



Making a difference - One drop at a time.

## MSc Proposal Defense Presentations go Virtual

Friday 21 May 2021

Keeping up with the changes associated with the COVID pandemic, first year MSc students presented and defended their research proposals over two sessions via the use of the zoom online platform in December 2020. These sessions brought together "food for thought" with the presentations consisting of diverse innovative topics that highlighted and covered several issues that impact and influence the hydrological cycle, earth's processes and society. The procedure for the MSc defense proposals commenced with an introduction of the topic by the projects supervisor, following the student's presentation a question and answer session was conducted, thereafter comments on the presentation was made by the audience. The first session of MSc defense proposals was conducted on the 10th December 2020. This session consisted of three MSc defense proposals Ms Khodani Khaku and Zama Ndlovu focused on using and improving modelling systems for design floods estimation. Whilst, the third by Ashvir Ramchandra looked at assessing techniques to improve the spatial representation of rainfall. The second session took place on the 18th December 2020 and the MSc proposal presenters included Sayuri Srikissan, Trisha Sukhdeo, Kivana Naidoo and Shanice Chetty. This session focused on projects that incorporated the use of Satellite Earth Observations or modelling systems to better understand and quantify various components of the hydrological system and their impacts on water resources management. The Q and A sessions clearly showed great interest in these research topics. Overall, from the attendance and interactive Q & A sessions it was recognized that the first attempt of having virtual CWRR MSc defense proposal presentations, was a successful event. *By Trisha Sukhdeo and Kershani Tinisha Chetty*



### The CWRR Newsletter

Welcome to the third issue of the CWRR Newsletter 2021. The Newsletter carries news and updates of the achievements and endeavors of CWRR's members, staff, associates and students.



The Newsletter is also available online at [CWRR.ukzn.ac.za](http://CWRR.ukzn.ac.za) For suggestions and queries, please email [HenrikssonR@ukzn.ac.za](mailto:HenrikssonR@ukzn.ac.za)

## Internet access for UKZN staff and students: What you should know

The South African National Research Network (SANReN) group has recently upgraded the link between all national universities and technical colleges from 10 to 100 gigabits per second (Gbps), which is similar to network speeds in Europe and the USA. This will reduce the time that researchers and students wait for big datasets to move between institutions. Eduroam is the secure, world-wide Internet access service that allows staff and students to access the Internet whilst visiting other universities in South Africa and across the world. Accessing UKZN's network via public WiFi available at hotels and conference/symposium venues can be unsafe. EduVPN solves this security problem by creating a secure, encrypted communication tunnel between your laptop/smartphone and the university. Download the Eduroam Companion and EduVPN apps from the Google Play or Apple store. *By Richard Kunz*

### Latest Publications

- ◆ Impact of Natural and Anthropogenic stresses on Surface and Groundwater Supply Sources of the Upper Awash Sub-Basin, Central Ethiopia. [Frontiers in Earth Science, 2021](#). B Birhanu, S Kebede, K Charles, M Taye, A Atlaw and M Birhane.
- ◆ Aquatic areas of ecological importance as inputs into surface water resource protection areas in Zambia. [Aquatic Conservation: Marine and Freshwater Ecosystems, 2021](#). N Rivers-Moore, B Paxton, F Chivava, L Katiyo, H Phiri, C Katongo, ML Thieme, B Lehner and S Linke.
- ◆ Adaptive and transformative learning in environmental water management: Implementing the Crocodile River's Ecological Reserve in the Kruger National Park, South Africa. [Koedoe, 2021](#). CA McLoughlin, ES Riddell, RM Peterson and J Venter.
- ◆ Climate variability affects water-energy-food infrastructure performance in East Africa. [One Earth, 2021](#). C Siderius, SR Kolusu, MC Todd, AG Bhave, AJ Dougill, CCJ Reason, DD Mkwambisi, JJ Kashaigili, J Pardoe, JJ Harou, K Vincent, NCG Hart, R James, R Washington, RT Geressu and D Conway.

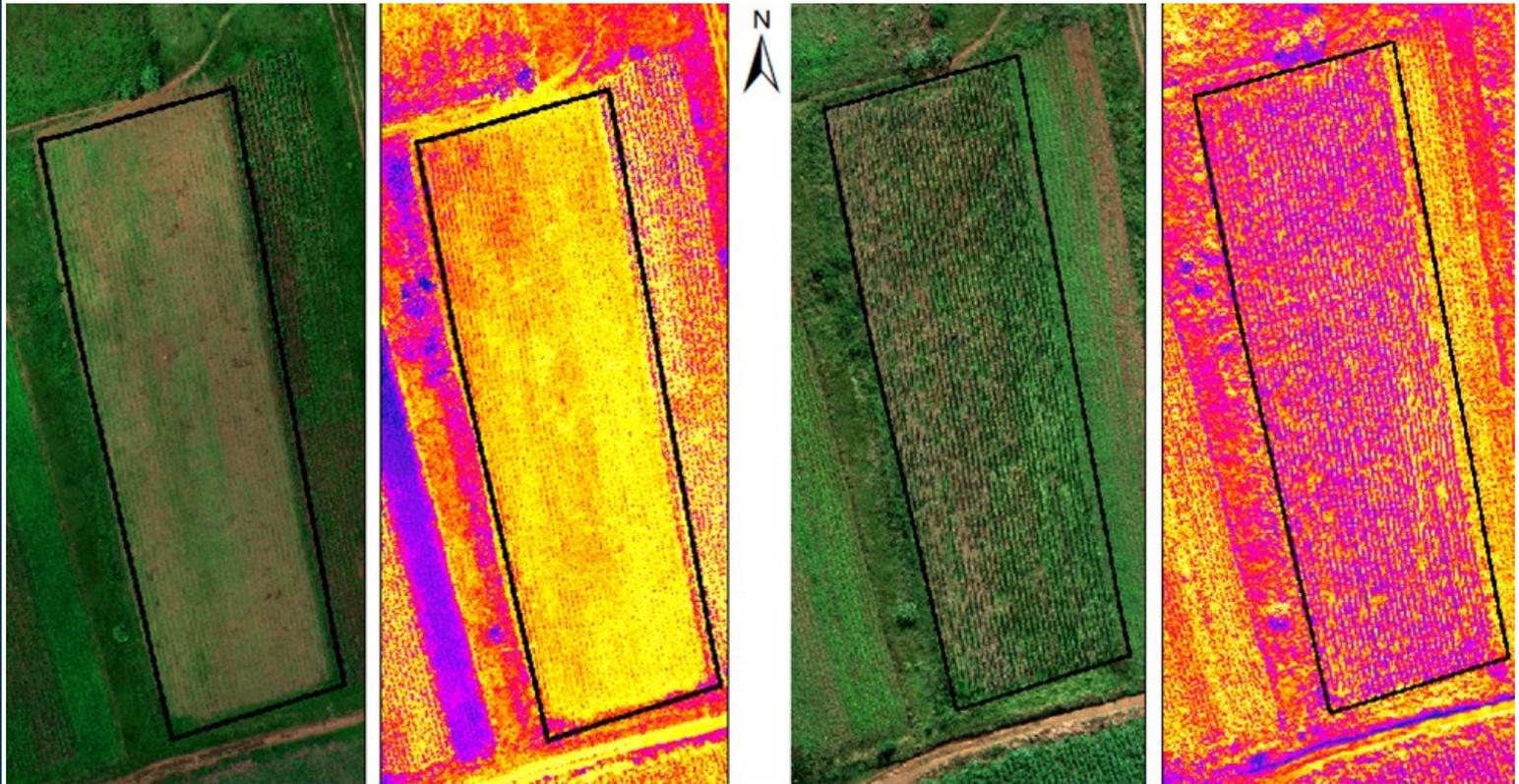


# Thermal imagery and canopy temperature captured using an unmanned aerial vehicle

## Citation milestone for Professor Roland Schulze

The Centre for Water Resources Research would like to congratulate Professor Roland Schulze on reaching 5000 citations and over 36 000 reads on [ResearchGate](#). More impressively, Professor Schulze currently has over 8400 citations according to [Google Scholar](#) with the most cited article i.e. the mid-90s South African Atlas of Agrohydrology and Climatology, being cited over 900 times. Congratulations on reaching yet another milestone.

Identifying potential crop water-stress is important in smallholder agriculture, as data informs farmers on implementing necessary irrigation schedules for their rain-fed crops. In our study, we assess water-stress through the proxy of canopy temperature. In-field temperature measurements are collected through the use of a handheld infrared thermometer (IRT) and mounted meteorological infrared radiometers (IRR). We measure maize canopy temperature, across the various growth stages to monitor temperature changes as the maize canopy forms. These field measurements are then correlated with the subsequent thermal drone imagery, and maize temperature is extracted from the high-resolution thermal image. We have found that canopy temperature did not correlate well at the young growth stages due to in-field measurements and drone data having a high soil background effect ( $R^2 = 0.5$ ). However, as the canopy formed temperature measurements correlated almost perfectly with the thermal drone image ( $R^2 = 0.9$ ). The results produced thus far suggest no water-stress and evidently suggest how drone applications are far superior to conventional satellite image applications. By K Brewer



Maize V5 (Young)

Maize R3 (Mature)

0 0.75 1.5 3 4.5 6 Meters