

Dublin

Using rain gardens to reduce spills from Victorian sewers

THE CHALLENGE

Cities are already experiencing water challenges because of climate change. The increased density of building coverage and our tendency to increase areas of hard surfacing with open spaces and paved gardens have resulted in increased risks from established climate patterns.

Recent studies¹ show that climate change has already resulted in an increased frequency and intensity of rainfall events, and this trend is likely to continue. In urban areas, the fact that the ground is almost completely impermeable due to hard surfacing means **these climate changes result in increased flooding in urban areas of the city.**

Dublin's drainage network is largely Victorian and uses a combined sewer system which means increased surface water runoff also results in overflows from this sewerage system into adjacent rivers.

KEY FACTS & FIGURES

- **Dublin population: 554,554.²**
- **By 2050, annual precipitation is expected to increase by 54.3mm.³**
- **By 2050, the temperature in Dublin is predicted to increase by 1.33 degrees.**
- **Over the last 10 years, the number of flood events caused by extreme weather has increased at a significant rate.⁴**
- **It is predicted that flood events will increase, and heavy rainfall days will rise.⁵**
- **Dublin will experience wetter and milder winters, with a 10-15% increase in rainfall, and drier summers.⁶**

¹ Blöschl, G., Hall, J., Viglione, A. et al. Changing climate both increases and decreases European river floods. *Nature* **573**, 108–111 (2019)

² "Sapmap Area: County Dublin City". *Census 2016. Central Statistics Office*. 2016.

³ Bastin, J.F. et al., Understanding Climate Change from a global analysis of city analogues, PLOS, 2019, <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0217592>

⁴ Dublin Climate Change 2019, Climate Risks Facing the Dublin Region, Dublin Council, viewed 18 December 2019, <https://dublinclimatechange.codema.ie/about/why-act/dublins-climate-risks/>

⁵ Dublin Climate Change 2019, Climate Risks Facing the Dublin Region, Dublin Council, viewed 18 December 2019, <https://dublinclimatechange.codema.ie/about/why-act/dublins-climate-risks/>

⁶ Dublin Climate Change 2019, Climate Risks Facing the Dublin Region, Dublin Council, viewed 18 December 2019, <https://dublinclimatechange.codema.ie/about/why-act/dublins-climate-risks/>

THE SOLUTION

Nature-based water retention measures in Dublin's communal spaces

The Dublin City Council Climate Change Action Plan aims to make Dublin climate-resilient while actively engaging citizens in climate change issues.

The focus of the project will be assessing the viability of integrating natural water retention measures (such as a rain gardens) within community-based environmental initiatives, in order to address the risk of flooding in the city as a result of climate change.

The community will be involved with retrofitting sustainable urban drainage systems (natural water retention measures) in existing developments. Demonstration sites will also be developed that showcase nature-based solutions with existing land uses.

THE BENEFITS

The project will reduce flood risks and pollution in the water course by treating surface water and reducing spills from combined sewer overflows. It should remove carbon and air pollutants from the atmosphere through the greening of the urban landscape and reduce energy usage at wastewater pumping stations and treatment plants. It should also reduce the carbon footprint produced by traditional drainage network installations, or upgrade and reduce the energy use of vehicles and machinery used to maintain a traditional network.

The programme will also reduce surface water runoff in a way that mimics the natural process and provide wider benefits such as enhancing biodiversity, health and wellbeing in the public realm.

Smart technology will be used to monitor the hydrological behaviour of natural water retention measures (NWRM), the air quality impact and the impact of NWRM on community engagement.

PROJECT LEADERS

The project is led by the Environment and Transportation Department of Dublin City Council. It is a cross-departmental project involving Flood Management, Surface Water Management and Water Framework Directive Section, Waste Management, Smart Dublin, Parks and Housing and the Climate Action Regional Office. Céline Reilly and Adrian Conway, Executive Managers from the Environmental and Transportation Department of Dublin City Council are leading the project.

Trinity College Dublin, the winners of the 2019 Climathon, will be involved with monitoring the benefits using their smart technology.

In Ireland, Climate Action Regional Offices (CAROs) will allow this project to be replicated across other local authorities and Irish cities.

The project involves collaboration with multiple stakeholders including various sections within Dublin City Council, Dublin Metropolitan Climate Action Regional Office, Trinity College and community groups. It seeks to build local, regional and multi-strand approaches to enhance community environmental initiatives through design, support and local empowerment.

CLIMATHON AWARDS

Run by Europe's Largest public-private partnership, EIT Climate KIC in partnership with Crowther Lab, the Climathon Global Awards called for cities around the world to engage in climate action and find new systems level solutions to tackle the worsening climate crisis.

With a vision to transform 100 cities into carbon neutral areas by 2030, the awards challenged cities with tackling major issues including air pollution, efficiency mobility and energy systems, and creating sustainable local economies. With a strong focus on 'systemic innovation', the most successful solutions must encompass both domestic and international governance, policy and the financial and market structures that influence behaviour.

The most visionary innovators have been chosen to attend the Climathon Global Awards Ceremony on 31 January in Paris during the ChangeNOW summit, where all finalists have the chance to win funding and expert support to make their ideas a reality.