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April 19, 2017

Using Ecological Restoration to Reduce Urban Flooding



Riverside Park of the Urban Ecology Center in Milwaukee, Wisconsin.
Photo: Urban Ecology Center

As climate change leads to an increase in the frequency of extreme precipitation events, urbanized landscapes face their own unique challenges.

[Events](#)

Depending on the city and its available resources, the threat of flooding following a storm can range from mild inconvenience to full-blown terror. Natural barriers can protect communities from flooding risks, but in many urban areas they have largely vanished - only to be replaced by vast expanses of asphalt, concrete and highly-compacted soils. Yet cities can use several strategies to mitigate flooding events - and this is where [ecological restoration](#) comes in. By working with the natural environment to restore local small-water cycles, we can increase the amount of rainwater absorbed into soils and greatly reduce the risks of flooding.



Disastrous flooding in Houston, Texas in May 2016.
Photo: Reuters

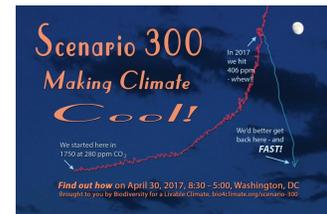
Most natural landscapes easily absorb rainwater, passing it down into the water table and refilling aquifers. As we discussed in [our previous issue](#), when small water cycles are severely damaged, they contribute greatly to the worsening of storms, droughts and floods. Conventional [stormwater management](#) diverts rainwater into large bodies of water, such as streams and rivers, rather than capturing it in soil and plants. In shifting the focus of stormwater management to urban ecological restoration and rainwater retention, cities can dramatically reduce the risk of flooding and recharge the small water cycle at the same time.

Here are just a few of the many strategies that urban populations can use to reduce flooding.

Remove impervious surfaces and replace them with porous materials.

Join us for our next conference on climate change in Washington, DC on April 30th...

Scenario 300: Making Climate Cool!



Scenario 300 is a strategy for going from a dangerous 406 ppm to a safer 300 ppm of carbon dioxide in our atmosphere. By regenerating healthy ecosystems, including soils, managing local water cycles, we can reverse our disastrous course towards climate change. During this inspiring and informative conference, we will discuss how to rapidly move carbon out of the skies and use it to support a diversity of life both above and below ground.

When: Sunday, April 30, 2017, 8:30 AM to 5



Permeable paving in St. Albans, Vermont. Photo: EPA

When urban areas are covered with large swaths of [impervious surfaces](#), rainwater remains on the surface - decreasing soil infiltration, increasing average and peak surface runoff, and exacerbating flooding events. Urban areas can significantly reduce flooding by replacing impervious surfaces with [permeable paving](#): surfaces that allow rainwater to percolate down through the surface and into the small water cycle. Examples of permeable paving include pervious concrete, porous asphalt, and paving stones. The [Depave project](#) based in Portland, Oregon provides informational and technical resources for those who are ready to depave. The 'de-paving' movement is gaining popularity across the country, and has already made its way to [Somerville, Massachusetts](#).

Expand urban agriculture.



The rooftop Sky Farm at Eskenazi Health Hospital in Indianapolis. Photo: Inhabitat

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Where: At the offices of Steptoe & Johnson LLP, 1330 Connecticut Avenue NW, Washington DC

Nearest Metro: Dupont Circle on the Red Line

Learn [more details](#) about the conference and [register here!](#)

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About Biodiversity for a Livable Climate

Through education, policy and outreach, our mission is to promote the power of the natural world to stabilize the climate and to restore biodiversity to ecosystems worldwide.

Urban farming does more than provide healthy, local food for urban residents - it's also a [valuable tool for reducing flooding](#) in urban areas. Many cities are [transforming vacant lots](#) and [rooftops](#) into thriving agroecosystems. The [Brooklyn Grange](#) is a productive vegetable rooftop farm in the industrial neighborhood of Long Island City that diverts thousands of gallons of stormwater from the sewer system. The expansion of urban agriculture can be a vital resource in capturing rainwater for storage and reuse, including crop irrigation.

Increase urban green space and create rain gardens.



An 8-level rooftop garden in Japan called Namba Parks.
Photo: Inhabitat

Increasing green spaces in urban areas is another way to reduce the risk of urban flooding. One [study](#) in Seoul, Korea concluded that introducing green spaces could cut the probability of urban flooding by more than half. Options for implementing more urban green spaces are plentiful; green roofs are one of many effective and space-efficient strategies. In [one study by the EPA](#), green roofs captured over 50% of total annual precipitation, and over 95% of precipitation in summer months. Similarly, rain gardens can effectively reduce urban flooding. [Rain gardens](#) are spaces or systems designed to reduce peak water flows, and to filter and slowly release rainwater into the landscape.

Collaborating with organizations around the globe, we advocate for the restoration of soil, and of grassland, forest, wetland, coastal and ocean ecosystems - along with the associated carbon, water and nutrient cycles - to draw down excess atmospheric greenhouse gases, cool the biosphere, and reverse global warming, for the benefit of all people and all life on earth.

Learn more about our ongoing projects and upcoming events and find additional information and resources at bio4climate.org.

Restore the ecosystems of lakes, rivers and streams in urban areas.



Restoration of the LA River includes the Glendale Narrows Riverwalk. Photo: Inhabitat

Many cityscapes are framed by or adjacent to substantial bodies of water, such as streams, lakes and rivers. Without natural surfaces to absorb rainfall, heavy storms in urban areas can send polluted runoff straight to those waterways. [Restored ecosystems around urban water bodies](#) can serve as natural buffers that capture rainfall, prevent stormwater runoff, and filter out pollutants before the water enters the local watershed.

Every city has its own set of unique traits - including geography, climate and community needs - that determine which strategies are most effective for reducing the risks of extreme precipitation events. By identifying these characteristics and assessing their capacity for urban ecological restoration, cities can work towards restoring local small water cycles while becoming more resilient to climate change.

Dr. Gina Angiola Helps Lead Maryland Ban on Fracking



Congratulations to Bio4Climate board member, Gina Angiola, who has been a leader in the [successful fracking ban](#) that just passed the Maryland legislature!

In her role as a board member of Chesapeake Physicians for Social Responsibility and founding member of the Don't Frack Maryland coalition, Dr. Angiola helped amplify the public health voice in the debate about fracking in Maryland. In 2017, the coalition worked successfully to ban hydraulic fracturing in Maryland, setting a national precedent as the first state with shale gas reserves to prohibit this practice through the legislative process.

Who's going to save the world? The humble earthworm

Our good friends, [the earthworms](#), have been terraforming the earth for 500,000 years or so. Along with permaculture, planned grazing, [organic 3.0](#), wetlands and shoreline restoration, [azolla](#) and many others - earthworms are vital to restoring global soil health and fertility.