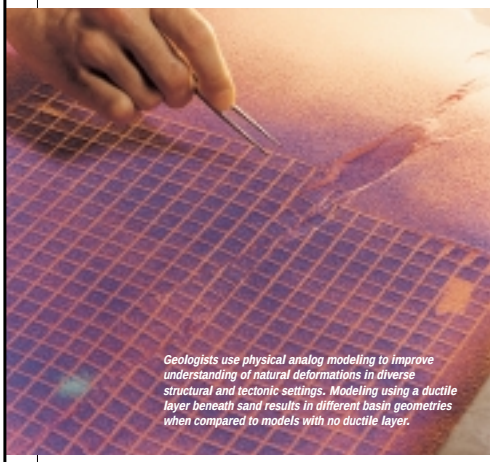
C · N · W · R · A

CENTER for · NUCLEAR · WASTE · REGULATORY · ANALYSES

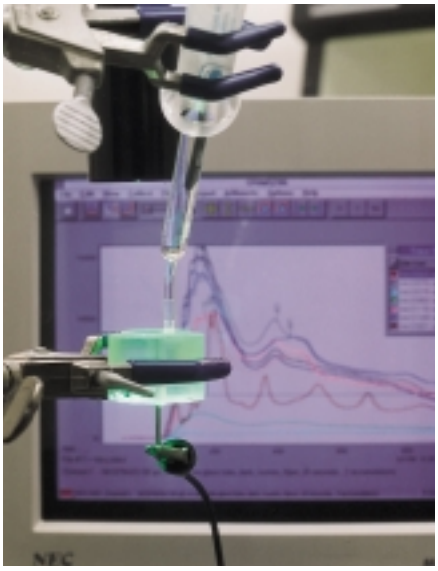
In 1987, the Center for Nuclear Waste Regulatory Analyses (CNWRA) was established at Southwest Research Institute™ to assist the Nuclear Regulatory Commission in regulating the public and worker health and safety aspects of the nation's first geological repository for high-level radioactive waste. This role has since expanded significantly, with the CNWRA providing comprehensive technical support to the Nuclear Regulatory Commission's regulatory role in defense waste management, commercial and federal site decommissioning, spent fuel storage and transportation, and uranium recovery programs.

Today, the CNWRA is an internationally recognized center of excellence in earth sciences and engineering, solving complex problems for government agencies and industry in the United States and abroad. As a federally funded research and development center, the CNWRA transfers, as appropriate, leading-edge technology developed under government contract to the commercial sector.

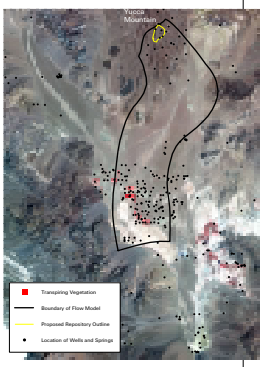
Housed in an 87,000-square-foot facility at Southwest Research Institute, the CNWRA offers sophisticated computational and visualization resources and extensive laboratories to solve diverse scientific and technical problems for government and industry.



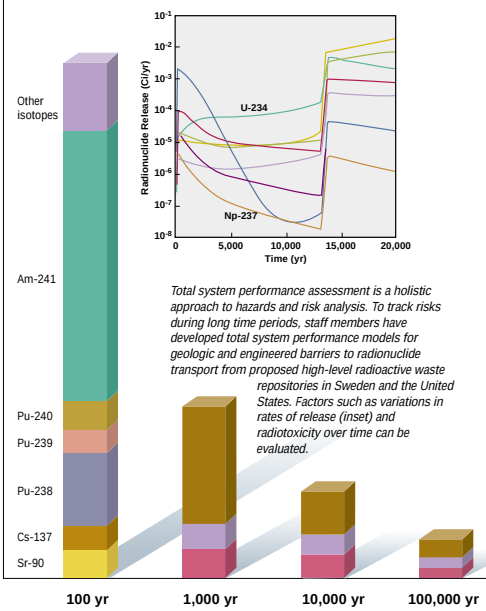
Geologists use physical analog modeling to improve understanding of natural deformations in diverse structural and tectonic settings. Modeling using a ductile layer beneath sand results in different basin geometries when compared to models with no ductile layer.



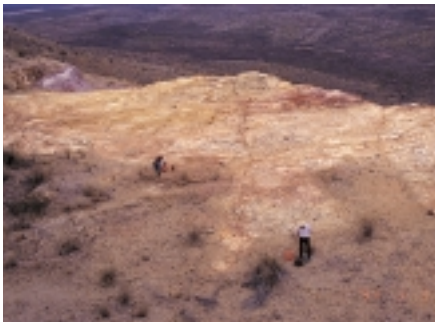
Using laser Raman spectroscopy, CNWRA scientists study the fundamental mechanisms of corrosion under varying conditions that affect the long-term behavior of materials utilized in the manufacture of high-level radioactive waste containers.



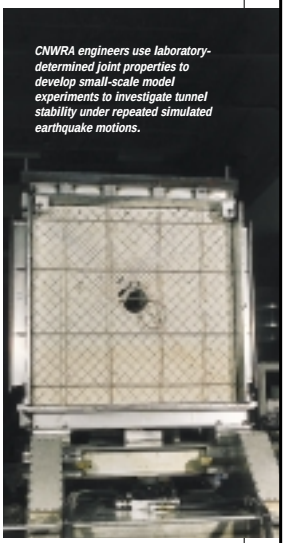
Geological, hydrological, and biological data are converted to numerical form and merged with information on manmade features to allow site characteristics analysis. High-precision data integration supports robust CNWRA flow and transport interpretations.



Total system performance assessment is a holistic approach to hazards and risk analysis. To track risks during long time periods, staff members have developed total system performance models for geologic and engineered barriers to radionuclide transport from proposed high-level radioactive waste repositories in Sweden and the United States. Factors such as variations in rates of release (inset) and radiotoxicity over time can be evaluated.



Geoscientists study natural systems, such as the Nopal uranium-mining district in Mexico, to extrapolate possible transport of contaminants from engineered waste disposal sites.



CNWRA engineers use laboratory-determined joint properties to develop small-scale model experiments to investigate tunnel stability under repeated simulated earthquake motions.