Coupled Carbon/Water Fluxes in Complex Terrain, Water-Limited Forests

Investigators:

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Overview:

The overall goal of this project to contribute toward a better understanding and methods of quantifying the magnitude, timing, distribution and coupling of carbon and water fluxes in mountainous forestlands. This includes one segment of the continuum of carbon and water flow from the "forest to the sea". The processes addressed here include the exchange of carbon/water between the atmosphere and the land surface (i.e., soil and vegetation) and the flux and storage of carbon/water by the soil and vegetation. We have three key objectives: 1) the merging of innovative new measurements with models to improve the biophysics of the models at the tree and canopy scale; 2) the application of models at the landscape scale, which is necessary for evaluating the impacts of human activities on regional carbon balance; and 3) the use of models to predict the impacts of policy decisions (i.e., land cover change) as well as climate change. This effort is consistent with long-term statewide goal to enhance existing infrastructure by developing a network of watersheds over a range of ecosystem types, complemented by a network of sampling locations in streams/reservoirs. Together with investments in human resource capabilities, this will help us achieve the long-term vision of quantifying the transport/fate of water/carbon throughout the continuum of atmosphere to ocean.

Dr. Walden's role in this project is to address how climate variability impacts canopy-scale and landscape-scale fluxes. Our role will be to provide climate forecasts for the Inter-mountain West region that are "downscaled" to the spatial scale require to drive a landscape model of carbon and water fluxes. The landscape model will be used to assess the impacts of future climate scenarios on regional carbon and water storage and balance.