

# Landscapes & Human Health

Chun-Yen Chang\*, Bin Jiang\*\*, Dongying Li\*\*\*, William Sullivan\*\*\*\*

\* Department of Horticulture and Landscape Architecture, National Taiwan University

\*\* Division of Landscape Architecture, Faculty of Architecture, University of Hong Kong

\*\*\* Department of Landscape Architecture, Ball State University

\*\*\*\* Department of Landscape Architecture, University of Illinois at Urbana-Champaign

Although we know that people prefer and benefit from greener, more vegetated landscapes (Bratman, Hamilton, Hahn, et al., 2015; Holtan, Dieterlen, & Sullivan 2014; Tang, Sullivan, & Chang, 2015) we understand little about the impact of ecologically healthy landscapes on human health and wellbeing (Sullivan, Frumkin, Jackson, & Chang, 2014). Biologically diverse, native landscapes contribute a great deal to the overall ecological integrity and resilience of a setting, but to what extent do these aspects of healthy landscapes also promote human health and wellbeing (Chang, Hammitt, Chen, Su, 2008)? What are the human health implications of being exposed to landscapes that support ecological health (Tang, Sullivan, & Chang, 2015)? How might these health benefits be measured?

This pre-conference intensive examines the extent to which landscapes that vary in ecological health impact human health and wellbeing. The landscapes in question range from intensely urban settings to rural farms and forests and encompass a range of ecologically healthy places. We explore these issues via three pathways through which landscapes impact human functioning—by restoring attentional capacity, enhancing mood, and by reducing stress. The health outcomes we address are measured using a range of traditional and emerging tools in landscape research: participant observation via GPS tracking, physiological measures, functional Magnetic Resonance Imaging (fMRI), and electroencephalogram (EEG). We will explore the advantages and disadvantages of using these tools to measure health related outcomes.

Two of the studies we present allow us to compare results across cultures. In addition to reporting on this recent work, our discussion will identify a number of opportunities for future research.

The workshop will begin with participants introducing themselves. Next, six short papers (15 minutes each) will be presented that explore one way in which landscapes that vary in ecological health impact human wellbeing.

The session will include 40 minutes of open discussion among all participants, allowing us to collectively examine key findings, explore future areas for research, and note new tools for exploring the impact of landscapes on human health. The open discussion will encourage considerable participation to mutually explore the direction and impact of research designed to investigate links between healthy landscapes and healthy people.

## Learning Objectives

By participating in this pre-conference symposium, individuals will:

1. Be able to describe recent empirical evidence exploring the relationships between landscapes that vary in terms of ecological health and functioning and human wellbeing.
2. Describe two pathways through which healthy landscapes might contribute to human health and wellbeing.
3. Discuss several advantages and disadvantages of using traditional and emerging tools that can be used to measure human health and wellbeing.
4. Identify three promising areas for future research.

### **Key Words**

Ecological Health, Biodiversity, Mental Health, Physical Health

### **References**

Bratman GN, Hamilton JP, Hahn KS, et al. (2015). Nature experience reduces rumination and subgenual prefrontal cortex activation. *Proceed National Academy of Science*, 112:8567-72.

Chang, C.Y., Hammitt, W., Chen, P.K., & Su, W.C. (2008). Psychophysiological responses and restorative value of natural environments in Taiwan. *Landscape & Urban Planning*, 85, p. 79-84.

Holtan, M.T., Dieterlen, S.L., & Sullivan, W.C. (2015). Social life under cover: Tree canopy and social capital in Baltimore, Maryland. *Environment & Behavior*, 47 (5) p. 502-525. DOI: 10.1177/0013916513518064.

Jiang, B., Li, D., Larsen, L., & Sullivan, W. C. (2014). A Dose-Response Curve Describing the Relationship Between Urban Tree Cover Density and Self-Reported Stress Recovery. *Environment and Behavior*, 0013916514552321.

Mitchell RJ, Richardson EA, Shortt NK, et al. Neighborhood environments and socioeconomic inequalities in mental well-being. *Am J Prevent Med* 2015;49:80-4.

Sullivan, W.C., Frumkin, H., Jackson, R.J., & Chang, C.Y. (2014). Gaia meets Asclepius: Creating Healthy Places. *Landscape & Urban Planning*, 127, p. 182-184.

Sullivan, W. C. (2015). In search of a clear head. In R. Kaplan & A. Basu (Eds) *Fostering Reasonableness: Supportive Environments for Bringing Out Our Best*. (pp. 54-69). Ann Arbor, MI: University of Michigan Press.

Tang, I.C., Sullivan, W.C., & Chang, C.Y. (2015). Perceptual evaluation of natural landscapes: The role of the individual connection to nature. *Environment & Behavior*, 47 (6), p. 595-617. DOI: 10.1177/0013916513520604.