Meeting of the
COMMITTEE ON EARTH RESOURCES

JUNE 6, 2019
National Academy of Sciences Building
2101 Constitution Ave NW
Washington, DC

The National Academies of | **SCIENCES ENGINEERING MEDICINE**

SUBSURFACE DATA AND MACHINE LEARNING

Collection and analysis of data on the contents and structure of the Earth's subsurface have been important throughout U.S. history for the identification, development, and stewardship of the nation's energy, mineral, and water resources, and for monitoring and mitigating potential natural and environmental hazards. However, ownership and development of these datasets are dispersed across private industry, government, academic researchers, and others, each with different use cases and approaches to data collection and processing. The lack of data sharing and common data collection, curation, and analysis standards presents a serious barrier to improved scientific understanding of the subsurface.

Development of advanced data analyses such as machine learning and artificial intelligence further open the opportunities for examining rich subsurface datasets to improve scientific and public understanding of the subsurface and to support development, stewardship, and management of subsurface resources in an economically and environmentally sound way. Our discussion will focus on progress, challenges, and opportunities in machine learning and artificial intelligence applied to subsurface datasets.

JUNE 6, 2018 | PUBLIC SESSION	*National Academy of Sciences Building ROOM 125*
10:00 AM **Welcome and Introductions** **Opening remarks**	*Jim Slutz, Chair*
KEYNOTE SESSION	*Moderator: Dan Connell, Committee Member*
10:15 AM **Keynote:** **Machine learning with subsurface datasets— current state of the science and practice**	***Paul Johnson*** *Los Alamos National Laboratory*

SUBSURFACE DATA AND **MACHINE LEARNING**

10:45 AM	**PANEL 1**: *Advances and opportunities for machine learning/AI for understanding and stewarding subsurface resources in the private sector* • ***John McGaughey***, *Mira Geoscience* • ***Smaine Zeroug,*** *Schlumberger Research* • ***Shaunna Morrison***, *Carnegie Science Geophysical Laboratory* *(3 panelists, 20 minutes each for presentation + discussion)*
12:00 PM	**LUNCH**
1:00 PM	**PANEL 2**: Moderator: John Leftwich, Committee member ***Basic research to applications*** • ***Grant Bromhal***, *National Energy Technology Laboratory* • ***Bill Vandermeer,*** *Department of Energy, Geothermal Technologies Office* • ***Wendy Harrison,*** *Colorado School of Mines* • ***Lance Waller,*** *Emory University* *(4 panelists, 15 minutes each for presentation, 30 minute discussion)*
2:30 PM	**BREAK**
2:45 PM	**Move to session to discuss proposed National Academies initiative on Subsurface Data Roundtable**
4:30 PM	**End of formal discussion**

END OF MEETING

The National Academies of
SCIENCES · ENGINEERING · MEDICINE