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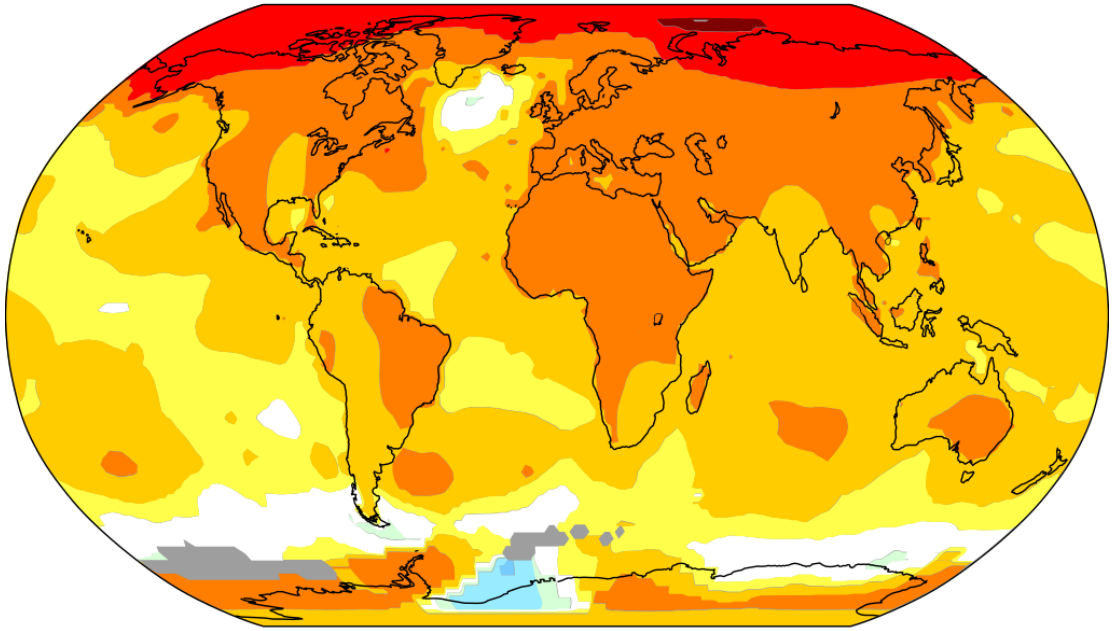
WINETECH geosmart iLeaf CGA UNIVERSITEIT STELLENBOSCH UNIVERSITY

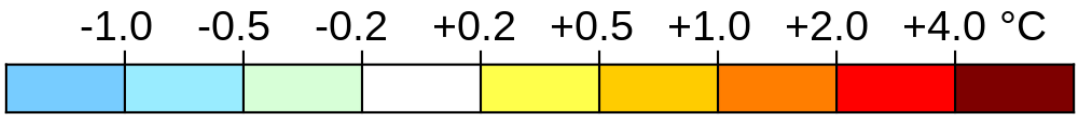
Problem TerraClim Aims To Solve : CLIMATE CHANGE

- ✓ Climate Change (Global-Local)

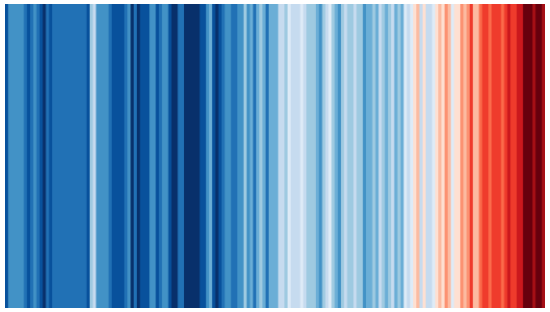
Temperature change in the last 50 years



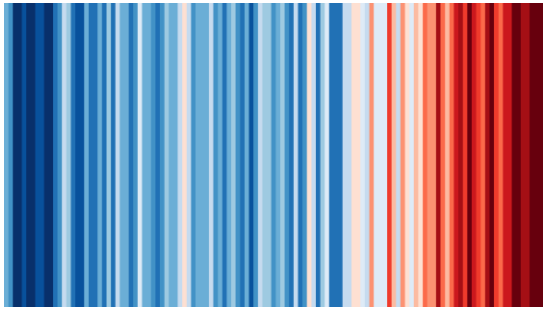
2011-2021 average vs 1956-1976 baseline



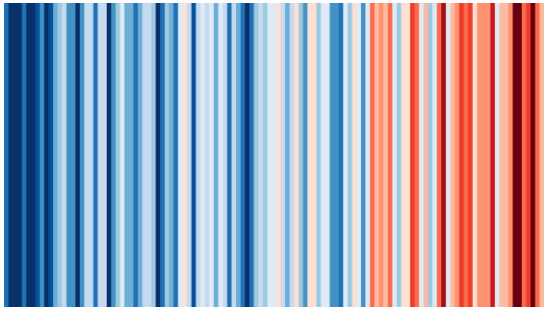
GLOBAL 1850-2021



AFRICA 1901-2021

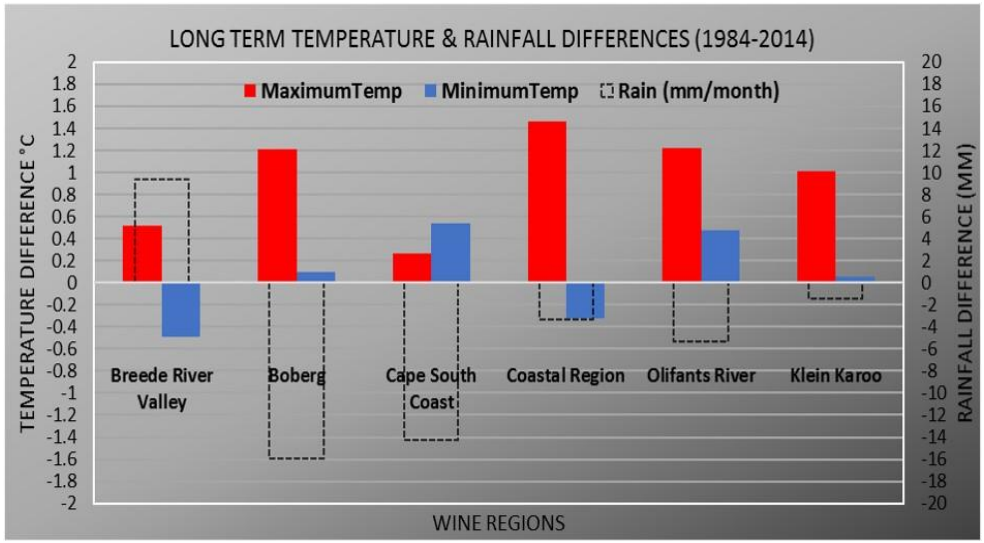


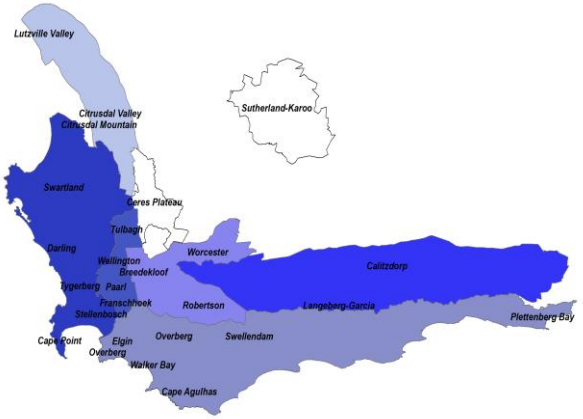
SOUTH AFRICA 1901-2021



Problem TerraClim Aims To Solve : CLIMATE CHANGE

✓ Climate Change (Global-Local) – REGIONAL (WESTERN CAPE)





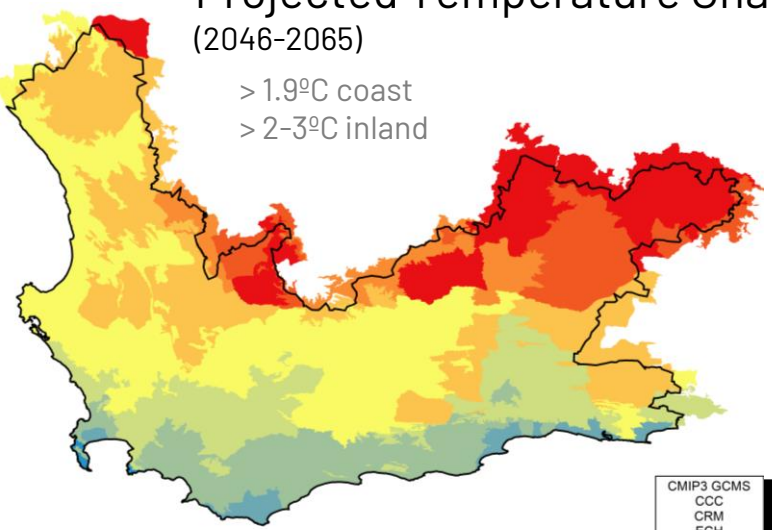
Increased warming : 1984-2015

- Warming 0.5-1.7ºC
- Tx: >1-2ºC / Tn: 0.6ºC

Projected Temperature Changes

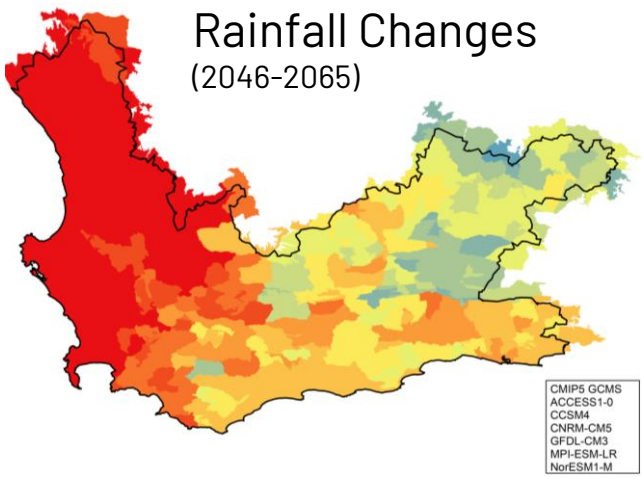
(2046-2065)

> 1.9ºC coast
> 2-3ºC inland



Rainfall Changes

(2046-2065)



Source: Midgley, Davis and Schulze

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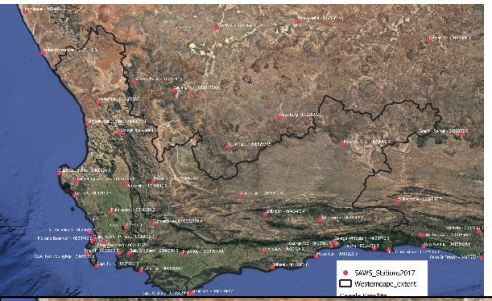
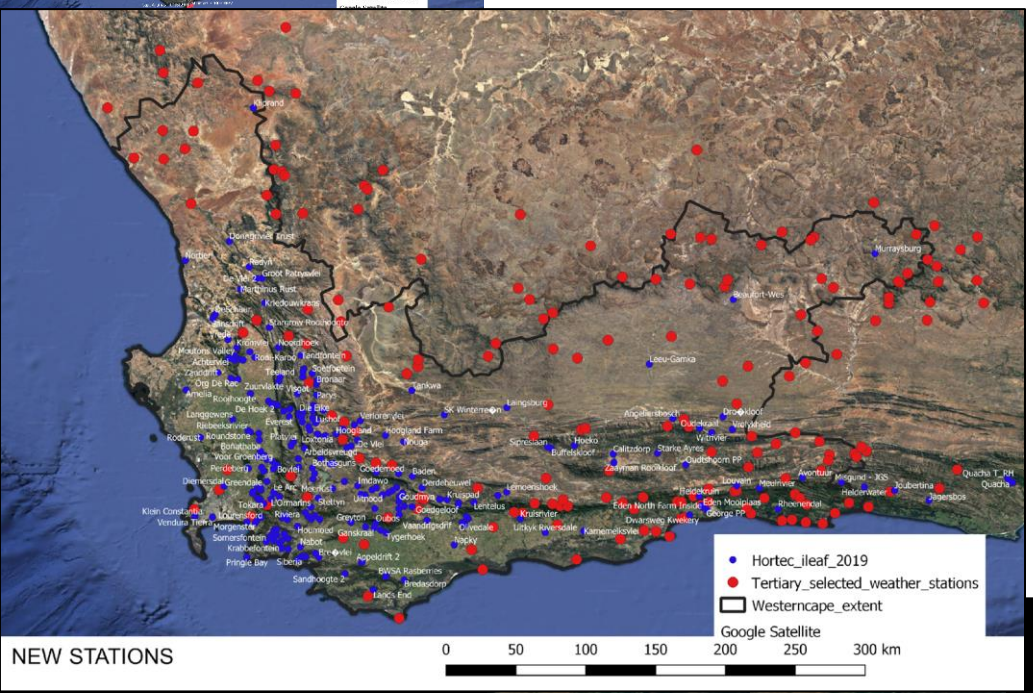
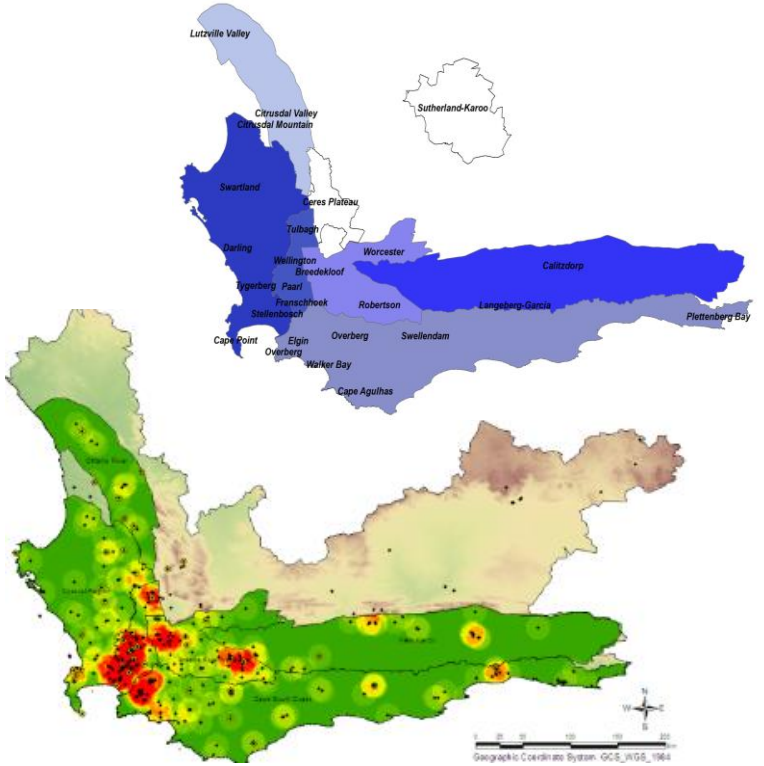
Problem TerraClim Aims To Solve : CLIMATE CHANGE

- ✓ Climate Change (Global-Local) – REGIONAL (WESTERN CAPE)

- ✓ Weather station
  - Spatial distribution
  - Data accessibility/integrity

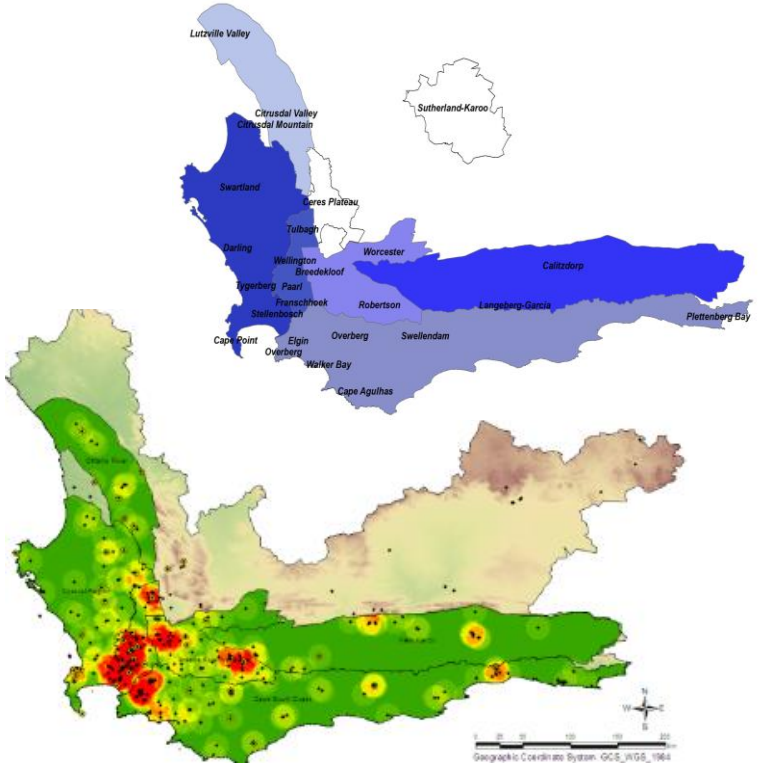






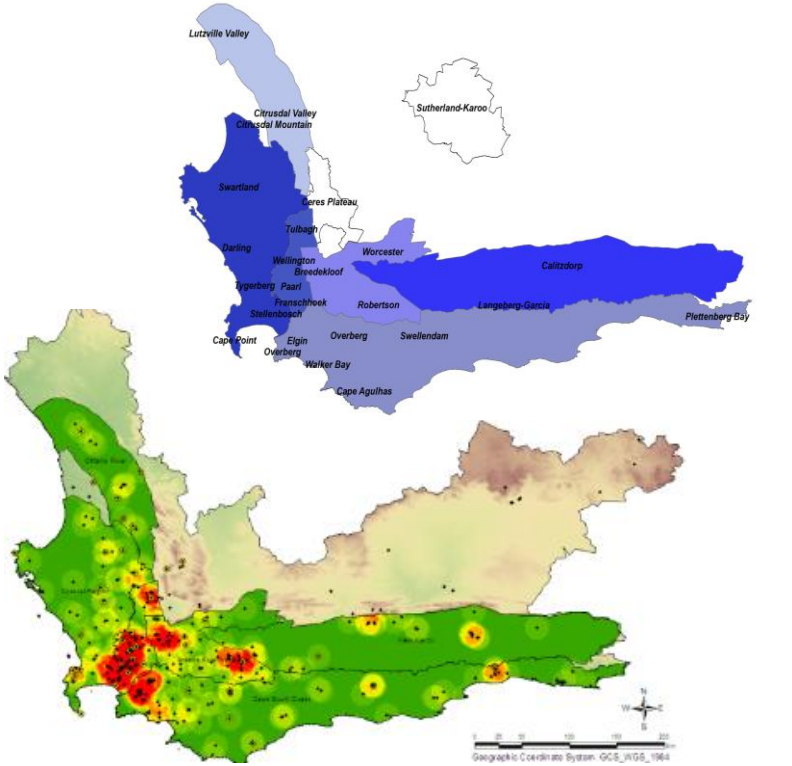
Problem TerraClim Aims To Solve : CLIMATE CHANGE

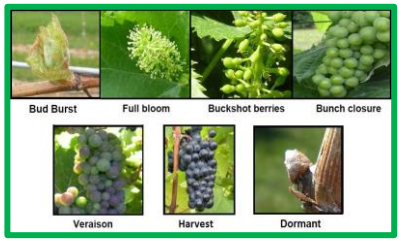
- ✓ Climate Change (Global-Local) – REGIONAL (WESTERN CAPE)
- ✓ Weather station
  - Spatial distribution
  - Data accessibility/integrity
- ✓ Topography/soil/coast



Problem TerraClim Aims To Solve : CLIMATE CHANGE

- ✓ Climate Change (Global-Local) – REGIONAL (WESTERN CAPE)
- ✓ Weather station
  - Spatial distribution
  - Data accessibility/integrity
- ✓ Topography/soil/coast
- ✓ Plant Pheno Phase analysis

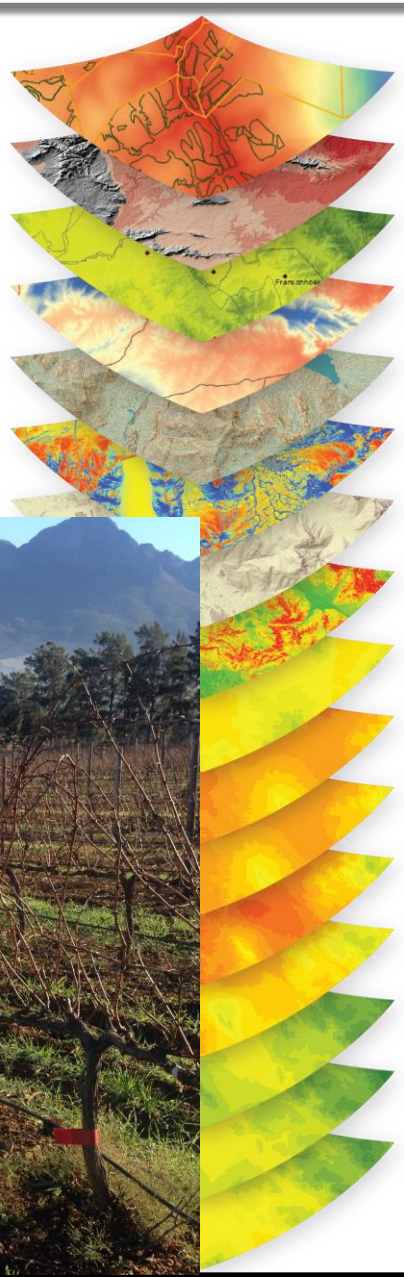




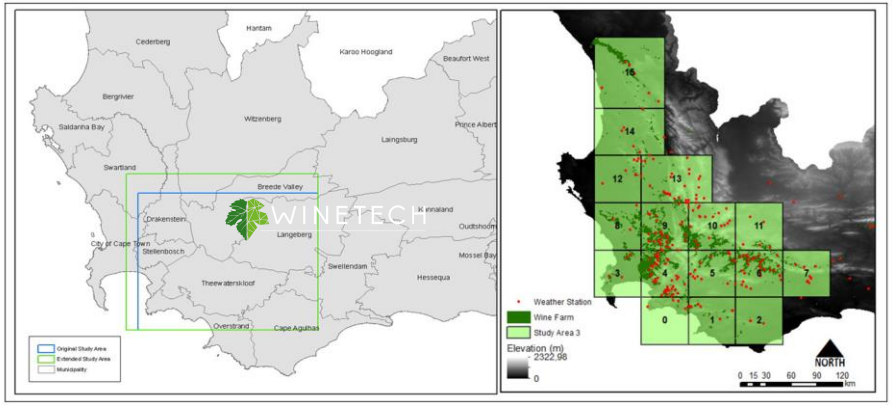
(**>hours 35-40°C**): earlier phenology in next season

TerraClim : Wine Industry Flagship Project : 2018 | 2019-2022

Addressing limited accessibility to climate/terrain information to the agriculture sector in the Western Cape.



TerraClim project : Improve the understanding of climate change in the complex terrain of the Western Cape and how specific agriculture crops responds to these changes.



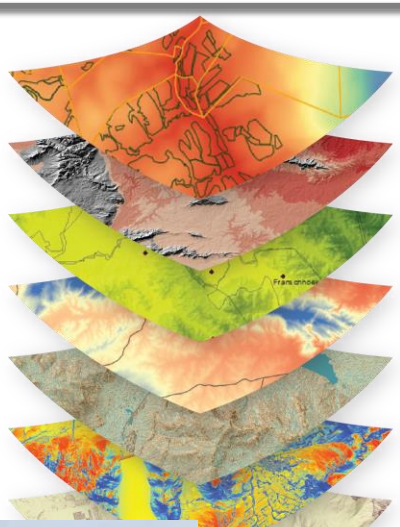
- *building a comprehensive climate & terrain database, using new technologies to spatialise climate & terrain.*

- *www.terraclim.co.za*

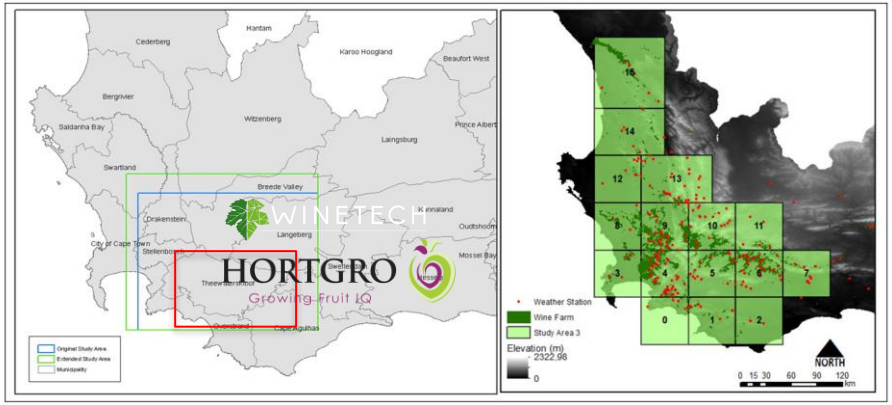
TERRACLIM

TerraClim : Hortgo Pilot Study in EGVV in 2020 : extending to KBV & LK

Addressing limited accessibility to climate/terrain information to the agriculture sector in the Western Cape.



Climate and Terrain Tool for the Elgin-Grabouw-Vyeboom-Villiersdorp production area specific to pome fruit



- *Climate profiling across*
  - *EGVV, KBV and LK for the last 5 seasons*

- *www.terraclim.co.za*

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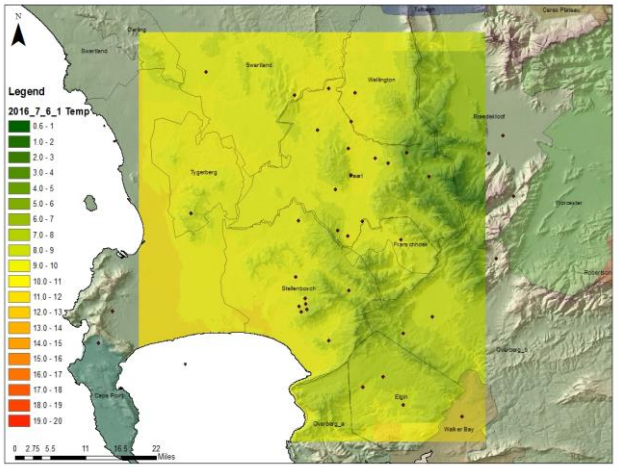
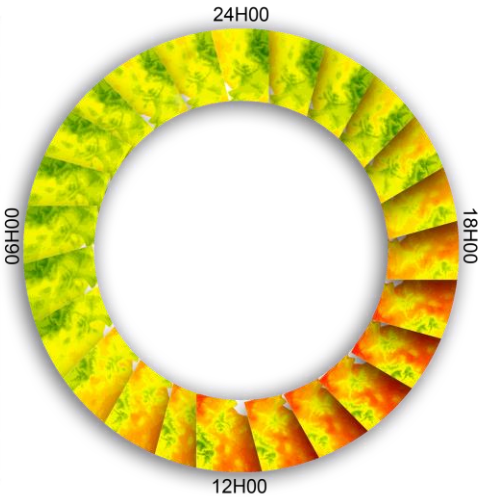
TerraClim : Methodology

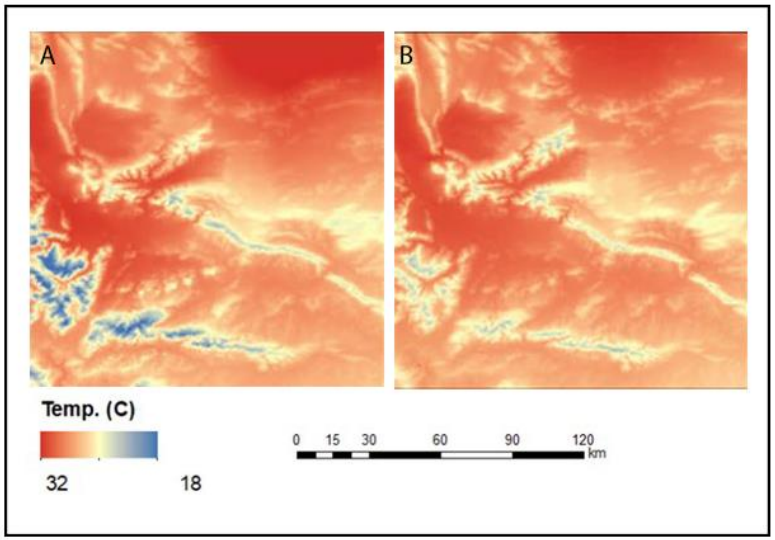
- *Automated workflows – ingesting multiple climate datasets into one standardised climate database*

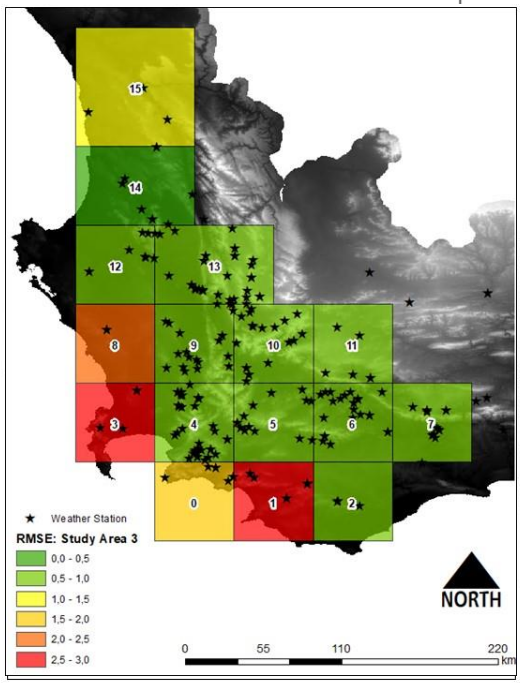


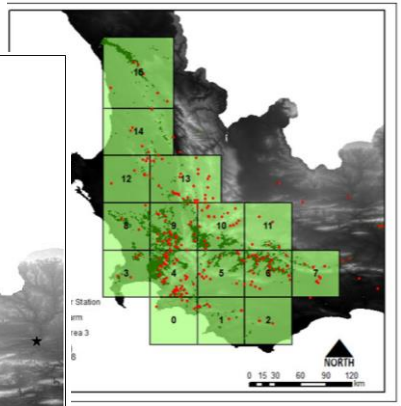


- *Interpolating hourly/daily/monthly wall-to-wall temperature surfaces*

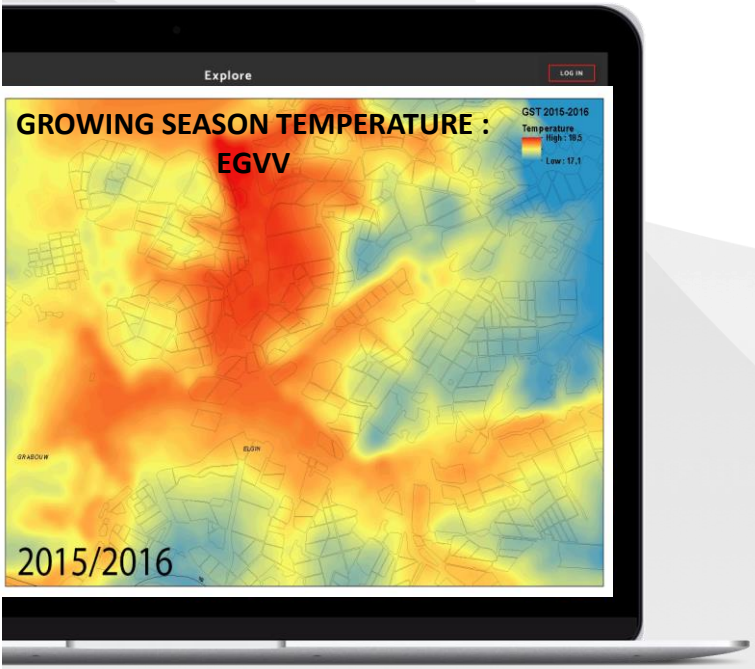
- *Regionality approach*

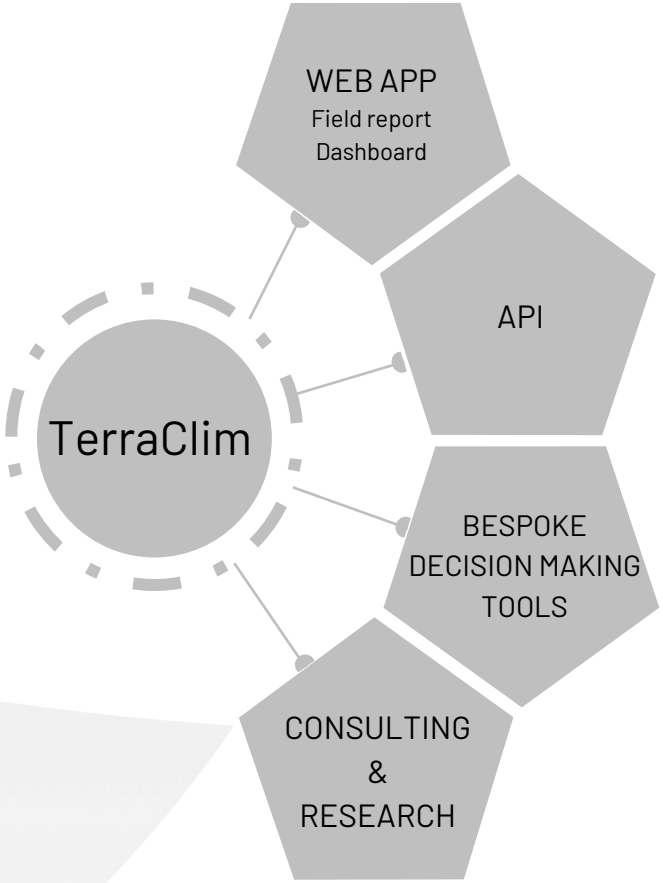


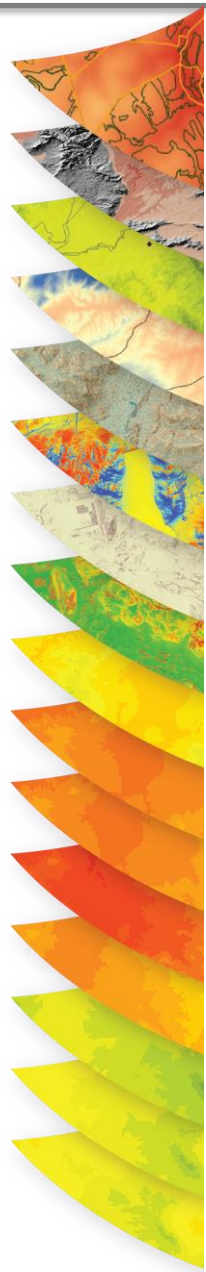




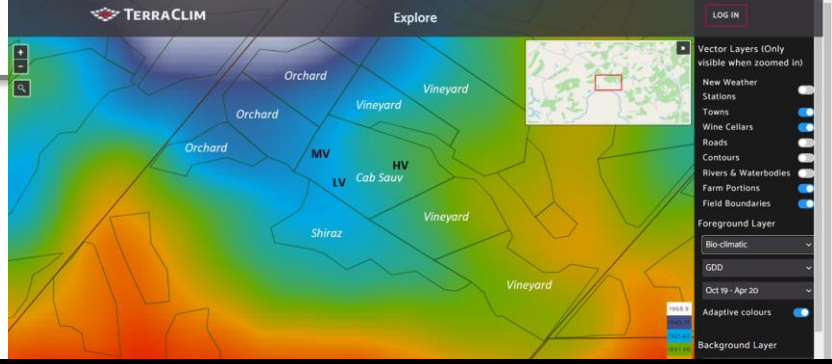
TerraClim : Data Dessimination

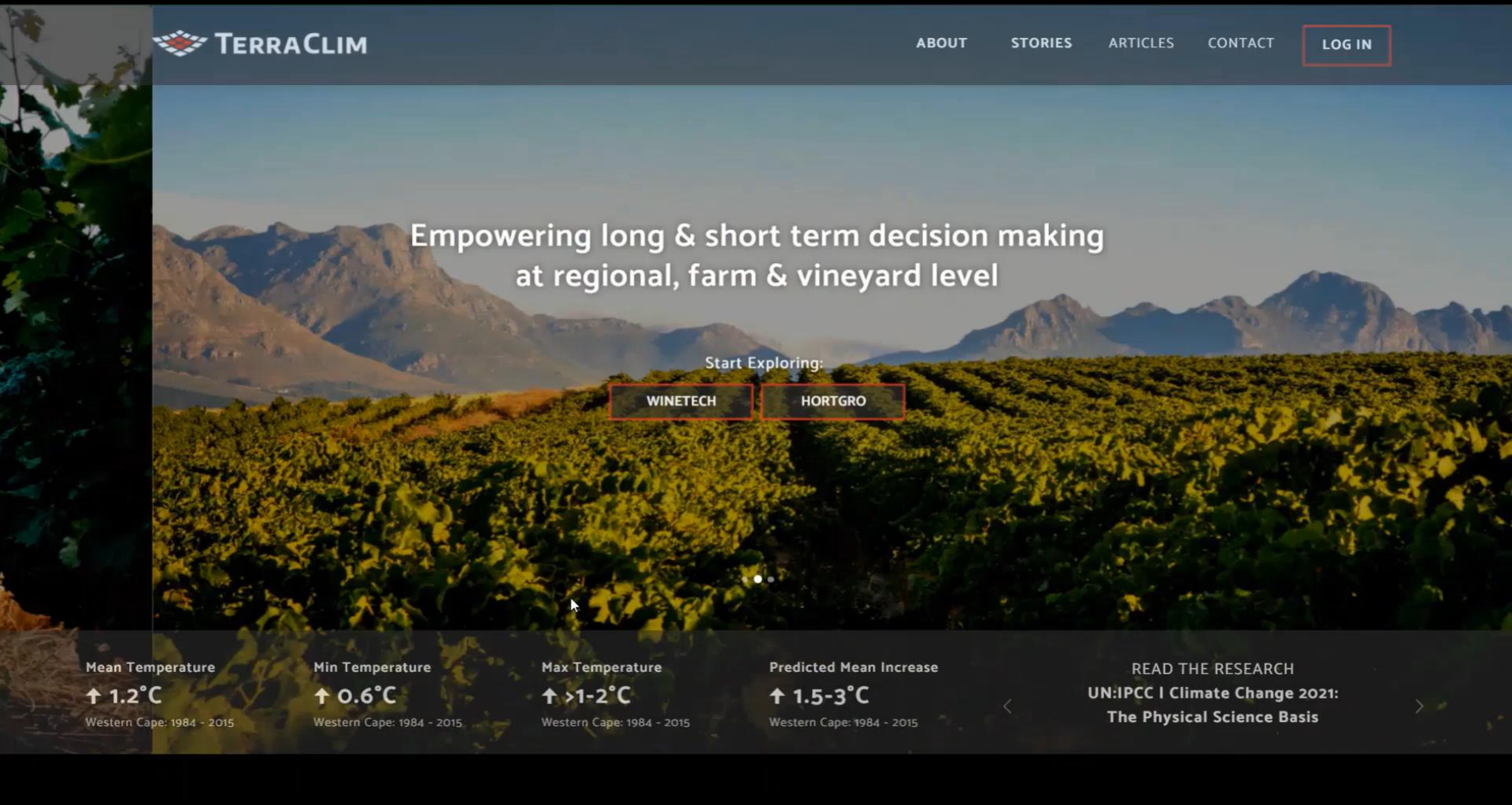






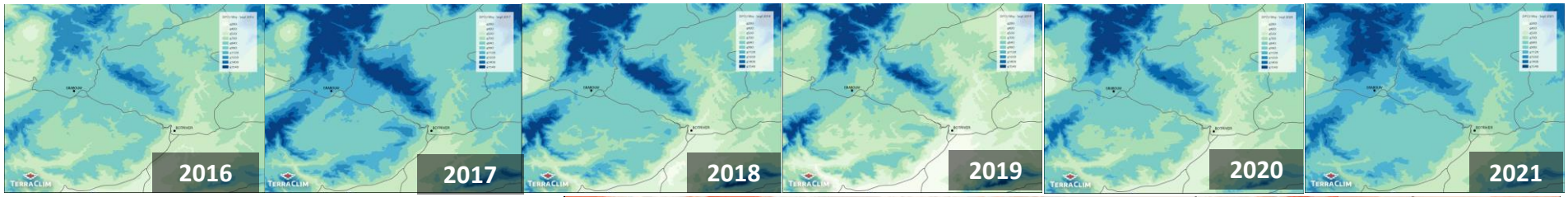
TerraClim : Tool Reporting



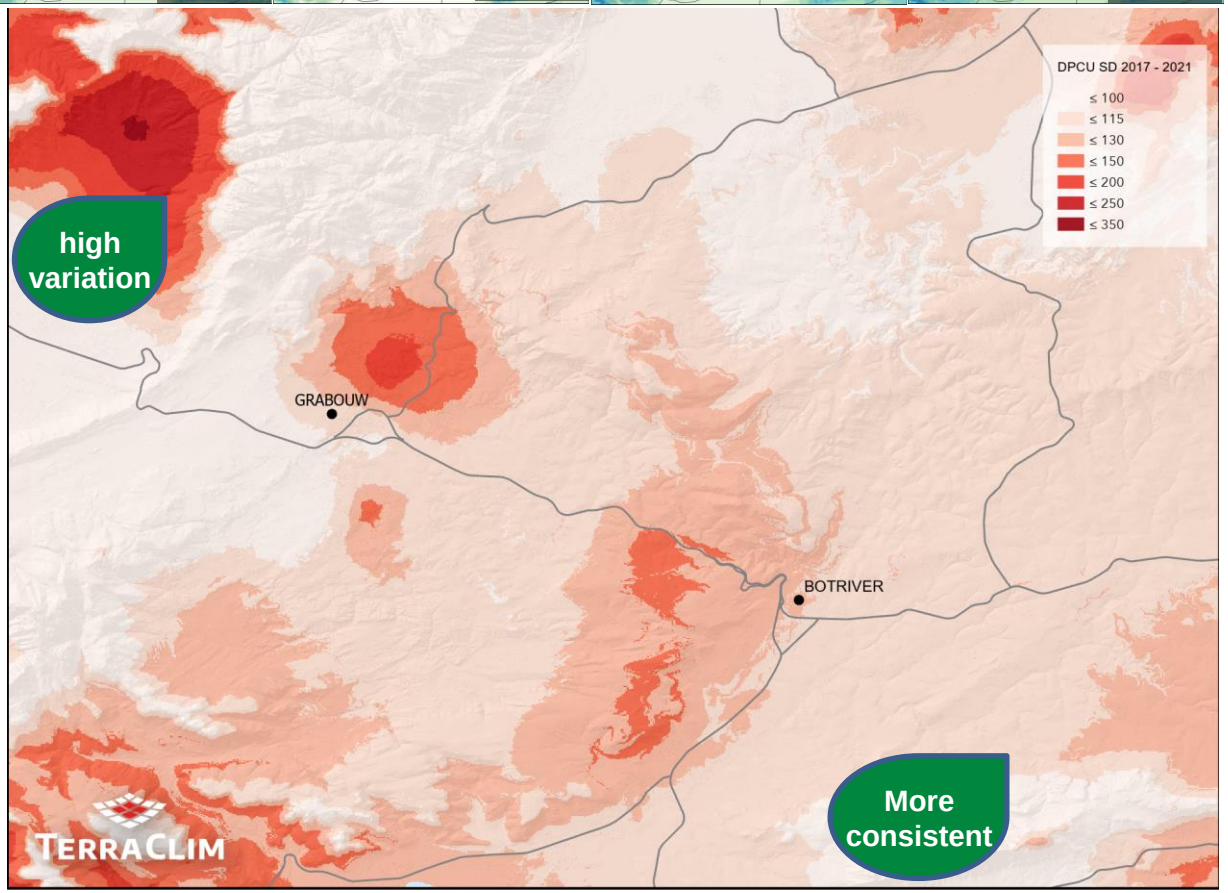


TerraClim: Preliminary Results : Daily Positive Chill Units

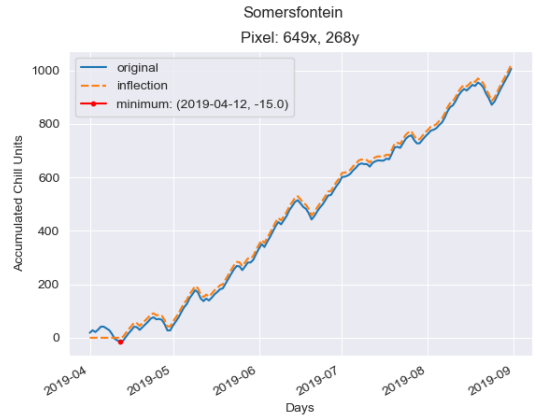
Chill Units: Daily Positive Chill Units (DPCU) : May to September (Darker colours representing higher chill)

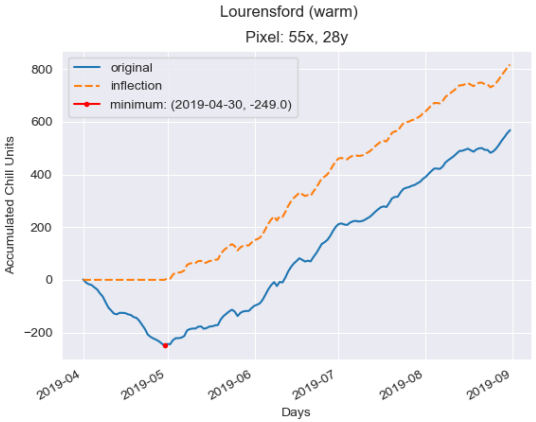


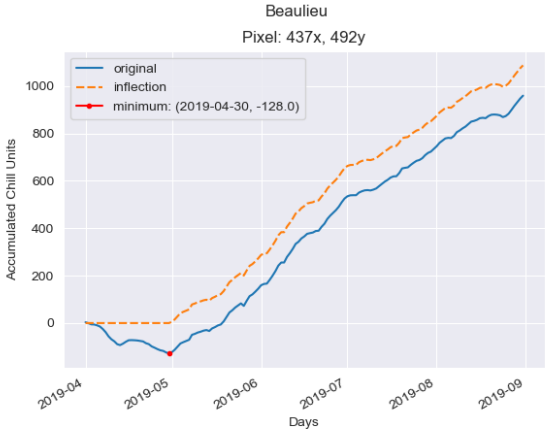
Inflection point?



TerraClim: Preliminary Results : Daily Positive Chill Units : Inflection point

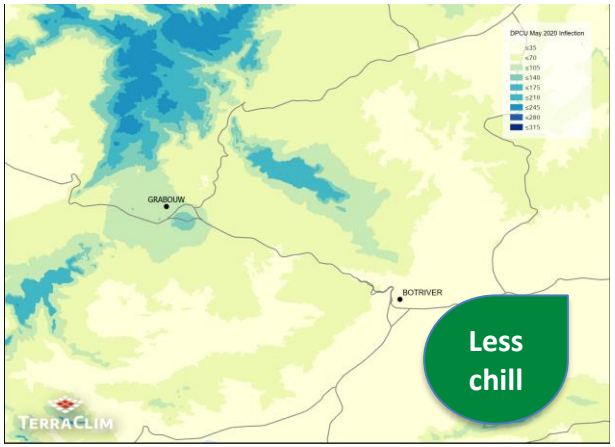




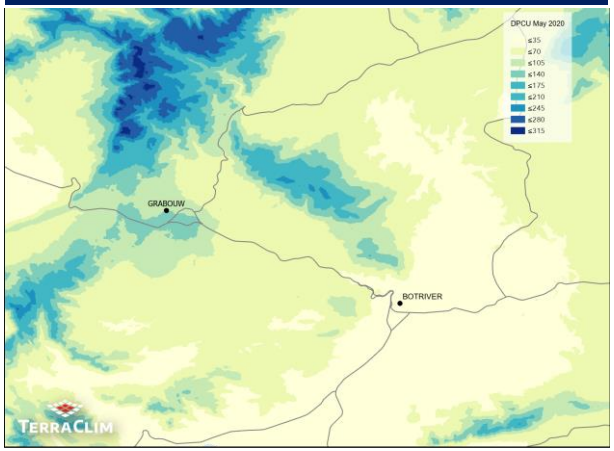


Light Yellows (<35) is lower values & Blues (315) higher values)

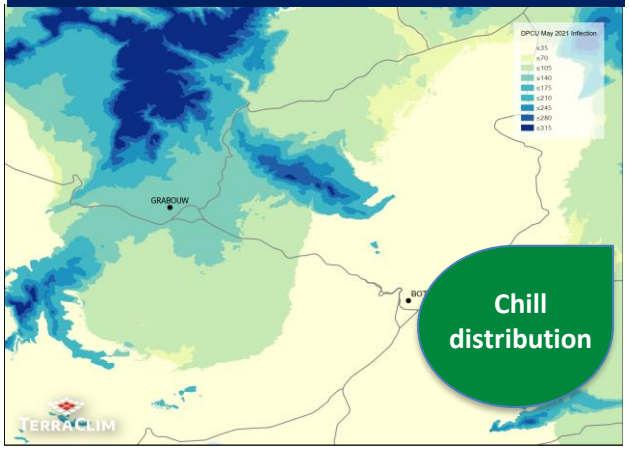
May 2020 Inflection



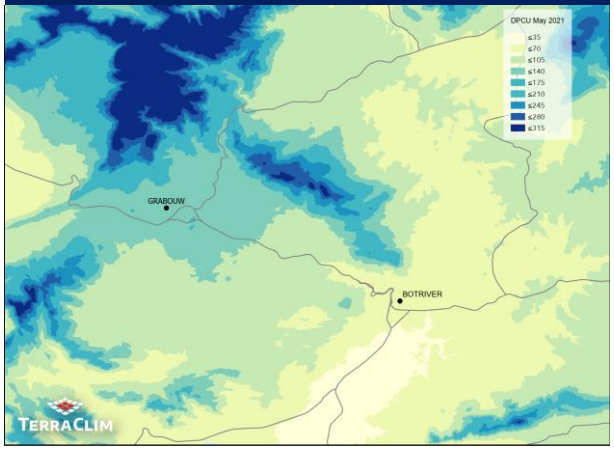
May 2020



May 2021 Inflection



May 2021



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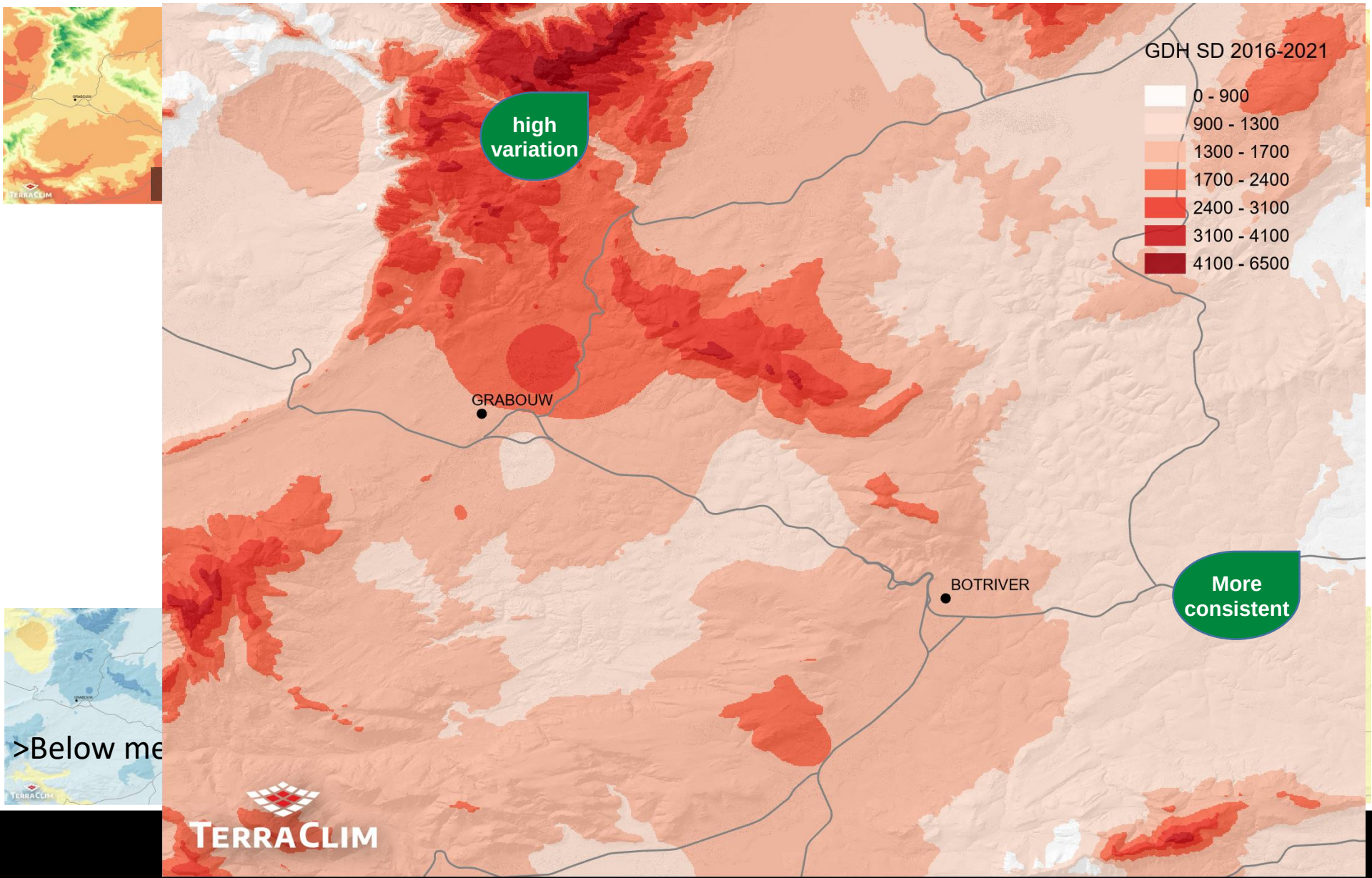
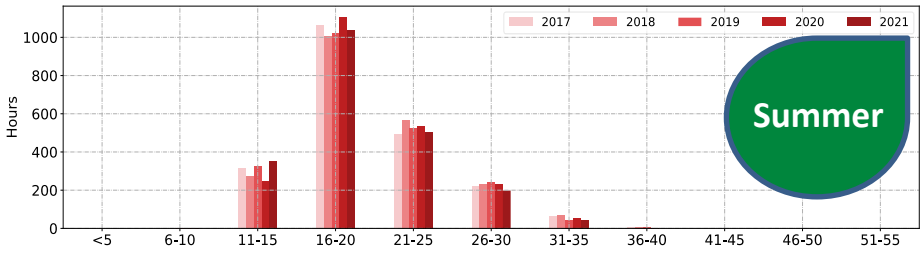
TerraClim: Preliminary Results : Growing degree hours

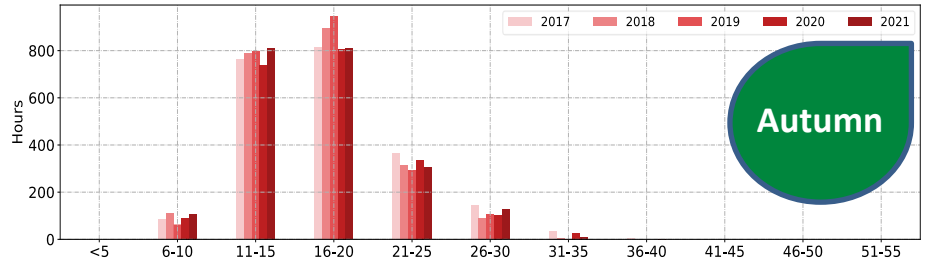
Growing degree hours (GDH) maps (Green is lower values & darker reds higher values) –October to April

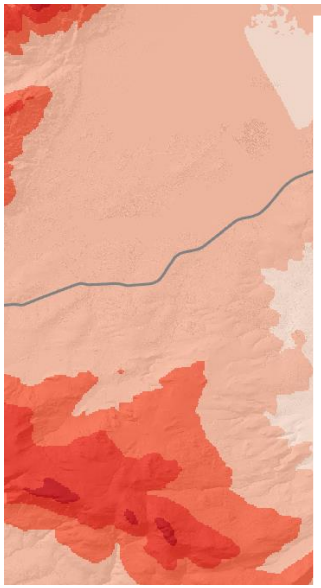


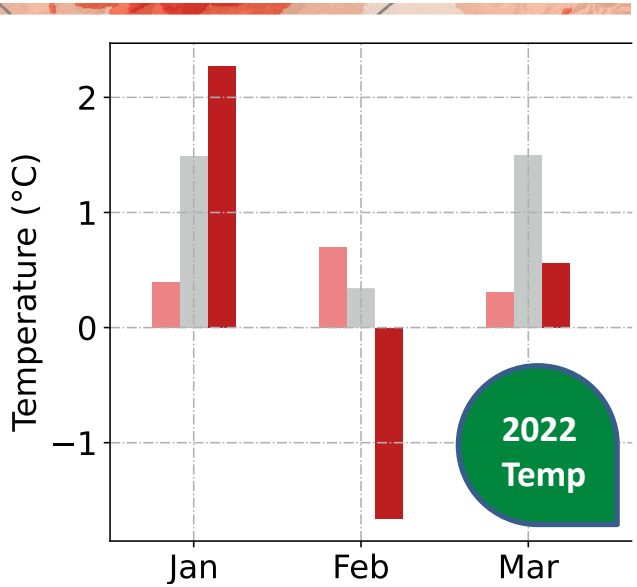
TerraClim: Hourly reporting

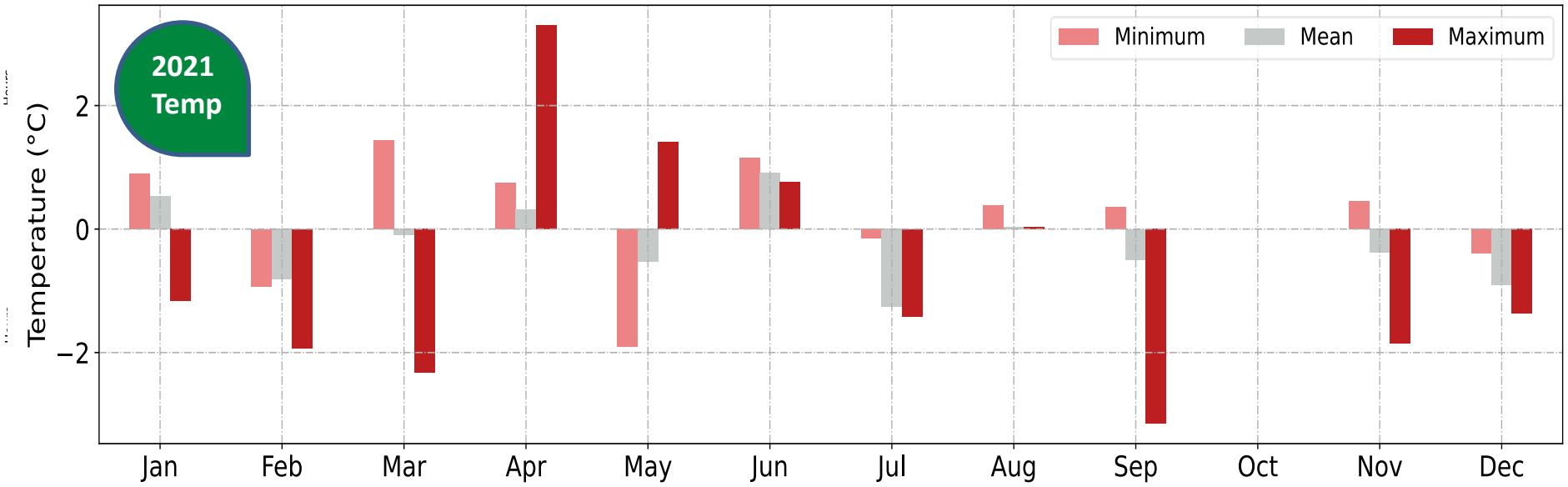
Hourly threshold graphs over seasons 2017-2021







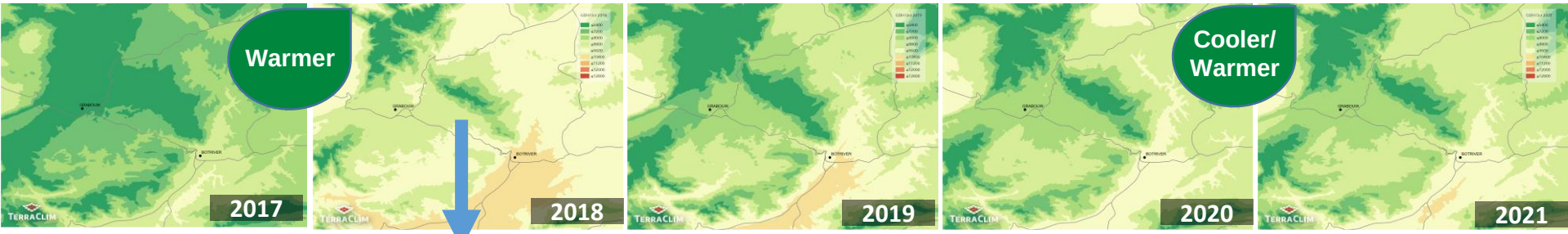


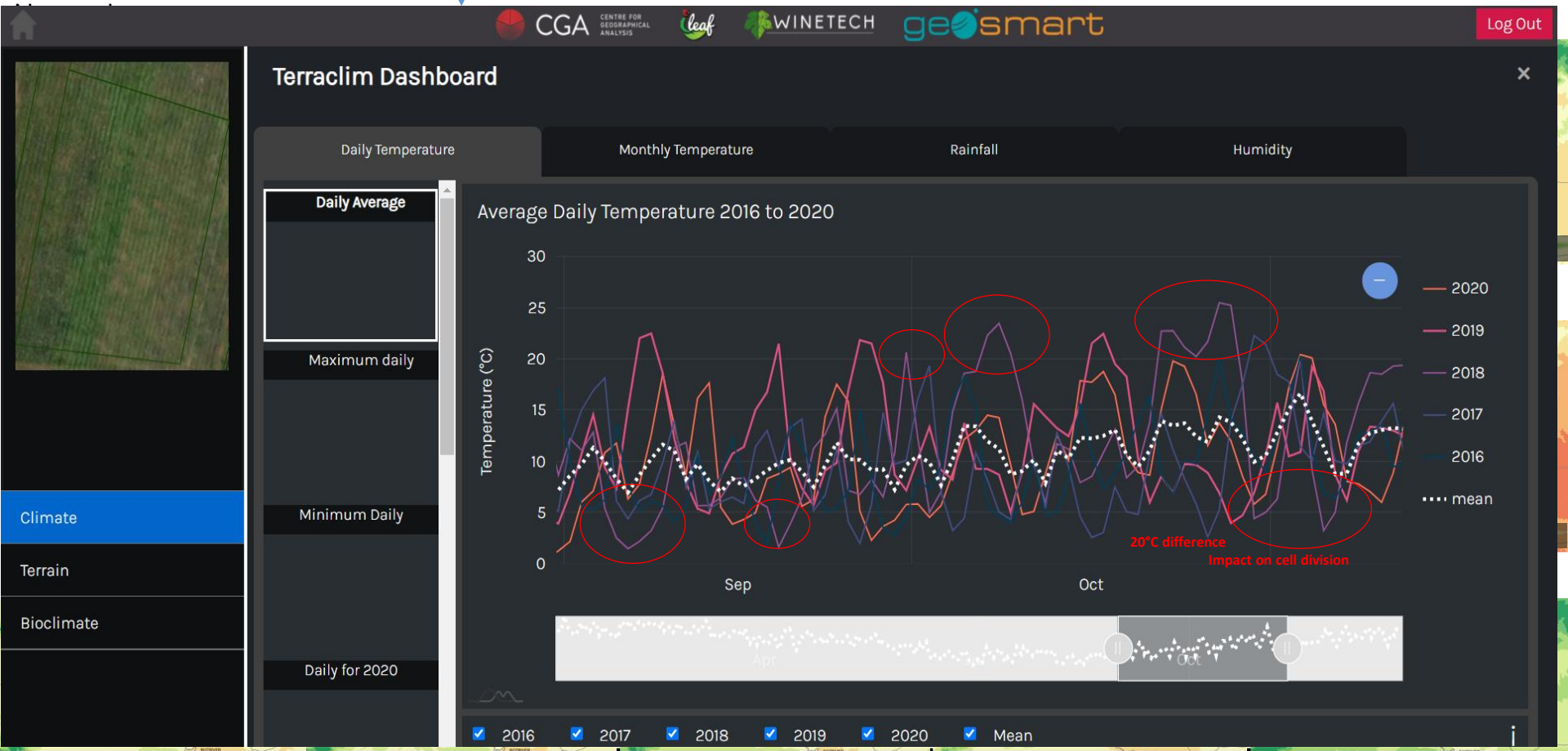


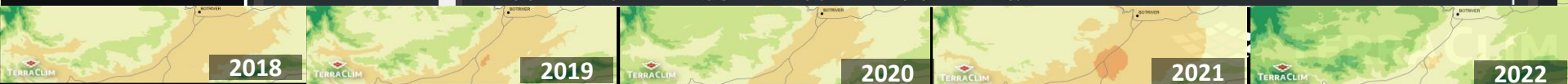
TerraClim: Preliminary Results : Growing degree hours

Green (<6400) is lower values & Reds (12800) higher values)

October





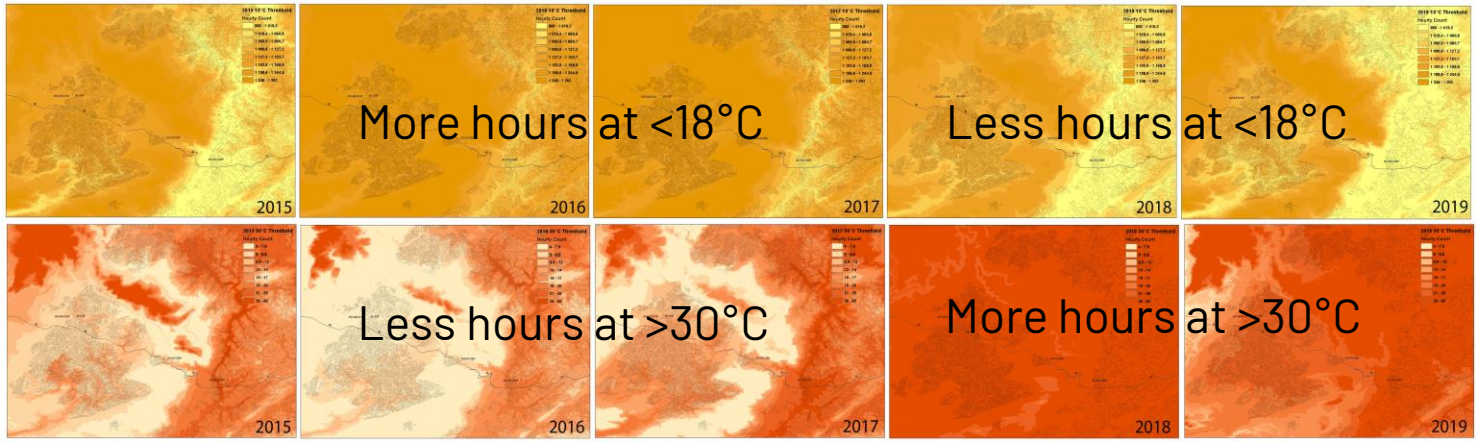


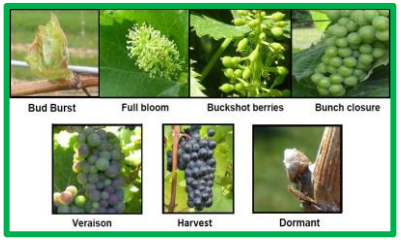
TerraClim: Threshold Maps : conditions unfavorable for flowering

Hindsight crop response modelling

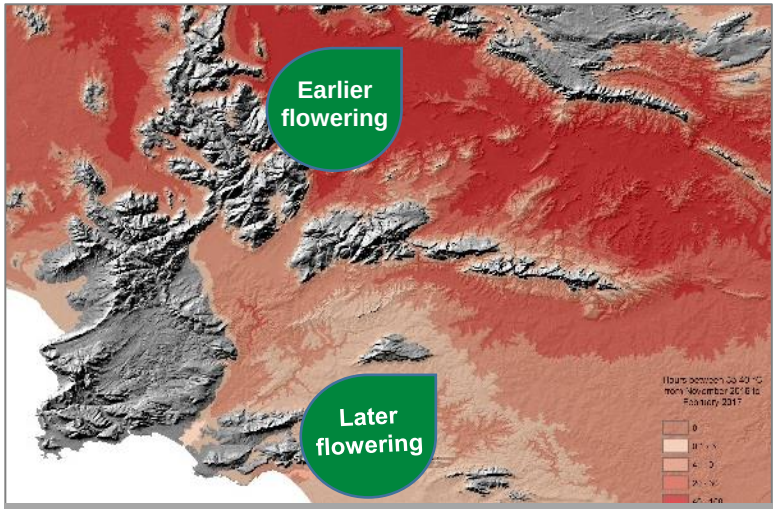
Threshold Maps : Hours below 18°C & above 30°C for September & October 2015-2019

light tones lower number of hours & darker reds more hours





(**>hours 35-40°C**): earlier phenology in next season

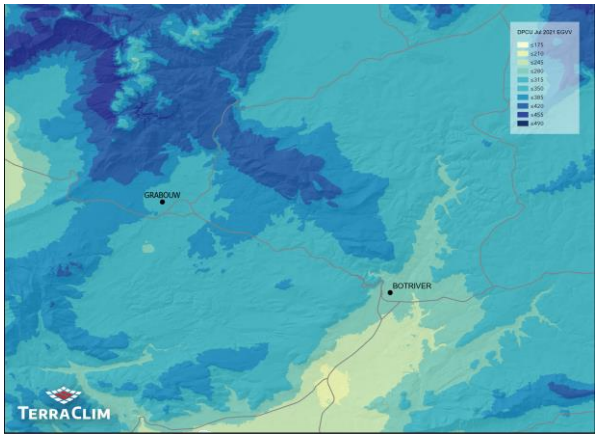


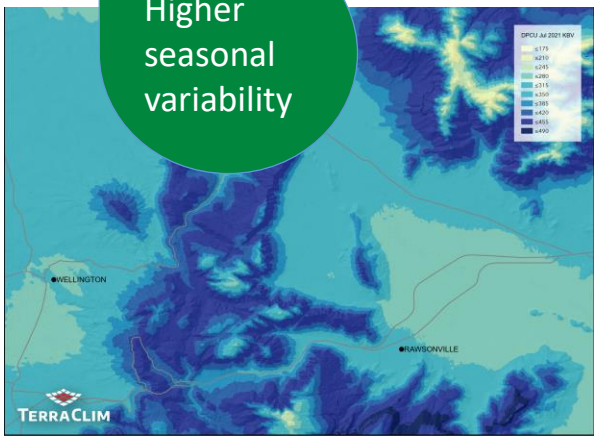
Temperature Maps : 35-40°C (Nov-March)

TerraClim: Regional Comparison : **EGVV** **KBV**

Cooler & Higher seasonal variability

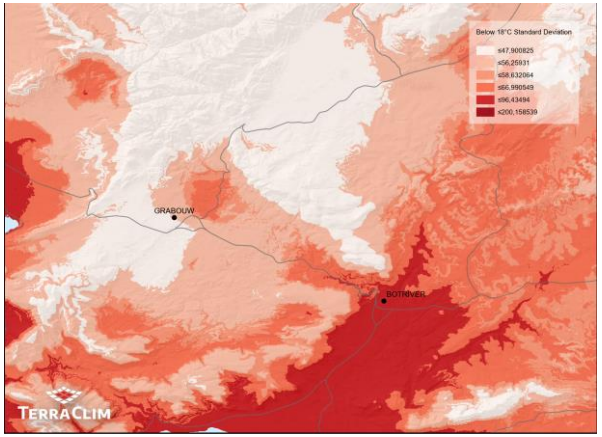
DPCU for July 2021

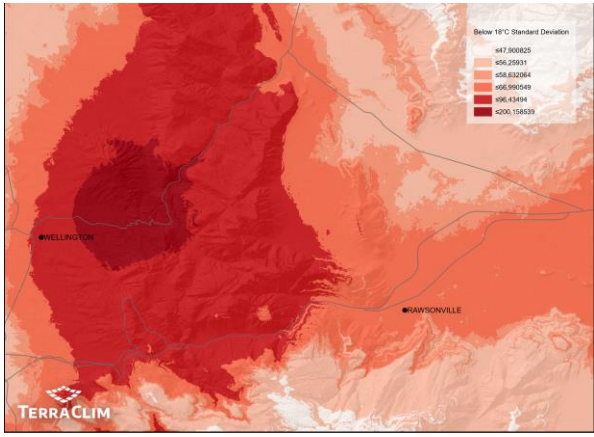




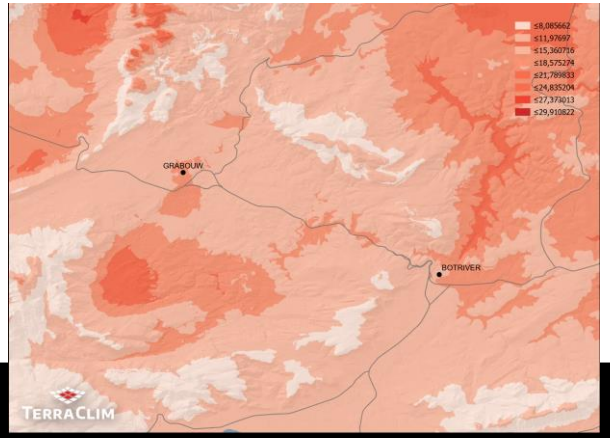
TREND ANALYSIS

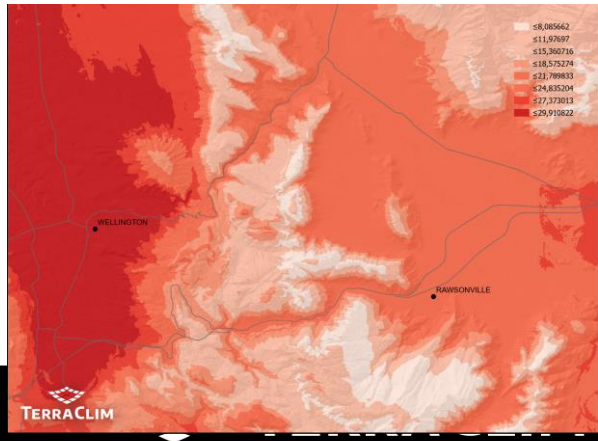
Threshold Maps :
Hours below 18°C
September & October
2015-2022



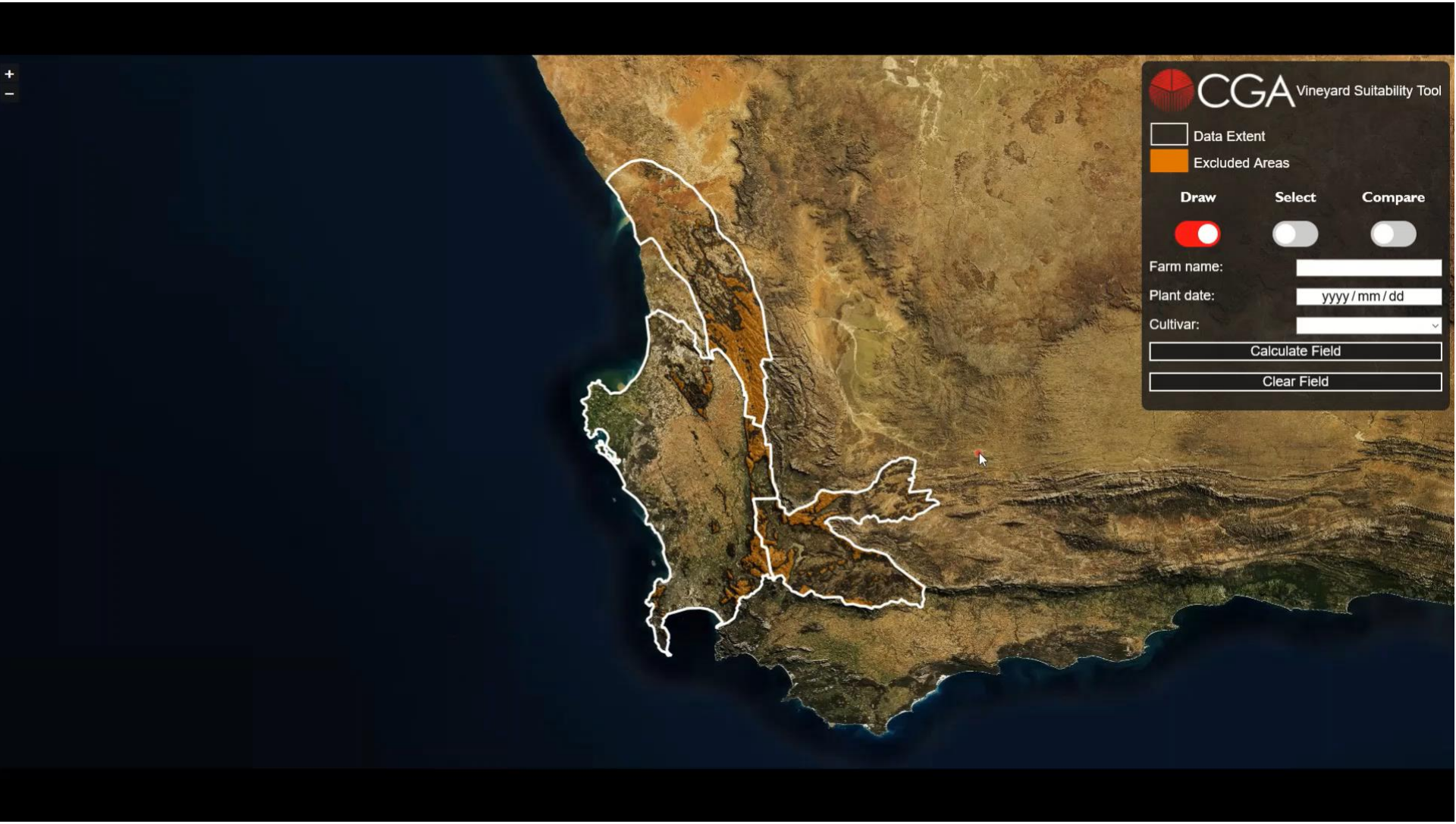


Threshold Maps :
Hours above 30°C
September & October
2015-2022

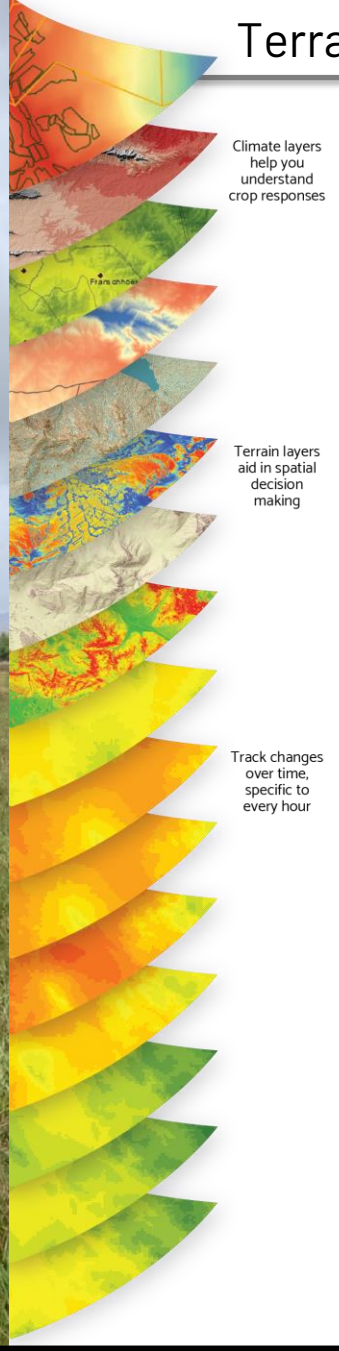




Suitability Tool: Data Integration



TerraClim : Take Home Message



✓ TerraClim webapp — www.terraclim.co.za

High temporal & spatial resolution maps of climatic & geographic datasets as a series of dynamic near-real time map layers

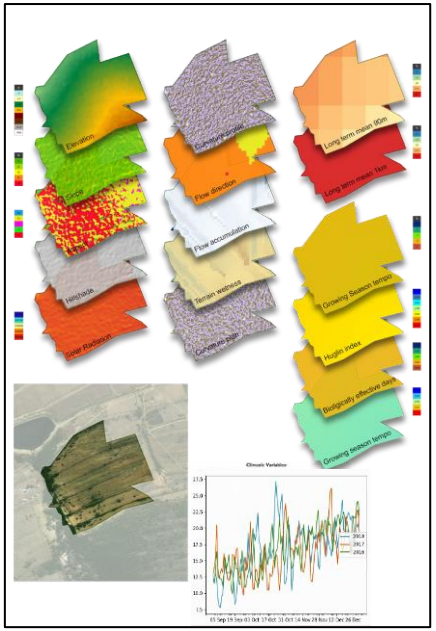
Empowering decision making

- ✓ Climate, terrain, soil
- ✓ Aid long/short-term decision making
- ✓ Analyse & mitigate climate change

@ regional, farm, orchard

- ✓ Change analysis
- ✓ Seasonal reporting
- ✓ Hindsight crop response modelling

Interactive orchard profiling tool, query functionality & cultivar suitability analysis



TERRACLIM

THANK YOU

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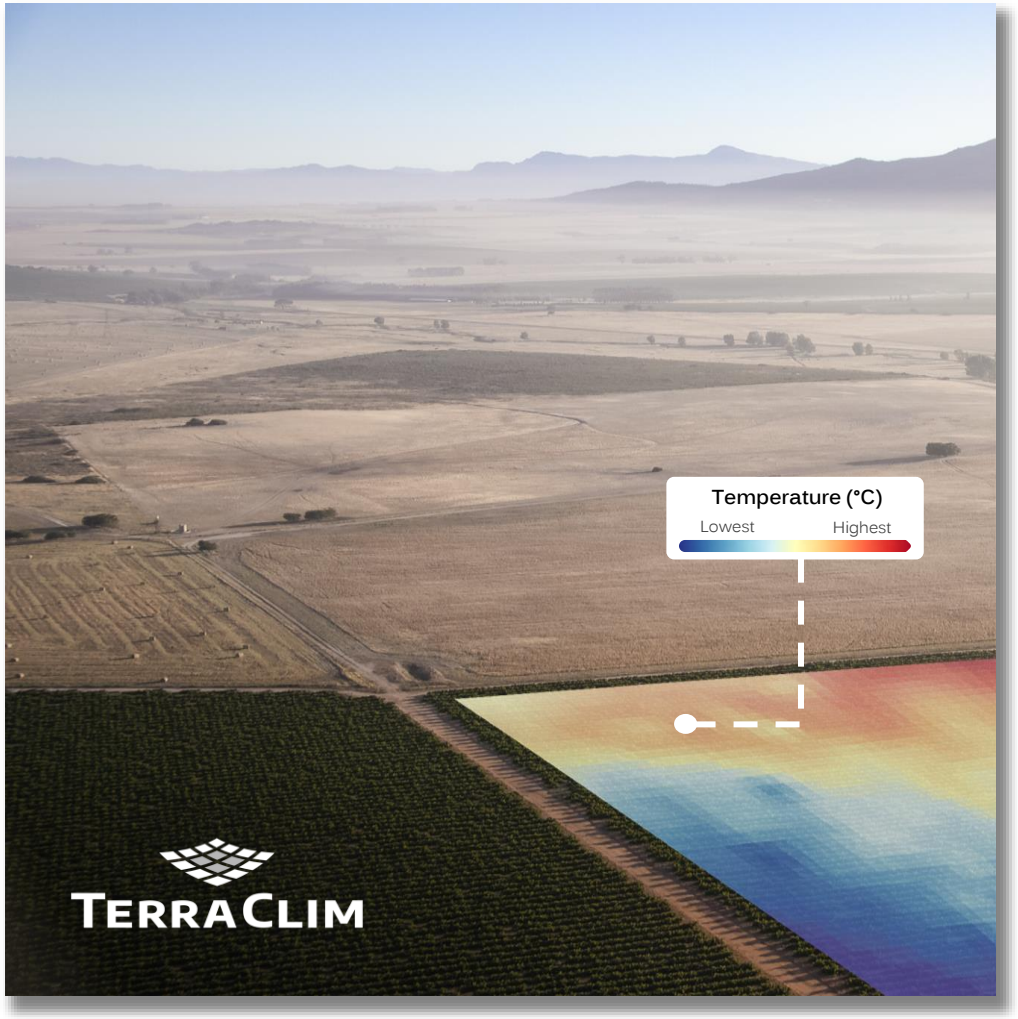

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