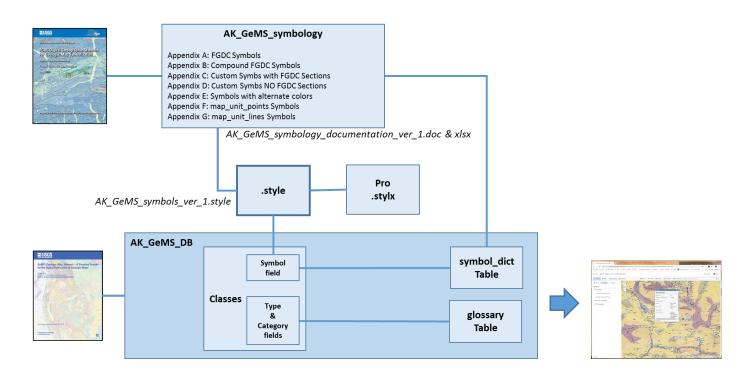
Symbolizing a GeMS Database DMT 2021 08 Jun 2021



Mike Hendricks, Trish Ekberg, Jen Athey, Amy Macpherson Alaska Division of Geological & Geophysical Surveys 3354 College Rd, Fairbanks AK 99709



Agenda

Introduction

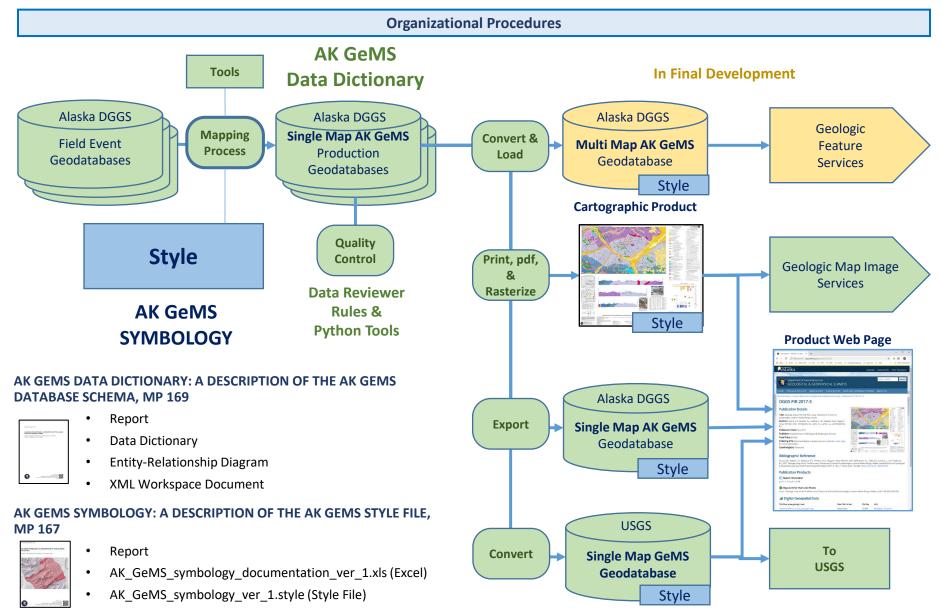
- Key Symbology quotes from TM 11-B10 (GeMS)
- Very brief review AK GeMS Geologic Mapping System
- AK GeMS Symbology philosophy & architecture
- **Style File** AK_GeMS_symbols_ver_1.style
- Custom Symbols Procedures and Documentation
- Future work

TM 11-B10: GeMS (Geologic Map Schema) Symbology Quotes

"The distinction between map data and their symbolization is important. Storing map data in a GIS—as opposed to its symbolization in a drawing program—facilitates machine-assisted analyses of the data, gives greater flexibility for alternate symbolization, and **eases reuse** of the data at different scales." *p.2*

"ArcGIS .style file that contains the area, line, and point symbols used to symbolize the map. **Must include all symbols specified in database.** It is recommended that the .style contain a subset of the symbols in the FGDC cartographic standard..." p11.

Alaska DGGS Geologic Mapping System Components



GeMS Validation

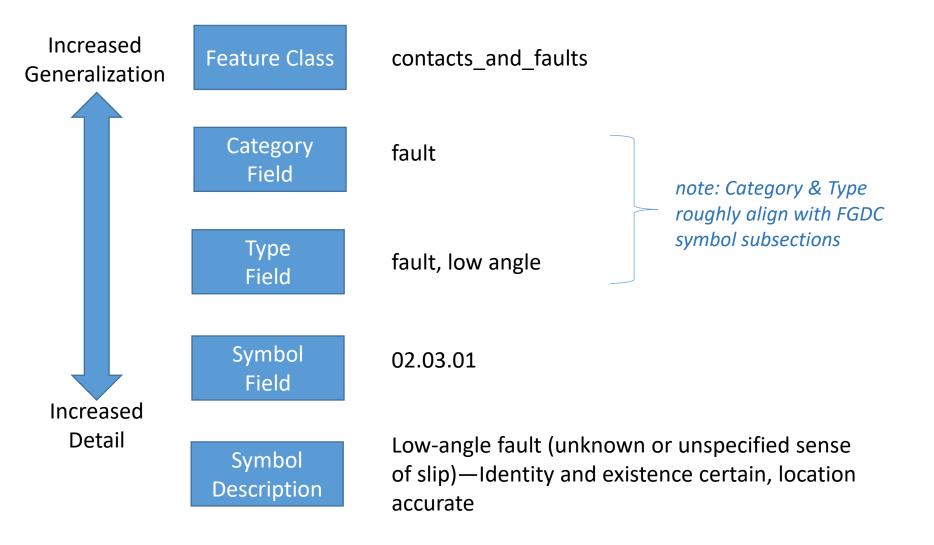
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AK GeMS Symbol philosophy

- Symbol code is part of a feature's representation hierarchy
- AK DGGS phased out the use of "ESRI representations"
- We do not use repurposed symbols We make custom symbols with new symbol code instead
- Formalize the process of requesting, creating, and storing custom symbols
- Always consider symbolization for single map pdf as well as online interactive multi-map representations

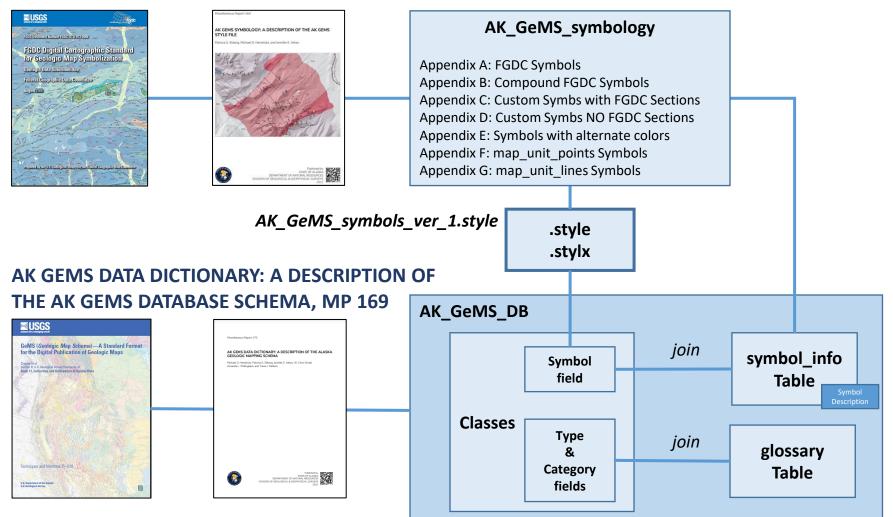
Symbol code is part of a feature's representation hierarchy



AK GeMS Symbology Architecture

AK GEMS SYMBOLOGY: A DESCRIPTION OF THE AK GEMS STYLE FILE, MP 167

- Report
- AK_GeMS_symbology_documentation_ver_1.xls (Excel)
- AK_GeMS_symbology_ver_1.style (Style File)



Key Symbol Related Schema Implementations

- All feature classes have symbol field
- All feature classes have binary draw_policy field
 - PlotAtScale field is not included in AK GeMS. We assume a value of 0 (draw at all scales) in GeMS submissions
- Include **symbol_rotation** field with select FCs: geologic_points, cartographic_points. *May add to more in ver 2.0*
- Include **symbol_alt** field with select FCs: orientation_points, contacts_and_faults. *May add to more in ver 2.0*
 - Orientation Point symbol for multiple observations at one locality
 - Symbolizing fault with custom point decorations.
- In DMU, area_fill_pattern_description field is populated with, and only with, the FGDC pattern code, 101-K, 116-C, etc. and included in style
- Include style field in the project_info table to store version of style used for database

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Elements included in: AK_GeMS_symbols_ver_1.style

🖥 \\nona\gis\standards\styles\AK GeMS symbology ver 1.style Reference Systems Maplex Labels Shadows Area Patches Line Patches Labels Representation Markers North Arrows Scale Bars Legend Items Scale Texts Color Ramps Borders Backgrounds Colors Vectorization Settings Fill Symbols Line Symbols Marker Symbols Text Symbols Representation Rules Hatches

For each code, each digit represents the percent of cyan, magenta, yellow, or black. Color codes use the following abbreviations: A=8%; 1=13%; 2=20%; 3=30%; 4=40%; 5=50%; 6=60%; 7=70%; X=100%.

×

Colors in style

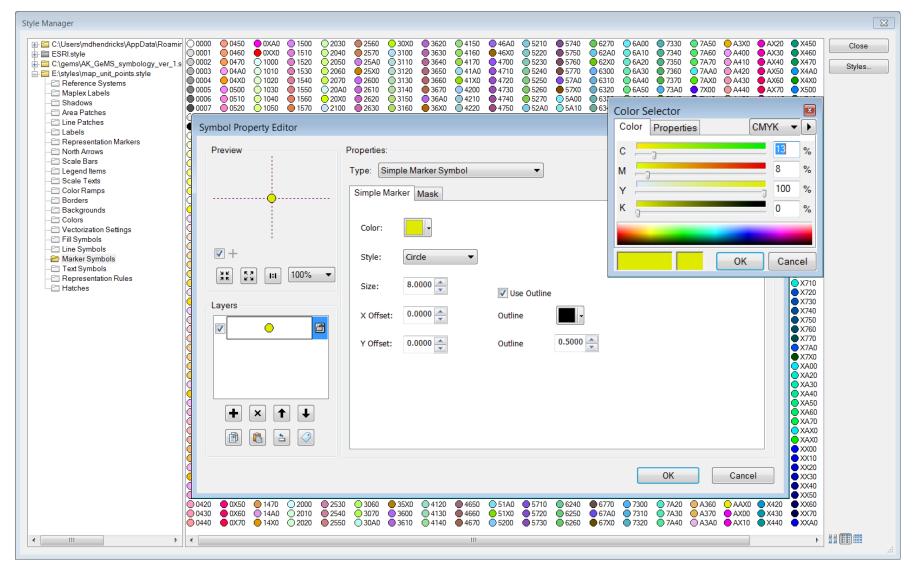
Style Manager

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ESRI.stvle	0010	0540	1070	1600	2130	2660	31X0	3720	4250	47A0	5310	5A40	6370	6X00	7430	7X60	A4X0	X020	X550	0.000
C:\gems\AK_GeMS_symbology_ver_1.style	0020	0550	10A0	1610	2140	2670	3200	3730	4260	47X0	5320	5A50	63A0	6X10	7440	7X70	A500	X030	X560	Styles
- C Reference Systems	0030	0560	10X0	1620	2150	26A0	3210	3740	4270	4A00	5330	5A60	63X0	6X20	7450	7XA0	A510	X040	X570	Styles
- C Maplex Labels	0040	0570	1100	1630	2160	26X0	3220	3750	42A0	4A10	5340	5A70	6400	6X30	7460	7XX0	A520	X050	X5A0	
C Shadows	0050	05A0	1110	1640	2170	2700	3230	3760	42X0	4A20	5350	5AA0	6410	6X40	7470	A000	A530	X060	X5X0	
Area Patches	0060	05X0	1120	1650	21A0	2710	3240	3770	4300	4A30	5360	5AX0	6420	6X50	74A0	A010	A540	X070	X600	
Line Patches	0070	0600	1130	1660	21X0	2720	3250	37A0	4310	4A40	5370	5X00	6430	6X60	74X0	A020	A550	X0A0	X610	
Labels	00A0	0610	1140	1670	2200	2730	3260	37X0	4320	4A50	53A0	5X10	6440	6X70	7500	A030	A560	X0X0	X620	
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Legend Items	0120	0650	11A0	1710	2240	2770	3300	3A30	4360	4AX0	5420	5X50	64A0	7010	7540	A070	A600	X130	X660	
Scale Texts	0130	0660	11X0	1720	2250	27A0	3310	3A40	4370	4X00	5430	5X60	64X0	7020	7550	A0A0	A610	X140	X670	
- Color Ramps	0140	0670	1200	1730 1740	2260	27X0	3320	3A50	43A0	4X10	5440 5450	5X70 5XA0	6500	7030	7560	A0X0	A620	X150	X6A0 X6X0	
Borders	0150	06A0	1210	1740	2270 22A0	2A00	3340	3A60 3A70	43/0	4X20 4X30	5460	5XA0	6510	7040	75A0	A100	A630	X170	X700	
Backgrounds	0170	0700	1220	1760	22X0	2A10	3350	3AA0	4400	4X40	5470	6000	6530	7050	75X0	A120	A640	X1A0	X710	
Colors	01A0	0700	1230	1770	2300	2A20	3360	3AX0	4410	4X40 4X50	54A0	6010	6540	7070	7600	A120	A650	X1X0	X720	
	01X0	0720	1250	17A0	2310	2A30	3370	3X00	4430	4X60	54X0	6020	6550	70A0	7610	A140	A670	X200	X730	
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	0500	1030	1560	20X0	2620	3150	36A0	4210	4740	5270	5A00	6330	6A60	73X0	7X20	A450	AXA0	X510		
	0510	1040	1570	2100	2630	3160	36X0	4220	4750	52A0	5A10	6340	6A70	7400	7X30	A460	AXX0	X520		
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Map_unit_points symbols

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	0005	0500	1030	1550	20A0	2610	3140 3150	3670	4200 4210	4730	5260 5270	57X0	6320	6A50	73A0	 7X00 7X10 	A440	AX70		
- Carl Shadows	0006	0510	0 1040	1560	2100	2620	3160	36A0	4210	4740					7400	0 7X20		AXX0		
- Carea Patches	0000A	0530	0 1050	0 15A0	02110	2640	03170	3700	4230	4760	52X0	0 5A10				• 7X30	A400	×000	X530	
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🗀 Labels	0010	0550	0 1070	0 1600	2130	2660			4250	047A0				6X00	07430	● 7X50			X560	
Representation Markers	0020	0560	0 10A0	0 1610	02140	2670	3200	3730	4260	47X0	05320	0 5A50	0 63A0		07440	● 7X60	A500	X030	X570	
C North Arrows	0030	0570	0 10X0	0 1620	2150		3210		4270		5330	O 5A60			7450	● 7X70	-	×040	-	
🗁 🗀 Scale Bars	0040	05A0		0 1630	2160	0 26X0	3220	3750	0 42A0	04A10		0 5A70		6X30	7460	0 7XA0	A520	O X050	X5X0	
- C Legend Items	0050	05X0	O 1110	0 1640	<u> </u>	2700	O 3230	3760	0 42X0		5350				07470	• 7XX0	A530		X600	
🗁 Scale Texts	0060	0600	01120	0 1650	O 21A0	2710	3240	3770	4300		5360	O 5AX0		6X50	074A0	O00AO	A540	X070	X610	
Color Ramps	0070	0610	Õ 1130	0 1660	Õ21X0	Õ 2720	Ö 3250	0 37A0	Õ 4310	04A40	0 5370	0 5X00	6430	Ğ 6Х60	074X0	Ŏ A010	A550	OA0X O	🖲 X620	
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Vectorization Settings	0110	0650	Ō 1170	0 1700	<u></u> 2230	2760	Ō 32X0	Ō 3A20	4350	04AA0	Ō 5410	5X40	6470	000 🔘	07530	Ō A050	A5X0	ŌX120	🔿 X660	
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Text Symbols	0150	🔴 06X0	0 1210	0 1740	2270 🔿	2A00	3330 🔘	🔵 3A60		🔴 4X20	5450	🔵 5XA0		07040	7560	OX0A 🔾			🔵 X700	
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	0310	0A40		0 1X00	2420	2X60	34X0	4010	4550	0 50A0	5610	6140	6670	07200	07720	A260	A7X0	X320	XA60	
	0320	OA60		0 1X10	2440		3500	04020	4560	0 50X0	5620	6150		7210	7730	A270			XA70	
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	03A0	0X10	0 1430	1X60	0 24X0	0 3020	3550	0 40A0		05140	5670	6200	6730	7260	077A0	A320		×3A0		
	03X0	0X20	0 1440	1X70	2500	0 3030	3560	040X0	4620	0 5150	0 56A0	6210	6740	0 7270	77X0	O A330	O AA60		🔿 XX30	
	0400	0X30	0 1450	0 1XA0	2510	0 3040	3570	4100	4630	0 5160	● 56X0	6220	6750	072A0	7A00	A340		×400		
	0410	0X40	0 1460	1XX0	2520	0 3050	0 35A0		4640	0 5170	5700	6230	6760	072X0	O 7A10	A350		OX410		
		0X50	0 1470	02000	2530	0 3060	🔵 35X0		4650	051A0					O 7A20					
	0430	🖲 0X60	🖲 14A0	<u> </u>	2540	<u> </u>		Ō 4130	4660	51X0	5720	6250	07A0				O0XA 🔘			
	0440	🔴 0X70	🖲 14X0	02020	2550	🔵 30A0	3610	4140	4670	0 5200	5730	6260	🔴 67X0	7320	🔵 7A40	A3A0	OAX10	🔵 X440	🔿 XXA0	
4 111	•								111										4	

Map_unit_points symbols



Map_unit_lines symbols

Synthetic line designed in the designed in

Fill symbols

Style Manager

Style Manager																	
			-	- 4 400	-	-			-			5540			7400	- 701	
C:\Users\mdhendricks\AppData\Roamir	0000	03A0 03X0	0X10 0X20	1430 1440	1X10 1X20	2430 2440	2X70	3450 3460	3XA0 3XX0	4440	4XA0 4XX0	5510 5520	6030 6040	6560 6570	7100 7110	763	Close
ESRI.style		03/0	0X20	1440	1X20	2440	2XA0	3460	4000	4450	5000	5520	6050	65A0	7120	764	
C:\gems\AK_GeMS_symbology_ver_1.s	0002	0400	0X30	1450	1X40	2450	3000	34A0	4010	4470	5000	5550	6060	65X0	7120	760	Styles
Reference Systems	0003	0420	0X40	1470	1X50	2470	3010	34X0	401-C	44A0	5020	5550	6070	6600	7140	767	
Maplex Labels	0005	0430	0X60	14A0	1X60	24A0	3020	3500	401-K	44X0	5020	5560	60A0	6610	7150	76/	
- C Shadows	0006	0440	0X70	14X0	1X70	24X0	3030	3510	401-M	4500	5040	5570	60X0	6620	7160	76)	
Area Patches	0007	0450	0XA0	1500	1XA0	2500	3040	3520	4020	4510	5050	55A0	6100	6630	7170	770	
Call Line Patches	000A	0460		1510	1XX0	2510	3050	3530	4030	4520	5060	55X0	6110	6640	71A0	771	
Labels	000X	0470	1000	1520	20.07	2520	3060	3540	4040	4530	5070	5600	6120	6650	71X0	772	
Representation Markers	0010	04A0	1010	1530	2000	2530	3070	3550	4050	4540	50A0	5610	6130	6660	7200	77:	
- C North Arrows	0020	04X0	1020	1540	2010	2540	30A0	3560	4060	4550	50X0	5620	6140	6670	7210	774	
Cale Bars	0030	0500	1030	1550	2020	2550	30X0	3570	4070	4560	5100	5630	6150	66A0	7220	775	
El Legend Items	0040	0510	1040	1560	2030	2560	31.08	35A0	40A0	4570	5110	5640	6160	66X0	7230	776	
🗁 Scale Texts	0050	0520	1050	1570	2040	2570	31.14	35X0	40X0	45A0	5120	5650	6170	6700	7240	777	
Color Ramps	0060	0530	1060	15A0	2050	25A0	31.15	3600	4100	45X0	5130	5660	61A0	6710	7250	77/	
🗁 Borders	0070	0540	1070	15X0	2060	25X0	31.16	3610	4110	4600	5140	5670	61X0	6720	7260	77)	
🗁 Backgrounds	00A0	0550	10A0	1600	2070	2600	31.17	3620	4120	4610	5150	56A0	6200	6730	7270	7 AI	
- Colors	00X0	0560	10X0	1610	20A0	2610	3100	3630	4130	4620	5160	56X0	6210	6740	72A0	7 A'	
Vectorization Settings	01.02.42		1100	1620	20X0	2620	3110	3640	4140	4630	5170	5700	6220	6750	72X0	7 A:	
Fill Symbols	01.02.43	05A0	1110	1630	2100	2630	3120	3650	4150	4640	51A0	5710	6230	6760	7300	7 A:	
- Eine Symbols		05X0	1120	1640	2110	2640	3130	3660	4160	4650	51X0	5720	6240	6770	7310	7 A-	
🛅 Marker Symbols	01.02.45	0600	1130	1650	2120	2650	3140	3670	4170	4660	5200	5730	6250	67A0	7320	7A!	
🛅 Text Symbols	01.03.13	0610	1140	1660 1670	2130 2140	2660 2670	3150 3160	36A0 36X0	41A0	4670 46A0	5210 5220	5740 5750	6260 6270	67X0 6A00	7330 7340	7A)	
Representation Rules	0100	0620	1150	1670 16A0	2140	2670 26A0	3160	36X0	41X0	46A0	5220	5750	6270 62A0	6A00 6A10	7340	7A 7A	
Hatches	0120	0630	1170	16A0	2150	26A0	31A0	3700	4200	46/0	5230	5760	62X0	6A10	7360	7A	
🗄 🔚 E:\styles\map_unit_points.style	0120	0650	// 119-K	17.58	2170	2700	31X0	3720	4210	4710	5240	57A0	6300	6A30	7370	7X	
⊞- 🖆 E:\styles\map_unit_lines.style	0140	0660	11A0	17.59	21/0 21A0	2710	3200	3730	4230	4720	5260	57X0	6310	6A40	73A0	7X	
	0150	0670	11X0	17.60	21X0	2720	3210	3740	4240	4730	5270	595-C	6320	6A50	73X0	7X	
	0160	06A0	1200	17.61	2200	2730	3220	3750	4250	4740	52A0	595-K	6330	6A60	7400	7X:	
	0170	06X0	1210	17.65	2210	2740	3230	3760	4260	4750	52X0	5A00	6340	6A70	7410	7X4	
	01A0	0700	1220	1700	2220	2750	3240	3770	4270	4760	5300	5A10	6350	6AA0	7420	7X !	
	01X0	0710	1230	1710	2230	2760	3250	37A0	42A0	4770	5310	5A20	6360	6X00	7430	7X (
	02.14.01	0720	1240	1720	2240	2770	3260	37X0	42X0	47A0	5320	5A30	6370	6X10	7440	7X	
	0200	0730	1250	1730	2250	27A0	3270	3A00	4300	47X0	5330	5A40	63A0	6X20	7450	7X /	
	0210	0740	1260	1740	2260	27X0	32A0	3A10	4310	4A00	5340	5A50	63X0	6X30	7460	7 X0	
	0220	0750	1270	1750	2270	2A00	32X0	3A20	4320	4A10	5350	5A70	6400	6X40	7470	A0(
	0230	0760	12A0	1760	22A0	2A10	3300	3A30	4330	4A20	5360	5AA0	6410	6X50	74A0	A0 ⁻	
	0240	0770	12X0	1770	22X0	2A20	3310	3A40	4340	4A30	5370	5AX0	6420	6X60	74X0	A0:	
	0250	07A0	1300	17A0	2300	2A40	3320	3A50	• 434-B	4A40	53A0	5X00	6430	6X70	7500	A0:	
	0260	07X0	1310	17X0	2310	2A50	3330	3A60	• 434-C	4A50	53X0	5X10	6440	6XA0	7510	A0-	
	0270	0A00	1320	19.02.04	2320	2A60	3340	3A70	• 434-M	4A60	5400	5X20	6450	6XX0	7520	A0!	
	02A0	0A10	1330	1A00	2330	2A70	3350	3AA0	• 434-R	4A70	5410	5X30	6460	7000	7530	A0	
	02X0	0A20	1340	1A10	2340	2AA0	3360	3AX0	4350	4AA0	5420	5X40	6470	7010	7540	A0	
	0300	0A30 0A40	1350	1A20	2350 2360	2AX0 2X00	3370 33A0	3X00 3X10	4360	4AX0 4X00	5430	5X50 5X60	64A0	7020	7550	A0, A0;	
	0310	0A40 0A50	1360 1370	1A30 1A50	2360	2X00 2X10	33X0	3X10 3X20	4370 43A0	4X00 4X10	5440 5450	5X60	6500	7030	7560	A0,	
	0320	0A50	1370 13A0	1A50	23/0 23A0	2X10	3400	3X30	43A0	4X10	5460	5XA0	6510	7040	75A0	A1	
	0340	0A00	13X0	1A70	23X0	2X20	3410	3X40	4400	4X30	5470	5XX0	6520	7060	75X0	A1:	
	0350	0AA0	1400	1AA0	2400	2X30	3420	3X50	4410	4X40	54A0	6000	6530	7070	7600	A1:	
	0360	0AX0	1410	1AX0	2410	2X50	3430	3X60	4420	4X60	54X0	6010	6540	70A0	7610	A14	
	0370	0X00	1420	1X00	2420	2X60	3440	3X70	4430	4X70	5500	6020	6550	70X0	7620	A1!	
		1														_	
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Marker Symbols

Style Manager

Style Manager										
	0 0000	00.15.01	05 10 02	1 OF 11 -1 00 0	0000 : 00.40	0700	6 00 00 15	1 00 000	00.001	
	0000	- 02.15.01	05.10.03	(_05.11.ak.02.0		0730			09.061	09.1 Close
ESRI.style	0001	+ 02.15.02	05.10.04	0500	9 06.44	0740		09.009	09.062	09.1
	0002	02.15.03		0510	¢= 06.45	0750	08.03.17	09.010	09.063	
C Reference Systems	0003	0200	■ 05.10.06	0520	€ 06.46	0760	• 08.03.18	09.011	09.064	• 09.1
🗁 Maplex Labels	0004	0210		0530	0600	0770	08.03.19	09.012	09.065	09.1
- C Shadows	0005	0220	▶ 05.10.08	0540	0610	07A0	08.03.20	09.013	09.066	↓ 09.1
- C Area Patches	0006	0230) 05.10.09	0550	0620	🔴 07X0	08.03.21	09.014	8 09.067	
- Cal Line Patches	0007	0240	⊕ 05.11.01	0560	0630	Ø 08.01.01	Ø 08.03.22	09.015	8 09.068	09.1
🗁 Labels	O000	0250		0570	0640	08.01.02	08.03.23	09.016	09.069	09.1
Representation Markers	• 000X	0260		05A0	0650			09.017	09.070	m 09.1
	0010	0270		05X0	0660	08.01.04	08.03.25	09.018	* 09.071	m 09.1
Scale Bars	0020	02A0	^{105.11.05}	⊕ 06.01	0670	08.01.05	08.03.26	09.019	* 09.072	09.1
	0030	O2X0	₩05.11.06	- 06.02	06A0	08.01.06	08.03.27	09.020	09.073	09.1
	0040	03.03.03	T05.11.07	06.03	🔶 06X0	:: 08.02.01	🔶 08.03.28	09.021	09.074	\$ 09.1
Cale Texts	0050	△ 03.03.04	<u>+</u> +05.11.08	∮ 06.04	+07.01		08.03.29	09.022	09.075	\$ 09.1
Color Ramps	0060	+ 03.03.05	05.11.09	° 06.05	07.02	> 08.02.03	📌 08.03.30	09.023	09.076	09.1
- Borders	0070	0300	H105.11.10	06.06	07.03	08.02.04	08.03.31	09.024	09.077	09.1
🗁 Backgrounds	OA00	0310	T ^{05.11.11}	06.07	07.04	08.02.05	08.03.32	09.025	09.078	2 09.1
-Colors	O0X0	0320	+05.11.12	06.08	07.05	08.02.06	08.03.33	09.026	\$ 09.079	2 09.1
Vectorization Settings	⊕ 01.03.ak.01	0330	05.11.13	06.09	07.06	08.02.07	08.03.34	09.027	<u></u>	09.1
Fill Symbols	- 01.03.ak.02	0340	05.11.14	J 06.10	+]+ 07.07	▶ 08.02.08	+ 08.03.35	09.028	09.081	09.1
🔚 Line Symbols	01.03.ak.03	0360	105.11.15	06.11	07.08		+ 08.03.36	09.029	09.082	v 09.1
Marker Symbols	01.03.ak.04	0370	⊈ 05.11.16	j 06.12	07.09		08.03.37	09.030	\$ 09.083	∲ 09.1
Text Symbols	01.04.01	03A0	₩05.11.17	- 06.13	07.10	- 08.02.11	J 08.03.38	9.031	\$ 09.084	09.1
Representation Rules	T 01.04.02	💛 03X0	⊈ 05.11.18	+06.14	<mark>ا 07.11</mark>	- 08.02.12	08.03.39	9.032	09.085	09.1
Hatches	01.04.03	04.02.03	₩05.11.19		07.12	← 08.02.13	€ 08.03.40	09.033	09.086	÷ 09.1
	01.04.04	[†] 04.02.04	2 05.11.20	06.16	÷÷07.13	- 08.02.14	A 08.03.41	09.034	09.087 09.087	÷ 09.1
	01.04.05	04.02.05	⊈ 05.11.21	06.17	07.14		# 08.03.42	o9.035	9.088	09.1
	J 01.04.06	04.02.06	2,05.11.22	06.18	Ť 07.15	₽ 08.02.16	08.03.43	og.036	09.089	09.1
	01.04.07	04.03.01	⊈ ∗05.11.23	06.19	07.16	8 08.02.17	J 08.03.44	09.037	09.090	☆ 09.1
	01.04.10	04.03.02	+05.11.24	J 06.20	<mark>ر 07.17</mark>	8 08.02.18	08.03.45	09.038		<u></u> <u> </u>
	01.04.11	04.03.03	05.11.25	06.21	07.18		🔶 08.03.46	09.039		0A0
	Q 0100.	04.03.04	≯ *05.11.26	06.22	÷€07.19	08.02.20	08.03.47	09.040	09.093	OA1
	0110	04.03.05	*05.11.27	06.23	\$ 07.20		+ 08.03.48	09.041	09.094	○ 0A2
	0120	04.03.06	+05.11.28	J 06.24	\$ 07.21	08.02.22	08.03.49	09.042	* 09.095	OA3
	0130	04.03.07	05.11.29	06.25	07.22	08.02.23	08.03.50	09.043	* 09.096	○ 0A4
	0140	04.03.08	♦< 05.11.30	{ 06.26	07.23	08.02.24	08.03.51	09.044	09.097	○ 0A5
	0150	¢ 04.03.09	¹ 05.11.31	l <mark>-</mark> 06.27	07.24	8 08.02.25	Ø 08.03.52	09.045	09.098	OA6
	0160	04.03.10	+05.11.32	+ 06.28	फ ़े07.25	08.02.26	08.03.53	09.046	09.099	OA7
	0170	04.03.11	05.11.33	∲ 06.29	ቀ 07.26	08.03.01	€ 08.03.54	09.047	09.100	
	O1A0	04.03.12	≯ ≉05.11.34	06.30	ቀ 07.27	08.03.02	Ø8.03.55	09.048	09.101	
	O1X0	0400	[*] 05.11.35	3 06.31	07.28	+ 08.03.03	08.03.56	09.049	09.102	OX0
	02.11.01	0410	D5.11.36	06.32	07.29	08.03.04	08.03.57	09.050	9.103	OX10
	02.11.03	0420	₩ 05.11.37	- 06.33	07.30	08.03.05	08.03.58	09.051	9 09.104	0X21
	202.11.04	0430	D5.11.38	06.34	++; 07.31	08.03.06	08.03.59	09.052	09.105	0X3I
	02.11.05	0440	₽ 05.11.39	°- 06.35	07.32		08.03.60	09.053	09.106	0X4(
	02.11.08	0450	05.11.40	- 06.36	07.33	08.03.08	09.001	09.054	09.107	0X51
	02.11.09	0460	405.11.41	+06.37	07.34	+ 08.03.09	09.002	09.055	↑ 09.108	0X6
	02.11.10	0470	05.11.42	4- 06.38	07.35	• 08.03.10	09.003	09.056	09.109	• 0X7I
	02.11.11	04A0	⊈ ≠05.11.43	+ 06.39	07.36	►08.03.11	09.004	09.057	09.110	• 0XA
	02.11.12	04X0	}≻05.11.ak.01	06.40	0700	• 08.03.12	09.005	09.058	109.111	
	02.11.ak.01	05.10.01	> 05.11.ak.01.0X00	= 06.41	0710	08.03.13	09.006	§ 09.059	† 09.112	♦ 10.0
	~^ 02.14.01	05.10.02	€05.11.ak.02	F 06.42	0720	08.03.14	+ 09.007	§ 09.060	09.113	(人10.0
< III >>	•	111								

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Line Symbols

Style Manager

rle Manager								
	=0000	- 01.02.18	- 02.02.10	- 02.06.10	- 02.09.01	- 02.10.30	 02.12.41	Close
ESRI.style	=0010	- 01.02.19	- 02.02.11	- 02.06.11	- 02.09.02	• 02.10.31	- 02.12.42	Close
□ C:\gems\AK_GeMS_symbology_ver_1.s		- 01.02.20	- 02.02.12	-02.06.11/02.13.04	- 02.09.03	- 02.10.32	- 02.12.43	
C.(genis(AK_Genis_symbology_vel_1.s)	- 01.01.01	- 01.02.21	- 02.02.13	- 02.06.12	- 02.09.04	- 02.10.33	T 02.12.44	Styles
	- 01.01.02	- 01.02.22	- 02.02.14	- 02.06.13	- 02.09.05	- 02.10.34	- 02.12.45	
Maplex Labels	- 01.01.03	- 01.02.23	- 02.02.15	- 02.06.14	- 02.09.06	- 02.10.35	+ 02.12.46	
Shadows	- 01.01.04	- 01.02.24	- 02.02.16	• 02.06.15	- 02.09.07	- 02.10.36	+ 02.12.47	
Area Patches	- 01.01.05	- 01.02.25	- 02.03.01	- 02.06.15/02.13.04	- 02.09.08	- 02.10.37	+ 02.12.48	
🗀 Line Patches	- 01.01.06	- 01.02.26	- 02.03.02	• 02.06.16	- 02.09.09	- 02.10.38	- 02.12.49	
🗀 Labels	- 01.01.07	- 01.02.27	- 02.03.03	- 02.07.01	- 02.09.10	- 02.10.39	+ 02.12.50	
Representation Markers	- 01.01.08	- 01.02.28	- 02.03.04	- 02.07.02	- 02.09.11	- 02.10.40	+ 02.12.51	
- C North Arrows	- 01.01.09	- 01.02.29	- 02.03.05	- 02.07.03	- 02.09.12	02.11.02	+ 02.12.52	
🔚 Scale Bars	- 01.01.10	- 01.02.30	- 02.03.06	- 02.07.04	- 02.09.13	02.11.21	- 02.12.53	
- 🗁 Legend Items	- 01.01.11	- 01.02.31	- 02.03.07	- 02.07.05	- 02.09.14	- 02.12.01	+ 02.12.54	
Cale Texts	- 01.01.12	- 01.02.32	- 02.03.08	- 02.07.06	- 02.09.15	- 02.12.02	÷ 02.12.55	
Color Ramps	- 01.01.13	01.02.33	- 02.04.01	- 02.07.07	- 02.09.16	- 02.12.03	÷ 02.12.56	
Borders	- 01.01.14	✓ 01.02.35	- 02.04.01red/02.11.04r		- 02.09.17	- 02.12.04	- 02.12.57	
- Backgrounds	01.01.15	✓ 01.02.37	- 02.04.02	- 02.07.09	- 02.09.18	+ 02.12.01	- 02.12.58	
- Colors	01.01.16	01.02.39	- 02.04.03	- 02.07.10	- 02.09.19	- 02.12.06	+ 02.12.59	
Vectorization Settings	01.01.17	- 01.03.01	- 02.04.03/02.11.04	- 02.07.11	- 02.09.20	- 02.12.07	+ 02.12.60	
	01.01.19	- 01.03.02	- 02.04.04	- 02.07.12	- 02.09.21	+ 02.12.07	- 02.12.61	
Fill Symbols	01.01.20	+ 01.03.03	- 02.04.05	- 02.07.13	- 02.09.22	+ 02.12.09	- 02.12.62	
- 🔁 Line Symbols		+ 01.03.04	- 02.04.05/02.11.04	- 02.07.14	- 02.09.23	- 02.12.00	+ 02.12.63	
- 🚰 Marker Symbols	····· 01.01.21		- 02.04.06	- 02.07.15	- 02.09.24	- 02.12.10 - 02.12.11	± 02.12.64	
Carl Symbols	→ 01.01.25 → 01.01.25	- 01.03.06	- 02.04.07	- 02.07.16	- 02.10.01	- 02.12.11	- 02.12.65	
Representation Rules	→ 01.01.25	- 01.03.07	- 02.04.08	- 02.08.01	- 02.10.01	- 02.12.12	- 02.12.65	
Hatches	— 01.01.26 — 01.01.27	- 01.03.08	- 02.05.01	- 02.08.01/02.13.04	- 02.10.02	- 02.12.13 - 02.12.14	- 02.12.67	
E:\styles\map_unit_points.style	→ 01.01.27	-01.03.09	- 02.05.02	- 02.08.02	- 02.10.03	- 02.12.14 - 02.12.15	- 02.12.67 - 02.12.68	
E:\styles\map_unit_lines.style		- 01.03.10	- 02.05.02	- 02.08.03	- 02.10.04	- 02.12.15 - 02.12.16	- 02.12.69	
, ,		- 01.03.10	- 02.05.03	02.08.03/02.13.04	- 02.10.05	- 02.12.18	- 02.12.09	
		- 01.03.12	- 02.05.05	- 02.08.04	- 02.10.07	- 02.12.17	- 02.12.70 - 02.12.71	
	01.01.31	= 01.03.12	- 02.05.06		- 02.10.07			
				• 02.08.04/02.13.04		+ 02.12.19	+ 02.12.72	
	- 01.01.33	=0120	- 02.05.07	- 02.08.05	- 02.10.09	+ 02.12.20	+ 02.12.73	
	⊤ 01.01.34	=0130	- 02.05.08	- 02.08.06	- 02.10.10	+ 02.12.21	+ 02.12.74	
	- 01.01.35	==01A0	- 02.05.09	- 02.08.07	- 02.10.11	+ 02.12.22	+ 02.12.75	
	T 01.01.36	=01X0	- 02.05.10	••• 02.08.07/02.13.04	- 02.10.12	+ 02.12.23	+ 02.12.76	
	- 01.02.01	- 02.01.01	- 02.05.11	- 02.08.08	- 02.10.13	+ 02.12.24	+ 02.12.77	
	- 01.02.02	- 02.01.02	- 02.05.12	- 02.08.09	- 02.10.14	- 02.12.25	+ 02.12.78	
	- 01.02.03	- 02.01.03	- 02.05.13	- 02.08.10	• 02.10.15	T 02.12.26	+ 02.12.79	
	- 01.02.04	- 02.01.04	- 02.05.14	- 02.08.11	·· 02.10.16	T 02.12.27	+ 02.12.80	
	- 01.02.05	- 02.01.05	·· 02.05.15	- 02.08.12	- 02.10.17	T 02.12.28	+ 02.12.81	
	- 01.02.06	- 02.01.06	• 02.05.16	- 02.08.13	- 02.10.18	- 02.12.29	+ 02.12.82	
	- 01.02.07	- 02.01.07	- 02.06.01	- 02.08.14	- 02.10.19	T 02.12.30	+ 02.12.83	
	- 01.02.08	- 02.01.08	- 02.06.02	·· 02.08.15	- 02.10.20	- 02.12.31	+ 02.12.84	
	- 01.02.09	- 02.02.01	- 02.06.03	·· 02.08.16	- 02.10.21	- 02.12.32	- 02.12.85	
	- 01.02.10	- 02.02.02	= 02.06.03/02.13.04	- 02.08.17	- 02.10.22	- 02.12.33	- 02.12.86	
	- 01.02.11	- 02.02.03	- 02.06.04	- 02.08.18	- 02.10.23	- 02.12.34	- 02.12.87	
	- 01.02.12	- 02.02.04	- 02.06.05	- 02.08.19	- 02.10.24	- 02.12.35	- 02.12.88	
	- 01.02.13	- 02.02.05	- 02.06.06	- 02.08.20	- 02.10.25	- 02.12.36	02.13.01	
	- 01.02.14	- 02.02.06	- 02.06.07	- 02.08.21	- 02.10.26	- 02.12.37	02.13.02	
	- 01.02.15	- 02.02.07	- 02.06.08	- 02.08.22	- 02.10.27	- 02.12.38	02.13.03	
	- 01.02.16	- 02.02.08	- 02.06.09	- 02.08.23	- 02.10.28	- 02.12.39	02.13.04	
	- 01.02.17	- 02.02.09	-02.06.09/02.13.04	 02.08.24 	- 02.10.29	- 02.12.40	- 02.16.01	
4 111								(55)
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Agenda

- Introduction
 - Key Symbology quotes from TM 11-B10 (GeMS)
 - Very brief review AK GeMS Geologic Mapping System
- AK GeMS Symbology philosophy & architecture
- Style File AK_GeMS_symbols_ver_1.style
- Custom Symbols Procedures and Documentation
- Future work

AK DGGS Symbol Categories & Code Conventions



AK GEMS SYMBOLOGY: A DESCRIPTION OF THE AK GEMS STYLE FILE, MP 167

- FGDC Standard Symbols—This tab explains all the FGDC Standard Symbols in the style file as they are found in the FGDC manual. Symbols are listed by their FGDC Symbol code, with padded zeros (example 01.01.01)
- Compound FGDC Symbols—This tab explains compound symbols which are created from two or more standard FGDC Symbols. Typically these are lines that need to have a repeating decoration along them, or a second symbol level of line color. Symbols are listed by the first FGDC Symbol code / second symbol code (example 02.04.03/02.11.04)
- Custom Symbols w FGDC Sections—This tab explains custom symbols that fit into the established FGDC Sections. The symbol codes all start with the FGDC section and subsection into which the feature corresponds, followed by 'ak' and a unique number (example 01.03.ak.01)
- Custom Symbols NO FGDC Sections— This tab explains custom symbols that DO NOT fit into the established FGDC Sections. The symbol codes all start with 'ak', followed by a group number (starting at 101 and assigned based on Category), followed by a unique number (example ak.101.01)
- **Symbols with alternate colors**—This tab explains FGDC and AK GeMS custom symbols that need to be shown in alternate colors. In the FGDC manual, the notes on usage for many symbols indicate that a symbol "may be shown in other colors". The default color, as shown in the FGDC manual, is the default color for the symbol in the style file.
 - When an alternate color is needed, a custom symbol is created that uses the standard symbol code and the CMYK color code of the alternate color.
 - For example, FGDC standard symbol 18.56 is a volcanic vent that has a default red color. When needed to be shown in black, the feature is symbolized with code **18.56.XXX0**.
 - To keep with the FGCD color convention of always keeping the K=0, the code XXX0 is used to represent black.
- **map_unit_point Symbols**—This tab explains the convention for symbolizing map unit points. Symbols code is the FGDC color code that corresponds to the color of each map unit
- map_unit_line Symbols This tab explains the convention for symbolizing map unit. Symbols code is the FGDC color code that corresponds to the color of each map unit

AK DGGS "Symbol Types"

symbol _type	definition
FGDC Primary	The primary and expected FGDC symbol used to draw a feature type stored in an AK GeMS database.
FGDC Secondary	A substitute FGSC symbol used to draw a feature type stored in an AK GeMS database. These symbols should not be used without coordination with the AK GeMS admin staff. See the assoc_symbol_code field for this secondary symbol's primary symbol.
FGDC Decoration	A FGSC symbol used to enhance, or decorate a symbol. For example, a plunge direction.
FGDC Decoration Secondary	A substitute FGDC symbol used to enhance or decorate a symbol. For example, a plunge direction. These symbols should not be used without coordination with the AK GeMS admin staff. See the assoc_symbol_code field for this secondary symbol's primary symbol.
FGDC Alternate	An alternate FGDC symbol used to draw a feature with special characteristics stored in an AK GeMS database. A typical example of an alternate symbols is an orientation point with multiple observations at one locality. See the assoc_symbol_code field for this symbol's primary symbol.
FGDC Not Used by AK GeMS	The FGDC symbol is not currently used by DGGS
FGDC Not Available in Style	The FGDC symbol is not available in the current style file.
AK GeMS Custom Primary	Custom symbol made by DGGS staff for features that do not have a standard FGDC symbol or in cases where a FGCD symbol needs to be repurposed.
AK GeMS Custom Secondary	Custom substitute symbol made by DGGS staff for features that do not have a standard FGDC symbol or in cases where a FGCD symbol needs to be repurposed.

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	Symbol Type	FGDC Section	FGDC Sub-Sectio					Category	Туре	Feature Description	Associated Symbo		er Usage	Notes	
	FGDC Primary	1Contacts, Key Beds, and Dikes	1.1Contacts	A-1-1	01.01.01	1.1.1	contacts_and_faults	contact	contact, generic	Contact—Identity and existence certain, location accurate	Null	Line Symbol			
	FGDC Primary	1Contacts, Key Beds, and Dikes	1.1Contacts	A-1-1	01.01.02	1.1.2	contacts_and_faults	contact	contact, generic	Contact-Identity or existence questionable, location accurate	Null	Line Symbol			
	FGDC Primary	1Contacts, Key Beds, and Dikes	1.1Contacts	A-1-1	01.01.03	113	contacts_and_faults		contact, generic	location approximate	Null	Line Symbol			
	FGDC Primary	1Contacts, Key Beds, and Dikes	1.1Contacts	A-1-1	01.01.04	1.1.4	contacts_and_faults	contact	contact, generic	Contact—Identity or existence questionable, location approximate		Line Symbol			
F	FGDC Primary	1Contaots, Key Beds, and Dikes	1.1Contacts	A-1-1	01.01.05	115	contacts_and_faults	contact	contact, generic	Contact—Identity and existence certain, location inferred	Null	Line Symbol			
	GDC Primary	1Contacts, Key Beds, and Dikes	1.1Contacts	A-1-1	01.01.06	1.1.6	contacts_and_faults	contact	contact, generic	Contact—Identity or existence questionable, location inferred	Null	Line Symbol			
F	GDC Primary	1Contacts, Key Beds, and Dikes	1.1Contacts	A-1-1	01.01.07	117	contacts_and_faults	contact	contact, generic	Contact—Identity and existence certain, location concealed	Null	Line Symbol			
F	GDC Primary	1Contacts, Key Beds, and Dikes	1.1Contacts	A-1-1	01.01.08	1.1.8	contacts_and_faults	contact	contact, generic	Contact—Identity or existence questionable, location concealed	Null	Line Symbol			
F	GDC Primary	1Contacts, Key Beds, and Dikes	1.1Contacts	A-1-1	01.01.09	1.1.9	contacts_and_faults	contact	contact, internal	Internal contact-Identity and existence certain, location accurate	Null	Line Symbol			
F	FGDC Primary	1Contacts, Key Beds, and Dikes	1.1Contacts	A-1-1	01.01.10	1.1.10	contacts_and_faults	contact	contact, internal	Internal contact-Identity or existence guestionable, location accurate	Null	Line Symbol			
F	FGDC Primary	1Contacts, Key Beds, and Dikes	1.1Contacts	A-1-1	01.01.11	1.1.11	contacts_and_faults	contact	contact, internal		Null	Line Symbol			
F	FGDC Primary	1Contacts, Key Beds, and Dikes	1.1Contacts	A-1-1	01.01.12	1.1.12	contacts_and_faults	contact	contact, internal		Null	Line Symbol			
F	GDC Primary	1Contacts, Key Beds, and Dikes	1.1Contacts	A-1-1	01.01.13	1.1.13	contacts_and_faults	contact	contact, internal		Null	Line Symbol			
F	GDC Primary	1Contacts, Key Beds, and Dikes	1.1Contacts	A-1-1	01.01.14	1.1.14	contacts_and_faults	contact	contact, internal	Internal contact—Identity or existence guestionable, location inferred	Null	Line Symbol			
F	GDC Primary	1Contacts, Key Beds, and Dikes	1.1Contacts	A-1-1	01.01.15	1.1.15	contacts_and_faults	contact	contact, internal	Internal contact-Identity and existence certain, location concealed	Null	Line Symbol			
F	GDC Primary	1Contacts, Key Beds, and Dikes	1.1Contacts	A-1-1	01.01.16	1.1.16	contacts_and_faults	contact	contact, internal	Internal contact—Identity or existence guestionable, location concealed	Null	Line Symbol			
F	GDC Primary	1Contacts, Key Beds, and Dikes	1.1Contacts	A-1-1	01.01.17	1.1.17	contacts_and_faults	contact	contact, gradational	Gradational contact-Identity and existence certain, location accurate	Null	Line Symbol			
F	GDC Primary	1Contacts, Key Beds, and Dikes	1.1Contacts	A-1-1	01.01.18	1.1.18	contacts_and_faults	contact	contact, gradational	Gradational contact-Identity or existence questionable, location accurate	Null	Line Symbol			
F	GDC Primary	1Contacts, Key Beds, and Dikes	1.1Contacts	A-1-1	01.01.19	1.1.19	contacts_and_faults	contact	contact, gradational	Gradational contact-Identity and existence certain, location approximate	Null	Line Symbol			
	GDC Primary	1Contacts, Key Beds, and Dikes	1.1Contacts	A-1-1	01.01.20	1.1.20	contacts_and_faults	contact	contact, gradational	Gradational contact-Identity or existence questionable, location approximate	Null	Line Symbol			
F	GDC Primary	1Contacts, Key Beds, and Dikes	1.1Contacts	A-1-1	01.01.21	1.1.21	contacts_and_faults	contact	contact, gradational	Gradational contact-Identity and existence certain, location inferred	Null	Line Symbol			
F	FGDC Primary	1Contacts, Key Beds, and Dikes	1.1Contacts	A-1-1	01.01.22	1.1.22	contacts_and_faults	contact	contact, gradational	Gradational contact-Identity or existence questionable, location inferred	Null	Line Symbol			
	FGDC Primary	1Contacts, Key Beds, and Dikes	1.1Contacts	A-1-1	01.01.23	1.1.23	contacts_and_faults	contact	contact, gradational	Gradational contact-Identity and existence certain, location concealed	Null	Line Symbol			
	FGDC Primary	1Contacts, Key Beds, and Dikes	1.1Contacts	A-1-1	01.01.24	1.1.24	contacts_and_faults		contact, gradational	questionable, location concealed	Null	Line Symbol			
	FGDC Primary	1Contacts, Key Beds, and Dikes	1.1Contacts	A-1-2	01.01.25	1.1.25	contacts_and_faults	contact	contact, unconformable		Null	Line Symbol			
	FGDC Primary	1Contacts, Key Beds, and Dikes	1.1Contacts	A-1-2	01.01.26	1.1.26	contacts_and_faults	contact	contact, unconformable	Unconformable contact—Identity or existence questionable, location accurate	Null	Line Symbol			
	FGDC Primary	1Contacts, Key Beds, and Dikes	1.1Contacts	A-1-2	01.01.27	1.1.27	contacts_and_faults	contact	contact, unconformable	Unconformable contact—Identity and existence certain, location approximate	Null	Line Symbol			
	FGDC Primary	1Contacts, Key Beds, and Dikes	1.1Contacts	A-1-2	01.01.28	1.1.28	contacts_and_faults	contact	contact, unconformable	Unconformable contact—Identity or existence questionable, location	Null	Line Symbol			
	()	A-FGDC Standa	rd Symbols	B-Compo	ound FG	DC Sym	nbols C-Ci	ustom Symb	os w FGDC Sections	D-Custom Symbs NO F	GDC Sections	E-Svn	nbols v 🕀		

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2.04.05		02.11.04	+	02.04.05/02.11.04		contacts_ar	acts_and_faults		fault, reverse			show relative motion. Reverse fault—Identity and exist Fault showing local right-lateral (motion,						
2.06.03	-==	02.13.04		02.06.03/02.13.04		contacts_ar	nd_faults	fault	fault, strike	, strike-slip, right-lateral offset			rike-slip fau rtain, locati	on approxima		ty and existence ht during Quaternary	line s	
2.06.09	<u> </u>	02.13.14		02.06.09/02.13.14		contacts_ar	nd_faults	fault	fault, strike	⊢slip, left-lat	teral offset	Si	rtain, locati	ty and existe during Qual		line		
2.06.11	<u> </u>	02.13.14		02.06.1¥02.13.14		contacts_ar	nd_faults	fault	fault, strike	⊷slip, left-lat	teral offset	St	rtain, locati	ult, left-lateral on approxima				line :
2.06.15		02.13.04		02.06.15/02.13.04		contacts_ar	nd_faults	fault	fault, strike-slip, left-lateral offset		St	rtain, locati	ult, left-lateral on concealed.			line		
2.08.01		02.13.04		02.08.01/02.13.04		contacts_ar	nd_faults	fault	fault, thrust	rust		TI	time (undifferentiated). Thrust fault —Identity and existence Displacement during Quaternary tim					lines
2.08.03		02.13.04		02.08.03/02.13.04		contacts_ar	nd_faults	fault	fault, thrust		ap	Thrust fault —Identity and existence of approximate. Displacement during Qu				n	line :	
2.08.04	??	02.13.04		02.08.04/02.13.04		contacts_ar	nd_faults	fault	fault, thrust	t		Ti ap		-Identity or exi Displacement			ation	line
2.08.07	••••	02.13.04		02.08.07/02.13.04		contacts_ar	nd_faults	fault	fault, thrust	t		Ti	nrust fault–	-Identity and e isplacement d			1	line
5.01.05	\$	05.10.05	•	05.01.05/05.10.05	←-ţ	structure_li		fold	fold, anticli	ne		PI	unging ant	icline—Identit ge arrowhead s				line
5.03.05	‡	05.10.05	•	05.03.05/05.10.05	~ -\$	structure_li		fold		line, asymm		lo	cation infer	rmmetric antic red. Large arro	whead show	s direction o	f plunge.	
5.03.06	‡?	05.10.05	4	05.03.06/05.10.05	← _‡ <i></i> ?	structure_lin		fold		line, asymm	etric	qu		rmmetric antic , location infer lunge.				line s
5.05.06	‡?		•	05.05.06/05.10.07	►- <u></u> ‡?	structure_li		fold	fold, syncli			lo	cation infer	ncline—Identit red. Large arro	whead show	s direction o	f plunge.	line s
5.06.03	-+	05.10.05	•	05.06.03/05.10.05	←+	structure_li		fold	fold, synfo			ар	proximate.	nform—Identit Large arrowh	ead shows di	ection of plu	unge.	line s
5.07.05	+	05.10.07	ard Symbo	05.07.05/05.10.07		structure_li	nes	fold	told, syncli	line, asymm ections				mmetric sync FGDC Se		and exister	nce certain,	lines

Future Work

- Continue adding custom symbols to style
- Integrate style_info table into data dictionary & DB template to assist with robust popups on interactive maps.
- Begin transition to ArcPro style becoming the primary style
- Explore symbolizing with Dictionary Symbology

Question?