



CRC for
Water Sensitive Cities



The impact of short-term weather variations on the valuation of local stormwater management projects

Industry Note
Program A: Society
Project A1.1

Do recent weather conditions affect the community's willingness to pay for the benefits associated with local stormwater management projects? For example, is the public willing to pay more for flood protection following a period of heavy rain? Does it place a greater value on urban cooling after a heatwave? In an important finding for policymakers, a recent study suggests that the public's valuation of environmental services is affected by short-term variations in weather conditions.

Stated preference methods, which involve surveying the community to gain insight into its willingness to pay for non-market goods and benefits, are an important tool in the evaluation of environmental services. However, as a consequence of financial and temporal constraints, these surveys are typically conducted in a small number of locations over a short period of time. This approach assumes that community preferences are broadly stable across time and locations; but could they vary based on local conditions (such as weather patterns) around the survey date?

To explore this issue, the CRC for Water Sensitive Cities (CRCWSC) conducted a study to investigate whether short-term variations in rain levels and temperatures impact the valuation of urban stormwater management policies.



Testing the impact of recent weather conditions on environmental preferences

981 homeowners in Melbourne and Sydney participated in a discrete choice experiment to value the benefits of local stormwater management projects. In particular, the respondents were asked about their willingness to pay for reductions in water restrictions, improvements in stream health, reductions in flash flooding, improvements in recreational and amenity benefits, and cooler summer temperatures.

The surveys were conducted in four metropolitan areas (Moonee Valley, Manningham, Warringah and Fairfield) each week between February and October 2013 (wave one), and November and December 2014 (wave two). The extended sampling periods were pivotal in achieving a broad range of weather conditions. During wave two, 318 of the surveyed homeowners were interviewed for a second time.

The study drew on daily weather data to estimate the impact of short-term variations in rainfall and temperature on the respondents' willingness to pay for reductions in flash flooding and cooler summer temperatures.



Recent weather conditions affect willingness to pay

Table 1 summarises the key findings from the study. The results show that the community is generally willing to pay for the benefits associated with stormwater management projects, although there was substantial variability in the willingness to pay values.

Notably, the severity and timing of local weather conditions also affected valuations. Reflecting this, respondents were generally unwilling to pay for further protection against flash flooding, except where they had recently experienced an extreme rain event. Amongst the latter group, willingness to pay was highest for those who had experienced extreme rain in the week prior to the survey, and diminished over time.

In addition, respondents were typically willing to pay more to reduce summer temperatures, unless they had recently experienced a number of very hot days. This suggests that short-term heatwaves may not have been as undesirable as respondents had generally expected.

Table 1. Key findings from the study of Brent et al. (2016)

Key findings	
Willing to pay for environmental services	<ul style="list-style-type: none"> Overall, respondents value the benefits associated with local stormwater management projects Large variation in willingness to pay
Sufficient flood protection	<ul style="list-style-type: none"> Unwilling to pay for further reductions in flood risk
Prefer more urban cooling	<ul style="list-style-type: none"> Willing to pay for additional reductions in peak urban temperatures
Recent, extreme weather has an impact on preferences	<ul style="list-style-type: none"> Respondents who had recently faced extremely heavy rain valued flood protection more than those who had not (this effect diminished over time) Respondents who had recently experienced extremely hot days valued cooler summer temperatures less than those who had not

What this means for policymakers

Data collected through stated preference surveys rightfully plays an important role in informing public policy design. However, the CRCWSC's study demonstrates that preferences can be affected by weather conditions around the time of the survey, at least where the weather is relevant to the subject matter in question.

For policymakers, these findings highlight the importance of considering the ways in which surveys have been conducted and their potential limitations when making scoping and investment decisions.

To assist policy development, further research could explore the mechanisms through which weather impacts community preferences and develop a range of weather distributions (including extremes) to allow policy makers to sample preferences under a range of climate change scenarios.

Further reading

Brent, D., Gangadharan, L., Lassiter, A., Leroux, A., & Raschky, P. (2016). Valuing the Multiple Benefits of Local Stormwater Management. Mimeo. Monash University, Department of Economics.

About the research

This research was conducted as part of the CRCWSC project Cities as Water Supply Catchments: Economic Valuation (Project A1.1). The project's main objectives are to identify the willingness to pay for stormwater harvesting, to quantify the contribution of urban water amenities to property values and to determine the optimal portfolio of urban water supply sources.

Further information



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