

## DEPARTMENT OF LAND AND WATER RESOURCES MANAGEMENT

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### I. STAFF

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## II. EQUIPMENT

### II.1 Teaching and Research Laboratories

Soil physics and hydrological laboratory

CAD and GIS laboratory

Computer room

## III. TEACHING

### III.1 Graduate Study

Subject	Semester	Hours Per Week Lectures      Seminars	Lecturer
Landscape Ecology and Spatial Planning	3	2 - 2	E. Klementová
Landscape Ecology	3	2 - 2	E. Klementová
Meteorology and Hydrology	3	2 - 2	J. Szolgay, S. Kohnová
Hydrology	3	2 - 2	J. Szolgay
Landscape Engineering	4	2 - 2	K. Hlavčová V. Macura
	5	2 - 1	J. Skalová
Pedology and Soil Management	6	2 - 2	J. Skalová
Hydraulic Structures	6	2 - 2	M. Čistý
Pedology and Evaluation of Fields	7	2 - 2	J. Skalová
Irrigation and Drainage	7	2 - 2	E. Klementová J. Skalová
Integrated River Basin Management	7	2 - 2	K. Hlavčová
Water Resources Management	8	2 - 2	J. Szolgay
Engineering Networks	8	2 - 2	J. Blaha
Hydrological Field Measurements	8	4 days	J. Blaha
River Training	8	2 - 2	V. Macura
Engineering Practice	8	4 weeks	M. Čistý
CAD Systems in Landscape Engineering	8	2 - 2	M. Čistý
Water Regime of a Landscape	9	2 - 2	J. Skalová V. Macura
Informatics in Water Management	9	2 - 2	S. Kohnová
Microirrigation	9	2 - 2	E. Klementová J. Hrbík V. Heinige
Design of Small Reservoirs (Dams)	10	2 - 1	M. Čistý
Reclamation and Conservation of Landscapes	10	2 - 1	E. Klementová K. Hlavčová
Computer Modelling in Water Management	10	2 - 1	S. Kohnová
Application of GIS in Water Resources	9	2 - 2	J. Szolgay K. Hlavčová
Sustainable Water Resources Management	9	2 - 2	S. Kohnová

Flood Protection	9	2 - 2	S. Kohnová
KVHK Project	8	0 - 3	K. Hlavčová
			V. Macura
Design of Water Management Constructions in a Landscape	9	0 - 3	M. Čistý
River Restoration	10	2 - 1	V. Macura
Water Bodies in Urban Environments	10	0 - 2	J. Blaha
Management of Wetlands	10	2 - 2	E. Klementová

## IV. RESEARCH TARGETS

- study of ecologically sound river training methods for the protection of river biotopes
- guidelines for restoring rivers
- reconstruction and optimization of irrigation systems
- hydrological flood routing and flood forecasting
- regional flood frequency analysis
- application of GIS techniques for land protection and sediment yield computation
- assessment of climate and land use change impacts on hydrological processes
- modelling of rainfall-runoff processes
- integrated river basin management
- restoration of wetland eco-systems
- analysis of hydrological drought

## V. RESEARCH PROJECTS

1. Relationships between the Ecological and Chemical Status of Surface Waters (REBECCA). Research Project of the Commission of the European Communities, 6<sup>th</sup> FP, Contract SSPI-CT-2003-502158 (2004 – 2006, J. Szolgay)
2. Scenarios of Extreme Hydrological Events for Integrated River Basin Management in Slovakia. Research Grant of the Slovak Grant Agency VEGA 2/5056/25 (2005-2007, K. Hlavčová)
3. Water Management and Ecological Evaluation of Water Bodies. Research Grant of the Slovak Grant Agency VEGA 1/2141/05 (2005-2007, V. Macura)
4. Modelling of Input Processes for Design, Optimization and Control of Water Structure Systems and Their Application to Selected Problems in Building. Research Grant of the Slovak Grant Agency VEGA 1/2032/05 (2005-2007, J. Szolgay, R. Mesiar)
5. Stochastic Analysis of Hydrometeorological Processes: Modelling of Nonstationarity, Heteroscedascity and Nonlinearity. Research Grant of the Slovak Grant Agency VEGA 1/2032/05 (2005-2007, J. Szolgay, R. Mesiar)
6. Prognosis of the Impact of Land Use Change on Quantity and Quality in Rivers. Research Project of APVT 51-017804 (2005-2007, K. Hlavčová)
7. Progressive Methods for Stochastic and Nonstochastic Modelling of Uncertainty and Their Engineering Applications. Research Project of APVT-20-003204 (2005-2007, J. Szolgay)
8. Regionalization of Hydrophysical Characteristics of Soils in Slovakia. Research Project of APVT-51-019804 (2005-2007, J. Skalová)

9. Economic Irrigation Technologies from the Aspect of Protection of Water from Pollution Caused by Agricultural Production of Nutrients. Research Project of APVT-99-033204 (2005-2007, E. Klementová)
10. Conservation, Restoration and Wise Use of Rich Fens in the Slovak Republic. SLO/03/G35/A/1G/72. United Nations Development Programme (2005-2010, J. Skalová)
11. Progressive Methods of Integrated River Basin Management. Research Project of the Ministry of the Environment of the SR (2005-2006, J. Szolgay)
12. Hydrological Drought and Its Impact on Exploitable Groundwater Resources. Research Project of APVV-0335-06 (2007-2009, E. Klementová)
13. Regionalization of Quality of Aquatic Parts of Rivers by Bioindicative Methods. Research project of AV 4/0110/06 (2006-2008, V. Macura)
14. Hydrometeorological Data Resources and Technologies for Effective Flash Flood Forecasting (HYDRATE). Research Project of the Commission of the European Communities, 6<sup>th</sup> FP, No. 037024 (2006-2009, J. Szolgay)
15. Hydrological Regionalisation – Towards a Coherent Framework. Subcontract of Research project of the Austrian Foundation for Education, FWF: P 18993 (2006-2009, J. Szolgay)
16. Sustainable Water Management Programme. Baltic University Programme for Education in Water Management (2006, S. Kohnová)
17. Climate Variability and Land Cover Change Impact on High and Low Flows, Research project of UNESCO – IHP IV- Project Friend 23.1 (2006, J. Szolgay)
18. Education in Building Industry and Geodesy. Project of European Social Fund (2005-2007, J. Szolgay)
19. Hydroinformatics. Project of European Social Fund (2005-2007, J. Szolgay)

## **VI. COOPERATION**

### **VI.1 Cooperation in Slovakia**

1. Ministry of the Environment, Bratislava
2. Ministry of Land Use and Water Resources, Bratislava
3. Bodrog and Hornad Rivers Basin Authority, Košice
4. Danube River Basin Authority, Bratislava
5. Vah River Basin Authority, Piešťany
6. Hron River Basin Authority, Banská Bystrica
7. Slovak River Basin Authority, Banská Štiavnica
8. Department of Geography, Faculty of Natural Sciences, Comenius University, Bratislava
9. Department of Meteorology and Climatology, Faculty of Mathematics and Physics, Comenius University, Bratislava
10. Department of Land Reclamation, University of Agriculture, Nitra
11. Institute of Hydrology of the Slovak Academy of Sciences, Bratislava
12. Institute of Land Ecology of the Slovak Academy of Sciences, Bratislava
13. Institute of Zoology of the Slovak Academy of Sciences, Bratislava
14. Irrigation Research Institute, Bratislava
15. Slovak Hydrometeorological Institute, Bratislava
16. Water Resources Research Institute, Bratislava
17. Daphne – Institute of Applied Ecology, Bratislava
18. Esprit, Banská Štiavnica

## VI.2 International Cooperation

1. Department of Hydraulic Engineering, Faculty of Civil Engineering, Czech Technical University, Prague, Czech Republic
2. Department of Landscape and Water Management, Faculty of Civil Engineering, Technical University, Brno, Czech Republic
3. Institute of Hydraulics, Hydrology and Water Management, Faculty of Civil Engineering, Vienna University of Technology, Vienna, Austria
4. Department of Hydraulic Structures, Warsaw Agricultural University, Poland
5. VITUKI – Water Research Centre, Budapest, Hungary
6. University of Uppsala, Sweden
7. Delft Hydraulics, Delft, The Netherlands
8. European Joint Research Centre, ISPRA, Italy
9. University of Bologna, Italy
10. Institute of Hydromechanics and Water Resources Management, Swiss Federal Institute of Technology, Zürich, Switzerland
11. University of Padova, Department of Land and Agroforest Environments, Italy
12. University of Jean Moulin Lyon 3, Lyon, France

### VI.2.1 Visitors to the Department

1. Gabor Balint	VITUKI Budapest, Hungary
2 Gunter Bloeschl	Vienna University of Technology, Vienna, Austria
3. Miroslav Dumbrovský	Faculty of Civil Engineering, Technical University, Brno, Czech Republic
4.. Manfred Dorninger	Vienna University of Technology, Vienna, Austria
5. David Goodrich	USDA-ARS-SWRC, Tuscon, USA
7. Milan Kalaš	European Joint Research Center, Ispra, Italy
8. C.G. Kilsby	Newcastle upon Tyne, United Kingdom
9. Helena Králová	Faculty of Civil Engineering, Technical University, Brno, Czech Republic
10. Gil Mahé	Maison des Sciences de l'Eau, Montpellier University, Montpellier cedex, France
11. Bruno Merz	GeoForschungZentrum Potsdam Telegrafenberg, Potsdam, Germany
12. Janos Mika	Meteorological Institute, Budapest, Hungary
13. Frank Molkethin	TU Berlin, Institute of Hydroinformatics, Germany
14. Peter Molnár	Geographishes Institut ETH, Zurich, Switzerland
15. Juraj Parajka	Vienna University of Technology, Vienna, Austria
16. Miloš Starý	Faculty of Civil Engineering, Technical University, Brno, Czech Republic
17. Jan Šálek	Faculty of Civil Engineering, Technical University, Brno, Czech Republic
18. Teun op ten Noort	Royal Haskoning, Nijmegen, The Netherlands
19. Karel Vrána	Faculty of Civil Engineering, Czech Technical University, Prague, Czech Republic

### VI.2.2 Visits of Staff Members and Postgraduate Students to Foreign Institutions

Škrinár, A.: University of Jean Moulin Lyon 3, Lyon, France, 13 - 30 October 2006

- Matúš, R.: Erasmus Programme - Katholieke Universiteit Leuven, Leuven, Belgium, October – December 2006
- Trnavská, E.: Erasmus Programme - Katholieke Universiteit Leuven, Leuven, Belgium, October – December 2006

## VII. THESES

### VII.1 Graduate Theses

No.	Student's name	Title	Supervisor
1.	R. Frič	Irrigation of Areas in Chtelnica	J. Blaha
2.	M. Chrappa	Irrigation of Areas in Tomašov	J. Blaha
3.	R. Mateáš	Flood Protection of the Village of Sučany	M. Čistý
4.	T. Hrúza	Automation in Design of Branched Irrigation Networks	M. Čistý
5.	M. Danko	Estimation of Land Use Effects on Runoff Regime in the Poprad River Basin	K. Hlavčová
6.	A. Kucejová	Land Protection and Erosion Control in the Olšavica River Basin	K. Hlavčová
7.	V. Martonová	Land Protection and Erosion Control in the Smižany River Basin	K. Hlavčová
8.	L. Berényi	Assessing Water Bodies in the Ipel' River Basin	E. Klementová
9.	L. Diviaková	Irrigation for Sports Areas	E. Klementová
10.	V. Kamyschanová	Assessment of Climatic Conditions in the Záhorie Region	E. Klementová
11.	J. Kmet'	Drip Irrigation for an Orchard in Latkovce	E. Klementová
12.	J. Bujalková	Assessment of Selected Water Bodies in the Záhorie Region	E. Klementová
13.	P. Tiso	Selection of Landscape Components of an Urban Environment	E. Klementová
14.	M. Ďugelová	Application of the MIKE BASIN Model for Simulation of Qualitative Indicators in the Hron River Basin	S. Kohnová
15.	P. Pajerchin	Design of Restoration of Runoff Conditions in the Sučiansky Creek Basin	S. Kohnová
16.	M. Áaloová	Analysis of Homogeneity and Precipitation Trends in the Abrod, Belianske Lúky and Kláštorské Lúky Wetlands	S. Kohnová
17.	K. Tvrdá	Restoration of the Jablonka River in Višňové	V. Macura
18.	J. Bušovský	Restoration Measures in the Rudava River	V. Macura
19.	S. Guľášová	Evaluation of a Soil Water Regime	J. Skalová
20.	K. Kňava	Effect of Groundwater Level on a Soil Water Regime	J. Skalová
21.	J. Slezák	Evaluation of Soil Water Regime in Wetland Ecosystems	J. Skalová
22.	M. Hartmanová	Application of the MIKE BASIN Model for Simulation of Qualitative Indicators in the Hron River Basin	J. Szolgay
23.	P. Kováč	Evaluation of Possibilities for Improvement of Flood Wave Transformations in the Lower Morava	J. Szolgay
24.	P. Mihala	Effectiveness of Forecasts of Flow Wave Peak Transformations in a River Channel	J. Szolgay

## VIII. OTHER ACTIVITIES

### VIII.1 Consulting Activities

1. Čistý, M., et al.: Technological Modernisation of Irrigation and Drainage Systems
2. Čistý, M., et al.: Application of GIS in Regulating a Soil Water Regime
3. Hlavčová, K., et al.: Impact of Climate Change on a Runoff Regime in Slovakia
4. Klementová, E., et al.: Assessment of Solution to a Water Problem from Ecologic and Economic Points of View – the Danube River Basin
5. Klementová, E., et al.: Assessment of a Solution to a Water Problem from Ecologic and Economic Points of View – the Ipel' River Basin
6. Kohnová, S., et al.: Analysis of Design Floods in the Hron Catchment
7. Macura, V., et al.: Ecological Aspects of Water Management Measures and Proposals for Improving Landscape Ecology
8. Szolgay, J., et al.: POVAPSYS. Slovak Flood Forecasting and Warning System
9. Szolgay, J., et al.: Integrated River Basin Management

## IX. PUBLICATIONS

### IX.1 Journals

- [1] BLOESCHL, G., et al. (SZOLGAY, J., co-author): UNESCO Working Group on the Impacts of Climate Variability and Land-Cover Change on Flooding and Low Flows as a Function of Scale. In: Demuth, S., et al., eds.: Climate Variability and Change – Hydrological Impacts. IAHS Publication No. 308. IAHS Press, Wallingford, ISBN 978-1-901502-78-7, pp. 667-671. ISSN 0144-7815 and ISBN 978-1-901502-78-7 (in English)
- [2] HLAVČOVÁ, K. - PARAJKA, J. - SZOLGAY, J. - KOHNOVÁ, S.: Grid-Based and Conceptual Approaches to Modelling the Impact of Climate Change on Runoff. Slovak Journal of Civil Engineering, XIV, 2006, 1, pp. 19-29 (in English)
- [3] HLAVČOVÁ, K. - SZOLGAY, J. - KOHNOVÁ, S. - HORVÁT, O.: Estimating Effect of Land-Use Change on Runoff Formation in the Slaná River Basin. Acta Hydrologica Slovaca, 7, 1, 2006, pp. 183-190 (in Slovak)
- [4] HLAVČOVÁ, K. - SZOLGAY, J. - KOHNOVÁ, S. - HORVÁT, O. - PAPÁNKOVÁ, Z.: Parameterization of Land-Use Characteristics in Distributed Rainfall-Runoff Modelling. Meteorological Journal, 9, 2006, pp. 131-138 (in English)
- [5] KLEMENTOVÁ, E. - KONEČNÁ, Z.: Irrigation for Carpet Beds of Gardens and Parks. Building. Monthly for the Building Industry and Architecture, IX, 2006, 4, pp. 38-41, ISSN 1335-5406 (in Slovak)
- [6] KLEMENTOVÁ, E. - KONEČNÁ, Z. - DIVIAKOVÁ, L.: Grass for Sports Fields. Building. Monthly for the Building Industry and Architecture, IX, 2006, 6, pp. 36-39, ISSN 1335-5406 (in Slovak)
- [7] KOHNOVÁ, S. - GAÁL, L. - SZOLGAY, J. - HLAVČOVÁ, K.: Regional Estimation of Design 10-Day Precipitation Totals in the Upper Hron Region. Slovak Journal of Civil Engineering, XIV, 2006, 1, pp. 10-18 (in English)

- [8] KOHNOVÁ, S. - ZVOLENSKÝ, M. - HLAVČOVÁ, K. - SZOLGAY, J.: Development of Regional Regression Relationships for Estimation of Rainfall-Runoff Model Parameters in the Hron River Basin. *Acta Hydrologica Slovaca*, 7, 1, 2006, pp. 183-190 (in English)
- [9] KOMORNÍK, J. - KOMORNÍKOVÁ, M. - MESIAR, R. - SZÖKEOVÁ, D. - SZOLGAY, J.: Comparison of Forecasting Performance of Nonlinear Models of Hydrological Time Series. *Physics and Chemistry of the Earth, Parts A/B/C*, Vol. 18, 2006, pp. 1127-1145 (in English)
- [10] KOVÁČ, P. - DANÁČOVÁ, M. - SZOLGAY, J.: Assessing Effectiveness of Polders Designed in the Lower Morava. *Acta Hydrologica Slovaca*, 7, 2006, 2, pp. 252 – 259 (in Slovak)
- [11] MACURA, V. - ŠKRINÁR, A.: Determination of Ecological State of the Drietomica River in Slovakia by Instream Flow Modelling. *TOM 11(2006)/Hydrology, Hydrochemistry and Hydroecology*. OBRII, Kiev 2006, pp. 288-293, ISBN 551.49: 288-293 (in English)
- [12] MACURA, V. - ŠKRINÁR, A. - ANDO, M.: Regionalization in Quality Assessment of Habitats in Mountainous Rivers. *Water Management*, 56, 2006, 2, pp. 47-50 (in Slovak)
- [13] MAJERČÁKOVÁ, O. - PEKÁROVÁ, P. - SZOLGAY, J.: Selected Problems and Priorities of Flood Protection. *Water Management Journal*, XLIX, 2006, 9-10, pp. 22-25 (in Slovak)
- [14] PEKÁROVÁ, P. - KOHNOVÁ, S. - TRNAVSKÁ, E. - MIKLÁNEK, P. - SZOLGAY, J. - HLAVČOVÁ, K. - PAUEROVÁ, I.: Determination of the 100-Year Specific Peak Flows in Small Catchments for Mapping Flood Risk. *Meteorological Journal*, 9, 2006, pp. 157-164 (in English)
- [15] SZOLGAY, J. - DANÁČOVÁ, M. - PAPÁNKOVÁ, Z.: Case Study of Multilinear Flood Routing Using Empirical Relationships between the Flood Wave's Speed and the Discharge. *Slovak Journal of Civil Engineering*, XIV, 2006, 1, pp. 1-9 (in English)
- [16] SZOLGAY, J. - DANÁČOVÁ, M.: Evaluation of Changes in Transformation of Flood Waves in the Lower Morava Based on Data from the Period of 1922-2002. *Acta Hydrologica Slovaca*, 7, 2006, 1 (in Slovak)
- [17] SZOLGAY, J. - DANÁČOVÁ, M. - PAPÁNKOVÁ, Z.: Constrained Optimisation of the Travel-Time Flood Peak Relationship Using Multilinear Routing and Evolutionary Algorithm. *Meteorological Journal*, 9, 2006, pp. 165-170 (in English)

## IX.2 Books and Textbooks

- [1] ČISTÝ, M.: The Use of Simulation and Optimization Methods in the Design, Maintenance and Reconstruction of Existing Water Distribution Systems. SUT, Bratislava 2006, 131 pp., ISBN 80-227-2556-0 (in Slovak)
- [2] MACURA, V.: Analysis and Modelling of the Quality of Aquatic Habitats. SUT, Bratislava 2006, 128 pp., ISBN 80-227-2566-8 (in Slovak)
- [3] KOHNOVÁ, S. - SZOLGAY, J. - SOLÍN, L. - HLAVČOVÁ, K.: Regional Methods for Prediction in Ungauged Basins. Key Publishing, Ostrava 2006, 113 pp., ISBN 80-87071-02-6 (in English)
- [4] KOHNOVÁ, S. - HLAVČOVÁ, K. - SZOLGAY, J. - PARAJKA, J.: On the Choice of a Spatial Interpolation Method for the Estimation of 1 to 5 Day Basin Average Design Precipitation. In: Schanze, J., et al., eds.: *Flood Risk Management: Hazards, Vulnerability*

and Mitigation Measures. Springer 2006, XI, Chapter 7, pp. 77-89, ISBN: 978-1-4020-4596-7 (in English)

- [5] KOHNOVÁ, S. - SZOLGAY, J. - PARAJKA, J. - GAÁL, L.: Regional Methods of Computation of Design Discharges and Precipitation for Projection of Water Management Constructions. SUT, Bratislava 2006, 122 pp., ISBN 80-227-2555-2 (in Slovak)
- [6] KOHNOVÁ, S. - SZOLGAY, J. - HLAVČOVÁ, K.: New Statistical Methods for Estimating Design Discharges and Precipitation for Projection of Hydrotechnical Constructions. SUT, Bratislava 2006, 80 pp., ISBN 80-227-2567-6 (in Slovak)

### **IX.3 Conference Papers**

- [1] BALÁŽ, M.: Possibilities of a Decrease in Operating Expenses of Swimming Pools. In: Majerčáková, O., Miklánek, P., eds.: 18<sup>th</sup> Conference of Young Hydrologists. SHMI, Bratislava 2006, 9 pp., ISBN 80-88907-56-X (in Slovak)
- [2] BARA, M.: Application of the BILAN Model for Modelling Changes in Groundwater in Accordance with Selected Climate Scenarios. In: Majerčáková, O., Miklánek, P., eds.: 18<sup>th</sup> Conference of Young Hydrologists. SHMI, Bratislava 2006, 12 pp., ISBN 80-88907-56-X (in Slovak)
- [3] BAJTEK, Z.: Analysis of Methods for Determination of Design Maximal Discharges in Small Basins of Slovakia. In: Majerčáková, O., Miklánek, P., eds.: 18<sup>th</sup> Conference of Young Hydrologists. SHMI, Bratislava 2006, 10 pp., ISBN 80-88907-56-X (in Slovak)
- [4] BRUŠKOVÁ, V. - KLEMENTOVÁ, E.: Groundwater Level Regime in the Upper Part of the Torysa River Catchment and Detection of Occurrence of Hydrological Droughts. BALWOIS 2006: Conference on Water Observation and Information Systems for Decision Making Support. Macedonia, Ohrid 2006, pp. 1-10 (in English)
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