Appendix 2. Procedure for using ArcGIS to identify uncertain areas.

This appendix includes the Python script used in conjunction with ArcGIS 10.6.1 and the Spatial Analyst extension to identify uncertain areas. To use this script with different datasets on a different computer, an experienced Python script writer would have to edit the script.

> Inputs
>> GeoAbove: polygon feature class in which stratigraphic units above the Lebanon-Ridley contact are coded as 1 in the Major1 attribute and those below are coded as 0.
>> StructureSurface: DEM of Lebanon-Ridley contact.
>> SRTM_float: raster DTM of floating point SRTM elevations.
> Output
>> SumofSurfaces: raster in which areas are coded based on agreement between predictions based on (a) a structure surface and (b) the digital geologic map. Areas agree if coded as 0 (below the contact according to both) or 2 (above the contact according to both) and disagree if coded as 1 (above the contact according to one and below according to the other). Areas of disagreement are defined as uncertain.

1. Create a raster which is coded as 1 if the land surface (DTM) is above the structure surface and 0 if the land surface is at or below the structure surface.
   arcpy.gp.RasterCalculator_sa('Con("SRTM_float " > " StructureSurface ",1,0)',
   "c:/Users/mabolins/documents/ArcGIS/Default.gdb/StructureSurfaceAbove")

2. Convert polygon feature class of stratigraphic units above the Lebanon-Ridley contact to raster coded as 1 for all units above the contact and 0 for all units below the contact. Set cell size to 28 m to match SRTM cell size.

   ```
   # The following inputs are layers or table views: "GeoAbove"
   arcpy.PolygonToRaster_conversion(in_features="GeoAbove",
   value_field="MAJOR1",
   out_rasterdataset="C:/Users/mabolins/Documents/ArcGIS/Default.gdb/RasterGeoAbove", cell_assignment="CELL_CENTER",
   priority_field="NONE", cellsize="28")
   ```

3. Add the raster based on the published geologic map to the raster based on the structure surface, creating a raster in which areas where the two agree are 0 (both below the contact) or 2 (both above the contact) and areas of disagreement (one is above and the other is below) are 1. Areas of disagreement are defined as uncertain.

   ```
   arcpy.gp.RasterCalculator_sa('"RasterGeoAbove" +
   "StructureSurfaceAbove"',
   "c:/Users/mabolins/documents/ArcGIS/Default.gdb/SumOfSurfaces
   ")
   ```