Technical Report Series on the
Boreal Ecosystem-Atmosphere Study (BOREAS)

Forrest G. Hall, Editor

Volume 106
Vector Topographic Map Data
over the BOREAS NSA and SSA
in SIF Format

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Space Administration

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Greenbelt, Maryland 20771

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Summary

This data set contains vector contours and other features of individual topographic map sheets from the NTS. The map sheet files were received in SIF and cover the BOREAS NSA and SSA at scales of 1:50,000 and 1:250,000. The individual files are stored in compressed Unix tar archives.

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1. Data Set Overview

1.1 Data Set Identification
Vector Topographic Map Data over the BOREAS NSA and SSA in SIF Format

1.2 Data Set Introduction
This data set was acquired by BOREal Ecosystem-Atmosphere Study (BOREAS) Information System (BORIS) staff from Geomatics Canada. The data exist as single or pairs of files for individual map sheets from the National Topographic Series (NTS). The data in the files were received in Standard Interchange Format (SIF).

1.3 Objective/Purpose
These data are provided as part of the BOREAS Staff Science Geographic Information System (GIS) Data Collection Program, which included the collection of pertinent map data, in both hardcopy and digital form. The purpose of this data-gathering effort was to provide the user with elevation contours of the Modeling Sub-Areas (MSAs). These data could be used to create Digital Elevation Models (DEMs) and to construct other topographic map features of the MSAs.
1.4 Summary of Parameters

There are feature codes located in the summary statistics (.ss) or description (.map) file for each map. These vary by map but contain, in addition to codes for elevation contours, codes for those map elements common to most topographic maps, such as water bodies, watercourses, trails, roads, and point information. For map elements corresponding to the contour feature codes, the elevation of the contour (meters above mean sea level) and North American Datum of 1983 (NAD83) Universal Transverse Mercator (UTM) coordinate pairs (easting and northing) along the contour are available.

1.5 Discussion

These data were given to BOREAS staff in various versions of SIF. Source code provided by the Hydrology (HYD)-08 science team was modified to read the contour data from various files. This code (undocumented) is provided as part of this data set. The input data were understood to be in a standard format, but they were not standard in terms of the software's ability to consistently read all of the data files. BORIS staff has not been able to obtain a format document or acquire commercial software for reading SIF, though such software does exist. BORIS staff used the modified HYD-08 source code to reformat the data into ARC GENERATE line format, which is strings of x, y coordinate pairs, with each string (line) being associated with an elevation value. For more detailed information regarding the ARC GENERATE format and data set, refer to the documentation for the BOREAS Vector Contours for the NSA and SSA in ARC/INFO Generate Format data.

1.6 Related Data Sets

- BOREAS Regional DEM in Raster Format and AEAC Projection
- BOREAS DEM Data over the NSA-MSA and SSA-MSA in the AEAC Projection
- BOREAS HYD-08 DEM Data over the NSA-MSA and SSA-MSA in the UTM Projection

2. Investigator(s)

2.1 Investigator(s) Name and Title

BOREAS Staff Science

2.2 Title of Investigation

BOREAS Staff Science GIS Data Collection Program

2.3 Contact Information

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David.Knapp@gsfc.nasa.gov

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NASA GSFC
Code 923
Greenbelt, MD 20771
(301) 286-3373
Jaime.Nickeson@gsfc.nasa.gov
3. Theory of Measurements

Not applicable.

4. Equipment

4.1 Sensor/Instrument Description
Unknown.

4.1.1 Collection Environment
Unknown.

4.1.2 Source/Platform
Unknown.

4.1.3 Source/Platform Mission Objectives
The NTS map sheets were acquired in analog form to provide users and staff with needed spatial and topographic information. The data also were acquired in digital form to help in the derivation of a DEM of the study areas.

4.1.4 Key Variables
The following sample, but not exhaustive, list of the map features contained in the data is from a summary statistics (.ss) file, in which one would also find feature codes for each feature listed:

<table>
<thead>
<tr>
<th>FEATURE NAME</th>
</tr>
</thead>
<tbody>
<tr>
<td>FOREST MONO</td>
</tr>
<tr>
<td>BOUNDARY 2ND CLASS DLS</td>
</tr>
<tr>
<td>BOUNDARY 4TH CLASS</td>
</tr>
<tr>
<td>BOUNDARY 6TH CLASS</td>
</tr>
<tr>
<td>BOUNDARY 6TH CLASS UNSURVEYED</td>
</tr>
<tr>
<td>BOUNDARY 7TH CLASS SECTION</td>
</tr>
<tr>
<td>BOUNDARY 8TH CLASS SURVEYED</td>
</tr>
<tr>
<td>SPOT ELEVATION POINT</td>
</tr>
<tr>
<td>ROAD-D</td>
</tr>
<tr>
<td>ROAD-E</td>
</tr>
<tr>
<td>ROAD-F</td>
</tr>
<tr>
<td>ROAD-G</td>
</tr>
<tr>
<td>TRAIL</td>
</tr>
<tr>
<td>BRIDGE</td>
</tr>
<tr>
<td>BARRIER/GATE-OTHER POINT</td>
</tr>
<tr>
<td>BLDG-OTHER POINT</td>
</tr>
<tr>
<td>BLDG-BARN/MACHINERY SHED POINT</td>
</tr>
<tr>
<td>BLDG-CHURCH POINT</td>
</tr>
<tr>
<td>BLDG-SCHOOL POINT</td>
</tr>
<tr>
<td>TOWER-FIRE &lt;30M POINT</td>
</tr>
<tr>
<td>BLDG-WARDEN/RANGER STA AREA</td>
</tr>
<tr>
<td>WATERCOURSE-DEFINITE</td>
</tr>
<tr>
<td>WETLAND AREA</td>
</tr>
<tr>
<td>WATERBODY-DEFINITE AREA</td>
</tr>
<tr>
<td>WATERBODY-INDEFINITE AREA</td>
</tr>
<tr>
<td>ESKER</td>
</tr>
<tr>
<td>PIT AREA</td>
</tr>
</tbody>
</table>
4.1.5 Principles of Operation
Unknown.

4.1.6 Sensor/Instrument Measurement Geometry
Unknown.

4.1.7 Manufacturer of Sensor/Instrument
Unknown.

4.2 Calibration

4.2.1 Specifications
Unknown.

4.2.1.1 Tolerance
Unknown.

4.2.2 Frequency of Calibration
Unknown.

4.2.3 Other Calibration Information
None.

5. Data Acquisition Methods

The data were acquired from Geomatics Canada's National Topographical Data Base through the Canadian Centre for Remote Sensing (CCRS). The data were available in SIF only.

6. Observations

6.1 Data Notes
None.

6.2 Field Notes
None.
7. Data Description

7.1 Spatial Characteristics

The various data files at each scale cover parts of the BOREAS NSA and SSA. Each file represents one NTS map at a scale of either 1:50,000 or 1:250,000.

7.1.1 Spatial Coverage

The two areas that are covered by these vector files include an area west of Thompson, Manitoba (NSA), and an area north of Prince Albert, Saskatchewan (SSA). Each of the 1:50,000-scale maps covers an area roughly 31.5 km x 27.8 km. The 1:250,000-scale maps cover 2 degrees of longitude by 1 degree of latitude. The following NTS map sheets are included:

1:50,000-scale maps of the NSA:

<table>
<thead>
<tr>
<th>Number</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>63 O/10</td>
<td>Wuskwatim Lake</td>
</tr>
<tr>
<td>63 O/15</td>
<td>Nelson House</td>
</tr>
<tr>
<td>63 O/16</td>
<td>Noble Lake</td>
</tr>
<tr>
<td>63 O/09</td>
<td>Ospwagan Lake</td>
</tr>
<tr>
<td>63 P/14</td>
<td>Begg Lake</td>
</tr>
<tr>
<td>64 A/03</td>
<td>Orr Lake</td>
</tr>
<tr>
<td>64 A/04</td>
<td>Strong Lake</td>
</tr>
<tr>
<td>64 B/01</td>
<td>Harding Lake</td>
</tr>
<tr>
<td>64 B/02</td>
<td>Leftrook Lake</td>
</tr>
</tbody>
</table>

1:50,000-scale maps of the SSA:

<table>
<thead>
<tr>
<th>Number</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>73 G/09</td>
<td>Halkett Lake</td>
</tr>
<tr>
<td>73 G/16</td>
<td>Waskesiu Lake</td>
</tr>
<tr>
<td>73 H/09</td>
<td>Torch River</td>
</tr>
<tr>
<td>73 H/10</td>
<td>Bedard Creek</td>
</tr>
<tr>
<td>73 H/11</td>
<td>Birchbark Lake</td>
</tr>
<tr>
<td>73 H/12</td>
<td>Emma Lake</td>
</tr>
<tr>
<td>73 H/13</td>
<td>Bittern Lake</td>
</tr>
<tr>
<td>73 H/14</td>
<td>Candle Lake</td>
</tr>
<tr>
<td>73 H/15</td>
<td>White Gull Creek</td>
</tr>
<tr>
<td>73 H/16</td>
<td>Falling Horse Creek</td>
</tr>
<tr>
<td>73 I/01</td>
<td>Scarth River</td>
</tr>
<tr>
<td>73 I/02</td>
<td>Summit Lake</td>
</tr>
<tr>
<td>73 I/03</td>
<td>Whiteswan Lake</td>
</tr>
<tr>
<td>73 I/04</td>
<td>Montreal Lake South</td>
</tr>
<tr>
<td>73 J/01</td>
<td>Crean Lake</td>
</tr>
</tbody>
</table>

1:250,000-scale map of the NSA:

<table>
<thead>
<tr>
<th>Number</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>64 C</td>
<td>Granville Lake</td>
</tr>
</tbody>
</table>

1:250,000-scale map of the SSA:

<table>
<thead>
<tr>
<th>Number</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>73 H</td>
<td>Prince Albert</td>
</tr>
</tbody>
</table>
The following bounding coordinates are provided to give a general idea of the area within which most of these map sheets fall; however, the maps do not cover all of the area described.

The North American Datum of 1983 (NAD83) corner coordinates of the SSA are:

<table>
<thead>
<tr>
<th></th>
<th>Latitude</th>
<th>Longitude</th>
</tr>
</thead>
<tbody>
<tr>
<td>Northwest</td>
<td>54.321 N</td>
<td>106.228 W</td>
</tr>
<tr>
<td>Northeast</td>
<td>54.225 N</td>
<td>104.237 W</td>
</tr>
<tr>
<td>Southwest</td>
<td>53.515 N</td>
<td>106.321 W</td>
</tr>
<tr>
<td>Southeast</td>
<td>53.420 N</td>
<td>104.368 W</td>
</tr>
</tbody>
</table>

The NAD83 corner coordinates of the NSA are:

<table>
<thead>
<tr>
<th></th>
<th>Latitude</th>
<th>Longitude</th>
</tr>
</thead>
<tbody>
<tr>
<td>Northwest</td>
<td>56.249 N</td>
<td>98.825 W</td>
</tr>
<tr>
<td>Northeast</td>
<td>56.083 N</td>
<td>97.234 W</td>
</tr>
<tr>
<td>Southwest</td>
<td>55.542 N</td>
<td>99.045 W</td>
</tr>
<tr>
<td>Southeast</td>
<td>55.379 N</td>
<td>97.489 W</td>
</tr>
</tbody>
</table>

7.1.2 Spatial Coverage Map
Not available.

7.1.3 Spatial Resolution
The original contour interval of the data is 25 ft (7.62 m) for the 1:50,000-scale maps and 100 ft (30.48 m) for the 1:250,000-scale maps.

7.1.4 Projection
The data are in their original UTM projection. The NSA data are in UTM zone 14, and the SSA data are in UTM zone 13.

7.1.5 Grid Description
Not applicable.

7.2 Temporal Characteristics

7.2.1 Temporal Coverage
Information regarding when the original source data were collected is not available. Most of the maps from which these contours were digitized were made in the 1970s or 1980s.

7.2.2 Temporal Coverage Map
Not available.

7.2.3 Temporal Resolution
Not applicable.

7.3 Data Characteristics

7.3.1 Parameter/Variable
The available information for each map is generally (but not always) contained in two files. Vector position data are contained in one of three file types (with the extensions .sif, .k2a, or .k8a) and map statistics/descriptions are contained in one of two file types (with the extensions .ss or .map). Although the features contained in each map are fairly consistent, the features and statistics do vary.
with location and map complexity.

The following sample ss file, 73g09.ss, lists the feature codes and features of the NTS 73g09 map sheet. Note that although feature codes 9231 and 9234 correspond to the intermediate (CONTOUR OTH COL INTMED DEF) and index (CONTOUR OTH COL NDX DEF) elevation contours in this map sheet, different feature code numbers represent the same features in other map sheets. The information available to BORIS personnel about the features is described in the following sections.

Statistics listing for SIF ASCII file 73g09.sif using the feature code tables
/usr/mgeadmin/tables/kork	feat.tbl:

<table>
<thead>
<tr>
<th>FEATURE CODE</th>
<th>FEATURE NAME</th>
<th>ASC</th>
<th>LST</th>
<th>CUR</th>
<th>SYM</th>
<th>TXT</th>
</tr>
</thead>
<tbody>
<tr>
<td>261</td>
<td>FOREST MONO</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>12</td>
</tr>
<tr>
<td>1230</td>
<td>BOUNDARY 2ND CLASS DLS</td>
<td>3</td>
<td>42</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1260</td>
<td>BOUNDARY 4TH CLASS</td>
<td>3</td>
<td>41</td>
<td>0</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>1322</td>
<td>BOUNDARY 6TH CLASS</td>
<td>1</td>
<td>38</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1323</td>
<td>BOUNDARY 6TH CLASS UNSURVEYED</td>
<td>1</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1371</td>
<td>BOUNDARY 7TH CLASS SECTION</td>
<td>1</td>
<td>76</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1381</td>
<td>BOUNDARY 8TH CLASS Surveyed</td>
<td>1</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1440</td>
<td>SPOT ELEVATION POINT</td>
<td>8</td>
<td>0</td>
<td>0</td>
<td>14</td>
<td>15</td>
</tr>
<tr>
<td>2050</td>
<td>ROAD-D</td>
<td>2</td>
<td>22</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2060</td>
<td>ROAD-E</td>
<td>1</td>
<td>61</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2070</td>
<td>ROAD-F</td>
<td>4</td>
<td>61</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2080</td>
<td>ROAD-G</td>
<td>1</td>
<td>9</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2090</td>
<td>TRAIL</td>
<td>2</td>
<td>22</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2190</td>
<td>BRIDGE</td>
<td>3</td>
<td>8</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2250</td>
<td>BARRIER/GATE-OTHER POINT</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>4010</td>
<td>BLDG-OTHER POINT</td>
<td>33</td>
<td>0</td>
<td>0</td>
<td>131</td>
<td>0</td>
</tr>
<tr>
<td>4050</td>
<td>BLDG-BARN/MACHINERY SHED POIN</td>
<td>31</td>
<td>0</td>
<td>0</td>
<td>71</td>
<td>0</td>
</tr>
<tr>
<td>4070</td>
<td>BLDG-CHURCH POINT</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>4160</td>
<td>BLDG-SCHOOL POINT</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>4317</td>
<td>TOWER-FIRE &lt;30M POINT</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>4361</td>
<td>BLDG-WARDEN/RANGER STA AREA</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>5040</td>
<td>WATERCOURSE-DEFINITE</td>
<td>51</td>
<td>667</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>5220</td>
<td>WETLAND AREA</td>
<td>71</td>
<td>790</td>
<td>0</td>
<td>0</td>
<td>640</td>
</tr>
<tr>
<td>5790</td>
<td>WATERBODY-DEFINITE AREA</td>
<td>4</td>
<td>411</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>5793</td>
<td>WATERBODY-INDEFINITE AREA</td>
<td>5</td>
<td>597</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>6160</td>
<td>ESKER</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>6240</td>
<td>PIT AREA</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>6330</td>
<td>VEGETATION-WOODED AREA</td>
<td>107</td>
<td>1380</td>
<td>0</td>
<td>0</td>
<td>223</td>
</tr>
<tr>
<td>7107</td>
<td>CROSS POINT</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>7390</td>
<td>TRANSMISSION LINE-POWER</td>
<td>1</td>
<td>5</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>7460</td>
<td>CEMETARY AREA</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>7550</td>
<td>MOBILE HOME PARK AREA</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>7640</td>
<td>PICNIC SITE POINT</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>7782</td>
<td>STOCKYARD AREA</td>
<td>1</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>8130</td>
<td>DAM</td>
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<td>9231</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>497</td>
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</tbody>
</table>

TOTAL of LST, CUR, SYM, and TXT: 7558
The best but absolutely unconfirmed guess by BORIS staff about the columns in the .ss files is that they represent areal (ASC), linear (LST), no guess (CURR), symbol (SYM), and text (TXT) record types in the corresponding vector data files. The best but absolutely unconfirmed guess by BORIS staff about the numbers in the columns is that they represent the number of those types of records/features in the corresponding vector data file.

7.3.2 Variable Description/Definition

The only features about which BORIS personnel have any substantial information are the elevation contours. Note that although feature codes 9231 and 9234 correspond to the intermediate (CONTOUR OTH COL INTMED DEF) and index (CONTOUR OTH COL NDX DEF) elevation contours in this map sheet, different feature code numbers represent the same features in other map sheets.

- CONTOUR OTH COL INTMED DEF: An elevation above mean sea level (the vertical distance between a plane at mean sea level and a parallel plane intersecting this point) and series of geographic coordinate pairs that define the points along the given intermediate elevation contour.
- CONTOUR OTH COL NDX DEF: An elevation above mean sea level (the vertical distance between a plane at mean sea level and a parallel plane intersecting this point) and series of geographic coordinate pairs that define the points along the given index elevation contour.

Note that depending on the map sheet, the geographic coordinates are given in either the NAD27 or the NAD83 datum, where:

- NAD27 UTM coordinate pairs are the NAD27-based UTM Easting and Northing coordinate pairs that define the geographic locations over which the given contour exists.
- NAD83 UTM coordinate pairs are the NAD83-based UTM easting and northing coordinate pairs that define the geographic locations over which the given contour exists.

7.3.3 Unit of Measurement

The measurement units known by BORIS personnel are:

- CONTOUR OTH COL INTMED DEF: meters above mean sea level
- CONTOUR OTH COL NDX DEF: meters above mean sea level.
- NAD27 UTM coordinate pairs: NAD27 UTM meters.
- NAD83 UTM coordinate pairs: NAD83 UTM meters.

7.3.4 Data Source

Geomatics Canada
Natural Resources Canada
615 Booth St.
Ottawa, Ontario K1A 0E9 CANADA

7.3.5 Data Range

Ranges given below are for the 1:50,000-scale maps; the 1:250,000-scale maps were not evaluated for data range.

NSA Elevation (meters)
---------
Minimum: 206
Maximum: 381

SSA Elevation (meters)
---------
Minimum: 335
Maximum: 747
7.4 Sample Data Record
Not applicable.

8. Data Organization

8.1 Data Granularity
The smallest amount of data obtainable is all of the 1:50,000-scale data and all of the 1:250,000-scale data.

8.2 Data Format(s)
Two tar files are associated with this data set: one that contains the 1:50,000 map files and one that contains the 1:250,000 map files. Each of the map files has been Unix compressed: to expand a given map file, use the Unix uncompress command. The NSA map file names begin with 73, and the SSA map file names begin with 63 or 64. The individual map files contained in the 1:50,000-scale tar file are:


The individual map files in the 1:250,000-scale tar file are:

- 64c.k2a.Z 64c.ss.Z 73h.k2a.Z 73h.map.Z 73h.sif.Z 73h.ss.Z

The available information for each map is generally (but not always) contained in two files. The file names correspond to the NTS map identifiers (i.e., 73I09 or 73I for the 1:50,000 and 1:250,000 scales, respectively). Vector position data have one of three file extensions, .sif, .k2a, or .k8a, and map statistics/descriptions have one of two file extensions, .ss or .map. Although the features contained in each map are fairly consistent, the features and statistics do vary with location and map complexity. The following are the file extensions that can be found as part of this data set, although little is known about these designations:

- .sif - standard interchange format
  ASCII data
- .k2a - KORK feature codes
  NAD27 datum
  ASCII data, meaning SIF data
- .k8a - KORK feature codes
  NAD83 datum
  ASCII data, meaning SIF data
- .ss - SIF statistics, which is an ASCII text file containing a feature code list for the corresponding SIF data file
- .map - map description file

BORIS staff was not able to obtain a format document or acquire commercial software for reading SIF. Although vendors such as Environmental Systems Research Institute, Inc. (ESRI) (developer of ARC/INFO) support this format, BORIS staff was not willing to absorb the costs associated with adding the necessary package to our existing license. Source code provided by the HYD-08 science
team was modified to read the contour data from various files. This source code is provided as part of this data set as the following files: sifread.c and gis2read.c. These two files are included in each of the tar files in addition to the files listed above. It is not known whether these files will work with the 1:250,000-scale files because we did not work with the contour data at this scale. Note also that in the 1:250,000 tar file, the map 73h is duplicated in two different formats. Please note that BORIS staff found inconsistencies in the file formats even within a given file's type or extension.

9. Data Manipulations

9.1 Formulae
None.

9.2 Data Processing Sequence

9.2.1 Processing Steps
None.

9.2.2 Processing Changes
None.

9.3 Calculations

9.3.1 Special Corrections/Adjustments
None.

9.3.2 Calculated Variables
None.

9.4 Graphs and Plots
None.

10. Errors

10.1 Sources of Error
One source of error is the digitizing process used to create the contours from the map sheets. It is not known whether the maps were hand digitized or if a more automated scanning process was used to digitize the contours.

10.2 Quality Assessment

10.2.1 Data Validation by Source
Unknown.

10.2.2 Confidence Level/Accuracy Judgment
Unknown.

10.2.3 Measurement Error for Parameters
Unknown.

10.2.4 Additional Quality Assessments
None.
10.2.5 Data Verification by Data Center
Quantitative estimates were not made for any of the features in the files. Visual assessment of the contour data showed the spacing to be appropriate for the 1:50,000 scale (i.e., there was no noticeable jaggedness or discontinuities along the contours). The 1:250,000-scale data were not checked. After extracting the data into the ARC/INFO Generate files, BORIS staff plotted the contour data and visually reviewed the data with the 1:50,000 hardcopy maps. No anomalies or errors in the contour data were detected in this review.

11. Notes

11.1 Limitations of the Data
Because the data have a 25-ft contour interval, variations in the terrain that are smaller than 25 ft may not be detectable. The user should not expect to see terrain detail such as small berms or other minor topographic relief. Even less topographic detail (variation under 100 ft) is available from the 1:250,000-scale maps with their 100-ft contour interval.

11.2 Known Problems with the Data
The NSA maps from which these Global Positioning System (GPS) data were derived were found to be in disagreement with differentially corrected GPS coordinates gathered by BOREAS by about 150 m. The error did not appear to be systematic. The SSA maps have a higher degree of accuracy (about 45 m) when compared to GPS.

11.3 Usage Guidance
If these data are going to be used to create a DEM, the various vector files should be edgematched to create seamless contours that do not have discontinuities at the map boundaries.
Before uncompressing the tar files on CD-ROM, be sure that you have enough disk space to hold the uncompressed data files.

11.4 Other Relevant Information
None.

12. Application of the Data Set
This data set can be used to create a gridded DEM of the area of interest. It could also be used for graphical purposes, as an overlay along with other vector layers.

13. Future Modifications and Plans
None.

14. Software

14.1 Software Description
The software to read the SIF data was originally produced by an unknown source. The BOREAS HYD-08 team provided source code that could read some of the SIF files. The software reads the input file and extracts certain features based on feature codes that are supplied by the user. The software is written in C and is operational on Unix workstations at GSFC.

14.2 Software Access
The software is included on the data tape.
15. Data Access

The vector topographic map data are available from the Earth Observing System Data and Information System (EOSDIS) Oak Ridge National Laboratory (ORNL) Distributed Active Archive Center (DAAC).

15.1 Contact Information
For BOREAS data and documentation please contact:

ORNL DAAC User Services
Oak Ridge National Laboratory
P.O. Box 2008 MS-6407
Oak Ridge, TN 37831-6407
Phone: (423) 241-3952
Fax: (423) 574-4665
E-mail: ornldaac@ornl.gov or ornl@eos.nasa.gov

15.2 Data Center Identification
Earth Observing System Data and Information System (EOSDIS) Oak Ridge National Laboratory (ORNL) Distributed Active Archive Center (DAAC) for Biogeochemical Dynamics

15.3 Procedures for Obtaining Data
Users may obtain data directly through the ORNL DAAC online search and order system [http://www-eosdis.ornl.gov/] and the anonymous FTP site [ftp://www-eosdis.ornl.gov/data/] or by contacting User Services by electronic mail, telephone, fax, letter, or personal visit using the contact information in Section 15.1.

15.4 Data Center Status/Plans
The ORNL DAAC is the primary source for BOREAS field measurement, image, GIS, and hardcopy data products. The BOREAS CD-ROM and data referenced or listed in inventories on the CD-ROM are available from the ORNL DAAC.

16. Output Products and Availability

16.1 Tape Products
The vector contour data can be made available on 8-mm, DAT, or 9-track tapes at 6250 or 1600 bpi.

16.2 Film Products
None.

16.3 Other Products
These data are available on the BOREAS CD-ROM series.
17. References

17.1 Platform/Sensor/Instrument/Data Processing Documentation
None.

17.2 Journal Articles and Study Reports


17.3 Archive/DBMS Usage Documentation
None.

18. Glossary of Terms
None.
19. List of Acronyms

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
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<tbody>
<tr>
<td>ASCII</td>
<td>American Standard Code for Information Interchange</td>
</tr>
<tr>
<td>BOREAS</td>
<td>BOReal Ecosystem-Atmosphere Study</td>
</tr>
<tr>
<td>BORIS</td>
<td>BOREAS Information System</td>
</tr>
<tr>
<td>BPI</td>
<td>Bytes Per Inch</td>
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<tr>
<td>CCRS</td>
<td>Canadian Centre for Remote Sensing</td>
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<td>CD-ROM</td>
<td>Compact Disk-Read-Only Memory</td>
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<td>DEM</td>
<td>Digital Elevation Model</td>
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<td>EOS</td>
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20. Document Information

20.1 Document Revision Date
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Last Updated: 05-Feb-1999

20.2 Document Review Date
BORIS Review: 15-May-1997
Science Review: 

20.3 Document ID

20.4 Citation

When using these data, please include the following acknowledgement as well as citations of relevant papers in Section 17.2:

These data originated as vector data that were provided to BORIS staff through the CCRS by Geomatics Canada. The contribution of the data by CCRS and Geomatics Canada and processing of the data by BORIS staff are greatly appreciated.
If using data from the BOREAS CD-ROM series, also reference the data as:

Also, cite the BOREAS CD-ROM set as:

20.5 Document Curator

20.6 Document URL
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   Forrest G. Hall, Editor

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   Greenbelt, Maryland 20771

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13. ABSTRACT (Maximum 200 words)
    This data set contains vector contours and other features of individual topographic map sheets from the NTS. The map sheet files were received in SIF and cover the BOREAS NSA and SSA at scales of 1:50,000 and 1:250,000. The individual files are stored in compressed Unix tar archives.

14. SUBJECT TERMS
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15. NUMBER OF PAGES
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