B43G-2643 WATER-USE EFFICIENCY IN SEMI-ARID ECOSYSTEMS OF NORTHERN MEXICO

Thursday, 14 December 2023
14:10 - 18:30
Poster Hall A-C - South (Exhibition Level, South, MC)

Abstract

Arid and semi-arid ecosystems represent 45% of the world's terrestrial ecosystems and 60% of Mexico's land surface. These regions play an important role in the global C sink variability, due to their response to water availability during wet seasons. The water-use efficiency of an ecosystem is a proxy that couples the C cycle to the water cycle, through the carbon fixation and water loss via evapotranspiration. The aim of this study is to compare the intrinsic water-use efficiency (iWUE) of semiarid ecosystems in northern Mexico during the wet season in four semiarid ecosystems. We used the *g1* parameter as a proxy of iWUE. *g1* is a parameter derived from an optimal stomatal conductance model, is inversely related to iWUE and is widely used in Earth systems models. The *g1* parameter was estimated using flux data (at ecosystem-scale) from eddy covariance sites which are part of the Mexican network of ecosystem fluxes (MexFlux). Four semiarid ecosystems were compared: a subtropical shrubland (MX-Ray), two tropical dry forest in different management conditions (MX-Tes, MX-Aog), and an oak woodland (MX-Oak), all located within a rain gradient of the North American Monsoon Region. Rainfall amounts varied across all the four ecosystems every summer season in the range of 450 to 820 mm. ET accounted for up to 70 to 100% of total annual precipitation bringing different impacts in ecosystem productivity and thus iWUE (or *g1*). Understanding the *g1* parameter across semiarid ecosystems is crucial for improving our ability to predict climate change. This study advanced our ability to predict regional contributions to global water and carbon cycles in northwestern Mexico.

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