CURRICULUM VITAE BENJAMIN WENTSEL VAN DER WAAL



PLACE OF BIRTH: ADDRESS: TELEPHONE: E-MAIL: CITIZENSHIP: MARITAL STATUS DRIVERS LICENSE HIGHEST QUALIFICATION PROFFESSIONAL REGISTRATION PESONALITY TYPE 15 February 1983, Pietersburg/Polokwane, South Africa 38 Bergview Road, Hilton, 3245, South Africa +27 84 740 7671 bvdwaal@gmail.com South African Married Code 8 (RSA) Category B PrDP PhD. SACNASP Earth Science (Pr. Sci. Nat. 127809) Architect (IntJ-A of the 16 Perosnality types) or Enneagram 5s

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INSTITUTION	QUALIFICATIONS OBTAINED:		
UNESCO-ISI, 2021	Sediment Transport Measurement and Monitoring Training		
	Workshop		
AulaGeo Academy, 2020	Hec-RAS and ArcGIS for Hydrologic Engineering		
GEO Data Design (Pty) Ltd 2018	Introduction to ERDAS remote sensing		
Land Rehabilitation Society of Southern	Practical course in the use of bio-engineering and Vetiver		
Africa (LaRSSA) and	grass		
Vetiver Network International (TVNI)			
2017			
Secolo Consulting Training Services	Flood control, land drainage and urban stormwater		
2016	management design workshop.		
Rhodes University (Grahamstown)	PhD in Geography-Sediment connectivity in the upper Thina		
2011-2014	catchment, Eastern Cape, South Africa. Supervised by Kate		
	Rowntree.		
Rhodes University (Grahamstown)	Basic conversational isiXhosa Level I		
2012			
International Association of	Landmap Intensive Course on Landslide Mapping		
Geomorphologists 2011			
PADI 2010	Open water diver		
Rhodes University (Grahamstown)	Tools for Wetland Assessment		
2009	Certified Short Course by Fred Ellery		

Makana Meadery 2009	Beekeeping Course Level I		
Eastern Wilderness School 2009	Pilot-Aircrew Survival Course		
Rhodes University (Grahamstown)	MSc. in Geography		
2008-2009	Thesis: The influence of Acacia mearnsii invasion on soil		
	properties in the Kouga Mountains, Eastern Cape, South		
	Africa. Supervisors: Prof K Rowntree & Dr J Gambiza		
Rhodes University (Grahamstown)	BSc Hons (Environmental Water Management)		
2007	Thesis: A study of sediment tracing applied to the Heuningnes		
	River, Kouga Catchment, Eastern Cape (Forbes Prize awarded		
	for best honours project)		
	Supervisor: Kate Rowntree		
	Courses covered: Integrated Water management, Water		
	Quality, Geographical Information Systems and Research		
	Philosophy and Methodology		
North-West University	BSc. (Courses covered: Botany, Geography, Environmental		
(Potchefstroom)	Science, Biochemistry, Microbiology, Statistics, Computer		
2004-2006	Science, Chemistry, Mathematics)		
Shangoni Management Services cc	ISO 14001 and Environmental Auditing		
10-14 Nov 2003			

Language Proficiency:

English (speak, read and write) Afrikaans (speak, read and write) Dutch (speak, read and understand) isiXhosa (basic conversational)

Computer literacy: Microsoft Office (Word, Excel, PowerPoint, Access);

GIS (ArcMap3/9/10 and QGIS); Google Earth; Pix4D; Agisoft Photoscan; CloudCompare; GNSS Solutions; Spin43; Zotero; Refworks; Statistica; R; GammaVision; TopComm; Solinst Levelogger; Hobo software; Spatsim; Mastersizer, Qreview, HEC RAS, Spatsim, Habflo.

Present occupation: Research Associate at the Geography Department, Rhodes University, South Africa. Projects include components of sediment dynamics, sediment monitoring, restoration planning, hydrology, hydraulics, environmental flow requirements and river channel change due to land-use change. Various consulting projects related to water resource development or sand mining and its effects on river-related geomorphology. I give guest lectures at Rhodes University and University of Mpumalanga. I present research work at various provincial, national and international conferences and meetings.

Research Interests: water management, geomorphology, fluvial geomorphology, wetlands, river ecology, environmental flows, hydrology and hydraulics, catchment management and erosional processes. The interest in understanding river systems and general ecological processes has led to experience in many locations across Africa (Kenya: Mara, Amala, Nyangores, Talek Rivers; Tanzania: Mara, Tobora, Tighite; Namibia: Zambezi and Kwando Rivers; Zambia: Kalungwishi River; South Africa - North West Province: Mooi and Vaal Rivers; Limpopo Province: Limpopo, Levuvhu, Mokolo Rivers and many headwater streams in the Soutpansberg; Eastern Cape Province: Thina, Tsitsa, Umzimvubu, Kei, Kouga, Heuningnes, Witteklip, Baviaans, Sundays and Kowie Rivers; KwaZulu Natal: Thukela, Buffels, eToleni, Wasbank, Mzimkhulu, Umzumbe and Umfolozi Rivers).

Key Qualifications and Skills:

- Project management & report writing
- Research design, planning and administration
- Primary and secondary experience includes:
 - Mapping, classification and description of river reaches

- \circ $\;$ Surveying with dumpy level, total station, differential GPS and UAVs $\;$
- o GIS analysis including remote sensing and 3D modelling
- \circ $\;$ Sediment tracing, dating and erosion monitoring
- \circ $\;$ Soil analysis and erosion prevention planning $\;$
- Vegetation surveys and assessments
- Fish surveys in a variety of habitats, ranging from headwater streams to large open waters. Fish identification, measurement and sexing. Stomach content analyses, parasite extraction and DNA sampling
- General ecological sampling and analysis
- Confident navigation in challenging terrain (4x4 and boat)
- Data analysis and interpretation
- Supervision and training of post graduate students and staff
- Lecturing at undergraduate and postgraduate level
- Hosting workshops and training sessions
- Enjoy national and international travel

Recent projects

- ORASECOM Establishment of Basin-Wide Resource Quality Objectives. ORASECOM and GroundTruth, 2021 ongoing.
- High confidence reserve determination study for surface water, groundwater and wetlands in the upper Orange catchment, ORASECOM and GroundTruth, 2021 ongoing.
- Risk framework for multiple stressors and integrated sustainability management of the transboundary water resources of the Inkomati Basin, southern Africa, WRC and Rivers of Life, 2021 ongoing.
- Geomorphological and Hydraulic specialist study for the Kakono Hydropower Project ESIA and Environmental Flows in Tanzania, SLR, AFD and TANESCO, 2020 ongoing.
- Geomorphological and Hydraulic specialist study for: E-flows for the Limpopo River building more resilient communities and ecosystems through improved management of transboundary natural resources, USAID and IWMI, 2020 ongoing.
- Resilience of regulatory ecosystem services of wetlands, NRF, 2019 ongoing.
- Geomorphic and hydraulic specialist study for: Environmental flows for the Lower Mara River, Tanzania, UNESCO-IHE, 2019
- IFR External Audit of LHDA, Lesotho, GroundTruth and LHDA, 2019.
- Geomorphic assessment of Kalungwishi River in Northern Zambia Environmental flow requirements, Groundtruth, 2017
- Hydraulic and geomorphic assessment for EWR in the lower Thukela River, Rivers of Life, UKZN and SAPPI. 2017.
- Geomorphic effects of an inter-basin transfer near Butterworth, Eastern Cape. Indwe Consulting, 2017.
- Review of wetland assessment for wetlands within the Ndlambe Municipal area. CES consulting, 2017.
- Hydraulic and Geomorphic assessment for EWR in the Mara River, Kenya. UNESCO-IHE, Nile Basin Initiative and MaMaSe. 2015 2016.
- Geomorphological specialist study: supplementary information for the Da-xa Sand CC sand mining application: Buffels River, Kwa-Zulu Natal. Enprocon (2016).
- Geomorphological specialist study: supplementary information for the construction of 12 reservoirs on the Goede Keus Farm, Kwa-Zulu Natal. Enprocon (2016).
- Green Village Project. Water Research Commission (2015 ongoing).
- Sediment dynamics, biophysical monitoring and integrated planning of/for the Tsitsa River Catchment, South Africa. Department Environmental Affairs (2014 ongoing).

- Geomorphological specialist study: supplementary information for the Da-xa Sand CC sand mining application: Buffels River, Kwa-Zulu Natal. Enprocon (2015).
- Investigating the impact of connectivity on water-linked ecosystems, upper Thina River, Eastern Cape, South Africa. Water Research Commission of South Africa (2011 2015).
- Umzumbe River Geomorphological Assessment for sand mining application. NatureStamp (2014).
- Rapid Reserve Determination: Tsitsa River at Lalini Geomorphological assessment. GroundTruth (2014).
- Impacts on sediment dynamics: proposed development of Portion 12 of farm Vetmaakvlakte No. 312. Scherman Colloty & Associates (2013).
- Geomorphological assessment and macroreach analysis of the Mokolo River. Water Research Commission (2010 2013).
- Nelson Mandela Bay Minicipality Proposed Jachtvlakte Sustainable Human Settlement Plan: Preliminary Aquatic and Terrestrial Ecological Assessment. Scherman Colloty & Associates (2012).
- Soil study of land on Erf 309 Port Ngqura, Port Elizabeth. Scherman Colloty & Associates (2012).
- Geomorphology and Hydrology of Ephemeral Rivers review of literature. Van der Waal & Associates (2012).
- Reserve determination for the Mzimkhulu River, junior fluvial geomorphologist. Institute for Natural Resources (2010).

Membership of scientific societies

SACNASP Professional Natural Scientist – Earth Science Reg. number 127809 Southern African Association of Geomorphologists South African Wetland Society Society for Ecological Restoration

Papers in Peer Reviewed Journals

Itzkin, A., Scholes, M.C., Clifford-Holmes, J.K., Rowntree, K., van derWaal, B. and Coetzer, K. A, 2021. Social-Ecological Systems Understanding of Drivers of Degradation in the Tsitsa River Catchment to Inform Sustainable Land Management. *Sustainability*, 13, 516. https://doi.org/10.3390/su13020516

Gwapedza, D., Nyamela, N., Hughes, D.A., Slaughter, A.R., Mantel, S.K., van der Waal, B., 2020. Prediction of sediment yield of the Inxu River catchment (South Africa) using the MUSLE. *International Soil and Water Conservation Research*. https://doi.org/10.1016/j.iswcr.2020.10.003

Le Roux, J., van der Waal, B., 2020. Gully erosion susceptibility modelling to support avoided degradation planning. *South Afr. Geogr. J.*, https://doi.org/10.1080/03736245.2020.1786444

Cockburn, J., Rosenberg, E., Copteros, A., Cornelius, S.F. (Ancia), Libala, N., Metcalfe, L., van der Waal, B., 2020. A Relational Approach to Landscape Stewardship: Towards a New Perspective for Multi-Actor Collaboration. *Land* 9, 224. https://doi.org/10.3390/land9070224

Pulley, S., Collins, A.L. and van der Waal, B.W., 2018. Variability in the mineral magnetic properties of soils and sediments within a single field in the Cape Fold Mountains, South Africa: Implications for sediment source tracing. *Catena*, DOI10.1016/j.catena.2017.12.019

Pulley, S, van der Waal, B.W., Collins, A.L. and Rowntree, K.M., 2018. Colour as reliable tracer to identify the sources of historically deposited flood bench sediment in the Transkei, South Africa: A comparison

with mineral magnetic tracers before and after hydrogen peroxide pre-treatment. *Catena*, DOI10.1016/j.catena.2017.09.018

Pulley, S, van der Waal, B.W., Collins, A.L. and Rowntree, K.M. 2017 Are source groups always appropriate when sediment fingerprinting? The direct comparison of source and sediment samples as a methodological step. *River Research and Applications*, DOI: 10.1002/rra.3192

Van der Waal, BW and Rowntree, K., 2017. Landscape Connectivity in the Upper Mzimvubu river Catchment: An assessment of Anthropogenic Influences on Sediment Connectivity: Landscape connectivity in the upper Mzimvubu River Catchment. *Land Degradation and Development*, DOI: 10.1002/ldr.2766.

LJ Bannatyne, KM Rowntree, BW van der Waal, and N Nyamela. 2017. Design and implementation of a citizen technician-based suspended sediment monitoring network: Lessons from the Tsitsa River catchment, South Africa. *WaterSA* Vol 43 No. 3

Rowntree, K.M., van der Waal, B.W. and Pulley, S., 2017. Magnetic susceptibility as a simple tracer for fluvial sediment source ascription during storm events. *Journal of Environmental Management*, 194, pp.54-62.

Mander, M., Jewitt, G., Dini, J., Glenday, J., Blignaut, J., Hughes, C., Marais, C., Maze, K., van der Waal, B. and Mills, A., 2017. Modelling potential hydrological returns from investing in ecological infrastructure: Case studies from the Baviaanskloof-Tsitsikamma and uMngeni catchments, South Africa. *Ecosystem Services*.

Shackleton, R.T., Angelstam, P., van der Waal, B. and Elbakidze, M., 2017. Progress made in managing and valuing ecosystem services: a horizon scan of gaps in research, management and governance. *Ecosystem Services*.

Prucha, B., Graham, D., Watson, M., Avenant, M., Esterhuyse, S., Joubert, A., Kemp, M., King, J., le Roux, P., Redelinghuys, N., Rossouw, L., Rowntree, K., Seaman, M., Sokolic, F., van Rensburg, L., van der Waal, B., van Tol, J., Vos, T., 2016. MIKE-SHE integrated groundwater and surface water model used to simulate scenario hydrology for input to DRIFT-ARID: The Mokolo River case study. *Water SA* 42, 384–398. doi:10.4314/wsa.v42i3.03

Seaman, M., Watson, M., Avenant, M., Joubert, A., King, J., Barker, C., Esterhuyse, S., Graham, D., Kemp, M., le Roux, P., Prucha, B., Redelinghuys, N., Rossouw, L., Rowntree, K., Sokolic, F., van Rensburg, L., van der Waal, B., van Tol, J., Vos, T., 2016a. DRIFT-ARID: Application of a method for environmental water requirements (EWRs) in a non-perennial river (Mokolo River) in South Africa. *Water SA* 42, 368–383. doi:10.4314/wsa.v42i3.02

Seaman, M., Watson, M., Avenant, M., King, J., Joubert, A., Barker, C., Esterhuyse, S., Graham, D., Kemp, M., le Roux, P., Prucha, B., Redelinghuys, N., Rossouw, L., Rowntree, K., Sokolic, F., van Rensburg, L., van der Waal, B., van Tol, J., Vos, T., 2016b. DRIFT-ARID: A method for assessing environmental water requirements (EWRs) for non-perennial rivers. *Water SA* 42, 356–367. doi:10.4314/wsa.v42i3.01

Van der Waal, B.W., Rowntree, K.M. and Pulley, S. 2015. Flood bench chronology and sediment source tracing in the upper Thina catchment, South Africa: the Role of Transformed Landscape Connectivity. *Journal of Soils and Sediments*, 15 (12), 2398-2411. DOI 10.1007/s11368-015-1185-4

Van der Waal, B.W., Rowntree, K.M. and Radloff, S.E., 2012. The effect of Acacia mearnsii invasion and clearing on soil movement in the Kouga Mountains, Eastern Cape, South Africa, *Land Degradation and Development*, 23: 577–585.

Conference proceedings

Rowntree, K., Mzobe, P. and Van der Waal, B., 2012. Sediment source tracing in the Thina catchment, Eastern Cape, South Africa, IAHS publication, 356: 404-411.

Van der Waal, B. and Rowntree, K., 2012. A Geomorphological Response Model for predicting sediment-related habitat change in ephemeral rivers, IAHS publication, 356: 276-283.

Book chapter

Rowntree, K., Van der Waal, B. and Smith-Adao, L., 2018. Fluvial system response to environmental change. In Southern African Landscapes and Environmental Change, Routeledge, London.

Popular Article

Tooth, S. and Van der Waal, B., 2019. The 'Global Wetland Outlook' report. Geography 104: 3, pp 154-159.

Lecturing

Guest lecture – Biogeography – drainage evolution and speciation in Africa, Geog202, second year, Rhodes University, 2019.

Guest lecture – Geomorphology and water management, 1st (CONS102), 2nd (REM201) and hounours classes, University of Mpumalanga, 2019.

Guest lecture – Geography Environmental Water Management Honours class, Integrated Catchment Management of the Tsitsa River, 2019.

Guest lecture – Environmental Science 2nd years, Rhodes University – Landscape restoration to mitigate sediment erosion – the Tsitsa River catchment case study. 2017.

Guest lecture – Environmental Science 3rd year course in environmental monitoring, Rhodes University, 2015, 2016 and 2018.

Guest lecture – Land degradation short course by Environmental Science, Rhodes University, 2015.

Supervision

Graduated: 2 BSc Hons and 5 MSc (3 with distinction) Current students: 1 MSc and 3 PhD

Conferences

Van der Waal, BW, Grenfell, S, Schlegel, P, Huchzermeyer, N, 2021. Refining and selecting suitable methods of developing digital elevation models for wetlands in data scarce environments. Wetlands Indaba, Online.

Bannatyne, L, Huchzermeyer, N, Rowntree, K, Van der Waal, B, 2021. Hydrological variability at subcatchment scale in the Tsitsa River catchment: the implications for sediment transport and catchment management. SAAG Conference Online.

Le Roux, J and Van der Waal, B, 2020. Gully erosion susceptibility modelling for avoided degradation planning. EGU, Vienna.

Bannatyne, L, Foster, I, Meiklejohn, I and Van der Waal, 2020. Determining sub-catchment contributions to the suspended sediment load of the Tsitsa River, Eastern Cape, South Africa. EGU, Vienna.

Van der Waal, B., Biggs, H., Powell, M., Braack, M., Kawa, K., Mtati, N., Lunderstedt, K., Palmer, T., Rowntree, K., Wolff, M. and Cockburn, J., 2019. Integrated restoration planning: from science led to science management society led planning in the Tsitsa catchment. SER, Cape Town, South Africa.

Herd-Hoare, S., Van der Waal, B., Coetzer-Hannack, K. and Meiklejohn, I., 2019. Poster: Seasonal trends of rainfall intensity, ground cover and sediment dynamics in the Little Pot River and Gqukunqa River catchments, South Africa. SER, Cape Town, South Africa.

Van der Waal, B., Tooth, S. and Ellery, W., 2019. Poster: A geomorphological approach to the prioritisation of wetlands for sediment buffering: Tsitsa River catchment, South Africa. SER, Cape Town, South Africa.

Le Roux, J. and Van der Waal, B., 2019. Avoiding degradation, the importance of soil erodibility. SAAG Biennial Conference, Cintsa, South Africa

Van der Waal, B. and Le Roux, J., 2019. Community based natural resource management planning: the role of geomorphology. SAAG Biennial Conference, Cintsa, South Africa.

Van der Waal, B., Tooth, S., Lisenby, P. and Ellery, W., 2018. Poster: A geomorphological approach to the prioritisation of wetlands for sediment trapping: Tsitsa River catchment, South Africa. BSG, Aberystwyth, United Kingdom.

Van der Waal, B., Powell, M. and Braack, M., 2018. Opportunities for participation in Sustainable Land Management (SLM) and restoration - an assessment of the need for restoration. Symposium of Contemporary Conservation Practise, Lions River, South Africa.

Schlegel, P.K., Huchzermeyer, N.H., van der Waal, B., 2018. Poster: Wetland prioritisation for livelihoods: avoiding further degradation. Wetland Indaba, Kimberley, South Africa.

Van der Waal, B., Tooth, S., Ellery, W. and Lisenby, P., 2018. Degraded riverine wetlands in the Tsitsa River catchment: a geomorphological approach for assessing rehabilitation options. Wetland Indaba, Kimberley, South Africa.

Van der Waal, B., Rowntree, K. and Buckle, J., 2017. Geomorphic principles for developing a catchment rehabilitation strategy: the case of the NLEIP in the Tsitsa catchment, South Africa. SAAG Biennial conference, Mbabane, Swaziland.

Rowntree, K. and Van der Waal, B., 2016. Application of modelling and monitoring to guiding rehabilitation practice: the case of the NLEIP in the Tsitsa catchment, South Africa. ICCE Conference, Rothamstead, UK.

Bannatyne, L., Rowntree, K., van der Waal, B.W. and Nyamela N., 2016. Jam-jars, smartphones, and Open Data Kit: A citizen science-based approach to direct suspended sediment sampling in the Tsitsa River catchment, Eastern Cape Province of South Africa. ICCE Conference, Rothamstead, UK.

Van der Waal, B. and Rowntree, K., 2015. Applying geomorphic connectivity thinking to catchment rehabilitation planning - insights from research in the upper uMzimvubu. WRC symposium, Pretoria, South Africa.

Van der Waal, B. and Rowntree, K., 2015. Landscape connectivity in the upper Umzimvubu River catchment: an assessment of anthropogenic influences on sediment connectivity. SAAG Conference, Sani, Lesotho.

Van der Waal, B. and Rowntree, K., 2015. Changing suspended sediment dynamics over two flood events in the Vuvu River, Mzimvubu catchment, South Africa: an application of sediment source tracing. IGU Conference, Prague, Czech Republic.

Van der Waal, B. and Rowntree, K., 2014. Sediment connectivity in the upper Thina River, Eastern Cape, South Africa. IASWS conference, Grahamstown, South Africa.

Van der Waal, B. and Rowntree, K., 2013. Sediment connectivity in the upper Thina River, Eastern Cape, South Africa. International Association of Geomorphology, Paris, France.

Van der Waal, B. and Rowntree, K., 2012. Predicting sediment related habitat change in non-perennial river systems: a Geomorphological Response Model. Southern African Association of Geomorphologists, Gobabeb, Namibia.

Van der Waal, B. and Rowntree, K., 2012. A Geomorphological Response Model for predicting sediment-related habitat change in ephemeral rivers. IAHS-ICCE International Symposium, Chengdu, China.

Van der Waal, B. and Rowntree, K., 2011. A geomorphological response model for predicting habitat change in non-perennial river systems: lessons from the Mokolo River, Limpopo Province, South Africa. IAG regional conference, Addis Ababa, Ethiopia.

Van der Waal, B., Rowntree, K, Gambiza, J. and Ripley B., 2009. Poster: Influence of *Acacia mearnsii* invasion on soil properties in the Kouga Mountains, Eastern Cape, South Africa. EMAPI Conference, Stellenbosch, South Africa.

Van der Waal, B., 2008. Wattle – the bomb sinking the rehab ship? Fynbos Forum, Outshoorn, South Africa.

Van der Waal, B. and Rowntree, K., 2007, A study of sediment tracing applied to the Heuningnes River, Kouga Catchment, Eastern Cape. SSAG conference, Port Elizabeth, South Africa.

Membership of scientific societies

Southern African Association of Geomorphologists South African Wetland Society Society for Ecological Restoration

Review of Journal Articles

Water South Africa (1) South African Geographical Journal (2) Wetlands Ecology and Management (1)

Review of research proposals

Afromontane Research Unit of the University of the Free State (1) Water Research Commission (1)

External examination of theses

Rhodes University Honours (1) University of the Western Cape Masters (1)