The Intersectoral Impact Model Intercomparison Project (ISIMIP)

Biomes Meeting 06-06-2023

Sector coordination

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Agenda

1. Biomes model update and status of simulations
2. Paper plans
3. Discussion & next steps
4. Groupiii simulations (Land-use data, adaptation)
5. Integration across sectors

Status biomes simulations

Model	Contact	
CARAIB	Louis Francois	3a to be uploaded, 3b to be started
CLASSIC	Sian Kou-Giesbrecht	3a uploaded, 3b for IPSL, GFDL
CLM5.0	Wim Thiery	will start runs soon, high priority
DLEM	Hanqin Tian/ Hao Shi	3a available, 3b in progress
JULES	Eleanor Burke	3a/3b to be/in process of being uploaded
LPJ-GUESS	Matthew Forrest. Thomas Hickler	3a simulated, needs uploading
LPJmL	Sebastian Ostberg	Test runs ongoing
LPJ-wsl	Zhen Zhang, Ben Poulter	3a uploaded
ORCHIDEE	Jinfeng Chang	3a and 3b being uploaded, further runs ongoing
VEGAS	Fang Zhao	Unclear
VISIT	Akihiko Ito	Currently wearing the "yellow jersey"
ELM-ECA	Qing Zhu, Bill Riley	3a finished, 3b GFDL
MC2-DGVM	John Kim	3a and 3b being uploaded/processed
SSiB4/ TRIFFID	Huilin Huang	3a uploaded as part of fire

Paper plans

- Sian Kou-Giesbrecht ▯N-cycling
- Akihiko Ito ▯Attribution SI
- Jinfeng Chang ▯ permafrost future
- Jinfeng Chang ▯ permafrost regional evaluation (maybe with TG1.7)
- Qing Zhu ▯Carbon-nutrient interactions during future permafrost thaws
- Hanqin Tian/Hao Shi ▯1) biomass evaluation 2) interacting effects of co2 and warming in different climate zones differentiate precipitation and temperature
- Thomas Hickler 2b

Global nitrogen cycling in historical and future simulations

- Lead: Sian Kou-Giesbrecht
- ISIMIP3a + 3b
- Compare historical simulations to observation-based estimates: nveg, fbnf, fnnetmin, fn2o, etc.
- N losses in future simulations: fnh3, fn2o, fnleach, fngasfire, etc.
- Compare C cycling in models with and without N cycle (historical and future simulations)

N-cycling on/off

- Yes: CLASSIC, Jules, ELM-ECA, CLM5.0, whoelse?
- Maybe: LPJ-GUESS
- No N-cycling included: LPJml, MC2, ORCHIDEE and VISIT
- Unclear: DLEM, CARAIB, LPJ-wsl, VEGAS,
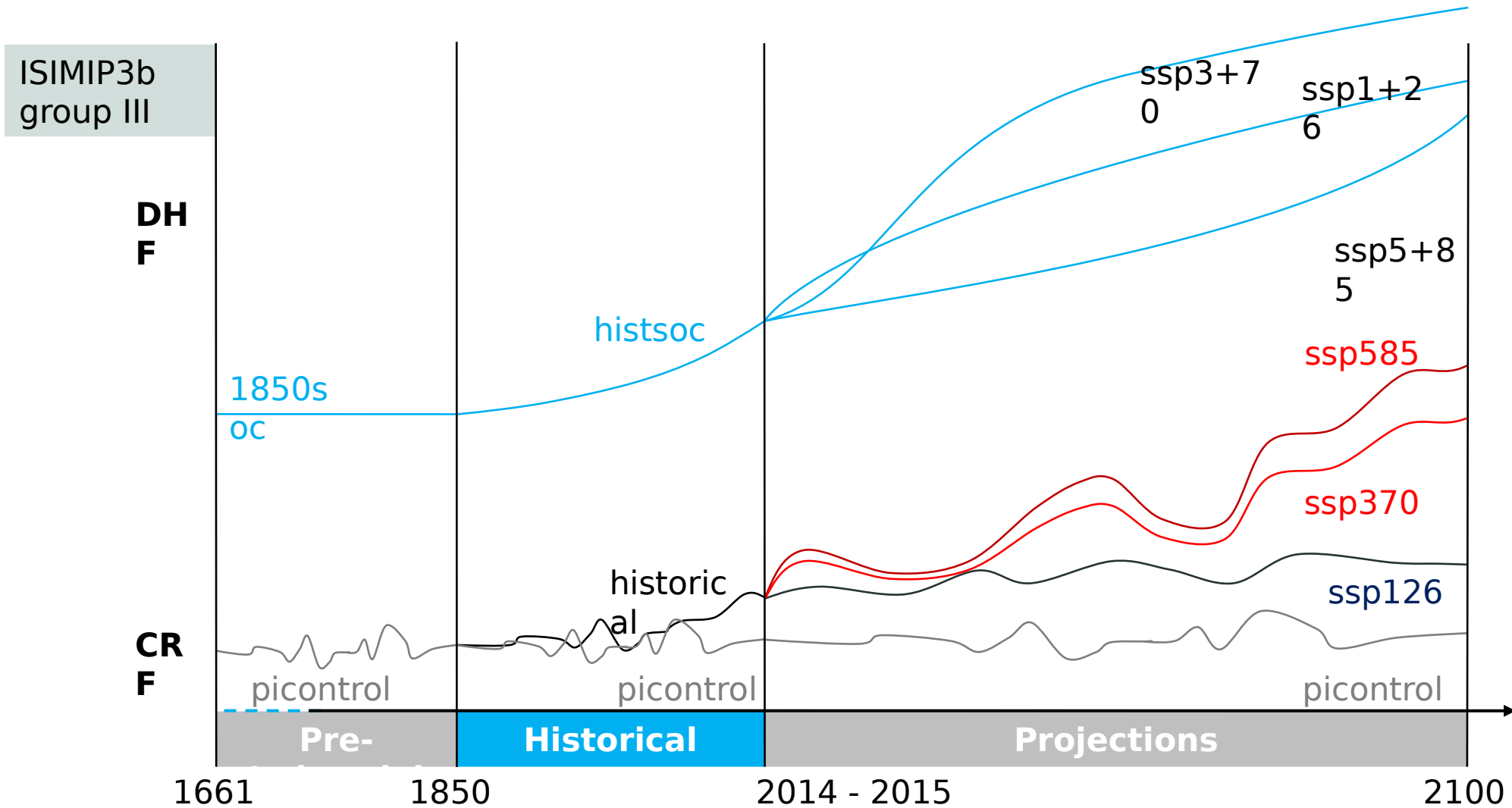
Next meetings & key lists

- Next biomes call around July 2023

Mailing lists:

- isimip-followers@listserv.dfn.de
- isimip-caveats@listserv.dfn.de
- https://www.listserv.dfn.de/sympa/info/proclias-all

- Join PROCLIAS Woking Groups:
- https://www.cost.eu/cost-action/process-based-models-for-climate-impact-attribution-across-sectors/#tabs+Name:Working%20Groups%20and%20Membership
- Or via https://proclias.eu/

Groupiii – Questions to Edna?

Groupiii - Adaptation

RCP2.6 2015soc-from-histsoc **1st priority** `ISIMIP3b` `agriculture` `biodiversity` `biomes` `diarrhea` `fire` `health` `coastal` `labour` `lakes_global` `lakes_local` `marine-fishery_global` `marine-fishery_regional` `peat` `permafrost` `water_global` `water_regional`	Identical to the similar **picontrol/1850soc** run above.	**historical** **histsoc**	**ssp126** **2015soc-from-histsoc**
RCP2.6 2015soc **1st priority** `ISIMIP3b` `agriculture` `biodiversity` `biomes` `coastal` `diarrhea` `fire` `health` `coastal` `labour` `lakes_global` `lakes_local` `peat` `permafrost` `water_global` `water_regional`	Does not have to be simulated, spin-up should be based on the 2015 DHF (see note below the table).	**historical** **2015soc**	**ssp126** **2015soc**
RCP2.6 1850soc **2nd priority** `ISIMIP3b` `biomes` `lakes_global` `lakes_local` `peat` `permafrost` `water_global`	Identical to the similar **picontrol/1850soc** run above.	**historical** **1850soc**	**ssp126** **1850soc**
RCP2.6 nat **2nd priority** `ISIMIP3b` `biomes` `peat` `marine-fishery_global` `marine-fishery_regional`	Does not have to be simulated, spin-up should not use any DHF (see note below the table).	**historical** **nat**	**ssp126** **nat**
RCP2.6 ssp126soc **1st priority** `ISIMIP3b` `agriculture` `biodiversity` `biomes` `diarrhea` `fire` `health` `coastal` `labour` `lakes_global` `lakes_local` `marine-fishery_global` `marine-fishery_regional` `peat` `permafrost` `water_global` `water_regional`	Identical to the similar **picontrol/1850soc** run above.	Identical to the similar **historical/histsoc** run above.	**ssp126** **ssp126soc-noadapt**
RCP2.6 ssp126soc-adapt **1st priority** `ISIMIP3b` `agriculture` `biodiversity` `biomes` `diarrhea` `fire` `health` `coastal` `labour` `lakes_global` `lakes_local` `marine-fishery_global` `marine-fishery_regional` `peat` `permafrost` `water_global` `water_regional`	Identical to the similar **picontrol/1850soc** run above.	Identical to the similar **historical/histsoc** run above.	**ssp126** **ssp126soc-adapt**

Adaptation challenge: Other measures to take into account?

... by additional / more detailed data sets on DHF:

- drainage of wetlands (peat)
- more detailed specification of land use (biodiversity)

... in a more rule-based approach:

- Changes in fire management (fire, biomes)
- changes in agricultural practices (agriculture)
- dam operations (global / regional water)
- flood protection levels (water / coastal systems)
- forest management (biomes / regional forest)

What level of adaptation do we want to consider in these additional measures?

	no adaptation	adaptation	To do
LU patterns	SSP1/ SSP3/ SSP5	SSP126/ SSP370/ SSP585	harmonization of GLOBIOM, IMAGE patterns
irrigation patterns	SSP1/ SSP3/ SSP5	SSP126/ SSP370/ SSP585	harmonization of GLOBIOM, IMAGE patterns, quality check
fertilizer input rates	SSP1/ SSP3/ SSP5	SSP126/ SSP370/ SSP585	bias adjustment of LUM national rates to LUH2 rates, addition of manure
growing seasons	fixed present day	SSP126/ SSP370/ SSP585	ready
hydropower dam locations	SSP1/ SSP3/ SSP5	SSP126/ SSP370/ SSP585	map to 0.5 degree grid, add upstream areas for inclusion into models
irrigation techniques shares	SSP1/SSP3/ SSP5	SSP126/ SSP370/ SSP585	can be provided but needs clarification how to apply in models

	no adaptation	adaptation	To do
sea water desalination	SSP1/SSP3/ SSP5	SSP126/ SSP370/ SSP585	ready
inter-basin water transfer	existing/under construction	existing/under construction/planned	ready
population patterns	SSP1/ SSP3/ SSP5	-	harmonization of gridded data to national totals
GDP	SSP1/ SSP3/ SSP5	-	harmonization of gridded data to national totals
fishing intensities	SSP1/ SSP3/ SSP5	SSP126/ SSP370/ SSP585	under development (see presentation by Olivier Maury)
heat-related mortality	?	?	under development