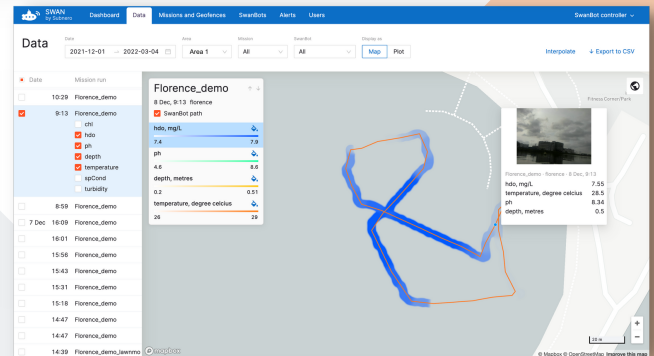# SUBNERO WATER ASSESSMENT NETWORK

**SUBNERO**

## SMART MONITORING OF THE WORLD'S MOST PRECIOUS RESOURCE

## SAFE & SUSTAINABLE

- Fully autonomous water quality sampling using a network of smart robots.
- Deployable in adverse conditions, such as wastewater and poor weather.
- Simultaneous coverage over large areas using networked operations powered by SWAN's *Bevy Intelligence*.
- Carbon-free and eco-friendly. Runs on rechargeable batteries.

Note: All data shown are for illustrative purposes.

## DENSE DATASETS IN REAL-TIME

- Dense datasets in real-time provide users with a holistic view of the health of water bodies.
- Large datasets enable advanced data analytics methods for preventive controls.
- Faster identification of hotspots leads to quicker response times on tackling potential issues.

## HIGH COST SAVINGS

- Up to 10x cost savings per sample.
- Minimal need for human intervention.

# SWAN CAPABILITIES

- Autonomous & Intelligent Monitoring

- Real-time Dense Datasets

- Multi-modal Heterogeneous Networks

- Disruption-Tolerant Network (DTN)

- Centralized Data management

- Scalable Operations

- Customizable Sensor Payload

## USE CASES

Water quality Data Collection
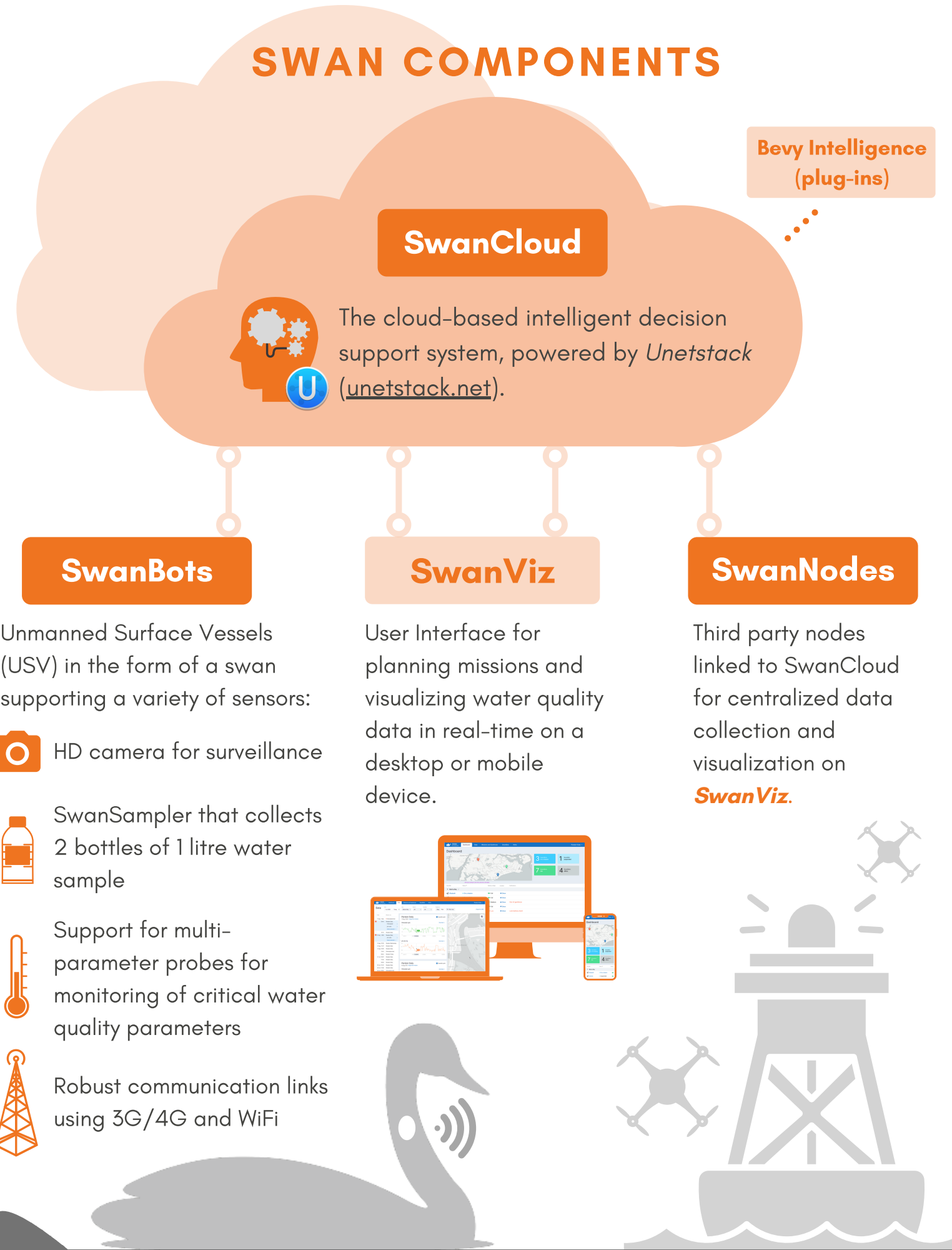
Monitoring of Hotspots & Events

Identification of Latent Phenomena
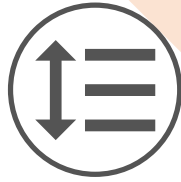
Surveillance & Inspection

Bathymetric Mapping

# SWAN COMPONENTS

**Bevy Intelligence (plug-ins)**

## SwanCloud

The cloud-based intelligent decision support system, powered by *Unetstack* (unetstack.net).

## SwanBots

Unmanned Surface Vessels (USV) in the form of a swan supporting a variety of sensors:

- HD camera for surveillance

- SwanSampler that collects 2 bottles of 1 litre water sample

- Support for multi-parameter probes for monitoring of critical water quality parameters

- Robust communication links using 3G/4G and WiFi

## SwanViz

User Interface for planning missions and visualizing water quality data in real-time on a desktop or mobile device.

## SwanNodes

Third party nodes linked to SwanCloud for centralized data collection and visualization on *SwanViz*.

# SWANCLOUD FEATURES

**Modular Framework**
Streamlines deployment in resource-constrained environments

**Extensible Architecture**
Supports integration with third-party systems

**Intuitive User Interface**
Visualizes real-time data and SwanBot mission progress

**Flexible Usage Options**
Provides flexibility of data plans and subscription periods

**Secure Solution**
Keeps data secure with state-of-the-art access control methods

# SWANBOT TECHNICAL SPECIFICATIONS

| FEATURES | DETAILS |
|---|---|
| Supported Water Quality Probes* | Eureka Manta 2, YSI 6000 |
| Monitored Parameters** | Temperature, pH, Conductivity, Chlorophyll, Dissolved Oxygen (DO), Turbidity, Depth |
| Depth of Monitoring | 0 – 4 m |
| Water Sampler | 2 bottles of 1 liter capacity each |
| Supported Sensors | Camera, Echosounder |
| Endurance | 6 – 8 hours |
| Battery | Lithium-ion Chemistry, Rechargeable |
| Storage | Cloud Storage |
| Communication Interfaces | 3G/4G, Wi-Fi |
| Control & Navigation | Autonomous (GPS based), 2.4 GHz Radio Transceiver |
| Dimensions | 0.8 m x 0.5 m x 0.8 m (L x B x H) |
| Weight | 18 kg |

* Other probes may be integrated upon request.
** List of parameters are not exhaustive and are dependent on the probe selection.