Water Use/Rainfall Variability Project

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KEY MESSAGES

- Twenty four digital rain gauges have been installed across the SCF membership zone to record rainfall events throughout the growing season.
- Access to the digital rain-gauge network is available to all SCF members.
- Rainfall variability is often for greater than shown in the current DPIRD rainfall summary maps. An increased deployment and density of rain-gauges and weather-stations will build greater accuracy in rainfall maps and lead to greater opportunities for more accurate weather forecasting.

Project Aims, Background & Methodology

The Stirlings to Coast Farmers (SCF) Rainfall Variability/Water Use Efficiency trial is a 12-month project that involves the implementation of digital technologies (automatic digital rain gauges) that help raise growers' awareness of weather variability and methods to improve overall on-farm water use efficiency. Ultimately, we want to lead our grower members onto a successful digital technology adoption path that helps improve their overall farm productivity & profitability.

Sponsored by AgriFutures, this two-part program will involve a workshop-based training component (held on June 14 2022) and a broad-scale member trial which utilises low-cost digital rain-gauge devices scattered across 24 farming locations throughout the Great Southern. This rainfall data will be collated to produce rainfall variability maps each fortnight across the whole membership zone, with a final rainfall value map and yield-potential map produced at the end of each season. Members will be able to analyse their management processes and identify potential shortcomings where their actual yield is lower than their potential yields.

Seasonal Rainfall Variability – Why more is better?

To better understand rainfall variability and change across the landscape you will need to increase the number of measurement locations. Sadly, depending on what weather source you may use, some rainfall variability maps could potentially be generated by as little as four automatic weather stations in the region (Albany Airport, North Walpole, Rocky Gully or Jacup), through to 16+ stations in the region when you consider the addition of DPIRD's weather stations throughout the zone.

Whilst 16 stations might sound like a representative number for the SCF membership zone, there are instances in the zone where there could be up to 50km between weather stations. This brings with it two potential challenges:

- an unknown amount of potential rainfall variation between the stations, and
- no known certainty of whether a current weather-station's placement is representative of the area it covers.

For the period of 15-30th November 2021, SCF recorded the total rainfall amounts throughout the recently installed weather-station network, which featured a storm event recorded during harvest. As seen in Figure 1, there were high levels of variation between stations along the Chillinup road with some gauges nearly recording double their neighbouring rainfall records, even with stations only 4kms apart.

Where to from here?

Additional weather monitoring points help add an extra level of information to the current deployment of DPIRD/BoM stations, and could be utilised to help improve the accuracy of measuring rainfall events. From the data collected, there is potential end-use cases for adding this data to further improve forecasting accuracy, combining the data with soil maps to nowcast plant-available soil water, through to creating yield potential maps for a range of crop types throughout the membership zone.

While there are still quite a few 'black-spots' to infill, SCF is committed to helping our members make the most from their data and welcomes discussions about collaborating to improve the accuracy & spatial resolution/ density of weather monitoring throughout the membership zone. Installing weather monitoring equipment on your farm effectively means that members can achieve the highest levels of accuracy for rainfall mapping, water-use mapping or even potential-yield maps, helping lead to better production and quality outcomes for our members, relevant to their specific location.

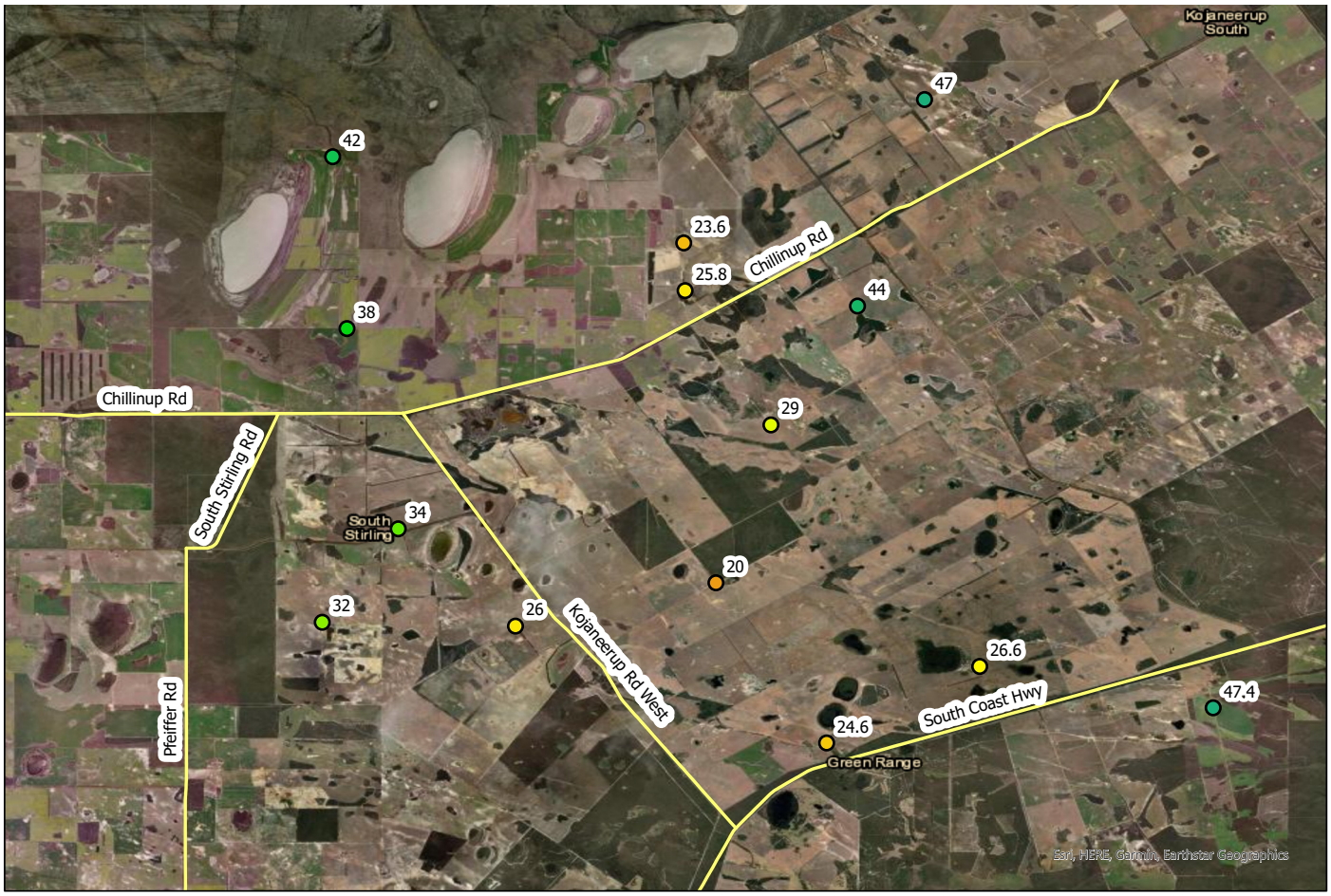

Figure 1: The raw rainfall data points collected through the combination of installed weather-stations and rain-gauges, distributed throughout the SCF membership zone for the period of 15-30th November 2021.

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