The Climate Impact Explorer, a free online tool providing sectoral impact projections for a wide range of scenarios down to the subnational level

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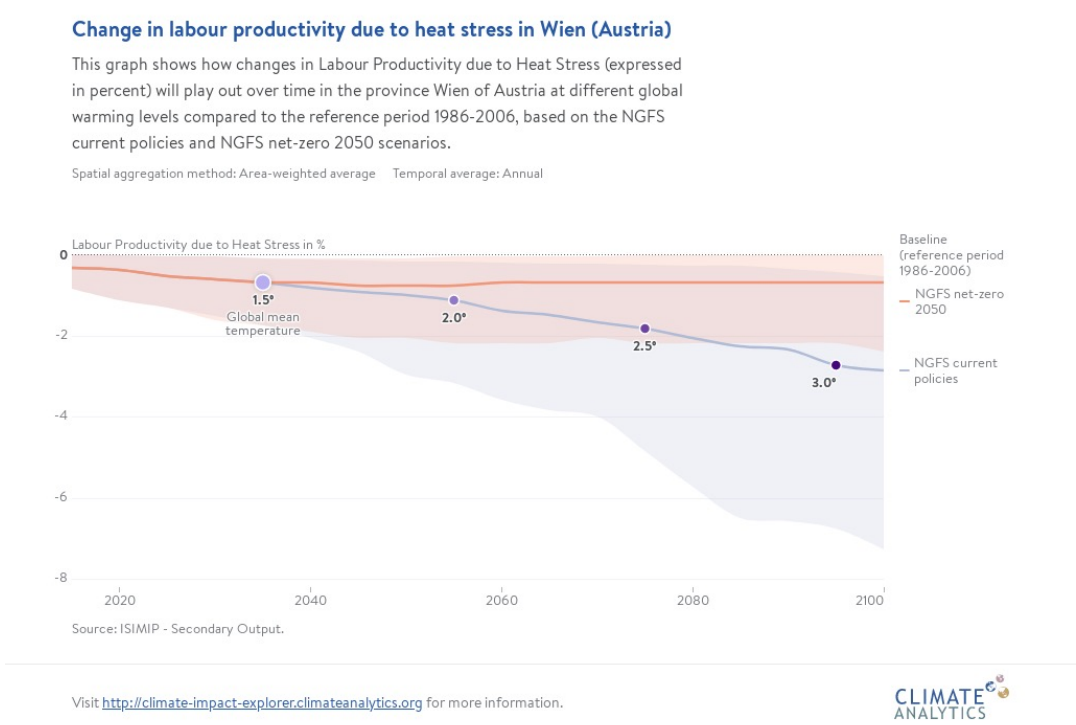
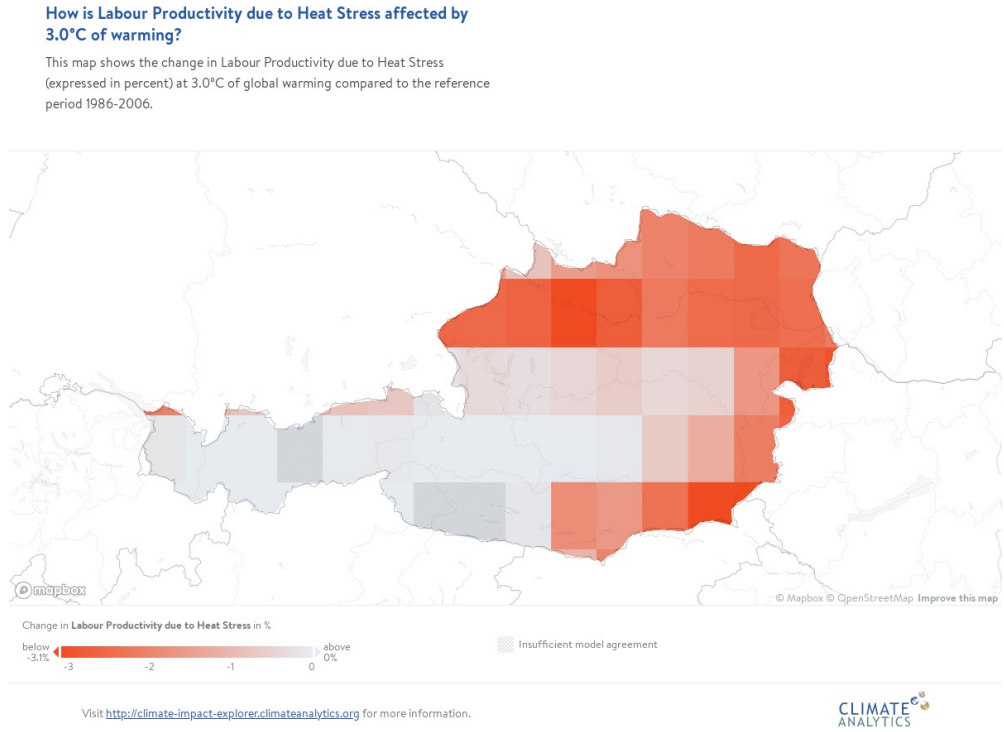
EGU General Assembly – 26.05.2022

Available information and functionalities (1/2)

Scenario projections aggregated at the national and subnational levels



Maps for landmark global warming levels (1.5, 2, 2.5, 3°C)



- Assuming **constant exposure and vulnerability** (population, land use etc. kept at present-day levels)
- All available **figures and underlying data are downloadable** in .png, .pdf or .csv format

Available information and functionalities (2/2)

- The tool was developed as part of a **collaboration with the Network for Greening the Financial Sector (NGFS)**. Engagement with the NGFS helped identify their specific needs and answer them by providing projections for:
    - **8 scenarios**: 3 developed for the NGFS, 1 from the Climate Action Tracker, and 4 Representative Concentration Pathways
    - **32 indicators from 5 sectors, including Economic Damages** (4). But also Climate (11), Extreme Events (8), Agriculture (5), Freshwater (4)
    - with a comprehensive estimate of the uncertainty range (especially its upper bound – worst case scenario)
- Possibility to **compare projections** for different scenarios, years or warming levels

Modelling chain and data sources

CLIMATE ANALYTICS

Emissions Scenarios *(Integrated Assesment Models)*

MAGICC

Global Mean Temperature *(Simple Climate Model)*

Results from the scenario modelling for the NGFS are available at https://iiasa.ac.at/scenario-ensembles-and-database-resources

CMIP The World Climate Research Programme's Coupled Model Intercomparison Project

ISIMIP Inter-Sectoral Impact Model Intercomparison Project

Bias-corrected climate projections *(Earth System Models)*

ISIMIP Inter-Sectoral Impact Model Intercomparison Project

Climate Impact projections *(Impact Models)*

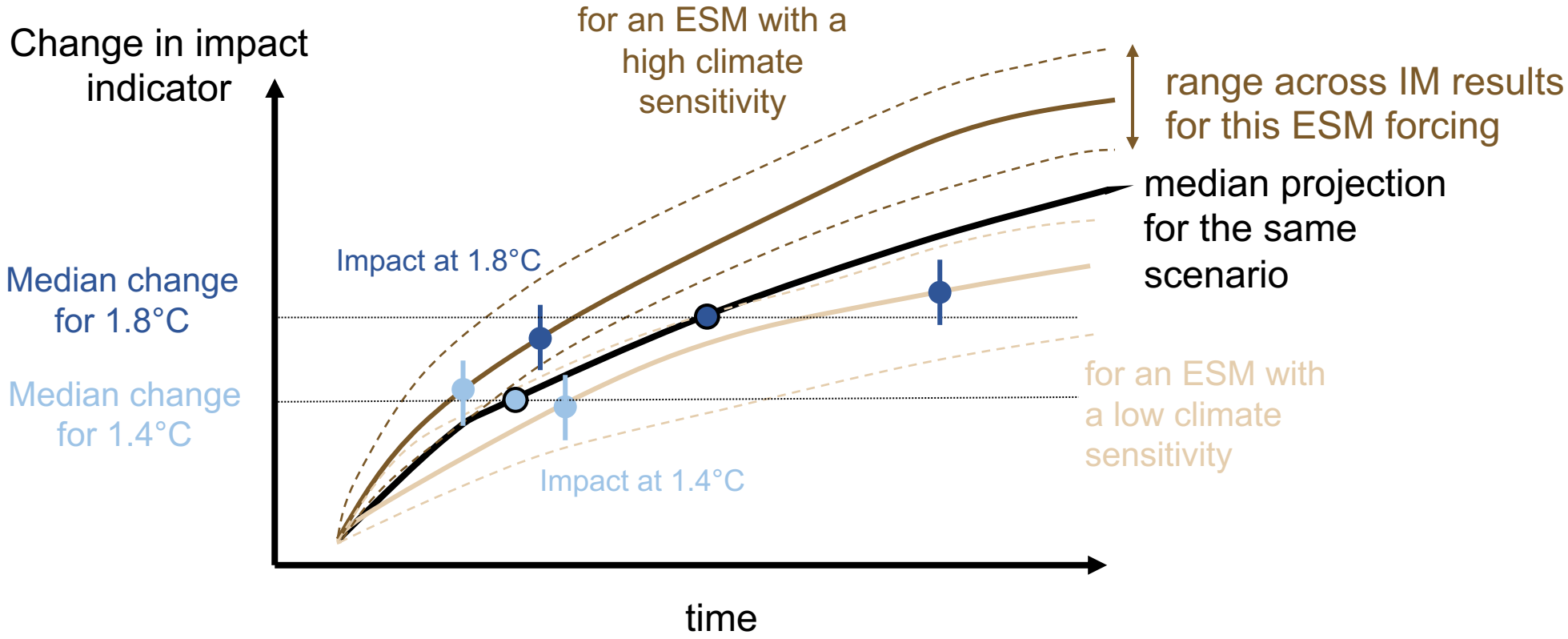
Economic Damages from Extreme Events *(Catastrophe Risk Model)*

CLIMADA Economics of Climate Adaptation

Processed for and displayed on the Climate Impact Explorer

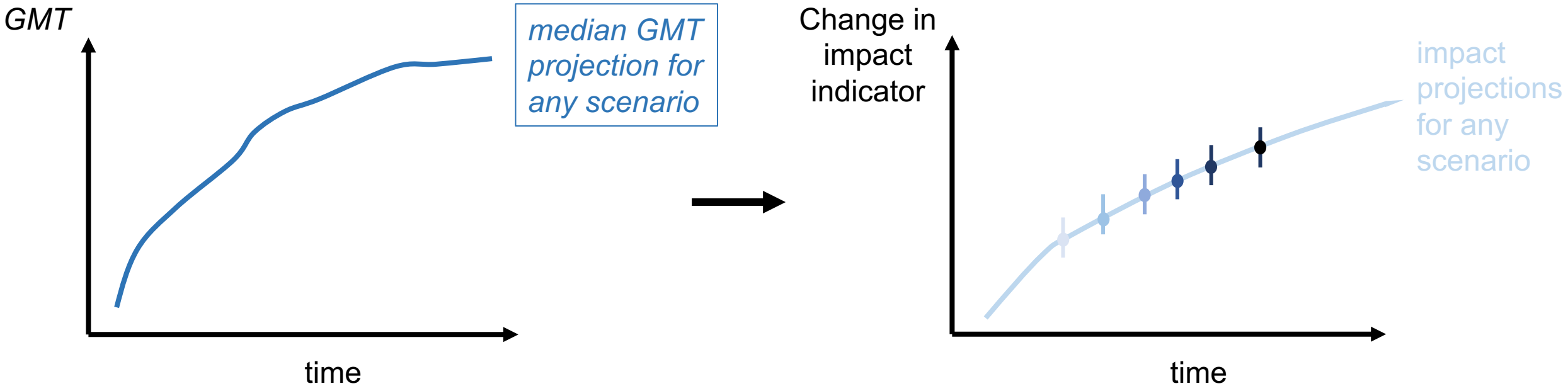
Calculating impacts for every 0.1°C of global warming

- **Main assumption**: changes in climate impact indicators are mainly a function of the level of global warming (irrespective of the scenario and time at which it is reached)
- The median and the spread in impact projections are calculated, depending on the indicator, for up to ~10 Impact Models (IMs), forced by up to 4 Earth System Models (ESMs), for 2-4 scenarios



Reconstructing projected impacts for any scenario

- **Scenarios available on the Climate Impact Explorer:**
  - NGFS scenarios: net-zero 2050, delayed transition, Current Policies
  - Climate Action Tracker: Current Policies
  - RCP2.6, 4.5, 6.0 and 8.5



Outlook

- The tool will be **updated in June 2022** (updated NGFS scenarios and documentation, revised presentation for some indicators, bug fixes…)

- Pursued collaboration with the NGFS to better understand how climate impact information as provided by the Climate Impact Explorer can help central banks and other financial institutions **stress test macro-economies to physical climate risks**

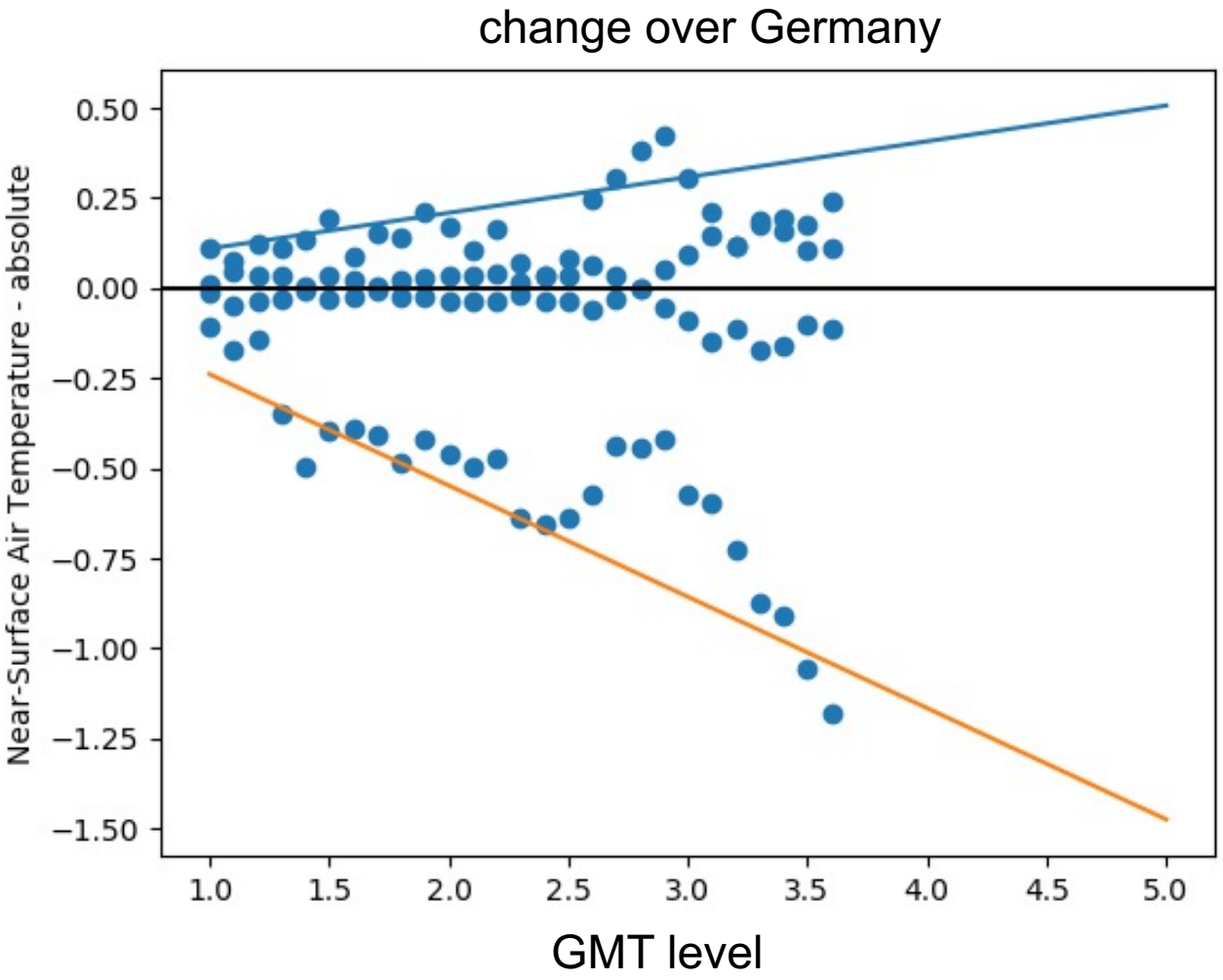
- Information is being used also by **other state and non-state actors**: governments especially in developing countries, as well as by journalists, NGOs…

- Check the CIE here: **https://climate-impact-explorer.climateanalytics.org/**
  → provide feedback at contact@climateanalytics.org or quentin.lejeune@climateanalytics.org

Uncertainty range in the impact projections

- **Quantile regressions** provide the relationships between the 5th and 95th percentiles of impact projections across the spread of projections from all scenario-ESM-IM combinations

- If the quantile regression lines cross the zero line, we consider a **constant uncertainty range** across all warming levels for which projections are available for all projections

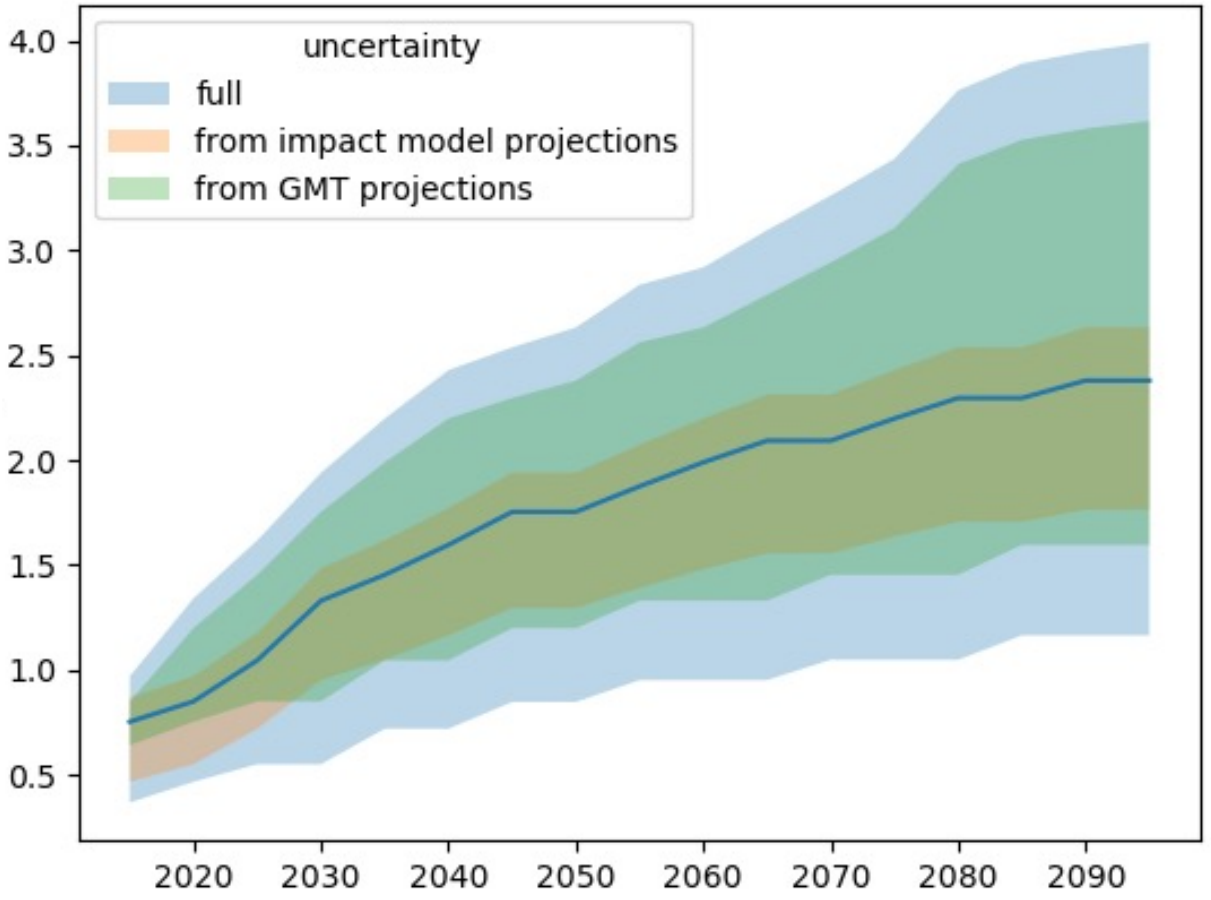


Estimation of the full uncertainty range

Two sources of uncertainty:

- GMT projections from MAGICC
- impact projections calculated from the ISIMIP database

→ **combination of the 5th-95th percentile ranges from each source to derive the full uncertainty range**



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