ClearWater SENSORS

Remote Nutrient Monitoring, Solved

- Nitrate
- Phosphate
- Silicate
- Iron
- pH

No Compromise Real-time Water Quality Monitoring

High quality data and long term deployments

The ClearWater Sensor's LOC instrument range uses state-of-the-art in high stability and high-specificity microfluidic assays to eliminate drift and inference. Automatic calibration to onboard standards allows the LOC series to be deployed in any water environment for years without maintenance.

ClearWater SENSORS

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Improve Your Data !

Automatic onboard calibration for long-term data stability, extreme accuracy, high-precision, and high-specificity.

Extend Your Deployments !

Low maintenance and low power requirements. Longer remote deployment.

Reduce Your Operational Costs !

Reliable unattended monitoring with thousands of high frequency data points. Fewer site visits and down time.

Go Deeper !

Submersible in both marine (to 6000 m) and fresh water

Device Optimisation

- Temperature and pressure effects
  - Electronics survival
  - Tolerances and differential bulk moduli
  - Robustness and resilience of moving parts
- Smart robust pumps
- Valve customisation
- Microfluidic chip robustness: Bonding resilience: time, temperature, pressure and chemicals
- Biofouling resistance

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Lab-on-Chip Sensors – Range and Parameters

Parameter	Range	LOD / precision	Time to result (* calibrated)	Energy (J) per measurement
Nitrate/nitrite	0 – 1000 µM	0.025 µM	~6 minutes	500
Phosphate	0 – 10 µM	0.04 µM	~8 minutes	500
Silicate	0 – 500 µM	1 µM	~7 minutes	500
Dissolved iron	0 – 1000 µM	0.02 µM	~6 minutes	500
pH	7.5 – 8.5	0.001 precision	~8 minutes*	1300

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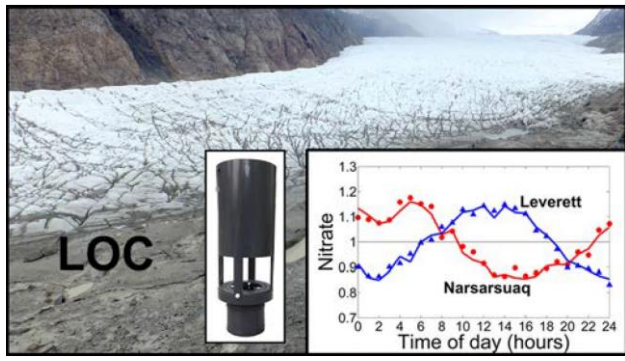
Catchment Monitoring

Autonomous Vehicle Integration

Deep Water Monitoring

Long Term Coastal Monitoring

Highly turbid water monitoring



Freezing / extreme conditions

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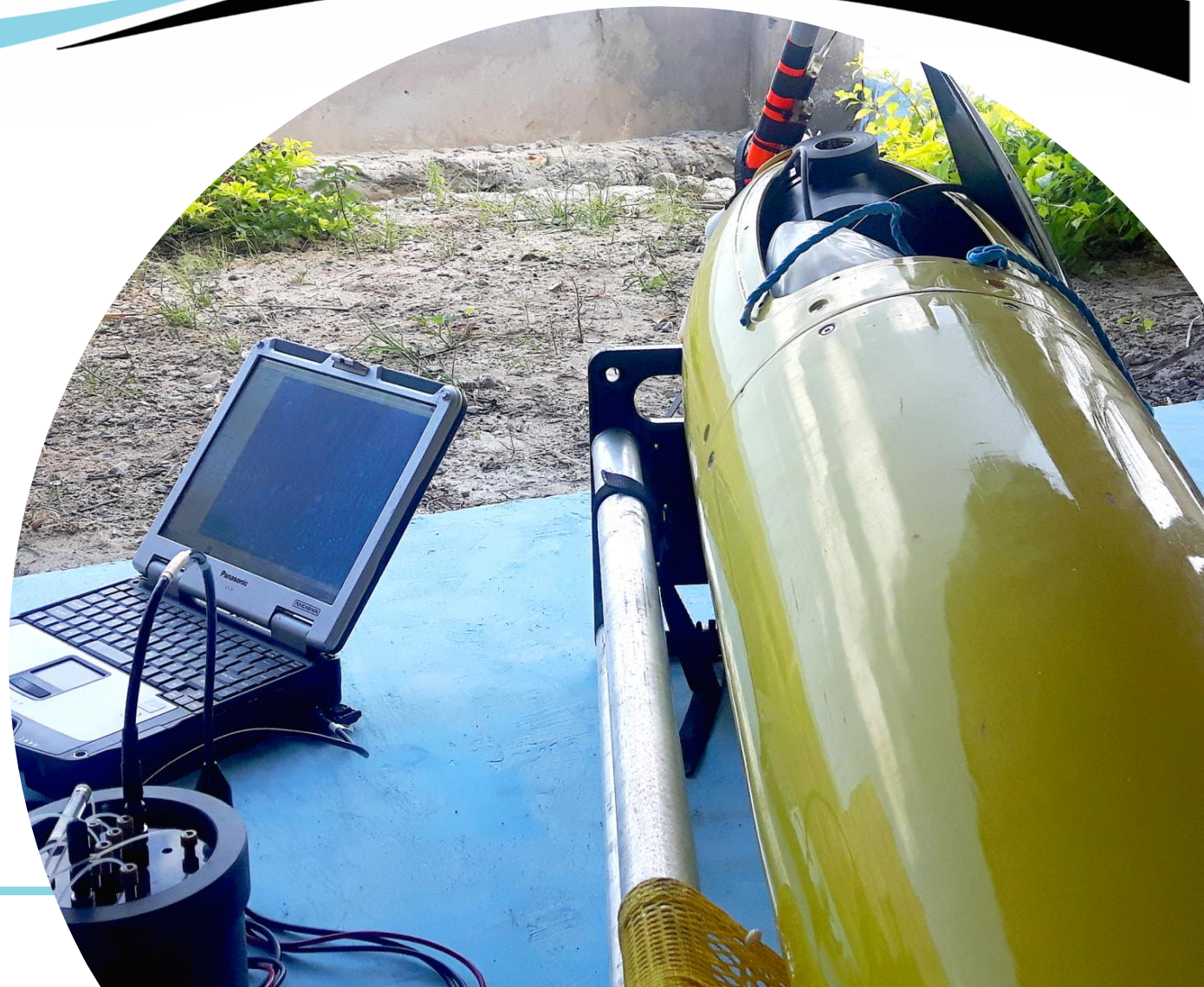
Features

- Onboard calibration standards
- User-swappable reagent canister – collects all waste
- Submersible to 6000 m
- Typically 2000 measurements per canister
- Onboard sophisticated microcontroller
- RS232 interface enables wireless or wired network connection (e.g. via GSM or Iridium modem)
- FAIR data solutions available for automated ingestion into data centres, or cloud based tools



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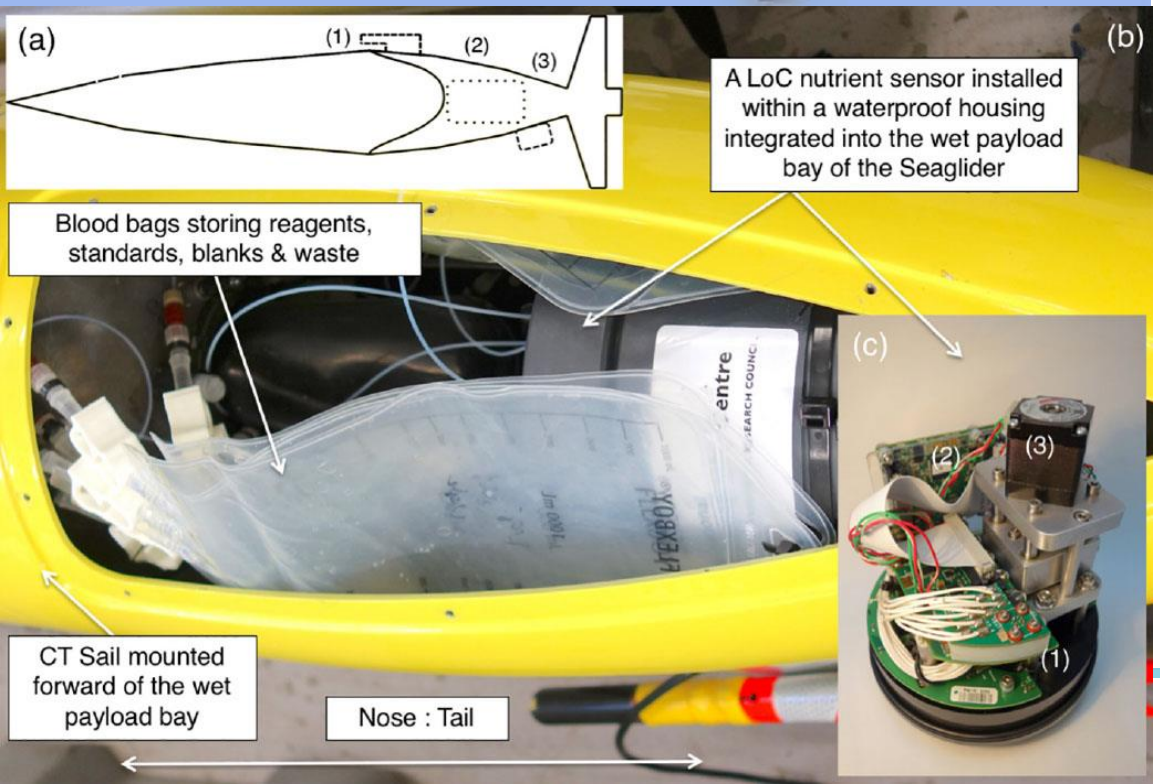

Vincent et al. 2018

Seaglider deployment

- Already demonstrated on Kongsberg Seagliders
- Low power allows multiple month-long deployments
- Over 10 successful Seaglider deployments to date with nitrate, phosphate and pH sensors

Recipe for success

- Quality management system (incl. record keeping & learning from failures)
- >17 years of testing and problem solving
- >200 deployments in harsh environments
- Large team of engineers AND analytical chemists
- Engaged environmental scientist stakeholders throughout development
- Motivated and committed individuals and teams