General information

Except as otherwise noted, each output field should be saved for the entire duration of each and every run.

The specifications for archiving model output, as described in the following tables, assume the following (please advise us if the assumptions are incorrect):

1. Sea ice fields and ocean biogeochemistry fields will be archived on the same grid as ocean fields.

2. Land fields (including ice and snow on land) and land biogeochemistry fields will be archived on the same grid as the atmosphere.

The following rules and recommendations for how to calculate quantities should be followed unless a different method is explicitly indicated in the notes that appear in the following tables.

1. It is recommended that ocean and sea-ice output (including O_clim, O_annual, O_mon, and OI_mon) be reported on the ocean's native grid. Unless noted otherwise in the tables, all other output should be reported on the atmospheric grid.

2. Unless otherwise specified, the ocean and sea-ice output (including O_clim, O_annual, O_mon, and OI_mon) represents a mean over only the sea portion of each grid cell (i.e., it is interpreted as "where ocean over ocean"), and a value of 0.0 should be reported where the sea fraction is 0.

3. Unless otherwise specified, the land output (in the L_mon and LI_mon tables) represents a mean over only the land portion of each grid cell (i.e., it is interpreted as "where land over land"), and a value of 0.0 should be reported where the land fraction is 0.

4. The default interpretation of a OI_mon field is that the quantity is averaged over the entire ocean portion of each grid-cell (with a value of zero applying anywhere the quantity is absent in this portion of the cell) and then averaged in time.

4. The default interpretation of a LI_mon field is that the quantity is averaged over the entire land portion of each grid-cell (with a value of zero applying anywhere the quantity is absent in this portion of the cell) and then averaged in time.

A note on priorities.

The priorities noted in the tables have been largely set by scientists who have participated in model intercomparison activities and have needed these variables in their own research. Since the priorities in different tables were set by different groups of scientists, the priorities in one table may have a different meaning from the priorities in another table. We hope that the vast majority of fields listed in all the tables will be archived by all the modeling groups, but in many cases where a group has not saved a particular field in the past, this may require non-trivial effort. The priorities listed here, along with the participating group's expert judgement should be considered when deciding which fields to save. Please make every effort to save as many of the fields as possible.

CMOR Dimensions

CMOR table(s)	CMOR dimension	output dimension name	description	standard name	long name	axis	units	index axis?	coords_ attrib	bounds?	stored direction	valid_ min
fx, Amon, Lmon, LImon, OImon, aero, da, 6hrLev, 6hrPlev, 3hr, Oclim, Oyr, Omon, cfMon, cfOff, cfDa, cf3hr	longitude	lon		longitude	longitude	X	degrees_east			yes	increasing	0
fx, Amon, Lmon, LImon, OImon, aero, da, 6hrLev, 6hrPlev, 3hr, Oclim, Oyr, Omon, cfMon, cfOff, cfDa, cf3hr	latitude	lat		latitude	latitude	Y	degrees_north			yes	increasing	-90
Amon	plev17	plev		pressure	pressure	Z	Pa			no	decreasing	
da	plev6	plev		pressure	pressure	Z	Pa			no	decreasing	
6hrPlev	plev3	plev		pressure	pressure	Z	Pa			no	decreasing	
cfMon, cfDa	plev7	plev	7 pressure layers defined by ISCCP simulator	pressure	pressure	Z	Pa			yes	decreasing	
cfDa	p500	plev	500 hPa	pressure	pressure	Z	Pa			no	decreasing	
cfDa	p700	plev	700 hPa	pressure	pressure	Z	Pa			no	decreasing	
cfMon, cfOff, cf3hr	p220	plev	pressure layer of high-level cloud in ISCCP simulator	pressure	pressure	Z	Pa			no	decreasing	
cfMon, cfOff, cf3hr	p560	plev	pressure layer of mid-level cloud in ISCCP simulator	pressure	pressure	Z	Pa			no	decreasing	
cfMon, cfOff, cf3hr	p840	plev	pressure layer of low-level cloud in ISCCP simulator	pressure	pressure	Z	Pa			no	decreasing	
Amon, aero, 6hrLev, cfMon, cfDa, cf3hr, cf30min	alevel	lev	atmospheric model level (What if a model has altitude as the vertical coordinate?)		atmospheric model level	Z		ok		yes	increasing	
cfMon, cfDa, cf3hr	alevbnds	lev	atmospheric model "half" level		atmospheric model half-level	Z		ok		no	increasing	
aero	alev1	lev	atmospheric model's lowest level		lowest atmospheric model level	Z		ok		yes	increasing	
cfMon, cfOff, cfDa, cf3hr	alt	alt	CloudSat vertical coordinate heights	altitude	altitude	Z	m			yes	increasing	
Oyr, Amon, Lmon, LImon, OImon, aero, da, 3hr, Omon, cfMon, cfOff, cfDa, cf3hr	time	time	for time-mean fields	time	time	T	days since ?			yes	increasing	
6hrLev, 6hrPlev, 3hr, cf3hr, cf30min	time1	time	synoptic times (for fields that are not time-means)	time	time	T	days since ?			no	increasing	
Oclim	time2	time	climatological times	time	time	T	days since ?			yes	increasing	
Amon, da, 3hr, cf3hr, cf30min	height2m	height	~2 m standard surface air temperature and surface humidity height	height	height	Z	m			no	increasing	1

Amon, da, 3hr, cf3hr, cf30min	height10m	height	~10 m standard wind speed height	height	height	Z	m			no	increasing	1
Lmon, LImon	sdepth	depth	coordinate values for soil layers (depth)	depth	depth	Z	m			yes	increasing	0
Lmon	sdepth1	depth	coordinate value for topmost 0.1 meter layer of soil	depth	depth	Z	m			yes	increasing	0
cfMon, cfDa	tau	tau	isccp optical depth categories	cloud_optical_depth	cloud optical depth		1			yes	increasing	
cfOff, cf3hr	scatratio	scatratio	15 bins of scattering ratio for the CALIPSO simulator CFAD	backwards_scattering_coefficent_ of lidar signal?	lidar backscattering ratio		1			yes	increasing	
cfOff, cf3hr	dbze	dbze	15 bins of radar reflectivity for CloudSat simulator CFAD	equivalent_reflectivity_factor?	CloudSat simulator equivalent radar reflectivity factor		dB			yes	increasing	
cfMon, cfOff, cfDa cf3hr	sza5	sza	5 solar zenith angles for PARASOL reflectances	solar_zenith_angle	solar zenith angle		degree			no	increasing	
cf30min	site	site	an integer assigned to each of 115 stations (standard) and 73 stations (aquaplanet)	?	site index		-	ok		no		
Omon	basin	basin		region	ocean basin		-	ok	region	no		
Omon	rho	rho	density? Potential density?	?	?	Z	?			yes	decreasing	
fx, Oclim, Oyr, Omon	olevel	lev	ocean model level (What about a model that has a true, dimensioned, vertical coordinate, like "depth below the surface"?)		ocean model level	Z	?	ok		yes	decreasing	
Omon	xline	xline	opening, passage, strait, channel, etc.	?	ocean passage		-	ok	passage	no		
cf3hr	location	loc	COSP profile in instantaneous curtain mode	?	location index		-	ok		no	increasing	
Lmon	vegtype	type	plant functional type		platnt functional type		-	ok	described	no	increasing	
OImon	icetype	type	sea ice category	?	sea ice thickness category		-	ok	described	no	increasing	

valid_ max	type	positive	value	bounds _values	requested	bounds_ requested	tol_on_request s: variance from requested values that is tolerated
360	double						
180	double						
	double	down			100000. 92500. 85000. 70000. 60000. 50000. 40000. 30000. 25000. 20000. 15000. 10000. 7000. 5000. 3000. 2000. 1000.		0.001
	double	down			100000. 85000. 70000. 50000. 25000. 10000.		0.001
	double	down			85000. 50000. 25000.		0.001
	double	down				100000. 80000. 80000. 68000. 68000. 56000. 56000. 44000. 44000. 31000. 31000. 18000. 18000. 0.	0.001
	double	down	50000.				
	double	down	70000.				
	double	down	22000.	0. 44000.			
	double	down	56000.	44000. 68000.			
	double	down	84000.	680. 100000.			
	double						
	double						
	double						
	double	up			240. 720. 1200. 1680. 2160. 2640. 3120. 3600. 4080. 4560. 5040. 5520. 6000. 6480. 6960. 7440. 7920. 8400. 8880. 9360. 9840. 10320. 10800. 11280. 11760. 12240. 12720. 13200. 13680. 14160. 14640. 15120. 15600. 16080. 16560. 17040. 17520. 18000. 18480. 18960.	. 0. 480. 480. 960. 960. 1440. 1440. 1920. 1920. 2400. 2400. 2880. 2880. 3360. 3360. 3840. 3840. 4320. 4320. 4800. 4800. 5280. 5280. 5760. 5760. 6240. 6240. 6720. 6720. 7200. 7200. 7680. 7680. 8160. 8160. 8640. 8640. 9120. 9120. 9600. 9600. 10080. 10080. 10560. 10560. 11040. 11040. 11520. 11520. 12000. 12000. 12480. 12480. 12960. 12960. 13440. 13440. 13920. 13920. 14400. 14400. 14880. 14880. 15360. 15360. 15840. 15840. 16320. 16320. 16800. 16800. 17280. 17280. 17760. 17760. 18240. 18240. 18720.	0.001
	double						
	double						
	double						
10	double	up	2.				

30	double	up	10.				
200	double	down					
0.2	double	down	0.05	0.0 0.1			
	double				0.15 0.8 2.45 6.5 16.2 41.5 100.	0.0 0.3 0.3 1.3 1.3 3.6 3.6 9.4 9.4 23.0 23.0 60.0 60.0 100000.	0.001
	double					0.01, 1.2, 3, 5, 7, 10, 15, 20, 25, 30, 40, 50, 60, 80, 999, 1009	0.001
	double				-47.5 -42.5 -37.5 -32.5 -27.5 -22.5 -17.5 -12.5 -7.5 -2.5 2.5 7.5 12.5 17.5 22.5	-50, -45, -40, -35, -30, -25, -20, -15, -10, -5, 0, 5, 10, 15, 20, 25	0.001
	double				0. 20. 40. 60. 80.		0.001
	character				atlantic_arctic_ocean indian_pacific_ocean global_ocean (These are corrections from Griffies' table)		
	double	down					
	double	down					
	character				barents_opening bering_strait canadian_archipelago denmark_strait drake_passage english_channel pacific_equatorial_undercurrent faroe_scotland_channel florida_bahamas_straight fram_strait iceland_faroe_channel indonesian_thoughflow mozambique_channel taiwan_luzon_straits windward_passage		
	double						
	double						
	double						

CMOR Table fx: Time-Invariant Fields fx

on atmospheric grid

Atmospheric and land fields may be submitted on a (single) grid of the modeling group's choosing. We expect most groups will elect to save output on the native grid. If data is "interpolated" to a different grid, it is important to preserve certain global mean properties (e.g., the total surface fluxes of heat, momentum, and water mass).

priority	long name	units	comment	questions	output variable name	confirmed or likely to be confirmed standard name
1	Atmosphere Grid-Cell Area	m^2			areacella	cell_area
1	Surface Altitude	m	height above the geoid; as defined here, "the geoid" is a surface of constant geopotential that, if the ocean were at rest, would coincide with mean sea level. Under this definition, the geoid changes as the mean volume of the ocean changes (e.g., due to glacial melt, or global warming of the ocean). Report here the height above the present-day geoid. Over ocean, report as 0.0		orog	surface_altitude
1	Land Area Fraction	%			sftlf	land_area_fraction
1	Fraction of Grid Cell Covered with Glacier	%	fraction of grid cell occupied by "permanent" ice (i.e., glaciers). If time varying, report annual values for each year of simulation		sftgif	land_ice_area_fraction
1	Capacity of Soil to Store Water	kg m^{-2}	"where land": divide the total water holding capacity of all the soil in the grid cell by the land area in the grid cell; report as "missing" where the land fraction is 0.		mrsofc	soil_moisture_content_at_field_capacity
1	Maximum Root Depth	m	report the maximum soil depth reachable by plant roots (if defined in model), i.e., the maximum soil depth from which they can extract moisture; report as "missing" where the land fraction is 0.		rootd	root_depth

on ocean grid

The WGOMD has recommended that all ocean fields be saved on the model's native ocean grid. Many groups will also elect to save the sea ice fields on the ocean grid. (The alternative is to save sea ice fields on the atmosphere grid.) If data is "interpolated" from its native grid, it is important to preserve certain global mean properties (e.g., the total surface fluxes of heat, momentum, and water mass into the ocean).

priority	long name	units	comment	questions	output variable name	confirmed or likely to be confirmed standard name
1	Sea Floor Depth	m	Ocean bathymetry. Report here the sea floor depth for present day. Report as missing for land grid cells.		deptho	sea_floor_depth_below_geoid
1	Ocean Grid-Cell Volume	m^3	3-D field: grid-cell volume ca. 2000.		volcello	ocean_volume
1	Ocean Grid-Cell Area	m^2			areacello	cell_area
1	Sea Area Fraction	%	Report on the ocean grid. For completeness, please provide this even if the ocean grid is the same as the atmospheric grid.	Should this be recorded as a function of depth?	sftof	sea_area_fraction
1	Region Selection Index		flag_values=0,1,2,3,4,5,6,7,8,9,10 corresponding to flag_meanings=global_land, southern_ocean, atlantic_ocean, pacific_ocean, arctic_ocean, indian_ocean, mediterranean_sea, black_sea, hudson_bay, baltic_sea, red_sea.	CMOR must write flag_values and flag_meanings	basin	region
1	Region Selection Index		flag_values=0,1,2,3,4,5,6,7,8,9,10 corresponding to flag_meanings=global_land, southern_ocean, atlantic_ocean, pacific_ocean, arctic_ocean, indian_ocean, mediterranean_sea, black_sea, hudson_bay, baltic_sea, red_sea.	CMOR must write flag_values and flag_meanings	basinv	region

unconfirmed or proposed standard name	unformatted units	cell_methods	valid min	valid max	mean absolute min	mean absolute max	positive	type	CMOR dimensions	CMOR variable name	realm
	m2		500	2.50E+05				real	longitude latitude	areacella	atmos land
	m		-700	1.00E+04				real	longitude latitude	orog	atmos
	%		0	100				real	longitude latitude	sftlf	atmos
	%		0	100				real	longitude latitude	sftgif	land
	kg m-2							real	longitude latitude	mrsofc	land
	m		0	30				real	longitude latitude	rootd	land

unconfirmed or proposed standard name	unformatted units	cell_methods	valid min	valid max	mean absolute min	mean absolute max	positive	type	CMOR dimensions	CMOR variable name	realm
	m		0	10000	2000	5000		real	longitude latitude	deptho	ocean
	m3		1000	1.00E+15	1.00E+10	1.00E+15		real	longitude latitude olevel	volcello	ocean
	m2		10	2.50E+05				real	longitude latitude	areacello	ocean
	%		0	100				real	longitude latitude	sftof	ocean
	0		1	10				integer	longitude latitude	basin	ocean
	0		1	10				integer	longitude latitude	basinv	ocean

CMOR Table Oclim: Monthly Mean Ocean Climatology (Jan. 1986-Dec. 2005) Oclim

(All Saved on the Ocean Grid)

Further explanation of the fields in the following tables can be found in Griffies et al., available at http://eprints.soton.ac.uk/65415/01/137_WGOMD_ModelOutput.pdf . Some of the information in that document will be transcribed into the "comment" column of this spreadsheet.

In CMOR Table Oclim: *WGOMD Table 2.9*

priority	long name	units	comment	questions	output variable name	confirmed or likely to be confirmed standard name
3	Ocean Vertical Heat Diffusivity	$m^2 s^{-1}$			difvho	ocean_vertical_heat_diffusivity
3	Ocean Vertical Salt Diffusivity	$m^2 s^{-1}$			difvso	
3	Ocean Vertical Tracer Diffusivity due to Background	$m^2 s^{-1}$			difvtrbo	ocean_vertical_tracer_diffusivity_due_to_background
3	Ocean Vertical Tracer Diffusivity due to Tides	$m^2 s^{-1}$			difvtrto	ocean_vertical_tracer_diffusivity_due_to_tides
3	Tendency of Ocean Potential Energy Content	$W m^{-2}$			tnpeo	tendency_of_ocean_potential_energy_content
3	Tendency of Ocean Potential Energy Content due to Tides	$W m^{-2}$			tnpeot	tendency_of_ocean_potential_energy_content_due_to_tides
3	Tendency of Ocean Potential Energy Content due to Background	$W m^{-2}$			tnpeotb	tendency_of_ocean_potential_energy_content_due_to_background
3	Ocean Vertical Momentum Diffusivity	$m^2 s^{-1}$			difvmo	ocean_vertical_momentum_diffusivity
3	Ocean Vertical Momentum Diffusivity due to Background	$m^2 s^{-1}$			difvmbo	ocean_vertical_momentum_diffusivity_due_to_background
3	Ocean Vertical Momentum Diffusivity due to Tides	$m^2 s^{-1}$			difvmto	ocean_vertical_momentum_diffusivity_due_to_tides
3	Ocean Vertical Momentum Diffusivity due to Form Drag	$m^2 s^{-1}$			difvmfdo	ocean_vertical_momentum_diffusivity_due_to_form_drag
3	Ocean Kinetic Energy Dissipation Per Unit Area due to Vertical Friction	$W m^{-2}$			dispkevfo	ocean_kinetic_energy_dissipation_per_unit_area_due_to_vertical_friction

In CMOR Table Oclim: *WGOMD Table 2.9*

priority	long name	units	comment	questions	output variable name	confirmed or likely to be confirmed standard name
3	Ocean Tracer Bolus Laplacian Diffusivity	$m^2 s^{-1}$			diftrblo	ocean_tracer_bolus_laplacian_diffusivity
3	Ocean Tracer Bolus Biharmonic Diffusivity	$m^4 s^{-1}$			diftrbbo	ocean_tracer_bolus_biharmonic_diffusivity

3	Ocean Tracer Epineutral Laplacian Diffusivity	$m^2 s^{-1}$		diftrelo	ocean_tracer_epineutral_laplacian_diffusivity
3	Ocean Tracer Epineutral Biharmonic Diffusivity	$m^2 s^{-1}$		diftrebo	ocean_tracer_epineutral_biharmonic_diffusivity
3	Ocean Tracer XY Laplacian Diffusivity	$m^2 s^{-1}$		diftrxylo	ocean_tracer_xy_laplacian_diffusivity
3	Ocean Tracer XY Biharmonic Diffusivity	$m^2 s^{-1}$		diftrxybo	ocean_tracer_xy_biharmonic_diffusivity
3	Tendency of Ocean Eddy Kinetic Energy Content due to Bolus Transport	$W m^{-2}$		tnkebto	tendency_of_ocean_eddy_kinetic_energy_content_due_to_bolus_transport
3	Ocean Momentum XY Laplacian Diffusivity	$m^2 s^{-1}$		difmxylo	ocean_momentum_xy_laplacian_diffusivity
3	Ocean Momentum XY Biharmonic Diffusivity	$m^2 s^{-1}$		difmxybo	ocean_momentum_xy_biharmonic_diffusivity
3	Ocean Kinetic Energy Dissipation Per Unit Area due to XY Friction	$W m^{-2}$		dispkexyfo	ocean_kinetic_energy_dissipation_per_unit_area_due_to_xy_friction

unconfirmed or proposed standard name	unformatted units	cell_methods	valid min	valid max	mean absolute min	mean absolute max	positive	type	CMOR dimensions	CMOR variable name	realm
	m2 s-1	time: mean within years time: mean over years						real	longitude latitude olevel time2	difvho	ocean
ocean_vertical_salt_diffusivity_due_to_background	m2 s-1	time: mean within years time: mean over years						real	longitude latitude olevel time2	difvso	ocean
	m2 s-1	time: mean within years time: mean over years						real	longitude latitude olevel time2	difvtrbo	ocean
	m2 s-1	time: mean within years time: mean over years						real	longitude latitude olevel time2	difvtrto	ocean
	W m-2	time: mean within years time: mean over years						real	longitude latitude olevel time2	tnpeo	ocean
	W m-2	time: mean within years time: mean over years						real	longitude latitude olevel time2	tnpeot	ocean
	W m-2	time: mean within years time: mean over years						real	longitude latitude olevel time2	tnpeotb	ocean
	m2 s-1	time: mean within years time: mean over years						real	longitude latitude olevel time2	difvmo	ocean
	m2 s-1	time: mean within years time: mean over years						real	longitude latitude olevel time2	difvmbo	ocean
	m2 s-1	time: mean within years time: mean over years						real	longitude latitude olevel time2	difvmto	ocean
	m2 s-1	time: mean within years time: mean over years						real	longitude latitude olevel time2	difvmfdo	ocean
	W m-2	time: mean within years time: mean over years						real	longitude latitude olevel time2	dispkevfo	ocean

unconfirmed or proposed standard name	unformatted units	cell_methods	valid min	valid max	mean absolute min	mean absolute max	positive	type	CMOR dimensions	CMOR variable name	realm
	m2 s-1	time: mean within years time: mean over years						real	longitude latitude olevel time2	diftrblo	ocean
	m4 s-1	time: mean within years time: mean over years						real	longitude latitude olevel time2	diftrbbo	ocean

m2 s-1	time: mean within years time: mean over years	real	longitude latitude olevel time2	diftrelo	ocean	
m2 s-1	time: mean within years time: mean over years	real	longitude latitude olevel time2	diftrebo	ocean	
m2 s-1	time: mean within years time: mean over years	real	longitude latitude olevel time2	diftrxylo	ocean	
m2 s-1	time: mean within years time: mean over years	real	longitude latitude olevel time2	diftrxybo	ocean	
W m-2	time: mean within years time: mean over years	real	longitude latitude olevel time2	tnkebto	ocean	
m2 s-1	time: mean within years time: mean over years	real	longitude latitude olevel time2	difmxylo	ocean	
m2 s-1	time: mean within years time: mean over years	real	longitude latitude olevel time2	difmxybo	ocean	
W m-2	time: mean within years time: mean over years	real	longitude latitude olevel time2	dispkexyfo	ocean	

CMOR Table Oyr: Annual Mean Ocean Fields, Including Biogechemical Fields Oyr

(All Saved on the Ocean Grid)

In CMOR Table Oyr: *3-D Marine Biogeochemical Tracer Fields*

priority	long name	units	comment	questions	output variable name	confirmed or likely to be confirmed standard name
1	Dissolved Inorganic Carbon Concentration	mol C m^{-3}	Dissolved inorganic carbon (CO3+HCO3+H2CO3) concentration		dissic	
2	Dissolved Organic Carbon Concentration	mol C m^{-3}	Dissolved organic carbon concentration		dissoc	
2	Phytoplankton Carbon Concentration	mol C m^{-3}	sum of phytoplankton carbon component concentrations		phyc	
2	Zooplankton Carbon Concentration	mol C m^{-3}	sum of zooplankton carbon component concentrations		zooc	
3	Bacterial Carbon Concentration	mol C m^{-3}	sum of bacterial carbon component concentrations		bacc	
2	Detrital Organic Carbon Concentration	mol C m^{-3}	sum of detrital organic carbon component concentrations		detoc	
2	Calcite Concentration	mol C m^{-3}	sum of particulate calcite component concentrations (e.g. Phytoplankton, Detrital, etc.)		calc	
2	Aragonite Concentration	mol C m^{-3}	sum of particulate aragonite components (e.g. Phytoplankton, Detrital, etc.)		arag	
3	Diatom Carbon Concentration	mol C m^{-3}	carbon from the diatom phytoplankton component concentration alone		phycdiat	
3	Non-Diatom Phytoplankton Carbon Concentrati	mol C m^{-3}	carbon from additional phytoplankton component concentrations alone (e.g. Calc., diaz., cyano., etc)		phycmisc	
3	Other Zooplankton Carbon Concentration	mol C m^{-3}	carbon from additional zooplankton component concentrations alone (e.g. Micro, meso)	How does this differ from "sum of zooplankton carbon component concentrations"?	zoocmisc	
1	Total Alkalinity	eq m^{-3}	total alkalinity equivalent concentration (including carbonate, nitrogen, silicate, and borate components)	Is "eq" in udunits? Is "equivalents" preferred to, say, 10**-6 (i.e., ppm) or kmol/m**3?	talk	
1	pH	?	negative log of hydrogen ion concentration with the concentration expressed as mol H kg-1.		ph	
1	Dissolve Oxygen Concentration	mol O_2 m^{-3}	dissolved oxygen gas concentration in sea water		o2	
1	Dissolved Nitrate Concentration	mol N m^{-3}	dissolved nitrate concentration in sea water		no3	
2	Dissolved Ammonium Concentration	mol N m^{-3}	dissolved ammonium concentration in sea water		nh4	
1	Dissolved Phosphate Concentration	mol P m^{-3}	dissolved Phosphate concentration in sea water		po4	
1	Dissolved Iron Concentration	mol Fe m^{-3}	dissolved iron concentration in sea water		dfe	
1	Dissolved Silicate Concentration	mol Si m^{-3}	dissolved silicate concentration in sea water		si	
1	Total Chlorophyll Mass Concentration	mg Chl m^{-3}	sum of chlorophyll from all phytoplankton group concentrations		chl	
3	Diatom Chlorophyll Mass Concentration	mg Chl m^{-3}	chlorophyll from diatom phytoplankton component concentration alone		chldiat	
3	Other Phytoplankton Chlorophyll Mass Concentration	mg Chl m^{-3}	chlorophyll from additional phytoplankton component concentrations alone		chlmisc	
3	Particulate Organic Nitrogen Concentration	mol N m^{-3}	sum of particulate organic nitrogen component concentrations		pon	
3	Particulate Organic Phosphorus Concentration	mol P m^{-3}	sum of particulate organic phosphorus component concentrations		pop	

3	Particulate Biogenic Iron Concentration	mol Fe m^{-3}	sum of particulate organic iron component concentrations		bfe	
3	Particulate Biogenic Silica Concentration	mol Si m^{-3}	sum of particulate silica component concentrations		bsi	
3	Phytoplankton Nitrogen Concentration	mol N m^{-3}	sum of phytoplankton nitrogen component concentrations		phyn	
3	Phytoplankton Phosphorus Concentration	mol P m^{-3}	sum of phytoplankton phosphorus components		phyp	
3	Phytoplankton Iron Concentration	mol Fe m^{-3}	sum of phytoplankton iron component concentrations		phyfe	
3	Phytoplankton Silica Concentration	mol Si m^{-3}	sum of phytoplankton silica component concentrations		physi	
3	Dimethyl Sulphide Concentration	mol DMS m^{-3}	dimethyl sulphide concentration		dms	

In CMOR Table Oyr: *Marine Biogeochemical 3-D Fields: Rates of Production and Removal*

priority	long name	units	comment	questions	output variable name	confirmed or likely to be confirmed standard name
3	Primary Carbon Production by Phytoplankton	mol C m^{-3} s^{-1}	total primary (organic carbon) production by phytoplankton		pp	
3	Primary Carbon Production by Phytoplankton Based on NO3 Alone	mol C m^{-3} s^{-1}	Primary (organic carbon) production by phytoplankton based on NO3 alone		pnew	
3	Biogenic Iron Production	mol Fe m^{-3} s^{-1}	Biogenic iron production		pbfe	
3	Biogenic Silica Production	mol Si m^{-3} s^{-1}	Biogenic silica production		pbsi	
3	Calcite Production	mol C m^{-3} s^{-1}	calcite production	Is this reported in units of C or is this wrong? Is calcite a carbon compound?	pcalc	
3	Aragonite Production	mol C m^{-3} s^{-1}	aragonite production	Is this reported in units of C or is this wrong? Is aragonite a carbon compound?	parag	
3	Sinking Particulate Organic Carbon Flux	mol C m^{-2} s^{-1}	sinking flux of organic carbon	Should these and following fluxes normally be reported on half levels? Are these really fluxes or divergence of vertical fluxes?	expc	
3	Sinking Particulate Organic Nitrogen Flux	mol N m^{-2} s^{-1}	sinking flux of organic nitrogen		expn	
3	Sinking Particulate Organic Phosphorus Flux	mol P m^{-2} s^{-1}	sinking flux of organic phosphorus		expp	
3	Sinking Particulate Iron Flux	mol Fe m^{-2} s^{-1}	sinking flux of iron		expcfe	
3	Sinking Particulate Silica Flux	mol Si m^{-2} s^{-1}	sinking flux of silica		expsi	
3	Sinking Calcite Flux	mol C m^{-2} s^{-1}	sinking flux of calcite	Is this reported in units of C or is this wrong? Is calcite a carbon compound?	expcalc	
3	Sinking Aragonite Flux	mol C m^{-2} s^{-1}	sinking flux of aragonite	Is this reported in units of C or is this wrong? Is aragonite a carbon compound?	exparag	
3	Calcite Dissolution	mol C m^{-3} s^{-1}	calcite dissolution	Is this reported in units of C or is this wrong? Is calcite a carbon compound?	dcalc	
3	Aragonite Dissolution	mol C m^{-3} s^{-1}	aragonite dissolution	Is this reported in units of C or is this wrong? Is aragonite a carbon compound?	darag	

3	Diatom Primary Carbon Production	mol C m^{-3} s^{-1}	Primary (organic carbon) production by the diatom component alone		pdi
3	Other Phytoplankton Carbon Production	mol C m^{-3} s^{-1}	Primary (organic carbon) production by other phytoplankton components alone	What is left out of "other"? Diatoms? Anything else?	phypmisc
3	Rate of Change of Dissolved Inorganic Carbon due to Biological Activity	mol C m^{-3} s^{-1}	Net of biological terms in time rate of change of dissolved inorganic carbon		bddtdic
3	Rate of Change of Nitrogen Nutrient due to Biological Activity	mol N m^{-3} s^{-1}	Net of biological terms in time rate of change of nitrogen nutrients (e.g. NO3+NH4)		bddtdin
3	Rate of Change of Dissolved Phosphate due to Biological Activity	mol P m^{-3} s^{-1}	Net of biological terms in time rate of change of dissolved phosphate		bddtdip
3	Rate of Change of Dissolved Inorganic Iron due to Biological Activity	mol Fe m^{-3} s^{-1}	Net of biological terms in time rate of change of dissolved inorganic iron		bddtdife
3	Rate of Change of Dissolved Inorganic Silicate due to Biological Activity	mol Si m^{-3} s^{-1}	Net of biological terms in time rate of change of dissolved inorganic silicate		bddtdisi
3	Rate of Change of Alkalinity due to Biological Activity	eq m^{-3} s^{-1}	Net of biological terms in time rate of change of alkalinity	Is "equivalents" preferred to, say, ppm or kmol/m**3?	bddtalk
3	Nonbiogenic Iron Scavenging	mol Fe m^{-3} s^{-1}	Dissolved Fe removed through nonbiogenic scavenging onto particles		fescav
3	Particle Source of Dissolved Iron	mol Fe m^{-3} s^{-1}	Dissolution, remineralization and desorption of iron back to the dissolved phase		fediss
3	Total Grazing of Phytoplankton by Zooplankton	mol Fe m^{-3} s^{-1}	Total grazing of phytoplankton by zooplankton		graz

unconfirmed or proposed standard name	unformatted units	cell_methods	valid min	valid max	mean absolute min	mean absolute max	positive	type	CMOR dimensions	CMOR variable name	realm
dissolved_inorganic_carbon	mol C m-3	time: mean area: mean where sea						real	longitude latitude olevel time	dissic	ocnBgchem
dissolved_organic_carbon	mol C m-3	time: mean area: mean where sea						real	longitude latitude olevel time	dissoc	ocnBgchem
phytoplankton_carbon	mol C m-3	time: mean area: mean where sea						real	longitude latitude olevel time	phyc	ocnBgchem
zooplankton_carbon	mol C m-3	time: mean area: mean where sea						real	longitude latitude olevel time	zooc	ocnBgchem
bacterial_carbon	mol C m-3	time: mean area: mean where sea						real	longitude latitude olevel time	bacc	ocnBgchem
detrital_organic_carbon	mol C m-3	time: mean area: mean where sea						real	longitude latitude olevel time	detoc	ocnBgchem
calcite	mol C m-3	time: mean area: mean where sea						real	longitude latitude olevel time	calc	ocnBgchem
aragonite	mol C m-3	time: mean area: mean where sea						real	longitude latitude olevel time	arag	ocnBgchem
diatom_carbon	mol C m-3	time: mean area: mean where sea						real	longitude latitude olevel time	phycdiat	ocnBgchem
other_phytoplankton_carbon	mol C m-3	time: mean area: mean where sea						real	longitude latitude olevel time	phycmisc	ocnBgchem
other_zooplankton_carbon	mol C m-3	time: mean area: mean where sea						real	longitude latitude olevel time	zoocmisc	ocnBgchem
total_alkalinity	eq m-3	time: mean area: mean where sea						real	longitude latitude olevel time	talk	ocnBgchem
ph	?	time: mean area: mean where sea						real	longitude latitude olevel time	ph	ocnBgchem
oxygen	mol O2 m-3	time: mean area: mean where sea						real	longitude latitude olevel time	o2	ocnBgchem
nitrate	mol N m-3	time: mean area: mean where sea						real	longitude latitude olevel time	no3	ocnBgchem
ammonium	mol N m-3	time: mean area: mean where sea						real	longitude latitude olevel time	nh4	ocnBgchem
phosphate	mol P m-3	time: mean area: mean where sea						real	longitude latitude olevel time	po4	ocnBgchem
iron	mol Fe m-3	time: mean area: mean where sea						real	longitude latitude olevel time	dfe	ocnBgchem
silicate	mol Si m-3	time: mean area: mean where sea						real	longitude latitude olevel time	si	ocnBgchem
total_chlorophyll	mg Chl m-3	time: mean area: mean where sea						real	longitude latitude olevel time	chl	ocnBgchem
diatom_chlorophyll	mg Chl m-3	time: mean area: mean where sea						real	longitude latitude olevel time	chldiat	ocnBgchem
other_phytoplankton_chlorophyll	mg Chl m-3	time: mean area: mean where sea						real	longitude latitude olevel time	chlmisc	ocnBgchem
particulate_organic_nitrogen	mol N m-3	time: mean area: mean where sea						real	longitude latitude olevel time	pon	ocnBgchem
particulate_organic_phosphorus	mol P m-3	time: mean area: mean where sea						real	longitude latitude olevel time	pop	ocnBgchem

particulate_biogenic_iron	mol Fe m-3	time: mean area: mean where sea						real	longitude latitude olevel time	bfe	ocnBgchem
particulate_biogenic_silica	mol Si m-3	time: mean area: mean where sea						real	longitude latitude olevel time	bsi	ocnBgchem
phytoplankton_nitrogen	mol N m-3	time: mean area: mean where sea						real	longitude latitude olevel time	phyn	ocnBgchem
phytoplankton_phosphorus	mol P m-3	time: mean area: mean where sea						real	longitude latitude olevel time	phyp	ocnBgchem
phytoplankton_iron	mol Fe m-3	time: mean area: mean where sea						real	longitude latitude olevel time	phyfe	ocnBgchem
phytoplankton_silica	mol Si m-3	time: mean area: mean where sea						real	longitude latitude olevel time	physi	ocnBgchem
dimethylsulfide	mol DMS m-3	time: mean area: mean where sea						real	longitude latitude olevel time	dms	ocnBgchem

unconfirmed or proposed standard name	unformatted units	cell_methods	valid min	valid max	mean absolute min	mean absolute max	positive	type	CMOR dimensions	CMOR variable name	realm
primary_production	mol C m-3 s-1	time: mean area: mean where sea						real	longitude latitude olevel time	pp	ocnBgchem
new_production	mol C m-3 s-1	time: mean area: mean where sea						real	longitude latitude olevel time	pnew	ocnBgchem
biogenic_iron_production	mol Fe m-3 s-1	time: mean area: mean where sea						real	longitude latitude olevel time	pbfe	ocnBgchem
biogenic_silica_production	mol Si m-3 s-1	time: mean area: mean where sea						real	longitude latitude olevel time	pbsi	ocnBgchem
calcite_production	mol C m-3 s-1	time: mean area: mean where sea						real	longitude latitude olevel time	pcalc	ocnBgchem
aragonite_production	mol C m-3 s-1	time: mean area: mean where sea						real	longitude latitude olevel time	parag	ocnBgchem
sinking_particulate_organic_carbon_export	mol C m-2 s-1	time: mean area: mean where sea						real	longitude latitude olevel time	expc	ocnBgchem
sinking_particulate_organic_nitrogen_export	mol N m-2 s-1	time: mean area: mean where sea						real	longitude latitude olevel time	expn	ocnBgchem
sinking_particulate_organic_phosphorus_export	mol P m-2 s-1	time: mean area: mean where sea						real	longitude latitude olevel time	expp	ocnBgchem
sinking_particulate_iron_export	mol Fe m-2 s-1	time: mean area: mean where sea						real	longitude latitude olevel time	expcfe	ocnBgchem
sinking_particulate_silica_export	mol Si m-2 s-1	time: mean area: mean where sea						real	longitude latitude olevel time	expsi	ocnBgchem
sinking_calcite_export	mol C m-2 s-1	time: mean area: mean where sea						real	longitude latitude olevel time	expcalc	ocnBgchem
sinking_aragonite_export	mol C m-2 s-1	time: mean area: mean where sea						real	longitude latitude olevel time	exparag	ocnBgchem
calcite_dissolution	mol C m-3 s-1	time: mean area: mean where sea						real	longitude latitude olevel time	dcalc	ocnBgchem
aragonite_dissolution	mol C m-3 s-1	time: mean area: mean where sea						real	longitude latitude olevel time	darag	ocnBgchem

diatom_production	mol C m-3 s-1	time: mean area: mean where sea		real	longitude latitude olevel time	pdi	ocnBgchem
other_phytoplankton_production	mol C m-3 s-1	time: mean area: mean where sea		real	longitude latitude olevel time	phypmisc	ocnBgchem
net_biological_dic_rate_of_change	mol C m-3 s-1	time: mean area: mean where sea		real	longitude latitude olevel time	bddtdic	ocnBgchem
net_biological_din_rate_of_change	mol N m-3 s-1	time: mean area: mean where sea		real	longitude latitude olevel time	bddtdin	ocnBgchem
net_biological_dip_rate_of_change	mol P m-3 s-1	time: mean area: mean where sea		real	longitude latitude olevel time	bddtdip	ocnBgchem
net_biological_dife_rate_of_change	mol Fe m-3 s-1	time: mean area: mean where sea		real	longitude latitude olevel time	bddtdife	ocnBgchem
net_biological_disi_rate_of_change	mol Si m-3 s-1	time: mean area: mean where sea		real	longitude latitude olevel time	bddtdisi	ocnBgchem
net_biological_alkalinity_rate_of_change	eq m-3 s-1	time: mean area: mean where sea		real	longitude latitude olevel time	bddtalk	ocnBgchem
nonbiogenic_iron_scavenging	mol Fe m-3 s-1	time: mean area: mean where sea		real	longitude latitude olevel time	fescav	ocnBgchem
dissolved_iron_source_from_particles	mol Fe m-3 s-1	time: mean area: mean where sea		real	longitude latitude olevel time	fediss	ocnBgchem
total_grazing	mol Fe m-3 s-1	time: mean area: mean where sea		real	longitude latitude olevel time	graz	ocnBgchem

CMOR Table Amon: Monthly Mean Atmospheric Fields and Some Surface Fields Amon

(All Saved on the Atmospheric Grid)

In CMOR Table Amon: *2-D fields on atmospheric grid*

priority	long name	units	comment	questions	output variable name	confirmed or likely to be confirmed standard name
1	Near-Surface Air Temperature	K	near-surface (usually, 2 meter) air temperature.		tas	air_temperature
1	Surface Temperature	K	"skin" temperature (i.e., SST for open ocean)		ts	surface_temperature
1	Daily Minimum Near-Surface Air Temperature	K	monthly mean of the daily-minimum near-surface (usually, 2 meter) air temperature.		tasmin	air_temperature
1	Daily Maximum Near-Surface Air Temperature	K	monthly mean of the daily-maximum near-surface (usually, 2 meter) air temperature.		tasmax	air_temperature
1	Sea Level Pressure	Pa	not, in general, the same as surface pressure		psl	air_pressure_at_sea_level
1	Surface Air Pressure	Pa	not, in general, the same as mean sea-level pressure		ps	surface_air_pressure
1	Eastward Near-Surface Wind Speed	m s^{-1}	near-surface (usually, 10 meters) eastward component of wind.		uas	eastward_wind
1	Northward Near-Surface Wind Speed	m s^{-1}	near-surface (usually, 10 meters) northward component of wind.		vas	northward_wind
1	Near-Surface Wind Speed	m s^{-1}	near-surface (usually, 10 meters) wind speed. This is the mean of the speed, not the speed computed from the mean u and v components of wind		sfcWind	wind_speed
1	Near-Surface Relative Humidity	%	near-surface (usually, 2meters) relative humidity expressed as a percentage. This is the relative humidity with respect to liquid water for T> 0 C, and with respect to ice for T<0 C.		hurs	relative_humidity
1	Near-Surface Specific Humidity	1	near-surface (usually, 2 meters) specific humidity.		huss	specific_humidity
1	Precipitation	kg m^{-2} s^{-1}	at surface; includes both liquid and solid phases from all types of clouds (both large-scale and convective)		pr	precipitation_flux
1	Snowfall Flux	kg m^{-2} s^{-1}	at surface; includes precipitation of all forms of water in the solid phase		prsn	snowfall_flux
1	Convective Precipitation	kg m^{-2} s^{-1}	at surface; includes both liquid and solid phases.		prc	convective_precipitation_flux
1	Evaporation	kg m^{-2} s^{-1}	at surface; flux of water into the atmosphere due to conversion of both liquid and solid phases to vapor (from underlying surface and vegetation)		evspsbl	water_evaporation_flux
1	Surface Snow and Ice Sublimation Flux	kg m^{-2} s^{-1}	The snow and ice sublimation flux is the loss of snow and ice mass from the surface resulting from their conversion to water vapor that enters the atmosphere.		sbl	water_sublimation_flux
1	Surface Downward Eastward Wind Stress	Pa			tauu	surface_downward_eastward_stress
1	Surface Downward Northward Wind Stress	Pa			tauv	surface_downward_northward_stress
1	Surface Upward Latent Heat Flux	W m^{-2}	includes both evaporation and sublimation		hfls	surface_upward_latent_heat_flux
1	Surface Upward Sensible Heat Flux	W m^{-2}			hfss	surface_upward_sensible_heat_flux
1	Surface Downwelling Longwave Radiation	W m^{-2}			rlds	surface_downwelling_longwave_flux_in_air
1	Surface Upwelling Longwave Radiation	W m^{-2}			rlus	surface_upwelling_longwave_flux_in_air
1	Surface Downwelling Shortwave Radiation	W m^{-2}			rsds	surface_downwelling_shortwave_flux_in_air
1	Surface Upwelling Shortwave Radiation	W m^{-2}			rsus	surface_upwelling_shortwave_flux_in_air
1	Surface Downwelling Clear-Sky Shortwave Radiation	W m^{-2}			rsdscs	surface_downwelling_shortwave_flux_in_air_assuming_clear_sky
1	Surface Upwelling Clear-Sky Shortwave Radiation	W m^{-2}			rsuscs	surface_upwelling_shortwave_flux_in_air_assuming_clear_sky

1	Surface Downwelling Clear-Sky Longwave Radiation	W m^{-2}			rldscs	surface_downwelling_longwave_flux_in_air_assuming_clear_sky
1	TOA Incident Shortwave Radiation	W m^{-2}	incident shortwave at the top of the atmosphere		rsdt	toa_incoming_shortwave_flux
1	TOA Outgoing Shortwave Radiation	W m^{-2}	at the top of the atmosphere		rsut	toa_outgoing_shortwave_flux
1	TOA Outgoing Longwave Radiation	W m^{-2}	at the top of the atmosphere (to be compared with satellite measurements)		rlut	toa_outgoing_longwave_flux
1	TOA Outgoing Clear-Sky Longwave Radiation	W m^{-2}			rlutcs	toa_outgoing_longwave_flux_assuming_clear_sky
1	TOA Outgoing Clear-Sky Shortwave Radiation	W m^{-2}			rsutcs	toa_outgoing_shortwave_flux_assuming_clear_sky
1	Atmosphere Water Vapor Content	kg m^{-2}	vertically integrated through the atmospheric column		prw	atmosphere_water_vapor_content
1	Total Cloud Fraction	%	for the whole atmospheric column, as seen from the surface or the top of the atmosphere. Include both large-scale and convective cloud.		clt	cloud_area_fraction
1	Column Integerated Cloud Water Content	kg m^{-2}	include both liquid and ice phases, consider all the mass of condensed water in the column and divide by the grid-cell area (in the longitude-latitude plane)		clwvi	atmosphere_cloud_condensed_water_content
1	Column Integerated Cloud Ice Content	kg m^{-2}	consider all the mass of ice-phase water in the column and divide by the grid-cell area (in the longitude-latitude plane)		clivi	atmosphere_cloud_ice_content
1	Net Downward Flux at Top of Model	W m^{-2}	i.e., at the top of that portion of the atmosphere where dynamics are explicitly treated by the model. Report only if this differs from the net downward radiative flux at the top of the atmosphere.		rtmt	net_downward_radiative_flux_at_top_of_atmosphere_model
1	Air Pressure at Convective Cloud Base	Pa			ccb	air_pressure_at_convective_cloud_base
1	Air Pressure at Convective Cloud Top	Pa			cct	air_pressure_at_convective_cloud_top
1	Fraction of Time Convection Occurs	1	Fraction of time that convection occurs in the grid cell .		ci	
2	Fraction of Time Shallow Convection Occurs	1	Fraction of time that shallow convection occurs in the grid cell. (For models with a distinct shallow convection scheme only)		sci	
1	Total Anthropogenic CO2 Flux (All Emissions)	kg C m^{-2} s^{-1}	This is requested only for the emission-driven coupled carbon climate model runs. Do not include natural fire sources, but include all anthropogenic sources, including fossil fuel use, cement production, agricultural burning, and all sources associated with anthropogenic land use change.	Chris Jones is checking	fco2antt	
1	Fossil Fuel Anthropogenic CO2 Flux (Fossil Fuel Emissions)	kg C m^{-2} s^{-1}	This is requested only for the emission-driven coupled carbon climate model runs. Report the prescribed anthropogenic CO2 flux from fossil fuel use.	Chris Jones is checking	fco2fos	

1	Natural Net Surface Flux of CO2 into The Atmosphere	kg C m^{-2} s^{-1}	Report from all simulations (both emission-driven and concentration-driven) performed by models with fully interactive and responsive carbon cycles. This is what the atmosphere sees (*on its own grid*). This field should be equivalent to the combined natural fluxes of carbon (requested in the L_mon and O_mon tables) that account for natural exchanges between the atmosphere and land or ocean reservoirs (i.e., "net biospheric productivity", for land, and "air to sea CO2 flux", for ocean.)	Chris Jones is checking	fco2nat	

In CMOR Table Amon: *Atmospheric 3-D fields on standard pressure levels, except 4 cloud fields which are on model levels.*

Include the following mandatory pressure levels (which are available from all available reanalyses and CMIP3): 1000, 925, 850, 700, 600, 500, 400, 300, 250, 200, 150, 100, 70, 50, 30, 20, and 10 hPa; Also include, when appropriate, output on the following additional pressure levels: 7, 5, 3, 2, 1 and 0.4 hPa.

priority	long name	units	comment	questions	output variable name	confirmed or likely to be confirmed standard name
1	Cloud Area Fraction	%	Report on model layers (not standard pressures). Include both large-scale and convective cloud.		cl	cloud_area_fraction_in_atmosphere_layer
1	Mass Fraction of Cloud Liquid Water	1	Report on model layers (not standard pressures). Include both large-scale and convective cloud. Calculate as the mass of cloud liquid water in the grid cell divided by the mass of air (including the water in all phases) in the grid cells.		clw	mass_fraction_of_cloud_liquid_water_in_air
1	Mass Fraction of Cloud Ice	1	Report on model layers (not standard pressures). Include both large-scale and convective cloud. Calculate as the mass of cloud ice in the grid cell divided by the mass of air (including the water in all phases) in the grid cell.		cli	mass_fraction_of_cloud_ice_in_air
1	Convective Mass Flux	kg m^{-2} s^{-1}	Report on model layers (not standard pressures). The atmosphere convective mass flux is the vertical transport of mass for a field of cumulus clouds or thermals, given by the product of air density and vertical velocity. The flux is computed as the mass divided by the area of the grid cell.		mc	convective_mass_flux
1	Air Temperature	K			ta	air_temperature
1	Eastward Wind	m s^{-1}			ua	eastward_wind
1	Northward Wind	m s^{-1}			va	northward_wind
1	Specific Humidity	1			hus	specific_humidity
1	Relative Humidity	%	This is the relative humidity with respect to liquid water for T> 0 C, and with respect to ice for T<0 C.		hur	relative_humidity
1	omega (=dp/dt)	Pa s^{-1}	commonly referred to as "omega", this represents the vertical component of velocity in pressure coordinates (positive down)		wap	lagrangian_tendency_of_air_pressure
1	Geopotential Height	m			zg	geopotential_height
1	Mole Fraction of O3	1e-9	if climatologically specified, report only 12 months, starting with January. (Note: include all 12 months even if the values don't vary seasonally.)	Are these the preferred units or should it be a unitless fraction? Should this field be reported instead on model levels? Or should we also require either the vertically integrated mole fraction (or mass?) of this species or the vertically integrated globally averaged mole fraction (or mass?)?	tro3	mole_fraction_of_ozone_in_air

1	Mole Fraction of CO2	1e-6	This field should not be reported for models simulations in which CO2 is well-mixed (i.e., uniform everywhere). For some simulations (e.g., prescribed concentration pi-control run), this will not vary from one year to the next, and so report values for only 12 months (starting with January. (Note: include all 12 months even if the values don't vary seasonally.)	Are these the preferred units or should it be a unitless fraction? Should this field be reported instead on model levels? Or should we also require either the vertically integrated mole fraction (or mass?) of this species or the vertically integrated globally averaged mole fraction (or mass?)?	co2	mole_fraction_of_carbon_dioxide_in_air
1	Total Atmospheric Mass of CO2	kg	For some simulations (e.g., prescribed concentration pi-control run), this will not vary from one year to the next, and so report values for only 12 months (starting with January. (Note: include all 12 months even if the values don't vary seasonally.)		co2mass	
1	Mole Fraction of CH4	1e-9	If assumed spatially uniform, report only time-series of the single value. For some simulations (e.g., prescribed concentration pi-control run), this will not vary from one year to the next, and so report values for only 12 months (starting with January. (Note: include all 12 months even if the values don't vary seasonally.)	Are these the preferred units or should it be a unitless fraction? Should this field be reported instead on model levels? Or should we also require either the vertically integrated mole fraction (or mass?) of this species or the vertically integrated globally averaged mole fraction (or mass?)?	ch4	mole_fraction_of_methane_in_air
1	Mole Fraction of N2O	1e-9	If assumed spatially uniform, report only time-series of the single value. For some simulations (e.g., prescribed concentration pi-control run), this will not vary from one year to the next, and so report values for only 12 months (starting with January. (Note: include all 12 months even if the values don't vary seasonally.)	Are these the preferred units or should it be a unitless fraction? Should this field be reported instead on model levels? Or should we also require either the vertically integrated mole fraction (or mass?) of this species or the vertically integrated globally averaged mole fraction (or mass?)?	n2o	mole_fraction_of_nitrous_oxide_in_air
1	Mole Fraction of Other Radiatively Important Trace Gases (That Are Evolving in Time).	???	If assumed spatially uniform, report only time-series of the single value. For some simulations (e.g., prescribed concentration pi-control run), this will not vary from one year to the next, and so report values for only 12 months (starting with January. (Note: include all 12 months even if the values don't vary seasonally.)	Please let me know what (if any) other trace gas concentrations should be included.	???	

unconfirmed or proposed standard name	unformatted units	cell_methods	valid min	valid max	mean absolute min	mean absolute max	positive	type	CMOR dimensions	CMOR variable name	realm
	K	time: mean						real	longitude latitude time height2m	tas	atmos
	K	time: mean						real	longitude latitude time	ts	atmos
	K	time: minimum within days time: mean over time						real	longitude latitude time height2m	tasmin	atmos
	K	time: maximum within days time: mean over time						real	longitude latitude time height2m	tasmax	atmos
	Pa	time: mean						real	longitude latitude time	psl	atmos
	Pa	time: mean						real	longitude latitude time	ps	atmos
	m s-1	time: mean						real	longitude latitude time height10m	uas	atmos
	m s-1	time: mean						real	longitude latitude time height10m	vas	atmos
	m s-1	time: mean						real	longitude latitude time height10m	sfcWind	atmos
	%	time: mean						real	longitude latitude time height2m	hurs	atmos
	1	time: mean						real	longitude latitude time height2m	huss	atmos
											atmos
	kg m-2 s-1	time: mean						real	longitude latitude time	pr	atmos
	kg m-2 s-1	time: mean						real	longitude latitude time	prsn	atmos
	kg m-2 s-1	time: mean						real	longitude latitude time	prc	atmos
	kg m-2 s-1	time: mean						real	longitude latitude time	evspsbl	atmos
	kg m-2 s-1	time: mean						real	longitude latitude time	sbl	atmos
											atmos
	Pa	time: mean					down	real	longitude latitude time	tauu	atmos
	Pa	time: mean					down	real	longitude latitude time	tauv	atmos
											atmos
	W m-2	time: mean					up	real	longitude latitude time	hfls	atmos
	W m-2	time: mean					up	real	longitude latitude time	hfss	atmos
	W m-2	time: mean					down	real	longitude latitude time	rlds	atmos
	W m-2	time: mean					up	real	longitude latitude time	rlus	atmos
	W m-2	time: mean					down	real	longitude latitude time	rsds	atmos
	W m-2	time: mean					up	real	longitude latitude time	rsus	atmos
	W m-2	time: mean					down	real	longitude latitude time	rsdscs	atmos
	W m-2	time: mean					up	real	longitude latitude time	rsuscs	atmos

	W m-2	time: mean	down	real	longitude latitude time	rldscs	atmos
							atmos
	W m-2	time: mean	down	real	longitude latitude time	rsdt	atmos
	W m-2	time: mean	up	real	longitude latitude time	rsut	atmos
	W m-2	time: mean	up	real	longitude latitude time	rlut	atmos
	W m-2	time: mean	up	real	longitude latitude time	rlutcs	atmos
	W m-2	time: mean	up	real	longitude latitude time	rsutcs	atmos
				real			atmos
	kg m-2	time: mean		real	longitude latitude time	prw	atmos
	%	time: mean		real	longitude latitude time	clt	atmos
	kg m-2	time: mean		real	longitude latitude time	clwvi	atmos
	kg m-2	time: mean		real	longitude latitude time	clivi	atmos
							atmos
	W m-2	time: mean	down	real	longitude latitude time	rtmt	atmos
	Pa	time: mean		real	longitude latitude time	ccb	atmos
	Pa	time: mean		real	longitude latitude time	cct	atmos
NOT PROPOSED. If it is a yes/no indicator of whether convection occurred, suggest a name of convection_type (by analogy with soil_type). A variable with this standard name could contain a string such as 'shallow' or 'deep' or contain integer values which would be explained by flag_values and flag_meanings attributes. If it is proportion of time that convection occurred, maybe we need time_fraction names like area_fraction names.	1	time: mean		real	longitude latitude time	ci	atmos
	1	time: mean		real	longitude latitude time	sci	atmos
NOT PROPOSED. Recommend anthropogenic_carbon_flux for consistency with biomass_burning_carbon_flux, etc.	kg C m-2 s-1	time: mean	up	real	longitude latitude time	fco2antt	atmos
NOT PROPOSED. Recommend fossil_fuel_burning_carbon_flux for consistency with biomass_burning_carbon_flux, etc.	kg C m-2 s-1	time: mean	up	real	longitude latitude time	fco2fos	atmos

NOT PROPOSED. Recommend tendency_of_atmosphere_mass_content_of_carbon_dioxide_due_to_biogenic_emission for consistency with chemistry names.	kg C m-2 s-1	time: mean					up	real	longitude latitude time	fco2nat	atmos

unconfirmed or proposed standard name	unformatted units	cell_methods	valid min	valid max	mean absolute min	mean absolute max	positive	type	CMOR dimensions	CMOR variable name	realm
	%	time: mean						real	longitude latitude alevel time	cl	atmos
	1	time: mean						real	longitude latitude alevel time	clw	atmos
	1	time: mean						real	longitude latitude alevel time	cli	atmos
	kg m-2 s-1	time: mean						real	longitude latitude alevel time	mc	atmos
	K	time: mean						real	longitude latitude plev17 time	ta	atmos
	m s-1	time: mean						real	longitude latitude plev17 time	ua	atmos
	m s-1	time: mean						real	longitude latitude plev17 time	va	atmos
	1	time: mean						real	longitude latitude plev17 time	hus	atmos
	%	time: mean						real	longitude latitude plev17 time	hur	atmos
	Pa s-1	time: mean						real	longitude latitude plev17 time	wap	atmos
	m	time: mean						real	longitude latitude plev17 time	zg	atmos
	1e-9	time: mean						real	longitude latitude plev17 time	tro3	atmos atmosChem

	1e-6	time: mean		real	longitude latitude plev17 time	co2	atmos
	kg	time: mean		real	time	co2global	atmos
	1e-9	time: mean		real	longitude latitude plev17 time	ch4	atmos atmosChem
	1e-9	time: mean		real	longitude latitude plev17 time	n2o	atmos atmosChem
	???			real	longitude latitude plev17 time	???	atmos atmosChem

CMOR Table Omon: Monthly Mean Ocean Fields, Including Biogechemical Fields Omon

(All Saved on the Ocean Grid)

In CMOR Table Omon: *Marine Biogeochemical 2-D Fields*

priority	long name	units	comment	questions	output variable name	confirmed or likely to be confirmed standard name
2	Surface Concentrations	mol XXX m^{-3}	surface concentrations of all 3D tracers. See first table in Oyr for a complete list of these tracers. "Tracer" concentations should be reported even if they are diagnosed rather than prognostically calculated.		sfc+short name	
1	Primary Organic Carbon Production by All Types of Phytoplankton	mol C m^{-2} s^{-1}	Vertically integrated total primary (organic carbon) production by phytoplankton		intpp	
2	Primary Organic Carbon Production by Phytoplankton Based on NO3 Alone	mol C m^{-2} s^{-1}	Vertically integrated primary (organic carbon) production by phytoplankton based on NO3 alone	Will it be clear to most people what "based on NO3 alone" means?	intpnew	
2	Primary Organic Carbon Production by Diatom Phytoplankton	mol C m^{-2} s^{-1}	Vertically integrated primary (organic carbon) production by the diatom phytoplankton component alone		intpdiat	
3	Primary Organic Carbon Production by Other Phytoplankton	mol C m^{-2} s^{-1}	Vertically integrated total primary (organic carbon) production by other phytoplankton components alone	Should the sum of this and the previous field add up to the field in line 14? Intpdiat+intpphymisc=intpp?	intpphymisc	
3	Iron Production	mol Fe m^{-2} s^{-1}	Vertically integrated biogenic iron production		intpbfe	
3	Silica Production	mol Si m^{-2} s^{-1}	Vertically integrated biogenic silica production		intpbsi	
3	Calcite Production	mol C m^{-2} s^{-1}	Vertically integrated calcite production		intpcalc	
3	Aragonite Production	mol C m^{-2} s^{-1}	Vertically integrated aragonite production		intparag	
1	Downward Flux of Particle Organic Carbon at 100M	mol C m^{-2} s^{-1}	sinking flux of organic carbon at 100m		epc100	
3	Downward Flux of Particulate Iron at 100M	mol Fe m^{-2} s^{-1}	sinking flux of biogenic and scavenged iron at 100m		epfe100	
3	Downward Flux of Particulate Silica at 100M	mol Si m^{-2} s^{-1}	sinking flux of biogenic silica at 100m		epsi100	
1	Downward Flux of Calcite at 100M	mol C m^{-2} s^{-1}	sinking flux of calcite at 100m		epcalc100	
1	Downward Flux of Aragonite at 100M	mol C m^{-2} s^{-1}	sinking flux of aragonite at 100m		eparag100	
2	Dissolved Inorganic Carbon Content	kg m^{-2}	Vertically integrated dDIC		intdic	
1	Surface Aqueous Partial Pressure of CO2	uatm	Surface aqueous partial pressure of CO2	Are thes correct and preferred units? Why not some variant on Pa?	spco2	
3	Delta PCO2	uatm	Difference between atmospheric and oceanic partial pressure of CO2 (positive meaning ocean > atmosphere)	Are thes correct and preferred units? Why not some variant on Pa?	dpco2	
3	Delta PO2	uatm	Difference between atmospheric and oceanic partial pressure of O2 (positive meaning ocean > atmosphere)	Are thes correct and preferred units? Why not some variant on Pa?	dpo2	
1	Surface Downward CO2 Flux	kg C m^{-2} s^{-1}	Gas exchange flux of CO2 (positive into ocean)	For consistency with other fluxes, shouldn't this have units of mol C m^{-2} s^{-1}	fgco2	
1	Surface Downward O2 Flux	mol O_2 m^{-2} s^{-1}	Gas exchange flux of O2 (positive into ocean)		fgo2	

3	Surface Upward DMS Flux	mol DMS m^{-2} s^{-1}	Gas exchange flux of DMS (positive into atmosphere)		fgdms
3	Flux of Carbon Into Ocean Surface by Runoff and Sediment Dissolution	mol C m^{-2} s^{-1}	Carbon supply to ocean through runoff and sediment dissolution (neglects gas exchange)		fsc
3	Downward Carbon Flux at Ocean Bottom	mol C m^{-2} s^{-1}	Carbon loss to sediments		frc
3	Nitrogen Fixation Rate in Ocean	mol N m^{-2} s^{-1}	Vertically integrated nitrogen fixation		intpn2
3	Surface Downward Net Flux of Nitrogen	mol N m^{-2} s^{-1}	N supply through deposition flux onto sea surface, nitrogen fixation, and runoff		fsn
3	Nitrogen Loss to Sediments and through Denitrification	mol N m^{-2} s^{-1}	N loss to sediment and water column denitrification		frn
3	Surface Downward Net Flux of Iron	mol Fe m^{-2} s^{-1}	Iron supply through deposition flux onto sea surface, runoff, coasts, sediments, etc		fsfe
3	Iron Loss to Sediments	mol Fe m^{-2} s^{-1}	Iron loss to sediments		frfe
3	Oxygen Minimum Concectration	mol O_2 m^{-3}	Vertical minimum concentration of dissolved oxygen gas		o2min
3	Depth of Oxygen Minimum Concectration	mol O_2 m^{-3}	Depth of vertical minimum concentration of dissolved oxygen gas (if two, then the shallower)		zo2min
3	Calcite Saturation Depth	m	Depth of calcite saturation horizon (0 if < surface, "missing" if > bottom, if two, then the shallower)		zsatcalc
3	Aragonite Saturation Depth	m	Depth of aragonite saturation horizon (0 if < surface, "missing" if > bottom, if two, then the shallower)		zsatarag
3	Rate of Change of Net Dissolved Inorganic Carbon	mol C m^{-2} s^{-1}	Net time rate of change of dissolved inorganic carbon	Is this the rate of change integrated through the entire water column?	fddtdic
3	Rate of Change in Upper 100 m of Net Dissolved Inorganic Nitrogen	mol N m^{-2} s^{-1}	Net time rate of change of nitrogen nutrients (e.g. NO3+NH4) in upper 100m		fddtdin
3	Rate of Change in Upper 100 m of Net Dissolved Inorganic Phosphate	mol P m^{-2} s^{-1}	vertical integral of net time rate of change of phosphate in upper 100m		fddtdip
3	Rate of Change in Upper 100 m of Net Dissolved Inorganic Iron	mol Fe m^{-2} s^{-1}	vertical integral of net time rate of change of dissolved inorganic iron in upper 100m		fddtdife
3	Rate of Change in Upper 100 m of Net Dissolved Inorganic Silicate	mol Si m^{-2} s^{-1}	vertical integral of net time rate of change of dissolved inorganic silicate in upper 100m		fddtdisi
3	Rate of Change in Upper 100 m of Alkalinity	eq m^{-2} s^{-1}	vertical integral of net time rate of change of alkalinity in upper 100m	Is "equivalents" preferred to, say, 10**-6 (i.e., ppm) or kmol/m**3?	fddtalk
3	Rate of Change in Upper 100 m of Dissolved Inorganic Carbon due to Biological Activity	mol C m^{-2} s^{-1}	vertical integral of net biological terms in time rate of change of dissolved inorganic carbon in upper 100m	Does it make sense for "inorganic carabon" to change due to biology?	fbddtdic
3	Rate of Change in Upper 100 m of Dissolved Inorganic Nitrogen due to Biological Activity	mol N m^{-3} s^{-1}	vertical integral of net biological terms in time rate of change of nitrogen nutrients (e.g. NO3+NH4) in upper 100m		fbddtdin
3	Rate of Change in Upper 100 m of Dissolved Inorganic Phosphate due to Biological Activity	mol P m^{-2} s^{-1}	vertical integral of net biological terms in time rate of change of phosphate in upper 100m		fbddtdip
3	Rate of Change in Upper 100 m of Dissolved Inorganic Iron due to Biological Activity	mol Fe m^{-2} s^{-1}	vertical integral of net biological terms in time rate of change of dissolved inorganic iron in upper 100m		fbddtdife
3	Rate of Change in Upper 100 m of Dissolved Inorganic Silicate due to Biological Activity	mol Si m^{-2} s^{-1}	vertical integral of net biological terms in time rate of change of dissolved inorganic silicate in upper 100m		fbddtdisi
3	Rate of Change in Upper 100 m of Biological Alkalinity due to Biological Activity	eq m^{-2} s^{-1}	vertical integral of net biological terms in time rate of change of alkalinity in upper 100m	Is "equivalents" preferred to, say, 10**-6 (i.e., ppm) or kmol/m**3?	fbddtalk

Further explanation of the fields in the following tables can be found in Griffies et al., available at http://eprints.soton.ac.uk/65415/01/137_WGOMD_ModelOutput.pdf .

In CMOR Table Omon: *WGOMD Table 2.2*

priority	long name	units	comment	questions	output variable name	confirmed or likely to be confirmed standard name
1	Sea Water Mass	kg			masso	sea_water_mass
1	Sea Water Pressure at Sea floor	dbar			pbo	sea_water_pressure_at_sea_floor
2	Sea Water Pressure at Sea Water Surface	dbar			pso	sea_water_pressure_at_sea_water_surface
1	Sea Water Volume	m^3			volo	sea_water_volume
1	Sea Surface Height Above Geoid	m			zos	sea_surface_height_above_geoid
3	Square of Sea Surface Height Above Geoid	m^2			zossq	square_of_sea_surface_height_above_geoid
1	Global Average Sea Level Change	m			zosga	global_average_sea_level_change
1	Global Average Steric Sea Level Change	m			zossga	global_average_steric_sea_level_change
1	Global Average Thermosteric Sea Level Change	m			zostoga	global_average_thermosteric_sea_level_change
1	Sea Water Mass Per Unit Area	kg m^{-2}			masscello	sea_water_mass_per_unit_area
1	Ocean Model Cell Thickness	m			thkcello	cell_thickness
1	Sea Water Potential Temperature	K			thetao	sea_water_potential_temperature
1	Global Average Sea Water Potential Temperature	K			thetaoga	sea_water_potential_temperature
2	Sea Surface Temperature	K	this may differ from "surface temperature" in regions of sea ice.		tos	sea_surface_temperature
				MOVED: "daily sea surface temperature" moved to "da" spreadsheet.		
3	Square of Sea Surface Temperature	K^2			tossq	square_of_sea_surface_temperature
				MOVED: "daily mean square of sea surface temperature" to "da" spreadsheet		
1	Sea Water Salinity	psu			so	sea_water_salinity
1	Global Mean Sea Water Salinity	psu			soga	sea_water_salinity
2	Sea Surface Salinity	psu			sos	sea_surface_salinity
3	Sea Water Potential Density	kg m^{-3}			rhopoto	sea_water_potential_density
3	Sea Water Age Since Surface Contact	yr			agessc	sea_water_age_since_surface_contact
3	Moles Per Unit Mass of CFC-11 in Sea Water	mol kg^{-1}			cfc11	moles_per_unit_mass_of_cfc11_in_sea_water
3	Ocean Barotropic Mass Streamfunction	kg s^{-1}	differs from CMIP3 because it includes mass.		msftbarot	ocean_barotropic_mass_streamfunction
3	Ocean Mixed Layer Thickness Defined by Sigma T	m			mlotst	ocean_mixed_layer_thickness_defined_by_sigma_t
3	Square of Ocean Mixed Layer Thickness Defined by Sigma T	m^2			mlotstsq	square_of_ocean_mixed_layer_thickness_defined_by_sigma_t

3	Mean Daily Maximum Ocean Mixed Layer Thickness Defined by Mixing Scheme	m	This might get moved to the "da" page, because the WGOMD requests that the daily maximum be saved every day.	omldamax	ocean_mixed_layer_thickness_defined_by_mixing_scheme
3	Monthly Maximum Ocean Mixed Layer Thickness Defined by Mixing Scheme	m		omlmax	ocean_mixed_layer_thickness_defined_by_mixing_scheme

In CMOR Table Omon: *WGOMD Table 2.3*

priority	long name	units	comment	questions	output variable name	confirmed or likely to be confirmed standard name
1	Sea Water X Velocity	m s^{-1}			uo	sea_water_x_velocity
1	Sea Water Y Velocity	m s^{-1}			vo	sea_water_y_velocity
1	Upward Ocean Mass Transport	kg s^{-1}	differs from CMIP3, which only had upward velocity.		wmo	upward_ocean_mass_transport
1	Square of Upward Ocean Mass Transport	kg^2 s^{-2}			wmosq	square_of_upward_ocean_mass_transport
2	Ocean Mass X Transport	kg s^{-1}			umo	ocean_mass_x_transport
2	Ocean Mass Y Transport	kg s^{-1}			vmo	ocean_mass_y_transport
2	Ocean Meridional Overturning Mass Streamfunction	kg s^{-1}	function of Y, Z, basin. differs from CMIP3 because it includes mass.		msftmyz	ocean_meridional_overturning_mass_streamfunction
2	Ocean Meridional Overturning Mass Streamfunction	kg s^{-1}	function of of Y-rho-basin.		msftmrhoz	ocean_meridional_overturning_mass_streamfunction
2	Ocean Y Overturning Mass Streamfunction	kg s^{-1}	function of Y, Z, basin.		msftyyz	ocean_y_overturning_mass_streamfunction
2	Ocean Y Overturning Mass Streamfunction	kg s^{-1}	function of Y, rho, basin.		msftyrhoz	ocean_y_overturning_mass_streamfunction
3	Ocean Meridional Overturning Mass Streamfunction due to Bolus Advection	kg s^{-1}	function of Y, Z, basin.		msftmyzba	ocean_meridional_overturning_mass_streamfunction_due to bolus advection
3	Ocean Meridional Overturning Mass Streamfunction due to Bolus Advection	kg s^{-1}	function of Y, rho, basin.		msftmrhozba	ocean_meridional_overturning_mass_streamfunction_due to bolus advection
3	Ocean Y Overturning Mass Streamfunction due to Bolus Advection	kg s^{-1}	function of Y, Z, basin.		msftyyzba	ocean_y_overturning_mass_streamfunction_due_to_bolus advection
3	Ocean Y Overturning Mass Streamfunction due to Bolus Advection	kg s^{-1}	function of Y, rho, basin.		msftyrhozba	ocean_y_overturning_mass_streamfunction_due_to_bolus advection
2	Northward Ocean Heat Transport	W			hfnorth	northward_ocean_heat_transport
3	Northward Ocean Heat Transport due to Bolus Advection	W			hfyba	northward_ocean_heat_transport_due_to_bolus_advection
3	Northward Ocean Heat Transport due to Diffusion	W			hfydiff	northward_ocean_heat_transport_due_to_diffusion
2	Ocean Heat X Transport	W				ocean_heat_x_transport
2	Ocean Heat Y Transport	W		For models with a latxlon grid, is this the same as "northward ocean heat transport" (in row 105)?	hfy	ocean_heat_y_transport
3	Ocean Heat X Transport due to Bolus Advection	W			hfxba	ocean_heat_x_transport_due_to_bolus_advection
3	Ocean Heat X Transport due to Diffusion	W			hfxdiff	ocean_heat_x_transport_due_to_diffusion
3	Ocean Heat Y Transport due to Bolus Advection	W			hfyba	ocean_heat_y_transport_due_to_bolus_advection
3	Ocean Heat Y Transport due to Diffussion	W			hfydiff	ocean_heat_y_transport_due_to_diffusion
2	Northward Ocean Heat Transport due to Gyre	W			htovgyre	northward_ocean_heat_transport_due_to_gyre
2	Northward Ocean Heat Transport due to Overturning	W			htovovrt	northward_ocean_heat_transport_due_to_overturning
2	Northward Ocean Salt Transport due to Gyre	kg s^{-1}			sltovgyre	northward_ocean_salt_transport_due_to_gyre

2	Northward Ocean Salt Transport due to Overturning	kg s^{-1}		sltovovrt	northward_ocean_salt_transport_due_to_overturning

In CMOR Table Omon: ***WGOMD Table 2.4***

sea water transport through (or associated with) the following straits, openings, channels, passages, etc.: barents_opening, bering_strait, canadian_archipelago, denmark_strait, drake_passage, english_channel, pacific_equatorial_undercurrent, faroe_scotland_channel, florida_bahamas_straight, fram_strait, iceland_faroe_channel, indonesian_thoughflow, mozambique_channel, taiwan_luzon_straits, and windward_passage. For definitions see WGOMD document referenced above. All transports will be stored in a single variable with a dimension that covers the set of regions listed here.

priority	long name	units	comment	questions	output variable name	confirmed or likely to be confirmed standard name
2	Sea Water Transport	kg s^{-1}			?	sea_water_transport_across_line

In CMOR Table Omon: ***WGOMD Table 2.5***

priority	long name	units	comment	questions	output variable name	confirmed or likely to be confirmed standard name
2	Rainfall Flux where Ice Free Ocean over Sea	kg m^{-2} s^{-1}	compute as the total mass of liquid water falling as liquid rain into the ice-free portion of the ocean divided by the area of the ocean portion of the grid cell.		pr	rainfall_flux
2	Snowfall Flux where Ice Free Ocean over Sea	kg m^{-2} s^{-1}	compute as the total mass of ice directly falling as snow into the ice-free portion of the ocean divided by the area of the ocean portion of the grid cell.		prsn	snowfall_flux
2	Water Evaporation Flux Where Ice Free Ocean over Sea	kg m^{-2} s^{-1}	compute as the total mass of water vapor evaporating from the ice-free portion of the ocean divided by the area of the ocean portion of the grid cell.		evs	water_evaporation_flux
2	Water Flux into Sea Water From Rivers	kg m^{-2} s^{-1}	compute as the river flux of water into the ocean divided by the area of the ocean portion of the grid cell.		friver	water_flux_into_sea_water_from_rivers
2	Water Flux into Sea Water From Icebergs	kg m^{-2} s^{-1}	compute as the iceberg melt water flux into the ocean divided by the area of the ocean portion of the grid cell.		ficeberg	water_flux_into_sea_water_from_icebergs
1	Water Flux into Sea Water due to Sea Ice Thermodynamics	kg m^{-2} s^{-1}	compute as the sea ice thermodynamic water flux into the ocean divided by the area of the ocean portion of the grid cell.	The priority set by the WGOMD was 2 for this field. The sea-ice folks requested that the priority be raised to 1.	fsitherm	water_flux_into_sea_water_due_to_sea_ice_thermodynamics
2	Water Flux into Sea Water	kg m^{-2} s^{-1}	compute as the water flux into the ocean divided by the area of the ocean portion of the grid cell. This is the sum of the next two variables in this table.		wfo	water_flux_into_sea_water
2	Water Flux into Sea Water Without Flux Correction	kg m^{-2} s^{-1}	compute as the water flux (without flux correction) into the ocean divided by the area of the ocean portion of the grid cell. This is the sum of the first 6 variables in this table?		wfonocorr	water_flux_into_sea_water_without_flux_correction
2	Water Flux Correction	kg m^{-2} s^{-1}	If this does not vary from one year to the next, report only a single year. Positive flux implies correction adds water to ocean.		wfcorr	water_flux_correction

In CMOR Table Omon: *WGOMD Table 2.6*

Priority	long name	units	comment	questions	output variable name	confirmed or likely to be confirmed standard name
2	Virtual Salt Flux into Sea Water due to Rainfall	kg m^{-2} s^{-1}			vsfpr	virtual_salt_flux_into_sea_water_due_to_rainfall
2	Virtual Salt Flux into Sea Water due to Evaporation	kg m^{-2} s^{-1}			vsfevap	virtual_salt_flux_into_sea_water_due_to_evaporation
2	Virtual Salt Flux into Sea Water From Rivers	kg m^{-2} s^{-1}			vsfriver	virtual_salt_flux_into_sea_water_from_rivers
1	Virtual Salt Flux into Sea Water due to Sea Ice Thermodynamics	kg m^{-2} s^{-1}	This variable measures the virtual salt flux into sea water due to the melting of sea ice. It is set to zero in models which receive a real water flux.	The priority set by the WGOMD was 2 for this field. The sea-ice folks requested that the priority be raised to 1.	vsfsit	virtual_salt_flux_into_sea_water_due_to_sea_ice_thermodynamics
2	Virtual Salt Flux into Sea Water	kg m^{-2} s^{-1}	If this does not vary from one year to the next, report only a single year. Positive flux implies correction increases salinity of water. This includes all virtual salt flux, including that due to a salt flux correction.		vsf	virtual_salt_flux_into_sea_water
2	Virtual Salt Flux Correction	kg m^{-2} s^{-1}			wfcorr	virtual_salt_flux_correction
1	Downward Sea Ice Basal Salt Flux	kg m^{-2} s^{-1}	This field is physical, and it arises since sea ice has a nonzero salt content, so it exchanges salt with the liquid ocean upon melting and freezing.	The priority set by the WGOMD was 2 for this field. The sea-ice folks requested that the priority be raised to 1.	sfdsi	downward_sea_ice_basal_salt_flux
2	Salt Flux into Sea Water from Rivers	kg m^{-2} s^{-1}			sfriver	salt_flux_into_sea_water_from_rivers

In CMOR Table Omon: *WGOMD Table 2.7*

Priority	long name	units	comment	questions	output variable name	confirmed or likely to be confirmed standard name
2	Upward Geothermal Heat Flux at Sea Floor	W m^{-2}			hfgeou	upward_geothermal_heat_flux_at_sea_floor
2	Temperature Flux due to Rainfall Expressed as Heat Flux into Sea Water	W m^{-2}	This is defined as "where ice_free_sea over sea"; i.e., compute the total flux (considered here) entering the ice-free portion of the grid cell divided by the area of the ocean portion of the grid cell.		hfrainds	temperature_flux_due_to_rainfall_expressed_as_heat_flux_into_sea_water
2	Temperature Flux due to Evaporation Expressed as Heat Flux Out of Sea Water	W m^{-2}	This is defined as "where ice_free_sea over sea"		hfevapds	temperature_flux_due_to_evaporation_expressed_as_heat_flux_out_of_sea_water
2	Temperature Flux due to Runoff Expressed as Heat Flux into Sea Water	W m^{-2}	In general this should be reported as a function of depth, (i.e., it will be a function of the generic "XYZ" dimensions). Include enough depth levels to represent the non-zero values of this field everywhere on the globe.		hfrunoffds	temperature_flux_due_to_runoff_expressed_as_heat_flux_into_sea_water
2	Heat Flux into Sea Water due to Snow Thermodynamics	W m^{-2}	In general this should be reported as a function of depth, (i.e., it will be a function of the generic "XYZ" dimensions). Include enough depth levels to represent the non-zero values of this field everywhere on the globe.		hfsnthermds	heat_flux_into_sea_water_due_to_snow_thermodynamics

1	Heat Flux into Sea Water due to Sea Ice Thermodynamics	W m^{-2}	In general this should be reported as a function of depth, (i.e., it will be a function of the generic "XYZ" dimensions). Include enough depth levels to represent the non-zero values of this field everywhere on the globe.	The priority set by the WGOMD was 2 for this field. The sea-ice folks requested that the priority be raised to 1.	hfsithermds	heat_flux_into_sea_water_due_to_sea_ice_thermodynamics
2	Heat Flux into Sea Water due to Iceberg Thermodynamics	W m^{-2}	In general this should be reported as a function of depth, (i.e., it will be a function of the generic "XYZ" dimensions). Include enough depth levels to represent the non-zero values of this field everywhere on the globe.		hfibthermds	heat_flux_into_sea_water_due_to_iceberg_thermodynamics
2	Surface Net Downward Longwave Radiation	W m^{-2}	This is defined as "where ice_free_sea over sea"		rlds	surface_net_downward_longwave_flux
2	Surface Downward Latent Heat Flux	W m^{-2}	This is defined as "where ice_free_sea over sea"		hfls	surface_downward_latent_heat_flux
2	Surface Downward Sensible Heat Flux	W m^{-2}	This is defined as "where ice_free_sea over sea"		hfss	surface_downward_sensible_heat_flux
2	Net Downward Shortwave Radiation at Sea Water Surface	W m^{-2}	This is the flux into the surface of liquid sea water only. This excludes shortwave flux absorbed by sea ice, but includes any light that passes through the ice and is absorbed by the ocean.		rsntds	
2	Downwelling Shortwave Radiation in Sea Water	W m^{-2}	In general the shortwave flux should be reported as a function of ocean depth, (i.e., it will be a function of the generic "XYZ" dimensions). Include enough depth levels to represent the non-zero values of this field everywhere on the globe.		rsds	downwelling_shortwave_flux_in_sea_water
2	Heat Flux Correction	W m^{-2}	If this does not vary from one year to the next, report only a single year. Positive indicates correction adds heat to ocean.		hfcorr	heat_flux_correction
1	Downward Heat Flux at Sea Water Surface	W m^{-2}	This is the net flux of heat entering the liquid water column through its upper surface (excluding any "flux adjustment") .		hfds	

In CMOR Table Omon: *WGOMD Table 2.8*

priority	long name	units	comment	questions	output variable name	confirmed or likely to be confirmed standard name
2	Surface Downward X Stress	N m^{-2}	This is the stress on the liquid ocean from overlying atmosphere, sea ice, ice shelf, etc.		tauuo	surface_downward_x_stress
2	Surface Downward Y Stress	N m^{-2}	This is the stress on the liquid ocean from overlying atmosphere, sea ice, ice shelf, etc.		tauvo	surface_downward_y_stress
2	Surface Downward X Stress Correction	N m^{-2}	This is the stress on the liquid ocean from overlying atmosphere, sea ice, ice shelf, etc. If this does not vary from one year to the next, report only a single year.		tauucorr	surface_downward_x_stress_correction
2	Surface Downward Y Stress Correction	N m^{-2}	This is the stress on the liquid ocean from overlying atmosphere, sea ice, ice shelf, etc. If this does not vary from one year to the next, report only a single year.		tauvcorr	surface_downward_y_stress_correction

unconfirmed or proposed standard name	unformatted units	cell_methods	valid min	valid max	mean absolute min	mean absolute max	positive	type	CMOR dimensions	CMOR variable name	realm
	mol XXX m-3	time: mean area: mean where sea						real	longitude latitude time	sfc+short name	ocnBgchem
integrated_primary_production	mol C m-2 s-1	time: mean area: mean where sea						real	longitude latitude time	intpp	ocnBgchem
integrated_new_production	mol C m-2 s-1	time: mean arera: where sea						real	longitude latitude time	intpnew	ocnBgchem
integrated_diatom_phytoplankton_production	mol C m-2 s-1	time: mean area: mean where sea						real	longitude latitude time	intpdiat	ocnBgchem
integrated_other_phytoplankton_production	mol C m-2 s-1	time: mean arera: where sea						real	longitude latitude time	intpphymisc	ocnBgchem
integrated_iron_production	mol Fe m-2 s-1	time: mean area: mean where sea						real	longitude latitude time	intpbfe	ocnBgchem
integrated_silica_production	mol Si m-2 s-1	time: mean arera: where sea						real	longitude latitude time	intpbsi	ocnBgchem
integrated_calcite_production	mol C m-2 s-1	time: mean area: mean where sea						real	longitude latitude time	intpcalc	ocnBgchem
integrated_aragonite_production	mol C m-2 s-1	time: mean arera: where sea						real	longitude latitude time	intparag	ocnBgchem
sinking_particle_organic_carbon_export	mol C m-2 s-1	time: mean area: mean where sea						real	longitude latitude time	epc100	ocnBgchem
sinking_particulate_iron_export	mol Fe m-2 s-1	time: mean arera: where sea						real	longitude latitude time	epfe100	ocnBgchem
sinking_particulate_silica_export	mol Si m-2 s-1	time: mean area: mean where sea						real	longitude latitude time	epsi100	ocnBgchem
sinking_calcite	mol C m-2 s-1	time: mean arera: where sea						real	longitude latitude time	epcalc100	ocnBgchem
sinking_aragonite	mol C m-2 s-1	time: mean area: mean where sea						real	longitude latitude time	eparag100	ocnBgchem
dic_inventory	kg m-2	time: mean arera: where sea						real	longitude latitude time	intdic	ocnBgchem
surface_pco2	uatm	time: mean area: mean where sea						real	longitude latitude time	spco2	ocnBgchem
delta_pco2	uatm	time: mean arera: where sea						real	longitude latitude time	dpco2	ocnBgchem
delta_po2	uatm	time: mean area: mean where sea						real	longitude latitude time	dpo2	ocnBgchem
air_to_sea_co2_flux	kg C m-2 s-1	time: mean arera: where sea						real	longitude latitude time	fgco2	ocnBgchem
air_to_sea_o2_flux	mol O2 m-2 s-1	time: mean area: mean where sea						real	longitude latitude time	fgo2	ocnBgchem

sea_to_air_dms_flux	mol DMS m-2 s-1	time: mean arera: where sea	real	longitude latitude time	fgdms	ocnBgchem
carbon_source_flux	mol C m-2 s-1	time: mean area: mean where sea	real	longitude latitude time	fsc	ocnBgchem
carbon_removal_flux	mol C m-2 s-1	time: mean arera: where sea	real	longitude latitude time	frc	ocnBgchem
integrated_nitrogen_fixation	mol N m-2 s-1	time: mean area: mean where sea	real	longitude latitude time	intpn2	ocnBgchem
nitrogen_source_flux	mol N m-2 s-1	time: mean arera: where sea	real	longitude latitude time	fsn	ocnBgchem
nitrogen_removal_flux	mol N m-2 s-1	time: mean area: mean where sea	real	longitude latitude time	frn	ocnBgchem
iron_source_flux	mol Fe m-2 s-1	time: mean arera: where sea	real	longitude latitude time	fsfe	ocnBgchem
iron_removal_flux	mol Fe m-2 s-1	time: mean area: mean where sea	real	longitude latitude time	frfe	ocnBgchem
oxygen_minimum	mol O2 m-3	time: mean arera: where sea	real	longitude latitude time	o2min	ocnBgchem
oxygen_minimum_depth	mol O2 m-3	time: mean area: mean where sea	real	longitude latitude time	zo2min	ocnBgchem
calcite_saturation_depth	m	time: mean arera: where sea	real	longitude latitude time	zsatcalc	ocnBgchem
aragonite_saturation_depth	m	time: mean area: mean where sea	real	longitude latitude time	zsatarag	ocnBgchem
net_dic_rate_of_change	mol C m-2 s-1	time: mean arera: where sea	real	longitude latitude time	fddtdic	ocnBgchem
net_din_rate_of_change	mol N m-2 s-1	time: mean area: mean where sea	real	longitude latitude time	fddtdin	ocnBgchem
net_dip_rate_of_change	mol P m-2 s-1	time: mean arera: where sea	real	longitude latitude time	fddtdip	ocnBgchem
net_dife_rate_of_change	mol Fe m-2 s-1	time: mean area: mean where sea	real	longitude latitude time	fddtdife	ocnBgchem
net_disi_rate_of_change	mol Si m-2 s-1	time: mean arera: where sea	real	longitude latitude time	fddtdisi	ocnBgchem
net_alkalinity_rate_of_change	eq m-2 s-1	time: mean area: mean where sea	real	longitude latitude time	fddtalk	ocnBgchem
net_biological_dic_rate_of_change	mol C m-2 s-1	time: mean arera: where sea	real	longitude latitude time	fbddtdic	ocnBgchem
net_biological_din_rate_of_change	mol N m-3 s-1	time: mean area: mean where sea	real	longitude latitude time	fbddtdin	ocnBgchem
net_biological_dip_rate_of_change	mol P m-2 s-1	time: mean arera: where sea	real	longitude latitude time	fbddtdip	ocnBgchem
net_biological_dife_rate_of_change	mol Fe m-2 s-1	time: mean area: mean where sea	real	longitude latitude time	fbddtdife	ocnBgchem
net_biological_disi_rate_of_change	mol Si m-2 s-1	time: mean arera: where sea	real	longitude latitude time	fbddtdisi	ocnBgchem
net_biological_alkalinity_rate_of_change	eq m-2 s-1	time: mean area: mean where sea	real	longitude latitude time	fbddtalk	ocnBgchem

unconfirmed or proposed standard name	unformatted units	cell_methods	valid min	valid max	mean absolute min	mean absolute max	positive	type	CMOR dimensions	CMOR variable name	realm
	kg	time: mean area: sum where sea						real	time	masso	ocean
	dbar	time: mean						real	longiutude latitude time	pbo	ocean
	dbar	time: mean						real	longiutude latitude time	pso	ocean
	m3	time: mean area: sum where sea						real	time	volo	ocean
	m	time: mean						real	longiutude latitude time	zos	ocean
	m2	time: mean						real	longiutude latitude time	zossq	ocean
	m	time: mean area: mean where sea						real	time	zosga	ocean
	m	time: mean area: mean where sea						real	time	zossga	ocean
	m	time: mean area: mean where sea						real	time	zostoga	ocean
	kg m-2	time: mean						real	longiutude latitude olevel time	masscello	ocean
	m	time: mean						real	longiutude latitude olevel time	thkcello	ocean
	K	time: mean						real	longiutude latitude olevel time	thetao	ocean
	K	time: mean area: mean where sea						real	time	thetaoga	ocean
	K	time: mean						real	longiutude latitude time	tos	ocean
											ocean
	K2	time: mean						real	longiutude latitude time	tossq	ocean
											ocean
	psu	time: mean						real	longiutude latitude olevel time	so	ocean
	psu	time: mean area: mean where sea						real	time	soga	ocean
	psu	time: mean						real	longitude latitude time	sos	ocean
	kg m-3	time: mean						real	longiutude latitude olevel time	rhopoto	ocean
	yr	time: mean						real	longiutude latitude olevel time	agessc	ocean
	mol kg-1	time: mean						real	longiutude latitude olevel time	cfc11	ocean
	kg s-1	time: mean						real	longitude latitude time	msftbarot	ocean
	m	time: mean						real	longitude latitude time	mlotst	ocean
	m2	time: mean						real	longitude latitude time	mlotstsq	ocean

	m	time: maximum within days time: mean over days		real	longitude latitude time	omldamax	ocean
	m	time: maximum		real	longitude latitude time	omlmax	ocean

unconfirmed or proposed standard name	unformatted units	cell_methods	valid min	valid max	mean absolute min	mean absolute max	positive	type	CMOR dimensions	CMOR variable name	realm
	m s-1	time: mean						real	longitude latitude olevel time	uo	ocean
	m s-1	time: mean						real	longitude latitude olevel time	vo	ocean
	kg s-1	time: mean						real	longitude latitude olevel time	wmo	ocean
	kg2 s-2	time: mean						real	longitude latitude olevel time	wmosq	ocean
	kg s-1	time: mean						real	longitude latitude olevel time	umo	ocean
	kg s-1	time: mean						real	longitude latitude olevel time	vmo	ocean
	kg s-1	time: mean longitude: mean						real	latitude olevel basin time	msftmyz	ocean
	kg s-1	time: mean longitude: mean						real	latitude rho basin time	msftmrhoz	ocean
	kg s-1	time: mean longitude: mean						real	latitude olevel basin time	msftyyz	ocean
	kg s-1	time: mean longitude: mean						real	latitude rho basin time	msftyrhoz	ocean
	kg s-1	time: mean longitude: mean						real	latitude olevel basin time	msftmyzba	ocean
	kg s-1	time: mean longitude: mean						real	latitude rho basin time	msftmrhozba	ocean
	kg s-1	time: mean longitude: mean						real	latitude olevel basin time	msftyyzba	ocean
	kg s-1	time: mean longitude: mean						real	latitude rho basin time	msftyrhozba	ocean
	W	time: mean						real	longitude latitude time	hfnorth	ocean
	W	time: mean						real	longitude latitude time	hfyba	ocean
	W	time: mean						real	longitude latitude time	hfydiff	ocean
	W	time: mean						real	longitude latitude time	0	ocean
	W	time: mean						real	longitude latitude time	hfy	ocean
	W	time: mean						real	longitude latitude time	hfxba	ocean
	W	time: mean						real	longitude latitude time	hfxdiff	ocean
	W	time: mean						real	longitude latitude time	hfyba	ocean
	W	time: mean						real	longitude latitude time	hfydiff	ocean
	W	time: mean longitude: mean						real	latitude basin time	htovgyre	ocean
	W	time: mean longitude: mean						real	latitude basin time	htovovrt	ocean
	kg s-1	time: mean longitude: mean						real	latitude basin time	sltovgyre	ocean

	kg s-1	time: mean longitude: mean						real	latitude basin time	sltovovrt	ocean

unconfirmed or proposed standard name	unformatted units	cell_methods	valid min	valid max	mean absolute min	mean absolute max	positive	type	CMOR dimensions	CMOR variable name	realm
	kg s-1	time: mean						real	xline time	?	ocean

unconfirmed or proposed standard name	unformatted units	cell_methods	valid min	valid max	mean absolute min	mean absolute max	positive	type	CMOR dimensions	CMOR variable name	realm
	kg m-2 s-1	time: mean area: mean where ice_free_sea over sea						real	longitude latitude time	pr	ocean
	kg m-2 s-1	time: mean area: mean where ice_free_sea over sea						real	longitude latitude time	prsn	ocean
	kg m-2 s-1	time: mean area: mean where ice_free_sea over sea						real	longitude latitude time	evs	ocean
	kg m-2 s-1	time: mean area: mean where sea						real	longitude latitude time	friver	ocean
	kg m-2 s-1	time: mean area: mean where sea						real	longitude latitude olevel time	ficeberg	ocean
	kg m-2 s-1	time: mean area: mean where sea						real	longitude latitude time	fsitherm	ocean seaIce
	kg m-2 s-1	time: mean area: mean where sea						real	longitude latitude time	wfo	ocean
	kg m-2 s-1	time: mean area: mean where sea						real	longitude latitude time	wfonocorr	ocean
	kg m-2 s-1	time: mean area: mean where sea					down	real	longitude latitude time	wfcorr	ocean

unconfirmed or proposed standard name	unformatted units	cell_methods	valid min	valid max	mean absolute min	mean absolute max	positive	type	CMOR dimensions	CMOR variable name	realm
	kg m-2 s-1	time: mean area: mean where sea						real	longitude latitude time	vsfpr	ocean
	kg m-2 s-1	time: mean area: mean where sea						real	longitude latitude time	vsfevap	ocean
	kg m-2 s-1	time: mean area: mean where sea						real	longitude latitude time	vsfriver	ocean
	kg m-2 s-1	time: mean area: mean where sea						real	longitude latitude time	vsfsit	ocean seaIce
	kg m-2 s-1	time: mean area: mean where sea						real	longitude latitude time	vsf	ocean
	kg m-2 s-1	time: mean area: mean where sea						real	longitude latitude time	wfcorr	ocean
	kg m-2 s-1	time: mean area: mean where sea						real	longitude latitude time	sfdsi	ocean seaIce
	kg m-2 s-1	time: mean area: mean where sea						real	longitude latitude time	sfriver	ocean

unconfirmed or proposed standard name	unformatted units	cell_methods	valid min	valid max	mean absolute min	mean absolute max	positive	type	CMOR dimensions	CMOR variable name	realm
	W m-2	time: mean area: whre sea					up	real	longitude latitude time	hfgeou	ocean
	W m-2	time: mean area: mean where ice_free_sea over sea					down	real	longitude latitude time	hfrainds	ocean
	W m-2	time: mean area: mean where ice_free_sea over sea					up	real	longitude latitude time	hfevapds	ocean
	W m-2	time: mean area: mean where sea						real	longitude latitude olevel time	hfrunoffds	ocean
	W m-2	time: mean area: mean where sea						real	longitude latitude olevel time	hfsnthermds	ocean

	W m-2	time: mean area: mean where sea						real	longitude latitude olevel time	hfsithermds	ocean seaIce
	W m-2	time: mean area: mean where sea						real	longitude latitude olevel time	hfibthermds	ocean
	W m-2	time: mean area: mean where ice_free_sea over sea					down	real	longitude latitude time	rlds	ocean
	W m-2	time: mean area: mean where ice_free_sea over sea					down	real	longitude latitude time	hfls	ocean
	W m-2	time: mean area: mean where ice_free_sea over sea					down	real	longitude latitude time	hfss	ocean
net_downward_shortwave_flux_at_sea_water_surface	W m-2	time: mean area: mean where sea					down	real	longitude latitude time	rsntds	ocean
	W m-2	time: mean area: mean where sea					down	real	longitude latitude olevel time	rsds	ocean
	W m-2	time: mean area: mean where sea					down	real	longitude latitude time	hfcorr	ocean
downward_heat_flux_at_sea_water_surface	W m-2	time: mean area: mean where sea					down	real	longitude latitude time	hfds	ocean

unconfirmed or proposed standard name	unformatted units	cell_methods	valid min	valid max	mean absolute min	mean absolute max	positive	type	CMOR dimensions	CMOR variable name	realm
	N m-2	time: mean area: mean where sea					down	real	longitude latitude time	tauuo	ocean
	N m-2	time: mean area: mean where sea					down	real	longitude latitude time	tauvo	ocean
	N m-2	time: mean area: mean where sea					down	real	longitude latitude time	tauucorr	ocean
	N m-2	time: mean area: mean where sea					down	real	longitude latitude time	tauvcorr	ocean

CMOR Table Lmon: Monthly Mean Land Fields, Including Lmon

Physical, Vegetation, Soil, and Biogeochemical Variables

(All fields should be saved on the atmospheric grid; unless otherwise indicated, values are averaged over only the land portion of each grid cell and report 0.0 where land fraction is 0.)

priority	long name	units	comment	questions	output variable name	confirmed or likely to be confirmed standard name
1	Moisture in Upper 0.1 m of Soil Column	kg m^{-2}	Compute the mass of water in all phases in the upper 0.1 meters of soil.		mrsos	moisture_content_of_soil_layer
1	Total Soil Moisture Content	kg m^{-2}	Compute the mass per unit area (summed over all soil layers) of water in all phases.		mrso	soil_moisture_content
1	Soil Frozen Water Content	kg m^{-2}	Compute the mass (summed over all all layers) of frozen water.		mrlso	soil_frozen_water_content_
1	Surface Runoff	kg m^{-2} s^{-1}	Compute the total surface runoff leaving the land portion of the grid cell.		mrros	surface_runoff_flux
1	Total Runoff	kg m^{-2} s^{-1}	compute the total runoff (including "drainage" through the base of the soil model) leaving the land portion of the grid cell.		mrro	runoff_flux
2	Precipitation onto Canopy	kg m^{-2} s^{-1}	Report the precipitation flux that is intercepted by the vegetation canopy (if present in model) before reaching the ground.		prveg	precipitation_flux_onto_canopy
1	Evaporation from Canopy	kg m^{-2} s^{-1}	Report the canopy evaporation+sublimation (if present in model).		evspsblveg	water_evaporation_flux_from_canopy
2	Transpiration Beta Factor	1		How is this defined? Can it be calculated in most models? Is it really dimensionless?	btran	
1	Water Evaporation from Soil‡	kg m^{-2} s^{-1}	includes sublimation.	what is the meaning of "‡" in the long name?	evspsblsoi	water_evaporation_flux_from_soil
1	Transpiration‡	kg m^{-2} s^{-1}		what is the meaning of "‡" in the long name?	tran	transpiration_flux
1	Water Content of Soil Layer‡	kg m^{-2}	in each soil layer, the mass of water in all phases, including ice.	what is the meaning of "‡" in the long name?	mrlsl	moisture_content_of_soil_layer
2	Temperature of Soil	K	Temperature of each soil layer. Report as "missing" for grid cells occupied entirely by "sea".		tsl	Two options for all these names: 1) Use existing standard name area_fraction + a scalar coordinate variable with existing standard name area_type. The area type names (with definitions) would then need to be proposed for inclusion in the new area_type table. 2) Propose the individual X_fraction names (by analogy with cloud_area_fraction, etc.) N.B. Neither option has been proposed so far. I recommend the first option because the area_types would then also be available
1	Tree Cover Fraction	%	fraction of entire grid cell that is covered by trees.		treeFrac	
1	Natural Grass Fraction	%	fraction of entire grid cell that is covered by natural grass.		grassFrac	
1	Shrub Fraction	%	fraction of entire grid cell that is covered by shrub.		shrubFrac	
1	Crop Fraction	%	fraction of entire grid cell that is covered by crop.		cropFrac	
1	Anthropogenic Pasture Fraction	%	fraction of entire grid cell that is covered by anthropogenic pasture.		pastureFrac	
1	Bare Soil Fraction	%	fraction of entire grid cell that is covered by bare soil.		baresoilFrac	
1	Fraction of Grid Cell that is Land but Neither Vegetation-Covered nor Bare Soil	%	fraction of entire grid cell that is land and is covered by "non-vegetation" and "non-bare-soil" (e.g., urban, ice, lakes, etc.)		residualFrac	
1	Burnt Area Fraction	%	fraction of entire grid cell that is covered by burnt vegetation.		burntArea	

	Land Carbon & Biogeochemistry				
1	Carbon in Vegetation	kg C m^{-2}		cVeg	vegetation_carbon_content
1	Carbon in Litter Pool	kg C m^{-2}		cLitter	litter_carbon_content
1	Carbon in Soil Pool	kg C m^{-2}		cSoil	soil_carbon_content
1	Carbon in Products of Land Use Change	kg C m^{-2}		cProduct	
1	Leaf Area Fraction	%	projected leaf area per unit of ground area (i.e., only the land portion of the grid cell), expressed as a percent. This is the same as 100 times the "leaf area index".	lai	leaf_area_index
1	Gross Primary Production	kg C m^{-2} s^{-1}		gpp	gross_primary_productivity_of_carbon?
1	Autotrophic (Plant) Respiration	kg C m^{-2} s^{-1}		ra	plant_respiration_carbon_flux?
1	Net Primary Production	kg C m^{-2} s^{-1}	needed for models that do not compute GPP (if any)	npp	net_primary_productivity_of_carbon?
1	Heterotrophic Respiration	kg C m^{-2} s^{-1}		rh	heterotrophic_respiration_carbon_flux?
1	CO2 Emission from Fire	kg C m^{-2} s^{-1}	CO2 emissions from natural fires + human ignition fires as calculated by the fire module of the DGVM, but excluding any CO2 flux from fire reported under variable Lmon 58	fFire	
1	CO2 Flux to Atmosphere from Grazing	kg C m^{-2} s^{-1}		fGrazing	
1	CO2 Flux to Atmosphere from Crop Harvesting	kg C m^{-2} s^{-1}		fHarvest	
1	CO2 Flux to Atmosphere from Land Use Change	kg C m^{-2} s^{-1}	human changes to land accounting possibly for different time-scales related to fate of the wood, for example.	fLuc	
1	Net Biospheric Productivity	kg C m^{-2} s^{-1}	This is the net flux between land and atmosphere defined as photosynthesis MINUS the sum of plant and soil respiration, carbonfluxes from fire, harvest, grazing and land use change. Positive flux is into the land.	nbr	
1	Total Carbon Flux from Vegetation to Litter	kg C m^{-2} s^{-1}		fVegLitter	litter_carbon_flux?
1	Total Carbon Flux from Litter to Soil	kg C m^{-2} s^{-1}		fLitterSoil	
1	Total Carbon Flux from Vegetation Directly to Soil	kg C m^{-2} s^{-1}	In some models part of carbon (e.g., root exudate) can go directly into the soil pool without entering litter.	fVegSoil	

2	Carbon in Leaves	kg C m^{-2}		This field and some of the following may sum to yield some of the more generic carbon pool totals given above.	cLeaf
2	Carbon in Wood	kg C m^{-2}	including sapwood and hardwood.		cWood
2	Carbon in Roots	kg C m^{-2}	including fine and coarse roots.		cRoot
2	Carbon in Other Living Compartments	kg C m^{-2}	e.g., labile, fruits, reserves, ….		cMisc
2	Carbon in Coarse Woody Debris	kg C m^{-2}			cCwd
2	Carbon in Above-Ground Litter	kg C m^{-2}			cLitterAbove
2	Carbon in Below-Ground Litter	kg C m^{-2}		Is "below-ground" litter distinguishable from soil?	cLitterBelow
2	Carbon in Fast Soil Pool	kg C m^{-2}	fast is meant as lifetime of less than 10 years for reference climate conditions (20°C, no water limitations).		cSoilFast
2	Carbon in Medium Soil Pool	kg C m^{-2}	medium is meant as lifetime of more than than 10 years and less than 100 years for reference climate conditions (20°C, no water limitations)		cSoilMedium
2	Carbon in Slow Soil Pool	kg C m^{-2}	fast is meant as lifetime of more than 100 years for reference climate conditions (20°C, no water limitations)		cSoilSlow
2	Fractional Land Cover of PFT	%	using each individual ESM PFT definition. This includes natural PFTs, anthropogenic PFTs, bare soil, lakes, urban areas, etc. Sum of all should equal the fraction of the grid-cell that is land. Note that the "types" will be model dependent and for each type there should be a full description of the PFT (plant functional type). To facilitate model comparison, it is also requested that the aggregated land cover types called for in lines 25 to 32 be archived		landCoverFrac

2	Total Primary Deciduous Tree Cover Fraction	%	Agregation of model PFTs as defined in 1st priority to aid model intercomparison. This is the fraction of the entire grid cell that is covered by "total primary deciduous trees."		treeFracPrimDec	Two options for all these names: 1) Use existing standard name area_fraction + a scalar coordinate variable with existing standard name area_type. The area type names (with definitions) would then need to be proposed for inclusion in the new area_type table. 2) Propose the individual X_fraction names (by analogy with cloud_area_fraction, etc.) N.B. Neither option has been proposed so far. I recommend the first option because the area_types would then also be available
2	Total Primary Evergreen Tree Cover Fraction	%	fraction of entire grid cell that is covered by primary evergreen trees.		treeFracPrimEver	
2	Total Secondary Deciduous Tree Cover Fraction	%	fraction of entire grid cell that is covered by secondary deciduous trees.		treeFracSecDec	
2	Total Secondary Evergreen Tree Cover Fraction	%	fraction of entire grid cell that is covered by secondary evergreen trees.		treeFracSecEver	
2	Total C3 PFT Cover Fraction	%	fraction of entire grid cell that is covered by C3 PFTs (including grass, crops, and trees).		c3PftFrac	
2	Total C4 PFT Cover Fraction	%	fraction of entire grid cell that is covered by C4 PFTs (including grass and crops).		c4PftFrac	
2	Growth Autotrophic Respiration	kg C m^{-2} s^{-1}	This and the following is a breakdown of the flux given in FIRST PRIORITY; thus, the sum should be identical to the earlier total fluxes.	I don't understand this. Be explicit about which terms should add together to equal earlier fluxes.	rGrowth	
2	Maintenance Autotrophic Respiration	kg C m^{-2} s^{-1}		Is "maintenance" precisely defined? Can we make it more understandable to the non-specialist?	rMaint	
2	CO2 Flux from Atmosphere due to NPP Allocation to Leaf	kg C m^{-2} s^{-1}	This is the rate of carbon uptake by leaves due to NPP		nppLeaf	
2	CO2 Flux from Atmosphere due to NPP Allocation to Wood	kg C m^{-2} s^{-1}	This is the rate of carbon uptake by wood due to NPP		nppWood	
2	CO2 Flux from Atmosphere due to NPP Allocation to Root	kg C m^{-2} s^{-1}	This is the rate of carbon uptake by roots due to NPP		nppRoot	
?	CO2 Flux to Atmosphere from Deforestation	kg C m^{-2} s^{-1}	human land use inducing forest to crops or pasture transition. This flux should account possibly for different time-scales related to fate of the wood, for example.	I don't understand the explanation written here. Does it differ from an earlier entry: CO2 flux to atmosphere from land use change? How?	fco2Deforest	
?	CO2 Flux to Atmosphere from Wood Harvest	kg C m^{-2} s^{-1}	human land use inducing forest to forest rotation. This flux should account possibly for different time-scales related to fate of the wood, for example.	I don't understand the explanation written here. Does it differ from an earlier entry: CO2 flux to atmosphere from land use change? How?	fco2WoodHarv	

unconfirmed or proposed standard name	unformatted units	cell_methods	valid min	valid max	mean absolute min	mean absolute max	positive	type	CMOR dimensions	CMOR variable name	realm
	kg m-2	time: mean area: mean where land						real	longitude latitude time sdepth1	mrsos	land
	kg m-2	time: mean area: mean where land						real	longitude latitude time	mrso	land
	kg m-2	time: mean area: mean where land						real	longitude latitude time	mrlso	land
	kg m-2 s-1	time: mean area: mean where land						real	longitude latitude time	mrros	land
	kg m-2 s-1	time: mean area: mean where land						real	longitude latitude time	mrro	land
	kg m-2 s-1	time: mean area: mean where land						real	longitude latitude time	prveg	land
	kg m-2 s-1	time: mean area: mean where land					up	real	longitude latitude time	evspsblveg	land
transpiration_beta_factor NOT PROPOSED	1	time: mean						real	longitude latitude time	btran	land
	kg m-2 s-1	time: mean area: mean where land					up	real	longitude latitude time	evspsblsoi	land
	kg m-2 s-1	time: mean area: mean where land					up	real	longitude latitude time	tran	land
water_content_of_soil_layer	kg m-2	time: mean area: mean where land						real	longitude latitude sdepth time	mrlsl	land
temperature_of_soil_layer NOT PROPOSED	K	time: mean						real	longitude latitude sdepth time	tsl	land
tree_cover_fraction	%	time: mean						real	longitude latitude time	treeFrac	land
natural_grass_fraction	%	time: mean						real	longitude latitude time	grassFrac	land
shrub_fraction	%	time: mean						real	longitude latitude time	shrubFrac	land
crop_fraction	%	time: mean						real	longitude latitude time	cropFrac	land
anthropogenic_pasture_fraction	%	time: mean						real	longitude latitude time	pastureFrac	land
bare_soil_fraction	%	time: mean						real	longitude latitude time	baresoilFrac	land
fraction_of_grid_cell_which_is_non_vegetation_and_non_bare_soil	%	time: mean						real	longitude latitude time	residualFrac	land
burnt_area_fraction	%	time: mean						real	longitude latitude time	burntArea	land

							land
	kg C m-2	time: mean area: mean where land		real	longitude latitude time	cVeg	land
	kg C m-2	time: mean area: mean where land		real	longitude latitude time	cLitter	land
	kg C m-2	time: mean area: mean where land		real	longitude latitude time	cSoil	land
carbon_in_products_of_luc NOT PROPOSED	kg C m-2	time: mean area: mean where land		real	longitude latitude time	cProduct	land
	%	time: mean area: mean where land		real	longitude latitude time	lai	land
gross_primary_production	kg C m-2 s-1	time: mean area: mean where land	up	real	longitude latitude time	gpp	land
autotrophic_plant_respiration	kg C m-2 s-1	time: mean area: mean where land	up	real	longitude latitude time	ra	land
net_primary_production	kg C m-2 s-1	time: mean area: mean where land	up	real	longitude latitude time	npp	land
heterotrophic_respiration	kg C m-2 s-1	time: mean area: mean where land	up	real	longitude latitude time	rh	land
co2_emission_from_fire NOT PROPOSED – recommend tendency_of_atmosphere_mass_content_of_carbon_dioxide_due_to_biomass_burning for consistency with chemistry names	kg C m-2 s-1	time: mean area: mean where land	up	real	longitude latitude time	fFire	land
co2_flux_to_atmosphere_from_grazing NOT PROPOSED – recommend tendency_of_atmosphere_mass_content_of_carbon_dioxide_due_to_grazing for consistency with chemistry names	kg C m-2 s-1	time: mean area: mean where land	up	real	longitude latitude time	fGrazing	land
co2_flux_to_atmosphere_from_crop_harvesting NOT PROPOSED – recommend tendency_of_atmosphere_mass_content_of_carbon_dioxide_due_to_crop_harvesting for consistency with chemistry names	kg C m-2 s-1	time: mean area: mean where land	up	real	longitude latitude time	fHarvest	land
co2_flux_to_atmosphere_from_land_use_change NOT PROPOSED – recommend tendency_of_atmosphere_mass_content_of_carbon_dioxide_due_to_land_use_change for consistency with chemistry names	kg C m-2 s-1	time: mean area: mean where land	up	real	longitude latitude time	fLuc	land
net_biospheric_productivity Is this the same as net_primary_productivity_of_carbon (also in cell G53)?	kg C m-2 s-1	time: mean area: mean where land	up	real	longitude latitude time	nbr	land
total_carbon_flux_from_vegetation_to_litter	kg C m-2 s-1	time: mean area: mean where land		real	longitude latitude time	fVegLitter	land
total_carbon_flux_from_litter_to_soil NOT PROPOSED – recommend carbon_flux_from_litter_into_soil for consistency with water and salt flux names	kg C m-2 s-1	time: mean area: mean where land		real	longitude latitude time	fLitterSoil	land
total_carbon_flux_from_vegetation_directly_to_soil NOT PROPOSED – recommend carbon_flux_into_soil_from_plants_excluding_litter for consistency with water and salt flux names and runoff names	kg C m-2 s-1	time: mean area: mean where land		real	longitude latitude time	fVegSoil	land

carbon_in_leaves NOT PROPOSED – recommend leaf_carbon_content for consistency with soil_carbon_content, etc.	kg C m-2	time: mean area: mean where land		real	longitude latitude time	cLeaf	land
carbon_in_wood NOT PROPOSED – recommend wood_carbon_content for consistency with soil_carbon_content, etc.	kg C m-2	time: mean area: mean where land		real	longitude latitude time	cWood	land
carbon_in_roots NOT PROPOSED – recommend root_carbon_content for consistency with soil_carbon_content, etc.	kg C m-2	time: mean area: mean where land		real	longitude latitude time	cRoot	land
carbon_in_other_living_compartments NOT PROPOSED – this should also be a carbon_content name, and we probably need something more specific than 'other_living_compartments' but I'm stuck for a suggestion here.	kg C m-2	time: mean area: mean where land		real	longitude latitude time	cMisc	land
carbon_in_coarse_woody_debris – NOT PROPOSED – recommend coarse_wood_debris_carbon_content or just wood_debris_carbon_content for consistency with soil_carbon_content, etc.	kg C m-2	time: mean area: mean where land		real	longitude latitude time	cCwd	land
carbon_in_aboveground_litter NOT PROPOSED – recommend surface_litter_carbon_content for consistency with soil_carbon_content, etc. and runoff names	kg C m-2	time: mean area: mean where land		real	longitude latitude time	cLitterAbove	land
carbon_in_aboveground_litter N.B. Should this be belowground litter? NOT PROPOSED – recommend subsurface_litter_carbon_content for consistency with soil_carbon_content, etc. and runoff names	kg C m-2	time: mean area: mean where land		real	longitude latitude time	cLitterBelow	land
carbon_in_fast_soil_pool NOT PROPOSED – recommend fast_soil_pool_carbon_content for consistency with soil_carbon_content, etc.	kg C m-2	time: mean area: mean where land		real	longitude latitude time	cSoilFast	land
medium_soil_pool NOT PROPOSED – recommend medium_soil_pool_carbon_content for consistency with soil_carbon_content, etc.	kg C m-2	time: mean area: mean where land		real	longitude latitude time	cSoilMedium	land
carbon_in_slow_soil_pool NOT PROPOSED – recommend slow_soil_pool_carbon_content for consistency with soil_carbon_content, etc.	kg C m-2	time: mean area: mean where land		real	longitude latitude time	cSoilSlow	land
fractional_land_cover_types NOT PROPOSED – is this actually a separate standard name or just a list of types as in the new area type table?	%	time: mean		real	longitude latitude vegtype time	landCoverFrac	land

total_primary_deciduous_tree_cover_fraction	%	time: mean		real	longitude latitude time	treeFracPrimDec	land
total_primary_evergreen_tree_cover_fraction	%	time: mean		real	longitude latitude time	reeFracPrimEve	land
total_secondary_deciduous_tree_cover fraction	%	time: mean		real	longitude latitude time	treeFracSecDec	land
total_secondary_evergreen_tree_cover_fraction	%	time: mean		real	longitude latitude time	treeFracSecEver	land
total_c3_pft_cover_fraction	%	time: mean		real	longitude latitude time	c3PftFrac	land
total_c4_pft_cover_fraction	%	time: mean		real	longitude latitude time	c4PftFrac	land
growth_autothrophic_respiration NOT PROPOSED – recommend plant_respiration_carbon_flux_due_to_growth for consistency with row 52	kg C m-2 s-1	time: mean area: mean where land	up	real	longitude latitude time	rGrowth	land
maintenance_autothrophic_respiration NOT PROPOSED – recommend plant_respiration_carbon_flux_due_to_maintenance for consistency with row 52 (what is 'maintenance'?)	kg C m-2 s-1	time: mean area: mean where land	up	real	longitude latitude time	rMaint	land
npp_allocation_to_leaf NOT PROPOSED – what is npp? Don't understand this quantity.	kg C m-2 s-1	time: mean area: mean where land	down	real	longitude latitude time	nppLeaf	land
npp_allocation_to_wood NOT PROPOSED – what is npp? Don't understand this quantity.	kg C m-2 s-1	time: mean area: mean where land	down	real	longitude latitude time	nppWood	land
npp_allocation_to_root NOT PROPOSED – what is npp? Don't understand this quantity.	kg C m-2 s-1	time: mean area: mean where land	down	real	longitude latitude time	nppRoot	land
co2_flux_to_atmosphere_from_deforestation NOT PROPOSED – recommend tendency_of_atmosphere_mass_content_of_carbon_dioxide_due_to_deforestation for consistency with chemistry names	kg C m-2 s-1	time: mean area: mean where land	up	real	longitude latitude time	fco2Deforest	land
co2_flux_to_atmosphere_from_wood_harvest NOT PROPOSED – recommend tendency_of_atmosphere_mass_content_of_carbon_dioxide_due_to_wood_harvesting for consistency with chemistry names	kg C m-2 s-1	time: mean area: mean where land	up	real	longitude latitude time	fco2WoodHarv	land

CMOR Table LImon: Monthly Mean Land Cryosphere Fields Limon

(All fields should be saved on the atmospheric grid; unless otherwise indicated, values are averaged over only the land portion of each grid cell and report 0.0 where land fraction is 0.)

priority	long name	units	comment	questions	output variable name	confirmed or likely to be confirmed standard name
1	Snow Area Fraction	%	Fraction of each grid cell that is occupied by snow that rests on land portion of cell.		snc	surface_snow_area_fraction
1	Surface Snow Amount	kg m^{-2}	Compute as the mass of surface snow on the land portion of the grid cell divided by the land area in the grid cell; report as 0.0 where the land fraction is 0; exclude snow on vegetation canopy or on sea ice.		snw	surface_snow_amount
1	Snow Depth	m	where land over land. Compute the mean thickness of snow in the land portion of the grid cell (averaging over the entire land portion, including the snow-free fraction. Report as 0.0 where the land fraction is 0.		snd	surface_snow_thickness
2	Liquid Water Content of Snow Layer	kg m^{-2}	where land over land: compute the total mass of liquid water contained interstitially within the snow layer of the land portion of a grid cell divided by the area of the land portion of the cell.		lwsnl	liquid_water_content_of_snow_layer
1	Soil Frozen Water Content	kg m^{-2}	summed over all soil layers, where land over land: compute by dividing the total mass of frozen water contained in the soil layer of the grid cell by the land area in the grid cell; report as 0.0 where the land fraction is 0.		mrfso	soil_frozen_water_content
2	Soil Water Content	kg m^{-2}	summed over all soil layers, where land over land: compute by dividing the total mass of water (both liquid and ice) contained in the soil layer of the grid cell by the land area in the grid cell; report as 0.0 where the land fraction is 0.		mfrso	soil_water_content
1	Snow Grain Size	m	When computing the time-mean here, the time-samples, weighted by the mass of snow on the the land portion of the grid cell, are accumulated and then divided by the sum of the weights.	Unless "grain size" is precisely defined, this variable will be eliminated. How, exactly, is "grain size" defined? Is it a radius, a diameter, or what? What is the correct cell_method for time?	grainsizesn	
2	Snow Soot Content	kg m^{-2}	Consider the entire land portion of the grid cell, with snow soot content set to 0.0 in regions free of snow.		sootsn	
1	Snow Age	day	When computing the time-mean here, the time samples, weighted by the mass of snow on the land portion of the grid cell, are accumulated and then divided by the sum of the weights. Report as "missing in regions free of snow on land.		agesno	
1	Snow Internal Temperature	K	This temperature is averaged over all the snow in the grid cell that rests on land or land ice. When computing the time-mean here, the time samples, the weighted by the mass of snow on the land portion of the grid cell, are accumulated and then divided by the sum of the weights. Report as "missing in regions free of snow on land.	Is this an average of the entire snow layer?	tsn	
2	Snow Thermal Energy Content	J m^{-2}	the energy content is taken to be 0 J for snow at 0 Celcius. This quantity is averaged over all the snow in the grid cell that rests on land or land ice. When computing the time-mean here, the time samples, weighted by the mass of snow on the land portion of the grid cell, are accumulated and then divided by the sum of the weights. Report as "missing in regions free of snow on land.	Unless someone can convince me this is essential, this variable will be removed. Do we need this quantity if we have the snow_internal_temperature and snow_amount (i.e., mass)?	esn	

1	Surface Snow Melt	kg m^{-2} s^{-1}	Compute as the total surface melt water on the land portion of the grid cell divided by the land area in the grid cell; report as 0.0 for snow-free land regions; report as 0.0 where the land fraction is 0.		snm	surface_snow_melt_flux
1	Surface Snow and Ice Sublimation Flux	kg m^{-2} s^{-1}	The snow and ice sublimation flux is the loss of snow and ice mass resulting from their conversion to water vapor. Compute as the total sublimation on the land portion of the grid cell divided by the land area in the grid cell; report as 0.0 for snow-free land regions; report as 0.0 where the land fraction is 0.		sbl	
1	Downward Heat Flux into Snow Where Land over Land	W m^{-2}	Compute the net downward heat flux from the atmosphere into the snow that lies on land divided by the land area in the grid cell; report as 0.0 for snow-free land regions or where the land fraction is 0.		hfdsn	
3	Permafrost Layer Thickness	m	where land over land. Compute the mean thickness of the permafrost layer in the land portion of the grid cell. Report as 0.0 in permafrost-free regions.		tpf	
3	Liquid Water Content of Permafrost Layer	kg m^{-2}	"where land over land", i.e., this is the total mass of liquid water contained within the permafrost layer within the land portion of a grid cell divided by the area of the land portion of the cell.		pflw	
3	Active Layer Thickness	m		This variable will be eliminated unless the following question is answered: How, exactly, is active layer defined?	activelt	
3	Liquid Water Content of Active Layer	kg m^{-2}		This variable will be eliminated unless the following questions are answered: where land over land? How, exactly, is active layer defined?	allw	
3	Temperature Profile in Active/Permafrost Layers	K		This variable will be eliminated unless the following questions are answered: Define "profile". So is this a multi-layer field (i.e., 3d, not 2d)? Where land over land?	tapl	
3	Equilibrium Line Altitude	m		This variable will be eliminated unless the following question is answered: How, exactly, is this defined?	ela	
3	Freezing Line Altitude	m		This variable will be eliminated unless the following question is answered: How, exactly, is this defined?	fla	

unconfirmed or proposed standard name	unformatted units	cell_methods	valid min	valid max	mean absolute min	mean absolute max	positive	type	CMOR dimensions	CMOR variable name	realm
	%	time: mean						real	longitude latitude time	snc	landIce land
	kg m-2	time: mean area: mean where land						real	longitude latitude time	snw	landIce land
	m	time: mean area: mean where land						real	longitude latitude time	snd	landIce land
	kg m-2	time: mean area: mean where land						real	longitude latitude time	lwsnl	landIce land
	kg m-2	time: mean						real	longitude latitude time	mrfso	landIce land
	kg m-2	time: mean						real	longitude latitude time	mfrso	landIce land
snow_grain_size	m	time: mean area: mean where land						real	longitude latitude time	grainsizesn	landIce land
snow_soot_content	kg m-2	time: mean area: mean where land						real	longitude latitude time	sootsn	landIce land
snow_age	day	time: mean area: mean where land						real	longitude latitude time	agesno	landIce land
snow_temperature	K	time: mean area: mean where land						real	longitude latitude time	tsn	landIce land
snow_thermal_energy	J m-2	time: mean area: mean where land						real	longitude latitude time	esn	landIce land

	kg m-2 s-1	time: mean area: mean where land		real	longitude latitude time	snm	landIce land
	kg m-2 s-1	time: mean area: mean where land		real	longitude latitude time	sbl	landIce land
net_downward_heat_flux	W m-2	time: mean area: mean where land	down	real	longitude latitude time	hfdsn	landIce land
permafrost_layer_thickness	m	time: mean area: mean where land		real	longitude latitude time	tpf	landIce land
liquid_water_content_of_permafrost_layer	kg m-2	time: mean area: mean where land		real	longitude latitude time	pflw	landIce land
active_layer_thickness	m	time: mean		real	longitude latitude time	activelt	landIce land
liquid_water_content_of_active_layer	kg m-2	time: mean		real	longitude latitude time	allw	landIce land
temperature_profile_in_active/permafrost_layers	K	time: mean		real	longitude latitude sdepth time	tapl	landIce land
equilibrium_line_altitude	m	time: mean		real	longitude latitude time	ela	landIce land
freezing_line_altitude	m	time: mean		real	longitude latitude time	fla	landIce land

CMOR Table Oimon: Monthly Mean Ocean Cryosphere Fields Oimon

(All saved on the ocean grid; unless otherwise indicated, values are averaged over only the ocean portion of each grid cell and report 0.0 where ocean fraction is 0.)

priority	long name	units	comment	questions	output variable name	confirmed or likely to be confirmed standard name
1	Sea Ice Area Fraction	%	fraction of grid cell covered by sea ice.		sic	sea_ice_area_fraction
1	Sea Ice Thickness	m	Compute the mean thickness of sea ice in the ocean portion of the grid cell (averaging over the entire ocean portion, including the ice-free fraction). Report as 0.0 in regions free of sea ice.		sit	sea_ice_thickness
1	Water Evaporation Flux from Sea Ice	kg m^{-2} s^{-1}	Compute the average rate that water mass evaporates (or sublimates) from the sea ice surface (i.e., kg/s) divided by the area of the ocean (i.e., open ocean + sea ice) portion of the grid cell. This quantity multiplied both by the oean area of the grid cell and by the length of the month should yield the total mass of water evaporated (or sublimated) from the sea ice. Report as 0.0 in regions free of sea ice.	For consistency throughout, mass and heat fluxes for sea ice covered regions are all now calculated "where sea ice over sea" whereas in CMIP3 this particular flux was calculated in a different way.	evap	water_evaporation_flux
1	Snow Depth	m	Compute the mean thickness of snow in the ocean portion of the grid cell (averaging over the entire ocean portion, including the snow-free ocean fraction). Report as 0.0 in regions free of snow-covered sea ice.		snd	surface_snow_thickness
2	Surface Snow Area Fraction	%	Fraction of entire grid cell covered by snow that lies on sea ice; exclude snow that lies on land or land ice.		snc	surface_snow_area_fraction
1	Bare Sea Ice Albedo	1	Report as "missing" if there is no sunlight or if a region is free of sea ice.	Will this vary from year to year or is it a property of "bare sea ice" and sun angle? How is the time-mean calculated?	ialb	
2	Sea Ice Thickness in Categories	m	where sea over sea: For each sea ice category, compute the mean thickness of that type of sea ice in the ocean portion of the grid cell (averaging over the entire ocean portion). Report as 0.0 in regions where the given category of sea ice is absent.	What are the requested categories? Need to specify how time-averaging is done. Is the following method correct? "When computing the time-mean here, the time sample thicknesses, weighted by the area of sea ice in the grid cell, are accumulated and then divided by the sum of the weights."	sitn	
2	Sea Ice Area Fraction in Categories	%	fraction of entire grid cell occupied by each sea-ice type (i.e., category) expressed as a percentage	What are the requested categories?	sicn	
3	Sea Ice Salinity	psu	When computing the time-mean here, the time-samples, weighted by the mass of sea ice in the grid cell, are accumulated and then divided by the sum of the weights. Report as "missing" in regions free of sea ice.		ssi	
1	Surface Temperature of Sea Ice	K	When computing the time-mean here, the time-samples, weighted by the area of sea ice in the grid cell, are accumulated and then divided by the sum of the weights. Report as "missing" in regions free of sea ice. Note this will be the surface snow temperature in regions where snow covers the sea ice.		tsice	
1	Temperature at Interface Between Sea Ice and Snow	K	When computing the time-mean here, the time-samples, weighted by the area of snow-covered sea ice in the grid cell, are accumulated and then divided by the sum of the weights. Report as "missing" in regions free of snow-covered sea ice.		tsnint	

1	Surface Rainfall Rate into the Sea Ice Portion of the Grid Cell	kg m^{-2} s^{-1}	where sea ice over sea: compute the the water mass per unit time falling as rain onto the sea ice portion of a grid cell divided by the area of the ocean portion of the grid cell (including both ice-free and sea-ice covered fractions). Report as 0. in regions free of sea ice.		pr	
1	Surface Snowfall Rate into the Sea Ice Portion of the Grid Cell	kg m^{-2} s^{-1}	where sea ice over sea: compute the the water mass per unit time falling as snow onto the sea ice portion of a grid cell divided by the area of the ocean portion of the grid cell (including both ice-free and sea-ice covered fractions). Report as 0. in regions free of sea ice.		prsn	
3	Age of Sea Ice	years	When computing the time-mean here, the time samples, weighted by the mass of sea ice in the grid cell, are accumulated and then divided by the sum of the weights. Report as "missing" in regions free of sea ice.		ageice	
1	Frazil Sea Ice Growth (Leads) Rate	kg m^{-2} s^{-1}	Compute the rate of change of sea ice mass due to frazil sea ice formation divided by the area of the ocean portion of the grid cell. Report as 0.0 in regions free of sea ice.		grFrazil	
1	Congelation Sea Ice Growth Rate	kg m^{-2} s^{-1}	Compute the rate of change of sea ice mass due to congelation sea ice divided by the area of the ocean portion of the grid cell. Report as 0.0 in regions free of sea ice.		grCongel	
1	Lateral Sea Ice Growth Rate	kg m^{-2} s^{-1}	Compute the rate of change of sea ice mass due to lateral growth alone of the sea ice divided by the area of the ocean portion of the grid cell. Report as 0.0 in regions free of sea ice.		grLateral	
1	Snow-Ice Formation Rate	kg m^{-2} s^{-1}	Compute the rate of change of sea ice mass due to transformation of snow to sea ice, divided by the area of the ocean portion of the grid cell. Report as 0.0 in regions free of snow-covered sea ice.		snoToIce	
1	Snow Melt Rate	kg m^{-2} s^{-1}	Compute the rate of change of snow mass due to melting, divided by the area of the ocean portion of the grid cell. Report as 0.0 in regions free of sea ice.	Should this include falling snow that melts on impact with the liquid ocean?	snomelt	
1	Rate of Melt at Upper Surface of Sea Ice	kg m^{-2} s^{-1}	Compute the rate of change of sea ice mass due to melting at its upper surface, divided by the area of the ocean portion of the grid cell. Report as 0.0 in regions free of sea ice.	Should this also include melting of snow that covers sea ice?	tmelt	
1	Rate of Melt at Sea Ice Base	kg m^{-2} s^{-1}	Compute the rate of change of sea ice mass due to melting at its lower surface, divided by the area of the ocean portion of the grid cell. Report as 0.0 in regions free of sea ice.	Is this field already requested in O_mon?	bmelt	
2	Sea Ice Total Heat Content	J	Ice at 0 Celsius is assumed taken to have a heat content of 0 J. When averaging over time, this quantity is weighted by the mass of sea ice. Report as "missing in regions free of snow on land.	should this include heat content of snow on sea ice?	hcice	
1	Downward Shortwave over Sea Ice	W m^{-2}	Compute the downward shortwave flux in regions of sea ice divided by the area of the ocean portion of the grid cell.	priority was raised from 2 to 1 because snow albedo was deleted.	rsdssi	surface_downwelling_shortwave_flux_in_air
1	Upward Shortwave over Sea Ice	W m^{-2}	Compute the upward shortwave flux in regions of sea ice divided by the area of the ocean portion of the grid cell.	priority was raised from 2 to 1 because snow albedo was deleted.	rsussi	surface_upwelling_shortwave_flux_in_air
2	Downward Long Wave over Sea Ice	W m^{-2}	Compute the downward longwave flux in regions of sea ice divided by the area of the ocean portion of the grid cell.		rldssi	surface_downwelling_longwave_flux_in_air
2	Upward Long Wave over Sea Ice	W m^{-2}	Compute the upward longwave flux in regions of sea ice divided by the area of the ocean portion of the grid cell.		rlussi	surface_upwelling_longwave_flux_in_air
2	Surface Upward Sensible Heat Flux over Sea Ice	W m^{-2}	Compute the upward sensible heat flux in regions of sea ice divided by the area of the ocean portion of the grid cell.		hfssi	surface_upward_sensible_heat_flux
2	Surface Upward Latent Heat Flux over Sea Ice	W m^{-2}	Compute the upward latent heat flux in regions of sea ice divided by the area of the ocean portion of the grid cell.		hflssi	surface_upward_latent_heat_flux
2	Sublimation over Sea Ice	kg m^{-2}	Compute the upward flux of water vapor to the atmosphere due to sublimation of snow and sea ice in regions of sea ice divided by the area of the ocean portion of the grid cell.		sblsi	surface_snow_and_ice_sublimation_flux
1	Eastward Sea Ice Transport	kg s^{-1}	The sea ice transport is 0.0 in ice-free regions of the ocean.		transix	

1	Northward Sea Ice Transport	kg s^{-1}	The sea ice transport is 0.0 in ice-free regions of the ocean.		transiy
2	Sea Ice Mass Transport Through Fram Strait	kg s^{-1}			transifs
2	Eastward Atmospheric Stress On Sea Ice	N m^{-2}	When computing the time-mean here, the time samples, weighted by the area of sea ice, are accumulated and then divided by the sum of the weights. Report as "missing" in regions free of sea ice.		strairx
2	Northward Atmospheric Stress On Sea Ice	N m^{-2}	When computing the time-mean here, the time samples, weighted by the area of sea ice, are accumulated and then divided by the sum of the weights. Report as "missing" in regions free of sea ice.		strairy
2	Eastward Ocean Stress On Sea Ice	N m^{-2}	When computing the time-mean here, the time samples, weighted by the area of sea ice, are accumulated and then divided by the sum of the weights. Report as "missing" in regions free of sea ice.		strocnx
2	Northward Ocean Stress On Sea Ice	N m^{-2}	When computing the time-mean here, the time samples, weighted by the area of sea ice, are accumulated and then divided by the sum of the weights. Report as "missing" in regions free of sea ice.		strocny
2	Compressive Sea Ice Strength	N m^{-2}	When computing the time-mean here, the time samples, weighted by the area of sea ice, are accumulated and then divided by the sum of the weights. Report as "missing" in regions free of sea ice.		streng
2	Strain Rate Divergence of Sea Ice	s^{-1}	When computing the time-mean here, the time samples, weighted by the area of sea ice, are accumulated and then divided by the sum of the weights. Report as "missing" in regions free of sea ice.		divice
2	Strain Rate Shear of Sea Ice	s^{-1}	When computing the time-mean here, the time samples, weighted by the area of sea ice, are accumulated and then divided by the sum of the weights. Report as "missing" in regions free of sea ice.		shrice
2	Sea Ice Ridging Rate	s^{-1}		How exactly is this defined? Are time-means weighted by sea ice area?	ridgice

unconfirmed or proposed standard name	unformatted units	cell_methods	valid min	valid max	mean absolute min	mean absolute max	positive	type	CMOR dimensions	CMOR variable name	realm
	%	time: mean						real	longitude latitude time	sic	seaIce ocean
	m	time: mean area: mean where sea						real	longitude latitude time	sit	seaIce ocean
	kg m-2 s-1	time: mean area: mean where sea_ice over sea					up	real	longitude latitude time	evap	seaIce
	m	time: mean area: mean where sea						real	longitude latitude time	snd	seaIce
	%	time: mean						real	longitude latitude time	snc	seaIce
bare_sea_ice_albedo	1	time: mean area: mean where sea_ice						real	longitude latitude time	ialb	seaIce
sea_ice_thickness_in_categories	m	time: mean area: mean where sea						real	longitude latitude icetype time	sitn	seaIce
sea_ice_area_fraction_in_categories	%	time: mean						real	longitude latitude icetype time	sicn	seaIce
sea_ice_salinity	psu	time: mean (weighted by mass of sea ice)						real	longitude latitude time	ssi	seaIce
surface_temperature_of_sea_ice	K	time: mean (weighted by area of sea ice)						real	longitude latitude time	tsice	seaIce
temperature_at_interface_between_sea_ice_and_snow	K	time: mean (weighted by area of snow-covered sea ice)						real	longitude latitude time	tsnint	seaIce

surface_rainfall_rate_into_the_sea_ice_portion_of_the_grid_cell	kg m-2 s-1	time: mean area: mean where sea_ice over sea		real	longitude latitude time	pr	seaIce
surface_snowfall_rate_into_the_sea_ice_portion_of_the_grid_cell	kg m-2 s-1	time: mean area: mean where sea_ice over sea		real	longitude latitude time	prsn	seaIce
age_of_sea_ice	years	time: mean (weighted b mass of sea ice)		real	longitude latitude time	ageice	seaIce
frazil_sea_ice_growth_(leads)_rate	kg m-2 s-1	time: mean area: mean where sea		real	longitude latitude time	grFrazil	seaIce
congelation_sea_ice_growth_rate	kg m-2 s-1	time: mean area: mean where sea		real	longitude latitude time	grCongel	seaIce
lateral_sea_ice_growth_rate	kg m-2 s-1	time: mean area: mean where sea		real	longitude latitude time	grLateral	seaIce
snow-ice_formation_rate	kg m-2 s-1	time: mean area: mean where sea		real	longitude latitude time	snoToIce	seaIce
snow_melt_rate	kg m-2 s-1	time: mean area: mean where sea		real	longitude latitude time	snomelt	seaIce
rate_of_melt_at_upper_surface_of_sea_ice	kg m-2 s-1	time: mean area: mean where sea		real	longitude latitude time	tmelt	seaIce
rate_of_melt_at_sea_ice_base	kg m-2 s-1	time: mean area: mean where sea		real	longitude latitude time	bmelt	seaIce
sea_ice_total_heat_content	J	time: mean (weighted by mass of sea ice)		real	longitude latitude time	hcice	seaIce
	W m-2	time: mean area: mean where sea_ice over sea	down	real	longitude latitude time	rsdssi	seaIce
	W m-2	time: mean area: mean where sea_ice over sea	up	real	longitude latitude time	rsussi	seaIce
	W m-2	time: mean area: mean where sea_ice over sea	down	real	longitude latitude time	rldssi	seaIce
	W m-2	time: mean area: mean where sea_ice over sea	up	real	longitude latitude time	rlussi	seaIce
	W m-2	time: mean area: mean where sea_ice over sea	up	real	longitude latitude time	hfssi	seaIce
	W m-2	time: mean area: mean where sea_ice over sea	up	real	longitude latitude time	hflssi	seaIce
	kg m-2	time: mean area: mean where sea_ice over sea	up	real	longitude latitude time	sblsi	seaIce
	kg s-1	time: mean		real	longitude latitude time	transix	seaIce

kg s-1	time: mean		real	longitude latitude time	transiy	sealce
kg s-1	time: mean		real	longitude latitude time	transifs	sealce
N m-2	time: mean (weighted by area of sea ice)	down	real	longitude latitude time	strairx	sealce
N m-2	time: mean (weighted by area of sea ice)	down	real	longitude latitude time	strairy	sealce
N m-2	time: mean (weighted by area of sea ice)		real	longitude latitude time	strocnx	sealce ocean
N m-2	time: mean (weighted by area of sea ice)		real	longitude latitude time	strocny	sealce ocean
N m-2	time: mean (weighted by area of sea ice)		real	longitude latitude time	streng	sealce
s-1	time: mean (weighted by area of sea ice)		real	longitude latitude time	divice	sealce
s-1	time: mean (weighted by area of sea ice)		real	longitude latitude time	shrice	sealce
s-1	time: mean		real	longitude latitude time	ridgice	sealce

CMOR Table aero: Monthly Mean Aerosol-Related Fields

aero

(All Saved on the Atmospheric Grid)

In CMOR Table aero: *2-D fields on atmospheric grid*

Priority	long name	units	comment	questions	output variable name	confirmed or likely to be confirmed standard name
	Aerosol Optics					
1	Ambient Aerosol Opitical Thickness at 550 nm	1	atmosphere_optical_thickness_due_to_ambient_aerosol: AOD from the ambient aerosls (i.e., includes aerosol water). Does not include AOD from stratospheric aerosols if these are prescribed but includes other possible background aerosol types.		od550aer	
1	Ambient Fine Aerosol Opitical Thickness at 550 nm	1	atmosphere_optical_thickness_due_to_pm1_ambient_aerosol: od550 due to particles with wet diameter less than 1 um ("ambient" means "wetted"). When models do not include explicit size information, it can be assumed that all anthropogenic aerosols and natural secondary aerosols have diameter less than 1 um		od550lt1aer	
1	Ambient Aerosol Absorption Optical Thickness at 550 nm	1	atmosphere_absorption_optical_thickness_due_to_aerosol	Is this for "ambient" aerosol?	abs550aer	
2	Ambient Aerosol Opitical Thickness at 870 nm	1	atmosphere_optical_thickness_due_to_aerosol	Is this identical to the first entry in this table, except at 870 nanometers?	od870aer	
	Aerosol Budgets					
1	Emission Rate of Dry Aerosol Organic Matter	kg m^{-2} s^{-1}	tendency of atmosphere mass content of organic matter dry aerosol due to net production and emission. This is the sum of total emission of POA and total production of SOA (see next two entries), and it should only be reported if POA and SOA cannot be separately reported. "Mass" refers to the mass of organic matter, not mass of organic carbon alone	Doesn't "emission" include "production". How do they differ? Should the long_name include "Total"?	emioa	
1	Emission Rate of Dry Aerosol Primary Organic Matter	kg m^{-2} s^{-1}	tendency_of_atmosphere_mass_content_of_primary_organic_matter_dry_aerosol_due_to_net_production_and_emission: "mass" refers to the mass of primary organic matter, not mass of organic carbon alone.	should this be POA or POM? Why is suggested variable name emi_pom while description is POA?	emipom	
1	Emission Rate of Dry Aerosol Secondary Organic Matter	kg m^{-2} s^{-1}	tendency_of_atmosphere_mass_content_of_secondary_organic_matter_dry_aerosol_due_to_net_production: If model lumps SOA emissions with POA, then report the sum of POA and SOA emissions as POA emissions.		chepsoa	tendency_of_atmosphere_mass_content_of_secondary_particulate_organic_matter_dry_aerosol_due_to_net_chemical_production
1	Emission Rate of Black Carbon Aerosol Mass	kg m^{-2} s^{-1}	tendency_of_atmosphere_mass_content_of_black_carbon_dry_aerosol_due_to_emission		emibc	tendency_of_atmosphere_mass_content_of_black_carbon_dry_aerosol_due_to_emission
3	Dry Deposition Rate of Dry Aerosol Organic Matter	kg m^{-2} s^{-1}	tendency_of_atmosphere_mass_content_of_organic_dry_aerosol_due_to_dry_deposition: This is the sum of dry deposition of POA and dry deposition of SOA (see next two entries), and it should only be reported if POA and SOA cannot be separately reported. "Mass" refers to the mass of organic matter, not mass of organic carbon alone		?	tendency_of_atmosphere_mass_content_of_particulate_organic_matter_dry_aerosol_due_to_dry_deposition
3	Dry Deposition Rate of Dry Aerosol Primary Organic Matter	kg m^{-2} s^{-1}	tendency_of_atmosphere_mass_content_of_primary_organic_matter_dry_aerosol_due_to_dry_deposition	should this be POA or POM? Why is suggested variable name dry_pom	ddeppom	tendency_of_atmosphere_mass_content_of_primary_particulate_organic_matter_dry_aerosol_due_to_dry_deposition
3	Dry Deposition Rate of Dry Aerosol Secondary Organic Matter	kg m^{-2} s^{-1}	tendency_of_atmosphere_mass_content_of_secondary_organic_dry_aerosol_due_to_dry_deposition		ddepsoa	tendency_of_atmosphere_mass_content_of_secondary_particulate_organic_matter_dry_aerosol_due_to_dry_deposition
3	Dry Deposition Rate of Black Carbon Aerosol Mass	kg m^{-2} s^{-1}	tendency_of_atmosphere_mass_content_of_black_carbon_dry_aerosol_due_to_dry_deposition		ddepbc	tendency_of_atmosphere_mass_content_of_black_carbon_dry_aerosol_due_to_dry_deposition

3	Wet Deposition Rate of Dry Aerosol Organic Matter	kg m^{-2} s^{-1}	tendency_of_atmosphere_mass_content_of_organic_matter_dry_aerosols_due_to_wet_deposition: This is the sum of wet deposition of POA and wet deposition of SOA (see next two entries), and it should only be reported if POA and SOA cannot be separately reported. "Mass" refers to the mass of organic matter, not mass of organic carbon alone	wdepom	tendency_of_atmosphere_mass_content_of_particulate_organic_matter_dry_aerosol_due_to_wet_deposition
3	Wet Deposition Rate of Dry Aerosol Primary Organic Matter	kg m^{-2} s^{-1}	tendency_of_atmosphere_mass_content_of_primary_organic_matter_dry_aerosols_due_to_wet_deposition	wdeppom	tendency_of_atmosphere_mass_content_of_primary_particulate_organic_matter_dry_aerosol_due_to_wet_deposition
3	Wet Deposition Rate of Dry Aerosol Secondary Organic Matter	kg m^{-2} s^{-1}	tendency_of_atmosphere_mass_content_of_secondary_organic_dry_aerosol_due_to_wet_deposition	wdepsoa	tendency_of_atmosphere_mass_content_of_secondary_particulate_organic_matter_dry_aerosol_due_to_wet_deposition
3	Wet Deposition Rate of Black Carbon Aerosol Mass	kg m^{-2} s^{-1}	tendency_of_atmosphere_mass_content_of_black_carbon_dry_aerosol_due_to_wet_deposition	wdepbc	tendency_of_atmosphere_mass_content_of_black_carbon_dry_aerosol_due_to_wet_deposition
1	Total Emission of Primary Aerosol from Biomass Burning	kg m^{-2} s^{-1}	tendency of atmosphere mass content of primary organic matter dry aerosol due to emission: This does not include sources of secondary aerosols from biomass burning aerosols, such as SO2 or SOA.	emibb	tendency_of_atmosphere_mass_content_of_primary_particulate_organic_matter_dry_aerosol_due_to_emission
1	Total Emission Rate of SO2	kg m^{-2} s^{-1}	tendency_of_atmosphere_mass_content_of_sulfur_dioxide_due_to_emission: mass refers to SO2, not S.	emiso2	tendency_of_atmosphere_mass_content_of_sulfur_dioxide_due_to_emission
1	Total Direct Emission Rate of SO4	kg m^{-2} s^{-1}	tendency_of_atmosphere_mass_content_of_sulfate_dry_aerosol_due_to_net_production_and_emission: mass refers to SO4, not S	emiso4	
1	Total Emission Rate of DMS	kg m^{-2} s^{-1}	tendency_of_atmosphere_mass_content_of_dimethyl_sulfide_due_to_emission: mass refers to DMS, not S	emidms	tendency_of_atmosphere_mass_content_of_dimethyl_sulfide_due_to_emission
3	Dry Deposition Rate of SO2	kg m^{-2} s^{-1}	tendency_of_atmosphere_mass_content_of_sulfur_dioxide_due_to_dry_deposition	ddepso2	tendency_of_atmosphere_mass_content_of_sulfur_dioxide_due_to_dry_deposition
1	Dry Deposition Rate of SO4	kg m^{-2} s^{-1}	tendency_of_atmosphere_mass_content_of_sulfate_due_to_dry_deposition	ddepso4	tendency_of_atmosphere_mass_content_of_sulfate_dry_aerosol_due_to_dry_deposition
3	Dry Deposition Rate of DMS	kg m^{-2} s^{-1}	tendency_of_atmosphere_mass_content_of_dimethyl_sulfide_due_to_dry_deposition: omit if DMS is not dry deposited in the model.	ddepdms	tendency_of_atmosphere_mass_content_of_dimethyl_sulfide_due_to_dry_deposition
1	Wet Deposition Rate of SO4	kg m^{-2} s^{-1}	tendency_of_atmosphere_mass_content_of_sulfate_dry_aerosol_due_to_wet_deposition	wdepso4	tendency_of_atmosphere_mass_content_of_sulfate_dry_aerosol_due_to_wet_deposition
3	Wet Deposition Rate of SO2	kg m^{-2} s^{-1}	tendency_of_atmosphere_mass_content_of_sulfur_dioxide_due_to_wet_deposition	wdepso2	tendency_of_atmosphere_mass_content_of_sulfur_dioxide_due_to_wet_deposition
3	Wet Deposition Rate of DMS	kg m^{-2} s^{-1}	tendency_of_atmosphere_mass_content_of_dimethyl_sulfide_due_to_wet_deposition: omit if DMS is not wet deposited in the model.	wdepdms	tendency_of_atmosphere_mass_content_of_dimethyl_sulfide_due_to_wet_deposition
1	Total Emission Rate of NH3	kg m^{-2} s^{-1}	tendency_of_atmosphere_mass_content_of_ammonia_due_to_emission	eminh3	tendency_of_atmosphere_mass_content_of_ammonia due to emission
3	Dry Deposition Rate of NH3	kg m^{-2} s^{-1}	tendency_of_atmosphere_mass_content_of_ammonia_due_to_dry_deposition	ddepnh3	tendency_of_atmosphere_mass_content_of_ammonia due to dry deposition
1	Dry Deposition Rate of NH4	kg m^{-2} s^{-1}	tendency_of_atmosphere_mass_content_of_ammonium_due_to_dry_deposition	ddepnh4	tendency_of_atmosphere_mass_content_of_ammonium_dry_aerosol_due_to_dry_deposition?
1	Wet Deposition Rate of NH4+NH3	kg m^{-2} s^{-1}	tendency_of_atmosphere_mass_content_of_ammonium_due_to_wet_deposition	wdepnh4	tendency_of_atmosphere_mass_content_of_ammonium_dry_aerosol_due_to_wet_deposition?
1	Total Emission Rate of Seasalt	kg m^{-2} s^{-1}	tendency_of_atmosphere_mass_content_of_seasalt_dry_aerosol_due_to_emission	emiss	tendency_of_atmosphere_mass_content_of_seasalt_dry_aerosol_due_to_emission
3	Dry Deposition Rate of Seasalt	kg m^{-2} s^{-1}	tendency_of_atmosphere_mass_content_of_seasalt_dry_aerosol_due_to_dry_deposition	ddepss	tendency_of_atmosphere_mass_content_of_seasalt_dry_aerosol_due_to_dry_deposition
3	Wet Deposition Rate of Seasalt	kg m^{-2} s^{-1}	tendency_of_atmosphere_mass_content_of_seasalt_dry_aerosol_due_to_wet_deposition	wdepss	tendency_of_atmosphere_mass_content_of_seasalt_dry_aerosol_due_to_wet_deposition
1	Total Emission Rate of Dust	kg m^{-2} s^{-1}	tendency_of_atmosphere_mass_content_of_dust_dry_aerosol_due_to_emission	emidu	tendency_of_atmosphere_mass_content_of_dust_dry_aerosol_due_to_emission
1	Dry Deposition Rate of Dust	kg m^{-2} s^{-1}	tendency_of_atmosphere_mass_content_of_dust_dry_aerosol_due_to_dry_deposition	drydu	tendency_of_atmosphere_mass_content_of_dust_dry_aerosol_due_to_dry_deposition
1	Wet Deposition Rate of Dust	kg m^{-2} s^{-1}	tendency_of_atmosphere_mass_content_of_dust_dry_aerosol_due_to_wet_deposition	wetdu	tendency_of_atmosphere_mass_content_of_dust_dry_aerosol_due_to_wet_deposition
	Aerosol Loads				

1	Load of Dry Aerosol Organic Matter	kg m^{-2}	atmosphere dry organic content: This is the vertically integrated sum of atmosphere_primary_organic_content and atmosphere_secondary_organic_content (see next two table entries), and therefore should only be reported if those two components cannot be separately reported.		oavi	atmosphere_mass_content_of_particulate_organic_matter_dry_aerosol
1	Load of Dry Aerosol Primary Organic Matter	kg m^{-2}	atmosphere_primary_organic_content	why is this called "Load of POA" but the variable name is "loadpom"?	pomvi	atmosphere_mass_content_of_primary_particulate_organic_matter_dry_aerosol
1	Load of Dry Aerosol Secondary Organic Matter	kg m^{-2}	atmosphere_secondary_organic_content		soavi	atmosphere_mass_content_of_secondary_particulate_organic_matter_dry_aerosol
1	Load of Black Carbon Aerosol	kg m^{-2}	atmosphere_black_carbon_content		bcvi	atmosphere_mass_content_of_black_carbon_dry_aerosol
1	Load of SO4	kg m^{-2}	atmosphere_sulfate_content	Is this "dry" or "ambient"?	so4vi	
1	Load of Dust	kg m^{-2}	atmosphere_dust_content		dustvi	atmosphere_mass_content_of_dust_dry_aerosol
1	Load of Seasalt	kg m^{-2}	atmosphere_seasalt_content		ssvi	atmosphere_mass_content_of_seasalt_dry_aerosol
1	Load of NO3	kg m^{-2}	atmosphere_nitrate_content		no3vi	atmosphere_mass_content_of_nitrate_dry_aerosol?
3	Load of NH4	kg m^{-2}	atmosphere_ammonium_content		nh4vi	atmosphere_mass_content_of_ammonium_dry_aerosol?
	Surface Concentrations					
3	Surface Concentration of Dry Aerosol Organic Matter	kg m^{-3}	mass_concentration_of_organic_aerosol_in_air: In model lowest layer (The location of the model's lowest layer should be recorded in the netCDF output file). This is the sum of concentrations of primary and secondary organic aerosol (see next two table entries), and therefore should only be reported if those two components cannot be separately reported.	why is this called "Surface concentration of OA" but the variable name is "sfcpa"?	sfcpa	mass_concentration_of_particulate_organic_matter_dry_aerosol_in_air
3	Surface Concentration of Dry Aerosol Primary Organic Matter	kg m^{-3}	mass_concentration_of_primary_organic_aerosol_in_air: In model lowest layer (The location of the model's lowest layer should be recorded in the netCDF output file).		sfcpom	mass_concentration_of_primary_particulate_organic_matter_dry_aerosol_in_air
3	Surface Concentration of Dry Aerosol Secondary Organic Matter	kg m^{-3}	mass_concentration_of_secondary_organic_aerosol_in_air: In model lowest layer (The location of the model's lowest layer should be recorded in the netCDF output file). If the model lumps SOA with POA, then report their sum as POA.		sfcsoa	mass_concentration_of_secondary_particulate_organic_matter_dry_aerosol_in_air
3	Surface Concentration of Black Carbon Aerosol	kg m^{-3}	mass_concentration_of_black_carbon_aerosol_in_air: In model lowest layer (The location of the model's lowest layer should be recorded in the netCDF output file).		sfcbc	mass_concentration_of_black_carbon_dry_aerosol_in_air
3	Surface Concentration of SO4	kg m^{-3}	mass_concentration_of_sulfate_aerosol_in_air: In model lowest layer (The location of the model's lowest layer should be recorded in the netCDF output file).		sfcso4	
3	Surface Concentration of Dust	kg m^{-3}	mass_concentration_of_dust_aerosol_in_air: In model lowest layer (The location of the model's lowest layer should be recorded in the netCDF output file).		sfcdust	mass_concentration_of_dust_dry_aerosol_in_air
3	Surface Concentration of Seasalt	kg m^{-3}	mass_concentration_of_seasalt_aerosol_in_air: In model lowest layer (The location of the model's lowest layer should be recorded in the netCDF output file).		sfcss	mass_concentration_of_seasalt_dry_aerosol_in_air
3	Surface Concentration of NO3	kg m^{-3}	mass_concentration_of_nitrate_aerosol_in_air: In model lowest layer (The location of the model's lowest layer should be recorded in the netCDF output file).		sfcno3	mass_concentration_of_nitrate_dry_aerosol_in_air
3	Surface Concentration of NH4	kg m^{-3}	mass_concentration_of_ammonium_aerosol_in_air: In model lowest layer (The location of the model's lowest layer should be recorded in the netCDF output file).		sfcnh4	mass_concentration_of_ammonium_dry_aerosol_in_air
	Clouds and Radiation			Should we move any of this next sub-group to A_mon? perhaps at least the diffuse flux, which might be of use to the land people???		
2	Surface Diffuse Downward Shortwave Radiation	W m^{-2}	downwelling_diffuse_shortwave_flux_in_air		rsdsdiff	

2	Surface Diffuse Downward Clear Sky Shortwave Radiation	W m^{-2}	downwelling_diffuse_shortwave_flux_in_air_assuming_clear_sky		rsdscsdiff	
1	Liquid Cloud-Top Effective Droplet Radius	m	cloud_droplet_effective_radius_at_liquid_water_cloud_top: report value from uppermost model layer with liquid cloud or, if available, TOA two-dimensional view of liquid cloud. Weight by liquid cloud top fraction when reporting monthly mean.		reffclwtop	
1	Liquid Cloud Droplet Number Concentration	m^{-3}	cloud_droplet_number_concentration_in_liquid_water_clouds: report value from uppermost model layer with liquid cloud or, if available, TOA two-dimensional view of liquid cloud. Weight by liquid cloud top fraction when reporting monthly mean.	Does anyone know how to calculate "liquid cloud top fraction"?	cldncl	
1	Ice Crystal Number Concentration	m^{-3}	ice_crystal_number_concentration_in_ice_water_clouds: report value from uppermost model layer with ice cloud or, if available, TOA two-dimensional view of ice cloud. Weight by ice cloud top fraction when reporting monthly mean.	Does anyone know how to calculate "ice cloud top fraction"?	cldnci	
1	Column Integrated Cloud Droplet Number	m^{-2}	weight by cloud fraction or volume on each layer when reporting monthly mean	I don't understand weighting. When computing monthly means, do you want to weight each time-sample by the total cloud fraction (as seen from TOA)? Or what? Does this include both liquid and ice crystals?	cldnvi	atmosphere_number_content_of_cloud_droplets

In CMOR Table aero: *3-D aerosol-related mixing ratios and extinction on model levels*

1-year samples: 1850 to 1950 every 20 years, 1960 to 2020 every 10 years, 2040 to 2100 every 20 years

priority	long name	units	comment	questions	output variable name	confirmed or likely to be confirmed standard name
1	Ambient Aerosol Extinction Optical Thickness at 550 nm	m^{-1}	atmosphere_extinction_due_to_ambient_aerosol: "ambient" means "wetted"	In a previous table you ask for "optical thickness" and "absorbtion optical thickness". Why do you want "extinction opitical thickness" here?	ec550aer	
1	Concentration of Dry Aerosol Organic Matter	kg m^{-3}	mass_concentration_of_organic_matter_dry_aerosol_in_air	Is the following statement correct? This is the sum of concentrations of primary and secondary organic aerosols (see next two table entries), and therefore should only be reported if those two components cannot be separately reported. Why is long name "OA" and variable name has pom?	aerpom	
1	Concentration of Dry Aerosol Primary Organic Matter	kg m^{-3}	mass_concentration_of_primary_organic_matter_dry_aerosol_in_air	Why is longname "POA" and variable name "pom"?	aerpom	
1	Concentration of Dry Aerosol Secondary Organic Matter	kg m^{-3}	mass_concentration_of_secondary_organic_matter_dry_aerosol_in_air: If the model lumps SOA with POA, then report their sum as POA.		aersoa	

1	Concentration of Biomass Burning Aerosol	kg m^{-3}	mass_concentration_of_biomass_burning_dry_aerosol_in_air		aerbb
1	Concentration of Black Carbon Aerosol	kg m^{-3}	mass_concentration_ of_black_carbon_dry_aerosol_in_air		aerbc
1	Concentration of Secondary Primary Organic Matter Dry Aerosol	kg m^{-3}	mass_concentration_of_secondary_primary_organic_matter_dry_ aerosol_in_air	I don't understand what is meant by "secondary primary organic matter". How does it differ from "primary organic matter" and "secondary organic matter?	aerpoa
1	Concentration of Aerosol Water	kg m^{-3}	mass_concentration_of_water_in_ambient_aerosol_in_air: "ambient" means "wetted"		aerh2o
1	Concentration of SO4	kg m^{-3}	mass_concentration_of_sulfate_dry_aerosol_in_air		aerso4
1	Concentration of SO2	kg m^{-3}	mole_concentration_of_sulfur_dioxide_in_air		aerso2
1	Concentration of DMS	kg m^{-3}	mole_concentration_of_dimethyl_sulfide_in_air		aerdms
1	Concentration of NO3 Aerosol	kg m^{-3}	mass_concentration_ of_nitrate_dry_aerosol_in_air		aerno3
1	Concentration of NH4	kg m^{-3}	mass_concentration_of_ammonium_dry_aerosol_in_air		aernh4
1	Concentration of Seasalt	kg m^{-3}	mass_concentration_ of_seasalt_dry_aerosol_in_air		aerss
1	Concentration of Dust	kg m^{-3}	mass_concentration_ of_dust_dry_aerosol_in_air		aerdust
2	Aerosol Number Concentration	m^{-3}	number_concentration_of_ambient_aerosol_in_air		aerno3
3	Number Concentration of Nucleation Mode Aerosol	m^{-3}	number_concentration_of_ambient_aerosol_in_nucleation_mode _in_air: include all particles with diameter smaller than 3 nm		aernumsmall
2	Number Concentration Coarse Mode Aerosol	m^{-3}	number_concentration_of_ambient_aerosol_in_coarse_mode_in_ air: include all particles with diameter larger than 1 micron		aernumlarge
1	Stratiform Cloud Droplet Effective Radius	m	The effective radius is defined as the ratio of the third moment over the second moment of the particle size distribution.	Do ice and liquid water drops all contribute? Should time-means be weighted by the extent of cloud in the layer or cloud water mass in the layer or what? Should probably make consistent with CFMIP 3-hourly data, but that data is not a time-mean.	reffclws
1	Convective Cloud Droplet Effective Radius	m	The effective radius is defined as the ratio of the third moment over the second moment of the particle size distribution.	Do ice and liquid water drops all contribute? Should time-means be weighted by the extent of cloud in the layer or cloud water mass in the layer or what? Should probably make consistent with CFMIP 3-hourly data.	reffclwc

unconfirmed or proposed standard name	unformatted units	cell_methods	valid min	valid max	mean absolute min	mean absolute max	positive	type	CMOR dimensions	CMOR variable name	realm
atmosphere_optical_thickness_due_to_ambient_aerosol PROPOSED AND UNDER DISCUSSION	1	time: mean						real	longitude latitude time	od550aer	aerosol
atmosphere_optical_thickness_due_to_pm1_ambient_aerosol NOT PROPOSED	1	time: mean						real	longitude latitude time	od550lt1aer	aerosol
atmosphere_absorption_optical_thickness_due_to_aerosol	1	time: mean						real	longitude latitude time	abs550aer	aerosol
atmosphere_optical_thickness_due_to_ambient_aerosol PROPOSED AND UNDER DISCUSSION	1	time: mean						real	longitude latitude time	od870aer	aerosol
											aerosol
	kg m-2 s-1	time: mean						real	longitude latitude time	emioa	aerosol
tendency_of_atmosphere_mass_content_of_primary_particulate_organic_matter_dry_aerosol_due_to_net_production_and_emission PROPOSED AND UNDER DISCUSSION	kg m-2 s-1	time: mean						real	longitude latitude time	emipom	aerosol
	kg m-2 s-1	time: mean						real	longitude latitude time	chepsoa	aerosol
	kg m-2 s-1	time: mean						real	longitude latitude time	emibc	aerosol
	kg m-2 s-1	time: mean						real	longitude latitude time	?	aerosol
	kg m-2 s-1	time: mean						real	longitude latitude time	ddeppom	aerosol
	kg m-2 s-1	time: mean						real	longitude latitude time	ddepsoa	aerosol
	kg m-2 s-1	time: mean						real	longitude latitude time	ddepbc	aerosol

	kg m-2 s-1	time: mean		real	longitude latitude time	wdepom	aerosol
	kg m-2 s-1	time: mean		real	longitude latitude time	wdeppom	aerosol
	kg m-2 s-1	time: mean		real	longitude latitude time	wdepsoa	aerosol
	kg m-2 s-1	time: mean		real	longitude latitude time	wdepbc	aerosol
	kg m-2 s-1	time: mean		real	longitude latitude time	emibb	aerosol
	kg m-2 s-1	time: mean		real	longitude latitude time	emiso2	aerosol
tendency_of_atmosphere_mass_content_of_sulfate_dry_aerosol_due_to_net_chemical_production_and_emission PROPOSED AND UNDER DISCUSSION	kg m-2 s-1	time: mean		real	longitude latitude time	emiso4	aerosol
tendency_of_atmosphere_mass_content_of_dimethyl_sulfide_due_to_emission	kg m-2 s-1	time: mean		real	longitude latitude time	emidms	aerosol
	kg m-2 s-1	time: mean		real	longitude latitude time	ddepso2	aerosol
	kg m-2 s-1	time: mean		real	longitude latitude time	ddepso4	aerosol
	kg m-2 s-1	time: mean		real	longitude latitude time	ddepdms	aerosol
	kg m-2 s-1	time: mean		real	longitude latitude time	wdepso4	aerosol
	kg m-2 s-1	time: mean		real	longitude latitude time	wdepso2	aerosol
	kg m-2 s-1	time: mean		real	longitude latitude time	wdepdms	aerosol
	kg m-2 s-1	time: mean		real	longitude latitude time	eminh3	aerosol
	kg m-2 s-1	time: mean		real	longitude latitude time	ddepnh3	aerosol
	kg m-2 s-1	time: mean		real	longitude latitude time	ddepnh4	aerosol
	kg m-2 s-1	time: mean		real	longitude latitude time	wdepnh4	aerosol
	kg m-2 s-1	time: mean		real	longitude latitude time	emiss	aerosol
	kg m-2 s-1	time: mean		real	longitude latitude time	ddepss	aerosol
	kg m-2 s-1	time: mean		real	longitude latitude time	wdepss	aerosol
	kg m-2 s-1	time: mean		real	longitude latitude time	emidu	aerosol
	kg m-2 s-1	time: mean		real	longitude latitude time	drydu	aerosol
	kg m-2 s-1	time: mean		real	longitude latitude time	wetdu	aerosol

	kg m-2	time: mean	real	longitude latitude time	oavi	aerosol
	kg m-2	time: mean	real	longitude latitude time	pomvi	aerosol
	kg m-2	time: mean	real	longitude latitude time	soavi	aerosol
	kg m-2	time: mean	real	longitude latitude time	bcvi	aerosol
atmosphere_sulfate_content PROPOSED AND UNDER DISCUSSION	kg m-2	time: mean	real	longitude latitude time	so4vi	aerosol
	kg m-2	time: mean	real	longitude latitude time	dustvi	aerosol
	kg m-2	time: mean	real	longitude latitude time	ssvi	aerosol
	kg m-2	time: mean	real	longitude latitude time	no3vi	aerosol
	kg m-2	time: mean	real	longitude latitude time	nh4vi	aerosol
	kg m-3	time: mean	real	longitude latitude alev1, time	sfcpa	aerosol
	kg m-3	time: mean	real	longitude latitude alev1, time	sfcpom	aerosol
	kg m-3	time: mean	real	longitude latitude alev1, time	sfcsoa	aerosol
	kg m-3	time: mean	real	longitude latitude alev1, time	sfcbc	aerosol
mass_concentration_of_sulfate_aerosol_in_air PROPOSED AND UNDER DISCUSSION	kg m-3	time: mean	real	longitude latitude alev1, time	sfcso4	aerosol
	kg m-3	time: mean	real	longitude latitude alev1, time	sfcdust	aerosol
	kg m-3	time: mean	real	longitude latitude alev1, time	sfcss	aerosol
	kg m-3	time: mean	real	longitude latitude alev1, time	sfcno3	aerosol
	kg m-3	time: mean	real	longitude latitude alev1, time	sfcnh4	aerosol
downwelling_diffuse_shortwave_flux_in_air	W m-2	time: mean	real	longitude latitude time	rsdsdiff	aerosol land

downwelling_diffuse_shortwave_flux_in_air_assuming_clear_sky	W m-2	time: mean						real	longitude latitude time	rsdscsdiff	aerosol land
cloud_droplet_effective_radius_at_liquid_water_cloud_top	m	time: mean						real	longitude latitude time	reffclwtop	aerosol
cloud_droplet_number_concentration_in_liquid_water_clouds	m-3	time: mean						real	longitude latitude time	cldncl	aerosol
ice_crystal_number_concentration_in_ice_water_clouds	m-3	time: mean						real	longitude latitude time	cldnci	aerosol
	m-2	time: mean						real	longitude latitude time	cldnvi	aerosol

unconfirmed or proposed standard name	unformatted units	cell_methods	valid min	valid max	mean absolute min	mean absolute max	positive	type	CMOR dimensions	CMOR variable name	realm
atmosphere_extinction_due_to_ambient_aerosol	m-1	time: mean							longitude latitude alevel time	ec550aer	aerosol
mass_concentration_of_organic_matter_dry_aerosol_in_air	kg m-3	time: mean							longitude latitude alevel time	aerpom	aerosol
mass_concentration_of_primary_organic_matter_dry_aerosol_in_air	kg m-3	time: mean							longitude latitude alevel time	aerpom	aerosol
mass_concentration_of_secondary_organic_matter_dry_aerosol_in_air	kg m-3	time: mean							longitude latitude alevel time	aersoa	aerosol

mass_concentration_of_biomass_burning_dry_aerosol_in_air	kg m-3	time: mean	longitude latitude alevel time	aerbb	aerosol
mass_concentration_of_black_carbon_dry_aerosol_in_air	kg m-3	time: mean	longitude latitude alevel time	aerbc	aerosol
mass_concentration_of_secondary_primary_organic_matter_dry_aerosol_in_air	kg m-3	time: mean	longitude latitude alevel time	aerpoa	aerosol
mass_concentration_of_water_in_ambient_aerosol_in_air	kg m-3	time: mean	longitude latitude alevel time	aerh2o	aerosol
mass_concentration_of_sulfate_dry_aerosol_in_air	kg m-3	time: mean	longitude latitude alevel time	aerso4	aerosol
mole_concentration_of_sulfur_dioxide_in_air	kg m-3	time: mean	longitude latitude alevel time	aerso2	aerosol
mole_concentration_of_dimethyl_sulfide_in_air	kg m-3	time: mean	longitude latitude alevel time	aerdms	aerosol
mass_concentration_of_nitrate_dry_aerosol_in_air	kg m-3	time: mean	longitude latitude alevel time	aerno3	aerosol
mass_concentration_of_ammonium_dry_aerosol_in_air	kg m-3	time: mean	longitude latitude alevel time	aernh4	aerosol
mass_concentration_of_seasalt_dry_aerosol_in_air	kg m-3	time: mean	longitude latitude alevel time	aerss	aerosol
mass_concentration_of_dust_dry_aerosol_in_air	kg m-3	time: mean	longitude latitude alevel time	aerdust	aerosol
number_concentration_of_ambient_aerosol_in_air	m-3	time: mean	longitude latitude alevel time	aerno3	aerosol
number_concentration_of_ambient_aerosol_in_nucleation_mode_in_air	m-3	time: mean	longitude latitude alevel time	aernumsmall	aerosol
number_concentration_of_ambient_aerosol_in_coarse_mode_in_air	m-3	time: mean	longitude latitude alevel time	aernumlarge	aerosol
	m	time: mean	longitude latitude alevel time	reffclws	aerosol
	m	time: mean	longitude latitude alevel time	reffclwc	aerosol

CMOR Table da: Daily Mean Atmosphere, Ocean and Surface Fields da

(saved on the model's atmospheric or ocean grid, as appropriate)

In CMOR Table da: *2-D daily mean atmospheric and surface fields*

The following daily mean variables should be collected for all simulations (for the full duration of each experiment).

priority	long name	units	comment	questions	output variable name	confirmed or likely to be confirmed standard name
1	Near-Surface Specific Humidity	1	near-surface (usually, 2 meter) specific humidity.		huss	specific_humidity
1	Daily Minimum Near-Surface Air Temperature	K	daily-minimum near-surface (usually, 2 meter) air temperature.		tasmin	air_temperature
1	Daily Maximum Near-Surface Air Temperature	K	daily-maximum near-surface (usually, 2 meter) air temperature.		tasmax	air_temperature
1	Near-Surface Air Temperature	K	daily-mean near-surface (usually, 2 meter) air temperature.		tas	air_temperature
1	Precipitation	kg m^{-2} s^{-1}	at surface; includes both liquid and solid phases from all types of clouds (both large-scale and convective)		pr	precipitation_flux
1	Sea Level Pressure	Pa			psl	air_pressure_at_sea_level
1	Daily-Mean Wind Speed	m s^{-1}	near-surface (usually, 10 meters) wind speed.		sfcWind	wind_speed
1	Square of Sea Surface Temperature	K^2	square of temperature of liquid ocean, averaged over the day. Report on the ocean grid. This variable appears in WGOMD Table 2.2		tossq	square_of_sea_surface_temperature
1	Sea Surface Temperature	K	temperature of liquid ocean. Report on the ocean grid. This variable appears in WGOMD Table 2.2		tos	surface_temperature

The rest of the daily mean fields on this spreadsheet should be collected only for a single member of the following simulations:

experiment	*time-period requested*
historical	Jan 1950 -- Dec 2005
future simulations driven by RCP concentrations or emissions	only years 2006-2100, 2181-2200, and 2281-2300
AMIP	all years

CMOR Table da: *2-D daily-mean atmospheric and surface fields*

priority	long name	units	comment	questions	output variable name	confirmed or likely to be confirmed standard name
1	Moisture in Upper 0.1 m of Soil Column	1		What is meant by "near surface" here? . In Amon we ask for moisture_content_of_soil_layer and request the user compute the mass of water in all phases in the upper 0.1 meters of soil. Is that what is requested here? Also check units! Should this be soil moisture content with units of kg m-2?	mrsos?	
1	Near-Surface Relative Humidity	%	near-surface (usually, 2 meter) relative humidity. This is the relative humidity with respect to liquid water for T> 0 C, and with respect to ice for T<0 C.		rhs	relative_humidity
1	Surface Daily Minimum Relative Humidity	%	near-surface (usually, 2 meter) minimum relative humidity. This is the relative humidity with respect to liquid water for T> 0 C, and with respect to ice for T<0 C.		rhsmin	relative_humidity
1	Surface Daily Maximum Relative Humidity	%	near-surface (usually, 2 meter) maximum relative humidity. This is the relative humidity with respect to liquid water for T> 0 C, and with respect to ice for T<0 C.		rhsmax	relative_humidity
1	Snow Area Fraction	%			snc	snow_area_fraction
1	Total Cloud Fraction	%	for the whole atmospheric column, as seen from the surface or the top of the atmosphere. Include both large-scale and convective cloud.		clt	cloud_area_fraction
1	Surface Temperature Where Land or Sea Ice	K	"skin" temperature of all surfaces except open ocean.	This has been changed from soil temperature to surface skin temperature outside regions of open ocean. If you want soil temperature, you must specify what thickness of surface soil you want to average over.	tsl	
1	Surface Snow Amount	kg m^{-2}	Compute as the mass of surface snow on the land portion of the grid cell divided by the land area in the grid cell; report 0.0 where the land fraction is 0; exclude snow on vegetation canopy or on sea ice.		snw	surface_snow_amount
1	Convective Precipitation	kg m^{-2} s^{-1}	at surface; includes both liquid and solid phases.		prc	convective_precipitation_flux
1	Solid Precipitation	kg m^{-2} s^{-1}	at surface; includes precipitation of all forms of water in the solid phase		prsn	solid_precipitation_flux
1	Total Runoff	kg m^{-2} s^{-1}	compute as the total runoff (including "drainage" through the base of the soil model) leaving the land portion of the grid cell divided by the land area in the grid cell.		mrro	runoff_flux
1	Eastward Wind	m s^{-1}	near-surface (usually, 10 meters) eastward component of wind.		uas	eastward_wind
1	Northward Wind	m s^{-1}	near-surface (usually, 10 meters) northward component of wind.		vas	northward_wind
1	Daily Maximum Wind Speed	m s^{-1}	near-surface (usually, 10 meters) wind speed.		sfcWindmax	wind_speed
1	Surface Upward Latent Heat Flux	W m^{-2}			hfls	surface_upward_latent_heat_flux
1	Surface Upward Sensible Heat Flux	W m^{-2}			hfss	surface_upward_sensible_heat_flux
1	Surface Downwelling Longwave Radiation	W m^{-2}			rlds	surface_downwelling_longwave_flux_in_air
1	Surface Upwelling Longwave Radiation	W m^{-2}			rlus	surface_upwelling_longwave_flux_in_air
1	Surface Downwelling Shortwave Radiation	W m^{-2}			rsds	surface_downwelling_shortwave_flux_in_air
1	Surface Upwelling Shortwave Radiation	W m^{-2}			rsus	surface_upwelling_shortwave_flux_in_air

1	TOA Outgoing Longwave Radiation	W m^{-2}	at the top of the atmosphere.	rlut	toa_outgoing_longwave_flux
1	Mean Square of Sea Surface Temperature	K^2	Report on ocean's grid. This variable appears in WGOMD Table 2.2	tsosq	
1	Eastward Sea Ice Velocity	m s^{-1}	Report on ocean's grid. Report as "missing" in regions free of sea ice.	usi	eastward_sea_ice_velocity
1	Northward Sea Ice Velocity	m s^{-1}	Report on ocean's grid. Report as "missing" in regions free of sea ice.	vsi	northward_sea_ice_velocity
1	Sea Ice Area Fraction	%	fraction of grid cell covered by sea ice. Report on ocean's grid.	sic	sea_ice_area_fraction
1	Sea Ice Thickness	m	Report on ocean's grid. Compute the mean thickness of sea ice in the ocean portion of the grid cell (averaging over the entire ocean portion, including the ice-free fraction). Report as 0.0 in regions free of sea ice.	sit	sea_ice_thickness

In CMOR Table da: daily mean 3-D atmospheric fields on the following pressure surfaces: 1000, 850, 700, 500, 250, 100 hPa

priority	long name	units	comment	questions	output variable name	confirmed or likely to be confirmed standard name
1	Air Temperature	K			ta	air_temperature
1	Relative Humidity	%	This is the relative humidity with respect to liquid water for T> 0 C, and with respect to ice for T<0 C.		hur	relative_humidity
1	Specific Humidity	1			hus	specific_humidity
1	omega (=dp/dt)	Pa s^{-1}	commonly referred to as "omega", this represents the vertical component of velocity in pressure coordinates (positive down)		wap	lagrangian_tendency_of_air_pressure
1	Northward Wind	m s^{-1}			va	northward_wind
1	Eastward Wind	m s^{-1}			ua	eastward_wind

unconfirmed or proposed standard name	unformatted units	cell_methods	valid min	valid max	mean absolute min	mean absolute max	positive	type	CMOR dimensions	CMOR variable name	realm
	1	time: mean						real	longitude latitude time height2m	huss	atmos
	K	time: minimum						real	longitude latitude time height2m	tasmin	atmos
	K	time: maximum						real	longitude latitude time height2m	tasmax	atmos
	K	time: mean						real	longitude latitude time height2m	tas	atmos
	kg m-2 s-1	time: mean						real	longitude latitude time	pr	atmos
	Pa	time: mean						real	longitude latitude time	psl	atmos
	m s-1	time: mean						real	longitude latitude time height10m	sfcWind	atmos
	K2	time:mean						real	longitude latitude time	tossq	atmos
	K	time: mean						real	longitude latitude time	tos	atmos

unconfirmed or proposed standard name	unformatted units	cell_methods	valid min	valid max	mean absolute min	mean absolute max	positive	type	CMOR dimensions	CMOR variable name	realm
	1	time: mean						real	longitude latitude time	mrsos?	atmos
	%	time: mean						real	longitude latitude time height2m	rhs	atmos
	%	time: minimum						real	longitude latitude time height2m	rhsmin	atmos
	%	time: maximum						real	longitude latitude time height2m	rhsmax	atmos
	%	time: mean						real	longitude latitude time	snc	atmos
	%	time: mean						real	longitude latitude time	clt	atmos
soil_temperature	K	time: mean						real	longitude latitude time	tsl	land
	kg m-2	time: mean area: mean where land						real	longitude latitude time	snw	land
	kg m-2 s-1	time: mean						real	longitude latitude time	prc	atmos
	kg m-2 s-1	time: mean						real	longitude latitude time	prsn	atmos
	kg m-2 s-1	time: mean area: mean where land						real	longitude latitude time	mrro	land
	m s-1	time: mean						real	longitude latitude time height10m	uas	atmos
	m s-1	time: mean						real	longitude latitude time height10m	vas	atmos
	m s-1	time: maximum						real	longitude latitude time height10m	sfcWindmax	atmos
	W m-2	time: mean					up	real	longitude latitude time	hfls	atmos
	W m-2	time: mean					up	real	longitude latitude time	hfss	atmos
	W m-2	time: mean					down	real	longitude latitude time	rlds	atmos
	W m-2	time: mean					up	real	longitude latitude time	rlus	atmos
	W m-2	time: mean					down	real	longitude latitude time	rsds	atmos
	W m-2	time: mean					up	real	longitude latitude time	rsus	atmos

	W m-2	time: mean			up	real	longitude latitude time	rlut	atmos
mean_square_of_sea_surface_temperature	K2	time: mean				real	longitude latitude time	tsosq	ocean
	m s-1	time: mean				real	longitude latitude time	usi	seaIce ocean
	m s-1	time: mean				real	longitude latitude time	vsi	seaIce ocean
	%	time: mean				real	longitude latitude time	sic	seaIce ocean
	m	time: mean area: mean where sea				real	longitude latitude time	sit	seaIce ocean

unconfirmed or proposed standard name	unformatted units	cell_methods	valid min	valid max	mean absolute min	mean absolute max	positive	type	CMOR dimensions	CMOR variable name	realm
	K	time: mean						real	longitude latitude plev6 time	ta	atmos
	%	time: mean						real	longitude latitude plev6 time	hur	atmos
	1	time: mean						real	longitude latitude plev6 time	hus	atmos
	Pa s-1	time: mean						real	longitude latitude plev6 time	wap	atmos
	m s-1	time: mean						real	longitude latitude plev6 time	va	atmos
	m s-1	time: mean						real	longitude latitude plev6 time	ua	atmos

CMOR Table 6hrLev: Fields (Sampled Every 6 Hours) for Driving Regional Models 6hrLev

The 6-hourly data on model levels should be sampled as *"snapshots"* (*not* as 6-hour means) at 0Z, 6Z, 12Z, and 18Z and should be collected only for the following experiments and years:

experiment	*time-period requested*
decadal hindcasts/forecasts	all years
historical	Jan 1950 - Dec 2005
AMIP	all years
RCP4.5 and RCP8.5	Jan 2006 - Dec 2100

priority	long name	units	comment	questions	output variable name	confirmed or likely to be confirmed standard name
1	Air Temperature	K	on all model levels		ta	air_temperature
1	Eastward Wind	m s^{-1}	on all model levels		ua	eastward_wind
1	Northward Wind	m s^{-1}	on all model levels		va	northward_wind
1	Specific Humidity	1	on all model levels		hus	specific_humidity
1	Surface Air Pressure	Pa	surface pressure, not mean sea level pressure		ps	surface_air_pressure

unconfirmed or proposed standard name	unformatted units	cell_methods	valid min	valid max	mean absolute min	mean absolute max	positive	type	CMOR dimensions	CMOR variable name	realm
	K							real	longitude latitude alevel time1	taLev	atmos
	m s-1							real	longitude latitude alevel time1	uaLev	atmos
	m s-1							real	longitude latitude alevel time1	vaLev	atmos
	1							real	longitude latitude alevel time1	husLev	atmos
	Pa							real	longitude latitude time1	ps	atmos

CMOR Table 6hrPlev: Fields (Sampled Every 6 Hours) for Storm-Track Analysis and other Advanced Diagnostic Applications 6hrPlev

The 6-hourly data on pressure levels should be sampled as *"snapshots"* (*not* as 6-hour means) at 0Z, 6Z, 12Z, and 18Z and should be collected only for the following experiments and years.

experiment	*time-period requested*
decadal hindcasts/forecasts	all years
historical	Jan 1950 - Dec 2005
AMIP	all years
RCP4.5 and RCP8.5	Jan 2006 - Dec 2100
preindustrial control	30 years -- preferably corresponding to years 1979-2008 of the historical run
Last glacial maximum paleo-run	last 30 years
mid-Holocene paleo- run	last 30 years

priority	long name	units	comment	questions	output variable name	confirmed or likely to be confirmed standard name
1	Eastward Wind	m s^{-1}	on the following pressure levels: 850, 500, 250 hPa		ua	eastward_wind
1	Northward Wind	m s^{-1}	on the following pressure levels: 850, 500, 250 hPa		va	northward_wind
1	Air Temperature	K	on the following pressure levels: 850, 500, 250 hPa		ta	air_temperature
1	Sea Level Pressure	Pa			psl	sea_level_pressure

unconfirmed or proposed standard name	unformatted units	cell_methods	valid min	valid max	mean absolute min	mean absolute max	positive	type	CMOR dimensions	CMOR variable name	realm
	m s-1							real	longitude latitude plev3 time1	uaPlev	atmos
	m s-1							real	longitude latitude plev3 time1	vaPlev	atmos
	K							real	longitude latitude plev3 time1	taPlev	atmos
	Pa							real	longitude latitude time1	psl	atmos

CMOR Table 3hr: 2-D Atmospheric and Surface Fields Sampled Every 3 Hours 3hr

all saved on the atmospheric grid and (except for precipitation) sampled synoptically at 0Z, 3Z, 6Z, 9Z, 12Z, 15Z, 18Z, and 21Z; precipitation should be averaged over 3-hour intervals (0-3Z, 3-6Z, 6-9Z, 9-12Z, 12-15Z, 15-18Z, 18-21Z, 21-24Z)

The 3-hourly data should be collected only for the following experiments and years:

experiment	*time-period requested*
decadal hindcasts/forecasts	all years
historical	Jan 1960 - Dec 2005
AMIP	all years
future simulations driven by RCP concentrations or emissions	Jan 2026 - Dec 2045, Jan 2081-Dec 2100, 2181-2200, and 2281-2300

priority	long name	units	comment	questions	output variable name	confirmed or likely to be confirmed standard name
1	Precipitation	kg m^{-2} s^{-1}	at surface; includes both liquid and solid phases. This is the 3-hour mean precipitation flux.		pr	precipitation_flux
1	Air Temperature	K	near-surface (usually, 2 meter) air temperature		tas	air_temperature
1	Surface Upward Latent Heat Flux	W m^{-2}			hfls	surface_upward_latent_heat_flux
1	Surface Upward Sensible Heat Flux	W m^{-2}			hfss	surface_upward_sensible_heat_flux
1	Surface Downwelling Longwave Radiation	W m^{-2}			rlds	surface_downwelling_longwave_flux_in_air
1	Surface Upwelling Longwave Radiation	W m^{-2}			rlus	surface_upwelling_longwave_flux_in_air
1	Surface Downwelling Shortwave Radiation	W m^{-2}			rsds	surface_downwelling_shortwave_flux_in_air
1	Surface Upwelling Shortwave Radiation	W m^{-2}			rsus	surface_upwelling_shortwave_flux_in_air
1	Eastward Near-Surface Wind Speed	m s^{-1}			uas	eastward_wind
1	Northward Near-Surface Wind Speed	m s^{-1}			vas	northward_wind
1	Near-Surface Specific Humidity	1	near-surface (usually 2 m) specific humidity.		huss	specific_humidity
1	Moisture in Upper 0.1 m of Soil Column	1		What is meant by "near surface" here? Also check units! Should this be soil moisture content with units of kg m^{-2}. In L_mon, we ask for "moisture content of soil layer (kg/m**2)", which we define as the top-most 0.1 meters. Is that what is requested here?	mrsos?	
1	Surface Temperature Where Land or Sea Ice	K	"skin" temperature of all surfaces except open ocean.	This has been changed from soil temperature to surface skin temperature outside regions of open ocean. CMOR can't write the proper specification for cell_methods for this variable because it requires "where" more than 1 surface type (i.e., both land and sea ice)	tsl	surface_temperature
1	Sea Surface Temperature	K	temperature of surface of open ocean		tso	sea_surface_temperature

1	Convective Precipitation	kg m^{-2} s^{-1}	at surface	prc	convective_precipitation_flux
1	Snowfall Flux	kg m^{-2} s^{-1}	at surface. Includes all forms of precipitating solid phase of water.	prsn	snowfall_flux
1	Total Runoff	kg m^{-2} s^{-1}	compute the total runoff (including "drainage" through the base of the soil model) leaving the land portion of the grid cell divided by the land area in the grid cell.	mrro	runoff_flux
1	Surface Downwelling Clear-Sky Longwave Radiation	W m^{-2}		rldscs	clear-sky_surface_downwelling_longwave_flux_in_air
1	Surface Downwelling Clear-Sky Shortwave Radiation	W m^{-2}		rsdscs	surface_downwelling_shortwave_flux_in_air_assuming_clear_sky
1	Surface Upwelling Clear-Sky Shortwave Radiation	W m^{-2}		rluscs	surface_upwelling_shortwave_flux_in_air_assuming_clear_sky
1	Surface Pressure	Pa	to diagnose atmospheric tides, this is better than mean sea level pressure.	ps	surface_pressure
1	Total Cloud Fraction	%		clt	total_cloud_fraction
1	Surface Downward Diffuse Shortwave Radiation	W m^{-2}		rsdsdiff	

unconfirmed or proposed standard name	unformatted units	cell_methods	valid min	valid max	mean absolute min	mean absolute max	positive	type	CMOR dimensions	CMOR variable name	realm
	kg m-2 s-1	time:mean						real	longitude latitude time	pr	atmos
	K	time: point						real	longitude latitude time height2m	tas	atmos
	W m-2	time: point					up	real	longitude latitude time1	hfls	atmos
	W m-2	time: point					up	real	longitude latitude time1	hfss	atmos
	W m-2	time: point					down	real	longitude latitude time1	rlds	atmos
	W m-2	time: point					up	real	longitude latitude time1	rlus	atmos
	W m-2	time: point					down	real	longitude latitude time1	rsds	atmos
	W m-2	time: point					up	real	longitude latitude time1	rsus	atmos
		time: point									atmos
	m s-1	time: point						real	longitude latitude time height10m	uas	atmos
	m s-1	time: point						real	longitude latitude time height10m	vas	atmos
	1	time: point						real	longitude latitude time height2m	huss	atmos
	1	time: point						real	longitude latitude time1	mrsos?	land
	K	time: point						real	longitude latitude time1	tsl	land
	K	time: point area: mean where sea						real	longitude latitude time1	tso	ocean

	kg m-2 s-1	time:mean		real	longitude latitude time	prc	atmos
	kg m-2 s-1	time:mean		real	longitude latitude time	prsn	atmos
	kg m-2 s-1	time: mean area: mean where land		real	longitude latitude time1	mrro	land
	W m-2	time: point	down	real	longitude latitude time1	rldscs	atmos
	W m-2	time: point	down	real	longitude latitude time1	rsdscs	atmos
	W m-2	time: point	up	real	longitude latitude time1	rluscs	atmos
	Pa	time: point		real	longitude latitude time1	ps	atmos
	%	time: point		real	longitude latitude time1	clt	atmos
surface_diffusive_downwelling_shortwave_radiative_flux_in_air	W m-2	time: point		real	longitude latitude time1	rsdsdiff	atmos

CMOR Table cfMon: CFMIP Monthly-Mean Cloud Diagnostic Fields cfMon

(All Saved on the Atmospheric Grid)

For further guidance, please see http://www.cfmip.net

The spread sheet "CFMIP expts." specifies the simulations and time-periods for which the cloud diagnostic fields listed on this spread sheet should be saved.

In CMOR Table cfMon: ***"CFMIP monthly 3D"-- monthly mean 3-D fields on model levels (or half levels in the case of fluxes)***

priority	long name	units	comment	questions	output variable name	confirmed or likely to be confirmed standard name
1	Upwelling Longwave Radiation	W m^{-2}	Include also the fluxes at the surface and TOA.		rlu	upwelling_longwave_flux_in_air
1	Upwelling Shortwave Radiation	W m^{-2}	Include also the fluxes at the surface and TOA.		rsu	upwelling_shortwave_flux_in_air
1	Downwelling Longwave Radiation	W m^{-2}	Include also the fluxes at the surface and TOA.		rld	downwelling_longwave_flux_in_air
1	Downwelling Shortwave Radiation	W m^{-2}	Include also the fluxes at the surface and TOA.		rsd	downwelling_shortwave_flux_in_air
1	Upwelling Clear-Sky Longwave Radiation	W m^{-2}	Include also the fluxes at the surface and TOA.		rlucs	upwelling_longwave_flux_in_air_assuming_clear_sky
1	Upwelling Clear-Sky Shortwave Radiation	W m^{-2}	Include also the fluxes at the surface and TOA.		rsucs	upwelling_shortwave_flux_in_air_assuming_clear_sky
1	Downwelling Clear-Sky Longwave Radiation	W m^{-2}	Include also the fluxes at the surface and TOA.		rldcs	downwelling_longwave_flux_in_air_assuming_clear_sky
1	Downwelling Clear-Sky Shortwave Radiation	W m^{-2}	Include also the fluxes at the surface and TOA.		rsdcs	downwelling_shortwave_flux_in_air_assuming_clear_sky
1	Air Temperature	K			ta	air_temperature
1	Tendency of Air Temperature	K s^{-1}			tnt	tendency_of_air_temperature
1	Tendency of Air Temperature due to Advection	K s^{-1}			tnta	tendency_of_air_temperature_due_to_advection
1	Tendency of Air Temperature due to Diabatic Processes	K s^{-1}			tntdp	tendency_of_air_temperature_due_to_diabatic_processes
1	Tendency of Air Temperature due to Stratiform Cloud Condensation and Evaporation	K s^{-1}			tntscce	
1	Tendency of Air Temperature due to Radiative Heating	K s^{-1}			tntr	tendency_of_air_temperature_due_to_radiative_heating
1	Tendency of Air Temperature due to Moist Convection	K s^{-1}			tntmc	
1	Specific Humidity	1			hus	specific_humidity
1	Tendency of Specific Humidity	s^{-1}			tnhus	tendency_of_specific_humidity
1	Tendency of Specific Humidity due to Advection	s^{-1}			tnhusa	tendency_of_specific_humidity_due_to_advection
1	Tendency of Specific Humidity due to Convection	s^{-1}			tnhusc	tendency_of_specific_humidity_due_to_convection
1	Tendency of Specific Humidity due to Diffusion	s^{-1}			tnhusd	tendency_of_specific_humidity_due_to_diffusion

1	Tendency of Specific Humidity due to Stratiform Cloud Condensation and Evaporation	s^{-1}			tnhusscce
1	Tendency of Specific Humidity due to Model Physics	s^{-1}		Can you give examples of what should and should not be included in "model physics"?	tnhusmp
1	Eddy Viscosity Coefficients for Momentum	$m^2 s^{-1}$			eviscu
1	Eddy Diffusivity Coefficients for Temperature	$m^2 s^{-1}$			evisct
1	Eddy Diffusivity Coefficients for Water	$m^2 s^{-1}$			eviscw
2	Convective Cloud Area Fraction	%			clc
2	Mass Fraction of Convective Cloud Liquid Water	1	Calculate as the mass of convective cloud liquid water in the grid cell divided by the mass of air (including the water in all phases) in the grid cell.		clwc
2	Mass Fraction of Convective Cloud Ice	1	Calculate as the mass of convective cloud ice in the grid cell divided by the mass of air (including the water in all phases) in the grid cell.		clic
2	Stratiform Cloud Area Fraction	%			cls
2	Mass Fraction of Stratiform Cloud Liquid Water	1	Calculate as the mass of stratiform cloud liquid water in the grid cell divided by the mass of air (including the water in all phases) in the grid cell.		clws
2	Mass Fraction of Stratiform Cloud Ice	1	Calculate as the mass of stratiform cloud ice in the grid cell divided by the mass of air (including the water in all phases) in the grid cell.		clis
2	Updraught Convective Mass Flux	$kg\ m^{-2} s^{-1}$	Calculate as the convective mass flux divided by the area of the whole grid cell (not just the area of the cloud).		mcu
2	Downdraught Convective Mass Flux	$kg\ m^{-2} s^{-1}$	Calculate as the convective mass flux divided by the area of the whole grid cell (not just the area of the cloud).		mcd
2	Shallow Convective Mass Flux	$kg\ m^{-2} s^{-1}$	For models with a distinct shallow convection scheme, calculate as the convective mass flux divided by the area of the whole grid cell (not just the area of the cloud).		smc
2	Deep Convective Mass Flux	$kg\ m^{-2} s^{-1}$	Calculate as the convective mass flux divided by the area of the whole grid cell (not just the area of the cloud).		dmc
2	Tendency of Mass Fraction of Stratiform Cloud Liquid Water due to Condensation and Evaporation	s^{-1}			tnsclwce
2	Tendency of Mass Fraction of Stratiform Cloud Liquid Water Due Convective Detrainment	s^{-1}			tnsclwcd
2	Tendency of Mass Fraction of Stratiform Cloud Liquid Water due to Homogeneous Nucleation	s^{-1}			tnsclwhon
2	Tendency of Mass Fraction of Stratiform Cloud Liquid Water due to Heterogeneous Nucleation	s^{-1}			tnsclwhen
2	Tendency of Mass Fraction of Stratiform Cloud Liquid Water due to Riming	s^{-1}			tnsclwri
2	Tendency of Mass Fraction of Stratiform Cloud Liquid Water due to Accretion to Rain	s^{-1}			tnsclwar
2	Tendency of Mass Fraction of Stratiform Cloud Liquid Water due to Accretion to Snow	s^{-1}			tnsclwas

2	Tendency of Mass Fraction of Stratiform Cloud Liquid Water due to Melting From Cloud Ice	s^{-1}		tnsclwmi
2	Tendency of Mass Fraction of Stratiform Cloud Liquid Water due to Autoconversion	s^{-1}		tnsclwac
2	Tendency of Mass Fraction of Stratiform Cloud Liquid Water due to Advection	s^{-1}		tnsclwa
2	Tendency of Mass Fraction of Stratiform Cloud Ice Due Convective Detrainment	s^{-1}		tncliscd
2	Tendency of Mass Fraction of Stratiform Cloud Ice due to Homogeneous Nucleation	s^{-1}		tnclishon
2	Tendency of Mass Fraction of Stratiform Cloud Ice due to Heterogeneous Nucleation From Cloud Liquid	s^{-1}		tnclishencl
2	Tendency of Mass Fraction of Stratiform Cloud Ice due to Heterogeneous Nucleation From Water Vapor	s^{-1}		tnclishenv
2	Tendency of Mass Fraction of Stratiform Cloud Ice due to Riming From Cloud Liquid	s^{-1}		tnclisricl
2	Tendency of Mass Fraction of Stratiform Cloud Ice due to Riming From Rain	s^{-1}		tnclisrir
2	Tendency of Mass Fraction of Stratiform Cloud Ice due to Deposition and Sublimation	s^{-1}		tnclisds
2	Tendency of Mass Fraction of Stratiform Cloud Ice due to Aggregation	s^{-1}		tnclisag
2	Tendency of Mass Fraction of Stratiform Cloud Ice due to Accretion to Snow	s^{-1}		tnclisas
2	Tendency of Mass Fraction of Stratiform Cloud Ice due to Evaporation of Melting Ice	s^{-1}		tnclisemi
2	Tendency of Mass Fraction of Stratiform Cloud Ice due to Melting to Rain	s^{-1}		tnclismr
2	Tendency of Mass Fraction of Stratiform Cloud Ice due to Melting to Cloud Liquid	s^{-1}		tnclismcl
2	Tendency of Mass Fraction of Stratiform Cloud Ice due to Icefall	s^{-1}		tnclisif
2	Tendency of Mass Fraction of Stratiform Cloud Ice due to Advection	s^{-1}		tnclisa
2	Tendency of Mass Fraction of Stratiform Cloud Condensed Water due to Condensation and Evaporation	s^{-1}	condensed water includes both liquid and ice.	tnclscce
2	Tendency of Mass Fraction of Stratiform Cloud Condensed Water due to Autoconversion to Rain	s^{-1}	condensed water includes both liquid and ice.	tnclscacr

2	Tendency of Mass Fraction of Stratiform Cloud Condensed Water due to Autoconversion to Snow	s^{-1}	condensed water includes both liquid and ice.	tnclscacs	
2	Tendency of Mass Fraction of Stratiform Cloud Condensed Water due to Icefall	s^{-1}	condensed water includes both liquid and ice.	tnclscif	
2	Tendency of Mass Fraction of Stratiform Cloud Condensed Water due to Advection	s^{-1}	condensed water includes both liquid and ice.	tnclsca	

In CMOR Table cfMon: *"CFMIP monthly 4xCO2 2D" -- mon thly mean 2D TOA radiative fluxes calculated by instantaneously quadrupling CO2.*

priority	long name	units	comment	questions	output variable name	confirmed or likely to be confirmed standard name
1	TOA Outgoing Shortwave Radiation in 4XCO2 Atmosphere	W m^{-2}			rsut4co2	
1	TOA Outgoing Longwave Radiation 4XCO2 Atmosphere	W m^{-2}			rlut4co2	
1	TOA Outgoing Clear-Sky Shortwave Radiation 4XCO2 Atmosphere	W m^{-2}			rsutcs4co2	
1	TOA Outgoing Clear-Sky Longwave Radiation 4XCO2 Atmosphere	W m^{-2}			rlutcs4co2	

In CMOR Table cfMon: *"CFMIP monthly 4xCO2 3D" -- mon thly mean 3-D radiative fluxes calculated by instantaneously quadrupling CO2. On model half levels, including the surface and the Top of the Atmosphere.*

priority	long name	units	comment	questions	output variable name	confirmed or likely to be confirmed standard name
1	Upwelling Longwave Radiation 4XCO2 Atmosphere	W m^{-2}			rlu4co2	
1	Upwelling Shortwave Radiation 4XCO2 Atmosphere	W m^{-2}			rsu4co2	
1	Downwelling Longwave Radiation 4XCO2 Atmosphere	W m^{-2}			rld4co2	
1	Downwelling Shortwave Radiation 4XCO2 Atmosphere	W m^{-2}			rsd4co2	
1	Upwelling Clear-Sky Longwave Radiation 4XCO2 Atmosphere	W m^{-2}			rlucs4co2	
1	Upwelling Clear-Sky Shortwave Radiation 4XCO2 Atmosphere	W m^{-2}			rsucs4co2	
1	Downwelling Clear-Sky Longwave Radiation 4XCO2 Atmosphere	W m^{-2}			rldcs4co2	
1	Downwelling Clear-Sky Shortwave Radiation 4XCO2 Atmosphere	W m^{-2}			rsdcs4co2	

In CMOR Table cfMon: "CFMIP monthly inline" -- monthly mean in line ISCCP and CALIPSO/PARASOL simulator output

priority	long name	units	comment	questions	output variable name	confirmed or likely to be confirmed standard name
1	ISSCP Total Cloud Fraction	%			cltisccp	cloud_area_fraction
1	ISSCP Mean Cloud Albedo	1			albisccp	cloud_albedo
1	ISSCP Mean Cloud Top Pressure	Pa			ctpisccp	air_pressure_at_cloud_top
1	ISSCP Cloud Area Fraction	%	7 levels x 7 tau		clisccp	isccp_cloud_area_fraction
1	CALIPSO Total Cloud Fraction	%			cltcalipso	cloud_area_fraction
1	CALIPSO Low Level Cloud Fraction	%			cllcalipso	cloud_area_fraction_in_atmosphere_layer
1	CALIPSO Mid Level Cloud Fraction	%			clmcalipso	cloud_area_fraction_in_atmosphere_layer
1	CALIPSO High Level Cloud Fraction	%			clhcalipso	cloud_area_fraction_in_atmosphere_layer
1	CALIPSO Cloud Fraction	%	40 height levels		clcalipso	cloud_area_fraction_in_atmosphere_layer
1	PARASOL Reflectance	1	5 bins of solar zenith angle. This is reflectance as seen at the top of the atmosphere.		parasolRefl	

unconfirmed or proposed standard name	unformatted units	cell_methods	valid min	valid max	mean absolute min	mean absolute max	positive	type	CMOR dimensions	CMOR variable name	realm
	W m-2	time: mean					up	real	longitude latitude alevbnds time	rlu	atmos
	W m-2	time: mean					up	real	longitude latitude alevbnds time	rsu	atmos
	W m-2	time: mean					down	real	longitude latitude alevbnds time	rld	atmos
	W m-2	time: mean					down	real	longitude latitude alevbnds time	rsd	atmos
	W m-2	time: mean					up	real	longitude latitude alevbnds time	rlucs	atmos
	W m-2	time: mean					up	real	longitude latitude alevbnds time	rsucs	atmos
	W m-2	time: mean					down	real	longitude latitude alevbnds time	rldcs	atmos
	W m-2	time: mean					down	real	longitude latitude alevbnds time	rsdcs	atmos
air_temperature	K	time: mean						real	longitude latitude alevel time	ta	atmos
	K s-1	time: mean						real	longitude latitude alevel time	tnt	atmos
	K s-1	time: mean						real	longitude latitude alevel time	tnta	atmos
	K s-1	time: mean						real	longitude latitude alevel time	tntdp	atmos
tendency_of_air_temperature_due_to_stratiform_cloud_condensation_and_evaporation	K s-1	time: mean						real	longitude latitude alevel time	tntscce	atmos
	K s-1	time: mean						real	longitude latitude alevel time	tntr	atmos
tendency_of_air_temperature_due_to_moist_convection	K s-1	time: mean						real	longitude latitude alevel time	tntmc	atmos
											atmos
	1	time: mean						real	longitude latitude alevel time	hus	atmos
	s-1	time: mean						real	longitude latitude alevel time	tnhus	atmos
	s-1	time: mean						real	longitude latitude alevel time	tnhusa	atmos
	s-1	time: mean						real	longitude latitude alevel time	tnhusc	atmos
tendency_of_specific_humidity_due_to_diffusion	s-1	time: mean						real	longitude latitude alevel time	tnhusd	atmos

tendency_of_specific_humidity_due_to_stratiform_cloud_condensation_and_evaporation	s-1	time: mean	real	longitude latitude alevel time	tnhusscce	atmos
tendency_of_specific_humidity_due_to_model_physics	s-1	time: mean	real	longitude latitude alevel time	tnhusmp	atmos
		time: mean				atmos
eddy_viscosity_coefficients_for_momentum_variables	m2 s-1	time: mean	real	longitude latitude alevel time	eviscu	atmos
eddy_diffusivity_coefficients_for_temperature_variable	m2 s-1	time: mean	real	longitude latitude alevel time	evisct	atmos
eddy_diffusivity_coefficients_for_water_variables	m2 s-1	time: mean	real	longitude latitude alevel time	eviscw	atmos
convective_cloud_area_fraction_in_atmosphere_layer	%	time: mean	real	longitude latitude alevel time	clc	atmos
mass_fraction_of_convective_cloud_liquid_water_in_air_	1	time: mean	real	longitude latitude alevel time	clwc	atmos
mass_fraction_of_convective_cloud_ice_in_air	1	time: mean	real	longitude latitude alevel time	clic	atmos
stratiform_cloud_area_fraction_in_atmosphere_layer	%	time: mean	real	longitude latitude alevel time	cls	atmos
mass_fraction_of_stratiform_cloud_liquid_water_in_air	1	time: mean	real	longitude latitude alevel time	clws	atmos
mass_fraction_of_stratiform_cloud_ice_in_air	1	time: mean	real	longitude latitude alevel time	clis	atmos
updraught_convective_mass_flux	kg m-2 s-1	time: mean	real	longitude latitude alevel time	mcu	atmos
downdraught_convective_mass_flux	kg m-2 s-1	time: mean	real	longitude latitude alevel time	mcd	atmos
shallow_convective_mass_flux	kg m-2 s-1	time: mean	real	longitude latitude alevel time	smc	atmos
deep_convective_mass_flux	kg m-2 s-1	time: mean	real	longitude latitude alevel time	dmc	atmos
						atmos
tendency_of_mass_fraction_of_stratiform_cloud_liquid_water_in_air_due_to_condensation_and_evaporation	s-1	time: mean	real	longitude latitude alevel time	tnsclwce	atmos
tendency_of_mass_fraction_of_stratiform_cloud_liquid_water_in_air_due_to_convective_detrainment	s-1	time: mean	real	longitude latitude alevel time	tnsclwcd	atmos
tendency_of_mass_fraction_of_stratiform_cloud_liquid_water_in_air_due_to_homogeneous_nucleation	s-1	time: mean	real	longitude latitude alevel time	tnsclwhon	atmos
tendency_of_mass_fraction_of_stratiform_cloud_liquid_water_in_air_due_to_heterogeneous_nucleation	s-1	time: mean	real	longitude latitude alevel time	tnsclwhen	atmos
tendency_of_mass_fraction_of_stratiform_cloud_liquid_water_in_air_due_to_riming	s-1	time: mean	real	longitude latitude alevel time	tnsclwri	atmos
tendency_of_mass_fraction_of_stratiform_cloud_liquid_water_in_air_due_to_accretion_to_rain	s-1	time: mean	real	longitude latitude alevel time	tnsclwar	atmos
tendency_of_mass_fraction_of_stratiform_cloud_liquid_water_in_air_due_to_accretion_to_snow	s-1	time: mean	real	longitude latitude alevel time	tnsclwas	atmos

tendency_of_mass_fraction_of_stratiform_cloud_liquid_water_in_air_due_to_melting_from_cloud_ice	s-1	time: mean	real	longitude latitude alevel time	tnsclwmi	atmos
tendency_of_mass_fraction_of_stratiform_cloud_liquid_water_in_air_due_to_autoconversion	s-1	time: mean	real	longitude latitude alevel time	tnsclwac	atmos
tendency_of_mass_fraction_of_stratiform_cloud_liquid_water_in_air_due_to_advection	s-1	time: mean	real	longitude latitude alevel time	tnsclwa	atmos
tendency_of_mass_fraction_of_stratiform_cloud_ice_in_air_due_convective_detrainment	s-1	time: mean	real	longitude latitude alevel time	tncliscd	atmos
tendency_of_mass_fraction_of_stratiform_cloud_ice_in_air_due_to_homogeneous_nucleation	s-1	time: mean	real	longitude latitude alevel time	tnclishon	atmos
tendency_of_mass_fraction_of_stratiform_cloud_ice_in_air_due_to_heterogeneous_nucleation_from_cloud_liquid	s-1	time: mean	real	longitude latitude alevel time	tnclishencl	atmos
tendency_of_mass_fraction_of_stratiform_cloud_ice_in_air_due_to_heterogeneous_nucleation_from_water_vapor	s-1	time: mean	real	longitude latitude alevel time	tnclishenv	atmos
tendency_of_mass_fraction_of_stratiform_cloud_ice_in_air_due_to_riming_from_cloud_liquid	s-1	time: mean	real	longitude latitude alevel time	tnclisricl	atmos
tendency_of_mass_fraction_of_stratiform_cloud_ice_in_air_due_to_riming_from_rain	s-1	time: mean	real	longitude latitude alevel time	tnclisrir	atmos
tendency_of_mass_fraction_of_stratiform_cloud_ice_in_air_due_to_deposition_and_sublimation	s-1	time: mean	real	longitude latitude alevel time	tnclisds	atmos
tendency_of_mass_fraction_of_stratiform_cloud_ice_in_air_due_to_aggregation	s-1	time: mean	real	longitude latitude alevel time	tnclisag	atmos
tendency_of_mass_fraction_of_stratiform_cloud_ice_in_air_due_to_accretion_to_snow	s-1	time: mean	real	longitude latitude alevel time	tnclisas	atmos
tendency_of_mass_fraction_of_stratiform_cloud_ice_in_air_due_to_evaporation_of_melting_ice	s-1	time: mean	real	longitude latitude alevel time	tnclisemi	atmos
tendency_of_mass_fraction_of_stratiform_cloud_ice_in_air_due_to_melting_to_rain	s-1	time: mean	real	longitude latitude alevel time	tnclismr	atmos
tendency_of_mass_fraction_of_stratiform_cloud_ice_in_air_due_to_melting_to_cloud_liquid	s-1	time: mean	real	longitude latitude alevel time	tnclismcl	atmos
tendency_of_mass_fraction_of_stratiform_cloud_ice_in_air_due_to_icefall	s-1	time: mean	real	longitude latitude alevel time	tnclisif	atmos
tendency_of_mass_fraction_of_stratiform_cloud_ice_in_air_due_to_advection	s-1	time: mean	real	longitude latitude alevel time	tnclisa	atmos
tendency_of_mass_fraction_of_stratiform_cloud_condensed_water_in_air_due_to_condensation_and_evaporation	s-1	time: mean	real	longitude latitude alevel time	tnclscce	atmos
tendency_of_mass_fraction_of_stratiform_cloud_condensed_water_in_air_due_to_autoconversion_to_rain	s-1	time: mean	real	longitude latitude alevel time	tnclscacr	atmos

tendency_of_mass_fraction_of_stratiform_cloud_condensed_water_in_air_due_to_autoconversion_to_snow	s-1	time: mean					real	longitude latitude alevel time	tnclscacs	atmos
tendency_of_mass_fraction_of_stratiform_cloud_condensed_water_in_air_due_to_icefall	s-1	time: mean					real	longitude latitude alevel time	tnclscif	atmos
tendency_of_mass_fraction_of_stratiform_cloud_condensed_water_in_air_due_to_advection	s-1	time: mean					real	longitude latitude alevel time	tnclsca	atmos

unconfirmed or proposed standard name	unformatted units	cell_methods	valid min	valid max	mean absolute min	mean absolute max	positive	type	CMOR dimensions	CMOR variable name	realm
toa_outgoing_shortwave_flux_4co2	W m-2	time: mean					up	real	longitude latitude time	rsut4co2	atmos
toa_outgoing_longwave_flux_4co2	W m-2	time: mean					up	real	longitude latitude time	rlut4co2	atmos
toa_outgoing_shortwave_flux_assuming_clear_sky_4co2	W m-2	time: mean					up	real	longitude latitude time	rsutcs4co2	atmos
toa_outgoing_longwave_flux_assuming_clear_sky_4co2	W m-2	time: mean					up	real	longitude latitude time	rlutcs4co2	atmos

unconfirmed or proposed standard name	unformatted units	cell_methods	valid min	valid max	mean absolute min	mean absolute max	positive	type	CMOR dimensions	CMOR variable name	realm
upwelling_longwave_flux_in_air_4co2	W m-2	time: mean					up	real	longitude latitude alevbnds time	rlu4co2	atmos
upwelling_shortwave_flux_in_air_4co2	W m-2	time: mean					up	real	longitude latitude alevbnds time	rsu4co2	atmos
downwelling_longwave_flux_in_air_4co2	W m-2	time: mean					down	real	longitude latitude alevbnds time	rld4co2	atmos
downwelling_shortwave_flux_in_air_4co2	W m-2	time: mean					down	real	longitude latitude alevbnds time	rsd4co2	atmos
upwelling_longwave_flux_in_air_assuming_clear_sky_4co2	W m-2	time: mean					up	real	longitude latitude alevbnds time	rlucs4co2	atmos
upwelling_shortwave_flux_in_air_assuming_clear_sky_4co2	W m-2	time: mean					up	real	longitude latitude alevbnds time	rsucs4co2	atmos
downwelling_longwave_flux_in_air_assuming_clear_sky_4co2	W m-2	time: mean					down	real	longitude latitude alevbnds time	rldcs4co2	atmos
downwelling_shortwave_flux_in_air_assuming_clear_sky_4co2	W m-2	time: mean					down	real	longitude latitude alevbnds time	rsdcs4co2	atmos

unconfirmed or proposed standard name	unformatted units	cell_methods	valid min	valid max	mean absolute min	mean absolute max	positive	type	CMOR dimensions	CMOR variable name	realm
	%	time: mean						real	longitude latitude time	cltisccp	atmos
	1	time: mean						real	longitude latitude time	albisccp	atmos
	Pa	time: mean						real	longitude latitude time	ctpisccp	atmos
	%	time: mean						real	longitude latitude plev7, tau, time	clisccp	atmos
	%	time: mean						real	longitude latitude time	cltcalipso	atmos
	%	time: mean						real	longitude latitude time p840	cllcalipso	atmos
	%	time: mean						real	longitude latitude time p560	clmcalipso	atmos
	%	time: mean						real	longitude latitude time p220	clhcalipso	atmos
	%	time: mean						real	longitude latitude height40 time	clcalipso	atmos
toa_bidirectional_reflectance	1	time: mean						real	longitude latitude sza5 time	parasolRefl	atmos

CMOR Table cfOff: "CFMIP monthly offline" Cloud Diagnostic Fields cfOff

(All Saved on the Atmospheric Grid)

For further guidance, please see http://www.cfmip.net

The spread sheet "CFMIP expts." specifies the simulations and time-periods for which the cloud diagnostic fields listed on this spread sheet should be saved.

CMOR Table cfOff: "CFMIP monthly offline" -- monthly mean CloudSat/CALIPSO/PARASOL simulator output

(Calculate monthly means by averaging the orbital curtain output from CFMIP_orbital_offline. The difference between similar variables appearing in this and the previous table is in the spatial sampling and time period requested. The previous table builds monthly means from global fields, whereas this table below uses only data along the satellite track for a short period of time (one year). This will enable studies of the impact of the satellite sampling in the comparisons.)

priority	long name	units	comment	questions	output variable name	confirmed or likely to be confirmed standard name
1	CALIPSO Cloud Fraction	%	(40 height levels)		clcalipso	cloud_area_fraction_in_atmosphere_layer
1	CALIPSO Cloud Fraction Undetected by CloudSat	%	(40 height levels) Clouds detected by CALIPSO but below the detectability threshold of CloudSat		clcalipso2	cloud_area_fraction_in_atmosphere_layer
1	CloudSat Radar Reflectivity	1	CFADs (Cloud Frequency Altitude Diagrams) are joint height - radar reflectivity (or lidar scattering ratio) distributions (40 levelsx15 bins) .		cfaddbze94	
1	CALIPSO Scattering Ratio	1	CFADs (Cloud Frequency Altitude Diagrams) are joint height - radar reflectivity (or lidar scattering ratio) distributions (40 levelsx15 bins) .		cfadLidarsr532	
1	PARASOL Reflectance	1	5 bins of solar zenith angle. This is reflectance as seen at the top of the atmosphere.		parasolRefl	
1	CALIPSO Total Cloud Fraction	%			cltcalipso	cloud_area_fraction
1	CALIPSO Low Level Cloud Fraction	%			cllcalipso	cloud_area_fraction_in_atmosphere_layer
1	CALIPSO Mid Level Cloud Fraction	%			clmcalipso	cloud_area_fraction_in_atmosphere_layer
1	CALIPSO High Level Cloud Fraction	%			clhcalipso	cloud_area_fraction_in_atmosphere_layer

unconfirmed or proposed standard name	unformatted units	cell_methods	valid min	valid max	mean absolute min	mean absolute max	positive	type	CMOR dimensions	CMOR variable name	realm
	%	time: mean						real	longitude latitude height40 time	clcalipso	atmos
	%	time: mean						real	longitude latitude height40 time	clcalipso2	atmos
histogram_of_equivalent_reflectivity_factor_over_height_above_reference_ellipsoid	1	time: mean						real	longitude latitude height40 dbze time	cfaddbze94	atmos
histogram_of_backscattering_ratio_over_height_above_reference_ellipsoid	1	time: mean						real	longitude latitude height40 scatratio time	cfadLidarsr532	atmos
toa_bidirectional_reflectance	1	time: mean						real	longitude latitude sza5 time	parasolRefl	atmos
	%	time: mean						real	longitude latitude time	cltcalipso	atmos
	%	time: mean						real	longitude latitude time p840	cllcalipso	atmos
	%	time: mean						real	longitude latitude time p560	clmcalipso	atmos
	%	time: mean						real	longitude latitude time p220	clhcalipso	atmos

CMOR Table cfDa: CFMIP Daily-Mean Cloud Diagnostic Fields cfDa

(All Saved on the Atmospheric Grid)

For further guidance, please see http://www.cfmip.net

The spread sheet "CFMIP expts." specifies the simulations and time-periods for which the cloud diagnostic fields listed on this spread sheet should be saved.

In CMOR Table cfDa: "CFMIP daily 2D" -- daily mean 2-D fields including inline ISCCP/CloudSat/CALIPSO/ PARASOL simulator output

priority	long name	units	comment	questions	output variable name	confirmed or likely to be confirmed standard name
1	Surface Air Pressure	Pa			ps	surface_air_pressure
1	TOA Incident Shortwave Radiation	W m^{-2}			rsdt	
1	TOA Outgoing Shortwave Radiation	W m^{-2}			rsut	
1	Surface Downwelling Clear-Sky Shortwave Radiation	W m^{-2}			rsdscs	
1	Surface Upwelling Clear-Sky Shortwave Radiation	W m^{-2}			rsuscs	
1	Surface Downwelling Clear-Sky Longwave Radiation	W m^{-2}			rldscs	
1	TOA Outgoing Clear-Sky Longwave Radiation	W m^{-2}			rlutcs	
1	TOA Outgoing Clear-Sky Shortwave Radiation	W m^{-2}			rsutcs	
1	Total Cloud Fraction	%			clt	
1	Column Integerated Cloud Water Content	kg m^{-2}	calculate mass of condensed water in the column divided by the area of the column (not just the area of the cloud-free portion of the column)		clwvi	
1	Column Integerated Cloud Ice Content	kg m^{-2}	calculate mass of ice in the column divided by the area of the column (not just the area of the cloud-free portion of the column)		clivi	
1	omega (=dp/dt)	Pa s^{-1}	at 500 hPa level; commonly referred to as "omega", this represents the vertical component of velocity in pressure coordinates (positive down)		wap500	
1	Air Temperature	K	at 700 hPa level		ta700	
1	Air Pressure at Convective Cloud Base	Pa			pccb	
1	Air Pressure at Convective Cloud Top	Pa			pcct	
1	Convective Precipitation	kg m^{-2} s^{-1}			prc	
1	Surface Upward Latent Heat Flux	W m^{-2}			hfls	
1	Surface Upward Sensible Heat Flux	W m^{-2}			hfss	
1	Surface Downwelling Longwave Radiation	W m^{-2}			rlds	
1	Surface Upwelling Longwave Radiation	W m^{-2}			rlus	
1	Surface Downwelling Shortwave Radiation	W m^{-2}			rsds	
1	Surface Upwelling Shortwave Radiation	W m^{-2}			rsus	
1	TOA Outgoing Longwave Radiation	W m^{-2}			rlut	
1	ISSCP Total Total Cloud Fraction	%			cltisccp	

1	ISSCP Mean Cloud Albedo	1		albisccp	
1	ISSCP Mean Cloud Top Pressure	Pa		pctisccp	
1	PARASOL Reflectance	1	5 bins of solar zenith angle. This is reflectance as seen at the top of the atmosphere.	parsolRefl	
1	CALIPSO Total Cloud Fraction	%		cltcalipso	
1	CALIPSO Low Level Cloud Fraction	%		cllcalipso	
1	CALIPSO Mid Level Cloud Fraction	%		clmcalipso	
1	CALIPSO High Level Cloud Fraction	%		clhcalipso	

In CMOR Table cfDa: "CFMIP daily 3D" --daily mean 3-D fields on model levels plus CALIPSO and ISCCP cloud fractions

priority	long name	units	comment	questions	output variable name	confirmed or likely to be confirmed standard name
1	Eastward Wind	m s^{-1}			ua	eastward_wind
1	Northward Wind	m s^{-1}			va	northward_wind
1	Air Temperature	K			ta	air_temperature
1	Specific Humidity	1			hus	specific_humidity
1	omega (=dp/dt)	Pa s^{-1}	commonly referred to as "omega", this represents the vertical component of velocity in pressure coordinates (positive down)		wap	lagrangian_tendency_of_air_pressure
1	Geopotential Height	m			zg	geopotential_height
1	Relative Humidity	%	This is the relative humidity with respect to liquid water for T> 0 C, and with respect to ice for T<0 C.		hur	relative_humidity
1	Cloud Area Fraction in Atmosphere Layer	%			cl	
1	Mass Fraction of Cloud Liquid Water	1	Calculate as the mass of cloud liquid water in the grid cell divided by the mass of air (including the water in all phases) in the grid cell.		clw	
1	Mass Fraction of Cloud Ice	1	Calculate as the mass of cloud ice in the grid cell divided by the mass of air (including the water in all phases) in the grid cell.		cli	
1	Convective Mass Flux	kg m^{-2} s^{-1}	Calculate as the convective mass flux divided by the area of the whole grid cell (not just the area of the cloud).		mc	
1	CALIPSO Cloud Fraction	%	40 levels		clcalipso	
1	ISSCP Cloud Area Fraction	%	7 levels x 7 tau		clisccp	
1	Pressure on Model Levels	Pa	provide this field for models in which the pressure can't be calculated from the vertical coordinate information stored already for each variable. Thus, the pressures are needed for height or theta-coordinate models, for example, but not sigma- or eta-coordinate models.		pfull	air_pressure
1	Pressure on Model Half-Levels	Pa	provide this field for models in which the pressure can't be calculated from the vertical coordinate information stored already for each variable. Thus, the pressures are needed for height or theta-coordinate models, for example, but not sigma- or eta-coordinate models.		phalf	air_pressure

unconfirmed or proposed standard name	unformatted units	cell_methods	valid min	valid max	mean absolute min	mean absolute max	positive	type	CMOR dimensions	CMOR variable name	realm
	Pa	time: mean						real	longitude latitude time	ps	atmos
toa_incoming_shortwave_flux	W m-2	time: mean					down	real	longitude latitude time	rsdt	atmos
toa_outgoing_shortwave_flux	W m-2	time: mean					up	real	longitude latitude time	rsut	atmos
surface_downwelling_shortwave_flux_in_air_assuming_clear_sky	W m-2	time: mean					down	real	longitude latitude time	rsdscs	atmos
surface_upwelling_shortwave_flux_in_air_assuming_clear_sky	W m-2	time: mean					up	real	longitude latitude time	rsuscs	atmos
surface_downwelling_longwave_flux_in_air_assuming_clear_sky	W m-2	time: mean					down	real	longitude latitude time	rldscs	atmos
toa_outgoing_longwave_flux_assuming_clear_sky	W m-2	time: mean					up	real	longitude latitude time	rlutcs	atmos
toa_outgoing_shortwave_flux_assuming_clear_sky	W m-2	time: mean					up	real	longitude latitude time	rsutcs	atmos
total_cloud_area_fraction	%	time: mean						real	longitude latitude time	clt	atmos
atmosphere_cloud_condensed_water_content	kg m-2	time: mean						real	longitude latitude time	clwvi	atmos
atmosphere_cloud_ice_content	kg m-2	time: mean						real	longitude latitude time	clivi	atmos
lagrangian_tendency_of_air_pressure	Pa s-1	time: mean						real	longitude latitude time p500	wap500	atmos
air_temperature	K	time: mean						real	longitude latitude time p700	ta700	atmos
air_pressure_at_convective_cloud_base	Pa	time: mean						real	longitude latitude time	pccb	atmos
air_pressure_at_convective_cloud_top	Pa	time: mean						real	longitude latitude time	pcct	atmos
convective_precipitation_flux	kg m-2 s-1	time: mean						real	longitude latitude time	prc	atmos
surface_upward_latent_heat_flux	W m-2	time: mean					up	real	longitude latitude time	hfls	atmos
surface_upward_sensible_heat_flux	W m-2	time: mean					up	real	longitude latitude time	hfss	atmos
surface_downwelling_longwave_flux_in_air	W m-2	time: mean					down	real	longitude latitude time	rlds	atmos
surface_upwelling_longwave_flux_in_air	W m-2	time: mean					up	real	longitude latitude time	rlus	atmos
surface_downwelling_shortwave_flux_in_air	W m-2	time: mean					down	real	longitude latitude time	rsds	atmos
surface_upwelling_shortwave_flux_in_air	W m-2	time: mean					up	real	longitude latitude time	rsus	atmos
toa_outgoing_longwave_flux	W m-2	time: mean					up	real	longitude latitude time	rlut	atmos
isccp_total__cloud_area_fraction	%	time: mean						real	longitude latitude time	cltisccp	atmos

isccp_mean_cloud_albedo	1	time: mean						real	longitude latitude time	albisccp	atmos
isccp_mean_cloud_top_pressure	Pa	time: mean						real	longitude latitude time	pctisccp	atmos
parasol_reflectance	1	time: mean						real	longitude latitude sza5 time	parsolRefl	atmos
calipso_total_cloud_fraction_	%	time: mean						real	longitude latitude time	cltcalipso	atmos
calipso_low_level_cloud_fraction_	%	time: mean						real	longitude latitude time	cllcalipso	atmos
calipso_mid_level_cloud_fraction_	%	time: mean						real	longitude latitude time	clmcalipso	atmos
calipso_high_level_cloud_fraction_	%	time: mean						real	longitude latitude time	clhcalipso	atmos

unconfirmed or proposed standard name	unformatted units	cell_methods	valid min	valid max	mean absolute min	mean absolute max	positive	type	CMOR dimensions	CMOR variable name	realm
	m s-1	time: mean						real	longitude latitude alevel time	ua	atmos
	m s-1	time: mean						real	longitude latitude alevel time	va	atmos
	K	time: mean						real	longitude latitude alevel time	ta	atmos
	1	time: mean						real	longitude latitude alevel time	hus	atmos
	Pa s-1	time: mean						real	longitude latitude alevel time	wap	atmos
	m	time: mean						real	longitude latitude alevel time	zg	atmos
	%	time: mean						real	longitude latitude alevel time	hur	atmos
cloud_area_fraction_in_atmosphere_layer	%	time: mean						real	longitude latitude alevel time	cl	atmos
mass_fraction_of_cloud_liquid_water_in_air	1	time: mean						real	longitude latitude alevel time	clw	atmos
mass_fraction_of_cloud_ice_in_air	1	time: mean						real	longitude latitude alevel time	cli	atmos
convective_mass_flux	kg m-2 s-1	time: mean						real	longitude latitude alevel time	mc	atmos
calipso_cloud_fraction	%	time: mean						real	longitude latitude height40 time	clcalipso	atmos
isccp_cloud_area_fraction	%	time: mean						real	longitude latitude tau plev7 time	clisccp	atmos
air_pressure_at_full_levels	Pa	time: mean						real	longitude latitude alevel time	pfull	atmos
air_pressure_at_half_levels	Pa	time: mean						real	longitude latitude levbnds time	phalf	atmos

CMOR Table cf3hr: CFMIP 3-Hourly Cloud Diagnostic Fields cf3hr

(All Saved on the Atmospheric Grid)

For further guidance, please see http://www.cfmip.net

The spread sheet "CFMIP expts." specifies the simulations and time-periods for which the cloud diagnostic fields listed on this spread sheet should be saved.

In CMOR Table cf3hr: "CFMIP 3-hourly orbital offline" -- CloudSat/CALIPSO/PARASOL simulator output in orbital curtain format

(For most of these variables, extract simulator input variables from models along A-train orbits, and run COSP on these in 'offline' mode.)

Priority	long name	units	comment	questions	output variable name	confirmed or likely to be confirmed standard name
1	CALIPSO Cloud Area Fraction	%	(40 height levels)		clcalipso	cloud_area_fraction_in_atmosphere_layer
1	CALIPSO Cloud Fraction Undetected by CloudSat	%	(40 height levels) Clouds detected by CALIPSO but below the detectability threshold of CloudSat		clcalipso2	cloud_area_fraction_in_atmosphere_layer
1	CloudSat Radar Reflectivity CFAD	1	CFADs (Cloud Frequency Altitude Diagrams) are joint height - radar reflectivity (or lidar scattering ratio) distributions (40 levelsx15 bins) .		cfaddbze94	
1	CALIPSO Scattering Ratio CFAD	1	CFADs (Cloud Frequency Altitude Diagrams) are joint height - radar reflectivity (or lidar scattering ratio) distributions (40 levelsx15 bins) .		cfadLidarsr532	
1	PARASOL Reflectance	1	5 bins of solar zenith angle. This is reflectance as seen at the top of the atmosphere.		parasolRefl	
1	CALIPSO Total Cloud Fraction	%			cltcalipso	cloud_area_fraction
1	CALIPSO Low Level Cloud Fraction	%			cllcalipso	cloud_area_fraction_in_atmosphere_layer
1	CALIPSO Mid Level Cloud Fraction	%			clmcalipso	cloud_area_fraction_in_atmosphere_layer
1	CALIPSO High Level Cloud Fraction	%			clhcalipso	cloud_area_fraction_in_atmosphere_layer
1	Longitude	degrees_east	function of time		lon	longitude
1	Latitude	degrees_north	function of time		lat	latitude
1	Offset Time	day	this "offset time" should be added to the value stored in the "time dimension" to get the actual time		toffset	?

In CMOR Table cf3hr: *"CFMIP 3-hourly inline" -- 2-D and 3-D fields on model levels (or half levels, as indicated) sampled synoptically every 3 hours (i.e., not time-mean) at 0Z, 3Z, 6Z, 9Z, 12Z, 15Z, 18Z, and 21Z.*

Except for the variables in the Amon table, are these all 3D fields?

Priority	long name	units	comment	questions	output variable name	confirmed or likely to be confirmed standard name
1	see the "Amon" spreadsheet for list of quantities		This table includes the 2-D variables listed in the "Amon" spreadsheet, omitting, however, the daily maximum and minimum temperatures. All variables should be reported as synoptic fields, not daily means.		?	
2	Altitude of Model Full-Levels	m	This is actual height above mean sea level, not geopotential height		zfull	height_above_reference_ellipsoid

2	Altitude of Model Half-Levels	m	This is actual height above mean sea level, not geopotential height. This is actual height above mean sea level, not geopotential height. Include both the top of the model atmosphere and surface levels.	zhalf	height_above_reference_ellipsoid
2	Pressure at Model Full-Levels	Pa	provide this field for models in which the pressure can't be calculated from the vertical coordinate information stored already for each variable. Thus, the pressures are needed for height or theta-coordinate models, for example, but not sigma- or eta-coordinate models.	pfull	air_pressure
2	Pressure at Model Half-Levels	Pa	provide this field for models in which the pressure can't be calculated from the vertical coordinate information stored already for each variable. Thus, the pressures are needed for height or theta-coordinate models, for example, but not sigma- or eta-coordinate models.	phalf	air_pressure
2	Air Temperature	K		ta	
2	Mass Fraction of Water	1	include all phases of water	h2o	
2	Mass Fraction of Stratiform Cloud Liquid Water	1	Calculate as the mass of stratiform cloud liquid water in the grid cell divided by the mass of air (including the water in all phases) in the grid cell.	clws	
2	Mass Fraction of Stratiform Cloud Ice	1	Calculate as the mass of stratiform cloud ice in the grid cell divided by the mass of air (including the water in all phases) in the grid cell.	clis	
2	Mass Fraction of Convective Cloud Liquid Water	1	Calculate as the mass of convective cloud liquid water in the grid cell divided by the mass of air (including the water in all phases) in the grid cell.	clwc	
2	Mass Fraction of Convective Cloud Ice	1	Calculate as the mass of convective cloud ice in the grid cell divided by the mass of air (including the water in all phases) in the grid cell.	clic	
2	Hydrometeor Effective Radius of Stratiform Cloud Liquid Water	m	This is defined as the ratio of the third moment over the second moment of the particle size distribution. No time means are required as this is all snapshot data.	reffclws	
2	Hydrometeor Effective Radius of Stratiform Cloud Ice	m	This is defined as the ratio of the third moment over the second moment of the particle size distribution. No time means are required as this is all snapshot data.	reffclis	
2	Hydrometeor Effective Radius of Convective Cloud Liquid Water	m	This is defined as the ratio of the third moment over the second moment of the particle size distribution. No time means are required as this is all snapshot data.	reffclwc	
2	Hydrometeor Effective Radius of Convective Cloud Ice	m	This is defined as the ratio of the third moment over the second moment of the particle size distribution. No time means are required as this is all snapshot data.	reffclic	
2	Stratiform Graupel Flux	kg m^{-2} s^{-1}	report on model half-levels	grplprof	
2	Convective Rainfall Flux	kg m^{-2} s^{-1}	report on model half-levels	prcprof	convective_rainfall_flux
2	Stratiform Rainfall Flux	kg m^{-2} s^{-1}	report on model half-levels	prsprof	stratiform_rainfall_flux
2	Convective Snowfall Flux	kg m^{-2} s^{-1}	report on model half-levels	prsnc	convective_snowfall_flux
2	Stratiform Snowfall Flux	kg m^{-2} s^{-1}	report on model half-levels	prsns	stratiform_snowfall_flux
2	Hydrometeor Effective Radius of Stratiform Graupel	m	This is defined as the ratio of the third moment over the second moment of the particle size distribution.	reffgrpls	
2	Hydrometeor Effective Radius of Convective Rainfall	m	This is defined as the ratio of the third moment over the second moment of the particle size distribution.	reffrainc	
2	Hydrometeor Effective Radius of Stratiform Rainfall	m	This is defined as the ratio of the third moment over the second moment of the particle size distribution.	reffrains	
2	Hydrometeor Effective Radius of Convective Snowfall	m	This is defined as the ratio of the third moment over the second moment of the particle size distribution.	reffsnowc	
2	Hydrometeor Effective Radius of Stratiform Snowfall	m	This is defined as the ratio of the third moment over the second moment of the particle size distribution.	reffsnows	
2	Stratiform Cloud Optical Depth	1		dtaus	
2	Convective Cloud Optical Depth	1		dtauc	
2	Stratiform Cloud Emissivity	1		dems	
2	Convective Cloud Emissivity	1		demc	

unconfirmed or proposed standard name	unformatted units	cell_methods	valid min	valid max	mean absolute min	mean absolute max	positive	type	CMOR dimensions	CMOR variable name	realm
	%	what is cell method for time here and in rest of this table? Is it "mean" or "point"?						real	location height40 time	clcalipso	atmos
	%							real	location height40 time	clcalipso2	atmos
histogram_of_equivalent_reflectivity_factor_over_height_above_reference_ellipsoid	1							real	location height40 dbze time	cfaddbze94	atmos
histogram_of_backscattering_ratio_over_height_above_reference_ellipsoid	1							real	location height40 scatratio time	cfadLidarsr532	atmos
toa_bidirectional_reflectance	1							real	location sza5 time	parasolRefl	atmos
	%							real	location time	cltcalipso	atmos
	%							real	location time p840	cllcalipso	atmos
	%							real	location time p560	clmcalipso	atmos
	%							real	location time p220	clhcalipso	atmos
	degrees_east							real	location time	lon	atmos
	degrees_north							real	location time	lat	atmos
?	day							real	location time	toffset	atmos

unconfirmed or proposed standard name	unformatted units	cell_methods	valid min	valid max	mean absolute min	mean absolute max	positive	type	CMOR dimensions	CMOR variable name	realm
		time: point						real	longitude latitude time1	?	atmos
height_of_full_levels_above_reference ellipsoid	m	time: point						real	longitude latitude alevel time1	zfull	atmos

height_of_half_levels_above_reference_ellipsoid	m	time: point	real	longitude latitude levbnds time1	zhalf	atmos
	Pa	time: point	real	longitude latitude alevel time1	pfull	atmos
air_pressure_at_half_levels	Pa	time: point	real	longitude latitude levbnds time1	phalf	atmos
temperature_in_air	K	time: point	real	longitude latitude alevel time1	ta	atmos
mass_fraction_of_water_in_air	1	time: point	real	longitude latitude alevel time1	h2o	atmos
mass_fraction_of_stratiform_cloud_liquid_water_in_air	1	time: point	real	longitude latitude alevel time1	clws	atmos
mass_fraction_of_stratiform_cloud_ice_in_air	1	time: point	real	longitude latitude alevel time1	#REF!	atmos
mass_fraction_of_convective_cloud_liquid_water_in_air	1	time: point	real	longitude latitude alevel time1	clis	atmos
mass_fraction_of_convective_cloud_ice_in_air	1	time: point	real	longitude latitude alevel time1	clic	atmos
effective_radius_of_stratiform_cloud_liquid_water_particle	m		real	longitude latitude alevel time1	reffclws	atmos
effective_radius_of_stratiform_cloud_ice_particle	m		real	longitude latitude alevel time1	reffclis	atmos
effective_radius_of_convective_cloud_liquid_water_particle	m		real	longitude latitude alevel time1	reffclwc	atmos
effective_radius_of_convective_cloud_ice_particle	m		real	longitude latitude alevel time1	reffclic	atmos
large_scale_graupel_flux	kg m-2 s-1		real	longitude latitude alevel time1	grplprof	atmos
	kg m-2 s-1		real	longitude latitude alevel time1	prcprof	atmos
	kg m-2 s-1		real	longitude latitude alevel time1	prsprof	atmos
	kg m-2 s-1		real	longitude latitude alevel time1	prsnc	atmos
	kg m-2 s-1		real	longitude latitude alevel time1	prsns	atmos
hydrometeor_effective_radius_of_stratiform_graupel	m		real	longitude latitude alevel time1	reffgrpls	atmos
effective_radius_of_convective_cloud_rain_particle	m		real	longitude latitude alevel time1	reffrainc	atmos
effective_radius_of_stratiform_cloud_rain_particle	m		real	longitude latitude alevel time1	reffrains	atmos
effective_radius_of_convective_cloud_snow_particle	m		real	longitude latitude alevel time1	reffsnowc	atmos
effective_radius_of_stratiform_cloud_snow_particle	m		real	longitude latitude alevel time1	reffsnows	atmos
atmosphere_optical_thickness_due_to_stratiform_cloud	1		real	longitude latitude alevel time1	dtaus	atmos
atmosphere_optical_thickness_due_to_convective_cloud	1		real	longitude latitude alevel time1	dtauc	atmos
stratiform_cloud_longwave_emissivity	1		real	longitude latitude alevel time1	dems	atmos
convective_cloud_longwave_emissivity	1		real	longitude latitude alevel time1	demc	atmos

CMOR Table cf30min: CFMIP 30-Minute Cloud Diagnostic Fields cf30min

(All Saved on the Atmospheric Grid)

For further guidance, please see http://www.cfmip.net

The spread sheet "CFMIP expts." specifies the simulations and time-periods for which the cloud diagnostic fields listed on this spread sheet should be saved.

CMOR Table cf30Min: ***"CFMIP 30-min" -- 2-D and 3-D fields on model levels sampled approximately every half-hour at specified locations (about 115 stations)***

The sampling interval must be the integer multiple of the model time-step that is nearest a half hour. Outputs should be instantaneous (not time mean) and from nearest gridbox (no spatial interpolation.) Note that except for the quantities appearing in the Amon spreadsheet (first line of table below), all other fields are 3-D.

priority	long name	units	comment	questions	output variable name	confirmed or likely to be confirmed standard name
1	see the "Amon" spreadsheet for list of quantities		This table includes the 2-D variables listed in the "Amon" spreadsheet, omitting, however, the daily maximum and minimum temperatures. All variables should be reported as synoptic fields, not daily means.		?	
1	Cloud Area Fraction	%	Include both large-scale and convective cloud.		cl	cloud_area_fraction_in_atmosphere_layer
1	Mass Fraction of Cloud Liquid Water	1	Include both large-scale and convective cloud. Calculate as the mass of cloud liquid water in the grid cell divided by the mass of air (including the water in all phases) in the grid cell.		clw	mass_fraction_of_cloud_liquid_water__in_air
1	Mass Fraction of Cloud Ice	1	Include both large-scale and convective cloud. Calculate as the mass of cloud ice in the grid cell divided by the mass of air (including the water in all phases) in the grid cell.		cli	mass_fraction_of_cloud_ice_in_air
1	Convective Mass Flux	kg m^{-2} s^{-1}	The atmosphere convective mass flux is the vertical transport of mass for a field of cumulus clouds or cloudless thermals, given by the product of air density and vertical velocity. Calculate as the convective mass flux divided by the area of the whole grid cell (not just the area of the updrafts).		mc	convective_mass_flux
1	Air Temperature	K			ta	air_temperature
1	Eastward Wind	m s^{-1}			ua	eastward_wind
1	Northward Wind	m s^{-1}			va	northward_wind
1	Specific Humidity	1			hus	specific_humidity
1	Relative Humidity	%	This is the relative humidity with respect to liquid water for T> 0 C, and with respect to ice for T<0 C.		hur	relative_humidity
1	omega (=dp/dt)	Pa s^{-1}	commonly referred to as "omega", this represents the vertical component of velocity in pressure coordinates (positive down)		wap	lagrangian_tendency_of_air_pressure
1	Geopotential Height	m			zg	geopotential_height
1	Upwelling Longwave Radiation	W m^{-2}			rlu	upwelling_longwave_flux_in_air
1	Upwelling Shortwave Radiation	W m^{-2}			rsu	upwelling_shortwave_flux_in_air
1	Downwelling Longwave Radiation	W m^{-2}			rld	downwelling_longwave_flux_in_air
1	Downwelling Shortwave Radiation	W m^{-2}			rsd	downwelling_shortwave_flux_in_air
1	Upwelling Clear-Sky Longwave Radiation	W m^{-2}			rlucs	upwelling_longwave_flux_in_air_assuming_clear_sky
1	Upwelling Clear-Sky Shortwave Radiation	W m^{-2}			rsucs	upwelling_shortwave_flux_in_air_assuming_clear_sky

1	Downwelling Clear-Sky Longwave Radiation	W m^{-2}	rldcs	downwelling_longwave_flux_in_air_assuming_clear_sky
1	Downwelling Clear-Sky Shortwave Radiation	W m^{-2}	rsdcs	downwelling_shortwave_flux_in_air_assuming_clear_sky
1	Tendency of Air Temperature	K s^{-1}	tnt	
1	Tendency of Air Temperature due to Advection	K s^{-1}	tnta	
1	Tendency of Air Temperature due to Diabatic Processes	K s^{-1}	tntdp	
1	Tendency of Air Temperature due to Stratiform Cloud Condensation and Evaporation	K s^{-1}	tntscce	
1	Tendency of Air Temperature due to Radiative Heating	K s^{-1}	tntr	
1	Tendency of Air Temperature due to Moist Convection	K s^{-1}	tntmc	
1	Tendency of Specific Humidity	s^{-1}	tnhus	
1	Tendency of Specific Humidity due to Advection	s^{-1}	tnhusa	
1	Tendency of Specific Humidity due to Convection	s^{-1}	tnhusc	
1	Tendency of Specific Humidity due to Diffusion	s^{-1}	tnhusd	
1	Tendency of Specific Humidity due to Stratiform Cloud Condensation and Evaporation	s^{-1}	tnhusscce	
1	Tendency of Specific Humidity due to Model Physics	s^{-1}	tnhusmp	
1	Eddy Viscosity Coefficient for Momentum Variables	m^2 s^{-1}	evu	
1	Eddy Diffusivity Coefficient for Temperature Variable	m^2 s^{-1}	edt	
1	Eddy Diffusivity Coefficient for Water Variables	m^2 s^{-1}	edw	

unconfirmed or proposed standard name	unformatted units	cell_methods	valid min	valid max	mean absolute min	mean absolute max	positive	type	CMOR dimensions	CMOR variable name	realm
		time: point						real	site, time1		atmos
	%	time: point						real	alevel, site, time1	cl	atmos
	1	time: point						real	alevel, site, time1	clw	atmos
	1	time: point						real	alevel, site, time1	cli	atmos
	kg m-2 s-1	time: point						real	alevel, site, time1	mc	atmos
	K	time: point						real	alevel, site, time1	ta	atmos
	m s-1	time: point						real	alevel, site, time1	ua	atmos
	m s-1	time: point						real	alevel, site, time1	va	atmos
	1	time: point						real	alevel, site, time1	hus	atmos
	%	time: point						real	alevel, site, time1	hur	atmos
	Pa s-1	time: point						real	alevel, site, time1	wap	atmos
	m	time: point						real	alevel, site, time1	zg	atmos
	W m-2	time: point					up	real	alevel, site, time1	rlu	atmos
	W m-2	time: point					up	real	alevel, site, time1	rsu	atmos
	W m-2	time: point					down	real	alevel, site, time1	rld	atmos
	W m-2	time: point					down	real	alevel, site, time1	rsd	atmos
	W m-2	time: point					up	real	alevel, site, time1	rlucs	atmos
	W m-2	time: point					up	real	alevel, site, time1	rsucs	atmos

	W m-2	time: point	down	real	alevel, site, time1	rldcs	atmos
	W m-2	time: point	down	real	alevel, site, time1	rsdcs	atmos
tendency_of_air_temperature	K s-1	time: point		real	alevel, site, time1	tnt	atmos
tendency_of_air_temperature_due_to_advection	K s-1	time: point		real	alevel, site, time1	tnta	atmos
tendency_of_air_temperature_due_to_diabatic_processes	K s-1	time: point		real	alevel, site, time1	tntdp	atmos
tendency_of_air_temperature_due_to_stratiform_cloud_condensation_and_evaporation	K s-1	time: point		real	alevel, site, time1	tntscce	atmos
tendency_of_air_temperature_due_to_radiative_heating	K s-1	time: point		real	alevel, site, time1	tntr	atmos
tendency_of_air_temperature_due_to_moist_convection	K s-1	time: point		real	alevel, site, time1	tntmc	atmos
tendency_of_specific_humidity	s-1	time: point		real	alevel, site, time1	tnhus	atmos
tendency_of_specific_humidity_due_to advection	s-1	time: point		real	alevel, site, time1	tnhusa	atmos
tendency_of_specific_humidity_due_to convection	s-1	time: point		real	alevel, site, time1	tnhusc	atmos
tendency_of_specific_humidity_due_to diffusion	s-1	time: point		real	alevel, site, time1	tnhusd	atmos
tendency_of_specific_humidity_due_to_stratiform_cloud_condensation_and_evaporation	s-1	time: point		real	alevel, site, time1	tnhusscce	atmos
tendency_of_specific_humidity_due_to model_physics	s-1	time: point		real	alevel, site, time1	tnhusmp	atmos
eddy_viscosity_coefficients_for_momentum_variables	m2 s-1	time: point		real	alevel, site, time1	evu	atmos
eddy_diffusivity_coefficients_for_temperature_variable	m2 s-1	time: point		real	alevel, site, time1	edt	atmos
eddy_diffusivity_coefficients_for_water_variables	m2 s-1	time: point		real	alevel, site, time1	edw	atmos

Reqeusted periods for saving special CFMIP model output

Experiment Name	Experiment Description	Experiment number	CFMIP monthly 3D (A1c_cfmip)		CFMIP monthly 4xCO2 2D		CFMIP monthly 4xCO2 3D		CFMIP monthly inline (A1d,f,g)	
pre-industrial control	coupled atmosphere/ocean control run	3.1			-20	-1			-20	-1
historical	simulation of recent past (1850-2005)	3.2							1979	2005
AMIP	AMIP (1979-2008)	3.3	1979	2008	1979	2008	1979	2008	1979	2008
RCP4.5	future projection (2006-2100) forced by RCP4.5	4.1								
RCP8.5	future projection (2006-2100) forced by RCP8.5	4.2								
ESM fixed climate 1	radiation code "sees" control CO2, but carbon cycle sees 1%/yr rise	5.4-1							121	140
ESM fixed climate 2	radiation code "sees" control CO2, but carbon cycle sees historical followed by RCP4.5 rise in CO2	5.4-2							232	251
ESM feedback 1	carbon cycle "sees" control CO2, but radiatation sees 1%/yr rise	5.5-1							121	140
ESM feedback 2	carbon cycle "sees" control CO2, but radiatation sees historical followed by RCP4.5 rise in CO2	5.5-2							232	251
1 percent per year CO2	impose a 1%/yr increase in CO2 to quadrupling	6.1							121	140
control SST climatology	AMIP-style experiment with control run climatological SSTs & sea ice	6.2a			1	30			1	30
CO2 forcing	as in expt. 6.2a, but with 4XCO2 imposed	6.2b							1	30
abrupt 4XCO2	impose an instantaneous quadrupling of CO2, then hold fixed	6.3							131	150
abrupt 4XCO2	generate an ensemble of runs like expt. 6.3, initialized in different months, and terminated after 5 years	6.3-E							1	5
aerosol forcing	as in expt. 6.2a, but with aerosols from year 2000 of expt. 3.2	6.4							1	30
4xCO2 AMIP	AMIP (1979-2008) conditions (expt. 3.3) but with 4xCO2	6.5	1979	2008					1979	2008
AMIP plus patterned anomaly	consistent with CFMIP, patterned SST anomalies added to AMIP conditions (expt. 3.3)	6.6	1979	2008					1979	2008
aqua planet control	consistent with CFMIP, zonally uniform SSTs for ocean-covered earth	6.7a	1	5	1	5	1	5	1	5
4xCO2 aqua planet	as in expt. 6.7a, but with 4XCO2	6.7b	1	5					1	5
aqua planet plus 4K anomaly	as in expt. 6.7a, but with a uniform 4K increase in SST	6.7c	1	5					1	5
AMIP plus 4K anomaly	as in expt. 3.3, but with a uniform 4K increase in SST	6.8	1979	2008					1979	2008

Why shouldn't these 3-hourly columns be combined?

CFMIP monthly offline (A1e)		CFMIP daily 2D (A2a,c,f)		CFMIP daily 3D (A2b,d,g)		CFMIP 3-hourly orbital offline (A2e)		CFMIP 3-hourly inline (A4)		CFMIP 30-min (A3)	
		-20	-1	-5	-1						
		1979	2005								
2007	2007	1979	2008	1979	2008	2007	2007	2007	2007	1979	2008
		121	140								
		232	251								
		121	140								
		232	251								
		121	140	136	140						
		1	30								
		1	30								
		131	150	146	150						
		1	5								
		1	30								
2007	2007	1979	2008	1979	2008	2007	2007	2007	2007	1979	2008
2007	2007	1979	2008	1979	2008	2007	2007	2007	2007	1979	2008
		1	5	1	5						
		1	5	1	5						
		1	5	1	5						
2007	2007	1979	2008	1979	2008	2007	2007	2007	2007	1979	2008