If you are standing in east Aurora with a view of the mountains looking west, you will see the outline of the city of Denver and you will also be overlooking agriculture as the foothills stretch to the north. What you immediately notice is the proximity of those urban and agricultural areas to our beautiful Rocky Mountains. What you may not notice right away, however, are the effects those areas have on mountain snowpack. Alpine areas are sensitive, and can be some of the first indicators of pollution deposition, water retention, and temperature variation.

Mountain areas have been termed "water towers of the 21st century" for their storage and release of water through snowpack. They are incredibly unique, as we know. Their topography allows for greater research opportunity, as the ecology changes quickly over a relatively short distance. Many of these areas are protected; like national parks, and generally not affected by human activities. Also significant – these characteristic zones are present all over the globe; and with their harsh environments, they are already at the edge of climate tolerance.

Sensitive, high-mountain zones, the collection of pollution here affects the amount and quality of groundwater that is released (the deposition of nitrogen for example). Catching and releasing acidic ions from snowpack, these ionic pulses acidify meltwater or surface water. The conceptual model for the area shows precipitation increasing. Their theory is that this happens because warming at lower levels increases water vapor at higher levels. More precipitation may increase deposited pollution. This is stored in the snowpack for months, and can be released in just weeks.

Changes in composition affect flora, as well as fauna like Bighorn Sheep. It is suggested that as they forage they are finding food without the correct balance of minerals, causing muscle disease. Small changes in energy, chemicals, and water in high elevation may signal larger changes not yet evident in downstream ecosystems.