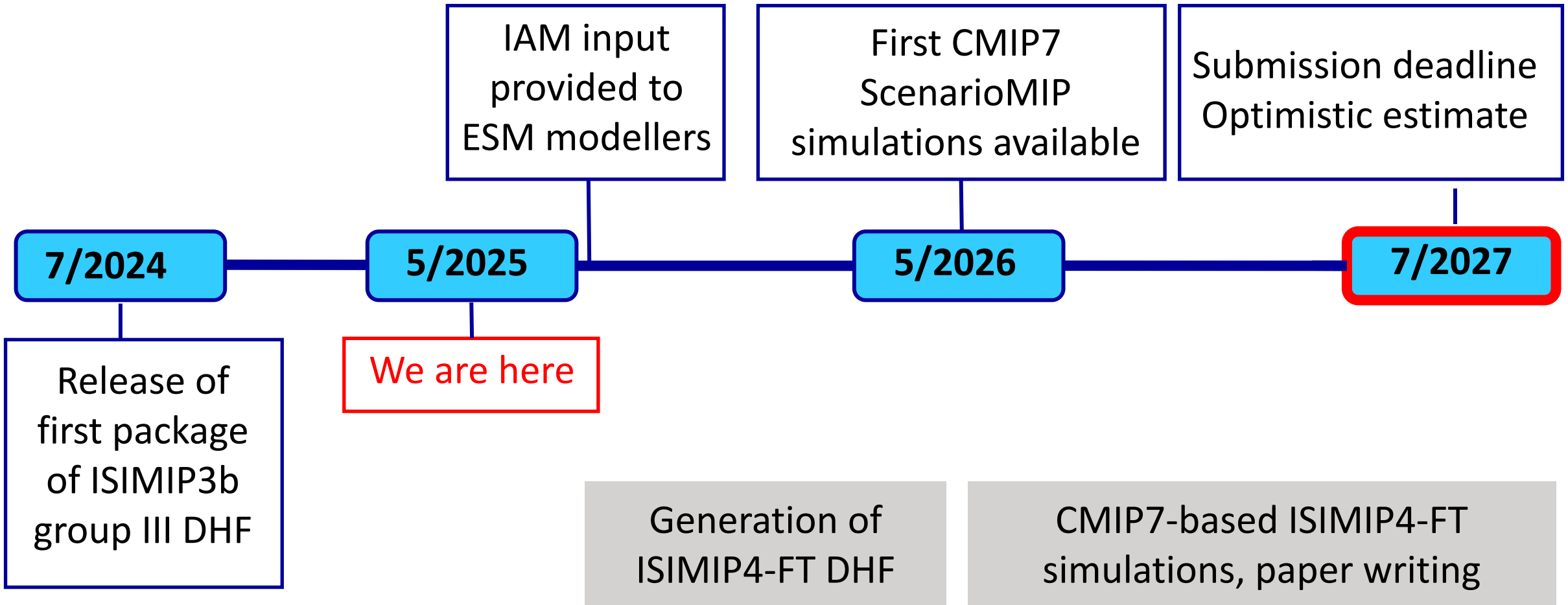
Sector perspectives on CMIP7- and overshoot scenarios

- **Which scenarios should we consider in ISIMIP4 FT?**
- **Will it be feasible to develop CMIP7-based ISIMIP4 simulations in time for IPCC AR7 (an ISIMIP4 “Fast Track”)?**

ISIMIP3 / ISIMIP4 Timeline to AR7



Generation of Direct Human Forcing in parallel to the ESM simulations

Probably doable because of activities already taking place now

- gridded populations
- gridded GDP
- Noadapt land use changes, irrigation patterns, N fertilizer inputs, land transformation, wood harvest,

Challenges where we need help

- Crop calendar based on the new ESM simulations
- Locations of hydropower dams

Generation of Direct Human Forcing in parallel to the ESM simulations

Even larger challenges as we do not even have the data for ISIMIP3b, group III:

- **Water quality:** Synthetic P fertilizer inputs, P manure, N manure, livestock numbers, P uptake, N uptake, wastewater treatment (from IMAGE-GNM?)
- **FishMIP:** Marine fishing efforts
- **Peat:** Peattypefrac (Percentage of grid cell covered by the natural, drained, restored or mineral (i.e. not peat) peat types);
  Drainagedepth (Depth of drainage of artificial drainage network.;
  Drainagedensity (Density of drainage network as total length of drainage network per km²).

Sector perspectives on CMIP7 and overshoot scenarios

ISIMIP4 FT-runs in time for AR7

Lakes: potentially GOTM, ALBM and CLM for the global lake; tbc for the local lakes. This is uncertain given the timing, most of the model runs depend on individuals with different career stages rather than modeling teams. Also, we will need to check with Jorrit and Johannes about local lakes (GOTM, GLM, Simstrat, FLake)

Agriculture: Not possible to make any reliable estimates due to the far-off date.

Water Quality: still busy with ISIMIP3; issue that simulations depend on input from other sectors; rather consider to prepare ISIMIP3-based input for AR7

Peat: LPX-Bern, LPJ-GUESS, JULES-Peat aim at ISIMIP4-FT simulations in time, PEATCLSM has no specific plans, but is interested in ISIMIP4

Sector perspectives on CMIP7 and overshoot scenarios

ISIMIP4 FT-runs in time for AR7

Water global: 1 model will be able to submit ISIMIP4 FT simulations, three more could maybe do it

Biomes: Yes will try: VISIT, CLM, ORCHIDEE, DLEM, LPJmL

Depending on funding: CLASSIC, LPJmL

⇒have concrete paper plans before starting simulations

Sector perspectives on CMIP7 and overshoot scenarios

Reflection on scenario survey results

Lakes: ISIMIP impact projections suffer from the limited amount of GCMs that are used in the scenarios. With rising compute capacity, the first priority should be to increase the number of CMIP7 GCMs that should be run until 2150 in order to increase the robustness projections. Second priority could be to perform long-term projections with a few GCMs.

Labour: perspective on overshoot scenarios:

focusing on distributional implications would be interesting, especially longer-term dynamics that come in which have effects beyond the time of overshoot. E.g. overshoot would bring higher temperatures and heatwaves and thereby have an impact on the labour force which would lead to wage losses and potential shifts of labour between sectors (among other impacts). This could have long-term effects on poorer households.

Country-deep dive studies: The OLG model in this paper captures one of the channels, which would be less education for kids in that case, so maybe it would be an interesting

Sector perspectives on CMIP7 and overshoot scenarios

Reflection on scenario survey results

Biomes: Overshoot scenarios the most relevant for ISIMIP4 FT

Sector perspectives on CMIP7 and overshoot scenarios: Panel discussion

FishMIP: Tyler Eddy
Lakes: Wim Thiery
Water-global: Simon Gosling
Groundwater: Inge de Graaf?
Energy: James Glynn (remote)
Biomes: Christopher Reyer
Peat: Noah Smith
Fire: Stijn Hantson
Biodiversity: Dirk Karger

Water quality: Maryna Strokal
Agriculture: Sam Rabin
Health / Labour: Shouro?