

Snow is good, really

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Staff Reporter

MILLBROOK — The climate change ecologists at the Cary Institute for Ecosystem Studies must be part of a scientific improv group because they are so talented at presentations. The "Snow Is Good" lecture was delivered with an entertainer's panache by Peter Groffman on Friday night, Jan. 28; it was funny, informative and important.

With more than 53 inches of snow so far this winter season, according to the Cary Environmental Monitoring Program, it's difficult to grasp that winters are getting warmer.

Groffman, a microbial ecologist, has been conducting research at Cary for 18 years. When introducing him, William Schlesinger, president of the Cary Institute, explained, "He works on the little things."

Groffman began by asking how many in the audience were tired of snow. Very few people raised their hands. Then he went into his lecture, after explaining that weather, which happens every day, interferes with our perception of gradual climate change.

Warming earth temperatures have actually had more impact in the Northeast on winter weather than summer. Last year, 2010, was the 18th year with a higher than average temperature. Very cold days are becoming very rare. There has been a 40 percent decline in -25 percent days and the last one was in 1994.

Frost-free days are fewer and the first fall frost is later in the year. This makes our forests more susceptible to destructive pests and insects like hemlock woolly adelgid, fondly known as HWA, whose numbers are no longer reduced by cold snaps.

Snow cover is also affected by warmer, shorter winters, and the ice season is shorter, declining half a day every year. While snowfall volume hasn't changed, the variability of snowstorms has. Five of New York City's 10 snowiest days since 1869 have occurred in the last 10 years.

Why is any of this important?

Groffman explained how to use the ecoservice's approach to sort out the meaning of these changes to the northern forests he studies. Damage to these forests impacts the value of forests to humans. The "support services" that forests provide are wood products, water and air purification, climate regulation, soil carbon storage and biodiversity maintenance and recreational opportunities are reduced.

What is the impact of snow droughts on the forest?

Groffman's research tried to measure this at a New Hampshire test site. His hypothesis was that snow insulates the forest floor and prevents freezing of the soil. Frozen soil increases microbial mortality and accelerates nutrient loss and soil acidification.

He explained carefully the preparation of 30-foot square plots in the forest where snow

was removed and temperature monitors placed in the soil. The test results supported his hypothesis. Root mortality doubled without snow cover. Huge increases in nitrate leaching, which affects water quality, were documented. N₂O flux increased creating a methane problem. The uptake of CH₄ was decreased.

Groffman explained that good science requires employing multiple lines of evidence and used another approach, elevation gradients, to see if the results would be the same. This involves studying the forest at different elevations and comparing results. The research confirmed the barren plot test. The underlying soil was warmer at higher elevations because there was more snow.

And then the moose got into the study

Scientists studying the growing moose population, an animal described by Groffman as being very large and not very attractive, discovered that decreasing snow cover contributed to increasing the moose population and the damage their browsing did to maple and pine trees.

"Is the principle of gravity a right-wing conspiracy?"

Groffman asked that question as he addressed the issue of communicating science to the general public. He stressed that science is fact based and should not be politicized, observing that the fossil fuel industry has engaged in "deliberate obfuscation of research."

Groffman said he is heartened that 85 percent of Americans agree that scientific research is important and stressed the importance of a dialogue between scientists and the public. While admitting that scientists can sometimes seem arrogant, he urged them to frame their message in relevant ways instead of hectoring.

During the brief question-and-answer period, one informed audience member asked about the views of Republican James Inhofe, senior United States senator from Oklahoma, "who has called climate change a fraud" and questioned the scientific consensus that change is occurring as a result of human activities.

Groffman diplomatically responded that Inhofe had every right to investigate. He used the history of cigarette research from 1960s to the 1990s to explain why there are still a few scientists that dispute man's role in climate change.

The audience left the Cary auditorium feeling smarter about their knowledge of the impact of global warming. The next public event at the institute will be a winter ecology walk on Sunday, Feb. 27, at 2 p.m.