Laser scanning and flood risk models

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Flood is one of the much serious, common and costly natural disasters that several countries are facing. Climate

change and growing urban areas have dramatically increased the frequency and the severity of flood events. This has

enhanced the interest of the Scientific Community and of the public institutions in more accurate studies regarding

the delineation of flooding areas.

In mountain and hill areas, it is much easier to mark the flooding areas even with a one-dimensional schematization,

while in lowlands the accurate delimitation of flood areas becomes much more difficult requiring a more detailed

description of the territory. In particular, the definition of flooded area in costal zones is extremely difficult

because of the small changes in the land surface elevation models and because of the presence of manmade structures

that may significantly modify flood diffusion. The study area is the Ionian coastal plain of the Basilicata region

(Southern Italy) crossed by five of the six main rivers of the region (Bradano, Basento, Cavone, Agri and Sinni).

This work aims:

-to analyze the capacity of LaserScan DTMs for the description of coastal morphology and modeling flood risk areas;

-to define the most effective strategy for the delineation of flood areas using the comparison of one dimensional

model (Hec-Ras River Analysis System developed by the Hydrologic Engineering Center of the United States Army Corps

of Engineers) versus the two dimensional schematization (MIKE 21 HD by the Danish Hydraulic Institute Water &

Environment and FLO-2D version 2007 J. S. O'Brien).