

## CURRICULUM VITAE: DR PATRICIA-ANN SCHERMAN

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Date of Birth: 21 May 1965  
Citizenship: South African  
HDI status: White female

### HIGHEST QUALIFICATION

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Ph.D in Biotechnology (1993), Rhodes University, Grahamstown, South Africa

### SPECIALIZATION

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Twenty six years of experience in environmental water quality; riverine ecology; river health (bio)monitoring; ecological Reserve, Classification and Resource Quality Objectives (RQOs) studies for rivers; management of large environmental inter-disciplinary teams; development, implementation and management of environmental monitoring programmes.

### PROFESSIONAL EXPERIENCE

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1992 - 1993	Snr Technical Officer in the Institute for Water Research (IWR), Rhodes University
1994 – Feb 2002	Snr Research Officer / Project Leader of the Centre for Aquatic Toxicology (CAT-IWR) IWR
Mar 2002 – Feb 2005	Senior Environmental Consultant at Coastal and Environmental Services (CES), Grahamstown.
Mar 2005 – Feb 2006	Principal Environmental Consultant at CES
Mar 2006 – Dec 2007	Operations Director at CES
Jan 2008	Registered Scherman Consulting as a sole trader
July 2009 – Dec 2018	Registered Scherman Colloty & Associates cc.: Environmental and Aquatic Management Consulting (CK 2009/112403/23)
Dec 2018 – present	Renamed cc to Scherman Environmental cc.: Aquatic and Environmental Management Consulting (CK 2009/112403/23)

### COUNTRIES OF WORK EXPERIENCE

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South Africa, Namibia, Zambia, Mozambique, Madagascar, Egypt, Lesotho, Swaziland and Kenya

### FRESHWATER RESEARCH + CONTRACT EXPERIENCE (SELECTED PROJECTS SINCE 2000)

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- SA River Health Programme (SA National Aquatic Ecosystem Biomonitoring Programme): national and provincial programmes.
- Participated in the Olifants River (1998-2001) and Breede River (2001) Reserve projects.
- The development and management of water quality monitoring programmes, including conducting surface water assessment and managing the water component of the East London Industrial Development Zone. 2002-2004: Phase I; 2004-2005: Phase II.
- Team member of the development of the Tsitsa Basin Land use and Environmental Management Plan (2009).
- CES projects at the Coega Industrial Development Zone (2004-2006).
- Overseeing and participating in the water studies associated with a number of heavy mineral mining EIAs: Corridor Sands Limitada (CSL) in Mozambique (2002-2007; team leader), Tiomin in Kenya (2006), Kenmare Moma in Mozambique (2006-2007), Toliara in Madagascar (2006) and El Burrulis in Egypt (2007).
- Water quality task leader on the following DWA Reserve contracts: Thukela, Letaba, Mokolo (2008/2010), Inkomati (2008/2010), Kromme / Seekoei (2003-2006) and Knysna / Swartvlei (2006 – 2010).
- Reserve team leader for the Kromme / Seekoei and Knysna / Swartvlei Reserve studies.
- Water quality specialist on the following Reserve studies: Sout River Reserve (2007-2009), Dwars Intermediate Reserve study (2007-2009) and Erasmuskloof Reserve (2007).

- Coordinator and lecturer of the technical training programme for the Ecological Reserve: A contract for DWA (2007-2010).
- Member of the Project Management Team for the Vaal Water Quality Reserve Study (2007-2011).
- Professional Service Provider to the Chief Directorate: Resource Directed Measures of DWA, regarding water quality and the Ecological Reserve (2006-2008, 2010, 2011).
- Member of a WRC project team to develop water quality methods for the Rapid level determination of the Ecological Reserve in wetlands (2008-2009).
- Team leader for the aquatic study for the N2 Wild Coast Toll Road, both in 2003 and the new EIA being undertaken in 2007-2008. Both studies generated CES reports.
- Member of the Provincial Task Team for the Eastern Cape River Health Programme (initiated in 2008).
- Aquatic specialist studies for EIAs at the Coega Industrial Development Zone: Exxaro's Manganese Project and Kalagadi's Manganese Smelter (2008-2009).
- Aquatic specialist for the Amanzi Development EIA (2008), and water quality specialist for the Hillcrest Hospital development in KwaZulu-Natal, South Africa.
- Water quality specialist for the flows requirement study for the Kafue Lower Gorge Hydropower Dam in Zambia and the Maputo Basin Project in Mozambique/Swaziland/South Africa (2008).
- The Ecological Reserve specialist for the Algoa Bay (2008-2009), Bloemfontein and Eastern Rivers (2009) water resource reconciliation strategies.
- Team member of the development of the Tsitsa Basin Land use and Environmental Management Plan (2009).
- Team member responsible for the development and implementation of a Reserve monitoring programme for the Komati Basin (2009).
- Team leader and water quality specialist (rivers) for the Ugie Dam Reserve study (2010-2011), the Lusikisiki Regional Water Supply Study: Reserve module (2010-2014), and the Gouritz Water Management Area Reserve study (2013-2015).
- Water quality specialist on the Vaal Water Resources Classification study (2011-2012).
- Water quality specialist for the Lower Orange (including the Fish River in Namibia) EFR study (2012-2014).
- Water quality specialist and Training task leader on the Mvoti, Letaba (2012-2015) and Inkomati Classification studies (2013-2015).
- Water specialist studies and Water Use License Applications for numerous solar and wind power projects (2010-2015, e.g. Abengoa Solar, Ilanga Solar Power, Mkuze Biofuels, Tsitsikamma Wind farm), and developments such as Doukamma and George Rex in Knysna (2016) and Burnside Farm and Isipingo Interchange (2015-2017).
- Scherman Colloty & Associates contracted to undertake the PES/EI/ES (Present Ecological State / Ecological Importance / Ecological Sensitivity) study for rivers and estuaries of WMA 12 and 15, for the Water Research Commission and Department of Water Affairs (2010-2013).
- Contracted as Reserve specialist on the Limpopo North Reconciliation Study and the Vioolsdrift Dam Feasibility Study (2015-2016).
- Team leader of the Mzimvubu Classification and Resource Quality Objective study (2016-2019).
- Water quality task leader for the DWS study on *Development of Procedures to operationalize Resource Directed Measures* (2016-2018).
- Water quality specialist on the biomonitoring team for the Crocodile East (2017-2018) and Komati (2018-2019) river systems for the Inkomati Usuthu Catchment Management Agency.
- Training of environmental staff at Lesotho Highlands Development Agency (LHDA) (2018).
- Coordination and running the Water Resources Monitoring Programme for the Toliara Sands heavy mineral mining project for Base Resources in Madagascar (2019).
- National Biodiversity Assessment 2018; SA National Biodiversity Institute: River specialist (2018-2019).

## SELECTED PUBLICATIONS (REPORTS AND PAPERS)

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(Goetsch and Scherman inter-changeable)

- McQuaid, C. D., and P-A. Scherman. 1988. Thermal stress in a high shore intertidal environment: Morphological and behavioural adaptations of the gastropod *Littorina africana*, p. 213-224. In Behavioural Adaptation to Intertidal Life.
- Goetsch, P-A., Rose, P. D. and R. Kirby. 1992. *Streptomyces* as a source of the polyphenolase enzyme system. In Proceedings of the Seventh Biennial Congress of the South African Society of Microbiology.
- Palmer, C. G., Goetsch, P-A. and J. H. O'Keeffe. 1996. Development of a recirculating artificial stream system to investigate the use of macroinvertebrates as water quality indicators. Water Research Commission Report No. 475/1/96.
- Uys, A. C., Goetsch, P-A. and J. H. O'Keeffe. 1996. Ecological indicators for the South African National Biomonitoring Programme: A review and recommendations. SA National Biomonitoring Report Series No. 4. Institute for Water Quality Studies, Department of Water Affairs and Forestry, Pretoria, South Africa.
- Palmer, C. G. and P-A. Scherman. 2000. Application of an artificial stream system to investigate macroinvertebrate water quality tolerances. Water Research Commission Report No. 686/1/00.
- Jooste, S., MacKay, H. M., Scherman, P-A. and W. J. Muller. 2000. Feasibility of using a risk-based approach to set integrated environmental objectives for the protection of water resources. Water Research Commission Report No. 914/1/00.
- Department of Water Affairs and Forestry. 2000. A protocol for acute toxicity testing using selected riverine invertebrates in artificial stream systems. Version 1.0. Produced by Scherman P-A and Palmer CG, Centre for Aquatic Toxicology, Institute for Water Research, Rhodes University, Grahamstown, South Africa.
- Muller, W. J. and P-A. Scherman. 2001. The use of biomonitoring tools - both in-stream bioassessment and laboratory-based toxicity tests - to assess the impact of selected pollutants on the macroinvertebrates of the Leeuspruit. Confidential report to Sasol Chemical Industries.
- Palmer, C. G. and P-A. Scherman. 2001. The application of salinity tolerance testing in the implementation of the South African National Water Act. Australasian Society for Ecotoxicology, Canberra, Australia.
- Zokufa, T. S., P-A. Scherman and C. G. Palmer. 2001. Tolerances of selected riverine indigenous macroinvertebrates from the Sabie River (Mpumalanga), and Buffalo River (Eastern Cape) to complex saline kraft and textile effluents. Water Research Commission Report No. 783/1/01.
- Everitt, V., P-A., Scherman and M. H. Villet. 2002. Zinc toxicity of a selected macroinvertebrate, *Adenophlebia auriculata* (Ephemeroptera, Leptophlebiidae): method development. *Afr. J. Aqu. Sc.* **27** 31-38.
- Palmer, C. G., Berold, R., Muller, N. and P-A. Scherman. 2002. Some, for all, forever: Water ecosystems for people. A Water Research Commission-funded booklet and course presented in Grahamstown 2001.
- Scherman, P-A., Muller, W.J. and C. G. Palmer. 2003 Links between ecotoxicology, biomonitoring and water chemistry in the integration of water quality into environmental flow assessments. *River Res. Applic.* **19** 1-11.
- Palmer, C. G., Muller, W. J., Gordon, A. K., Scherman, P-A., Davies-Coleman, H. D., Pakhomova, L. and E. de Kock. 2004. The development of a toxicity database using freshwater macroinvertebrates, and its application to the protection of South African water resources. *S. Afr. J. Sci.* **100** 643 – 664.
- Palmer, C. G., Rossouw, N., Muller, W. J. and P-A. Scherman. 2005. The development of water quality methods within ecological Reserve assessments, and links to environmental flows: *Water SA* **31(2)** 161 – 170. Department of Water Affairs and Forestry, South Africa. 2008. Methods for determining the Water Quality component of the Ecological Reserve. Prepared by Scherman Consulting, Draft 2.
- Palmer, C. G., Griffin, N. J. and P-A. Scherman. 2011. A preliminary examination of water quality compliance in a selected lowveld river: towards implementation of the Reserve. Water Research Commission Project K8/984, Deliverable 1.

Palmer, C. G., Griffin, N. J., Scherman, P-A., Du Toit, D., Mandikiana, B. and S. Pollard. 2012. A preliminary examination of water quality compliance in a selected lowveld river: towards implementation of the Reserve. Water Research Commission Project K8/984, Deliverable 4.

Numerous reports have emanated from consulting experience at Coastal & Environmental Services (CES), Scherman Consulting (SC), Scherman Colloty & Associates (SC&A) and Scherman Environmental. All contract experience has resulted in at least one report, with Reserve and Classification/RQO studies managed by Dr Scherman, resulting in 15-20 reports per study. Only two of the DWS-contract reports, and none of the contract reports prepared from 2000 are listed above.