by a thousand cuts," Baker says. McCarthy's nomination finally seems to be on course to a vote by the full Senate. But as *Nature* went to press, there is no word on when that vote might come.

To Calvin Mackenzie, a political scientist at Colby College in Waterville, Maine, who studies the presidential appointment process, the current stalemate is the culmination of a trend that began decades ago. Over the years, both major US political parties have taken advantage of Senate rules and customs to hinder nominations. During the presidency of George W. Bush, for example, Senate Democrats stalled the nomination of EPA chief Michael Leavitt for several weeks. "There is blood on the hands of both parties here," Mackenzie says. "The trouble with a scorched-earth policy is it keeps getting worse."

Some observers fear that the political manoeuvring will start to have an impact on US research. Like the rest of the federal government, US science agencies are grappling with the impact of automatic budget cuts known as sequestration, which has chopped roughly 5% from their funding to 30 September and is set to continue until 2021 (see page 419). Neal Lane, a former NSF director and science adviser to President Bill Clinton, says that having only an acting director can make budget negotiations problematic for agencies.

The EPA is finalizing a new rule to limit carbon dioxide emissions from power plants, and it is also advising the Department of State over whether to permit the construction of the Keystone XL pipeline to carry oil from the Canadian tar sands to the Gulf of Mexico. Those efforts are likely to be delayed until the EPA and other science agencies are again run by permanent leaders, says Lane, now at Rice University in Houston, Texas.

That's not to say interim heads aren't experienced. "They know how the agency works and they can keep the trains moving," says Lane. "But it's a serious problem if that acting arrangement lasts very long, because large policy decisions are generally on hold during that period."

Jeffrey Holmstead, who headed the EPA's Office of Air and Radiation during the George W. Bush administration, disagrees. "A lot depends on the reputation and stature" of an agency's interim chief, says Holmstead, head of the environmental-strategies group at the law firm Bracewell & Giuliani in Washington DC. He notes that the EPA eased clean-air regulations for older coal-fired power plants during a four-month period in 2003 when the agency was run by an acting administrator.

In the meantime, those watching the McCarthy nomination say they are cautiously optimistic that her long wait will end in confirmation. "I wouldn't be surprised if some day she will be confirmed," Mackenzie says. But he adds, "With these things, who knows?" ■

The flooded Red River isolated houses in North Dakota in 2011. Budget cuts now endanger monitoring.

SCOTT OLSON/GETTY IMAGES

POLICY

# US budget cuts hit Earth monitoring

*Sequestration threatens records of snow and stream levels in western United States.*

BY ALEXANDRA WITZE

Two kilometres south of the US–Canadian border, in Pembina, North Dakota, a stream gauge measures the height of the water surging down the Red River. The instrument, one of about 8,000 maintained by the US Geological Survey (USGS), is a sentinel for communities along the river that experienced devastating floods in 2009, 2010 and 2011. Yet this spring, the USGS announced plans to shut down the Pembina stream gauge — a casualty of the sweeping federal budget cuts known as sequestration.

Implemented on 1 March, sequestration slashes about 5% from the budget of every federal agency and programme until the end of the fiscal year on 30 September, with further cuts expected until the end of 2021 unless Congress intervenes. Scientists in fields from biology to astronomy are bracing themselves for an era of smaller and fewer research grants, which will begin within months (see *Nature* **494,** 158–159; 2013). But the cuts are already hampering Earth-monitoring projects, including stream gauges and snowpack measurements, which require a constant influx of funds to keep data flowing.

Monitoring equipment frequently breaks and must be repaired or replaced, usually during the short period of summer fieldwork. That often requires expensive journeys to remote sites by helicopter or other means.

Such is the case for surveys of the United States' western snowpack, a crucial source of water in summer for many states. Continuing a tradition that began in 1906, when a University of Nevada researcher measured snow depth along a transect in the Sierra Nevada mountains, the US Department of Agriculture's Natural Resources Conservation Service conducts more than 1,100 manual 'snow courses' once a month throughout winter and spring. In 1980 it also began operating automated snow telemetry (SNOTEL) sites, and it now has around 860 spread over 13 western states. Survey data are used to produce water-supply forecasts and to analyse changes in the snowpack over time.

But in January, the snow survey announced that it would eliminate 39 snow courses in Montana. The programme was already suffering from reduced funding: it received US$9.3 million in fiscal year 2012, about 15% less than the year before. Congress has not yet finalized the 2013 budget, but the survey is probably facing another 7.5% cut this year when sequestration is taken into account, says Michael Strobel, director of the National Water and Climate Center in Portland, Oregon.

More snow courses may be at risk. "We're trying to prioritize sites that have ▶

scientifically critical information", says Strobel, as well as to decide "which ones have enough SNOTEL and other sites nearby to have a lower priority".

SNOTEL sites typically need to be visited each year to have melted snow drained away, antifreeze added and damage from grizzly bears and other problems repaired. But tight budgets will probably prevent workers from getting to every location this summer, so some of the measurements are likely to fail.

Once snow melts and starts running down from the mountains, USGS stream gauges measure it — unless they, too, are shut down. The national stream-gauge network costs about $165 million to operate each year. The federal government supplies a little more than half of that, and state, local and tribal agencies make up the rest. Information from the 8,000 gauges is posted online in real time and used in everything from weather forecasting to designing bridges and planning kayaking trips.

Federal cutbacks mean that about 50 stream gauges are being shut down and some 100 more could be at risk, says Michael Norris, coordinator for the National Streamflow Information Program, based in Reston, Virginia. The USGS prioritizes gauges mandated by law, such as those that support water treaties, as well as gauges in crucial flood-forecast areas or those that have been in operation for a long time. The agency consults with local officials about which gauges can be cut.

The Pembina gauge was targeted because another station just across the Canadian border in Emerson provides much the same information, says Gregg Wiche, head of the North Dakota Water Science Center in Bismarck. But when Wiche heard how much the community used the information — a local railway relies on its forecasts, for example — he and others worked out a deal to keep the Pembina station and drop one elsewhere in the state instead.

Such small adjustments do little to reassure Johnnie Moore, a hydrologist at the University of Montana in Missoula who has used USGS streamflow data to study long-term trends in melt run-off from the northern Rocky Mountains. He worries that shutting off stream gauges that have been operating for decades could hurt climate-change studies. "Over the long run there's been a big decline in the number of gauges", says Moore, and to cut even more now "is pretty disconcerting".

The outlook is not entirely grim: some of the 50 or so gauges at immediate risk have received extra funding from state or local governments to carry them through to 30 September.

And US President Barack Obama's budget request for fiscal year 2014 asks for a 25% increase over 2012 levels for the streamflow information programme. That money, if Congress provides it, could let the USGS go back to watching the west's water. ■

EUROPEAN SCIENCE

# Russian academy awaits new head

*Reform is in the air at the nation's oldest research body.*

BY QUIRIN SCHIERMEIER

From czarist times to the days of perestroika, the Russian Academy of Sciences (RAS) was the pillar of the nation's scholarship, boasting the country's best scientists as members. The dramatic decline in science spending after the break-up of the Soviet Union ended the academy's days of plenty, and although funding has rallied in recent years, those roubles have increasingly gone to other research centres.

Now awaiting the first new academy president in more than two decades, Russian scientists hope that the leadership will revive the struggling institution and bring about reform they feel is long overdue.

Critics say that the RAS, which employs some 45,000 scientists at 436 institutes across Russia, is burdened by a host of unproductive ageing scientists awaiting retirement and by many pursuing research of dubious value (see *Nature* **449,** 524–527; 2007). They say that current president Yuri Osipov, a mathematician who has presided over the RAS since 1991, has failed to clear out dead wood and take other steps to prevent the academy, which was founded in 1724 by Peter the Great, from declining into insignificance.

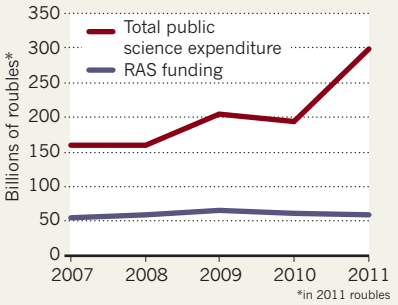
On 29 May, the academy's general assembly of more than 1,000 full and corresponding members will vote in a secret ballot on its future head. Osipov, 76, said earlier this month that he will not run for a fifth term. "I'm tired," he told the Russian news service Pravda.ru . It is time for a new person with "new views and fresh energy" to take over.

How new the views and how fresh the energy will depend on who wins on 29 May. The favoured contender, according to sources close to the academy, is 67-year-old plasma physicist Vladimir Fortov, former deputy prime minister and former science minister in the Russian government. His election manifesto includes a raft of proposals for the RAS — to cut red tape, to improve efficiency, to regularly review the performance of institutes and scientists, and to base funding on merit. "Fortov is no doubt determined to start some reform, however timidly," says Konstantin Severinov, a molecular biologist at the recently inaugurated Skolkovo Institute of Science and Technology near Moscow, and a professor at Rutgers University in Piscataway, New Jersey.

Fortov's chief opponent, Zhores Alferov, is considered less likely to modernize the academy. The 83-year-old physicist and long-time director of the respected Ioffe Physico-Technical Institute in St Petersburg shared the Nobel Prize in Physics in 2000 for his ground-breaking work on semiconductor heterostructures. He is also a member of the

**FLATLINING**

Funding at the Russian Academy of Sciences (RAS) has stayed flat in real terms as overall science funding has risen.

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