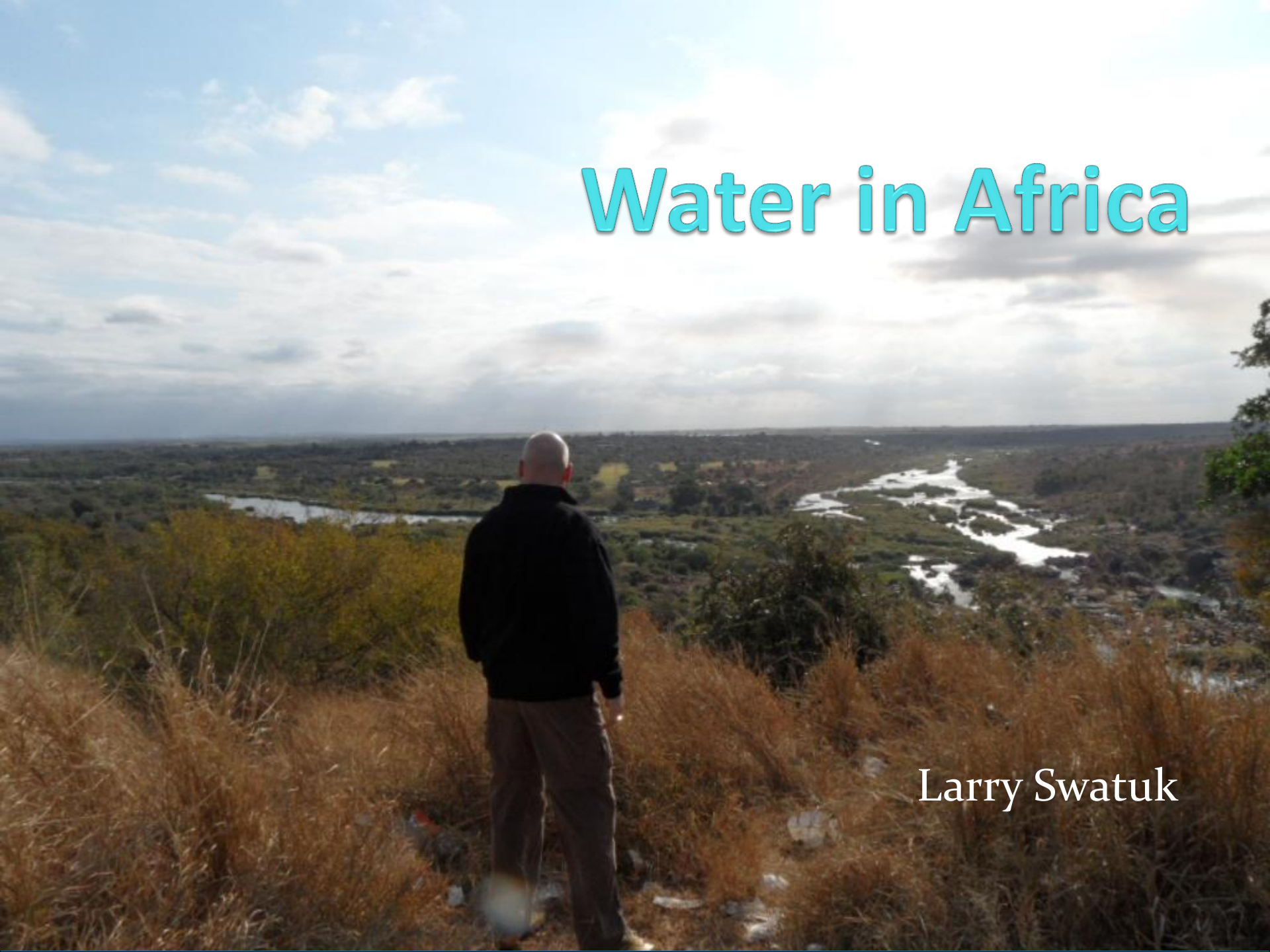


Water in Africa

Larry Swatuk



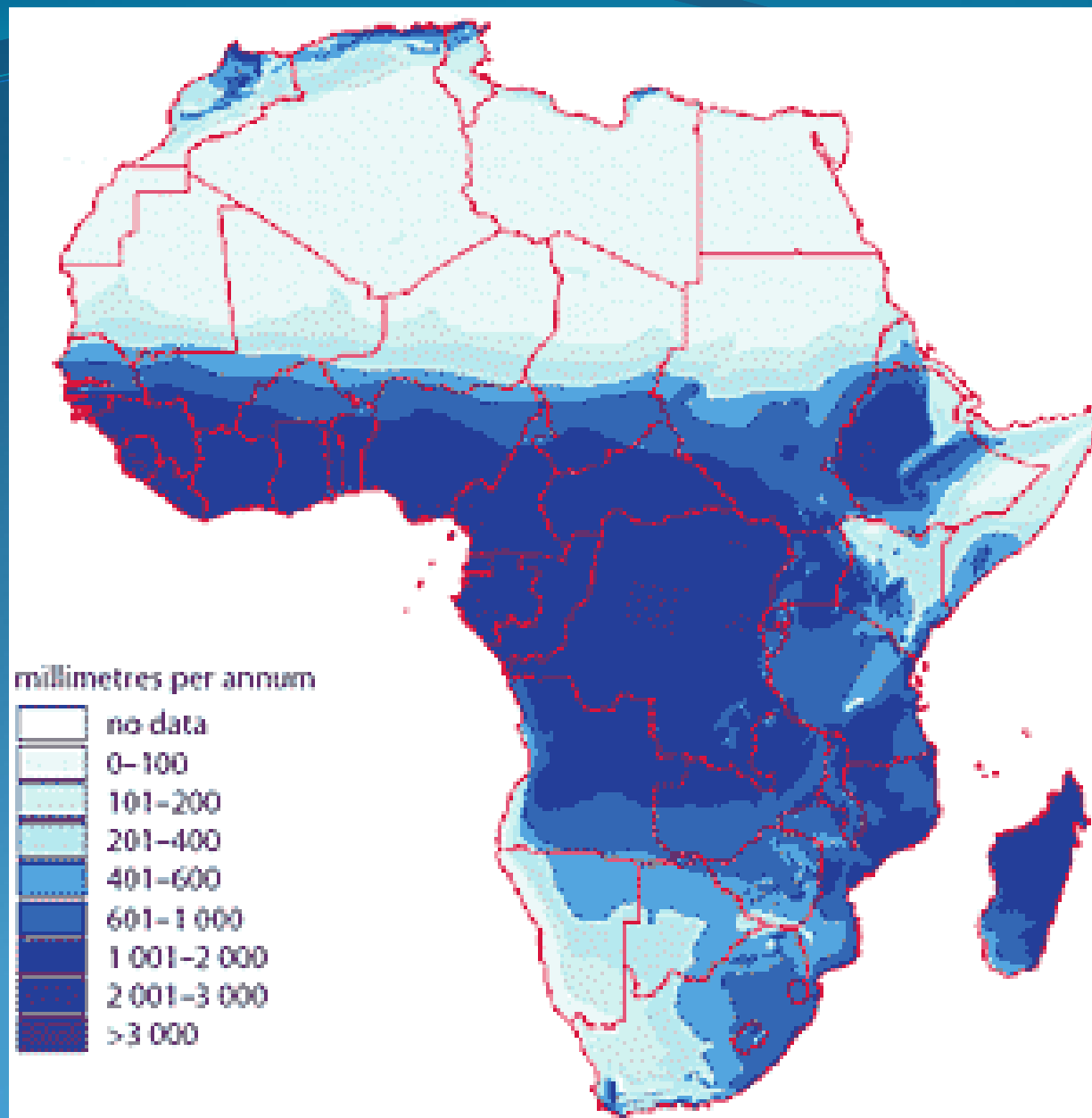
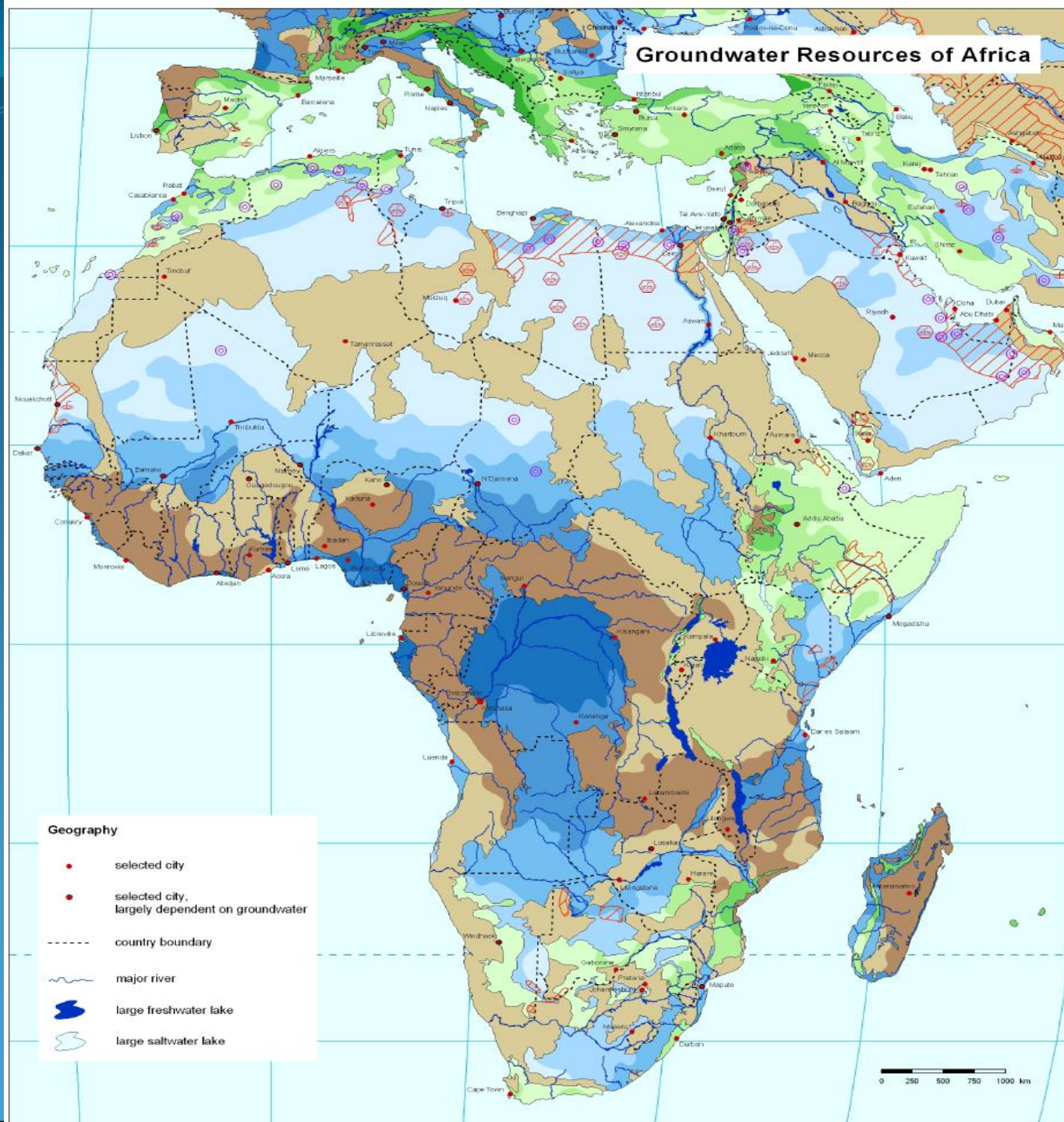


Table 2: Surface water resources in the sub-regions of Africa

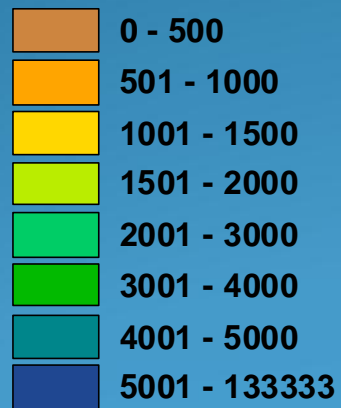
Region	Area (km ²)	Runoff (km ³ /year)	% of Total Runoff	Runoff (mm/year)	Water/capita/year
Central Africa	5,328,660	1,912	48	359	21,849
Eastern Africa	2,924,970	260	7	89	1,567
Gulf of Guinea	2,119,270	952	24	449	5,388
Indian Oceans Islands	594,270	345	9	581	18,533
Northern Africa	5,752,890	50	1	9	346
Southern Africa	4,738,520	271	7	57	2,653
Sudano-Sahelian	8,587,030	160	4	19	1,609
Africa	30,045,610	3,950	100	131	4,979

Source: FAO (2003)

Groundwater Resources of Africa

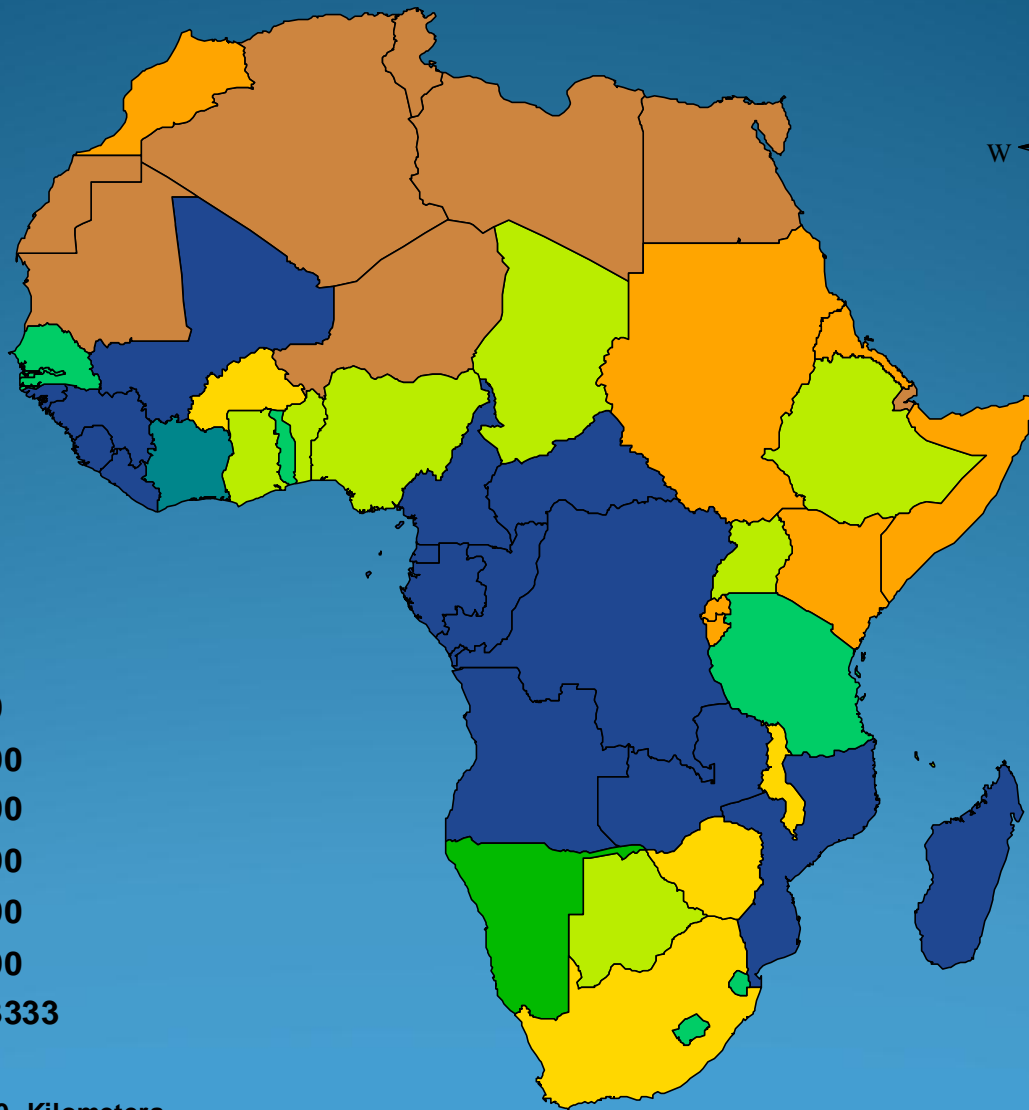


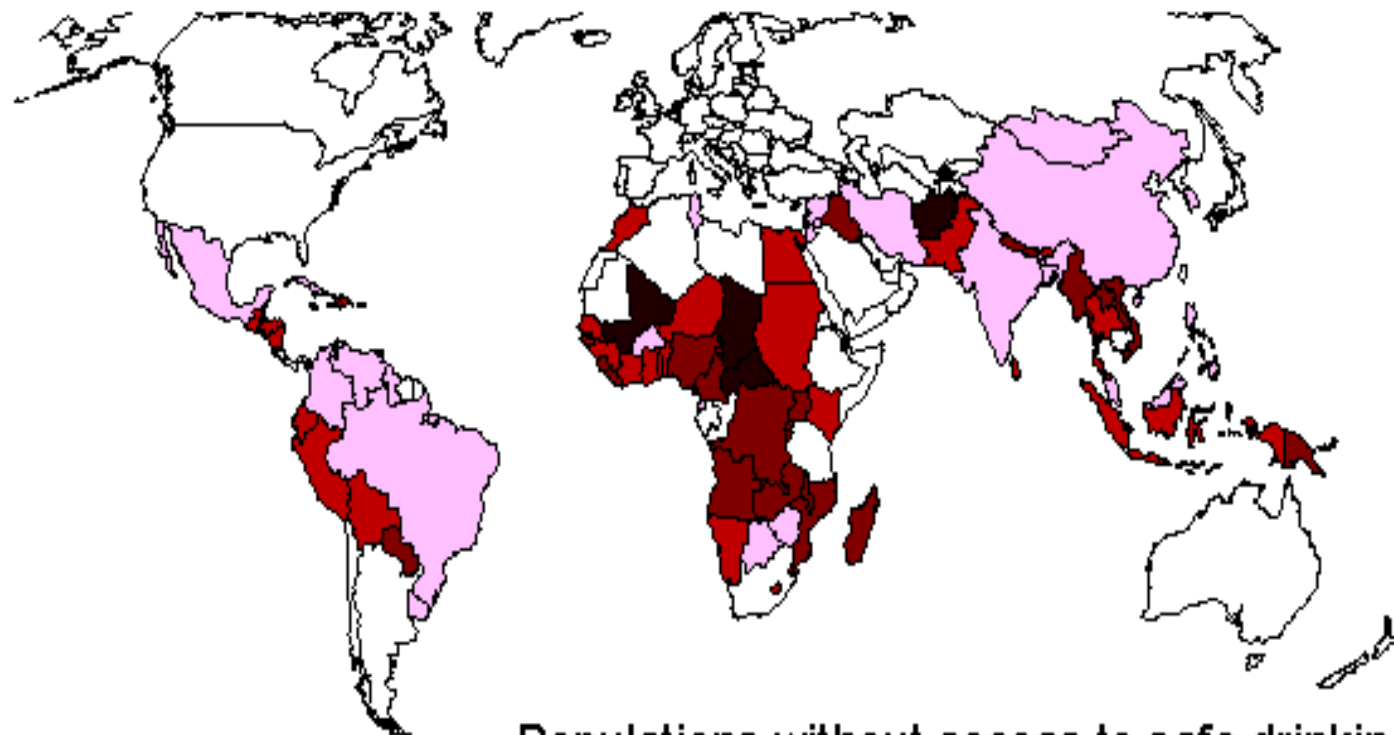
**Cubic metres/
capita/year**



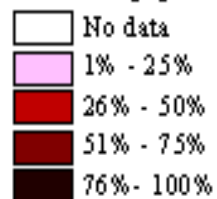
0 1000 2000 Kilometers

A horizontal scale bar with three segments, corresponding to 0, 1000, and 2000 kilometers.





Percent of population without access

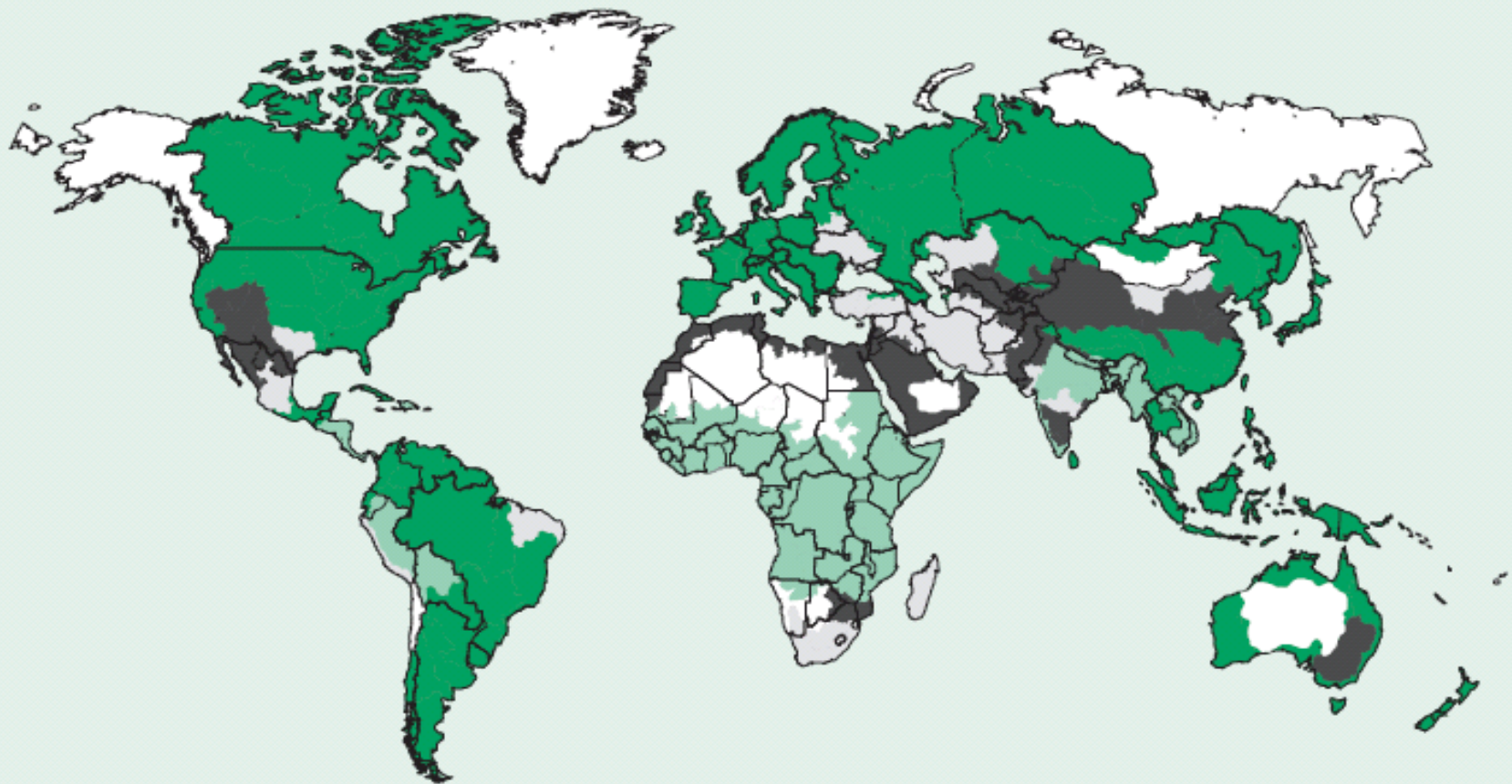


Populations without access to safe drinking water

from *The World's Water*
The Biennial Report on Freshwater Resources
(Gleick 1998)

Incomplete 'hydraulic mission'

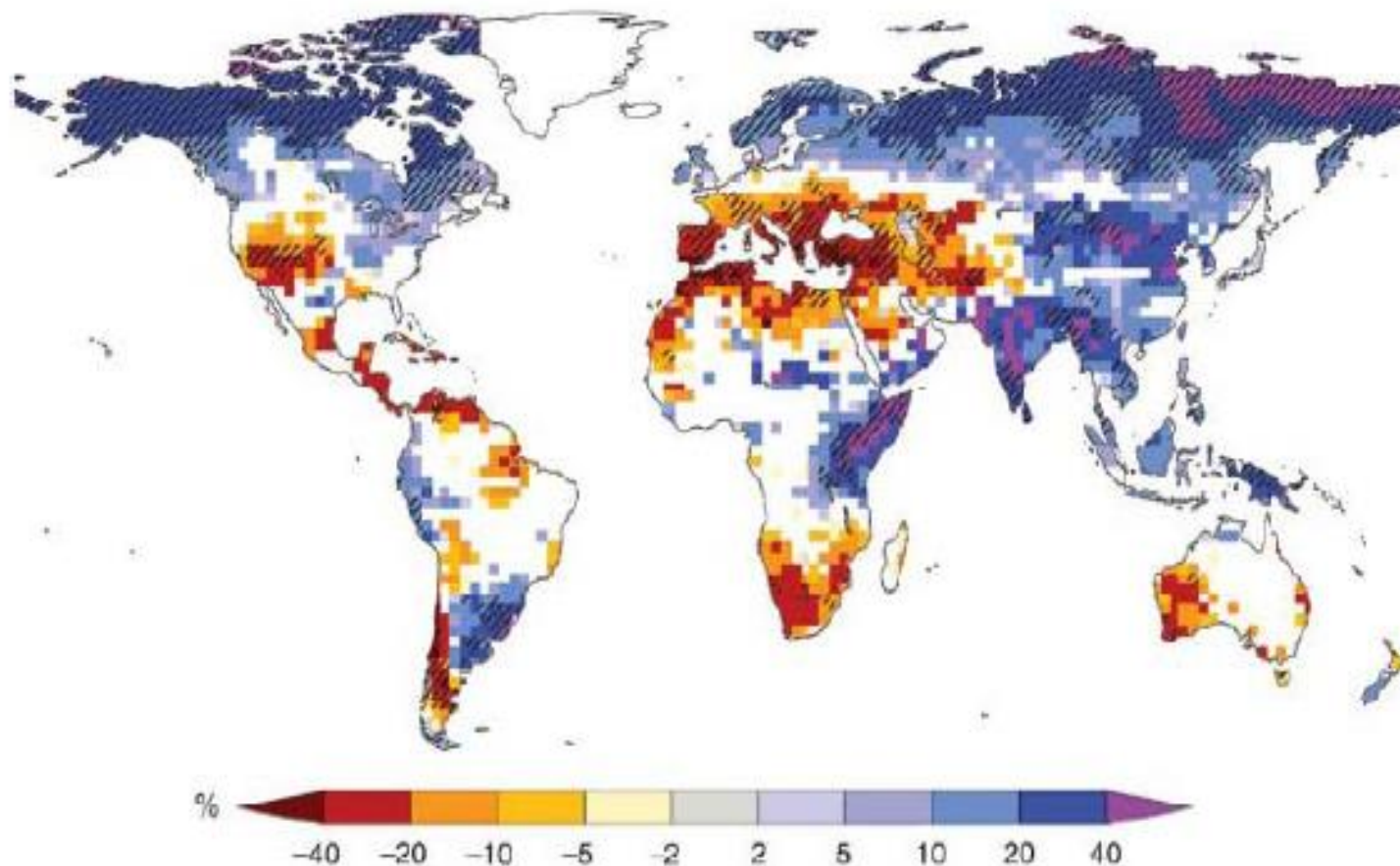
Figure 8-1. Physical and Economic Water Scarcity



- Little or no scarcity: <25 percent of river flows withdrawn for human uses
- Physical scarcity: >75 percent of river flows withdrawn for agriculture, industry, domestic purposes
- Approaching physical scarcity: > 60 percent of river flows withdrawn
- Economic scarcity: <25 percent of river flows withdrawn, but human, institutional, and financial capital limit access to water
- Not Estimated

Source: IWMI

Climate Change

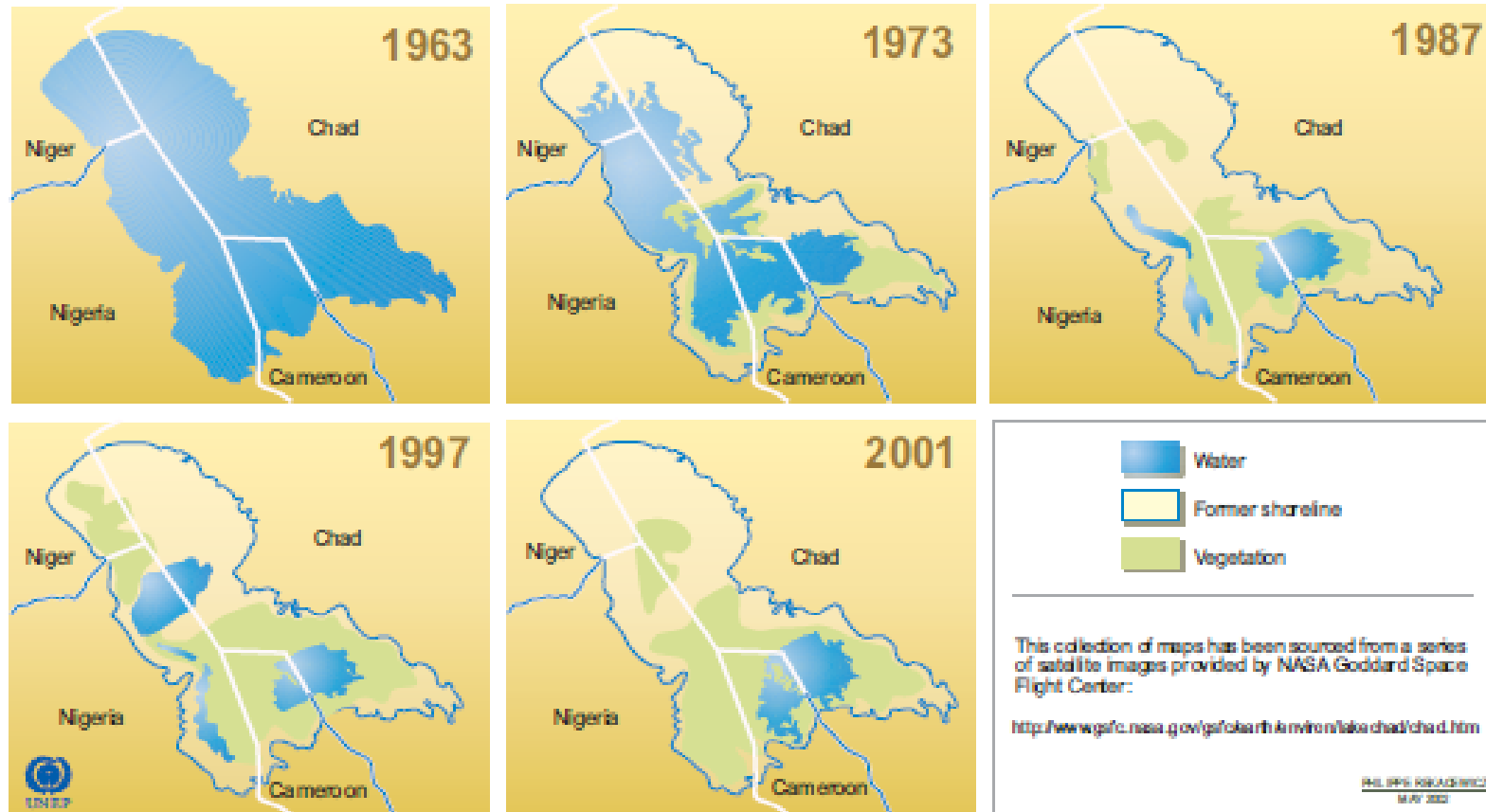


Note: Values represent the median of 12 climate models under the SRES A1B scenario. White areas are where less than 66% of the 12 models agree on the sign of change, and the hatched areas are where more than 90% of models agree on the sign of change.



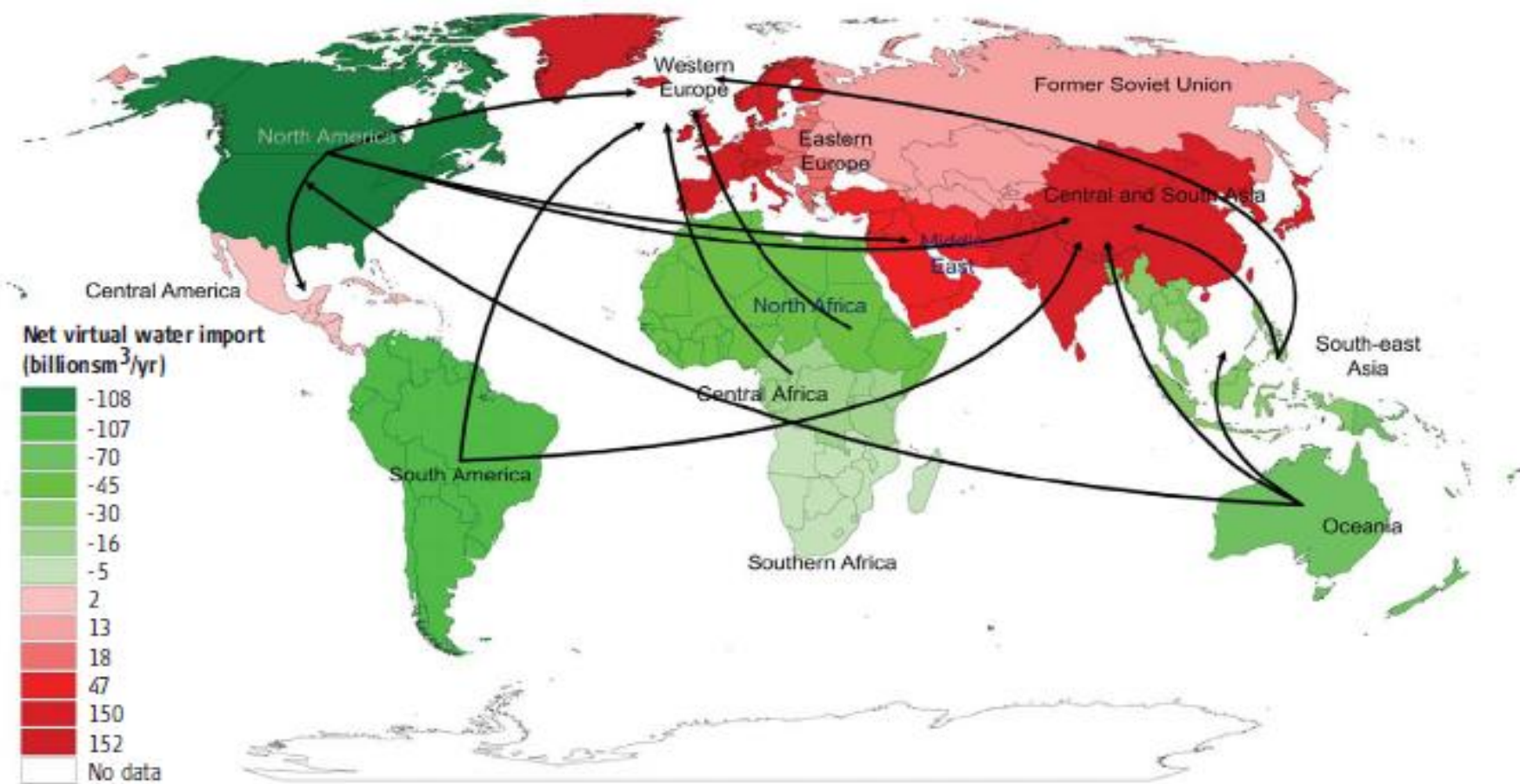
Map. 5.4: Levels of Lake Chad 1963–2001

A Chronology of Change Natural and Anthropogenic Factors Affecting Lake Chad



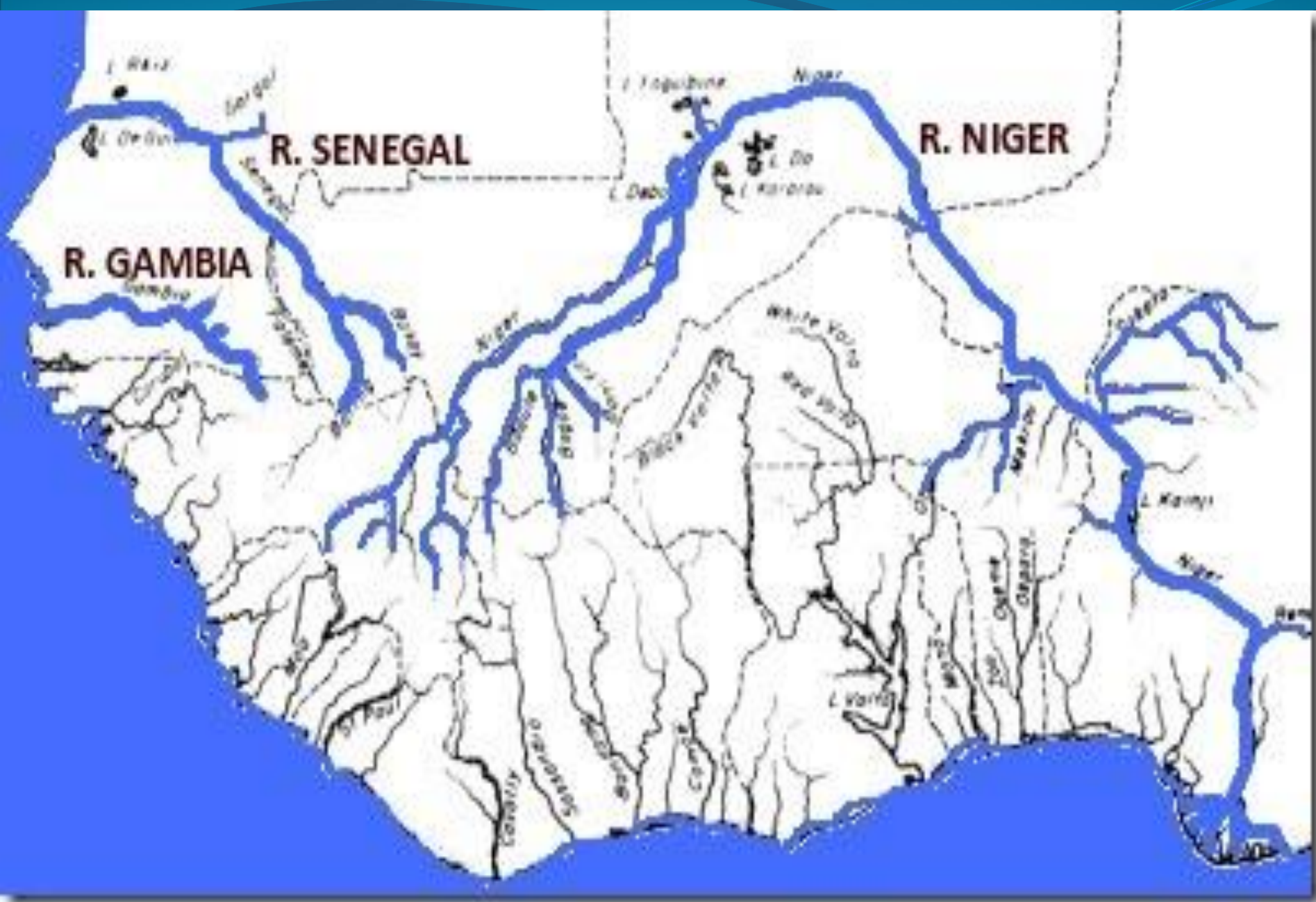
Source: UNEP, 2002c, 2004c.

Map 11.4: Net virtual water imports around the world



Note: Regional virtual water balances and net interregional water flows related to the trade in agricultural products. Period 1997-2001. Only the biggest net flows (>10Gm³/yr) are shown.

Source: Chapagain and Hoekstra, 2004.



















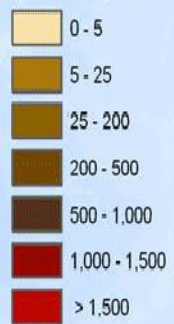




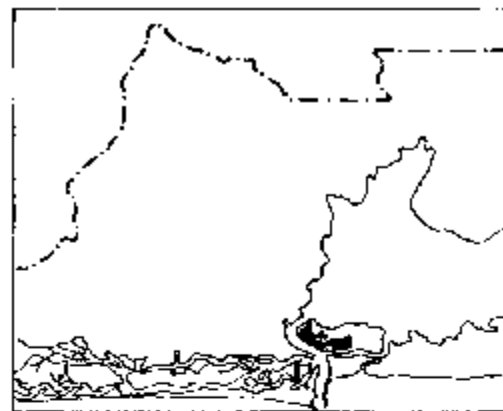


**Estimated 2015
Population Density**

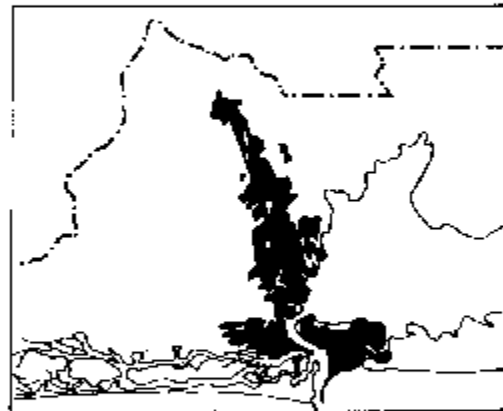
persons per km²



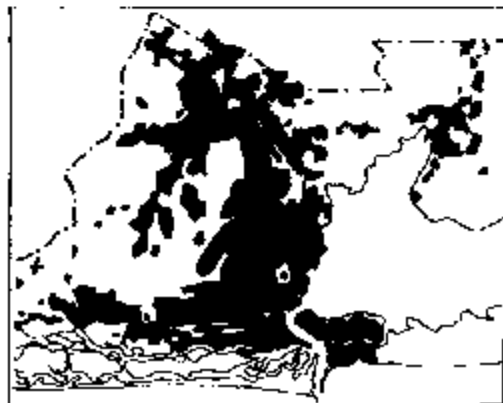
Urban Expansion



1900



1963



1984

--- State Boundary

■ Contiguously Built-up Area





UrbanetGh
Sustainable Livelihoods for all

PROGRAMMES

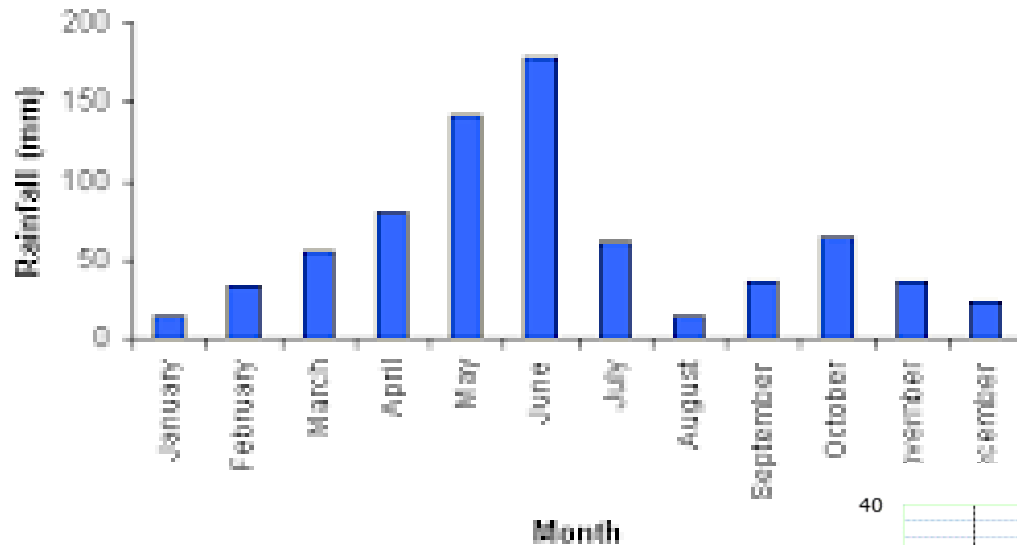
- AGRICULTURE AND FOOD SECURITY
- YOUTH EMPOWERMENT
- ENVIRONMENT AND CLIMATE CHANGE
- MICRO-CREDIT

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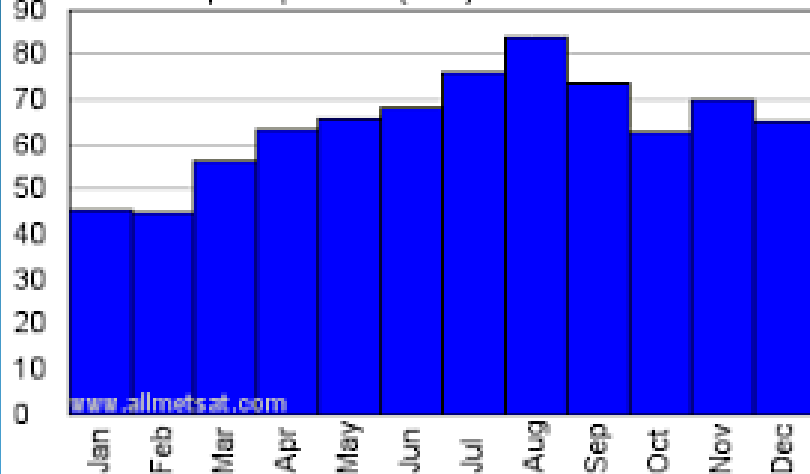


AVERAGE MONTHLY RAINFALL

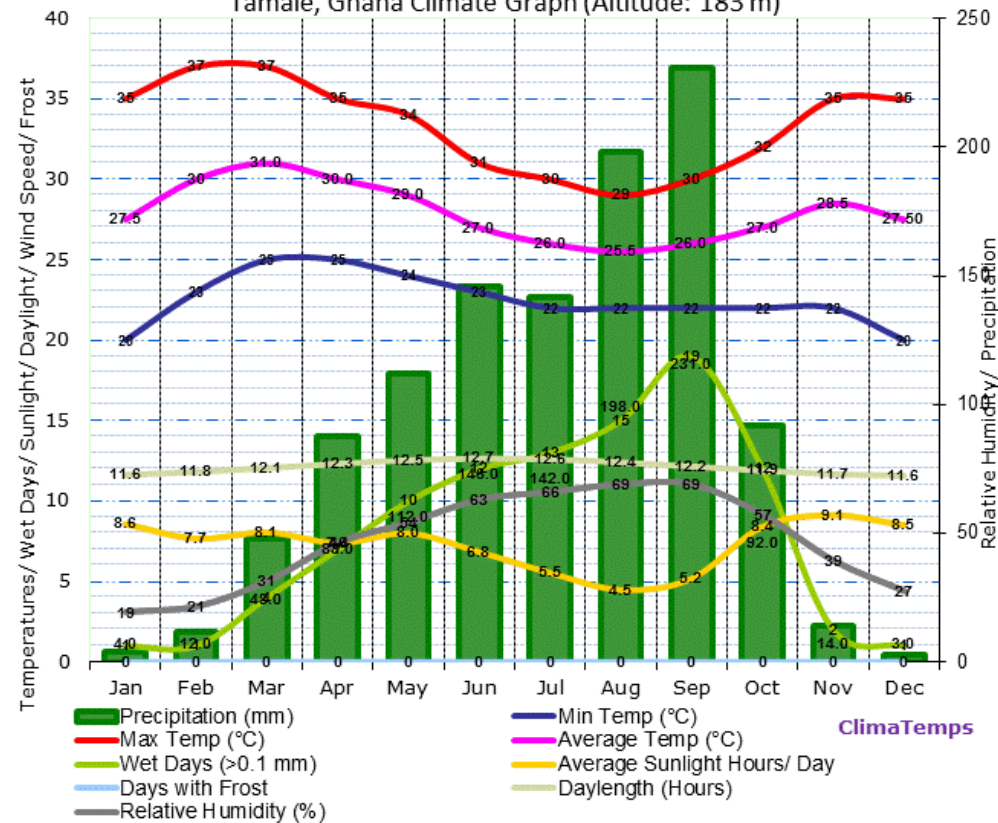


Accra, Ghana

Toronto : precipitation (mm)



Tamale, Ghana Climate Graph (Altitude: 183 m)



Shared Rivers

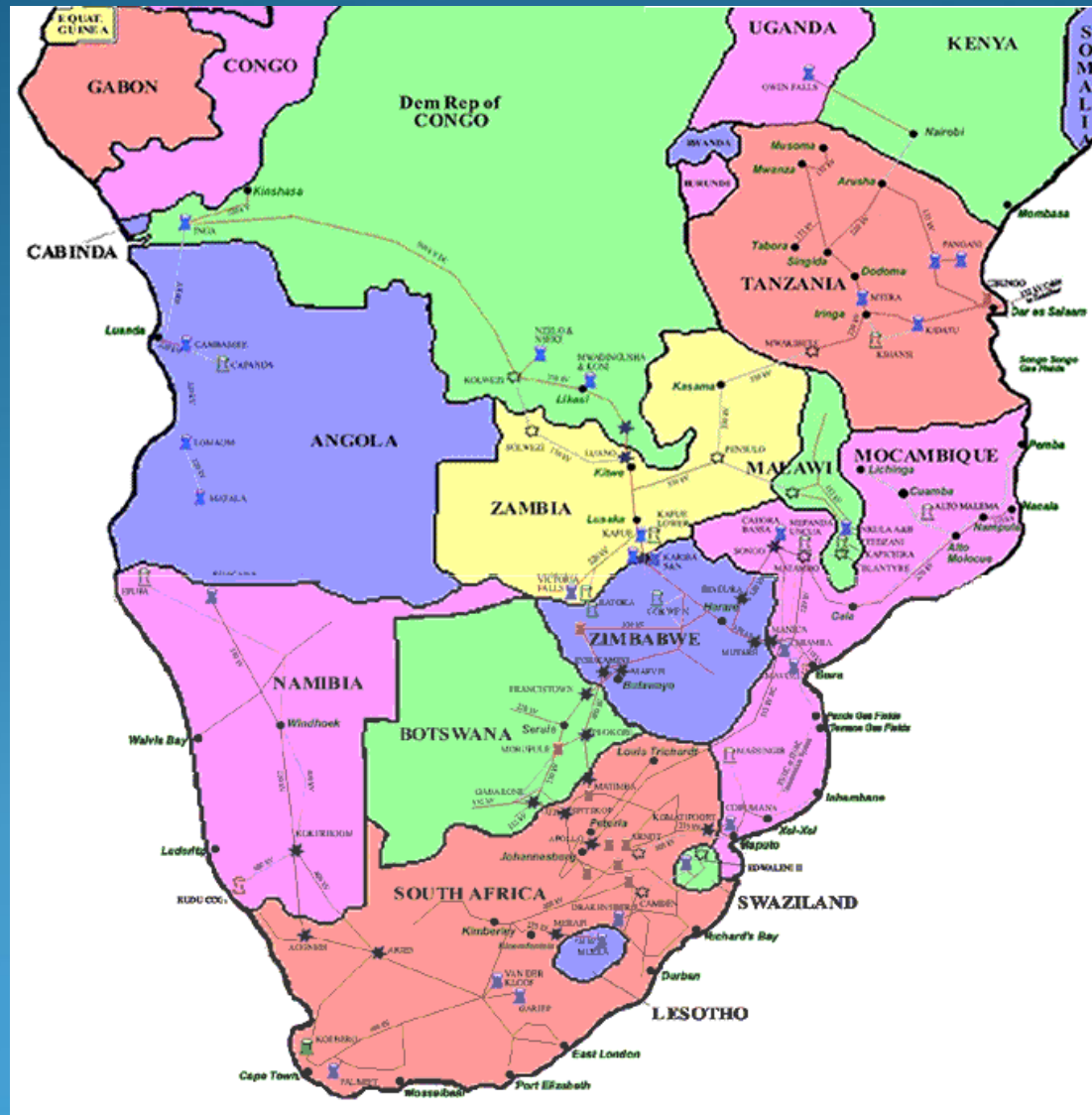
Table 3: Selected Transboundary Rivers in Africa

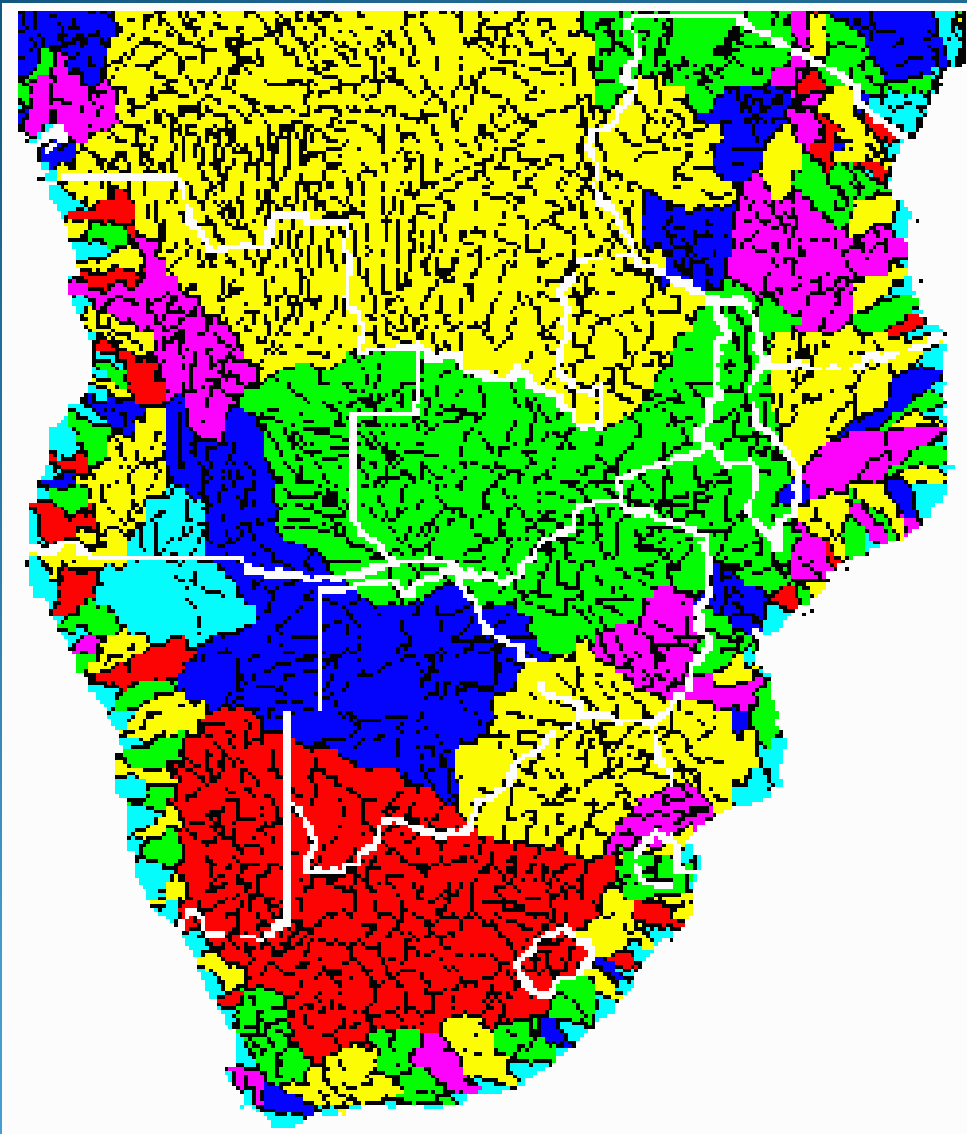
River/Lake Name	Number of countries sharing the basin	Remarks	Management Structures
Nile	10	Africa's longest river at 6700 km; basin covers 3 million km ²	Permanent Joint Technical Committee; Nile Basin Initiative
Niger	10	4100 km in length and with the basin area being 1.47 million km ²	Niger Basin Authority
Congo	9	3100 km in length; basin area is 3.7 million km ² and receives 30% of Africa's total rainfall.	
Zambezi	8	3000 km in length; Kariba and Cahora Bassa dams important for hydropower generation in southern Africa.	Zambezi River Authority; Zambezi Watercourse Commission
Senegal	4	1050 km in length; 0.5 million km ²	Senegal River Development Organisation

Gambia	4	The country of Gambia consists mainly of the lower portion of the river, so making it the ultimate 'downstream' riparian	Gambia River Basin Development Organisation
Volta	6	Lake Volta behind the Akosombo Dam is the largest reservoir by surface area in the world	Volta Basin Authority
Mano	3	Cote d'Ivoire soon to become fourth member joining Liberia, Sierra Leone and Guinea	Mano River Union
Kagera	4	Tributary of Nile through Lake Victoria; hydropower project planned at Rusumo Falls	Kagera Basin Organisation
Shebelle-Juba	3	The Shebelle flows from Ethiopia to Somalia, reaching the Juba in good rainy season years	
Lake Victoria	5	2 nd largest freshwater lake in the world	Lake Victoria Basin Commission; Lake Victoria Fisheries Organisation
Lake Malawi/Nyasa	3	Most species-rich lake in the world	Lake Malawi/Niassa/Nyasa Basin Commission
Lake Chad	5	Has shrunk from 25,000 km ² to roughly 1,250 km ² due to human overuse and mismanagement	Lake Chad Basin Commission
Okavango	3	Basin covers about 1% of Africa's land surface but virtually pristine	Okavango River Basin Commission
Limpopo	4	Heavily utilized by South Africa	Limpopo River Basin Commission
Orange-Senqu	4	Covers 3% of Africa's land surface; heavily utilized by South Africa	Orange-Senqu River Basin Commission



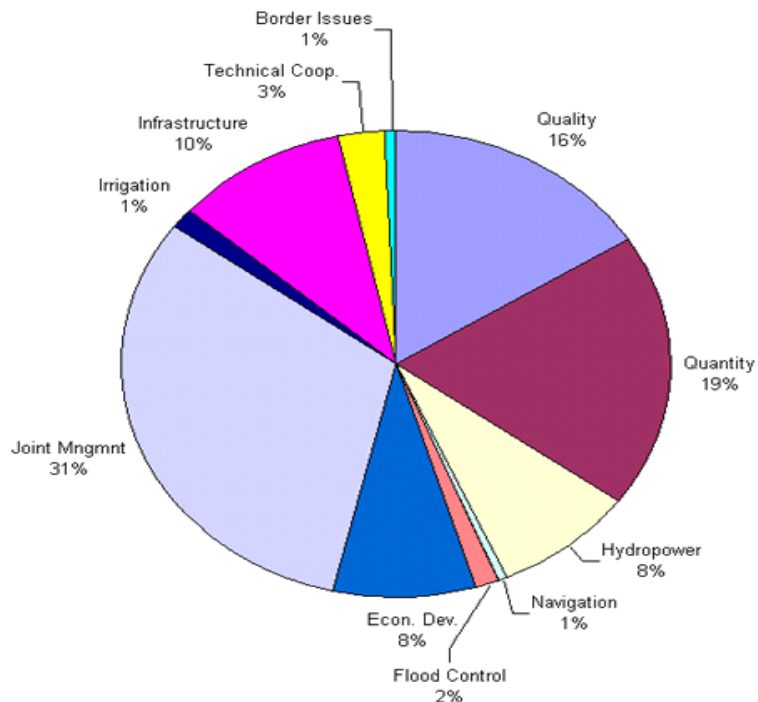
Southern Africa



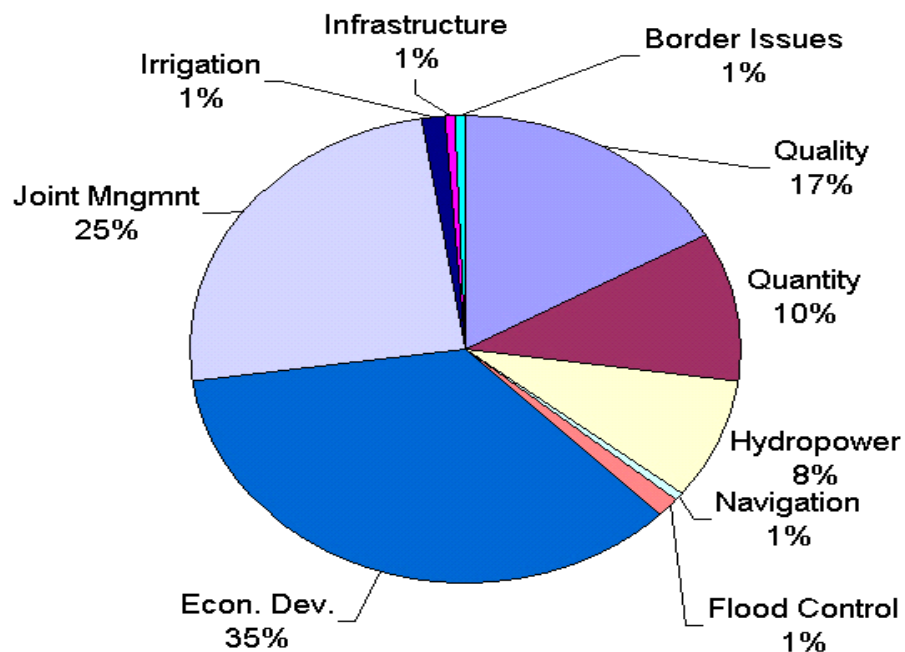


- Buzi
- Congo
- Cunene
- Cuvelai
- Incomati/Nkomati
- Limpopo
- Maputo/Pongola
- Nata
- Okavango
- Orange
- Pungwe
- Rovuma
- Save
- Umbeluzi
- Zambezi

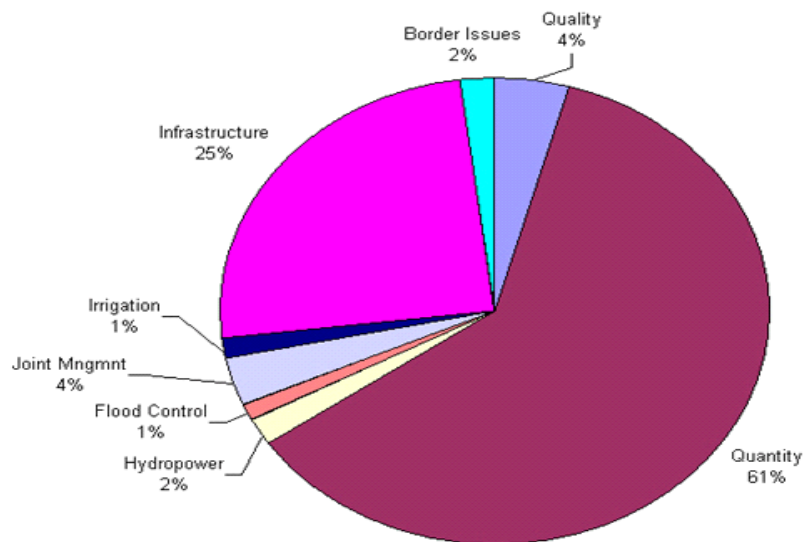
Distribution of Total Cooperative Events by Issue Area



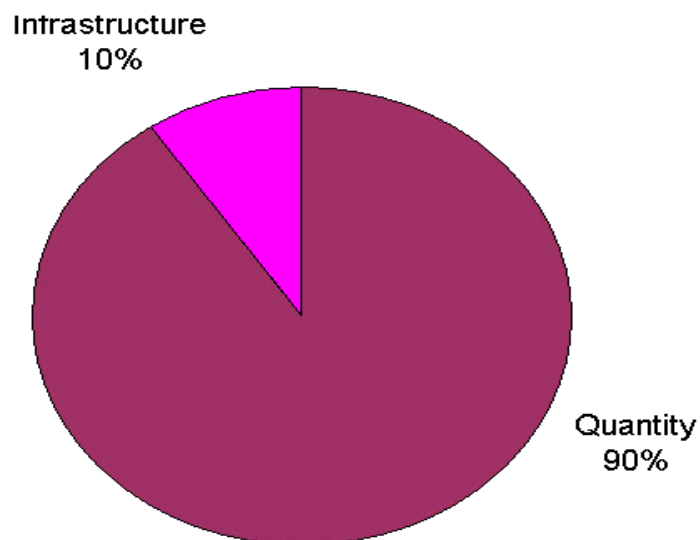
Country-Pair Interactions By Issue Type Extreme (BAR Scale 6) Cooperation



Distribution of Total Conflicting Events by Issue Area



Country-Pair Interactions by Issue Type Extreme (BAR Scale -6) Conflict



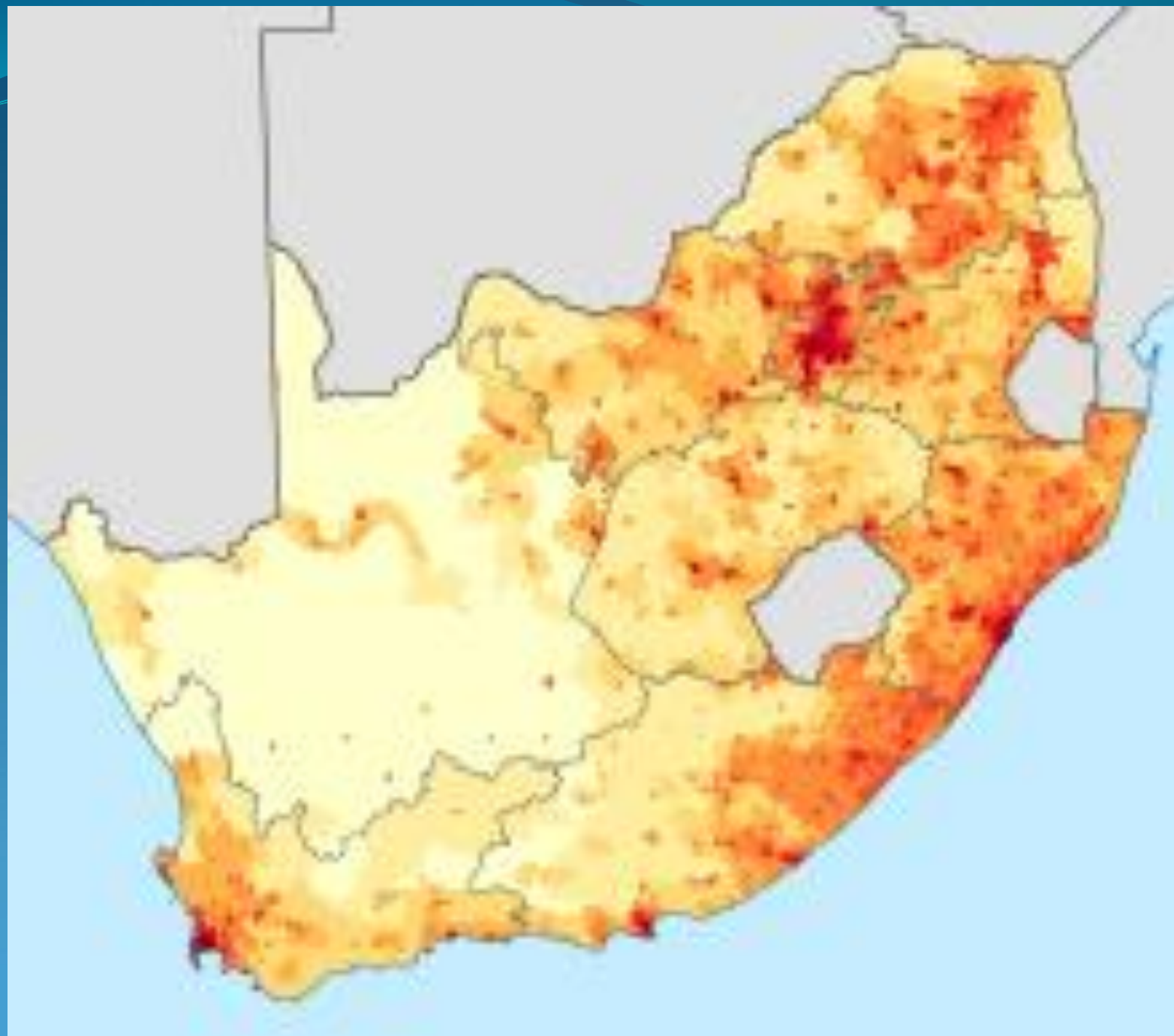


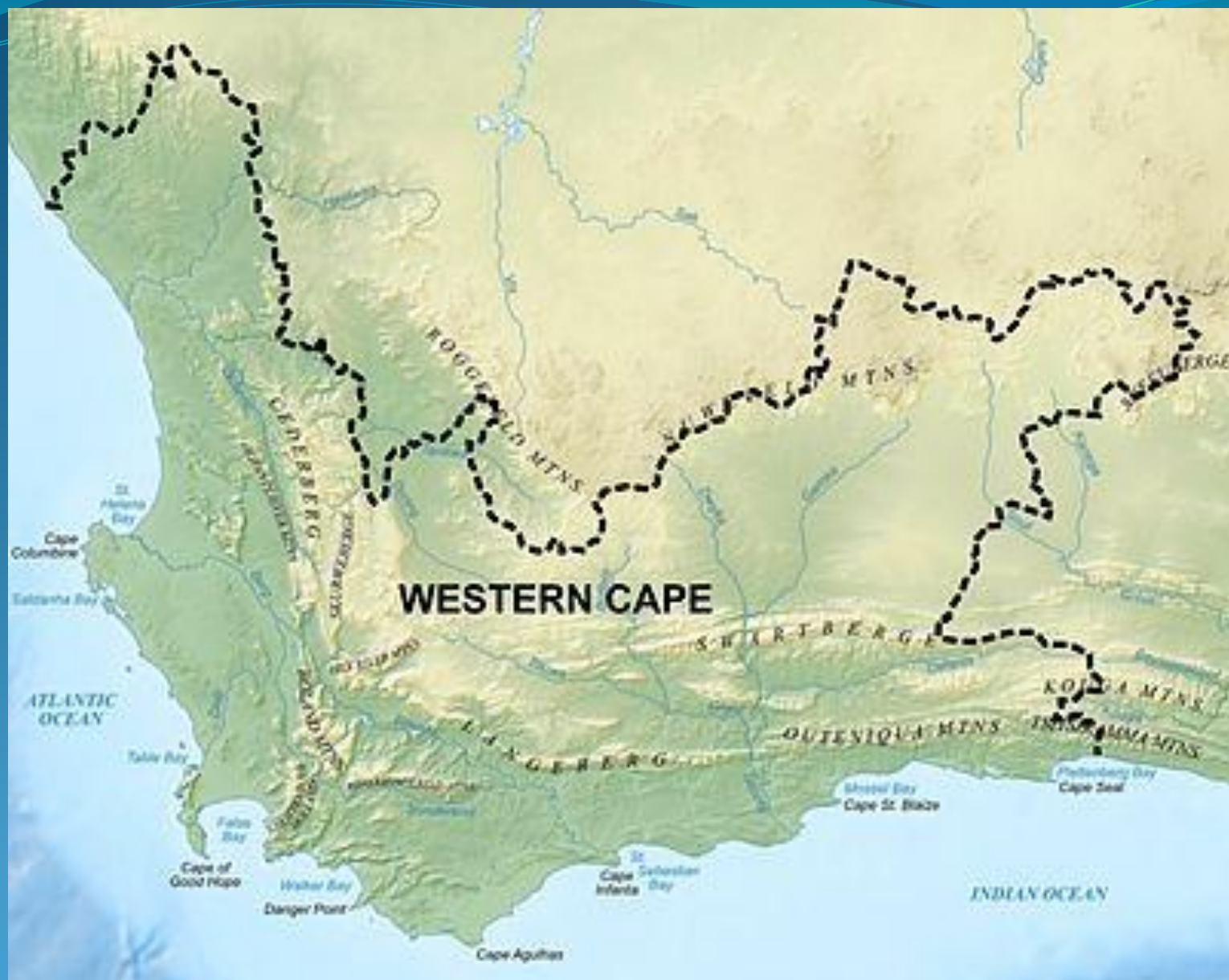


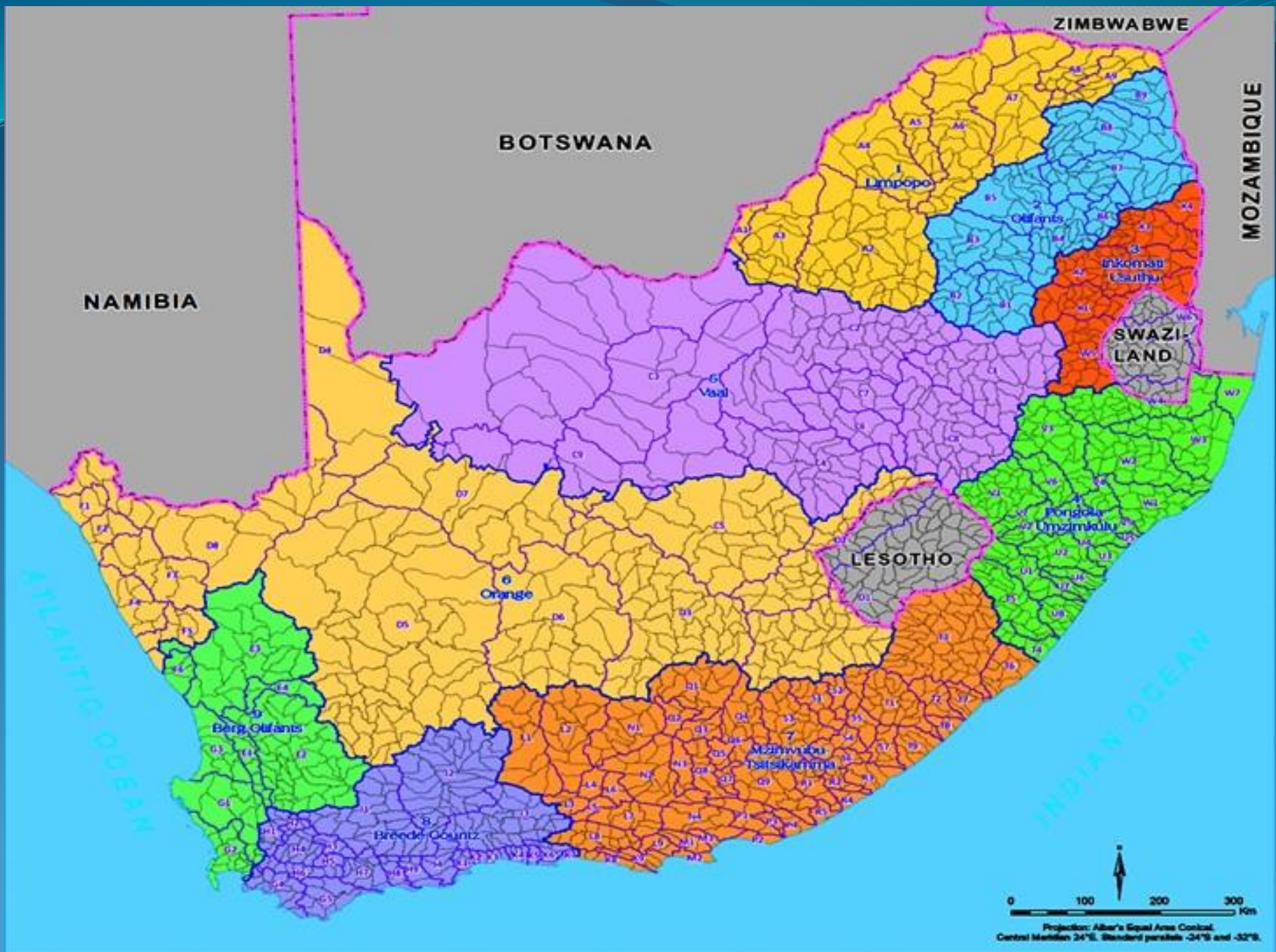
'Day Zero' in Cape Town?

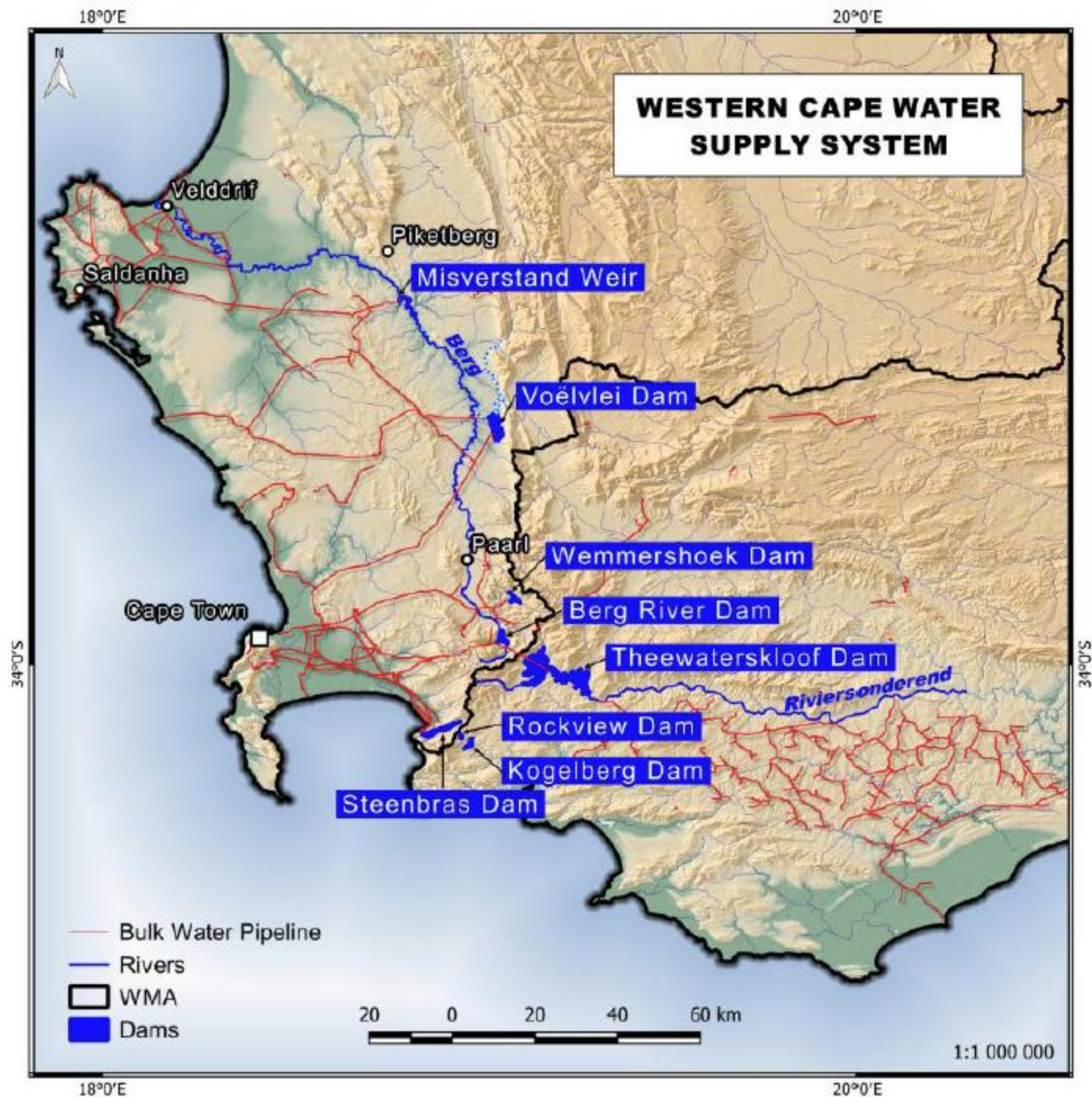




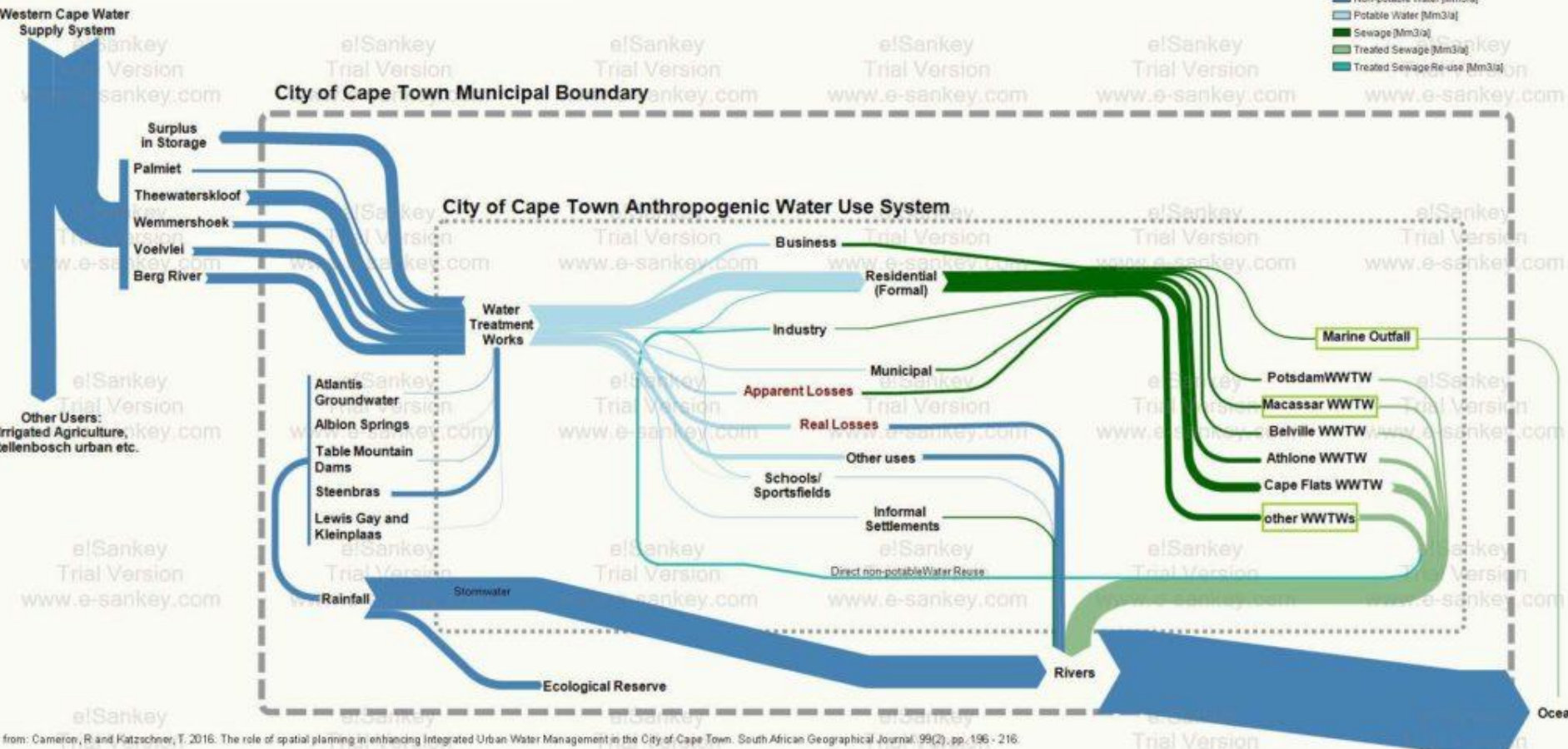








City of Cape Town Water Use Sankey Diagram



from: Cameron, R and Katzschner, T. 2016. The role of spatial planning in enhancing Integrated Urban Water Management in the City of Cape Town. South African Geographical Journal. 99(2). pp.196 - 216.

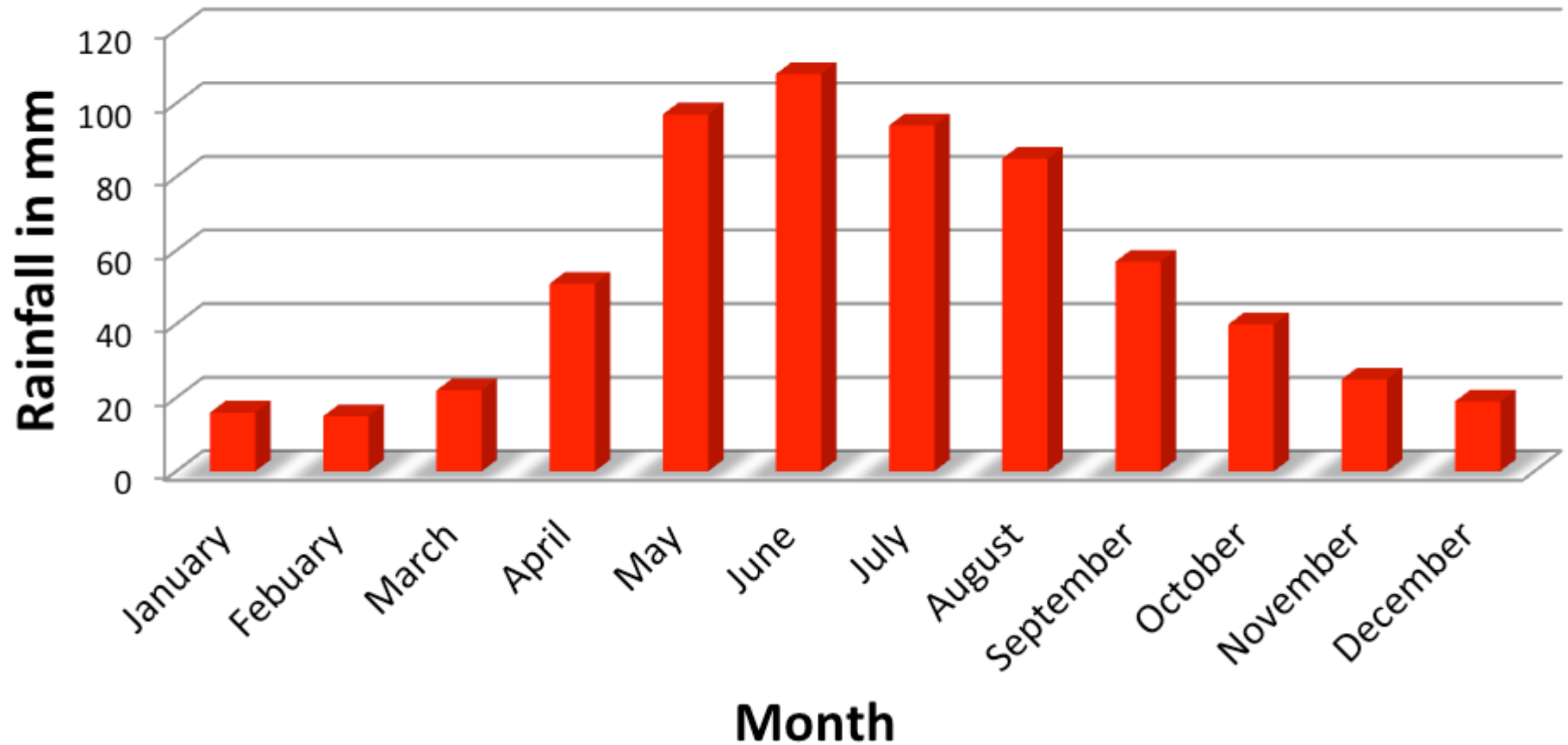




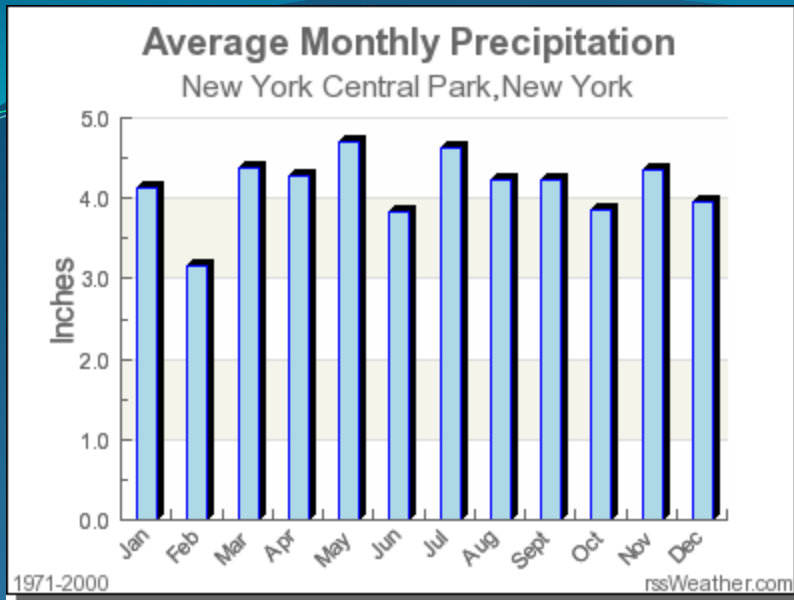




Monthly Average Rainfall - Cape Town

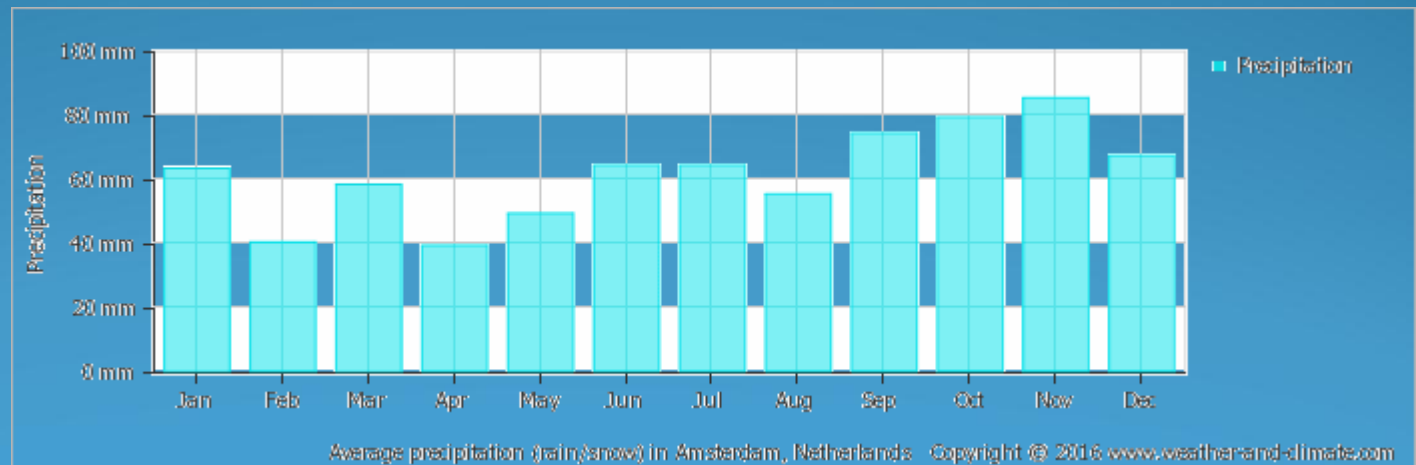


About 600 mm/annum



1200 mm/annum

4 inches = 101.6 mm



740 mm/annum

PRAY FOR RAIN

Team South Africa is called upon to pray or meditate
for much needed rain during the weekend of

9-11 FEBRUARY 2018

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Questions and Directions?

