

**Glacier and Climate Change and the relevance for power generation –
test case Rhone River Catchment**

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Mountain glaciers outside hyperarid regions respond sensitively to temperature and to a much lesser degree to precipitation changes. This makes mountain glaciers excellent paleo-thermometers and particularly vulnerable elements of our environment in a warming world.

Glacier change in populated areas directly impacts societies. One prominent example is presented by melting glaciers that modify the hydrological system and, in turn, their impact hydro- and nuclear power generation. Glaciers provide water in the summer dry season, when other hydro input sources run dry, making the glacier melt water summer supply essential for hydropower plants and cooling systems of nuclear power plants.

Here we propose to combine paleoclimate investigations of glacier climate sensitivity in the Alps, with modern glacier observations that both feed into a numerical model, integrating all glaciers in the Rhone River Catchment. The results of this study would lay the foundation to evaluate the first-order impact of glacier change on hydro and nuclear power generation along the Rhone River, a region where a significant portion of the total electrical power of France is generated by nuclear and hydro power plants. We expect this Climate Center project to be the initiation of a cross-cutting NSF-SEES proposal involving paleoclimate, climate, glaciology, engineering, economy and social sciences.