

It is my great pleasure to introduce you to the

**SUMMARY REPORT, CONCLUSIONS AND
RECOMMENDATIONS OF THE
24TH CONFERENCE OF THE DANUBE COUNTRIES ON HYDROLOGICAL
FORECASTING AND HYDROLOGICAL BASIS OF WATER MANAGEMENT
Bled, Slovenia – 2 to 4 June 2008**

INTRODUCTORY COMMENTS

Within the framework of the International Hydrological Programme IHP of UNESCO, since 1961 the Danube countries have successfully cooperated at two levels: (i) implementing joint projects in the Danube Basin and (ii) organizing conferences on Hydrological Forecasting and Hydrological Basis of Water, which take place biennially in a different Danube country, with the participation of experts from other countries as well as of international scientific and professional organizations.

The 24th Conference of the Danube Countries took place between 2nd to 4th June 2008 in Bled, Slovenia and was organized by the National Committee of Slovenia for the International Hydrological Programme of UNESCO, under the auspices of the President of Republic of Slovenia. It has been organized jointly by the Slovenian National Commission for UNESCO and the Environmental Agency of the Republic of Slovenia, under the support of UNESCO, WMO, and IAHS.

OPENING CEREMONY

The opening session was chaired by the representatives of the organizers. The session was officially opened by the Chairman of the Slovenian National Committee IHP, Prof. Mitja Brilly.

On behalf of the Environmental Protection Agency of the Republic of Slovenia, the Conference was addressed by Director Mr Silvo Žlebir. The importance of the regional cooperation of the Danube countries was emphasized in the subsequent addresses by Mr Gašper Hrastelj of the Slovenian National Commission for UNESCO, as well as by Mr Phillippe Pypaer from UNESCO Venice Office and Mr Andrej Kranjc, representative of the Slovenian Academy of Sciences and Arts, Karst Research Institute.

At the end of the opening session Dr. Mikloš Domokoš addressed the audience to commemorate the death of Prof. Heinz Bergmann, the famous hydrologist in the Danube river catchment.

WORKING SESSION

The Conference continued in working sessions, in accordance with the Agenda. Each session was chaired by two experts of the respective subject. The 10-minute presentations of papers were followed by discussions. Altogether 250 participants from 22 countries, including the representatives of UNESCO, took part in the Conference.

The total number of papers presented orally or by posters was 210, by participants from 20 countries (Table 1).

The number of participants and the number of presented papers was larger than in any of the previous conferences on hydrological cooperation of the Danube countries. This fact proves the increasing importance of water issues in the Danube basin and the vitality of the cooperation of the Danube countries in hydrology.

Table 1: Distribution of papers per country

Nr.	Country	Number of papers
1	Serbia	28
2	Slovenia	25
3	Ukraine	24
4	Romania	22
5	Bulgaria	21
6	Germany	16
7	Slovakia	16
8	Croatia	15
9	Czech Republic	14
10	Austria	8
11	Hungary	7
12	Iran	3
13	Russia	2
14	Macedonia	2
15	Greece	2
16	Libya	1
17	Jordan	1
18	Tunis	1
19	France	1
20	Italy	1
Total		210

Table 2 Distribution of the presented papers by topic

Topic No.	Title of topic	Number of papers
1	Hydrological Forecasting	25
2	Hydro-meteorological extremes, floods and droughts	54
3	Global climate change and hydrological processes	45
4	Water management	40
5	Floods, morphological processes, erosion, sediment transport and sedimentation	30
6	Developments in hydrology	16
Total		210

The Local Scientific Committee of the Conference selected 80 papers for oral presentation, taking into account the distribution per topic and by country. In addition, 130 papers were presented in posters.

MAIN CONCLUSIONS OF THE DISCUSSIONS

Topic 1: Hydrological Forecasting

- The hydrological forecasting models are still the most useful tools for the prediction of extreme hydrological events and thus give the possibility for a better understanding and mitigation of events.
- The continuous increase of population and property values to be protected require ongoing work on models improvement.
- Collection of data, which are precised and detailed enough to support the model and meet the required level of reliability, is essential for further development.
- New techniques and products in field data collection, special analysis, remote sensing, and communication are available and should find the proper place in hydrological forecasting.
- Cooperation and exchange of experiences are necessary to improve the reliability by performance of:
 - comparative analysis and results of the models;
 - joint/harmonized evaluation of used data quality.

Topic 2: Hydro-meteorological extremes, floods and droughts

- Different global climate models deserve different assessment of uncertainties in data estimation.
- No uniform spatial patterns of change at Elbe, Odra, and Danube rivers in central Europe area.
- Hydrology and hydro-morphology together with ecology aspects such as water abstractions on specific portions of rivers as eco-hydro proposed

models for RBMP (river basin management plans) within EU Water Framework Directive.

- Modeling of small reservoirs on different watersheds assessed as not sufficient for events higher than the designed ones.
- Mapping of excess water hazard using several parameters at well defined subsurfaces can be taken as useful tool for water management.
- Large flooding events appeared after very high rainfall depth and intensity several times for the last couple of years. Forecast of such extreme rainfall were lacking so modeling of such events probably should start by improving prediction of rainfall.
- Measurement results and accuracy and reliability of those should be improved accounting for quality management of measurements.
- Regional analysis of extreme rainfall data should include 24-hour depths beside daily totals as well as different regional and local analysis.
- Presentations in general covered measurements and analysis of rainfall extremes ranging from 40 mm/day in the region of Black Sea till 300 mm/day in Alpine region in the Danube river basin. Also presented analysis of hydrology measurements covered small catchments from 36 km² all through 5000 km², accounting for natural floods, artificial regime using reservoirs and both environmental and hydrology aspects.

Topic 3: Global climate change and hydrological processes

- By the climatic scenario we have to be careful: into the scenario we have to include the multiannual variability of climate under NAO, AO, QBO phenomena.
- In central Europe the increase of runoff during winter-spring period and decrease during the summer period is predicted.
- The simulations have to be verified by statistical analysis of measured data.
- It the high frequency of low flows periods during the summer is predicted.
- Harmonizing the model results of the separated areas would be designable in a large scale aspect.

Topic 4: Water management

- Water management is nowadays determined to a large extent by the common EU policy (WFD, the floods directive, ground water, etc.) but the level of the implementation seems to be different due to historical and financial reasons.
- Water management is necessary to be implemented by the integrated approach at different scales, but also prerequisite for clear targets, which should be defined by general water management plans.
- Good hydrological data that should be integrated into large publicly available data bases and the quality monitoring are still important hydrological bases for integrated water management.

- Integrated water management is influenced by social sciences (public perception, public awareness, participation, etc.).
- Quality and quantity issues should be taken into account equally within water management.
- Transboundary questions will gain in importance in the Danube catchment and should be taken within good cooperation.
- Water regulations are more and more complex and should be implemented at different administrative levels wisely.

Topic 5: Floods, morphological processes, erosion, sediment transport and sedimentation

- Human impacts on sediment transport were studied. Especially examples were given in relation to surface erosion and transport in torrents/ivers.
- Quite successful examples were presented to reduce surface erosion by land use management including non-technical and technical measures.
- The transport of sediments in torrents/ivers could be also managed by different actions. In general, the processes are not fully understood although large experience is available. 3D models will assist in the improved understanding.
- Risk zonation is an important tool for assessment of the impact of floods and vulnerability. The latter requires comprehensive research to reduce the uncertainty in the assessment.
- A relevant point is also how this information is displayed and communicated to the people. Simple and informative mapping is recommended as one possibility. Risk (hydrological probability combined with consequences) perception is a new topic in water management.
- From the thirty papers submitted more than 25% deal with erosion and several other papers, even if their title does not refer directly to erosion. They also deal with river bed scouring and its consequences. Due to the great interest of different authors in land and river bed erosion it is recommended to devote one topic of the future Conferences entirely to erosion problems.
- Cut-off of meanders like on the Kolubara River, initiated by human intervention on its tributaries (like Pestan River) give a good example how important could be the connection between water managers and decision makers. Ministries of water affairs should be convinced that sustainable situations can only be achieved by considering the results and proposals of the hydro-science. The organizers of future Conferences should therefore involve policy makers into the organizing committees to enhance a better understanding between the participants.
- Remote sensing and similar new techniques can be very useful tools in studying regional erosion but also estimating the suspended sediment transport of large rivers, like the Danube. It is suggested to create a separate subject: New Techniques in Hydrology and Hydraulic Research, or similar in the list of themes of future Conferences.

Topic 6: Developments in hydrology

- Small experimental basins have still their justification important for knowledge gaining of hydrological processes.
- Experimental watersheds should be maintained for a longer time to detect environmental respond.
- Simple model concepts can still be used for ungauged basin forecast.
- Remote sensing data will play more important role in future, provided that these data are not too expensive.
- Distance learning can have its justification to provide international standards in education and can be important and interesting also for the “third world” countries because of financial reasons.

CONFERENCE PROCEEDINGS

During the registration, the participants of the Conference obtained the Proceedings, with printed extended abstracts of all papers and a CD comprising the full papers. The publication and CD have been provided with ISBN identification. The Proceedings were edited by Mitja Brilly and Mojca Šraj, whereas the technical implementation is due to Mojca Vilfan and Maja Koprivšek, University of Ljubljana, Slovenia.

FULL DAY EXCURSION

Two full day excursions on 4 June to the Ljubljana Karst basin and along the Sava river basin were organized. The program included a visit to the Postojna Cave and to the three HPPs and/or construction sites: Krško, Blanca, and Boštanj.

ACKNOWLEDGEMENTS

In line with the tradition of the preceding conferences, the participants did not have to pay any fees. With the help of the sponsors the organizers secured meals for all participants. All participants received free copies of the Conference Proceedings including a CD, as well as various promotional material.

CONCLUDING REMARKS

This report was summarized by Prof. Stevan Prohaska based on the reports given by chairmen of each session: Sanja Barbalić, Mira Kobold, Jovan Despotović, Pavla Pekarova, Matjaž Mikoš, Johann Weber, Hans Peter Nachtnebel, Lidija Globevnik, László Rákóczi, Mojca Šraj, and Hubert Holzmann.

Bled, June 2008

For the International Scientific
Committee:

Prof. dr. Stevan Prohaska