Working Trees Info

How can agroforestry help landowners adapt to increased rain intensity?

Rain events have become heavier and more frequent. These events can often cause flooding that damages crops and leads to erosion.

As the climate changes, many regions of the United States are experiencing rain events of increasing intensity, with peak rainfall occurrences becoming more frequent and surpassing previous peak rainfall amounts. Additionally, a greater percentage of total precipitation is occurring during peak precipitation events.

> Future climate projections suggest this increase in heavy precipitation events will continue.

All of this is causing greater soil erosion and more frequent flooding, especially in the Northeast and Midwest. Future climate projections suggest that the increase in heavy precipitation events will continue, even in regions where total precipitation is projected to decrease, such as the Southwest.

These heavy precipitation events affect agricultural and forested landscapes by increasing the amount of water flowing through streams and rivers, making field and bank erosion, as well as flooding, worse. Both erosion and flooding can damage crops, overload infrastructure, and increase siltation in drinking water reservoirs.

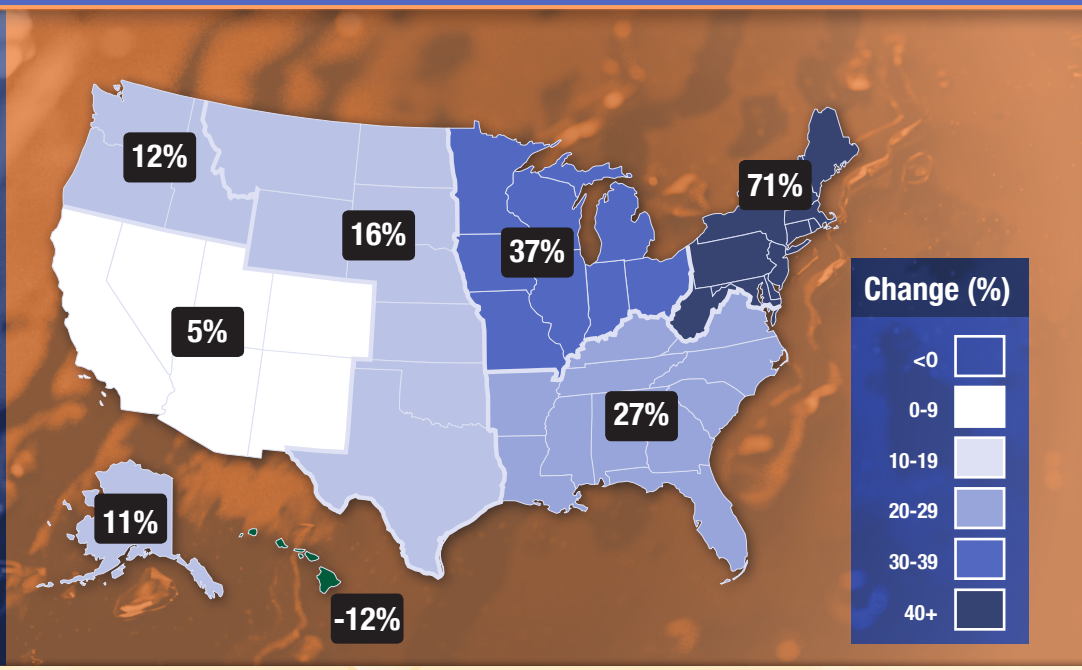
Agroforestry systems can help landowners adapt to this change and lessen negative impacts. Forest and tree cover can intercept rainfall, increase the amount of that rain that filters into the ground, and reduce the quantity, speed, and peak flows of runoff. Tree plantings can have positive effects at a watershed scale, even if trees are established in narrow strips along uplands or riparian areas.

Decision-support tools can help to identify riparian areas where bank erosion is likely to occur and where riparian forest buffers would be effective at reducing erosion and enhancing water quality. Riparian buffers work best as part of a system of conservation practices. Proper management can reduce the potential negative

Observed Change in Very Heavy Precipitation

The map shows percent increases in the amount of precipitation falling in very heavy events (defined as the heaviest 1% of all daily events) from 1958 to 2012 for each region of the continental United States.

Source: National Climate Assessment 2014
http://1.usa.gov/20J0adv



effects of streamside trees, such as clogged agricultural drainages from tree debris.

The addition of trees and other permanent vegetation to the landscape through agroforestry can allow landowners to reduce impacts of extreme rainfall events while enhancing agricultural production. Riparian forest buffers have been discussed above. Windbreaks and alley cropping systems can help to reduce soil erosion and flooding throughout the watershed, while maintaining, or in some cases increasing, crop production. Silvopasture and forest farming also allow the positive effects associated with tree cover while diversifying and increasing economic productivity.

By adopting agroforestry practices, landowners can help adapt their lands and the watersheds in which they live to the increased rain intensity associated with a changing climate.

To learn more, please explore:

- 2014 National Climate Assessment – Heavy Downpours Increasing: http://1.usa.gov/20J0adv
- USDA NAC AgBufferBuilder: http://nac.unl.edu/tools/AgBufferBuilder.htm
- USDA Climate Hubs: http://climatehubs.oce.usda.gov/
- USGS Climate DATA Portal: http://cida.usgs.gov/gdp/
- USFS Center for Forest Disturbance: http://www.srs.fs.usda.gov/forestdisturbance/
- USFS Eastern Forest Environmental Threat Assesment Center: http://bit.ly/20p6SmQ

USDA National Agroforestry Center

A partnership between:
United States Forest Service
Natural Resources Conservation Service

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The USDA National Agroforestry Center (NAC) is a partnership of the Forest Service (Research & Development and State & Private Forestry) and the Natural Resources Conservation Service. NAC's staff is located at the University of Nebraska, Lincoln, NE. NAC's purpose is to accelerate the development and application of agroforestry technologies to attain more economically, environmentally, and socially sustainable land use systems by working with a national network of partners and cooperators to conduct research develop technologies and tools, establish demonstrations, and provide useful information to natural resource professionals.

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