EFC WPMMW
Working Group Forests and Water: a Case Study on the Management of Forests in Catchments of Drinking Water Reservoirs

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Mission of the „Forests and Water“ Working Group

a) Better understanding the forest and water relationship in headwater catchments

b) Environmental services in headwater catchments

c) Participatory watershed management

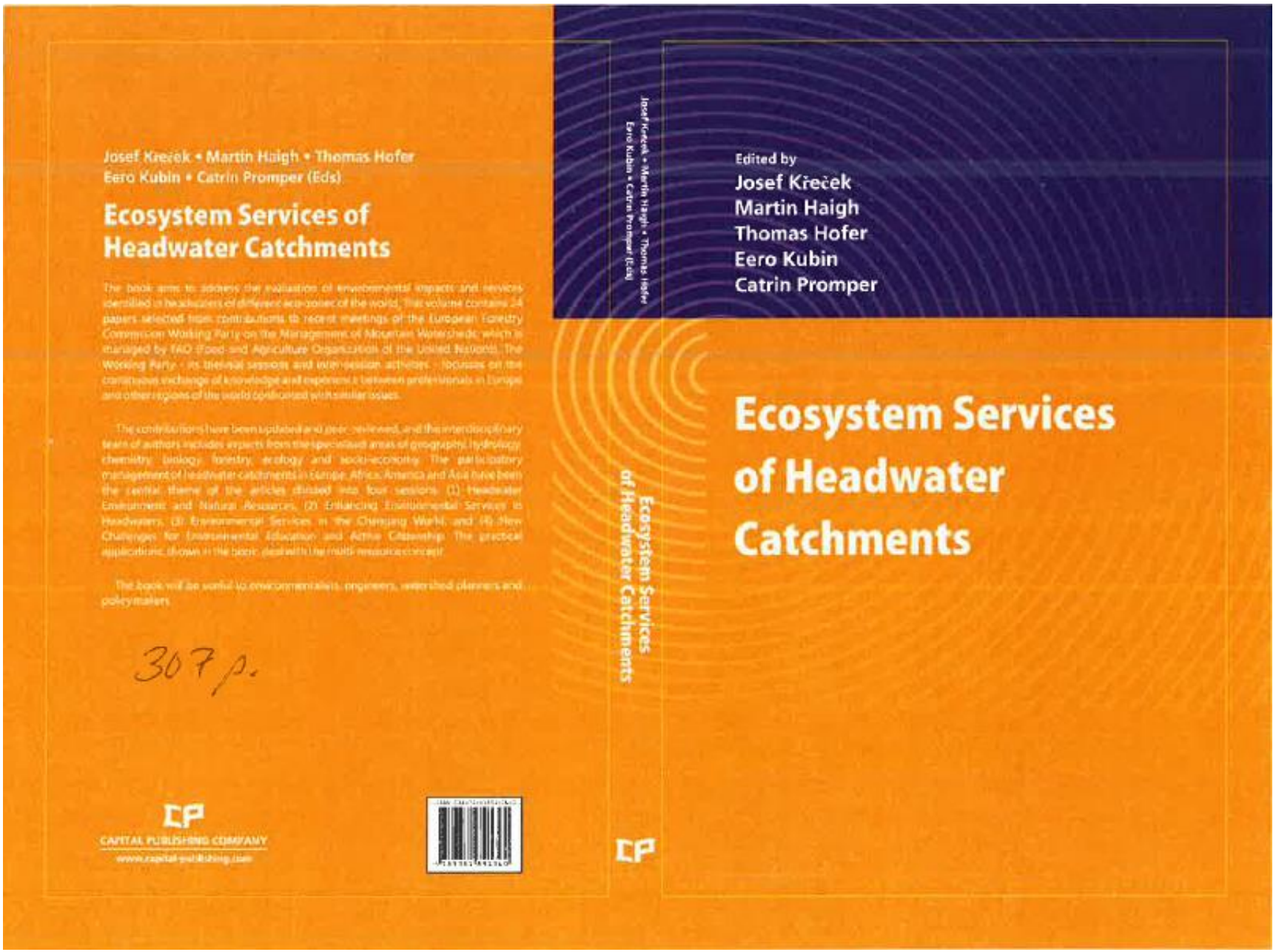
d) Citizen science and active citizenship

e) Environmental education for sustainability in changing world

f) Demonstration projects and training courses

Secretariat provided by FAO: Yuka.Makino@fao.org

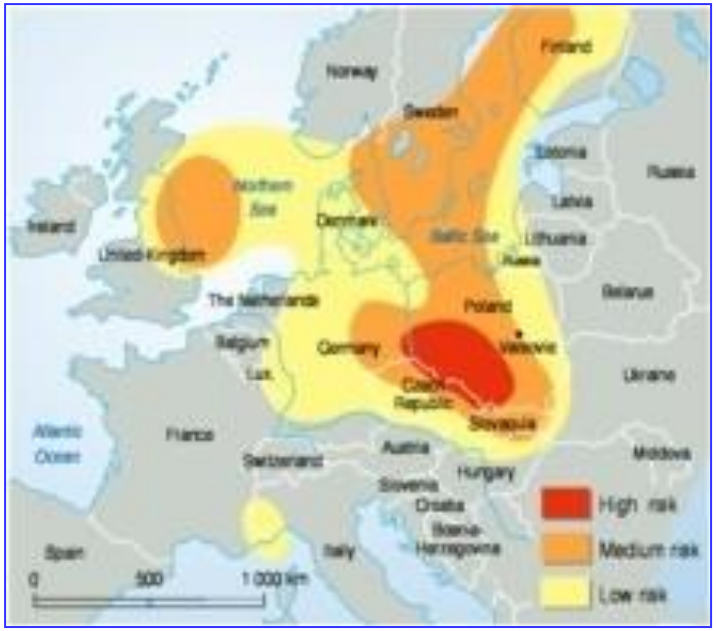
Outcomes: Springer Book published in 2017



Case study: forestry in catchments of drinking water reservoirs affected by acid atmospheric deposition

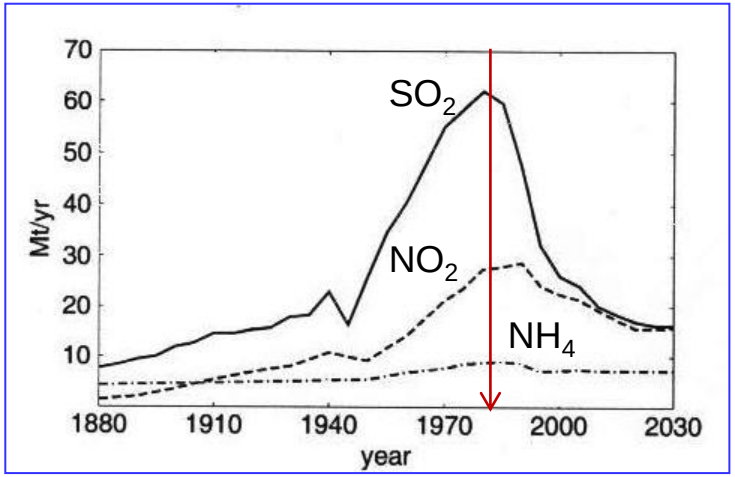
The European „Black Triangel“

Risk of acidification in Europe



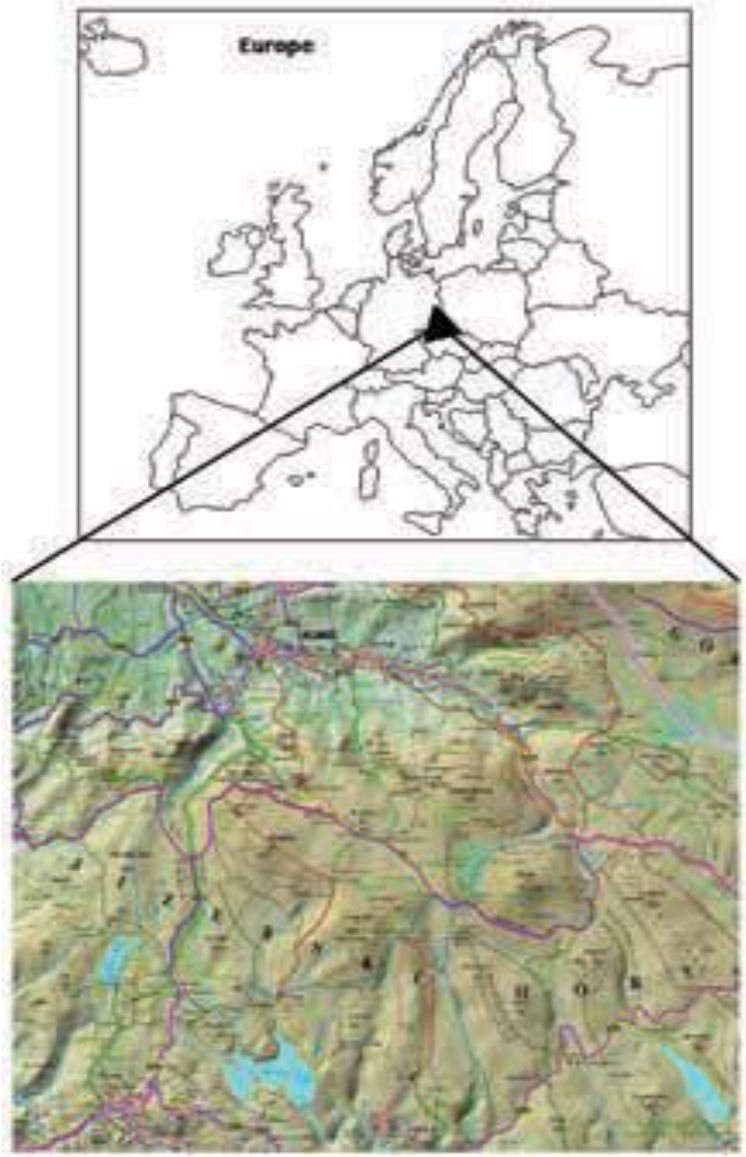
UNEP (2005)

European emissions prognoses



Schöpp *et al*. (2003)

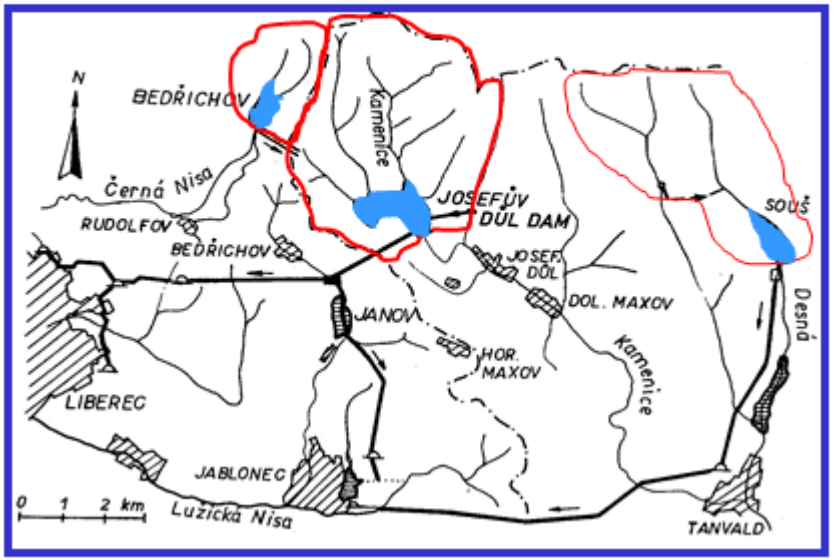
THE JIZERA MTS. (CZECH REPUBLIC)



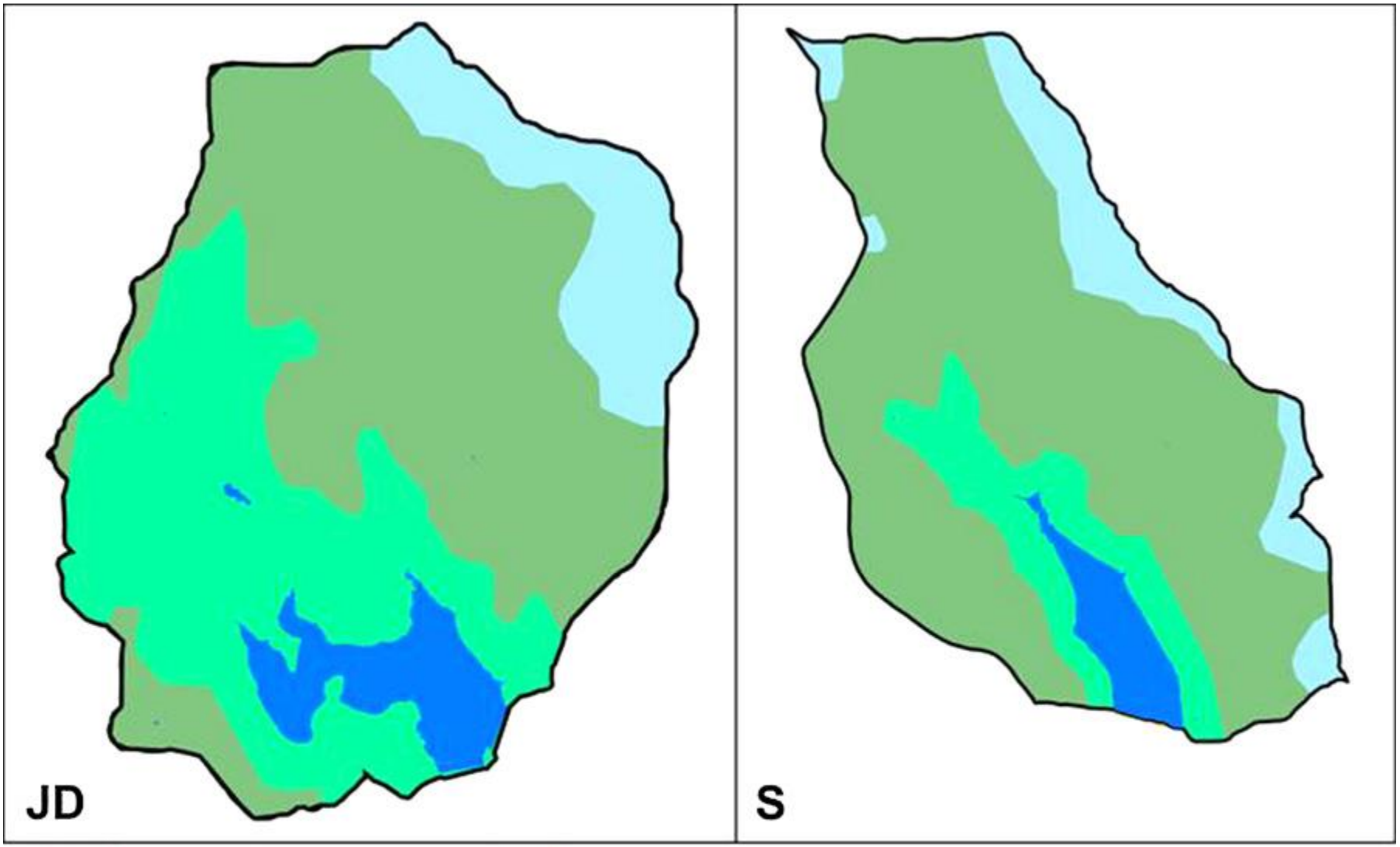
In the 1980s and 1990s:

- Low pH values
- High conents os Al^{3+}
- Fishless streams and reservoirs

System of Drinking Water Supply in the Jizera Mts.



CLIMAX FOREST ZONES IN FOCUSED CATCHMENTS



CHANGING PRIORITIES IN WATERSHED MANAGEMENT

1. 1900 – 1970: Flood control

a) Building retention dams after the catastrophic floods in 1897

b) Reforestation

2. Since 1970: Drinking water supply

a) Retention dams changing to water supply systems

3. Since 1980, particularly, control of water quality

a) Reduction of the acid atmospheric deposition

b) Participatory watershed management

PROBLEMS

1. Commerical forestry:

a) Converting native forests - Common beech (*Fagus sylvatica*), Common silver fir (*Abies alba*), and Norway spruce (*Picea abies*) – to spruce plantations, during the 19th century.

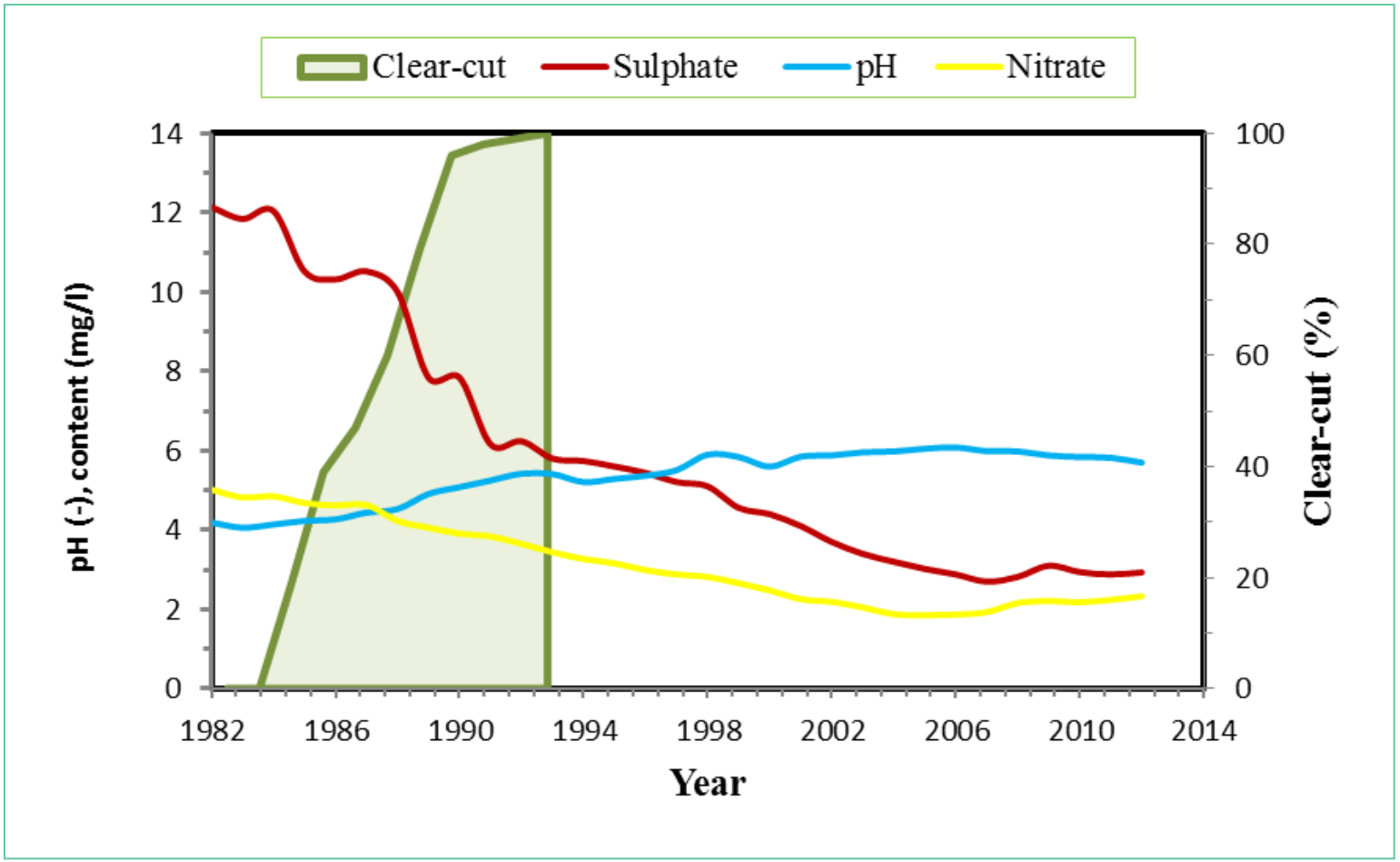
b) Clear-cut and heavy mechanisation, used in the 1980s and 1990s.

2. Extreme acid atmospheric deposition (emissions of Sulphur and Nitrogen) culminating in the late 1980s.

3. Expected climate change impacts (2071-2100):

Water yield reduced: 10 – 40 %.
More intensive extreme events: rainstorms, flash-floods, and draughts.
Seasonal runoff changes: drop (20 – 90 %) in the summer,
increase (30 – 50 %) in the winter.
Snow cover reduced: 30 %.
Spruce stands endangered: 50 %.

IMPACT OF SPRUCE CANOPY REDUCTION ON STREAMFLOW CHEMISTRY



MODIFICATION OF FOREST STANDS IN FOCUSED WATERSHEDS

To support water resources recharge, to reduce the acid atmospheric load and to mitigate flood genesis:

- Regulating the acid deposition in elevations > 900 m,
- Increasing water yield at slopes < 25^{o},
- Controlling runoff genesis and soil erosion at slopes > 25^{o},
- Support of riparian buffer zones (width of ca 30 m) to protect the drainage network.

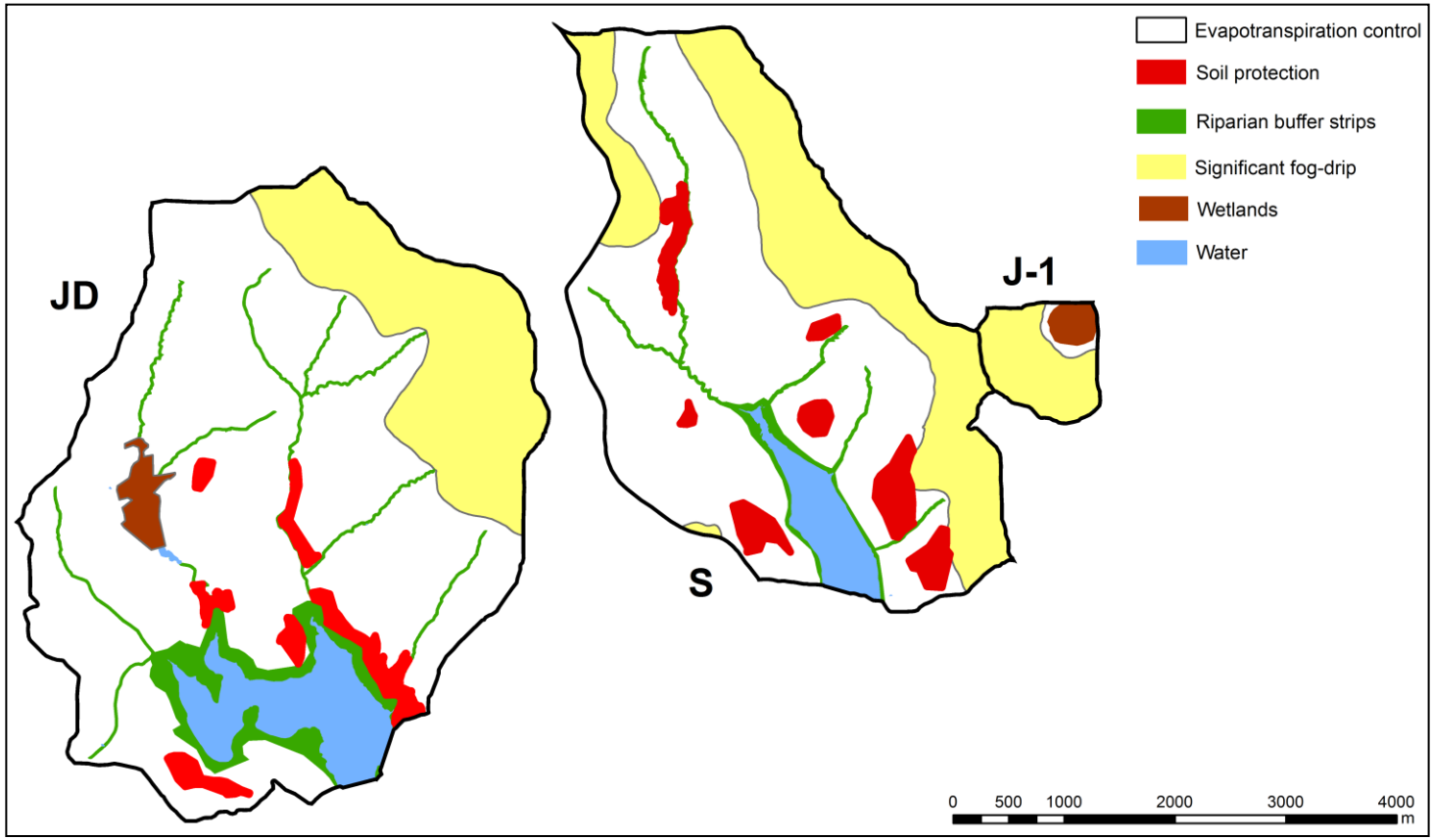
STRUCTURED FORESTRY PRACTICES FOR DRINKING WATER SUPPLY

- Identification of stakeholders and roundtable debate.
- Core participants: managers in sectors of water, forestry, nature conservation, municipalities, and recreation business.
- The aim: to identify optimum forestry practices in watersheds of Josefův Důl (JD) and Souš (S) to support the water resources recharge (quantity and quality), according to the *Water Act 254/2001 Coll*.

Criteria C	Weights w	Rating A_1	A_2	A_3	A_4	Performance values a_1	a_2	a_3	a_4
C_1. Water quality	30	5	4	2	1	150	120	60	30
C_2. Water yield	10	2	2	3	3	20	20	30	30
C_3. Flood prevention	20	4	3	2	1	80	60	40	20
C_4. Biodiversity	20	4	3	2	1	80	60	40	20
C_5. Timber yield	10	2	2	4	5	20	20	40	50
C_6. Recreation	10	3	3	2	2	30	30	20	20
Totals	100					380	310	230	150

Sructured forestry zonation

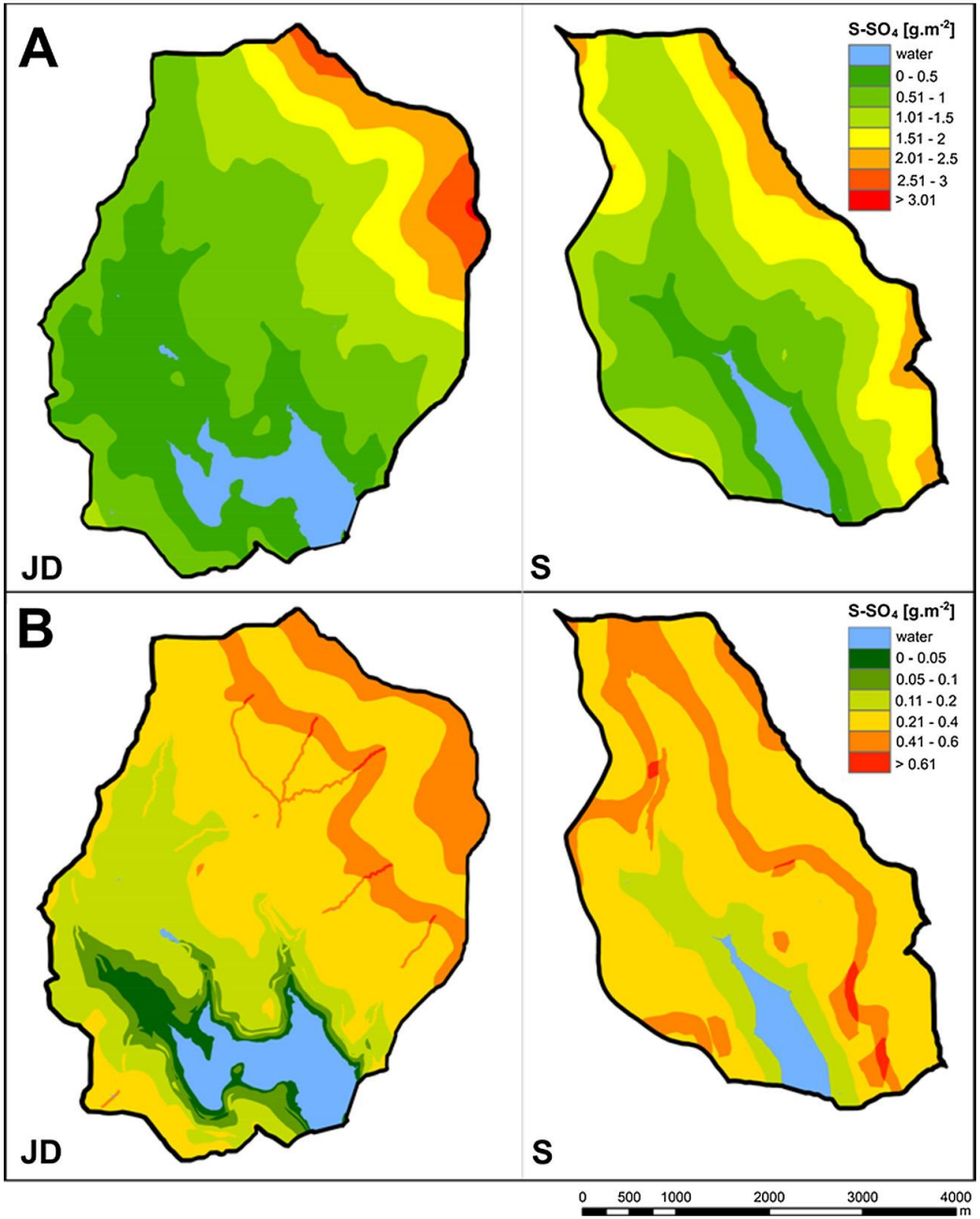
1) Riparian buffer strips
2) Zones of soil protection
3) Evapotranspiration control
4) Areas of significant fog drip
5) Wetlands.



ANNUAL DEPOSITION OF SULPHUR

Scenario A:
Even aged mature spruce forest stands

Scenario B:
Structured forestry with beech stands in riparian and soil protection zones; spruce stands with reduced crown closure to 0.5 at the slopes below 30%, and, grass cover in elevations above 900 m




… thank you