

Template for Impact Case Studies Submission

Title of the Impact Case Study:

Woz'Olwandle: real-time coastal water quality forecasts for safer South African beaches

Submitting University:

University of KwaZulu-Natal

Name, position and email address of Contact Person for this case study:

Dr Justin Pringle, Senior Lecturer in Hydraulics and Environmental Fluid Mechanics, Discipline of Civil Engineering, School of Engineering, pringlej@ukzn.ac.za

Summary of the impact:

Woz'Olwandle (isiZulu for 'come to the sea') is a free public website, developed at the University of KwaZulu-Natal (UKZN), that predicts real-time and forecasts bathing water quality at Durban's beaches. Recurrent sewage pollution had left beachgoers with no reliable way of knowing whether the water was safe to swim in. Woz'Olwandle translates coastal water quality modelling into a simple daily guide: 'good', 'acceptable' or 'poor'. Since its launch in April 2023 the site has recorded more than 20,000 visits, attracted sustained print and broadcast media coverage, and drawn the eThekweni Municipality and the City of Cape Town into partnerships to extend the service nationally under a R1.5 million Water Research Commission (WRC) grant. Beneficiaries include the swimming public, whose exposure to waterborne pathogens is reduced; coastal tourism businesses, which depend on public confidence in beach safety; and the municipalities responsible for coastal water quality management.

Underpinning academic work:

The website rests on research in environmental fluid mechanics conducted within the Discipline of Civil Engineering, School of Engineering, UKZN, led by Dr Justin Pringle and Professor Derek Stretch. Their work on nearshore hydrodynamics, pollutant transport and dispersion, and wave-driven mixing in the surf zone produced a coastal water quality model that predicts *Escherichia coli* (*E. coli*) concentrations in the nearshore zone over a 24-hour horizon. The model assimilates real-time and forecast winds, rainfall, and river and stormwater drain discharges; it is calibrated against laboratory-analysed water samples and reports against European Union recreational water quality guidelines. The underpinning academic work is classified as Engineering and Technology.

Narrative description of the impact:

The problem. Durban's beaches are central to the city's identity and its tourism economy, yet by 2022 they had become unreliable public assets. The April 2022 KwaZulu-Natal floods severely damaged wastewater infrastructure, and recurrent sewage spills drove *E. coli* concentrations at popular swimming beaches to critically high levels, forcing repeated beach closures, including during peak holiday seasons. Conventional monitoring compounded the problem: water quality was assessed from grab samples analysed in a laboratory, so results reached the public days after sampling. Beachgoers were told what the water had been, not what it was or would be.

The research response. Drawing on more than a decade of UKZN research into surf-zone mixing and pollutant dispersion, the research team developed a predictive coastal water quality model for the Durban nearshore zone. Rather than waiting for laboratory results, the model forecasts *E. coli* concentrations from the physical drivers of pollution: wind, rainfall, and river and

stormwater flows. Measured samples, analysed by the water quality laboratory Talbot, are used to calibrate and verify the forecasts.

The pathway to impact. In April 2023 the team launched Woz'Olwandle, a free public website that converts the model output into simple icons, 'good', 'acceptable' or 'poor', for six of Durban's most popular beaches: Country Club, Pirates, North, South, uShaka and Point. The launch attracted national media attention, and the coverage carried the service well beyond its initial audience. The site has since recorded more than 20,000 visits, from South Africa and from countries including the United States, the United Kingdom, China, Australia and Germany.

Reach. The impact extends across a diverse set of beneficiaries: residents and tourists who swim at Durban's beaches; ocean-sport communities such as surfers, paddlers and open-water swimmers; beachfront tourism businesses, which depend on public confidence in water safety; and the municipal authorities responsible for managing coastal water quality.

Significance. The service has changed how beachgoers decide whether to enter the water: they now act on a forecast of current conditions rather than on laboratory results that are days old, or on no information at all. The eThekweni Municipality has promoted the service through its own public news channels, an independent endorsement of its value. Institutional uptake provides further evidence of significance: the WRC has awarded R1.5 million to extend the platform to other coastal cities, in partnership with Stellenbosch University, the eThekweni Municipality and the City of Cape Town. That expansion is under way; the impact claimed in this case study is the impact already realised in Durban.

Period of impact. April 2023 to the present, and ongoing.

Evidence and sources to corroborate the impact:

1. The Woz'Olwandle website: <https://www.wozolwandle.com>
2. Website analytics recording more than 20,000 visits since launch, from South Africa, the United States, the United Kingdom, China, Australia and Germany (available on request).
3. Water Research Commission grant of R1.5 million for national expansion of the platform, co-led with Stellenbosch University in partnership with the eThekweni Municipality and the City of Cape Town (project documentation available on request).
4. TimesLIVE: 'New website tells Durban if beaches are poo free or not', 27 April 2023: <https://www.timeslive.co.za/news/south-africa/2023-04-27-new-website-tells-durban-if-beaches-are-poo-free-or-not/>
5. SABC News radio interview: 'Woz'Olwandle tool aims to monitor Durban beaches and inform people on the cleanest bathing spots': <https://omny.fm/shows/newsbreak-2/podcast-wozolwandle-tool-aims-to-monitor-durban-be>
6. UKZN School of Engineering: 'New poo predictor tells swimmers if water's safe at Durban beaches': <https://engineering.ukzn.ac.za/news/new-poo-predictor-tells-swimmers-if-waters-safe-at-durban-beaches/>
7. Water&Sanitation Africa (May/June 2023): 'Website to tell swimmers if Durban beaches are safe': https://issuu.com/glen.t/docs/wasa_may_june_2023/s/24548679
8. eThekweni Municipality news: 'New site will let you know if it's safe to go to the sea': <https://yourethekweni.co.za/news/new-site-will-let-you-know-if-its-safe-to-go-to-the-sea-75ccc922-111c-4892-8a93-72a61c494495>
9. Inside Education: 'The science of beach water amid sewage pollution': <https://insideeducation.co.za/the-science-of-beach-water-amid-sewage-pollution/>
10. Daily Maverick: New 'poo predictor' tells swimmers if water's safe at Durban beaches: <https://www.dailymaverick.co.za/article/2023-03-08-new-poo-predictor-tells-swimmers-if-waters-safe-at-durban-beaches/>

Any other information considered relevant:

The project builds research capacity alongside public impact: five MSc students at UKZN and Stellenbosch University are currently conducting research on the platform's expansion. The work is co-led with Dr Katelyn Johnson (Stellenbosch University) and involves the private sector through Talbot, which supplies laboratory analysis of water samples. The platform contributes directly to Sustainable Development Goals 3 (good health and well-being), 6 (clean water and sanitation) and 14 (life below water).

Signed off on behalf of the University by a designated Senior Officer (Name, position and email address):

A handwritten signature in black ink, appearing to read 'Anil Chuturgoon', written in a cursive style.

Prof Anil Chuturgoon
Acting DVC Research

Date: 14 July 2026