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The Bulletin: Prepared for the Employees of the Maine Department of Conservation, October 1988

Maine Department of Conservation

THE BULLETIN

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OCTOBER 1988

Commissioner's Column

The timing of this issue of the Bulletin couldn't be better. It gives me a chance just as I depart, to thank the people of DOC for the support you have given me as your Commissioner.

My twenty month career in public service has been immensely challenging. It has given me an appreciation of the challenges that many of you face and master on a regular basis. While it has been challenging, it has been fun, also (challenging every day; not fun every day).

Only two real regrets come to mind. One is that I didn't find time to meet and get to know more of you; the other, a shorter second career than I anticipated.

So much for the regrets. To list all the good stuff would take a lot more space in the Bulletin that the editor allows me. Suffice to say, it is gratifying to see a growing pride within the organization--a pride that is being earned through dedication and hard, smart work.

You have a winner in Ed Meadows whom, Governor McKernan has nominated as the new DOC Commissioner. I know DOC will continue to prosper and progress under his leadership. I'll be an interested observer from the sidelines.

Again, thanks for the support. I hope you're having some fun.

Robert R. LaBonta
Commissioner

Review of GIS development

On September 13, 1988, the Land and Water Resources Council approved a plan, developed by the Department of Conservation and members of a multi-departmental committee, for Geographic Information System (GIS) implementation. This approval marked the end of a most difficult period of argument and disagreement among several agencies regarding GIS development and the beginning of the challenge of initiating a state-of-the-art GIS to handle the state's spatial natural resource data.

GIS has nearly as many definitions as there are researchers and users in the field. Most agree, however, that a true GIS is a sophisticated package of hardware and software designed for entry, analysis, and output of spatial data. These data consist not only of the points, lines, and areas on a map but all the descriptive information pertaining to the mapped features. For example, a water well is a simple geographic entity consisting of a point defined by a latitude and a longitude. However, the non-graphical descriptive information pertaining to the well can be quite extensive and varied, consisting of such things as well owner, street address, depth, water yield, etc. Similarly, more complex features such as lines and areas may have descriptive information. Within the GIS the ties between graphic and descriptive data are automatically maintained in such a way that the descriptive information can be accessed through the graphics and vis versa. What sets the GIS apart from simple computer mapping systems is that it includes analytical procedures which permit different map layers to be digitally overlain and combined to generate new types of maps and present new ways of looking at spatial information.

To put the events of the past several months into perspective it is necessary to briefly review the history of GIS development within state government. The concept of GIS was first introduced in DOC during the early 80's as part of the Spruce Budworm Mapping Program. The need then was to keep track of the acreages and ownership of lands sprayed under this program. Computer mapping software was generated at the University of Maine, Orono, to handle this specific need. It consists of several programs which allow map data to be digitized from quadrangle maps or aerial photographs, edited, and plotted at varying scale using color and patterns to differentiate features. However, in the decade since this software was initially developed the capabilities of GIS software in the private sector has expanded many-fold while the University software as remained essentially static.

In spite of the limited capabilities of the University software, in 1985 DOC chose to retain the limited hardware acquired during the Budworm Program and access to the software following the completion of that program. Using the experience of the Budworm personnel and pay-as-you-go funding, DOC has managed to keep a GIS program of sorts afloat. In the few years since 1985, with this limited GIS capability, we have undertaken several projects which demonstrated the value of GIS analysis in many areas.

The first project involved the comparison of wetland areas as mapped by various federal and state agencies in a southwestern Maine township. This was

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a simple demonstration of a basic GIS capability, map reprojection. The differences in the scales of the source maps made it nearly impossible to compare the maps by conventional means. By digitizing the wetlands from each map and reprojecting this information to a common base, the maps could be compared accurately for the first time.

In projects following this we attempted to demonstrate more sophisticated GIS capabilities. The most interesting was the mapping of the sand beaches of Maine in conjunction with the sand dune development laws. The rules governing development on sand dunes prohibit certain types of construction based on a combination of the geologic environment of the sand dune system and the flood hazard zone within which a land parcel falls. This analysis requires the combination of two maps, the geologic map of the dune system, and flood insurance maps. This is the classic "map overlay" problem that the GIS is particularly well suited for solving. After digitizing and overlaying the two source maps with the GIS, a new map was generated which showed areas of relative hazard to construction.

These and other projects demonstrated some of the important capabilities of GIS and how they may be applied to natural resource problems. Additionally the Maine Geological Survey presented several demonstration sessions to key personnel of a fully functional GIS. In spite of the best efforts of the MGS in generating support for the GIS concept, the limited capabilities of the University software and the high cost of its use resulted in only lukewarm reception for GIS in the other state agencies.

It was the lack of capability and high cost associated with the University software which prompted the MGS during August, 1987 to develop draft legislation to acquire a fully functional GIS. Our proposal was quite modest. It provided for GIS hardware, software, and a core staff; it did not address the great expense of data entry. Our hope was that with the development of projects in a true GIS environment we would generate within other natural resource agencies the level of support needed to move the data entry program forward.

As we advanced with our own plans, events during the fall of 1987 brought the value of GIS analysis into brighter light. Several Regional Councils of Government around the state, having independently recognized the applicability of GIS to planning problems, were developing their own GIS initiatives. Concurrently the Legislature was considering methods of planning for and controlling development. Recognized as a tool which would be useful in this area, our GIS initiative was included in the Governor's package of growth management legislation. Thus began the protracted period of disagreement among agencies, the majority of which centered on the primary objective of the GIS. Our position was that it be primarily for natural resource studies while others felt it should be oriented toward growth management.

We have now survived perhaps the worst period with regard to our GIS initiative and are moving ahead with implementation. Through a series of meetings since December, 1987 most of the agencies with GIS needs have come to a common ground regarding the plan for GIS. We plan to use the $407,000 appropriated in April, 1988 to develop the GIS around groundwater as the initial data layer. We selected groundwater as the first GIS project for several reasons. (1) Groundwater data are important to many studies whether pertaining directly to natural resources or to growth management. (2) Considerable coordination among agencies with stewardship of groundwater data has already begun with regard to issues of data standardization and quality control. (3) Groundwater-related products can be generated in a relatively short period of time due to this effort.

At the recommendation of DOC, a GIS committee has been established with membership from each department with GIS needs. The committee, which I chair is charged with developing an RFP for hardware and software acquisition, to develop an organizational plan around the GIS, and to develop timely GIS products. RFP development is in progress and we must keep an ambitious schedule if we are to have a working GIS facility by this time in 1989. With the continued support of the many agencies involved in the GIS effort, our goal will be realized.

BOB MARVINNEY
MAINE GEOLOGICAL SURVEY

SEASONAL EMPLOYEES

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THE BULLETIN is prepared for the employees of the Maine Department of Conservation. It will be distributed with paychecks each month to keep you informed about our department.