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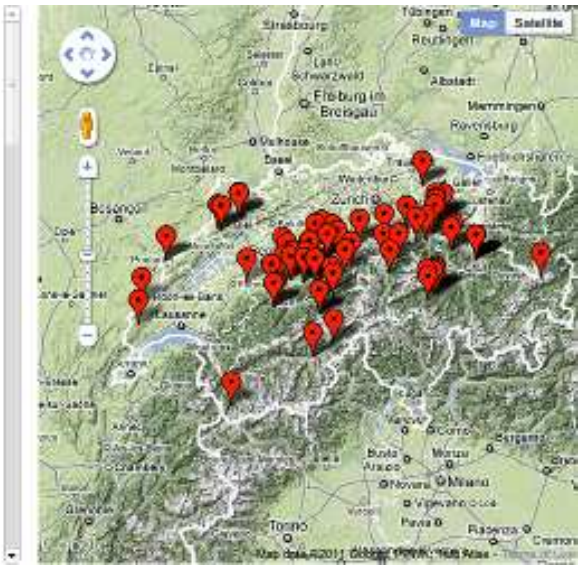
Zürich, October 3, 2011

Topic: Visualization of the Spatial Feed Data with Color Plots

The core of the Swiss Feed Database are measurements of nutrients from feed samples that are collected across the Switzerland. The current on-line interface to query the feed data graphically illustrates feed samples with flags. This is illustrated in the below Figure. The user asks for the measurements of nutrient 'calcium' in all feed samples that are collected from locations with altitude greater than 600 meters. Each feed sample of the query result is illustrated by a flag on the map and for each feed sample the containment of nutrient calcium is given as a text in the list.

	LIMS-Nr.	Canton	PLZ	CA
1	XXXXXX31-006	Bern	2808	7.196
2	XXXXXX73-001	Bern	2808	8.749
3	XXXXXXXX8835834800	Bern	2812	9.537
4	XXXXXX31-001	Bern	2733	9.387
5	XXXXXX31-002	Bern	2733	9.215
6	XXXXXX46-001	Bern	2733	9.423
7	XXXXXXX0454980	Bern	3150	7.214
8	XXXXXXXXX2664085315	Bern	3436	7.359
9	XXXXXX32-001	Bern	3506	7.07
10	XXXXXX08-001	Bern	3557	9.47
11	XXXXXX33-002	Bern	3557	8.606
12	XXXXXX96-001	Bern	3557	8.378
13	XXXXXX96-002	Bern	3557	9.085
14	XXXXXX48-001	Bern	3557	7.59
15	XXXXXX63-001	Bern	3615	8.191
16	XXXXXX48-001	Bern	3616	9.74
17	XXXXXXXXX6485606603	Bern	3661	7.954
18	XXXXXX41-001	Bern	3752	14.85
19	XXXXXX14-006	Bern	3753	9.36
20	XXXXXX38-006	Bern	3753	10.44
21	XXXXXX02-001	Bern	3816	10.054



There are two essential drawbacks while visualizing feed samples with flags. First, in case then there are many feed samples from the same location, all of them are visualized by a single flag and, therefore, it is hard for the user to compare different locations based on the

number of feed samples. Second, flags do not reveal the information about the containment of the selected nutrients and, thus, it is not possible to visually compare the feed quality across different locations.

The goal of this project is to extend visualization of the query result with color plots which with different palettes color the map to show the density of the collected feed samples and content of the selected nutrients. We will pursue our goal with two techniques. First, we will use kernel density estimation to compute the density of the feed samples at any point of the map. Next, we will use the JavaScript language and 'canvas' element of HTML do dynamically color on the map based on the query results.

The deliverables of the project are:

1. Implementation of the color plots with JavaScript;
2. Report of 5-10 pages;
3. Presentation of the results.

Supervisor:

- Andrej Taliun

Starting date: to be assigned

Ending date: to be assigned

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