

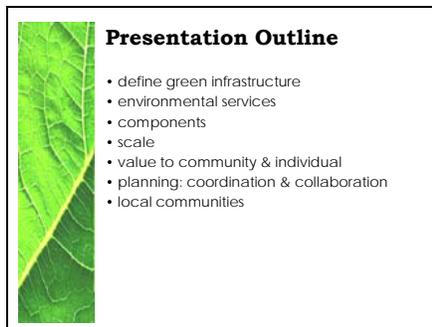
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An introduction to implementing green infrastructure projects.

This presentation discusses the role that sites and neighborhoods can play into the development of larger GI projects.

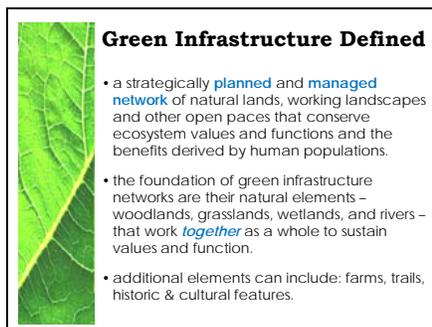
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In this presentation I will cover:

- the definition of green infrastructure (GI) and describe examples;
- discuss the principal environmental services (the “currency” of GI)
- talk about green infrastructure in terms of scale (region to site);
- discuss the value of GI to communities, neighborhoods, and individuals;
- discuss how planning is a key element of successful GI projects;
- and then discuss in general terms how individuals, neighborhoods, and communities can interact to create GI

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The key words in this definition include: planned, managed, and network.

In addition, the concept of ecosystem services ties the “green” to people for a desired benefit.

GI is based on “natural” systems (or elements) as opposed to built structures (houses, roads, water treatment plants).

The “elements” can vary: rivers, wetlands, farms, trails, and historic or cultural resources.

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Environmental Services
the "value" of green infrastructure

- air quality (urban heat island, PM10)
- watershed services (quality & quantity)
- climate (carbon sequestration)
- biodiversity
- recreation
- energy conservation (i.e. Shading)
- other cultural (physical & mental health)

Note: Services received are related to the scale of the GI project

The principal environmental services (or ecosystem services/values):

- improved air quality (local shade, ameliorated regional temperatures, capturing particulates)
- water quality improvement (sediment), and reductions in stormwater runoff (forested/green riparian zones)
- carbon sequestration and avoided carbon
- wildlife and plant diversity; habitat protection
- recreational opportunity (human health related)
- psychological benefits and the complex called "quality of life"

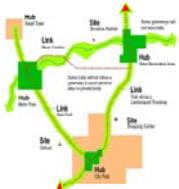
The type and level of environmental services depends on scale of the GI project

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Components

- a system of *hubs* and *links*



A simple graphic illustrates GI with a "network" of hubs (focal points) and links (routes).

GI includes the concept of the "site"; a feature of interest close to the GI network.

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Spatial Scale Range

- while planning occurs at the 'landscape scale'
- elements of the network are found at all scales:
 - multi-state
 - state-wide
 - regional
 - county
 - city
 - development
 - neighborhood
 - parcel/site scale

GI planning should occur at the highest scale possible; the highest, most appropriate scale of planning is dependent on vision, interest (or support) and a broad constituency.

Elements of the GI network are found at all scales.

GI becomes most valuable as scale progresses from the smallest (e.g. site) to the largest (e.g. regional, state); but there is value at all scales. A rain garden might be thought of as a micro green infrastructure with important but limited ecosystem services.

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Spatial Scale - Neighborhood

- elements of implementation may include:
 - New Urbanism concepts
 - form-based code concepts
 - low-impact development practices (LID)
 - LEED - ND prerequisites and credits
 - interfaces between grey & green
- these components can be found at the development, neighborhood, and site scale

At the development or neighborhood scale there are a variety of implementation protocols or guides.

- New Urbanism that relies on walkable communities practically “demands” some form of green infrastructure for those links.
- Form-based code, like Smartcode, uses a transect model to control development, and emphasizes regional, neighborhood, and site scale elements.
- One emphasis of low impact development is the identification, preservation, and use of natural site elements for stormwater control. Many of these elements could also function as hubs and links in GI.
- The newest LEED standard for neighborhood developments includes many prerequisites and criteria that would also support a GI network.
- Within the urban continuum of grey to green infrastructure there many opportunities for unique and subtle interfaces.

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Value to Communities

- recreational
- economic (e.g. working lands; ag and forest)
- environmental (riparian, heat island, health)
- sense of place (i.e. unique character)

Value to Individuals

- economic
 - property value
 - energy
- environmental (localized buffers)

The ecosystem values (environmental services) provided by the GI decrease as we go down the scale, and the recipients of those benefits move from the community at-large to small groups to individuals.

At large scales the values are less quantifiable; as the scale moves to your neighborhood and individual homes the benefits are more tangible and often (e.g. reduced energy demand for air conditioning) personally quantifiable.

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Going Green

Initiation:

- visionary from the “top down”
- visionary from the “bottom up”

GI as a “Process”:

- all players from the “area” (scale)
- vision, objectives, identify & prioritize

Implementation:

- “new” development must follow the green infrastructure plan
- existing and redevelopment must retrofit and be opportunistic

Two concepts to consider.

Starting the process can be “large scale” and be proposed by visionary community leaders (i.e.. elected officials, staff, regional planners).

Or, in the absence of vision at the “top”, local neighborhoods can start at a smaller scale and implement GI to lead the leaders. Probably more efficient from “top down”; but, many “bottom up” efforts can gain critical mass and drive the community.

Regardless of approach,, the GI “process” must function. Partnerships and participation; a clearly defined vision and objective(s) regardless of scale.

As “new” development occurs the emphasis is on local ordinances that “follow” the GI plan.

For existing development the primary task is one of retrofit as opportunities arise.

At any scale, a “champion” is important (needed).

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Coordination & Collaboration

- key criteria: *planning*
 - GI as a functioning network
 - many “players”
 - players & components at all scales
- a “top-down” approach for GI (scale dependent)
 - multi-state
 - state
 - region
 - community (city, county)
 - neighborhood(s)

Regardless of how or where it started, successful GI is dependent on planning.

Inherent in planning are:

- the development of a functioning and productive system
- collaboration with many “players”
- coordination of effort among and across those “players”

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Coordination & Collaboration

If vision & initiation is lacking from leaders:

- from “bottom up” (grass roots)
 - site or lot
 - neighborhood(s)
 - community (city, county)
 - region (multiple cities and/or counties)
 - state
 - multi-state

Regardless of how or where it started, successful GI is dependent on planning.

When the “vision” or “need” is from local (i.e. neighborhood) leaders, collaboration and the embracing of new “players” is what can move the “vision” to the “top”.

There are many obstacles when working from the bottom up:

- legal
- political
- economic
- organizational capacity
- Cultural
-

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Communities/Neighborhoods

- organize within the neighborhood
 - hubs & links
 - individual efforts become part of the “whole”
- locate and cooperate with other neighborhoods when possible
- connect with or participate in a community plan (e.g. a component of a comprehensive plan)
- tie your neighborhood scale into the larger community scale green infrastructure (whether formal or informal)

So, local communities can implement their portion of a larger, future, community-wide green infrastructure by identifying those things locally of environmental importance to them.

When they then combine their neighborhood with adjoining neighborhoods, then the cumulative “value” of the GI increases synergistically and the visibility of the “vision” within the community rises.

Properly planned and implemented GI at smaller scales can become important and/or useful within a community GI plan. Your pocket park “hub” for your neighborhood may not become an important community hub, but can help increase the complexity of the community-wide GI system. A valuable GI “site” for the larger plan.

What do we look for in our neighborhood/community to build and benefit from a GI system:

hubs

- public areas (parks, buildings, farmers’ markets)
- historic sites
- “donated” land with long-term access
- quasi-public sites (e.g. churches)
- brownfields
- DOD base closures

links

- streets
- trails (e.g. rail corridors, abandoned railroads)
- riparian zones
- public lands

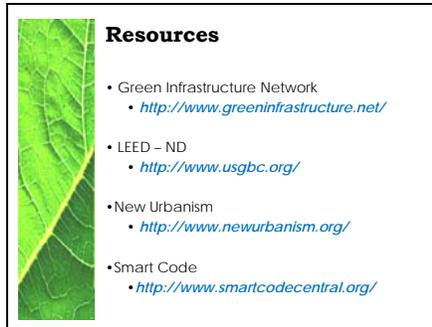
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Neighborhood Elements

- *hubs*
 - parks – of any size
 - playgrounds
 - any public site (school, post office)
 - community gardens
- *links*
 - streets (with sidewalks)
 - trails
- community scale connections
 - your *hub* as a community hub (or site)
 - your *link* as a partial link at the community scale

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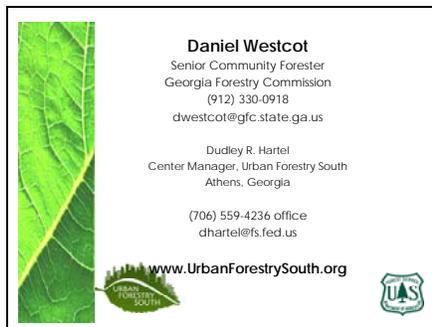
Resources

- Green Infrastructure Network
 - <http://www.greeninfrastructure.net/>
- LEED – ND
 - <http://www.usgbc.org/>
- New Urbanism
 - <http://www.newurbanism.org/>
- Smart Code
 - <http://www.smartcodecentral.org/>

Some Internet resources.

Also, the Green Infrastructure Center in Charlottesville, Virginia.
<http://gicinc.org/resources.htm>

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A PDF of this presentation will be at www.UrbanForestrySouth.org .

“Quick Search” with ‘GUFC green infrastructure’ (no quotes).