

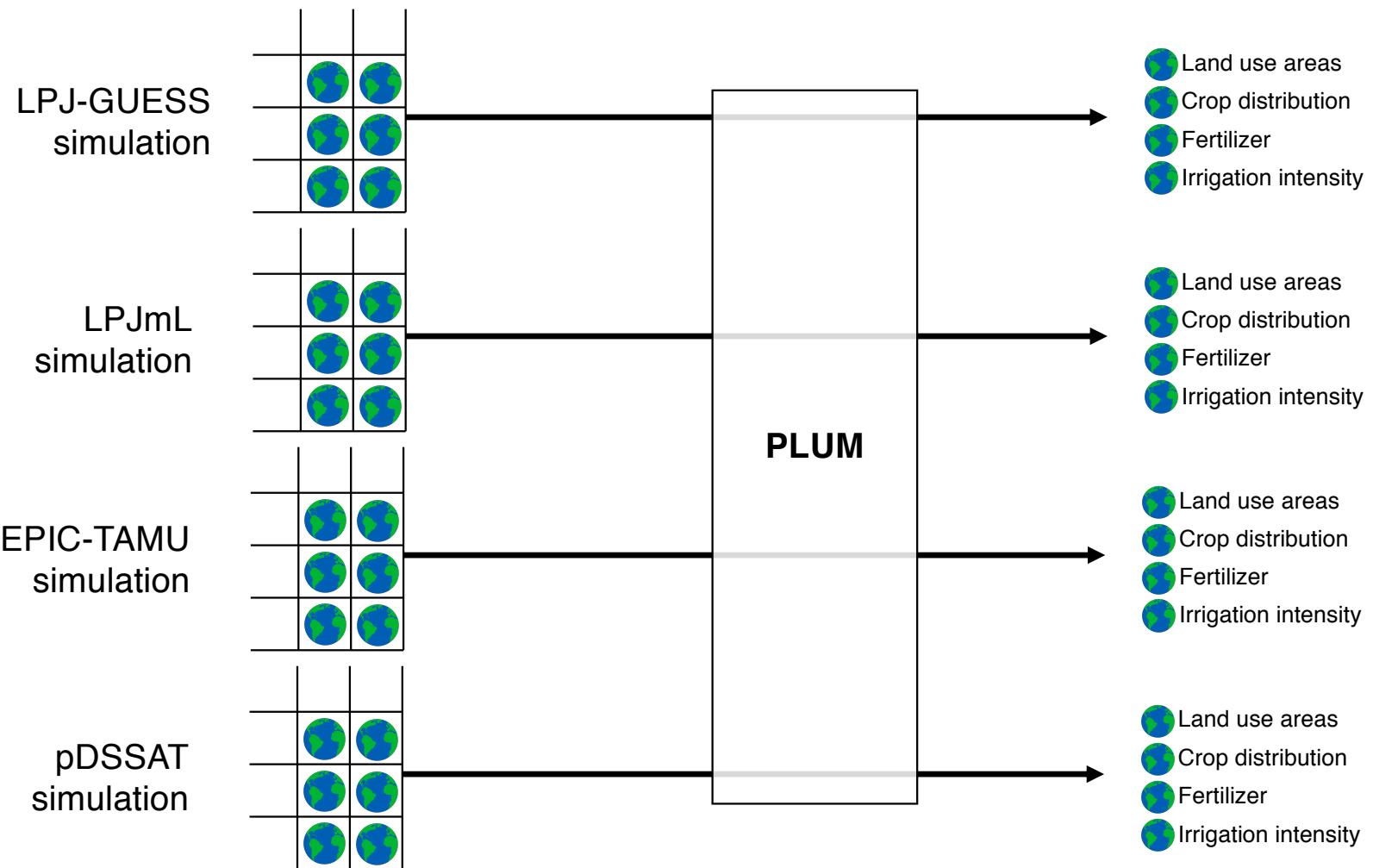
Feeding PLUM with crop emulators

2021-01-11

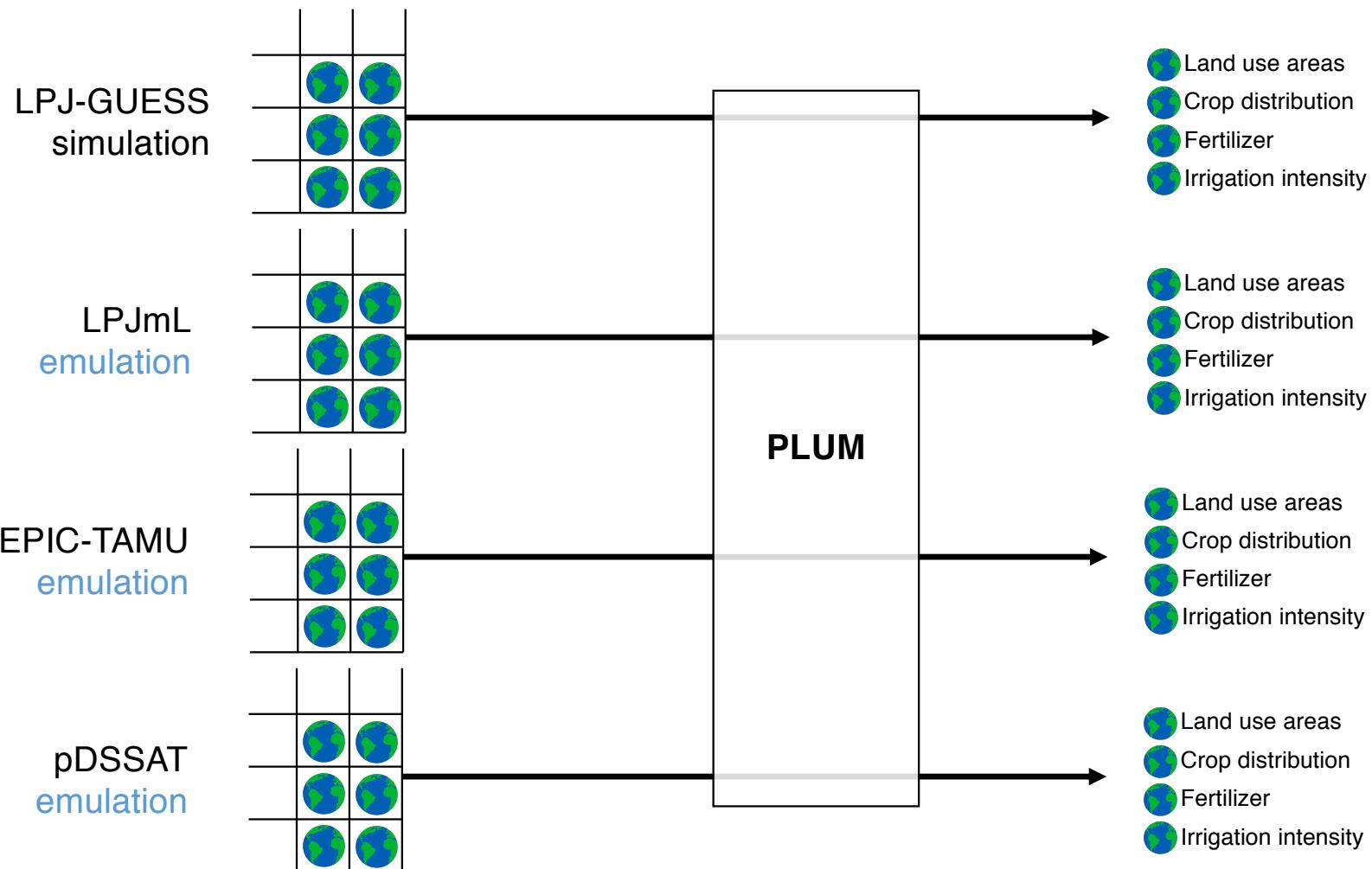
Maillot vert: Meeting IPCC AR6 submission deadline: Jonas Jägermeyr and Sam Rabin



Crop model uncertainty



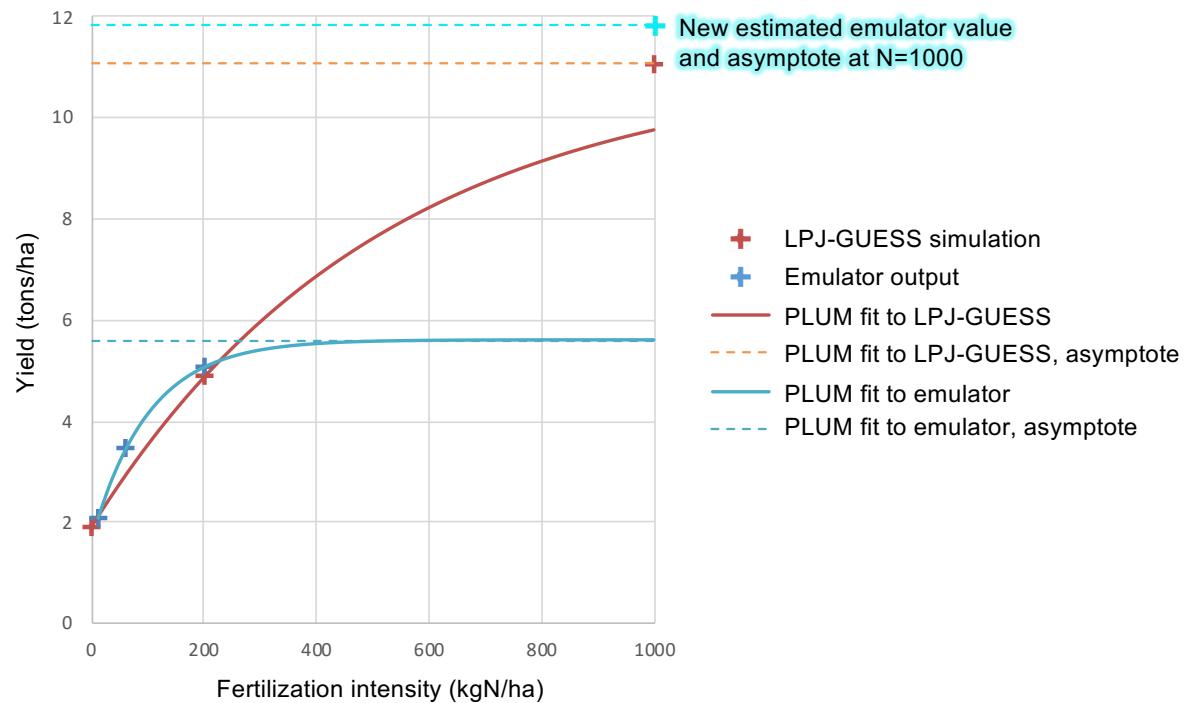
Use emulators



Previous issues

Emulators max out at 200 kgN/ha,
too low for PLUM to produce
realistic outputs.

✓ Boost to 1000 kgN/ha based
on LPJ-GUESS simulations



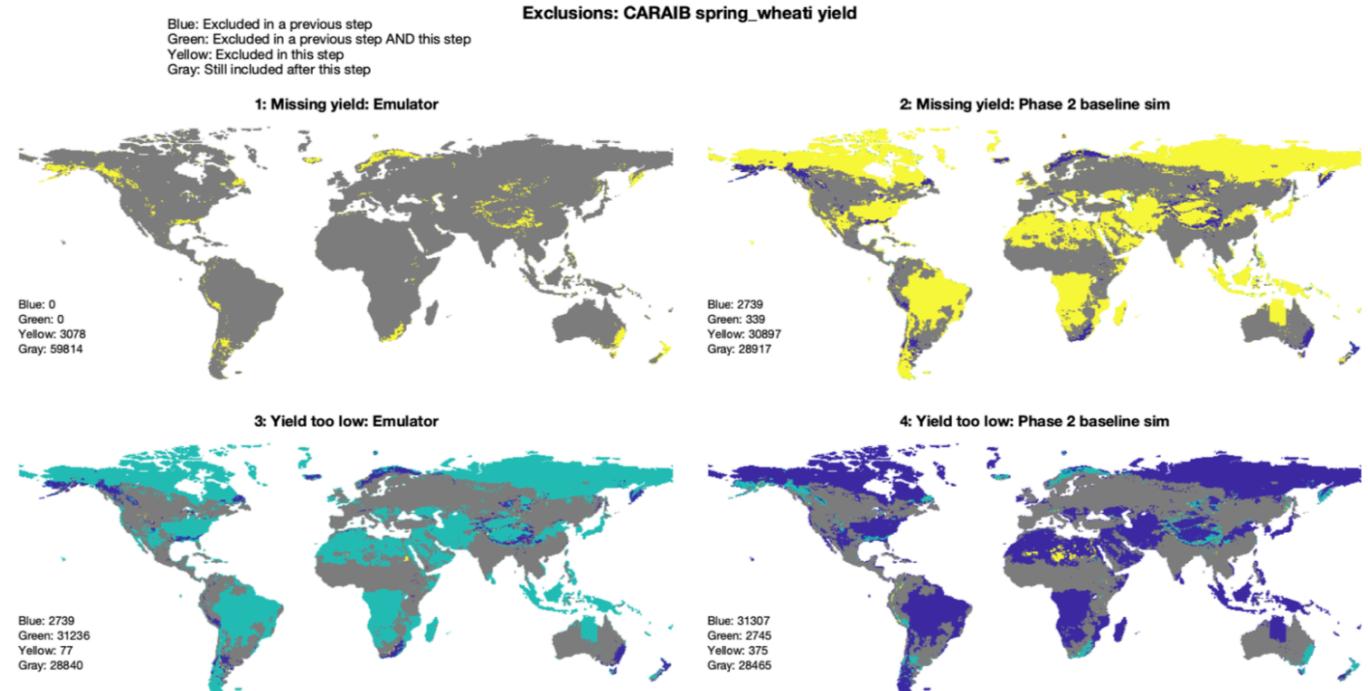
Previous issues

Some emulators missing
too much simulated area

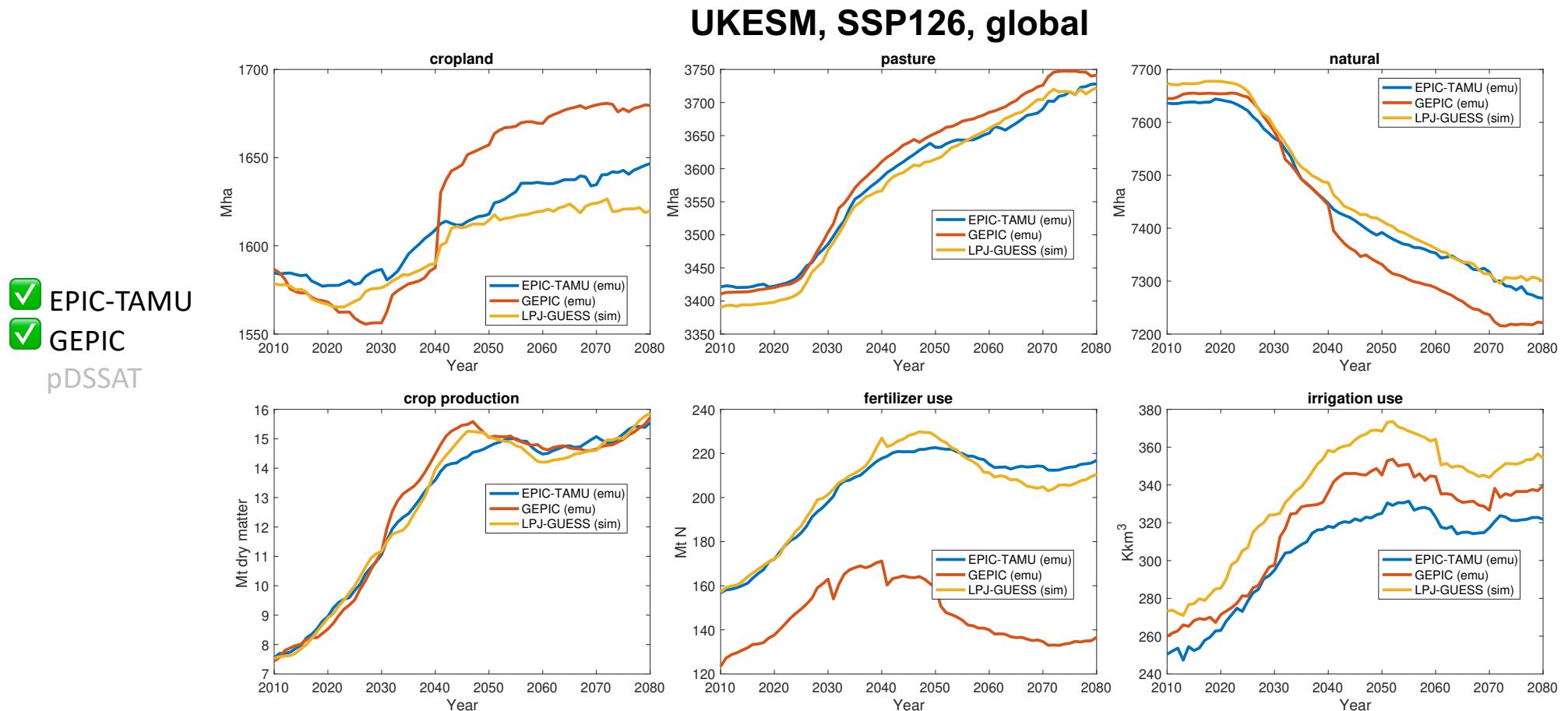
Remaining:

- EPIC-TAMU
- GEPIC
- pDSSAT

**✗ PEPIC Problems with
irrigation emulators**



Happy new year: It's working!



✓ EPIC-TAMU
✓ GEPIC

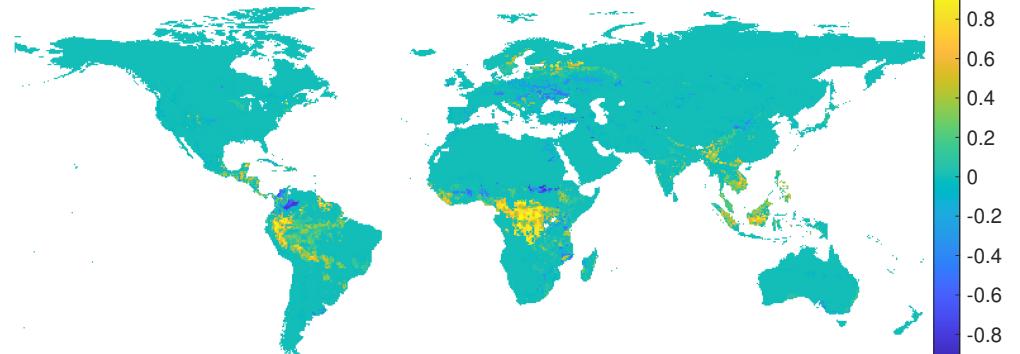
pDSSAT

Happy new year:
It's working!

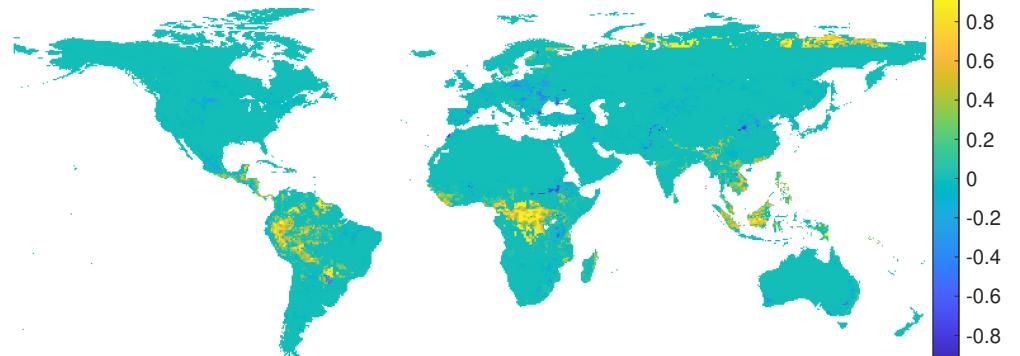
- EPIC-TAMU
- GEPIC
- pDSSAT

UKESM, SSP126
 Δ agricultural fraction
2010–2080

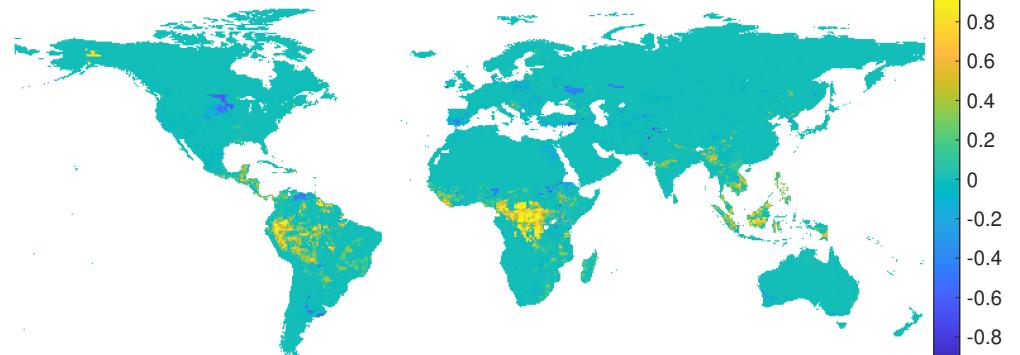
EPIC-TAMU (emu)



GEPIC (emu)



LPJ-GUESS (sim)



Next steps

- Finish processing changes for pDSSAT
- Process all 5 GCMs x 3 scenarios
- Perform LPJ-GUESS potential-yield runs with CMIP6 climates (also generates pasture productivity, required by PLUM)
- Perform PLUM runs given emulated and simulated yields
 - Median parameters
 - + Parameter uncertainty?
- Compare contributions to PLUM-output land-use uncertainty:
 - Scenario
 - GCM
 - Crop model/emulator
 - + PLUM parameters?

Fix LPJ-GUESS... (?)