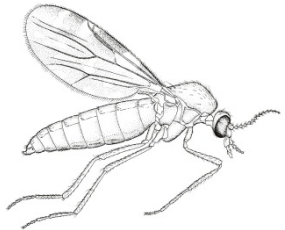


Disease Control & Food Production

ARC-Onderstepoort Vet Institute

Dr Roy Williams

Vector transmitted diseases



African horsesickness, Bluetongue, Equine encephalosis



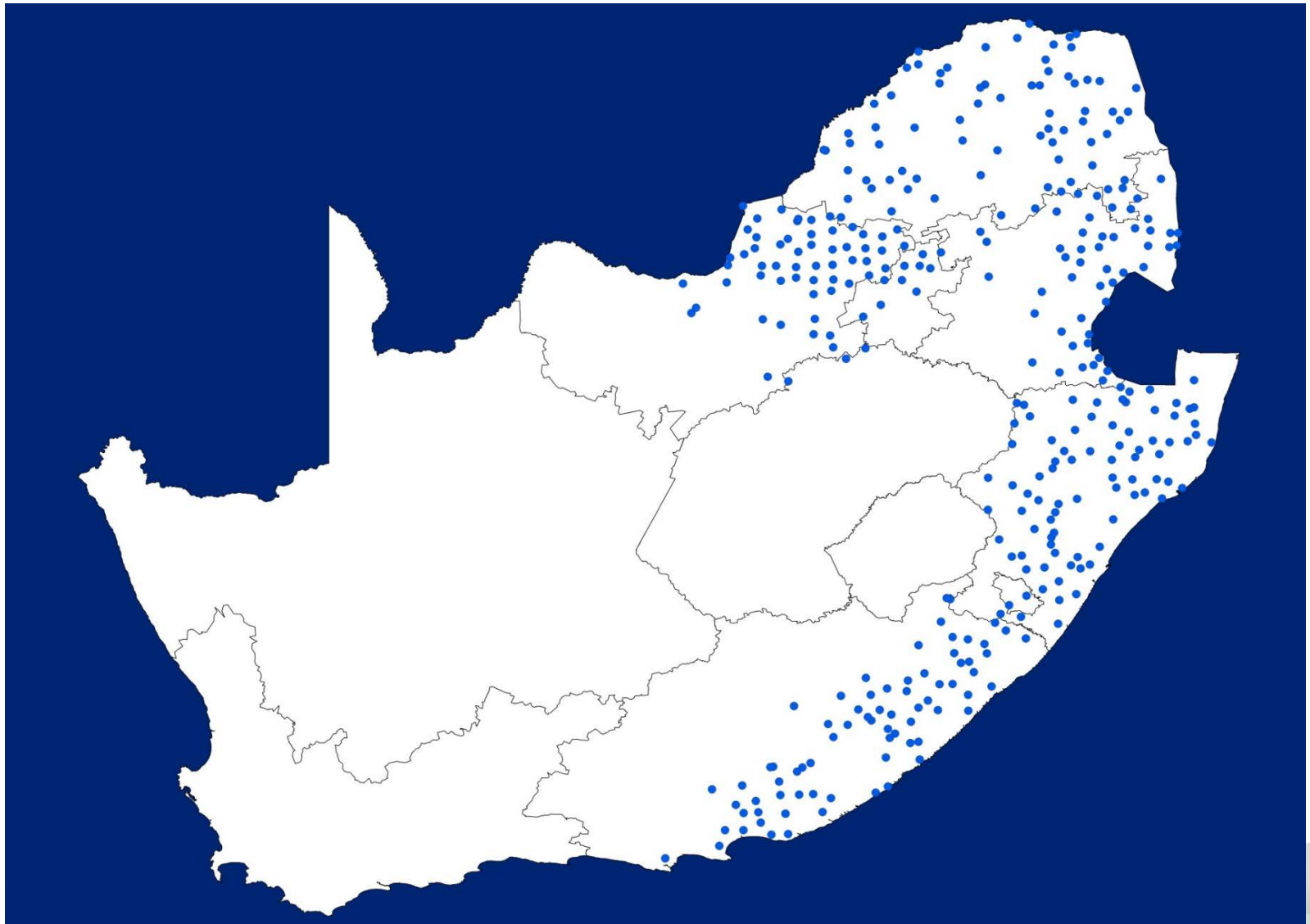
Hartwater, Redwater, Anaplasmosis, East Coast fever, Corridor disease



Rift Valley fever, Wesselsbron, West Nile



Trypanosoma spp

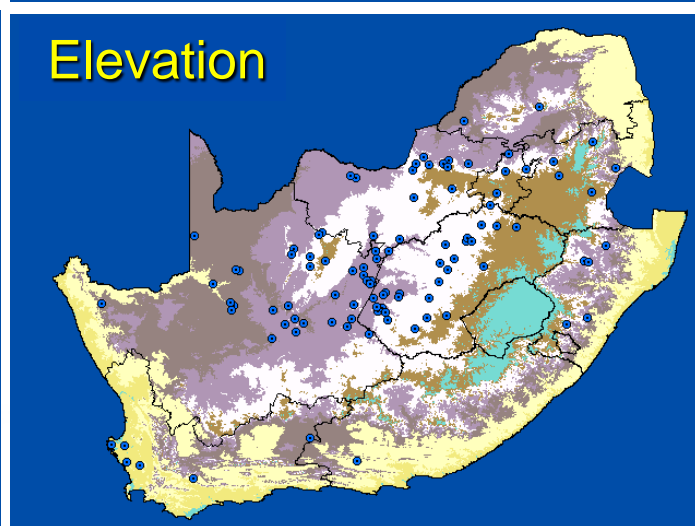
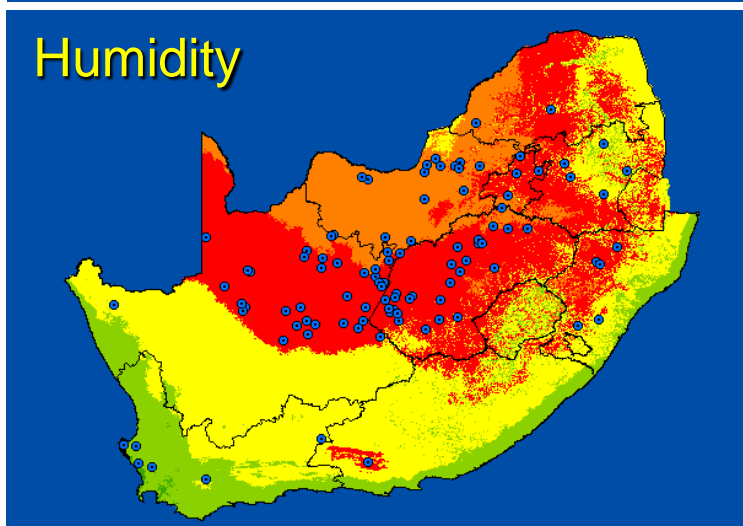
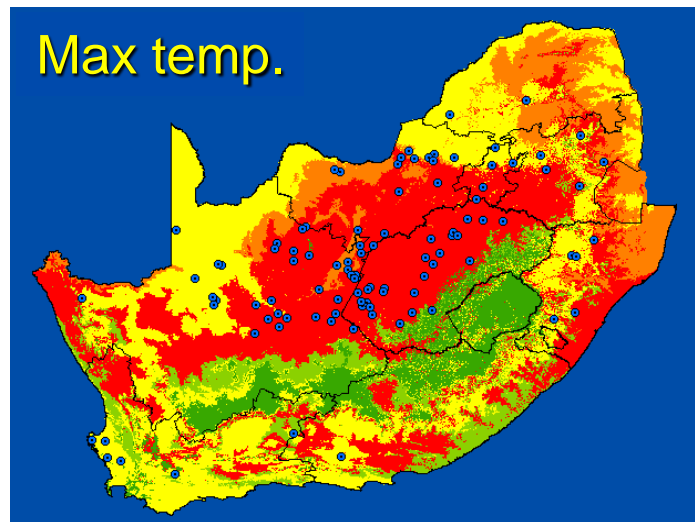
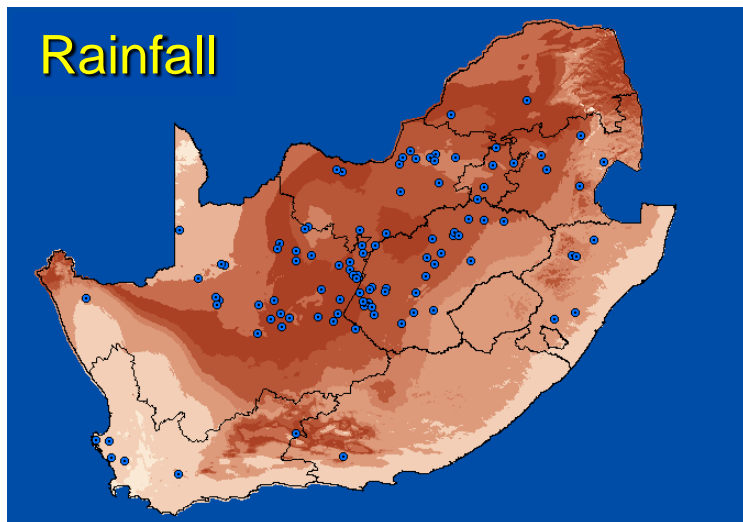


ARC • LNR

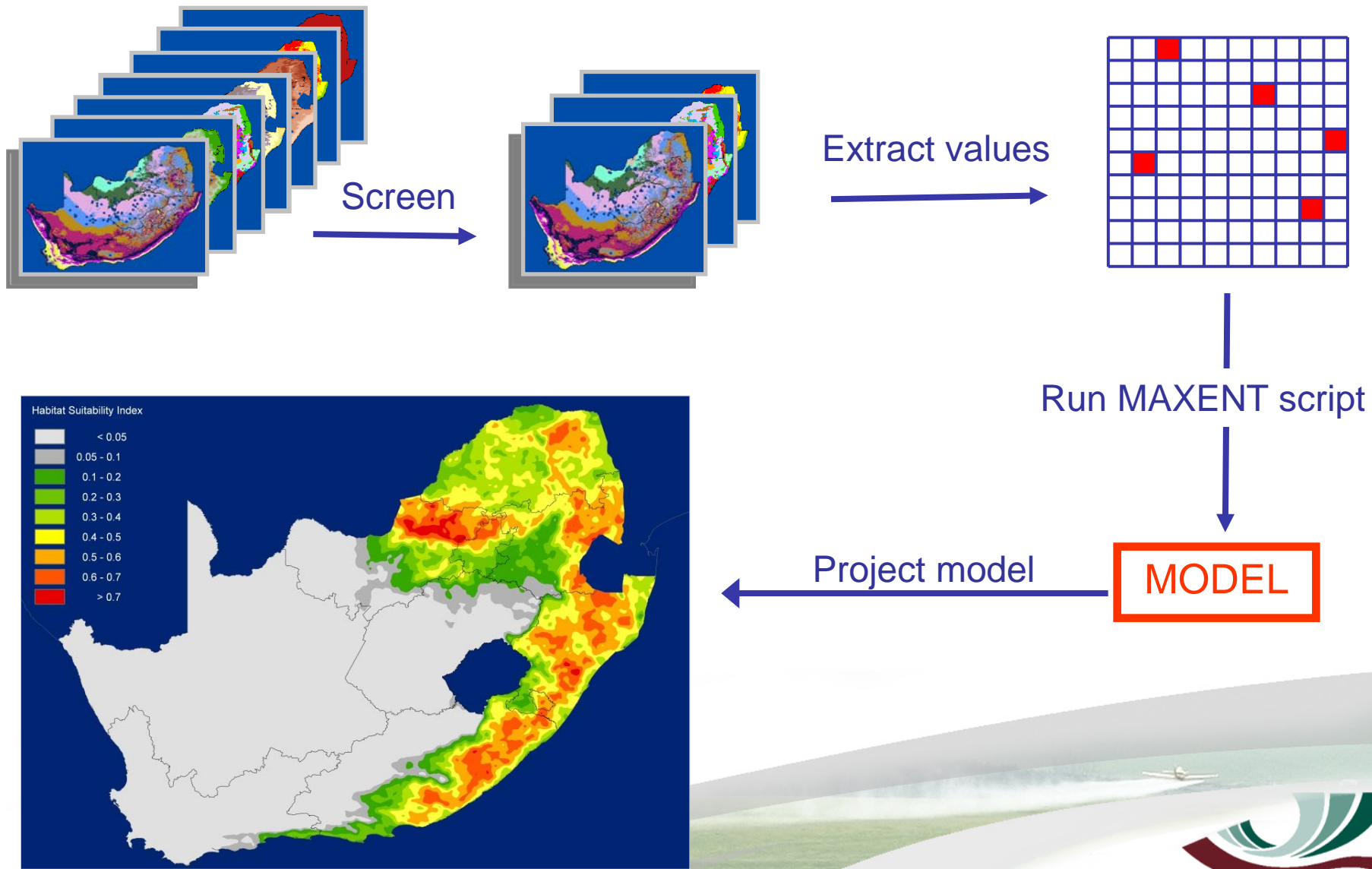
Excellence in Research and Development



Environmental variables



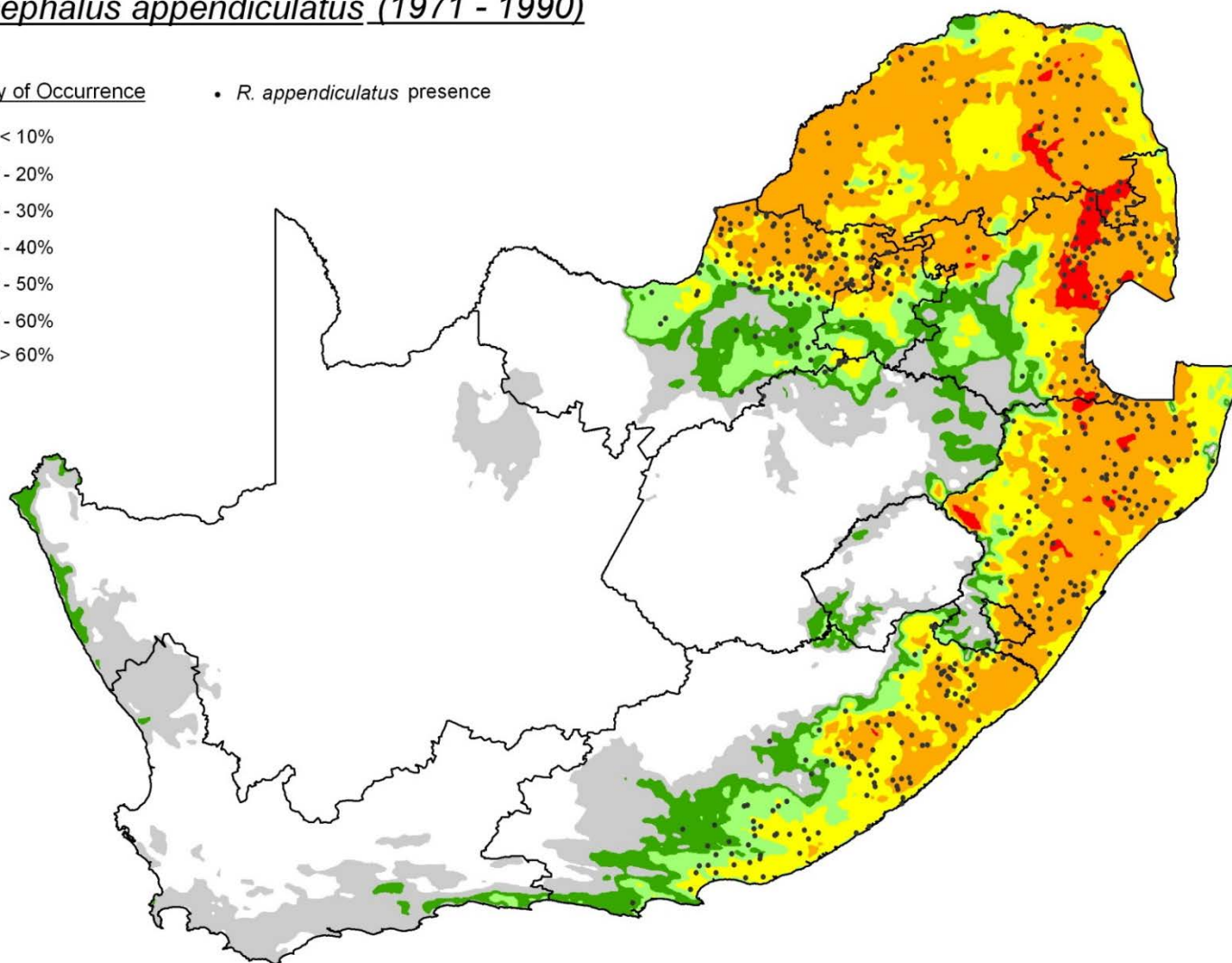
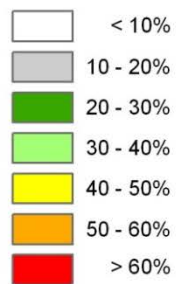
Modelling procedure



Rhipicephalus appendiculatus (1971 - 1990)

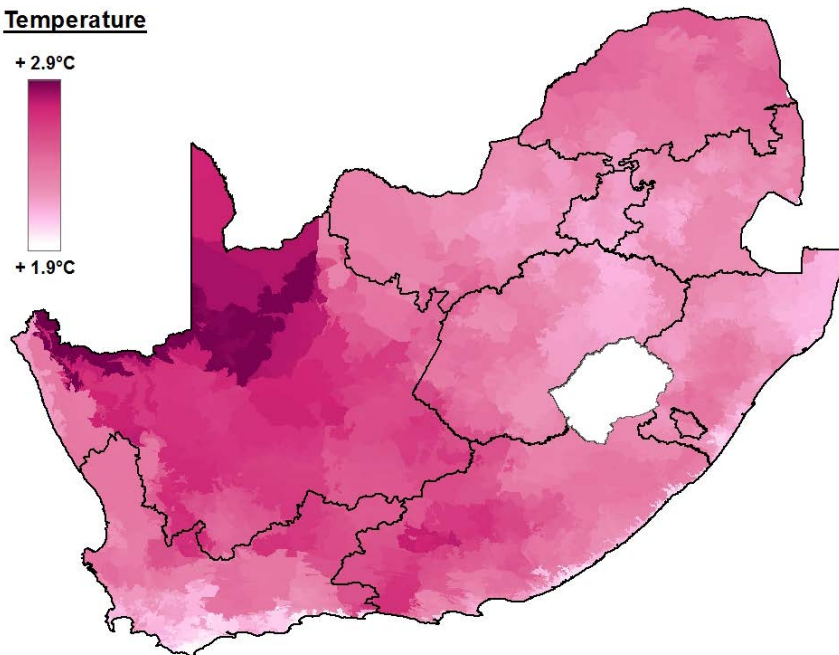
Probability of Occurrence

• *R. appendiculatus* presence

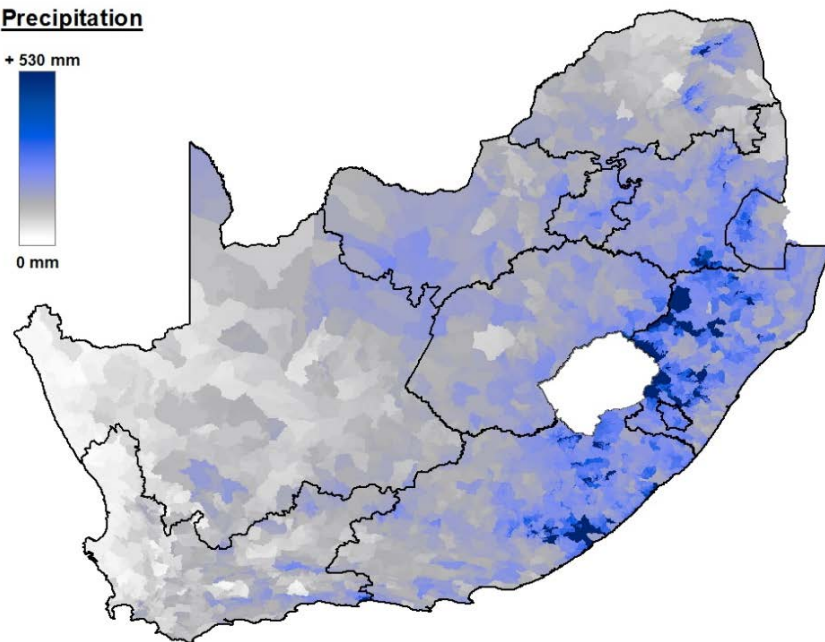


Climate change

Temperature

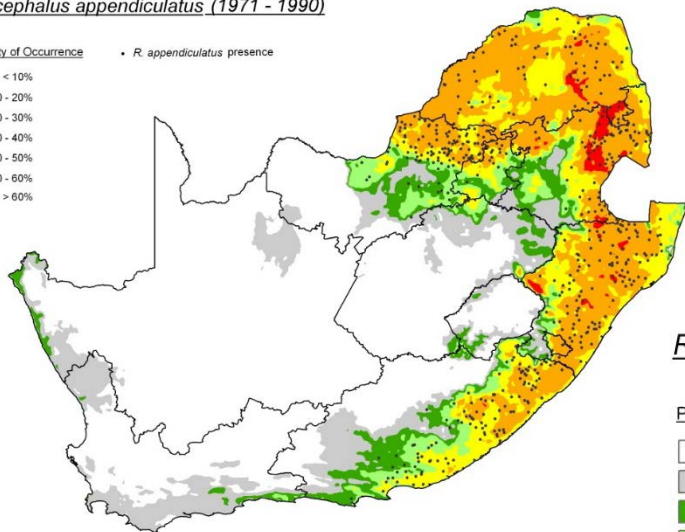
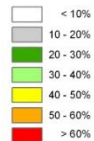


Precipitation



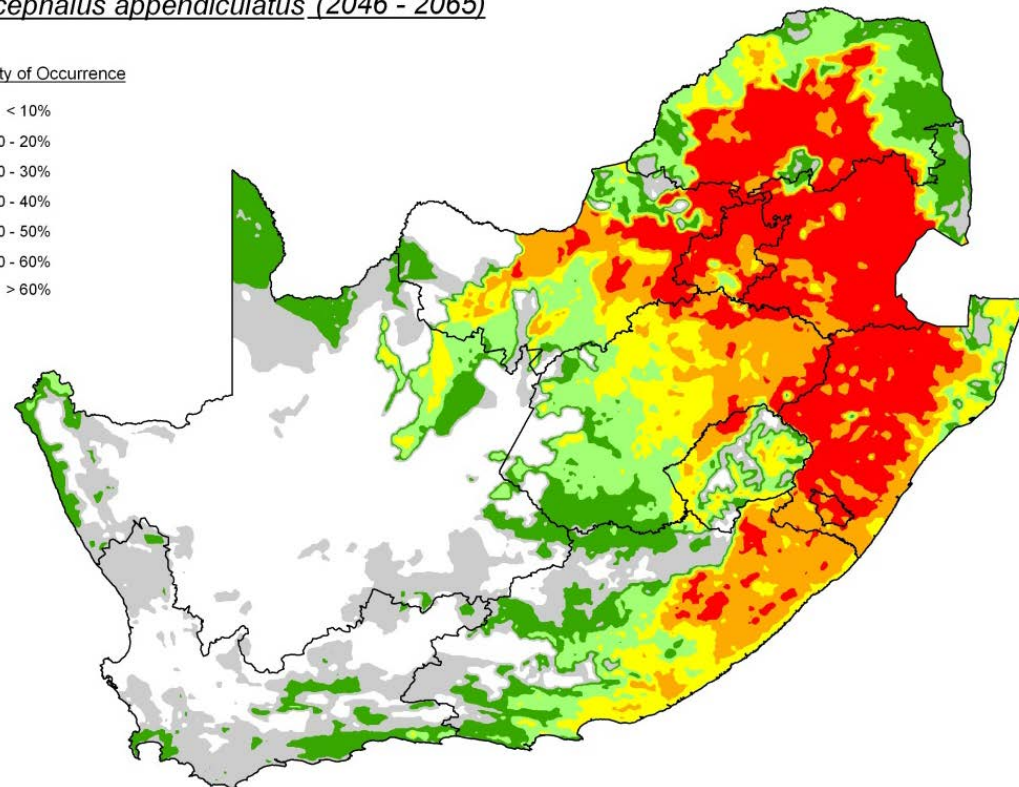
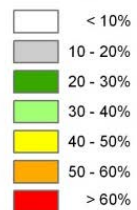
Rhipicephalus appendiculatus (1971 - 1990)

Probability of Occurrence • *R. appendiculatus* presence



Rhipicephalus appendiculatus (2046 - 2065)

Probability of Occurrence



Source: SA Atlas of Climate Change - RE Schutze

Rift Valley fever



Rift Valley fever

- Viral disease of livestock & humans in Africa & Arabian peninsula

Rift Valley fever

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- Above average rainfall – increased mosquito populations

Rift Valley fever

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- Human mortalities:
 - SA (2008-2011) – over 300 humans infected, 25 deaths
 - East Africa (2008) – over 400 deaths

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- Huge economic losses:
 - livestock abortions & deaths
 - restriction on exports of animals & animal products

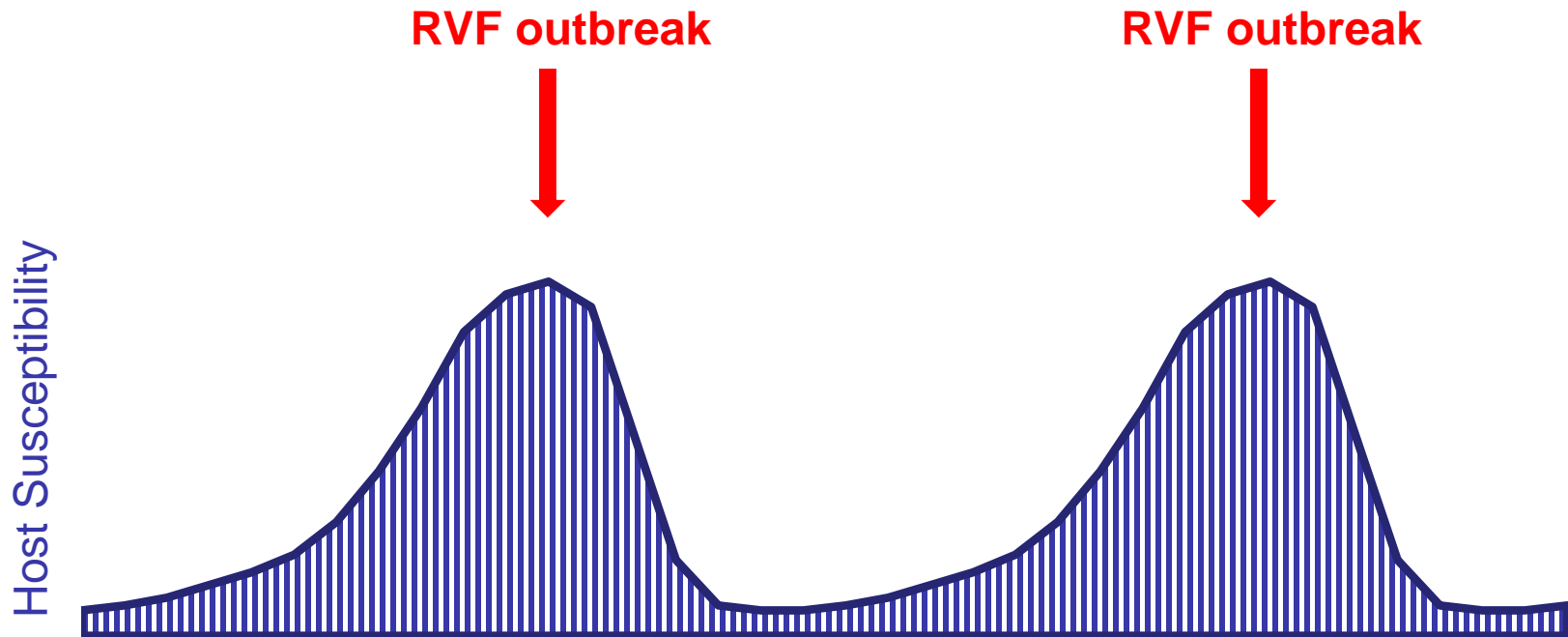
Rift Valley fever

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Rift Valley fever

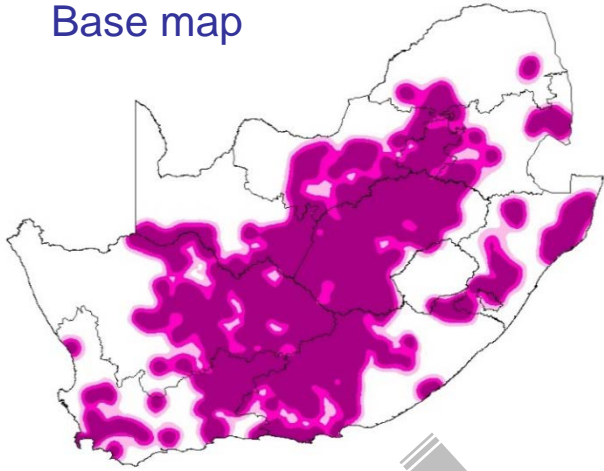
- Viral disease of livestock & humans in Africa & Arabian peninsula
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 - SA (2008-2011) – over 300 humans infected, 25 deaths
 - East Africa (2008) – over 400 deaths
- Huge economic losses:
 - livestock abortions & deaths
 - restriction on exports of animals & animal products
- Vaccination only effective control
- Epidemics at irregular intervals of 5 – 15 years

Host susceptibility cycle of RVF

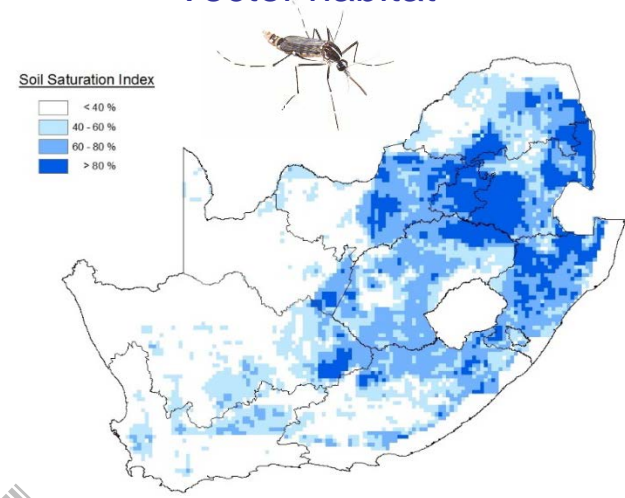


Early Warning System

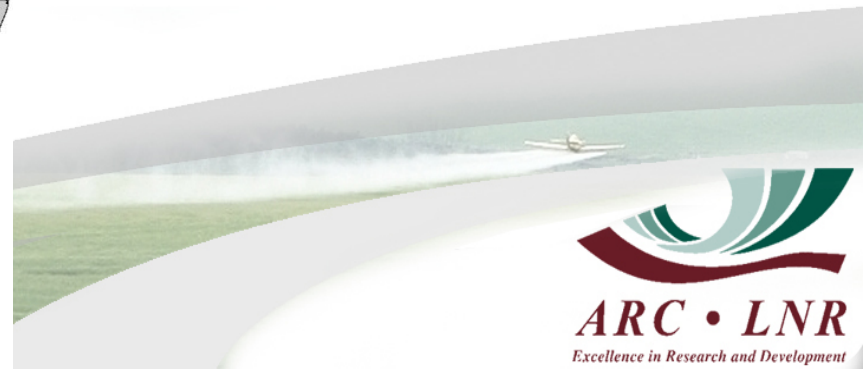
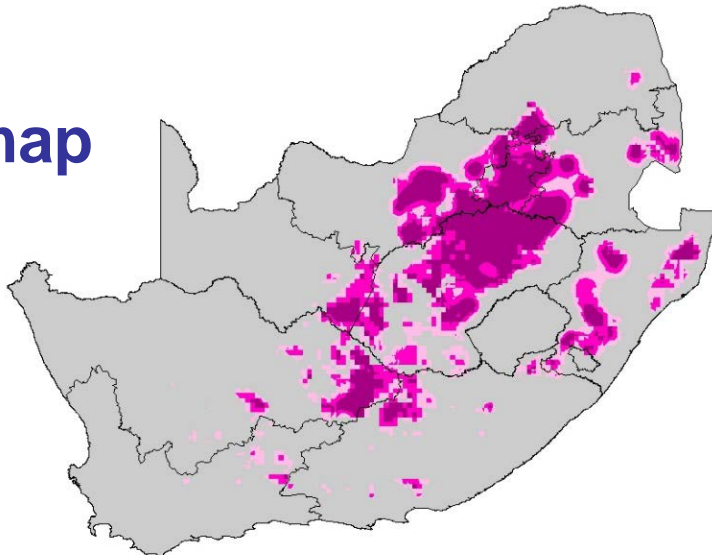
Base map



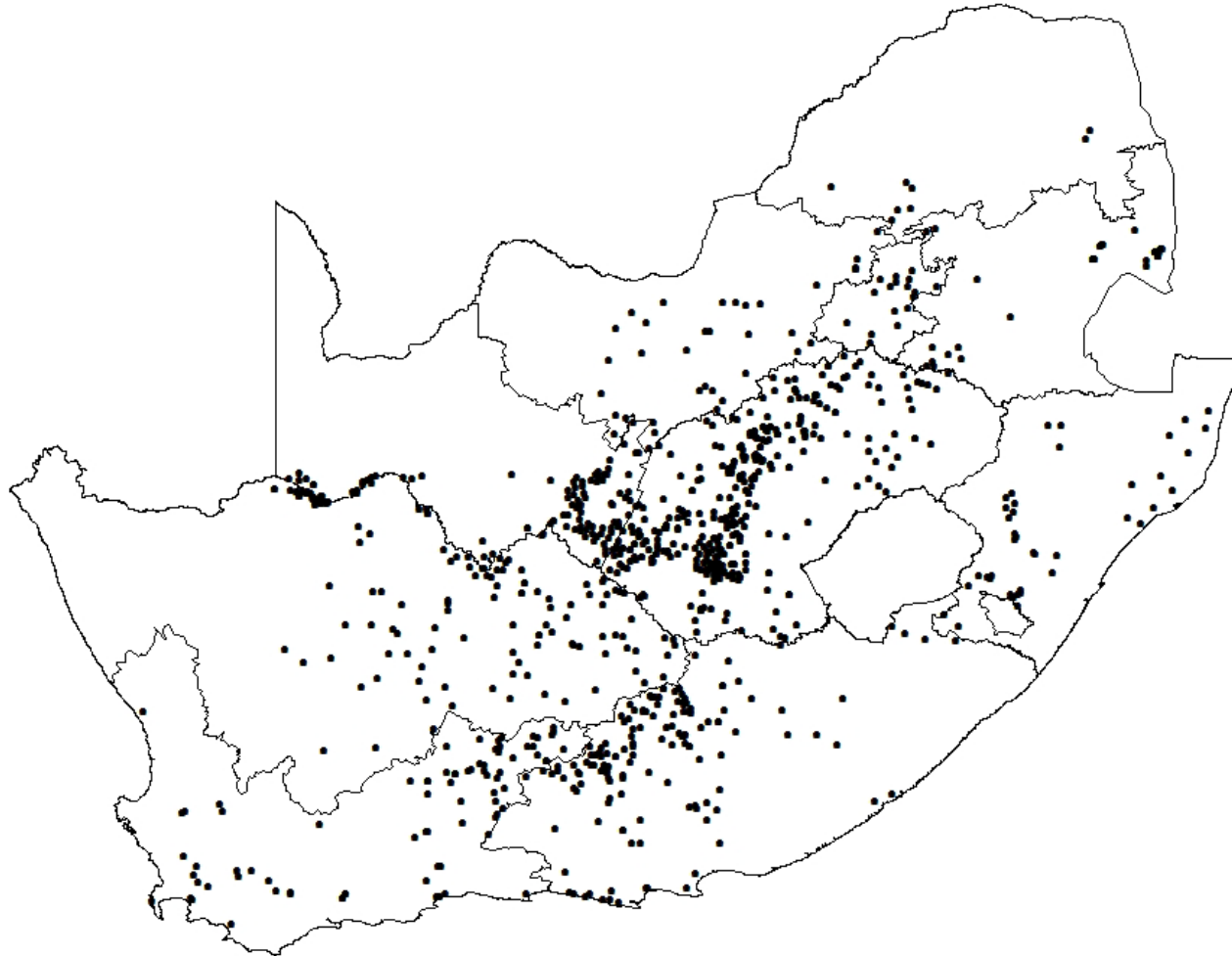
Vector habitat



Risk map

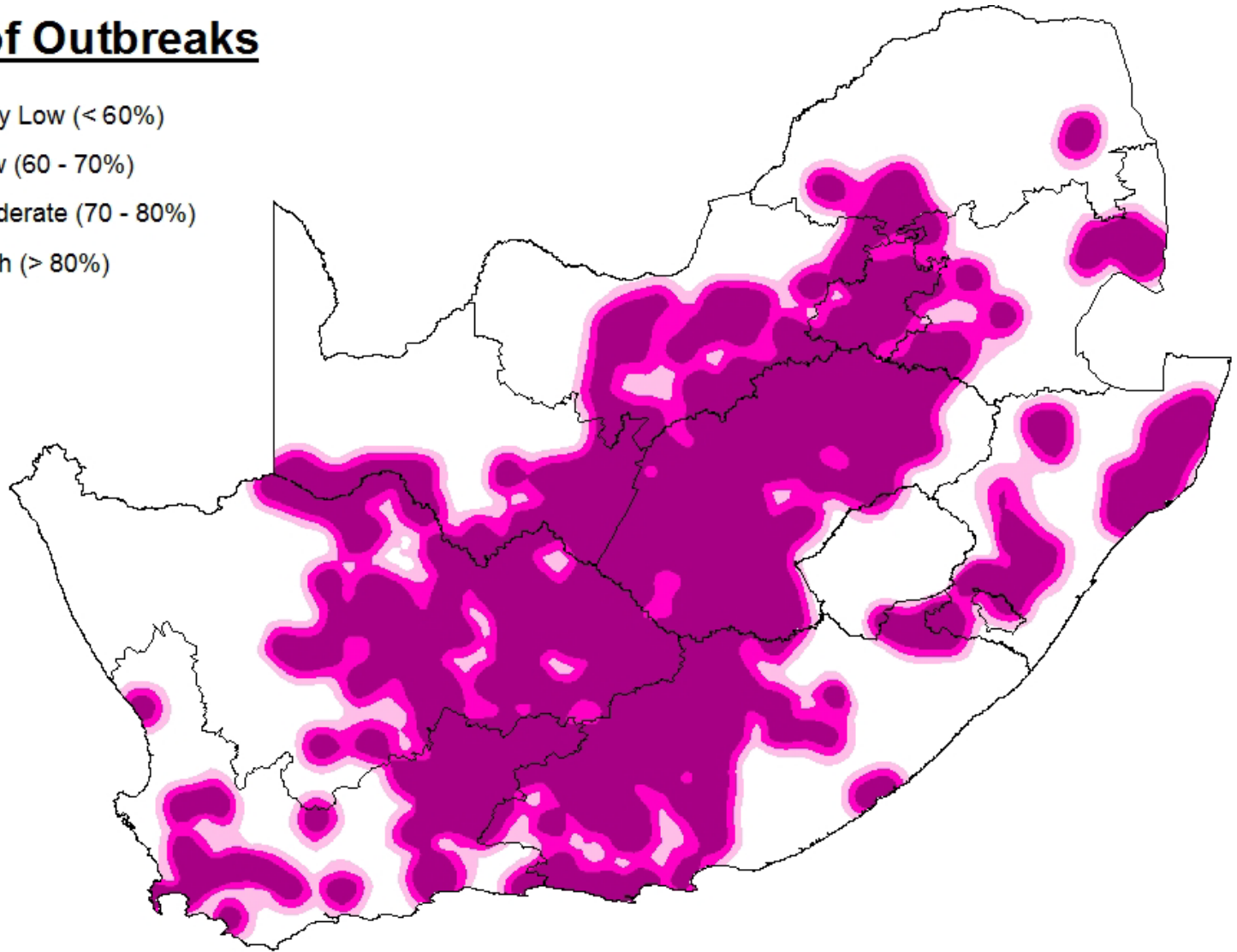


Historic RVF outbreaks

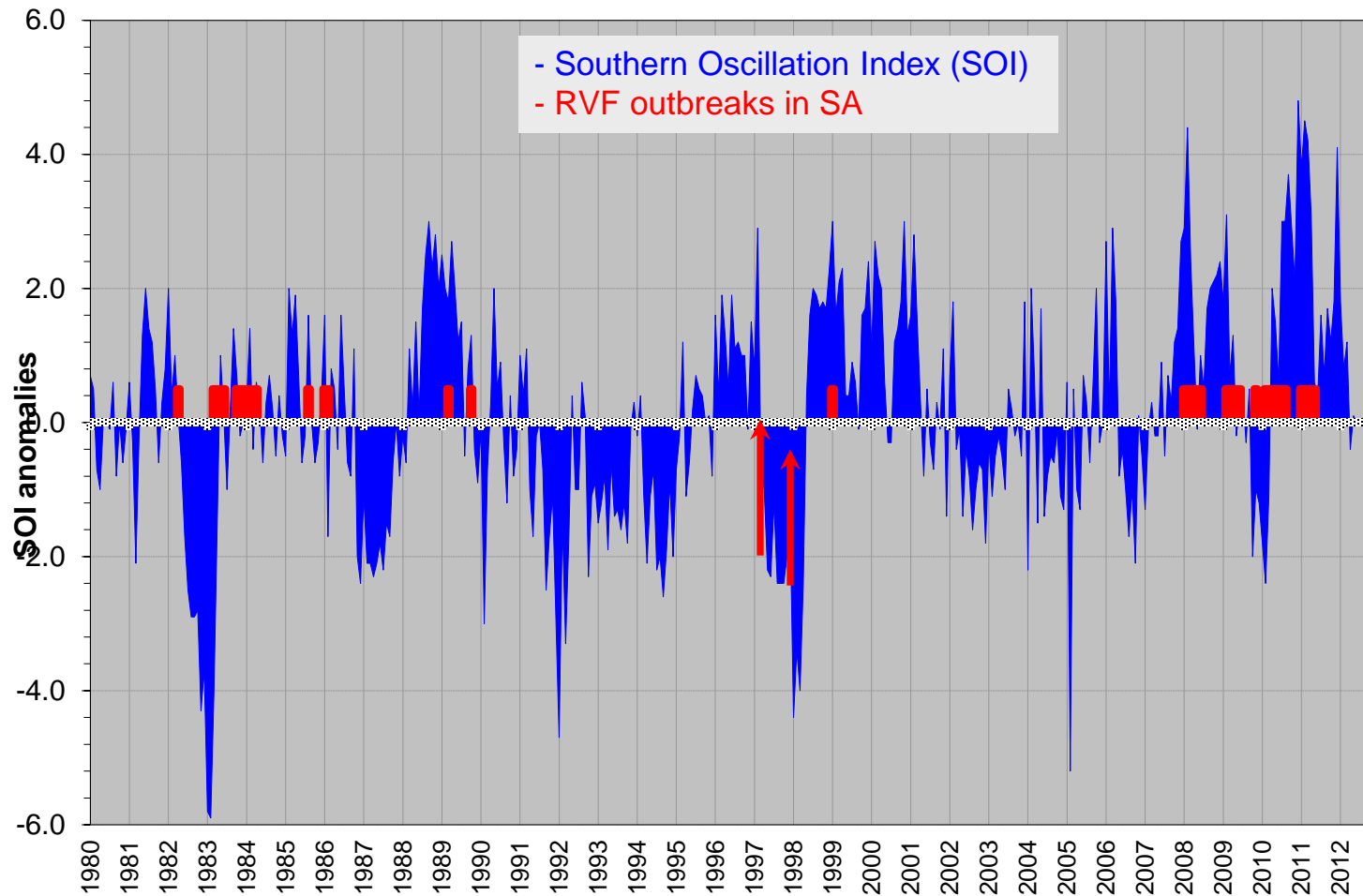


Risk of Outbreaks

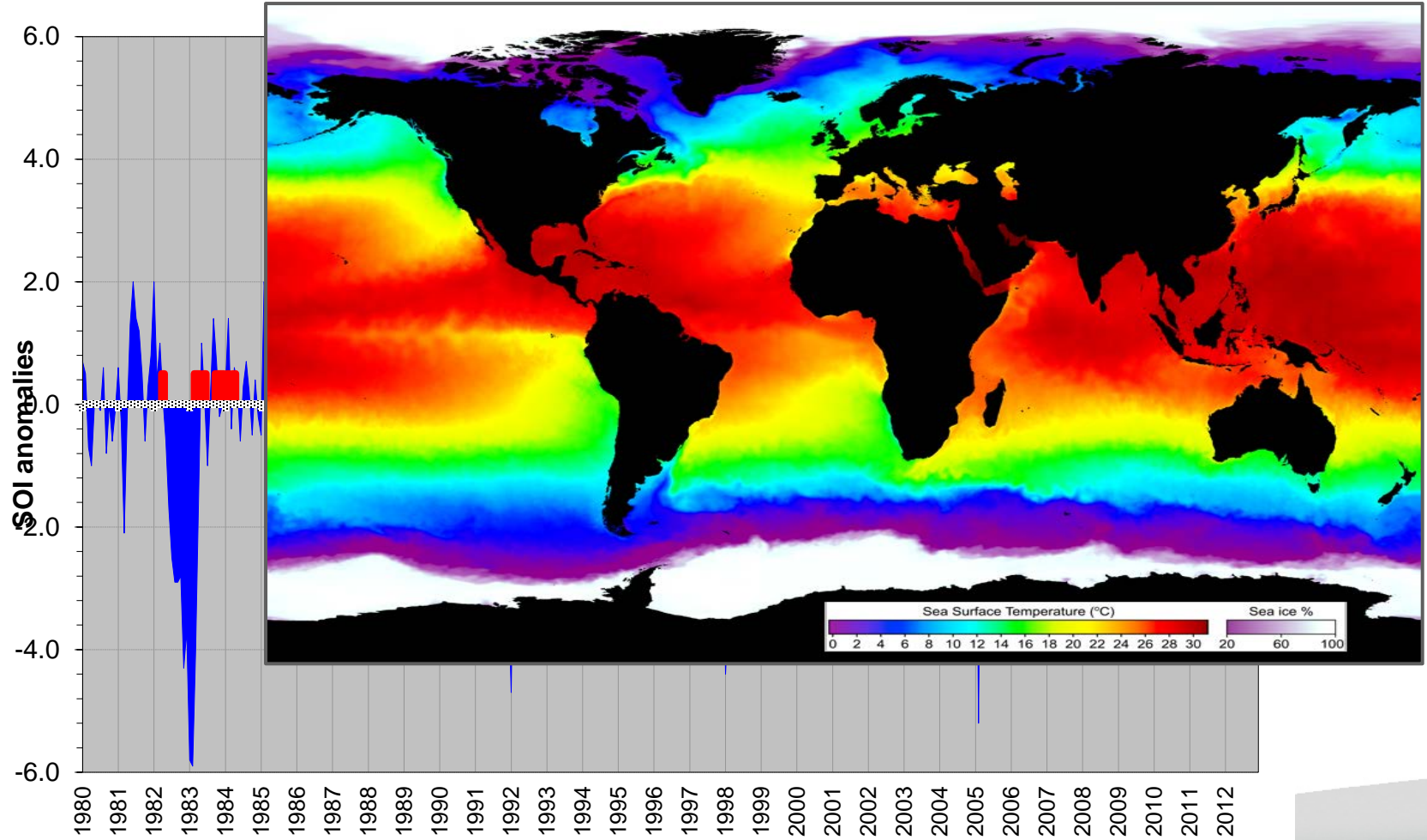
- Very Low (< 60%)
- Low (60 - 70%)
- Moderate (70 - 80%)
- High (> 80%)



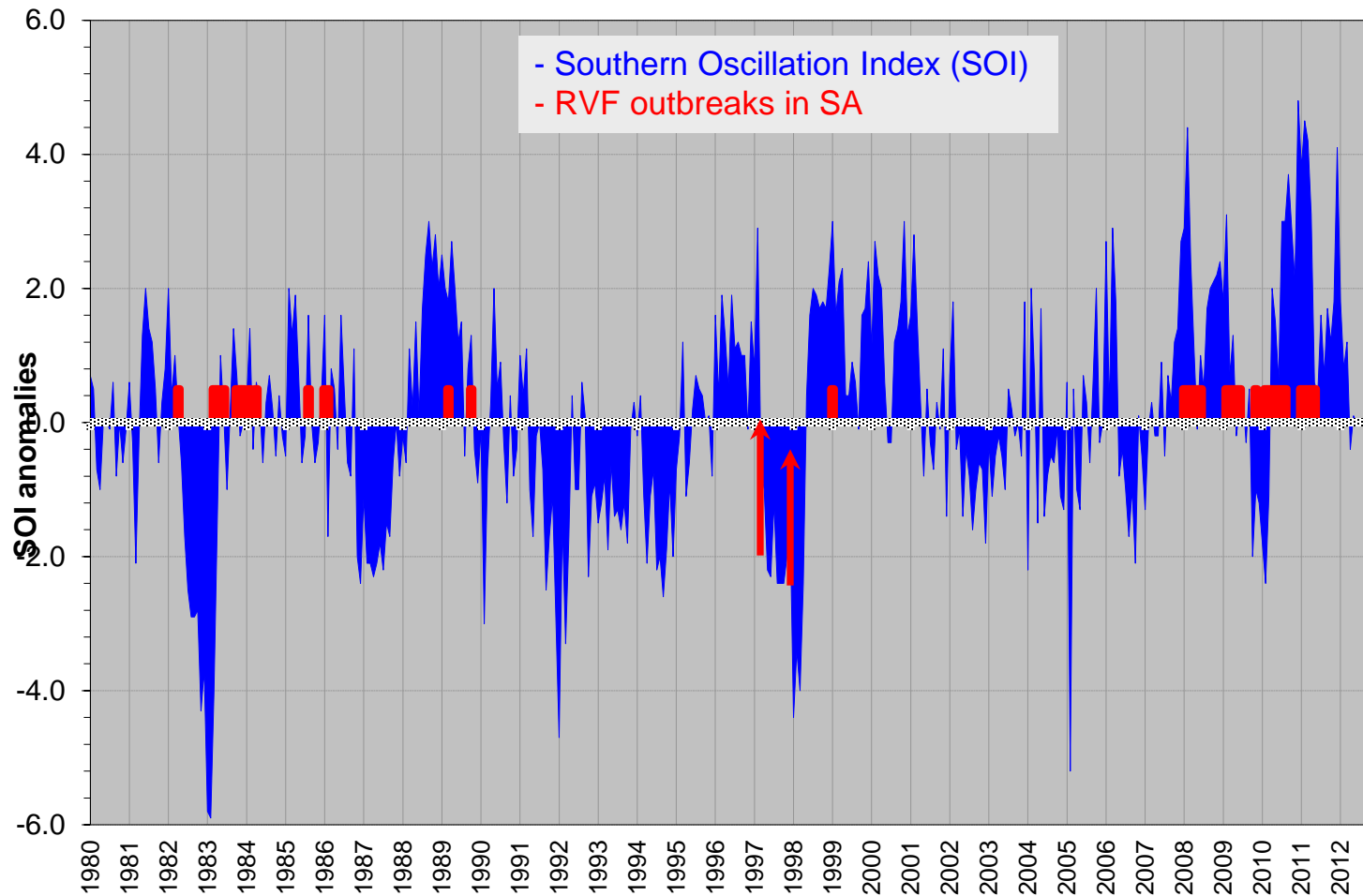
Pre-season indicator



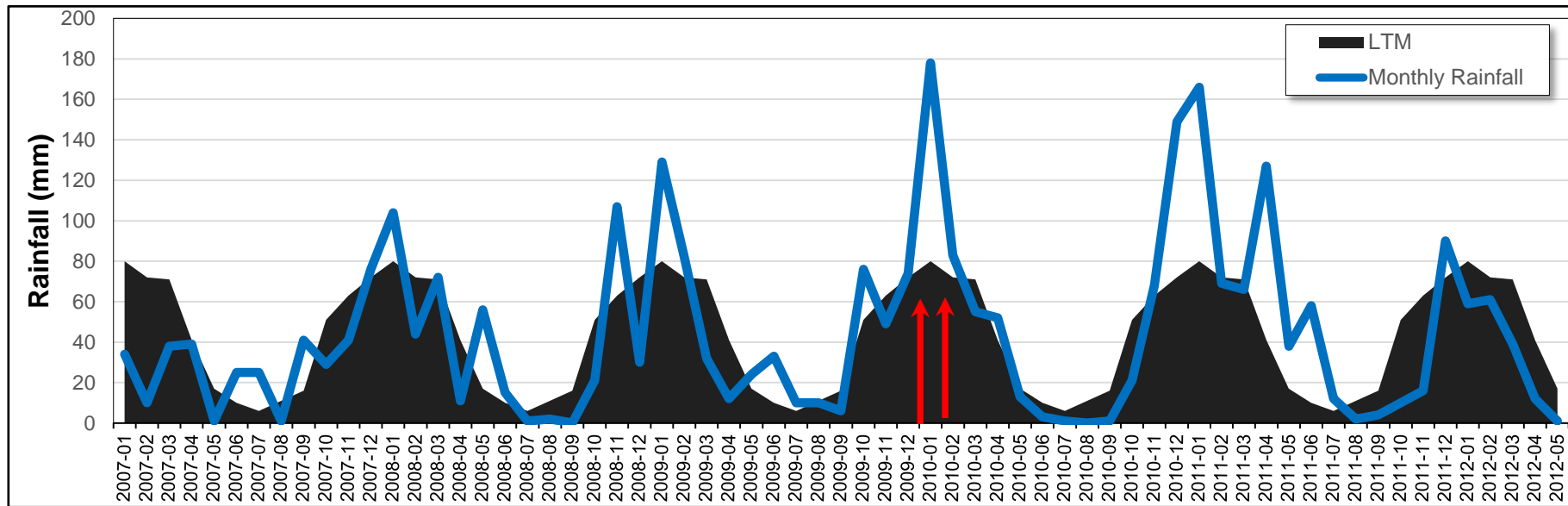
Pre-season indicator



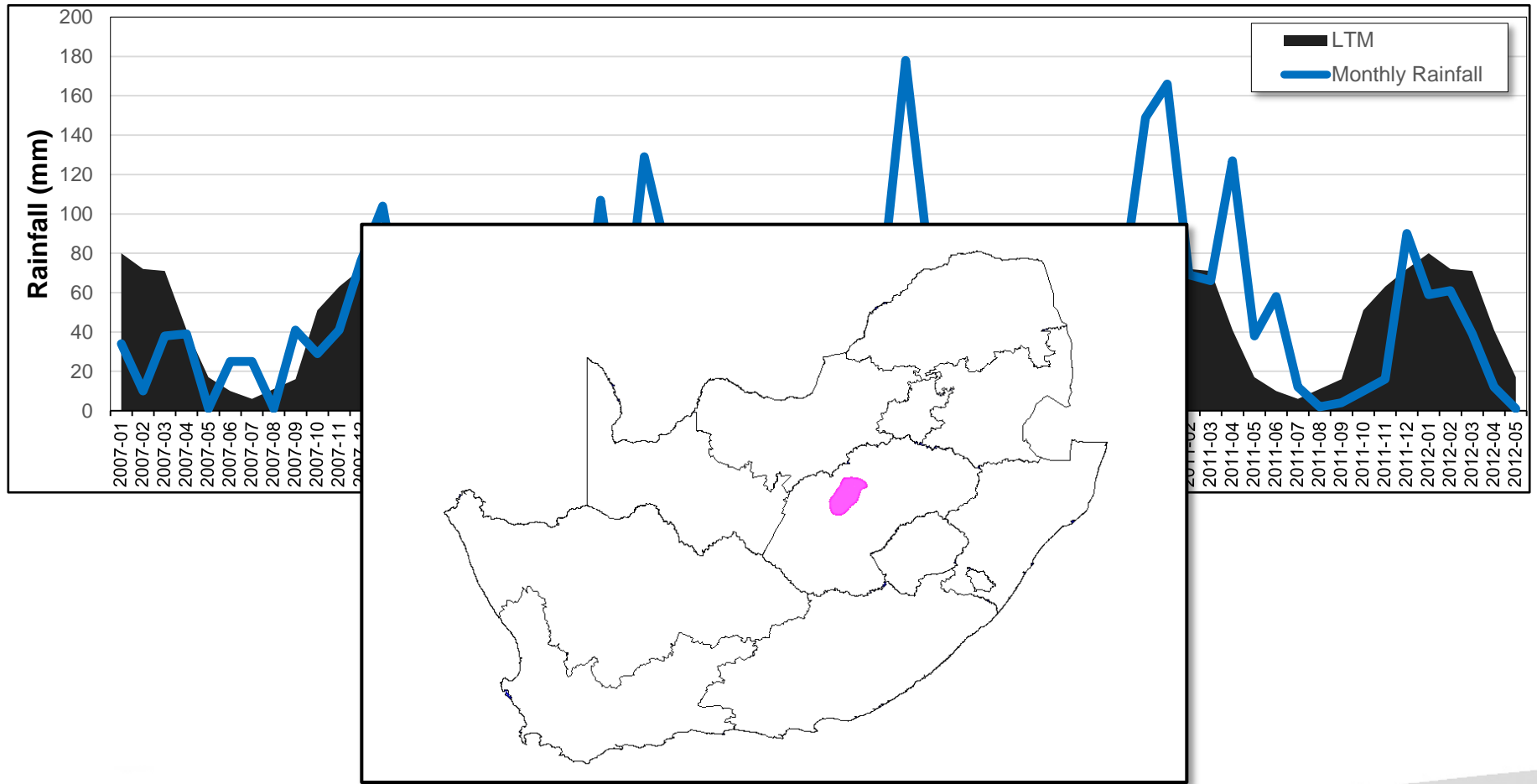
Pre-season indicator



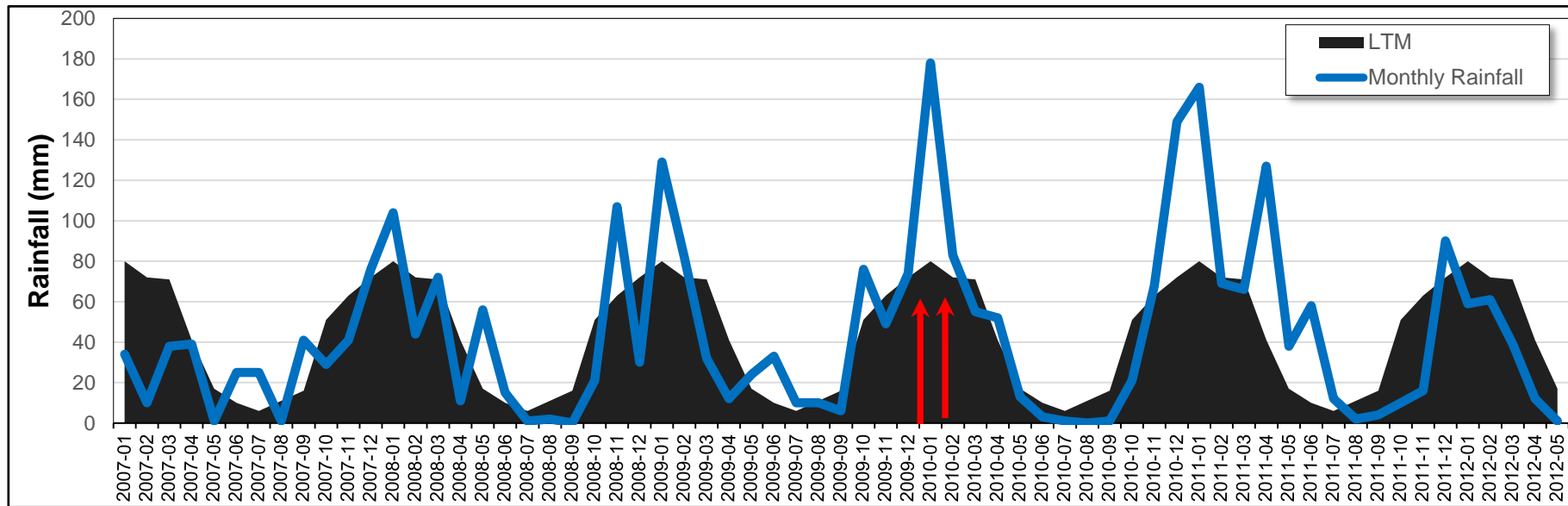
Risk indicator



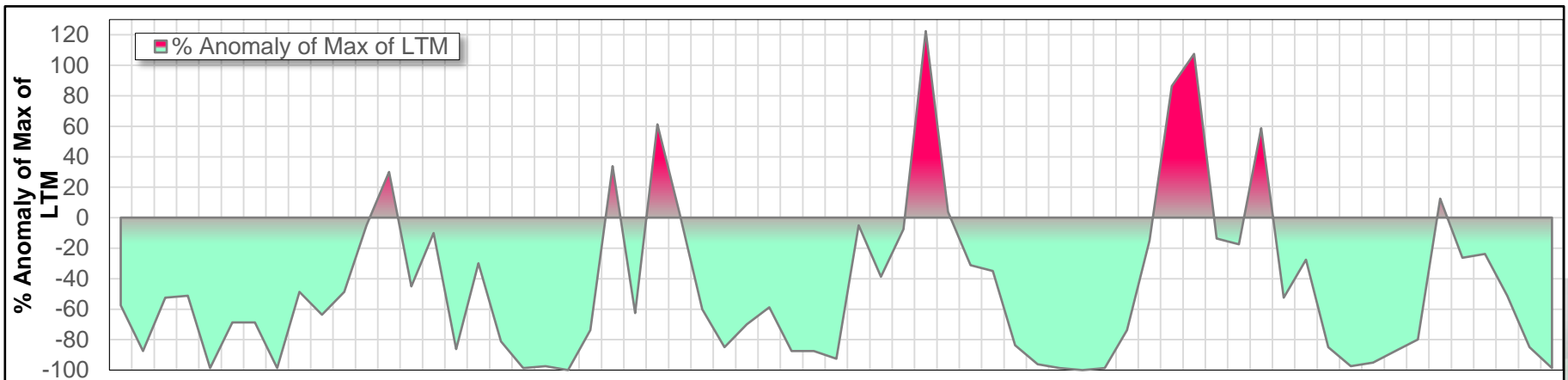
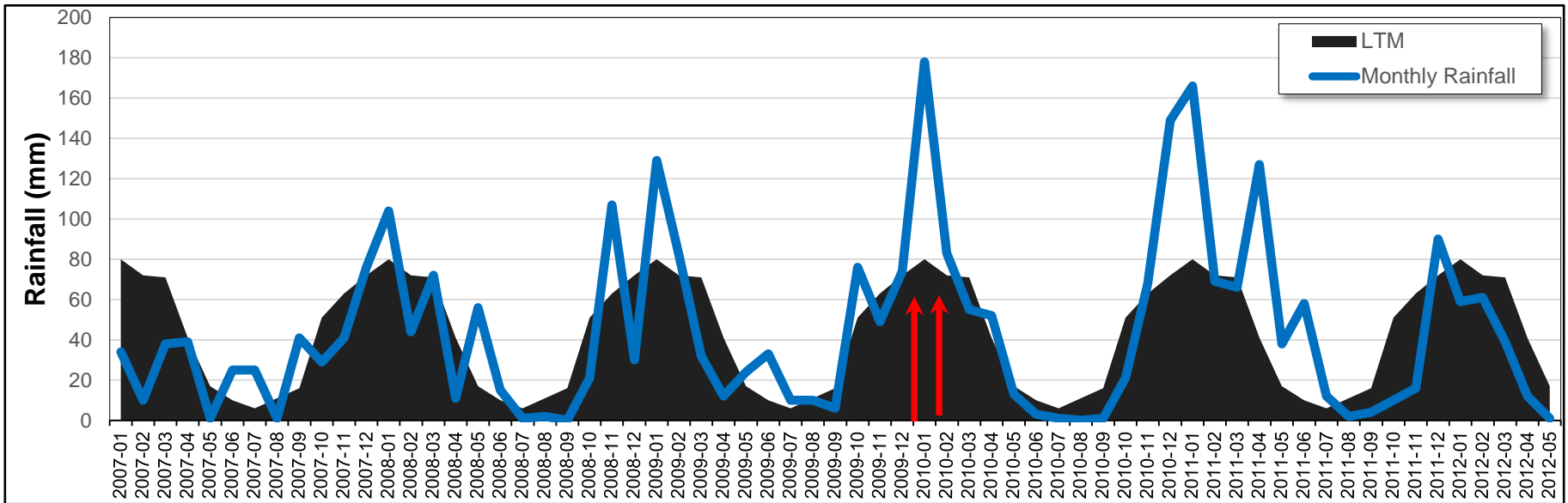
Risk indicator



Risk indicator



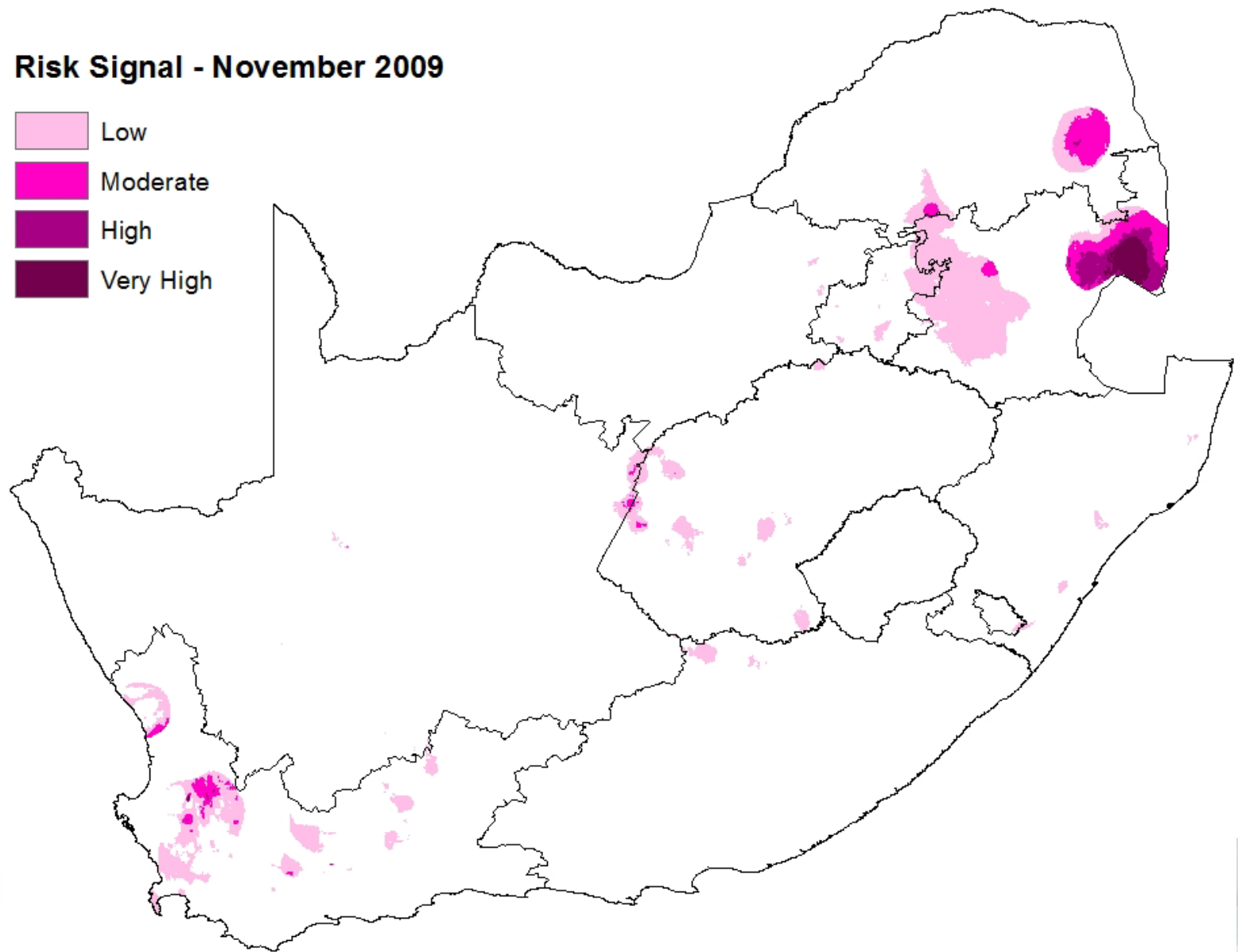
Risk indicator





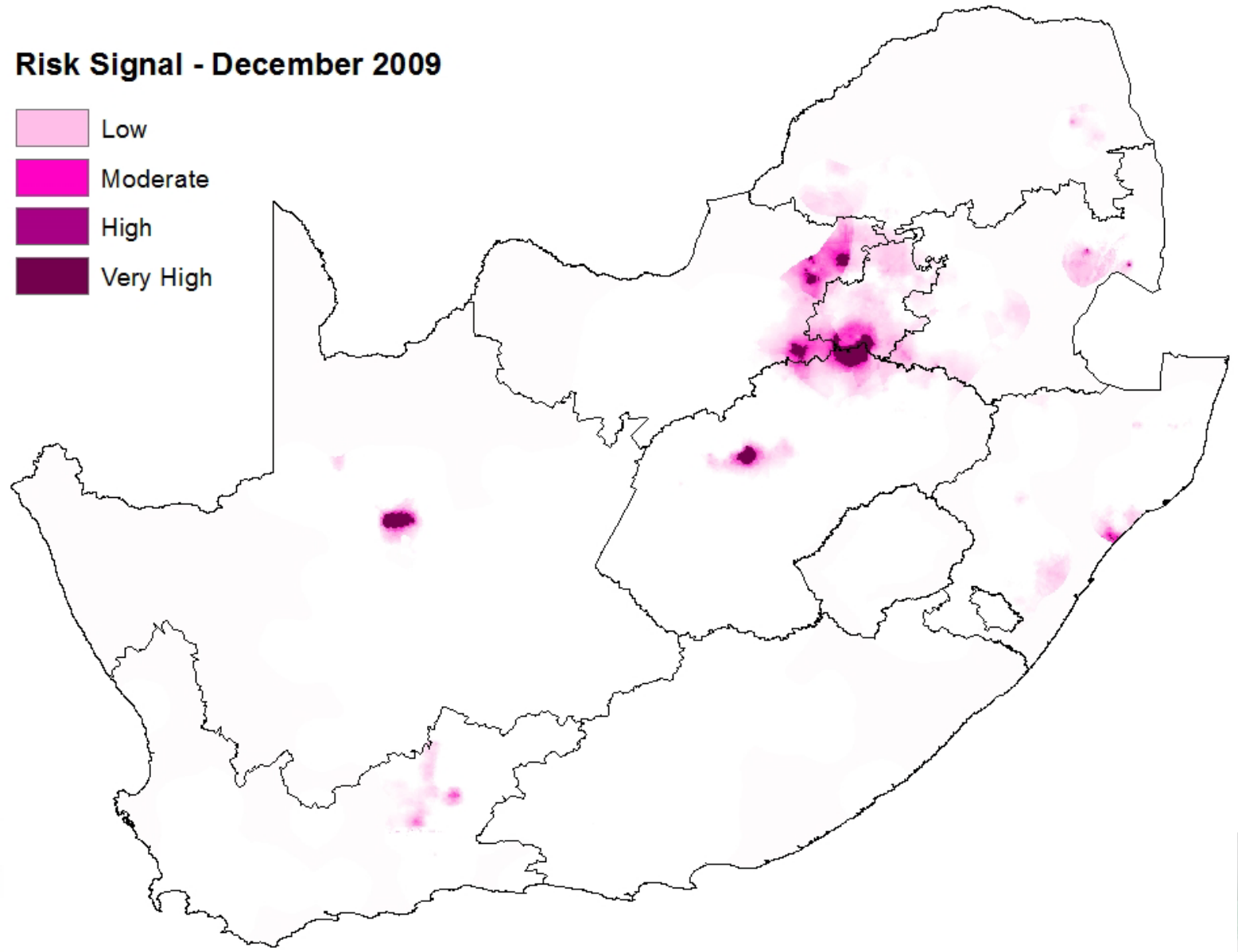
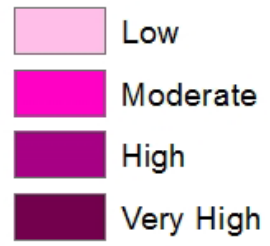
Risk Signal - November 2009

- Low
- Moderate
- High
- Very High





Risk Signal - December 2009

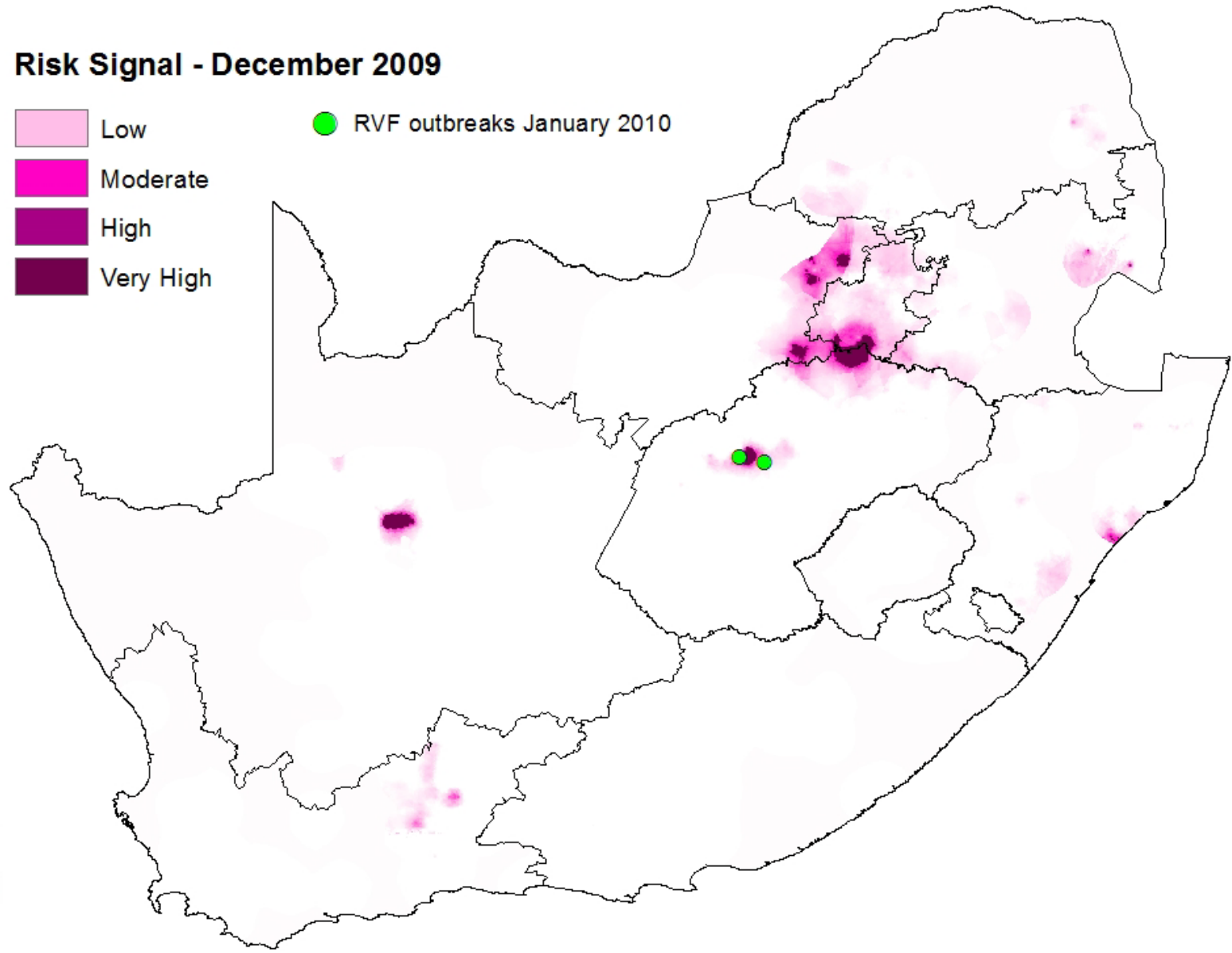




Risk Signal - December 2009

- Low
- Moderate
- High
- Very High

RVF outbreaks January 2010

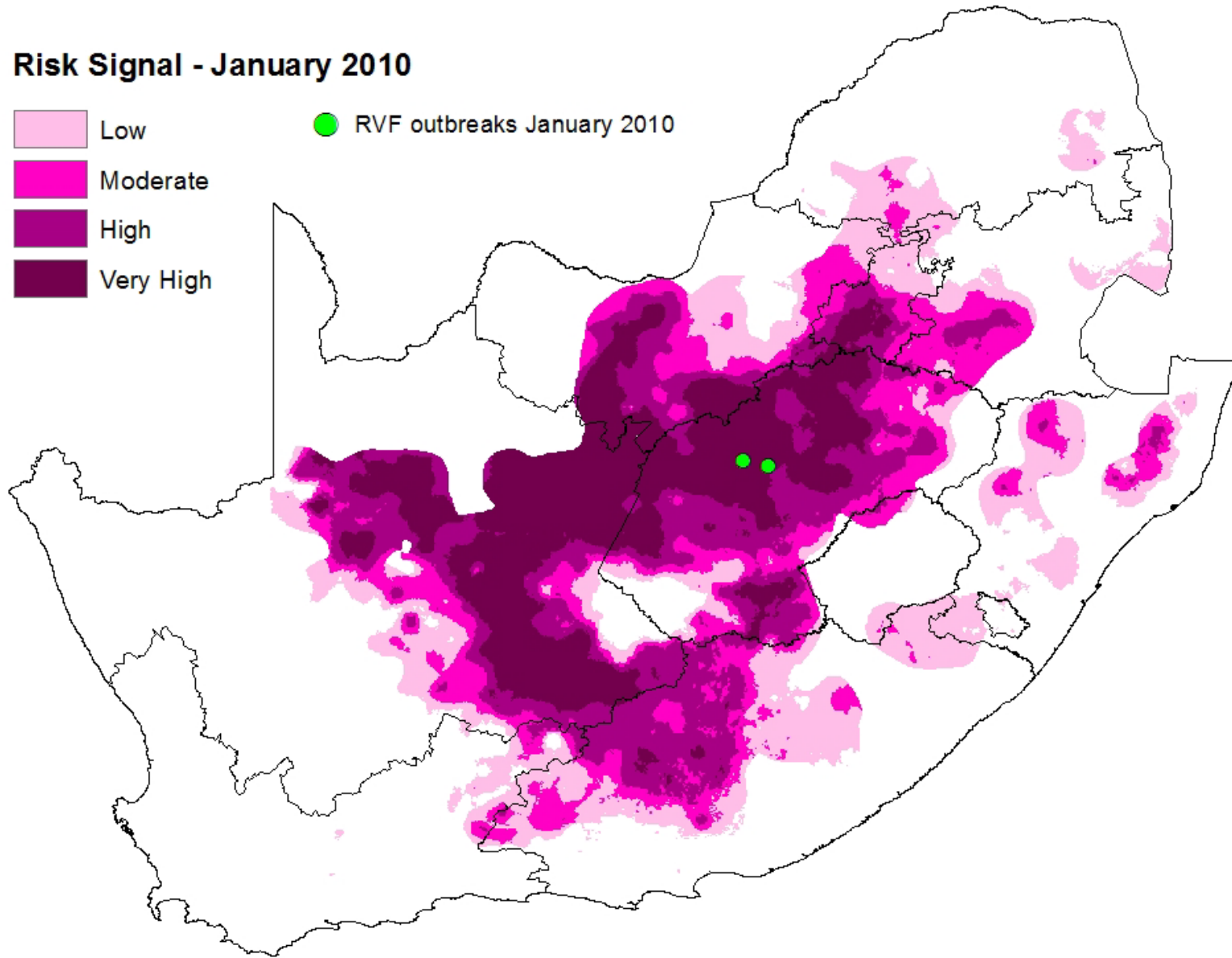




Risk Signal - January 2010

- Low
- Moderate
- High
- Very High

RVF outbreaks January 2010

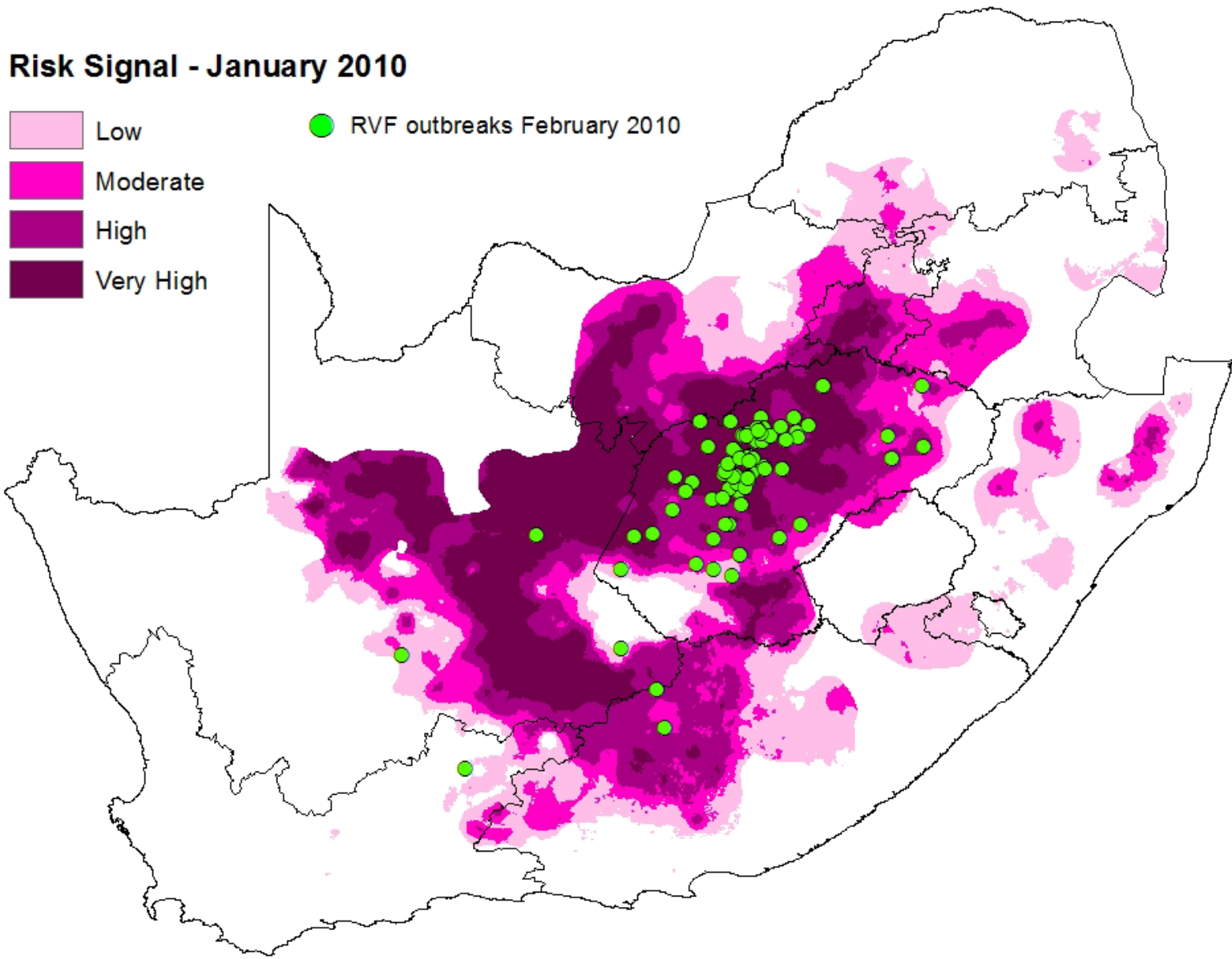




Risk Signal - January 2010

- Low
- Moderate
- High
- Very High

RVF outbreaks February 2010



Rift Valley fever

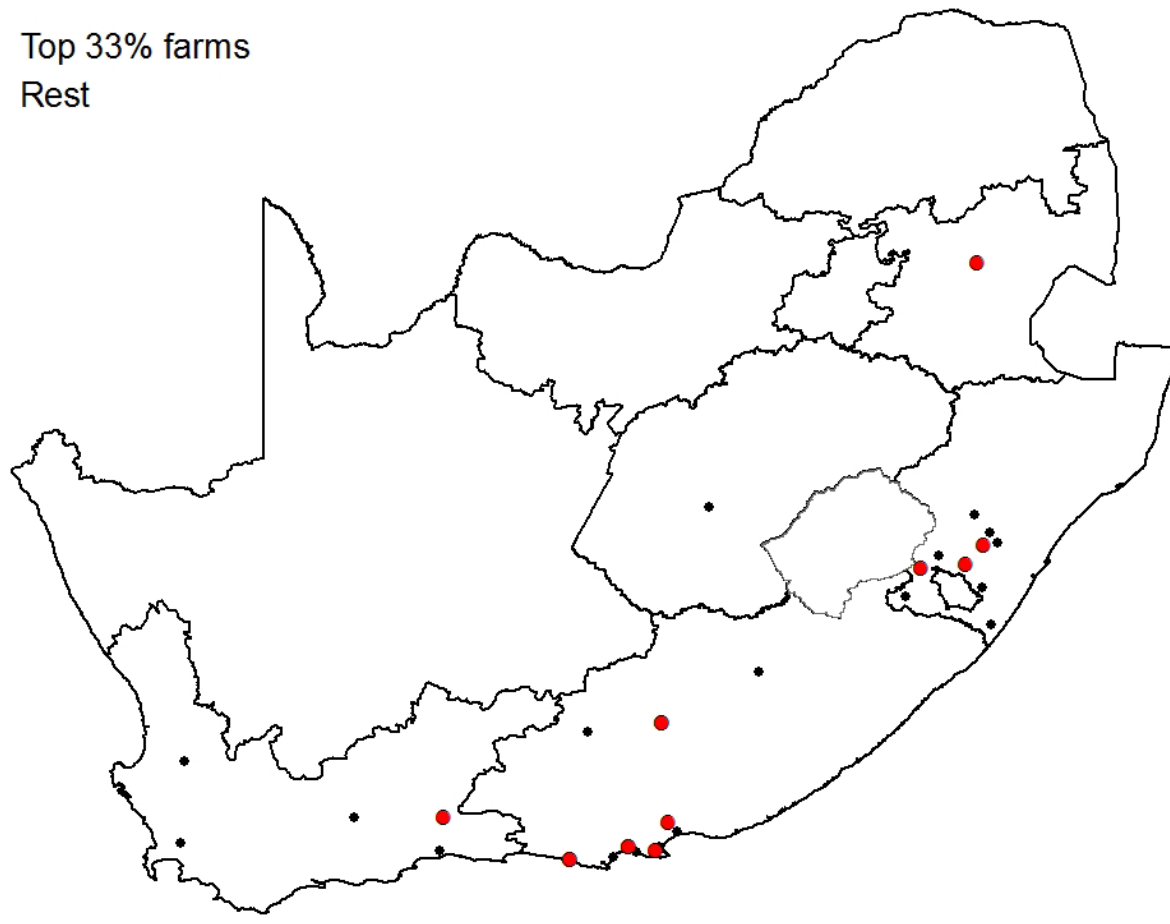
- Refining risk prediction procedure
- Incorporate Early Warning System in ARC information hub for roll players to get access on internet – funding needed!
- Long term climate data storage – monitoring changes in rainfall and other climate patterns

Milk production in dairy cattle



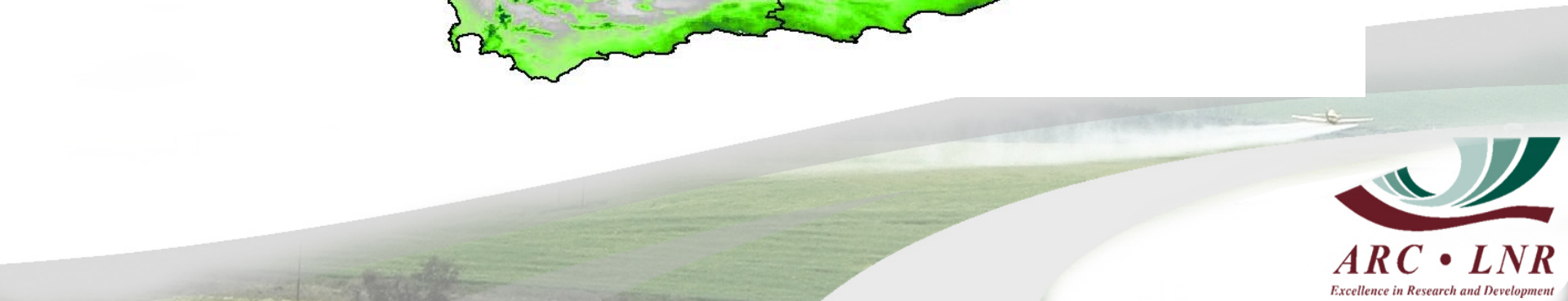
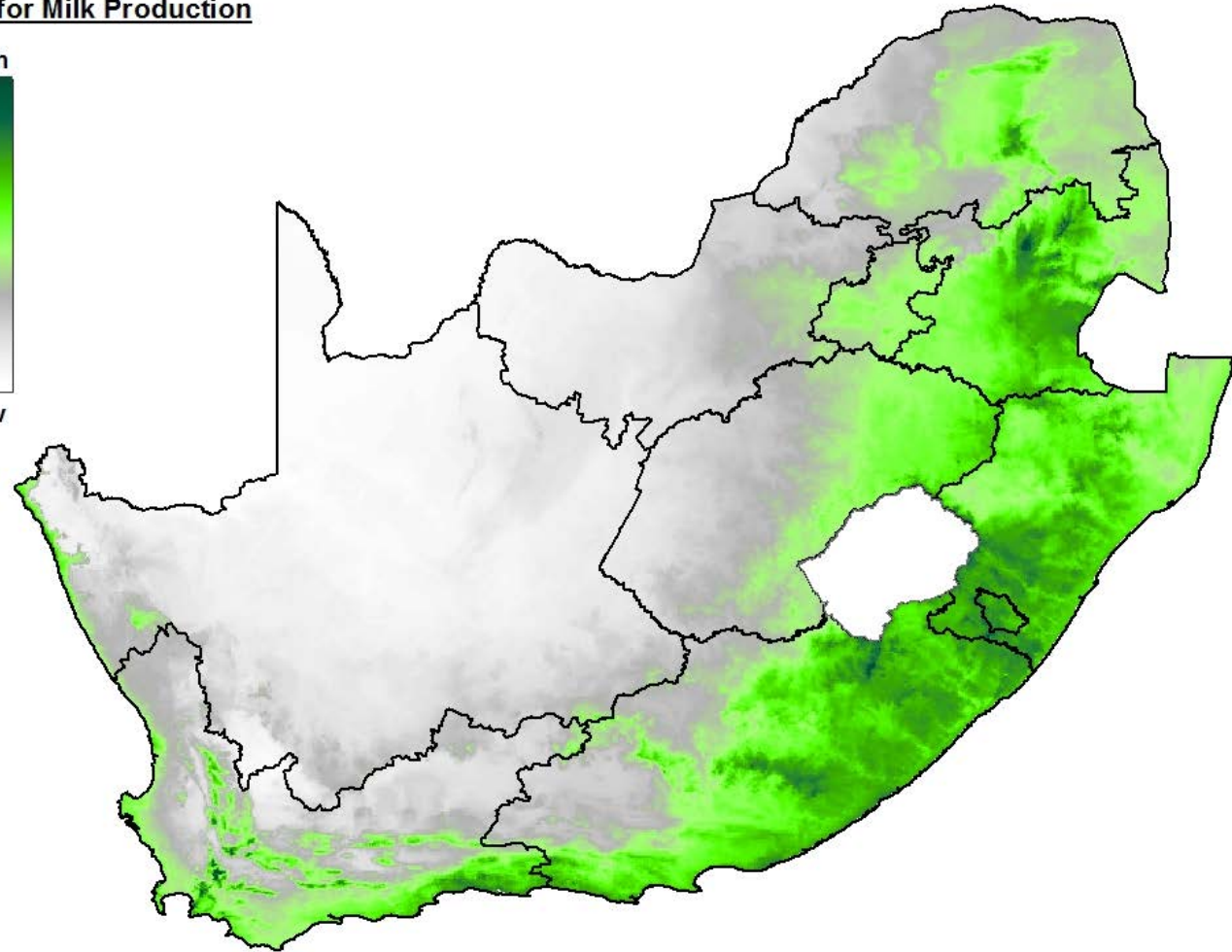
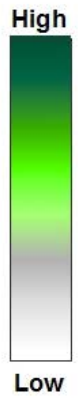
Holstein cattle on pastures

- Top 33% farms
- Rest



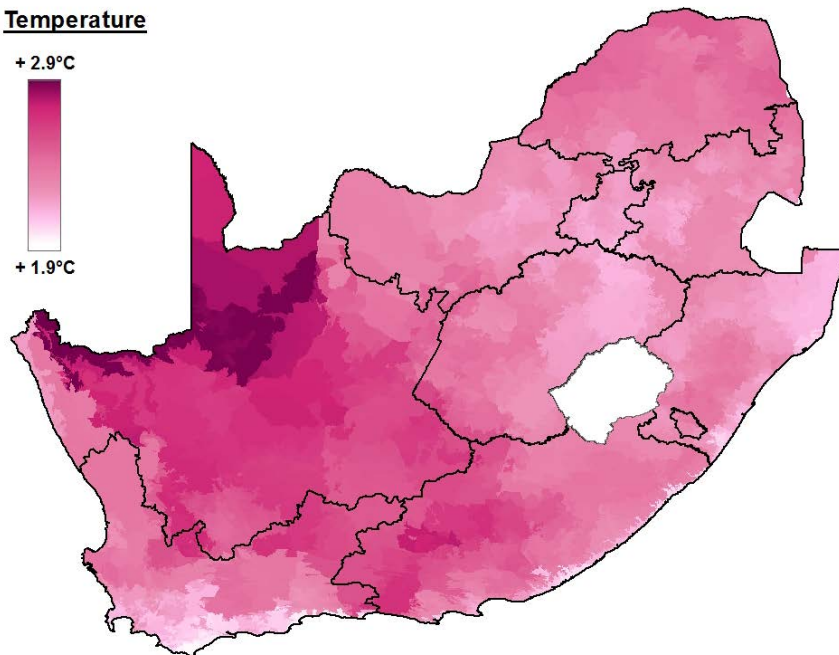


Suitability for Milk Production

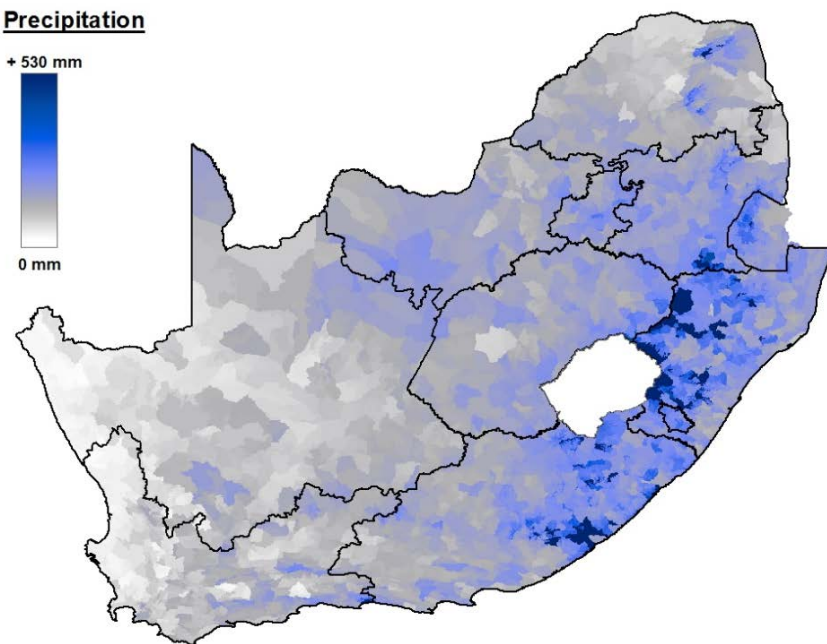


Climate change

Temperature

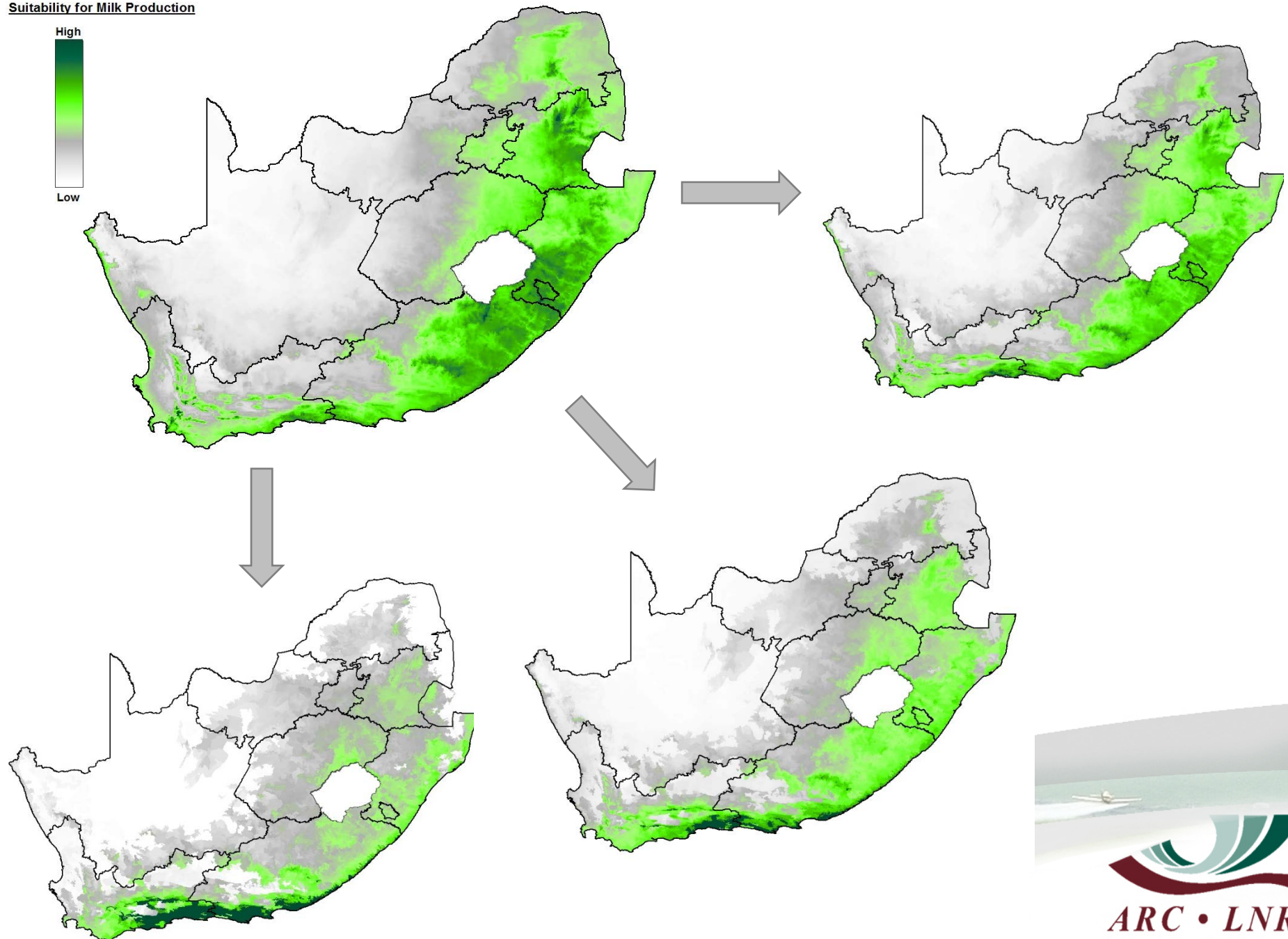


Precipitation





Suitability for Milk Production





Thank you.

