A high-resolution model is vital to project reliable and possible future changes in weather extremes such as tropical cyclone and heavy rainfall. Unprecedented super-high-resolution atmospheric models are being used for global warming projection in a project "Projection of the Change in Future Weather Extremes using Super-high-resolution Atmospheric Models" under the Innovative Program of Climate Change Projection for the 21st Century (KAKUSHIN Program). Our team is performing climate projections in the near future (2030s) and at the end of the 21st century using a global 20-km mesh atmospheric general circulation model (AGCM). Projections on tropical cyclones reveal marked future increases in precipitation and surface wind velocity fields at inner-core region within 150 km from the tropical cyclone center, implying increase in disaster risk induced by tropical cyclones in the future. Information on the uncertainty of future projection is significant for any decision-making processes, and the ensemble technique using the global 60-km model version is used for such a purpose. Four different geographical distributions of sea surface temperature (SST) were given to the model, since atmospheric model is strongly influenced by SST spatial pattern. We also make ensemble simulations with different physical (i.e., cumulus) parameterizations. These data are being used for various application studies on disaster prevention.