MAECS

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Contents

Chapter 1

MAECS: Model for Adaptive Ecosystems in Coastal Seas

1.1 General Overview

The goal of MAECS is...

```
maybe some script here
```

1.2 References

- K. W. Wirtz and M. Pahlow (2010): ...

Chapter 2

Todo List

Type fabm_hzg_maecs::type_hzg_maecs
describe the type_hzg_maecs

Chapter 3

Data Type Index

3.1 Class Hierarchy

This inheritance list is sorted roughly, but not completely, alphabetically:

Chapter 4

Data Type Index

4.1 Data Types List

Here are the data types with brief descriptions:

Chapter 5

File Index

5.1 File List

Here is a list of all documented files with brief descriptions:

Chapter 6

Data Type Documentation

6.1 fabm_hzg_maecs Module Reference

The MAECS module contains initialize do (=> maecs_do) get_light_extinction get_vertical_movement (=> maecs-_get_vertical_movement) and maybe some humanly explanation here.

Data Types

- interface maecs_get_vertical_movement

  Brief description of routine.
- type type_hzg_maecs

  here we extend a model

6.1.1 Detailed Description

The MAECS module contains initialize do (=> maecs_do) get_light_extinction get_vertical_movement (=> maecs-_get_vertical_movement) and maybe some humanly explanation here.

The documentation for this module was generated from the following file:

- maecs.F90

6.2 maecs_functions Module Reference

Public Member Functions

- pure real(rk) function, public **smooth_small** (x, eps)
- pure real(rk) function, public **uptflex** (Aff0, Vmax0, Nut, fAv)
- pure real(rk) function, public **queuefunc0** (n, x)
- subroutine, public **queuefunc** (n, x, qfunc, qderiv)
- real(rk) function, public **queuederiv** (n, x)
- subroutine, public **sinking** (vS, phys_status, sinkvel)
- subroutine, public **min_mass** (maecs, phy, method)
- subroutine, public **calc_rel_chloropl** (maecs, phy, method)
- subroutine, public **calc_sensitivities** (maecs, sens, phy, env, nut)
- subroutine, public **calc_internal_states** (maecs, phy, det, dom, zoo)

The documentation for this module was generated from the following file:

- maecs_functions.F90

6.3 fabm_hzg_maecs::maecs_get_vertical_movement Interface Reference

Brief description of routine.

6.3.1 Detailed Description

Brief description of routine.

Author

Routine Author Name and Affiliation. Flow method (rate of change of position) used by integrator. Compute $\frac{d\lambda}{dt}$, $\frac{d\phi}{dt}$, $\frac{dz}{dt}$

Parameters

in	*inParam*	
out	*outParam*	

Returns

returnValue

The documentation for this interface was generated from the following file:

- maecs.F90

6.4 maecs_grazing Module Reference

Public Member Functions

- subroutine, public **grazing** (Imax, HalfSat, preyconc, rate)
- subroutine, public **grazing_losses** (zoo, resC, Q_prey, lossZNut, lossZDet, mswitch)

The documentation for this module was generated from the following file:

- maecs_grazing.F90

6.5 maecs_primprod Module Reference

Public Member Functions

- subroutine, public **photosynthesis** (self, sens, phy, uptake, exud, acc)

The documentation for this module was generated from the following file:

- maecs_primprod.F90

6.6 maecs_types Module Reference

Data Types

- type type_maecs_allocation_fractions

- type type_maecs_base_model
- type type_maecs_derivative
- type type_maecs_env
- type type_maecs_om
- type type_maecs_phy
- type type_maecs_rhs
- type type_maecs_sensitivities
- type type_maecs_switch
- type type_maecs_traitdyn
- type type_maecs_zoo

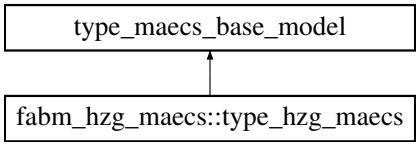
The documentation for this module was generated from the following file:

- maecs_types.F90

6.7 fabm_hzg_maecs::type_hzg_maecs Type Reference

here we extend a model

Inheritance diagram for fabm_hzg_maecs::type_hzg_maecs:



Public Member Functions

- procedure **initialize**
- procedure do => maecs_do

  initializes
- procedure **get_light_extinction**
- procedure **get_vertical_movement** =>maecs_get_vertical_movement

6.7.1 Detailed Description

here we extend a model

Todo describe the type_hzg_maecs

The documentation for this type was generated from the following file:

- maecs.F90

6.8 maecs_types::type_maecs_allocation_fractions Type Reference

Public Attributes

- real(rk) **rub**
- real(rk) **theta**

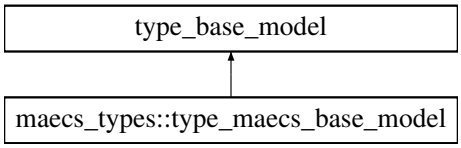
- real(rk) **nutupt**
- real(rk) **totfree**
- real(rk) **rel_phys**

The documentation for this type was generated from the following file:

- maecs_types.F90

6.9 maecs_types::type_maecs_base_model Type Reference

Inheritance diagram for maecs_types::type_maecs_base_model:



Public Attributes

- type(type_state_variable_id) **id_nutn**
- type(type_state_variable_id) **id_nutp**
- type(type_state_variable_id) **id_nuts**
- type(type_state_variable_id) **id_phyc**
- type(type_state_variable_id) **id_phyn**
- type(type_state_variable_id) **id_phyp**
- type(type_state_variable_id) **id_phys**
- type(type_state_variable_id) **id_zooc**
- type(type_state_variable_id) **id_detc**
- type(type_state_variable_id) **id_detn**
- type(type_state_variable_id) **id_detp**
- type(type_state_variable_id) **id_dets**
- type(type_state_variable_id) **id_domc**
- type(type_state_variable_id) **id_domn**
- type(type_state_variable_id) **id_domp**
- type(type_state_variable_id) **id_rub**
- type(type_state_variable_id) **id_chl**
- type(type_dependency_id) **id_temp**
- type(type_dependency_id) **id_par**
- type(type_diagnostic_variable_id) **id_chl2**
- type(type_diagnostic_variable_id) **id_fracr**
- type(type_diagnostic_variable_id) **id_qn**
- type(type_diagnostic_variable_id) **id_qp**
- type(type_diagnostic_variable_id) **id_tmp**
- type(type_conserved_quantity_id) **id_totc**
- type(type_conserved_quantity_id) **id_totn**
- type(type_conserved_quantity_id) **id_totp**
- type(type_conserved_quantity_id) **id_tots**
- real(rk) **nutn_initial**
- real(rk) **nutp_initial**
- real(rk) **nuts_initial**
- real(rk) **phyc_initial**

- real(rk) **phyn_initial**
- real(rk) **phyp_initial**
- real(rk) **phys_initial**
- real(rk) **zooc_initial**
- real(rk) **detc_initial**
- real(rk) **detn_initial**
- real(rk) **detp_initial**
- real(rk) **dets_initial**
- real(rk) **domc_initial**
- real(rk) **domn_initial**
- real(rk) **domp_initial**
- real(rk) **frac_rub_ini**
- real(rk) **frac_chl_ini**
- real(rk) **p_max**
- real(rk) **alpha**
- real(rk) **sigma**
- real(rk) **theta_lhc**
- real(rk) **rel_chloropl_min**
- real(rk) **qn_phy_0**
- real(rk) **qn_phy_max**
- real(rk) **v_nc_max**
- real(rk) **affn**
- real(rk) **zeta_cn**
- real(rk) **exud_phy**
- real(rk) **qp_phy_0**
- real(rk) **qp_phy_max**
- real(rk) **v_pc_max**
- real(rk) **affp**
- real(rk) **qsi_phy_0**
- real(rk) **qsi_phy_max**
- real(rk) **v_sic_max**
- real(rk) **affsi**
- real(rk) **syn_nut**
- real(rk) **adap_rub**
- real(rk) **adap_theta**
- real(rk) **tau_regv**
- real(rk) **phi_agg**
- real(rk) **vs_phy**
- real(rk) **vs_det**
- real(rk) **hydrol**
- real(rk) **remin**
- real(rk) **ae_all**
- real(rk) **t_ref**
- real(rk) **const_nc_zoo**
- real(rk) **const_pc_zoo**
- real(rk) **g_max**
- real(rk) **k_grazc**
- real(rk) **yield_zoo**
- real(rk) **basal_resp_zoo**
- real(rk) **mort_zoo**
- real(rk) **a_water**
- real(rk) **a_spm**
- real(rk) **a_chl**
- real(rk) **frac_par**
- real(rk) **small**

- real(rk) **dil**
- real(rk) **k_qn_phy**
- real(rk) **ik_qn**
- real(rk) **ik_qp**
- real(rk) **itheta_max**
- real(rk) **aver_qn_phy**
- real(rk) **aver_qp_phy**
- real(rk) **small_finite**
- logical **rubiscoon**
- logical **photoacclimon**
- logical **phosphoruson**
- logical **siliconon**
- logical **grazingon**
- logical **biocarbochemon**
- logical **biooxyon**
- logical **debugdiagon**
- logical **chemostaton**
- logical **uptakelock**
- logical **detritus_no_river_dilution**
- logical **plankton_no_river_dilution**

The documentation for this type was generated from the following file:

- maecs_types.F90

6.10 maecs_types::type_maecs_derivative Type Reference

Public Attributes

- real(rk) **dregv**
- real(rk) **dtheta**
- real(rk) **dfracr**
- real(rk) **dfracp**
- real(rk) **dqn**

The documentation for this type was generated from the following file:

- maecs_types.F90

6.11 maecs_types::type_maecs_env Type Reference

Public Attributes

- real(rk) **temp**
- real(rk) **par**

The documentation for this type was generated from the following file:

- maecs_types.F90

6.12 maecs_types::type_maecs_om Type Reference

Public Attributes

- real(rk) **c**
- real(rk) **n**
- real(rk) **p**
- real(rk) **s**

The documentation for this type was generated from the following file:

- maecs_types.F90

6.13 maecs_types::type_maecs_phy Type Reference

Public Attributes

- real(rk) **c**
- real(rk) **n**
- real(rk) **p**
- real(rk) **s**
- real(rk) **c_reg**
- real(rk) **n_reg**
- real(rk) **p_reg**
- real(rk) **chl**
- real(rk) **rub**
- real(rk) **rel_chloropl**
- real(rk) **rel_qn**
- real(rk) **rel_qp**
- real(rk) **rel_qsi**
- real(rk) **qn**
- real(rk) **qp**
- real(rk) **qsi**
- real(rk) **qpn**
- real(rk) **theta**
- type(type_maecs_allocation_fractions) **frac**

The documentation for this type was generated from the following file:

- maecs_types.F90

6.14 maecs_types::type_maecs_rhs Type Reference

Public Attributes

- real(rk) **nutn**
- real(rk) **nutp**
- real(rk) **nuts**
- real(rk) **phyc**
- real(rk) **phyn**
- real(rk) **phyp**
- real(rk) **phys**

- real(rk) **zooc**
- real(rk) **detc**
- real(rk) **detn**
- real(rk) **detp**
- real(rk) **dets**
- real(rk) **domc**
- real(rk) **domn**
- real(rk) **domp**
- real(rk) **rub**
- real(rk) **chl**

The documentation for this type was generated from the following file:

- maecs_types.F90

6.15 maecs_types::type_maecs_sensitivities Type Reference

Public Attributes

- real(rk) **func_t**
- real(rk) **p_max_t**
- real(rk) **a_light**
- real(rk) **s_phot**
- real(rk) **up_nc**
- real(rk) **up_pc**
- real(rk) **up_sic**

The documentation for this type was generated from the following file:

- maecs_types.F90

6.16 maecs_types::type_maecs_switch Type Reference

Public Attributes

- logical **isp**
- logical **issi**
- logical **istoting**

The documentation for this type was generated from the following file:

- maecs_types.F90

6.17 maecs_types::type_maecs_traitdyn Type Reference

Public Attributes

- real(rk) **dtheta_dt**
- real(rk) **dfracr_dt**
- real(rk) **drchl_dtheta**
- real(rk) **drchl_dfracr**

- real(rk) **drchl_dqn**
- real(rk) **tmp**
- real(rk) **fac1**
- real(rk) **fac2**

The documentation for this type was generated from the following file:

- maecs_types.F90

6.18 maecs_types::type_maecs_zoo Type Reference

Public Attributes

- real(rk) **c**
- real(rk) **n**
- real(rk) **p**
- real(rk) **yield**
- real(rk) **flopp**
- real(rk) **qn**
- real(rk) **qp**
- real(rk) **feeding**

The documentation for this type was generated from the following file:

- maecs_types.F90

Chapter 7

File Documentation

7.1 maecs.F90 File Reference

main MAECS module

```
#include "fabm_driver.h"
```

Data Types

- module fabm_hzg_maecs

  The MAECS module contains initialize do (=> maecs_do) get_light_extinction get_vertical_movement (=> maecs_get_vertical_movement) and maybe some humanly explanation here.
- type fabm_hzg_maecs::type_hzg_maecs

  here we extend a model
- interface fabm_hzg_maecs::maecs_get_vertical_movement

  Brief description of routine.

7.1.1 Detailed Description

main MAECS module

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HZG

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