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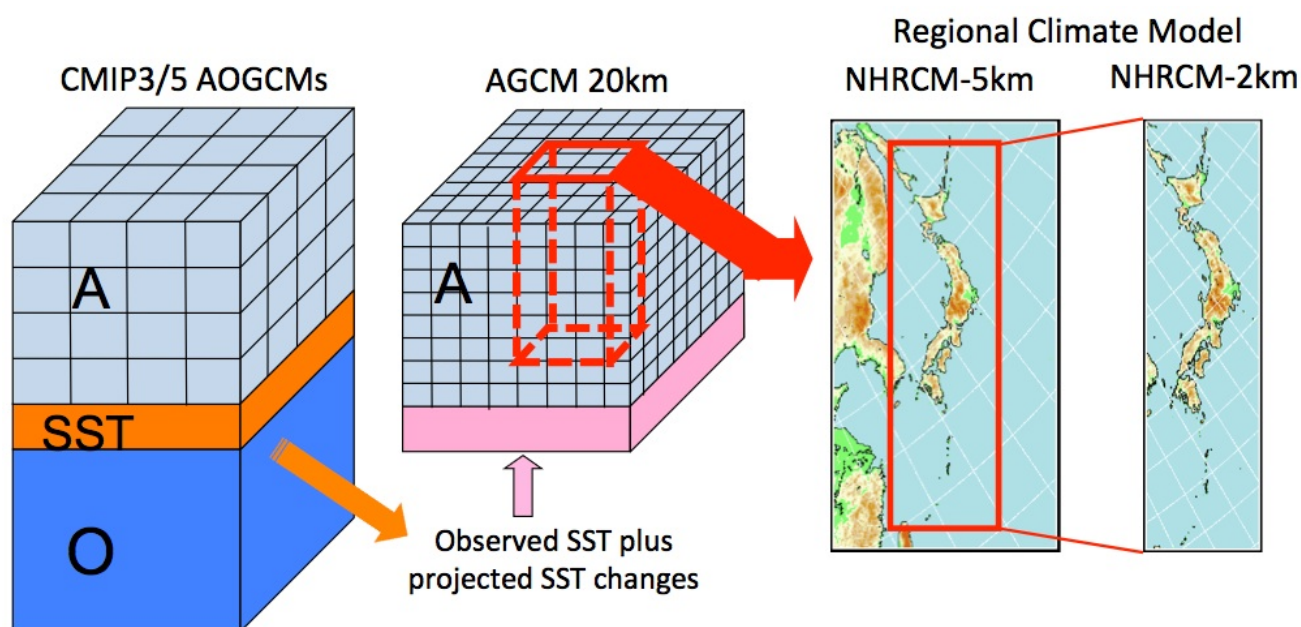


Figure 1: A schematic of the high-resolution Meteorological Research Institute (MRI) atmospheric general circulation model (AGCM) – regional climate model (RCM) system.

- A direct dynamical downscaling with a regional climate model (RCM) embedded within an atmosphere-ocean coupled general circulation model (AOGCM) is broadly used but is subject to systematic biases such as in sea surface temperature (SST) in their present-day simulations, which may cause unexpected effects on future projections and lead to difficult interpretation of climate change.
- A high-resolution atmospheric general circulation model (AGCM)–RCM system (Figure 1) is one of methods to minimize the effects of such biases.
- A Meteorological Research Institute AGCM with 20-km grids is successfully applied to project future changes in weather extremes such as tropical cyclones and rain systems that cause heavy rainfall and strong winds. Regional downscaling with a few-km mesh RCM is then performed over certain area such as Japan to investigate local extreme rainfall events and their future changes.