What are the models that are part of the LBA-MIP?

Natalia and Marcos

21 models in LBA-MIP

- SSiB2
- BIOME-BGC
- SiB3
- LPJ
- HYLAND
- JULES
- SPA
- CLM3.5
- SiB-CASA
- ORCHIDEE
- VISIT
- COLM
- IBIS
- 5PM
- SiB2
- CLM3-DP
- CLM3-GW
- CLM3-OOTB
- NOAH-DV
- NOAH-STD
- LM3V

The LBA-MIP working group understands that a comparison of the ecosystem models that simulate energy, water and CO_2 fluxes against the continuous observations over the LBA area will:

- diagnose how well the models quantify the land surface processes
- identify models deficiencies
- suggest ways models can be improved.

Description of the various models

- Necessary for a general introduction to the experiment
- May allow more sophisticated analyses on the relevance of some processes to simulate some fluxes
- May suggest directions for future model improvement / simplification

- We request that each modeling group answer the questions in the template that we distribute.

- A summary of results will be presented tomorrow.

Model name / LBA-MIP code:			

Carbon Cycle			
Gross Photosynthesis Production (GPP)	Does model simulate GPP?		Yes / No
	Does model consider C3 photosynthesis pathway?		Yes / No / N/A
	Does model consider C4 photosynthesis pathway?		Yes / No / N/A
	Does water stress limit phothosyntesis?		Yes / No / N/A
	Does temperature limit phothosyntesis?		Yes / No / N/A
	Does light limit photosynthesis?		Yes / No / N/A
Autotrophic respiration (Ra)	Does model simulate autotrophic respiration?		Yes / No
	Does model simulate maintenance respiration?		Yes / No / N/A
	Does model simulate growth respiration?		Yes / No / N/A
Net Primary Productivity (NPP)	Is NPP calculated from GPP and Ra?		Yes / No
Live carbon pools	Does model have separate carbon pools?		Yes / No
	Which biomass pools?	aboveground heartwood	Yes / No / N/A
		leaves	Yes / No / N/A
		generic roots	Yes / No / N/A
		coarse / fine roots	Yes / No / N/A
		sapwood above ground	Yes / No / N/A
		sapwood below ground	Yes / No / N/A
		fruits (fruits & flowers)	Yes / No / N/A
		carbohydrate reserve	Yes / No / N/A
Allocation of NPP to live carbon pools	Is the carbon allocation fixed or dynamic in time?		Fixed / Dynamic
	If fixed, which fraction (0-1) is allocated to each pool? (should be consistent with answer above)	aboveground heartwood	
		leaves	
		generic roots	
		coarse / fine roots	
		sapwood above ground	
		sapwood below ground	
		fruits (fruits & flowers)	
		carbohydrate reserve	
Turnover times of live carbon pools	What is the typical turnover time of each live carbon pool. Please specify unit [days/years]	aboveground heartwood	[days] / [years]
		leaves	[days] / [years]
		generic roots	[days] / [years]
		coarse / fine roots	[days] / [years]
		sapwood above ground	[days] / [years]
		sapwood below ground	[days] / [years]
		fruits (fruits & flowers)	[days] / [years]
		carbohydrate reserve	[days] / [years]
Other carbon pools	Does model include litter pool?		Yes / No
	Which litter pools are included in model?	structural	Yes / No / N/A
		metabolic	Yes / No / N/A
		above surface	Yes / No / N/A
		below surface	Yes / No / N/A
	Does model include soil carbon pool?		Yes / No
	Which soil carbon pools are included in model?	active (fast)	Yes / No / N/A
		slow	Yes / No / N/A
		passive	Yes / No / N/A
	What is depth of the soil carbon pool, in m?		[m] / N/A
	What is the integrated turnover time soil carbon pool (stock / flux soil carbon pool in equilibrium)		[years] / N/A
Heterotrophic respiration	The heterotrophic respiration rates are fixed or dynamic in time?		Fixed / Dynamic
Time step carbon cycle	What is the time step of the carbon cycle? Please specify unit.		

Energy and Water Cycles			
Radiation fluxes	Does model specify reflectance / transmittance /absorptance at different wavebands for the solar radiation?		Yes / No
	Does model calculate infrared radiation transfer?		Yes / No
	Does model represent canopy gaps with respect to canopy radiative transfer?		Yes / No
Energy fluxes	Does model partition net radiation in latent and		Yes / No
	Does model simulate ground heat flux?		Yes / No
	Does model have canopy heat storage (ie, canopy temperature varies with time?)		Yes / No
Conductances	Does model parametrize turbulent processes?		Yes / No
	Does model parametrize in-canopy diffusive processes?		Yes / No
	Does model parametrize canopy / stomatal conductance?		Yes / No
	Is the canopy / stomatal conductance connected to the photosynthesis component?		Yes / No / N/A
Precipitation partition	Is the precipitation partition dynamic or static?		Dynamic / static?
	Is the precipitation partitioned among which processes?	Transpiration	Yes / No
		Soil evaporation	Yes / No
		Canopy evaporation	Yes / No
		Interception	Yes / No
		Runoff	Yes / No
		Groundwater flow	Yes / No
Time step SVAT	What is the time step of the SVAT, in hours?		[hours] / N/A

Vegetation Dynamics			
Disturbance	Does the model include disturbance?		Yes / No
	Which types of disturbance model includes?	Fires	Yes / No / N/A
		Land use change	Yes / No / N/A
		Blowdowns	Yes / No / N/A
		Other	Yes / No / N/A
Vegetation Dynamics Processes	Does the model include tree mortality?		Yes / No
	Does the model include senescence?		Yes / No
	Does the vegetation compete for light?		Yes / No
	Does the vegetation compete for water?		Yes / No
LAI	Is LAI fixed in time (annual mean value)?		Yes / No
	Is LAI fixed in time, but presenting a seasonal cycle?		Yes / No
	Is LAI dynamically calculated?		Yes / No
	Is LAI assimilated from remote sensing?		Yes / No
Plant functional types	Total number of plant functional types		
	Number of plant functional types used in all LBA-MIP simulations		
Parametrization of plant functional types	Vcmax, opt: Opt max rubisco-limited potential photosynthetic capacity		Yes / No
	Topt: Optimum photosynthetic temperature		Yes / No
	□max: Maximum LAI □beyond which there is no allocation of biomass to leaves		Yes / No
	z root: exponential depth scale for root length profile depth scale for root length profile		Yes / No
	□leaf: prescribed leaf albedo		Yes / No
	h: prescribed height of vegetation		Yes / No
	Ac: critical leaf age for leaf senescence		Yes / No
	Ts: weekly temperature□below which leaves are shed if seasonal temperature tre		Yes / No
	Hs: weekly moisture stress below which leaves are shed		Yes / No
	Eo: activation energy		Yes / No
	Rref: reference respiration		Yes / No
	Other (specify)		
Dynamic vegetation model (DVGM)	Name & Reference		
Time step DVGM	What is the time step of DGVM? Please specify unit.		

Other	
Number of soil layers for water & temperature	
Number of soil carbon pools	
Total soil layer depth	
Depth of water extraction (rooting system depth), in m	
Number of canopy layers	
Does water extraction varies according to depth	Yes / No
Does model include hydraulic redistribution?	Yes / No
Does model have a N limitation function of soil humidity & temperature (microbial activity)?	Yes / No