Integrated “One Water” Management
Moving Beyond Institutional Challenges

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WaterRA Research Symposium
July 2014
Institutional Challenges to Integrated Water Management (One Water)

Project Team:

Institute for Sustainable Futures
UNIVERSITY OF TECHNOLOGY SYDNEY
ForEvolutionSolutions
CNT

Project Funders:

WERF
Water Research Foundation
Water Research Australia
One Water Management

Future – One Water Community
Need: Resilient, Sustainable, Engaged Communities

<table>
<thead>
<tr>
<th>Period</th>
<th>Community</th>
<th>Need</th>
<th>Function</th>
</tr>
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<tbody>
<tr>
<td>Early 1800s</td>
<td>Water Supply Community</td>
<td>Provide reliable water supply</td>
<td>Supply Hydraulics</td>
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<tr>
<td>Late 1800s</td>
<td>Sewered Community</td>
<td>Protect Human Health</td>
<td>Separate Sewerage Schemes</td>
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<tr>
<td>Mid 1900s</td>
<td>Drained Community</td>
<td>Increase Usable Land for Agriculture &amp; Development</td>
<td>Dams, Drainage Systems, Channelization</td>
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<tr>
<td>1970s</td>
<td>Waterways Community</td>
<td>Protection for Environment - Regulation</td>
<td>Point &amp; NP Source Pollution Mgmt</td>
</tr>
<tr>
<td>1990s</td>
<td>Water Cycle Community</td>
<td>Address Natural Resource Limitations</td>
<td>Diverse, Fit for Use Supplies, Conservation &amp; Waterways Protection (MFLs)</td>
</tr>
</tbody>
</table>
Moving to a One Water paradigm

Plausible futures determined by weights of history, pushes of today, and aspirational pulls

PULL of the future: aspirations

PLAUSIBLE FUTURES

PUSH of now: unavoidable

WEIGHT of history: structural inertia
Institutions:

**Hard**
- Organizational structures
- Departments
- Committees
- Laws
- Regulations
- Taxes & Subsidies

**Soft**
- Social relations
- Informal networks
- Administrative routines
- Professional cultures
- Social worlds
1. LITERATURE REVIEW:
What are the institutional barriers to One Water?
2. CASE STUDY ANALYSIS:
How have others overcome these challenges?

- **3 in-depth case studies** at different scales
  - Pittsburgh, Pennsylvania (*Regional scale*)
  - City of Sydney, Australia (*City scale*)
  - Clean Water Services, Oregon (*Utility scale*)

- **25 snapshot case studies** of one water initiatives overcoming institutional barriers across water service sector areas
CASE STUDY: Sydney Decentralised Master Plan

“ensuring resilience to climate change (drought) and reducing the pollution levels in the waterways and harbour”

Transferable lessons and enabling actions:

a. **Champions** to drive the vision and the implementation of the strategy

b. **Consultation** with the community and stakeholders

c. **Capacity building** within the CoS

d. **Collaboration** and partnership building

e. **Capital budgets** to be allocated to key bulk infrastructure schemes.

f. **Compliance** through the approval of development applications lodged with the CoS.
Challenges:

High level Drivers:
- Planning & Coordination
- Legislation, Policy & Regulations
- Economics & Finance
- Knowledge, Culture & Capacity
- Engagement

Water Supply-demand management

Stormwater and flood management

Wastewater management, Recycling and resource recovery

Green infrastructure (WSUD, SUDS)

Water and energy efficiency

Environment and waterways protection

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**Seattle (1): Thorton Creek Water Quality Channel Project**

**Problem level:**
- Societal [Strategic]
- Institutional [Tactical]

**Project:** Operational

**Type of initiative:**
- Infrastructure: Retrofit
- Infrastructure: New development
- Policy change

**Scale of initiative:**
- Individual homes
- Individual commercial / industry
- Precinct / development
- City-based
- State-wide
- National

**Proponents:**
- Private
- Public
- Combination

**Underlying causes for the challenge:**
- Lack of vision
- Lack of leadership
- Lack of drivers
- Lack of good data
- Lack of integration

**Drivers for Change:**
- Supply/demand management
- Stormwater management
- Wastewater management
- Green space/infrastructure
- Water/energy efficiency
- Environ / waterways protection

**Country:** USA

**State:** Washington

**Issue:**
Adopting a consensus approach to planning to achieve community, economic and environmental goals through stream revitalization activities.

**Background:**
The Thorton Creek watershed is Seattle’s largest watershed at 680 acres (SvR Design, 4) and drains into Lake Washington to the east of the city. Throughout the history of the city, this creek had been buried to allow development and was confined to a 80-inch pipe running underground. As Seattle became more aware of water quality issues related to Thorton Creek, they began to think of ways to improve water quality and “find a balance between urbanization and environmental sustainability” (SvR Design, 4). The city convened a group of stakeholders (Northgate Stakeholder Group) from business, community and environmental interest groups in order to propose a facility that would improve water quality in both Thorton Creek and Lake Washington while also promoting open space, livability and economic development. This group of 22 members decided (by consensus) that the facility ultimately built would be an improved biopilot swale that served as a way to slow stormwater and retain pollution-laden sediment. In addition, the facility has also served as an anchor to private development including both residential and retail developments which are estimated to bring an additional $200 million dollars to the Northgate neighborhood (the project cost $14.7 million) (SvR Design, 27).

**Stage of the process:**
Understanding
Planning
Managing
Implementing
Monitoring and evaluation

**The Challenge:**
The rehabilitation efforts of Thorton Creek were part of a range of factors, which often affected Planning in this area for

WHAT'S GETTING IN THE WAY OF A ‘ONE WATER’ APPROACH TO WATER SERVICES PLANNING AND MANAGEMENT?

An analysis of the challenges and barriers to an integrated approach to water

P Mukheibir, C Howe, D Gallet

ABSTRACT
A range of factors prevents the development of institutional changes that would allow a shift to "One Water" systems. Foremost of these is the inertia associated with the dominant paradigm of centralised and siloed systems. This, together with the complex structure of regulations that currently exist for water supply, wastewater and stormwater management, poses significant obstacles to a fully integrated approach. The regulatory patchwork environment, with overlapping responsibilities and jurisdictions, particularly with respect to the need for management of both public health and integrated water resources management (IWRM) and water-sensitive urban design (WSUD) (US Water Alliance, 2013). The One Water approach strives for a move away from conventional approaches to one with greater coordination among diverse interests, stakeholders and decision-makers, recognising that water quantity and quality, whether above or below ground, depend on multi-faceted collaborations. Table 1 presents the key differences between conventional and integrated approaches.

Research to date has shown that, for the One Water paradigm to be accepted and integrated into infrastructure planning, the appropriate institutional structures need to be in place (Maheepala

<table>
<thead>
<tr>
<th>Table 1. The key differences between conventional and integrated approaches to urban water management.</th>
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<tbody>
<tr>
<td>Aspect of urban water management</td>
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<td>---------------------------------</td>
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<tr>
<td>Overall approach</td>
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<tr>
<td>Collaboration</td>
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3. DEVELOP FRAMEWORK:

<table>
<thead>
<tr>
<th>Proximate</th>
<th>What you can DO</th>
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<tbody>
<tr>
<td>Remote</td>
<td>What you can INFLUENCE</td>
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<table>
<thead>
<tr>
<th>Planning &amp; Coordination</th>
<th>Legislation, Policy &amp; Regulations</th>
<th>Economics &amp; Finance</th>
<th>Knowledge, Culture &amp; Capacity</th>
<th>Engagement</th>
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</thead>
<tbody>
<tr>
<td>Knowledge &amp; Awareness</td>
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<tr>
<td>Planning</td>
<td></td>
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<tr>
<td>Implementing &amp; operating</td>
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Planning + Collaboration

- Fragmented, inflexible + short term solution-based
- Lack of cross-industry collaboration
- Politics

Planning & collaboration
- Lack of unified vision
- Lack of systems thinking and integration
- Culture, knowledge and capacity
- Economics & finance
- Legislation & regulations
- Citizens engagement
- Lack of data collection and sharing
- Lack of drivers and urgency
- Politics
PARTNER, PARTNER, PARTNER

Innovative solutions don’t happen in a vacuum.
Culture, Knowledge + Capacity

- Organizational resistance + inertia
- Lack of incentives + champions
- No time to 'think outside box'
TRANSFORM AGENCY CULTURE

Give your team the tools they need to be successful and think outside the box (Capacity building & training)

Get rid of silos
Citizen Engagement

- Learn to speak differently: consider your audience
- Get savvy with outreach technology
- Transparency builds trust
BRANDING + COMMUNITY ENGAGEMENT

Actively engage and be transparent with your community and elected officials.
Legislation + Regulation

- Inconsistent, complex + overlapping
- Prescriptive vs. performance based
- Risk adverse environment
REGULATIONS

Simplify red tape to enable innovation

Compliance to encourage innovation
Economics + Finance

- Lack of full benefit cost accounting
- Access to funding difficult
- Cost recovery issues
PUBLIC FUNDING (CAPEX)

Create enabling environment through bulk infrastructure and incentives
5 Underlying Causes

- Lack of unified vision
- Lack of systems thinking and integration
- Planning & collaboration
- Culture, knowledge and capacity
- Economics & finance
- Legislation & regulations
- Citizens engagement
- Lack of leadership & political will
- Lack of Data collection and sharing
- Lack of drivers and urgency
POWERFUL LEADERSHIP
Champions are a strong catalyst for progress + innovation.
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Thank you:

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