

Preparatory steps for PPGIS data

Urban Experience course 2022



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Don't worry – there's always an answer behind the corner

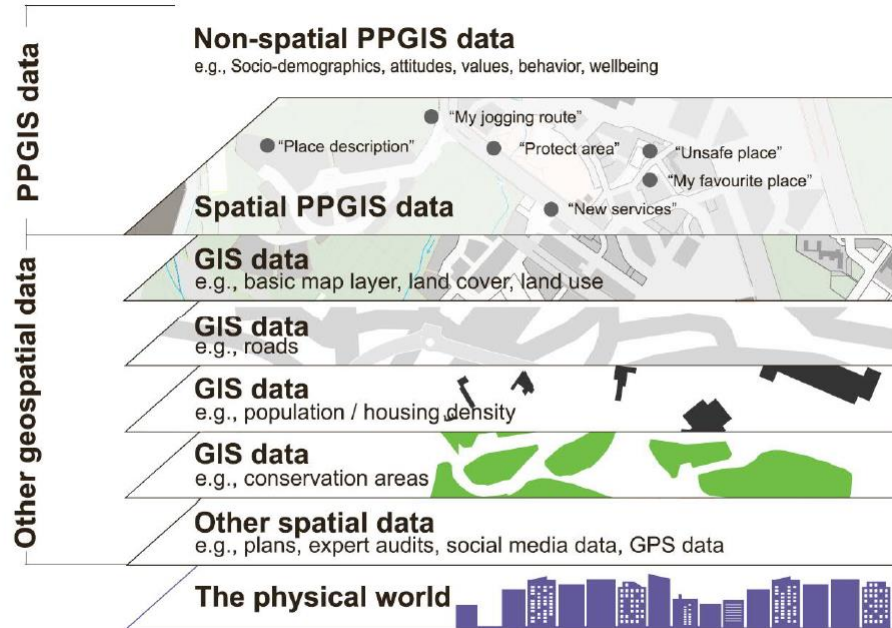
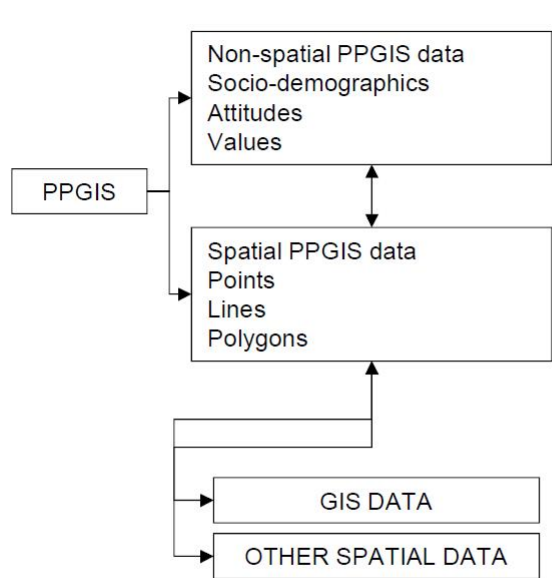
- Learn how your data is structured
- Learn how your survey is structured
- Compare these two – You'll quickly start understanding what is what

respondent	createtime	id	buttonname	visibleLayers	zoomLevel	wkt	What makes the place nice?
18	2016-10-17T05:27:17.0	1	My school	MapBox	17	POINT (24.630575 60.153104)	6.630758 60.151999
21	2016-10-17T05:27:58.0	2	My school	MapBox	17	POINT (24.630575 60.153104)	6.630835 60.152976
17	2016-10-17T05:28:05.4	3	My home	MapBox	17	POINT (24.655970 60.197308)	6.630877 60.153048
18	2016-10-17T05:28:05.4	4	My school	MapBox	17	POINT (24.630575 60.153104)	6.630843 60.152010

respondent	lang_code	sex	width	your_grade_5th_grad	your_grade_9th_grad	four_grade	Gender_girl	Gender_boy	Gender	How do you most often travel your journey?	Other transport mode, what?
17	fi	1280	1	0	5	grade	0	1	boy	16	LINESTRING (24.631004 60.153136, 24.631004 60.153136)
18	fi	1920	1	0	5	grade	0	1	boy	18	LINESTRING (24.634266 60.153991, 24.634266 60.153991)
19	fi	1920	1	0	5	grade	0	1	boy	17	LINESTRING (24.629674 60.152185, 24.629674 60.152185)
20	fi	1920	1	0	5	grade	0	1	boy	17	LINESTRING (24.634309 60.152466, 24.634309 60.152466)
21	fi	1280	1	0	5	grade	0	1	boy	17	LINESTRING (24.633504 60.152223, 24.633504 60.152223)
22	fi	1280	1	0	5	grade	1	0	girl	18	LINESTRING (24.637181 60.148792, 24.637181 60.148792)
23	fi	1920	1	0	5	grade	0	1	boy	17	LINESTRING (24.633504 60.152223, 24.633504 60.152223)
24	fi	1034	1	0	5	grade	1	0	girl	17	LINESTRING (24.634577 60.151871, 24.634577 60.151871)
25	fi	1920	1	0	5	grade	0	1	boy	17	LINESTRING (24.633504 60.152223, 24.633504 60.152223)
26	fi	1920	1	0	5	grade	0	1	boy	17	LINESTRING (24.633504 60.152223, 24.633504 60.152223)
27	fi	1173	1	0	5	grade	1	0	girl	17	LINESTRING (24.632024 60.154996, 24.632024 60.154996)
29	fi	1920	1	0	5	grade	1	0	girl	18	LINESTRING (24.632867 60.152028, 24.632867 60.152028)
30	fi	1280	1	0	5	grade	1	0	girl	19	LINESTRING (24.635797 60.151285, 24.635797 60.151285)
31	fi	1280	1	0	5	grade	1	0	girl	15	LINESTRING (24.708485 60.287273, 24.708485 60.287273)
33	fi	1280	1	0	5	grade	0	1	boy	15	LINESTRING (24.640794 60.154623, 24.640794 60.154623)
34	fi	1034	1	0	5	grade	0	1	boy	18	LINESTRING (24.638498 60.150995, 24.638498 60.150995)
36	fi	1280	1	0	5	grade	0	1	boy	17	LINESTRING (24.640918 60.154322, 24.640918 60.154322)
37	fi	1280	1	0	5	grade	1	0	girl	17	LINESTRING (24.632024 60.152435, 24.632024 60.152435)
38	fi	1280	1	0	5	grade	0	1	boy	19	LINESTRING (24.651502 60.148664, 24.651502 60.148664)
39	fi	1280	1	0	5	grade	1	0	girl	17	LINESTRING (24.633504 60.151887, 24.633504 60.151887)
40	fi	1280	1	0	5	grade	1	0	girl	17	LINESTRING (24.633504 60.152028, 24.633504 60.152028)
42	fi	1280	1	0	5	grade	1	0	girl	14	LINESTRING (384.803181 60.287231, 384.803181 60.287231)
45	fi	1280	1	0	5	grade	1	0	girl	15	LINESTRING (24.743915 60.151796, 24.743915 60.151796)
47	fi	1280	1	0	5	grade	1	0	girl	15	LINESTRING (24.735505 60.158023, 24.735505 60.158023)
51	fi	1280	1	0	5	grade	1	0	girl	15	LINESTRING (24.711514 60.147473, 24.711514 60.147473)
52	fi	1280	1	0	5	grade	1	0	girl	15	LINESTRING (24.648868 60.149436, 24.648868 60.149436)

respondent	createtime	id	buttonname	visibleLayers	zoomLevel	wkt	How do you most often travel your journey?	Other transport mode, what?
17	2016-10-17T05:29:41.8	10	My school journey	Google Hybrid	16	LINESTRING (24.631004 60.153136, 24.631004 60.153136)	16	By bus
19	2016-10-17T05:30:10.2	13	My school journey	MapBox	18	LINESTRING (24.634266 60.153991, 24.634266 60.153991)	18	By scooter
20	2016-10-17T05:31:44.8	28	My school journey	MapBox	17	LINESTRING (24.629674 60.152185, 24.629674 60.152185)	17	By foot
24	2016-10-17T05:33:52.0	30	My school journey	MapBox	17	LINESTRING (24.634309 60.152466, 24.634309 60.152466)	17	By foot
25	2016-10-17T05:32:51.6	42	My school journey	MapBox	17	LINESTRING (24.633504 60.152223, 24.633504 60.152223)	17	By foot
18	2016-10-17T05:34:05.6	52	My school journey	MapBox	18	LINESTRING (24.637181 60.148792, 24.637181 60.148792)	18	By scooter
25	2016-10-17T05:34:47.8	58	My school journey	MapBox	17	LINESTRING (24.633504 60.152223, 24.633504 60.152223)	17	By foot
27	2016-10-17T05:34:58.0	59	My school journey	MapBox	17	LINESTRING (24.633504 60.152028, 24.633504 60.152028)	17	By foot
25	2016-10-17T05:35:08.0	62	My school journey	MapBox	17	LINESTRING (24.634577 60.151871, 24.634577 60.151871)	17	By foot
34	2016-10-17T05:37:18.4	81	My school journey	MapBox	17	LINESTRING (24.632024 60.154996, 24.632024 60.154996)	17	By foot
38	2016-10-17T05:38:13.8	95	My school journey	MapBox	18	LINESTRING (24.632867 60.152028, 24.632867 60.152028)	18	By foot
29	2016-10-17T05:38:52.2	98	My school journey	Google Hybrid	19	LINESTRING (24.635797 60.151285, 24.635797 60.151285)	19	By foot
21	2016-10-17T05:39:23.8	80	My school journey	MapBox	15	LINESTRING (24.708485 60.287273, 24.708485 60.287273)	15	By bus
31	2016-10-17T05:40:03.5	111	My school journey	Google Hybrid	15	LINESTRING (24.640794 60.154623, 24.640794 60.154623)	15	By foot
40	2016-10-17T05:41:38.2	127	My school journey	Google Hybrid	18	LINESTRING (24.638498 60.150995, 24.638498 60.150995)	18	By foot
31	2016-10-17T05:44:02.3	160	My school journey	Google Hybrid	17	LINESTRING (24.640918 60.154322, 24.640918 60.154322)	17	By bus
47	2016-10-17T05:49:09.7	262	My school journey	MapBox	17	LINESTRING (24.632024 60.152435, 24.632024 60.152435)	17	By foot
30	2016-10-17T05:49:10.7	203	My school journey	Google Hybrid	19	LINESTRING (24.651502 60.148664, 24.651502 60.148664)	19	By bicycle
31	2016-10-17T05:51:20.5	223	My school journey	MapBox	17	LINESTRING (24.633504 60.151887, 24.633504 60.151887)	17	By foot
44	2016-10-17T05:54:07.1	251	My school journey	MapBox	17	LINESTRING (24.633504 60.152028, 24.633504 60.152028)	17	By foot
83	2016-10-17T07:48:13.3	381	My school journey	MapBox	14	LINESTRING (384.803181 60.287231, 384.803181 60.287231)	14	By taxi
64	2016-10-17T07:48:14.9	303	My school journey	MapBox	15	LINESTRING (24.743915 60.151796, 24.743915 60.151796)	15	By taxi
64	2016-10-17T07:48:14.8	305	My school journey	MapBox	15	LINESTRING (24.735505 60.158023, 24.735505 60.158023)	15	By taxi
64	2016-10-17T07:50:03.0	306	My school journey	MapBox	15	LINESTRING (24.711514 60.147473, 24.711514 60.147473)	15	By taxi
67	2016-10-17T07:50:09.8	307	My school journey	MapBox	17	LINESTRING (24.648868 60.149436, 24.648868 60.149436)	17	By taxi
68	2016-10-17T07:51:09.8	309	My school journey	MapBox	13	LINESTRING (24.719318 60.212331, 24.719318 60.212331)	13	By taxi

About the nature of PPGIS data



Non-spatial PPGIS data

PPGIS

Non-spatial PPGIS data
 Socio-demographics
 Attitudes
 Values

respondent	lang_code	scr_width	Your grade_5th gra	Your grade_9th gra	Your grade	Gender_girl	Gender_boy	Gender
17	fi	1280	1	0	5. grade	0	1	boy
18	fi	1920	1	0	5. grade	0	0	boy
19	fi	1920	1	0	5. grade	0	0	boy
20	fi	1920	1	0	5. grade	0	0	boy
21	fi	1280	1	0	5. grade	0	1	boy
22	fi	1280	1	0	5. grade	1	0	girl
23	fi	1920	1	0	5. grade	0	1	boy
24	fi	1920	1	0	5. grade	0	0	boy
25	fi	1034	1	0	5. grade	1	0	girl
26	fi	1920	1	0	5. grade	0	0	boy
27	fi	1173	1	0	5. grade	1	0	girl
29	fi	1920	1	0	5. grade	1	0	girl
30	fi	1280	1	0	5. grade	1	0	girl
31	fi	1280	1	0	5. grade	1	0	girl
33	fi	1280	1	0	5. grade	1	0	boy
34	fi	1034	1	0	5. grade	0	0	boy
36	fi	1280	1	0	5. grade	1	0	girl
37	fi	1280	1	0	5. grade	1	0	girl
38	fi	768	1	0	5. grade	0	1	boy
39	fi	1920	1	0	5. grade	0	1	boy
40	fi	1920	1	0	5. grade	1	0	girl
42	fi	1280	1	0	5. grade	1	0	girl
45	fi	1280	1	0	5. grade	1	0	girl
47	fi	1920	1	0	5. grade	0	1	boy
51	fi	1173	1	0	5. grade	1	0	girl
52	fi	1280	1	0	5. grade	1	0	girl

Could you please provide some background information?

The results will be handled confidentially. No single respondent can be identified.

Gender

Female
 Male

Birthyear (1900)

Monthly available household income (after taxation)

Are you retired?

Yes
 No

Which of the following personal goals are important to you?

People have, at different stages of their life, a variety of areas of interests, projects and objectives. These interests or objectives might be related to any area of your life, such as to oneself, hobbies, everyday life, health, relationships, or children, or friends. We ask you now to think about which of the following objectives, projects and interests describe you at the moment.

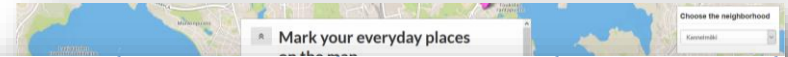
Evaluate the importance of the objectives mentioned here below on a scale from zero to six.

0 = Not important... 6 = very important.

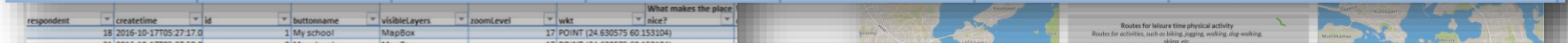
Current interests of targets and goals:	0 Not important	1	2	3	4	5	6 Very important
Ever play physical activities (e.g. walking, hiking)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sports or dance hobby	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Self development	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Managing with a disease	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Maintaining health and functional capacity of the body	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Diet / weight loss / physical appearance	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Maintaining memory capacities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Spatial PPGIS data

DDGIS



respondent	createtime	id	buttonname	visibleLayers	zoomLevel	wkt	What makes the place nice?
18	2016-10-17T05:27:17.0	1	My school	MapBox		17 POINT (24.630575 60.153104)	
21	2016-10-17T05:27:58.0	2	My school	MapBox		17 POINT (24.630575 60.153104)	
17	2016-10-17T05:28:05.4	3	My home	MapBox		17 POINT (24.655970 60.197308)	
20	2016-10-17T05:28:22.4	4	My school	MapBox		17 POINT (24.630575 60.153104)	
20	2016-10-17T05:28:32.4	5	My home	MapBox		17 POINT (24.630758 60.151999)	
17	2016-10-17T05:28:55.5	6	My school	Google Hybrid		16 POINT (24.630833 60.152976)	
19	2016-10-17T05:29:11.3	7	My school	MapBox		18 POINT (24.630677 60.153048)	
20	2016-10-17T05:29:17.1	8	Safe place	MapBox		17 POINT (24.630843 60.152010)	



respondent	createtime	id	buttonname	visibleLayers	zoomLevel	wkt	How to you most often travel your school journeys?	Other transport mode what?
17	2016-10-17T05:29:41.3	10	My school journey	Google Hybrid		16 LINESTRING (24.631004 60.153136, 24.631004 60.153136)	By bus	
19	2016-10-17T05:30:10.2	13	My school journey	MapBox		18 LINESTRING (24.634266 60.153991, 24.634266 60.153991)	By scooter	
23	2016-10-17T05:31:43.9	28	My school journey	MapBox		17 LINESTRING (24.629674 60.152181, 24.629674 60.152181)	By foot	
24	2016-10-17T05:31:52.0	30	My school journey	MapBox		17 LINESTRING (24.634309 60.154364, 24.634309 60.154364)	By foot	
25	2016-10-17T05:32:51.6	42	My school journey	MapBox		17 LINESTRING (24.633504 60.152223, 24.632131 60.152346)		
18	2016-10-17T05:34:01.6	52	My school journey	MapBox		18 LINESTRING (24.637181 60.148752, 24.637181 60.148752)	By scooter	
25	2016-10-17T05:34:47.9	58	My school journey	MapBox		17 LINESTRING (24.633558 60.152245, 24.633558 60.152245)	By foot	
27	2016-10-17T05:34:58.0	59	My school journey	MapBox		17 LINESTRING (24.633290 60.152026, 24.633290 60.152026)	By foot	
25	2016-10-17T05:35:38.0	62	My school journey	MapBox		17 LINESTRING (24.634577 60.151871, 24.634577 60.151871)	By foot	
34	2016-10-17T05:37:19.4	83	My school journey	MapBox		17 LINESTRING (24.632024 60.154994, 24.632024 60.154994)	By foot	

So the next steps are:

- **Get to know your data**
 - Non-spatial data
 - Spatial data
 - Other data sets – what data sets you might need?
 - Does your data need cleaning?
- **Do you need to transform your raw data files to spatial data?**
 - Each excel sheet to csv. and then csv. to shp.
- **Explore, Explain, Predict. GO!**

Where to do your analysis

- **Statistics**
 - Excel, SPSS
- **GIS**
 - QGIS, ArcGIS, ArcGIS Pro

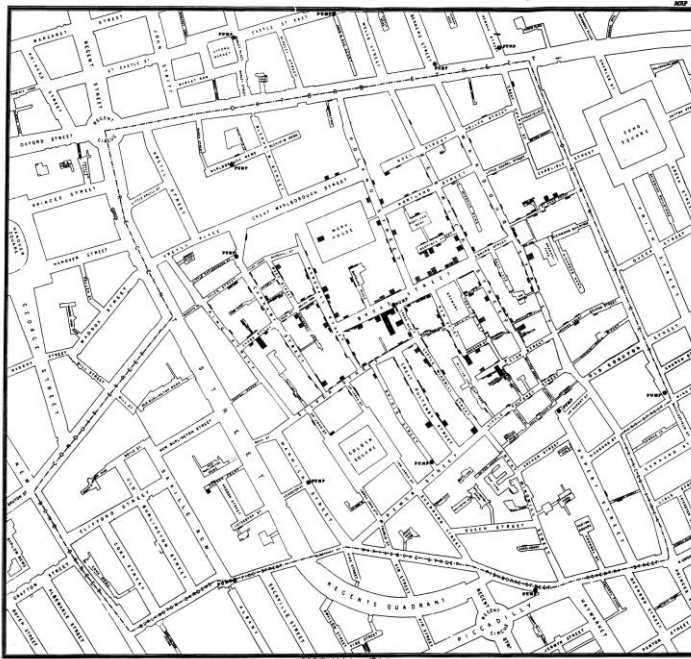
What is GIS?

- **GIS: Geographic Information Science (System)**
- **Almost everything that happens, happens somewhere! Knowing where something happens can be critically important.**
 - We humans usually confine our activities to the surface and near-surface of the earth (from tunnels and mines deep under the grounds to the planes flying through lower levels of atmosphere)
- **Geographic information (GI) is the knowledge of place:**
 - It tells us where things are, or perhaps, where they were or will be.

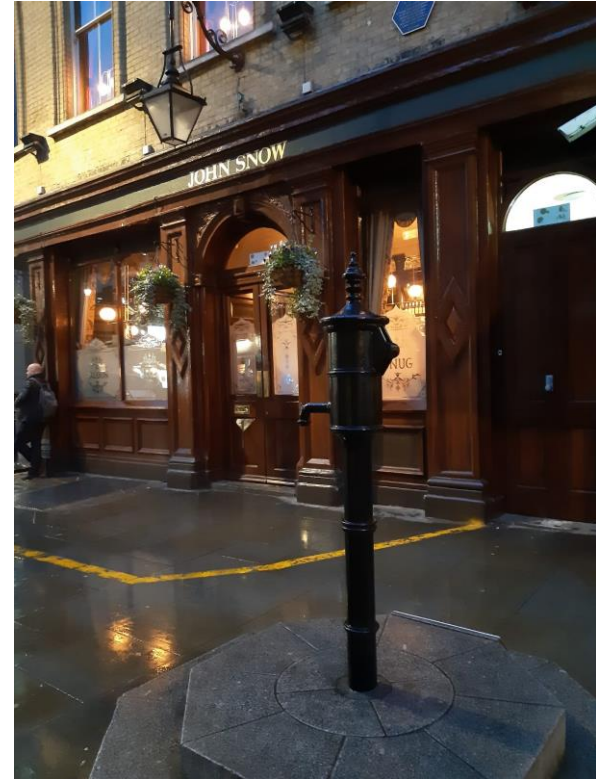
History of GIS

- One can argue that GIS dates back all the way to the very first maps ever made by humans!
- A well-known early use of maps for solving a problem:
London Cholera outbreak 1854
- John Snow was not convinced that “bad air” is the cause of cholera. He made a dot map of cholera occurrences to find out that a water pump might be the cause of epidemic.

History of GIS



Original map by John Snow showing the clusters of cholera cases in the London epidemic of 1854



John Snow memorial and public house on

What is GI System?

GIS is more than just software.

A system is bounded by a set of components.

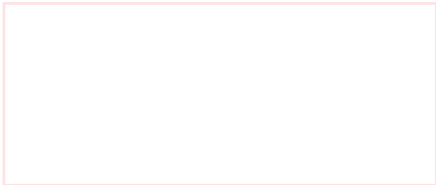
People and methods are combined with geospatial software and tools, to enable spatial analysis, manage large datasets, and display information in a map/graphical form.



Making maps:

There are many types of maps, but the process is generally the same:

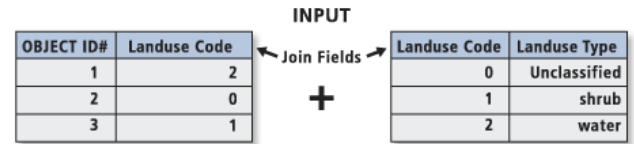
- Establish the purpose of the map
- Define the scale of the map
- Select the *features* (spatial entities) from the real world that you want to map
- Choose a method for representation of these features (points, lines, areas)
- Generalize these features for representation in two dimensions
- Adopt a suitable *map projection* to place features on a flat surface
- Apply a spatial referencing to locate these features relative to each other
- Annotate the map with keys, legends and text to make it easier to use and understand



Joining datasets

Very often we need to join datasets to create new data for our analysis

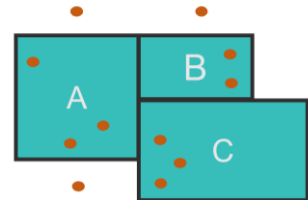
- **Attribute based join:** A join based on a column field in to datasets (e.g. Mapping_ID, respondent)



OUTPUT

OBJECT ID#	Landuse Code	Join Table Landuse Code	Join Table Landuse Type
1	2	2	water
2	0	0	Unclassified
3	1	1	shrub

- **Spatial join:** uses a spatial relationship to create the join (e.g. intersection)



Coordinate systems and projection

WGS 1984 Web Mercator
(auxiliary sphere) -- WKID: 3857

EUREF FIN TM35FIN --
WKID:3067

