CRC for
Water Sensitive Cities

Community understanding of water terminology

A survey of Australian community members' understanding of water-related terminology

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Engaging communities with water sensitive cities – A2.3 – 2016

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Executive Summary

Background and rationale

The language and terminology used to communicate about water issues is an important consideration in engagement programs and materials. Using language or terms that people don't understand can alienate people, turning them off the conversation or information being presented. On the other hand, language that is community-friendly and easily understood is more likely to engage people because they can easily follow what is being communicated. Research has shown that fluency—that is, the perceived ease or difficulty of completing a mental task—can influence engagement (Oppenheimer, 2008). Therefore words or terms that people easily understand should promote fluency whereas those that are not easily understood should decrease fluency.

The current report describes research conducted as part of the A2.3 project: Engaging communities with water sensitive cities. The research contributes to developing an understanding of what water terms are more or less community-friendly, that is, understood and used by community members.

This project has three central aims, which are to:

1. Assess the extent to which community members report understanding a range of terms commonly used in communication about water issues.
2. Assess the socio-demographic and psychological factors that predict more or less understanding of the terms.
3. Examine water professionals' understanding of key water terms and compare their perceptions of community members' understanding with community members' reported understanding of these same terms.

What was done?

A survey of 415 residents of Brisbane, Sydney, Melbourne, and Perth was conducted in September 2015 to assess their understanding of a range of water-related terms commonly used by the water industry. The survey also measured socio-demographic variables and objective water-related knowledge. A survey of 211 water professionals was also conducted from July to September 2015 which assessed understanding of a range of key water terms as well as perceptions of community members understanding of these terms.

What was found?

- A third or more of the sampled community members reported no understanding of the following terms: fit-for-purpose, total water cycle management, water sensitive, treatment wetlands, decentralised water supply, raingarden, biofiltration, urban heat island effect, microclimate, and riparian. A majority or close to a majority of respondents reported understanding the terms recycled water and sustainability well or very well. A majority of community members reported between moderate to very good understanding of the terms: waterwise, catchment, stormwater pollution, and biodiversity.

- Comparisons of understanding between community members from different capital cities and with varying education levels revealed very few differences. When differences did arise, Perth respondents reported greater understanding as did those with a university level education.

- On average, water professionals reported understanding a selection of 11 of the 17 terms between moderately and very well. On average, they judged community members' to understand the terms a little which aligned with how community members' reported their own understanding of the terms.

- Regression analysis to identify the predictors of community members' overall understanding of the water terminology revealed that gender, age, city, and objective water knowledge were the only significant predictors. Greater reported understanding of water terminology overall was associated with being male, younger age, and having greater objective water knowledge. Perth respondents reported more overall understanding than those from Brisbane and Sydney.

- Community members were randomly presented with a description of 2 of 8 water concepts and asked to come up with a term for the concept. The terms that were advanced generally used quite simple language and incorporated terms that are commonly used, for example, natural, eco-, bio-. Examples are: 'natural filtration' for biofiltration, 'purified water' for recycled water, 'city heat' for urban heat island effect, 'purpose specific water treatment' for fit-for-purpose, 'neighbourhood water supply' for decentralised water supply, 'waterwise city' for water sensitive city, and 'polluted runoff' for stormwater pollution.

Where to next?

These findings will inform ongoing research that seeks to identify community-friendly terminology and effective ways to engage communities with sustainable urban water management.

Background

Effective engagement strategies rely on people having a shared language that allows for easy communication and understanding of the key concepts that are the focus of the engagement. Using language or terms that are not familiar could turn people off a topic and decrease their motivation and engagement. A key concept that provides an explanation for how certain terms or language could facilitate or hinder engagement is 'fluency' which refers to the "subjective experience of ease or difficulty associated with completing a mental task" (Oppenheimer, 2008) [p. 237]. In general, research has shown that when statements are perceived to be more fluent (that is, people have a sense of ease in reading and understanding them) they are also judged as more true, likeable, frequent, and to come from a more intelligent sources (Oppenheimer, 2008). Fluency can impact on whether people attend to information, remember it, and it can also direct their choices. Therefore terminology that people feel is easy to understand is more likely to engage people with a topic.

What do we know about community understanding of water terminology?

There are a small number of studies conducted in the United States that have investigated community understanding of water terms.

- An online survey of householders in Western USA asked respondents how familiar they were with 14 water terms (Thorvaldson et al., 2010). A majority of respondents were not at all familiar with eight of the 14 terms. The terms that respondents were very or somewhat familiar with were: ground water, surface water, water reuse, diversion, consumptive use, beneficial use. The terms that respondents were least familiar with included riparian right, conjunctive use, and river call.

- Another study showed that only a third or less of respondents across four regions in the U.S. chose the correct definition of a watershed (Giacalone et al., 2010).

- A study of school students' (aged 12 to 18 years) ocean literacy in Canada showed that the average score on the quiz was below 50% (Guest et al., 2015). A majority of the students' surveyed correctly answered questions relating to whales, plankton, evaporation, and evolution. Ocean literacy was also positively correlated with value of the marine environment.

- A study focused on ocean fisheries surveyed 3000 Pacific Northwest U.S. citizens and asked about their familiarity with terms related to ocean fisheries (Steel et al., 2005). A majority of respondents reported knowing what 6 of the 11 terms meant. These terms were: ecosystem, rockfish, gill net, non-indigenous species, biodiversity, and mixed-stock fisheries. A minority of respondents said they understood nonpoint source pollution, and coastal zone management act. Interestingly, citizens with greater knowledge about ocean conditions were more supportive of ocean and coastal protection.

In summary, familiarity with and understanding of water terminology is generally quite low in the U.S. studies discussed above. The current study, to our knowledge, is the first to test understanding of water terminology in an Australian sample.

What we did: Survey

Who was surveyed?

A survey of community members in Brisbane, Sydney, Melbourne, and Perth was conducted in September 2015. A total of 415 adults were recruited from a permission based social research panel with approximately the same number of respondents in each of the cities. Participants received a small amount of compensation for taking part. As Table 1 shows, there was a broad age range and the gender breakdown was relatively even. There was a higher number of participants who had undertaken university education than the other two education categories (i.e. school or trade/diploma) but there was a relatively even spread across income brackets.

Table 1. Demographic characteristics of the community survey participants

Demographic variable	**Total sample N = 415**	
Age	Mean Range	47.09 years 18 – 90
Gender	Males = 204 Females = 211	204 (49%) 211 (51%)
City	Brisbane Sydney Melbourne Perth	105 104 101 105
Language other than English spoken at home	Yes No	104 (25%) 311 (75%)
Education	School Trade/Diploma University	103 (25%) 129 (32%) 176 (43%)
Total annual household income	<$20,000 $20,000 to less than 40,000 $40,000 to less than 60,000 $60,000 to less than 80,000 $80,000 to less than 100,000 $100,000 to less than 150,000 $150,000 or more Don't know/can't say Prefer not to answer	21 (5%) 68 (16%) 64 (15%) 62 (15%) 47 (11%) 58 (14%) 31 (8%) 10 (2%) 54 (13%)

A survey of water professionals was also undertaken from July to September 2015. The full demographic breakdown of the participants of the water professionals' survey are shown in Appendix A. Participants were recruited via an advertisement in the CRC for Water Sensitive Cities newsflash and through emails to contacts in water organisations around Australia. A total of 211 water professionals took part in the survey; the mean age of participants was 42.05 (SD = 10.20) with ages ranging from 23 to 69 years. Of the 210 participants who indicated their gender, 119 (57%) were male and 91 (43%) were female. Participants had been employed in their respective organisations for a mean of 7.47 years (SD = 6.92), and in the water industry for 11.65 years on average (SD = 9.61)

Community survey measures

The community survey measured the following concepts.

Understanding and use of water terminology

Seventeen water-related terms were selected from a list of 62 water-related terms commonly utilised in the water industry. The items were gathered through a review of water industry documents and websites targeted at non-water industry professionals. A full list of the terms can be found in Table 2. For each term, respondents were asked:

- How well do you understand this term? (response options ranged from 1 = not at all, 5 = very well)
- How often do you use this term? (response options ranged from 1 = never, 5 = very often)

Relevance and importance of the terminology

Respondents were then presented with the full list of 17 terms and asked how relevant the water terms were to them in their day-to-day life (1 = not at all, 5 = very relevant) and how important it was to them to understand the water terms (1 = not at all important, 5 = very important).

Community-generated terminology

A selection of 8 terms was chosen from the full list of 17 items; the items were biofiltration, recycled water, urban heat island effect, fit for purpose, decentralised water supply, water sensitive, stormwater pollution, and microclimate. Each respondent was then randomly presented with the definition for two of these eight terms and asked to come up with a name for the process or concept that aligned with each definition.

Water knowledge

Fourteen items were used to assess objective knowledge of water (see Appendix B). These items were taken from a bank of water knowledge questions developed by Dean, Fielding, Newton, and Ross (2015). Correct responses to the questions were scored 1 and incorrect responses as 0. An overall water knowledge index was also created based on summing correct responses to the 14 questions with higher scores indicating greater water knowledge.

Demographics

Respondents were asked their age, gender, city of residence, whether a language other than English was spoken at home (Yes = 1, No = 0), level of education recoded into school (education up to Year 12), trade/Diploma, and university (bachelor, postgraduate degree) institutions. Total annual household income level was also assessed.

Water professional survey

In a separate survey, water professionals were asked about 11 of the 17 water terms included in the community survey. The water professionals were also asked about terms not included in the community survey. The terms can be found in Table 7. For each term the water professionals were asked:

- How well do you understand this term?
- How well do you think community members understand this term?

What we found

How well do community members understand the water terminology?

As Table 2 shows, recycled water and sustainability were the most well understood terms with 62% of community members reporting that they understand recycled water well or very well and 49% reporting that they understand the term sustainability well or very well. As depicted in Figure 1, however, understanding was quite low overall, with more than a third of the sampled community members reporting no understanding of the terms microclimate, total water cycle management, fit-for-purpose, water sensitive, treatment wetlands, decentralised water supply, raingarden, biofiltration, urban heat island effect, and riparian. More than 60% of community members reported having no understanding of the terms urban heat island effect and riparian.

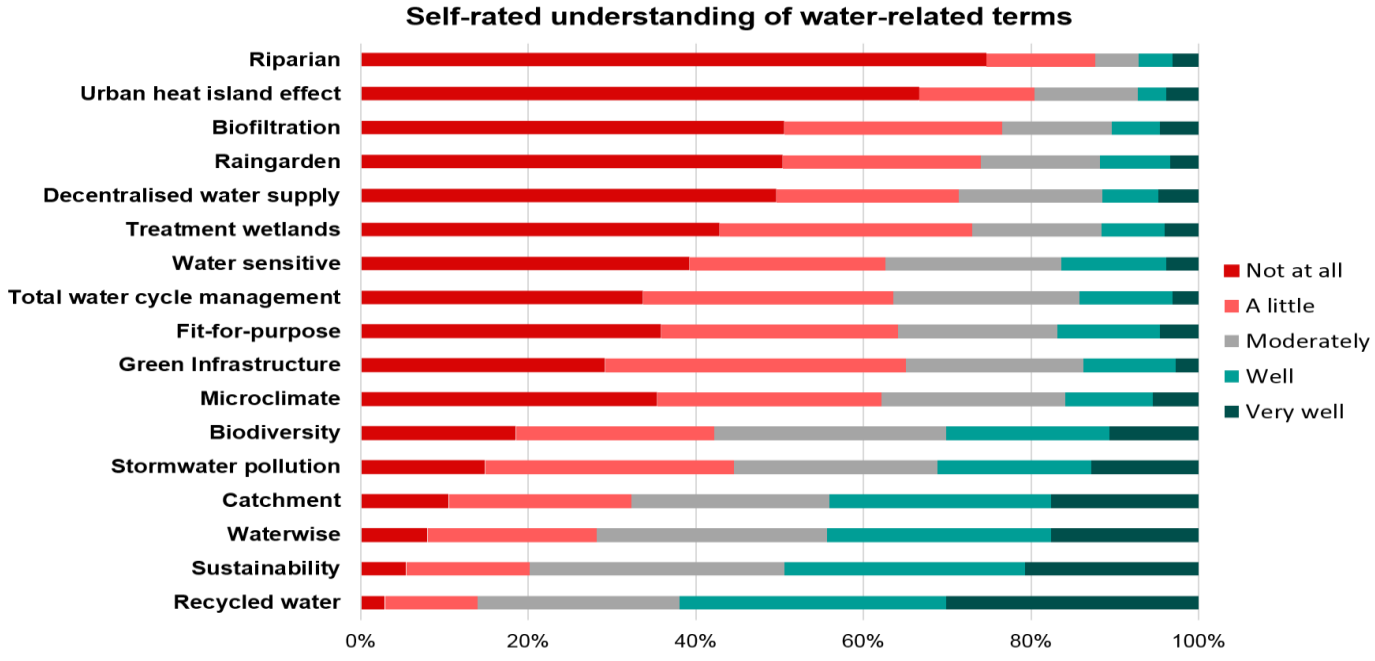


Figure 1. Percentage of responses of community member participants to the question of who well they understand each of the terms

Table 2. Community members' understanding of water terminology: percentage for each response, means, and standard deviation

Water term	1 Not at all	2 A little	3 Moderately	4 Well	5 Very well	Mean (SD)
Recycled water	2.9	11.1	24.1	31.8	30.1	3.75 (1.09)
Sustainability	5.5	14.7	30.4	28.7	20.7	3.44 (1.14)
Waterwise	8.0	20.2	27.5	26.7	17.6	3.26 (1.20)
Catchment	10.6	21.7	23.6	26.5	17.6	3.19 (1.26)
Stormwater pollution	14.9	29.6	24.3	18.3	12.8	2.84 (1.25)
Biodiversity	18.6	23.6	27.7	19.5	10.6	2.80 (1.25)
Microclimate	35.4	26.7	21.9	10.4	5.5	2.24 (1.20)
Green Infrastructure	29.2	35.9	21.2	11.1	2.7	2.22 (1.07)
Fit-for-purpose	35.9	28.2	19.0	12.3	4.6	2.21 (1.19)
Total water cycle management	33.7	29.9	22.2	11.1	3.1	2.20 (1.12)
Water sensitive	39.3	23.4	21.0	12.5	3.9	2.18 (1.19)
Treatment wetlands	42.9	30.1	15.4	7.5	4.1	2.00 (1.12)
Decentralised water supply	49.6	21.7	17.1	6.7	4.8	1.95 (1.17)
Raingarden	50.4	23.6	14.2	8.4	3.4	1.91 (1.13)
Biofiltration	50.6	26.0	13.0	5.8	4.6	1.88 (1.13)
Urban heat island effect	66.7	13.7	12.3	3.4	3.9	1.64 (1.07)
Riparian	74.7	13.0	5.1	4.1	3.1	1.48 (.987)

How often do community members use the water terms?

Not surprisingly, the pattern of responses with respect to the level of usage of the water-related terms is similar to that identified for understanding. As Table 3 shows, 40% of community members said that they sometimes use the term recycled water and 41% sometimes use the term catchment, while just over a third sometimes use the terms sustainability, waterwise, and biodiversity. As depicted in Figure 2, over 40% of community members stated that they never use 11 of the 17 water-related terms listed.

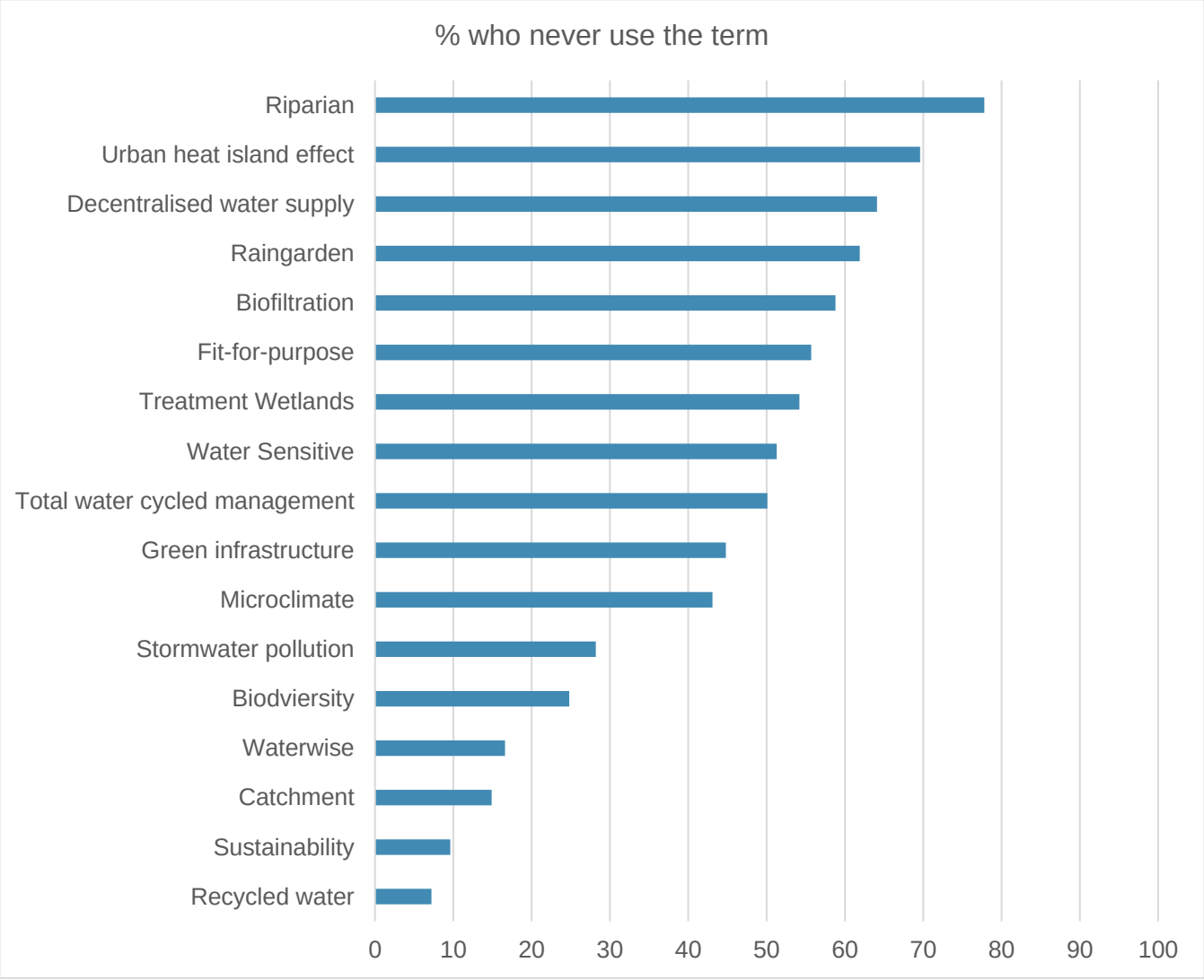


Figure 2. Percentage of community members who never use the term

Table 3. Community members' use of water-related terminology: percentage for each response, means and standard deviation

Water term	1 Never	2 Rarely	3 Sometimes	4 Often	5 Very often	Mean (SD)
Recycled water	7.2	24.1	40.2	21.4	7.0	2.97 (1.01)
Sustainability	9.6	16.9	36.9	26.0	10.6	3.11 (1.12)
Waterwise	16.6	26.3	36.6	16.4	4.1	2.65 (1.07)
Catchment	14.9	28.0	41.4	12.3	3.4	2.61 (.99)
Stormwater pollution	28.2	47.3	27.0	6.0	1.4	2.15 (.95)
Biodiversity	24.8	24.3	34.9	14.5	1.4	2.43 (1.06)
Microclimate	43.1	33.7	17.8	4.1	1.2	1.87 (.93)
Green Infrastructure	44.8	33.0	17.8	3.4	1.0	1.83 (.91)
Fit-for-purpose	55.7	27.2	13.3	2.7	1.2	1.67 (.89)
Total water cycle management	50.1	31.1	14.9	2.9	1.0	1.73 (.89)
Water sensitive	51.3	29.2	13.5	4.6	1.4	1.76 (.95)
Treatment wetlands	54.2	31.3	10.4	3.1	1.0	1.65 (.86)
Decentralised water supply	64.1	23.6	8.4	2.9	1.0	1.53 (.84)
Raingarden	61.9	24.3	9.4	3.6	0.7	1.57 (.86)
Biofiltration	58.8	28.2	10.1	2.2	0.7	1.58 (.82)
Urban heath island effect	69.6	16.9	10.1	2.2	1.2	1.48 (.85)
Riparian	77.8	13.7	5.3	2.4	0.7	1.34 (.75)

Are there differences in community member understanding of water related terms between cities and education levels?

Comparing understanding between cities

As Table 4 shows, there were very few significant differences in understanding of the water terminology between cities. Of the differences that did emerge, Perth community members always reported more understanding. Specifically, Perth respondents reported: a greater understanding of the term waterwise than their counterparts from Sydney or Melbourne; better understanding of total water cycle management than those from Brisbane; better understanding of the term water sensitive than respondents from all other cities; better understanding of the term biofiltration than both Brisbane and Melbourne respondents.

Table 4. Comparison of understanding of water terminology across Australian capital cities

Water term	Brisbane M	Sydney M	Melbourne M	Perth M	F
Recycled water	3.75	3.74	3.75	3.75	.007
Sustainability	3.30	3.41	3.37	3.69	2.31
Waterwise	3.30_{ab}	3.05_{a}	3.01_{a}	3.66_{b}	6.75***
Catchment	3.22	3.21	3.17	3.15	.069
Stormwater pollution	2.78	3.07	2.86	2.67	1.91
Biodiversity	2.60	2.90	2.73	2.96	1.83
Microclimate	2.12	2.27	2.14	2.42	1.38
Green Infrastructure	2.11	2.18	2.27	2.32	.781
Fit-for-purpose	2.17_{ab}	2.05_{a}	2.15_{ab}	2.49_{b}	2.69
Total water cycle management	1.97_{a}	2.17_{ab}	2.15_{ab}	2.50_{b}	4.26**
Water sensitive	2.03_{a}	2.01_{a}	2.12_{a}	2.57_{b}	5.30***
Treatment wetlands	1.91	1.83	2.11	2.14	1.93
Decentralised water supply	1.85	1.93	1.93	2.10	.892
Raingarden	1.70	1.93	1.95	2.05	1.73
Biofiltration	1.66_{a}	1.93_{ab}	1.73_{a}	2.18_{b}	4.64**
Urban heat island effect	1.39_{a}	1.70_{ab}	1.60_{ab}	1.86_{b}	3.57
Riparian	1.54	1.40	1.37	1.60	1.31

**p<.01; ***p<.001; given the large number of analyses conducted and the potential for this to lead to Type 1 error, only differences less than p<.01 are considered significant

Comparing understanding across education levels

As with the comparisons across Australian capital cities, there were few significant differences in reported understanding of the water terms across educational levels. Not surprisingly, in all cases it was community members with a university level education who reported the best understanding of the terminology. Specifically, respondents with a university education reported better understanding of the terms biodiversity, biofiltration, urban heat island effect, and riparian than those with trade/diploma or school education; university educated respondents also reported better understanding of microclimate than community members with school education.

Table 5. Comparison of understanding of water terminology according to educational achievement

Water term	School only N = 103	Trade or diploma N = 129	University N = 176	F
Recycled water	3.51	3.80	3.85	3.260
Sustainability	3.19	3.41	3.60	4.275
Waterwise	3.22	3.32	3.22	.303
Catchment	2.94	3.33	3.22	2.814
Stormwater pollution	2.60	2.98	2.88	2.811
Biodiversity	2.44_a	2.79_a	3.06_b	8.816***
Microclimate	1.91_a	2.22_{ab}	2.43_b	6.231**
Green Infrastructure	2.00	2.22	2.34	3.387
Fit-for-purpose	2.05	2.24	2.27	1.200
Total water cycle management	2.00	2.13	2.37	4.021
Water sensitive	2.14	2.12	2.25	.559
Treatment wetlands	2.00	1.95	2.02	.122
Decentralised water supply	1.78	1.82	2.14	4.234
Raingarden	1.81	1.85	1.99	1.091
Biofiltration	1.61_a	1.84_{ab}	2.06_b	5.27**
Urban heat island effect	1.39_a	1.50_a	1.87_b	8.337***
Riparian	1.30_a	1.36_a	1.66_b	5.578**

**p<.01; ***p<.001; given the large number of analyses conducted and the potential for this to lead to Type 1 error, only differences less than p<.01 are considered significant

How relevant and important are the water related terms to community members?

Overall, respondents did not think that the water terms were very relevant to them in their day-to-day life; 48% stated that they are not at all relevant. Overall, 31% judged that it was not at all important to understand the terms while a further 29% judged it to be very important for them to understand the terms.

Table 6.
How relevant are the water terms to you in your day-to-day life?

1 Not at all %	2	3	4	5 Very relevant	Mean (SD)
48.4	12.8	14.7	9.2	14.9	2.29 (1.50)

Table 7. How important to you is it to understand the water terms?

1 Not at all important %	2	3	4	5 Very important	Mean (SD)
30.6	15.9	14.5	10.4	28.7	2.91 (1.62)

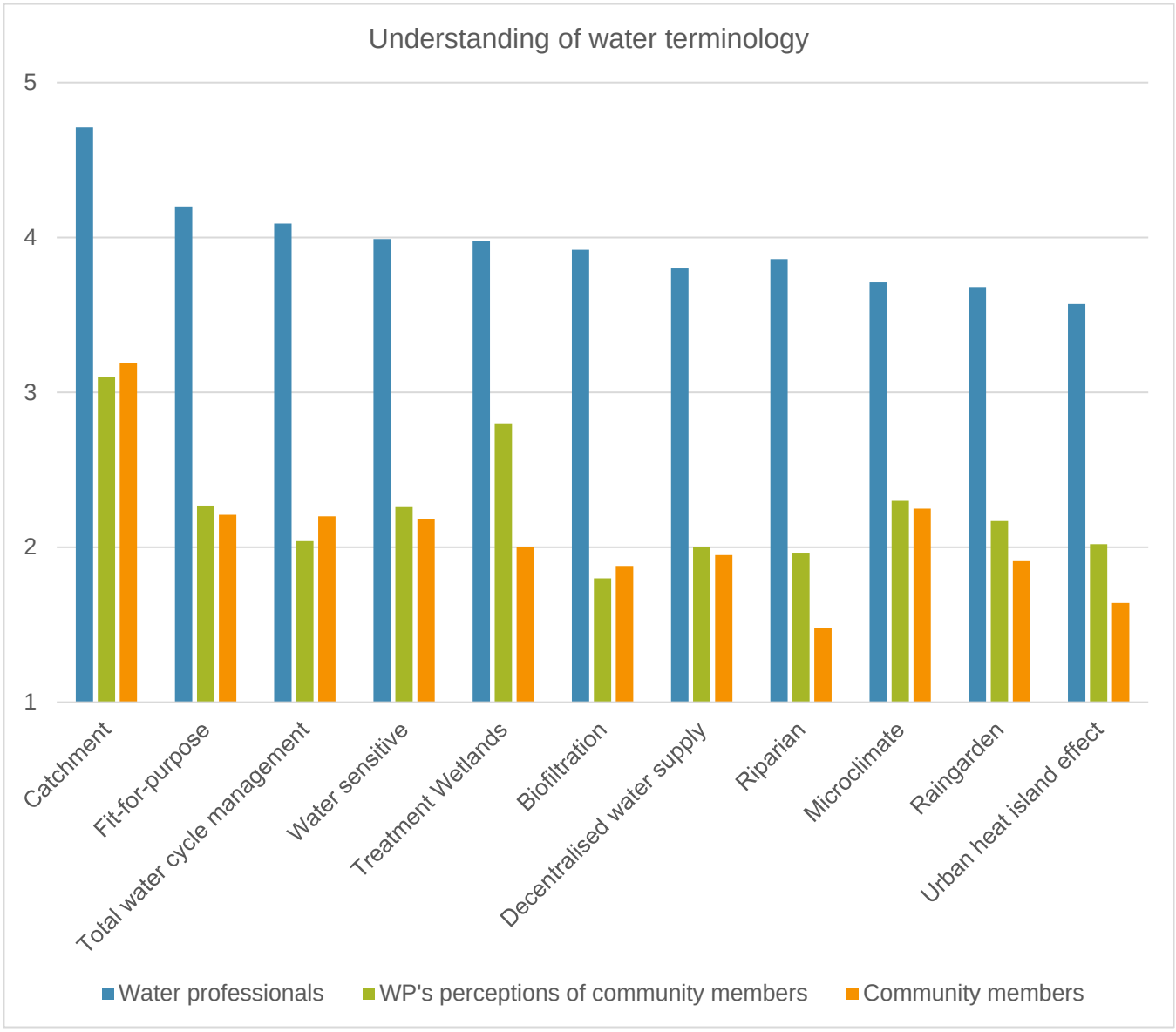
Water professionals' understanding of water terminology compared to that of community members'

Eleven of the water terms included in the community survey were also included in the survey administered to water professionals. As Table 8 shows, water professionals' average reported understanding of catchment, fit-for-purpose, and total water cycle management were at the upper end of the scale (i.e., between well understood and very well understood). Their average understanding of the remaining eight terms fell between moderate and well understood. Their perceptions of community members' understanding of the terms generally fell between a little and moderately understood with biofiltration and riparian perceived to be understood less than the other terms. According to the current data, there is a high level of alignment between what water professionals' perceive to be the level of understanding among community members and how community members rate their own level of understanding. In other words, water professionals' perceptions of what community understand is relatively accurate.

Table 8. Mean responses of water professionals' own understanding of water terminology, their perceptions of the level of understanding among community members, and community members' own reported levels of understanding

Water Terms Used	Water professionals' understanding **Mean**	Water professionals' perceptions of community members' understanding **Mean**	Community members' reported understanding **Mean**
Catchment	4.71	3.10	3.19
Fit-for-purpose	4.20	2.27	2.21
Total water cycle management	4.09	2.04	2.20
Water sensitive	3.99	2.26	2.18
Treatment wetlands	3.98	2.18	2.00
Biofiltration	3.92	1.80	1.88
Riparian	3.86	1.96	1.48
Decentralised water supply	3.80	2.00	1.95
Microclimate	3.71	2.30	2.24
Raingarden	3.68	2.17	1.91
Urban heat island effect	3.57	2.02	1.64

Scale: 1 = not at all, 2 = a little, 3 = moderately, 4 = well, 5 = very well

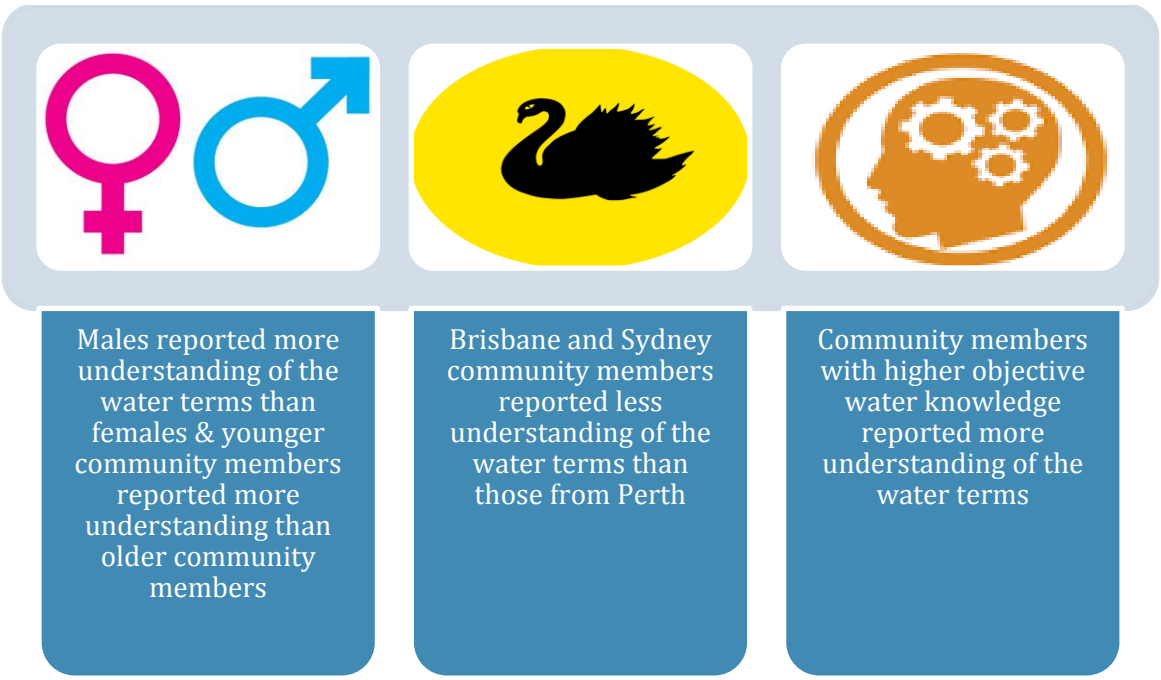


Scale: 1 = not at all, 2 = a little, 3 = moderate, 4 = well, 5 = very well

What factors are associated with community members' reported understanding of the water terminology?

To explore which factors may be associated with more or less reported understanding of the water terminology, a multiple regression analysis was conducted. A scale representing overall understanding of the designated water terminology was computed based on the mean of the responses to the 17 items used to assess understanding of water terms. The reliability of the scale was high (Cronbach's alpha = .94).

The predictors of overall understanding of water terminology included in the analysis were: gender, age, education level, income, whether respondents had a garden or not, city, and score on the overall water knowledge index. The only significant predictors of overall understanding of the water terms were: age, gender, city, and water knowledge. Males reported more understanding than females, younger respondents reported more understanding, Brisbane and Sydney community members reported less understanding than their Perth counterparts, and those with higher objective water knowledge reported better understanding than community members with lower objective water knowledge. The full statistics for this analysis can be found in Appendix B.



What alternative terms did community members come up with for water concepts?

Community members came up with a number of different terms when they were randomly presented with a range of water related definitions. These are outlined below. Note that in all cases, some community members suggested the accepted term and this was especially the case for microclimate.

Biofiltration	***Recycled water***
Biopurification	Smart water
Biocleaning	Reusable water
Natural filters/filtration	Clean/cleaned water
Natural purification	New Water
Natural pollutant removal	Purified water
Eco cleaning	Reclaimed water
	Water rejuvenation
	Waste nothing water system
Urban heat island effect	***Fit for purpose***
Urban heat sink/store	Designed water
City/urban climate	Water for purpose
City heat	Wise use of water
Inner city warming	Special purpose water
Hot city	Purpose specific water treatment
	Water suitability

Decentralised water supply Local/localised water supply Non-mains water Neighbourhood water supply/system Urban water collection system Shared water assets MyWater Water hub Renewed water Harvest Water	***Water sensitive city*** Hydrosustainable city Waterwise city (most common response) Ecocity Biocity Water community/water harmony Water sensible Green city/clean city/nature city Water friendly/water sensible Water conscious (Note that there were many responses that reflected the ideal nature of this concept. People provided terms that reflected this: arcadia, utopia, paradise, wonderland, the perfect city, a nice place to live and work. One person said “quite honestly, a bloody miracle!!!”).
Stormwater pollution Polluted stormwater Polluted rainwater Polluted runoff/runoff pollution City polluted water Dirty water	***Microclimate*** Localised/local environment Unique climate Local conditions Variable climate Climate diversity Mini climate Microtemp (Note that the most common option was microclimate)

Summary

To our knowledge, the current research is the first to investigate Australian community members' understanding of water terms that are often used in communication with external stakeholders. Terminology is important as research has shown that people are more likely to remember and pay attention to messages when they feel that they can easily understand the words or statements.

The following conclusions can be drawn from the data:

- The results indicate typically low levels of understanding of commonly used water terminology; a majority or close to a majority of community members understood the terms recycled water and sustainability well or very well. A third or more of the sampled community members reported no understanding of 9 of the 17 water-related terms; more than 50% said that they had no understanding of the terms raingarden, biofiltration, heat island effect, and riparian. Our analyses revealed few differences in understanding across cities, education levels, or other demographic factors.

- Our findings also showed that water professionals seem to understand the relatively low level of understanding within the community when it comes to water terminology. Specifically, there is a high level of alignment between what water professionals' perceive to be the level of understanding among community members and how community members rate their own level of understanding.

- Although close to a majority of the sampled community members did not judge the water terminology to be a relevant part of their day-to-day life, 29% felt that it was very important for them to understand the terms.

- The key predictors of overall understanding of the water terms were gender, age, city, and objective water knowledge. Greater reported understanding of the terms overall was associated with being male, younger age, and having greater objective water knowledge. Brisbane and Sydney community members reported less overall understanding of the terms than those from Perth.

Implications for practice

An interesting conclusion from the current research is that despite water professionals' accurate judgement that community members have little understanding of many water-related terms, the terminology continues to be used in communication materials. This point clearly highlights a need to work to: 1) develop community-friendly water terms, and/or 2) work to educate and familiarise community members with water-related terminology. In relation to developing community-friendly terminology, the current research asked respondents to come up with terms to describe a selection of water concepts. Many of the terms advanced by respondents used simple or familiar language. For example, natural, bio-, eco-, waterwise are terms that are commonly used and for this reason came easily to the mind of many respondents. One water term that has received attention from researchers and water organisations because of the potential for negative responses to it is recycled water (Simpson and Stratton, 2011). A range of terms have been generated for recycled water that respondents in our study nominated including new water and purified water suggesting that people are becoming familiar with these alternative, positively balanced terms.

Where to next?

These findings will inform ongoing research that seeks to identify community-friendly terminology and effective ways to engage communities with sustainable urban water management.

References

Dean, A., Fieldilng, K., Newton, F. & Ross, H. (2015) Community knowledge about water: Who has better water-related knowledge and is this important? . Melbourne, Australia: Cooperative Research Centre for Water Sensitive Cities.

Giacalone, K. M. C., Mobley, C., Sawyer, C., Witte, J. & Edison, G. (2010). Survey says: Implications of a public perception survey on stormwater education programming. *Journal of Contemporary Water Research & Education,* 146**,** 92-102.

Guest, H., Lotze, H. K. & Wallace, D. (2015). Youth and the sea: Ocean literacy in Nova Scotia, Canada. *Marine Policy,* 58**,** 98-107.

Oppenheimer, D. M. (2008). The secret life of fluency. *Trends in Cognitive Sciences,* 12**,** 237-241.

Simpson, J. & Stratton, H. 2011. Talking about water: words and images that enhance understanding. *Waterlines Report.* Canberra: National Water Commission.

Steel, B., Lovrich, N., Lach, D. & Fomenko, V. (2005). Correlates and Consequences of Public Knowledge Concerning Ocean Fisheries Management. *Coastal Management,* 33**,** 37-51.

Thorvaldson, J., Pritchett, J. & Goemans, C. (2010). Western Households' water knowledge, preferences, and willingness to pay. *Canadian Journal of Agricultural Economics,* 58**,** 497-514.

Appendix A

Table A1. Demographics of the respondents to the water professional survey

Demographic variable	Total sample N = 211	
Age	Mean Range	42.05 years 23-69
Gender	Males Females	119 (57%) 91 (43%)
Highest level of education	School Diploma/Trade qualification Undergraduate degree Postgraduate degree	4 (2%) 20 (10%) 76 (37%) 108 (52%)
State	ACT NSW QLD SA VIC WA International	1 (0.5%) 21 (10%) 67 (32%) 2 (0.9%) 70 (33%) 40 (19%) 10 (5%)
Length of time in water industry	Mean Standard deviation	14.45 years 9.98 years
Length of employment in current organisation	Mean Standard deviation	7.47 years 6.92 years
Type of organisation	Local Government State Government Water utility Private Other	70 (33%) 34 (17%) 55(26%) 36 (17%) 16 (8%)
Level in organisation	Executive Senior/middle management Supervisor/team leader No management responsibility Other	13 (6%) 38 (18%) 45 (21%) 105 (50%) 10 (5%)

Appendix B

Note that n = 26 respondents were excluded from this analysis because they clicked on exactly the same number for each of the knowledge questions, suggesting that they were not engaged with these questions. Education level was dummy coded so that university education was the reference category. City was dummy coded so that Perth was the reference category.

Table B1. Results of the multiple regression analysis predicting community members' overall understanding of the water terminology.

Variables	Outcome: understanding of water terminology
Step 1	R^2=.07, F(10,337)=2.71, p = .003
Age	-.122*
Gender	-.161**
School	-.108
Trade/Diploma	-.007
Income	-.024
Garden	-.048
Brisbane	-.164**
Melbourne	-.082
Sydney	-.133*
LOTE	
Step 2	R^2_{ch}=.13, F(1,336)=55.72, p<.001
Water knowledge	.461***

*p<.05, **p<.01, ***p<.001; Gender coded as 1 = male, 2 = female; School and Trade/diploma compared to university; Garden coded as 0 = no garden, 1 = garden; Brisbane, Melbourne & Sydney compared to the reference category of Perth

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