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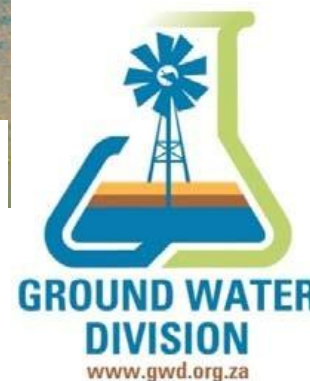


IAH
SOUTH
AFRICA

SPECIALIST DIVISION OF THE GEOLOGICAL SOCIETY OF SOUTH AFRICA

GROUND WATER DIVISION

QUALITY | SUPPLY | MANAGEMENT | SUSTAINABILITY



Professionals for the responsible management and development of groundwater

The Ground Water Division aims to serve the groundwater community in southern Africa, for the advancement of the science and technology of groundwater, and to promote the efficient use of groundwater and professionalism throughout the groundwater industry.

Annual Report to Membership 2018/19

from Period May 2018 to December 2019

EXECUTIVE COMMITTEE

The duties of the Executive Committee are to manage the affairs of the Division in the interest of the Members of the Division and in accordance with the GWD Constitution and the Roles and Responsibilities guidelines as set out in the Addendum.

The Executive Committee serves for one term (2 years) and can be re-elected limited to one consecutive term only.

2019 was Election year and nominations for the new term

2020/2021 Executive Committee opened in May 2019.

Only Good Standing members were eligible to nominate and be nominated. After receiving all nominations (a total of 26 individuals were nominated and seconded), and concluding the process of inviting the Nominees to accept their nominations, the GWD opened the ballots with a total of 13 Candidates. The final results were announced at the 2019 GWD Conference Cocktail that followed after the GWD AGM at the Ground Water Conference in October 2019.

THANK YOU TO THE 2018/19 EXECUTIVE COMMITTEE

NATIONAL COMMITTEE

Dr. Matthys Dippenaar (University of Pretoria) - *National Chairperson. Dr. Dippenaar was re-elected as National Chairperson for a second term.*

Mrs. Nicolette Vermaak (Department Water and Sanitation, Belville) – *National Vice-Chair*

Mr. Yazeed van Wyk (Water Research Commission) - *National Treasurer*

Mr. Sakhile Mndaweni (Department Water and Sanitation, Pretoria) – *National Secretariat*

Mrs. Elanda Schaffner – *Appointed Service Provider, National Coordinator*

Branch Representatives on the Executive Committee:

Central Branch Chair: Mr. Gawie van Dyk (Department Water and Sanitation)

Eastern Cape Branch Chair: Mr. Gert Nel (SRK)

Gauteng Branch Chair (est. 2017): Ms. Nelda Breedt (Aquatico)

KwaZulu-Natal Branch Chair:

Mr Mark Schapers (JG Afrika) - Mr Schapers was re-elected as KwaZulu-Natal Chairperson for a second term.

Limpopo Branch Chair:

Mr. Duncan Munyai (Private Consultant) - Mr Munyai was re-elected as Limpopo Chairperson for a second term.

Western Cape Branch Chair:

Dr. Jaco Nel (University of the Western Cape)

The International Association of Hydrogeologists (IAH) South Africa National Chapter Chair:

Mr Julian Conrad (GEOSS) – *The IAH-SA Chairperson as from 2017 a permanent co-opted member to the GWD Executive Committee as minuted and accepted at the 2017 GWD AGM:*

The IAH is the 'International link' not only to worldwide events but also to international working groups.

CONGRATULATIONS TO THE NEWLY ELECTED 2020/21 EXECUTIVE COMMITTEE

NATIONAL COMMITTEE

Mr. Fanus Fourie (DWS) - National Chairperson

Mrs. Nicolette Vermaak (IGS) (re-elected)

Mr. Yazeed van Wyk (WRC) (re-elected)

Dr Jaco Nel (UWC) (re-elected)

Branch Representatives on the Executive Committee:

Central Branch Chair: **Dr Amy Allwright (UFS, IGS)**

Eastern Cape Branch Chair: **Mr Etienne Mouton (Hallowed Ground Consulting)**

Gauteng Branch Chair: **Mr Kwazikwakhe Majola (DWS)**

KwaZulu-Natal Branch Chair/ GAKZN Representation:
Mr Pieter Labuschagne (GCS)

Western Cape Branch Chair: **Dr Sumaya Israel (UWC)**

In 2019, the incorporation of the Limpopo Branch and planned North- West branch was incorporated into the establishment of a new **NORTHERN branch**:

Prof Ingrid Dennis was elected to take the lead in the establishment of this Branch.

Co-opted position:

The International Association of Hydrogeologists (IAH) South Africa National Chapter Chair: This will remain **Mr Julian Conrad** until a new elected IAH Chair will take it further.

Co-opted position:

Professional Portfolio seat. A Professional Panel (Chaired and Represented on the EXCO Body by the Immediate-Past GWD Chair- **Dr Matthys Dippenaar**) will be called together. This will ensure succession planning, contingency and also a stronger and committed Professional reference group/ panel etc.

GWD MEMBERSHIP

The Division strategically focuses on **individual** membership. The current GWD membership Categories are Honorary -, Professional -, Ordinary -and Student membership:

HONORARY MEMBERS are individuals whom the Division, through the Executive Committee, desires to honour for outstanding service in the field of ground water. The Division also confer Honorary Life Membership on these members for their

meritorious and outstanding service and dedication to furthering the science and technology of ground water.

With the devastating loss of ten of the Division's honorary members in the last decade, the Division not only realises what a wealth of knowledge these individuals contributed to the sector, but also that our members are valued colleagues and loved friends and form deep connections where each plays a part in the strength of the Sector.

It is with great sadness that we take a moment to remember our late but certainly not forgotten Honorary Members:

Dr Thomas Steyn Kok (1919 – 2013)

Prof Gerrit van Tonder (1953 -2014)

Mr Johannes Roelf Vegter (1925 – 2016)

Mr Siep Talma (1944 - 2016)

Dr Johan van der Merwe (2017)

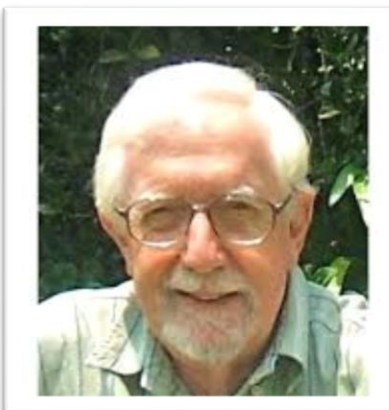
Mr Wilhelm Ernst Bertram (1951 – 2018)

Mr Philip Hobbs (1954 – 2018)

Prof Balt Verhagen (2018)

Prof Frank Hodgson (2019)

FAREWELL TO GWD HONORARY MEMBER PROF BALT VERHAGEN (2018)

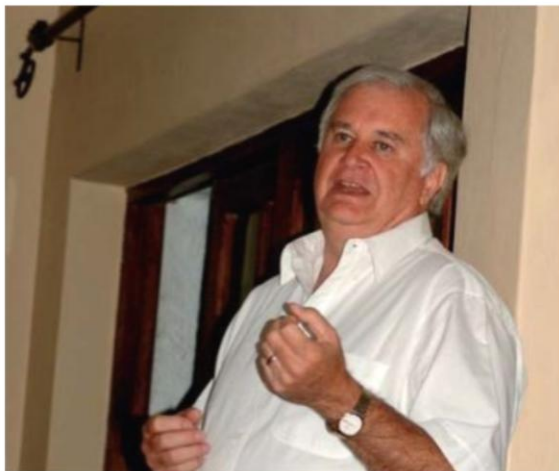


We were deeply saddened by the news that **Prof. Verhagen** passed away on Tuesday, 21 August 2018. The unexpectedly loss of a much beloved colleague, friend and mentor left us all with great sorrow, but also sharing in the

celebration of a good life lived and an immense contribution made to the Science he so much loved. Rest in Peace dear Prof.

FAREWELL TO GWD HONORARY MEMBER PROF FRANK HODGSON (1943-2019)

In memory of an Industry giant: A grand master of his trade and much loved and respected leader within the Ground Water Sector.



Prof. Frank Hodgson, former head of the IGS, retired after more than 30 years of service in this position. The photo was taken during his farewell function.

It was with great sadness that the GWD learned of the passing of one of its Honorary members, Prof. Frank Hodgson. Prof Hodgson was awarded the Ground Water Division of the Geological Society of South Africa Groundwater medal, as far back as 1988, for his significant contributions to the advancement of groundwater in South Africa.

Prof Hodgson and his wife Rene were on tour in France, when a sudden heart attack struck and despite efforts from the emergency response teams, Prof Hodgson sadly succumbed. Condolences and heartfelt messages were streaming in from across the globe, and the local press announced on various platforms the sad news of his passing. He is survived by his wife Rene, two daughters Minette and Renata and two grandchildren.

Prof Hodgson is lauded as the founding father of the Institute for Groundwater Studies (IGS) at the University of the Free State in 1974 and became its' first Director where he served in that leadership role for 30 years. In 2004, the UFS also rewarded him with a centenary medal for his entrepreneurial management of the IGS.

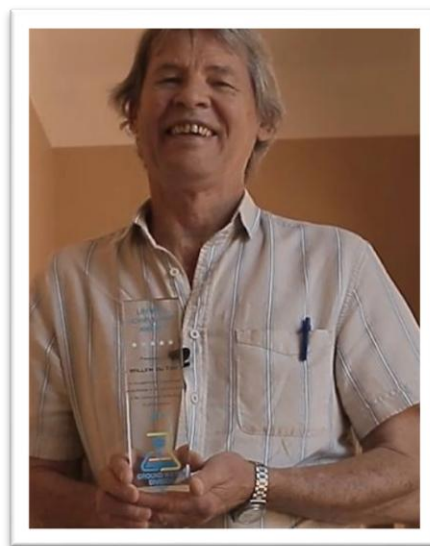
IGS noted *"The nine indigenous trees that Prof. Hodgson planted in front of the IGS building will always bear witness to the fact that he was not only a brilliant scientist, but also deeply involved in environmental concerns."*

The trees he planted are surely also symbolic of the life, stability and growth he ensured within the industry. ..And we all will benefit of the huge shade you left us to further grow and nurture the past and present students and professional geohydrologists in South Africa.

Thank you Prof.

Rest in Peace.

The Division also wish to make special mention of its newly bestowed 2019 Honorary Awards:



Newly Awarded GWD Lifetime Achievement Award (2019 Conference): **Mr Willem du Toit**

Full interview available on

<https://vimeo.com/367268476/0a8545094a>

*The recipient of the 2019 GROUND WATER DIVISION
INSTITUTIONAL EXCELLENCE AWARD.*



In 2019, the GWD also actioned the 1st Institutional Award to an organization in recognition of outstanding service and dedication to

furthering the science and technology of groundwater through research excellence.



Dr Shafick Adams received the award on behalf of the **WATER RESEARCH COMMISSION**

The current 2019 Honorary members of the Division are:

Mr Willem du Toit (GAU), Dr Shafick Adams (GAU), Isa Thompson (GAU), Prof Jopie Botha (Central), Prof Eberhard Braune (GAU/WCAPE), Dr Kym L Morton (GAU) and Dr Gideon Tredoux (WCAPE).

PROFESSIONAL MEMBERS are members who specialize and practice in groundwater specific fields, have a recognised qualification and are professionally registered with SACNASP. They may be officials of various state departments, academics, consultants or any other individual, but are required to be (a) registered with SACNASP and (b) subscribe to both the SACNASP and GSSA Code of Conduct.

By law, SACNASP membership is required to practice in a particular field of natural science. As from 2017, all registered SACNASP members in Earth Science, Geological Science and Water Resources Science (the fields groundwater practitioners can currently register under), will require Continuing Professional Development credits to enable renewal of SACNASP membership. Professionals need to accumulate 25 credits per five-year cycle (3 credits annually where 1 credit is 10 hours = 30 hours p/annum). These CPD's can be issued by **educational institutes**, training providers and/ or **voluntary natural scientific associations**.

The GWD, within the ambit of the Geological Society of South Africa voluntary organisation status, is now formally recognised and registered by SACNASP to evaluate and award CPD accreditation in all groundwater related applications. To date a number of activities had been CPD accredited and the process are now streamlined.

The Division has a total of **244** Professional Members registered of which **77** are **paid-up active 2019 members**.

The following SACNASP Field of Practices (FoPs) are represented with the majority of members registered for one FoP, with some up to 3 FoPs.

	2018	2019
Earth Science	59	96
Environmental Science	2	11
Geological Science	18	27
Water Resources Science	20	35
Other: Aquatic Science, Chemical Science Agricultural Science, Natural Science	2	40
Other: Pending queries		35

The GWD website, is envisioned as a GWD professional yellow pages, listing its **professionals available to consult in the areas of:**

Geographical Information Systems, Geochemical Modelling, Numerical Groundwater Flow and Transport Modelling, Ground Geophysics, Unsaturated Flow Hydraulics, Oil and Gas (hydrocarbon assessment), Remediation, management and monitoring of contaminated sites / land, Groundwater Quality Monitoring and Assessment, Surface- and Groundwater Interaction/modelling, Groundwater Impact/Resource Assessment, Groundwater Reserve Determination, Groundwater Resource Quality Objectives, Seepage Modelling, Groundwater exploration and development, Aquifer recharge, Tailing Dam Hydrogeology and Geochemistry, Groundwater Governance and Management

To some sublevel, also available: Drilling, Pumping (and falling/rising head) Tests, Water reticulation and piping, Down the hole geophysics, Camera logging, Scaling and corrosivity assessment of water.

ORDINARY MEMBERS are members of the Division who are not SACNASP registered professionals in the groundwater field but have an interest, directly or indirectly, in all matters groundwater. This category includes hydrogeologists not (yet) registered with SACNASP. Ordinary members subscribe to the GSSA Code of Conduct.

The Division has a total of **218** Ordinary Members registered of which **45** are **paid-up active 2019 members**. Ordinary membership peaks in a Conference year. The GWD strives to offer continuous benefits for Ordinary membership in non-Conference years by exposure to regular sector event and sector related communications.

STUDENT MEMBERS shall be bona fide students who are registered at a recognised institution for higher education, are studying groundwater and who are under the age of 26. These members may be required to assist in the running of national and regional GWD conferences, seminars or courses. Student members subscribe to the GSSA Code of Conduct.

The Division has a total of **309** Student Members registered of which **20** are **paid up members**. The Division audited its student membership as a number of individuals graduated and therefore were not eligible for student membership. New information for these students are obtained and upgrades to Ordinary membership is pending. Students that are confirmed are sent a membership invoice.

BRANCHES

Membership/ Branches	Central	ECape	Gauteng	KZN	Limpopo	WCape	TOTAL GWD
Total GWD DB	100	59	378	40	29	173	779
Professional	23	15	122	19	10	55	244
Ordinary	24	18	111	17	6	42	218
Student	51	26	141	4	13	74	309
Honorary	2	0	4	0	0	2	8
Paid-up 2019	19	16	56	18	4	33	146

Update from the Branches

The Central Branch of Ground Water Division incorporates members from the Free State, Northern Cape and North West Provinces.

Chair: G van Dyk. From the Branch members the following members volunteered to serve on the GWD Central Branch Committee: Danita Hohne (Immediate past-chair), Ferdi Goussard (Communication); Jan Makhetha, Gawie van Dyk (Technology); Eelco Lukas, Amy Allwright (Events). The branch hosted a Member event in July 2019 in Bloemfontein. This CPD event focused on a few presentations with local groundwater content followed with social interaction and mobilisation for the 2019 GWD conference in Port Elizabeth. *Refer to the 'Activities of the Year'*

The Eastern Cape Branch of the Ground Water Division incorporates members from the Eastern Cape.

Chair: Gert Nel

The Eastern Cape Branch hosted the 2019 Groundwater Conference and Exhibition in Port Elizabeth in October 2019.

Refer to the 'Activities of the Year'

The Gauteng Branch of the Ground Water Division incorporates members from Gauteng and Mpumalanga. Chair: Nelda Breedt

This branch hosted a Membership Event with local Honorary members and Industry professionals sharing past experiences and future trends, in May 2019. *(Refer to the 'Activities of the Year')*

The KwaZulu-Natal Branch of the Ground Water Division incorporates members from this region and in close partnership with the Groundwater Association KwaZulu-Natal (GAKZN).

The GAKZN is an existing representative body for sector roleplayers and I&A parties in the region. The GWD and the GAKZN solidified its partnership by hosting combined events in 2018. The recent Local Election for the GAKZN were concluded

and Mark Schapers stepping down with Pieter Labuschagne taking the leadership role forward for 2019/2020.

The GWD interest will be mediated by March Schapers until the full run of the GWD term conclude in Dec 2019.

Mark Schapers continues his involvement and support in a number of initiatives (e.g. Lake Sibiya) that receives much press in local media.

The Limpopo Branch of the Ground Water Division, Chair: Duncan Munyai. This Polokwane-based branch has much potential with strategic projects that were successfully completed and much to build on further. This Branch now merged with members from the North-West into a new **Northern Branch**.

The Western Cape Branch incorporates members from this region. An active and energetic Branch with Dr Jaco Nel with the braai-tong and Marlese Nel with the pen in hand. This branch has a strong liaison with local membership and organisations of note. Western Cape hosted the 2019 FIELD SCHOOL (July 2019) and was central in arranging the professional Pest Modelling Course that was presented as the pre-Conference course in October 2019.

The GWD and IAH-SA branch also hosted a Farewell to Mrs Nicolette Vermaak that moved from Western Cape Water Affairs where she had been working for a number of years to the University of the Free State. The Region thanked and recognised her contribution.

Refer to the 'Activities of the Year'

ACTIVITIES FOR THE YEAR

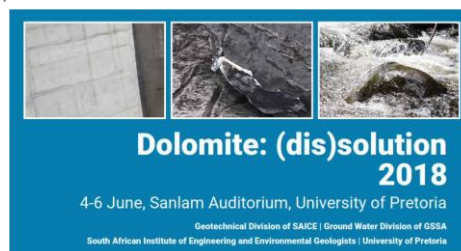
Dolomite: (dis)solution 2018

4-6 June, Sanlam Auditorium, University of Pretoria

Geotechnical Division of SAICE | Ground Water Division of GSSA

South African Institute of Engineering and Environmental Geologists | University of Pretoria

GWD/ ECSA CPD EVENT



Resilience to geological and hydrological hazards in dolomitic terrains is increasingly affected by climate change, rapid urbanisation and unforeseen implications of development during and after construction. The influences of the bedrock properties, karst development, hydrology and proposed development all

affect the potential risk posed by the development. Dolomite and karst research has a long history with the University of Pretoria. With the partnership of the relevant societies for geotechnical engineering, hydrogeology and engineering geology, new advances, technologies and techniques were showcased to a wide range of interdisciplinary professionals working in dolomitic terrains.

Focusing on urban environments and anthropogenic change, the interrelationship between proper understanding of subsurface water, geotechnical properties and resultant behaviour, and mitigation and engineering solutions were highlighted.

Following on the 2014 dolomite seminar, this seminar highlighted developments in the past years, new directions of thought, and a new paradigm for our ability to safely and optimally utilise both the dolomite land and dolomite water resources, while being able to mitigate risk, monitor change, and effect remediation diligently. With presentations focusing on building on the status quo, the seminar programme covered:

- Context, status-quo, risks and remediation of dolomitic land (Day 1)
- Legislation, governance and management, including the update of SANS 1936 (Day 1)
- Hydrogeological, engineering geological and geotechnical advances (Day 2)
- Field visits and karst dialogue (facilitated panel) (Day 3)

Honours Fieldschool 2018, Potchefstroom June 2018

Hosted by Dr Ingrid Dennis (NWU) on behalf of the GWD/IAH-SA

Students from the North-West University (NWU; Potch), University of Pretoria University of KwaZulu-Natal, University of Stellenbosch and University of the Western Cape attended the field school. Thank you to all involved Dr Matthys Dippenaar, Dr Molla Demlie, Dr Jodie Miller, Dr Roger Diamond and Dr Thokozani Kanyerere.



South Africa has a number of universities providing professional academic qualifications in groundwater and groundwater related

professions. Being a very practical discipline, hydrogeology requires a substantial amount of field and laboratory exposure for graduates. This can be very costly and is hard to achieve without placing the financial burden of field exposure on the students directly.

As such, the GWD and IAH teamed up to host the first ever combined field school for students completing their professional four-year degrees in groundwater-related subjects. The GWD agreed to host industry courses for professionals requiring continuous professional development (CPD) points with the professional registrar. Profits from this event, as well as some presenter honoraria donated back to the GWD, were used to fund the mobilization, accommodation, meals and study materials of 31 students from five universities across South Africa.

The North-West University opted to host this first field school, with the budget acquired through industry courses presented at the University of Pretoria. Students from the North-West University (NWU; Potchefstroom), University of Pretoria (UP; Pretoria), University of KwaZulu-Natal (UKZN; Durban), University of Stellenbosch (US; Cape Town) and University of the Western Cape (UWC; Cape Town) attended the field school 11-15 June in Potchefstroom with the course being presented by Prof Ingrid Dennis, Dr Rainier Dennis and Mr Nicolaus van Zweel from NWU, and Dr Roger Diamond and Dr Matthys Dippenaar from UP.

Students were exposed to field-based geophysical investigations, rotary percussion borehole drilling, borehole logging, hydraulic testing including slug-testing and pumping testing, groundwater sampling, and downhole camera.

Short lectures focused on specialist topics covered in varying detail in different syllabi presented by academics publishing on the topics. These included geophysics, vadose zone hydraulics, and isotope hydrology. Normal hydrogeological background normal was assumed, and the field school did not attempt to replace content fixed in different curricula of different institutions.

As the event was completely free for students, it was all inclusive and accessible to all. The only requirements for participation was involvement of the relevant university in the GWD as the primary funder of the event, the commitment of the university to contribute to this or future such field schools, and, if required, contributing to mobilization costs.

Feedback from UWC Students

Kamohelo Mokoena

On the behalf of all of the University of Western Cape students who attend the Winter Field School, we would like to thank you for this great opportunity.

As the Winter Field School has created a platform that allowed us to gain first-hand experience in hydrogeology. We were exposed not only the theory but the practical side of this field.

We appreciate the uniqueness of the programme it allowed us to further our knowledge and our skillset. The programme has also contributed to our individual honours research project by increasing our understanding to different components of hydrogeology.

Lastly we were able to network with students and professionals from different fields of hydrogeology, this was very exciting and informative.

King Regards, UWC Students

The event was an enormous success and highlights collaboration between tertiary academic institutions to the benefit of the profession without conflict of interest. Students made friends with future colleagues from other specialist disciplines, at other institutions, and from other cities. They learnt about new research from South African academics and broadened their horizons through exposure to state-of-the-art field methods.

Given the success and very positive feedback from this event, we are planning to host another in 2019, with universities in the city of Cape Town being prepared to host.

GWD WCape Symposium, 2 November 2018 Groundwater and The Drought: *Between a rock and a wet place.*

Hosted at the UWC, by Dr Jaco Nel and Marlese Nel
SACNASP CPD EVENT

The symposium consisted of one day with two (2) main sessions and a total of 68 delegates attended this event.



The current drought has left immense stresses on our water resources in various parts of the country, and especially in the Western-, Eastern- and Northern Cape. It was easy to see the impact on our surface water resources by the daunting pictures of especially the Theewaterskloof Dam when it reached a level of only 11% capacity. As the possibility of Day Zero crept closer, more and more

individuals, businesses and even local government hastily turned

to groundwater use. This led to an unprecedented increase in boreholes being drilled in the Western Cape. And in many cases, this “back door” water supply source has kept the front door open for businesses to stay economically feasible, for hospitals to secure essential services and for municipalities to continue to deliver water to its residents.

This increased demand for groundwater supply inevitably led to people asking questions; like ‘Will we destroy the groundwater source?’, ‘How much water can we abstract?’ and ‘Is the resource resilient to the drought?’. Very opposing views on the potential impact of the increased groundwater abstraction were publically expressed by various specialists. In this regard, the Department of Water and Sanitation imposed a 45% reduction in domestic and Industrial groundwater use and a 60% reduction in Agricultural groundwater use in Government Gazette 41381 on 12 January 2018 for the Breede Gouritz and Olifants Doorn water management areas in the province.

Which led to this one-day symposium, hosted by the Western Cape Branch of the Ground Water Division of SA (GWD) on 2 November 2018.

The only way to determine the extent of the impact of the drought on the groundwater resources is to have monitoring data; the hard numbers – no speculation of whether water levels dropped because of the drought or whether the amount of rainfall had an influence or not. To eliminate any speculation, the first session of the symposium was aptly titled “Show me yours, and I’ll show you mine”; referring to data sharing of course..

Dr Jaco Nel, Deputy Director of the Institute for Water Studies at UWC, and also the Chair of the Western Cape Branch of the GWD, opened the symposium with a question: Do we need to limit the use of groundwater in drought periods, or do we continue to use it?

Mr Fanus Fourie from the Department of Water and Sanitation: National Planning Directorate shared a statistical perspective on the monitoring data before and after the drought in the Western Cape. The lowest water levels ever measured (from 2008 to 2018) was recorded in June 2018, and levels are starting to recover from that level. Whether these lowest water levels represent a real impact largely depend how we define where exactly the bottom of the aquifer is.

Various hydrogeological consultants in the Western Cape not only attended the day, but also presented very recent and/or current data from groundwater resource assessment studies they are involved in. Some of the comments and conclusions about the impact of the drought on groundwater that all agreed on are the following

There is no drought impact on groundwater resources, but definitely a drought signature in how the aquifers respond to the change in precipitation.

- The drier cycles of 2003-4, 2011-12 are showing similar signatures as 2015-18.
- Groundwater recharge processes are different during the drought conditions, compared to “normal” precipitation.
- In 2018 we still experienced a below average rainfall season in large parts of the Western Cape, resulting in the drought signature still evident in the current groundwater level data.
- The data shared at the seminar suggested that large users of groundwater with monitoring data and continuous evaluation of the data were able to supply groundwater through the drought period without any significant impact on the water level trends.
- Although some good data available with private consultants and their clients, very limited data is available to DWS to assess the impacts of the drought or for researchers/other consultants to build upon.



Ms Candice Lasher-Scheepers, Principal Professional Officer, Geohydrology at the City of Cape Town's Bulk Water Supply Department announced an initiative by the CoCT and also pledged their commitment to put all groundwater data from any previous studies in the Metropole on the CoCT website to be accessible to any interested party. This will ensure that future studies do not duplicate previous ones that it is easier to collaborate data and compare historical trends with current trends and also that future hydrogeological projects use the same set of information as a starting point. Apart from sharing data, the second session of the day was titled 'Surprise Surprise!' and contained talks on unexpected revelations some of the attendees encountered during drilling or



(Picture: Two UWC-IWS students attending the symposium – Mr Angelo Johnson (left), current MSc Hydrogeology student and Mr Adolf October, UWC Alumni, GPT Consultants.)

monitoring of aquifer systems. This session induced some interesting discussions and challenged some of the fellow hydrogeologists' thinking about the hydrogeology of some areas in the Western Cape.

Various alumni of the EWS Department at UWC attended and contributed to the symposium, which is an indication of the successful hydrogeology mentoring and training students receive here, preparing them for the consultancy environment and to make a contribution to the knowledge pool of groundwater scientists in the Western Cape, and even in the rest of South Africa.

By Marlese Nel

Managed Aquifer Recharge (MAR) Workshop (IAH) 10-12 April 2019, STIAS, in Stellenbosch Field trip: Cape Flats Aquifer tour SACNASP/SAICE CPD EVENT

The MAR workshop held in Stellenbosch from 10 to 14 April was attended by 57 delegates. Most attending were from South Africa and we also had delegates from Namibia and Botswana attending the workshop. Russell Martin of WGA in Australia and Ricky Martin of Groundwater Africa presented the 3 day workshop which also included a Field trip to the Cape Flats Aquifer. Several companies sponsored and/or exhibited at the workshop. The three-day event was registered with SACNASP and ECSA for CPD points for the delegates that attended. –Deidre Cloete



The International Association of Hydrogeologists (IAH) South Africa hosted a Managed Aquifer Recharge (MAR) workshop held in Stellenbosch from 10 to 12 April 2019. The MAR workshop was organised by GEOSS, and attended by a total of 56 delegates from scientific and engineering consultancies and organizations, municipal and governmental institutions, as well as from several South African universities. Delegates were predominantly South African, with a few members of other southern African countries. The event was opened by Julian Conrad of GEOSS, president of IAH South Africa. Christine Colvin from WWF-South Africa gave context to the workshop by

addressing the overall concerns regarding water security in the changing climate, with particular emphasis on the growing importance of well understanding managed aquifers. Russell Martin of WGA in Australia and Dr. Ricky Murray of Groundwater Africa then presented the 3-day workshop, which included a Field trip to the Cape Flats Aquifer. Ten companies sponsored and/or exhibited at the workshop. The 3-day event was registered with SACNASP and ECSA for CPD points for the delegates.

Participants were guided through the scientific and technical pre-requisitions in assessing potential MAR applications, as well as further discussions on the requirements of MAR feasibility studies. This included key factors in understanding the availability and chemical requirements of the water sources and what MAR schemes to expect from different aquifer types and parameters. Also discussed were the determining factors on the financial success of MAR schemes and how these stacked up against their common competitors (typically desalination and water transfer schemes) and how to facilitate end-user concerns and hesitations in order to produce high quality MAR schemes that are well received and locally supported.

The workshop took a more detailed focus on the key technical issues associated with planning, feasibility assessments, authorisation, design, construction, operation, performance evaluation and management of MAR systems via boreholes and infiltration basins, two of the most common MAR methods applied worldwide. Case studies from Southern Africa and Australia were used to illustrate the focal areas of the workshop, how these are applied under different conditions and where improvements or changes could have been made in the testing phases and designs to improve the schemes.

Overall, the workshop was a huge success! MAR has gained a lot of international traction in the last few decades, as well more recently in South Africa and other African countries. This workshop was well-timed to inform those involved with planning and implementing potential MAR schemes in the near future, as well as the authorities whose responsibilities it will be to approve these schemes. The event enabled delegates to learn from start to finish what the potential of MAR is to large scale water users and providers, as well as facilitated discussions between consultants, clients and authorities on how to begin and proceed with these schemes within the South African legal framework.

by Camille Olianti (GEOSS)



Honours and Industry Fieldschool 2019, Cape Town June 2019

Hosted at the UWC, by Dr Jaco Nel and Marlese Nel
SACNASP CPD EVENT

Presenters 2019: Christian Steyn (NWU), Martin De Klerk (Cape Geophysics), Dr Matthys Dippenaar (UP), Candice Lasher-Scheepers (CoCT), Dr Jaco Nel (UWC), Christiaan Vermaak, Angelo Johnson (UWC), Steve Kalule (USK Environmental), Dr Kelley Reynolds (Eskom), Dr Gideon Tredoux (GWD Honorary)

Building on the successes of the annual Industry Field Schools (hosted in Gauteng in 2016-18) and the Honour Students' Field School (2018, hosted in Potchefstroom by the NWU), the GWD combined these events in 2019 where together delegates (2) and students (30) participated not only in field (*exploration, drilling, sampling*) to desk (*analyses, interpretation and reporting*) instructional sessions, but also heard from the industry experts and joined in the panel discussions to gain more insight into current, real-world issues such as contaminant hydrology, remediation, source protection, security of supply and much more.

This is an annual Course and aimed at those involved or interested in groundwater (or geohydrology) who wish to broaden their understanding of the fundamentals in the application of hydrogeological field work.

The next Field School will be hosted in Gauteng in 2020.





**Groundwater Symposium GWD Central Branch
IGS at UFS in Bloemfontein, 12 July 2019**
Hosted at IGS by the Central Branch Committee
SACNASP CPD EVENT

The GWD Central Branch, serving the greater Free State, North West and Northern Cape, invited all members and prospective members to join in this 1 day Symposium that was hosted at the University Free State, Institute for Groundwater Studies.

Presenters included:

Dr Eddy van Wyk, Golder Associates: The Application of Isotope Hydrology and Supporting Tracers in Subterranean Flow Studies
Mr Fanie de Lange, UFS IGS: Hydraulic Fracturing Research in the Karoo Basin

Mr Ray van Rensburg, Geotron Systems: AT Receiver: Pseudo science or a method worth investigating?

Mr Anton Lukas, IGS: Complexity versus Simplicity: A comparative analysis of complex geology in hydrogeological modelling



Presenters and Attendees at the GWD Central event. Dr Amy Allwright handing over gifts to the presenters

The majority of the world's current environmental problems can be traced back to industrialization. Issues such as climate change, groundwater contamination, unsafe levels of air pollution, toxins in rivers and soils, overflowing levels of waste on land and in oceans, and loss of biodiversity and deforestation are negative consequences of industrialization.

As the Fourth Industrial Revolution gathers pace, innovations are becoming faster, more efficient and more widely accessible than before. Technology is becoming increasingly connected, and we are now seeing a convergence of the digital, physical and biological realms. Emerging technologies, including the Internet of Things (IoT), virtual reality (VR) and artificial intelligence (AI) are enabling societal shifts by seismically impacting economies, values, identities and possibilities for future generations.

We have a unique opportunity to harness this Fourth Industrial Revolution – and the societal shifts it triggers – to help address environmental issues and transform how we manage our shared global environment. The Fourth Industrial Revolution could, however, also exacerbate existing threats to environmental security or create entirely new risks that will need to be considered and managed.

For seven consecutive years, water issues have ranked among the top five global risk factors in the World Economic Forum's annual Global Risks Report.³ In 2018, of those global risks perceived to have both the highest likelihood to manifest and the highest impact on the world in the next decade, all but one can be linked to water. Over this period of time, while other risks have emerged and disappeared – including the financial crisis and chronic diseases – water has remained.



GWD Gauteng Branch Mixer

29 August 2019, WRC Offices, the Well, Pretoria

"From the past - into the Future"

It is within this context that the GWD hosted a social event to highlight some of our past experiences in terms of lessons learnt, and how that can frame and inform our thinking and planning to adapt to these new changes.



Honorary members Prof Eberhard Braune and Dr Shafick Adams shared their experiences and ideas for the future, introduced by Ms Nelda Breedt. Gauteng Branch Chair 2018/19.

GWD/ IAH-SA Branch Event The Western Cape is Bidding Farewell to Nicolette Vermaak, 19 September 2019, UWC, Life Sciences Building

Nicolette presented the findings of her PhD research: The geohydrology of the West Coast, Langebaan – more to add to this fascinating puzzle.

A number of attendees joined in the Cheese and Wine networking and farewell event afterwards.



Nicolette Vermaak with Julian Conrad (IAH-SA) and Dr Jaco Nel (GWD WCape) at the Farewell function



Pre-Conference Course - Darcy Lecturer: Two Day Course with Optional Third Day: Principles and Practice of Model Calibration and Uncertainty Analysis

20-23 Oct 2019, Port Elizabeth, Beach Hotel

SACNASP CPD EVENT

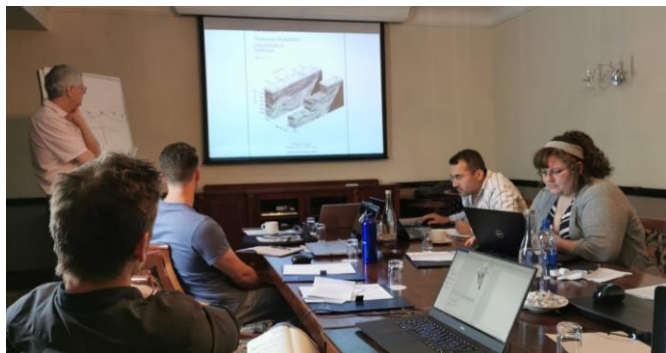
The course had two purposes. One of these were served on days 1 and 2 of the course. The third was served on the optional third day of the course.

The first two days of the course were devoted to explaining the principles and algorithms that underpin model calibration and calibration-constrained uncertainty analysis. Important by-products of this exploration are insights into what modelling can and cannot achieve, and what should, and should not, be asked of modelling when undertaken for decision support. The presentation was informal, with many real-world examples.

The third day of the course was for modellers who wished to learn more about using programs of the PEST and PEST++ suites in their modelling work. This included further details of PEST and PEST++ algorithms and behaviour, as well as advice on practical use of these programs.

Presenter

The course was presented by John Doherty, author of the PEST suite of software. John was also the 2019 Darcy lecturer. He has worked in the water industry as both a geophysicist and a modeller in a career spanning over 40 years. He has been employed by government, academic and consulting institutions. He presently runs his own company, Watermark Numerical Computing (of which he is the sole employee).



GWD ConfEx 2019, 20-23 Oct 2019, Port Elizabeth

Eastern Cape, South Africa – 16th Groundwater Bi-Annual Conference and exhibition
SACNASP CPD EVENT



The GWD Conference Chair, Gert Nel

On behalf of the Eastern Cape Branch of the Groundwater Division, we welcome each and every one to the 2019 Groundwater Conference and the beautiful city of Port Elizabeth. We trust that you will enjoy your time here and experience our Friendly City. The conference is about groundwater and we are all excited to discuss and share our knowledge on this crucial resource, but I also want to urge you to think about the groundwater user, from rural level to bulk supply. How can we help them to better understand this resource, to develop a passion for the conservation of groundwater. How can we, as scientists, help our colleagues in the water services and water management sectors to make their work a bit lighter? As scientists we try and understand nature, so that we can protect a water resource, but the fruits of our work must be enjoyed by the man/woman in the street, by small and large businesses. Our knowledge and research must provide the population of South Africa with some security that they will not run out of water, but it must also urge them to help in any way they can, because they want to!

The impact that a single water user makes by conserving water and preventing contamination, must not be underestimated.



We thank and acknowledge the following sponsors for their contributions:

Water Research Commission

Proceedings Sponsor



EDRS

Conference Goods

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JMA

Poster Session



Acknowledged student/ delegate sponsors:

SRK Consulting, Waterworks (PTY) LTD, NRF, GWD

MAJOR THEMES

Fundamentals of **Groundwater Drilling**
site selection, borehole construction and depths, pump testing, water quality testing.

Fundamentals of **Groundwater Management**

Recharge versus abstraction, groundwater monitoring, co-operation between private groundwater users and the water services providers/ authorities.

Fundamentals in **Water Conservation**

Bridging the gap between water availability and water use, efficient water usage (hardware and user education), addressing user expectations versus water availability.

Fundamentals in **Water Surety/ Security**

Key aspects to be aware of when your business, enterprise or institution

absolutely depends on the constant availability of water; in-depth look at current shortfalls in scientific research into water surety.

We thank and acknowledge the Exhibitors and Networkers at the Conference:

AQUATICO	HARSONIC
BLUTECH PROJECTS PTY LTD	SADC-GMI
DIGITAL BOREHOLE SURVEYING	SRK CONSULTING
EDRS	STEYNS DRILLING CC
GCS	TUCANA SOLUTIONS
GWD/GSSA/ IAH-SA	USK-HMA
GOODSPEED ENVIRONMENTAL SERVICES CC	WIMS
	WRC

Congratulations to the following attendees that received Awards at the Conference:

Best Oral Presenter: **Dr Amy Allwright (IGS)**

Best Oral presenter Student: **Anna-Lisa Vicente (SRK/UWC)**

Best Poster: **Jan Myburgh (AGES Omega)**

Best Poster Student: **Ashleigh Tomlinson (UWC)**

Best Exhibitor: **USK / HMA**

Best Networker: **BluTech**

Highlights at this Conference, apart from 76 individual presentations, included the two workshops hosted as plenary sessions:

- **Drilling Regulations Workshop.** Chaired by Gert Nel and Wandile Nomqophu (WRC) with presenters and panelists: Zachariah Maswuma (DWS), Mark Schapers (JG Afrika) and Derek Whitfield (EDRS)
- **Groundwater Conservation Workshop.** Facilitated by Etienne Mouton (Hallowed Ground Consulting) with presenters and panelists: Fanus Fourie (DWS) and Sivashni Naicker (DWS)

A new addition to the Conference was an OPEN DAY invitation to the public. This open day offered free access to the Conference Exhibition as well as an opportunity for attendees to ask pertinent and relevant borehole questions to a panel of experts.

The Conference was attended by 220 Conference Delegates.



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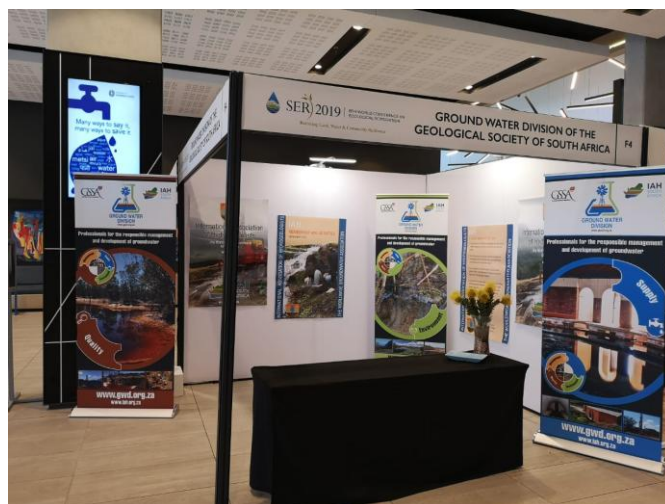
The GWD and IAH-SA jointly exhibited at the Southern African Development Community – Groundwater Management Institute (SADC-GMI) and the International Water Management Institute (IWMI) 1st Annual Groundwater Conference held under the theme “Adapting to Climate Change in the SADC Region through Water Security – A Focus on Groundwater”. The conference was hosted at Birchwood Hotel & OR Tambo Conference Centre in Johannesburg, South Africa, during 26–28 September 2018.

The GWD and IAH-SA jointly exhibited at the SADC-GMI 2nd Annual Groundwater Conference held under the theme “Groundwater Contribution to achievement of Sustainable Development Goals in SADC Region.” The conference was hosted in Johannesburg, South Africa, during 4 – 6 September 2019.



The GWD and IAH-SA jointly exhibited at the Society for Ecological Restoration (SER) 8th World Conference on Ecological restoration. The conference was held in Cape Town, South Africa, 22-27 September, 2019.

SER2019 connects researchers, practitioners, policymakers, industry professionals, and students with backgrounds in natural and social sciences, environmental engineering, urban and regional planning, natural resource management, public policy, and more. Conference sessions will foster knowledge sharing and debate around big-picture issues and trends, as well as specific tools, techniques, challenges, and strategies for ecological restoration around the world.



PUBLICATIONS



South African Journal of Geology (2019) 122 (3): 267-268.

Mathys Dippenaar; Shafick Adams
<https://doi.org/10.25131/sajg.122.0031>

UPCOMING EVENTS

**Honours and Industry Fieldschool 2020, Pretoria
13-17 July**

NATIONAL OFFICE UPDATE

The updated and much simplified GWD website went live in February 2019 in time to facilitate the Groundwater Conference online Registration. Phase I (migration) will slowly but surely flow into Phase II. Prof Eberhard Braune has been consulting on the current development of the GWD Conference Papers database. This database will launch as Phase II development.

FINANCIAL SUMMARY

Below is reporting on activities and balances from start of January to 13 December 2019.

Annual Report Financial Reporting (Jan 2019-13 Dec 2019)		
	Jan-19	Dec-19
Opening Balance Current Account	24,277.21	182,985.04
Opening Balance Investment Account	1,294,838.64	736,620.97
	2019	
	INCOME	EXPENSE
Designs/Website/Email and IT		26,025.06
Bank Charges		3,029.25
SP Retainer		77,675.00
Events 2019 - Branches	14,810.00	139,719.99
Events 2019 - Conference & PEST	1,012,328.79	1,228,306.62
Meetings/Travel Exco/Refunds		9,969.06
Advertising/ Sector Support	460.00	48,360.35
Membership	49,045.00	
Projects: Paper Database - Outsourced		12,600.00
	1,076,643.79	1,545,685.33

In memory of **PANNIE ENGELBRECHT** (1949-2019)

Pannie hailed from Namaqualand and initially joined the police force before switching to medical technology. He joined the CSIR some 40 years ago and started research on the application of sewage sludge to land and quantified the risks of bacterial and heavy metal contamination of vegetables. His research greatly assisted the Department of Health to draw up guidelines for the safe use of sewage sludge as a fertilizer on edible crops. It extended to the wider use of sludge for example on sports fields. In those early days he was also involved in desalination of brackish water and was stationed in Henties Bay Namibia for nine months to monitor the desalination experiments with the EDR technique on behalf of the CSIR.

Since the 1970s the CSIR was monitoring the seawater quality and the marine group was involved in dilution studies at sewage outfalls in the marine environment. Pannie carried out the monitoring of the bacterial quality of the water both at Green Point and at Hout Bay. The Hout Bay study extended over two decades before and after construction of the marine outfall and this served as excellent material for a D Tech study, a token of his perseverance.

As part of the groundwater group he carried out research on the impact of cemeteries on groundwater quality and provided guidance to many consultants on the placement of such facilities. Pannie also contributed significantly to a wide variety of groundwater projects, notably the study of the occurrence of nitrate in groundwater in Botswana, Namibia and South Africa. He also played a key role in the investigation of groundwater pollution at the massive cattle graves in Ngamiland, Botswana. His resourcefulness made him an ideal team member for carrying out any task.

Pannie also was a talented graphic artist and had the knack to do graphs and presentations in an innovative way. He assisted many colleagues with this task and with designing report covers. He will also be remembered for the finesse to prepare the meat expertly when he organized a braai.

We honour a special colleague and friend and are grateful that we had the opportunity to work together. His presence and especially his Namaqualand humour will be sorely missed.

Gideon Tredoux
23 July 2019

