Alaska Division of Geological & Geophysical Surveys
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Stardate: NCGMP09

to boldy go where no standard has gone before

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Into the Final Frontier

Until recently, the Alaska Division of Geological & Geophysical surveys has not had existing data or map standards. Implementing new standards and workflows can be an intimidating and frustrating process for those who are not already "in the know". DGGS offers special training sessions for our geologists and GIS users to make the transition from "do whatever works" to using the NCGMP09 standard. Training sessions highlight the benefits of using a standard, provide a solid background of the geodatabase design, and explain the details of creating, loading, and editing data in NCGMP09 format. Sessions are designed to be fun, engaging, and interactive.They also include hands-on activities, practice data sets, and helpful resources.

Prepare to Engage

Planning ahead and being prepared are important parts of hosting a successful training session. I sent out a "save the date" email 3 weeks before the scheduled training. This allowed colleges to schedual other events without conflicting with training sessions. This greatly increased attendance. The emails I send out to our division are purposely designed to be eye catching, funny, and a little kooky! People are more likely to read emails that are entertaining and fun and, at the very least, not dread the upcoming training.

A week prior to the training session, I sent out yet another reminder. This second email gave people a more detailed description about what material would be covered. Also by this time, the division director and section chiefs had made NCGMP09 mandatory (resistance is futile). In this second email I asked people to RSVP. An accurate headcount allowed me to better prepare and organize the practice data for the hands-on exercises. I also coordinated with the IT staff at this time to make sure that the wireless network in the conference room would be able to handle the manypeople accessing ArcMap on laptops during the training.


Save the dates
for
DGGS GIS Training
(you're going to LOVE it)

NC-WHAT??
DGGS standards for data and maps
Tues. April 29th 12:30pm-4:30pm

ArcSkillz #1
Get the party started
Thurs. May 1st 9am-1:00pm

ArcSkillz #2
Step it up
Tues.May 6th 12:30pm-4:30pm

ArcSkillz #3
The final countdown
Thurs. May 8st 9am-1:00pm

Get 'er Done
Workflows, tips, and best practices
Wed. May 14th 12:30pm-4:30pm

Standards Deux
Feature re-run of NC-WHAT??
Thurs. May 15st 9am-1:00pm

"Save the date" reminder card. Because, who wouldn't totally LOVE some GIS training? I found the picture online and edited the text using Adobe Illustrator.


GALLAGHERS SCHOOL of ARC-CRAFT and GIS USER-RY
~ Presents ~

DGGS Standards
Tuesday April 29th 1pm - 4:30pm

RSVP to Trish ASAP
Although I do not have the authority to say this training is mandatory, everyone who makes maps in any way should REALLY REALLY come!

What will be covered:

NCGMP09 data standard
- What it is
- How to create a NCGMP09 geodatabase
- Populating new data into NCGMP09
- Importing existing data into NCGMP09
- Hands-on activities!

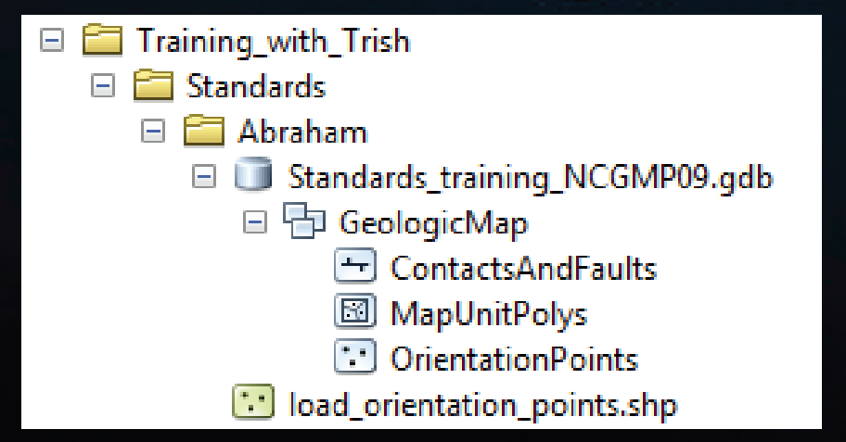
FGDC Cartographic standard
- What it is
- Gifts for everyone!
- Picking symbols
- How FGDC works perfectly with NCGMP09
- What to do if you can't find a symbol
- What to do if you don't like the standard symbol

DGGS figure standard
- What Paula and I look for when editing figures
- How to make the best figures OF YOUR LIFE

For hands-on excercises, please bring a laptop with ArcMap 10.1 and a regular computer mouse for easy digitizing

Second training reminder. Also designed to be fun and entertaining, it gives a brief description of what will be covered and requests people to RSVP.

To save time during the training session, I prepared personalized practice data for use suring the exercises. For each participant, I created a folder on the shared network. Each folder had a simplified NCGMP09 geodatabase. Each geodatabase had part of the GeologicMap feature dataset with three feature classes. The MapUnitPolys featureclass is blank to demonstrate creating new data in the NCGMP09 format. The Orientation Points feature class is blank to demonstrate loading existing data. The ContactsAndFaults feature class has four pre-existing lines with complete NCGMP09 attributes and was used to demonstrate how to choose FGDC symbols. Each folder also contained a shapefile of orientation points. This was also used in the demonstration about loading existing data.

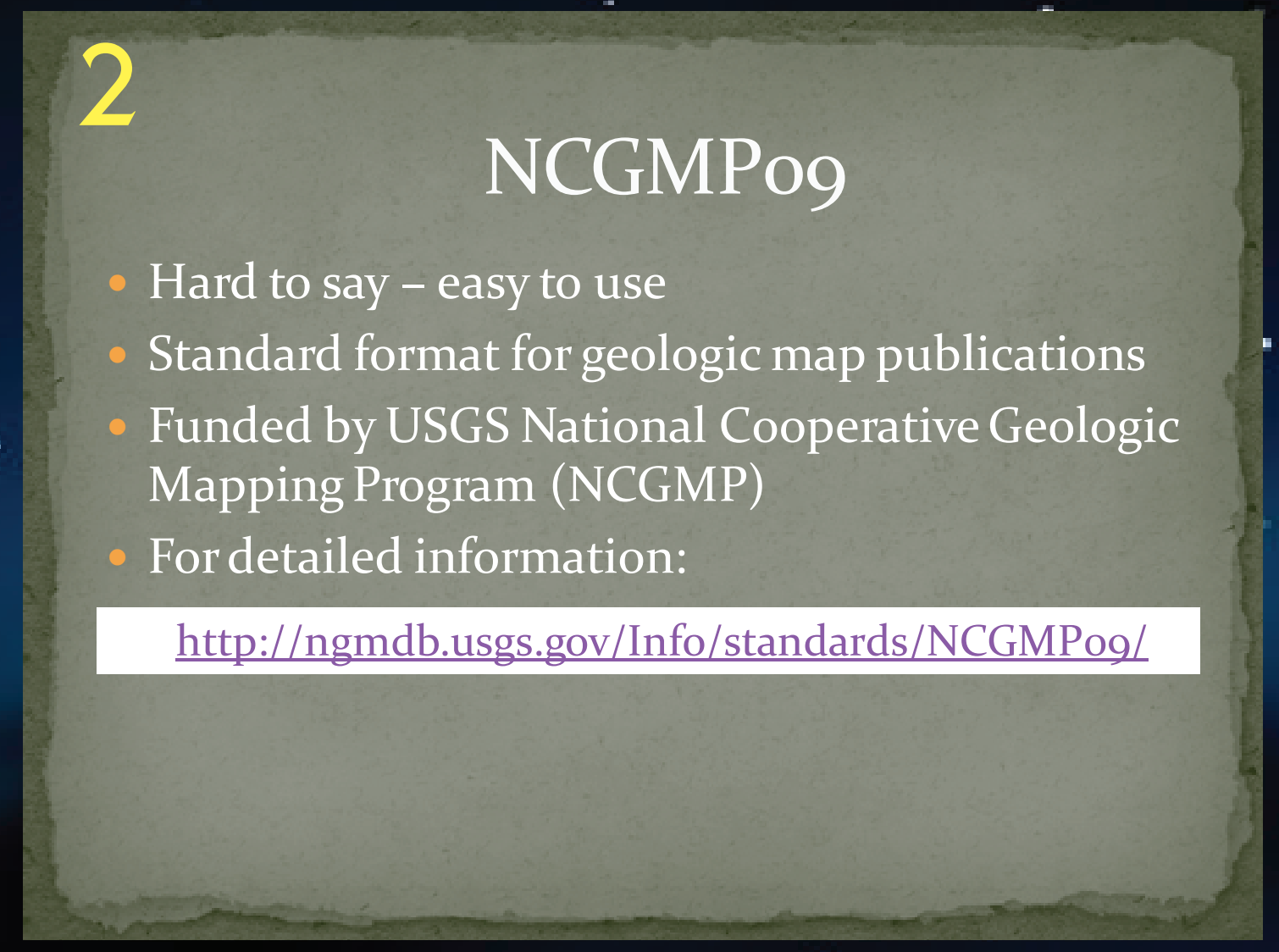


Each participant recieved their own folder with practice data.


1

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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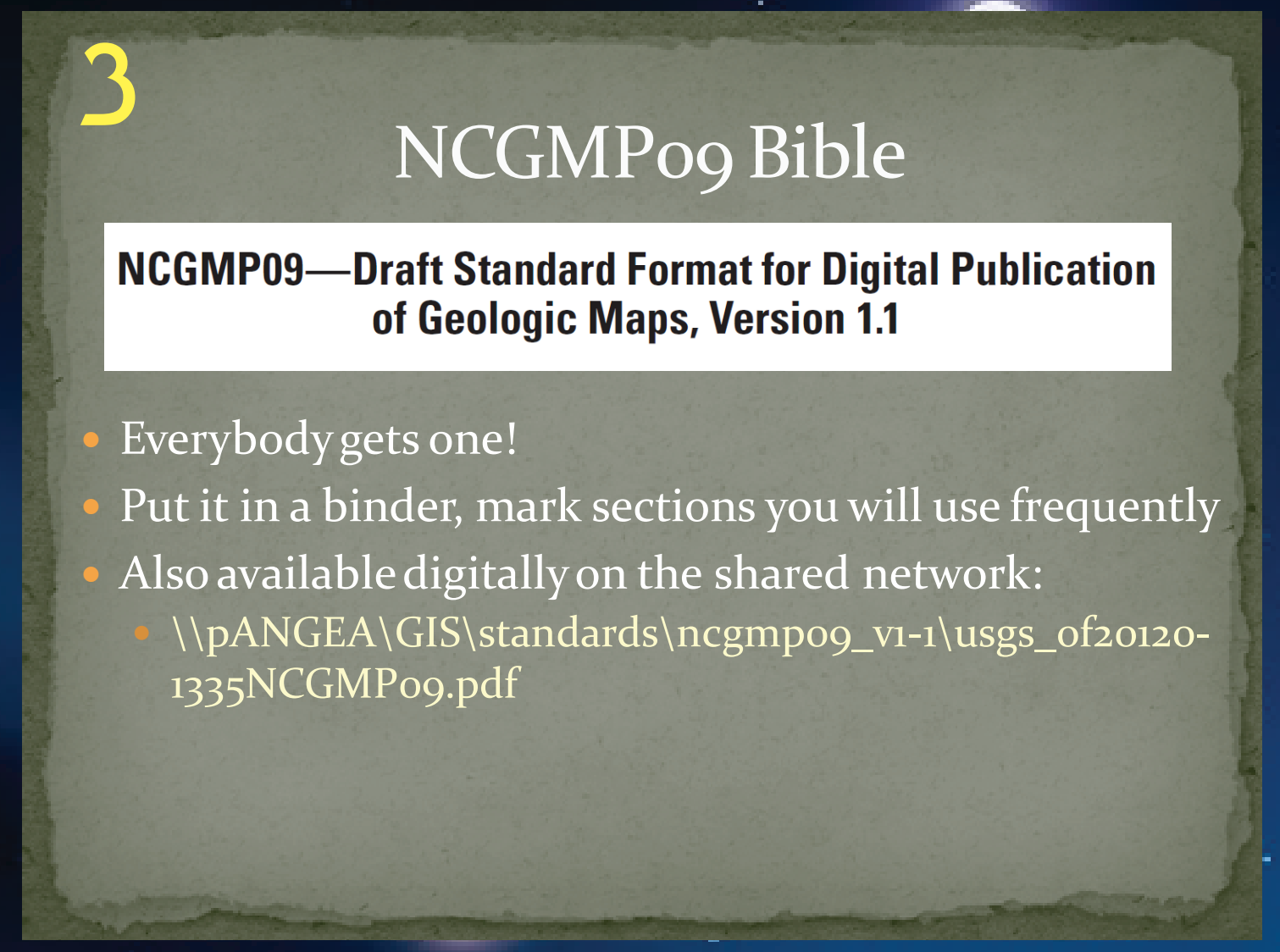
NCGMP09

- 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/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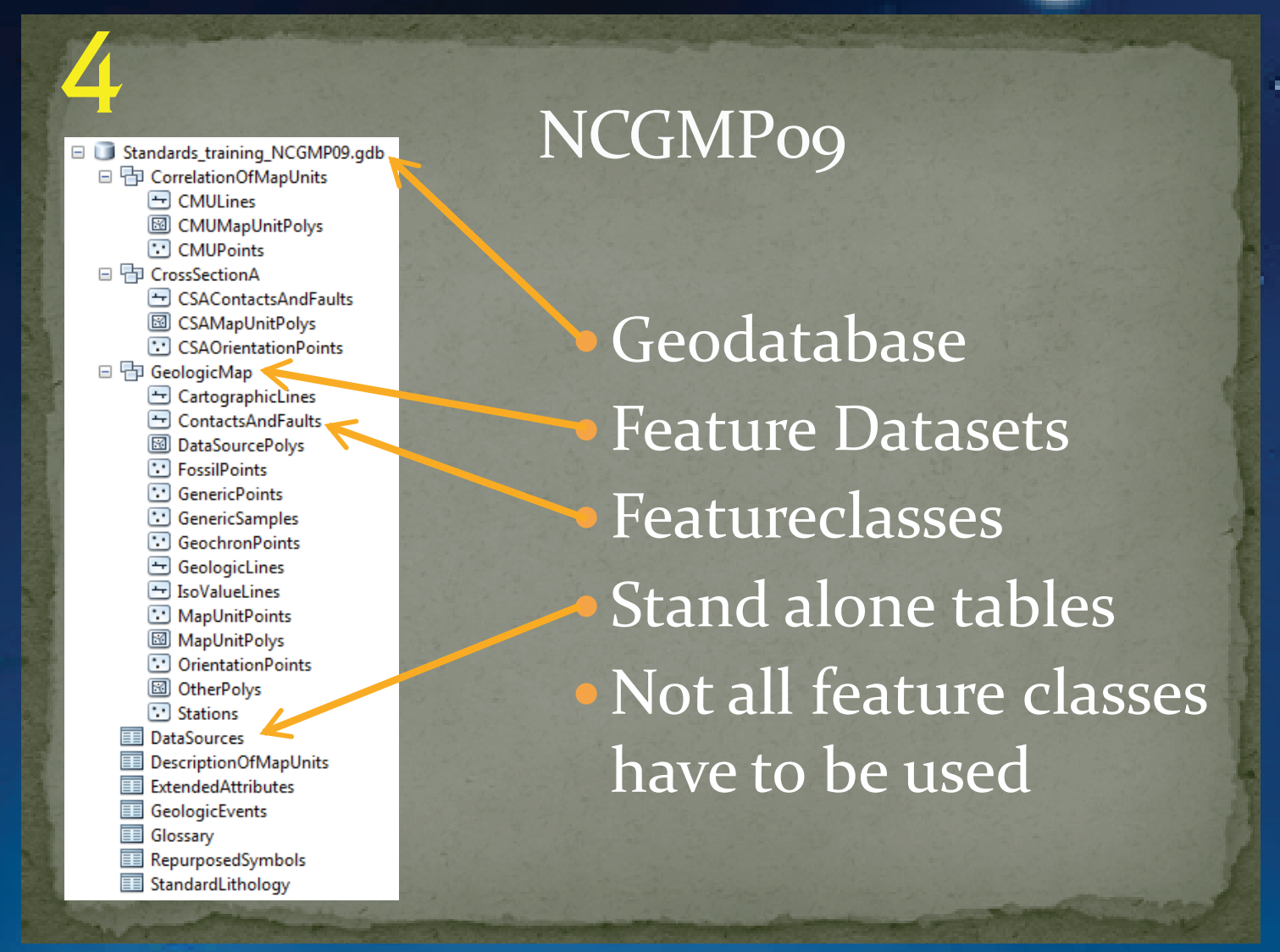
NCGMP09 Bible

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 frequently
- Also available digitally on the shared network:
  - \\pANGEA\GIS\standards\ncgmp09_v1-1\usgs_of20120-1335NCGMP09.pdf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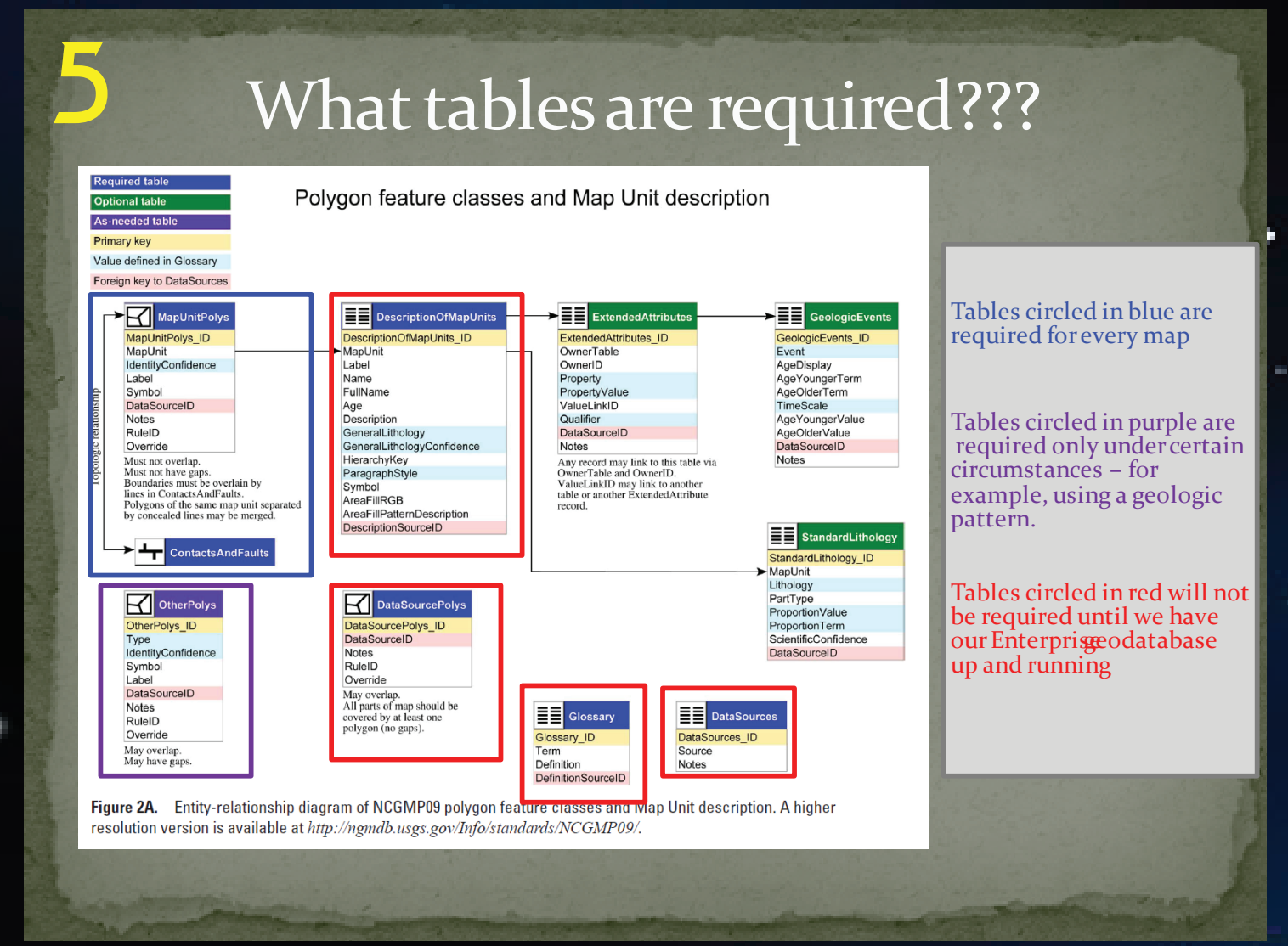
NCGMP09

- Geodatabase
- Feature Datasets
- Featureclasses
- Stand alone tables
- Not all feature classes have to be used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What tables are required???

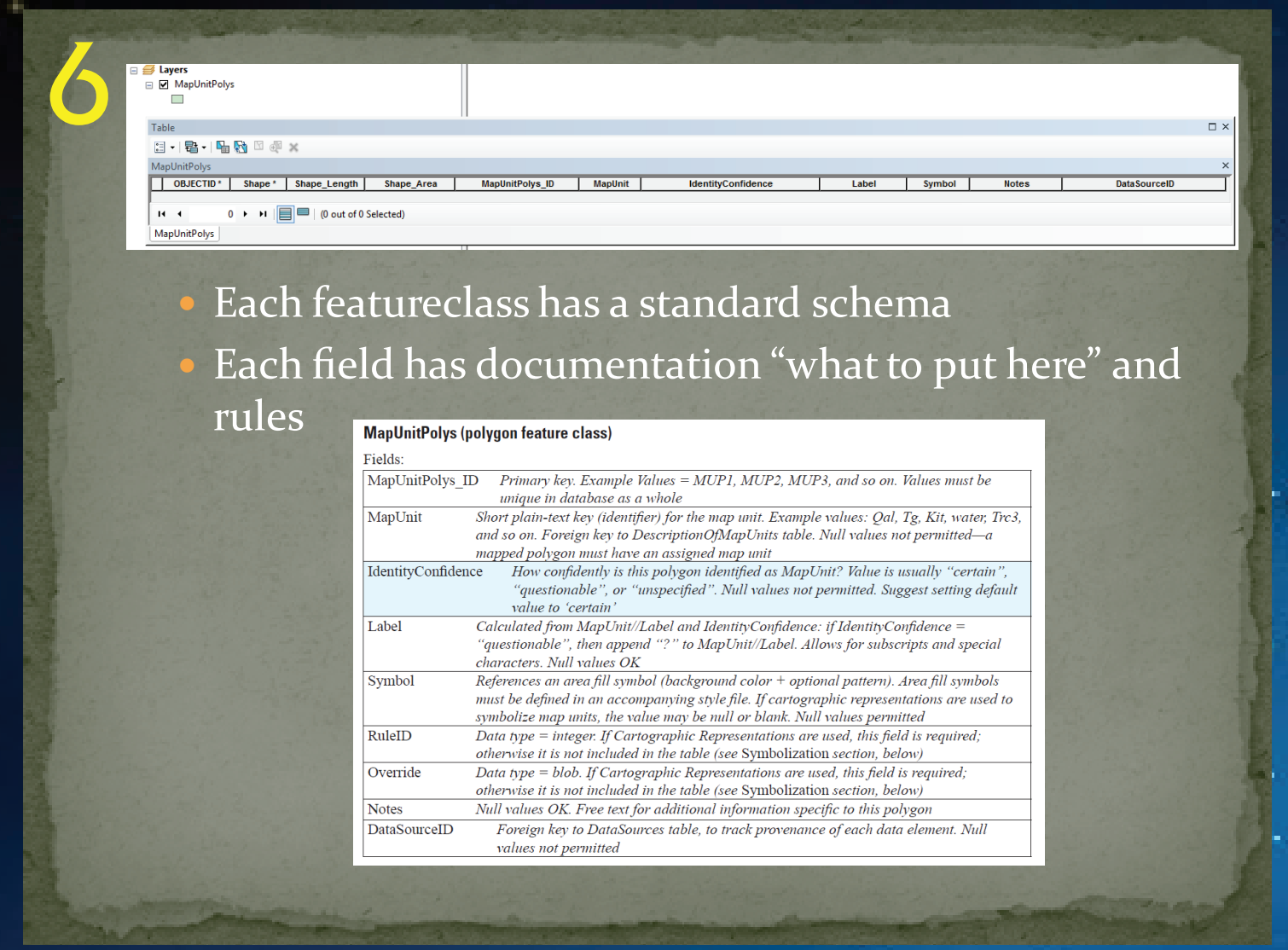
Polygon feature classes and Map Unit description

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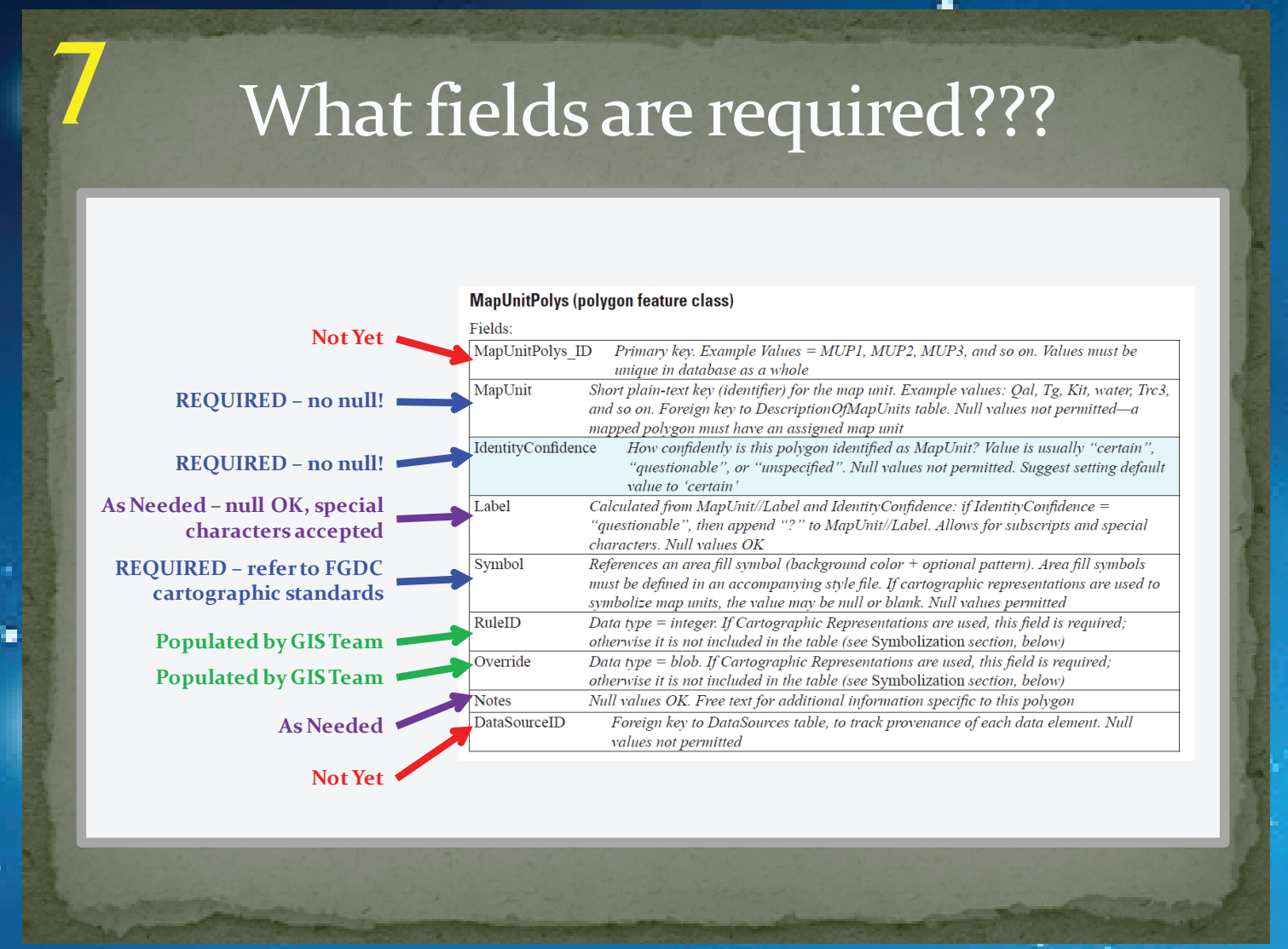
- Each featureclass has a standard schema
- Each field has documentation "what to put here" and rules

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*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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*
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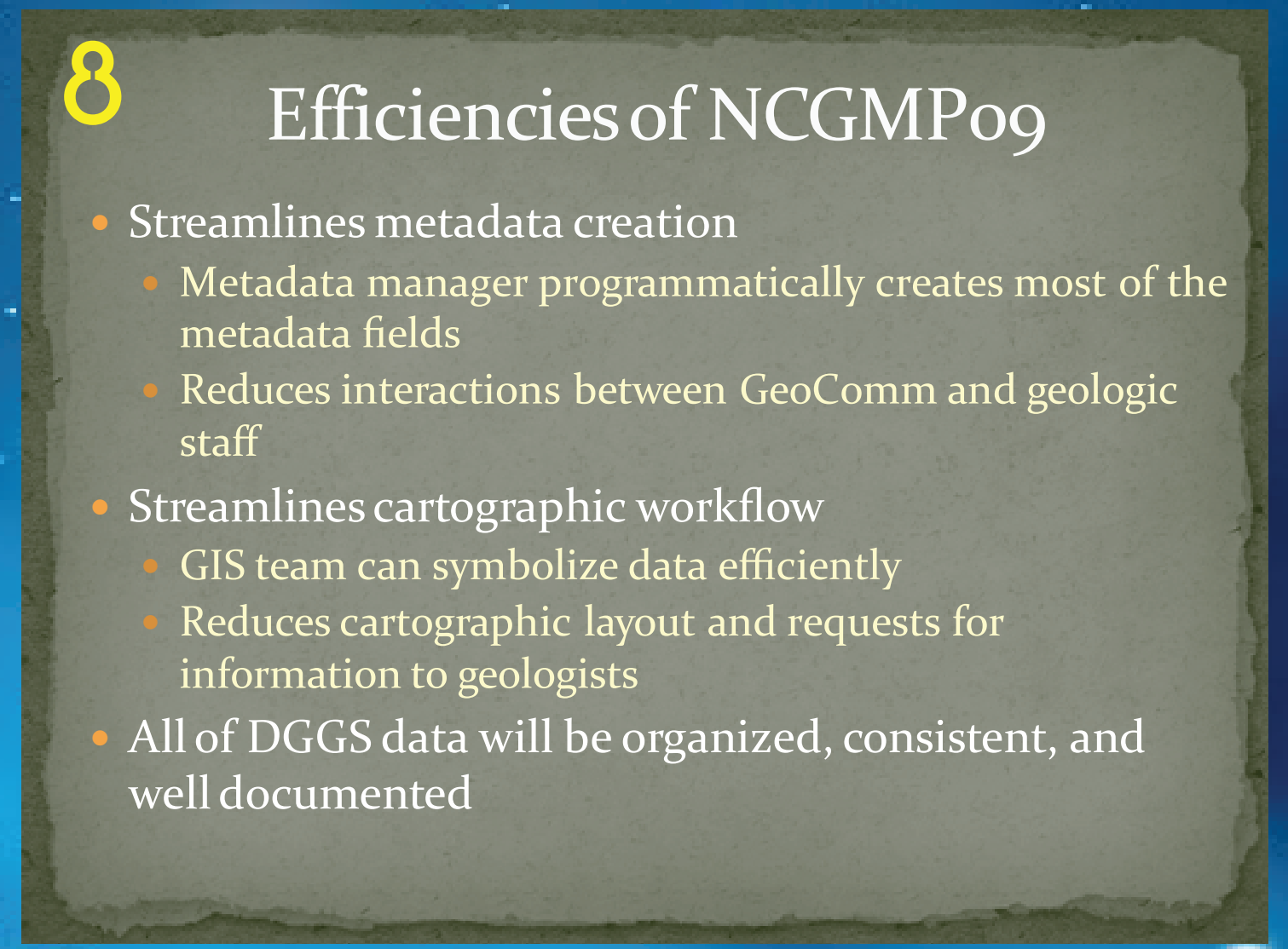
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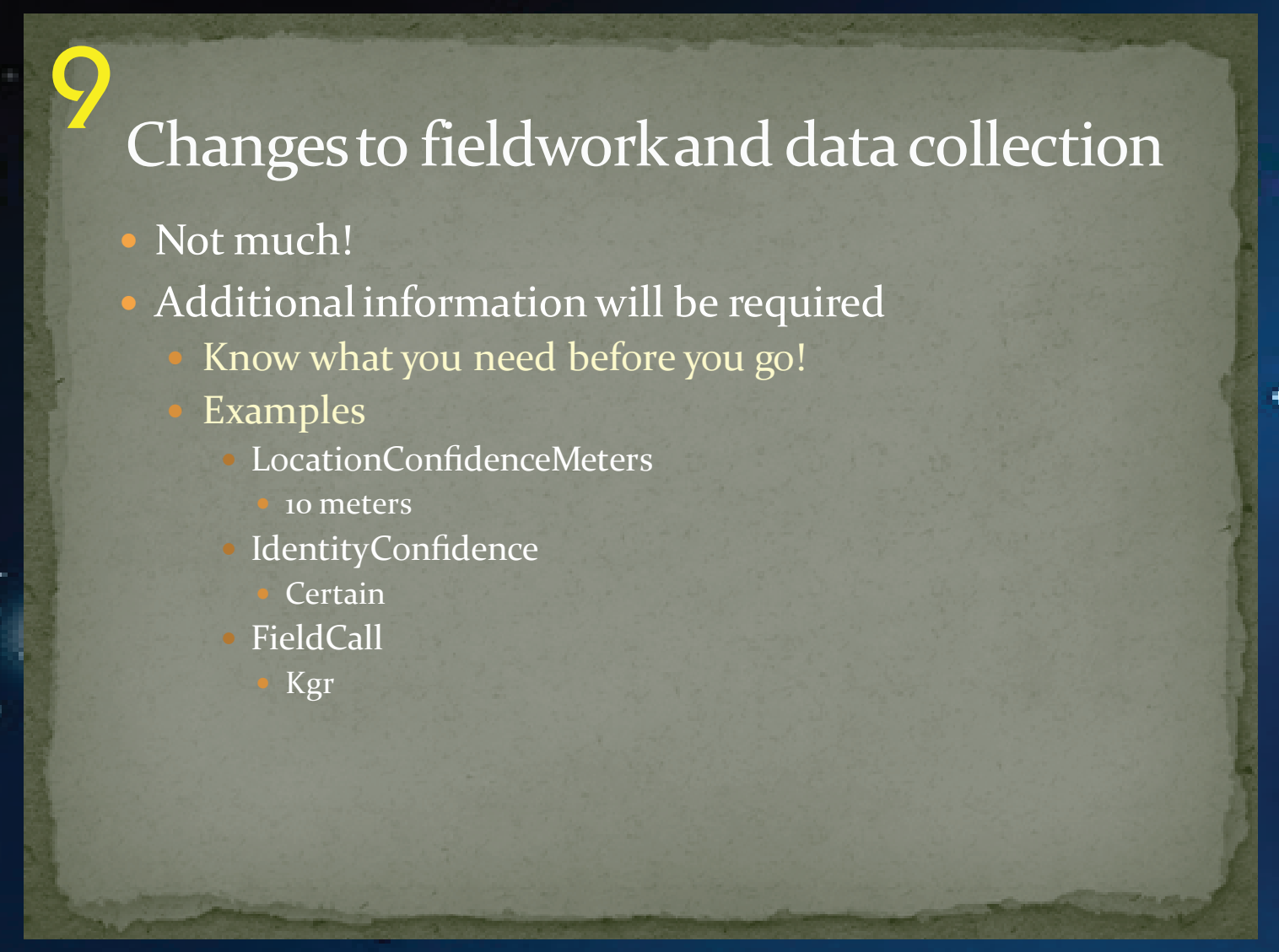
Efficiencies of NCGMP09

- Streamlines metadata creation
  - Metadata manager programmatically creates most 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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Changes to fieldwork and data collection

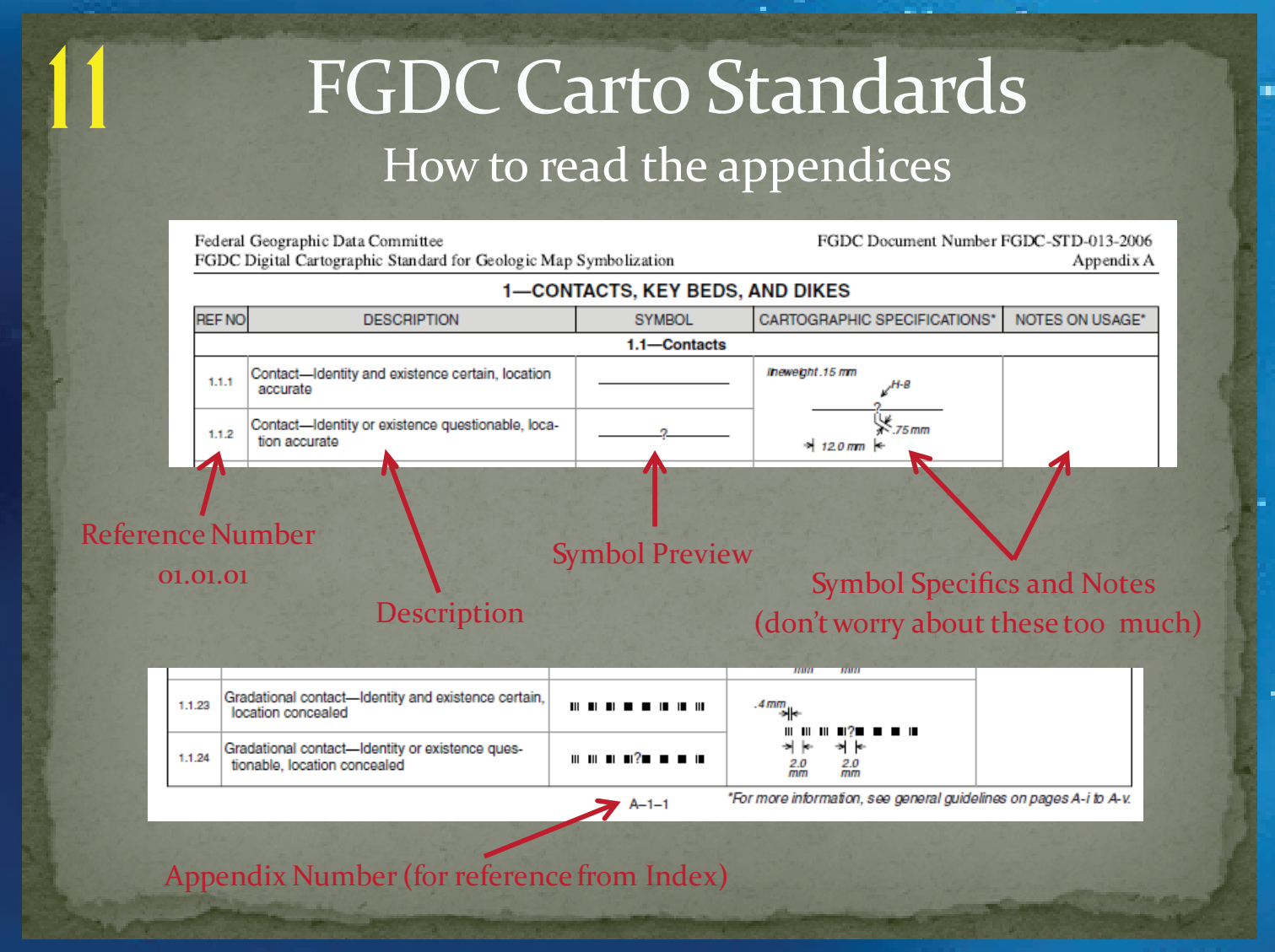
- Not much!
- Additional information will be required
  - Know what you need before you go!
  - Examples
    - LocationConfidenceMeters
      - 10 meters
    - IdentityConfidence
      - Certain
    - FieldCall
      - Kgr


10

FGDC Carto Standards Bible

FGDC Digital Cartographic Standard for Geologic Map Symbolization

- 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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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

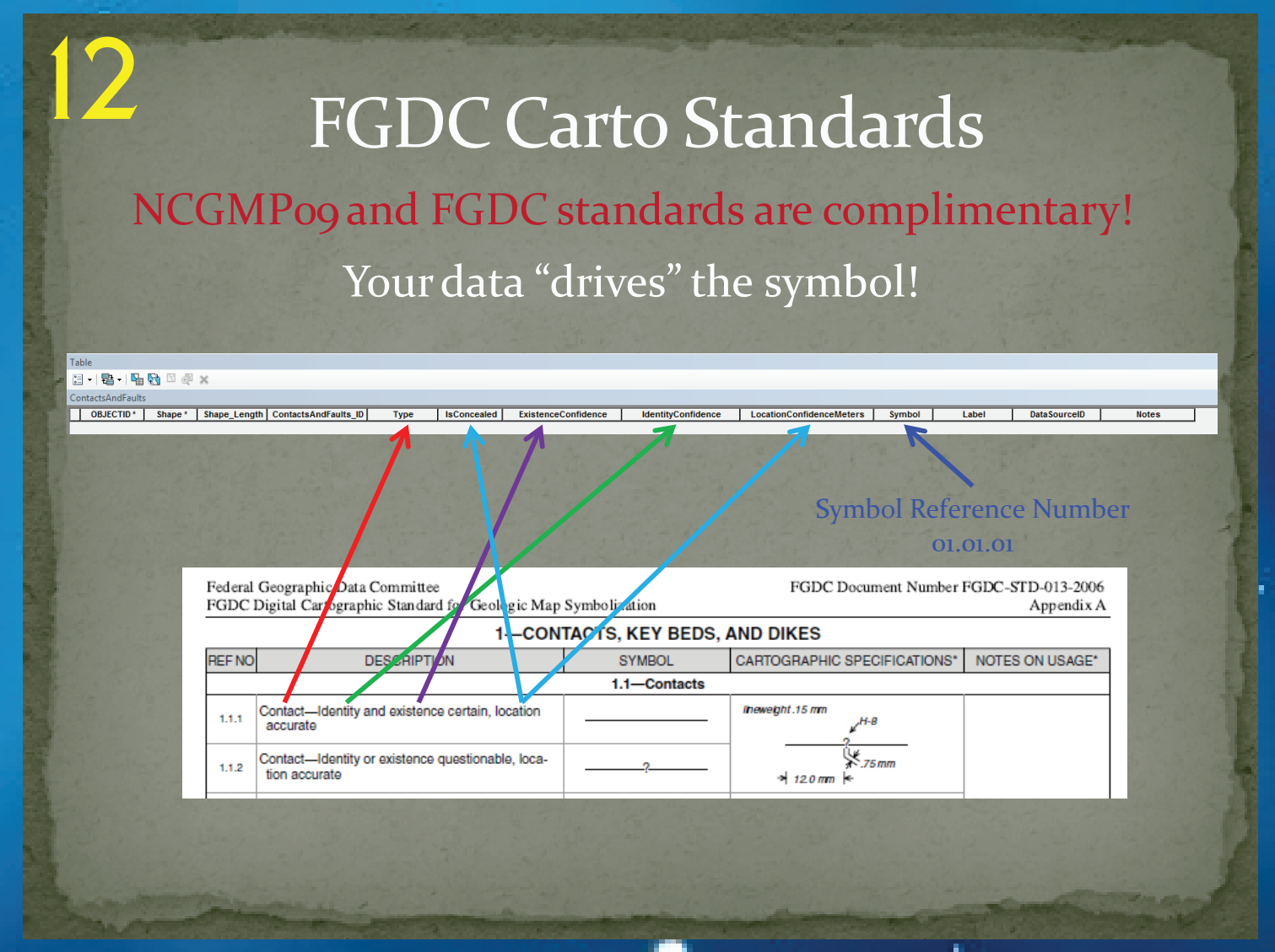
1—CONTACTS, KEY BEDS, AND DIKES

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	
1.1.2	Contact—Identity or existence questionable, location accurate	?	H-8; .75 mm; 12.0 mm	
1.1.23	Gradational contact—Identity and existence certain, location concealed		.4 mm	
1.1.24	Gradational contact—Identity or existence questionable, location concealed	?	2.0 mm; 2.0 mm	

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)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FGDC Carto Standards

NCGMP09 and FGDC standards are complimentary!

Your data "drives" the symbol!

Symbol Reference Number
01.01.01

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

FGDC Document Number FGDC-STD-013-2006
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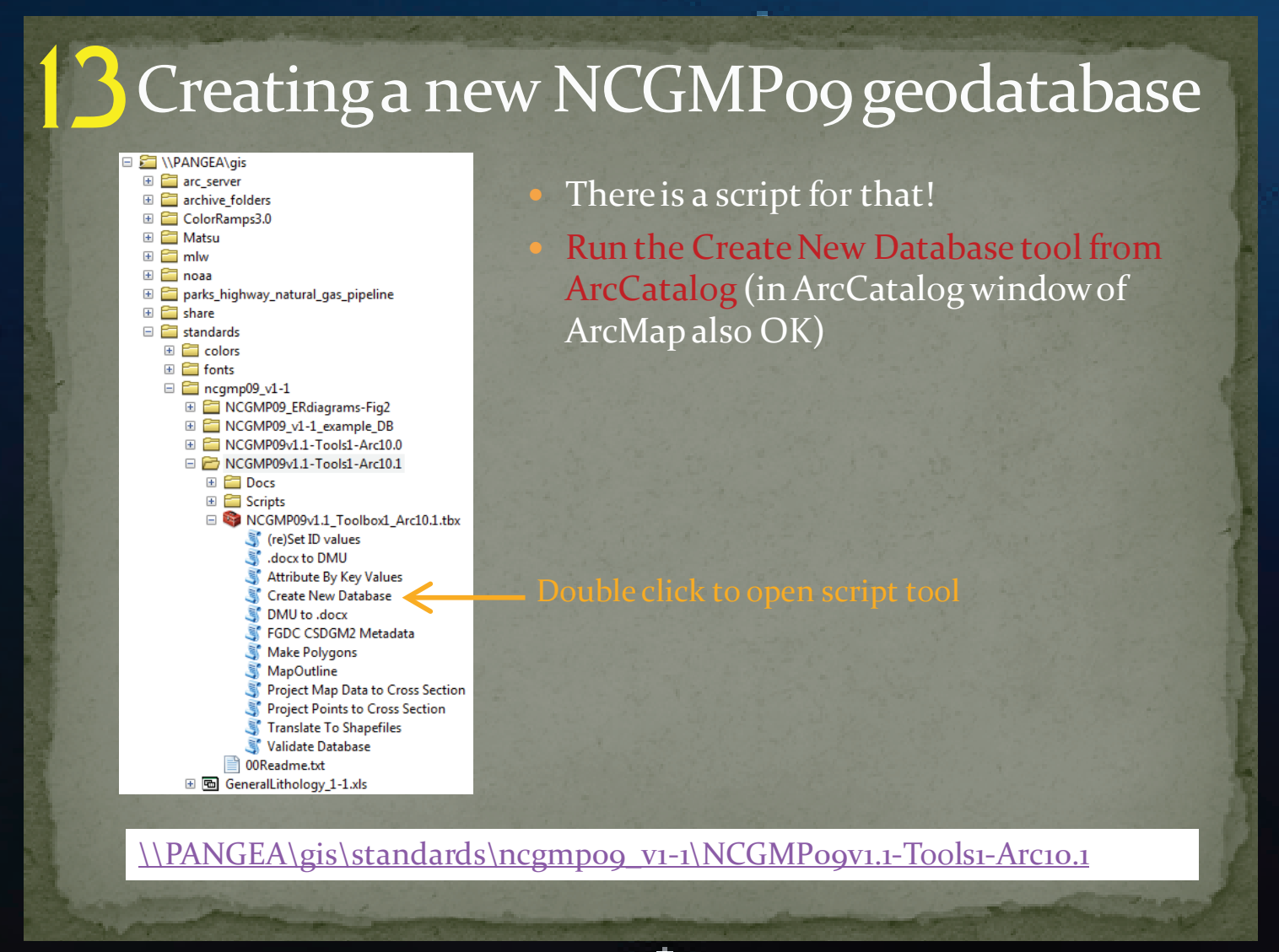
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Creating a new NCGMP09 geodatabase

- 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

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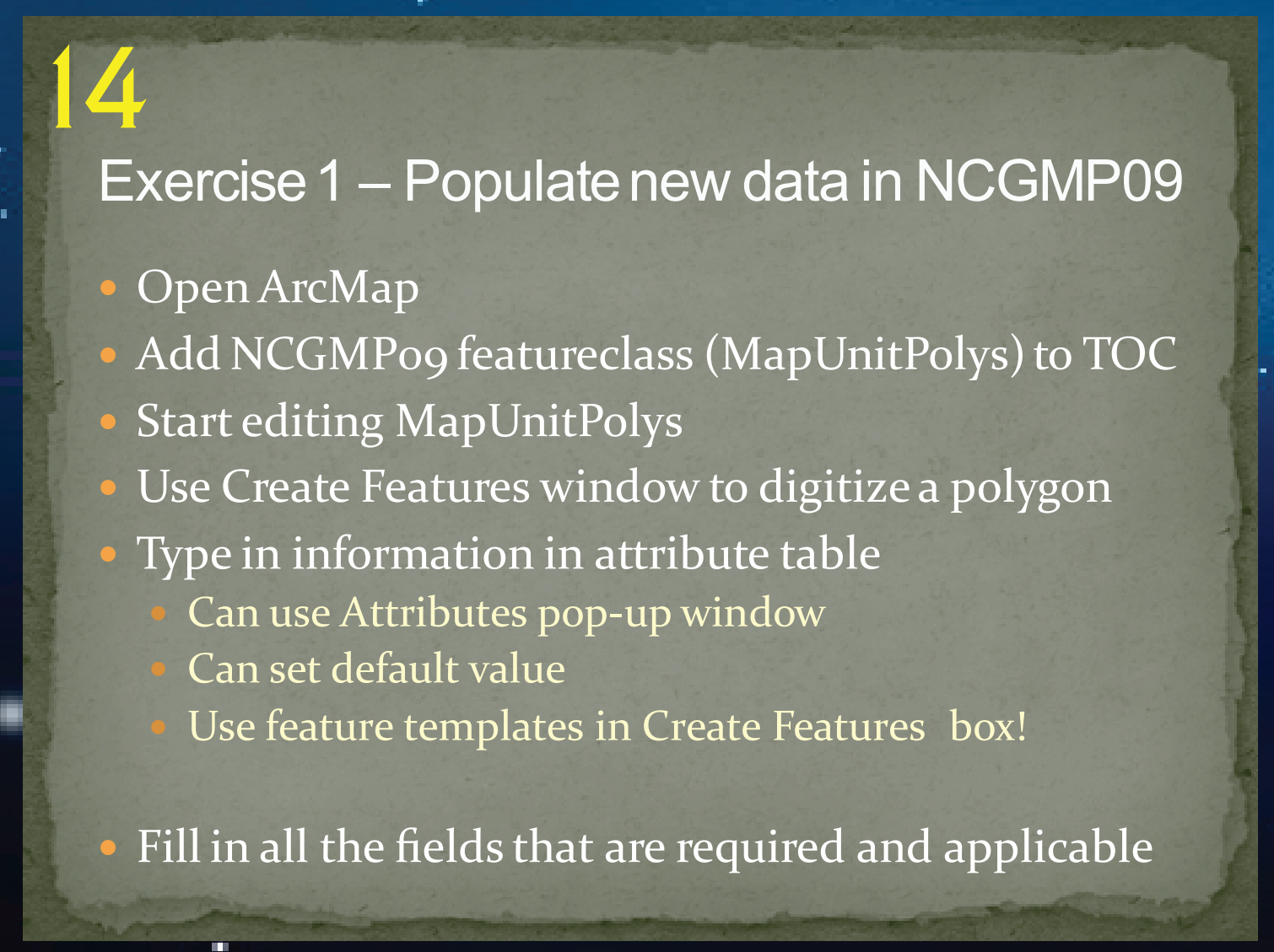
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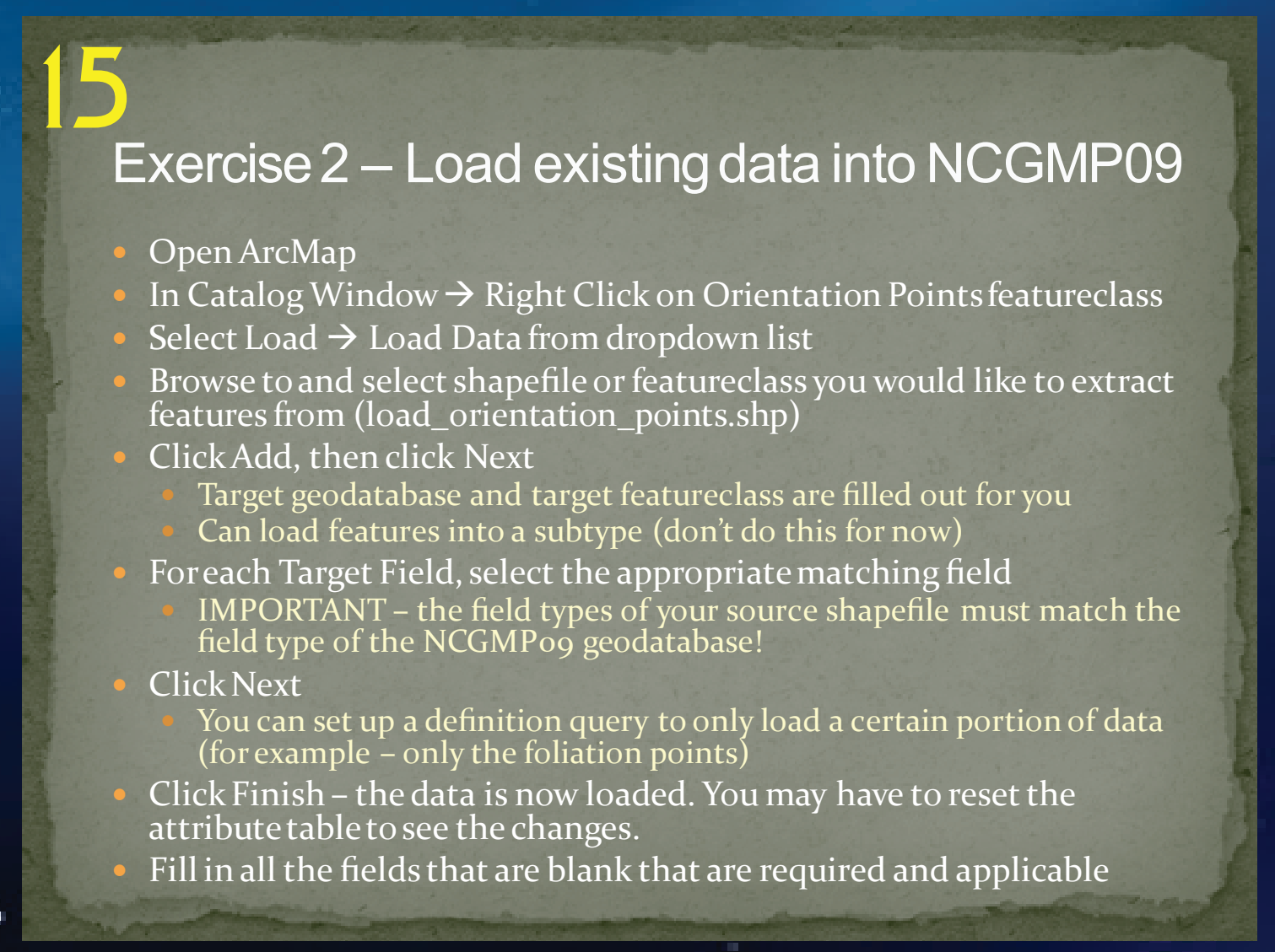
Exercise 1 – Populate new data in NCGMP09

- 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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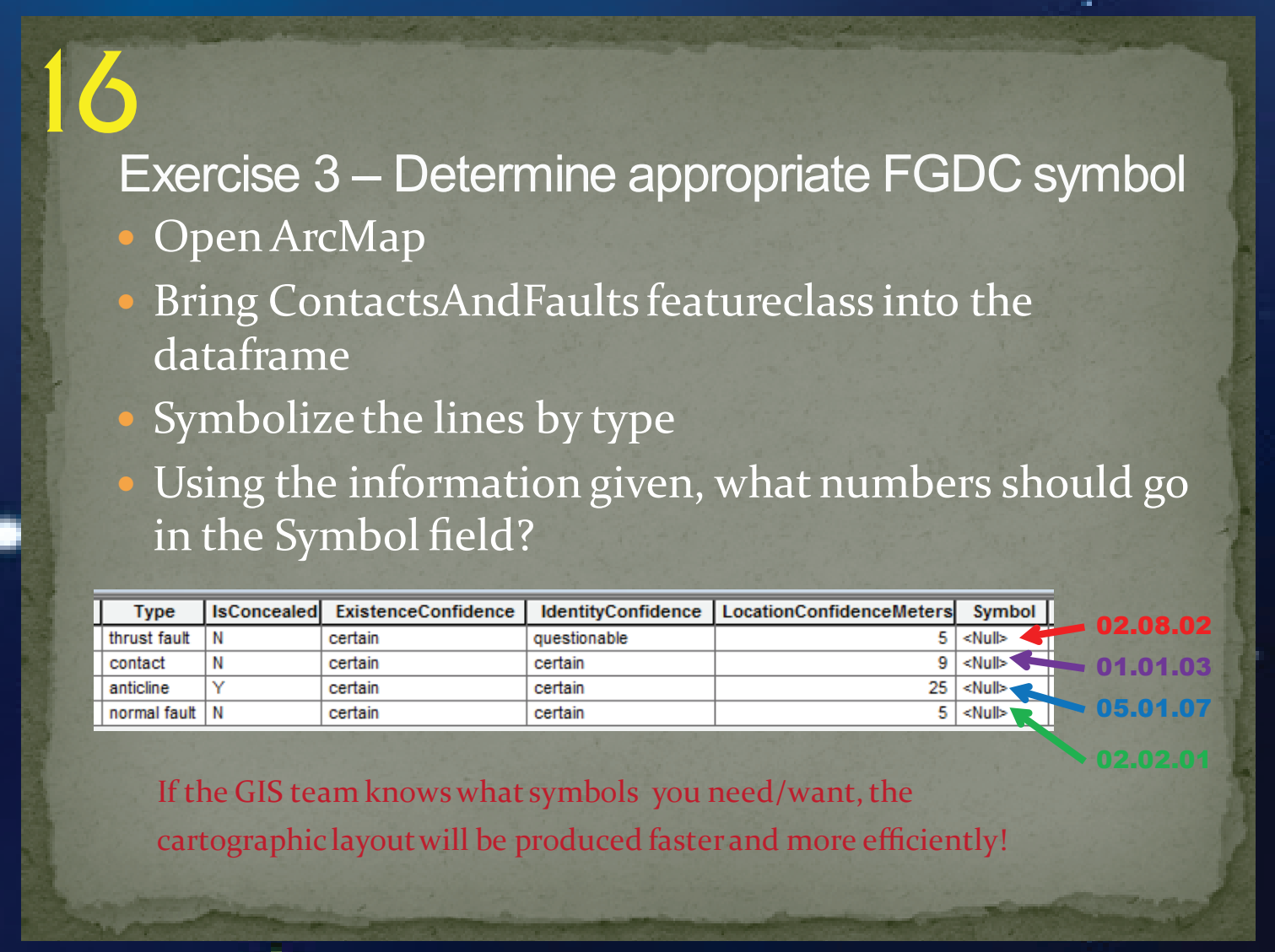
Exercise 2 – Load existing data into NCGMP09

- 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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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!

Make it so

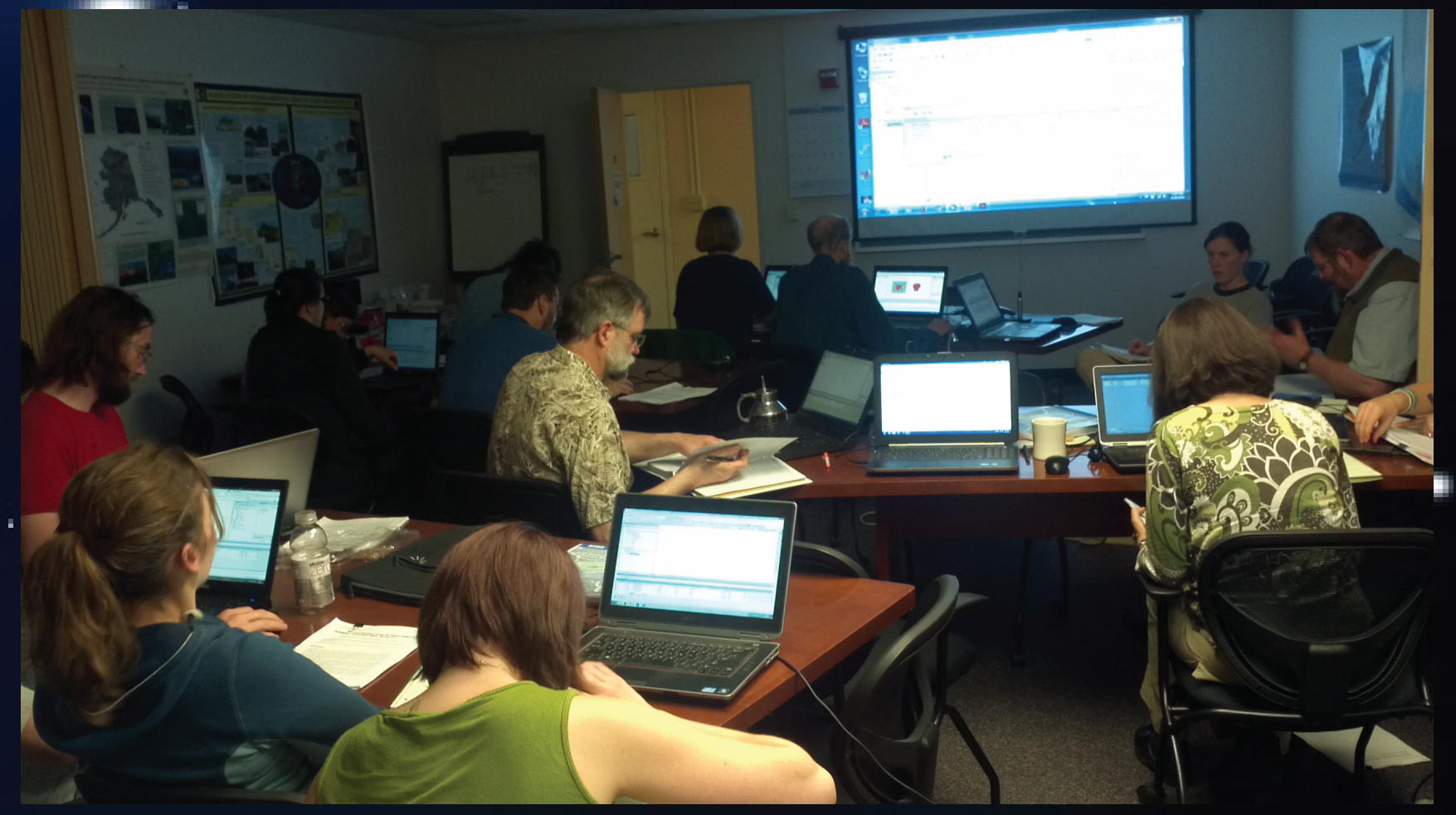
I started off the training session with something fun - a little competition. Whoever could tell me what the acronyms NCGMP and FGDC stood for got a fun prize. It's amazing how fast a room of professional scientists get excited about the prospect of a free candy bar!

My presentation started by answering the question: Why do we want to standardize? It's always helpful to know the reasoning behind a large decision, such as moving to a new standard (slide 1). Then I introduced NCGMP09. The acronym itself is quite intimidating, but the concept is generally simple (slide 2). Next, I handed everyone a printed out copy of the "NCGMP09 Bible". Most people found having a hard copy available during training to be very useful. I also included a link to its location on our network so that people could use the digital version if, for example, they wanted to look up tables by searching for a single word (slide 3). The next slide conveyed the concept that NCGMP09 is a geodatabase similar to what they are already using – but it contains standardized elements (slide 4).

A large part of getting to know NCGMP09 is figuring out which tables (and feature classes) are required, which varies greatly depending on the project. I created some guidelines for DGGS then and walked participants though examples of what fields are required, as needed , or could left blank (slides 5 and 6). To finish the NCGMP09 part of the talk, I wanted to emphasize why using this particular standard will be more efficient for everyone in the future (slide 8). When trying to win people to your side of a standard, you can never say too many good things about it. I added a slide describing how using NCGMP09 affects geologic fieldwork. People were generally relieved to hear that not much was going to change (slide 9).

I also wanted to talk about the FGDC cartographic standards because they fit together perfectly with NCGMP09. I gave everyone a copy of the manual and encouraged them to read the introductory material (slide 10). We went through how to read the various codes and symbols (slide 11). Then, I explained how FGDC and NCGMP09 work together to let the data drive the symbololgy (slide 12). There were many great discussions; particularly concerning location confidence. The great debate between specific (10 meter, 25 meter, etc) and descriptive (certain, approximate, etc.) location confidence could have gone on for hours!

Lastly, I had everyone fired-up their laptops for some hands-on activities. Before we all jumped into the exercises, I demonstrated the process of creating an NCGMP09 geodatabase using the 10.1 script in the NCGMP09 toolbox (slide 13). I did NOT have the participants try it on their own; it just would have required too much time. In the first exercise, participants populated new data into the MapUnitPolys feature class in their practice data folders (slide 14). Participants were able to practice creating data and filling in the required information. I also went over how to use the Create Features windows to help set defaults and templates. In the second exercise, participants loaded point features from a shapefile into the NCGMP09 Orientation-Points feature class (slide 15). This gave them practice on how to use the Simple Data Loader and identify missing required NCGM09 information. Lastly, people worked in groups to determine the best FGDC symbol for the lines in the ContactsAndFaults feature class (slide 16). It was interesting to see that groups chose slightly different symbols based on their interpretation of the LocationConfidenceMeters field.



DGGS geologists and GIS users explore strange new worlds and seek out new standards and new workflows.