Abstract Title	Tools and strategy for the optimization of Trihalomethanes' levels in a large Water Supply System affected by the effects of Climate Emergency
Topic	X Improving water quality O Resilient water systems O Circular solutions: Reuse, Recover and Recycle O Transitions in water, agro/food and energy
Challenges and Solutions	Challenges: Improvement of the trihalomethane's levels in a large and complex DW Supply System, with sources affected by the effects of climate emergency (quality/quantity), that has to use alternative resources like reclaimed waters. Solutions: different technological and prediction solutions (models) to difficult with this complex context will be presented (treatment plant improvements, 'satellite' local treatment systems, online analyzers, mathematical prediction models developed, etc.)
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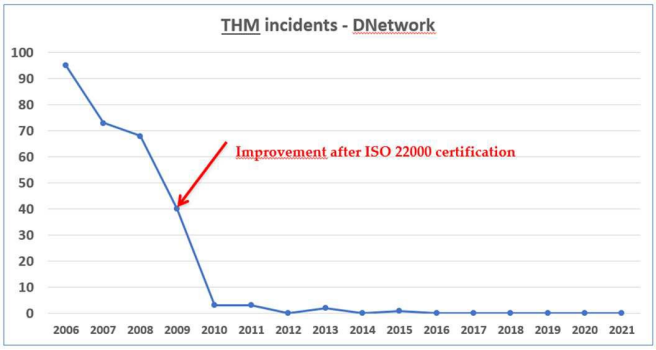
Abstract	The management of trihalomethanes (THM) in distribution systems can become very complex, especially when raw water quality is poor and the distribution network extensive, with chains of tanks (and/or chlorine boosting stations), and the retention times of the water till the supply points can be high: this management becomes even more difficult when the systems suffer from water scarcity in their sources, as the quality is also deteriorated, a problem that has increased in many countries a result of the climate emergency. THM levels are a non-conservative magnitude, as concentrations increase over time from the outlets of the Drinking Water Treatment Plants (DWTPs) or delivery points; thus, even when the values at the DWTP outlets and/or at the reception points are consistent, problems may arise, especially at the most extreme points of the distribution networks, if the water management strategy THMs is not adequate or it's not optimized for these difficult contexts. The factors that affect the formation of THMs are well known: water quality

	(type of organic matter and concentration, pH, temperature, bromide concentration), type and dose of disinfectant, contact time with it, etc. However, on many occasions management strategies in distribution networks are not optimized and do not have a sufficiently preventive vision, focusing on specific corrections when the *parametric values* (legal limits) are exceeded. To ensure that THMs values are obtained that not only comply with the requirements of current legislation at all supply points but are also optimized, it is necessary to design a comprehensive and preventive strategy throughout the whole supply system, jointly considering the actions carried out at the treatment plants and in the distribution network. In this paper, in addition to recalling the most appropriate treatment systems to minimize their formation, the fundamental elements of this strategy at a large and complex supply system -especially affected by droughts and the effects of climate emergency- will be reviewed, as well as the different tools developed and implemented, such as the online prediction of the THM formation potential (THMFP), the continuous monitoring of the levels in the network using on-line analyzers or the "satellite" reduction systems installed at critical points of the distribution network. For all of them, practical experiences and real results of their application under an ISO 22000 certified system will be presented.
Figures/diagrams/illustrations	 Reduction of THMs in the distribution network after the ISO 22000 system implementation. Prediction of THMs by the mathematical model developed