Forestry research grows at UNB

$200,000 to develop Integrated Forestry Planning System

(UNBPRI) While Canada's growth has always been inextricably linked with the forest, that growth has generally happened more by chance than design. A new planning system two University of New Brunswick professors are devising will reverse that balance in the future.

Mark Jamnick, a specialist in forest operations planning, and Ted Robak, a forest engineer, have received over $200,000 in contracts and contributions to develop an Integrated Forestry Planning System (IFPS) at UNB's faculty of forestry in Fredericton.

An integrated planning system is a computer model that combines long - and short-term planning with medium-term investment strategies. "It's the hot forestry topic of the year - not just in Canada but around the world," says Prof. Robak.

Their first goal is to combine several existing software packages in a single user-friendly interactive program. This program would be used to plan almost every detail of a timber harvest. After the second phase, the researchers will have a system capable of much more.

One of the biggest problems facing forestry today, adds Dr. Jamnick, is inconsistency. "We do a lot of long-term planning - five to 45 years in the future - to ensure that the forest renews itself. Then we do short-term planning of the actual day-to-day operations. Very often there is no correlation between what was planned and what happens. If you aren't going to follow the long-term plan, why go to the expense in the first place?"

Long-term plans are forest wide and based on the types and ages of trees, which are divided into forest classes or strata. Getting the maximum use out of the forest requires planning how to harvest these strata so that the forest will renew itself.

The first phase of the project has been jointly funded by the federal and provincial governments under the Industrial Innovation and Technology Development Agreement. The Federal Government gave $104,798 through the Atlantic Canada Opportunities Agency while the New Brunswick Government provided $44,913 through the Department of Economic Development and Tourism. Universal Systems Ltd., a local technology firm, has contributed $30,000 in equipment and programmer time, and UNB in Fredericton has donated $16,000 in office space and support services.

The system will have five major components. "The first of these is a long-term harvest scheduling program that we have already developed," explains Dr. Jamnick. "The next two components, programs called Block and Crystal, were created by graduate students in the UNB departments of forest resources and forest engineering." Crystal divides the forest into small blocks, according to strata, for harvesting over five to 45 years. Next, Block schedules the harvest of those blocks given certain constraints.

"Then for the fourth step we go to my model, OP-PLAN, which decides the short-term planning details: how much staffpower to schedule, which equipment to buy, where and how to build roads, and how expensive it will be," continues Prof. Robak.

The fifth major component is the geographic information system, or GIS. This computer model of very accurate maps details all geographic features right down to the types of trees. Crystal uses it to decide which order to cut those divisions or blocks. OP-PLAN uses it to see how far the blocks are from roads.
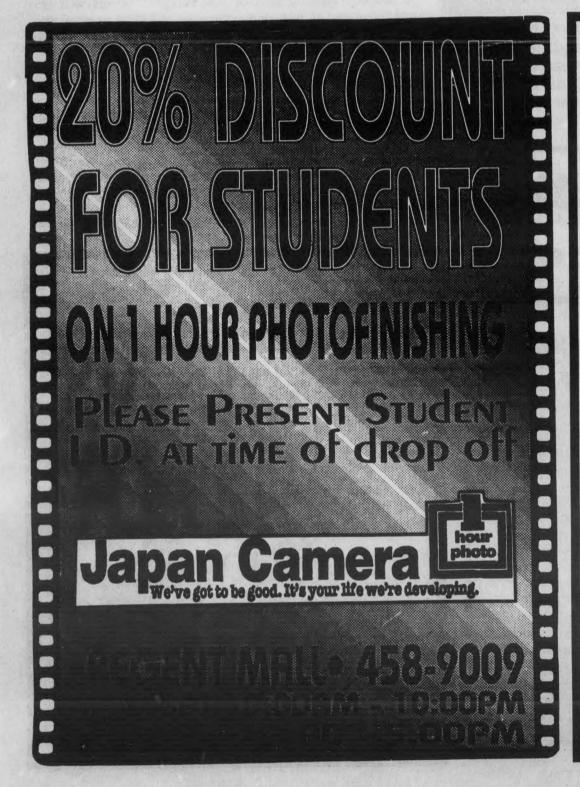
The GIS that Prof. Robak and Dr. Jamnick plan to use, at least for phase one, is Universal Systems' own CARIS. Developed in Fredericton, CARIS is an example of competitive local technology.

"Ultimately, the Integrated Forestry Planning System will be able to work with any geographic information system, but we are happy to be using local technology, because it shows how flexible our system is, and it showcases the ability of New Brunswick technology firms," explains Prof. Robak.

In fact, Prof. Robak feels that the project has the potential not only to highlight local technology but also to foster co-operation between local technology firms and local forest products companies.

Although the current $200,000 contract covers only the first phase of their project, which is a fully functional IFPS prototype, Dr. Jamnick and Prof. Robak would like to expand it to reflect the changing concerns of both the forest industry and society. The initial program will maximize the use of timber within some limited environmental constraints. Maximum return on investment is the most important concern to forest products companies, as it is a logical first step. In phase two, a more complete program will be designed to take account of road construction and maintenance, wildlife habitat, visual quality, recreation, environmental concerns, harvesting costs and timber volumes.

Although they feel that a successful timber-based IFPS will be a major step forward for forestry, the professors have still bigger plans. They will be setting up a consulting firm within the university to serve outside needs. Called the Advanced Research Management System or ARMS unit, this group will consult on forest management problems around the world.