



Federal Ministry for the  
Environment, Nature Conservation  
and Nuclear Safety



# Water Management: Impacts, Adaptation Challenges and Options

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## Impacts + Challenges (1)

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**A rising temperature will**

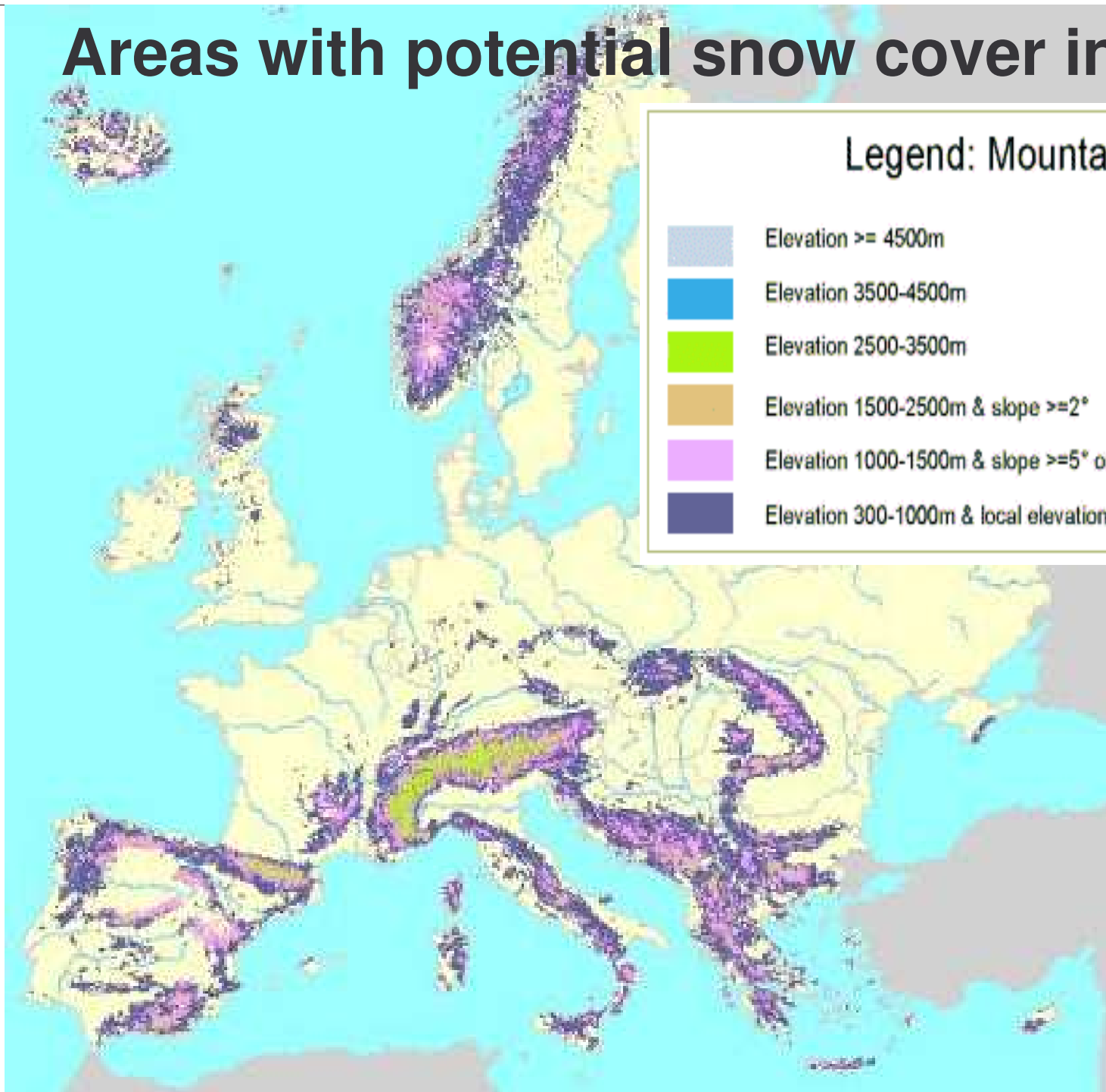
⇒ **change precipitation pattern across Europe**

- **Annual precipitation**
- **Seasonal pattern**
- **Increase likelihood of torrential rain**







⇒ **Change flow regimes + water availability**

⇒ **change inter-seasonal storage of water due to rise of the snow line by 300 to 500 metres** (thus drastically limiting the area covered with snow, see next slide)

# Areas with potential snow cover in winter



## Legend: Mountains

-  Elevation  $\geq 4500\text{m}$
-  Elevation 3500-4500m
-  Elevation 2500-3500m
-  Elevation 1500-2500m & slope  $\geq 2^\circ$
-  Elevation 1000-1500m & slope  $\geq 5^\circ$  or local elevation range  $>300$
-  Elevation 300-1000m & local elevation range  $>300$

## Impacts + Challenges (2)

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- **Further increase in risk of flooding**
  - 1998 – 2002 more than 100 major floods
  - Estimated 25 billion Euro insured losses
- **Further decrease in water availability**
  - Ø annual impact 5.3 billion Euro / a in last years
  - already 7.5 billion in 2003
  - **Water stress will increase** further at regional level (at present 10% of total freshwater are abstracted)
- **Impact on water quality + biodiversity**

# Options / Measures for Adaptation Strategies

Wide range of options to counteract impacts :

- **Technically oriented measures**
- **Economic instruments** (steer consumer behaviour)
- **Land use related measures**
- **Information measures**
- **Regulatory measures** – legal + institutional frame to solve conflicts among water users; prioritization of uses?



## EU Policy Framework

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- **EU Water Framework Directive**
- **Financial Framework**
- **forthcoming „EU Floods Directive“ and**
- **„EU Marine Strategy Directive“ provide**
  - Clear objectives (**good status, cost recovery...**)
  - Step by step approach + sound analysis
  - Instruments (Management Plan + PoM)
  - Institutional frame + time schedule



## Personal Conclusions

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- **Adaptation requires wide range of changes .....**  
nevertheless possibilities for adaptation limited:  
probably **no solutions to all problems** possible
- **Climate change is a new key challenge**, but not the  
only one existing in water management
- **EU Policy Frame** with IWRM + ICZM is sound basis  
for coordination across sectors but
- **further developments** involving all concerned  
**necessary** to avoid conflicts among different users -  
prioritization of uses, sharing of costs ....



## Session A – Water Management

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**5 presentations foreseen** with speakers from

- Portugal, Spain, Netherlands, UK, Water Supply Sector
- covering experiences and approaches across Europe.

With subsequent discussion of key questions focusing on options/ policy needs / conclusions

**Be Welcome – Thank you for listening!**