



W • S E N S E

WE GIVE VOICE TO THE OCEAN

Our Underwater IoT solution allows **monitoring and surveillance any critical offshore infrastructure**. WSense collects real time data facilitating **threats recognition and the transmission of associated alarms**. Moreover, it creates empowers **networks of patrolling AUVs** providing the possibility to protect offshore assets like **ports, pipelines, cables, oil & gas facilities, underwater data centers and more**.



WWW.WSENSE.IT

HISTORY AND MISSION

Turning research into impact: milestones, partners, and global expansion

2017

- Start of commercial activities



2022–2023

- Raised over €15M, with a Series A in 2023
- BlueInvest award



2025–26

- Raised €10M from investors to support commercial expansion
- Strategic partnership with Fincantieri
- Reached 80 FTEs



2012–2016

- Sapienza University of Rome spin-off



2018–2021

- Two international patents granted, four customers
- First contract in Defence



2024

- WSense strengthened its role within the Italian MoD center for the underwater domain
- The company reached 51 FTEs
- Successfully passed SwiG interoperability tests
- Elected EIB Blue Champion
- Featured in the Harvard Business Review



OUR LIVES DEPEND ON THE OCEAN: NEVER HIGHER STAKES



**WSense gives the ocean
a voice by enabling**

- **REAL-TIME**
- **LARGE SCALE**
- **HIGH DENSITY**
- **CONTINUOUS OCEAN DATA COLLECTION**

EARLY WARNING SYSTEMS TO PROTECT AND SURVEIL
UNDERWATER INFRASTRUCTURES
AND MARINE ECOSYSTEMS



Traction

- **TO DATE:** €25M+ RAISED (SERIES A, PRE-SERIES B)
- **OUR TEAM:** 88 EMPLOYEES (30% WITH PHD)
- **OFFICES:** ITALY, NORWAY, UAE, FRANCE, UK
- **USE SECTORS:** ENERGY, CRITICAL INFRASTRUCTURES,
INTERNET OF UNDERWATER THINGS

TAKING THE LEAD: WHERE OTHERS STOP, WE DIVE DEEPER

Traditional solutions



- X** No real-time
- X** No near-shore
- X** Not fine-grained
- X** Point solutions

Current solutions lack the ability to continuously monitor and integrate data to ensure ocean accountability or reduce harmful phenomena. They're also not cost-effective when large areas must be monitored across multiple depths.



- ✓** Real-time
- ✓** High density
- ✓** Large Areas
- ✓** Cost effective

Underwater wireless, multi-channel, multi-modal adaptive and software-defined modems enable secure multi-hop and mesh networks providing real-time, reliable data transmission among underwater devices, even in harsh ocean environments. This makes it possible to monitor large areas cost-effectively.

WSENSE TECH SUITE OVERVIEW

Underwater wireless mesh networking

- + INTELLIGENCE
- + CYBERSECURITY
- + LOW POWER
- + MULTIVENDOR



1 WPCLOUD

Highly customizable cloud-based data collection and visualization platform for data analytics, remote control, and management of underwater systems.



2 UNDERWATER DRONE GENERAL PURPOSE MODULE

Module for real-time data transmission, remote control, and communications with underwater or surface networks. It supports advanced acoustic and optical communication technologies, including WSense software defined modems and third-party modems, as well as navigation, localisation and in situ data analytics.



3 WMICRO

Real-time miniaturized modem to connect and localise small drones or divers.



4 WNODE & WNODE ENHANCED

Underwater multi sensor nodes with acoustic and/or optical modems for shallow water and for deep water (MIL grade), up to 3000m depth. Edge computing and AI capability. Underwater GPS support.



5 WGATEWAY

Bridge between underwater and terrestrial networks. Supports Ethernet, 4G/5G, LoRaWAN, SatCom communications. Edge platform running microservices.



6 SMART BUOYS

Advanced, multi-functional topside buoy platform powered by solar panels and integrating WGateway to interface above water and underwater systems. Can integrate sensors and multiple modems.



7 UNDERWATER FIBER GATEWAY

Joint product with Alcatel Submarine Networks, integrated into underwater telecom cables optical repeaters with gateway functionality. It enables interfacing underwater telecom Internet backbone with WSense underwater Mesh Networks.



OCEAN DATA TOGETHER WITH OUR CUSTOMERS & PARTNERS

ENERGY



3M+

DATAPOINTS
TRANSMITTED IN
REAL-TIME

42

OCEAN
MONITORED AREAS

CRITICAL INFRASTRUCTURE



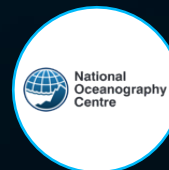
55

PARAMETERS
MEASURED

09

MPAS DEPLOYED

INTERNET OF UNDERWATER THINGS



COLLECTED
ACROSS:
MEDITERRANEAN
SEA, ATLANTIC
OCEAN, RED SEA

WSENSE SELECTED USE CASES IN THE ENERGY, CRITICAL INFRASTRUCTURE AND IOUT SEGMENTS

Confidential

Energy

ASSET INTEGRITY MONITORING

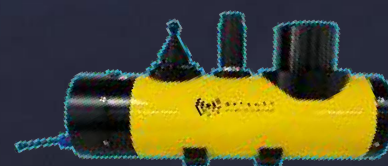


SUBSEA NETWORKS



Critical Infrastructure

CRITICAL INFRASTRUCTURE MONITORING



MARINA MILITARE

Internet Of Underwater Things

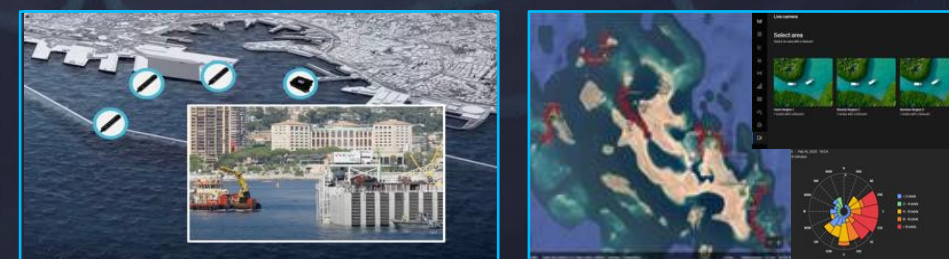
HYDROELECTRIC BASINS



ENVIRONMENTAL MONITORING AND METOCEAN DATA



WIRELESS STRUCTURAL MONITORING MARINE PROTECTED AREAS



WSENSE, SCALING THROUGH STRATEGIC PARTNERSHIPS

SAIPEM



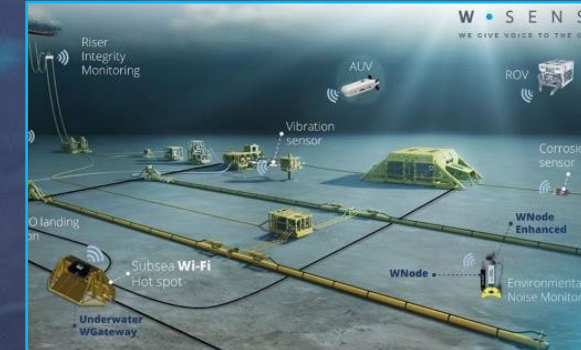
AGREEMENT FOR UNDERWATER DRONE
COMMUNICATION NETWORKS

FINCANTIERI



SIGNED AN AGREEMENT IN THE
UNDERWATER DOMAIN

ALCATEL SUBMARINE NETWORK



NEXT-GENERATION WIRELESS
UNDERWATER COMMUNICATION
SYSTEMS

TERNA



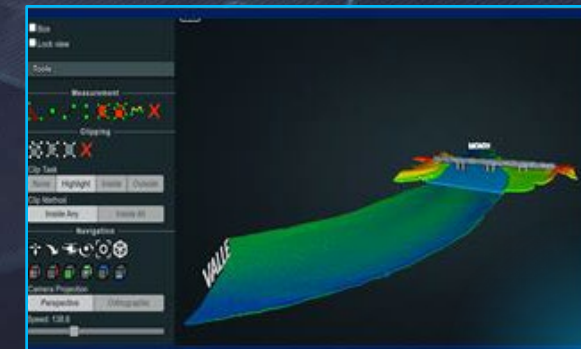
TERNA LOOKS TO THE FUTURE FOR THE
INTERNET OF UNDERWATER THINGS

HUB OCEAN



SIGNED MOU TO ADVANCE OCEAN
SUSTAINABILITY AND DATA SHARING

A2A



WSENSE AND A2A FOR REAL-TIME
SEDIMENT MONITORING

Mesh Multi-Hop Wireless Real-Time Sensor Agnostic



W CLOUD



UNDERWATER DRONE
GENERAL PURPOSE
MODULE



W MICRO



W NODE
& W NODE ENHANCED



W GATEWAY



SMART BUOYS



UNDERWATER FIBER
GATEWAY

We give voice
to the ocean

W • S E N S E



Upstream Oil
& Gas Operations



Downstream Oil & LNG
Terminal Operations



Impact of Marine
Industrial Activity



Subsea Infrastructure
Stability



Critical Asset Surveillance
& Protection



Environmental &
Biodiversity Monitoring



W • S E N S E



Biodiversity Monitoring



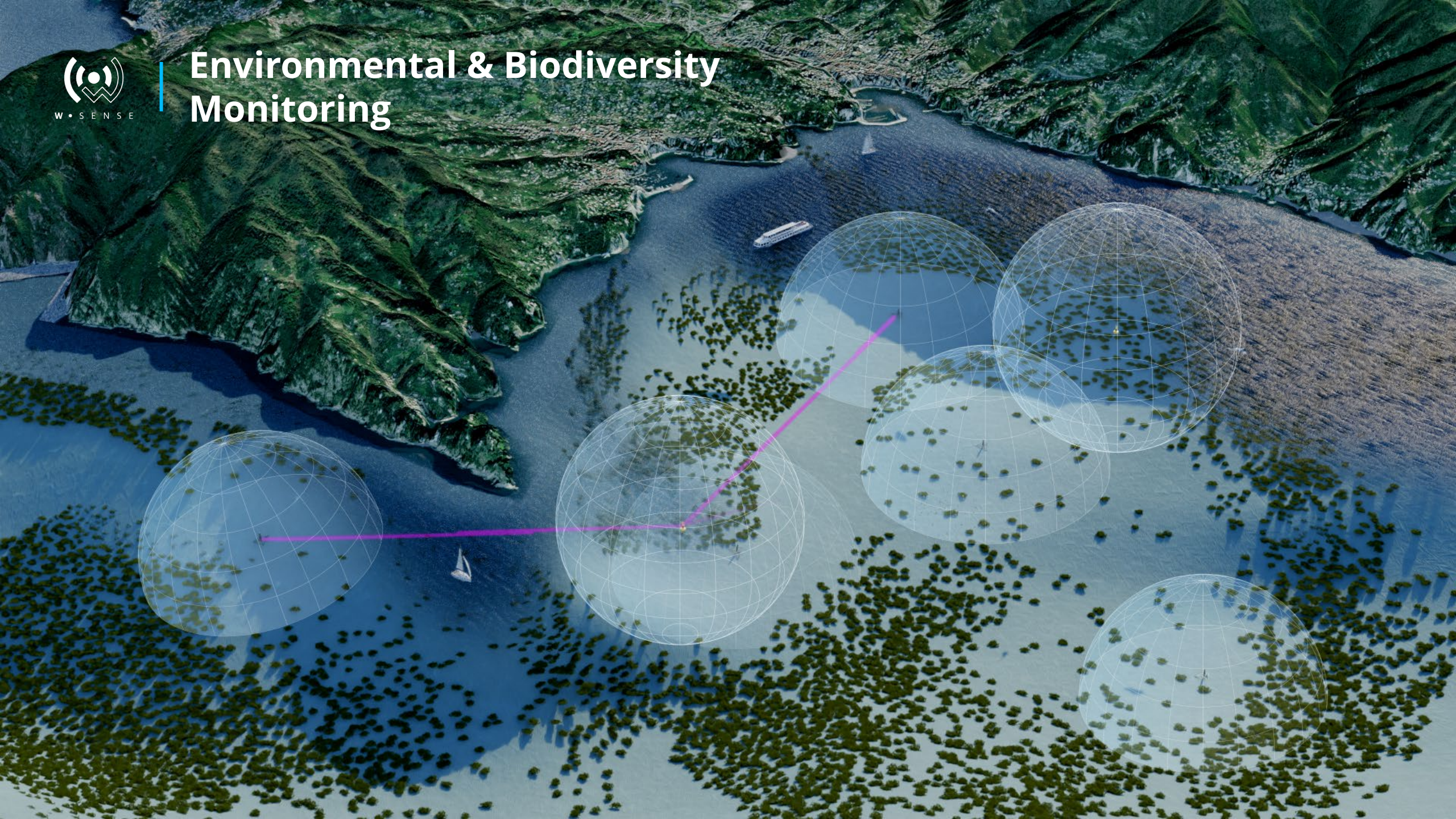
Environmental & Biodiversity Monitoring

WSense's mesh wireless underwater monitoring system transforms marine biodiversity protection.

It uses real-time, wireless acoustic technology that avoids heavy infrastructure and minimizes disturbance to fragile habitats such as Posidonia oceanic meadows, coral reefs, and areas frequented by marine mammals.



Environmental & Biodiversity Monitoring





Environmental & Biodiversity Monitoring



Digital Twin
Integrated Subsea-Surface

AUV
Patrolling



Water Column
Parameters



Noise Alerting
System

Diver Messaging
& Localization



Biodiversity
Indexing



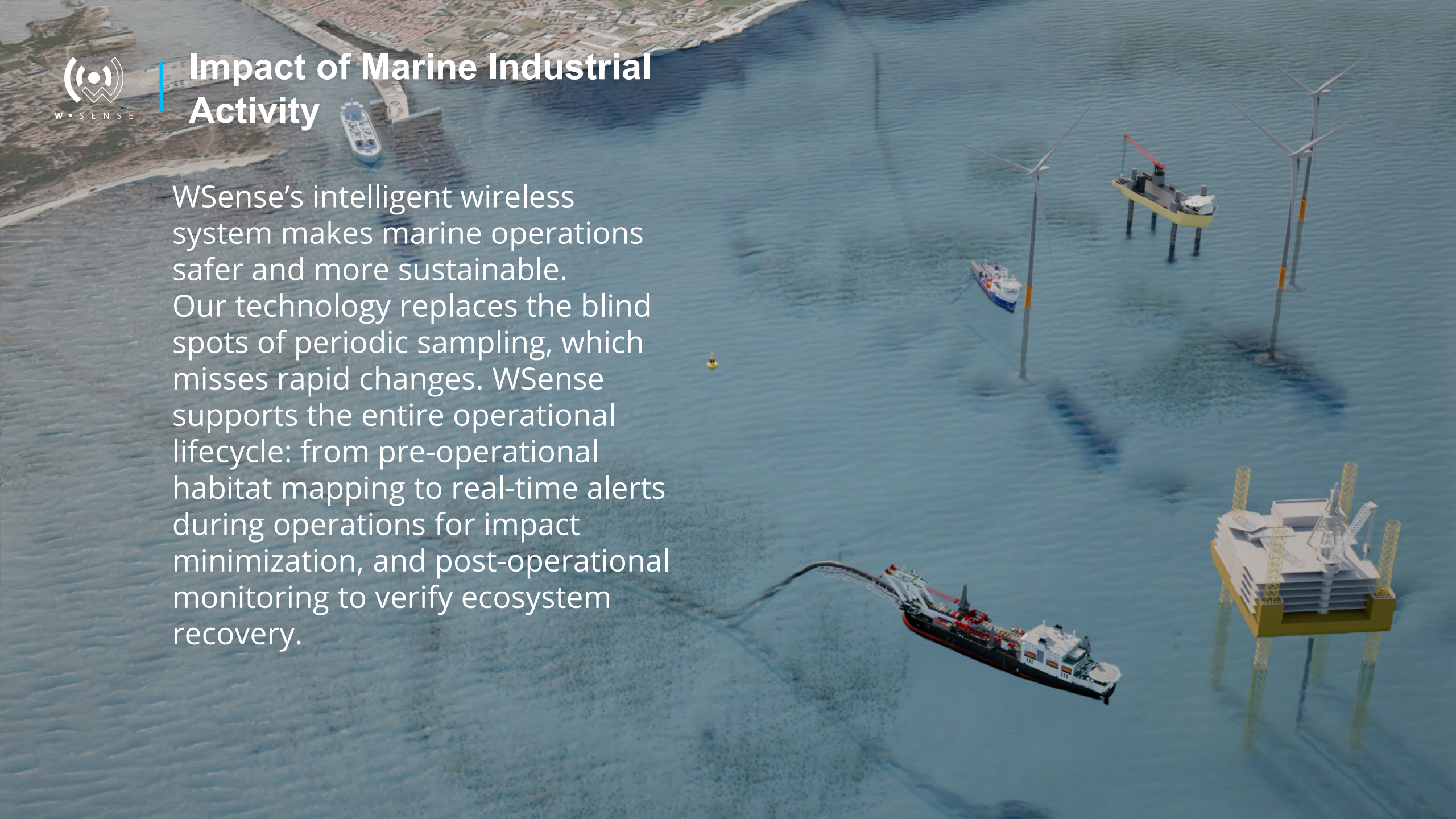


Impact of Marine Industrial Activity



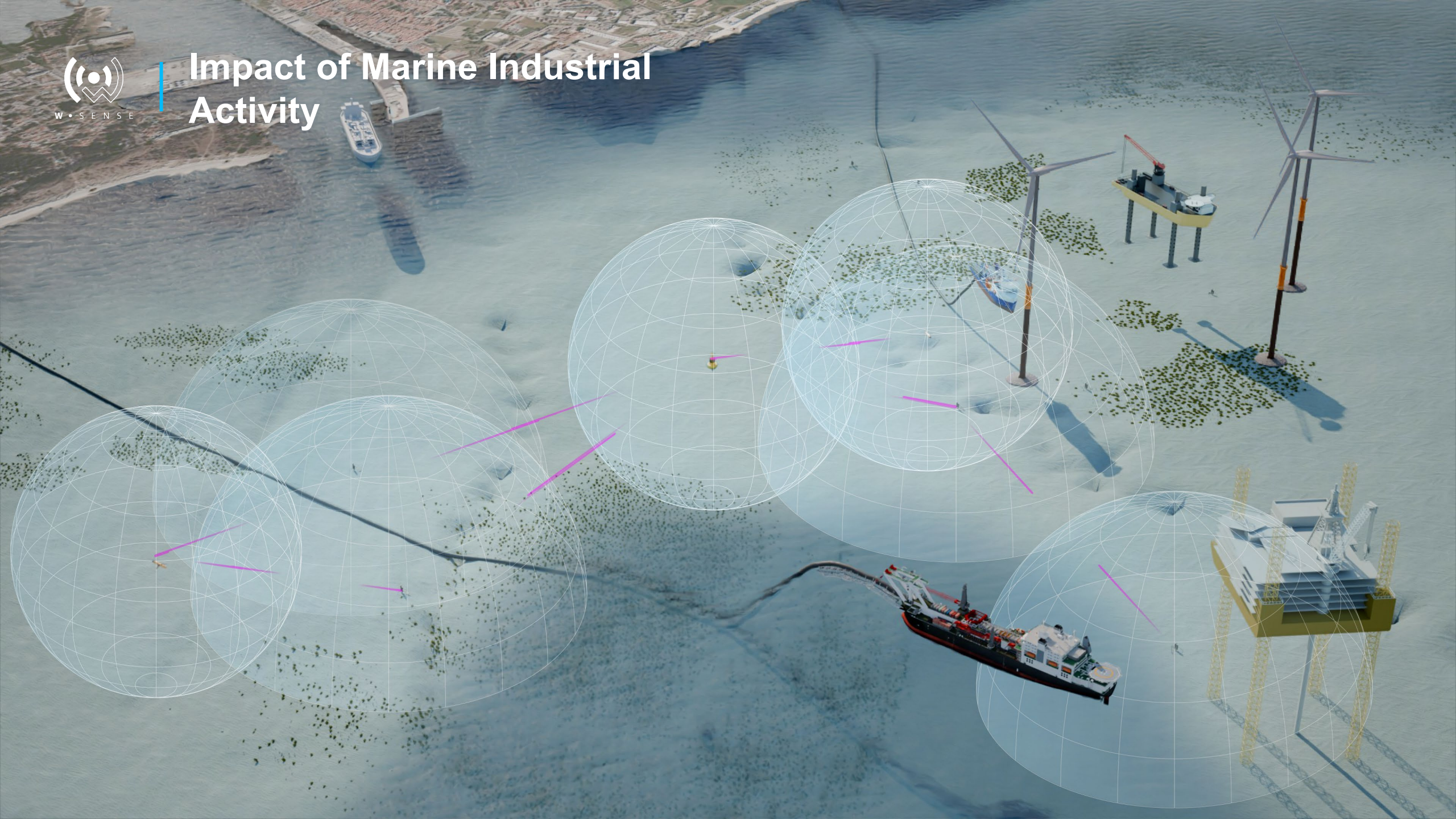
Impact of Marine Industrial Activity

WSense's intelligent wireless system makes marine operations safer and more sustainable. Our technology replaces the blind spots of periodic sampling, which misses rapid changes. WSense supports the entire operational lifecycle: from pre-operational habitat mapping to real-time alerts during operations for impact minimization, and post-operational monitoring to verify ecosystem recovery.





Impact of Marine Industrial Activity





Impact of Marine Industrial Activity

Digital Twin Integrated
Subsea-Surface



AUV
Coordination



Water Column
Parameters



Structural
Health



Noise Alerting
System



Chemical & Physical
Parameters



Biodiversity
Identification





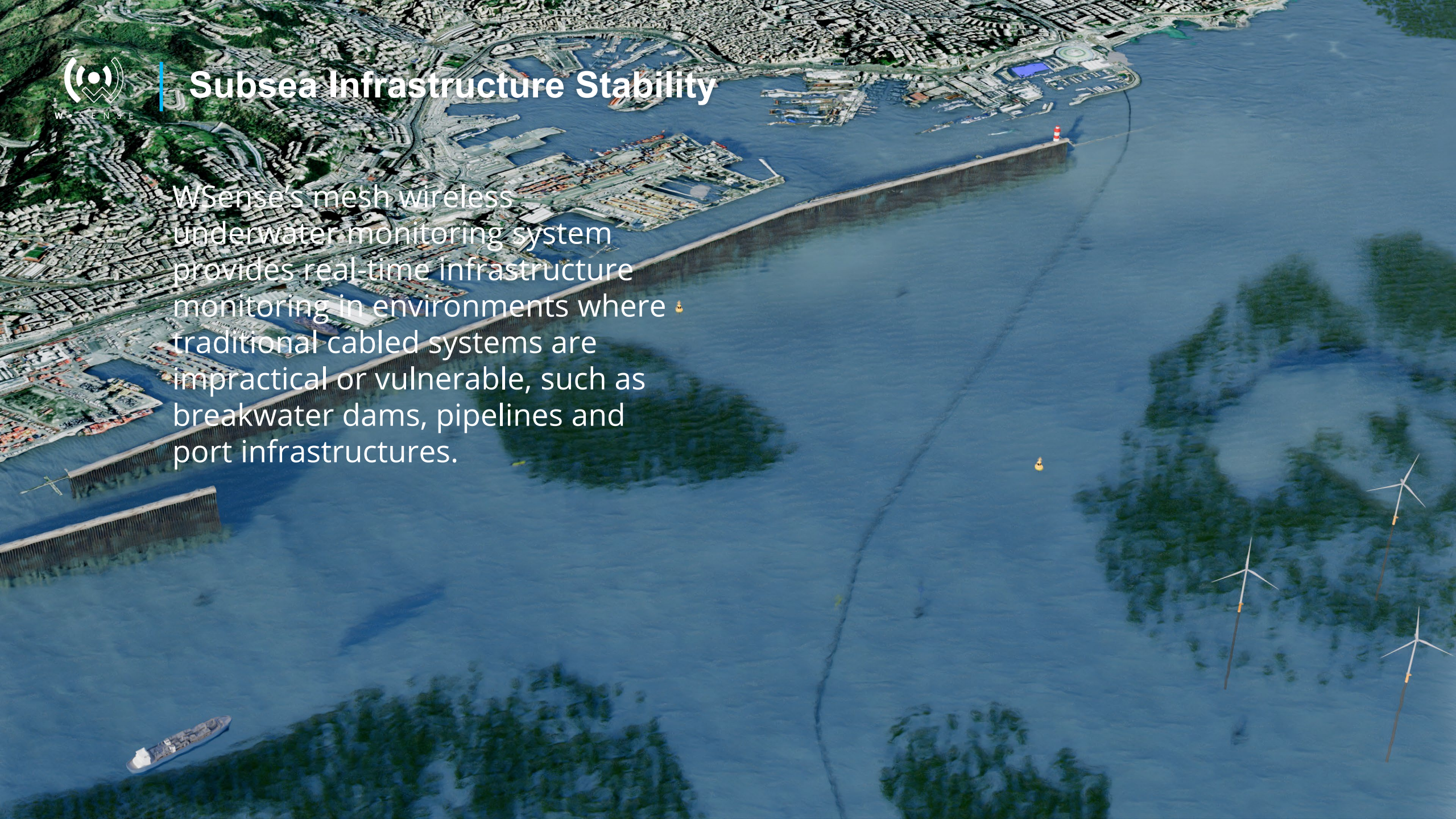
Subsea Infrastructure Stability



WSENSE

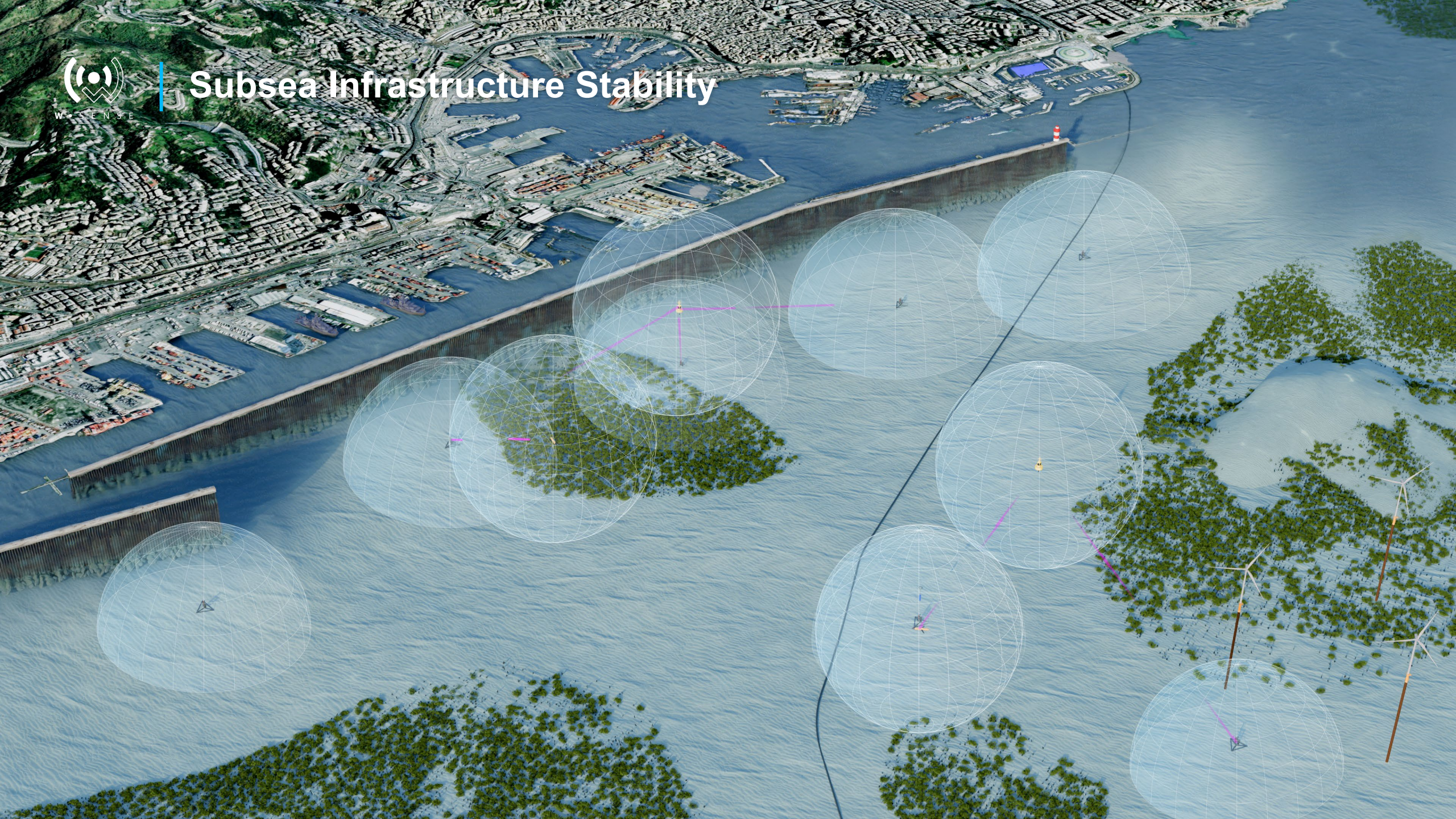
Subsea Infrastructure Stability

WSense's mesh wireless underwater monitoring system provides real-time infrastructure monitoring in environments where traditional cabled systems are impractical or vulnerable, such as breakwater dams, pipelines and port infrastructures.





Subsea Infrastructure Stability





Subsea Infrastructure Stability



Digital Twin Integrated
Subsea-Surface



Meteo-Marine
Monitoring



AUV
Coordination



Underwater
Gateway



Water Column
Parameters



Structural
Health



Structural
Subsidence



Critical Asset Surveillance & Protection



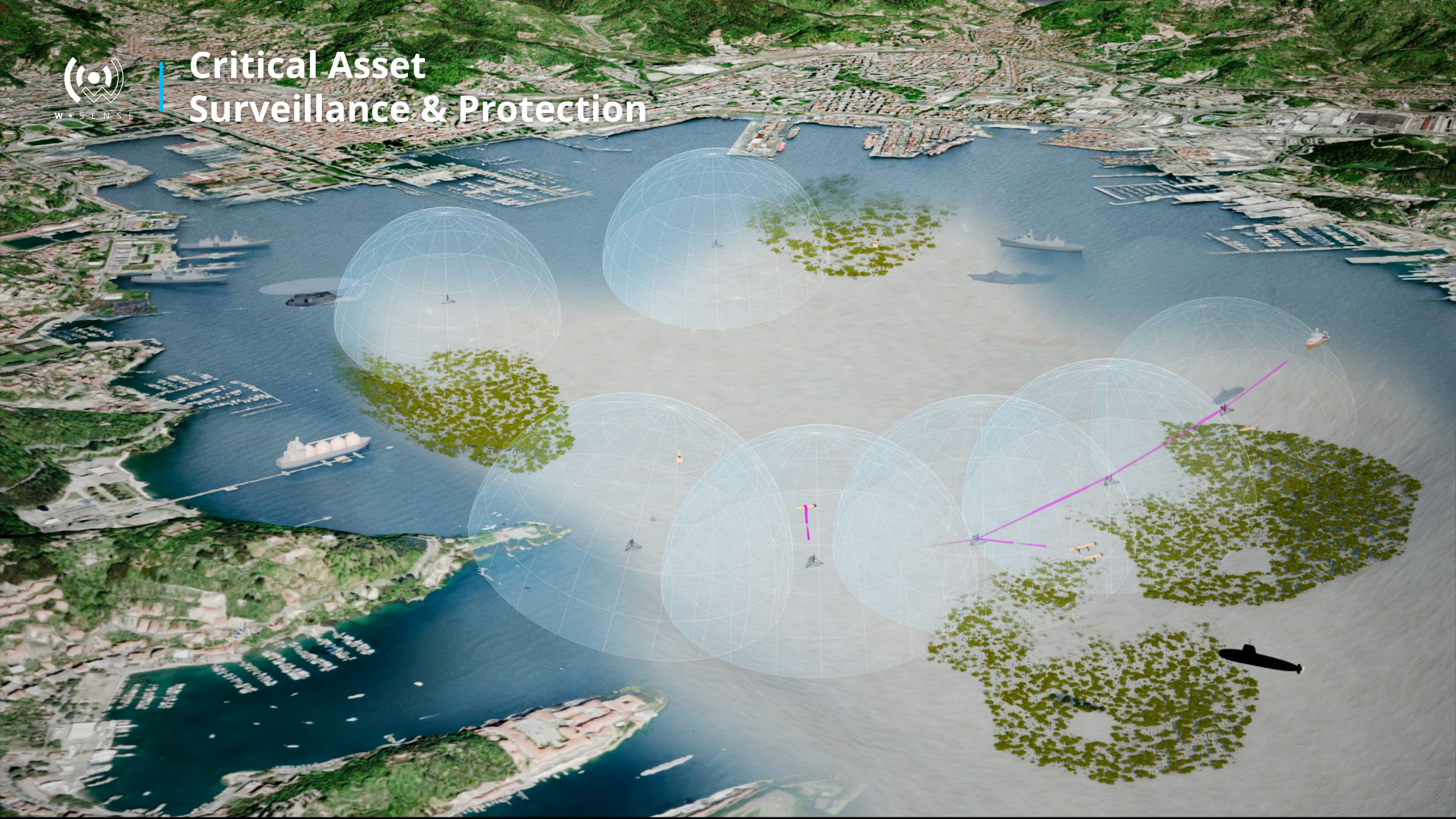
Critical Asset Surveillance & Protection

WSense's wireless underwater networks deliver a new level of security and resilience to critical subsea infrastructure.

By delivering **early warning and fast response** capabilities, we protect assets—including cables, pipelines, terminals, and platforms—from **sabotage and hybrid threats**.



Critical Asset Surveillance & Protection





Critical Asset Surveillance & Protection



Early Warning Integrated
Subsea-Surface

SeaFencing



Intrusion Detection
& Classification



Underwater
Gateway



AUV
Swarming





Upstream Oil & Gas Operations



Upstream Oil & Gas Operations

WSense is setting a new benchmark for offshore oil and gas operations with its wireless real-time monitoring solutions. From riser integrity to supporting dynamic mission planning for residents AUVs, to long term monitoring of shut-in wells.





Upstream Oil & Gas Operations





Upstream Oil & Gas Operations



Structural Health



Digital Twin
Integrated Subsea-
Surface

AUV
Coordination



Environmental
Hazard Response



Monitoring of
Shut-In Wells



Underwater
Gateway





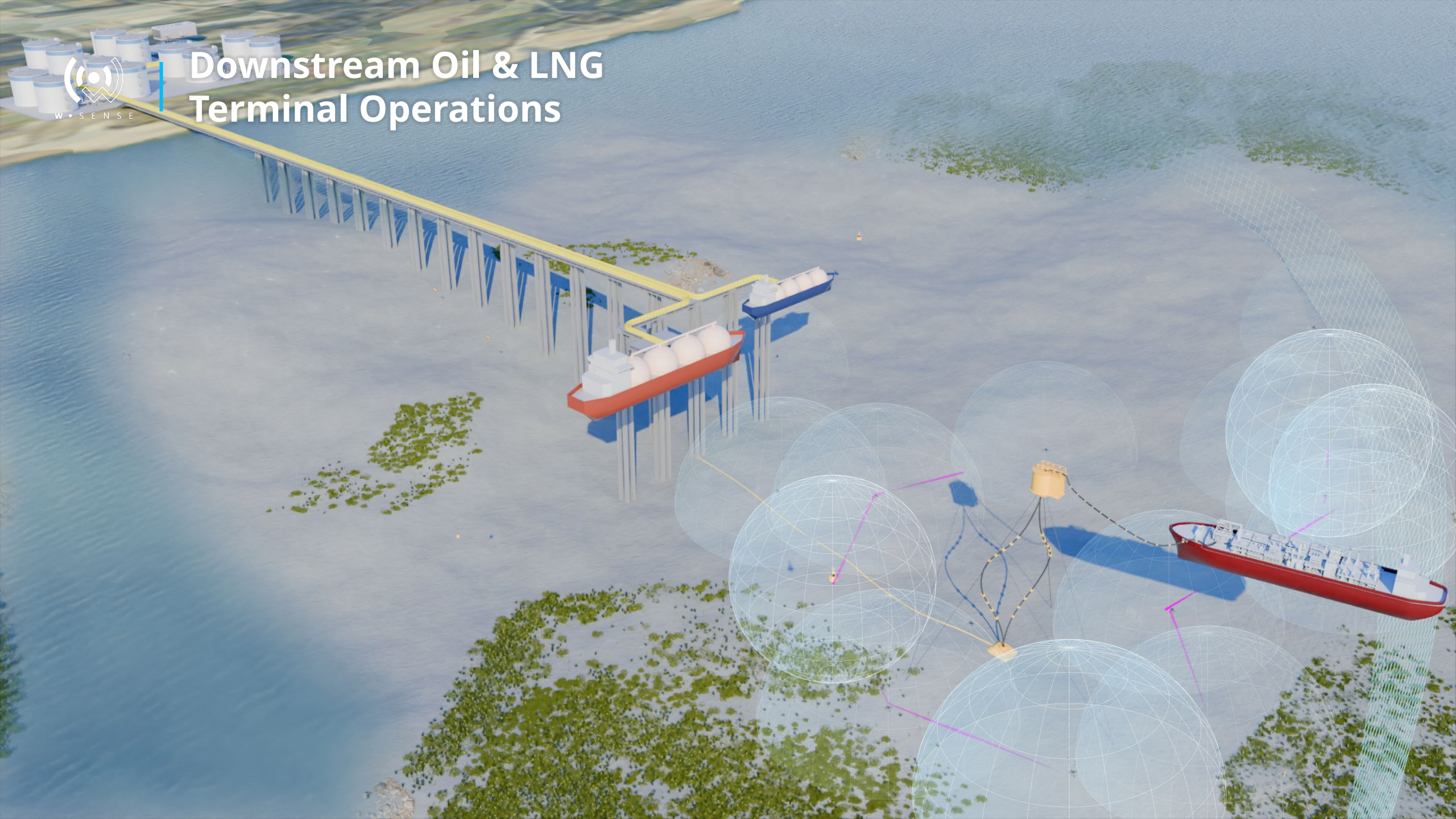
Downstream Oil & LNG Terminal Operations



Downstream Oil & LNG Terminal Operations

WSense is redefining safety and sustainability for offshore LNG terminals with its wireless real-time monitoring technology. WSense enables operators to detect leaks early, monitor mooring stability, and ensure compliance with the latest regulations.





Downstream Oil & LNG Terminal Operations



Downstream Oil & LNG Terminal Operations



AUV & Satellite
Integration



Digital Twin
Integrated Subsea-
Surface



Hose
Integrity



Mooring System
Integrity



Environmental
Hazard Response



Seafencing



Structural
Subsidence



Appendix - WSense Components

W · S E N S E

WE GIVE VOICE TO THE OCEAN

Patented multi-protocol networking software for underwater communication



WMesh is the WSense patented multiprotocol routing application, which aims to increase the degree of reliability of data transmitted in the wireless network through the creation of robust and adaptive multi-hop submarine networks.

The use of WMesh allows to define a robust and adaptive multi-hop underwater network in relation to the conditions in which the network nodes are deployed (WNode, WNode Enhanced and WGateway), thanks to machine learning algorithms and the analysis of the best protocol parameters.

Robustness of WMesh is ensured by machine learning algorithms that allow to convey the packets containing or collected data to the available nodes of the network according to a mechanism of optimization of the reception path in relation to parameters, such as, channel occupancy level, energy levels, and network topology and quality of environmental conditions.

This results in the high reliability of the transmission of information that crosses the entire infrastructure up to the terminal nodes.

WSense Software Platform for data collection and analysis



WSense's proprietary software platform based on Cloud services, which allows the data transferred from the WGateway to be stored in real time and continuously and processed to extract information and trends, which can be consulted through analysis graphs and interactive dashboards, to extract valuable information from the underwater environment.

WCloud interfaces and its functionalities can be managed and customized directly from this powerful software tool, including the definition of alarm thresholds for the set-up of a reporting system in case of exceeding these values and sending alert and alarm messages. The platform offers the possibility of threshold values different from those initially established and obtaining the related analyzes and statistics.

The WCloud user interface allows to view on a georeferenced map the exact position of the deployed architecture, including the WNodes and WGateways installed at sea, as well as their operational status.

The WCloud platform allows interfacing with third-party platforms, allowing to import or export data according to standard protocols (REST, MQTT, FTP), guaranteeing security and reliability in the transmission of information. It is possible to access the WCloud platform and its functions via the web with dedicated User accounts.

The underwater multi-sensor node with acoustic modem

DIMENSION

8,5 cm diameter
x 44,5 cm height



Features

- Underwater wireless networking (single-hop/multi-hop, bidirectional info exchange)
- Reprogrammable and reconfigurable from remote
- Very Low power operation (>year), power management of integrated probes
- Underwater localization: node position can be accurately estimated and communicated
- Supports information processing and compression
- Easy to deploy and retrieve
- Designed for easy and safe integration outside, on or inside the cage, up to 300m depth
- Secure communication through encryption and digital signatures

Options

- Supports integration of multi-vendor external sensors (for water quality and structural integrity monitoring)
- Rechargeable batteries
- Battery isolation system
- W-Switch: integrates up to four different external devices with a single node, supporting RS232, RS485, RS422, MODBUS(RS485)

The bridge between underwater and terrestrial environment



Features

- Bridge between underwater networks and local/remote control centers
- Acoustic/RF communication for underwater/above water wireless communication
- Bidirectional communication (real-time change of configuration and settings, actuator control, data communications)
- Secure communications through digital signatures, encryption etc
- Localization of any underwater device
- Robust communications (multi-hop smart networking, multiple transceivers per gateway)
- Integrated with on cage cabinets (e.g., Aqualine) and on cage power supply
- Fully compliant to the IoT Hub feature in the Aquacloud Sensor Data Standard
- Customizable open APIs for fast and easy integration to third party systems

Options

- Support of up to 3 acoustic transceiver in a single unit
- External GPS
- Ethernet connection
- Support direct connection with wired sensors

Real-time miniaturized modem to connect and localize small drones or divers.



- + WMicro is a small node designed to be integrated with external devices (especially underwater IoT devices such as tablets) equipped with battery.
- + WMicro is a multipurpose device available in two stand-alone versions: for support to the AUV (Autonomous Underwater Vehicle) or for integration to oblong to support the communication of the diver.
- + WMicro has a wired connection for both power and data, resulting in a small and lightweight device without mounted batteries.
- + WMicro use allows to enable underwater communication between divers and the exchange of information between mobile nodes.

WNode Enhanced

The underwater multi-sensor node supporting Deep water and AI



- High computational power to perform AI based tasks
- Can work in deep water (Up to 2000m)
- Remote reconfiguration and control through the underwater acoustic network
- Full integration of submarine energy-intensive devices (multiparametric probes, camera and hydrophone)
- Easy integration with external auxiliary power supply
- Can work with external additional acoustic and optical underwater modems with different modulations and transmission speeds and frequencies

Enabling Underwater Nodes Capabilities



WSwitch – device that extends the number of sensors that can be supported by a single WSense node and external power supply systems.

It can work jointly with an auxiliary battery pack to extend the operational life of WNode and WNode Enhanced.

Each WSwitch consists of 1 input and 4 outputs for sensors and 1 additional output (subconn) to connect additional WSwitch (ensuring up to 8 WSwitch in cascade).

WSwitch supports the connection and communication of data from up to 4 multi-vendor sensors. This device allows to configure the sampling frequency of the data from the individual probes.

A multiple WSwitch cascade configuration can be used to increase the number of usable sensors, up to a maximum of 32 (8 WSwitch cascade).

WSwitch also guarantees, in off-line mode, up to 512 memory recordings, which can be interrogated both by tool and by acoustic channel.

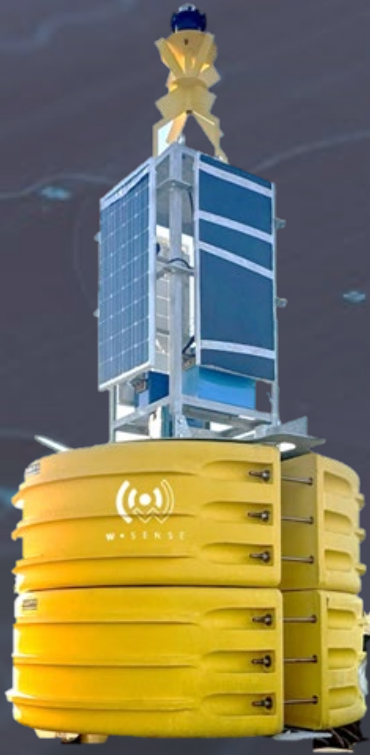
Long Lasting Extra Battery Pack



- Among the most efficient battery optimized for marine usage and offshore applications
- Provides high-capacity power while being lightweight and of small volume
- Rechargeable Li-ion battery

FEATURE	VALUE
DIMENSIONS	13 cm diameter x 44 cm height (5,12 inches x 17,32 inches)
MAXIMUM CERTIFIED OPERATING DEPTH	Up to 300m (984,25 ft)
CASE MATERIAL	PVC-U
WEIGHT	Approximately 10Kg (22 lb)
NOMINAL VOLTAGE	18 Volt
NOMINAL CAPACITY	66,5 Ah
NOMINAL ENERGY	1,197kWh

Advanced, multi-functional floating platform designed to enhance underwater wireless communication, environmental monitoring, and data collection



Unlike conventional buoys that operate in point-to-point mode, WSense's Smart Buoy leverages a multi-hop underwater wireless mesh network.

- **Advanced payload integration:** Supports cameras, hydrophones, and other complex sensors for operational and environmental AI/ML.
- **Multi-sensor array:** Measures temperature, salinity, wave height, current speed/direction, turbidity, dissolved oxygen, and atmospheric pressure.
- **Wireless Mesh networking:** Collects data from underwater nodes at different distances and depths, enabling area-wide coverage with a single surface unit.
- **Energy autonomy:** Solar-powered with intelligent energy management for long-term deployment.
- **Edge computing:** AI based on onboard processing for alerts and data compression.
- **Robust design:** Engineered for harsh marine environments with anti-biofouling coatings and corrosion.
- **Integration-ready:** Seamlessly connects with 3rd party cloud platforms.
- **Wireless communication:** Real-time data transmission via 4G-5G, radio, and satellite links.

Underwater General Purpose Module

Module for real-time data transmission, remote control, and comms with underwater or surface networks with advanced acoustic and optical communication technologies



Module for real-time data transmission, remote control, and communication with underwater or surface networks with **advanced multi-modal (acoustic and optical) and multi-frequencies communication technologies**.

It enables robust, **multi-layered networking within UUV swarms**. The general-purpose communication module can be integrated into UUVs to support autonomous navigation, as well as multimedia information analysis and compression and distributed intelligence in case of multiple UUVs. This is a modular, underwater communication unit capable of operating across **high, medium, and low acoustic frequencies** and with optical modems. This module can be integrated into UUVs of various sizes and can also be used as a fixed node/payload.

This architecture supports adaptive bandwidth allocation, reliable and adaptive data routing thanks to WMesh patented technology, mission-driven communication strategies, and localization enhancing swarm coordination, situational awareness, and autonomy in complex subsea environments.

Aanderaa

Turbidity Sensors

Temperature	C°
Turbidity	FTU

Doppler Current Sensor & current profiler (DCS & DCPS)

Abs speed	cm/s
Direction	Deg.M
North	cm/s
East	cm/s
Heading	Deg.M
Tilt	Deg
SP std	cm/s
Strength	dB
Ping count	
Abs Tilt	Deg
Max Tilt	Deg
Std Tilt	Deg
Temperature	C°

Conductivity Sensors

Conductivity	mS/cm
Salinity	PSU
water Density	kg/m3
Speed of Sound	m/s

YSI



EXO2 & EXO3 – Multiparametric

Oxygen	mg/L
Conductivity	mS/cm
pH/ORP	pH
fDOM	Ppb QSE
Chlorophyll	µg/L
Turbidity	FNU



SeapHOx v.2

Conductivity, Temp, Depth	mS/cm
pH	pH
Oxygen	mg/L

Environmental Sensors



Oxygen Optode

O2-concentration	µM
Temperature	C°
Air Saturation	%

Pressure, Wave and Tide sensors

Pressure	kPa
Tide pressure	kPa
Tide level	m
Significant wave height	m
Maximum wave height	m
Mean period	s
Peak period	s
Energy wave period	s
Mean zero crossing period	s
Steepness	-
Irregularity of sea-state	-
Cut-off frequency	Hz
Pressure Series	kPa
Spectrum	m2



TRIPOD : Numerical multi probe

temperature	°C
pH	pH
Redox	mV
Oxygen	%
Oxygen	mg/L
Oxygen	ppm
C4E conductivity	µS/c
Salinity	g/kg
TDS_ Kcl	ppm



Wimo Plus 7 – Multiparametric

S::CAN



I::SCAN multi-parameter

Turbidity	NTU/FTU
Color (app)	Hazen
Color (tru)	Hazen
Total Organic Carbon (TOC)	mg/L
Dissolved Organic Carbon (DOC)	mg/L
UV254 (organic matter in water)	Abs/m
UV254 f	Abs/m
UVT10	%

In-Situ



RDO PRO-X

O2-concentration	µM
Temperature	C°
Air Saturation	%

Franatech



METS Methane sensor

Gas Temperature	C°
Raw Methane	V

ANB Sensors



Ph Sensor DC300

pH	pH
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Chelsea



Uvilux Trilux – Biological sensors

Trilux- Chlorophyll, turb, algae	µg/l
Uvilux - PAH, CDOM, TLF, BOD	µg/l

Pro-Oceanus



Solu-Blu series

CO2	Ppmv – mg/L
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Nortek



AWAC Acoustic Doppler Current profiler

ADCP	
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Aanderaa



Acoustic Doppler Current profiler

DCPs, DCs	
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Proteus



P-35

E-Coli	Count/ml
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Gestecno



PT100

High temperatures (up to 130°)	C
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Video and Audio Acquisition

OceanSonics



Hydrophone IcListen RB9

Mammal, noise, vessels detection	
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LH Camera



Underwater Camera HD-PTZ

Ethernet Underwater Camera	
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Imenco



LABRUS Underwater Camera

Ethernet Underwater Camera	
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Structural Sensors

Straininstall



Underwater Load Shackles

Cells excitation voltage	VDC
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Measurand



Structural Sensors (accelerometers arrays)

SAAX Model 003 (Accelerometer)	m/s2
SAAV Model 001 (Inclinometer)	Degrees

Gestecno



Structural Sensors (Piezometer arrays)

Resistive Electric Piezometer	cm
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Keller



Pressure Sensors

Oil & Gas double carcass hoses	bar
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Blue Robotics



Ping Sonar

Sediment variation	cm
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Impact subsea



Ping Sonar ISA 500

Sediment variation	cm
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Integrated Sensors by Application



Integrated Sensor	Type	Environmental Monitoring (Dredging, Remediation)	Offshore Operations (O&G, Cables, Pipes)	Critical Infrastructure Protection (Dams, Ports)
Turbidity	Physical	✗	✗	
Current Profiling	Physical	✗	✗	✗
Depth	Physical	✗	✗	
Temperature	Physical	✗		✗
Wave and Tide Height	Physical		✗	✗
Redox	Bio-chemical	✗		✗
Salinity	Bio-chemical	✗	✗	
Total Dissolved Solids	Bio-chemical	✗		
CO ₂	Bio-chemical	✗	✗	
Methane	Bio-chemical	✗	✗	
BOD	Bio-chemical	✗		
Total Organic Carbon	Bio-chemical	✗		
Dissolved Organic Carbon	Bio-chemical	✗		
Air Saturation	Bio-chemical	✗		
Conductivity	Bio-chemical	✗		
Oxygen	Bio-chemical	✗		
pH/ORP	Bio-chemical	✗		
Chlorophyll	Bio-chemical	✗		
Inclinometer	Infrastructural		✗	✗
Piezometer	Infrastructural		✗	✗
Accelerometer	Infrastructural		✗	✗
Sediment Deposition	Infrastructural	✗		✗
Noise	AI Based Media	✗	✗	✗
Camera	AI Based Media		✗	✗