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Federal Department  
of the Environment, Transport, Energy and Communications DETEC  
**Federal Office for the Environment FOEN**  
Hazard Prevention Division

# **Swiss approach to DRR – Flood Protection Strategy & Integrated Risk Management**

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Visit of the Vice Minister of Water Resources, China

08. December 2017, Berne



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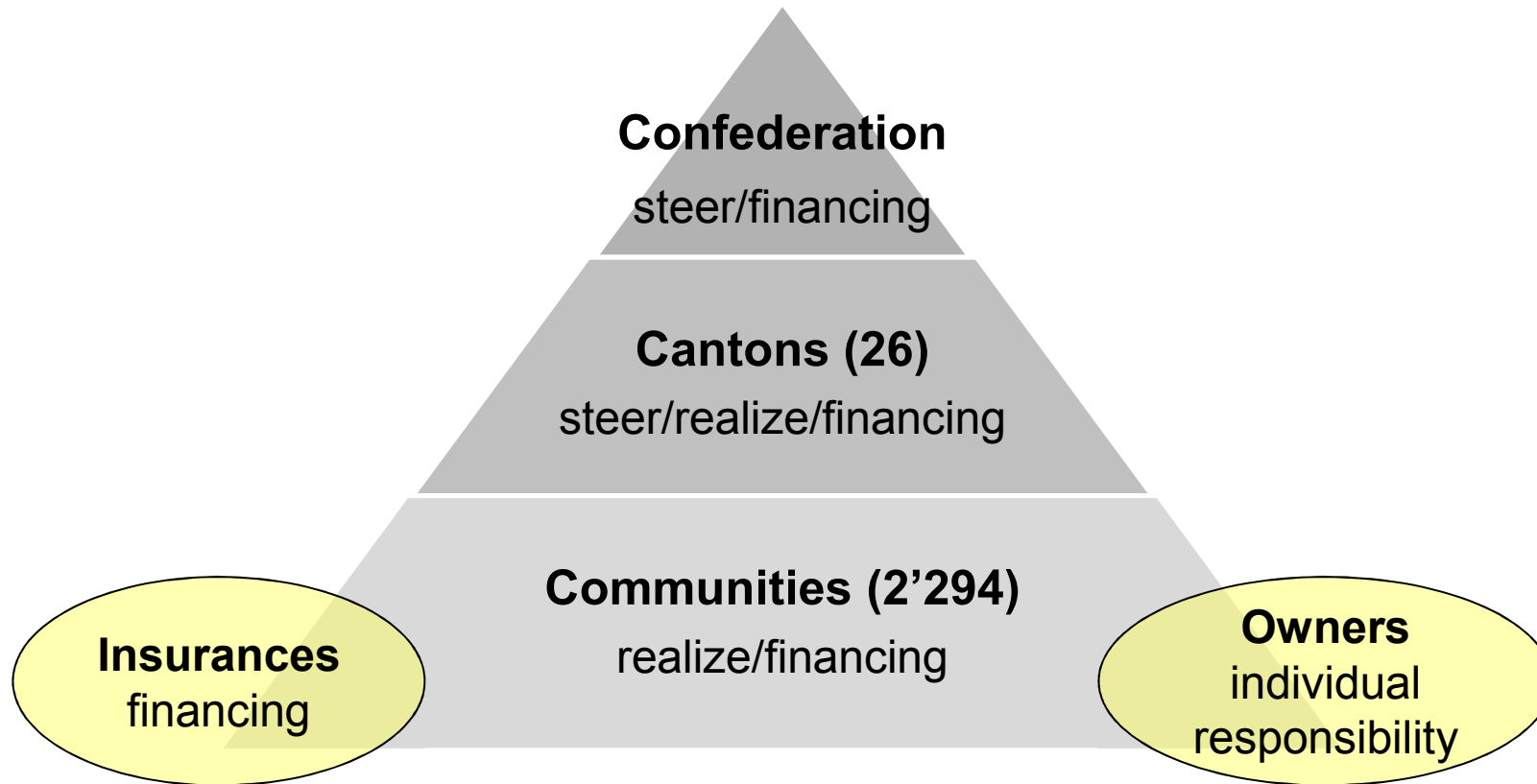
# Flood protection in Switzerland

## Governance





# Governance of DRR in Switzerland



**> policy > division of tasks and responsibilities > exchange networks**





# Flood protection in Switzerland

## Overview

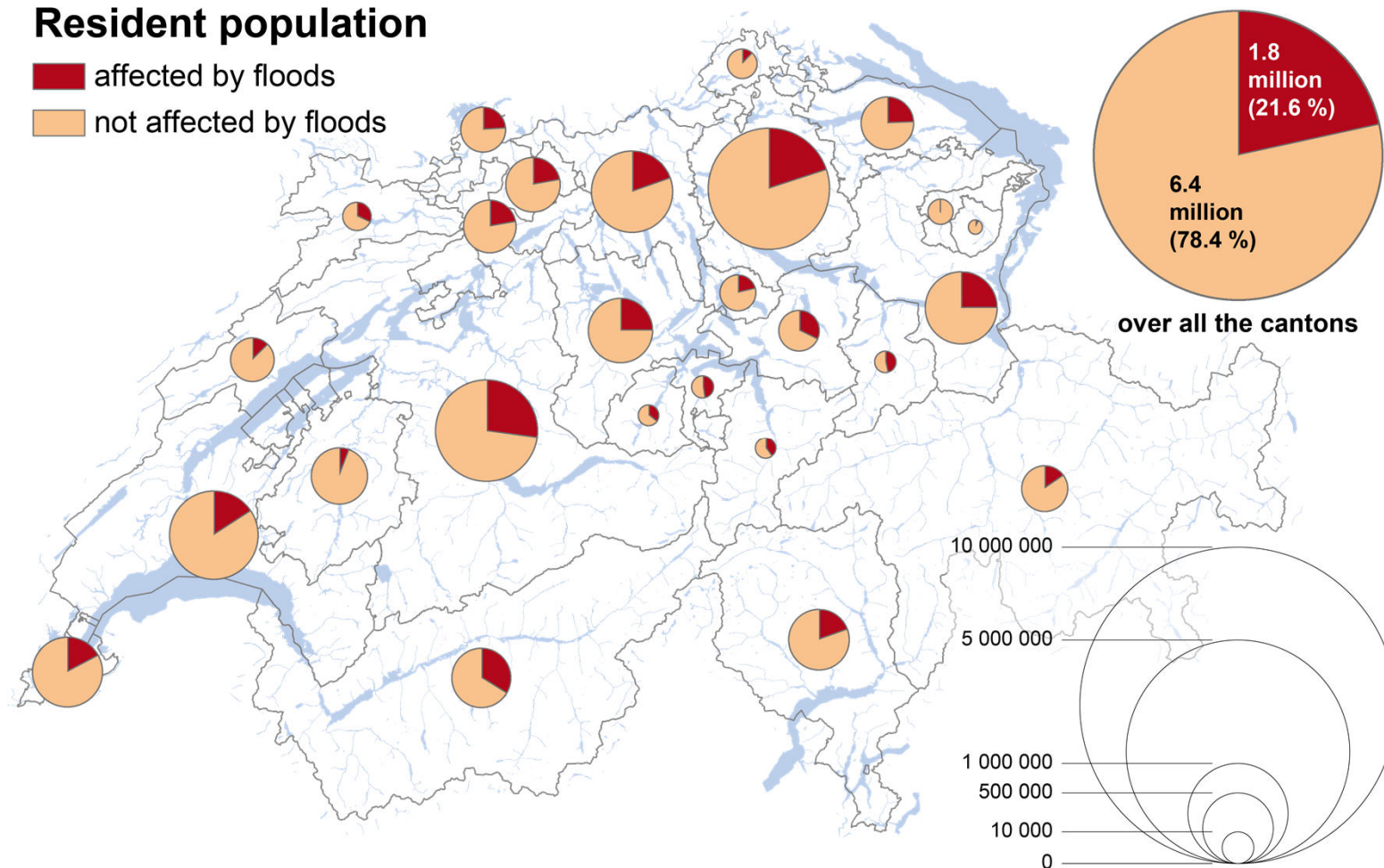




# Damage potential for protected objects

## Resident population

- affected by floods
- not affected by floods



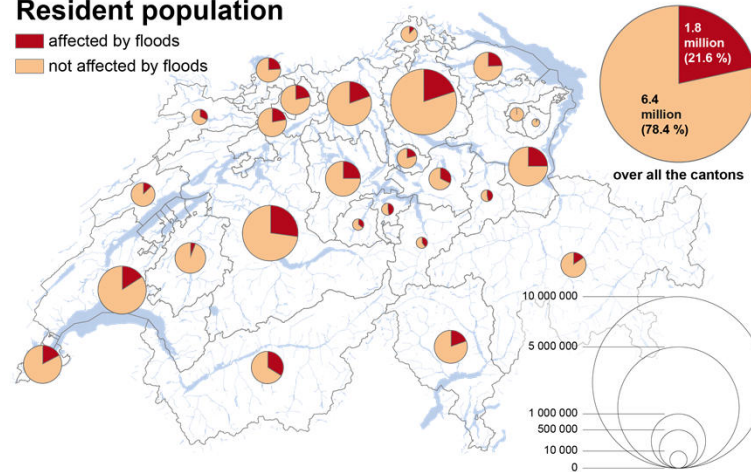




# Affected goods

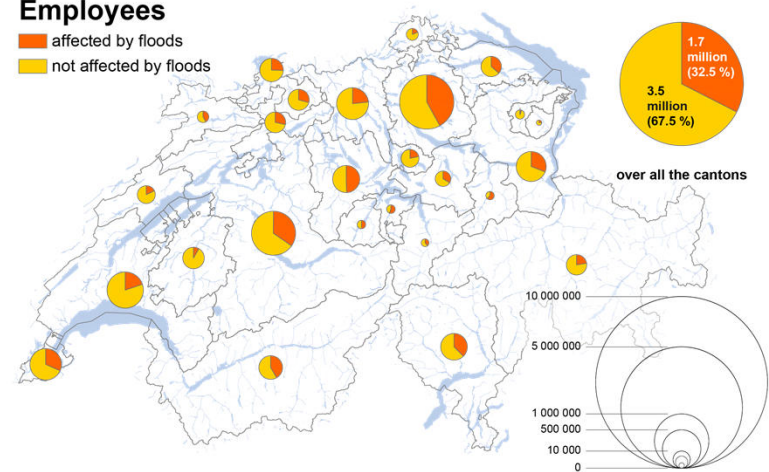
## Resident population

■ affected by floods  
■ not affected by floods



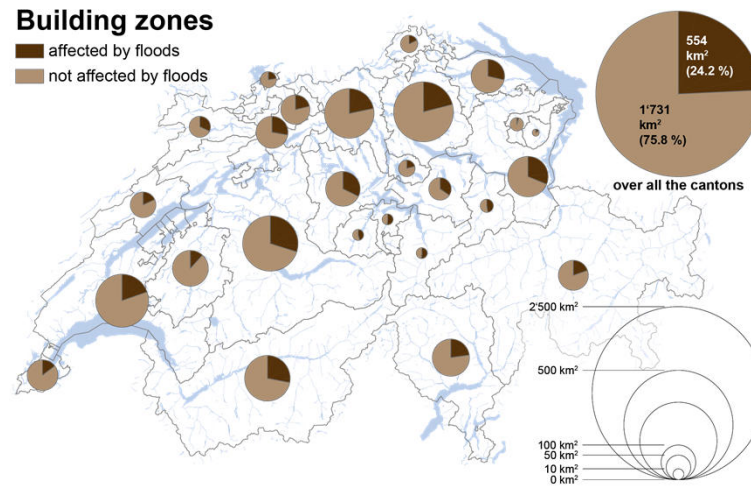
## Employees

■ affected by floods  
■ not affected by floods



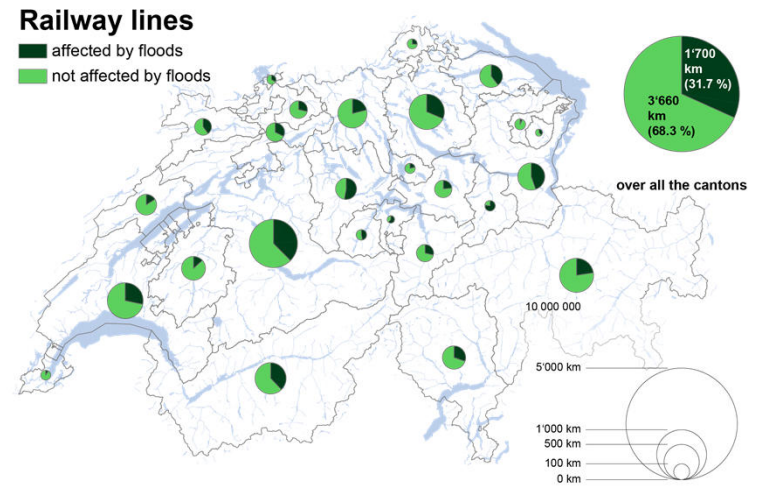
## Building zones

■ affected by floods  
■ not affected by floods



## Railway lines

■ affected by floods  
■ not affected by floods

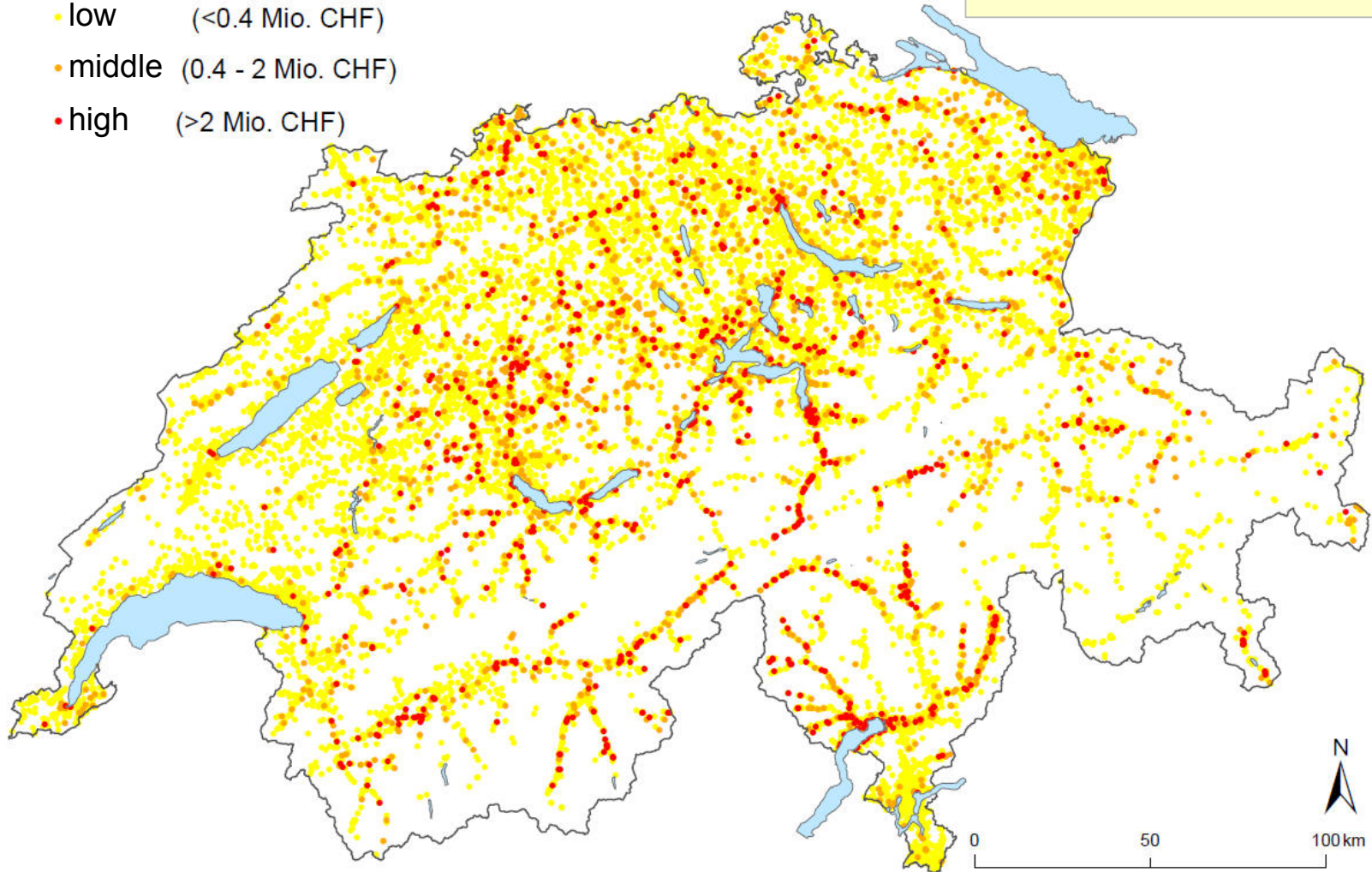




# Damages 1972 - 2016

- low (<0.4 Mio. CHF)
- middle (0.4 - 2 Mio. CHF)
- high (>2 Mio. CHF)

Total damage costs:  
approx. **CHF 13.5 billions**



Swiss approach to DRR – Flood Protection, Strategy & Integrated Risk Management

Swiss NGO-DRR Plattform, Berne, 08. December 2017, Carlo Scapozza, Hazard Prevention Division, FOEN

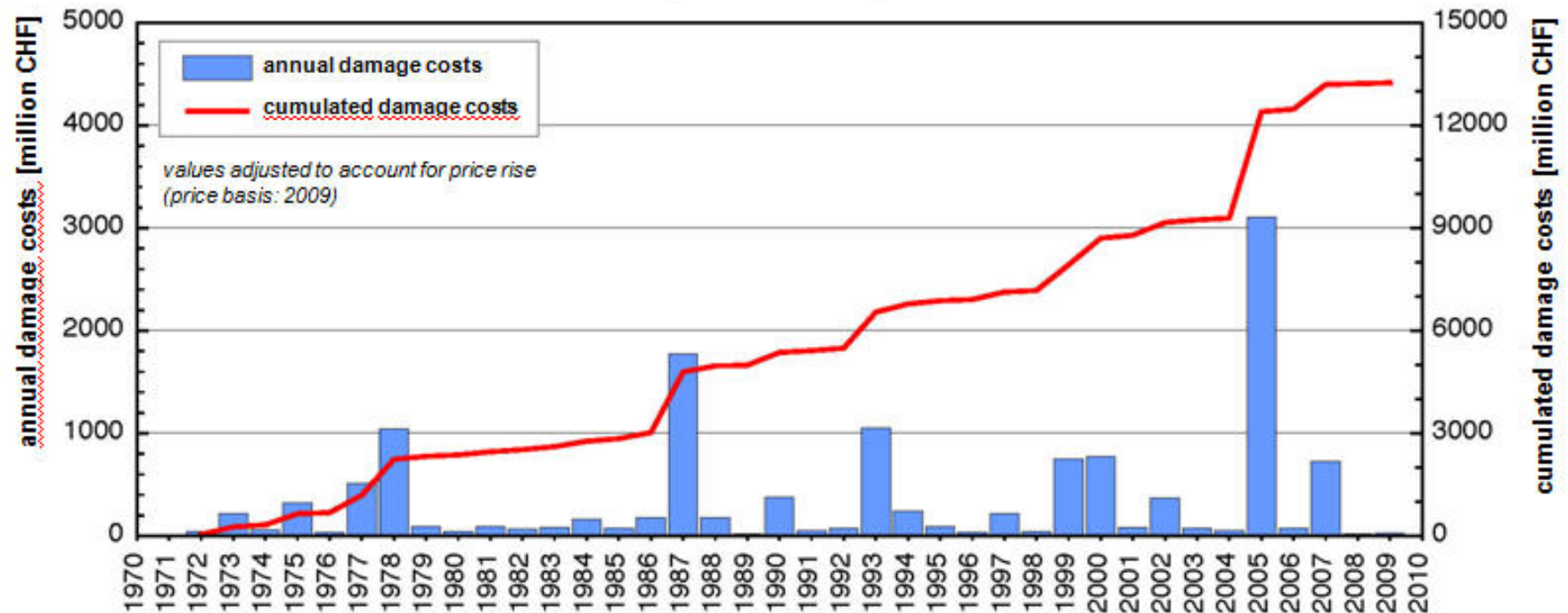




# Cumulated damage costs

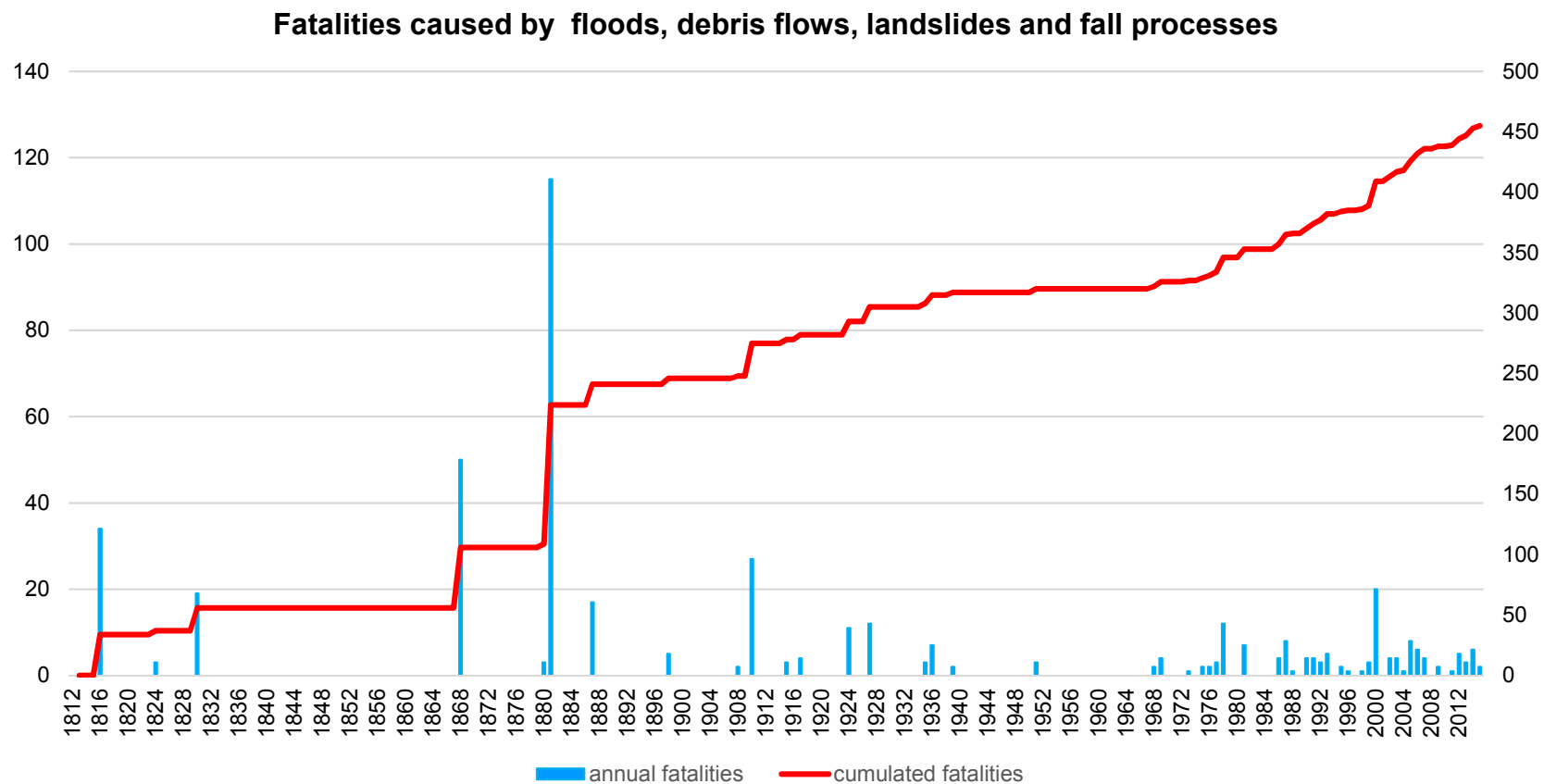
## Damages due to flood, slope instabilities and slides in Switzerland since 1972

(Data: WSL, FOEN)





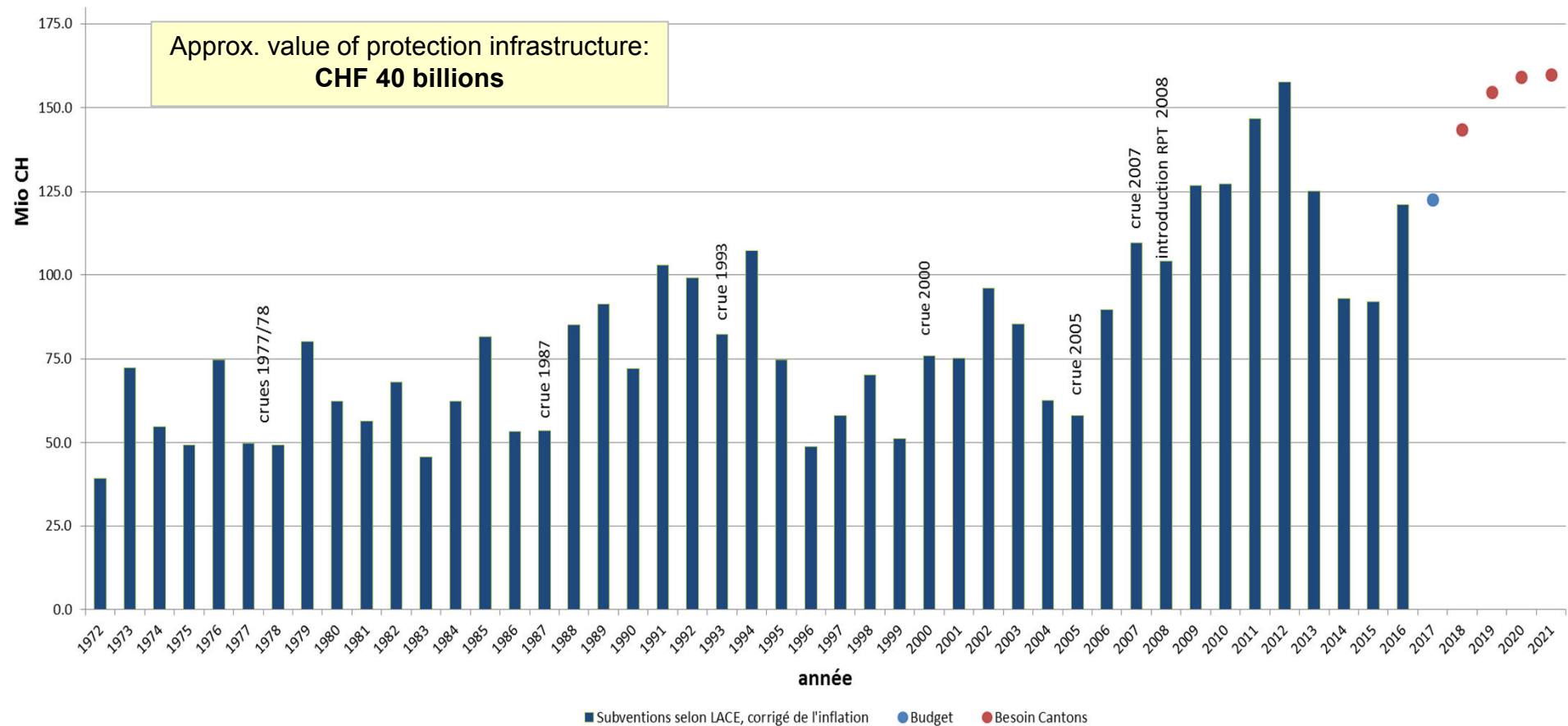
# Number of fatalities





# Achieve and maintain security

*Investments in flood protection (confederation, approximately 1/3 of all public investments)*



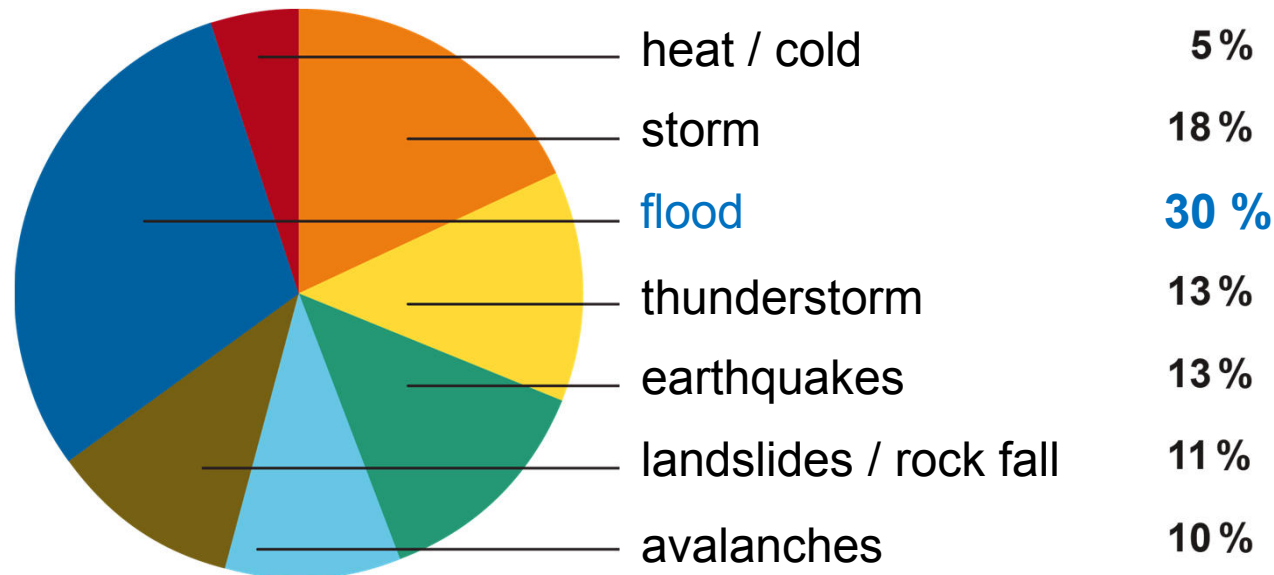




# Achieve and maintain security

## *Annual investments (private and public, all natural hazard)*

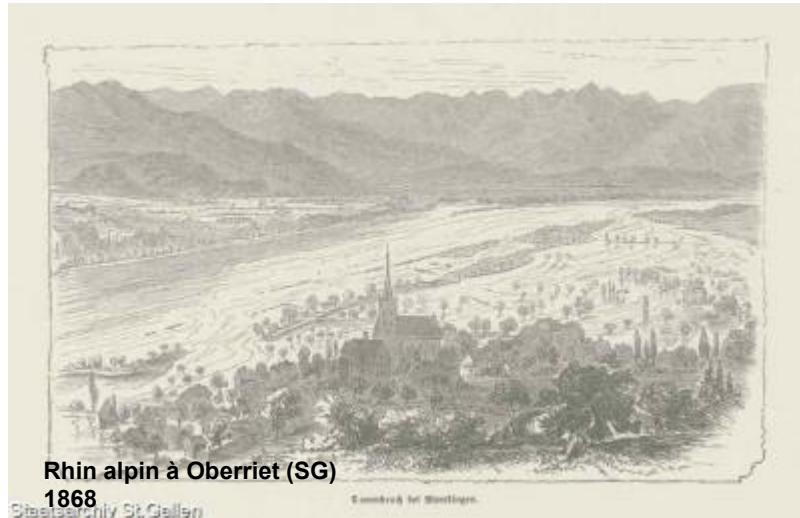
- > ca. CHF 2.9 billions
- > ca. CHF 1.7 billions (private/insurance)
- > ca. CHF 1.2 billions (public)



Source: PLANAT 2007



# Lessons learned from catastrophic events



Rhin alpin à Oberriet (SG)  
1868



Reuss dans la vallée de la Reuss (UR)  
1987



Poschiavino à Poschiavo (GR)  
1987

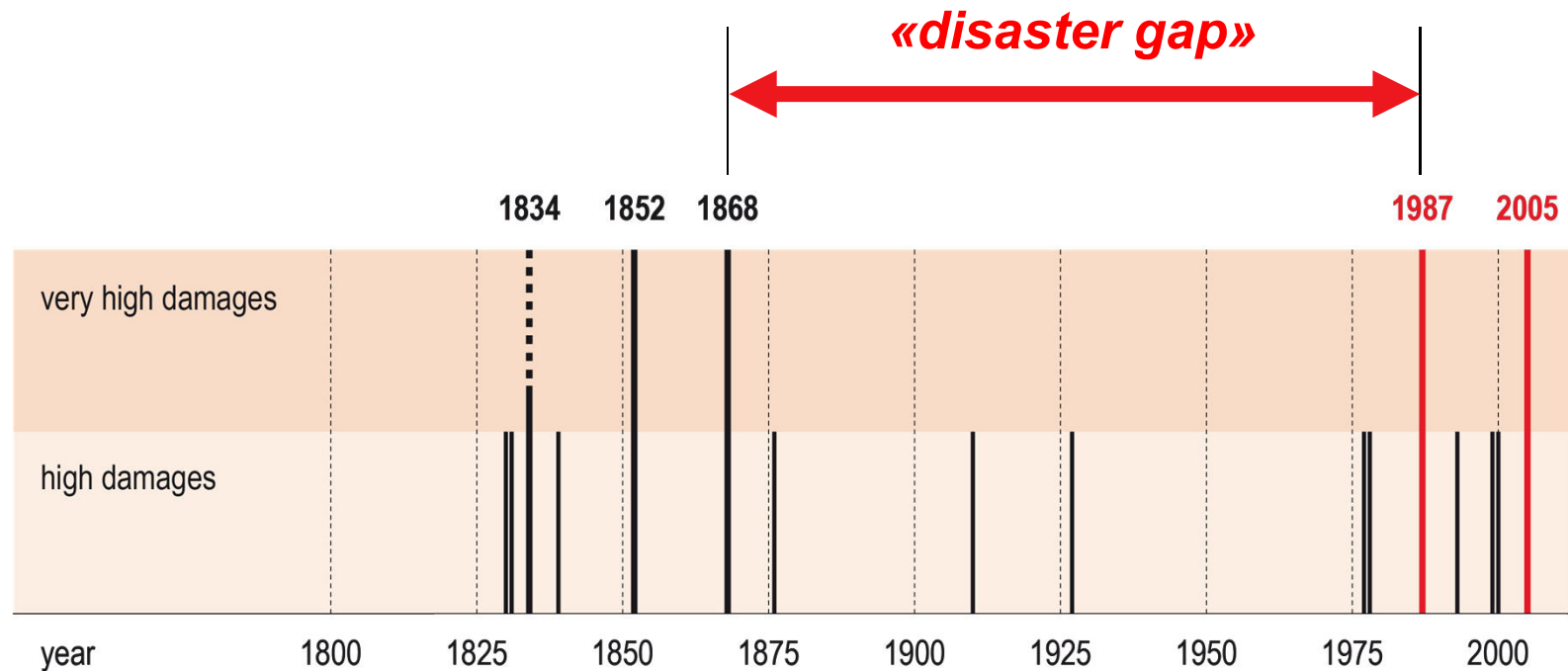


Aare à Berne (BE)  
2005



# Disaster events since 1800

## *Supraregional flood events in Switzerland*



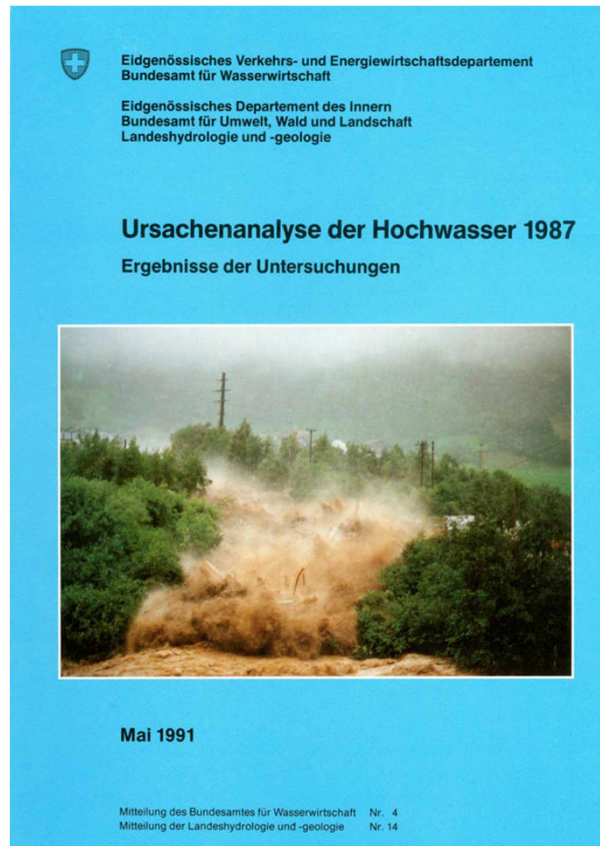
Flood events with total damages (according to today's value)  
between 500 million and several billions Swiss Francs





# A turning point for flood protection

## *The floods of 1987 – analysis and lessons learned*

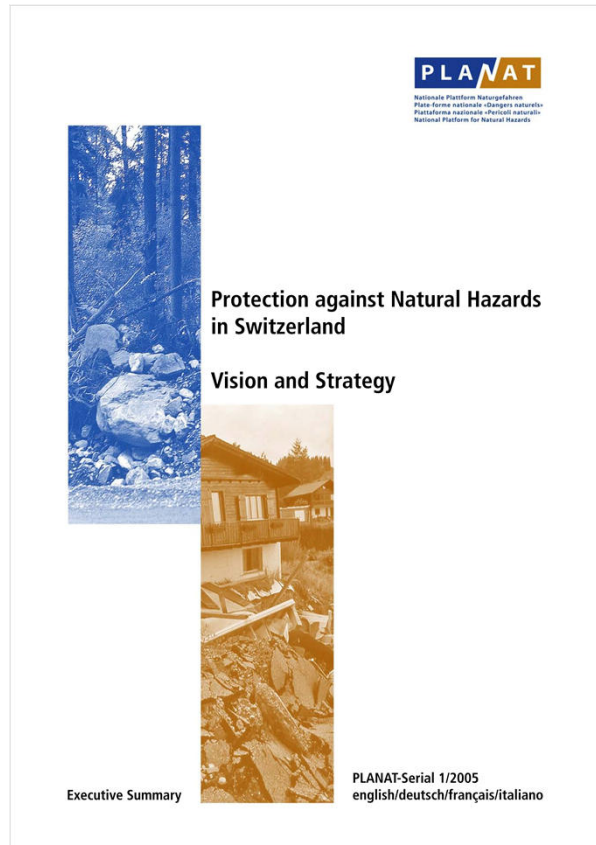


- no absolute safety
  - differentiated protection objectives
  - importance of:
    - hazard fundamentals
    - land use planning
    - maintenance
- > ***Adaptation of laws on hydraulic engineering and forests in 1991***



# Paradigm shift into a risk culture

## *Strategy Natural Hazards Switzerland (2004)*



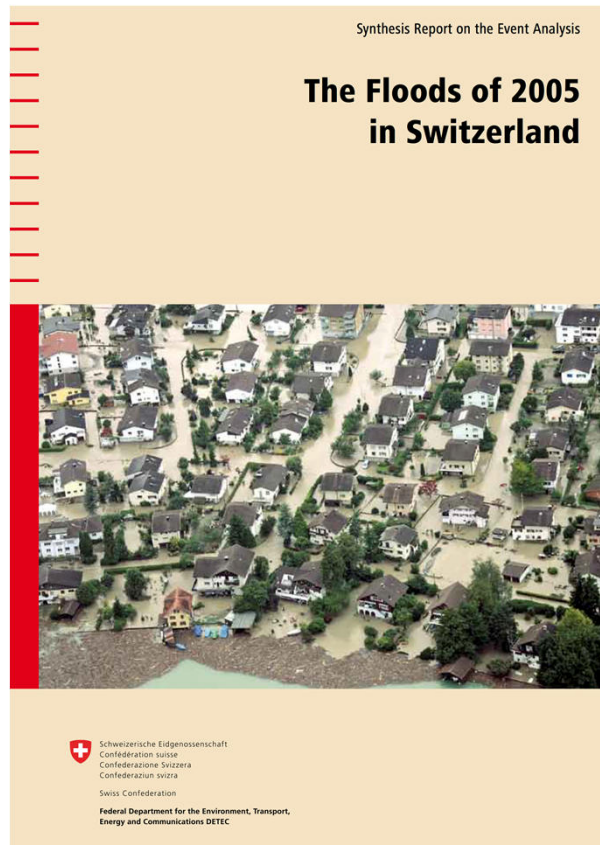
- culture of risk
- integrated risk management
- risk fundamentals
- risk dialogue

**> *implementation of PLANAT action plan (2005-2011)***



# Momentum due to the floods in 2005

## *The floods of 2005 – analysis and lessons learned*



- improve coordination
- improve forecasts, early warning and alerting
- raise public awareness
- encourage individual responsibility

**> set of measures to improve early warning and alerting (OWARNA)**





# Political support



«Comparable and even more severe events will arise in the future. In order to avoid similar or even worse consequences, we would like and must continue to implement consistent flood protection measures.»

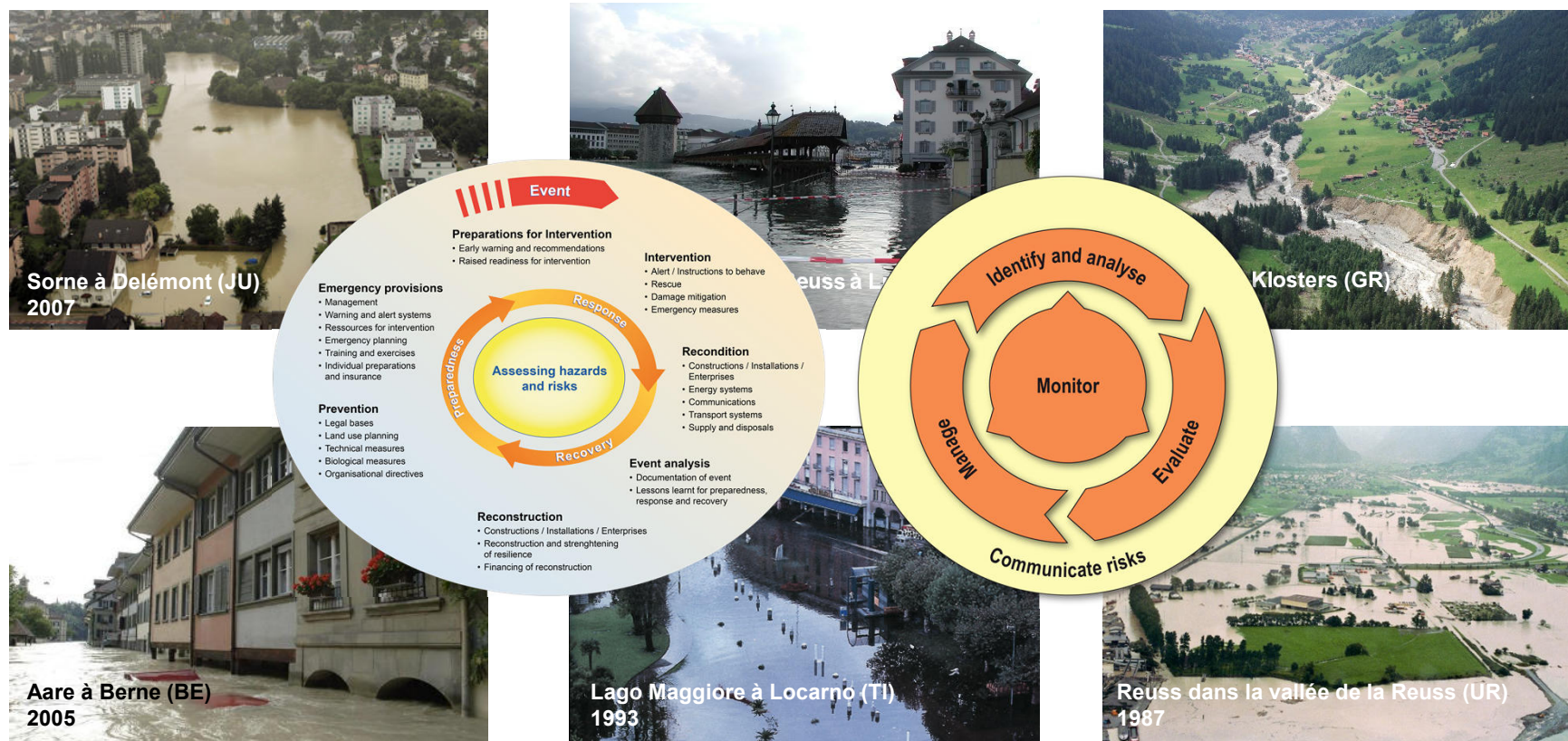
«***Thus integrated risk management is required.***»

**Federal Councillor Moritz Leuenberger**

Head of the Federal Department for the Environment, Transport, Energy and Communications DETEC, 2008

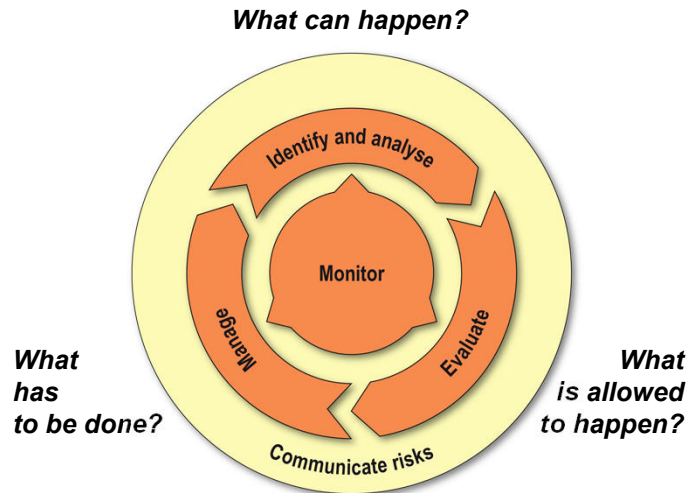


# Integrated risk management IRM

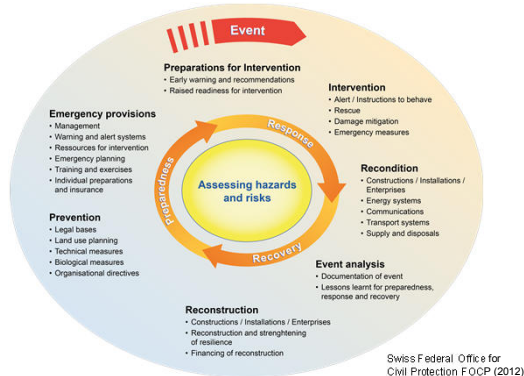




# Meaning of IRM



Risk management tasks



Range of measures involved in integrated risk management



## ***Risk management***

Continuous and systematic identification, analysis and evaluation of risks, planning and implementation of measures in response to detected risks

## ***Integrated risk management considers***

- > all prevailing natural hazards
- > all process specific conditions
- > all options for action
- > all types of measures
- > all future developments
- > all aspects of sustainability

## ***and involves***

- > all responsible actors and the directly affected



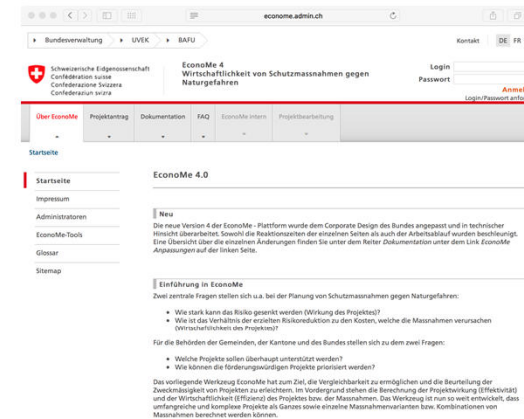


# Evolution of IRM

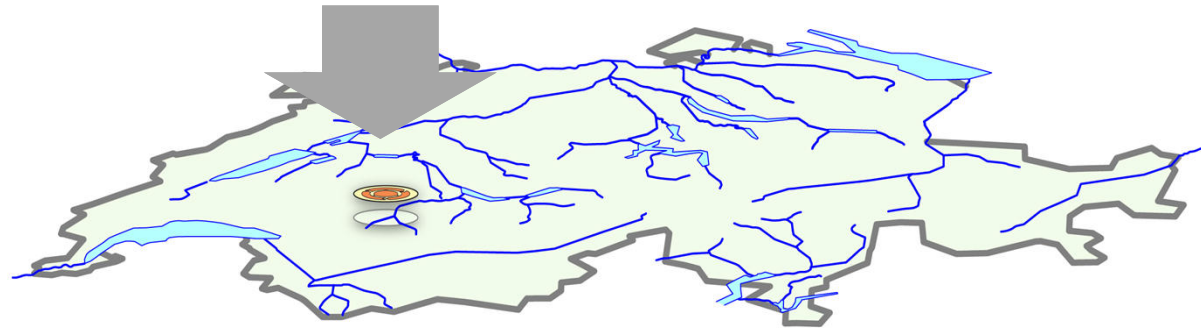
## *Risk-based approach in protection projects*

Manual «Programme agreements»  
*Important part of the subsidy policy*

Online-tool «EconoMe»  
*Calculation of risk, cost-benefit analysis*



**local**

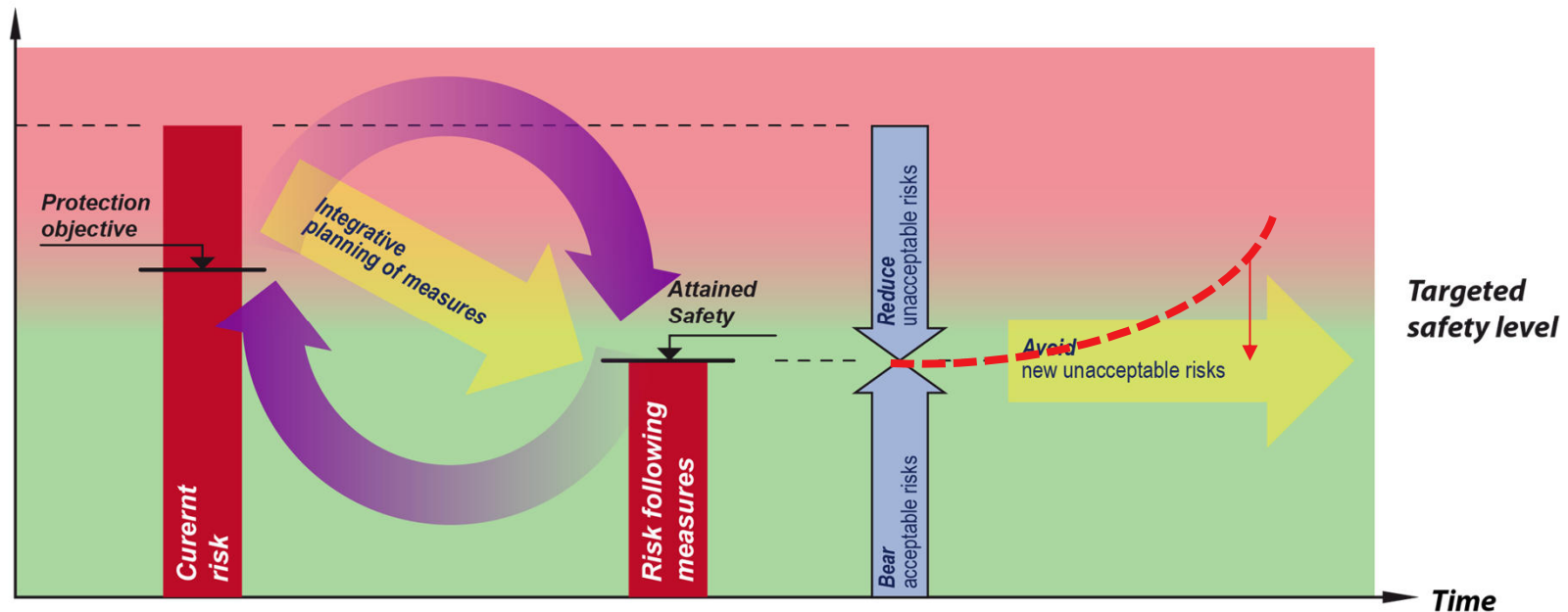




# Evolution of IRM

*Achieve and maintain security*

**Risk** *Avoid new unacceptable risks* 



Examine risk	Create greater safety	Maintain attained safety
Protection objectives to assess the need for action	Integrative planning: participatory process, optimisation considering all aspects of sustainability	Long-term preservation of the attained security level with <ul style="list-style-type: none"><li>- spatial planning measures</li><li>- comprehensive management of protection infrastructure</li><li>- hazard-proofed buildings and infrastructures</li></ul>



# Achieve and maintain security

## *Types of measures*

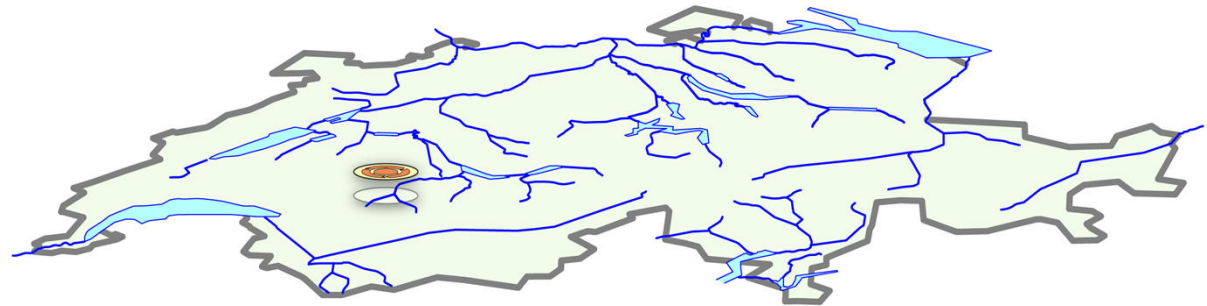




# Further development of IRM

*«bottom up» and «top down»*

***local***



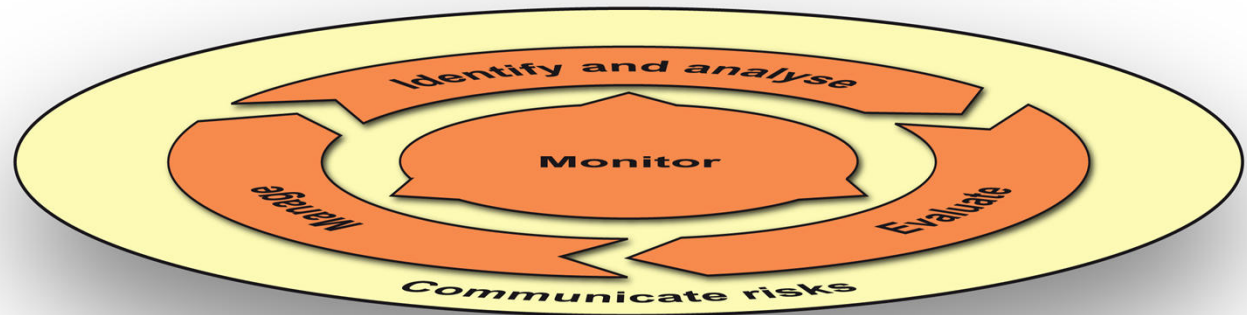




# Further development of IRM

«bottom up» and «top down»

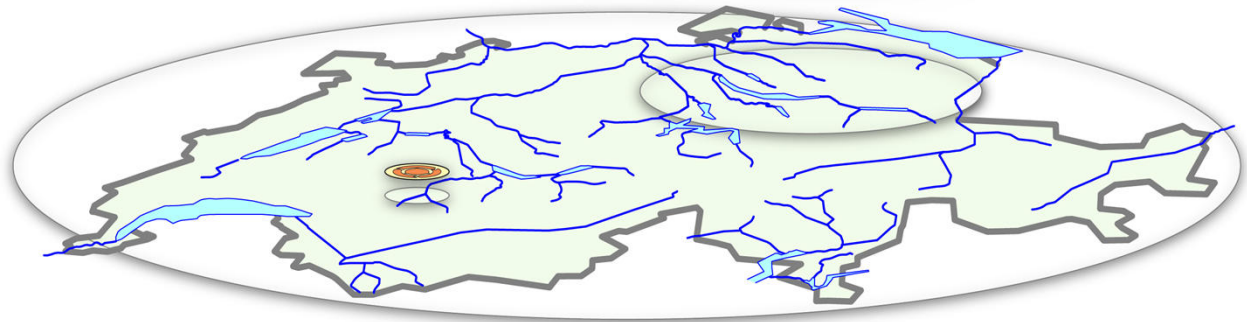
***national***



***cantonal***

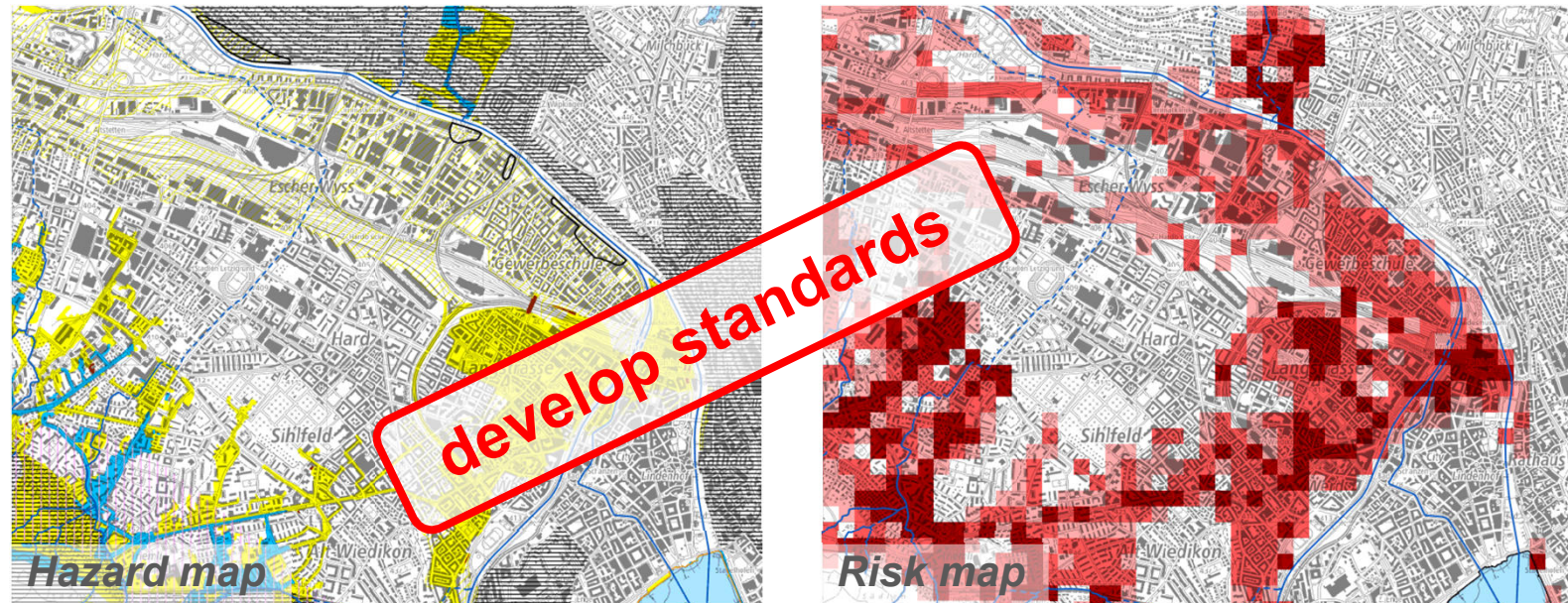


***local***





# Risk overviews – Local level



Risk map Zurich – topic and aim:

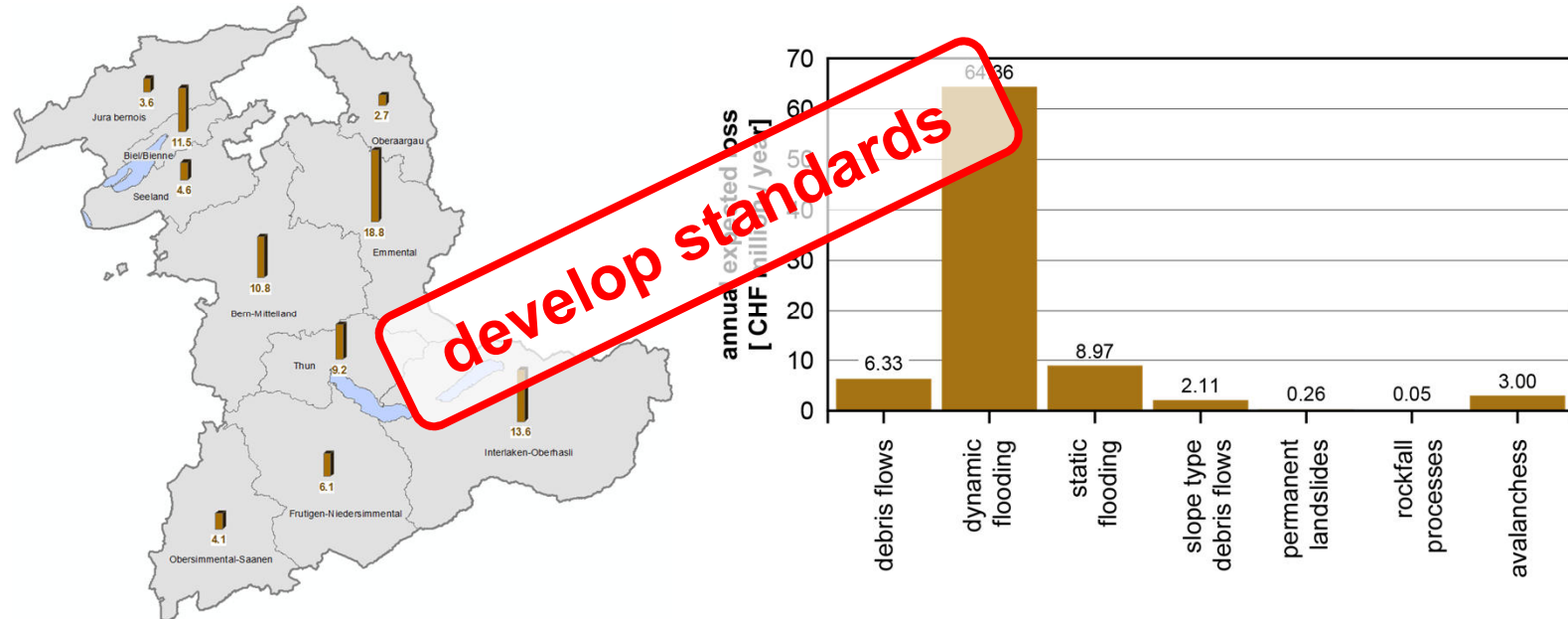
- consequences for persons, material assets, lifelines, vital goods and services, cultural goods, environment (geo-referenced data available)
- comparability through classification of protected objects according to their importance (by means of risk indices )

**> Identify hotspots, highlight need for action, promote risk dialogue**



# Risk overviews – Cantonal level

*Annual expected losses for permanently inhabited buildings differentiated by administrative units and hazard processes*



Risk overview Bern – topic and aim:

- overall view of the threat for persons, building zones and residential buildings for different processes
- annual expected losses for personal and property risks
- > **highlight need for action**

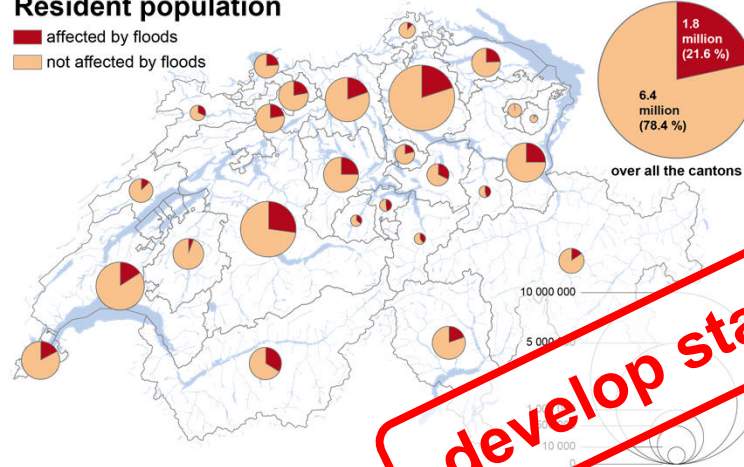




# Risk overviews – National

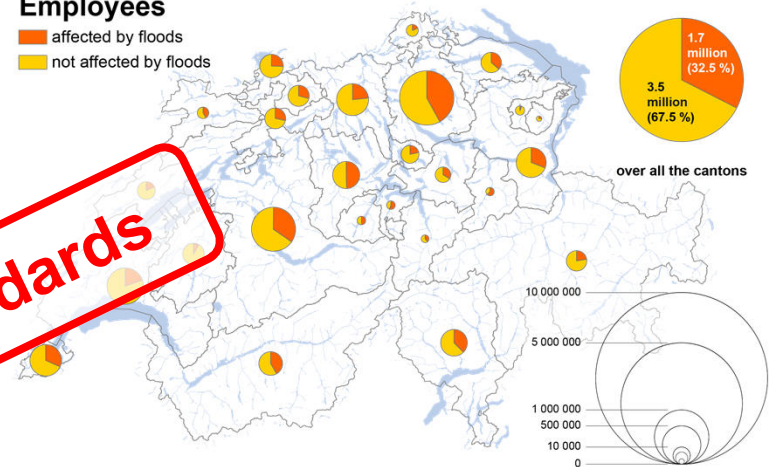
## Resident population

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■ not affected by floods



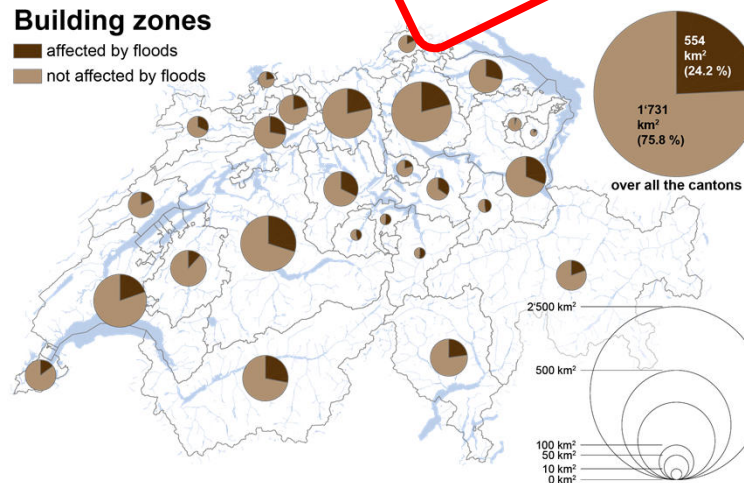
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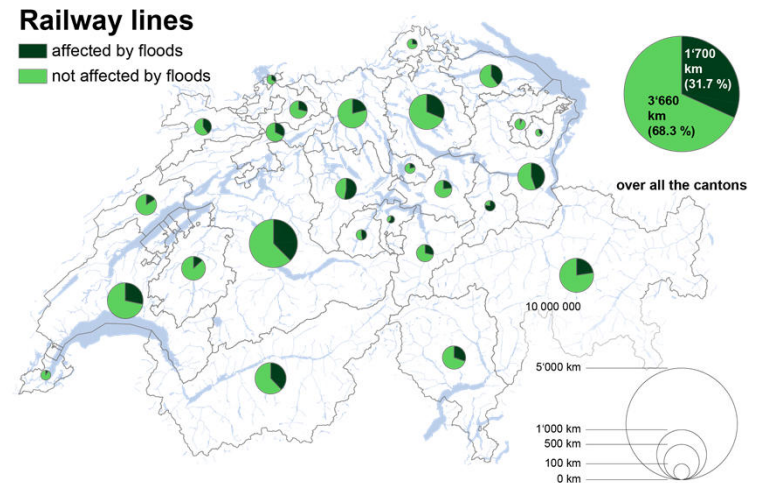
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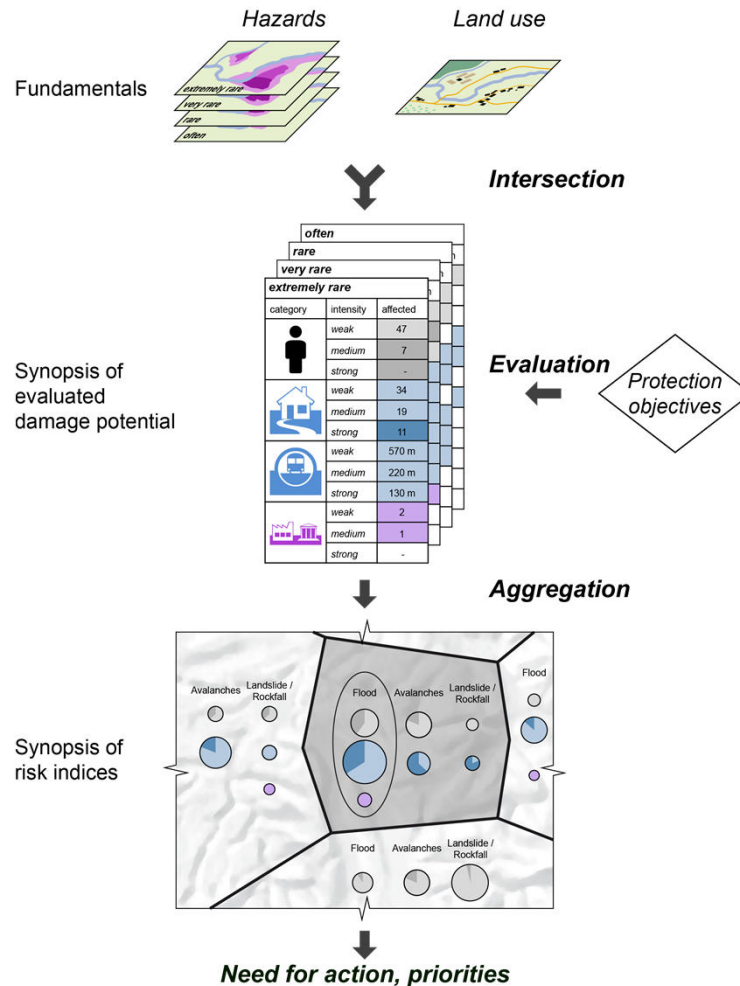


**> point out the affectedness, justify the budgetary requirements**





# Concept for higher-level risk overviews



- consistent over several levels
- based on homogenous data
- as detailed as necessary
- as generalised as possible
- «evaluated damage potential»
- aggregation of risk indices across protected objects and spatial units
- presentation of the overall risk (not only of the deficits)

> **need for action, priorities**



# Keys of success

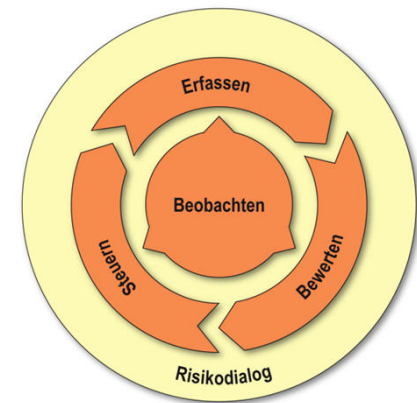
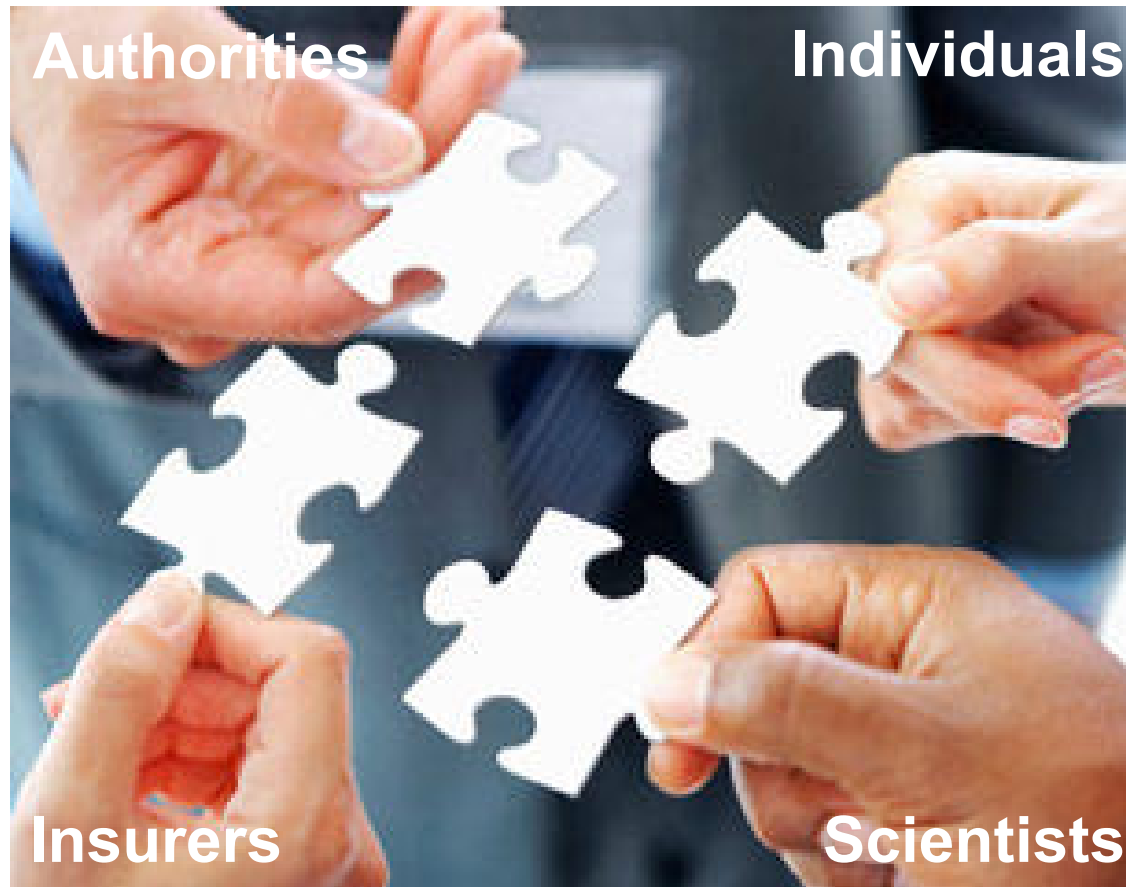






# Cooperation

www.iqperhour.com



**> overview > common understanding > concerted action**



# Synergies

flood protection

river  
renaturation



improvement of  
infrastructures

reorganisation  
of mobility

reorganisation  
of land use

improvement  
of recreation  
infrastructure





# Dealing with natural hazards today and tomorrow

## *Report «Dealing with natural hazards in Switzerland»*



- comprehensive analysis by 2016
- participatory process involving all relevant actors

### **> Fields of action:**

- ***optimize the use of financial resources by prioritization***
- ***subsidy further types of measures***
- ***comprehensive master plans***
- ***adaptation of legislation***



# Tank you for your attention!