The British Columbia Geological Survey geochronologic database: Preliminary release of ages

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Databases for this paper can be downloaded from

https://www2.gov.bc.ca/gov/content/industry/mineral-exploration-mining/british-columbia-geological-survey/publications/geofiles#GF2020-10

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Summary

Given advances in analytical techniques and improved access to laboratories, the volume of geochronologic data has increased significantly in the last 15 years (e.g., Harmon, 2020). At the organization level, this increase has led to the need for developing relational geochronologic databases that integrate with other geoscience information for web delivery (e.g., Sircombe, 2006). Database-oriented data management and web service-based data distribution provide an effective means to streamline data life-cycle activities, including maintenance, update, standardization, and quality control (Eglington et al., 2009; He et al., 2018; and Puetz, 2018).

The first attempt by the British Columbia Geological Survey to develop a database for age determinations from across the province was by Breitsprecher and Mortensen (2004). Called 'BCAge' this database included 7759 ages that were retrieved from 622 papers published between 1960 and 2004. The ages and related metadata were stored in a plain relational database using Microsoft Access. Building on this work, we have developed a new, more formal relational database that integrates BCAge data with results published since 2004. In addition to the ages in Breitsprecher and Mortensen (2004), the new database contains 532 ages from 66 papers and reports (Fig. 1). These reports include British Columbia Geological Survey publications (Geological Fieldwork, Open Files, GeoFiles), GeoscienceBC works, and external publications. The ages were determined using ten mineral-isotopic systems and six dating methods, predominantly U-Pb zircon.

This GeoFile releases ages published between 1960 and 2020 in two CSV files and one Microsoft Access file (BCGS_GF2020-10.zip). The CSV files, one for new data (**new_age.csv)** the other for BCAge data (**bc_age.csv**), were generated with simplicity, exchangeability, and GIS-readiness in mind. They contain sample location coordinates, age, and numerous other primary attributes (Table 1). The Microsoft Access database file (**geochron_db.accdb**) includes entities, relationships, and data that mirror the operating BCGS system. To assist data access and query, the relational data model of the database is given in Figure 2. Descriptions of entity attributes can be found inside the database file.

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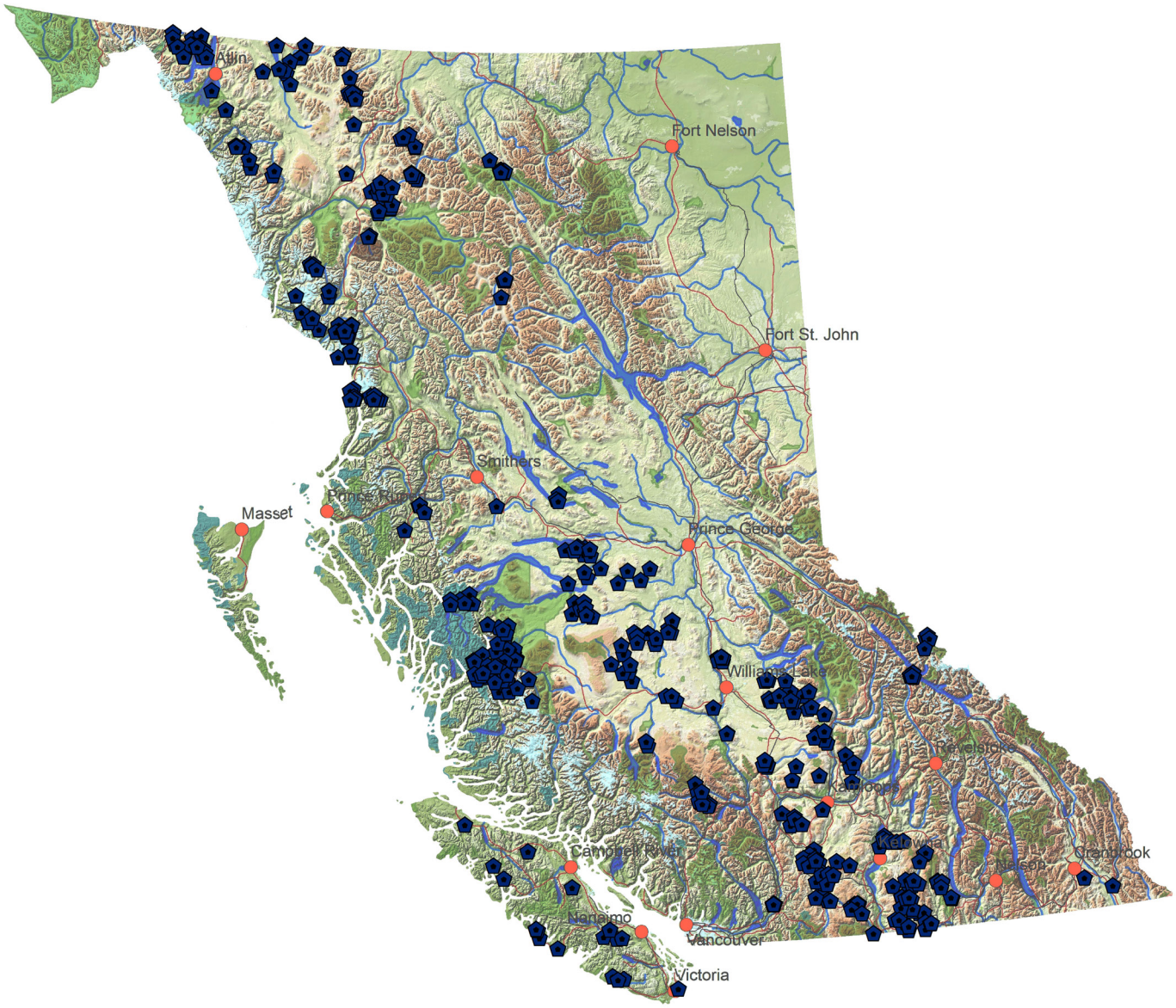

Fig. 1. Sample locations of new age data and those included in BCAge.

Table 1. Attributes included in CVS files for BCAge data files (bc_age.csv) and new ages (new_age.csv).

Column Name	Description	Example of values
Same Name	Same name as appeared in the original publication	06NMA05-01-02
Longitude (WGS84)	Longitude of sample location in decimal degree with WGS84 spatial reference system	49.57491
Latitude (WGS84)	Latitude of sample location in decimal degree with WGS84 spatial reference system	-118.738
Elevation (m)	Sample elevation above sea level in meters	1853
Rock Type	Sample lithology	Granitoid
Sample Description	Additional or further sample information	massive to porphyritic hornblende-(biotite) granite
Sample Age	Radiometric age in million years determined to be age of the sample	165.4
Uncertainty (+)	Standard error (older than age determination) in million years	2.1
Uncertainty (-)	Standard error (young than age determination) in million years	2.1
Age Interpretation	Geological events the age represents	Crystallization
Isotopic System	Radiometric system based on which age is determined.	U-Pb
Mineral Analyzed	Mineral extracted for age dating	Zircon
Method	Acronym of the analytical method used for age determination	SHRIMP
Lab	Name of the laboratory where sample dating was conducted.	UBC Pacific Centre for Isotopic and Geochemical Research
Primary Reference	Name of the publication where sample age was originally reported.	U-Pb and K-Ar Isotopic Dates from the Beece Creek – Tatlayoko Lake Area (NTS 92N/9, 92O/5, 6), Southwestern British Columbia, BCGS Geological Fieldwork P2005-01-11.
Author(s)	Authors of the publication	Friedman, R., Gabites, J. and Schiarizza P.

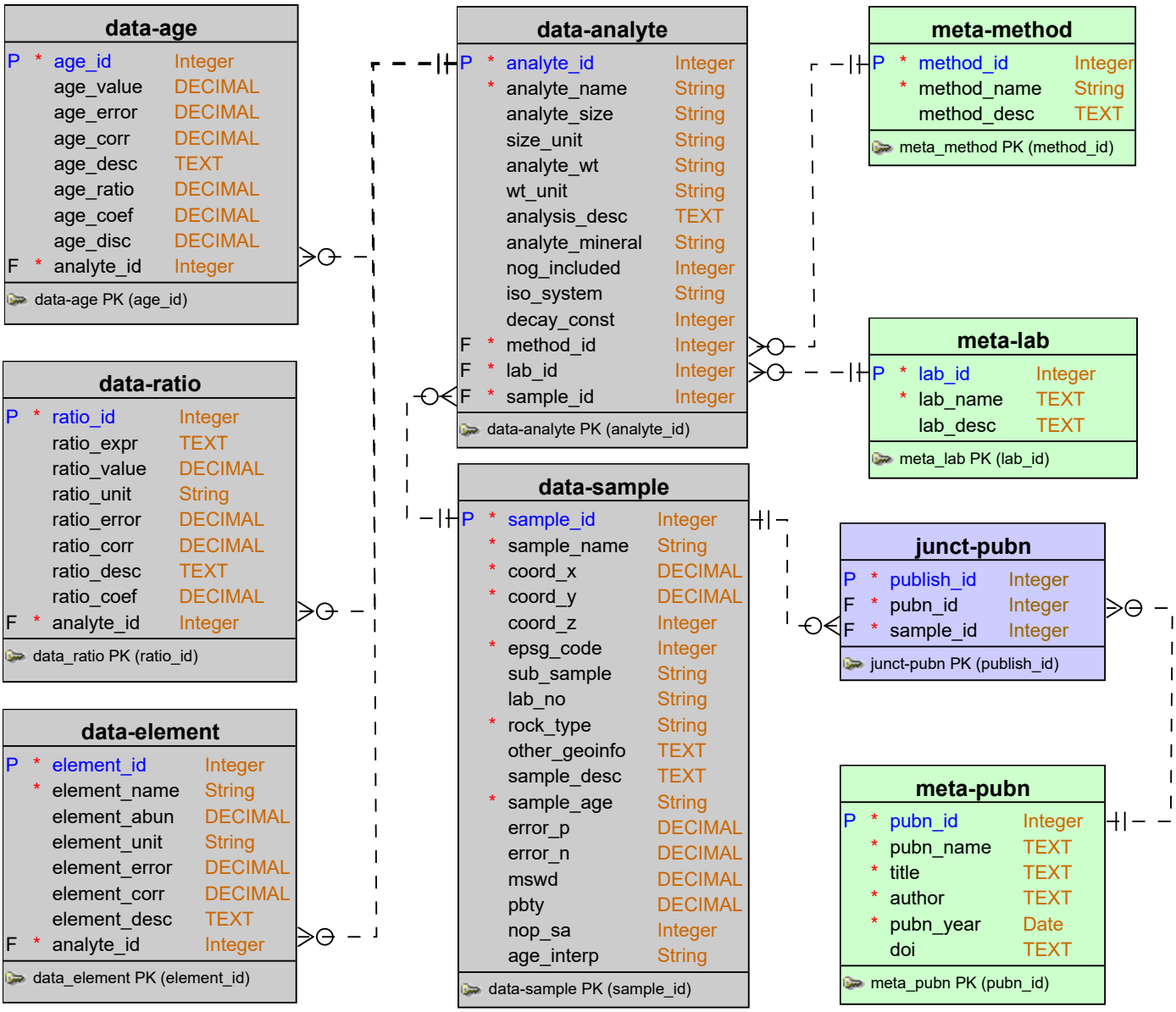

Fig. 2. Relational data model of the BCGS geochronologic database.

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