maine GEO-LIBRARY

(www.maine.gov/geolib)

Maine Library of Geographic Information
2005 Annual Report to the Legislature
and
Joint Standing Committees on
Natural Resources and State and Local Government

TABLE OF CONTENTS

1. **The GeoLibrary** **page**
   - 1.1 Introduction 3
   - 1.2 Legislative Background 3
   - 1.3 Mission/Vision/Strategic Focus 3
   - 1.4 Governance 4
   - 1.5 Library Structure 5

2. **Goals and Accomplishments**
   - 2.1 2005 Initiative/Major Projects 6
   - 2.2 2006 Priorities and Initiatives 7

3. **Finances** Expenditures through 2005.....12

4. **Requested Legislative Action** 13

5. **Appendices**
   - A. Parcel Grants Round 1 Award List 14
   - B. Parcel Grants Round 2 Award List 14
   - C. Map of orthophotography coverage 15
   - D. 1' orthophotography sample 16
   - E. 2' orthophotography sample 17
   - F. Public Survey Orthoimage Summary.....18
   - G. GeoLibrary Brochure..... .....Attached

This report has been prepared in accordance with the Maine Library or Geographic Information Act, Sec. 5 M.R.S.A. Section 2003(I)(L).

Acronyms & Selected Definitions

Board	Board of Directors for the Maine Library of Geographic Information
GeoLibrary	Common name for Maine Library of Geographic Information
GIS	Geographic Information System
MeGIS	Maine Office of GIS
Resolve 23	Legislative committee that drafted the Plan that resulted in the MLGI

Cover: Orthophoto of Maine State Capitol

1. THE GEOLIBRARY

1.1 Introduction

The Maine Library of Geographic Information ("the GeoLibrary") is a virtual library created by the Maine Legislature and governed by a partnership of public and private stakeholders to provide cost efficient, web-based public access to public geospatial data.

1.2 Legislative Background

In 2001, the Legislature instructed the State Planning Office to convene what came to be called the Resolve 23 Steering Committee to study the use of GIS in statewide strategic planning. The Committee developed a needs assessment, the conclusion of which formed the basis for the GeoLibrary, its method of governance, and its strategic focus. The Legislature acted on the Committee's recommendations to create the Maine Library of Geographic Information in April 2002 as envisioned by L.D. 2116 "An Act to Establish the Maine Library of Geographic Information (Chapter 649)". The GeoLibrary's current statutory framework is set forth in the Maine Library of Geographic Information Act 5 M.R.S.A. Section 2001 *et seq.*) (the "GeoLibrary Act"). The GeoLibrary is governed by an independent board of public and private stakeholders, it is staffed by agreement with BIS, and its projects are funded by a 2003 State bond of $2,300,000 matched with a variety of Federal grants.

1.3 Mission / Vision / Strategic Focus

As defined by the Board in consultation with L.D. 2116, the mission of the GeoLibrary is to create an electronic gateway to public geographic information, and to expand and promote the value of geographic spatial data through widespread distribution and innovative use for the benefit of Maine's citizens.

The GeoLibrary's vision is to provide state-of-the-art, comprehensive, and ever expanding access to public geospatial information and services, and to facilitate the availability of collections and access for all citizens. This vision encompasses:

- the design and implementation of appropriate data standards;
- the maintenance of a GeoLibrary Portal to ensure coordinated access to these datasets as well as standards compliance with Open GIS Consortium guidelines and the developing geospatial data construct;
- the stewardship of priority statewide spatial datasets and the associated technology essential for sharing geographic data;
- facilitating the modernization and GIS development of local government land records;
- support for smart growth and growth management with datasets and techniques that enable government and communities to effectively plan land use, location decisions, and site designs in a way that will minimize negative impacts on the social, economic and environmental health of Maine;
- multi-organizational data-sharing that results in significant savings in the cost of creating and maintaining geospatial data;
- budgeting and revenue development that prioritizes the strategic importance of geospatial information;
- promoting innovative uses of public geospatial information that fosters economic development;
- implementing education and outreach programs that advocates for the further development of Maine as a national center for GIS research, education, and industrial growth.

The Board has identified four areas of strategic focus to realize its mission and vision:

SF1. the development and implementation of statewide data standards to ensure data quality and to enable common use;

SF2. the development of a web-based distribution system to facilitate access to statewide data holdings;

SF3. the provision of funding and management for high priority data and database development to support community and regional planning, smartgrowth, and community preservation;

SF4. the provision of coordination, outreach, and education in support of better public use of geospatial data and to enhance Maine's position as a national center for GIS research, education and industrial growth.

1.4 Governance

The GeoLibrary is governed by a Board of Directors structured in accordance with L.D. 2116. Its members are appointed by the Governor, the President of the Senate, the Speaker of the House, the UM Chancellor, the Director of the State Planning Office, and professional organizations representing major stakeholder groups. A strength of the organization is that the Board is independent, term-limited (with the possibility of reappointment) and drawn from the public and private sectors. It is therefore uniquely positioned to represent all stakeholders fairly and in a way most likely to foster efficient cooperation and mission success. The current membership is:

Representing GIS Vendors
James H. Page, Chair
President / CEO, James W. Sewall Company

Representing GIS Vendors
Will Mitchell, President
Mitchell Geographics

Representing Utility Interests
Dennis Boston, Senior Analyst
Energy East

Representing Environmental Interests
Barbara Charry, Biologist, GIS Manager
Maine Audubon Society

Representing the Public
Sean Myers, GIS Specialist
Kennebunk, Maine

Representing Statewide Association of Regional Councils
Ken Murchison, GIS Specialist
Northern Maine Development Corporation

Representing Statewide Association of Counties
Currently open

Representing the UMaine System
Marilyn Lutz, Vice-Chair
Director, IT Planning, University of Maine

Representing Municipal Government
Paul Mateosian, Assessor
City of Bath

Representing Municipal Government
Currently open

Representing State Government
David. M. Blocher, representing
Richard B. Thompson, Chief Information Officer

Representing State GIS Functions
Elizabeth Hertz
State Planning Office

Representing the Commissioner of Administrative and Financial Services
Judy Mathiau
Maine Revenue Services

Representing Real Estate & Development Interests
William H. Hanson, Esq.
Rudman & Winchell, LLC, Bangor

The GeoLibrary Board meets monthly. Agendas and meeting notes can be found on the GeoLibrary website: http://www.maine.gov/geolib/ The Board is organized into three standing subcommittees:

A. Finance Committee, with responsibility for:
- budget oversight;
- recommending budget actions to the Board for approval;
- primary interaction with outside entities on financial issues.

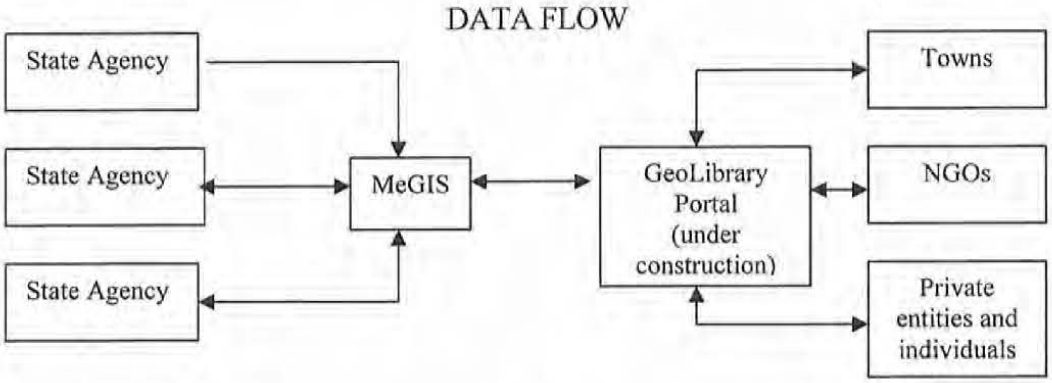
B. Policy Committee, with responsibility for:
- policy oversight;
- memorializing approved GeoLibrary policies;
- recommending policy adoptions and amendments to the Board;
- primary interaction with outside entities on policy issues.

C. Technical Committee, with responsibility for:
- oversight of all Board projects;
- advising the Board on all technical matters;
- primary interaction with outside entities on technical issues.

The GeoLibrary is staffed by The Maine Office of GIS, Dan Walters, Director, an arm of the Department of Administration and Finance, Bureau of Information Services. MeGIS manages and operates the GeoLibrary website, GIS database and data access facilities.

1.5 Library Structure

The GeoLibrary's portal is the central node in a distributed system linking its stakeholders via the web as well as providing the central point of connection between state agencies and the public and other public entities. Schematically:



One commonly asked question is whether MeGIS and the GeoLibrary are redundant. They are not. The GeoLibrary maintains no technical staff, using the MeGIS operations structure already in place to serve its needs. At the same time, the public / private structure of the GeoLibrary Board makes it the most technical and policy effective interface between the state and other GIS users.

2. GOALS AND ACCOMPLISHMENTS

2.1 2005 Initiatives / Major Projects[1]

In 2005 the GeoLibrary undertook the following projects or initiatives in support of each of the areas of strategic focus:

SF1. To support the development and implementation of statewide data standards to ensure data quality and to enable common use;

- The GeoLibrary Board developed and maintains data standards for parcel data submitted to the GeoLibrary or developed with GeoLibrary managed funds.
- The GeoLibrary Board developed and implemented policies concerning budget authority and relations with private industry, and currently is refining policy regarding the contributions of datasets to the GeoLibrary and the adoption of standards.

SF2. To support the development of a web-based distribution system to facilitate access to statewide data holdings:

- the GeoLibrary is constructing an enhanced web-based portal as its "front door" for public access to statewide data and to facilitate the development of a virtual GIS network linking statewide geospatial data holdings. The GeoLibrary Portal Project was designed and put out to competitive bid in the fall of 2005. The Ionic Corporation was awarded the project with work beginning January 2006 with completion scheduled for 2Q, 2006.

SF3. To support the provision of funding and management for high priority data and database development to encourage community and regional planning, smart growth, and community preservation, the GeoLibrary Board:

- implemented a $3.2M project in conjunction with the Federal Government to produce digital orthophotography for the state's organized townships. Areas now available and those that will be available in 2006 are presented in Attachment C. See Attachment D for a survey summarizing public response (including cost savings) and Attachments E and F for samples.
- developed a grant program budgeting bond funds to digitize property tax maps with awards varying from $1,000 to $10,000. The first round of awards was made in 2004 to 45 towns, with 41 completing their projects on schedule, 3 requesting and receiving extensions, and 1 municipality withdrawing from the program. A second round of awards was announced with some 39 municipalities applying for grants and 29 awards made in January 2006. It is noteworthy that because of the GeoLibrary's unique system of governance, 100% of allocated funds in both grant rounds were distributed to the towns. See Attachments A, B for the 2005 and 2006 award lists.

SF4. To support the provision of coordination, outreach, and education in support of better public use of geospatial data and to enhance Maine's position as a national center for GIS research, education and industrial growth, the GeoLibrary completed a flyer on the GeoLibrary for educational and outreach purposes, a copy of which is included as Attachment G. Presentations were made at to Maine Society of Land Surveyors, three to representatives of Maine County Government, and one to the Maine GIS Users Group (MEGUG).

2.2 2006 Priorities and Initiatives

Pending funding, the GeoLibrary Board plans to undertake the following projects or initiatives in support of its strategic focus.

[1] Note that the GeoLibrary's fiscal year ends June 31. All year references, however, are to the calendar year.

GEOLIBRARY ORDERED PRIORITIES						
Details follow		Bond funds		Match		
Priority	Project	FY07	FY08	FY07	FY08	NOTES:
1	Complete orthophoto project					
	Tier B	$270,000		$270,000		Federal Match
	Tier C		$330,000		$330,000	Federal Match
	begin update cycle		$250,000		$250,000	Likely Federal Match
2	Parcel Grants	$750,000	$750,000	$750,000	$750,000	Municipal Match
3	Conservation lands maps	$200,000	$200,000			
4	Zoning maps grants	$50,000	$50,000			
5	Update statewide land cover		$100,000			
6	DFIRM production	$300,000	$430,000	$300,000	$430,000	Federal Match
7	Development tracking	$250,000				
8	Build statewide GIS network	$150,000	$150,000			
9	Standards, conformity and upgrades validation	$100,000	$200,000			
	Subtotal	$2,070,000	$2,460,000	$1,320,000	$1,760,000	
	Total		$4,530,000		$3.080,000	

Priority 1: Complete Orthophoto Project and begin the first update cycle
To support the management of high priority data and database development for community and regional planning, smartgrowth, and community preservation, the GeoLibrary implemented a $3.2M project in conjunction with the Federal Government to produce digital orthophotography for the state's organized townships. Digital orthophotography are aerial photographs that have been processed to function as "photomaps", having the scale and the measurement characteristics of a map with the qualities and characteristics of a photograph. Digital orthophotos are widely used as a base map or backdrop in GIS on which other layers of mapped information can be viewed or analyzed. Because of the "bird's eye view", orthophotos make it easy to view, recognize and understand the relationship of objects on the ground. Digital orthophotos are also used as the source for digitizing ground features to create GIS data layers for specific business functions including road centerlines, building footprints, farm fields, forest types, eelgrass beds and utility & road corridors. Change analysis can then be conducted using orthophotos from different years. This effort represents significant cost savings as the cost of producing orthophotos for municipalities individually would be dramatically greater than the realized cost of undertaking a single, statewide project. New bond funding will allow the completion of this project for the entire state as well as begin the first update cycle in FY08.

This initiative has been extremely well received. Following is a representative quote:

> "Members of the Maine's Cooperative Forestry Research Unit, a consortium of Maine's forestland owners representing over 7.5 million acres, are benefiting directly from the GeoLibrary orthophoto

program. The digital elevation model (DEM) data that was created with the orthophoto program is currently being used to produce depth to water table maps for over 5 million acres across the state. When complete, these maps will improve forest management by reducing road construction costs, improving harvest operations, enhancing silviculture planning, and identifying wetlands. As much of the forestland being mapped is in northern Maine, development of these maps would be greatly improved by additional photography and the underlying DEM data being completed in areas of northern Maine that have not yet been covered." Robert G. Wagner, Professor and Director, Cooperative Forestry Research Unit, The University of Maine.

Priority 2. Continue the Municipal Grants Program for Digital Property Maps

Also known as cadastral maps, digital property maps show the boundaries of land for purposes of describing and recording ownership and taxation. Property Maps are one of the most important local government information assets, forming a fundamental base for many municipal activities. Although GIS parcel data cannot replace detailed ground surveys, the data assists municipal officials with functions such as accurate property tax assessment, planning and zoning. Furthermore, a digital cadastre provides the most efficient method of collecting and collating geospatial data for infrastructure development and regional planning. A grant program has been developed budgeting bond funds to digitize property tax maps with awards to municipalities varying from $1,000 to $10,000 requiring a minimum 1-1 municipal match for each dollar awarded. The first two rounds of awards is complete with 103 municipalities applying for, and 74 receiving grants. The Board's priority is to meet municipal demand by doubling the grant monies available under this program.

Priority 3. Dvelop Comprehensive Conservation Lands Maps

The State does not have a mechanism to track conservation lands that are in state, federal, municipal or private ownership. Efforts (described below) are currently underway to address this set of data gaps. Without the application of additional technology, however, these systems will not provide an ability to compile or maintain an inventory of all conserved lands.

- One of the requirements of accepting a Geolibrary Parcel Grant is the return of the digital data for inclusion in the state GIS catalog. This is one way to eventually capture information on public access and conserved land at the municipal scale.
- A new focal area for land protection efforts is the preservation of working waterfronts. The Island Institute is developing a database to house data on working waterfronts including information on public access opportunities. The Maine Land Trust Network is currently leading an initiative to develop a database of privately conserved lands. In this effort, land trusts will be invited to provide their data for inclusion in statewide database; specific attributes for each record will include whether the record can be released to the public and whether or not public access is allowed.

The audience of people interested in the status and quality of conserved lands in Maine is large and varied.

- Legislators, municipal officials, voters and members of non-profit conservation groups want to know about the success of the programs in which they have invested, as well as having ready access to information concerning acreage protected, attributes of the properties, visitor numbers and geographic distribution of lands.
- Under Maine statutes and rules, permit reviewers need to know the location and attributes of conserved lands to analyze the potential effects of new development on these properties. Size, location, type of easements or restrictions, habitat types, and viewsheds are types of information needed by this audience.
- New policy directives such as the Maine Coast Protection Initiative (MCPI) and the Coastal and Estuarine Land Conservation Plan challenge conservation organizations to choose projects that address multiple objectives such as public access to the shore, conservation of working lands, and protection of high priority habitat types. Project reviewers have a more complex task when

assessing funding proposals, needing to factor in a more diverse set of information. Because each of the seventy MCPI partners has committed to a new framework for strategic land conservation, a variety of public and private conservation organizations would benefit from better evaluative tools.

- Planners and policy makers need to conduct strategic assessments and periodic evaluations of current programs in order to invest resources effectively
- The increasingly more sophisticated eco-tourist desires additional information about conserved lands beyond simple locational information. With more visitors using the internet, a web-based coastal access guide would complement Maine's efforts to claim additional market share of nature-based travelers.

Funds will be used to update the current conserved lands/public access data and to develop a mechanism to update the data annually. This will include coordination with a Steering Committee; discovery and review of documents held by state and local entities; input of attributes into a database; geolocation of sites as necessary; development of FGDC-complaint metadata; and a mechanism to update the database.

Priority 4. Create a Zoning Maps Grants Program

A comprehensive statewide or regional zoning data layer is an important component of economic development plans, development tracking, build-out analyses and modeling of zoning options. Some limited regional composites of zoning data have been made but municipal zoning does not exist on a statewide basis. Regional or statewide digital zoning maps would be used by realtors, developers, business development groups, conservation organization and municipalities. Zoning data maintained at the municipal level fall into two major types:

- Shoreland zoning, created statewide by statute and general municipal zoning which varies considerably from one town to the next. Zoning data from each community would be automated and submitted for comparison to an established standard and insertion into the GeoLibrary. Partly because it was created by state statute and partly because it is based necessarily on natural features, shoreland zoning is comparatively uniform. This part of the project would lend itself to a regional approach.
- General Municipal Zoning. Zoning maps would be automated with zoning areas represented as polygons with attributes describing the municipal zoning classification. Maine municipal zoning does not have a uniform set of zoning codes. Therefore, as with the digital parcel data, standards will need to be developed by the Geolibrary Board to guide data development. A state standard would not involve removing local codes from the data. The final attribute table would include two fields: 1) municipal zoning code, and 2) state zoning code. Again, data from each individual community would be automated and submitted to the state for comparison to the standard and insertion into the Geolibrary.

The Board would fund a program of grants to create modeled on the Parcel Grants Program to upgrade and submit digital zoning to the GeoLibrary to create a statewide zoning data layer.

Priority 5. Update Land Use/Land Cover

The GeoLibrary used bond funds to provide partial funding for the development of a new Maine Landcover Dataset to assist organizations in planning for growth and monitoring natural resources. Landcover mapping indicates the dominant vegetation or ground cover within a particular 5mx5m square, grouped into areas of two acres or more. This project is tightly integrated with federal efforts to map landcover and imperviousness nationwide at 30-meter resolution, realizing tremendous cost savings. Other contributors to the project include federal agencies (U S Geological Survey , National Oceanographic Atmospheric Administration, Environmental Protection Agency (Federal)), as well as state agencies (Maine Department of Environmental Protection , Maine Department of Transportation, Maine State Planning Office, Maine Inland Fisheries & Wildlife, Maine Drinking Water Program). The users of land use/land cover data include:

- biologists modeling species habitat for population management

- planners studying growth in Maine
- environmental specialists looking at storm water issues (imperviousness)
- forestry planners studying forest composition and change
- emergency management planners
- meteorologists modeling air emissions
- growth planners assisting siting of new businesses
- municipal governments for their planning needs

Each of the above uses can be accomplished in a more cost effective manner through remote sensing than through field mapping, and having a statewide effort provides an added level of consistency. Updates of this data every 2 to 5 years to assess change over time is key to an effective ROI.

Priority 6. Assist with Digital Flood Insurance Rate Map Production

The losses due to recent flooding events has made the public and every level of government more aware than ever of the significant hazards, risks and costs of occupying land along or near our nation's coastline and rivers. Trends and decisions on where and how to develop in these areas have often not reflected the fact that floods have historically caused more damage and economic loss in the United States than any other type of natural disaster. Yet, it is estimated that more than 50% of the US population lives within 50 miles of the coast or Great Lakes. Yet significant development pressures continue along inland rivers and lakes. It is therefore incumbent upon public and private land use and mitigation planners, state and local economic and community development personnel, and local officials to be able to assess flood hazards and guide development in such a way that will increase its sustainability, reducing future physical and economic losses.

The flood hazard data and maps (Flood Insurance Rate Maps, or FIRMs) created by the Federal Emergency Management Agency (FEMA) are critical tools used by land use and mitigation planners, economic and community development officials, code officers and building inspectors, engineers, lenders, insurance agents, as well as the public to help ensure the appropriateness and sustainability of new and re-development occurring in flood hazard areas along water bodies. Congress implemented the National Flood Insurance Program (NFIP) in 1969, which is now administered by FEMA within the Department of Homeland Security. The Program provides the availability of flood insurance in those communities that join the NFIP and adopt both the FIRMs and FEMA's floodplain development standards. The development standards which are tied to the various flood hazard zones delineated on the maps, reduce the potential and extent of structural damage during flooding events. The flood hazard zones shown on the maps also help identify the level of risk for flood insurance purposes and are one of the factors related to the premium rate structure.

Many of the original flood hazard maps created in the 1970's were updated in the mid 1980's to early 1990's. Since then, FEMA's budget and remapping efforts have been limited by technology and funding, resulting in outdated maps and data. In recognition, Congress has committed to a Five-Year Flood Map Modernization Program, which is FEMA's initiative focused on updating the country's aging inventory of FIRMs, to reflect development changes that have occurred in watersheds and to update mapping methodologies and technologies. The modernized maps will be produced as a truly digital and seamless layer of flood hazard data which will more accurately reflect flood hazard areas for floodplain management / land use purposes and flood risk zones for insurance purposes. The digital FIRMs, or DFIRMs, will:

- better guide economic development, mitigation planning and emergency response;
- provide better information to lenders, insurance agents and the public on issues relating to flood risk and flood insurance; and
- reduce the economic impacts of flooding

FEMA's Flood Map Modernization Initiative also promotes stronger state partnerships in an effort to create efficiencies in the mapping process. Increased state participation in Flood Map Modernization management and mapping activities will help to focus funding on areas of state priority and maximize the utilization of mapping funds. The State Planning Office's Floodplain Management Program (MFMP) is partnering closely with FEMA on the management of Maine's Map Modernization activities. The Maine Office of GIS has been collaborating with SPO and FEMA to digitally convert flood maps in two ccounties. However, MEGIS lacks the capacity to accomplish this activity for the entire State. The average age of Maine's FIRMs (19 years old) is significantly older than the national average and nearly half of the State's FIRMs lack detailed flood hazard data. These two factors dramatically increase the cost of creating updated DFIRMs for Maine. Federal Map Modernization funds being received by Maine are not adequate for the State to meet FEMA's metrics. Increasing the State's contribution to the Map Modernization initiative has a positive effect on the level of federal funding and will allow mapping contractors to supplement the mapping currently being done by MEGIS. Without additional funds, Maine will not meet the national goals of the Flood Map Modernization initiative and will leave Maine citizens, communities and professionals with outdated maps that do not accurately reflect the flood hazard and risk zones.

Priority 7. Development Tracking

The following is excerpted from the Final Report of the Development Tracking Steering Committee, March 2005:

> "Development tracking involves documenting changes in the landscape induced by human behavior. In its most basic form, development tracking entails monitoring the construction of buildings and the extension of directly related infrastructure such as roads and utilities. It may also entail the study of changes in how lands are used by humans, including changes in land cover related to changes in agricultural and forest management practices, changes in residence patterns from seasonal to year-round occupancy, and the aggregate effects of individual land-use changes on the character of communities.
>
> "Understanding where new development is occurring and where changes in land use and infrastructure are taking place is valuable information for a wide array of stakeholders in both the public and private sectors. For example, land-use planners may use this information to evaluate the effectiveness of existing growth management strategies and design future growth management strategies. Economists may use this information to evaluate changes in real-estate markets, study the location decisions of households and firms, and predict future changes in development. Similarly, community economic development specialists may use this information to evaluate linkages between regional economic trends and changes in growth patterns. Ecologists may use development tracking information to identify natural resources that face significant threats from development and evaluate changes in habitat associated with development. Land conservationists may use this information to manage their holdings and plan for future investments. Local officials may use development tracking information to plan for capital investments such as new schools or roads and changes in service areas such as extensions of police and fire protection areas. In addition, these officials may employ this information when revising local ordinances to maintain the quality of life in their communities. Private firms may use development tracking information to assess the market potential of different areas and plan future investments. Finally, citizens may find this information helpful as they consider changes in their community, strive to retain their community's character, or plan a move to a different community."

The Board will work with SPO and MEGIS to appoint a development tracking implementation committee and task the group with coordinating the data collection and pilot projects as outlined in the Steering Committee's report.

Priority 8. Building a Statewide GIS Network

The Board will develop a virtual network of GIS nodes linked through common standards such as the Open GIS Consortium (OGC) standards for web holdings. The strategy is to implement a grant program whereby organizations that have GIS holdings make the information available using OGC standards. The grant program would be separated into two tiers.

Tier A – Organizations that already have web enabled GIS data holdings would be eligible for grants up to $5000 to make their GIS data holdings OGC compliant and thus viewable through a variety of desktop GIS applications (e.g. ESRI, MapInfo, Autodesk).

Tier B – Organizations that have GIS holdings that are not web enabled would be eligible for grants up to $15,000 to implement a web-based GIS server and to provide assistance with making their GIS holdings OGC compliant.

Priority 9. Build Conformity and Validation Tools.

Standards conformity validation applications will allow the State to determine rapidly if the data submitted by any collaborating entity meets the Board standard for that data layer. Current GIS softwares provide very limited validation tools for Quality Assurance/Quality Control of the spatial data and of the related attribute information. Consequently, GIS users, especially state governments, traditionally invest a large amount of time attempting to evaluate the quality of data. Validation tools automate this process, saving staff time and scarce funding. Typically in validation programs, data sets are auto-scanned for spatial errors and attributes outside set parameters; simply put to see if anything "sticks out". If the data passes the conformity test, then it can move forward in the process for eventual inclusion into the GeoLibrary. If the data does not pass, it would be returned to the supplier, perhaps with a report card, so that its deficiencies can be addressed. While automated tools will be important, there will also be a need for accompanying manual quality assurance/quality control procedures.

3. FINANCES Expenditures through 2005

The GeoLibrary Board serves *pro bono*, and, as noted, its staffing is funded by arrangement with BIS. The Board was given authority to administer $2,300,000 in State bond funds for GIS capital investments in November 2002. The Board has entered a series of cooperative agreements with Federal agencies to garner the required $1.6 million federal match for the approved bond funds. This effort resulted in a number of federal partnerships that have provided federal dollars for Maine GIS initiatives as noted in the following summary.

Total expenditures (spent or encumbered by contract to 12.31.05)	**Maine Bond**	**Federal Match or Grants**
1. Infrastructure Development	$ 5,209	$ 0
2. Orthophotography Project (04-05)	$ 783,447	$ 783,447
3. Maine Parcel Grants Program (Round 1)	$ 178,083	$ 0
4. Archive Project	$ 3,000	$ 100,000
5. GeoLibrary Portal	$ 110,000	$ 0
Subtotal	**$1,077,039**	**$ 883,447**
Approved by Board vote but not yet encumbered by contract		
6. Maine Landcover Project	$ 120,000	$ 300,000
7. GeoArchives Project	$ 7,708	$ 7,708
8. Parcel Grants Program, Round 2	$ 185,988	$ 185,988
9. Orthophotography Project	$ 868,216	$ 868,216
10. County GIS Use Study	$ 6,250	$ 15,000
11. Outreach Brochure	$ 5,000	$ 0
Subtotal	**$1,193,162**	**$1,376,912**
TOTAL	**$2,270,201**	**$2,260,359**

4. REQUESTED LEGISLATIVE ACTION

Although much has been accomplished, at current levels of funding the GeoLibrary will not be able to sustain its mission. *The GeoLibrary Board requests that the Legislature approve $4,530,000 in new bond funding in support of statewide GIS development as detailed in the above priority list* to include costs for bond administration not to exceed 2% (two percent).

ATTACHMENT A1:
Parcel Grants Round 1 Award List

Standard Grants: 54 towns applied, 21 awarded

- Cape Elizabeth
- Casco
- Ellsworth
- Falmouth
- Freeport
- Gorham
- Gray
- Islesboro
- Jackson
- New Gloucester
- North Yarmouth
- Norway
- Oxford
- Paris
- Raymond
- Rockport
- Rumford
- South Portland
- Thorndike
- Unity
- Woodstock

Rapid Grants: 27 towns applied, 24 awarded

- Anson
- Auburn
- Bath
- Biddeford
- Bridgton
- Brooksville
- Casco
- Castle Hill
- Chapman
- Cumberland
- Denmark
- Fort Kent
- Harrison
- Kittery
- Madawaska
- Mapleton
- Mariaville
- Raymond
- Skowhegan
- Stonington
- Sweden
- Verona
- Woodland
- Yarmouth

ATTACHMENT A2:
Parcel Grants Round 2 Award List

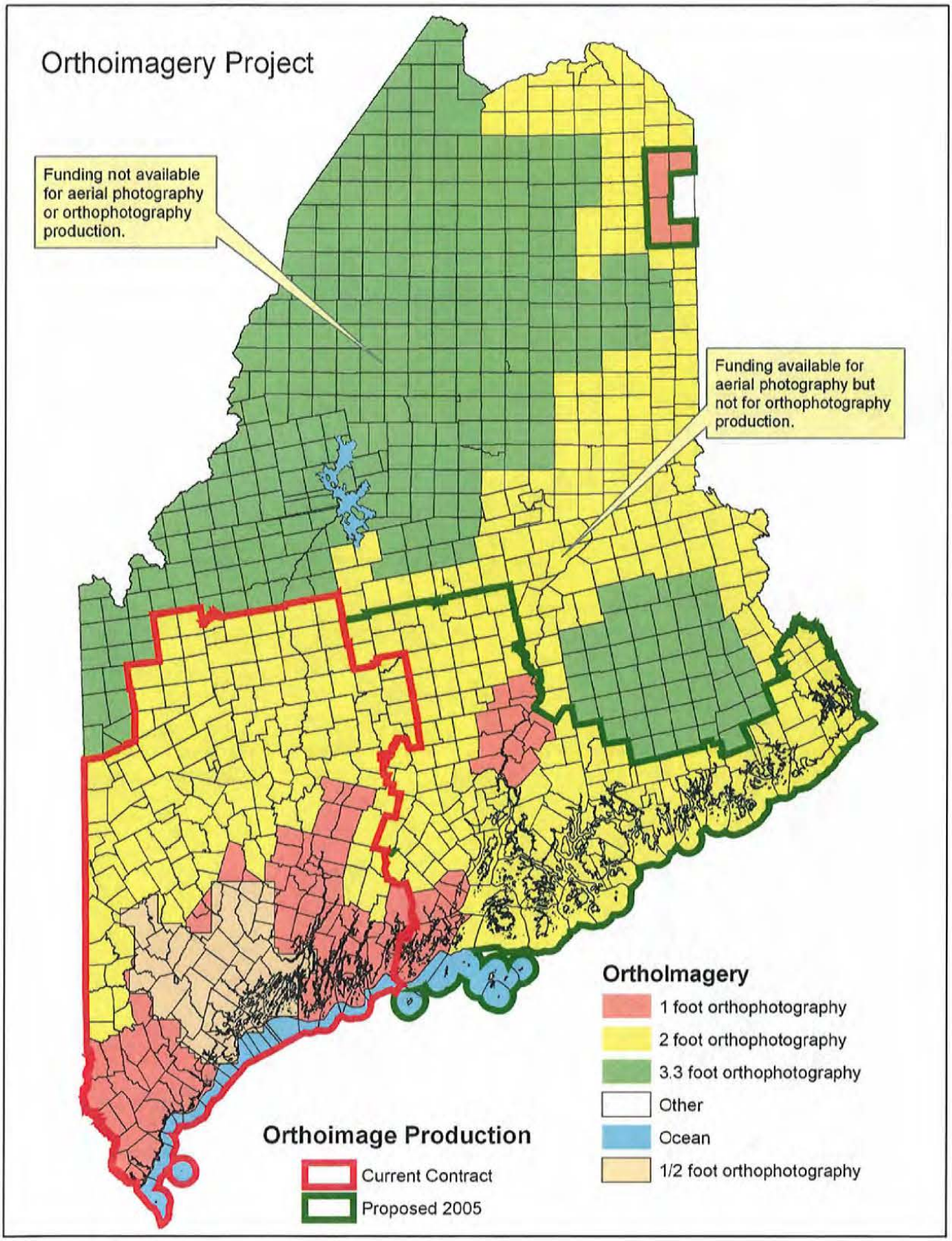
Standard Grants: 36 towns applied, 26 awarded

- Arrowsic
- Bethel
- Bowdoin
- Bowdoinham
- China
- Dover-Foxcroft
- Friendship
- Hermon
- Lincoln
- Levant
- Lovell
- Lyman
- Ogunquit
- Readfield
- Richmond,
- Saco
- Searsmont
- Searsport
- South Berwick
- Standish
- Topsham
- Turner
- Vassalboro
- Waldoboro
- West Bath
- Winslow

Rapid Grants: 3 towns applied, 3 awarded

- Clifton
- Phippsburg
- Whiting

Attachment B: Map of Orthophotography Coverage



Attachment C: 1' Orthophotography Sample

1 foot orthophotography sample 1" = 100'

Attachment D: 2' Orthophotography Sample

2 foot orthophotography sample 1" = 200'

F. Public Survey Orthoimage Summary

The following organizations have accessed the orthoimagery supplied by the Maine GeoLibrary to download from the website, used internet browser to view aerial photography and/or brought the aerial photography viewer into GIS software as a data layer.

ORGANIZATION	TYPE	BENEFIT	COST SAVINGS	OTHER GIS LAYERS
Air National Guard	Other	It is a great free source of public information. I have not found any imagery that is better than what you provide.	No need to purchase public information for data warehouses	Newer imagery
Boyle Associates	Business	We use the data for due-diligence information on potential development areas, for mapping of natural resource features and for gaining information on areas prior to entering the field.	Using the Orthos available through the GeoLibrary is quick and saves time versus using CD data or purchasing aerials from other sources.	You should link to the NRCS soil survey information; also NWI wetland maps would be helpful.
Bureau of Parks and Land	State Gov	Locating roads and abutters. Wish you fly some in the fall; we could also use it for timber types.	Did not have to pay for imagery for a new project that happens to primarily be located in So. Maine	New Sat. imagery
Bureau of Parks and Land	State Gov	Looked up imagery for public lots for which we have no photos	Time saved to aid in finding a lot and aid in typing	
Bureau of Parks and Land	State Gov	Frequently download images for project preplanning, road changes, land use determination	Saves from having to ground truth everything early in a project, enables	Some areas of the state are not covered well. Would like to see the whole state adequately covered with recent data.
Coastal Mountains Land Trust	Non-profit	Use imagery to produce baseline monitoring documentation of our conservation properties.	N/A	Updated color photos of our service region which extends from Rockport to Prospect along the midcoate. We've been waiting with great excitement for these updates.
DeLuca-Hoffman Associates, Inc.	Business	The orthoimagery has helped our company in a number of ways. As a base plan for conceptual layouts of industrial, business/office parks and utility extensions.	We were retained by the City of Saco to design an industrial park on approx. 70 acre parcel which the city owned. There were some physical restraints (wetland & topography) that needed to be known prior to the design of the project. With the use of the	COST SAVINGS: imagery and other features of the GEO Library we were able to offer the city a number of different options w/o a lot of upfront costs to us or the city. The cost of having a topo/wetland survey would have been significant amount money. A complete coverage of soil data, orthoimagery, the possible smaller intervals in the contour layer. One new day layer that would be helpful but can see as a large task would be to add tax map data.
Dr. James Acheson, Univ.	Education		It will reduce the amount of time we will need to spend on the	I wish to see forest cover in townships in So. And Central

ORGANIZATION	TYPE	BENEFIT	COST SAVINGS	OTHER GIS LAYERS
of Maine			ground.	Maine
Forest Society of Maine	Non-profit	Resource analysis of properties. Using the imagery provides someone with a knowledge of photogrammetry to make an assessment of what they are seeing. When researching the conservation values of properties the more data the better.	The ability of orthoimagery provided through the Maine GeoLibrary has saved us from having to do costly ground visits to get an initial understanding of the conditions of properties under consideration for conservation.	More raster datasets, including the recently acquire SPOT satellite imagery. Raw imagery is often more useful to users who want to create their own derived products. Annual purchase of summer time (statewide) Landsat 5/7 imagery would be exceptional especially if it was available to be downloaded for free (or costs shared across agencies/partners). DOQs for the entire state, including NW Maine. Forestry users are a HUGE component of the GIS users in Maine.
Irving Woodlands LLC	Business	Helps identify and locate property lines, locate roads, identify hazards to harvesting (mostly swamps), identify the presence of very old forest roads, etc.	Saves enormous amounts of field man-hours in the examples stated above and many more. Complements our own imaging program by filling the gaps.	
Jeanne MacDonald	Other	To show my children different places in Maine that we visited and to let them choose new places to visit. We really enjoy 'flying over' our beautiful state.		
Jim MacDougall, Topsfield, MASS	Other	Used the orthophoto to assess a piece of land I bought in China, ME	N/A	Better quality photos, accurate wetland boundaries, infrared ortho photos
John Clark, University of Maine	Education	I am studying GIS applications at the University and have used the orthoimagery for a variety of projects.	There is not way a college student could afford to buy this sort of a product. It's a wonderful investment in developing the State's human resources, among its many other uses.	I would like to see some higher resolution imagery for Eastern and Northern Maine.
Joseph Herlihy	Business	I'm a real estate appraiser and use the information in researching properties I'm appraising.	Its ongoing, the aerial photos are very helpful in locating improvements on a site. I haven't had as much luck downloading information about wetlands.	Soil types would be helpful, actually any information about land.
Mark Robinson, Town of Fayette	Municipal Government	For my work as a municipal official	Unknown, but I am sure they are significant	Not at this time

ORGANIZATION	TYPE	BENEFIT	COST SAVINGS	OTHER GIS LAYERS
Mitchell Geographics	Business	We are using it for mapmaking and assorted GIS data development projects for clients.	In WWF project we worked with 8 coastal towns interviewing town officials to identify WWF access points on screen. This process would have required days of field work without the imagery (for a lesser quality result) - vs. 1/2 day in office.	Parcels
Northern Maine Development Commission	Non-profit	We have used Maine GeoLibrary Orthoimagery for site section, land use identification and project area description.	Being in a rural area requires that we are required to fabricate much of the required mapping for any given project and being able to use imagery reduces cost in production and time.	Would like to see an expanded parcel program that would actually aid in constructing the digital parcel data for all municipalities currently afforded only by those more affluent municipalities.
Office of Information Technology - MeGIS	State Gov	We use extensively for mapping and heads up digitizing of E911 roads	Using the imagery to digitize new roads saves us having to GPS collect them - a savings of probably $20,000-$30,000 per year.	
Pete Jolliffe	Business	Forestry helps with cover typing - can print and bring maps in the field, use it almost every day.	Nothing specific - saves time though, something that may have taken 2 days without the imagery now takes less than 1 day.	Would like to see municipal parcels, and more color of orthoimagery for more of the state.
Spatial Alternatives	Business	The orthoimagery is an invaluable resource for my work with Maine municipalities. I have used it to increase the accuracy of existing base map data, to provide maps for towns with no other GIS information, and a variety of other projects.	I have used the orthophotos to produce Level 2 parcel data for towns that had no previous orthophotography. Those towns would not have been able to create such accurate base data without this resource.	Making the photos and related information available to the towns for photogrammetric work would be exceptionally helpful. This would allow a variety of projects requiring data gathering from the photography to move forward. Being able to define a project area and download the clipped data would also greatly enhance the work that I do. The time spent downloading; merging, projecting & clipping date is a costly addition to projects.
SRI International	Non-profit	To view information for project	No need to purchase information for hundreds of dollars	Not sure
US Fish and Wildlife Services	Other	To digitize features; use as a backdrop for maps; use for navigation in the field.	Saved the cost of flying certain areas to obtain imagery.	Town parcels, NHD at 24K, 24K public lands including town-owned properties (with a complete database describing the status of the property - current database is too brief).
Washington Valuations	Business	Brunswick uses the GIS system for their town zoning maps.		

ORGANIZATION	TYPE	BENEFIT	COST SAVINGS	OTHER GIS LAYERS
Winrock International	Non-profit	Ability to study land use and land changes.	Saves time and money and energy to look in one place for my GIS data needs.	Updated land use images.
Univ of So. Maine/ Maine GIS Education Consortium	Education	We use the orthos for teaching in many ways. It is used for background for maps, GPS data collection, for land use interpretation, and even for an introduction to GIS and remote sensing to get younger students excited. Researchers can use it to map features for their research.	Geologists use it to create base maps for field work.	Land use satellite images, but other than that, so many great data layers...great work!
SGC Engineering LLC	Business	Overlay onto surveys for estimation & field checks	Trip to field to look a site vs. Looking at coverage online	
Walther Wefel	Land Surveyor	Preliminary survey with ArcPad Cadastral overlay on Medoq's Terrestrial/GPS measurements on Medoq's	Less wandering around with a compass. Better conceptualizing of deed lines, better understanding of shoreland zone/riparian/wetland issues, better communication with client	Unorganized territory parcel lines (Bureau of Taxation) LURC regulatory parcels MDOT control points/ROW monuments Town cadastral layer.
Maine Drinking Water Program	State Gov	Significantly improves out ability to map and track land use in public water supply source protection areas, also an excellent public education tool for source protection awareness.	Having high-quality seamless coverage has greatly reduced the time needed to make base maps for water supplies. A map that formerly took more than a day is not a couple of hours work.	
Lakes Environmental Association	Educ/Non-profit	The orthoimagery has allowed us to create and update land use files for help with phosphorus loading watershed models, town comprehensive planning and TMDLS. It has also helped us rectify parcel data.	Creating high quality land use data would be impossible for our organization to do without recent, high resolution ortho images. We do not have the funds to pay for an outside contractor to fly and ortho rectify images so we would be unable to develop land use data which we use for models and provide (free of charge) to the towns we work in.	Periodic updates of the ortho images are always appreciated. Accurate and current land use files are needed or many areas as well. Parcel data is always nice, although rapidly changing.
Woodlot Alternatives Inc.	Business	Use the orthos as a base map image for a lot of our general mapping needs.	Using the orthos speeds up our mapmaking time resulting in an overall savings in production time.	Mosaics made from the orthos for city or county scale mapping by reducing the resolution of the imagery and increasing the area covered by the photography. It would save time downloading and computer processing time.
Dept. of Marine Resources	Government	Routinely integrate the IMS service into ArcInfo sessions. Usually as backdrop for orientation. Intranet based usage.	Used imagery as base layer for marine resource mapping project. Simple and fast. Intranet based usage.	Almost any base map layer including marine features through SDE access (Intranet).
Gorrill-Palmer	Business	Use orthos for preliminary	Significant	Use many layers that are

ORGANIZATION	TYPE	BENEFIT	COST SAVINGS	OTHER GIS LAYERS
Consulting Engineers		design and for various maps in GIS.		already available in the GIS catalog. Would like to see everything you have available to the public.
Biodiversity & Spatial Information Center	State Government	Using for habitat modeling of wildlife populations.	N/A	Detailed soils, roads, LiDAR
Maine DEP	State Government	Before we had access to the color, high-resolution ortho, we would usually use USGS DRGs for a quick base map (almost never used B&W DOQs). The newest DRGs were probably late 80s / early 90s vintage, so having updated, recent orthos to use as a base map really helps to improve the timeliness of the data we either generate or qa/qc (edit) during projects.	Although we do understand the benefits provided by the orthos, we really cannot provide specific cost savings figures.	Not at this time.
SW Cole Engineering Inc	Business	Use as base maps for geological projects	N/A	N/A
Corner Post Land Surveying	Business	We use this information for survey job planning and to better relate information to our clients.	Doesn't save us a particular dollar amount, but rather allows us to better serve our clients and keep them more informed in a manner they can more easily understand.	Town zoning lines might be helpful, though this would be a difficult task. We work primarily in York County. So. Maine Regional Planning has this sort of line work for many of the local towns; maybe something could be worked out with them? Your other GIS layers such as FIRM lines, NWI and endangered animals have all been very helpful, Thank you.
Franford Mutual Aid Fire Training Assoc.	Non-profit	We use the imagery for response logistics. Mostly landing zone (life flight, medivac) and water resource locations.	No cost savings – just convenience and added knowledge	N/A
Brown University	Education	Compare coastal wetlands against hyperspectral data, map coastal resources and coastal changes. Data provides an excellent "ground truth"	Trying to map wetlands through hyperspectral imagery. To "ground truth" our data, requires a check on the ground. With an orthophoto, can check in a small location and infer about other locations. With no orthos could not accomplish any accurate ground truth, or would be required to manually map the entire system or obtain our own photos. To manually map the system would require over 3 weeks of intensive manual labor by 2 individuals (say 240 hours or $12,000)	Updates on orthos as often as they occur. The system is great.
Cumberland	Other	The CCEMA has used the	Since many of the questions the	Layers that show the locations

ORGANIZATION	TYPE	BENEFIT	COST SAVINGS	OTHER GIS LAYERS
County EMA		imagery as a base layer in map products, to more accurately locate shelters and other facilities, and to produce better information for detour plans, threat assessment, flood hazards, preplanning, scenario development and related estimates.	EMA deals with are spatial in nature, we just know intuitively that having the orthos available for projects has saved this agency time (which is money) and has been a very effective part of our GIS – that does add value to our projects. But, unfortunately we have no specific, quantifiable examples of cost savings to report.	of agricultural activities, orchards, and cattle, dairy, and poultry farms. Data that indicates typical air / airflow patterns.
Town of York	Municipal Government	We can augment our own 2005 aerial photography that is exclusive to the Town of York, with imagery that exists outside of our borders.	No	None at the moment
Town of Gorham Maine	Municipal Government	Used aerial photographies to show locations of parcels requesting zone changes, show locations for bidding documents, and also for planning board reference material.	No	Yes
Portland Pipe Line Corp.	Business	When a landowner contacts us regarding a proposed development along our pipelines, we often review the orthoimagery as the quickest way to gain an accurate understanding of how the proposal relates to our pipelines and to existing land use and buildings. This has been increasingly true as the image quality has been improved from south to north along our pipelines, which run from So. Portland to Gilead in Maine.	Saves 15 minutes in image searching, and can obviate a field inspection visit. We have used the Aerial Photo Viewer to help us prepare permit applications for MDEP and MBLM. Maintaining the imagery up to date will be important for our uses.	Municipal tax mapping, Surficial geology, Surficial hydrology. Probably the GeoLibrary already offers other data that would be useful is we knew of it and how to sue it; getting the work out would help. I only found the Aerial Photo Viewer by accident and work of mouth.
Aerial Survey & Photo Inc.	Business	As a commercial mapping vendor, we have used the orthophotography as a substitute for planimtric base maps in digitizing and recompiling municipal tax maps.	We estimate that for a town of approximately 2000 parcels, the savings in a tax mapping project is $20,000 or more by using the orthoimagery.	For the future, a second round of digital imagery sometime around the year 2015 would be worth considering. Perhaps at the 1 ft pixel resolution for the current 2 ft pixel area.
Wells NERR	Non-profit State Gov	Highly detailed imagery of coastal Maine accessible at single site in single layer	Substantial time savings over searching multiple sites	Comprehensive index of cartographic and imager from different scales, dates and sources for Maine e.g. historic topo maps, NRCS and AMS air photos. Etc. Ability to "drill" through to identify all resources for a given location.