

全球規模での氷河縮小と海水準上昇の将来予測

Future projection of global-scale glacier mass loss and sea level rise

*藤田 耕史¹、坂井 亜規子¹

*Koji Fujita¹, Akiko Sakai¹

1. 名古屋大学大学院環境学研究科

1. Graduate School of Environmental Studies, Nagoya University

We conducted a global scale future projection of glacier mass loss by an energy-mass balance model [1] with two RCP scenarios (2.6 and 8.5) of 12 GCMs of CMIP5 to contribute GlacierMIP [2]. Following an approach of optimizing precipitation based on an assumption of median elevation as ELA [3, 4], we surveyed optimizing period resulting the best estimate of reconciled glacier mass loss for the period 2003-2009 [5] with ERA-Interim reanalysis dataset. Further calibration was made on GCM air temperatures by referring ERA-Interim air temperature. Glacier hypsometry was simplified with elevations of terminus, median and maximum, and then changed with a conventional area-volume scaling. The estimated glacier mass loss for the validation period (2003-2009) was 183 Gt yr⁻¹ while the reconciled mass loss was 253 Gt yr⁻¹. The projected glacier mass losses were 54.8 and 105.7 mm s.l.e. for RCP2.6 and RCP8.5, respectively. These projections are 55 to 70% of the projections in IPCC AR5 [6].

References

1. Fujita K, Ageta Y (2000) Effect of summer accumulation on glacier mass balance on the Tibetan Plateau revealed by mass-balance model. *Journal of Glaciology*, 46, 244-252.
2. Gardner, A. S. et al. (2013) A reconciled estimate of glacier contributions to sea level rise: 2003 to 2009. *Science* 340, 852-857.
3. Sakai A, et al. (2015) Climate regime of Asian glaciers revealed by GAMDAM Glacier Inventory. *The Cryosphere*, 9, 865-880.
4. Sakai A, Fujita K (2017) Contrasting glacier responses to recent climate change in high-mountain Asia. *Scientific Reports*, 7(1), 13717.
5. Hock R (2017) How do glacier inventory data aid global glacier assessments and projections? AGU Fall Meeting Abstract, C51D-01.
6. IPCC-AR5 WG1 (2013) *Climate Change*.

キーワード：氷河、海水準上昇、将来予測

Keywords: glaciers, sea level rise, future projection