

Numerical simulations of floodwater on Mars: validation test of the three-dimensional model on the terrestrial study

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Martian outflow channels and the Channeled Scabland in Washington State are believed to have been formed by catastrophic water floods. However, details of the flood processes are not fully understood. Particularly the relationship between observed flood landforms and the supply rate and total amount of floodwater to form them is not quantitatively studied. In this study, we developed three-dimensional numerical simulation code of surface and subsurface flows to understand the cataclysmic flood processes on Earth and Mars. We applied our model to the Channeled Scabland flood to find that the code can reproduce reasonable covering area and that this approach enables us to estimate total amount of floodwater to cover the observed flood landforms.