Adaptive Management-
Strategic Urban Forest Planning

Urban Forest Institute
May 8, 2013

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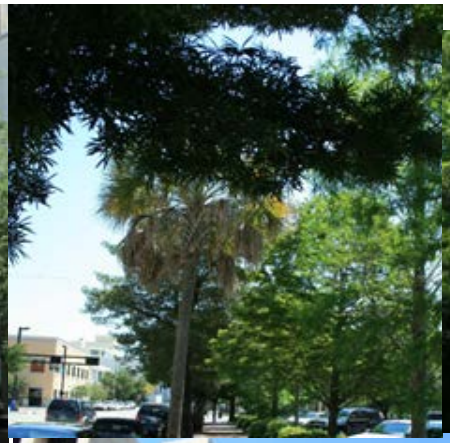
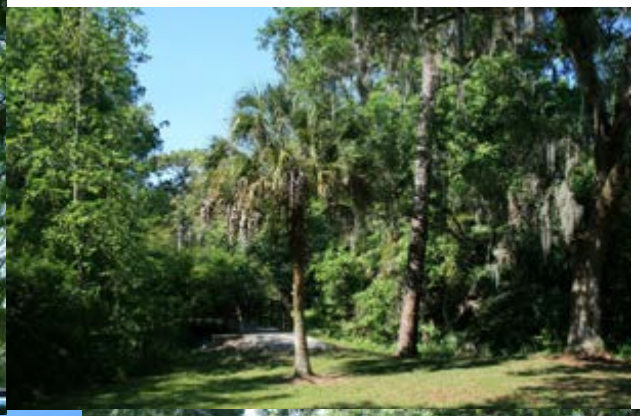
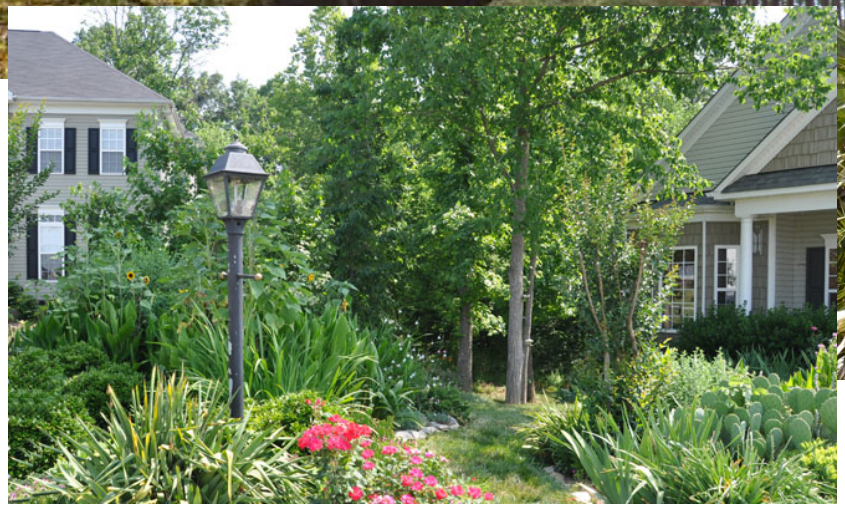
Urban forests are diverse and interconnected ecosystems.


Urban forest management requires the involvement of a widening range of disciplines, users and managers.

Current urban forest management often focuses on sustaining publicly owned trees.

Expanding the management focus to all trees and open spaces is required.



Management required will be challenging and will often require nontraditional techniques.

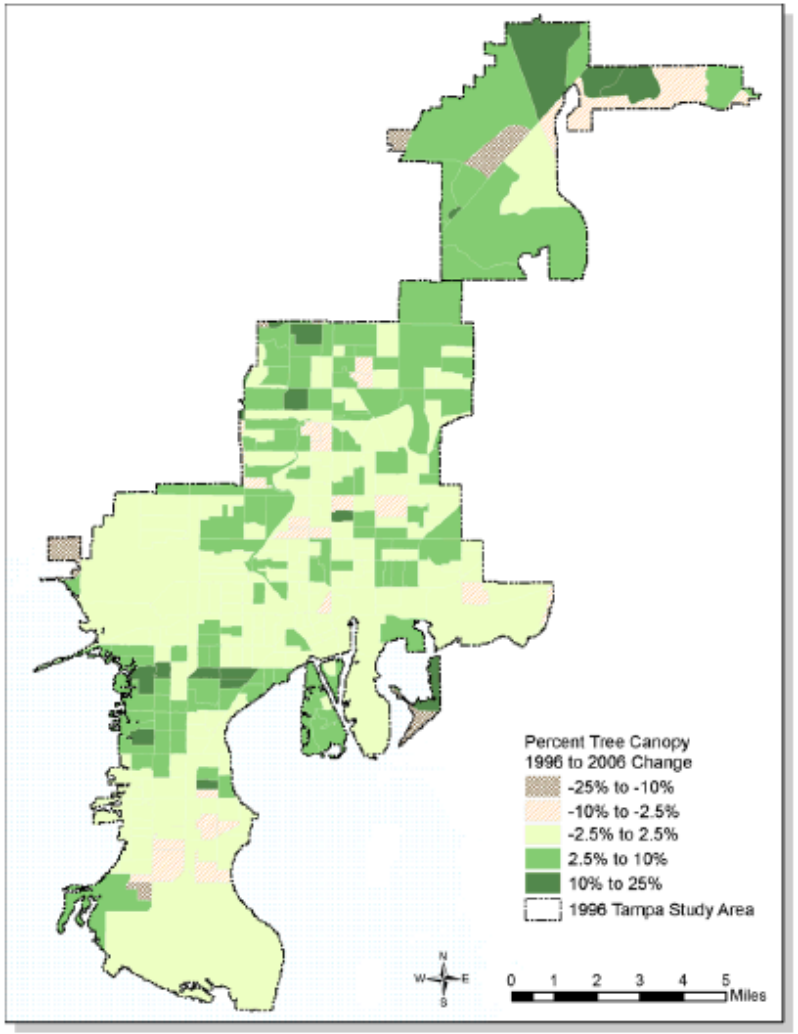
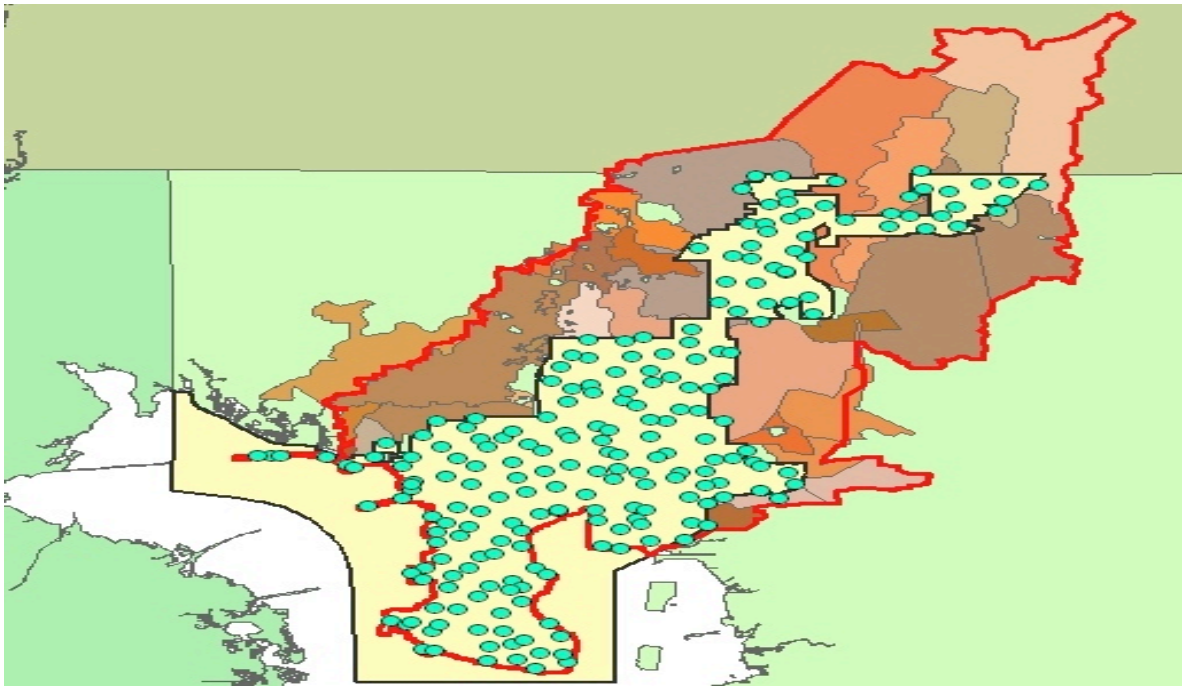


Figure 10. Census block group level tree canopy change between 1996 and 2006. Values indicate the difference in tree canopy percentage by subtracting 1996 canopy from 2006 canopy; positive indicates canopy and negative indicates canopy loss.

New approaches to urban forest management must be comprehensive and must be adaptive to allow for adjustments in management activities based on new information.

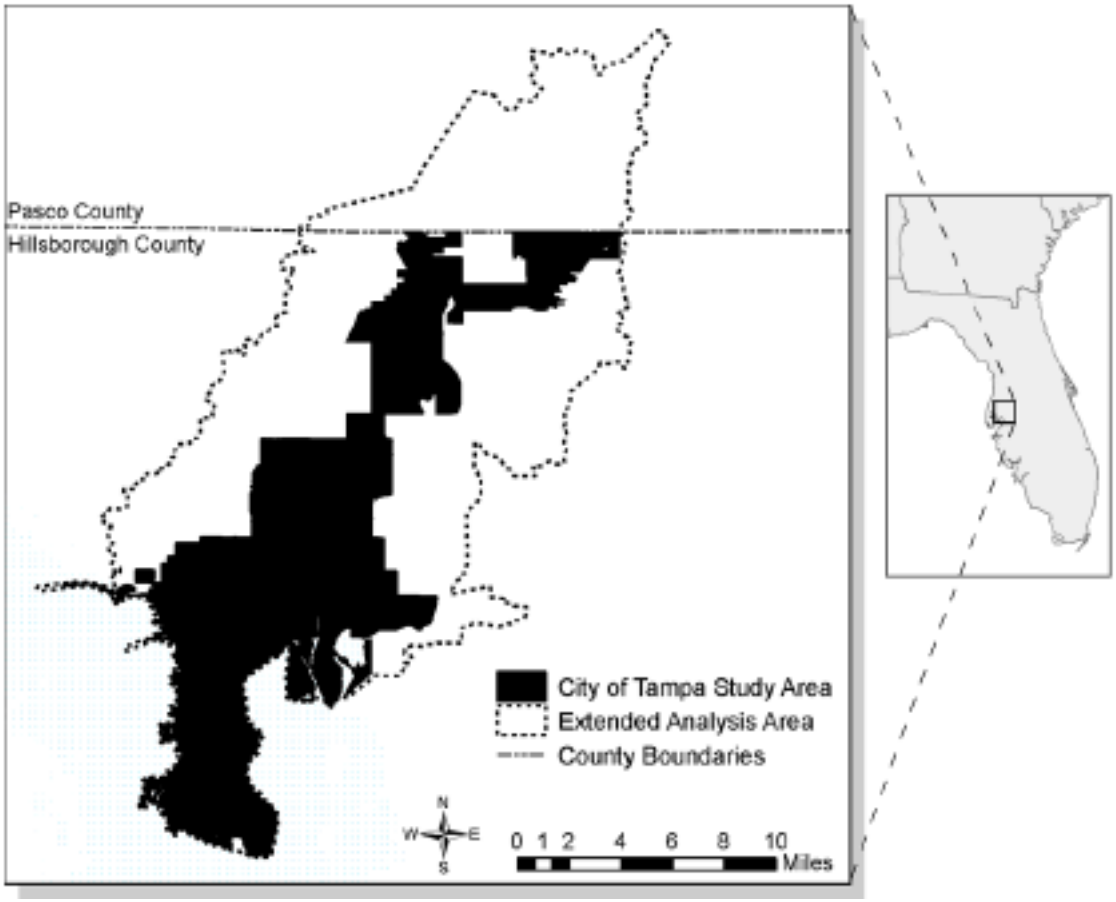


Urban forest managers should consider the needs and attitudes of the community.

Urban forest manager should consider what urban forest structure is necessary to best address community needs.

Urban foresters should periodically reassess community needs and urban forest structure to ensure that management plans remain appropriate.

Adaptive management can be used to evaluate the effectiveness of management activities and public policies.

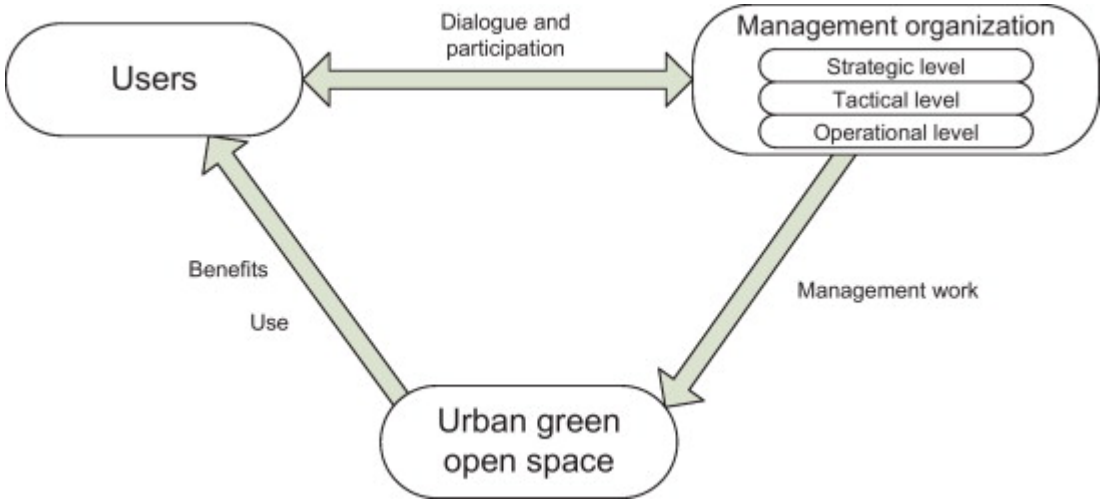


Implicit in adaptive management of urban forests is the ability to monitor the effects of program activities and policies.

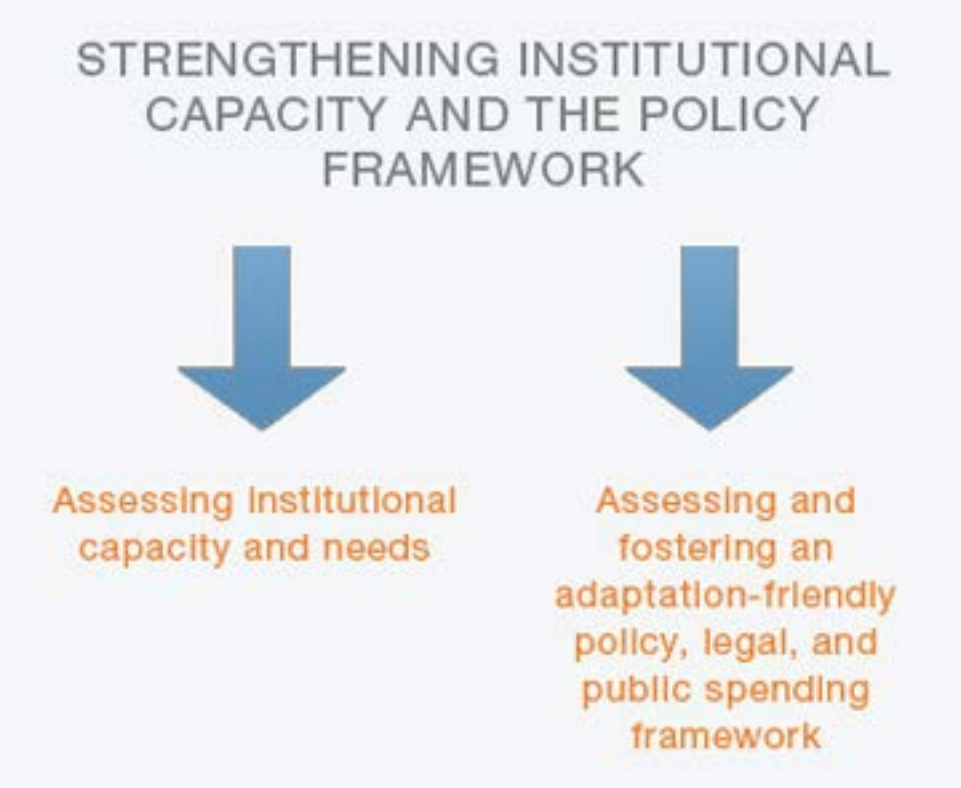
Implicit in adaptive management is the evaluation of the effectiveness of management and policy decisions.

Implicit in adaptive management is modification of management activities based upon new information.

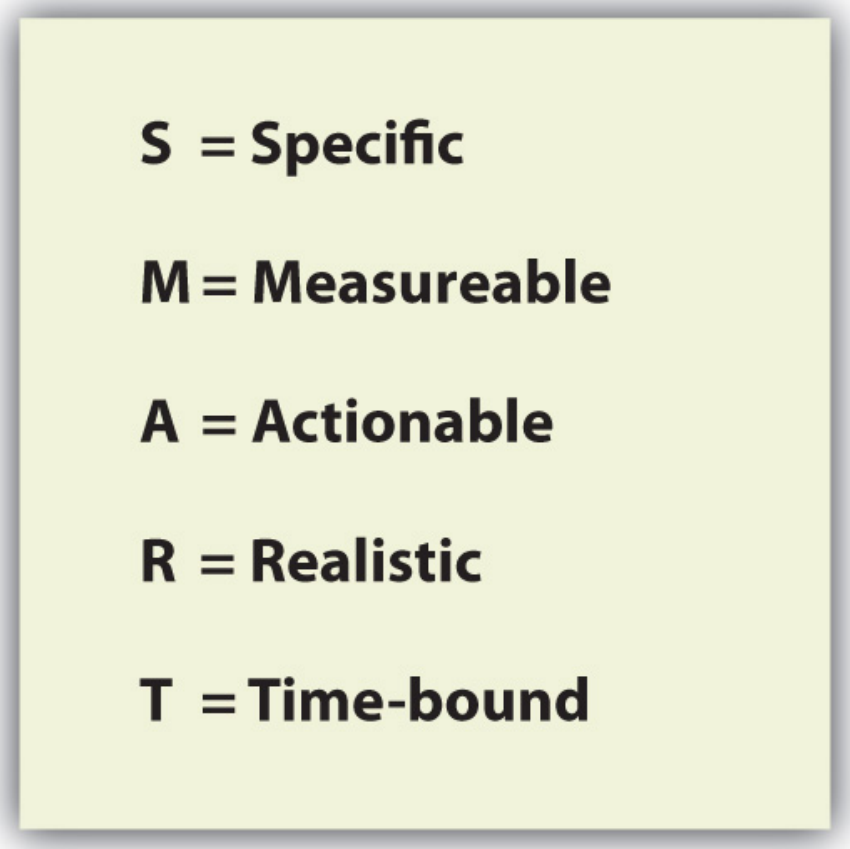
Urban forest management is a mandate to take action in the face of uncertainty.



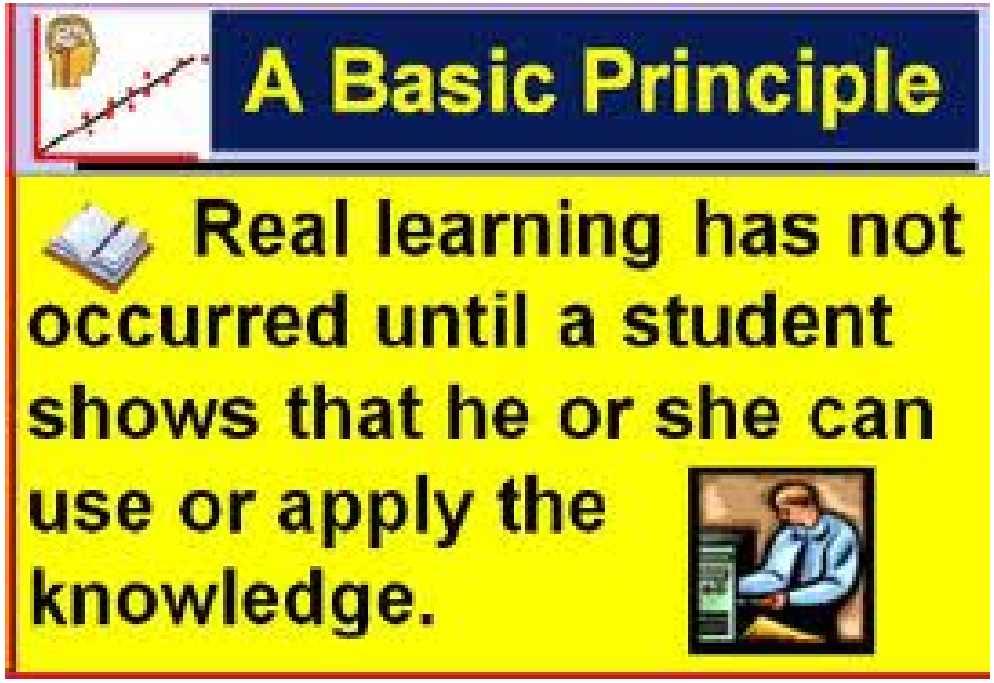
Adaptive management will succeed only if the the public institutions has the capacity and commitment to support the process.



The use of adaptive management requires clear and quantifiable objectives.

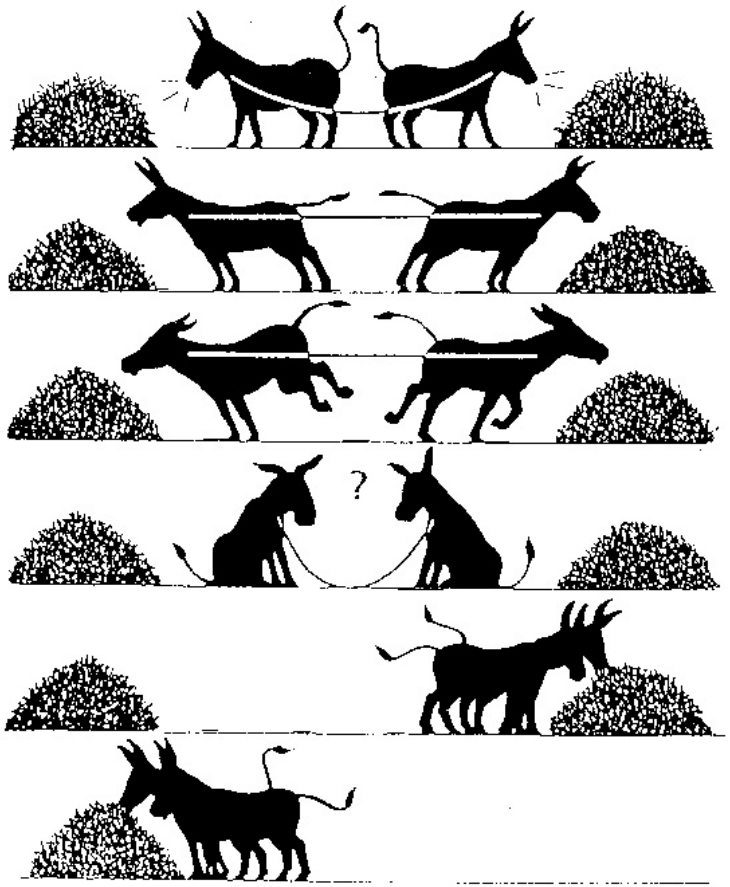


Adaptive management should only be used when there is an opportunity to apply learning to reduce uncertainty.



There are situations where the application of adaptive management may not be appropriate.

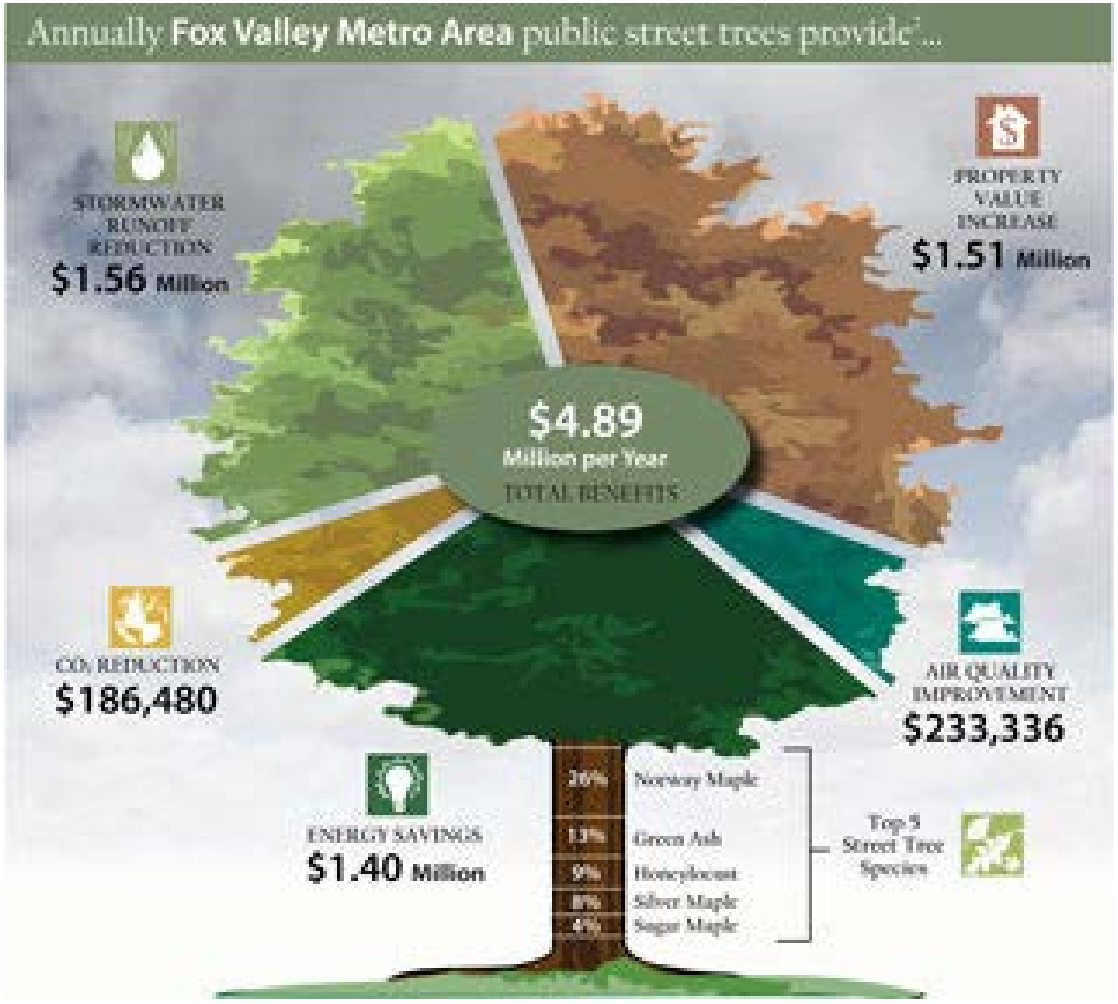
Adaptive management is not appropriate if there are irresolvable conflicts about objectives or decision alternatives.



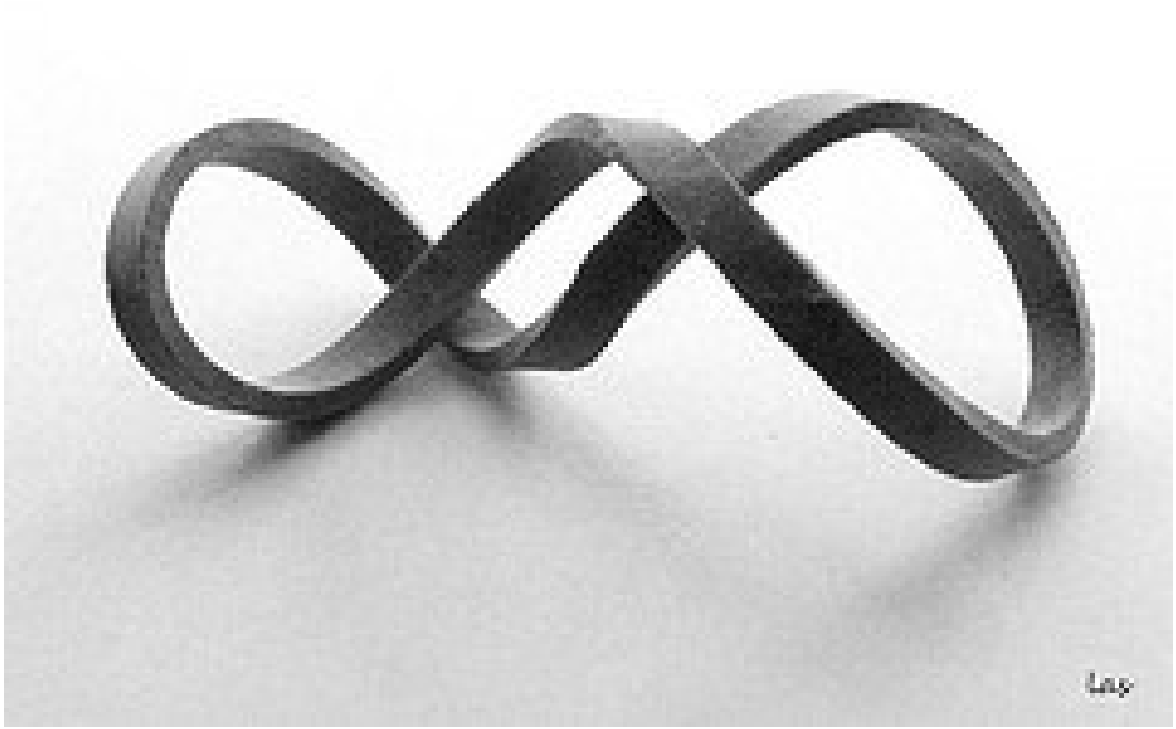
Adaptive management is not feasible if monitoring cannot provide useful information for decision making.

It is not appropriate if there is not a commitment to sustained funding for monitoring and assessment.

Benefits

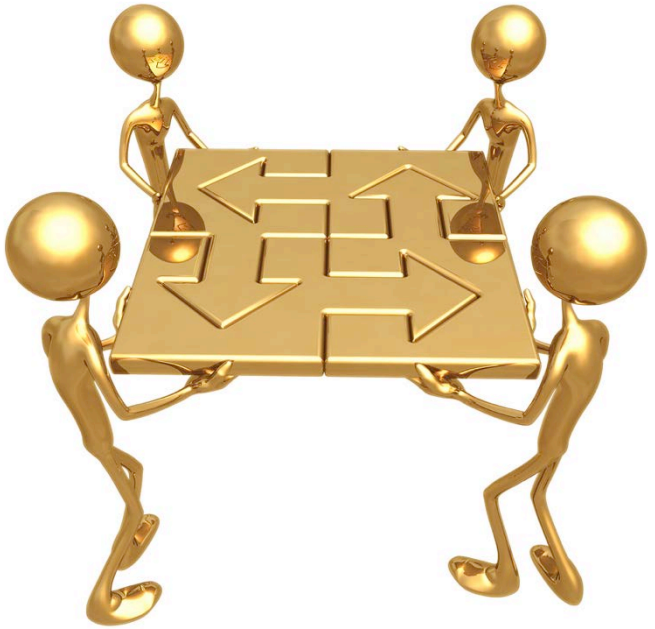

Annually Fox Valley Metro Area public street trees provide¹...
STORMWATER RUNOFF REDUCTION
$1.56 Million
PROPERTY VALUE INCREASE
$1.51 Million
$4.89
Million per Year
TOTAL BENEFITS
CO₂ REDUCTION
$186,480
AIR QUALITY IMPROVEMENT
$233,336
ENERGY SAVINGS
$1.40 Million
26% Norway Maple
13% Green Ash
9% Honeylocust
8% Silver Maple
4% Sugar Maple
Top 5 Street Tree Species

An adaptive approach provides flexibility to act in the face of uncertainty.



Adaptive management promotes optimal decision making with the information available.

Adaptive management encourages long-term collaboration among stakeholders.



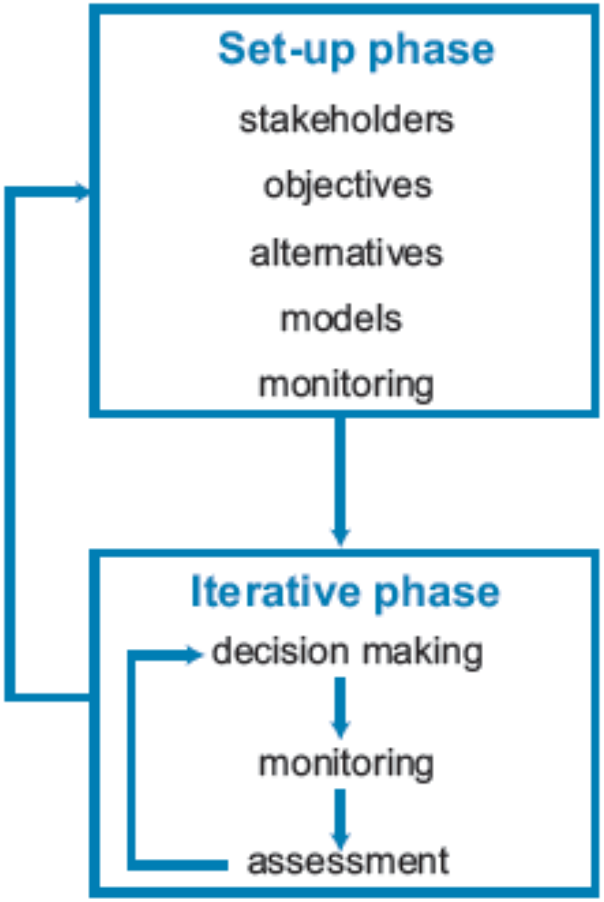
Challenges

Resistance to institutional change and/or a complex legal environment can be impediments to adaptive management.

Agencies must be willing to commit to monitoring and evaluation over the life of an adaptive management project.

Adaptive management projects should be tailored to the resource and objectives.

Implementation of adaptive management can be described in terms of two phases: set-up and iterative.



Set-up Phase


Set-up phase
stakeholders
objectives
alternatives
models
monitoring

Step 1 – A strong effort must be made to identify and engage the appropriate stakeholders.

Step 2 - Clear, measureable and agreed-upon management objectives must be identified.

S = Specific

M = Measureable

A = Actionable

R = Realistic

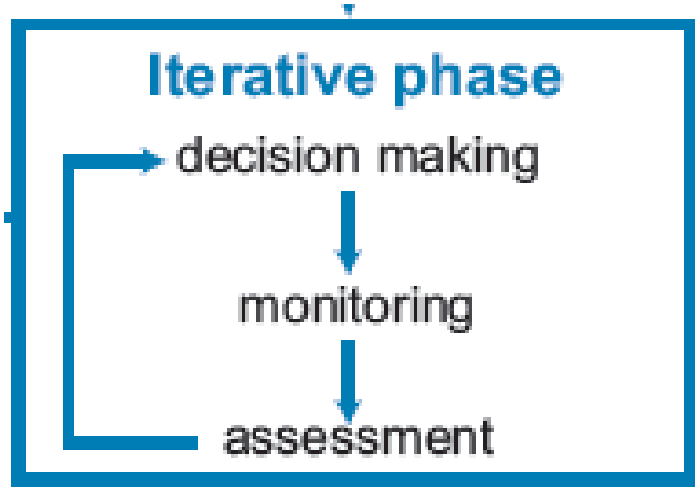
T = Time-bound

Step 3 - All stakeholders should participate in the identification of alternatives for action.

Step 4 - Identify the models that will be used to characterize the urban forest's structure and management.

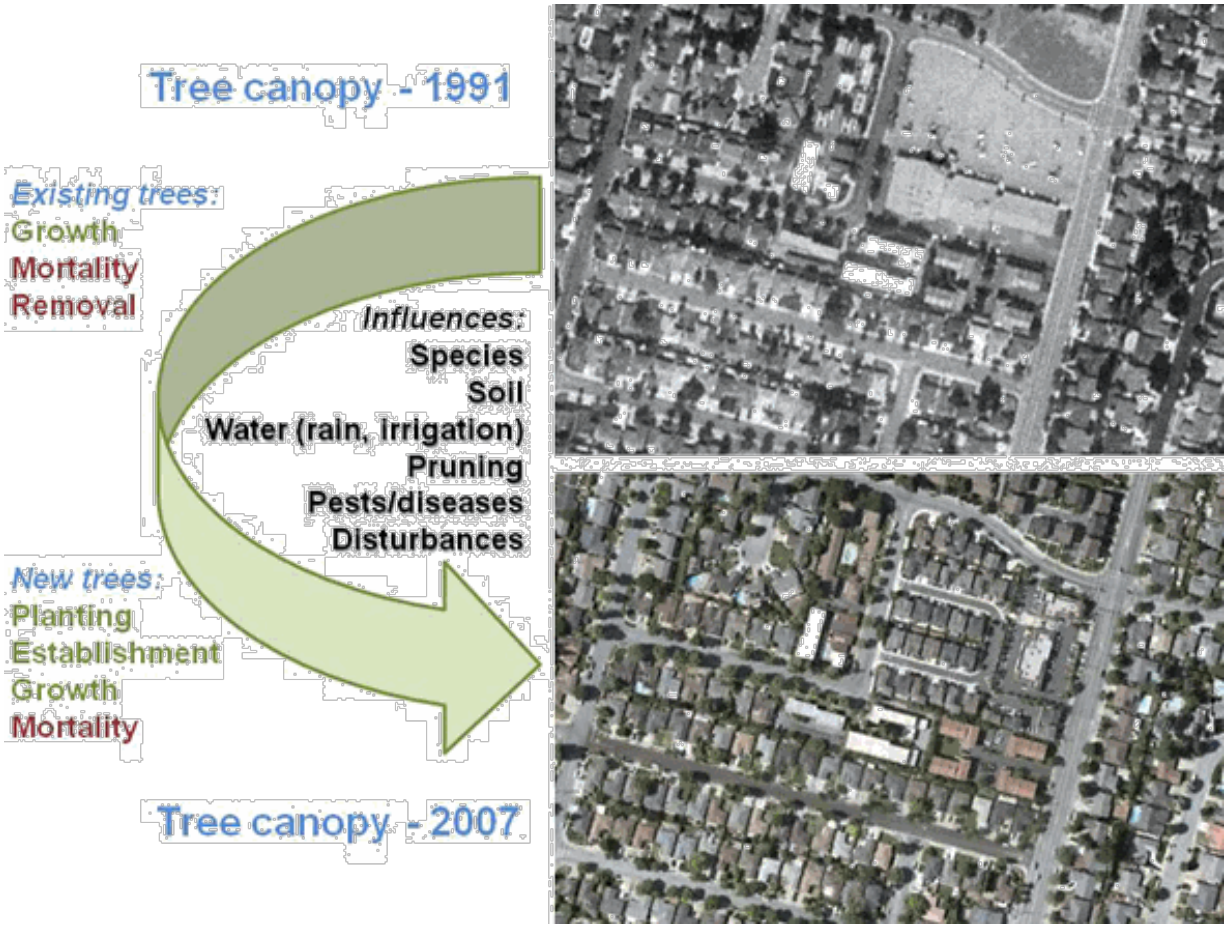
Step 5 – Design and implement a monitoring plan.

Iterative Phase

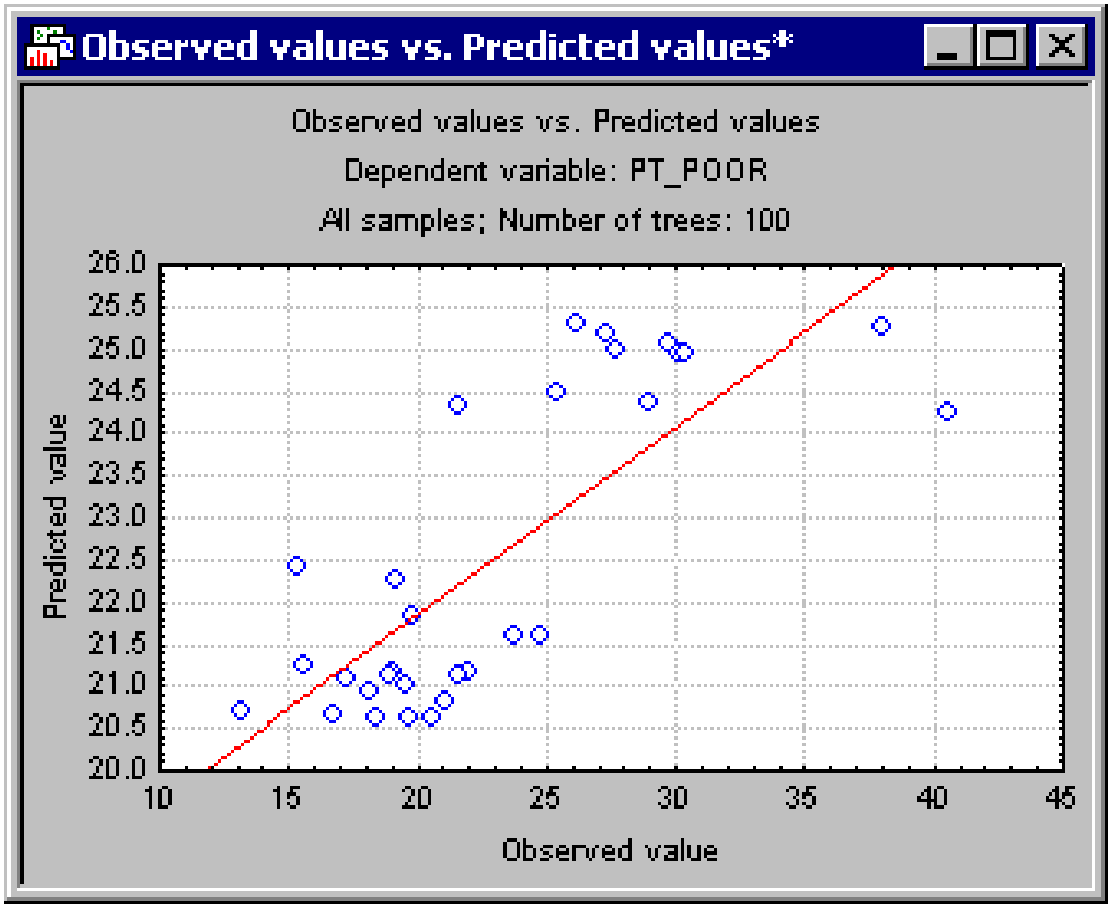


Step 6 – Select the management actions based upon objectives, resource conditions and present understanding.

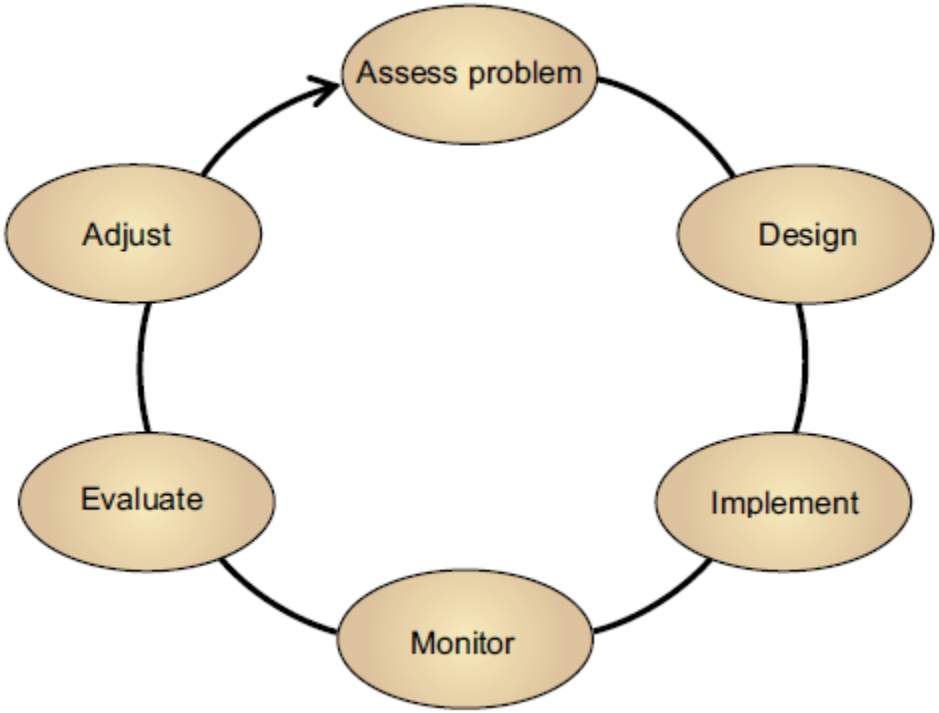
Step 7 – Use designed monitoring program to track responses to management actions.



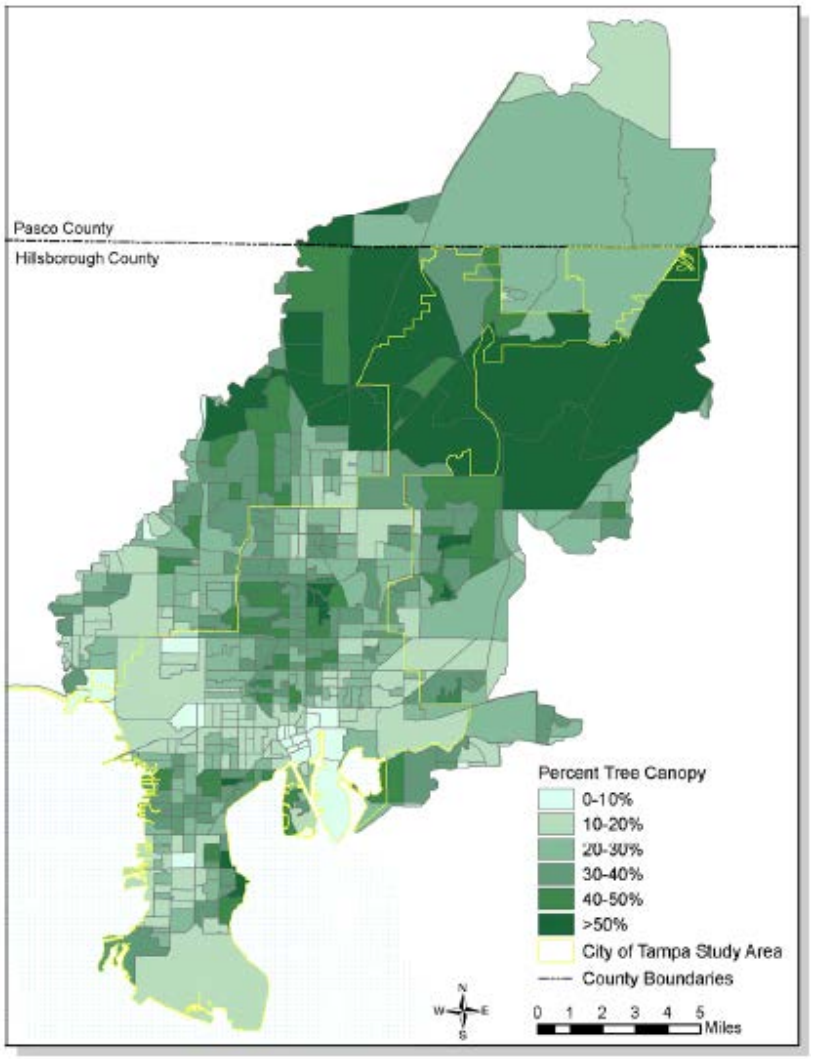
Step 8 – Compare predicted and observed changes in resource status.



Step 9 – Adjust management strategy to reflect knowledge gained from monitoring program.



Example – City of Tampa's Urban Forest Canopy Cover



Objective: No net loss of canopy cover by planning district (land use code).

Management actions:

1. Mitigation occurs within the same planning districts in which it occurred.

Intended outcomes:

1. No net loss of canopy cover city wide.
2. No lose of environmental equity citywide

Canopy cover monitoring program

1. Confidence interval - ±5%
2. High resolution spatial analysis - <1ft.
3. Conducted once every 5 years
4. Reviewed by Internal Technical Advisory Committee and external Natural Resources Advisory Committee
5. Recommend changes to institutional processes and land use code

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