

CORDEX: requested variables

21 Feb 2014 Version 3.1

output variable name	units	Tier 2		Tier 1		Core				fx	long_name	standard_name	direction of positive fluxes ^a	realm (not required, however, if included should have the value as in CMIP5)	cell-method: area (optional) ^b
		frq [1/day]	ag	frq [1/day]	ag	frq [1/mon]	ag	frq [1/sem]	ag						
tas	K	8	i	1	8	1	m*8	1	s*8		Near-Surface Air Temperature	air_temperature		atmos	
tasmx	K			1		1	m	1	s		Daily Maximum Near-Surface Air Temperature	air_temperature		atmos	
tasmin	K			1		1	m	1	s		Daily Minimum Near-Surface Air Temperature	air_temperature		atmos	
pr	kg m-2 s-1	8	a	1		1		1			Precipitation	precipitation_flux		atmos	
ps	Pa	8	i	1	8						Surface Air Pressure	surface_air_pressure		atmos	
psl	Pa	8	i	1	8	1	m*8	1	s*8		Sea Level Pressure	air_pressure_at_sea_level		atmos	
huss	1	8	i	1	8	1	m*8	1	s*8		Near-Surface Specific Humidity	specific_humidity		atmos	
hurs	%	8	i	1	8	1	m*8	1	s*8		Near-Surface Relative Humidity	relative_humidity		atmos	
sfcWind	m s-1	8	i	1	8	1	m*8	1	s*8		Near-Surface Wind Speed	wind_speed		atmos	
sfcWindmax	m s-1			1		1	m	1	s		Daily Maximum Near-Surface Wind Speed	wind_speed		atmos	
clt	%	8	a	1		1		1			Total Cloud Fraction	cloud_area_fraction		atmos	
sund	s	8	a	1		1		1			Duration of Sunshine	duration_of_sunshine		atmos	
rsds	W m-2	8	a	1		1		1			Surface Downwelling Shortwave Radiation	surface_downwelling_shortwave_flux_in_air	down	atmos	
rlds	W m-2	8	a	1		1		1			Surface Downwelling Longwave Radiation	surface_downwelling_longwave_flux_in_air	down	atmos	
hfis	W m-2	8	a	1		1		1			Surface Upward Latent Heat Flux	surface_upward_latent_heat_flux	up	atmos	
hfss	W m-2	8	a	1		1		1			Surface Upward Sensible Heat Flux	surface_upward_sensible_heat_flux	up	atmos	
rsus	W m-2	8	a	1		1		1			Surface Upwelling Shortwave Radiation	surface_upwelling_shortwave_flux_in_air	up	atmos	
rlus	W m-2	8	a	1		1		1			Surface Upwelling Longwave Radiation	surface_upwelling_longwave_flux_in_air	up	atmos	
evspsbl	kg m-2 s-1	4	a	1		1		1			Evaporation	water_evaporation_flux		atmos	
evspsblpot	kg m-2 s-1	4	a	1		1		1			Potential Evapotranspiration	water_potential_evaporation_flux		atmos	
mrfso	kg m-2	4	i	1	4	1	m*4	1	s*4		Soil Frozen Water Content	soil_frozen_water_content		land landice	mean where land
mrros	kg m-2 s-1	4	a	1		1		1			Surface Runoff	surface_runoff_flux		land	mean where land
mrro	kg m-2 s-1	4	a	1		1		1			Total Runoff	runoff_flux		land	mean where land
mrso	kg m-2	4	i	1	4	1	m*4	1	s*4		Total Soil Moisture Content	soil_moisture_content		land	mean where land
snw	kg m-2	4	i	1	4	1	m*4	1	s*4		Surface Snow Amount	surface_snow_amount		landice land	mean where land
snm	kg m-2 s-1	4	a	1	4	1		1			Surface Snow Melt	surface_snow_melt_flux		landice land	mean where land
prhmx	kg m-2 s-1			1							Daily Maximum Hourly Precipitation Rate	precipitation_flux		atmos	
prc	kg m-2 s-1	8	a	1							Convective Precipitation	convective_precipitation_flux		atmos	
rlut	W m-2	4	a	1		1		1			TOA Outgoing Longwave Radiation	toa_outgoing_longwave_flux	up	atmos	
rsdt	W m-2	4	a	1		1		1			TOA Incident Shortwave Radiation	toa_incoming_shortwave_flux	down	atmos	
rsut	W m-2	4	a	1		1		1			TOA Outgoing Shortwave Radiation	toa_outgoing_shortwave_flux	up	atmos	
uas	m s-1	4	i	1	4	1	m*4	1	s*4		Eastward Near-Surface Wind	eastward_wind		atmos	
vas	m s-1	4	i	1	4	1	m*4	1	s*4		Northward Near-Surface Wind	northward_wind		atmos	
wsgsmax	m s-1			1							Daily Maximum Near-Surface Wind Speed of Gust	wind_speed_of_gust		atmos	
tauu	Pa	4	a	1							Surface Downward Eastward Wind Stress	surface_downward_eastward_stress	down	atmos	
tauv	Pa	4	a	1							Surface Downward Northward Wind Stress	surface_downward_northward_stress	down	atmos	
ts	K	4	i	1	4						Surface Temperature	surface_temperature		atmos	
zmla	m	4	i	1	4						Height of Boundary Layer	atmosphere_boundary_layer_thickness		atmos	
prw	kg m-2	4	i	1	4						Water Vapor Path	atmosphere_water_vapor_content		atmos	
clwvi	kg m-2	4	i	1	4						Condensed Water Path	atmosphere_cloud_condensed_water_content		atmos	
clivi	kg m-2	4	i	1	4						Ice Water Path	atmosphere_cloud_ice_content		atmos	
ua850	m s-1	4	i	1	4	1	m*4	1	s*4		Eastward Wind	eastward_wind		atmos	
va850	m s-1	4	i	1	4	1	m*4	1	s*4		Northward Wind	northward_wind		atmos	
ta850	K	4	i	1	4	1	m*4	1	s*4		Air Temperature	air_temperature		atmos	
hus850	1	4	i	1	4	1	m*4	1	s*4		Specific Humidity	specific_humidity		atmos	
ua500	m s-1	4	i	1	4	1	m*4	1	s*4		Eastward Wind	eastward_wind		atmos	
va500	m s-1	4	i	1	4	1	m*4	1	s*4		Northward Wind	northward_wind		atmos	
zg500	m	4	i	1	4	1	m*4	1	s*4		Geopotential Height	geopotential_height		atmos	
ta500	K	4	i	1	4	1	m*4	1	s*4		Air Temperature	air_temperature		atmos	
ua200	m s-1	4	i	1	4	1	m*4	1	s*4		Eastward Wind	eastward_wind		atmos	
va200	m s-1	4	i	1	4	1	m*4	1	s*4		Northward Wind	northward_wind		atmos	
ta200	K	4	i	1	4	1	m*4	1	s*4		Air Temperature	air_temperature		atmos	
zg200	m	4	i	1	4	1	m*4	1	s*4		Geopotential Height	geopotential_height		atmos	
clh	%	4	a	1							High Level Cloud Fraction	cloud_area_fraction_in_atmosphere_layer		atmos	
clm	%	4	a	1							Mid Level Cloud Fraction	cloud_area_fraction_in_atmosphere_layer		atmos	
cli	%	4	a	1							Low Level Cloud Fraction	cloud_area_fraction_in_atmosphere_layer		atmos	
snc	%	4	i	1	4	1	m*4	1	s*4		Snow Area Fraction	surface_snow_area_fraction		landice land	
snd	m	4	i	1	4	1	m*4	1	s*4		Snow Depth	surface_snow_thickness		landice land	mean where land
sic	%			1		1	m	1	s		Sea Ice Area Fraction	sea_ice_area_fraction		seaice ocean	
prsn	kg m-2 s-1			1							Snowfall Flux	snowfall_flux		atmos	
areacella	m2									0	Atmosphere Grid-Cell Area	cell_area		atmos land	
orog	m									0	Surface Altitude	surface_altitude		atmos	
sftf	%									0	Land Area Fraction	land_area_fraction		atmos	
sftgif	%									0	Fraction of Grid Cell Covered with Glacier	land_ice_area_fraction		land	
mrsofc	kg m-2									0	Capacity of Soil to Store Water	soil_moisture_content_at_field_capacity		land	
rootd	m									0	Maximum Root Depth	root_depth		land	

^a The column specifies the direction of fluxes (redundantly with the standard:name); if given as a NetCDF attribute it must have the value as given here

^b If given as a NetCDF attribute it must have the value as given here

frq: frequency [samples per day]
 ag: aggregation
 a: averaged over output interval (in model)
 i: instantaneous
 number: minimum samples per day if not averaged over interval
 green: if available
 red: late correction
 m: number of days in month
 s: number of days in season

3-hourly output (3hr)

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output variable name	cell_methods
tas	time: point
pr	time: mean
ps	time: point
psl	time: point
huss	time: point
hurs	time: point
sfcWind	time: point
clt	time: mean
sund	time: sum
rsds	time: mean
rlds	time: mean
hfls	time: mean
hfss	time: mean
rsus	time: mean
rlus	time: mean
prc	time: mean

6-hourly output (6hr)

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output variable name	cell_methods	cell_methods (2nd option)
evspsbl	time: mean	time: mean
evspsblpot	time: mean	time: mean
mrfs0	time: point	time: point area: mean where land
mrros	time: mean	time: mean area: mean where land
mrro	time: mean	time: mean area: mean where land
mrso	time: point	time: point area: mean where land
snw	time: point	time: point area: mean where land
snm	time: mean	time: mean area: mean where land
rlut	time: mean	time: mean
rsdt	time: mean	time: mean
rsut	time: mean	time: mean
uas	time: point	time: point
vas	time: point	time: point
tauu	time: mean	time: mean
tauv	time: mean	time: mean
ts	time: point	time: point
zmla	time: point	time: point
prw	time: point	time: point
clwvi	time: point	time: point
clivi	time: point	time: point
ua850	time: point	time: point
va850	time: point	time: point
ta850	time: point	time: point
hus850	time: point	time: point
ua500	time: point	time: point
va500	time: point	time: point
zg500	time: point	time: point
ta500	time: point	time: point
ua200	time: point	time: point
va200	time: point	time: point
ta200	time: point	time: point
zg200	time: point	time: point
clh	time: mean	time: mean
clm	time: mean	time: mean
cil	time: mean	time: mean
snc	time: point	time: point
snd	time: point	time: point area: mean where land

daily output (day)

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output variable name	cell_methods	cell_methods (2nd option)
tas	time: mean	time: mean
tasmax	time: maximum	time: maximum
tasmin	time: minimum	time: minimum
pr	time: mean	time: mean
ps	time: mean	time: mean
psl	time: mean	time: mean
huss	time: mean	time: mean
hurs	time: mean	time: mean
sfcWind	time: mean	time: mean
sfcWindmax	time: maximum	time: maximum
clt	time: mean	time: mean
sund	time: sum	time: sum
rsds	time: mean	time: mean
rlds	time: mean	time: mean
hfls	time: mean	time: mean
hfss	time: mean	time: mean
rsus	time: mean	time: mean
rlus	time: mean	time: mean
evspsbl	time: mean	time: mean
evspsblpot	time: mean	time: mean
mrfso	time: mean	time: mean area: mean where land
mrros	time: mean	time: mean area: mean where land
mrro	time: mean	time: mean area: mean where land
mrso	time: mean	time: mean area: mean where land
snw	time: mean	time: mean area: mean where land
snm	time: mean	time: mean area: mean where land
prhmax	time: maximum	time: maximum
prc	time: mean	time: mean
rlut	time: mean	time: mean
rsdt	time: mean	time: mean
rsut	time: mean	time: mean
uas	time: mean	time: mean
vas	time: mean	time: mean
wsgsmax	time: maximum	time: maximum
tauu	time: mean	time: mean
tauv	time: mean	time: mean
ts	time: mean	time: mean
zmla	time: mean	time: mean
prw	time: mean	time: mean
clwvi	time: mean	time: mean
clvi	time: mean	time: mean
ua850	time: mean	time: mean
va850	time: mean	time: mean
ta850	time: mean	time: mean
hus850	time: mean	time: mean
ua500	time: mean	time: mean
va500	time: mean	time: mean
zg500	time: mean	time: mean
ta500	time: mean	time: mean
ua200	time: mean	time: mean
va200	time: mean	time: mean
ta200	time: mean	time: mean
zg200	time: mean	time: mean
clh	time: mean	time: mean
clm	time: mean	time: mean
cil	time: mean	time: mean
snc	time: mean	time: mean
snd	time: mean	time: mean area: mean where land
sic	time: mean	time: mean
prsn	time: mean	time: mean

monthly output (mon)

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output variable name	cell_methods	cell_methods (2nd option)
tas	time: mean	time: mean
tasmax	time: maximum within days time: mean over days	time: maximum within days time: mean over days
tasmin	time: minimum within days time: mean over days	time: minimum within days time: mean over days
pr	time: mean	time: mean
psl	time: mean	time: mean
huss	time: mean	time: mean
hurs	time: mean	time: mean
sfcWind	time: mean	time: mean
sfcWindmax	time: maximum within days time: mean over days	time: maximum within days time: mean over days
clt	time: mean	time: mean
sund	time: sum within days time: mean over days	time: sum within days time: mean over days
rsds	time: mean	time: mean
rlds	time: mean	time: mean
hfls	time: mean	time: mean
hfss	time: mean	time: mean
rsus	time: mean	time: mean
rlus	time: mean	time: mean
evspsbl	time: mean	time: mean
mrfso	time: mean	time: mean area: mean where land
mrros	time: mean	time: mean area: mean where land
mrro	time: mean	time: mean area: mean where land
mrso	time: mean	time: mean area: mean where land
snw	time: mean	time: mean area: mean where land
snm	time: mean	time: mean area: mean where land
rlut	time: mean	time: mean
rsdt	time: mean	time: mean
rsut	time: mean	time: mean
uas	time: mean	time: mean
vas	time: mean	time: mean
ua850	time: mean	time: mean
va850	time: mean	time: mean
ta850	time: mean	time: mean
hus850	time: mean	time: mean
ua500	time: mean	time: mean
va500	time: mean	time: mean
zg500	time: mean	time: mean
ta500	time: mean	time: mean
ua200	time: mean	time: mean
va200	time: mean	time: mean
ta200	time: mean	time: mean
zg200	time: mean	time: mean
snc	time: mean	time: mean
snd	time: mean	time: mean area: mean where land
sic	time: mean	time: mean

seasonal output (sem)

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output variable name	cell_methods	cell_methods (2nd option)
tas	time: mean	time: mean
tasmax	time: maximum within days time: mean over days	time: maximum within days time: mean over days
tasmin	time: minimum within days time: mean over days	time: minimum within days time: mean over days
pr	time: mean	time: mean
psl	time: mean	time: mean
huss	time: mean	time: mean
hurs	time: mean	time: mean
sfcWind	time: mean	time: mean
sfcWindmax	time: maximum within days time: mean over days	time: maximum within days time: mean over days
clt	time: mean	time: mean
sund	time: sum within days time: mean over days	time: sum within days time: mean over days
rsds	time: mean	time: mean
rlds	time: mean	time: mean
hfls	time: mean	time: mean
hfss	time: mean	time: mean
rsus	time: mean	time: mean
rlus	time: mean	time: mean
evspsbl	time: mean	time: mean
mrfso	time: mean	time: mean area: mean where land
mrros	time: mean	time: mean area: mean where land
mrro	time: mean	time: mean area: mean where land
mrso	time: mean	time: mean area: mean where land
snw	time: mean	time: mean area: mean where land
snm	time: mean	time: mean area: mean where land
rlut	time: mean	time: mean
rsdt	time: mean	time: mean
rsut	time: mean	time: mean
uas	time: mean	time: mean
vas	time: mean	time: mean
ua850	time: mean	time: mean
va850	time: mean	time: mean
ta850	time: mean	time: mean
hus850	time: mean	time: mean
ua500	time: mean	time: mean
va500	time: mean	time: mean
zg500	time: mean	time: mean
ta500	time: mean	time: mean
ua200	time: mean	time: mean
va200	time: mean	time: mean
ta200	time: mean	time: mean
zg200	time: mean	time: mean
snc	time: mean	time: mean
snd	time: mean	time: mean area: mean where land
sic	time: mean	time: mean

time invariant output (fx)

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output variable name
areacella
orog
sftlf
sftgif
mrsofc
rootd

Section A: NetCDF global attributes

CORDEX name as in ADD ¹	CMIP5 ² name	mandatory or optional CORDEX/CMIP5	CV or free text CORDEX/CMIP5	comment
institute_id	institute_id	mandatory/mandatory	CV/CV	
institution	institution	optional/mandatory	free text/free text	
model_id	model_id	mandatory/mandatory	CV/CV	CORDEX starts with <institute_id>
experiment_id	experiment_id	mandatory/mandatory	CV/CV	same CV as CMIP5 with "evaluation" in addition
experiment	experiment	optional/mandatory	free text/CV	long version of "experiment_id"
contact	contact	mandatory/mandatory	free text/free text	
product	product	mandatory/mandatory	CV/CV	single value ("output")
Conventions	Conventions	optional/mandatory	CV/CV	later than CF1.4 if present / single value ("CF-1.4")
creation_date	creation_date	mandatory/mandatory	YYYY-MM-DDTHH:MM:SSZ	format according to UNIDATA conventions (same in CMIP5 & CORDEX)
frequency	frequency	mandatory/mandatory	CV/CV	same CV as CMIP5 with "sem" in addition; 3hr highest freq. in CORDEX; no "yr"
driving_model_id		mandatory/	<CMIP5 institute_id> <member in CMIP5 CV list of model_id >	starts with <CMIP5 institute_id>
driving_model_ensemble_member		mandatory/	CMIP5 CV (e.g. "r1i1p1")	
driving_experiment_name		mandatory/	"evaluation" or <member in CMIP5 CV list of experiment_id >	
driving_experiment		optional/mandatory	"<driving_model_id>, <driving_experiment_name>, <driving_model_ensemble_member>"	members of the CMIP5 list of forcing agents are not necessarily forcing agents of RCM (besides implicitly in driving_experimnt)
rcm_version_ID		mandatory/	<free text string>; valid characters only	indicates model mods during the project (e.g.parameterizations, small upgrades)
project_id	project_id	mandatory/mandatory	CV	single value
CORDEX_domain		mandatory/	CV (e.g. "AFR-44", "AFR-44i")	includes resolution acronym
references	references	optional/optional	free text/free text	typically should refer to model formulation (i.e. wrong example in ADD) not explained
tracking_id	same	optional/mandatory	generated	not required or explained in ADD; it is, however, strongly recommended to include it as prescribed CMIP5.
comment	same	optional/optional	free text/free text	not in the ADD example
	modeling_realm	/mandatory	/CV	CORDEX variables are all "atmos" or "land"; there is no specification of ocean, sea ice, etc. specification; not adopted by CORDEX
	table_id	/mandatory	/CV	not adopted by CORDEX; MIP tables exist named according to frequencies
	source	/mandatory	/free text	not adopted by CORDEX
	realisation	/mandatory	/integer	the CMIP5 concept of ensemble members is not adopted by CORDEX
	initialization	/mandatory	/integer	the CMIP5 concept of ensemble members is not adopted by CORDEX
	parent_experiment_rpt	/mandatory	/CV	the CMIP5 concept of parent experiments is not adopted by CORDEX
	parent_experiment_id	/mandatory	/CV	the CMIP5 concept of parent experiments is not adopted by CORDEX; the driving_experiment_id is conceptually different

Section B: other CORDEX attributes

CORDEX as in ADD ¹	CMIP5 name	mandatory or optional CORDEX/CMIP5	CV / free text	comment
time reference point	basetime	mandatory/mandatory	CV/CV ("1949-12-01T00:00:00Z")	single value in CORDEX; oth formatted according to UNIDATA conventions
calendar	calendar	mandatory/mandatory	CV - CF conventions	as in driving model
grid attributes		mandatory/mandatory according to CF conventions	CV - CF conventions	

Section C: CORDEX DRS elements and corresponding attributes (in order of appearance in the file name)

CORDEX DRS element ¹	mandatory or not	NetCDF attribute
<i>Institution</i>		<i>institute_id</i>
<i>VariableName</i>	mandatory	see ADD tables
<i>Domain</i>	mandatory	<i>CORDEX_domain</i>
<i>GCMModelName</i>	mandatory	<i>driving_model_id</i>
<i>CMIP5ExperimentName</i>	mandatory	<i>driving_experiment_name</i>
<i>CMIP5EnsembleMember</i>	mandatory	<i>driving_model_ensemble_member</i>
<i>RCMModelName</i>	mandatory	<i>model_id</i>
<i>RCMVersionID</i>	mandatory	<i>rcm_version_id</i>
<i>Frequency</i>	mandatory	<i>frequency</i>
<i>StartTime-EndTime</i>	not allowed if <frequency>=fx	N/A

¹ see Christensen, Gutowski, Nikulin, and Legutke; 2013. CORDEX Archive Design (http://cordex.dmi.dk/joomla/images/CORDEX/cordex_archive_specifications.pdf)² Taylor, K., and C. Doutriaux, 2011. "CMIP5 Model Output Requirements: File Contents and Format, Data Structure and Meta Data" (http://cmip-pcmdi.llnl.gov/cmip5/output_req.html#metadata)

NetCDF attribute	DRS element	comment	# CV values													
N/A	VariableName		ref	<												
institute_id	Institution		ref	see http://cordex.dmi.dk/joomla/images/CORDEX/RCMModelName.txt												
model_id	RCMModelName		ref	see http://cordex.dmi.dk/joomla/images/CORDEX/RCMModelName.txt												
experiment_id	CMIP5ExperimentName	any CMIP5 experiment_id is acceptable	7	evaluation	rcp45	rcp85	decadal1980	decadal1990	decadal2005	amip						
product			1	output												
Conventions			3	CF-1.4	CF-1.5	CF-1.6										
frequency	Frequency		6	sem	mon	day	6hr	3hr	fx							
driving_model_id	GCMModelName		rule	<CMIP5-institute_id>-<CMIP5-model_id> from the CMIP5 CV (see http://cordex.dmi.dk/joomla/images/CORDEX/GCMModelName.txt)												
driving_model_ensemble_member	CMIP5EnsembleMember		rule	rLiMpN, L,M,N=1,2,3, ... or L=M=N=0 for time invariant values												
driving_experiment_name		any CMIP5 experiment_id + reanalyses	2+	ERAINT	ERA40	<CMIP5-experiment_id> from CMIP5 CV or values in fields F6 to K6										
rcm_version_ID	RCMVersionID		rule	any string built from valid CORDEX element characters (a-z, A-Z, 0-9, '-')												
project_id	Project		1	CORDEX												
region_id			13	SAM	CAM	NAM	EUR	AFR	WAS	EAS	CAS	AUS	ANT	AEC	MED	MNA
resolution_flag			5	44	22	11	055	0275								
CORDEX_domain	Domain		rule	<region_id>-<resolution_flag> as in http://cordex.dmi.dk/joomla/images/CORDEX/cordex_archive_specifications.pdf (Table)												
N/A	StartTime-EndTime		rule	format: YYYY[MM[DD[HH]]]-YYYY[MM[DD[HH]]]												