Designing with Nature: Green Walls

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Green walls

Definitions, terminology and categorisation

Ecosystem services (Why should we build green walls?)

**Workshop:**
How can we progress development of green walls in Scotland?
Are schools and workplaces a good place to start?
Definitions, Terminology, Categorisation
What is a green wall?

“Vegetation growing on or against a vertical surface” – Staffordshire University Green Wall Centre
Types of green wall

Growing medium: ground vs wall

Hydroponic vs soil/substrate

Active (‘biofilter’) vs passive: air pumps vs none
Green façades
'Modular' green walls (hydroponic or soil/substrate)
Green screens
Green Wall, Living Wall or Vertical Garden?
Green Wall Ecosystem Services
Green Walls Ecosystem Services

**Biodiversity**
e.g. Chiquet et al (2014): animal biodiversity and characteristics of green walls (birds, molluscs, spiders, insects)
e.g. Atkins et al (2015): bird use of hedges and design of LW’s

**Air quality**
e.g. Sternberg et al (2010): Ivy walls
e.g. Pugh et al (2012): modelling study
e.g. Dover (2016): Agrosci Aerogation Active Green Wall – NO₂
e.g. Torpy et al / Sydney Uni. Tech. ‘Junglefly Breathing Wall’
e.g. Carslaw et al (2015): *negative* impact of plant VOCs on IAQ
Green Walls Ecosystem Services

Urban cooling/ UHI
  e.g. Price et al (2015): Vertical greenery systems as a strategy

Noise abatement
  e.g. Veisten et al (2012): green walls as soundscape measures
  e.g. Coma et al (2015): acoustic insulation in buildings

Water management
  e.g. Köhler (2007): Rain water management with green roofs and living walls

Environmental aesthetics
  e.g. Sutton (2014): Aesthetics for green roofs and walls
Green Walls Ecosystem Services

Human health and wellbeing

e.g. Rootes et al (2015): green wall in a schools

- Significant increase in Workplace satisfaction + Perceived productivity
- Perceived ‘restorativeness’: Being away + Fascination
- Mood: Valence + Pleasant activation

- e.g. Statistic Ltd: Naava active greenwalls in work environments – reduced health symptoms (tiredness, coughing, dry + stuffy air)
Green Walls Ecosystem Services

**Energy conservation & building protection**
e.g. Cameron et al (2014): Plant choice and wall cooling
e.g. Perez et al (2014): Vertical greenery systems for energy savings in buildings – a review

**Urban Ecotourism**
e.g. Kanter Otçu (2015): Role and benefits of vertical gardens in sustainable tourism
Environmental education

Marc Grañén’s ‘Edible’ Vertical Gardens in Schools, Barcelona
Environmental education

Marc Grañén’s ‘Edible’ Vertical Gardens, Barcelona
Bringing Marc Grañén’s edible green walls to Scotland

Central Scotland Green Network Ideas Fund Competition Winner 2016
How can we progress development of green walls in Scotland?
What opportunities and barriers are there?
Who are the key organisations that might be involved?
What research needs to be done?
What can we do to ensure sustainability and best practice?