

International Commission for the Hydrology of the Rhine Basin

CHR

RheinBlick 2050

Abschlusskolloquium

13.-14. Oktober 2010 in Bonn

Global change and impacts on the water resources in the Rhine river basin

Monitoring

- Development of measurement networks
- Securing of comparable data by international measurement campaign
- Provision of data

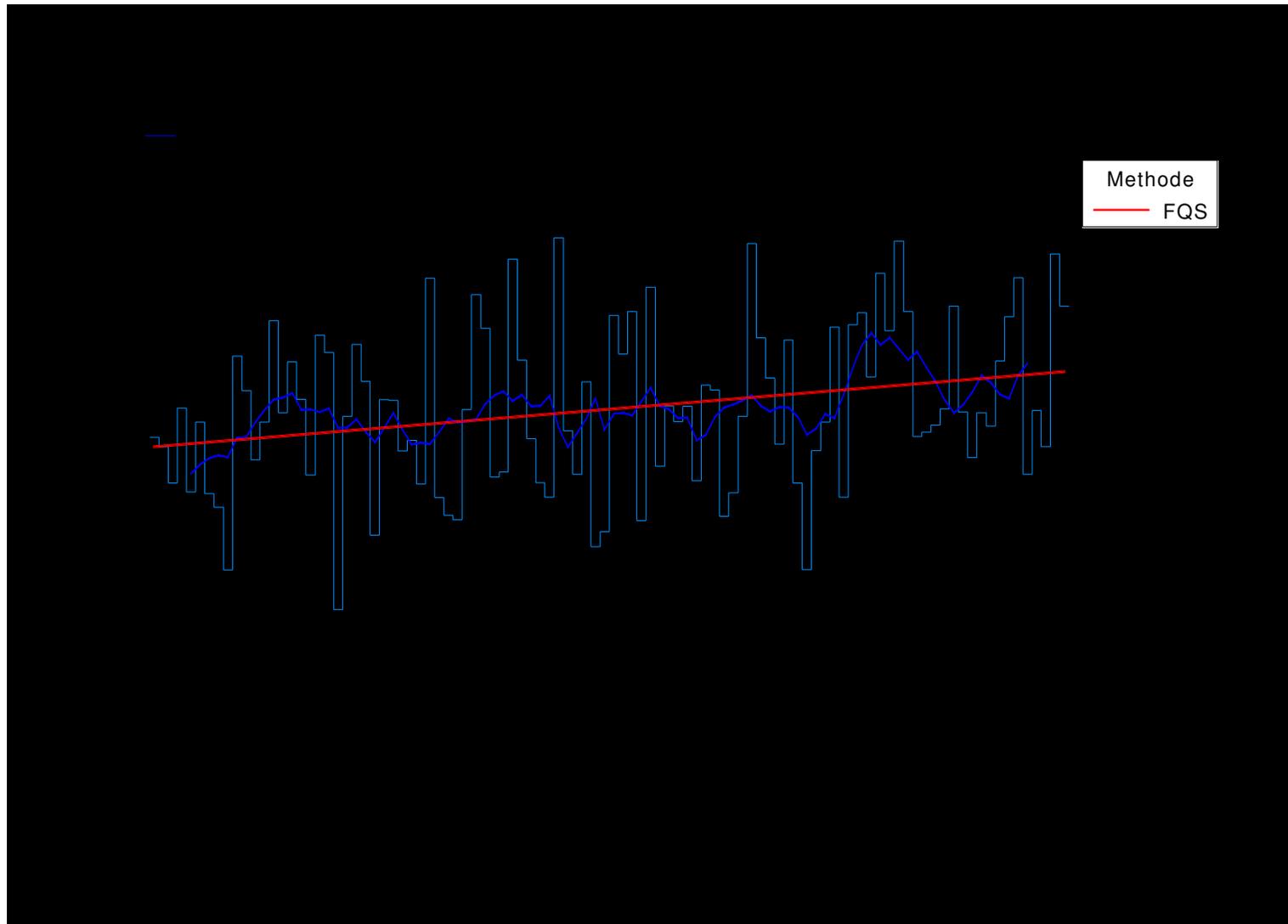


Analysis of hydrometeorological longtime monitoring series 1900 - 2000



The Rhine river basin with the 38 river basins investigated

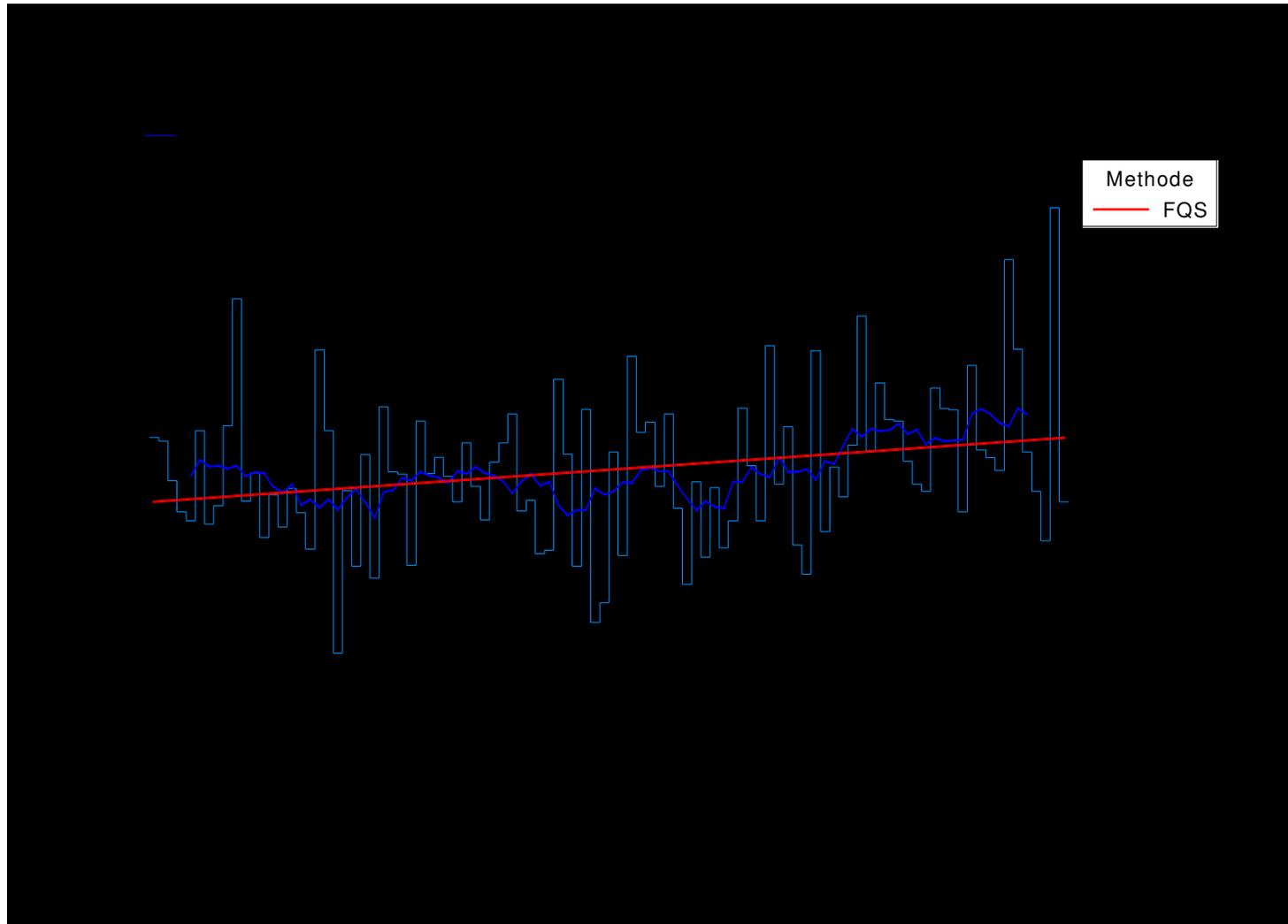
Development of the mean discharges during the winter months in the river Rhine from 1901-2000



What's about the yearly
maximum floods?

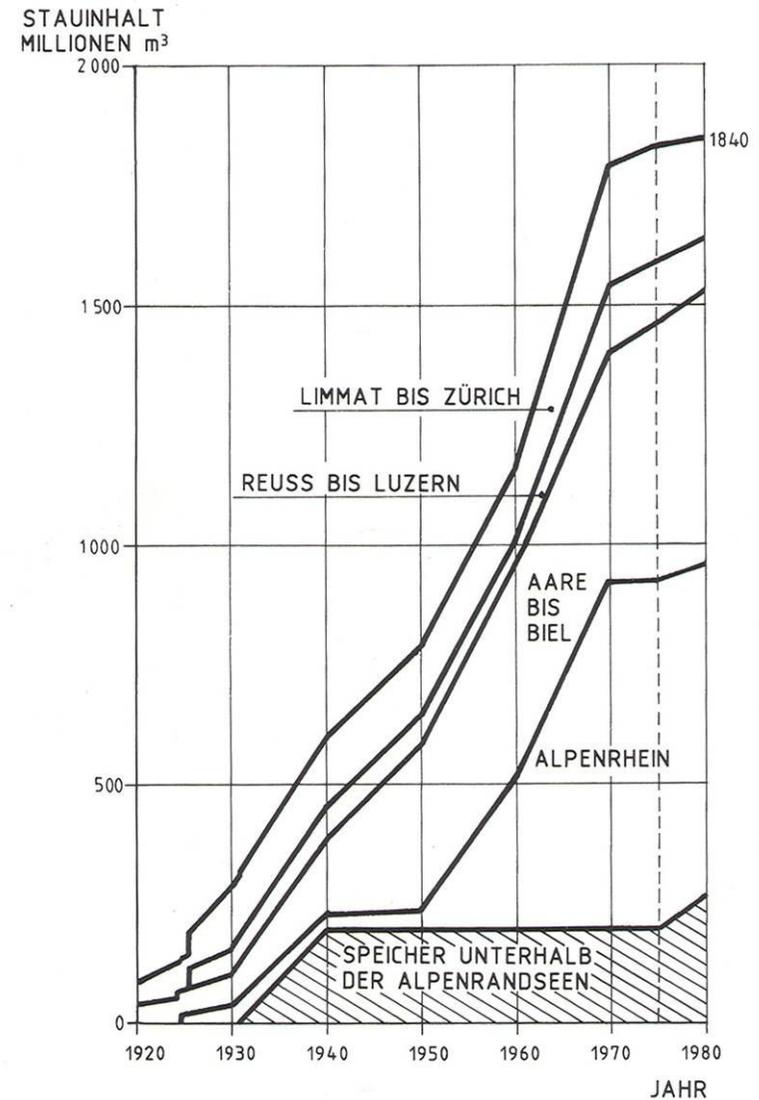
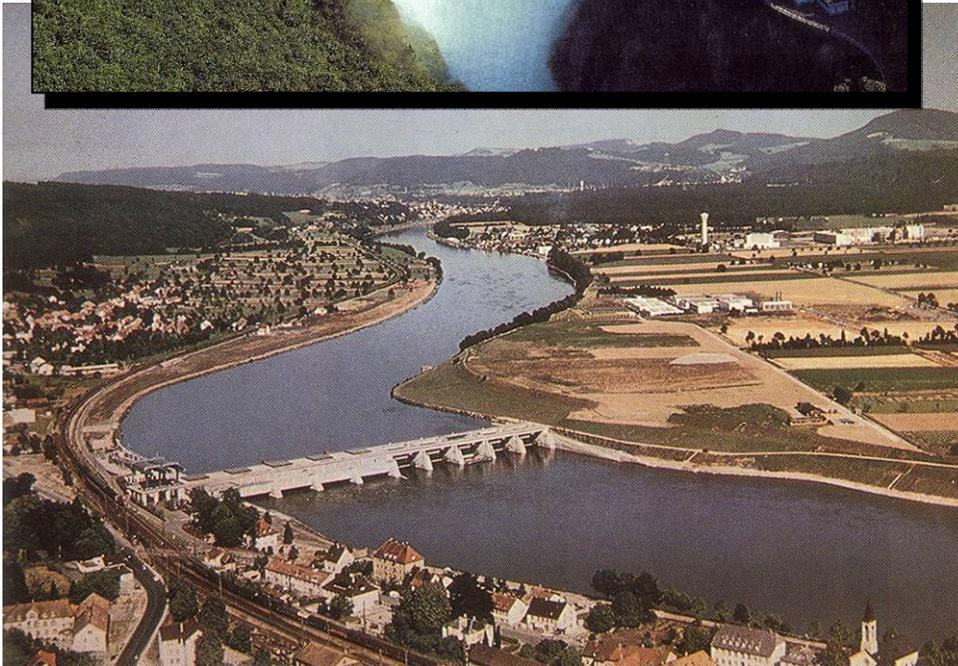


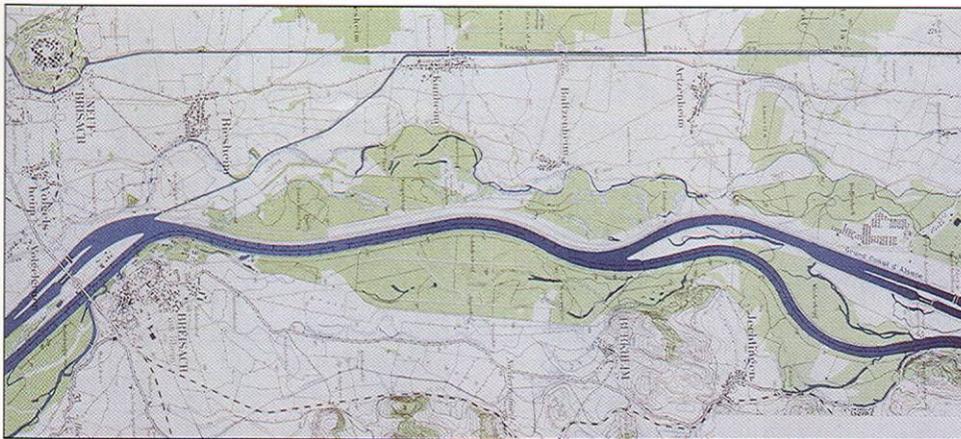
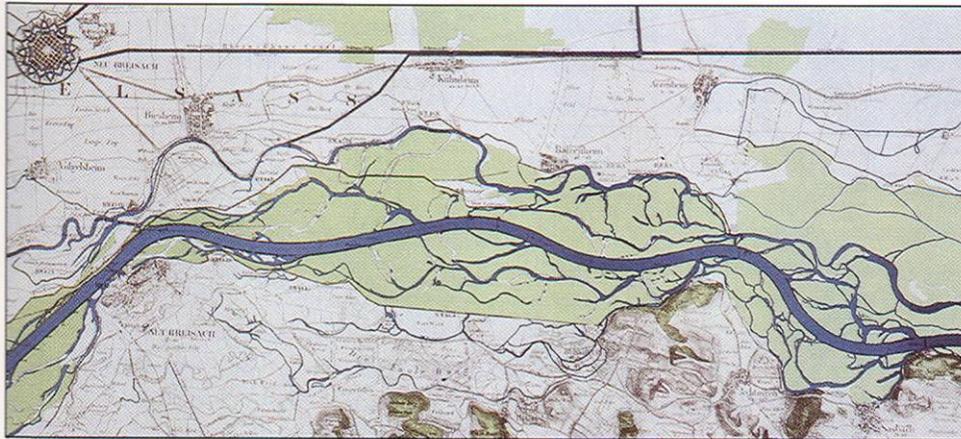
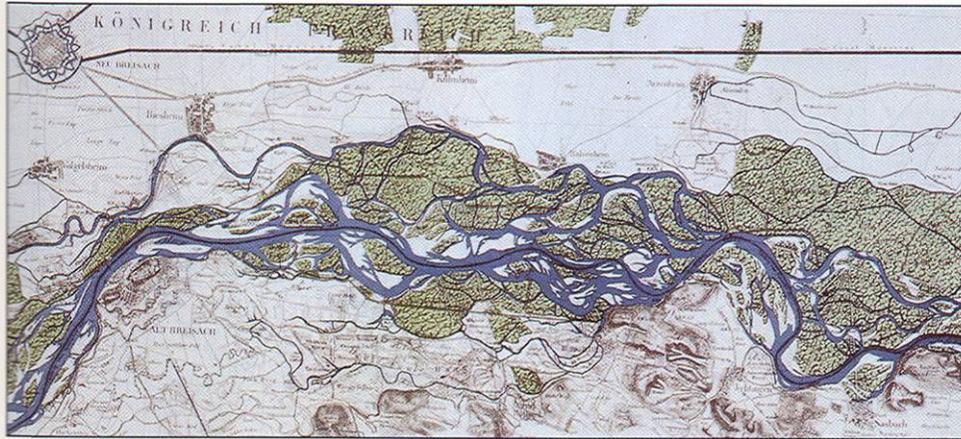
Development of yearly flood in the river Rhine from 1901 – 2000 by Basle



Anthropogenic impacts on natural flows

Management of reservoirs and water power stations along rivers

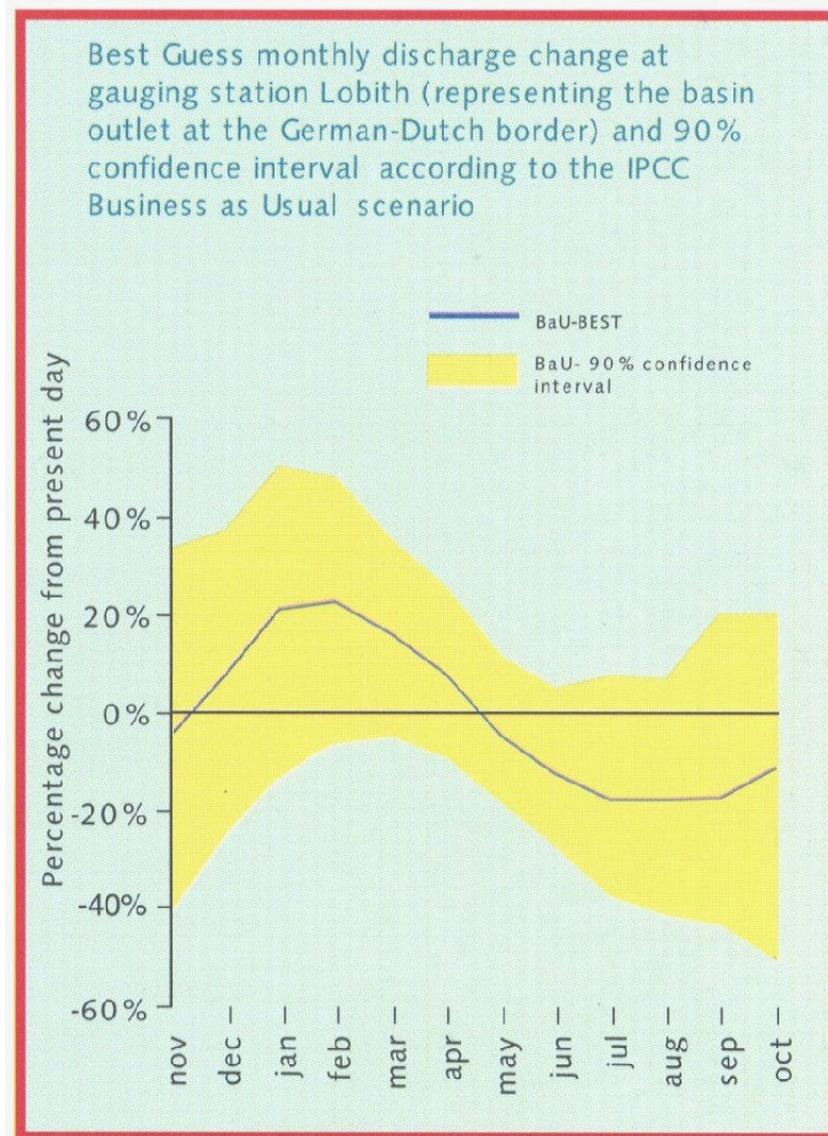




Anthropogenic impacts on natural flows

Hydraulic works in the Upper Rhine for navigation

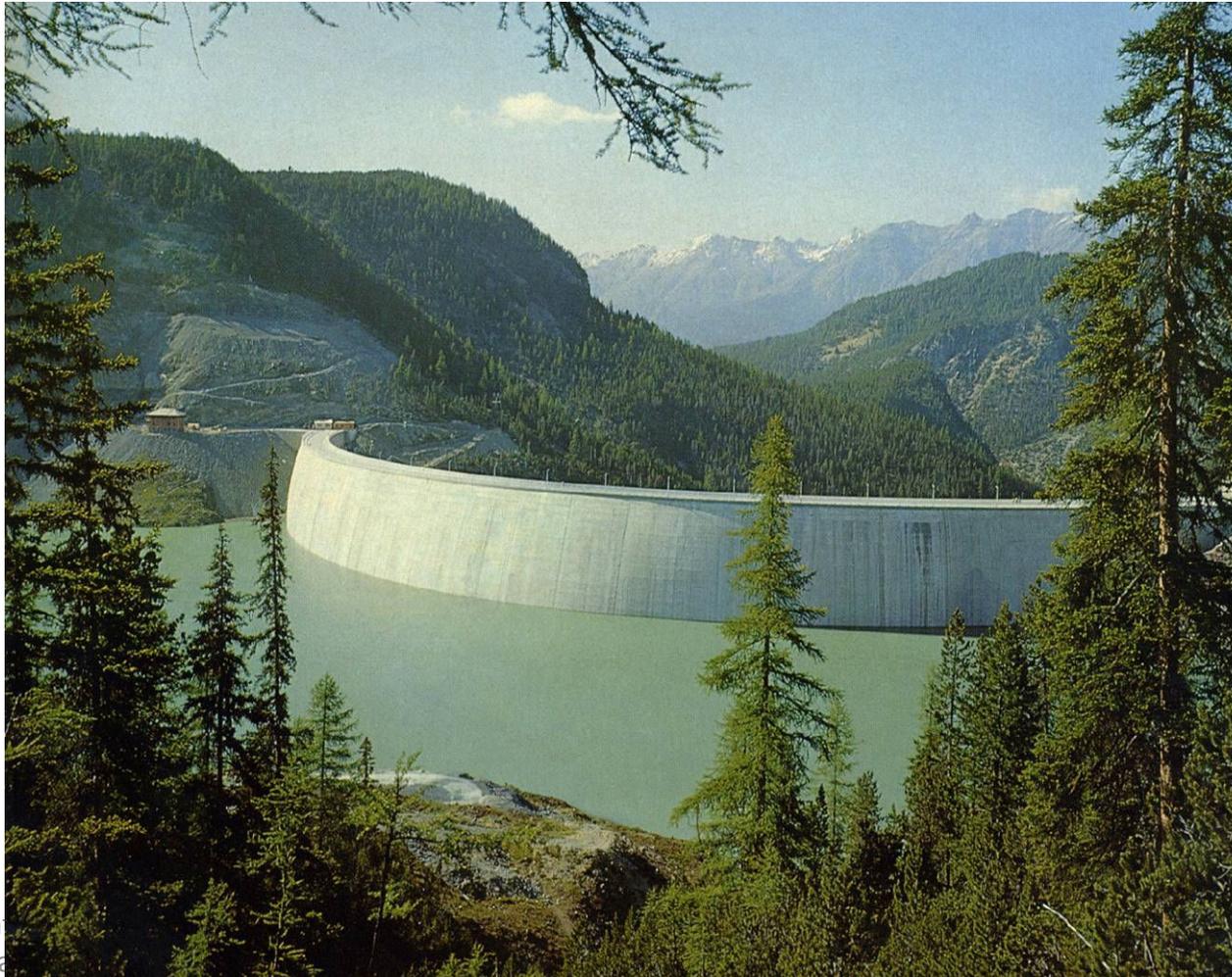
Effects of climate change on discharge in the Rhine basin



More discharge in winter half year and decrease in summer

Effects of climate change in mountain areas

More hydropower in winter



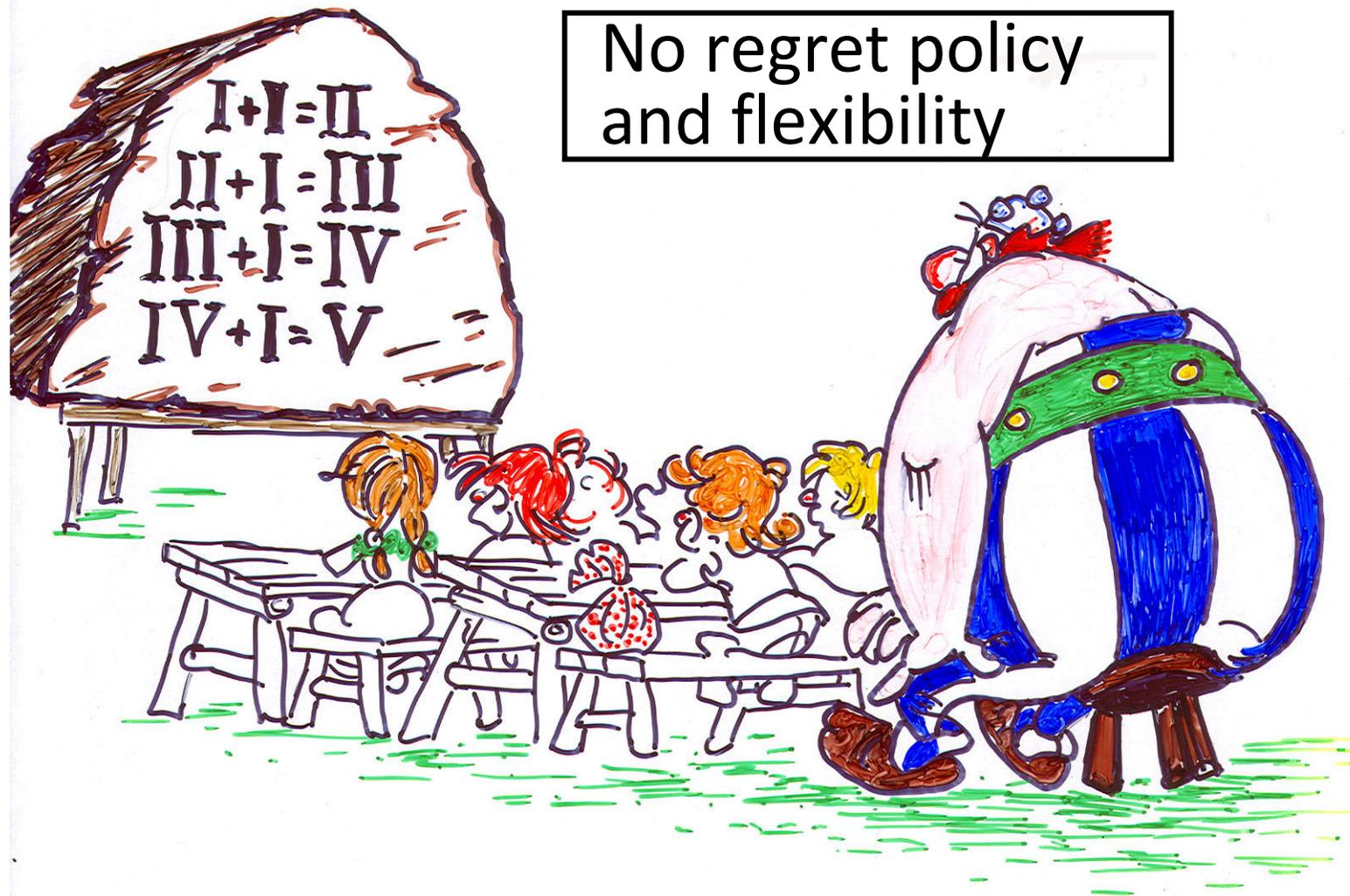
Effects of climate change in mountain areas



No regret policy and flexibility

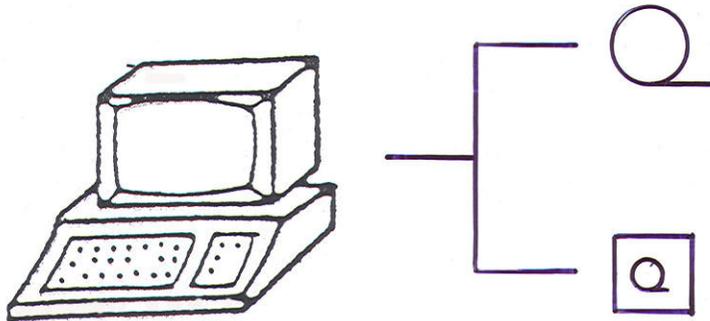
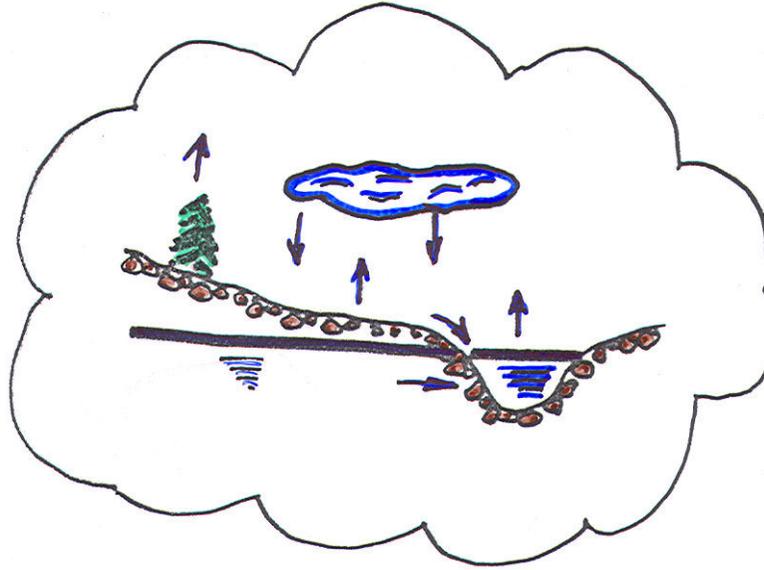
Balancing required actions
against
economic costs having in
mind the
uncertainties





Long-term plans should be flexible and adaptable to a growing knowledge base

No regret policy and flexibility



Anticipatory measures, like reservation of sufficient space for the rivers in combination with ecological rehabilitation should be set-up already now.



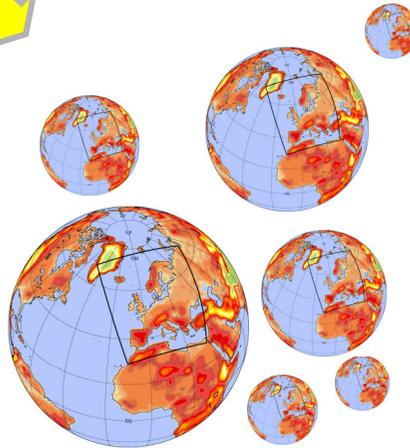
Many research groups
have than cooked in the
climate soup

The uncertainty cascade

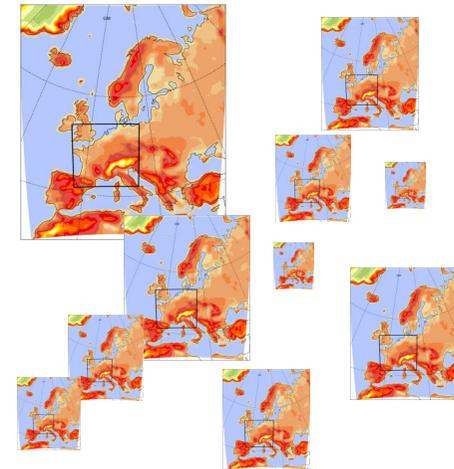
Emissions models



Global climate models



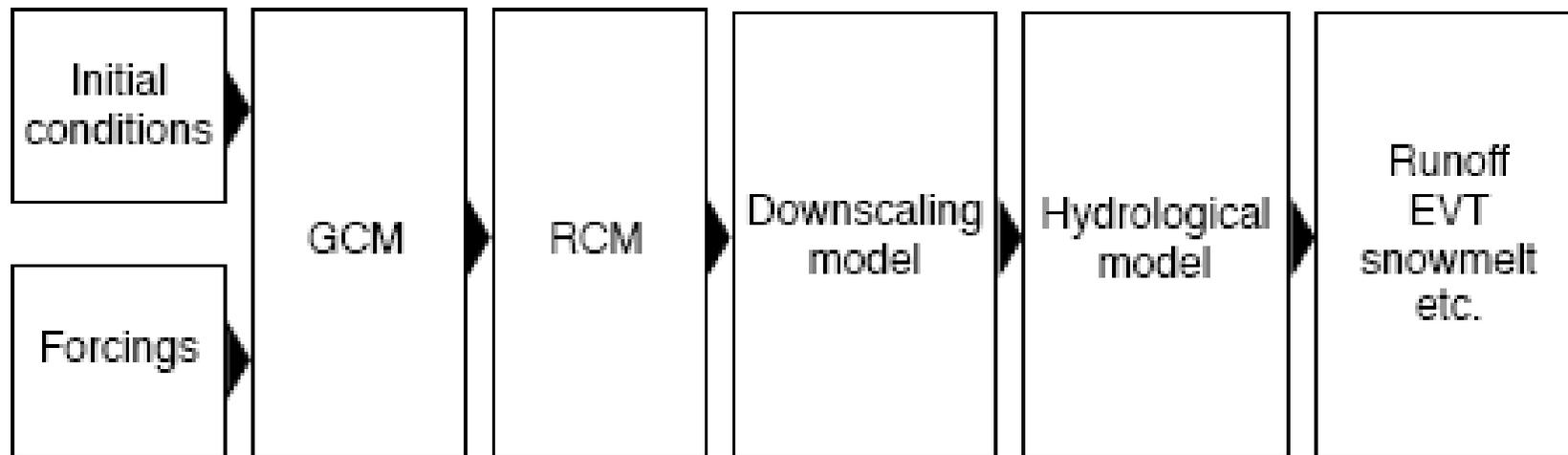
Regional climate models



Uncertainties in demographic, technologic and economic development

Uncertainties in the knowledge of the modeling of the global and regional climate

Model Chain (Th. Bosshard, ETHZ) for
determination of changes in hydrological
parameters due to global change



Conclusions

1. Reasonable agreement on the trends
2. Much less agreement on the speed and magnitude
3. Certainly too little agreement to design water management systems according to classical approaches (WMO, 1987)
 - Continuous effort on this is needed for the sake of science. **HOWEVER** the potential that point 3 will be solved in the next 5-10 years is **VERY LOW**

Goal of RheinBlick

Development and interpretation of common, consistent discharge projection for the river Rhine basin

Many researchers have worked together



Have they reached this goal?