

ENVIRONMENTAL OBSERVATIONS

ENVIRONMENTAL OBSERVATIONS

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WATER & ENVIRONMENT APPLICATIONS

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OBSCAPE B.V

Engineering High Quality, Easy-to-use, Robust and Wireless **Real-Time Monitoring** Solutions to Suit All Budgets and Environments Worldwide





WAVE BUOY

Ocean wave measurements are an indispensable part of any MetOcean project. The Obscape Wave Buoy is based on recent advances in sensor and data technology, ensuring a lightweight, flexible, reliable and affordable wave buoy.

- AFFORDABLE OPERATIONAL COSTS
- COMPACT & LIGHT WEIGHT
- EASY TO DEPLOY & SERVICE
- BULK WAVE PARAMETERS
- DIRECTIONAL WAVE SPECTRUM
- GPS POSITION & WATCH CIRCLE





The Power and Telemetry Module

Obscape's Power & Telemetry Module (PTM) is a highly convenient all-in-1 datalogger. Its built-in solar panels and cellular modem will turn any 3rd party sensor of your choice into a plug-and-play real-time monitoring solution. With its wireless nature and rugged housing, the PTM was designed to function in both urban and remote environments.

- VERSATILE DATA PORTAL INCLUDED
- SOLAR-POWERED
- Completely Wireless
- VARIETY OF SENSOR MOUNTING OPTIONS



LEVEL GAUGE

Obscape's Level Gauge delivers realtime water level measurements which give you the capability to monitor natural or man-made water systems.

KEY FEATURES:

- INTEGRATED LOGGER
- INTEGRATED TELEMETRY
- INTEGRATED POWER
- INTEGRATED SENSOR
- COMPLETELY WIRELESS
- REAL-TIME DATA
- SOLAR POWERED



TIME LAPSE CAMERA

Obscape's Time-Lapse Camera is a robust, fully wireless solution that delivers time-lapse images to your desktop in real-time. It allows you to have a look at your area of interest remotely.

KEY FEATURES

- INTEGRATED LOGGER
- INTEGRATED TELEMETRY
- INTEGRATED POWER
- INTEGRATED 5MP RESOLUTION
- COMPLETELY WIRELESS
- REAL-TIME DATA

DOWN FACING CAMERA AVAILABLE



WEATHER STATION

Obscape's Weather Station is a robust and user-friendly device which combines Obscape's Power and Telemetry Module with an industry-standard weather sensor

Our Weather Station provides a wide range of weather measurements, including:

- AIR TEMPERATURE AND PRESSURE,
- WIND SPEED AND DIRECTION,
- RELATIVE HUMIDITY
- SOLAR RADIATION
- LIGHTNING
- RAINFALL

- COMPREHENSIVE WEATHER DATA
- COMPLETELY WIRELESS
- REAL-TIME DATA
- SOLAR POWERED



RAIN GAUGE

Obscape's Rain Gauge delivers real-time rainfall measurements. Its industry-standard rain collector is connected to Obscape's Power and Telemetry Module to create a completely wireless real-time rain gauge.

- ACCURATE RAINFALL INTENSITY MEASUREMENTS
- INDUSTRY-STANDARD RAIN
 COLLECTOR
- 0.2 mm resolution
- COMPLETELY WIRELESS
- ROBUST DESIGN





WATER QUALITY STATION

Whether you are monitoring aquatic habitats, estuarine hydrodynamics or salt intrusion, the Obscape CT Station will suit your needs.

- ACCURATE CONDUCTIVITY, TEMPERATURE AND SALINITY
- TOROIDAL SENSOR MINIMISES BIO-FOULING
- Completely wireless
- REAL-TIME DATA
- SOLAR POWERED
- GSM TELEMETRY (3G)
- MULTIPLE MOUNTING OPTIONS
- VERSATILE DATA PORTAL INCLUDED





FLOW GAUGE

The Flow Gauge is suitable for application in natural as well as man-made water systems. Whether you are interested in measuring river flow, outfall discharge or channel runoff, the Obscape Flow Gauge will suit your needs.

- ACCURATE SURFACE FLOW VELOCITY DATA
- RADAR TECHNOLOGY
- NO UNDERWATER COMPONENTS
- COMPLETELY WIRELESS
 - REAL-TIME DATA







DATA PORTAL

- Real-time data & Monitoring alerts
- Report generation & Integral data management

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PORTAL

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PALMIET RIVER BIRDH.

UMGENI_RIVER_MOUTH

UMHLANGA_WWTW

ATHLONE_PARK_RES

UMKOMAAS

ALVERSTN

Umgeni River Mout

MAN7IMTOTI RIVER M

- Data forwarding & Maintenance log
- White labelling

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WATER & ENVIRONMENT SECTOR



Water & Environment are important for our environment, economy and livelihoods.

Reasons to monitor these sectors have many functions from reducing floods to producing clean water and food for urban, domestic, industry, power generation, environment and agricultural uses.

Monitoring waterways also provide important confirmation of habitat for many animals and plants.

By monitoring Freshwater catchment areas and bodies, wastewater, sewage and stormwater, the Obscape PTM Core Products and DataBuoys, empower our customers with the tools to ensure safe and resourceful water and environment. Whilst Commercial Mining and Power Generation operations require confirmation to adhere to stringent legislation and standards.



Construction

- Smart Cities
- Waste Water Treatment
- Catchment Management
- Stormwater Management
- Environmental Monitoring
- Power Generation
- Industrial Production & Processing

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Mining Operations



WATER & ENVIRONMENT Applications and Past Work

The supply and monitoring of Construction areas, Smart Cities, Waste Water Treatment Plants, Catchment networks, Stormwater management, Environmental Monitoring, Power Generation operations, Industrial Production/ Processing and Mining Operations.

Turn-Key; Automated Notification and Warning is an important reason our clients opt to install our PTM and DataBuoy devices, which report in Real Time to the free to use and secure DataPortal system.

From the single Environmental Consultant receiving a real time alert to the major commercial entity, environmental NPO, Government Agency or commercial operation receiving warning notification. We can help avoid catastrophe & costly downtime.

Real Time Monitoring empowers our customers in the real time response of ecological disaster prevention, storm events, extreme weather, flooding, droughts, safe commercial operating conditions and targeted urban disaster management to name a few.





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Stormwater Management

Stormwater management is the effort to reduce runoff of rainwater or melted snow into streets, lawns and other sites and the improvement of water quality, according to the United States Environmental Protection Agency (EPA)

Stormwater infrastructure helps to transfer vast quantities of water and wastewater across urban areas. Urban hydrology & natural hydrological water flow can combine & lead to an additional influx of water and contaminants to natural water systems. Obscape monitors & reports on the health & safety of both Ecosystem & Urban environments.

Application Example:

Impermeable surfaces such as pavement and roofs prevent rain from naturally soaking into the ground within urban and built-up areas. Storm drains, sewer systems and drainage ditches are designed to safely & efficiently remove this runoff. However blocked, overflowing systems can cause flooding, erosion, turbidity, storm and sanitary sewer system overflow, and infrastructure damage. Combined reporting from Time Lapse, Water Level Gauges, Rain Gauges, & Weather Gauges into our powerful & easy to use portal enables our clients to monitor, forecast and react these events.



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Power Generation

Obscape's Complete Device monitoring & Portal Reporting systems offers an obvious advantage of not having to send professional personnel to the Site to examine the atmospheric conditions for the purpose of safe operation & maintenance. It enables every level of management to access to data regarding future operation planning, testing, or further evaluation of the maintenance schedule. It can also be beneficial in monitoring environment health, alerts on pollution control and reporting parameters in real time on ecosystem conditions.

Application Example:

The Obscape WaveBuoy meets the demands of fresh water based Solar Floating Farms to provide affordable, accurate and highly dependable data to report on metweather conditions for safe operating conditions conducted during normal operations and maintenance requirements.

By providing Real Time Data, the Solar Farm operator is empowered to quickly respond to changes in environmental conditions, or conduct adaptive sampling based on waterquality or weather conditions. Obscape devices can be configured to alert via email if parameters exceed certain thresholds, removing the need for someone to continuously monitor the data, therefore creating greater awareness of weather, water and water quality conditions, temperature, and water quality issues.



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Smart Cities

In March 2012 the global population exceeded 7 billion people for the first time, representing a doubling of the global population in less than 50 years (United States Census Bureau, 2012). It is estimated that more than 55% of the global population live in cities and that 394 of the world's cities have a population that exceeds 1 million inhabitants (UN 2011). By the year 2050, the United Nations predicts global population will be 9.8 billion people.

According to the Population Reference Bureau, these populations will surge from rural areas to urban areas; with an estimated 70% of the global population living in cities by the time we reach 10 billion human beings,

This larger portion of the population will inhabit the same cities we live in today; where fresh air and water, availability, treatment & quality are already stressed. To support this explosion of population density, cities around the globe are going to require major improvements to infrastructure and efficiencies.

OBSCAPE can assist in a turnKey approach to monitoring water resources & air quality. In addition OSCAPE systems report on stressed areas in Urban Infrastructure in real time; therefore forecast where improvement in water infrastructure is required. This can include important areas such as reservoir and groundwater supply, to improve efficiencies across waterrelated disciplines.





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Mine Water Monitoring & Management

The mining sector requires vast amounts of water for operations. Processed mine water, groundwater and discharged water, in close proximity of the environment & communities based in and around mining areas, need to be monitored in order to quantify and characterise the impact the mining activity has on the immediate operations, greater catchment areas and the subsequent ecosystem. Obscape monitoring systems are of vital importance as they not only provide real time baseline information on environment mine monitoring before, during & after the operations, but the information can be used as a forecast tool for localised mine pollution control and containment for healthy mine operations

Application Example:

The Rain Gauge, TimeLapse Camera & WeatherStation can monitor and report on mine surface, immediate catchment & local community environment conditions. The LevelGauge, WaterQuality Gauge monitor processed water, boreholes & wells in subsurface, open pit & operational areas. The DataPortal merges all information & sends Alerts of mine weather and pollution events in real time and allows for forecasting potential hazards. Obscape TimeLapse cameras can monitor the efficiency of integrated water & waste management rehabilitation activities in real time.





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Environmental

Recent years have seen an increased focus on the importance of compliance with new or evolving environmental protection legislation, leading to ever greater collection of environmental data to help inform robust decision-making and monitor compliance. Obscape have developed their Monitoring systems as a result of this need to gather information in the easiest and most cost-effective manner. This includes collection of data using remote systems without need to repeatedly visit site. Our remote telemetry methods can improve the efficiency and quality of environmental data gathering. we strive to recognise the merits and suitability of each environment to the chosen application. By installing an Obscape Monitoring device we guarantee a great investment and low running costs. This is in addition to reliability, resilience, installation & operation ease of use

Application Example:

Obscape was commissioned by a government authority to monitor environment properties as indicators of the health of aquatic, vegetation and coastal natural environmental ecosystems.

Because of the rich biodiversity, unique ecosystems and natural beauty; a healthy environment is vital to ensure species diversity and ongoing speciation.





Obscape works closely with local government to identify strained & underutilised resources.

Application Example:

Local Government Water treatment solutions are to re-source, recover and reclaim high quality drinkable and process water from wastewater, seawater, ground or surface water. A precious resource that needs to be monitored at Reservoirs & Treatment Plants. There is a requirement for water treatment plants to be more automated, making Obscapes Telemetry observations ideal to monitor the decentralised operations, & during seasonal demand or emergencies.

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Waste Water Treatment

In developing countries, more than 80% of domestic wastewater is discharged untreated, polluting rivers, lakes and coastal areas. Aging infrastructure, an expanding population and stringent regulations combined with a diminishing supply of available fresh water is significantly straining Municipalities capability to provide clean, safe potable water.





Catchment Management

Catchment management requires resource management which aims to effectively and efficiently monitor naturally occurring water within catchment areas. Data reporting on an area or region which 'catches' the rainfall runoff flows with reference to a point on a river or drainage system is vital for water resource management.

Application Example:

Water Level Gauges, Time Lapse Cameras & Weather Stations can be integrated for catchment management, to record & confirm the environmental condition of land, water, and biodiversity which cannot be achieved in isolation from each other & therefore requires multiple, deployments & Remote telemetry types with accumulated reporting to one secure easy to use Data Portal.

Examples of our clients within this field:

Our Client, a local Government Coastal, Stormwater and Catchment Management Department has assigned Obscape to assist with reporting on catchment management which includes monitoring & reporting on flood risks to houses, industrial and commercial properties. Confirm water data by managing and monitoring developments in urban river corridors and wetlands as important natural features within the urban landscape; for the purpose of promoting multi-functional, sustainable use of river corridors and drainage systems.

Industrial Production & Processing

Over the past few years, Internet of things has aimed each consumer in almost every industry. This has been empowering businesses to embrace industry 4.0. for providing smarter services with smart factories. Industries have now realized that the fast increasing data has increased productivity by detecting problems in the system resulting in better decisions in production reporting system and management and thereby driving better business management.

Obscape can assist in all industries, production material reporting and management.

Application Example:

Remote Production Monitoring enables a regular Inspection. Obscape enables our customers to scrutinize their factory output, confirm specifications and identifying outliers.



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Construction

As the development of Urban & Industrial space continues to expand to accommodate a growing global population, there remains a real need to quantify and qualify the impacts of construction on natural environment processes. The Industrialised expansion of global urban areas has resulted in marked alterations to natural processes, environmental quality and natural resource consumption.

Obscape provides assistance in its capacity to quantify & report on these dynamics across a varied landscape at contrasting scales.

Application Example:

Novel design & construction strategies are widely implemented in new urban developments, to control runoff & improve water quality. The monitoring capabilities of our Data Portal combined with devices such as the Water Level Gauge, Rain Gauge, Weather Station & Time Lapse Camera can assist in the design, construction and commisioning phase in Urban & Industrial Environments.

Additional Examples of Water & Environment Uses

POWER STATIONS, HYDROELECTRICAL PLANTS: Precise meteorological data are a prerequisite for weatherdependent overhead line operation, for short: dynamic line rating (DLR). Some network operators are already using it to optimize their power grids and exploit the capacities of their lines. Measurement of wind direction and speed, captures temperature, humidity, and air pressure, with built-in pyranometer for measuring solar radiation.

HEALTH CARE: Wireless Medical Telemetry Services (WMTS) will play a major role in the healthcare segment. The market is expected to show tremendous growth in the automation industry (manufacturing and process control), vehicle (telematics, transportation and logistics), and retail segments. Retail is being deemed as a potential market and will show major developments in the coming years, despite smaller market size

POWER: Oil & Gas Refineries & Power Plants consists of a number of complexes, having a telemetry based system with versatile multiple PTM devices deployed in outlying unmanned platforms across the vast plant areas reporting to the onsite office or offsite monitoring, both of which give complete observation of the entire plant in real time.



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ENVIRONMENTAL OBSERVATIONS



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WATER ------

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WEATHER

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TIME-LAPSE CAMERA

CASE STUDIES AND REFERRALS



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A Government Agency on the East Coast of South Africa, responsible for Coastal, Stormwater and Catchment Management has assigned Obscape to assist with environment monitoring & reporting on coastal and catchment management, flood risk areas, storm drains & drainage ditches.

To meet this requirement Obscape provides a robust IoT secure system that helps the Muinicipality with secure environment monitoring, by combining IoT-enabled Obscape PTM TimeLapse Cameras, Water LevelGauges, RainGauges, WeatherStations and WaveBuoys, which empowers our client to monitor & forecast weather events visually in the Powerful Obscape DataPortal.

For the purpose of multi-functional versatile observations of river corridors and drainage systems, the connectivity platform facilitates the IoT solution we provide to our client. Within this environment and urban landscape, the Local Government Agency can monitor environment data and developments in coastal areas, urban river corridors and wetlands; in Real Time.

Real Time Obscape systems can also report on stressed areas in Urban Infrastructure; & forecast where improvement in water infrastructure is required. Collated Data received from PTM field deployments, enable Obscape to advise the Agency on predictive capabilities of flood mapping when looking at historical flood data paired with real-time and predicted weather and precipitation data.

With the aid of communication systems Obscape have developed their Durable Monitoring systems to convey, repeatable accurate reliable information in the most efficient & cost-effective manner. This includes collection of data to transmit from remote areas; with the information transmitted back to the user without need to repeatedly visit a site, improving the efficiency and quality of our environmental data gathering and reducing our customers costs.

With Telemetry capability in our (PTM)Powered Telemetry Modules we can guarantee a great investment, low running costs, reliability, resilience, operator ease of use installation, operation, data accuracy, quality assurance quality control and data security.





East Coast of South Africa

1. Marianta

Area: 2297 km²
Inhabitants: 3.7 million

Complex environment:

- Rivers: 4000 km
- Catchments: 18
- Estuaries: 17
- Coastline: 100 km
- Culverts: 200 km









Challenges & Calamities



- Flash floods
- Settlements
- Infrastructure
- Land slides
- Debris/pollution
- Coastal flooding
- Estuarine dynamics

CHALLENGES LEADING TO FLOOD PROBLEMS

Engineering Causes

- Insufficient storm water Infrastructure
- Lack of maintenance
- Climate Change leading to bigger storms
- Design not considering 100yr flood and climate change



Social Causes

- Unplanned Informal Settlements
- Dumping in Storm water systems (manholes)
- Vandalizing of infrastructure



HOMES DESTROYED AND LIVES LOST



















EAST COAST FLOODS 2017



WORST NATURAL DISASTERS IN SOUTH AFRICA

March 2017 flood event



NO EARLY WARNING



NO REAL TIME WEATHER UPDATES

PROPOSED SOLUTION

CHL

• TideGauges

- Level Gauges
- RainGauges
- WeatherStations
- TimeLapse Cameras
- Real Time Water Quality
- Wave Buoys
- AIS Data Logging
- Weather Station


The purpose of monitoring







EAST COAST APRIL 2019 FLOOD

















APRIL 2019 FLOOD



OBSCAPE DataPortal Real Time Rainfall Monitoring

Obscape TimeLapse Camera , WeatherStation & LevelGauge. Real Time Estuary Breach confirmation

n

Time Lapse Camera





RainGauge





Time Lapse Camera

Obscape TimeLapse, RainGauge& Water LevelGauge. Real Time Flood Event



Obscape Water LevelGauge Real Time Canal Flood



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Silt Canal Tide - Water level





DELIVERING PREMIUM ENVIRONMENTAL TECHNOLOGY AND INSTRUMENTATION

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WATER

WAVE

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TIME-LAPSE CAMERA

RAIN

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WEATHER

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DRIFTER QUALITY BUOY

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CASE STUDY

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LITTERBOOM PROJECT 2020

CASE STUDY

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The Litterboom Project

- Focusing on the interception of marine plastic pollution in South African Rivers since 2017
- Currently operating in Cape
 Town and Durban
- We work into 7 major River systems
- We have employed overs 76 team members over the last 3 years
- We have collected over 320 000 kilograms of plastic over the past 3 years
- We are part of South Africas Civil Society Organisation, involved with implementing EPR regulations and waste management innovations

Focus of the Pilot

- Work with students to select specific areas best applicable to marine debris research within the Cape Town region
- Developing plastic detection algorithms for the camera images
- Data analysis will be used to determine efficacy of <u>Litterbooms</u>, as well as plastic load trends within the River system/s
- Extrapolating this data will develop a framework for how frequently we need to install Litterbooms and what other interception mechanisms can support the existing solutions that are in place to prevent plastic leakage into the Oceans

OBSCAPE <u>TimeLapse</u> Camera and Data Portal monitoring





Delft University of Technology





An initiative of PARLEY

Cameron Service

CEO The Litterboom Project www.thelitterboomproject.com PBO Number 930068745

Key benefits to customer

- Telemetry connection
- Solar-powered wireless
- Real-time Alerts & Data Forwarding
- 3rd party sensor interface
- Secure & Free to Use Data Portal
- Affordable Devices
- Robust & Durable
- Low maintenance for remote deployments

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DataPortal



Ø Map

🗠 Data 🖪

E Devices

C Monitor Log

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|----------------------|------|----------|
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| Umdiofi Estuary | 6 | ~ |
| Umgeni River Mouth | 0 | ~ |
| Vetches Beach | 0 | ~ |
| Umgeni | 6 | ~ |
| AMANZIMTOTI_RIVER_M | | ~ |
| ISIPINCO_RIVER_MOUTH | ٩ | 4 |
| LA_LUCIA_CUL_1 | | ~ |
| PALMIET_RIVER_BIRDH | | ~ |
| SLT_CANAL TIDE | | V |

Access information on any electronic device with internet functionality

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Devices in the Field





ENVIRONMENTAL OBSERVATIONS