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Project Narrative
2003 Highlights, Accomplishments and Activities

In 2003, we focused our efforts on two key components of a conceptual and analytical framework for modeling visibility impairment and regional haze from prescribed and wildland fire: a classification of natural fuels and a simulation system for generating fire probabilities.

1) A classification of natural fuels across landscapes of the western United States

A detailed fuel characteristic classification system (FCCs) for natural fuels is under development at the Pacific Northwest Research Station, US Forest Service. A *fuelbed* is defined therein as the combination of multiple layers (from canopy to litter and duff) of live and dead fuels. Both quantitative (fuel loadings for multiple layers) and qualitative (vegetation life forms, species, etc.) variables are associated with each fuelbed. Currently there are 71 fuelbed prototypes for the western United States. Some are sufficiently general to occur in multiple ecoregions, whereas others are specific to one or even to a single ecosystem province. Decision rules were developed within each section, within each province, to assign fuel characteristics to landscapes. All unique combinations of potential vegetation and current cover were entabulated and matched to FCC fuelbeds, using vegetation associated with fuelbeds, gradient variables (elevation, climate) and geographic location as additional criteria. Where more than one fuelbed was possible the most likely was assigned to that cell, but fuzzy membership of the cell in multiple fuelbed "classes" was assumed and also recorded. Classification relied on both a set of general rules and the ecological and biogeographical knowledge of the lead scientists and colleagues. To date we have completed classification of 25% of western provinces.

Results from this effort were reported at three scientific conferences, and will be published as a proceedings paper and a US Forest Service General Technical Report.

2) A fire scenario builder for model-based estimates of regional haze

We have designed and are currently constructing a Fire Scenario Builder (FSB) to develop scenarios of future fire based on expected changes in fire regime, fuels, vegetation, climate, and land management strategies. The FSB uses a simultaneous weighting of all known influences on fire frequency and intensity (vegetation, current and historical fire regimes, daily to multi-annual climatology, and management, e.g., prescribed fire and thinning) to create mapped distributions of fire probabilities, including both the likelihood of a fire occurring and the probabilistic distribution of fire size. These probabilities can then be used to stochastically place realistic future fire scenarios on the landscape such that they can be used in the integrated modeling of regional haze.

Results of this effort will be presented at three scientific conferences in Fall 2003, and published in proceedings.