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In search of a footprint: an investigation about the potentiality of large datasets and territorial analysis in disaster and resilience research.

Marco Pregnolato (1), Marcello Petitta (1), Stefan Schneiderbauer (1), Lydia Pedoth (1), Christian Iasio (2), and Giedrius Kaveckis (3)

(1) EURAC, Institute for Applied Remote Sensing, Bolzano, Italy, (2) Henesis s.r.l., Viale dei Mille, 108, Parma, Italy, (3) Institute of Geography - University of Hamburg, Hamburg, Germany

The present investigation aims to contribute to a better understanding if and how coarse scale data can prove useful in a study on resilience of communities towards natural hazards. Main goal of the work is the exploitation of large datasets in search for indicators and information valuable for resilience research; in particular, for marks in the statistical distribution of events as well as in the physical signs on a territory, to be possibly defined as disaster footprints.
The approach developed required to start from theoretical considerations about some key concepts, such as footprint and resilience and the possible influence of different types of adverse events on a territory.
In particular, the research focuses on statistical signals that can be identified within datasets, concerning the effects of hazardous events against the background of resilience, defined as the "ability of a system and its component parts to anticipate, absorb, accommodate, or recover" from a disaster.
The hypothesis for this work was that a disaster footprint could be shown using land features and changes maps. The question linked to this hypothesis was: is there a possibility to recognize on the land a multi-dimensional footprint? Is it possible to do this using land cover/land use data? In order to answer these questions this work proposes a synthetic index, named for convenience Hazard-Territory Index, created to categorize classes of Land Use/Land Cover from the CORINE Land Cover maps, by the mean of different approaches, according to the type of hazard.
Through the use and elaboration of CORINE Land Cover data this work investigates whether the land and its use (in a way the relationship between a territory and the community living on it) and its changes over time can reveal some information and results relevant for the analysis of resilience.
The investigation, set up in order to analyse these "signs on a map", led to implicate the notion of footprint as a multi-dimensional concept, dealing with different temporal scales and dimensions of resilience and it proposes therefore a definition of disaster footprint, as a multi-parametrical and complex impact indicator (or rather an indicator family).
The mutual influence between the land, the hazard and the system on the territory presents different aspects that we tried to synthesize into the same index, differently analyzed according to different dimensions of disaster footprint considered; namely: probability of occurrence, susceptibility to harm, long-term impacts and modifications.
The index visualizes the information at national and supra-national scale on maps.
Although presenting important theoretical limitations (mainly in the spatial and temporal resolution of the data and in the definition of proxies for physical parameters), the application of this methodology at a supra-national scale has proved useful in the attempt to define the domains of investigations for community resilience studies at a local scale.