

Piemonte region (Italy): DEFENSE

Years of operation: 2010 - today
 Area covered: 3750 km²
 Managed by: ARPA Piemonte

Summary: Every 5 minutes weather radar nowcasting (rainfall prediction in the following hour) is combined with a classification of catchments (in 3 classes) and rainfall hourly intensity thresholds (one for each catchment class) to predict debris flow occurrence in each one of the 2100 catchments considered by the system.

DEFENSE:
 DEbris Flow
 triggerEd by storm
 - Nowcasting
 SystEm

Types of landslides

Debris flows

Monitoring

Weather radar

Forecast

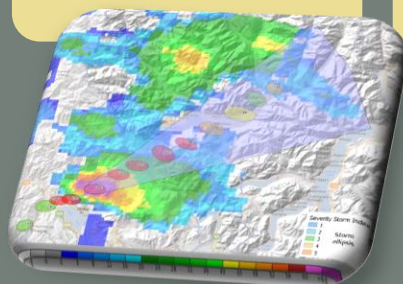
1 hour rainfall
 (radar forecasting)

Other input features

Classification of catchments in 3 lithological classes based on lithotype features related to the basin response to severe storms

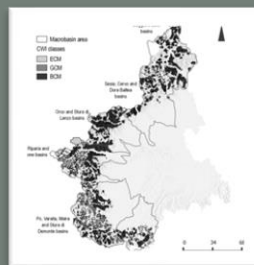
Types of assessment

Estimation of rainfall intensity in each basin



Formulation

Rainfall hourly intensity thresholds for each class of catchment (20, 30, 50 mm/h)



Spatial discretization

2100 catchments with alluvial fans (area from 0,5 to 50 km²) in 6 macrobasins

Human consultation before issuing a warning?

Yes

Warning zones

Catchments

Warning levels

Two
 (warning/no warning)

Warning time

Updating interval of 5 minutes

Information type

- E-mail warning when a threshold has been exceeded
- Detailed info to civil protection (secure channels)
- Note in the regional warning daily bulletin
- Website

Landslide data from
 1549 events, years 1800-2012