

## Climate and socioeconomic scenarios for climate change impact and adaptation assessments in Japan

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In order to assess the overall impacts of climate change on a nation and investigate effective adaptation measures, it is important to collect scientific understanding beyond academic disciplines, because impacts of climate change emerge every aspect of the society. Modeling is a widely accepted method to assess future climate change impacts: develop climate and socioeconomic environment assumptions in the future (scenarios), run statistical or process based models using the scenarios, and simulate the future situation for each subject and discipline. If a large number of modelers conduct simulations using a set of common scenarios, one can obtain a multidisciplinary national perspective of climate change impacts and potential adaptation strategy.

We have been conducting a strategic research project funded by the Ministry of Environment, which is named 'Comprehensive research on climate change impact assessment and adaptation policies' (Abbr.: S-8 project; Period: FY2010-2014; Project leader: Prof. Nobuo Mimura, Ibaraki University). In S-8 project, we are working on quantitative analyses of climate change impact on various sectors and adaptation in Japan for the purpose of supporting adaptation policy makings as well as of evaluating possibility of the society that can adapt to the anticipated climate change. The sectors covered in the project include water resource, coastal, disaster prevention, natural vegetation, agriculture, and human health. In S-8 project, climate and socioeconomic scenarios for Japan were discussed for climate change impact assessment and adaptation measures investigation by reviewing earlier literature and latest research activities. Based on the discussion, with keeping in step with the research schedule of the project, sets of scenarios were developed twice covering the whole Japan (the 1st version: March 2011, the 2nd version: November 2013), utilizing information available at the respective timings.

For the 2nd version of the S-8 scenario set, we used the climate projection of four climate models and three radiative forcing scenarios of the Coupled Model Intercomparison Project Phase 5 (CMIP5). We utilized the results of dynamical downscaling using a regional climate model which is consistent with the global scenarios after applying bias-correction techniques. Regarding the population projection scenarios, we developed nine scenarios taking into account not only uncertainty range of the total numbers but also uncertainty in its spatial distribution. We also proposed land use scenarios compatible with the population projections.

In the JPGU session, as a case of multidisciplinary collaboration, we will introduce the background and procedure of the S-8 scenarios development. We will also mention future challenges, which have been found in the scenario development process.

Keywords: climate change, climate change impact, adaptation, scenario