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Climate change impacts on irrigation water resource in Switzerland

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According to climate projections, rainfall rates and summer discharge from snow and glacier melt in Switzerland are expected to decrease by the end of the 21st century. This may lead to limited water availability for irrigation in agriculture in the future and high irrigation water demand especially during the summer months, which consequently enhances the problem of water scarcity for agriculture.

These predicted changes make the identification of timescales, frequencies, and geographical pattern of water scarcity a fundamental concern for future agricultural practices. Therefore, the main aim of this work is to investigate climate change impacts on water resources and the consequences on irrigation water supply in Switzerland. By creating maps of the geographic distribution of natural water resources available according to climate projections until the end of the 21st century using ArcGIS, the severity of water scarcity is quantified, while regional differences and the most affected areas can be revealed.

The expected outcomes are increasing days of water scarcity per year over the course of the 21st century, while those regions furthest away from melt water sources and lakes will be most affected. This in turn might lead to restricted irrigation potential, making more efficient water use indispensable in Switzerland, while creating general shifts to more water-resistant crops in Swiss agricultural practices.