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THE USE OF BIOLOG ECOPLATES™ TO MEASURE THE EFFECTS OF TEMPERATURE AND MOISTURE ON MICROBIAL COMMUNITIES IN ROADSIDE GULLY POT CONTENTS

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Abstract

Roadside gully pots are ubiquitous in urban drainage networks. They are primarily used to retain sediments from road runoff, leaves and organic litter, in order to avoid blockages or hydraulic restriction in the system, which may lead to flooding. Recent research investigating gully pot content activity *ex situ* indicated that they were relatively similar systems across space and time, allowing the contents to be evaluated universally. Although season did not prove to be a major issue when studying the activity of the contents *ex situ*, the microbial community of the contents *in situ* and how temperature and moisture impact upon it is yet unknown. This study is based on gully pots in the city of Kingston upon Hull, U.K. where blocked gullies were partially blamed for exacerbating the flooding in the city during the 2007 floods.

Model gully pots were set up in a laboratory environment to replicate the activity of the contents *in situ* under controlled conditions, and were monitored over a six month period. Biolog EcoPlates™ were used to evaluate the effects of different temperature (5°C, 16°C, 25°C and 30°C) and moisture levels (60% and 80%) on the microbial community of gully pot contents.

The results showed over a six month period different moisture levels did not cause a change in the microbial communities. However, obvious differences in the microbial community were observed between temperatures, where increased temperatures showed an increase in the relative activity observed in the carbon utilisation profiles. These apparent temperature effects were observed throughout the six month observation period

This study demonstrates that temperature has a more dominant effect on the microbial community of roadside gully pot contents *in situ* as opposed to the effects of moisture. These results are important when considering future research investigating more sustainable methods for managing urban drainage.