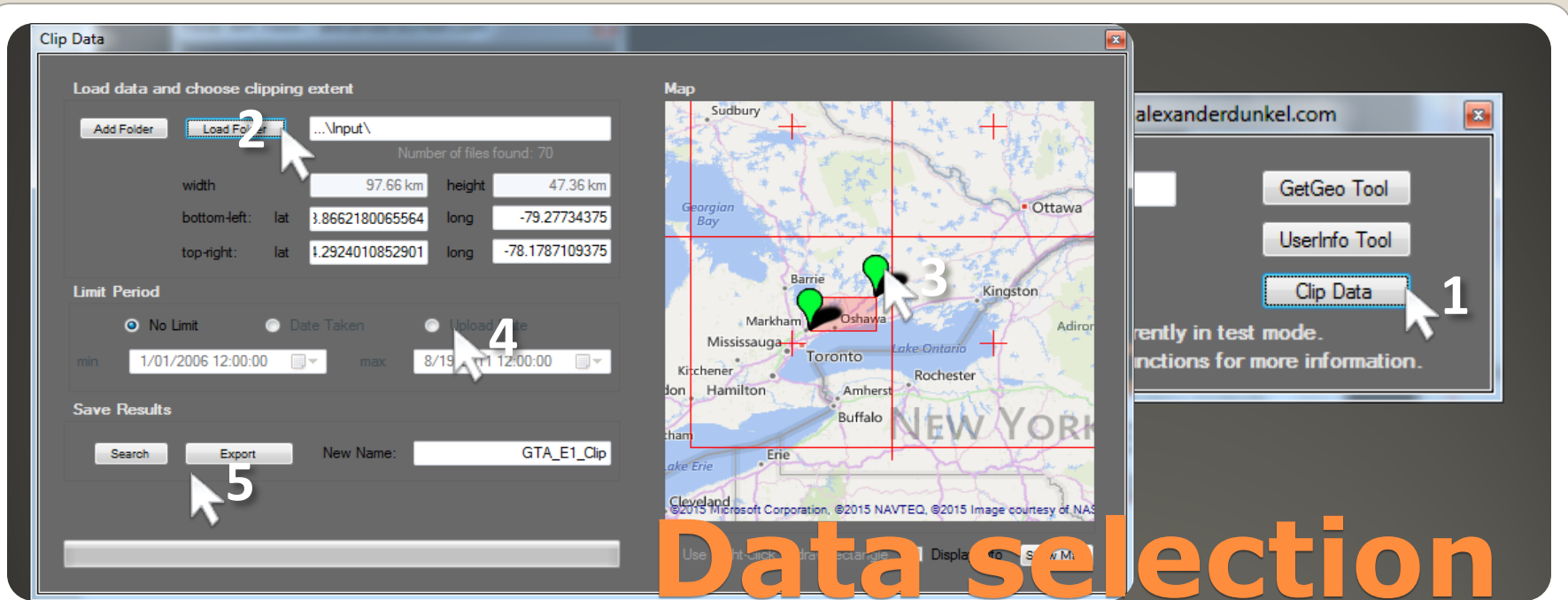




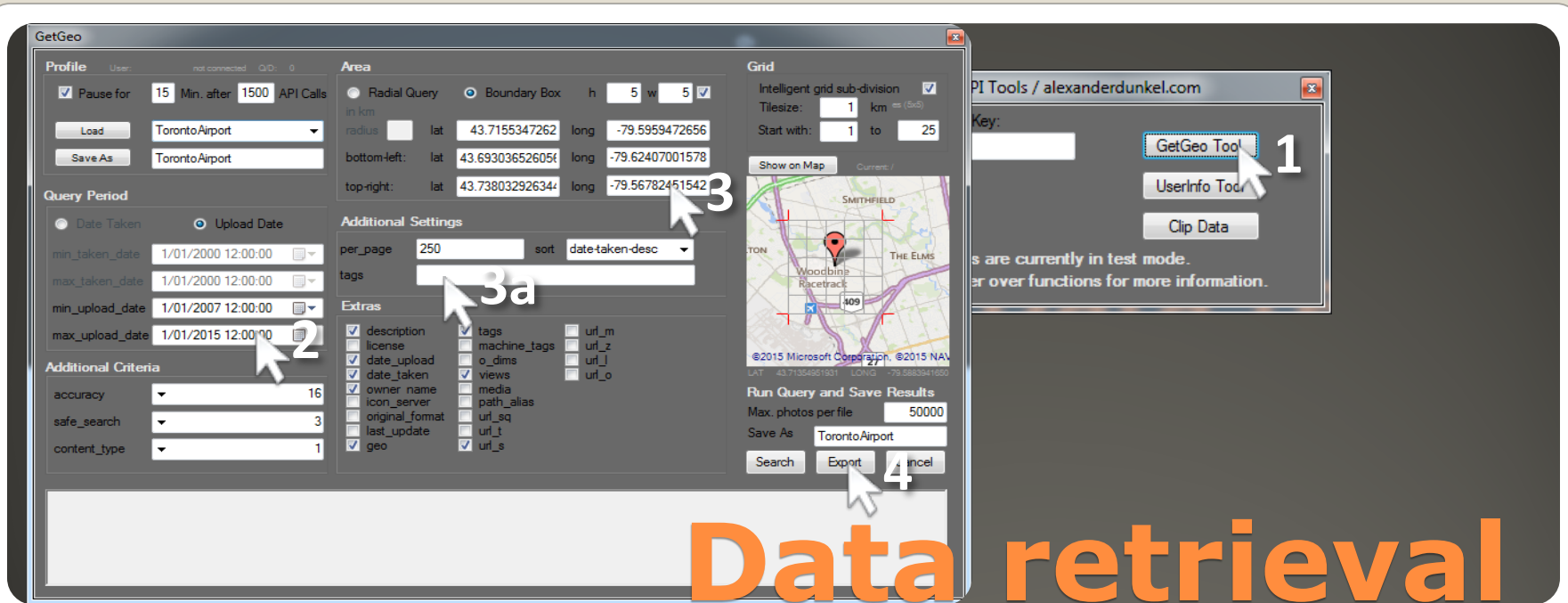
- Retrieving photo data from Flickr API
- Quantitative processing in MS Access
  - Spatial clustering in ArcGIS
  - Mapping and Symbolization

- **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 >)

# Preparations

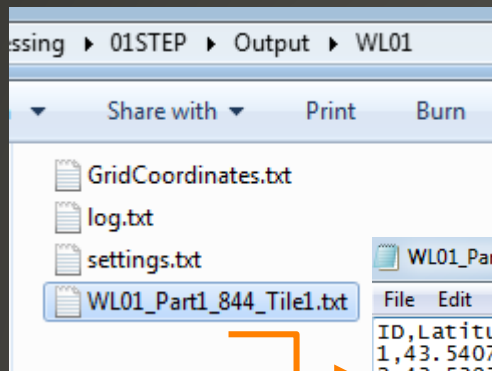


- For clipping data from existing dataset
  - OPEN <..\01STEP\GETGEO.EXE >
    - Open ClipData Tool (1)
    - **Load Folder** <...\Input\> (2)
- areas with existing datasets are highlighted by red boundary
  - Choose clipping extent by moving markers (3)
  - Optionally use temporal constraints for photodata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



- 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\ >

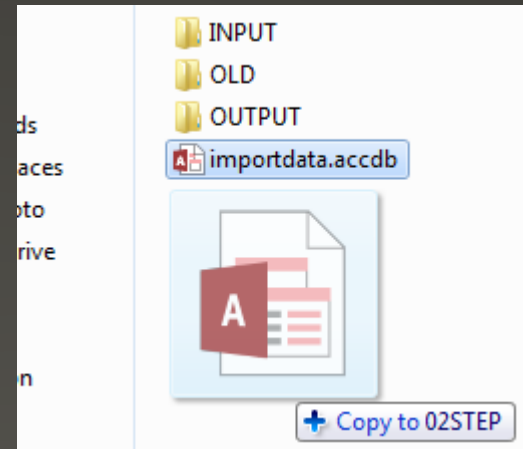
- Output folder < ...\Output\NAME\ > contains datafiles + additional files
  - Photos itself are not downloaded
- Datafiles contain comma separated photo data, including URL to photo
  - Select all datafiles..



```
WL01_Part1_844_Tile1.txt - Notepad
File Edit Format View Help
ID, Latitude, Longitude, NAME, URL, PhotoID, Owner, UserID, DateTaken, UploadDate, Views, Tags, MTags
1, 43.540771, -80.553646, St. Jacobs Mill, https://farm8.staticflickr.com/7504/15844733307_66b
2, 43.539394, -80.553796, Night-Time St. Jacobs Snowy Photowalk 9, https://farm8.staticflickr.
3, 43.539635, -80.55386, Night-Time St. Jacobs Snowy Photowalk 10, https://farm8.staticflickr.
4, 43.539635, -80.55386, Night-Time St. Jacobs Snowy Photowalk 3, https://farm9.staticflickr.c
5, 43.539122, -80.55386, Night-Time St. Jacobs Snowy Photowalk 5, https://farm6.staticflickr.c
6, 43.54032, -80.553249, Night-Time St. Jacobs Snowy Photowalk 1, https://farm9.staticflickr.c
7, 43.539635, -80.55386, Night-Time St. Jacobs Snowy Photowalk 4, https://farm8.staticflickr.c
```

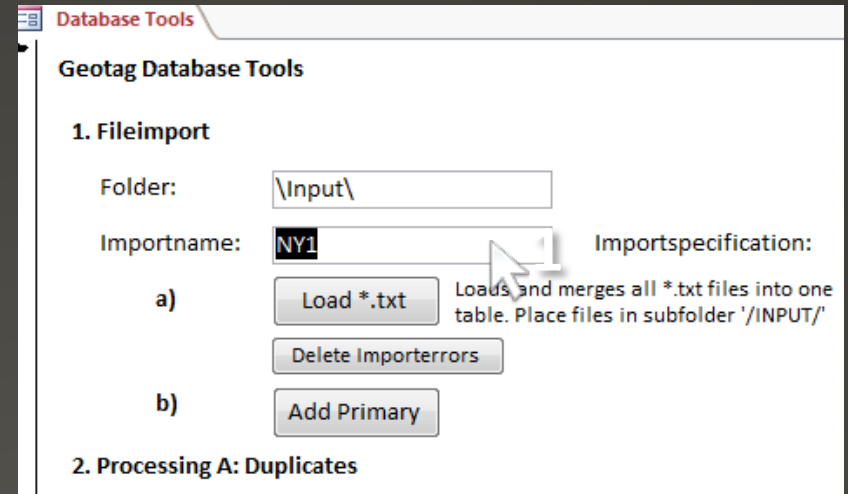
# Review Data

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



## Prepare Access database

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



### 2. Processing A: Duplicates

Name Original:

Column:

Copies table and removes duplicates in specified column.

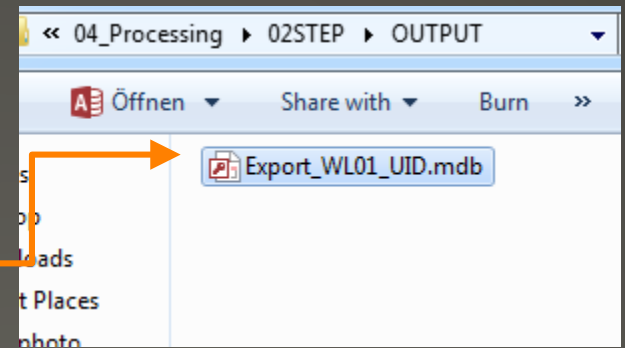
**Import data to Access database**

- 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

Table:

Save As:

Exports data from specified table to  
MDB compatible with ArcGIS 10.



## Export photodata to ArcGIS



**3. Processing B: Tags**

Table:

a)  1

1/1 Done.

b)

Name:

Template:

Sort Out Global:

Sort Out InStr \*:

Output:

2

# (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)

The screenshot illustrates the workflow for generating a tag list. On the left, the 'Count distinct Tags' tool is configured with the following settings:

- Table: Taglist\_WL01\_UID\_DistCl
- Field: Tags
- output: Taglist\_WL01\_UID\_DistCl\_

The 'Count distinct Tags' button is labeled 'a)' and '1'. An arrow points from this button to the 'Duplicate' button, which is labeled 'b)' and '2'. Another arrow points from the 'Duplicate' button to the output table on the right, which is labeled '3'.

The output table, titled 'Taglist\_WL01\_UID\_DistCl\_Count', contains the following data:

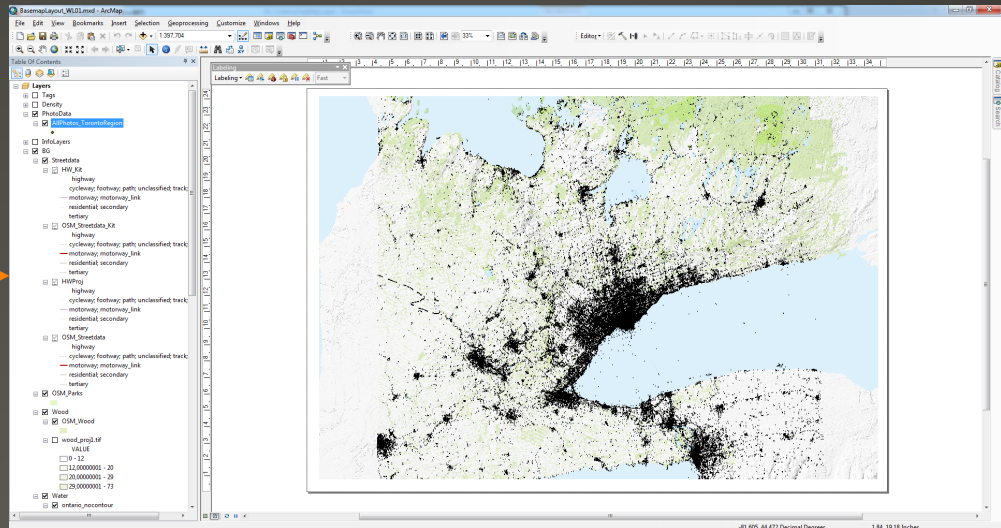
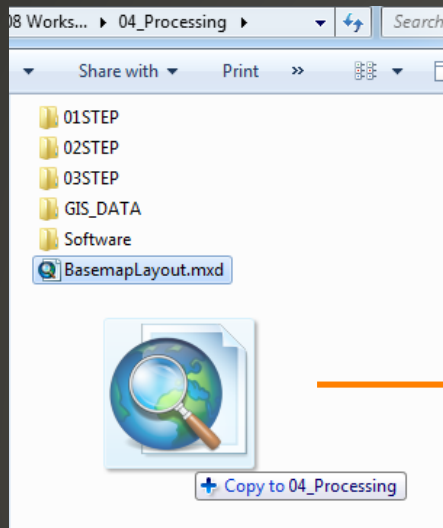
TAGNAME	TAGCOUNT
stjacobs	47
ontario	42
canada	35
jacobs	11
waterloo	11
st	10
river	9
sky	8
orange	7
tree	7
trees	7
bridge	6
snow	6
winter	6

# Generate Tag List

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

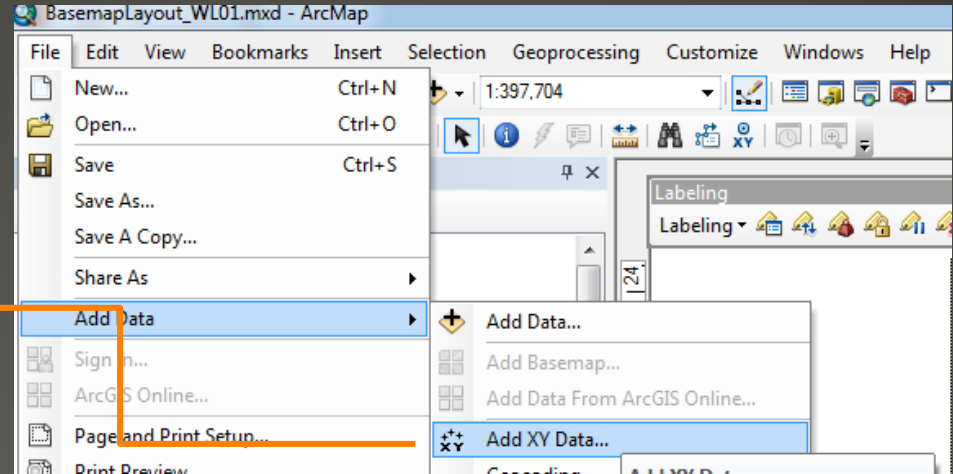
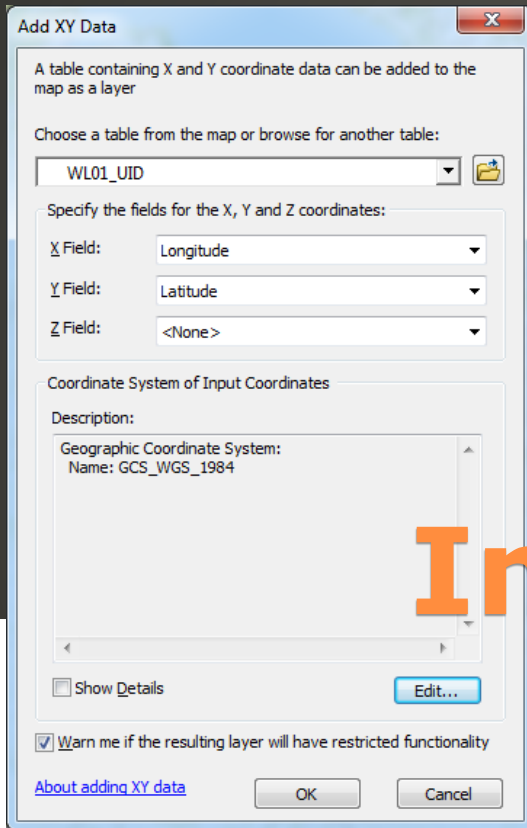
The image shows a screenshot of the Microsoft Access export options dialog box. The 'Table' field is set to 'Taglist\_WL01\_UID\_DistCI', the 'Field' is 'Tags', and the 'output:' is 'Taglist\_WL01\_UID\_DistCI'. Under 'Table:', 'Count distinct Tags' is selected (labeled 'a') and 'Duplicate' is also selected (labeled 'b'). The 'Folder:' is set to '\\Output\'. Below the fields are three export options: 'Export \*.XLS' (Exports data from specified table to Excel Spreadsheet), 'Export \*.XLSX' (Exports data from specified table to Excel 2007 Spreadsheet (allows more than 65,536 rows)), and 'Export \*.DBF' (Exports data from specified table to \*.dbf table (Supported only in Access 2010 and below)). An orange arrow points from the 'Export \*.XLS' option to a file explorer window on the right. The file explorer shows the path 'ing > 02STEP > OUTPUT' and contains two files: 'Export\_WL01\_UID.mdb' and 'Taglist\_WL01\_UID\_DistCI\_Count\_Sel.xls'.

# Export Tag List



# 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**

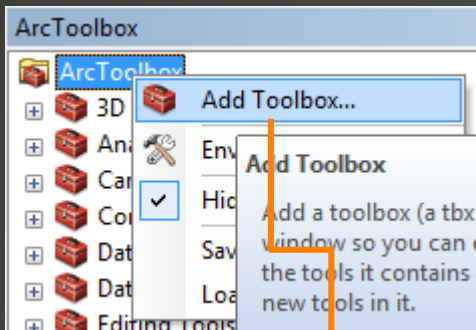


# Import photo data

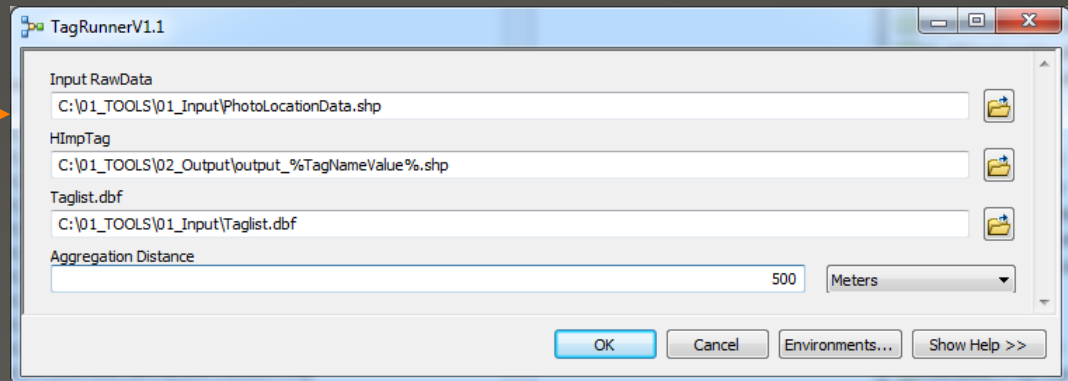
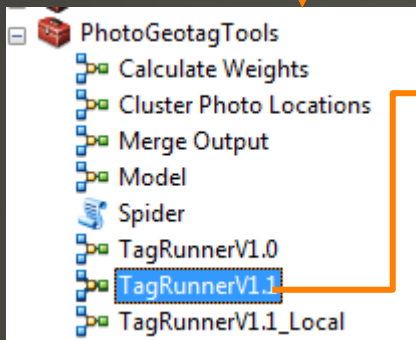
- Choose File > Add Data > Add XY Data
  - Load < ...02STEP\OUTPUT\\*.mdb >
    - X Field = Longitude
    - Y Field = Latitude
  - Coordinate System of Input: **GCS WGS 1984**
    - (Edit > Geographic Coordinate Systems > World > WGS1984)
    - Click OK to import data
  - Right-Click > Zoom to Layer
- 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 >



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

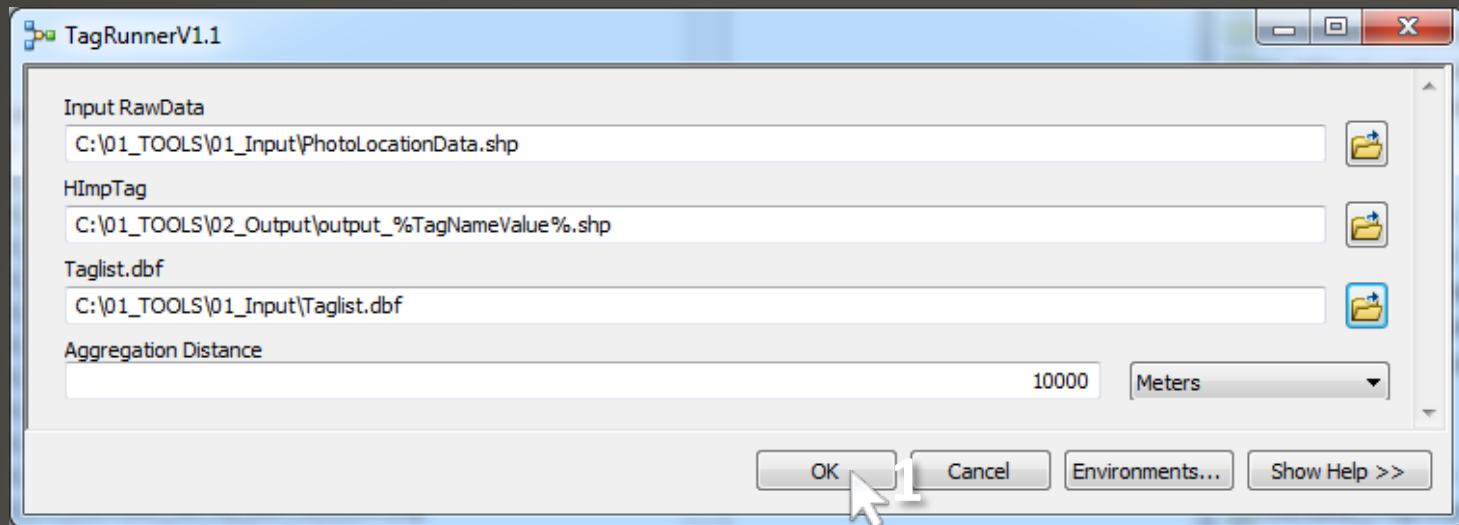


- **\_Standard** > Fast [Regional Scale]
- **\_Local** > Medium [City Scale]
- **\_All** > Slow [Street Scale]



# Generate Tag Clusters

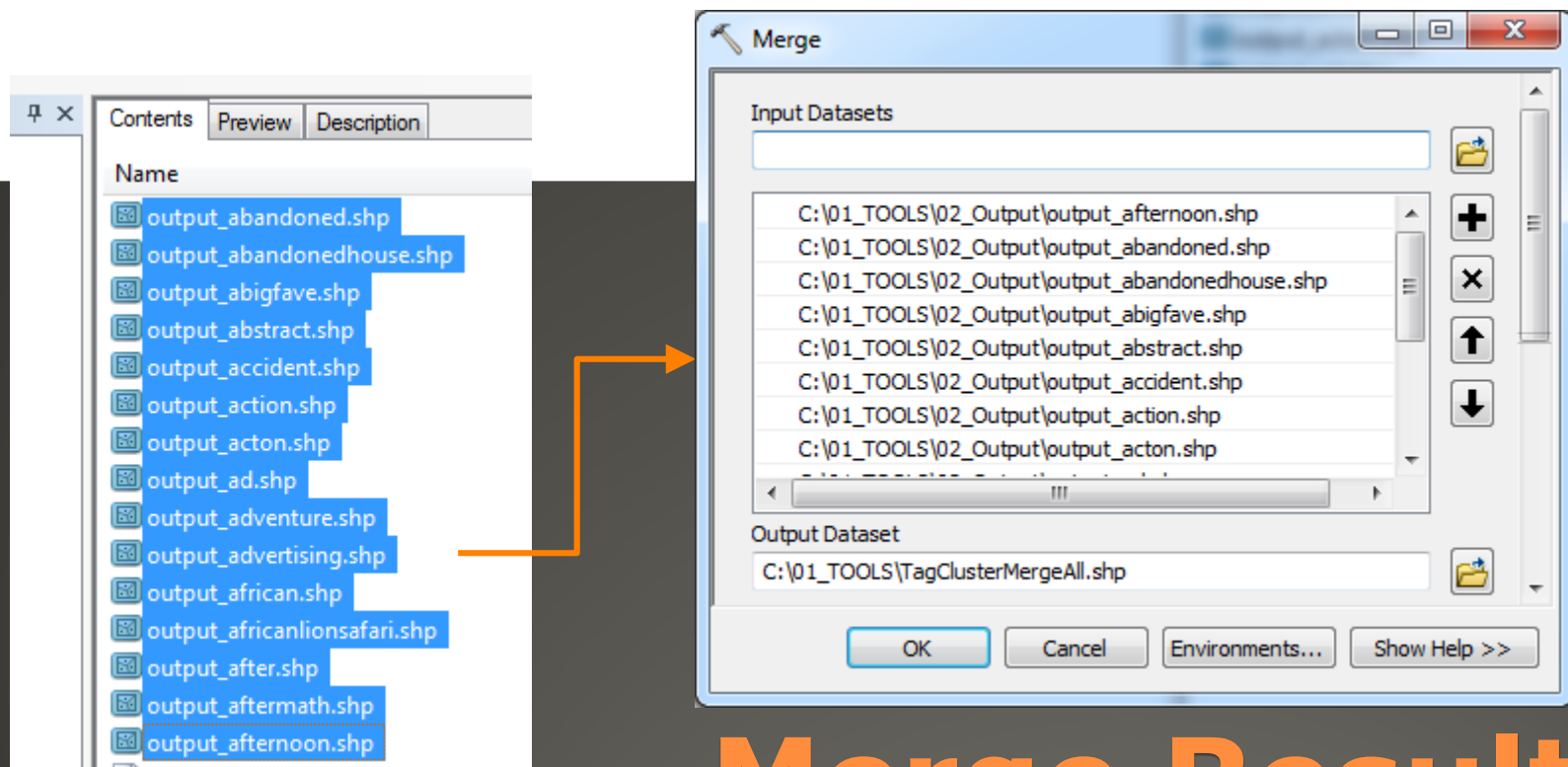
- Input RawData:
  - .. Single photo locations and tags
- HImpTag:
  - .. Output cluster files for each tag in Taglist.dbf
- Aggregation Distance:
  - .. Accuracy of processing: choose value based on scale of analysis & final display size



# Generate Tag Clusters



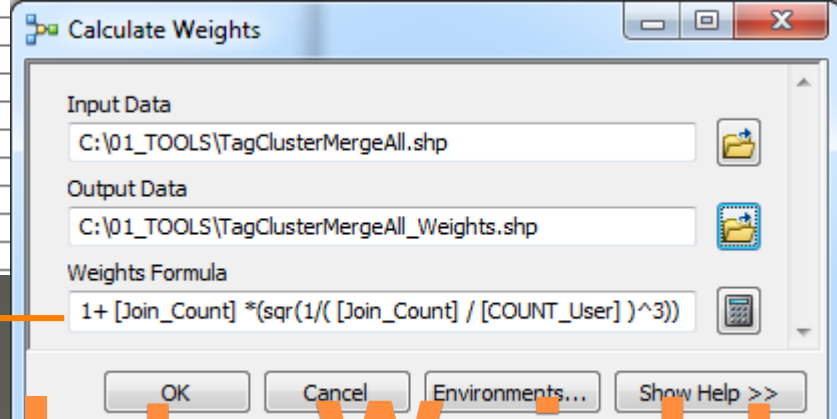
- Output Files are saved to..  
< C:\01\_TOOLS\02\_Output\ >
- Select all output files and Merge to a single file using Merge  
(Data management Tools)  
(Menu Geoprocessing > Search For Tools > **Merge Tool**)
  - **Or:** Use Tool *PhotoGeotag Tools* > **"Merge Output"**



# 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						

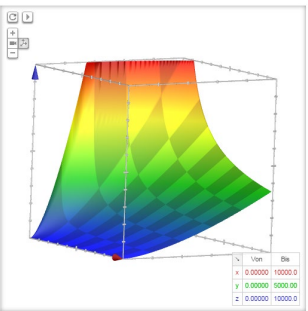


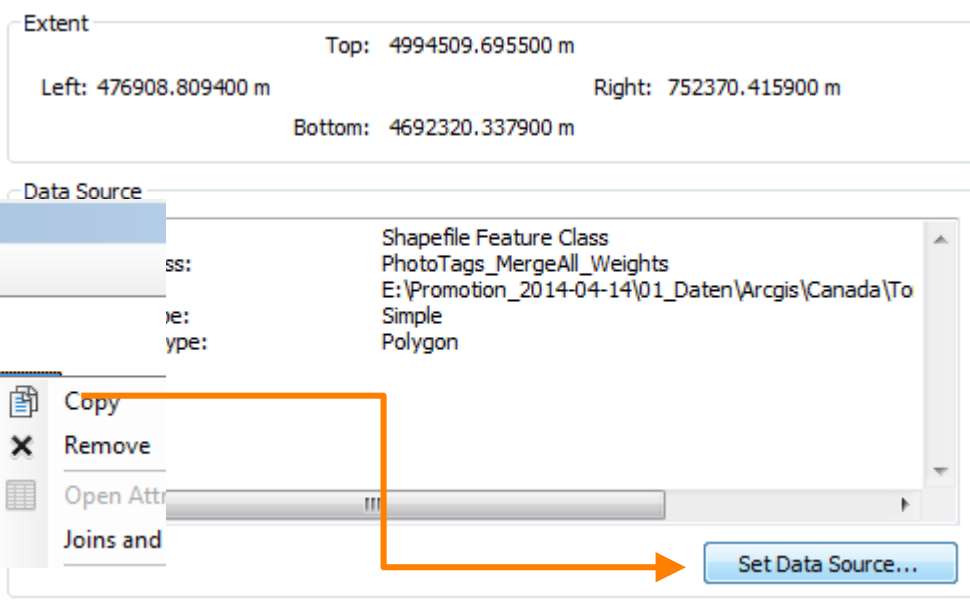
Standard Weights Formula

# 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

AllTags1000\_Merge\_Weights

FID	Shape *	Join Count	TARGET FID	Views	FREQUENCY	COUNT User	SUM FREQUE	ImpTag	HImpTag	Weights
2872	Polygon	4539	0	110126	235	235	4539	waterloo	1	54.471418
1445	Polygon	3578	0	571855	158	158	3578	kitchener	1	34.202093
3359	Polygon	609	0	87986	77	77	609	cambridge	1	28.379622
2307	Polygon	149	1	18768	37	37	149	river	1	19.437815
1114	Polygon	93	0	23508	30	30	93	grandriver	1	18.038855
						22	40	church	1	17.315637
						28	83	train	1	17.2629
						42	349	park	1	15.570056
						31	149	galt	1	15.14
						16	21	bridge	1	14.965945
						18	32	water	1	14.5

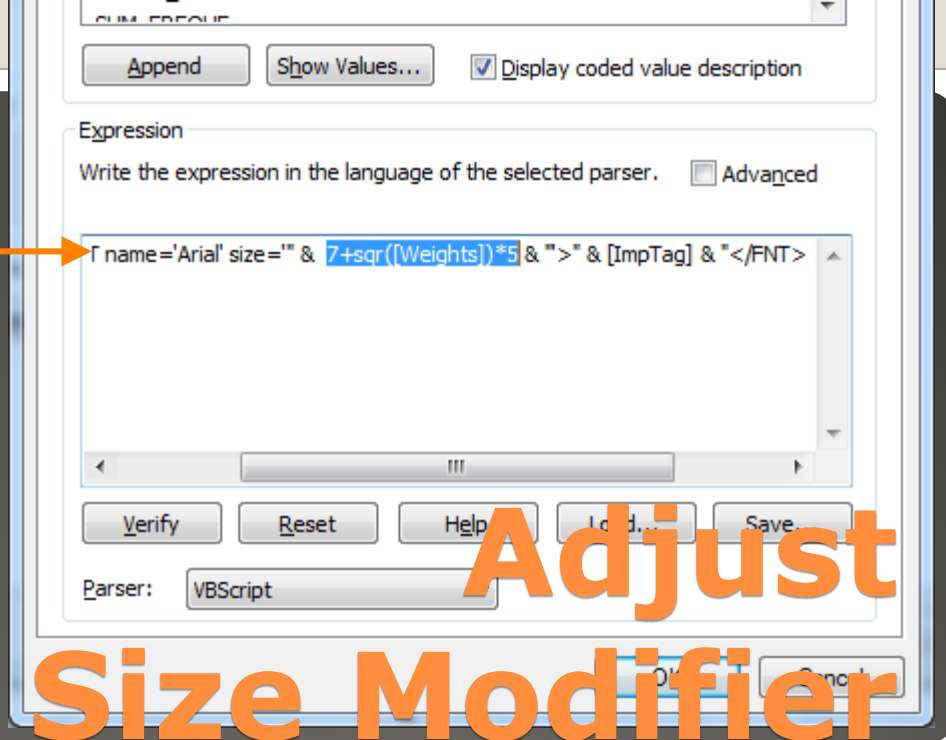
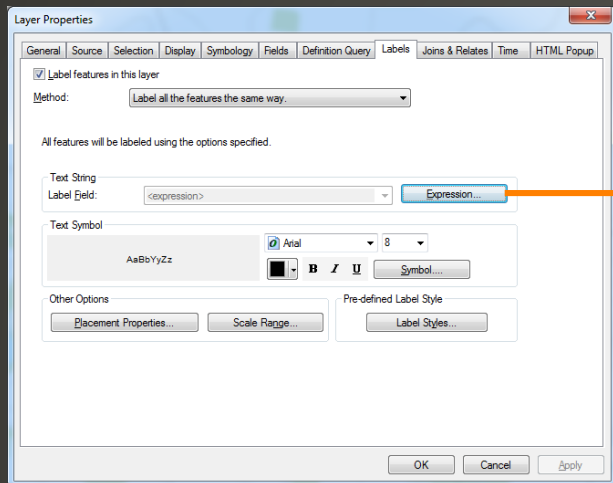
Layer Properties

General Source Selection Display Symbology Fields Definition Query

Definition Query:  
 "Weights" >= 20 AND "HImpTag" = 1

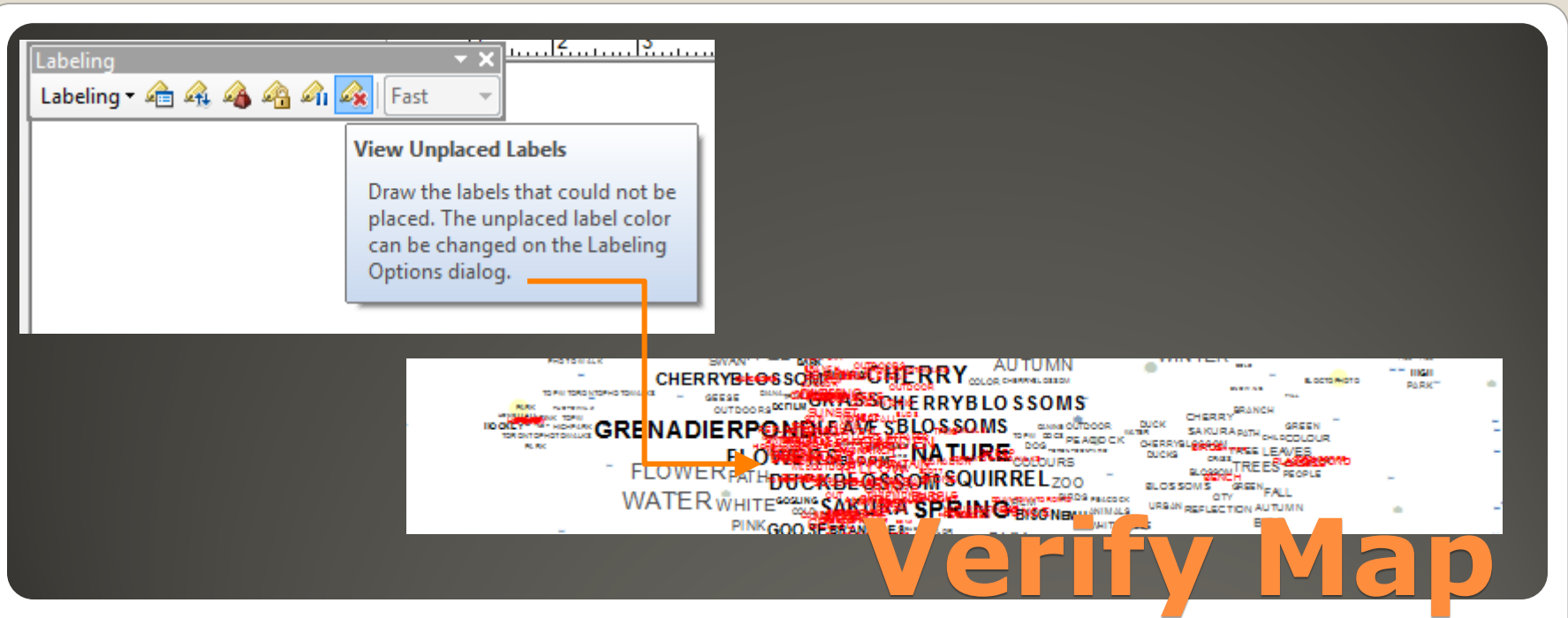
# Adjust Definition Query

- 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.



# Adjust Font Size Modifier

- 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:  $7 + \sqrt{[Weights]} * 5$ 
    - 7** = Set minimum Font Size
    - **Sqr** = optional flattening of font size display curve
    - \* **5** = Set largest Font Size



- 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:**

$1 + [\text{Join\_Count}] * (\text{sqr}(1 / ([\text{Join\_Count}] / [\text{COUNT\_User}] ) ^ 3)) \rightarrow$  Standard weighting formula

$1 + [\text{Join\_Count}] * (\text{sqr}(1 / ([\text{Join\_Count}] / [\text{COUNT\_User}] ) ^ 2)) \rightarrow$  less importance on User\_Count in correlation to photo count [Join\_Count]

$\text{sqr}([\text{Join\_Count}] + (2 * \text{sqr}([\text{Join\_Count}]))) * 2 \rightarrow$  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