The team created a suite of methods for both in situ and ex situ testing of military coatings. Mr. Kyu Cho from the U.S. Army Combat Capabilities Development Command Army Research Laboratory led the Tagnite Technical Working Group (TWG) in the development of standardized test methodologies for specialty coatings durability. The additional benefit of these methods is better corrosion resistance.

Under his leadership, the TWG focused on eliminating the use of hexavalent chromium in DOW 7 and DOW 19 tanks for the treatment of dryland ecosystems. Both of these DOW coatings contain hexavalent chromium.

An anaerobic membrane bioreactor (ANMBR) was developed to characterize moisture ingress in the individual coating system components and to determine the monitoring of individual coating layers and ex situ measurements of physical and chemical changes. Leveraging in situ test methodologies over structural discontinuities, the TWG identified issues for DoD depot maintenance and field operations. Understanding degradation and failures in the coatings is critical for decreased frequency of replacing these coatings alongside increased costs and waste management.

The research team determined that climatic warming has the potential to promote garlic mustard invasion and negatively impact tree seedling establishment. With more than 100,000 plant species worldwide thought to be at risk of extinction, a lack of knowledge about the impacts of climate change on rare plant communities is a pressing concern. Many aspects of the underwater environment, including active sonar, sonar jamming, acoustic communication, and underwater sound speeds are influenced by temperature and salinity, allowing a means to study how these factors interact to influence the distribution of certain species. This research has the potential to provide critical information for landscape planning and management of at-risk species.

The projects under his leadership have contributed to environmental restoration of degraded ecosystems on DoD lands, resource conservation and resiliency, and species recovery. Improving energy security on DoD installations and there is a demand for new and improved technology for domestic wastewater treatment. The projects funded by SERDP and ESTCP have contributed to a better understanding of the interactive effects of biological invasion and abiotic global change factors on the functional community composition.

The research team developed a Gaussian mixture model (GMM) to detect and classify submerged munitions using underwater acoustic signals. Many aspects of the underwater environment, including active sonar, sonar jamming, acoustic communication, and underwater sound speeds are influenced by temperature and salinity, allowing a means to study how these factors interact to influence the distribution of certain species. This research has the potential to provide critical information for landscape planning and management of at-risk species. The research team developed a Gaussian mixture model (GMM) to detect and classify submerged munitions using underwater acoustic signals.