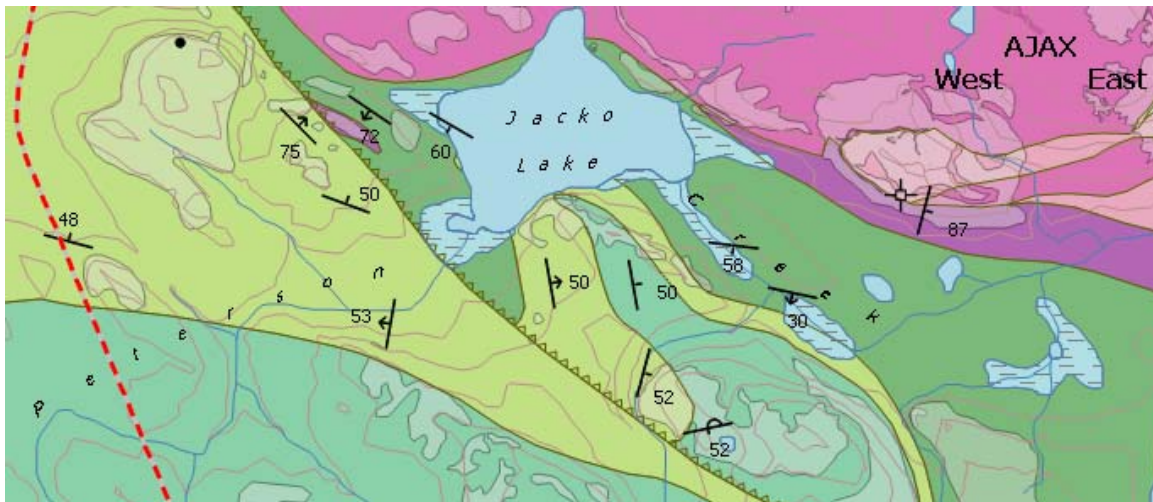# Geofile 2005-16

British Columbia Geological Survey Symbols for Manifold® Geographic Information System

By: Mitchell G. Mihalynuk
       Shannon S.M. Mallory, and
       Brian Grant

Introduction

Manifold® is a full-featured, inexpensive, commercial Geographic Information System (GIS). It costs one or two orders of magnitude less than other GIS software suites that have comparable functionality, and it operates under Windows XP, providing formidable GIS analytical and display capabilities to anybody with a modest budget.

For the production of geological maps, however, Manifold ®[1] right out of the box, comes up short. It lacks the ability to build custom line types (especially thrust faults) and does not come with a library of geological symbols or patterned fills.

While not entirely an aesthetically pleasing solution, Manifold's built-in triangle barb line type can be used as a proxy for the thrust fault line type. Geological symbols are more work, but Manifold does provide a facility, through a pared-down implementation of Extensible Markup Language (XML), for the production of custom symbols and fills. We have used XML to create a more than 130 symbols that and two dozen fill patterns ("area styles" in Manifold) that are available as part of this publication: Geofile 2005-16. Four files are included as part of this Geofile:
1. This report, Geofile2005-16.pdf
2. XML coded symbols and fills, BCGSgeosymbolV1.5.xml
3. Manifold mapping and tabulation of the symbols and fills, BCGSgeosymbol&fill.map
4. Manifold point style theme, PointStyleTheme.xml

BCGSgeosymbols V1.5

BCGSgeosymbols V1.5 is a library of geological symbols for use in Manifold (Figure 1). Symbols are based upon Specifications and *Guidelines for Bedrock Mapping in British Columbia* (BC Geological Survey, 1997), and *Geoscience Reporting Guidelines* (Grant, 2003).

Users gain access to the symbol library by copying BCGSgeosymbolsV1.5.xml to the …Manifold\Config subdirectory and then restarting Manifold. All of the symbols can be scaled, rotated and coloured like other symbols available in Manifold. They can be selected by scrolling to near the bottom of the symbol pick box.

HINT: if you use standard BC Geological Survey Branch feature codes, you can apply the PointStyleTheme.xml theme file to automatically assign geological symbols to a coded point. Otherwise, if you prefer to manually pick symbols for a thematic query, it is best to apply a default geological symbol to all points representing structural measurements and then edit them. This latter method avoids the tedium of scrolling to the end of the symbol pick box list each time you wish to select a geological symbol.

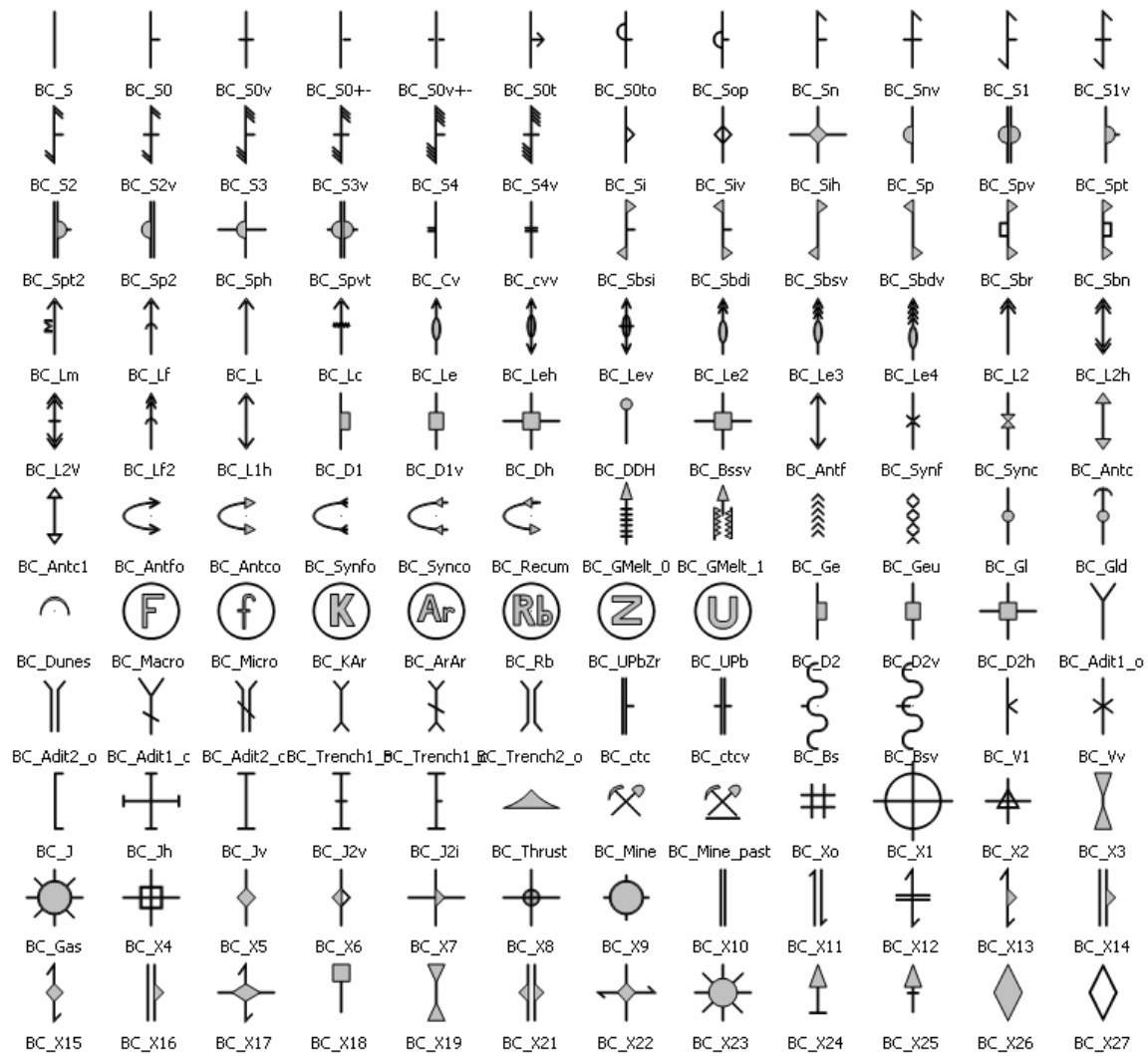[1] Hitherto referred to as "Manifold".

Figure 1. A portion of the map provided in BCGSsymbols&fills.map as displayed from within Manifold. These symbols are available in Manifold once BCGSgeosymbolV1.5.xml is copied to the …\Manifold\Config subdirectory and the program is restarted.

ID	XML name	X (I)	Y (I)	Description	Feature
11166	BC_S	-450	375	Unspecified trend line	S
11167	BC_S0	-375	375	Bedding	S0
11168	BC_S0v	-300	375	Bedding -vertical	S0v
11169	BC_S2	-450	300	Foliation -second generation	S2
11170	BC_S2v	-375	300	Foliation -second generation, vertical	S2v
11171	BC_S3	-300	300	Foliation -third generation	S3
11172	BC_S3v	-225	300	Foliation, 3rd generation, vertical	S3v
11173	BC_S4	-150	300	Foliation -fourth generation	S4
11174	BC_S4v	-75	300	Foliation -gourth generation, vertical	S4v
11175	BC_Si	0	300	Igneous flow banding	Si
11176	BC_Siv	75	300	Igneous flow banding - vertical	Siv
11177	BC_Sp	225	300	Layering -pillows, inclined	Sp
11178	BC_Spv	300	300	Layering -pillows, vertical	Spv
11180	BC_Spt	375	300	Layering -pillows, tops known	Spt
11181	BC_Spt2	-450	225	Layering -pillows2, tops known	Spt2
11182	BC_Sp2	-375	225	Layering -pillows2, inclined	Sp2
11183	BC_Sph	-300	225	Layering -pillows, horizontal	Sph
11185	BC_Spvt	-225	225	Layering -pillows, tops known, vertical	Spvt
11190	BC_Lm	-450	150	Lineation, mineral elongation	Lm
11191	BC_Lf	-375	150	Lineation - fold hinge (larger than crenulat...	Lf
11192	BC_L	-300	150	Lineation - unspecified	L
11193	BC_Lc	-225	150	Lineation - crenulation	Lc
11194	BC_Le	-150	150	Lineation - elongation (e.g. clasts)	Le
11197	BC_Leh	-75	150	Lineation -elongation, horizontal	Leh
11198	BC_Lev	0	150	Lineation -elongation, vertical	Lev
11199	BC_Le4	225	150	Lineation -elongation, fourth phase	Le4
11200	BC_L2	300	150	Lineation - second generation	L2
11201	BC_L2h	375	150	Lineation -second phase, horizontal	L2h
11214	BC_Antfo	-375	0	Antiform -overturned	Antfo

Figure 2. Part of the geocoded table from which Figure 1 is created.

BCGSgeopatterns

Two dozen different, geologically oriented, patterned fills are coded and included as part of BCGSgeosymbolsV1.5.xml (Figure 3) and will be available for use once the file is copied into the …Manifold\Config directory and the program is restarted. These patterned fills can be scaled, and different foreground and background colours can be applied like any other "area style" built into Manifold.

BC_Breccia_1 BC_Breccia_2 BC_Breccia_3 BC_Silt BC_Dolomite_1

BC_Breccia_4 BC_Breccia_5 BC_Granite_1 BC_Limestone

BC_Granite_2 BC_Granite_3 BC_Argillite BC_Granite_4

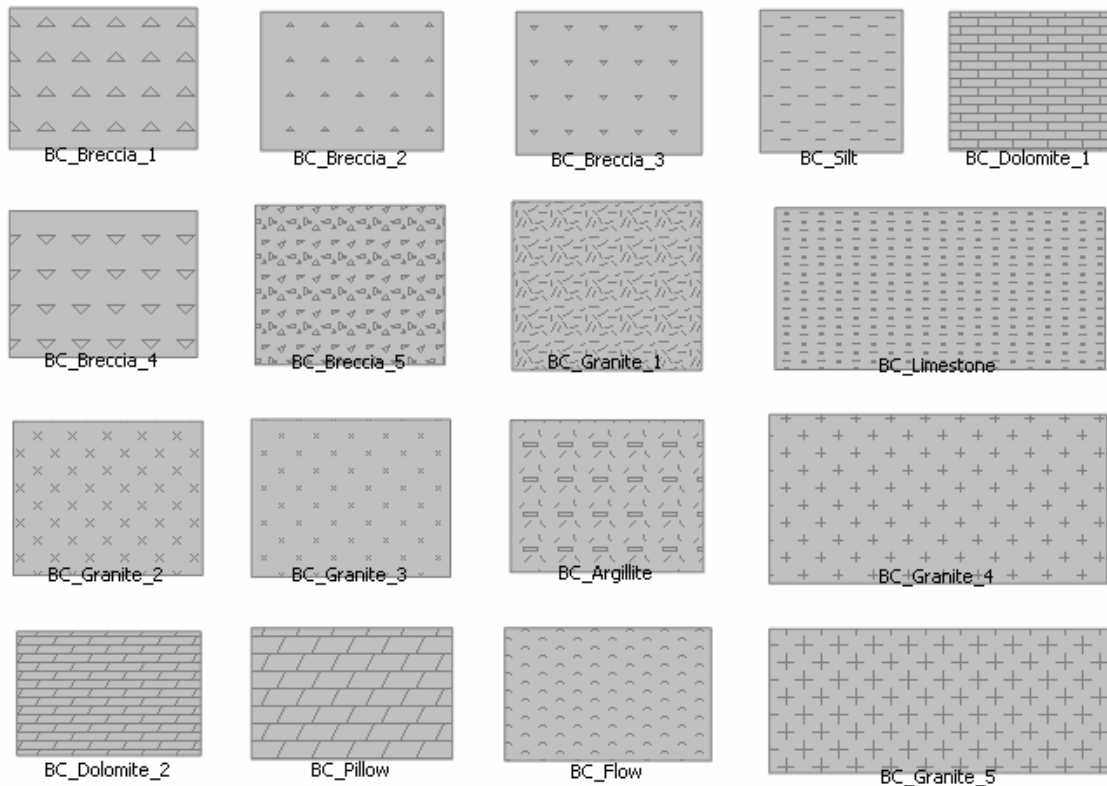BC_Dolomite_2 BC_Pillow BC_Flow BC_Granite_5

Figure 3. A portion of the map provided in BCGSsymbols&fills.map as displayed from within Manifold. These fill patterns are available in Manifold once BCGSgeosymbolV1.5.xml is copied to the …\Manifold\Config subdirectory and the program is restarted.

Terms of use

You may freely use, copy and distribute these files. However, please ensure that use of this material is appropriately referenced. By doing so, you will provide incentive for future development of this and other geological mapping facilities.

References Cited

Grant, B. (2003): Geoscience Reporting Guidelines; Victoria, BC, Canada, ISBN 0-9687963-1-4, 356 pages.

BC Geological Survey (1997): Specifications and Guidelines for Bedrock Mapping in British Columbia; BC Ministry of Energy and Mines, Information Circular 1997-3, 186 pages, ISBN 0-7726-2950-1; URL http://www.em.gov.bc.ca/Mining/Geolsurv/Publications/InfoCirc/IC1997-03/toc.htm