



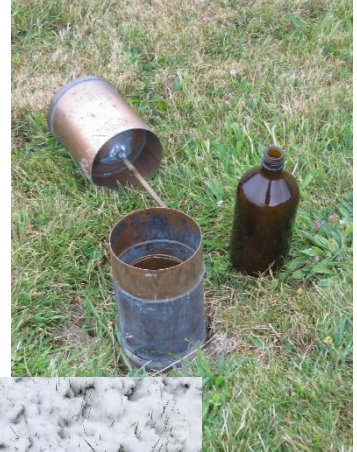
Insights into rainfall undercatch in differing gauge types and heights: the impact of wind speed and rainfall event intensity

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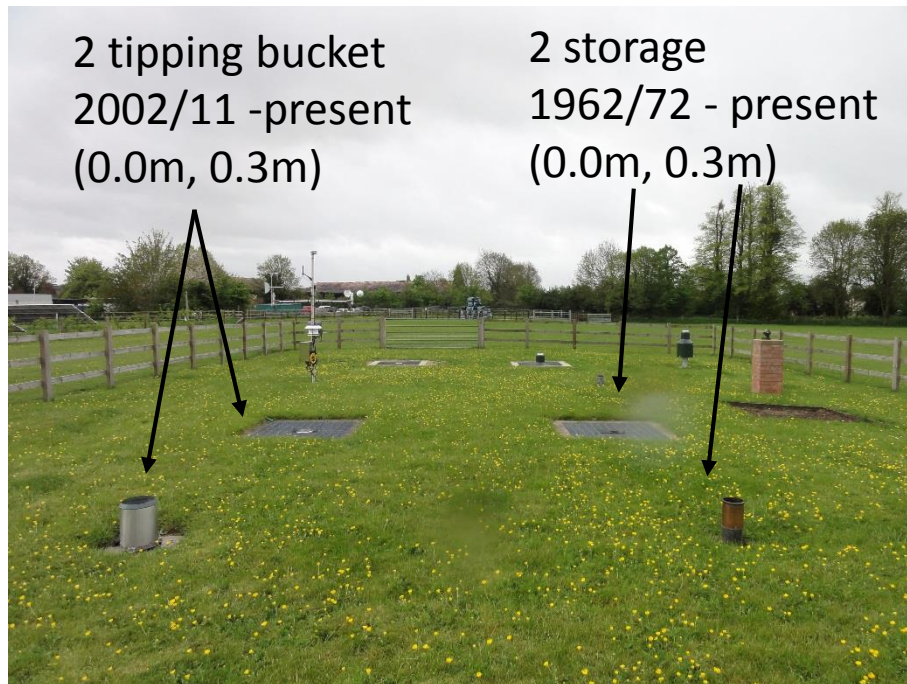
The problem – rainfall measurement

- Rainfall measurement has a long history, but instruments are not perfect!
 - Issue: high intensities, resolution, snow
- Newer technology – weighing gauges
 - Finer resolution, large capacity, improved snow measurement amount
- UK operational network of 30cm gauges
 - Existing research of wind-induced undercatch
- Change in UK network from TBR at 30cm height to weighing gauges at 1m height



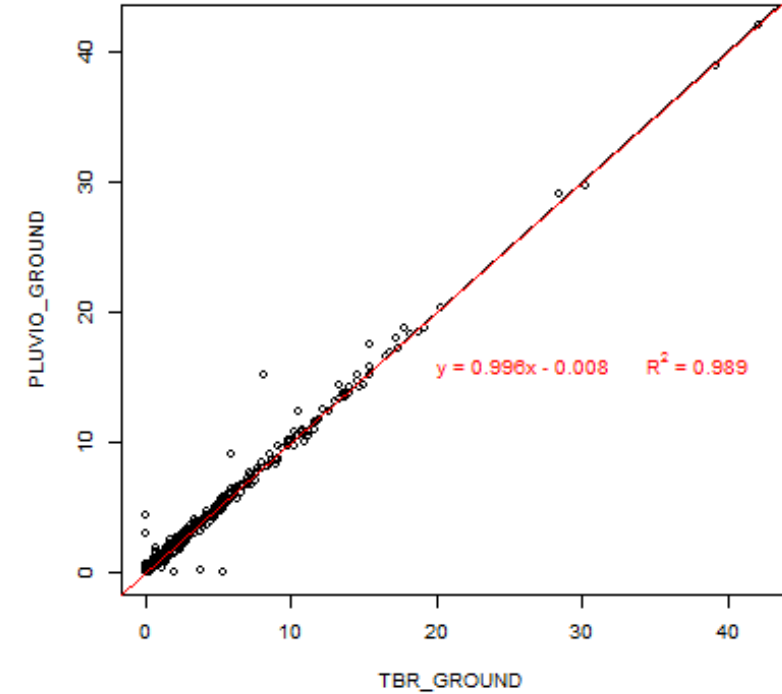
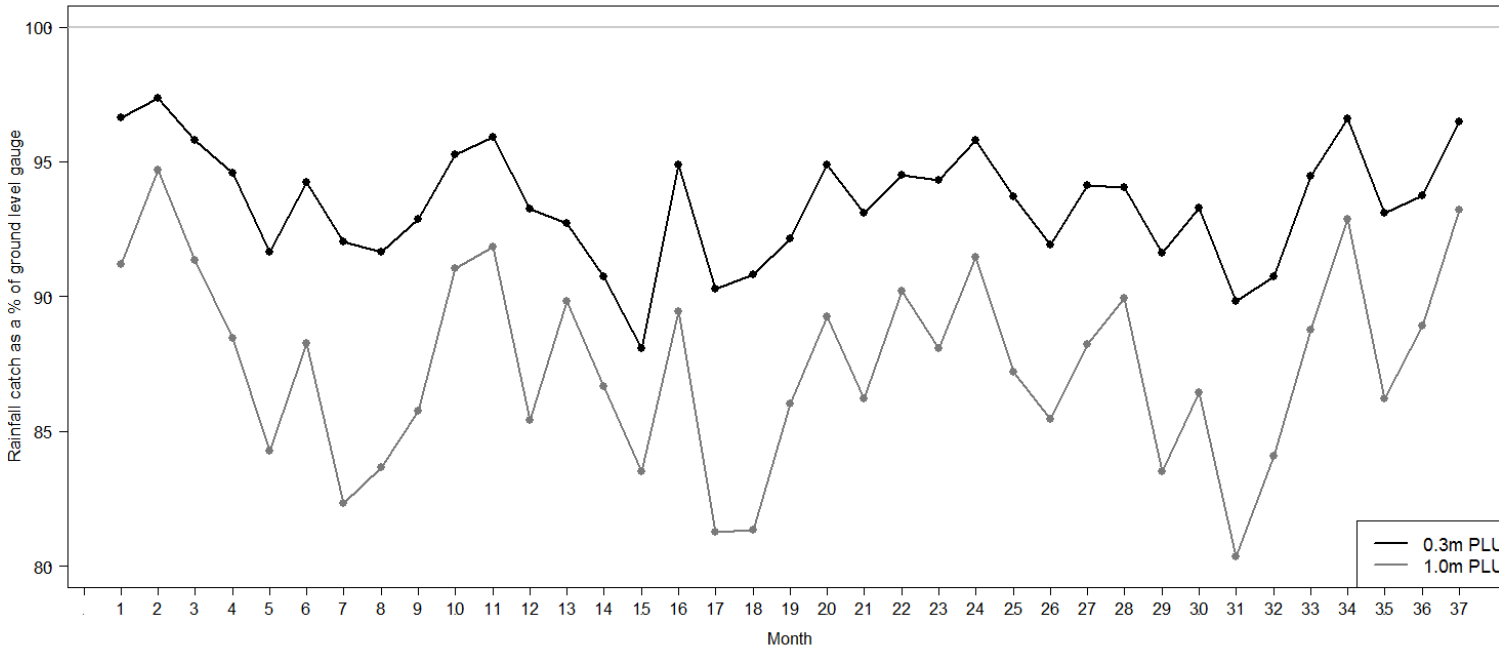
The research – raingauge trials

- Impact of changing from tipping bucket to weighing gauge
- Impact of changing from a 30cm mounting height to 1m
- Drivers of undercatch
- Ways of correcting rainfall recorded at 1m to a lower mounting height



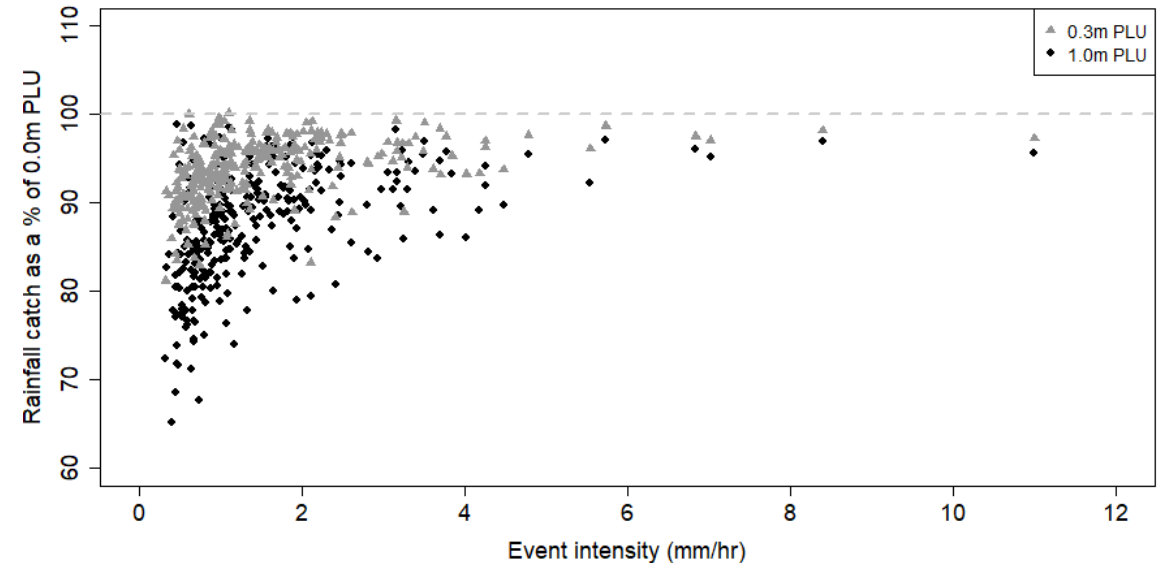
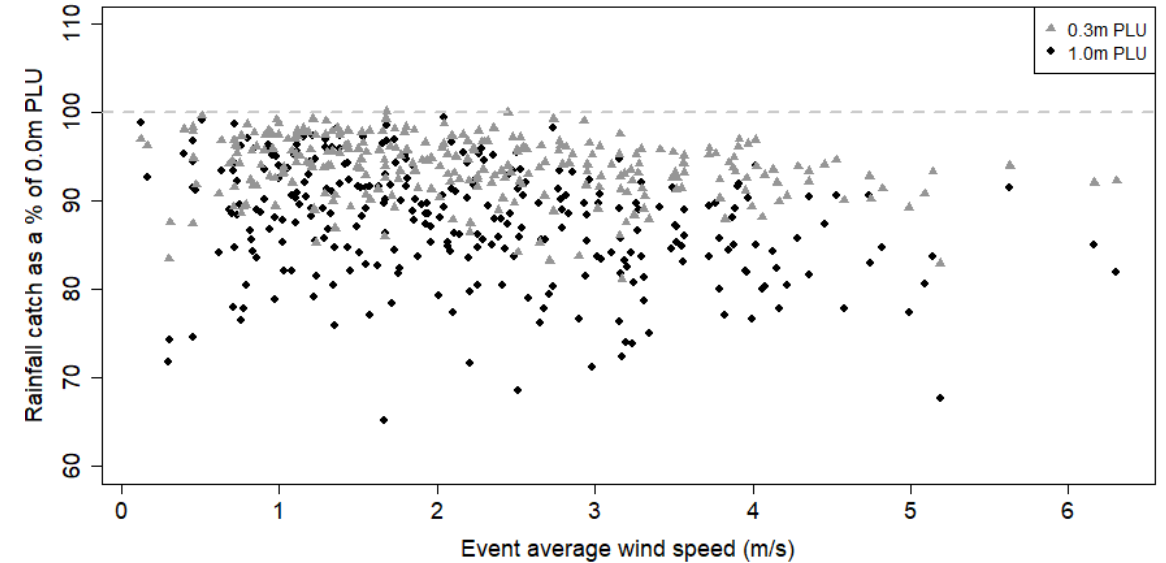
The research – results

- Changing gauge type does not have an impact
- Changing gauge height does have an impact
 - 0.3m - avg. 6.7% undercatch
 - 1.0m - avg. 12.7% undercatch





The research – results (undercatch)

- Event average wind speed
 - Positive relationship, although with a large amount of scatter
- Event average intensity
 - Negative relationship, although with a large amount of scatter, particularly at low intensities



The solution?

- Produce a correction factor? 
 - Complex relationship between undercatch and wind speed / rainfall intensity
 - Particularly at low intensities (78% of events here were <2 mm/hr)
 - If possible, it would only be location specific
 - Need a national network of pit-installed Pluvio gauges
- Gain a better understanding of the relationship 
 - Installation of high resolution wind speed measurement at gauge height

Conclusions

- What is the impact of changing from tipping bucket gauge (TBR) to weighing gauge?
 - Minimal impact (if the gauge is installed at the same height)
- What is the impact of changing from a 30cm mounting height to 1m?
 - Average 6.6% (2.8% - 10.6%).
- What is driving any observed undercatch?
 - Complex relationship between wind speed and rainfall intensity
- Is there a way to correct rainfall data recorded at 1m to a lower mounting height?

Not based on these trials, further research needed / investigation with higher resolution data



Photo: Katie Muchan

Thank you

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