

## REINETTE (OONSIE) BIGGS – CURRICULUM VITAE

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South African citizen

### HIGHER EDUCATION DEGREES

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- 2008 PhD (Limnology & Marine Science), University of Wisconsin-Madison, USA  
*Uncertainty, learning and adaptation in ecosystem management* (under Prof SR Carpenter)
- 2005 MSc (Environmental Science), University of the Witwatersrand, South Africa  
*Assessing biodiversity intactness* (under Prof RJ Scholes and Prof CH Vogel)
- 2001 BScHons (Applied Environmental Science), University of Natal, South Africa  
*Agricultural Land-Cover Change in South Africa: An eighty-year dataset* (under Prof RJ Scholes)
- 2000 BSc (Geography), University of South Africa, Pretoria, South Africa

### PRESENT POSITION

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- 2016- Ass. Prof., South African Research Chair (SARChI) in Social-Ecological Systems & Resilience  
Centre for Complex Systems in Transition, Stellenbosch University, South Africa
- 2010- Research Theme Leader, Stockholm Resilience Center, Sweden

### PREVIOUS POSITIONS

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- 2013–2015 Research Associate, Centre for Studies in Complexity, Stellenbosch University, South Africa
- 2008–2010 Postdoctoral Researcher, Stockholm Resilience Center, Sweden
- 2005–2008 Research Assistant, Center for Limnology, University of Wisconsin, USA
- 2001–2005 Researcher, Council Scientific and Industrial Research (CSIR) South Africa
- 1998–2000 Worked part-time for: South African National Parks, Jacana Education, Association for Water and Rural Development, South African Weather Bureau, Mpumalanga Parks Board.

### SUPERVISION

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#### Researchers

- 2015- *present* Prof Scott Drimie, Stellenbosch University (Chief Researcher, GRAID project, part-time)
- 2015- *present* Dr Laura Pereira, Stellenbosch University (Researcher, GRAID project)
- 2014- *present* Dr Rika Preiser, Stellenbosch University (Senior Researcher, Swedbio & GRAID projects)

#### Postdocs

- 2017- *present* Dr Kristi Maciejewski, Stellenbosch University (main supervisor)
- 2016 - 2017 Dr Maike Hamann, Stellenbosch University (main supervisor)

#### PhD

- 2017 – *present* Catherine Pringle, PhD, Stellenbosch University (main supervisor)
- 2016 – *present* Luke Metelerkamp, PhD, Stellenbosch University (co-supervisor)
- 2016 – *present* Suzara (Liza) van der Merwe, PhD, Stellenbosch University (main supervisor)
- 2014 – *present* Linda Luvuno, PhD, Stellenbosch University (main supervisor)
- 2012 – *present* Odi Selomane, PhD, Stellenbosch University (co-supervisor)
- 2011 – 2016 Maike Hamann, PhD, Stockholm University (main supervisor)
- 2010 – 2015 Juan Rocha, PhD, Stockholm University (co-supervisor)

#### Masters

- 2017- *present* Olive Zgambo, MPhil, Stellenbosch University (co-supervisor)
- 2016 – *present* Megan Lindow, MPhil, Stellenbosch University (co-supervisor)
- 2011 – 2012 Daniel Ospina, MSc, Stockholm University (main supervisor)
- 2011 – 2012 Johnny Musumbu, MSc, Uppsala University (co-supervisor)
- 2010 - 2012 Christine Hammond, MSc, Stockholm University (main supervisor)
- 2010 – 2011 Rolands Sadauskis, MSc, Stockholm University (co-supervisor)
- 2009 – 2010 Juan Rocha, MSc, Stockholm University (main supervisor)

Prof Biggs has also supervised 10 internships at the Stockholm Resilience Centre.

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## SCIENTIFIC OUTPUT

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**NRF-rating:** P; **h-index:** 37 (Google Scholar) as of 2 August 2017

47 Peer-reviewed journal articles, including articles in *Nature* (2005) and *Science* (2015, 2010)

26 Peer-reviewed book chapters

1 Edited book published by Cambridge University Press (2015)

1 Edited special issue published by *Ecology and Society* (2015)

11 Peer-reviewed reports

## MAJOR AWARDS

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2016-present South African Research Chair (SARChI) in Social-Ecological Systems and Resilience

2010-2015 ETH Society in Science Fellowship (1 of 3 fellowships awarded globally)

2005-2008 Fulbright Scholarship for doctoral studies in the USA (1 of 15 scholarships awarded by the Fulbright South Africa program)

2005 Most Promising Young Researcher Award at the CSIR Natural Resources and Environment Excellence Awards

2005 Best Publication Award in the CSIR Natural Resources and Environment Division for paper on the Biodiversity Intactness Index published in *Nature* in March 2005

2003-2004 South African National Research Foundation Prestigious Masters Scholarship (1 of 22 scholarships awarded nationally)

2000 Faculty Medal for the best performance in the degree Bachelor of Science at the University of South Africa in the year 2000

## LEADERSHIP POSITIONS & SPECIAL COMMISSIONS

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- Serve on editorial boards of *Ecology & Society* (2011- ), *Koedoe* (2013-), *BioScience* (2014-) and *Anthropocene* (2017-)
- Serve on the Scientific Committee of the international Program on Ecosystem Change and Society (PECS) (2016 – present)
- Lead the Southern African Program on Ecosystem Change and Society (SAPECS) (2012– present)
- Coordinating lead author (CLA) on the Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES) Africa assessment (2016 – present)
- Member of the IPBES expert group on scoping a set of regional/subregional assessments on biodiversity and ecosystem services (2014)
- Coordinator of the *Resilience Alliance Young Scholars* (RAYS) network (2009 – 2011). Served on the RAYS Facilitatory Committee from 2007 – 2009.
- Coordinator of the African *Akili Young Scientists* (AYS) network (2010 – 2012).
- Member of the Scientific Evaluation Committee (SEC) for the EU BiodivERsA call on *Biodiversity Dynamics: Developing Scenarios, Identifying Tipping Points and Improving Resilience* (2012)
- Project reviewer for German Federal Ministry of Education and Research (BMBF) (2013, 2014)
- Reviewer for the Netherlands Organisation of Scientific Research (NOW) (2009, 2011)

## MEDIA AND DISSEMINATION EXPERIENCE

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- Produced 3 brochures of ~20 pages each that provide popular science summaries of books and reports
- Contributed 2 articles to the *Pan European Networks* Government policy publication (2015)
- Produced 3 websites: [www.regimeshifts.org](http://www.regimeshifts.org), [www.sapecs.org](http://www.sapecs.org) and [goodanthropocenes.net/](http://goodanthropocenes.net/)
- Have spoken at various public forums, including a Royal Dialogue with the Swedish Crown Princess Victoria (2013), launch of the State of the Future Report (2012), meeting between Stockholm University and Sony Ericsson funders (2011), session keynote at the World Water Week (2010), and EU Environment Advisory Group in Brussels (2009). Recently participated in Stellenbosch University's first Science Café event (2015), attended by over 100 members of the public.
- Have initiated, coordinated and facilitated 19 multi-day project-linked transdisciplinary stakeholder workshops involving more than 25 participants each
- Have organized 9 transdisciplinary dialogues or colloquia with 50- 100 participants each
- Interviewed on South African national television (Morning Live show), as well as by several newspapers and radio stations in South Africa during the public outreach phase of the Southern African Millennium Assessment in 2004, to highlight the key findings from the project.

## PUBLICATIONS

### JOURNAL ARTICLES

1. Bennett E, M Solan, **R Biggs**, T McPhearson, A Norström, P Olsson, L Pereira, G Peterson, C Raudsepp-Hearne, F Biermann, S Carpenter, E Ellis, T Hichert, V Galaz, M Lahsen, M Milkoreit, B Martín-López, K Nicolas, R Preiser, G Vince, J Vervoort, J Xu. 2016. Bright spots: Seeds of a good Anthropocene. *Frontiers in Ecology and the Environment* 14(8): 441-448. doi:10.1002/fee.1309
  2. Hamann MH, **R Biggs**, B Reyers. An exploration of human well-being bundles as identifiers of ecosystem service use patterns. Target Journal: *PLoS ONE* 11(10): e0163476.
  3. Folke C, **R Biggs**, A Norström, B Reyers, J Rockström. 2016. Social-Ecological Resilience and Biosphere-Based Sustainability Science. *Ecology & Society* 21(3): 41.
  4. **Biggs R**, WJ Boonstra, GD Peterson, M Schlüter. 2016. The domestication of fire as social-ecological regime shift. *Past Global Changes (PAGES)* 24(1): 22-23.
  5. Rocha J, GD Peterson, **R Biggs**. 2015. Regime shifts in the Anthropocene: drivers, risks, and resilience. *PLoS ONE* 10(8): e0134639.
  6. Selomane O, B Reyers, **R Biggs**, S Polasky, H Tallis. 2015. Towards integrated social-ecological sustainability indicators: exploring the contribution and gaps in existing global data. *Ecological Economics* 118: 140–146.
  7. Hamann MH, **R Biggs**, B Reyers. 2015. Mapping social-ecological systems: Identifying ‘green-loop’ and ‘red-loop’ dynamics based on characteristic bundles of ecosystem service use. *Global Environmental Change* 34: 218–226.
  8. Homer-Dixon T, B Walker, **R Biggs**, A-S Crepin, C Folke, EF Lambin, GD Peterson, J Rockström, M Scheffer, W Steffen, and M Troell. 2015. Synchronous failure: The emerging causal architecture of global crisis. *Ecology and Society* 20 (3): 6.
  9. Fischer J, TA Gardner, EM Bennett, P Balvanera, **R Biggs**, SR Carpenter, T Daw, C Folke, R Hill, T Hughes, T Luthe, MI Maass, M Meacham, AV Norström, G Peterson, C Queiroz, R Seppelt, M Spierenburg, J Tenhunen. 2015. Advancing sustainability through mainstreaming a social-ecological systems perspective. *Current Opinion in Environmental Sustainability* 14: 144-149
  10. Palmer CG, **R Biggs**, GS Cumming. 2015. Guest Editorial: Applied research for enhancing human well-being and environmental stewardship: using complexity thinking in Southern Africa. *Ecology and Society* 20(1): 53.
  11. **Biggs R**, C Rhode, S Archibald, LM Kunene, SS Mutanga, N Nkuna, PO Ocholla, and LJ Phadima. 2015. Strategies for managing complex social-ecological systems in the face of uncertainty: Examples from South Africa and beyond. *Ecology and Society* 20(1): 52.
  12. Steffen W, K Richardson, J Rockström, SE Cornell, I Fetzer, EM Bennett, **R Biggs**, SR Carpenter, W de Vries, CA de Wit, C Folke, D Gerten, J Heinke, GM Mace, LM Persson, V Ramanathan, B Reyers, S Sörlin. 2015. Planetary Boundaries: Guiding human development on a changing planet. *Science* 347(6223): 1259855. DOI: 10.1126/science.1259855.
  13. Rocha J, J Yletyinen, **R Biggs**, T Blenckner, and GD Peterson. 2015. Marine Regime Shifts: Drivers and Impacts on Ecosystems Services. *Philosophical Transactions of the Royal Society B* 370: 20130273.
  14. Tallis H, Lubchenco J, et al. 2014. Working together: A call for inclusive conservation. *Nature* 515: 27-28. doi:10.1038/515027a
  15. Leadley P, V Proença, J Fernández-Manjarrés, HM Pereira, R Alkemade, **R Biggs**, E Bruley, W Cheung, D Cooper, J Figueiredo, E Gilman, S Guénette, G Hurtt, C Mbow, T Oberdorff, C Revenga, JPW Scharlemann, R Scholes, M Stafford-Smith, R Sumaila, M Walpole. 2014. Interacting Regional Scale Regime Shifts for Biodiversity and Ecosystem Services. *BioScience* 64: 665-679.
  16. Mace GM, B Reyers, R Alkemade, **R Biggs**, FS Chapin, SE Cornell, S Díaz, S Jennings, P Leadley, PJ Mumby, A Purvis, RJ Scholes, AWR Seddon, M Solan, W Steffen, G Woodward. 2014. Approaches to defining a planetary boundary for biodiversity. *Global Environmental Change* 28: 289-297.
  17. Gaertner M, **R Biggs**, M Te Beest, J Molofsky, DM Richardson. 2014. Invasive plants as drivers of regime shifts: Identifying high priority invaders that alter feedback relationships. *Diversity and Distributions* 20: 733-744.
  18. Scholes RJ, B Reyers, **R Biggs**, MJ Spierenburg, A Duriappah. 2013. Multi-scale and cross-scale assessments of social-ecological systems and their ecosystem services. *Current Opinion in Environmental Sustainability* 5(1): 16-25.
  19. Rogers KH, HC Biggs, **R Biggs**, S Blignaut, A Choles, R Luton, C Palmer, P Tangwe. 2013. Fostering complexity thinking in action research for change in social-ecological systems. *Ecology and Society* 18(2): 31.
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20. Reyers B, **R Biggs**, GS Cumming, T Elmqvist, AP Hejnowicz, S Polasky. 2013. Getting the measure of ecosystem services: a social-ecological approach. *Frontiers in Ecology and the Environment* 11: 268–273.
21. Pearson L, **R Biggs**, M Harris, and BH Walker. 2013. Measuring sustainable development: the promise and difficulties of implementing Inclusive Wealth in the Goulburn-Broken Catchment, Australia. *Sustainability: Science, Practice, & Policy* 9(1): 16-27.
22. Carpenter, SR, KJ Arrow, S Barrett, **R Biggs**, WA Brock, A-S Crépin, G Engström, C Folke, TP Hughes, N Kautsky, CZ Li, G McCarney, K Meng, K-G Mäler, S Polasky, M Scheffer, J Shogren, T Sterner, JR Vincent, BH Walker, A Xepapadeas, and A de Zeeuw. 2012. General resilience to cope with extreme events. *Sustainability* 4: 3248-3259.
23. Crepin, AS, **R Biggs**, S Polasky, M Troell and A de Zeeuw. 2012. Regime shifts and management. *Ecological Economics* 84: 15-22.
24. **Biggs, R**, M Schlüter, D Biggs, EL Bohensky, S Burnsilver, G Cundill, V Dakos, T Daw, L Evans, K Kotschy, A Leitch, C Meek, A Quinlan, C Raudsepp-Hearne, M Robards, ML Schoon, L Schultz, and PC West. 2012. Towards principles for enhancing the resilience of ecosystem services. *Annual Review of Environment and Resources* 37: 421-448.
25. Biggs D, **R Biggs**, V Dakos, RJ Scholes, ML Schoon. 2011. Are we entering an era of concatenated global crises? *Ecology and Society* 16(2): 27.
26. Pereira HM, PW Leadley, V Proença, R Alkemade, JPW Scharlemann, JF Fernandez-Manjarrés, MB Araújo, P Balvanera, **R Biggs**, WWL Cheung, L Chini, HD Cooper, EL Gilman, S Guénette, GC Hurtt, HP Huntington, GM Mace, T Oberdorff, C Revenga, P Rodrigues, RJ Scholes, UR Sumaila, M Walpole. 2010. Scenarios for Global Biodiversity in the 21st Century. *Science* 330:1496-1501.
27. **Biggs R**, FR Westley, SR Carpenter. 2010. Navigating the back loop: Fostering social innovation and transformation in ecosystem management. *Ecology and Society* 15(2): 9.
28. **Biggs R**, MW Diebel, D Gilroy, AM Kamarainen, MS Kornis, ND Preston, JE Schmitz, CK Uejio, MC Van De Bogert, BC Weidel, PC West, DPM Zaks, SR Carpenter. 2010. Preparing for the future: Teaching scenario planning at the graduate level. *Frontiers in Ecology and the Environment* 8(5): 267-273.
29. Chapin FS III, SR Carpenter, GP Kofinas, C Folke, N Abel, WC Clark, P Olsson, DM Stafford Smith, BH Walker, OR Young, F Berkes, **R Biggs**, JM Grove, RL Naylor, E Pinkerton, W Steffen, FJ Swanson. 2010. Ecosystem Stewardship: Sustainability Strategies for a Rapidly Changing Planet. *Trends in Ecology and Evolution* 25(4): 241-249.
30. Walker BH, L Pearson, M Harris, KG Mäler, L Chuan-Zhong, **R Biggs**, T Baynes. 2010. Incorporating resilience in the assessment of Inclusive Wealth: An example from South East Australia. *Environmental and Resource Economics* 45: 183-202.
31. **Biggs R**, SR Carpenter, WA Brock. 2009. Turning back from the brink: Detecting an impending regime shift in time to avert it. *Proceedings of the National Academy of Sciences* 106(3): 826-831.
32. **Biggs R**, SR Carpenter, WA Brock. 2009. Spurious certainty: How ignoring measurement error and environmental heterogeneity may contribute to environmental controversies. *BioScience* 59(1): 65-76.
33. Kamarainen AM, F Rowland, **R Biggs**, SR Carpenter. 2008. Zooplankton and the Total Phosphorous-Chlorophyll a relationship: A hierarchical Bayesian analysis. *Canadian Journal of Fisheries and Aquatic Sciences* 65: 2644-2655.
34. **Biggs R**, H Simons, M Bakkenes, RJ Scholes, B Eickhout, D van Vuuren, JRM Alkemade. 2008. Scenarios of biodiversity loss in southern Africa in the 21<sup>st</sup> Century. *Global Environmental Change* 18: 296-309.
35. Hui D, **R Biggs**, RJ Scholes, RB Jackson. 2008. Measuring uncertainty in estimates of biodiversity loss: The example of biodiversity intactness variance. *Biological Conservation* 141: 1091-1094.
36. **Biggs R**, C Raudsepp-Hearne, C Atkinson-Palombo, E Bohensky, E Boyd, G Cundill, H Fox, S Ingram, K Kok, S Spehar, M Tengö, D Timmer, M Zurek. 2007. Linking futures across scales: a dialog on multi-scale scenarios. *Ecology and Society* 12(1):17.
37. Kok K, **R Biggs**, M Zurek. 2007. Methods for developing multiscale participatory scenarios: Insights from Southern Africa and Europe. *Ecology and Society* 13(1):8.
38. Carpenter SR, BJ Benson, **R Biggs**, JW Chipman, JA Foley, SA Golding, RB Hammer, PC Hanson, PTJ Johnson, AM Kamarainen, TK Kratz, RC Lathrop, KD McMahon, B Provencher, JA Rusak, CT Solomon, EH Stanley, MG Turner, MJ Vander Zanden, C-H Wu, H Yuan. 2007. Understanding regional change: Comparison of two lake districts. *BioScience* 57(4): 323-335.
39. **Biggs R**, B Reyers, RJ Scholes. 2006. A biodiversity intactness score for South Africa. *South African Journal of Science* 102(7/8): 277-283.
40. Scholes RJ, **R Biggs**. 2005. A biodiversity intactness index. *Nature* 434: 45-49.
41. Van Jaarsveld AS, **R Biggs**, RJ Scholes, E Bohensky, B Reyers, T Lynam, C Msuvuto, C Fabricius. 2005. Measuring conditions and trends in ecosystem services at multiple scales: The Southern African

Assessment (SAfMA) experience. *Philosophical Transactions of the Royal Society of London, Biological Sciences* 360: 425-441.

42. **Biggs R**, HC Biggs, TT Dunne, N Govender, ALF Potgieter. 2003. Experimental burn plot trial in the Kruger National Park: history, experimental design and suggestions for data analysis. *Koedoe* 46(1): 1-15.
43. **Biggs R**, RJ Scholes. 2002. Land-cover changes in South Africa 1911-1993. *South African Journal of Science* 98(9/10): 420-424.
44. Jacobs OS, **R Biggs**. 2002. The impact of the African elephant on Marula (*Sclerocarya birrea* subsp. *caffra*) trees in the Kruger National Park. *South African Journal of Wildlife Research* 32(1): 13-22.
45. Jacobs OS, **R Biggs**. 2002. The status and population structure of the Marula (*Sclerocarya birrea* subsp. *caffra*) in the Kruger National Park. *South African Journal of Wildlife Research* 32(1): 1-12.
46. Jacobs OS, **R Biggs**. 2001. The effect of different fire treatments on the population structure and density of the Marula, *Sclerocarya birrea* (A.Rich.) subsp. *caffra* (Sond.) *kokwaro* (Kokwaro & Gillet 1980) in the Kruger National Park. *African Journal of Range and Forage Science* 18(1): 13-23.
47. Enslin BW, ALF Potgieter, HC Biggs, **R Biggs**. 2000. Long term effects of fire frequency and season on the woody vegetation dynamics of the *Sclerocarya birrea*/*Acacia nigrescens* savanna of the Kruger National Park. *Koedoe* 43(1): 27-37.

#### BOOK CHAPTERS

1. Scholes, RJ, A Driver, **R Biggs**, G Forsyth. Biodiversity: Natural Capital to be wisely used. In press. *South African Risk and Vulnerability Atlas*. Department of Science & Technology, South Africa.
2. **Biggs R**, M Schlüter, ML Schoon. 2015. An introduction to the resilience approach and principles to sustain ecosystem services in social-ecological systems. Chapter 1 (p1-31) in: *Principles for Building Resilience: Sustaining Ecosystem Services in Social-Ecological Systems*. R Biggs, M Schlüter, ML Schoon (eds). Cambridge University Press.
3. Schoon ML, M Robards, K Brown, N Engle, C Meek, **R Biggs**. 2015. Politics and the Resilience of Ecosystem Services. Chapter 2 (p32-49) in: *Principles for Building Resilience: Sustaining Ecosystem Services in Social-Ecological Systems*. R Biggs, M Schlüter, ML Schoon (eds). Cambridge University Press.
4. Kotschy K, **R Biggs**, T Daw, C Folke, P West. 2015. Principle 1 - Maintain diversity and redundancy. Chapter 3 (p50-79) in: *Principles for Building Resilience: Sustaining Ecosystem Services in Social-Ecological Systems*. R Biggs, M Schlüter, ML Schoon (eds). Cambridge University Press.
5. **Biggs R**, L Gordon, C Raudsepp-Hearne, M Schlüter, B Walker. 2015. Principle 3 – Manage slow variables and feedbacks. Chapter 5 (p105-141) in: *Principles for Building Resilience: Sustaining Ecosystem Services in Social-Ecological Systems*. R Biggs, M Schlüter, ML Schoon (eds). Cambridge University Press.
6. Schlüter M, **R Biggs**, ML Schoon, MD Robards, JM Anderies. 2015. Reflections on Building Resilience: Interactions among Principles and Implications for Governance. Chapter 10 (p251-282) in: *Principles for Building Resilience: Sustaining Ecosystem Services in Social-Ecological Systems*. R Biggs, M Schlüter, ML Schoon (eds). Cambridge University Press.
7. Crépin A-S, Biggs R, Polasky S, Troell M, de Zeeuw A. 2013. Regime Shifts and Management. In: *Encyclopedia of Energy, Natural Resource, and Environmental Economics*, Vol. 2 (p339-348). JF Shogren (ed). Elsevier, Amsterdam. ISBN: 978-0-08-096452-2.  
[www.sciencedirect.com/science/referenceworks/9780080964522](http://www.sciencedirect.com/science/referenceworks/9780080964522)
8. West PC, **R Biggs**, B McKenney, C Monfreda. 2013. Feeding the world and protecting biodiversity. (p426-434) In *Encyclopedia of Biodiversity 2nd Edition*. SA Levin (ed). Elsevier Academic Press, Waltham, MA, USA. ISBN: 978-0-12-384720-1. <http://store.elsevier.com/Encyclopedia-of-Biodiversity/isbn-9780123847195/>
9. Rocha J, **R Biggs**, GD Peterson. 2012. Regime Shifts. (p330-334) In: *Berkshire Encyclopedia of Sustainability: Ecosystem Management and Sustainability*. RK Craig, JC Nagle, B Parady, OJ Schmitz, WK Smith (eds). Berkshire Publishing, Gt Barrington, MA, USA. ISBN: 9781933782164.  
<http://berkshirepublishing.com/home/product.aspx?projid=99>
10. **Biggs R**, T Blenckner, C Folke, L Gordon, A Norström, M Nyström, GD Peterson. 2012. Regime Shifts. (p609-617) In: *Encyclopedia of Theoretical Ecology*. A Hastings, L Gross (eds). University of California Press, Ewing, NJ, USA. ISBN: 9780520269651. [www.ucpress.edu/book.php?isbn=9780520269651](http://www.ucpress.edu/book.php?isbn=9780520269651)
11. O'Brien K, A Patwardhan, M Pelling, S Hallegatte, A Maskrey, T Oki, U Oswald-Spring, T Wilbanks, PZ Yanda, F Berkhout, **R Biggs**, HG Brauch, K Brown, C Folke, L Harrington, H Kunreuther, C Lacambra, R Leichenko, R Mechler, C Pahl-Wostl, V Przylyski, D Satterthwaite, F Sperling, L Sygna, T Tanner, P Tschakert, K Ulsrud, V Viguié. 2012. Toward a Sustainable and Resilient Future. Chapter 8 (p437-486) in: *Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation*. CB Field, V Barros, TF Stocker, Q Dahe, DJ Dokken, G-K Plattner, KL Ebi, SK Allen, MD Mastrandrea, M Tignor, KJ

- Mach, PM Midgley (eds). Special Report of the Intergovernmental Panel on Climate Change (IPCC). Cambridge University Press, Cambridge, UK. ISBN: 978-1-107-60780-4. <http://ipcc-wg2.gov/SREX/report/>
12. Scholes RJ, **R Biggs**, C Palm, A Duraiappah. 2010. Assessing state and trends in ecosystem services and human well-being. Chapter 4 (p115-150) in: *Ecosystems and Human Well-being: A manual for assessment practitioners*. N Ash, H Blanco, C Brown, K Garcia, T Henrichs, N Lucas, C Raudsepp-Hearne, RD Simpson, RJ Scholes, T Tomich, B Vira, M Zurek (eds). Island Press, Washington DC. ISBN: 9781597267106.
  13. Carpenter SR, **R Biggs**. 2009. Freshwaters: Managing across scales in space and time. Chapter 9 (p197-220) in: *Principles of ecosystem stewardship: Resilience-based natural resource management in a changing world*. FS Chapin, III, GP Kofinas, C Folke (eds). Springer, New York. ISBN: 978-0-387-73032-5.
  14. Chapin FS III, GP Kofinas, C Folke, SR Carpenter, P Olsson, N Abel, **R Biggs**, RL Naylor, E Pinkerton, DM Stafford-Smith, WL Steffen, BH Walker, OR Young. 2009. Resilience-based stewardship: Strategies for navigating sustainable pathways in a changing world. Chapter 15 (p319-337) in: *Principles of ecosystem stewardship: Resilience-based natural resource management in a changing world*. FS Chapin, III, GP Kofinas, C Folke (eds). Springer, New York. ISBN: 978-0-387-73032-5.
  15. Zurek M, **R Biggs**, C Raudsepp-Hearne, EM Bennett, K Kok, SJ Velarde. 2008. Looking into the future of ecosystem services and human well-being. Chapter 4 (p45-56) in: *Ecosystem Services: A Guide for Decision Makers*. J Ranganathan, C Raudsepp-Hearne, N Lucas, F Irwin, M Zurek, K Bennett, N Ash, P West. World Resources Institute, Washington DC, USA. ISBN: 978-1-56973-669-2. [http://pdf.wri.org/ecosystem\\_services\\_guide\\_for\\_decisionmakers.pdf](http://pdf.wri.org/ecosystem_services_guide_for_decisionmakers.pdf)
  16. **Biggs R**, RJ Scholes. 2007. Assessing the loss of natural capital: A biodiversity intactness index. Chapter 6 (p44-54) in: *Restoring Natural Capital: Science, Business, and Practice*. J Aronson, SJ Milton, JN Blignaut (eds). The Science and Practice of Ecological Restoration Series. Island Press, Washington DC, USA. ISBN: 1-59726-076-2.
  17. Scholes RJ, **R Biggs**, EJ Brown, E Gaddis, KD Holl. 2007. Overcoming obstacles at a global scale to restore natural capital. Chapter 30 (p265-274) in: *Restoring Natural Capital: Science, Business, and Practice*. J Aronson, SJ Milton, JN Blignaut (eds). The Science and Practice of Ecological Restoration Series. Island Press, Washington DC, USA. ISBN: 1-59726-076-2.
  18. **Biggs R**, RJ Scholes, BJE ten Brink, D Vačkář. 2007. Biodiversity Indicators. Chapter 16 (p249-270) in: *Sustainability indicators: A scientific assessment*. T Hák B Moldan, AL Dahl (eds). SCOPE Report 67, Island Press, Washington DC, USA. ISBN: 1-59726-131-9.
  19. Karlsson S, AL Dahl, **R Biggs**, BJE ten Brink, E Gutierrez-Espeleta, MNH Hasan, G Laumann, B Moldan, A Singh, J Spangenberg, D Stanners. 2007. Meeting conceptual challenges. Chapter 2 (p27-48) in: *Sustainability indicators: A scientific assessment*. T Hák B Moldan, AL Dahl (eds). SCOPE Report 67, Island Press, Washington DC, USA. ISBN: 1-59726-131-9.
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