BAS Data Integration Utility

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Install:

1. ESRI Add-in File
    a. Download the Add-In File
        i. For ArcGIS 10.2 (521kb)
        ii. For ArcGIS 10.1 (496kb)
    b. Double click the Add-In file in Windows Explorer. Click 'Install Add-in', and there will be a prompt stating that the install was successful.
2. Resources
    a. Download the required resources *(10mb)*
    b. Save the .ZIP folder anywhere on a local drive that has read/write access except the root of the C: drive. Do NOT unzip the folder manually.
    c. When the application is run the first time, it will prompt you for the directory of the zip file. After the data is unpacked, it will prompt you when it is safe to delete the zip file. There will also be a new folder on the C: drive called "Data_Integrator"; Outputs, documentation, and the extracted resources for the utility will be stored here.
3. Access Toolbar in ArcMap
    a. Open ArcMap, preferably a new blank document.
    b. To add the toolbar, click Customize > Toolbars > BAS Utility

Create BAS Change File Utility

Purpose: Provide local government users a way to easily and automatically generate Boundary Annexation Survey (BAS) Change Files based on their high quality local data in order to update the US Census Bureau's geography. The BAS Integrator was designed and built to work within ESRI ArcMap at any license level. It is important to note that this tool:

- Will not change your local dataset; It will only compare it to the Census Bureau's data.
- Will not submit a change file to the US Census Bureau, it will only create one based on a comparison of your local data.

Functionality: Compares US Census Bureau geography with local municipal data to generate a symmetrical difference, automatically enter the required attributes, filter acceptable changes, and flag potential annexations not yet submitted to or absorbed by the U.S. Census Bureau.

1. Click the Create BAS Change File button to start the utility.
2. Select your accurate municipal boundary layer (must be polygons)
    a. May be Shapefile (.shp) or fGDB Feature Class; May contain all municipalities in a county, or an individual municipality; May be municipal boundaries or ward layer
    b. If a municipality is in multiple counties, it will need to be submitted in parts by county.
3. Select Parameters
    a. Type of Update:
        i. Boundary Correction: Data may or may not contain annexations, but likely does contain boundary correction polygons not within the US Census data. *Default*
        ii. Annexation/Deannexations: Data contains only annexations/deannexations
    b. Entity Type:
        i. Is the input an entire county of municipal boundaries or a single municipality?
    c. Entity Content:
        i. Is the layer made of municipal boundaries, or municipalities made of wards?
    d. Select State and County:
        i. Required even if a single municipality.
    e. Select COUSUBFP Field *(NOT Required)*
        i. Field of complete US Census municipal codes. If not specified, one will be assigned.
        ii. Note: If COUSUBFP field is not specified, municipalities should be one feature, or a unique MCD Id field should be specified (see below).
    f. Other Unique MCD Id Field *(NOT Required)*
        i. If the input data is a countywide ward layer dataset, but no COUSUBFP field exists, another unique municipal code of some type must be supplied.
        ii. Note: Unique codes are case insensitive, so "MADISON" and "Madison" are equal.
    g. Enter a Project Name *(NOT Required)*:
        i. Enter a name for this run of the utility. This will be used to store the output file, and allow access to the result in future documentation efforts. If a project name is not provided it will be automatically created.
4. Click OK to run the Utility. The Documentation Utility will automatically launch after the BAS Change File has been created.

Document BAS Change File

Goal: Locate and document any annexations or deannexations that are not currently updated in the U.S. Census Bureau's geographic data.

Functionality: The utility will allow the user to enter the web link to the documentation, and effective date for an annexation or deannexation. After the information is entered the change polygons will automatically fill in all of the remaining attributes. The information is placed in a partner centroid point file.

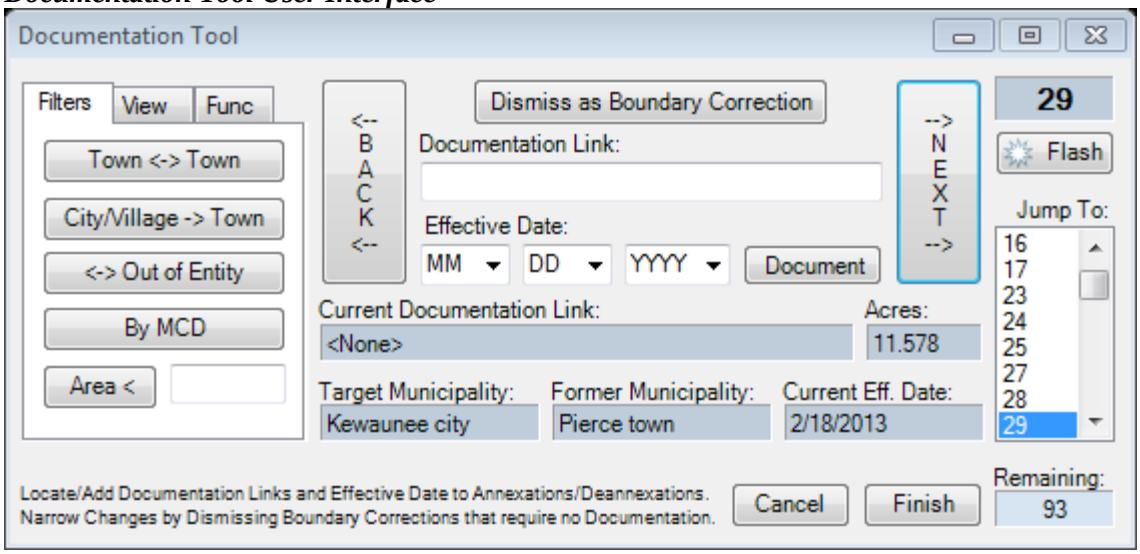
Usage: Multiple ways to use the Documentation utility

1. Dismissing Boundary Corrections
    a. Dismissing change polygons does not delete the change polygon, only excuses it from the list of polygons that may potentially need documentation.
    b. 'Dismiss' change polygons that are only boundary corrections by using several different tools to help narrow down potential annexations.
2. Narrow with Filters:
    a. Find annexations throughout the county that were previously unknown to the US Census. There may be annexations from several years ago that have not been entered into the geography.
    b. Use the buttons on the Filters tab such as: 'Town <-> Town', 'City/Village->Town', '<-> Out of Entity', 'Area<'. See: Documentation Tool User Interface for information on button functionality. If you know that there have been no annexations that meet those parameters in the last several years, you can eliminate them all in one click.
        i. Township to Township annexations, deannexations, county to county annexations, new land in a lake, and annexations under a specified size are all not very common, so change polygons meeting these parameters may be automatically marked as Boundary Corrections when these buttons are clicked. Using these functions should help narrow down possible annexations.
    c. Use the 'By MCD' button to dismiss any change polygon going into any specified municipalities. If a municipality has not had an annexation or deannexation in several years then these change polygons may be excused.
3. Use the Map:
    a. If there are known annexations that are missing from the US Census data, the user has the option to simply pan and zoom in ArcMap to the location of the annexation.
    b. There will be an ID number in bold over the change polygon, jump to the ID number in the UI, confirm it is the correct number by clicking the 'Flash' button to blink the polygon, and fill in the documentation for that polygon.
4. Check 'View' tab, turn 'Flagged Polygons' on
    a. These polygons met certain parameters that made them likely targets as annexations.
    b. Use the 'Next' and 'Back' buttons to scroll through them to see if there were any annexations. If unsure, just leave it until later. You may always return. Once finished, uncheck 'View Flagged Polygons' to see all of the remaining.
5. Use the User Interface to step through the remaining
    a. After the previous steps, there should be significantly less change polygons that could be annexations. Turn 'View Undocumented Only' on, and click 'Dismiss' for any change polygons to excuse them as boundary corrections. Use 'View Aerial Imagery' or 'View Topographic Map' to assist in identifying areas.
6. Return Anytime:

a. After running the 'Create BAS Change File Utility', the resulting change polygon may be documented any time after, in any MXD, by clicking the 'Document BAS Change File Utility'.
b. If there are either BAS files (point or polygon) in the MXD, it will automatically add the required files, including a copy of the original input data. Otherwise, the user may choose the name of the project from a drop-down menu.

7. Click Finish to create the final package to be forwarded to the U.S. Census.

Documentation Tool User Interface



1. *Core Functionality:*
   a. **Documentation Link:** Enter a web link to documentation, or "See Attached PDF: [Name of PDF]" if you are submitting PDFs with the change polygons, about an annexation.
   b. **Effective Date:** Enter a valid date of an annexation. Boundary corrections are given the day the change file was created as their effective date.
   c. **Document:** Store the documentations in the partnered point file. Annexation codes and attributes are updated automatically.
   d. **Clear Documentation:** Clear the current documentation and effective date from the polygon, and resets polygon as potentially requiring documentation.
   e. **Finish:** The final zip package is created. The user will be given the location of the zip file. This will be the file forwarded on to the US Census.
   f. **Cancel:** Exit the UI. The user may return at any time to continue documentation.
2. *View Tab Functionality:*
   a. **Flagged Only:** Only polygons automatically flagged will be visible. These are the most likely annexations as determined during the change file creation process.
   b. **Undocumented Only:** Only polygons with no documentation will be visible.
   c. **Aerial Imagery:** Add Aerial map service
   d. **Topographic Map:** Add Topographic map service
   e. **US Census CCDs/Accurate Dataset:** Toggles layers off/on
   f. **Current Polygon ID:** Active polygon ID
   g. **Jump To:** Jump to selected polygon ID

h. **Next/Back:** Go to next/previous polygon
i. **Zoom Out/In:** Map zoom control
j. **Flash:** Flash the polygon in the map
k. **Remaining:** # of polygons currently undocumented or not dismissed as Boundary Corrections.

3. *Dismiss Functionality (Assists in finding missing annexations by eliminating boundary corrections):*
   a. **Dismiss as Boundary Correction:** If boundary correction only, than dismiss the active polygon from the list of polygons that may require documentation.
   b. **Reset Dismissals:** Reset all previously dismissed polygons
   c. **Undo Last Dismissal:** Reset last dismissed polygon
   d. **Town <-> Town :** Dismiss all change polygons that are moving from a Township to a Township, meaning that no townships have annexed into other townships.
   e. **City/Village -> Town:** Dismiss all change polygons that are moving from a City/Village to a Township, this means that there have been no deannexations.
   f. **<-> Out of Entity:** Dismiss all change polygons moving to/from outside of the input entity, or to/from a major lake. If the input was a county, this also means that the county has not annexed into another county or state.
   g. **Add ID:** Reset a previously dismissed polygon by ID
   h. **Area<:** Dismiss any change polygon less than a set value in acres. Entering a '1' would eliminate all change polygons less than an acre, which means you are saying that there were no annexations under an acre in several years.
   i. **By MCD:** Dismiss any change polygon going INTO user specified municipalities.
4. *Display Functionality:*
   a. **Current Documentation Link/Effective Date:** Displays the current documentation and effective date associated with the polygon
   b. **Target/Former Municipality:** Displays what municipality the polygon is moving from (Former) and moving into (Target).
   c. **Acres:** Area of change polygon in acres.
   d. **Remaining:** Number of change polygons in the view option that have not been dismissed as a Boundary Correction already.

Output BAS Change File Package:

1. After clicking 'Finish' in the Documentation UI, a .ZIP file will be created the user's project folder. A prompt will remind the user of the exact path location.
2. Naming Convention:
    a. ***bas<yy>_<basID>_<update type>_<type>*** *(ie.bas14_55105_changes_cousub)*
        i. *<yy>* = BAS Year (i.e. 2014)
        ii. *<basID>* = BAS Entry ID (i.e. 55 for Wisconsin, 105 for Kewaunee County)
        iii. *<update type>* = "changes" for Change Polygons
        iv. *<type>* = Polygon type (i.e. County = county, MCD = cousub)
3. BAS Change File *(ie.bas14_55105_changes_cousub.shp)*
    a. Description: The file contains individual polygons, called "change polygons", of the areas in which the submitted accurate data differs from the US Census. The polygons have been filtered to only include those with a width of greater than 30 feet.
    b. A width of 30 feet is defined as the ability to fit a 15 radius circle entirely within any portion of the polygon. If any portion of the change polygon exceeds 30 feet in width by this definition, than the entire contiguous polygon is included.
4. BAS Documentation File *(ie.bas12_55105_changes_cousub_DOCU.shp)*
    a. Description: This is the partner file for the Change file. It is unavoidable to separate boundary corrections and annexations without manually dividing the polygons along an arbitrary line. The US Census does not allow documentation to be appended directly to polygon features that contain both annexations and boundary corrections. The work around is to create centroids that contain the annexation's documentation, even if a boundary correction as part of the annexation, and include a "BAS_JoinID" field to connect the two files.
5. Attributes:
    a. Attributes are the same for both the Change File and the Documentation file, except the documentation and effective date are only completed in the Documentation point file.
    b. NAME
        i. Municipality that is annexing, or gaining a boundary correction polygon
    c. COUSUBFP
        i. US Census unique entity code of the annexing municipality
    d. CHNG_TYPE
        i. 'A' = Annexation
        ii. 'B' = Boundary Correction
        iii. 'D' = Deannexation
    e. EFF_DATE
        i. Effective Date for annexation/deannexation
    f. DOCU
        i. Link to documentation. Required for annexations. This will be completed using the Documentation utility.
    g. AREA
        i. Calculated area of change in Acres
    h. RELATE
        i. 'IN' = Add area in boundary correction. This area will become part of the municipality in the NAME field, which will match the ID in the COUSUBFP field
        ii. 'OUT' = Remove area in boundary correction. This area will be removed from the

municipality in the NAME field, which will match the ID in the COUSUBFP field. These areas are on the edges of the state, county, major lake or individual municipalities in which they are being submitted. The U.S. Census will determine what entity the polygon should be reassigned.

i. USC_COUSUB
    i. The original municipal entity code for the change polygon according to the U.S. Census Bureau

j. BAS_JoinID
    i. Unique ID referenced in the Documentation utility. This field is used to join the tables of the point and polygon shapefiles of the BAS Change File together.