



Climate change in the Western Cape. Fact or fiction?

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I have neither requested nor received any financial or material support from any source in connection with the issues described in this report.

IMPORTANT

I was in the final stage of writing this report when a press release by the prestigious Royal Society, the world's oldest and most respected scientific institution was published on the Internet. It was dated 28 May 2010.

The Society was forced to react to rising pressures from its own members in the light of serious revelations of unscientific practices by a number of influential scientists and institutions. Some of these were the subject of investigations by a committee recently appointed by the British House of Commons.

My own studies and reports on this subject over the years in which I could find no evidence to support the alarmist claims, have been vindicated.

South African climate change scientists now have a moral, professional and legal obligation to reassess their positions and advise the South African authorities accordingly. This should be done as a matter of great urgency.

This is an extract from the press release.

Martin Rees, President of the Royal Society said: "Climate change is a hugely important issue but the public debate has all too often been clouded by exaggeration and misleading information. We aim to provide the public with a clear indication of what is known about the climate system, what we think we know about it and, just as importantly, the aspects we still do not understand very well."

This is an about turn in the Society's position. It had previously maintained that the science was settled and objections were mischievous and misleading.

WJRA 1 June 2010

Collapse of climate change science

Failure of political agreements

The Intergovernmental Panel on Climate Change (IPCC) was established jointly by the World Meteorological Organisation and the United Nations Environmental Programme in 1988. The IPCC issued extensive progress reports for decision makers at approximately five-year intervals. The two issues of importance are those published in 2001 and 2007 (respectively prior to and subsequent to the WCape report).

The major international agreement whereby many, but not all nations accepted the need for the reduction of emissions (mainly carbon dioxide) from their coal-fired power stations and other major sources expires in 2012. It was called the Kyoto Protocol. It has to be renewed before 2012.

In December last year a major, high-level conference was held in Copenhagen where nations of the world were expected to adopt legally binding agreements to reduce their emissions. This conference was a total failure. Led by the BASIC nations, (Brazil, South Africa, India and China), the developing nations of the world refused to adopt the proposed agreement. Their reason was that these costly measures would retard their economic development.

It also became clear that the Western nations, led by the USA, UK, and EU had political motives. They were using the climate change issue to restrain the rising economic competitiveness of the major developing nations particularly China and India. There is a growing division between the Western nations and the rest of the world on political grounds. It is generally accepted that no legally binding international agreements to replace the Kyoto Protocol will be reached in the foreseeable future.

Exposures of corrupt science

Quite independently of the political aspects, there has been a total collapse of climate change science itself. The very basis of the scientific approach is that the emissions of undesirable gases into the atmosphere will create a greenhouse effect. This will result in an increase of global temperatures (called global warming). This in turn is predicted to have a whole range of undesirable effects. These predictions are based solely on abstract theory that is used as an input for complex computer-generated climate models.

As proof of this theory it is claimed that global temperatures are now higher than at any time in the past thousand years. It is further claimed that among the observed consequences are the melting of the Himalayan glaciers that are the source of water for a large area of India and other nations of the Asian subcontinent. Another alarming consequence is the claimed progressive destruction of the Amazon forest. In South Africa, many of the alarmist predictions were described in the report published in 2005 that is the subject of these comments.

I am one of the many scientists in the world who have questioned climate change science on the grounds that there is no scientifically believable evidence to support the alarmist claims.

Our views were confirmed in the dramatic developments starting in November last year with what is known as the *Climategate Scandal*. It became known via leaked e-mail correspondence that the claim that the global temperatures are higher than at any time in the past thousand years was fraudulent. The body concerned, the University of East Anglia in the United Kingdom, was forced to concede their deliberate error when they appeared before a committee appointed by the UK House of Commons to investigate the matter.

These scientists were also obliged to concede that there have been no sustained increases in global temperatures during the past 10 years. These facts totally undermine climate change theory including that postulated by South African climate change scientists.

This exposure initiated the total collapse of climate change science as one exposure of malpractices after another was exposed.

The chairman of the IPCC was forced to admit that his claim that the Himalayan glaciers would melt away by 2035 was fraudulent. It was based on a report that the glaciers would melt by the year 2350, not 2035. He also admitted that the claim that the Amazon forest had already started to suffer as a result of climate change was based on a news report, not science. Many similar examples of fraud in the IPCC documents have since been exposed.

As a consequence, the chairman of the UNFCCC resigned and the United Nations and other high-level bodies are at present conducting investigations into the activities of the IPCC and climate change science in general. There have also been politically initiated and funded scientific assessments targeted at supporting the actions of the Western nations that have already started implementing drastic and economically damaging measures. These have added further confusion on the validity of climate change science.

Recent dramatic development

The UK Royal Society has always been a strong supporter of the climate change issue. Until now it has steadfastly maintained that climate change science is settled. A group of its own members recently petitioned the Society. As a result of this and other pressures, the Society issued a press release on 28 May in which it stated that it intends to publish a new guide to the science of climate change. The following is a paragraph from the press release.

Martin Rees, President of the Royal Society said that climate change is a hugely important issue but the public debate has all too often been clouded by exaggeration and misleading information. We aim to provide the public with a clear indication of what is known about the climate system, what we think we know about it and, just as importantly, the aspects we still do not understand very well.

It is now very obvious that serious uncertainties relating to climate change remain to be clarified. Under these circumstances alone it would be most unwise for the South African national and provincial authorities to implement measures about which there are still serious uncertainties.

This statement completely justifies my views on climate change science that I have expressed over the years. Some of them are detailed in this report.

Unscientific linkages

One more point. Climate change scientists have shrewdly linked climate change with the environmental consequences. Anybody who questions climate change is immediately accused of criticising the very real need to conserve the natural environment. These are two entirely separate issues.

Lastly, South African climate change scientists have followed the international practice in this field by refusing to participate in formal multidisciplinary discussions where they would be obliged to defend their unscientific approaches and reports.

It is most unfortunate that South African climate change scientists have refrained from admitting that serious doubts have arisen regarding the validity of their reports to the South African authorities that were used to implement countermeasures at provincial and national levels. There are no signs that these authorities are aware of the total collapse of climate change science on which their actions were based.

My position

My position on the climate change issue is well known nationally as well as internationally through many reports, publications and Internet communications. In view of the above, I was requested to comment on the climate change situation as it affects the Western Cape region.

This is my response. Once again I recommend that this whole issue be discussed by a high-level commission of enquiry before measures are taken that could further damage our economy and threaten South Africa's efforts to overcome the very serious issues that now face our nation.

I need to make it very clear that the comments in this report are not criticisms of individuals, but criticism of the science that they practise.

Relevant reports

The report that is the basis for these comments is the extensive 156-page report by fifteen scientists from seven institutions titled *A Status Quo, Vulnerability and Adaptation Assessment of the Physical and Socio-Economic Effects of Climate Change in the Western Cape* published in June 2005. I refer to it as the WCape report in the following comments.

I discussed this report in my 17-page report *Climate change in the southern and western Cape. A critical assessment*. It was distributed in February 2006.

This followed my detailed report *An assessment of the likely consequences of global warming on the climate of South Africa* that I distributed internationally in November 2005. This report contained 92 pages, 15 figures, 13 tables, and 50 references. These two reports are available on request.

My studies that are relevant to this report are summarised in the attached appendices.

Introduction

In February 2006 I produced a 17-page report *Climate change in the Southern and Western Cape. A critical assessment*. It was in response to an approach by a group of landowners and others in the Oudtshoorn area who were striving to develop a living landscape consisting of regions where people live in harmony with the environment. They expressed concern that the alarmist publications of a small group of scientists and the reaction of the provincial authorities would have the opposite effect to that intended. Many people had already expressed the view that this was a hopeless cause. They said that most species were about to become extinct as a result of climate change, so why bother?

There was also a growing concern among other researchers in the natural and engineering sciences whose studies directly contradicted those of the climate change lobbyists. Their concern was heightened by the deliberate policy of excluding all those who hold different views from participating in policy-making conferences. I am not the only one to have experienced this discrimination.

My response was based on my long professional experience and detailed studies.

Unique richness

There are few regions in the world that have a greater diversity of climate and corresponding diversity of flora and fauna than the southern and western regions of South Africa. While there is an obvious need to preserve this unique richness for posterity, there is an equally important need to sustain agricultural and other activities required in a healthy society. Only then will we be in a position to eliminate poverty, malnutrition and disease among our growing population. A balance has therefore to be found between conservation and development.

Solutions have to be sought in the first instance by impartial, multidisciplinary, scientific studies. The results have to be reduced and summarised in a form that is readily understandable by the public as well as the political decision makers. There is a fundamental difference between theoretical papers published in scientific journals and a report addressed to decision makers and the public. In the latter case the scientists are expected to present both the benefits as well as the adverse consequences of climate change in an impartial manner.

Researchers are also required to develop practical prevention and adaptation strategies. These require not only sound scientific knowledge, but also an advanced knowledge of the sociological and economic aspects. These have to be in sufficient detail to allow decision makers to make informed decisions.

It is most unfortunate that the comprehensive report by fifteen authors from seven different institutions: *A status quo, vulnerability and adaptation assessment of the physical and socio-economic effects of climate change in the Western Cape*, (Midgley et al 2005), does not meet these basic requirements. The public and the provincial authorities have been seriously misled. I protested strongly at the time but to no avail.

In view of my subsequent studies and the very recent disintegration of international science in this field, I was requested to produce a short report in a format that could be used by the decision makers to develop appropriate measures.

This is my report. It is not confidential. I have reduced the whole issue to a short summary of the main points of disagreement in a way that will allow others to respond to them. I recommend that this report be distributed to all interested parties, and that a meeting be arranged where these issues can be discussed calmly and professionally. I recommend very strongly that no costly decisions should be implemented until such time as these discussions are held.

This report is presented in segments to facilitate responses to the issues raised. I refer to the above report as the WCape report in these notes.

My knowledge and experience in this field

1942-1945. Served in the South African Engineer Corps in North Africa and Italy during WWII. Graduated in November 1949.

1950. Joined the Department of Irrigation (now Water Affairs).

1950-1970. Resident Engineer in charge of the construction of several major water supply projects in the Karoo and the Cape Midlands. These included the world's longest continuous tunnel beneath the continental divide that diverted water from the Orange River to the Eastern Cape including Port Elizabeth.

1970-1984. Chief of the Division of Hydrology and later Manager of Scientific Services in the Department. Responsibilities included the collection and publication of hydrometeorological data, water resource and flood studies, as well as the development and operation of national flood routing and drought operation procedures.

1985-2000. Professor in the Department of Civil Engineering, University of Pretoria. My research included the development of advanced methods for water resource and flood analyses.

2000 to date. Continued research in the field of water resources studies as South Africa's water resources approach the limits of exploitation.

Publications. Nearly 200 publications from technical reports through to refereed papers and two handbooks on flood risk reduction measures. Now in the final stage of preparing my 500+ page handbook on *Analytical methods for water resource development and management*. It contains material new to science.

Commissioned research reports. In addition to the above I have produced more than 20 substantial commissioned research reports.

Professional appointments. The following are some of my professional appointments during my career.

Southern African Regional Committee for the Conservation and Utilisation of the Soil (member)

International Association for Hydrological Sciences (sub committee member)

UN Scientific and Technical Committee on Natural Disasters (member)

South African National Programme for Environmental Sciences (member)

Inland Water Ecosystems Committee of the NPES (chairman)

South African National Committee for IAHS (member)

St Lucia Scientific Advisory Committee (member)

Professional awards. I have received the following professional awards.

1987 SAICE Water Division (Contributions as scientist, manager and educator in the field of hydrology)

1993 Johannesburg municipality (Service to the community)

2000 National Science and Technology Forum (Outstanding contribution to science and technology for the year 2000)

2002 South African Association for the Advancement of Science (Certificate of Merit)

2006 South African Institution of Civil Engineering (Honorary Fellow)

COMMENTS:

Basic science

The essence of the concerns related to global warming is that undesirable emissions of so-called greenhouse gases, principally carbon dioxide (CO₂), from coal-fired power stations, heavy industries, aircraft and motor vehicles, creates a blanket effect in the atmosphere that raises global air temperatures. Claimed observable consequences of increases in global temperatures are the melting of the Arctic and Antarctic ice sheets, rising sea levels, melting of the Himalayan glaciers and progressive destruction of the Amazon forests.

The principal postulated (i.e. as yet unproven) consequences of global warming are changes in rainfall (e.g. droughts), river flow (e.g. floods), and air temperature. These in turn may pose threats to agriculture, water supplies and the natural environment. Beneficial consequences are largely ignored in the South African literature.

The postulated remedy is to reduce dependence on carbon fuels, which in turn will increase the cost of electricity and transport. These will result in a decrease in national and individual prosperity. The consequences will be an increase in poverty with accompanying increase in malnutrition and disease. There will be consequent threats to economic and political stability.

Note: The effectiveness of the proposed control measures remains unproven. It is very difficult to visualise how the reduction of greenhouse gas emissions in South Africa can prevent the postulated environmental consequences. This aspect is not addressed in the WCape report.

This immediately identifies a major shortcoming in the whole climate change issue. The principal postulated consequences of global warming relate to rainfall, river flow and temperature. These are readily measurable and quantifiable. The absence of arguments based on data from the official SAWS and DWEA databanks, would, in my opinion, not survive the rigorous examination of an independent commission of enquiry.

Here is a simple question. The seriousness of the consequences of global warming is at the very heart of the climate change issue. We are repeatedly told that the past decade was the warmest for the past thousand years or more. Why then is there no evidence of the consequences of this global warming in South African published data? Why do the climate change lobbyists have to rely on abstract theory instead of being able to produce solid and incontestable evidence that these undesirable consequences are already taking place? The answer is very simple. There are no observable changes for the simple reason that they do not exist.

The whole global warming theory is no more than an untested and unproven hypothesis. This is not just my view but is that of all internationally recognised experts with whom I have consulted.

I am in the fortunate position where I spent my early years in the field building dams and water resource development projects in the Karoo, Cape Midlands, Free State and southern Cape. During the past 35 years I have studied and numerically quantified the principal hydrological and meteorological processes that are vulnerable to the effects of global warming. The driving reason for my concern was, and still is, the knowledge that the water resources of South Africa in particular, and many other countries of the African continent are rapidly approaching the limits of exploitation. This will have severe economic and social consequences on the African nations and their peoples.

To add to my responsibilities is the knowledge that while many investigations have been made into the numerical characterisation of individual rainfall and river flow processes, I am the only scientist who has assembled and studied a large and comprehensive hydrometeorological database **as a whole** with emphasis on the search for properties that are concurrent in time within and between the processes. This is an essential requirement when attempting to determine the consequences of climate change on the prosperity of the peoples and nations on the African continent.

For more details and references see the extended summary of my technical report *An assessment of the likely consequences of global warming on the climate of South Africa* (Alexander 2005). It has 92 pages, with 14 tables, 16 illustrations and 50 references.

QUESTION: Why were the beneficial consequences of climate change not given equal prominence in the WCape report? This is a fundamental scientific requirement.

My involvement in this issue

In February 2006 I was approached by a representative of landowners in the Oudtshoorn area. They were worried by the prediction in the WCape report that Proteas would be adversely affected by climate change. If this was the case, they saw no point in protecting these areas. I was asked for a second opinion.

I obtained a copy of the report. It was clear that there was no scientific foundation for the alarmist predictions. I prepared a 17-page response titled *Climate change in the southern and western Cape. A critical assessment*. in which I dealt with each of these issues. I submitted it to the representative who passed it on to the interested persons as well as to the authors and the provincial authorities in Cape Town.

I was then informed that the proposed meeting in Oudtshoorn was cancelled on the insistence of pressure from Cape Town.

I corresponded with some of the authors of the WCape report detailing the errors. The errors were acknowledged. I was told that the report was intended to be a discussion document. However, I repeatedly offered to participate in discussions on this subject. They were all ignored. There was nothing more that I could do.

QUESTION: Who instructed the Oudtshoorn community to cancel the meeting that I was requested to address?

Computer models

The very foundation of the WCape report is that global warming will reduce rainfall over the region. This assumption is based entirely on the outputs of global climate computer models, whereas a simple analysis of the long records of the many rainfall stations in the region shows that there has been a general increase in rainfall. For example, some districts show substantial increases of up to 68% during the period of record. As global warming is reported to have increased steadily during the past century, it follows that rainfall will continue to increase as long as global temperatures continue to rise.

The following are brief extracts from the introductory section of the WCape report. The emphases are mine. References to a drier future climate are patently false, as future climate in this region will be wetter, not drier.

In this study we have carried out a broad reassessment of the vulnerability of the Western Cape to climate change impacts using a wider range of climate scenarios from more sophisticated climate models ...

The future climate of the Western Cape is likely to be one that is warmer and drier than at present according to a number of current model predictions.

A future that is warmer and possibly drier, will encompass a range of consequences that will affect the economy, the livelihoods of the people and the ecological integrity of the Western Cape region.

Projections for the Western Cape are for a drying trend from west to east...[My analyses demonstrate the opposite.]

In a warmer and drier future, the competition for fresh water will increase steeply.

The vulnerability of estuaries to warming and drying is particularly acute ...

The impact of climate change manifested by a warmer and drier climate is likely to be a progressive impoverishment in species richness ...

A drier environment would restrict the spread of alien invasive species ...

The combination of increasing water scarcity, and rising temperatures will also regularly affect sectors of the economy that are particularly dependent on ecosystem goods and services, for example agriculture, forestry and fishing.

All that the authors should have done was to spend an afternoon plotting the rainfall data on graph paper and they would have noticed the very clear increase in rainfall in the region. Claims of future water scarcity as a result of global warming have no foundation.

The following statement would be laughable if it was not so serious.

Economic sectors such as insurance, banks (through the underlying secured assets), transport and communication infrastructure and construction may all be affected to some degree by climate change.

Regrettably, this all-inclusive statement illustrates a complete ignorance of how modern society functions.

The standard scientific procedure when developing computer prediction models is to confirm their accuracy by comparing their outputs with recorded data. There are no indications in the WCape report that this was done.

QUESTION: Why were the standard computer output verification procedures not performed in the case of the WCape studies?

Global temperatures

The whole climate change issue rests on the sole assumption that the use of fossil fuels will emit undesirable gases, (mainly carbon dioxide) into the atmosphere. These will create a greenhouse effect causing global temperatures to rise with a range of undesirable consequences.

As proof of this the WCape report quotes the following in its executive summary.

The world is now warmer than at any time during the past 1000 years. Empirical evidence for this is the retreat of glaciers almost everywhere on the globe, rising temperatures, increased storminess and a constant (though globally varied) rate of sea level rise....

Projections for the Western Cape are for a drying trend from west to east, with the weakening of winter rainfall, possibly slightly more summer rainfall (mainly in the east of the province), a shift to more irregular rainfall of possibly greater intensity, and rising mean, minimum and maximum temperatures everywhere.

As shown in this report these statements are demonstrably false.

The world is not warmer than at any time during the past 1000 years.

Glaciers are not retreating everywhere.

Sea levels are not rising dramatically.

Climate in the Western Cape is not becoming drier and warmer.

Rainfall is not decreasing.

QUESTION: Why were details of the sea level increases in Cape Town during the past century not included in the WCape report?

Regional rainfall

The postulated changes in rainfall as a result of climate change is the key issue in the WCape report. It is discussed in some detail in Appendix B to this report.

An essential component of any climate change studies is the determination of the natural conditions. Only then is it possible to identify changes that could be attributed to human activities.

Referring to the information in Appendix B, South Africa has a wealth of rainfall records, starting with those recorded by the Royal Observatory in Cape Town in 1842 – more than 150 years ago. There is

more than enough data in the Western Cape region to determine the natural rainfall conditions and the departure from these conditions that could be attributed to human activities.

QUESTION: Why were the natural rainfall conditions in the Western Cape deliberately excluded from the WCape report?

Environmental concerns

I have omitted references to the environmental concerns for the obvious reason that if the postulated drivers of climate change do not exist, then any changes in the biological processes are the consequence of causes other than climate change resulting from human activities.

Solar linkage

Energy from the sun drives the Earth's climate. It is obvious that variations in this energy must result in corresponding climatic variations. This issue is described in detail in Appendix C to this report. South African scientists are world leaders in this field starting with Hutchins' report published in 1889, and continuing through to the present. Note that Hutchins quoted data from the Royal Observatory since 1842.

South Africa's well-documented contributions during more than the past 100 years were completely ignored in the WCape report. Instead, the report quotes a British scientist Foucal as proof that variations in solar radiation do not influence South African climate. In his paper he claimed that the **brightness** of the Sun had not changed significantly over the years and therefore it could not be the cause of climatic variations. This statement displays a total ignorance of the manner in which energy from the sun influences global climate.

QUESTION: Why did the writers of the WCape report deliberately ignore the wealth of South African studies on the linkage between solar activity and climate? The only logical answer is because they wanted to demonstrate that climatic changes were the sole consequence of human activities. Is this interpretation correct?

Dishonest practices

Budapest Declaration on Science

In 1999, the world's two highest international scientific bodies, the United Nations Educational, Scientific and Cultural Organisation (UNESCO) and the International Council for Science (ICSU), held a world conference in Budapest on science for the twenty first century. The conference produced a *Declaration on Science and the Use of Scientific Knowledge*. The following are passages from the declaration that are directly relevant to these notes. The emphases are mine.

We seek active collaboration across all the fields of scientific endeavour, i.e. the natural sciences such as the physical, earth and biological sciences, the biomedical and engineering sciences, and the social and human sciences.

Today, there is need for a vigorous and informed democratic debate on the production and use of scientific knowledge...Greater interdisciplinary efforts, involving both natural and social sciences, are a prerequisite for dealing with ethical, social, cultural, environmental, gender, economic and health issues.

Scientists have a special responsibility for seeking to avert applications of science, which are ethically wrong or have adverse impact.

The practice of scientific research and the use of knowledge from that research should always aim at the welfare of humankind.

The social responsibility of scientists requires that they maintain high standards of scientific integrity and quality control, share their knowledge, communicate with the public and educate the younger generation.

Relevance to climate change science

Why is it that South African climate change scientists have completely ignored these fundamental requirements on the application of scientific knowledge? There have been no collaborations with others in the other sciences. They have studiously avoided vigorous and informed democratic debate. They have avoided any multi-disciplinary efforts. Their ethical standards are dubious. They have elevated environmental concerns over the welfare of humankind. Their standards of scientific integrity are altogether lacking.

It is very clear that while the WCape writers were honest and conscientious, they were complete amateurs in this field.

It is also clear that they followed the unscientific procedures adopted by overseas climate change scientists. These can be summarised as follows.

Never include the beneficial consequences in the report.

Never agree to participate in multidisciplinary discussions where the other side can express its views.

Always elevate environmental concerns above humanitarian concerns.

Make maximum use of the media to propagate your views. The more alarmist the views, the greater the media interest.

QUESTION: Why have South African climate change scientists adopted these thoroughly unscientific practices?

Looming crises

South Africa will indeed face a crisis in the years ahead as we exhaust our water resources. Conflicts between the need for water to sustain the quality of human life and to sustain the environment will pose serious challenges.

In 2008 my article on the likelihood of global droughts from 2009 to 2016 was published in the magazine *Civil Engineering*. I predicted the very real probability of imminent severe drought conditions. They have since commenced in the southern Cape region where a seawater desalination plant has been installed in the Sedgefield area. Additional seawater desalination plants are planned for the wider region. The drought has already spread as far as Beaufort West and is also occurring in the Limpopo region. There are many other regions of the world where severe droughts are presently being experienced.

There are rising concerns that the unusually quiet Sun could be an indicator of the imminent beginning of a mini ice age with associated severe climatic consequences including increased threats to water supplies.

This has nothing whatsoever to do with climate change.

Solutions

Solutions will have to be sought. The policy followed by climate change lobbyists of excluding all those who hold different views on the solution of the problem is not the way to go.

Recommendations

It is now vitally important that South Africa should carry out its own investigations of the climate change issue independently of the activities of the clearly politically motivated science of the developed countries of Europe and the USA.

In my opinion, the only way that this can be achieved is for the authorities to appoint an independent high-level, multidisciplinary commission that complies with the recommendations of the UNESCO/IUGG declaration on the use of science.

The organisations listed in the WCape report should take note of the damage that their publication and exclusion policy will do to their scientific integrity. They are: South African Biodiversity Institute; CSIR Environmentek, Stellenbosch and Pretoria; Climate Systems Analysis Group, Department of Environment and Geographical Sciences, University of Cape Town; de Wit Sustainable Options CC (Pty) (Ltd); and Energy Research Centre, University of Cape Town.

Conclusions

It would be a tragedy if the WCape report is accepted without question by the national and provincial authorities. There is a very real possibility of a backlash once it becomes known that the basis of the report and the proposed costly and intrusive recommendations, have no foundation in science or reality, and are unsupported by large sections of the scientific community.

In the meantime it would be wise for the Western Cape authorities not to implement costly measures until the science has been clarified.

APPENDIX A

Essence of my studies relevant to climate change

[See my detailed report *An assessment of the likely consequences of global warming on the climate of South Africa* that I distributed internationally in November 2005. This report contained 92 pages, 15 figures, 13 tables, and 50 references.]

The essence of my studies relevant to climate change is that after many years of study of a comprehensive hydrometeorological database, I could find no evidence of unexplained variations in the data. It became increasingly obvious that the anomalies were the consequence of variations in the receipt and poleward redistribution of solar energy.

The following are very small samples of the figures and tables in my report. Table 1 is the comprehensive and extensive database used in the analyses. It is available in computer-readable format.

Table 1. Database used in the analyses			
Set	Process	Stations	Years
1	Water surface evaporation	20	1180
2	Concurrent rainfall	20	1180
3	District rainfall	93	7141
4	Dam inflow	14	825
5	River flow	14	1052
6	Flood peak maxima	17	1235
7	Groundwater	4	312
8	Southern oscillation index	1	114
	TOTAL	183	11 804

Figure 9 is very important. It demonstrates the unequivocal synchronous relationship between annual sunspot numbers and the annual flows in the Vaal River that is South Africa's major river. Note the alternating above (rising) and below (falling) flow sequences. Note also their synchronous relationship with sunspot numbers; as well as the statistically significant (95%), 21-year periodicity in the flow data that is synchronous with the double sunspot cycle.

Notice also the absence of 11-year periodicity in the correlogram of the Vaal River. It is no wonder that climate change scientists have been unable to detect synchronous relationships with the 11-year sunspot cycle. It does not exist! This is because the properties of the alternating solar cycles are fundamentally different to the extent that the climatic responses are also very different.

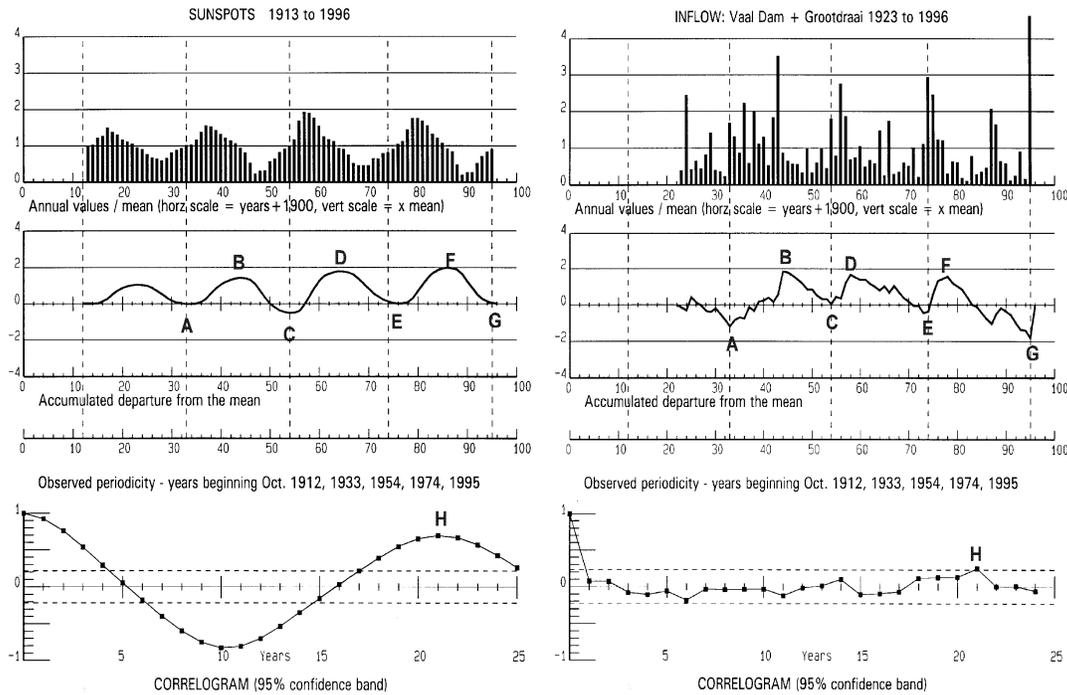


Figure 9. Comparisons of the characteristics of annual sunspot numbers with corresponding characteristics of the annual flows in the Vaal River.

Another frequent error associated with the sunspot cycle is the assumption that the maximum effect is associated with the sunspot maxima. This is altogether wrong. The maxima occur immediately after the solar minima. Table 10 illustrates this.

Table 10. Comparison of sudden changes in the annual flows in the Vaal River with corresponding sudden changes in sunspot numbers					
Three-year totals of flows in Vaal River (% of record mean)			Three-year totals associated with the corresponding sunspot minimum		
Minimum year	Three previous years	Three subsequent years	Sunspot minimum	Three lowest years	Three subsequent years
1932/33	100	388	1933	25	250
1941/42	297	625	1944	56	277
1953/54	205	538	1954	50	370
1965/66	234	241	1964	53	247
1972/73	177	654	1975	73	275
1986/87	112	438	1986	60	400
1994/95	135	464+	1996	48	277
Average	180	478	Average	52	300

Table 12 demonstrates the well-known Joseph Effect of alternating above and below average multi-year sequences published separately by two other South African authors. It is very interesting. Compare the durations of the wet and dry sequences with Joseph's biblical prophecy of seven years of plenty followed by seven years of famine. The coincidence is not fortuitous.

Table 12. Wet and dry sequences				
Years	Wet/dry	Length of sequence		Sunspot cycles
		Wet	Dry	
Bredenkamp: Mzimgazi + St Lucia + Uitenhage + Wondergat				
1919-24	Wet	5		1913-22
1925-29	Dry		4	1923-32
1930-39	Wet	9		1933-43
1941-53	Dry		12	1944-53
1955-62	Wet	7		1954-63
1965-71	Dry		6	1964-75
1972-78	Wet	6		1976-85
1980-83	Dry		3	-do-
1984-90	Wet	6		
Tyson: South African rainfall				
1905-15	Dry		10	1901-12
1916-24	Wet	8		1913-22
1925-32	Dry		7	1923-32
1933-43	Wet	10		1933-43
1944-52	Dry		8	1944-53
1953-61	Wet	8		1954-63
1962-70	Dry		8	1964-75
1971-80	Wet	9		1976-85

This table completely destroys the repeatedly stated claim in the IPCC literature and repeated in the WCape report that there is no meaningful linkage between variations in solar activity and synchronous linkages with variations in the climatic processes.

Conclusions

The following conclusions were summarised on the first page of my report.

Continued global warming will NOT

- Pose a threat to water supplies
- Adversely affect agricultural production
- Increase the risk of floods and droughts
- Increase the spread of malaria
- Increase the eutrophication of water in dams
- Increase soil erosion
- Result in the loss of natural plant and animal species
- Result in desertification

There is no believable evidence to support these claims.

It would be most unwise for South African authorities to force the implementation of costly measures, based on unverifiable global climate models, and abstract theory, for which there is no believable evidence.

APPENDIX B

Changes in rainfall in the southern and western Cape

Fig. 13 is an analysis of the annual rainfall for District 5 in the centre of the south-western Cape region. (See Fig. 14 below.)

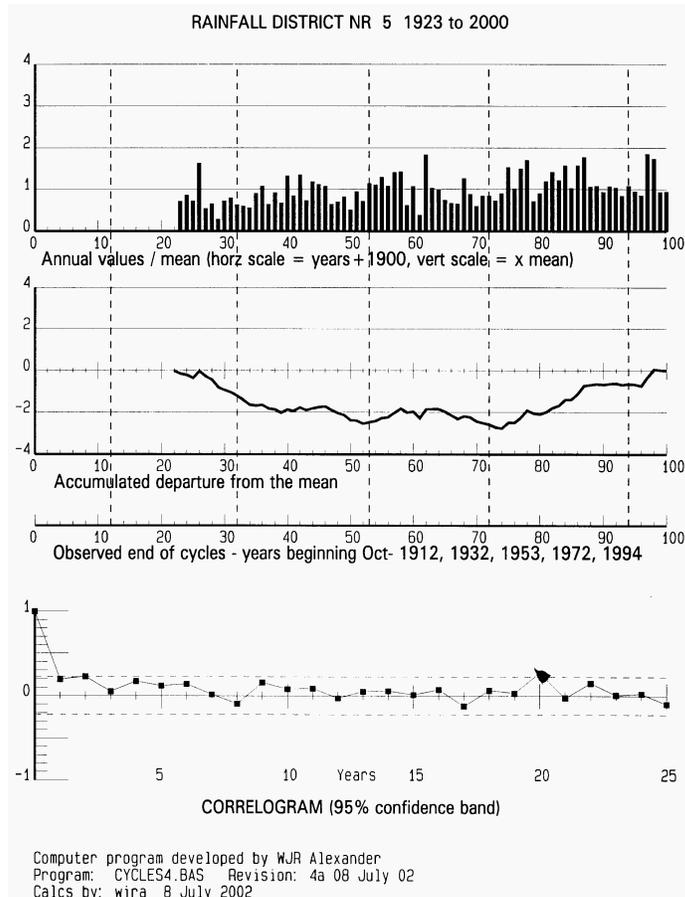


Figure 13. Annual rainfall for District 5 in the Western Cape from 1923 to 2000.

A very clear increase in rainfall is evident in both the histogram and the cusp shape of the accumulated departure plot. There is also a statistically significant 20-year periodicity. There is an indication of an accelerated increase after 1972. None of this very important climatological information was provided in the studies discussed above.

During January 2005 the SAWS kindly provided me with the recently revised district rainfall data for the period 1940 to 2004. This is shorter than the previous record from 1923 to 2000. Other than Districts 14 (no data for the 1950s) and 58 (Lesotho) the analyses are complete.

I carried out a few calculations using the data supplied by the SAWS. It only took about four hours. I analysed the data for districts 1 to 20 in the western and southern Cape, which include the fynbos and the succulent Karoo regions. (See Fig. 14 below.) I divided the data for each district into three equal 21-year periods. These were from 1940 to 1960, 1961 to 1981, and 1982 to 2002 (inclusive). The use of 21-year periods neutralises the effect of the statistically significant 21-year periodicity in the data, which in turn is directly related to corresponding changes in solar activity.

Two years 2003 and 2004 were omitted in the first round of analyses. I then selected the lowest of these two remaining years and compared them with the ranked data. For example, the rainfall in District 1 for 2003 was the 5th lowest during the 65 years of record. The results are shown in Table 13. The rainfalls are in millimetres.

Fig. 14 below shows the location of the South African rainfall districts. Fig. 15 shows the percentage increases in rainfall in the 20 districts within the south-western Cape. Table 13 shows the progressive increase in rainfall during the period of record. This information completely negates the view that future conditions in the southern and western Cape will be drier than at present.

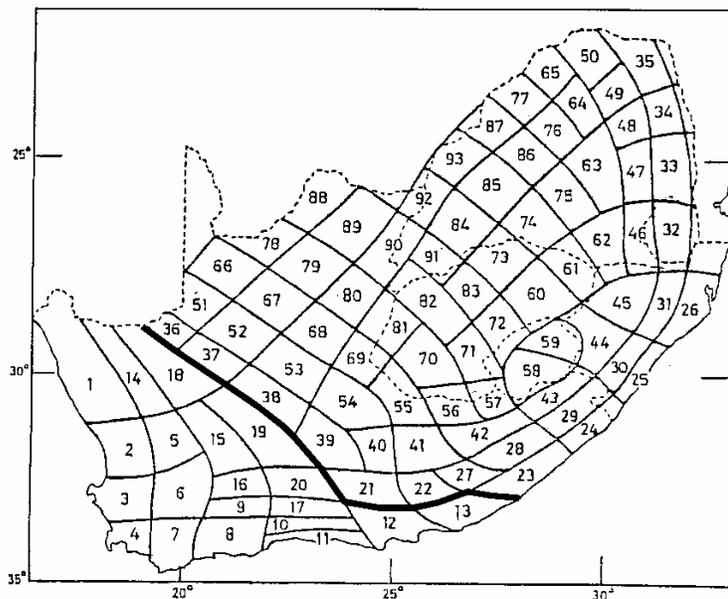


Figure 14. Rainfall districts in the western and southern Cape.

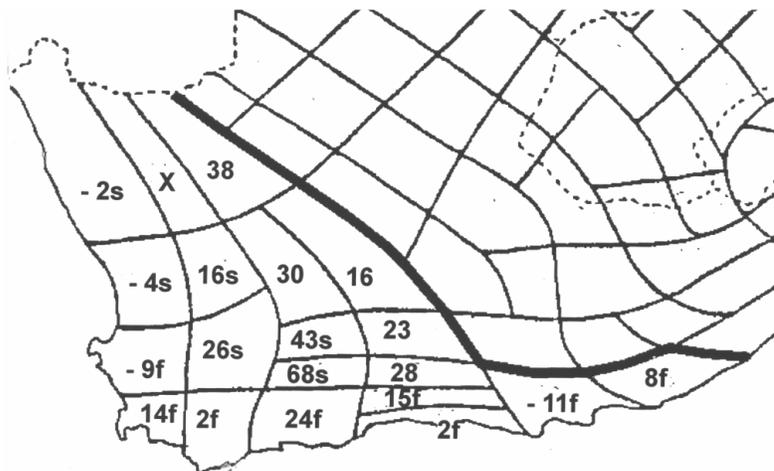


Figure 15. Percentage increase in district rainfall in the SW Cape, 1950-1992. (Negative values indicate decreases.)

The letters 's' and 'f' indicate districts where succulent Karoo and fynbos biomes occur in the above figure and Table 13. Note the substantial percentage increases in the annual rainfall in all but four districts in Figure 15 and Table 13.

Note the wide range of rainfall conditions where these species thrive. Authors of the alarmist reports failed to provide this information or the equivalent annual temperatures.

District	1940-1960	1961-1981	1982-2002	% change 1950-1992	Rank of 2003/04
1 S	157	143	154	- 2	5
2 S	268	224	256	- 4	8
3 F	546	468	497	- 9	5
4 F	909	922	1038	14	4
5 S	208	219	241	16	5
6 S	248	262	312	26	10
7 F	396	381	402	2	17
8 F	398	451	495	24	56
9 S	164	244	275	68	28
10 F	254	293	293	15	33
11 F	748	723	761	2	44
12 F	536	606	478	- 11	10
13	592	671	640	8	12
14	X	726	794	X	X
15	143	187	186	30	9
16 S	143	178	205	43	37
17	180	210	230	28	7
18	96	130	132	38	3
19	175	228	203	16	6
20	185	213	227	23	18
Avr	334	374	391	17.1%	16

Interpretation of the facts

The midpoints of the 21-year sequences are 1950, 1971 and 1992. The details in the table demonstrate the following:

There was a 17% (57 mm) increase in regional rainfall during the 42-year period 1950 to 1992, and a greater increase during the whole period of record.

Only four districts showed a decrease in rainfall during the period of record.

The other 15 districts with complete records all showed increases within the range of +2% to +68%.

The regional rainfall showed a consistent increase from the first to the second to the third periods.

In not a single district was either the 2003 or 2004 rainfall the driest on record. For the region as a whole, the average of the worst of these two years was only the 16th lowest on record.

This very simple analysis showed that except for the three districts (1, 2 and 3) along the west coast, and the single district (12) on the south coast, all other districts in the western and southern Cape, including those in which the fynbos and large areas of the succulent Karoo are located, exhibited consistent increases in rainfall during the period of record.

The information above clearly illustrates that these alarmist predictions have no substance.

QUESTION: Why did the writers of the WCape report not carry out the simple analyses described here using the district rainfall data that has been available since the 1970s? The analyses would have taken less than a day to perform, and do not require any numerical expertise other than simple arithmetic. This would have demonstrated the unreliability of global climate models and consequent invalid conclusions in their papers.

APPENDIX C

Linkage with solar activity

This quote is from the WCape report. The emphasis is mine.

Climate variability has been linked to variation in solar activity, i.e. the sunspot cycle, (Houghton et al (2001). However, recent analyses by Foukal et al (2005) have called this hypothesis into question, citing the small variation of solar output (0.8%) that can be attributed to the sunspot cycle and the relatively poor ability of instruments to measure accurately these variations.

In 1889, more than 100 years ago, the Knysna forester D E Hutchins reported as follows in his book *Cycles of drought and good seasons in South Africa*.

This confirmation comes from the Cape Town Observatory. The returns for thirty years from the Cape Town Observatory show a close correspondence between sun-spots and temperatures, the maximum of temperature lagging a year behind the minimum of sun-spots. (p17).

At Cape Town, the correspondence between the mean rainfall and mean sunspot frequency has long been an established fact. (p25).

For these reasons we ought to consider the Cape Town Observatory rainfall figures as of great importance to ourselves, an importance enhanced by the fact that they go back to the year 1842. For the three cycles comprised in the period 1842 to 1875 the mean annual rainfall at the Royal Observatory, Cape Town, was: –

During Minimum Sunspot years	21.05 inches.
“ Intermediate “	23.59 “
“ Maximum “	27.95 “

QUESTION: Given all this information, based on records extending back as far as 1842, why did these fifteen scientists choose to quote an overseas author’s claim that no linkage existed when the linkage was demonstrated by a Knysna forester more than 100 years ago? All that was needed was for one of these authors to study the rainfall and temperature records and possible linkages with sunspot activity. Instead they chose to rely on an overseas author who was obviously ignorant of the well-documented, synchronous linkages that have been reported in South Africa and internationally for more than a century.