



Intensive post-event campaign (IPEC) Slovenia November 2007

- The IPEC procedure
- The results
- First interpretations



Participation:

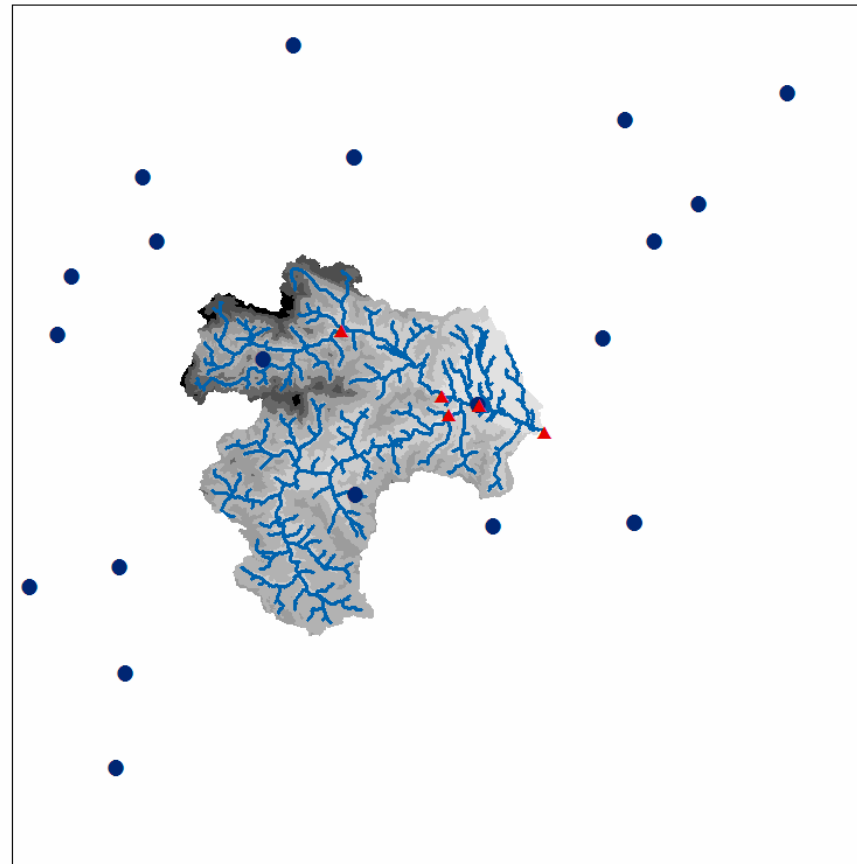
21 researchers from different European countries and institutions

- **Italy: University of Padova + CNR: 8 researchers**
- **France: CNRS + ENPC: 5 researchers;**
- **Romania: RNMA: 2 researchers;**
- **Spain: UPC: 2 researchers;**
- **Slovakia: STUBA: 2 researchers;**
- **Greece: TUC: 2 researchers.**

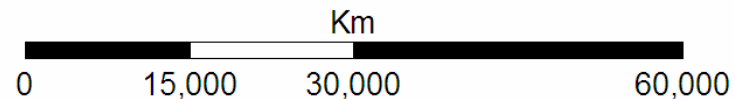


Location:

The Selscica watershed upstream Zelesniki. Some data collected on the Cerknica watershed upstream Cerkno.



- ▲ streamgauges
- raingauges





Tasks:

29 cross-section surveys, about 15 interviews, various observations of erosion, landslides, debris flows and detailed analysis of the main debris flow, first infiltrometric tests.

- Cross-section surveys
(peak discharge estimates)**

- Interviews
(timing of the flood)**

- Sediment dynamics**

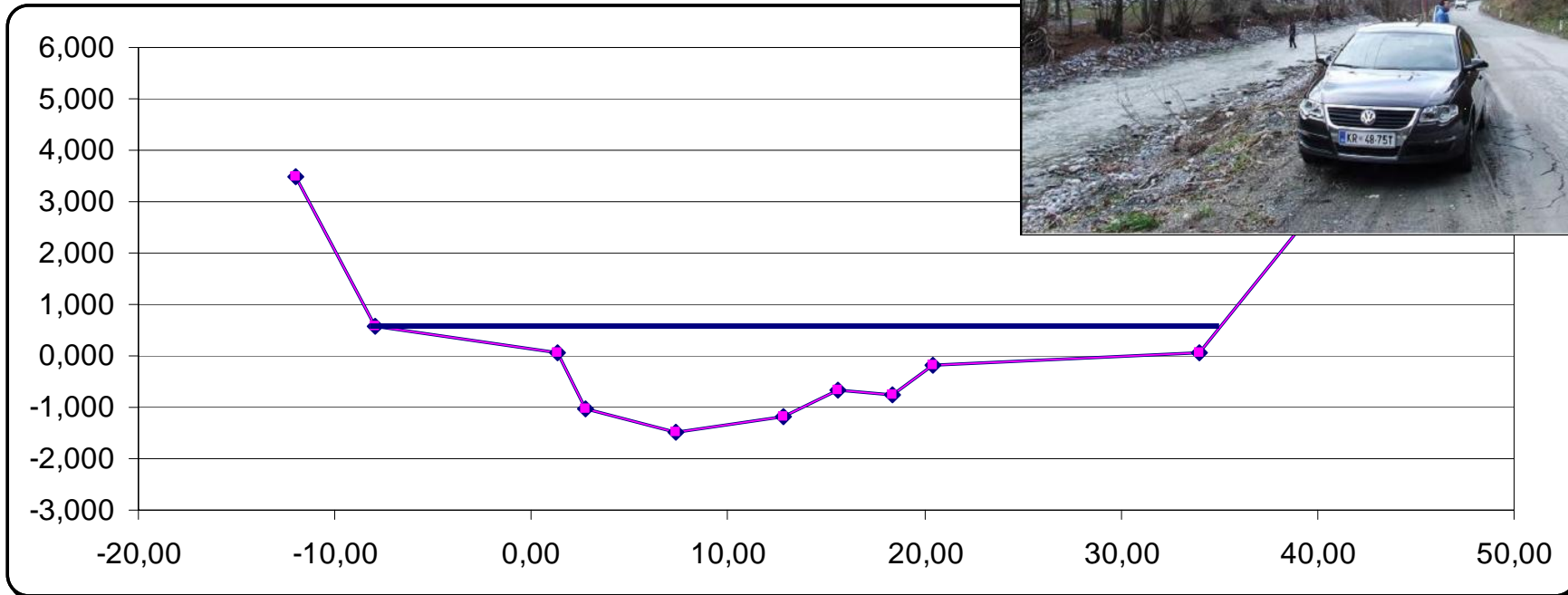


Cross-section surveys:





Cross-section surveys:



Cross-sections :

River bed : 35 m²

Right bank : 4 m²

Left bank : 12 m²

Slope 1.2 %

Velocities river bed : 3.5 m/s

Velocity right bank : 0.3 m/s

Velocity left bank : 0.5 m/s

Estimated discharge : 140 m³/s

Minimum guess : 110 m³/s

Maximum guess : 165 m³/s

Interviews

River:

Witness:

Spatial Coordinates (WGS84, UTM):

Collected by: Eric Gaume and Janez Polajnar

Date: 21 November 2007

Description of the site: Isolated house, located 200 meters upstream section 2S10 on the left hand side of the river, just upstream the confluence with a small tributary.

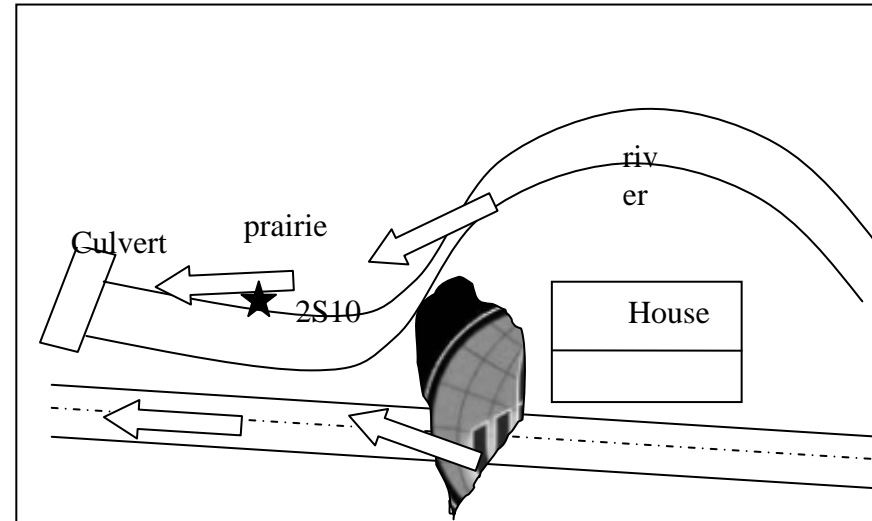
Summary of the interview:

The intense rainfall started at 11h00, the maximum level has been reached between 12h00 and 13h00. The maximum level was reached within 30 minutes. The water retreated also rapidly, within one hour. There has only been one peak. A debris flow occurred on the small tributary simultaneously to the flood and covered the road. It diverted one part of the flow from the main stream which has flown on the prairie on the right bank of the river and returned to the river at the level of the culvert situated a few hundred meters downstream.

The debris flow stopped on the road and the corresponding water flowed on the road downstream.

It has also rained again in the evening but with small influence on the stream discharges.

Previous floods: Two other floods occurred recently in 1991 and 1996. The 1991 was the most important one (the road has also been flooded), but nothing in comparison to the 2007 flood. The house has been built in 1950. The witness has no remembrance of previous major floods and never heard stories of comparable floods from his parents or grand-parents.



Sediment dynamics

**A large variety of erosion processes
linked to faults and subsurface flows**

Erosion rills



Debris flows



**Shallow slope failures
and landslides**



Sediment dynamics

Succession of eroded and filled reaches along the main river channels. Few amount of sediments transferred downstream.

Sediment deposition area



Incised river bed



No evidence of active sedimentary processes



Sediment dynamics

Specific study of one debris flow (UPC).

No major landslide, mobilization of the material stored in the thalweg.

Continuous and progressive process.

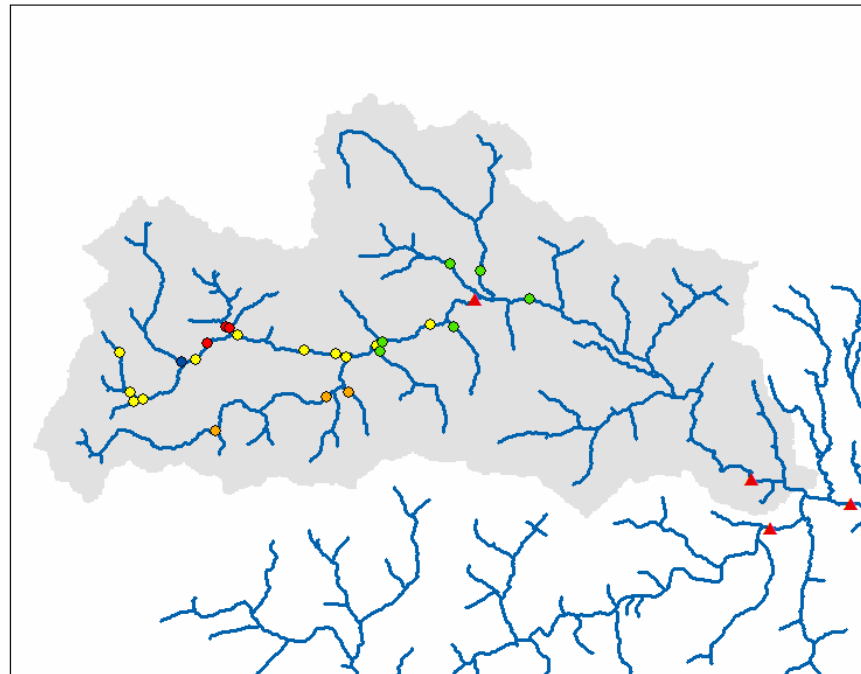
**Debris flow fan
in Selscica valley**



**Upstream part of the
debris flow**



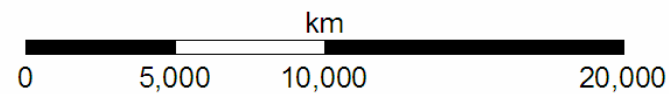
Peak discharges



discharge estimations

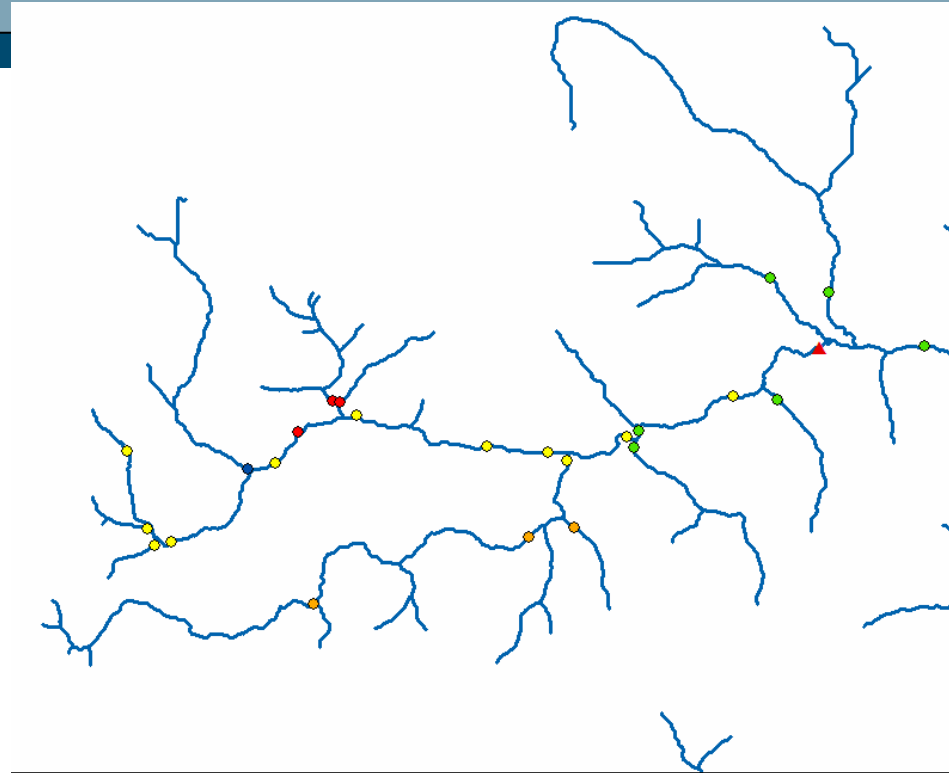
Spec.discharge

- <1
- 1-3
- 3-5
- 5-10
- >10



Peak discharges

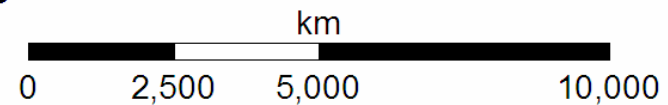
- Coherent values
- Validation of the stream gages first evaluations
- Some surprises
- Limited runoff rates



discharge estimations

Spec. discharge

- <1
- 1-3
- 3-5
- 5-10
- >10





Interviews

- Sharp peak discharge (overflow duration 1 to 2 hours)
- Peak reached at 12h30 on the upstream tributary and at 14h00 in Zelezniki



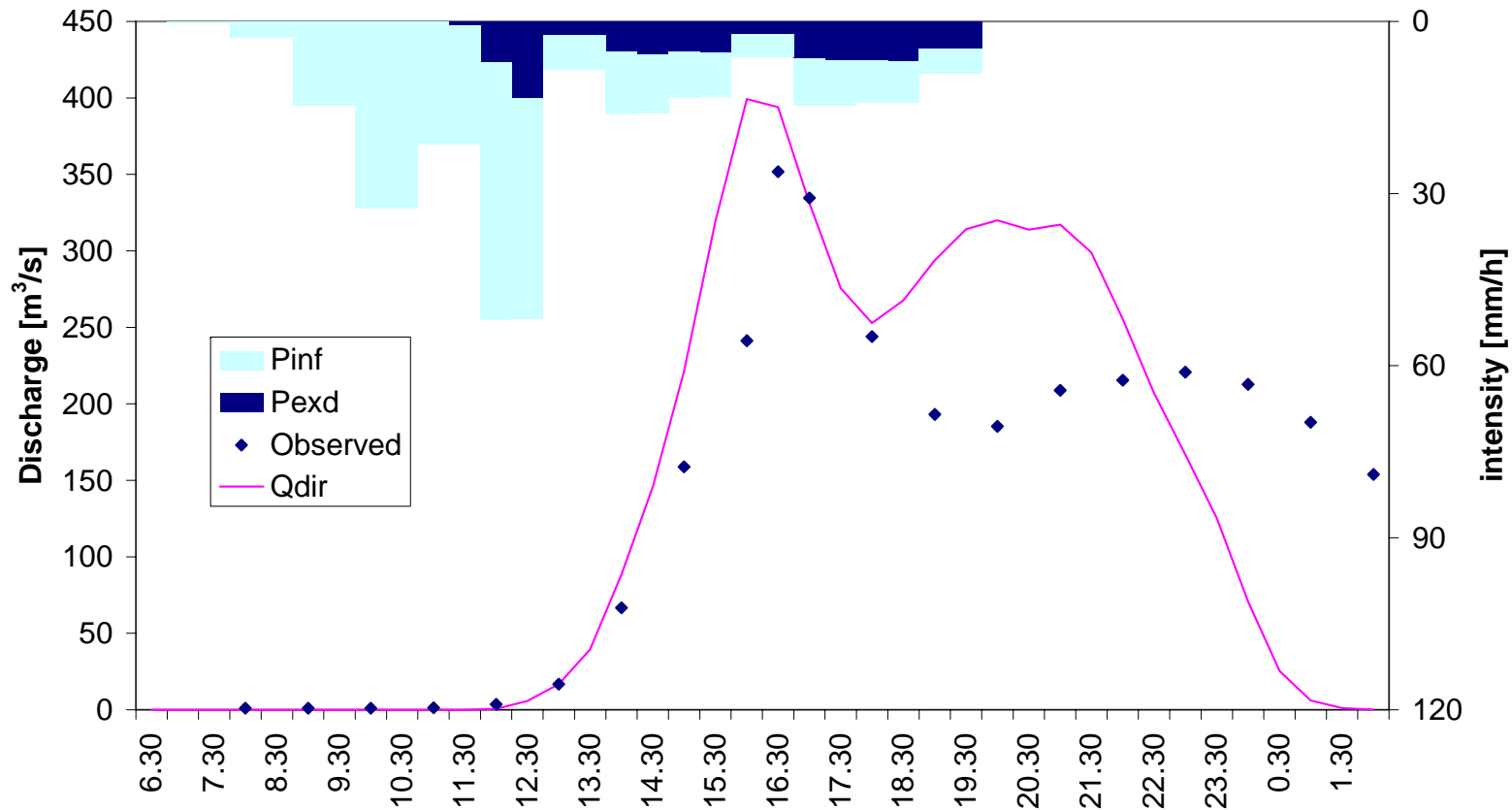
Sediment dynamics

- Generalized over the watershed
- Indicating intense infiltration and subsurface flow,
- Small size to moderate size phenomena
- Sediment transport over small distances in the main river channels
- Few amount of sediments reaching Zelezniki
- Some highly dangerous situations : **Zali Log**

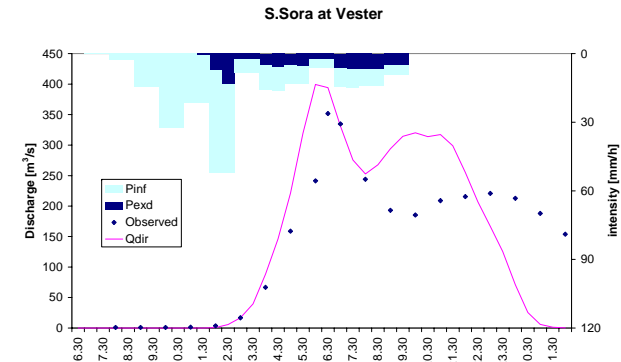


Rainfall-runoff dynamics

S.Sora at Vester



Rainfall-runoff dynamics



- Moderate instantaneous runoff rates (<20%)
- Important role of infiltration and subsurface flow with extremely rapid drainage dynamics (a few days)
- Flood wave attenuation and slowing in Zelezniki and downstream