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[Publication](#) | 10.07.2006

Climate change impacts

Climate change could cause earthquakes and volcanic eruptions

The climate interacts with the Earth's crust through the changing mass of water and ice that is shifted around the planet. Actually the pressure of water and ice on the crust is enormous: 1 cubic metre of water weighs 1 tonne, while the same volume of ice weighs up to 0.9 tonnes.

When the weight of ice is removed through the melting, the suppressed strains and stresses of the underlying rock come to life. The crust and mantle bounce back, immediately as well as over thousand of years. According to studies of prehistoric and recent earthquakes and volcanoes, that "isostatic rebound" can make the planet's seismic plates slip catastrophically and cause also volcanic eruptions.

The effect can be compared to a thumb pressed on a ball: when the pressure of the thumb is removed, the ball springs back to its original shape. Therefore on a regional level, close to the areas where the glaciers are melting, climate change induced earthquakes and volcanic activity are likely to appear.

Indeed the Earth's crust is sensitive: there are well-documented cases of dams causing earthquakes when the weight of the water behind the dam fills the reservoir !

For full information go to:

NewScientist article

NASA research

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