INTERIM RELEASE OF ALASKA HIGHWAY BOREHOLE DATABASE
March 24, 2009

PROJECT BACKGROUND

A large volume of permafrost and surficial geology information (stratigraphy, texture, and ice character and content) exists in borehole logs drilled along the Alaska Highway and the proposed Alaska Highway pipeline route over the last 30 years. This data is extremely useful in a digital, GIS compatible database for a variety of planning purposes within the Alaska Highway corridor, including modeling thaw settlement sensitivity and mapping the distribution of permafrost in greater detail than currently exists.

Every time a highway is realigned in Yukon, boreholes are drilled every 100 m down the centre line, averaging 6 m deep. Permafrost classification and descriptions of surficial material properties are included in the borehole logs. While the more modern highway borehole logs were entered into a digital database (ESEBASE) at the Yukon Department of Highways and Public Works, the database structure is not GIS-compatible, and universal location coordinates and permafrost data were not included. Most of the earlier borehole data from the early 1970s to 1992 was never digitally captured, and is stored in over 1500 hardcopy field note books.

In 2005, the YGS (Erin Trochim) began to compile Yukon Department of Highways and Public Works borehole data into an MS Access database modeled after the GSC's Mackenzie Valley geotechnical borehole database. Over 4000 boreholes were entered into the database along a 200-km stretch of the Alaska Highway between Beaver Creek and Kluane Lake. Geotechnical data from ESEBASE was manipulated into a more useable form and imported into the borehole database. Permafrost data was manually entered from hardcopy logbooks. Borehole locations were also digitized from highway design maps, which required the additional process of georeferencing and manipulation of digitally scanned maps and AutoCAD files. This work was continued in 2006, and the addition of approximately 1000 more boreholes extended the coverage along the Alaska Highway south of Kluane Lake and east of Haines Junction.

Megan James (M.Sc. candidate from University of Ottawa) continued work on the database under the NSERC Northern Internship in early 2008. She focused on compiling data for boreholes drilled along the Alaska Highway between Whitehorse and Watson Lake. She is currently using this data to support her graduate thesis work which will examine the historic changes in permafrost distribution in southwestern Yukon in relation to climate change.

FILE DESCRIPTIONS

"Yukon_Highways_Boreholes_beaverck_kluane.mdb" is the main borehole database in MS Access format. When you open the database, the "User Interface" form should pop up automatically to allow you to browse the data associated with each hole. The database contains data for 5394 boreholes drilled along the Alaska Highway since 1978, and for which we have known real-world coordinates.

While there is fairly complete coverage between Beaver Creek and Haines Junctions, there are still many gaps between Haines Junction and Watson Lake. We are still working on compiling data for this section, and are hoping to have that data available by the end of this summer. All the borehole data was obtained from Yukon Department of Highways and Public Works, where the original hard copy log books are kept (contact Jeff Marynowski).

"OpenFile4924_Mackenzie_borehole_db.pdf" – describes the structure of the Access database (which was copied from the GSC's Mackenzie Valley borehole database).

Shapefiles in the "general_GIS" folder include borehole locations (not all of which have corresponding records in the database at this time) and kilometer posts. These were digitized from as-built design maps that were either imported from legacy AutoCAD files or georeferenced scanned maps. Errors inherent in the georeferencing process resulted in borehole locational errors of up to 20 m, although they are usually located to within 5m.

Shapefiles in the "GIS_data_Beaver_Ck_Kluane" folder were derived from the data in the Access database, but only for the Beaver Creek to Kluane Lake section of the highway.

Please note that none of this data has been formally released at this point, and this is only an interim product. As such, minimal documentation is available, we cannot guarantee completeness or accuracy of the data, and inherent limitations may be encountered.

We would appreciate any feedback on the usefulness of this data, and in what capacity it has been applied to your projects. For further information or to deliver feedback, please contact:

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DATA ACCESS

Alaska_Highway_borehole_database_interim_release_March2009.zip