Block Check Tool Instructions

This tool can be used prior to a Human Exposure Model (HEM) run to ensure the Census blocks (using 2020 Census data) modeled by HEM (versions 4.2 and later) are appropriately located off of facility property and accurately represent residential locations within Census blocks. To accomplish this, the 2020 Block Check Tool identifies 2020 Census blocks within two user-specified distances from emissions sources. The first distance specifies how far out from each emission source the tool should look for Census blocks that are potentially on facility property. The second distance specifies how far out from each emission source the tool should look for Census blocks that are large and, consequently, have centroids that potentially are not representative of the residences inside the block.

Tool Inputs

The tool has three required input parameters and one optional input parameter:

1) The distance (m) within which the tool will locate Census blocks that are potentially on facility property. Note: Census blocks within this distance will be shown in red in the output.
    a. This is a required input.
    b. If this distance is small (e.g., 100 meters), some on-site blocks may be missed.
    c. If this distance is large (e.g., 1,000 meters), typically there will be too many blocks identified as potentially on-site.
    d. There is no default value included in the tool, but 300 meters is a suggested default.
2) The distance (m) within which the tool will locate Census blocks that are large and that may have block centroids that are not representative of residences in the block. Note: Census blocks within this distance will be shown in yellow in the output.
    a. This is a required input.
    b. There is no default value included in the tool, but 1,000 meters is a suggested default.
3) The full path to HEM's Emissions Location (Excel™) input file that is used in the HEM modeling.
    a. This is a required input. See the HEM User's Guide for more information.
    b. An example file path is "C:\HEM_inputs\Name_Actual_EmisLoc.xlsx".
4) The full path to HEM's Polygon Vertex (Excel™) input file that is used in the HEM modeling.
    a. This is an optional input because this file may not exist for the HEM modeling, if no sources are modeled as polygons. See the HEM User's Guide for more information.
    b. An example file path is "C:\HEM_inputs\Name_Actual_Polygon_Vertex.xlsx".

Tool Resource Files

The Block Check Tool requires two resource files to perform its operations. These files must be in a folder named "Resources" that is a subfolder to the folder containing the tool:

1) The first file is the HEM Census block input file in CSV format that contains all blocks in the U.S., Puerto Rico, and U.S. Virgin Islands. This file is named "Census2020_US_HEM.csv."
2) The second file contains the vertices for all Census block polygons in the U.S., Puerto Rico, and U.S. Virgin Islands. This file is in CSV format and is named "2020_Block_Polygons_Final.csv."

The HEM Census block file, "Census2020_US_HEM.csv.", should be kept current so that it reflects all previous block changes. An update can be performed by deleting the current file in the Resources folder, copying the current HEM Census file into the Resources folder, and renaming the HEM Census file to "Census2020_US_HEM.csv."

Tool Output

There is a single output file created by the tool: a Google Earth KMZ file named "BlockCheck.kmz". This output file will be located in the folder that contains HEM's Emissions Location input file entered for "Tool Inputs" (#3 input above). This file contains multiple layers, including:

1) a point layer of the point source emissions,
2) an optional polygon layer of polygon emission sources, and
3) point and polygon layers for the potential on-site blocks (shown in red), other nearby blocks (shown in green), and the large blocks (shown in yellow).

Using this KMZ file, the potential on-site block layer (red layer) can be reviewed along with the aerial imagery to determine whether the identified blocks have their centroid on facility property. The large block layer (yellow layer) can be reviewed to determine whether the user may want to move the block centroid receptor or add user receptors (using the user receptor HEM input file) within the identified blocks to better represent the residences in these blocks.

The tool is not perfect, and there can be cases where another nearby block (green layer) is on facility property but was not identified by the tool as potentially on-site (red layer) because of the user distance input. Therefore, QA review of the output is advised, and the user may want to rerun the Block Check Tool with inputs at larger distances.