Understanding the Characteristics of Historical Extreme Events

Summary

Water-related natural hazard events can strongly influence water resource management and risk management. The occurrence, magnitude and consequences of such events, mainly the largest ones having biggest impact, have to be considered and understood.

A profound knowledge of the relevant natural hazard processes and the analyses of historic natural hazard events is the fundament for a thorough planning of adaption measures and the long-term development of JRB. As a result, for a better understanding of historical extreme events and discussions on extreme event scenarios in the view of climate change, a quantitative approach was implemented for the evaluation of historic extreme events.

Objective

The activities of Output 1.1 aim to create a better understanding of characteristics of historical flood and drought disaster events (i.e. extreme events), as well as landslides and debris flow which impact the river regime.

Approach

- Literature and inventory review on water-related natural hazard events, data collection on historical disaster events
- Elaboration of a standardized analytical framework to be able to make a quantitative description and classification of the characteristics
- Analysis and evaluation of the registered events
- Report to outline the understanding of analytical framework and provide information on extreme events

2016.11.15

Results and Outcomes

Natural hazard extreme event register platform developed with event registration

32 flood events, 16 drought events, 10 debris flow events, and 4 landslide events were collected and registered

This is a browser-based online system, http://jinsha.geomaps.ch. It can be used both for event data registration and for browsing registered events. This platform consists of web-forms (Fig. 1) for data entry, coupled with a map and orderable list (Fig. 2) for data retrieval. Spatial information is added via a map interface within the web-form.

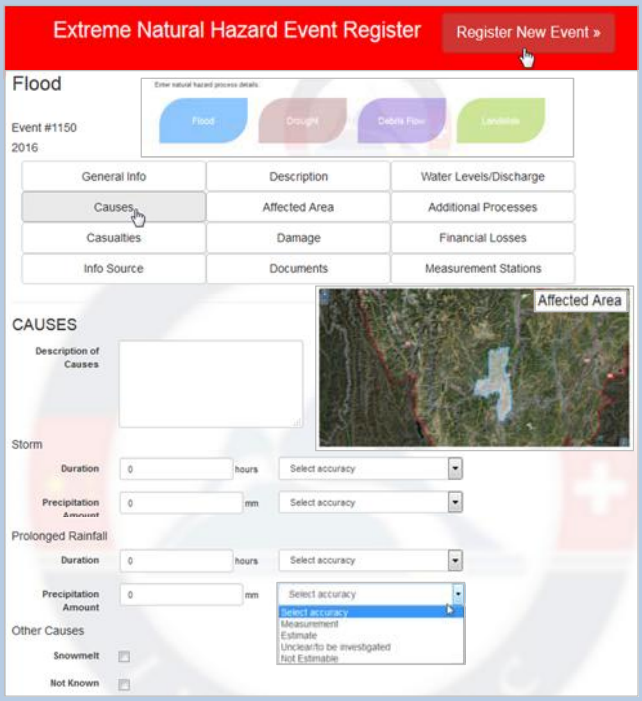

Fig. 1: Web-form for natural hazard event registration

Fig. 2: The natural hazard event table view

Extreme events analyzed, defined and classified

The flood with a return period of 50 years or more, of which the peak flow is very large, generally ranks in the history of top 1 to 4 for each hydrological gauging station. These floods could be defined as extreme events.

The 20-50 years recurrence period floods, which could be top 3-7 in history, could be defined as severe flood events.

The 10-20 years floods are defined as large flood events, 5-10 years recurrence period floods, moderate floods (Fig. 3).

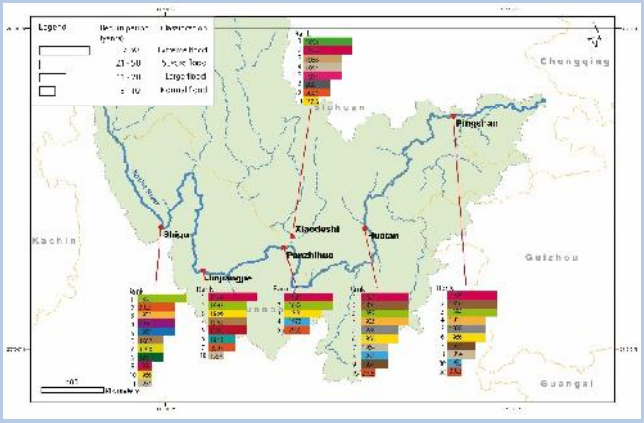

Fig.3: Map of the classified flood events

Based on the registered characteristics at the web-based platform, drought events are classified as follows:

Extreme drought: return period of more than 50 years

Severe drought: return period of 20-50 years

Large drought: return period of 10-20 years

Moderate drought: return period of 5-10 years