

International Association of Hydrogeologists  
**COMMISSION ON GROUNDWATER & CLIMATE CHANGE**  
**IAH-CGCC**



**ANNUAL REPORT 2019**

**Chairs**

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IAH-CGCC website: <https://gwclimate.iah.org/>

**1. IAH-CGCC Aims**

The mission of the IAH Commission on Groundwater and Climate Change (IAH-CGCC) is: **to improve understanding of (1) the relationship between groundwater and climate change, and (2) the role of groundwater in adaptation to climate variability and change.**

The IAH-CGCC will seek to fulfil its mission by:

1. promoting related research and development to advance scientific and technical knowledge;
2. fostering inter-disciplinary, international collaborations among universities and research institutions, water resource managers, and water policy makers;
3. fostering linkages with related research and development activities in climate, hydrological, agricultural and health sciences;
4. engaging with key international organisations, agencies and programmes (*e.g.* UNESCO-IHP, WMO, FAO, UNICEF, WHO, IAEA-WRP, GEWEX, GWSP)
5. working with the International Groundwater Resources Assessment Centre (IGRAC) to promote the development of a programme and facility for the collection, evaluation, archiving and sharing of groundwater data including both ground-based observations and satellite measurements;
6. identifying and evaluating a series of representative case studies illustrating the relationship between groundwater and climate change and the role of groundwater in adaptation to climate variability and change;
7. disseminating research and development outcomes to the global research community including specifically the IPCC, and global development community including governmental and non-governmental organisations and those specifically concerned with enabling adaptation to climate change; and
8. creating awareness of the IAH-CGCC among IAH members, related professions and wider water resources and water supply communities.

## 2. Progress on IAH-CGCC objectives during 2019 through:

### 2.1 Knowledge dissemination initiatives – projects and programmes

- The new website of IAH-CGCC was launched early 2019. This was announced through the IAH communication channels and by a personalized email to current members of the Commission. It received many enthusiastic responses and requests from new members to join the IAH-CGCC. The website itself has information on the commission, its history (*in preparation*), its current members and their profiles (LinkedIn, ResearchGate) and contacts, links to other networks, commissions and organizations, challenges addressed by the commission, news and events, and relevant publications. Other components to be added, besides the commission's history, are opportunities, ideas and ongoing activities in which the commission is involved.
- The annual meeting of IAH-CGCC was held in Malaga (Spain) during the 46<sup>th</sup> IAH Congress, in September 2019. In this meeting the activities of the commission were presented to an audience of around 40 people. Among these, the following can be highlighted: Palaeogroundwater of INQUA (Jianyao Chen), Chronicles Consortium (Richard Taylor) and Groundwater and Global Change – Impacts and Adaptation (Tibor Stigter). During the congress networking was done and closer collaboration was sought with the IAH MAR commission.
- Tibor Stigter is coordinator of the International Joint MSc programme on Groundwater and Global Change – Impacts and Adaptation (GroundwatCh, [www.groundwatermaster.eu](http://www.groundwatermaster.eu)) offered by IHE Delft, TU Dresden and IST/University of Lisbon, as well as a large number of private and public associated partners. GroundwatCh has entered its second phase, with 80 more scholarships available (around 4M EUR, fifth edition of the programme currently running). The programme was labelled as “good practice” by the European Commission.
- Regarding the palaeogroundwater IFG (International Focus Group) of International Quaternary Union (INQUA), a GIS-based version of database on palaeoclimatic signals with more than 500 wells is being created. The Special issue of Quaternary International on palaeoclimatic signals from large aquifers is still on the review and modification process. A G@GPS session was organized in INQUA Congress in July in Dublin Ireland. Seven posters were given during the congress period, and one oral presentation “Understanding of Paleoclimate change and Pathways to Increasing Resilience in a Changing Climate among Urban Communities of Cox’s Bazar Municipality and its adjacent area, Bangladesh” was given by Ashraf Ali Seddique. In addition, G@GPS progress was presented in TERPRO meeting in Dublin. Furthermore, a proposal was submitted to Natural Science Foundation of China (NSFC) and Israel Science Foundation (ISF) on “Groundwater age and paleoclimatic signals based on novel dating method of radioactive noble gases” in January 2019. This proposal was approved and is to be funded jointly during the period of Oct. 2019 and Sept. 2022 with Chinese PI Jianyao Chen, and Israeli PI Prof. Yoseph Yechieli.

- Regarding the Chronicles Consortium, an initiative of IAH-CGCC and UNESCO-IHP GRAPHIC, supported by UPGro (UK) and IRD (France), multi-decadal groundwater level time series (chronicles) were so far compiled from nine countries in Sub-Saharan Africa across an aridity gradient of humid to hyper-arid. Members from 13 countries in Africa and beyond co-produced analyses at workshops in Uganda, Benin & Tanzania. A paper was published by Mark Cuthbert and others in Nature.
- Contribution to WWDR 2020: Water and Climate Change

## **2.2 Contributions to international conferences**

2019, Jul	<b>20th INQUA Dublin (Ireland).</b> G@GPS session was organized, during which seven posters and one oral presentation were given.
2019, Sep	<b>46th IAH Congress “Groundwater Management and Scarcity – Coping with Water Scarcity”, Malaga (Spain).</b> Tibor Stigter was involved in Scientific Committee. Topic 2 on “Groundwater and Climate Change” had a total of six sessions, 30 oral presentations and 13 poster presentations. There were 14 contributions from alumni of the International Joint Master Programme on Groundwater and Global Change – Impacts and Adaptation.
2019, Dec	<b>EIP Water Conference on Accelerating action to tackle water pollution and enhance EU preparedness to water-related climate change impacts, Zaragoza (Spain).</b> Tibor Stigter was invited to give a talk on “Sand river recharge and storage - opportunities and challenges in semi-arid Africa” at the Workshop on “Managed aquifer recharge as a real climate change adaptation mechanism. Examples and indicators from five countries”.
2019, Oct-Nov	<b>20th WaterNet/ WARFSA/GWP-SA Symposium, Johannesburg (South Africa).</b> Special Session on “The present and future of alluvial aquifers as nature-based solutions for enhancing rural livelihoods in (semi-)arid Africa.”, organized by IHE Delft under the A4Labs Project ( <a href="https://a4labs.un-ihe.org">https://a4labs.un-ihe.org</a> )

## **2.3 Publications**

- Taylor et al. (2019) Topical Collection: Determining groundwater sustainability from long-term piezometry in Sub-Saharan Africa. *Hydrogeology Journal* 27:443-446
- Cuthbert et al. (2019) Observed controls on resilience of groundwater to climate variability in sub-Saharan Africa. *Nature* 572: 230-234

- Various authors (2020) Palaeoclimatic signals from large aquifers. Special issue of Quaternary International
- Co-authorship of IAH Strategic Overview Series on Climate Change Adaptation & Groundwater ([https://iah.org/wp-content/uploads/2019/07/IAH\\_Climate-ChangeAdaptationGdwtr.pdf](https://iah.org/wp-content/uploads/2019/07/IAH_Climate-ChangeAdaptationGdwtr.pdf))

## **2.4 Engagement with international programmes and scientific agenda:**

Besides looking at climate change impacts on groundwater, the importance of drivers such as population growth, development, urbanisation and changing dietary preferences in large emerging countries, which all lead to increased (ground)water demand, also merit attention within the activities of IAH-CGCC, as does the role of groundwater in adaptation. For this reason, contacts are sought with other relevant commissions within IAH, such as the Commission on Managing Aquifer Recharge, as well as with international programmes (e.g. UNESCO GRAPHIC), organizations (e.g. IGRAC) and networks (e.g. IWRA, ECHN). A few examples:

### **(i) INQUA and IGCP**

- IAH-CGCC Co-chair Jianyao Chen serves also as INQUA IFG Palaeogroundwater leader, which enables the close communication between INQUA, IGCP and the IAH and contributes to the Commission with knowledge of global change from large aquifers.

### **(ii) International Groundwater Resources Assessment Centre (IGRAC)**

- IAH-CGCC and IGRAC are involved in joint activities including awareness raising, knowledge dissemination and MSc supervision.

- IGRAC hosts the website for *The Chronicles Consortium* and acts as the portal for a pan-African dataset of multi-decadal groundwater-level records recently compiled under this initiative.

### **(iii) IAH Commission on Managed Aquifer Recharge**

- Close collaboration within the GroundwatCh Joint MSc programme

- Joint participation in events (e.g. EIP Water Conference on Accelerating action to tackle water pollution and enhance EU preparedness to water-related climate change impacts)

### **(iv) Inter-governmental Panel on Climate Change (IPCC)**

- IAH-CGCC members have contributed as external reviewers to the IPCC 6th Assessment Report

### **(v) International Water Resources Association (IWRA)**

- Joint organisation of online conference on “Addressing Groundwater Resilience under Climate Change”, 28/29 October 2020

Tibor Stigter, Jodie Miller & Jianyao Chen  
IAH-CGCC Co-Chairs