

Combined dynamical and statistical downscaling and its application in the development of socio-economy



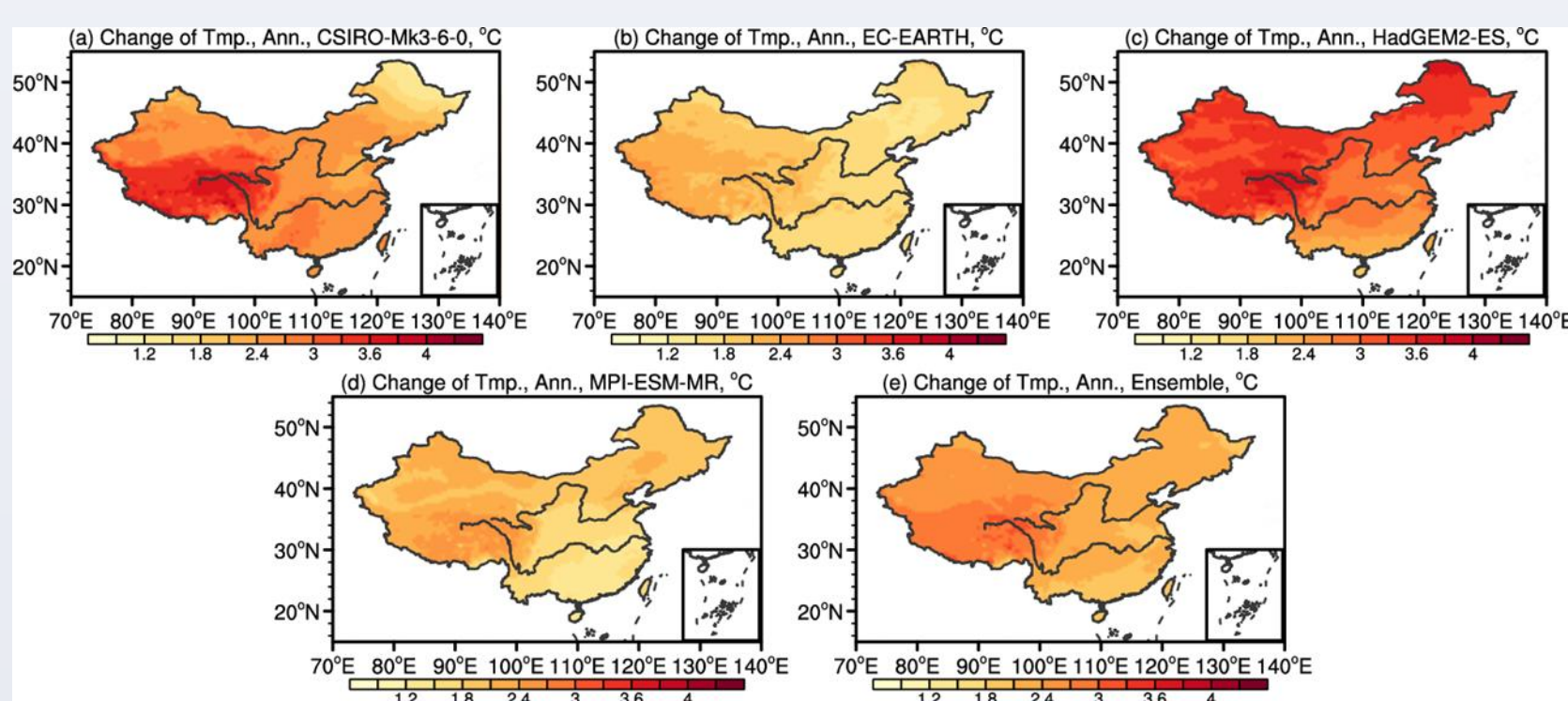
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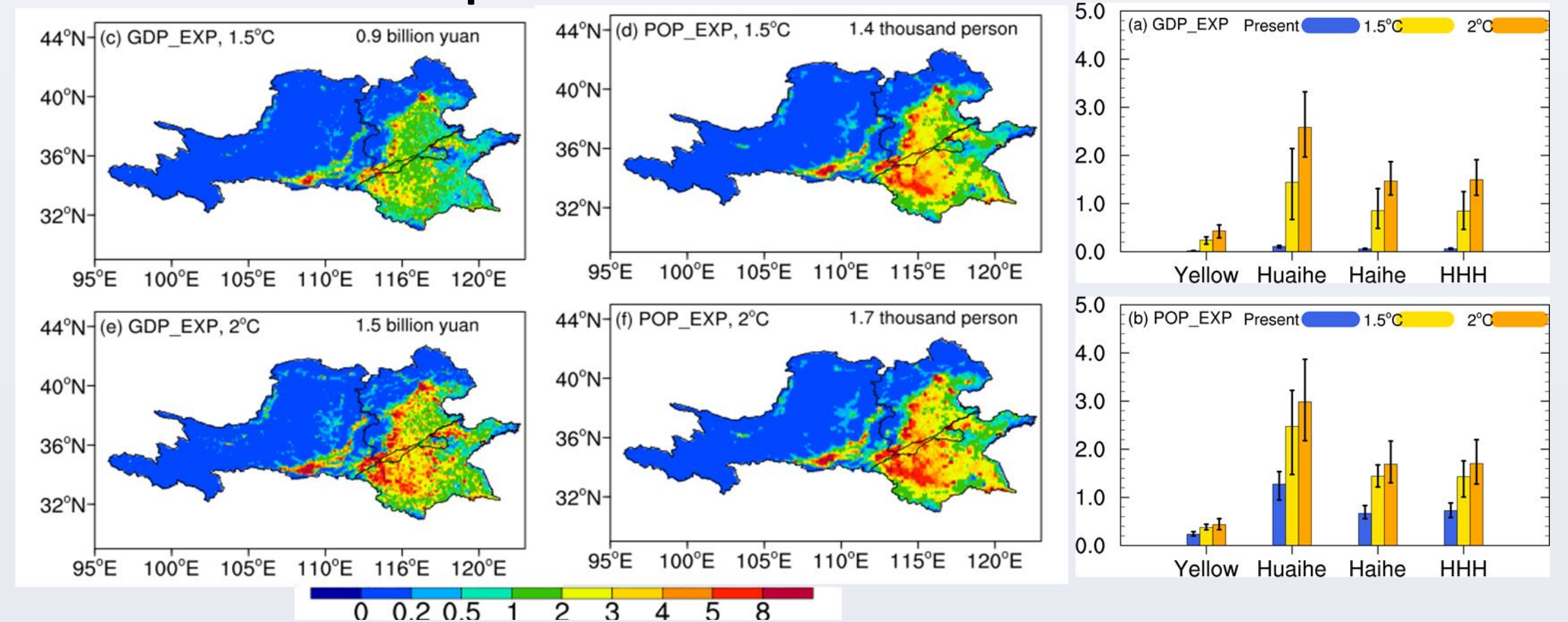
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- While the current generation of coupled global GCMs are of higher spatial resolution and more comprehensive than their precedents, the resolution is still too coarse to capture the effects of local and regional forcing.
- **The nested high-resolution regional climate models (RCMs)** can greatly improve the simulations over the East Asia region.
- **Fine resolution** is desirable not only for improving the model simulation of present-day climate but also for supporting impact assessment studies.
- Climate impact assessment and the development of **regional to local-scale adaptation strategies** require climate change information be available at **locally-relevant spatial scales**.

Changes of temperature over China

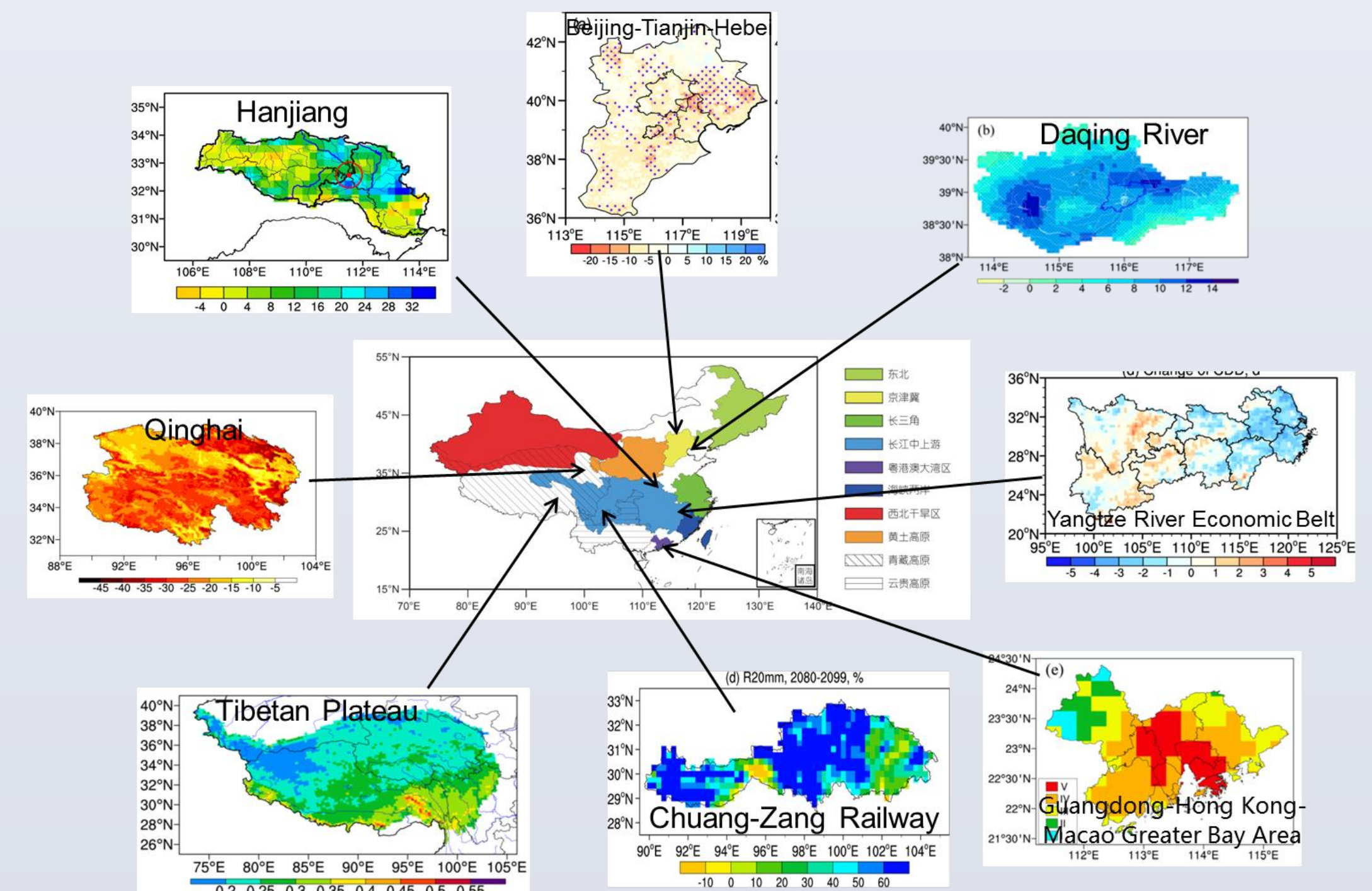
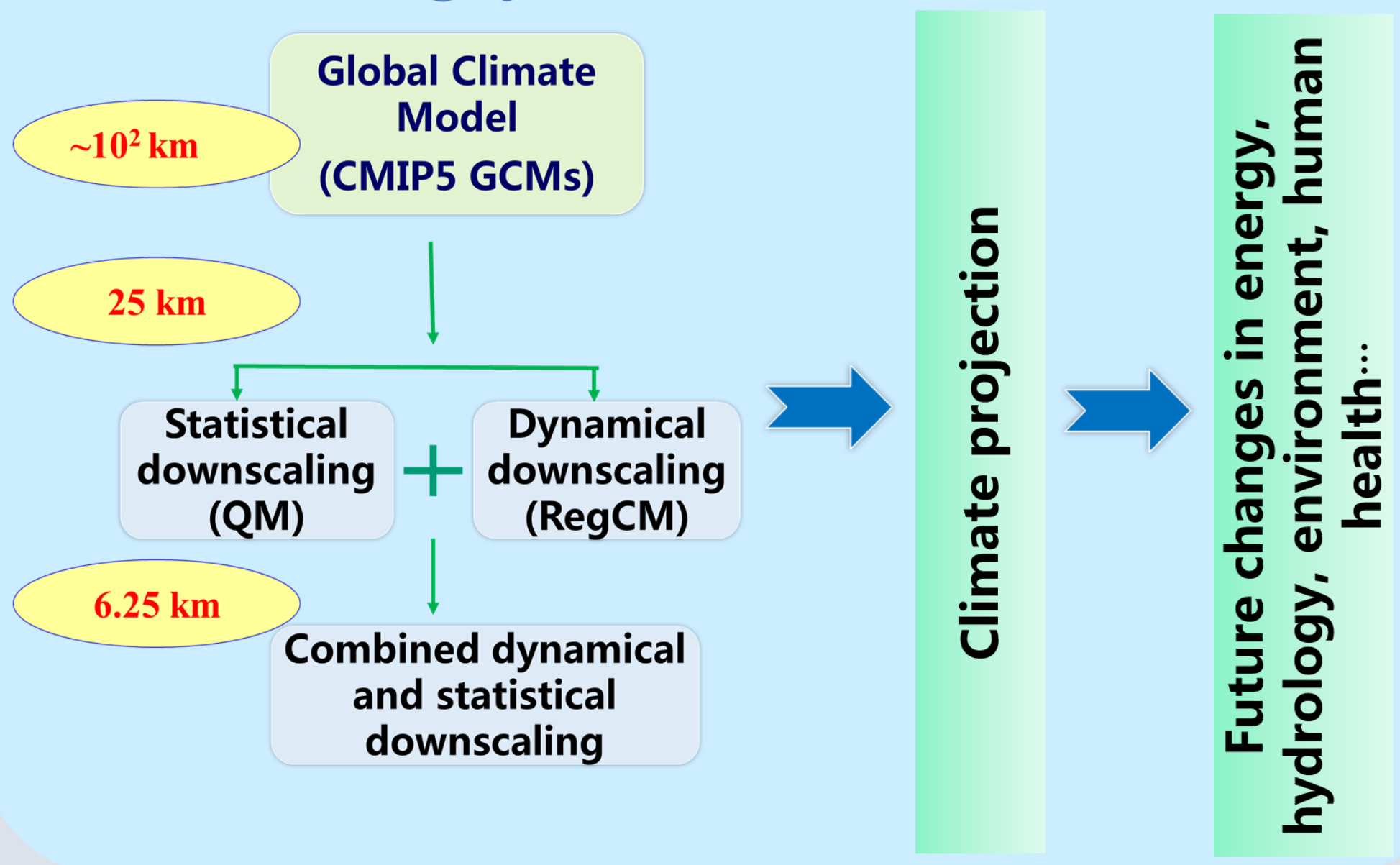


Projected changes for 1.5°C and 2°C of global warming in GDP and POP exposures to HD across HHH river basin

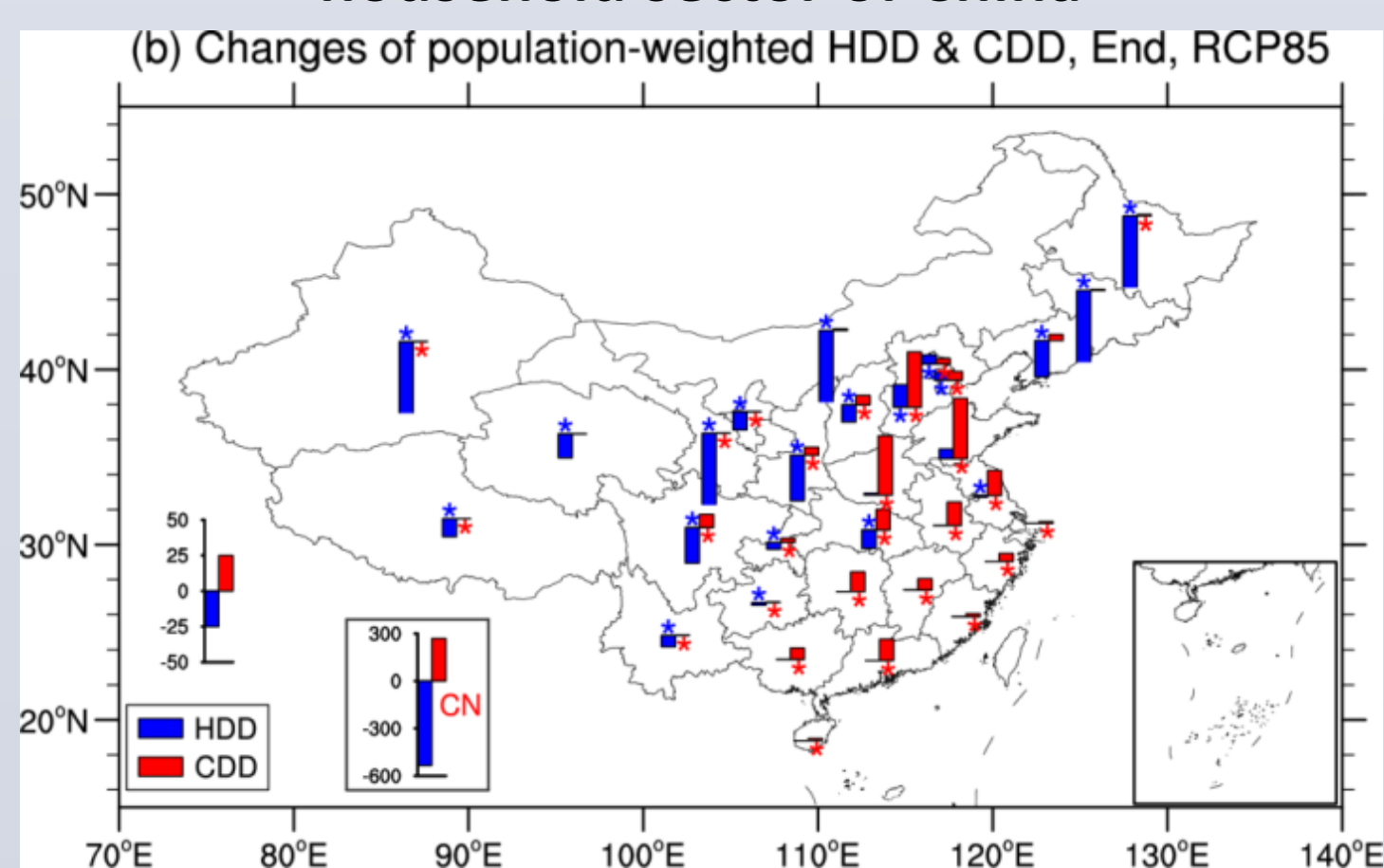


Downscaling System

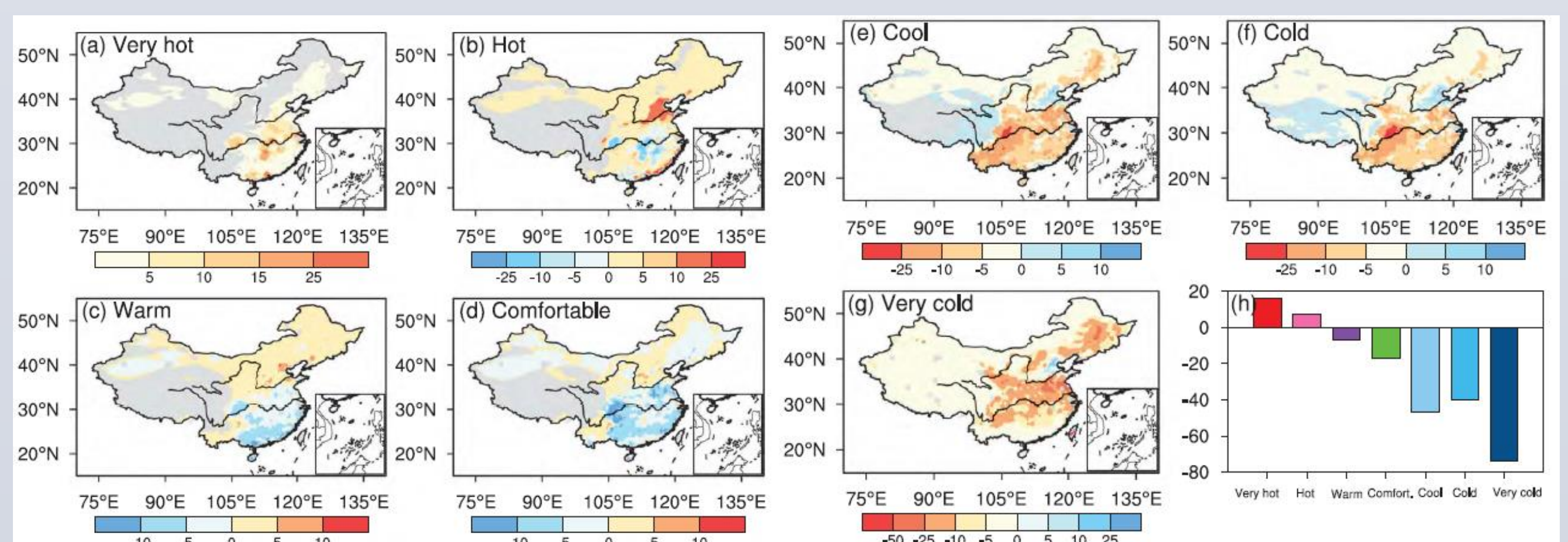
Application



Effects of climate change on heating and cooling degree days and potential energy demand in the household sector of China



Future changes in thermal comfort conditions over China



- **Large uncertainties** exist in the simulation and projection of future climate changes, and are especially problematic at regional and local scales.
- Coupling dynamical and statistical downscaling techniques can produce a reliable **multivariable, multimember, multidecadal (1980–2099), high-resolution (6.25km)** product with daily data for climate change projections.
- The downscaling system can be directly applied to other CORDEX regions and other emission scenarios if quality high-resolution observations are available.
- The higher resolution outputs produced by the system compared to the direct dynamical downscaling would provide **valuable scientific support for scientists conducting climate impact studies and for policymakers making climate change mitigation and adaptation decisions.**

References:

- Han ZY, Shi Y, Wu J, et al., 2019, JAMC; Shi Y, Gao XJ, Xu Y, et al., 2016, CR; Wu J, Han ZY, Li RK, et al., 2021, IJOC; Gao XJ, Wu J, Shi Y, et al., 2018, AOSL.....