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## Equilibrium Climate Sensitivity in AWI-ESM: Mechanisms and Effects

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The global-mean surface air temperature change due to a doubled carbon dioxide concentration in the atmosphere (equilibrium climate sensitivity, ECS) is an important measure to quantify the impact of predicted anthropogenic climate change. The latest climate modeling intercomparison project (CMIP6) exhibits a higher ECS compared to the previous climate model generation (1.8 to 5.6 K for CMIP6 versus 1.5 to 4.5 K for CMIP5). The increase in ECS is likely due to decreases in extratropical low cloud coverage and albedo, caused by improvements in the numerical aerosol schemes. Our state-of-the-art Earth system model AWI-ESM, developed at the Alfred Wegener Institute, Helmholtz Centre for Polar and Marine Research, yields an ECS of 3.59-3.62 K, which is close to the CMIP5 mean. Using a set of varying model configurations, we identify dynamic vegetation and model resolution as the primary driving factors which influence the modeled global response to an increased greenhouse gas forcing.