

Feb 25th 2015, UW

Public perception *visualized* through Flickr photo data

Methods & Techniques for extracting peoples' perceptual responses to the environment
from large crowdsourced photo data sets

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Landscape Architecture and Environmental Planning

Flickr photo data:

Time (of photo taking/Upload time)

→ **Temporal patterns**

Location (Geotag)

→ **Spatial patterns**

Attributes (Tags)

→ **Attribute patterns**

User information (origin etc.)

→ **User Group patterns**

Views (Interestingness for others)

linked

Techniques:

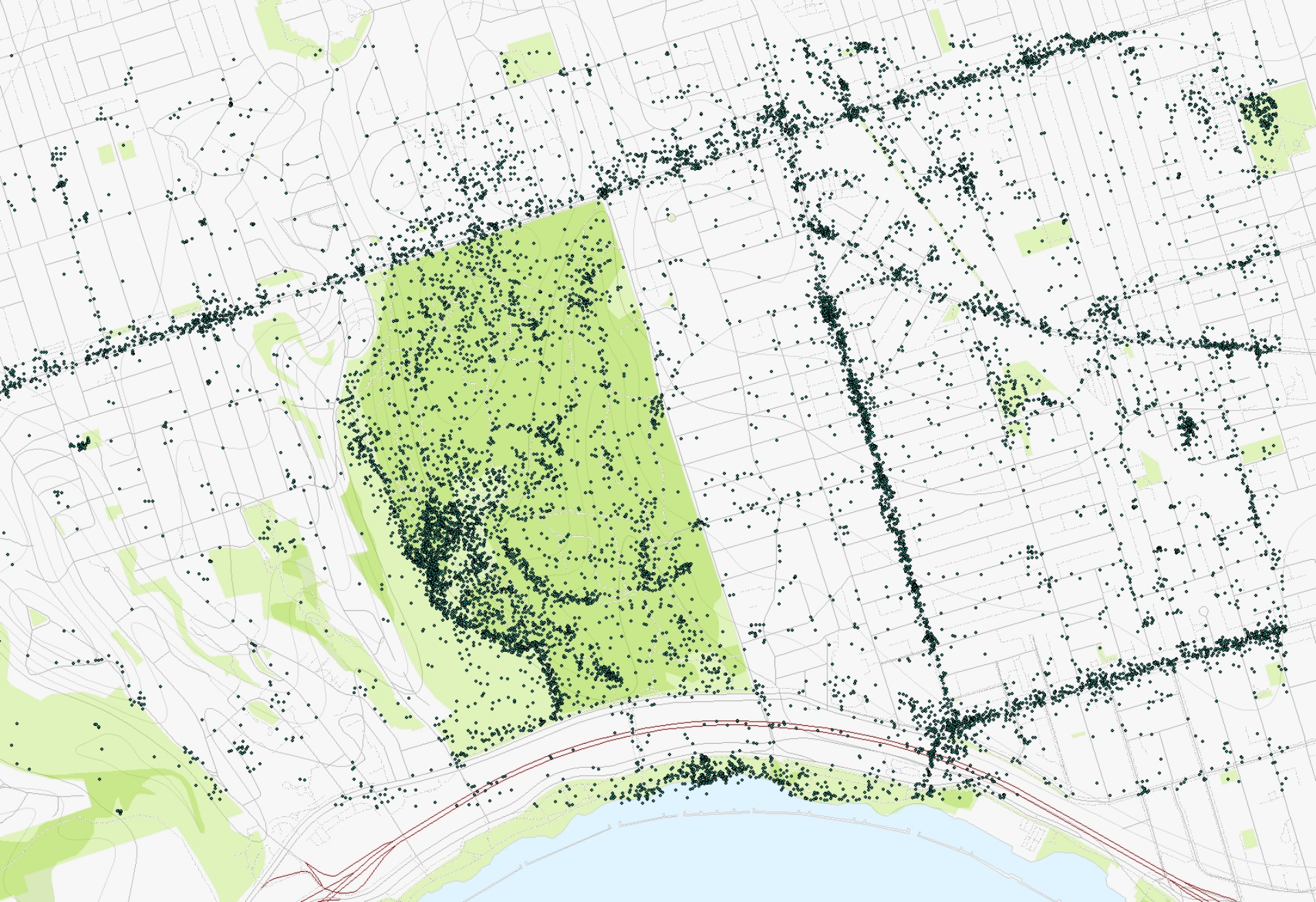
- 1) Tag maps**
- 2) Sightlines**
- 3) Local tag/time/attribution patterns**

Tag Maps

Steps

Photo Location Clustering

Example: Highpark, Toronto

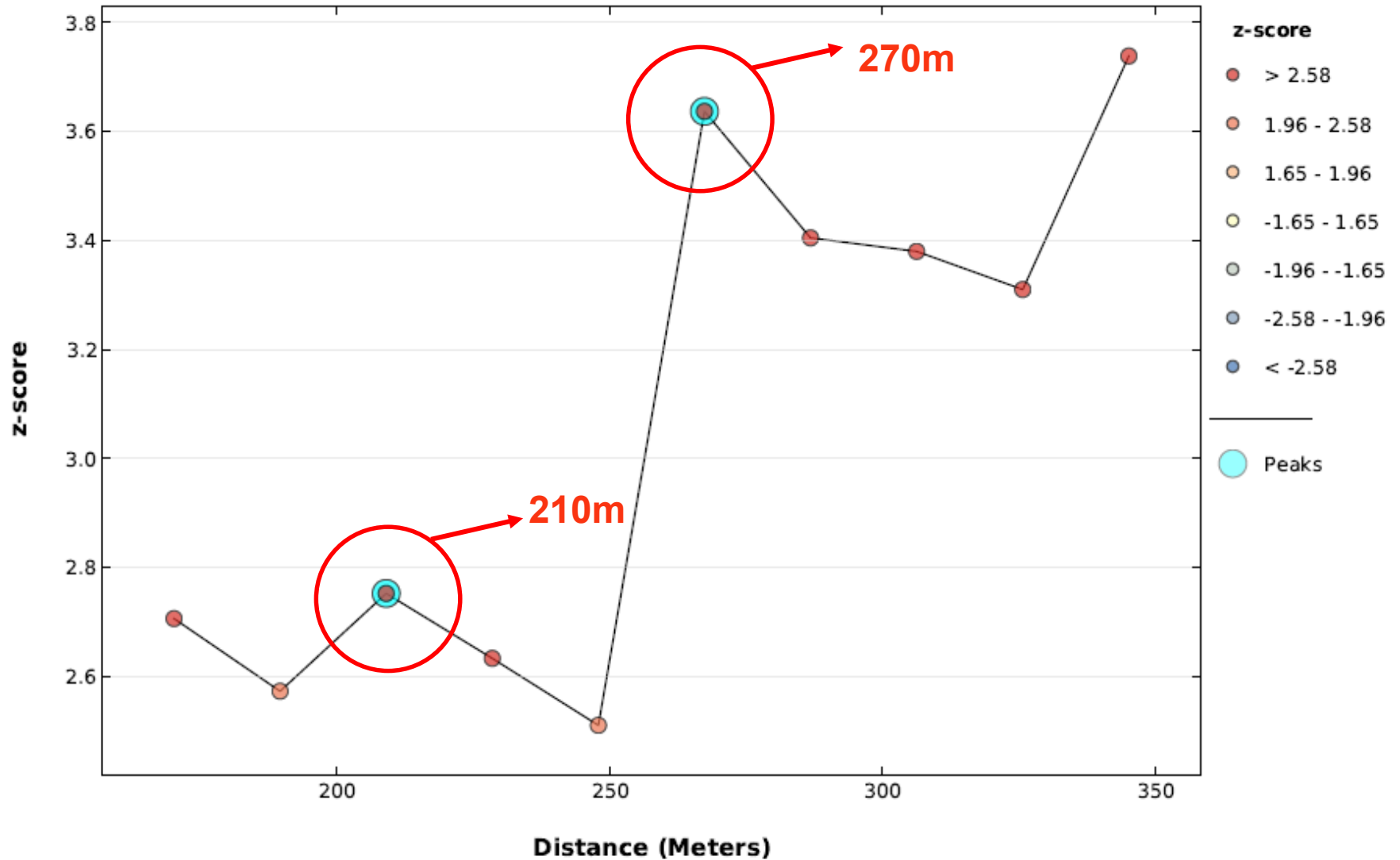


31,000 Photo Locations

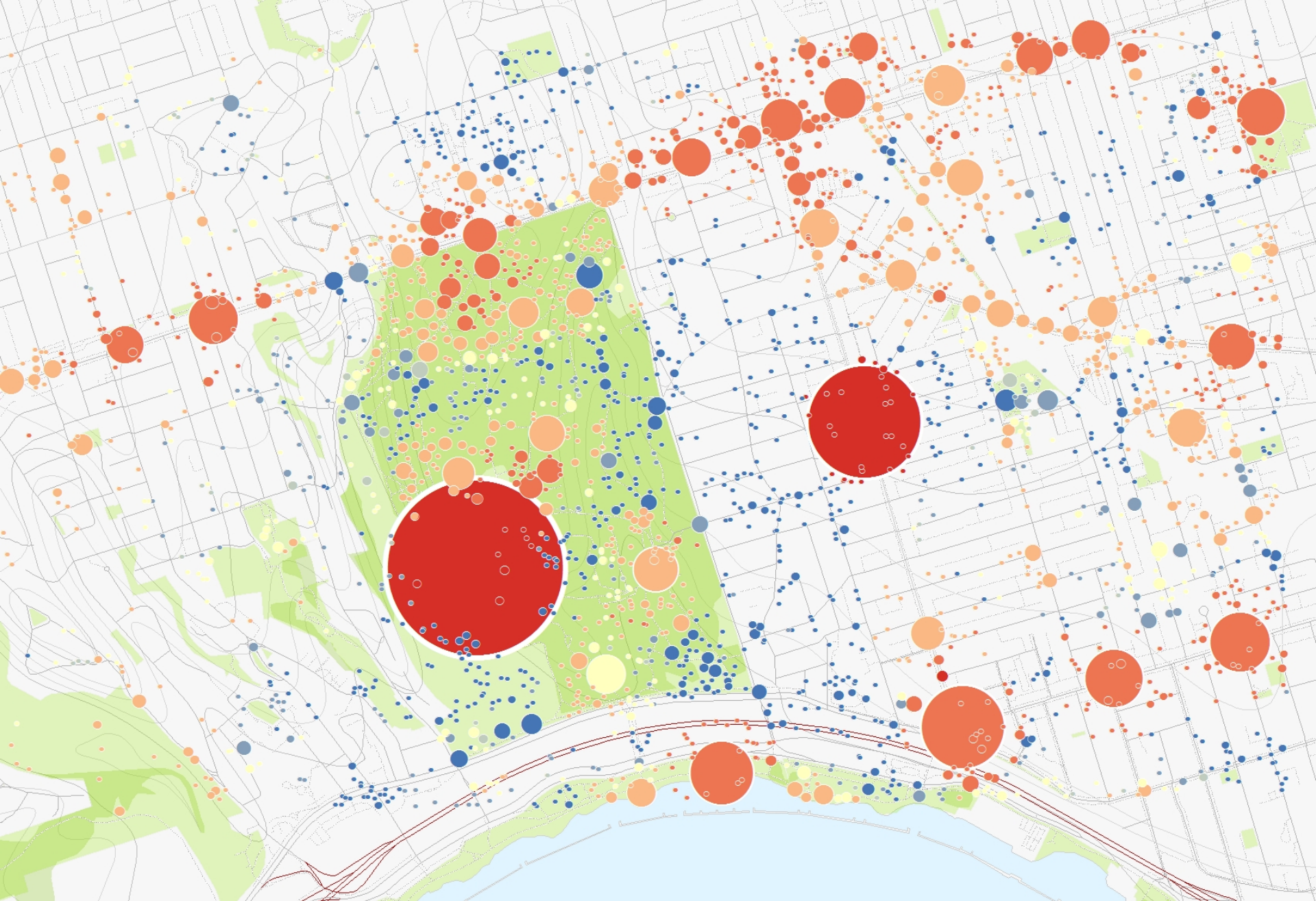


First Level Clustering: 2,800 Clusters

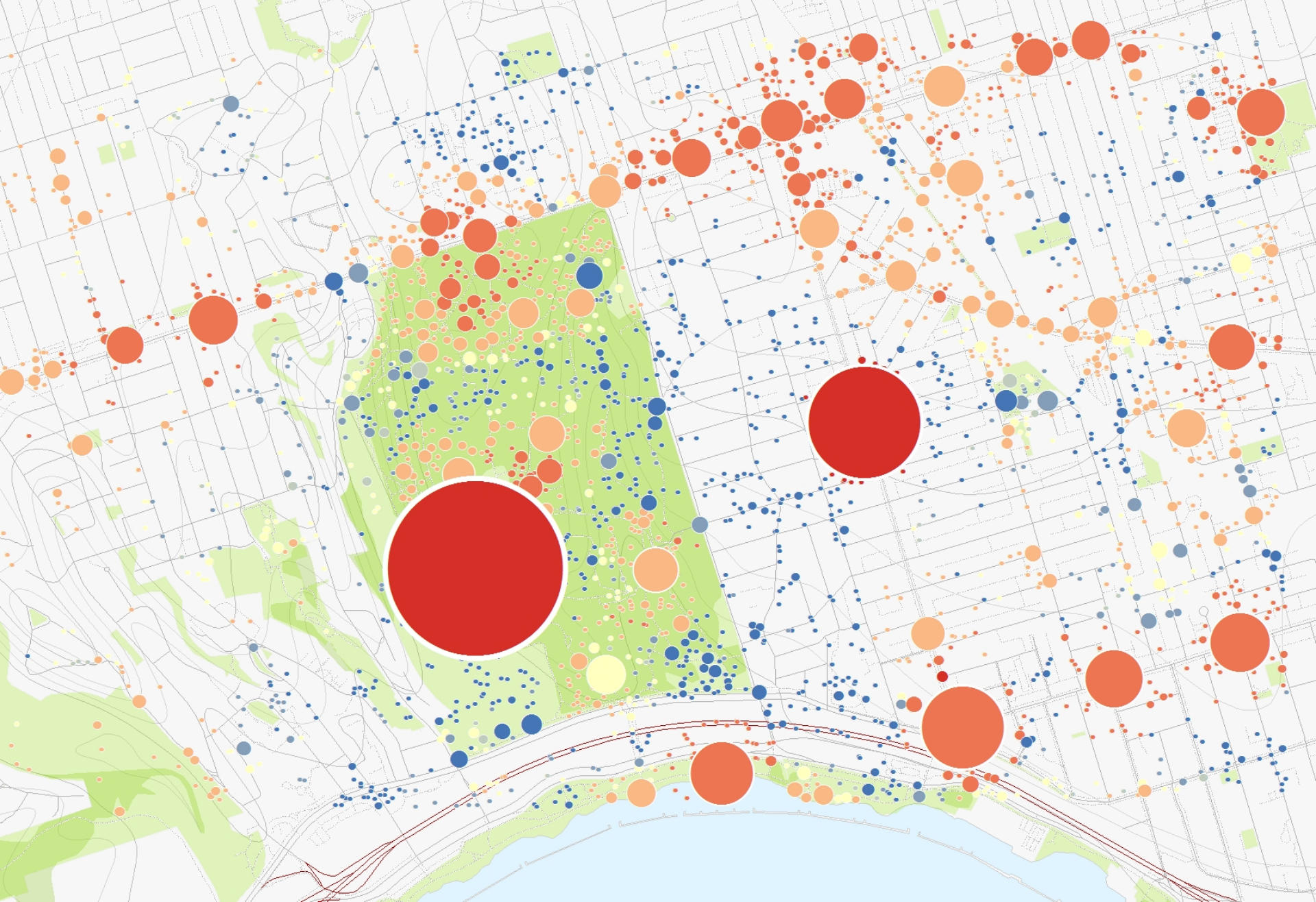
Spatial Autocorrelation by Distance



Incremental Spatial Autocorrelation



Second Level Clustering: Getis-Ord GI*



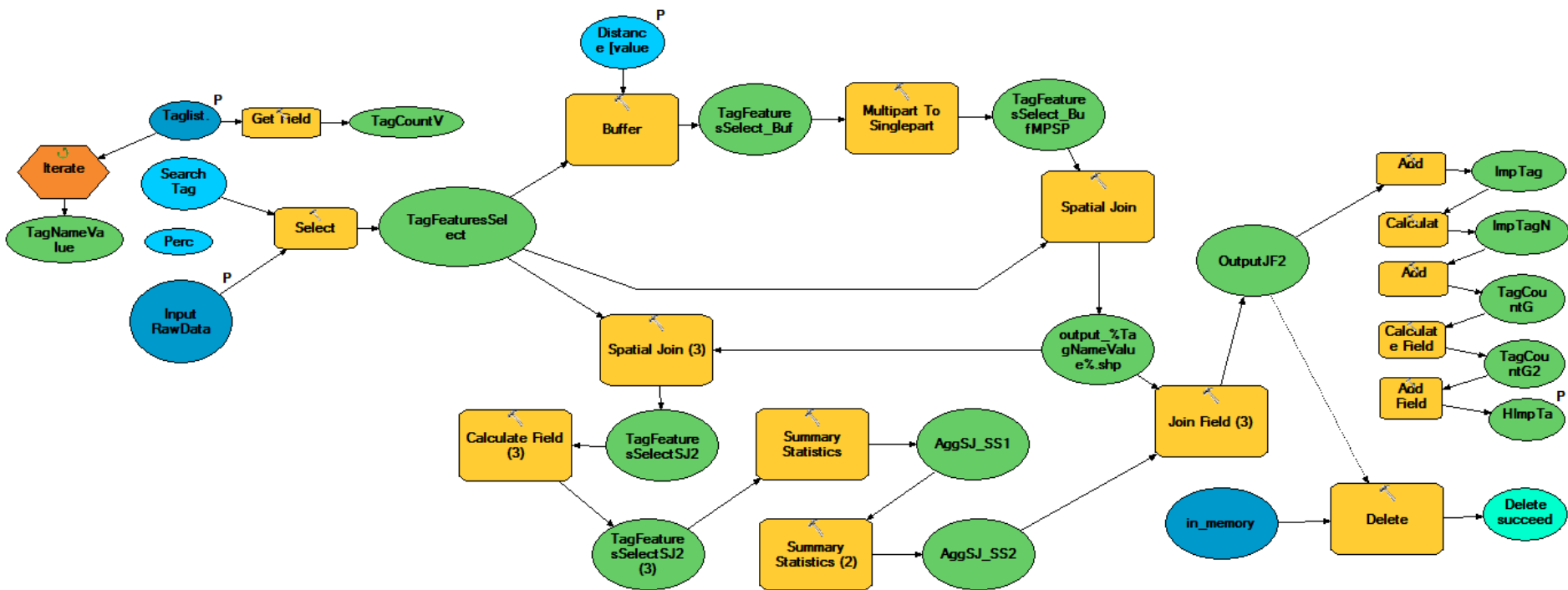
Sorted Output

Tag Clustering

Tags

..
..
..
.west;storefront;queenstreetwest;queenstreet;queenstw;
.west;storefront;queenstreetwest;queenstreet;queenstw;
.west;storefront;queenstreetwest;queenstreet;queenstw;
.storefront;queenstreetwest;queenstreet;queenstw;
.west;storefront;queenstreetwest;queenstreet;queenstw;
.west;storefront;queenstreetwest;queenstreet;queenstw;
.west;storefront;queenstreetwest;queenstreet;queenstw;
.west;storefront;queenstreetwest;queenstreet;queenstw;
.west;storefront;queenstreetwest;queenstreet;queenstw;
.west;storefront;queenstreetwest;queenstreet;queenstw;
.west;storefront;queenstreetwest;queenstreet;queenstw;
.xmas;music;toronto;records;rebecca;live;lounge;trumpet;lula;horn;barnyard;hennessy;ef85mmf12liium;
.xmas;music;toronto;records;dave;live;lounge;clark;lula;barnyard;ef35mmf14lusem;
.xmas;music;toronto;records;audience;live;lounge;crowd;lula;listener;barnyard;ef35mmf14lusem;
.snow;toronto;bike;bicycle;winterbike;snowybike;lockedbike;
.xmas;music;toronto;records;drums;live;stage;lounge;lula;cymbals;barnyard;ef35mmf14lusem;
.xmas;music;toronto;records;live;stage;lounge;horns;lula;trumpets;barnyard;ef35mmf14lusem;
.toronto;ttc;busstop;passengers;streetcar;streetcarstop;506streetcar;collegestreetcar;
.toronto;rain;umbrella;pedestrian;collegestreet;dundasstreet;umbrellaman;
.toronto;traffic;collegestreet;lansdowne;brockton;streetcartracks;torontotraffic;
.toronto;sorauren;longlens;soraurenavenue;
.toronto>window;pigeon;perch;baywindow;perchedbirds;
.square;squareformat;rise;iphoneography;instagramapp;uploaded:by=instagram;
..
.street;toronto;candid;parkdale;streetlevelphoto;olympusepl5;panasoniclumix14mm25;
.street;toronto;candid;parkdale;streetlevelphoto;olympusepl5;panasoniclumix14mm25;
.street;toronto;parkdale;streetlevelphoto;olympusepl5;panasoniclumix14mm25;
.toronto;ontario;pentax;trains;187;railways;jackman;trm;modelrailway;2014;hoscale;caperace;canadianpacificrailway;1645;k20d;rapidotrains;torontorailwaymuseum;bgrgroup;
.toronto;ontario;pentax;trains;187;railways;jackman;trm;modelrailway;2014;hoscale;caperace;canadianpacificrailway;1645;k20d;rapidotrains;torontorailwaymuseum;bgrgroup;
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.toronto;ontario;pentax;trains;187;railways;jackman;trm;modelrailway;2014;hoscale;caperace;canadianpacificrailway;1645;k20d;rapidotrains;torontorailwaymuseum;bgrgroup;
.toronto;ontario;pentax;trains;187;railways;jackman;trm;modelrailway;2014;hoscale;caperace;canadianpacificrailway;1645;k20d;rapidotrains;torontorailwaymuseum;bgrgroup;
.square;squareformat;walden;iphoneography;instagramapp;uploaded:by=instagram;
.square;squareformat;iphoneography;instagramapp;uploaded:by=instagram;foursquare:venue=4b6040daf964a52015dc29e3;
.square;lofi;squareformat;iphoneography;instagramapp;uploaded:by=instagram;
.approved;andrevautour;
..

Unsorted Tag Data: 28,500 Tags



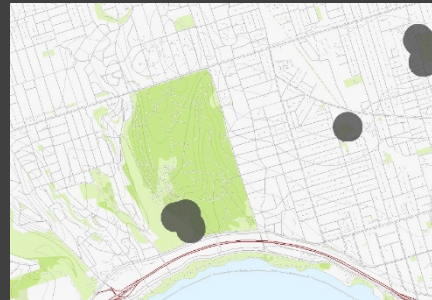
Clustering Tags Occurences...



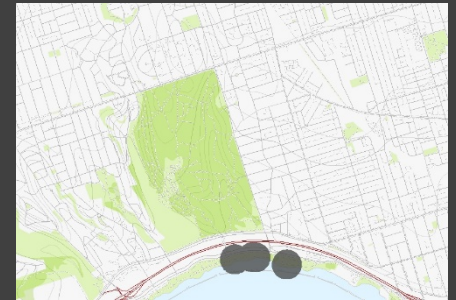
abandoned



animals



autumncolors



beaches



bikes



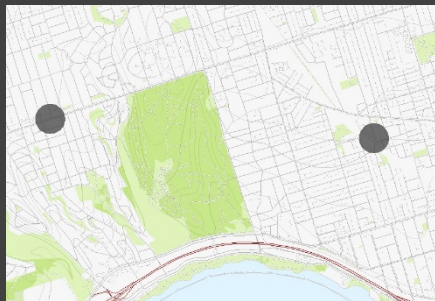
blacksquirrel



blossoms



breeze

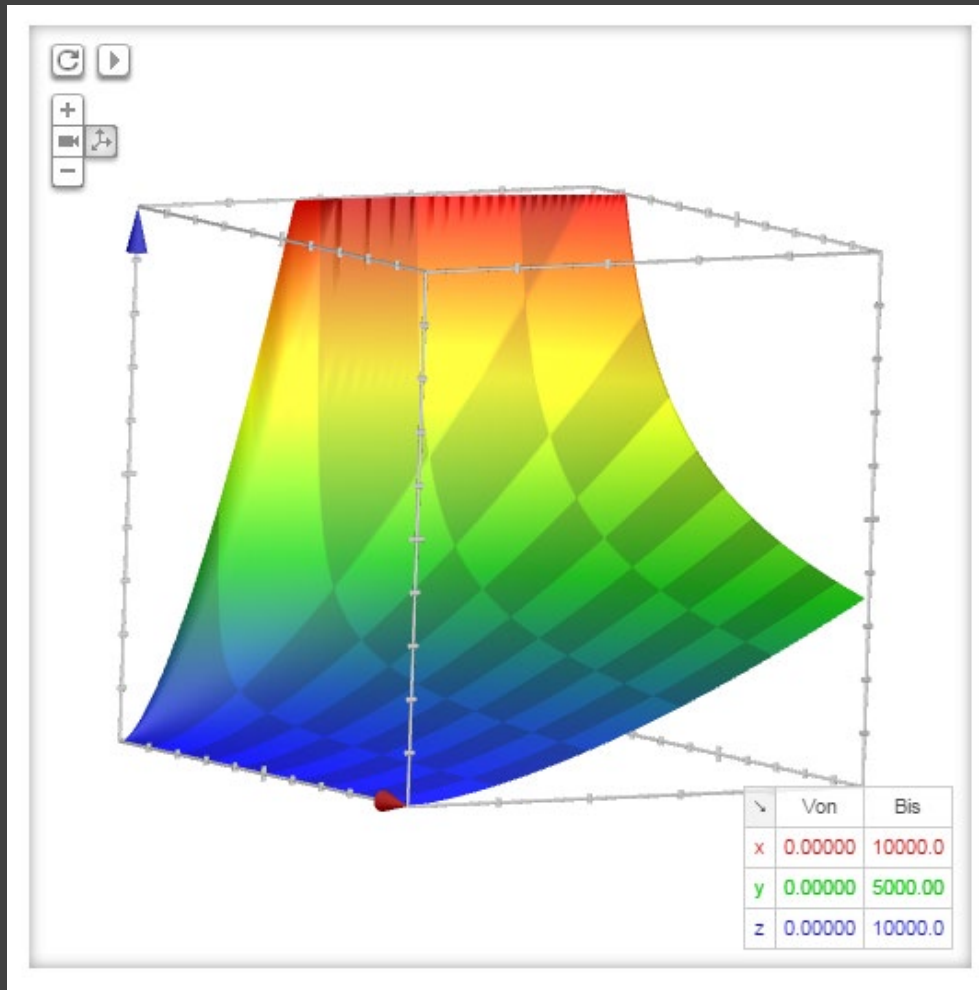


supermarked

... for each Tag in List (2,800)



Merge all Clusters: 12,200

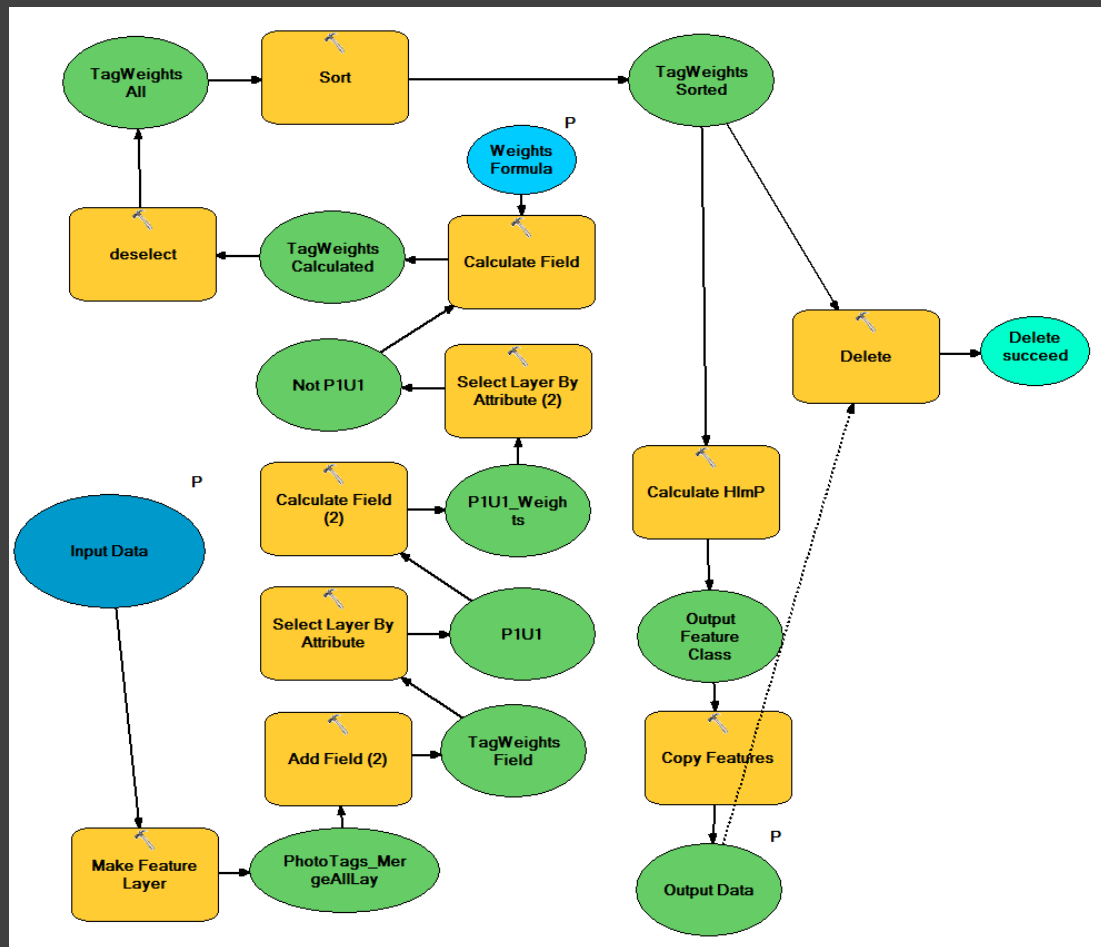


Per Cluster:

$$f(x) = 4 + x \cdot \sqrt{\frac{1}{\left(\frac{x}{y}\right)^3}} \cdot 10$$

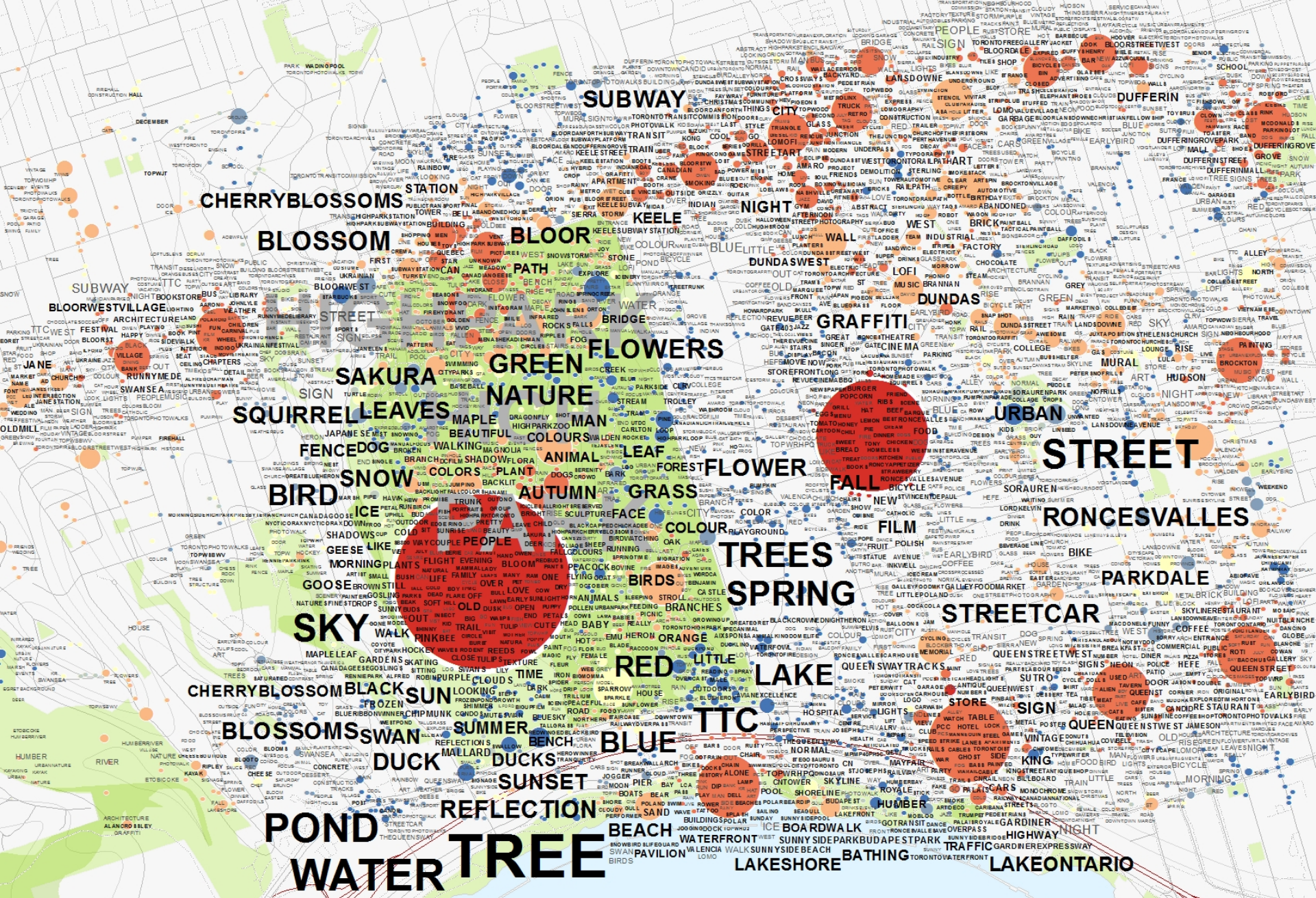
X = Number of Photos
y = Number of Photographers
4+ = Minimum Font Size
*10 = Display Size Modifier

Calculate Weights for each Cluster



Calculate Weights for each Cluster

Adjust Minimum & Maximum Font Size Modifier



Final Map