U.S. CREATES NATIONAL CLIMATE SERVICE

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National Climate Service

OAA will now have a new one-stop shop where different groups can obtain climate information, the agency announced in February. The new National Climate Service is intended to be a portal where decision-makers, individuals and industries from wind power to corn

growers can get information on how to prepare for climate change in their own backyards, the agency said.

U.S. Commerce Secretary Gary Locke, whose department includes NOAA, announced the intention to create the

new office on Feb. 8. NOAA plans to have it up and running on Oct. 1. The service's interim director will be Thomas Karl, the director of NOAA's National Climatic Data Center in Asheville, N.C. Although this is considered a reorganization of existing resources, rather than a brandnew office, NOAA's budget for fiscal year 2011, which requested a \$130 million increase for climate, includes funds for the development of the climate service.

The announcement came after years of discussion and recommendations regarding a centralized climate office that would include outreach, Karl says. "Over the last 10 to 15 years, NOAA has put considerable investment in climaterelated research," he says. But now, "there's a recognition of a real need to take that science and deliver services to [help policymakers and industry] make more effective decisions."

Last May, NOAA Administrator Jane Lubchenco presented the case for this new service to the House Subcommittee on Energy and the Environment, part of the Committee on Science and Technology. "From concerns about droughts and sealevel rise to changes in the chemistry of the ocean, there is a real hunger for more and better information," Lubchenco said in her testimony.

She cited several external and internal studies that recommended the creation of such an agency, including a 2007 National Academy of Sciences report that evaluated the progress of the

U.S. Climate Change Science Program (now the U.S. Global Change Research Program), which was established in 1989 to integrate and coordinate federal research on climate change. The report "highlighted existing gaps in federal programs to provide climate change information," Lubchenco noted in her

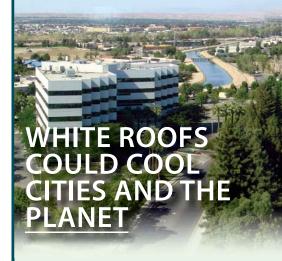
testimony. In particular, she said, the report stated that although climate science itself has advanced in recent years, synthesis of the research results to support decision-making and risk management "has been inadequate."

In response to the 2007 National Academy of Sciences study and other recommendations, in June 2008, NOAA drafted a strategic plan for the new climate service, outlining how it would become a central point from which to provide federal climate information and tools, as well as outreach and feedback to the public. The new integrated office is intended to be similar to the National Weather Service (NWS) in that it will bring together already-existing research labs and observation systems with public outreach.

NWS is a useful model in another way, Lubchenco noted in her May 2009 testimony, in that it relies on multiple partners to help disseminate its information, including partnerships with other federal and state agencies as well as private organizations like the Weather Channel. NWS also has partnerships with private weather groups to tailor its information to specific sectors, such as freeze forecasts for agriculture or weather information for transportation.

Similarly, the National Climate Service may help promote a private climate information industry, Karl says. How to engage the private sector and where it can take responsibility is "one of the key issues, and we don't claim to have the answer right now," he adds. "Our challenge will be to see how far we can go [at the federal level] and still take advantage of what's out there."

Carolyn Gramling



year ago, President Barack Obama's energy secretary, Steven Chu, said that the United States and the world could reduce the effects of global climate change by installing white roofs on buildings in urban areas. By doing so, he said, more solar heat energy could be reflected back into space, offsetting increases in carbon dioxide emissions that cause global warming. White roofs could also lower temperatures in the cities themselves. A new study quantifies these effects, but also suggests that the change in temperatures due to whitened roofs may not be as large as initially thought in some parts of the world.

Cities tend to be a degree or two higher than their surrounding areas due to an effect called the urban heat island. Some of this is attributable to a reduced albedo, the ability of a material to reflect light. Instead, solar energy is absorbed by dark asphalt and concrete roads and building surfaces, which then radiate the heat to the rest of the city, even at night. A lack of shady trees and parks heightens the effect.

Much has been written about the potential effects of increasing albedo in cities by painting roads and roofs white. A study published in the journal Climatic Change last year by Hashem Akbari, the Hydro-Quebec Industrial Research Chair professor at Concordia University in Montreal, Canada, and his colleagues found that increasing the albedo of roofs and pavements of the world's urban areas by a realistic and moderate amount, say by 25 percent, could offset 44 gigatons of carbon dioxide, equivalent to the projected growth in carbon dioxide emission rates for the next 11 years.

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Using more reflective roofing materials could lower urban temperatures.

Keith Oleson and Gordon Bonan of the National Center for Atmospheric Research in Boulder, Colo., and Johannes Feddema of the University of Kansas in Lawrence went a step further in the new study, published in Geophysical Research Letters. In trying to determine the effect of increased albedo on temperatures in cities, they used an urban canyon model, which takes into account the various heat-absorbing characteristics of roofs, walls and the ground to simulate how cities in 33 regions across the planet reflect sunlight, and then coupled this model with a global circulation model. They compared one simulation with cities as they currently are with another in which all roofs were coated in white to achieve their maximum albedo.

The model showed that when all roofs in a city are painted white, there is a significant difference in urban temperatures throughout the world: The average daily maximum temperature decreased by 0.6 degrees Celsius, and minimum temperature decreased by 0.3 degrees Celsius. The heat island effect was decreased by about a third, with the average annual difference in temperature between urban and rural areas dropping from 1.2 degrees Celsius to 0.8 degrees Celsius.

At high latitudes, however, such as in northern Europe and Eurasia, the researchers found that painting roofs white would

have minimal effect on the temperatures of the cities during the winter. Nearer to the poles, sunlight comes in at such a shallow angle in winter that changing the roof albedo has little effect on temperature. Furthermore, those buildings are more likely to already have white snow on them. And even if painting the roofs white did reflect a significant amount of energy, this would lead to a greater need for interior heating, which would add to the heat island effect.

However, the increased heating costs in winter should not discourage efforts to install white roofs, says Akbari, who was not involved in the new research. Overall, the effect is beneficial: In summer the effect would be significant (reducing the urban heat island effect by 0.5 degrees Celsius or more, according to Oleson), while the need for increased heating in winter would be negligible. "If you're in Toronto, and you save \$50" in the summer by painting your roof white, but lose \$10 on your heating in the winter, "you still save energy and money," he says.

The new study is important, Akbari says. Using different methods, it independently confirms results similar to those previously found by Akbari and others. Still, he says, it's important to note that all of these findings are based on models, not on observations and measurements.

Bernard Langer

FIVE FIRMS IN FIRST ROUND OF NASA PRIVATIZATION PUSH

n early February, NASA announced its budget request for fiscal year 2011, which included a controversial change of direction, terminating the troubled and over-budget Constellation manned spaceflight program as well as the aging space shuttle program, and instead seeking private partners to develop new spacecraft and technologies to take humans back into low-Earth orbit.

One day later, the agency announced it was awarding contracts totaling \$50 million to five American firms that would become part of this new, outsourced launch industry. The firms are Sierra Nevada Corporation, Boeing, United Launch Alliance (a joint venture between Boeing and Lockheed Martin), Blue Origin and Paragon Space Development Corporation. Between them, the winners of the contracts will be responsible for developing different aspects of the launch system, including upgrading rockets to make them safer, building a launch escape system and developing life support systems.

Carolyn Gramling



In February, NASA awarded a total of \$50 million in new contracts to five companies, in addition to two contracts previously awarded to SpaceX and Orbital Sciences Corporation. From left: Ken Bowersox of SpaceX; David Thompson of Orbital Sciences Corporation; Mark Sirangelo of Sierra Nevada Corporation; NASA Administrator Charles Bolden; Director of the White House Office of Science and Technology Policy John P. Holdren; Jane Poynter of Paragon Space Development Corporation; Brewster Shaw of Boeing; Robert Millman of Blue Origin; Mike Gass of United Launch Alliance.