

"His work is very convincing; I would even say unimpeachable," said Dr. Glenn Juday, a forest ecologist at the University of Alaska. "For the first time, I now think beetle infestation is related to climate change."

While Dr. Juday did not collaborate on Dr. Berg's spruce studies, he relayed some of the findings at a recent conference on climate change in Oslo, as part of the Arctic Climate Impact Assessment Project, a study by scientists from several nations. It was also presented by Dr. Berg himself in a speech at an American forestry conference this year.

"There is enormous excitement over Ed Berg's studies," Dr. Juday said.

But other scientists are still skeptical, saying it may be only a coincidence that rising temperatures go hand in hand with growing beetle infestations. Some say he has found a big piece of the puzzle, but not all of it.

"I think Ed Berg is only partially correct," said Dr. Ed Holsten, who studies insects for the Forest Service in Alaska. The trees on the Kenai are old, and ripe for beetle outbreaks. If they had been logged, or burned in fire, it might have kept the bugs down, Dr. Holsten said.

The spruce beetle, which is about a quarter-inch long with six legs, is barely visible to most people who roam through evergreen forests in the West and Alaska. Large swaths of forest in Colorado, Idaho and Wyoming have been felled by the bug. But nothing has approached the Alaska kill.

The beetles take to the air in spring, looking for trees to attack. When they find a vulnerable stand, they will signal to other beetles "a chemical message," Dr. Holsten says. They burrow under the bark, feeding on woody capillary tissue that the tree uses to transport nutrients.

In Dr. Berg's office, he has a cross-section of a tree that has been under attack by beetles. They build a web of canals as they eat. Eventually, the tree loses its ability to feed itself; it is essentially choked to death, a process that can take several years, Dr. Berg said.

Spruce trees produce chemicals, called terpenes, that are supposed to drive beetles off. But when so many beetles go after a single tree, the beetles usually win. As it dies, the normally green needles of spruce will turn red, and then, in later years, silver or gray. Ghostly stands of dead, silver-colored spruce—looking like black and white photographs of a forest—can be seen throughout south-central Alaska, particularly on the Kenai. Scientists estimate that 38 million spruce trees have died in Alaska in the current outbreak.

"It's very hard to live among the dead spruce; it's been a real kick in the teeth," said Dr. Berg. "We all love this beautiful forest."

One reason Dr. Berg may have been able to see the large implications of the beetle attack when others saw only dead trees is that he is one of few government scientists for the Fish and Wildlife Service who is paid to study the big picture.

His title is ecologist for the Kenai refuge. "When they hired me they felt the need to look at things from a broader scale rather than simply do moose counts," he said.

Working with a doctoral student, Chris Fastie, on a federal grant, Dr. Berg has been matching the volume of dead trees to climate. Since 1987, he said, the Kenai Peninsula has had a string of above-normal temperature years, particularly in the summer. Each of those years coincided with huge outbreaks of beetle infestation and dead trees, matching warmer years and a rise in spruce kills in the early 1970's. Dr. Berg found a similar pattern in the Kluane area of the Canada's Yukon Territory, where it is much colder.

Spruce beetle eggs normally hatch by August, then spend the winter, dormant, in larvae beneath the bark. They can withstand temperatures of up to 35 degrees below zero. The normal life of a spruce beetle—if not picked off by woodpeckers or other birds—is two years. But in the warmer years, Dr. Berg and others found that the beetles were completing a two-year cycle in a single year. This mass of insects has consumed nearly every mature spruce tree on the Kenai, until there is very little left to eat. Most of the trees are more than 100 years old.

Other scientists say the warming climate may be responsible for a big part of the huge bug outbreak, but not all of it.

"These bugs are coldblooded," Dr. Holsten said. "They are an early warning indicator of climate change. If it warms up enough they can complete that two-year life in a single year."

#### WARMER WEATHER ALLOWS VORACIOUS INSECTS TO THRIVE

Spruce has grown on the Kenai Peninsula for about 8,000 years. Other infestations have killed up to 30 percent of a forested area, before bug populations died from fire or freeze or other natural causes. The current infestation never slowed until the beetles ran out of food.

"It slowed down only after they had literally eaten themselves out of house and home," Dr. Berg said.

The Forest Service has been studying beetle-killed spruce for some time, but has yet to come up with any way of attacking the insects, other than suggestions of logging and controlled-burn fires—each of which is hotly contested.

What may follow in the path of the dead forest will be likely be a mix of grasses, and more hardwood trees like birch, alder and aspens, said Dr. Berg.

Climate records have been kept for barely a hundred years in most places in Alaska. By studying tree rings—which expand in warmer years and barely grow in cold years—scientists in Alaska say the current warming period is unmatched for at least 400 years. By studying dead trees, they say they can find no evidence of a spruce beetle outbreak of this magnitude, ever.

### ADDITIONAL STATEMENTS

#### TRIBUTE TO PATRICIA OBRADOVICH

• Mr. SMITH of Oregon. Mr. President, the late Oregon Governor Tom McCall once said, "Heroes are not giant statues framed against a red sky. They are people who say, 'This is my community and it's my responsibility to make it better.'"

I rise today to pay tribute to Patricia Obradovich, a remarkable Oregonian who was a true hero, because she dedicated her entire career to making her community, her State, and her Nation a better place. Patricia passed away last month at the young age of 44, after a courageous battle against cancer. Her legacy, however, will continue long into the future.

Patricia dedicated her entire professional life to working for the Federal Government. I have long believed that government service is a high and important calling. The hours are often long, the pressures are great, and the monetary compensation is frequently

lower than what is available in the private sector. Patricia was one of those individuals who was more concerned with making a difference than making a fortune.

Patricia joined the U.S. Army Corp of Engineers as an economist with the Portland, OR District in May of 1981, and continued with the Corps for 21 years. In that time, she served in many roles, including Chief of Economics, Acting Chief of Planning, and Outreach Coordinator.

During her two decades of service, Patricia earned a reputation in Oregon and across the Nation as a public servant of great intelligence and integrity. She played a leadership role in formulating policy on many projects of national significance, including salmon restoration and navigation projects along the Oregon coast and the Columbia River. As an employee of the Federal Government, Patricia received a remarkable 26 awards, including an Achievement Medal for Civilian Service.

I had the occasion to meet Patricia several times, and know the very high regard in which she was held by her coworkers, her countless friends, and her loving family. It is my hope they will take solace in the fact that through two decades of doing the day-to-day work of democracy, Patricia Obradovich truly earned the title of "hero."•

#### PRAISE ON THE 12TH ANNIVERSARY OF THE AMERICANS WITH DISABILITIES ACT

• Mr. JOHNSON. Mr. President, I rise today in praise of the Americans with Disabilities Act on the occasion of its 12th anniversary. The advances in law, health care, education, transportation, and technology promoted in this historic legislation over the past 12 years have given Americans with disabilities a new lease on life.

Today, 53 million Americans live with a disability, of which 1 in 8 is severely disabled. Yet due to the landmark Americans with Disabilities Act, the stereotypes against these persons are crumbling and they are able to lead increasingly integrated fulfilled lives. The Americans with Disabilities Act has provided disabled individuals protection from discrimination in both the public and private sector, and guarantees equal access to employment, public services, and public accommodations. The Act has also spurred research and improved care for seniors, children and mentally disabled persons. In going so, this monumental Act has ensured an improved quality of life for people living with disabilities and has promised disabled children hope for a successful future. The contributions of the Americans with Disabilities Act over the past 12 years are an inspiration for what can be done to improve the lives of Americans living with disabilities, and a proponent of more progress in the future.