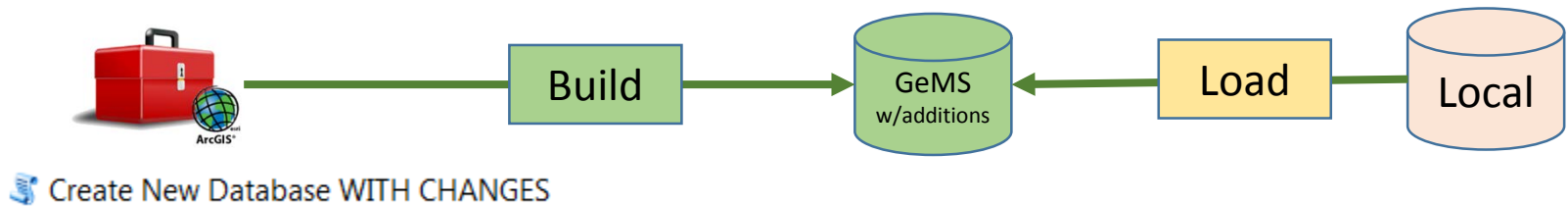


# Customizing the GeMS Toolbox for local requirements

DMTLite 2020 - 08 Dec 2020



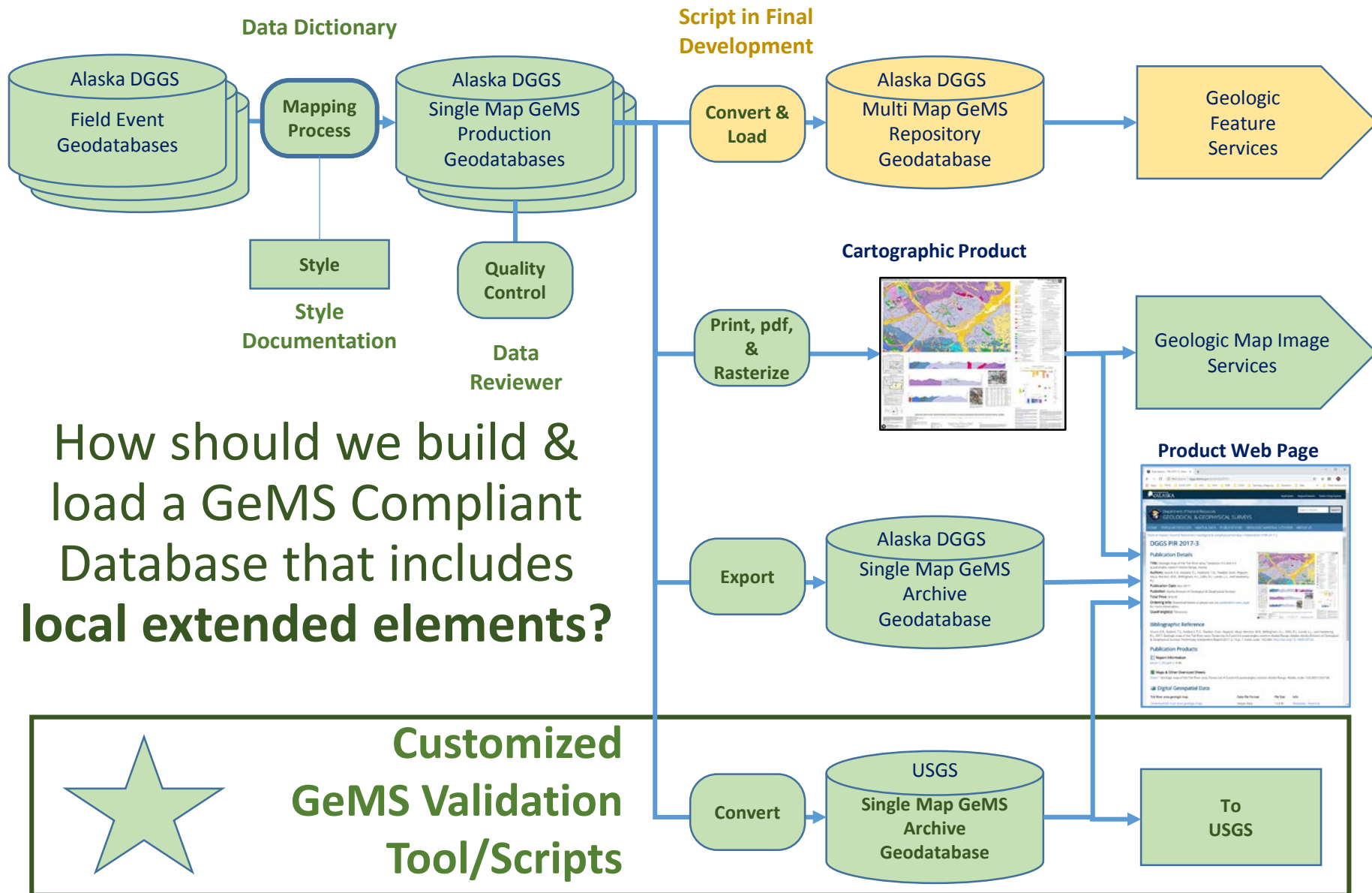
Mike Hendricks, Jen Athey, Trish Ekberg, Chris Wyatt, et al

**Alaska Division of Geological & Geophysical Surveys**

3354 College Rd, Fairbanks AK 99709



# Alaska DGGs Geologic Mapping System Products

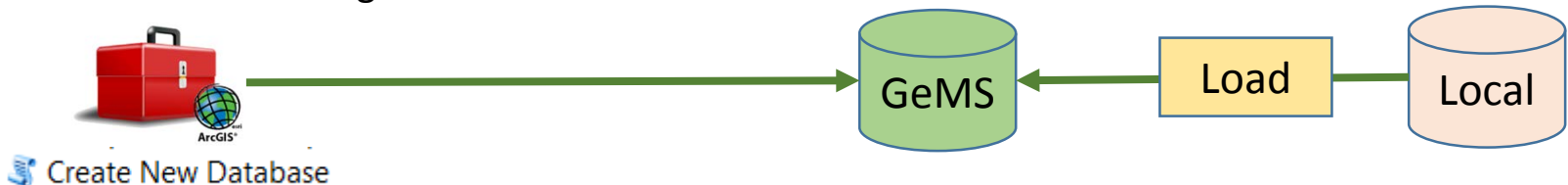


# Some Options to Building & Using a GeMS Database

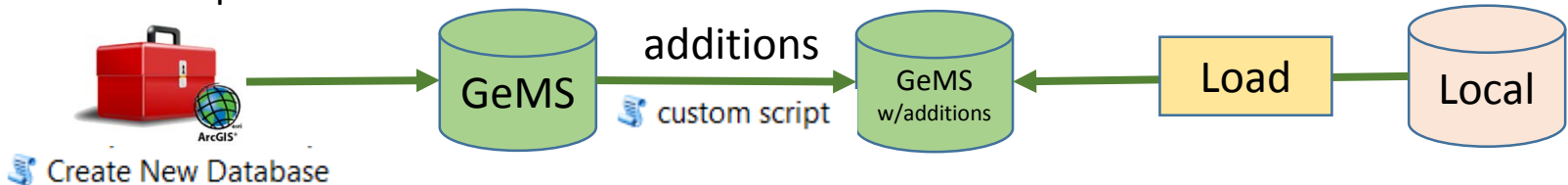
Use GeMS without additions



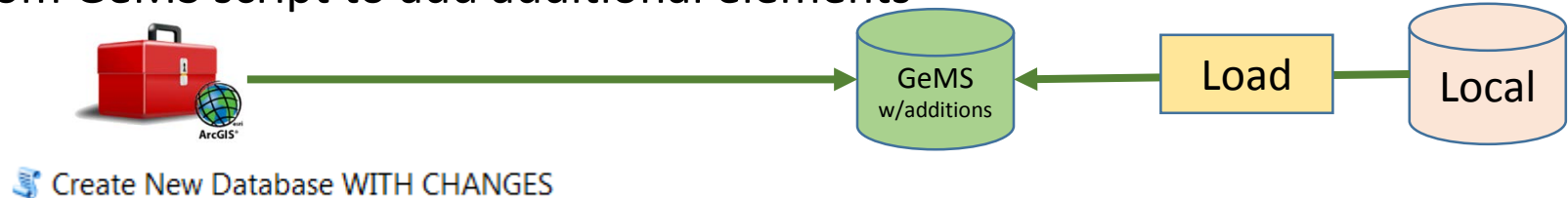
Try to Shoehorn local changes into Basic GeMS



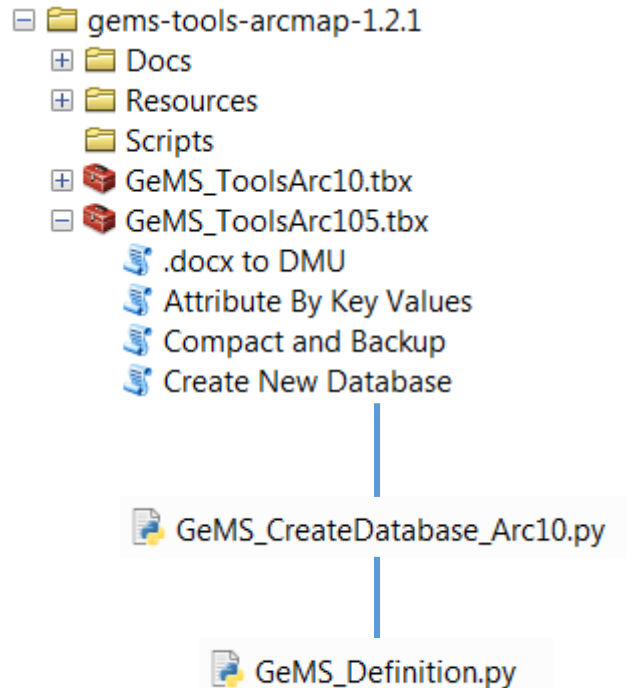
Create custom script to add additional elements



Custom GeMS script to add additional elements



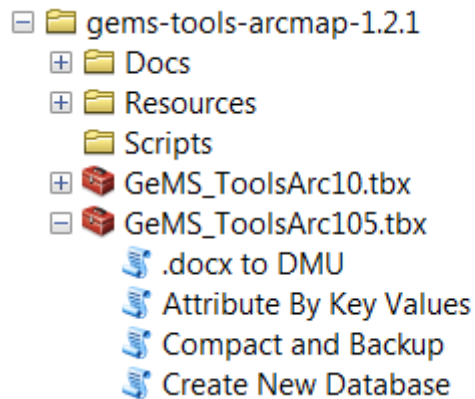
# The Tools & Scripts to Build a GeMS DB



- The GeMS Toolbox “Create New Database” Script, creates a GeMS compliant database with required, optional, and as-needed tables.
- The Schema of these tables is stored in the GeMS Definition.py (python) file.
- You can modify this file.

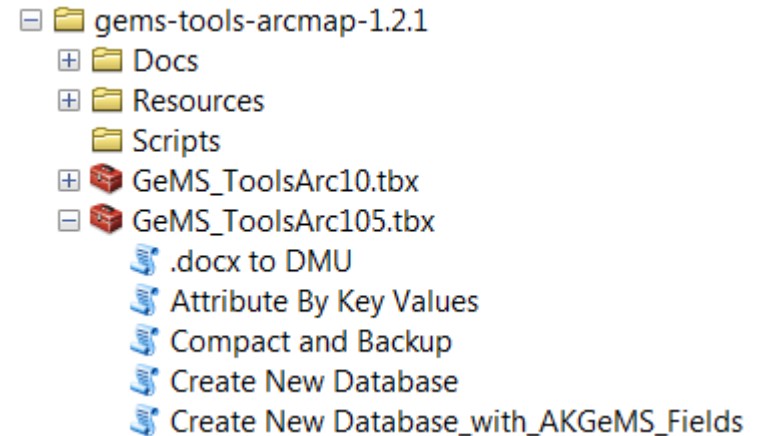
# The Tools & Scripts to Build a GeMS DB

## Customized files Toolbox and Scripts



GeMS\_CreateDatabase\_Arc10.py

GeMS\_Definition.py



GeMS\_CreateDatabase\_Arc10\_AKGeMS.py

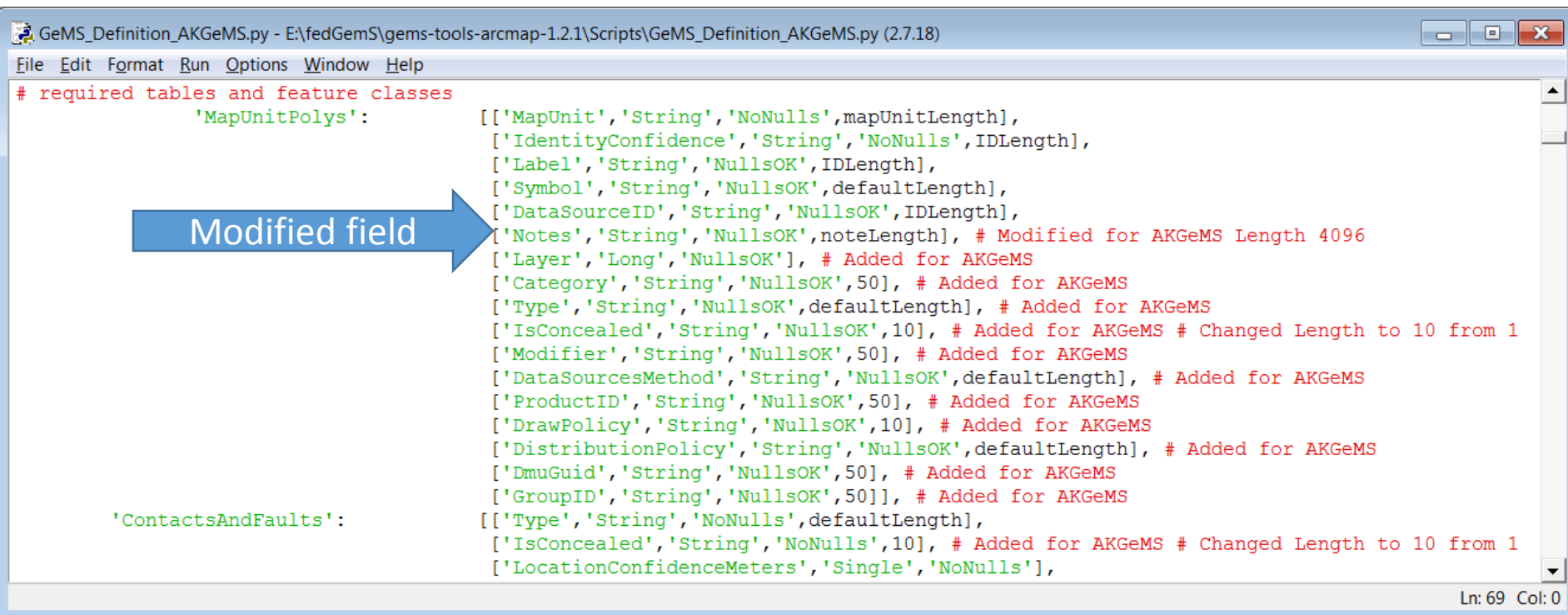
GeMS\_Definition\_AKGeMS.py

# Steps

1. Create copy and rename GeMS Definition.py
  - Make changes to definitions
    - Changes to original tables (new fields, and adjustments to existing)
    - Add new tables
2. Create copy and rename GeMS CreateDatabase Arc10.py
  - Change import path to new GeMS Definition renamed.py
  - Make changes to account for new tables
3. Create copy and rename Create New Database script in the GeMS\_ToolsArc105.tbx
  - Change source path customized script
  - Modify value list with new table names

# 1. Changes to original tables (new fields, and adjustments to existing)

## Example of Updates to the MapUnitPolys feature class Schema Definition



```
GeMS_Definition_AKGeMS.py - E:\fedGemS\gems-tools-arcmap-1.2.1\Scripts\GeMS_Definition_AKGeMS.py (2.7.18)
File Edit Format Run Options Window Help

# required tables and feature classes
    'MapUnitPolys':
        [['MapUnit','String','NoNulls',mapUnitLength],
         ['IdentityConfidence','String','NoNulls',IDLength],
         ['Label','String','NullsOK',IDLength],
         ['Symbol','String','NullsOK',defaultLength],
         ['DataSourceID','String','NullsOK',IDLength],
         ['Notes','String','NullsOK',noteLength], # Modified for AKGeMS Length 4096
         ['Layer','Long','NullsOK'], # Added for AKGeMS
         ['Category','String','NullsOK',50], # Added for AKGeMS
         ['Type','String','NullsOK',defaultLength], # Added for AKGeMS
         ['IsConcealed','String','NullsOK',10], # Added for AKGeMS # Changed Length to 10 from 1
         ['Modifier','String','NullsOK',50], # Added for AKGeMS
         ['DataSourcesMethod','String','NullsOK',defaultLength], # Added for AKGeMS
         ['ProductID','String','NullsOK',50], # Added for AKGeMS
         ['DrawPolicy','String','NullsOK',10], # Added for AKGeMS
         ['DistributionPolicy','String','NullsOK',defaultLength], # Added for AKGeMS
         ['DmuGuid','String','NullsOK',50], # Added for AKGeMS
         ['GroupID','String','NullsOK',50]], # Added for AKGeMS

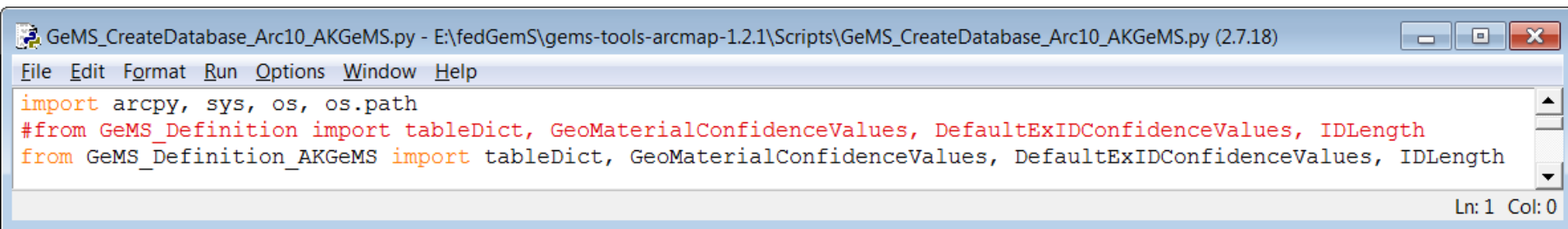
    'ContactsAndFaults':
        [['Type','String','NoNulls',defaultLength],
         ['IsConcealed','String','NoNulls',10], # Added for AKGeMS # Changed Length to 10 from 1
         ['LocationConfidenceMeters','Single','NoNulls'],

Ln: 69 Col: 0
```

*Fun Fact: You can change the order of fields here as well!*

**# Commented changes to original**

## 2a. Change import path to new GeMS\_Definition\_renamed.py



The screenshot shows a Python script editor window titled "GeMS\_CreateDatabase\_Arc10\_AKGeMS.py - E:\fedGemS\gems-tools-arcmap-1.2.1\Scripts\GeMS\_CreateDatabase\_Arc10\_AKGeMS.py (2.7.18)". The menu bar includes File, Edit, Format, Run, Options, Window, and Help. The code in the editor shows the replacement of an import from "GeMS\_Definition" with an import from "GeMS\_Definition\_AKGeMS".


```
import arcpy, sys, os, os.path
#from GeMS_Definition import tableDict, GeoMaterialConfidenceValues, DefaultExIDConfidenceValues, IDLength
from GeMS_Definition_AKGeMS import tableDict, GeoMaterialConfidenceValues, DefaultExIDConfidenceValues, IDLength
```

Ln: 1 Col: 0

## 2a. Make changes to account for new tables

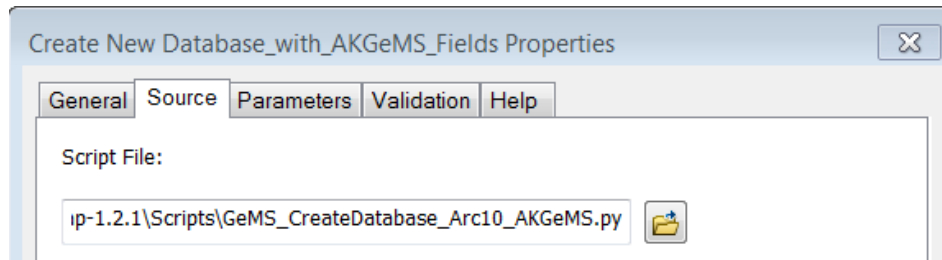
*For example, line feature classes changes*

```
# line feature classes
featureClasses = ['ContactsAndFaults']
for fc in ['GeologicLines', 'CartographicLines', 'IsoValueLines', 'MapUnitLines', 'StructureLines']: # AK GeMS Added 'StructureLines'
    if fc in OptionalElements:
        featureClasses.append(fc)
for featureClass in featureClasses:
    fieldDefs = tableDict[featureClass]
    if featureClass in ['ContactsAndFaults', 'GeologicLines'] and addLTYPE:
        fieldDefs.append(['LTYPE', 'String', 'NullsOK', 50])
    createFeatureClass(thisDB, 'GeologicMap', featureClass, 'POLYLINE', fieldDefs)
```

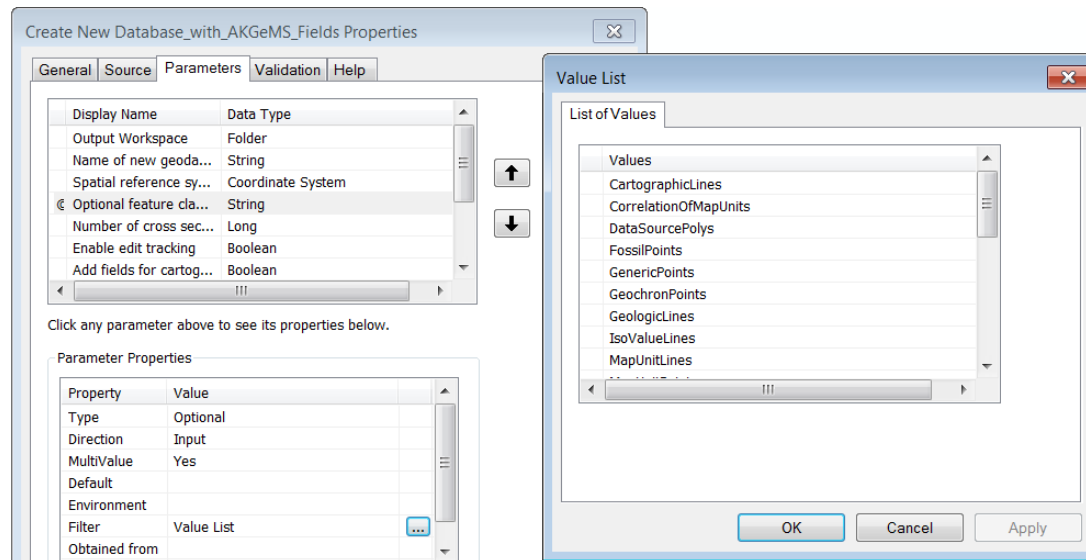


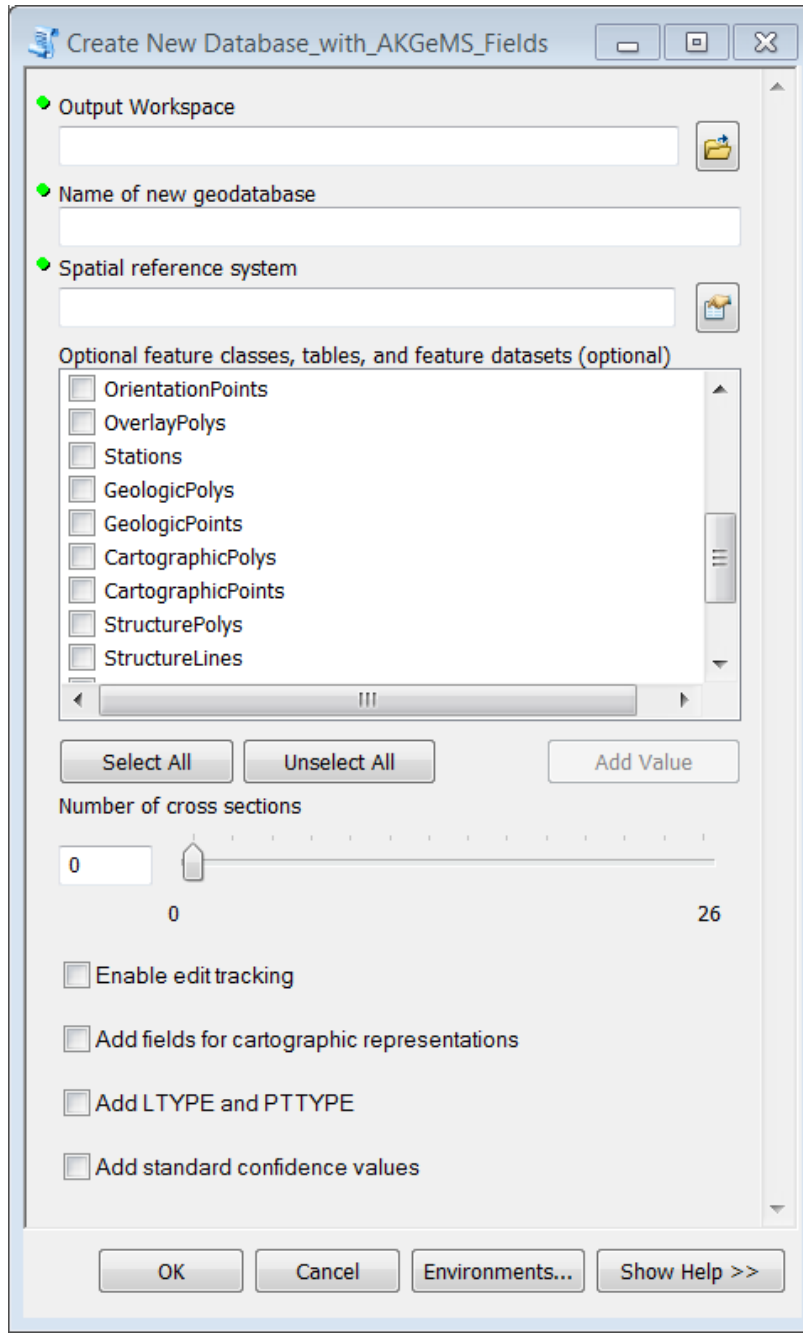


### 3a. Change source path customized script

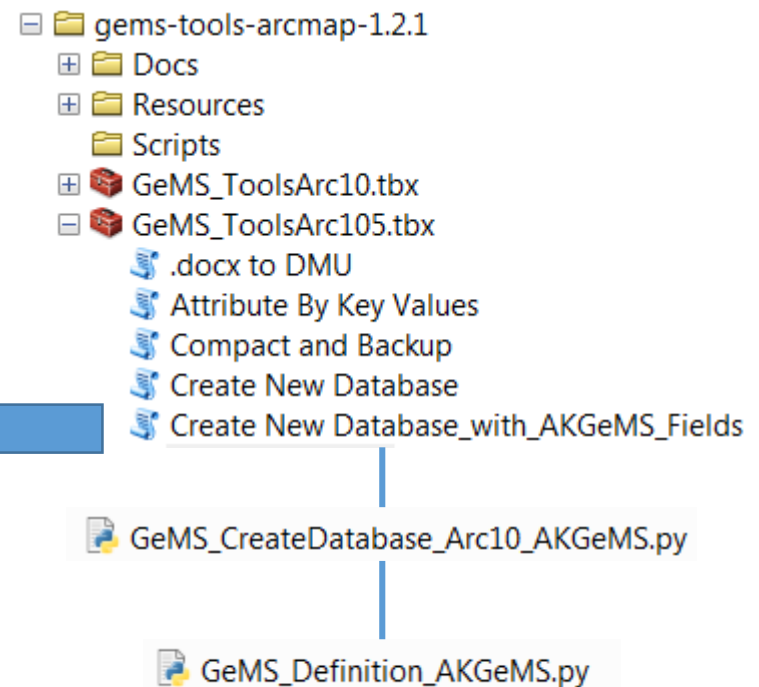


### 3b. Modify value list with new table names

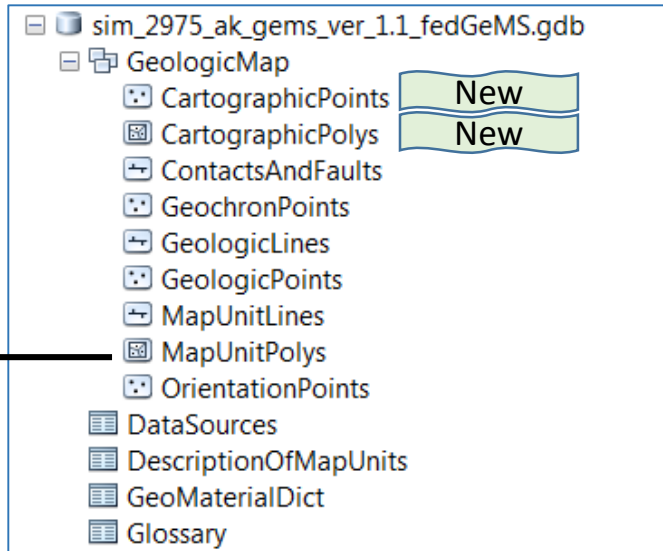




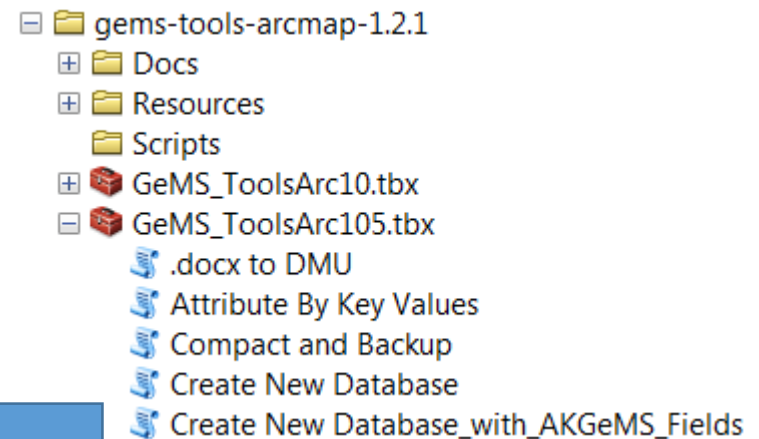
## Customized files Toolbox and Scripts



# Results



## Customized files Toolbox and Scripts



GeMS\_CreateDatabase\_Arc10\_AKGeMS.py

GeMS\_Definition\_AKGeMS.py

| Field Name         | Data Type    |
|--------------------|--------------|
| OBJECTID           | Object ID    |
| Shape              | Geometry     |
| Shape_Length       | Double       |
| Shape_Area         | Double       |
| MapUnit            | Text         |
| IdentityConfidence | Text         |
| Label              | Text         |
| Symbol             | Text         |
| DataSourceID       | Text         |
| Notes              | Text         |
| Layer              | Long Integer |
| Category           | Text         |
| Type               | Text         |
| IsConcealed        | Text         |
| Modifier           | Text         |
| DataSourcesMethod  | Text         |
| ProductID          | Text         |
| DrawPolicy         | Text         |
| DistributionPolicy | Text         |
| DmuGuid            | Text         |
| GroupID            | Text         |
| MapUnitPolys_ID    | Text         |

**Additional fields**

Questions