



Escherichia coli Maximum Allowable Daily Loads (MADL): an environmental management tool to improve the microbiological quality of the Thau lagoon water (France)

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The yearly shellfish harvest in the Thau lagoon (75 km²) is about of 13000 tons of oysters and 4000 tons of mussels, representing 10% of the French shellfish production. The microbiological shellfish quality is directly related to the lagoon water quality which is dependent from the watershed inputs. By dry weather or after rainfall events, the Thau lagoon shells are regularly impacted by microbial pollutions of faecal origin exceeding health standard, resulting in the closure of the shellfish harvest.

To improve the water quality, and in the face of increasing population pressure around the lagoon, the OMEGA Thau project (Environmental Management Tool and Alert Management) was initiated in 2006. This project, managed by local stakeholders, associates scientists, private companies, local institutions and shellfish farmers. The aim of this project was to develop an Environmental Management Tool, to guide local authorities in infrastructure improvements and urban planning (sanitation system, stormwater network) so as to achieve optimal water quality consistent with European standards for shellfish harvesting areas.

This management tool was developed in five steps: (i) inventory of the watershed pollution sources; (ii) simultaneous measurements of microbial quality in the watershed and the lagoon; (iii) development and validation of mathematical models, both on watershed and on the lagoon, to understand the processes involved; (iv) use of these models to determine *E. coli* Maximum Allowable Daily Loads (MADLs), above which shellfish microbial quality falls below public health safety thresholds; and (v) comparison of MADLs to real inputs from inlets, to identify the critical zones of the basin and to define priority work programs to reduce the pollution.