Who knew? Bees are using outhouses, researchers find

By Laura Robertson

In 2021, researchers Leah Valdes and Hailey Scofield combed the Nome road system collecting bees. After discovering that the Nome bees used their own "outhouse" to do their business, they learned that these could significantly reduce bee diseases. Last week, they gave a Strait Science talk about their findings.

The status of bumblebees and their declines has been extensively studied in the Lower 48 and in Europe, according to Valdes, but scientists know "a lot less about their status in Alaska and much of Canada as well as what causes might be contributing to those changes."

In the Lower 48, the threats to bumblebee habitats come largely from large-scale farming. There are pesticides and insecticides which can kill the bees directly and the fields of monoculture crops limit their diets to be less nutritious.

Alaska is home to 22 bumblebee species. "That represents half of all species in the whole United States," said Valdes.

Scofield and Valdes started their research by collecting bees around the road system in Nome. They gathered three hundred and sixty bees and sent them to a lab to be IDed. Eleven bee species were identified. "This is about half of all the species in Alaska, which is pretty amazing, just along the Nome road system," said Valdes.

Having identified the bees, they checked their guts for pathogens. The gut parasites known as crithidia exist in bee populations worldwide, and negatively affect colony establishment, worker survival, and foraging efficiency, especially for stressed bees.

They tested fifty bombus frigidus bees, the most abundant species. They found that fifty-eight percent of the bees they tested had the pathogen.

"This sounds like quite a lot of infection. If sixty percent of people had a disease, I would not feel good about that," said Valdes. "But this isn't too exceptional." Infection rates can range from zero to over eighty percent in different places across the country.

Next, they looked at how the bees defended themselves. A bee might consume some pollen that is infected, and then later poops on another plant which is eaten by another bee—this is a common way the disease spreads. But bees are also social animals, living in colonies at night. Valdes and Scofield wanted to know if the disease could spread inside the colonies.

"When we investigated the nests, all of them had this main nest cavity that was nice and clean and had the eggs, the bees, the food provisions, and then a cavity next to it which was cold and wet and filled with poop," said Valdes, describing it as a kind of bee outhouse.

In later experiments, when other non-Alaska bees were given the opportunity to build nests within the lab, they too built outhouses. Next, the researchers did an experiment where some bees had infected feces placed in their outhouse and some had it placed in their main nest. After two weeks, the bees with the feces in the outhouse touched it much less than the bees with feces in the main nest. This suggested that the waste removal provided by the outhouse helped limit the spread of disease within the colony.

A final experiment involved inoculating groups of bees with either high or low amounts of the pathogen and providing some with outhouses and some without. The researchers found that over six weeks, there wasn't a very significant difference between the bees with and without an outhouse if their inoculation was low—"it's difficult to reduce infection from no infection," Valdes said—but there was a dramatic difference among the groups with high inoculation.

This may have been due to another factor. Some of the bees had begun dying of a fungal infection, later identified as aspergillus flavus, and the groups with the outhouses had significantly lower rates of this too.

Valdes said that while the idea of outhouses preventing disease had been around, this study is, to date, the "only study that's backed it up in a non-human species." She said it has practical real life applications, especially for farmers who breed bees in captivity to pollinate their crops.

"All this began with some field observations that Haley and I made of wild Alaskan bumblebee nests," said Valdes. She joked that it seemed like a "whimsical bee fact," but it also helped reveal a potential unexpected solution for real human challenges. "Who would have thought that we could simply give bees an outhouse space to reduce disease, if the Alaskan bees hadn't shown us the way?"

• Graphite One

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to dock and take on the projected 7,000 containers with graphite concentrate for shipment to a plant in Ohio. "We need to be able to bring in 40-foot depth draft, self-loading container ships," said Torpy. One of these ships is capable of carrying 1732, 20-foot containers per load, and Graphite One anticipates needing nine of those per summer.

If the draft is not deep enough for the ships to dock, the containers would need to be lightered from port to the ship anchor in deeper waters. Currently, there is no container crane at the port of Nome.

Torpy said that they will not contemplate shipping through Grantley Harbor, Tuksuk Channel and into Imuruk Basin, mostly for subsistence reasons. However, he said, there may be the possibility that they will explore shipping materials and equipment via this route. He talked about "perhaps staging a bit of equipment on the shore at the beginning of construction and taking up a winter trail that wouldn't have any surface disturbance, just to get us going."

Local impact

As is common in pitches for mine development, economic upsides, local engagement and the desire to help train a local workforce was pointed out. Schaffner stressed the desire to have 100 percent local hire and highlighted financial support given to Teller and Brevig to the tune of $50,000 per year to use as they please, provided it's benefiting the community as a whole. According to Schaffner, Graphite One has donated $30,000 in 2023 to the NEST shelter in Nome. Bering Straits Native Corporation invested in Graphite One and although they own only 1 percent of shares, Graphite One made an agreement with the regional Native corporation which gives BSNC a seat on the advisory board and the promise to give preferential hiring to BSNC shareholders and descendants as well as local hire and preferencing local suppliers.

Graphite One has stood up subsistence councils that advise the company on the traditional uses of the land around Imuruk Basin.

What's the revenue and what's in it for Nome, asked an audience member. Schaffner said that at 175,000 tons, worth about $980 per ton, the revenue is about $160 million in revenue. The biggest expense is paying wages to employees, next

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College Student Housing Grant

Bering Straits Regional Housing Authority is pleased to award eligible regional tribal college students who are living on campus with up to $4,000 per semester for housing costs if they meet the requirements and are enrolled to one of tribes under the Tribal Designated Housing Entity.

2025 Fall semester applications will be accepted May 1st through June 15; award notification will begin in July and disbursement to the university in August.

Applications may be filled out online at bsrha.org, Faxed to (907) 443-2697 or emailed to jevan@bsrha.org. Applications can be picked up at our office at 1008 East Front Street. If you have any questions, please contact Jeanette Evan the Program Administrator at (907) 443-8623.

Marie Tozier

For Sitnasuak Native Corporation Board of Directors

Dear Sitnasuak Shareholders:

Please consider me for SNC Board of Directors. My experience includes prior board service and serving as the Executive Director of Nome Eskimo Community. I support growth for Sitnasuak and also increased benefits for Shareholders. I support education, scholarships and land use for Shareholders and descendants. I will fight for your rights as an SNC Shareholder!

My parents are John and the late Laraine Garrison. My grandparents are the late Dan and Ethel Karmun. I will represent SNC Shareholders without compromise, and I would appreciate your vote.

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