Prof. Renata Romanowicz
1950-2021

Instytut Geofizyki
Polskiej Akademii Nauk

WUT Faculty of Electronics

- 1968 - Matura exam at a school with English as the language of instruction
- 1974 - Master's degree in electronics, specialty: automatics, diploma thesis entitled "Nonlinear optimization methods with constraints".

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IG PAS for the first time1974 - 1983

Laboratory of Hydrological Systems
- Prof. Witold Strupczewski

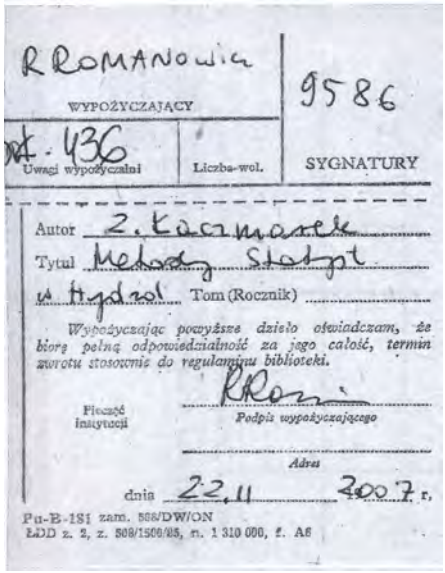
Department of Atmospheric and Near-Earth Space Physics
- Prof. Aniela Łosiowa

1974-1976 Stochastic properties of hydrological processes

Optimal control of retention reservoirs for flood protection (1976-1981)

- 1981 – PhD degree in physical sciences
- "Analysis of the problem of controlling the system of retention reservoirs with random supply”

Prof. Zdzisław Kaczmarek



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Tomasz Brandyk
Dean of the Faculty of Land Reclamation and Environmental Engineering of the Warsaw University of Life Sciences

Research on the modeling of water flow processes in the unsaturated zone (1981-1988)

She applied the theory of water flow in an unsaturated medium to control the irrigation system with a short and long time horizon.

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University College Dublin (UCD) 1989-1990

Stochastic analysis of the flow of moisture from the soil surface

Prof. Philip O'Kane.

Prof. James Dooge

EEC Research Project „Spatial Variability of Land Surface Processes”.

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Research in the field of linear theory of flow in open channels

In cooperation with Prof. Strupczewski, Prof. Kundzewicz, and Prof. Dooge Prof. Romanowicz researched simplified linear models with physical parameters derived from the St. Venant equations.

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1990-2007 Work at the University of Lancaster on the uncertainty of models of hydrological processes

Prof. K. Beven

Renata worked with Prof. K. Beven at the University of Lancaster, with a three-year gap when she was employed at Westlakes Scientific Consulting.

The main subject of the cooperation was the analysis of the uncertainty of environmental processes and the uncertainty of prediction of models of these processes.

Key issues considered:

- modelling of precipitation-runoff processes,
- water quality,
- the spread of the flood wave in floodplains and determining flood risk.

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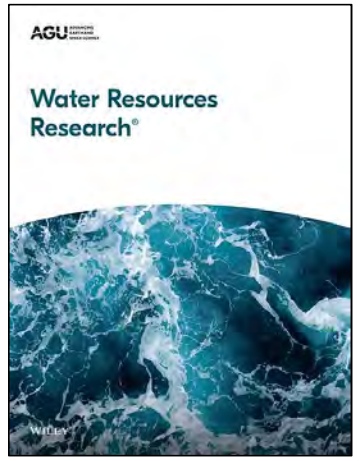
Work at the University of Lancaster on the uncertainty of models of hydrological processes

Prof. Romanowicz used the one proposed by Prof. Beven's method of uncertainty estimation using the GLUE likelihood function to determine the time- and space-variable probabilities of flood wave propagation in floodplains.

Romanowicz R.J. and K. J. Beven, 1998. Dynamic real-time prediction of flood inundation Probabilities. Hydrological Sciences Journal, Times Cited: 78 (JCR)

Romanowicz R.J. and K. J. Beven, 2003. Estimation of flood inundation probabilities as conditioned on event inundation maps, Water Resources Research, Times Cited: 126 (JCR)

three-year break



Uniwersytet w Lancaster 2000-2007
Data-based mechanistic modelling of physical processes

P.C. Young

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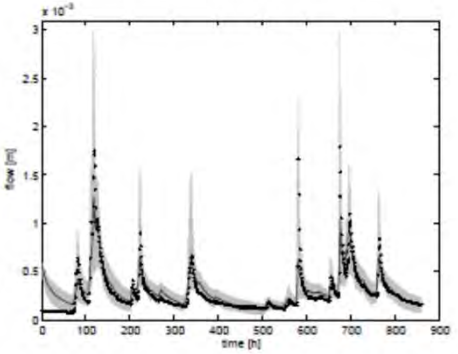
Polskiej Akademii Nauk

This technique enables the estimation of the structure of the parameter covariance matrix along with the estimation of the prediction error, assuming the Gaussian character of the problem..

Stochastic Transfer Function **(STF)**

Ratto, M., P.C. Young, R.J. Romanowicz, F. Pappenberger, A. Saltelli, and A. Pagano, 2007**, Uncertainty, sensitivity analysis and the role of data based mechanistic modelling in hydrology**, Hydrology and Earth System Sciences. 67 citations



2004 – degree of habilitated doctor – dissertation entitled Modeling of natural environment processes under conditions of uncertainty

1. TOPMODEL as an application module within WIS, 1993, conference mat.,
2. A MATLAB implementation of TOPMODEL, 1997, *Hydrol. Proc.*
3. GIS and distributed hydrological models, 1994, rozdz. 15 w *Geographical Information Handling - Research and Applications*
4. Evaluation of predictive uncertainty in nonlinear hydrological models using a Bayesian approach, 1994, w S*tatistics for the Environment* (2), *Water-Related Issues.*
5. Bayesian calibration of flood inundation models, 1996, *Floodplain Processes*,
6. Dynamic real-time predictions of flood inundation probabilities, 1998 *Hydrol. Sci. J*.
7. Estimation of flood inundation probabilities as conditioned on event inundation maps, 2003, *Wat. Resour. Res.*
8. Bayesian uncertainty estimation methodology applied to air pollution modelling, 2000, *Environmetrics*
9. Data assimilation and uncertainty analysis of environmental assessment problems, 2002, mat. konfer.
10. Data assimilation and uncertainty analysis of environmental assessment problems – an application of transfer function and generalized likelihood uncertainty estimation techniques, 2003, *Reliability Engineering and System Safety*
11. Modelling algae concentrations in the Elbe in 1985-2001 using observations of daily oxygen concentrations, 2003, *Acta Hydrochim. and Hydrobiol.*

In September 2007, RR started working at the IG PAS.

1. Data-based modelling of transport processes;
2. Estimation of human impact in the presence of natural fluctuations of environmental variables;
3. Prediction of flood probability and flood forecasting;
4. Calibration of distributed hydrological models
5. The impact of changes in catchment and soil management on flood flows;
6. Non-linear modelling of flood wave propagation;
7. Modelling low flows;
8. Analysis of the impact of human activity on water relations in lowland rivers

9. analiza wpływu działalności człowieka na stosunki wodne w rzekach nizinnych.

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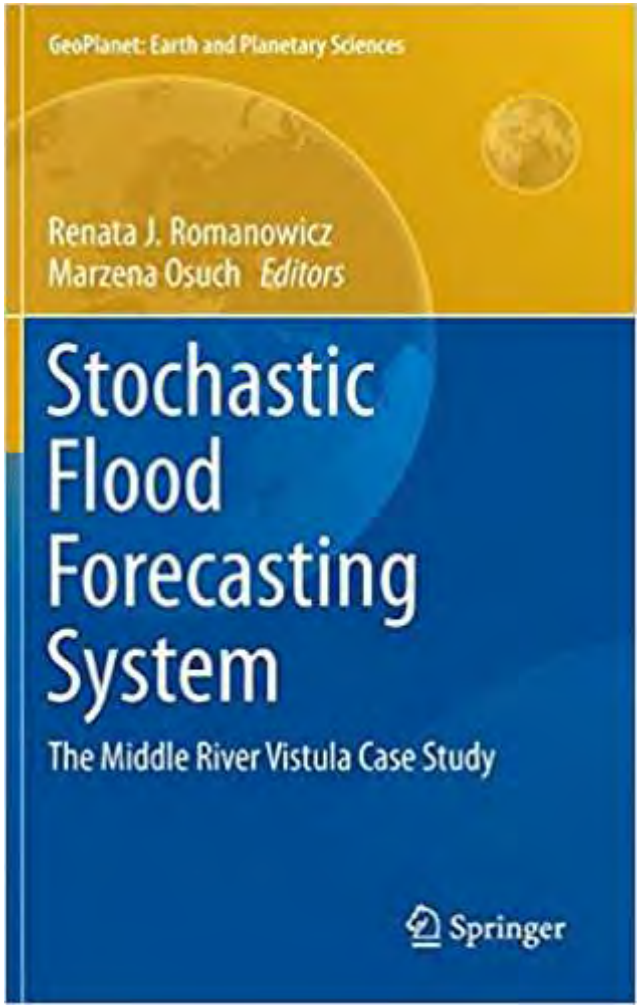
Management of research projects carried out at the IG PAS

NCN "Stochastic Flood Forecasting System (on the example of the Vistula section from Zawichost to Warsaw)" – 2011-2014.



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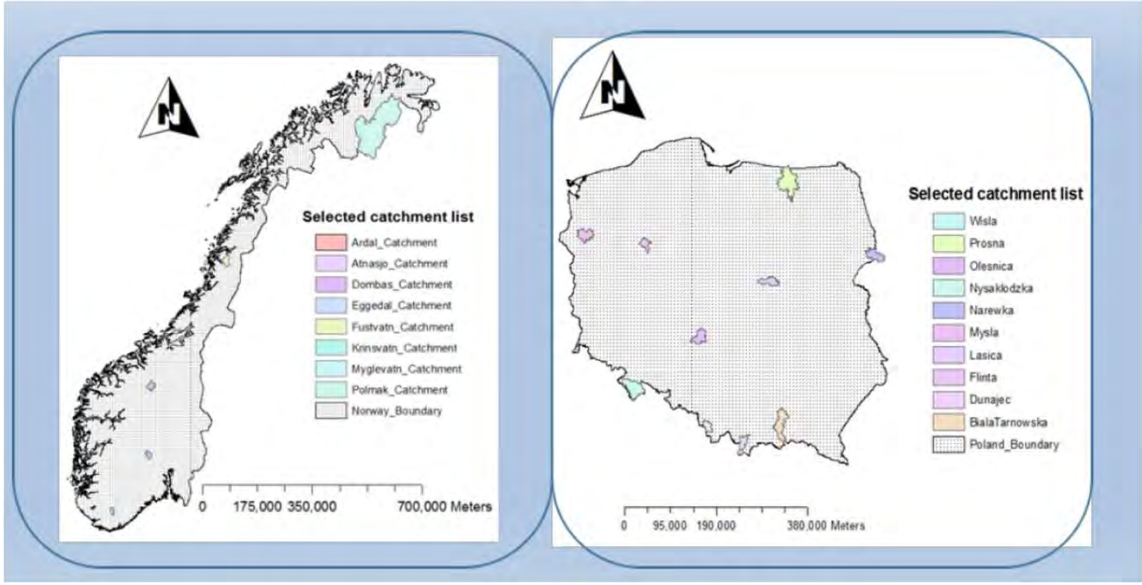
Management of research projects ca
out at the IG PAS

CHIHE (Climate Change Impact on Hydrological Extremes) was implemented under the Polish-Norwegian Research Program (Norway Grants) in cooperation with NVE (Norwegian Water Resources and Energy Directorate) 2013-2016.



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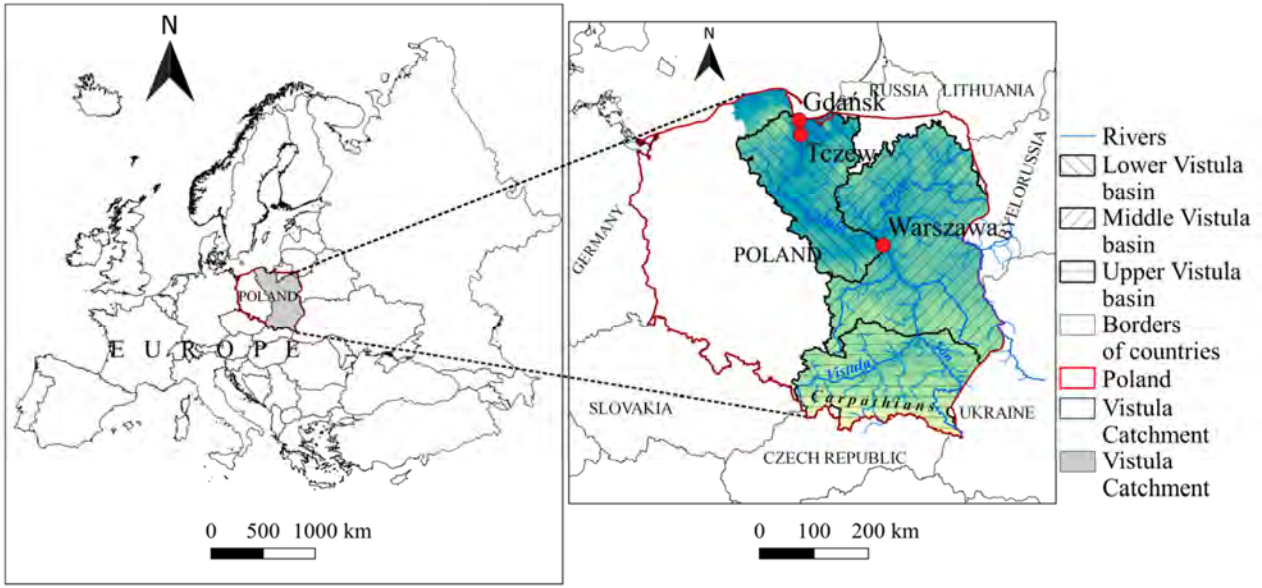
Management of research projects carried out at the IG PAS

Project **HUMDROUGHT** „Human and climate impacts on drought dynamics and vulnerability"; SHENG 1 -Polish-Chinese Funding Initiative, 08.2019 - 08.2022

Doktorant: Tesfaye Senbeta

Hohai University

Wen Wang,
Coordinate the project implementation on the China side



Membership in organizations and associations

Subject editor for many journals, Acta Geophysica co-editor since 2011
Committee of Geophysics of the Polish Academy of Sciences

- the chairwoman
- Deputy-chairman
- Member of the Bureau

Scientific Council of the IG PAS
Association of Polish Hydrologists
Association of Polish Climatologists
IFAC TC on Modelling and Control of Environmental System
FRIEND-Water LFD
Panta Rhei Working Group: Natural and man-made control systems in water resources

Scientific cooperation

- Lancaster Environmental Centre, Lancaster University, UK (Prof. K. Beven)
- Czech University of Life Sciences, Prague, Czech Republic (Prof. Pavel Pech)
- T.G. Masaryk Water Research Institute, Prague, Czech Republic (Dr Sarka Blazkova)
- The European Centre for Medium-Range Weather Forecasts (ECMWF), Shinfield Park, Reading RG2 9AX, United Kingdom (Dr Florian Pappenberger)
- University of Twente, Department of Water Engineering and Management, Horst building Z-1.36, PO Box 217 7500 AE Enschede, Netherlands, (Dr Martijn Booij)
- Dipartimento di Elettronica e Informazione, Politecnico di Milano, Piazza Leonardo da Vinci, 32, 20133 Milano, ITALY, (Dr Andrea Castelletti)

Ph.D. Students

- Marzena Osuch - Modeling of the flow and migration of selected pollutants in the section of the Narew National Park, 2008.
- Bartłomiej Luks, Dynamics of changes in snow cover in the area of south-western Spitzbergen, 2012
- Emilia Karamuz - Impact of climate change and land use on the flows of the middle Vistula, 2017
- Hadush Kidane Meresa - Modeling of Hydrological Extremes under the Influence of Future Climate Change, 2017
- Joanna M. Doroszkiewicz - Adaptation of flood risk management to climate change in Poland, on the example of the Biała Tarnowska catchment, 2020
- Sisay Eshetu Debele - Frequency analysis of extreme river flows: selected methods and their application, 2017
- Tesfaye Senbeta – An integrated approach to assessthe dynamics of hydrological processes and physical vulnerability to deought under conditio of climate change and human interventions, 2023?

Biblimetric data acc. JCR

Publications - 72,
H-index - 19,
Citations - 1382