CMIP6 Model Documentation

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Documentation Contents

1 Key Properties

Land surface key properties

1.1 Key Properties

Land surface key properties

1.1.1 Model Overview

Overview of land surface model.

Spec. ID: cmip6.land.key_properties.model_overview

Is Required ? TRUE

Enter TEXT value:

1.1.2 Model Name

Name of land surface model code (e.g. MOSES2.2)

Spec. ID: cmip6.land.key_properties.model_name

Is Required ? TRUE

Enter TEXT value:

1.1.3 Description

General description of the processes modelled (e.g. dymanic vegation, prognostic albedo, etc.)

Spec. ID: cmip6.land.key_properties.description

Is Required ? TRUE

Enter TEXT value:

1.1.4 Land Atmosphere Flux Exchanges

Fluxes exchanged with the atmopshere.

Spec. ID: cmip6.land.key_properties.land_atmosphere_flux_exchanges

Is Required ? FALSE

Select value(s):

- ☐ Water
- ☐ Energy
- ☐ Carbon
- ☐ Nitrogen
- ☐ Phospherous
- ☐ Other - please specify:

1.1.5 Atmospheric Coupling Treatment

Describe the treatment of land surface coupling with the Atmosphere model component, which may be different for different quantities (e.g. dust: semi-implicit, water vapour: explicit)

Spec. ID: cmip6.land.key_properties.atmospheric_coupling_treatment

Is Required ? TRUE

Enter TEXT value:

1.1.6 Land Cover

Types of land cover defined in the land surface model

Spec. ID: cmip6.land.key_properties.land_cover

Is Required ? TRUE

Select value(s):

☒ Bare soil

☐ Urban

☒ Lake

☐ Land ice

☐ Lake ice

☒ Vegetated

☐ Other - please specify:

1.1.7 Land Cover Change

Describe how land cover change is managed (e.g. the use of net or gross transitions)

Spec. ID: cmip6.land.key_properties.land_cover_change

Is Required ? FALSE

Enter TEXT value:

1.1.8 Tiling

Describe the general tiling procedure used in the land surface (if any). Include treatment of physiography, land/sea, (dynamic) vegetation coverage and orography/roughness

Spec. ID: cmip6.land.key_properties.tiling

Is Required ? TRUE

Enter TEXT value:

1.2 Conservation Properties

TODO

1.2.1 Energy

Describe if/how energy is conserved globally and to what level (e.g. within X [units]/year)

Spec. ID: cmip6.land.key_properties.conservation_properties.energy

Is Required ? FALSE

Enter TEXT value:

1.2.2 Water

Describe if/how water is conserved globally and to what level (e.g. within X [units]/year)

Spec. ID: cmip6.land.key_properties.conservation_properties.water

Is Required ? FALSE

Enter TEXT value:

1.2.3 Carbon

Describe if/how carbon is conserved globally and to what level (e.g. within X [units]/year)

Spec. ID: cmip6.land.key_properties.conservation_properties.carbon

Is Required ? FALSE

Enter TEXT value:

1.3 Timestepping Framework

TODO

1.3.1 Timestep Dependent On Atmosphere

Is a time step dependent on the frequency of atmosphere couplingxxx?

Spec. ID: cmip6.land.key_properties.timestepping_framework.timestep_dependent_on_atmosphere

Is Required ? TRUE

Select value:

☐ True ☐ False

1.3.2 Time Step

Overall timestep of land surface model (i.e. time between calls)

Spec. ID: cmip6.land.key_properties.timestepping_framework.time_step

Is Required ? TRUE

Enter INTEGER value: 1

1.3.3 Timestepping Method

General description of time stepping method and associated time step(s)

Spec. ID: cmip6.land.key_properties.timestepping_framework.timestepping_method

Is Required ? TRUE

Enter TEXT value:

1.4 Software Properties

Software properties of land surface code

1.4.1 Repository

Location of code for this component.

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

Is Required ? FALSE

Enter TEXT value:

1.4.2 Code Version

Code version identifier.

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

Is Required ? FALSE

Enter TEXT value:

1.4.3 Code Languages

Code language(s).

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

Is Required ? FALSE

Enter TEXT value(s):

2 Grid

Land surface grid

2.1 Grid

Land surface grid

2.1.1 Overview

Overview of the grid in the land surface

Spec. ID: cmip6.land.grid.overview

Is Required ? TRUE

Enter TEXT value:

2.2 Horizontal

The horizontal grid in the land surface

2.2.1 Description

Describe the general structure of the horizontal grid (not including any tiling)

Spec. ID: cmip6.land.grid.horizontal.description

Is Required ? TRUE

Enter TEXT value:

2.2.2 Matches Atmosphere Grid

Does the horizontal grid match the atmospherexxx?

Spec. ID: cmip6.land.grid.horizontal.matches_atmosphere_grid

Is Required ? TRUE

Select value:

☐ True ☐ False

2.3 Vertical

The vertical grid in the soil

2.3.1 Description

Describe the general structure of the vertical grid in the soil (not including any tiling)

Spec. ID: cmip6.land.grid.vertical.description

Is Required ? TRUE

Enter TEXT value:

2.3.2 Total Depth

The total depth of the soil (in metres)

Spec. ID: cmip6.land.grid.vertical.total_depth

Is Required ? TRUE

Enter INTEGER value:

3 Soil

Land surface soil

3.1 Soil

Land surface soil

3.1.1 Overview

Overview of soil in the land surface

Spec. ID: cmip6.land.soil.overview

Is Required ? TRUE

Enter TEXT value:

3.1.2 Heat Water Coupling

Describe the coupling between heat and water in the soil

Spec. ID: cmip6.land.soil.heat_water_coupling

Is Required ? TRUE

Enter TEXT value:

3.1.3 Number Of Soil layers

The number of soil layers

Spec. ID: cmip6.land.soil.number_of_soil layers

Is Required ? TRUE

Enter INTEGER value:

3.1.4 Prognostic Variables

List the prognostic variables of the soil scheme

Spec. ID: cmip6.land.soil.prognostic_variables

Is Required ? TRUE

Enter TEXT value:

3.2 Soil Map

Key properties of the land surface soil map

3.2.1 Description

General description of soil map

Spec. ID: cmip6.land.soil.soil_map.description

Is Required ? TRUE

Enter TEXT value:

3.2.2 Structure

Describe the soil structure map

Spec. ID: cmip6.land.soil.soil_map.structure

Is Required ? FALSE

Enter TEXT value: ISLSCP Initiative I (FAO, GISS, U. Arizona, NASA/GSFC)

3.2.3 Texture

Describe the soil texture map

Spec. ID: cmip6.land.soil.soil_map.texture

Is Required ? FALSE

Enter TEXT value: ISLSCP Initiative I (FAO, GISS, U. Arizona, NASA/GSFC)

3.2.4 Organic Matter

Describe the soil organic matter map

Spec. ID: cmip6.land.soil.soil_map.organic_matter

Is Required ? FALSE

Enter TEXT value:

3.2.5 Albedo

Describe the soil albedo map

Spec. ID: cmip6.land.soil.soil_map.albedo

Is Required ? FALSE

Enter TEXT value: ISLSCP Initiative I (ERBE)

3.2.6 Water Table

Describe the soil water table map, if any

Spec. ID: cmip6.land.soil.soil_map.water_table

Is Required ? FALSE

Enter TEXT value: N/A

3.2.7 Continuously Varying Soil Depth

Does the soil properties vary continuously with depthxxx?

Spec. ID: cmip6.land.soil.soil_map.continuously_varying_soil_depth

Is Required ? TRUE

Select value:

☐ True ☐ False

3.2.8 Soil Depth

Describe the soil depth map

Spec. ID: cmip6.land.soil.soil_map.soil_depth

Is Required ? FALSE

Enter TEXT value:

3.3 Snow Free Albedo

TODO

3.3.1 Prognostic

Is snow free albedo prognosticxxx?

Spec. ID: cmip6.land.soil.snow_free_albedo.prognostic

Is Required ? TRUE

Select value:

☐ True ☐ False

3.3.2 Functions

If prognostic, describe the dependancies on snow free albedo calculations

Spec. ID: cmip6.land.soil.snow_free_albedo.functions

Is Required ? FALSE

Select value(s):

☐ Vegetation type

☐ Soil humidity

☐ Vegetation state

☐ Other - please specify:

3.3.3 Direct Diffuse

If prognostic, describe the distinction between direct and diffuse albedo

Spec. ID: cmip6.land.soil.snow_free_albedo.direct_diffuse

Is Required ? FALSE

Select value:

☐ Distinction between direct and diffuse albedo

☐ No distinction between direct and diffuse albedo

☐ Other - please specify:

3.3.4 Number Of Wavelength Bands

If prognostic, enter the number of wavelength bands used

Spec. ID: cmip6.land.soil.snow_free_albedo.number_of_wavelength_bands

Is Required ? FALSE

Enter INTEGER value:

3.4 Hydrology

Key properties of the land surface soil hydrology

3.4.1 Description

General description of the soil hydrological model

Spec. ID: cmip6.land.soil.hydrology.description

Is Required ? TRUE

Enter TEXT value:

3.4.2 Time Step

Time step of river soil hydrology in seconds

Spec. ID: cmip6.land.soil.hydrology.time_step

Is Required ? TRUE

Enter INTEGER value:

3.4.3 Tiling

Describe the soil hydrology tiling, if any.

Spec. ID: cmip6.land.soil.hydrology.tiling

Is Required ? FALSE

Enter TEXT value:

3.4.4 Vertical Discretisation

Describe the typical vertical discretisation

Spec. ID: cmip6.land.soil.hydrology.vertical_discretisation

Is Required ? TRUE

Enter TEXT value:

3.4.5 Number Of Ground Water Layers

The number of soil layers that may contain water

Spec. ID: cmip6.land.soil.hydrology.number_of_ground_water_layers

Is Required ? TRUE

Enter INTEGER value: 6

3.4.6 Lateral Connectivity

Describe the lateral connectivity between tiles

Spec. ID: cmip6.land.soil.hydrology.lateral_connectivity

Is Required ? TRUE

Select value(s):

☐ Perfect connectivity - Common soil for multiple tiles

☐ Darcian flow - Darcian flow among hillslope tiles

☐ Other - please specify:

3.4.7 Method

The hydrological dynamics scheme in the land surface model

Spec. ID: cmip6.land.soil.hydrology.method

Is Required ? TRUE

Select value:

☐ Bucket

☐ Force-restore

☐ Choisnel

☒ Explicit diffusion

☐ Other - please specify:

3.5 Freezing

TODO

3.5.1 Number Of Ground Ice Layers

How many soil layers may contain ground ice

Spec. ID: cmip6.land.soil.hydrology.freezing.number_of_ground_ice_layers

Is Required ? TRUE

Enter INTEGER value: 6

3.5.2 Ice Storage Method

Describe the method of ice storage

Spec. ID: cmip6.land.soil.hydrology.freezing.ice_storage_method

Is Required ? TRUE

Enter TEXT value: Thermo dynamics

3.5.3 Permafrost

Describe the treatment of permafrost, if any, within the land surface scheme

Spec. ID: cmip6.land.soil.hydrology.freezing.permafrost

Is Required ? TRUE

Enter TEXT value:

3.6 Drainage

TODO

3.6.1 Description

General describe how drainage is included in the land surface scheme

Spec. ID: cmip6.land.soil.hydrology.drainage.description

Is Required ? TRUE

Enter TEXT value:

3.6.2 Types

Different types of runoff represented by the land surface model

Spec. ID: cmip6.land.soil.hydrology.drainage.types

Is Required ? FALSE

Select value(s):

- ☐ Gravity drainage
- ☐ Horton mechanism
- ☐ Topmodel-based
- ☐ Dunne mechanism
- ☐ Lateral subsurface flow
- ☐ Baseflow from groundwater
- ☐ Other - please specify:

3.7 Heat Treatment

TODO

3.7.1 Description

General description of how heat treatment properties are defined

Spec. ID: cmip6.land.soil.heat_treatment.description

Is Required ? TRUE

Enter TEXT value:

3.7.2 Time Step

Time step of soil heat scheme in seconds

Spec. ID: cmip6.land.soil.heat_treatment.time_step

Is Required ? TRUE

Enter INTEGER value:

3.7.3 Tiling

Describe the soil heat treatment tiling, if any.

Spec. ID: cmip6.land.soil.heat_treatment.tiling

Is Required ? FALSE

Enter TEXT value:

3.7.4 Vertical Discretisation

Describe the typical vertical discretisation

Spec. ID: cmip6.land.soil.heat_treatment.vertical_discretisation

Is Required ? TRUE

Enter TEXT value:

3.7.5 Heat Storage

Specify the method of heat storage

Spec. ID: cmip6.land.soil.heat_treatment.heat_storage

Is Required ? TRUE

Select value:

☐ Force-restore

☒ Explicit diffusion

☐ Other - please specify:

3.7.6 Processes

Describe processes included in the treatment of soil heat

Spec. ID: cmip6.land.soil.heat_treatment.processes

Is Required ? TRUE

Select value(s):

☒ Soil moisture freeze-thaw

☐ Coupling with snow temperature

☐ Other - please specify:

4 Snow

Land surface snow

4.1 Snow

Land surface snow

4.1.1 Overview

Overview of snow in the land surface

Spec. ID: cmip6.land.snow.overview

Is Required ? TRUE

Enter TEXT value:

4.1.2 Tiling

Describe the snow tiling, if any.

Spec. ID: cmip6.land.snow.tiling

Is Required ? FALSE

Enter TEXT value:

4.1.3 Number Of Snow Layers

The number of snow levels used in the land surface scheme/model

Spec. ID: cmip6.land.snow.number_of_snow_layers

Is Required ? TRUE

Enter INTEGER value: 3

4.1.4 Density

Description of the treatment of snow density

Spec. ID: cmip6.land.snow.density

Is Required ? TRUE

Select value:

☐ Prognostic

☒ Constant

☐ Other - please specify:

4.1.5 Water Equivalent

Description of the treatment of the snow water equivalent

Spec. ID: cmip6.land.snow.water_equivalent

Is Required ? TRUE

Select value:

☒ Prognostic

☐ Diagnostic

☐ Other - please specify:

4.1.6 Heat Content

Description of the treatment of the heat content of snow

Spec. ID: cmip6.land.snow.heat_content

Is Required ? TRUE

Select value:

☐ Prognostic

☒ Diagnostic

☐ Other - please specify:

4.1.7 Temperature

Description of the treatment of snow temperature

Spec. ID: cmip6.land.snow.temperature

Is Required ? TRUE

Select value:

☒ Prognostic

☐ Diagnostic

☐ Other - please specify:

4.1.8 Liquid Water Content

Description of the treatment of snow liquid water

Spec. ID: cmip6.land.snow.liquid_water_content

Is Required ? TRUE

Select value:

☐ Prognostic

☐ Diagnostic

☐ Other - please specify:

4.1.9 Snow Cover Fractions

Specify cover fractions used in the surface snow scheme

Spec. ID: cmip6.land.snow.snow_cover_fractions

Is Required ? TRUE

Select value(s):

☒ Ground snow fraction

☒ Vegetation snow fraction

☐ Other - please specify:

4.1.10 Processes

Snow related processes in the land surface scheme

Spec. ID: cmip6.land.snow.processes

Is Required ? TRUE

Select value(s):

☒ Snow interception

☒ Snow melting

☐ Snow freezing

☐ Blowing snow

☐ Other - please specify:

4.1.11 Prognostic Variables

List the prognostic variables of the snow scheme

Spec. ID: cmip6.land.snow.prognostic_variables

Is Required ? TRUE

Enter TEXT value:

4.2 Snow Albedo

TODO

4.2.1 Type

Describe the treatment of snow-covered land albedo

Spec. ID: cmip6.land.snow.snow_albedo.type

Is Required ? TRUE

Select value:

☒ Prognostic

☐ Prescribed

☐ Constant

☐ Other - please specify:

4.2.2 Functions

If prognostic,

Spec. ID: cmip6.land.snow.snow_albedo.functions

Is Required ? FALSE

Select value(s):

☐ Vegetation type

☒ Snow age

☐ Snow density

☐ Snow grain type

☒ Aerosol deposition

☐ Other - please specify:

5 Vegetation

Land surface vegetation

5.1 Vegetation

Land surface vegetation

5.1.1 Overview

Overview of vegetation in the land surface

Spec. ID: cmip6.land.vegetation.overview

Is Required ? TRUE

Enter TEXT value:

5.1.2 Time Step

Time step of vegetation scheme in seconds

Spec. ID: cmip6.land.vegetation.time_step

Is Required ? TRUE

Enter INTEGER value:

5.1.3 Dynamic Vegetation

Is there dynamic evolution of vegetationxxx?

Spec. ID: cmip6.land.vegetation.dynamic_vegetation

Is Required ? TRUE

Select value:

☐ True ☐ False

5.1.4 Tiling

Describe the vegetation tiling, if any.

Spec. ID: cmip6.land.vegetation.tiling

Is Required ? FALSE

Enter TEXT value:

5.1.5 Vegetation Representation

Vegetation classification used

Spec. ID: cmip6.land.vegetation.vegetation_representation

Is Required ? TRUE

Select value:

☒ Vegetation types

☐ Biome types

☐ Other - please specify:

5.1.6 Vegetation Types

List of vegetation types in the classification, if any

Spec. ID: cmip6.land.vegetation.vegetation_types

Is Required ? FALSE

Select value(s):

☒ Broadleaf tree

☒ Needleleaf tree

☒ C3 grass

☒ C4 grass

☒ Vegetated

☐ Other - please specify:

5.1.7 Biome Types

List of biome types in the classification, if any

Spec. ID: cmip6.land.vegetation.biome_types

Is Required ? FALSE

Select value(s):

☐ Evergreen needleleaf forest

☐ Evergreen broadleaf forest

☐ Deciduous needleleaf forest

☐ Deciduous broadleaf forest

☐ Mixed forest

☐ Woodland

☐ Wooded grassland

☐ Closed shrubland

☐ Opne shrubland

☐ Grassland

☐ Cropland

☐ Wetlands

☐ Other - please specify:

5.1.8 Vegetation Time Variation

How the vegetation fractions in each tile are varying with time

Spec. ID: cmip6.land.vegetation.vegetation_time_variation

Is Required ? TRUE

Select value:

☐ Fixed (not varying)

☒ Prescribed (varying from files)

☐ Dynamical (varying from simulation)

☐ Other - please specify:

5.1.9 Vegetation Map

If vegetation fractions are not dynamically updated , describe the vegetation map used (common name and reference, if possible)

Spec. ID: cmip6.land.vegetation.vegetation_map

Is Required ? FALSE

Enter TEXT value:

5.1.10 Interception

Is vegetation interception of rainwater representedxxx?

Spec. ID: cmip6.land.vegetation.interception

Is Required ? TRUE

Select value:

☒ True ☐ False

5.1.11 Phenology

Treatment of vegetation phenology

Spec. ID: cmip6.land.vegetation.phenology

Is Required ? TRUE

Select value:

☐ Prognostic

☐ Diagnostic (vegetation map)

☐ Other - please specify:

5.1.12 Phenology Description

General description of the treatment of vegetation phenology

Spec. ID: cmip6.land.vegetation.phenology_description

Is Required ? FALSE

Enter TEXT value:

5.1.13 Leaf Area Index

Treatment of vegetation leaf area index

Spec. ID: cmip6.land.vegetation.leaf_area_index

Is Required ? TRUE

Select value:

☒ Prescribed

☐ Prognostic

☐ Diagnostic

☐ Other - please specify:

5.1.14 Leaf Area Index Description

General description of the treatment of leaf area index

Spec. ID: cmip6.land.vegetation.leaf_area_index_description

Is Required ? FALSE

Enter TEXT value:

5.1.15 Biomass

Treatment of vegetation biomass

Spec. ID: cmip6.land.vegetation.biomass

Is Required ? TRUE

Select value:

☐ Prognostic

☐ Diagnostic

☐ Other - please specify:

5.1.16 Biomass Description

General description of the treatment of vegetation biomass

Spec. ID: cmip6.land.vegetation.biomass_description

Is Required ? FALSE

Enter TEXT value:

5.1.17 Biogeography

Treatment of vegetation biogeography

Spec. ID: cmip6.land.vegetation.biogeography

Is Required ? TRUE

Select value:

☐ Prognostic

☐ Diagnostic

☐ Other - please specify:

5.1.18 Biogeography Description

General description of the treatment of vegetation biogeography

Spec. ID: cmip6.land.vegetation.biogeography_description

Is Required ? FALSE

Enter TEXT value:

5.1.19 Stomatal Resistance

Specify what the vegetation stomatal resistance depends on

Spec. ID: cmip6.land.vegetation.stomatal_resistance

Is Required ? TRUE

Select value(s):

☒ Light

☒ Temperature

☒ Water availability

☒ CO2

☐ O3

☐ Other - please specify:

5.1.20 Stomatal Resistance Description

General description of the treatment of vegetation stomatal resistance

Spec. ID: cmip6.land.vegetation.stomatal_resistance_description

Is Required ? FALSE

Enter TEXT value:

5.1.21 Prognostic Variables

List the prognostic variables of the vegetation scheme

Spec. ID: cmip6.land.vegetation.prognostic_variables

Is Required ? TRUE

Enter TEXT value:

6 Energy Balance

Land surface energy balance

6.1 Energy Balance

Land surface energy balance

6.1.1 Overview

Overview of energy balance in land surface

Spec. ID: cmip6.land.energy_balance.overview

Is Required ? TRUE

Enter TEXT value:

6.1.2 Tiling

Describe the energy balance tiling, if any.

Spec. ID: cmip6.land.energy_balance.tiling

Is Required ? FALSE

Enter TEXT value:

6.1.3 Number Of Surface Temperatures

The maximum number of distinct surface temperatures in a grid cell (for example, each subgrid tile may have its own temperature)

Spec. ID: cmip6.land.energy_balance.number_of_surface_temperatures

Is Required ? TRUE

Enter INTEGER value: 2

6.1.4 Evaporation

Specify the formulation method for land surface evaporation, from soil and vegetation

Spec. ID: cmip6.land.energy_balance.evaporation

Is Required ? TRUE

Select value(s):

- ☐ Alpha
- ☐ Beta
- ☐ Combined
- ☐ Monteith potential evaporation
- ☐ Other - please specify:

6.1.5 Processes

Describe which processes are included in the energy balance scheme

Spec. ID: cmip6.land.energy_balance.processes

Is Required ? TRUE

Select value(s):

☒ Transpiration

☐ Other - please specify:

7 Carbon Cycle

Land surface carbon cycle

7.1 Carbon Cycle

Land surface carbon cycle

7.1.1 Overview

Overview of carbon cycle in land surface

Spec. ID: cmip6.land.carbon_cycle.overview

Is Required ? TRUE

Enter TEXT value:

7.1.2 Tiling

Describe the carbon cycle tiling, if any.

Spec. ID: cmip6.land.carbon_cycle.tiling

Is Required ? FALSE

Enter TEXT value:

7.1.3 Time Step

Time step of carbon cycle in seconds

Spec. ID: cmip6.land.carbon_cycle.time_step

Is Required ? TRUE

Enter INTEGER value:

7.1.4 Anthropogenic Carbon

Describe the treament of the anthropogenic carbon pool

Spec. ID: cmip6.land.carbon_cycle.anthropogenic_carbon

Is Required ? FALSE

Select value(s):

- ☐ Grand slam protocol
- ☐ Residence time
- ☐ Decay time
- ☐ Other - please specify:

7.1.5 Prognostic Variables

List the prognostic variables of the carbon scheme

Spec. ID: cmip6.land.carbon_cycle.prognostic_variables

Is Required ? TRUE

Enter TEXT value:

7.2 Vegetation

TODO

7.2.1 Number Of Carbon Pools

Enter the number of carbon pools used

Spec. ID: cmip6.land.carbon_cycle.vegetation.number_of_carbon_pools

Is Required ? TRUE

Enter INTEGER value:

7.2.2 Carbon Pools

List the carbon pools used

Spec. ID: cmip6.land.carbon_cycle.vegetation.carbon_pools

Is Required ? FALSE

Enter TEXT value:

7.2.3 Forest Stand Dynamics

Describe the treatment of forest stand dyanmics

Spec. ID: cmip6.land.carbon_cycle.vegetation.forest_stand_dynamics

Is Required ? FALSE

Enter TEXT value:

7.3 Photosynthesis

TODO

7.3.1 Method

Describe the general method used for photosynthesis (e.g. type of photosynthesis, distinction between C3 and C4 grasses, Nitrogen depencence, etc.)

Spec. ID: cmip6.land.carbon_cycle.vegetation.photosynthesis.method

Is Required ? FALSE

Enter TEXT value:

7.4 Autotrophic Respiration

TODO

7.4.1 Maintainance Respiration

Describe the general method used for maintainence respiration

Spec. ID: cmip6.land.carbon_cycle.vegetation.autotrophic_respiration.maintainance_respiration

Is Required ? FALSE

Enter TEXT value:

7.4.2 Growth Respiration

Describe the general method used for growth respiration

Spec. ID: cmip6.land.carbon_cycle.vegetation.autotrophic_respiration.growth_respiration

Is Required ? FALSE

Enter TEXT value:

7.5 Allocation

TODO

7.5.1 Method

Describe the general principle behind the allocation scheme

Spec. ID: cmip6.land.carbon_cycle.vegetation.allocation.method

Is Required ? TRUE

Enter TEXT value:

7.5.2 Allocation Bins

Specify distinct carbon bins used in allocation

Spec. ID: cmip6.land.carbon_cycle.vegetation.allocation.allocation_bins

Is Required ? TRUE

Select value:

- ☐ Leaves + stems + roots
- ☐ Leaves + stems + roots (leafy + woody)
- ☐ Leaves + fine roots + coarse roots + stems
- ☐ Whole plant (no distinction)
- ☐ Other - please specify:

7.5.3 Allocation Fractions

Describe how the fractions of allocation are calculated

Spec. ID: cmip6.land.carbon_cycle.vegetation.allocation.allocation_fractions

Is Required ? TRUE

Select value:

- ☐ Fixed
- ☐ Function of vegetation type
- ☐ Function of plant allometry
- ☐ Explicitly calculated
- ☐ Other - please specify:

7.6 Phenology

TODO

7.6.1 Method

Describe the general principle behind the phenology scheme

Spec. ID: cmip6.land.carbon_cycle.vegetation.phenology.method

Is Required ? TRUE

Enter TEXT value:

7.7 Mortality

TODO

7.7.1 Method

Describe the general principle behind the mortality scheme

Spec. ID: cmip6.land.carbon_cycle.vegetation.mortality.method

Is Required ? TRUE

Enter TEXT value:

7.8 Litter

TODO

7.8.1 Number Of Carbon Pools

Enter the number of carbon pools used

Spec. ID: cmip6.land.carbon_cycle.litter.number_of_carbon_pools

Is Required ? TRUE

Enter INTEGER value:

7.8.2 Carbon Pools

List the carbon pools used

Spec. ID: cmip6.land.carbon_cycle.litter.carbon_pools

Is Required ? FALSE

Enter TEXT value:

7.8.3 Decomposition

List the decomposition methods used

Spec. ID: cmip6.land.carbon_cycle.litter.decomposition

Is Required ? FALSE

Enter TEXT value:

7.8.4 Method

List the general method used

Spec. ID: cmip6.land.carbon_cycle.litter.method

Is Required ? FALSE

Enter TEXT value:

7.9 Soil

TODO

7.9.1 Number Of Carbon Pools

Enter the number of carbon pools used

Spec. ID: cmip6.land.carbon_cycle.soil.number_of_carbon_pools

Is Required ? TRUE

Enter INTEGER value:

7.9.2 Carbon Pools

List the carbon pools used

Spec. ID: cmip6.land.carbon_cycle.soil.carbon_pools

Is Required ? FALSE

Enter TEXT value:

7.9.3 Decomposition

List the decomposition methods used

Spec. ID: cmip6.land.carbon_cycle.soil.decomposition

Is Required ? FALSE

Enter TEXT value:

7.9.4 Method

List the general method used

Spec. ID: cmip6.land.carbon_cycle.soil.method

Is Required ? FALSE

Enter TEXT value:

7.10 Permafrost Carbon

TODO

7.10.1 Is Permafrost Included

Is permafrost includedxxx?

Spec. ID: cmip6.land.carbon_cycle.permafrost_carbon.is_permafrost_included

Is Required ? TRUE

Select value:

☐ True ☐ False

7.10.2 Emitted Greenhouse Gases

List the GHGs emitted

Spec. ID: cmip6.land.carbon_cycle.permafrost_carbon.emitted_greenhouse_gases

Is Required ? FALSE

Enter TEXT value:

7.10.3 Decomposition

List the decomposition methods used

Spec. ID: cmip6.land.carbon_cycle.permafrost_carbon.decomposition

Is Required ? FALSE

Enter TEXT value:

7.10.4 Impact On Soil Properties

Describe the impact of permafrost on soil properties

Spec. ID: cmip6.land.carbon_cycle.permafrost_carbon.impact_on_soil_properties

Is Required ? FALSE

Enter TEXT value:

8 Nitrogen Cycle

Land surface nitrogen cycle

8.1 Nitrogen Cycle

Land surface nitrogen cycle

8.1.1 Overview

Overview of the nitrogen cycle in the land surface

Spec. ID: cmip6.land.nitrogen_cycle.overview

Is Required ? TRUE

Enter TEXT value:

8.1.2 Tiling

Describe the notrogen cycle tiling, if any.

Spec. ID: cmip6.land.nitrogen_cycle.tiling

Is Required ? FALSE

Enter TEXT value:

8.1.3 Time Step

Time step of nitrogen cycle in seconds

Spec. ID: cmip6.land.nitrogen_cycle.time_step

Is Required ? TRUE

Enter INTEGER value:

8.1.4 Prognostic Variables

List the prognostic variables of the nitrogen scheme

Spec. ID: cmip6.land.nitrogen_cycle.prognostic_variables

Is Required ? TRUE

Enter TEXT value:

9 River Routing

Land surface river routing

9.1 River Routing

Land surface river routing

9.1.1 Overview

Overview of river routing in the land surface

Spec. ID: cmip6.land.river_routing.overview

Is Required ? TRUE

Enter TEXT value:

9.1.2 Tiling

Describe the river routing, if any.

Spec. ID: cmip6.land.river_routing.tiling

Is Required ? FALSE

Enter TEXT value:

9.1.3 Time Step

Time step of river routing scheme in seconds

Spec. ID: cmip6.land.river_routing.time_step

Is Required ? TRUE

Enter INTEGER value:

9.1.4 Grid Inherited From Land Surface

Is the grid inherited from land surfacexxx?

Spec. ID: cmip6.land.river_routing.grid_inherited_from_land_surface

Is Required ? TRUE

Select value:

☐ True ☐ False

9.1.5 Grid Description

General description of grid, if not inherited from land surface

Spec. ID: cmip6.land.river_routing.grid_description

Is Required ? FALSE

Enter TEXT value:

9.1.6 Number Of Reservoirs

Enter the number of reservoirs

Spec. ID: cmip6.land.river_routing.number_of_reservoirs

Is Required ? TRUE

Enter INTEGER value: 2

9.1.7 Water Re Evaporation

TODO

Spec. ID: cmip6.land.river_routing.water_re_evaporation

Is Required ? TRUE

Select value(s):

☐ Flood plains

☐ Irrigation

☐ Other - please specify:

9.1.8 Coupled To Atmosphere

Is river routing coupled to the atmosphere model componentxxx?

Spec. ID: cmip6.land.river_routing.coupled_to_atmosphere

Is Required ? FALSE

Select value:

☒ True ☐ False

9.1.9 Coupled To Land

Describe the coupling between land and rivers

Spec. ID: cmip6.land.river_routing.coupled_to_land

Is Required ? FALSE

Enter TEXT value:

9.1.10 Quantities Exchanged With Atmosphere

If couple to atmosphere, which quantities are exchanged between river routing and the atmosphere model componentsxxx?

Spec. ID: cmip6.land.river_routing.quantities_exchanged_with_atmosphere

Is Required ? FALSE

Select value(s):

☐ Heat

☐ Water

☐ Tracers

☐ Other - please specify:

9.1.11 Basin Flow Direction Map

What type of basin flow direction map is being usedxxx?

Spec. ID: cmip6.land.river_routing.basin_flow_direction_map

Is Required ? TRUE

Select value:

☒ Present day

☐ Adapted for other periods

☐ Other - please specify:

9.1.12 Flooding

Describe the representation of flooding, if any

Spec. ID: cmip6.land.river_routing.flooding

Is Required ? FALSE

Enter TEXT value:

9.1.13 Prognostic Variables

List the prognostic variables of the river routing

Spec. ID: cmip6.land.river_routing.prognostic_variables

Is Required ? TRUE

Enter TEXT value:

9.2 Oceanic Discharge

TODO

9.2.1 Discharge Type

Specify how rivers are discharged to the ocean

Spec. ID: cmip6.land.river_routing.oceanic_discharge.discharge_type

Is Required ? TRUE

Select value:

☒ Direct (large rivers)

☐ Diffuse

☐ Other - please specify:

9.2.2 Quantities Transported

Quantities that are exchanged from river-routing to the ocean model component

Spec. ID: cmip6.land.river_routing.oceanic_discharge.quantities_transported

Is Required ? TRUE

Select value(s):

☐ Heat

☒ Water

☐ Tracers

☐ Other - please specify:

10 Lakes

Land surface lakes

10.1 Lakes

Land surface lakes

10.1.1 Overview

Overview of lakes in the land surface

Spec. ID: cmip6.land.lakes.overview

Is Required ? TRUE

Enter TEXT value:

10.1.2 Coupling With Rivers

Are lakes coupled to the river routing model componentxxx?

Spec. ID: cmip6.land.lakes.coupling_with_rivers

Is Required ? TRUE

Select value:

☒ True ☐ False

10.1.3 Time Step

Time step of lake scheme in seconds

Spec. ID: cmip6.land.lakes.time_step

Is Required ? TRUE

Enter INTEGER value:

10.1.4 Quantities Exchanged With Rivers

If coupling with rivers, which quantities are exchanged between the lakes and rivers

Spec. ID: cmip6.land.lakes.quantities_exchanged_with_rivers

Is Required ? FALSE

Select value(s):

☐ Heat

☒ Water

☐ Tracers

☐ Other - please specify:

10.1.5 Vertical Grid

Describe the vertical grid of lakes

Spec. ID: cmip6.land.lakes.vertical_grid

Is Required ? FALSE

Enter TEXT value:

10.1.6 Prognostic Variables

List the prognostic variables of the lake scheme

Spec. ID: cmip6.land.lakes.prognostic_variables

Is Required ? TRUE

Enter TEXT value:

10.2 Method

TODO

10.2.1 Ice Treatment

Is lake ice includedxxx?

Spec. ID: cmip6.land.lakes.method.ice_treatment

Is Required ? TRUE

Select value:

☒ True ☐ False

10.2.2 Albedo

Describe the treatment of lake albedo

Spec. ID: cmip6.land.lakes.method.albedo

Is Required ? TRUE

Select value:

☐ Prognostic

☒ Diagnostic

☐ Other - please specify:

10.2.3 Dynamics

Which dynamics of lakes are treatedxxx? horizontal, vertical, etc.

Spec. ID: cmip6.land.lakes.method.dynamics

Is Required ? TRUE

Select value(s):

☐ No lake dynamics

☐ Vertical

☐ Horizontal

☐ Other - please specify:

10.2.4 Dynamic Lake Extent

Is a dynamic lake extent scheme includedxxx?

Spec. ID: cmip6.land.lakes.method.dynamic_lake_extent

Is Required ? TRUE

Select value:

☒ True ☐ False

10.2.5 Endorheic Basins

Basins not flowing to ocean includedxxx?

Spec. ID: cmip6.land.lakes.method.endorheic_basins

Is Required ? TRUE

Select value:

☒ True ☐ False

10.3 Wetlands

TODO

10.3.1 Description

Describe the treatment of wetlands, if any

Spec. ID: cmip6.land.lakes.wetlands.description

Is Required ? FALSE

Enter TEXT value: