Geology Hazard Monitoring and Risk Assessment

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1. Introduction

2. Prediction and information acquisition in the earthquake rescue

3. Emergency in one sudden geology hazard

4. Suggestion and Forecast
1 Introduction

**Before 2008:**
The dammed lakes induced by Yigong landslide, PaliHu landslide in Tibet, Qianjiangping Landslide in Hubei, Tiantaixiang Landslide in Sichuan et al.

**Since 2008:**
1. Emergency of secondary disaster induced by earthquakes
   Wenchuan, Yushu, Lushan, Minxian and Changdu
2. Emergency of one landslide or debris flow
   - **Debris flows:** Zhouqu in Gansu, Puladi in Nujiang Prefecture of Yunnan, et al.
   - **Landslides:** Guanling in Guizhou; Qiyan in Shanxi; Wulong in Chongqing, Zhenxiong in Yunnan, Jiama in Tibet, Sanxi in Sichuan, et al.
   - **Lake break:** debris flow induced the lake break of tailing pond in Linfen, Sichuan; ice lake break in Zhongyu Village, Jiali County, Tibet; et al.
Based on the previous work, **one database and two systems** are being built.

- Database for susceptible area of geology hazard
- Decision support system of remote sensing on geology hazard
- Rescue system of geology hazards based on technics of remote sensing and low-level unmanned plane
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2 Prediction and information acquisition in the earthquake rescue

• **Just after earthquake:**
• **Predict the possibility of geology hazards occurrence and the likeliest area**

**Yushu earthquake:** we stated that no large-scale secondary geological disasters would occur in the meeting organized by Ministry of Land and Resources in 15, April, 2010, the day after the earthquake. And the statement is proved true.
2 Prediction and information acquisition of the secondary geological disaster

- After earthquake:
  - Predict the range of remote sensing reception, aerial photograph and unmanned plane photograph
  - Interpret the road passing condition to the disaster area;
  - Interpret and plan the rescue route and key area;
  - Interpret the secondary geology hazards
  - Evaluate the induced damage
  - Evaluate the scale and location of dammed lakes
  - Evaluate the area and probability of the debris flow induced by the loess materials.
Wenchuan earthquake

- Obtain high-definition aerial remote sensing image of 14 disaster counties over 4300 km.
- Aerial remote sensing survey and interpret disasters: 7226 landslides, 147 dammed lakes, 1423 damaged roads, 264 risky counties, 1732 risky roads.

Application of our outcomes:
- Earthquake relief.
- Precaution for secondary disaster.

Debris flow area
Houses threatened by debris flows
Houses threatened by landslides
Landslides that threaten houses
Wenchuan earthquake

Chenjiaba landslide
Yushu earthquake

Work area
Ground rupture induced by the earthquake in the remote sensing image
The distribution characteristics of secondary geology hazards
Prediction and information acquisition of the rescue traffic situation

Lushan earthquake
The distribution of secondary geology disaster
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3 Emergency in one sudden geological disaster

Jiweishan Landslide in Wulong county-
5, June, 2009
Zhouqu debris flow in Gansu

- Flowing area
- Surface flow accumulation area
- Buried accumulation area
- Scour accumulation area
- Detrital sedimentation area
- Sanyan Village
- Luojiayu Village
- Zhou County
- Yueyuan Village
- Chengguan Town
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4 Suggestion and forecast

- Strengthen the communication among the institutions on RS
- Strengthen data sharing
- Standardize and improve the accuracy of the data
- Found an association of the RS on geology hazards
Thank you!