General information

Except as otherwise noted near each table and summarized in the last two spreadsheets ("CFMIP output" and "other output"), 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 Oclim, Oyr, Omon, and OImon) 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 Oclim, Oyr, Omon, and OImon) 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 Lmon and LImon 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 OImon 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 LImon field is that the quantity is averaged over the entire land portion of each grid-cell (witl 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. For lower priority variables, if you can't save them for all the experiments and realizations, please consider saving them for a subset that you think might be of most interest.

Key	
(pink)	questions
(yellow)	need standard name
(green)	modified between 13 January 2010 and 2 April 2010
(blue)	modified after 2 April 2010
(peach)	modified after 20 May 2010

CMOR Dimensions

CMOR table(s)	CMOR dimension	output dimension name	description	standard name	long name	axis	units	index axis?	coords_ attrib	bounds?
fx, Amon, Lmon, LImon, OImon, aero, day, 6hrLev, 6hrPlev, 3hr, Oclim, Oyr, Omon, cfMon, cfOff, cfDay, cf3hr	longitude	lon		longitude	longitude	X	degrees_ east			yes
fx, Amon, Lmon, LImon, OImon, aero, day, 6hrLev, 6hrPlev, 3hr, Oclim, Oyr, Omon, cfMon, cfOff, cfDay, cf3hr	latitude	lat		latitude	latitude	Y	degrees_ north			yes
Amon	plevs	plev	There are 17 mandatory levels and up to 6 additional levels requested of models with sufficient resolution in the stratosphere.	air_pressure	pressure	Z	Pa			no
day	plev8	plev		air_pressure	pressure	Z	Pa			no
6hrPlev	plev3	plev		air_pressure	pressure	Z	Pa			no
cfMon, cfDay	plev7	plev	7 pressure layers defined by ISCCP simulator	air_pressure	pressure	Z	Pa			yes
cfDay	p500	plev	500 hPa	air_pressure	pressure	Z	Pa			no
cfDay	p700	plev	700 hPa	air_pressure	pressure	Z	Pa			no
cfMon, cfOff, cf3hr	p220	plev	pressure layer of high-level cloud in ISCCP simulator	air_pressure	pressure	Z	Pa			no
cfMon, cfOff, cf3hr	p560	plev	pressure layer of mid-level cloud in ISCCP simulator	air_pressure	pressure	Z	Pa			no
cfMon, cfOff, cf3hr	p840	plev	pressure layer of low-level cloud in ISCCP simulator	air_pressure	pressure	Z	Pa			no

stored direction	valid_ min	valid_ max	type	positive	value	bounds _values	requested	bounds_ requested	tol_on_requests: variance from requested values that is tolerated
increasing	0	360	double						
increasing	-90	90	double						
decreasing			double	down			100000. 92500. 85000. 70000. 60000. 50000. 40000. 30000. 25000. 20000. 15000. 10000. 7000. 5000. 3000. 2000. 1000.		0.001
decreasing			double	down			100000. 85000. 70000. 50000. 25000. 10000. 5000. 1000.		0.001
decreasing			double	down			85000. 50000. 25000.		0.001
decreasing			double	down				100000. 80000. 80000. 68000. 68000. 56000. 56000. 44000. 44000. 31000. 31000. 18000. 18000. 0.	0.001
decreasing			double	down	50000.				
decreasing			double	down	70000.				
decreasing			double	down	22000.	44000. 0.0			
decreasing			double	down	56000.	68000. 44000.			
decreasing			double	down	84000.	100000. 68000.			

Amon, aero, 6hrLev, cfMon, cfDay, cf3hr, cfSites	alevel	lev	generic atmospheric model vertical coordinate (nondimensional or dimensional)		atmospheric model level	Z		ok	yes
Amon, cfMon, cfDay, cf3hr, cfSites	alevhalf	lev	atmospheric model "half" level		atmospheric model half-level	Z		ok	no
aero	alev1	lev	atmospheric model's lowest level		lowest atmospheric model level	Z		ok	yes
cfMon, cfOff, cfDay, cf3hr	alt40	alt40	CloudSat vertical coordinate heights	altitude	altitude	Z	m		yes
Oyr, Amon, Lmon, LImon, OImon, aero, day, 3hr, Omon, cfMon, cfOff, cfDay, cf3hr	time	time	for time-mean fields	time	time	T	days since ?		yes
6hrLev, 6hrPlev, 3hr, cf3hr, cfSites	time1	time	synoptic times (for fields that are not time-means)	time	time	T	days since ?		no
Oclim, Amon	time2	time	climatological times	time	time	T	days since ?		yes
Amon, day, 3hr, cf3hr, cfSites	height2m	height	~2 m standard surface air temperature and surface humidity height	height	height	Z	m		no
Amon, day, 3hr, cf3hr, cfSites	height10m	height	~10 m standard wind speed height	height	height	Z	m		no
Lmon, LImon	sdepth	depth	coordinate values for soil layers (depth)	depth	depth	Z	m		yes
Lmon	sdepth1	depth	coordinate value for topmost 0.1 meter layer of soil	depth	depth	Z	m		yes
cfMon, cfDay	tau	tau	isccp optical depth categories	atmosphere_optical_thickness_due_to_cloud	cloud optical thickness		1		yes
cfOff, cf3hr	scatratio	scatratio	15 bins of scattering ratio for the CALIPSO simulator CFAD	backscattering_ratio	lidar backscattering ratio		1		yes
cfOff, cf3hr	dbze	dbze	15 bins of radar reflectivity for CloudSat simulator CFAD	equivalent_reflectivity_factor	CloudSat simulator equivalent radar reflectivity factor		dBZ		yes
cfMon, cfOff, cfDay, cf3hr	sza5	sza	5 solar zenith angles for PARASOL reflectances	solar_zenith_angle	solar zenith angle		degree		no
cfSites	site	site	an integer assigned to each of 119 stations (standard) and 73 stations (aquaplanet)		site index		1	ok	no

			double	up					
			double	up					
increasing			double						
increasing			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. 18720. 19200.	0.001
increasing			double						
increasing			double						
increasing			double						
increasing	1	10	double	up	2.				
increasing	1	30	double	up	10.				
increasing	0	200	double	down					
increasing	0	0.2	double	down	0.05	0.0 0.1			
increasing			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
increasing			double					0.01 1.2 3 5 7 10 15 20 25 30 40 50 60 80 999 1009	0.001
increasing			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
increasing			double				0. 20. 40. 60. 80.		0.001
			integer						

Omon	basin	basin		region	ocean basin		1		region	no
Omon	rho	rho	density? Potential density++++?		density++++?	Z	?			yes
fx, Oclim, Oyr, Omon	olevel	lev	generic ocean model vertical coordinate (nondimensional or dimensional)		ocean model level	Z		ok		yes
Omon	oline	line	opening, passage, strait, channel, etc.		ocean passage		1		passage	no
cf3hr	location	loc	COSP profile in instantaneous curtain mode		location index		1	ok		no
Lmon	vegtype	type	plant functional type		plant functional type		1		type_description	no
Omon	olayer100m	depth	coordinate for 100 m ocean surface layer	depth	depth	Z	m			no
Omon	depth100m	depth	coordinate value for 100 m ocean depth	depth	depth	Z	m			no
Omon	depth0m	depth	vertical coordinate for ocean surface	depth	depth	Z	m			no

			character				atlantic_arctic_ocean indian_pacific_ocean global_ocean
decreasing			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_strait fram_strait iceland_faroe_channel indonesian_thoughflow mozambique_channel taiwan_luzon_straits windward_passage
increasing			integer				
			character				
increasing	0	100	double	down	50.	0. 100.	
increasing	80	120	double	down	100.		
increasing	0	100	double	down	0.		

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
1	Atmosphere Grid-Cell Area	m^2			areacella
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
1	Land Area Fraction	%			sftlf
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
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
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

fx

standard name	unconfirmed or proposed standard name	unformatted units	cell_methods	positive	type	CMOR dimensions	CMOR variable name	realm
cell_area		m2			real	longitude latitude	areacella	atmos land
surface_altitude		m			real	longitude latitude	orog	atmos
land_area_fraction		%			real	longitude latitude	sftlf	atmos
land_ice_area_fraction		%			real	longitude latitude	sftgif	land
soil_moisture_content_at_field_capacity		kg m-2			real	longitude latitude	mrsofc	land
root_depth		m			real	longitude latitude	rootd	land

frequency	cell_measures	flag_values	flag_meanings
	area: areacella		
	area: areacella		
	area: areacella		
	area: areacella		
	area: areacella		

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
1	Sea Floor Depth	m	Ocean bathymetry. Report here the sea floor depth for present day. Report as missing for land grid cells.		deptho
1	Ocean Grid-Cell Volume	m^3	3-D field: grid-cell volume ca. 2000.		volcello
1	Ocean Grid-Cell Area	m^2			areacello
1	Sea Area Fraction	%	Report on the same grid that ocean fields are reported (i.e., the ocean native grid, or the grid that ocean data has been provided to CMIP. For completeness, provide this even if the ocean grid is the same as the atmospheric grid. This is the area fraction at the ocean surface.	Should this be recorded as a function of depth?	sftof
1	Region Selection Index	1	Report on the same grid as the temperature field. 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. Report on the grid used for the temperature field.		basin
1	Region Selection Index	1	Report on the same grid as the ocean 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. Report on the grid used for the meridional overturning stream function.		basinv

standard name	unconfirmed or proposed standard name	unformatted units	cell_methods	positive	type	CMOR dimensions	CMOR variable name	realm
sea_floor_depth_below_geoid		m			real	longitude latitude	deptho	ocean
ocean_volume		m3			real	longitude latitude olevel	volcello	ocean
cell_area		m2			real	longitude latitude	areacello	ocean
sea_area_fraction		%			real	longitude latitude	sftof	ocean
region		1			integer	longitude latitude	basin	ocean
region		1			integer	longitude latitude	basinv	ocean

frequency	cell_measures	flag_values	flag_meanings
	area: areacello		
	area: areacello		
	area: areacello	0 1 2 3 4 5 6 7 8 9 10	global_land southern_ocean atlantic_ocean pacific_ocean arctic_ocean indian_ocean mediterranean_sea black_sea hudson_bay baltic_sea red_sea
		0 1 2 3 4 5 6 7 8 9 10	global_land southern_ocean atlantic_ocean pacific_ocean arctic_ocean indian_ocean mediterranean_sea black_sea hudson_bay baltic_sea red_sea

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
1	Dissolved Inorganic Carbon Concentration	mol m^{-3}	Dissolved inorganic carbon (CO3+HCO3+H2CO3) concentration		dissic
2	Dissolved Organic Carbon Concentration	mol m^{-3}	Dissolved organic carbon concentration		dissoc
2	Phytoplankton Carbon Concentration	mol m^{-3}	sum of phytoplankton carbon component concentrations. In most (all?) cases this is the sum of phycdiat and phycmisc (i.e., "Diatom Carbon Concentration" and "Non-Diatom Phytoplankton Carbon Concentration"		phyc
2	Zooplankton Carbon Concentration	mol m^{-3}	sum of zooplankton carbon component concentrations		zooc
3	Bacterial Carbon Concentration	mol m^{-3}	sum of bacterial carbon component concentrations		bacc
2	Detrital Organic Carbon Concentration	mol m^{-3}	sum of detrital organic carbon component concentrations		detoc
2	Calcite Concentration	mol m^{-3}	sum of particulate calcite component concentrations (e.g. Phytoplankton, Detrital, etc.)		calc
2	Aragonite Concentration	mol m^{-3}	sum of particulate aragonite components (e.g. Phytoplankton, Detrital, etc.)		arag
3	Mole Concentration of Diatoms expressed as Carbon in Sea Water	mol m^{-3}	carbon from the diatom phytoplankton component concentration alone		phydiat
3	Mole Concentration of Diazotrophs Expressed as Carbon in Sea Water	mol m^{-3}	carbon concentration from the diazotrophic phytoplankton component alone		phydiaz
3	Mole Concentration of Calcareous Phytoplankton expressed as Carbon in Sea Water	mol m^{-3}	carbon concentration from calcareous (calcite-producing) phytoplankton component alone		phycalc
3	Mole Concentration of Picophytoplankton expressed as Carbon in Sea Water	mol m^{-3}	carbon concentration from the picophytoplankton (<2 um) component alone		phypico
3	Mole Concentration of Miscellaneous Phytoplankton expressed as Carbon in Sea Water	mol m^{-3}	carbon concentration from additional phytoplankton component alone		phymisc
3	Mole Concentration of Microzooplankton expressed as Carbon in Sea Water	mol m^{-3}	carbon concentration from the microzooplankton (<20 um) component alone		zmicro

yr

standard name	unconfirmed or proposed standard name	unformatted units	cell_methods	positive	type	CMOR dimensions	CMOR variable name	realm
mole_concentration_of_dissolved_inorganic_carbon_in_sea_water		mol m-3	time: mean area: mean where sea		real	longitude latitude olevel time	dissic	ocnBgchem
mole_concentration_of_dissolved_organic_carbon_in_sea_water		mol m-3	time: mean area: mean where sea		real	longitude latitude olevel time	dissoc	ocnBgchem
mole_concentration_of_phytoplankton_expressed_as_carbon_in_sea_water		mol m-3	time: mean area: mean where sea		real	longitude latitude olevel time	phyc	ocnBgchem
mole_concentration_of_zooplankton_expressed_as_carbon_in_sea_water		mol m-3	time: mean area: mean where sea		real	longitude latitude olevel time	zooc	ocnBgchem
mole_concentration_of_bacteria_expressed_as_carbon_in_sea_water		mol m-3	time: mean area: mean where sea		real	longitude latitude olevel time	bacc	ocnBgchem
mole_concentration_of_organic_detritus_expressed_as_carbon_in_sea_water		mol m-3	time: mean area: mean where sea		real	longitude latitude olevel time	detoc	ocnBgchem
mole_concentration_of_calcite_expressed_as_carbon_in_sea_water		mol m-3	time: mean area: mean where sea		real	longitude latitude olevel time	calc	ocnBgchem
mole_concentration_of_aragonite_expressed_as_carbon_in_sea_water		mol m-3	time: mean area: mean where sea		real	longitude latitude olevel time	arag	ocnBgchem
mole_concentration_of_diatoms_expressed_as_carbon_in_sea_water		mol m-3	time: mean area: mean where sea		real	longitude latitude olevel time	phydiat	ocnBgchem
mole_concentration_of_diazotrophs_expressed_as_carbon_in_sea_water		mol m-3	time: mean area: mean where sea		real	longitude latitude olevel time	phydiaz	ocnBgchem
mole_concentration_of_calcareous_phytoplankton_expressed_as_carbon_in_sea_water		mol m-3	time: mean area: mean where sea		real	longitude latitude olevel time	phycalc	ocnBgchem
mole_concentration_of_picophytoplankton_expressed_as_carbon_in_sea_water		mol m-3	time: mean area: mean where sea		real	longitude latitude olevel time	phypico	ocnBgchem
mole_concentration_of_miscellaneous_phytoplankton_expressed_as_carbon_in_sea_water		mol m-3	time: mean area: mean where sea		real	longitude latitude olevel time	phymisc	ocnBgchem
mole_concentration_of_microzooplankton_expressed_as_carbon_in_sea_water		mol m-3	time: mean area: mean where sea		real	longitude latitude olevel time	zmicro	ocnBgchem

frequency	cell_measures	flag_values	flag_meanings
	area: areacello volume: volcello		
	area: areacello volume: volcello		
	area: areacello volume: volcello		
	area: areacello volume: volcello		
	area: areacello volume: volcello		
	area: areacello volume: volcello		
	area: areacello volume: volcello		
	area: areacello volume: volcello		
	area: areacello volume: volcello		
	area: areacello volume: volcello		
	area: areacello volume: volcello		
	area: areacello volume: volcello		
	area: areacello volume: volcello		
	area: areacello volume: volcello		

3	Mole Concentration of Mesozooplankton expressed as Carbon in Sea Water	mol m^{-3}	carbon concentration from mesozooplankton (20-200 um) component alone		zmeso
3	Other Zooplankton Carbon Concentration	mol m^{-3}	carbon from additional zooplankton component concentrations alone (e.g. Micro, meso). Since the models all have different numbers of components, this variable has been included to provide a check for intercomparison between models since some phytoplankton groups are supersets.		zoocmisc
1	Total Alkalinity	mol m^{-3}	total alkalinity equivalent concentration (including carbonate, nitrogen, silicate, and borate components)		talk
1	pH	1	negative log of hydrogen ion concentration with the concentration expressed as mol H kg-1.		ph
1	Dissolve Oxygen Concentration	mol m^{-3}	dissolved oxygen gas concentration in sea water		o2
1	Dissolved Nitrate Concentration	mol m^{-3}	dissolved nitrate concentration in sea water		no3
2	Dissolved Ammonium Concentration	mol m^{-3}	dissolved ammonium concentration in sea water		nh4
1	Dissolved Phosphate Concentration	mol m^{-3}	dissolved Phosphate concentration in sea water		po4
1	Dissolved Iron Concentration	mol m^{-3}	dissolved iron concentration in sea water	dissolved iron is meant to include both Fe2+ and Fe3+ ions (but not, e.g., particulate detrital iron)	dfe
1	Dissolved Silicate Concentration	mol m^{-3}	dissolved silicate concentration in sea water		si
1	Total Chlorophyll Mass Concentration	kg m^{-3}	sum of chlorophyll from all phytoplankton group concentrations. In most models this is equal to chldiat+chlmisc, that is the sum of "Diatom Chlorophyll Mass Concentration" plus "Other Phytoplankton Chlorophyll Mass Concentration"		chl
3	Diatom Chlorophyll Mass Concentration	kg m^{-3}	chlorophyll from diatom phytoplankton component concentration alone		chldiat
3	Mass Concentration of Diazotrophs expressed as Chlorophyll in Sea Water	kg m^{-3}	chlorophyll concentration from the diazotrophic phytoplankton component alone		chldiaz
3	Mass Concentration of Calcareous Phytoplankton expressed as Chlorophyll in Sea Water	kg m^{-3}	chlorophyll concentration from the calcite-producing phytoplankton component alone		chlcalc
3	Mass Concentration of Picophytoplankton expressed as Chlorophyll in Sea Water	kg m^{-3}	chlorophyll concentration from the picophytoplankton (<2 um) component alone		chlpico
3	Other Phytoplankton Chlorophyll Mass Concentration	kg m^{-3}	chlorophyll from additional phytoplankton component concentrations alone		chlmisc

mole_concentration_of_mesozooplankton_expressed_as_carbon_in_sea_water	mol m-3	time: mean area: mean where sea	real	longitude latitude olevel time	zmeso	ocnBgchem
mole_concentration_of_miscellaneous_zooplankton_expressed_as_carbon_in_sea_water	mol m-3	time: mean area: mean where sea	real	longitude latitude olevel time	zoocmisc	ocnBgchem
sea_water_alkalinity_expressed_as_mole_equivalent	mol m-3	time: mean area: mean where sea	real	longitude latitude olevel time	talk	ocnBgchem
sea_water_ph_reported_on_total_scale	1	time: mean area: mean where sea	real	longitude latitude olevel time	ph	ocnBgchem
mole_concentration_of_molecular_oxygen_in_sea_water	mol m-3	time: mean area: mean where sea	real	longitude latitude olevel time	o2	ocnBgchem
mole_concentration_of_nitrate_in_sea_water	mol m-3	time: mean area: mean where sea	real	longitude latitude olevel time	no3	ocnBgchem
mole_concentration_of_ammonium_in_sea_water	mol m-3	time: mean area: mean where sea	real	longitude latitude olevel time	nh4	ocnBgchem
mole_concentration_of_phosphate_in_sea_water	mol m-3	time: mean area: mean where sea	real	longitude latitude olevel time	po4	ocnBgchem
mole_concentration_of_dissolved_iron_in_sea_water	mol m-3	time: mean area: mean where sea	real	longitude latitude olevel time	dfe	ocnBgchem
mole_concentration_of_silicate_in_sea_water	mol m-3	time: mean area: mean where sea	real	longitude latitude olevel time	si	ocnBgchem
mass_concentration_of_phytoplankton_expressed_as_chlorophyll_in_sea_water	kg m-3	time: mean area: mean where sea	real	longitude latitude olevel time	chl	ocnBgchem
mass_concentration_of_diatoms_expressed_as_chlorophyll_in_sea_water	kg m-3	time: mean area: mean where sea	real	longitude latitude olevel time	chldiat	ocnBgchem
mass_concentration_of_diazotrophs_expressed_as_chlorophyll_in_sea_water	kg m-3	time: mean area: mean where sea	real	longitude latitude olevel time	chldiaz	ocnBgchem
mass_concentration_of_calcareous_phytoplankton_expressed_as_chlorophyll_in_sea_water	kg m-3	time: mean area: mean where sea	real	longitude latitude olevel time	chlcalc	ocnBgchem
mass_concentration_of_picophytoplankton_expressed_as_chlorophyll_in_sea_water	kg m-3	time: mean area: mean where sea	real	longitude latitude olevel time	chlpico	ocnBgchem
mass_concentration_of_miscellaneous_phytoplankton_expressed_as_chlorophyll_in_sea_water	kg m-3	time: mean area: mean where sea	real	longitude latitude olevel time	chlmisc	ocnBgchem

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3	Particulate Organic Nitrogen Concentration	mol m^{-3}	sum of particulate organic nitrogen component concentrations		pon
3	Particulate Organic Phosphorus Concentration	mol m^{-3}	sum of particulate organic phosphorus component concentrations		pop
3	Particulate Biogenic Iron Concentration	mol m^{-3}	sum of particulate organic iron component concentrations		bfe
3	Particulate Biogenic Silica Concentration	mol m^{-3}	sum of particulate silica component concentrations		bsi
3	Phytoplankton Nitrogen Concentration	mol m^{-3}	sum of phytoplankton nitrogen component concentrations		phyn
3	Phytoplankton Phosphorus Concentration	mol m^{-3}	sum of phytoplankton phosphorus components		phyp
3	Phytoplankton Iron Concentration	mol m^{-3}	sum of phytoplankton iron component concentrations		phyfe
3	Phytoplankton Silica Concentration	mol m^{-3}	sum of phytoplankton silica component concentrations		physi
3	Dimethyl Sulphide Concentration	mol m^{-3}	dimethyl sulphide concentration		dms
2	Mole Concentration of Carbonate expressed as Carbon in Sea Water	mol m^{-3}	carbonate ion concentration		co3
2	Mole Concentration of Calcite expressed as Carbon in Sea Water at Saturation	mol m^{-3}	carbonate ion concentration at calcite solution saturation	is it clear what "saturation" refers to? Is this like "saturation vapor pressure"? If so, should we say "Saturation Mole Concentration"?	co3satcalc
2	Mole Concentration of Aragonite expressed as Carbon in Sea Water at Saturation	mol m^{-3}	carbonate ion concentration at aragonite solution saturation	is it clear what "saturation" refers to? Is this like "saturation vapor pressure"? If so, should we say "Saturation Mole Concentration"?	co3satarag

mole_concentration_of_particulate_organic_matter_expressed_as_nitrogen_in_sea_water	mol m-3	time: mean area: mean where sea	real	longitude latitude olevel time	pon	ocnBgchem
mole_concentration_of_particulate_organic_matter_expressed_as_phosphorus_in_sea_water	mol m-3	time: mean area: mean where sea	real	longitude latitude olevel time	pop	ocnBgchem
mole_concentration_of_particulate_organic_matter_expressed_as_iron_in_sea_water	mol m-3	time: mean area: mean where sea	real	longitude latitude olevel time	bfe	ocnBgchem
mole_concentration_of_particulate_matter_expressed_as_silicon_in_sea_water	mol m-3	time: mean area: mean where sea	real	longitude latitude olevel time	bsi	ocnBgchem
mole_concentration_of_phytoplankton_expressed_as_nitrogen_in_sea_water	mol m-3	time: mean area: mean where sea	real	longitude latitude olevel time	phyn	ocnBgchem
mole_concentration_of_phytoplankton_expressed_as_phosphorus_in_sea_water	mol m-3	time: mean area: mean where sea	real	longitude latitude olevel time	phyp	ocnBgchem
mole_concentration_of_phytoplankton_expressed_as_iron_in_sea_water	mol m-3	time: mean area: mean where sea	real	longitude latitude olevel time	phyfe	ocnBgchem
mole_concentration_of_phytoplankton_expressed_as_silicon_in_sea_water	mol m-3	time: mean area: mean where sea	real	longitude latitude olevel time	physi	ocnBgchem
mole_concentration_of_dimethyl_sulfide_in_sea_water	mol m-3	time: mean area: mean where sea	real	longitude latitude olevel time	dms	ocnBgchem
mole_concentration_of_carbonate_expressed_as_carbon_in_sea_water	mol m-3	time: mean area: mean where sea	real	longitude latitude olevel time	co3	ocnBgchem
mole_concentration_of_calcite_expressed_as_carbon_in_sea_water_at_saturation	mol m-3	time: mean area: mean where sea	real	longitude latitude olevel time	co3satcalc	ocnBgchem
mole_concentration_of_aragonite_expressed_as_carbon_in_sea_water_at_saturation	mol m-3	time: mean area: mean where sea	real	longitude latitude olevel time	co3satarag	ocnBgchem

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

priority	long name	units	comment	questions	output variable name
3	Primary Carbon Production by Phytoplankton	mol $m^{-3} s^{-1}$	total primary (organic carbon) production by phytoplankton		pp
3	Primary Carbon Production by Phytoplankton due to Nitrate Uptake Alone	mol $m^{-3} s^{-1}$	Primary (organic carbon) production by phytoplankton due to nitrate uptake alone		pnitrate
3	Biogenic Iron Production	mol $m^{-3} s^{-1}$	Biogenic iron production		pbfe
3	Biogenic Silica Production	mol $m^{-3} s^{-1}$	Biogenic silica production		pbsi
3	Calcite Production	mol $m^{-3} s^{-1}$	calcite production		pcalc
3	Aragonite Production	mol $m^{-3} s^{-1}$	aragonite production		parag
3	Sinking Particulate Organic Carbon Flux	mol $m^{-2} s^{-1}$	sinking flux of organic carbon		expc
3	Sinking Particulate Organic Nitrogen Flux	mol $m^{-2} s^{-1}$	sinking flux of organic nitrogen		expn
3	Sinking Particulate Organic Phosphorus Flux	mol $m^{-2} s^{-1}$	sinking flux of organic phosphorus		expp
3	Sinking Particulate Iron Flux	mol $m^{-2} s^{-1}$	sinking flux of iron		expcfe
3	Sinking Particulate Silica Flux	mol $m^{-2} s^{-1}$	sinking flux of silica		expsi
3	Sinking Calcite Flux	mol $m^{-2} s^{-1}$	sinking flux of calcite		expcalc
3	Sinking Aragonite Flux	mol $m^{-2} s^{-1}$	sinking flux of aragonite		exparag
3	Calcite Dissolution	mol $m^{-3} s^{-1}$	calcite dissolution		dcalc
3	Aragonite Dissolution	mol $m^{-3} s^{-1}$	aragonite dissolution		darag

standard name	unconfirmed or proposed standard name	unformatted units	cell_methods	positive	type	CMOR dimensions	CMOR variable name	realm
tendency_of_mole_concentration_of_particulate_organic_matter_expressed_as_carbon_in_sea_water_due_to_net_primary_production		mol m-3 s-1	time: mean area: mean where sea		real	longitude latitude olevel time	pp	ocnBgchem
tendency_of_mole_concentration_of_particulate_organic_carbon_expressed_as_carbon_in_sea_water_due_to_nitrate_utilization		mol m-3 s-1	time: mean area: mean where sea		real	longitude latitude olevel time	pnitrate	ocnBgchem
tendency_of_mole_concentration_of_iron_in_sea_water_due_to_biological_production		mol m-3 s-1	time: mean area: mean where sea		real	longitude latitude olevel time	pbfe	ocnBgchem
tendency_of_mole_concentration_of_silicon_in_sea_water_due_to_biological_production		mol m-3 s-1	time: mean area: mean where sea		real	longitude latitude olevel time	pbsi	ocnBgchem
tendency_of_mole_concentration_of_calcite_expressed_as_carbon_in_sea_water_due_to_biological_production		mol m-3 s-1	time: mean area: mean where sea		real	longitude latitude olevel time	pcalc	ocnBgchem
tendency_of_mole_concentration_of_aragonite_expressed_as_carbon_in_sea_water_due_to_biological_production		mol m-3 s-1	time: mean area: mean where sea		real	longitude latitude olevel time	parag	ocnBgchem
sinking_mole_flux_of_particulate_organic_matter_expressed_as_carbon_in_sea_water		mol m-2 s-1	time: mean area: mean where sea	down	real	longitude latitude olevel time	expc	ocnBgchem
sinking_mole_flux_of_particulate_organic_nitrogen_in_sea_water		mol m-2 s-1	time: mean area: mean where sea	down	real	longitude latitude olevel time	expn	ocnBgchem
sinking_mole_flux_of_particulate_organic_phosphorus_in_sea_water		mol m-2 s-1	time: mean area: mean where sea	down	real	longitude latitude olevel time	expp	ocnBgchem
sinking_mole_flux_of_particulate_iron_in_sea_water		mol m-2 s-1	time: mean area: mean where sea	down	real	longitude latitude olevel time	expcfe	ocnBgchem
sinking_mole_flux_of_particulate_silicon_in_sea_water		mol m-2 s-1	time: mean area: mean where sea	down	real	longitude latitude olevel time	expsi	ocnBgchem
sinking_mole_flux_of_calcite_expressed_as_carbon_in_sea_water		mol m-2 s-1	time: mean area: mean where sea	down	real	longitude latitude olevel time	expcalc	ocnBgchem
sinking_mole_flux_of_aragonite_expressed_as_carbon_in_sea_water		mol m-2 s-1	time: mean area: mean where sea	down	real	longitude latitude olevel time	exparag	ocnBgchem
tendency_of_mole_concentration_of_calcite_expressed_as_carbon_in_sea_water_due_to_dissolution		mol m-3 s-1	time: mean area: mean where sea		real	longitude latitude olevel time	dcalc	ocnBgchem
tendency_of_mole_concentration_of_aragonite_expressed_as_carbon_in_sea_water_due_to_dissolution		mol m-3 s-1	time: mean area: mean where sea		real	longitude latitude olevel time	darag	ocnBgchem

frequency	cell_measures	flag_values	flag_meanings
	area: areacello volume: volcello		
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3	Diatom Primary Carbon Production	mol m^{-3} s^{-1}	Primary (organic carbon) production by the diatom component alone		pdi
3	Tendency of Mole Concentration of Organic Carbon in Sea Water due to Net Primary Production by Diazatrophs	mol m^{-3} s^{-1}	Primary (organic carbon) production by the diazotrophic phytoplankton component alone		dpocdtdiaz
3	Tendency of Mole Concentration of Organic Carbon in Sea Water due to Net Primary Production by Picophytoplankton	mol m^{-3} s^{-1}	Primary (organic carbon) production by the calcite-producing phytoplankton component alone		dpocdtcalc
3	Tendency of Mole Concentration of Organic Carbon in Sea Water due to Net Primary Production by Picophytoplankton	mol m^{-3} s^{-1}	Primary (organic carbon) production by the picophytoplankton (<2 um) component alone		dpocdtpico
3	Other Phytoplankton Carbon Production	mol m^{-3} s^{-1}	Primary (organic carbon) production by other phytoplankton components alone	I think this variable is unnecessary since it can be gotten by subtracting diatom primary carbon production from pp.	phypmisc
3	Rate of Change of Dissolved Inorganic Carbon due to Biological Activity	mol 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 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 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 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 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	mol m^{-3} s^{-1}	Net of biological terms in time rate of change of alkalinity	Is "eq" in udunits? Dunne says "equivalents" is preferred to 10**-6 (i.e., ppm) or kmol/m**3?	bddtalk
3	Nonbiogenic Iron Scavenging	mol m^{-3} s^{-1}	Dissolved Fe removed through nonbiogenic scavenging onto particles		fescav
3	Particle Source of Dissolved Iron	mol m^{-3} s^{-1}	Dissolution, remineralization and desorption of iron back to the dissolved phase		fediss

tendency_of_mole_concentration_of_particulate_organic_matter_expressed_as_carbon_in_sea_water_due_to_net_primary_production_by_diatoms	mol m-3 s-1	time: mean area: mean where sea	real	longitude latitude olevel time	pdi	ocnBgchem
tendency_of_mole_concentration_of_particulate_organic_matter_expressed_as_carbon_in_sea_water_due_to_net_primary_production_by_diazatrophs	mol m-3 s-1	time: mean area: mean where sea	real	longitude latitude olevel time	dpocdtdiaz	ocnBgchem
tendency_of_mole_concentration_of_particulate_organic_matter_expressed_as_carbon_in_sea_water_due_to_net_primary_production_by_calcareous_phytoplankton	mol m-3 s-1	time: mean area: mean where sea	real	longitude latitude olevel time	dpocdtcalc	ocnBgchem
tendency_of_mole_concentration_of_particulate_organic_matter_expressed_as_carbon_in_sea_water_due_to_net_primary_production_by_picophytoplankton	mol m-3 s-1	time: mean area: mean where sea	real	longitude latitude olevel time	dpocdtpico	ocnBgchem
tendency_of_mole_concentration_of_particulate_organic_matter_expressed_as_carbon_in_sea_water_due_to_net_primary_production_by_miscellaneous_phytoplankton	mol m-3 s-1	time: mean area: mean where sea	real	longitude latitude olevel time	phypmisc	ocnBgchem
tendency_of_mole_concentration_of_dissolved_inorganic_carbon_in_sea_water_due_to_biological_processes	mol m-3 s-1	time: mean area: mean where sea	real	longitude latitude olevel time	bddtdic	ocnBgchem
tendency_of_mole_concentration_of_dissolved_inorganic_nitrogen_in_sea_water_due_to_biological_processes	mol m-3 s-1	time: mean area: mean where sea	real	longitude latitude olevel time	bddtdin	ocnBgchem
tendency_of_mole_concentration_of_dissolved_inorganic_phosphate_in_sea_water_due_to_biological_processes	mol m-3 s-1	time: mean area: mean where sea	real	longitude latitude olevel time	bddtdip	ocnBgchem
tendency_of_mole_concentration_of_dissolved_inorganic_iron_in_sea_water_due_to_biological_processes	mol m-3 s-1	time: mean area: mean where sea	real	longitude latitude olevel time	bddtdife	ocnBgchem
tendency_of_mole_concentration_of_dissolved_inorganic_silicate_in_sea_water_due_to_biological_processes	mol m-3 s-1	time: mean area: mean where sea	real	longitude latitude olevel time	bddtdisi	ocnBgchem
tendency_of_sea_water_alkalinity_expressed_as_mole_equivalent_due_to_biological_processes	mol m-3 s-1	time: mean area: mean where sea	real	longitude latitude olevel time	bddtalk	ocnBgchem
tendency_of_mole_concentration_of_dissolved_iron_in_sea_water_due_to_scavenging_by_inorganic_particles	mol m-3 s-1	time: mean area: mean where sea	real	longitude latitude olevel time	fescav	ocnBgchem
tendency_of_mole_concentration_of_dissolved_iron_in_sea_water_due_to_dissolution_from_inorganic_particles	mol m-3 s-1	time: mean area: mean where sea	real	longitude latitude olevel time	fediss	ocnBgchem

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3	Total Grazing of Phytoplankton by Zooplankton	mol $m^{-3} s^{-1}$	Total grazing of phytoplankton by zooplankton	graz

tendency_of_mole_concentration_of_dissolved_iron_in_sea_water_due_to_grazing_of_phytoplankton	mol m-3 s-1	time: mean area: mean where sea	real	longitude latitude olevel time	graz	ocnBgchem

area: areacello
volume: volcello

CMOR Table Oclim: Monthly Mean Ocean Climatology (Jan. 1986-Dec. 2005 of historical run) 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
3	Ocean Vertical Heat Diffusivity	$m^2 s^{-1}$			difvho
3	Ocean Vertical Salt Diffusivity	$m^2 s^{-1}$			difvso
3	Ocean Vertical Tracer Diffusivity due to Background	$m^2 s^{-1}$			difvtrbo
3	Ocean Vertical Tracer Diffusivity due to Tides	$m^2 s^{-1}$			difvtrto
3	Tendency of Ocean Potential Energy Content	$W m^{-2}$			tnpeo
3	Tendency of Ocean Potential Energy Content due to Tides	$W m^{-2}$			tnpeot
3	Tendency of Ocean Potential Energy Content due to Background	$W m^{-2}$			tnpeotb
3	Ocean Vertical Momentum Diffusivity	$m^2 s^{-1}$			difvmo

monClim

standard name	unconfirmed or proposed standard name	unformatted units	cell_methods	positive	type	CMOR dimensions	CMOR variable name	realm
ocean_vertical_heat_diffusivity		m2 s-1	time: mean within years time: mean over years		real	longitude latitude olevel time2	difvho	ocean
ocean_vertical_salt_diffusivity	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
ocean_vertical_tracer_diffusivity_due_to_background		m2 s-1	time: mean within years time: mean over years		real	longitude latitude olevel time2	difvtrbo	ocean
ocean_vertical_tracer_diffusivity_due_to_tides		m2 s-1	time: mean within years time: mean over years		real	longitude latitude olevel time2	difvtrto	ocean
tendency_of_ocean_potential_energy_content		W m-2	time: mean within years time: mean over years		real	longitude latitude olevel time2	tnpeo	ocean
tendency_of_ocean_potential_energy_content_due_to_tides		W m-2	time: mean within years time: mean over years		real	longitude latitude olevel time2	tnpeot	ocean
tendency_of_ocean_potential_energy_content_due_to_background		W m-2	time: mean within years time: mean over years		real	longitude latitude olevel time2	tnpeotb	ocean
ocean_vertical_momentum_diffusivity		m2 s-1	time: mean within years time: mean over years		real	longitude latitude olevel time2	difvmo	ocean

frequency	cell_measures	flag_values	flag_meanings
	area: areacello volume: volcello		
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	area: areacello volume: volcello		

3	Ocean Vertical Momentum Diffusivity due to Background	$m^2 s^{-1}$	difvmbo
3	Ocean Vertical Momentum Diffusivity due to Tides	$m^2 s^{-1}$	difvmto
3	Ocean Vertical Momentum Diffusivity due to Form Drag	$m^2 s^{-1}$	difvmfdo
3	Ocean Kinetic Energy Dissipation Per Unit Area due to Vertical Friction	$W m^{-2}$	dispkevfo

ocean_vertical_momentum_diffusivity_due_to_background	m2 s-1	time: mean within years time: mean over years	real	longitude latitude olevel time2	difvmbo	ocean
ocean_vertical_momentum_diffusivity_due_to_tides	m2 s-1	time: mean within years time: mean over years	real	longitude latitude olevel time2	difvmto	ocean
ocean_vertical_momentum_diffusivity_due_to_form_drag	m2 s-1	time: mean within years time: mean over years	real	longitude latitude olevel time2	difvmfdo	ocean
ocean_kinetic_energy_dissipation_per_unit_area_due_to_vertical_friction	W m-2	time: mean within years time: mean over years	real	longitude latitude olevel time2	dispkevfo	ocean

area: areacello
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In CMOR Table Oclim: *WGOMD Table 2.10*

priority	long name	units	comment	questions	output variable name
3	Ocean Tracer Bolus Laplacian Diffusivity	$m^2 s^{-1}$			diftrblo
3	Ocean Tracer Bolus Biharmonic Diffusivity	$m^4 s^{-1}$			diftrbbo
3	Ocean Tracer Epineutral Laplacian Diffusivity	$m^2 s^{-1}$			diftrelo
3	Ocean Tracer Epineutral Biharmonic Diffusivity	$m^4 s^{-1}$			diftrebo
3	Ocean Tracer XY Laplacian Diffusivity	$m^2 s^{-1}$			diftrxylo
3	Ocean Tracer XY Biharmonic Diffusivity	$m^4 s^{-1}$			diftrxybo
3	Tendency of Ocean Eddy Kinetic Energy Content due to Bolus Transport	$W m^{-2}$			tnkebto
3	Ocean Momentum XY Laplacian Diffusivity	$m^2 s^{-1}$			difmxylo
3	Ocean Momentum XY Biharmonic Diffusivity	$m^4 s^{-1}$			difmxybo
3	Ocean Kinetic Energy Dissipation Per Unit Area due to XY Friction	$W m^{-2}$			dispkexyfo

standard name	unconfirmed or proposed standard name	unformatted units	cell_methods	positive	type	CMOR dimensions	CMOR variable name	realm
ocean_tracer_bolus_laplacian_diffusivity		m2 s-1	time: mean within years time: mean over years		real	longitude latitude olevel time2	diftrblo	ocean
ocean_tracer_bolus_biharmonic_diffusivity		m4 s-1	time: mean within years time: mean over years		real	longitude latitude olevel time2	diftrbbo	ocean
ocean_tracer_epineutral_laplacian_diffusivity		m2 s-1	time: mean within years time: mean over years		real	longitude latitude olevel time2	diftrelo	ocean
ocean_tracer_epineutral_biharmonic_diffusivity		m4 s-1	time: mean within years time: mean over years		real	longitude latitude olevel time2	diftrebo	ocean
ocean_tracer_xy_laplacian_diffusivity		m2 s-1	time: mean within years time: mean over years		real	longitude latitude olevel time2	diftrxylo	ocean
ocean_tracer_xy_biharmonic_diffusivity		m4 s-1	time: mean within years time: mean over years		real	longitude latitude olevel time2	diftrxybo	ocean
tendency_of_ocean_eddy_kinetic_energy_content _due_to_bolus_transport		W m-2	time: mean within years time: mean over years		real	longitude latitude olevel time2	tnkebto	ocean
ocean_momentum_xy_laplacian_diffusivity		m2 s-1	time: mean within years time: mean over years		real	longitude latitude olevel time2	difmxylo	ocean
ocean_momentum_xy_biharmonic_diffusivity		m4 s-1	time: mean within years time: mean over years		real	longitude latitude olevel time2	difmxybo	ocean
ocean_kinetic_energy_dissipation_per_unit_area _due_to_xy_friction		W m-2	time: mean within years time: mean over years		real	longitude latitude olevel time2	dispkexyfo	ocean

frequency	cell_measures	flag_values	flag_meanings
	area: areacello volume: volcello		
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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
1	Near-Surface Air Temperature	K	near-surface (usually, 2 meter) air temperature.		tas
1	Surface Temperature	K	"skin" temperature (i.e., SST for open ocean)		ts
1	Daily Minimum Near-Surface Air Temperature	K	monthly mean of the daily-minimum near-surface (usually, 2 meter) air temperature.		tasmin
1	Daily Maximum Near-Surface Air Temperature	K	monthly mean of the daily-maximum near-surface (usually, 2 meter) air temperature.		tasmax
1	Sea Level Pressure	Pa	not, in general, the same as surface pressure		psl
1	Surface Air Pressure	Pa	not, in general, the same as mean sea-level pressure		ps
1	Eastward Near-Surface Wind	$m\ s^{-1}$	near-surface (usually, 10 meters) eastward component of wind.		uas
1	Northward Near-Surface Wind	$m\ s^{-1}$	near-surface (usually, 10 meters) northward component of wind.		vas
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
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
1	Near-Surface Specific Humidity	1	near-surface (usually, 2 meters) specific humidity.		huss
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
1	Snowfall Flux	$kg\ m^{-2}\ s^{-1}$	at surface; includes precipitation of all forms of water in the solid phase		prsn
1	Convective Precipitation	$kg\ m^{-2}\ s^{-1}$	at surface; includes both liquid and solid phases.		prc
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
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

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standard name	unconfirmed or proposed standard name	unformatted units	cell_methods	positive	type	CMOR dimensions	CMOR variable name	realm
air_temperature		K	time: mean		real	longitude latitude time height2m	tas	atmos
surface_temperature		K	time: mean		real	longitude latitude time	ts	atmos
air_temperature		K	time: minimum within days time: mean over days		real	longitude latitude time height2m	tasmin	atmos
air_temperature		K	time: maximum within days time: mean over days		real	longitude latitude time height2m	tasmax	atmos
air_pressure_at_sea_level		Pa	time: mean		real	longitude latitude time	psl	atmos
surface_air_pressure		Pa	time: mean		real	longitude latitude time	ps	atmos
eastward_wind		m s-1	time: mean		real	longitude latitude time height10m	uas	atmos
northward_wind		m s-1	time: mean		real	longitude latitude time height10m	vas	atmos
wind_speed		m s-1	time: mean		real	longitude latitude time height10m	sfcWind	atmos
relative_humidity		%	time: mean		real	longitude latitude time height2m	hurs	atmos
specific_humidity		1	time: mean		real	longitude latitude time height2m	huss	atmos
								atmos
precipitation_flux		kg m-2 s-1	time: mean		real	longitude latitude time	pr	atmos
snowfall_flux		kg m-2 s-1	time: mean		real	longitude latitude time	prsn	atmos
convective_precipitation_flux		kg m-2 s-1	time: mean		real	longitude latitude time	prc	atmos
water_evaporation_flux		kg m-2 s-1	time: mean		real	longitude latitude time	evspsbl	atmos
water_sublimation_flux		kg m-2 s-1	time: mean		real	longitude latitude time	sbl	atmos
								atmos

frequency	cell_measures	flag_values	flag_meanings
	area: areacella		
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1	Surface Downward Eastward Wind Stress	Pa		tauu
1	Surface Downward Northward Wind Stress	Pa		tauv
1	Surface Upward Latent Heat Flux	W m^{-2}	includes both evaporation and sublimation	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	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 Incident Shortwave Radiation	W m^{-2}	incident shortwave at the top of the atmosphere	rsdt
1	TOA Outgoing Shortwave Radiation	W m^{-2}	at the top of the atmosphere	rsut
1	TOA Outgoing Longwave Radiation	W m^{-2}	at the top of the atmosphere (to be compared with satellite measurements)	rlut
1	TOA Outgoing Clear-Sky Longwave Radiation	W m^{-2}		rlutcs
1	TOA Outgoing Clear-Sky Shortwave Radiation	W m^{-2}		rsutcs
1	Water Vapor Path	kg m^{-2}	vertically integrated through the atmospheric column	prw
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
1	Condensed Water Path	kg m^{-2}	calculate mass of condensed (liquid + ice) water in the column divided by the area of the column (not just the area of the cloudy portion of the column). Include precipitating hydrometeors ONLY if the precipitating hydrometeor affects the calculation of radiative transfer in model.	clwvi
1	Ice Water Path	kg m^{-2}	calculate mass of ice water in the column divided by the area of the column (not just the area of the cloudy portion of the column). Include precipitating frozen hydrometeors ONLY if the precipitating hydrometeor affects the calculation of radiative transfer in model.	clivi

surface_downward_eastward_stress	Pa	time: mean	down	real	longitude latitude time	tauu	atmos
surface_downward_northward_stress	Pa	time: mean	down	real	longitude latitude time	tauv	atmos
							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
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
							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
toa_outgoing_longwave_flux	W m-2	time: mean	up	real	longitude latitude time	rlut	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
				real			atmos
atmosphere_water_vapor_content	kg m-2	time: mean		real	longitude latitude time	prw	atmos
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
							atmos

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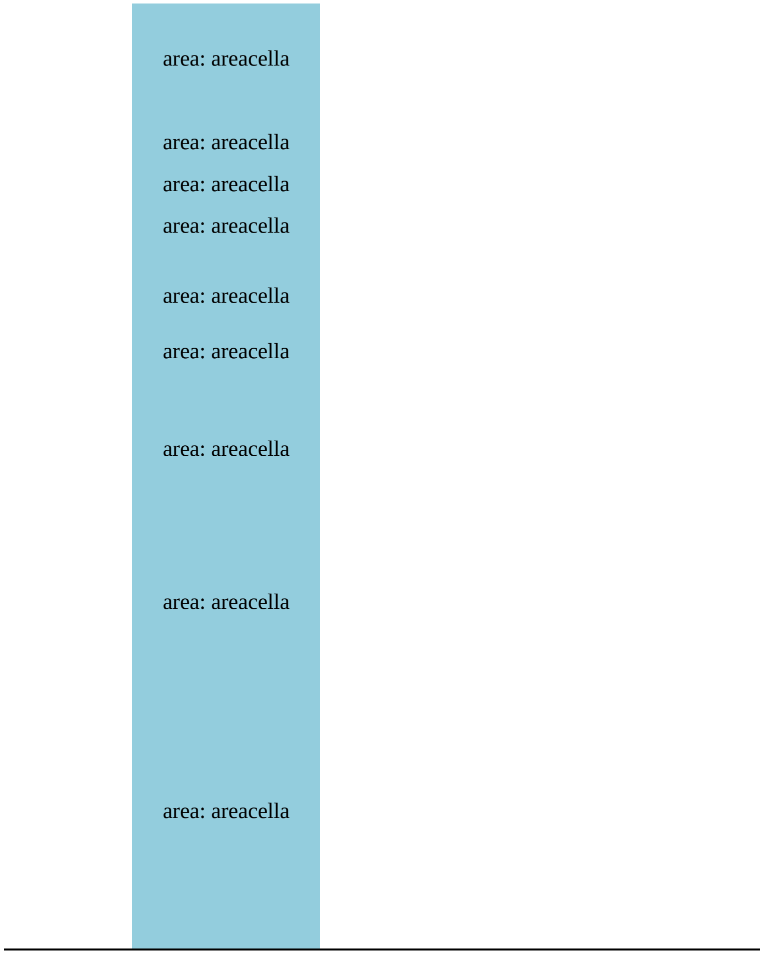
1	Net Downward Flux at Top of Model	W m^{-2}	i.e., at the top of that portion of the atmosphere where dynamics are explicitly treated by the model. Report only if this differs from the net downward radiative flux at the top of the atmosphere.	rtmt
1	Air Pressure at Convective Cloud Base	Pa		ccb
1	Air Pressure at Convective Cloud Top	Pa		cct
1	Fraction of Time Convection Occurs	1	Fraction of time that convection occurs in the grid cell .	ci
1	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	Carbon Mass Flux into Atmosphere Due to All Anthropogenic Emissions of CO2	kg 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 sources associated with anthropogenic land use change excluding forest regrowth.	fco2antt
1	Carbon Mass Flux into Atmosphere Due to Fossil Fuel Emissions of CO2	kg 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, including cement production, and flaring (but not from land-use changes, agricultural burning, forest regrowth, etc.)	fco2fos
1	Surface Carbon Mass Flux into the Atmosphere Due to Natural Sources	kg 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 ecosystem biospheric productivity", for land, and "air to sea CO2 flux", for ocean.)	fco2nat

net_downward_radiative_flux_at_top_of_atmosphere_model		W m-2	time: mean	down	real	longitude latitude time	rtmt	atmos
air_pressure_at_convective_cloud_base		Pa	time: mean		real	longitude latitude time	ccb	atmos
air_pressure_at_convective_cloud_top		Pa	time: mean		real	longitude latitude time	cct	atmos
		1	time: mean		real	longitude latitude time	ci	atmos
		1	time: mean		real	longitude latitude time	sci	atmos
		kg m-2 s-1	time: mean	up	real	longitude latitude time	fco2antt	atmos
		kg m-2 s-1	time: mean	up	real	longitude latitude time	fco2fos	atmos
		kg m-2 s-1	time: mean	up	real	longitude latitude time	fco2nat	atmos


area: areacella
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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
1	Cloud Area Fraction	%	Report on model layers (not standard pressures). Include both large-scale and convective cloud.		cl
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. Include precipitating hydrometeors ONLY if the precipitating hydrometeor affects the calculation of radiative transfer in model.		clw
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. Include precipitating hydrometeors ONLY if the precipitating hydrometeor affects the calculation of radiative transfer in model.		cli
1	Convective Mass Flux	kg m^{-2} s^{-1}	Report on model half-levels (i.e., model layer bounds and not standard pressures). The net mass flux should represent the difference between the updraft and downdraft components. The flux is computed as the mass divided by the area of the grid cell.		mc
1	Air Temperature	K			ta
1	Eastward Wind	m s^{-1}			ua
1	Northward Wind	m s^{-1}			va
1	Specific Humidity	1			hus
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
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

standard name	unconfirmed or proposed standard name	unformatted units	cell_methods	positive	type	CMOR dimensions	CMOR variable name	realm
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
atmosphere_net_upward_convective_mass_flux		kg m-2 s-1	time: mean	up	real	longitude latitude alevhalf time	mc	atmos
air_temperature		K	time: mean		real	longitude latitude plevs time	ta	atmos
eastward_wind		m s-1	time: mean		real	longitude latitude plevs time	ua	atmos
northward_wind		m s-1	time: mean		real	longitude latitude plevs time	va	atmos
specific_humidity		1	time: mean		real	longitude latitude plevs time	hus	atmos
relative_humidity		%	time: mean		real	longitude latitude plevs time	hur	atmos
lagrangian_tendency_of_air_pressure		Pa s-1	time: mean		real	longitude latitude plevs time	wap	atmos

frequency	cell_measures	flag_values	flag_meanings
	area: areacella		
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	area: areacella		
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1	Geopotential Height	m			zg
1	Mole Fraction of O3	1e-9	If this does not change over time (except possibly to vary identically over each annual cycle), report instead the variable described in the next table entry.	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
1	Mole Fraction of O3	1e-9	If O3 does not vary from one year to the next, report 12 months, starting with January. (Note: include all 12 months even if the values don't vary seasonally.) When calling CMOR, identify this variable as tro3Clim, not tro3. If the O3 varies from one year to the next, then report instead the field described in the previous table entry.	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
1	Mole Fraction of CO2	1e-6	For some simulations (e.g., prescribed concentration pi-control run), this will not vary from one year to the next, and so report instead the variable described in the next table entry. If spatially uniform, omit this field, but report Total Atmospheric Mass of CO2 (see the table entry after the next one).	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
1	Mole Fraction of CO2	1e-6	Report only for simulations (e.g., prescribed concentration pi-control run), in which the CO2 does not vary from one year to the next. Report 12 monthly values, starting with January, even if the values don't vary seasonally. When calling CMOR, identify this variable as co2Clim, not co2. If CO2 is spatially uniform, omit this field, but report Total Atmospheric Mass of CO2 (see the table entry after the next).	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

geopotential_height	m	time: mean	real	longitude latitude plevs time	zg	atmos
mole_fraction_of_ozone_in_air	1e-9	time: mean	real	longitude latitude plevs time	tro3	atmos atmosChem
mole_fraction_of_ozone_in_air	1e-9	time: mean within years time: mean over years	real	longitude latitude plevs time2	tro3Clim	atmos atmosChem
mole_fraction_of_carbon_dioxide_in_air	1e-6	time: mean	real	longitude latitude plevs time	co2	atmos
mole_fraction_of_carbon_dioxide_in_air	1e-6	time: mean within years time: mean over years	real	longitude latitude plevs time2	co2Clim	atmos

	area: areacella
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1	Total Atmospheric Mass of CO_2	kg	For some simulations (e.g., prescribed concentration pi-control run), this will not vary from one year to the next, and so report instead the variable described in the next table entry. If CO_2 is spatially nonuniform, omit this field, but report Mole Fraction of CO_2 (see the table entry before the previous one).		co2mass
1	Total Atmospheric Mass of CO_2	kg	Report only for simulations (e.g., prescribed concentration pi-control run), in which the CO_2 does not vary from one year to the next. Report 12 monthly values, starting with January, even if the values don't vary seasonally. When calling CMOR, identify this variable as co2massClim, not co2mass. If CO_2 is spatially nonuniform, omit this field, but report Mole Fraction of CO_2 (see the table entry before the previous one).		co2mass
1	Mole Fraction of CH_4	1e-9	For some simulations (e.g., prescribed concentration pi-control run), this will not vary from one year to the next, and so report instead the variable described in the next table entry. If CH_4 is spatially uniform, omit this field, but report Global Mean Mole Fraction of CH_4 (see the table entry after the next one).	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
1	Mole Fraction of CH_4	1e-9	Report only for simulations (e.g., prescribed concentration pi-control run), in which the CH_4 does not vary from one year to the next. Report 12 monthly values, starting with January, even if the values don't vary seasonally. When calling CMOR, identify this variable as ch4global, not ch4. If CH_4 is spatially uniform, omit this field, but report Global Mean Mole Fraction of CH_4 (see the table entry after the next).	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
1	Global Mean Mole Fraction of CH_4	1e-9	For some simulations (e.g., prescribed concentration pi-control run), this will not vary from one year to the next, and so report instead the variable described in the next table entry. If CH_4 is spatially nonuniform, omit this field, but report Mole Fraction of CH_4 (see the table entry before the previous one).	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?)?	ch4global

	kg	time: mean	real	time	co2mass	atmos
	kg	time: mean within years time: mean over years	real	time2	co2massClim	atmos
mole_fraction_of_methane_in_air	1e-9	time: mean	real	longitude latitude plevs time	ch4	atmos atmosChem
mole_fraction_of_methane_in_air	1e-9	time: mean within years time: mean over years	real	longitude latitude plevs time2	ch4Clim	atmos atmosChem
mole_fraction_of_methane_in_air	1e-9	time: mean	real	time	ch4global	atmos atmosChem

monClim	
	area: areacella
monClim	area: areacella

1	Global Mean Mole Fraction of CH4	1e-9	Report only for simulations (e.g., prescribed concentration pi-control run), in which the CH4 does not vary from one year to the next. Report 12 monthly values, starting with January, even if the values don't vary seasonally. When calling CMOR, identify this variable as ch4globalClim, not ch4global. If CH4 is spatially nonuniform, omit this field, but report Global Mean Mole Fraction of CH4 (see the table entry before the previous one).	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?)?	ch4global
1	Mole Fraction of N2O	1e-9	For some simulations (e.g., prescribed concentration pi-control run), this will not vary from one year to the next, and so report instead the variable described in the next table entry. If N2O is spatially uniform, omit this field, but report Global Mean Mole Fraction of N2O (see the table entry after the next one).	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
1	Mole Fraction of N2O	1e-9	Report only for simulations (e.g., prescribed concentration pi-control run), in which the N2O does not vary from one year to the next. Report 12 monthly values, starting with January, even if the values don't vary seasonally. When calling CMOR, identify this variable as n2oglobal, not n2o. If N2O is spatially uniform, omit this field, but report Global Mean Mole Fraction of N2O (see the table entry after the next).	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
1	Global Mean Mole Fraction of N2O	1e-9	For some simulations (e.g., prescribed concentration pi-control run), this will not vary from one year to the next, and so report instead the variable described in the next table entry. If N2O is spatially nonuniform, omit this field, but report Mole Fraction of N2O (see the table entry before the previous one).	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?)?	n2oglobal

mole_fraction_of_methane_in_air	1e-9	time: mean within years time: mean over years	real	time2	ch4globalClim	atmos atmosChem
mole_fraction_of_nitrous_oxide_in_air	1e-9	time: mean	real	longitude latitude plevs time	n2o	atmos atmosChem
mole_fraction_of_nitrous_oxide_in_air	1e-9	time: mean within years time: mean over years	real	longitude latitude plevs time2	n2oClim	atmos atmosChem
mole_fraction_of_nitrous_oxide_in_air	1e-9	time: mean	real	time	n2oglobal	atmos atmosChem

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	area: areacella
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1	Global Mean Mole Fraction of N2O	1e-9	Report only for simulations (e.g., prescribed concentration pi-control run), in which the N2O does not vary from one year to the next. Report 12 monthly values, starting with January, even if the values don't vary seasonally. When calling CMOR, identify this variable as ch4globalClim, not ch4global. If N2O is spatially nonuniform, omit this field, but report Global Mean Mole Fraction of N2O (see the table entry before the previous one).	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?)?	n2oglobal
1	Mole Fraction of Other Radiatively Important Trace Gases (That Are Evolving in Time).	1	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.	

In CMOR Table Amon: *Climatological atmospheric 3-D pressure fields*

These field are requested *only for models in which the pressure can't be calculated from the vertical coordinate information stored already for each variable.* Thus, the pressures on each model level are needed for height or theta-coordinate models, for example, but not sigma- or eta-coordinate models. The annual cycle climatology (computed from an appropriate segment of the pre-industrial control run) should be reported on model levels and half levels. DO ***NOT*** REPORT ALL MONTHS FOR ALL EXPERIMENTS: Report only 12 months of data representing the climatology of the pre-industrial control run.

priority	**long name**	**units**	**comment**	**questions**	**output variable name**
1	Pressure on Model Levels	Pa			pfull
1	Pressure on Model Half-Levels	Pa			phalf

mole_fraction_of_nitrous_oxide_in_air		1e-9	time: mean within years time: mean over years		real	time2	n2oglobalClim	atmos atmosChem
		1			real	longitude latitude plevs time	0	atmos atmosChem

standard name	unconfirmed or proposed standard name	unformatted units	cell_methods	positive	type	CMOR dimensions	CMOR variable name	realm
air_pressure		Pa	time: mean within years time: mean over years		real	longitude latitude alevel time2	pfull	atmos
air_pressure		Pa	time: mean within years time: mean over years		real	longitude latitude alevhalf time2	phalf	atmos

monClim			
	area: areacella		

frequency	cell_measures	flag_values	flag_meanings
monClim	area: areacella		
monClim	area: areacella		

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
2	Surface Concentration of (+name of tracer)	mol m^{-3} or kg m^{-3} or 1, consistent with first table in Oyr	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.		include Oyr 3D tracers
1	Primary Organic Carbon Production by All Types of Phytoplankton	mol m^{-2} s^{-1}	Vertically integrated total primary (organic carbon) production by phytoplankton. This should equal the sum of intpdiat+intpphymisc, but those individual components may be unavailable in some models.		intpp
2	Primary Organic Carbon Production by Phytoplankton Based on Nitrate Uptake Alone	mol m^{-2} s^{-1}	Vertically integrated primary (organic carbon) production by phytoplankton based on nitrate uptake alone		intpnitrate
2	Primary Organic Carbon Production by Diatoms	mol m^{-2} s^{-1}	Vertically integrated primary (organic carbon) production by the diatom phytoplankton component alone		intpdiat
3	Net Primary Mole Productivity of Carbon by Diazatrophs	mol m^{-2} s^{-1}			intpdiaz
3	Net Primary Mole Productivity of Carbon by Calcareous Phytoplankton	mol m^{-2} s^{-1}			intpcalc
3	Net Primary Mole Productivity of Carbon by Picophytoplankton	mol m^{-2} s^{-1}			intppico
3	Primary Organic Carbon Production by Other Phytoplankton	mol m^{-2} s^{-1}	Vertically integrated total primary (organic carbon) production by other phytoplankton components alone		intpmisc
3	Iron Production	mol m^{-2} s^{-1}	Vertically integrated biogenic iron production		intpbfe
3	Silica Production	mol m^{-2} s^{-1}	Vertically integrated biogenic silica production		intpbsi
3	Calcite Production	mol m^{-2} s^{-1}	Vertically integrated calcite production		intpcalc
3	Aragonite Production	mol m^{-2} s^{-1}	Vertically integrated aragonite production		intparag
1	Downward Flux of Particle Organic Carbon at 100M	mol m^{-2} s^{-1}	sinking flux of organic carbon at 100m		epc100

mon

standard name	unconfirmed or proposed standard name	unformatted units	cell_methods	positive	type	CMOR dimensions	CMOR variable name	realm
		mol m-3 or kg m-3 or 1, consistent with first table in Oyr	time: mean area: mean where sea		real	longitude latitude time depth0m		ocnBgchem
net_primary_mole_productivity_of_carbon		mol m-2 s-1	time: mean area: mean where sea		real	longitude latitude time	intpp	ocnBgchem
net_primary_mole_productivity_of_carbon_due_to_nitrate_utilization		mol m-2 s-1	time: mean area: where sea		real	longitude latitude time	intpnitrate	ocnBgchem
net_primary_mole_productivity_of_carbon_by_diatoms		mol m-2 s-1	time: mean area: mean where sea		real	longitude latitude time	intpdiat	ocnBgchem
net_primary_mole_productivity_of_carbon_by_diazatrophs		mol m-2 s-1	time: mean area: where sea		real	longitude latitude time	intpdiaz	ocnBgchem
net_primary_mole_productivity_of_carbon_by_calcareous_phytoplankton		mol m-2 s-1	time: mean area: where sea		real	longitude latitude time	intpcalc	ocnBgchem
net_primary_mole_productivity_of_carbon_by_picophytoplankton		mol m-2 s-1	time: mean area: where sea		real	longitude latitude time	intppico	ocnBgchem
net_primary_mole_productivity_of_carbon_by_miscellaneous_phytoplankton		mol m-2 s-1	time: mean area: where sea		real	longitude latitude time	intpmisc	ocnBgchem
tendency_of_ocean_mole_content_of_iron_due_to_biological_production		mol m-2 s-1	time: mean area: mean where sea		real	longitude latitude time	intpbfe	ocnBgchem
tendency_of_ocean_mole_content_of_silicon_due_to_biological_production		mol m-2 s-1	time: mean area: where sea		real	longitude latitude time	intpbsi	ocnBgchem
tendency_of_ocean_mole_content_of_calcite_expressed_as_carbon_due_to_biological_production		mol m-2 s-1	time: mean area: mean where sea		real	longitude latitude time	intpcalc	ocnBgchem
tendency_of_ocean_mole_content_of_aragonite_expressed_as_carbon_due_to_biological_production		mol m-2 s-1	time: mean area: where sea		real	longitude latitude time	intparag	ocnBgchem
sinking_mole_flux_of_particulate_organic_matter_expressed_as_carbon_in_sea_water		mol m-2 s-1	time: mean area: mean where sea	down	real	longitude latitude time depth100m	epc100	ocnBgchem

frequency	cell_measures	flag_values	flag_meanings
	area: areacello		
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3	Downward Flux of Particulate Iron at 100M	mol m^{-2} s^{-1}	sinking flux of biogenic and scavenged iron at 100m		epfe100
3	Downward Flux of Particulate Silica at 100M	mol m^{-2} s^{-1}	sinking flux of biogenic silica at 100m		epsi100
1	Downward Flux of Calcite at 100M	mol m^{-2} s^{-1}	sinking flux of calcite at 100m		epcalc100
1	Downward Flux of Aragonite at 100M	mol m^{-2} s^{-1}	sinking flux of aragonite at 100m		eparag100
2	Dissolved Inorganic Carbon Content	kg m^{-2}	Vertically integrated DIC		intdic
1	Surface Aqueous Partial Pressure of CO2	Pa	Surface aqueous partial pressure of CO2		spco2
3	Delta PCO2	Pa	Difference between atmospheric and oceanic partial pressure of CO2 (positive meaning ocean > atmosphere)		dpco2
3	Delta PO2	Pa	Difference between atmospheric and oceanic partial pressure of O2 (positive meaning ocean > atmosphere)		dpo2
1	Surface Downward CO2 Flux	kg m^{-2} s^{-1}	Gas exchange flux of CO2 (positive into ocean)	For consistency with other fluxes, shouldn't this have units of mol m^{-2} s^{-1}. No it is better in these units for direct comparison with surface fluxes of CO2 on land	fgco2
1	Surface Downward O2 Flux	mol m^{-2} s^{-1}	Gas exchange flux of O2 (positive into ocean)		fgo2
3	Surface Upward DMS Flux	mol 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 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 m^{-2} s^{-1}	Carbon loss to sediments		frc
3	Nitrogen Fixation Rate in Ocean	mol m^{-2} s^{-1}	Vertically integrated nitrogen fixation		intpn2
3	Surface Downward Net Flux of Nitrogen	mol 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 m^{-2} s^{-1}	N loss to sediment and water column denitrification		frn
3	Surface Downward Net Flux of Iron	mol m^{-2} s^{-1}	Iron supply through deposition flux onto sea surface, runoff, coasts, sediments, etc		fsfe
3	Iron Loss to Sediments	mol m^{-2} s^{-1}	Iron loss to sediments		frfe
3	Oxygen Minimum Concentration	mol m^{-3}	Vertical minimum concentration of dissolved oxygen gas		o2min

sinking_mole_flux_of_particulate_iron_in_sea_water	mol m-2 s-1	time: mean area: where sea	down	real	longitude latitude time depth100m	epfe100	ocnBgchem
sinking_mole_flux_of_particulate_silicon_in_sea_water	mol m-2 s-1	time: mean area: mean where sea	down	real	longitude latitude time depth100m	epsi100	ocnBgchem
sinking_mole_flux_of_calcite_expressed_as_carbon_in_sea_water	mol m-2 s-1	time: mean area: where sea	down	real	longitude latitude time depth100m	epcalc100	ocnBgchem
sinking_mole_flux_of_aragonite_expressed_as_carbon_in_sea_water	mol m-2 s-1	time: mean area: mean where sea	down	real	longitude latitude time depth100m	eparag100	ocnBgchem
ocean_mass_content_of_dissolved_inorganic_carbon	kg m-2	time: mean area: where sea		real	longitude latitude time	intdic	ocnBgchem
surface_partial_pressure_of_carbon_dioxide_in_sea_water	Pa	time: mean area: mean where sea		real	longitude latitude time	spco2	ocnBgchem
surface_carbon_dioxide_partial_pressure_difference_between_sea_water_and_air	Pa	time: mean area: where sea		real	longitude latitude time	dpco2	ocnBgchem
surface_oxygen_partial_pressure_difference_between_sea_water_and_air	Pa	time: mean area: mean where sea		real	longitude latitude time	dpo2	ocnBgchem
surface_downward_mass_flux_of_carbon_dioxide_expressed_as_carbon	kg m-2 s-1	time: mean area: where sea	down	real	longitude latitude time	fgco2	ocnBgchem
surface_downward_mole_flux_of_molecular_oxygen	mol m-2 s-1	time: mean area: mean where sea	down	real	longitude latitude time	fgo2	ocnBgchem
surface_upward_mole_flux_of_dimethyl_sulfide	mol m-2 s-1	time: mean area: where sea	up	real	longitude latitude time	fgdms	ocnBgchem
tendency_of_ocean_mole_content_of_carbon_due_to_runoff_and_sediment_dissolution	mol m-2 s-1	time: mean area: mean where sea		real	longitude latitude time	fsc	ocnBgchem
tendency_of_ocean_mole_content_of_carbon_due_to_sedimentation	mol m-2 s-1	time: mean area: where sea	down	real	longitude latitude time	frc	ocnBgchem
tendency_of_ocean_mole_content_of_elemental_nitrogen_due_to_fixation	mol m-2 s-1	time: mean area: mean where sea		real	longitude latitude time	intpn2	ocnBgchem
tendency_of_ocean_mole_content_of_elemental_nitrogen_due_to_deposition_and_fixation_and_runoff	mol m-2 s-1	time: mean area: where sea	down	real	longitude latitude time	fsn	ocnBgchem
tendency_of_ocean_mole_content_of_elemental_nitrogen_due_to_denitrification_and_sedimentation	mol m-2 s-1	time: mean area: mean where sea		real	longitude latitude time	frn	ocnBgchem
tendency_of_ocean_mole_content_of_iron_due_to_deposition_and_runoff_and_sediment_dissolution	mol m-2 s-1	time: mean area: where sea	down	real	longitude latitude time	fsfe	ocnBgchem
tendency_of_ocean_mole_content_of_iron_due_to_sedimentation	mol m-2 s-1	time: mean area: mean where sea		real	longitude latitude time	frfe	ocnBgchem
mole_concentration_of_molecular_oxygen_in_sea_water_at_shallowest_local_minimum_in_vertical_profile	mol m-3	time: mean area: where sea depth: minimum		real	longitude latitude time	o2min	ocnBgchem

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3	Depth of Oxygen Minimum Concentration	m	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 in Upper 100 m of Net Dissolved Inorganic Carbon	mol $m^{-2} s^{-1}$	Net time rate of change of dissolved inorganic carbon in upper 100m	fddtdic
3	Rate of Change in Upper 100 m of Net Dissolved Inorganic Nitrogen	mol $m^{-2} s^{-1}$	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 $m^{-2} s^{-1}$	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 $m^{-2} s^{-1}$	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 $m^{-2} s^{-1}$	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	mol $m^{-2} s^{-1}$	vertical integral of net time rate of change of alkalinity in upper 100m	fddtalk
3	Rate of Change in Upper 100 m of Dissolved Inorganic Carbon due to Biological Activity	mol $m^{-2} s^{-1}$	vertical integral of net biological terms in time rate of change of dissolved inorganic carbon in upper 100m	fbddtdic
3	Rate of Change in Upper 100 m of Dissolved Inorganic Nitrogen due to Biological Activity	mol $m^{-2} s^{-1}$	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 $m^{-2} s^{-1}$	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 $m^{-2} s^{-1}$	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 $m^{-2} s^{-1}$	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	mol $m^{-2} s^{-1}$	vertical integral of net biological terms in time rate of change of alkalinity in upper 100m	fbddtalk

depth_at_shallowest_local_minimum_in_vertical_profile_of_mole_concentration_of_molecular_oxygen_in_sea_water	m	time: mean area: mean where sea	real	longitude latitude time	zo2min	ocnBgchem
minimum_depth_of_calcite_undersaturation_in_sea_water	m	time: mean area: where sea	real	longitude latitude time	zsatcalc	ocnBgchem
minimum_depth_of_aragonite_undersaturation_in_sea_water	m	time: mean area: mean where sea	real	longitude latitude time	zsatarag	ocnBgchem
tendency_of_ocean_mole_content_of_dissolved_inorganic_carbon	mol m-2 s-1	time: mean area: where sea	real	longitude latitude time olayer100m	fddtdic	ocnBgchem
tendency_of_ocean_mole_content_of_dissolved_inorganic_nitrogen	mol m-2 s-1	time: mean area: mean where sea	real	longitude latitude time olayer100m	fddtdin	ocnBgchem
tendency_of_ocean_mole_content_of_dissolved_inorganic_phosphorus	mol m-2 s-1	time: mean area: where sea	real	longitude latitude time olayer100m	fddtdip	ocnBgchem
tendency_of_ocean_mole_content_of_dissolved_inorganic_iron	mol m-2 s-1	time: mean area: mean where sea	real	longitude latitude time olayer100m	fddtdife	ocnBgchem
tendency_of_ocean_mole_content_of_dissolved_inorganic_silicon	mol m-2 s-1	time: mean area: where sea	real	longitude latitude time olayer100m	fddtdisi	ocnBgchem
integral_wrt_depth_of_tendency_of_sea_water_alkalinity_expressed_as_mole_equivalent	mol m-2 s-1	time: mean area: mean where sea	real	longitude latitude time olayer100m	fddtalk	ocnBgchem
tendency_of_ocean_mole_content_of_dissolved_inorganic_carbon_due_to_biological_processes	mol m-2 s-1	time: mean area: where sea	real	longitude latitude time olayer100m	fbddtdic	ocnBgchem
tendency_of_ocean_mole_content_of_dissolved_inorganic_nitrogen_due_to_biological_processes	mol m-2 s-1	time: mean area: mean where sea	real	longitude latitude time olayer100m	fbddtdin	ocnBgchem
tendency_of_ocean_mole_content_of_dissolved_inorganic_phosphorus_due_to_biological_processes	mol m-2 s-1	time: mean area: where sea	real	longitude latitude time olayer100m	fbddtdip	ocnBgchem
tendency_of_ocean_mole_content_of_dissolved_inorganic_iron_due_to_biological_processes	mol m-2 s-1	time: mean area: mean where sea	real	longitude latitude time olayer100m	fbddtdife	ocnBgchem
tendency_of_ocean_mole_content_of_dissolved_inorganic_silicon_due_to_biological_processes	mol m-2 s-1	time: mean area: where sea	real	longitude latitude time olayer100m	fbddtdisi	ocnBgchem
integral_wrt_depth_of_tendency_of_sea_water_alkalinity_expressed_as_mole_equivalent_due_to_biological_processes	mol m-2 s-1	time: mean area: mean where sea	real	longitude latitude time olayer100m	fbddtalk	ocnBgchem

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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
1	Sea Water Mass	kg			masso
1	Sea Water Pressure at Sea floor	dbar			pbo
2	Sea Water Pressure at Sea Water Surface	dbar			pso
1	Sea Water Volume	m^3			volo
1	Sea Surface Height Above Geoid	m			zos
3	Square of Sea Surface Height Above Geoid	m^2			zossq
1	Global Average Sea Level Change	m			zosga
1	Global Average Steric Sea Level Change	m			zossga
1	Global Average Thermosteric Sea Level Change	m			zostoga
1	Sea Water Mass Per Unit Area	kg m^{-2}			masscello
1	Ocean Model Cell Thickness	m			thkcello
1	Sea Water Potential Temperature	K			thetao
1	Global Average Sea Water Potential Temperature	K			thetaoga
2	Sea Surface Temperature	K	this may differ from "surface temperature" in regions of sea ice.		tos
3	Square of Sea Surface Temperature	K^2			tossq
1	Sea Water Salinity	psu			so
1	Global Mean Sea Water Salinity	psu			soga
2	Sea Surface Salinity	psu			sos

standard name	unconfirmed or proposed standard name	unformatted units	cell_methods	positive	type	CMOR dimensions	CMOR variable name	realm
sea_water_mass		kg	time: mean area: sum where sea		real	time	masso	ocean
sea_water_pressure_at_sea_floor		dbar	time: mean		real	longitude latitude time	pbo	ocean
sea_water_pressure_at_sea_water_surface		dbar	time: mean		real	longitude latitude time	pso	ocean
sea_water_volume		m3	time: mean area: sum where sea		real	time	volo	ocean
sea_surface_height_above_geoid		m	time: mean		real	longitude latitude time	zos	ocean
square_of_sea_surface_height_above_geoid		m2	time: mean		real	longitude latitude time	zossq	ocean
global_average_sea_level_change		m	time: mean area: mean where sea		real	time	zosga	ocean
global_average_steric_sea_level_change		m	time: mean area: mean where sea		real	time	zossga	ocean
global_average_thermosteric_sea_level_change		m	time: mean area: mean where sea		real	time	zostoga	ocean
sea_water_mass_per_unit_area		kg m-2	time: mean		real	longitude latitude olevel time	masscello	ocean
cell_thickness		m	time: mean		real	longitude latitude olevel time	thkcello	ocean
sea_water_potential_temperature		K	time: mean		real	longitude latitude olevel time	thetao	ocean
sea_water_potential_temperature		K	time: mean area: mean where sea		real	time	thetaoga	ocean
sea_surface_temperature		K	time: mean		real	longitude latitude time	tos	ocean
square_of_sea_surface_temperature		K2	time: mean		real	longitude latitude time	tossq	ocean
sea_water_salinity		psu	time: mean		real	longitude latitude olevel time	so	ocean
sea_water_salinity		psu	time: mean area: mean where sea		real	time	soga	ocean
sea_surface_salinity		psu	time: mean		real	longitude latitude time	sos	ocean

frequency	cell_measures	flag_values	flag_meanings
	area: areacello		
	area: areacello		
	area: areacello		
	area: areacello		
	area: areacello volume: volcello		
	area: areacello volume: volcello		
	area: areacello volume: volcello		
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	area: areacello volume: volcello		
	area: areacello		

3	Sea Water Potential Density	kg m^{-3}			rhopoto
3	Sea Water Age Since Surface Contact	yr			agessc
3	Moles Per Unit Mass of CFC-11 in Sea Water	mol kg^{-1}			cfc11
3	Ocean Barotropic Mass Streamfunction	kg s^{-1}	differs from CMIP3 because it includes mass.		msftbarot
3	Ocean Mixed Layer Thickness Defined by Sigma T	m			mlotst
3	Square of Ocean Mixed Layer Thickness Defined by Sigma T	m^2			mlotstsq
3	Mean Daily Maximum Ocean Mixed Layer Thickness Defined by Mixing Scheme	m			omldamax
3	Monthly Maximum Ocean Mixed Layer Thickness Defined by Mixing Scheme	m			omlmax

In CMOR Table Omon: *WGOMD Table 2.3*

priority	long name	units	comment	questions	output variable name
1	Sea Water X Velocity	m s^{-1}			uo
1	Sea Water Y Velocity	m s^{-1}			vo
1	Upward Ocean Mass Transport	kg s^{-1}	differs from CMIP3, which only had upward velocity.		wmo
1	Square of Upward Ocean Mass Transport	kg^2 s^{-2}			wmosq
2	Ocean Mass X Transport	kg s^{-1}			umo
2	Ocean Mass Y Transport	kg s^{-1}			vmo
2	Ocean Meridional Overturning Mass Streamfunction	kg s^{-1}	function of latitude, Z, basin. differs from CMIP3 because it includes mass. For a model with a cartesian latxlon grid, this is the same as the "Ocean Y Overturning Mass Streamfunction", listed a few lines down, which should in this case be omitted. For other models, this transport should be approximated as the transport along zig-zag paths corresponding to latitudes with spacing between latitudes appropriate to the model's resolution.		msftmyz
2	Ocean Meridional Overturning Mass Streamfunction	kg s^{-1}	function of of latitude, rho, basin. Also see note above.		msftmrhoz

sea_water_potential_density		kg m-3	time: mean		real	longitude latitude olevel time	rhopoto	ocean
sea_water_age_since_surface_contact		yr	time: mean		real	longitude latitude olevel time	agessc	ocean
moles_of_cfc11_per_unit_mass_in_sea_water		mol kg-1	time: mean		real	longitude latitude olevel time	cfc11	ocean
ocean_barotropic_mass_streamfunction		kg s-1	time: mean		real	longitude latitude time	msftbarot	ocean
ocean_mixed_layer_thickness_defined_by_sigma_t		m	time: mean		real	longitude latitude time	mlotst	ocean
square_of_ocean_mixed_layer_thickness_defined_by_sigma_t		m2	time: mean		real	longitude latitude time	mlotstsq	ocean
ocean_mixed_layer_thickness_defined_by_mixing_scheme		m	time: maximum within days time: mean over days		real	longitude latitude time	omldamax	ocean
ocean_mixed_layer_thickness_defined_by_mixing_scheme		m	time: maximum		real	longitude latitude time	omlmax	ocean

standard name	unconfirmed or proposed standard name	unformatted units	cell_methods	positive	type	CMOR dimensions	CMOR variable name	realm
sea_water_x_velocity		m s-1	time: mean		real	longitude latitude olevel time	uo	ocean
sea_water_y_velocity		m s-1	time: mean		real	longitude latitude olevel time	vo	ocean
upward_ocean_mass_transport		kg s-1	time: mean		real	longitude latitude olevel time	wmo	ocean
square_of_upward_ocean_mass_transport		kg2 s-2	time: mean		real	longitude latitude olevel time	wmosq	ocean
ocean_mass_x_transport		kg s-1	time: mean		real	longitude latitude olevel time	umo	ocean
ocean_mass_y_transport		kg s-1	time: mean		real	longitude latitude olevel time	vmo	ocean
ocean_meridional_overturning_mass_streamfunction		kg s-1	time: mean longitude: mean		real	latitude olevel basin time	msftmyz	ocean
ocean_meridional_overturning_mass_streamfunction		kg s-1	time: mean longitude: mean		real	latitude rho basin time	msftmrhoz	ocean

	area: areacello volume: volcello		
	area: areacello volume: volcello		
	area: areacello volume: volcello		
	area: areacello		
	area: areacello		
	area: areacello		
	area: areacello		
	area: areacello		

frequency	cell_measures	flag_values	flag_meanings
	area: areacello volume: volcello		
	area: areacello volume: volcello		
	area: areacello volume: volcello		
	area: areacello volume: volcello		
	area: areacello volume: volcello		
	area: areacello volume: volcello		

2	Ocean Y Overturning Mass Streamfunction	kg s^{-1}	function of Y, Z, basin. Also see note above.		msftyyz
2	Ocean Y Overturning Mass Streamfunction	kg s^{-1}	function of Y, rho, basin. Also see note above.		msftyrhoz
3	Ocean Meridional Overturning Mass Streamfunction due to Bolus Advection	kg s^{-1}	function of latitude, Z, basin. Also see note above.		msftmyzba
3	Ocean Meridional Overturning Mass Streamfunction due to Bolus Advection	kg s^{-1}	function of latitude, rho, basin. Also see note above.		msftmrhozba
3	Ocean Y Overturning Mass Streamfunction due to Bolus Advection	kg s^{-1}	function of Y, Z, basin. Also see note above.		msftyyzba
3	Ocean Y Overturning Mass Streamfunction due to Bolus Advection	kg s^{-1}	function of Y, rho, basin. Also see note above.		msftyrhozba
2	Northward Ocean Heat Transport	W	For a model with a cartesian latxlon grid, this is the same as the "Ocean Heat Y Transport", listed a few lines down, which should in this case be omitted. For other models, this transport should be approximated as the transport along zig-zag paths corresponding to latitudes with spacing between latitudes appropriate to the model's resolution.		hfnorth
3	Northward Ocean Heat Transport due to Bolus Advection	W	see note above.		hfnorthba
3	Northward Ocean Heat Transport due to Diffusion	W	see note above.		hfnorthdiff
2	Ocean Heat X Transport	W			hfx
2	Ocean Heat Y Transport	W	For a model with a cartesian latxlon grid, this is the same as the "Northward Ocean Heat Transport", listed a few lines above, which should be saved instead of this.		hfy
3	Ocean Heat Y Transport due to Bolus Advection	W	see note above.		hfyba
3	Ocean Heat Y Transport due to Diffusion	W	see note above.		hfydiff
3	Ocean Heat X Transport due to Bolus Advection	W			hfxba
3	Ocean Heat X Transport due to Diffusion	W			hfxdiff
2	Northward Ocean Heat Transport	W	This differs from a similar, previous entry in that northward transport across individual basins is called for, rather than the fully gridded fields..		hfbasin
3	Northward Ocean Heat Transport due to Bolus Advection	W			hfbasinba
3	Northward Ocean Heat Transport due to Diffusion	W			hfbasindiff
2	Northward Ocean Heat Transport due to Gyre	W	function of latitude, basin		htovgyre
2	Northward Ocean Heat Transport due to Overturning	W	function of latitude, basin		htovovrt

ocean_y_overturning_mass_streamfunction	kg s-1	time: mean longitude: mean	real	latitude olevel basin time	msftyyz	ocean
ocean_y_overturning_mass_streamfunction	kg s-1	time: mean longitude: mean	real	latitude rho basin time	msftyrhoz	ocean
ocean_meridional_overturning_mass_streamfunction_due_to_bolus_advection	kg s-1	time: mean longitude: mean	real	latitude olevel basin time	msftmyzba	ocean
ocean_meridional_overturning_mass_streamfunction_due_to_bolus_advection	kg s-1	time: mean longitude: mean	real	latitude rho basin time	msftmrhozba	ocean
ocean_y_overturning_mass_streamfunction_due_to_bolus_advection	kg s-1	time: mean longitude: mean	real	latitude olevel basin time	msftyyzba	ocean
ocean_y_overturning_mass_streamfunction_due_to_bolus_advection	kg s-1	time: mean longitude: mean	real	latitude rho basin time	msftyrhozba	ocean
northward_ocean_heat_transport	W	time: mean	real	longitude latitude time	hfnorth	ocean
northward_ocean_heat_transport_due_to_bolus_advection	W	time: mean	real	longitude latitude time	hfnorthba	ocean
northward_ocean_heat_transport_due_to_diffusion	W	time: mean	real	longitude latitude time	hfnorthdiff	ocean
ocean_heat_x_transport	W	time: mean	real	longitude latitude time	hfx	ocean
ocean_heat_y_transport	W	time: mean	real	longitude latitude time	hfy	ocean
ocean_heat_y_transport_due_to_bolus_advection	W	time: mean	real	longitude latitude time	hfyba	ocean
ocean_heat_y_transport_due_to_diffusion	W	time: mean	real	longitude latitude time	hfydiff	ocean
ocean_heat_x_transport_due_to_bolus_advection	W	time: mean	real	longitude latitude time	hfxba	ocean
ocean_heat_x_transport_due_to_diffusion	W	time: mean	real	longitude latitude time	hfxdiff	ocean
northward_ocean_heat_transport	W	time: mean longitude: mean	real	latitude basin time	hfbasin	ocean
northward_ocean_heat_transport_due_to_bolus_advection	W	time: mean longitude: mean	real	latitude basin time	hfbasinba	ocean
northward_ocean_heat_transport_due_to_diffusion	W	time: mean longitude: mean	real	latitude basin time	hfbasindiff	ocean
northward_ocean_heat_transport_due_to_gyre	W	time: mean longitude: mean	real	latitude basin time	htovgyre	ocean
northward_ocean_heat_transport_due_to_overturning	W	time: mean longitude: mean	real	latitude basin time	htovovrt	ocean

area: areacello

area: areacello

area: areacello

area: areacello

area: areacello

area: areacello

area: areacello

area: areacello

area: areacello

2	Northward Ocean Salt Transport due to Gyre	kg s^{-1}	function of latitude, basin	sltovgyre
2	Northward Ocean Salt Transport due to Overturning	kg s^{-1}	function of latitude, basin	sltovovrt

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

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_strait, 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
2	Sea Water Transport	kg s^{-1}			mfo

In CMOR Table Omon: *WGOMD Table 2.5*

priority	long name	units	comment	questions	output variable 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
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
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
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
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

standard name	unconfirmed or proposed standard name	unformatted units	cell_methods	positive	type	CMOR dimensions	CMOR variable name	realm
	sea_water_transport_across_line	kg s-1	time: mean		real	oline time	mfo	ocean

standard name	unconfirmed or proposed standard name	unformatted units	cell_methods	positive	type	CMOR dimensions	CMOR variable name	realm
rainfall_flux		kg m-2 s-1	time: mean area: mean where ice_free_sea over sea		real	longitude latitude time	pr	ocean
snowfall_flux		kg m-2 s-1	time: mean area: mean where ice_free_sea over sea		real	longitude latitude time	prsn	ocean
water_evaporation_flux		kg m-2 s-1	time: mean area: mean where ice_free_sea over sea		real	longitude latitude time	evs	ocean
water_flux_into_sea_water_from_rivers		kg m-2 s-1	time: mean area: mean where sea		real	longitude latitude time	friver	ocean
water_flux_into_sea_water_from_icebergs		kg m-2 s-1	time: mean area: mean where sea		real	longitude latitude olevel time	ficeberg	ocean

frequency	cell_measures	flag_values	flag_meanings

frequency	cell_measures	flag_values	flag_meanings
	area: areacello		
	area: areacello		
	area: areacello		
	area: areacello		
	area: areacello volume: volcello		

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
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
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
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

In CMOR Table Omon: *WGOMD Table 2.6*

priority	**long name**	**units**	**comment**	**questions**	**output variable name**
2	Virtual Salt Flux into Sea Water due to Rainfall	kg m^{-2} s^{-1}			vsfpr
2	Virtual Salt Flux into Sea Water due to Evaporation	kg m^{-2} s^{-1}			vsfevap
2	Virtual Salt Flux into Sea Water From Rivers	kg m^{-2} s^{-1}			vsfriver
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
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
2	Virtual Salt Flux Correction	kg m^{-2} s^{-1}			vsfcorr
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
2	Salt Flux into Sea Water from Rivers	kg m^{-2} s^{-1}			sfriver

water_flux_into_sea_water_due_to_sea_ice_thermodynamics		kg m-2 s-1	time: mean area: mean where sea		real	longitude latitude time	fsitherm	ocean seaIce
water_flux_into_sea_water		kg m-2 s-1	time: mean area: mean where sea		real	longitude latitude time	wfo	ocean
water_flux_into_sea_water_without_flux_correction		kg m-2 s-1	time: mean area: mean where sea		real	longitude latitude time	wfonocorr	ocean
water_flux_correction		kg m-2 s-1	time: mean area: mean where sea	down	real	longitude latitude time	wfcorr	ocean

standard name	unconfirmed or proposed standard name	unformatted units	cell_methods	positive	type	CMOR dimensions	CMOR variable name	realm
virtual_salt_flux_into_sea_water_due_to_rainfall		kg m-2 s-1	time: mean area: mean where sea		real	longitude latitude time	vsfpr	ocean
virtual_salt_flux_into_sea_water_due_to_evaporation		kg m-2 s-1	time: mean area: mean where sea		real	longitude latitude time	vsfevap	ocean
virtual_salt_flux_into_sea_water_from_rivers		kg m-2 s-1	time: mean area: mean where sea		real	longitude latitude time	vsfriver	ocean
virtual_salt_flux_into_sea_water_due_to_sea_ice_thermodynamics		kg m-2 s-1	time: mean area: mean where sea		real	longitude latitude time	vsfsit	ocean seaIce
virtual_salt_flux_into_sea_water		kg m-2 s-1	time: mean area: mean where sea		real	longitude latitude time	vsf	ocean
virtual_salt_flux_correction		kg m-2 s-1	time: mean area: mean where sea		real	longitude latitude time	vsfcorr	ocean
downward_sea_ice_basal_salt_flux		kg m-2 s-1	time: mean area: mean where sea		real	longitude latitude time	sfdsi	ocean seaIce
salt_flux_into_sea_water_from_rivers		kg m-2 s-1	time: mean area: mean where sea		real	longitude latitude time	sfriver	ocean

	area: areacello		
	area: areacello		
	area: areacello		
	area: areacello		

frequency	**cell_measures**	**flag_values**	**flag_meanings**
	area: areacello		
	area: areacello		
	area: areacello		
	area: areacello		
	area: areacello		
	area: areacello		
	area: areacello		
	area: areacello		

In CMOR Table Omon: *WGOMD Table 2.7*

priority	long name	units	comment	questions	output variable name
2	Upward Geothermal Heat Flux at Sea Floor	W m^{-2}			hfgeou
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
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
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
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
1	Heat Flux into Sea Water due to Frazil Ice Formation	W m^{-2}	As of May 2010, the WGOMD document recommends that this field should be saved instead of the field listed immediately below. 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.		hfsifrazil
1	Heat Flux into Sea Water due to Sea Ice Thermodynamics	W m^{-2}	As of May 2010, the WGOMD document recommends that instead of saving this field, the field listed immediately above should be saved instead. 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
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

standard name	unconfirmed or proposed standard name	unformatted units	cell_methods	positive	type	CMOR dimensions	CMOR variable name	realm
upward_geothermal_heat_flux_at_sea_floor		W m-2	time: mean area: whre sea	up	real	longitude latitude time	hfgeou	ocean
temperature_flux_due_to_rainfall_expressed_as_heat_flux_into_sea_water		W m-2	time: mean area: mean where ice_free_sea over sea	down	real	longitude latitude time	hfrainds	ocean
temperature_flux_due_to_evaporation_expressed_as_heat_flux_out_of_sea_water		W m-2	time: mean area: mean where ice_free_sea over sea	up	real	longitude latitude time	hfevapds	ocean
temperature_flux_due_to_runoff_expressed_as_heat_flux_into_sea_water		W m-2	time: mean area: mean where sea		real	longitude latitude olevel time	hfrunoffds	ocean
heat_flux_into_sea_water_due_to_snow_thermodynamics		W m-2	time: mean area: mean where sea		real	longitude latitude olevel time	hfsnthermds	ocean
	heat_flux_into_sea_water_due_frazil_ice_formation	W m-2	time: mean area: mean where sea		real	longitude latitude olevel time	hfsifrazil	ocean seaIce
heat_flux_into_sea_water_due_to_sea_ice_thermodynamics		W m-2	time: mean area: mean where sea		real	longitude latitude olevel time	hfsithermds	ocean seaIce
heat_flux_into_sea_water_due_to_iceberg_thermodynamics		W m-2	time: mean area: mean where sea		real	longitude latitude olevel time	hfibthermds	ocean

frequency	cell_measures	flag_values	flag_meanings
	area: areacello		
	area: areacello		
	area: areacello		
	area: areacello volume: volcello		
	area: areacello volume: volcello		
	area: areacello volume: volcello		
	area: areacello volume: volcello		
	area: areacello volume: volcello		

2	Surface Net Downward Longwave Radiation	W m^{-2}	This is defined as "where ice_free_sea over sea"		rlds
2	Surface Downward Latent Heat Flux	W m^{-2}	This is defined as "where ice_free_sea over sea"		hfls
2	Surface Downward Sensible Heat Flux	W m^{-2}	This is defined as "where ice_free_sea over sea"		hfss
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
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
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
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
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
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
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_net_downward_longwave_flux		W m-2	time: mean area: mean where ice_free_sea over sea	down	real	longitude latitude time	rlds	ocean
surface_downward_latent_heat_flux		W m-2	time: mean area: mean where ice_free_sea over sea	down	real	longitude latitude time	hfls	ocean
surface_downward_sensible_heat_flux		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
downwelling_shortwave_flux_in_sea_water		W m-2	time: mean area: mean where sea	down	real	longitude latitude olevel time	rsds	ocean
heat_flux_correction		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

standard name	**unconfirmed or proposed standard name**	**unformatted units**	**cell_methods**	**positive**	**type**	**CMOR dimensions**	**CMOR variable name**	**realm**
surface_downward_x_stress		N m-2	time: mean area: mean where sea	down	real	longitude latitude time	tauuo	ocean
surface_downward_y_stress		N m-2	time: mean area: mean where sea	down	real	longitude latitude time	tauvo	ocean
surface_downward_x_stress_correction		N m-2	time: mean area: mean where sea	down	real	longitude latitude time	tauucorr	ocean
surface_downward_y_stress_correction		N m-2	time: mean area: mean where sea	down	real	longitude latitude time	tauvcorr	ocean

	area: areacello		
	area: areacello		
	area: areacello		
	area: areacello		
	area: areacello volume: volcello		
	area: areacello		
	area: areacello		

frequency	cell_measures	flag_values	flag_meanings
	area: areacello		
	area: areacello		
	area: areacello		
	area: areacello		

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
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
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
1	Soil Frozen Water Content	kg m^{-2}	Compute the mass (summed over all all layers) of frozen water.		mrfso
1	Surface Runoff	kg m^{-2} s^{-1}	Compute the total surface runoff leaving the land portion of the grid cell.		mrros
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
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
1	Evaporation from Canopy	kg m^{-2} s^{-1}	Report the canopy evaporation+sublimation (if present in model).		evspsblveg
1	Water Evaporation from Soil	kg m^{-2} s^{-1}	includes sublimation.		evspsblsoi
1	Transpiration	kg m^{-2} s^{-1}			tran
1	Water Content of Soil Layer	kg m^{-2}	in each soil layer, the mass of water in all phases, including ice.		mrlsl
2	Temperature of Soil	K	Temperature of each soil layer. Report as "missing" for grid cells occupied entirely by "sea".		tsl
1	Tree Cover Fraction	%	fraction of entire grid cell that is covered by trees.	I think we need to add a scalar coordinate variable where some indication of "tree" needs to be included.	treeFrac
1	Natural Grass Fraction	%	fraction of entire grid cell that is covered by natural grass.	I think we need to add a scalar coordinate variable where some indication of "tree" needs to be included.	grassFrac

mon

standard name	unconfirmed or proposed standard name	unformatted units	cell_methods	positive	type	CMOR dimensions	CMOR variable name	realm
moisture_content_of_soil_layer		kg m-2	time: mean area: mean where land		real	longitude latitude time sdepth1	mrsos	land
soil_moisture_content		kg m-2	time: mean area: mean where land		real	longitude latitude time	mrso	land
soil_frozen_water_content		kg m-2	time: mean area: mean where land		real	longitude latitude time	mrfso	land landIce
surface_runoff_flux		kg m-2 s-1	time: mean area: mean where land		real	longitude latitude time	mrros	land
runoff_flux		kg m-2 s-1	time: mean area: mean where land		real	longitude latitude time	mrro	land
precipitation_flux_onto_canopy		kg m-2 s-1	time: mean area: mean where land		real	longitude latitude time	prveg	land
water_evaporation_flux_from_canopy		kg m-2 s-1	time: mean area: mean where land	up	real	longitude latitude time	evspsblveg	land
water_evaporation_flux_from_soil		kg m-2 s-1	time: mean area: mean where land	up	real	longitude latitude time	evspsblsoi	land
transpiration_flux		kg m-2 s-1	time: mean area: mean where land	up	real	longitude latitude time	tran	land
moisture_content_of_soil_layer	water_content_of_soil_layer	kg m-2	time: mean area: mean where land		real	longitude latitude sdepth time	mrlsl	land
soil_temperature		K	time: mean		real	longitude latitude sdepth time	tsl	land
area_fraction		%	time: mean		real	longitude latitude time	treeFrac	land
area_fraction		%	time: mean		real	longitude latitude time	grassFrac	land

frequency	cell_measures	flag_values	flag_meanings
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1	Shrub Fraction	%	fraction of entire grid cell that is covered by shrub.	I think we need to add a scalar coordinate variable where some indication of "tree" needs to be included.	shrubFrac
1	Crop Fraction	%	fraction of entire grid cell that is covered by crop.	I think we need to add a scalar coordinate variable where some indication of "tree" needs to be included.	cropFrac
1	Anthropogenic Pasture Fraction	%	fraction of entire grid cell that is covered by anthropogenic pasture.	I think we need to add a scalar coordinate variable where some indication of "tree" needs to be included.	pastureFrac
1	Bare Soil Fraction	%	fraction of entire grid cell that is covered by bare soil.	I think we need to add a scalar coordinate variable where some indication of "tree" needs to be included.	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.)	I think we need to add a scalar coordinate variable where some indication of "tree" needs to be included.	residualFrac
1	Burnt Area Fraction	%	fraction of entire grid cell that is covered by burnt vegetation.	I think we need to add a scalar coordinate variable where some indication of "tree" needs to be included.	burntArea
	Land Carbon & Biogeochemistry				
1	Carbon Mass in Vegetation	kg m^{-2}			cVeg
1	Carbon Mass in Litter Pool	kg m^{-2}			cLitter
1	Carbon Mass in Soil Pool	kg m^{-2}			cSoil
1	Carbon Mass in Products of Land Use Change	kg m^{-2}			cProduct
1	Leaf Area Index	1	projected leaf area per unit of ground area (i.e., only the land portion of the grid cell), expressed as a proper fraction (not a percentage)		lai
1	Carbon Mass Flux out of Atmosphere due to Gross Primary Production on Land	kg m^{-2} s^{-1}			gpp
1	Carbon Mass Flux into Atmosphere due to Autotrophic (Plant) Respiration on Land	kg m^{-2} s^{-1}			ra
1	Carbon Mass Flux out of Atmosphere due to Net Primary Production on Land	kg m^{-2} s^{-1}	needed for models that do not compute GPP (if any)	should this be "into Atmosphere " rather than "out of Atmosphere"?	npp
1	Carbon Mass Flux into Atmosphere due to Heterotrophic Respiration on Land	kg m^{-2} s^{-1}			rh

area_fraction		%	time: mean		real	longitude latitude time	shrubFrac	land
area_fraction		%	time: mean		real	longitude latitude time	cropFrac	land
area_fraction		%	time: mean		real	longitude latitude time	pastureFrac	land
area_fraction		%	time: mean		real	longitude latitude time	baresoilFrac	land
area_fraction		%	time: mean		real	longitude latitude time	residualFrac	land
area_fraction		%	time: mean		real	longitude latitude time	burntArea	land
								land
vegetation_carbon_content		kg m-2	time: mean area: mean where land		real	longitude latitude time	cVeg	land
litter_carbon_content		kg m-2	time: mean area: mean where land		real	longitude latitude time	cLitter	land
soil_carbon_content		kg m-2	time: mean area: mean where land		real	longitude latitude time	cSoil	land
	PF: carbon_in_products_of_luc NOT PROPOSED	kg m-2	time: mean area: mean where land		real	longitude latitude time	cProduct	land
leaf_area_index		1	time: mean area: mean where land		real	longitude latitude time	lai	land
gross_primary_productivity_of_carbon	gross_primary_productivity_of_carbon? gross_primary_production	kg m-2 s-1	time: mean area: mean where land	down	real	longitude latitude time	gpp	land
plant_respiration_carbon_flux	plant_respiration_carbon_flux? autotrophic_plant_respiration	kg m-2 s-1	time: mean area: mean where land	up	real	longitude latitude time	ra	land
net_primary_productivity_of_carbon	net_primary_productivity_of_carbon? net_primary_production	kg m-2 s-1	time: mean area: mean where land	down	real	longitude latitude time	npp	land
heterotrophic_respiration_carbon_flux	heterotrophic_respiration_carbon_flux? heterotrophic_respiration	kg m-2 s-1	time: mean area: mean where land	up	real	longitude latitude time	rh	land

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1	Carbon Mass Flux into Atmosphere due to CO2 Emission from Fire	kg m^{-2} s^{-1}	CO2 emissions (expressed as a carbon mass flux) from natural fires + human ignition fires as calculated by the fire module of the DGVM, but excluding any CO2 flux from fire included in fLuc, defined below (CO2 Flux to Atmosphere from Land Use Change).	fFire
1	Carbon Mass Flux into Atmosphere due to Grazing on Land	kg m^{-2} s^{-1}		fGrazing
1	Carbon Mass Flux into Atmosphere due to Crop Harvesting	kg m^{-2} s^{-1}		fHarvest
1	Net Carbon Mass Flux into Atmosphere due to Land Use Change	kg m^{-2} s^{-1}	human changes to land (excluding forest regrowth) accounting possibly for different time-scales related to fate of the wood, for example.	fLuc
1	Carbon Mass Flux out of Atmosphere due to Net Biospheric Production on Land	kg m^{-2} s^{-1}	This is the net mass flux of carbon between land and atmosphere calculated 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.	nbp
1	Total Carbon Mass Flux from Vegetation to Litter	kg m^{-2} s^{-1}		fVegLitter

	PF: 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 m-2 s-1	time: mean area: mean where land	up	real	longitude latitude time	fFire	land
	PF: 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 m-2 s-1	time: mean area: mean where land	up	real	longitude latitude time	fGrazing	land
	PF: 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 m-2 s-1	time: mean area: mean where land	up	real	longitude latitude time	fHarvest	land
	PF: 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 m-2 s-1	time: mean area: mean where land	up	real	longitude latitude time	fLuc	land
	PF: net_biospheric_productivity Is this the same as net_primary_productivity_of_carbon (also in cell G53)?	kg m-2 s-1	time: mean area: mean where land	down	real	longitude latitude time	nbp	land
litter_carbon_flux	PF: carbon_flux_from_vegetation_into_litter total_carbon_flux_from_vegetation_to_litter	kg m-2 s-1	time: mean area: mean where land		real	longitude latitude time	fVegLitter	land

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1	Total Carbon Mass Flux from Litter to Soil	kg m^{-2} s^{-1}			fLitterSoil
1	Total Carbon Mass Flux from Vegetation Directly to Soil	kg 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 Mass in Leaves	kg 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 Mass in Wood	kg m^{-2}	including sapwood and hardwood.		cWood
2	Carbon Mass in Roots	kg m^{-2}	including fine and coarse roots.		cRoot
2	Carbon Mass in Other Living Compartments on Land	kg m^{-2}	e.g., labile, fruits, reserves, etc.		cMisc

	PF: carbon_flux_from_litter_into_soil 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 m-2 s-1	time: mean area: mean where land	real	longitude latitude time	fLitterSoil	land
	PF: carbon_flux_into_soil_from_plants_excluding_litter 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 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. PF agrees.	kg 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. PF agrees	kg 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. PF agrees.	kg 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. PF agrees.	kg m-2	time: mean area: mean where land	real	longitude latitude time	cMisc	land

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2	Carbon Mass in Coarse Woody Debris	kg m^{-2}		cCwd
2	Carbon Mass in Above-Ground Litter	kg m^{-2}		cLitterAbove
2	Carbon Mass in Below-Ground Litter	kg m^{-2}		cLitterBelow
2	Carbon Mass in Fast Soil Pool	kg m^{-2}	fast is meant as lifetime of less than 10 years for reference climate conditions (20 C, no water limitations).	cSoilFast
2	Carbon Mass in Medium Soil Pool	kg 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 Mass in Slow Soil Pool	kg m^{-2}	fast is meant as lifetime of more than 100 years for reference climate conditions (20 C, no water limitations)	cSoilSlow

	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. PF agrees.	kg m-2	time: mean area: mean where land		real	longitude latitude time	cCwd	land
	PF: aboveground_litter_carbon_content carbon_in_aboveground_litter NOT PROPOSED. recommend surface_litter_carbon_content for consistency with soil_carbon_content, etc. and runoff names	kg m-2	time: mean area: mean where land		real	longitude latitude time	cLitterAbove	land
	PF: belowground_litter_carbon_content 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 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. PF agrees.	kg 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. PF agrees.	kg 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. PF agrees.	kg m-2	time: mean area: mean where land		real	longitude latitude time	cSoilSlow	land

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2	Plant Functional Type Grid Fraction	%	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 (but not in this variable).	need to explain how to define vegtype.	landCoverFrac
2	Total Primary Deciduous Tree 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."	I think we need to add a scalar coordinate variable where some indication of "tree" needs to be included.	treeFracPrimDec
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	Carbon Mass Flux into Atmosphere due to Growth Autotrophic Respiration on Land	kg m^{-2} s^{-1}	This flux and the one in the following row provide a breakdown of the higher priority "Autotrophic (Plant) Respiration" in an earlier row of this table; thus the sum should be identical to that.		rGrowth
2	Carbon Mass Flux into Atmosphere due to Maintenance Autotrophic Respiration on Land	kg m^{-2} s^{-1}	This flux and the one in the previous row provide a breakdown of the higher priority "Autotrophic (Plant) Respiration" in an earlier row of this table; thus the sum should be identical to that.		rMaint
2	Carbon Mass Flux due to NPP Allocation to Leaf	kg m^{-2} s^{-1}	This is the rate of carbon uptake by leaves due to NPP		nppLeaf

area_fraction		%	time: mean		real	longitude latitude vegtype time	landCoverFrac	land
area_fraction		%	time: mean		real	longitude latitude time	reeFracPrimDe	land
	total_primary_evergreen_tree_cover_fraction	%	time: mean		real	longitude latitude time	eeFracPrimEv	land
	total_secondary_deciduous_tree_cover_fraction	%	time: mean		real	longitude latitude time	reeFracSecDe	land
	total_secondary_evergreen_tree_cover_fraction	%	time: mean		real	longitude latitude time	reeFracSecEve	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
	PF: for consistency with row 40: growth_autothrophic_respiration NOT PROPOSED. recommend plant_respiration_carbon_flux_due_to_growth for consistency with row 52	kg m-2 s-1	time: mean area: mean where land	up	real	longitude latitude time	rGrowth	land
	PF: for consistency with row 40: maintenance_autothrophic_respiration NOT PROPOSED. recommend plant_respiration_carbon_flux_due_to_maintenance for consistency with row 52 (what is 'maintenance'?)	kg m-2 s-1	time: mean area: mean where land	up	real	longitude latitude time	rMaint	land
	PF: net_primary_production_allocated_into_leaves npp_allocation_to_leaf NOT PROPOSED. what is npp? Don't understand this quantity.	kg m-2 s-1	time: mean area: mean where land	down	real	longitude latitude time	nppLeaf	land

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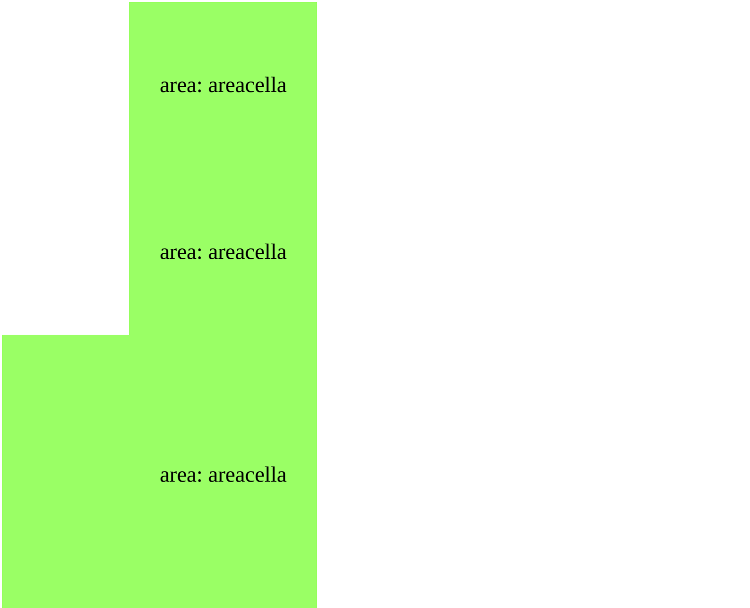
2	Carbon Mass Flux due to NPP Allocation to Wood	kg m^{-2} s^{-1}	This is the rate of carbon uptake by wood due to NPP	nppWood
2	Carbon Mass Flux due to NPP Allocation to Roots	kg m^{-2} s^{-1}	This is the rate of carbon uptake by roots due to NPP	nppRoot
1	Net Carbon Mass Flux out of Atmophere due to Net Ecosystem Productivity on Land.	kg m^{-2} s^{-1}	Natural flux of CO2 (expressed as a mass flux of carbon) from the atmosphere to the land calculated as the difference between uptake associated will photosynthesis and the release of CO2 from the sum of plant and soil respiration and fire. Positive flux is into the land. emissions from natural fires + human ignition fires as calculated by the fire module of the DGVM, but excluding any CO2 flux from fire included in fLuc, defined below (CO2 Flux to Atmosphere from Land Use Change).	nep

	PF: net_primary_production_allocated_into_wood npp_allocation_to_wood NOT PROPOSED. what is npp? Don't understand this quantity.	kg m-2 s-1	time: mean area: mean where land	down	real	longitude latitude time	nppWood	land
	PF: net_primary_production_allocated_into_roots npp_allocation_to_root NOT PROPOSED. what is npp? Don't understand this quantity.	kg m-2 s-1	time: mean area: mean where land	down	real	longitude latitude time	nppRoot	land
	net_ecosystem_productivity_of_carbon_dioxide	kg m-2 s-1	time: mean area: mean where land	down	real	longitude latitude time	nep	land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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
1	Snow Area Fraction	%	Fraction of each grid cell that is occupied by snow that rests on land portion of cell.		snc
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
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
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
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.		tsn
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

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standard name	unconfirmed or proposed standard name	unformatted units	cell_methods	positive	type	CMOR dimensions	CMOR variable name	realm
surface_snow_area_fraction		%	time: mean		real	longitude latitude time	snc	landIce land
surface_snow_amount		kg m-2	time: mean area: mean where land		real	longitude latitude time	snw	landIce land
surface_snow_thickness		m	time: mean area: mean where land		real	longitude latitude time	snd	landIce land
liquid_water_content_of_snow_layer		kg m-2	time: mean area: mean where land		real	longitude latitude time	lwsnl	landIce land
snow_soot_content	snow_soot_content	kg m-2	time: mean area: mean where land		real	longitude latitude time	sootsn	landIce land
	surface_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
surface_snow_melt_flux		kg m-2 s-1	time: mean area: mean where land		real	longitude latitude time	snm	landIce land

frequency	cell_measures	flag_values	flag_meanings
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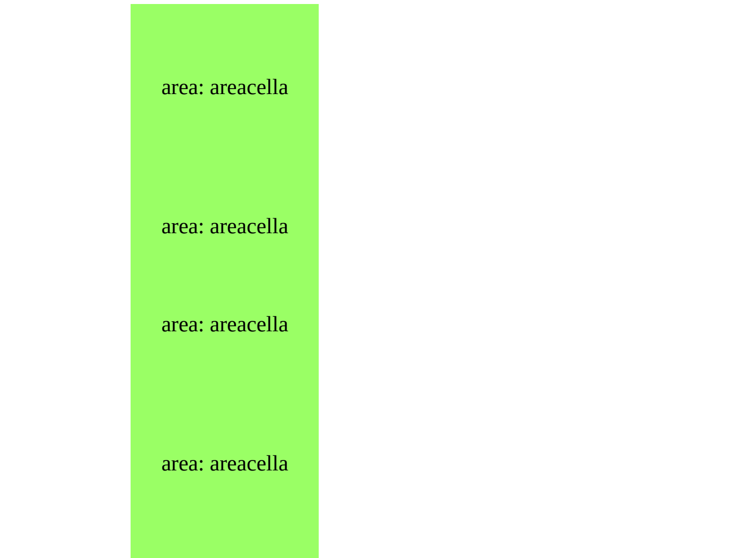
1	Surface Snow and Ice Sublimation Flux	kg m^{-2} s^{-1}	The snow and ice sublimation flux is the loss of snow and ice mass resulting from their conversion to water vapor. Compute as the total sublimation on the land portion of the grid cell divided by the land area in the grid cell; report as 0.0 for 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.	Why do you want to know mass of liquid water? Are you studying the seaasonal melting/freezing cycle? Don't you care about how much frozen water is tied up as permafrost?	pflw

surface_snow_and_ice_sublimation_flux		kg m-2 s-1	time: mean area: mean where land		real	longitude latitude time	sbl	landIce land
	surface_downward_heat_flux_in_snow	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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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
1	Sea Ice Area Fraction	%	fraction of grid cell covered by sea ice.		sic
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
1	Frozen Water Mass	kg m^{-2}	Compute the mass per unit area of sea ice plus snow 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.		sim
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. [This was computed differently in CMIP3		evap
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
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
1	Bare Sea Ice Albedo	1	Report as "missing" if there is no sunlight or if a region is free of sea ice.	This variable may be omitted unless the answers to the following questions are obvious: 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

mon

standard name	unconfirmed or proposed standard name	unformatted units	cell_methods	positive	type	CMOR dimensions	CMOR variable name	realm
sea_ice_area_fraction		%	time: mean		real	longitude latitude time	sic	seaIce ocean
sea_ice_thickness		m	time: mean area: mean where sea		real	longitude latitude time	sit	seaIce ocean
		kg m-2	time: mean area: mean where sea		real	longitude latitude time	sim	seaIce ocean
water_evaporation_flux		kg m-2 s-1	time: mean area: mean where sea_ice over sea	up	real	longitude latitude time	evap	seaIce
surface_snow_thickness		m	time: mean area: mean where sea		real	longitude latitude time	snd	seaIce
surface_snow_area_fraction		%	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

frequency	cell_measures	flag_values	flag_meanings
	area: areacello		
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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

	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

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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. Include falling snow that melts on impact with the surface.		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.		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
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
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
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
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
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
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
1	X-Component of Sea Ice Mass Transport	kg s^{-1}	The sea ice transport is 0.0 in ice-free regions of the ocean. Include snow is calculation of mass.		transix
1	Y-Component of Sea Ice Transport	kg s^{-1}	The sea ice transport is 0.0 in ice-free regions of the ocean. Include snow is calculation of mass.		transiy
2	Sea Ice Mass Transport Through Fram Strait	kg s^{-1}			transifs

	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
surface_downwelling_shortwave_flux_in_air		W m-2	time: mean area: mean where sea_ice over sea	down	real	longitude latitude time	rsdssi	seaIce
surface_upwelling_shortwave_flux_in_air		W m-2	time: mean area: mean where sea_ice over sea	up	real	longitude latitude time	rsussi	seaIce
surface_downwelling_longwave_flux_in_air		W m-2	time: mean area: mean where sea_ice over sea	down	real	longitude latitude time	rldssi	seaIce
surface_upwelling_longwave_flux_in_air		W m-2	time: mean area: mean where sea_ice over sea	up	real	longitude latitude time	rlussi	seaIce
surface_upward_sensible_heat_flux		W m-2	time: mean area: mean where sea_ice over sea	up	real	longitude latitude time	hfssi	seaIce
surface_upward_latent_heat_flux		W m-2	time: mean area: mean where sea_ice over sea	up	real	longitude latitude time	hflssi	seaIce
surface_snow_and_ice_sublimation_flux		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	seaIce
		kg s-1	time: mean		real	time	transifs	seaIce

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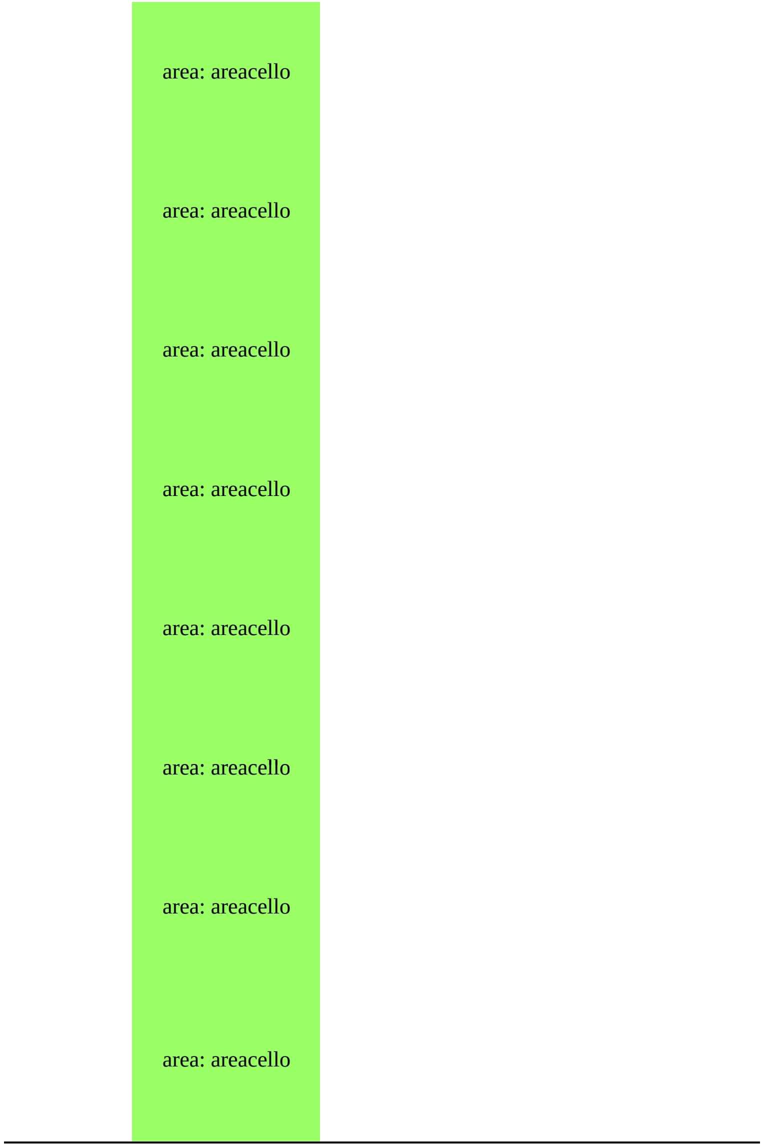
2	X-Component of Atmospheric Stress On Sea Ice	N m^{-2}	When computing the time-mean here, the time samples, weighted by the area of sea ice, are accumulated and then divided by the sum of the weights. Report as "missing" in regions free of sea ice.		strairx
2	Y-Component of Atmospheric Stress On Sea 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	X-Component of 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	Y-Component of 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}		This field may be omitted unless the answers to the following questions are obvious: How exactly is this defined? Are time-means weighted by sea ice area?	ridgice

		N m-2	time: mean (weighted by area of sea ice)	down	real	longitude latitude time	strairx	seaIce
		N m-2	time: mean (weighted by area of sea ice)	down	real	longitude latitude time	strairy	seaIce
		N m-2	time: mean (weighted by area of sea ice)		real	longitude latitude time	strocnx	seaIce ocean
		N m-2	time: mean (weighted by area of sea ice)		real	longitude latitude time	strocny	seaIce ocean
		N m-2	time: mean (weighted by area of sea ice)		real	longitude latitude time	streng	seaIce
		s-1	time: mean (weighted by area of sea ice)		real	longitude latitude time	divice	seaIce
		s-1	time: mean (weighted by area of sea ice)		real	longitude latitude time	shrice	seaIce
		s-1	time: mean		real	longitude latitude time	ridgice	seaIce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CMOR Table aero: Monthly Mean Aerosol-Related Fields (All Saved on the Atmospheric Grid)

aero

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

priority	long name	units	comment	questions	output variable name
	Aerosol Optics				
1	Ambient Aerosol Optical 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 Optical 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			abs550aer
2	Ambient Aerosol Optical Thickness at 870 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.		od870aer
	Aerosol Budgets				
1	Rate of Emission and Production of Dry Aerosol Total 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.		emioa
1	Emission Rate of Dry Aerosol Primary Organic Matter	kg m^{-2} s^{-1}	tendency of atmosphere mass content of primary organic aerosol due to emission: "mass" refers to the mass of primary organic matter, not mass of organic carbon alone.	In a previous message you said production referred to SOA, not POA, so I've removed "production" here and only use "emission". Is this o.k.?	emipoa
1	Production 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. "mass" refers to the mass of primary organic matter, not mass of organic carbon alone.		chepsoa

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standard name	unconfirmed or proposed standard name	unformatted units	cell_methods	positive	type	CMOR dimensions	CMOR variable name	realm
atmosphere_optical_thickness_due_to_ambient_aerosol		1	time: mean		real	longitude latitude time	od550aer	aerosol
atmosphere_optical_thickness_due_to_pm1_ambient_aerosol		1	time: mean		real	longitude latitude time	od550lt1aer	aerosol
atmosphere_absorption_optical_thickness_due_to_ambient_aerosol		1	time: mean		real	longitude latitude time	abs550aer	aerosol
atmosphere_optical_thickness_due_to_ambient_aerosol		1	time: mean		real	longitude latitude time	od870aer	aerosol
tendency_of_atmosphere_mass_content_of_particulate_organic_matter_dry_aerosol_due_to_net_chemical_production_and_emission		kg m-2 s-1	time: mean		real	longitude latitude time	emioa	aerosol
		kg m-2 s-1	time: mean		real	longitude latitude time	emipoa	aerosol
tendency_of_atmosphere_mass_content_of_secondary_particulate_organic_matter_dry_aerosol_due_to_net_chemical_production		kg m-2 s-1	time: mean		real	longitude latitude time	chepsoa	aerosol

frequency	cell_measures	flag_values	flag_meanings
	area: areacella		
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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
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.	dryoa
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	drypoa
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	drysoa
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	drybc
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.	wetoa
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	wetpoa
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	wetsoa
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	wetbc
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
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
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
3	Dry Deposition Rate of SO2	kg m^{-2} s^{-1}	tendency_of_atmosphere_mass_content_of_sulfur_dioxide_due_to_dry_deposition	dryso2

tendency_of_atmosphere_mass_content_of_black_carbon_dry_aerosol_due_to_emission		kg m-2 s-1	time: mean	real	longitude latitude time	emibc	aerosol
tendency_of_atmosphere_mass_content_of_particulate_organic_matter_dry_aerosol_due_to_dry_deposition		kg m-2 s-1	time: mean	real	longitude latitude time	dryoa	aerosol
tendency_of_atmosphere_mass_content_of_primary_particulate_organic_matter_dry_aerosol_due_to_dry_deposition		kg m-2 s-1	time: mean	real	longitude latitude time	drypoa	aerosol
tendency_of_atmosphere_mass_content_of_secondary_particulate_organic_matter_dry_aerosol_due_to_dry_deposition		kg m-2 s-1	time: mean	real	longitude latitude time	drysoa	aerosol
tendency_of_atmosphere_mass_content_of_black_carbon_dry_aerosol_due_to_dry_deposition		kg m-2 s-1	time: mean	real	longitude latitude time	drybc	aerosol
tendency_of_atmosphere_mass_content_of_particulate_organic_matter_dry_aerosol_due_to_wet_deposition		kg m-2 s-1	time: mean	real	longitude latitude time	wetoa	aerosol
tendency_of_atmosphere_mass_content_of_primary_particulate_organic_matter_dry_aerosol_due_to_wet_deposition		kg m-2 s-1	time: mean	real	longitude latitude time	wetpoa	aerosol
tendency_of_atmosphere_mass_content_of_secondary_particulate_organic_matter_dry_aerosol_due_to_wet_deposition		kg m-2 s-1	time: mean	real	longitude latitude time	wetsoa	aerosol
tendency_of_atmosphere_mass_content_of_black_carbon_dry_aerosol_due_to_wet_deposition		kg m-2 s-1	time: mean	real	longitude latitude time	wetbc	aerosol
tendency_of_atmosphere_mass_content_of_primary_particulate_organic_matter_dry_aerosol_due_to_emission		kg m-2 s-1	time: mean	real	longitude latitude time	emibb	aerosol
tendency_of_atmosphere_mass_content_of_sulfur_dioxide_due_to_emission		kg m-2 s-1	time: mean	real	longitude latitude time	emiso2	aerosol
		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
tendency_of_atmosphere_mass_content_of_sulfur_dioxide_due_to_dry_deposition		kg m-2 s-1	time: mean	real	longitude latitude time	dryso2	aerosol

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1	Dry Deposition Rate of SO4	kg m^{-2} s^{-1}	tendency_of_atmosphere_mass_content_of_sulfate_due_to_dry_deposition	dryso4
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.	drydms
1	Wet Deposition Rate of SO4	kg m^{-2} s^{-1}	tendency_of_atmosphere_mass_content_of_sulfate_expressed_as_sulfur_dry_aerosol_due_to_wet_deposition	wetso4
3	Wet Deposition Rate of SO2	kg m^{-2} s^{-1}	tendency_of_atmosphere_mass_content_of_sulfur_dioxide_due_to_wet_deposition	wetso2
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.	wetdms
1	Total Emission Rate of NH3	kg m^{-2} s^{-1}	tendency_of_atmosphere_mass_content_of_ammonia_due_to_emission	eminh3
3	Dry Deposition Rate of NH3	kg m^{-2} s^{-1}	tendency_of_atmosphere_mass_content_of_ammonia_due_to_dry_deposition	drynh3
1	Dry Deposition Rate of NH4	kg m^{-2} s^{-1}	tendency_of_atmosphere_mass_content_of_ammonium_due_to_dry_deposition	drynh4
1	Wet Deposition Rate of NH4+NH3	kg m^{-2} s^{-1}	tendency_of_atmosphere_mass_content_of_ammonium_due_to_wet_deposition	wetnh4
1	Total Emission Rate of Seasalt	kg m^{-2} s^{-1}	tendency_of_atmosphere_mass_content_of_seasalt_dry_aerosol_due_to_emission	emiss
3	Dry Deposition Rate of Seasalt	kg m^{-2} s^{-1}	tendency_of_atmosphere_mass_content_of_seasalt_dry_aerosol_due_to_dry_deposition	dryss
3	Wet Deposition Rate of Seasalt	kg m^{-2} s^{-1}	tendency_of_atmosphere_mass_content_of_seasalt_dry_aerosol_due_to_wet_deposition	wetss
1	Total Emission Rate of Dust	kg m^{-2} s^{-1}	tendency_of_atmosphere_mass_content_of_dust_dry_aerosol_due_to_emission	emidust
1	Dry Deposition Rate of Dust	kg m^{-2} s^{-1}	tendency_of_atmosphere_mass_content_of_dust_dry_aerosol_due_to_dry_deposition	drydust
1	Wet Deposition Rate of Dust	kg m^{-2} s^{-1}	tendency_of_atmosphere_mass_content_of_dust_dry_aerosol_due_to_wet_deposition	wetdust
	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.	loadoa
1	Load of Dry Aerosol Primary Organic Matter	kg m^{-2}	atmosphere_primary_organic_content	loadpoa
1	Load of Dry Aerosol Secondary Organic Matter	kg m^{-2}	atmosphere_secondary_organic_content	loadsoa
1	Load of Black Carbon Aerosol	kg m^{-2}	atmosphere_black_carbon_content	loadbc

tendency_of_atmosphere_mass_content_of_sulfate_dry_aerosol_due_to_dry_deposition	kg m-2 s-1	time: mean	real	longitude latitude time	dryso4	aerosol
tendency_of_atmosphere_mass_content_of_dimethyl_sulfide_due_to_dry_deposition	kg m-2 s-1	time: mean	real	longitude latitude time	drydms	aerosol
tendency_of_atmosphere_mass_content_of_sulfate_expressed_as_sulfur_dry_aerosol_due_to_wet_deposition	kg m-2 s-1	time: mean	real	longitude latitude time	wetso4	aerosol
tendency_of_atmosphere_mass_content_of_sulfur_dioxide_due_to_wet_deposition	kg m-2 s-1	time: mean	real	longitude latitude time	wetso2	aerosol
tendency_of_atmosphere_mass_content_of_dimethyl_sulfide_due_to_wet_deposition	kg m-2 s-1	time: mean	real	longitude latitude time	wetdms	aerosol
tendency_of_atmosphere_mass_content_of_ammonia_due_to_emission	kg m-2 s-1	time: mean	real	longitude latitude time	eminh3	aerosol
tendency_of_atmosphere_mass_content_of_ammonia_due_to_dry_deposition	kg m-2 s-1	time: mean	real	longitude latitude time	drynh3	aerosol
tendency_of_atmosphere_mass_content_of_ammonium_dry_aerosol_due_to_dry_deposition	kg m-2 s-1	time: mean	real	longitude latitude time	drynh4	aerosol
tendency_of_atmosphere_mass_content_of_ammonium_dry_aerosol_due_to_wet_deposition	kg m-2 s-1	time: mean	real	longitude latitude time	wetnh4	aerosol
tendency_of_atmosphere_mass_content_of_seasalt_dry_aerosol_due_to_emission	kg m-2 s-1	time: mean	real	longitude latitude time	emiss	aerosol
tendency_of_atmosphere_mass_content_of_seasalt_dry_aerosol_due_to_dry_deposition	kg m-2 s-1	time: mean	real	longitude latitude time	dryss	aerosol
tendency_of_atmosphere_mass_content_of_seasalt_dry_aerosol_due_to_wet_deposition	kg m-2 s-1	time: mean	real	longitude latitude time	wetss	aerosol
tendency_of_atmosphere_mass_content_of_dust_dry_aerosol_due_to_emission	kg m-2 s-1	time: mean	real	longitude latitude time	emidust	aerosol
tendency_of_atmosphere_mass_content_of_dust_dry_aerosol_due_to_dry_deposition	kg m-2 s-1	time: mean	real	longitude latitude time	drydust	aerosol
tendency_of_atmosphere_mass_content_of_dust_dry_aerosol_due_to_wet_deposition	kg m-2 s-1	time: mean	real	longitude latitude time	wetdust	aerosol
atmosphere_mass_content_of_particulate_organic_matter_dry_aerosol	kg m-2	time: mean	real	longitude latitude time	loadoa	aerosol
atmosphere_mass_content_of_primary_particulate_organic_matter_dry_aerosol	kg m-2	time: mean	real	longitude latitude time	loadpoa	aerosol
atmosphere_mass_content_of_secondary_particulate_organic_matter_dry_aerosol	kg m-2	time: mean	real	longitude latitude time	loadsoa	aerosol
atmosphere_mass_content_of_black_carbon_dry_aerosol	kg m-2	time: mean	real	longitude latitude time	loadbc	aerosol

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1	Load of SO4	kg m^{-2}	atmosphere_sulfate_content	Is this "dry" or "ambient"?	loadso4
1	Load of Dust	kg m^{-2}	atmosphere_dust_content		loaddust
1	Load of Seasalt	kg m^{-2}	atmosphere_seasalt_content		loadss
1	Load of NO3	kg m^{-2}	atmosphere_nitrate_content		loadno3
3	Load of NH4	kg m^{-2}	atmosphere_ammonium_content		loadnh4
	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.		sconcoa
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).		sconcpoa
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.		sconcsoa
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).		sconcbc
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).		sconcso4
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).		sconcdust
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).		sconcss
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).		sconcno3
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).		sconcnh4
	Clouds and Radiation				

atmosphere_mass_content_of_sulfate_dry_aerosol	kg m-2	time: mean	real	longitude latitude time	loadso4	aerosol
atmosphere_mass_content_of_dust_dry_aerosol	kg m-2	time: mean	real	longitude latitude time	loaddust	aerosol
atmosphere_mass_content_of_seasalt_dry_aerosol	kg m-2	time: mean	real	longitude latitude time	loadss	aerosol
atmosphere_mass_content_of_nitrate_dry_aerosol	kg m-2	time: mean	real	longitude latitude time	loadno3	aerosol
atmosphere_mass_content_of_ammonium_dry_aerosol	kg m-2	time: mean	real	longitude latitude time	loadnh4	aerosol
mass_concentration_of_particulate_organic_matter_dry_aerosol_in_air	kg m-3	time: mean	real	longitude latitude alev1 time	sconcoa	aerosol
mass_concentration_of_primary_particulate_organic_matter_dry_aerosol_in_air	kg m-3	time: mean	real	longitude latitude alev1 time	sconcpoa	aerosol
mass_concentration_of_secondary_particulate_organic_matter_dry_aerosol_in_air	kg m-3	time: mean	real	longitude latitude alev1 time	sconcsoa	aerosol
mass_concentration_of_black_carbon_dry_aerosol_in_air	kg m-3	time: mean	real	longitude latitude alev1 time	sconcbc	aerosol
mass_concentration_of_sulfate_dry_aerosol_in_air	kg m-3	time: mean	real	longitude latitude alev1 time	sconcso4	aerosol
mass_concentration_of_dust_dry_aerosol_in_air	kg m-3	time: mean	real	longitude latitude alev1 time	sconcdust	aerosol
mass_concentration_of_seasalt_dry_aerosol_in_air	kg m-3	time: mean	real	longitude latitude alev1 time	sconcss	aerosol
mass_concentration_of_nitrate_dry_aerosol_in_air	kg m-3	time: mean	real	longitude latitude alev1 time	sconcno3	aerosol
mass_concentration_of_ammonium_dry_aerosol_in_air	kg m-3	time: mean	real	longitude latitude alev1 time	sconcnh4	aerosol

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priority	long name	units	comment	questions	output variable name
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	Cloud-Top Effective Droplet Radius	m	Droplets are liquid only. Report effective radius "as seen from space" over liquid cloudy portion of grid cell. This is the value from uppermost model layer with liquid cloud or, if available, it is better to sum over all liquid cloud tops, no matter where they occur, as long as they are seen from the top of the atmosphere. Weight by total liquid cloud top fraction of (as seen from TOA) each time sample when computing monthly mean.		reffclwtop
1	Cloud Droplet Number Concentration of Cloud Tops	m^{-3}	Droplets are liquid only. Report concentration "as seen from space" over liquid cloudy portion of grid cell. This is the value from uppermost model layer with liquid cloud or, if available, it is better to sum over all liquid cloud tops, no matter where they occur, as long as they are seen from the top of the atmosphere. Weight by total liquid cloud top fraction of (as seen from TOA) each time sample when computing monthly mean.		cldncl
1	Ice Crystal Number Concentration of Cloud Tops	m^{-3}	Report concentration "as seen from space" over liquid cloudy portion of grid cell. This is the value from uppermost model layer with ice cloud or, if available, it is better to sum over all ice cloud tops, no matter where they occur, as long as they are seen from the top of the atmosphere. Weight by total ice cloud top fraction (as seen from TOA) of each time sample when computing monthly mean.		cldnci
1	Column Integrated Cloud Droplet Number	m^{-2}	Droplets are liquid only. Weight by liquid cloud fraction in each layer when vertically integrating. Weight by total liquid cloud fraction (as seen from TOA) when reporting monthly mean		cldnvi

In CMOR Table aero: *3-D aerosol-related concentrations and properties 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
1	Ambient Aerosol Extinction Optical Thickness at 550 nm	m^{-1}	atmosphere_extinction_due_to_ambient_aerosol: "ambient" means "wetted". This and other fields in this table are 3-D.		ec550aer

	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
atmosphere_number_content_of_cloud_droplets		m-2	time: mean		real	longitude latitude time	cldnvi	aerosol

standard name	unconfirmed or proposed standard name	unformatted units	cell_methods	positive	type	CMOR dimensions	CMOR variable name	realm
	atmosphere_extinction_due_to_ambient_aerosol	m-1	time: mean			longitude latitude alevel time	ec550aer	aerosol

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frequency	cell_measures	flag_values	flag_meanings
	area: areacella		

1	Concentration of Dry Aerosol Organic Matter	kg m^{-3}	mass_concentration_of_organic_matter_dry_aerosol_in_air mass concentration of organic matter dry aerosol in air: 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.	concoa
1	Concentration of Dry Aerosol Primary Organic Matter	kg m^{-3}	mass_concentration_of_primary_organic_matter_dry_aerosol_in_air	concpoa
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.	concsoa
1	Concentration of Biomass Burning Aerosol	kg m^{-3}	mass_concentration_of_biomass_burning_dry_aerosol_in_air	concbb
1	Concentration of Black Carbon Aerosol	kg m^{-3}	mass_concentration_ of_black_carbon_dry_aerosol_in_air	concbc
1	Concentration of Aerosol Water	kg m^{-3}	mass_concentration_of_water_in_ambient_aerosol_in_air: "ambient" means "wetted"	concaerh2o
1	Concentration of SO4	kg m^{-3}	mass_concentration_of_sulfate_dry_aerosol_in_air	concso4
1	Mole Fraction of SO2	1	mole_fraction_of_sulfur_dioxide_in_air	concso2
1	Mole Fraction of DMS	1	mole_concentration_of_dimethyl_sulfide_in_air	concdms
1	Concentration of NO3 Aerosol	kg m^{-3}	mass_concentration_ of_nitrate_dry_aerosol_in_air	concno3
1	Concentration of NH4	kg m^{-3}	mass_concentration_of_ammonium_dry_aerosol_in_air	concnh4
1	Concentration of Seasalt	kg m^{-3}	mass_concentration_ of_seasalt_dry_aerosol_in_air	concss
1	Concentration of Dust	kg m^{-3}	mass_concentration_ of_dust_dry_aerosol_in_air	concdust
2	Aerosol Number Concentration	m^{-3}	number_concentration_of_ambient_aerosol_in_air	conccn
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	concnmcn
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	conccmcn
1	Stratiform Cloud Droplet Effective Radius	m	Droplets are liquid. The effective radius is defined as the ratio of the third moment over the second moment of the particle size distribution and the time-mean should be calculated, weighting the individual samples by the cloudy fraction of the grid cell.	reffclws

mass_concentration_of_particulate_organic_matter_dry_aerosol_in_air		kg m-3	time: mean	longitude latitude alevel time	concoa	aerosol
mass_concentration_of_primary_particulate_organic_matter_dry_aerosol_in_air		kg m-3	time: mean	longitude latitude alevel time	concpoa	aerosol
mass_concentration_of_secondary_particulate_organic_matter_dry_aerosol_in_air		kg m-3	time: mean	longitude latitude alevel time	concsoa	aerosol
		kg m-3	time: mean	longitude latitude alevel time	concbb	aerosol
mass_concentration_of_black_carbon_dry_aerosol_in_air		kg m-3	time: mean	longitude latitude alevel time	concbc	aerosol
mass_concentration_of_water_in_ambient_aerosol_in_air		kg m-3	time: mean	longitude latitude alevel time	concaerh2o	aerosol
mass_concentration_of_sulfate_dry_aerosol_in_air		kg m-3	time: mean	longitude latitude alevel time	concso4	aerosol
mole_fraction_of_sulfur_dioxide_in_air		1	time: mean	longitude latitude alevel time	concso2	aerosol
mole_fraction_of_dimethyl_sulfide_in_air		1	time: mean	longitude latitude alevel time	concdms	aerosol
mass_concentration_of_nitrate_dry_aerosol_in_air		kg m-3	time: mean	longitude latitude alevel time	concno3	aerosol
mass_concentration_of_ammonium_dry_aerosol_in_air		kg m-3	time: mean	longitude latitude alevel time	concnh4	aerosol
mass_concentration_of_seasalt_dry_aerosol_in_air		kg m-3	time: mean	longitude latitude alevel time	concss	aerosol
mass_concentration_of_dust_dry_aerosol_in_air		kg m-3	time: mean	longitude latitude alevel time	concdust	aerosol
	number_concentration_of_ambient_aerosol_in_air	m-3	time: mean	longitude latitude alevel time	conccn	aerosol
	number_concentration_of_ambient_aerosol_in_nucleation_mode_in_air	m-3	time: mean	longitude latitude alevel time	concnmcn	aerosol
	number_concentration_of_ambient_aerosol_in_coarse_mode_in_air	m-3	time: mean	longitude latitude alevel time	conccmcn	aerosol
effective_radius_of_stratiform_cloud_liquid_water_particle		m	time: mean	longitude latitude alevel time	reffclws	aerosol

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1	Convective Cloud Droplet Effective Radius	m	Droplets are liquid. The effective radius is defined as the ratio of the third moment over the second moment of the particle size distribution and the time-mean should be calculated, weighting the individual samples by the cloudy fraction of the grid cell.		reffclwc
1	Cloud Droplet Number Concentration	m^{-3}	Cloud droplet number concentration in liquid clouds	Weighted by the cloud liquid fraction.	cdnc
1	Ice Crystal Number Concentration	m^{-3}	Ice Crystal number concentration in ice clouds	Weighted by the ice liquid fraction.	inc

effective_radius_of_convective_cloud_liquid_water_particle		m	time: mean	longitude latitude alevel time	reffclwc	aerosol
		m-3	time: mean	longitude latitude alevel time	cdnc	aerosol
		m-3	time: mean	longitude latitude alevel time	inc	aerosol

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

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

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

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

priority	long name	units	comment	questions	output variable name
1	Near-Surface Specific Humidity	1	near-surface (usually, 2 meter) specific humidity.		huss
1	Daily Minimum Near-Surface Air Temperature	K	daily-minimum near-surface (usually, 2 meter) air temperature.		tasmin
1	Daily Maximum Near-Surface Air Temperature	K	daily-maximum near-surface (usually, 2 meter) air temperature.		tasmax
1	Near-Surface Air Temperature	K	daily-mean near-surface (usually, 2 meter) air temperature.		tas
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
1	Sea Level Pressure	Pa			psl
1	Daily-Mean Near-Surface Wind Speed	m s^{-1}	near-surface (usually, 10 meters) wind speed.		sfcWind
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
1	Sea Surface Temperature	K	temperature of liquid ocean. Report on the ocean grid. This variable appears in WGOMD Table 2.2		tos
1	Daily Maximum Ocean Mixed Layer Thickness Defined by Mixing Scheme	m	Report on the ocean grid. This variable appears in WGOMD Table 2.2		omldamax

day

standard name	unconfirmed or proposed standard name	unformatted units	cell_methods	positive	type	CMOR dimensions	CMOR variable name	realm
specific_humidity		1	time: mean		real	longitude latitude time height2m	huss	atmos
air_temperature		K	time: minimum		real	longitude latitude time height2m	tasmin	atmos
air_temperature		K	time: maximum		real	longitude latitude time height2m	tasmax	atmos
air_temperature		K	time: mean		real	longitude latitude time height2m	tas	atmos
precipitation_flux		kg m-2 s-1	time: mean		real	longitude latitude time	pr	atmos
air_pressure_at_sea_level		Pa	time: mean		real	longitude latitude time	psl	atmos
wind_speed		m s-1	time: mean		real	longitude latitude time height10m	sfcWind	atmos
square_of_sea_surface_temperature		K2	time:mean		real	longitude latitude time	tossq	ocean
surface_temperature		K	time: mean		real	longitude latitude time	tos	ocean
ocean_mixed_layer_thickness_defined_by_mixing_scheme		m	time: maximum		real	longitude latitude time	omldamax	ocean

frequency	cell_measures	flag_values	flag_meanings
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The rest of the daily mean fields on this spreadsheet should be collected only for a single ensemble member of the following experiments.

experiment	*time-period requested*
pre-industrial controls	20 years, preferably corresponding to years 1986-2005 of the historical run
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 day: *2-D daily-mean atmospheric and surface fields*

priority	long name	units	comment	questions	output variable 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
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
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
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
1	Snow Area Fraction	%			snc
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
1	Surface Temperature Where Land or Sea Ice	K	"skin" temperature of all surfaces except open ocean.		tslsi
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
1	Convective Precipitation	kg m^{-2} s^{-1}	at surface; includes both liquid and solid phases.		prc
1	Solid Precipitation	kg m^{-2} s^{-1}	at surface; includes precipitation of all forms of water in the solid phase		prsn

standard name	unconfirmed or proposed standard name	unformatted units	cell_methods	positive	type	CMOR dimensions	CMOR variable name	realm
moisture_content_of_soil_layer		kg m-2	time: mean		real	longitude latitude time	mrsos	atmos
relative_humidity		%	time: mean		real	longitude latitude time height2m	rhs	atmos
relative_humidity		%	time: minimum		real	longitude latitude time height2m	rhsmin	atmos
relative_humidity		%	time: maximum		real	longitude latitude time height2m	rhsmax	atmos
surface_snow_area_fraction		%	time: mean		real	longitude latitude time	snc	atmos
cloud_area_fraction		%	time: mean		real	longitude latitude time	clt	atmos
surface_temperature		K	time: mean		real	longitude latitude time	tslsi	land
surface_snow_amount		kg m-2	time: mean area: mean where land		real	longitude latitude time	snw	land
convective_precipitation_flux		kg m-2 s-1	time: mean		real	longitude latitude time	prc	atmos
snowfall_flux		kg m-2 s-1	time: mean		real	longitude latitude time	prsn	atmos

frequency	cell_measures	flag_values	flag_meanings
	area: areacella		
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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
1	Eastward Near-Surface Wind	m s^{-1}	near-surface (usually, 10 meters) eastward component of wind.		uas
1	Northward Near-Surface Wind	m s^{-1}	near-surface (usually, 10 meters) northward component of wind.		vas
1	Daily Maximum Near-Surface Wind Speed	m s^{-1}	near-surface (usually, 10 meters) wind speed.		sfcWindmax
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}	at the top of the atmosphere.		rlut
1	Eastward Sea Ice Velocity	m s^{-1}	Report on ocean's grid. Report as "missing" in regions free of sea ice.		usi
1	Northward Sea Ice Velocity	m s^{-1}	Report on ocean's grid. Report as "missing" in regions free of sea ice.		vsi
1	Sea Ice Area Fraction	%	fraction of grid cell covered by sea ice. Report on ocean's grid.		sic
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

In CMOR Table day: daily mean 3-D atmospheric fields on the following pressure surfaces: 1000, 850, 700, 500, 250, 100, 50, and 10 hPa

priority	**long name**	**units**	**comment**	**questions**	**output variable name**
1	Air Temperature	K			ta
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

runoff_flux		kg m-2 s-1	time: mean area: mean where land		real	longitude latitude time	mrro	land
eastward_wind		m s-1	time: mean		real	longitude latitude time height10m	uas	atmos
northward_wind		m s-1	time: mean		real	longitude latitude time height10m	vas	atmos
wind_speed		m s-1	time: maximum		real	longitude latitude time height10m	sfcWindmax	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
eastward_sea_ice_velocity		m s-1	time: mean		real	longitude latitude time	usi	seaIce ocean
northward_sea_ice_velocity		m s-1	time: mean		real	longitude latitude time	vsi	seaIce ocean
sea_ice_area_fraction		%	time: mean		real	longitude latitude time	sic	seaIce ocean
sea_ice_thickness		m	time: mean area: mean where sea		real	longitude latitude time	sit	seaIce ocean

standard name	unconfirmed or proposed standard name	unformatted units	cell_methods	positive	type	CMOR dimensions	CMOR variable name	realm
air_temperature		K	time: mean		real	longitude latitude plev8 time	ta	atmos
relative_humidity		%	time: mean		real	longitude latitude plev8 time	hur	atmos

	area: areacella		
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frequency	cell_measures	flag_values	flag_meanings
	area: areacella		
	area: areacella		

1	Specific Humidity	1		hus
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
1	Northward Wind	m s^{-1}		va
1	Eastward Wind	m s^{-1}		ua
2	Geopotential Height	m		zg

specific_humidity	1	time: mean	real	longitude latitude plev8 time	hus	atmos
lagrangian_tendency_of_air_pressure	Pa s-1	time: mean	real	longitude latitude plev8 time	wap	atmos
northward_wind	m s-1	time: mean	real	longitude latitude plev8 time	va	atmos
eastward_wind	m s-1	time: mean	real	longitude latitude plev8 time	ua	atmos
geopotential_height	m	time: mean	real	longitude latitude plev8 time	zg	atmos

area: areacella
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area: areacella

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	***reporting time-period***	***ensemble size***
historical	Jan 1950 - Dec 2005	1
AMIP	all years	1
RCP4.5 and RCP8.5	Jan 2006 - Dec 2100	1 for each expt.
decadal hindcasts/forecasts runs inititalized in late 2005 and late 1980	late 2005 - Dec 2035 and late 1980 - Dec 2010	3 for each period
decadal hindcasts/forecasts runs inititalized in late 1990	late 1990 - Dec 2000	3

priority	**long name**	**units**	**comment**	**questions**	**output variable name**
1	Air Temperature	K	on all model levels		ta
1	Eastward Wind	$m\ s^{-1}$	on all model levels		ua
1	Northward Wind	$m\ s^{-1}$	on all model levels		va
1	Specific Humidity	1	on all model levels		hus
1	Surface Air Pressure	Pa	surface pressure, not mean sea level pressure		ps

6hr

priority	standard name	unconfirmed or proposed standard name	unformatted units	cell_methods	positive	type	CMOR dimensions	CMOR variable name	realm
highest	air_temperature		K			real	longitude latitude alevel time1	ta	atmos
highest	eastward_wind		m s-1			real	longitude latitude alevel time1	ua	atmos
highest	northward_wind		m s-1			real	longitude latitude alevel time1	va	atmos
lower	specific_humidity		1			real	longitude latitude alevel time1	hus	atmos
lower	surface_air_pressure		Pa			real	longitude latitude time1	ps	atmos

frequency	cell_measures	flag_values	flag_meanings
	area: areacella		
	area: areacella		
	area: areacella		
	area: areacella		
	area: areacella		

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**
1	Eastward Wind	$m\ s^{-1}$	on the following pressure levels: 850, 500, 250 hPa		ua
1	Northward Wind	$m\ s^{-1}$	on the following pressure levels: 850, 500, 250 hPa		va
1	Air Temperature	K	on the following pressure levels: 850, 500, 250 hPa		ta
1	Sea Level Pressure	Pa			psl

6hr

standard name	unconfirmed or proposed standard name	unformatted units	cell_methods	positive	type	CMOR dimensions	CMOR variable name	realm
eastward_wind		m s-1			real	longitude latitude plev3 time1	ua	atmos
northward_wind		m s-1			real	longitude latitude plev3 time1	va	atmos
air_temperature		K			real	longitude latitude plev3 time1	ta	atmos
air_pressure_at_sea_level		Pa			real	longitude latitude time1	psl	atmos

frequency	cell_measures	flag_values	flag_meanings
	area: areacella		
	area: areacella		
	area: areacella		
	area: areacella		

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

All fields are saved on the atmospheric grid. Precipitation, clouds, and all flux variables are averaged over 3-hour intervals (0-3Z, 3-6Z, 6-9Z, 9-12Z, 12-15Z, 15-18Z, 18-21Z, 21-24Z). All other fields are sampled synoptically at 0Z, 3Z, 6Z, 9Z, 12Z, 15Z, 18Z, and 21Z.

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
pre-industrial control	30 years (ideally the years corresponding to the last 30 years of abrupt 4xCO2 run)
1 percent per year CO2	last 30 years
control SST climatology (6.2a)	all years
CO2 forcing (6.2b), anthropogenic aerosol forcing (6.4a), and sulfate aerosol forcing (6.4b)	all years
abrupt 4XCO2 (6.3)	first 5 years and last 30 years
abrupt 4XCO2 ensemble (6.3-E)	all years

priority	long name	units	comment	questions	output variable 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
1	Air Temperature	K	near-surface (usually, 2 meter) air temperature, sampled synoptically.		tas
1	Surface Upward Latent Heat Flux	$W\ m^{-2}$	This is the 3-hour mean flux.		hfls
1	Surface Upward Sensible Heat Flux	$W\ m^{-2}$	This is the 3-hour mean flux.		hfss
1	Surface Downwelling Longwave Radiation	$W\ m^{-2}$	This is the 3-hour mean flux.		rlds
1	Surface Upwelling Longwave Radiation	$W\ m^{-2}$	This is the 3-hour mean flux.		rlus
1	Surface Downwelling Shortwave Radiation	$W\ m^{-2}$	This is the 3-hour mean flux.		rsds
1	Surface Upwelling Shortwave Radiation	$W\ m^{-2}$	This is the 3-hour mean flux.		rsus

3hr

standard name	unconfirmed or proposed standard name	unformatted units	cell_methods	positive	type	CMOR dimensions	CMOR variable name	realm
precipitation_flux		kg m-2 s-1	time:mean		real	longitude latitude time	pr	atmos
air_temperature		K	time: point		real	longitude latitude time1 height2m	tas	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

frequency	cell_measures	flag_values	flag_meanings
	area: areacella		
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1	Eastward Near-Surface Wind Speed	m s^{-1}	sampled synoptically.	uas
1	Northward Near-Surface Wind Speed	m s^{-1}	sampled synoptically.	vas
1	Near-Surface Specific Humidity	1	near-surface (usually 2 m) specific humidity, sampled synoptically.	huss
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
1	Surface Temperature Where Land or Sea Ice	K	"skin" temperature of all surfaces except open ocean, sampled synoptically.	tslsi
1	Sea Surface Temperature	K	temperature of surface of open ocean, sampled synoptically.	tso
1	Convective Precipitation	kg m^{-2} s^{-1}	at surface. This is a 3-hour mean convective precipitation flux.	prc
1	Snowfall Flux	kg m^{-2} s^{-1}	at surface. Includes all forms of precipitating solid phase of water. This is the 3-hour mean snowfall flux.	prsn
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, averaged over the 3-hour interval.	mrro
1	Surface Downwelling Clear-Sky Longwave Radiation	W m^{-2}	This is a 3-hour mean flux.	rldscs
1	Surface Downwelling Clear-Sky Shortwave Radiation	W m^{-2}	This is a 3-hour mean flux.	rsdscs
1	Surface Upwelling Clear-Sky Shortwave Radiation	W m^{-2}	This is a 3-hour mean flux.	rluscs
1	Surface Pressure	Pa	sampled synoptically to diagnose atmospheric tides, this is better than mean sea level pressure.	ps
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. This is a 3-hour mean.	clt
1	Surface Downward Diffuse Shortwave Radiation	W m^{-2}	This is a 3-hour mean flux.	rsdsdiff

								atmos
eastward_wind		m s-1	time: point		real	longitude latitude time1 height2m	uas	atmos
northward_wind		m s-1	time: point		real	longitude latitude time1 height2m	vas	atmos
specific_humidity		1	time: point		real	longitude latitude time1 height2m	huss	atmos
moisture_content_of_soil_layer		kg m-2	time: point		real	longitude latitude time1	mrsos	land
surface_temperature		K	time: point		real	longitude latitude time1	tslsi	land
sea_surface_temperature		K	time: point area: mean where sea		real	longitude latitude time1	tso	ocean
convective_precipitation_flux		kg m-2 s-1	time:mean		real	longitude latitude time	prc	atmos
snowfall_flux		kg m-2 s-1	time:mean		real	longitude latitude time	prsn	atmos
runoff_flux		kg m-2 s-1	time: mean area: mean where land		real	longitude latitude time	mrro	land
downwelling_longwave_flux_in_air_assuming_clear_sky		W m-2	time: mean	down	real	longitude latitude time	rldscs	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	rluscs	atmos
surface_air_pressure		Pa	time: point		real	longitude latitude time1	ps	atmos
cloud_area_fraction		%	time: mean		real	longitude latitude time	clt	atmos
	surface_diffuse_downwelling_shortwave_radiative_flux_in_air	W m-2	time: mean		real	longitude latitude time	rsdsdiff	atmos

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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 output" 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"-- mon thly mean 3-D fields on model levels (or half levels in the case of fluxes).* Different GCMs will have different cloud tendency terms due to different model formulations. Please submit the terms which are necessary to close the stratiform cloud water budget of your model. If your model contains terms not listed here, please email mark.webb@metoffice.gov.uk to request an update to the table.

priority	long name	units	comment	questions	output variable name
1	Upwelling Longwave Radiation	W m^{-2}	Include also the fluxes at the surface and TOA.		rlu
1	Upwelling Shortwave Radiation	W m^{-2}	Include also the fluxes at the surface and TOA.		rsu
1	Downwelling Longwave Radiation	W m^{-2}	Include also the fluxes at the surface and TOA.		rld
1	Downwelling Shortwave Radiation	W m^{-2}	Include also the fluxes at the surface and TOA.		rsd
1	Upwelling Clear-Sky Longwave Radiation	W m^{-2}	Include also the fluxes at the surface and TOA.		rlucs
1	Upwelling Clear-Sky Shortwave Radiation	W m^{-2}	Include also the fluxes at the surface and TOA.		rsucs
1	Downwelling Clear-Sky Longwave Radiation	W m^{-2}	Include also the fluxes at the surface and TOA.		rldcs
1	Downwelling Clear-Sky Shortwave Radiation	W m^{-2}	Include also the fluxes at the surface and TOA.		rsdcs
1	Air Temperature	K			ta
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}			tntmp

mon

standard name	unconfirmed or proposed standard name	unformatted units	cell_methods	positive	type	CMOR dimensions	CMOR variable name	realm	frequency
upwelling_longwave_flux_in_air		W m-2	time: mean	up	real	longitude latitude alevhalf time	rlu	atmos	
upwelling_shortwave_flux_in_air		W m-2	time: mean	up	real	longitude latitude alevhalf time	rsu	atmos	
downwelling_longwave_flux_in_air		W m-2	time: mean	down	real	longitude latitude alevhalf time	rld	atmos	
downwelling_shortwave_flux_in_air		W m-2	time: mean	down	real	longitude latitude alevhalf time	rsd	atmos	
upwelling_longwave_flux_in_air_assuming_clear_sky		W m-2	time: mean	up	real	longitude latitude alevhalf time	rlucs	atmos	
upwelling_shortwave_flux_in_air_assuming_clear_sky		W m-2	time: mean	up	real	longitude latitude alevhalf time	rsucs	atmos	
downwelling_longwave_flux_in_air_assuming_clear_sky		W m-2	time: mean	down	real	longitude latitude alevhalf time	rldcs	atmos	
downwelling_shortwave_flux_in_air_assuming_clear_sky		W m-2	time: mean	down	real	longitude latitude alevhalf time	rsdcs	atmos	
air_temperature		K	time: mean		real	longitude latitude alevel time	ta	atmos	
tendency_of_air_temperature		K s-1	time: mean		real	longitude latitude alevel time	tnt	atmos	
tendency_of_air_temperature_due_to_advection		K s-1	time: mean		real	longitude latitude alevel time	tnta	atmos	
tendency_of_air_temperature_due_to_model_physics		K s-1	time: mean		real	longitude latitude alevel time	tntmp	atmos	

cell_measures	flag_values	flag_meanings
area: areacella		
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1	Tendency of Air Temperature Due to Stratiform Cloud and Precipitation and Boundary Layer Mixing	$K\ s^{-1}$		tntscpbl
1	Tendency of Air Temperature due to Radiative Heating	$K\ s^{-1}$		tntr
1	Tendency of Air Temperature due to Moist Convection	$K\ s^{-1}$		tntc
1	Specific Humidity	1		hus
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}		tnhusscpbl
1	Tendency of Specific Humidity due to Model Physics	s^{-1}	This should include sources and sinks from parametrized physics (e.g. convection, stratiform condensation/evaporation, etc.) and should exclude sources and sinks from resolved dynamics and diffusion.	tnhusmp
1	Eddy Viscosity Coefficients for Momentum	$m^2\ s^{-1}$		eviscu
1	Eddy Diffusivity Coefficients for Temperature	$m^2\ s^{-1}$		evisct
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. Include precipitating hydrometeors ONLY if the precipitating hydrometeor affects the calculation of radiative transfer in model.	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. Include precipitating hydrometeors ONLY if the precipitating hydrometeor affects the calculation of radiative transfer in model.	clic
2	Stratiform Cloud Area Fraction	%		cls

tendency_of_air_temperature_due_to_stratiform_cloud_and_precipitation_and_boundary_layer_mixing	K s-1	time: mean	real	longitude latitude alevel time	tntscpbl	atmos
tendency_of_air_temperature_due_to_radiative_heating	K s-1	time: mean	real	longitude latitude alevel time	tntr	atmos
tendency_of_air_temperature_due_to_convection	K s-1	time: mean	real	longitude latitude alevel time	tntc	atmos
specific_humidity	1	time: mean	real	longitude latitude alevel time	hus	atmos
tendency_of_specific_humidity	s-1	time: mean	real	longitude latitude alevel time	tnhus	atmos
tendency_of_specific_humidity_due_to_advection	s-1	time: mean	real	longitude latitude alevel time	tnhusa	atmos
tendency_of_specific_humidity_due_to_convection	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_and_precipitation_and_boundary_layer_mixing	s-1	time: mean	real	longitude latitude alevel time	tnhusscpbl	atmos
tendency_of_specific_humidity_due_to_model_physics	s-1	time: mean	real	longitude latitude alevel time	tnhusmp	atmos
		time: mean				
atmosphere_momentum_diffusivity	m2 s-1	time: mean	real	longitude latitude alevel time	eviscu	atmos
atmosphere_heat_diffusivity	m2 s-1	time: mean	real	longitude latitude alevel time	evisct	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

area: areacella
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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. Include precipitating hydrometeors ONLY if the precipitating hydrometeor affects the calculation of radiative transfer in model.	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. Include precipitating hydrometeors ONLY if the precipitating hydrometeor affects the calculation of radiative transfer in model.	clis
2	Updraft Convective Mass Flux	kg m^{-2} s^{-1}	Report on model half-levels (i.e., model layer bounds and not standard pressures). Calculate as the convective mass flux divided by the area of the whole grid cell (not just the area of the cloud).	mcu
2	Downdraft Convective Mass Flux	kg m^{-2} s^{-1}	Report on model half-levels (i.e., model layer bounds and not standard pressures). 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}	Report on model half-levels (i.e., model layer bounds and not standard pressures). The net mass flux should represent the difference between the updraft and downdraft components. 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}	Report on model half-levels (i.e., model layer bounds and not standard pressures). The net mass flux should represent the difference between the updraft and downdraft components. 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 In Air	s^{-1}		tnsclw
2	Tendency of Mass Fraction of Stratiform Cloud Liquid Water In Air Due To Cloud Microphysics	s^{-1}		tnsclwcm
2	Tendency of Mass Fraction of Stratiform Cloud Liquid Water In Air Due To Boundary Layer Mixing	s^{-1}		tnsclwbl
2	Tendency of Mass Fraction of Stratiform Cloud Liquid Water In Air Due To Bergeron Findeisen Process To Cloud Ice	s^{-1}		tnsclwbfpcli

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
atmosphere_updraft_convective_mass_flux	kg m-2 s-1	time: mean	up	real	longitude latitude alevhalf time	mcu	atmos
atmosphere_downdraft_convective_mass_flux	kg m-2 s-1	time: mean	down	real	longitude latitude alevhalf time	mcd	atmos
atmosphere_net_upward_shallow_convective_mass_flux	kg m-2 s-1	time: mean	up	real	longitude latitude alevhalf time	smc	atmos
atmosphere_net_upward_deep_convective_mass_flux	kg m-2 s-1	time: mean	up	real	longitude latitude alevhalf time	dmc	atmos
tendency_of_mass_fraction_of_stratiform_cloud_liquid_water_in_air	s-1	time: mean		real	longitude latitude alevel time	tnsclw	atmos
tendency_of_mass_fraction_of_stratiform_cloud_liquid_water_in_air_due_to_cloud_microphysics	s-1	time: mean		real	longitude latitude alevel time	tnsclwcm	atmos
tendency_of_mass_fraction_of_stratiform_cloud_liquid_water_in_air_due_to_boundary_layer_mixing	s-1	time: mean		real	longitude latitude alevel time	tnsclwbl	atmos
tendency_of_mass_fraction_of_stratiform_cloud_liquid_water_in_air_due_to_bergeron_findeisen_process_to_cloud_ice	s-1	time: mean		real	longitude latitude alevel time	tnsclwbfpcli	atmos

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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 to 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 In Air	s^{-1}		tnscli
2	Tendency of Mass Fraction of Stratiform Cloud Ice In Air Due To Cloud Microphysics	s^{-1}		tnsclicm
2	Tendency of Mass Fraction of Stratiform Cloud Ice In Air Due To Boundary Layer Mixing	s^{-1}		tnsclibl
2	Tendency of Mass Fraction of Stratiform Cloud Ice In Air Due To Bergeron Findeisen Process from Cloud Liquid	s^{-1}		tnsclibfpcl
2	Tendency of Mass Fraction of Stratiform Cloud Ice Due Convective Detrainment	s^{-1}	Tendency of Mass Fraction of Stratiform Cloud Ice Due to Convective Detrainment	tnsclicd

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	s-1	time: mean	real	longitude latitude alevel time	tnscli	atmos
tendency_of_mass_fraction_of_stratiform_cloud_ice_in_air_due_to_cloud_microphysics	s-1	time: mean	real	longitude latitude alevel time	tnsclicm	atmos
tendency_of_mass_fraction_of_stratiform_cloud_ice_in_air_due_to_boundary_layer_mixing	s-1	time: mean	real	longitude latitude alevel time	tnsclibl	atmos
tendency_of_mass_fraction_of_stratiform_cloud_ice_in_air_due_to_bergeron_findeisen_process_from_cloud_liquid	s-1	time: mean	real	longitude latitude alevel time	tnsclibfpcl	atmos
tendency_of_mass_fraction_of_stratiform_cloud_ice_in_air_due_to_convective_detrainment	s-1	time: mean	real	longitude latitude alevel time	tnsclicd	atmos

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2	Tendency of Mass Fraction of Stratiform Cloud Ice due to Homogeneous Nucleation	s^{-1}	tnsclihon
2	Tendency of Mass Fraction of Stratiform Cloud Ice due to Heterogeneous Nucleation From Cloud Liquid	s^{-1}	tnsclihencl
2	Tendency of Mass Fraction of Stratiform Cloud Ice due to Heterogeneous Nucleation From Water Vapor	s^{-1}	tnsclihenv
2	Tendency of Mass Fraction of Stratiform Cloud Ice due to Riming From Cloud Liquid	s^{-1}	tnscliricl
2	Tendency of Mass Fraction of Stratiform Cloud Ice due to Riming From Rain	s^{-1}	tnsclirir
2	Tendency of Mass Fraction of Stratiform Cloud Ice due to Deposition and Sublimation	s^{-1}	tnsclids
2	Tendency of Mass Fraction of Stratiform Cloud Ice due to Aggregation	s^{-1}	tnscliag
2	Tendency of Mass Fraction of Stratiform Cloud Ice due to Accretion to Snow	s^{-1}	tnsclias
2	Tendency of Mass Fraction of Stratiform Cloud Ice due to Evaporation of Melting Ice	s^{-1}	tnscliemi
2	Tendency of Mass Fraction of Stratiform Cloud Ice due to Melting to Rain	s^{-1}	tnsclimr
2	Tendency of Mass Fraction of Stratiform Cloud Ice due to Melting to Cloud Liquid	s^{-1}	tnsclimcl
2	Tendency of Mass Fraction of Stratiform Cloud Ice due to Icefall	s^{-1}	tnscliif
2	Tendency of Mass Fraction of Stratiform Cloud Ice due to Advection	s^{-1}	tnsclia
2	Tendency of Mass Fraction of Stratiform Cloud Condensed Water In Air	s^{-1}	tnsccw
2	Tendency of Mass Fraction of Stratiform Cloud Condensed Water In Air Due To Cloud Microphysics	s^{-1}	tnsccwcm

tendency_of_mass_fraction_of_stratiform_cloud_ice_in_air_due_to_homogeneous_nucleation	s-1	time: mean	real	longitude latitude alevel time	tnsclihon	atmos
tendency_of_mass_fraction_of_stratiform_cloud_ice_in_air_due_to_heterogeneous_nucleation_from_cloud_liquid_water	s-1	time: mean	real	longitude latitude alevel time	tnsclihencl	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	tnsclihenv	atmos
tendency_of_mass_fraction_of_stratiform_cloud_ice_in_air_due_to_riming_from_cloud_liquid_water	s-1	time: mean	real	longitude latitude alevel time	tnscliricl	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	tnsclirir	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	tnsclids	atmos
tendency_of_mass_fraction_of_stratiform_cloud_ice_in_air_due_to_aggregation	s-1	time: mean	real	longitude latitude alevel time	tnscliag	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	tnsclias	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	tnscliemi	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	tnsclimr	atmos
tendency_of_mass_fraction_of_stratiform_cloud_ice_in_air_due_to_melting_to_cloud_liquid_water	s-1	time: mean	real	longitude latitude alevel time	tnsclimcl	atmos
tendency_of_mass_fraction_of_stratiform_cloud_ice_in_air_due_to_icefall	s-1	time: mean	real	longitude latitude alevel time	tnscliif	atmos
tendency_of_mass_fraction_of_stratiform_cloud_ice_in_air_due_to_advection	s-1	time: mean	real	longitude latitude alevel time	tnsclia	atmos
tendency_of_mass_fraction_of_stratiform_cloud_condensed_water_in_air	s-1	time: mean	real	longitude latitude alevel time	tnsccw	atmos
tendency_of_mass_fraction_of_stratiform_cloud_condensed_water_in_air_due_to_cloud_microphysics	s-1	time: mean	real	longitude latitude alevel time	tnsccwcm	atmos

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2	Tendency of Mass Fraction of Stratiform Cloud Condensed Water In Air Due To Boundary Layer Mixing	s^{-1}		tnsccwbl
2	Tendency of Mass Fraction of Stratiform Cloud Condensed Water due to Condensation and Evaporation	s^{-1}	condensed water includes both liquid and ice.	tnsccwce
2	Tendency of Mass Fraction of Stratiform Cloud Condensed Water due to Autoconversion to Rain	s^{-1}	condensed water includes both liquid and ice.	tnsccwacr
2	Tendency of Mass Fraction of Stratiform Cloud Condensed Water due to Autoconversion to Snow	s^{-1}	condensed water includes both liquid and ice.	tnsccwacs
2	Tendency of Mass Fraction of Stratiform Cloud Condensed Water due to Icefall	s^{-1}	condensed water includes both liquid and ice.	tnsccwif
2	Tendency of Mass Fraction of Stratiform Cloud Condensed Water due to Advection	s^{-1}	condensed water includes both liquid and ice.	tnsccwa

tendency_of_mass_fraction_of_stratiform_cloud_condensed_water_in_air_due_to_boundary_layer_mixing	s-1	time: mean	real	longitude latitude alevel time	tnsccwbl	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	tnsccwce	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	tnsccwacr	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	tnsccwacs	atmos
tendency_of_mass_fraction_of_stratiform_cloud_condensed_water_in_air_due_to_icefall	s-1	time: mean	real	longitude latitude alevel time	tnsccwif	atmos
tendency_of_mass_fraction_of_stratiform_cloud_condensed_water_in_air_due_to_advection	s-1	time: mean	real	longitude latitude alevel time	tnsccwa	atmos

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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
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
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

standard name	unconfirmed or proposed standard name	unformatted units	cell_methods	positive	type	CMOR dimensions	CMOR variable name	realm	frequency
toa_outgoing_shortwave_flux		W m-2	time: mean	up	real	longitude latitude time	rsut4co2	atmos	
toa_outgoing_longwave_flux		W m-2	time: mean	up	real	longitude latitude time	rlut4co2	atmos	
toa_outgoing_shortwave_flux_assuming_clear_sky		W m-2	time: mean	up	real	longitude latitude time	rsutcs4co2	atmos	
toa_outgoing_longwave_flux_assuming_clear_sky		W m-2	time: mean	up	real	longitude latitude time	rlutcs4co2	atmos	

standard name	unconfirmed or proposed standard name	unformatted units	cell_methods	positive	type	CMOR dimensions	CMOR variable name	realm	frequency
upwelling_longwave_flux_in_air		W m-2	time: mean	up	real	longitude latitude alevhalf time	rlu4co2	atmos	
upwelling_shortwave_flux_in_air		W m-2	time: mean	up	real	longitude latitude alevhalf time	rsu4co2	atmos	
downwelling_longwave_flux_in_air		W m-2	time: mean	down	real	longitude latitude alevhalf time	rld4co2	atmos	
downwelling_shortwave_flux_in_air		W m-2	time: mean	down	real	longitude latitude alevhalf time	rsd4co2	atmos	
upwelling_longwave_flux_in_air_assuming_clear_sky		W m-2	time: mean	up	real	longitude latitude alevhalf time	rlucs4co2	atmos	
upwelling_shortwave_flux_in_air_assuming_clear_sky		W m-2	time: mean	up	real	longitude latitude alevhalf time	rsucs4co2	atmos	
downwelling_longwave_flux_in_air_assuming_clear_sky		W m-2	time: mean	down	real	longitude latitude alevhalf time	rldcs4co2	atmos	
downwelling_shortwave_flux_in_air_assuming_clear_sky		W m-2	time: mean	down	real	longitude latitude alevhalf time	rsdcs4co2	atmos	

cell_measures	flag_values	flag_meanings
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cell_measures	flag_values	flag_meanings
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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
1	ISCCP Total Cloud Fraction	%			cltisccp
1	ISCCP Mean Cloud Albedo	1	When computing time-means, weight by the ISCCP Total Cloud Fraction - see http://www.cfmip.net/README		albisccp
1	ISCCP Mean Cloud Top Pressure	Pa	When computing time-means, weight by the ISCCP Total Cloud Fraction - see http://www.cfmip.net/README		ctpisccp
1	ISCCP Cloud Area Fraction	%	7 levels x 7 tau		clisccp
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
1	CALIPSO Cloud Fraction	%	40 height levels		clcalipso
1	PARASOL Reflectance	1	5 bins of solar zenith angle. This is reflectance as seen at the top of the atmosphere.		parasolRefl

standard name	unconfirmed or proposed standard name	unformatted units	cell_methods	positive	type	CMOR dimensions	CMOR variable name	realm	frequency
cloud_area_fraction		%	time: mean		real	longitude latitude time	cltisccp	atmos	
cloud_albedo		1	time: mean		real	longitude latitude time	albisccp	atmos	
air_pressure_at_cloud_top		Pa	time: mean		real	longitude latitude time	ctpisccp	atmos	
isccp_cloud_area_fraction		%	time: mean		real	longitude latitude plev7, tau, time	clisccp	atmos	
cloud_area_fraction		%	time: mean		real	longitude latitude time	cltcalipso	atmos	
cloud_area_fraction_in_atmosphere_layer		%	time: mean		real	longitude latitude time p840	cllcalipso	atmos	
cloud_area_fraction_in_atmosphere_layer		%	time: mean		real	longitude latitude time p560	clmcalipso	atmos	
cloud_area_fraction_in_atmosphere_layer		%	time: mean		real	longitude latitude time p220	clhcalipso	atmos	
cloud_area_fraction_in_atmosphere_layer		%	time: mean		real	longitude latitude alt40 time	clcalipso	atmos	
toa_bidirectional_reflectance		1	time: mean		real	longitude latitude sza5 time	parasolRefl	atmos	

cell_measures	flag_values	flag_meanings
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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 output" 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
1	CALIPSO Cloud Fraction	%	(40 height levels)		clcalipso
1	CALIPSO Cloud Fraction Undetected by CloudSat	%	(40 height levels) Clouds detected by CALIPSO but below the detectability threshold of CloudSat		clcalipso2
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	Simulated reflectance from PARASOL as seen at the top of the atmosphere for 5 solar zenith angles. Valid only over ocean and for one viewing direction (viewing zenith angle of 30 degrees and relative azimuth angle 320 degrees).		parasolRefl
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

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standard name	unconfirmed or proposed standard name	unformatted units	cell_methods	positive	type	CMOR dimensions	CMOR variable name	realm
cloud_area_fraction_in_atmosphere_layer		%	time: mean		real	longitude latitude alt40 time	clcalipso	atmos
cloud_area_fraction_in_atmosphere_layer		%	time: mean		real	longitude latitude alt40 time	clcalipso2	atmos
histogram_of_equivalent_reflectivity_factor_over _height_above_reference_ellipsoid		1	time: mean		real	longitude latitude alt40 dbze time	cfadDbze94	atmos
histogram_of_backscattering_ratio_over_height_ above_reference_ellipsoid		1	time: mean		real	longitude latitude alt40 scatratio time	cfadLidarsr53 2	atmos
toa_bidirectional_reflectance		1	time: mean		real	longitude latitude sza5 time	parasolRefl	atmos
cloud_area_fraction		%	time: mean		real	longitude latitude time	cltcalipso	atmos
cloud_area_fraction_in_atmosphere_layer		%	time: mean		real	longitude latitude time p840	cllcalipso	atmos
cloud_area_fraction_in_atmosphere_layer		%	time: mean		real	longitude latitude time p560	clmcalipso	atmos
cloud_area_fraction_in_atmosphere_layer		%	time: mean		real	longitude latitude time p220	clhcalipso	atmos

frequency	cell_measures	flag_values	flag_meanings
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CMOR Table cfDay: CFMIP Daily-Mean Cloud Diagnostic Fields cfDay

(All Saved on the Atmospheric Grid)

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

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

In CMOR Table cfDay: "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
1	Surface Air Pressure	Pa			ps
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	%	for the whole atmospheric column, as seen from the surface or the top of the atmosphere. Include both large-scale and convective cloud.		clt
1	Condensed Water Path	$kg m^{-2}$	calculate mass of condensed (liquid + ice) water in the column divided by the area of the column (not just the area of the cloudy portion of the column). Include precipitating hydrometeors ONLY if the precipitating hydrometeor affects the calculation of radiative transfer in model.		clwvi
1	Ice Water Path	$kg m^{-2}$	calculate mass of ice water in the column divided by the area of the column (not just the area of the cloudy portion of the column). Include precipitating frozen hydrometeors ONLY if the precipitating hydrometeor affects the calculation of radiative transfer in model.		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

day

standard name	unconfirmed or proposed standard name	unformatted units	cell_methods	positive	type	CMOR dimensions	CMOR variable name	realm
surface_air_pressure		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
		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
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

frequency	cell_measures	flag_values	flag_meanings
	area: areacella		
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1	Air Temperature	K	at 700 hPa level		ta700
1	Air Pressure at Convective Cloud Base	Pa			ccb
1	Air Pressure at Convective Cloud Top	Pa			cct
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	ISCCP Total Total Cloud Fraction	%			cltisccp
1	ISCCP Mean Cloud Albedo	1	When computing time-means, weight by the ISCCP Total Cloud Fraction - see http://www.cfmip.net/README		albisccp
1	ISCCP Mean Cloud Top Pressure	Pa	When computing time-means, weight by the ISCCP Total Cloud Fraction - see http://www.cfmip.net/README		pctisccp
1	PARASOL Reflectance	1	Simulated reflectance from PARASOL as seen at the top of the atmosphere for 5 solar zenith angles. Valid only over ocean and for one viewing direction (viewing zenith angle of 30 degrees and relative azimuth angle 320 degrees).		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 cfDay: "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
1	Eastward Wind	m s^{-1}			ua
1	Northward Wind	m s^{-1}			va
1	Air Temperature	K			ta

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	ccb	atmos
air_pressure_at_convective_cloud_top		Pa	time: mean		real	longitude latitude time	cct	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
cloud_area_fraction		%	time: mean		real	longitude latitude time	cltisccp	atmos
cloud_albedo		1	time: mean		real	longitude latitude time	albisccp	atmos
air_pressure_at_cloud_top		Pa	time: mean		real	longitude latitude time	pctisccp	atmos
toa_bidirectional_reflectance		1	time: mean		real	longitude latitude sza5 time	parsolRefl	atmos
cloud_area_fraction		%	time: mean		real	longitude latitude time	cltcalipso	atmos
cloud_area_fraction_in_atmosphere_layer		%	time: mean		real	longitude latitude time	cllcalipso	atmos
cloud_area_fraction_in_atmosphere_layer		%	time: mean		real	longitude latitude time	clmcalipso	atmos
cloud_area_fraction_in_atmosphere_layer		%	time: mean		real	longitude latitude time	clhcalipso	atmos

standard name	unconfirmed or proposed standard name	unformatted units	cell_methods	positive	type	CMOR dimensions	CMOR variable name	realm
eastward_wind		m s-1	time: mean		real	longitude latitude alevel time	ua	atmos
northward_wind		m s-1	time: mean		real	longitude latitude alevel time	va	atmos
air_temperature		K	time: mean		real	longitude latitude alevel time	ta	atmos

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frequency	cell_measures	flag_values	flag_meanings
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1	Specific Humidity	1		hus
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
1	Geopotential Height	m		zg
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
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. Include precipitating hydrometeors ONLY if the precipitating hydrometeor affects the calculation of radiative transfer in model.	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. Include precipitating hydrometeors ONLY if the precipitating hydrometeor affects the calculation of radiative transfer in model.	cli
1	Convective Mass Flux	kg m^{-2} s^{-1}	Report on model half-levels (i.e., model layer bounds and not standard pressures). The net mass flux should represent the difference between the updraft and downdraft components. 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	ISCCP Cloud Area Fraction	%	7 levels x 7 tau	clisccp
1	Pressure on Model Levels	Pa	This field is needed only 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
1	Pressure on Model Half-Levels	Pa	This field is needed only 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

specific_humidity	1	time: mean		real	longitude latitude alevel time	hus	atmos
lagrangian_tendency_of_air_pressure	Pa s-1	time: mean		real	longitude latitude alevel time	wap	atmos
geopotential_height	m	time: mean		real	longitude latitude alevel time	zg	atmos
relative_humidity	%	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
atmosphere_net_upward_convective_mass_flux	kg m-2 s-1	time: mean	up	real	longitude latitude alevhalf time	mc	atmos
cloud_area_fraction_in_atmosphere_layer	%	time: mean		real	longitude latitude alt40 time	clcalipso	atmos
cloud_area_fraction_in_atmosphere_layer	%	time: mean		real	longitude latitude tau plev7 time	clisccp	atmos
air_pressure	Pa	time: mean		real	longitude latitude alevel time	pfull	atmos
air_pressure	Pa	time: mean		real	longitude latitude alevhalf time	phalf	atmos

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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 output" 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
1	CALIPSO Cloud Area Fraction	%	(40 height levels)		clcalipso
1	CALIPSO Cloud Fraction Undetected by CloudSat	%	(40 height levels) Clouds detected by CALIPSO but below the detectability threshold of CloudSat		clcalipso2
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	Simulated reflectance from PARASOL as seen at the top of the atmosphere for 5 solar zenith angles. Valid only over ocean and for one viewing direction (viewing zenith angle of 30 degrees and relative azimuth angle 320 degrees).		parasolRefl
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
1	Longitude	degrees_east	function of time		lon
1	Latitude	degrees_north	function of time		lat
1	Offset Time	day	this "offset time" should be added to the value stored in the "time dimension" to get the actual time. This actual time is the time (UTC) of the corresponding point in the satellite orbit used to extract the model data.		toffset

3hr

standard name	unconfirmed or proposed standard name	unformatted units	cell_methods	positive	type	CMOR dimensions	CMOR variable name	realm
cloud_area_fraction_in_atmosphere_layer		%	time: point		real	location alt40 time1	clcalipso	atmos
cloud_area_fraction_in_atmosphere_layer		%	time: point		real	location alt40 time1	clcalipso2	atmos
histogram_of_equivalent_reflectivity_factor_over_height_above_reference_ellipsoid		1	time: point		real	location alt40 dbze time1	cfadDbze94	atmos
histogram_of_backscattering_ratio_over_height_above_reference_ellipsoid		1	time: point		real	location alt40 scatratio time1	cfadLidarsr532	atmos
toa_bidirectional_reflectance		1	time: point		real	location sza5 time1	parasolRefl	atmos
cloud_area_fraction		%	time: point		real	location time1	cltcalipso	atmos
cloud_area_fraction_in_atmosphere_layer		%	time: point		real	location time1 p840	cllcalipso	atmos
cloud_area_fraction_in_atmosphere_layer		%	time: point		real	location time1 p560	clmcalipso	atmos
cloud_area_fraction_in_atmosphere_layer		%	time: point		real	location time1 p220	clhcalipso	atmos
longitude		degrees_east	time: point		real	location time1	lon	atmos
latitude		degrees_north	time: point		real	location time1	lat	atmos
time		day			real	location time1	toffset	atmos

frequency	cell_measures	flag_values	flag_meanings

In CMOR Table cf3hr: *"CFMIP 3-hourly inline" -- 2-D fields as specified in the Amon table plus convective cloud fraction and 3-D f ields 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.*

priority	long name	units	comment	questions	output variable name
1	(use names for Amon 2D table)		This table includes all the 2-D variables listed in the Amon table, omitting, however, the daily maximum and minimum temperatures. All variables should be reported as synoptic fields, not daily means.		include Amon 2D
1	Convective Cloud Fraction	%	for the whole atmospheric column, as seen from the surface or the top of the atmosphere. Include only convective cloud. Besides the quantities from the Amon table, this is the only other 2-D field in this table.		cltc
2	Altitude of Model Full-Levels	m	This is actual height above mean sea level, not geopotential height		zfull
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
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
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
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. Include precipitating hydrometeors ONLY if the precipitating hydrometeor affects the calculation of radiative transfer in model.		clws

standard name	unconfirmed or proposed standard name	unformatted units	cell_methods	positive	type	CMOR dimensions	CMOR variable name	realm
			time: point		real	longitude latitude time1		atmos
convective_cloud_area_fraction		%	time: point		real	longitude latitude time1	cltc	atmos
height_above_reference_ellipsoid		m	time: point		real	longitude latitude alevel time1	zfull	atmos
height_above_reference_ellipsoid		m	time: point		real	longitude latitude alevhalf time1	zhalf	atmos
air_pressure		Pa	time: point		real	longitude latitude alevel time1	pfull	atmos
air_pressure		Pa	time: point		real	longitude latitude alevhalf time1	phalf	atmos
air_temperature		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

frequency	cell_measures	flag_values	flag_meanings
	area: areacella		
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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. Include precipitating hydrometeors ONLY if the precipitating hydrometeor affects the calculation of radiative transfer in model.	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. Include precipitating hydrometeors ONLY if the precipitating hydrometeor affects the calculation of radiative transfer in model.	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. Include precipitating hydrometeors ONLY if the precipitating hydrometeor affects the calculation of radiative transfer in model.	clic
2	Hydrometeor Effective Radius of Stratiform Cloud Liquid Water	m	This is defined as the in-cloud ratio of the third moment over the second moment of the particle size distribution (obtained by considering only the cloudy portion of the grid cell).	reffclws
2	Hydrometeor Effective Radius of Stratiform Cloud Ice	m	This is defined as the in-cloud ratio of the third moment over the second moment of the particle size distribution (obtained by considering only the cloudy portion of the grid cell).	reffclis
2	Hydrometeor Effective Radius of Convective Cloud Liquid Water	m	This is defined as the in-cloud ratio of the third moment over the second moment of the particle size distribution (obtained by considering only the cloudy portion of the grid cell).	reffclwc
2	Hydrometeor Effective Radius of Convective Cloud Ice	m	This is defined as the in-cloud ratio of the third moment over the second moment of the particle size distribution (obtained by considering only the cloudy portion of the grid cell).	reffclic
2	Stratiform Graupel Flux	kg m^{-2} s^{-1}	report on model half-levels	grpllsprof
2	Convective Rainfall Flux	kg m^{-2} s^{-1}	report on model half-levels	prcprof
2	Stratiform Rainfall Flux	kg m^{-2} s^{-1}	report on model half-levels	prlsprof
2	Convective Snowfall Flux	kg m^{-2} s^{-1}	report on model half-levels	prsnc
2	Stratiform Snowfall Flux	kg m^{-2} s^{-1}	report on model half-levels	prlsns
2	Hydrometeor Effective Radius of Stratiform Graupel	m	This is defined as the in-cloud ratio of the third moment over the second moment of the particle size distribution (obtained by considering only the cloudy portion of the grid cell).	reffgrpls

mass_fraction_of_stratiform_cloud_ice_in_air	1	time: point	real	longitude latitude alevel time1	clis	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	time: point	real	longitude latitude alevel time1	reffclws	atmos
effective_radius_of_stratiform_cloud_ice_particle	m	time: point	real	longitude latitude alevel time1	reffclis	atmos
effective_radius_of_convective_cloud_liquid_water_particle	m	time: point	real	longitude latitude alevel time1	reffclwc	atmos
effective_radius_of_convective_cloud_ice_particle	m	time: point	real	longitude latitude alevel time1	reffclic	atmos
large_scale_graupel_flux	kg m-2 s-1	time: point	real	longitude latitude alevel time1	grpllsprof	atmos
convective_rainfall_flux	kg m-2 s-1	time: point	real	longitude latitude alevel time1	prcprof	atmos
large_scale_rainfall_flux	kg m-2 s-1	time: point	real	longitude latitude alevel time1	prlsprof	atmos
convective_snowfall_flux	kg m-2 s-1	time: point	real	longitude latitude alevel time1	prsnc	atmos
large_scale_snowfall_flux	kg m-2 s-1	time: point	real	longitude latitude alevel time1	prlsns	atmos
effective_radius_of_stratiform_cloud_graupel_particle	m	time: point	real	longitude latitude alevel time1	reffgrpls	atmos

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2	Hydrometeor Effective Radius of Convective Rainfall	m	This is defined as the in-cloud ratio of the third moment over the second moment of the particle size distribution (obtained by considering only the cloudy portion of the grid cell).	reffrainc
2	Hydrometeor Effective Radius of Stratiform Rainfall	m	This is defined as the in-cloud ratio of the third moment over the second moment of the particle size distribution (obtained by considering only the cloudy portion of the grid cell).	reffrains
2	Hydrometeor Effective Radius of Convective Snowfall	m	This is defined as the in-cloud ratio of the third moment over the second moment of the particle size distribution (obtained by considering only the cloudy portion of the grid cell).	reffsnowc
2	Hydrometeor Effective Radius of Stratiform Snowfall	m	This is defined as the in-cloud ratio of the third moment over the second moment of the particle size distribution (obtained by considering only the cloudy portion of the grid cell).	reffsnows
2	Stratiform Cloud Optical Depth	1	This is the in-cloud optical depth obtained by considering only the cloudy portion of the grid c	dtaus
2	Convective Cloud Optical Depth	1	This is the in-cloud optical depth obtained by considering only the cloudy portion of the grid c	dtauc
2	Stratiform Cloud Emissivity	1	This is the in-cloud emissivity obtained by considering only the cloudy portion of the grid cel	dems
2	Convective Cloud Emissivity	1	This is the in-cloud emissivity obtained by considering only the cloudy portion of the grid cel	demc
2	Convective Cloud Area Fraction	%		clc
2	Stratiform Cloud Area Fraction	%		cls

effective_radius_of_convective_cloud_rain_particle	m	time: point	real	longitude latitude alevel time1	reffrainc	atmos
effective_radius_of_stratiform_cloud_rain_particle	m	time: point	real	longitude latitude alevel time1	reffrains	atmos
effective_radius_of_convective_cloud_snow_particle	m	time: point	real	longitude latitude alevel time1	reffsnowc	atmos
effective_radius_of_stratiform_cloud_snow_particle	m	time: point	real	longitude latitude alevel time1	reffsnows	atmos
atmosphere_optical_thickness_due_to_stratiform_cloud	1	time: point	real	longitude latitude alevel time1	dtaus	atmos
atmosphere_optical_thickness_due_to_convective_cloud	1	time: point	real	longitude latitude alevel time1	dtauc	atmos
stratiform_cloud_longwave_emissivity	1	time: point	real	longitude latitude alevel time1	dems	atmos
convective_cloud_longwave_emissivity	1	time: point	real	longitude latitude alevel time1	demc	atmos
convective_cloud_area_fraction_in_atmosphere_layer	%	time: point	real	longitude latitude alevel time1	clc	atmos
stratiform_cloud_area_fraction_in_atmosphere_layer	%	time: point	real	longitude latitude alevel time1	cls	atmos

area: areacella
area: areacella
area: areacella
area: areacella
area: areacella
area: areacella
area: areacella
area: areacella
area: areacella
area: areacella

CMOR Table cfSites: CFMIP high frequency Cloud Diagnostic Fields cfSites

(sampled only at specified locations)

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

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

CMOR Table cfSites: "CFMIP Timestep Station Data" -- 2-D fields from the Amon table and 3-D fields on model levels sampled at 20 to 30 minute intervals at 73 specified locations for aquaplanet experiments and 119 specified locations for other experiments (see http://cfmip.metoffice.com/cfmip2/pointlocations.txt.

The sampling interval should be the integer multiple of the model time-step that is nearest to 30 minutes and divides into 60 minutes with no remainder. e.g. (30->30,20->20,15->30,10->30). 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
1	(use names from Amon 2D table)		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.		include Amon 2D
1	Cloud Area Fraction	%	Include both large-scale and convective cloud.		cl
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. Include precipitating hydrometeors ONLY if the precipitating hydrometeor affects the calculation of radiative transfer in model.		clw
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. Include precipitating hydrometeors ONLY if the precipitating hydrometeor affects the calculation of radiative transfer in model.		cli
1	Convective Mass Flux	kg m^{-2} s^{-1}	Report on model half-levels (i.e., model layer bounds and not standard pressures). The net mass flux should represent the difference between the updraft and downdraft components. Calculate as the convective mass flux divided by the area of the whole grid cell (not just the area of the updrafts).		mc

subhr

standard name	unconfirmed or proposed standard name	unformatted units	cell_methods	positive	type	CMOR dimensions	CMOR variable name	realm
			time: point		real	site time1		atmos
cloud_area_fraction_in_atmosphere_layer		%	time: point		real	alevel site time1	cl	atmos
mass_fraction_of_cloud_liquid_water_in_air		1	time: point		real	alevel site time1	clw	atmos
mass_fraction_of_cloud_ice_in_air		1	time: point		real	alevel site time1	cli	atmos
atmosphere_net_upward_convective_mass_flux		kg m-2 s-1	time: point	up	real	alevhalf site time1	mc	atmos

frequency	cell_measures	flag_values	flag_meanings

1	Air Temperature	K		ta
1	Eastward Wind	m s^{-1}		ua
1	Northward Wind	m s^{-1}		va
1	Specific Humidity	1		hus
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
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
1	Geopotential Height	m		zg
1	Upwelling Longwave Radiation	W m^{-2}		rlu
1	Upwelling Shortwave Radiation	W m^{-2}		rsu
1	Downwelling Longwave Radiation	W m^{-2}		rld
1	Downwelling Shortwave Radiation	W m^{-2}		rsd
1	Upwelling Clear-Sky Longwave Radiation	W m^{-2}		rlucs
1	Upwelling Clear-Sky Shortwave Radiation	W m^{-2}		rsucs
1	Downwelling Clear-Sky Longwave Radiation	W m^{-2}		rldcs
1	Downwelling Clear-Sky Shortwave Radiation	W m^{-2}		rsdcs
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}		tntmp
1	Tendency of Air Temperature due to Stratiform Cloud Condensation and Evaporation	K s^{-1}		tntscpbl
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}		tntc
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}		tnhusscpbl
1	Tendency of Specific Humidity due to Model Physics	s^{-1}		tnhusmp

air_temperature	K	time: point		real	alevel site time1	ta	atmos
eastward_wind	m s-1	time: point		real	alevel site time1	ua	atmos
northward_wind	m s-1	time: point		real	alevel site time1	va	atmos
specific_humidity	1	time: point		real	alevel site time1	hus	atmos
relative_humidity	%	time: point		real	alevel site time1	hur	atmos
lagrangian_tendency_of_air_pressure	Pa s-1	time: point		real	alevel site time1	wap	atmos
geopotential_height	m	time: point		real	alevel site time1	zg	atmos
upwelling_longwave_flux_in_air	W m-2	time: point	up	real	alevel site time1	rlu	atmos
upwelling_shortwave_flux_in_air	W m-2	time: point	up	real	alevel site time1	rsu	atmos
downwelling_longwave_flux_in_air	W m-2	time: point	down	real	alevel site time1	rld	atmos
downwelling_shortwave_flux_in_air	W m-2	time: point	down	real	alevel site time1	rsd	atmos
upwelling_longwave_flux_in_air_assuming_clear_sky	W m-2	time: point	up	real	alevel site time1	rlucs	atmos
upwelling_shortwave_flux_in_air_assuming_clear_sky	W m-2	time: point	up	real	alevel site time1	rsucs	atmos
downwelling_longwave_flux_in_air_assuming_clear_sky	W m-2	time: point	down	real	alevel site time1	rldcs	atmos
downwelling_shortwave_flux_in_air_assuming_clear_sky	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_model_physics	K s-1	time: point		real	alevel site time1	tntmp	atmos
tendency_of_air_temperature_due_to_stratiform_cloud_and_precipitation_and_boundary_layer_mixing	K s-1	time: point		real	alevel site time1	tntscpbl	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_convection	K s-1	time: point		real	alevel site time1	tntc	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_and_precipitation_and_boundary_layer_mixing	s-1	time: point		real	alevel site time1	tnhusscpbl	atmos
tendency_of_specific_humidity_due_to_model_physics	s-1	time: point		real	alevel site time1	tnhusmp	atmos

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	Pressure on Model Levels	Pa	This field is needed only 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
1	Pressure on Model Half-Levels	Pa	This field is needed only 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

atmosphere_momentum_diffusivity	m2 s-1	time: point	real	alevel site time1	evu	atmos
atmosphere_heat_diffusivity	m2 s-1	time: point	real	alevel site time1	edt	atmos
air_pressure	Pa	time: point	real	alevel, site, time1	pfull	atmos
air_pressure	Pa	time: point	real	alevel, site, time1	phalf	atmos

Requested output: years requested for each expt./output table combination (see CFMIP output sheet for information on time-periods for saving the special CFMIP-focused output.

red font means output should be reported for only a single member in the case of an ensemble of simulations

blue font means this is a lower priority request

If a cell is shaded yellow, none of the variables will be part of the subset of model output that will be replicated at several locations (except, as noted by * or ** -- see note at right-- this may apply only to lower priority variables)

"all*" indicates that although all *years* will be included in the "replicated" subset, only the high and medium priority *variables* will be included in the replicated subset.
"all**" indicates that although all *years* will be included in the "replicated" subset, only the highest priority *variables* will be included in the replicated subset

"decadal" prediction experiments

Experiment	Description	Expt. #	Oclim	Oyr	Amon	Omon lon x lat x olev	Omon other	Lmon	Limon	Oimon	aero lon x lat	aero lon x lat x alev
10-year predictions	10-year hindcasts/predictions	1.1		all*	all	all**	all	all	all	all	all	year 10
30-year predictions	30-year hindcasts/predictions	1.2		all*	all	all**	all	all	all	all	all	years 10, 20, & 30
10-year predictions	increased ensemble size of 1.1	1.1-E		all*	all	all**	all	all	all	all	all	year 10
30-year predictions	increased ensemble size of 1.2	1.2-E		all*	all	all**	all	all	all	all	all	years 10, 20, & 30
10-year predictions	additional start dates for expts. 1.1	1.1-I		all*	all	all**	all	all	all	all	all	year 10
AMIP	AMIP (1979-2008)	3.3			all			all	all	all	all	years 1980, 1990, 2000, & possibly 2010
pre-industrial control	control run, but possibly as short as 100 years	3.1-S		all*	all	all**	all	all	all	all	all	years 20, 40, 60, 80, & 100
1 percent per year CO2	1% per year CO2 rise imposed	6.1-S		all*	all	all**	all	all	all	all		
volcano-free hindcasts	hindcasts but without volcanoes	1.3		all*	all	all**	all	all	all	all	all	year 2010, 2011, and 2012
prediction with 2010 volcano	Pinatubo-like eruption imposed	1.4		all*	all	all**	all	all	all	all	all	year 10
initialization alternatives	experiments to explore impact of different initialization procedures	1.5		all*	all	all**	all	all	all	all	all	year 10
chemistry-focused runs	near-term runs with enhanced chemistry/aerosol models	1.6										

day		6hrLev	6hrPlev	3hr
subset of fields saved for selected expts.	other			lon x lat
	all	for expt. initialized in late 1980, years late 1980-1990; for expt. initialized in late 2005, years late 2005-2015	all	all
	all	for expt. initialized in late 1980, years 1991-2010; for expt. initialized in late 2005, years 2016-2035	all	all
	all		all	all
	all		all	all
	all		all	all
all	all	all	all	all
	all			30
	all			30
	all		all	all
	all		all	all
	all		all	all

experiments focusing on the "longer-term"

Experiment	Description	Expt. #	Oclim	Oyr	Amon	Omon		Lmon	Limon	Oimon	aero	
						lon x lat x olev	other				lon x lat	lon x lat x alev
pre-industrial control	coupled atmosphere/ocean control run	3.1		all*	all	all**	all	all	all	all	all	years corresponding to years 1850, 1870, 1890, . . . , 1950, 1960, 1970, . . . , 2000 of the historical run and years 2010, 2020, 2040, 2060, 2080, & 2100 of the RCP run
historical	simulation of recent past (1850-2005)	3.2	1986-2005 monthly climatology	all*	all	all**	all	all	all	all	all	years 1850, 1870, 1890, . . . , 1950, 1960, 1970, . . . , 2000
AMIP	AMIP (1979-2008)	3.3			all			all	all	all	all	1980, 1990, 2000, & possibly 2010
historical	increase ensemble size of expt. 3.2	3.2-E		all*	all	all**	all	all	all	all	all	years 1850, 1870, 1890, . . . , 1950, 1960, 1970, . . . , 2000
AMIP	increase ensemble size of expt. 3.3	3.3-E			all			all	all	all	all	1980, 1990, 2000, & possibly 2010
mid-Holocene	consistent with PMIP, impose Mid-Holocene conditions	3.4		all*	all	all**	all	all	all	all	all	
last glacial maximum	consistent with PMIP, impose last glacial maximum conditions	3.5		all*	all	all**	all	all	all	all	all	
last millennium	consistent with PMIP, impose forcing for 850-1850	3.6		all*	all	all**	all	all	all	all	all	
RCP4.5	future projection (2006-2100) forced by RCP4.5	4.1		all*	all	all**	all	all	all	all	all	2010, 2020, 2040, 2060, 2080, & 2100
RCP8.5	future projection (2006-2100) forced by RCP8.5	4.2		all*	all	all**	all	all	all	all	all	2010, 2020, 2040, 2060, 2080, & 2100
RCP2.6	future projection (2006-2100) forced by RCP2.6	4.3		all*	all	all**	all	all	all	all	all	2010, 2020, 2040, 2060, 2080, & 2100
RCP6	future projection (2006-2100) forced by RCP6	4.4		all*	all	all**	all	all	all	all	all	2010, 2020, 2040, 2060, 2080, & 2100
RCP4.5	extension of expt. 4.1 through 2300	4.1-L		all*	all	all**	all	all	all	all	all	2010, 2020, 2040, 2060, 2080, & 2100
RCP8.5	extension of expt. 4.2 through 2300	4.2-L		all*	all	all**	all	all	all	all	all	2010, 2020, 2040, 2060, 2080, & 2100
RCP2.6	extension of expt. 4.3 through 2300	4.3-L		all*	all	all**	all	all	all	all	all	2010, 2020, 2040, 2060, 2080, & 2100

day		6hrLev	6hrPlev	3hr
subset of fields saved for selected expts.	other			
20 years corresponding to years 1986-2005 of historical run	all		30	30
1950-2005	all	1950-2005	1950-2005	1960-2005
all	all	all	all	all
	all		1950-2005	1960-2005
	all		all	all
	all		last 30 years	
	all		last 30 years	
	all			
all	all	all	all	2026-2045, 2081-2100
all	all	all	all	2026-2045, 2081-2100
all	all			2026-2045, 2081-2100
all	all			2026-2045, 2081-2100
2181-2200, 2281-2300	all			2181-2200, 2281-2300
2181-2200, 2281-2300	all			2181-2200, 2281-2300
2181-2200, 2281-2300	all			2181-2200, 2281-2300

ESM pre-industrial control	as in expt. 3.1, but atmospheric CO2 determined by model	5.1		all*	all	all**	all	all	all	all	all	years corresponding to years 1850, 1870, 1890, . . . , 1950, 1960, 1970, . . . , 2000 of the historical run and years 2010, 2020, 2040, 2060, 2080, & 2100 of the RCP run
Emission-driven historical	as in expt. 3.2, but with atmospheric CO2 determined by model	5.2		all*	all	all**	all	all	all	all	all	years 1850, 1870, 1890, . . . , 1950, 1960, 1970, . . . , 2000
emission-driven RCP8.5	as in expt. 4.2, but with atmospheric CO2 determined by model	5.3		all*	all	all**	all	all	all	all	all	2010, 2020, 2040, 2060, 2080, & 2100
ESM fixed climate 1	radiation code "sees" control CO2, but carbon cycle sees 1%/yr rise	5.4-1		all*	all	all**	all	all	all	all	all	
ESM fixed climate 2	radiation code "sees" control CO2, but carbon cycle sees historical followed by RCP4.5 rise in CO2	5.4-2		all*	all	all**	all	all	all	all	all	
ESM feedback 1	carbon cycle "sees" control CO2, but radiatation sees 1%/yr rise	5.5-1		all*	all	all**	all	all	all	all	all	
ESM feedback 2	carbon cycle "sees" control CO2, but radiatation sees historical followed by RCP4.5 rise in CO2	5.5-2		all*	all	all**	all	all	all	all	all	
1 percent per year CO2	imposed 1%/yr increase in CO2 to quadrupling	6.1		all*	all	all**	all	all	all	all		
control SST climatology	An atmosphere-only run driven by prescribed climatological SST and sea ice.	6.2a			all			all	all	all	all	
CO2 forcing	as in expt. 6.2a, but with 4XCO2 imposed	6.2b			all			all	all	all		
abrupt 4XCO2	impose an instantaneous quadrupling of CO2, then hold fixed	6.3			all	all**	all	all	all	all		
abrupt 4XCO2	generate an ensemble of runs like expt. 6.3, initialized in different months, and terminated after 5 years	6.3-E			all	all**	all	all	all	all		
anthropogenic aerosol forcing	as in expt. 6.2a, but with anthropogenic aerosols from year 2000 of expt. 3.2	6.4a			all			all	all	all	all	
sulfate aerosol forcing	as in expt. 6.2a, but with sulfate aerosols from year 2000 of expt. 3.2	6.4b			all			all	all	all	all	
Cloud response to imposed 4xCO2	consistent with CFMIP, impose AMIP (1979-2008) conditions (expt. 3.3) but with 4xCO2	6.5			all			all	all	all		
Cloud response to an imposed change in SST pattern	consistent with CFMIP, add a patterned SST perturbation to AMIP SSTs of expt. 3.3.	6.6			all			all	all	all		
aqua planet: control run	consistent with CFMIP, impose zonally uniform SSTs on a planet without continents	6.7a			all			all	all	all		
aqua planet: cloud response to imposed 4xCO2	Consistent with CFMIP requirements, impose 4xCO_2 on the zonally uniform SSTs of expt. 6.7a	6.7b			all			all	all	all		
Aqua-planet: cloud response to an imposed uniform change in SST.	Consistent with CFMIP requirements, add a uniform +4K to the zonally uniform SSTs of expt. 6.7a (which is the control for this run).	6.7c			all			all	all	all		

20 years corresponding to years 1986-2005 of historical run	all			
1950-2005	all			1960-2005
all	all			2026-2045, 2081-2100
	all			
	all			
	all			
	all			
	all			30
	all			all
	all			all
	all			first 5 and last 30
	all			all
	all			all
	all			all
	all			
	all			
	all			
	all			
	all			

Cloud response to an imposed uniform change in SST	Consistent with CFMIP requirements, add a uniform +4 K SST to the AMIP SSTs of expt. 3.3 (which is the "control" for this run).	6.8			all			all	all	all		
natural-only	historical simulation but with natural forcing only	7.1		all*	all	all**	all	all	all	all	all	
GHG-only	historical simulation but with greenhouse gas forcing only	7.2		all*	all	all**	all	all	all	all		
other-only	historical simulation but with other individual forcing agents	7.3		all*	all	all**	all	all	all	all	all	
natural-only	increase ensemble size of expt. 7.1	7.1-E		all*	all	all**	all	all	all	all	all	
GHG-only	increase ensemble size of expt. 7.2	7.2-E		all*	all	all**	all	all	all	all		
other-only	increase ensemble size of expt. 7.3	7.3-E		all*	all	all**	all	all	all	all	all	

atmosphere-only experiments

Experiment	Description	Expt. #	Oclim	Oyr	Amon	Omon: lon x lat x olev	Omon: other	Lmon	Limon	Oimon	aero: lon x lat	aero: lon x lat x alev
AMIP	AMIP (1979-2008)	3.3			all			all	all	all	all	years 1980, 1990, 2000, & possibly 2010
2030 time-slice	conditions for 2026-2035 imposed	2.1			all			all	all	all	all	
AMIP	increase ensemble size of expt. 3.3	3.3-E			all			all	all	all	all	years 1980, 1990, 2000, & possibly 2010
2030 time-slice	increase ensemble size of expt. 2.1	2.1-E			all			all	all	all	all	
Cloud response to imposed 4xCO2	consistent with CFMIP, impose AMIP (1979-2008) conditions (expt. 3.3) but with 4xCO2	6.5			all			all	all	all		
Cloud response to an imposed change in SST pattern	consistent with CFMIP, add a patterned SST perturbation to AMIP SSTs of expt. 3.3.	6.6			all			all	all	all		
aqua planet: control run	consistent with CFMIP, impose zonally uniform SSTs on a planet without continents	6.7a			all			all	all	all		
aqua planet: cloud response to imposed 4xCO2	Consistent with CFMIP requirements, impose $4xCO_2$ on the zonally uniform SSTs of expt. 6.7a	6.7b			all			all	all	all		
Aqua-planet: cloud response to an imposed uniform change in SST.	Consistent with CFMIP requirements, add a uniform +4K to the zonally uniform SSTs of expt. 6.7a (which is the control for this run).	6.7c			all			all	all	all		
Cloud response to an imposed uniform change in SST	Consistent with CFMIP requirements, add a uniform +4 K SST to the AMIP SSTs of expt. 3.3 (which is the "control" for this run).	6.8			all			all	all	all		

	all			
	all			
	all			
	all			
	all			
	all			
	all			

day		6hrLev	6hrPlev	3hr
subset of fields saved for selected expts.	other			
all	all	all	all	all
	all			
	all			
	all			
	all			
	all			
	all			
	all			
	all			
	all			

If a cell is shaded yellow/tan, none of the variables will be part of the subset of model output that will be replicated at several locations.

Reqeusted periods for saving special CFMIP model output

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

* The years specified for the pre-industrial experiment are relative to the point in the control where expts. 6.1 and 6.3 were initiated. 6.1 and 6.3 should be initiated from the same point in the control run, so that the control run sampled output can be compared directly to each of these runs, and any drift in the control can be accounted for.

		appearing in cfOff		appearing in cfDay				appearing in cf3hr				appearing in cfSites	
CFMIP monthly inline (A1d,f,g)		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 time-step station data (A3)	
1*	20*			1*	20*								
121*	140*			121*	140*	121*	140*						
1979	2005			1979	2005								
1979	2008	2008	2008	1979	2008	1979	2008	2008	2008	2008	2008	1979	2008
121	140			121	140								
121	140			121	140								
121	140			121	140	121	140						
1	30			1	30								
1	30			1	30								
1	20			1	20								
121	140			121	140	121	140						
1	5			1	5								
1	30			1	30								
1	30			1	30								
1979	2008	2008	2008	1979	2008	1979	2008	2008	2008			1979	2008
1979	2008	2008	2008	1979	2008	1979	2008	2008	2008			1979	2008
1	5			1	5	1	5					1	5
1	5			1	5	1	5					1	5
1	5			1	5	1	5					1	5
1979	2008	2008	2008	1979	2008	1979	2008	2008	2008			1979	2008