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STATE/FEDERAL INTERACTION OF LANDSAT SYSTEM & RELATED
TECHNICAL ASSISTANCE

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I would like to cover four general topics in my talk this afternoon. First I would describe in more detail, the background and state involvement in Landsat systems planning and related efforts. Secondly, I want to discuss the status of state Landsat use and share with you, a couple of snapshots of where the states were at various times in utilizing this technology. Thirdly, I will discuss the federal government's future plans for the Landsat system, and what I feel the impacts of the recent budget decisions will be on that system. Finally, I want to talk about the FY 82 budget process.

NCSL first became involved in Landsat in 1976. A study on user requirements for Landsat D was conducted by one of our first Landsat committees. At that time, it was called the Remote Sensing Task Force. We currently have a Natural Resource Information Systems Task Force which is a descendent of that group. There are three representatives from this region on that task force. They are well aware of various Landsat issues, and have been involved with the task force for several years now. If one of those gentlemen is in your state, I would recommend that you sit down and visit with him and find out what their interests in Landsat technology are, their feelings and perhaps you can share with them what your interests and plans are and what you would like them to be.

Coming out of these first user requirement studies, a number of technical recommendations on the configuration of the Landsat System were made including appropriate wavelength, resolutions, etc., for various applications. In addition, a Landsat D support campaign was initiated. It was not at all clear back then, whether there would be a Landsat D and a number of people got involved in this question, wrote many letters to Congress, and OMB. Their voices were heard and, as a result of that, there is a Landsat D program and the spacecraft that are being constructed.

At that time, the study on state needs for technology transfer was conducted. This study made a number of recommendations regarding what should be included in such programs and the direction they should take in their focus. These recommendations in conjunction with the General Accounting Office, report that Alex Tuyahov mentioned, were instrumental in getting the RAP program started.

Over the years, we have looked at these various issues for the spacecraft and the system and have made a number of recommendations. We have been involved in a number of user awareness activities with state legislatures, various committees, state agencies, state universities including committee briefings, workshops. We produced a number of publications that we have developed, some of which are available in the display area. Products such as Land Satellites Guide to Natural Resource Information Systems, a number of data requirement surveys and our newsletter, the NIRS Newsletter.

In late 1978, the Governor's Association, through the Council of State Planning Agencies, initiated the Earth Resources Data Project, of which the Earth Resources Data Council- was a part. They are more or less, a counterpart of our NIRS Task Force on the agency side of the game.

In conjunction with the ERDC, our NIRS Task Force has made continuing recommendations on the operational system and technology transfer requirements of the states. The AGA project has engaged in a number of user awareness activities in conjunction, sometimes with us, sometimes independently, sometimes with NASA. I will not go into detail on the Isotap studies. Leonard covered that quite well, but we were an active participant in the Isotap study and spent many hours developing data to support the recommendations that were made a part of that study.

Over the years, the states have taken part in the Congressional process and have provided support and comments on a number of initiatives operational of lines of that program, namely, the Mossville, the Fordville, the Stephensonville, the Schmidville and I imagine there will be a state participation in and comments upon future villes which I can be anticipated at least from Senator Schmidt and perhaps from Representatives and the Senate bill, at least, should be available by summer and it will be on both the short and long term issues related to the Landsat system. That is enough I think, on state involvement in Landsat. What I have said, together with what Leonard has said, should make it clear that we have indeed been in the trenches for at least the last five years trying to convince the Federal establishment that this Landsat system is useful to state and local governments if they will give us the kind of help we can use to make it useful and if we know it is going to be there.

In terms of the status of state Landsat use, in July 1976, there were four states that had analysis and applications capabilities for Landsat data, mainly, Texas, Georgia, South Dakota and Mississippi. At that time, there were initial stirrings of interest from a number of different states as to the applicability of this technology to their information needs.

In July of 1978, two more states had developed analysis and applications capabilities, New Jersey and North Dakota. At that time, there were about 20 states beginning involvement with the NASA regional applications centers. Largely as a result of that involvement, today we see 16 states with visual Landsat capabilities, Georgia, Idaho, Iowa, Kansas, Louisiana, Maryland, Maine, Minnesota, New Jersey, Oklahoma, Oregon, South Carolina, South Dakota, Texas, Vermont and Washington. In addition, 10 states are planning on developing capabilities at this time, Arizona, Alaska, Florida, Kentucky, Mississippi, Michigan, Montana, New Mexico, North Carolina and Virginia. I feel these are conservative estimates. There are other states that may be moving ahead that we have not included, and if you are one of the, please let me know so that I can update my list here.

By July, 1982, half of the states will be routine users of Landsat data (at a minimum), I think the NASA Regional Applications Program can take the lion's share of credit for bringing this technology to the users and fashioning it to meet their needs.

Federal Landsat planning has been going on for quite some time - back to the late 1960's as a matter of fact, where the early Landsat missions, had its ups and downs. I would like to discuss one particular up and one particular down with you now.

What I would call the best case scenario for the Landsat program is the budget submitted by President Carter early in January. This program consisted of a space segment which was to build Landsat D3 and D4, or D double prime and D triple prime, depending upon whether you prefer the NASA or the no and notation. There was \$ 103 million dollars to begin procurement of those two spacecraft. The ground segment included an operational data processing system at Goddard and a quick look capability. The third segment, which often is not recognized by Federal bureaucrats and policymakers, is the user application segment. They can visualize the hardware in space, the space segment and the various facilities on the ground to retrieve the data, the ground segment, but they really do not recognize this user application segment. I guess they go by the better mousetrap theory.

Under the Carter budget, the NASA Landsat Technology Transfer Programs to aid state and local governments in examining Landsat technology was funded adequately. It suffered, I believe, a 10% cut, which was reasonable. NOAA was scheduled to initiate a market development program to work with other user sectors.

That was the up. Now we come to the down part. It felt quite good for a period of time. Those of us who had been in the trenches for a number of years, finally felt that we had made a mark. We had compelled the Federal Government to listen and succeeded in our plans and desires to get this technology institutionalized and operationalized. Well, along came David Stockman and things changed. We were back on the downslide. I believe that the Administration and Congress is probably going to examine the very commitment of the previous Administration to an operational system. That has become clear by some of the policy decisions that they have made. In fact, there is an implicit reversal of PD 54 by the budgetary actions which OMB and the President have recommended. The \$ 100 million dollars, plus Bill D3 and D4, has been eliminated from the budget. I view this as the single most significant impact. We are told that two satellites will give us data continuity through 1988. Well, if everything works out right, maybe so. But assuming a 10% failure among successful launch for each of two satellites, and a 10% probability for premature malfunction or the thing conking out before its design life, that gives us 65% chance of data continuity between the launch of Landsat D and the end of 1988. Apparently that is good enough for OMB, close enough for government work, they might say. I am not sure. I felt a lot better having D3 and D4 coming down the line, and some built-in redundancy, in case there was a premature failure or unsuccessful launch.

The enhancements to the ground data processing system proposed by NOAA in the transition plan, fell victim to the very first round of Reagan budget cuts. The money to build what NOAA would term, a data processing facility was eliminated, some ten or eleven million dollars, and NOAA was instructed to work with EROS to provide data to users. Now maybe this will work out and maybe it won't. All I know is, I've heard many complaints from people waiting eight months to get a CCT. Perhaps they will tighten the operation up - perhaps the new preprocessing facility for Landsat DMSS data will help - perhaps it will not. I side with NOAA on the need to have something of a more operational data processing system. Maybe it can be done by putting more money into EROS rather than building an entirely new facility. Perhaps that would be more cost effective, but the current budget calls for a \$ 700,000 band-aid upon the EROS Data Center and that will be our operational user service facility. The people at EROS claim that it is adequate, but the people at NASA also say that the private sector is going to provide its technology transfer system. I guess I am glad to see all the Feds standing up here like good soldiers and telling us how we are going to be so much better off under this new budget, and it is really all right. Well, I do not believe it for a minute and I hope you don't.

Finally, and what perhaps from a state and local government standpoint is the most crucial cut in the budget, is the entire elimination of the NASA Landsat technology transfer activities. This fell victim in that.

last round of cuts when they said, "Oops, we must cut another six billion dollars. We added wrong." Well, we are going to suffer from that, that mistake and those cuts. NASA and NOAA programs in technology transfer and market development have been entirely eliminated from the budget. The regional applications program, the user requirements program, and the ASVT programs are to be terminated by October, 1981. In fact, there is revisions to the current fiscal year's budgets and the RAP centers are beginning to shut off demonstration projects in midstream, I believe. Some will be finished, additional resources will be put in, finish off those that are near - perhaps some that are just getting started will be shut down cold and we are on our own now, or will be shortly.

This, I believe, is a very serious cut. The RAP Program has provided valuable service to state governments in particular, and the NOAA market development activities would have provided valuable services to other sectors of the user market.

We do need an operational Landsat system and I am not sure that the current FY 82 budget is going to provide that system. The Carter budget would have done so. I would like to discuss in detail, some of the reasons we need this operations system.

One of them has to do with the general shift in resource planning and management to the states. The Federal Government is pulling out of a lot of programs - coastal zone management is one good example - and they are cutting funds to the states to participate in these activities. They are lumping them all together in one pot called block grants and they are cutting them in half and they are going to let everyone at the state level fight it out for the half that is left. Now you can make the argument that perhaps 20 or 25% of the categorical grants were a waste, but we are talking about 50% of the money, not 75%. So there is a lot of valuable things that are going right down the tubes as a result of these cuts and Federal aid and as a result of this supposed savior of block grants.

I was very disappointed at the recent NGA meeting to see the governors going for this. They apparently like the flexibility of block grants. I think they will change their minds when they try and do 75% of the work with 50% of the money. I predict some very intense scuffling on the state level when it comes to divvying up that pork barrel.

State budgets all over are very tight. In Michigan, for example, they face an eight billion dollar deficit this year and they have had to do more with less and eliminate a lot of things.

This Landsat technology was developed by the Federal Government at about a cost of about one billion dollars. Sounds like a lot of money but it is only as much as four XM tanks or whatever they are. I believe the states and the people of this country should benefit from this one billion dollar investment. I don't feel it is long-sighted of the Federal Government to eliminate technology transfer activities in portions of the operational systems after we have accomplished this much. Shall I say in all charity that it is penny-wise and pound-foolish.

There is some national policy implications here. We are the leaders of the world in space technology. But what do you think of the idea of Toyota-Sat? Perhaps we are going to be using that type of data. We are already thinking of using Japanese communications satellites because we have relinquished our lead in that area by deassigning NASA from responsibility for our centers. And as was mentioned earlier, the French are active. We must have data continuity and reliability. United States leadership in this field is very much challenged and I am disturbed by the national policy implications of this. Now this does not really affect the states per se, but it is an important argument I think.

We also have a very strong need for a NASA Landsat technology transfer program. As I pointed out before, the space hardware and ground segment are only one part of the overall system. The Federal Government needs to recognize and service the user application segment.

For six million dollars a year, I believe we can assure that the state and local segment and the public sector users benefit from this one billion dollar Federal investment and it is really penny-wise and pound foolish to cut out these last few million dollars to assure the benefit of this one billion dollar investment.

I feel the private sector will not do technology transfer on its own. They want to sell services and products, not develop self sufficient users. The NASA technology transfer program, in fact, has helped create business for some private sector firms selling Landsat classifications and hardware and so on and it is very short-sighted of these users to stand up and say things that like NASA, is competing with them when in fact, they are creating a market for them to service.

Technology transfer is rather cheap. As I pointed out before, one tank costs 250 million dollars or something ridiculous like that. No, it is two and one half million dollars. For the cost of two tanks, we could have a very credible Landsat technology transfer program. May I suggest that the Administration put out only releases on the number of tanks created and perhaps add a little bit more butter instead of the guns.

I don't think the Russians would miss two tanks. We could just tell them they are there and they will not know any better. Or perhaps we could build the next shuttle with a few less tiles. Take off the chrome on the dashboard on the shuttle - there must be some way that NASA can reallocate their funds and help assure the dissemination of the technology they have developed.

We need to recognize that the states are very conservative and do not take risks. They are very conservative in developing new programs. Our Governors and Legislators are all from Missouri when it comes to evaluating new technologies and I just wonder how many of the states here that have had Landsat demonstration projects, would be willing to pony up 50 to \$ 100,000 for a Landsat demonstration project sight unseen. The answer is, the person suggesting that would be shown the door very quickly. We need this low-cost, low-risk opportunity to evaluate Landsat technology. Given this opportunity, most states have decided to invest. Without the demonstrations, they would not even have investigated the technology, much less invested in it.

The private sector serves the largest users and lets the small ones go. This was perfectly illustrated in the Goddard conference in Boston (or outside of Boston) when someone stood up and made this observation. It is that the private sector goes after the big part of the market and perhaps, you know, this little tail end will get serviced. In terms of the dollar volumes of Landsat sales, states are small users - 6 - 8% of the market at best. In terms of the public policy significance of their applications, however, the states are very important users. The states manage resources, and provide stewardship to assure that these resources are not depleted and that they are here for future generations to use and enjoy without abusing.

This idea of a private sector market as applied to Landsat is very fallacious. This private sector model is irrelevant to state and local government. Landsat technology is a very complex issue. We are not talking about supply and demand for widgets which is what economists like to talk about and things like that. It is a very complex matter. It assumes that the states are rational entities. I would submit that that is not necessarily always true and for good reason.

Natural resource data needs cannot compete with more immediate needs such as funding for Medicare, food stamps and welfare. There is a lot of votes for those things - there is not a lot of votes for Landsat systems and in the budget crunch we know how things are going to turn out and perhaps that is how things should be - that is the way they are.

This private sector better mousetrap argument does not deal with this at all. It ignores the public policy significance of usage by resource management agencies. What is the value of one acre of prime agricultural land preserve or one stream cleaned up based on using Landsat and other data to find out where the soil is eroding and clogging it up.

You are not going to find the fish standing up and screaming to restore funds for data to clean up their streams. You are not going to find many economists that are going to put a value on the relative marginal utility of cleaning streams. This sort of shortsighted argument on the part of the new Administration is really very frustrating. It is really shortsighted to terminate technology transfer. I think Huey Johnson this morning, provided a perfect example of the need for Landsat technology transfer. He stood up and said he was very skeptical. He was from Missouri and then Landsat and NASA proved themselves to him. The private sector is not going to invest \$ 50 or \$ 100,000 in convincing Huey Johnson that Landsat is valuable.

It is the resource base of our country that is going to suffer from the abuses allowed by inadequate state knowledge of environmental impacts, and the negative effects of certain resource development projects. The criteria for moving ahead on different things is switching in case you have not noticed. The short term market and financial reasons are going to determine which resources are exploited, not their environmental sensitivity nor the long-term issues related to their depletion. Now, perhaps, these are facts and we have to face up to them. As someone who has been in environmental and conservation things for awhile, I find it most discouraging that our values are taking a radical shift and this whole Landsat cut business is just one part of it.