NWRTC
Northwest Regional Technology Center
@PNNL

Pacific Northwest
NATIONAL LABORATORY

AROUND THE REGION IN HOMELAND SECURITY

The Northwest Regional Technology Center (NWRTC) is a virtual resource center, operated by Pacific Northwest National Laboratory (PNNL), that supports regional preparedness, resilience, response, and recovery. The center enables homeland security solutions for emergency responder communities and federal, state, and local stakeholders in the Northwest.

UNDERSTANDING THE ENVIRONMENTAL LIFE CYCLE OF FENTANYL

At its best, fentanyl is a synthetic drug prescribed and monitored by doctors to treat pain at health care facilities and homes, made and distributed by pharmaceutical companies to people who need it. At its worst, it has been altered in illicit laboratories into more powerful, dangerous, and even deadly analogs for illegal purchase on the streets.

"Fentanyl doesn't degrade in sunlight, and it doesn't degrade by heat. The microbes in soil that break down drugs like Tylenol and ibuprofen don't want to touch it," said Kristin Omberg, a chemist at PNNL. "So, if it's not breaking down naturally, then where is it going?"

In other words, when disposed of—whether it be via health care, homes, or landfills—where is fentanyl's final resting place?

That's a question that researchers at PNNL are investigating as part of a recent literature review. Specifically, how fentanyl is introduced to the environment and what effects it has on our soil and water supply.

To learn more, view "Environmental life cycle of fentanyl: From the cradle to an unknown grave," recently published in the *Journal of Environmental Quality*.

NWRTC
Northwest Regional
Technology Center
@PNNL

Pacific Northwest
NATIONAL LABORATORY

REIMAGINING IMAGING AT AIRPORTS

The Department of Homeland Security (DHS) Science and Technology (S&T) Screening at Speed Program, in collaboration with the Transportation Security Administration (TSA), is working with PNNL to develop improved detection capabilities and a more user-friendly passenger experience. The effort leverages High Definition-Advanced Imaging Technology developed by PNNL.

"In partnership with DHS S&T and TSA, PNNL has developed a full suite of millimeter-wave imaging technologies that are shaping the future of aviation security screening," said Trent Hartman, systems engineer at PNNL. "Our goal is to simplify, expedite, and enhance the screening process while offering passengers both convenience and safety. We're addressing this through next-generation full-body scanners that have fewer false alarms, footwear scanners that allow travelers to keep their shoes on, and real-time systems that provide quick screening of people in motion."

To give passengers a taste for the future, the millimeter-wave-based shoe scanner system was on display for in-person demonstrations at the CES 2025 conference. Conference goers had the opportunity to step onto the system designed to scan under a person's feet for concealed objects in footwear, with no need for shoe removal. Check it out!

See the feature article to learn more.

PNNL JOINS AI TASK FORCE

PNNL has joined the initial Testing Risks of AI for National Security (TRAINS) Taskforce to address national security concerns related to artificial intelligence (AI). PNNL is one of 10 national laboratories to join the taskforce alongside representation from across the U.S. government, including the Department of Commerce, Department of Defense, DHS, and the National Institutes of Health.

"The TRAINS taskforce provides an opportunity for AI safety experts to conduct evaluations of AI models before they are deployed," said Jessica Baweja, applied research psychologist at PNNL. "We can help determine what risks, if any, the models might present to the public and if they could be used for harmful activities." Baweja leads the AI literacy subcommittee within the Center for AI @PNNL. The center plays a pivotal role in the use and development of safe, secure, and trustworthy AI at PNNL. Baweja is joined on the task force by Nathan Hodas, who leads PNNL's Generative AI Investment.

See the PNNL article and subscribe to the Center for AI @PNNL newsletter to learn more.

PANELS EXPLORE AI FOR EM

How is emerging technology affecting emergency management (EM)? A series of conference panels explored how new and evolving technologies, such as AI, can support emergency managers' responsibilities but can also come with challenges in implementation.

"More frequent and intense disasters put pressure on emergency operations centers to rapidly share and analyze data that informs decision-making. Capabilities like AI are posing both opportunities and challenges to that task," said Jon Barr, a senior systems engineer at PNNL. "These panels gave us an opportunity to share the work we're doing to explore the AI and EM landscape and to invite EM and public safety professionals to share their ideas and concerns for what it means for the future." Read more.

For more information, contact Director Ann Lesperance (ann.lesperance@pnnl.gov | (206) 528-3223) or Deputy Director Rachel Bartholomew (rachel.bartholomew@pnnl.gov | (509) 371-6906) or visit pnnl.gov/projects/nwrtc.

PNNL-SA-207765