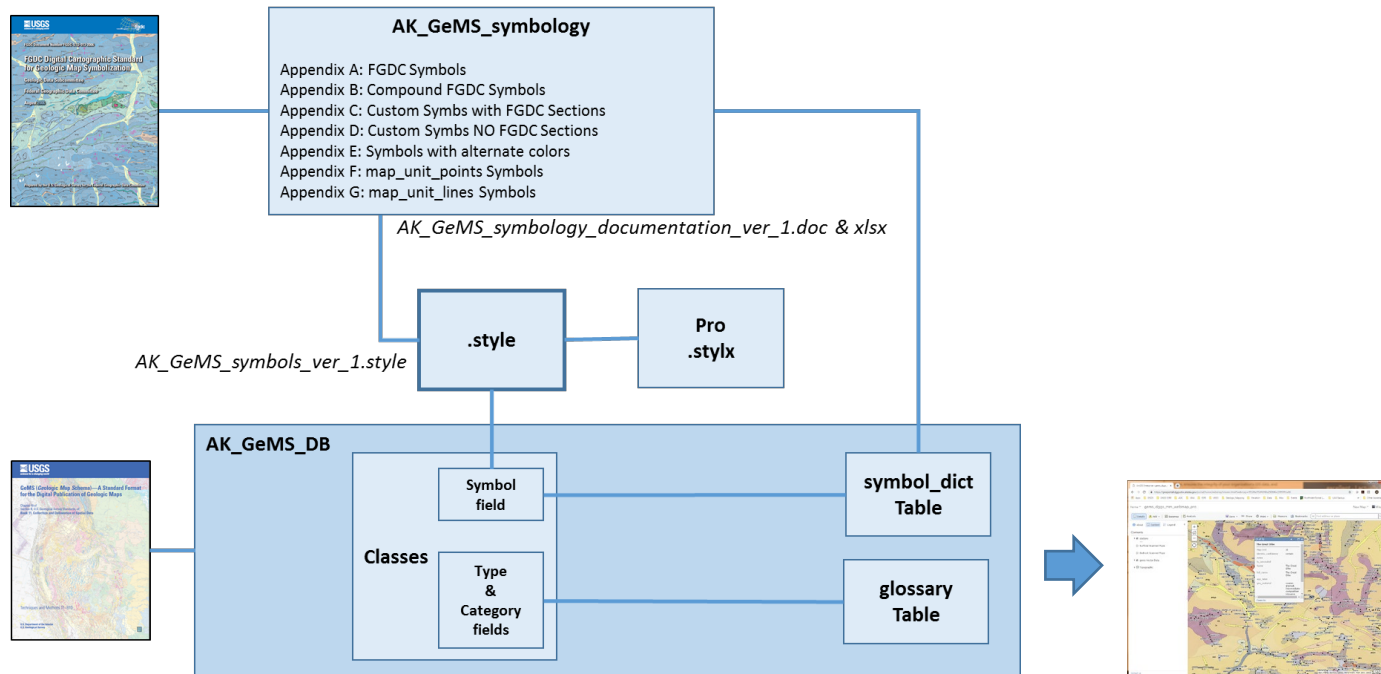


# Symbolizing a GeMS Database

DMT 2021

08 Jun 2021



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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**

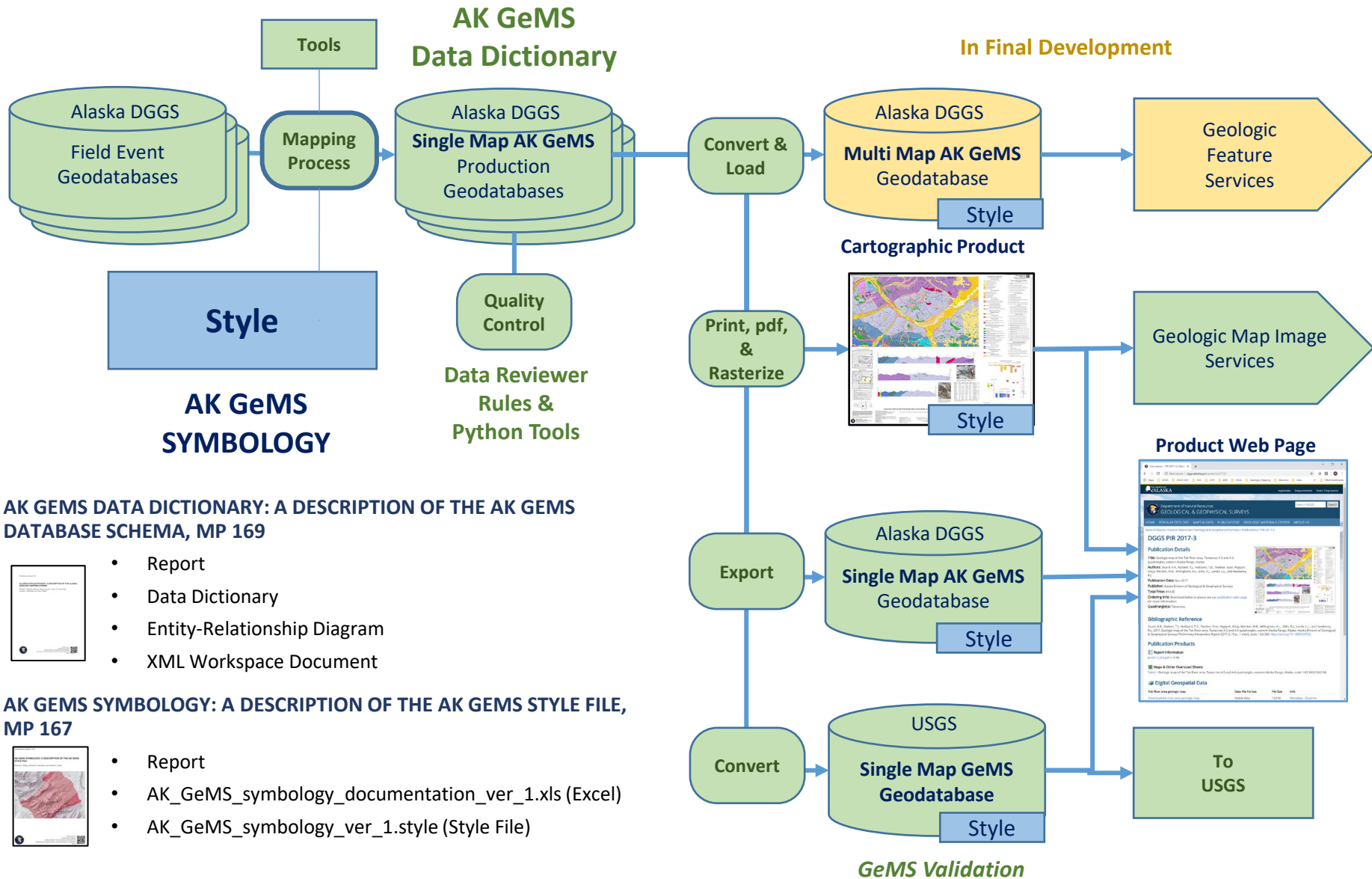
# TM 11-B10: GeMS (Geologic Map Schema) Symbology Quotes

*“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

## Organizational Procedures



### AK GEMS DATA DICTIONARY: A DESCRIPTION OF THE AK GEMS DATABASE SCHEMA, MP 169



- Report
- Data Dictionary
- Entity-Relationship Diagram
- XML Workspace Document

### 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)

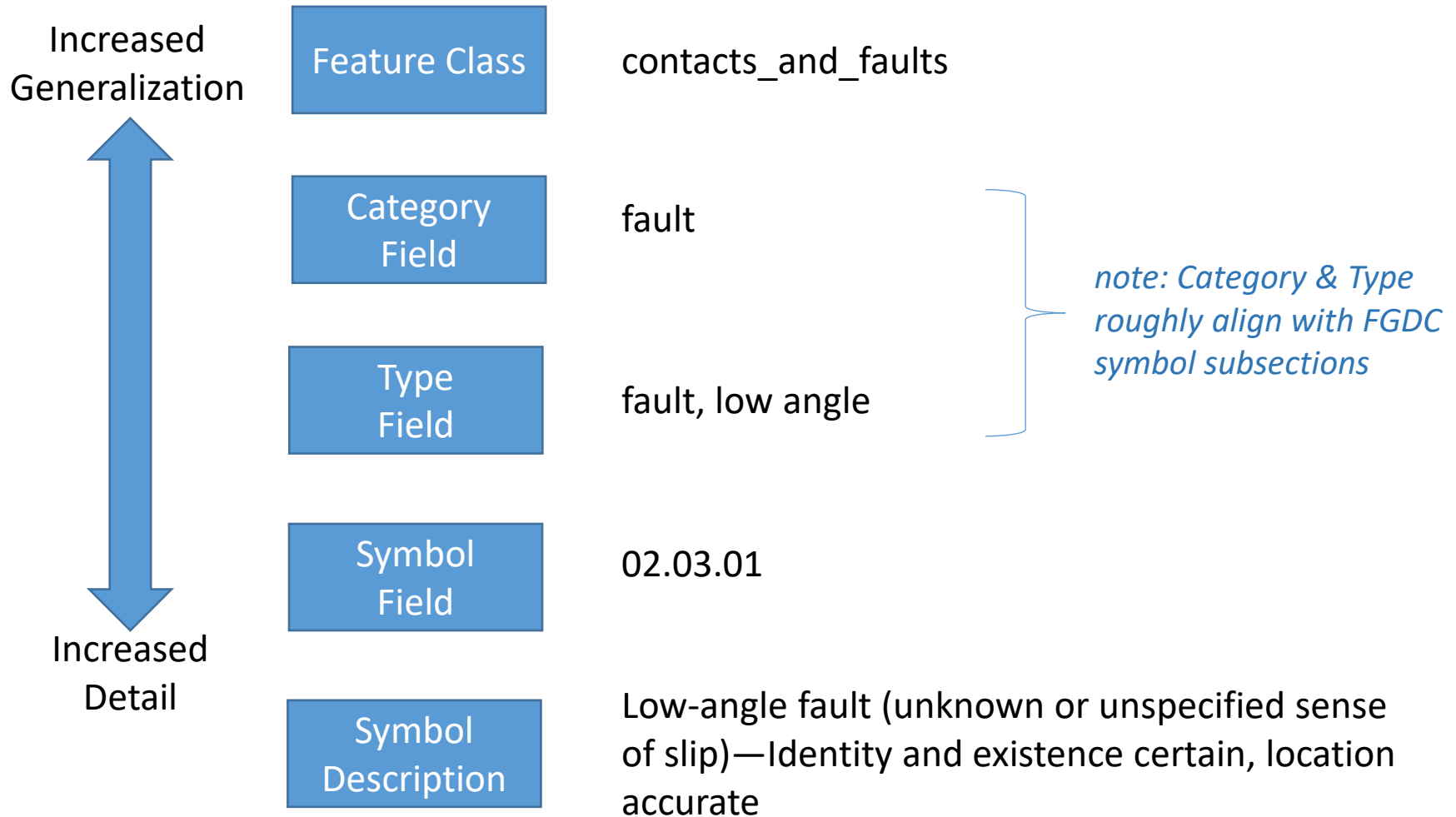
# Agenda

- Introduction
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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

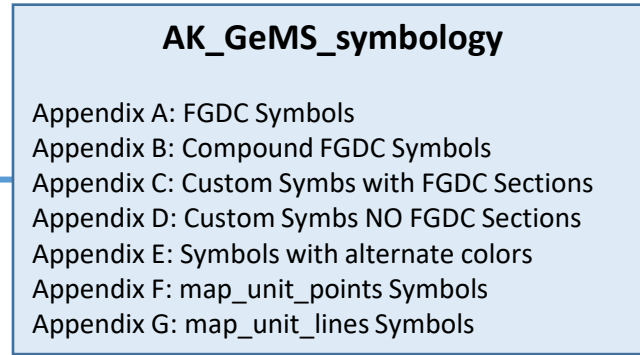
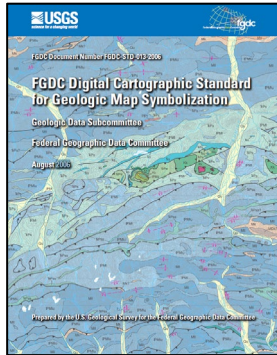
# Symbol code is part of a feature's representation hierarchy



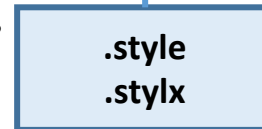
# AK GeMS Symbology Architecture

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

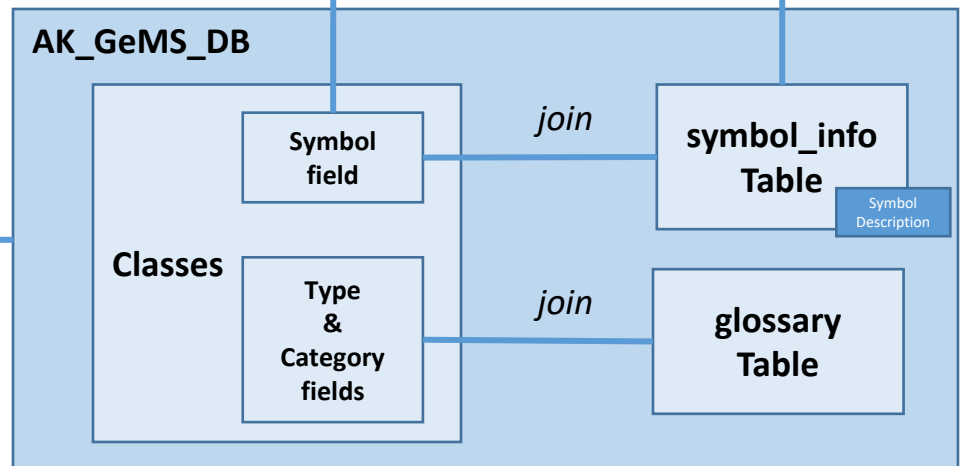
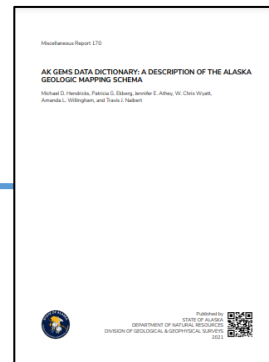
- Report
- AK\_GeMS\_symbology\_documentation\_ver\_1.xls (Excel)
- AK\_GeMS\_symbology\_ver\_1.style (Style File)



**AK\_GeMS\_symbols\_ver\_1.style**



## AK GEMS DATA DICTIONARY: A DESCRIPTION OF THE AK GEMS DATABASE SCHEMA, MP 169





# Key Symbol Related Schema Implementations

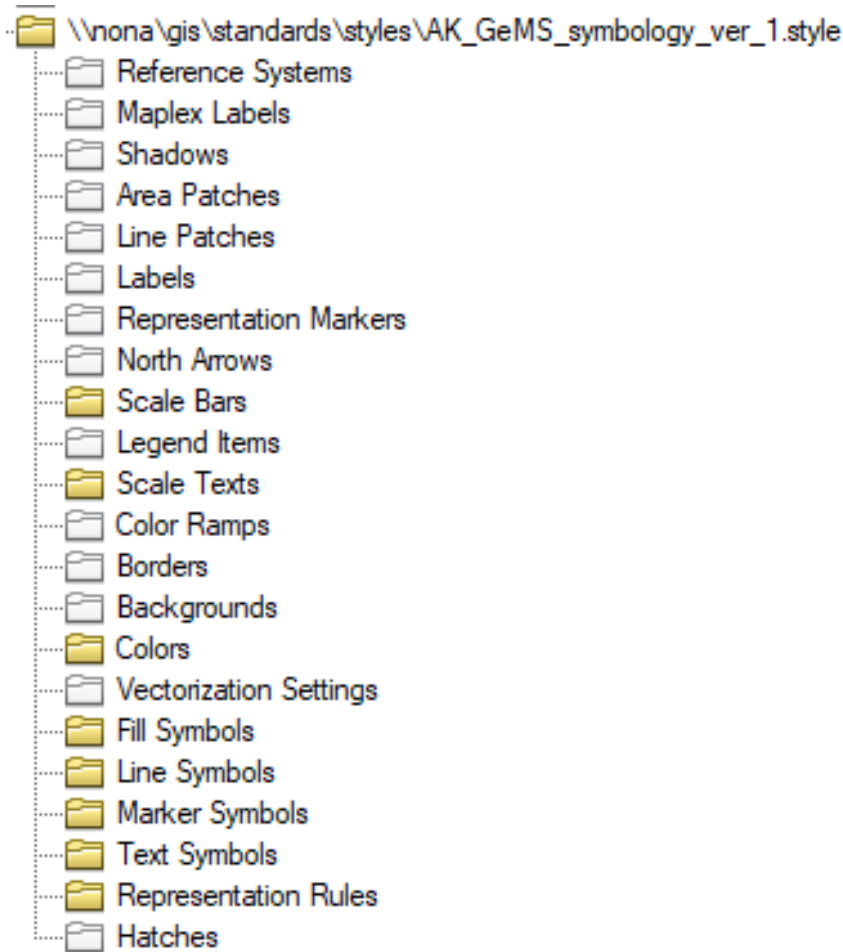
- All feature classes have **symbol** field
- All feature classes have binary **draw\_policy** field
  - *PlotAtScale field is not included in AK GeMS. We assume a value of 0 (draw at all scales) in GeMS submissions*
- Include **symbol\_rotation** field with select FCs: geologic\_points, cartographic\_points. *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

# Agenda

- Introduction
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Elements included in:

*AK\_GeMS\_symbols\_ver\_1.style*



# Colors in style

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%.

The screenshot shows the 'Style Manager' application window. On the left is a tree view of style categories including 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, and Hatches. The main area displays a grid of 400 color swatches, each with a unique alphanumeric code. The codes are arranged in 20 columns and 20 rows, starting from 0000 in the top-left and ending with XXXX in the bottom-right. The colors transition through a spectrum from light pastels to dark, saturated colors. The application window includes a 'Close' button, a 'Styles...' button, and a scroll bar at the bottom.

# Map\_unit\_points symbols

The image shows a screenshot of the 'Style Manager' application window. The main area displays a grid of 440 symbols, each represented by a small colored circle with a unique alphanumeric label. The labels are organized in a grid of 20 columns and 22 rows. The labels include codes such as 0000, 0450, 0XA0, 1500, 2030, 2560, 30X0, 3620, 4150, 46A0, 5210, 5740, 6270, 6A00, 7330, 7A50, A3X0, AX20, X450, and many others, ending with 0440, 0X70, 14X0, 2020, 2550, 30A0, 3610, 4140, 4670, 5200, 5730, 6260, 67X0, 7320, 7A40, A3A0, AX10, X440.

The left sidebar shows a tree view of style categories, including:

- 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

The right sidebar contains two buttons: 'Close' and 'Styles...'. The window title is 'Style Manager'.

# Map\_unit\_points symbols

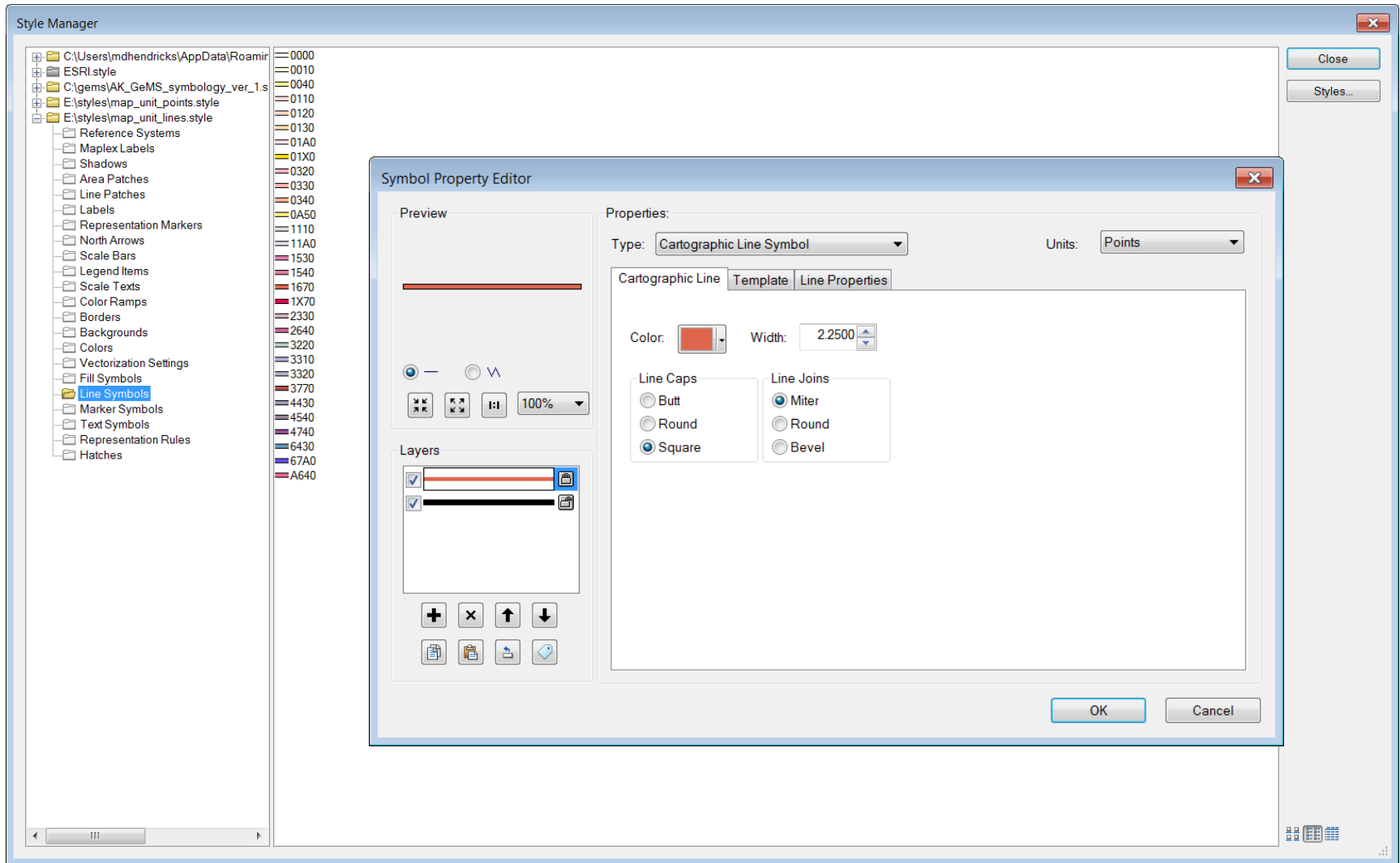
The screenshot displays the ArcGIS Style Manager interface. The main window is titled "Style Manager" and shows a tree view on the left with categories like "Reference Systems", "Maplex Labels", "Shadows", "Area Patches", "Line Patches", "Labels", "Representation Markers", "North Arrows", "Scale Bars", "Legend Items", "Scale Texts", "Color Ramps", "Borders", "Backgrounds", "Colors", "Vectorization Settings", "Fill Symbols", "Line Symbols", "Marker Symbols", "Text Symbols", "Representation Rules", and "Hatches".

The "Symbol Property Editor" is open, showing a "Preview" window with a yellow circle symbol. The "Properties" section is set to "Simple Marker Symbol" and "Mask". The "Simple Marker" section includes a "Color" dropdown (yellow), a "Style" dropdown (Circle), a "Size" spinner (8.0000), and a "Use Outline" checkbox (checked). The "Outline" section includes an "Outline" color dropdown (black) and an "Outline" spinner (0.5000). The "X Offset" and "Y Offset" spinners are both set to 0.0000.

A "Color Selector" dialog is open, showing the "Color" tab. The "CMYK" values are: C: 13%, M: 8%, Y: 100%, K: 0%. The dialog includes a color bar and "OK" and "Cancel" buttons.

The symbol palette at the top shows a grid of symbols with alphanumeric codes. The bottom of the palette shows a vertical list of codes: X710, X720, X730, X740, X750, X760, X770, X7A0, X7X0, X7X10, X7X20, X7X30, X7X40, X7X50, X7X60, X7X70, X7X80, X7X90, X800, X810, X820, X830, X840, X850, X860, X870, X880, X890, X900, X910, X920, X930, X940, X950, X960, X970, X980, X990.

# Map\_unit\_lines symbols



# Fill symbols

Style Manager

- C:\Users\mdhendricks\AppData\Roaming\ESRI\style
- C:\gens\AK\_GeMS\_symbology\_ver\_1.s
  - 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
- E:\styles\map\_unit\_points.style
- E:\styles\map\_unit\_lines.style

0000	03A0	0X10	1430	1X10	2430	2X70	3450	3XA0	4440	4XA0	5510	6030	6560	7100	7630
0001	03X0	0X20	1440	1X20	2440	2XA0	3460	3XX0	4450	4XX0	5520	6040	6570	7110	7640
0002	0400	0X30	1450	1X30	2450	2XX0	3470	4000	4460	5000	5530	6050	65A0	7120	7650
0003	0410	0X40	1460	1X40	2460	3000	34A0	4010	4470	5010	5540	6060	65X0	7130	7660
0004	0420	0X50	1470	1X50	2470	3010	34X0	401-C	44A0	5020	5550	6070	6600	7140	7670
0005	0430	0X60	14A0	1X60	24A0	3020	3500	401-K	44X0	5030	5560	60A0	6610	7150	76A0
0006	0440	0X70	14X0	1X70	24X0	3030	3510	401-M	4500	5040	5570	60X0	6620	7160	76B0
0007	0450	0XA0	1500	1XA0	2500	3040	3520	4020	4510	5050	55A0	6100	6630	7170	7700
000A	0460	0XX0	1510	1XX0	2510	3050	3530	4030	4520	5060	55X0	6110	6640	71A0	7710
000X	0470	1000	1520	20.07	2520	3060	3540	4040	4530	5070	5600	6120	6650	71X0	7720
0010	04A0	1010	1530	2000	2530	3070	3550	4050	4540	50A0	5610	6130	6660	7200	7730
0020	04X0	1020	1540	2010	2540	30A0	3560	4060	4550	50X0	5620	6140	6670	7210	7740
0030	0500	1030	1550	2020	2550	30X0	3570	4070	4560	5100	5630	6150	66A0	7220	7750
0040	0510	1040	1560	2030	2560	31.08	35A0	40A0	4570	5110	5640	6160	66X0	7230	7760
0050	0520	1050	1570	2040	2570	31.14	35X0	40X0	45A0	5120	5650	6170	6700	7240	7770
0060	0530	1060	15A0	2050	25A0	31.15	3600	4100	45X0	5130	5660	61A0	6710	7250	77A0
0070	0540	1070	15X0	2060	25X0	31.16	3610	4110	4600	5140	5670	61X0	6720	7260	77B0
00A0	0550	10A0	1600	2070	2600	31.17	3620	4120	4610	5150	56A0	6200	67A0	7270	77C0
00X0	0560	10X0	1610	20A0	2610	3100	3630	4130	4620	5160	56X0	6210	67X0	72A0	77D0
01.02.42	0570	1100	1620	20X0	2620	3110	3640	4140	4630	5170	5700	6220	6750	72X0	77E0
01.02.43	05A0	1110	1630	2100	2630	3120	3650	4150	4640	51A0	5710	6230	6760	7300	77F0
01.02.44	05X0	1120	1640	2110	2640	3130	3660	4160	4650	51X0	5720	6240	6770	7310	77G0
01.02.45	0600	1130	1650	2120	2650	3140	3670	4170	4660	5200	5730	6250	67A0	7320	77H0
01.03.13	0610	1140	1660	2130	2660	3150	36A0	41A0	4670	5210	5740	6260	67X0	7330	77I0
0100	0620	1150	1670	2140	2670	3160	36X0	41X0	46A0	5220	5750	6270	6800	7340	77J0
0110	0630	1160	16A0	2150	26A0	3170	3700	4200	46X0	5230	5760	62A0	6A10	7350	77K0
0120	0640	1170	16X0	2160	26X0	31A0	3710	4210	4700	5240	5770	62X0	6A20	7360	77L0
0130	0650	119-K	17.58	2170	2700	31X0	3720	4220	4710	5250	57A0	6300	6A30	7370	77M0
0140	0660	11A0	17.59	21A0	2710	3200	3730	4230	4720	5260	57X0	6310	6A40	73A0	77N0
0150	0670	11X0	17.60	21X0	2720	3210	3740	4240	4730	5270	57C0	6320	6A50	73X0	77O0
0160	06A0	1200	17.61	2200	2730	3220	3750	4250	4740	52A0	57K0	6330	6A60	7400	77P0
0170	06X0	1210	17.65	2210	2740	3230	3760	4260	4750	52X0	5A00	6340	6A70	7410	77Q0
01A0	0700	1220	1700	2220	2750	3240	3770	4270	4760	5300	5A10	6350	6AA0	7420	77R0
01X0	0710	1230	1710	2230	2760	3250	37A0	42A0	4770	5310	5A20	6360	6X00	7430	77S0
02.14.01	0720	1240	1720	2240	2770	3260	37X0	42X0	47A0	5320	5A30	6370	6X10	7440	77T0
0200	0730	1250	1730	2250	27A0	3270	3A00	4300	47X0	5330	5A40	63A0	6X20	7450	77U0
0210	0740	1260	1740	2260	27X0	32A0	3A10	4310	4A00	5340	5A50	63X0	6X30	7460	77V0
0220	0750	1270	1750	2270	2A00	32X0	3A20	4320	4A10	5350	5A70	6400	6X40	7470	77W0
0230	0760	12A0	1760	22A0	2A10	3300	3A30	4330	4A20	5360	5AA0	6410	6X50	74A0	77X0
0240	0770	12X0	1770	22X0	2A20	3310	3A40	4340	4A30	5370	5AX0	6420	6X60	74X0	77Y0
0250	07A0	1300	17A0	2300	2A40	3320	3A50	43A0	4A40	53A0	5X00	6430	6X70	7500	77Z0
0260	07X0	1310	17X0	2310	2A50	3330	3A60	43X0	4A50	53X0	5X10	6440	6XA0	7510	77[0
0270	0A00	1320	19.02.04	2320	2A60	3340	3A70	43A0	4A60	5400	5X20	6450	6XX0	7520	77\0
02A0	0A10	1330	1A00	2330	2A70	3350	3AA0	43A0	4A70	5410	5X30	6460	7000	7530	77]0
02X0	0A20	1340	1A10	2340	2AA0	3360	3AX0	43X0	4A80	5420	5X40	6470	7010	7540	77^0
0300	0A30	1350	1A20	2350	2AX0	3370	3X00	4360	4AX0	5430	5X50	64A0	7020	7550	77_0
0310	0A40	1360	1A30	2360	2X00	33A0	3X10	4370	4X00	5440	5X60	64X0	7030	7560	77`0
0320	0A50	1370	1A50	2370	2X10	33X0	3X20	43A0	4X10	5450	5X70	6500	7040	7570	77a0
0330	0A60	13A0	1A60	23A0	2X20	3400	3X30	43X0	4X20	5460	5XA0	6510	7050	75A0	77b0
0340	0A70	13X0	1A70	23X0	2X30	3410	3X40	4400	4X30	5470	5XX0	6520	7060	75X0	77c0
0350	0AA0	1400	1AA0	2400	2X40	3420	3X50	4410	4X40	54A0	6000	6530	7070	7600	77d0
0360	0AX0	1410	1AX0	2410	2X50	3430	3X60	4420	4X60	54X0	6010	65A0	70A0	7610	77e0
0370	0X00	1420	1X00	2420	2X60	3440	3X70	4430	4X70	5500	6020	6550	70X0	7620	77f0

Close Styles...



# Marker Symbols

The screenshot displays the Style Manager dialog box, which is used for configuring the visual appearance of map elements. The 'Marker Symbols' category is selected, showing a grid of 100 different marker symbols. Each symbol is represented by a small icon and a corresponding alphanumeric label. The symbols include various shapes (circles, squares, diamonds, crosses, etc.) and colors (black, white, yellow, orange, red, purple, pink, etc.). The labels are organized into columns and rows, with some labels starting with '0000', '0100', '0200', etc., and others with '0A0', '0A1', etc. The dialog box has a 'Close' button and a 'Styles...' button on the right side. The background of the dialog box is light blue, and the list of symbols is displayed in a grid format.

0000	02.15.01	05.10.03	05.11.ak.02.0X00	06.43	0730	08.03.15	09.008	09.061	09.1
0001	02.15.02	05.10.04	05.10.05	06.44	0740	08.03.16	09.009	09.062	09.1
0002	02.15.03	05.10.05	05.10.06	06.45	0750	08.03.17	09.010	09.063	09.1
0003	0200	05.10.06	05.10.07	06.46	0760	08.03.18	09.011	09.064	09.1
0004	0210	05.10.07	05.10.08	06.47	0770	08.03.19	09.012	09.065	09.1
0006	0220	05.10.08	05.10.09	06.48	07A0	08.03.20	09.013	09.066	09.1
0007	0230	05.10.09	05.11.01	06.49	07X0	08.03.21	09.014	09.067	09.1
000A	0240	05.11.01	05.11.02	06.50	08.01.01	08.03.22	09.015	09.068	09.1
000X	0250	05.11.02	05.11.03	06.51	08.01.02	08.03.23	09.016	09.069	09.1
0010	0260	05.11.03	05.11.04	06.52	08.01.03	08.03.24	09.017	09.070	09.1
0020	0270	05.11.04	05.11.05	06.53	08.01.04	08.03.25	09.018	09.071	09.1
0030	02A0	05.11.05	05.11.06	06.54	08.01.05	08.03.26	09.019	09.072	09.1
0040	02X0	05.11.06	05.11.07	06.55	08.01.06	08.03.27	09.020	09.073	09.1
0050	03.03.03	05.11.07	05.11.08	06.56	08.02.01	08.03.28	09.021	09.074	09.1
0060	03.03.04	05.11.08	05.11.09	06.57	08.02.02	08.03.29	09.022	09.075	09.1
0070	03.03.05	05.11.09	05.11.10	06.58	08.02.03	08.03.30	09.023	09.076	09.1
00A0	0300	05.11.10	05.11.11	06.59	08.02.04	08.03.31	09.024	09.077	09.1
00X0	0310	05.11.11	05.11.12	07.00	08.02.05	08.03.32	09.025	09.078	09.1
01.03.ak.01	0320	05.11.12	05.11.13	07.01	08.02.06	08.03.33	09.026	09.079	09.1
01.03.ak.02	0330	05.11.13	05.11.14	07.02	08.02.07	08.03.34	09.027	09.080	09.1
01.03.ak.03	0340	05.11.14	05.11.15	07.03	08.02.08	08.03.35	09.028	09.081	09.1
01.03.ak.04	0360	05.11.15	05.11.16	07.04	08.02.09	08.03.36	09.029	09.082	09.1
01.04.01	0370	05.11.16	05.11.17	07.05	08.02.10	08.03.37	09.030	09.083	09.1
01.04.02	03A0	05.11.17	05.11.18	07.06	08.02.11	08.03.38	09.031	09.084	09.1
01.04.03	03X0	05.11.18	05.11.19	07.07	08.02.12	08.03.39	09.032	09.085	09.1
01.04.04	04.02.03	05.11.19	05.11.20	07.08	08.02.13	08.03.40	09.033	09.086	09.1
01.04.05	04.02.04	05.11.20	05.11.21	07.09	08.02.14	08.03.41	09.034	09.087	09.1
01.04.06	04.02.05	05.11.21	05.11.22	07.10	08.02.15	08.03.42	09.035	09.088	09.1
01.04.07	04.02.06	05.11.22	05.11.23	07.11	08.02.16	08.03.43	09.036	09.089	09.1
01.04.08	04.03.01	05.11.23	05.11.24	07.12	08.02.17	08.03.44	09.037	09.090	09.1
01.04.09	04.03.02	05.11.24	05.11.25	07.13	08.02.18	08.03.45	09.038	09.091	09.1
01.04.10	04.03.03	05.11.25	05.11.26	07.14	08.02.19	08.03.46	09.039	09.092	09.1
01.04.11	04.03.04	05.11.26	05.11.27	07.15	08.02.20	08.03.47	09.040	09.093	09.1
0100	04.03.05	05.11.27	05.11.28	07.16	08.02.21	08.03.48	09.041	09.094	09.1
0110	04.03.06	05.11.28	05.11.29	07.17	08.02.22	08.03.49	09.042	09.095	09.1
0120	04.03.07	05.11.29	05.11.30	07.18	08.02.23	08.03.50	09.043	09.096	09.1
0130	04.03.08	05.11.30	05.11.31	07.19	08.02.24	08.03.51	09.044	09.097	09.1
0140	04.03.09	05.11.31	05.11.32	07.20	08.02.25	08.03.52	09.045	09.098	09.1
0150	04.03.10	05.11.32	05.11.33	07.21	08.02.26	08.03.53	09.046	09.099	09.1
0160	04.03.11	05.11.33	05.11.34	07.22	08.03.01	08.03.54	09.047	09.100	09.1
0170	04.03.12	05.11.34	05.11.35	07.23	08.03.02	08.03.55	09.048	09.101	09.1
01A0	0400	05.11.35	05.11.36	07.24	08.03.03	08.03.56	09.049	09.102	09.1
01X0	0410	05.11.36	05.11.37	07.25	08.03.04	08.03.57	09.050	09.103	09.1
02.11.01	0420	05.11.37	05.11.38	07.26	08.03.05	08.03.58	09.051	09.104	09.1
02.11.02	0430	05.11.38	05.11.39	07.27	08.03.06	08.03.59	09.052	09.105	09.1
02.11.03	0440	05.11.39	05.11.40	07.28	08.03.07	08.03.60	09.053	09.106	09.1
02.11.04	0450	05.11.40	05.11.41	07.29	08.03.08	09.001	09.054	09.107	09.1
02.11.05	0460	05.11.41	05.11.42	07.30	08.03.09	09.002	09.055	09.108	09.1
02.11.06	0470	05.11.42	05.11.43	07.31	08.03.10	09.003	09.056	09.109	09.1
02.11.07	04A0	05.11.43	05.11.44	07.32	08.03.11	09.004	09.057	09.110	09.1
02.11.08	04X0	05.11.44	05.11.ak.01	07.33	08.03.12	09.005	09.058	09.111	09.1
02.11.09	05.10.01	05.11.ak.01.0X00	05.11.ak.02	07.34	08.03.13	09.006	09.059	09.112	09.1
02.11.10	05.10.02	05.11.ak.02		07.35	08.03.14	09.007	09.060	09.113	09.1
02.11.11				07.36					10.0
02.11.12				07.37					10.0
02.11.ak.01				07.38					
02.14.01				07.39					

# Line Symbols

Style Manager

- C:\Users\mdhendricks\AppData\Roaming
  - ESRI.style
  - C:\gens\AK\_GeMS\_symbology\_ver\_1.s
    - 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
  - E:\styles\map\_unit\_points.style
  - E:\styles\map\_unit\_lines.style

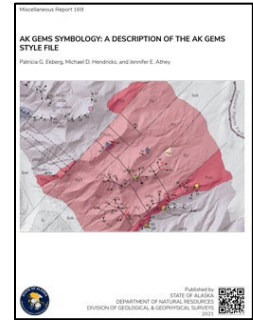
0000	- 01.02.18	- 02.02.10	- 02.06.10	- 02.09.01	- 02.10.30	02.12.41
0010	- 01.02.19	- 02.02.11	- 02.06.11	- 02.09.02	.. 02.10.31	02.12.42
0040	- 01.02.20	- 02.02.12	02.06.11/02.13.04	- 02.09.03	.. 02.10.32	02.12.43
01.01.01	- 01.02.21	- 02.02.13	- 02.06.12	- 02.09.04	- 02.10.33	02.12.44
01.01.02	- 01.02.22	- 02.02.14	- 02.06.13	- 02.09.05	- 02.10.34	02.12.45
01.01.03	.. 01.02.23	.. 02.02.15	- 02.06.14	- 02.09.06	- 02.10.35	02.12.46
01.01.04	.. 01.02.24	.. 02.02.16	.. 02.06.15	.. 02.09.07	- 02.10.36	02.12.47
01.01.05	- 01.02.25	- 02.03.01	02.06.15/02.13.04	.. 02.09.08	- 02.10.37	02.12.48
01.01.06	- 01.02.26	- 02.03.02	.. 02.06.16	- 02.09.09	- 02.10.38	02.12.49
01.01.07	- 01.02.27	- 02.03.03	- 02.07.01	- 02.09.10	.. 02.10.39	02.12.50
01.01.08	- 01.02.28	- 02.03.04	- 02.07.02	- 02.09.11	.. 02.10.40	02.12.51
01.01.09	- 01.02.29	- 02.03.05	- 02.07.03	- 02.09.12	- 02.11.02	02.12.52
01.01.10	- 01.02.30	- 02.03.06	- 02.07.04	- 02.09.13	02.11.21	02.12.53
01.01.11	.. 01.02.31	.. 02.03.07	.. 02.07.05	- 02.09.14	02.12.01	02.12.54
01.01.12	- 01.02.32	.. 02.03.08	.. 02.07.06	.. 02.09.15	02.12.02	02.12.55
01.01.13	∨ 01.02.33	- 02.04.01	.. 02.07.07	.. 02.09.16	02.12.03	02.12.56
01.01.14	∨∨ 01.02.35	red 02.04.01red/02.11.04red	.. 02.07.08	- 02.09.17	02.12.04	02.12.57
01.01.15	∨∨ 01.02.37	- 02.04.02	- 02.07.09	- 02.09.18	02.12.05	02.12.58
01.01.16	∨ 01.02.39	- 02.04.03	- 02.07.10	- 02.09.19	02.12.06	02.12.59
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	02.12.08	02.12.61
01.01.20	+ 01.03.03	- 02.04.05	- 02.07.13	- 02.09.22	02.12.09	02.12.62
01.01.21	+ 01.03.04	- 02.04.05/02.11.04	- 02.07.14	.. 02.09.23	02.12.10	02.12.63
01.01.23	- 01.03.05	- 02.04.06	.. 02.07.15	.. 02.09.24	02.12.11	02.12.64
01.01.25	- 01.03.06	.. 02.04.07	.. 02.07.16	- 02.10.01	02.12.12	02.12.65
01.01.26	→ 01.03.07	.. 02.04.08	.. 02.08.01	- 02.10.02	02.12.13	02.12.66
01.01.27	- 01.03.08	- 02.05.01	02.08.01/02.13.04	- 02.10.03	02.12.14	02.12.67
01.01.28	→ 01.03.09	- 02.05.02	- 02.08.02	- 02.10.04	02.12.15	02.12.68
01.01.29	- 01.03.10	- 02.05.03	- 02.08.03	02.10.05	02.12.16	02.12.69
01.01.30	- 01.03.11	- 02.05.04	02.08.03/02.13.04	- 02.10.06	02.12.17	02.12.70
01.01.31	- 01.03.12	- 02.05.05	- 02.08.04	.. 02.10.07	02.12.18	02.12.71
01.01.32	0110	- 02.05.06	02.08.04/02.13.04	.. 02.10.08	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
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	02.12.26	02.12.79
01.02.04	- 02.01.04	- 02.05.14	- 02.08.11	.. 02.10.16	02.12.27	02.12.80
01.02.05	- 02.01.05	.. 02.05.15	- 02.08.12	.. 02.10.17	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	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

Close Styles...

# 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 FGDC 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

Custom symbols

# AK DGGS “Symbol Types”

symbol_type	definition
<b>FGDC Primary</b>	The primary and expected FGDC symbol used to draw a feature type stored in an AK GeMS database.
<b>FGDC Secondary</b>	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.
<b>FGDC Decoration</b>	A FGSC symbol used to enhance, or decorate a symbol. For example, a plunge direction.
<b>FGDC Decoration Secondary</b>	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.
<b>FGDC Alternate</b>	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.
<b>FGDC Not Used by AK GeMS</b>	The FGDC symbol is not currently used by DGGS
<b>FGDC Not Available in Style</b>	The FGDC symbol is not available in the current style file.
<b>AK GeMS Custom Primary</b>	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.
<b>AK GeMS Custom Secondary</b>	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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A1 Symbol Type

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
	Symbol Type	FGDC Section	FGDC Sub-Section	FGDC Page	Symbol Co	FGDC Co	Feature Class	Category	Type	Feature Description	Associated Symbol	Style Folder	Usage	Notes
1	FGDC Primary	1--Contacts, Key Beds, and Dikes	11--Contacts	A-1-1	01.01.01	1.11	contacts_and_faults	contact	contact, generic	Contact--Identity and existence certain, location accurate	Null	Line Symbol		
2	FGDC Primary	1--Contacts, Key Beds, and Dikes	11--Contacts	A-1-1	01.01.02	1.12	contacts_and_faults	contact	contact, generic	Contact--Identity or existence questionable, location accurate	Null	Line Symbol		
3	FGDC Primary	1--Contacts, Key Beds, and Dikes	11--Contacts	A-1-1	01.01.03	1.13	contacts_and_faults	contact	contact, generic	Contact--Identity and existence certain, location approximate	Null	Line Symbol		
4	FGDC Primary	1--Contacts, Key Beds, and Dikes	11--Contacts	A-1-1	01.01.04	1.14	contacts_and_faults	contact	contact, generic	Contact--Identity or existence questionable, location approximate	Null	Line Symbol		
5	FGDC Primary	1--Contacts, Key Beds, and Dikes	11--Contacts	A-1-1	01.01.05	1.15	contacts_and_faults	contact	contact, generic	Contact--Identity and existence certain, location inferred	Null	Line Symbol		
6	FGDC Primary	1--Contacts, Key Beds, and Dikes	11--Contacts	A-1-1	01.01.06	1.16	contacts_and_faults	contact	contact, generic	Contact--Identity or existence questionable, location inferred	Null	Line Symbol		
7	FGDC Primary	1--Contacts, Key Beds, and Dikes	11--Contacts	A-1-1	01.01.07	1.17	contacts_and_faults	contact	contact, generic	Contact--Identity and existence certain, location concealed	Null	Line Symbol		
8	FGDC Primary	1--Contacts, Key Beds, and Dikes	11--Contacts	A-1-1	01.01.08	1.18	contacts_and_faults	contact	contact, generic	Contact--Identity or existence questionable, location concealed	Null	Line Symbol		
9	FGDC Primary	1--Contacts, Key Beds, and Dikes	11--Contacts	A-1-1	01.01.09	1.19	contacts_and_faults	contact	contact, internal	Internal contact--Identity and existence certain, location accurate	Null	Line Symbol		
10	FGDC Primary	1--Contacts, Key Beds, and Dikes	11--Contacts	A-1-1	01.01.10	1.110	contacts_and_faults	contact	contact, internal	Internal contact--Identity or existence questionable, location accurate	Null	Line Symbol		
11	FGDC Primary	1--Contacts, Key Beds, and Dikes	11--Contacts	A-1-1	01.01.11	1.111	contacts_and_faults	contact	contact, internal	Internal contact--Identity and existence certain, location approximate	Null	Line Symbol		
12	FGDC Primary	1--Contacts, Key Beds, and Dikes	11--Contacts	A-1-1	01.01.12	1.112	contacts_and_faults	contact	contact, internal	Internal contact--Identity or existence questionable, location approximate	Null	Line Symbol		
13	FGDC Primary	1--Contacts, Key Beds, and Dikes	11--Contacts	A-1-1	01.01.13	1.113	contacts_and_faults	contact	contact, internal	Internal contact--Identity and existence certain, location inferred	Null	Line Symbol		
14	FGDC Primary	1--Contacts, Key Beds, and Dikes	11--Contacts	A-1-1	01.01.14	1.114	contacts_and_faults	contact	contact, internal	Internal contact--Identity or existence questionable, location inferred	Null	Line Symbol		
15	FGDC Primary	1--Contacts, Key Beds, and Dikes	11--Contacts	A-1-1	01.01.15	1.115	contacts_and_faults	contact	contact, internal	Internal contact--Identity and existence certain, location concealed	Null	Line Symbol		
16	FGDC Primary	1--Contacts, Key Beds, and Dikes	11--Contacts	A-1-1	01.01.16	1.116	contacts_and_faults	contact	contact, internal	Internal contact--Identity or existence questionable, location concealed	Null	Line Symbol		
17	FGDC Primary	1--Contacts, Key Beds, and Dikes	11--Contacts	A-1-1	01.01.17	1.117	contacts_and_faults	contact	contact, gradational	Gradational contact--Identity and existence certain, location accurate	Null	Line Symbol		
18	FGDC Primary	1--Contacts, Key Beds, and Dikes	11--Contacts	A-1-1	01.01.18	1.118	contacts_and_faults	contact	contact, gradational	Gradational contact--Identity or existence questionable, location accurate	Null	Line Symbol		
19	FGDC Primary	1--Contacts, Key Beds, and Dikes	11--Contacts	A-1-1	01.01.19	1.119	contacts_and_faults	contact	contact, gradational	Gradational contact--Identity and existence certain, location approximate	Null	Line Symbol		
20	FGDC Primary	1--Contacts, Key Beds, and Dikes	11--Contacts	A-1-1	01.01.20	1.120	contacts_and_faults	contact	contact, gradational	Gradational contact--Identity or existence questionable, location approximate	Null	Line Symbol		
21	FGDC Primary	1--Contacts, Key Beds, and Dikes	11--Contacts	A-1-1	01.01.21	1.121	contacts_and_faults	contact	contact, gradational	Gradational contact--Identity and existence certain, location inferred	Null	Line Symbol		
22	FGDC Primary	1--Contacts, Key Beds, and Dikes	11--Contacts	A-1-1	01.01.22	1.122	contacts_and_faults	contact	contact, gradational	Gradational contact--Identity or existence questionable, location inferred	Null	Line Symbol		
23	FGDC Primary	1--Contacts, Key Beds, and Dikes	11--Contacts	A-1-1	01.01.23	1.123	contacts_and_faults	contact	contact, gradational	Gradational contact--Identity and existence certain, location concealed	Null	Line Symbol		
24	FGDC Primary	1--Contacts, Key Beds, and Dikes	11--Contacts	A-1-1	01.01.24	1.124	contacts_and_faults	contact	contact, gradational	Gradational contact--Identity or existence questionable, location concealed	Null	Line Symbol		
25	FGDC Primary	1--Contacts, Key Beds, and Dikes	11--Contacts	A-1-2	01.01.25	1.125	contacts_and_faults	contact	contact, unconformable	Unconformable contact--Identity and existence certain, location accurate	Null	Line Symbol		
26	FGDC Primary	1--Contacts, Key Beds, and Dikes	11--Contacts	A-1-2	01.01.26	1.126	contacts_and_faults	contact	contact, unconformable	Unconformable contact--Identity or existence questionable, location accurate	Null	Line Symbol		
27	FGDC Primary	1--Contacts, Key Beds, and Dikes	11--Contacts	A-1-2	01.01.27	1.127	contacts_and_faults	contact	contact, unconformable	Unconformable contact--Identity and existence certain, location approximate	Null	Line Symbol		
28	FGDC Primary	1--Contacts, Key Beds, and Dikes	11--Contacts	A-1-2	01.01.28	1.128	contacts_and_faults	contact	contact, unconformable	Unconformable contact--Identity or existence questionable, location	Null	Line Symbol		

A-FGDC Standard Symbols | B-Compound FGDC Symbols | C-Custom Syms w FGDC Sections | D-Custom Syms NO FGDC Sections | E-Symbols w ...

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	B	C	D	E	F	G	H	I	J
	First Symbol Code (fault, fold, etc)	Second Symbol Code (ie - decoration)	Symbol Code (firstcode,secondcode)	Picture	Feature Class	Category	Type	Feature Description	Style F
1	02.04.03	02.11.04	02.04.0302.11.04		contacts_and_faults	fault	fault, reverse	Reverse fault—Identity and existence certain, location approximate. Fault showing local right-lateral offset. Arrows show relative motion.	line syrr
2	02.04.05	02.11.04	02.04.0502.11.04		contacts_and_faults	fault	fault, reverse	Reverse fault—Identity and existence certain, location inferred. Fault showing local right-lateral offset. Arrows show relative motion.	line syrr
3	02.06.03	02.13.04	02.06.0302.13.04		contacts_and_faults	fault	fault, strike-slip, right-lateral offset	Strike-slip fault, right-lateral offset—Identity and existence certain, location approximate. Displacement during Quaternary time (undifferentiated).	line syrr
4	02.06.09	02.13.14	02.06.0902.13.14		contacts_and_faults	fault	fault, strike-slip, left-lateral offset	Strike-slip fault, left-lateral offset—Identity and existence certain, location accurate. Displacement during Quaternary time (undifferentiated).	line syrr
5	02.06.11	02.13.14	02.06.1102.13.14		contacts_and_faults	fault	fault, strike-slip, left-lateral offset	Strike-slip fault, left-lateral offset—Identity and existence certain, location approximate. Displacement during Quaternary time (undifferentiated).	line syrr
6	02.06.15	02.13.04	02.06.1502.13.04		contacts_and_faults	fault	fault, strike-slip, left-lateral offset	Strike-slip fault, left-lateral offset—Identity and existence certain, location concealed. Displacement during Quaternary time (undifferentiated).	line syrr
7	02.08.01	02.13.04	02.08.0102.13.04		contacts_and_faults	fault	fault, thrust	Thrust fault—Identity and existence certain, location accurate. Displacement during Quaternary time (undifferentiated).	line syrr
8	02.08.03	02.13.04	02.08.0302.13.04		contacts_and_faults	fault	fault, thrust	Thrust fault—Identity and existence certain, location approximate. Displacement during Quaternary time (undifferentiated).	line syrr
9	02.08.04	02.13.04	02.08.0402.13.04		contacts_and_faults	fault	fault, thrust	Thrust fault—Identity or existence questionable, location approximate. Displacement during Quaternary time (undifferentiated).	line syrr
10	02.08.07	02.13.04	02.08.0702.13.04		contacts_and_faults	fault	fault, thrust	Thrust fault—Identity and existence certain, location concealed. Displacement during Quaternary time (undifferentiated).	line syrr
11	05.01.05	05.10.05	05.01.0505.10.05		structure_lines	fold	fold, anticline	Plunging anticline—Identity and existence certain, location inferred. Large arrowhead shows direction of plunge.	line syrr
12	05.03.05	05.10.05	05.03.0505.10.05		structure_lines	fold	fold, anticline, asymmetric	Plunging asymmetric anticline—Identity and existence certain, location inferred. Large arrowhead shows direction of plunge.	line syrr
13	05.03.06	05.10.05	05.03.0605.10.05		structure_lines	fold	fold, anticline, asymmetric	Plunging asymmetric anticline—Identity or existence questionable, location inferred. Large arrowhead shows direction of plunge.	line syrr
14	05.05.06	05.10.07	05.05.0605.10.07		structure_lines	fold	fold, syncline	Plunging syncline—Identity or existence questionable, location inferred. Large arrowhead shows direction of plunge.	line syrr
15	05.06.03	05.10.05	05.06.0305.10.05		structure_lines	fold	fold, synform	Plunging synform—Identity and existence certain, location approximate. Large arrowhead shows direction of plunge.	line syrr
16	05.07.05	05.10.07	05.07.0505.10.07		structure_lines	fold	fold, syncline, asymmetric	Plunging asymmetric syncline—Identity and existence certain, location approximate. Large arrowhead shows direction of plunge.	line syrr

A-FGDC Standard Symbols    B-Compound FGDC Symbols    C-Custom Syms w FGDC Sections    D-Custom Syms NO FGDC Section ...

READY 70%

# 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 Symbolology



Question?