

Future Projections for Water Scarcity in Scotland: Impacts on the Arable Sector



IMAGE: CANVA

What are the future projections?

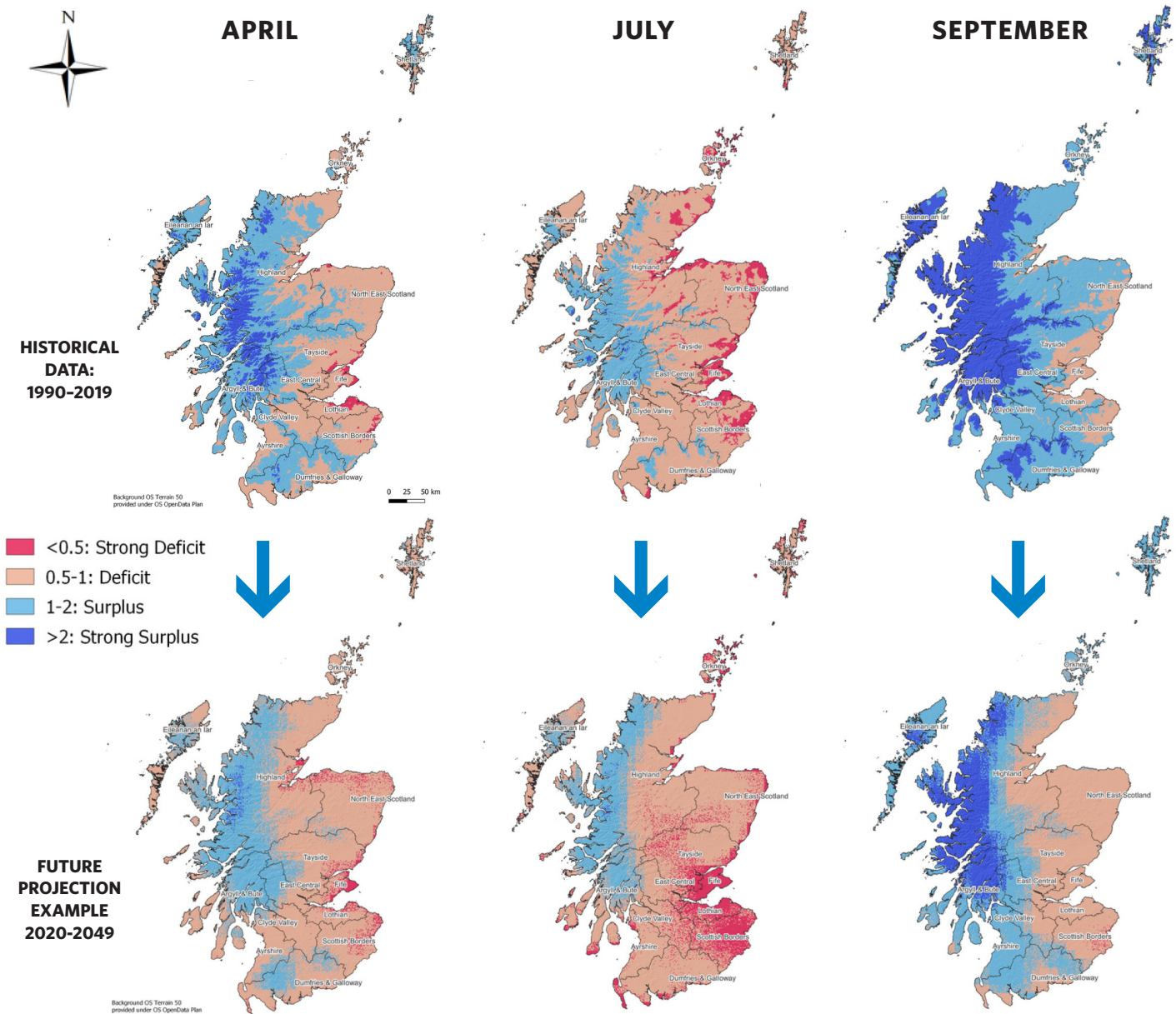
There is an increasing amount of climate variability leading to an increased risk of meteorological drought.

Increasing probability of more frequent and higher water deficits between spring and autumn under climate projections to 2049, ([see report](#)).

Deficits indicate reduced water availability from soils as more soil moisture will be lost to evapotranspiration.

The maps shown are based on one climate projection where mean annual total rainfall is 3% less than the past and temperature is 2.1°C warmer. Lower rainfall and higher temperature projections will likely result in higher deficits.

Increasing water deficit (ratio of rainfall to evapotranspiration) is projected, especially in spring and late summer/autumn.



Strong Deficit: rainfall is 50% or less of the evapotranspiration demand. Deficit: rainfall is 50% to 100% of the evapotranspiration demand. Surplus: rainfall is 100% to 200% of the evapotranspiration demand. Strong Surplus: rainfall is 200% or more than the evapotranspiration demand.

How is water used by the sector?

Arable crops are mainly reliant on rainfed water sources to provide enough soil moisture during key growth stages.

Although rare, irrigation is sometimes required for growing arable crops.

Rainfall across Scotland during growing months of April to August ranges from 180mm to over 400mm ([see ref](#)).

What are the future risks?

Increasing water deficits would result in key growth stage months becoming noticeably drier.

Drier conditions may lead to a reduction in crop yields, as seen in 2018 with income losses for wheat £34 million, and barley £26 million ([see report](#)).

The switch between the wet winter and dry spring months is also likely to be more abrupt due to higher wet-dry weather extremes, affecting germination through too much or too little soil moisture.

What are the adaptation options?

Increasing soil organic matter can improve soil water holding capacity ([see report](#)).

Measuring water use can help identify areas for improved water use efficiency and increase resilience.

Emerging drought resistant varieties are a potential future adaptation.

Irrigation can counter-act soil moisture deficits, but may not be profitable and will increase overall abstraction volume.

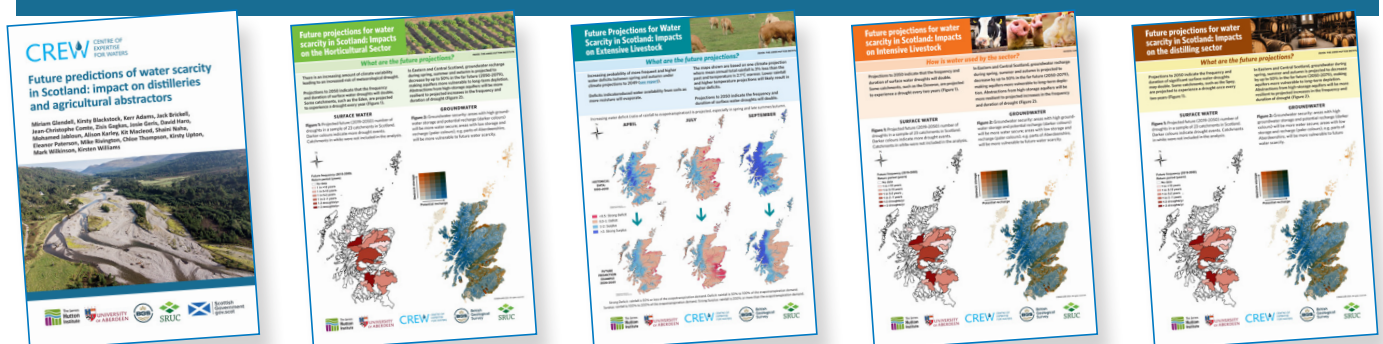
Sector	Soil conservation	Measuring water use	Drought tolerant crops	Drip irrigation	Off-line storage lagoon
Arable	●	●	●	●	●

● Higher uptake potential

● Lower uptake potential

Other adaptation measures may be available. Uptake potential will vary from farm to farm.

More Information



PROJECT MAIN REPORT



HORTICULTURAL INFOGRAPHIC



EXTENSIVE LIVESTOCK INFOGRAPHIC



INTENSIVE LIVESTOCK INFOGRAPHIC



DISTILLERY INFOGRAPHIC

The maps in this infographic are from the climate trends and extremes reports which can be accessed [here](#).
 For more information on future projections please visit [The James Hutton Institute Climate Data Visualisation](#)
 To access all project outputs please visit: www.crew.ac.uk/publication/water-scarcity-impacts-distilleries-agricultural