

Motivation

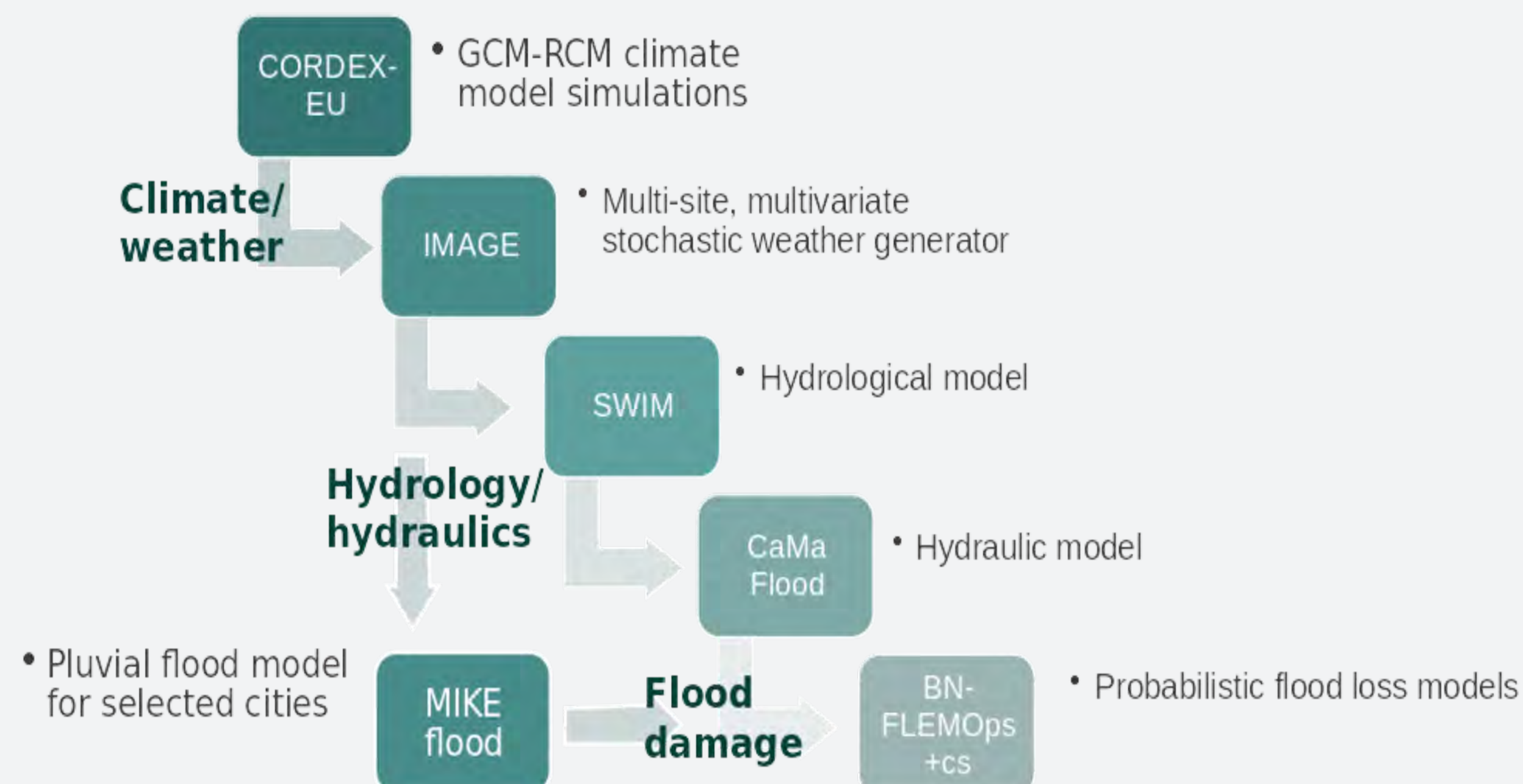
- Floods have huge socio economic impacts globally
- Impacts are expected to rise due to socio-economic development and climate change
- Efficient flood risk reduction and adaptation needs consistent and reliable information about future risks

Objectives

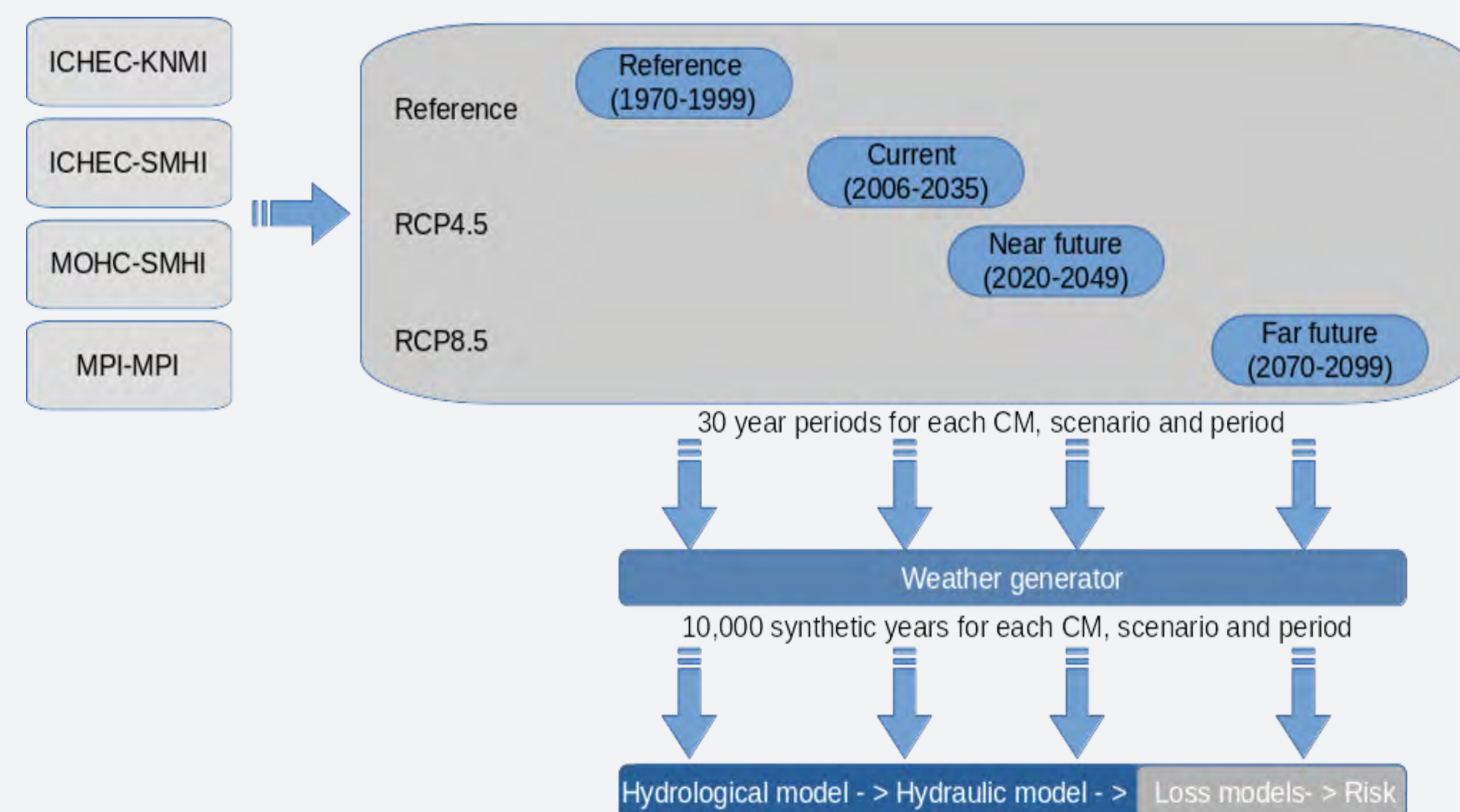
- Demonstrate the Future Danube Model (FDM) as a multi-hazard and risk model suite for the Danube region (Hattermann et al. 2018)
- Investigate the future development of flood risk in the Danube basin for RCP4.5 and RCP8.5 climate projections for the 21st century (Schröter et al. 2021)

Approach

- Modular chain of process based modelling tools to represent the entire flood risk chain



- Long-term continuous simulation for current and future climate



Conclusions

- Marked increase in flood recurrence in most parts of the Danube
- Projected increase of flood risk by 25 - 40% for near and far future
- Consistent integration of climate change scenarios in trans-boundary flood risk assessment

Acknowledgements



This research has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 730381.

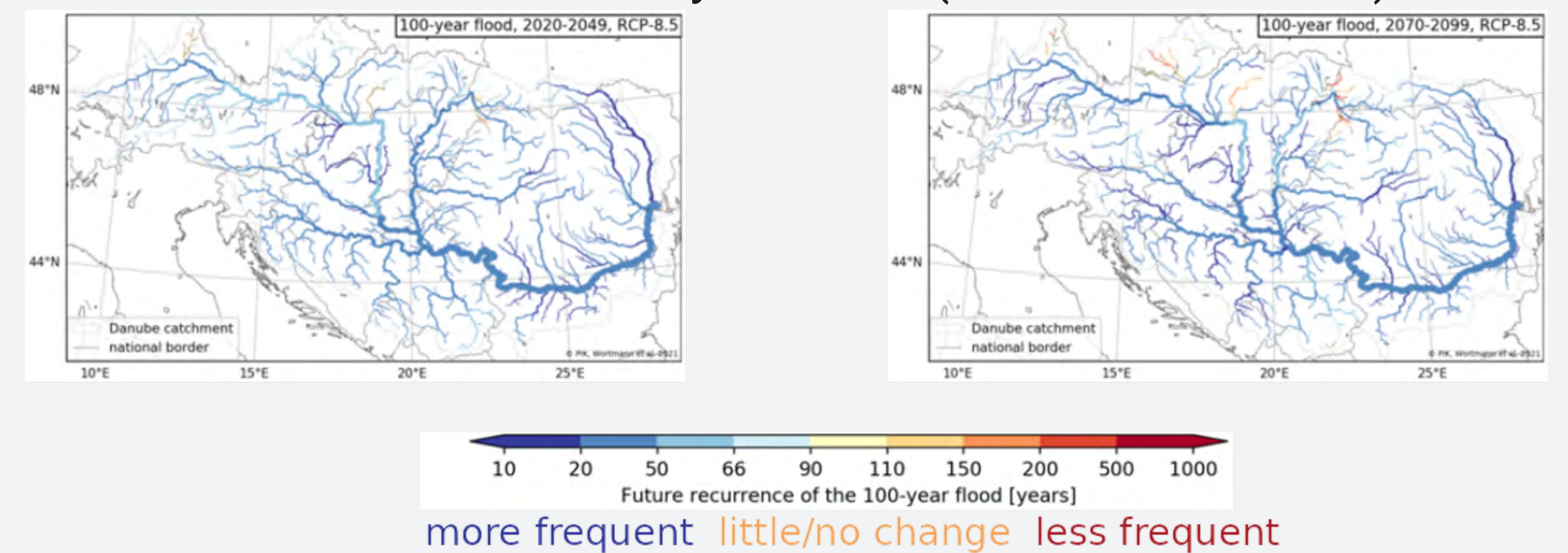
Study area: Danube basin



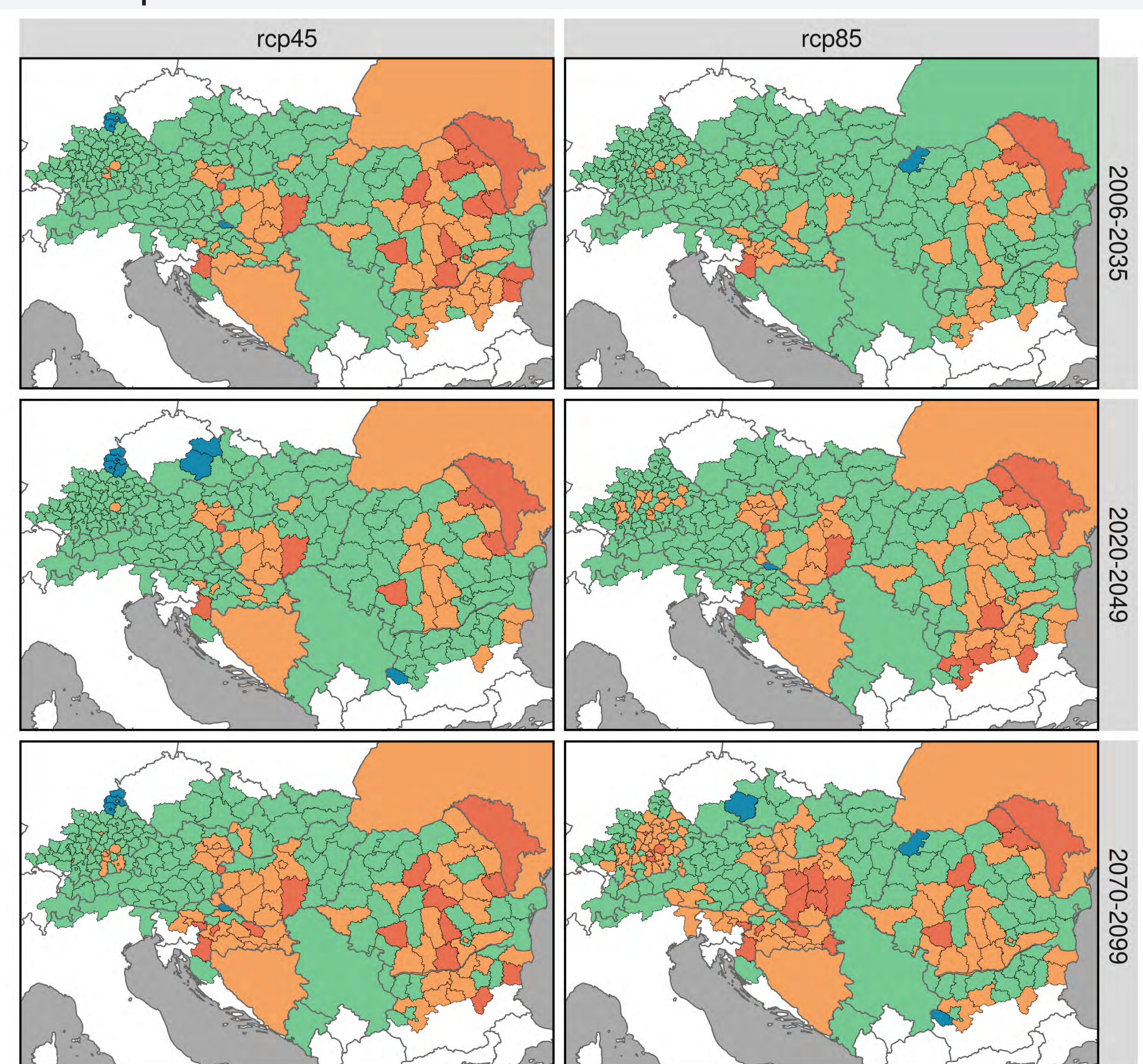
Area=800,000 km²; 19 countries; > 81 Million inhabitants

Results

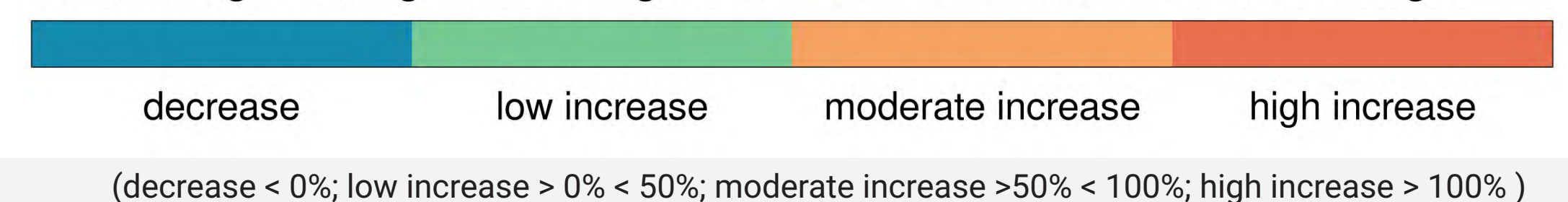
Changes in flood frequency: Future recurrence of the 100-year flood (median of 4 RCMs)



Changes in flood risk for residential buildings on NUTS3 level without flood protection



Percentage change in average annual loss for residential buildings



References

- Hattermann, F. F., Wortmann, M., Liersch, S., Toumi, R., Sparks, N., Genillard, C., Schröter, K., Steinhausen, M., Gyalai-Korpos, M., Máté, K., Hayes, B., del Rocio Rivas López, M., Rácz, T., Nielsen, M. R., Kaspersen, P. S., and Drews, M.: Simulation of flood hazard and risk in the Danube basin with the Future Danube Model, *Climate Services*, 12, 14–26, 2021.
- Schröter, K., Steinhausen, M., Wortmann, M., Lütke, S., Hayes, B., Drews, M., Hattermann, F., and Kreibich, H.: Current and future flood risk in the Danube region using an open loss modelling framework, in: *Science and practice for an uncertain future, FLOODrisk 2020 - 4th European Conference on Flood Risk Management*, Online, 2021