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Climate Change in the Western Cape: a Disaster Risk Assessment of the impact on human health

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Background

- Internationally and in SA there is a paradigm shift to risk reduction rather than response
- The Disaster Management Act (Act 57 of 2002) instructs all municipal and provincial spheres of government to conduct scientific risk assessments
- Climate change is currently not taken into consideration in Disaster Risk Assessments
- There are many impacts of climate change with many unquantified inter-dependencies – health is only one example

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Climate and Health

- Health is regarded as a fundamental aspect of society, a key element of intrinsic human rights and justice
- Climate change poses a major and unfamiliar challenge
- Impacts of CC on health was previously neglected in assessment and mitigation reports
- Not yet determined in depth or with narrow margins of uncertainty

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- This study integrates the disciplines of disaster risk management, climate change and health to address the research questions

  - It examines the current disaster risk for the case study area and determine major threats
  - It qualitatively assesses the possible risk to human health under a changed climate by
    - assessing the change in hazard occurrence and
    - assessing changes in vulnerability of the affected community
  - It determines the implications of the impacts for policy and disaster management planning and suggest mitigation and preparedness strategies

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Study area…

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Study Area

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The Cape Winelands District

- Population increase: 10% 1996 – 2001
- Young female population dominates
- Illiterate, unskilled labour – migration
- 543 742 out of 629 491 (86%) people lives in relative or seasonal poverty (<R1600/mnth ; <$200/mnth)
- Economic drivers: tourism and agriculture (& related industries)
- Agricultural sector: 38% of income, 38% of employment…wine and fruit exports….

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Health status quo:

- Leading causes of ***mortality*** in CWDM:
  1. Tuberculosis
  2. HIV/AIDS
  3. Homicide
  4. Road traffic deaths
  5. Pneumonia
  6. Chronic Obstructive Pulmonary Disease
  7. Heart disease
  8. Low birth weight
  9. Stroke
  10. Diarrhoea

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- Diarrhoeal disease
  - Leading cause of death in children under 5 (160 – 200 Children *per day*) in SA
  - 2nd highest cause of ***infant mortality*** in study area
  - Indicates a ***poverty-stricken community***, living in ***polluted environment*** – exposed to ***contaminated water and poor sanitation***

- Tuberculosis
  - is main cause of premature death
  - Caseload per municipality has increased steadily since 2000
  - Cure rate well below national target of 85%

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- before we can assess future risk, we must understand current risk

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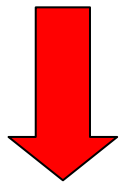
Basic methodology

RISK = fn (hazard, vulnerability, resilience, exposure)



RISK = Hazard x Vulnerability / Capacity to cope

Each of these are assessed to determine total risk

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typical output per local municipality

Relative Risk Priorities Table for Breede Valley Local Municpality

Hazard	Total Risk	Total Risk Manageability	Relative Risk Priority	Actions Needed
Drought	Safe	Modest	Safe	Preparedness Planning
Earthquakes	Tolerable	Modest	Tolerable	Risk Reduction Interventions and Preparedness Plan
Fires	Destructive	Poor	Destructive	Urgent Risk Reduction Interventions
Floods	Destructive	Poor	Destructive	Urgent Risk Reduction Interventions
Hail Storms	Safe	Modest	Safe	Preparedness Planning
Severe Storms	Destructive	Modest	Destructive	Urgent Risk Reduction Interventions
Food Poisoning	Tolerable	High	Safe	Preparedness Planning
Malaria	Safe	High	Safe	Preparedness Planning
Measles	Tolerable	High	Safe	Preparedness Planning
Meningococcal Infections	Tolerable	High	Safe	Preparedness Planning
Polio	Safe	High	Safe	Preparedness Planning
Tuberculosis	Destructive	High	Tolerable	Risk Reduction Interventions and Preparedness Plan
Typhoid	Safe	High	Safe	Preparedness Planning
HIV/AIDS	Destructive	High	Tolerable	Risk Reduction Interventions and Preparedness Plan
Dam Failures	Destructive	Modest	Destructive	Urgent Risk Reduction Interventions
Aircraft Accidents	Destructive	Modest	Destructive	Urgent Risk Reduction Interventions
Bus Accidents	Destructive	Modest	Destructive	Urgent Risk Reduction Interventions
Air Pollution	Safe	High	Safe	Preparedness Planning

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Current major risks

- Flooding
- Fire (veld and structural)
- Drought
- Road accidents
- (Earthquake risk)
- Biological hazard (water-related disease)
- Environmental degradation (water pollution)

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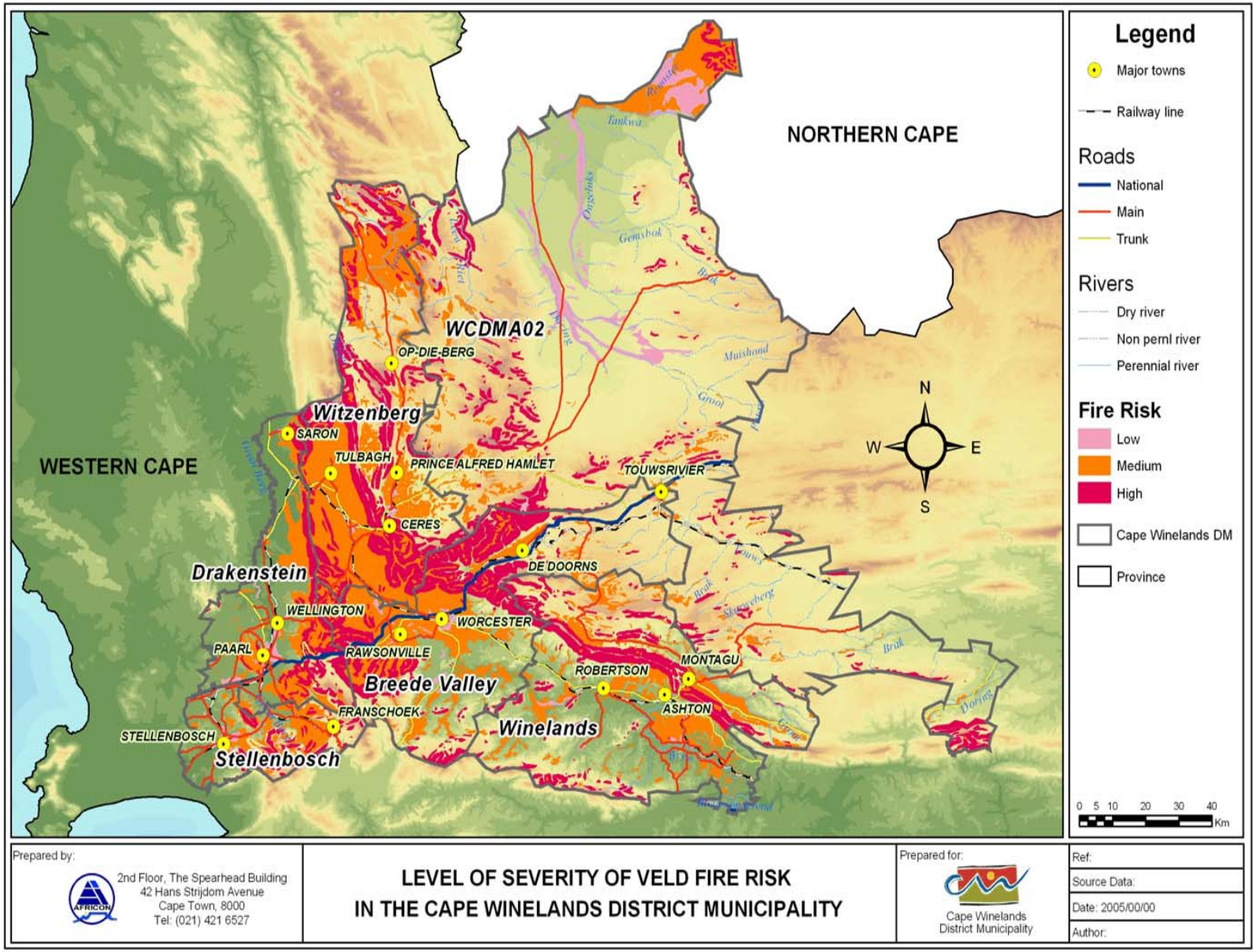

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LEVEL OF SEVERITY OF VELD FIRE RISK IN THE CAPE WINELANDS DISTRICT MUNICIPALITY

Prepared for:

Cape Winelands District Municipality

Ref:	
Source Data:	
Date: 2005/00/00	
Author:	

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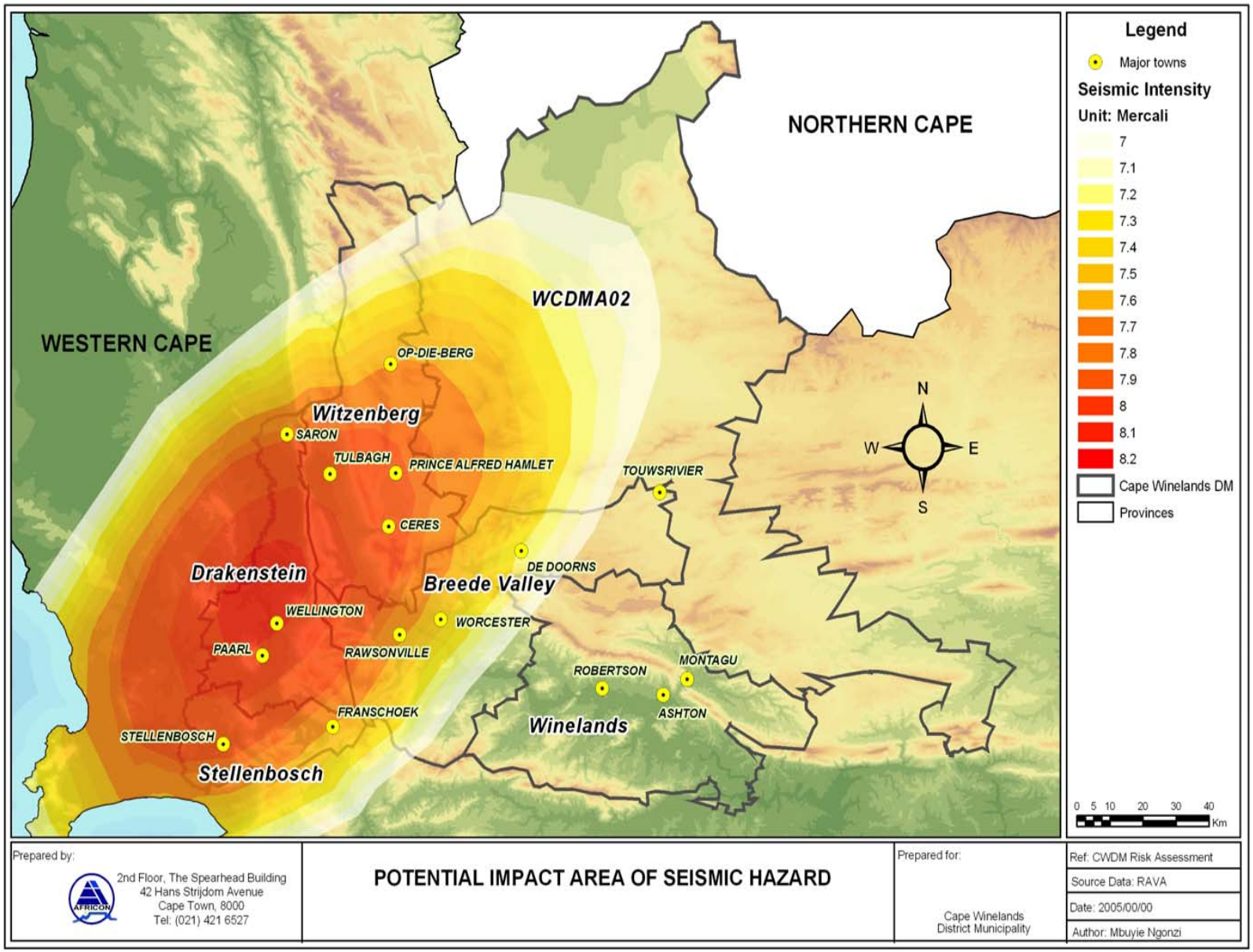

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POTENTIAL IMPACT AREA OF SEISMIC HAZARD

Prepared for:

Cape Winelands
District Municipality

Ref: CWDM Risk Assessment
Source Data: RAVA
Date: 2005/00/00
Author: Mbuyie Ngonzi

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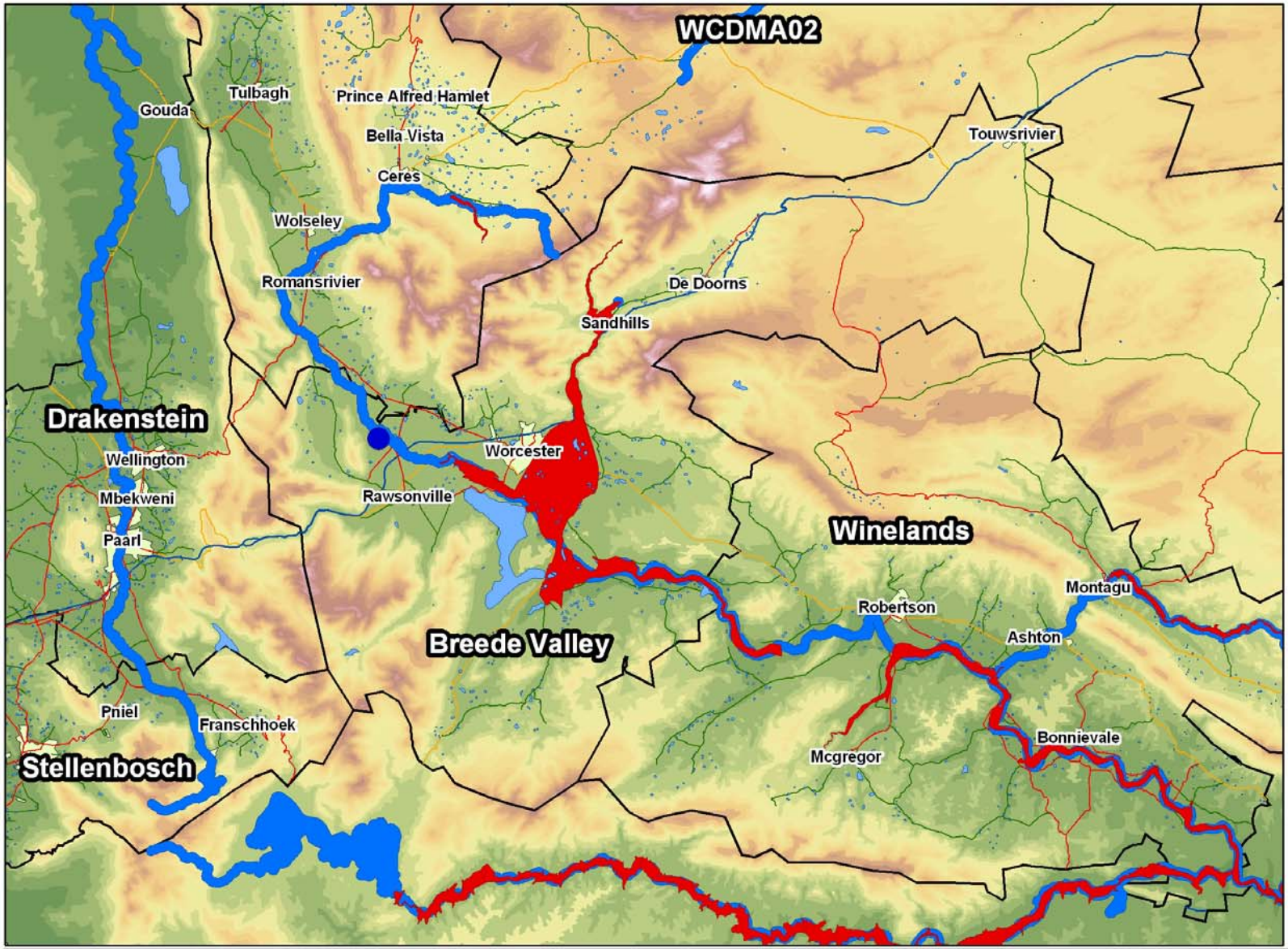

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POTENTIAL IMPACT AREA OF FLOOD HAZARD

Ref: 101563\GIS\maps\flood_hazard2.mxd	
Source Data: RAVA	
Date: 2004/11/29	
Author: Ntina Majara	

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Climate Change in the Western Cape?

- Regional downscaling of GCM's used (5 models)

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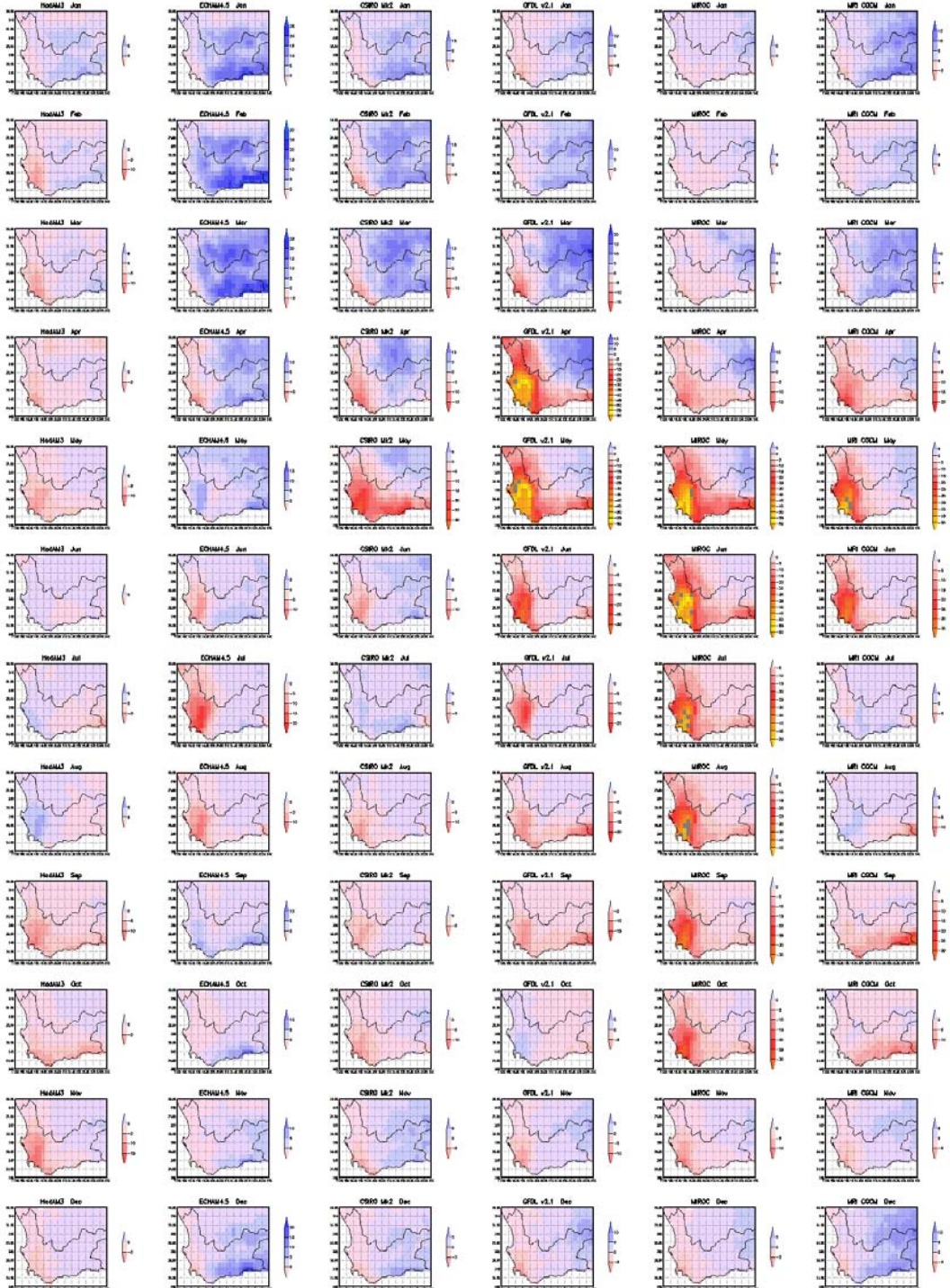
Precipitation



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In summary

- Less rain during early winter
- Higher minimum temperatures
- More extreme events – floods, heat waves

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Impact of climate change on hazard

- Flooding: more frequent
- Fire: more frequent
- Droughts: more severe
- Biological hazard: more likely
- Water pollution: higher levels
- Road accidents: higher frequency

- thus…risks associated with current hazards will increase …

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Secondary consequences: Impact of climate change on health

- Flooding:
  - trauma, mental health, diseases associated with displaced people (diarrhoea, measles, meningitis)
- Fire:
  - Burn wounds, smoke inhalation
- Droughts:
  - malnutrition
- Road accidents:
  - Trauma injury
- Environmental degradation:
  - water-related disease (hepatitis, scabies, diarrhoea, cholera, typhoid)
- Other:
  - Allergies, cold and heat related illnesses, asthma, heart attacks, cancer

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Impact on hazard vs. vulnerability

- The health impacts summarised were all secondary impacts of the effects of climate change on *hazard occurrence* (i.e more extreme rainfall events, drier periods etc)
- When assessing risk, we also must analyse the *vulnerabilities*

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Vulnerability of agricultural sector

- 38% of population is employed in agricultural sector!!
- What is the impact of climate change on the agricultural sector?
- Example: Apple case study (Cartwright)

+1°C:	Ceres:	3 in 21 yrs unsuitable
	Grabouw:	7 in 21 years unsuitable

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CC and agriculture

- For every ***R1mil of additional demand*** an additional ***92.8 person years employment*** is needed…. *and vice versa*

  (Louw DB)
- Job losses on farms will results in ***migration to informal settlements***
- It will put further ***pressure on water resources*** due to lack of sanitation and water supply
- Water resources are already under threat (qualitatively) with a changing climate
- Net effect is an ***increase in water-related disease***

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The impacts of climate change on health are..

- The main impacts of CC on health:
  - Water-related
  - Poverty-related
- The major impact on future risk profiles in the CWDM is through the ***impact of CC on vulnerabilities***
- *This is a typical example of a slow-onset disaster that requires urgent risk reduction initiatives that are inter-sectoral and inter-departmental*

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Local Solutions for Local Challenges

Risk reduction strategies

- To uplift physical living conditions contributing to disease of the poor (water, sanitation, crowding)
- To alleviate poverty in urban settlements
- To improve and maintain health care services and public sector service delivery
- To address the impacts of climate change on agriculture ~ alternative crops?
- The solutions must be **inter-sectoral and inter-departmental** to address future health!

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How?

- Disaster Management in SA still functions in a response and recovery paradigm – education and awareness is needed…and RISK REDUCTION PLANNING!

- Research in this field must be inter-sectoral, as solutions should be. More efforts are required from government (the national, provincial and district disaster management centres ?) in partnership with the private sector to encourage this approach and plan accordingly.

- Quality data is needed on regional level to assist in the planning process.

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In conclusion

The study area can ‘just’ deal with the current scenarios.

Change, such as the aggravating conditions projected under a changed climate, will tip the scale to a full-fledged ‘disaster’ scenario.

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Thank you

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