University of Gdańsk

Subject card

Subject name and code	Changes in water conditions (Lecture), PG_00196125		
Field of study	Physical geography and geoinformation		
Date of commencement of studies	October 2026	Academic year of realisation of subject	2026/2027
Education level	Master's studies	Subject group	Obligatory subject group in the field of study Subject group related to scientific research in the field of study
Mode of study	full-time studies	Mode of delivery	at the university
Year of study	1	Language of instruction	Polish
Semester of study	1	ECTS credits	3.0
Learning profile	academic	Assessment form	exam
Conducting unit	Department of Hydrology -> Faculty of Oceanography and Geography -> Rector		
Name and surname of lecturer (lecturers)	Subject supervisor	dr Kamil Nowiński	
	Teachers		

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	30.0	0.0	0.0	0.0	0.0	30

E-learning hours included: 0.0

Learning activity and number of study hours

Learning activity	Participation in didactic classes included in study plan	Participation in consultation hours	Self-study	SUM
Number of study hours	30	2.0	43.0	75

Subject objectives

1. To acquire knowledge of natural and anthropogenic transformations of water relations.

2. To identify the main factors causing hydrological, hydrochemical and hydrobiological changes in different hydrographic objects (river, lake, wetland, spring).

3. Recognise the effects of changes in water relations on the water resources of the catchment and changes in the ecosystems of selected hydrographic sites.

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[GFGMU2_W01] knows and understands to a deepened extent the specificity of Earth sciences in the field of physical geography, its internal structure, research subject and main research directions, the methods applied, conceptual apparatus, as well as practical applications of scientific achievements	Knows and understands the conceptual apparatus as well as the practical applications of scientific developments in the field of water relations and their transformation	[SW4] test/exam - oral or written
	[GFGMU2_U05] is able to integrate knowledge from the discipline of Earth and environmental sciences, explaining and interpreting the interrelationships between environmental processes and phenomena in order to solve research problems in physical geography and geoinformation	Be able to integrate knowledge of earth and environmental sciences, correctly explaining and interpreting the interrelationships between processes and phenomena accompanying global environmental change during the Anthropocene period	[SU4] test/exam - oral or written
	[GFGMU2_K03] is prepared to fulfil professional responsibilities in both independent and team-based work by advancing the field of geography, upholding the profession's ethos, adhering to and developing the principles of professional ethics, and ensuring compliance with these principles	He/she is ready to actively broaden his/her professional competences and update his/her knowledge of the hydrosphere, in particular its changes, respecting and developing professional ethics, including respecting copyrights in his/her own activities and those of others	[SK4] test/exam - oral or written
	[GFGMU2_K01] is able to behave appropriately in the workplace and in everyday life by critically evaluating information received in the light of their existing knowledge, recognising the importance of knowledge in solving cognitive and practical problems, and, when faced with difficulties, drawing on expert knowledge	He is ready to critically evaluate his knowledge of hydrosphere transformations, to complement it and to verify his knowledge and skills through critical reading of the literature.	[SK4] test/exam - oral or written
	[GFGMU2_W02] knows and understands to a deepened extent issues in the field of exact sciences enabling the understanding of complex processes and phenomena occurring in the Earth's natural environment, and in their interpretations consistently relay on empirical foundations, using qualitative and quantitative methods	Knows and understands the causes of environmental phenomena in relation to the hydrosphere, and in interpreting them consistently builds on empirical foundations, using qualitative and quantitative methods	[SW4] test/exam - oral or written
	[GFGMU2_U03] is able to use academic literature in the fields of physical geography and geoinformation in Polish and English, selecting it appropriately for the research objective	Can make effective use of skilfully selected scientific literature in the field of water relations transformations in Polish and English.	[SU4] test/exam - oral or written
	[GFGMU2_W08] knows and understands in a deepened extent the most important contemporary problems in the field of contemporary climate change and environmental crises on a regional and global scale, their essence, genesis and possible consequences	Knows and understands the incidence of aquatic environmental hazards at regional and global scales, their nature, genesis, possible consequences and techniques for analysing their occurrence.	[SW4] test/exam - oral or written
	[GFGMU2_U02] is able to precisely and appropriately use terminology in the field of physical geography and geoinformation in oral statements and written works	Can fluently and appropriately apply terminology on water relations and their changes in written work.	[SU4] test/exam - oral or written

Subject contents	Defining the concept of water relations. Influence of natural and anthropogenic conditions on the formation of cause and effect relationships between different hydrographic objects. Regional aspects of variation in water relations. Physico-chemical and biological effects of changes in water relations and their impact on changes in aquatic ecosystems. Hydrological and hydrographical effects of changes in water relations (disappearance of peatlands, ponds, regulation of watercourses). Causes and effects of natural and anthropogenic transformation of lakes, methods of protection and reclamation of lakes. Importance of water reclamation (alluvial plains). Groundwater outflows as an indicator of environmental change. Anthropopressure in urbanised areas - urban water. Water relations of industrialised areas. Changes in catchment water relations and their impact on the water cycle in the catchment. Environmental, social and economic consequences of changes in water relations. Threats and methods to counteract changes in water relations. Record of changes in water relations (cartographic materials, historical records, hydrological measurements). Legal and economic consequences of water relations change, Water law, Water Framework Directive.
Prerequisites and co-requisites	

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
written examination with open and closed questions (tasks)	51.0%	100.0%

Recommended reading	Basic literature	Ciepielowski A., Gutry-Korycka M., 1993, Impact of water reclamation. [in:] Changes of water relations in Poland as a result of natural and anthropogenic processes., UJ, Kraków. Chełmicki W., 2001, Water. Resources, degradation, conservation, PWN, Warszawa. Dynowska I. (ed.), 1993. Changes in water relations in Poland as a result of natural and anthropogenic processes. Jagiellonian University Publishing House, Cracow.Kajak Z., 1998, Hydrobiologia Limnologia, PWN, Warsaw.Nowicka B., 2002, Influence of urbanization on runoff conditions. Prace Instytutu Geografii AŚ, 7.Soczyńska U., 1989, Hydrological processes, PWN, Warsaw.

	Supplementary literature	Błaszkiewicz M., 2007, Genesis and evolution of lake basins in the young glacial area of Poland - selected problems, Stud. Limnologica et Telmatologica 1. Borowiak M., 2007, The influence of the drainage system on the chemical characteristics of surface waters in the Vistula delta, [in:].M. Ziułkiewicz (red.), Stan i antropogeniczne zmiany jakości wód w Polsce, t. V, UŁ Komisja Hydrologiczna PTG, Łódz, s. 95-107. Borowiak M., Maślanka W., 2007, Influence of multi-year anthropopression on the abiotic environment of Klasztorne Małe Lake, (in:) Klasztornego Małego, (w: A. Kostrzewski, J.Szpikowski (red.), Procesy ekstremalne w środowisku geograficznym, Funkcjonowanie geoekosystemów zlewni rzecznych Tom 4, Bogucki Wydawnictwo Naukowe, Poznań, s. 239-252.) Chlost I., 2009, Cartographic record of changes in the water network of the Gardneńsko-Łebska Lowland during the 19th and 20th centuries [in:]. Kaniecki A., Baczyńska A. (red.) Zmiany stosunków wodnych w czasach historycznych, Studia i Prace z Geografii i Geologii nr 9, Bogucki Wydawnictwo Naukowe, Poznań, 17-32. Cieśliński R., Jereczek-Korzeniewska K., 2006. Anthropopressure and water relations of the Oliva Creek catchment. [in:] L. Krzysztofiak (red.), Zintegrowany monitoring środowiska przyrodniczego. Funkcjonowanie i monitoring geoekosystemów Polski w warunkach narastającej antropopresji, Państwowa Inspekcja Ochrony Środowiska, Biblioteka Monitoringu Środowiska, Warszawa Drwal J., Cieśliński R., Fac-Beneda J., 2011, Geographic record of human impact conformance to different water relationships along a coastal river (the Łupawa valley), Quaestiones Geographicae, no 30(1), s. 19-29. Fac-Beneda J., 2000, Changes in the area and depth of the depression in Żuławy Elbląskie, Peribalticum VIII, GTN, Wydz. V Nauk o Ziemi, Gdańsk, s. 9-24. Jankowski A., Absalon D., Machowski R., Ruman M. (red.), 2009, Transformation of water relations under a changing climate, UŚ, Sosnowiec. Kaniecki A., 2004, Poznań history of the city written in water.Poznańskie Towarzystwo Przyjaciół nauk, Poznań. Kowalewski Z. 2003. Impact of surface water retention on the water balance of small agricultural catchments. Woda-Środowisko-Obszary Wiejskie. Rozpr. Nauk. Monogr. nr 6. Morisawa M., 1985, Rivers, form and process, ser. 7, Geomorphology Text, Longman, London, s. 137-155. https://www.watercalculator.org/water-use/climate-change-water-resources/
	eResources addresses	

Example issues/ example questions/ tasks being completed	Definition of the term water relations. Direct effects of changing recharge conditions and water level fluctuations on the hydrological type of the lake. Natural factors affecting the transformation of lakes.
Work placement	Not applicable

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