

Science Under Wraps in Prince William Sound

Researchers are complaining that a gag on their data has made rational decisions on cleanup impossible

YOU'RE AN ENVIRONMENTAL SCIENTIST working on a huge eco-disaster. Your work shows that a certain type of cleanup is the best possible response. But the company responsible for the catastrophe is reluctant to begin cleaning up until it's been convinced by enough hard data on environmental damage to be quite sure that you're recommending the right cleanup method. So you provide the damage data, right?

Wrong. You're not supposed to talk about it because it's under a secrecy order imposed by a key public official in your state. Your science is censored. Now what do you do?

This isn't a theoretical puzzler from an undergraduate "ethics in science" course. It's as real as today's headlines. The company that could use your data is Exxon. The disaster is, of course, the *Exxon Valdez* oil spill. And the muzzled scientist is actually a whole cadre of environmental scientists in Alaska, who are laboring under restrictions imposed by the state attorney general. Their work has been declared practically as secret as the latest Star Wars gadgetry. And many complain that this secrecy has impeded the cleanup and clouded public understanding of the spill's effects.

Only months after the March 1989, accident in Prince William Sound, Alaska's attorney general at the time, Doug Bailey, issued a series of memos to state scientists ordering them to keep their data on the spill under wraps. His motivation, Bailey says, was to prevent Exxon from gaining the upper hand in the litigation that was shaping up from the moment the *Valdez* ran aground. State scientists have largely complied; little information has been forthcoming from their work. The gag has been particularly effective in muzzling the most contentious data—that relating to environmental damage.

The gag took on particular significance in recent weeks when the \$1-billion deal that had been worked out among Exxon, the state of Alaska, and the federal government collapsed. First, U.S. District Judge Russel Holland ruled that a \$100-million criminal fine wasn't enough punishment for Exxon and threw out the plea bargaining arrangement. Then the Alaska legislature voted the agreement down. Finally, Exxon and the government agencies began backing away from plea bargaining and preparing for liti-

gation. Yet with environmental experts unable to review and discuss openly the data on the spill's damage, it isn't easy to tell whether those decisions are reasonable or wildly overreactive.

But for scientists, there's an even deeper question than that of the spill's effects: What is a researcher's primary loyalty? Is it to the process of science, to society, or to the state agency that foots the bills? Among scientists working on the spill, answers to that question are sharply divided. David Shaw, a chemist at the University of Alaska who collected some data on the spill for the state, quit when the gag was imposed. "The whole point of doing science in an academic setting," he says, "is to be able to go to colleagues and say, 'I've been looking at this phenomenon' and ask, 'What do you think?'"

Others think the critics are just crybabies who aren't sufficiently worldly wise about government and public policy. Arthur Weiner, a biologist for the state's Department of Natural Resources who has been a principal investigator for the state on the spill, says: "Scientists will whine as long as they can't publish." He adds: "We all knew when we signed on that we were being paid by the state to get ready for litigation....It's the attorneys who are running the show here." Former attorney general Doug Bailey agrees wholeheartedly: "The job of state scientists in this case is to further the interest of the state, not the interest of science."

No matter who's right in that debate, the reality is that so far little damage assessment data has been made public. In fact, much of the official information has come from an

18-page summary of 58 studies done by federal scientists that was recently released by the federal government. The summary confirms that immediate damage was severe and that local birds were among the hardest hit: As many as half a million birds of various species died—including 200 bald eagles—along with several hundred thousand more chicks. The 18-page summary, however, offers little in the way of a scientific estimate of long-term damage to the ecology of Prince William Sound.

Indeed, far too little data has been made public for the response experts to come to a unanimous opinion of the best strategies for cleanup. In some cases, the response specialists have not been allowed to see the state's damage assessment results, a situation that makes them very uneasy. "We need to know the damage assessment findings so we can make better responses about the course of action," says David Kennedy, who heads the National Oceanic and Atmospheric Admin-



The right move? Oil spill response experts Jim Gibeaut (top) and David Kennedy (bottom) say it's hard to know without damage assessment data that has been kept secret by the state of Alaska.

istration's (NOAA) oil spill response unit. In some cases, Kennedy says, his team had to duplicate the state's damage-assessment studies when they weren't allowed to see the results.

And it isn't only the federal scientists who feel frustrated. Jim Gibeaut, chief science coordinator for oil spill response for the state of Alaska, also believes his work has been hampered by the wall of secrecy erected between his team and the damage-assessment crew. "Without the damage-assessment data, the environment suffers," Gibeaut says. Without that data, he asks, "how do we know what cleanup efforts would do more harm than good?"

Several scientists interviewed by *Science* agree that the gag has created problems in at

least one significant area of the cleanup: streams where anadromous fish such as salmon breed. The main question was whether it is better to clean the streams, risking damage to fish eggs and immature fish, or simply leave the oil in place, letting nature take its course. Damage assessment teams had done extensive studies on the streams, but their data was not made available to response teams until recently—almost 2 years after the spill.

After some data was shared, a number of response scientists came to the conclusion that the streams should be cleaned. When the response experts presented their conclusion to a technical advisory group made up of state, federal, and Exxon scientists, Exxon was reluctant to begin a cleanup without solid evidence that it was, in fact, the best strategy. The state response scientists had seen those studies, but, bound to silence, they could not discuss the results.

In the end the streams were cleaned by mechanical and chemical means. But Jacqueline Michel, a geochemist with Research Planning Inc. who consulted for NOAA, doesn't think a cleanup was necessarily the right solution for the streams. And

she believes the reason a solid decision wasn't made is the lack of free scientific communication. She asks: "How can people make good decisions when the data is only whispered in one ear?"

To some scientists, the gag not only presents obstacles to the cleanup, it also obscures public understanding of the effects of the spill. Within a few days of the spill, Exxon engaged independent contract research organizations to monitor the effect of petroleum hydrocarbons on Prince William Sound and the Gulf of Alaska. Most of that data was kept within the company, but some assessments supporting the company's public position were released. Jerry Neff, a senior consultant for Arthur D. Little, one of the firms retained by Exxon, concluded in his study that it was "extremely unlikely that hydrocarbon concentrations resulting from the spill have had or will have any adverse effects on plants and animals in the water column of Prince William Sound."

Alaska's Gibeau shoots back that the Exxon studies are "totally incomplete." He thinks "Exxon has misled the public into believing that things will totally recover." His state team would like the public to know the

"other side" of the effects, he says.

NOAA's Kennedy, on the other hand, would like more information to be made public for the opposite reason: to contradict what he thinks are exaggerated media reports of environmental damage. "The end of the world has not come," says Kennedy, and 2 years after the spill there has been "incredible recovery." But he notes that emotionally charged media coverage in the absence of solid scientific data has had damaging consequences. "The hysteria put pressure on Exxon to clean up every drop of oil, though leaving oil in place was in some cases best for the environment."

In the absence of results from the damage assessment studies, it's difficult to know how much damage the *Exxon Valdez* spill has actually done to one of Alaska's most pristine wilderness areas. Until the data are released, perhaps the only thing to do is rely on what Judge Holland said when he overturned the deal Exxon cut with state and federal agencies: "There is no question that the *Exxon Valdez* oil spill was off the charts."

■ LISA BUSCH

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Science Academy Elects New Members

The National Academy of Sciences elected 60 new members—56 men and 4 women—and 15 foreign associates at its annual meeting in Washington, D.C. last week. This brings the NAS membership total to 1626 and the foreign associates total to 277. The new members are:

Andreas Acrivos, City University of New York; **Norman L. Allinger**, University of Georgia; **Mathew Alpern**, University of Michigan; **Walter Alvarez**, University of California, Berkeley; **David H. Auston**, Columbia University; **John C. Avise**, University of Georgia; **Victoria R. Bricker**, Tulane University; **Maurice B. Burg**, National Heart, Lung, and Blood Institute; **Luis A. Caffarelli**, Institute for Advanced Study; **John Cairns, Jr.**, Virginia Polytechnic Institute and State University; **Mario R. Capecchi**, University of Utah School of Medicine; **John E. Casida**, University of California, Berkeley; **Anthony Cerami**, Rockefeller University; **Alexandre J. Chorin**, University of California, Berkeley; **R. John Collier**, Harvard Medical School; **Marc Davis**, University of California, Berkeley; **Francis J. Disalvo**, Cornell University; **Harrison Echols**, University of California, Berkeley; **Mary Edmonds**, University of Pittsburgh; **Mary Katherine Gaillard**, University of California, Berkeley.

Stephen C. Harrison, Harvard University; **James B. Hartle**, University of California, Santa Barbara; **Robert Haselkorn**, University of Chicago; **John P. Holdren**, University of California, Berkeley; **H. Robert Horvitz**, Massachusetts Institute of Technology; **Albert J. Hudspeth**, University of Texas Southwestern Medical Center; **D. Gale Johnson**, University of Chicago; **Daniel D. Joseph**, University of Minnesota; **Paul J. Kaesberg**, University of Wisconsin; **Charles F. Kennel**, University of California, Los Angeles; **Toichiro Kinoshita**, Cornell University; **James L. Kinsey**, Rice University; **Andrew H. Knowl**, Harvard University; **Robert A. Laudise**, AT&T Bell Laboratories; **David M. Lee**, Cornell University; **Patrick A. Lee**, Massachusetts Institute of Technology; **Susan E. Leeman**, University of Massachusetts Medical School; **Richard A. Lerner**, Research Institute of Scripps Clinic; **Arnold J. Levine**, Princeton University; **David Me-**

chanic, Rutgers University; **N. David Mermin**, Cornell University.

Harley W. Moon, National Animal Disease Center; **Royce W. Murray**, University of North Carolina; **William H. Oldendorf**, Veterans Administration Medical Center; **Stuart H. Orkin**, Harvard Medical School; **Norman R. Pace**, Indiana University; **Ronald L. Phillips**, University of Minnesota; **Darwin J. Prockop**, Thomas Jefferson University; **Jane S. Richardson**, Duke University; **David E. Rumelhart**, Stanford University; **Marshall D. Sahlins**, University of Chicago; **Douglas J. Scalapino**, University of California, Santa Barbara; **Richard M. Schoen**, Stanford University; **James A. Spudich**, Stanford University School of Medicine; **Robert T. N. Tjian**, University of California, Berkeley; **Don C. Wiley**, Harvard University; **William J. Wilson**, University of Chicago; **Peter G. Wolynes**, University of Illinois; **John A. Wood**, Harvard-Smithsonian Center for Astrophysics; **Amnon Yariv**, California Institute of Technology.

The new foreign associates are:

Sir James Black, Rayne Institute; **Piet Borst**, Netherlands Cancer Institute; **Leonid M. Brekhovskikh**, USSR Academy of Sciences; **Richard H. Dalitz**, Oxford University; **Arnt Eliassen**, University of Oslo, Institute for Geophysics; **Richard R. Ernst**, Eidgenössische Technische Hochschule, Zurich; **Madhav Gadgil**, Indian Institute of Science; **Takayoshi Higuchi**, Kyoto University; **Allen Kerr**, University of Adelaide; **Tadamitsu Kishimoto**, Osaka University; **Jake Macmillan**, University of Bristol; **Philippe Nozieres**, College de France, Institut Laue-Langevin; **Shosaku Numa**, Kyoto University; **Rashid A. Sunyaev**, Space Research Center, USSR Academy of Sciences; **Elie Woolman**, Institut Pasteur.