Stimulated Communication as a Prerequisite for effective Water Protection:

Insights from the Magdeburgian Water Protection Seminars in the German&Czech Elbe River Basin

PD Dr. Wolf von Tümpling
One of the German Co-ordniators of the MGS

12.06.2026, Karslruhe

Why am I here?

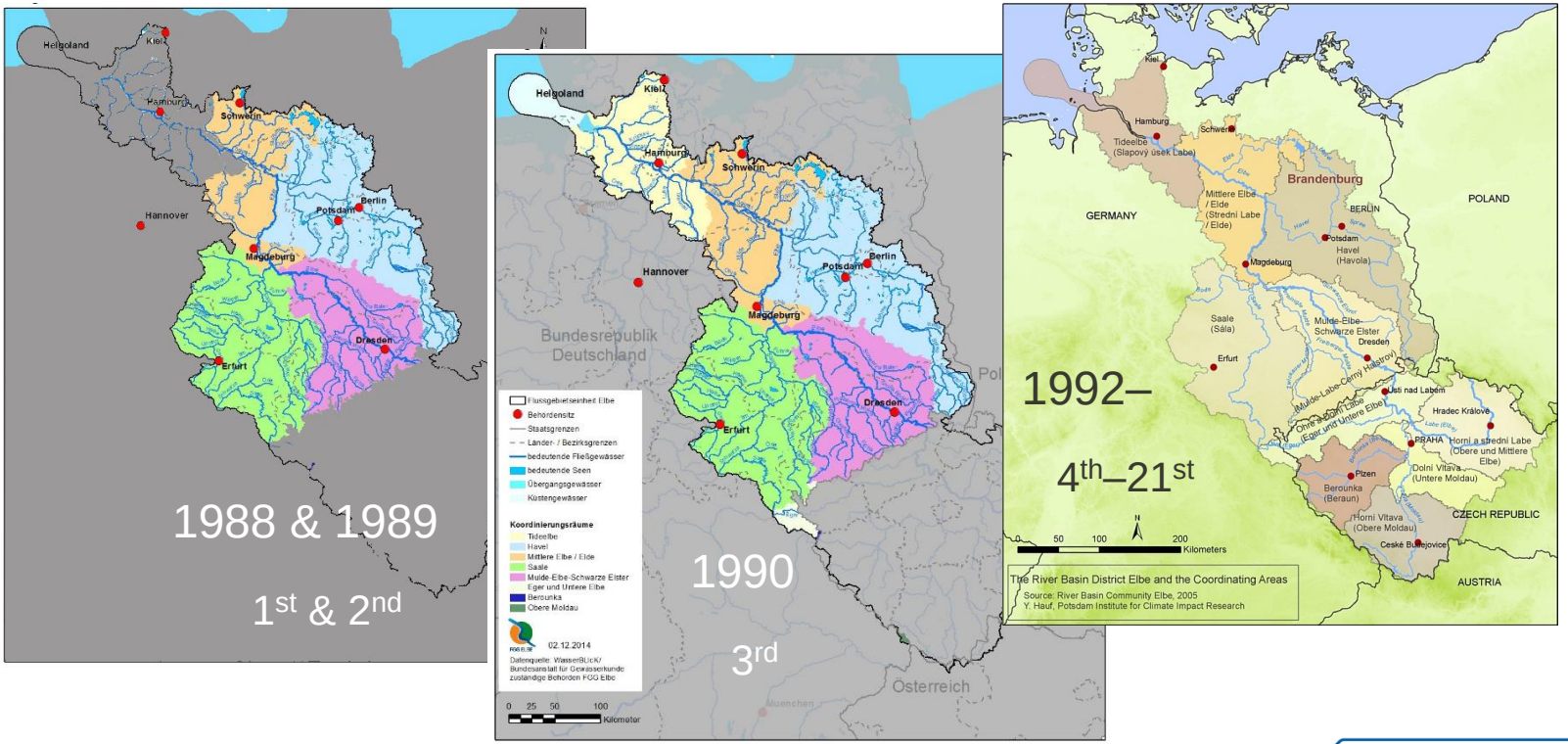
1. Listen to how collaboration between researchers and decision-makers works in other catchment areas
2. Present a personal experience report from the German-Czech Magdeburg Water Protection Seminar, which has a history spanning nearly 40 years
3. Contribute the idea of cross-catchment collaboration
4. Feedback of the key information to the MGS Orga committee

Timeline of the past seminars

„GDR“ Elbe	FRG Elbe	complete Elbe catchement	Elbe + ?

1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	11th	12th	13th	14th	15th	16th	17th	18th	19th	20th	21st	22nd
Magdeburg		Magdeburg		Magdeburg		České Budějovice		Berlin		Leipz ig		Magdeburg		Hamburg		Dresden		Video Konferenz		Magdeburg	
1988	1989	1990	1992	1993	1994	1996	1998	2000	2002	2004	2006	2008	2010	2012	2014	2016	2018	2021	2023	2025	2027
Magdeburg		Špindlerův Mlýn		Cuxhaven		Karlovy Vary		Špindlerův Mlýn		Český Krumlov		Teplice		Špindlerův Mlýn		Praha		Karlovy Vary		Hradec Králové	

Catchements observed during the seminars



Some facts about the Elbe catchment

Source:	National Park Krkonose Mountains (CZ)
Estuary:	North Sea at Cuxhaven (D)
Elevation difference:	1.384 m
Length:	ca. 1.091 km
Mean discharge:	861 m^3/s in the estuary, 311 m^3/s at the CZ-D border
Catchment:	ca. 148.000 km^2, of which ca. 97.000km^2 in D and ca. 50.000 km^2 in CZ; Rest in PL & AT
Inhabitants:	ca. 25 mio. people (18 mio. in D & 7 mio. CZ)
Landscape:	situated in the North German lowlands (70%) and in the in the D / CZ mountain (ca. 30%)
Major tributaries:	Vltava/Moldau (28.090 km^2), Saale (24.079 km^2), Havel (23.860 km^2), Mulde (7.400 km^2), Schwarze Elster (5.705 km^2), Eger/Ohre (5.614km^2)
Other large rivers:	Spree (9.793 km^2), Berounka (8.855 km^2), Unstrut (6.343 km^2), Weiße Elster (5.154 km^2)

National administrative Challenges: Germany

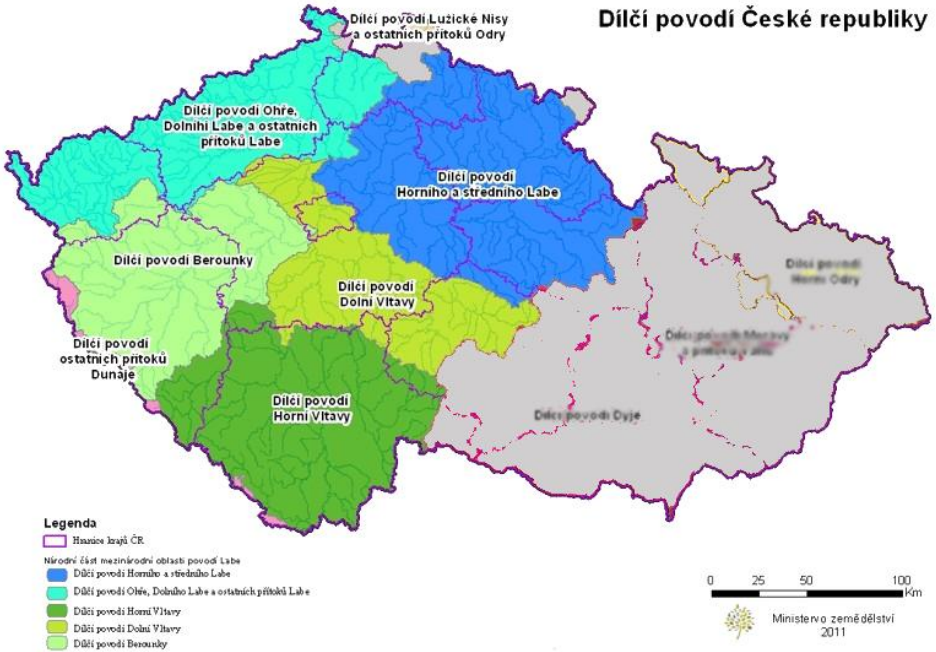
10 federal states

in co-operation

with the FGG Elbe + BfG

Bavaria, Berlin, Brandenburg, Hamburg, Mecklenburg-Western Pomerania, Lower Saxony, Saxony, Saxony-Anhalt, Schleswig-Holstein, and Thuringia

National administrative Challenges: Czech Republic



Water management authorities based on 5 sub-basin :

- Upper and Middle Elbe
- Upper Vltava
- Berounka
- Lower Vltava
- Ohře, Lower Elbe, & other tributaries

Pivotal point for bilateral coordination: IKSE (ICPER engl.) International Commission for the Protection of the Elbe River

https://www.ikse-mkol.org/themen/magdeburger-gewaesserschutzseminar

ICPER - IKSE

D state & federal authorities / FGG & ***water management authorities CZ***

Since 1998 ***UFZ*** and VUV Praha

D & CZ Universities and Colleges

D / CZ Ministries for education and research

National Park Authorities

Federal Institute of Hydrology

NGO´s: BUN**D** / Arnika **CZ;** WWF

Environmental ministries
and
Offices for nature and environment

Supported national an bilaterale research and pilot projects

Water and Shipping Authorities

Environmental offices of municipalities and districts

Focus areas of the seminars

- **Pollutant and Nutrient Inputs**
- **Implementation of the European Water Framework Directive (WFD)**
- **Monitoring issues**
- **Water Resources Management in the Elbe River Basin**
- **Climate Change and the Water Balance**
- **Aquatic Ecology and Water Quality**
- **The Elbe as a Waterway**
- **Future River Basin Management and International Cooperation?**

Focus areas of the seminars

Pollutant and Nutrient Inputs ☹
Assessment of pressures from industry, municipalities, and agriculture, as well as measures to reduce them.

https://www.mz.de/lokal/halle-saale/umweltverschmutzung-in-der-ddr-als-die-saale-blasen-warf-3481537

https://www.mz.de/lokal/halle-saale/paddeln-im-saale-schaum-fast-vergessenes-foto-belegt-umweltfrevel-in-der-ddr-3882755

In the late 1980s, the Saale itself was in places hardly visible.

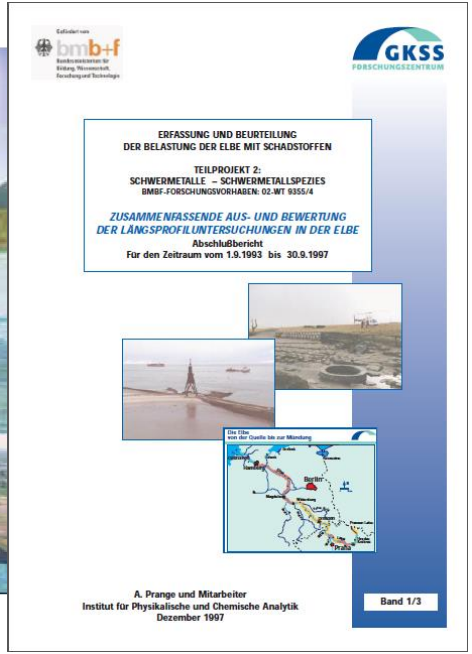
Outlet of Synthesia Pardubice in the 90th

GKSS + lokal and regional authorities monitoring

Pollutant and Nutrient Inputs

Assessment of pressures from industry, municipalities, and agriculture, as well as measures to reduce them.

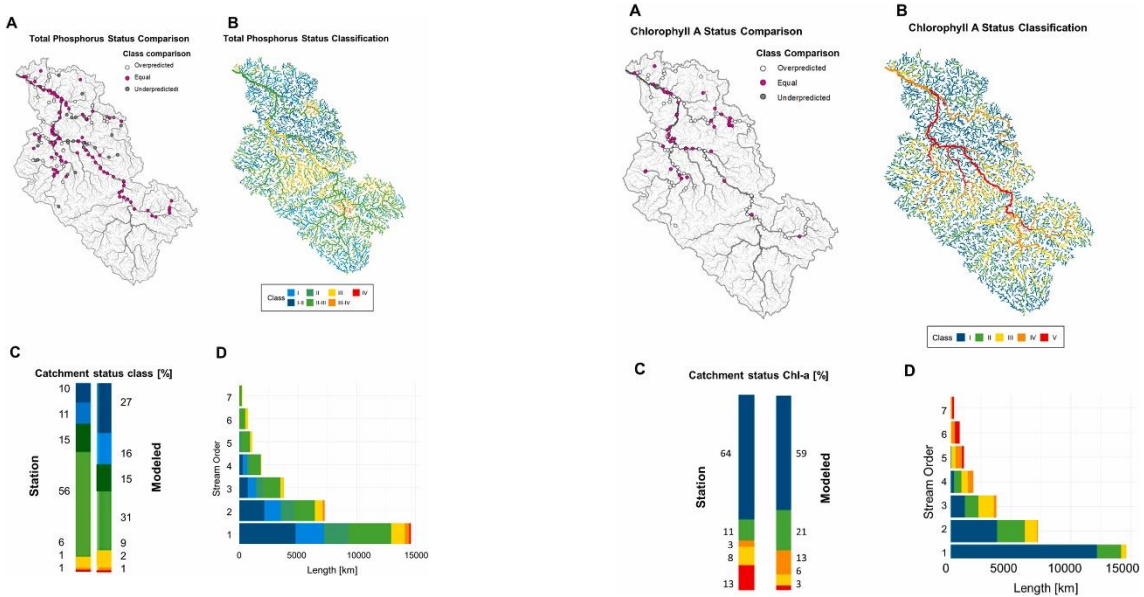
.



Todays pollutant and nutrient Inputs ☺

Focus areas of the seminars

Implementation of the European Water Framework Directive (WFD)
Measures aimed at achieving good ecological status of water bodies.



Niklas Heinemann, Soohyun Yang, Olaf Büttner, Dietrich Borchardt, Nutrient loading and stream order shape benthic and pelagic spring algal biomass in a large, temperate river basin (Elbe River), Journal of Environmental Management, Volume 383, 2025,125440,

Water Resources Management in the Elbe River Basin

Strategies for the sustainable use of water resources while balancing environmental and socio-economic demands.

Overall strategy for the Elbe

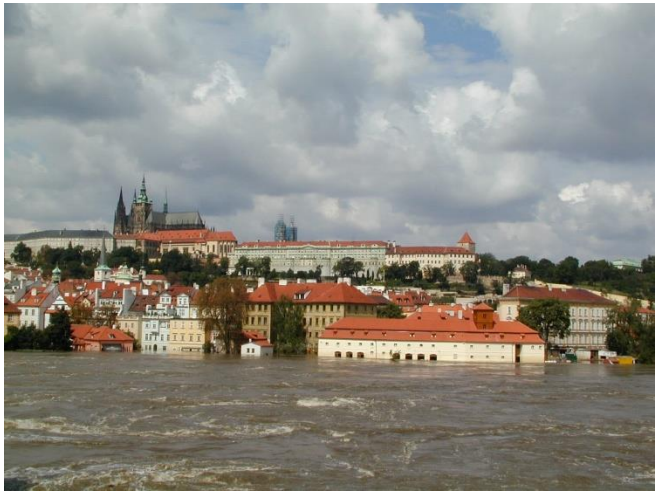
Gierra, T. Das Gesamtkonzept Elbe - Gemeinsam für einen Lebens- und Wirtschaftsraum mit Zukunft. *Wasserwirtsch* **112**, 31–35 (2022). https://doi.org/10.1007/

Climate Change and the Water Balance

Impact of floods, and extreme events on water bodies and water management.

Flood event 2002

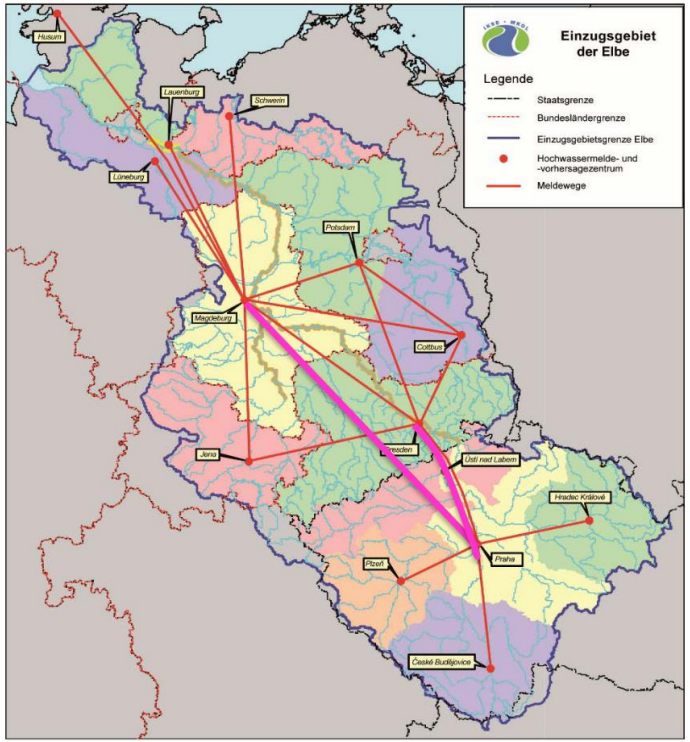
Dresden



Praha

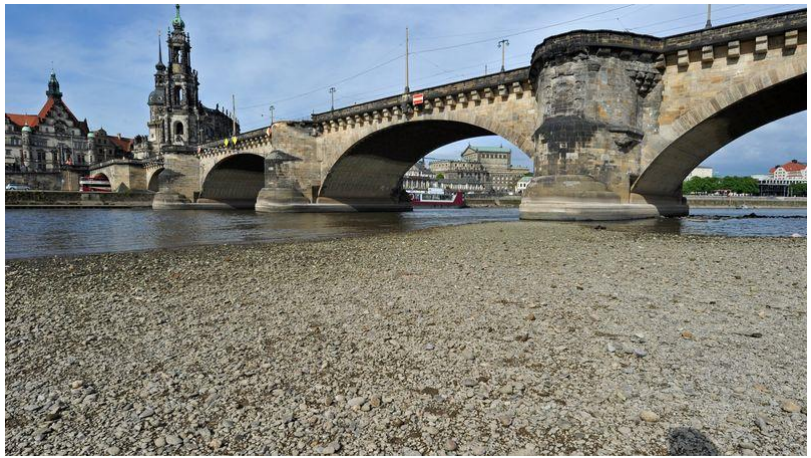
Climate Change and the Water Balance

- **2003** Action Plan for Flood Protection in the Elbe River Basin
- **2004** Documentation of the August 2002 Flood
- **2007** Hydrological Analysis of the Spring Flood
- **2012** Hydrological Analysis of the Flood Events of 08/09 2010
- **2012** Final Report on the Implementation of the “Elbe Flood Protection Action Plan” during the Period 2003–2011
- **2014** Hydrological Analysis of the June 2013 Flood
- **2015** International Flood Risk Management Plan for the Period 2016–2021, Part A
- **2021** International Flood Risk Management Plan, Part A, Update for the Period 2022–2027



Climate Change and the Water Balance

Niedrigwasser der Elbe an der Augustusbrücke in Dresden - hier allerdings im Mai 2015.



https://dpa-factchecking.com/germany/220818-99-428733/

Stav vody na Orlíku 2019

https://ekolist.cz/cz/ekolist/mesicni-souhrn/jakubn-hladky-stav-vody-na-orliku-kde-sledovat-informace

Climate Change and the Water Balance

Vodohospodářské technicko-ekonomické informace
https://www.vtei.cz › uploads › 2021/07 › 6340

ZÁVĚR

Ze zpracování výskytu případů hydrologického sucha v řadě průtoků Labe v Děčíně a srážek i teplot v povodí Labe v Děčíně z období 1851–2020 vyplynuly následující poznatky:

- Významná víceletá hydrologická sucha o trvání pět a více let se vyskytla v období 1861–1876 a pak až v období 1932–2020, což souvisí s dlouhodobým kolísáním průměrných srážek v povodí. Výskyty hydrologického sucha odpovídají obdobím, v nichž byly minimální víceleté průměry srážek.
- Při setřídění případů hydrologického sucha podle trvání z dat vyplývá, že hydrologické sucho 2013–2020 bylo nejdelší ze všech období sucha od roku 1851. Trvalo téměř sedm let a také se vyznačuje největším celkovým nedostatkovým objemem (pod dlouhodobým průměrným průtokem). Při posouzení podle průměrného ročního nedostatkového objemu je však až na čtvrtém místě.
- V období sucha potenciální evapotranspirace vzrůstá s teplotou, ale vztah rozdílu srážek a odtoku (což je bilanční odhad územního výparu) k potenciální evapotranspiraci je velmi volný. Rozdíl srážek a odtoku je dominantně závislý na velikosti srážek. V období sucha, kromě zimních měsíců, je vlivem vysokých teplot vzduchu pro výpar dostatek energie. Výpar je proto omezen víceméně množstvím spadlých srážek, bez nichž už není, co by se vypařilo.

Poděkování

Vznik článku byl podpořen interním grantem VÚV TGM 3600.52.28.2020.

Literatura

[1] VLNAS, R. a kol. *Časová a plošná variabilita hydrologického sucha v podmínkách klimatické změny na území České republiky*. Praha: Výzkumný ústav vodohospodářský T. G. Masaryka, 2010. 160 s. ISBN 978-80-87402-11-5.

[2] BRÁZDIL, R., TRNKA, M. a kol. *Historie počasí a podnebí v českých zemích XI: Sucho v českých zemích: minulost, současnost a budoucnost*. Brno: Centrum výzkumu globální změny AV ČR, 2015. 402 s. ISBN 978-80-87902-31-0.

[3] DAŇHELKA, J. a kol. *Vyhodnocení sucha na území České republiky v roce 2015*. Praha: Český hydrometeorologický ústav, 2015. Dostupné z: http://portal.chmi.cz/files/portal/docs/meteo/ok/SUCHO/zpravy/Sucho_2015_CHMU_prosinec.pdf

[4] KAŠPÁREK, L., VLNAS, R., NESLÁDKOVÁ, M. *Hlavská kaskáda – podklady pro střednědobé plánování provozu při málovodných obdobích*. Praha: Výzkumná zpráva zpracovaná pro Povodí Vltavy, s. p., Praha: Výzkumný ústav vodohospodářský T. G. Masaryka, 2016. 37 s.

[5] DAŇHELKA, J. a kol. *Sucho 2019–2020 skoro ukončilo*. Praha: Český hydrometeorologický ústav, 2020, 42 s. ISSN 978-80-87577-91-2.

[6] ELLEDER, L., KAŠPÁREK, L., ŠÍROVÁ, J., KABELKA, T. Low water stage marks on hunger stones: verification for the Elbe from 1616 to 2015. *Climate of the Past* [on-line]. 2020, 16(5), 1821–1846 [vid. 2020-11-01]. ISSN 1814-9324. Dostupné z: doi:10.5194/cp-16-1821-2020

[7] KAŠPÁREK, L., VLČINA, A., KOŽÍN, R. Využití hydrologického modelu BILAN pro odhad změny schopnosti půdy zadržet vodu. *Vodní hospodářství*, 2017, roč. 67, s. 19–22

[8] KAŠPÁREK, L. Dlouhodobé kolísání průtoků Vltavy v Praze. *Vodohospodářské technicko-ekonomické informace*, 2017, roč. 59, č. 5, s. 25–30

Autoři

Ing. Ladislav Kašpárek, CSc.
ladislav.kasparek@vuv.cz
ORCID: 0000-0002-8394-9136

Ing. Roman Kožín
roman.kozin@vuv.cz
ORCID: 0000-0002-5773-6567

Výzkumný ústav vodohospodářský T. G. Masaryka

Příspěvek prošel lektorským řízením.

DOI: 10.46555/VTEI.2021.03.002

EXTREME MULTI-ANNUAL HYDROLOGICAL DROUGHTS IN THE ELBE RIVER BASIN

KAŠPÁREK, L., KOŽÍN, R.

T. G. Masaryk Water Research Institute

Keywords: multi-annual hydrological drought – Elbe – deficit volume – extremes

The aim of the study was the evaluation of multi-year hydrological droughts in the Elbe river basin for the Děčín stream gauging station (catchment area 51 104 m²). Average monthly flows from period 1851–2000 are available for the station. For this period, we also compiled a series of average monthly precipitation and temperatures from several data sources. We calculated annual values for precipitation, temperatures and differences in annual precipitation and runoff, then we computed long-term averages and regression linear trends for change over time. The trends are only slightly upward for all three variables, but long-term fluctuations in precipitation are more significant. According to the quantified multi-year average flows and precipitation, we searched for and merged cases from which one continuous drought lasting at least 5 years is generated for both precipitation and runoff. We quantified deficit volumes for individual drought periods. The long-term average flow was chosen as the threshold flow. The hydrological drought 2013–2020 had the longest duration, almost 7 years, of all droughts since 1851 and was also characterized by the largest total deficit volume. When compared to the average annual deficit volume, it is only in fourth place. When comparing the time series of monthly flows, it turned out that cases from different periods have similar patterns and behavior.

Renaturation – open-pit lignite mining Goitsche, Mulde catchment area

1990

2002

Renaturation – open-pit lignite mining Goitsche, Mulde catchment area

Renaturation – open-pit lignite mining north bohemia

2010

Nature Conservation 2022 — 25. 5. 2022 — Nature and Landscape Management
Ecosystem Restoration of Brown Coal Open-pit Mines
authors: Pavel Pešout, Michal Porteš, Kateřina Černý Pixová, Markéta Hendrychová, Petr Kříž, David Lacina

Wilde Mulde – Revitalization of a Wild River Landscape in Central Germany

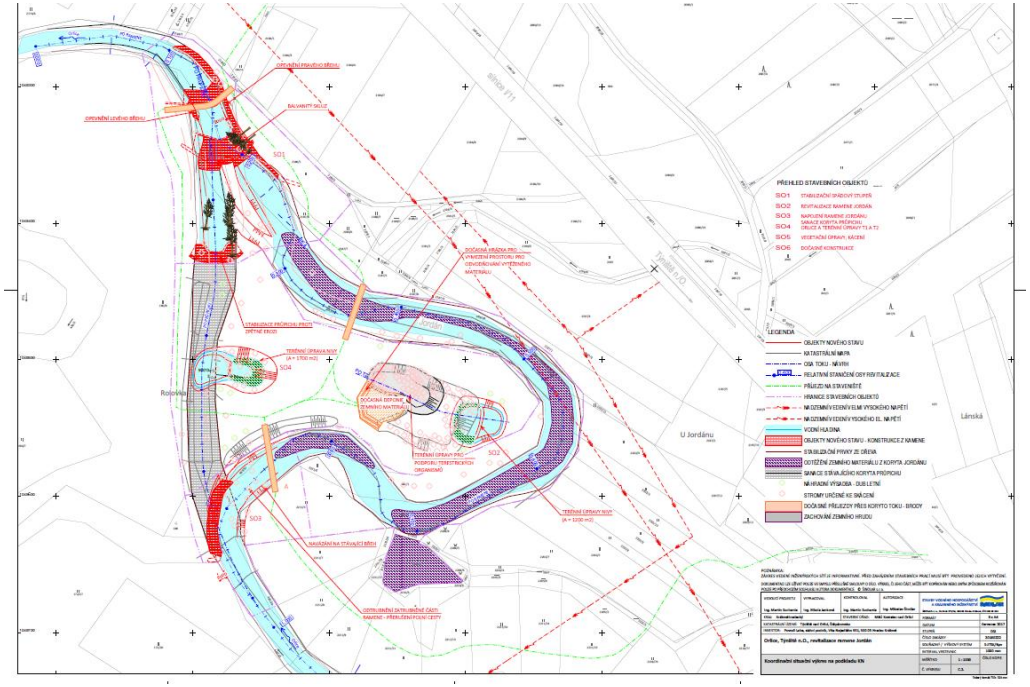
- **Local influence of large dead rowan tree on flow and sediment dynamics in the Mulde River** (with TU Braunschweig)
- **Field measurements of bed shear stress around large woody debris** (with TU Braunschweig))
- **Large woody debris as mesohabitats for macrozoobenthos** (with UFZ)
- **Retention of particulate and dissolved substances by large woody debris** (with UFZ)

Bundesministerium für Umwelt, Naturschutz und Reaktorsicherheit

Bundesamt für Naturschutz

https://www.gerstgraser.de/files/Forschung_Foerderung/bfn_logo.png

Ecological restoration of the river branch Jordán nearTýniště nad Orlicí



The Elbe as a Waterway

Opportunities and limitations of inland navigation in the context of balancing ecological and economic interests.

The Elbe as a Waterway

Opportunities and limitations of inland navigation in the context of balancing ecological and economic interests.

Expert discussions on the construction of the Děčín weir

Lessons we learned from constraints and risks

- How to deal with different legal and administrative systems?
- How can we overcome with Language and disciplinary differences.
- How can we increase data availability including a harmonisation of different monitoring traditions?
- How can scientists, government experts, and funding bodies collaborate to develop environmental, ecological, and social measures and put them into practice through pilot studies?
- Regular seminars are needed to ensure continuity over time.

Take-home massages

- **Cross-border water protection depends on recurring communication structures.**
- **Seminars are effective when they combine science, administration, and practice.**
- **Trust and shared understanding are prerequisites for coordinated basin management.**
- **Communication should be designed as part of water governance, not treated as an afterthought.**

Take-home massages

- **Cross-border water protection depends on recurring communication structures.**
- **Seminars are effective when they combine science, administration, and practice.**
- **Trust and shared understanding are prerequisites for coordinated basin management.**
- **Communication should be designed as part of water governance, not treated as an afterthought.**

Outlook


„GDR“ Elbe
FRG Elbe
complete Elbe catchement
Elbe + ?
1st 2nd 3rd 4th 5th 6th 7th 8th 9th 10th 11th 12th 13th 14th 15th 16th 17th 18th 19th 20th 21st 22nd
Magdeburg
Magdeburg
Magdeburg
České Budějovice
Berlin
Leipz ig
Magdeburg
Hamburg
Dresden
Video Konferenz
Magdeburg
1988 1989 1990 1992 1993 1994 1996 1998 2000 2002 2004 2006 2008 2010 2012 2014 2016 2018 2021 2023 2025 2027
Magdeburg
Špindlerův Mlýn
Cuxhaven
Karlovy Vary
Špindlerův Mlýn
Český Krumlov
Teplice
Špindlerův Mlýn
Praha
Karlovy Vary
Hradec Králové

Outlook

Everyone is warmly invited to contribute to and take part

in MGS 2027 in Hradec Králové.

While the main focus will continue to be the Elbe River basin,

past experience suggests

that it will once again be a stimulating and inspiring seminar.