

Spatial Modeling of Seedbed Microclimate and the Utility of Ecological Site Descriptions for Rangeland Restoration Planning

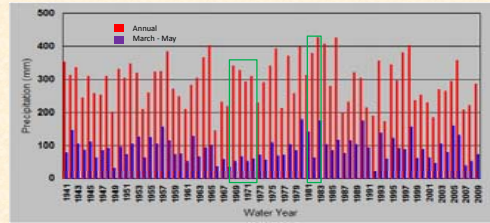
Alex R. Boehm¹, Stuart P. Hardegre¹, Nancy F. Glenn² and Gerald N. Flerchinger¹

¹USDA ARS Northwest Watershed Research Center,

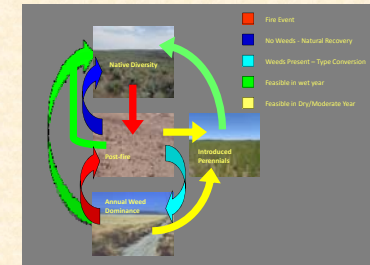
²Idaho State University, Boise Center Aerospace Laboratory, Boise, ID .



Millions of hectares in need of restoration



High temporal variability in weather



Weather drives restoration success

Seedbed Modeling

Hydrothermal Germination Response

Ecological indices of seasonal and annual variability in seedbed microclimate

$\sum R = 1$ and germination occurs

$\sum R(\text{year, season}) = \# \text{times expected to germinate}$

$\sum R(\text{year, season}) = \text{relative favorability of microclimate}$

$\sum R(\text{year, season}) = \text{Ranking mechanism to compare years, species, treatment scenarios, forecast scenarios, etc.}$

**United States Department of Agriculture
Natural Resources Conservation Service
Ecological Site Description**

Ecological Site Descriptions

Weather-related information in current Ecological Site Descriptions is derived from climatological indices that do not account for annual and seasonal variability in seedbed microclimate, and potential response of desirable and undesirable plant species. Seedbed modeling can be used to characterize microclimatic variability, rank specific years for potential establishment, and to quantify transition probabilities between post-disturbance and post-seeding ecological states.

Microclimatic indices and ranking with spatial weather, soils and topographic information

