18 November 2016
Issue 477

Subscribe to free weekly News Alert

Source: Mak, C., Scholz, M., & James, P. (2016). Sustainable drainage system site assessment method using urban ecosystem services. *Urban Ecosystems*. DOI:10.1007/s11252-016-0593-6. This study is free to view at: http://link.springer.com/article/10.1007/s11252-016-0593-6.

Contact:
miklas.scholz@tvrl.lth.se; m.scholz@salford.ac.uk

Read more about:
Biodiversity, Green infrastructure, Water

1. www.ciria.org/Resources/Free_publications/SuDS_manual_C753.aspx

2. Scholz, M., Uzomah, V., Almuktar, S., Radet-Taligot, J. (2013). Selecting sustainable drainage structures based on ecosystem service variables estimated by different stakeholder groups. *Water*, 5:1741–1759. DOI:10.3390/w5041741.

3. Tzoulas, K., James, P. (2009). Making biodiversity measures accessible to non-specialists: an innovative method for rapid assessment of urban biodiversity. *Urban Ecosystems*, 13: 113–127. DOI:10.1007/s11252-009-0107-x.

European Commission

Science for Environment Policy

Sustainable drainage systems: new ecosystem services-based evaluation methods

Sustainable drainage systems (SuDS) could be made better for biodiversity and local people with the help of two new evaluation methods presented by a recent study. The methods, which assess the value of SuDS sites for wildlife habitat, carbon sequestration, recreation and education, are described by the study's authors as cost-effective, quick and reliable, and could help designers plan and retrofit SuDS that are wildlife-friendly and socially inclusive.

SuDS mimic nature to manage and treat storm water. There are various forms of SuDS which help prevent flooding and clean up contaminants; these include ponds, green roofs, artificial wetlands and absorbent pavements. The green infrastructure provided by SuDS is seen as an important way of helping EU Member States achieve good surface water status under the Water Framework Directive.

In the UK, where this study was conducted, the Construction Industry Research and Information Association (CIRIA) has recently updated its influential SuDS manual[1], which provides guidance on the planning, design, construction, operation and maintenance of SuDS. This latest version promotes the design of SuDS design that provide a range of ecosystem services.

The evaluation methods presented by this study are intended to support this ecosystems-services approach[2]. They can help designers understand and improve the value of a SuDS site. They also give designers a better understanding of which features[2] of a SuDS site provide which ecosystem services, to help guide new developments.

The **first method** considers which features provide **biodiversity-related services**, specifically habitat for wildlife and carbon sequestration. It is adapted from an existing method[3] and based on evidence that diverse vegetation, at various heights, is best for providing habitat. The method involves assessing which broad types of vegetation are present, such as trees and grasses, at which heights (e.g., upper canopy of a tree, low bush, long grass, cropped grass), and if there are any plants in water.

Designers can then give a SuDS site a score to indicate its potential for providing habitat and carbon ecosystem services. In general, points are given for every layer of vegetation (including aquatic plant species, if present). However, the method considers ecosystem disservices as well as services, and the scoring system deducts points for some layers; for example, cropped grass, which is unbeneficial for carbon sequestration. The presence of any built and impermeable layers at a site (e.g. concrete surface) also leads to points being deducted.

The **second method** considers which features contribute to **recreational and educational ecosystem services**. It assesses public accessibility to a site (both legal and physical), evidence of the site being used for educational purposes by community groups, educational signs, the distance to the nearest educational establishment, and recreational infrastructure (e.g. benches and footpaths). Again, ecosystem disservices are considered, so the presence of litter and dog faeces is also assessed, as well as bins, which help reduce these two problems.

Continued on next page.

European Commission

Science for Environment Policy

Sustainable drainage systems: new ecosystem services-based evaluation methods *(continued)*

18 November 2016
Issue 477

Each feature is scored on a scale of 0 to 3. Scores for recreational features and scores for educational features are combined separately to produce two total scores.

The researchers tested the two methods on 49 SuDS sites in and around the city of Manchester, UK. This revealed that large sites (over 5 500 m^2) with permanent aquatic features such as ponds tended to be more capable of providing habitat and carbon sequestration services. Scores for habitat and scores for recreation were positively linked to each other.

The researchers acknowledge that there is some subjectivity to the evaluation methods, but say that they provide the right balance of reliability, speed and cost-effectiveness.

Source: Mak, C., Scholz, M., & James, P. (2016). Sustainable drainage system site assessment method using urban ecosystem services. *Urban Ecosystems*. DOI:10.1007/s11252-016-0593-6. This study is free to view at: http://link.springer.com/article/10.1007/s11252-016-0593-6.

Contact:
miklas.scholz@tvrl.lth.se; m.scholz@salford.ac.uk

Read more about:
Biodiversity, Green infrastructure, Water