

The Tahoe Decision Support System (TDSS)

The Tahoe Decision Support System (TDSS) is a tool to help resource managers use the latest scientific information to make sound management decisions that maintain environmental and socioeconomic health. The system is being developed by a team of scientists from the Science Section of the USGS Western Geographic Science Center in conjunction with the Tahoe Regional Planning Agency (TRPA).

The need for TDSS was identified in the *Lake Tahoe Basin Watershed Assessment* conducted by the UDSA Forest Service (USFS). The report recommended that regulatory and management agencies within the Lake Tahoe Basin (Basin) work together using an 'adaptive management framework.' Adaptive management is an approach that allows for learning and adjustment to occur while management and restoration actions are ongoing.

Resource managers are challenged with the difficult task of executing policies that will optimize environmental and socioeconomic benefits. Decision support models are tools that better enable decision-makers to understand the factors driving a particular management decision and then predict the outcome and potential impacts of that choice. For example, creating more biking trails could improve recreational experiences, but might reduce the habitat of an endangered native species. A decision support tool will show the potential positive socioeconomic impact of adding bike trails while evaluating the effects on the endangered species population. TDSS will optimize Basin agencies' long-term planning by incorporating environmental and socioeconomic considerations.

TDSS will build upon existing related work, specifically a decision support tool called the Tahoe Constrained Optimization Model (TCOM). USGS in collaboration with TRPA, US Environmental Protection Agency (USEPA) and the Desert Research Institute (DRI) built the model in 2002. TCOM was developed to characterize the economic and environmental consequences of implementing specific land-use regulations. Specifically, it focused on the regulation of impervious coverage by granting or denying building permits in a single watershed (the Upper Truckee River Basin). TCOM sought to identify the 'optimal' allocation of building permits that maximized the value of the region's land market while meeting TRPA's environmental objectives.

TDSS will expand beyond a single watershed and incorporate additional criteria for decision making in the Basin. It will examine a wider array of socioeconomic and natural resource management issues. It will also provide tools and methods for integrating and analyzing models, data and modeling results.

The system will utilize TRPA's updated environmental threshold indicators to measure a scenario's likely impact. A scenario is comprised of an expected development footprint, an estimate of future population, a projection of future climate changes, and a set of management controls. In 1982, TRPA adopted nine threshold categories including: water quality, air quality, soil conservation, wildlife habitat, fish habitat, vegetation, noise recreation and scenic resources. Each threshold category contains a number of specific indicators and standards that are used to track, evaluate, and report the attainment status of each threshold over time. These are currently being reviewed and updated. TDSS will utilize the updated indicators to characterize the likely outcomes of alternative scenarios.

The system is being developed in phases over the next several years. The first phase of the project will focus on a small set of established scenarios including a 'No-project Alternative'. Results of this scenario will demonstrate the consequences of continuing to do business as usual, as described in the current regional plans and the Environmental Improvement Program Update, a list of projects aimed at improving the Basin's environmental health. A preliminary report will be completed in the fall of 2004 and will propose procedures for compiling data, analyzing impacts and communicating results. Updated and enhanced versions of TDSS are scheduled for delivery in the fall of 2005 and 2006.

For more information about TDSS, please contact the Western Geographic Science Center:

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References

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Tahoe Constrained Optimization Model, USGS Geographic Analysis and Monitoring Program, <http://gam.usgs.gov/DSSandCSP/tcom.shtml>