What Are the Knowledge Gaps for Fate and Transport at Complex Sites?

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Panelists
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This panel will review the evolution in our approach to remediate complex sites, identify key knowledge gaps as of 2023, and then speculate how our field may change as we move through the rest of the 2020s. After a brief introduction of the panelists, we will present four "discussion modules":

1. Understanding complex sites in the year 2000 versus the year 2023:
   - What are key technologies/practices we no longer use?
   - What are the key innovations since the turn of the century?
   - Which subfield has progressed the most since 2000: 1) site characterization; 2) understanding fate and transport processes 3) remedial technology?
   - What is the most impactful scientific paper, guidance document, regulation written in our field since 2000?

2. Key problems we see today when we are dealing with complex sites:
   - What is the most difficult site challenge with complex sites: regulatory, technical, or cost issues?
   - If you could change one factor about regulations, what would you do?
   - If you could modestly improve a key technology (e.g., characterization, modeling, remediation) what would you improve?
   - Can we do better at finding sources?

3. Knowledge gaps at complex sites based on the type of COC and hydrogeologic setting:
   - What is the biggest knowledge gap at petroleum hydrocarbon sites?
   - What is the biggest knowledge gap at chlorinated solvent sites?
   - What is the biggest knowledge gap at PFAS sites?
   - How about knowledge gaps for unconsolidated versus fractured rock?

4. Discuss specific knowledge gaps
   - How do we recognize and characterize the features of the geology that carry groundwater plumes?
   - What techniques do we have to get inexpensive, high resolution values for hydraulic conductivity that can go into fate and transport models?
   - What is the best place to look for sources, and what is the best tool to use?
   - What would a perfect groundwater remediation model look like?