

INTRODUCTION

The time- and depth-dependent seismic subsurface maps presented herein are part of an eight-map series of the subsurface of Sabine Peninsula spanning the Early Permian through Early Cretaceous interval.

These maps are the product of the application of modern geoscientific methods of interpretation and processing of seismic reflection data acquired by the Geological Survey of Canada (Mervin, Sand, Western Arctic districts). The resultant processed seismic lines were interpreted using the existing regional geological framework (see Harrison, 1995) by integrating existing regional well data, geophysical logs, age control, and lithological information through synthetic

seismicity. Quantifying the uncertainty of seismic subsurface maps is difficult since several sources of error may occur at each unique level of interpretation, are used in the map generation. Sources of error may arise from limitations in acquisition, processing, and interpretation. Moreover, seismic data are inherently noisy and the interpretation of seismic data is a subjective process involving a number of physical concepts. Constraints in acquisition that increase the uncertainty include gaps in coverage because of obstacles to source and receiver deployment, and effect of direction of shooting on data quality (Sheriff and Geldart, 1995). Processing errors may result from inadequate sampling of seismic data, and errors in processing and interpretation of seismic data.

REGIONAL SETTING

The Sabine Peninsula of Melville Island is located within the Sverdrup Basin in the Queen Elizabeth Islands, eastern Weddell Sea (Fig. 1). It covers for about 1500 km² and extends in a north-southward direction and up to 350 km in length. The basin contains up to 13 km of sedimentary strata (Embry and Beauchamp, 2006). The Sverdrup Basin is separated from the underlying Franklinian Basin by the East Greenland Ridge, which is a major tectonic boundary separating the two basins (Embry and Beauchamp, 2006). The Sverdrup Basin was formed and subsequently deepened following the Late Devonian–earliest Carboniferous Eimerian orogeny. The tectonic depression created by this orogeny was subsequently filled by the Paleogene (Embry and Beauchamp, 2006). The Sverdrup Basin was subsequently uplifted and deformed during the early Cenozoic Eocene orogeny. The Paleogene–Cenozoic tectonic evolution of the Sverdrup Basin, the Sabine Peninsula is an exception to this, as surface strata are part of the Sverdrup Basin. The geology of the Sabine Peninsula consists of deformed Late Carboniferous to Paleocene strata (Embry and Beauchamp, 2006).

TIME- AND DEPTH-STRUCTURE DATA DISPLAY

During a 1961 to 1985 phase of petroleum exploration, companies drilled 52 wells on Melville Island and surrounding waters (22 of which were on Sabine Peninsula) and acquired 3,400

AWINGAK MAP DESCRIPTIONS

SEISMIC DATA SET AND PROCESSING

Data access was obtained through a Memorandum of Understanding signed in 1997 by the Geological Survey of Canada (GSC), Panarctic Oils, the Arctic Islands Exploration Group, and the Canadian Geophysical Survey (CGS). The seismic data were collected from 1986 to 1992 in the Beaufort Sea and along the Mackenzie River valley. The seismic-reflection field data (transmitted from 21-, 7-, and 3-track mode). Data were collected using

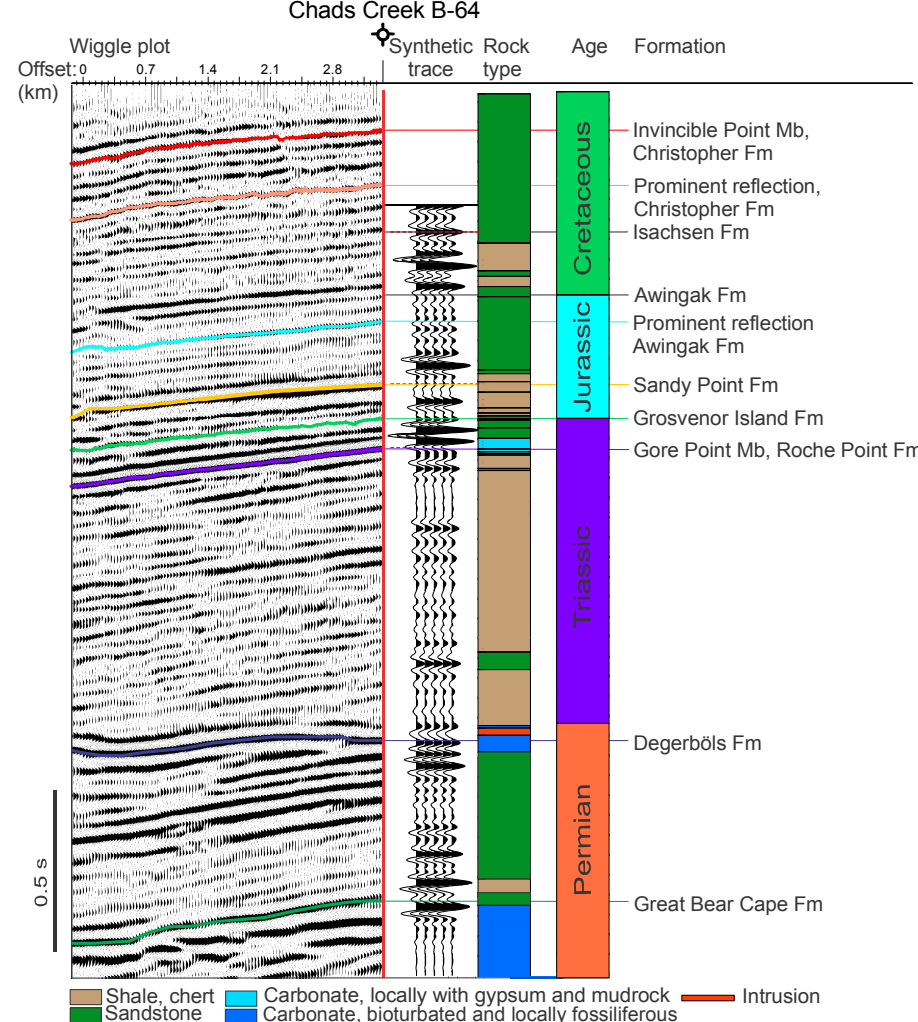
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Figure 3. Comparison of the wiggle plot, synthetic trace, stratigraphy, age, and formation-top data for the Chads Creek B-64 well.

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CANADIAN GEOSCIENCE MAP 163

TIME- AND DEPTH-STRUCTURE MA

GAK FORMATION



Canadian Geoscience Maps



Time-structure map by V.I. Brake and M.J. Duchesne,
Geological Survey of Canada, 2013

Geomatics by V.I. Brake, Geological Survey of Canada and G. Huot-Vézina, Institut national de la recherche scientifique

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Geological Survey of Canada, 2010–2013

auspices of the Western Arctic Islands' project as part of Natural Resources Canada's Geo-mapping for Energy and Minerals (GEM) program.

CANADIAN GEOSCIENCE MAP 161

TIME- AND DEPTH-STRUCTURE MAP AWINGAK FORMATION

Sabine Peninsula, Melville Island
Nunavut–Northwest Territories

1.300.000



Map projection Universal Transverse Mercator, zone 12

Base map at the scale of 1:250 000 from Natural Resource Canada
with modifications.

Proximity to the North Magnetic Pole causes the magnetic compass to be useless in this area.

The Geological Survey of Canada welcomes corrections or additions

The data may include additional observations not portrayed on this map.
See documentation accompanying the data.

This publication is available for free download through
GEOSCAN (<http://geoscan.ess.nrcan.gc.ca/>).

This map is not to be used for navigational purpose