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A geomatic methodology for spatio-temporal analysis of climatologic variables and water related diseases

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The main objective of this research is to propose, by the way of geomatic developments, an integrated tool to analyze and model the spatio-temporal pattern of human diseases related to environmental conditions, in particular the ones that are linked to water resources.

The geomatic developments follows four generic steps : requirement analysis, conceptual modeling, geomatic modeling and implementation (in Idrisi GIS software). A first development consists of the preprocessing of water, population and health data in order to facilitate the conversion and validation of tabular data into the required structure for spatio-temporal analysis. Three parallel developments follow :
water balance, demographic state and evolution, epidemiological measures (morbidity and mortality rates, diseases burden).

The new geomatic modules in their actual state have been tested on various regions of Mexico Republic (Lerma watershed, Chiapas state) focusing on diarrhea and vector borne diseases (dengue and malaria)
and considering records over the last decade : a yearly as well as seasonal spreading trend can be observed in correlation with precipitation and temperature data.

In an ecohealth perspective, the geomatic approach results particularly appropriate since one of its purposes is the integration of the various spatial themes implied in the study problem, environmental as
anthropogenic. By the use of powerful spatial analysis functions, it permits the detection of spatial trends which, combined to the temporal evolution, can be of particularly use for example in climate change
context, if sufficiently valid historical data can be obtain.