



## **Environmental Hydrological Education in Ukraine: Present State and New Challenges**

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In order to protect waters from damages, improve water-environmental quality and mitigate water-related disasters need the advanced science and technology, sufficient investment and appropriate management. All of these need an effective education and training in the hydrology as the part of water – related sciences. The education in the hydrology is the part of national water-related activity in Ukraine. The needs in the quality of hydrological education will increase as the introduction of new ideas and techniques into practice of water resources planners and managers become comparative. Environmentally oriented water resources development, inherent challenges of man-made and climate change impact on waters have to be tackled worldwide by well trained engineers and scientist relying on modern technology. Ukraine has more than 70 years of experience in the training of hydrologists. At the present hydrologists of B.Sc., M. Sc. and Ph D levels are trained at the Odesa State Environmental University (on the engineering basis) and at the Faculty of Geography of the Kyiv National University (on the geographical basis). The Geographical training of hydrologists at the Kyiv National University provides deeper understanding of natural processes in rivers, lakes and reservoirs, to view them in geographical complex with other physiogeographical phenomena. For this purpose students study geology, geomorphology, biology, meteorology, soil science, physical geography etc. The graduate hydrologists work in the organizations of the State Hydrometeorological Service, the State Committee for Water Management, the Academy of Sciences, others governmental and private organizations. The requirements for hydrologists of these organizations are different in context and scope. This leads to the conclusion that a level of training of hydrologists should have a wide-scope in education. This is achieved by the university-wide fundamental and general geographic training during first and second years and orientation on special hydrological training during next years. After the completion of first and second years academic program, students undertake field practical works under a supervision of their teachers at field stations of the Kyiv National University and at organization of the State Hydrometeorological Service. New challenges in climate changes, increasing of human impact on waters as well as a rapid development of environmental oriented researches stimulate the upgrading of requirements to educational programs. In order to meet these requirements a number of measures have been undertaken by the Kyiv National University in cooperation with the State Hydrometeorological Service and the State Committee for Water Management. A number of the new courses (“Hydroinformatics”, “Environmental Planning and Management”, “New Technologies Using in the Hydrometeorological Service” and others) have been developed during last years. The practical training of using of new hydrological and hydrochemical equipment and methods of observation and forecasting in the State Hydrometeorological Service is increased. All students have practical works at the organization of the State Hydrometeorological Service: meteorological and hydrological stations, observatories, hydrological forecasting units. The special complex program of practical hydrological training of students was development by the Administration of the State Hydrometeorological Service in 2007. One way of the development of hydrological training is increasing the flexibility of educational programs, which includes providing by the Kyiv National University and the State Hydrometeorological Service of on-line and short courses.