README concerning the dataset ReJaNe available via DKRZ
/pool/data resources

Date: 06.12.2022

TITLE OF THE DATASET

Re-analysis data from the Japanese Reanalysis JRA-55 and NCEP1 (ReJaNe)

PATH TO THE DATASET

/pool/data/ReJaNe

OWNER / PRODUCER OF THE DATASET

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DATA USAGE LICENSE
The usage of the provided data is open for any DKRZ and ZMAW / CEN
user. The source of the datasets should be duly acknowledged in
scientific and technical papers, publications, press releases and other
communications regarding the datasets. Example for *JRA-55*: The dataset used for this
study is from the Japanese 55-year Reanalysis (JRA-55) project carried out by the Japan Meteorological
Agency (JMA). Or example for *NCEP1*: NCEP Reanalysis data were provided by the NOAA/OAR/ESRL PSL,
Boulder, Colorado, USA, from their Web site at http://psl.noaa.gov/

Citation of the data is then as follows:
JRA-55: Japan Meteorological Agency/Japan. 2013, updated monthly. *JRA-55: Japanese 55-year
Reanalysis, Daily 3-Hourly and 6-Hourly Data*. Research Data Archive at the National Center for
Atmospheric Research, Computational and Information Systems Laboratory.
https://doi.org/10.5065/D6HH6H41. Accessed 28 Nov 2022.

NCEP1: Kalnay et al., The NCEP/NCAR 40-year reanalysis project, Bull. Amer. Meteor. Soc., 77, 437-470,
1996. https://psl.noaa.gov/data/gridded/data.ncep.reanalysis.html . Accessed 8 Dec 2022.

Disclaimer (for JRA-55 only):
Although JMA has taken the utmost care in creating the datasets, it assumes no responsibility regarding
their reliability. JMA is not responsible for any damage that may result from their use.

Intellectual property (for JRA-55 only):
The intellectual property rights of the datasets belong exclusively to JMA.

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CONTENT OF THE DATASET
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Japanese Atmospheric Reanalysis JRA-55:
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Abstract: The Japan Meteorological Agency (JMA) conducted JRA-55, the second Japanese global atmospheric reanalysis project. It covers 55 years, extending back to 1958, coinciding with the establishment of the global radiosonde observing system. Compared to its predecessor, JRA-25, JRA-55 is based on a new data assimilation and prediction system (DA) that improves many deficiencies found in the first Japanese reanalysis. These improvements have come about by implementing higher spatial resolution (TL319L60), a new radiation scheme, four-dimensional variational data assimilation (4D-Var) with Variational Bias Correction (VarBC) for satellite radiances, and introduction of greenhouse gases with time varying concentrations. The entire JRA-55 production was completed in 2013, and thereafter will be continued on a real time basis.

Specific early results of quality assessment of JRA-55 indicate that a large temperature bias in the lower stratosphere has been significantly reduced compared to JRA-25 through a combination of the new radiation scheme and application of VarBC (which also reduces unrealistic temperature variations). In addition, a dry land surface anomaly in the Amazon basin has been mitigated, and overall forecast scores are much improved over JRA-25.

Most of the observational data employed in JRA-55 are those used in JRA-25. Additionally, newly reprocessed METEOSAT and GMS data were supplied by EUMETSAT and MSC/JMA respectively. Snow depth data over the United States, Russia and Mongolia were supplied by UCAR, RIHMI and IMH respectively.

The Data Support Section (DSS) at NCAR has processed the 1.25 degree version of JRA-55 with the RDA (Research Data Archive) archiving and metadata system. The model resolution data has also been acquired, archived and processed as well, including transformation of the TL319L60 grid to a regular latitude-longitude Gaussian grid (320 latitudes by 640 longitudes, nominally 0.5625 degree). All RDA JRA-55 data is available for internet download, including complete subsetting and data format conversion services.

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National Center for Environmental Prediction Re-Analysis NCEP1:
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Abstract: The NCEP/NCAR Reanalysis 1 project is using a state-of-the-art analysis/forecast system to perform data assimilation using past data from 1948 to the present. A large subset of this data is available from PSL in its original 4 times daily format and as daily averages. However, the data from 1948-1957 is a little different, in the regular (non-Gaussian) gridded data. That data was done at 8 times daily in the model, because the inputs available in that era were available at 3Z, 9Z, 15Z, and 21Z, whereas the 4x daily data has been available at 0Z, 6Z, 12Z, and 18Z. These latter times were forecasted and the combined result for this early era is 8x daily. The local ingestion process took only the 0Z, 6Z, 12Z, and 18Z forecasted values, and thus only those were used to make the daily time series and monthly means here.

DATA COVERAGE / RESOLUTION / FORMAT

JRA-55: Global / 1.25 degree x 1.25 degree grid resolution / netCDF file
format.

The data set contains extracts from the RDA.NCAR.EDU archive of JRA-55
data of
1) JRA-55 6-Hourly 1.25 Degree Total Column Analysis Fields
2) JRA-55 6-Hourly 1.25 Degree Surface Analysis Fields
3) JRA-55 3-Hourly 1.25 Degree 2-Dimensional Average Diagnostic Fields
4) JRA-55 6-Hourly 1.25 Degree Isobaric Analysis Fields

Folder "Surface" hosts data at the surface with 6-hourly sampling for
the analysis (filename begins with "anl") (this is item 1) and 2) in
the list above) and 3-hourly sampling for the forecast (filename begins
with "fcst") (this is item 3) from the list above); the latter comprise
of data of the evaporation and total precipitation.

Every netCDF file contains data of one year - except those for which
the year is not yet complete.

Common name	Unit	Name of variable in file	Long or standard name
2m air temperature	K	TMP_GDS0_HTGL	Temperature
Potential temperature	K	POT_GDS0_SFC	Potential temperature
Dew point depression	K	DEPR_GDS0_HTGL	Dew-point depression
Relative humidity	%	RH_GDS0_HTGL	Relative humidity
Specific humidity	kg/kg	SPFH_GDS0_HTGL	Specific humidity
3-hour average evaporation	mm/day	EVP_GDS0_SFC	Evaporation
3-hour average total precipitation	mm/day	TPRAT_GDS0_SFC	Total precipitation
Mean sea level pressure	Pa	PRMSL_GDS0_MSL	Pressure reduced to MSL
Surface pressure	Pa	PRES_GDS0_SFC	Pressure
Eastward wind component at 10m	m/s	UGRD_GDS0_HTGL	u-component of wind
Northward wind component at 10m	m/s	VGRD_GDS0_HTGL	v-component of wind
Precipitable water	kg/m²	PWAT_GDS0_EATM	Precipitable water

Folder "IsobaricLayers" (see above list item 4) hosts data on the model's pressure levels with 6-hourly sampling; these are analysis data.

Every netCDF file contains data of one month.

Common name	Unit	Name of variable in file	Long or standard name
air temperature	K	TMP_GDS0_ISBL	Temperature
geopotential height	gpm	HGT_GDS0_ISBL	Geopotential height
dew point depression	K	DEPR_GDS0_ISBL	Dew-point depression
Relative humidity	%	RH_GDS0_ISBL	Relative humidity
specific humidity	kg/kg	SPFH_GDS0_ISBL	Specific humidity
eastward wind component	m/s	UGRD_GDS0_ISBL	u-component of wind
northward wind component	m/s	VGRD_GDS0_ISBL	v-component of wind
vertical velocity	Pa/s	VVEL_GDS0_ISBL	Vertical velocity

NCEP1: Global / 2.5 degree x 2.5 degree grid resolution / netCDF file format.

The data set contains extracts from the archive of the NCEP-NCAR reanalysis 1 data at
https://psl.noaa.gov/data/gridded/data.ncep.reanalysis.html

Folder "surface" hosts data at the surface with 6-hourly sampling for the analysis. Every netCDF file contains data of an entire year, except for the latest (running) year.

Common name	Unit	Name of variable in file	Long or standard name
2m air temperature	K	air	4xDaily air temperature at sigma level 995
Potential temperature	K	pottmp	4xDaily potential temperature at sigma level 995
Mean sea level pressure	Pa	slp	4xDaily sea level pressure
Surface pressure	Pa	pres	4xDaily pressure at surface
Lifted index	K	lftx	4xDaily surface lifted index
Precipitable water	Kg/m²	pr_wtr	4xDaily precipitable water for entire atmosphere
Relative humidity	%	rhum	4xDaily relative humidity at sigma level 995
Eastward wind component at 10m	m/s	uwnd	4xDaily u-wind at sigma level 995
Northward wind component at 10m	m/s	vwnd	4xDaily v-wind at sigma level 995
Vertical velocity	Pa/s	omega	4xDaily omega at sigma level 995

In addition, there are two static files: land.nc and hgt_sfc.nc
containing the land-water distribution and the geopotential height at
the surface.

Folder "pressure" hosts data at the pressure levels with 6-hourly
sampling for the analysis. Every netCDF file contains data of an entire
year, except for the latest (running) year.

Common name	Unit	Name of variable in file	Long or standard name
Air temperature	K	air	4xDaily air temperature
Geopotential height	gpm	hgt	4xDaily geopotential height
Relative humidity	%	rhum	4xDaily relative humidity
Specific humidity	kg/kg	shum	4xDaily specific humidity
Eastward wind component	m/s	uwnd	4xDaily u-wind
Northward wind component	m/s	vwnd	4xDaily v-wind
Vertical velocity	Pa/s	omega	4xDaily omega

DATA USAGE SCENARIOS

METHODS USED FOR DATA CREATION

JRA-55: Data were downloaded from https://rda.ucar.edu/data/ds628.0/ via wget in GRIB format and
subsequently converted into netCDF file format using ncl_convert2nc

NCEP1: Data were downloaded from ftp://ftp.cdc.noaa.gov/Datasets/ncep.reanalysis/ via wget in
netCDF file format

ISSUES

None

VOLUME OF THE DATASET (AND POSSIBLE CHANGES THEREOF)

The JRA-55 reanalysis data have a volume of 4.3 TB

The NCEP1 reanalysis data have a volume of 0.2 TB

This volume will increase slowly as consequence of the updates of the reanalysis data by the original
data providers.