

Accountants Fret Over EOS Data

By the end of the decade, the National Aeronautics and Space Administration (NASA) plans to be operating an earth sciences data system so advanced that nobody can now say how it will work. The challenge in building this system is staggering: It will eventually contain 1000 times the amount of text currently stored in the Library of Congress, take in 2000 billion bits of data every day from a constellation of earth-observing satellites—more information in 2 weeks than has been accumulated to date from every satellite launched since the mid-1960s—and incorporate all previously collected U.S. digital earth science information.

If it all comes together properly, the system, known as EOSDIS (Earth Observing System Data and Information System) will be an immensely powerful research resource for earth scientists around the world, who will be able to tap into it through electronic networks. But, given NASA's recent record in major technical undertakings, the scale and ambition of the venture are making some people nervous. Last week, the congressional General Accounting Office (GAO) issued a report critical of NASA's planning for the project, and some key members of Congress—which will have to approve the \$3-billion tab for the system—sounded a note of caution at a hearing on GAO's findings. Even one of NASA's biggest supporters, Ralph Hall (D-TX), chairman of the House science subcommittee on space, said: "I sincerely hope that NASA does not simply circle the wagons and stonewall on this report."

The central concern raised by GAO is one that constantly faces agencies like NASA trying to plan systems that incorporate rapidly changing technology: How do you get a contractor to build something that you can't fully describe in a federal contract? Space agency officials are confident that, while it may be hard to say in advance precisely what the work will entail, NASA will be able to "beat up on the contractor after we get him on board"—as one agency scientist said—and create the world's most advanced data retrieval system. In fact, the agency has already solicited bids for the EOSDIS core contract and expects to choose a winner in May from one of two finalists (either Hughes Aircraft or TRW, Inc., according to one observer).

But GAO, as befits an accounting agency, argues for a more cautious approach. "We don't see a need to rush into this," says GAO evaluator John de Ferrari, whose report argues that NASA should identify the hard technical barriers in detail and lay out a plan

for overcoming them before it signs a contract. The prototypes NASA has funded so far "do not fully address critical areas where technical feasibility is in question nor are they substantial enough to allow users to assess key EOSDIS functions," the report says. For example, explains de Ferrari, NASA has not focused attention on the three most difficult questions: How will the new system "characterize" data in its files (attach identity tags to batches of data so that researchers can find what they're looking for), how will it conduct searches without grinding to a halt, and what kind of visual format will it use for presenting data?

All these problems have been solved for small data bases, says de Ferrari. But the solutions that worked in the past can't be scaled up for EOSDIS and just won't be adequate for the future. The characterization of raw data—now done by hand—will have to be done in an automated fashion for EOSDIS, because the task will be at least 100 times larger than it is at present on the largest data base. As data management expert Barbara Mihalas of the Illinois

Supercomputer Center says, "Filtering turns out to be the biggest problem." Yet, according to de Ferrari, NASA has "not addressed this issue head on at all." Unless NASA makes a special effort to attack these problems before the contract is locked in, says de Ferrari, the risk is that "we will just get a bigger version of what we have now"—the quirky, labor-demanding archives NASA already owns. De Ferrari insists that GAO isn't asking for a "specific delay" in signing the EOSDIS contract, but just some effort to get the contractor to focus on the truly difficult aspects of the job.

In response, Lennard Fisk, NASA's associate administrator for space science and applications, issued a statement saying that "the greatest concern" for EOSDIS "is not technical," but "rather it is that we not be allowed to proceed expeditiously to make data on the global environment available to policy makers." He warned: "Any delay in the EOSDIS is inappropriate." Fisk also told the Hall subcommittee that he thought there was a "philosophical difference" between his view and GAO's over how to manage R&D work. EOSDIS demands something new, Fisk explained, "not the normal relationship with a contractor, but a hand-in-glove partnership." ■ ELIOT MARSHALL

Should Heads Keep Rolling in Africa?

This week, as the Bush Administration drew the highly publicized rancor of conservation groups and politicians over its decision to support a reversal of the worldwide ban on ivory traffic, some of those very conservation groups were lining up in a curious alliance with big game hunters who want to bring whole elephant heads—including the tusks—into the United States.

This bizarre twist occurred almost unnoticed while a high-powered international meeting was taking place in Kyoto, devoted to reexamining the ban on traffic in ivory that was first approved (with U.S. support) by the United Nations in 1989 in order to preserve the world's dwindling elephant herds. Now a few nations—South Africa and Zimbabwe among them—think the elephant herds in southern Africa are doing well enough so the ban could be lifted, and the United States took a sympathetic stance on this, enraging conservationists. But at the same time, with much less fanfare, the U.S. Fish and Wildlife Service was edging up to a decision, expected in the next week or so, on whether hunters will be allowed to continue to bring elephant heads into the United States, as is currently allowed by an exception to the treaty banning the ivory trade.

And, lo and behold, conservation organizations such as World Wildlife Fund International and the International Union for the Conservation of Nature (IUCN) are backing the great white hunters. In fact, at last month's IUCN-sponsored World Parks Congress in Caracas, Venezuela, dozens of



Poached elephant. David Wills of the Humane Society with the skull of an elephant killed by poachers.