

Oslo Reopening Waterways



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This good practice is relevant to European Green Capital Award indicators:
 2: Climate Change: Adaptation, 4: Sustainable Land Use, 5: Nature and Biodiversity, 9: Water

Introduction and Objective

The City of Oslo is defined by its **urban waterways** which have shaped the development of the city throughout history. Oslo has **ten main waterways** in the built up zone of the city, equating to 354 km of rivers and streams. These waterways provide **vital ecosystem services**, including **recreational opportunities**, **wildlife habitat** and act as the city's arteries for **flood control**. Up until the 1980s, the waterways were considered problematic due to leakages from the sewage system, heavy pollution from emissions and spills, and as obstacles for efficient urban development. Hence large sections of waterways were put in pipes or culverts.

In recent years, extreme weather events, increased rainfall and storm surges resulting from **climate change** have made Oslo more vulnerable to the **risk of flooding**. The capacity of culverted rivers to manage water is limited by their design. During peak times, increased rainfall can overburden the water infrastructure and cause flood events. Oslo decided to **reopen its waterways as an integral part of its climate change adaptation plan** to make the city resilient to flood risk. The reopened waterways also serve to contribute to increased **biodiversity**, improve **water quality** and benefit **public health**.

In 2016, the City's **investment budget allocated €11.7 million** for reopening projects. In the past decade, a total of **2,810 metres of waterways were reopened**. This includes 1,080 metres between 2015 and 2016. The City of Oslo is actively working to reopen closed rivers and streams with tributaries wherever it is possible and expedient with long-term plans to opening up **30 stretches of waterways** including an additional eight kilometres of waterways in the coming 10 years.

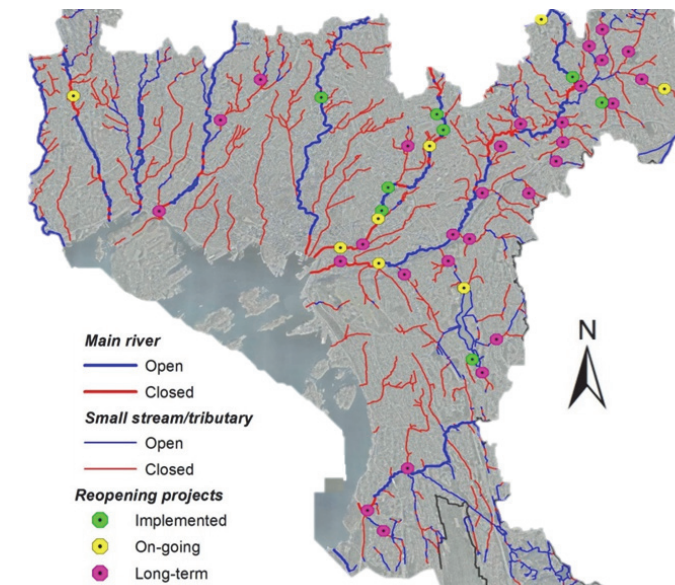


Figure 1: Oslo Plan for Reopening Waterways. Source: European Green Capital Award 2019, City of Oslo Application (2017)



Oslo at a Glance

Statistics sourced from Oslo's EGCA 2019 Application

- Gross Domestic Product: €83,746/capita
- Population: 658,390
- % Blue Areas in Overall City: 6%
- Köppen Climate Classification: Dfb (Warm Summer Continental Climate)
- Annual Rainfall: 763 mm (10/16 - 09/17)

Want to know more?

For further information about Oslo's Reopening Waterways Project please see:

- [Principles for reopening of streams and rivers in Oslo \(Norwegian\)](#)
- [Reopening Waterways \(English\)](#)
- [Climate Change Adaptation Strategy 2014-2030 \(Short version\)](#)
- [Action Plan for Storm Water Management \(English\) \(Short version\)](#)
- [Storm Water Management Strategy 2013-2030 \(Norwegian\)](#)
- [The 2015 Municipal Master Plan: Oslo towards 2030 'Smart, Resilient and Green' \(Norwegian\)](#)

Find out more about the **European Green Capital Award**, and its sister competition, the **European Green Leaf Award** on our website:

ec.europa.eu/europeangreencapital/



Methodology

In the late 1990s, the trend of closing streams and rivers was reversed. Inspired by international trends, efforts of NGOs, grass roots organisations and individual engagement, Oslo started its work to reopen its waterways. Today, **Oslo has an explicit goal to reopen rivers and streams** enshrined in local policy. This goal is assessed in all development projects in proximity to closed waterways. The success of the reopening waterways project has been heavily dependent on **planning** bespoke policies, **monitoring** of water quality and **collaboration** between the city's stakeholders.

Planning

- The **City Investment Budget** (2016) set aside €11.7 million for reopening projects throughout Oslo.
- In 2016, municipal agencies developed a management document outlining **principles for reopening projects** and a list of prioritised projects.
- The **Oslo Action Plan for Stormwater Management** (2016) highlighted the need to utilise open waterways in a three step strategy for managing stormwater and extreme weather events.
- The **Municipal Master Plan** (2015) made provision for setting construction zones 20 m away from main waterways and 12 m away from tributaries to mitigate construction related pollution.
- The Municipal Master Plan (2015) also set out specific measures for maintaining blue-green infrastructure. The **blue-green factor (BGF)** is a tool that uses zoning proposals to ensure sufficient vegetation in new development areas to support storm water management and flood control measures. Guidelines are being developed to aid planners in understanding aggregate effects of nature-based flood control.

Monitoring

- For over 10 years Oslo has been **monitoring bacteriological, chemical and ecological parameters** of the waterways, including assessment of the bottom dwellers and fish in order to assess the conditions of the ecosystems.
- Each year the city monitors two rivers. Monitoring results are published annually and uploaded to the city's statistics webpages ensuring that **Oslo's citizens are kept informed** on the quality of water in their urban environment.

Collaboration

- Storm water management requires **cooperation** between city agencies, other public agencies, the private sector and Non-Government Organisations (NGO).
- The **Oslo River Forum** (Elveforum) is an NGO that works with the city agencies to protect and rehabilitate the waterways in Oslo. Elveforum serves to preserve important **cultural heritage and environmental** aspects of Oslo's waterways.
- The forum actively **engages with stakeholders and disseminates project information** via a regularly updated website: <http://www.osloelveforum.no>

Key Benefits

The extensive reopening of waterways has made a major contribution to the protection of Oslo's environment and cultural heritage. It is a fundamental element of **Oslo's climate adaptation strategy** which has provided multiple benefits for the City's citizens by **minimising flood risk and developing blue-green infrastructure**.

Oslo has strived to develop a **sustainable solution** to adapt to the impacts of climate change and specifically, the **risk of flooding** caused by increased rainfall and storm surges. Storm water is ideally handled in open flood ways and existing rivers and streams. Therefore the **reopened waterways provide ideal conditions to minimise and prevent costly damages caused by flooding**.

In all reopening projects, the City of Oslo endeavours to make the aquatic habitat and surrounding environment as natural as possible. Only **native vegetation** has been planted in water networks and adjacent land including, amongst others, marsh marigold, purple loosestrife, yellow iris, bulrush, reed canary grass and common alder. Emphasis is also placed on creating natural bottom substrates for invertebrates and fish. The **restoration of Oslo's aquatic and terrestrial ecology with native species** continues to be a positive development for the preservation and management of local biodiversity. The project is **recovering migration paths** for fish which has enabled breeding and population growth of migratory fish in the region.



Flood Alleviation

Sustainable solutions for storm water management to minimise and prevent costly flooding damages



Biodiversity

Creation of aquatic and terrestrial habitats for flora and fauna including natural bottom substrates for fish



Recreation

Spaces for community recreation and leisure including parks, hiking trails, walkways and playgrounds



Water Quality

Natural cleaning by dense vegetation sedimentation basins, shallow areas and rapids to improve water quality

Several of the projects are planned and developed as **natural cleaning systems**, with sedimentation basins, water rapids and shallow waters with dense vegetation for uptake of excess nutrients from the water. The use of these natural systems to control pollution offers a **sustainable solution for water management** and **improves the water quality** for the city's citizens and wildlife.

Reopened waterways with associated park areas, playgrounds and trails are **high value amenities** for Oslo's citizens. The projects serve as learning arenas for children, schools and educational institutions. Reopening waterways has made a positive contribution to **education and knowledge** sharing by recovering lost biodiversity, creating access to indigenous habitat for residents and raising awareness about local flora and fauna.

Challenges

Reopening waterways can be **costly** and often **challenging** in dense urban areas due to existing buildings and infrastructure, both above and below ground. For these reasons, **close cooperation** across several city agencies, private companies and NGOs is required for **planning, budgeting and implementation** of projects. Three examples of successful projects are the Hølaløkka Waterpark, Alna River Redevelopment, and Teglværksdammen.



Photo: I.H. Kjerkreit, 2007

Hølaløkka Waterpark

- Early redevelopment project undertaken between 2003 and 2004.
- Known as 'a showcase for physical, ecological and aesthetic waterway rehabilitation in an urban area', (Holtan Hartwig et al p. 94).
- Reopening and environmental enhancement of c. 300 m of a closed section of the River Alna.
- Development of a new nature and environmental park for recreational use.
- Construction of a wetland to treat polluted storm water from traffic and industrial areas.



Source: Municipality of Oslo Application for Candidacy to the Landscape Award of the Council of Europe 2016/17

Alna River Redevelopment

- Plans for the river were explored in Oslo's 'Alna Report of Ideas, A Walk with Water' (2002).
- The Municipal Sector Plan for the Alna Environmental Park (2003-2007) enshrined the commitment to the river's improvement in the city's land-use plans.
- Development of green structures, improvement of biodiversity and preservation of cultural heritage by reopening waterways.
- Natural soils and plant life were utilised to improve the water quality by filtering pollution and creating habitats.
- Development of hiking trails and river walkways to areas which were previously inaccessible or difficult to access.
- New access point to the Alna includes a tunnel under a train track called the Haugen Gate.
- The Leir Waterfall, which was previously covered by a concrete dam, was reopened as part of the Alna River Redevelopment.



Source: City of Oslo, EGCA 2019 Application

Teglværksdammen

- Oslo's flagship reopening waterways project cost approximately €10 million and was completed in August 2015.
- Reopening of approximately 650 m of the Hovinbekken stream.
- Development of a natural cleaning system to filter incoming waters.
- Designed as a natural filtration system consisting of several sedimentation basins, streams with rapids, a small lake and high-density native vegetation.
- Development of a clean habitat to native species, rejuvenated biodiversity and creation of a popular recreation zone.