Modeling volcanic hazards of Jan Mayen

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The Island of Jan Mayen is situated at 71 degrees N and 8.3 degrees W in the north Atlantic. It is a volcanic island extending for about 53 km from SW towards NE. The island can be divided into two major volcanic centers, South Jan and North Jan. Known eruptions on the island have occurred in 1732, 1818, 1851, 1970 and 1985. The four last eruptions were mainly effusive and bound to the northern most part of the island. However the 1732 was a phreatomagmatic explosive eruption that covered most of the island. The eruption in 1970 started with an explosive phase producing a steam and ash cloud 10 km high. The plume was observed to extend towards east then fanning out ESE from the island. Latter the eruption became effusive and confined to the northern foothills of Beerenberg. Reports from UK mentioned prolonged twilights and red sunset during the eruption indicating sulfuric contamination in the atmosphere due to the eruption. North Jan is characterized by Beerenberg, a major volcano reaching an altitude of some 2277 m. It has a breached summit crater, about 1,5 km in diameter. The edifice shows a petrological evolution from porphyritic ankaramites in the distal peripheral craters to more plg porphyritic trachybasaltic composition higher up and a summit region composed mainly of tristanite. No major explosive eruption has yet been tied to the volcano. South Jan on the other hand is characterized by small fissures, lava flows and domes. Its petrology indicates evolved trachybasalts to trachytes. One major explosive tephra sequence is identified within the South Jan complex, the Borga formation, its age is unknown but the volume of deposits indicate that it could be related to a caldera formation.

Volcanic hazard on Jan Mayen has only been briefly been analyzed by Sylvester(1976), in light of increasing Norwegian and Icelandic activity on the Jan Mayen ridge and in light of recent events in Iceland a new and more comprehensive analysis needs to be carried out. In this presentation we will present data from modeling of the 1732 phreatomagmatic eruption and potential effusive eruptive scenarios in order to estimate near and far field hazard for the island of Jan Mayen.