Commission for Water Sustainability

Member profile: Prof. Dr.habil. Frank Winde

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Affiliation

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Study areas

Countries	**Germany, South Africa, Australia, Namibia**
Region	**Halle (Saale), Wismut region (East-Thuringia), Witwatersrand Basin (Far West Rand, Central Rand), Rössing U-mine (Swakoopmund), Alligator Rivers**

Topics of last three projects

1	Underground Pumped Hydro Energy Storage in abandoned deep level mine shafts in South Africa
2	Assessing disease burden in residents living near uraniferous tailings dams in gold mining areas of the Witwaterrans goldfields
3	link between naturally U-polluted groundwater and leukeamia in an arid farming area in South Africa

Envisioned activities in Commission

attend/ organise meetings	x
contribute to publications	x
read newsletter	x
joint research, collaboration	x
Other (please specify)	**establish student/ scientists exchange among member's institutions; act as Chair,**

Research interests in water (select maximum 10)

Climate & Water		Hydrological extreme events		Water flow		Surface water		Ground water		Marine Environment		Aquatic habitats/ Ecosystems		Water availability	
Water in arid areas	x	**Floods**	x	Catchment processes		Limnology		Soil water		Coastal waters		**Wetlands**	x	Water utility	
Arctic water		Droughts		**Run-off generation**	x	**Fluvial dynamics**	x	**Karst water**	x	Estuarian waters		Lakes		Water storage	
Water cycle		Ice phenomena		**Groundwater-Surface water interactions**	x	Continental scale processes		**Hydrogeology**	x			**Peatlands**	x	Dams / Reservoirs	
Atmospheric water				**Hyporheic processes**	x	**Dams / Reservoirs**	x	**Recharge**	x			Rivers		Water scarcity	
Glaciers & Cryosphere				**Interstitial water**	x	**Sediments**	x							Supply & Distribution	
				Porewater	x	**Rivers**	x							Water allocation	
				Alluvial water	x	**Floodplains**	x							Water restrictions	

Modelling and GIS		Water quality		Water & Health		Water & Energy		Water management/ policy		Water use		Water Law & Economics		Socio-political aspects	
Hydro GIS	x	**Pollution**	x	Water & Sanitation		Water-Energy nexus		Integrated Catchment management		**Urban**	x	Water trade		Water history	
Groundwater modelling		Purification		Water & Food		**Water for energy**	x	Integrated water resource management		Agricultural		Virtual water		Water wars	
Surface water modelling		**Hydrochemistry**	x	**Waterborne diseases**	x	Energy for water		Water loss		**Mine water**	x	Privatisation		Water & Poverty	
Remote sensing	x	Treatment		**Drinking water**	x	Water, Food & Energy		Reticulation & Supply		Industrial		Water as public good		Access to water	
		Desalination		**Water purification**	x			Transboundary water		Grey water		Right to water			
		Waste water	x							Green water		Bills & Laws			
		Sewage	x							Blue water		Affordability			
										Return water					
										Water sustainability	x				
										Competing water use	x				

Other (please specify)

Hydrochemical oscillations

Research interests in water (supply 5 keywords)	uranium pollution and mobility	mine water issues	U-related health risks	stream-groundwater interactions	underground pumped hydro energy storage

	Topics of last 10 publications	Publication links
1	Storing energy in disused mines: comparing technical and economic feasibility of water- and compressed air-based mechanical storage technologies.	1
2	Uranium from Africa – an overview on past and current mining activities: re-appraising associated risks and chances in a global context. Journal for African Earth Sciences, doi: 10.1016/j.jafrearsci.2016.12.004	2
3	Uranium contaminated drinking water linked to leukaemia – revisiting a case study from an arid sheep farming area in South Africa. Science of the Total Environment, 574, 400-421, September, doi 10.1016/j.scitotenv.2016.09.035	3
4	Exploring the use of deep level gold mines in South Africa for underground pumped storage schemes. Renewable and Sustainable Energy Reviews	4
5	Uranium pollution in South Africa: past research and future needs. Croation Geographical Bulletin (Hrvatski Geografski Glasnik), 77/2, 33-53	5
6	Unearthing a hidden treasure: 60 years of karst research in the Far West Rand. South African Journal of Science, 111 (5/6), http://dx.doi.org/1017159/saja.2015/20140144, pp. 7	6
7	Assessing risks associated with the flooding of mine voids on underground infrastructure and water resources in and around Johannesburg (South Africa). In: Merkel BJ, Arab A (eds.): Uranium – past and future challenges. Proceedings of the 7th Internationa	7
8	Virtual Geographical Environments (VGE) as A tool to map hu-man exposure to mining-related radionuclides. In: Merkel BJ, Arab A (eds.): Uranium – past and future challenges. Proceedings of the 7th International Conference on Uranium Mining and Hydrogeolog	8
9	Health effects in populations living around the uraniferous gold mine tailings in South Africa: gaps and opportunities for research. Cancer Epidemiology, 38, 628-632	9
10	Determining hydraulic parameters of a karst aquifer using unique historical data from large-scale dewatering by deep level mining – a case study from South Africa. Water SA, 40 (3), 1-15	10

Winde F, Erasmus E (2011): Peatlands as filters for polluted mine water? – A case study from an uranium-contaminated karst system in South Africa. Part I: Hydrogeological setting and U-fluxes. *Water*, **3**, 291-322, doi:10.3390/w3010291

Winde F (2011): Peatlands as filters for polluted mine water? – A case study from an uranium-contaminated karst system in South Africa. Part II: International case studies and a conceptual peat filter model for uranium. *Water*, *3* , 323-355; doi:10.3390/w301

Winde F (2011): Peatlands as filters for polluted mine water? – A case study from an uranium-contaminated karst system in South Africa. Part III: The hydraulic filter component. *Water*, **3**, 356-390; doi:10.3390/w3010356

Winde F (2011): Peatlands as filters for polluted mine water? – A case study from an uranium-contaminated karst system in South Africa. Part IV: The chemical filter component. *Water*, **3**, 391-423; doi:10.3390/w3010391

Winde F (2010): Uranium pollution of the Wonderfonteinspruit: 1997 – 2008. Part I: U-toxicity, regional background and mining-related sources of U-pollution. *Water SA* , **36** (3), 239-256

Winde F (2010): Uranium pollution of the Wonderfonteinspruit: 1997 – 2008. Part II: U in water – concentrations, loads and associated risks. *Water SA* , **36** (3), 257-278

Winde F, Stoch EJ (2010): Threats and opportunities for post-closure development in dolomitic gold mining areas of the West Rand and Far West Rand (South Africa) – an hydraulic view. Part I: Mining legacy and future threats. Mining Towns in South Africa:

Winde F, Stoch EJ (2010): Threats and opportunities for post-closure development in dolomitic gold mining areas of the West Rand and Far West Rand (South Africa) – an hydraulic view. Part II: Opportunities. Mining Towns in South Africa: Planning and devel

Stoch EJ, Winde F (2010): Threats and Opportunities for post-mining development in dolomitic gold mining areas of South Africa – an hydraulic approach. Part III: Planning and uncertainty – lessons from history. *Water SA* , **36** (1), 83-88

Hoffmann E, Winde F (2010): Generating high resolution Digital Elevation Models for wetland research using Google Earth TM imagery – an example from South Africa. *Water SA* , **36** (1), 53-68

Winde F (2006): Challenges for sustainable water use in dolomitic mining regions of South Africa – a case study of uranium pollution, Part I: sources and pathways. *Physical Geography,* ISSN 0272-3646, **27**, 2, 335-346.

Winde F (2006): Challenges for sustainable water use in dolomitic mining regions of South Africa – a case study of uranium pollution, Part II: Spatial patterns, mechanisms and dynamics. *Physical Geography,* ISSN 0272-3646, **27**, 2, 379-395.

Winde F (2006): Impacts of gold and uranium mining on water resources in dolomitic karst areas in South Africa - examples from the Wonderfonteinspruit catchment. *Geo-Öko,* (ISSN 16161 – 0983), *27* , *1-2/2006* , 52-76.

Winde F, van der Walt IJ (2004): The significance of groundwater-stream interactions and fluctuating stream-chemistry on waterborne uranium contamination of streams – a case study from a gold mining site on South Africa. *Journal of Hydrology* , **287**, 178-196

Schrader A, Winde F, Erasmus E (2014): Using impacts of deep-level mining to research karst hydrology – a Darcy-based approach to predict the future of dried-up dolomitic springs in the Far West Rand goldfield (South Africa). Part 1: a conceptual model of

Schrader A, Winde F, Erasmus E (2014): Using impacts of deep-level mining to research karst hydrology – a Darcy-based approach to predict the future of dried-up dolomitic springs in the Far West Rand goldfield (South Africa). Part 2: predicting inter-comp