

Landsat flies in politically charged skies

Allied forces in the Gulf war frequently sought help from an unlikely source: a pair of aging, civilian satellites called Landsat. Images beamed back from these orbiting eyes have proved important not just to military missions but to a host of other endeavors ranging from global change studies to oil exploration.

Members of Congress warned last week, however, that defense and research efforts relying on Landsat data could be jeopardized by the Bush administration's repeated delays in funding the program.

At a joint hearing of the House science and intelligence committees on June 26, military officials revealed for the first time the key role played by civilian satellites in mission planning during the Gulf conflict. Landsat, U.S. weather satellites and a French satellite called SPOT all "made important contributions in support of Operation Desert Storm," testified D. Brian Gordon of the Defense Intelligence Agency in Arlington, Va.

The administration is currently weighing the importance of funding Landsat. With the program's federal support on such shaky ground, many users of Landsat data now expect that the Department of Defense (DOD) will offer to provide a major share of the needed funding.

If the White House accepts such an offer, DOD could effectively acquire control over Landsat, perhaps even restricting access to the craft's high-resolution images of Earth's surface. "This could have a truly chilling effect on the availability of Landsat data to a whole range of valuable civil environmental initiatives," Rep. Howard Wolpe (D-Mich.) asserted after the hearing.

Like an orphaned child shuttled from one set of foster parents to another, the Landsat program has suffered for lack of a stable home. Originally under NASA, it was shifted to the Commerce Department in 1979 in a commercialization plan that would eventually place it under private ownership and operation. But that effort brought in far smaller revenues than expected, and the program now languishes, according to Landsat users. The Commerce Department, which runs the National Weather Service, has little need for Landsat data and is far more concerned with its own troubled satellites (see story, p.5).

Both of the orbiting Landsats have outlasted their expected lifetimes by several years, and the United States plans to launch a replacement, called Landsat 6, in mid-1992. Landsat 6 is designed to operate for five years, but the Bush administration has yet to appropriate money for its successor, whose construction could take six to eight years. Users of Landsat data worry that Landsat 7 will not be ready when Landsat 6 stops working, leaving a gap in coverage that could last

several years. Such a disruption, they say, would undermine efforts to monitor global change and to market Landsat data commercially.

Landsat developers are still debating what kind of instruments to fly on the next generation of these satellites. If DOD takes on a large chunk of Landsat 7's funding, it will likely push for higher-resolution imagers that can depict features less than 5 meters across. But researchers fear that the military may also seek to classify such high-resolution data, says Tom Lillesand, director of the Environmental Remote Sensing Center at the University of Wisconsin-Madison. Calling Landsat "one of the most fundamental sources of information about the globe that we've ever had," he says the data are essential for global change research.

A federal task force reached the same conclusion last year, although the White House has yet to release the group's report. At last week's hearing, adminis-



This 1987 Landsat image helps scientists monitor the USSR's shrinking Aral Sea.

tration science officials did not mention the task force findings in their prepared testimony; only under questioning did they acknowledge its conclusions. Wolpe charges that the White House, still undecided on how to handle Landsat's future, "seems intent on preventing [those findings] from getting out." — R. Monastersky

Dad's farming may hike baby's liver risk

A father's farm work, especially if it involves pesticides, may put his unborn child at risk of a rare liver disorder, according to a new epidemiologic study. Although the finding is very preliminary, it may help scientists track down the origins of this often deadly defect.

Children with biliary atresia are born with missing or underdeveloped bile ducts. Normally, these tubes carry bile from the liver to the small intestine. But in infants with biliary atresia, the bile backs up, causing liver inflammation, yellowing of the skin and an inability to properly digest fatty foods. Surgery can sometimes correct defective ducts, but in many cases the damaging inflammation recurs. Unless these children receive a successful liver transplant, they may face early death.

Scientists know very little about the causes of biliary atresia, which strikes about one in every 25,000 babies born in the United States. Now, researchers report a statistical link between a father's farming occupation and his offspring's risk of the birth defect.

At the Johns Hopkins University School of Hygiene and Public Health in Baltimore, Carol Magee and her co-workers contacted pediatric surgeons across the United States and located 267 families of children born with the disorder between 1982 and 1987. They also recruited a control group of 245 families whose children had been treated for other conditions by the same pediatric surgeons, in most cases for hernia repair. All parents filled out detailed questionnaires asking about their age, personal

habits and occupational history, including past exposure to pesticides.

Statistical analyses revealed no link with biliary atresia for most of the factors on the questionnaire. However, the team discovered that fathers of children with biliary atresia, compared with control fathers, were about twice as likely to have worked on a farm, and these men were more than twice as likely to report pesticide exposure than were farm-working fathers in the control group. A link between farm work and biliary atresia also showed up on the maternal side, but this trend was statistically weaker than the paternal association, says Magee, now at the University of Maryland in Baltimore. She presented the results last week at the Teratology Society's annual meeting in Boca Raton, Fla.

Magee suspects that farm chemicals handled by the father reach the developing fetus via the mother. For example, women who handle clothes dusted with pesticides may absorb the chemicals through their skin — an indirect route to the fetus. On the other hand, she says, pesticide exposure might somehow alter the father's sperm, affecting the fertilized egg directly.

But she cautions that her survey does not prove a cause-and-effect relationship between farm pesticides and biliary atresia. "I don't think we know enough to issue a public health alert," she says. "We have a lot more work to do." Among other things, Magee wants to identify specific pesticidal chemicals that would prevent normal development of the bile ducts.

— K.A. Fackelmann