

Land Use in the SSPs

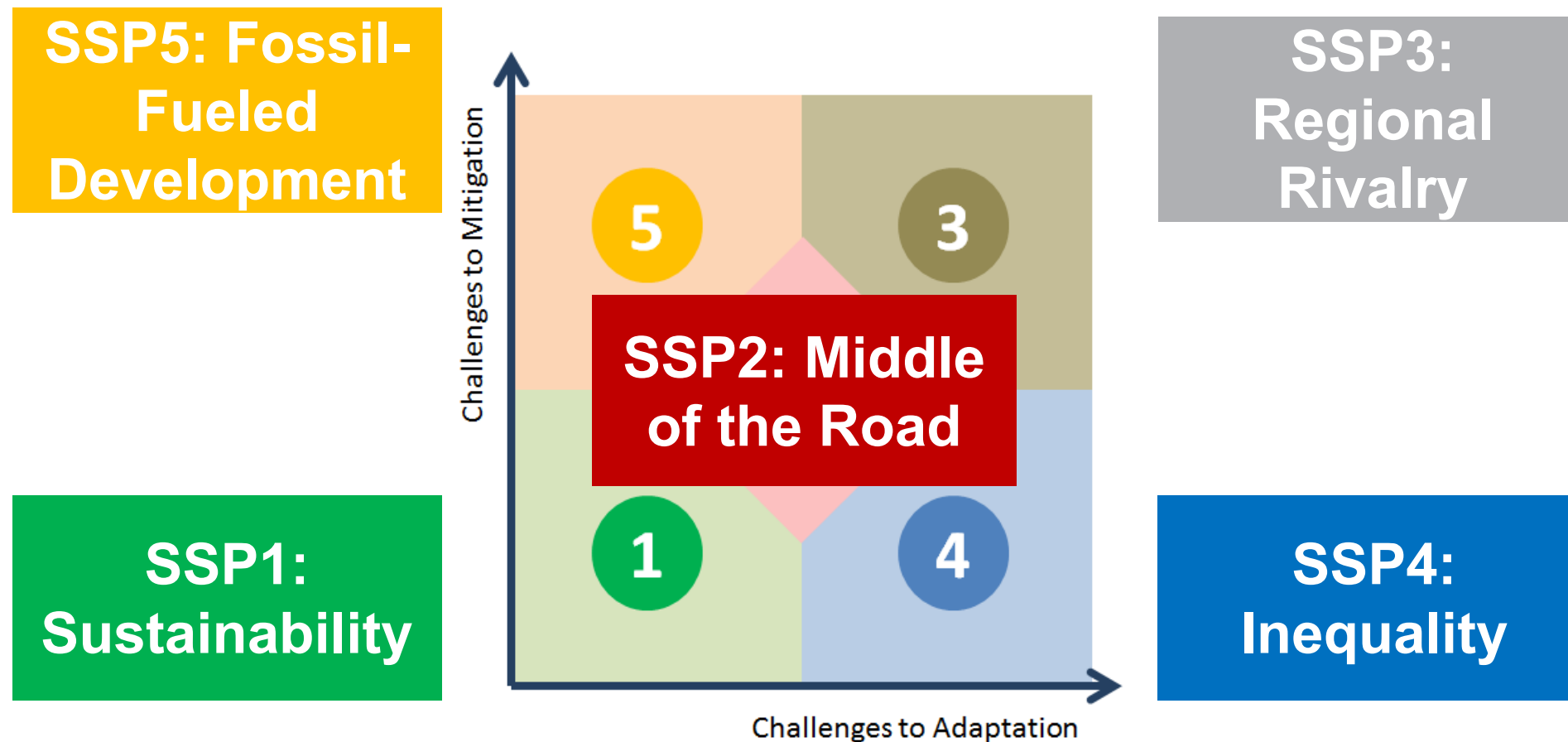
November 25, 2019

Kate Calvin



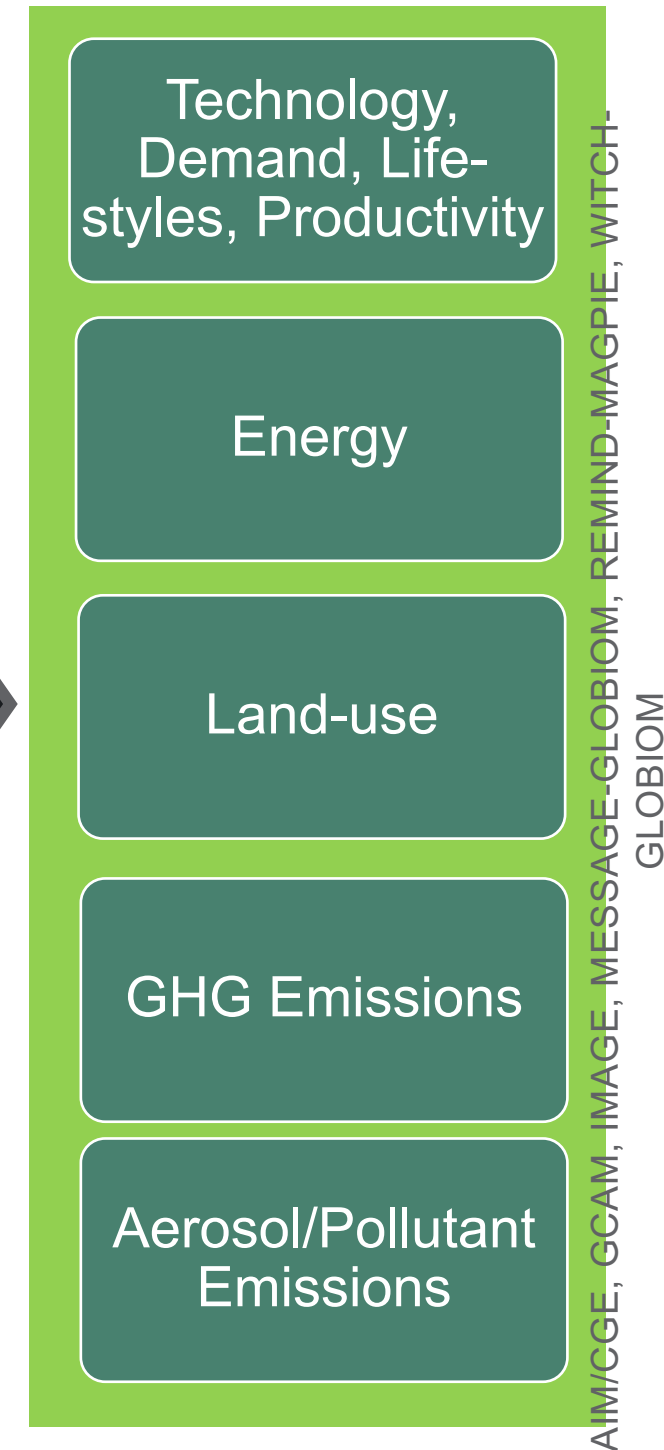
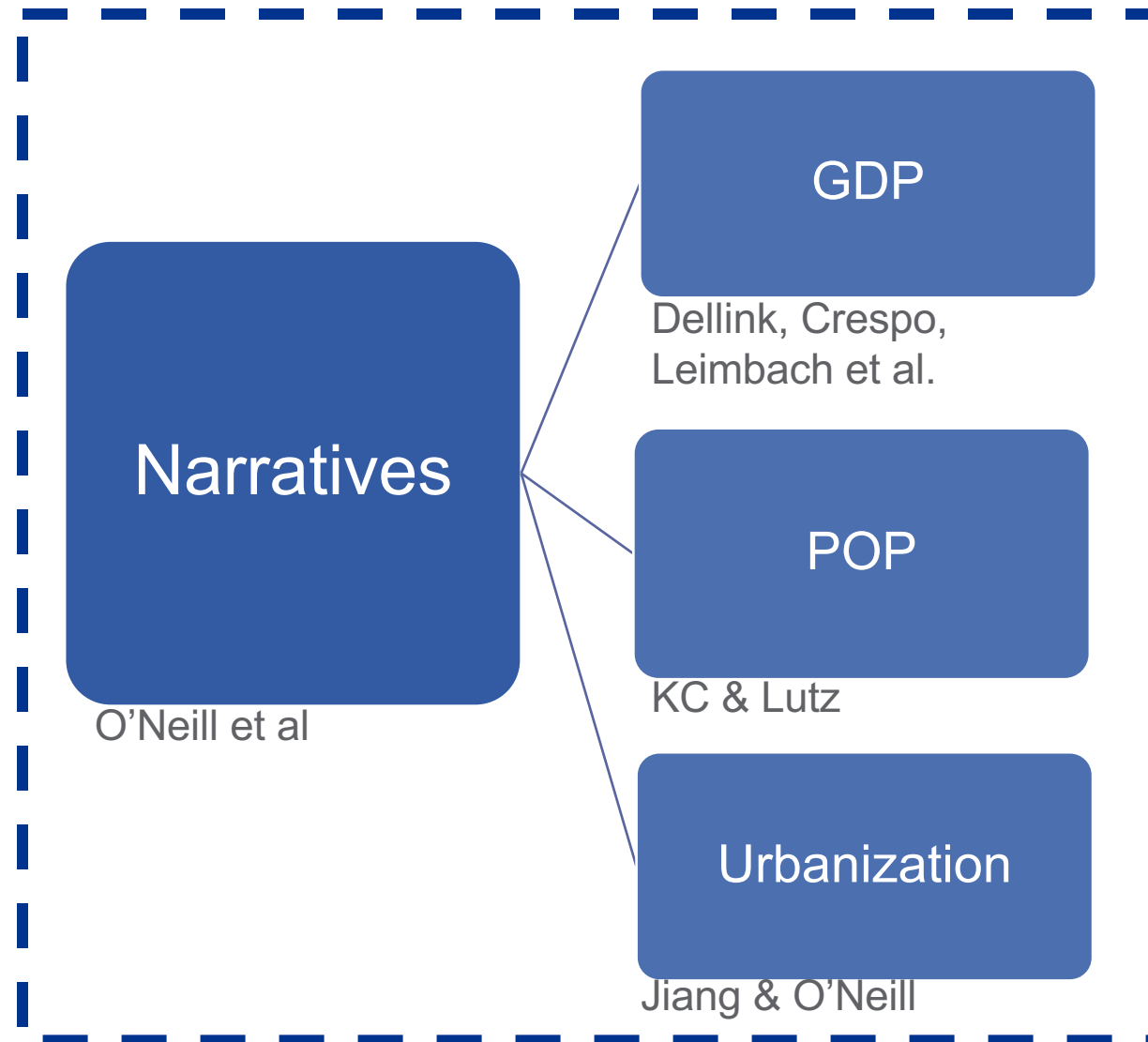
Overall Process

- Five Shared Socio-economic Pathways were designed to explore a range of future societal circumstances that exhibit a wide range of
 - Challenges to adaptation, and
 - Challenges to mitigation.



Overall Process

SSPs (Basic Drivers)



SSP Storylines

SSP5

Food Demand: High
LUC Regulation: Medium
Ag Productivity: High
Trade: Globalized
Marker: REMIND-MAGPIE

SSP3

Food Demand: Low
LUC Regulation: Low
Ag Productivity: Low
Trade: Regionalized
Marker: AIM/CGE

SSP2

Food Demand: Medium
LUC Regulation: Medium
Ag Productivity: Medium
Trade: Regionalized
Marker: MESSAGE-GLOBIOM

SSP1

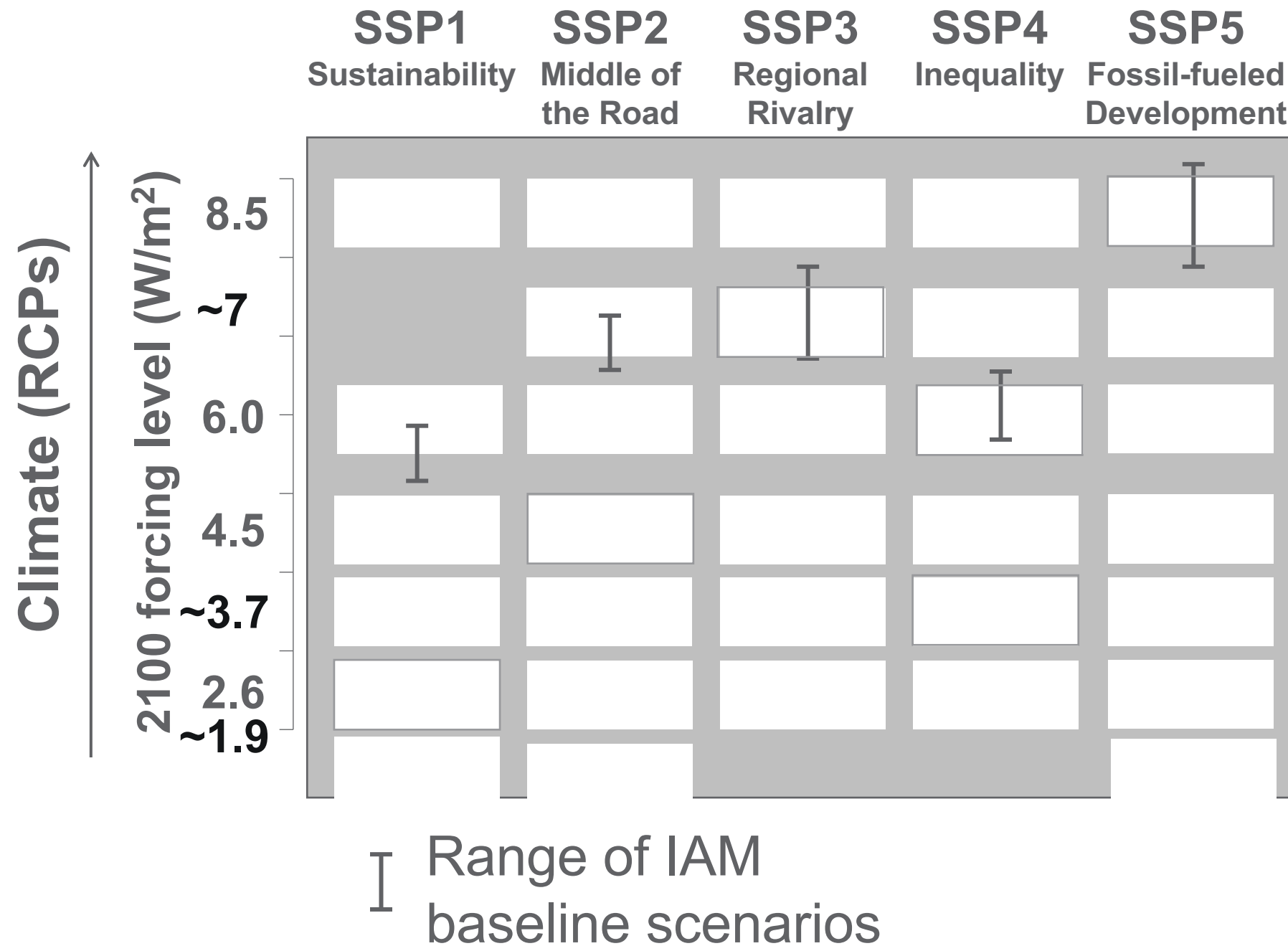
Food Demand: Low
LUC Regulation: Strong
Ag Productivity: High
Trade: Globalized
Marker: IMAGE

SSP4

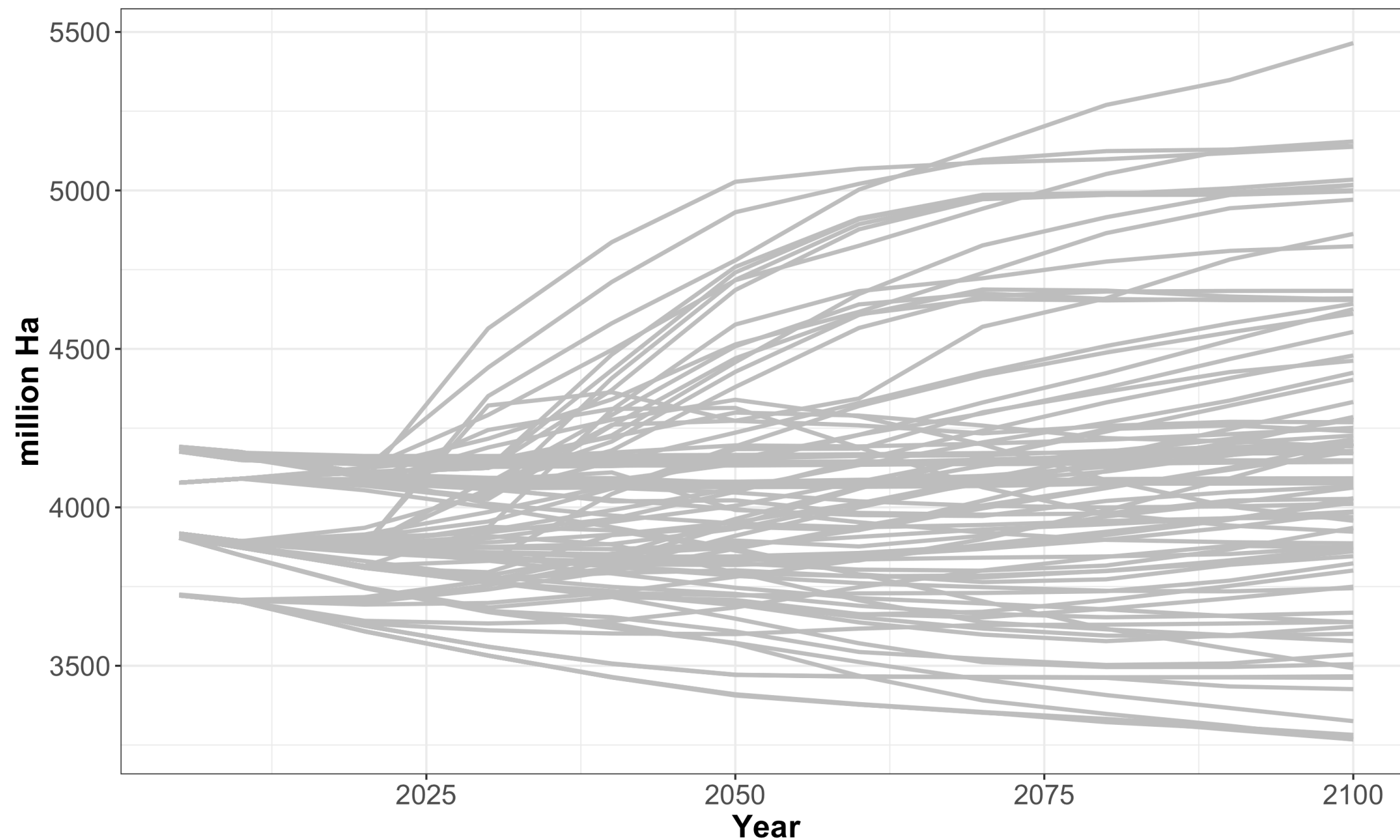
Food Demand: Medium
LUC Regulation (Low Income): Low
LUC Regulation (High Income): High
Ag Productivity (Low Income): Low
Ag Productivity (High Income): High
Trade: Limited Access for Low Inc
Marker: GCAM

Combining SSPs and RCPs

Shared Socioeconomic Pathways

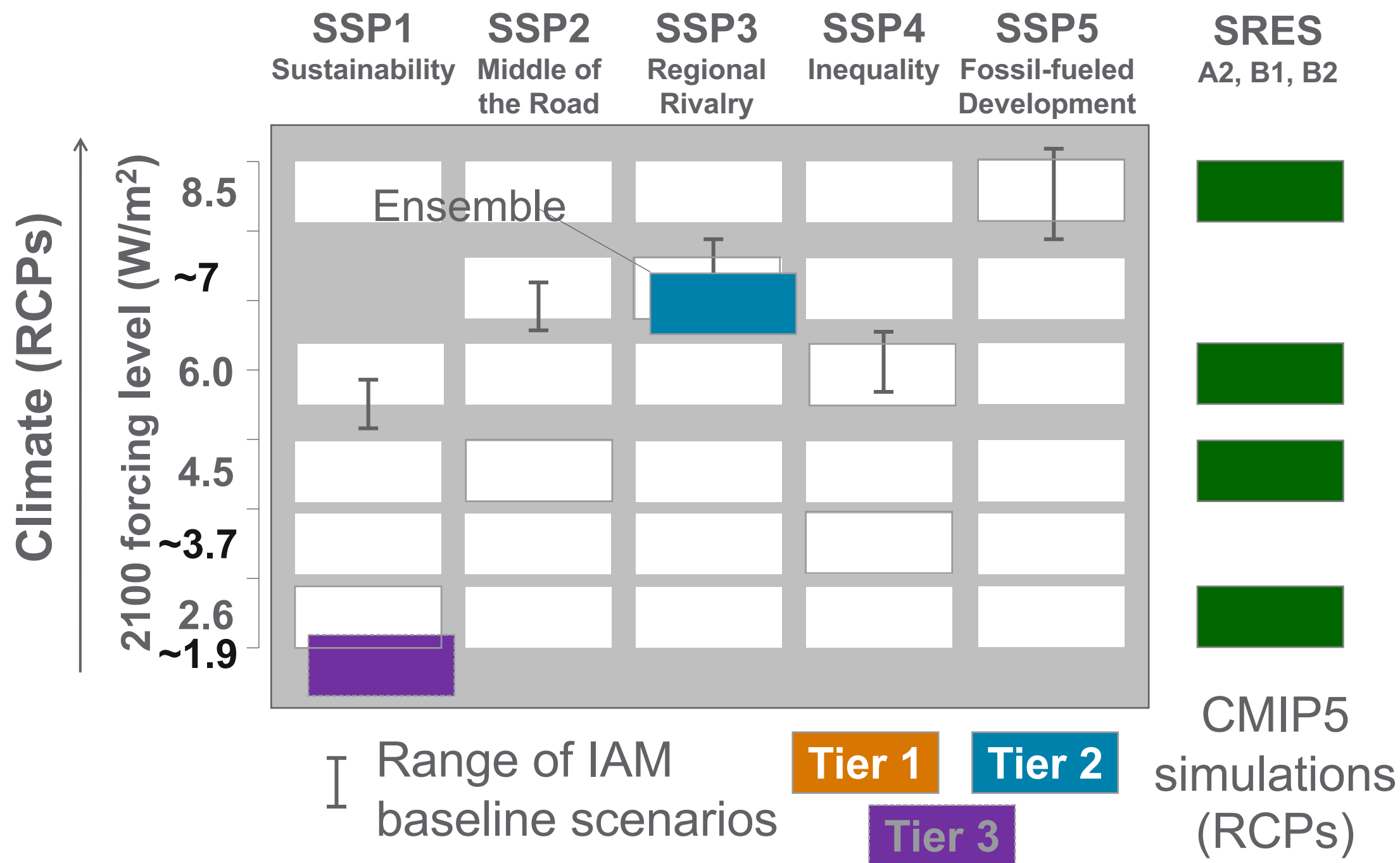


Global Forest Cover in all SSP-RCP-IAM combinations



ScenarioMIP Design: Specific Scenarios

Shared Socioeconomic Pathways



Global Forest Cover in ScenarioMIP Scenarios

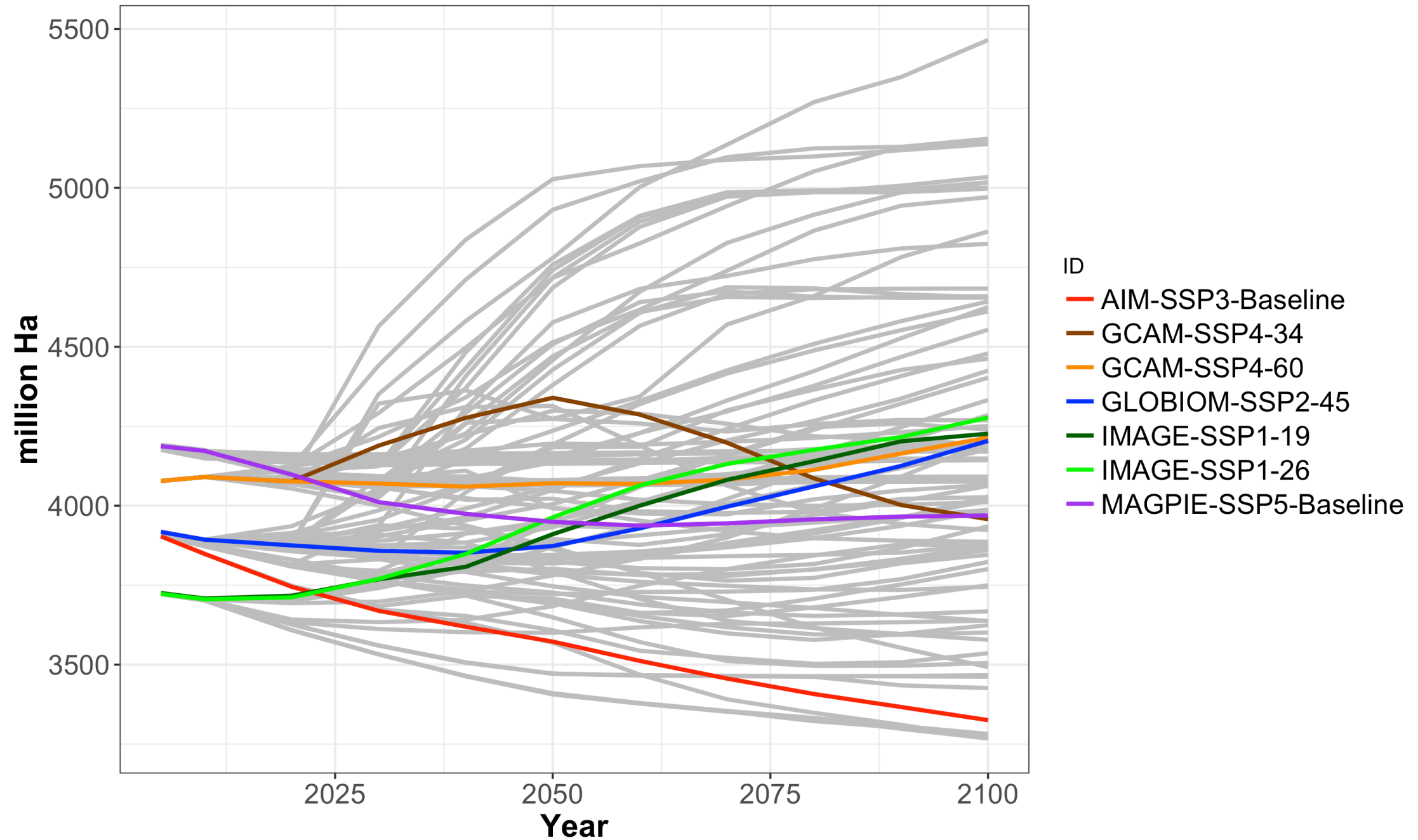
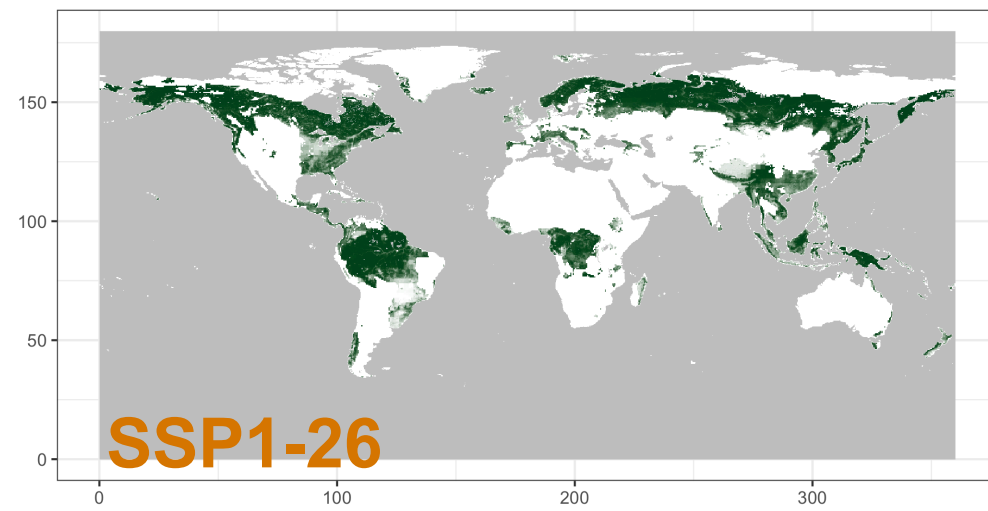
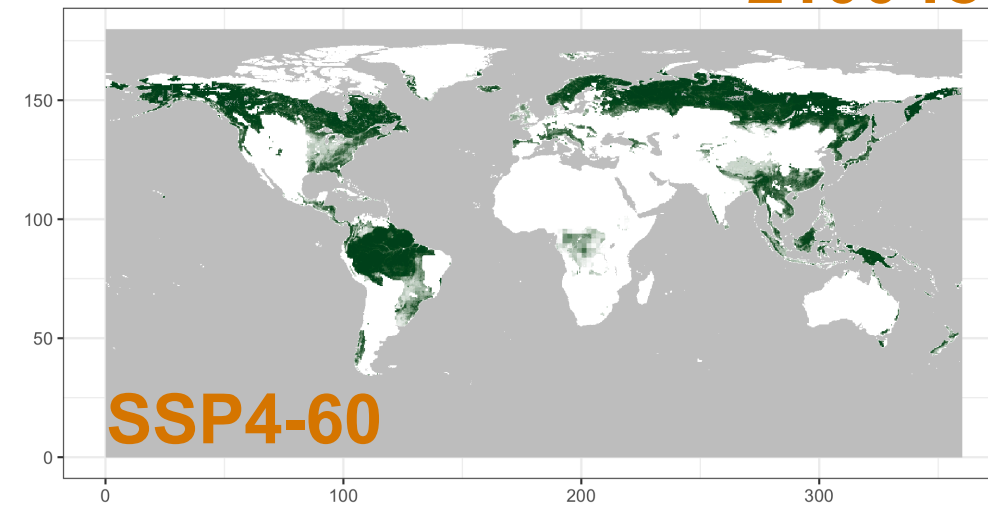




IMAGE-ssp126 forest

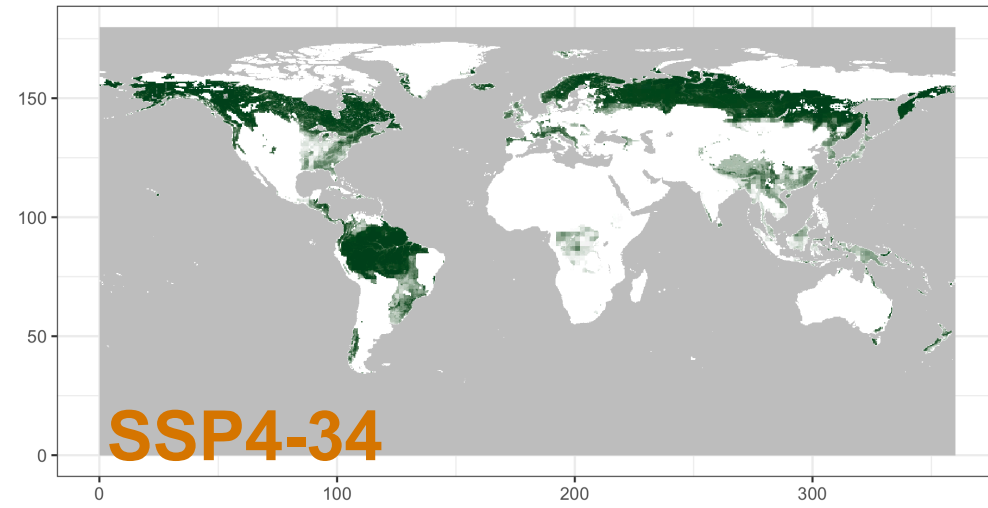


GCAM-ssp460 forest

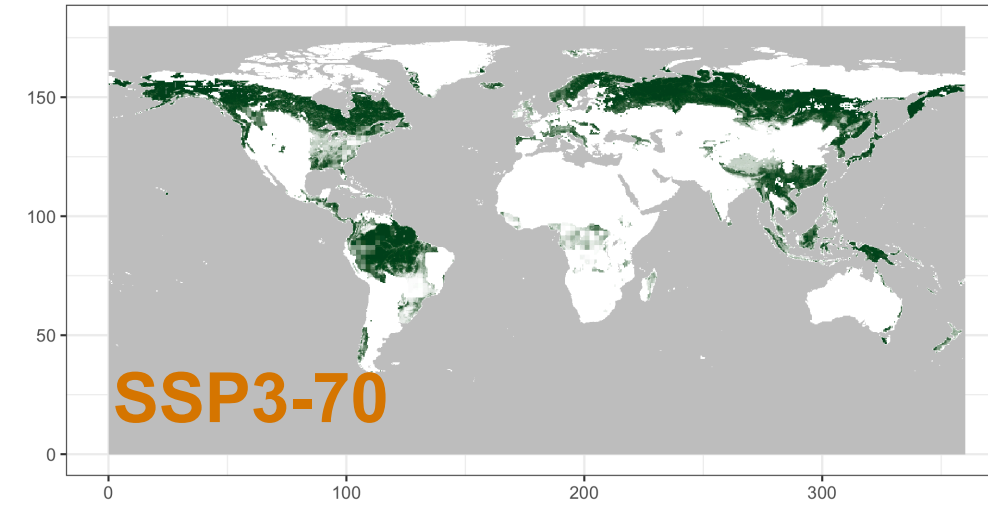


2100 forest

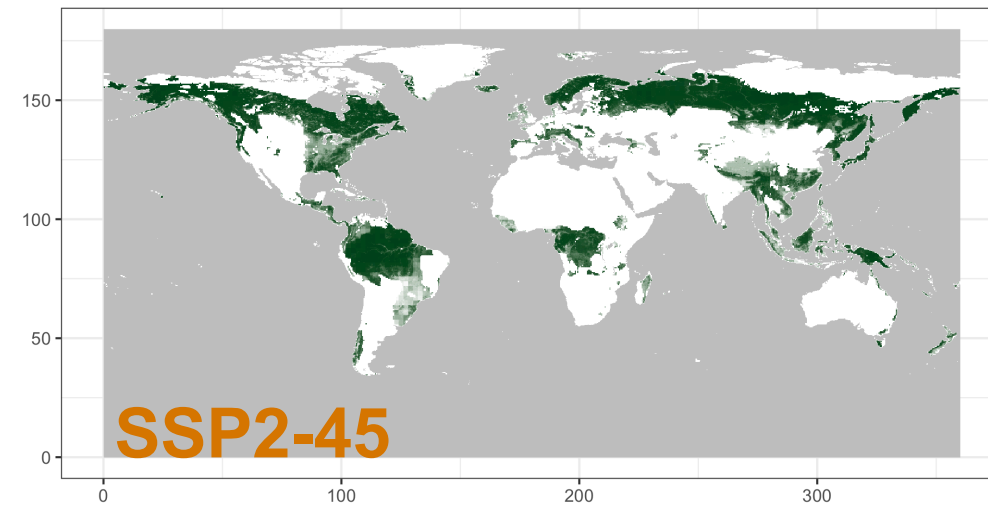
GCAM-ssp434 forest



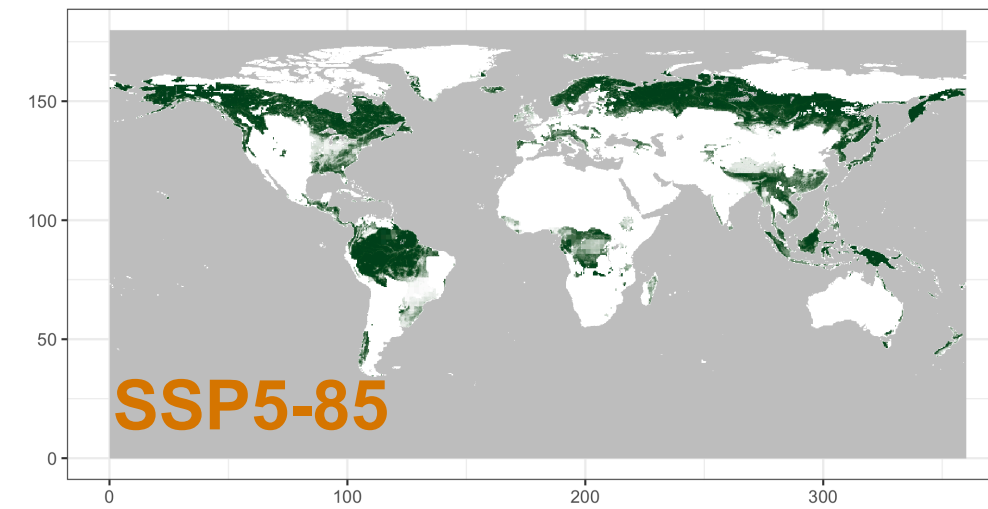
AIM-ssp370 forest



MESSAGE-ssp245 forest



MAGPIE-ssp585 forest

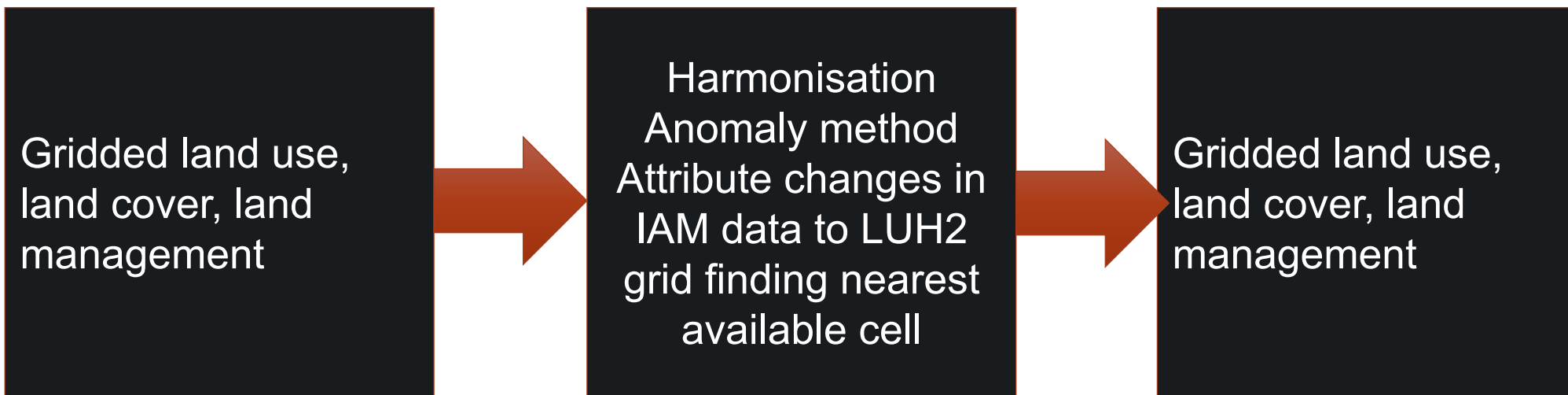


Translating land use

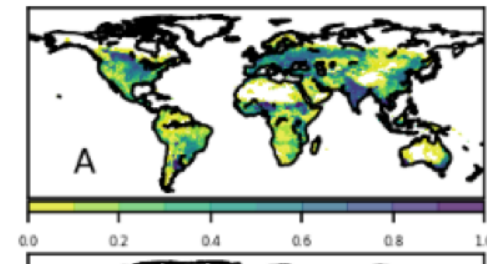
IAM

LUH2

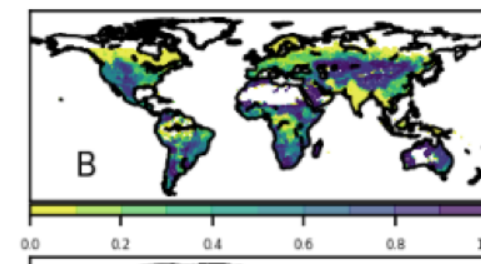
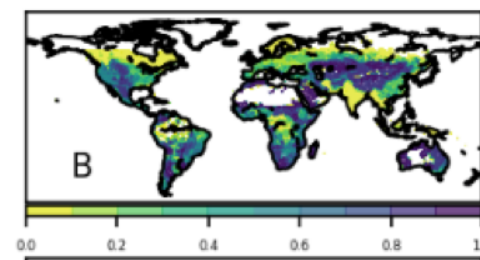
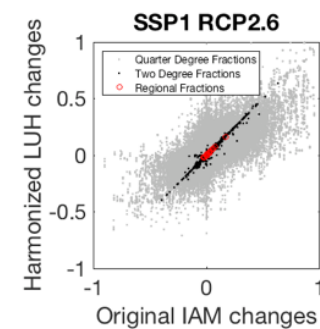
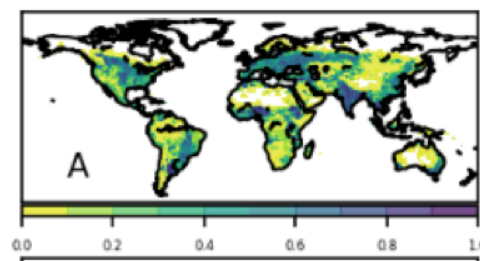
ESM



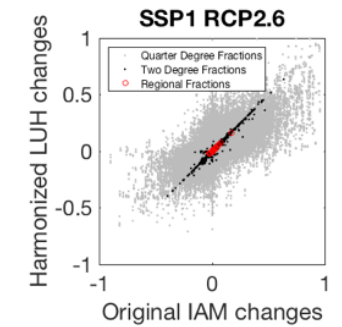
IAM



LUH2



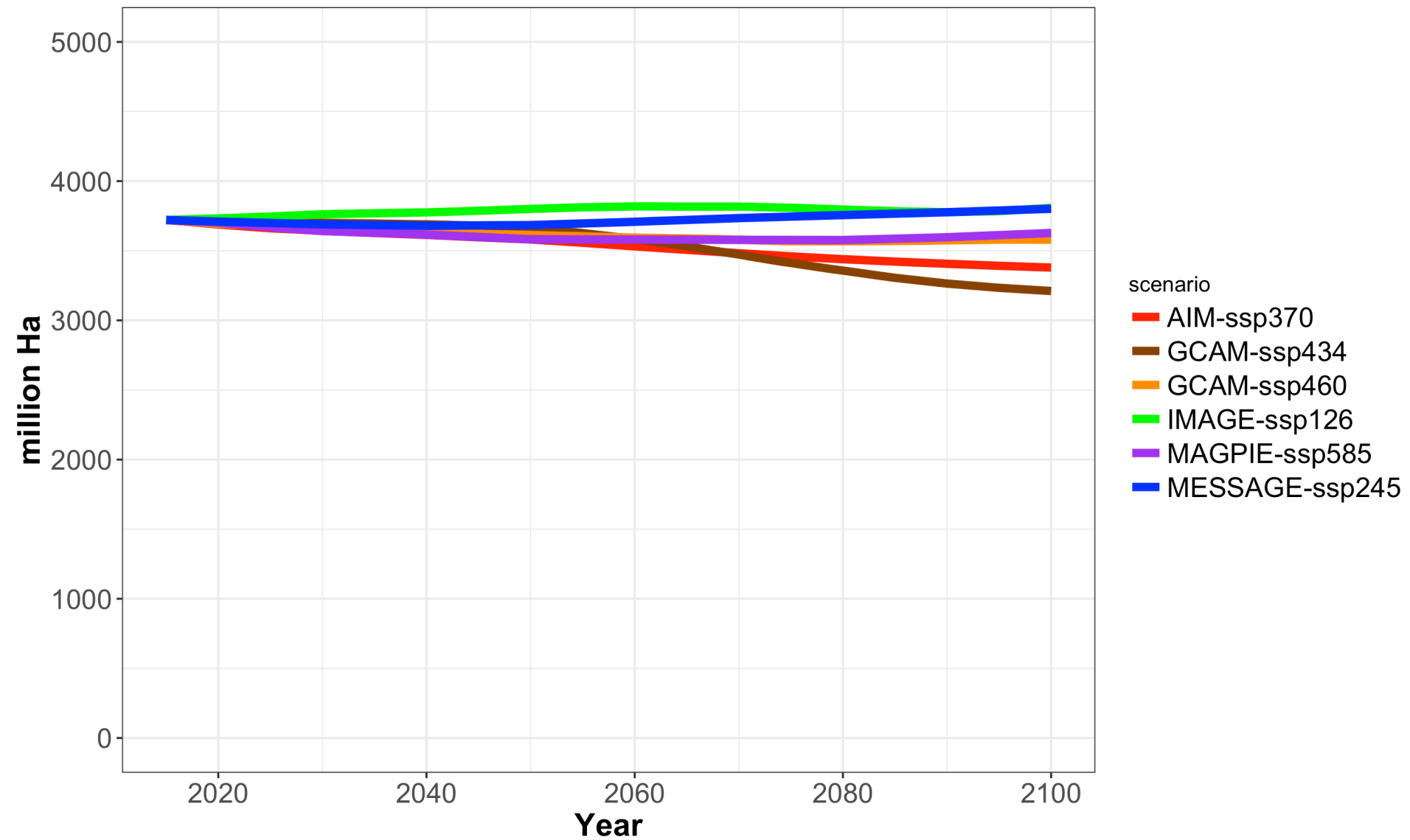
So what could possibly go wrong?



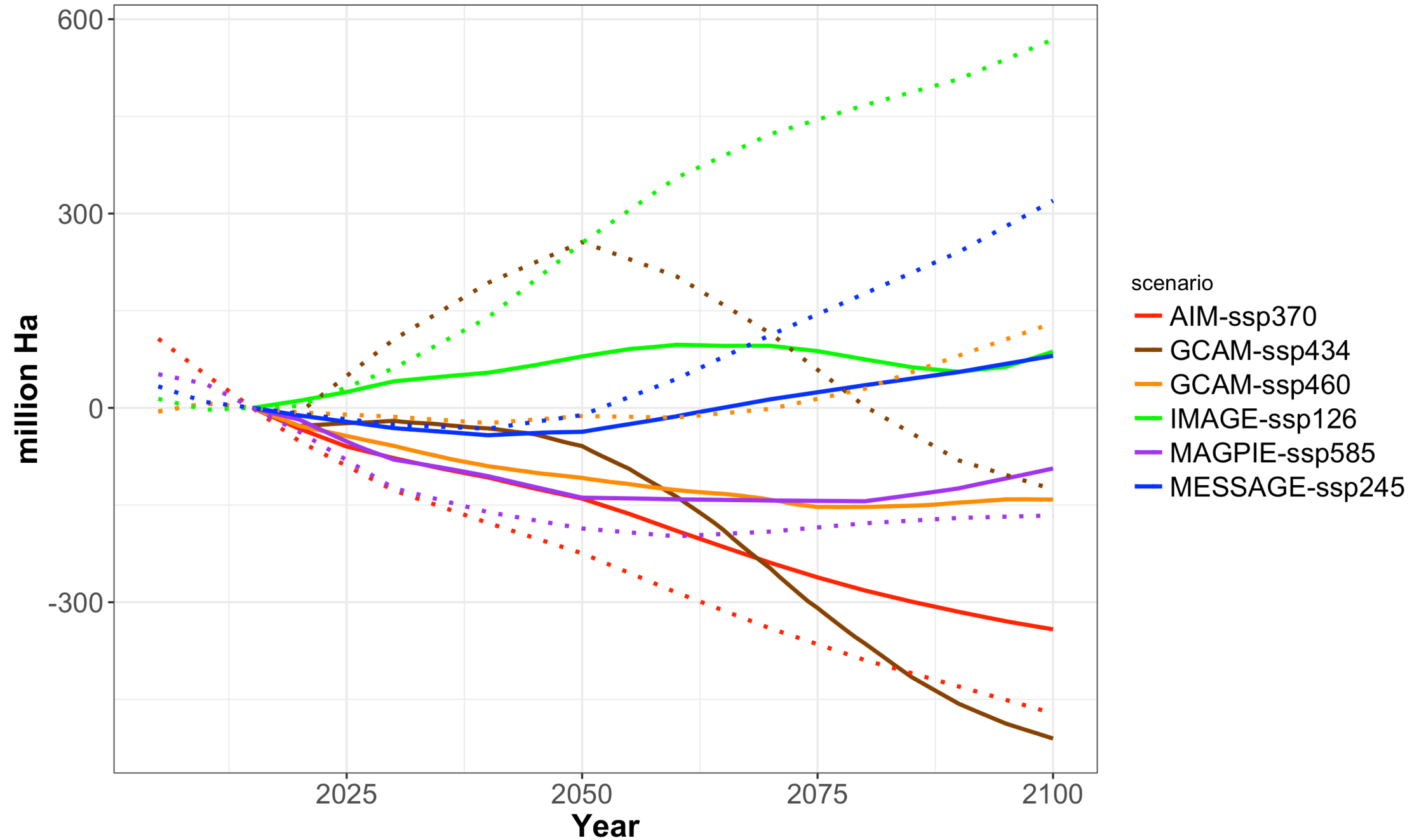
- IAM -> LUH2
 - LUH2 represents cropland, pasture, urbanization as well it can... but not perfect (>~80%)
- LUH2 -> ESM
 - A bit more dangerous – as it is mostly out-of-sight, and with less attention.
 - To be discussed this week.
- Not translated
 - LUH2 uses an underlying natural area map
 - LUH2 will not pick-up deliberate reforestation
- Other possible mismatches
 - Adding new assumptions
 - Very different carbon pools
 - Albedo

Global Forest

primf + secdf

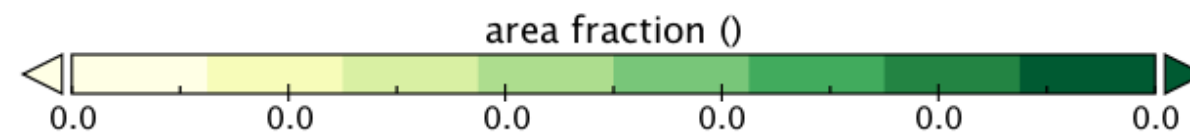
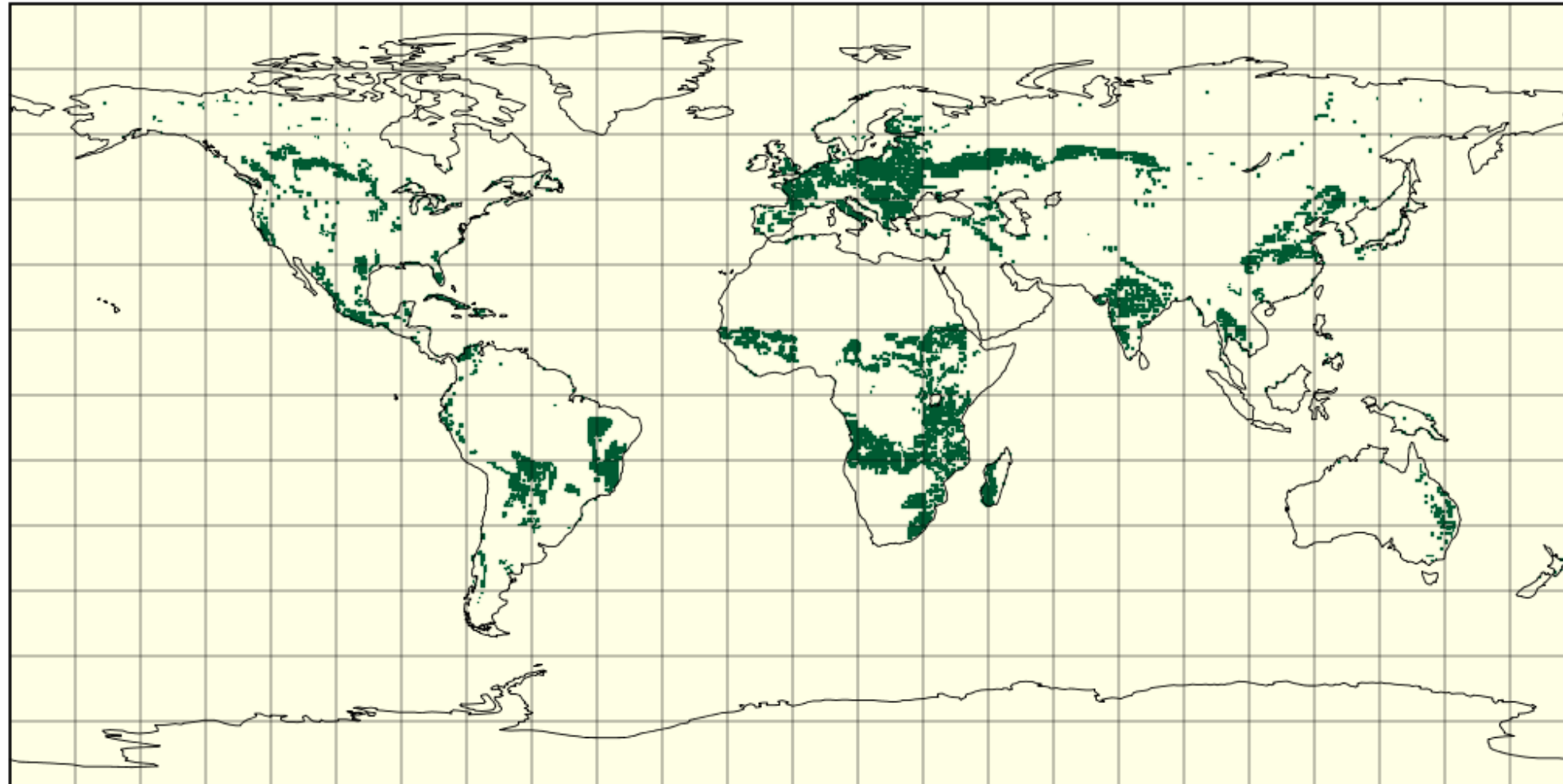


Global Forest: IAM vs. LUH2



Added Tree Cover

area fraction



Data Min = 0.0, Max = 0.2, Mean = 0.0

Acknowledgments

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- **IMAGE:** Detlef van Vuuren, Elke Stehfest, David Gernaart ...
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Thank you

