2017 Historic MPAS Simulation over the Mesoamerica and Caribbean Region - Available Variables

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Post-Processed Files

These are the 28 variables included for the post-processed files (those with names starting with deg.25*.nc), which are conservatively regridded to a latitude-longitude grid at a spatial resolution of roughly 30 km, comparable to ERA5.

Variable Name	Description	Units	Parameters
olrtoa	All-sky top-of-atmosphere outgoing longwave radiation flux	W/m²	(xtime, lat, lon)
rainc	Accumulated convective precipitation	mm	(xtime, lat, lon)
rainnc	Accumulated total grid-scale precipitation	mm	(xtime, lat, lon)
mslp	Mean sea-level pressure	Pa	(xtime, lat, lon)
relhum_700hPa	Relative humidity vertically interpolated to 700 hPa	%	(xtime, lat, lon)
relhum_850hPa	Relative humidity vertically interpolated to 850 hPa	%	(xtime, lat, lon)
temperature_925hPa	Temperature vertically interpolated to 925 hPa	K	(xtime, lat, lon)
uzonal_500hPa	Reconstructed zonal wind at cell centers, vertically interpolated to 500 hPa	m/s	(xtime, lat, lon)
uzonal_700hPa	Reconstructed zonal wind at cell centers, vertically interpolated to 700 hPa	m/s	(xtime, lat, lon)
uzonal_850hPa	Reconstructed zonal wind at cell centers, vertically interpolated to 850 hPa	m/s	(xtime, lat, lon)
umeridional_500hPa	Reconstructed meridional wind at cell centers, vertically interpolated to 500 hPa	m/s	(xtime, lat, lon)
umeridional_700hPa	Reconstructed meridional wind at cell centers, vertically interpolated to 700 hPa	m/s	(xtime, lat, lon)
umeridional_850hPa	Reconstructed meridional wind at cell centers, vertically interpolated to 850 hPa	m/s	(xtime, lat, lon)
w_700hPa	Vertical velocity vertically interpolated to 700 hPa	m/s	(xtime, lat, lon)
w_850hPa	Vertical velocity vertically interpolated to 850 hPa	m/s	(xtime, lat, lon)
t_isobaric	Temperature interpolated to isobaric surfaces defined in t_iso_levels	K	(xtime, lat, lon, t_iso_levels)
z_isobaric	Height interpolated to isobaric surfaces defined in z_iso_levels	m	(xtime, lat, lon, z_iso_levels)
uzonal_isobaric	Zonal wind interpolated to isobaric surfaces defined in u_iso_levels	m/s	(xtime, lat, lon, u_iso_levels)
qv_isobaric	Water vapor mixing ratio interpolated to isobaric surfaces defined in t_iso_levels	kg/kg	(xtime, lat, lon, t_iso_levels)
rh_isobaric	Relative humidity interpolated to isobaric surfaces defined in t_iso_levels	%	(xtime, lat, lon, t_iso_levels)

w_isobaric	Vertical wind interpolated to isobaric surfaces defined in u_iso_levels	m/s	(xtime, lat, lon, u_iso_levels)
rhod_isobaric	Dry air density interpolated to isobaric surfaces defined in t_iso_levels	kg/m³	(xtime, lat, lon, t_iso_levels)
umeridional_isobaric	Meridional wind interpolated to isobaric surfaces defined in u_iso_levels	m/s	(xtime, lat, lon, u_iso_levels)
dtheta_dt_mp_isobaric	Potential temperature heating rate from microphysics interpolated to isobaric surfaces defined in t_iso_levels	K/s	(xtime, lat, lon, t_iso_levels)
rthratenlw_isobaric	Tendency of potential temperature due to long wave radiation interpolated to isobaric surfaces defined in t_iso_levels	K/s	(xtime, lat, lon, t_iso_levels)
rthratensw_isobaric	Tendency of potential temperature due to short wave radiation interpolated to isobaric surfaces defined in t_iso_levels	K/s	(xtime, lat, lon, t_iso_levels)
rthblten_isobaric	Tendency of potential temperature due to pbl processes interpolated to isobaric surfaces defined in t_iso_levels	K/s	(xtime, lat, lon, t_iso_levels)
hfx	Upward heat flux at the surface	W/m²	(xtime, lat, lon)

Dimensions

NOTE: t_iso_levels, z_iso_levels, and z_iso_levels are the same

Dimensions	**Description**	**Units**	**Range of Values**
lat	Latitude	°N	-89.875, -89.625, -89.375, ..., 89.375, 89.625, 89.875
lon	Longitude	°	-180. , -179.75, -179.5 , ..., 179.25, 179.5 , 179.75
t_iso_levels	Levels for vertical interpolation of temperature to isobaric surfaces	Pa	10000., 12500., 15000., ..., 95000., 97500., 100000.
z_iso_levels	Levels for vertical interpolation of height to isobaric surfaces	Pa	10000., 12500., 15000., ..., 95000., 97500., 100000.
u_iso_levels	Levels for vertical interpolation of winds to isobaric surfaces	Pa	10000., 12500., 15000., ..., 95000., 97500., 100000.
xtime	Time		2017-09-15T00:00:00.000000000', '2017-09-15T01:00:00.000000000', '2017-09-15T02:00:00.000000000', ..., '2017-09-29T22:00:00.000000000', '2017-09-29T23:00:00.000000000', '2017-09-30T00:00:00.000000000'

Native Grid Files

These are the variables included for the native grid files (those with names starting with diag*.nc).

Variable Name	Description	Units/Format	Parameters
initial_time	Model initialization time	YYYY-MM-DD_hh:mm:ss	()
xtime	Model valid time	YYYY-MM-DD_hh:mm:ss	(Time)
olrtoa	all-sky top-of-atmosphere outgoing longwave radiation flux	W/m²	(Time, nCells)
rainc	accumulated convective precipitation	mm	(Time, nCells)
rainnc	accumulated total grid-scale precipitation	mm	(Time, nCells)
refl10cm_max	10 cm maximum radar reflectivity	dBZ	(Time, nCells)
refl10cm_1km	diagnosed 10 cm radar reflectivity at 1 km AGL	dBZ	(Time, nCells)
refl10cm_1km_max	maximum diagnosed 10 cm radar reflectivity at 1 km AGL since last output time	dBZ	(Time, nCells)
precipw	precipitable water	kg/m²	(Time, nCells)
u10	10-meter zonal wind	m/s	(Time, nCells)
v10	10-meter meridional wind	m/s	(Time, nCells)
q2	2-meter specific humidity	kg/kg	(Time, nCells)
t2m	2-meter temperature	K	(Time, nCells)
th2m	2-meter potential temperature	K	(Time, nCells)
mslp	Mean sea-level pressure	Pa	(Time, nCells)
relhum_200hPa	Relative humidity vertically interpolated to 200 hPa	%	(Time, nCells)
relhum_250hPa	Relative humidity vertically interpolated to 250 hPa	%	(Time, nCells)
relhum_500hPa	Relative humidity vertically interpolated to 500 hPa	%	(Time, nCells)
relhum_700hPa	Relative humidity vertically interpolated to 700 hPa	%	(Time, nCells)
relhum_850hPa	Relative humidity vertically interpolated to 850 hPa	%	(Time, nCells)
relhum_925hPa	Relative humidity vertically interpolated to 925 hPa	%	(Time, nCells)
dewpoint_200hPa	Dewpoint temperature vertically interpolated to 200 hPa	K	(Time, nCells)

dewpoint_250hPa	Dewpoint temperature vertically interpolated to 250 hPa	K	(Time, nCells)
dewpoint_500hPa	Dewpoint temperature vertically interpolated to 500 hPa	K	(Time, nCells)
dewpoint_700hPa	Dewpoint temperature vertically interpolated to 700 hPa	K	(Time, nCells)
dewpoint_850hPa	Dewpoint temperature vertically interpolated to 850 hPa	K	(Time, nCells)
dewpoint_925hPa	Dewpoint temperature vertically interpolated to 925 hPa	K	(Time, nCells)
temperature_200hPa	Temperature vertically interpolated to 200 hPa	K	(Time, nCells)
temperature_250hPa	Temperature vertically interpolated to 250 hPa	K	(Time, nCells)
temperature_500hPa	Temperature vertically interpolated to 500 hPa	K	(Time, nCells)
temperature_700hPa	Temperature vertically interpolated to 700 hPa	K	(Time, nCells)
temperature_850hPa	Temperature vertically interpolated to 850 hPa	K	(Time, nCells)
temperature_925hPa	Temperature vertically interpolated to 925 hPa	K	(Time, nCells)
height_200hPa	Geometric height interpolated to 200 hPa	m	(Time, nCells)
height_250hPa	Geometric height interpolated to 250 hPa	m	(Time, nCells)
height_500hPa	Geometric height interpolated to 500 hPa	m	(Time, nCells)
height_700hPa	Geometric height interpolated to 700 hPa	m	(Time, nCells)
height_850hPa	Geometric height interpolated to 850 hPa	m	(Time, nCells)
height_925hPa	Geometric height interpolated to 925 hPa	m	(Time, nCells)
uzonal_200hPa	Reconstructed zonal wind at cell centers, vertically interpolated to 200 hPa	m/s	(Time, nCells)
uzonal_250hPa	Reconstructed zonal wind at cell centers, vertically interpolated to 250 hPa	m/s	(Time, nCells)
uzonal_500hPa	Reconstructed zonal wind at cell centers, vertically interpolated to 500 hPa	m/s	(Time, nCells)
uzonal_700hPa	Reconstructed zonal wind at cell centers, vertically interpolated to 700 hPa	m/s	(Time, nCells)
uzonal_850hPa	Reconstructed zonal wind at cell centers, vertically interpolated to 850 hPa	m/s	(Time, nCells)
uzonal_925hPa	Reconstructed zonal wind at cell centers, vertically interpolated to 925 hPa	m/s	(Time, nCells)
umeridional_200hPa	Reconstructed meridional wind at cell centers, vertically interpolated to 200 hPa	m/s	(Time, nCells)

umeridional_250hPa	Reconstructed meridional wind at cell centers, vertically interpolated to 250 hPa	m/s	(Time, nCells)
umeridional_500hPa	Reconstructed meridional wind at cell centers, vertically interpolated to 500 hPa	m/s	(Time, nCells)
umeridional_700hPa	Reconstructed meridional wind at cell centers, vertically interpolated to 700 hPa	m/s	(Time, nCells)
umeridional_850hPa	Reconstructed meridional wind at cell centers, vertically interpolated to 850 hPa	m/s	(Time, nCells)
umeridional_925hPa	Reconstructed meridional wind at cell centers, vertically interpolated to 925 hPa	m/s	(Time, nCells)
w_200hPa	Vertical velocity vertically interpolated to 200 hPa	m/s	(Time, nCells)
w_250hPa	Vertical velocity vertically interpolated to 250 hPa	m/s	(Time, nCells)
w_500hPa	Vertical velocity vertically interpolated to 500 hPa	m/s	(Time, nCells)
w_700hPa	Vertical velocity vertically interpolated to 700 hPa	m/s	(Time, nCells)
w_850hPa	Vertical velocity vertically interpolated to 850 hPa	m/s	(Time, nCells)
w_925hPa	Vertical velocity vertically interpolated to 925 hPa	m/s	(Time, nCells)
vorticity_200hPa	Relative vorticity vertically interpolated to 200 hPa	1/s	(Time, nVertices)
vorticity_300hPa	Relative vorticity vertically interpolated to 300 hPa	1/s	(Time, nVertices)
vorticity_500hPa	Relative vorticity vertically interpolated to 500 hPa	1/s	(Time, nVertices)
vorticity_700hPa	Relative vorticity vertically interpolated to 700 hPa	1/s	(Time, nVertices)
vorticity_850hPa	Relative vorticity vertically interpolated to 850 hPa	1/s	(Time, nVertices)
vorticity_925hPa	Relative vorticity vertically interpolated to 925 hPa	1/s	(Time, nVertices)
t_isobaric	Temperature interpolated to isobaric surfaces defined in t_iso_levels	K	(Time, nCells, t_iso_levels)
z_isobaric	Height interpolated to isobaric surfaces defined in z_iso_levels	m	(Time, nCells, z_iso_levels)
uzonal_isobaric	Zonal wind interpolated to isobaric surfaces defined in u_iso_levels	m/s	(Time, nCells, u_iso_levels)
qv_isobaric	Water vapor mixing ratio interpolated to isobaric surfaces defined in t_iso_levels	kg/kg	(Time, nCells, t_iso_levels)
rh_isobaric	Relative humidity interpolated to isobaric surfaces defined in t_iso_levels	%	(Time, nCells, t_iso_levels)

w_isobaric	Vertical wind interpolated to isobaric surfaces defined in u_iso_levels	m/s	(Time, nCells, u_iso_levels)
rhod_isobaric	dry air density interpolated to isobaric surfaces defined in t_iso_levels	kg/m³	(Time, nCells, t_iso_levels)
umeridional_isobaric	Meridional wind interpolated to isobaric surfaces defined in u_iso_levels	m/s	(Time, nCells, u_iso_levels)
meanT_500_300	Mean temperature in the 300 hPa - 500 hPa layer	K	(Time, nCells)
cape	Convective available potential energy	J/kg	(Time, nCells)
cin	Convective inhibition	J/kg	(Time, nCells)
lcl	Lifted condensation level	m	(Time, nCells)
lfc	Level of free convection	m	(Time, nCells)
dtheta_dt_mp_isobaric	Potential temperature heating rate from microphysics interpolated to isobaric surfaces defined in t_iso_levels	K/s	(Time, nCells, t_iso_levels)
rthratenlw_isobaric	tendency of potential temperature due to long wave radiation interpolated to isobaric surfaces defined in t_iso_levels	K/s	(Time, nCells, t_iso_levels)
rthratensw_isobaric	tendency of potential temperature due to short wave radiation interpolated to isobaric surfaces defined in t_iso_levels	K/s	(Time, nCells, t_iso_levels)
rthblten_isobaric	tendency of potential temperature due to pbl processes interpolated to isobaric surfaces defined in t_iso_levels	K/s	(Time, nCells, t_iso_levels)
hfx	upward heat flux at the surface	W/m²	(Time, nCells)

Coordinates

Coordinates	Description	Units	Range of Values
t_iso_levels	Levels for vertical interpolation of temperature to isobaric surfaces	Pa	10000., 12500., 15000., ..., 95000., 97500., 100000.
u_iso_levels	Levels for vertical interpolation of winds to isobaric surfaces	Pa	10000., 12500., 15000., ..., 95000., 97500., 100000.
z_iso_levels	Levels for vertical interpolation of height to isobaric surfaces	Pa	10000., 12500., 15000., ..., 95000., 97500., 100000.