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Modeling oceanic emissions of brominated VSLS under a changing climate: Stratospheric bromine budget and the impact on ozone

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Very short-lived substances (VSLS) of mainly natural, oceanic origin, contribute significantly to the tropospheric and stratospheric bromine loading. About 25% of the bromine loading in the stratosphere is due to oceanic emissions of VSLS for present day conditions. In recent years, there had been much progress in understanding emission and transmission processes of VSLS supplying bromine to the stratosphere. Integration of these in chemistry climate models (CCM) results in a good agreement with available observation.

We compute the impact on ozone and investigate long-term changes in transport and transformation processes of the supply of VSLS to the stratosphere based on chemistry climate model simulations over the period 1950-2099. The simulations indicate that brominated VSLS significantly reduce ozone. The impact is largest in the lowermost stratosphere and in the free troposphere, a region where ozone changes have the largest impact on surface climate.