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## **Newsletter No. 20**

*September 2020*

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## **1 A brief review of the past year**

When we concluded our annual meeting in Bucharest in July 2019, plans for our activities in 2020 were laid out and approved. This included a proposed special issue led by prof. Natalia Frolova on papers presented in Bucharest, joint projects aimed at stimulating active collaboration of members through active data sharing and agreeing on themes for Commission sessions to be held at the 34<sup>th</sup> IGC in Istanbul (Turkey) in August 2020. Consequently, proposals for 6 sessions were duly submitted to the LOC in Turkey of which 4 were approved. In addition, two travel grant applications of members were supported with endorsement letters by the Commission and also approved.

However, owing to restrictions imposed in response to the global corona pandemic that started in December 2019 the IGC was postponed to 16-20 August 2021. On 2n April 2020 the LOC informed us that all *registration fees paid, abstracts accepted, travel grants awarded and the conference programme are carried over.*

While, therefore, no Commission could take place in 2020 we still managed to continue with some of the planned projects and, thanks to the tireless efforts of prof. Natalia and her colleagues at Lomonosov University, successfully managed to conclude the Special Issue in *Geography Environment Sustainability* as Scopus-indexed peer-reviewed journal.

In addition, we submitted the annual report on Commission activities to IGU, as prerequisite for retaining approval as active Commission. However, in August 2020 we learned that an additional report had to be submitted by July covering our activities over the previous 4-year period and outlining plans for the next four years (2020-24). Owing to a less than perfect communication, this request did not reach us in time to be used as basis for the Executive Committee to confirm or otherwise the continuation of task forces and Commissions. Fortunately, based on our record of accomplishment we had had strong support from within the Executive Committee (inter alia from Proffs. Meadows and Kolossov) well as from Dr. Ivan Canjevac as sitting SC-member representing Croatia at the meeting successfully arguing for renewing approval of our Commission.

Subsequently, the requested reports were duly submitted (included in this newsletter) and the Secretary General, Dr. Singh, officially approved the continuation under the condition that members of the SC who reached the maximum allowable term of service are to be replaced. Details are given in the section of following section

## **2 New Steering Committee for period 2020-2024**

Following a consultation process with all sitting members of the SC via email suitable candidates were identified taking geographical and gender representation as well as track records of Commission-related activities into account. In this way the following three new members were identified and approached for consent:

- Dr. Marcela H. Gonzalez, University of Buenos Aires (Argentina),
- Prof. Danijel Orešić, University of Zagreb (Croatia) and,

- Prof. Hejuun Chang, Portland State University (USA).

I would like to thank the three colleagues for agreeing to serve on the SC and extend a most cordially welcome to them on behalf of the Commission with best wishes for a fruitful, productive and not least also enjoyable time on the SC.

Owing to their crucial importance for the continued operation of the Commission the two outgoing Vice Chairs, proffs. Natalia Frolova and Chansheg He were asked to please remain on the SC as (non-executive) advisory members, a possibility indicated by the Secretary General.

The positions as Vice Chair are now taken over by proffs. Liliana Zaharia, University of Bucharest (Romania) and Prof. Daniel Karthe (as of November 2020 United Nations University Dresden, Germany).

The composition of the newly constituted SC as approved by all members of the sitting SC is indicated below:

### Steering Committee for 2020-2024

SC-Function	Name	Country, sex	SC since	max. to	Affiliation	Portfolio
Chair	Prof. Dr. habil. <b>Frank Winde</b>	South Africa, male	2012	2024	North-West University, Vanderbijlpark Campus, Geography and Environmental Studies, PO Box 1174, Vanderbijlpark, 1900; Extraordinary Professor Wismut GmbH, 09117 Chemnitz, Jagdschänken-straße 29, Monitoring and Radiation Protection, Tel. +49 151 2571 3237, <a href="mailto:frank.winde@gmail.com">frank.winde@gmail.com</a>	Management and admin, Membership/ recruitment, website/ public visibility
Vice Chair	Prof. Dr. <b>Daniel Karthe</b>	Germany, male	2016	2024	United Nations University, Institute for Integrated Management of Material Fluxes and of Resources, Dresden, Germany. Email: <a href="mailto:karthe@unu.edu">karthe@unu.edu</a>	co-organize publications over the next 4 years
Vice Chair	Prof. Dr. <b>Liliana Zaharia</b>	Romania, female	2016	2024	University of Bucharest, Faculty of Geography 1 Nicolae Balcescu Blv., 010041, Bucharest, Romania, Tel: + 40-21-305 38 22, Fax: + 40-21-315 30 74, <a href="mailto:zahariali@yahoo.com">zahariali@yahoo.com</a> ; <a href="mailto:zaharialili@hotmail.com">zaharialili@hotmail.com</a>	Outreach activities, reporting, archiving, membership recruitment
Member	Prof. Dr. <b>Danijel Orešić</b>	Croatia, male	2020	2028	University of Zagreb, Department of Geography, Marulićev trg 19/II, 10 000 Zagreb, Hrvatska (Croatia), <a href="mailto:doresic@geog.pmf.hr">doresic@geog.pmf.hr</a>	Collaboration + outreach
Member	Dr. <b>Lanhui Zhang</b>	China, female	2016	2024	Lanzhou University, College of Earth Environmental Sciences, Guanyun Building 0912, Tianshuinan Road 222, Lanzhou City, zip code: 730000, Gansu Province , China, Tel/Fax:010 931 8912805 <a href="mailto:lh Zhang@lzu.edu.cn">lh Zhang@lzu.edu.cn</a>	Proposed: Publications + reporting
Member	Prof. Dr. <b>Heejun Chang</b>	USA, male	2020	2028	Portland State University, Geography, 1721 SW Broadway, PO Box 751, Tel. 503-725-3162, Fax: 503-725-3166; <a href="mailto:changh@pdx.edu">changh@pdx.edu</a>	Book publication, collaborative research, outreach, mentoring.
Member	Dr. <b>Marcela Hebe Gonzalez</b>	Argentina, female	2020	2028	University of Buenos Aires, Department of Atmospheric and Ocean Science – CIMA CONICET. Intendente Güiraldes 2160 2nd floor Building II Ciudad Universitaria C1428EGA CABA ARGENTINA Tel 54-11-52858472 int. 58472, <a href="mailto:marcelahebe@gmail.com">marcelahebe@gmail.com</a> , <a href="mailto:gonzalez@cima.fcen.uba.ar">gonzalez@cima.fcen.uba.ar</a>	Collaboration + proposed publications
Advisory member	Prof. Dr. <b>Natalia Frolova</b>	Russia, female	2020	2024	Lomonossov State University, Moscow, Department of Hydrology, Faculty of Geography, GSP-1, 119991, Leninskie Gory, MSU. Phone: +7 (495) 939-15-33 <a href="mailto:frolova_nl@mail.ru">frolova_nl@mail.ru</a>	non-executive advisor
Advisory member	Prof. Dr. <b>Chan-sheng He</b>	USA, male	2012	2024	Western Michigan University. Wood Hall, Department of Geography, Western Michigan University, 3234 Wood Hall, Kalamazoo, MI 49008-5424. Phone: (269) 387-3425 Fax: (269) 387-3442 <a href="mailto:chansheng.he@wmich.edu">chansheng.he@wmich.edu</a>	non-executive advisor
Honorary Member	Prof. emer. <b>Tony Jones</b>	UK, male	2002	open ended	Institute of Geography and Earth Sciences, University of Wales, Aberystwyth. <a href="mailto:tonyandjenjones@btinternet.com">tonyandjenjones@btinternet.com</a>	non-executive advisor

### 3 Quadrennial report to IGU for period 2016-2020

This report as well as the research plan to 2024 were compiled with inputs from members of the previous SC including proffs. Canjevac, Frolova, Karthe and Zaharia for which I than them sincerely.

#### 3.1 Composition of Steering Committee

The leadership of the Commission changed end of 2015 following a brief period of uncertainty regarding the continuation of the Commission after several founding members retired from Commission. Through email ballot, the then Vice Chair was unanimously elected Chair by the SC-members and subsequently appointed by the General Assembly at the IGC in Beijing. A new SC was subsequently constituted, and its members approved by the Executive Committee of IGU in 2016.

Details of members currently serving on the steering committee (SC) are given in the table below:

Function	Name	Country, gender	SC since	max. to	Institution	Portfolio
Chair	Prof. Dr. habil. <b>Frank Winde</b>	South Africa, male	2012	2024	North-West University, Vanderbijlpark Campus, Geography and Environmental Studies, PO Box 1174, Vanderbijlpark, 1900; Extraordinary Professor Wismut GmbH, 09117 Chemnitz, Jagdschänkenstraße 29, Tel. +49 151 2571 3237, Skype: frank.winde, <a href="mailto:frank.winde@gmail.com">frank.winde@gmail.com</a>	Management and admin, Membership/recruitment, website/public visibility
Vize chair	Prof. Dr. <b>Natalia Frolova</b>	Russia, female	2012	2020	Lomonossov State University, Moscow, Department of Hydrology, Faculty of Geography, GSP-1, 119991, Leninskie Gory, MSU. Phone: +7 (495) 939-15-33 <a href="mailto:frolova_nl@mail.ru">frolova_nl@mail.ru</a>	Meetings + archiving
Vice-Chair	Prof. Dr. <b>Chan-sheng He</b>	USA, male	2012	2020	Western Michigan University. Wood Hall, Department of Geography, Western Michigan University, 3234 Wood Hall, Kalamazoo, MI 49008-5424. Phone: (269) 387-3425 Fax: (269) 387-3442 <a href="mailto:chansheng.he@wmich.edu">chansheng.he@wmich.edu</a>	Publications + reporting
Member	Dr. <b>Ivan Canjevac</b>	Croatia, male	2012	2020	University of Zagreb, Faculty of Science, Department of Geography, Marulicev trg 19/II, 10000 Zagreb, Croatia, <a href="mailto:canjevac@geog.pmf.hr">canjevac@geog.pmf.hr</a> , Tel. 0038514895424, Fax 0038514895440, Skype name: <a href="mailto:naumovac.canjevac@geog.pmf.hr">naumovac.canjevac@geog.pmf.hr</a>	Collaboration + outreach
Member	Dr. <b>Daniel Karthe</b>	Mongolia, male	2016	2024	Environmental Engineering Section German-Mongolian Institute for Resources and Technology (GMIT) GMIT Campus, 2nd Khoroo, Nalaikh, Mongolia Email: <a href="mailto:karthe@gmit.edu.mn">karthe@gmit.edu.mn</a>	Membership + recruitment
Member	Prof. Dr. <b>Liliana Zaharia</b>	Romania, female	2016	2024	University of Bucharest, Faculty of Geography 1 Nicolae Balcescu Blv., 010041, Bucharest, Romania, Tel: + 40-21-305 38 22, Fax: + 40-21-315 30 74, <a href="mailto:zaharialil@yahoo.com">zaharialil@yahoo.com</a> ; <a href="mailto:zaharialili@hotmail.com">zaharialili@hotmail.com</a>	Proposed: Meetings + archiving
Member	Prof. Dr. <b>Lanhui Zhang</b>	China, female	2016	2024	Lanzhou University, College of Earth Environmental Sciences, Guanyun Building 0912, TianshuiNan Road 222, Lanzhou City, zip code: 730000, Gansu Province, China, Tel/Fax:010 931 8912805 <a href="mailto:lhzhang@lzu.edu.cn">lhzhang@lzu.edu.cn</a>	Proposed: Publications + reporting
Member	Dr <b>Julia Hall</b>	Austria, female	2017	2025	Vienna University of Technology, Institute of Hydraulic Engineering and Water Resources Management, Austria, Tel. 4315880122322, 1040 Vienna, Karlsplatz 13/222-2 <a href="mailto:hall@hydro.tuwien.ac.at">hall@hydro.tuwien.ac.at</a>	Collaboration + outreach
Member	Prof. emer. <b>JAA Jones</b>	UK, male	2002	open ended	Institute of Geography and Earth Sciences, University of Wales, Aberystwyth. <a href="mailto:tonyandjenjones@btinternet.com">tonyandjenjones@btinternet.com</a>	honorary SC-member

Currently, the Commission operates without a secretary leaving nearly all administrative work and duties (such as processing of membership applications,

reporting to IGU, updating of website, endorsements, grant applications etc.) almost exclusively to the chair.

### **3.2 Objectives of the Commission**

The objectives of the Commission guiding its activities over the reporting period are as follows:

The Commission strives to provide a recognised platform for international scientific exchange of physical and human Geographers as well as scientists from other disciplinary backgrounds sharing insights, knowledge and data on water-sustainability in its broadest sense. This includes natural and human impacts on the availability and quality of water and their implications for sustainable water use at local, regional and global scale. The Commission specifically encourages dialogue and collaboration between physical and human water sciences including economic, cultural, legal and medical aspects to arrive at a comprehensive understanding of natural and anthropogenic factors governing water sustainability. A focus is on water-stressed areas worldwide encouraging and fostering mutually beneficial collaboration between scientists from developing and developed nations.

The Commission aims to interpret “sustainability” in the widest possible sense, including the sustainability of the environment in the face of water development work as well as the sustainability of water resources. It aims to foster links between the human and physical aspects of water management, with specific concern for the sustainability of water resources and for the impacts of water management on the environment. The Commission holds regular international conferences, circulates a regular newsletter to registered corresponding members, and maintains a website displaying pertinent information. The Commission also aims to support collaborative and multidisciplinary research amongst its members. Current focal points of the Commission’s research include but are not limited to the following topics:

- Climatic and meteorological impacts on water resources
- Water in urban environments
- Groundwater management
- Water availability in arid and semi-arid regions
- Impacts of mining on surface and groundwater
- Hydrological processes and extreme events
- Integrated catchment and water resource management
- Water pollution and health
- Hydro – GIS (Geographical Information Systems)

### **3.3 Activities**

#### ***A. Membership development***

Even though several hundred of addresses were listed on the e-mail circulation list end of 2015 there was little response or active participation by most recipients.

To consolidate membership and facilitate active involvement in the activities of the Commission a template was designed and sent out to listed members capturing

personal details, affiliation, and research interests. Only those members timely returning the filled-in template retained membership. Certificates of Membership were introduced and sent out on request.

All member profiles are now displayed on the Commissions website (<https://igu-water.org/2018/05/14/members/>). Since 2016, the number of members registered in this way grew by 41 to 59 in 2020 (as of 28 August). This includes 19 female and 38 males representing 26 countries on six continents.

New members were recruited by existing members, joined at conferences and, increasingly, requested membership via the revamped website. To encourage active participation a new clause was introduced and is displayed on the website stipulating a set of minimum activities for retaining membership.

### ***B. Meetings***

Over the reporting period a total of six conferences were organised by members of the Commission of which:

- two meetings were Annual Meetings organised exclusively by the Commission (Baikal 2017, Bucharest 2019); both meetings included extensive field trips on hydrological topics
- two meetings were held in conjunction with larger IGU events (33rd IGC Beijing 2016; IGU Regional Conference Quebec 2018) with dedicated sessions of the Commission and associated field trips, partly organised by the Commission;
- two meetings were organised by SC-members on specific themes (IGU-Thematic Conference on Practical Geography, Moscow 2018; International Conference on sustainable use of abandoned mines, Johannesburg 2017 jointly hosted by the National Academies of Science of Germany and South Africa).

All events were in detail reported on in the respective annual reports of the Commission. In addition, the Commission held four Business Meetings during the conferences in Beijing, Baikal, Quebec and Bucharest.

In preparation of the planned IGC in Istanbul 2020 detailed proposals for sessions and associated abstracts were submitted to the LOC of the IGC. Information on the cancellation of the event due to the corona pandemic was distributed to members in due time. Preparations for the event, now postponed to 2021, are currently underway.

In addition, prof. Frolova coordinated the preparation of the 4<sup>th</sup> Conference on World's Large Rivers planned to take place in August 2020 in Moscow (Russia), which for the same reason, was postponed to 2021.

### ***C. Networking/ Collaboration***

This section distinguishes between joint activities of members within the Commission (internal collaboration) and collaboration of the Commission with external entities such as international organisations and institutions (external collaboration).

*Regarding internal collaboration, several activities occurred including:*

- Joint publication of three special issues on work of the Commission in international peer-reviewed journals (Croatian Geographical Bulletin, Ecosystem Health and Sustainability; Geography Environment Sustainability)
- International collaborative research project AMIPHYR on methods to quantify human impact on hydro-morphology of rivers between Romanian, Croatian and French members (Universities of Bucharest, Zagreb and Grenoble)
- Research visits of members (Prof. He visiting Prof. Zaharia in Romania and vice versa), application for Fulbright visit of Prof. He to Prof. Winde in South Africa, Prof. Opp visiting Prof. Winde in South Africa etc.
- Supporting grant applications and promotions of members through endorsement letters from the chair (Prof. Ch. He: 3 x applications, Prof. L. Zaharia: 2 x applications, Dr. G. Morosanu 2 x applications, Dr. O. Fashae: 1 x application)
- Pre-peer review of manuscripts of members intended for submission to English-speaking international journals (6 x)
- Joint publications by two or more members of the Commission (a selection is provided in this report)
- Preliminary discussion of possible Commission projects (Hydrological glossary, textbook on Hydrogeography, joint use of software on hydrograph separation provided by M. Kireeva, data acquisition of crowd-sourced data from members for improving remote-sensing based soil moisture forecasts initiated of research of prof. He and his colleagues in arid parts of NW China)
- Support for local media reports of members on international water issues (e.g. water crisis Cape Town, water quality Baikal)
- For all commission meetings themes of sessions were designed and submitted abstract reviewed by members of the SC

*External collaboration:*

Joint projects of the Commission or its individual members include the following international organisations (associated projects):

- UNESCO (Mining impacts on water and health in Africa; World's Large Rivers Conference)
- WHO-IARC (World Health Organisation, International Agency for Research on Cancer, UN; Health effects of environmental uranium exposure)
- IAHS (International Association of Hydrological Sciences; FRIEND: Flow Regimes from International Experimental and Network Data; meeting of the Low-Flow Group Freiburg, Germany, October 2017)
- IAEA (International Atomic Energy Agency, UN; Global inventory of uraniumiferous mine waste deposits)

## D. Publications

### *Newsletters and reports*

- 3 x newsletters circulated; 3 x annual reports submitted to the General Secretary of IGU
- 2 x Quadrennial reports (2012-2016; 2016-2020; Winde F (2017): Water Sustainability. Quadrennial report of the Commission for Water Sustainability 2012-2016. International Geographical Union Bulletin, 65-66 (2015-2016), 344-353)
- 2 x reports to funding agencies of conferences and
- 1 x an extended response to a request for feedback on the Quebec conference 2018

### *Special editions*

- HRVATSKI GEOGRAFSKI GLASNIK/ Croatian Geographical Bulletin (2016), Proceedings of Dubrovnik meeting (2014), Lead: I. Canjevac
- ENVIRONMENTAL HEALTH AND SUSTAINABILITY (2018), “Water Sustainability and Watershed Ecosystem Health”, Lead: Ch. He
- GEOGRAPHY ENVIRONMENT SUSTAINABILITY (2020), “Water sustainability at global, regional and national levels», Lead: Prof. N. Frolova

Much of the work relating to this special issue (submissions, review procedure, editing etc.) fell into a time with limited physical contact due to restrictions related to the Corona pandemic. With two planned conferences being postponed, this special edition was an important part of maintaining communication and active collaboration among members.

### *Conference proceedings*

- International Conference Water Sustainability in a Changing World (2019), Book of Abstracts, Eds.L. Zaharia, P. Breţcan, G. Ioana-Toroimac
- International Conference on Linking Science, Society, Business and Policy for the Sustainable Use of Abandoned Mines in the SADC Region, Johannesburg, South Africa (2017), doi <http://dx.doi.org/10.17159/assaf.2018/0025>
- IGU Thematic Conference: Practical Geography and XXI Century Challenges, Moscow (2018), lead Prof. Frolova

### *Joint papers by Commission members*

(selection; red – Members of Commission)

- Blöschl G, **Julia Hall**, Juraj Parajka, Perdigão Rui A.P, Bruno Merz, Berit Arheimer, Aronica Giuseppe T., Ardian Bilbashi, Ognjen Bonacci, Marco Borga, **Ivan Čanjevac**, Attilio Castellarin, Chirico Giovanni B., Pierluigi Claps, Károly Fiala, **Natalia Frolova**, Liudmyla Gorbachova, Ali Gül, Jamie Hannaford, Shaun Harrigan, **Maria Kireeva**, et al. Changing climate shifts timing of European floods. *Science*. 2017. 357 (6351). P. 588-590. DOI: 10.1126/science.aan2506
- Frolova N.L.**, **Kireeva M.B.**, **Magritckiy D.V.**, Bolgov M.B., Kopylov V.N., **Hall J.**, Semenov V.A., Kosolapov A.E., Dorozhkin E.V., Korobkina E.A., Rets E.P., Akutina Y., Dzhamalov R.G., Efremova N.A., Sazonov A.A., Agafonova S.A., Belyakova P.A. Hydrological hazards in Russia: origin, classification, changes and risk assessment. *Natural Hazards*. 2017. 88. № 1, p. 103-131 DOI ^ 10.1007/s11069-016-2632-2

- Agafonova S.A., Frolova N.L., Krylenko I.N., Sazonov A.A., Golovlyov P.P. Dangerous ice phenomena on the lowland rivers of European Russia. *Natural Hazards*. 2017. 88. № 1, p 171-188 DOI: 10.1007/s11069-016-2580-x
- Rets E., Chizhova Ju N., Loshakova N., Tokarev I., Kireeva M.B., Budantseva N.A., Vasil'chuk Yu K., Frolova N., Popovnin V., Toropov P., Terskaya E., Smirnov A.M., Belozarov E., Karashova M. Using isotope methods to study alpine headwater regions in the Northern Caucasus and Tien Shan. *Frontiers of the Earth Science*, 2017. 11, № 3, p. 531-543 DOI: 10.1007/s11707-017-0668-6
- Čanjevac, I., Orešić, D. (2018): Changes in discharge regimes of rivers in Croatia, *Acta Geographica Slovenica – Geografski Zbornik* 58 (2), 7-18. DOI: 10.3986/ags.2004
- Zaharia, L., Costache, R., Prăvălie, R. Ioana-Toroimac, G., 2017, Mapping flood and flooding potential indices: a methodological approach to identifying areas susceptible to flood and flooding risk. Case study: the Prahova catchment (Romania), *Front. Earth Sci.*, 1-19, DOI:10.1007/s11707-017-0636-1 (Impact factor 0,760) <https://link.springer.com/article/10.1007/s11707-017-0636-1>
- Moroşanu G.A., Zaharia L., Ioana-Toroimac G., 2017, Changes in forest and water management in the upper Jiu River Catchment (Romania): possible effects on the hydro-sedimentary dynamics, *17 th International Multidisciplinary scientific Geoconference – SGEM 2017, Conference proceedings*, volume 17, Water Resources, Forest, Marine and Ocean Ecosystems, Issue 32, 749-756, ISSN 1314-2704, DOI: 10.5593/SGEM\_GeoConference (ISI indexed).
- Ioana-Toroimac G., Zaharia L., Minea G., Moroşanu G.A., 2017, Using a multi-criteria analysis to identify rivers with hydromorphological restoration priority: Braided rivers in the south-eastern Subcarpathians (Romania), *Science of the Total Environment*, 599–600 (2017) 700–709 (Impact factor 2015/2016: 3,976) [10.1016/j.scitotenv.2017.04.209http://www.sciencedirect.com/science/article/pii/S0048969717310616](http://www.sciencedirect.com/science/article/pii/S0048969717310616)
- Khundzhua D. A., Kharcheva A. V., Krasnova E. D., Gorshkova O. M., Chevel K. A., Yuzhakov V. I., Patsaeva S. V\*, 2016. Absorption and fluorescence of hydrophobic components of dissolved organic matter in several Karelian lakes with stratified structures. Proceedings of SPIE - The International Society for Optical Engineering, SPIE, the International Society for Optical Engineering (Bellingham, WA, United States), v. 9917, pp. 99170R-1-99170R-7 DOI: 10.1117/12.2229856; \* participant Istomino meeting
- Vasil'chuk Yu K., Frolova N.L., Krasnova E.D., Budantseva N.A., Vasil'chuk A.C., Dobrydneva L.V., Efimova L.E., Terskaya E.V., Chizhova Ju N., 2016. Water Isotopic-Geochemical Composition in the Trekhtsvetnoe Meromictic Lake on the White Sea COSAT. *Water Resources*, v. 43, № 5, pp. 828-838 DOI: <https://doi.org/10.1134/S0097807816050110>
- Winde F, Kaiser F, Erasmus E (2017): Exploring the use of deep level gold mines in South Africa for underground pumped storage schemes. *Renewable and Sustainable Energy Reviews*, 78, 668-682, <http://dx.doi.org/10.1016/j.rser.2017.04.116> (IF 2016: 6.798, Q1)
- Winde F, Erasmus E, Geipel G (2016): Uranium contaminated drinking water linked to leukaemia – revisiting a case study from an arid sheep farming area in South Africa. *Science of the Total Environment*, 574, 400-421, September, doi 10.1016/j.scitotenv.2016.09.035 (IF 2015: 3.976; Q1)
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- ZHANG, Lanhui, Chansheng HE\*, Xiao Bai, Yi Zhu. 2017. Physically-based adjustment factors for precipitation estimation in a large arid mountainous watershed, Northwest China. *Journal of Hydrologic Engineering* 22(11):04017047, DOI: 10.1061/(ASCE)HE.1943-5584.0001576(SCI).
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- Vasilchuk Y, Frolova N, Kasimov N, Winde F, Budantseva N, Chizhova J, Efimova L, Krasnova E, Terskaya E, Tokarev I, Vasilchuk A (2018): Isotope stratification of meromictic Lake Terkhtsvetnoe at the White Sea coast (Russia). *International Journal of Limnology*, 54 (23), 9 pages,

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- Čanjevac, I, Orešić, D (2018): Changes in discharge regimes of rivers in Croatia. *Acta Geographica Slovenica*, 58 (2), 7-18.
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## E. Website

The website has been extensively overhauled regarding design, structure and contents. A new address has been purchased ([www.igu-water.org](http://www.igu-water.org)) in order to make the site easier to remember and omit any advertising reference to the hosting company (WordPress). Newly added items and functionalities include:

- Research profiles of members
- Composition of steering committee
- Archives of conferences and presented papers (where available)
- Links to international water institutions and hydrological online glossaries
- E-mail contact facilities for visitors wishing to join the Commission
- Rules on membership
- Announcements of upcoming conferences and events
- Obituaries, acknowledgment of awards, retirement etc. of members
- News archive

Yet, challenges on high-frequency updating remain as resources such as time, required information etc. are not always readily available.

## 4 Planned activities for period 2020-2024

### 4.1 Proposed composition of Steering Committee

In accordance with statutory requirements of IGU there are 3 x members of the current SC whose maximum term expires end of 2020. Apart from reaching the end of allowable terms there are also aspects regarding size and structure of the SC, portfolio aspects, regular input, attendance of meetings, change of personal circumstances etc. to be considered. While preliminary discussion on the best way forward have been taken place via email, it is proposed to wait with any concrete decision until physical (i.e. not only virtual) meetings are possible again to finalise some of the more sensitive aspects. Generally, we believe that it is in the best interest of the continued work of the Commission to not only take formal requirements into account but also levels of past and current engagement, frequency, importance and relevance of input, leadership qualities and experiences among others. We, therefore, argue in favour of an option where terms of deserving members can be expanded if approved by the majority of SC-members. Also, activities of SC-Members in their respective portfolios should be analysed to find the optimum fit between personal strengths and expertise and the area of responsibility.

For details on the new SC refer to section 2.

### 4.2 Proposed objectives of the Commission

The objectives of the CWS remain essentially the same as in the past 4 years with some modifications (red).

#### *Objectives*

The Commission strives to provide a recognised platform for international scientific exchange of physical and human Geographers as well as scientists from other disciplinary backgrounds sharing insights, knowledge and data on water-sustainability in its broadest sense. This includes natural and human impacts on the availability and quality of water and their implications for sustainable water use at local, regional and global scale. The Commission specifically encourages the dialogue between physical and human water sciences including economic, cultural, legal and medical aspects to arrive at a comprehensive understanding of natural and anthropogenic factors governing sustainability **and resilience** of water systems. A particular focus is on water-stressed areas worldwide where we try to foster mutually beneficial collaboration between scientists from **developing, emerging and developed economies**. The Commission also aims to support collaborative and multidisciplinary research amongst its members and with international organizations. Current focal points of the Commission's research include but are not limited to the following topics:

- Anthropogenic impacts on water sustainability
- Groundwater management
- Climatic and meteorological impacts on water resources

- Sustainability and resilience of water systems in arid and semi-arid regions
- Hydrological processes and extreme events
- Fluvial morphology and dynamics
- Integrated catchment and water resource management
- Water pollution, **protection and conservation**
- Water, health and human well-being
- **Methods in Hydrology: HydroGIS, modelling, remote sensing etc.**
- **Water-Energy–Food-Nexus**

### **4.3 Research and other activities**

#### ***A. Membership development***

- As identified previously, it will be a continued focus of the Commission to further grow the proportion of young scientists among members. Promising examples over the past four years include the attraction of doctoral students or young post-docs from Romania, South Africa, China and Russia to name but a few.
- Also, the policy of attracting female scientists and researchers with a non-natural science background as well as practitioners from relevant water sectors will further be pursued.
- Member from countries facing water scarcity (such as the Middle East, Northern/ Southern Africa for example) are also to be targeted.
- Means of attracting members include word of mouth by current members as perhaps most important way, actively inviting identified colleagues to meetings of the Commission, advertising the work of the Commission on the website, providing support in research grant and travel applications etc. In addition, a review of listed members regarding the stipulated 2-year-non-activity rule is to be conducted to avoid accumulating non-active members as happened in the past.

#### ***B. Meetings***

Even before the Corona pandemic limited travelling and physical presence at conferences the Commission proposed to explore the use of digital communication as a means to increase participation of members who cannot afford overseas travelling on regular basis. With the surge in tele-communication, software developed and released during the corona pandemic this might be viable and acceptable option the Commission intends to make increasing use of in future meetings.

In addition, acknowledged experts on topics relating to water sustainability including UNESCO-Chairs of Hydrology are to be targeted by personal invitations to present at Commission meetings.

For conferences, the Commission generally strives to include hydrological topics of local relevance to attract scientists from the host nation.

For the period ahead, the following meetings are envisaged:

- **34th IGC, Istanbul 2021**
  - proposals for dedicated sessions of Commission as submitted for 2020 will be retained for 2021
  - members are informed of regarding re-submission of abstracts etc.
  - two newly joined Turkish members may be asked for organising thematic field trip(s)
- **Conference on world's large rivers, Moscow 2021**
  - also postponed to 2021
  - will be actively supported by UNESCO, IAHR, IAHS as well as the Commission
- **Regional IGU conference, Paris 2022**
  - proposed to coincide with annual meeting of the Commission, including a business meeting
  - proffs. Canjevac and Zaharia may contact long-term French collaborators (including one member of the Commission) to organise thematic field trips
- **Annual Commission Meeting 2023**
  - venue still to be determined based on members' proposals trying not to re-select past venues; as usual, a focus will be on extended field trip
  - one option, proposed by Prof. Karthe, is to organise a joint meeting between the Commission and the Working Group of Hydrology in Germany to facilitate networking among the groups with a view towards establishing long-term collaboration among members.
- **35<sup>th</sup> IGC, Dublin 2024**
  - Commission will be holding dedicated sessions as well as a business meeting
  - topics for sessions will also consider local relevance (e.g. peat hydrology etc.)

### ***C. Projects and Collaboration***

Joined projects that started in 2018/19 are set to continue. This includes:

#### *(i) Textbook on Hydrography*

-Originally proposed by Prof. Karthe as addressing a gap in literature he identified preliminary discussions were held via e-mail as well as at the meeting in Bucharest regarding the merits of the project and its pros and cons as well as technical details. With Prof. Karthe soon moving to the UN-University in Dresden (Germany) (the Commission congratulates him on this appointment) he anticipates to shed much of the current administrative work load that inhibited progress on the textbook project.

#### *(ii) Improving algorithm for hydrograph separation*

A software developed in Russia and introduced to the Commission by Dr. Kireeva (Moscow State University) for separating fluvial run-off components from flood hydrographs will be made available to members via a link. The aim is to improve the robustness of the algorithm through informed feedback from specialist users. Owing to the pandemic the project has not yet been implemented.

*(iii) Ground-truthing satellite data*

Inspired by work of Prof. He and his colleagues in arid China trying to calibrate satellite-based soil moisture data using on-site field measurements the chair proposed to apply the developed methods to various environment for increasing the set of relevant data. The project was announced in the newsletter following the Bucharest meeting and received positive initial response, inter alia, by Prof. Schnug from Germany offering to serve as facilitator of collaboration with remote sensing specialist in the agricultural field. Concrete steps to implement the idea are still be taken.

*(iv) Mapping projects of Commission members*

Core idea is to use freely available software (Google Earth) for mapping the spatial extent and main contents of water-related research projects conducted by Commission members. Required inputs are to be provided in standardised template format capturing information such as kml/kmz files of projects of members, main aims and objectives, duration, funding agency and associated publications. The compiled GE database will be available on the website and open to all visitor aiming to initiate and facilitate collaboration with scientists working on similar projects elsewhere, or on different projects in the same area.

*(v) Other*

In continuing with past activities envisaged collaboration also includes mutual research visits of members at their respective institutions including guest professorships, joint supervision of students, exchange of students and post-graduates, creating shared data bases, joined grant applications (e.g. of members from BRICS countries) etc.

In addition existing links to international bodies such as ICSU, WMO, IWRA, IMWA, UNESCO-IHP, ICOLD, IAEA are to be maintained and expanded.

Following a preliminary exchange of ideas on possible future projects proffs. Winde and Chang floated a couple of ideas for possible follow-up including the following:

HC:

1. Meetings: Organizing sessions at non-IGU meetings (e.g., AAG, AGU), reviewing abstracts and chairing sessions at those meetings.
2. Publications: Initiating a joint publication book on SDG 6 - Clean Water and Sanitation (how land use affect water demand and clean water supply) - an initial conversion going on with Springer
3. Collaborative Research: Compile and develop transdisciplinary water research ideas based on the commission interest and societal needs - a working group or task force can be formed with a regular meeting - bi-monthly or quarterly?
4. Membership: Mentoring early career scholars in another country (Ph.D. students and an early career scholar who obtained a PhD in the last 5 years)
5. Outreach: create a database or an interactive website for the IGU commission members. Who is studying where and on what topic. I think we might want

to initiate a google drive for the commission so that people can have access to those folders.

FW:

In addition to the input members provide in the form of assisting with organising meetings, especially our own non-IGU events, initiating, coordinating and leading joint publications in special issues etc., assisting with reviewing abstracts and chairing sessions relating to our own sessions at IGU-events we could perhaps consider some of the following activities:

- (1) Compiling a spatially represented database on research projects of Commission members using Google Earth or other-free-of-charge virtual geographic environments including a short project description, linked papers, photos etc. - perhaps with some access restriction on raw data if some feel the need for it (relates to the proposal above)
- (2) Conducting a gap analysis of literature and projects on water sustainability to identify topical and geographical niche areas for the Commission.
- (3) Create our own archive of pertinent open source papers and presentations by members on the website including teaching material on core concepts etc. to develop into a real resource for students worldwide, specifically in low-income countries
- (4) Compile a list of ideas with potential collaboration projects among members.

#### ***D. Publications***

In contrast to the previous practice of mainly publishing books the Commission in 2016 decided to increasingly shift attention towards supporting joint papers of members in peer-reviewed journals e.g. by mutually assisting each other with (language) editing, internal pre-reviews etc. The number of joint papers listed in this report is proof of the successful implementation of this strategy. In addition, we envisage to continue publishing Special Issues on selected topics like the three issues we managed to complete in the preceding period.

#### ***E. Website***

One of the challenges of any website is the need for frequent updates. Running parallel to normal work duties with support of no dedicated website administrator this can be challenging at times. Issues needing attention relate to the following:

- updating member profiles where affiliation or contact details changed and new publications appeared (e.g. at annual intervals)
- completing the archive of past meetings
- making more presentations given at meetings available on the website
- regularly updating publication records of members.

As part of branding the Commission the use of its logo by members is encouraged.

## **5 Summary and outlook**

Looking back at our activities over the past four years and the formal as well as informal feedback we receive from members, IGU executives and external observers we can safely conclude that the Commission lived up to its own objectives and expectations of members.

In going into the next cycle with a newly constituted SC I would like to encourage all members to share possible ideas on how to further improve what we are doing and actively shape the way in which the Commission operates. And, of course, advertising our work among colleagues and professional networks to increase our relevance and impact attracting new members keen to actively participate in work of the Commission.

I look forward to receive your ideas and to see many of you in virtual as well as physical meetings soon again.

Until then stay safe and healthy,

Frank Winde