

MEETING NOTES and NASA White Papers

NSGIC / NASA Liaison Committee Meeting July 29, 1999

The following persons participated in this Liaison Committee conference call which started at 3:30 p.m. and ended at 5:00 p.m. eastern time.

Milo Robinson	FGDC
Ron Hess	Nevada
Karen Siderelis	North Carolina
Susan Lambert	Kentucky
Hal Anderson	Idaho
Alex Tuyahov	NASA
Chris Lee	NASA
Gene Trobia	Arizona
Bill Burgess	Maryland

The agenda for the meeting was provided verbally at the beginning of the call and included the following items.

1. Commercial Satellite Data and Copyright Licensing Concerns
2. Regional Map
3. Data Buy
4. Workshops
5. State Summaries
6. NSGIC Conference “scholarships”

Bill Burgess began the discussion with an observation about the value of satellite data when purchasers are restricted on potential uses. The example of Louisiana’s problem dealing with SPOT Image was cited in the last meeting. This week Maryland had contacted SPOT to determine if the SOPT images used on the internal GIS system could be provided as JPEG files on the Internet version of the system and the answer from SPOT Image is that they can not. While SPOT’s position is understandable due to their need to protect their “only” product, it makes it difficult for State users/purchasers to justify the use of these products when they are already marginal. Maryland will have to revert to a planimetric map and remove the SPOT imagery from their public portion of the system.

The regional map was discussed and it was determined that the data requested during the previous meeting was not yet available. Therefore this item will be discussed during a future call. Chris Lee noted that the information is important for the potential training programs that will be offered under NASA’s state and local government initiatives.

The concept of the “Data Buy” appears to be pretty well established at this time. Alex Tuyahov explained to the group that NASA funds could not be used to buy products from foreign nations

such as the RADARSAT data from Canada. We discussed the general specifications for the Landsat 7 data and there were no additions. One Committee member noted that we did not include IKONOS data in the sampler kit proposal found in the last meeting notes. It was agreed that this should be added as a potential data source. In addition, we discussed and agreed to consider MODIS, ASTER and Terra Point data in the sampler kit. The idea of providing data in the Sampler Kits for each state was discussed. The group considered the cost of this initiative and determined that we should consider providing the Sampler Kits on a regional basis which again emphasizes that the Committee needs to determine logical regional groupings for the states. This program can be discussed at the NSGIC Conference to finalize a design for the Sampler Kits and location considerations.

Alex and Chris informed the Committee that after considering the comments from the Western Governor's meeting, the Santa Barbara meeting and our tele-conferences, they have focused on the following areas for their budget requests.

1. Common Products (Data Buy and Sampler Kit)
2. Pilot Projects (FFY 2001?)
3. Regional Infrastructure (RESAC's, etc.)
4. Workforce Development (Graduate Student Fellowships in state and local government agencies)
5. Informational Workshops

It was also noted that these items will build on each other in many state and local agencies. For example, a county government might obtain a Graduate Fellow that would use the data in the Sampler Kit to work on one of the Pilot Projects. Finally, NASA has some ROUGH DRAFT white papers on these areas that are embedded at the end of these minutes.

The real challenge will be to coordinate the training workshops. The recent Global Change workshops may serve as an appropriate model for this effort. This item will require significant discussion at the annual conference with an initial proposal to provide \$20 - 40K for state or regional workshops that would provide information and training on NASA's products and private sector capabilities. Gene Trobia noted that large states will be better served having this information provided at their annual GIS conferences due to the travel required for regional meetings in the west. However, we also discussed using regional workshops to help decide on the appropriate means to implement the training requirements.

Bill Burgess informed the Committee that the Board had modified its procurement policy and that a contract will be let with Lisa Warnecke to complete the State Summaries which she has begun under separate contracts to the Western Governors Association and NOAA. NSGIC will fund the development of 22 State Summaries and Lisa Warnecke will provide all 50 summaries and a "master summary" to NSGIC for posting on the NSGIC Home Page.

Bill also reminded the group about candidates for the conference scholarships and asked for help in identifying people that will return from the conference and help disseminate information on NASA's programs.

Everyone except Alex Tuyahov, Chris Lee, Ron Hess and Bill Burgess left the call at this point. These four individuals stayed on-line to discuss the NASA sessions at the annual conference. It was noted that Nancy Maynard will likely be on-hand at the conference to make the opening comments. Alex wants to get inputs from the audience on applications areas. Chris Lee and Bill Burgess will rework the afternoon session to outline the components of NASA's state and local programs (see five items above). Since the exact nature of these programs will not be known until after the conference, we can not describe in detail the funding mechanisms that will be used. It was noted that the time would be well spent obtaining feedback from the audience on the design of certain components such as the Sampler Kit, Training Workshops and Fellowship Program. Ron Hess noted that it was still important to provide information on NASA's funding mechanisms for state and local agencies that wanted to learn how to tackle an NRA or CAN grant application. Alex, Chris and Bill agreed to meet ASAP to settle the content of the sessions at the conference.

DRAFT WHITE PAPERS FOLLOW

1. COMMON PRODUCT

Rationale: There are products which can be derived from remotely sensed data that can support a wide variety of State and Local level applications; and produce a wide variety of benefits for the American People. An example of this type of effort conducted at the Federal level is the Multi-Resolution Land Characteristics (MRLC) effort by a consortium of Agencies including: USGS (WRD and NMD), EPA, NOAA (C-CAP), and the Forest Service. Using Landsat Thematic Mapper (TM) data from the 1992 timeframe, \pm one year, these Agencies jointly created a land cover map of the conterminous United States using a modified NOAA, C-CAP legend (similar to an Anderson level II land cover product). Hawaii and Alaska were not done owing to funding and data constraints. This product has been widely used within these agencies.

At this time these same Agencies, USGS (WRD, BRD, NMD), EPA, Forest Service and perhaps NOAA (C-CAP), are in the process of working towards an updated MRLC – 2000 effort using a modified approach. The planned approach to be taken this time is to create a land characteristics database of seasonal land cover regions of the entire United States using three dates of Landsat-7 Enhanced Thematic Mapper (ETM) data. From this land characteristics data base users can edit the seasonal land cover spectral clusters into any of the variety of land cover legends used within their respective Agencies. At this time, funding has been generated for the creation of the database for the conterminous United States. Funding for Alaska and Hawaii and for the purchase all of the ETM data needed to create the database is still being sought.

It is this type of database that might be of real value to State and Local users. It would be able to be modified to meet the specific land cover needs of individual State and Local users or user groups. There are several models that could be used to accomplish this type of State or locally specific adaptation. NASA and NASA associated applied and commercial users could work with State and Local user; or these State and Local users could work directly with MRLC Agencies if they consider it more appropriate.

There are other products that might also be of interest to State and Local users (see below). Yet, it is important to note that based upon the results of the Workshops in Santa Barbara, CA. (State and Local Applications of Remotely Sensed Data); and Denver CO. (Regional Workshop for State Policy Makers) land cover was listed as a high priority product by the user communities represented.

Objectives: This effort is directed at working with State and Local users, NASA centers, other Federal Agencies (e.g. USGS, EPA, NOAA, FEMA), academia, Non-governmental Organizations (NGOs), and commercial enterprises to create one or several products or product lines derived from remotely sensed data.

Approach: The approach to be taken in this portion of the NASA State and Local Initiative Program (SLIP) would involve a series of tasks. These tasks include:

1. Determine which specific products (e.g. base map, hydrologic basin map, actual vegetation community map,) or product lines (e.g. land characteristics database and a variety of derived land cover maps) derived from remotely sensed data have the widest appeal to State and Local users.
2. Work with appropriate entities to acquire or assist in the acquisition of the data needed to create the product or products.
3. Support the NASA or NASA funded applied or commercial remote sensing community's participation in the creation data sets or databases for assist State and Local users.
4. Fund State and Local users as they seek to operational employ these data sets and/or databases within their respective agencies.

Products and Processes: In the one hand the product of this portion of the State and Local Initiative could produce a common land characteristic database of the entire United States. On the other hand the product could be one or a series of high interest thematic data products (e.g. base map, hydrologic basin map, actual vegetation community map,) of the entire United States. The process by which a product or products would be developed would involve continuing to interact with State and Local users and with other relevant organizations through workshops. These workshops would be a mechanism for the determination of high priority remote sensing based data and information products. These workshops would also focus on how NASA and other associated organizations should interact with State and Local user to insure that any products developed in this effort meet their need to the maximum extent practical.

Schedule and Organizations: This effort should begin now if NASA is to influence the development of the MRLC – 2000 land characteristics database. The effort should take until the 2005 time frame to adequately complete this cycle. While this effort is moving forward NASA should continue to assess State and Local user needs through Workshops, and meetings. They should work to designate individuals as leads at appropriate NASA Centers and to formulate plans for a solicitation for State and Local, commercial and applied remote sensing organizations to participate in this effort. Organizations who should be involved in this overall effort would include NASA and NASA Centers (e.g. Stennis, Goddard, Ames, and Marshal), other Federal Agencies (e.g. USGS, EPA, NOAA, Forest Service), Private industry, academia and NGOs.

Performance Metrics: The following are performance metrics for this common product portion of the NASA State and Local Initiative Program (SLIP).

Input: Cost sharing of products, Multi-Agency teaming, NASA data and science, NASA supported training and capacity building.

Output: Development of operational procedures to meet specific State and Local user needs through thoughtful development and adaptation of a national land cover database, mechanisms for obtaining and using these products, and training workshops to assist in the adoption of these products and techniques.

Outcome: Increased operational usage of NASA data/information products in State and Local Agencies, Increased understanding of State and Local User needs by the Applied and Commercial Remote Sensing Communities, improved relationships between NASA and State and Local government, and exposure to the user communities the benefits and applications of Remotely Sensed data products.

Impacts: Feedback of information back into the NASA Science community, expanded use of NASA science and data products, expanded base of remote sensing users nationally, assisting in the development of a robust commercial remote sensing industry, appreciable cost savings to users, and considerable return.

2. ELEMENT: STATE AND LOCAL GOVERNMENT PILOT PROJECTS

Objectives

5. To demonstrate the applications of ESE data and technology to address information needs of decision makers in state and local governments.
6. To demonstrate that ESE science and technology can play a significant role in meeting the day to day operational requirements for data and information by state and local governments.
7. To demonstrate that the use of ESE science and data can be both cost effective and timely in providing equivalent or improved information to decision-makers.
8. To provide for training and capacity building as necessary to implement the use of ESE science and data on an operational basis

Approach

1. NASA will work through existing state and local government associations to ensure projects are selected that represent a broad spectrum of user needs and address problems that are common to a significant number of organizations.
2. Pilot projects will be selected to demonstrate use of ESE science and data to support a full range of information needs to address the issues of: 1) food and fiber; 2) natural resources; 3) disaster management; 4) environmental quality; 5) urban and infrastructure; 6) human health and safety; 7) weather and climate; and, 8) land use/land cover.
3. Pilot projects will be selected with adequate geographical distribution to insure that demonstrations are applicable to a full range of ecozones.

4. Pilot projects will be selected to cover the full range of existing capabilities of proposing agencies, e.g. agencies that are advanced in the use of remote sensing and GIS as well as agencies that have little or no experience with those technologies.
5. Pilot projects will be selected with agencies and organizations representing state governments, county governments, city governments, tribal governments and non-governmental organizations (NGOs).
6. Proposals involving a range of functional arrangements will be considered, from in house agency operation to any combination of government, academia and industry.
7. Proposals indicating a firm commitment to implement the technology for continued operational use will be considered before those that do not fully commit.

Pilot projects will normally run for three to five years to fully establish a capability to continue the effort on an operational basis. Capacity building and training for personnel inside the cooperating organization will be included in the project if needed. NASA will provide remote sensing as appropriate data and the scientific expertise to oversee processing and analysis of the data. Technical and scientific support will be provided as needed at the beginning of the project and gradually phase into total user agency operation. Funding for the projects will be cost shared by NASA and the user agencies. NASA financial support will be primary in the early years and phase to total user agency funding during the last year of the project. The number of projects approved and funded each year will depend on the available funding and the quality of the proposals received.

Products/Process

The products resulting from these activities will be both near and long term. Near term products will be information to address specific types of common and or recurring problems faced by state and local decision-makers. These products will range from simple application of remote sensing data to complex spatial data models involving numerous kinds of input data. State and local government associations have identified numerous areas where remote sensing data may be useful in providing improved and/or more timely information for decision-makers. The areas identified by states were, in the order of priority; 1)land use/land cover; 2)foundation layers (i.e. image base map); 3)water resource monitoring; 4)pollution (point and non-point); 5)disaster response; 6)water quality and quantity; 7)coincident data with 2000 census; 8)urban infrastructure and rural information; 9)air quality;10)soils; 11) human health; 12)cadastre (for tax maps); and, 13)coastal zone (bathymetry). Areas identified by local governments were essentially the same but in a slightly different order of priority, e.g. 1)foundation layers (image base maps); 2)disaster response; 3)coincident data with 2000 census; 4)land use/land cover; etc.

Each pilot project will be carefully selected to meet the criteria presented in the 'Approach' section above. Once the projects are funded NASA will provide the appropriate remote sensing data plus the scientific and technical expertise to process and analyze the data to the desired information format. The NASA scientific and technical support will be provided as training for the participating agency personnel. The processed information will then be entered into a spatial data model or other appropriate media for the decision-makers. As the projects progress the NASA support will be diminished over time and the user organization will assume full responsibility for the operation. Projects will normally be approved for five years and it is planned

that the last year of the projects will be totally funded by the user organization with NASA being 'on call' only.

Schedule and Organization

It is planned that pilot project phase of the program will start in fy2001. Ten to fifteen projects will be selected for funding with the average being five years in time. New projects will be added each year as funding becomes available but no later than 2003 when funding for the first year projects is reduced. This process will continue with new data sources and new users until the program is completed.

NASA will be supported in the process by associations representing broad areas of users. Some of these organizations are: 1) National Conference of State Legislators (NCSL); 2) National Governors Association (NGA); 3) Western Governors Association (WGA); 4) National Association of Counties (NACO); 5) National Association of Mayors; Urban League; 6) National States Geographic Information Council (NSGIC); etc. These organizations will serve to provide NASA with information as to the most common needs of their constituent organizations as well as provide council and over-site to the project activities. They will also serve as channels to communicate both NASA plans and project results to a broader audience of users and as a feedback to NASA for changing requirements of the various user communities.

Benefits/Utility

The pilot project will serve to demonstrate to the state and local user communities (including NGOs and tribal) the utility of ESE data, science and technology in providing timely and /or improved information to the decision-makers. They will further increase the number of users of ESE data in the future in all these user communities by leaving behind the capacity to implement the continued use of ESE science, data and technology on an operational basis. The resulting benefit to the users will be better and/or less expensive sources of information resulting in costs saving and/or better management practices.

Performance targets for the pilot project element will be to start ten to fifteen pilot projects in fy2001 (depending on funding level) and to successfully complete seventy five percent of those (to operational capability) by the end of fy2005.

3. REGIONAL INFRASTRUCTURE

Rational: If we are to work with State and Local users we will need to implement an infrastructure that can provide them adequate assistance as they seek to operationally integrate remote sensing derived data/information products within their agencies and or organizations. It is axiomatic that most potential State and local user will have a wide variety of needs from capacity building through training to help in data acquisition, research and development prior to any operational implementation of the use of remotely sensed data and information products. What this means is that some form of flexible, adaptive infrastructure must be put in place to accommodate the complex variety of needs that will arise as this program is implemented. These

needs can range from general (e.g. data acquisition help) to very complex (e.g. discipline specific technical issues).

NASA has implemented a type of infrastructure to assist State and Local users in the past in a program called the Regional Application Program (RAP). As with the current State and Local Initiative the RAP program recognized that there are region specific high priority State and Local issues that could benefit from the input of data/information derived from remotely sensed data products. The infrastructure of the RAP broken the nation down into three regions (roughly the Eastern, Central and Western United States). NASA Goddard was the lead NASA Center for the Eastern U.S.; Stennis, the lead for the Central U.S.; and Ames was the lead for the Western U.S.

There are still region specific high priority issues facing prospective State and Local level users of remotely sensed data and information. In the Eastern and Western United States smart growth and the lose of prime agricultural land maybe a high priority issue than in the mid continent region. Groundwater levels and early warning of tornadoes are issues in the Mid-West. Invasive species and Drought are also a major issue in the Mid West. Water, wildfires, earthquakes and environmental protection are important topics in the West. In the South Severe storms, forest management coastal wetlands non point source pollution and urban expansion. In the Eastern U.S. transportation corridors, Great Lakes and Chesapeake Bay water quality and wetlands issues are all issues. In Hawaii smart growth, coral reef destruction and tsunami warning are issues. While in Alaska environmental and resources management are important.

Objective: Put in place a flexible, adaptive infrastructure to support, in so far as practical, the complex variety of needs that will arise as this State and Local Initiative Program (SLIP) is implemented.

Approach: Under overall NASA Headquarters direction a number of SLIP applied remote sensing Regional Assistance Centers (RACs) will be established. These may consist of appropriate organizations at NASA Centers or other Federal Centers (e.g. USGS, EROS Data Center, or the NOAA Coastal Systems Center). Included in such centers could also be Regional Earth Science Applications Centers (RESACs), Earth Science Information Partners (ESIPs), Affiliated Research Centers (ARCs), or other university centers or commercial entities, or other similarly appropriate organizations. Under the direction of the lead center for a given region some one or a combination of these organizations would be directed to assisted State and Local users meet specific aspects of needs from capacity building through training to R&D and operational implementation. The key will be to match as closely as possible the needs of the users to the skills of the organizations that comprise each of the RACs. An overall program steering committee will be implemented to evaluate the work of these RACs at regular intervals and to report to NASA Headquarters concerning performance.

Products and Processes: The primary products of this program will be the operational implementation of the use of data and information products derived from remotely sensed data by State and Local Agencies. Overall we will be increasing the applied remote sensing user community through a combination of capacity building, training, pilot projects and operational demonstrations. If successful we should also increase the market for the U.S. commercial remote

sensing industry. With respect to processes this portion of the project will require a variety of types of training and capacity building mechanism. From standard classes or workshops to the innovative methods used at ARCs, NASA will be challenged to explore all possible mechanisms as we seek to assist State and Local users to integrate remote sensing data and information products into their operations.

Schedule and Organization: Program initiation should begin in FY-2000 and run through 2006. In the first year the RACs should begin to be put in place and a solicitation for State and Local applied remote sensing pilot project should be developed. This solicitation should be for funding beginning in FY-2001. The organization of the SLIP should be Headquarters Lead; Regional Applications Centers and their affiliated organizations provide assistance directly to the State and Local users who agree if pilot projects meet established success criteria to, in so far as possible and practical, operationally implement within their organizations.

Performance Metrics: The following are performance metrics for this Regional Infrastructure portion of the NASA State and Local Initiative Program (SLIP).

Cost sharing of products, NASA supported training and capacity building.

Output: Development of operational procedures to meet specific State and Local user needs for infrastructure, mechanisms for implementing these products, and training workshops to assist in the adoption of these products and techniques.

Outcome: Increased operational usage of NASA data/information products in State and Local Agencies, Increased understanding of State and Local User needs by the Applied and Commercial Remote Sensing Communities, improved relationships between NASA and State and Local government.

Impacts: Feedback of information back into the NASA Science community, expanded use of NASA science and data products, expanded base of remote sensing users nationally, assisting in the development of a robust commercial remote sensing industry, appreciable cost savings to users, and considerable return on NASA investment through increased product usage.

4. CAPACITY BUILDING/WORKFORCE DEVELOPMENT

Rationale: One of the most significant barriers to State and local government use of remotely sensed data is the lack of personnel trained in the acquisition, processing, and analysis of such data. Experience shows that simply providing funds in the form of a mini-grant does not usually result in a significant and long-term gain with respect to the training and placement of technologically proficient personnel. The money is more often than not used to supplement the salary of an existing or temporary slot, and that once the funding ceases the position disappears or shifts to a more traditional activity.

Other Federal agencies, specifically EPA and NOAA, have implemented highly successful

internship and fellowship programs focused on placing graduates and graduate students with commercial companies and resource management agencies. The NOAA Coastal Management Fellowship and the NOAA Industrial Fellows Program are two examples.

The Coastal Management Fellowship, with some tailoring to meet the specific goals of the Earth Science Enterprise, provides an excellent model for the creation of an externship program by NASA in partnership with State and local governments. The NOAA Coastal Management Fellowship was established in 1996 to provide professional on-the-job education and training opportunities for post-graduate students in coastal resource management and policy and to provide specific technical assistance for state coastal resource management programs. The program matches highly qualified, recently graduated master's, professional, and doctoral degree students with state hosts around the U.S. in state coastal zone management programs. For two years, the recipients work on substantive state-level coastal resource management issues that pertain to federal management policies and regulations.

In the case of the Industrial Fellows program, support is provided for highly-qualified graduate students who are pursuing focused research topics of interest to a particular industry/company. In a true partnership, the student, the faculty adviser, the Sea Grant college or institute, and the industry representative work together on a project from beginning to end.

Both the Industrial Fellows Program and the Coastal Management Fellowship have components that provide models for the internships and externships proposed as part of the State and Local Initiative Program (SLIP).

Internships will be modeled after the focused aspect of the Industrial Fellows program in that they will involve a clearly delineated application that is accomplishable within a one semester time frame. The goal is to provide current graduate students with experience and a thesis research topic while at the same time providing State and Local resource management agencies with expertise to address specific, short-term remote sensing based applications.

Unlike the one semester duration internships, the externships, which involve graduate students that have recently completed their programs, are three years in length with NASA paying all but some minor costs during the first two years, and sharing the cost with the State or Local partner during the third year. Ideally after that point the State or Local Partner will pick up the funding permanently. The NOAA Coastal Management Fellowship has had about a 60% success rate with permanent hires using a two-year, fully funded approach.

Objective: To implement a program of internships (graduate students) and externships (recently graduated students) that will place individuals with remote sensing expertise in State and local agencies and, in the case of externships, provide mechanisms to increase the likelihood that their positions will be institutionalized and that they will be hired permanently at the end of three years.

Approach: The approach to be taken in this portion of the NASA State and Local Initiative Program involves a phased implementation of externships with an increasing number of internships each year as the initiative progresses. A full funding scenario would result in a total of

160 semester long internships over the life of the initiative while the externship funding structure will result in a total workload of 195 person/years (65 three-year externships) during the course of the initiative.

Products and Processes: The primary products of this program will be the development of a workforce that will spearhead the operational use of data and information products, derived from remotely sensed data, by State and Local Agencies. Through this component of the initiative NASA ESE will be increasing the applied remote sensing user community through workforce development and institutional capacity building which should not only result in greater use of remote sensing data, but more importantly, a sustained use of the data that will continue beyond the life of the initiative.

Schedule and Organization: Program initiation should begin in FY-2000 and run through 2006. In the first year solicitations for both internships and externships should be developed with a goal of funding an initial set of 10 interns and 10 externs in FY-2000. Timing of this component is important to take full advantage of the successful candidates in helping to organize and execute tasks associated with the Common Data Product and the Informational Workshops. During subsequent years the number of both internships and externships will increase resulting in the totals presented under Approach (assuming, full, overguide funding)

Performance Metrics: The following are performance metrics for this workforce development portion of the NASA State and Local Initiative Program (SLIP).

Input: Cost support (first two years) and cost sharing (third year) with host agency for externships, one semester stipend for internships.

Output: Development of institutional remote sensing capacity within states through the placement of interns and externs in appropriate management agencies.

Outcome: Increased operational usage of NASA and commercially available data/information products in State and Local Agencies, improved relations between NASA and State and Local government.

Impacts: Feedback of information back to into the NASA Science community, expanded use of NASA science and data products, expanded use of NASA science and data products, expanded base of remote sensing users nationally, assisting in the development of a robust commercial remote sensing industry, appreciable cost savings to users, and considerable return on NASA investment through increased product usage.

5. INFORMATIONAL WORKSHOPS

Rationale: A series of workshops have been held over the two years by the Applications, Commercialization, and Education (ACE) Division of the Earth Science Enterprise (ESE) with representatives of state and local government. The purpose was to begin to establish a relationship

that would (1) help ESE better understand the information and technology requirements of these groups, and thus (2) extend the benefits of ESE science results and data to this broader audience. What emerged from these workshops was a realization that within this group there is a very poor understanding of (1) what NASA does, (2) what kinds of products are available now, (3) what is coming in the future, and (4) how to use any of it.

Despite the lack of knowledge, there is a large and quickly growing demand for new information products within this group. The explosion in the use geographic information system (GIS) technology has created a skilled cadre of potential NASA science and data users in state and local governments. As they become more sophisticated in their use of these tools, their demand for newer and better information is growing quickly. Moreover, within the past five years, they have developed national associations that are coordinated with state groups that serve as mechanisms for information exchange. From the NASA perspective, there is a clear need to better inform this important group that affects local and regional policy, and there is a mechanism by which they might be reached. Better communication with these groups would (1) allow them to understand what NASA has to offer, and (2) allow NASA to understand and respond to their special information needs.

Objectives: The goal of the informational workshops initiative is to reach the largest possible number of potential users of NASA science results and data within state and local government.

8. To familiarize state and local government agencies at the technical and executive levels with the uses of NASA Earth science results and data.
9. To guide them to points of access for data, software and technical support.
10. To establish a broad-based network to support remote sensing applications within state and local governments.
11. To characterize the range of state and local government users and establish a baseline to assess their adoption of ESE science and data.

Approach: A series of workshops would be conducted that would involve all 50 states, at various levels.

Regional Technical Workshops (coordinated by National States, Geographic Information Council [NSGIC]). Conduct up to 10 regional workshops that include 5-7 states (technical representatives from each state selected by state geographic information council [GIC] or equivalent).

Workshops would include (1) formal presentations of ESE science results and data, (2) distribution (via CD) of free data (region/state specific), software, and web-based resource materials (URLs of important sites) via CD, (3) hands-on exercises, (4) working group session (network building; feedback opportunities), and (5) completion of user survey (see activity 4 below). Workshops would be conducted by regional groups composed of NASA centers, NASA PIs, appropriate universities, and the private sector.

State Technical Workshops (coordinated by NSGIC through GICs). Based on the material presented (and distributed) at the regional workshop, state GICs would sponsor similar workshops within each state for technicians/operations managers within state agencies, counties, and municipalities. The structure would be the same as the regional workshop (to the degree possible), with special emphasis on (1) introductions to the technology, (2) where to find data, software, and technical support, (3) the distribution of free data and software, and other web-based resource materials, and (4) completion of user survey (see activity 4). They would include the designated GIC regional representatives, the appropriate NASA centers, NASA PIs, appropriate universities, and the private sector.

State Executive Briefings (coordinated by NSGIC and implemented by GICs). High level overview for administrators of (1) state agencies, and (2) regional, county and municipal governments presented by GICs with support from NASA centers, NASA PIs, universities, and private sector. In addition to presentation, a user survey would be conducted (see activity 4).

Preliminary Market Segment Analysis (conducted by NASA/ESE). The set of workshops provides a unique opportunity to understand the state and local government “market segment” for ESE science results and data. The workshops will involve upwards of 5,000 professionals at all levels: working, administrative, and executive. By performing an initial study of their interests, needs, and the constraints that confront them, it will be possible monitor rates of adoption of ESE science results and data, and to identify those factors which affect them most.

Products:

Direct Contacts: Regional workshops will reach upwards of 500 technicians (50 x 10). Each of the 2 workshops held in each state (one for executives, one for technicians from state and local agencies) will reach an additional 2,500 each (50 x 50). Thus, upwards of 5,500 people would be directly involved. A reasonable total would be 5,500.

Educational Materials: CDs containing generic training materials, free software, and URLs for sites that provide technical support (wide applications) as well as free specific data (maps and images) for each region (provided by NASA, USGS, NOAA). These products will be useful in approaching other groups within these regions (e.g., farmers; natural resource managers).

Market Segment Survey: A survey will be designed to develop a complete picture of the state and local government “market segment.” Each workshop is focused on a different part of this audience (technicians at all levels and administrators). Questionnaires will be distributed at each workshop. Analysis of the survey results will establish a baseline of (1) information needs, (2) expectations of ESE science results and data, and (3) perceived constraints to their adoption. Over the next two years, it will then be possible to monitor the adoption of ESE products and then establish those factors that enhance or retard the process.

Schedule and Organizations: The workshops will be conducted within the first six months of 2000. The materials that will be distributed will be prepared during the last quarter of 1999. Regional workshops will be coordinated and hosted by the NSGIC, with input from NASA

Centers, USGS, NOAA, appropriate universities, and the value added industry. State workshops will be coordinated by NSGIC, but hosted by state GICs with technical support from NASA Centers, state universities, and industry. The market segment analysis would be completed by October, 2001.

Performance Metrics

Input: Cost sharing of products, multi-agency teaming, NASA science results and data, NASA supported training and capacity building.

Output: Direct and substantive contact between the remote sensing community and a large potential user base, and development of a better understanding of the information requirements and operating constraints of state and local government. Development of operational procedures to meet specific State and Local user needs through thoughtful development and adaptation of a national land cover database, mechanisms for obtaining and using these products, and training workshops to assist in the adoption of these products and techniques.

Outcome: The development of functioning regional networks between state and local government users with NASA ESE that will lead to (1) increased operational use of NASA data/information products in State and Local Agencies, (2) increased understanding of State and Local User needs by the Applied and Commercial Remote Sensing Communities, (3) improved relationships between NASA and State and Local government, and (4) exposure to the user communities the benefits and applications of Remotely Sensed data products.

Impacts: Feedback of information back into the NASA Science community, expanded use of NASA science and data products, expanded base of remote sensing users nationally, assisting in the development of a robust commercial remote sensing industry, appreciable cost savings to users, and considerable return