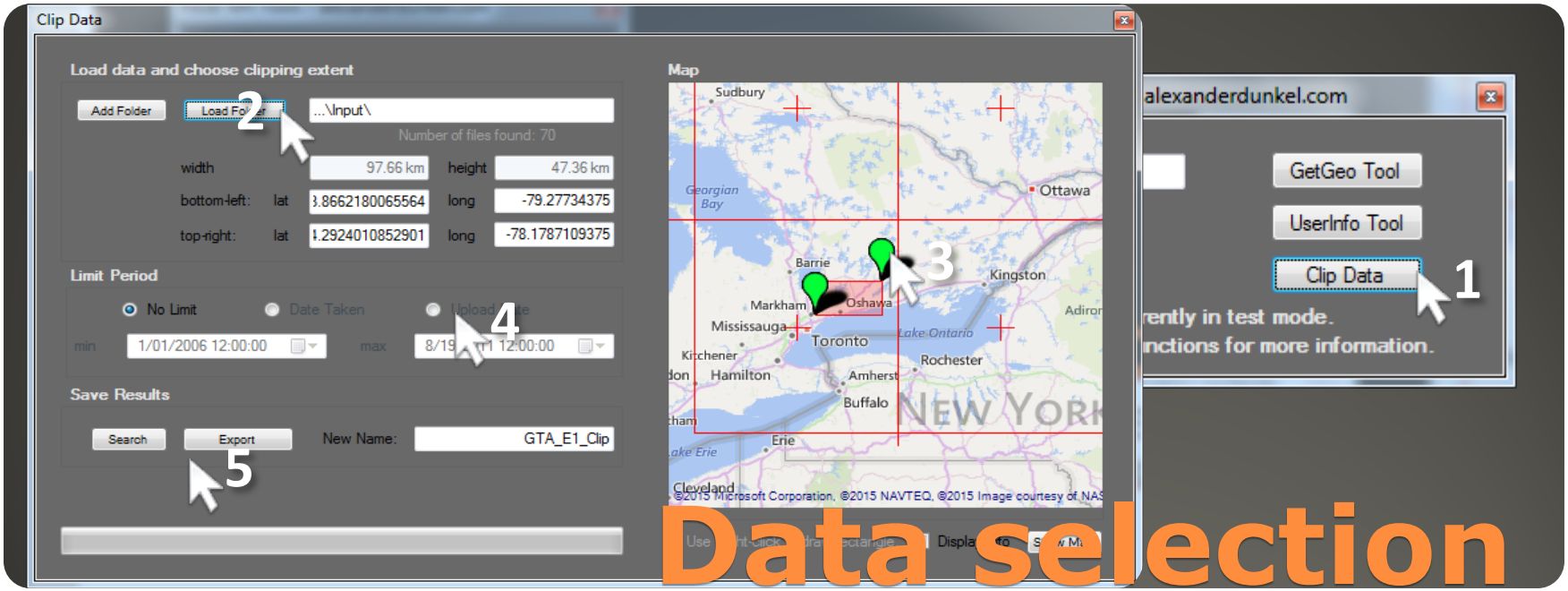
Workshop part 1: tag maps

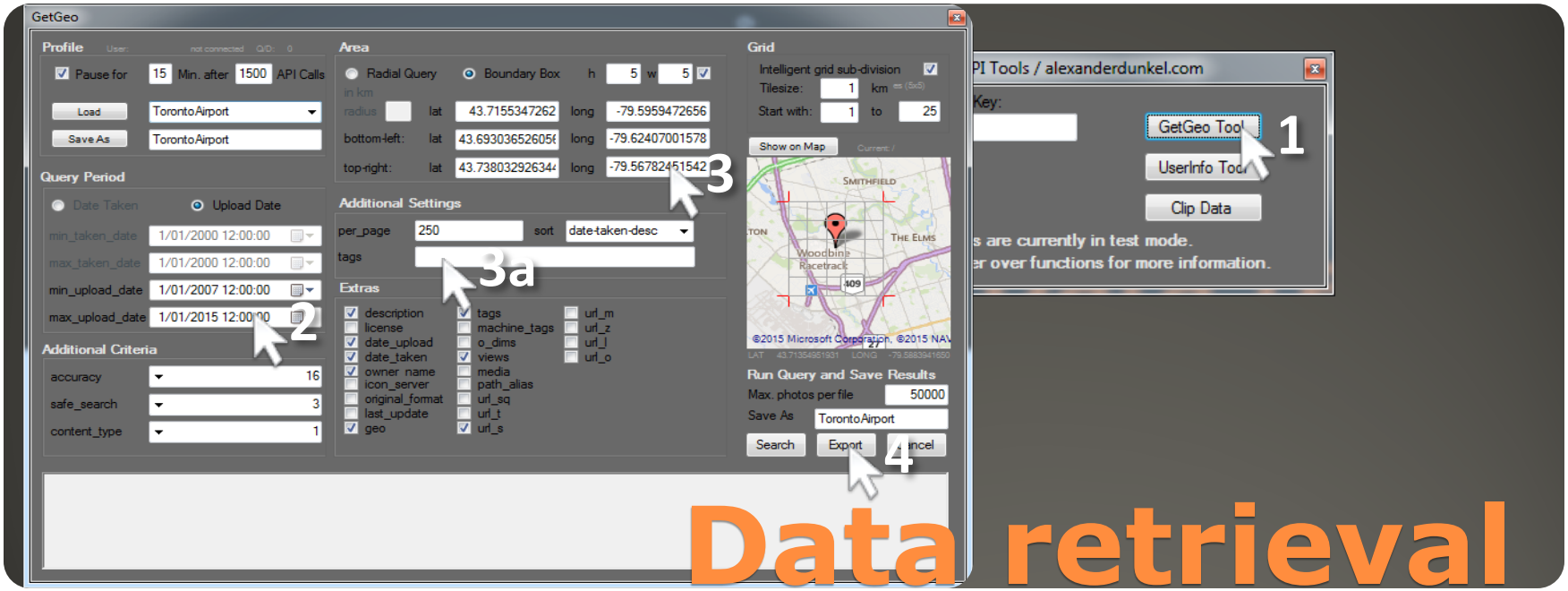
- Retrieving photo data from Flickr API
- Quantitative processing in MS Access
  - Spatial clustering in ArcGIS
  - Mapping and Symbolization

Preparations

- Software:
  - MS Access 2003, 2007, 2010, 2013
  - **or** MS Access Runtime (free)
    (See Software/AccessRuntime_x64_de-de.exe (64bit), AccessRuntime_x86_de-de.exe (32 bit))
  - Access Photo data processing form: <..\02STEP\importdata.accdb >
- ESRI ArcGis 10.1+, ArcInfo License
  (Standard License may work, but slow due to using Buffer instead of Aggregate)
  - Flickr ArcGis Toolbox …\03STEP\01_TOOLS\PhotoGeotagTools.tbx >
  - Recommended: Copy "01_TOOLS" Folder to <C:/01_TOOLS/ >
- PhotoData Toolkit <…\01STEP\GetGeo.exe > (Windows 2007/2008 x64/x86 only)
  (in case program does not run, install using <…\01STEP\Setup_Files\setup.exe >
- Optionally:
  - LibreOffice Portable for editing *.dbf-Files
    (See <Software/LibreOfficePortable/LibreOfficeCalcPortable.exe >)



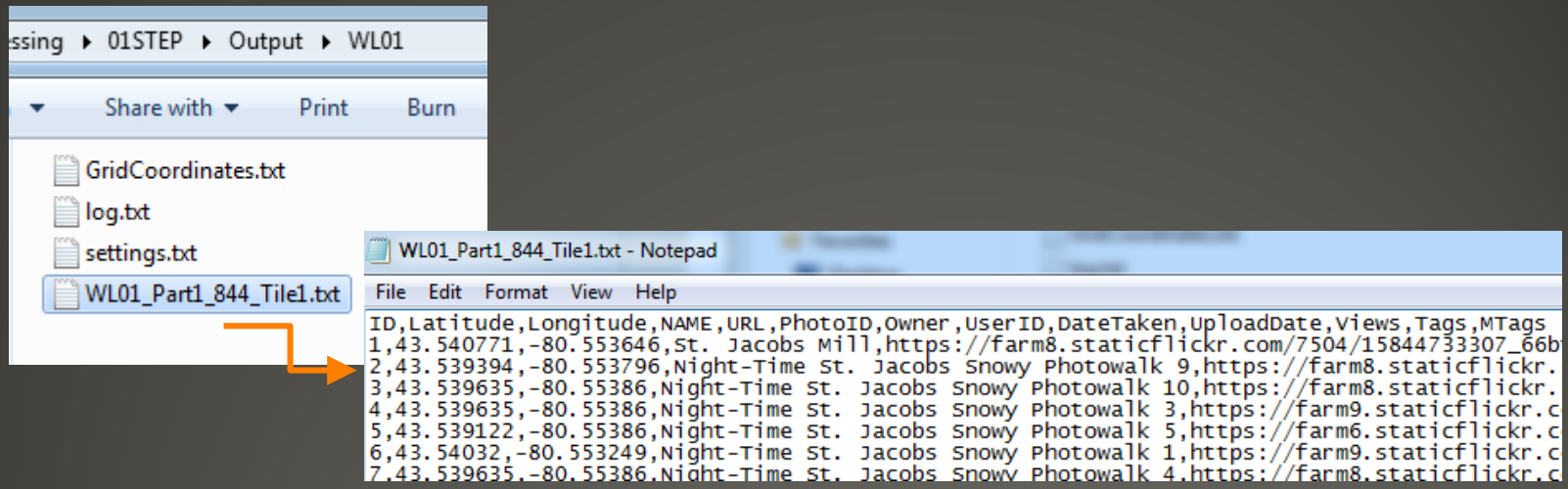
- For clipping data from existing dataset
  - OPEN <..\01STEP\GETGEO.EXE >
  - Open ClipData Tool (1)
  - **Load Folder** <…\Input\> (2)
- areas with existing datasets are highlighted by red boundary
  - Choose clipping extent by moving markers (3)
  - Optionally use temporal constraints for photodata (4)
  - **Search** will preview available photo data for criteria (5)
  - **Export** will save photo data to < …\Output\NAME\ > (5)



Data retrieval

- For retrieving new data from Flickr API Open GetGeo Tool (1)
- Choose timespan for photo data (2)
- Choose spatial extent for photo data (3)
- Click „Show Map“
- zoom/pan to area
- click on LAT / LONG to update position
- Optionally, limit search to specific tags, separated by comma (3a)
- Enter Name and click **Export** (4)
- **Export** will save photo data to < …\Output\NAME\ >

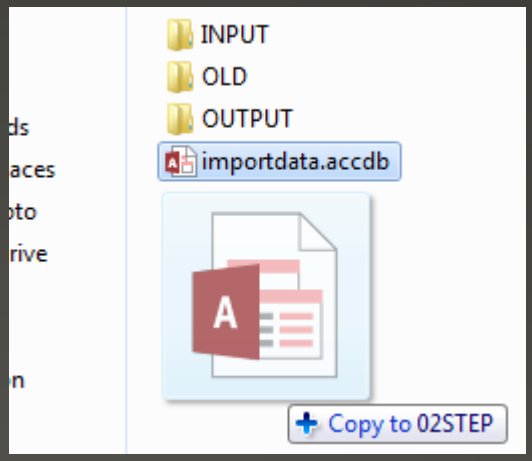
- Output folder < …\Output\NAME\ > contains datafiles + additional files
  - Photos itself are not downloaded
- Datafiles contain comma separated photo data, including URL to photo
  - Select all datafiles..



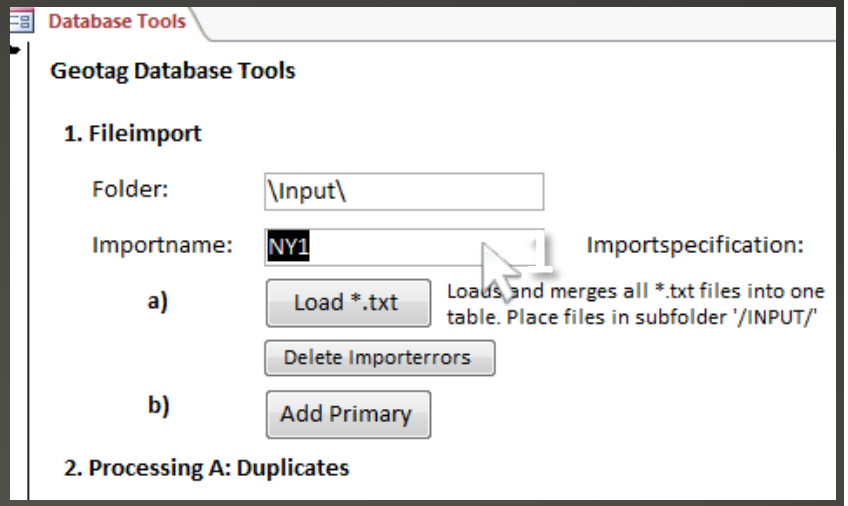
Review Data

Prepare Access database

- ..and copy to folder < 02STEP\INPUT\ >
- Go to Folder < …\02STEP\>
- Copy importdata.accdb
- Rename & open new Access Database

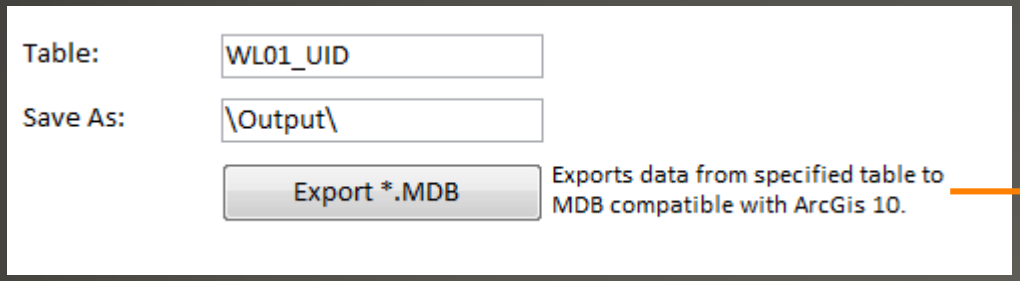


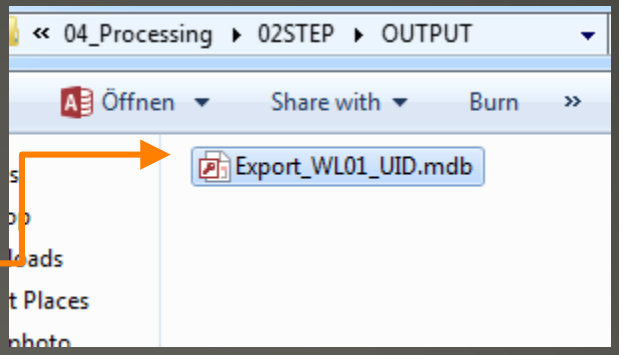
- Enter name for Import table (1)
- .. Click
  a) Load *.txt
  b) Add Primary
- Remove any duplicate data entries (2):



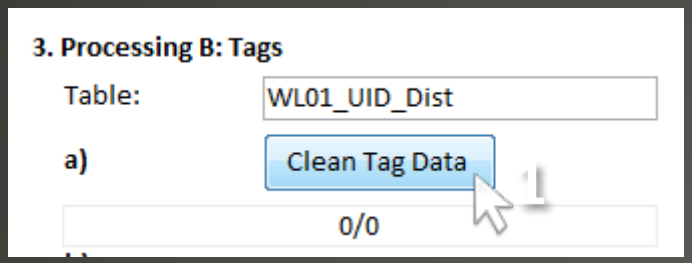
Import data to Access database

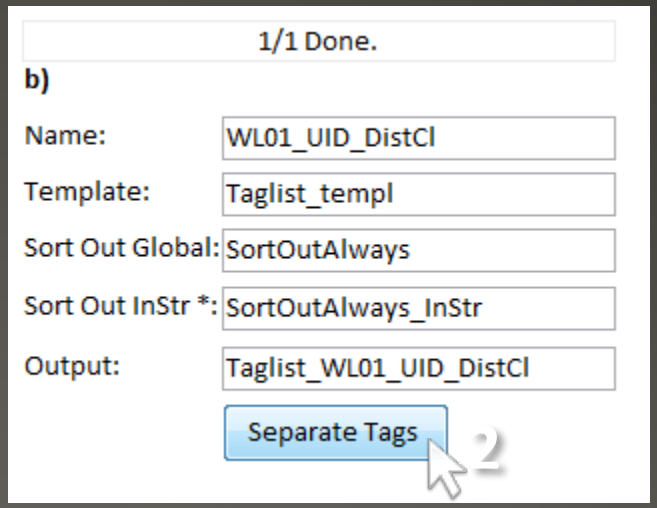
- Export table to *.mdb (ArcGIS 10.0 compatible database)
- …data is exported to < …02STEP\OUTPUT*.mdb >
- We will later use this file for mapping photo location data in ArcGIS





Export photodata to ArcGIS

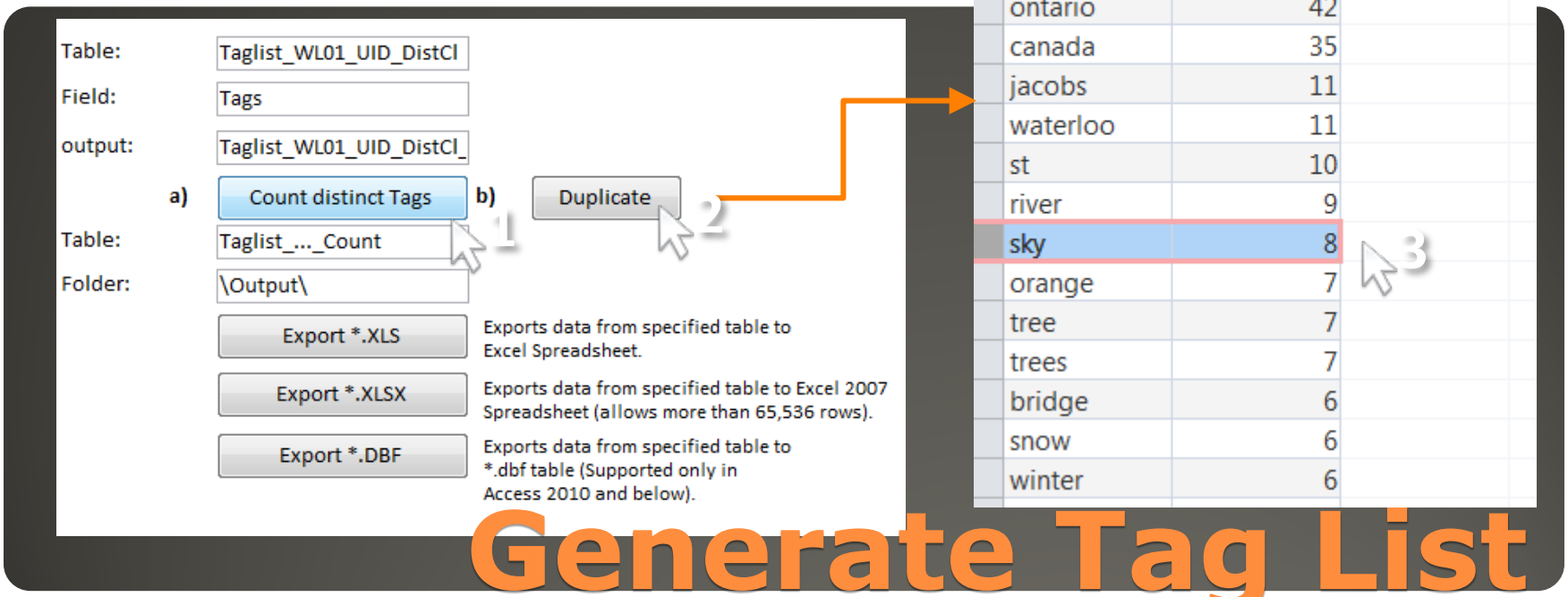




(Pre-)Processing Tags

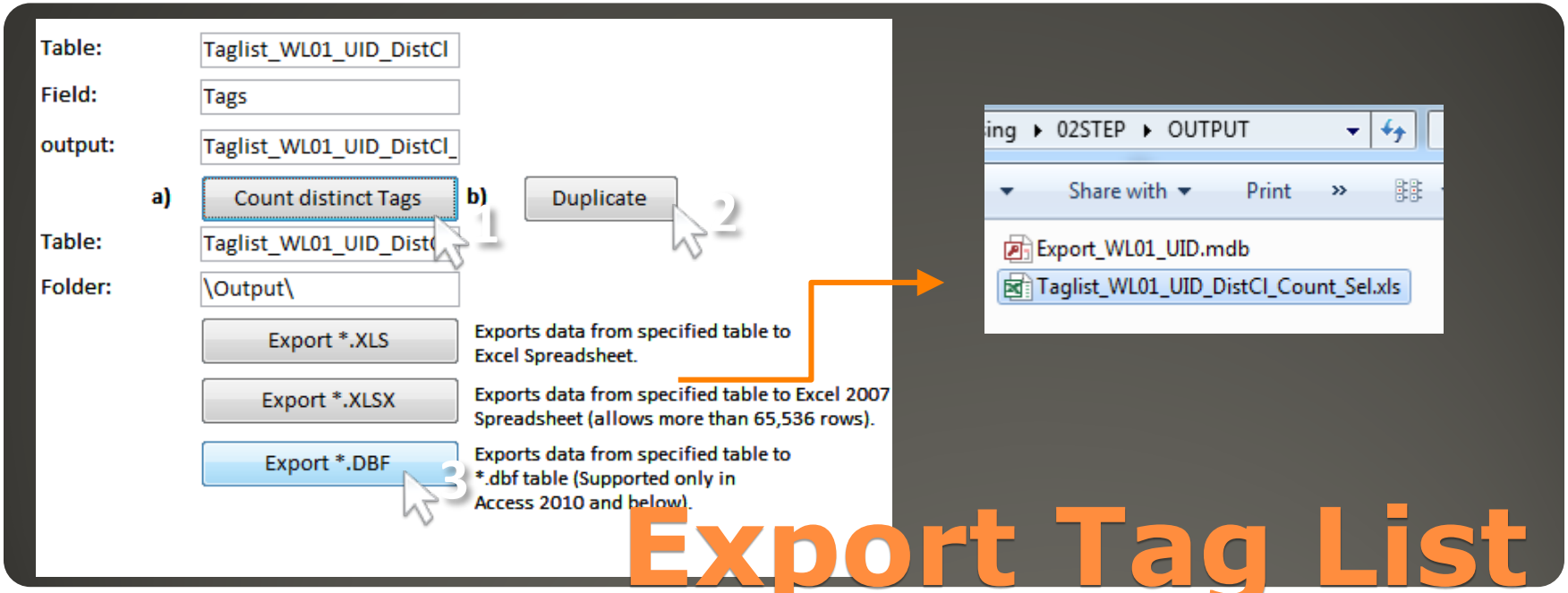
- Analyze available tags in dataset
- Clean Tag Data first (1)
(each tag is counted once per user)
- Remove tags based on stop list (2)
(optionally edit stop list first > Tables: SortOutAlways and SortOutAlways_InStr)

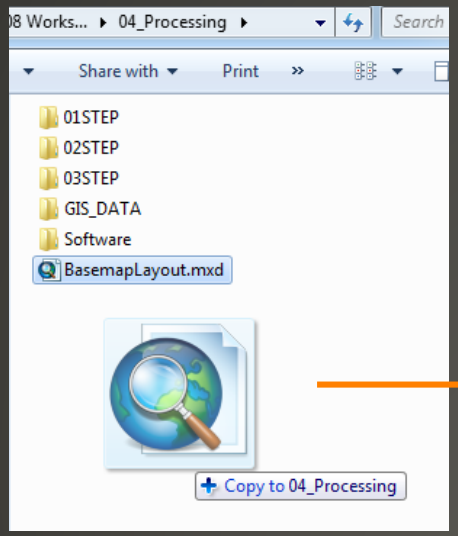
- Count distinct tags (1)
  - …duplicate list (2)..
- Select tags for clustering in ArcGIS …
  - ..by first removing unwanted tags (3)
- .. number of total tags influences cluster processing time, recommended: first 1000 or less)

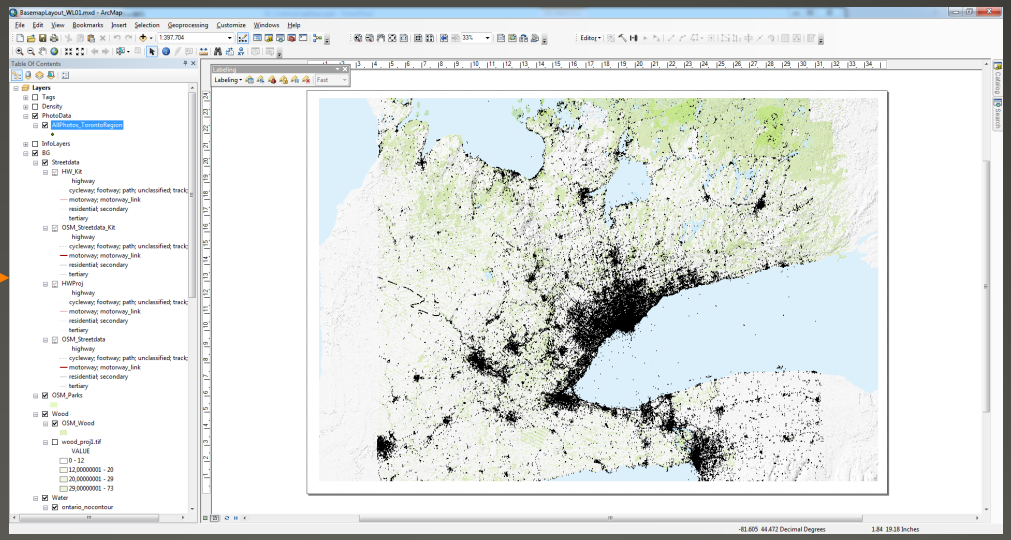


Generate Tag List

- Export table to *.dbf File (only works in Access 2010 and earlier) or *.xls File (Excel)
- Saved to < …02STEP\OUTPUT*.xls >

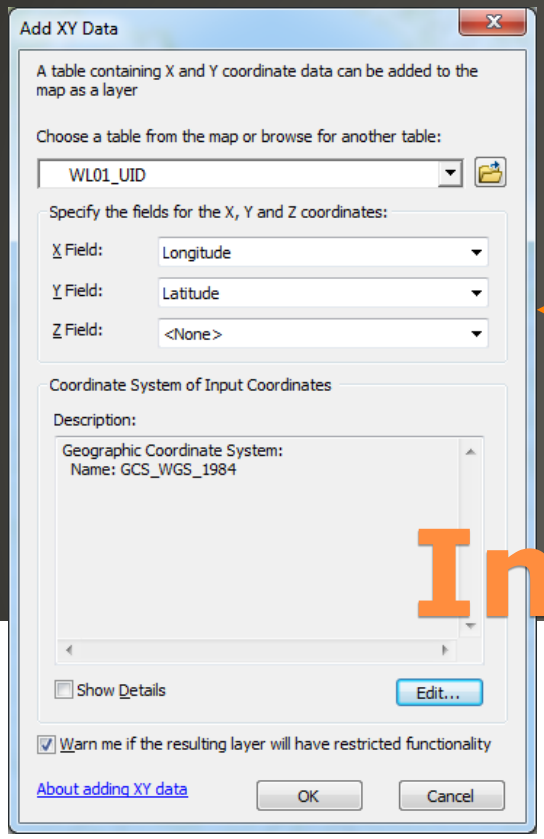


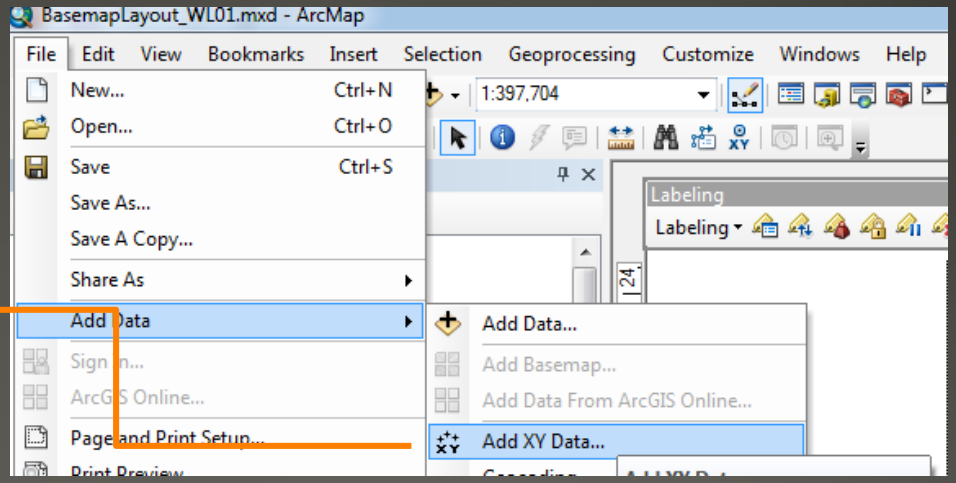




Mapping data in ArcGis

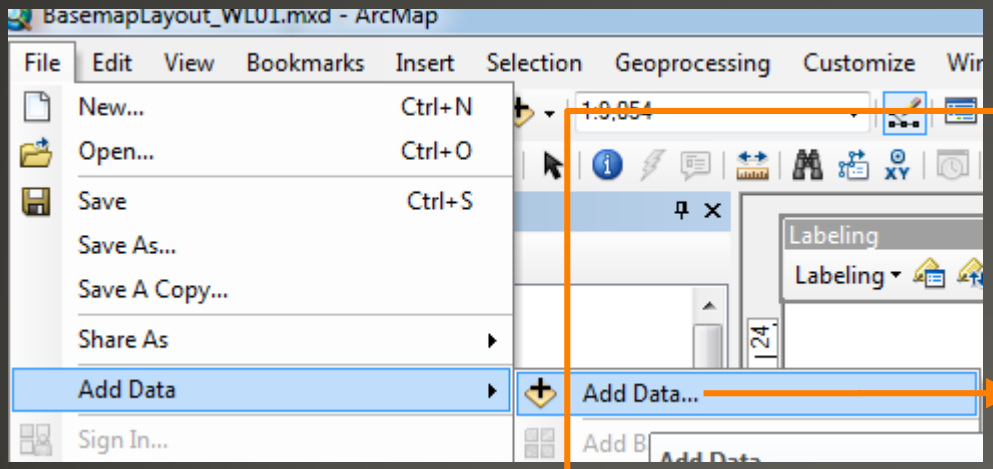
- make a copy of **BasemapLayout.mxd**
- Rename & open file in ArcGIS
- Repair missing data links if necessary
- Set paper layout to A1 Oversize or similar (24.61 x 35.43 Inches)
- Display example photo data: Enable Layer **AllPhotos_TorontoRegion**

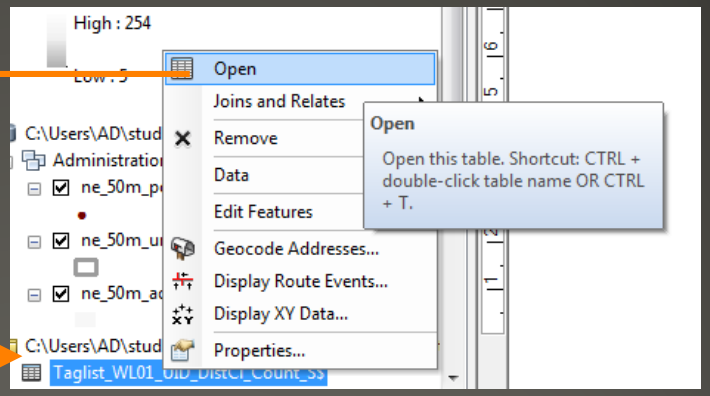


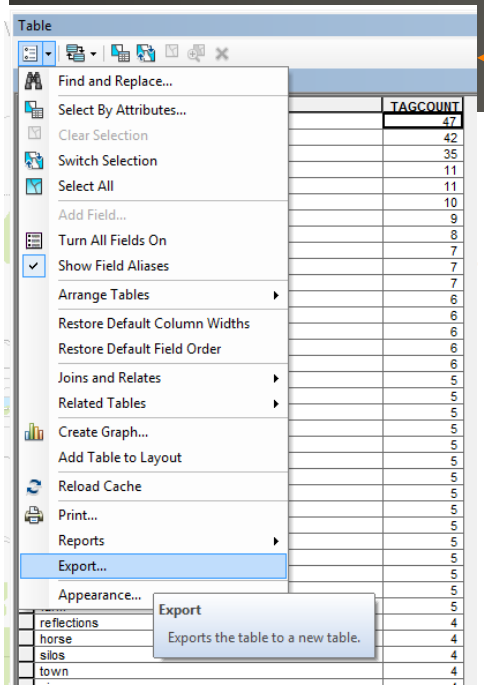


Import photo data

- Choose File > Add Data > Add XY Data
- Load < …02STEP\OUTPUT*.mdb >
- X Field = Longitude
- Y Field = Latitude
- Coordinate System of Input: **GCS_WGS_1984**
(Edit > Geographic Coordinate Systems > World > WGS1984)
- Click OK to import data
- Right-Click > Zoom to Layer
- Project Features to WGS_1984_UTM_Zone_17N (Canada)…
- (Menu Geoprocessing > Search For Tools > **Project Tool**)
Save to < C:\01_TOOLS\01_Input**PhotoLocationData.shp** >



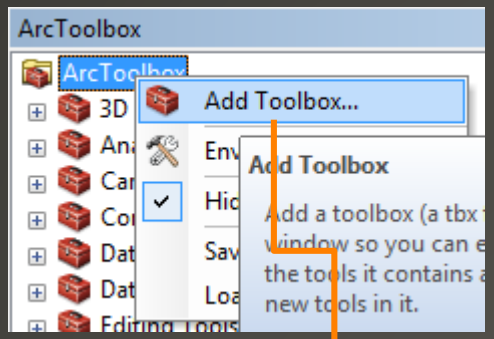


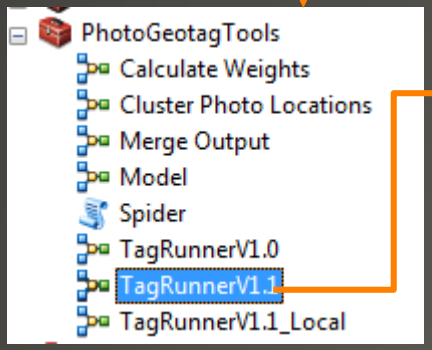


Import tag list

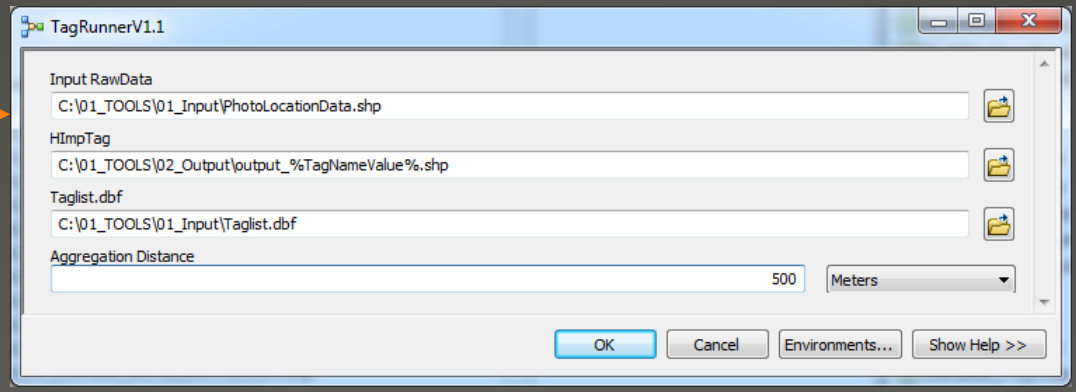
- For Access 2013, convert *.xls to *.dbf:
  - Choose File > Add Data > Add Data…
  Load Table from < …02STEP\OUTPUT*.xls >
  - Right-Click Table > Open
  - Choose Menu > Export
  - Export table as DBase Table to
  < C:\01_TOOLS\01_Input**Taglist.dbf** >

- Open ArcCatalog, Open Toolbox-Window
- Load < C:\01_TOOLS\PhotoGeotagTools.tbx >
- Open PhotoGeotagTools > **TagRunnerV1.1, choose..**



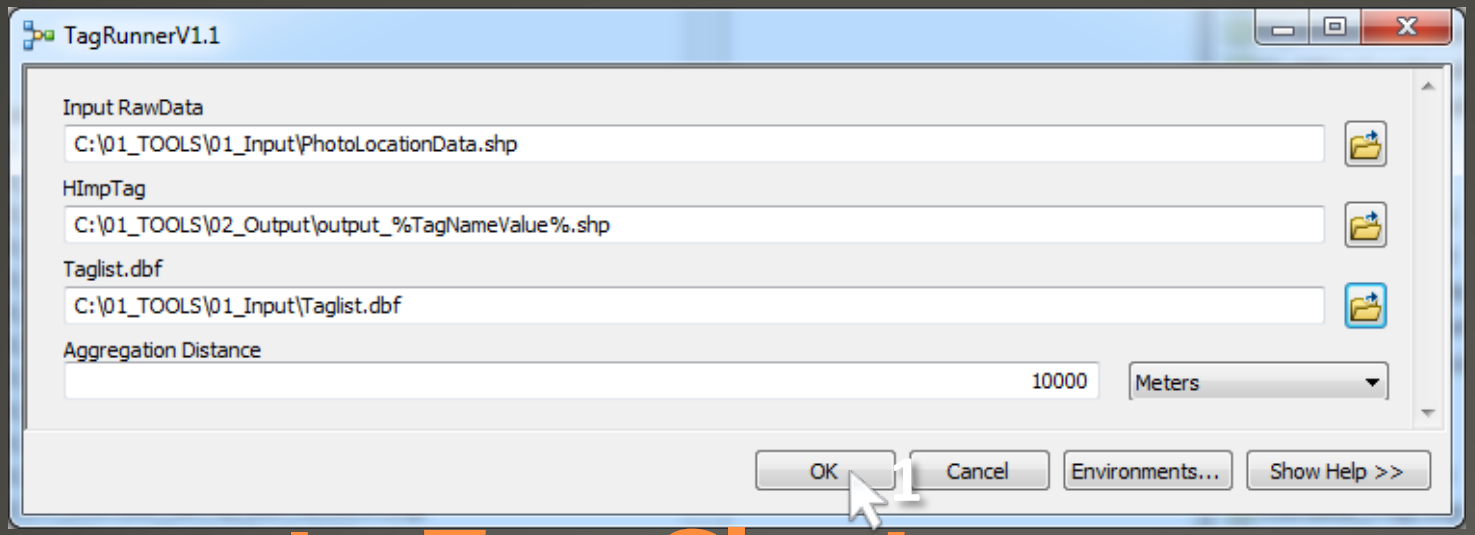


- **_Standard** > Fast [Regional Scale]
- **_Local** > Medium [City Scale]
- **_All** > Slow [Street Scale]



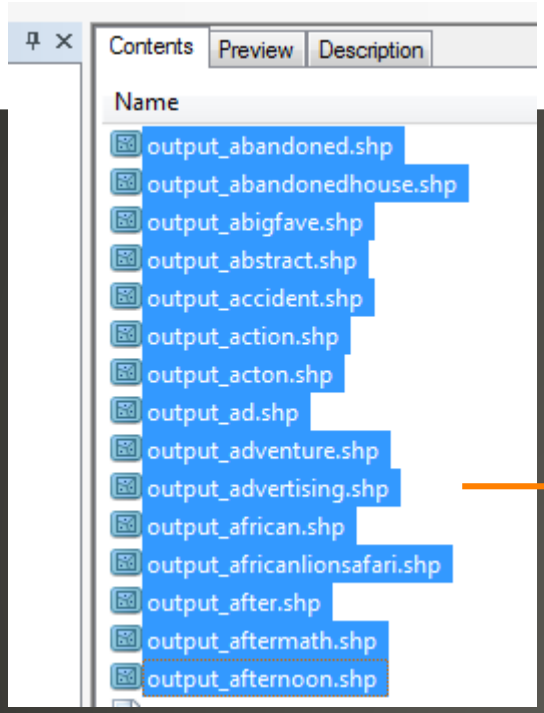
Generate Tag Clusters

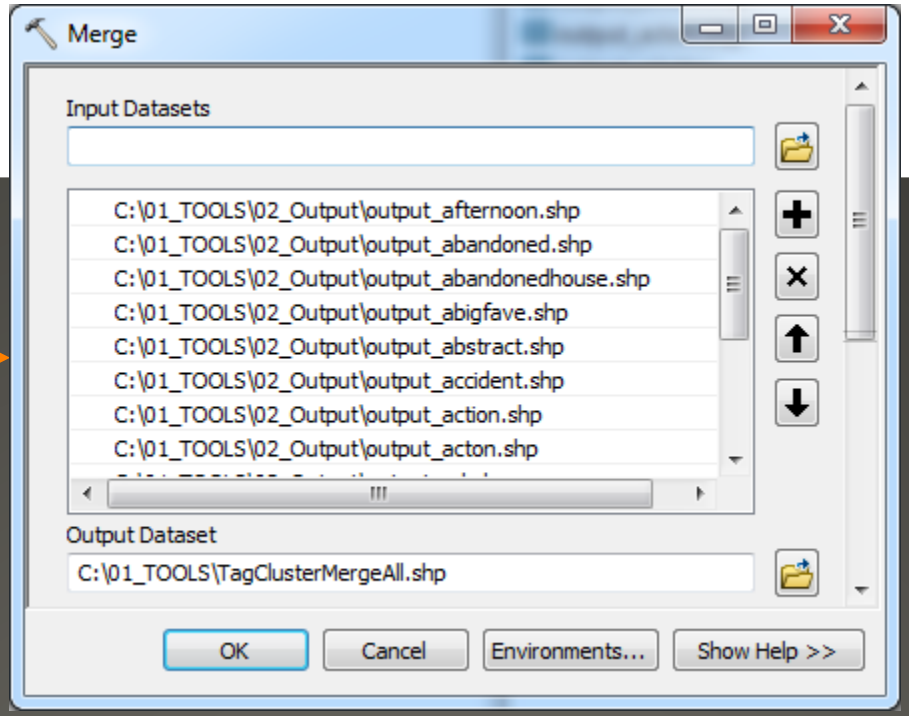
- Input RawData:
  .. Single photo locations and tags
- HImpTag:
  .. Output cluster files for each tag in Taglist.dbf
- Aggregation Distance:
  .. Accuracy of processing: choose value based on scale of analysis & final display size



Generate Tag Clusters

- Output Files are saved to..
< C:\01_TOOLS\02_Output\ >
- Select all output files and Merge to a single file using Merge (Data management Tools)
(Menu Geoprocessing > Search For Tools > **Merge Tool**)
- **Or**: Use Tool *PhotoGeotag Tools* > "**Merge Output**"

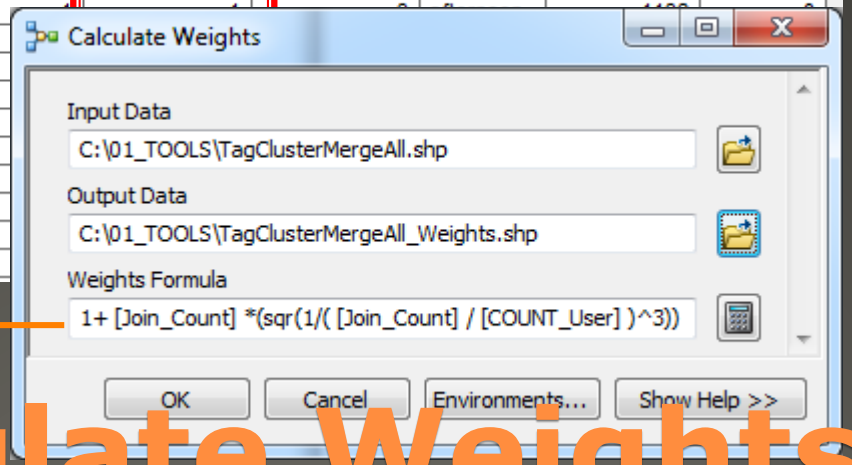




Merge Results

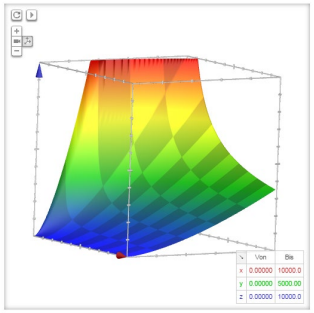
TagClusterMergeAll

FID	Shape *	Join_Count	TARGET_FID	Views	FREQUENCY	COUNT_User	SUM_FREQUE	ImpTag	TagCountG	HImpTag
0	Polygon	4	0	824	1	1	4	afternoon	1136	0
1	Polygon	3	1	540	2	2	3	afternoon	1136	0
2	Polygon	3	2	1547						
3	Polygon	1	0	8						
4	Polygon	1	0	427						
5	Polygon	1	0	11						
6	Polygon	1	0	248						
7	Polygon	1	0	210						
8	Polygon	1	0	5						
9	Polygon	1	0	538						
10	Polygon	1	0	12						
11	Polygon	1	0	5						

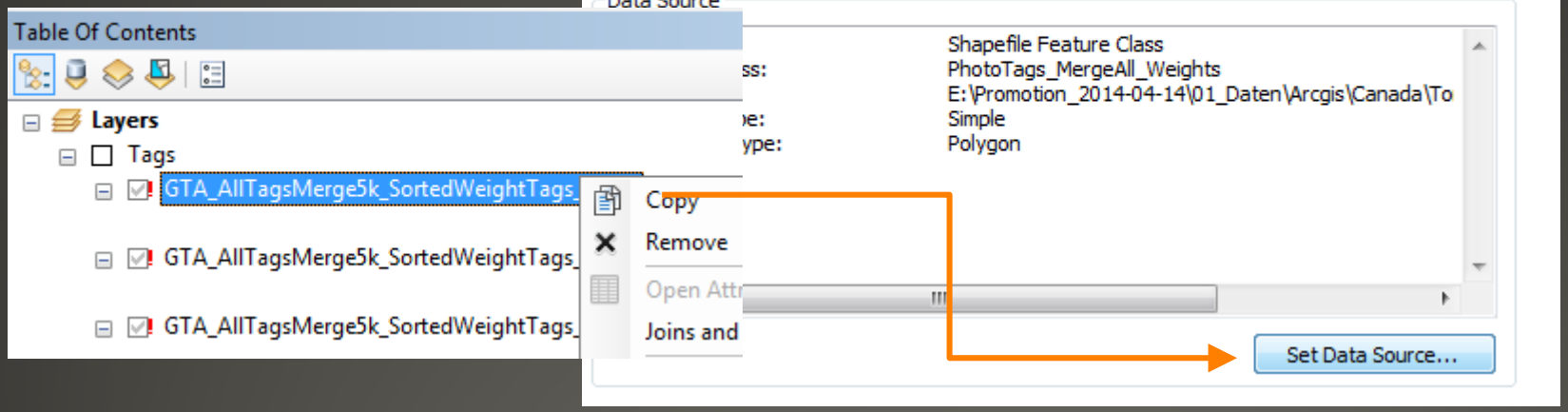


Standard Weights Formula

Calculate Weights

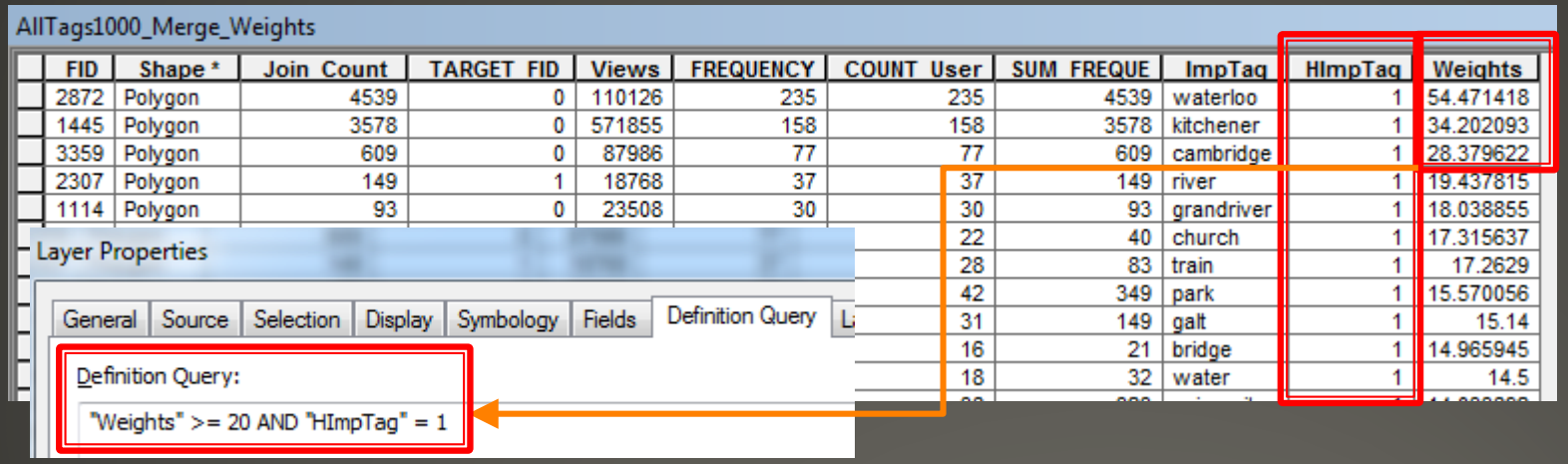


- Merged results file contains a list of all Tag Clusters:
[Join_Count] > Number of Photos in each Cluster
[Views] > Sum of Views for Photos in each Cluster
[COUNT_User] > Number of Photographers
[ImpTag] > Tag Cluster Name
- **Weights** are used to calculate Font Size
- To Calculate Weights, …
use Tool *PhotoGeotag Tools* > "**Calculate Weights**"



Map Results

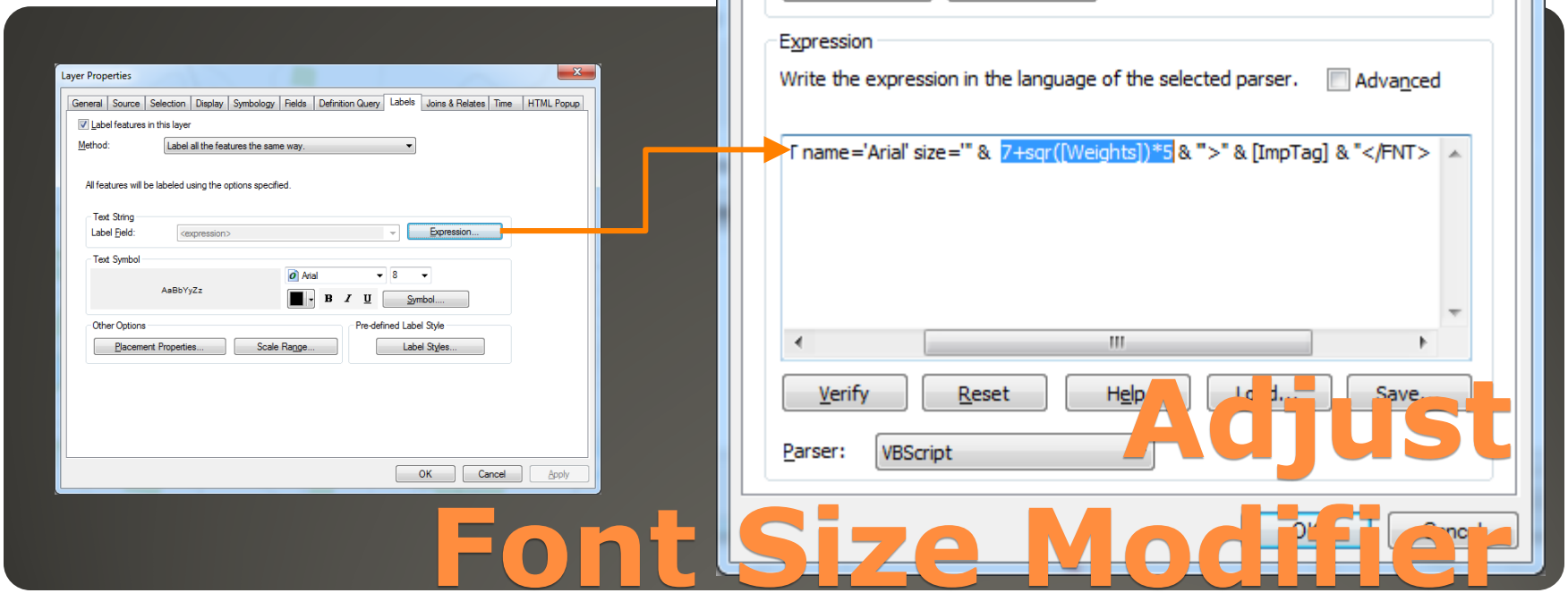
- Open your copy of **BasemapLayout.mxd**
- Use existing symbolization for Tags-Layers: Right Click First Layer > Properties > Data Source
- Click **Set Data Source** and Choose **Merged Results File** from previous step
- Repeat process for next two tag layers



Adjust Definition Query

- Tags are placed on the map in the following sequence:
  First, most used tags (largest font size) are placed in background
  Layer 3: **Weights > x AND [HImP] = 1**
  Second, each cluster with the most occurrences for each tag is placed:
  Layer 1: **Weights < x AND [HImP] = 1**
  Finally, all other tags are placed:
  Layer 2:**[HImP] = 0**

- Edit **Definition Query** (Layer Preferences) to select the number of tags which should get placed in background:
  Example:
  Definition Query **"Weights" >= 20**, all labels with weights over 20 are placed in background.

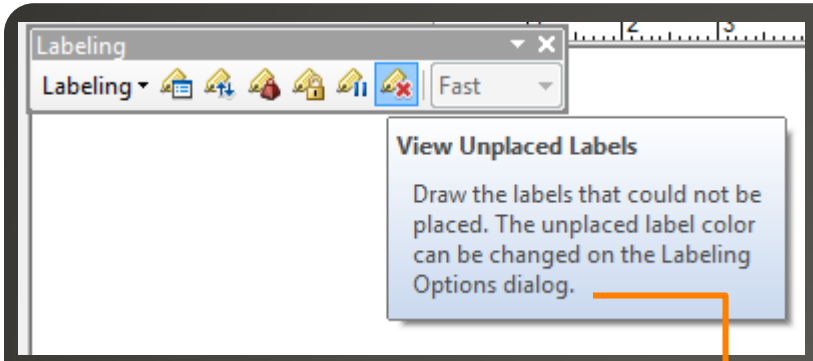


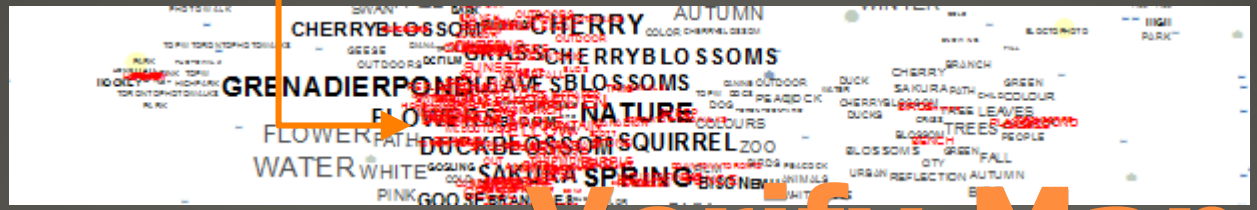
- The Font Size Modifier is used to adjust Fonts to your final map display size (Paper Size)
  - **For each tag layer**, go to … Layer Properties > Labels > Expression
  - Adjust Modifier: 7+sqr([Weights])*5

7 = Set minimum Font Size

- **Sqr** = optional flattening of font size display curve

*** 5** = Set largest Font Size





Verify Map

- final map display depends on several criteria:
- Use different **Aggregation** Distance [AD] if information resolution is too fuzzy, or too many duplicate clusters exist (AD too small)
- Use different **weighting formula, examples**:

1+ [Join_Count] *(sqr(1/([Join_Count] / [COUNT_User])**^3**)) → Standard weighting formula

1+ [Join_Count] *(sqr(1/([Join_Count] / [COUNT_User])**^2**)) → less importance on User_Count in correlation to photo count [Join_Count]

sqr(([Join_Count]+(2*sqr([Join_Count])))*2) → Ignores User_Count, this will emphasize individual and very active users

- Use Right-Click > Labeling > "**View Unplaced Labels**" to verify tag placement, ..

..red labels are labels not placed on the map due to label density issues

- Adjust Font Size Modifier if Fonts are too large or small, or placed too far off