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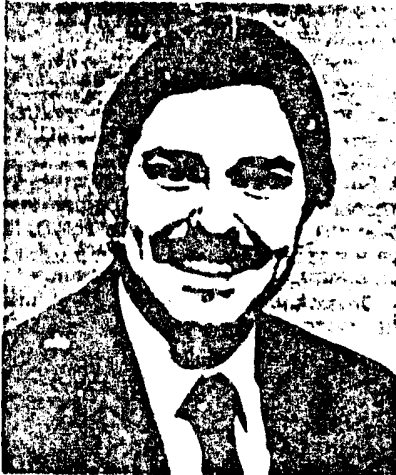
# Commercializing Landsat and the Weather Satellites

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On March 1, 1984, a Delta rocket rose from the Vandenberg Air Force Western Test Range in California. Several hundred spectators applauded and cheered as the rocket poured a white vapor trail skyward. Among the spectators was a team from GAO who, for more than a year, followed events surrounding the launch.

The rocket carried the last government-owned civilian land remote sensing satellite, called Landsat. The satellite senses the differences in visible, ultraviolet, and infrared light waves reflected by the earth's surface and sends the data back to earth. This data, when processed into photographic images and computer tapes, is used for crop estimates, mineral exploration, mapmaking, and many other purposes.

In March 1983, the President announced

his decision to transfer the civil operations land remote sensing satellite and the weather satellites to the private sector. The federal government had spent about \$1 billion building and launching the satellites and developing a ground system. The administration believed the private sector could develop a market for Landsat better than the National Oceanic and Atmospheric Administration (NOAA). In fiscal year 1983, the federal government sold about \$7 million worth of data from its distribution center, while operating costs were more than \$22 million. If a private operator could enhance the market, it would offset costs and help the nation retain its international leadership in technology. France and other nations were about to enter through commercial firms.

Because Landsat had not been economically self-sustaining since its inception as a research instrument in 1972, the proposal was made to commercialize the weather satellites, which would provide a subsidy to attract private entrepreneurs. The weather satellites appeared to be a more lucrative commercial venture because of an assured market, specifically the federal government. The National Weather Service, the primary user, has depended on the satellite data for more than 20 years to detect and issue warnings about hurricanes, tornadoes, and other severe storms; to

Ten foreign ground stations are operated under agreements with the United States, requiring them to pay a \$200,000 annual fee and a fee for each Landsat product distributed.

gather environmental data; to provide daily weather forecasts; and for research. Other users included, for example, the Department of Defense, the Department of Agriculture, the news media, airlines, farmers, and foreign nations.

The strongest objections to the sale were focused on the weather satellites. Some satellite experts said the federal government was the main user, and the private satellite operators would charge exorbitant amounts for hurricane warnings and warnings of other life-threatening storms. Foreign nations objected to the possibility of paying for satellite weather data. For more than 100 years, weather data had been exchanged freely among all nations. U.S. satellite data was used all over the world, particularly by Canada and many Western European allies, plus developing nations that had few sources of weather data.

In return for U.S. weather satellite data, the United States received ground and aerial observations from other nations around the world. This information, vital to U.S. military and commercial interests worldwide, was exchanged through the United Nations World Meteorological Organization's telecommunications system. Some nations said if the United States or its satellite operator charged them for weather satellite data, they would be forced to charge the United States and the rest of the world for their weather observations. Several weather experts suggested that a collapse of the free exchange of weather data would hurt the United States more than any other nation, since it used the most data.

Within a few months of the announced sale, the Department of State had approved a position ensuring free weather satellite data to all nations. In effect, the U.S. government would buy the data from a private operator and provide it freely to federal users, the public, and other nations.

### **GAO's Role - A Non-Traditional Approach**

Almost a year before the President's announcement to commercialize Landsat, GAO, at congressional request, began examining issues related to the weather satellites and Landsat. Since that time, GAO's response to six congressional requests has run the gamut of traditional services: briefing committee staffs, testifying, issuing three reports, providing questions for hearings, and commenting on legislation.<sup>2</sup>

However, to achieve these goals, some less traditional approaches were

used. They included GAO's participation in an ad hoc legislative group, GAO's leadership in a seminar at an international conference, and rapid but extensive visits to three continents to learn about international uses and concerns surrounding the satellites.

Early in GAO's examination of Landsat, the Subcommittee on Space Science and Applications, House Committee on Science and Technology, formed an ad hoc group to formulate issues and obtain information on the administration's evolving satellite sale. The Landsat Liaison Group was composed of congressional staffs, the Office of Technology Assessment (OTA), the Congressional Research Service (CRS), the National Academy of Sciences, and GAO. Administration officials briefed the group on several oc-

casions. The forum also allowed GAO to raise additional issues with the Congress and to comment on legislation as it was being developed. The meetings also provided GAO an additional opportunity to meet with CRS and OTA staff. GAO and its sister agencies kept in touch every few weeks to share views and to keep each other informed. For example, when GAO and OTA were called to testify before the House Government Operations Committee, staffs of both offices met to compare their statements prior to the hearing.

<sup>2</sup>In May 1984, several congressional committees requested GAO to review the problems related to the technical failure of several weather satellites. This review is ongoing.



An engineer inspects a geostationary weather satellite.



This Delta rocket being launched is similar to the one used to carry the Landsat satellites into space. (Courtesy of the National Aeronautics and Space Administration)

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### More Tools Used

Another tool for gathering information for policy and technical issues was GAO's establishment of a seminar at an international satellite conference. GAO solicited opinions on the sale from a broad range of satellite experts at the 17th International Symposium on Remote Sensing of the Environment, Ann Arbor, Michigan, 1983. About 60 symposium participants joined the discussions to voice their initial reactions to the sale of Landsat. The symposium also provided GAO an opportunity to meet informally with foreign Landsat satellite conferences, which gave us personal contacts and information on the sale of the satellites and some technical background on how the satellites operate. During two of the conferences, we observed the successful launch of a weather satellite from Cape Canaveral, Florida, and the Landsat launch, mentioned earlier, from Vandenberg Air Force Base.

To obtain in-depth comments on foreign uses of Landsat and the weather satellites and opinions on the sale, three GAO staff members each covered different nations on three continents to discuss the sale with the leaders of foreign space agencies and weather services. In 2 weeks, we held discussions in 11 nations: Argentina, Barbados, Brazil, France, Germany, India, Italy, Japan, Peru, Thailand, and the United Kingdom. We also met with representatives of the World Meteorological Organization, Geneva, Switzerland.

The discussions placed GAO staff in an unusual role as goodwill ambassadors. Many of the officials were pleased that the U.S. government had sent representatives who sought their opinions and briefed them on the latest status of the sale. At the end of the trips, GAO was uniquely qualified with foreign opinions on the sale. In September 1983, a few weeks after the trips, GAO staff testified on this subject before the House Government Operations Committee.

### What Other Countries Said

GAO testimony indicated several foreign policy benefits to Landsat. Among the 10 foreign Landsat-receiving ground stations existing in 1983, 9 had only been in existence since 1979, so they believed they were recovering the investment they had made largely in computer hardware, software, and trained personnel. When they built ground stations, they expected the United States would keep Landsat

satellites operating at least through the 1990's. In some developing nations, Landsat was at the forefront of their space programs, and it was a means of learning more about the countries' natural resources. In addition, the U.S. policy of providing the data equally to any nation seeking it created goodwill and diminished suspicions that a superpower, using technology, could exploit the resources of these countries. Landsat was also a visible sign of U.S. leadership in research and development.

For foreign users, commercialization of the satellite left them with ambivalence about the continuity and equal distribution of data. Other users' concerns were also discussed in our briefings and reports to the Congress. Non-federal and federal users of Landsat were concerned that commercialization could increase costs. Although the federal government planned to buy weather satellite data and distribute it freely to users, some were unconvinced that price increases or diminished service would never occur in future years.

### Moving Ahead

Based in part on our briefings, the Congress enacted legislative prohibiting the immediate sale of the weather satellites. GAO issued a report to the Subcommittee on Space Science and Applications, House Committee on Science and Technology, on the costs and uses of the satellites; a report to the Subcommittee on Legislation and National Security, House Committee on Government Operations, and three Senators on the effects on users of commercializing the satellites; and a classified report on the national security aspects of the sale.<sup>3</sup> GAO commented on drafts of legislation on remote sensing satellite commercialization. The legislation, which passed in June 1984, set guidelines for commercialization including the following areas:

- the federal government's financial package for a commercial operator,
- continuity of data for foreign ground stations

<sup>3</sup> Costs and Uses of Remote Sensing Satellites (GAO/RCEd 83-111, Mar. 4, 1983); Effects on Users of Commercializing Landsat and the Weather Satellites (GAO/RCEd 84-93, Feb. 24, 1984); National Security Implications of Commercializing Landsat and Weather Satellites (GAO/RCEd 84-1, Feb. 1, 1984).

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A weather satellite image of Hurricane Allen over the Gulf of Mexico in August 1960. (Photo courtesy of the National Oceanographic and Atmospheric Administration)

**U.S. General Accounting Office. WIC Evaluations Provide Some Favorable But No Conclusive Evidence On The Effects Expected For The Special Supplemental Program For Women, Infants, and Children. PEMD-84-4, 1984.**

An evaluation synthesis for the WIC program.

*Consolidated, Cont'd from pg. 17*

with the Arthur Andersen publication<sup>5</sup> you mentioned earlier, issued in 1975. Mr. Bowsler reportedly was involved with preparing that report. I think there's no question that the effort to establish an auditable, consolidated financial statement will continue at least through this Comptroller General's term, probably beyond.

Smith: Voters and politicians are another source of support for sustaining CFS effort. One of their primary concerns is the size of pension and social security liabilities, and anything that will successfully help these two groups get a handle on how big these liabilities are—how they relate to the whole—should get sustained support.

Fiske: Now, what about the second element for a successful management improvement effort—a coherent and generally accepted doctrine? The report on management improvement efforts notes that, without a standard or model of good management, it is difficult to gain agency acceptance of any advice or criticism.

Smith: Accounting standards are particularly important because of the need to assure that all financial statements contain comparable information. In the private sector, the Financial Accounting Standards Board (FASB) established accounting standards. When these standards are followed, financial statements are reasonably reliable and comparable.

Orne: There are already some established accounting standards for government accounting. The NCGA has been working for years doing just this for state and local governments. Its successor, the recently established Governmental Accounting Standards Board (GASB) is expected to continue the work.

Smith: The Comptroller General has stated that he intends to follow as many of the GASB and FASB standards as possible, given the federal environment.

Fiske: How about the third element of a successful management improvement effort—attention to career-level staff implementation?

Orne: There is considerable interest in a CFS at the highest levels of GAO and Treasury. However, from talking to others in the governmental accounting field, there doesn't seem to be that much interest or information at the lower levels, especially outside GAO.

Fiske: I've met a lot of career-level employees who are at least as dissatisfied as the average taxpayer with the way the government is run. Providing lower-level employees with information can make them a significant source of support and ideas for making the CFS concept work.

Smith: Part of my dissertation research involved communication with current readers of the prototype CFS. Government-sector readers tended to be more skeptical about using a CFS approach to government financial reporting.

Fiske: Government employees are often skeptical of new initiatives, because they've seen so many new ideas come and go. However, if the initiative is implemented properly, and career-level staff are assigned to it on a sustained basis, I believe it can work.

What about the fourth element for success—a basis in law?

Lau: Isn't the Federal Managers' Financial Integrity Act (FIA) a start? If you're going to have auditable financial statements, the first step is to ensure that you have a documented system of internal control for which managers are held accountable. This is the goal of the FIA.

Orne: The FIA is a start, but I would guess that any move to enact additional laws should be slow. There are many pieces that must fall into place before a good law could be drafted covering such a complex subject.

Smith: My contacts at Treasury have indicated that their agency would prefer not to get locked into a statute before all the issues and implementation problems are resolved.

Orne: We may not need additional statutory authorization. After all, doesn't the Comptroller General already have statutory authority to prescribe agency accounting principles and standards?

Fiske: Let's summarize. We agree that the CFS, backed by a uniform auditable accounting system, is a good idea, that it will be difficult to implement, but that it can be done.

And I'd like to close with a story. As I was working on this article, my 10-year-old son asked me what I was doing. First, of course, I had to explain what a financial statement was. Then, I told him we were working on developing such a statement for the federal

government.

He only had one question: "You mean, they don't do that already?"

<sup>5</sup>Sound Financial Reporting in the Public Sector.

<sup>6</sup>P.L. 81-734, Budget and Accounting Procedures Act of 1950.

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- non-discriminatory availability of data,
- continuing federal archiving, research, and development, and
- national security implications.

In the meantime, a source evaluation board, chartered by the Secretary of Commerce, had issued a request for proposals only for the land remote sensing system. In June 1984, the Secretary of Commerce announced that two of seven bidders had been selected for final negotiations on a land remote sensing satellite contract. GAO has received four congressional requests to review the contract proposals for compliance with the recently passed legislation. If the transfer is completed, perhaps some GAO staff will be on hand to witness the first launch of a commercial remote sensing satellite and the beginning of a new era of enterprise in space.

*Measuring, Cont'd from pg. 25*

environment, and in this environment, this approach no doubt provided a reasonably accurate measure of the government's borrowing cost. However, in periods of volatile interest rates, and after considering the actual short-term nature of Treasury's borrowings, this approach may need to be reconsidered. Clearly, some form of adjustable or variable interest rate approach could better account for, measure, and where appropriate, recover the government's borrowing cost. Consequently, the authors would like to invite further discussion of this issue and the appropriate form (rate basis) that should be used to best carry out an adjustable/variable interest rate scheme.