

**APPLICATION OF MM5 AND CALPUFF TO A COMPLEX TERRAIN
ENVIRONMENT IN EASTERN ICELAND**

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Meteorological and dispersion modeling of pollutants from a proposed aluminum smelter in Reydarfjordur in Eastern Iceland has been conducted. The meteorological conditions at the site of the proposed smelter are complex with a confluence of five valley systems at the end of a fiord with strong terrain channeling effects and a seasonally variable land-sea breeze circulation interacting with slope flows to produce strong convergence zones. Overwater transport and dispersion across the fiord and strongly varying dispersion conditions are characteristics of the location. In addition, a complex source configuration consisting of a pair of buoyant line sources (potrooms) over 1000m in length and point sources subject to building downwash effects are part of the industrial facility.

In this study, the MM5 model has been run for an annual period on a set of four nests down to one km grid spacing. The diagnostic CALMET meteorological model has been used to refine the MM5 meteorological fields to 300m grid spacing and blend them with observational data. In the fiord and surrounding areas, five meteorological towers have collected multiple years of wind data for comparison with the MM5 meteorological model. An evaluation of the meteorological model performance as a function of MM5 grid spacing and radiation effects has been conducting using the METEVAL software package. This consists of both quantitative (statistical) and qualitative (wind roses and vector fields) measures of model performance. The results of the meteorological model evaluation and of the dispersion modeling analysis are presented. The model comparisons indicate a critical grid resolution in MM5 that resolves the land-sea boundary in the fiord is critical and more constraining than the resolution required to resolve the terrain features.

EXTENDED ABSTRACT NOT SUPPLIED