THOË

THOË, THE TECHNIQUE SERVING PERFORMANCE

- → Possibility of exposing 12 DGTs sequentially
- → Programming time sequences from a few hours to several weeks
- → Built-in temperature sensor for accurate concentration calculation
- → Titanium rotating axis to direct the DGTs towards the current
- → Maximum immersion depth of 1000 m
- → Structure, carrousel and seals made of chemical inert materials (PEEK, PETP, PTFE and Silicon)
- → Autonomy in immersion mode of more than one year

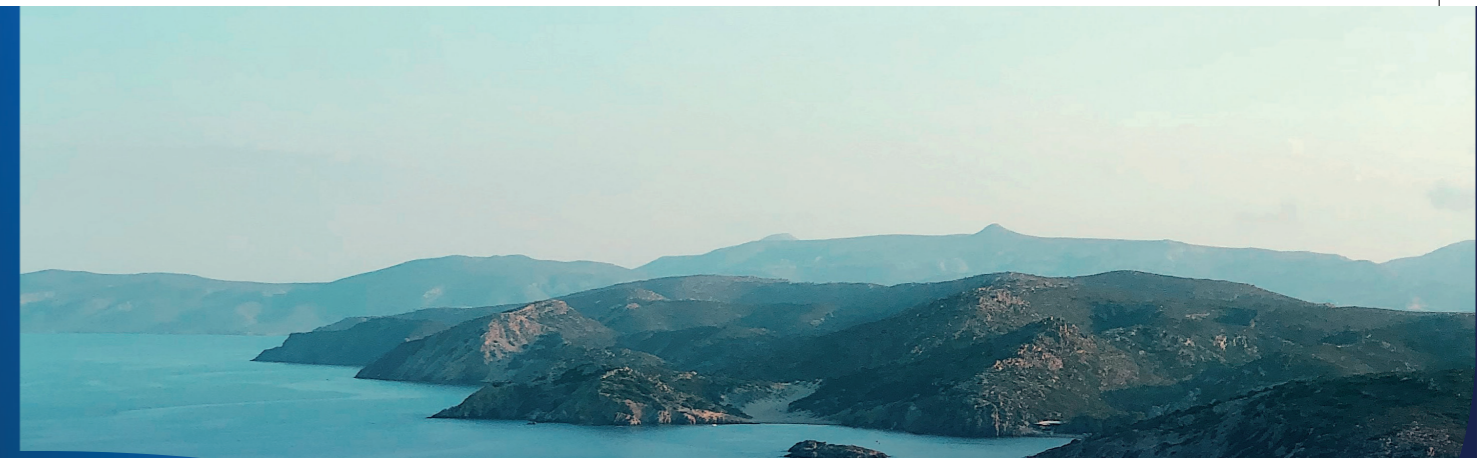## THOË ADAPTS TO ALL ENVIRONMENTS, AND FOR A MULTITUDE OF FIELDS OF APPLICATION

- → Research programs
- → Aquatic environment restoration programs
- → Regulatory environmental monitoring
- → Risk assessment for aquatic media
- → Industrial accident

HIGH SEAS

COASTS

RIVERS

LAKES

MONITORING OF ALL AQUATIC ENVIRONMENTS

THOË adapts to the monitoring of all aquatic environments, catering to a multitude of application domains, ranging from fundamental research to regulatory monitoring

THOË IN SEAWATER

ASK US FOR YOUR OWN TAILOR MADE APPLICATION

AEL/LEA Pépinière IRD - B.P. A5
98848 Nouméa - New Caledonia
+687 26 08 19
info@thoe-monitoring.com

afaq
ISO 9001
Qualité
AFNOR CERTIFICATION
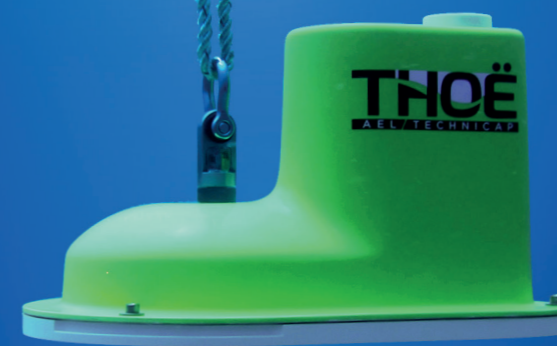
THOË

AN OPPORTUNITY TO INNOVATE WITH A LONG TERM PROCESS

In the early 2000s, Vale mining group established operations in New Caledonia, utilizing an innovative ore processing technology for extracting nickel. This technology generates aqueous solutions with high concentrations of dissolved metals that require treatment before being discharged into the sea via an effluent plume.

In 2010, monitoring of effluent plume dispersion was initiated using spot sampling. In order to improve monitoring quality, reduce costs, and address logistical challenges, several comparative studies were conducted to evaluate the performance of DGTs compared to traditional preconcentration techniques. The utilization of DGTs (Diffusive Gradients in Thin films) was seen as an efficient solution, and the development of an automated device was initiated.

In 2018, THOË was born !

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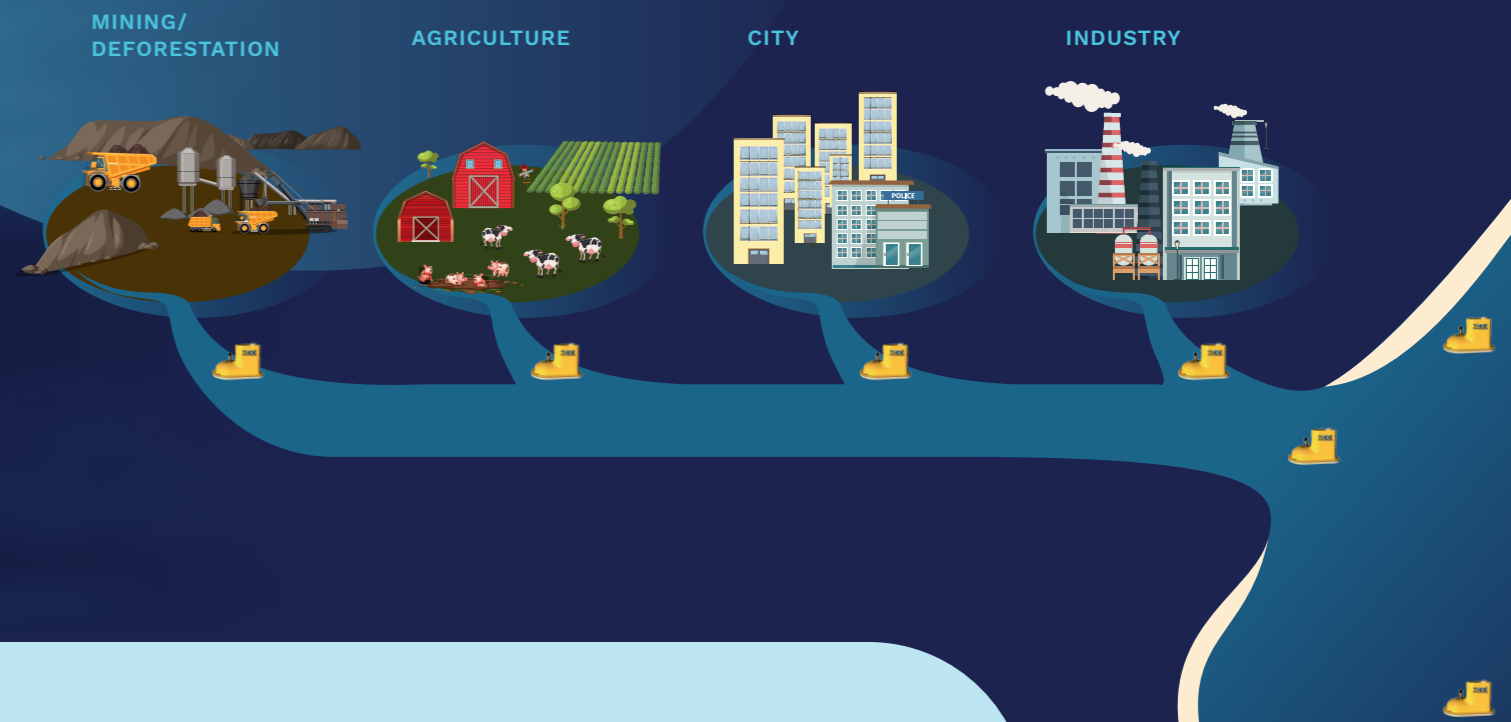
1 UNDERSTAND THE CONTEXT AND THE PROBLEM
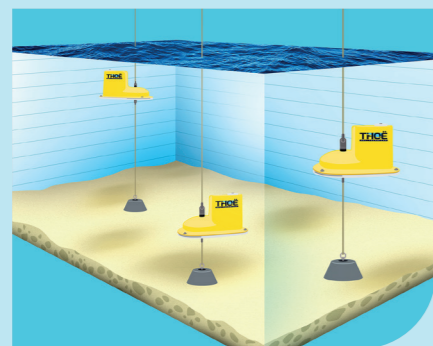
THOË, the researcher of trace elements in hydrothermal sources along the Tonga's subsea volcanic arc

A multidisciplinary project has dedicated its efforts to investigating the influence of shallow hydrothermal sources on trace element distribution. The study focused on micronutrients such as manganese and mercury, along the Tonga volcanic arc. Two THOË samplers were deployed on mooring lines at a depth of around 220 meters and remained in place for a year. Each DGT was exposed for a one-month period, providing valuable insights into the dynamics of these trace elements in the region.

2 MONITORING SITES AND POLLUANTS SELECTION

THOË, the guardian of a pollution-free marine effluent outfall in New Caledonia

Within a world heritage zone, a mining operator has a marine outfall where THOË ensures continuous monitoring of dissolved metal concentrations. Positioned on mooring lines at a depth of around 35 meters, six THOË devices generate time series data, significantly reducing logistical costs compared to traditional grab sampling methods.

3 DEPLOYMENT OF THE AUTOMATIC PASSIVE SAMPLERS DEVICES

THOË, the investigator of metal transfer phenomena between two bays in New Caledonia

Due to opencast mining, a recent study has been conducted to investigate the potential damage to the coastal area of the lagoon. A 3D hydrodynamic model has highlighted a potential transfer of water masses between Bay 1, affected by mining activity, and Bay 2, a reference site. The modelling data was overlaid with a two-month sequential passive sampling campaign that successfully captured this phenomenon of dissolved metal transport in the field. The combination of the two techniques has thus allowed for a better understanding of metal transfer phenomena and provides a powerful decision support tool.
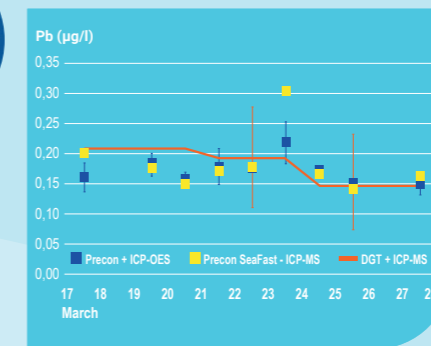
4 ANALYSIS OF THE PASSIVE SAMPLE

THOË, the trustworthy monitoring technology for dissolved metals in a port in New Caledonia

The shipping activities in a commercial port result in the release of undesirable chemicals into the environment. The THOË sampler demonstrates that the concentrations of dissolved metals remained relatively constant during the first 18 days, followed by an increase over the next 9 days, and finally a decrease during the last 3 days. In comparaison, the results obtained through grab sampling showed more variability.

5 RESULTS INTERPRETATION

Pb (µg/l)

Precon + ICP-OES   Precon SeaFast - ICP-MS   DGT + ICP-MS

17 18 19 20 21 22 23 24 25 26 27 28 March

THOË, the advanced technology for high-quality environmental monitoring in New Caledonia

A comparative study of three different analytical techniques was conducted to validate the use of DGT (Diffusive Gradients in Thin Films) in seawater. The analysis involved triplicate spot water sampling using a GoFlo bottle and exposure of DGTs for three days. Overall, the three techniques showed very good agreement, and furthermore, the use of THOË ensured precise results by obtaining averaged concentrations of contaminants.
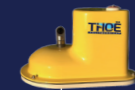
THOË IS A POWERFUL MONOTORING TOOL

1 TIME SERIES COLLECTION OF POLLUTANT CONCENTRATIONS

2 BETTER LOQ (BY X 50) AND DETERMINATION OF AVERAGE CONCENTRATIONS FROM HOURS TO SEVERAL WEEKS OF EXPOSURE

3 REDUCES MONITORING COST BY AT LEAST 30% AND COLLECTS DATA WHATEVER THE WEATHER