Pine-killing southern beetle may be more deadly in North

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This Sept. 20, 2013 photo provided by the USDA Forest Service shows a southern pine beetle completing metamorphosis into an adult that will attack a pine tree, at Kisatchie National Forest, in Pineville, La. The beetle that has killed millions of acres of pines in southern forests is munching its way north, and new research suggests its tree-killing prowess could be magnified in cooler climes. (Erich Vallery/USDA Forest Service via AP)

A beetle that has killed millions of acres of pines in southern forests is munching its way north, and new research suggests its tree-killing prowess could be magnified in cooler climes.

Once unheard-of north of Delaware, southern pine beetles have been steadily expanding their range as the climate warms. Efforts are underway to quell a large outbreak in Long Island's pine barrens and monitoring traps have caught beetles as far north as New England. The insect could reach Nova Scotia by 2020 and cover forests from the upper Midwest to Maine by 2080, according to a Columbia University study published in the journal Nature Climate Change in August.

Now there's more bad news in a new study from Dartmouth College: Cooler fall and winter temperatures in this new range increase the beetle's destructive potential. That's because larvae developing in the fall are put on hold as pupae when the temperature drops below 50 degrees Fahrenheit (10 degrees Celsius), to emerge as adults for a mass killing spree in springtime.

The researchers found that in warmer regions, beetles mature at various times rather than all at once.

"The way they kill trees is by attacking in large numbers, like a pack of wolves killing a moose," said Matthew Ayres, co-author of the study published last month in the journal *Oecologia*. "When they all attack at once, they draw down the tree's defenses—bleed it out—and the tree is toast."

The rice-size black beetles chew winding tunnels under the bark that disrupt the flow of nutrients and kill the tree in a few months. Pines fend off insect assaults by oozing toxic resin. But pine pitch is no match for thousands of beetles burrowing at once.

Southern pine beetles normally pool their efforts by using chemical attractants called pheromones to summon each other to target trees. The synchronized development brought about by cooler winters gives another means of massive attack.

This Dec. 2, 2010 photo provided by Matthew Ayres shows dying pitch pines in New Jersey Pinelands near Mays Landing, a few weeks after the trees were attacked by tens of thousands of southern pine beetles. Once unheard-of north of Delaware, southern pine beetles have been steadily expanding their range as the climate warms. (Matthew Ayres via AP)

"The power of numbers from synchronously emerging beetles can spell disaster for pine trees," said lead author Jeffrey Lombardo.

The beetles are in the genus Dendroctonus, or "tree killer" in Greek. The genus also includes mountain pine beetles, which have killed trees across

millions of acres in the Rocky Mountains. An outbreak of southern pine beetles in the southeastern United States between 1999 and 2002 caused more than $1 billion in losses for the timber industry, according to the U.S. Forest Service.

"Millions of acres of pines get killed in the southeast," Ayres said. "It's the beetle's natural biology to have huge population fluctuations and when they're abundant to kill large numbers of trees, you can easily see it from outer space."

Such widescale damage is unlikely in the Adirondacks and New England forests because white pines are the predominant pine species there, said Jeff Garnas, a forest ecologist at the University of New Hampshire who's not associated with the Dartmouth study. The southern pine beetle's primary targets are pitch pines, red pines and jack pines.

Garnas said it's possible the benefit of synchronized emergence in spring could be outweighed by the North's shorter warm season, which limits overall population growth, and subzero cold snaps that kill overwintering beetles.

Areas most at risk of southern pine beetle infestation are pitch pine barrens, which are scattered around the Northeast including Long Island and Albany in New York and Cape Cod in Massachusetts. New York's Department of Environmental Conservation has cut 18,000 trees in Long Island's central pine barrens since an infestation was found there four years ago.

Ayres, who previously worked for the U.S. Forest Service in Louisiana, said early detection, suppression by removing infested trees and thinning to improve forest health are the keys to quelling outbreaks. He said knowledge from the new study is being built into the prediction system that forest managers use to anticipate seasons of high risk and ramp up

detection and suppression efforts.