



Responding to climate variability and climate change

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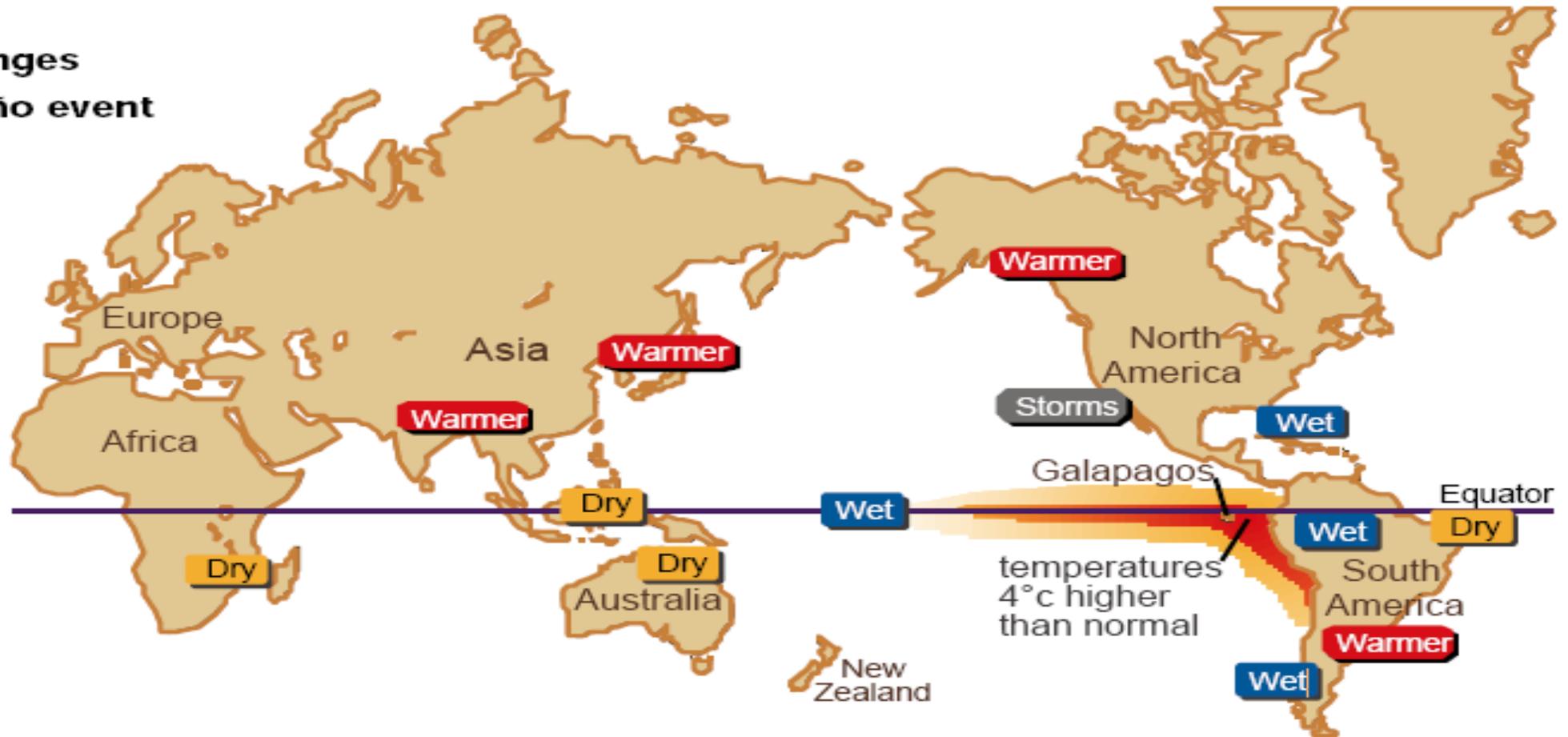


El Niño and Global Weather Systems

The El Niño phenomenon is the result of the heating of the Pacific Ocean.

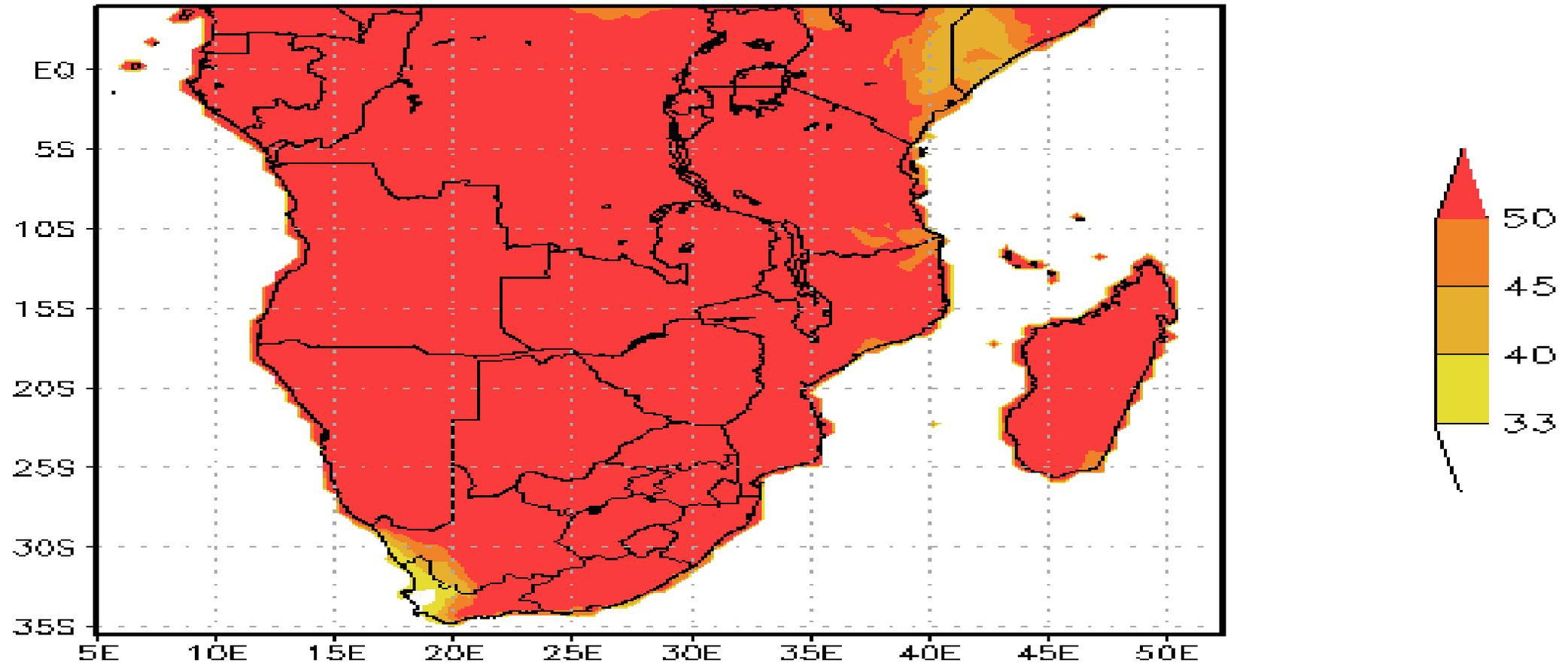
It induces above normal dry conditions in some parts of the world (southern Africa and Australia) and above normal wet conditions in other parts (South America). It is likely to last for the summer season.

Worldwide changes during an El Niño event

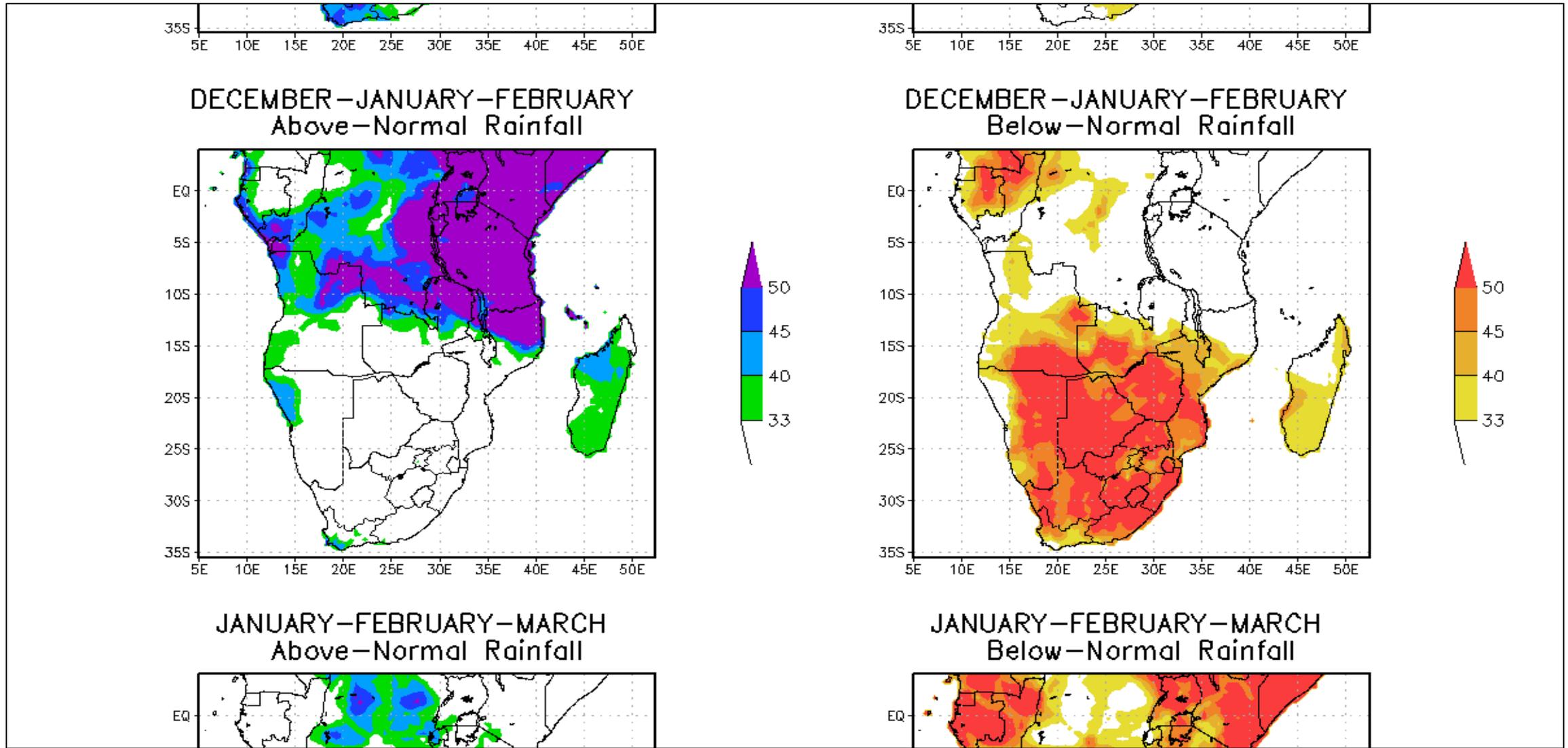


Probability for above normal temperatures

DECEMBER – JANUARY – FEBRUARY
Above – Normal Max Temp



Probability for above and below normal rainfall



Government response to climate change impacts

- Policy

- National Climate Change Response Policy
- Adaptation: Build a climate resilient society and emergency response capacity

- Research

- Long-term adaptation scenarios that provide scientific information on climate trends, climate information, projections and adaptation options
- Provincial climate vulnerability assessments

- Institutional and Operational

- Horizontal- Role of sectors in implementing their adaptation plans or strategies.
- Vertical- Role of provinces and local government in the implementation of their provincial and local strategies (climate change integrated in IDP through Lets Respond Toolkit)

- International

- Adaptation as a priority for South Africa & the Africa Region
- Adaptation in the new agreement and adaptation as a global responsibility

National climate change response policy

Long term Adaptation Scenarios



Climate scenarios
Impact Scenarios,
Adaptation Options

Water, Agriculture and Forestry; Marine fisheries, Human health, Biodiversity, human settlements, Disaster Risk management, Food security, Economics of adaptation, Sub-regional Interventions,



SA's vulnerability to climate change

System	Changes
Water	Significant proportion allocated; reductions in availability, increased frequency of extremes
Agriculture	Most scenarios suggest adverse impacts, implications for food security & small-scale farmers
Human health	Strong interactions with environmental quality and current disease burden
Disaster Management	Extreme events, weather-related impacts are already exacerbated by unsustainable land use management
Biodiversity and ecosystems	Degradation trends affecting biodiversity & ecosystem services; opportunities for resilience through ecosystem based adaptation
Human settlements and livelihoods	Emerging understanding suggests significant implications on infrastructure and livelihoods –coastal, urban and rural
Ocean and coasts	Sea level rise, extreme weather events and resultant disasters- implications for coastal infrastructure, tourism, ocean based economy and services

Climate change is an environmental, developmental, economic and a social challenge, that also presents



Towards a climate resilient South Africa

Enhance the **ability to anticipate and reduce risk** to climate variability and change

Enhance **ability to “bounce back”** from the negative impacts of climate variability and change

Focus on **reducing inequality and increasing social and other capitals** so that the most vulnerable in society are not differentially negatively impacted by climate change.

Resilience requires consideration of:

- Complex nature of vulnerability and exposure to climate risks;
- Responses to climate change require cross-sectoral governance and coordination;
- Importance of information, learning and knowledge-sharing;
- Need for flexibility and room to be pro-active, in order to respond quickly to impacts;
- Need for climate resilience to be integrated into development planning.

A climate resilient society is therefore defined as: “A society that **identifies existing and potential interacting vulnerabilities across social, economic, political, physical and environmental systems, continuously acts to reduce vulnerabilities and create opportunities, and responds to unavoidable impacts quickly and flexibly through inclusive decision making**”.



Strategic and policy considerations

1. **Implementation of robust and integrated monitoring systems** to reduce uncertainty regarding climate change
2. Advancing **Early Warning Systems** to mitigate the projected increase of extreme events and support effective Disaster Risk Reduction
3. **Improving understanding of water, food and health nexus** as associated the trade-offs to promote sustainable resource use and development
4. Expanding initiatives such as **maintenance of ecological infrastructure and ecosystems** to help to maintain, support and sustain livelihoods and ecosystem services
5. **Mainstreaming climate resilience** into infrastructure and operational designs
6. **Building robust infrastructure** with an understanding of the long term vs. short term costs and benefits
7. Increasing **education & capacity building** as they are cornerstone adaptation responses necessary at all levels and in all sectors
8. **Coordination at all levels of government vertically and horizontally** in the context of climate change
9. Investing in further **research** into climatic impacts at a local level and across industry value chains
10. Exploring **innovative financing models** to support deliver of appropriate adaptation responses



Adaptation implementation

Adaptation plans have been completed and are under implementation by:

- Department Agriculture, Forestry and Fisheries
- Department of Water and Sanitation
- Department of Rural Development Land Reform
- Department of Health to guide adaptation on health impacts
- Department of Environmental Affairs (adaptation to climate impacts on ecosystems).
- A number of provinces

The Department of Environmental Affairs is co-ordinating:

- Working for Water (managing invasive alien plants for water security);
- Working on Fire (to manage the increase of veld and forest fires);
- Working for Wetlands (conserving the ecological services of wetlands)
- Working for Ecosystems (conserving the ecological services of catchments)

THE WORKING FOR WATER PROGRAMME

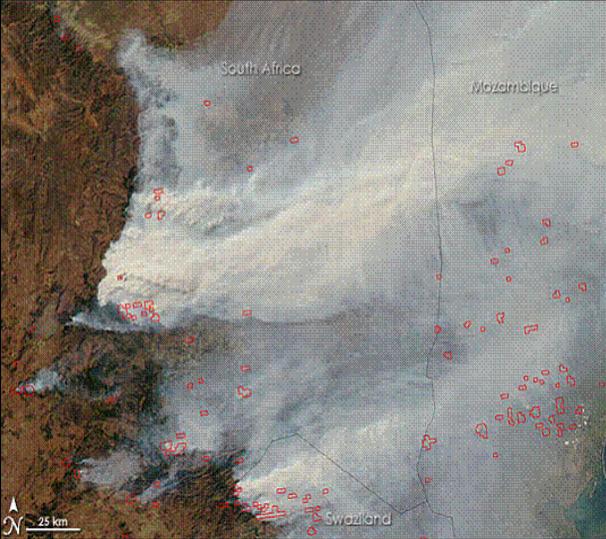
Managing invasive alien plants for water security

1. Invasive alien plants are using 5% of our mean annual runoff.
2. Left alone, this impact will rise to 16% as the plants spread and grow. In specific catchments, they can consume all available water.
3. Climate change will exacerbate this impact by invasive plants.
4. The Department runs the **Working for Water** programme, on behalf of a partnership of Departments, to control such invasions.
5. Over 2,800,000 hectares of land have been cleared of invasive plants through this programme.
6. WfW has allocated R 1 033 069 229 (R1.03 Billion) for this work in 2015/16.
7. Over 38,000 people will work on this programme in this year.
8. This work is essential for long-term water security. The CSIR calculated the value of the water as a result of the control of invasives at 400 billion.
9. In the short-term, Working for Water will seek to re-prioritize some of its work, to focus on invaded riparian areas. This can facilitate immediate water benefits.



THE WORKING ON FIRE PROGRAMME

Integrated Veld and Forest Fire Management



1. Wild fires are a major factor in the management of fire-prone ecosystems.
2. Most of the areas that are currently experiencing drought are in fire-prone systems.
3. Fire is necessary for the health and productivity of these ecosystems (e.g. grazing).
4. A failure to burn, or burn timeously (be it too often or too infrequently), can lead to weakened ecosystem functioning and even collapse, with all the productivity losses.
5. The Department manages the **Working on Fire** programme, again on behalf of a partnership of Departments.
6. Over 3,000 wild fires are expected to be brought under control through the programme in 2015/16, on top of controlled burns and establishing firebreaks.
7. WoF has allocated R527 928 132 for this work in 2015/16.
8. Over 6,000 highly trained Fire-fighters will work on this programme in this year.
9. The drought is bound to lead to serious challenges in the fire seasons in the south (in Summer) and potentially in the north (next Winter).
10. WoF is capacitated to fight fires, co-ordinate preventative protection measures, and enhance productivity of land, now, and in a changing climate.

THE WORKING FOR WETLANDS PROGRAMME

Conserving the Ecological Services of Wetlands



1. Water quality is a pressing issue in a developing world. Wetlands are often referred to as “Nature’s Kidneys”, for the filtration and purification services that they offer.
2. Wetlands similarly have critical roles in flood attenuation – a factor that will grow in importance as climate change bites.
3. They are also important for biological diversity, food security, disease management and other attributes, as well as low-flows of water supply.
4. DEA manages **Working for Wetlands** on behalf of partner Departments.
5. Over 1,100 wetlands have been repaired and conserved through this programme.
6. Working for Wetlands has allocated R 110 601 659 for this work in 2015/16.
7. Over 1,500 people will work on this programme in this year.
8. An emphasis on wetland conservation, and a particular use of offsets to establish artificial wetlands that mitigate water quality problems from poor sanitation, are among the envisaged short-term interventions in these circumstances.

THE WORKING FOR ECOSYSTEMS PROGRAMME

Conserving the Ecological Services of Catchments



1. Soil erosion, siltation, slippage, mudslides and sedimentation are major factors in the immediate water challenges faced in South Africa, and certainly in the long-term management of water.
2. The sooner these impacts of poor land-use practices are addressed, the lower the impact, including upon water.
3. The Department manages the **Working for Ecosystems** programme in key catchment areas, in partnership with other Departments, as well as a **Working on Land** programme, that address this problem..
4. Working for Ecosystems has allocated R92,552,294 for this work in 2015/16, and a further R27,100,000 is budgeted through Working for Land.
5. Over 2,000 workers will work on these programmes in this year.
6. Whilst the benefits are critical in the long-term, the programmes will seek to focus some of its work for short-term gains in this drought.

THERE IS NO CHOICE WITH WATER: ADAPT OR DIE

The good thing is that it is a profitable thing to do

1. South Africa, like all countries, must adapt to a changing climate that will have various impacts, including with respect to water.
2. Whilst this inevitably means that our water use per capita has to reduce, on average (and be equitable), the changes that are necessary must be embraced.
3. We can do them now, because we are currently experiencing a drought and the challenge of El Nino, but actually the measures that we should all adopt will be investments in the long-term.
4. This is particularly true of demand-side management options, where dual-flush toilets, low-flow showerhead, water-wise gardens and the like offer quality solutions to what are frankly inefficient and wasteful practices. We can take this further in what we prescribe for development, such as the norms and standards for housing, that can ensure a “technology leap” for development in the country.
5. The control of invasive alien plants in our catchments and landscapes is essential. The sooner it is done, the less it will cost. Whilst greater water security is an obvious benefit, there are many other benefits, including greater productivity of land. The same is true of our management of wetlands, of wild fires, of land and ecosystems. And all of them are among our most important opportunities for jobs.
6. As much as we need to adapt our lifestyles, and ensure that we make every drop of water count, these are changes that are frankly overdue in a world with a changing climate and growing population. Adapt or die.