

Environment water quality: Opening of public bathing sites in natural environment

NCC France

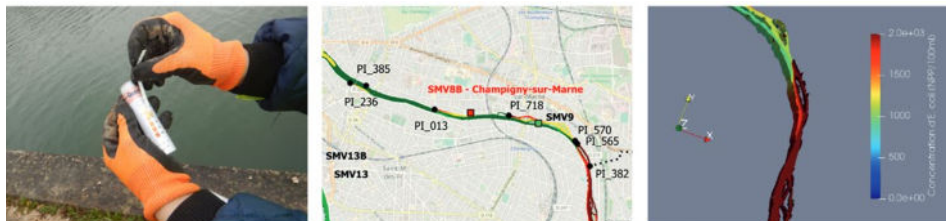
Industrial organisations involved:

The NCC CC-FR is managed by TERATEC the European Pole of Competence in high performance digital simulation, in partnership with CERFACS the European Center for Advanced Research and Training in Scientific Computing, with Inria Academy, a continuing education program dedicated to open source software, with CRIANN, the regional computer centre and digital applications of Normandy, and ROMEO the Regional Computing Center of the University of Reims Champagne-Ardenne.



Technical /scientific challenge:

How to succeed in opening swimming sites in the river la Marne after the Paris 2024 Olympic Games? The Public authorities need to obtain a fine modeling of dispersion bacteriological strains since their point emission. In order to support the management plans settled by public authorities in these highly urbanized areas, Prolog engineering has developed a model coupling hydrodynamics and water quality on the Criann supercomputer.



Fine modeling of the dispersion of bacteriological strains from their point of emission

Solutions:

PROLOG INGÉNIERIE group, specialized in the field of water and environment was supported by CC-FR to deploy a code coupling hydrodynamics and water quality on the CRIANN Supercomputer to obtain a fine representation of the dispersion of pollution at a bathing area in 3 steps:

1. 2D modeling by the Telemac-Mascaret system representing the conditions hydrodynamics of a 40 km long section of the Marne
2. Prioritization of pollution sources due to permanent or accidental wastewater discharges and rainwater discharges
3. Focus on a potential bathing site. 3D modeling for a fine representation of local dispersion of pollution- Proof of concept that was achieved:
 - 3D hydrodynamic simulation of a section of the river Marne with consideration of pollution sources
 - Deployment 3D hydrodynamic simulation on HPC architecture
 - Getting started with the HPC environment

Business impact:

Thanks to CC-FR and CRIANN with a high-level expertise in intensive computing, PROLOG INGÉNIERIE group has been able to significantly increase their expertise to deploy 3D hydrodynamic simulation on HPC architecture. Individual and personalized support has also enabled the company quickly become autonomous in the use of super-computer and to enable large client to be carried out with a significant productivity gain.

Benefits:

- Speed of calculation time
- Fine representation of pollution dispersion at bathing area level
- More than 120,000 CPU hours was needed

- Keywords: HPC, Simulation, dispersion of pollution, Environment water quality
- Industry Sector: Environment/climate/weather and Finance/Insurance and Public
- services/Civil protection
- Technology: HPC, Simulation

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