed highest requirement level) samples divided by the total number of samples (EmMw_N)
- R11: Mean of brightness temperature ratio 11V/11H
- R11_Var: Variance of brightness temperature ratio 11V/11H over all samples included in R11.
- EmMw_SpSD: Mean of the spatial standard deviation of daily regridded emissivities.
- QC: Quality indicator (integer or bitwise binary)

3.3 Data decompression

Scaling factors and offsets can be found in the local attributes of NetCDF data fields. For data with scale and offset values, the data values can be obtained in the specified units with the following equation:

$$\text{data value in units} = (\text{stored data value} \times \text{scale factor}) + \text{offset}$$

3.4 Spatial coverage and resolution

Spatial coverage is global except for high latitudes regions where MODIS LST is not retrieved by the day/night LST algorithm. Global sinusoid grid resolution is 27.79 km with number of columns=1440 and number of rows=720.

Total number of grid points is 1036800. Land surface is defined as land fraction greater then 0.1, and the number of land surface grid points is 199520. The database contains valid values for land surface grid points if data are available. Water surface grid points are filled with missing values.

3.5 Temporal coverage and resolution

Each file contains monthly datasets. Multi-product database has separate day and night monthly products. Merged emissivity database has day and night averaged products. Year 2003 files are available.

3.6 File naming convention

Both databases follow the name convention:

earthgrid_EmMw_V##_yyy1m1d1_yyy2m2d2_sssss.nc

Example file name: earthgrid_EmMw_V01_20030701_20030731_multi.nc

Table 1 lists the valid value for the file name variables.

Table 1

##	file version number
yyy1	four-digit start year
m1	two-digit start month
d1	two-digit start day
yyy2	four-digit end year
m2	two-digit end month
d2	two-digit end day
sssss	database indicator, “multi” or “merge”

3.7 File size

Each multi-product database file is approximately 440 MB.
Each merged emissivity database is approximately 75 MB.

3.8 Data Access

Please see contact for order option.

4. Multi-product Database

4.1 Dataset overview

This database contains the emissivity products of each of the main algorithms by which AMSR-E channel emissivities were retrieved. In the case of 1a products, data are given separately for day and night measurements. This database is intended for relatively sophisticated users who have become familiar with the qualities and limitations of each of the products, and who have determined that one of those products is most appropriate to their application or who intend to use their own criteria to merge the products. The merged database was derived entirely from the contents of this database.

4.2 Multi-product Database Data Dimensions

dimension	value	comment
nCol_nRow_nTimeLevels	1036800	nCol × nRow × nTimeLevels(=1 currently)
nValsPerGrid	10	AMSR-E Res.2 channels
nFreq	5	AMSR-E Res.2 frequencies
nQC_1b	1	
nQC	2	

4.3 Multi-product Database Data Fields

field	type	long name
EmMw_Day_1a	short	1a day microwave (MW) surface emissivity
EmMw_Var_Day_1a	float	1a day MW surface emissivity variance
EmMw_N_Day_1a	short	1a day number of combined samples
fclear_Day_1a	short	fraction of clear cases among 1a day samples
EmMw_Night_1a	short	1a night MW surface emissivity
EmMw_Var_Night_1a	float	1a night MW surface emissivity variance
EmMw_N_Night_1a	short	1a night number of combined samples
fclear_Night_1a	short	fraction of clear cases among 1a night samples
R11_Day_1a	short	1a day MW brightness temperature ratio 11V/11H
R11_Var_Day_1a	float	1a day MW brightness temperature ratio 11V/11H variance
R11_Night_1a	short	1a night MW brightness temperature ratio 11V/11H
R11_Var_Night_1a	float	1a night MW brightness temperature ratio 11V/11H variance
EmMw_SpSD_Day_1a	float	1a day mean MW surface emissivity spatial standard deviation
EmMw_SpSD_Night_1a		1a night mean MW surface emissivity spatial standard deviation
EmMw_Day_class	short	classification-based day MW surface emissivity
EmMw_Var_Day_class	float	classification-based day MW surface emissivity variance
EmMw_Night_class	short	classification-based night MW surface emissivity

EmMw_Var_Night_class	float	classification-based night MW surface emissivity variance
EmMw_1b	short	1b MW surface emissivity
alpha	float	1b emission depth metric
EVP	float	1b explained variance for penetration
QC_1b	short	1b quality flag
QC_Day	byte	day quality flag
QC_Night	byte	night quality flag

4.4 Global attributes

Please see Appendix.

4.5 Dataset contents descriptions

1a emissivity product

1a product is retrieved directly from AMSR-E brightness temperature, using MODIS LST to represent the emitting temperature of the surface and ancillary data to define the atmospheric contribution. Emissivities are retrieved from swath data (AMSR-E L2A, Res. 2 swath), with ascending and descending swaths separate. All the swath data from a calendar day are sorted according to the percent of the AMSR-E footprint with clear-condition MODIS LST and gridded to global sinusoidal grid files corresponding to three minimum threshold clear-condition levels. Monthly mean values are obtained from the daily product with the highest possible level of clear condition that yields an adequate number of samples that pass the quality control algorithm.

Classification-based emissivity product

Classification-based dataset emissivity is produced where persistent cloud coverage precludes production of the ordinary 1a product. The emissivity and variance are obtained from a combination of data from all clear (at highest level of clear condition minimum threshold) grid points that have a compatible MODIS-retrieved land class and R11.

1b emissivity product

1b dataset estimates the microwave emission depth and effective emissivity by fitting the solution of a thermal diffusion equation to a one-month time series of clear-sky measurements, assuming sinusoidal diurnal surface forcing. It is produced as an alternative to the 1a product over arid or semi-arid regions where the emission depth effect is substantial and our time-series model solution provides credible estimates. Emissivities at 24-GHz are not generated by this process. Model estimated emission depth parameter alpha is included at the other 4 frequencies. Explained variance for penetration (EVP) measures the degree to which the depth-dependent diurnal thermal model improves upon a similar strawman model in which the depth dependence is eliminated. The 19 GHz H-pol EVP in the database is used in the 1b quality control algorithm (described in AMSR-E_emissivity_database_descrip_v1.doc) as a major criterion of 1b product's validity.

R11 metric

MW brightness temperature ratio 11V/11H (R11) and variance (R11_Var) are computed in 1a process as a quality control parameter of surface stability. Valid AMSR-E 11-GHz brightness

temperature measurements are included in the monthly mean calculation without regard to the percent of the AMSR-E footprint with clear-condition MODIS LST.

Spatial standard deviation (SpSD)

Daily emissivity standard deviation is calculated from the samples that are averaged to one grid, the monthly mean of SpSD is a quality control parameter of surface homogeneity.

QC flags

QC flags (QC_Day or QC_Night) contain two bytes. The first byte QC0 checks retrieval and surface status**,** and the second byte QC1 represents product recommendation.
Table 2 lists the definition of first byte QC0.

Table 2

bit	field	flag	comment
0	Missing emissivity value	0 = emissivity produced 1= emissivity not produced	=1 if none of 1a, classification-based, or 1b produces valid data for the grid. In this case all the following QC bits are not examined.
1	10 GHz radio frequency interference	0 = not RFI contaminated 1 = RFI contaminated	RFI contamination is provided by static external RFI map.
2	snow covered surface	0 = not snow covered 1 = snow covered	snow coverage is decided by regridded AMSR-E/Aqua monthly L3 global snow water equivalent data
3	temporally unstable surface	0 = no 1 = yes	Stable surface threshold sqrt(R11_Var) <= 0.015

Table 3 lists the definition of first byte QC1.

Table 3

bits	field	flag	comment
10	product preference	00 = 1a 01 = classification-based 10 = 1b	QC1 is relevant only for grid points with bit0=0 in QC0

Steps to set QC1:

1. 1a product is baseline, QC1 = 00 initially.
2. if classification-based criteria were met, QC1 = 01.
3. if 1b product passes the 1b quality control algorithm, QC1 = 10.

5. Merged Emissivity Database

5.1 Dataset overview

This database contains a single emissivity product at each populated grid point, which resulted from a merger of the emissivity products from the main algorithms by which AMSR-E channel emissivities were retrieved. For each grid point, only the "best" available estimate of the average effective emissivity is given, where the objective criteria for determining the best estimate are described below. The precise meaning/interpretation of the effective emissivity varies among the grid points according to the algorithm whose product was deemed to be the best.

5.2 Merged Database Data Dimensions

dimension	value	comment
nCol_nRow_nTimeLevels	1036800	nCol × nRow × nTimeLevels(=1 currently)
nValsPerGrid	10	AMSR-E Res.2 channels
nQC	2	

5.3 Merged Database Data Fields

field	type	long name
EmMw	short	Microwave surface emissivity
EmMW_Var	float	MW surface emissivity variance
QC_Sum	byte	summary quality flag for merged data
QC_Day	byte	day quality flag
QC_Night	byte	night quality flag

5.4 Global attributes

Please see Appendix.

5.5 Intermediate day and night separate products

The process of obtaining the merged product from the products of the three algorithms has an intermediate step in which mergers are done separately for day and night data. For each, QC flags are considered to select the intermediate day and night products.

For 1a grid points, three 1a data fields are copied to the merged intermediate datasets: mean emissivity, emissivity variance and number of samples.

For classification-based grid points, two data field are copied to the merged intermediate datasets: mean emissivity and emissivity variance, while numbers of samples are filled with missing values.

For 1b grid points, only 1b mean emissivity field is copied to the merged datasets, emissivity variance and number of samples are filled with missing values; 24 GHz channels are filled with missing values.

Day and night intermediate merged products each are assigned QC flags (QC_Day or QC_Night) based on a series tests:

(1) 'SpSD': fails if the 11H monthly mean emissivity spatial standard deviation (SpSD) > 0.01.
(2) 'snow': fails if QC0 in the combined dataset shows snow flag.
(3) 'fclear': fails if fclear in the combined dataset < 0.15; applicable to 1a grid points only.
(4) 'deltaE': fails if 19V day-night emissivity difference < –0.01; not applicable to 1b grid points.
(5) 'emN': fails if number of combined samples < 8; applicable to 1a grid points only.
(6) 'R11': fails if QC0 in the combined dataset show unstable surface.
(7) 'SD': fails if 19V temporal emissivity SD > 0.01; not applicable to 1b grid points.

The overall QC levels of day and night are defined as:

Level	Criteria	Interpretation
0	passes all the tests or only fails (1)	Favorable surface and measurement conditions for reliable estimation
1	fails (2) or (3) or (4) or (5) and passes (6) and (7)	Suboptimal conditions for estimating the effective emissivity
2	fails (6) or (7)	Unsteady surface condition hinders definition of undisturbed/background average emissivity
3	no emissivity product exists, i.e. bit0=1 in QC0 in the combined dataset	

5.6 Final day and night averaged product

The final mean emissivity value is defined as the average of merged day and night products. If only day or night product is available, it is accepted. The final emissivity variance value is calculated by a similar method.

The final overall summary QC (QC_Sum) level is determined as the lower quality level (higher QC index) between day and night values.

The intermediate QC flags of day and night (QC_Day and QC_Night) tests results are also included in the merged database.

6. Appendix

In the global attributes, included in the lists below, the attribute mwpolarizations is coded as 0=vertical, 1=horizontal.

6.1 Multi-product database header example

```
netcdf earthgrid_EmMw_20030701_20030731_multi {
dimensions:
    nCol_nRow_nTimeLevels = UNLIMITED ; // (1036800 currently)
    nValsPerGrid = 10 ;
    nFreq = 5 ;
    nQC = 2 ;
    nQC_1b = 1 ;
variables:
    short EmMw_Day_1a(nCol_nRow_nTimeLevels, nValsPerGrid) ;
        EmMw_Day_1a:long_name = "1a day MW surface emissivity" ;
        EmMw_Day_1a:units = "none" ;
        EmMw_Day_1a:scale = 0.0001f ;
        EmMw_Day_1a:offset = 0.f ;
    float EmMw_Var_Day_1a(nCol_nRow_nTimeLevels, nValsPerGrid) ;
        EmMw_Var_Day_1a:long_name = "1a day MW surface emissivity variance" ;
        EmMw_Var_Day_1a:units = "none" ;
        EmMw_Var_Day_1a:scale = 1.f ;
        EmMw_Var_Day_1a:offset = 0.f ;
    short EmMw_N_Day_1a(nCol_nRow_nTimeLevels) ;
        EmMw_N_Day_1a:long_name = "1a day number of combined samples" ;
        EmMw_N_Day_1a:units = "none" ;
        EmMw_N_Day_1a:scale = 1 ;
        EmMw_N_Day_1a:offset = 0 ;
    short fclear_Day_1a(nCol_nRow_nTimeLevels) ;
        fclear_Day_1a:long_name = "fraction of clear cases among 1a day samples " ;
        fclear_Day_1a:units = "none" ;
        fclear_Day_1a:scale = 0.0001f ;
        fclear_Day_1a:offset = 0.f ;
    short EmMw_Night_1a(nCol_nRow_nTimeLevels, nValsPerGrid) ;
        EmMw_Night_1a:long_name = "1a night MW surface emissivity" ;
        EmMw_Night_1a:units = "none" ;
        EmMw_Night_1a:scale = 0.0001f ;
        EmMw_Night_1a:offset = 0.f ;
    float EmMw_Var_Night_1a(nCol_nRow_nTimeLevels, nValsPerGrid) ;
        EmMw_Var_Night_1a:long_name = "1a night MW surface emissivity variance" ;
        EmMw_Var_Night_1a:units = "none" ;
        EmMw_Var_Night_1a:scale = 1.f ;
        EmMw_Var_Night_1a:offset = 0.f ;
    short EmMw_N_Night_1a(nCol_nRow_nTimeLevels) ;
        EmMw_N_Night_1a:long_name = "1a night number of combined samples" ;
        EmMw_N_Night_1a:units = "none" ;
        EmMw_N_Night_1a:scale = 1 ;
        EmMw_N_Night_1a:offset = 0 ;
    short fclear_Night_1a(nCol_nRow_nTimeLevels) ;
        fclear_Night_1a:long_name = "fraction of clear cases among 1a night samples " ;
        fclear_Night_1a:units = "none" ;
        fclear_Night_1a:scale = 0.0001f ;
        fclear_Night_1a:offset = 0.f ;
```

```
short R11_Day_1a(nCol_nRow_nTimeLevels) ;
        R11_Day_1a:long_name = "1a day MW brightness temperature ratio 11V/11H" ;
        R11_Day_1a:units = "none" ;
        R11_Day_1a:scale = 0.0001f ;
        R11_Day_1a:offset = 0.f ;
float R11_Var_Day_1a(nCol_nRow_nTimeLevels) ;
        R11_Var_Day_1a:long_name = "1a day MW brightness temperature ratio 11V/11H variance" ;
        R11_Var_Day_1a:units = "none" ;
        R11_Var_Day_1a:scale = 1.f ;
        R11_Var_Day_1a:offset = 0.f ;
short R11_Night_1a(nCol_nRow_nTimeLevels) ;
        R11_Night_1a:long_name = "1a night MW brightness temperature ratio 11V/11H" ;
        R11_Night_1a:units = "none" ;
        R11_Night_1a:scale = 0.0001f ;
        R11_Night_1a:offset = 0.f ;
float R11_Var_Night_1a(nCol_nRow_nTimeLevels) ;
        R11_Var_Night_1a:long_name = "1a night MW brightness temperature ratio 11V/11H variance" ;
        R11_Var_Night_1a:units = "none" ;
        R11_Var_Night_1a:scale = 1.f ;
        R11_Var_Night_1a:offset = 0.f ;
float EmMw_SpSD_Day_1a(nCol_nRow_nTimeLevels, nValsPerGrid) ;
        EmMw_SpSD_Day_1a:long_name = "1a day mean MW surface emissivity spatial standard deviation" ;
        EmMw_SpSD_Day_1a:units = "none" ;
        EmMw_SpSD_Day_1a:scale = 1.f ;
        EmMw_SpSD_Day_1a:offset = 0.f ;
float EmMw_SpSD_Night_1a(nCol_nRow_nTimeLevels, nValsPerGrid) ;
        EmMw_SpSD_Night_1a:long_name = "1a night mean MW surface emissivity spatial standard deviation" ;
        EmMw_SpSD_Night_1a:units = "none" ;
        EmMw_SpSD_Night_1a:scale = 1.f ;
        EmMw_SpSD_Night_1a:offset = 0.f ;
short EmMw_Day_class(nCol_nRow_nTimeLevels, nValsPerGrid) ;
        EmMw_Day_class:long_name = "classification-based day MW surface emissivity" ;
        EmMw_Day_class:units = "none" ;
        EmMw_Day_class:scale = 0.0001f ;
        EmMw_Day_class:offset = 0.f ;
float EmMw_Var_Day_class(nCol_nRow_nTimeLevels, nValsPerGrid) ;
        EmMw_Var_Day_class:long_name = "classification-based day MW surface emissivity variance" ;
        EmMw_Var_Day_class:units = "none" ;
        EmMw_Var_Day_class:scale = 1.f ;
        EmMw_Var_Day_class:offset = 0.f ;
short EmMw_Night_class(nCol_nRow_nTimeLevels, nValsPerGrid) ;
        EmMw_Night_class:long_name = "classification-based night MW surface emissivity" ;
        EmMw_Night_class:units = "none" ;
        EmMw_Night_class:scale = 0.0001f ;
        EmMw_Night_class:offset = 0.f ;
float EmMw_Var_Night_class(nCol_nRow_nTimeLevels, nValsPerGrid) ;
        EmMw_Var_Night_class:long_name = "classification-based night MW surface emissivity variance" ;
        EmMw_Var_Night_class:units = "none" ;
        EmMw_Var_Night_class:scale = 1.f ;
        EmMw_Var_Night_class:offset = 0.f ;
short EmMw_1b(nCol_nRow_nTimeLevels, nValsPerGrid) ;
        EmMw_1b:long_name = "1b MW surface emissivity" ;
        EmMw_1b:units = "none" ;
        EmMw_1b:scale = 0.0001f ;
        EmMw_1b:offset = 0.f ;
float alpha(nCol_nRow_nTimeLevels, nFreq) ;
```

```
        alpha:long_name = "1b penetration metric" ;
        alpha:units = "none" ;
        alpha:scale = 1.f ;
        alpha:offset = 0.f ;
    float EVP (nCol_nRow_nTimeLevels, nfreq) ;
        EVP:long_name = "1b explained variance for penetration" ;
        EVP:units = "none" ;
        EVP:scale = 1.f ;
        EVP:offset = 0.f ;
    short QC_1b(nCol_nRow_nTimeLevels, nQC_1b) ;
        QC_1b:long_name = "1b quality flag" ;
        QC_1b:units = "none" ;
    byte QC_Day(nCol_nRow_nTimeLevels, nQC) ;
        QC_Day:long_name = "day quality flag" ;
        QC_Day:units = "none" ;
    byte QC_Night(nCol_nRow_nTimeLevels, nQC) ;
        QC_Night:long_name = "night quality flag" ;
        QC_Night:units = "none" ;

// global attributes:
        :case = "Version 1.0" ;
        :CreationTime = "Tue Apr 21 20:30:29 2009" ;
        :nDimUnlim = 3 ;
        :dimUnlimDims = 1440, 720, 1 ;
        :dimNamesUnlim1 = "nCol" ;
        :dimNamesUnlim2 = "nRow" ;
        :dimNamesUnlim3 = "nTimeLevels" ;
        :nDimFixed = 1 ;
        :dimFixedDims = 10 ;
        :dimNamesFixed1 = "nValsPerGrid" ;
        :dimUnlimName = "nCol_nRow_nTimeLevels" ;
        :nchmw = 10 ;
        :mwfrequencies = 10.65f, 10.65f, 18.7f, 18.7f, 23.8f, 23.8f, 36.5f, 36.5f, 89.f, 89.f ;
        :mwpolarizations = 0, 1, 0, 1, 0, 1, 0, 1, 0, 1 ;
        :map_projection_type = "Sinusoidal" ;
        :map_origin_latitude = 0.f ;
        :map_origin_longitude = 0.f ;
        :grid_origin_offset_row = 360.f ;
        :grid_origin_offset_col = 720.f ;
        :map_scale = 27.79973f ;
        :map_scale_units = "km" ;
        :earth_radius = 6371.2f ;
        :tile_column_index = 0 ;
        :tile_row_index = 0 ;
        :ncol_globaltiles = 1 ;
        :nrow_globaltiles = 1 ;
        :timeLevelIncrement = 31.f ;
        :timeLevelUnits = "days" ;
        :start_date = "20030701" ;
        :end_date = "20030731" ;
}
```

6.2 Merged database header example

```
netcdf earthgrid_EmMw_20030701_20030731_merge {
dimensions:
```

```
        nCol_nRow_nTimeLevels = UNLIMITED ; // (1036800 currently)
        nValsPerGrid = 10 ;
        nQC = 1 ;
variables:
        short EmMw(nCol_nRow_nTimeLevels, nValsPerGrid) ;
                EmMw:long_name = "MW surface emissivity" ;
                EmMw:units = "none" ;
                EmMw:scale = 0.0001f ;
                EmMw:offset = 0.f ;
        float EmMw_Var(nCol_nRow_nTimeLevels, nValsPerGrid) ;
                EmMw_Var:long_name = "MW surface emissivity variance" ;
                EmMw_Var:units = "none" ;
                EmMw_Var:scale = 1.f ;
                EmMw_Var:offset = 0.f ;
        byte QC_Sum(nCol_nRow_nTimeLevels, nQC) ;
                QC_Sum:long_name = "summary quality flag for merged data" ;
                QC_Sum:units = "none" ;
        byte QC_Day(nCol_nRow_nTimeLevels, nQC) ;
                QC_Day:long_name = "day quality flag" ;
                QC_Day:units = "none" ;
        byte QC_Night(nCol_nRow_nTimeLevels, nQC) ;
                QC_Night:long_name = "night quality flag" ;
                QC_Night:units = "none" ;

// global attributes:
                :case = "Version 1.0" ;
                :CreationTime = "Tue Apr 21 20:31:38 2009" ;
                :nDimUnlim = 3 ;
                :dimUnlimDims = 1440, 720, 1 ;
                :dimNamesUnlim1 = "nCol" ;
                :dimNamesUnlim2 = "nRow" ;
                :dimNamesUnlim3 = "nTimeLevels" ;
                :nDimFixed = 1 ;
                :dimFixedDims = 10 ;
                :dimNamesFixed1 = "nValsPerGrid" ;
                :dimUnlimName = "nCol_nRow_nTimeLevels" ;
                :nchmw = 10 ;
                :mwfrequencies = 10.65f, 10.65f, 18.7f, 18.7f, 23.8f, 23.8f, 36.5f, 36.5f, 89.f, 89.f ;
                :mwpolarizations = 0, 1, 0, 1, 0, 1, 0, 1, 0, 1 ;
                :map_projection_type = "Sinusoidal" ;
                :map_origin_latitude = 0.f ;
                :map_origin_longitude = 0.f ;
                :grid_origin_offset_row = 360.f ;
                :grid_origin_offset_col = 720.f ;
                :map_scale = 27.79973f ;
                :map_scale_units = "km" ;
                :earth_radius = 6371.2f ;
                :tile_column_index = 0 ;
                :tile_row_index = 0 ;
                :ncol_globaltiles = 1 ;
                :nrow_globaltiles = 1 ;
                :timeLevelIncrement = 31.f ;
                :timeLevelUnits = "days" ;
                :start_date = "20030701" ;
                :end_date = "20030731" ;
}
```