Urban Agroforestry:

How can agroforestry support urban agriculture?

NACD Urban and Community Webinar
June 21, 2018

Presentation Outline

What is agroforestry?

What can urban agroforestry look like?

Resources

What is Agroforestry?

The *intentional* integration of agriculture and forestry to create productive and sustainable farms, ranches, and woodlands.



Ecological benefits

- Improve soil health
- Improve water quality
- Improve air quality
- Provide wildlife habitat
- Support pollinators
- Grow renewable energy sources

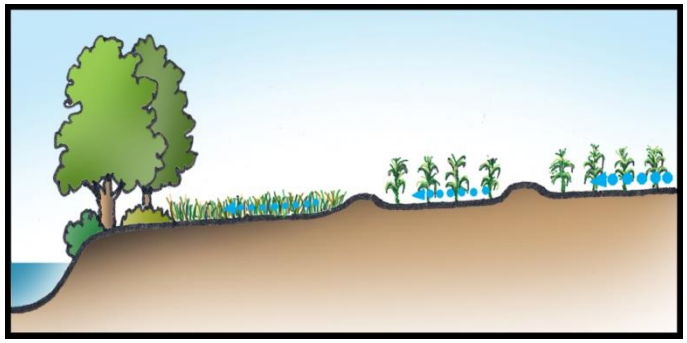
Economic benefits

- Mitigates risk
- Increases crop yields & livestock production
- “Stacks” income: vertically and over time
- Produces salable products
- Provides value-added opportunities
- Increases property values

Social benefits

- Creates jobs and supports local communities
- Opportunities for learning and teaching
- Development of cooperatives for value added processing

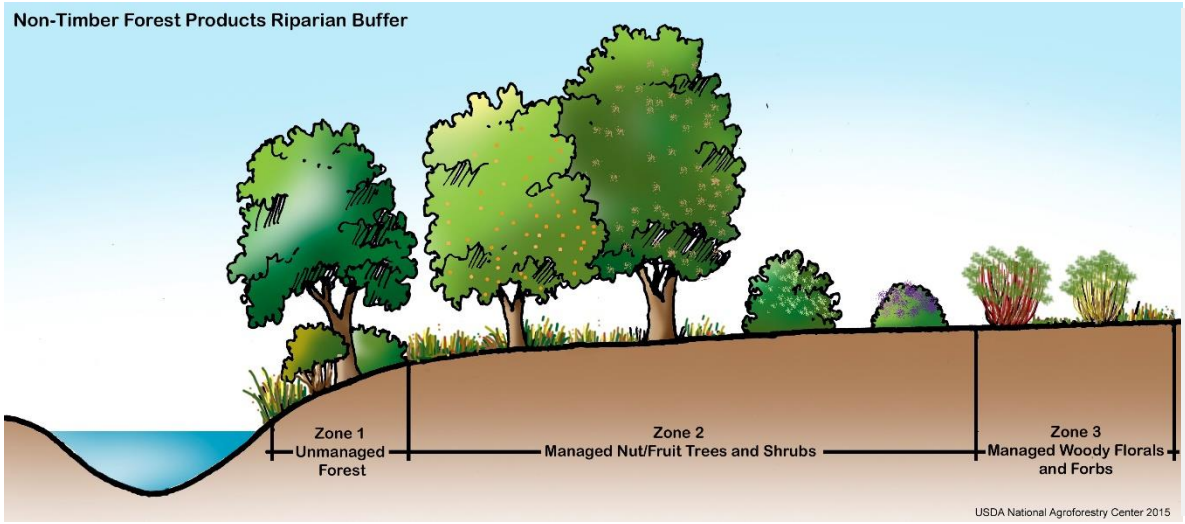
Riparian Forest Buffers



Riparian forest buffers are natural or planted woodlands adjacent to water bodies. They are designed with trees, shrubs, and grasses to protect water resources from non-point source pollution.

Riparian Buffers for Urban Ag

- *Filter runoff & stabilize streambanks*
- *Provide landscape and habitat connectivity*
- *Riparian forest buffers that produce something that can be harvested*



Information Sheet: Why add edible and floral plants to riparian forest buffers?
https://www.fs.usda.gov/nac/documents/workingtrees/infosheets/WTInfoSheet-MultiFunctionalBuffer.pdf

Sprouting Hope Community Garden in Marion, VA
https://www.youtube.com/watch?v=Nq0-xA2tt8E

Windbreaks and Hedgerows

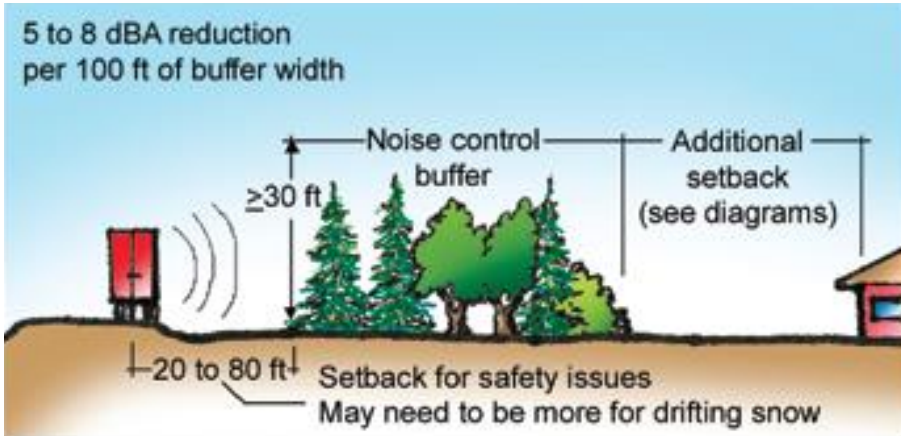


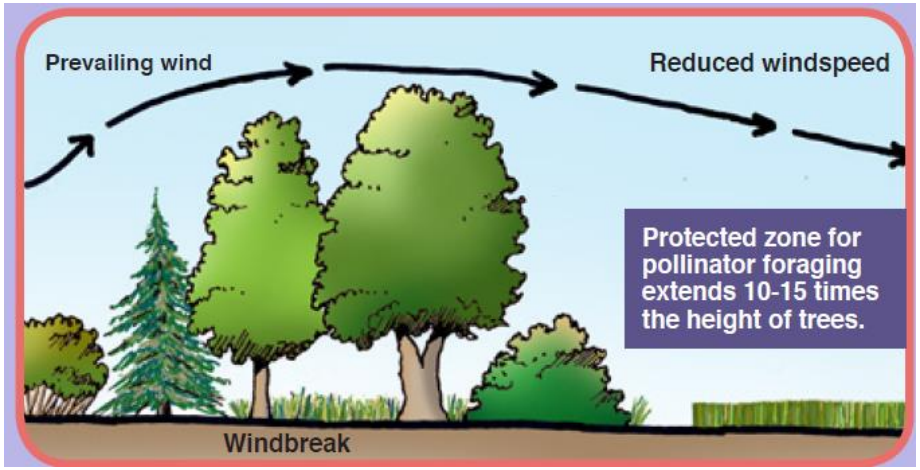



Plantings of single or multiple rows of trees or shrubs that redirect or modify the wind and are established for one or more environmental purposes.

Windbreaks and Hedgerows for Urban Ag

- *Provide visual screen or noise buffer*
- *Create a Vegetative Environmental Barrier (VEB) to reduce dust, odor from adjacent land uses*
- *Minimize herbicide or pesticide drift*
- *Provide pollinator habitat to enhance pollination services*





Windbreaks and Hedgerows for Urban Ag

- *Enhance crop yield and/or quality*

Crop	Field Years	Percent Yield Increase
Winter Wheat	131	23
Barley	30	25
Rye	39	19
Millet	18	44
Corn	209	12
Alfalfa	3	99
Hay (mixed grass & legumes)	14	20
Soybeans	17	15
Spring Wheat	190	8

Crop	Response
Broccoli	Increased leaf area
Pepper	Reduced bacterial spot; Improved yield in dry years; Larger plants; Earlier flowers; Greater yields
Potato	Earlier sprouting and ripening; Increased yield and quality
Snap bean	Reduced disease; Earlier ripening; Larger leaf area; Increased yield of marketable beans
Tomato	Reduced sandblast injury; less flower abortion; greater fruit set; Increased yield of high quality fruit
Cabbage	Greater yield and improved tenderness
Melon	Longer vines; Earlier flowering and fruit maturity; Increased yield
Carrot	Improved germination; Reduced sandblasting
Cucumber	Reduced vine damage; Increased yield
Lettuce	Reduced sandblast injury; Increased yield
Raspberry	Reduced desiccation of canes; Improved yields and fruit quality
Strawberry	Increased yields and fruit quality
Plum	Increased yield and more marketable fruit
Anjou pear	Improved quality of fruit
Grape	Reduced desiccation of young vines; Improved growth rates and yields; Reduced leaf damage and rubbing of grape bunches; Improved quality

Silvopasture

Managing trees, livestock, and forage production on the same acreage.

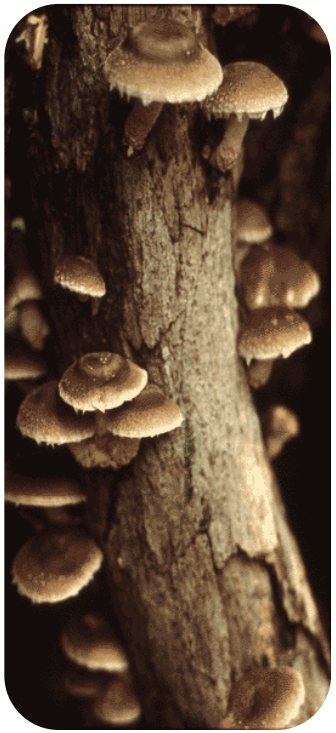
Silvopasture for Urban Agriculture

- *Provide shade to reduce heat stress*
- *Protect livestock from winter winds*

Photos by Reginaldo Haslett-Marroquin

Main Street Project: poultry & hazelnut systems https://mainstreetproject.org/

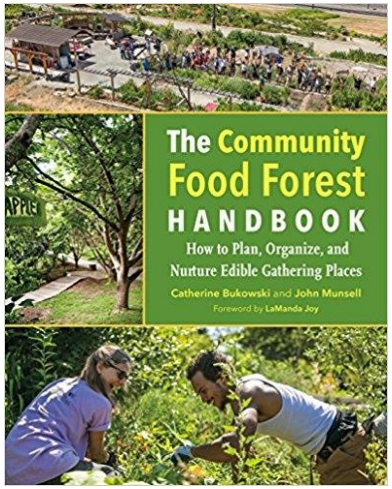
Forest Farming – Multistory Cropping



The intentional management of woodlands to produce non-timber products under a managed forest canopy.

Forest Farming for Urban Agriculture

- *Use a wooded portion of land for production: fruit trees & shrubs, mushrooms, decorative woody florals, herbs*
- *Create a food forest: food production systems that use perennial plants combined with annuals in a multi-story cropping design*



Photos by Catherine Bukowski http://communityfoodforests.com/

Alley Cropping

Growing an annual or perennial crop simultaneously in the alley ways between rows of a long term tree crop.

Alley Cropping for Urban Agriculture

- *Enhance use of small land areas, using space both horizontally and vertically*
- *Add fruit and nut tree or shrub rows, with annual production in the alley*
- *Provide pollinator habitat among the rows of trees*

Photo by Tracey Coulter

Agroforestry Can Enhance Urban Ag

Benefits of trees & shrubs:

- Fruit and nut products
- Food production services
- Air quality
- Extreme weather adaptation

Adapt to Extreme Weather

Image by the Denver Post

Adapt to Extreme Weather

- Deep rooted trees and shrubs offer resilience to droughts and floods.
  Garrett 2009

Mitigate Urban Heat Islands

- Peak air temperatures in tree groves are 9ºF (5ºC) cooler *EPA 2013*

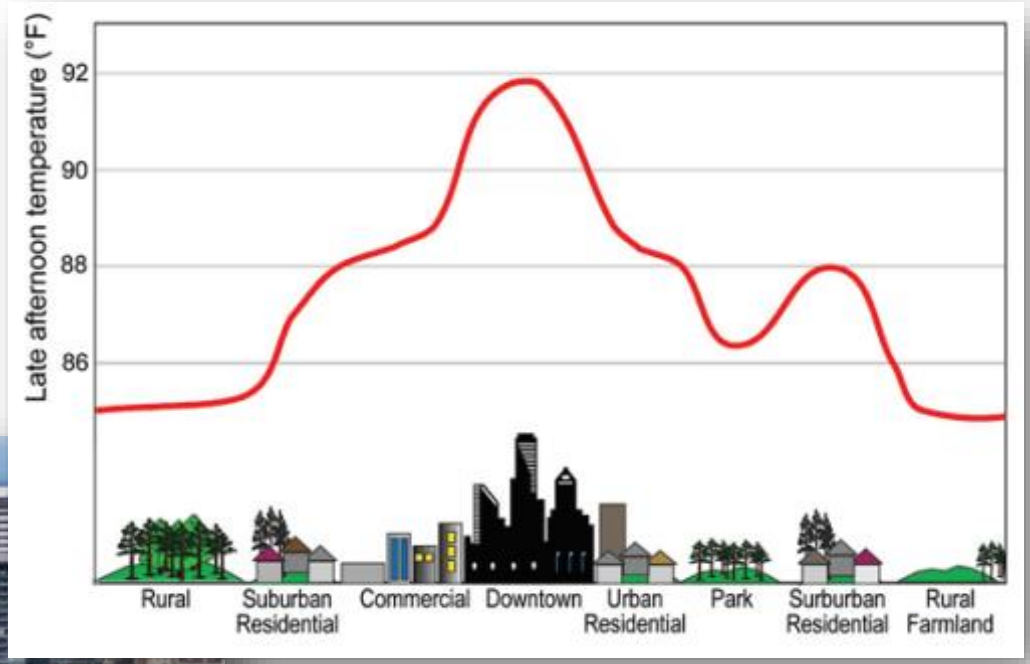


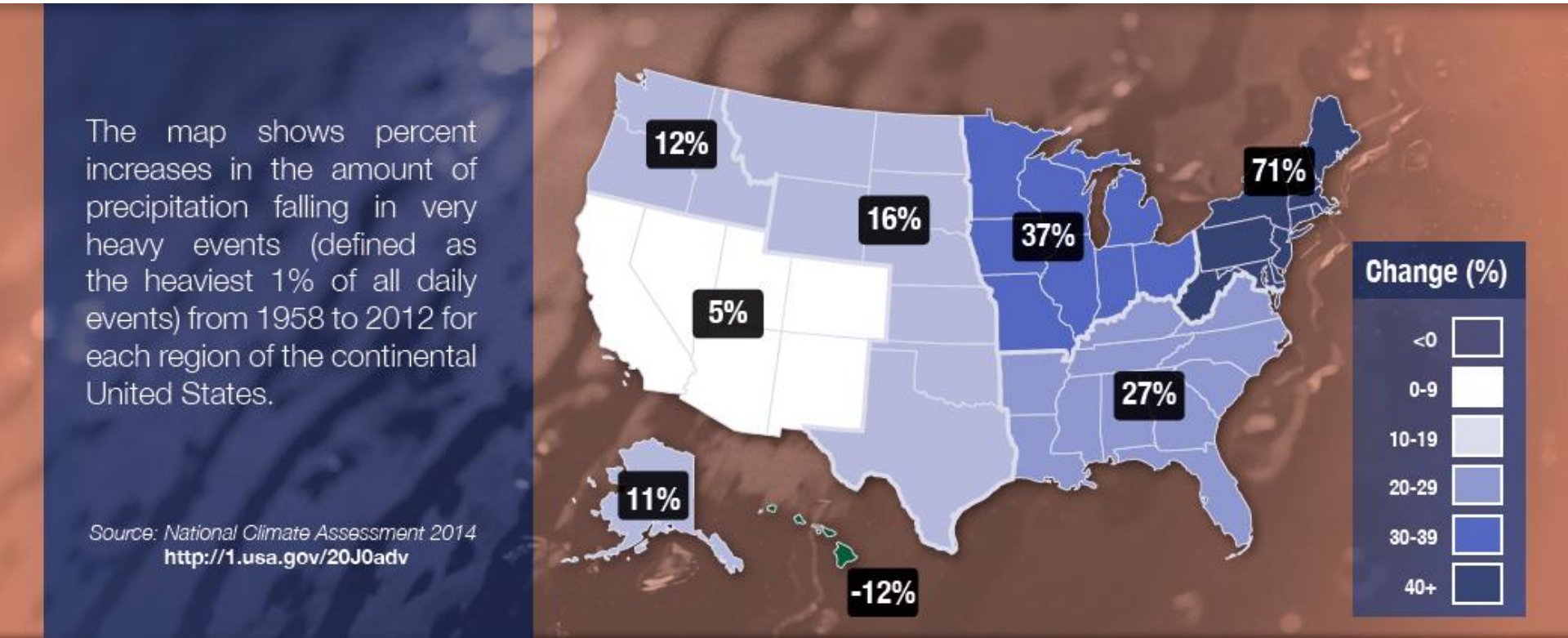
Image by Lemmen and Warren 2004

Image by The Oregonian

- A 1% increase in urban forest canopy can reduce max temps down .07-.36° F *Nowak et al. 1996*

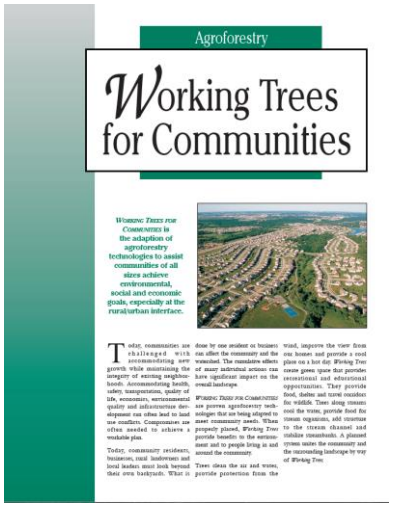
Mitigate Flooding

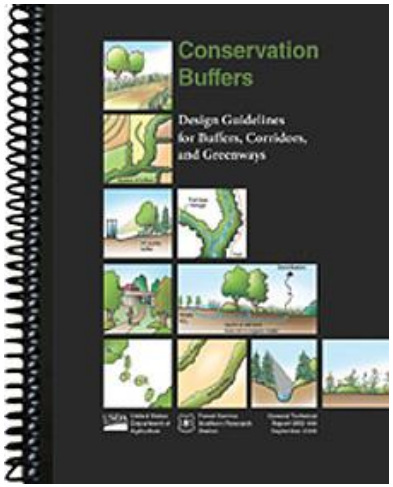
- Forest and tree cover can intercept rainfall, increase the amount of that rain that filters into the ground, and reduce the quantity, speed, and peak flows of runoff.
- Tree plantings can have positive effects at a watershed scale, even if trees are established in narrow strips along uplands or riparian areas.



Resources

- More information on agroforestry
- Free publications for use in workshops
- Webinar library





https://www.fs.usda.gov/nac/issues/communities.shtml

Questions?

https://www.fs.usda.gov/nac/

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