



EUROPEAN FOREST INSTITUTE
MEDITERRANEAN REGIONAL OFFICE - EFIMED

Water for forest & people in the Mediterranean Region: a challenging balance

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The water cycle links ecosystems and human societies

- Water: foundation for all biological life on Earth
- Basic link between biosphere and atmosphere
- Equally fundamental for humans and nature

Med. Region: area with marked interactions between MaB

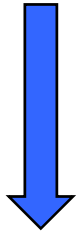
- Interactions & co-evolution between MaB over millenaries; over the last 150 years, contrasted evolutions in land use between the N & the S
- Water the main limiting factor for life; more constraints due to CC and demographic expansion
- The need for water: **Blue** and **Green**, but what trade-off?





Key issue

Changing the paradigm of looking only at blue water



Considering water in all processes underlying the functioning of Forest Ecos. and the supply of goods and services

Support functions

- nutrients cycle
- soil formation
- primary production
- functional biodiversity

Provision

- food
- fresh water
- wood & fibres
- fuel

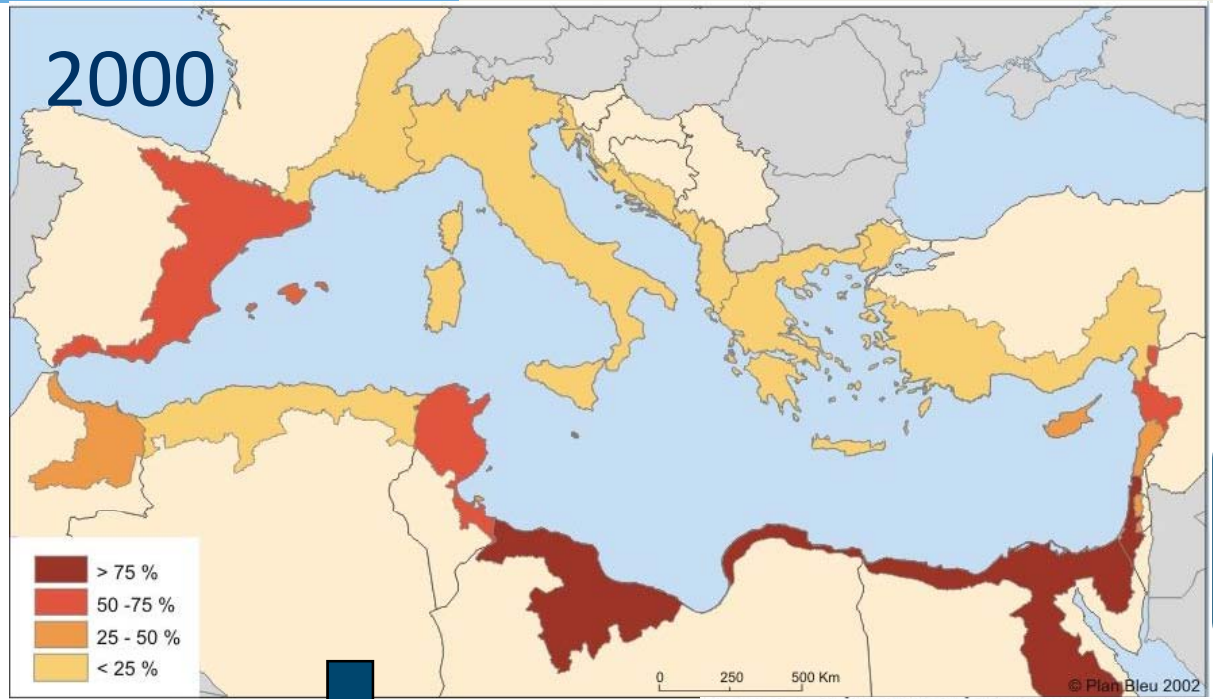
Regulation

- climate
- erosion
- peak flows & floods
- water purification

Cultural aspects

- aesthetical
- spiritual
- education
- recreation

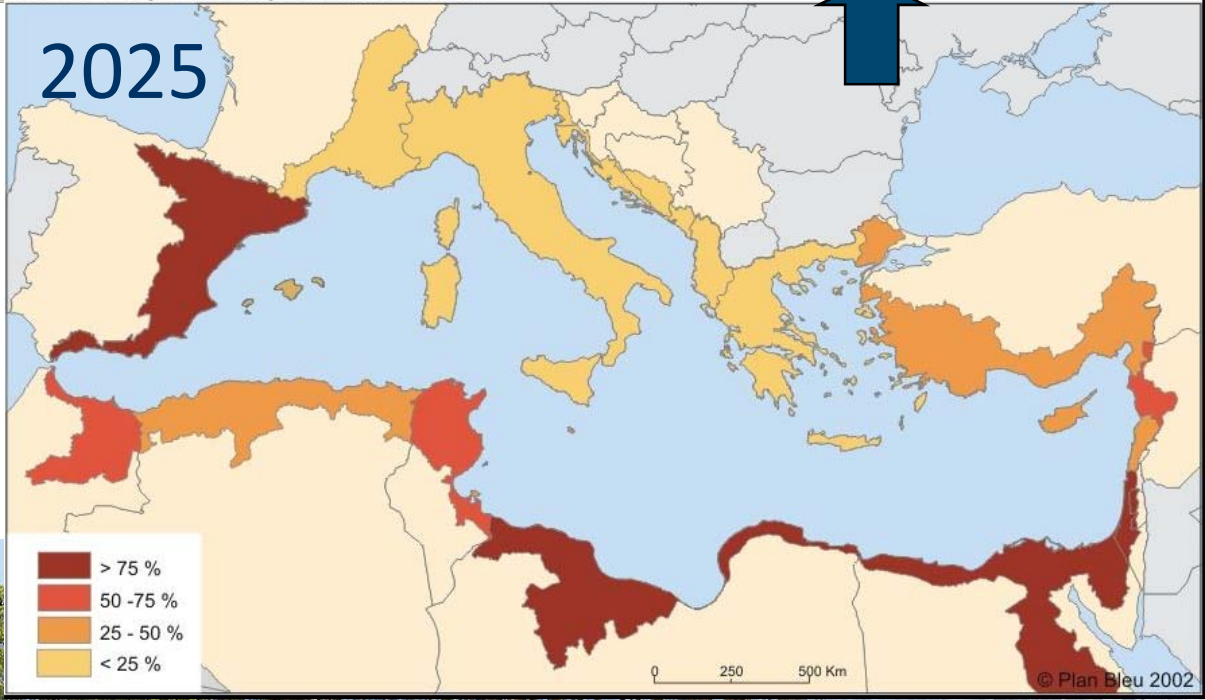
Source : Millenium Ecosystem Assessment (2005)



Water exploitation indices

80 millions with less than 500 m³/year

60% of the world's "water-poor" countries



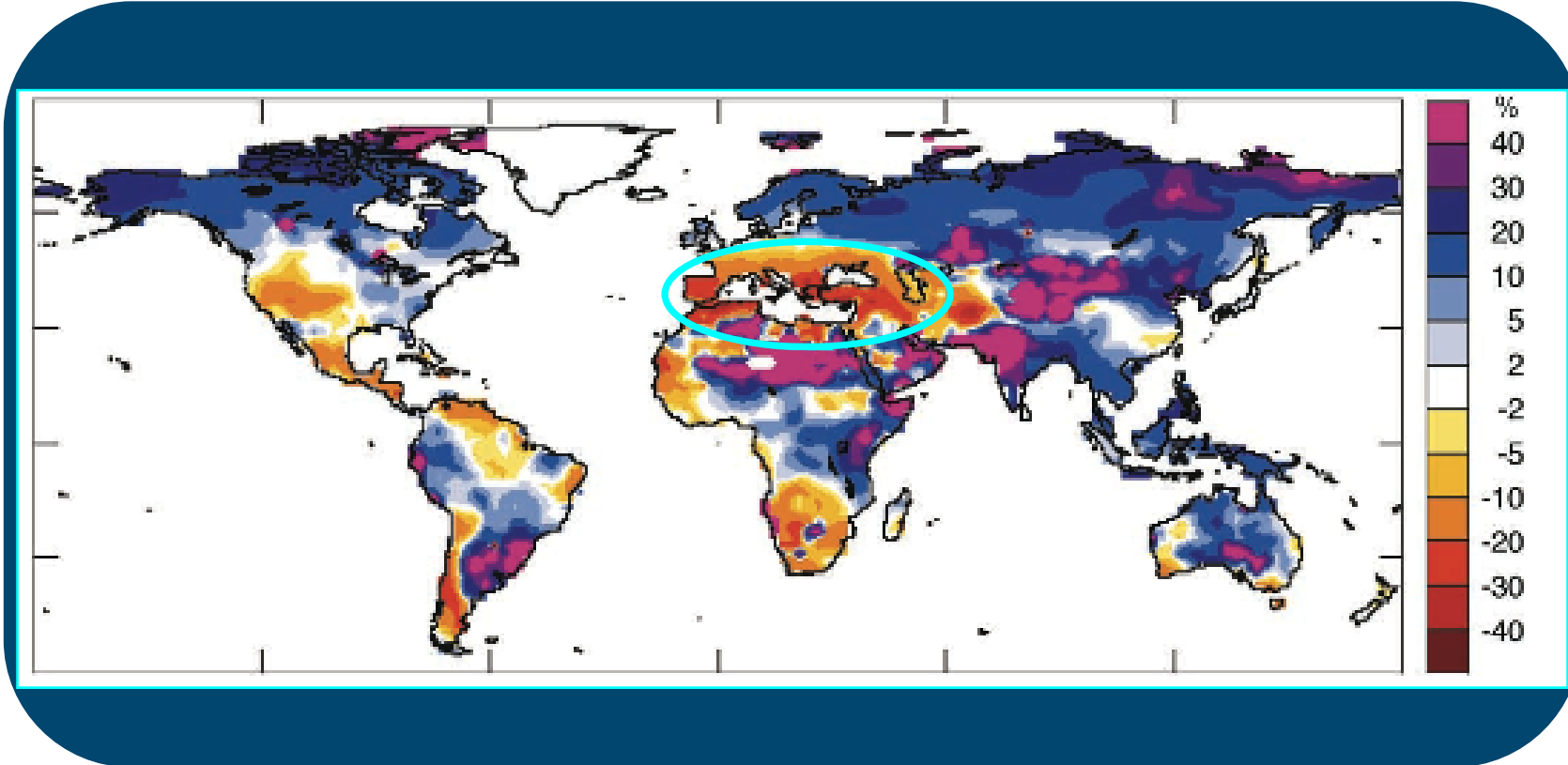
SOURCE: Plan Bleu, 2003



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Climate change (temp. & rain) and water resources



Projection of changes in runoff by 2041-60 based on 12 models
Source: IPCC, AR4, 2007

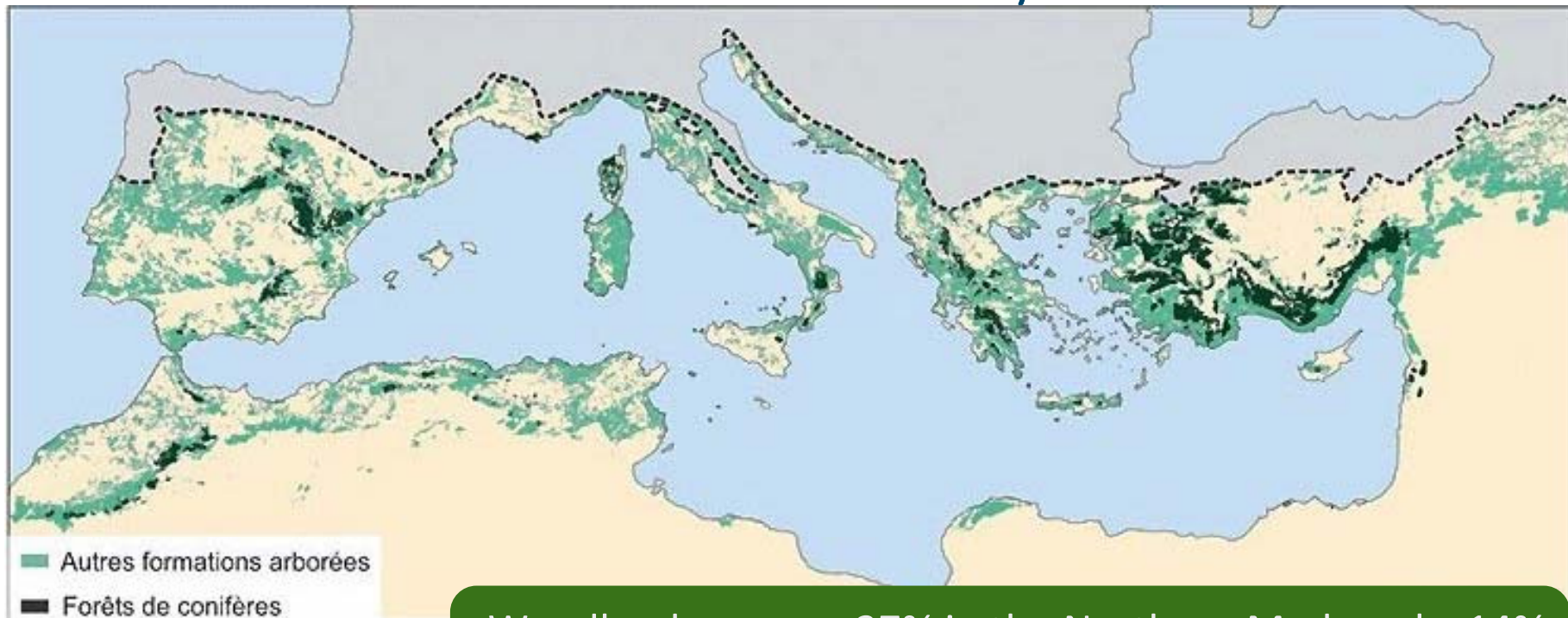




Forest cover in the Mediterranean area

High deforestation rate in the south, forest fires in the north...

More than half of the basin affected by **desertification**



Source: Plan Bleu, 2003

Woodlands cover > 37% in the Northern Med., only 14% in the South and 5% in Eastern

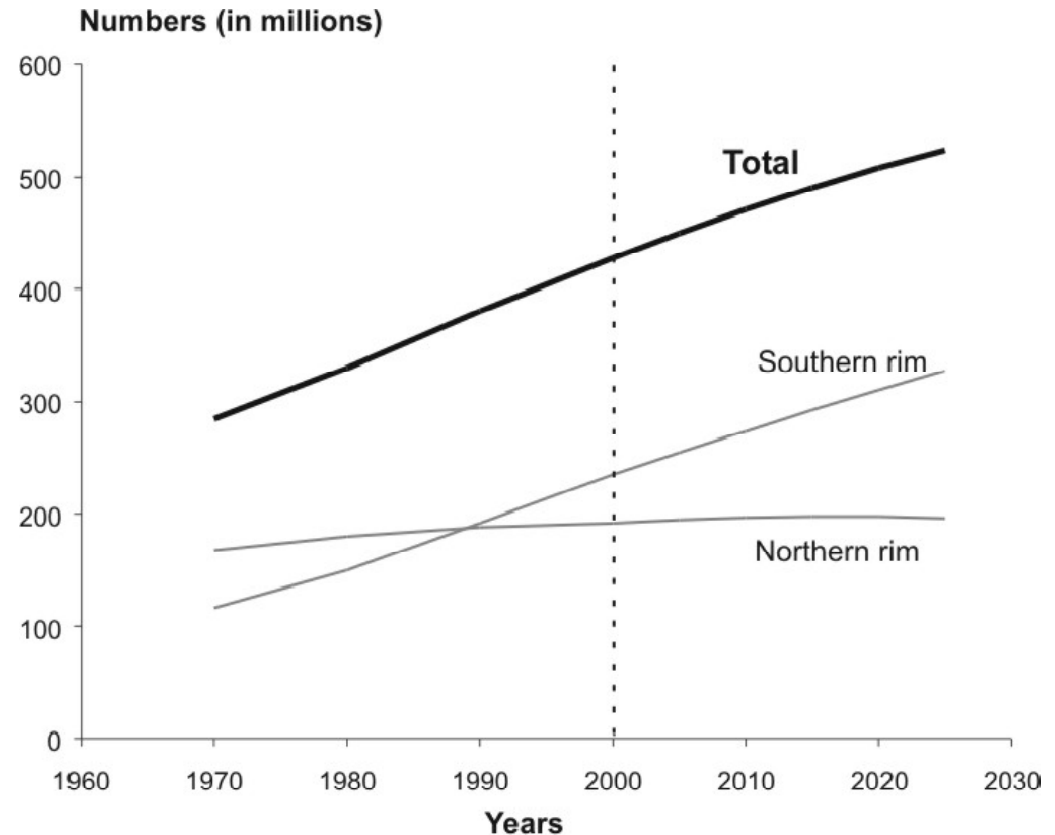




People in time and space

Population on southern rim has almost doubled over the last 30 years

Densely concentrated in coastal regions:
to **150 h/km²**(2000)
+
175 millions of tourists/year



SOURCE: Plan Bleu, 2003

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In a scarcity context, understanding the interactions water x forest x society is crucial

- Med. Region is mountainous, with forests located in upper part of watershed, acting as water tower, and influencing water resources and ecosystems (incl. aquatic) downstream
- A complex issue, characterized by “clichés” and commonly accepted opinions; «no one size fits all»
- Hydrological patterns specific to the Mediterranean call for specific approaches; soil and water are linked
- Balancing water between man and nature through socio-eco-hydrological approach, based on integrated water/ecosystem/land/territories management: a necessity, but on which background?

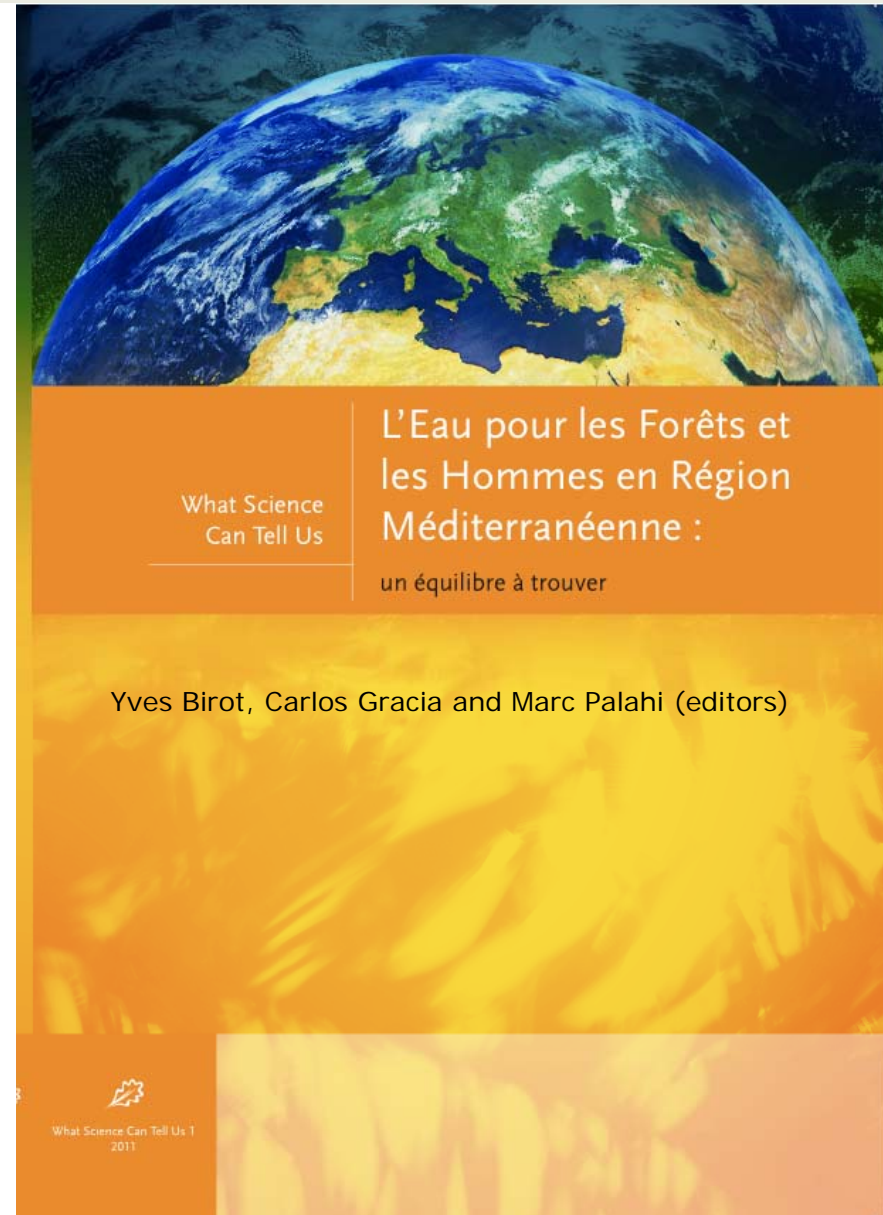




The need for a collective scientific expert review

- reconciling science's findings and public perception
- assembling available knowledge scattered among disciplines (forestry, hydrology, soil science, climatology, ecology, economics)
- proposing ways to cope with future challenges

EFIMED initiative – 40 authors





OUTLINE

1. The basics

- 1.1 The hydrologic cycle at a glance; blue and green water
- 1.2 Water and forest resources, and people in the Mediterranean: current situation
- 1.3 Do forest areas influence rainfall regime?
- 1.4 Water fluxes in forests
- 1.5 Role of Mediterranean forests in water and soil conservation

2. The blue water

- 2.1 [Hydrology of Mediterranean ecosystems](#)
- 2.2 Water resources depend on vegetation cover and land use

3. The green water

- 3.1 Green water to sustain forest ecosystems processes and their functions
- 3.2 Water processes in trees: water uptake and transpiration/photosynthesis
- 3.3 How plant species cope with water stress





4. Blue and/or green water: what trade-off?

4.1 Securing water for trees and people: possible avenues

4.2 Balancing water for ecosystems, goods and services, and people

4.3 Integrated watershed management at the landscape level; science backing development; a case study in Tunisia

4.4 Towards integrated ecological-socioeconomic-hydrological management: new scientific approaches and policy recommendations

4.5 Water footprint of our daily life: how much water do we use?

4.6 Lessons drawn from the past: an historical perspective on forest hydrology and soil conservation in the North and South of the Mediterranean Basin

5. Key challenges

5.1 Climate change implications on forest and hydrology: an overview

5.2 Coping with population growth and land use changes

5.3 Afforestation to combat desertification in arid zones requires a concerted endeavour

5.4 Keeping healthy riparian and aquatic ecosystems

5.5 The economics of water and forest: issues and policy recommendations

Main messages





A glance at the book



Supply of blue water to the Roman city of Nimes:
The Gard Aqueduct 2000 years BP (close to Avignon)
Photo: C. Birot

- Hydrology of Med. Ecos. by **Francesc Gallart**
- Green & blue water: what trade-offs? by **Carlos Gracia**
- Balancing water for ecos. goods & services by **Robert Mavsar**
- An economic insight on integrating water and forest into policies by **Irina Prokovieva**
- Assessing the impact of land-use & forest management on water-related ecosys. services by **Bart Muys**

