

## **Optimising models to predict faecal pollution in shellfish harvesting areas based on geographical and climatic parameters**

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Tuesday, 16th May - 17:00 - Bacterial contamination - Bailey Allen 2 - Oral

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*We examined the relationships between concentrations of faecal indicator organisms (FIO) in bivalve shellfish (*P. perna*) and water sampled from 50 sampling sites within production areas in the North and South bays of Santa Catarina (SC, Brazil) and climatic and geographic characteristics of upstream river catchments from August 2012 to October 2013. Models to predict faecal pollution in coastal areas were developed based on geographic and climatic parameters. Model performance was assessed considering different buffer zones around the sampling sites and different time lags with respect to sampling dates. The spatial variation of FIO levels in water and molluscs in the bays was best associated with the human population in adjacent catchments whose outfalls are located within a three-kilometre radius from the sampling sites. By considering different buffer zones around monitoring points, the levels of explained variance in the spatial fluctuations of faecal pollution in the study sites were improved by ~30% in relation to models that considered only the closest pollution source. The temporal variation of FIO levels in water was best associated with cumulative rainfall six days prior to sampling and solar irradiation two days prior to sampling. By considering different time lags prior to sampling, models without significant correlations turned out explaining ~50% of variability in temporal bacterial fluctuations. The proposed approach can help shellfish safety authorities in understanding the role of geography and climate on faecal pollution levels in shellfish waters and in implementing active management systems for FIO prediction in shellfish production areas.*