

# IAD's 50th Anniversary in 2006: Re-defining the scientific profile

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## Introduction

The history of IAD has been described by WACHS (1996) and will be revived during the 36<sup>th</sup> Jubilee Conference. However, the political and social turbulences in Europe during the early 1990s surprised IAD mostly unprepared for new challenges of a rapidly changing situation in the Danube River Basin. From this perspective, it seems that IAD, for a whole decade or more, simply stayed still, its scientific performance declined and, moreover, it did not take advantage of being the only basin-wide professional limnological association. Even the link to the roof organization, the SIL, was neglected to a critical point. Yet, these topics have already been discussed and do not need detailed repetition (e.g. BLOESCH 1999a, 1999b, 2002, 2003). Rather, by presenting a comprehensive summary of recent, ongoing, and planned IAD activities and projects that identify actual limnological concepts and promising applied research, we challenge the new research approach initiated in 1999/2000 (BLOESCH 2001) and develop a strategy by which our association should re-define its scientific identity. Although stretching between science and NGO activities has been recognized as the imperative (BLOESCH 2003, 2006a), we are convinced that IAD's basics is science. Therefore, we focus here on IAD's scientific profile, intentionally leaving NGO activities and structural, organizational and financial problems out of scope.

## Where have we recently been?

After the failure of all IAD projects submitted to various EU programmes in 2001 (FP 5, REReP, INCO and INTAS) it became clear that IAD, in spite of its long tradition and basin-wide presence was not ready for large or even medium scale European or regional projects, and we have to regretfully conclude that the situation has changed little since then. Why is it so? Lack of fresh ideas? Poor PR action? Low overall scientific performance that disqualifies our association from major scientific "contests"? Or, is it simply the lack of commitment to IAD? Unfortunately, all these arguments are partly true and contribute to the problem. However, it could well be that, after the political and social changes in Europe, nobody really needs IAD or any similar organization, as a new governmental body, the ICPDR, came into function and, apparently, individual IAD members, via their home institutions, are included into various regional and European research projects. Furthermore, since many specialized scientific associations have emerged, IAD and SIL need to face competition within the globalised scientific community.

IAD's potential as a valuable network for recruiting partner institutions and individual researchers was used only occasionally, though successfully, for example by the IAD Expert Group "Macrophytes". The whole expert group was engaged in a basin-wide project "Multifunctional Integrated Study Danube Corridor and Catchment (MIDCC)" undertaken by the University of Vienna during 2001 – 2005 and financed by the Austrian Federal Ministry for Education, Science and Culture. To a certain extent, the same expert group was included

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into the FP 5 financed Tisza River Project lead by Vituki Institute, Hungary from 2002 to 2004, via University of Vienna as a contractor. However, it has to be underlined that, although the result was a special edition of “Large Rivers” including papers from many IAD members engaged in the project (JANAUER et al. 2003), MIDCC was not an IAD project, as IAD was not a project partner. The reason is rather simple, as IAD was not a legal entity at the time. However, MIDCC provided unique scientific experiences which enabled a shift from basic taxonomic or routine monitoring studies to a more functional and predictive approach, as the project challenged, among other topics, one of the prominent limnological hypotheses – the concept of connectivity. As a result and thanks to the introduction of a reviewing system in IAD Conference Proceedings (HORVATIC 2000, BREZEANU et al. 2002, TEODOROVIC et al. 2004), the scientific performance of IAD as a whole increased significantly, yet its reputation and scientific (ir)relevance in the region remained unchanged. On the other hand, IAD fulfilled well one of its original goals – knowledge and information transfer among the Danube countries through scientific networking.

Another example of IAD networking, quite different in its approach to the previously mentioned, could be found in recent years. The IAD Expert Group “Saprobiology” produced the quality map of the Danube River and all major tributaries in 1995 and update in 2002. The maps did not derive from a specific research project but from data originating mainly from state and scientific publications of the riparian countries. The main goal of the map back in 1995 was to provide a first overview and the foundation for future updating and ecological monitoring of the Danube River in the context of implementing EU – WFD (SCHMID 2000, 2004). Although this project was done under IAD flag, it had little relevance to governmental structures, as after the foundation of ICPDR in 1998, IAD could not compete any longer in issues of basin-wide water management, such as chemical and biological Danube River monitoring, which formerly was a strong field of IAD (WACHS 1996, BLOESCH 2003). IAD’s role is restricted now to (active) observer-ship within ICPDR given the chance, however, to supply scientific knowledge needed to get the basic tools for WFD implementation, such as defining reference conditions and participating in the Joint Danube Surveys in 2001 and 2007.

At the turn of the century, it was time for reconsidering scientific priorities, topics and overall strategy. Several imperatives for recuperation of the severely shaken status of IAD were outlined (BLOESCH 2003, 2006a), yet from the scientific perspective the most urgent were, in short, redefining research topics (BLOESCH 2001), the switch from scientific events to research projects, no matter how small, but conducted under the IAD flag and followed by scientific publications in peer reviewed international journals.

### **Where are we now?**

In line with the new research strategy launched in 1999/2000, IAD focused on several topics of high priority: Sturgeons, Macrophytes, Microbiology, Mapping/GIS/Hydromorphology and Biomonitoring/Ecototoxicology. Particular attention was given to the missing link between hydrology and limnology by organizing a workshop in 2004 supported by UNESCO ROSTE, so far the only completely externally sponsored IAD project (Table 1). Although the workshop gathered researchers from both disciplines and resulted in a valuable publication (BLOESCH et al. 2005), it has not fulfilled its main goal – no research project was initiated as a follow up activity.

Almost exclusively sponsored by EAWAG – Bloesch, several small projects were launched in 2004/2005, under the IAD flag, with a strict obligation of the contractor to submit, apart from reporting to the IAD board, a paper to any international peer-reviewed scientific journal (Table 1). The feasibility study of SCHWARZ (2005) led to the follow-up project of hydromorphological mapping of Drava/Mura River (SCHWARZ 2006) that may be the basis

for a similar map of the Danube River by respecting the scaling problems involved. The classical upstream-downstream approach on the Mures near Arad combined traditional and modern biomonitoring methods and showed the effects of chemical pollution on various aquatic organisms (SANDU et al. 2006; KÖHLER et al. 2006, TRIEBSKORN et al. 2006). The study of the prokaryotic community revealed for the first time some insight into the microbial spiralling along the Danube River (WINTER et al. 2006). Another project launched in 2005, the nutrient balance in two Nature Reserves on River Prut, demonstrated the high capacity of wetlands to retain phosphorus and to a less extent nitrogen (DRUMEA 2006). Finally, the sturgeon workshop in cooperation with WWF resulted in perhaps the greatest achievement of IAD since the Danube Monography of Liepolt, as it merged its scientific and NGO role – the Sturgeon Action Plan under the Bern Convention, very much relying on the literature study by REINARTZ (2002) on behalf of IAD (BLOESCH 2006b).

Table 1: IAD Research Projects in 2004 - 2006, sponsored by EAWAG<sup>1</sup> and UNESCO ROSTE<sup>2</sup>.

Author	Title	Schedule
U. Schwarz	<i>Hydromorphological Map I: Danube (Feasibility Study)</i> <sup>1</sup>	2004
U. Schwarz	<i>Hydromorphological Map II: Drava/Mura</i> <sup>1</sup>	2005 – 2006
J. Bloesch et al.	<i>IAD-UNESCO WS Limnology-Hydrology</i> <sup>2</sup>	2004 – 2005
H. Köhler et al.	<i>Biomarker Monitoring Mures/Tisza</i> <sup>1</sup>	2004 – 2005
A. Farnleitner et al.	<i>JDS 2001 – Prokaryotic Community of the Danube</i> <sup>1</sup>	2005 – 2006
D. Drumea	<i>Nutrient Balance Nature Reserve Prut</i> <sup>1</sup>	2005 – 2006
J. Bloesch & WWF	<i>Sturgeon 2020: WS &amp; AP Bern Convention</i> <sup>1</sup>	2005

### Where should we go?

IAD should finally utilise its knowledge gained through years of thorough taxonomic and water quality monitoring based on biological methods (TEODOROVIC 2005) and switch to conceptual and functional research of riverine ecosystems on basin-wide scale (BLOESCH 2005a, b).

In recent years, scientific research into ecomorphology, ecohydrology, floodplains and the role of habitat variability for biodiversity, i.e. the function of dynamic aquatic ecosystems, has gained much attention. Risk assessments and numerous publications throughout Europe indicate the hydromorphological alterations as the main cause of ecological status impairment, but more importantly on loss of biodiversity and ecosystem integrity. Considering the impacts of global change and future pressures in the Danube River Basin such as flood protection, hydropower and navigation we need to focus on scientific evaluation, predictive modelling and support of decision making in wetland conservation and restoration. Sturgeons as key animals of the Danube fit well together with this topic, and IAD should foster research into sturgeon habitats and migration as suggested by the Action Plan (BLOESCH 2006b). Further, the function of large floodplains as potential areas of nutrient retention and greenhouse gases needs more detailed research, and also sediment research may be later added. Chemical stress due to environmental pollutants is still an important issue in the Danube River Basin, applying to the reduction of both point and diffuse sources in the framework of EU-WFD. IAD research should focus on the wide field of environmental toxicology stressing acute, sub-acute and chronic effects of heavy metals, persistent organic pollutants and endocrine disruptors, dose dependant response, cause-effect relationships and mode of action of a number of priority pollutants on standardized bio-tests and models.

In this respect, the selection of topics presented above was a beginning and will hold for a while. Initial steps have been undertaken and for the future we propose the transboundary Mures River Basin, hydromorphologically almost intact but under constant pressure of severe point pollution, as IAD playground, where all disciplines meet and contribute to the catchment approach, in the long term (SANDU 2006, SANDU & BLOESCH 2006). The catchment approach is the scientific foundation of applied “sustainable” river basin management to be implemented by the Danube countries through ICPDR under the EU-WFD.

Via contacts and activities of individual members, we aim to attract more representatives of the “scientific elite” and young promising researchers within and outside the Danube Basin. One means to support young scientists was the promotion of poster sessions within the SIL Congresses in 1998, 2001 and 2004. To our belief, finding an IAD niche means focusing on the mentioned “hot” limnological topics where we have already achieved some results, reputation and recognition within the Danube River Basin, and by doing so, IAD might become a suitable (or hopefully desirable) partner in regional and large-scale projects. Yet we are aware that the process is slow and associated with a large uncertainty.

## References

- BLOESCH, J. (1999a): The International Association for Danube Research (IAD) between tradition and new water management strategies. Proceedings International Conference on EU Water Management Framework Directive and Danubian Countries. Bratislava, June 21 – 23, 1999: 191 – 206.
- BLOESCH, J. (1999b): The International Association for Danube Research (IAD) and its future role in Danube research. Arch. Hydrobiol. Suppl. 115/3, Large Rivers 11/3: 239-259.
- BLOESCH, J. (2001): “*Auf zu neuen Ufern*” – *Forschungsaktivitäten der IAD* (with English summary). Festschrift „25 Jahre Donauforschung: OEN-IAD, MaB“, Wien, 3.12.2001. Schriftenreihe des Bundesamtes für Wasserwirtschaft. 12: 91-109.
- BLOESCH, J. (2002): The International Association for Danube Research (IAD) and its environment. Analysis of, and concepts for, strategies in IAD research, IAD organization and public relations. Peer Review, Internal Report, 25 pp. & appendix.
- BLOESCH, J. (2003): Report on activities of the International Association for Danube Research of the Societas Internationalis Limnologiae (1998 – 2001). Verh. Internat. Verein. Limnol. 28: 1950-1955.
- BLOESCH, J. (2005a): Scientific concepts and implementation of sustainable transboundary river basin management. Summary report on the 35<sup>th</sup> IAD-Conference, April 19-23, 2004, in Novi Sad (Serbia and Montenegro). Large Rivers 16/1-2, Arch. Hydrobiol. Suppl. 158/1-2: 7-28.
- BLOESCH, J. (ed.) (2005b): River Basin Management: Concepts and Transboundary Implementation (with special reference to the Danube River). Selected papers of the 35th IAD-Conference 18-23 April, 2004, Novi Sad (Serbia and Montenegro). Large Rivers Vol. 16, No. 1-2, Arch. Hydrobiol. Suppl., 158/1-2, 328 pp.
- BLOESCH, J. (2006a): Report on activities of the International Association for Danube Research of the Societas Internationalis Limnologiae (2001 – 2004). Verh. Internat. Verein. Limnol. 29, in print.
- BLOESCH, J. (2006b): The ultimate need for the implementation of sturgeon protection in the Danube River Basin - a view of 2006 and call for actions with the Sturgeon Action Plan under the Bern Convention. IAD Limnological Reports, 36: this issue.

- BLOESCH, J., GUTKNECHT, D., & IORDACHE, V. (eds). (2005): Hydrology and Limnology Another Boundary in the Danube River Basin. *A contribution to the IHP Ecohydrology Project* Report on the International Workshop organized by the International Association for Danube Research (IAD) and sponsored by the UNESCO Venice Office. Petronell, Austria, 14-16 October 2004. IHP-VI Technical Documents in Hydrology No. 75 UNESCO, Paris, 2005.
- BREZEANU, G. & STIUCA, R. (eds.) (2002): IAD Limnological Reports, Vol. 34. – Proc. 34<sup>th</sup> Conference, Tulcea, Romania, 2002, 895 pp.
- DRUMEA, D. (2006): Nutrient balance in nature reserves in the Moldovan part of the Danube River Basin (Prut River). IAD internal Report, 23 pp.
- HORVATIC, J. (ed.) (2000): IAD Limnological Reports, Vol. 33. – Proc. 33<sup>rd</sup> Conf., Osijek, Croatia, 2000, 552 pp.
- KÖHLER, H.-R., SANDU, C., SCHEIL, V., NAGY-PETRICĂ, E.M., SEGNER, H., TELCEAN, I., STAN, G. & TRIEBSKORN, R. (2006): Monitoring Pollution in River Mureș, Romania, Part III: Biochemical Effect Markers in Fish and Integrative Reflection. Environmental Monitoring and Assessment, submitted.
- JANAUER, G. A., HALE, P., SWEETING, R. (eds.) (2003): Macrophyte inventory of the river Danube: A pilot study. Large Rivers 14/1-2, Arch. Hydrobiol. Suppl. 147/1-2: 229 pp.
- REINARTZ, R. (2002): Sturgeons in the Danube River: Biology/Status/Conservation. – Literature study conducted on behalf of IAD, Bezirk Oberfalz and Landesfishereiverband Bayern e.V., 150 pp.
- SANDU, C. (2006): Mureș River Basin. Scientific background information. IAD Report. In prep.
- SANDU, C. & BLOESCH, J. (2006): The Mureș River ecosystem - scientific background information as the basis for a catchment approach in the framework of IAD. IAD Limnological Reports, 36: this issue.
- SANDU, C., FARKAS, A., MUSA-IACOB, R., IONICA, D., PARPALA, L., ZINEVICI, V., DOBRE, D., RADU, M., PRESING, M., CASPER, H., BURUIANA, V., STANA, I., WEGMANN, K., STAN, G., ARDELEAN, A., TRIEBSKORN, R. & KÖHLER, H.-R. (2006): Monitoring Pollution in River Mureș, Romania, Part I: How aquatic communities are affected. Environmental Monitoring and Assessment, submitted.
- SCHMID, R. (2000): Water quality of the Danube and her tributaries - 1995. Explanations to the River Danube water quality map. Gewässergüte der Donau und ihrer Nebenflüsse - 1995. Erläuterungen zur Gewässergütekarte der Donau. - State Office for Regional Water Management Regensburg and IAD General Secretary Vienna, April 2000. Wasserwirtschaftsamt Regensburg und Generalsekretariat IAD Wien, April 2000.
- SCHMID, R. (2004): Water quality of the Danube and its tributaries – 1995 updated and 2002. Explanations to the river quality map. Gewässergüte der Donau und ihrer Nebenflüsse – 1995 nachgeführt und 2002. Erläuterungen zur Gewässergütekarte. - State Office for Regional Water Management Regensburg and IAD General Secretary Vienna, April 2000. Wasserwirtschaftsamt Regensburg und Generalsekretariat IAD Wien, April 2004.
- SCHWARZ, U. (2005): Feasibility study for the Project: Hydromorphological map of the Danube 2005. IAD Report, Vienna January 5, 2005, 24 pp.
- SCHWARZ, U. (2006): Hydromorphological map of the Drava River 2005. IAD Report, in prep.

TEODOROVIC, I. (2005): Preface. Large Rivers 16/1-2, Arch. Hydrobiol. Suppl., 158/1-2: 3-5.

TEODOROVIC, I., RADULOVIC, S., BLOESCH, J. (eds.) (2004): IAD Limnological Reports, Vol. 35. – Proc. 35<sup>th</sup> Conf., Novi Sad, Serbia and Montenegro 2004. Visio Mundi Academic Press and National Committee of IAD Serbia and Montenegro. 681 pp.

TRIEBSKORN, R., TELCEAN, I., CASPER, H., FARKAS, A., SANDU, C., STAN, G., COLĂRESCU, O., DORI, T. & KÖHLER, H.-R. (2006): Monitoring Pollution in River Mureş, Romania, Part II: Metal accumulation and histopathology in fish. Environmental Monitoring and Assessment, submitted.

WACHS, B. (1996): The International Association for Danube research (IAD) and its relevance to the Danube basin. Arch. Hydrobiol. Suppl. 113, Large Rivers 10: 229-236.

WINTER, C., HEIN, T., KAVKA, G., MACH, R.L. & FARNLEITNER, A.H. (2006): Longitudinal changes in the bacterial community composition of the Danube River: A whole river approach. Environmental Microbiology, submitted.