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Application of neogeographic tools for geochemistry

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Neogeography is a usage of geographical tools for utilization by a non-expert group of users. It have been rapidly developing last ten years and is founded on (a) availability of Global Positioning System (GPS) receivers, that allows to obtain very precise geographical position (b) services, that allows linking geographical position with satellite images, GoogleEarth for example and (c) programs as GPS Track Maker or OziExplorer, that allows linking geographical coordinates with other raster images (for example, maps).
However, the possibilities of neogeographic approach are much wider. It allows linking different parameters with geographical coordinates on the one hand and space image or map – on the other. If it is easy to measure a parameter, a great database could be collected for a very small time. The results can be presented in very different ways. One can plot a parameter versus the distance from a particular point (for example, a source of a substance), make two-dimension distribution of parameter of put the results onto a map or space image. In the case of chemical parameters it can help finding the source of pollution, trace the influence of pollution, reveal geochemical processes and patterns.
The main advantage of neogeograpic approach is the employment of non-experts in collecting data. Now non-experts can easily measure electrical conductivity and pH of natural waters, concentration of different gases in the atmosphere, solar irradiation, radioactivity and so on. If the results are obtained (for example, by students of secondary schools) and shared, experts can proceed them and make significant conclusions. An interface of sharing the results (http://maps.sch192.ru/) was elaborated by V. Ilyin. Within the interface a user can load *.csv file with coordinates, type of parameter and the value of parameter in a particular point. The points are marked on the GoogleEarth map with the color corresponding the value of the parameter. The color scale can be edited manually.
We would like to show some results of practical and scientific importance, obtained by non-experts. At 2006 our secondary school students investigated the distribution of snow salinity around Kosygina Street in Moscow. One can conclude that the distribution of salinity is reproducible and that the street influences the snow up to 150 meters. Another example obtained by our students is the distribution of electrical conductivity of swamp water showing extreme irregularity of this parameter within the small area (about 0.5x0.5 km) the electrical conductivity varied from 22 to 77 uS with no regularity. It points out the key role of local processes in swamp water chemistry. The third example (maps of electrical conductivity and pH of water on a large area) one can see at http://fenevo.narod.ru/maps/ec-maps.htm and http://fenevo.narod.ru/maps/ph-maps.htm. Basing on the map one can conclude mechanisms of formation of water mineralization in the area.
Availability of GPS receivers and systems for easy measuring of chemical parameters can lead to neogeochemical revolution as GPS receivers have led to neogeographical. A great number of non-experts can share their geochemical results, forming huge amount of available geochemical data. It will help to falsify and visualize concepts of geochemistry and environmental chemistry and, maybe, develop new ones. Geophysical and biological data could be shared as well with the same advantages for corresponding sciences.