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## A German – South African SPACES collaboration to advance land degradation assessments



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Joint Project BMBF Grant No.: 01LL1701 A - D

## The Team of



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# SALDi Objectives

- **monitor and model land surface dynamics / land degradation** in multi-use landscapes across the climate gradient of South Africa
- **advance tools** for soil degradation **assessment**, i.e. soil erosion by water
- take advantages of **high spatial-temporal Earth Observation data** and **in situ** information as well as **modeling** approaches
- understand **socio-economic implications** of land degradation on farmers level
- contribute to **scientific exchange and capacity building**

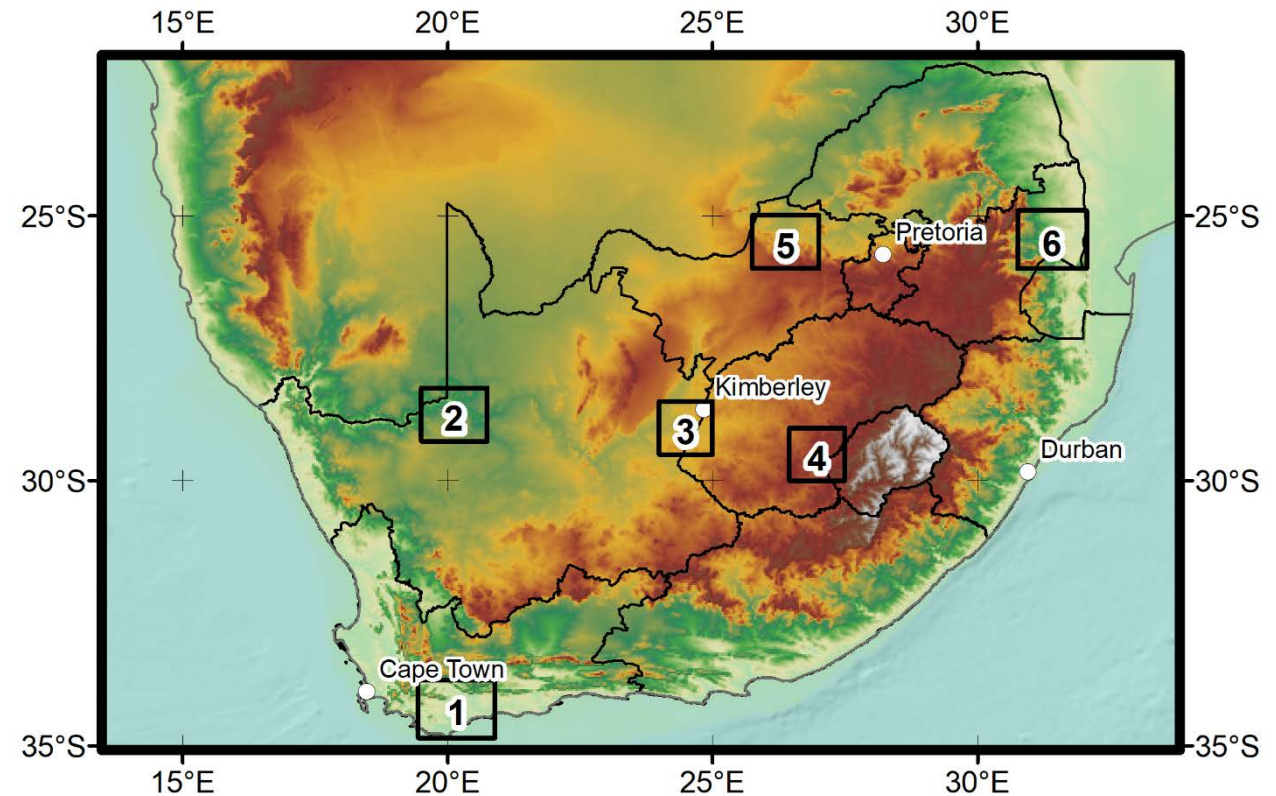


Figure 1: SALDi study sites (size : 100 x 100 km) across the climate gradient in South Africa.

# SALDi Objectives and workflow I

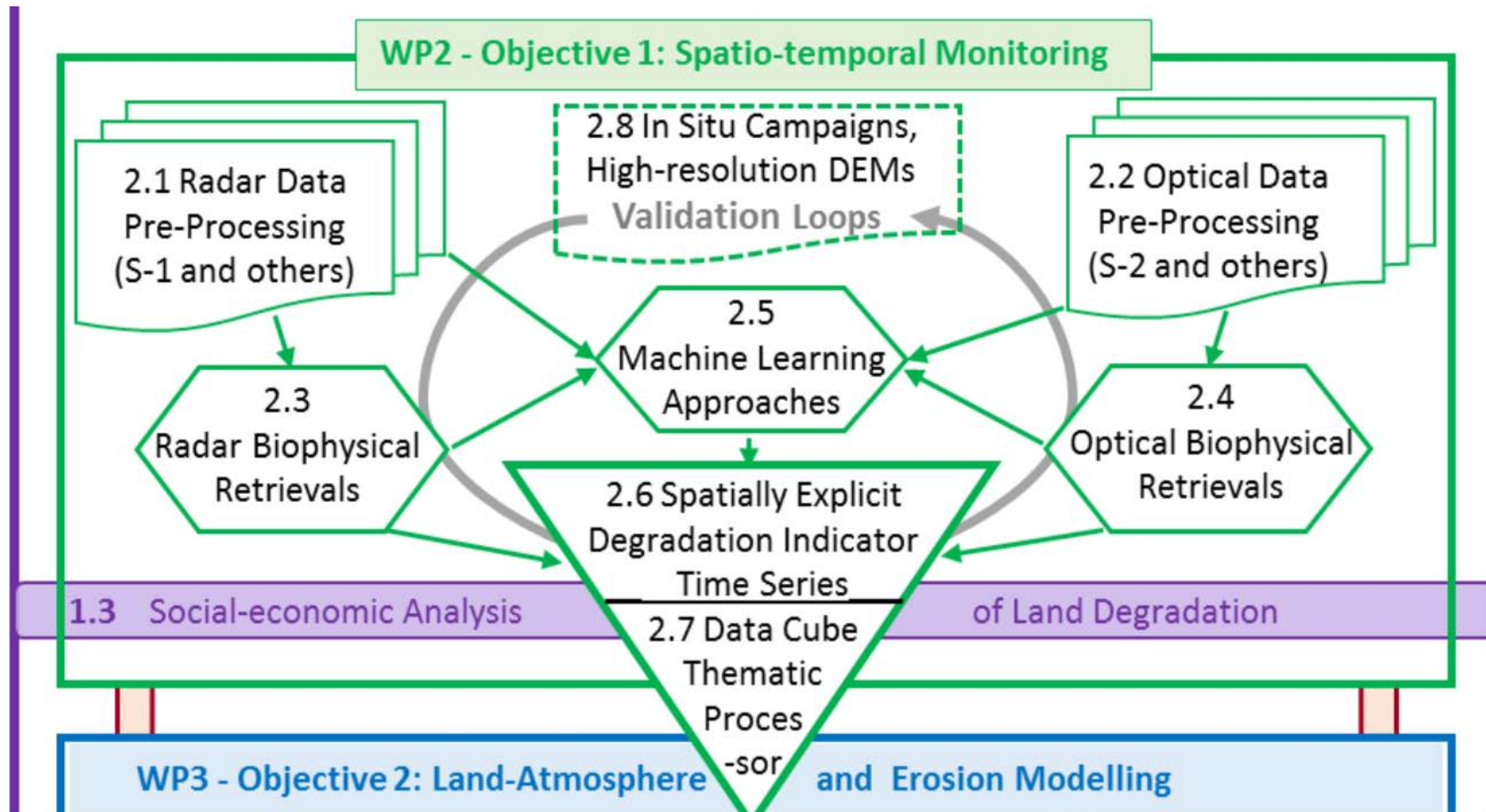


Figure 2a: SALDi WP1 Spatio-temporal Monitoring activities



# SALDi Objectives and workflow II

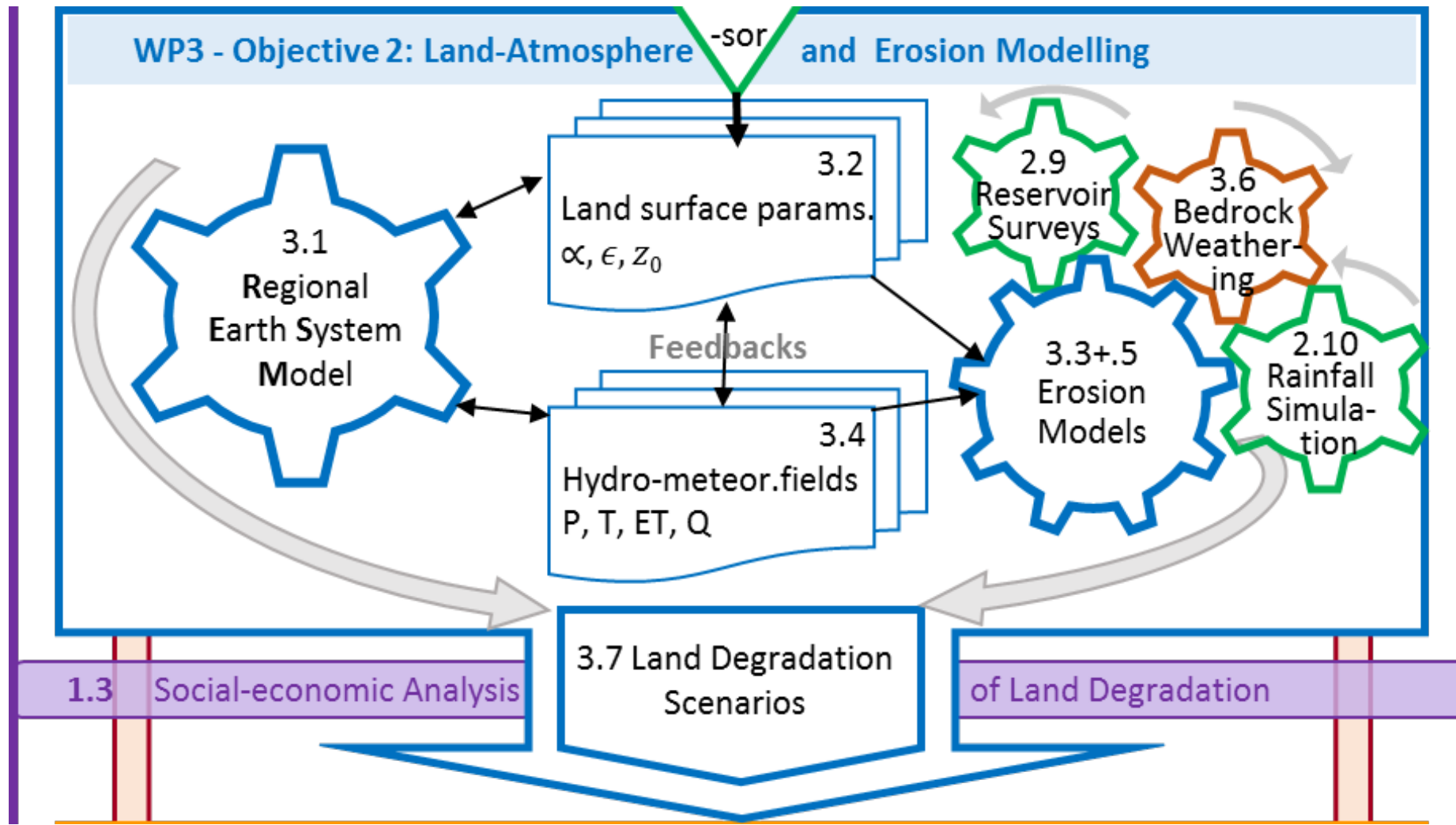


Figure 2b: SALDi WP2 Land-Atmosphere and Erosion Modelling activities

# SALDi Objectives and workflow III

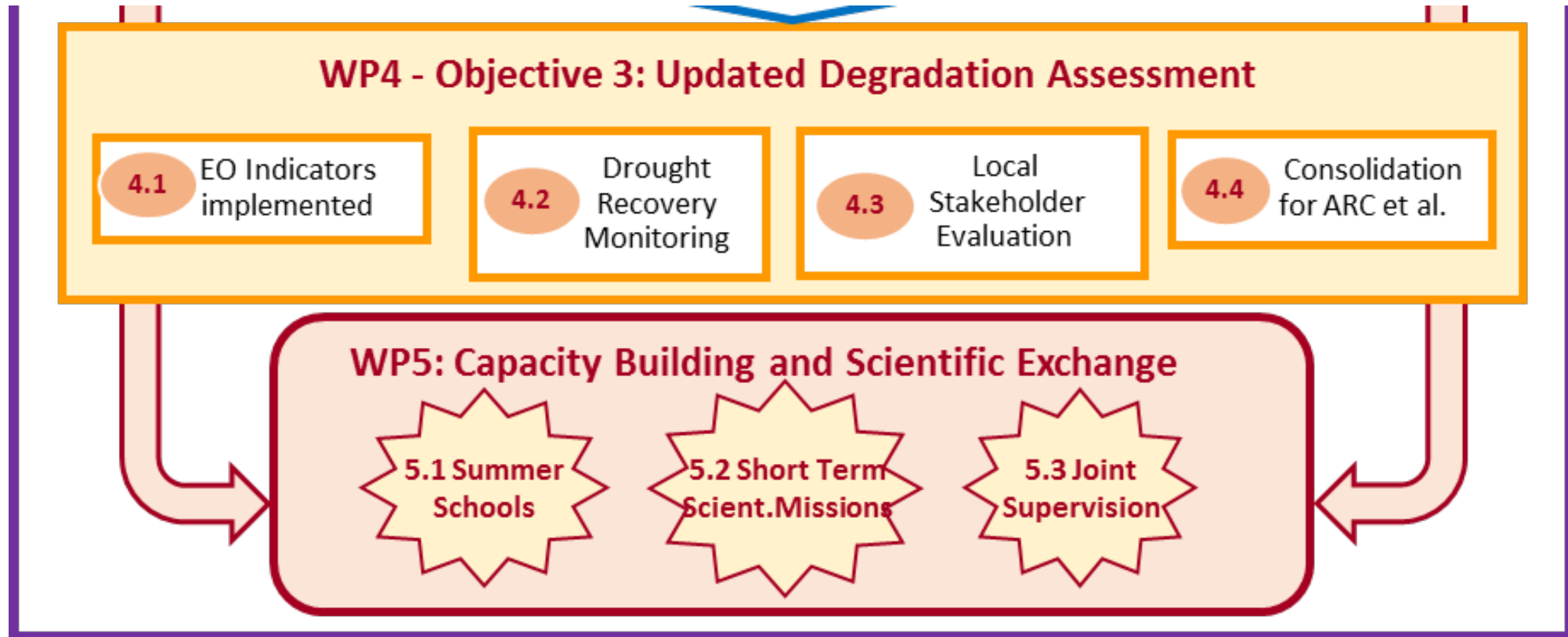


Figure 2c: SALDi WP4 Updated Degradation Assessment and WP5 Capacity Building and Scientific Exchange activities

# SALDi 1<sup>st</sup> years activities and achievements



Figure 3: Installation of soil moisture network at Lower Sabie, southern Kruger Nationalpark (KNP)

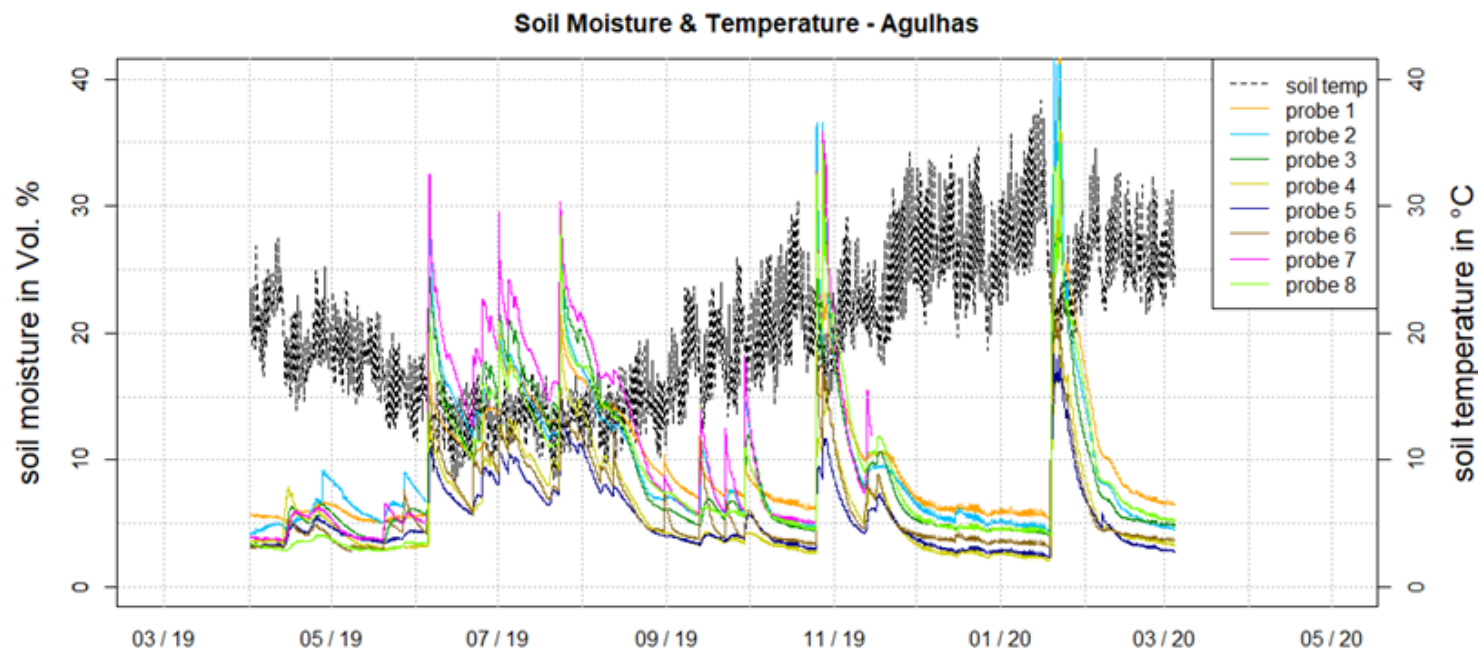


Figure 4: 1<sup>st</sup> years soil moisture and soil temperature record for the Agulhas site in the Nuwejaars Wetland SMA close to Elim

# SALDi 1<sup>st</sup> years activities and achievements



Figure 5: Rainfall simulation experiment in the Eastern Free State close to Ladybrand

For more details see:

SSS2.5, D2164, EGU2020-18155

<https://meetingorganizer.copernicus.org/EGU2020-18155.html>

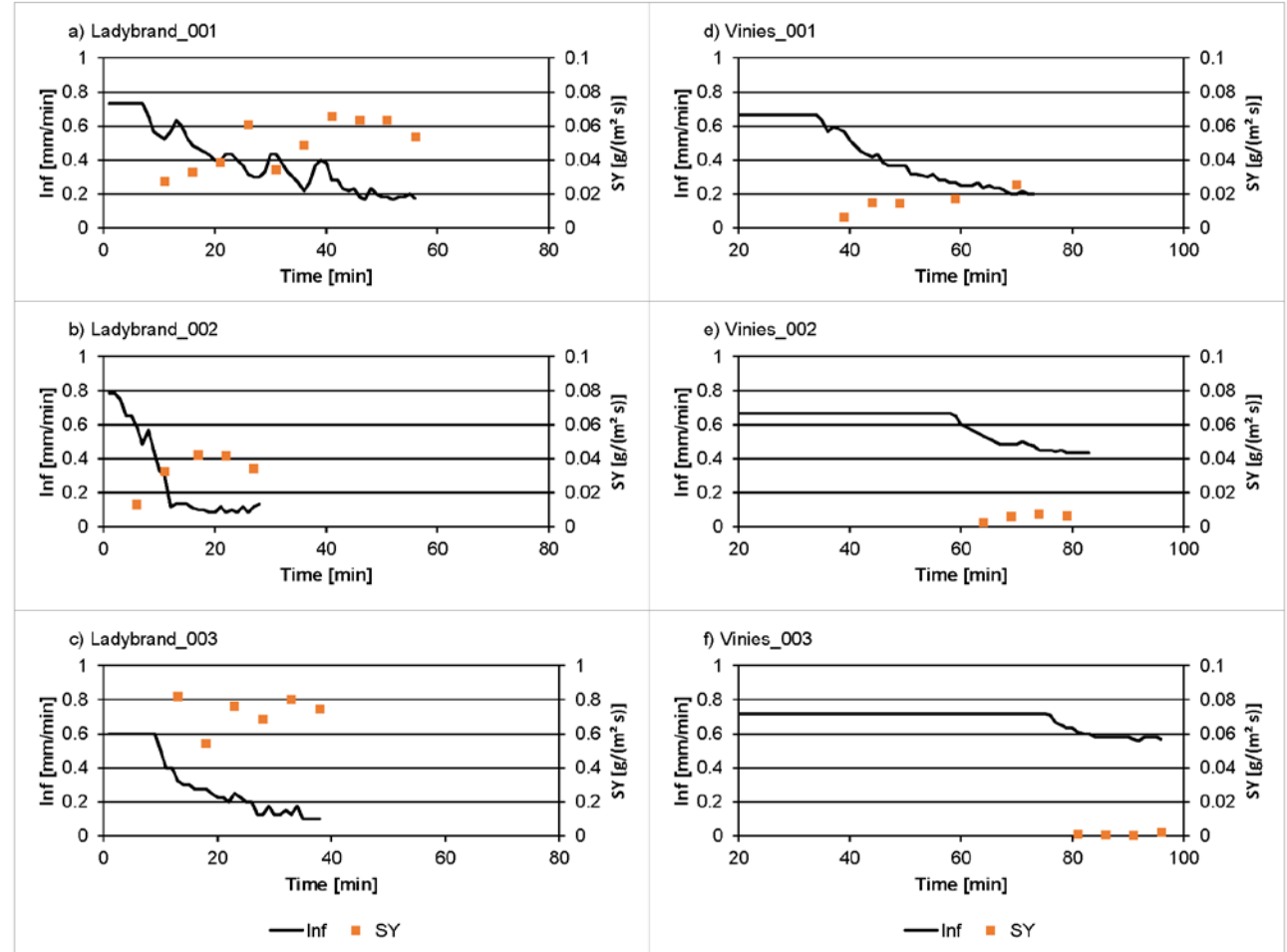


Figure 6: Infiltration [mm/min] and soil loss (g/(m<sup>2</sup> s)) for rainfall simulation experiments (40 mm/h) on six different plots (3 m<sup>2</sup>)



# SALDi 1<sup>st</sup> years activities and achievements

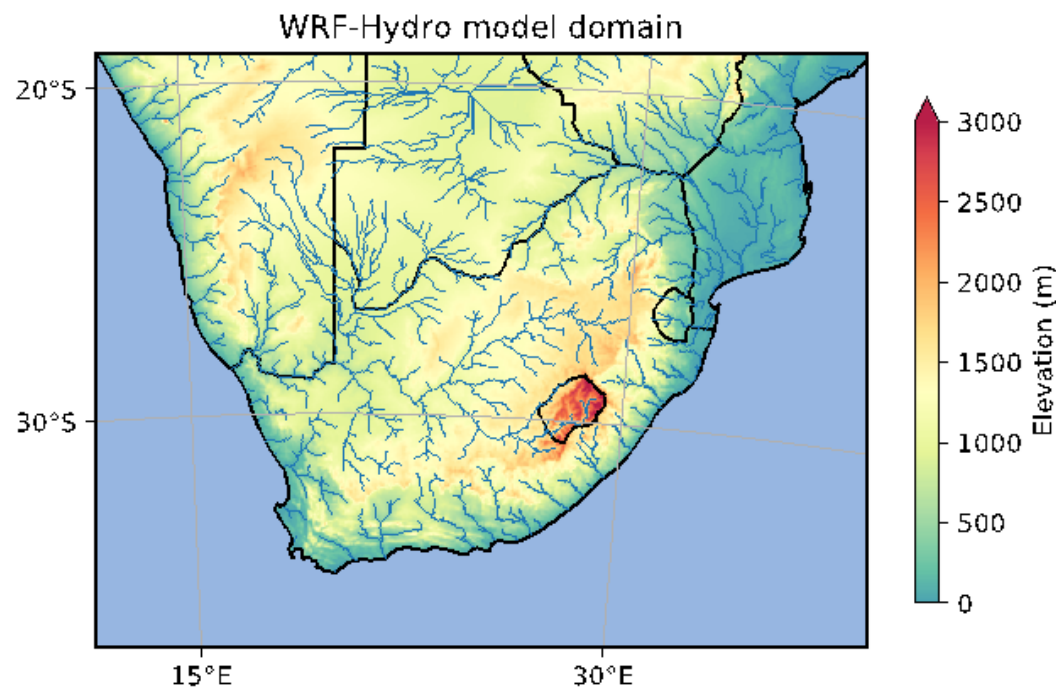


Figure 7: Domain for the Hydro-WRF modelling of land-atmosphere interactions

For more details see:

HS2.2.2, D110, EGU2020-17772

[https://presentations.copernicus.org/EGU2020/EGU2020-17772\\_presentation.pdf](https://presentations.copernicus.org/EGU2020/EGU2020-17772_presentation.pdf)

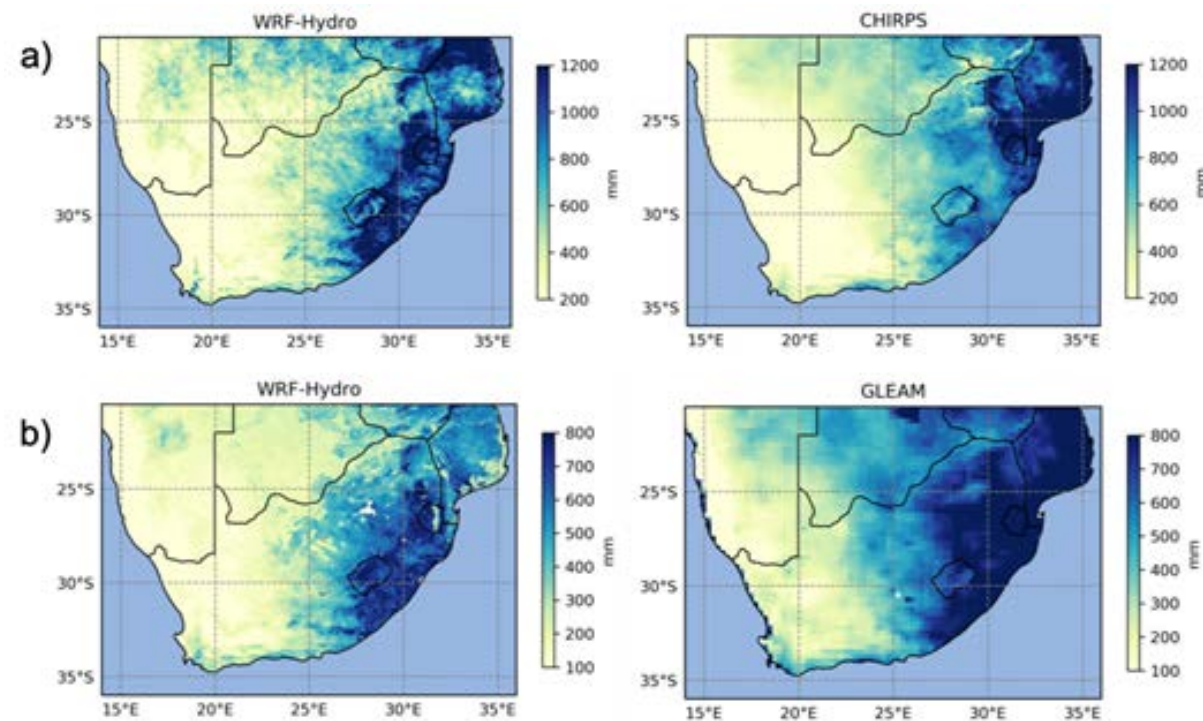


Figure 8: First results of the model adjustment to the model domain (left) and comparison with existing data (right) for June 2000

a) accumulated precipitation  
b) accumulated evapotranspiration

# SALDi 1<sup>st</sup> years activities and achievements

The SALDi remote sensing activities include the analysis of Sentinel-1 (S1) radar and Sentinel-2 (S2) optical data and in-situ assessment of observations in multi-use landscapes across the climate gradient of South Africa, i.e. the six SALDi study sites

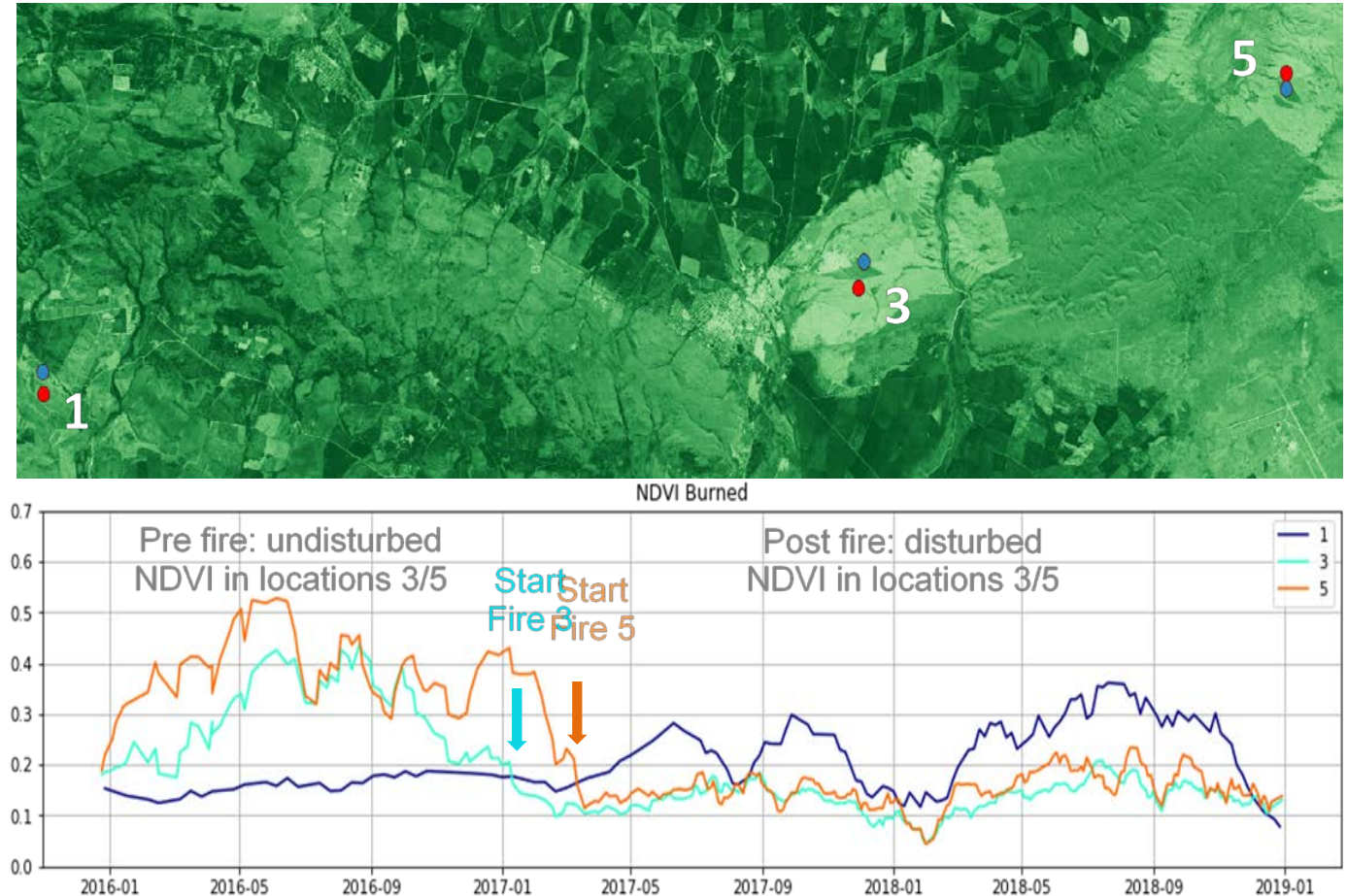


Figure 9: Effects of fires in the Agulhas Region measured by NDVI. Fire 1 (blue) started before the S2 mission launch and shows a steady recovery, while areas affected by fires 3 and 5 show only a slight recovery after two years.



# SALDi 1<sup>st</sup> years activities and achievements



Figure 11: The team of SALDi discussing land degradation issues with experts at ARC-ISCW in Pretoria



Figure 12: Discussing land degradation issues with local Land Care experts in the field (Eastern Free State)

**Thank you for your attention and interest**