

REGEN MAPPER: A Web-Based Tool for Predicting Postfire Conifer Regeneration and Prioritizing Reforestation Efforts in the Western United States

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Overview:

- Resource managers would use tools for identifying and prioritizing potential planting sites. A web-based decision support system was developed (DSS) to provide spatial information on potential for natural regeneration in postdisturbance environments.
- We use the ecohydrology model ech2o and high-resolution gridded weather data to predict postfire conifer regeneration for areas across the western United States.
- These models are publicly available via a web-based tool and will predict probability of conifer recruitment and return a suite of raster and vector outputs for anywhere in the western United States.
- High surface temperatures following canopy removal can limit recruitment at lower-elevation, warm dry sites.

Summary:

Increasing wildfire area burned and accelerated timber harvest have amplified the need for postdisturbance reforestation; this need has outpaced current capacity. Resource managers would use tools for identifying and prioritizing potential planting sites. A web-based decision support system was developed (DSS) to provide spatial information on potential for natural regeneration in postdisturbance environments. Users can select burn severity information using 1-year postfire data (Monitoring Trends in Burn Severity), or for recent disturbance events using either Rapid Assessment of Vegetation Condition After Wildfire or Soil Burn Severity Layers. The DSS predicts the potential for natural regeneration, based on distance to adult live trees (seed sources) and historical climatic conditions. The tool returns 30-meter resolution gridded raster maps describing the probability of natural seedling regeneration, distance to roads, and a cost-benefit calculation to assist in prioritizing planting areas. Additionally, the tool returns a set of plots visualizing the outputs, as well as Forest Service



Activity Tracking System spatial data indicating where previous management activities mandate reforestation under the National Forest Management Act. Simulations of potential surface temperature, in the absence of any tree canopy cover, are also provided for areas that have been burned. This layer may be useful for identifying where lethal surface temperatures could limit survival of seedlings, such as low-elevation, south-facing slopes.

Silvicultural Concepts:

- Forest structure mediates near-surface microclimates that influence conifer regeneration.
- Physically based model predictions of interactions between overstory vegetation and near-surface conditions can guide reforestation management decisions.

Management Applications:

- The REGEN MAPPER tool provides a means for forest managers to assess and prioritize sites for planting following wildfire or other disturbance.