

# Mapping Canada: Addressing challenges through collaboration and innovation

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## Abstract:

Canada is big, very big! Its vast and diverse geographical landscape presents unique challenges to maintain a current, high quality base cartography. Constantly maintaining and transforming this digital representation of our country's lands, waters and infrastructure is essential to efficiently address issues from natural resources development to climate change impacts adaptation.

Traditional approaches to cartographic activities are however not suitable to reconcile the increasingly localized need for high-resolution analysis-ready products while maintaining a base-level nationwide cartography. As such, Natural Resources Canada is increasingly making use of the emergence and proliferation of high-resolution and high-precision technologies such as lidar and satellite imagery, coupled with constantly increasing computing capacity and ever evolving AI-based automatic extraction methods. These innovations not only enable scalability in the creation of new, accurate, and up-to-date foundational geospatial datasets, but also have a transformative impact on the nature of these products, in some cases providing them with temporal qualities.

Despite these exciting new capabilities, successful mapping initiatives in Canada still largely hinge on collaboration across federal, provincial, and territorial governments. Other contributors also include industry and academia who play a key role in supporting data acquisition and advancing geospatial science and systems. This multi-level approach ensures efficiency throughout the data lifecycle, and promote open collaboration for the development and adoption of best practices, approaches, systems, and standards.

Key Canadian products derived from these new data sources, innovative approaches, and multi-governmental collaborations include the Lidar Point Cloud, High Resolution and Medium Resolution Digital Elevation Models (HRDEM & MRDEM), Canadian Hydrospatial Network (CHN), Automatically Extracted Buildings, and GeoAI – GeoBase Series. Beyond the direct impact on mandates and programs for which these products are developed, their open publication maximizes their impact and enables their use in a slew of other activities, including emergency management, as well as environmental and socio-economic analysis.

This presentation will explore how Canada strategically addresses its unique mapping challenges and contributes to global cartographic excellence through a collaborative national geospatial data strategy, varied collaborative governance structures, such as the Canadian Council on Geomatics, and cutting-edge technological innovations. It will highlight how all of those puzzle pieces come together and play a critical role in advancing important national priorities, such as advancing flood mapping in Canada.