Geophysical Research Abstracts
Vol. 13, EGU2011-314, 2011
EGU General Assembly 2011

Neogeoscience and scientific education

Denis Zhilin
Moscow Institute for Open Education, Chemistry, Russian Federation (zhila2000@mail.ru)

Recent decade availability of geoinformatic tools (GPS and open services such as GoogleEarth) has boosted neogeography – a system of collecting and sharing huge amount of geographical data by non-expert users. Now it influences geographical education, but it should not be restricted to geography.
If we link any scientific data to a certain geographic position (a map in particular), we get geoscientific data. Chemical data in certain position give geochemical data, botanical – geobotanical and so on. If non-expert users collect and share scientific data and link it to certain positions, then we get neogeoscience – a system of collecting geoscience data by non-expert users. Pupils are non-expert users, and they can collect data within their curricular and extracurricular activity. So, neogeoscience can be widely used in scientific education.
What is the benefit of neogeoscience? It allows to introduce and illustrate experimentally many geoscience theories and patterns. It shifts the students activity outdoors from a classroom. It links the concealed processes to a particular landscapes. For example, measuring levels of pollution one can make a map thus revealing patterns of pollutant distribution. Measuring soil moisture along with plant describing species, one can revealing properties of plants and geobotanic patterns. Measuring temperature in different places one can reveal principles of heat transferring and its influence on life. And so on.
Sharing and comparing neogeoscience data users can verify their own data, as well as patterns and theories. Professional scientists could also use these data at least as preliminary or even as a base for their professional patterns.
Thus neogeoscience can significantly alternate the scientific education. Many theories would be constructed basing on experiments instead of presenting in ready-made form. Very far concepts can be conjoined on the map or landscape basis. Really it can provide a paradigmal shift in the scientific education.
Why it is still not widely implemented? It faces to two groups of problems – technical and mental. To develop neogeochemistry the following tools are necessary: GPS receivers; sensors for rapid obtaining parameter; public service for linking parameters with geographical position, sharing, processing and extracting them. Currently there is no problem with GPS receivers: they are widely used in common life. There are also available sensors (magnetic field, irradiation, vibration, sound, soil moisture, pH and electrical conductivity of water, CO2 in atmosphere and so on), but they are seldom used in common life – non-experts do not see reasons for it. However, all of them are cheap enough to be used in education (and are really used). Concerning public service, when we began to develop this approach there was no relevant one, so we created our own Open Neogeoscience Database (maps.sch192.ru). It is reported for ESSI10 section. So, there are no core technical obstacles to implementation of neogeoscience. The only remaining technical task is to combine all the three tools in one – currently there are no appropriate solutions and the data are to be merged manually, which is boring. However, this task is soluble within one-two years.
However, mental problems are essential. The arrays of neogeoscience data are huge – teachers (and non-experts in general) are familiar with them. Many science teachers (at least in Russia) are not able to process qualitative experimental data at all and consequently cannot develop any theory from experimental data. So, presently very small number of teachers can use neogeoscience approach in full power. Besides, the neogeoscience tasks for students have to be in their zone of proximal development, that is not easy to think up.
Thereby the neogeoscience approach is promising, especially within the educational system. It could provoke great changes in scientific education up to the paradigmal shift. It is possible technically, but wide implementation of this approach requires insight from teachers, that is not easy to gain.