



The implications of climate change on land and water use within the agricultural sector of the Garden Route.

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Climate change implications for agriculture



- Water (supply, demand and quality)
- Yield variability and product quality
- Reproductive success & growth rate
- Extreme events, drought/flood/hail
- Pests and diseases



Gap Analysis

- Existing natural variability
- Current agricultural practices: climate thresholds for different industries.
- Given projected climate scenarios: Influence on climate thresholds.
- Which and where are industries near critical climate tolerance thresholds (multiple stresses) –most vulnerable?
- Effects on water & land use, productivity, and biodiversity.
- Sustainable/feasible alternatives
- Costs involved relating to adaptation/alternatives?
- Mitigation: land stewardship, ecological corridors, best practices.
- Rural livelihoods

Information (from data) needed

- Historical climate trends
- Future projected patterns in:
e.g. rainfall intensity & distribution, potential evaporation, wind speeds
- Hydrological response to changes
- Adaptation to current variability
- Farmers' attitudes

We need to know more about:

- Combined effect of stress factors
- Water use efficiency

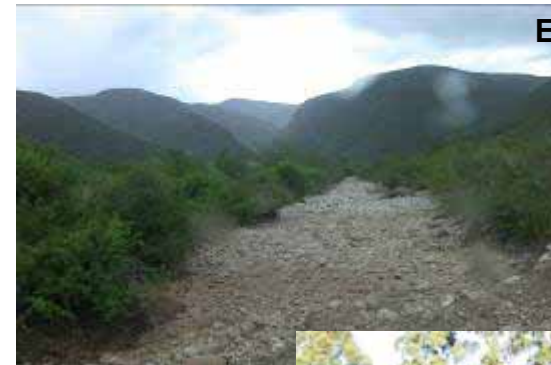
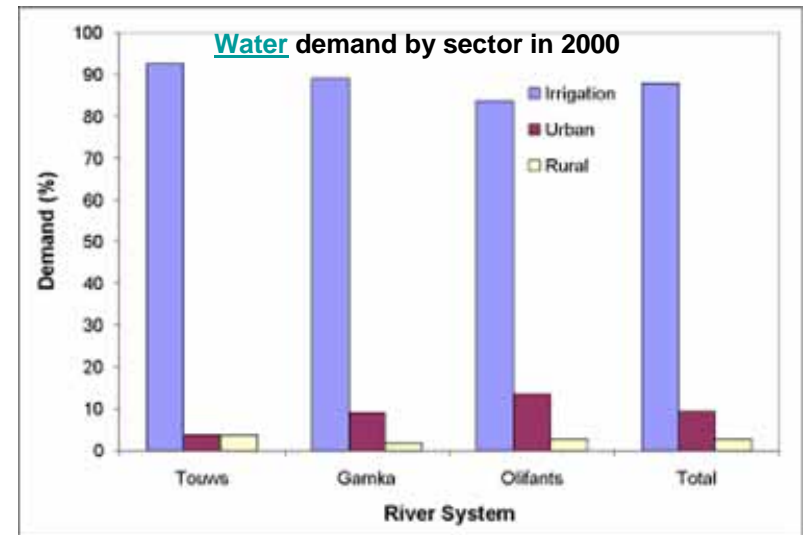


For example, Gouritz WMA

- Existing water scarcity: Gouritz WMA
- 55 million m³ available/human requirements 98 million m³ (coastal sub-area)
- Almost 75% of water requirements in WMA for irrigation.
- Water users (e.g. dairy, vegetables, hops, lucerne)

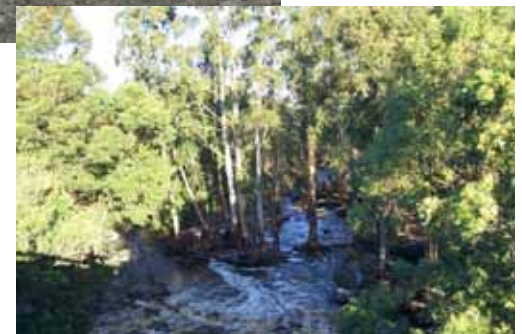
Risks :

- Climate stresses: Warming and drying trend, changing rainfall patterns, floods, increased wind speeds
- Alien vegetation
- Land use change, loss of wetlands



Excessive water extraction

Alien vegetation

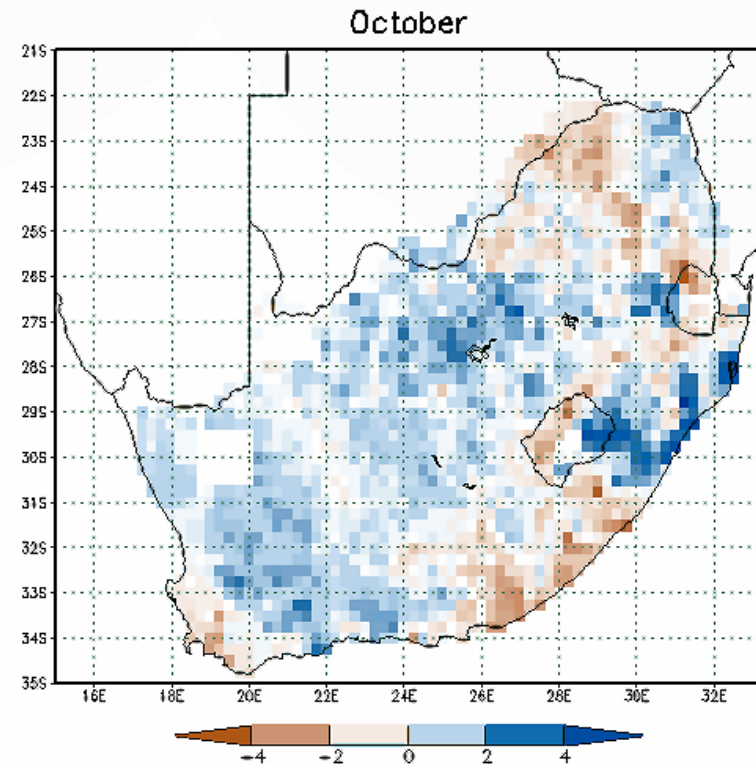
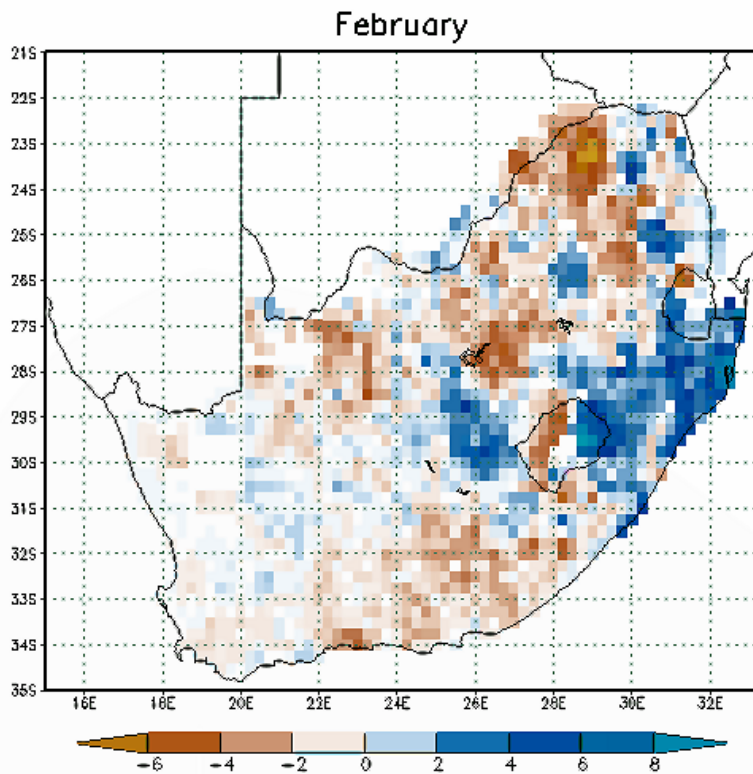


Data needed for adaptation

- Extent to which farmers are addressing current variability and capacity to adapt.
- Infrastructure
- Economics
- Exposed/sensitive areas



Historical Trends in Monthly Total Rainfall between 1950 and 2000 (Bruce Hewitson, Climate Systems Analysis Group)



Getting drier (red shading) in Feb over the southern Karroo and wetter (blue shading) in October - changes in the seasons ??

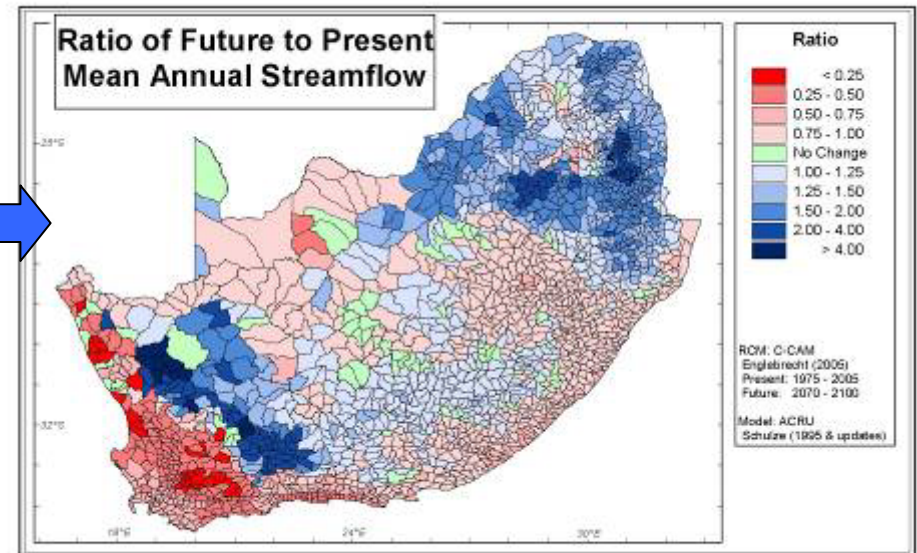
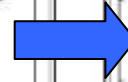
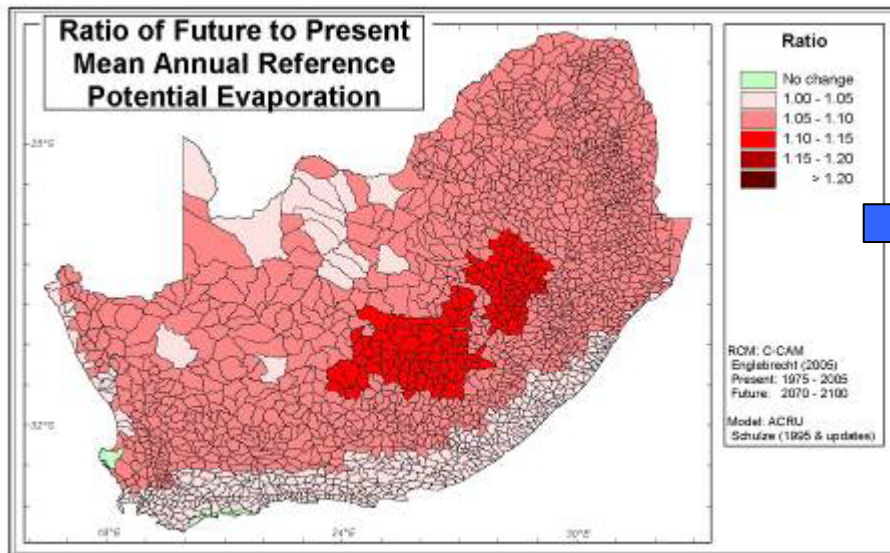
Scenarios

Based on projected climate patterns develop scenarios:

If agricultural patterns continue as per the status quo + a 2 deg temp increase



increases potential evaporation, reduces soil moisture and can reduce runoff by over 25%



Conclusion

- Use of CC data to assess impact on different agricultural practices, land use and water use
- Identify vulnerable agricultural practices (industries)
- Generate information to support decisions on adaptation and practical, sustainable and viable alternatives