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NWRMs – experience from Austria

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Main characteristics of AUSTRIA

alpine

- precipitation, incline, settlements & (land)uses

Pustertal / Lesachtal (Tyrol)

Annual Precipitation in Austria

400 – 3500 mm/a

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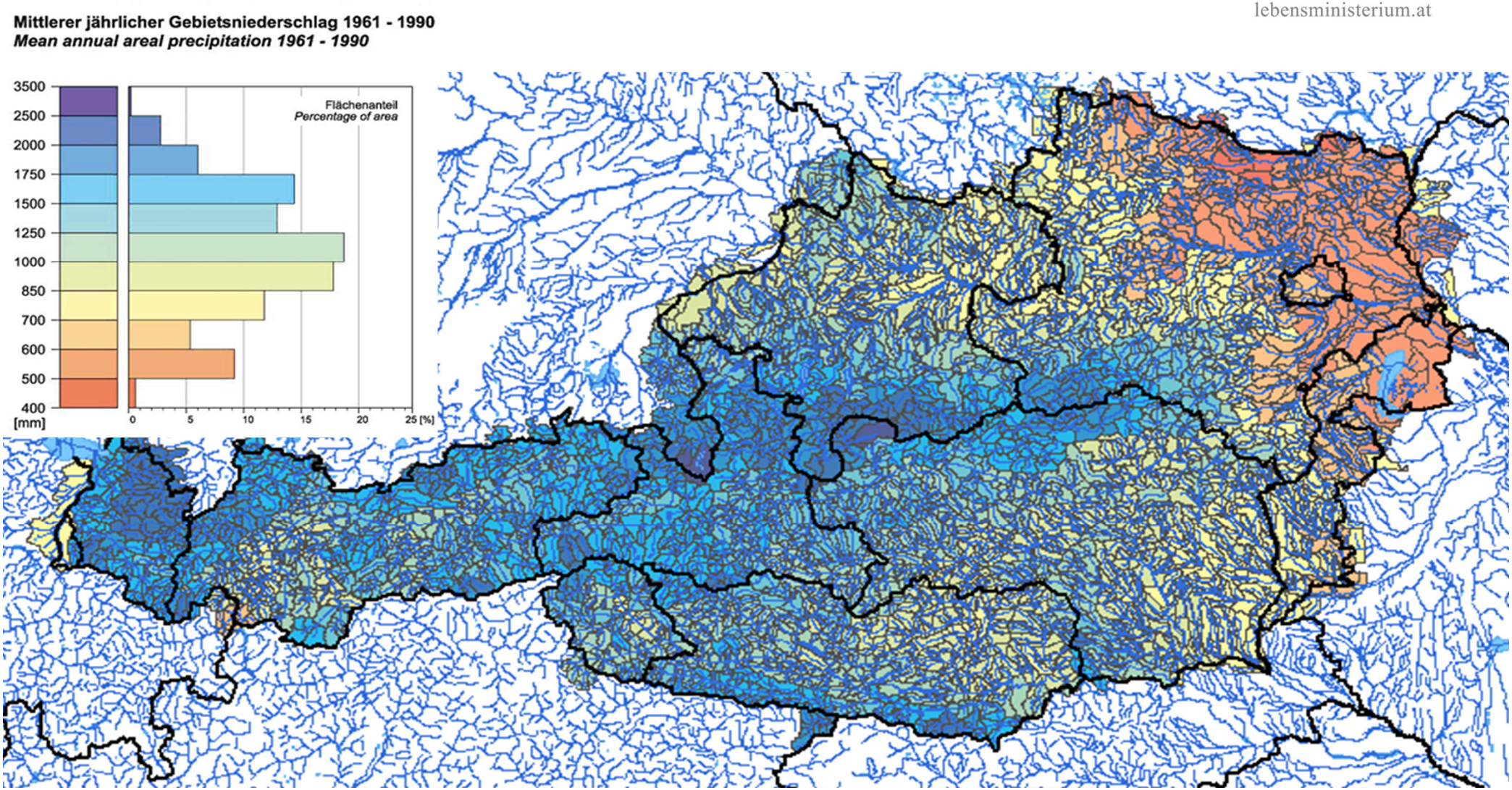

Areas available for permanent settlement

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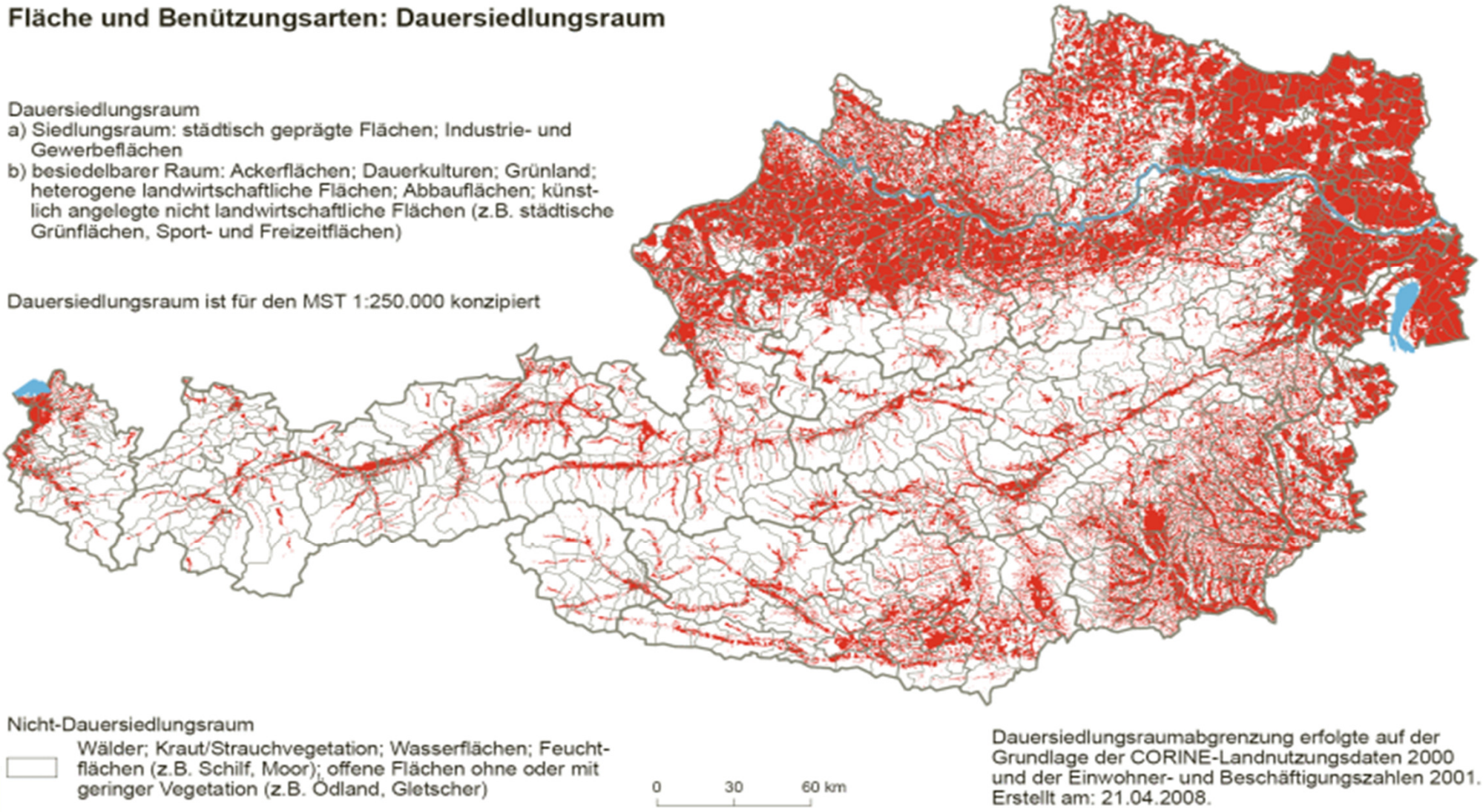

Population densities

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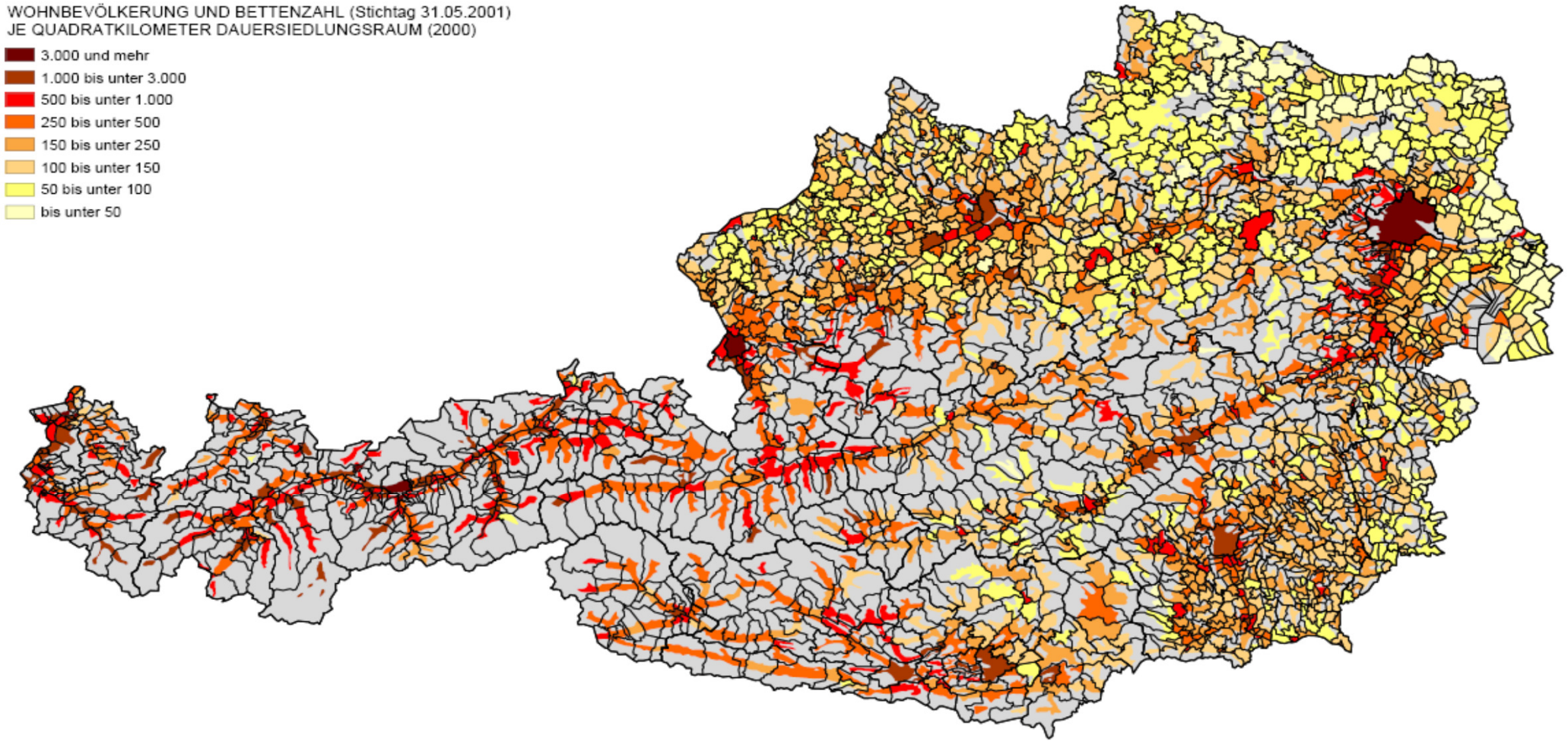

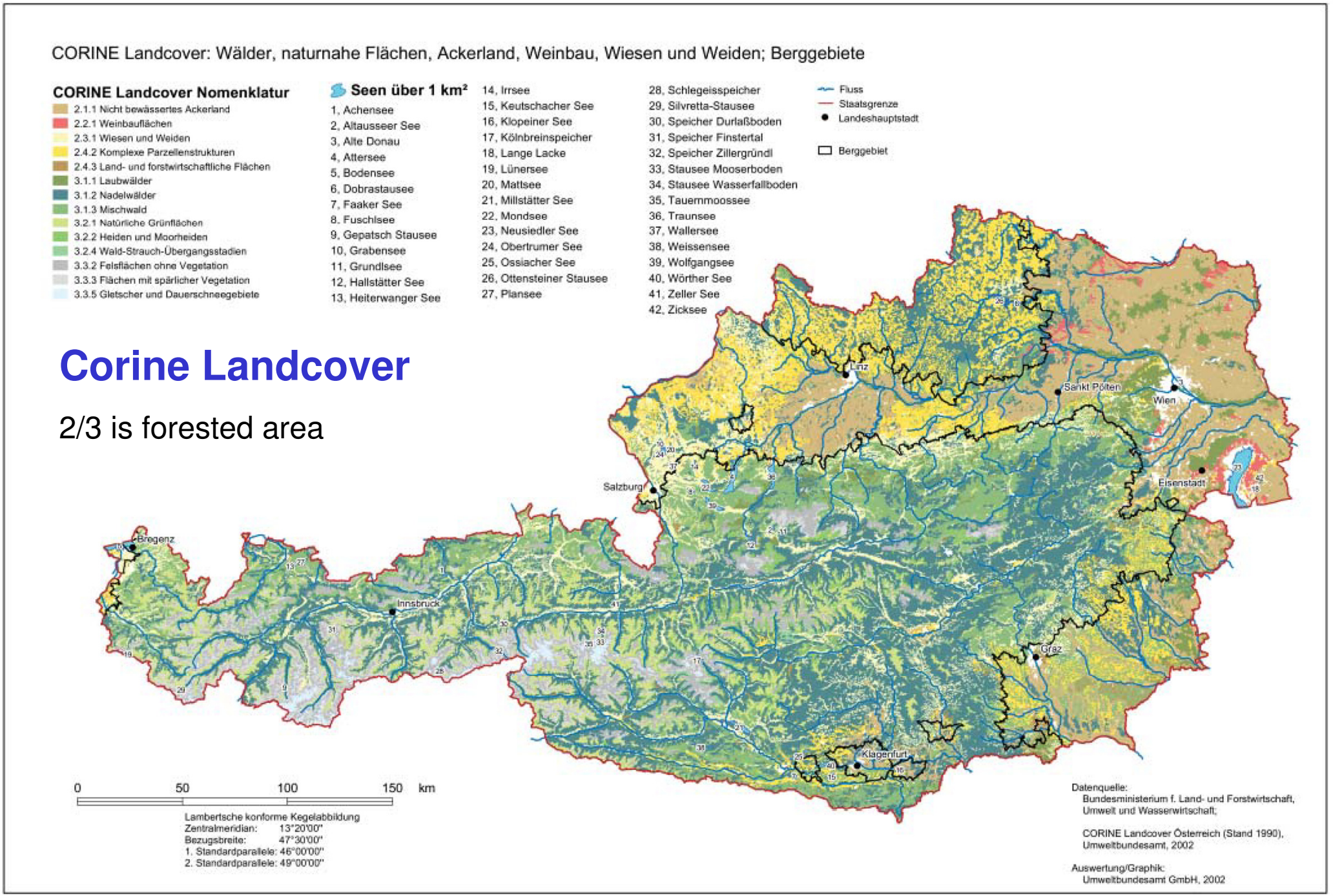

Corine Landcover

2/3 is forested area

Main relevant characteristics

alpine (precipitation, incline, 2/3 forest areas)

- **Limited areas for settlements –**
  high population density: in valleys and basins

→ **flood protection has long tradition!**

25% of river net > 10 km² is significantly altered in morphology

Pustertal / Lesachtal (Tyrol)
(© by K-LR, S.Tichy)

Austrian commitment for „sustainable flood protection“

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clear legal linkages:

National Water Act

Any intervention which might have a significant effect on water quality/ecology (hydropower, flood protection, water abstraction, waste water discharges, …) needs authorisation

- 1990: negative ecological effects have to be minimised, ecological functioning has to be ensured

2003: adaption to WFD objectives/requirements

2011: adaption to FD requirements

„Protection against water and protection of waters“

Technical Guidlines for Flood protection (RIWA-T)
- strategies for sustainable flood management

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General principles

- Avoidance of those measures that would increase erosion and the discharge of draining water.
- Adaptation of the landuse in zones near water bodies to the effects of excessive run-off and high water levels.
- Support of the natural possibilities of water retention and the improvement of the bed load balance.
- Conservation and reactivation of natural run-off and retention areas.
- Having regard to the ecological functions of water bodies, also for measures that are applied in settled areas.
- Preferential use of near-natural methods of building that correspond to the latest developments in technology.
- Taking into consideration the whole river basin or catchment area when choosing measures.

Sustainable flood protection

Hierarchy of measures

- Passive (non-structural) flood protection (i.e. adaptation of use to the particular hazard) has priority over active flood protection (structural protection measures)
- Measures in the catchment area have priority over measures at the main channel.
- Retention measures have priority over linear structural measures.
- Natural and near-natural methods of building have priority over methods that are less so.

First choice „passive“ measures

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any avoidance of acticvities which may increase flood intensity

- adapting uses to events of high floods (restricted uses)
- acquisition of lots of land by the government to keep free from use
- acquisition of lots in outlying areas to be exchanged later on
- transposition of land use to areas with low flood risk
- use and maintainance of existing retention areas

Prevention - reduction of floodpeaks:
Danger of flooding can be reduced mosts effectively through natural retention in riparian forests and meadow lands, floodplains and undeveloped areas in valleys.

Availability of retention area in Austria ~ 110 Mio. m³
in 2012: creation of more than 3 Mio. m³

Technical Guidelines for flood protection (RIWA-T)

…directly linked to national funding scheme – requirements for being fincanced

sets different level of flood protection planning

- River development schemes (supraregional, flood risk, WFD objective, uses, social aspects, ….)
- Regional planning
- General project planning
- Detailed project planning

states scope, required data/info (hydraulic, hydrological, (hydro-)geological, sediment, soil mechanics, ecological, …), data quality, maps, (….), requirements for cost calculation, recommendations for public involvement, … includes forms, checking lists, ….

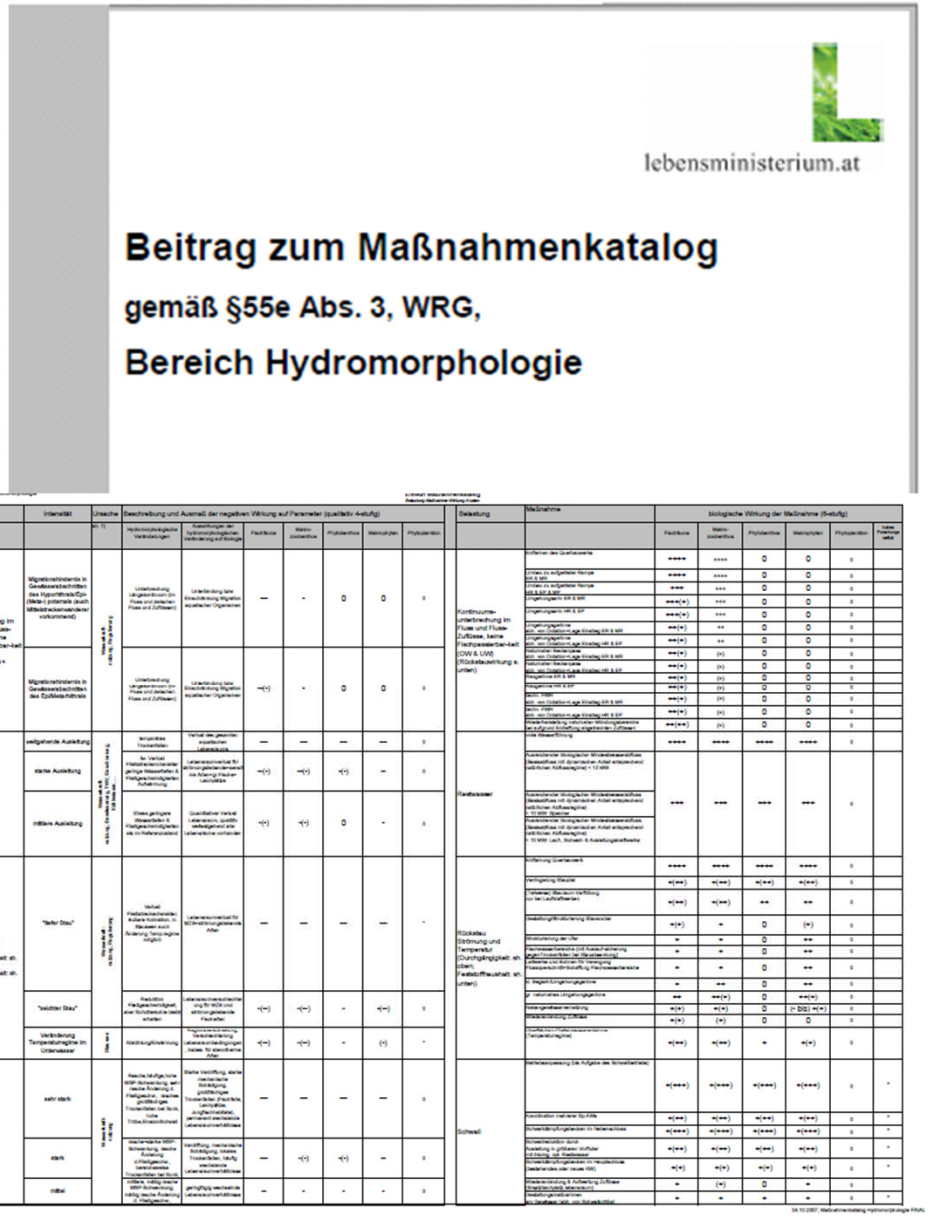
Linkage to WFD objectives

Supporting tool for GES restoration:

„**catalogue of technical measures**“

Collection of hydromorphological restoration/mitigation measures

- effects on biology
- effects on hymo
- effects on water quality
- cumulative effects/interactions
- effects on other uses
- reaction time for ecol improvement
- costs



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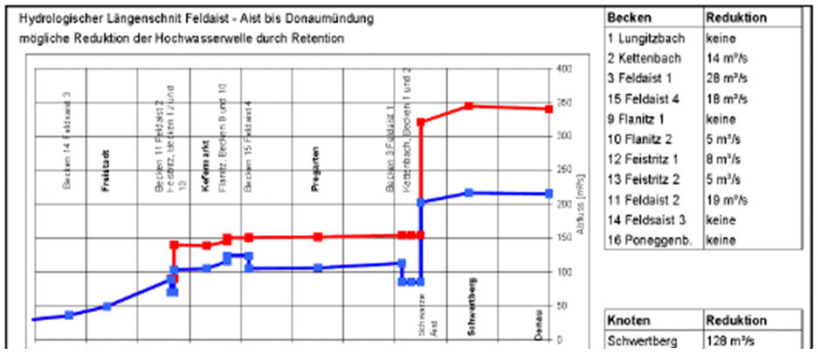
Costs

Natural retention is usually much more expensive than technical measures

Are to be taken into account:

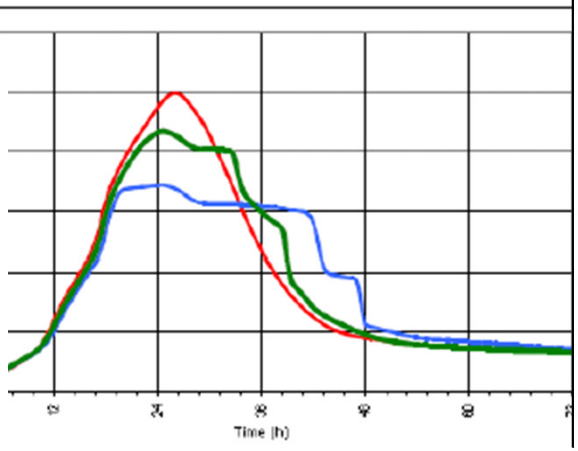
several options are evaluated;

not the „cheapest“ will be implemented automatically as also ecological objectives have to be met.



Becken	Reduktion
1 Lungitzbach	keine
2 Kettenbach	14 m³/s
3 Feldaist 1	28 m³/s
15 Feldaist 4	18 m³/s
9 Flanitz 1	keine
10 Flanitz 2	5 m³/s
12 Feistritz 1	8 m³/s
13 Feistritz 2	5 m³/s
11 Feldaist 2	19 m³/s
14 Feldsaist 3	keine
16 Poneggenb.	keine

Knoten	Reduktion
Schwertberg	128 m³/s



GUTACHTEN

Analyse von geplanten Hochwasserschutzmaßnahmen an der Aist in Oberösterreich

Auftraggeber: Hochwasserschutzverband Aist, St. Oswalderstraße 2, 4293 Gutau

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Hainersdorf, Dezember 2012

elle 14: Matrix zur Lösungsfindung (sind nur Beispiele, müsste vor Umsetzung noch im Detail geprüft werden)

Kriterien:	Wirksamkeit					Kosten					Ökologie					soziale Verträglichkeit					Summe
	HQ_{10}	HQ_{30}	HQ_{50}	HQ_{100}	$>HQ_{100}$	sehr hoch				sehr gering	Rote-Liste-Arten bedroht	Fisch-wanderungen werden ständig unterbunden	Fischaufstieg funktioniert, Geschiebe wird zurückgehalten	Fischaufstieg funktioniert, Geschiebe wird periodisch weiter-transportiert	Durchgängigkeit für Wasser, Biota und Feststoffe ständig gegeben	HW-Schutz-maßnahme wird gegen den Widerstand der Anrainer durch-geführt (z.B. Zwangs-enteignung)	HW-Schutz-maßnahme berührt massiv Anrainer-interessen	?	HW-Schutz-maßnahme durch Zustimmung der Anrainer	HW-Schutz-maßnahme berührt keine Anrainer-interessen	
Zielerfüllung:	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	

Lessons learnt

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Use of existing natural retention areas is the most cost-effective measure

Improving hydromorphology of altered rivers (incl. floodplain reconnection) - „giving more room“ – is a win-win-solution

- indispensible for the achievement of WFD objectives
- a valuable measure for FD
- increases biodiversity
- increases natural retention
- ……..

Retention areas are in most cases much more expensive than straight technical measures for flood protection

Political commitment for sustainable management / use of NWRM is crucial

Need of a definite financing instrument;
financing /financial support has to be linked to ecological objectives

„Critical“ lessons learnt

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Hydropower reservoirs can have a positive retention effect, but in special cases can even increase flood peak

Flood plains are never the most cost effective measure with regard to nutrient/ contaminants removal/ improving water quality as they can never can replace the efficiency of a waste water treatment plants (UWWD has to be fulfilled anyway!)

Is a valuable supportive measure

In general:

NWRM are not automatically more ecologically sound; they can also can have a negative effect on ecological status (deterioration!)

i.e. modification of a river to retention pond, building meanders where this is not typespecific,

Lessons learnt

In most cases we can ensure that

- new flood protection measures can be performed in a way that good ecological status is still maintained (no deterioration!)
- in HMWBs designated due to flood protection good ecological status can be achieved for all biological elements except fish;

  good ecological potential comprises self sustaining fish populations

To be unable to achieve good ecological status (solution: HMWB, exemption) is often a lame excuse for not being willing to do anything.

Costs might often be a limiting factor – but …
Is the ecological damage also calculated correctly?
Are the solutions sustainable or just producing new problems elsewhere?

Foto: Salzach Burghausen (Christian Weinberger)

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Thank you ...

for your attention

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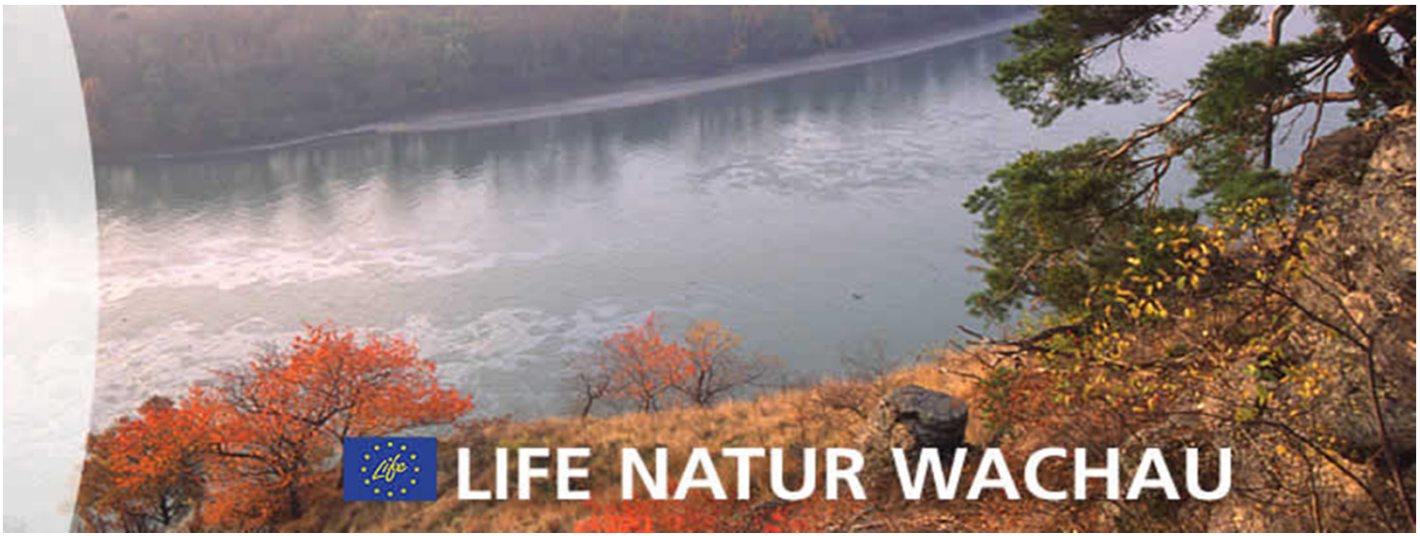

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Restrukturierung Ybbsmündung

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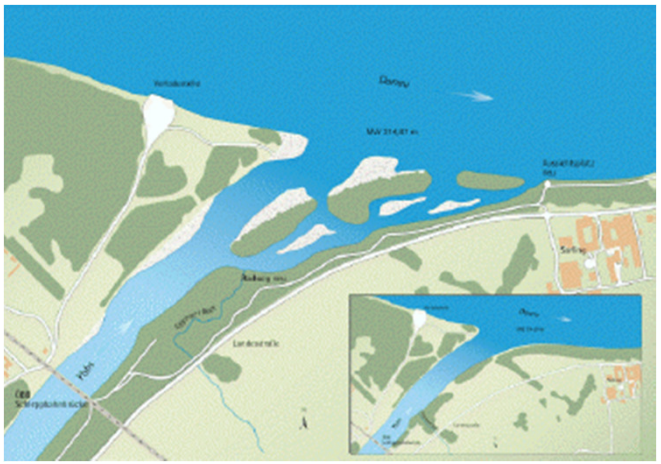

Danube, south of Vienna

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Upper Drava

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