

## **of Shallow Subsurface Noble Gas Transport Using Subsurface Transport over Multiple Phases (STOMP)**

Gas dynamics in the shallow underground environment are a critical component dictating how delayed noble gas indicators of underground nuclear explosions eventually arrive at the surface. Understanding how these gases behave in response to rapid pressure changes, how natural gas backgrounds evolve, and the nature of the atmosphere-surface interface are essential to optimizing monitoring and verification efforts. The Pacific Northwest National Laboratory (PNNL) transport simulator STOMP (Subsurface Transport over Multiple Phases) has been used for decades to understand radionuclide evolution in the environment with respect to waste repository and cleanup efforts. The new application of STOMP to understanding post-nuclear explosion noble gas transport, specifically in the shallow subsurface, is presented here.

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**Track Classification:** 2. Events and Nuclear Test Sites