

Seasonal Soil Moisture Patterns in Contrasting Habitats in the Willamette Valley, Oregon

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Changing seasonal soil moisture regimes caused by global warming may alter plant community composition in sensitive habitats such as wetlands and oak savannas. To evaluate such changes, an understanding of typical seasonal soil moisture regimes is necessary. The primary objective of this study was to document current seasonal soil moisture patterns in the rooting zone of herbaceous plant communities across a range of soils typical of Willamette Valley wet prairie, floodplain, and oak savanna habitats. Volumetric soil moisture data were collected periodically from January 2010 through December 2011 at study sites using time domain reflectometry. In addition, plant communities and soil texture and chemical attributes were evaluated at all sites. Volumetric soil moisture was converted to plant-available moisture using moisture release data for each of the soils. In 2010, a year with unusually high spring rainfall, soils did not begin dry down until the third week in June, and many soils were below the wilting point by late July. Soil moisture began increasing with rains in early September. In 2011 the pattern was similar but July rainfall delayed the summer dry-down by about two weeks, and low rainfall in September prolonged the drought into early October. Well-drained floodplain soils consistently had the lowest soil moisture. Wet prairie sites began to dry down shortly after oak savanna sites, and their rates of dry-down were similar. These results suggest that the composition of herbaceous plant communities in wet prairie habitats may be influenced more by winter inundation than by summer drought.