



BIGCEES

Big data to rescue the environment



Researchers at the IPRA-LMAP (Laboratory for mathematics and its applications) in Pau are steering a multidisciplinary project combining data analysis and statistics at the service of ecology.

On one hand is the Earth, undergoing unpredictable climate changes, and on the other hand is an unprecedented and under-exploited data deluge on coastal erosion, pluviometry, marine pollution, etc. In the middle, two statisticians of the IPRA-LMAP (Laboratory for mathematics and its applications) in Pau (Benoît Liquet and Noëlle Bru), an oceanographer (Damien Sous, from the University of Toulon) and a project: BIGCEES, standing for “big model and big data in computational ecology and environmental sciences”. A member of the MIRA federation (aquatic environments and resources) associating researchers of the UPPA, the CNRS, the Ifremer and the INRA, Benoît Liquet had the idea of forming a multidisciplinary team to process and cross-reference existing data in order to model the impact of climate change on the environment and natural resources. A bold objective, as the ambition of this tool – yet to be created – is to predict coastal risks due to extreme events. For this purpose, the group is composed of mathematicians (IPRA-LMAP), experts in coastal engineering (IPRA-SIAME), hydrologists (the Irstea) and halieutic specialists (the Ifremer).

The first task is to evaluate the impact of climate change on the marine species of the Bay of Biscay. The MCIA (the mesocenter of Aquitaine for high performance computing) will be in charge of processing the data in order to build operational tools in real time. The researchers will also tackle coastal risks (submersion, pollution, erosion, etc.), the difficulty being to compile reliable data on extreme events. Lastly, BIGCEES will focus on developing hydrology models capable of evaluating flow-rates in the event of heavy rainfall or floods. “Our project will rely on innovative methods to develop tools that will enable big data to be applied in environmental sciences,” concludes Benoît Liquet, who is convinced that the huge dataflow is likely to reveal some of Mother nature's secrets too. Artificial intelligence will play a part, particularly Bayesian networks and deep learning methods (neural networks). All we have to do now is make the figures speak...

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