

This project is a collaboration between Oak Ridge National Laboratory and Lawrence Livermore National Laboratory. This research has two, long-term goals

- to develop an ecological framework for evaluating impacts of brine and/or oil spills at exploration and production sites, utilizing population models based on patchiness of landscapes and, in research by LLNL, trophic transfer
- to develop exclusion criteria from the ecological risk assessment process (if possible), based on *de minimus* size and distribution of spills.

In addition, this research could be used to recommend:

- Restoration priorities and strategies for companies that may be undertaken prior to exiting a site, or
- Ecological criteria for drilling patterns or road locations in remote but newly accessed areas.

A spatially explicit, individual-based model for the American badger has been developed, and the model has been used to investigate impacts of brine spills of different sizes and total areas at the Tallgrass Prairie Preserve in Osage County, Oklahoma, a Nature-Conservancy-owned E&P site.

Two computer programs to generate hypothetical spills with realistic features have also been developed. Simulated American badger populations decrease with increasing spill area.

A preliminary ecological framework for evaluating terrestrial vertebrate populations at E&P sites has been developed.

In future research, we will evaluate the requirements for generalizing the individual-based model for describing impacts of various types of habitat disturbance to multiple species at E&P sites in different ecosystems.

[Read more about this work.](#)