Books on trees



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Prospect for a greener Hong Kong



HKU: First research green roof



HKU: Second research green roof



Sky woodland: The vision





Sky woodland: Design & monitoring



Sky woodland: Environmental monitoring



Equipped with environmental monitoring equipment to glean data for scientific assessment of the benefits under humidsubtropical and densely-urbanized conditions

Railway station: The vision

Tai Po Railway Station





Railway station: Realization



Railway station: Vertical greening

Tai Po Railway Station





Taipo Railway Station

Railway station: Vertical greening







Shatin DSD Sewage Plant







New prison: Green roof



New prison: Green roof



Proposal submitted toHongkong BankFoundation in July 2007

Funding approval in October 2007

Donate green roofs to 10 schools

➤Each school to receive about 400 m² of lawn plus irrigation system

Maintenance shouldered by school









Christian Alliance SW Chan Memorial College









Major research orientation

- Interdisciplinary approach
- Both conceptual and applied studies
- Emphasis on compact and south cities
- Focus on Hong Kong and other Chinese cities
 - (Shenzhen, Zhuhai, Guangzhou, Nanjing, Taipei, Beijing)
- >Advocate of sustainable city through greening
- Translating research findings to professional practices
- >29 years of teaching, research and application
 - experience
- >Over \$12 million research grants

Current research projects

- Evaluating tree growth and performance in public housing estates (HKHA)
- Climbing plant species for vertical greening and environmental benefits (DSD)
- Environmental benefits of green roofs on Tai Po railway station (MTRC)
- Microclimatic and energy performance of sky woodland (CLP)
- Species trial and screening for tropical green roofs and green walls
- Thermal performance and energy budget of tropical green roofs (Hui Oi Chow Trust Fund, Midland Charity)
- Ecological modelling of green roof ecosystem (Stanley Ho Alumni Challenge Fund)
- Assessing the ecological and conservation values of stone retaining walls (RGC)
- Green Roof for Schools Project (Hongkong Bank Foundation)

- Green roof (ecological design, energy performance)
- >Ecological design of a tropical native woodland on a roof site
- Soil moisture variations and their controlling factors associated with roof greening
- Assessing a drought-resistant plant (Sedum spp.) for minimummaintenance green roofs in Hong Kong
- Developing a cost-effective roof greening technology for energy conservation
- Thus far designed and installed 18 green roof and vertical greening sites, in total covering 14,000 m²
- > 6 sites are fully equipped with environmental sensors and data loggers

HKU: Environmental monitoring

HKU: Cooling benefit



HKU: Cooling benefit



C Y Jim: Sustainable urban greening

HKU: Hydrological benefit

Water attribute	Green roof vs rainfall	Green roof vs bare roof
рН	+++	+==
Temp°C	===	===
SS (mg/L)		+++
TDS (mg/L)	+++	
Conductivity (µS/cm)	+++	
DO (mg/L)		
CI-(mg/L)	+++	+++
NO2- (mg/L)		
NO3- (mg/L)		
PO4-3 (mg/L)	++ -	== -
NH4+ (mg/L)		000
SO4-2 (mg/L)	+++	- +=
Ca (mg/L)	+++	+= -
Mg (mg/L)	+++	+++
K (mg/L)	+++	
Na (mg/L)	+++	
AI (mg/L)	000	000
Fe (mg/L)	000	000
Mn (mg/L)		+
Cu (mg/L)	000	000
Pb (mg/L)	+	+
Cd (mg/L)	0+0	0+0
Cr (mg/L)	000	000
Ni (mg/L)	- ++	

HKU: Second research green roof











- Green space (ecosystem services, economic valuation)
 Assessing the services and value of green spaces in urban ecosystems in Guangzhou
- Valuating urban green spaces and water bodies based on hedonic pricing model of housing market in Guangdong
- Urban greenspaces in Guangzhou (China): Attitude, preference, use pattern and assessment
- Cost-benefit analysis of greening in Zhuhai using contingent valuation method
- Multiple values and roles of urban green spaces in Hong Kong
- Hedonic pricing analysis of green space contribution to residential property value in Hong Kong
- >Economic and ecological services of urban forests in Chinese cities

Urban forest and heritage trees

- Circum-Harbour Afforestation Plan (CAP) in Hong Kong
- Systematic evaluation of the management and performance of public urban trees in Hong Kong
- Management and conservation of outstanding (champion) trees in a Hong Kong
- Landscape and ecological assessment of heritage trees in Guangzhou
- Biogeographical study of urban forestry in Guangzhou
- >Urban forestry and greening strategies: The case of Nanjing
- Species diversity and community ecology of urban trees and green spaces in Taipei
- Urban development and evolution in Hong Kong: Reciprocity between nature and culture

- **Urban soil science**
- >Urban park soils and user impacts in Hong Kong
- Soil conditions in landscape tree planters in urban Hong Kong
- Soil moisture and related edaphic properties of street-tree pits
- Urban soil pollution by heavy metals in public greenspaces in Hong Kong: Profile and particle-fraction distribution
- Soils and management of sports turf in Hong Kong
- Characteristics and genesis of soils in fung shui woodlands
- Soil genesis and vegetation growth in pulverized fuel ash and refuse landfills capped by decomposed granite
- Soils and afforestation in the Shing Mun Country Park
- Trampling impact on soil and vegetation in country parks:
 Experimental and monitoring studies

Resarch team and support

Research team

- >1 research assistant professor
- > 2 postdoctoral fellows
- ➢ 6 PhD students
- ➤ 2 technicians
- Other research assistants
- Past: supervised 34 graduated PhD and MPhil students
- **Research facilities**
- Well equipped soil and urban ecology laboratory
- Physical and chemical analysis of soil and environmental samples
- Field environmental monitoring using a wide range of sensors and data loggers

Research profile

Additional information on my webpage:

>http://geog.hku.hk/staff/jim.htm



The End Questions and Comments are Welcome