

# Trends in Research and Management of Freshwater Ecosystems

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# Chronology of aquatic science

- 💧 WRC study, conceptualised in 2008
- 💧 Contact list of people with “long memories”
- 💧 Regional meetings: Pietermaritzburg, Pretoria, Bloemfontein, Grahamstown and Cape Town
- 💧 Developed draft; invited contributions
- 💧 Co-compilers:
  - 💧 Charles Breen, Jenny Day, Steve Mitchell, Maitland Seaman and Michael Silberbauer



# Motivation for this study

- Science is a highly systematic and cumulative process of knowledge production
- Conversion of knowledge from tacit to explicit form is hard
- Experiment in slowing down:
  - To learn from the past, anticipate the future and have a more meaningful experience of the present (Paul Cilliers)



# Exceptional pioneers of the past

- 💧 Mary Pocock (31 Dec 1886 – 10 July 1977)
- 💧 Keppel Barnard (13 Mar 1887 – 22 Sept 1964)
- 💧 Evelyn Hutchenson (30 Jan 1903 – 17 May 1991)
- 💧 E. M. van Zinderen Bakker (15 April 1907 – 19 Mar 2002)
- 💧 John Day (25 Aug 1909 – 24 April 1989)
- 💧 Marjorie Scott (19 Jan 1913 – 26 April 1998)
- 💧 Arthur Harrison (24 Dec 1921 – 30 Dec 2007)



- 💧 The early years (1900 – 1945)
- 💧 The middle years (1946 – 1979)
- 💧 The turbulent transitional years (1980 – 1994)
- 💧 The latter years – coping with change (1995 – 2010)



# The early years (1900-1945)

## Chronology of key events

- 💧 **1901** – Publication of the first textbook on limnology, by Prof F.A. Forel
- 💧 **1908** – Establishment of first journal for limnology, *Internationale Revue der gesamten Hydrobiologie und Hydrographie*
- 💧 **1915** – The first comprehensive ichthyological survey of a South African estuary is conducted on the Zwartkops estuary
- 💧 **1922** – Establishment of the *International Association for Theoretical and Applied Limnology* (SIL)
- 💧 **1945** – Establishment of the CSIR as a “body corporate” outside of the Public Service



# The early years (1900-1945)

## Institutional landscape

- 💧 Several extreme events
  - 💧 World War I (1914-1918)
  - 💧 Spanish flu epidemic (1918-1920)
  - 💧 Great Depression (1929-1940)
  - 💧 World War II (1939-1945)
- 💧 Bygone era of academic and student life
- 💧 Little support – but time and research freedom
- 💧 Limnology dominated by European scholars





# The middle years (1946-1979)

## Chronology of key events

- 💧 1956 – Passing of SA's first Water Act (Act No. 54 of 1956)
- 💧 1962 – Publication of Rachel Carson's *Silent Spring*
- 💧 **1963** – Founding of Limnological Society of Southern Africa
- 💧 **1966** – Launch of Commission of Enquiry into Water Matters
  - 💧 1971 – Water Research Commission
  - 💧 1972 – Hydrological Research Institute
- 💧 **1975** – CSIR establishes the Co-operative Scientific Programmes (CSPs)





# The middle years (1946-1979)

## Institutional landscape

- 💧 Post WW II optimism
- 💧 International isolation
- 💧 Systemic integration in research but limited management uptake
- 💧 Field work and research stations
  - 💧 Marion Island, UOFS, 1965, E.M. van Zinderen Bakker
  - 💧 Lake Kariba, Wits, 1960
  - 💧 Lake Sibaya, Rhodes, 1967
  - 💧 Gariep Dam, UOFS, 1973
  - 💧 Swartvlei, Rhodes, 1974
  - 💧 Pongola Floodplain, U Natal, 1974



# The turbulent transitional years (1980-1994)

## Chronology of key events

- 💧 **1980** – Rhodes initiates Masters in Limnology
- 💧 **1980** – UOFS starts Honours Degree in Limnology
- 💧 **1984** – Initiation of FRU at UCT
- 💧 **1991** – Establishment of IWR at Rhodes
- 💧 **1984** – Birth of the CSIR's FRD



# The turbulent transitional years (1980-1994)

## Key publications

- 💧 *Man and the Pongolo Floodplain (1982)*
- 💧 *The limnology of Hartbeespoort Dam (1985)*
- 💧 *Management of the Water Resources of the RSA (1986)*
- 💧 *Inland Waters of Southern Africa: An Ecological Perspective (1990)*
- 💧 *Water Quality Management Policies and Strategies in the RSA (1991)*
- 💧 *Freshwater Fishes of Southern Africa (1993)*
- 💧 *Surface Water Resources of South Africa 1990 (1994)*



# The turbulent transitional years (1980-1994)

## Institutional landscape

- 💧 Commercialisation of science
- 💧 Hartbeespoort Dam Ecosystem Programme (1980-1989)
- 💧 Social cohesion & science-management interfacing
- 💧 Digital revolution
  - 💧 1981 – First IBM personal computers
  - 💧 1991 – Tim Berners-Lee creates the World Wide Web
  - 💧 1994 – Netscape is launched



# The latter years – coping with change (1995-2010)

## Chronology of key events

- 💧 1997 – White Paper on a National Water Policy for South Africa
- 💧 1998 – National Water Act No. 36 of 1998
- 💧 **2004** – National Spatial Biodiversity Assessment
- 💧 2004 – Publication of the National Water Resource Strategy
- 💧 2008 – Formation of Centre for Aquatic Research at UJ
- 💧 2009 – International Environmental Water Allocations Conference is held in Port Elizabeth
- 💧 2010 – The International Limnological Conference is held in Cape Town



# The latter years – coping with change (1995-2010)

## Institutional landscape

- 💧 Policy revision
- 💧 Frenzy of restructuring and renaming
- 💧 Notable research-management “programmes”
  - 💧 KNP Rivers Research Programme
  - 💧 Environmental Water Requirements
  - 💧 River Health Programme
  - 💧 Freshwater Conservation planning
  - 💧 Wetlands research, inter-basin transfers , toxicology, ...
- 💧 Research: from self governance to hierarchical management
- 💧 Poor ecological state; limited capacity to respond



# Recap

- 💧 The early years (1900-1945)
  - 💧 Remarkable pioneers; found ways and means to conduct their research without significant support
- 💧 The middle years (1946-1979)
  - 💧 CSIR; Co-operative Scientific Programmes; cohesion within aquatic science community; field stations
- 💧 The transitional years (1980-1994)
  - 💧 Drive to commercialise research; demise of CSPs, cohesion across science-management domains, WRC
- 💧 The latter years (1995-2010)
  - 💧 Exciting water legislation; new business model for science; chronic capacity constraints in management





# 1. Slow down – this is a complex operating environment

- 💧 No buffer time
- 💧 Little space to nurture creativity and originality
- 💧 Speed (efficiency) has become a virtue in itself
- 💧 Selective resistance & patient persistence



## 2. Strive for excellence

International excellence



National vision



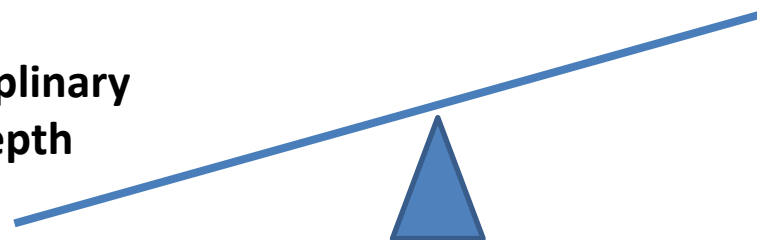
Local relevance



Inter-disciplinary  
skills



Disciplinary  
depth



# 3. Rediscover noble purpose

- 💧 Not just a job or business proposition
- 💧 Stewards and discoverers
  - 💧 *“... we relish the fun and challenges of problem-solving, and we wish to contribute something useful to current and future generations” (Lubchenco)*
- 💧 Selectively resist pressures
  - 💧 *All too often today scientists seem forgetful of their calling and submit passively to being overmanaged into a state of creative impotence (Philip)*



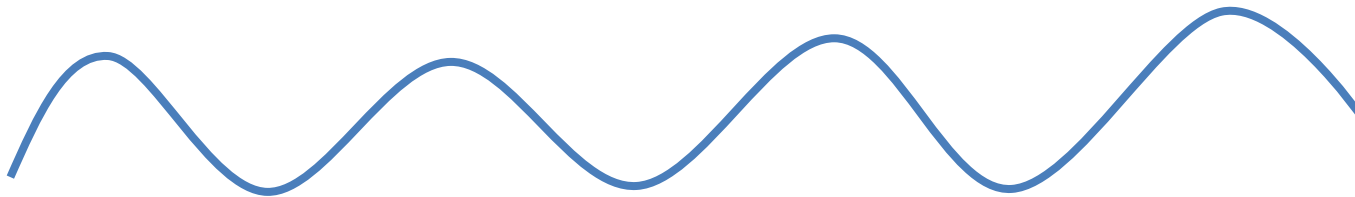
## 4. Learn with others

- 💧 People construct new knowledge/understanding based on what they already know or believe
- 💧 Co-learning is more than participation
- 💧 It requires empathetic listening



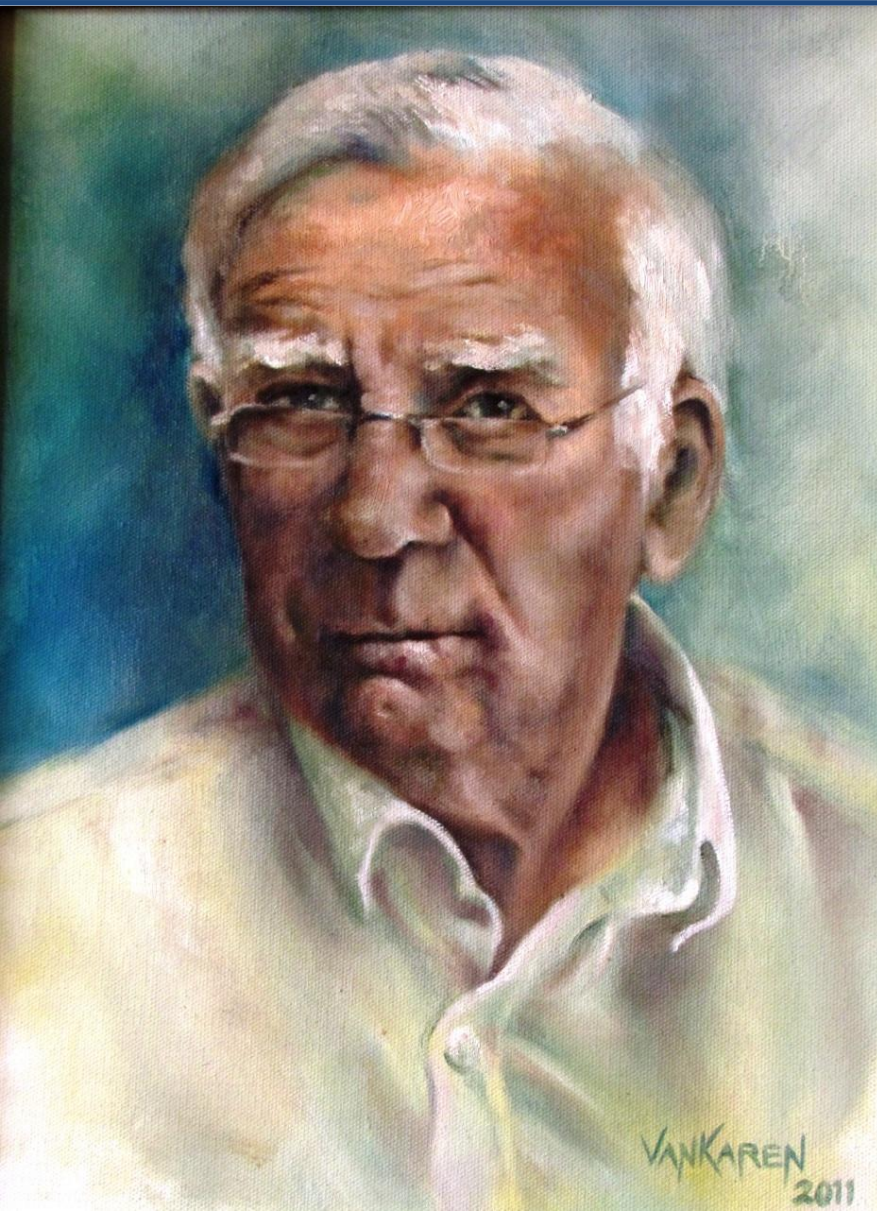
# 5. Have fun

- 💧 “Cannot wait for retirement ...”
- 💧 “Forever trying to clear my desk ...”
- 💧 Ambiance – frequency of interruptions; space for reflection; culture of group learning; lab and field work
- 💧 Pace your race: oscillating career rhythm





# Prof Brian Allanson



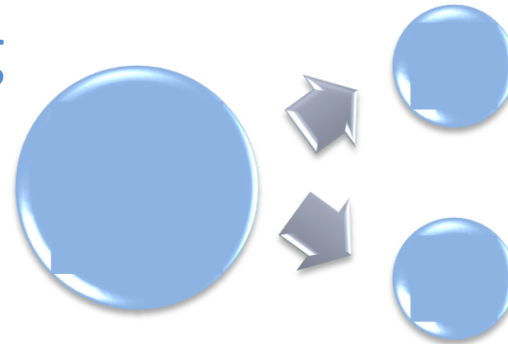
Knysna, August 2011

## Thank you



# Trends: *dichotomy* or *seesaw*

A *dichotomy* is any splitting of a whole into two non-overlapping parts



A *seesaw* provides balancing between two forces; as one goes up, the other goes down

