DGGS Standards

What they are and why they are awesome

Why Standardize?

- Provides uniform data standard for internal and external users
  - Consistent attribute fields and values
  - Capturing field information in GIS data
- Streamlines metadata creation
  - Reduces the time to create metadata
  - Reduces interactions between GeoComm and geologic staff
- Streamlines cartographic workflow
  - Reduces the time to create sheets
  - Reduces exchanges between GeoComm and geologic staff
- Facilitates a division-wide geodatabase
  - There is a compelling need for a centralized geologic database for DGGS

DGGS "big three" standards

- NCGMP09 ← For Data!
  - How to create a NCGMP09 geodatabase
  - How to create NEW data in NCGMP09
  - How to import existing data into NCGMP09
- FGDC Digital Cartographic Standard ← For Maps!
  - How to use that giant book of tiny symbols
  - How FGDC ties into NCGMP09
- DGGS figure standards ← For Figures!
  - Make those report figures look fabulous!

NCGMP09

- Hard to say – easy to use
- Standard format for geologic map publications
- Funded by USGS National Cooperative Geologic Mapping Program (NCGMP)
- For detailed information:

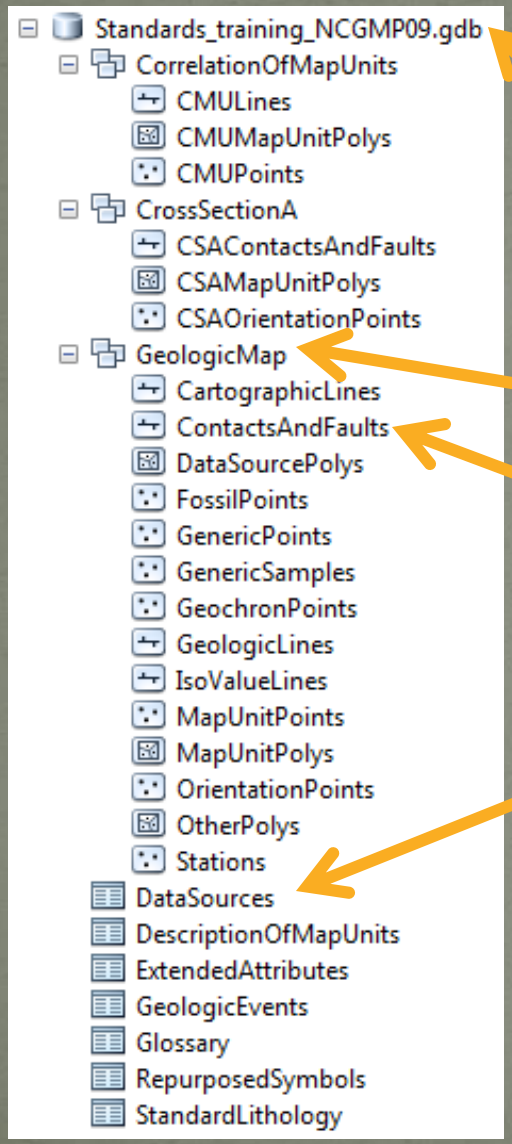
http://ngmdb.usgs.gov/Info/standards/NCGMP09/

NCGMP09 Bible

NCGMP09—Draft Standard Format for Digital Publication of Geologic Maps, Version 1.1

- Everybody gets one!
- Put it in a binder, mark sections you will use a lot
- Also available digitally on the network:
  - \\pANGEA\GIS\standards\ncgmp09_v1-1\usgs_of2012o-1335NCGMP09.pdf
- You may run across inconsistencies between our geodatabase and the documentation – please ask if you are confused!

NCGMP09



- Geodatabase
- Feature Datasets
- Featureclasses
- Stand alone tables
- Not all Featureclasses have to be used

NCGMP09

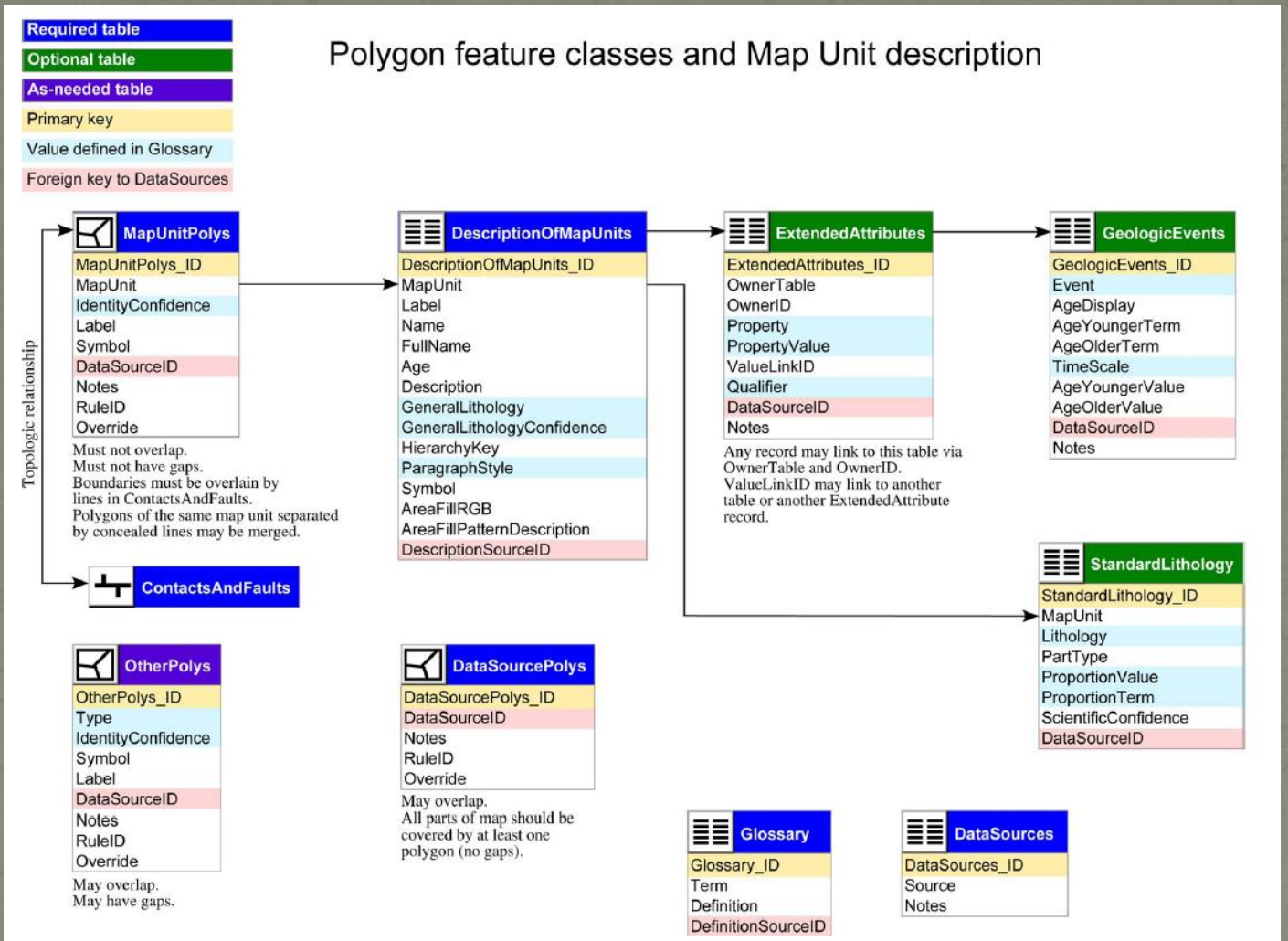


Figure 2A. Entity-relationship diagram of NCGMP09 polygon feature classes and Map Unit description. A higher resolution version is available at *http://ngmdb.usgs.gov/Info/standards/NCGMP09/*.

What tables are required???

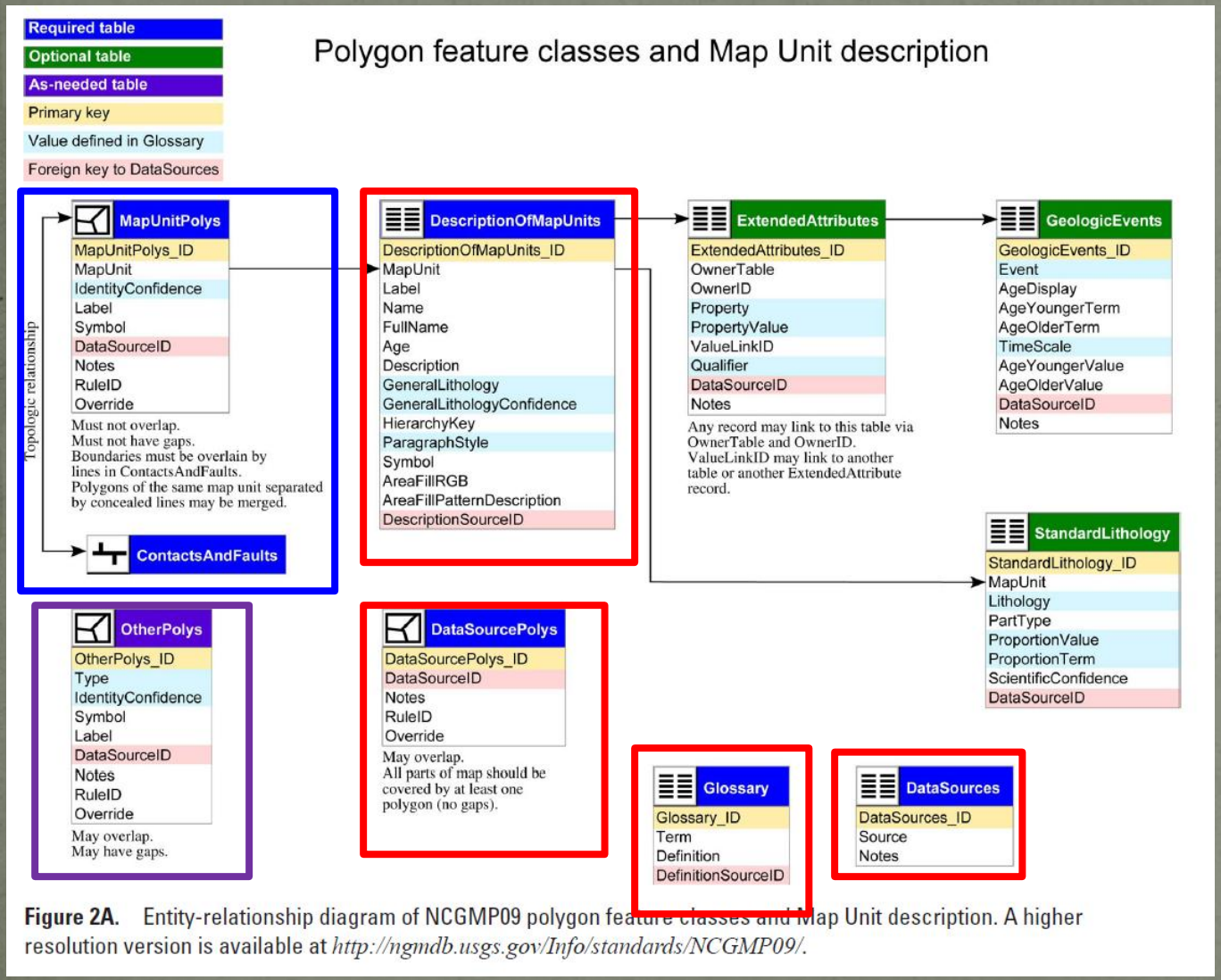
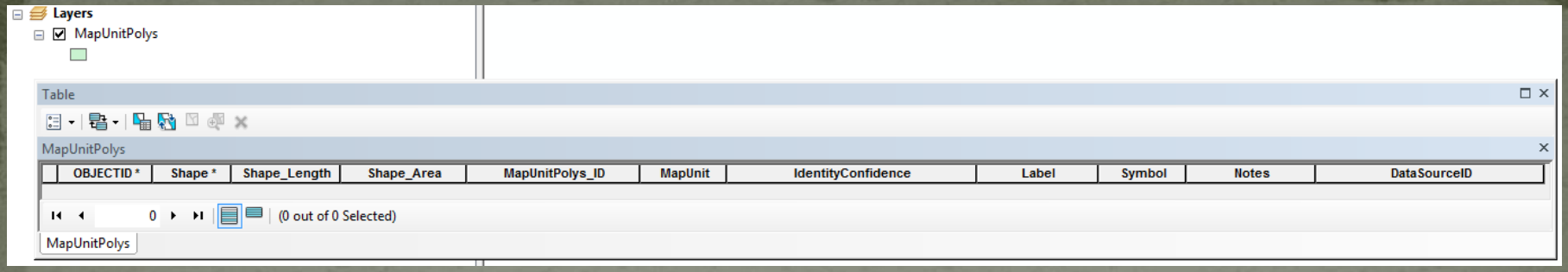


Figure 2A. Entity-relationship diagram of NCGMP09 polygon feature classes and Map Unit description. A higher resolution version is available at *http://ngmdb.usgs.gov/Info/standards/NCGMP09/*.

Tables circled in blue are required for every map

Tables circled in purple are required only under certain circumstances – for example, using a geologic pattern.

Tables circled in red will not be required until we have our Enterprise geodatabase up and running



- Each featureclass has a standard schema
- Each field has documentation "what to put here" and rules

MapUnitPolys (polygon feature class)

Fields:

MapUnitPolys_ID	*Primary key. Example Values = MUP1, MUP2, MUP3, and so on. Values must be unique in database as a whole*
MapUnit	*Short plain-text key (identifier) for the map unit. Example values: Qal, Tg, Kit, water, Trc3, and so on. Foreign key to DescriptionOfMapUnits table. Null values not permitted—a mapped polygon must have an assigned map unit*
IdentityConfidence	*How confidently is this polygon identified as MapUnit? Value is usually "certain", "questionable", or "unspecified". Null values not permitted. Suggest setting default value to 'certain'*
Label	*Calculated from MapUnit//Label and IdentityConfidence: if IdentityConfidence = "questionable", then append "?" to MapUnit//Label. Allows for subscripts and special characters. Null values OK*
Symbol	*References an area fill symbol (background color + optional pattern). Area fill symbols must be defined in an accompanying style file. If cartographic representations are used to symbolize map units, the value may be null or blank. Null values permitted*
RuleID	*Data type = integer. If Cartographic Representations are used, this field is required; otherwise it is not included in the table (see* Symbolization *section, below)*
Override	*Data type = blob. If Cartographic Representations are used, this field is required; otherwise it is not included in the table (see* Symbolization *section, below)*
Notes	*Null values OK. Free text for additional information specific to this polygon*
DataSourceID	*Foreign key to DataSources table, to track provenance of each data element. Null values not permitted*

What fields are required???

Not Yet

REQUIRED – no null!

REQUIRED – no null!

As Needed – null OK, special characters accepted

REQUIRED – refer to FGDC cartographic standards

Populated by GIS Team

Populated by GIS Team

As Needed

Not Yet

MapUnitPolys (polygon feature class)

Fields:

MapUnitPolys_ID	*Primary key. Example Values = MUP1, MUP2, MUP3, and so on. Values must be unique in database as a whole*
MapUnit	*Short plain-text key (identifier) for the map unit. Example values: Qal, Tg, Kit, water, Trc3, and so on. Foreign key to DescriptionOfMapUnits table. Null values not permitted—a mapped polygon must have an assigned map unit*
IdentityConfidence	*How confidently is this polygon identified as MapUnit? Value is usually "certain", "questionable", or "unspecified". Null values not permitted. Suggest setting default value to 'certain'*
Label	*Calculated from MapUnit//Label and IdentityConfidence: if IdentityConfidence = "questionable", then append "?" to MapUnit//Label. Allows for subscripts and special characters. Null values OK*
Symbol	*References an area fill symbol (background color + optional pattern). Area fill symbols must be defined in an accompanying style file. If cartographic representations are used to symbolize map units, the value may be null or blank. Null values permitted*
RuleID	*Data type = integer. If Cartographic Representations are used, this field is required; otherwise it is not included in the table (see* Symbolization *section, below)*
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Notes	*Null values OK. Free text for additional information specific to this polygon*
DataSourceID	*Foreign key to DataSources table, to track provenance of each data element. Null values not permitted*

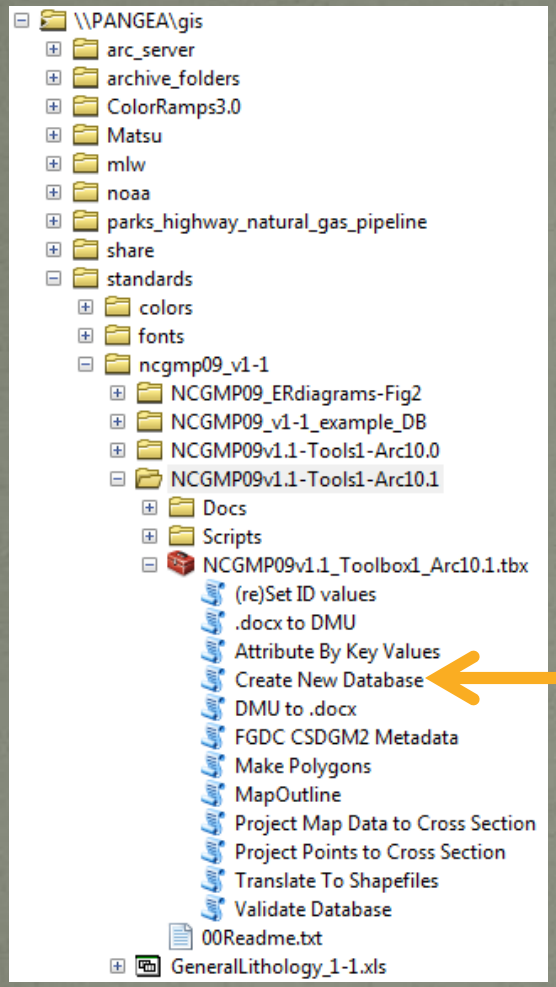
Efficiencies of NCGMP09

- Streamlines metadata creation
  - Simone programmatically creates a vast majority of the metadata fields
  - Reduces interactions between GeoComm and geologic staff
- Streamlines cartographic workflow
  - GIS team can symbolize data efficiently
  - Reduces cartographic layout and requests for information to geologists
- All of DGGS data will be organized, consistent, and well documented

Changes to fieldwork and data collection

- Not much!
- Additional information will be required
  - Know what you need before you go!
  - Examples
    - LocationConfidenceMeters
      - 10 meters
    - IdentityConfidence
      - Certain
    - FieldCall
      - Kgr

Creating a new NCGMP09 geodatabase

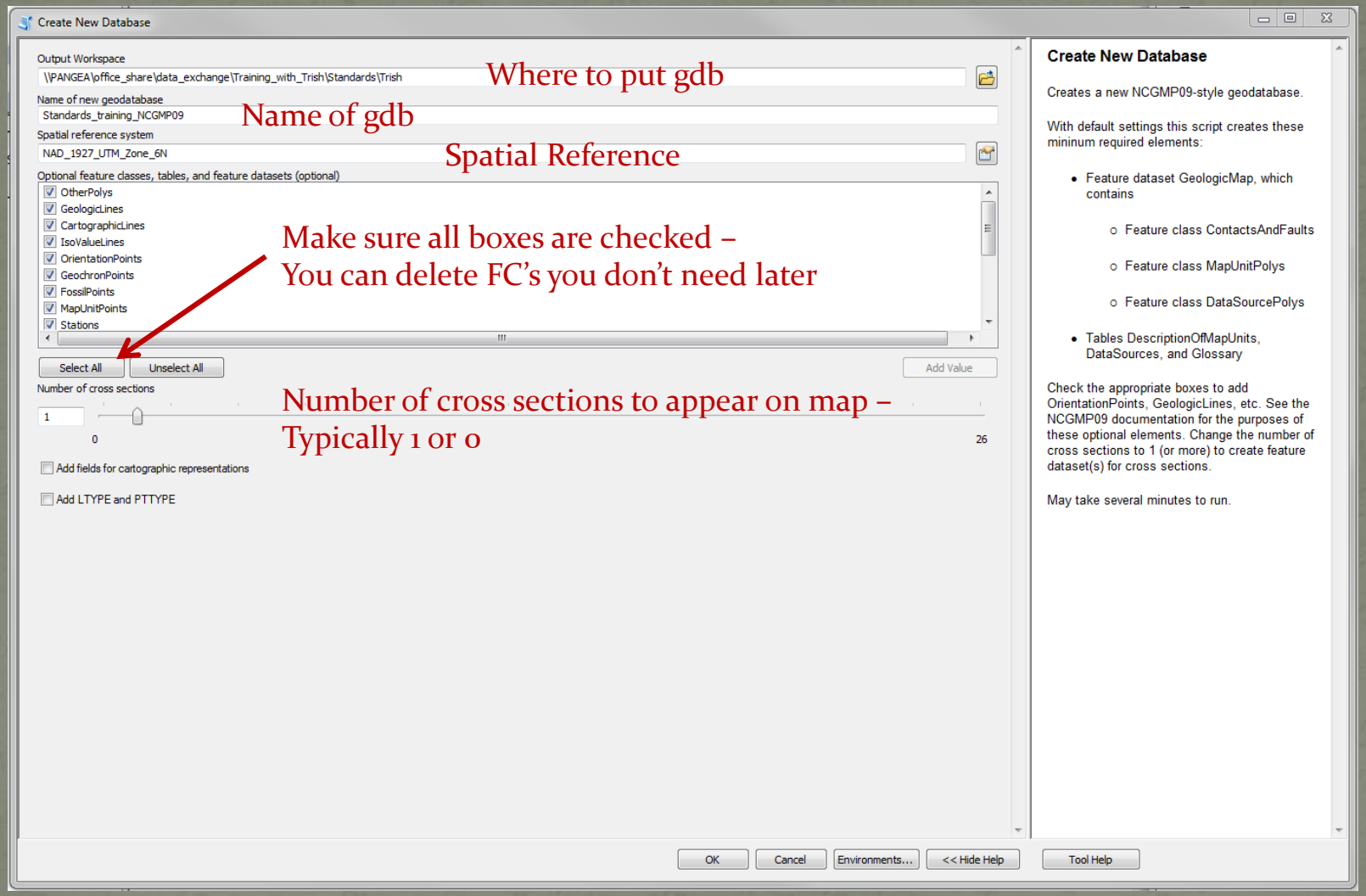


- There is a script for that!
- Run the Create New Database tool from ArcCatalog (in ArcCatalog window of ArcMap also OK)

Double click to open script tool

\\PANGEA\gis\standards\ncgmp09_v1-1\NCGMP09v1.1-Tools1-Arc10.1

Creating a new NCGMP09 geodatabase



Can take a while to run – be patient!

Exercise 1 – Populate new data in NCGMP09

- Open ArcMap
- Add NCGMP09 featureclass (MapUnitPolys) to TOC
- Start editing MapUnitPolys
- Use Create Features window to digitize a polygon
- Type in information in attribute table
  - Can use Attributes pop-up window
  - Can set default value
  - Use feature templates in Create Features box!
- Fill in all the fields that are required and applicable

Exercise 2 – Load existing data into NCGMP09

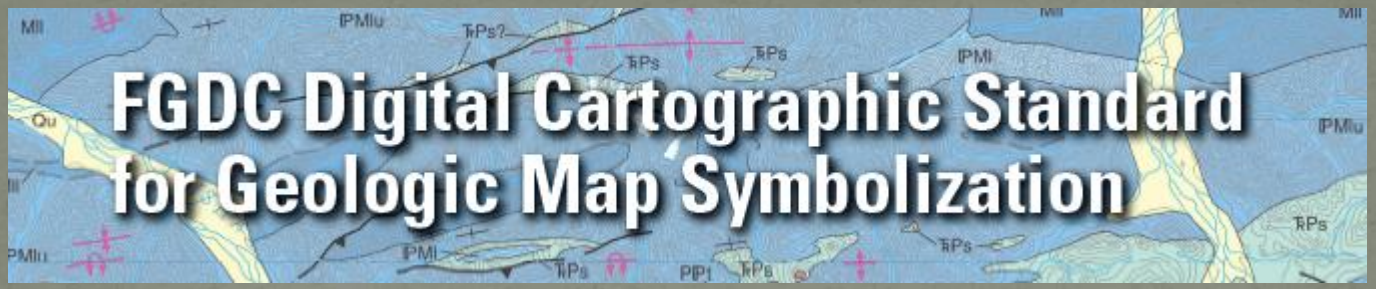
- Open ArcMap
- In Catalog Window → Right Click on Orientation Points featureclass
- Select Load → Load Data from dropdown list
- Browse to and select shapefile or featureclass you would like to extract features from (load_orientation_points.shp)
- Click Add, then click Next
  - Target geodatabase and target featureclass are filled out for you
  - Can load features into a subtype (don't do this for now)
- For each Target Field, select the appropriate matching field
  - IMPORTANT – the field types of your source shapefile must match the field type of the NCGMP09 geodatabase!
- Click Next
  - You can set up a definition query to only load a certain portion of data (for example – only the foliation points)
- Click Finish – the data is now loaded. You may have to reset the attribute table to see the changes.
- Fill in all the fields that are blank that are required and applicable

FGDC Digital Cartographic Standards

- Giant book – lots of choices
- Standard symbols and colors for geologic maps
- Prepared for the USGS by the Federal Geographic Data Commitee
- For detailed information:

http://ngmdb.usgs.gov/fgdc_gds/geolsymstd.php

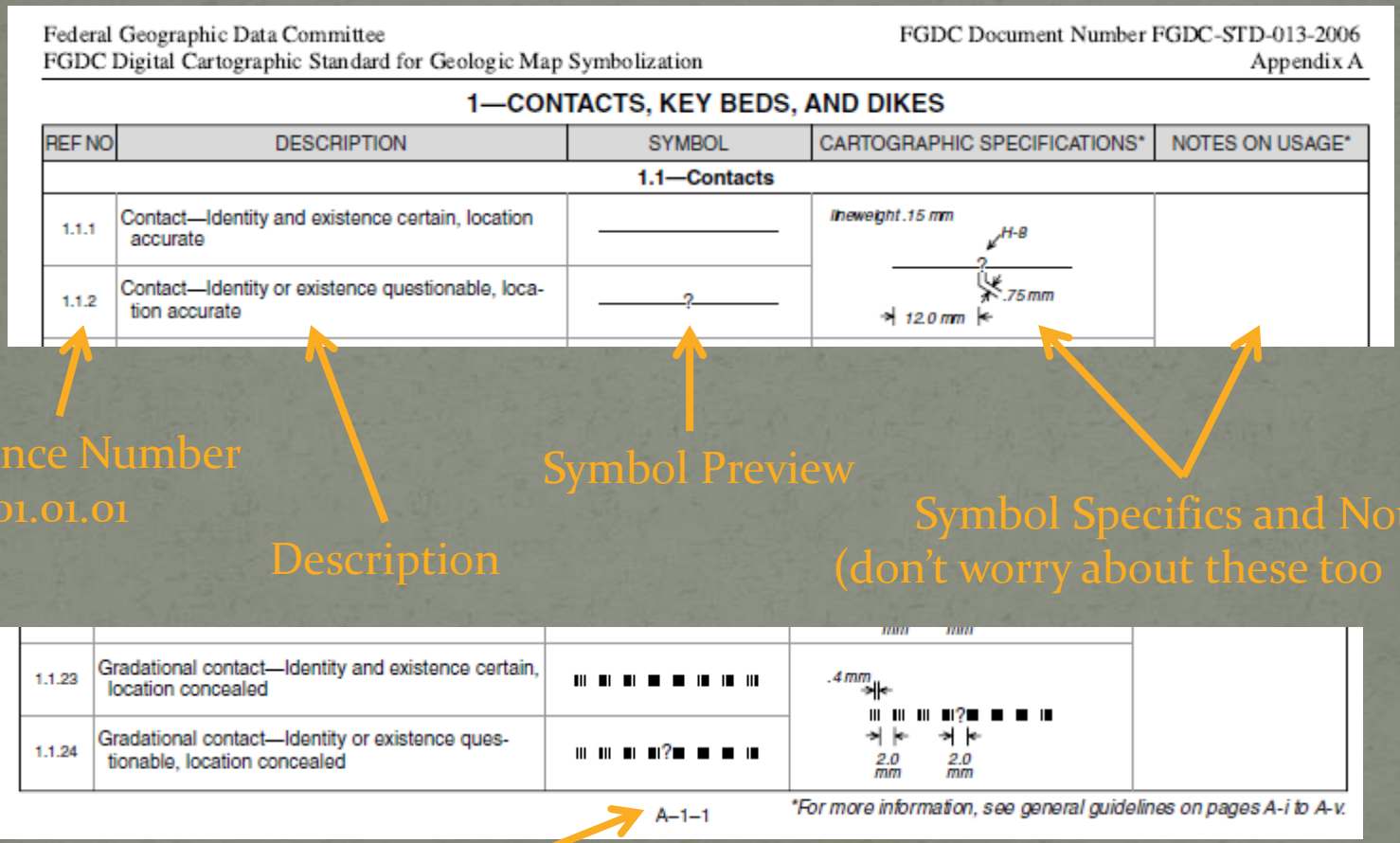
FGDC Carto Standards Bible



- Everybody gets one!
- Put it in a binder, mark sections you will use a lot
- Also available digitally on the network:
  - \\pANGEA\GIS\standards\fgdc-geolsym-all.pdf
- The Introductory Material is a really good resource – please read it

FGDC Carto Standards

How to read the appendices



Federal Geographic Data Committee
FGDC Digital Cartographic Standard for Geologic Map Symbolization

FGDC Document Number FGDC-STD-013-2006
Appendix A

1—CONTACTS, KEY BEDS, AND DIKES

REF NO	DESCRIPTION	SYMBOL	CARTOGRAPHIC SPECIFICATIONS*	NOTES ON USAGE*
	1.1—Contacts			
1.1.1	Contact—Identity and existence certain, location accurate		lineweight .15 mm; H-8; .75 mm; 12.0 mm	
1.1.2	Contact—Identity or existence questionable, location accurate	?		
1.1.23	Gradational contact—Identity and existence certain, location concealed		.4 mm; 2.0 mm; 2.0 mm	
1.1.24	Gradational contact—Identity or existence questionable, location concealed	?		

A–1–1

*For more information, see general guidelines on pages A-i to A-v.

Reference Number
01.01.01

Description

Symbol Preview

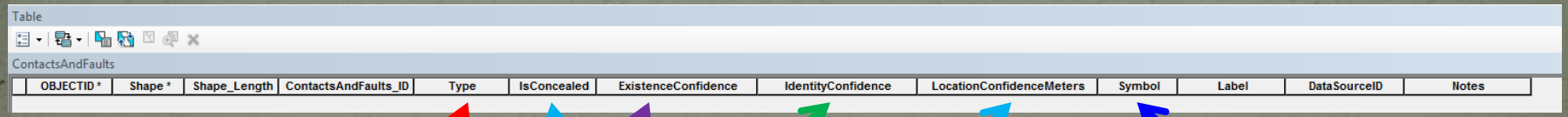
Symbol Specifics and Notes
(don't worry about these too much)

Appendix Number (for reference from Index)

FGDC Carto Standards

NCGMP09 and FGDC standards are complimentary!

Your data "drives" the symbol!



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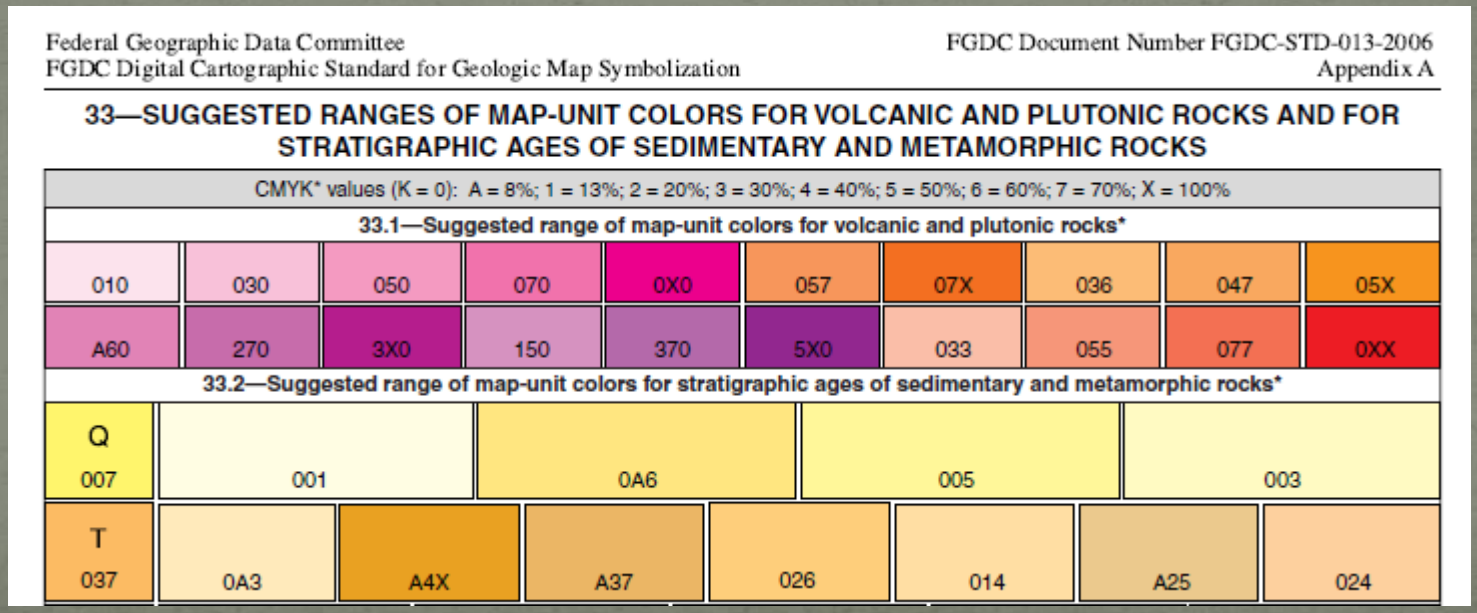
1.1.1	Contact—Identity and existence certain, location accurate		lineweight .15 mm	
1.1.2	Contact—Identity or existence questionable, location accurate	?	H-8, .75 mm, 12.0 mm	

FGDC Carto Standards

A note about unit colors and patterns

- FGDC basis color selection off of rock type and age
  - More information is in the introductory text and USGS guide for selecting colors
    - \\pANGEA\GIS\standards\colors



Federal Geographic Data Committee
FGDC Digital Cartographic Standard for Geologic Map Symbolization

FGDC Document Number FGDC-STD-013-2006
Appendix A

33—SUGGESTED RANGES OF MAP-UNIT COLORS FOR VOLCANIC AND PLUTONIC ROCKS AND FOR STRATIGRAPHIC AGES OF SEDIMENTARY AND METAMORPHIC ROCKS

CMYK* values (K = 0): A = 8%; 1 = 13%; 2 = 20%; 3 = 30%; 4 = 40%; 5 = 50%; 6 = 60%; 7 = 70%; X = 100%

33.1—Suggested range of map-unit colors for volcanic and plutonic rocks*

010	030	050	070	0X0	057	07X	036	047	05X
A60	270	3X0	150	370	5X0	033	055	077	0XX

33.2—Suggested range of map-unit colors for stratigraphic ages of sedimentary and metamorphic rocks*

Q 007	001	0A6	005	003				
T 037	0A3	A4X	A37	026	014	A25	024	

Exercise 3 – Determine appropriate FGDC symbol

- Open ArcMap
- Bring ContactsAndFaults featureclass into the dataframe
- Symbolize the lines by type
- Using the information given, what numbers should go in the Symbol field?

Type	IsConcealed	ExistenceConfidence	IdentityConfidence	LocationConfidenceMeters	Symbol
thrust fault	N	certain	questionable	5	<Null>
contact	N	certain	certain	9	<Null>
anticline	Y	certain	certain	25	<Null>
normal fault	N	certain	certain	5	<Null>

02.08.02

01.01.03

05.01.07

02.02.01

If the GIS team knows what symbols you need/want, the cartographic layout will be produced faster and more efficiently!

Frequently Asked Questions

The symbol I need is not in the book. Now what?

- Look very carefully – there are lots of very specific options and it is easy to miss something
- If absolutely necessary, a symbol can be re-purposed

I don't like this symbol. Can I have that one instead?

- No
- If the symbol for your data is listed in the book, you CAN NOT use a different one

DGGS Figure Standards

Legible

Consistent

Pretty

DGGS Figure Standards

Legible

- All text should be easy to read and see
  - Text halos are a great way to accomplish this (better than boxes)
  - Lead lines are acceptable only if you can clearly see them
- If possible, water body labels should be in blue and italic fonts
- Try to steer clear of colors that are match to closely with the base map, or are unnecessarily bright.
- Try to keep text labels off of contour lines, other labels, or graticules

DGGS Figure Standards

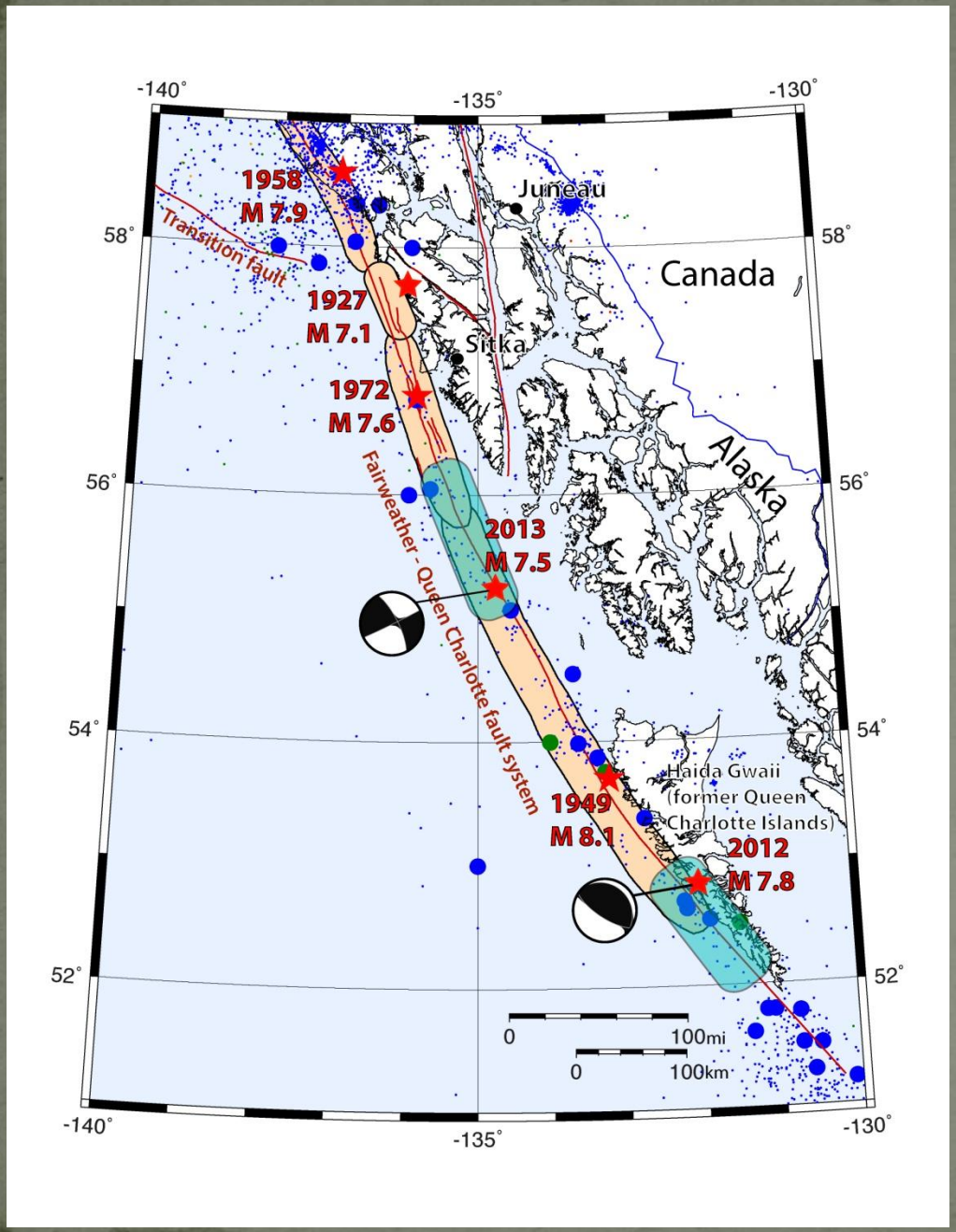
Consistent

- If possible, fonts and colors of labels should remain the same throughout all the figures in the report
- Graticule axis should be consistent with consistent labels
  - -155 verus 155W, minutes or sections shown or not

DGGS Figure Standards

Pretty

- Halos can also be used around points and lines
- Curve text along line features like faults and streams
- Use complementary colors that are easy to read and pleasing to the eye
- Don't forget the scale bar, north arrow, and legend
  - The legend needs to have all the symbols on the map – no more and no less



How would YOU improve this figure?