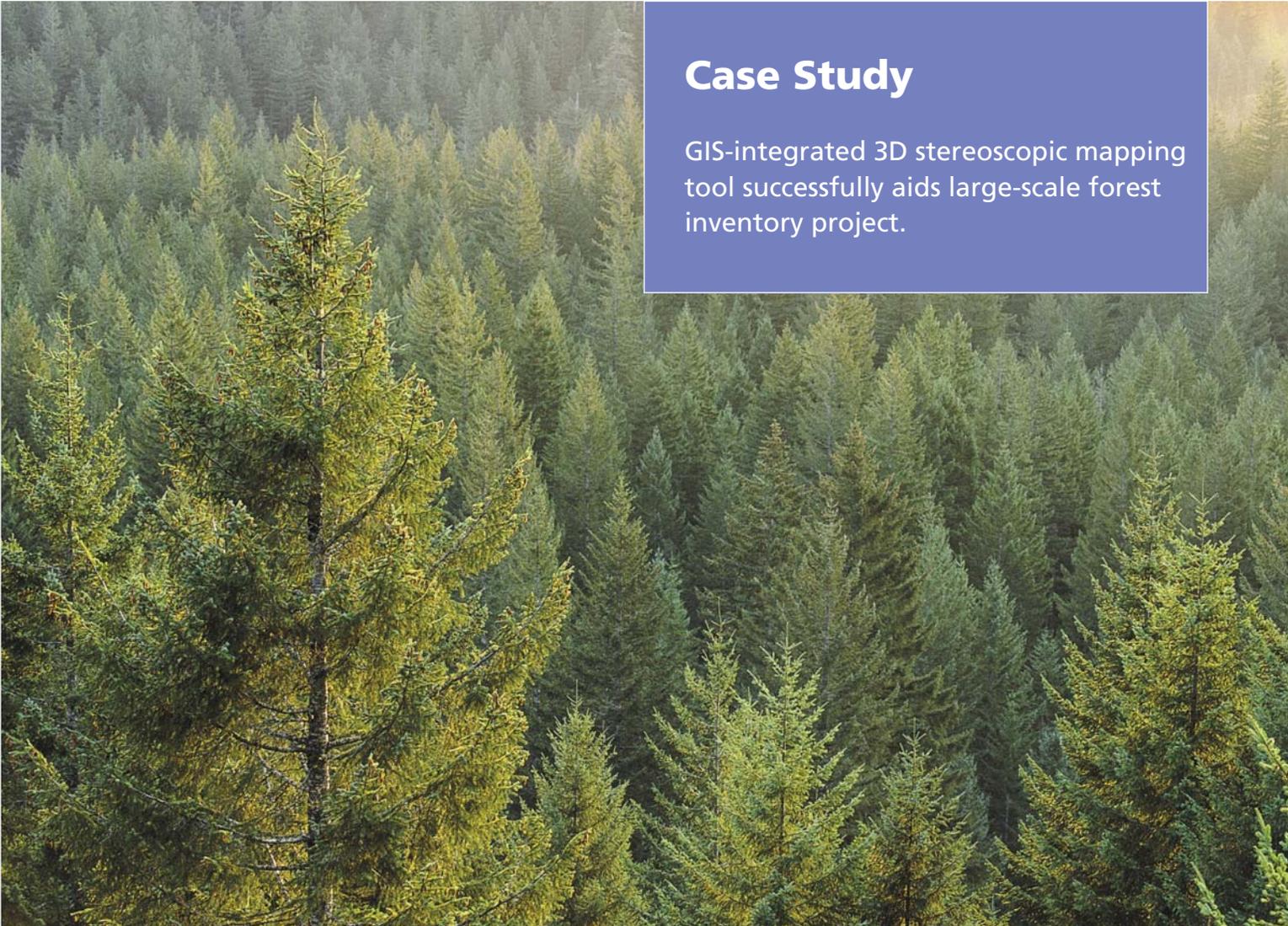# ESRI Canada

Case Study

GIS-integrated 3D stereoscopic mapping tool successfully aids large-scale forest inventory project.

Capturing the Kenogami Forest

In 2005, the Canadian forestry consulting firm Timberline was commissioned by paper products manufacturer Neenah Paper to capture aerial photography and conduct photo interpretation and mapping for the entire Kenogami forest. To complete this large project as quickly and easily as possible, while ensuring that all captured data met rigorous Forest Information Manual (FIM) requirements, the GIS-integrated 3D stereoscopic mapping tool PurVIEW was used for image interpretation.

Challenge

Located 300 kilometres northeast of Thunder Bay, the vast Kenogami forest spans almost 2 million hectares. The existing forest inventory was over 20 years old and a new one was required to complete a forest management plan that would meet FIM standards.

Timberline was faced with the mammoth task of acquiring black and white aerial photography at a scale of 1:20,000 for the entire forest. They were then to interpret the images and identify the species, age, height and ecosystem within each forest stand, along with approximately 40 other attributes. Another objective of the project was to improve the accuracy of the existing base data, which involved interpreting data for the rivers, lakes and roads that run throughout the forest.

In order to produce data that would meet new FIM standards, Timberline required a stereoscopic viewing tool to interpret detailed 3D images. A streamlined, efficient process was required as any project delays were forecast to add up to 1 million dollars to the project's overall costs. This presented a true challenge due to the sheer enormity of the task at hand – over 4,000 photos were required to cover the forest inventory.

Polygons of historic silviculture information are overlain to assist the photo interpreter in determining the content of each forest stand.

> "The ability to view data in 3D was essential to this project so that we could quickly and accurately identify base layers and feature attributes. Data produced by PurVIEW was simple, clean and much more accurate than data we were able to produce prior to acquiring this product."

Craig Robinson
Branch Manager
Timberline's Thunder Bay Office

Solution

After careful consideration, Timberline chose PurVIEW – a stereoscopic tool tightly integrated with ESRI's ArcGIS desktop technology that enables 3D visualization and data capture. The tool did not require specialized training, making it easy for staff working with 2D images to begin working in 3D.

The ability to view 3D stereoscopic data meant that technicians were able to quickly identify data inaccuracies and feature omissions, which expedited the photo interpretation process. Using PurVIEW the technicians were able to:

- **easily delineate forest stands and capture important forest inventory attribute information such as tree heights and terrain,**
- **perform extremely accurate feature digitizing while displaying 3D coordinates in real-time,**
- **capture data and edit directly to the central GIS database thereby significantly reducing conversion costs and inevitable transfer errors.**

Using PurVIEW, Timberline was able to zoom into images and accurately view scales as large as 1:2,000. The thumbnail image composition feature meant that technicians could view up to 20 photos in a single view, enabling them to efficiently scan through the area of compilation for the exact location required.

Benefits

The Kenogami forest inventory project required an immense amount of hands-on production work. However, by using a tool that was congruent with the company's existing skill sets, Timberline was able to take an integrated approach to this project and meet contractual requirements on budget.

The ability to work directly in ESRI's ArcGIS meant that fewer steps were involved in the photo interpretation and data capture processes and there was much less room for error. As a result, the quality of the overall product was improved and aggressive timelines were met.

PurVIEW's advanced features and functionality like dynamic 3D visualization enabled Timberline to produce highly accurate data that complied with Ontario's FIM standards. Through PurVIEW's positional attribute extraction and accurate feature digitizing, Timberline was able to produce a new set of base layers and capture over 40 different data attributes which greatly enhanced the Kenogami forest inventory.

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Founded in 1984, ESRI Canada provides enterprise geographic information systems (GIS) solutions that empower businesses, governments, and educational institutions to make timely, informed and mission critical decisions by leveraging the power of maps. The company distributes the world's leading GIS software from ESRI, Miner and Miner, Azteca Systems, and other technology partners. Headquartered in Toronto, the company serves over 8,000 customers from 16 regional offices across Canada.

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