Construction of rating territories for water-damage claims

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Abstract

Sweden is the fifth largest country in Europe and has considerable regional differences with respect to geography, demography and meteorological conditions. From relative flat terrain in the south to larger hills and mountains in the north-west, higher level of precipitation along the west border and larger cities and densely populated areas by the coastal line. In an attempt to explain the increased number of water-damage claims during the past years we want to know how these are related to differences in geography. We investigate how one can create rating territories using generalized linear models, credibility theory, smoothing and clustering techniques.

Under the hypothesis that all residual variation in a generalized linear model for claim frequency is a pure effect of geography we are able to estimate the relative risk of water-damage in each municipality. The estimates are used in order to aggregate the municipalities into larger territories reflecting an elevation and similarity of risk. We can conclude that the best way to group geographical units is using a minimum within territory variance criterion and aggregate by adjacency. Included in a generalized linear model the zone-variable turns out highly significant and there are no remaining detectable differences between the geographical units.

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