


ANNUAL REPORT for 2014

Sustainability Research Unit
Entity Leader: Prof. Christo Fabricius

Faculty of Science

This annual report and the audited financial statement were approved by the Faculty on the _____ day of _____ 2015.			
	Print name	Signature	Date
Entity leader	Christo Fabricius		2 March 2015
Finance			
Chairperson of Governing Board (If applicable)			
Chairperson: Faculty RTI Committee/ Faculty Board			
Dean			
DVC: RE (when applicable)			

1. Mission / purpose

The Sustainability Research Unit (SRU) was established in 2009 and develops the capacity for the sustainable management of ecological, social and economic systems through user-inspired research, training and policy-related work. The SRU raises awareness of sustainability issues amongst stakeholders. The unit brings together decision makers and researchers from various institutions such as universities, local municipalities and the private sector to address challenges collaboratively, thereby adding value to existing expertise and financial resources.

1.1 SRU focuses on four related activities:

- a. Develop useful information systems and models based on good science, to enable decision makers to understand the long term consequences of land and water use plans, policies and strategies;
- b. Provide scientific information about the causes, impacts, consequences and good ecosystem management practices related to climate change;
- c. Develop and implement practical strategies that can promote sustainability in urban development, tourism, agriculture, forestry, fisheries and biodiversity conservation, and to promote the sustainable long term use of land and water and sustainable food production;
- d. Offer training courses to raise the awareness of decision makers at all levels of the impacts of climate change, what can be done about it and which practices should be avoided.

1.2 The principles guiding the SRU's work are:

- It takes a long term approach, inspired by the principles and practices of resilience and adaptive co-management;
- The users (decision makers and resource users) inspire our work;
- Resources (funds and expertise) is being pooled;
- Approaches are inter-disciplinary, with a strong "evidence-seeking" focus because of the complex nature of the challenges being addressed and the high levels of uncertainty;
- Its impacts build the capacity of government, municipal and civil society decision makers through data collection, awareness creation, learning, training and implementation.

In recent years (2013-2014) the SRU's focus has increasingly shifted to participatory action research and engagement of local stakeholders, especially in the Garden Route.

1.3 Alignment with vision and mission of the NMMU:

The SRU's focus is on the provision of scientific information and practical strategies to promote sustainability. Thus, the unit aligns itself with the NMMU vision of generating cutting edge knowledge for a sustainable future. The principles guiding the SRU, and in particular its inter-disciplinary approach to complex challenges of high level uncertainty, furthermore aligns the SRU with the NMMU vision.

The SRU's principles of post-graduate training, inter-disciplinarity, awareness creation, learning, training and implementing align the unit's focus and principles with the NMMU mission of offering a diverse range of quality educational opportunities.

The sustainability focus and attention to building capacity of government, municipal and civil decision makers makes a critical and constructive contribution to regional, national and global sustainability, as prescribed by the NMMU mission.

2. Governance structures

The SRU reports to the Dean of Science and Science Faculty. It has a Management Committee consisting of Prof. Christo Fabricius, Prof. Janine Adams, Dr Dirk Roux, Ms Bianca Currie and Ms Verouschka Sonn (student representative).

2.1 Governance Structure meetings

Meeting	Date	Significant outcomes
SRU MANCO	16.04.2014	Endorsement of SRU 2013 review and go-ahead for Winter School.
SRU MANCO	05.09.2014	Working for Water grant approved and MOU in circulation. Student representative role to be handed over.
SRU MANCO	18.11.2014	V. Sonn was selected as the new SRU MANCO student representative. SRU part-time administrative position to be advertised. Knowledge broker post not to be appointed in 2015, but will not be dissolved.

3. Human Resources

3.1 Staff Members

In 2014 members of the SRU included Prof. Christo Fabricius (Entity leader), Ms Bianca Currie (Lecturer, PhD researcher & Deputy Entity leader), Prof. Janine Adams (Botany) and Ms Jeanette Pauw (Part-time Lecturer, Statistician). Mrs Aneri Roos was hired part-time in the position of Knowledge Broker for the SRU to strengthen and stimulate stakeholder relations for the Unit. Dr Dirk Roux, a Research Associate employed by SANParks, Dr Jaco Barendse, a Post-doctoral Researcher and Dr Yashwant Rawat, a Research Fellow from India, were all based within the SRU. Dr Sue Milton, a Research Associate, was based in Prince Albert and Dr Jeanne Nel, a Research Associate employed by CSIR, was based in Stellenbosch. During the year Dr Milton resigned as Research Associate.

3.2. Postgraduate Students

The Unit supervised 5 BTechs, 9 Masters and 4 PhD students. Their names follow:

Table 1. SRU students, 2014

Student	Supervisor	Degree	Department/School
Currie, B (Ms)	Fabricius	PhD (Part-time)	Botany
Alant, Maretha (Ms)	Kerley, Fabricius	Phd	Zoology
Heider, Lisa (Ms)	Fabricius	Phd	Botany
Nieuwwoudt, Cara (Ms)	Fabricius	Phd	Botany
Botes, Peet (Mr)	Fabricius	MTech (Nature conservation)	SNRM
Crisp, Abigail (Ms)	Fabricius, Roux	MTech (Nature conservation)	SNRM

Jackson, Andrew (Mr)	Milton, Wigley	MTech (Nature conservation)	SNRM
Mc Culloch, Samantha (Ms)	Fabricius Roux	MTech (Nature conservation)	SNRM
Sonn, Verouschka (Ms)	Fabricius	MTech (Nature conservation)	SNRM
Tshivhase, Kutelani (Mr)	Fabricius	MTech (Forestry)	SNRM
Roos, Aneri (Mrs)	Adams, Roux	MSC	Botany
Southey, Phillippa (Ms)	Kerley, Fabricius	MSc	Zoology
Buckle, Dorothea (Ms)	Fabricius, Wozniak	MA	Arts
Lorriaan Kruger (Ms)	Barendse	BTech (Nature conservation)	SNRM
Yentl Swartz (Ms)	Barendse	BTech (Nature conservation)	SNRM
Jimmy Vincent (Mr)	Barendse	BTech (Nature conservation)	SNRM
Leandré Visser (Ms)	Barendse	BTech (Nature conservation)	SNRM
Brenda du Preez (Ms)	Barendse	BTech (Nature conservation)	SNRM

3.3 Human resources changes

- Dr Sue Milton resigned as SRU member, June 2014;
- Mrs Gillian Londt was employed as a part-time administrative assistant;
- Miss Nieuwoudt (Phd student) withdrew from a collaborative project in December 2014. A replacement was soon recruited.

4 **Goals / targets for the year under review**

4.1 Statement of goals/targets

The primary goals were to:

- Increase peer reviewed papers;
- Maintain postgraduate numbers;
- Host or initiate at least one post-graduate capacity development event per quarter; and
- Increase financial income.

4.2 Strategies employed to achieve goals/target

Strategies included hosting stakeholder workshops, visiting national and international research partners and recruiting new students by funding BTech projects and raising Masters and PhD bursaries. Forming collaborative links with other research organisations such as CSIR, SANParks, other universities and other departments in NMMU is an important component of our strategy. One of the foundations of our work is to publish internationally recognised journals and to be visible at national and international conferences. The SRU aims to build the research capacity on the George campus and hosted fortnightly journal club meetings, fortnightly writing workshops, a postgraduate orientation workshop and a social-ecological systems Winter School, attended by students and academics from 5 universities.

4.3 Outputs

Academic outputs

SRU members published 9 peer reviewed papers, 3 research reports and made 16 conference presentations at national and international symposia. There are also 5 papers in press (2 now published in 2015) and 6 in review. A total of 5 BTech students, 9 Masters and 4 PhD students were supervised during 2014 (Table 1). Three separate capacity development workshops/ courses were attended by SRU members and a total of 39 academic engagements were facilitated by SRU staff for post-grad student capacity development.

Awareness raising and community engagement

In total the unit facilitated 34 engagements for community members in the Garden Route. These engagements include members of government, NGOs and private sector. Ties between the SRU and the GRI, Southern Cape Landowners Initiative (SCLI), CapeNature, SANParks, Eden District Municipality, George Municipality, Knysna Municipality, WESSA, Future Works, the Botanical Society and various ratepayers associations were maintained and strengthened during 2014 with continued engagements and active participation in research studies. The unit also published two articles in popular media sources to raise awareness about the buffering capacity of ecological infrastructure. The SRU leader was awarded the SANParks Regional Koedoe Award for research excellence.

National and international academic engagement

The SRU collaborated on proposals and joint research projects with SANParks, CSIR, Stellenbosch University, Stockholm University, University of Exeter, Arizona State University, CIRAD in France and University of Helsinki. We also worked closely with Eden District Municipality, George Municipality, WWF, the Garden Route Initiative and the Agricultural Research Council. Prof. Fabricius lead the development of a successful proposal to Department of Environmental Affairs – Natural Resource Management division, for a funding grant of R940 866 per annum from 2014 -2017. Relationships were also strengthened with the DST-NRF Internship Programme, the Stellenbosch Institute for Advanced Studies, the Food and Agriculture Organisation of the United Nations and the International Institute for Applied Systems Analysis.

Prof. Fabricius served on the International Programme Advisory Committee of the Department for International Development and NERC in the UK, the Scientific Committee of the Resilience 2014 conference in Montpellier and is currently Science Leader of the Resilience Alliance. Prof. Fabricius served on the editorial committees of Ecology and Society as well as Koedoe. Dr Roux served on the editorial committee of Conservation Letters and Koedoe.

International visitors included Professor Karl Folke of the Stockholm Resilience Centre and Dr Herve Fritz of CNRS and Claude Bernard University of Lyon.

4.4 Self-assessment of achievement of goals/targets

Targets were exceeded. Peer reviewed papers increased from 7 to 9; conference papers from 9 to 11; 3 new PhD students were included in the group; and funding more than doubled.

4.5 Highlights and special achievements

Christo Fabricius received the SANParks regional award for research excellence. Andrew Jackson received the Best Student Paper award at the Annual Conference of the Land Rehabilitation Society of South Africa (LaRSSA). Maretha Alant received recognition for the best presentation at the Fynbos Forum meeting, whilst Kate Southey was the runner-up for best student presentation at the Fynbos Forum.

5. Finances

5.1 Financial review

The SRU currently has funding from the NRF and Belmont Forum, the Water Research Commission under sub-contract with CSIR and the Department of Environmental Affairs, which is a contract for R 2.8 million over three years with the SRU.

5.2 Financial statements

See Page 7.

6. Additional information

The SRU is grateful for the exceptionally good operational support from George Campus Management, in particular the provision of an excellent post-graduate 'laboratory' with space for 16 students, and superb logistical and IT support. Without this support our continuous growth would not have been possible.

7. Mandatory Summary for Senate

The SRU had a very successful 2014 based on the substantial growth in student numbers, financial income and research outputs. Community engagement showed significant improvement on previous years.

INCOME STATEMENT OF SUSTAINABILITY RESEARCH UNIT

ENTITY NAME : SUSTAINABILITY RESEARCH UNIT
ENTITY LEADER : PROF C.FABRICIUS
COST CENTRES : L307, L233, L276, L345, H285, H392

INCOME STATEMENT FOR PERIOD :	Year 2014	Year 2013
Opening Balance	451 996	367 815
INCOME	750 893	787 909
NRF funded income	529 673	363 546
Council research funds	71 680	107 960
Private Grants	149 540	316 403
EXPENDITURE	943 248	703 728
Operating Expenses	472 843	361 822
Capital Expenditure	38 950	31 277
Bursary Awards External Funds	253 650	92 000
Salaries	177 806	4 628
Student bursaries	-	214 000
Surplus/(Loss) for the year	(192 355)	84 182
Closing Balance	259 641	451 996

Signed off by Finance Dept.

Name : Mariam Jogee-Jamal

Title : Director Corporate Finance

Signature : 

Date : 2015-02-27

All amounts for 2014 as per ITS at 2015/02/23
All amounts are in ZAR.

**ANNEXURE A
RESEARCH OUTPUTS/ACTIVITIES (2014)**

OUTPUTS/ ACTIVITIES	NO	DETAILS	STAFF STUDENT INVOLVED	OTHER (Specify)	DESCRIPTION/ COMMENTS
CONFERENCES					
International Conferences (Published Papers)					
National Conferences (Published Papers)		<i>"Molecular analysis confirms genetically distinct populations of two indigenous estuarine fish species in an isolated lake: implications for the management of exotic ichthyofauna". Southern African Marine Science Symposium (SAMSS)</i>	J Barendse	<u>Collaborators:</u> Nikki Phair, Sophie von der Heyden (Stellenbosch University), Kyle Smith (SANParks)	Presenter: N.Phair Paper "In Press" in Conservation Genetics
International Conference (presented but not published papers)		<i>"Transdisciplinarity for systemic learning: who to learn with, what to learn about and how to learn."</i> Resilience 2014	D. Roux	<u>Collaborators:</u> J.Nel (CSIR) and G. Cundill (RU)	Montpellier, France
		<i>"Top-down conservation targets and bottom-up management action: from disconnect to feedback."</i> Resilience 2014	D. Roux	<u>Collaborators:</u> J.Nel (CSIR)	Montpellier, France
		<i>"Resilience in agricultural landscapes".</i> Resilience 2014	C. Fabricius		Montpellier, France
		<i>Ecosystems and society in southern africa: traps and transformations.</i> Resilience 2014 Conference, Montpellier, France, May 2014	C. Fabricius		Montpellier, France
		<i>"Understanding and Learning from Maladaptations in Coastal Areas"</i>	C. Fabricius	<u>Collaborators:</u> Barreteau; Brown; Mathevet; Anderies	Rotterdam, Netherlands
		<i>"Top-down conservation targets and bottom-up management action: mutual feedback strategies to improve biodiversity outcomes."</i> World Parks Congress 2014	D. Roux & J. Barendse	<u>Collaborators:</u> J.Nel (CSIR)	Sydney, Australia
National Conference (presented but not published papers)		<i>"Top-down targets to bottom-up action, and the missing wetland in between".</i> Keynote address Fynbos Forum 2014	D. Roux & J. Barendse	<u>Collaborators:</u> J.Nel (CSIR)	
		<i>"A. Tacit and explicit dimensions of adaptive management."</i> SAWMA conference 2014	D. Roux	<u>Collaborators:</u> A.Gaylard	
		<i>"Micro catchments effectiveness at enhancing transplant survival in Nama-Karoo riparian ecosystem restoration".</i> Land Rehabilitation Society of Southern Africa (LaRSSA)	A. Jackson		Awarded best student input

		“Approaches to Protected Area Prioritisation in the Garden Route” Fynbos Forum 2014	P. Southey		Awarded Runner-best student presentation
		“Functional connectivity of mammal species in the Knysna Buffer Zone, Garden Route National Park” Fynbos Forum 2014	M. Alant		Awarded best presentation
		“Adaptive management for invasive alien plant management – is it effective?” SAWMA conference 2014	W. Loftus & C. Fabricius		
		“Using social learning workshop design to guide learning and collaboration in the Garden Route”. Southern African Wildlife Management Association Symposium, Port Elizabeth, 3 September 2014	B. Currie		
		“Local participation, collaborative learning and ecosystem stewardship in the Garden Route”. Keynote address at the Fynbos Forum 2014	C. Fabricius and B. Currie		
		“Every angler’s dream: Do 70 years of trophy fish catches reported in a Garden Route newspaper reflect known trends in linefish stocks or indicate baseline shifts?” Southern African Marine Science Symposium (SAMSS)	J. Barendse	Collaborators: Kyle Smith (SANParks), Stefan Oosthuizen, Duane Roberts (NMMU)	Poster presentation Stellenbosch
		Adaptive management and the problem of implementation paralysis. Southern African Wildlife Management Association Symposium, Port Elizabeth, 3 September 2014	C. Fabricius		
International Conferences (only attended)		Resilience 2014, Montpellier, France	A. Crisp, C. Nieuwoudt & L. Heider		Montpellier, France
National Conferences (only attended)					
JOURNAL ARTICLES					
International indices (ISI & IBSS)		Barendse, J. & Best, P. B. 2014. Shore-based observations of seasonality, movements, and group behaviour of southern right whales in a nonnursery area on the South African west coast. <i>Marine Mammal Science</i> . doi:10.1111/mms.12116.	J. Barendse	In collaboration with Mammal Research Institute, University of Pretoria	
		Elwen, S.H., Tonachella, N., Barendse, J. , et al. 2014. Humpback whales off Namibia: occurrence, seasonality, and a regional comparison of photographic catalogs and scarring. <i>Journal of Mammalogy</i> . 95: 1064-1076.	J. Barendse		
		Carvalho, I., Loo, J., Collins, T., Barendse, J. Pomilla, C., Leslie, M. S. Ngouesso, S. Best, P. B. & Rosenbaum, H. C. 2014. Does	J. Barendse		

		temporal and spatial segregation explain the complex population structure of humpback whales on the coast of West Africa? <i>Marine Biology</i> : 1-15.			
		Fabricius, C., & Cundill, G. 2014. Learning in adaptive management: insights from published practice. <i>Ecology and Society</i> 19(1): 29. http://dx.doi.org/10.5751/ES-06263-190129 .	C. Fabricius		
		Roux, D.J., Breen, C.M. & Carruthers, J. 2014. Reflections on the history of aquatic science in South Africa with particular reference to the period after 1994. <i>Water SA</i> 40: 255-262. http://dx.doi.org/10.4314/wsa.v40i2.7	D. Roux		
		Von Maltitz, G., Gasparatos, A. & Fabricius, C. 2014. The Rise, Fall and Potential Resilience Benefits of <i>Jatropha</i> in Southern Africa. <i>Sustainability</i> 6:3615-3643. doi:10.3390/su6063615	C. Fabricius		
DoE list of South African Journals					
Other Peer-reviewed Journal Articles					
<u>BOOKS AND BOOK CHAPTERS</u>					
<u>RESEARCH REPORTS</u>	1	<i>Conversations for improved public participation.</i> George: Sustainability Research Unit, NMMU George Campus.	B. Currie		
		<i>From Boat to Plate. Linking the seafood consumer and supply chain.</i> 2014. WWF-South Africa/SASSI Unpublished Report.	J. Barendse	Contributed to these reports	
		<i>10 Years of being SASSI. A documentation of the sustainable seafood movement in South Africa.</i> 2014. Unpublished Technical Report, WWF-South Africa.			
<u>CREATIVE OUTPUTS</u>		Popular articles published in Media and other sources			
		Ecological Infrastructure, Ecosystem Services, Strategic Water Source Areas and SIP 19	D. Roux		SANParks Management Brief
		Nature's infrastructure.	C. Fabricius		<i>Wild News</i> , Febru: 2014.
		Climate problems a serious concern.	C. Fabricius		George Herald
<u>MASTERS AND DOCTORAL DEGREES COMPLETED</u>	3				
Masters by Coursework and Treatise	0				

Masters by Research	3	Crisp, A – MTech	C. Fabricius & D. Roux		
		Roos, A - MSc	C. Roux & D. Adams		
		Southey, P	C. Fabricius (co-supervisor)		
Doctoral Degrees	0				
<u>HUMAN CAPITAL DEVELOPMENT</u>					
Emerging (Staff & PG Students)		Post-graduate start-up workshop 2014	All students		
		Statistical training in R	A. Jackson		
		PA training for admin staff	G. Londt		
Established Researchers		Participated as supervisor in the IIASA-NRF Young Scholar's Support Programme	C. Fabricius		Bloemfontein and Vienna (Austria)
<u>ACADEMIC ENGAGEMENT</u>					
		Talk at ScieEx at Glenwood High School	J. Barendse		
		Facilitated a Bi-weekly Journal club	Students and lecturers		
		Facilitated Bi-weekly writing workshops for postgraduates	C. Fabricius		
		Science Faculty Post Graduate Symposium	Hosted by SRU students and SNRM staff		8 students from NMMU, P.E visited and engaged with students from NMMU, George Campus
		Served on the International Project Advisory Panel of the UK's Ecosystems and Poverty Alleviation (ESPA) project	C. Fabricius	www.espa.ac.uk	High-level international advisory panel
		Served as Science Director of the Resilience Alliance	C. Fabricius	www.resalliance.org	
		Hosted and facilitated a Post Graduate Orientation Workshop 2014	B. Currie, D. Roux, C. Fabricius		
		Hosted and facilitated a 4-day SAPEC Winter School 2014	B. Currie, D. Roux, C. Fabricius, A. Roos & S. Mc Culloch	Collaborating facilitators: R. Biggs, G. Cundill, H. Lotz-Sisitka, R. Preiser, S. Shackleton, L. Dziba, M. Hamann, L. Pereira & O. Selomane	21 Students from five universities
		SRU Field Trip - Khayaletu Nature Reserve/ Rastafarian Community	All SRU students and Staff		
		Hosted and facilitated a SANParks Publications Seminar	D. Roux & C. Fabricius		

		Hosted and facilitated as SANParks strategic dialogue	D. Roux, Y. Rawat, C. Fabricius		
		Designed and offered an Environmental Stewardship module to all SNRM first year students	C. Fabricius & A. Roos		
		Designed and taught a Freshwater Ecology module to BTech (Nature Cons.) – field trip, poster assignment	D. Roux & A. Crisp C. Fabricius J. Barendse		
<u>COMMUNITY ENGAGEMENT</u>		Coordinated a Fynbos forum panel discussion	C. Fabricius, D. Roux		
		Hosted a Sustainability Dialogue: 'The Silo Effect'.	C. Fabricius, D. Roux & S. Mc Culloch		Stakeholders Inc.: SANParks, Eden District Municipality, George Municipality, DEADP
		Hosted a SANParks Stewardship Forum	D. Roux & C. Fabricius		
		Conducted 18 participatory mapping workshops with communities in the Wilderness catchment area	A. Roos, D. Buckle, S. Mc Culloch, C. Fabricius		
		Facilitated South Cape Land Initiative (SCLI) workshop: invasive alien plant management and presented topic ' <i>Leading the Way in Connecting Ecosystems and Society</i> '	C. Fabricius		
		Participate in DEA-NRM management planning workshop	C. Fabricius		
		Assisted with hosting a 'Good Anthropocene' workshop, Stellenbosch	D Roux C Fabricius		
	3	Presentation on Absorptive Capacity and its relevance to learning organisations for adaptive to environmental change	S. Mc Culloch		Presented to employees of CapeNature, Eden District Municipality and Garden Route National Park
	5	Presentation of Ecological Infrastructure	C. Fabricius & D. Roux		Presented on separate occasion to SANParks, Wilderness Park Area forum in Garden Route, Eden District Municipality, Wilderness Ratepayers Association, Touw River Conservancy
<u>GRANTS RECEIVED</u>		DEA NRM Funding (R 948 000 p.a., 2014 – 2017)			Funding for 2-3 post-graduate research projects in invasive alien plants

		DST Global Change funds	Fabricius is Lead PI on the project		
KNOWLEDGE PRODUCTS					
Intellectual Property					
IP Commercialisation					
Disclosures					
OTHER (Specify)		Diana Mouton - Information session on Sub-Directorate: Environmental Law Enforcement mandates, functions and co-operative governance, 19 May 2014.			Department Environmental Affairs., Development & Planning
		Prof Carl Folke – Reconnecting development to the Biosphere, 21 October 2014.			The Founder & Science Director of the Stockholm Resilience Centre Stockholm University and Director of the Beijer Institute Ecological Economics of the Royal Swedish Academy Sciences.