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**GEOLOGICAL SURVEY OF CANADA
OPEN FILE 5339**

GIS dataset of geology, Ware (94F), British Columbia

K.M. Fallas and A.V. Okulitch

2015

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ABSTRACT

The geological database is derived from previous regional mapping of the Ware (NTS 94F) 1:250 000 scale map area, compiled as part of the Geological Survey of Canada's Central Foreland NATMAP project. Geological features represented by attributed points, lines, and polygons have been compiled into a GIS dataset suitable for stand-alone use, or integration with other data sets. Provided geological features extend traditional geological map information with greater detail and enhancements such as measured section locations and fossil localities. The Ware map area extends across the fold and thrust belt of the northern Rocky Mountains. The geology of the area is characterised by predominantly sedimentary strata, of Middle or Late Proterozoic to Paleogene age, exposed in northeast-verging thrust sheets, folds, and normal fault-bounded grabens. Early Proterozoic orthogneiss and Paleogene granite and dacite dykes occur along the western edge of the map-area. Upper Triassic and unconformably overlying Cretaceous strata of the Foothills Belt occur in the northeastern most corner of the map-area where they are overthrust by a panel containing Proterozoic strata of the Muskwa Assemblage unconformably overlain by Cambrian through Middle Devonian miogeoclinal rocks. The Muskwa Assemblage is intruded by 779 Ma gabbro dykes. To the southwest, major anticlines and several thrust faults expose Proterozoic to Silurian strata. The Paleozoic carbonate platform succession undergoes a gradual facies change southwest into fine clastics and basinal carbonates. Loss of thick carbonate panels results in a change in structural style from thrust fault-dominated to fold-dominated. In the central part of the area, sets of closely spaced folds and thrust faults deform Cambrian through Triassic units with older units predominating to the southwest until metasedimentary rocks of the Neoproterozoic Misinchinka Group are encountered in the last thrust sheet beside the Rocky Mountain Trench graben. This graben contains the Cretaceous and Tertiary Sifton Formation, which also lies unconformably on Proterozoic to Ordovician strata to the southwest. In the southwest corner of the map-area are folded and faulted exposures of the Neoproterozoic Ingenika Group overlain unconformably by the Lower Cambrian Atan Group and Cambro-Ordovician Kechika Formation. Minor Late Triassic gabbro and Paleogene dacite dykes intrude the succession.

NOTES

This GIS compilation of the Ware map area is derived from a map compilation published as a print-ready map by Okulitch et al. in 2002. That compilation incorporated data and interpretations from three previous sources: Gabrielse (1977), Taylor (1979) and MacIntyre (1996), which were products of field mapping by numerous geologists conducted between 1964 and 1981. Details of the compilation issues addressed by Okulitch et al. (2002) are provided in the marginal notes of that map publication.

Measured stratigraphic sections and biostratigraphic information from fossil localities have been compiled and added to bedrock map features in the GIS data files. Original sources for stratigraphic and biostratigraphic data are cited in the data files, and full references are provided in this document. These sources include published journal papers and government reports, unpublished theses, and unpublished paleontological reports produced by the Geological Survey

of Canada. Biostratigraphic ages of fossil collections reported in the GIS files use the geological timescale terms provided by the reporting paleontologist. As a result, some terms may be consistent with older versions of the timescale. For example the subdivision of the Cambrian into Early, Middle and Late as used in older fossil reports, has been changed to Terreneuvian, Series 2 (~Early), Series 3 (~Middle), and Furongian (~Late) on recent versions of the timescale.

The addition of measured section and biostratigraphic data to this GIS compilation revealed some difficulties with each of the previous map compilations mentioned above. Although some modifications have been made to reconcile the Okulitch et al. (2002) compilation with the stratigraphic and biostratigraphic data, in some cases a satisfactory solution was not apparent without seeking new field observations. As a result some discrepancies between the bedrock map features and stratigraphic or biostratigraphic observations remain, and may serve as a useful starting point for future work.

The attempt to reconcile stratigraphic and biostratigraphic observations with the Okulitch et al. (2002) compilation required careful examination of stratigraphic relationships, particularly in areas with closely spaced folds and faults, such as the central portion of the map area previously mapped by MacIntyre (1996). As noted by Okulitch et al. (2002), interpretations of fault motions varied between previous compilations, and the steepness of fault surfaces makes it difficult in some cases to differentiate between normal and reverse or steepened thrust faults. The steep dips on some of these structures are illustrated in cross-sections shown in MacIntyre (1996). Inconsistent sense of stratigraphic offset (e.g. west-side-up or west-side-down) along the trace of some faults further complicates the assessment of fault motion. For these reasons some faults previously assigned as either normal or thrust faults are assigned as generic faults in this compilation to highlight the ambiguity of the structural history.

DATA DESCRIPTION

Data Types:

Vector GIS features (points, lines, polygons) with descriptive attributes representing the bedrock geology accompanied by stratigraphic and biostratigraphic data.

Location Information and Spatial Domain:

NTS map area 94F, Ware, British Columbia.

Bounding Coordinates in geographic coordinates (decimal degrees):

North Bounding Latitude: 58.00

South Bounding Latitude: 57.00

East Bounding Longitude: -124.00

West Bounding Longitude: -126.00

Projection:

Universal Transverse Mercator (UTM), Zone 10, NAD83

Spatial Data File Types:

Data from ArcGIS 9.3.1 are provided in the following file types:

.zip - compressed Extensible Markup Language (XML) files

.shp - ESRI® Shape file format

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Compilation by H. Gabrielse, 1977 (west half), G.C. Taylor, 1979 (east half), D.G. MacIntyre, 1994-1995 (central and south-central), and A.V. Okulitch, 2001. Additional revisions made by K.M. Fallas based on examination of measured section and biostratigraphic observations in 2006, 2014.

Digital data preparation and data editing by Karen Fallas with assistance from: Megan Crockett, Steven Hinds, Larry MacDonald, Rachel Noble, David Nunez, Mark Ponto, Heather Schneider, and Carol Wagner.

Scientific peer review by L.S. Lane.

Any revisions or additional geological information from the user would be welcomed by the Geological Survey of Canada.

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