Risk and Vulnerability Assessment for Nuclear Risk Management

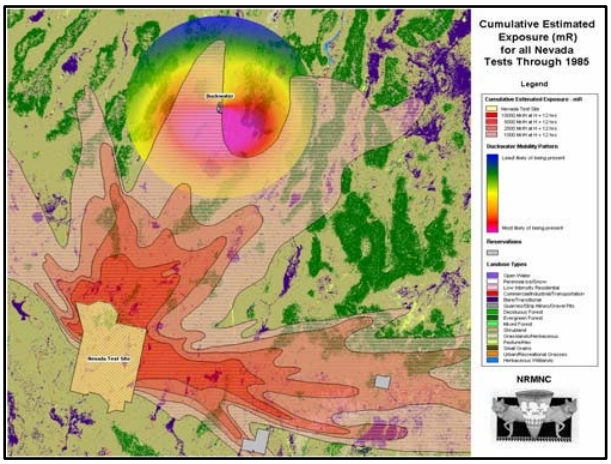
By Clark Labs

Native Communities Use GIS for Nuclear Risk Management

The Native Communities Project (NRMNC) introduced GIS to the community members within the Western Shoshone and Southern Paiute territories as a tool for making informed decisions in their management of the health risks of nuclear hazards. This will be accomplished through the development and dissemination of nuclear contamination health hazard information as well as the development of a community-based hazards management infrastructure and plan. Collaborators include Clark Labs, the Childhood Cancer Research Institute, and the Marsh Institute at Clark University

Central to the project goals is use of IDRISI. Areas of fallout exposure from nuclear tests will be modeled along with information that can spatially describe the activities and lifestyles of the communities. The Project hopes to use this model to aid the communities in detecting patterns of nuclear fallout, identifying significant areas for hazard control, and linking the nuclear exposure to their daily activities, such as hunting and diet.

A variety of data is being utilized, including the physical characteristics of the land, social and economic aspects of the communities and the extent and radiance composition of nuclear test events. Interview data on community activities and lifestyles is also being incorporated.



A pilot project for the Duckwater reservation has already been completed. 3-dimensional maps were created, combining elevation data with land cover data. Using a variety of interpolation techniques, continuous exposure surfaces for some of the nuclear test events were created, providing an estimated fallout exposure at every location in the landscape. A visual picture of the native community's livelihood pattern was then incorporated. For example, how far and in which

direction does deer hunting take place? By combining the distance, direction and hunting season with the prevailing wind and intensity of each test event, a map was developed that shows areas of high and low risk of exposure to radiation and a map that shows which kind of land cover has maximum exposure (see above image).

The GIS process allows the native communities to directly participate in hazard management and the decision making process. Through interview and survey, community members can voice their concerns and needs as well as select and implement their criteria on health-related issues in a participatory GIS process. With the introduction of GIS technology, the community members and researchers have realized the potential and benefits of GIS to participatory community-based hazard management.