

Local Environmental Impacts of Deicers in the Sagebrush Ecosystem

ABSTRACT

In this study, environmental impacts of two commercial rock-salt, chloride-based deicer products will be evaluated at the Truckee Meadows Community College (TMCC) Dandini campus. Selected chemical deicers have little chance of severely damaging the environment/ecosystem under normal dilution conditions (Xiag et al., 2019). However, with increased concentrations, deicing runoff can have a deteriorating effect on soil and water quality (Devikarani and Thiruvengkatachari, 2002). Our study site is a drainage basin on the eastern edge of Dandini campus where most runoff occurs, and our control site is located 39.5743 N, -119.7927 W. The Dandini Campus is located in the Great Basin Sagebrush Zone, where a combination of hot, dry summers, and cold winters result in characteristic vegetation dominated by aromatic, perennial shrubs including sagebrush (*Artemisia* spp.) and rabbitbrush (*Chrysothamus & Ericameria* spp.). The degree of deicer impact will be localized and dependent upon factors including climate, the chemical composition of deicing salts used, and the timing of deicer application. For most of winter, Reno receives less than an inch of snow on the ground, and snow mainly accumulates during January at higher elevations; the average snowpack in Reno accumulates to at least 24.5cm within a single 24-hour period in January. In winter (Dec-Feb) 2022, the average temperature was 37.8°C, precipitation was 8.74cm, and snowfall was 34.04cm, which is considered a drought year (weather.gov, 2022). We are currently determining the volume of deicer applied at Dandini during this time, and our baseline soil analyses at the drainage basin were collected (7.66 pH, 0.02 PPT salinity, total dissolved solids 27.7 PPT, 39.8 mS conductivity). We are also developing a protocol to analyze impacts of deicers on the native vegetation.