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.

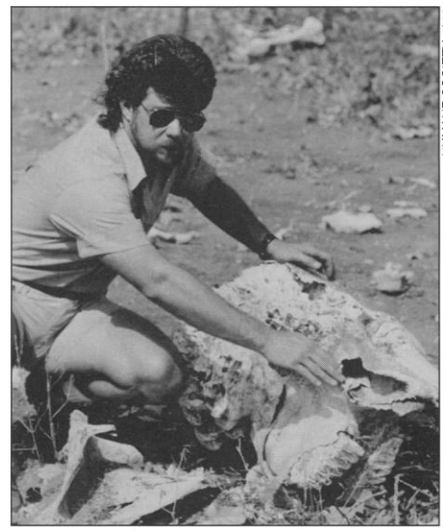
In response, Lennard Fisk, NASA's associate administrator for space science and applications, issued a statement saying that "the greatest concern" for EOSDIS "is not technical," but "rather it is that we not be allowed to proceed expeditiously to make data on the global environment available to policy 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.*

conservationists voiced concern that political pressure in the United States, and not scientific merit, could inadvertently send the whole elephant conservation program down the drain.

The reason conservationists such as Jeffrey McNeely, formerly IUCN's chief conservation officer and now its Director General, favor allowing continued import of elephant trophies is that carefully managed hunting is at the heart of a program in Zimbabwe that one faction of the conservation movement thinks is a model for how endangered species ought to be conserved. Called the Campfire program, it allows hunters to come in and take a certain number of elephants per year, if they pay the people who live near the national parks. The beauty of the program, advocates say, is that it has caused local residents to look on the elephants as a resource that should be protected from poachers. And since 90% of the hunters who use the program are American, if the Fish and Wildlife agency were to ban importing elephant trophies, Campfire would likely collapse.

"Campfire is what conservationists have been striving for over the past decade," says Simon Metcalf, a wildlife biologist at Cornell University. "It protects wildlife while returning something tangible to the local population. And above all, it does so in a sustainable manner."

But not everyone in the conservation community agrees. David K. Wills, vice president for investigations at the Humane Society of the United States describes as "pure fiction" the claim that the elephant population in southern Africa is doing well enough for any hunting to continue. "The census that we conducted shows that elephant numbers are not as high in southern Africa as many claim, and poaching is as rampant as it ever was. Yes, people living near the parks are benefitting, but the animals are not being protected."

Wills and his confreres at organizations such as the African Wildlife Federation have persuaded officials in the White House to support their point of view and back a ban on elephant trophies. But the White House position doesn't mean the Fish and Wildlife agency will put a stop to the hunting, because its decision rests partly on a scientific debate having to do with the state of African elephant populations.

Everybody in the debate agrees that east African elephant populations (in Kenya, Tanzania, and surrounding countries) are dangerously low. But many conservationists, supported by animal population census studies by the World Wildlife Fund (WWF) through the 1980s, say elephants are thriving in Zimbabwe, South Africa, Namibia, Botswana, Zambia, and Swaziland. In Zimbabwe, for example, WWF estimates that there are at between 60,000 and 75,000 elephants, up sharply from the lowpoint, 1900, when 5,000 elephants were counted.

Based on the WWF census data, each of the local district councils that are responsible for protecting wildlife sets a yearly elephant harvest level. For example, in 1988 through 1990, the elephant population in the Nyaminyami District of Zimbabwe averaged between 1500 and 2000 animals; the quota in each year was set at 12. Since the fee for an elephant trophy is $5000, $60,000 annually went into local coffers. Over the past 3 years, the council voted to use the money to build a daycare center, grinding mill, and water treatment facility, and to provide a $200 dividend yearly to each family in the district.

But Wills disagrees sharply with the WWF data that form the basis of the Campfire program. After a recent 5-week trip through southern Africa, he said, "the number of elephants in Zimbabwe is not the 75,000 that WWF claims, but is more like 40,000. In addition, poaching is as widespread as ever. I personally saw 25 to 30 fresh kills with tusks chopped off."

Is Wills right? Or is the Campfire program a boon to the southern African elephant? In the next week it will be up to officials of the Fish and Wildlife Service to decide. *Science* will report on the result of that decision-making process. ■ JOSEPH ALPER

Health Official Falls, Lands in NIMH

Under attack by 26 black congressmen, Representative John Dingell (D–MI), and Senator Edward Kennedy (D–MA) for remarks comparing the behavior of inner-city youth to that of male primates, psychiatrist Frederick K. Goodwin has resigned as head of the Alcohol, Drug Abuse, and Mental Health Administration (ADAMHA). But Goodwin's superiors were willing to bend only so far to congressional wrath: Secretary of Health and Human Services Louis Sullivan, asserting his "complete confidence in Dr. Goodwin's scientific integrity and commitment to equality," promptly appointed him director of the National Institute of Mental Health (NIMH).

Goodwin had already planned to move to NIMH later this year. But events took a new turn on 11 February during a public meeting of the NIMH Advisory Council on Mental Health. While describing a proposed "violence initiative" at ADAMHA, Goodwin said, in part: "If you look, for example, at male monkeys, especially in the wild, roughly half of them survive to adulthood. The other half die by violence. That is the natural way of it for males, to knock each other off." Furthermore, "the same hyperaggressive monkeys who kill each other are also hypersexual, so they...reproduce more to offset the fact that half of them are dying." Goodwin then went on to suggest that "the loss of social structure... particularly within the high impact inner-city areas, has removed some of the civilizing evolutionary things that we have built up... maybe it isn't just the careless use of the word when people call certain areas of certain cities jungles...." Goodwin added that "I say this with the realization that it might be easily misunderstood."

It was, generating much publicity. After meeting with Sullivan, Goodwin formally apologized on 21 February for his "insensitivity." He continued apologizing the following week, but key members of Congress weren't satisfied. On 25 February, members of the Congressional Black Caucus wrote Sullivan questioning Goodwin's fitness to serve as ADAMHA director in view of his apparent inference that "inner city black youth are essentially animals." They asked for a meeting with Sullivan to discuss the matter, including "the extent to which the federal government funds research of the type to which Dr. Goodwin made reference." Kennedy and Dingell, the chairmen of ADAMHA's oversight committees, also weighed in on 26 February with a letter decrying Goodwin's "extremist and appalling view" of urban problems. Goodwin resigned the following day, saying he was "appalled to see the way in which complex and important scientific issues can become so distorted when they enter the political arena...."

Senator Orrin D. Hatch (R–UT), reportedly a key figure in persuading Sullivan to keep Goodwin around, agreed, and said in a 28 February statement: "I'm happy that Fred is getting back to NIMH." But some observers are still wondering if Goodwin's political effectiveness has been grievously wounded. Alan Kraut, head of the American Psychological Society, says, "I'd be shocked if this were the end of it." Sure enough, on 28 February Charles D. Spielberger, president of the 114,000-member American Psychological Association, wrote Sullivan to say it opposes Goodwin's appointment as NIMH director. Goodwin nonetheless says he is optimistic, though he acknowledged to *Science*, "I have got a lot of repair work to do." ■ CONSTANCE HOLDEN