

Scientists from across country lending expertise to AltEn study

- [Chris Dunker](#)
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Scientists from the U.S. Geological Survey have joined the expanding research effort at AltEn to better understand how pesticides used widely in seed treatments move across the landscape.

And, by scouring creek beds, studying food webs and sampling tap water from homes near the former ethanol plant, the U.S. Department of the Interior's lead science agency hopes to gain more clarity into the final fate of those chemicals in the environment.

The results of the study could inform new laws or help guide future cleanup efforts of the AltEn site, said Brenda Densmore, an associate director of hydrological studies at the Nebraska Water Science Center, a USGS office located in Lincoln.



Brenda Densmore

Courtesy photo

“We provide the science to say what is there,” Densmore said, adding policymakers and managers will then interpret the science to make decisions on how to act.

AltEn, which opened in 2015, was forced to close by the Nebraska Department of Environment and Energy in 2021 following mounting violations of state environmental regulations.

The former biofuel plant used seeds coated in neonicotinoids — a class of pesticides similar to nicotine that overstimulate insects' nervous systems, leading to their death — to produce ethanol, which in turn left behind toxic solid and liquid waste.

Since the shutdown, focus has turned to cleaning up the stockpiles of waste at the site just south of Mead — a task taken on by six seed industry companies that formerly used AltEn to dispose of unplanted seeds — as well as [determining how far chemicals from the plant have traveled off-site](#).

To that end, a team of researchers from across the University of Nebraska and Creighton University began collecting samples from the air, surface and groundwater, as well as animals and pollinators shortly after the plant closed, and [shared their preliminary findings at a town hall meeting in June](#).

That work will continue for at least one more year with a [\\$1 million appropriation from the Legislature](#).

While USGS had been involved in research at AltEn before the plant closed — results gathered from UNL entomologist Judy Wu-Smart's team, which discovered high concentrations of pesticides [following massive die-offs of honey bee hives](#), have been analyzed in a USGS lab — the agency has taken a more proactive role beginning earlier this year.

The research has included collecting samples of surface water both upstream of AltEn, where those channels are likely to be unaffected, as well as from affected channels like Johnson Creek, said Dana Kolpin, a hydrologist based at the Central Midwest Water Science Center in Iowa City.

USGS partnered with UNL to collect preliminary samples both of the water and sediment from the bottom of the creek in March before spring planting occurred in order to better understand what level of neonics exist on the landscape.



Dana Kolpin

Courtesy photo

“We already know neonics are getting into the stream based on typical farming practices, but we have this higher source being laid over the typical signature and that’s what we’re trying to understand,” Kolpin said, adding a second round of sampling was conducted in May after the planting season.

This summer, with the help of university research teams, Kolpin will begin collecting and examining organisms that illustrate the food web that exists in areas potentially affected by AltEn, as well as those that were not affected.

They’ll start by collecting macroinvertebrate organisms — worms, larvae and snails, to name a few — that spend part of their lives in the water as well as the terrestrial spiders that feed on them. The team will also gather fish and other aquatic animals to sample.

Building the food web and charting the complex interactions will help develop an understanding of how neonicotinoids in particular are transported from organism to organism and what that might mean for the future of the ecosystem.

Kolpin said USGS will also compare the diversity between areas that were potentially exposed to high concentrations of neonics running off the AltEn site and those that were not, as well as in areas surrounding other biofuel plants that produce ethanol through more traditional methods.

“We’re already looking at an ethanol plant where they aren’t taking (neonicotinoid-coated seeds),” he said. “Now that (AltEn’s) process has stopped, there’s still a lot of wet cake around, so I think that signature is still there. The plant is shut down, but that doesn’t mean the problem has stopped.”

Meanwhile, similar to the study being conducted by NU, the USGS is also seeking to gain understanding about the role AltEn may play in human health.

Paul Bradley, a research ecologist and hydrologist based in Columbia, South Carolina, said part of USGS’s mission is to “support decision makers and public health researchers” in understanding how exposure to potential contaminants leads to adverse health outcomes in humans.

Earlier this summer, capitalizing on contacts made by UNL and UNMC, Bradley and his team have collected samples “at the point of contamination” — roughly 25 bottles at each home participating in the study to look for 500 different organic compounds, as well as 35 inorganic compounds.

Speaking to residents, Bradley said every individual is concerned about their potential exposure.

“We’re collecting samples at the point of contamination so you’re getting what the actual final exposure looks like,” Bradley said. “That’s done at people’s kitchen sink, where they’re actually getting water for drinking and cooking.”

The water studies will continue along with USGS's ongoing support analyzing animal samples, which includes examining red wing blackbird eggs, tadpoles, honey bees and vegetation collected from areas near AltEn.

Michelle Hladik, a research chemist at the California Water Science Center in Sacramento who studies the fate and transport of pesticides and other contaminants, said the samples from AltEn and the surrounding area will be compared to samples gathered from other sites.

“This is the Midwest — there's lots of corn and soy — so just because you detect pesticides that are indicative of a seed coating, it could be from some other use than the plants,” Hladik said.

So it's important that the scientists take their time to get the right data to place it in the right context, she added, and “follow the science where it leads.”

That can make for a time-consuming process, Densmore said, which can be stressful when there is potentially an adverse human health effect.

While the data will ultimately be compiled and shared publicly, USGS will be in communication with residents about the results, she said.

“If we do see results come across our desks that are above some sort of human health standard, or some sort of standard set by federal agencies or local agencies, then we'll reach out and contact those people,” Densmore said.