much cost avoidance," says Kathy Ramirez-Aguilar, programme manager of the university's Green Labs Program, who conducted the study with her deputy, Christina Greever.

Robert Kuchta, an enzymologist who uses the facility, points to a less obvious, environmental benefit of the sharing system. "It dramatically reduces liquid-nitrogen usage," he says. That's because containers used to store liquid nitrogen are typically cylindrical, and many small cylinders, of the type that might be used by individual labs, have a larger collective surface area — and thus a higher rate of nitrogen evaporation — than does a single, large cryopreservation tank of the same volume that can store samples in one place.

Even without access to a joint facility, individual labs can still realize some of these gains by taking advantage of laboratory-management software. An automated inventory system can free money that would otherwise be spent on paying someone to keep tabs on the thousands of reagents commonly used by large chemistry labs. And it can save researchers from making wasteful purchases because they can't find existing stock on the shelves.

"You find ways to pack the same waste together — and it's quite often the same price, because you're disposing of one package."

What's more, just as members of the University of Colorado's shared facility can pool their hazardous junk for disposal — reducing the number of times sterilized autoclaves are inefficiently run half-empty, and getting a better deal from waste-disposal companies — so, too, can individual labs that share a common chemical-tracking system.

"You find ways to pack the same waste together — and it's quite often the same price, because you're disposing of one package," says Marcus Phelan, a chief technical officer and dangerous-goods safety adviser at Trinity College Dublin, where chemistry labs all use a cloud-based inventory system called LabCup.

A NEW LIGHT DAWNS

As well as benefiting from campus-wide initiatives, scientists can take individual action that will simultaneously save money, the environment and the integrity of their research.

For example, labs with fluorescent microscopes can replace mercury lamps with light-emitting diodes (LEDs), which are less toxic and more energy-efficient. According to Allison Paradise, executive director of My Green Lab, LEDs are better for science because they provide a more consistent light source than do mercury lamps, which degrade over time and make it hard to quantitatively compare images from different time points in an experiment. Buoyed by the success of the freezer challenge, Paradise says that she is in discussions with sponsors to set up a similar initiative, this time aimed at eliminating mercury from microscope lamps. If she's successful, that effort will launch later this year.

Ultimately, it might take a greater attention to sustainability and efficiency across the entire research enterprise for the biggest benefits to accrue, both financially and environmentally — in which case, scientists and funding agencies must band together to make that goal a priority.

Individual labs might not have to pay the energy bills out of their own research grants, but facilities fees are part of the funding infrastructure, through what's often referred to as 'indirect costs'. Bringing those costs down could make more funds available for salaries, travel, equipment and other expenses that more directly support scientists and their research projects.

So far, there's little incentive for individual scientists to do their part. However, with many funding agencies emphasizing the need to justify the broader impacts of proposed research, Ramirez-Aguilar argues that implementing energy-efficient and environmentally sustainable lab practices can be a smart way for researchers to make their grants stand out. It might seem a small detail, but having such procedures in place could make all the difference to the success of your application. "If it makes your proposal look better," she says, "you're more likely to get funding." ■

Elie Dolgin *is a science writer in Somerville, Massachusetts.*

TRADE TALK
River reader

Formerly an Arctic hydrologist at the University of Alaska Fairbanks, Jessie Cherry is now a senior hydrologist with the US Alaska-Pacific River Forecast Center in Anchorage, where she predicts river levels and flow. Shortlisted twice for NASA's astronaut programme, she is also a commercial bush pilot with two single-engine planes.

Why did you leave academia?
I loved Earth science and being outside. But I spent most of my time finding funding for my research programme and staff. And as the chief scientist of the Geographic Information Network of Alaska, I had to raise another US$2 million a year. I was also unhappy with the shift towards projects with multiple principal investigators.

Why did you get a pilot's licence?
Planes are the main form of transport in Alaska, so a licence is handy. From the air, I've photographed methane bubbles frozen in lakes, and ice build-up under bridges.

What made you a good candidate for NASA's astronaut programme?
I applied because the independence required to live and work in the Arctic — like doing my own plumbing and electrical work — made me highly qualified. As a commercial pilot, I'm familiar with aviation and aircraft systems, and I can make quick judgement calls about safety and risk.

Describe your job.
We forecast river levels and flows — floods in particular — for public safety. I compare measured river observations against forecast data, check the weather across Alaska and forecast how precipitation will affect river flows. And I get to do side projects, such as studies of glacial outburst floods.

Why did you join the forecast centre?
In academia, I was so overwhelmed with grant writing that I couldn't keep up with my field. Now I can become an expert in Arctic hydrology and examine the relationship between river flows and snowmelt, for example. Plus I enjoy the 40-hour working week. ■

INTERVIEW BY SARAH BOON

This interview has been edited for length and clarity.