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On Neutrons at the Frontier of Earth Sciences and Environment (NESE)- A Perspective form the U.S. Department of Energy

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As the Federal Government's single largest supporter of basic research in the physical sciences in the United States, and overseeing the Nation's cross-cutting research programs in high-energy physics, nuclear physics, and fusion energy sciences, the Department of Energy (DOE) is guiding grand challenges in earth sciences that will have an impact on everything from mineralogy and crystallography, to geochemistry and volcanology, to geomaterials and magnetism, to energy resources and the environment. Within the DOE's Office of Science, the Office of Basic Energy Sciences (BES) leads research and development for geosciences research, which supports the Department's missions of national security, energy, science, and the environment. At the cornerstone of the BES program are the signature activities of designing, constructing and operating many of the nation's most advanced, large-scale neutron user facilities, for research and development, of importance to all areas of earth science. These state-of-the art facilities such as the Spallation Neutron Source which is under development Oak Ridge National Laboratory are shared with the science community worldwide and contain technologies and instruments that are available nowhere else. Like all DOE national user facilities, the neutron facilities are designed to make novel state-of-the-art research tools available to the world, and to accelerate a broad scale national effort in basic science research and development including the frontiers of earth sciences and the environment.