Leveraging Available Data Models to Characterize Current and Future Land Use on Munitions Response Sites

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The presence of hazardous waste, munitions and explosives of concern, and munitions constituents may pose a risk to human health or the environment when a pathway exists between the hazard and the affected populations or ecosystems. DoD’s ability to manage and mitigate risks is dependent on the fidelity of the risk assessment and its relevant inputs. When gathering data to support risk assessments at affected sites, the DoD must answer the following questions: How is the land used currently, and how is it reasonably anticipated to be used in the future? Who are the current and reasonably anticipated future potential receptors? Where are they located within/adjacent to the site? What activities are they performing on the site? How frequently are they interacting with the contaminated media? Common data gathering practices to answer these questions may include querying US Census data, analyzing utility provider records, interviewing landowners, or documenting field observations. These data points can help inform current localized receptor information, but they do not provide sufficient insight into the type and frequency of receptor activities or project-level scale details on land-use variability, or demographics and risk susceptibility. These data collection approaches can also be prone to significant error stemming from selection bias, or the sample of respondents who agree to provide input not being representative of the population. Additionally, the methods for predicting the future use at a site are not well defined and are often not supported by data. These limitations present an opportunity for new modeling and analysis tools that provide precise spatialized breakdowns in population demographics (geodemographics) and land-use/activity data to play a critical role in the DoD risk assessment and decision process, enabling data-driven risk and impact assessments and remediation prioritizations.

This presentation will focus on exploring how three existing platforms developed by Oak Ridge National Laboratory (ORNL) could be leveraged to facilitate data-driven land use characterization. ORNL’s UrbanPop, MapSpace, and LandCast platforms were all previously created for other Federal sponsors and have been actively used for multiple years. The USACE/ORNL team will describe how combining established capabilities in land-use characterization, geodemographics, and urban growth futures can provide a holistic representation of the social and built environment conditions associated with Formerly Used Defense Sites.