Dr JG CHIRIMA								
CONTACT PARTICULARS								
WORK ADDRESS:	Ge In: Pr 00 So	eoInformatics stitute for Soil, Climate ivate Bag X79 etoria 101 outh Africa	e and Water	TEL: (+27) 012 310 2672 Mobile: (+27) 820750910 E-MAIL: chirimaj@arc.agric.za ALTERNATE E-MAIL: chirimageorge@gmail.com FAX: (+27) 012 323 1157 ORCID 0000-0002-5784- 033X [Unbind]				
		PERS	SONAL DETAILS	l				
SURNAME			Chirima					
FIRST NAME	S		Johannes, George					
DATE OF BIR	тн		1968/07/24					
NATIONALIT	Y		South African Permanent Resident					
	-	LANGUAGE	PROFICIENCY					
Language	Readin	g	Speaking		Writing			
English,	Outstan	ding	Outstanding		Outstanding			
Spanish,	Exceller	nt	Excellent		Excellent			
		ACADEM		S				
Degree			Institution					
PhD			University of the Witwatersrand-RSA					
IVISC MSc			Indiana University-USA					
IVISC			University of Zimbabwe-ZIM					
MS.ED (Master of Science Education)			University of Havana-Cuba					
BSc (Hons)			University of Zimbabwe-ZIM					
		REGISTRATION 	WITH PROFESSION	AL BOD	Y			
Registered Professional Natural Scientist: (SACNASP): Reg. Number: 400348/12 South Africa Wildlife management Association Grassland Society of Southern Africa African Association of Remote Sensing of the Environment (AARSE); ID: 26921938								
		FIELDS OF SPEC	IALITY AND COMP	ETANC	E			
 Statistical and Ecological modelling Geographic Information Sciences (GIS and Earth Observation) Spatial Statistics Big Data Analytics Drought assessments Applied Animal Ecology 								
Kev Skills								

 Geoinformation Remote sensing Statistical and E Big Data Analyti Natural resource Herbivore resource Herbivore resource Crop yields assepredictions Land degradation 	Sciences (GIS and Manag project cological modelling Propos cs Strateg es management Humar rce selection Progra ssments & [large n Drough on assessment	 Managing large international funded projects (e.g. UN work) Proposal writing Strategic planning Human and financial resources management Programme and project management [large research teams] Drought monitoring and mitigation 					
	TEACHING EXPERIENCE						
2018-present	University of Pretoria	Extraordinary lecturer					
2010-Present	Witwatersrand University	Research fellow					
2005-2010	Witwatersrand University	Tutor/Assistant lecturer					
2000-2005	Indiana University, USA	Assistant lecturer					
1996-2000	University of Zimbabwe	Tutor & Stand in lecturer					
	CURRENT STUDENT SUPERVISI	ON					
5 PhD 8 MSc 2 BSc (Hons)							
GRADUATED STUDENTS AT UP [2019-2021]							
Name	Degree	Status					
Zinhle Mashaba- Munghemezulu	PhD	(Thesis Submitted)					
Reletile Mangani	MSc	Completed					
Collette de Villiers	MSc	Completed					
Zinhle Mashaba	MSc	Completed					
Bongiwe Tshabalala	BSc Honours	Completed					
Janique Dustine Savy	BSc Honours	Completed					
Carli Kriek	BSc Honours	Completed					
Shaun Muirhead	BSc Honours	Completed					
RECENT PROFFESIONAL CAREER							
(years – most recent first)	(position)	(Organisation)					
2014-to present	Research Team Manager: GeoInformation Sciences	Agricultural Research Council					

2012-2014	Acting Programme Manager: GeoInformatics	Agricultural Research Council	
2011-2012	Senior Researcher: GeoInformatics	Agricultural Research Council	
2010-2011	Spatial data analyst & Landscape Ecology	Kruger National Park	
	External Examiner		
Since 2010-present	University of South Africa		
2011-present	Witwatersrand University		
2016-Present	Free State University		
2015-Present	KZN		
2013 to present	University of Pretoria		
2012 to present	University of Fort Hare		
	Recent Thesis/ Research Project examinations 2019-2021		
BSc Hons (projects)	30		
MSc	15		
PhDs	10		

RECENT SCIENTIFIC OUTPUT [5 – years]

Masiza, W.; **Chirima, J.G.;** Hamandawana, H.; Kalumba, A.M.; Magagula, H.B (2022). A Proposed Satellite-Based Crop Insurance System for Smallholder Maize Farming. *Remote Sensing. 2022; 14(6):1512.* <u>https://doi.org/10.3390/rs14061512</u>

Ngoepe, E, **Chirima JG**, Mohale, Mogano K, Suzuki T, Makita K, Sabeta, C.T. (2022). Rabies outbreak in black-backed jackals (Canis mesomelas), South Africa, 2016. *Epidemiology & Infection*. DOI: 10.1017/S0950268821002685

Nduku L, Kalumba AM, Munghemezulu C, Mashaba-Munghemezulu Z, **Chirima JG**, Afuye GA, Busayo ET (2021). Earth Observation Systems and Pasture Modeling: A Bibliometric Trend Analysis. *ISPRS Int. J. Geo-Inf*. 2021, 10, 793. <u>https://doi.org/10.3390/ijgi10110793</u>

Gurdak R, Dąbrowska-Zielińska K, Bochenek Z, Kluczek M, Bartold M, Newete SW, **Chirima JG**. (2021) Crop Growth Monitoring and Yield Prediction System Applying Copernicus Data for Poland & South Africa," *2021 IEEE International Geoscience and Remote Sensing Symposium IGARSS*, 2021, pp. 6564-6567, DOI: 10.1109/IGARSS47720.2021.9554744.

Dlamini M, **Chirima JG**, Sibanda M, Adam E, Dube T (2021). Characterizing Leaf Nutrients of Wetland Plants and Agricultural Crops with Nonparametric Approach Using Sentinel-2 Imagery Data. *Remote Sensing*. 2021; **13** (21):4249. <u>https://doi.org/10.3390/rs13214249</u>

Mashaba-Munghemezulu Z, **Chirima JG**, Munghemezulu C. (2021). Modeling the Spatial Distribution of Soil Nitrogen Content at Smallholder Maize Farms Using Machine Learning

Regression and Sentinel-2 Data. *Sustainability.* 2021; **13** (21):11591. <u>https://doi.org/10.3390/su132111591</u>

Masiza W, **Chirima, JG**, Hamandawana H, Kalumba A, Magagula H (2021). Linking Agricultural Index Insurance with Factors That Influence Maize Yield in Rain-Fed Smallholder Farming stems. *Sustainability*. 2021; **13** (9):5176.<u>https://doi.org/10.3390/su13095176</u>

Mashaba-Munghemezulu Z.; **Chirima, JG.;** Munghemezulu, C. (2021). Delineating Smallholder Maize Farms from Sentinel-1 Coupled with Sentinel-2 Data Using Machine Learning. *Sustainability*. 2021; **13** (9):4728. <u>https://doi.org/10.3390/su13094728</u>

Mashaba-Munghemezulu Z.; **Chirima, JG.;** Munghemezulu, C. (2021). Mapping smallholder maize farms using multi-temporal Sentinel-1 data In Support of the Sustainable Development Goals. *Remote Sens.* 2021, 13 (9): 1666. <u>https://doi.org/10.3390/rs13091666</u>

Dlamini M, Adam E, **Chirima JG**, Hamandawana H (2021). A remote sensing-based approach to investigate changes in land use and land cover in the lower uMfolozi floodplain system, South Africa. Transactions of the Royal Society of South Africa. 76 (3): 1-13. <u>https://doi.org/10.1080/0035919X.2020.1858365</u>

Dlamini M, **Chirima JG**, Nebo Jovanovic N, Adam E (2021). Assessing the Effects of Land Use on Surface Water Quality in the Lower uMfolozi Floodplain System, South Africa. Int. J. Environ. Res. Public Health 2021, 18 (2), 561. <u>https://doi.org/10.3390/ijerph18020561</u>

Kellner K, Mangani RT, Tshegofatso J.K. Sebitloane, **Chirima JG**, Meyer N, Coetzee HC, Malan PW, Koch J (2021). Restoration after bush control in selected rangeland areas of semi-arid savannas in South Africa. *Bothalia, African Biodiversity & Conservation*. 2021; **51** (1):1. <u>https://doi.org/10.38201/btha.abc.v51.i1.7</u>

Schmullius C, Urban M, Hirner A, C. Berger C, Schellenberg K, Ramoelo A, Smit I, Strydom T, **Chirima JG**, Morgenthal T, Melly B, Gessner U, Mashiyi N, Mlisa A, Kganyago M, Baade J (2020). Earth observation strategies for degradation monitoring in South Africa with sentinels – results from the SPACES 2 SALDi-project year 1. 978-1-7281-6374-1/20/\$31.00 ©2020 IEEE

Sabeta CT, Mohale D, Phahladira B, Ngoepe E, Van Schalkwyk A, Mogano K, **Chirima JG**, Suzuki T, Makita K (2020). Complete Coding Sequences of 23 South African Domestic and Wildlife Rabies Viruses. *Microbiology Resource Announcements*, 9 (38), pp. 1 - 3. <u>https://doi.org/10.1128/MRA.00621-20</u>

Adekunle Raimi[,] Ashira Roopnarain, **George J. Chirima**, and Rasheed Adeleke (2020). Insights into the microbial composition and potential efficiency of selected commercial biofertilisers. *Heliyon 6 e04342* pages 1-11. <u>https://doi.org/10.1016/j.heliyon.2020.e04342</u>

Masiza W, **Chirima JG**, Hamandawana H, Pillay R. Enhanced mapping of a smallholder crop farming landscape through image fusion and model stacking. *International Journal of Remote Sensing*. 2020; **41** (22):8739-8756. <u>https://doi.org/10.1080/01431161.2020.1783017</u>

De Villiers C, Munghemezulu C, **Chirima JG**, Tsele P, and Mashaba Z, (2020). Machine learning algorithms for mapping *Prosopis glandulosa* and land cover change using multi-temporal Landsat products: a case study of Prieska in the Northern Cape Province, South Africa. *South African Journal of Geomatics*. 2020; 9 (2):179-197

http://dx.doi.org/10.4314/sajg.v9i2.13

Mangani T, Coetzee H, Kellner K, **Chirima JG** (2020). Socio-Economic Benefits Stemming from Bush Clearing and Restoration Projects Conducted in the D'Nyala Nature Reserve and Shongoane Village, Lephalale, South Africa. *Sustainability*, 12 (12), pp. 1 - 15. <u>https://doi.org/10.3390/su12125133</u>

Siphokazi R Gcayi & **George J Chirima** & Samuel A Adelabu & Elhadi Adam & Khaled Abutaleb, (2019). Evaluating the Potential of Narrow-Band Indices to Predict Soybean Glycine Max L. Merr Grain Yield in The Free State and Mpumalanga of South Africa. Open Access Journal Of Environmental & Soil Science, Lupine Publishers, LLC, vol. 3(1), pages 265-278. DOI:10.32474/OAJESS.2019.02.000153

R. Maake, T.E. Masupha, **J.G. Chirima**, M.E. Moeletsi, P. Beukes. (2019). The Umlindi Newsletter: disseminating climate-related information for agriculture and natural disaster in South Africa. *Proceedings of the 35th South African Society for Atmospheric Sciences*. Pages 64-67.

Chirima, JG, Owen-Smith, N, Abd Elbasit, M and Nyamugama, (2018). Expansions and contractions of occupied range by large mammalian herbivores in Kruger Park, South Africa: a response to rainfall variability. *Biodiversity Int. J.* 2018: **2**:545–557. DOI: 10.15406/bij.2018.02.00111

Mashiane RA, Adeleke RA, Bezuidenhout CC, **Chirima JG**, Rhode OHJ (2018). Community composition and functions of endophytic bacteria of transgenic maize genotype- Bt maize. S Afr. J Sci. 2018; 114(7/8), Art. #2017-0018, pg. 88-97. <u>https://doi.org/10.17159/sajs.2018/20170018</u>

Sakuno Y, Yajima H, Yoshioka Y, Sugahara S, Mohamed A M, Adam E and **Chirima JG** (2018). Evaluation of Unified Algorithms for Remote Sensing of Chlorophyll-*a* and Turbidity in Lake Shinji and Lake Nakaumi of Japan and the Vaal Dam Reservoir of South Africa under Eutrophic and Ultra-Turbid Conditions. *Water* vol. *10: page 1-18* https://doi.org/10.3390/w10050618

Madodomzi M, Tsele P, Botai JO, Manyama P, **Chirima JG**, Monate T and Mnyengeza M (2018). Radiometric calibration framework for ultra-high resolution UAV derived orthomosaics for largescale mapping of invasive alien plants in semi-arid woodlands: *Harrisia pomanensis* as a case study. *International Journal of Remote Sensing* 2018,vol 39 pg. 5119-5140: DOI: 10.1080/01431161.2018.1490503

Mashaba Z, **Chirima JG**, Botai J, Combrinck L, Munghemezulu C (2018). Forecasting winter wheat yields using MODIS NDVI data for the Central Free State region. *South African Journal of Science*. DOI: <u>https://doi.org/10.17159/sajs.2017/20160201</u>

Mohamed, AMA, **Chirima, JG** and Knight, J, (2018). Evaluation of kinetic energy and erosivity potential of simulated rainfall using Laser Precipitation Monitor, by Meshesha, et al. (2016)" <u>Catena http://dx.doi.org/10.1016/j.catena.2017.04.021</u>

Submitted (2021-2022)

Mangani T, Kellner K, **Chirima JG**, Mangani R (2021). Restoring degraded semi-arid rangelands using brush packing as a sustainable and cost-effective method to improve

aboveground grass biomass after bush clearing (Submitted to Resources and Sustainable Utilization MDPI, Manuscript ID: sustainability-1481690)

Tsele P, Ramoelo A, Qabaqaba M, Mafanya M, **Chirima JG** (2021). Validation of LAI, Chlorophyll and FVC biophysical estimates from Sentinel-2 Level 2 Prototype Processor over a heterogeneous savanna and grassland environment in South Africa. (Submitted to Environmental Remote Sensing MDPI: Manuscript ID: remotesensing-1481184)

Reports (2021-20220

Chirima JG, R Tswai, J Malherbe, and Nciizah A (2021). BASELINE REPORT DESERTIFICATION, LAND DEGRADATION, LAND COVER CHANGE AND DROUGHT IN SOUTH AFRICA. Global Water Partnership

R Tswai, JG Chirima, C Dekker, S Newete , A Khaled, EC Van den Berg, MAM Abd Elbasit, A Nyamugama, JP Nell, and V Nkambule (2021). PHASE 2 OF DESERTIFICATION, LAND DEGRADATION AND DROUGHT (DLDD) LAND COVER MAPPING IMPACT INDICATOR OF THE UNITED NATIONS CONVENTION TO COMBAT DESERTIFICATION (UNCCD)

Recent Presentations (MAX 5)

- JG Chirima, (2021). Applications of the 4th Industrial Revolution to Natural Resources and Agriculture. The BIO Africa 2021 Digital Convention, 23rd -24th August.
- JG Chirima, R Tswai, J Malherbe, C Dekker, ZE Mashimbye, EC Van den Berg, M Abd Elbasit, A Nyamugama, JP Nell, and V Nkambule, (2017) Spurring a Transformation for Land Degradation, Drought, and Desertification monitoring in South Africa: A synthesis for the UNCCD framework. AfriGEOSS, Sunyani, Ghana
- George J. Chirima, (2018) What is the progress made in coordinating food security and agriculture activities under AfriGEOSS i.e. the AfriGEOSS Agriculture Monitoring (AfriGAM) Initiative. 2nd AfriGEOSS Symposium, 13 15 June 2017 in Sunyani, Ghana, hosted by the Earth Observation Research and Innovation Centre (EORIC), University of Energy and Natural Resources (UENR), Ghana.
- George J. Chirima, (2017) Earth Observation approaches for monitoring Land degradation in South Africa: A synthesis for the Department of Environmental Affairs UNCCD framework. The 37th International Symposium on Remote Sensing of the Environment, Tshwane, South Africa 8-12 May 2017
- George J. Chirima, (2016) Russia Satellite data modelling: the future tool for mitigating and adapting to Food Security and Food production challenges under a changing climate in semi-arid Africa, Presentation at Information for Meeting Africa's Agricultural Transformation and Food Security Goals (IMAAFS), Russia

Current Networking: Local, regional and international networks

Local & Regional collaborations:

The University of Pretoria, Centre for Scientific and Industrial Research [CSIR], North West University, Free State University, SANSA, University of the Witwatersrand, Kruger National Park, and University of KZN.

Active International collaborations:

- Earth Obseravtion: Friedrich Schiller University Jena, Germany;
- GEO & GEOGLAM: Geneva, Switzerland;
- Department at Institute of Geodesy and Cartography, Poland;
- Department of Geography and Earth Observation: Universite Catholique De Louvain, Belgium;
 Department of Environmental and Symbiotic Sciences, Rakuno Gakuen University, Ebetsu, Hokkaido, Japan
- Through these networks, exchange visits as well as training and research studies have been undertaken.

	1.	
		Professor Norman Owen-Smith
		Phone: +27 (011) 717 6454
REFEREES		Fax: +27(011) 403-1429
		e-mail: Norman.Owen-Smith@wits.ac.za
	2.	Dr Mark Keith
		Tel. +27 (12) 420 2569
		Fax. +27 (12) 420 6096
		e-mail: <u>Mark.Keith@up.ac.za</u>
		Centre for Wildlife Management
		Department of Animal and Wildlife Sciences
		Private Bag X20
		University of Pretoria
		South Africa, 0028
	3.	Dr. Michael H. Kesner
		525 Edgewood Avenue
		Indiana, PA 15701, USA
		001(724) 357-2309
		e-mail: <u>mkesner@iup.edu</u> or <u>mhkesner525@gmail.com</u>