

The Eco-Health Relationship Browser

4 ecosystems:

- Forests
- Urban Ecosystems
- Wetlands
- Agro-Ecosystems

6 Ecosystem Services:

Health promotional services

- Aesthetics & Engagement with Nature
- Recreation & Physical Activity

Buffering services

- Clean Air
- Clean Water
- Heat Hazard Mitigation →
- Water Hazard Mitigation



30+ health outcomes:

- Asthma
- ADHD
- Cancers
- Cardiovascular diseases
- Heat stroke
- Healing
- Low birth weight
- Obesity
- Social relations
- Stress
- ... many more



Goals of Eco-Health Relationship Browser

- Increase awareness of nature's role in individual and community health and well-being
- Demonstrate value of green infrastructure through multiple benefits of "ecosystem services"
- Augment services in low SES and disproportionately stressed or vulnerable communities
- Prevent unintended consequences of habitat alteration and landscaping plans
- Promote systems thinking
- Provide documentation of scientific studies and strength of their results

<http://www.epa.gov/research/healthscience/browser/introduction.html>



SUSTAINABLE & HEALTHY COMMUNITIES RESEARCH PROGRAM

Bibliography Eco-Health Relationship Browser: Public Health Linkages to Ecosystem Services Topics:

Click a topic bubble or choose a topic from the dropdown menu. Hover over linkages (+) to view the relationship details.

Details

Description: Urban Ecosystems
An urban ecosystem that combines natural elements with built infrastructure. A large proportion of these systems are located in urban areas and/or people live in them. These systems include blue spaces within the area, such as parks, cemeteries, lakes and streams, along with human components. Urban ecosystems can mimic the function of natural ecosystems and thus provide their own important ecosystem services that contribute to human well-being in those urban areas. Various green environments such as shade trees, urban green spaces and urban forests, can exist within a single urban region. The services provided by urban ecosystems include filtering water runoff, providing areas for physical activity and recreation such as hunting and bird watching, and mitigating the Urban Heat Island effect by replacing heat-absorbing impervious surfaces and increased shading from shade trees. Additionally, urban green spaces such as private gardens provide opportunities for

Citations/Sources
Pickett et al., 2001; Guidotti, 2010; Hancock, 2002; Freeman et al., 2012

You are here: **Urban Ecosystems**

based on Moritz Steiner's Relation Browser

Bibliography Eco-Health Relationship Browser: Public Health Linkages to Ecosystem Services Topics: **Urban Ecosystems**

Click a topic bubble or choose a topic from the dropdown list above.
 Hover over linkages (+) to view the relationship between elements.

Details

Description: Urban Ecosystems
 An urban ecosystem is a dynamic system that contains both built and natural elements. In urban ecosystems, built infrastructure typically covers a large proportion of the land surface and/or people live in high densities. These systems include all green and blue spaces within the area, such as parks, cemeteries, lakes and streams, along with human components. Urban ecosystems can mimic the function of natural ecosystems and thus provide their own important ecosystem services that contribute to human well-being in those urban areas. Various green environments such as shade trees, urban green spaces and urban forests, can exist within a single urban region. The services provided by urban ecosystems include filtering water runoff, providing areas for physical activity and recreation such as hunting and bird watching, and mitigating the Urban Heat Island effect by replacing heat-absorbing impervious surfaces and increased shading from shade trees. Additionally, urban green spaces such as private gardens provide opportunities for

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URBAN ECOSYSTEMS / HEAT HAZARD MITIGATION


Green spaces within urban areas can decrease daytime atmospheric temperatures through shading and evapotranspiration, thus decreasing the Urban Heat Island effect (UHI). Increasing vegetative cover and adding higher reflective surface materials in urban areas can reduce temperatures within the area and

You are here: **Urban Ecosystems**

based on Moritz Stefaner's Relation Browser

Bibliography Eco-Health Relationship Browser: Public Health Linkages to Ecosystem Services Topics: Heat Hazard Mitigation

Click a topic bubble or choose a topic from the dropdown list above.
Hover over linkages (+) to view the relationship between elements.



Details

Description: Heat Hazard Mitigation
The Urban Heat Island (UHI) effect is a heating phenomenon that occurs in urban centers and their surrounding suburban areas. With the UHI effect, metropolitan areas do not cool down at night due to the release of heat from dark surfaces that absorb heat throughout the day. In UHIs, temperatures can be 6 to 8 degrees higher in urban centers than in nearby woodlands. This fact is especially important during heat wave events, where those who reside in urban areas are often most effected due to exposure to higher maximum temperatures and less nighttime reprieve from heat. In urban systems, green spaces such as parks, urban forests and green roofs, can reduce urban temperatures and mitigate the effects of heat wave events through evapotranspiration and shading. The cooling effects of these green spaces may be especially important during heat waves, where temperatures directly outside the homes in which people are confined (elderly, infirm) have an effect on mortality.

You are here: [Urban Ecosystems](#) / [Heat Hazard Mitigation](#)

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Bibliography Eco-Health Relationship Browser: Public Health Linkages to Ecosystem Services Topics: Heat Hazard Mitigation

Click a topic bubble or choose a topic from the dropdown list above.
 Hover over linkages (+) to view the relationship between elements.

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  graph TD
    U[Urban Ecosystems] -- "+" --> H[Heat Hazard Mitigation]
    A[Anxiety] -- "+" --> H
    M[Mortality] -- "+" --> H
    HS[Heat Stroke] -- "+" --> H
  
```

Details

Description: Heat Hazard Mitigation
 The Urban Heat Island (UHI) effect is a heating phenomenon that occurs in urban centers and their surrounding suburban areas. With the UHI effect, metropolitan areas do not cool down at night due to the release of heat from dark surfaces that absorb heat throughout the day. In UHIs, temperatures can be 6 to 8 degrees higher in urban centers than in nearby woodlands. This fact is especially important during heat wave events, where those who reside in urban areas are often most effected due to exposure to higher maximum temperatures and less nighttime reprieve from heat. In urban systems, green spaces such as parks, urban forests and green roofs, can reduce urban temperatures and mitigate the effects of heat wave events through evapotranspiration and shading. The cooling effects of these green spaces may be especially important during heat waves, where temperatures directly outside the homes in which people are confined (elderly, infirm) have an effect on mortality.

- Evidence -

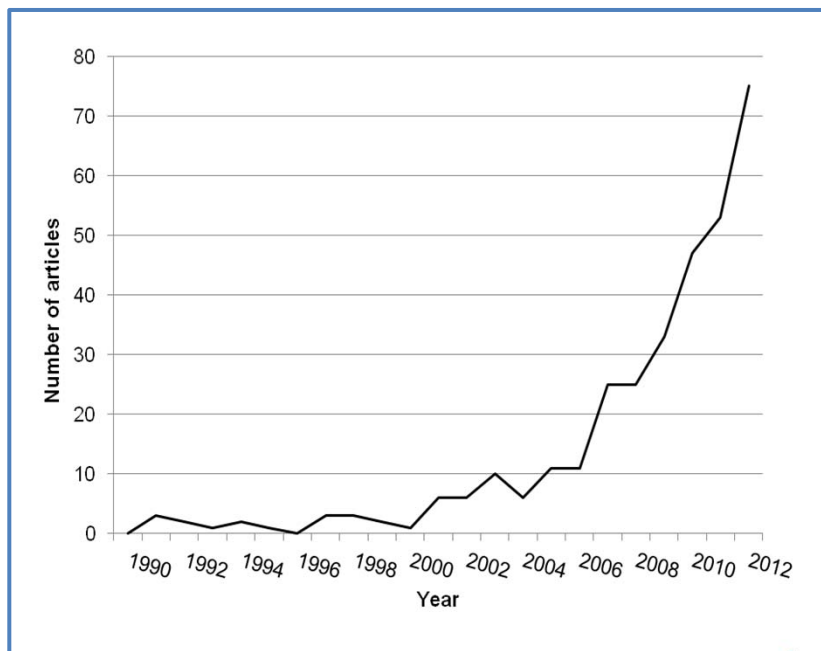
[1] Compared to non-heat wave periods, there was a 17.4% increase in hospital admissions for dementia and a > 2 fold increase in hospital admissions for senility during heat waves (temperatures above 26.7 degrees Celsius) (Hansen et al 2008; n=1.16 million, Adelaide, Australia).

You are here: Urban Ecosystems / Heat Hazard Mitigation

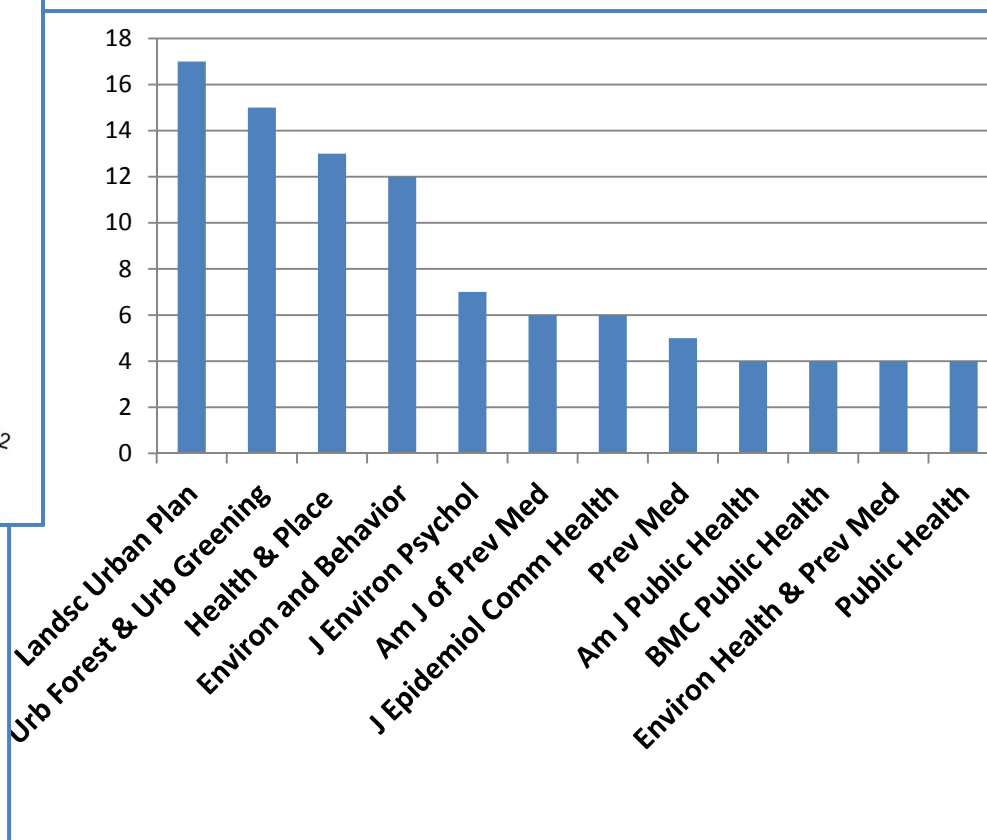
based on Moritz Stefaner's Relation Browser



Based on Literature Review, 1990 - 2012



Number of relevant articles found

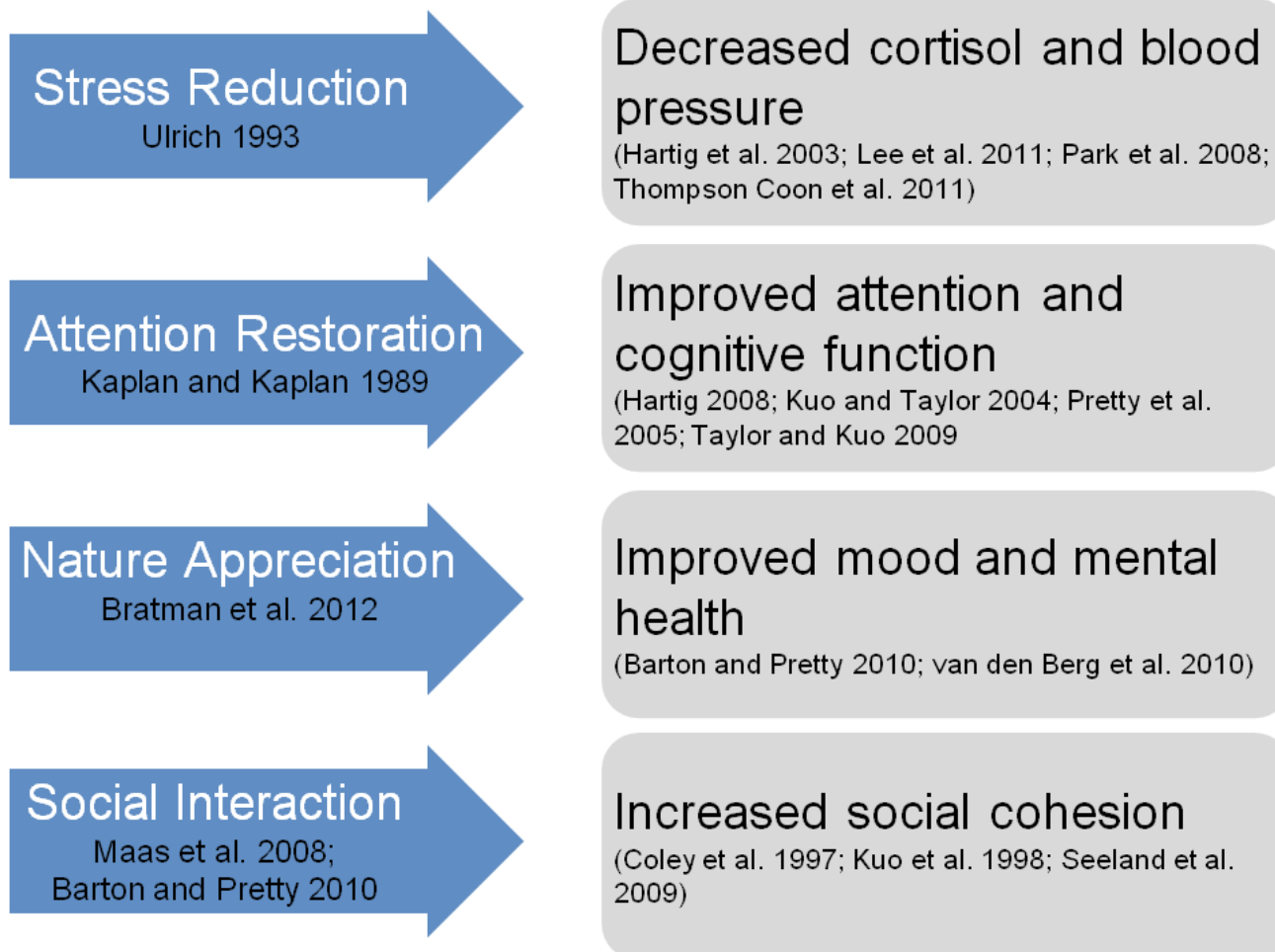


Journals publishing the most articles identified in review



Engagement with Nature—How Does that Affect Health?

Prevailing Mechanistic Theories

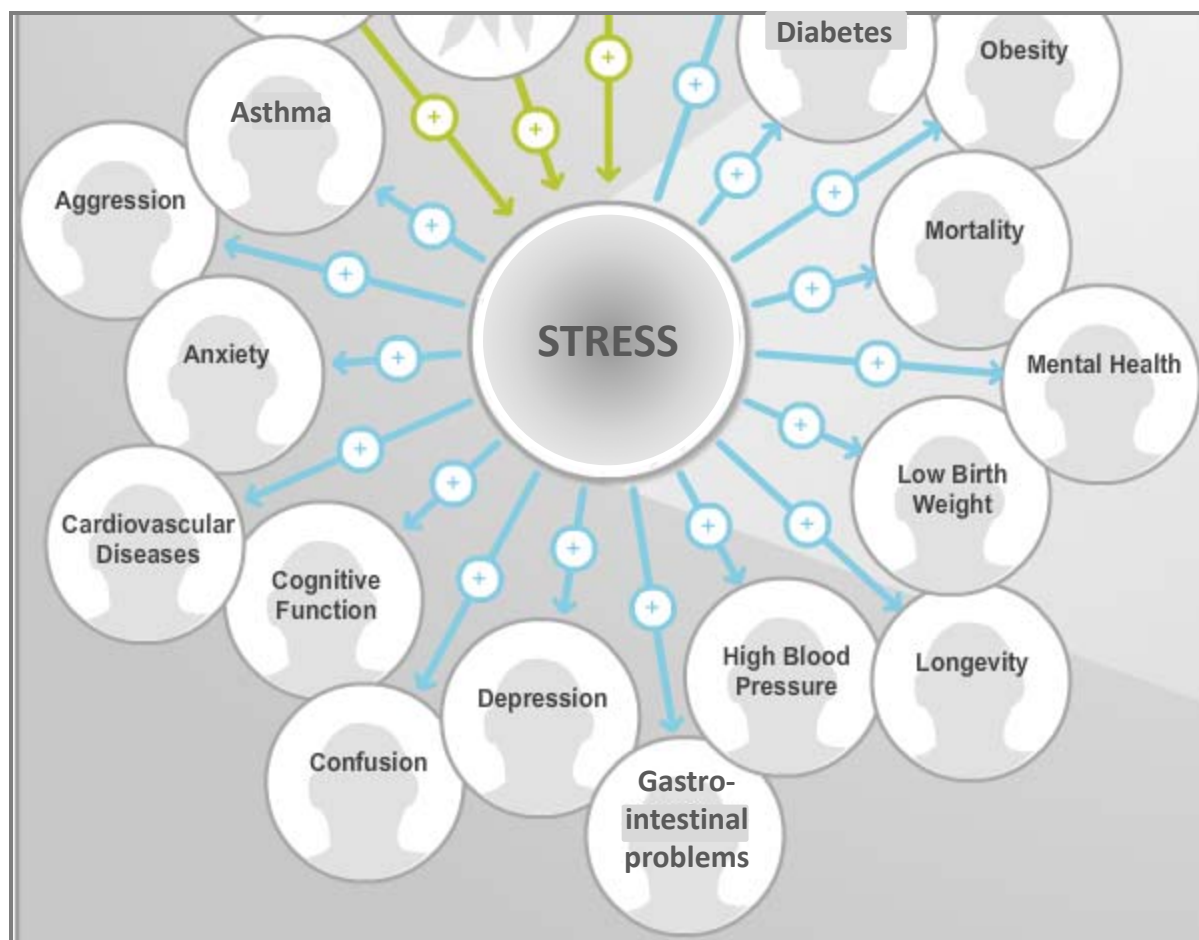




Theories intersect;
uncertainties remain.

		Public Health				
		Promotion of:				
		Feelings of Well-Being		Mental Acuity		
		Happiness	Self Esteem	Serenity	Concentration	School Performance Cognition in Elderly
Green Space	Catalyzes:	Social Interaction	Stress Reduction <i>from social cohesion?</i>			
		Engagement with nature (visual & physical)	Stress Reduction <i>for nature lovers only?</i>		Attention Restoration	

(Examples of measured outcomes)





SUSTAINABLE & HEALTHY COMMUNITIES RESEARCH PROGRAM

		<i>Public Health</i>						
		Promotion of:			Protection against:			
		Feelings of Well-Being	Mental Acuity	Healthy Body Weight	Toxicity	Extreme Events	Deprivation	
Green Space	Catalyzes:	Social Interaction	Stress Reduction			<i>Increased Resilience</i>	<i>Increased Resilience</i>	<i>Increased Resilience</i>
		Engagement with nature (visual & physical)	Stress Reduction	Attention Restoration				
		Physical Exercise	Stress Reduction	Attention Restoration	Bio-energetics			
	Provides:	Hazard Buffers				Filtration	Modulation	
		Food Water Raw Materials					<i>Increased Resilience</i>	<i>Increased Resilience</i>