



Accelerated global warming after 1998 is caused by decrease in terrestrial evapotranspiration

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Over the last 50 years, the global temperature has increased an average of 0.180K per decade. However, the increase has accelerated since 1998 at a rate of 0.334K per decade. No satisfactory explanation has been offered by any past research concerning the accelerated global warming after 1998. In this hypothesis-driven study, we proposed that accelerated global warming since 1998 is mainly caused by a significant reduction of global terrestrial evapotranspiration (ET). This is because global annual terrestrial ET increased on average by 7.1 mm per year per decade between 1982 and 1997 and has decreased on average by 7.9 mm per year per decade since 1998. To verify this hypothesis, we analyzed terrestrial ET energy consumption data and the effects of terrestrial ET change on global warming. Results show that the global warming rate by including the effect of terrestrial ET reduction is 0.349K per decade, which is very close to the observed global warming rate of 0.334K per decade. Our study also shows that global warming can be alleviated by increasing terrestrial ET. The global temperature can be reduced by 0.129K per decade by increasing 1 W/m², which can be achieved by a combination of land use management measures (such as increasing natural vegetation rehabilitation, crop land irrigation) and appropriate water management for biofuel production.