

Green Infrastructure and Adaptive Management

A New Synergy



One Water
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Imagine the result



GREEN INFRASTRUCTURE IMPLEMENTATION

 **wef** special publication

Prepared by the **Green
Infrastructure Implementation**
Task Force of the **Water
Environment Federation**

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Chapter 9 Adaptive Management

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Green Infrastructure Implementation

1. Introduction and Overview
2. Navigating the Institutional Landscape
3. Framework of Regulations, Standards and Structures
4. Financial Strategies
5. Engaging Stakeholders and the Public
6. Developing Municipal Standards for GI
7. Valuing Green Infrastructure
8. Maintenance Programs
9. **Adaptive Management**
10. Selecting GI Stormwater Controls
11. Evaluating the Feasibility of GI
12. Implementing at the Building and Site Scale
13. GI in Rights-of-Way
14. Implementation of Linked GI on a Neighborhood Scale
15. Green Spaces to Improve Waterways and Communities
16. Implementation at the City, Basin and Regional Level

What is Adaptive Management?

A management approach that is...

- 👍 Iterative
 - 👍 Driven by the achievement of goals
 - 👍 Continuous Improvement
 - 👍 Flexible

Consider when objectives must be met in the face of uncertainty

Adaptive Management Process

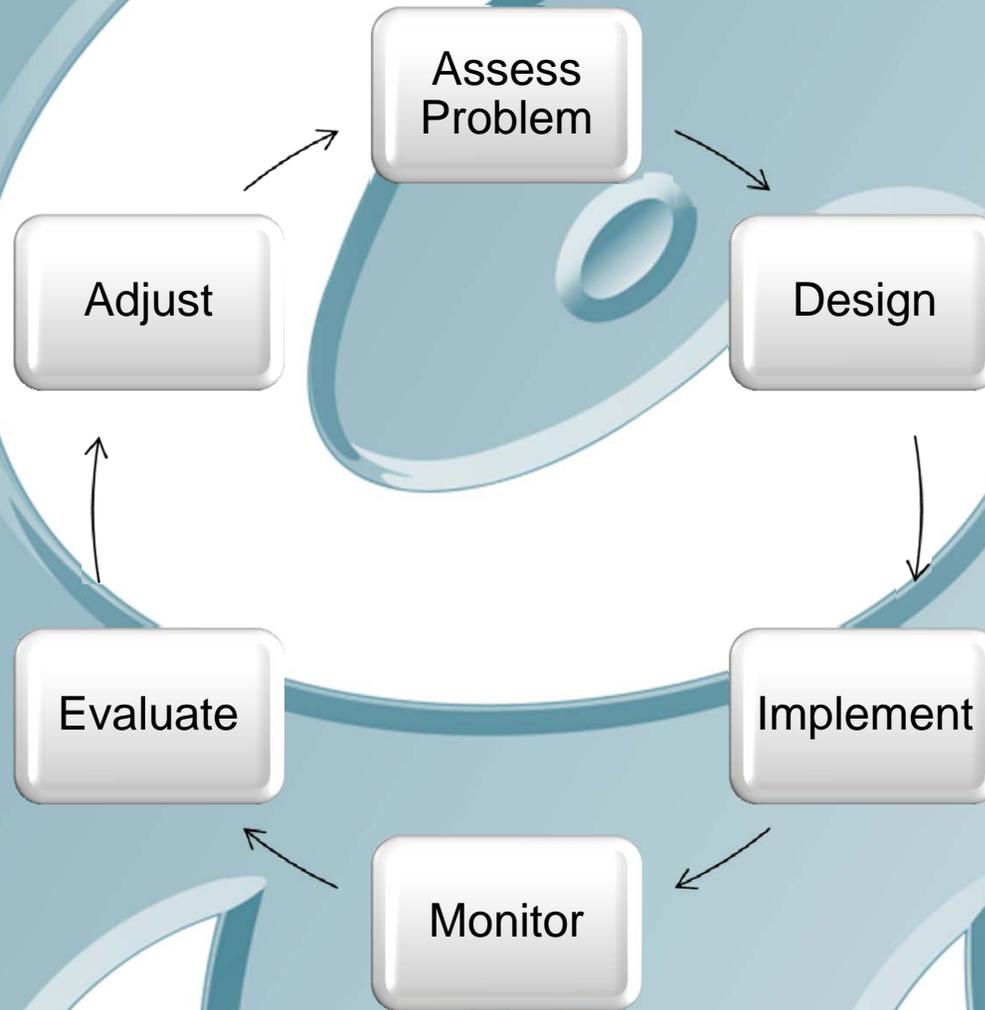


Figure 9.1



Adaptive Management

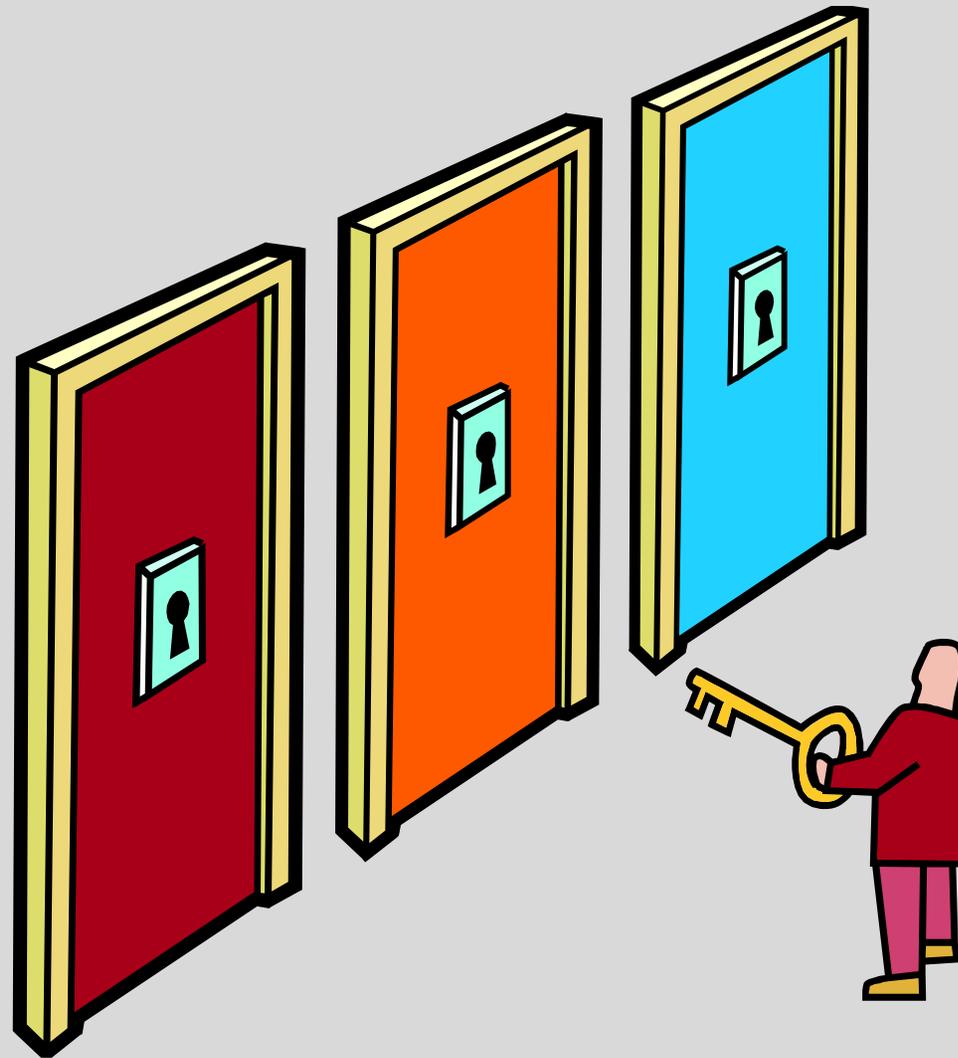
**The U.S. Department of the Interior
Technical Guide**

*Adaptive
Management
Working
Group*

Problem-Scoping Key
9 questions to find out if
Adaptive Management is
for you



Is some kind
of
management
decision to
be made?



Can stakeholders be engaged?



Can
management
objectives be
stated
explicitly?



Is decision
making
confounded
by
uncertainty
about
potential
management
effects?



Can
resource
relationships
and
management
effects be
represented
in models?



Can
monitoring
be designed
to inform
decision-
making?



Can
progress be
measured in
achieving
management
objectives?



Can
management
actions be
adjusted in
response to
what has
been
learned?



Does the
whole
process fit
within the
appropriate
legal
framework?



If you can answer “YES” to all questions

ADAPTIVE MANAGEMENT IS FOR YOU

If you answer “No” to even one question, another management style may be a better fit

Inherently, Adaptive Management

- Flexes as uncertainty is defined
- Is applied over longer time tables
- Includes many steps, tasks, phases, projects, etc
- Values stakeholder participation
- Uses monitoring as a basis for learning
- Produces a very efficient, effective result that attains the objectives

Hurdles to using Adaptive Management

- ❖ We've always done it this way
- ❖ We don't need stakeholders
- ❖ It has to be right the first time

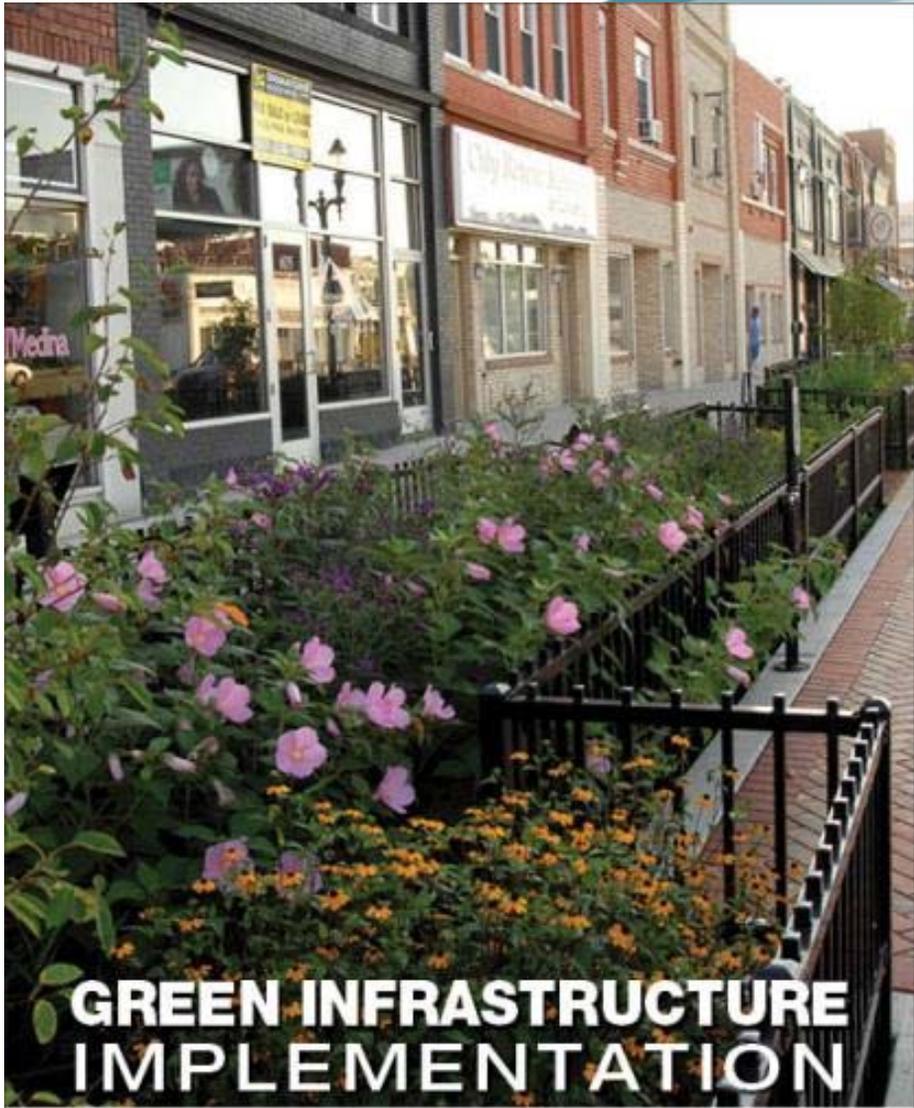


Chapter 9: Adaptive Management

1. Adaptive Management for GI
2. Defining Adaptive Management
3. Adaptive Management Cycle
4. Using Adaptive Management for GI
5. Examples of Adaptive Management in CWA Consent Orders
6. GI Adaptive Management Readiness and Assessment Tool
7. GI Adaptive Management System Monitoring
8. Implemented Program Case Studies: Onondaga County

Readiness and Assessment Tool

Administrative program				Operational program				Economic program			
Green infrastructure management objective:				Green infrastructure management objective:				Green infrastructure management objective:			
Program element		Plan element	Goal/criteria	Program element	Goal/criteria	Status	Adaptive action				
1.1	Policy	Policy program	Program management i forum of decision-imple changing conditions.	3.1	Funding	The green infrastructure program is fully supported by a sewer or stormwater service fee.					
1.2	National Pollutant Discharge Elimination System permits (CSO/MS4)	2.1 Management	A calibrated hydrologic progress and is the bac infrastructure master pla	3.2	Service fee discounts	Service fee discounts are provided to all property owners including residential for green infrastructure retrofits.					
1.3	Intergovernmental cooperation	2.2 System model	Targeted to specific volu master plan schedule	3.3	Green infrastructure incentives	Green infrastructure incentives in the form of grants are provided to qualified private property owners.					
1.4	Zoning	2.3 Green infrastructure capital improvements	Detention ponds are no properties. Volume and impact development an	3.4	Interactive data tools	Private property owners have access to an interactive GIS database that assists in the design of a green infrastructure retrofits and calculation of runoff volume reduction					
1.5	Regional planning	2.4 Runoff standards	A green infrastructure a program with annual rep	3.5	Developer credits	Developers are awarded a fungible credit for exceeding runoff volume standards via green infrastructure.					
1.6	Transportation planning	2.5 O&M	Supported by standard permits, and enforce	3.6	Development fees	Developers are required to meet a volumetric standard for runoff through the use of green infrastructure, pay a mitigation fee, or mitigate off-site based on a greater standard.					
1.7	Codes	2.6 Regulatory program	GIS database with volu	3.7	Urban plan incentives	Reduction in runoff standards is provided for redevelopment and targeted urban areas using green infrastructure.					
1.8	Public engagement	2.7 Inventory of built green infrastructure practices	A low impact developme development design gui	3.8	Grants	Grants are provided to qualified retrofit or redevelopment projects using green infrastructure.					
1.9	Public-private partnerships	2.8 Tools and technical support	Mandatory review at co	3.9	Tax incentives	Tax-incentive financing is provided to private developers for qualifying redevelopment projects that use green infrastructure and reduce runoff.					
1.10	Communication	2.9 Development review process	Web-based information communication								
1.11	University partnerships	2.10 Technology	Performance-based with								
1.12	Education	2.11 Landscaping	Required with any roof demolition, or abandone								
		2.12 Public property retrofit	Technical support and e								
		2.13 Private property retrofit	Regular district informat green infrastructure des needs/preferences								
		2.14 Public engagement									



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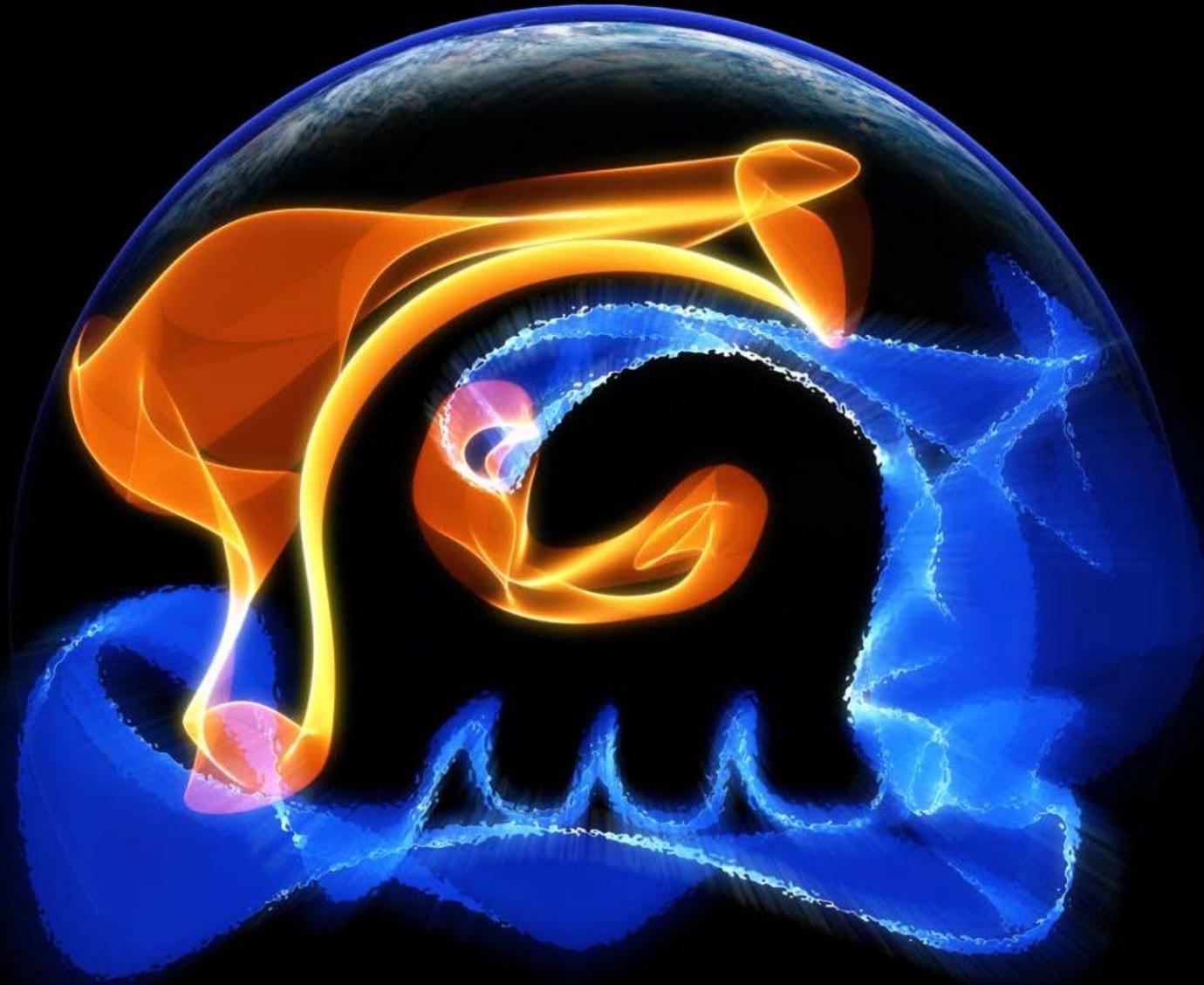
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