

# Future Projections for Water Scarcity in Scotland: Impacts on Extensive Livestock



IMAGE: THE JAMES HUTTON INSTITUTE

## What are the future projections?

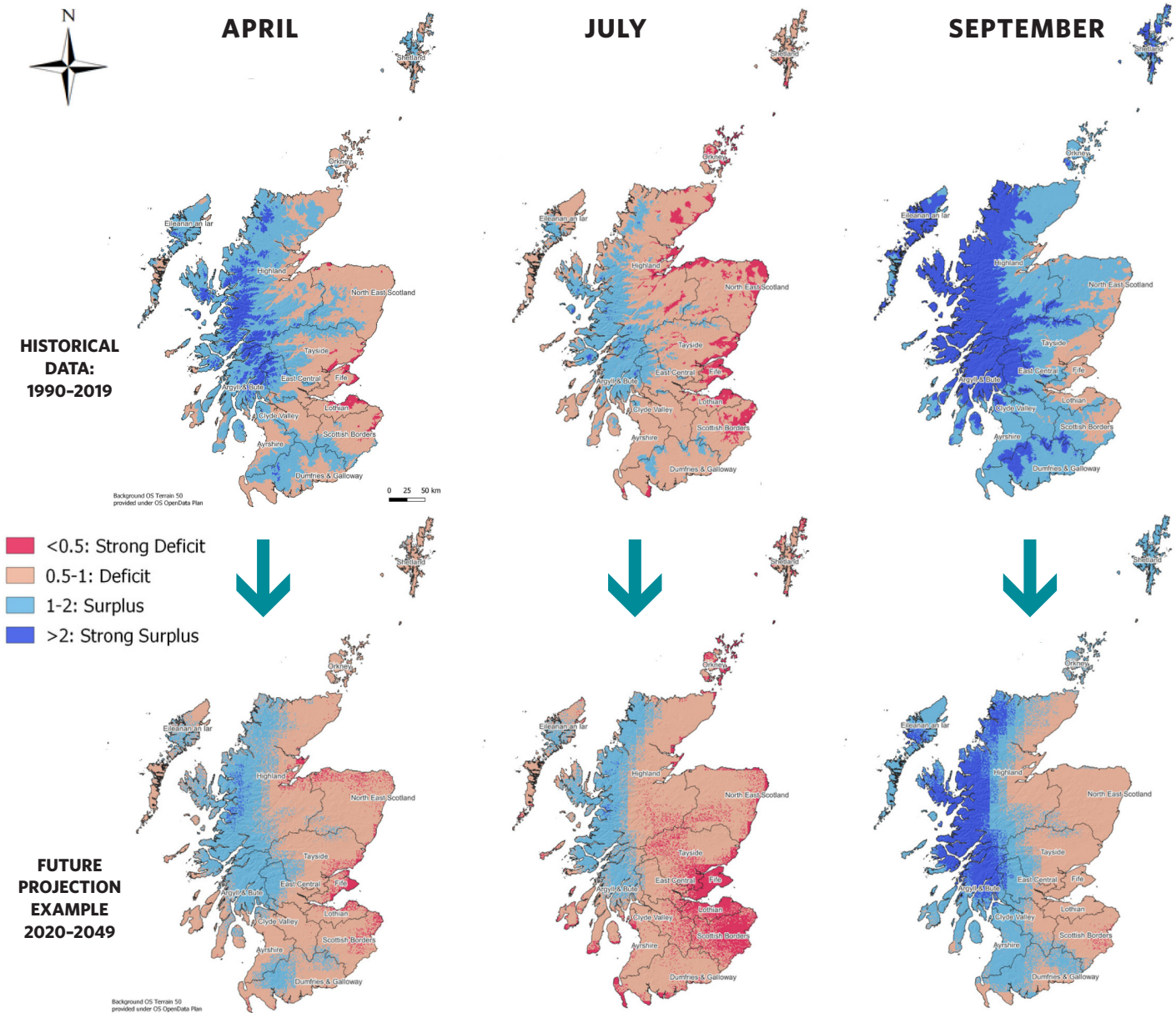
Increasing probability of more frequent and higher water deficits between spring and autumn under climate projections to 2049 ([see report](#)).

Deficits indicate reduced water availability from soils as more moisture will evaporate.

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.

Projections to 2050 indicate the frequency and duration of surface water droughts will double.

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?

Extensive livestock production systems depend on rainfed water sources for the growth of grasslands, which are a vital food source for livestock.

Surface and groundwater sources are required for drinking water to maintain animal health and well-being.

An Irish case study indicates beef production has an average carcass weight water footprint of 8,391 l/kg. ([see ref](#)). Studies show only 1.1% of footprint is drinking water ([see ref](#)).

## What are the future risks?

Burns and lochans used for drinking water may dry up with more, and longer, surface water droughts, requiring careful use of supply and emergency alternative sources.

Drier conditions and reduced soil moisture in the growth states (April and May) may lead to a reduction in grassland yields.

Reduced grass growth could lead to reduced stocking rates, destocking, and purchasing of winter forage.

## What are the adaptation options?

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

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

Alternative deep rooting forages, mixed species swards and building a resource of late season cover with forage crops will increase resilience.

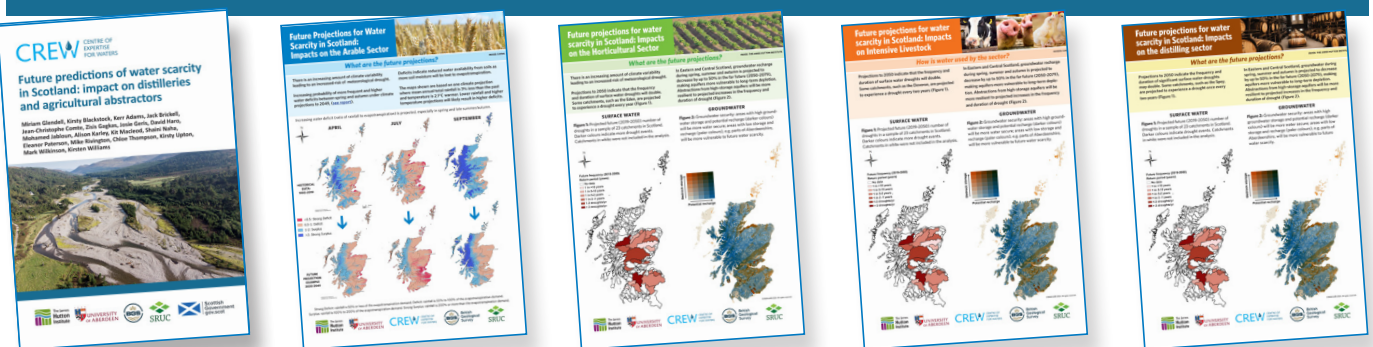
Alternative water systems, such as solar and pasture pump systems, use water efficiently, reducing pressure on low water levels. ([see ref](#)).

Sector	Soil conservation	Measuring water use	Deep rooting forages, mixed swards & bank covers	Alternative watering systems (pasture & solar pumps)
Extensive Livestock	●	●	●	●

● High uptake potential

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

## More Information



PROJECT MAIN REPORT



ARABLE INFOGRAPHIC



HORTICULTURE 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](http://www.crew.ac.uk/publication/water-scarcity-impacts-distilleries-agricultural)