Parameters in BARRA

The following parameters comprise the Bureau of Meteorology Atmospheric high-resolution Regional Reanalysis of Australia (BARRA) dataset.

For information on the model system, current data availability and access see the project webpage: http://www.bom.gov.au/research/projects/reanalysis/

Short name Parameter name used in netCDF filename and variable name

Standard name CF standard name of parameter if it exists. 'None' indicates there is no CF standard name

Full name Full parameter name

Time step Temporal frequency of parameter output. BARRA parameters are mostly hourly frequency except for 'spec' stream parameters which are 10 minute frequency

Vertical levels Information on the vertical levels profiles of the parameter output. 'slv' and 'spec' are all single level or 9 surface tiles, 'prs' are on pressure levels, and 'mdl' and 'cld' are on either (35, 70 or 71) 'theta' or 'rho' levels

Models BARRA includes output from model BARRA-R and subdomain models BARRA-XX (comprised of BARRA-SY,AD,TA and PH). Most parameters are included in both R and XX model datasets but some are only available in a single model dataset

Stream Catagoric parameters streams 'mdl', 'cld', 'prs' , 'slv' and 'spec'

mdl' & 'cld'	(Dry) model level parameters and cloud model level parameters defined on all 70 vertical levels
prs'	Pressure level parameters defined on a subset of vertical isobaric levels
slv'	Single level parameters
spec'	Single level parameters output at 10-minute frequency

Description Description of the parameter as taken from the UM diagnostic metadata stashmaster file

Method Cell method for time sampling ie. mean, max, instantaneous etc.

Units Parameter units. Nondimensional parameters have unit '1'

Completeness Most parameters will be available for the complete time period unless specified

Short name	Standard name	Full name	Time step	Vertical levels	Models	Stream	Description	Method	Units	Completeness
area_cld_frac	cloud_area_fraction_in_atmosphere_layer	AREA CLOUD FRACTION IN EACH LAYER	hourly	L1-70 theta levels	R and XX	cld	This is the area fraction of a gridbox which is covered in cloud when observed in isolation from above, at the end of the timestep. It may be greater than the bulk (volume) cloud fraction (1 0 266) since the cloud may not be uniformly spread in the vertical.	Instantaneous	1	
n_cld_droplets	None	CLOUD DROP NUMBER CONC. /m3	hourly	L1-70 theta levels	R and XX	cld	Cloud drop number concentration (/m3) This is the cloud drop number concentration that is calculated within the autoconversion scheme in large-scale precipitation. It is usually a function of the aerosol present or a fixed value dependent on whether the grid point is a sea or a land point. Where there is no cloud, the droplet number concentration is zero. Divide by 1.0E6 to get the drop number in units of number per cubic cm (this unit is often used in cloud physics literature). The cloud droplet number concentration is important for radiation calculations and to determine whether it will rain or not.	Instantaneous	m-3	
cld_ice	mass_fraction_of_cloud_ice_in_air	QCF AFTER TIMESTEP	hourly	L0-70 theta levels	R and XX	cld	This is the gridbox mean specific ice content (cloud condensate), in kg of ice per kg of air, at the end of the timestep.	Instantaneous	kg kg-1	
cld_water	mass_fraction_of_cloud_liquid_water_in_air	QCL AFTER TIMESTEP	hourly	L0-70 theta levels	R and XX	cld	This is the gridbox mean specific liquid content (cloud condensate), in kg of liquid per kg of air, at the end of the timestep.	Instantaneous	kg kg-1	
graupel	None	GRAUPEL AFTER TIMESTEP	hourly	L1-70 theta levels	XX Only	cld	Prognostic graupel water content (kg/kg).	Instantaneous	kg kg-1	Partial in 2015, available otherwise
ice_cld_frac	None	FROZEN CLOUD FRACTION IN EACH LAYER	hourly	L0-70 theta levels	R and XX	cld	This is the volume fraction of a gridbox covered in ice condensate at the end of a timestep. Note that the value of the ice cloud fraction plus the liquid cloud fraction (1 0 267) may be greater than the bulk cloud fraction (1 0 266) due to overlap between the ice and liquid clouds.	Instantaneous	1	
lqd_cld_frac	None	LIQUID CLOUD FRACTION IN EACH LAYER	hourly	L0-70 theta levels	R and XX	cld	This is the volume fraction of a gridbox covered in liquid condensate at the end of a timestep. Note that the value of the liquid cloud fraction plus the ice cloud fraction (1 0 268) may be greater than the bulk cloud fraction (1 0 266) due to overlap between the liquid and ice clouds.	Instantaneous	1	
bulk_cld_frac	None	BULK CLOUD FRACTION IN EACH LAYER	hourly	L0-70 theta levels	R only	cld	This is the volume fraction of a gridbox covered in cloud at the end of a timestep. It may be less than the area cloud fraction (1 0 265) if the cloud is not uniformly spread in the vertical.			
rain	mass_fraction_of_rain_in_air	RAIN AFTER TIMESTEP	hourly	L0-70 theta levels	R and XX	cld	Prognostic rain water content (kg/kg)	Instantaneous	kg kg-1	
air_temp	air_temperature	TEMPERATURE ON THETA LEVELS	hourly	L1-70 theta levels	R and XX	mdl		Instantaneous	K	
grad_r_number	None	GRADIENT RICHARDSON NUMBER	hourly	L1-35 (BARRA-R), L1-50 (BARRA-XX) lowest theta levels	R and XX	mdl	The gradient Richardson number used in the calculation of stability functions in the local boundary layer diffusion scheme.	Instantaneous	1	Partial in 2010-2015, available otherwise
p_half	air_pressure	PRESSURE AT RHO LEVELS AFTER TS	hourly	L1-71 rho levels	R and XX	mdl		Instantaneous	Pa	
pressure	air_pressure	PRESSURE AT THETA LEVELS AFTER TS	hourly	L1-70 theta levels	R and XX	mdl		Instantaneous	Pa	
exner_pressure	dimensionless_exner_function	EXNER PRESSURE (RHO) AFTER TIMESTEP	hourly	L1-71 rho levels	R only	mdl		Instantaneous	1	
density_r_r	None	DENSITY*R*R AFTER TIMESTEP	hourly	L1-71 rho levels	R only	mdl		Instantaneous	kg kg-1	
turb_ke	None	TURBULENT KINETIC ENERGY	hourly	L1-35 (BARRA-R), L1-50 (BARRA-XX) lowest theta levels	R and XX	mdl		Instantaneous	m2 s-2	Partial in 2010-2015, available otherwise
height_rho	height_above_reference_ellipsoid	H OF RHO MODEL LEVS FROM SEA LEVEL	static	L1-71 rho levels	R and XX	mdl		Instantaneous	m	
height_theta	height_above_reference_ellipsoid	H OF THETA MODEL LEVS FROM SEA LEVEL	static	L1-70 theta levels	R and XX	mdl		Instantaneous	m	
spec_hum	specific_humidity	SPECIFIC HUMIDITY AFTER TIMESTEP	hourly	L0-70 theta levels	R and XX	mdl		Instantaneous	kg kg-1	
theta	air_potential_temperature	THETA AFTER TIMESTEP	hourly	L0-70 theta levels	R and XX	mdl	Potential temperature on p points on native c grid. K	Instantaneous	K	
vertical_wnd	upward_air_velocity	W COMPNT OF WIND AFTER TIMESTEP	hourly	L0-70 theta levels	R and XX	mdl		Instantaneous	m s-1	
wnd_ucmp	x_wind	U COMPNT OF WIND AFTER TIMESTEP	hourly	L1-70 rho levels	R and XX	mdl	u component of wind on u pts on native c grid. m/s	Instantaneous	m s-1	
wnd_vcmp	y_wind	V COMPNT OF WIND AFTER TIMESTEP	hourly	L1-70 rho levels	R and XX	mdl	v component of wind on v pts on native c grid. m/s	Instantaneous	m s-1	
air_temp	air_temperature	TEMPERATURE ON P LEV/P GRID	hourly	37 pressure levels	R and XX	prs		Instantaneous	K	
geop_ht	geopotential_height	GEOPOTENTIAL HEIGHT ON P LEV/P GRID	hourly	37 pressure levels	R and XX	prs	Geopotential height in metres on pressure levels on the native grid This useful meteorological field is often output on a standard set of pressure levels. It is required on 1000, 850 & 500mb levels to produce the PWS diagnostics 20001 & 20002, 1000-500 & 1000-850 Thicknesses and 20028 snow probability.	Instantaneous	m	
pot_vor	None	POTENTIAL VORTICITY ON PRESSURE LEVS	hourly	37 pressure levels	R and XX	prs		Instantaneous	K m2 s-1 kg-1	

Short name	Standard name	Full name	Time step	Vertical levels	Models	Stream	Description	Method	Units	Completeness
relhum	relative_humidity	RH WRT WATER ON P LEV/P GRID	hourly	37 pressure levels	R and XX	prs		Instantaneous	%	
relhum_ice	relative_humidity	RH WRT ICE ON P LEV/P GRID	hourly	37 pressure levels	R and XX	prs	Relative humidity on pressure levels This is the ratio of the water vapour content of the air to the saturated water vapour content of the air at the same temperature and pressure, multiplied by a factor 100. The saturated water vapour content is calculated with respect to a flat ice surface at temperatures below 0 degrees C, and with respect to a flat liquid water surface at temperatures above 0 degrees C. An artificial upper limit of 100 is imposed for the 2B,2C,2D and 2E large scale precipitation schemes. No upper limit is imposed for the 3A or 3B large scale precipitation schemes. A lower limit of 0 is imposed for all large scale precipitation schemes.	Instantaneous	%	
vertical_wnd	upward_air_velocity	W COMPNT (OF WIND) ON PRESSURE LEVS	hourly	37 pressure levels	R and XX	prs		Instantaneous	m s-1	
wnd_ucmp	x_wind	U WIND ON PRESSURE LEVELS B GRID	hourly	37 pressure levels	R and XX	prs		Instantaneous	m s-1	
wnd_vcmp	y_wind	V WIND ON PRESSURE LEVELS B GRID	hourly	37 pressure levels	R and XX	prs		Instantaneous	m s-1	
accum_evap	None	EVAP FROM SOIL SURF -AMOUNT KG/M2/TS	hourly	Single-level	R and XX	slv		time: sum	kg m-2	
av_abl_ht	atmosphere_boundary_layer_thickness	BOUNDARY LAYER DEPTH AFTER TIMESTEP (Mean)	hourly	Single-level	R and XX	slv		time: mean (interval: 1 hour)	m	
av_accum_evap_sea	None	EVAP FROM OPEN SEA: SEA MEAN KG/M2/S (Mean)	hourly	Single-level	R and XX	slv	This item is the evaporative flux from the open sea. It is weighted by the total sea (ie open sea and sea-ice) fraction.	time: mean (interval: 1 hour)	kg/m^2/s	
av_lat_hflx	surface_upward_latent_heat_flux	SURFACE LATENT HEAT FLUX W/M2 (Mean)	hourly	Single-level	R and XX	slv		time: mean (interval: 1 hour)	W m-2	
av_lwsfcdown	surface_downwelling_longwave_flux	DOWNWARD LW RAD FLUX: SURFACE (Mean)	hourly	Single-level	R and XX	slv	The total downward flux of LW radiation at the ground or ocean surface. The diagnostic is calculated only on LW radiation timesteps.	time: mean (interval: 1 hour)	W m-2	
av_mslp	air_pressure_at_sea_level	PRESSURE AT MEAN SEA LEVEL (Mean)	hourly	Single-level	R and XX	slv		time: mean (interval: 1 hour)	Pa	
av_netlwsfc	surface_net_downward_longwave_flux	NET DOWN SURFACE LW RAD FLUX (Mean)	hourly	Single-level	R and XX	slv	The net downward (total downward minus upward) LW radiative flux at the surface (ground or ocean surface). The diagnostic is available only on LW radiation timesteps.	time: mean (interval: 1 hour)	W m-2	
av_netswsfc	None	NET DOWN SURFACE SW FLUX : CORRECTED (Mean)	hourly	Single-level	R and XX	slv	The net downward (total downward minus upward) radiative SW flux at the surface (ground or ocean surface). This diagnostic is available on all model timesteps and has been corrected for the solar zenith angle that is valid for the model timestep.	time: mean (interval: 1 hour)	W m-2	
av_olr	toa_outgoing_longwave_flux	OUTGOING LW RAD FLUX (TOA) (Mean)	hourly	Single-level	R and XX	slv	The flux of LW radiation leaving the top of the atmosphere. The diagnostic is calculated only on LW radiation timesteps.	time: mean (interval: 1 hour)	W m-2	
av_oswrad_flx	toa_outgoing_shortwave_flux	OUTGOING SW RAD FLUX (TOA):CORRECTED (Mean)	hourly	Single-level	R and XX	slv	The outgoing SW radiative flux at the top of the atmosphere. This diagnostic is available on all model timesteps and has been corrected for the solar zenith angle that is valid for the model timestep.	time: mean (interval: 1 hour)	W m-2	
av_qsair_scrn	specific_humidity	SPECIFIC HUMIDITY AT 1.5M (Mean)	hourly	Single-level	R and XX	slv	Estimate of atmospheric specific humidity (g/kg) at 1.5m. Calculated by integrating the similarity equations from the surface to 1.5m (surface value taken as saturated specific humidity at the surface temperature). Available on all timesteps.	time: mean (interval: 1 hour)	kg kg-1	
av_sens_hflx	surface_upward_sensible_heat_flux	SURFACE SENSIBLE HEAT FLUX W/M2 (Mean)	hourly	Single-level	R and XX	slv	Sensible heat flux at the surface, single level field. Available on all timesteps.	time: mean (interval: 1 hour)	W m-2	
av_sfc_mois_flx	surface_upward_water_flux	SURFACE TOTAL MOISTURE FLUX KG/M2/S (Mean)	hourly	Single-level	R and XX	slv	Moisture flux profile, on model half levels, with the first value being the surface moisture flux. Available on all timesteps.	time: mean (interval: 1 hour)	kg m-2 s-1	
av_sfc_sw_dif	None	DIFFUSE SURFACE SW FLUX : CORRECTED (Mean)	hourly	Single-level	R and XX	slv	The diffuse (scattered) component of the total downward SW radiative flux at the surface (ground or ocean surface). This diagnostic is available on all model timesteps and has been corrected for the solar zenith angle that is valid for the model timestep. Wm-2	time: mean (interval: 1 hour)	W m-2	
av_sfc_sw_dir	None	DIRECT SURFACE SW FLUX : CORRECTED (Mean)	hourly	Single-level	R and XX	slv	The direct (unscattered) component of the total downward SW radiative flux at the surface (ground or ocean surface). This diagnostic is available on all model timesteps and has been corrected for the solar zenith angle that is valid for the model timestep. Wm-2	time: mean (interval: 1 hour)	W m-2	
av_swirrtop	toa_incoming_shortwave_flux	INCOMING SW RAD FLUX (TOA): ALL TSS (Mean)	hourly	Single-level	R and XX	slv	The incoming SW radiative flux from the sun. The diagnostic is calculated for all timesteps.	time: mean (interval: 1 hour)	W m-2	
av_swsfcdown	surface_downwelling_shortwave_flux_in_air	TOTAL DOWNWARD SURFACE SW FLUX (Mean)	hourly	Single-level	R and XX	slv	The total downward SW radiative flux at the surface (ground or ocean surface). The diagnostic is available only on SW radiation timesteps.	time: mean (interval: 1 hour)	W m-2	
av_temp_scrn	air_temperature	TEMPERATURE AT 1.5M (Mean)	hourly	Single-level	R and XX	slv	Estimate of atmospheric temperature (K) at 1.5m (screen level). Calculated by integrating the similarity equations from the surface to 1.5m. Available on all timesteps.	time: mean (interval: 1 hour)	K	
av_ttl_cld	None	TOTAL CLOUD AMOUNT MAX/RANDOM OVERLP (Mean)	hourly	Single-level	R and XX	slv		time: mean (interval: 1 hour)	1	
av_uwnd10m	x_wind	10 METRE WIND U-COMP (Mean)	hourly	Single-level	R and XX	slv		time: mean (interval: 1 hour)	m s-1	
av_uwnd_strs	surface_downward_eastward_stress	X-COMP SURFACE BL STRESS (Mean)	hourly	Single-level	R and XX	slv	The x component of the surface stress. This is included to allow correct diagnosis and labelling of surface stress without the need for a STASH work around.	time: mean (interval: 1 hour)	Pa	
av_vwnd10m	y_wind	10 METRE WIND V-COMP (Mean)	hourly	Single-level	R and XX	slv		time: mean (interval: 1 hour)	m s-1	
av_vwnd_strs	surface_downward_northward_stress	Y-COMP SURFACE BL STRESS (Mean)	hourly	Single-level	R and XX	slv	The y component of the surface stress. This is included to allow correct diagnosis and labelling of surface stress without the need for a STASH work around.	time: mean (interval: 1 hour)	Pa	
av_wndgust10m	wind_speed_of_gust	WIND GUST (Mean)	hourly	Single-level	R and XX	slv	Gust windspeed at 10m. Single level available every timestep.	time: mean (interval: 1 hour)	m s-1	
canopy_wtr_cont	canopy_water_amount	CANOPY WATER CONTENT	hourly	Single-level	R and XX	slv	None	Instantaneous	kg m-2	

Short name	Standard name	Full name	Time step	Vertical levels	Models	Stream	Description	Method	Units	Completeness
cld_base_gt0p1	None	CLOUD BASE ASL COVER.GT.0.1 OCTA KFT	hourly	Single-level	R and XX	slv	CLOUD BASE ASL COVER.GT.N OCTA KFT where n These diagnostics provide the cloud base ABOVE SEA LEVEL for a range of cloud cover thresholds. The algorithm searches from the bottom up until the required cloud cover threshold is found. The diagnostic then reports the height at which this threshold is first reached. WARNING: this diagnostic is NOT in SI units, it is in kft (kilo-feet, i.e. 1.0e3 feet). WARNING: This diagnostic is calculated WITH RESPECT TO THE MEAN-SEA LEVEL. For locations over land one needs to subtract the height of the orography at that point in order to get a height ABOVE GROUND LEVEL. Note however that one may want to subtract the actual height of a location rather than the height of the model orography at that point depending on exactly what kind of comparison one wishes to do.	Instantaneous	kft	
cld_base_gt1p5	None	CLOUD BASE ASL COVER.GT.1.5 OCTA KFT	hourly	Single-level	R and XX	slv	See description for cld_base_gt0p1	Instantaneous	kft	
cld_base_gt2p5	None	CLOUD BASE ASL COVER.GT.2.5 OCTA KFT	hourly	Single-level	R and XX	slv	See description for cld_base_gt0p2	Instantaneous	kft	
cld_base_gt3p5	None	CLOUD BASE ASL COVER.GT.3.5 OCTA KFT	hourly	Single-level	R and XX	slv	See description for cld_base_gt0p3	Instantaneous	kft	
cld_base_gt4p5	None	CLOUD BASE ASL COVER.GT.4.5 OCTA KFT	hourly	Single-level	R and XX	slv	See description for cld_base_gt0p4	Instantaneous	kft	
cld_base_gt5p5	None	CLOUD BASE ASL COVER.GT.5.5 OCTA KFT	hourly	Single-level	R and XX	slv	See description for cld_base_gt0p5	Instantaneous	kft	
cld_base_gt6p5	None	CLOUD BASE ASL COVER.GT.6.5 OCTA KFT	hourly	Single-level	R and XX	slv	See description for cld_base_gt0p6	Instantaneous	kft	
cld_base_gt7p9	None	CLOUD BASE ASL COVER.GT.7.9 OCTA KFT	hourly	Single-level	R and XX	slv	See description for cld_base_gt0p7	Instantaneous	kft	
cs_dsfc_lw_flx	None	CLEAR-SKY (II) DOWN SURFACE LW FLUX	hourly	Single-level	R and XX	slv	The total downward flux of LW radiation at the ground or ocean surface neglecting the radiative effects of all clouds in the atmosphere. The diagnostic is calculated only on LW radiation timesteps.	Instantaneous	W m-2	
cs_dsfc_sw_flx	surface_downwelling_shortwave_flux_in_air_assuming_clear_sky	CLEAR-SKY (II) DOWN SURFACE SW FLUX	hourly	Single-level	R and XX	slv	The downward clear-sky SW radiative flux at the surface. This is an actual downward flux, not a net flux. It is calculated using method II for clear-sky fluxes; that is at every grid-point the radiative flux is calculated using exactly the same physical inputs (gaseous mixing ratios, surface albedos etc.) as for the all-sky calculation, except that the radiative effects of clouds are ignored.	Instantaneous	W m-2	
cs_usfc_sw_flx	surface_upwelling_shortwave_flux_in_air_assuming_clear_sky	CLEAR-SKY (II) UP SURFACE SW FLUX	hourly	Single-level	R and XX	slv	The upward clear-sky SW radiative flux at the surface. It is calculated using method II for clear-sky fluxes; that is at every grid-point the radiative flux is calculated using exactly the same physical inputs (gaseous mixing ratios, surface albedos etc.) as for the all-sky calculation, except that the radiative effects of clouds are ignored. Note on calculating mean albedos: Temporal or spatial means of albedos must be defined in terms of fluxes. To calculate a mean clear-sky surface albedo the total clear-sky downward flux at the surface should be diagnosed. These fields should be meaned in space and time as required and then ratioed to give an albedo: it would be incorrect to average an albedo itself as this would distort the proper flux-weighting of the diagnostic.	Instantaneous	W m-2	
dewpt_scrn	dew_point_temperature	DEWPOINT AT 1.5M (K)	hourly	Single-level	R and XX	slv		Instantaneous	K	
fog_fraction	fog_area_fraction	FOG FRACTION AT 1.5 M	hourly	Single-level	R and XX	slv		Instantaneous	1	
fric_vel	None	FRICTION VELOCITY	hourly	Single-level	R and XX	slv	The friction velocity (units m/s). This gives a scalar measure of the magnitude of the surface stress.	Instantaneous	m s-1	
lat_hflx	surface_upward_latent_heat_flux	SURFACE LATENT HEAT FLUX W/M2	hourly	Single-level	R and XX	slv		Instantaneous	W m-2	
max_temp_scrn	air_temperature	TEMPERATURE AT 1.5M (Maximum)	hourly	Single-level	R and XX	slv	Estimate of atmospheric temperature (K) at 1.5m (screen level). Calculated by integrating the similarity equations from the surface to 1.5m. Available on all timesteps.	time: maximum (interval: 1 hour)	K	
min_temp_scrn	air_temperature	TEMPERATURE AT 1.5M (Minimum)	hourly	Single-level	R and XX	slv	Estimate of atmospheric temperature (K) at 1.5m (screen level). Calculated by integrating the similarity equations from the surface to 1.5m. Available on all timesteps.	time: minimum (interval: 1 hour)	K	
prob_vis_1km_ppt	None	PROB OF VIS < 1 KM (incl precip)	hourly	Single-level	R and XX	slv	The visibility probability is similar to the cloud fraction except it records the fraction of a grid box with RH greater than that required for the critical visibility (e.g 1 km), taking into account precipitation.	Instantaneous	1	
prob_vis_5km_ppt	None	PROB OF VIS < 5 KM (incl precip)	hourly	Single-level	R and XX	slv	The visibility probability is similar to the cloud fraction except it records the fraction of a grid box with RH greater than that required for the critical visibility (e.g 1 km), taking into account precipitation.	Instantaneous	1	
seaice	sea_ice_area_fraction	FRAC OF SEA ICE IN SEA AFTER TSTEP	hourly	Single-level	R and XX	slv		Instantaneous	1	
sens_hflx	surface_upward_sensible_heat_flux	SURFACE SENSIBLE HEAT FLUX W/M2	hourly	Single-level	R and XX	slv	Sensible heat flux at the surface, single level field. Available on all timesteps.	Instantaneous	W m-2	
sfc_mois_flx	surface_upward_water_flux	SURFACE TOTAL MOISTURE FLUX KG/M2/S	hourly	Single-level	R and XX	slv	Moisture flux profile, on model half levels, with the first value being the surface moisture flux. Available on all timesteps.	Instantaneous	kg m-2 s-1	
snow_amt_lnd	snowfall_amount	SNOW AMOUNT OVER LAND AFT TSTP KG/M2	hourly	Single-level	R and XX	slv		Instantaneous	kg m-2	
soil_mois	moisture_content_of_soil_layer	SOIL MOISTURE CONTENT IN A LAYER	hourly	Single-level	R and XX	slv	Total (frozen+unfrozen) soil moisture content in a soil layer (kg/m2). Available on land points only. Note: Includes the "wilting point" soil moisture.	Instantaneous	kg m-2	
soil_temp	soil_temperature	DEEP SOIL TEMP. AFTER HYDROLOGY DEGK	hourly	Single-level	R and XX	slv	Available on land points only.	Instantaneous	K	
uwnd_strs	surface_downward_eastward_stress	X-COMP SURFACE BL STRESS	hourly	Single-level	R and XX	slv	The x component of the surface stress. This is included to allow correct diagnosis and labelling of surface stress without the need for a STASH work around.	Instantaneous	Pa	
veg_ruff	surface_roughness_length	ROUGHNESS LENGTH AFTER TIMESTEP	hourly	Single-level	R and XX	slv		Instantaneous	m	
vis_conv_pptn	None	VISIBILITY AT 1.5M IN CONV PPTN M	hourly	Single-level	R and XX	slv	Available only if Sulphur Cycle on and supporting boundary layer version selected. The dry deposition velocity is calculated as 1 / (R(aerodyn)+R(B)+R(stomatal)) R(aerodyn) STASH item (1, 3, 286), R(B) STASH item (1, 3, 277), R(stomatal) STASH item (1, 3, 281),	Instantaneous	m	

Short name	Standard name	Full name	Time step	Vertical levels	Models	Stream	Description	Method	Units	Completeness
vis_ls_pptn	None	VISIBILITY AT 1.5M IN LS PPTN M	hourly	Single-level	R and XX	slv	Available only if Sulphur Cycle on and supporting boundary layer version selected. The dry deposition velocity is calculated as 1 / (R(aerodyn)+R(B)+R(stomatal)) R(aerodyn) STASH item (1, 3, 286), R(B) STASH item (1, 3, 276), R(stomatal) STASH item (1, 3, 280),	Instantaneous	m	
vis_precip	visibility_in_air	VIS AT 1.5M (incl precip) M	hourly	Single-level	R and XX	slv	Calculated from 1.5m T, q, qcl, qcf using droplet growth equations and assuming standard values for aerosol concentration, density, dry radius, etc, found in comdeck C_VISBTY, plus the impact of precip. Wright, B. J., 1997: Improvements to the Nimrod Visibility Analysis/Forecast System. FR-Div. Tech. Rep., No. 217. Wright, B. J., 1997: A New Visibility Analysis/Forecast System for Nimrod. Met. Office FR Tech Rep., No. 222.	Instantaneous	m	
vis_prob	None	PROBABILITY OF VIS LESS THAN 5 KM	hourly	Single-level	R and XX	slv	Unitless, values between 0 and 1 it's a probability, but could also be thought of as a grid-box fraction	Instantaneous	1	
visibility	visibility_in_air	VISIBILITY AT 1.5M M	hourly	Single-level	R and XX	slv	Calculated from 1.5m T, q, qcl, qcf using droplet growth equations and assuming standard values for aerosol concentration, density, dry radius, etc, found in comdeck C_VISBTY. Further details in: Wright, B. J., 1997: Improvements to the Nimrod Visibility Analysis/Forecast System. FR-Div. Tech. Rep., No. 217. Wright, B. J., 1997: A New Visibility Analysis/Forecast System for Nimrod. Met. Office FR Tech Rep., No. 222. Available on all timesteps.	Instantaneous	m	
vwnd_strs	surface_downward_northward_stress	Y-COMP SURFACE BL STRESS	hourly	Single-level	R and XX	slv	The y component of the surface stress. This is included to allow correct diagnosis and labelling of surface stress without the need for a STASH work around.	Instantaneous	Pa	
abl_ht	atmosphere_boundary_layer_thickness	BOUNDARY LAYER DEPTH AFTER TIMESTEP	10 min	Single-level	R and XX	spec		Instantaneous	m	
accum_conv_prcp	convective_rainfall_amount	CONVECTIVE RAIN AMOUNT KG/M2/TS	10 min	Single-level	R only	spec	Convective scheme rainfall amount at the surface in kg/m2 per model timestep.	time: sum	kg m-2	
accum_conv_snow	convective_snowfall_amount	CONVECTIVE SNOW AMOUNT KG/M2/TS	10 min	Single-level	R only	spec	Convective scheme snowfall amount at the surface in kg/m2 per model timestep.	time: sum	kg m-2	
accum_ls_prcp	stratiform_rainfall_amount	LARGE SCALE RAIN AMOUNT KG/M2/TS	10 min	Single-level	R and XX	spec	Large scale rain amount kg/m2/ts This is the mass per metre squared of rain (liquid precipitation) which falls on the surface during a single timestep as diagnosed by the large scale precipitation scheme. It does not include a onvective contribution (see diagnostic 1 5 201). This is also equivalent to the total precipitation in convection allowing models (when convective parameterisations are turned off)	time: sum	kg m-2	
accum_ls_snow	stratiform_snowfall_amount	LARGE SCALE SNOW AMOUNT KG/M2/TS	10 min	Single-level	R and XX	spec	Large scale snow amount kg/m2/ts This is the mass per metre squared of snow (frozen precipitation) which falls on the surface during a single timestep as diagnosed by the large scale precipitation scheme. It does not include a convective contribution (see diagnostic 1 5 202). For model runs with prognostic graupel, this snowfall diagnostic will include contributions from graupel. Do not add diagnostic (1 4 209) to this value in any analysis or otherwise your answers will be wrong as the graupel will be counted twice. For snow amount without graupel, please use diagnostic (1 4 302) This is also equivalent to the total snowfall in convection allowing models (when convective parameterisations are turned off)	time: sum	kg m-2	
accum_prcp	precipitation_amount	TOTAL PRECIPITATION AMOUNT KG/M2/TS	10 min	Single-level	R only	spec	Total precipitation amount at the surface in kg/m2 per timestep. This is the sum of the large scale and convective rainfall and snowfall at the surface.	time: sum	kg m-2	
aero_r	None	AERODYNAMIC RESISTANCE (S/M)	10 min	Single-level	R and XX	spec		Instantaneous	s m-1	
dewpt_scrn	dew_point_temperature	DEWPOINT AT 1.5M (K)	10 min	Single-level	R and XX	spec		Instantaneous	K	
hi_cld	high_type_cloud_area_fraction	HIGH CLOUD AMOUNT	10 min	Single-level	R and XX	spec		Instantaneous	1	
low_cld	low_type_cloud_area_fraction	LOW CLOUD AMOUNT	10 min	Single-level	R and XX	spec		Instantaneous	1	
mid_cld	medium_type_cloud_area_fraction	MEDIUM CLOUD AMOUNT	10 min	Single-level	R and XX	spec		Instantaneous	1	
mslp	air_pressure_at_sea_level	PRESSURE AT MEAN SEA LEVEL	10 min	Single-level	R and XX	spec		Instantaneous	Pa	
n_lightning_fl	None	NUMBER OF LIGHTNING FLASHES	10 min	Single-level	XX only	spec	This is a 2D field measuring the total number of lightning flashes over a given time period. It includes both intracloud and cloud-to-ground forms of lightning. It is intended to be output as a STASH accumulation.	time: sum	1	
pressure	air_pressure	PRESSURE AT THETA LEVELS AFTER TS	10 min	L1 theta level	R and XX	spec		Instantaneous	Pa	
qsair_scrn	specific_humidity	SPECIFIC HUMIDITY AT 1.5M	10 min	Single-level	R and XX	spec	Estimate of atmospheric specific humidity (g/kg) at 1.5m. Calculated by integrating the similarity equations from the surface to 1.5m (surface value taken as saturated specific humidity at the surface temperature). Available on all timesteps.	Instantaneous	kg kg-1	
sfc_pres	surface_air_pressure	SURFACE PRESSURE AFTER TIMESTEP	10 min	Single-level	R and XX	spec		Instantaneous	Pa	
sfc_temp	surface_temperature	SURFACE TEMPERATURE AFTER TIMESTEP	10 min	Single-level	R and XX	spec	Temperature of the land or sea/sea-ice surface after timestep. On land points this is either the temperature of the top soil layer (versions of Boundary Layer & Hydrology BEFORE 5A) or the surface "skin" temperature (BL and Hydrol 5A and beyond). On ice-free sea points it is the temperature of the sea surface (top ocean layer in coupled models), and on sea points with ice it is a gridbox mean given by: [(ice fraction)*(temperature of top ice layer computed by the atmosphere surface/boundary layer scheme)] + [(1 - ice fraction)*(freezing point of sea water)]	Instantaneous	K	
spec_hum	specific_humidity	SPECIFIC HUMIDITY AFTER TIMESTEP	10 min	L1 theta level	R and XX	spec		Instantaneous	kg kg-1	
storm_loc_flag	None	STORM LOCATION FLAG	10 min	Single-level	XX only	spec	This is a 2D field. It is a binary (1/0) flag to define where 'electrical storms' exist in the model. A value of 1 output means a storm has been diagnosed at this point.	Instantaneous	1	Partial in 2010-2015, available otherwise
temp_scrn	air_temperature	TEMPERATURE AT 1.5M	10 min	Single-level	R and XX	spec	Estimate of atmospheric temperature (K) at 1.5m (screen level). Calculated by integrating the similarity equations from the surface to 1.5m. Available on all timesteps.	Instantaneous	K	

Short name	Standard name	Full name	Time step	Vertical levels	Models	Stream	Description	Method	Units	Completeness
tiles_coeffs_ratio	None	COEFFS RATIO FOR 1.5M T ON TILES	10 min	9-tiles	R and XX	spec	Ratio of the surface transfer coefficients for screen level and for the first atmospheric model level. This is available on all land surface tiles.	Instantaneous	1	
tiles_pot_et	None	POTENTIAL EVAPORATION ON TILES	10 min	9-tiles	R and XX	spec	Diagnostic of the potential evaporation rate (kg/m2/s) for each land tile. Potential evaporation here is defined as the evapotranspiration that would occur if the soil and vegetation surfaces are saturated. This is calculated by taking the ratio of the explicit actual and potential evapotranspiration fluxes. This ratio is used to calculate the total (i.e. explicit flux and implicit correction term to account for changes during the timestep) potential evapotranspiration from the total actual evapotranspiration. (The implicit correction for potential evapotranspiration cannot be calculated directly as the surface and boundary layer states are consistent with the actual evapotranspiration and not the potential evaporation flux).	Instantaneous	kg m-2 s-1	
tiles_r_evap	None	COMBINED RESIST. TO EVAP ON TILES	10 min	9-tiles	R and XX	spec	Ratio of the aerodynamic resistance to the sum of the aerodynamic and surface resistances (Ra/(Ra+Rs)). The surface resistance is a combined stomatal and bare soil resistance. This is available on all land surface tiles.	Instantaneous	1	
ttl_cld	None	TOTAL CLOUD AMOUNT MAX/RANDOM OVERLP	10 min	Single-level	R and XX	spec		Instantaneous	1	
ttl_col_dry_mass	None	TOTAL COLUMN DRY MASS RHO GRID	10 min	Single-level	R and XX	spec		Instantaneous	kg m-2	
ttl_col_qcf	atmosphere_mass_per_unit_area	TOTAL COLUMN WET MASS RHO GRID	10 min	Single-level	R and XX	spec		Instantaneous	kg m-2	
ttl_col_qcl	atmosphere_cloud_liquid_water_content	TOTAL COLUMN QCL RHO GRID	10 min	Single-level	R and XX	spec		Instantaneous	kg m-2	
ttl_col_wet_mass	atmosphere_cloud_ice_content	TOTAL COLUMN QCF RHO GRID	10 min	Single-level	R and XX	spec		Instantaneous	kg m-2	
uwnd10m	x_wind	10 METRE WIND U-COMP	10 min	Single-level	R and XX	spec		Instantaneous	m s-1	
vwnd10m	y_wind	10 METRE WIND V-COMP	10 min	Single-level	R and XX	spec		Instantaneous	m s-1	
wndgust10m	wind_speed_of_gust	WIND GUST	10 min	Single-level	R and XX	spec	Gust windspeed at 10m. Single level available every timestep.	Instantaneous	m s-1	
max_wndgust10m	None	WIND GUST	10 min	Single-level	AD only	spec	Maximum gust windspeed at 10m. Single level available every timestep.	time: maximum (interval: 10 min)	m s-1	

BARRA-R (12km) model level sets

Model level set

The BARRA model system uses a hybrid Charney-Phillips vertical scheme, terrain following at the surface and flat at the top of the atmosphere (Davies et al. 2005). The BARRA-R grid has an 80km 'top' with 70 levels. Model levels are also vertically staggered by half a grid cell height for different sets of parameters (nominally denoted 'rho-levels' and 'theta-levels' after the main variables in each set). A useful+B4 explanation can be found in the Bureau's description of the ACCESS-G2 Numerical Prediction System (link below) which uses the same vertical grid definition as BARRA-R. The BARRA 'mdl' and 'cld' parameters are defined on either the 'theta-levels' or the 'rho-levels' but should be specified in their 'Vertical levels' column.

BARRA-R model vertical levels and equivalent heights and η values in the absence of topography and International Standard Atmosphere pressure at this geopotential height (ISA P0 = 1013.25 hPa). The lowest "constant height" rho level (level 50 in BARRA-R) is indicated with an asterisk. η is the normalised model level fraction defined as per Eq 1. in link:

http://www.bom.gov.au/australia/charts/bulletins/APOB105.pdf

For exact model level heights (3D fields) see the static parameter height_rho and height_theta .

Pressure level set

(Right) BARRA-R pressure levels which define the isobars on which the 'prs' parameters (yellow in master list) are defined.

BARRA-R mdl and cld (model-level) data

Model level number	η on theta (θ) levels	Model θ-level height (m) in absense of topography	Pressure θ-levels (hPa) using ISA P0=1013.25 hPa	η on rho (ρ) levels	Model ρ-level height (m) in absense of topography	Pressure ρ-levels (hPa) using ISA P0=1013.25 hPa
70	1.0000000	80000.0	0.009	0.9508334	76066.7	0.017
69	0.9016668	72133.0	0.033	0.8582535	68660.3	0.057
68	0.8148403	65187.0	0.096	0.7765451	62123.6	0.15
67	0.7382500	59060.0	0.231	0.7044966	56359.7	0.333
66	0.6707432	53659.0	0.476	0.6410096	51280.8	0.646
65	0.6112759	48902.0	0.872	0.5850902	46807.2	1.14
64	0.5589045	44712.0	1.48	0.5358422	42867.4	1.89
63	0.5127798	41022.0	2.42	0.4924589	39396.7	3.01
62	0.4721379	37771.0	3.77	0.4542161	36337.3	4.62
61	0.4362943	34903.0	5.67	0.4204658	33637.3	6.81
60	0.4046373	32371.0	8.21	0.3906297	31250.4	9.71
59	0.3766222	30129.0	11.5	0.3641936	29135.5	13.4
58	0.3517651	28141.0	15.5	0.3407014	27256.1	17.8
57	0.3296378	26371.0	20.3	0.3197505	25580.0	23
56	0.3098631	24789.0	25.9	0.3009862	24078.9	28.9
55	0.2921094	23368.0	32.3	0.2840981	22727.9	35.7
54	0.2760868	22086.0	39.5	0.2688150	21505.2	43.2
53	0.2615432	20923.0	47.3	0.2549014	20392.1	51.5
52	0.2482597	19860.0	56	0.2421538	19372.3	60.4
51	0.2360480	18883.0	65.3	0.2303973	18431.8	70.1
50*	0.2247466	17979.0	75.3	0.2194822	17558.6	80.5
49	0.2142178	17137.0	86	0.2092815	16742.5	91.5
48	0.2043451	16347.0	97.4	0.1996879	15975.0	103.3
47	0.1950307	15602.0	109.5	0.1906118	15248.9	115.8
46	0.1861929	14895.0	122.4	0.1819786	14558.3	129.1
45	0.1777643	14221.0	136.2	0.1737269	13898.2	143.3
44	0.1696895	13575.0	150.7	0.1658067	13264.5	158.4
43	0.1619238	12953.0	166.3	0.1581776	12654.2	174.4
42	0.1544313	12354.0	182.8	0.1508076	12064.6	191.3
41	0.1471838	11774.0	200.3	0.1436715	11493.7	209.4
40	0.1401592	11212.0	218.8	0.1367499	10940.0	228.5
39	0.1333406	10667.0	238.4	0.1300280	10402.2	248.5
38	0.1267154	10137.0	258.8	0.1234950	9879.6	269.3
37	0.1202745	9622.0	280	0.1171429	9371.4	290.8
36	0.1140113	9120.9	301.9	0.1109663	8877.3	313.1
35	0.1079213	8633.7	324.5	0.1049615	8396.9	336
34	0.1020017	8160.1	347.8	0.0991261	7930.1	359.6
33	0.0962505	7700.0	371.7	0.0934586	7476.7	383.8
32	0.0906668	7253.3	396.2	0.0879584	7036.7	408.5
31	0.0852500	6820.0	421.1	0.0826250	6610.0	433.7
30	0.0800000	6400.0	446.5	0.0774583	6196.7	459.2
29	0.0749167	5993.3	472.2	0.0724583	5796.7	485.1
28	0.0700000	5600.0	498.3	0.0676250	5410.0	511.2
27	0.0652500	5220.0	524.5	0.0629583	5036.7	537.6
26	0.0606667	4853.3	550.9	0.0584584	4676.7	563.9
25	0.0562500	4500.0	577.3	0.0541250	4330.0	590.4
24	0.0520000	4160.0	603.6	0.0499583	3996.7	616.7
23	0.0479167	3833.3	629.9	0.0459583	3676.7	642.8
22	0.0440000	3520.0	655.9	0.0421250	3370.0	668.7
21	0.0402500	3220.0	681.7	0.0384583	3076.7	694.3
20	0.0366667	2933.3	707	0.0349583	2796.7	719.4
19	0.0332500	2660.0	731.9	0.0316250	2530.0	744
18	0.0300000	2400.0	756.2	0.0284583	2276.7	768
17	0.0269167	2153.3	779.9	0.0254583	2036.7	791.3
16	0.0240000	1920.0	802.9	0.0226250	1810.0	813.9
15	0.0212500	1700.0	825	0.0199583	1596.7	835.6
14	0.0186667	1493.3	846.2	0.0174583	1396.7	856.3
13	0.0162500	1300.0	866.5	0.0151250	1210.0	876.1
12	0.0140000	1120.0	885.7	0.0129583	1036.7	894.8
11	0.0119167	953.3	903.8	0.0109583	876.7	912.3
10	0.0100000	800.0	920.8	0.0091250	730.0	928.6
9	0.0082500	660.0	936.4	0.0074583	596.7	943.6
8	0.0066667	533.0	950.8	0.0059583	476.7	957.3
7	0.0052500	420.0	963.8	0.0046250	370.0	969.6
6	0.0040000	320.0	975.4	0.0034583	276.7	980.5
5	0.0029167	233.3	985.5	0.0024583	196.7	989.8
4	0.0020000	160.0	994.2	0.0016250	130.0	997.7
3	0.0012500	100.0	1001.3	0.0009583	76.7	1004.1
2	0.0006667	53.3	1006.8	0.0004583	36.7	1008.9
1	0.0002500	20.0	1010.8	0.0001250	10.0	1012

BARRA-R prs (pressure-level) data

Pressure level index	Pressure level (hPa)
37	1000
36	975
35	950
34	925
33	900
32	850
31	800
30	750
29	700
28	600
27	500
26	450
25	400
24	350
23	300
22	275
21	250
20	225
19	200
18	175
17	150
16	100
15	70
14	50
13	30
12	20
11	10
10	7
9	5
8	3
7	2
6	1
5	0.7
4	0.5
3	0.3
2	0.2
1	0.1

BARRA-R (12km) & BARRA-XX (1.5km) single and surface level set

Soil level set

Four soil layers are modelled in BARRA with JULES. The depths of these soil layers are 0 – 0.1 m (0.1 m thickness), 0.1 – 0.35 m (0.25 m thickness), 0.35 – 1 m (0.65 m thickness) and 1 – 3 m (2 m thickness). This is relevant for interpreting the "soil_mois" and "soil_temp" slv model diagnostic parameters (Section 9 and 10). The top boundary conditions is the infiltration of water at the soil surface, and the lower boundary condition is drainage, which contributes to sub-surface runoff (Best et al., 2011).

Modelled soil moisture is model specific such that BARRA soil moisture values cannot be directly compared against other models or observations, even in terms of same units (Koster et al., 2009). Generally, observation operators are used such as rescaling or statistical matching are applied before intercomparison.

Tiles set

JULES uses 9 tiles to describe sub-grid scale heterogeneity in land cover (Section 2.1.2). The table on the right shows the mapping between the tile index to surface types. This is relevant for interpreting the "tiles_coeff_ratio", "tiles_pot_et", and "tiles_r_evap" spec diagnostic parameters, with "surf_type_frac" ancillary. The perennial grasses can be classified as either C3 or C4 plants, with labels distinguish the different pathways that plants use to capture carbon dioxide during photosynthesis. Users are referred to link:
https://www.dpi.nsw.gov.au/agriculture/pastures-and-rangelands/native-pastures/what-are-c3-and-c4-native-grass

slv data for soil mois, soil temp fields

depth level index	depth bnds (m)	Soil layer thickness (m)
1	0 to 0.1	0.1
2	0.1 to 0.35	0.25
3	0.35 to 1	0.65
4	1 to 3	2

spec and spec_proc data for tiles_* field

Tile index	Surface types
1	broadleaf trees
2	needleleaf trees
3	C3 (temperate) grass
4	C4 (temperate) grass
5	shrubs
6	urban
7	inland water
8	bare soil
9	ice

Sub-domain models BARRA-XX (1.5km) model & pressure level sets

Model level set

The BARRA model system uses a hybrid Charney-Phillips vertical scheme, terrain following at the surface and flat at the top of the atmosphere (Davies et al. 2005). BARRA-XX has a 40km model 'top' and 70 levels. Model levels are also vertically staggered by half a grid cell height for different sets of parameters (nominally denoted 'rho-levels' and 'theta-levels' after the main variables in each set). A useful explanation can be found in the Bureau's description of the ACCESS-G2 Numerical Prediction System (link below) which has the same vertical scheme but a different level set as BARRA-XX. The BARRA 'mdl' and 'cld' parameters are defined on either the 'theta-levels' or the 'rho-levels' but should be specified in their 'Vertical levels' column.

BARRA-XX model vertical levels and equivalent heights and η values in the absence of topography and International Standard Atmosphere pressure at this geopotential height (ISA P0 = 1013.25 hPa). The lowest "constant height" rho level (level 50 in BARRA) is indicated with an asterisk. η is the normalised model level fraction defined as per Eq 1. in link:

http://www.bom.gov.au/australia/charts/bulletins/APOB105.pdf

For exact model level heights (3D fields) see the static parameter height_rho and height_theta .

Pressure level set

(Right) BARRA-XX pressure levels which define the isobars on which the 'prs' parameters (yellow in master list) are defined.

BARRA-XX mdl and cld (model-level) data

Model level number	η on theta (θ) levels	Model θ-level height (m) in absense of topography	Pressure θ-levels (hPa) using ISA P0=1013.25 hPa	η on rho (ρ) levels	Model ρ-level height (m) in absense of topography	Pressure ρ-levels (hPa) using ISA P0=1013.25 hPa
70	1	40000.0	2.8	0.948063	37922.5	3.7
69	0.896125	35845.0	5	0.850472	34018.9	6.4
68	0.804818	32192.7	8.4	0.764727	30589.1	10.7
67	0.724636	28985.5	13.7	0.689502	27580.1	16.9
66	0.654368	26174.7	21	0.623635	24945.4	25.3
65	0.592902	23716.1	30.6	0.566061	22642.5	36.2
64	0.539221	21568.8	42.8	0.515811	20632.4	49.6
63	0.492401	19696.0	57.4	0.471999	18880	65.3
62	0.451598	18063.9	74.3	0.433824	17352.9	83.1
61	0.41605	16642.0	93	0.400559	16022.3	102.5
60	0.385068	15402.7	113	0.37155	14862	123.1
59	0.358033	14321.3	134.1	0.346212	13848.5	144.4
58	0.334392	13375.7	155.6	0.324021	12960.8	166.1
57	0.313651	12546.0	177.4	0.304511	12180.4	187.9
56	0.295372	11814.9	199	0.287271	11490.8	209.5
55	0.27917	11166.8	220.4	0.271939	10877.6	230.7
54	0.264708	10588.3	241.4	0.2582	10328	251.4
53	0.251692	10067.7	261.6	0.24578	9831.2	271.3
52	0.239869	9594.8	281.2	0.234446	9377.9	290.5
51	0.229024	9160.9	300.1	0.223998	8959.9	309.3
50	0.218973	8758.9	318.6	0.214269	8570.7	327.6
49	0.209564	8382.6	336.7	0.205119	8204.8	345.6
48	0.200673	8026.9	354.6	0.196436	7857.4	363.4
47	0.192198	7687.9	372.4	0.188129	7525.1	381.1
46	0.184059	7362.4	390.1	0.180127	7205.1	398.9
45	0.176195	7047.8	407.9	0.172379	6895.2	416.7
44	0.168562	6742.5	425.7	0.164846	6593.8	434.6
43	0.161129	6445.1	443.7	0.157502	6300.1	452.7
42	0.153875	6155.0	461.9	0.150333	6013.3	470.9
41	0.146792	5871.7	480.2	0.143333	5733.3	489.3
40	0.139875	5595.0	498.6	0.1365	5460	507.8
39	0.133125	5325.0	517.1	0.129833	5193.3	526.4
38	0.126542	5061.7	535.8	0.123333	4933.3	545
37	0.120125	4805.0	554.4	0.117	4680	563.7
36	0.113875	4555.0	573.1	0.110833	4433.3	582.4
35	0.107792	4311.7	591.8	0.104833	4193.3	601
34	0.101875	4075.0	610.4	0.099	3960	619.6
33	0.096125	3845.0	629	0.093333	3733.3	638.1
32	0.090542	3621.7	647.4	0.087833	3513.3	656.5
31	0.085125	3405.0	665.7	0.0825	3300	674.7
30	0.079875	3195.0	683.9	0.077333	3093.3	692.8
29	0.074792	2991.7	701.8	0.072333	2893.3	710.6
28	0.069875	2795.0	719.6	0.0675	2700	728.2
27	0.065125	2605.0	737	0.062833	2513.3	745.6
26	0.060542	2421.7	754.2	0.058333	2333.3	762.6
25	0.056125	2245.0	771.1	0.054	2160	779.3
24	0.051875	2075.0	787.6	0.049833	1993.3	795.6
23	0.047792	1911.7	803.7	0.045833	1833.3	811.5
22	0.043875	1755.0	819.4	0.042	1680	827
21	0.040125	1605.0	834.7	0.038333	1533.3	842.1
20	0.036542	1461.7	849.5	0.034833	1393.3	856.7
19	0.033125	1325.0	863.9	0.0315	1260	870.8
18	0.029875	1195.0	877.7	0.028333	1133.3	884.3
17	0.026792	1071.7	891	0.025333	1013.3	897.3
16	0.023875	955.0	903.7	0.0225	900	909.7
15	0.021125	845.0	915.8	0.019833	793.3	921.5
14	0.018542	741.7	927.3	0.017333	693.3	932.7
13	0.016125	645.0	938.1	0.015	600	943.2
12	0.013875	555.0	948.3	0.012833	513.3	953.1
11	0.011792	471.7	957.9	0.010833	433.3	962.3
10	0.009875	395.0	966.7	0.009	360	970.7
9	0.008125	325.0	974.8	0.007333	293.3	978.5
8	0.006542	261.7	982.2	0.005833	233.3	985.5
7	0.005125	205.0	988.9	0.0045	180	991.8
6	0.0028608	180.0	991.8	0.0020662	130	997.7
5	0.003875	155.0	994.8	0.003333	133.3	997.3
4	0.002792	111.7	999.9	0.002333	93.3	1002.1
3	0.001875	75.0	1004.3	0.0015	60	1006.1
2	0.001125	45.0	1007.9	0.000833	33.3	1009.3
1	0.000542	21.7	1010.6	0.000333	13.3	1011.6
0	0.000125	5.0	1012.6	0.000062	2.5	1012.9

BARRA-XX prs (pressure-level) data

Pressure level index	Pressure level (hPa)
37	1000
36	975
35	950
34	925
33	900
32	850
31	800
30	750
29	700
28	600
27	500
26	450
25	400
24	350
23	300
22	275
21	250
20	225
19	200
18	175
17	150
16	100
15	70
14	50
13	30
12	20
11	10
10	7
9	5
8	3
7	2
6	1
5	0.7
4	0.5
3	0.3
2	0.2
1	0.1