ENVIRONMENT

Dispute Over *Exxon Valdez* Cleanup Data Gets Messy

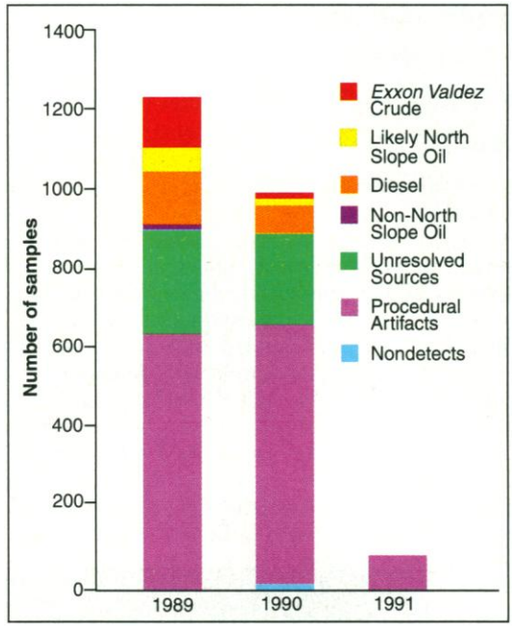
In a plush hotel in Atlanta last week, several dozen environmental scientists gathered to celebrate the amazing ecological comeback of Alaska's Prince William Sound after the disastrous spill of oil from the *Exxon Valdez* 4 years ago. But they didn't seem to be eyeing the same body of water as other researchers in the very same hotel. Where one group saw most of the Sound's denizens returning to full strength and largely free of oil from the spill, the other group claimed that the Sound was still staggering from a major ecological blow and that original *Valdez* crude and its weathered components had contaminated vast numbers of Alaskan wildlife. It may take years, they said, for several animal populations to recover.

How can two groups of scientists have such different views of the same place? It might or might not be relevant that the upbeat studies were funded by Exxon and that the downbeat ones were done by researchers at the National Oceanic and Atmospheric Administration (NOAA), who accused their Exxon colleagues of selectively analyzing raw data from the government's Prince William Sound Oil database (PWSOIL), which contains analyses of hydrocarbons present in animals and plants taken from the area. Exxon scientists shot back that government scientists lacked the expertise to analyze their own data. The sharp words exchanged at the conference, a meeting of the American Society for Testing and Materials, left a bitter residue that might take as long to clean up as the mess in Prince William Sound.

At the heart of the dispute is a laboratory technique that is used routinely in oil exploration to help companies determine which rocks yield which kinds of oil. When crude oil gets pumped out of the ground, it's a soup containing all sorts of different hydrocarbon molecules, some bigger than others. The proportions of the different-sized hydrocarbons vary with the point of origin of the crude, and so the technique, known as "hydrocarbon fingerprinting," can be used to pinpoint their place of birth. The Exxon researchers moved this method from rocks to the fauna of the Sound, says Exxon geochemist Edward Bence.

The fingerprint of *Valdez* crude was taken and compared with other hydrocarbon sources in the Sound, including *Valdez* crude that had degraded there in the last 3 years, causing the fingerprint to change as the more volatile molecules evaporate. It was also compared with diesel oil, kerosene, other refined products, and oil from natural seeps. The Exxon team then matched these fingerprints with the government's analyses of hydrocarbon contamination in 5000 samples of blubber, liver tissue, hair, stomach contents, and other parts of animals from the Sound.

That analysis showed, Bence and his colleagues reported to the conference, that "excluding shellfish, only a small fraction of the samples contain recognizable *Exxon Valdez* crude residues," mostly from samples collected in 1989. "Only rarely," the report continued, "is *Exxon Valdez* crude identified in samples collected in 1990, and never in 1991 samples."



Clean analysis? Exxon-funded studies show that most of the oil in Alaskan fish and other wildlife can no longer be traced to the *Exxon Valdez*.

Why, then, do other researchers find *Valdez* crude if it no longer exists? The government scientists, Bence told *Science*, often "misidentified" the source of contamination in biological tissues collected after the spill. "Those misidentifications are the basis for the claims of continued exposure," he says. For example, samples of fish might have been contaminated by diesel soot from the smokestack of boats used to collect the fish, Bence says, and floor waxes and other laboratory solvents might have contaminated samples during preparation. Government scientists "just didn't have the expertise to recognize the critical criteria," he argues.

This, not surprisingly, is a contention that the NOAA scientists totally reject. In a 10-page statement released in Atlanta they contend that hydrocarbon fingerprinting is an inappropriate method for tracking oil-spill damage to biota. "The same rules don't necessarily apply to animate objects as inanimate objects," says marine biologist Robert Spies, chief scientific adviser to the Exxon Valdez Oil Spill Trustees Council, a group of six federal and state officials charged with administering a $900 million cleanup fund for the area.

Spies and other scientists argue that animals often metabolize the hydrocarbons into compounds that bear little resemblance to the raw material. "Critters chomp up petroleum in very different ways," says Carol Ann Manen, a NOAA chemist who oversees the PWSOIL database. "It gets real hard, if not impossible, to say that these hydrocarbons are from a particular source," she says. In addition, the NOAA researchers argue that oil from the deep-water hydrocarbon seeps couldn't have been responsible for polluting shallow parts of the Sound, where they say most of the biological damage occurred.

Although the details of hydrocarbon fingerprinting may seem arcane, in fact, the stakes in this scientific debate are very much of this world: a tremendous amount of money is riding on who's right. Exxon remains embroiled in litigation with about 40,000 Alaskan natives, fishermen, and other individuals who are claiming a total of about $2.4 billion in spill-related damages (not to mention an unspecified amount of punitive damages). That class-action suit is expected to come to trial in June 1994, and some of what happened in Atlanta could be a rehearsal. "There's no question in my mind that what you saw Exxon present in Atlanta you'll see presented in trial next year," says Kenneth Adams, a plaintiff's attorney with Dickstein, Shapiro, and Morin in Washington, D.C. There's also the matter of that $900 million cleanup fund: If the Sound is clean already, how should the money be spent? Wildlife conservation groups and fishermen, to name just two interested parties, have a number of different answers to that question.

There's at least a slim possibility that before the lawyers get into the act, the conflicting studies might be reconciled within the scientific arena. The Trustees Council says it would like to take an open-minded approach to the Exxon data. "We have to sit down with their data and our data and try to come to the bottom of this," says Spies. "Hopefully, we can do that without a lot of lawyers." But based on the proceedings in Atlanta, it seems likely that before the scientists get to the bottom of their differences the lawyers will already be weighing in.

–Richard Stone