

## Submitted Abstract

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## Abstract

In Central Chile, annual precipitation is characterized by a large year-to-year variability and depends mostly on few storm events during winter. Precipitation that falls as snow at high elevations is one of the principal water sources for the region. The last decade was especially dry in Central Chile - the so-called central Chile megadrought. The extraordinarily dry conditions and the increased water consumption have led to a considerable stress of the water system. People living in high mountain areas are especially vulnerable to water scarcity. But scientists are not always aware of the concerns and needs of the local population, which makes it difficult to generate scientific knowledge in line with local knowledge.

The project Vecinos de las Nieves (Snow Neighbors) connects local community knowledge with water resource science to jointly study snow and rain dynamics in the mountains of the Coquimbo Region, Chile. Since 2018, we have collected fresh snow data in collaboration with community members who live and/or work in the mountainous sector (above 1,390 m asl). Following each snowfall, the volunteers measure the physical-chemical characteristics of the snow on the ground. In total, 13 precipitation events were documented, with up to 29 cm at the highest observation site (3150 m asl.). In 2021, we expanded the initiative, and created a network of primary schools and rural establishments in the mountains. This year, the work team conducted face-to-face interviews with the participants to analyze their learning experiences and observations, opening a space for reflection on the megadrought and its impacts.

Most participants have observed drier conditions in their environment during the last years, with fewer snow events compared to previous years. They show growing concern about the water availability in the future. Also, some participants mentioned water allocation conflicts in their communities due to decreasing precipitation and increasing water use in the last years. In response to this, some participants are developing adaptation strategies.

In conclusion, the program has generated new scientific understanding of snow and rain processes during the four winter periods, as well as connected isolated communities in the pursuit of science, and has highlighted the importance to connect local knowledge and interdisciplinary research to understand snow dynamics and water availability in this area.