

## Scientists Ride the Rails Across Siberia

—By Barbara McGehan

This summer, three NOAA scientists were the first Americans to participate in an international experiment along the route of the Trans-Siberian Railway.

James Elkins from NOAA's Climate Monitoring and Diagnostics Laboratory and Dale Hurst and Russian native Pavel Romashkin of the NOAA cooperative institute at the University of Colorado in Boulder, joined forces with scientists from Russia and Germany to measure ozone-depleting gases in the air from a railway car as it rolled through southern Siberia.

From Moscow to Khabarovsk on the Chinese border and back again, the scientists' specially equipped rail car became their laboratory on wheels. For nearly two weeks, as

they crossed the Siberian countryside, the researchers took a scientific snapshot of the region's air quality and established a baseline for future measurements of emissions.

International agreements such as the Montreal Protocol limit production and consumption of certain ozone-depleting gases. The researchers were assessing how well these agreements were working along this particular route, as well as measuring the amount of gases that drift over from Asia.

Even though this was the seventh year of the experiment and the group included Nobel Prize winning scientist Paul Crutzen from the Max Planck Institute for Chemistry in Mainz, Germany, and *continued on page 2*

## Deaf People Get Weather Warnings in Pilot Program

—By Keli Tarp

Deaf and hard-of-hearing people in Oklahoma now have better access to hazardous weather information through a new program initiated by two NOAA employees in Norman, Okla.

The pilot program sends weather messages from local National Weather Service offices via alphanumeric pagers to people with hearing disabilities who sign up for the service with the School for the Deaf in Sulphur, Okla.

The school, a division of the Oklahoma Department of Rehabilitation Services, which is implementing the pilot project with NOAA, will transmit lifesaving information about tornadoes, severe thunderstorms, winter storms, flash floods, river floods and high winds.

The original idea for the Hazardous Weather Pager Program, which is believed to be the first of its kind in the United States, began with Vincent "Bim" Wood, a research meteorologist at NOAA's National Severe Storms Laboratory in Norman.

Wood, who has been deaf since infancy, conducted a nine-month survey following the deadly tornadoes that struck Oklahoma on May 3, 1999. Telephone lines were jammed during the crisis, and friends and families of deaf people had no way to communicate with them.

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*Pavel Romashkin/NOAA*

*(left to right) NOAA's Dale Hurst, Eva Oberlander of the Max Planck Institute for Chemistry and Igor Belikov of the Russian Institute of Atmospheric Physics in their science rail car adjust their instrument for measuring emissions of greenhouse and ozone-depleting gases.*

## Students Sample Science Aboard *Ferrel*

—By Jeanne Kouhestani

On a clear, still day of high anticipation and heat so bruising you could feel your skin sizzle, 16 students and two teachers from Wando High School in Charleston, S.C., boarded the NOAA Ship *Ferrel* for a day of science at sea.

The pilot project, called “At Sea!,” was the brainstorm of Linda Taylor of the National Ocean Service and Prentiss Lund of the Office of Marine and Aviation Operations.

Lund enlisted her former professor, Leslie Sautter of the College of Charleston, who used one of her allotted Sea Grant days aboard the vessel to mentor the students.

Sautter’s indispensable assistant and marine education specialist Steven Vettese also pitched in.

Wando teacher Salina Caparas, also a former student of Sautter’s, brought her students for their first firsthand experience in marine science.

The project had the enthusiastic endorsement of National Ocean Service Assistant Administrator Margaret Davidson and OMAO Director Rear Adm. Evelyn Fields, who also spent the day aboard *Ferrel*, as well as the full support of *Ferrel* commanding officer Lt. Cdr. James Meigs and his crew.

“This is a huge advantage to these kids,” Meigs said. “The program is totally directed towards them. They’re not going to get in the way. They can get involved.”

Sautter has taken teachers working on advanced degrees and college students aboard *Ferrel* to learn oceanographic and biological sampling techniques, but the Aug. 27 cruise with high schoolers was a first for her.

“We’re here to simulate an oceanographic cruise,” she told the students as they gathered around a navigational chart to plot their course. “Imagine a day like this repeated over the course of three

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## Siberia

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Nikolai Elansky from the Russian Institute of Atmospheric Physics in Moscow, the experiment almost never got rolling.

One of the first things the NOAA team had to contend with was getting their equipment aboard the train, which meant getting approval from border officials.

“It took us ten days to get our stuff through Russian customs,” Elkins said.

The “stuff” included a unique, custom-built instrument that measures atmospheric gases, along with computers and all the auxiliary materials needed to make the experiment happen.

Elkins said the customs problems were not deliberate, but were due to simple things.

“For instance, their computers broke down,” he said. “And there was a new agreement we were using with customs and it was written in English.”

Elkins said the Russians wanted the Americans to be there and to measure these gases. “They want people to know that they are open and that while they do have some environmental problems, they are working on them,” he said.

After being delayed ten days, the scientists were beginning to think they would never get to participate in this experiment.

“All the money spent, all the equipment sent over, and there we sat,” Hurst said. “And then a miracle happened. Sixteen hours before the train was to leave, they gave us the go-ahead. One thing I’ll always remember was getting the phone call that said, ‘Okay. We’ve cleared your equipment through customs. You can pick it up now.’ It took us from about 4 p.m. to 11 p.m. to get everything aboard.”

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Jeanne Kouhestani/NOAA

*Ferrel* skipper Lt. Cdr. James Meigs explains shipboard operations to visiting students, while student mentor Leslie Sautter (far right) looks on.



Dan Purcell/NOAA

Dwight C. Lee.

## Dwight C. Lee Is the Team Member of the Month

—By Keli Tarp

When a radar is broken and a storm is coming, the National Weather Service's Radar Operations Center in Norman, Okla., calls on Dwight C. Lee and his crew to fix it.

Lee, a contractor and president of DBZ and Lee Corporation, is NOAA's Team Member of the Month for September.

He uses his extensive technical knowledge of the WSR-88D Doppler weather radar to fix extra difficult radar outages the government cannot resolve in a timely manner with its own maintenance resources.

"I'll do anything I can to support the mission of the Radar Operations Center and keep the radars working," Lee said.

Lee's goal is to provide emergency repair for the radars anywhere, anytime, within 24 hours, no matter the weather. He and his employees have fixed radars in

snow storms, thunderstorms and hurricanes.

He recently assisted center personnel and other contractors restoring two radars to operation after unique, catastrophic failures.

First, he assisted with the replacement of the main gear of the Little Rock, Ark., radar's 28-foot antenna pedestal, providing technical advice and working 12- to 15-hour days for nine days straight.

Less than three days later, Lee traveled to Laughlin Air Force Base, Tex., to assess the damage to the WSR-88D radar dome that had been destroyed by large hail and strong winds. He was a part of the team that assessed the damage and later reassembled and reinstalled the radar's antenna in 100+ degree heat for more than a week.

"Mr. Lee's contributions during the restoration of these two radars is an outstanding example of how NOAA personnel and contractors should work together to complete our mission," said center director James Belville.

Lee has also been active in supporting local charitable causes, including working with inner city schools to install PCs for student use.

As a boy in Texarkana, Tex., Lee would lie on his back in the yard and watch the sky, finding shapes in the clouds. Today, he still studies clouds, but from his office. He monitors the quality of the radar data from every WSR-88D around the world, notifying radar operators when he sees a potential problem so that routine maintenance can be done.

DBZ & Lee currently has three employees in Norman and four in Kansas City.

"It's just a wonderful job when you think your hands touch equipment that provides radar coverage for the entire country and military bases around the world," Lee said. ☺



Michelle Tolson

Marc Tolson.

## Marc Tolson Is the NOAA Employee of the Month

—By Dane Konop

Marc Tolson, the September Employee of the Month, is on call on his job 24 hours a day, seven days a week. He regularly goes into the office at NOAA's Information Technology Center in Largo, Md., on nights and weekends. And he says he likes it that way.

Tolson is the lead data base administrator for production applications of CAMS, which will be the financial system of record for all of NOAA beginning Oct. 1.

Tolson is on call 24/7 because it's his responsibility to keep the CAMS data base running and accessible to NOAA financial officers, budget analysts and other users.

"If there's a problem at night, we need to get it fixed immediately because the users are going to expect the data base to be available in the morning," Tolson said.

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# Focus On...

## Tall Ships Sail Into Thunder Bay

—By Nancy O'Donnell

With snapping sails and the creak of wooden timbers, *The Pride of Baltimore II* and *H.M.S. Tecumseh*, replicas of nineteenth century sailing vessels, glided into the Thunder Bay National Marine Sanctuary and Underwater Preserve for a two-day Tall Ships Festival Aug. 18-19.

Co-hosted by the new National Marine Sanctuary Foundation, the city of Alpena, Mich., Charter Comunicacions and local businesses, the festival attracted government officials, community leaders, business representatives and several thousand other visitors to the Lake Huron port town of Alpena.

Designated the nation's first Great Lakes sanctuary and underwater preserve on Oct. 6, 2000, and co-managed by NOAA's Office of National Marine Sanctuaries and the state of Michigan, Thunder Bay contains a sunken wealth of U.S. maritime history.

The 448-square-mile sanctuary protects historically significant shipwrecks ranging from nineteenth century wooden side-wheelers to twentieth century steel-hulled steamers.

An estimated 116 ships fell prey to the fogs, storms and hard shoals of Lake Huron. To date, only 40 shipwrecks have been located.

National Marine Sanctuary System chief of staff Capt. Scott Kuester introduced U.S. Rep. Bart Stupak of Michigan, state Rep. Andy Nesmann and other dignitaries at the festival.



Lori Arguelles/NMSF

*A reproduction of H.M.S. Tecumseh visits Alpena, Mich., on Thunder Bay.*

“We hope to locate more shipwrecks by working with notable scientists such as Dr. Robert Ballard and others to identify new wrecks. We also plan to bring the stories of these wrecks and what

they represent to our country's history for all to learn from and enjoy,” Kuester said.

“Seeing the tall ships today emphasizes the importance of  
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preserving the historical remains on the bottom of the Thunder Bay National Marine Sanctuary and Underwater Preserve,” said Stupak, an early and ardent supporter of the new sanctuary. “It is our responsibility, all of us, to make sure that we take care of the lakes because they are preserving our past, and we have preserved them for the future.”

Earlier, Rep. Stupak urged young visitors “to leave [the festival] with an enhanced understanding of the role sailing ships played in the discovery, settlement and development of the Great Lakes states, and of the continued importance of the Great Lakes themselves.”

Sanctuary acting manager Ellen Brody agreed. “Interpretation of maritime history is a priority for the Thunder Bay National Marine Sanctuary and Underwater Preserve,” she said. “This festival helps make the captivating maritime stories come alive for a whole new generation.”

The two visiting replica ships represented both sides of the War of 1812, which pitted Great Britain against its former colony, the fledgling United States.

The Great Lakes based *H.M.S. Tecumseh*, named for the famed Shawnee chief, is a replica of a



Lori Arguelles/NMSF

Visitors learn about the Thunder Bay National Marine Sanctuary at information displays at the Tall Ships Festival in Alpena, Mich.

Royal Navy war schooner.

*The Pride of Baltimore II* is a reproduction of a Baltimore clipper, a privately owned vessel licensed to attack British ships.

“We were delighted to help connect Michigan’s maritime history with the important work being done today to preserve this important legacy through the

Thunder Bay sanctuary,” said Pat Romanowksi, president of the National Marine Sanctuary Foundation, the non-profit agency that helps support the work of the National Marine Sanctuaries. “Our goal is to help the public interact directly with the resources of the sanctuary, and this festival is an ideal way to accomplish that aim.” ☺



Lori Arguelles/NMSF

*The Pride of Baltimore*, a reproduction of a Baltimore clipper ship, visits Thunder Bay.

## Siberia

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The miracle was due to several things, one of which was the intervention by Igor Granberg of the Russian Institute of Atmospheric Physics, who cajoled and pleaded with officials to pass the equipment.

The downside was that the scientists missed the chance to test their equipment, which normally would have taken about four days.

"So we went ahead and departed from Moscow and took the first day of the experiment to test, calibrate and stabilize the instrument," Romashkin said. "This isn't the kind of instrument you can just turn on cold."

As the researchers adjusted to their new surroundings, they continued with their science measurements, which they had started as soon as they left the station in Moscow.

"We found a few surprises," said Elkins, the principal investigator for the American team. "We saw fewer pipeline leaks of methane than the Russians had seen in the past. We also saw a lot of halons."

Elkins said that automobiles and apartments in Russia are required to have fire extinguishers, which may be a source of the halons, an ozone-depleting gas.

The expedition crossed seven time zones and covered about 11,000 miles round trip.

Russia is so vast that the people there say that during the summer, as the sun is rising in the east it is setting in the west at the very same time.

"One of the big surprises for me," said Hurst, "was how populated Siberia was. Somehow, I wasn't prepared for that. I thought it would be open with rolling hills. But it was heavily forested."

As they traveled across Siberia,  
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## Weather Warnings

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Wood's survey revealed 81 percent of deaf and hard-of-hearing people have experienced fear about being unprepared for weather emergencies and that they have relatively limited ways of knowing severe weather is imminent.

One deaf couple he talked with narrowly escaped a deadly F5 tornado as it went through their neighborhood. They reported they were unaware of the approaching tornado until they looked outside and saw neighbors frantically fleeing their houses. Fortunately, the tornado missed them by a block and a half, although their home and surrounding houses were damaged from the debris.

"Deaf and hard-of-hearing people want access to the same critical information hearing people receive from the audio portion of emergency broadcasts," Wood explained. "Alphanumeric pagers are an ideal notification method for those who cannot afford to be tied

down to a personal computer or other weather data source, and who are concerned about hazardous weather catching them off guard."

James Purpura, warning coordination meteorologist with the Weather Service forecast office in Norman, suggested using an automated computer system to initiate pages of products from the Weather Service.

Representatives from the Oklahoma Department of Civil Emergency Management then recommended using their emergency management paging alert system to send weather alerts to the deaf community.

The Oklahoma School for the Deaf agreed to oversee and finance the pilot program. They purchased a computer system, equipment, phone lines and a one year software license at a cost of \$13,000.

"The program will be worth all the effort if it saves one life and gives deaf Oklahomans greater peace of mind," said Larry Hawkins, superintendent of the Oklahoma School for the Deaf. ☺



*Keli Tarp/NOAA*

*Research meteorologist Vincent "Bim" Wood (left) and warning coordination meteorologist James Purpura compare the text of a warning issued by the forecast office with the text that appears on a pager for the deaf and hard-of-hearing.*



## At Sea!

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weeks, where 500 stations are sampled. If you don't properly code each sample and record when and where you collected it, the data are useless."

According to Sautter, the real value of the program is to show the students how science works and to get them involved from start to finish—collecting, labeling, managing, analyzing and interpreting the data.

The cruise was just one aspect of the project.

The students attended a pre-cruise workshop to prepare them for the hands-on work and post-cruise workshops to analyze and interpret the data they collected on *Ferrel*. The pre- and post-cruise phases were conducted during non-school hours—a good indication of the students' motivation and interest in participating in this project.

On *Ferrel*, the students divided into three teams—Alpha, Bravo and Charlie—and rotated among four sampling stations.

The teams took turns working with an instrument that samples water chemistry and measures water depth, a sediment grabber for geological sampling, a disk that is lowered into the water to measure how deep light penetrates, a plankton net for biological sampling and a fish trap.

These tasks were performed at three locations: in the brackish water of the Cooper River, the estuarine waters of Charleston Harbor and in the salt water of the Atlantic Ocean.

Concurrently, the students learned how to plot their position on a navigational chart and record latitude, longitude, time/date, water depth and tide phase.

They also learned how to describe sediment, place it in

sample bags, label it and record their observations, generating data tables to record important variables. In short, the students did what scientists do in the course of a day at sea.

Caparas was thrilled to see her students get this hands-on experience.

"I teach marine science in the classroom, but to actually come out and do it is an awesome opportunity," she said. "It really reinforces what we do in the classroom."

Sautter hopes to provide similar opportunities for students aboard other NOAA vessels, a concept supported by both Fields and Davidson, but within constraints.

Nearly all NOAA ships go to sea for extended periods, making it difficult to put student visitors aboard.

Fields said, "We really have to look at the availability of ships and ship time and for projects that clearly relate to other projects so there's not a major interruption of research time.

"I'd like to see us be able to offer this opportunity to other schools. I think it's important that kids in general see what opportunities exist in different career fields," Fields said.

Students watched the *Ferrel* crew operate the cranes, winches and cables that raised and lowered the equipment.

The students also got the benefit of seeing an unscheduled dive operation, as officers donned scuba gear to free up some entangled lines.

Some students piloted the ship under the watchful eyes of the ship's executive officer.

"I'm in heaven," enthused student Lindsay Thomas. "I'm used to small boats close to shore where we're always being tossed around. I'm putting this At Sea! experience aboard a NOAA research vessel on my college applications." ☺

## Tolson

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"Most people work from nine to five. If there's some maintenance that we need to do, we can't just say, 'At twelve o'clock the data bases are going down. Nobody can access them.' We generally do that work at night," Tolson said.

"But we still need to be here during the day to handle problems. A lot of weekends we spend here trying to fix problems that we couldn't really fix during the week because people need to use the systems," he said.

Because Tolson and others at the center can telework from home, a system fix can often be accomplished using his home computer.

"My wife is very understanding that it's part of my job. And I like my job," Tolson said.

Tolson's supervisor, Lillian Barnes, said he has been single-handedly performing a job that normally would be handled by a team of people. "The Census Bureau has probably somewhere between four and eight people doing this type of work on their production version of CAMS," she said.

Since being hired nearly five years ago as an applications developer, Tolson has also developed or updated several important computer systems for the Office of Finance and Administration, including the distribution system used to send out mass mailings to NOAA employees, the RENTS system used to track information about NOAA facilities and NOAA's Freedom of Information Act tracking system.

"I must say that there are many federal employees out there that are very skilled and deserving of this award," Tolson said. "We have quite a few in our own office alone. So just being nominated was a blessing to me, let alone to win it." ☺

# Siberia

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the scientists had little time for sightseeing.

“At each stop along the way, the train would stop briefly for from two to 60 minutes,” Elkins said. “The problem was that no one knew how long it would stop. And if you got off to look around, the train could leave without you. Since your ticket was for that specific train, you could be left stranded there.”

Borscht, anyone?

For about \$5, they could get a good meal in the train’s restaurant car, consisting of soup, usually borscht, vegetables such as cucumbers and tomatoes, smoked fish and meat of some sort, and sometimes a cube steak.

“And of course, at every stop there were little stands with peanuts, chips, drinks and other things. But again, we were hesitant to get off for fear of being left behind,” Elkins said.

The researchers had also brought some food with them in the science car, and there was a simple cooking facility there so they could cook eggs, oatmeal and other quick meals.

On one happy occasion, Romashkin’s family came to the train with all kinds of food for him, which he shared with the rest of the crew. Romashkin’s parents live in Novosibirsk, the largest town along the route.

The train is electric, but made a lot of noise. It could travel at 70 miles an hour, but typically only went about 35.

The researchers each had their own compartment with a berth to sleep in.

There were bathrooms on the train, one at each end of each of the railway cars. That meant there were two bathrooms for the almost 40 people who shared a car.

Americans are used to their daily bath or shower. But on the train, there was no provision for either. The railroad was built in the early 20th century by Czar Nickolas, and some things have not been updated since.

Each day, the scientists made their way through twelve passenger cars to get to the science car.

Since their instrument was fully automated, “our presence in the very cramped and hot science car was kept to a minimum,” Hurst said. “We would visit the instrument several times a day during train stops of about 10 minutes to check its operation and download data, and would only remain in the science car if a problem was detected, or if we needed to run [tests]. Otherwise, the bulk of our time was spent in the passenger compartments.”

Since it was not possible to access the science car while the train was moving, the scientists had to plan their visits carefully.

“Pavel and I were nearly left behind at one ‘19-minute’ stop,” Hurst said. “We were walking back from the science car along the platform at about 2 a.m. when the train began to pull away after only about two minutes. Luckily, the doors to the restaurant car were still open after a quick delivery of food, and we were able to jump on the moving train and enter those doors.”

Because it was summer and the high season for travel, all the trains were packed with Russians. But, since none of the U.S. scientists spoke Russian except Romashkin, the scientists didn’t have much of an opportunity to interact with their fellow passengers. They also weren’t able to get a sense of what the Siberian culture is like until they got to Khabarovsk at the end of the line.

They spent a day there, took much needed showers and got to

look around.

Khabarovsk, with a population of about seven hundred thousand people, is called the “Capital of the Far East.” Situated on the Amur River, which runs along the Chinese border, the city is a center for the region’s commerce and business.

“It’s at the far edge of Siberia,” Elkins said. “There’s a large market with all kinds of food—Korean food, Japanese restaurants. It’s a very diverse area.”

People there often have a summer house, which gives them an opportunity to get outside the main city.

“Pavel’s uncle lives there and took us out to his summer house, where he had his vegetable garden,” Hurst said. “It’s very common for people there to have a little place in the country. They live in high-rise apartments, and having a place 30 to 45 minutes away gives them an opportunity to get away to a more simple environment.”

After their stop in Khabarovsk, it was time to get back on the train for the return to Moscow.

“This has been a great trip,” Romashkin said. “It has provided me with an opportunity to use my U.S. training to help my country solve its environmental problems.” ☺

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