Urban drain vs Living stream

- **Traditional drain**
  - Drainage

- **Living stream**
  - Drainage
  - Remove nutrients
  - Support biodiversity
  - Social value
Case study:
Bannister Creek Living Stream Project
Case study: Bannister Creek Living Stream Project

- Implemented by the Bannister Creek Catchment Group and the City of Canning from the late 2000
- Give the creek a more natural shape with meanders, riffles, fringing sedges, gentle sloping banks and thick vegetation on the banks
Case study:
Bannister Creek Living Stream Project
Bannister Creek Living Stream: Water quality time series decomposition

Trend
Remainder
Seasonal
Nitrogen
Seasonal Phosphorus
Remainder
Trend
Measuring Non-Market Values

- **Stated preference methods**
  - Ask people how do they value things

- **Revealed preference methods**
  - Observe how do people behave
    (how much do they pay for things)
Estimating Amenity Value: Hedonic Model

\[
\log(P_{it}) = \alpha_1 LS_{it} + \alpha_2 LSY_{it} + \beta X_{it} + \gamma_{it} + \rho_{ij} + \varepsilon_{it} + \eta_i
\]

- **Living stream**
- **Years since Living stream**
- **Characteristics of a house**
- **Time fixed effects (year-quarter)**
- **Spatial fixed effects (SA1)**
Sales Data

Suburbs of Lynwood, Langford, Ferndale, Parkwood, Riverton, and Willeton
Sales Data

1991  81,800
1995  85,800
1999  112,000
2005  201,000
2007  89,100
2009  372,500
Impact of Bannister Creek Living Stream on house values within 200 m

-6% -4% -2% 0% 2% 4% 6% 8%

Period effect
Trend effect

Year
Bannister Creek Living Stream Project
200-2011
Cost-benefit analysis

- Benefits in 2010: $404K * 4.4% * 270 = $4.8M
- Costs (compounded to 2010 @ 7%): $1.9M
- Benefit-Cost ratio: 2.5

**Sensitivity analysis:**

<table>
<thead>
<tr>
<th>Benefit estimate</th>
<th>Costs discount rate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>5%</td>
</tr>
<tr>
<td>Low (2.9%)</td>
<td>1.8</td>
</tr>
<tr>
<td>Central (4.4%)</td>
<td>2.6</td>
</tr>
<tr>
<td>High (6.0%)</td>
<td>3.5</td>
</tr>
</tbody>
</table>
Conclusions

- In Western Australia, proponents of WSUD have had limited success in promoting their ideas.

- Possible reason is lack of *ex post* evaluations.

- Our evaluation of a specific WSUD project have shown project benefits to be larger than costs.
Acknowledgement

- Water Sensitive Cities Cooperative Research Centre for financial support
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- SECURL for telling the story and providing information about the project

More information: http://purl.umn.edu/206300