



European Geosciences Union

GIFT – Geosciences Information For Teachers

Telling and Measuring Urban Floods: Event Reconstruction by Means of Public-domain Media



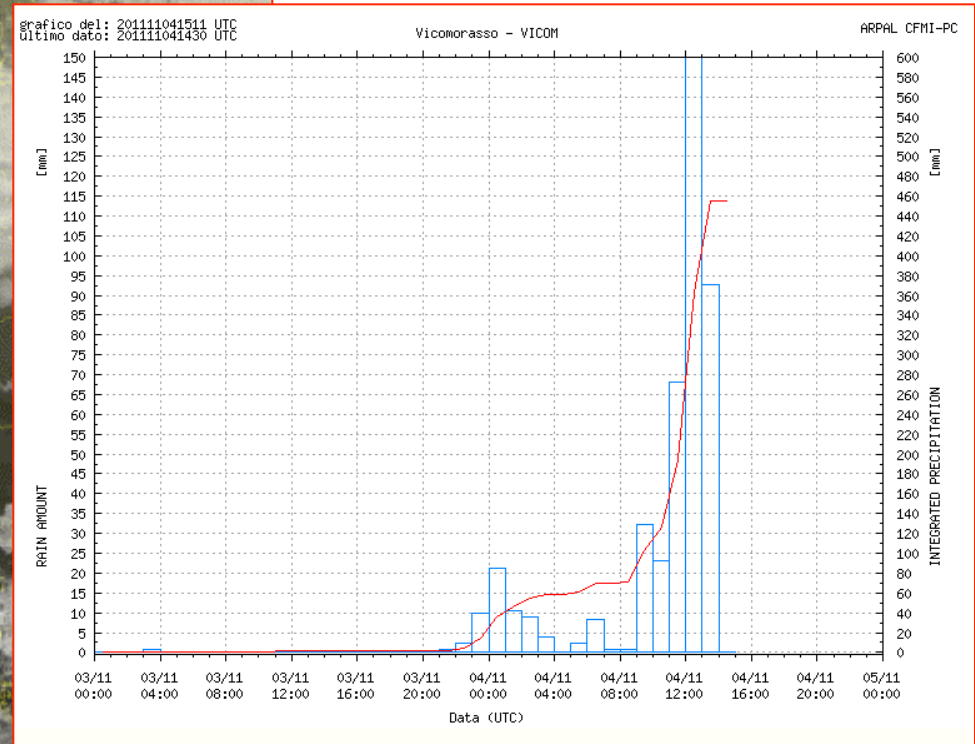
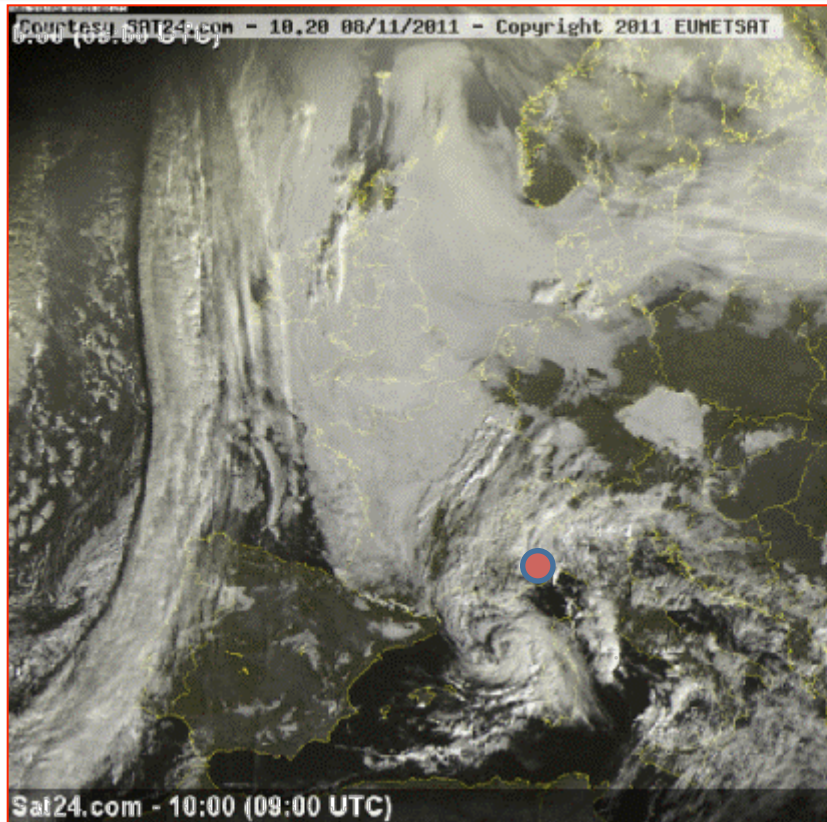
S. Macchia⁽¹⁾, E. Gallo⁽²⁾ and P. Claps⁽³⁾



- (1) Giovanni Arpino, Junior School, Italy
(2) CINID, Consorzio Interuniversitario per l'Idrologia, Italy
(3) DIATI, Politecnico di Torino, Italy



The Most Dramatic Flood in Italy in 2011: Genova 4.11.2011



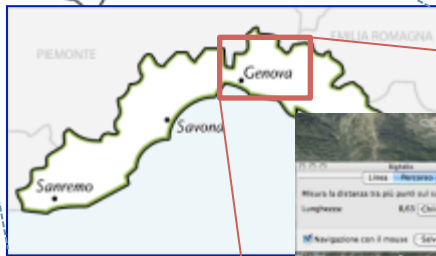
Precipitation Intensity

Tropical cyclone-like "Rolf"

● Genova (Italy)

The Genova (Italy) flash flood event on 4th November 2011

Liguria (Italy)



'Rio Ferggiano'
River Watershed



Reporter's name: 'Topolino'



Reporter's name: 'Gerryap'



The Most Dramatic Flood in Italy in 2011: Genova 4.11.2011



<http://www.ilsussidiario.net>



<http://www.bergamosera.com>

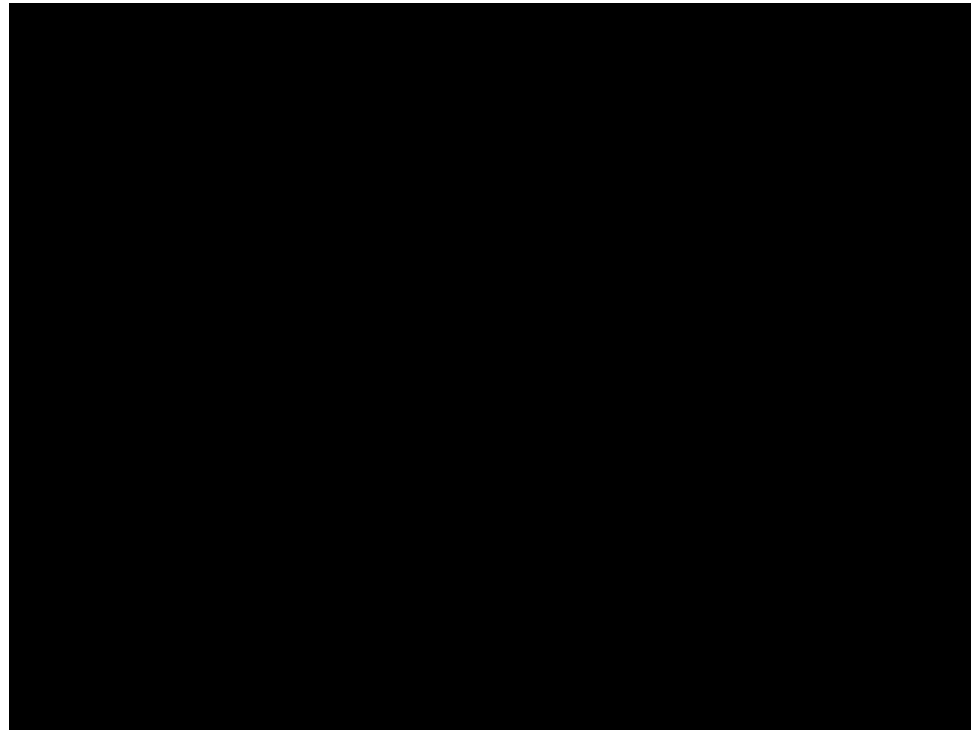


<http://www.blitzquotidiano.it/>



<http://www.ansa.it/>

A Simplified Reconstruction



A Simplified Reconstruction



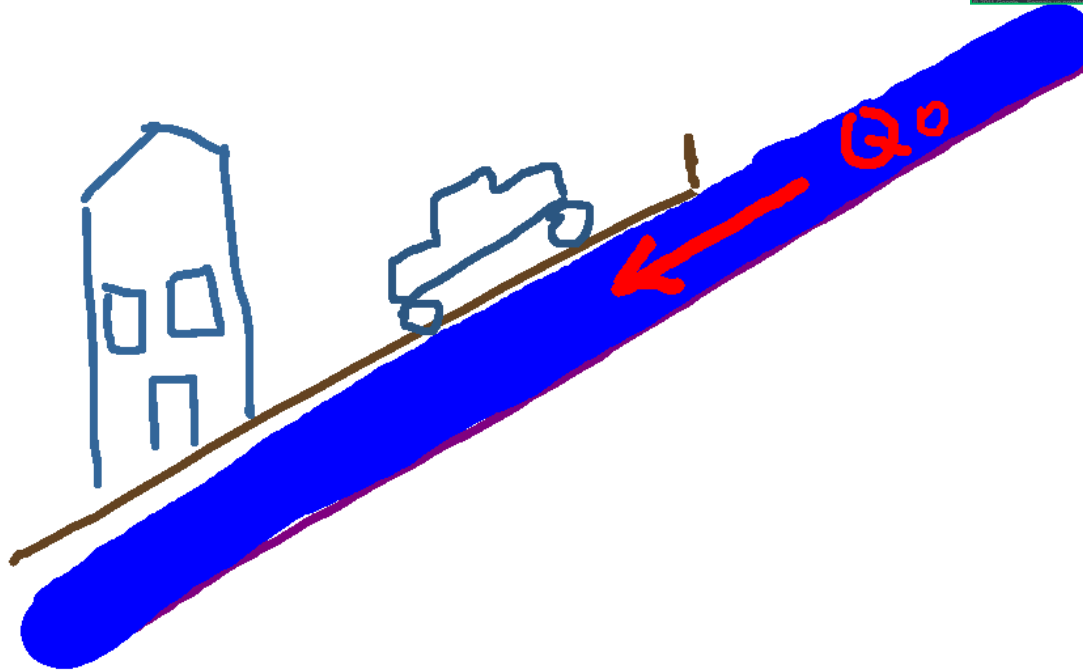
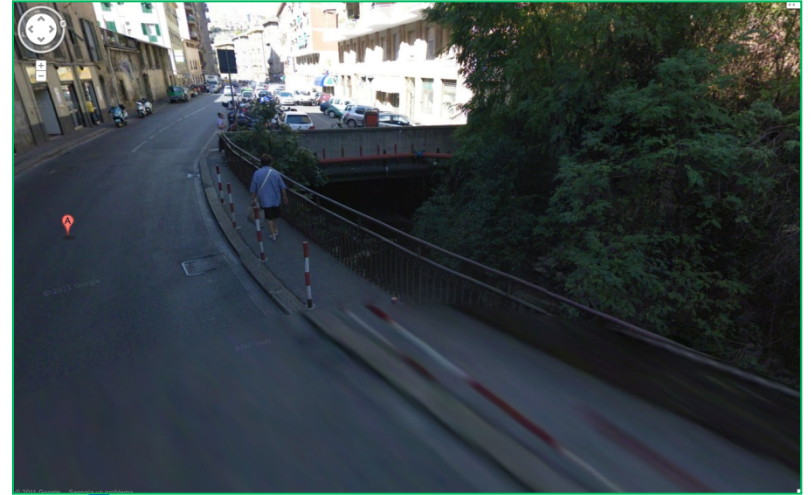
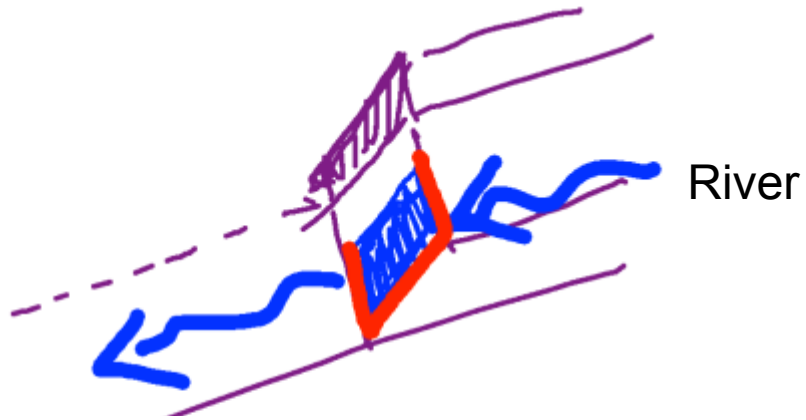
A Simplified Reconstruction



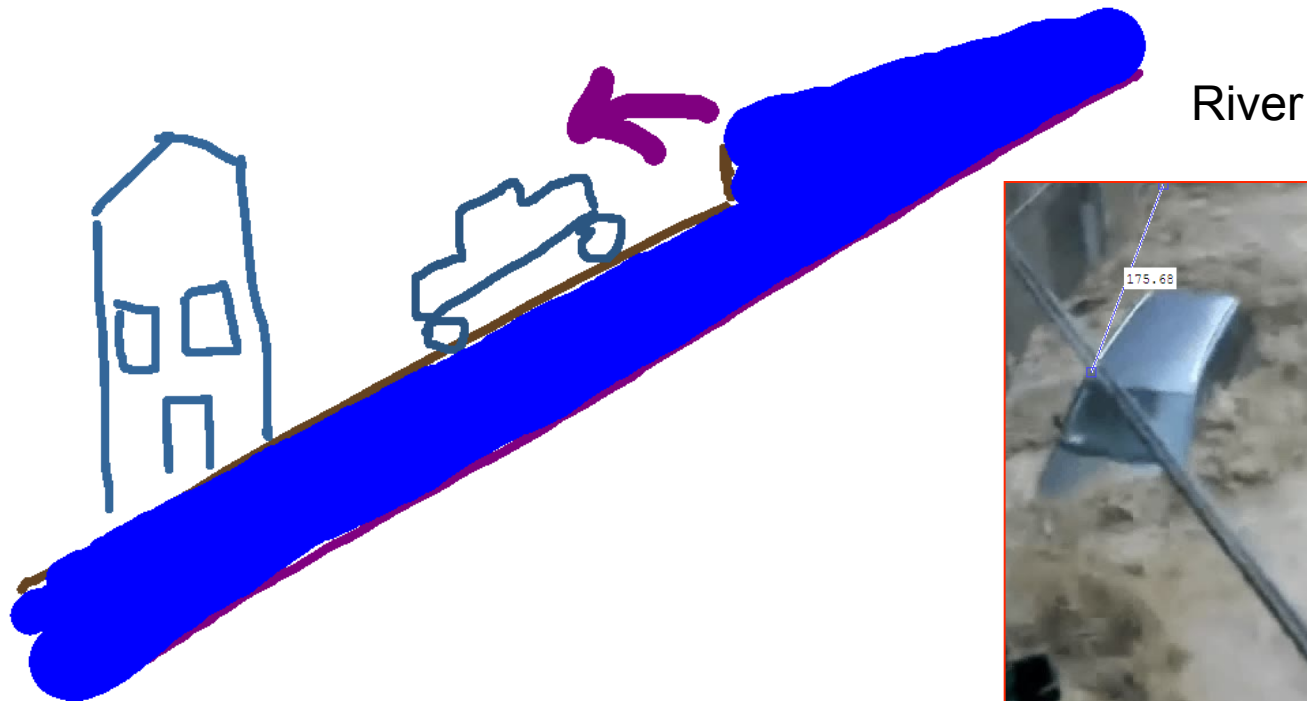
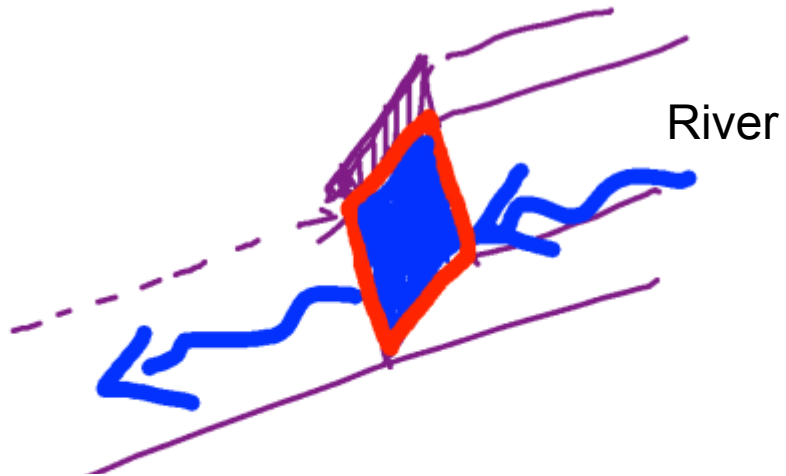
‘Rio Fereggiانو’



A Simplified Reconstruction



A Simplified Reconstruction



More Accurate Reconstruction



12.30 pm



12.15 pm



11.30 am



12.53 pm



One example

Estimated Height of the Flow

Picture from amateur's video

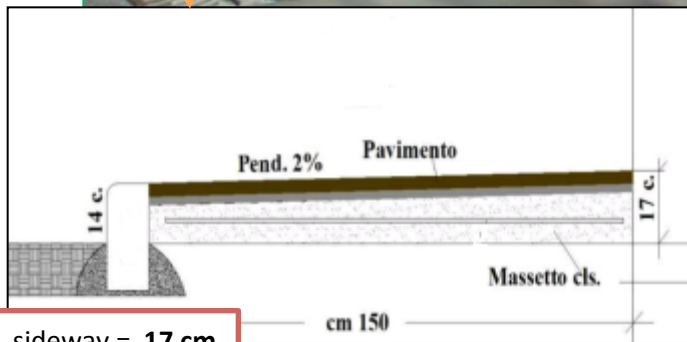


Standard Electric Point

Real height of the water flow during the event

Sidewalk

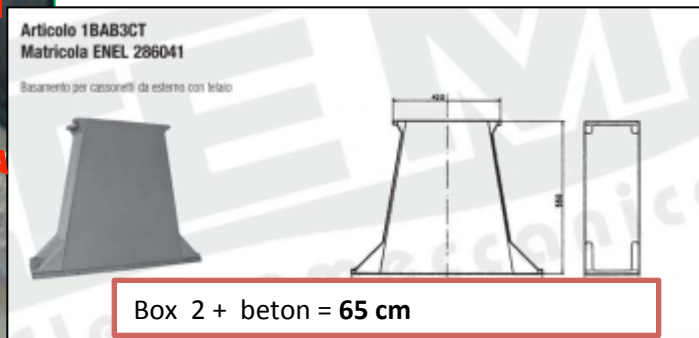
Picture from Street View



sideway = 17 cm

Box 1

Box 2



$$\text{Height} \approx 17 + 42 + 65 = 124 \text{ cm}$$

One example

Estimated Speed of the Flow

Picture from 'Gerrap'

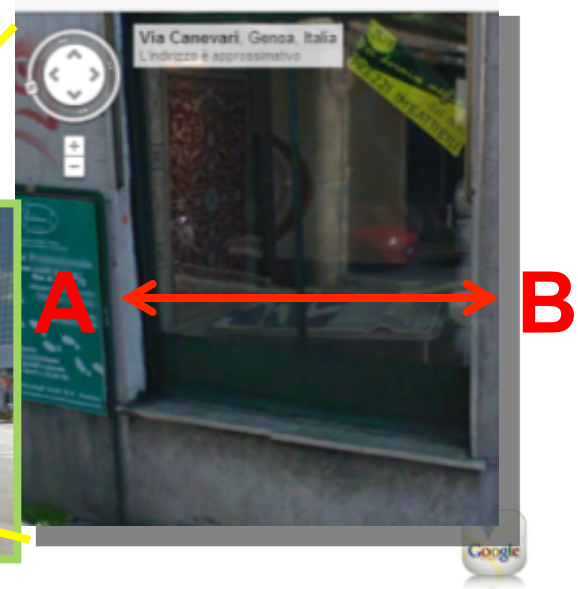


Start time

End time

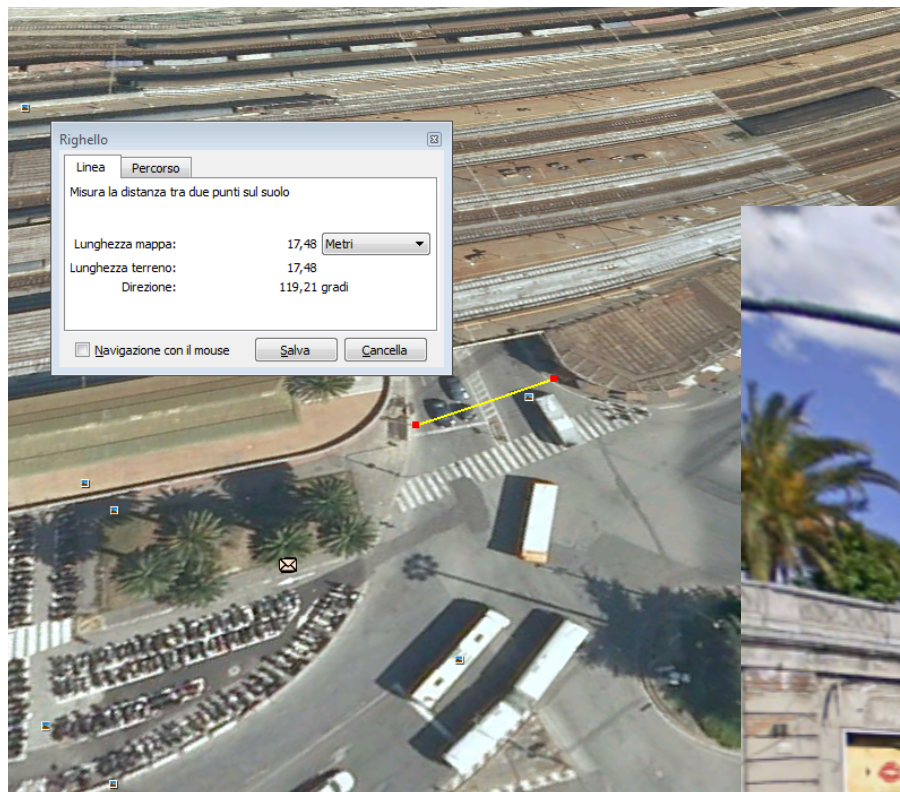
$$V \approx 1 \text{ m/s}$$

Picture from Street View



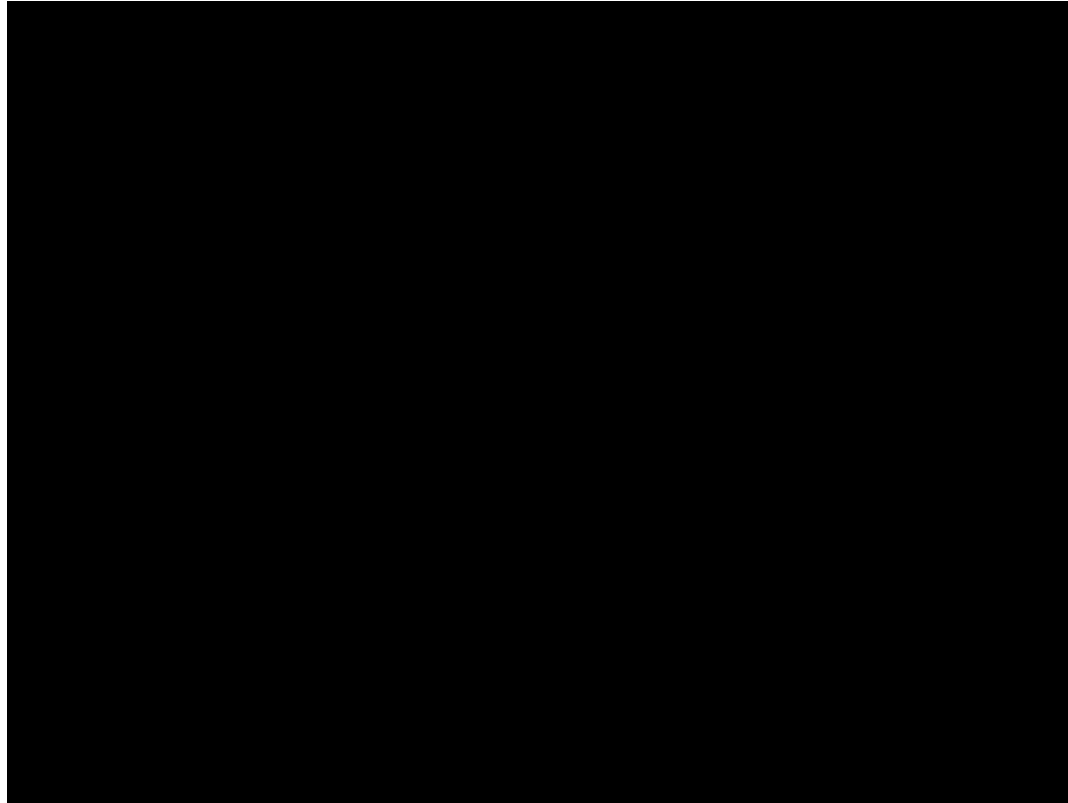
One example

Estimated Street Width



Width \approx 18 m

Dangerous Behavior!



Safety Information for the Inhabitants

Click on the icons to get information



Safety information

Amateur video

Information

Name
Geographical coordinates
Time of recording
Video title
Address



Atlante video reporter - Genova, 4 novembre 2011

idrologia.org idrologia.org idrologia.org idrologia.org

naviditalia
Aggiornata il 10 feb

Salire ai piani alti!

Alluvione Genova

Reporter: naviditalia

Lat: 44.416122
Long: 8.962552

Via: Onorato 9/18, 6° piano

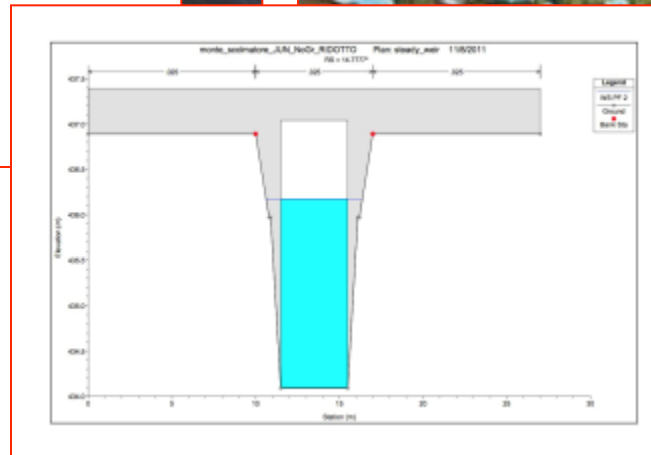
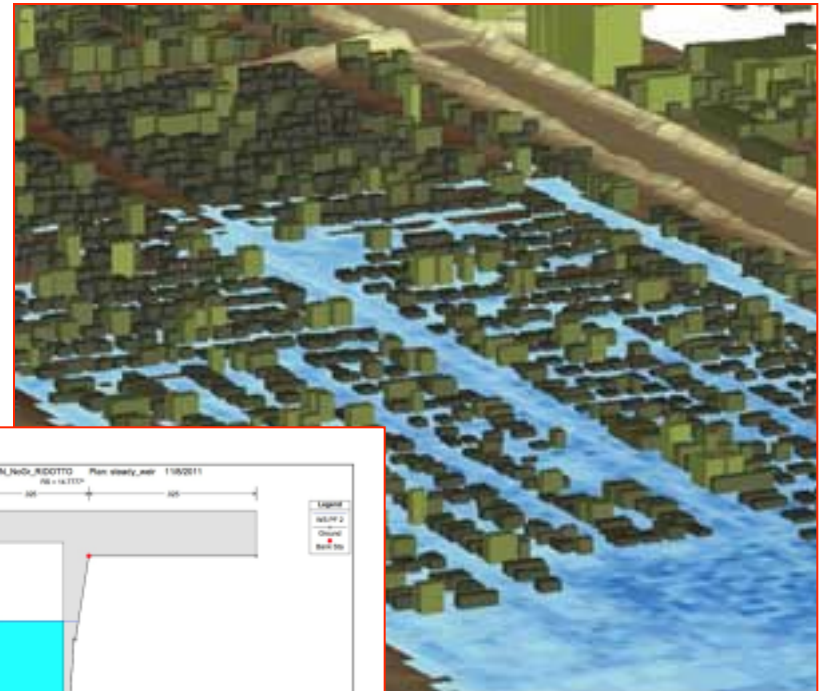
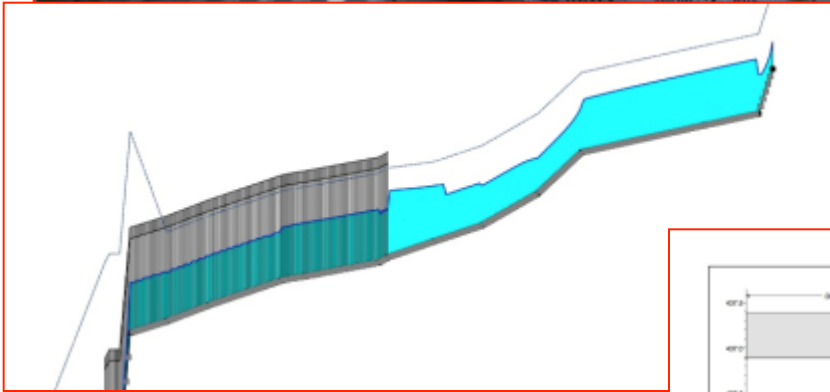
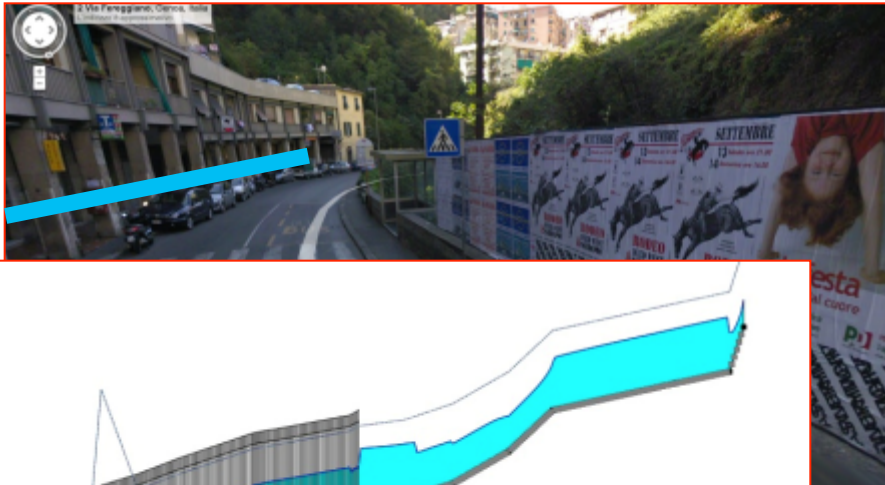
Time: 01.18 pm

Indicazioni stradali Cerca nelle vicinanze Salva

This information is available at www.idrologia.org

Future Research

Using amateur videos for 2D hydraulic modelling in urban areas



<http://www.esri.com>

Future Research

Platforms to increase information for the public

One example, the Ushahidi platform

The screenshot shows the 'Submit a New Report' form on the Ushahidi platform. The form is divided into several sections: 'Report Title' and 'Description' (text input fields), 'Date & Time' (pre-filled with 'Today at 8:33 pm (Europe/Paris)'), 'Categories' (checkboxes for 'Issue 1' and 'Issue 2'), and 'Optional Information' (fields for 'First Name', 'Last Name', and 'Email'). A map interface is integrated into the form, showing a satellite view of a coastal area with a red location pin. Below the map are controls for 'City, State and/or Country' and 'Refine Location Name'. There are also fields for 'News Source Link', 'External Video Link', and 'Upload Photos' with a 'Browse...' button. A green 'Submit' button is located at the bottom right of the form.

1. To improve accessibility to videos and images in order to warn people on how to behave in floods.
2. Easy upload videos and images
3. Easy location of the reporter
4. Tools to determine easily height and speed water



<http://www.ushahidi.com/>

THANK YOU FOR YOUR ATTENTION