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**GEOLOGICAL SURVEY OF CANADA
OPEN FILE 8061**

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from Western and Northern Canada: a digitized data set**

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Late Jurassic to early Late Cretaceous palynological data from Western and Northern Canada: a digitized data set

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ABSTRACT

A digital data set of Late Jurassic to early Late Cretaceous palynomorphs from Western and Northern Canada (and Montana) ([Figure 1](#)) has been compiled from both published literature and unpublished theses. Palynological records, securely related to individual samples, from known localities, were transcribed from the literature. The data presented here comprise 956 samples, from 89 sections or wells.

INTRODUCTION

This data set of Late Jurassic to early Late Cretaceous palynological data from Western and Northern Canada was compiled in order to improve the ability of palynologists to determine ages and depositional environments in the Western Canadian Sedimentary Basin and in the Canadian Arctic. This contributes to geologic mapping and resource exploration. Digital data improves potential for comprehensive retrieval of occurrences of known biostratigraphic indicators, for traditional plotting and comparison of assemblages, and for multivariate and other analyses of palynostratigraphic data. Digital loading of this database was undertaken between 1998 and 2001 by M. Hills-Urbat for J.M. White, as Scientific Authority, under Standing Offer #23294-8-01512/001CAL.

The data set includes occurrences of pollen, spores, dinoflagellates and acritarchs. The records entered into the data set were chosen to meet three objectives, as best as possible: 1) documents report detailed assemblages, which limits the data to published works and theses; 2) the palynological assemblage should be reported by sample; and, 3) the sections and samples can be securely located in their geographic and stratigraphic contexts. The intent is to have a data set containing data which replicates, as closely as possible, that published by the authors. The data were extracted from 12 publications and two Ph.D. theses, from which the range chart records were entered into [StrataBugs](#), versions 1.5 and 1.6.

ABUNDANCE SCHEMES

[StrataBugs](#) is designed for storage, retrieval and graphing of biostratigraphic data ([StrataData](#), 2016). The strictures of the [StrataBugs](#) computer program, at the time of the data entry (1998 to 2001), required us to digitize the data into a [StrataBugs](#)-acceptable format, while still maintaining the best possible representation of the nominal/ordinal/interval character of the data. This affected the presence/absence, relative abundance and quantitative recording schemes of several authors. In particular, [StrataBugs](#) did not allow entry of both presence/absence and quantitative data in one sample, making compromises necessary to record the data.

Different abundance schemes were used by different authors. Leckie and Burden (2000), Norris (1967) and Playford (1971) used a presence/ absence schemes, while others such as Singh (1964, 1971, 1983) used more complex schemes. In [StrataBugs](#), abundance schemes can be created by assigning values to relative abundances. See the “**COMMENTS**” column (P) in [Table 1](#), (a Microsoft® Office Excel® 97-2003 Worksheet called “[of_8061_tab1.xls](#)”).

Users of these data should recognize that the meaning of ordinal designations such as rare, common, and abundant may look the same across the work of various authors, but determining the actual numerical meaning with respect to each author requires that the original work be consulted. Nonetheless, the ordinal abundance hierarchy implicit in the various authors’ schemes is preserved, where possible, in our data entry and is useful for analysis.

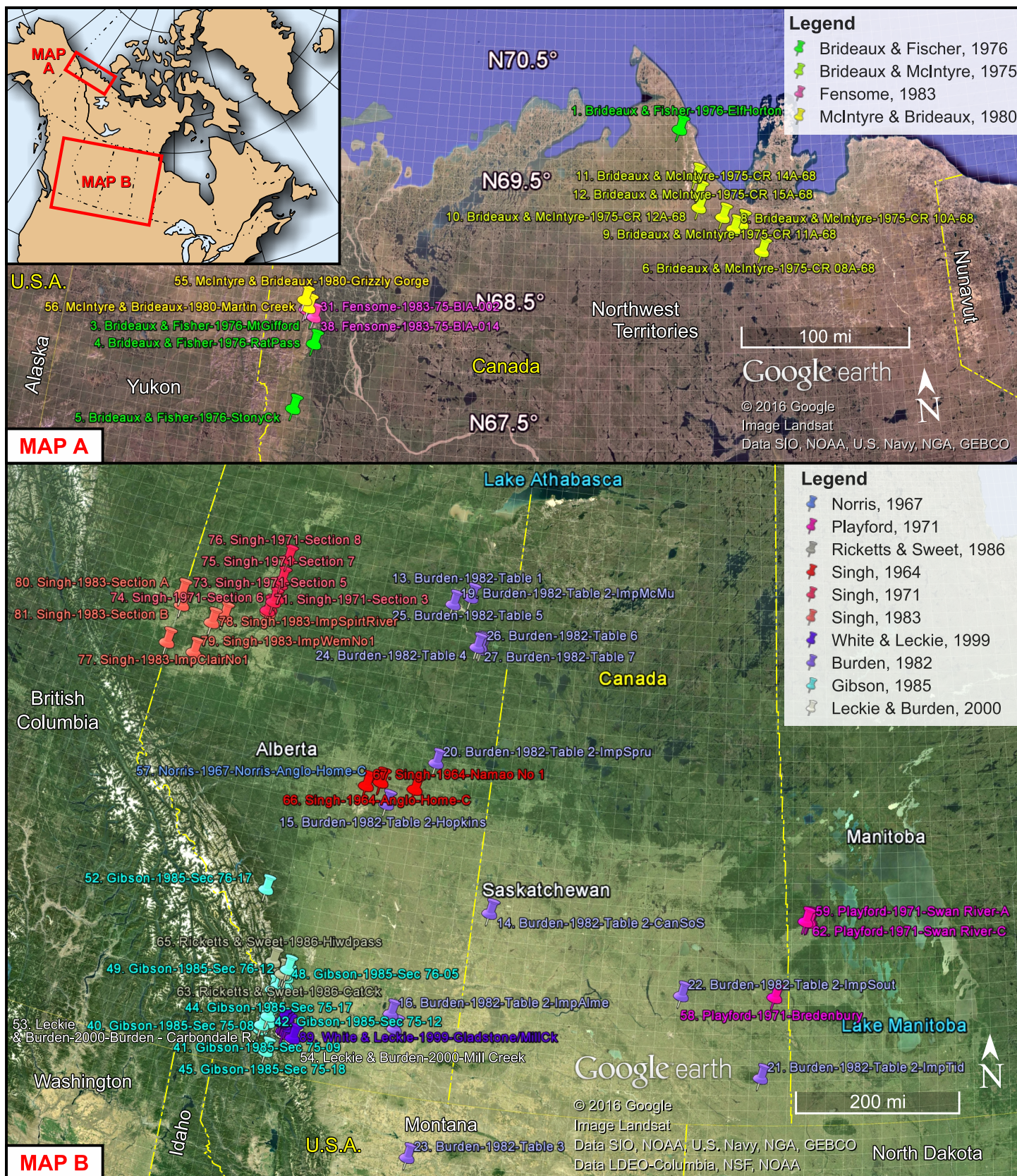


Figure 1. Map of the wells and outcrops locations included in the “.csv” files.

The [StrataBugs](#) data have been released here as a series of individual “.csv” files for sections or wells so that they may be used by workers lacking the [StrataBugs](#) program. [Table 1](#), a Microsoft® Office Excel® 97-2003 spreadsheet, summarizes the data in both [StrataBugs](#) and the well/section files in [Table 1](#). The columns indicate the “**AUTHOR**” (column B), “**YEAR**” (column C), “**TITLE**” (column D), and “**REFERENCE**” (column E) of the paper. The next column, “**STRATABUGS WELL NAMES**” (column F), is the name of the well or section in [StrataBugs](#). Following that, “**WELL/OUTCROP**” (column G), is the indication whether the samples came from a well or an outcrop. The next three columns are for the location of samples: first a “**GENERAL LOCATION**” column (H) and then the next two columns are for “**LATITUDE**” (column I) and “**LONGITUDE**” column (J). The next column contains the number of samples (“**NO. OF SAMPLES**”, column K) entered into each of the wells, and is followed by columns for the “**TYPES OF PALYNOMORPHS**” (column L), “**THE SAMPLE INTERVAL**” (column M), the “**AGE OF SAMPLES**” (column N), and the formation(s) (“**FORMATIONS**” (column O) found in the wells/sections. The final column is the aforementioned “**COMMENTS**” column (P), which describes any problems or compromises made in order to enter the data into [StrataBugs](#). Also noted in this field are changes made in the spelling of taxa.

ORTHOGRAPHY

Our intent is to have a data set that is consistent with taxonomic usage of palynologists working in Western and Northern Canada. Many taxa were preloaded in [Stratabugs](#) and were not identical to those used by this work, especially in authorships of species. Many inconsistencies were fixed during data entry by M. Hills-Urbat, but some may have been missed.

Rare variation in spelling of taxonomic names has been observed amongst different publications. These likely derive from typographic errors, or from ingrained history of usage amongst various authors, particularly before the days of shared databases, such as Palynodata (Palynodata and White, 2008). Our compilation of data is to facilitate analysis of Mesozoic palynological patterns in Western and Northern Canada, and orthographic variations interfere with this objective. Where such variations have been detected, we have standardized spelling on Singh (1964, 1971, 1983) or on Palynodata (Palynodata and White, 2008).

GEOGRAPHIC COORDINATES

[StrataBugs](#) required location data to be entered as Latitude and Longitude, but many well locations were given as Dominion Land System values. To accomplish this conversion, we used the [Geographic Location Conversion Tool](#) (Lepard, 2008).

CSV FILES

The digitized per sample assemblage records for wells or sections have been exported from [StrataBugs](#) as “.csv” files. These files contain only the taxa and their occurrences within each sample. Some of the data that is contained in the well information in [StrataBugs](#) was not exportable to the “.csv” files, but much of the information lost during this export can be found in [Table 1](#). However, information in the [StrataBugs](#) “biostratigraphic comments” field cannot be obtained from either of these sources. The biostratigraphic comments include the range of a sample's depth or thickness because [StrataBugs](#) version 1.5 allowed only the entry of a discrete sample depth. The wells or sections to which this problem pertains are indicated in the “**COMMENTS**” column (P) of the [Table 1](#), a Microsoft® Office Excel® 97-2003 spreadsheet. The “.csv” files can be viewed in a text editor or imported into a spreadsheet.

DATA ENTRY VERIFICATION, ORTHOGRAPHY, AND CAVEAT

The entry of biostratigraphic data into [StrataBugs](#) required consistent, meticulous attention to detail. Some errors are to be expected. A sample audit of the data entry was carried out by Ms. S. Saad (December 27, 2009 to January 4, 2010), who cross-checked spreadsheets exported from [StrataBugs](#) with the source literature. Twenty-five distribution and abundance charts from the following ten publications were verified:

1. [Brideaux and Fisher, 1976:](#)
[Brid & Fish-'76-Elf-Horton](#)
[Brid & Fish-'76-MartinCr](#)
[Brid & Fish-'76-MtGifford](#)
[Brid & Fish-'76-RatPass](#)
[Brid & Fish-'76-StonyCr](#)
2. [Brideaux and McIntyre \(1975\):](#)
[B&M'75 CR 08A-68](#)
3. [Fensome \(1983\):](#)
[Fensome – 75-BIA-002](#)
[Fensome – 75-BIA-003](#)
[Fensome – 75-BIA-004](#)
4. [McIntyre and Brideaux \(1980\):](#)
[M&B'80 – Grizzly Gorge](#)
[M&B'80 – Martin Creek](#)
5. [Norris, 1967:](#)
[Norris-Anglo-Home-C](#)
6. [Playford \(1971\):](#)
[Playford-Bredenbury](#)
[Playford-Swan River-A](#)
7. [Ricketts and Sweet \(1986\):](#)
[Ricketts & Sweet-CatCr](#)
[Ricketts & Sweet-CoalCr](#)
[Ricketts & Sweet-Hiwdpass](#)
8. [Singh \(1971\):](#)
[Singh'71-Section 1](#)
[Singh'71-Section 8](#)
9. [Singh \(1983\):](#)
[Singh'83 – ImpClairNo1](#)
[Singh'83 – ImpSpirtRiver](#)
[Singh'83 – ImpWemNo1](#)
10. [White and Leckie \(1999\):](#)
[White'99-Adanac-Mine](#)
[White'99-Bellevue](#)
[White'99-Coleman5](#)

Very rare missing data entries were flagged and corrected. This verification is not a guarantee that there are no other errors in the data entry. The verification has shown that the data entry achieved a high level of accuracy, but was not perfect. It behooves any user to check with the original literature if critical decisions are made on the basis of this set of digitized data.

During the audit, a few orthographic variations were flagged for checking. [Table 2](#) lists spelling discrepancies that were found, but the table is probably incomplete. Where such variations have been

detected, we have attempted to standardized spelling on Singh (1964, 1971, 1983) or on Palynodata (Palynodata and White, 2008).

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We thank E. Burden and R. Fensome for permitting their doctoral theses to be included in the data set. We would like to thank S. Saad for the data audit, K. Sulphur and J. Galloway for useful review comments, and D.G. Sargent for the careful preparation of this Open File.

LIST OF FIGURES

[Figure 1](#). Map of the wells and outcrops locations included in the “.csv” files.

LIST OF TABLES

[Table 1](#). A spreadsheet of metadata for the sections and wells found in the accompanying “csv” files. The “**STRATABUGS WELL NAMES**” column (F) is a list of the file names of the 89 sections and wells in the accompanying “.csv” files. Please note the data entry *caveats* in the “**COMMENTS**” column.

[Table 2](#). List of spelling discrepancies found in this study.

METADATA AND DATA ACCESS

The metadata for surface sections and wells is found in [Table 1](#). The name of the section or well that is used to identify the data in storage is found in the column titled, “**STRATABUGS WELL NAMES**”, (column F) of this file. This name allows the correct “.csv” file to be located.

The columns in [Table 1](#) are as follows:

SECTION/WELL COUNT NO. (Reference) – Column A

AUTHOR (of publication) – Column B

YEAR (of publication) – Column C

TITLE (of publication) – Column D

REFERENCE (to publication) – Column E

STRATABUGS WELL NAME (the key to finding the data in [StrataBugs](#)) – Column F

WELL/OUTCROP (metadata) – Column G

GENERAL LOCATION (of samples from publication) – Column H

LATITUDE (of study site) – Column I

LONGITUDE (of study site) – Column J

NO. OF SAMPLES (reported in publication and entered into [StrataBugs](#)) – Column K

TYPES OF PALYNOMORPHS (found in the samples – acritarchs, dinoflagellates, pollen, and spores) – Column L

SAMPLE INTERVAL (range in outcrop or location in well from which samples were taken) – Column M

AGE OF SAMPLES (general age of strata from which analyzed samples were taken) – Column N

FORMATIONS (from which samples were collected) – Column O

COMMENTS (The comment column describes problems or compromises made in order to enter the data into [StrataBugs](#). Also noted in this field are changes made in the spelling of taxa. See [Table 2](#) with a list of spelling discrepancies that were found. If there were discrepancies in spelling, Singh's spellings or Palynodata spellings were used as standard.) – Column P