

Three Minute Thesis (3MT) Competition - McGill University
April 18, 2018

<https://www.youtube.com/watch?v=gI8gO-r1tlw>

3-Minute Thesis Canadian Eastern Regional Competition
(54:00 - 58:04)

Josephine Nalbantoglu (54:00) So we've had nano-particle and I think another message that's coming through is sustainability, sustainability science and what the... our uh ... graduate students are doing to address these problems.

(54:20) The next presenter is Molly Leblanc. She is completing her master of applied science at Saint Mary's University in the department of Environmental Science. She lives in Halifax, Nova Scotia and is here to talk about her work studying the effects of abandoned gold mines.

Molly Leblanc (54:47) Gold, a metal that makes us think about wealth, value, treasure. Across countries and cultures gold is revered, searched for with intensity, used for our most beautiful and important possessions. And in my province Nova scotia we have history rich with gold. We're no California but we've been mining it for about a century and have produced over a million ounces. But today those gold companies are almost all retired. And if you were to visit one of the almost 300 abandoned mines they left across the province you would see something like this.

(55:19) Because prosper and development isn't all that mining industry left behind. In order to separate the gold from the rock, miners used to use another metal, mercury. But we know now, mercury is a neuro-toxin. It can accumulate in the kidney, the brain, even in a developing fetus and cause serious neurological and developmental damage. For every one ounce of gold mined, one ounce of mercury was used, meaning over a million ounces total. And, as you can probably guess, environmental protocols weren't as strict back then, so any leftover waste was typically dumped nearby usually in a wetland like this one. Today there's thought to be about 3 million tonnes of this sand-like, mercury rich

mining waste left in wetlands across the province in Nova Scotia alone.

(56:03) But there are sites like this all across the country. Despite that though, hardly anyone is researching the affect these sites had on the sites nearby. So that's where my work comes in. And I'm starting with the little critters low on the food chain, wetland insects. What I found is that insects from these gold mine sites have mercury levels 50 times higher than insects from clean, healthy wetlands. And in species like dragonflies and mayflies which shed their skin, hatch from the water and fly away, those adults are still keeping almost half of that mercury even after they hatch. So this means not only are these sites leading to mercury entering the food webs, its also at risk of spreading, moving with these insects as they leave the wetlands and fly to neighbouring habitats.

(56:50) Now I can probably guess your answer if I were to offer you a choice between a handful of gold and a handful of bugs, but let me make my case for why these guys are just as valuable. These insects are the base of so many important food webs, some of them, which lead to us. And the fishing industry is huge here. If our fish are feeding on insects that are high in mercury there's a chance mercury could make it's way to humans. And these sites are still open to the public. They're used for ATV rallies, for cottages, and this picture shows children playing in what looks like sand but is actually tailings. Now, the price of gold is rising again and we as a society put so much value on things like gold. But what deserves just as much of our attention and our passion is cleaning up these messes we make so we can protect the real treasure, these species and ecosystems we all depend on. Thank you. (applause)

Josephine Nalbantoglu Thank you Molly. I think it's quite remarkable that we have a good mixture of doctoral students and
(57:48) masters students so thank you for participating even very early on in your education.