

Controlling water quality in the age of pollution and natural disasters

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Two years ago, Hurricane Sandy damaged more than 100 drinking water supply facilities and sewage treatment plants, leaving the state of New York, with an unexpected €2 billion bill to repair them. On the other side of the globe, drinking water even kilometres from the Fukushima power plant in Japan still is, today, a life gamble. In a time when natural disasters and pollution catastrophes seem to be happening at an increasing pace, how to make sure that tap water is always safe?

A European research team led by Veolia environment, a world leader in the water sector, has developed an entire system to monitor [water quality](#). It will come at a tenth of the cost of previous solutions, making it more affordable for local governments, regional administrations and cities to manage water resources.

"Access to water has considerably improved today and we do not even realise that this did not use to be the case barely half a century ago. Nevertheless, urbanisation, higher risks of floods, industrial contamination and a growing demand, all that challenges our ability to detect and react on accidental contamination," says Cyrille Lemoine, the leader of the ACQUEAU SWARM research project. "In an open and complex water distribution network in an urban area, accidents can happen at any time."

Scaling up

Today, water quality tests are mainly performed in labs, a time-consuming process, and [water pollution](#) is sometimes detected too late. Moreover, public concern with the quality of running water and the resulting regulations have made water monitoring a rapidly growing market, where European companies are global leaders.

Between 2009 and 2011, French multinational, Veolia, decided to invest massively into small companies developing water monitoring solutions, creating the holding company Endetec for which Cyrille Lemoine acts as lead scientific advisor. "We decided to develop our own solution because the current players in this market have a model only adapted to a small number of monitoring devices, coming at a very high price," explains Cyrille Lemoine. "We had to join forces with a different kind of players to scale-up in a cost-effective way."

To develop a new set of water monitoring tools that could be scaled up, Veolia and Endetec teamed up with an unusual partner: EFI automotive, an electronics supplier for the car industry. "For us this was mainly about the capacity to deliver low cost solutions at a mass production scale," explains Cyrille Lemoine. At the same time, the team benefited from the most recent developments in sensor technologies, a booming research sector and a promising market. The partnership was made possible by ACQUEAU, a public-private initiative which goal is to promote transnational collaboration in water technologies.

Cities: a new market

"The monitoring devices we have developed are quite simple to use and require a minimum maintenance, as they are fully wireless. The technology behind them is cutting-edge. What we have come up with is a system of sensors attached to buoys, those monitor standard parameters which give us a digital fingerprint of the water flowing at a particular point: pH, levels of oxygen, water conductivity and a few more. Two

other sensors complement this system: one will monitor traces of DNA in the water: this is a way of identifying algae or bacterial pollution for example. The second one is a spectrophotometer, helping to identify organic pollutants."

Today, Veolia and Endetec are targeting the national and regional public water distributors and city councils. Those players are increasingly important in the water distribution sector and are in demand for technologies similar to the one developed in the SWARM project. Mr. Lemoine sees [water distribution](#) from an urban perspective: he used to be responsible for the water network servicing of the suburbs of Paris supplying nearly 4 million people with drinkable [tap water](#).

"Cities represent a huge market and a small metropolis of 200.000 inhabitants could purchase a whole monitoring system for the basic price of €100.000. This is relatively cost-effective when compared to similar existing systems, if you take into account that it includes operation costs for 10 measurement points" Cyrille Lemoine tells us.

If catastrophes such as Hurricane Sandy or Fukushima cannot be avoided, Cyrille Lemoine insists on the fact that we can learn from them. 'In fact such events are an opportunity to learn about where the danger could come from and react rapidly with the set of sensors in place. The system developed during the SWARM project could be a game changer in the way we make sure that tap [water](#) can be supplied safely.

Provided by Eureka Network

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