SCOP categories but having different names.

These databases are already proving to structural biologists that they need to choose new targets for their efforts. In 1994, for example, only 10% of the proteins submitted to the protein database represented new families—with no sequence similarity to other proteins—and only a third of those had a new fold. Based on the number of new folds found over time, researchers predict that the universe of proteins may contain 1000 or more folds. It could take decades to find them all, Brenner points out, unless crystallographers change their tactics.

For this reason, Kim and others have begun to streamline fold discovery by trying to pick proteins that should have novel folds and working on several of them at once. As they go through the difficult task of making and crystallizing the proteins, they eliminate those candidates that might bog down the work because they are hard to synthesize in sufficient quantities or won't crystallize properly. In this way, "[we] get the structure information we need from the one that's the easiest to get it from," says Tom Terwilliger, a structural biologist at Los Alamos National Laboratory in New Mexico.

One way to efficiently find proteins that have novel folds, says Kim, is to choose genes from organisms that don't have many proteins. "The idea is just to pick a small, self-replicating organism that presumably has a smaller number of genes but a large fraction of the three-dimensional folds," he explains. For example, using genome data from The Institute for Genomic Research (TIGR) in Rockville, Maryland, Kim's team hopes to nail down the core structures of many of the 1700 proteins coded for in the completely sequenced genome of *Methanococcus jannaschii* (*Science*, 23 August 1996, pp. 1043, 1058).

As a test, Kim had TIGR send him 10 *Methanococcus* genes that look like known genes and 10 with no recognizable similarity to previously discovered genes. He and his colleagues put those genes in bacteria and eliminated from the study any that did not yield heat-stable proteins that could be purified readily. So far, they have purified five proteins and solved the structures of three. While none of them turned out to contain a new fold, Kim is confident this strategy is a good one for identifying those proteins that do.

The meeting participants did not reach a consensus about what to do next, but they did agree to meet twice more, once in April and again in October, to come up with a more concrete plan. A few are worried that most structural biologists are too independent to sign on to a project in which their goals are so well-defined. But Kim is adamant. "We don't have any choice," he says. "What else can we do if we're trying to get the function of as many gene [products] as possible?"

–Elizabeth Pennisi

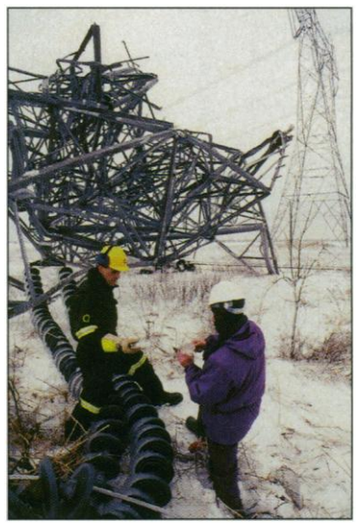
CANADIAN SOCIAL SCIENCE

Database Funding Left Out in the Cold

OTTAWA—Last month's killer ice storm, which caused extensive damage in eastern Canada and Maine and left hundreds of thousands without power for up to a month, was a reminder of modern society's vulnerability to the elements. To a group of Canadian social science researchers, it also presented a rare opportunity to build a research database on how people coped with the once-in-a-lifetime disaster. Unfortunately, the researchers soon confronted another cold reality: No Canadian funding agency was prepared even to review a proposal to fund such a venture.

This snub, social scientists contend, is the latest piece of evidence that their field doesn't receive the same respect—or financial support—accorded the natural and biomedical sciences. There is no government program to fund infrastructure projects in the social sciences, and leading practitioners in the field say a new $600 million program to fund infrastructure needs at Canadian universities will leave most social science projects out in the cold. "It's the task of the social scientist and the humanist to set the larger context. And for any government to exclude [their needs] is myopic in the extreme," says University of Victoria historian Eric Sager, who spent 2 years cobbling together funding for a $700,000 project to digitize a randomized 5% sample of the 1901 Canadian population census.

The proposed disaster database would compile and analyze the mountains of documents generated by this winter's storm. Potential studies include the dynamics of disaster response, the adequacy of public emergency preparedness programs, society's reliance on technology, the impact of severe individual stress on community relations, and the role of the national reserves in maintaining civil order during natural disasters. The results, say proponents like University of Montreal sociologist Paul Bernard, would greatly expand knowledge of how systems respond to crises.



AP PHOTO/T. RIVIERES / *LE NOUVELLISTE* VIA CP

Nature 1, Quebec 0. Transmission tower was no match for ice storm.

The government's Social Sciences and Humanities Research Council (SSHRC) is desperately trying to broker a funding package among public agencies and departments that would allow the social scientists to begin amassing such a disaster database. Its own coffers are bare after taking a $20 million cut in the last 3 years, and "there is no mechanism or program" to create, maintain, and update databases or other forms of social sciences research infrastructure, says Chad Gaffield, president of the Humanities and Social Sciences Federation of Canada and a historian at the University of Ottawa.

The much-ballyhooed Canada Foundation for Innovation (CFI), a 5-year infrastructure program announced last year (*Science*, 28 February 1997, p. 1256), won't help those seeking to establish the disaster database, because its first awards won't be made before fall. In any case, it's not yet clear what kinds of social science infrastructure projects would be eligible for CFI support.

Initially, the CFI said databases weren't eligible. After objections from the community, CFI officials drew a murky line between the creation and maintenance of databases. The former will be eligible, the latter will not. But that's not the only bone of contention: Annual additions to existing databases and digitization projects and virtual libraries are also nonstarters. The line between an eligible database and an ineligible virtual library is, however, "subject to interpretation," says CFI spokesperson Janet Halliwell.

University of Calgary academic vice president Ron Bond says that the definitional squabble indicates that the infrastructure deck is stacked against the social sciences. However, acting CFI President Denis Gagnon says the fund's long-term intention is to serve all disciplines. And he says he'll recommend "drastic measures" should the agency discover after a few competitions that the social sciences have been shortchanged or that database proposals are being routinely rejected.

Social scientists aren't sure how to respond to the controversy. Some, like Univer-

sity of Toronto dean of arts and sciences Carl Amrhein, argue that the only solution is to flood the CFI's forthcoming grants competition with a host of applications that would test its definition and, thus, force the fund to spell out its rules. But others argue against trying to squeeze the field's needs into CFI's criteria for support and urge their colleagues to campaign for either a new foundation for the social sciences or a new program on infrastructure within SSHRC. The research infrastructure needs of the social sciences "differ substantially" from the machinery-and-mortar model of the natural and biomedical sciences, says Serge Courville, a geographer at Laval University in Quebec.

Gaffield says the community must fight against the notion that it is somehow "virtuous" to pay for research tools out of pocket. Like others, he's concerned that if universities use their endowment monies to pay for the maintenance and research costs associated with the new infrastructure grants awarded by CFI, the shift in funds will reduce the resources available for other research areas. "Rather than trying to fit a square peg in a round hole," Gaffield argues, Ottawa should simply create a separate infrastructure program to address the "unique needs of the social sciences and humanities."

–Wayne Kondro

Wayne Kondro is a free-lance writer in Ottawa.

ECOLOGY

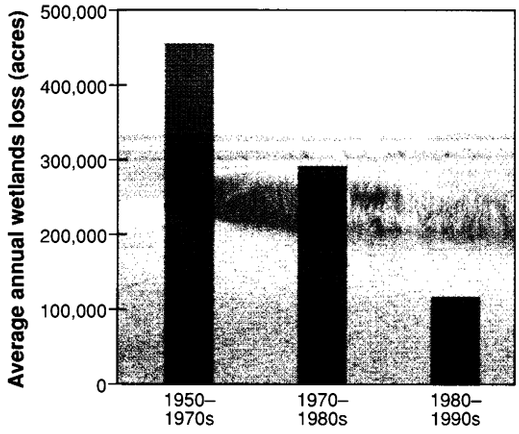
New Wetlands Proposal Draws Flak

Environmentalists and some ecologists are assailing draft regulations that they claim could open up to development many now-protected wetlands, including swamps, bogs, and seasonal marshes. The guidelines, written by the U.S. Army Corps of Engineers, have also sparked concern among other federal agencies with jurisdiction over wetlands policy.

The Corps proposal is supposed to replace an existing scheme that itself has come under fire for being too developer-friendly. Known as Nationwide Permit 26, it originally gave fast-track approval for building on parcels of up to 4 hectares of wetlands that fall into two categories regarded as ecologically less valuable: "headwater" and "isolated." Federal regulations have slowed wetlands loss considerably in recent decades (see chart). But environmentalists claim that the rules aren't protective enough—particularly Permit 26, which the Natural Resources Defense Council (NRDC) vilifies as "the single largest source of wetlands destruction in America." Now NRDC attorney Andrew Caputo contends that a draft of the new permit procedure, leaked to the press last month, would make matters worse by potentially opening up all nontidal wetlands to development. The Army Corps has fired back, saying its critics are jumping to faulty conclusions. After a public review, the agency insists, the final plan will protect more wetlands than ever before.

Experts have argued ever since Permit 26 was started 21 years ago that there is no valid scientific reason for singling out "headwater" and "isolated" wetlands as less valuable than those near lakes or streams. Lending a high-profile voice to these concerns, a National Research Council (NRC) panel in 1995 noted that these wetlands "are not necessarily less valuable or less functional than other wetlands are" and recommended a review of "the rationale for extensive use" of Permit 26. The Corps promised it would do just that.

Under the proposal, the new permits would leave only tidal wetlands untouched. While the proposal would eliminate the arbitrary boundary between types of nontidal wetlands, it fails to offer guidelines for weighing the relative ecological value of a given parcel. Instead, the proposal would simply reduce the maximum size for many permits to 1.2 hectares, instead of 4. Permits would be granted according to 16 classes of activities, such as homebuilding and mining, and for larger projects developers would have to submit a mitigation plan to "offset" the lost hectares.



Shifting tide? Environmentalists say new rule could reverse gains in wetlands protection.

These proposed changes have set off alarm bells at other agencies briefed on the proposal. In a 12 January memo to the Corps, officials from the Environmental Protection Agency, the National Marine Fisheries Service, and the U.S. Fish and Wildlife Service protested that any protection gained by limiting the amount of wetlands available would be lost by opening all nontidal wetlands to potential development. They also argued that the new approach "lacks any data that would support the draft proposed permits." Without those data, it's impossible to say whether the new permits would destroy fewer hectares of ecologically valuable wetlands—or more—than do the current permits, one agency official says. "We're in this netherworld of not having the data on which to base conclusions," he says.

Academic scientists who have seen the draft are upset, too. "It would relax the protection of clean water in the U.S.," says ecologist Mark Brinson of East Carolina University in Greenville, who served on the 1995 NRC panel. Like the agency scientists, Brinson says the Corps seems to have arbitrarily chosen threshold measurements without regard for wetland type. Scientists also decry the notion that mitigation can make up for losses, says ecologist Joy Zedler of the University of Wisconsin, Madison, because some wetlands "are far easier to re-create than others."

The Army Corps contends its critics have rushed to judgment before it could make its case. Michael Davis, an Army deputy assistant secretary, told *Science* that the Corps has assembled data on permit usage to back up its draft proposal, which it plans to present to other agencies later this month. The leaked version is only "preliminary," Davis says; a revised proposal will be aired for public comment in the *Federal Register* in March. A final rule, scheduled for release in December, "will be more protective than what we have today," says Davis, in part because field officers who issue permits will be expected to impose additional restraints on development when necessary.

But this rather arcane debate over permits may soon be "overshadowed," says Jon Kusler, executive director of the Association of State Wetland Managers. The reason: A series of federal court decisions have come to conflicting conclusions about which wetlands are protected under the law covering the permits, the Clean Water Act. Kusler says the issue may be headed to the U.S. Supreme Court, but he predicts Congress may ultimately have to clarify which wetlands it wants to protect under the act. Whatever protection strategy emerges is unlikely to satisfy wetlands ecologists, who acknowledge that they don't have a concrete plan of their own. "Many of us would have liked a moratorium on damage to wetlands and aquatic habitats until we could show that those damages would not be far-reaching in time and space," Zedler says.

–Jocelyn Kaiser