



Case Study

Belfast Harbour

Overview

Belfast Harbour partnered with DataDirect Intelligence and EarthSense to implement a real-time air-quality monitoring solution across its extensive maritime and commercial estate.

Using EarthSense Zephyr® sensors integrated into DataDirect Intelligence agnostic sensor platform, the Harbour gained accurate pollution insight to support environmental management, operational planning, and long-term sustainability objectives.

The system provides continuous monitoring across an area where industry, transport, tourism, and citizens intersect.

The Challenge

Belfast Harbour is Northern Ireland's primary maritime gateway, handling over 70% of regional seaborne trade across a 2,000-acre, mixed-use estate with more than 760 businesses and high levels of cruise and visitor traffic.

Its scale and diverse activity required a reliable way to measure air quality at street level to support sustainability goals, understand pollution patterns, and protect the health of workers, visitors, and nearby communities.

The Solution

DataDirect Intelligence deployed an integrated monitoring system using EarthSense Zephyr® air-quality sensors positioned across the harbour estate.

The Zephyr® devices feed real-time pollutant data into DataDirect Intelligence agnostic monitoring platform, creating a single dashboard for live readings, alerts, and trend analysis.

The system captures NO₂, NO, O₃, and particulate matter, enabling Belfast Harbour to establish accurate baselines and monitor variations during periods of changing activity, including the COVID-19 lockdown.



Outcomes

The Harbour gained continuous, high-resolution air-quality data to support operational and environmental decision-making.

Baseline readings established during reduced-emission periods provided a clearer understanding of pollution sources and trends.

The data offers evidence for planning, compliance, and stakeholder reporting, and helps identify specific times or locations where emissions increase.

The system also supports proactive intervention and improved communication with businesses and local communities.

Long Term Benefits

Accurate, validated environmental data strengthens Belfast Harbour's long-term sustainability planning and supports its commitment to improving public health and reducing exposure to pollutants.

The insights help inform future infrastructure decisions, guide emission-reduction initiatives, and improve transparency for stakeholders. The solution is scalable and can be expanded with additional sensors for noise, weather, traffic, or construction activity as the Harbour's smart-estate ambitions evolve.

Quotes

"Working with DataDirect Intelligence and EarthSense has given us reliable, real-time visibility of air quality across our port estate.

For the first time, we can clearly understand how different operational activities influence pollution levels and use that evidence to inform planning decisions, strengthen environmental reporting, and advance our wider air quality and climate action strategies."

Agnieszka Matczak
Compliance Lead – Belfast Harbour

The Future

Belfast Harbour intends to expand its environmental monitoring network as part of its smart-port and ESG initiatives. Additional locations, pollutant types, or cross-environmental sensors may be incorporated to create a more complete picture of the harbour's environmental footprint.

The current deployment provides a strong foundation for wider monitoring across transport hubs, logistics zones, and future development sites.

Get in Touch

info@earthsense.co.uk

www.earthsense.co.uk