CMIP6 Model Documentation

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Documentation Contents

1 Key Properties

Key properties of the model

1.1 Key Properties

Key properties of the model

1.1.1 Model Overview

Top level overview of coupled model

Spec. ID: cmip6.toplevel.key_properties.model_overview

Is Required ? TRUE

Enter TEXT value:

1.1.2 Model Name

Name of coupled model.

Spec. ID: cmip6.toplevel.key_properties.model_name

Is Required ? TRUE

Enter TEXT value:

1.2 Flux Correction

Flux correction properties of the model

1.2.1 Details

Describe if/how flux corrections are applied in the model

Spec. ID: cmip6.toplevel.key_properties.flux_correction.details

Is Required ? TRUE

Enter TEXT value:

1.3 Genealogy

Genealogy and history of the model

1.3.1 Year Released

Year the model was released

Spec. ID: cmip6.toplevel.key_properties.genealogy.year_released

Is Required ? TRUE

Enter TEXT value:

1.3.2 CMIP3 Parent

CMIP3 parent if any

Spec. ID: cmip6.toplevel.key_properties.genealogy.cmip3_parent

Is Required ? FALSE

Enter TEXT value:

1.3.3 CMIP5 Parent

CMIP5 parent if any

Spec. ID: cmip6.toplevel.key_properties.genealogy.cmip5_parent

Is Required ? FALSE

Enter TEXT value:

1.3.4 Previous Name

Previously known as

Spec. ID: cmip6.toplevel.key_properties.genealogy.previous_name

Is Required ? FALSE

Enter TEXT value:

1.4 Software Properties

Software properties of model

1.4.1 Repository

Location of code for this component.

Spec. ID: cmip6.toplevel.key_properties.software_properties.repository

Is Required ? FALSE

Enter TEXT value:

1.4.2 Code Version

Code version identifier.

Spec. ID: cmip6.toplevel.key_properties.software_properties.code_version

Is Required ? FALSE

Enter TEXT value:

1.4.3 Code Languages

Code language(s).

Spec. ID: cmip6.toplevel.key_properties.software_properties.code_languages

Is Required ? FALSE

Enter TEXT value(s):

1.4.4 Components Structure

Describe how model realms are structured into independent software components (coupled via a coupler) and internal software components.

Spec. ID: cmip6.toplevel.key_properties.software_properties.components_structure

Is Required ? FALSE

Enter TEXT value:

1.4.5 Coupler

Overarching coupling framework for model.

Spec. ID: cmip6.toplevel.key_properties.software_properties.coupler

Is Required ? FALSE

Select value:

- ☐ OASIS - The OASIS coupler - prior to OASIS-MCT
- ☐ OASIS3-MCT - The MCT variant of the OASIS coupler
- ☐ ESMF - Vanilla Earth System Modelling Framework
- ☐ NUOPC - National Unified Operational Prediction Capability variant of ESMF
- ☐ Bespoke - Customised coupler developed for this model
- ☐ Unknown - It is not known what/if-a coupler is used
- ☐ None - No coupler is used
- ☐ Other - please specify:

1.5 Coupling

1.5.1 Overview

Overview of coupling in the model

Spec. ID: cmip6.toplevel.key_properties.coupling.overview

Is Required ? TRUE

Enter TEXT value:

1.5.2 Atmosphere Double Flux

Is the atmosphere passing a double flux to the ocean and sea ice (as opposed to a single one)xxx?

Spec. ID: cmip6.toplevel.key_properties.coupling.atmosphere_double_flux

Is Required ? TRUE

Select value:

☐ True ☐ False

1.5.3 Atmosphere Fluxes Calculation Grid

Where are the air-sea fluxes calculated

Spec. ID: cmip6.toplevel.key_properties.coupling.atmosphere_fluxes_calculation_grid

Is Required ? FALSE

Select value:

☐ Atmosphere grid

☐ Ocean grid

☐ Specific coupler grid

☐ Other - please specify:

1.5.4 Atmosphere Relative Winds

Are relative or absolute winds used to compute the fluxxxx? I.e. do ocean surface currents enter the wind stress calculationxxx?

Spec. ID: cmip6.toplevel.key_properties.coupling.atmosphere_relative_winds

Is Required ? TRUE

Select value:

☐ True ☐ False

1.6 Tuning Applied

Tuning methodology for model

1.6.1 Description

General overview description of tuning: explain and motivate the main targets and metrics/diagnostics retained. Document the relative weight given to climate performance metrics/diagnostics versus process oriented metrics/diagnostics, and on the possible conflicts with parameterization level tuning. In particular describe any struggle with a parameter value that required pushing it to its limits to solve a particular model deficiency.

Spec. ID: cmip6.toplevel.key_properties.tuning_applied.description

Is Required ? TRUE

Enter TEXT value:

1.6.2 Global Mean Metrics Used

List set of metrics/diagnostics of the global mean state used in tuning model

Spec. ID: cmip6.toplevel.key_properties.tuning_applied.global_mean_metrics_used

Is Required ? FALSE

Enter TEXT value(s):

1.6.3 Regional Metrics Used

List of regional metrics/diagnostics of mean state (e.g THC, AABW, regional means etc) used in tuning model/component

Spec. ID: cmip6.toplevel.key_properties.tuning_applied.regional_metrics_used

Is Required ? FALSE

Enter TEXT value(s):

1.6.4 Trend Metrics Used

List observed trend metrics/diagnostics used in tuning model/component (such as 20th century)

Spec. ID: cmip6.toplevel.key_properties.tuning_applied.trend_metrics_used

Is Required ? FALSE

Enter TEXT value(s):

1.6.5 Energy Balance

Describe how energy balance was obtained in the full system: in the various components independently or at the components coupling stagexxx?

Spec. ID: cmip6.toplevel.key_properties.tuning_applied.energy_balance

Is Required ? TRUE

Enter TEXT value:

1.6.6 Fresh Water Balance

Describe how fresh_water balance was obtained in the full system: in the various components independently or at the components coupling stagexxx?

Spec. ID: cmip6.toplevel.key_properties.tuning_applied.fresh_water_balance

Is Required ? TRUE

Enter TEXT value:

1.7 Heat

Global heat convervation properties of the model

1.7.1 Global

Describe if/how heat is conserved globally

Spec. ID: cmip6.toplevel.key_properties.conservation.heat.global

Is Required ? TRUE

Enter TEXT value:

1.7.2 Atmos Ocean Interface

Describe if/how heat is conserved at the atmosphere/ocean coupling interface

Spec. ID: cmip6.toplevel.key_properties.conservation.heat.atmos_ocean_interface

Is Required ? FALSE

Enter TEXT value:

1.7.3 Atmos Land Interface

Describe if/how heat is conserved at the atmosphere/land coupling interface

Spec. ID: cmip6.toplevel.key_properties.conservation.heat.atmos_land_interface

Is Required ? TRUE

Enter TEXT value:

1.7.4 Atmos Sea-ice Interface

Describe if/how heat is conserved at the atmosphere/sea-ice coupling interface

Spec. ID: cmip6.toplevel.key_properties.conservation.heat.atmos_sea-ice_interface

Is Required ? FALSE

Enter TEXT value:

1.7.5 Ocean Seaice Interface

Describe if/how heat is conserved at the ocean/sea-ice coupling interface

Spec. ID: cmip6.toplevel.key_properties.conservation.heat.ocean_seaice_interface

Is Required ? FALSE

Enter TEXT value:

1.7.6 Land Ocean Interface

Describe if/how heat is conserved at the land/ocean coupling interface

Spec. ID: cmip6.toplevel.key_properties.conservation.heat.land_ocean_interface

Is Required ? FALSE

Enter TEXT value:

1.8 Fresh Water

Global fresh water convervation properties of the model

1.8.1 Global

Describe if/how fresh_water is conserved globally

Spec. ID: cmip6.toplevel.key_properties.conservation.fresh_water.global

Is Required ? TRUE

Enter TEXT value:

1.8.2 Atmos Ocean Interface

Describe if/how fresh_water is conserved at the atmosphere/ocean coupling interface

Spec. ID: cmip6.toplevel.key_properties.conservation.fresh_water.atmos_ocean_interface

Is Required ? FALSE

Enter TEXT value:

1.8.3 Atmos Land Interface

Describe if/how fresh water is conserved at the atmosphere/land coupling interface

Spec. ID: cmip6.toplevel.key_properties.conservation.fresh_water.atmos_land_interface

Is Required ? TRUE

Enter TEXT value:

1.8.4 Atmos Sea-ice Interface

Describe if/how fresh water is conserved at the atmosphere/sea-ice coupling interface

Spec. ID: cmip6.toplevel.key_properties.conservation.fresh_water.atmos_sea-ice_interface

Is Required ? FALSE

Enter TEXT value:

1.8.5 Ocean Seaice Interface

Describe if/how fresh water is conserved at the ocean/sea-ice coupling interface

Spec. ID: cmip6.toplevel.key_properties.conservation.fresh_water.ocean_seaice_interface

Is Required ? FALSE

Enter TEXT value:

1.8.6 Runoff

Describe how runoff is distributed and conserved

Spec. ID: cmip6.toplevel.key_properties.conservation.fresh_water.runoff

Is Required ? FALSE

Enter TEXT value:

1.8.7 Iceberg Calving

Describe if/how iceberg calving is modeled and conserved

Spec. ID: cmip6.toplevel.key_properties.conservation.fresh_water.iceberg_calving

Is Required ? FALSE

Enter TEXT value:

1.8.8 Endoreic Basins

Describe if/how endoreic basins (no ocean access) are treated

Spec. ID: cmip6.toplevel.key_properties.conservation.fresh_water.endoreic_basins

Is Required ? FALSE

Enter TEXT value:

1.8.9 Snow Accumulation

Describe how snow accumulation over land and over sea-ice is treated

Spec. ID: cmip6.toplevel.key_properties.conservation.fresh_water.snow_accumulation

Is Required ? FALSE

Enter TEXT value:

1.9 Salt

Global salt convervation properties of the model

1.9.1 Ocean Seaice Interface

Describe if/how salt is conserved at the ocean/sea-ice coupling interface

Spec. ID: cmip6.toplevel.key_properties.conservation.salt.ocean_seaice_interface

Is Required ? FALSE

Enter TEXT value:

1.10 Momentum

Global momentum convervation properties of the model

1.10.1 Details

Describe if/how momentum is conserved in the model

Spec. ID: cmip6.toplevel.key_properties.conservation.momentum.details

Is Required ? FALSE

Enter TEXT value:

2 Radiative Forcings

Radiative forcings of the model for historical and scenario (aka Table 12.1 IPCC AR5)

2.1 Radiative Forcings

Radiative forcings of the model for historical and scenario (aka Table 12.1 IPCC AR5)

2.1.1 Overview

Overview of radiative forcings (GHG and aerosols) implementation in model

Spec. ID: cmip6.toplevel.radiative_forcings.overview

Is Required ? TRUE

Enter TEXT value:

2.2 CO2

Carbon dioxide forcing

2.2.1 Provision

How this forcing agent is provided (e.g. via concentrations, emission precursors, prognostically derived, etc.)

Spec. ID: cmip6.toplevel.radiative_forcings.greenhouse_gases.co2.provision

Is Required ? TRUE

Select value(s):

☐ N/A - Not applicable - forcing agent is not included

☐ M - Emissions and concentrations determined by the model state rather than externally prescribed

☐ Y - Prescribed concentrations, distributions or time series data

☐ E - Concentrations calculated interactively driven by prescribed emissions or precursor emissions

☐ ES - Surface emissions (and 3-D concentrations away from the surface) derived via the model from the prescribed surface concentration

☐ C - Fixed prescribed climatology of concentrations with no year-to-year variability

☐ Other - please specify:

2.2.2 Additional Information

Additional information relating to the provision and implementation of this forcing agent (e.g. citations, use of non-standard datasets, explaining how multiple provisions are used, etc.).

Spec. ID: cmip6.toplevel.radiative_forcings.greenhouse_gases.co2.additional_information

Is Required ? FALSE

Enter TEXT value:

2.3 CH4

Methane forcing

2.3.1 Provision

How this forcing agent is provided (e.g. via concentrations, emission precursors, prognostically derived, etc.)

Spec. ID: cmip6.toplevel.radiative_forcings.greenhouse_gases.ch4.provision

Is Required ? TRUE

Select value(s):

☐ N/A - Not applicable - forcing agent is not included

☐ M - Emissions and concentrations determined by the model state rather than externally prescribed

☐ Y - Prescribed concentrations, distributions or time series data

☐ E - Concentrations calculated interactively driven by prescribed emissions or precursor emissions

☐ ES - Surface emissions (and 3-D concentrations away from the surface) derived via the model from the prescribed surface concentration

☐ C - Fixed prescribed climatology of concentrations with no year-to-year variability

☐ Other - please specify:

2.3.2 Additional Information

Additional information relating to the provision and implementation of this forcing agent (e.g. citations, use of non-standard datasets, explaining how multiple provisions are used, etc.).

Spec. ID: cmip6.toplevel.radiative_forcings.greenhouse_gases.ch4.additional_information

Is Required ? FALSE

Enter TEXT value:

2.4 N2O

Nitrous oxide forcing

2.4.1 Provision

How this forcing agent is provided (e.g. via concentrations, emission precursors, prognostically derived, etc.)

Spec. ID: cmip6.toplevel.radiative_forcings.greenhouse_gases.n2o.provision

Is Required ? TRUE

Select value(s):

☐ N/A - Not applicable - forcing agent is not included

☐ M - Emissions and concentrations determined by the model state rather than externally prescribed

☐ Y - Prescribed concentrations, distributions or time series data

☐ E - Concentrations calculated interactively driven by prescribed emissions or precursor emissions

☐ ES - Surface emissions (and 3-D concentrations away from the surface) derived via the model from the prescribed surface concentration

☐ C - Fixed prescribed climatology of concentrations with no year-to-year variability

☐ Other - please specify:

2.4.2 Additional Information

Additional information relating to the provision and implementation of this forcing agent (e.g. citations, use of non-standard datasets, explaining how multiple provisions are used, etc.).

Spec. ID: cmip6.toplevel.radiative_forcings.greenhouse_gases.n2o.additional_information

Is Required ? FALSE

Enter TEXT value:

2.5 Tropospheric O3

Troposheric ozone forcing

2.5.1 Provision

How this forcing agent is provided (e.g. via concentrations, emission precursors, prognostically derived, etc.)

Spec. ID: cmip6.toplevel.radiative_forcings.greenhouse_gases.tropospheric_o3.provision

Is Required ? TRUE

Select value(s):

☐ N/A - Not applicable - forcing agent is not included

☐ M - Emissions and concentrations determined by the model state rather than externally prescribed

☐ Y - Prescribed concentrations, distributions or time series data

☐ E - Concentrations calculated interactively driven by prescribed emissions or precursor emissions

☐ ES - Surface emissions (and 3-D concentrations away from the surface) derived via the model from the prescribed surface concentration

☐ C - Fixed prescribed climatology of concentrations with no year-to-year variability

☐ Other - please specify:

2.5.2 Additional Information

Additional information relating to the provision and implementation of this forcing agent (e.g. citations, use of non-standard datasets, explaining how multiple provisions are used, etc.).

Spec. ID: cmip6.toplevel.radiative_forcings.greenhouse_gases.tropospheric_o3.additional_information

Is Required ? FALSE

Enter TEXT value:

2.6 Stratospheric O3

Stratospheric ozone forcing

2.6.1 Provision

How this forcing agent is provided (e.g. via concentrations, emission precursors, prognostically derived, etc.)

Spec. ID: cmip6.toplevel.radiative_forcings.greenhouse_gases.stratospheric_o3.provision

Is Required ? TRUE

Select value(s):

☐ N/A - Not applicable - forcing agent is not included

☐ M - Emissions and concentrations determined by the model state rather than externally prescribed

☐ Y - Prescribed concentrations, distributions or time series data

☐ E - Concentrations calculated interactively driven by prescribed emissions or precursor emissions

☐ ES - Surface emissions (and 3-D concentrations away from the surface) derived via the model from the prescribed surface concentration

☐ C - Fixed prescribed climatology of concentrations with no year-to-year variability

☐ Other - please specify:

2.6.2 Additional Information

Additional information relating to the provision and implementation of this forcing agent (e.g. citations, use of non-standard datasets, explaining how multiple provisions are used, etc.).

Spec. ID: cmip6.toplevel.radiative_forcings.greenhouse_gases.stratospheric_o3.additional_information

Is Required ? FALSE

Enter TEXT value:

2.7 CFC

Ozone-depleting and non-ozone-depleting fluorinated gases forcing

2.7.1 Provision

How this forcing agent is provided (e.g. via concentrations, emission precursors, prognostically derived, etc.)

Spec. ID: cmip6.toplevel.radiative_forcings.greenhouse_gases.cfc.provision

Is Required ? TRUE

Select value(s):

☐ N/A - Not applicable - forcing agent is not included

☐ M - Emissions and concentrations determined by the model state rather than externally prescribed

☐ Y - Prescribed concentrations, distributions or time series data

☐ E - Concentrations calculated interactively driven by prescribed emissions or precursor emissions

☐ ES - Surface emissions (and 3-D concentrations away from the surface) derived via the model from the prescribed surface concentration

☐ C - Fixed prescribed climatology of concentrations with no year-to-year variability

☐ Other - please specify:

2.7.2 Equivalence Concentration

Details of any equivalence concentrations used

Spec. ID: cmip6.toplevel.radiative_forcings.greenhouse_gases.cfc.equivalence_concentration

Is Required ? TRUE

Select value:

☐ N/A - Not applicabale (CFCs not included or emissions and concentrations determined by the model state)

☐ Option 1 - CFCs, including CFC-12, are provided as actual concentrations

☐ Option 2 - CFC-12 is provided as actual concentrations and any other gases are provided as an equivalence concentration of CFC-11

☐ Option 3 - Ozone depleting gases, including CFC-12, are provided as an equivalence concentration of CFC-12 and all other fluorinated gases are provided as an equivalence concentration of HFC-134a

☐ Other - please specify:

2.7.3 Additional Information

Additional information relating to the provision and implementation of this forcing agent (e.g. citations, use of non-standard datasets, explaining how multiple provisions are used, etc.).

Spec. ID: cmip6.toplevel.radiative_forcings.greenhouse_gases.cfc.additional_information

Is Required ? FALSE

Enter TEXT value:

2.8 SO4

SO4 aerosol forcing

2.8.1 Provision

How this forcing agent is provided (e.g. via concentrations, emission precursors, prognostically derived, etc.)

Spec. ID: cmip6.toplevel.radiative_forcings.aerosols.so4.provision

Is Required ? TRUE

Select value(s):

☐ N/A - Not applicable - forcing agent is not included

☐ M - Emissions and concentrations determined by the model state rather than externally prescribed

☐ Y - Prescribed concentrations, distributions or time series data

☐ E - Concentrations calculated interactively driven by prescribed emissions or precursor emissions

☐ ES - Surface emissions (and 3-D concentrations away from the surface) derived via the model from the prescribed surface concentration

☐ C - Fixed prescribed climatology of concentrations with no year-to-year variability

☐ Other - please specify:

2.8.2 Additional Information

Additional information relating to the provision and implementation of this forcing agent (e.g. citations, use of non-standard datasets, explaining how multiple provisions are used, etc.).

Spec. ID: cmip6.toplevel.radiative_forcings.aerosols.so4.additional_information

Is Required ? FALSE

Enter TEXT value:

2.9 Black Carbon

Black carbon aerosol forcing

2.9.1 Provision

How this forcing agent is provided (e.g. via concentrations, emission precursors, prognostically derived, etc.)

Spec. ID: cmip6.toplevel.radiative_forcings.aerosols.black_carbon.provision

Is Required ? TRUE

Select value(s):

☐ N/A - Not applicable - forcing agent is not included

☐ M - Emissions and concentrations determined by the model state rather than externally prescribed

☐ Y - Prescribed concentrations, distributions or time series data

☐ E - Concentrations calculated interactively driven by prescribed emissions or precursor emissions

☐ ES - Surface emissions (and 3-D concentrations away from the surface) derived via the model from the prescribed surface concentration

☐ C - Fixed prescribed climatology of concentrations with no year-to-year variability

☐ Other - please specify:

2.9.2 Additional Information

Additional information relating to the provision and implementation of this forcing agent (e.g. citations, use of non-standard datasets, explaining how multiple provisions are used, etc.).

Spec. ID: cmip6.toplevel.radiative_forcings.aerosols.black_carbon.additional_information

Is Required ? FALSE

Enter TEXT value:

2.10 Organic Carbon

Organic carbon aerosol forcing

2.10.1 Provision

How this forcing agent is provided (e.g. via concentrations, emission precursors, prognostically derived, etc.)

Spec. ID: cmip6.toplevel.radiative_forcings.aerosols.organic_carbon.provision

Is Required ? TRUE

Select value(s):

☐ N/A - Not applicable - forcing agent is not included

☐ M - Emissions and concentrations determined by the model state rather than externally prescribed

☐ Y - Prescribed concentrations, distributions or time series data

☐ E - Concentrations calculated interactively driven by prescribed emissions or precursor emissions

☐ ES - Surface emissions (and 3-D concentrations away from the surface) derived via the model from the prescribed surface concentration

☐ C - Fixed prescribed climatology of concentrations with no year-to-year variability

☐ Other - please specify:

2.10.2 Additional Information

Additional information relating to the provision and implementation of this forcing agent (e.g. citations, use of non-standard datasets, explaining how multiple provisions are used, etc.).

Spec. ID: cmip6.toplevel.radiative_forcings.aerosols.organic_carbon.additional_information

Is Required ? FALSE

Enter TEXT value:

2.11 Nitrate

Nitrate forcing

2.11.1 Provision

How this forcing agent is provided (e.g. via concentrations, emission precursors, prognostically derived, etc.)

Spec. ID: cmip6.toplevel.radiative_forcings.aerosols.nitrate.provision

Is Required ? TRUE

Select value(s):

☐ N/A - Not applicable - forcing agent is not included

☐ M - Emissions and concentrations determined by the model state rather than externally prescribed

☐ Y - Prescribed concentrations, distributions or time series data

☐ E - Concentrations calculated interactively driven by prescribed emissions or precursor emissions

☐ ES - Surface emissions (and 3-D concentrations away from the surface) derived via the model from the prescribed surface concentration

☐ C - Fixed prescribed climatology of concentrations with no year-to-year variability

☐ Other - please specify:

2.11.2 Additional Information

Additional information relating to the provision and implementation of this forcing agent (e.g. citations, use of non-standard datasets, explaining how multiple provisions are used, etc.).

Spec. ID: cmip6.toplevel.radiative_forcings.aerosols.nitrate.additional_information

Is Required ? FALSE

Enter TEXT value:

2.12 Cloud Albedo Effect

Cloud albedo effect forcing (RFaci)

2.12.1 Provision

How this forcing agent is provided (e.g. via concentrations, emission precursors, prognostically derived, etc.)

Spec. ID: cmip6.toplevel.radiative_forcings.aerosols.cloud_albedo_effect.provision

Is Required ? TRUE

Select value(s):

☐ N/A - Not applicable - forcing agent is not included

☐ M - Emissions and concentrations determined by the model state rather than externally prescribed

☐ Y - Prescribed concentrations, distributions or time series data

☐ E - Concentrations calculated interactively driven by prescribed emissions or precursor emissions

☐ ES - Surface emissions (and 3-D concentrations away from the surface) derived via the model from the prescribed surface concentration

☐ C - Fixed prescribed climatology of concentrations with no year-to-year variability

☐ Other - please specify:

2.12.2 Aerosol Effect On Ice Clouds

Radiative effects of aerosols on ice clouds are representedxxx?

Spec. ID: cmip6.toplevel.radiative_forcings.aerosols.cloud_albedo_effect.aerosol_effect_on_ice_clouds

Is Required ? TRUE

Select value:

☐ True ☐ False

2.12.3 Additional Information

Additional information relating to the provision and implementation of this forcing agent (e.g. citations, use of non-standard datasets, explaining how multiple provisions are used, etc.).

Spec. ID: cmip6.toplevel.radiative_forcings.aerosols.cloud_albedo_effect.additional_information

Is Required ? FALSE

Enter TEXT value:

2.13 Cloud Lifetime Effect

Cloud lifetime effect forcing (ERFaci)

2.13.1 Provision

How this forcing agent is provided (e.g. via concentrations, emission precursors, prognostically derived, etc.)

Spec. ID: cmip6.toplevel.radiative_forcings.aerosols.cloud_lifetime_effect.provision

Is Required ? TRUE

Select value(s):

☐ N/A - Not applicable - forcing agent is not included

☐ M - Emissions and concentrations determined by the model state rather than externally prescribed

☐ Y - Prescribed concentrations, distributions or time series data

☐ E - Concentrations calculated interactively driven by prescribed emissions or precursor emissions

☐ ES - Surface emissions (and 3-D concentrations away from the surface) derived via the model from the prescribed surface concentration

☐ C - Fixed prescribed climatology of concentrations with no year-to-year variability

☐ Other - please specify:

2.13.2 Aerosol Effect On Ice Clouds

Radiative effects of aerosols on ice clouds are representedxxx?

Spec. ID: cmip6.toplevel.radiative_forcings.aerosols.cloud_lifetime_effect.aerosol_effect_on_ice_clouds

Is Required ? TRUE

Select value:

☐ True ☐ False

2.13.3 RFaci From Sulfate Only

Radiative forcing from aerosol cloud interactions from sulfate aerosol onlyxxx?

Spec. ID: cmip6.toplevel.radiative_forcings.aerosols.cloud_lifetime_effect.rfaci_from_sulfate_only

Is Required ? TRUE

Select value:

☐ True ☐ False

2.13.4 Additional Information

Additional information relating to the provision and implementation of this forcing agent (e.g. citations, use of non-standard datasets, explaining how multiple provisions are used, etc.).

Spec. ID: cmip6.toplevel.radiative_forcings.aerosols.cloud_lifetime_effect.additional_information

Is Required ? FALSE

Enter TEXT value:

2.14 Dust

Dust forcing

2.14.1 Provision

How this forcing agent is provided (e.g. via concentrations, emission precursors, prognostically derived, etc.)

Spec. ID: cmip6.toplevel.radiative_forcings.aerosols.dust.provision

Is Required ? TRUE

Select value(s):

☐ N/A - Not applicable - forcing agent is not included

☐ M - Emissions and concentrations determined by the model state rather than externally prescribed

☐ Y - Prescribed concentrations, distributions or time series data

☐ E - Concentrations calculated interactively driven by prescribed emissions or precursor emissions

☐ ES - Surface emissions (and 3-D concentrations away from the surface) derived via the model from the prescribed surface concentration

☐ C - Fixed prescribed climatology of concentrations with no year-to-year variability

☐ Other - please specify:

2.14.2 Additional Information

Additional information relating to the provision and implementation of this forcing agent (e.g. citations, use of non-standard datasets, explaining how multiple provisions are used, etc.).

Spec. ID: cmip6.toplevel.radiative_forcings.aerosols.dust.additional_information

Is Required ? FALSE

Enter TEXT value:

2.15 Tropospheric Volcanic

Tropospheric volcanic forcing

2.15.1 Provision

How this forcing agent is provided (e.g. via concentrations, emission precursors, prognostically derived, etc.)

Spec. ID: cmip6.toplevel.radiative_forcings.aerosols.tropospheric_volcanic.provision

Is Required ? TRUE

Select value(s):

☐ N/A - Not applicable - forcing agent is not included

☐ M - Emissions and concentrations determined by the model state rather than externally prescribed

☐ Y - Prescribed concentrations, distributions or time series data

☐ E - Concentrations calculated interactively driven by prescribed emissions or precursor emissions

☐ ES - Surface emissions (and 3-D concentrations away from the surface) derived via the model from the prescribed surface concentration

☐ C - Fixed prescribed climatology of concentrations with no year-to-year variability

☐ Other - please specify:

2.15.2 Historical Explosive Volcanic Aerosol Implementation

How explosive volcanic aerosol is implemented in historical simulations

Spec. ID: cmip6.toplevel.radiative_forcings.aerosols.tropospheric_volcanic.historical_explosive_volcanic_aerosol_implementation

Is Required ? TRUE

Select value:

☐ Type A - Explosive volcanic aerosol returns rapidly to zero (or near-zero) background.

☐ Type B - Explosive volcanic aerosol returns rapidly to constant (average volcano)

☐ Type C - Explosive volcanic aerosol returns slowly (over several decades) to constant (average volcano) background.

☐ Type D - Explosive volcanic aerosol set to zero

☐ Type E - Explosive volcanic aerosol set to constant (average volcano) background

☐ Other - please specify:

2.15.3 Future Explosive Volcanic Aerosol Implementation

How explosive volcanic aerosol is implemented in future simulations

Spec. ID: cmip6.toplevel.radiative_forcings.aerosols.tropospheric_volcanic.future_explosive_volcanic_aerosol_implementation

Is Required ? TRUE

Select value:

☐ Type A - Explosive volcanic aerosol returns rapidly to zero (or near-zero) background.

☐ Type B - Explosive volcanic aerosol returns rapidly to constant (average volcano)

☐ Type C - Explosive volcanic aerosol returns slowly (over several decades) to constant (average volcano) background.

☐ Type D - Explosive volcanic aerosol set to zero

☐ Type E - Explosive volcanic aerosol set to constant (average volcano) background

☐ Other - please specify:

2.15.4 Additional Information

Additional information relating to the provision and implementation of this forcing agent (e.g. citations, use of non-standard datasets, explaining how multiple provisions are used, etc.).

Spec. ID: cmip6.toplevel.radiative_forcings.aerosols.tropospheric_volcanic.additional_information

Is Required ? FALSE

Enter TEXT value:

2.16 Stratospheric Volcanic

Stratospheric volcanic forcing

2.16.1 Provision

How this forcing agent is provided (e.g. via concentrations, emission precursors, prognostically derived, etc.)

Spec. ID: cmip6.toplevel.radiative_forcings.aerosols.stratospheric_volcanic.provision

Is Required ? TRUE

Select value(s):

☐ N/A - Not applicable - forcing agent is not included

☐ M - Emissions and concentrations determined by the model state rather than externally prescribed

☐ Y - Prescribed concentrations, distributions or time series data

☐ E - Concentrations calculated interactively driven by prescribed emissions or precursor emissions

☐ ES - Surface emissions (and 3-D concentrations away from the surface) derived via the model from the prescribed surface concentration

☐ C - Fixed prescribed climatology of concentrations with no year-to-year variability

☐ Other - please specify:

2.16.2 Historical Explosive Volcanic Aerosol Implementation

How explosive volcanic aerosol is implemented in historical simulations

Spec. ID: cmip6.toplevel.radiative_forcings.aerosols.stratospheric_volcanic.historical_explosive_volcanic_aerosol_implementation

Is Required ? TRUE

Select value:

☐ Type A - Explosive volcanic aerosol returns rapidly to zero (or near-zero) background.

☐ Type B - Explosive volcanic aerosol returns rapidly to constant (average volcano)

☐ Type C - Explosive volcanic aerosol returns slowly (over several decades) to constant (average volcano) background.

☐ Type D - Explosive volcanic aerosol set to zero

☐ Type E - Explosive volcanic aerosol set to constant (average volcano) background

☐ Other - please specify:

2.16.3 Future Explosive Volcanic Aerosol Implementation

How explosive volcanic aerosol is implemented in future simulations

Spec. ID: cmip6.toplevel.radiative_forcings.aerosols.stratospheric_volcanic.future_explosive_volcanic_aerosol_implementation

Is Required ? TRUE

Select value:

☐ Type A - Explosive volcanic aerosol returns rapidly to zero (or near-zero) background.

☐ Type B - Explosive volcanic aerosol returns rapidly to constant (average volcano)

☐ Type C - Explosive volcanic aerosol returns slowly (over several decades) to constant (average volcano) background.

☐ Type D - Explosive volcanic aerosol set to zero

☐ Type E - Explosive volcanic aerosol set to constant (average volcano) background

☐ Other - please specify:

2.16.4 Additional Information

Additional information relating to the provision and implementation of this forcing agent (e.g. citations, use of non-standard datasets, explaining how multiple provisions are used, etc.).

Spec. ID: cmip6.toplevel.radiative_forcings.aerosols.stratospheric_volcanic.additional_information

Is Required ? FALSE

Enter TEXT value:

2.17 Sea Salt

Sea salt forcing

2.17.1 Provision

How this forcing agent is provided (e.g. via concentrations, emission precursors, prognostically derived, etc.)

Spec. ID: cmip6.toplevel.radiative_forcings.aerosols.sea_salt.provision

Is Required ? TRUE

Select value(s):

☐ N/A - Not applicable - forcing agent is not included

☐ M - Emissions and concentrations determined by the model state rather than externally prescribed

☐ Y - Prescribed concentrations, distributions or time series data

☐ E - Concentrations calculated interactively driven by prescribed emissions or precursor emissions

☐ ES - Surface emissions (and 3-D concentrations away from the surface) derived via the model from the prescribed surface concentration

☐ C - Fixed prescribed climatology of concentrations with no year-to-year variability

☐ Other - please specify:

2.17.2 Additional Information

Additional information relating to the provision and implementation of this forcing agent (e.g. citations, use of non-standard datasets, explaining how multiple provisions are used, etc.).

Spec. ID: cmip6.toplevel.radiative_forcings.aerosols.sea_salt.additional_information

Is Required ? FALSE

Enter TEXT value:

2.18 Land Use

Land use forcing

2.18.1 Provision

How this forcing agent is provided (e.g. via concentrations, emission precursors, prognostically derived, etc.)

Spec. ID: cmip6.toplevel.radiative_forcings.other.land_use.provision

Is Required ? TRUE

Select value(s):

☐ N/A - Not applicable - forcing agent is not included

☐ M - Emissions and concentrations determined by the model state rather than externally prescribed

☐ Y - Prescribed concentrations, distributions or time series data

☐ E - Concentrations calculated interactively driven by prescribed emissions or precursor emissions

☐ ES - Surface emissions (and 3-D concentrations away from the surface) derived via the model from the prescribed surface concentration

☐ C - Fixed prescribed climatology of concentrations with no year-to-year variability

☐ Other - please specify:

2.18.2 Crop Change Only

Land use change represented via crop change onlyxxx?

Spec. ID: cmip6.toplevel.radiative_forcings.other.land_use.crop_change_only

Is Required ? TRUE

Select value:

☐ True ☐ False

2.18.3 Additional Information

Additional information relating to the provision and implementation of this forcing agent (e.g. citations, use of non-standard datasets, explaining how multiple provisions are used, etc.).

Spec. ID: cmip6.toplevel.radiative_forcings.other.land_use.additional_information

Is Required ? FALSE

Enter TEXT value:

2.19 Solar

Solar forcing

2.19.1 Provision

How solar forcing is provided

Spec. ID: cmip6.toplevel.radiative_forcings.other.solar.provision

Is Required ? TRUE

Select value(s):

- ☐ N/A - Not applicable - solar forcing is not included
- ☐ Irradiance - Solar irradiance forcing
- ☐ Proton - Proton pathway to solar forcing
- ☐ Electron - Electron pathway to solar forcing
- ☐ Cosmic ray - Cosmic ray pathway to solar forcing
- ☐ Other - please specify:

2.19.2 Additional Information

Additional information relating to the provision and implementation of this forcing agent (e.g. citations, use of non-standard datasets, explaining how multiple provisions are used, etc.).

Spec. ID: cmip6.toplevel.radiative_forcings.other.solar.additional_information

Is Required ? FALSE

Enter TEXT value: