

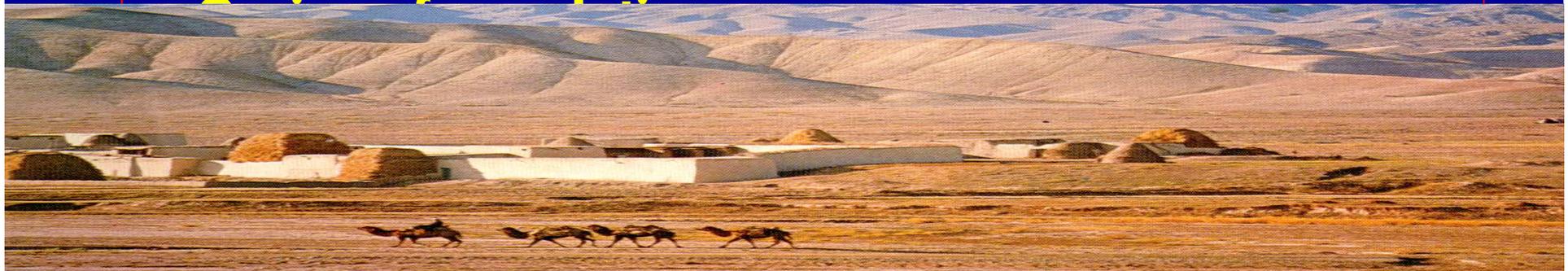
WATER and CLIMATE on THE BLUE PLANET

Michal Kravčík
People and Water, NGO
Slovakia



Paris, August, 21th 2014

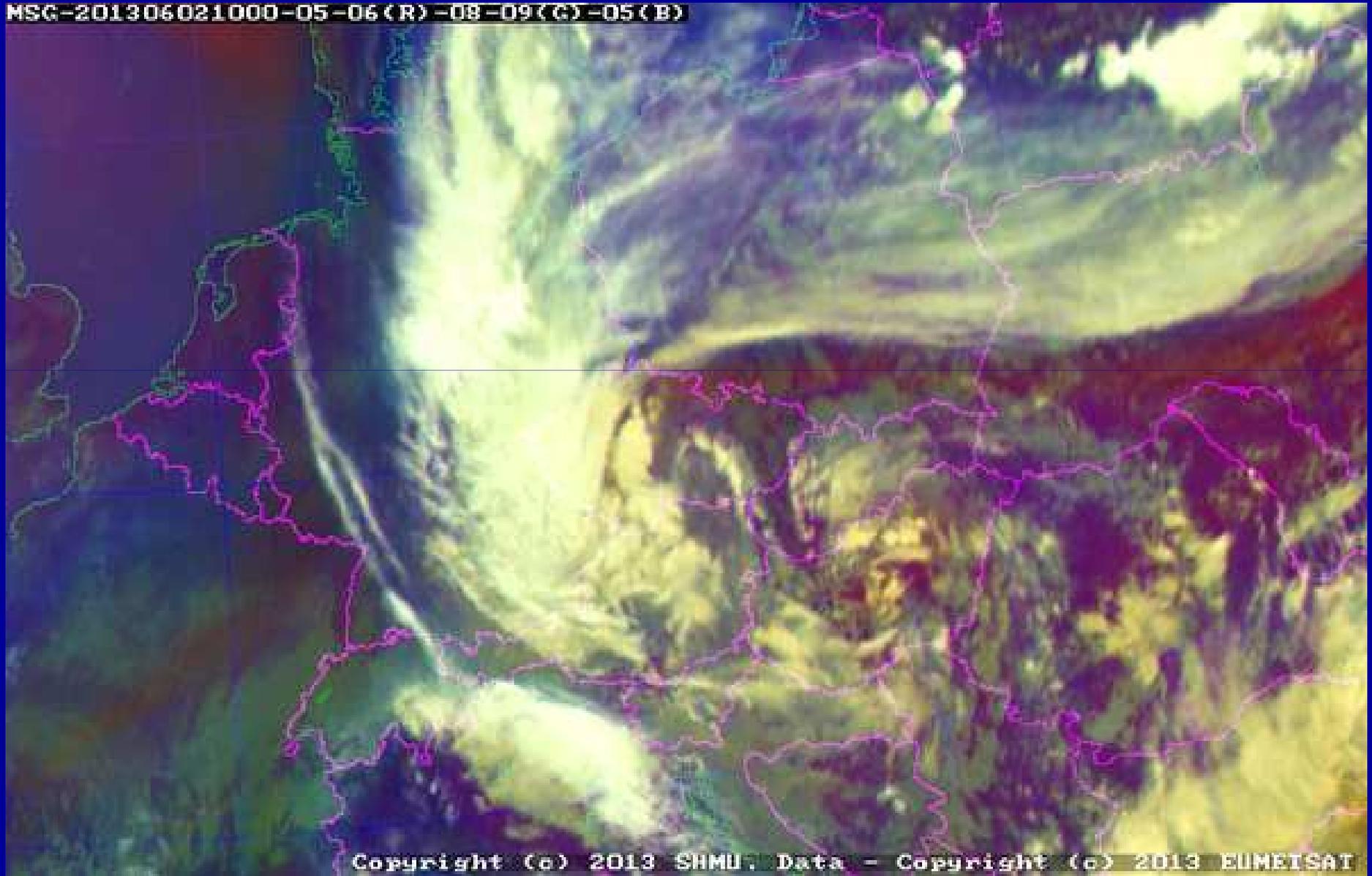
1. **More heavy storms**
2. **More natural damages**
3. **Increasing of extremality of weather and heavyrain**
4. **More water erosion process**
5. **More fires**
6. **Time and space changes of rain distribution**
7. **Luck of water sources for nature**
8. **More drying up regions**
9. **Treat of safety of food**
10. **Treat of biodiversity**



Bad perspective with drying up of landscape

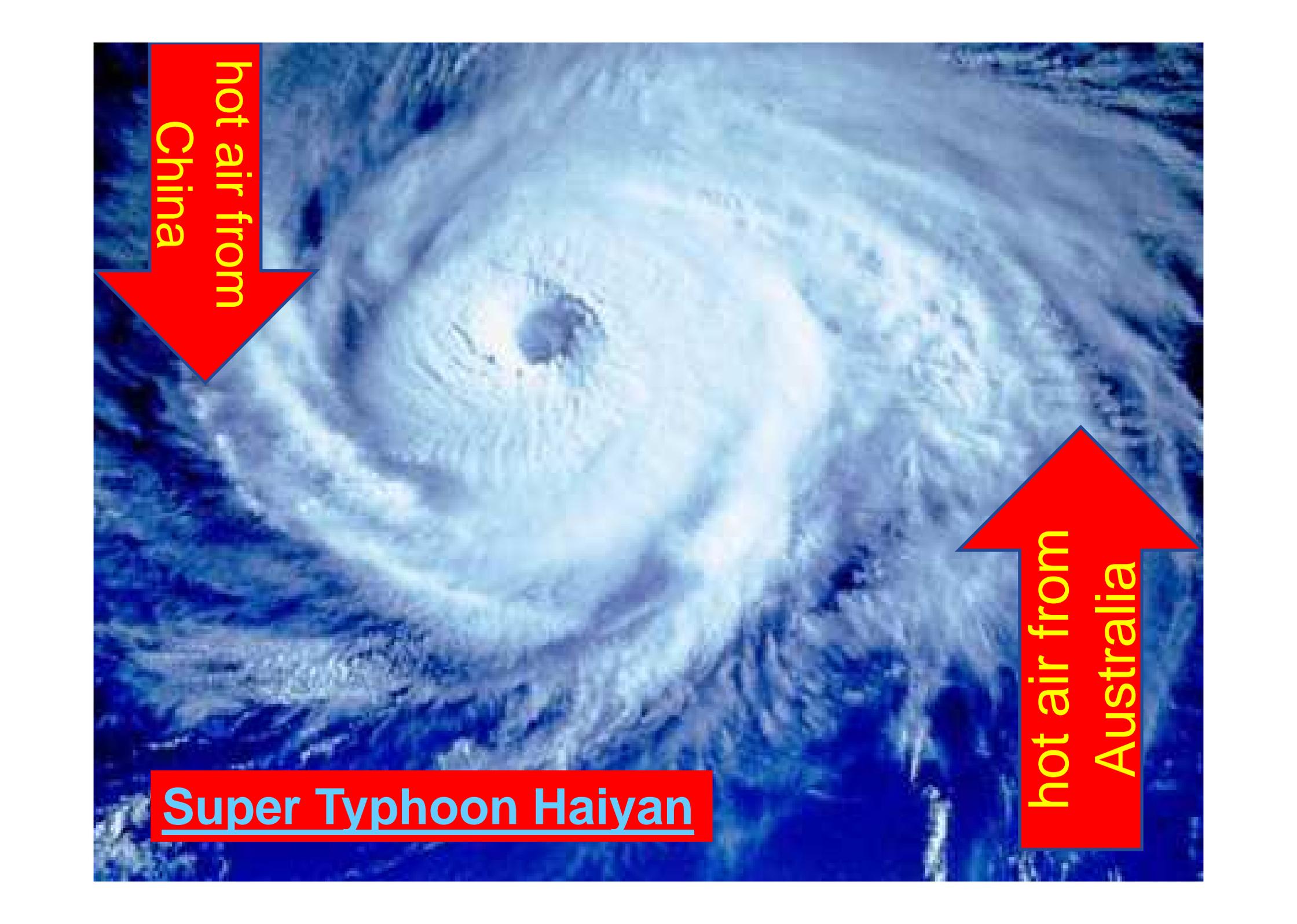
Central Europe 2012

MSC-201306021000-05-06 (R) -08-09 (G) -05 (B)



Copyright (c) 2013 SHMU. Data - Copyright (c) 2013 EUMETSAT



A satellite image of Super Typhoon Haiyan, showing a well-defined eye and spiral cloud bands. Two red arrows point towards the center of the storm. One arrow originates from the left side of the image, pointing towards the storm's eye, and is labeled 'hot air from China'. The other arrow originates from the bottom right side of the image, pointing towards the storm's eye, and is labeled 'hot air from Australia'.

hot air from
China

hot air from
Australia

Super Typhoon Haiyan

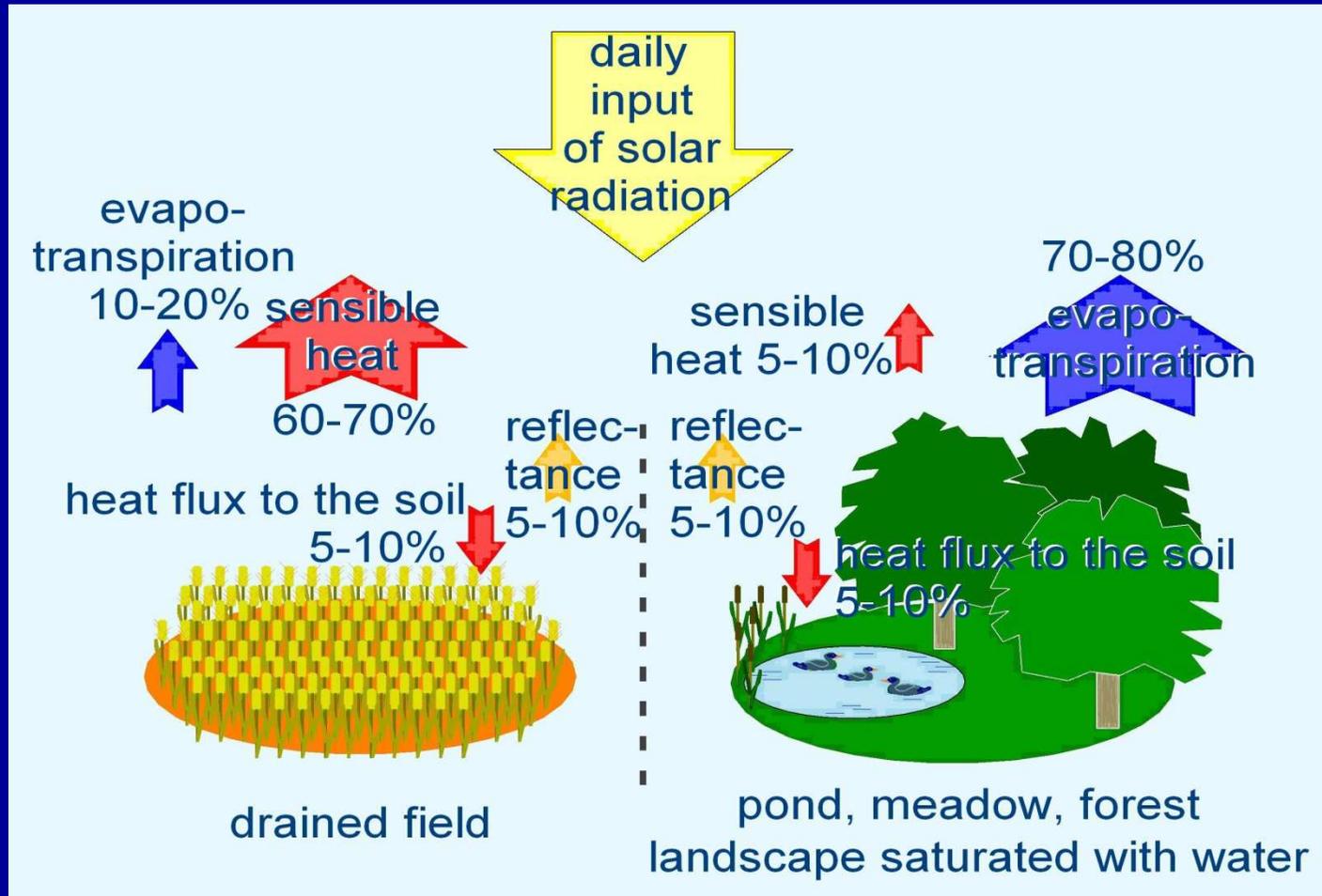
Superstorm Sandy





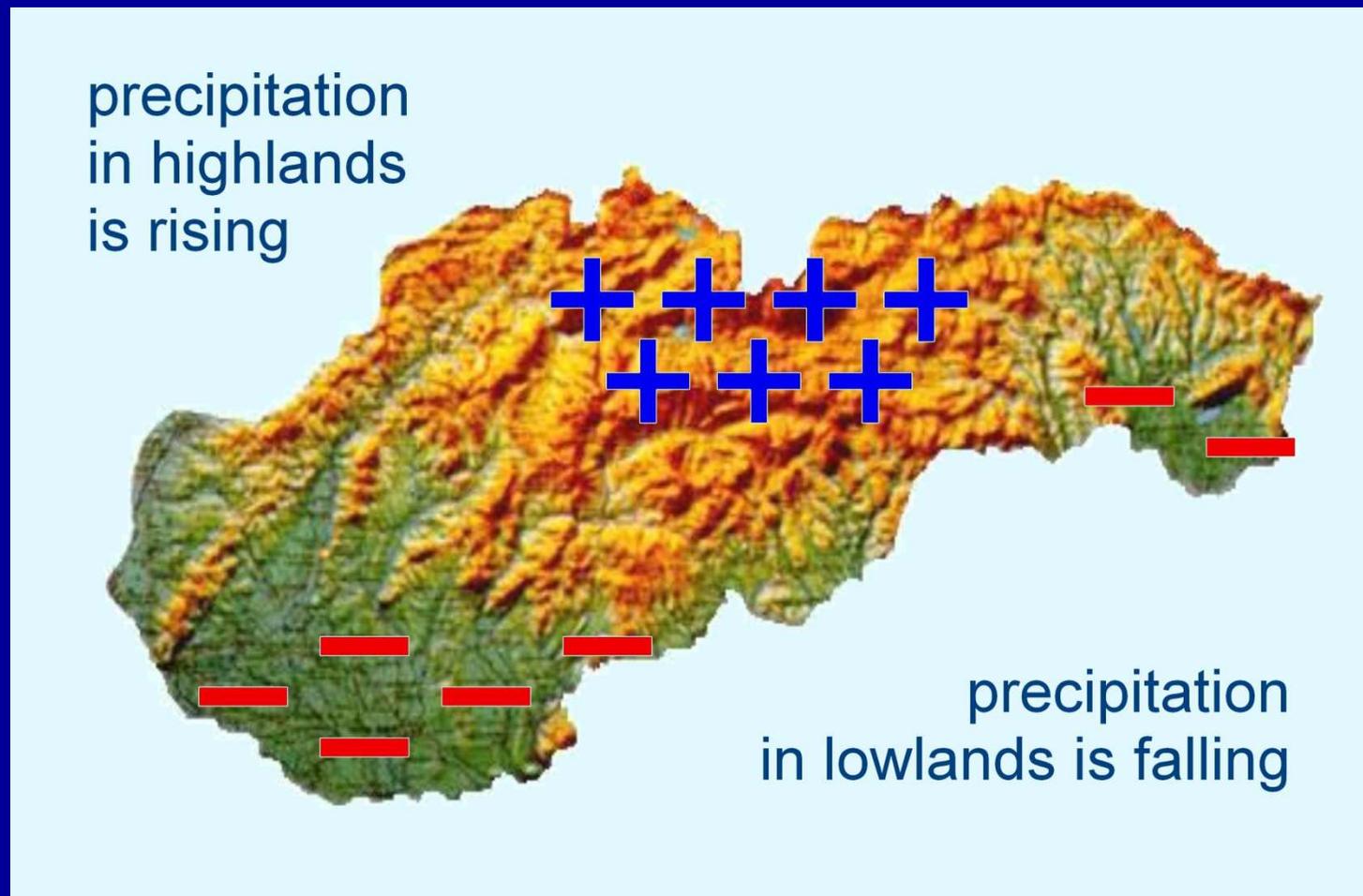
On the end: Global floods

DISTRIBUTION OF SOLAR ENERGY



Dry land: Most solar energy is changed into *sensible heat*,
Wet land: Most solar energy is consumed on vapor water from landscape

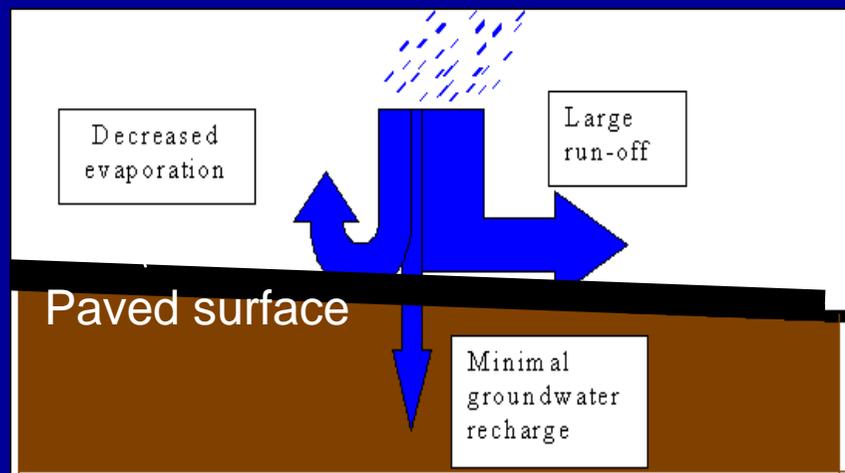
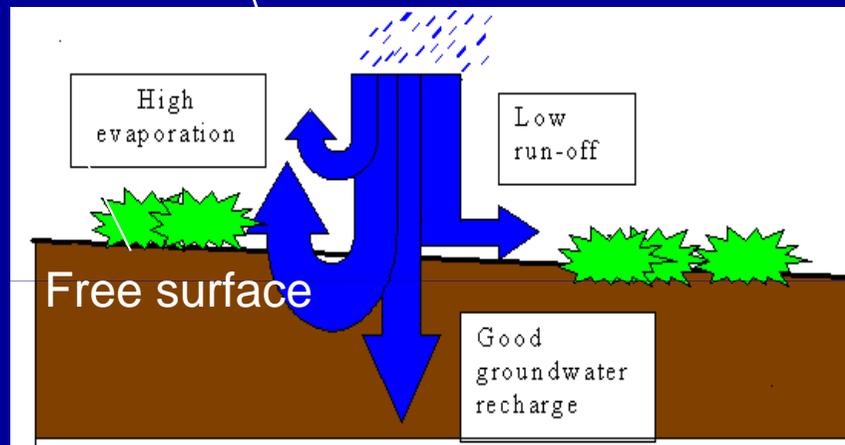
The rain in Slovakia fails mainly on the plain...



What we inherited ?



Impact of deforestation, agriculture and urbanization on state of water in small water cycles:



- runoff increases, infiltration and evaporation decrease
- More than 30.000 billion m3 of rainwater was lost from landscape of continents over last 70 years
- More than 10 cm see level rise

Water runoff on forestry road network!



Water runoff on forestry road network!



Agricultural lands drying by roads !



Agricultural lands drying by bad management !



Forest lands drying by roads !



Drying lands by roads



DEFORESTATION & AGRICULTURE



Deforestation / some forms of farming cause:

- increase of runoff (and erosion)
- lower infiltration (groundwater recharge)
- lower evaporation (change of regional climate)

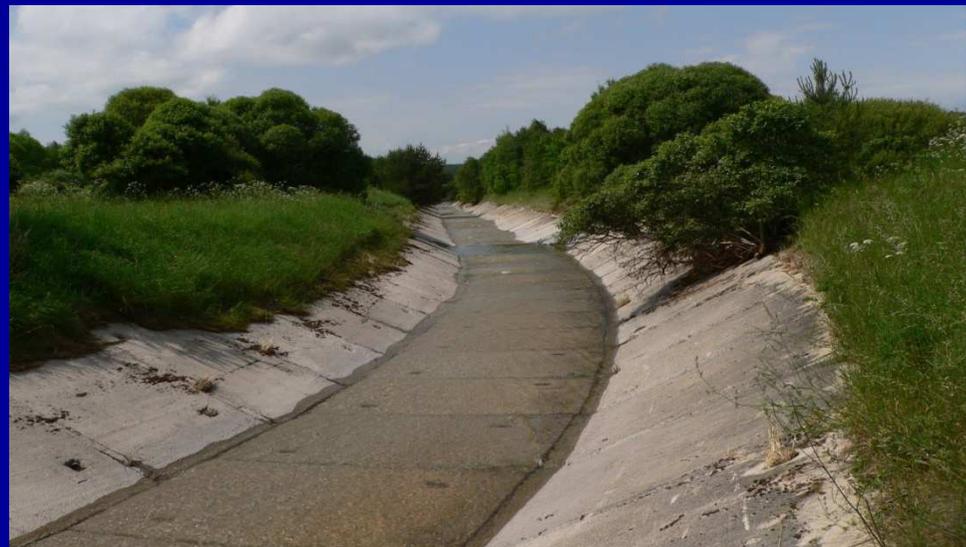
SOIL SEALING IN CITIES

about 20 billion m³ of rainwater sluiced from municipalities of Europe annually, and about 760 bil m³ sluiced from all continents annually.

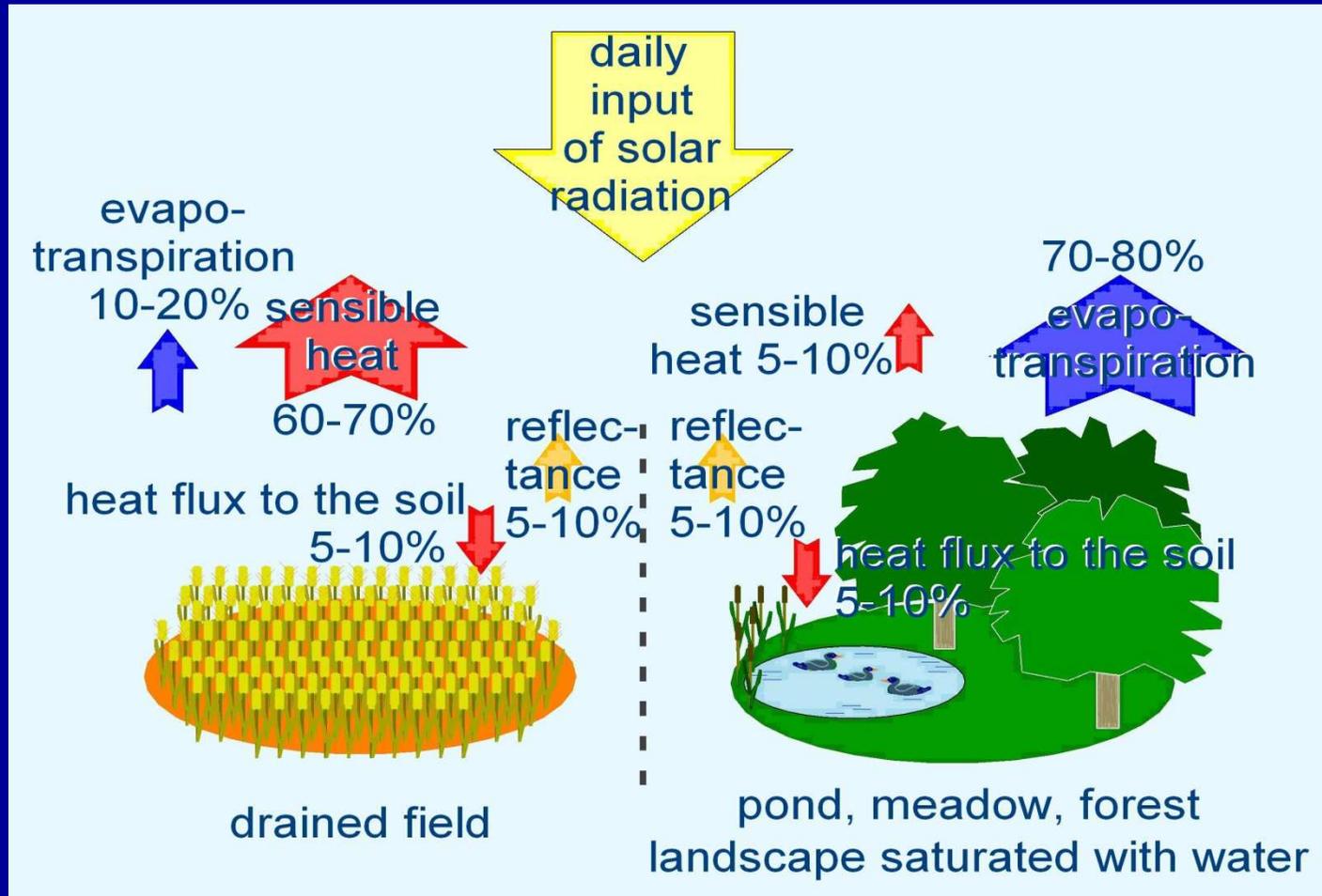


ALTERATION OF RIVERS

- **natural meanders removed**
- **adjacent swamps drained**
- **shortening length increases slope**
- **acceleration of runoff**
- **lowering land's ability to retain water**

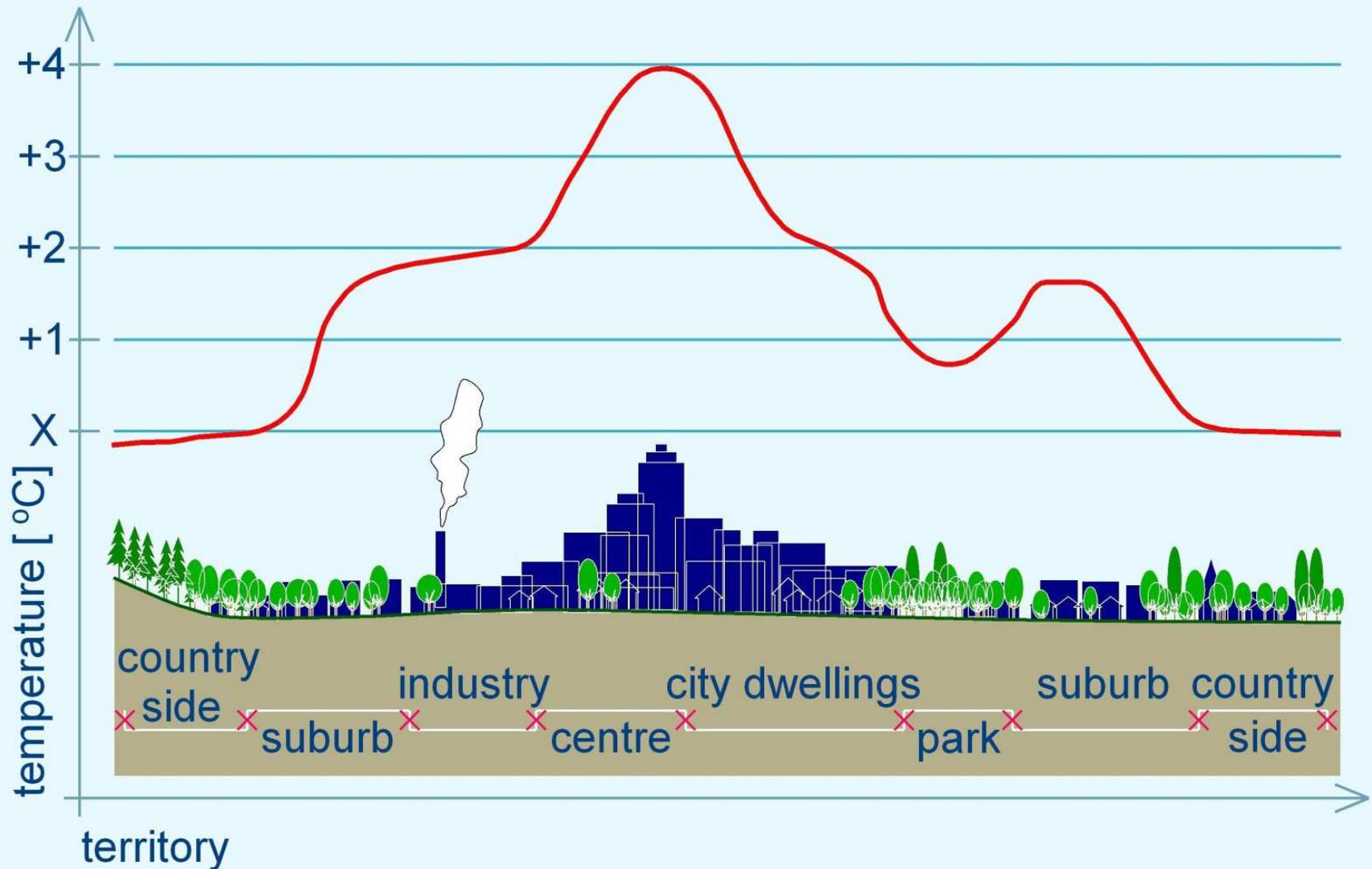


DISTRIBUTION OF SOLAR ENERGY

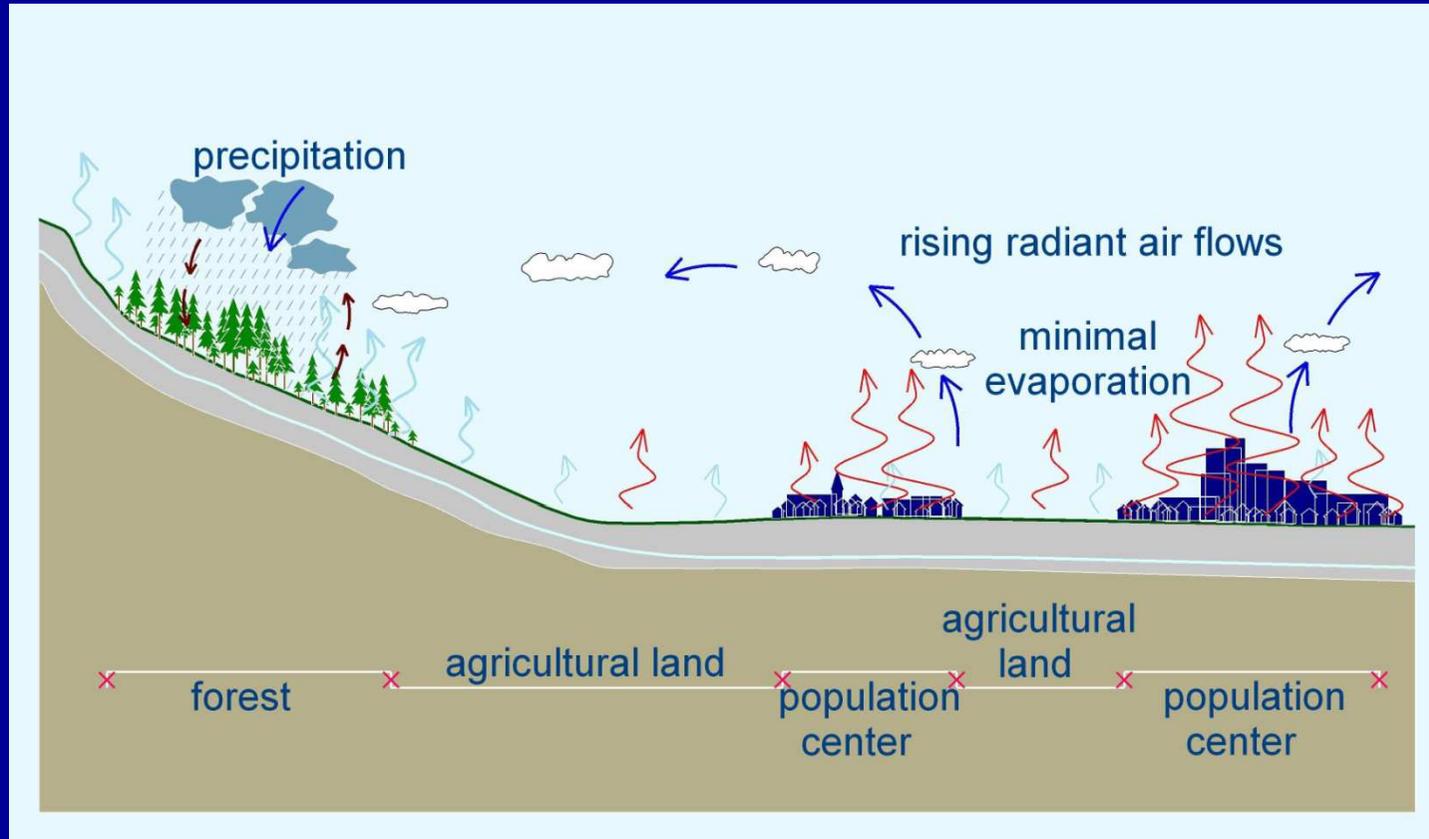


Dry land: Most solar energy is changed into *sensible heat*,
Wet land: Most solar energy is consumed on vapor water from landscape

HEAT ISLANDS OVER DRY and HOT LANDSCAPE

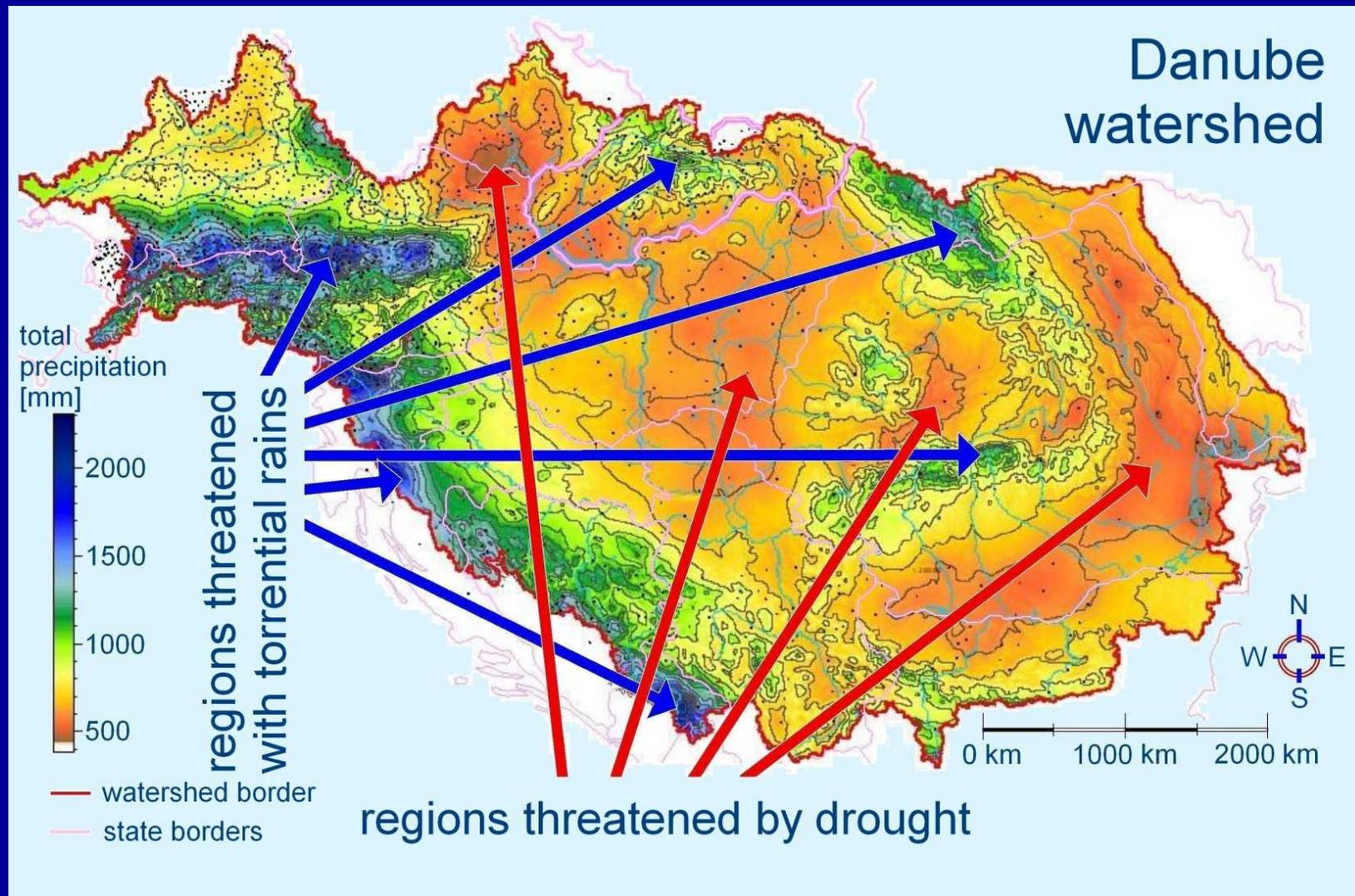


IMPACTS ON WEATHER / CLIMATE

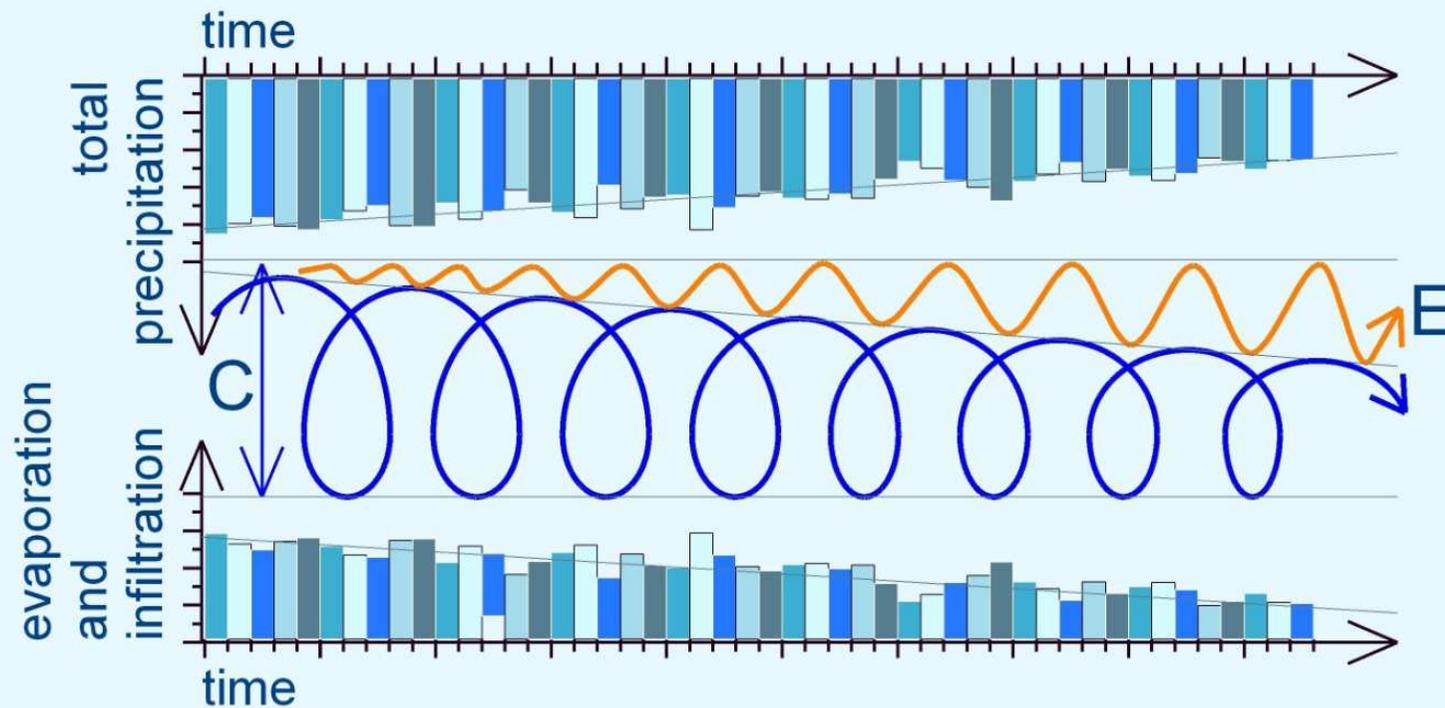


Frequency of droughts and floods increasing

PRECIPITATION IN MOUNTAINS AND LOWLANDS – DANUBE WATERSHED



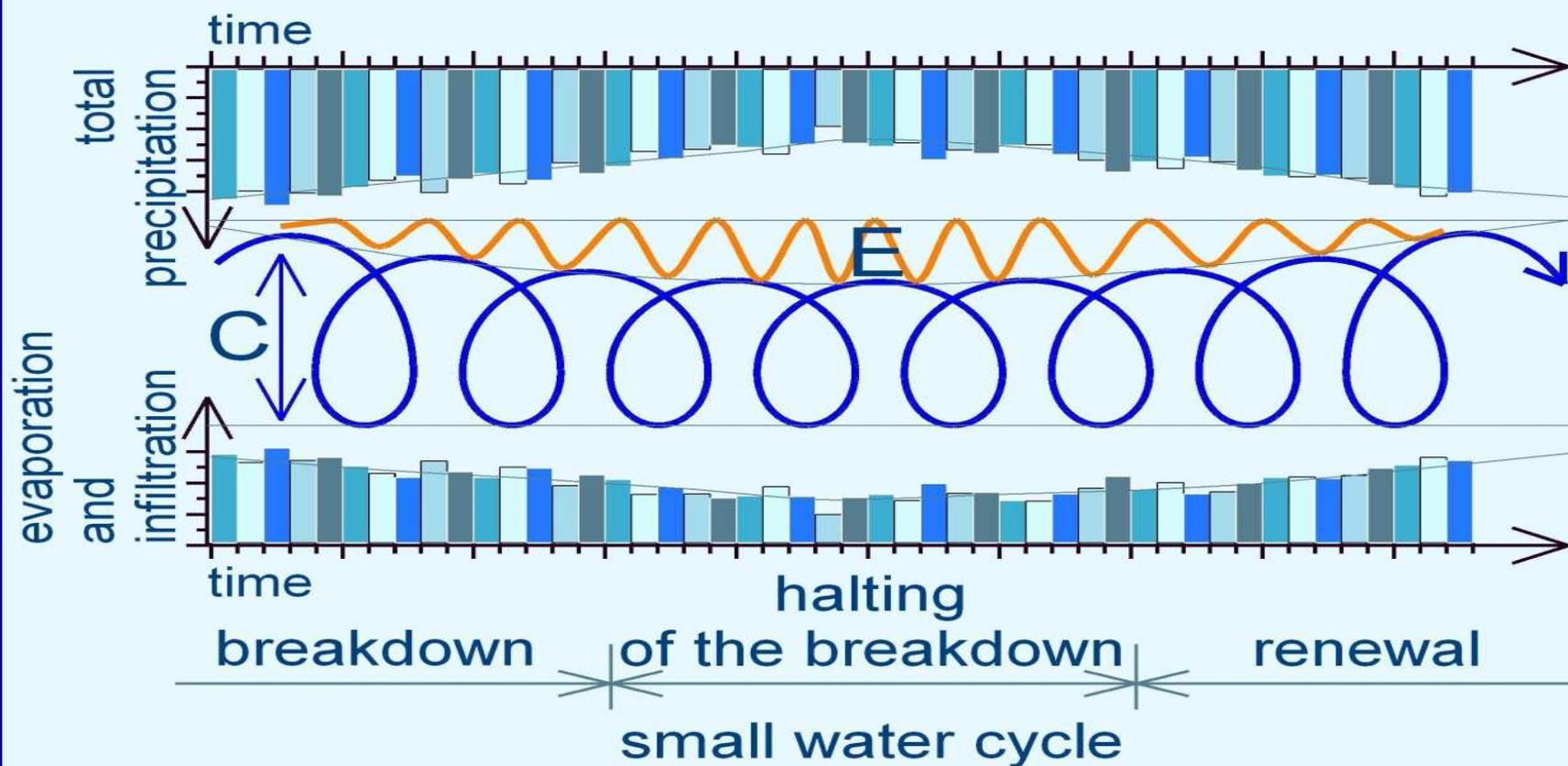
GROWTH OF EXTREME WEATHER WITH DECLINE OF SMALL WATER CYCLES



C - diagram of the circulation of water on land

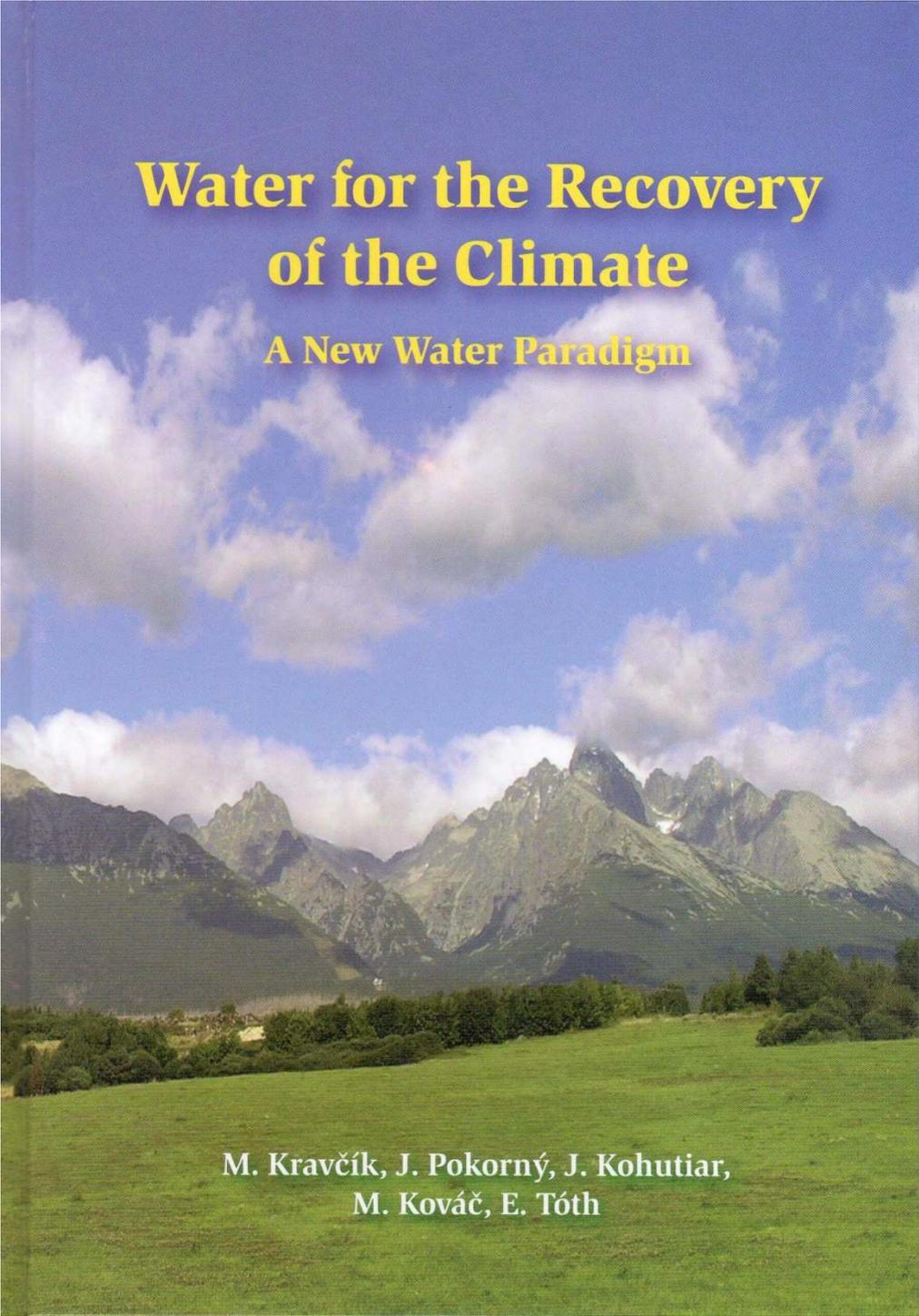
E - diagram of extreme weather events

DESTRUCTION AND RENEWAL OF SMALL WATER CYCLE



C - diagram of the circulation of water on land

E - diagram of extreme weather events



Water for the Recovery of the Climate

A New Water Paradigm

M. Kravčík, J. Pokorný, J. Kohutiar,
M. Kováč, E. Tóth

- **humanity accelerates the runoff from land**
- **more solar energy is transformed into sensible heat**
- **draining of a land can be reversed through comprehensive conservation of rainwater**
- **renewal of small water cycle over land can temper extreme weather events and ensure a growth in water reserves**

•
www.waterparadigm.org

Old water paradigm

- **protects surface water as the main source and reserve of water**

New water paradigm

- **protects groundwater and soil water as the main treasure of water**

www.waterparadigm.org

Old water paradigm

- **rainwater is an inconvenience, needs to be quickly removed**

New water paradigm

- **rainwater is an asset that needs to be retained (especially in soil/plants)**

www.waterparadigm.org

Old water paradigm

- **soil sealing has minimal impact on the water cycle**

New water paradigm

- **soil sealing has a fundamental impact on the water cycle**

www.waterparadigm.org

Old water paradigm

- **soil sealing has minimal influence on global warming**

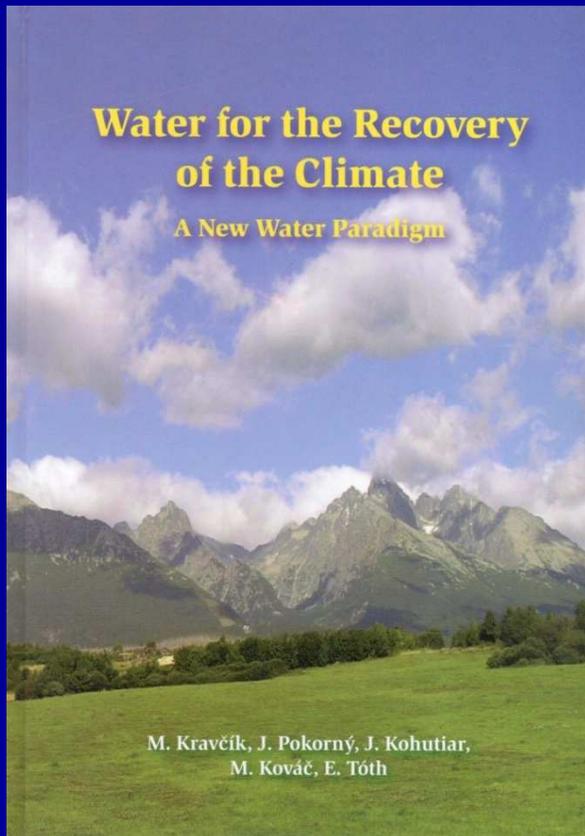
New water paradigm

- **soil sealing may be important factor in global warming**

www.waterparadigm.org

Initiative by group of Central European Activists

Water for the Recovery
of the Climate
A New Water Paradigm



M. Kravčík, J. Pokorný, J. Kohutiar,
M. Kováč, E. Tóth

Discussion Contribution

**“THE SUBSTANTIAL
ROLE OF WATER
IN THE CLIMATE
SYSTEM OF THE
EARTH”**

**(distributed to more
than 7.000
institutions around
the globe)**



www.ourclimate.eu

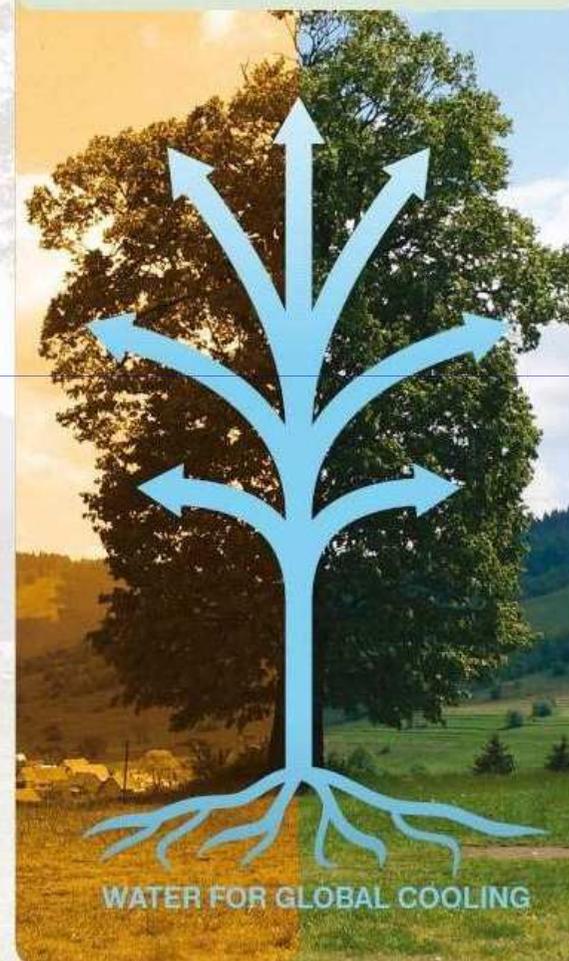
Contact in Copenhagen:

Michal Kravčík
NGO People and Water (Slovakia), Chairman

E-mail: kravcik@ludiaavoda.sk
Mobile phone: +421 905 482 099

WATER, VEGETATION AND CLIMATE CHANGE

Košice Civic Protocol
(addressed to COP15 - Copenhagen)



WATER FOR GLOBAL COOLING

NEW WATER DEAL

more clouds



more soft rain

higher air humidity



more evaporation from lands

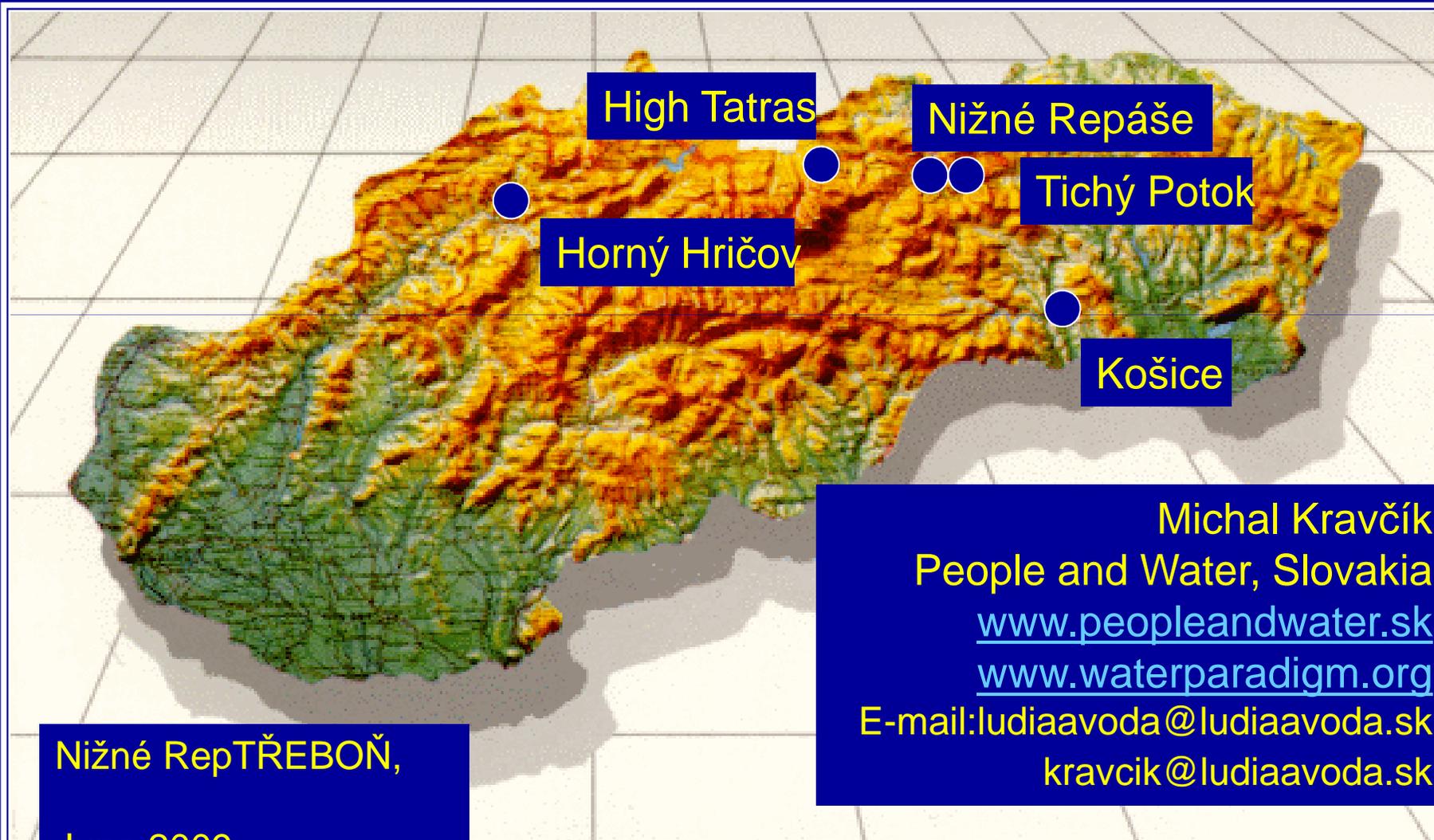
more vegetation and biodiversity

more groundwater recharge

THE NEW WATER DEAL for BLUE PLANET

- **Creation more than 50 million jobs for poor people**
- **waterholding measures can returne 1000 km³ rainwater a year to small water cycles**
- **duration ten years**
- **0,008 EUR/m³, while current technologies require cca 0,3 eur/m³**
- **costs about 400 billion EUR annually**

The cases for rehabilitation of devastated landscape by People and Water



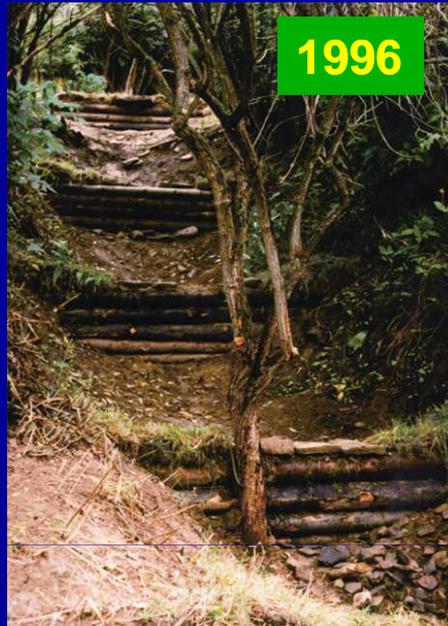
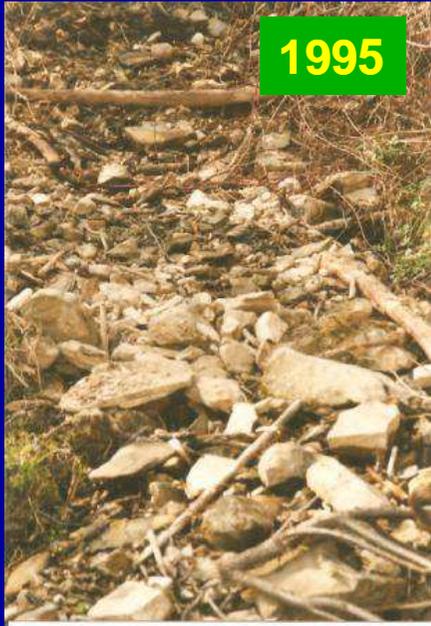
Nižné RepTŘEBOŇ,

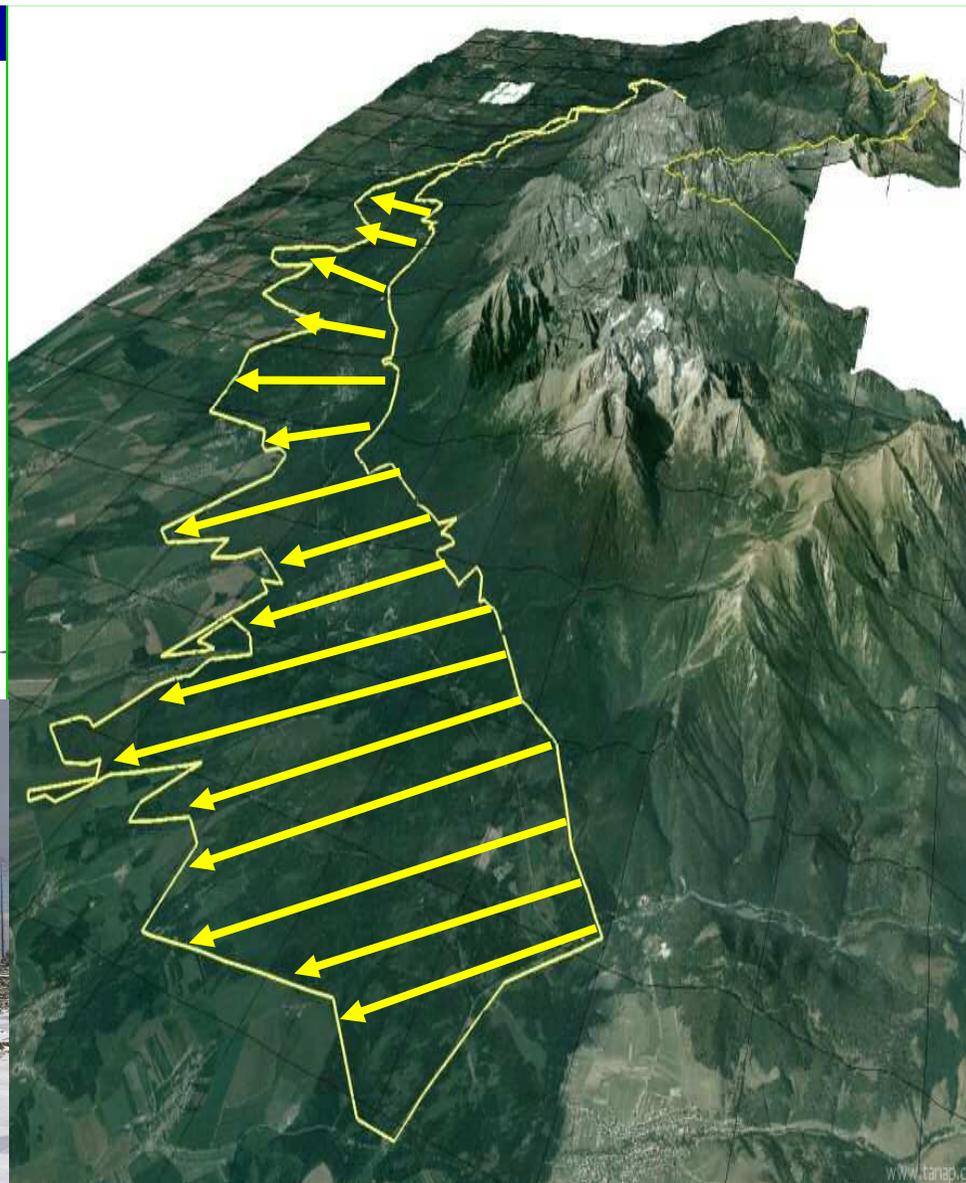
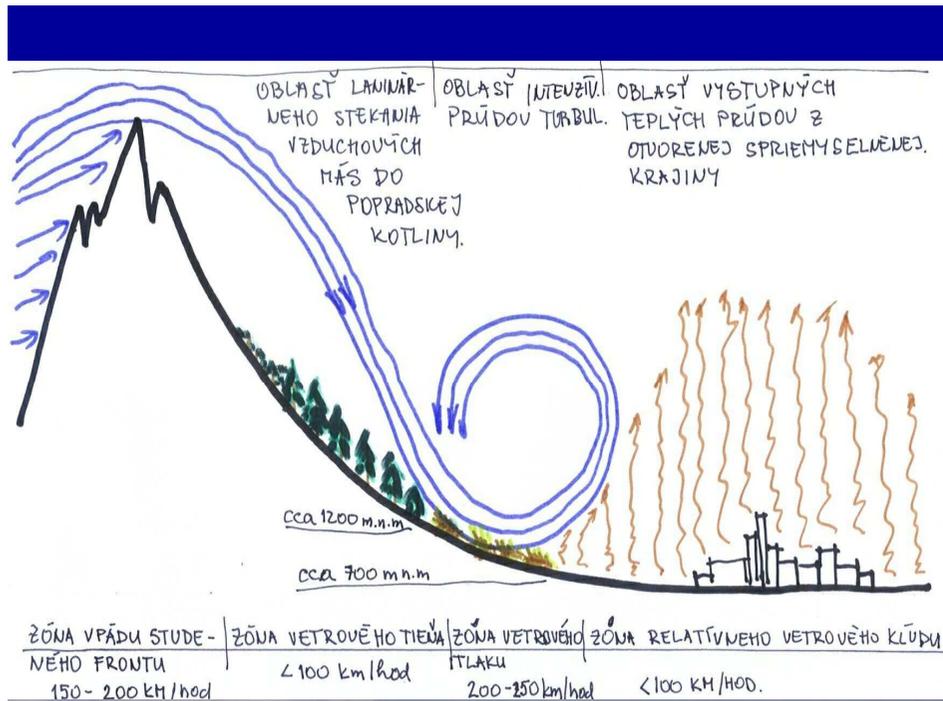
June 2000

BLUE ALTERNATIVE - TICHÝ POTOK, 1996



BLUE ALTERNATIVE





**What happened in November, 19th 2004
12.600 hectares of forest was damaged, with risks of drying up,
erosion and loss typical climate**



2nd Phase:
Building more than 2.000 waterholdings on the 40 ha of Water Forest
(July – September 2005)



3rd Phase:

Building waterholdings on the 12 ha of burned area
(September – October 2005)



4th Phase:
Planting new trees at Water Forest
October 2005 - May 2006



Water Forest in High Tatras after 5 years



Water Forest in High Tatras after 9 years

Flood protection Waterholding, High Tatras, Slovakia





Botanic garden in High Tatras 2006

Horný Hričov, 2009

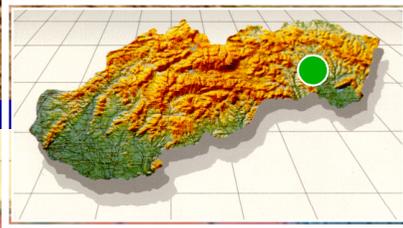




November, 28th 2005



June, 6th 2006



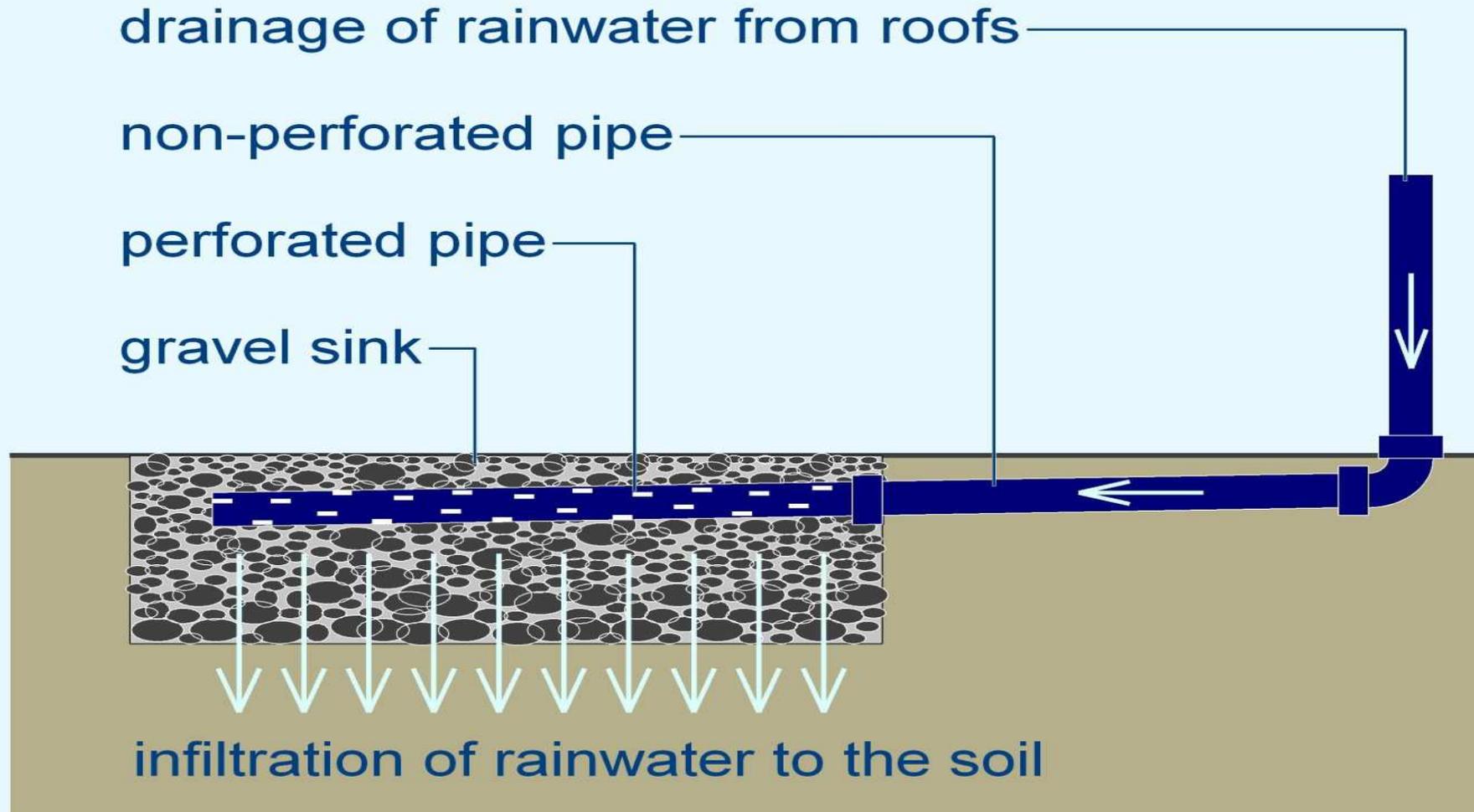
June, 30th 2006



September, 16th 2006

**Restoration of water sources in urban zone Košice
People and Water, September 2006**

RAINWATER HARVESTING FROM ROOFS IN CITIES



Principle „Keep rainwater on the land“

MIKROŠTRUKTÚRY NA ZACHYTÁVANIE VODY V TERÉNE

1. VRSTEVNICOVÉ HRÁDZKY



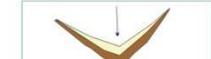
2. TERASY



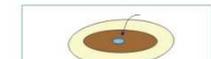
3. POLOOBLÚKOVÉ HRÁDZKY



4. TROJUHOLNÍKOVÉ HRÁDZKY



5. OČNÉ TERASY



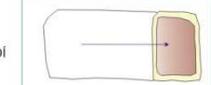
6. ŽLABOVÝ TYP MIKROPOVODÍ



7. JAMKOVÉ ŠTRUKTÚRY



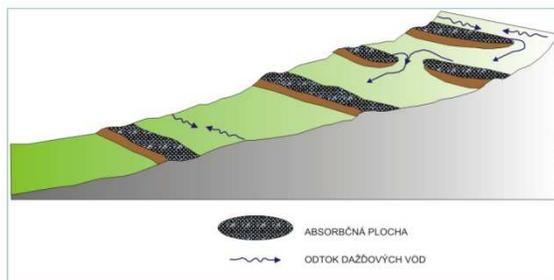
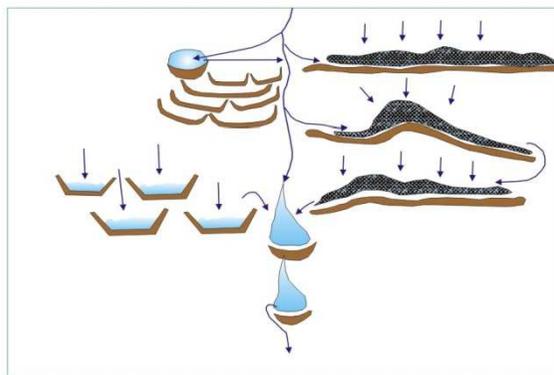
8. KAZETOVÉ ŠTRUKTÚRY MIKROPOVODÍ



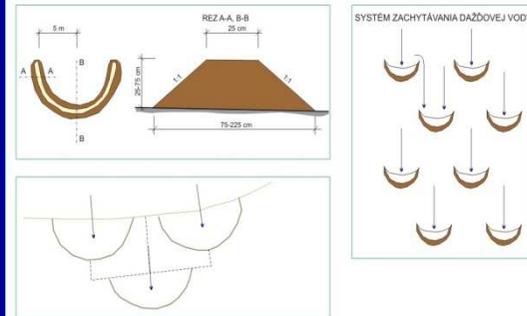
9. ŠACHOVNICOVÉ ŠTRUKTÚRY



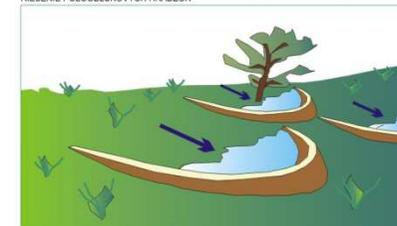
KOMBINÁCIA ROZNYCH TECHNÍK ZADRŽIAVANIA DAŽDOVÝCH VOD



POLOOBLÚKOVÉ HRÁDZKY



RIEŠENIE POLOOBLÚKOVÝCH HRÁDZOK



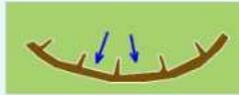
RIEŠENIE POLOOBLÚKOVÝCH HRÁDZOK



RAINWATER HARVESTING ON SLOPES

Microstructures for the rainwater harvesting on land

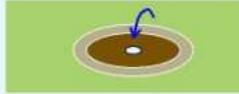
Contoured barrages



Terraces



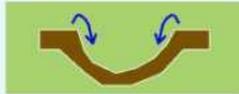
Eyebrow terraces



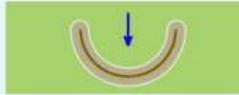
Pits



Vallerani-type microcatchments



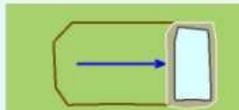
Semicircular bunds



Triangular bunds



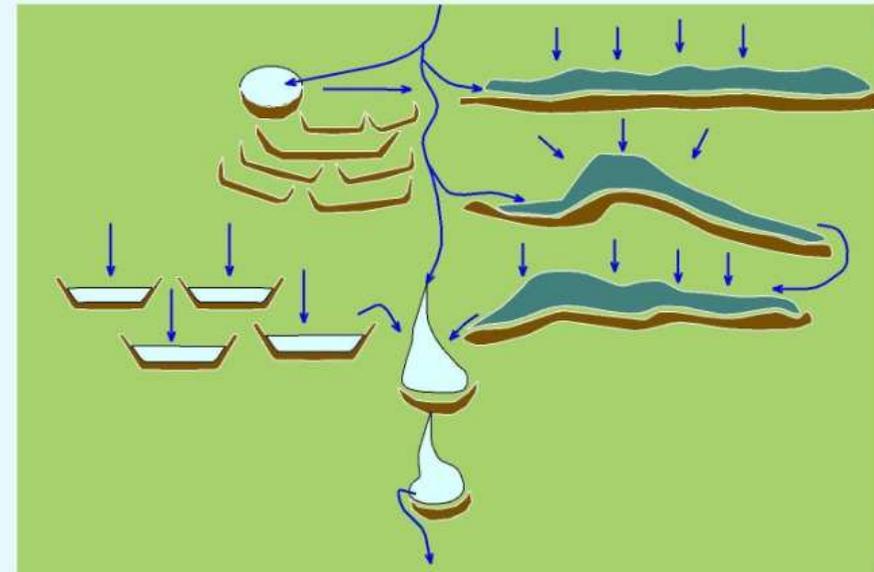
Meskat



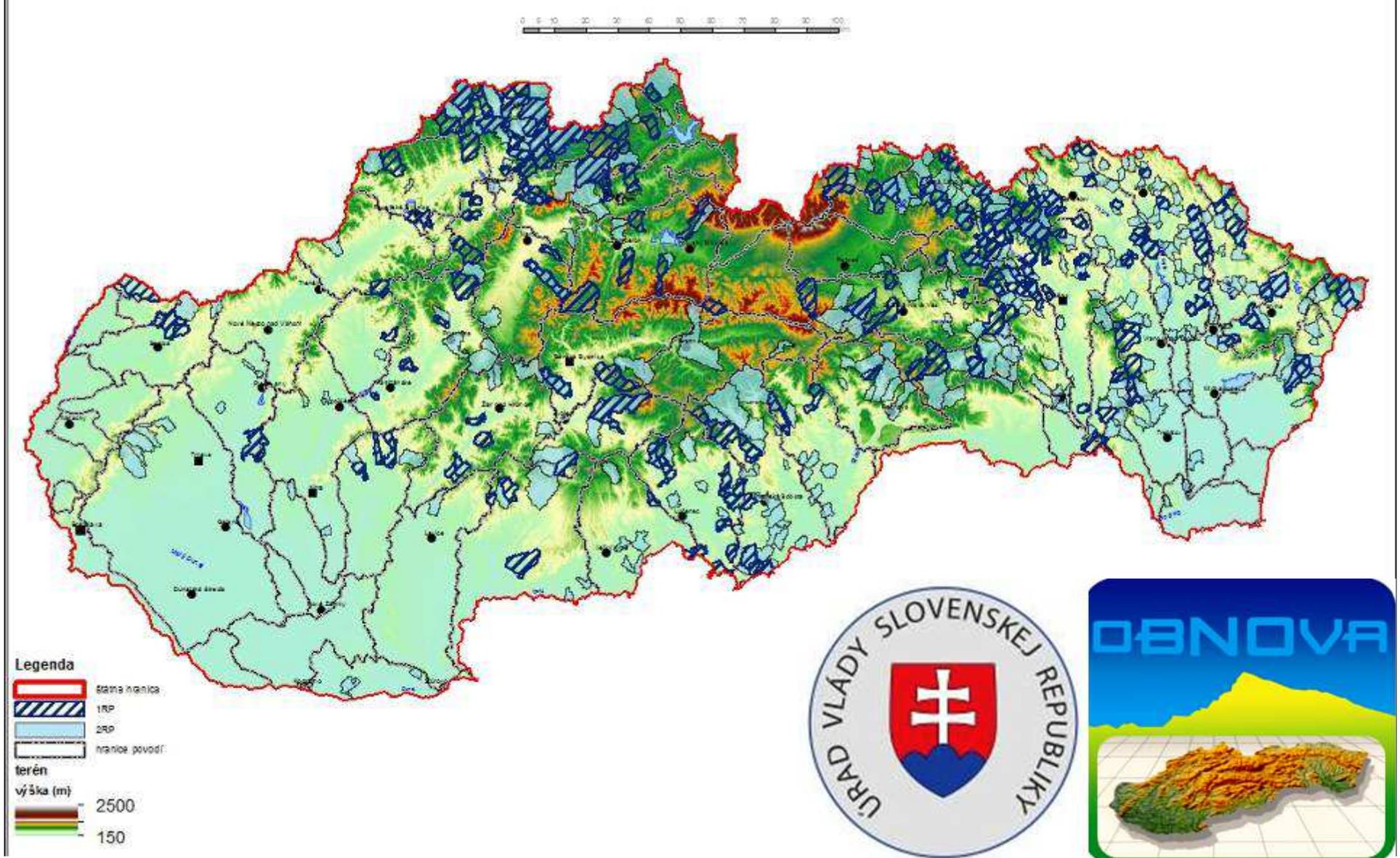
Negarim



Combination of different rainwater harvesting technologies

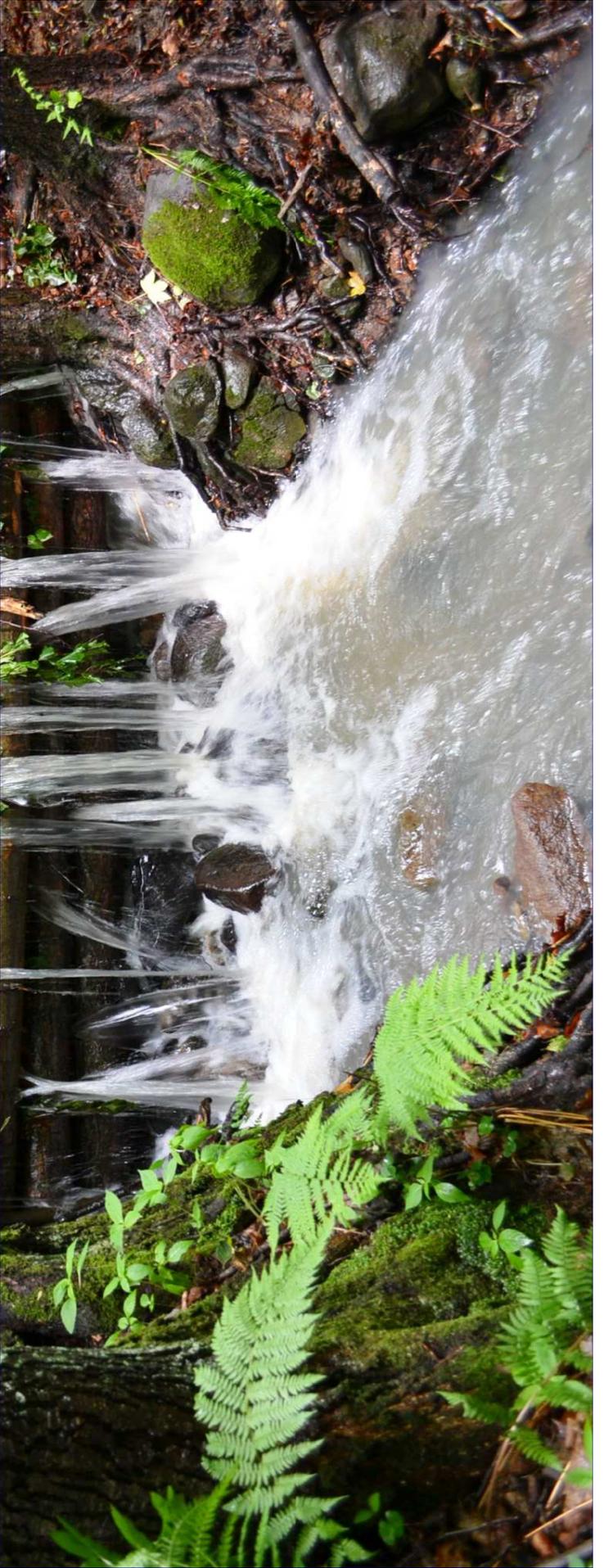


488 communities involved in the Government Landscape Restoration Program in 2011



ŤAHANOVCE





Snežnica

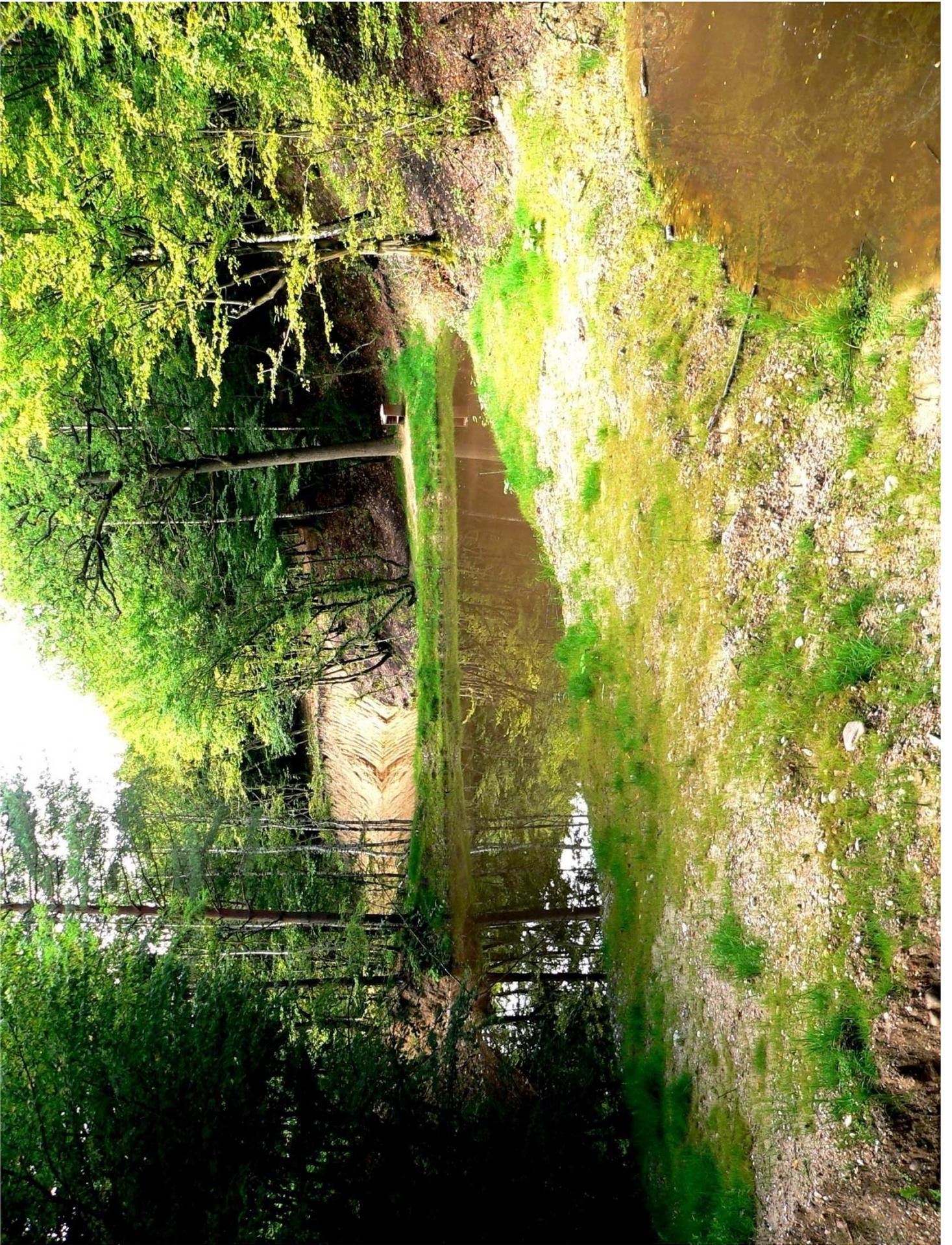


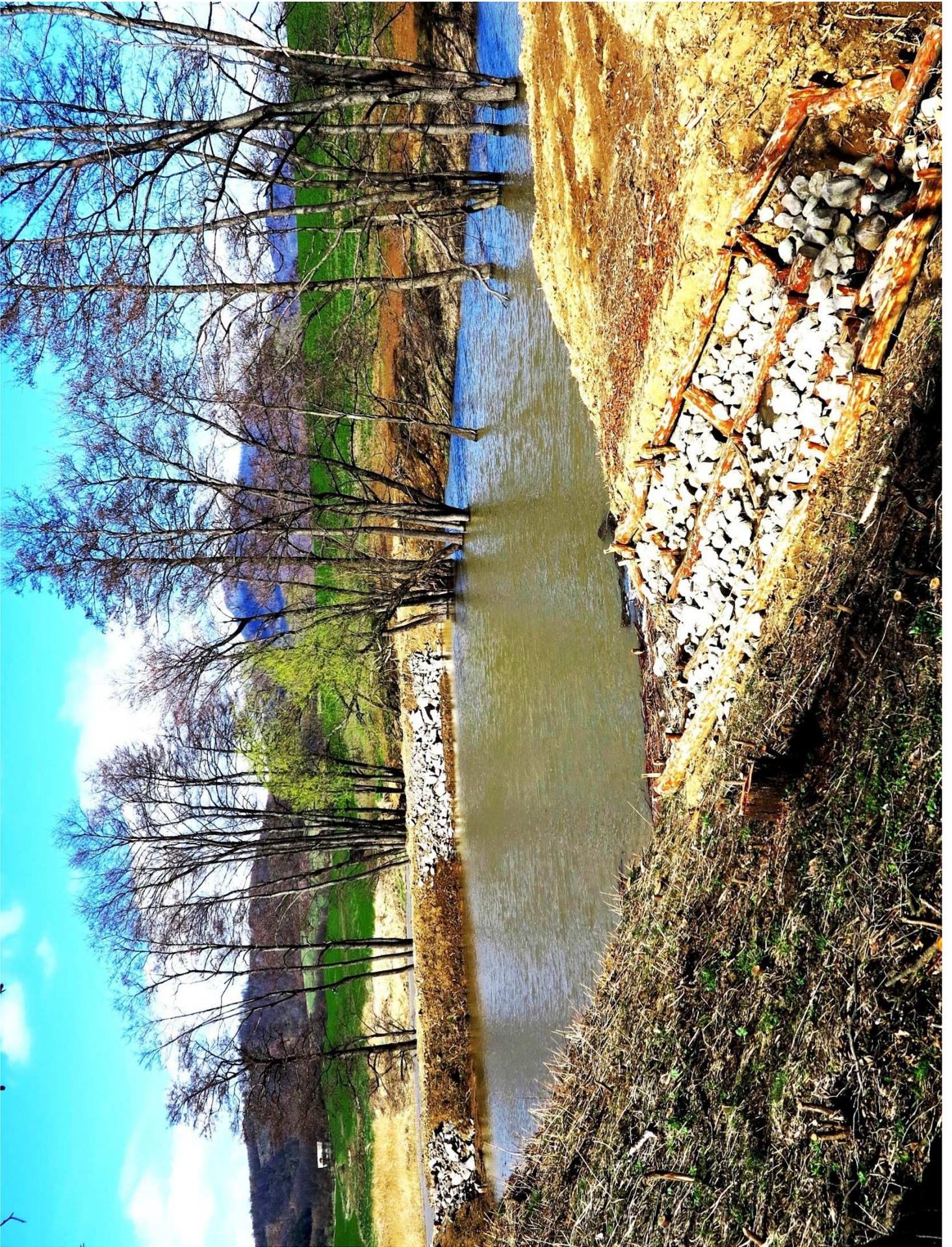
Hlohovec

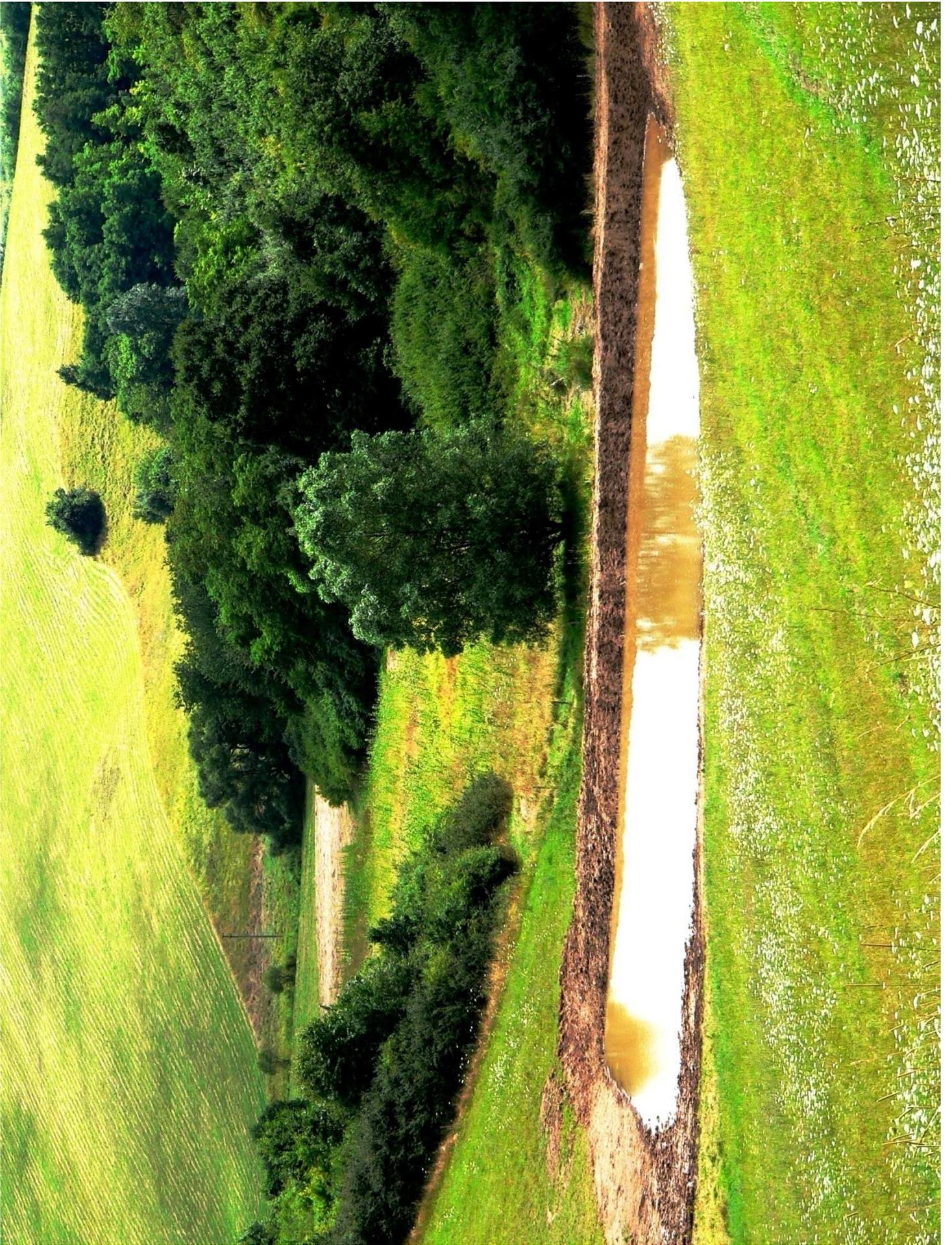


Hlohovec









THE SLOVAK NEW WATER DEAL



MICHAL KRAVČÍK A KOLEKTÍV

Po nás púšť a potopa?

After us, the desert and the deluge?

1. More than 100.000 measures in 488 communities
2. More than 10 mil. m³ of waterholdings
3. More than 8.000 jobs for poor people

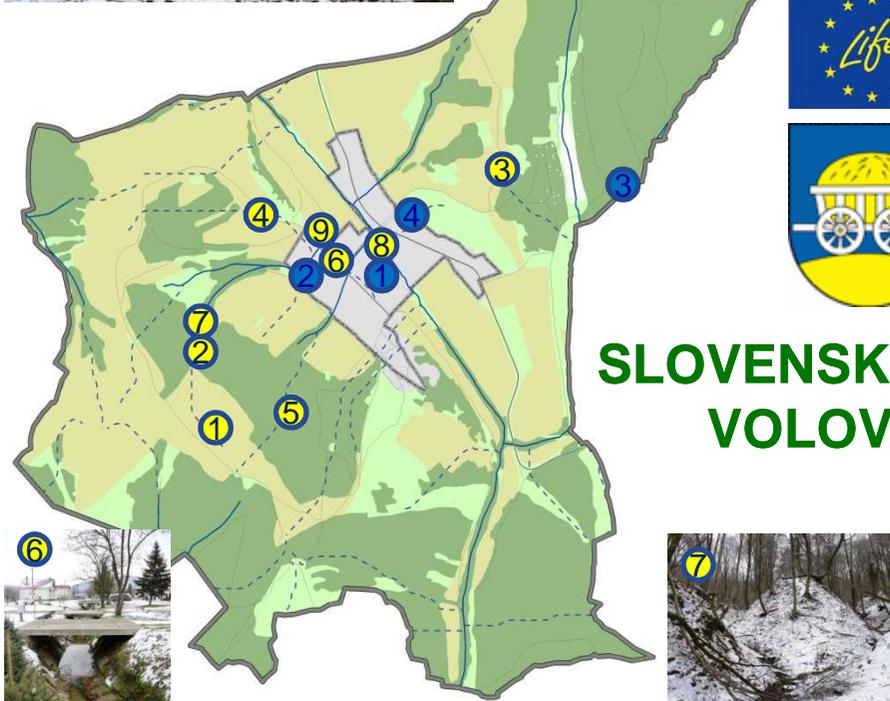
Hydro-Climate Recovery

Rainwater Storage in damaged landscape



LIFE11 ENV/SK/1019,





Legenda

Využitie územia

- TTP a ostatné plochy
- les
- orná pôda

- miestna komunikácia
- ostatné komunikácie
- toky
- suché toky

Administratívne hranice

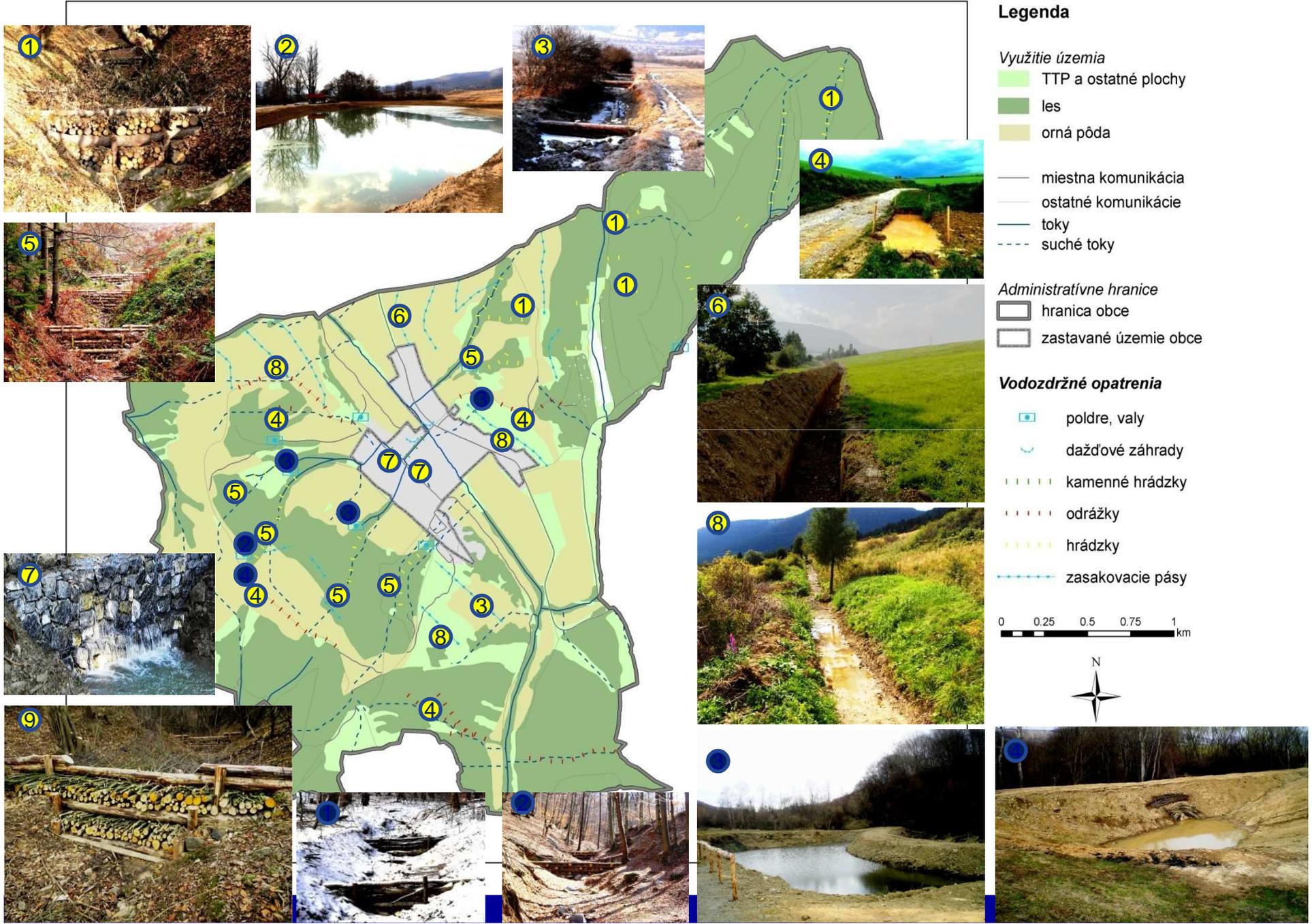
- hranica obce
- zastavané územie obce



SLOVENSKÁ VOĽOVÁ



Slovenská Volová



Legenda

Využitie územia

- TTP a ostatné plochy
- les
- orná pôda

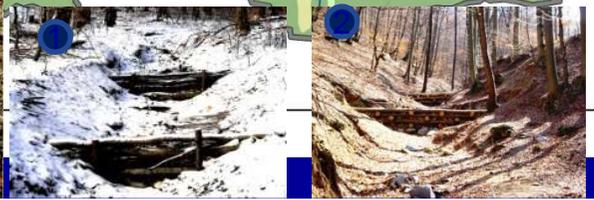
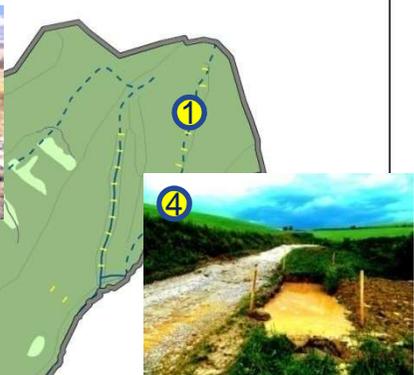
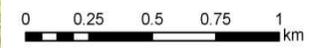
- miestna komunikácia
- ostatné komunikácie
- toky
- suché toky

Administratívne hranice

- hranica obce
- zastavané územie obce

Vodozdržné opatrenia

- poldre, valy
- dažďové záhrady
- kamenné hrádzky
- odrážky
- hrádzky
- zasakovacie pásy



One village - SLOVENSKÁ VOLOVÁ



- 142 soft measurements
- 8 unemployments
- 5 months

Image © 2014 CNES / Astrium
© 2014 Google

Google earth

Types of measurements in landscape



Summary in 2013

1. Implemented 758 measurements,
2. 58 jobs for poor people
3. In 8 villages of one catchment area

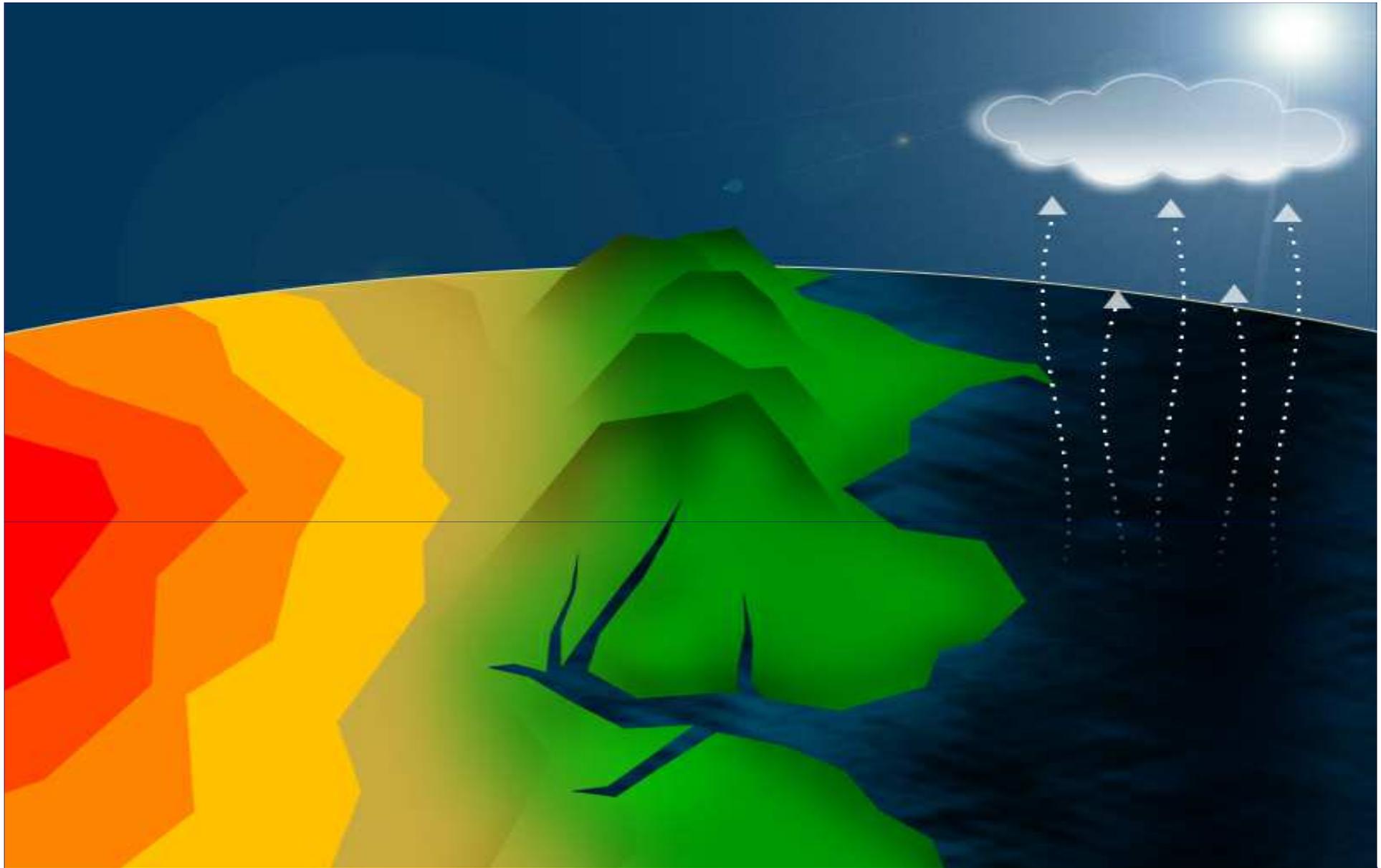


Solution for urban area



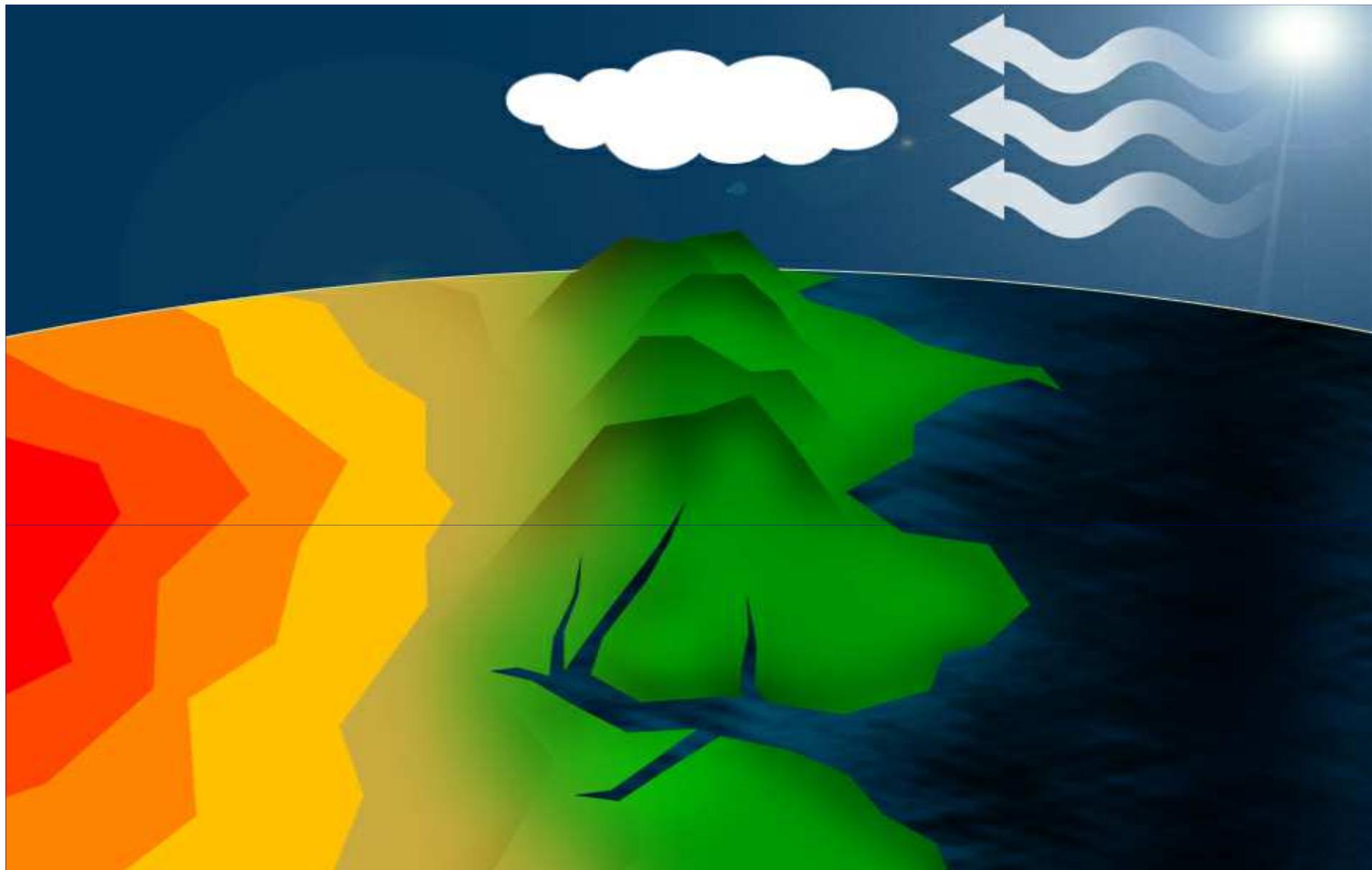
Rain gardens for urban zones





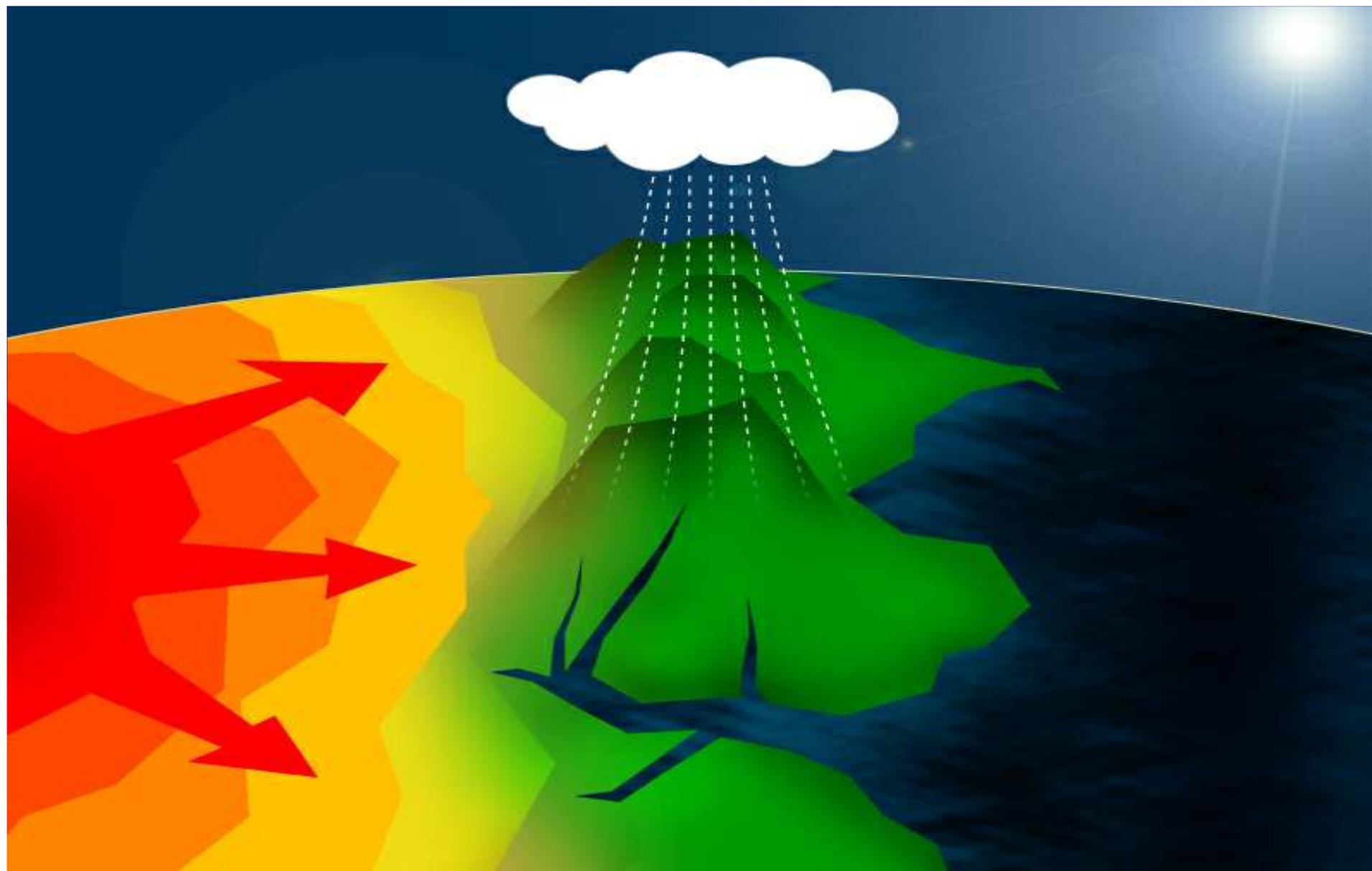
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Institute for Sustainable Watersheds

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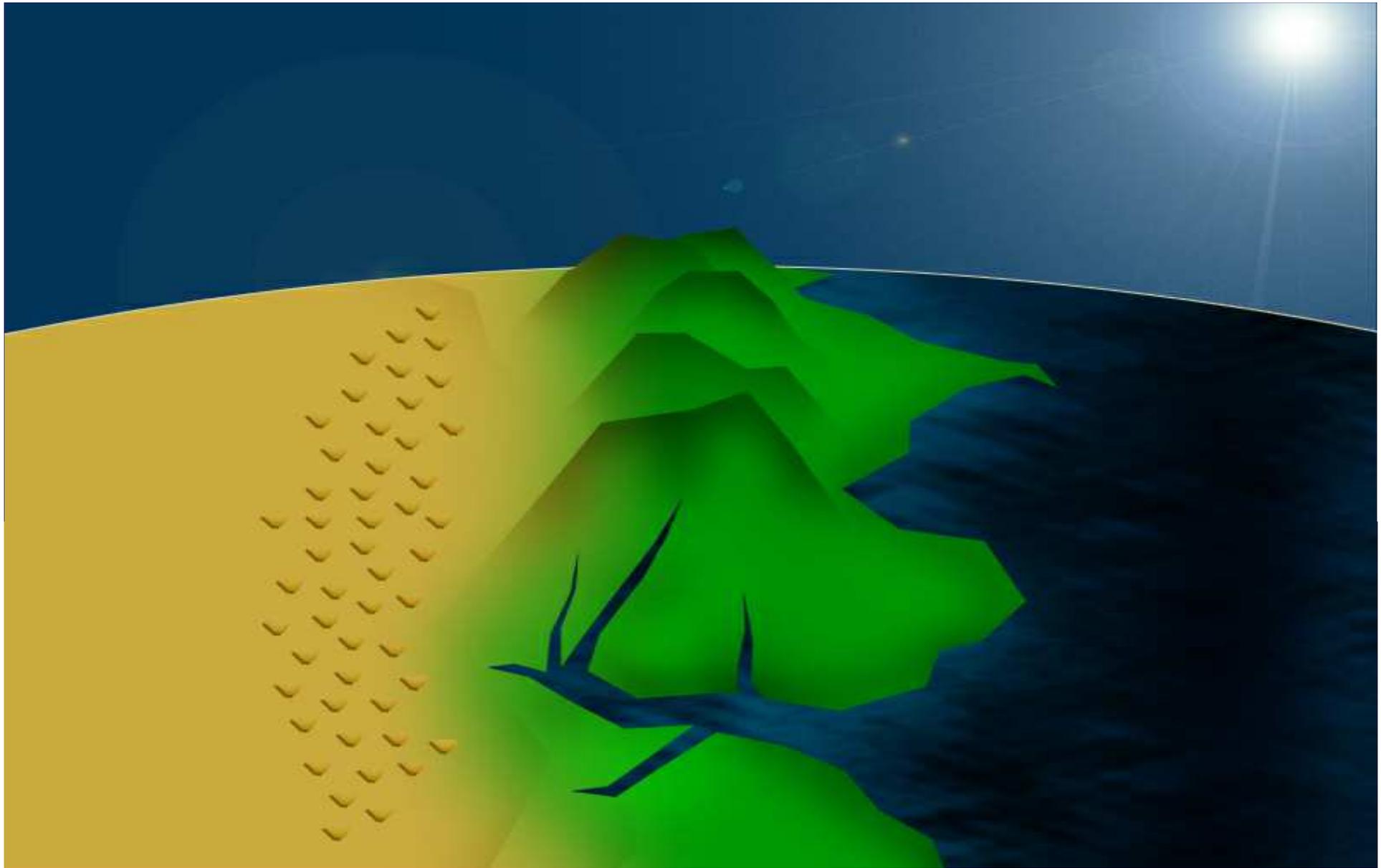
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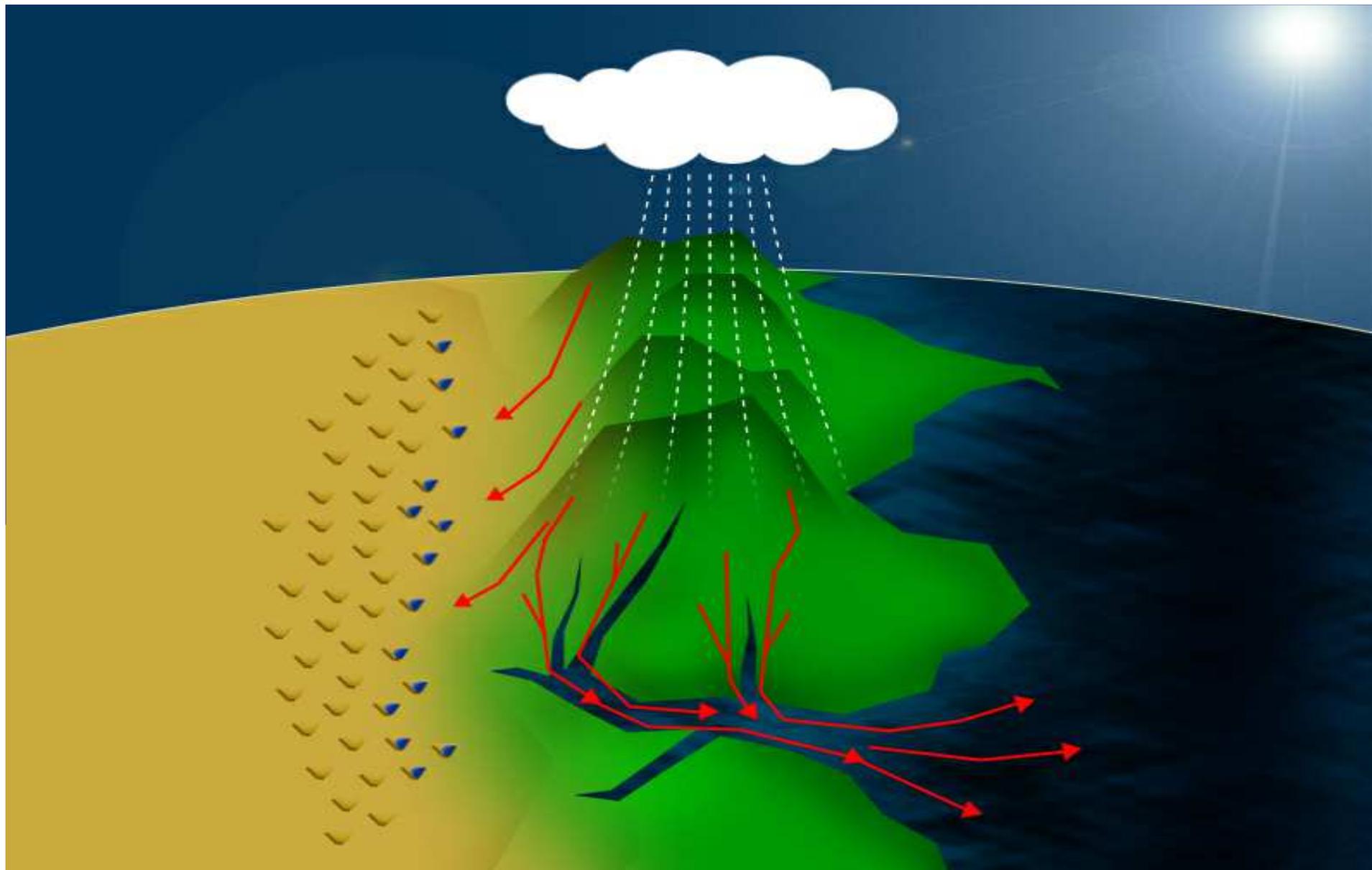
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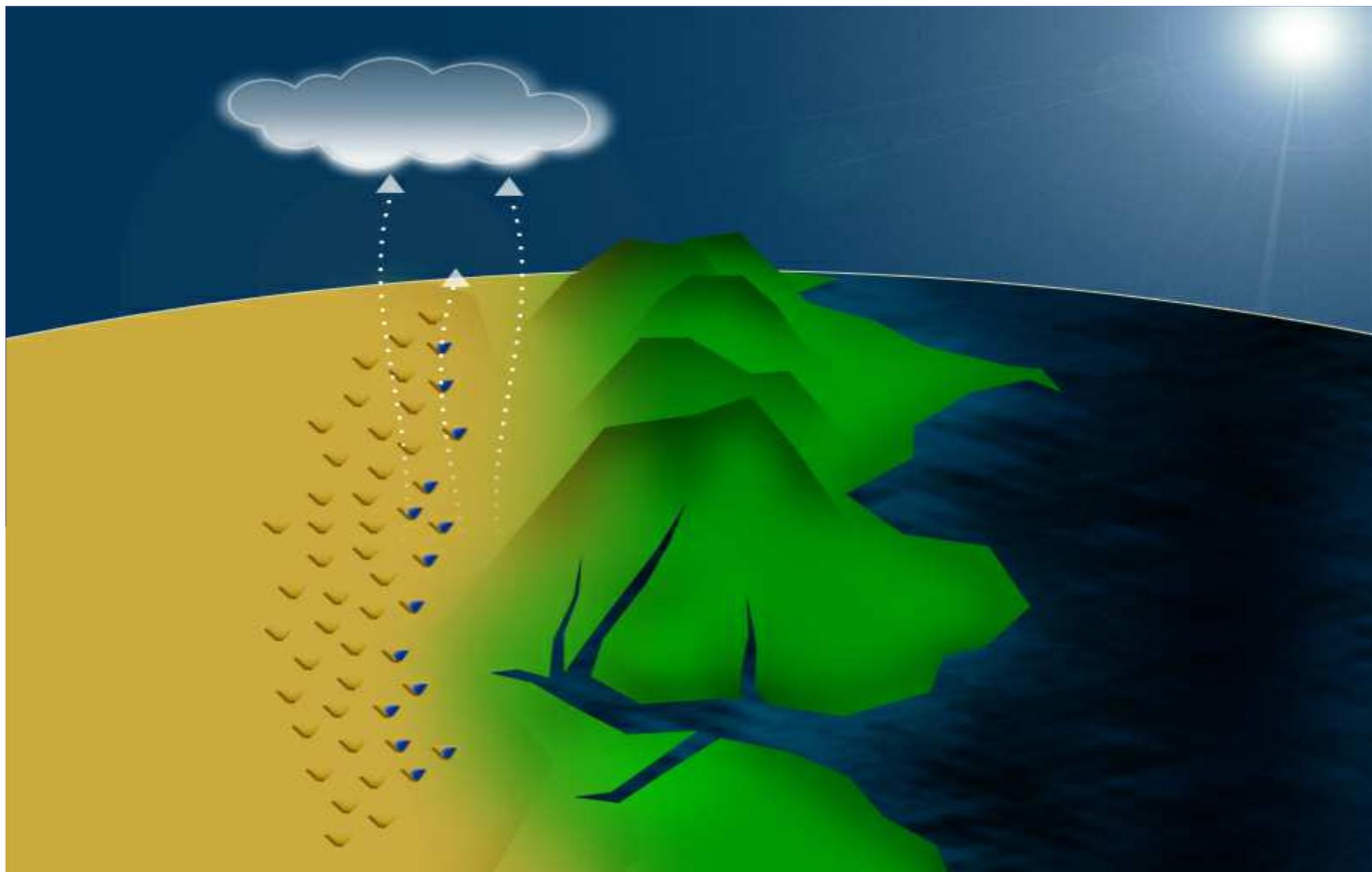
Cermelska road 24, 040 01 Kosice, Slovakia Tel.Fax: +421 55 799 88 06-7, e-mail: ludiaavoda@ludiaavoda.sk, www.ludiaavoda.sk



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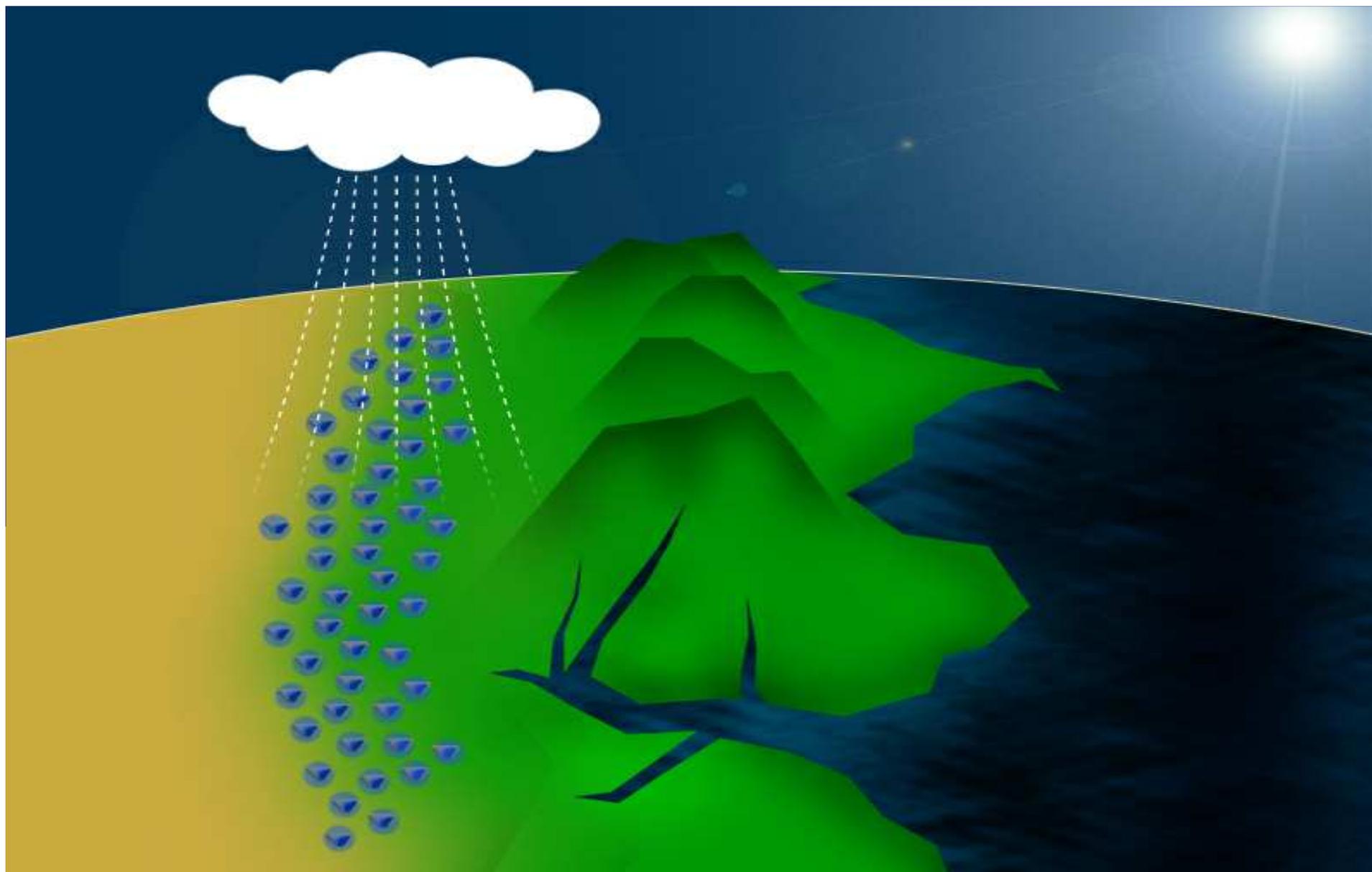
Cermelska road 24, 040 01 Kosice, Slovakia Tel.Fax: +421 55 799 88 06-7, e-mail: ludiaavoda@ludiaavoda.sk, www.ludiaavoda.sk



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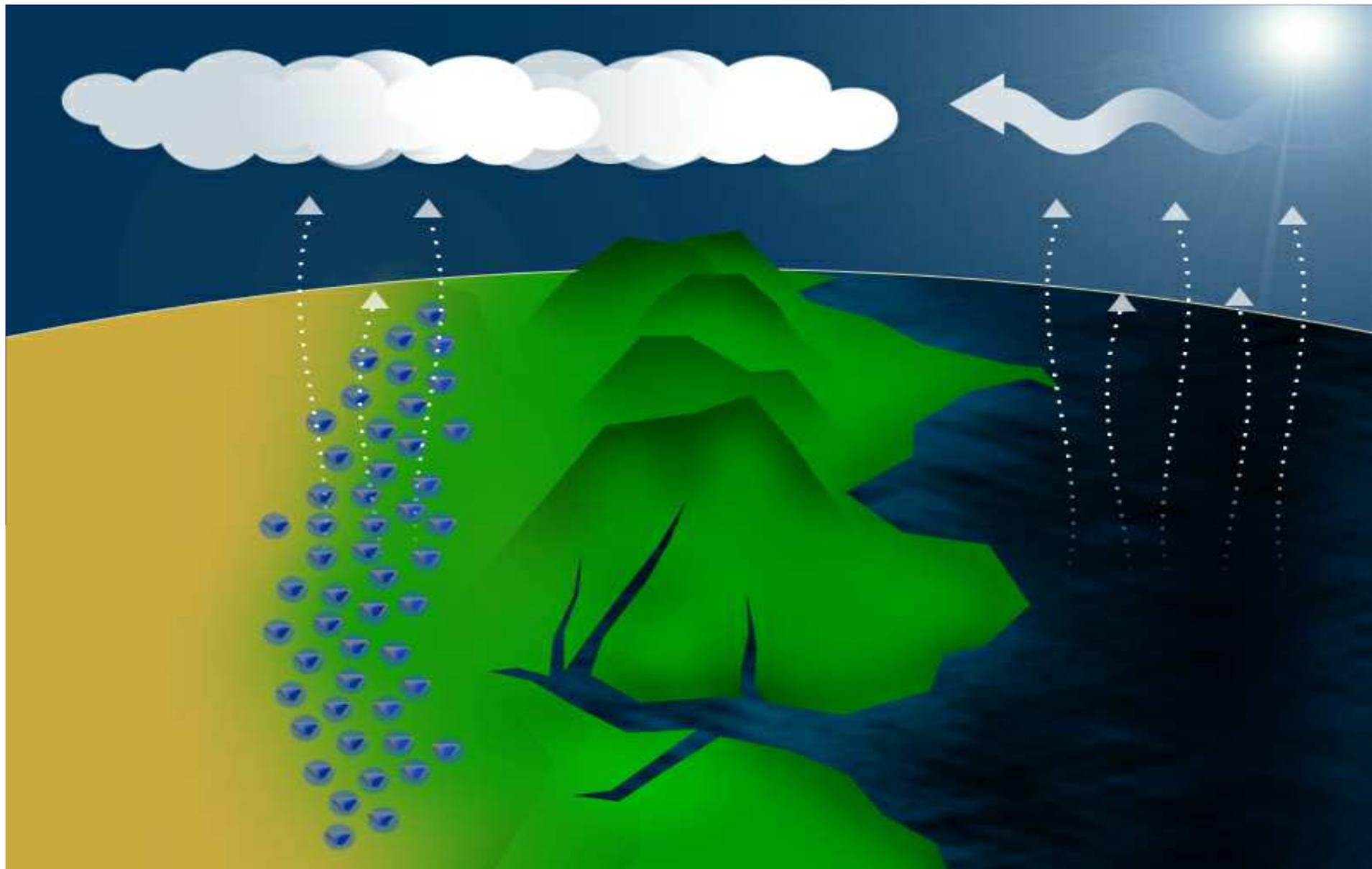
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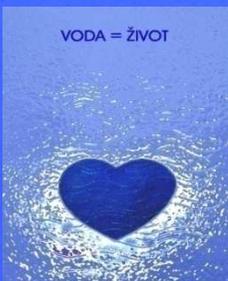


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