

Submitted Abstract

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Abstract

Tourism industry and government demand for knowledge of the impacts of climate change on ski tourism is growing. Despite the more than 70-year history and large cultural significance of alpine skiing in Sweden, little is known about the industry's future under a changing climate. This study applies the SkiSim2 model with low to high emission scenarios (RCP2.6 to 8.5) to analyse the implications of climate change for ski operations (season length, snowmaking requirements) at 23 alpine ski areas across Sweden for the early, mid and late twenty-first century. Northern areas of Sweden show much less reduction in average season length compared to central and southern Sweden under the high emission mid- (13% versus 58% and 81%) and late-century scenarios (27% versus 72% and 99%). To limit season losses in these scenarios, snow production increases of over 250% are required in all regions. Such increases will create additional financial and environmental stressors, which may lead to the closure of the most at-risk resorts. With greater impacts projected for much of the European Alps ski market, northern Sweden may represent a 'last resort' for the European ski industry under higher emission scenarios by the mid-late twenty-first century.