

# STAND-ALONE PROJECT - FINAL REPORT

**Project number** P22.265-G18

**Project title** Environmental History of the Viennese Danube 1500-1890

**Project leader** Univ. Prof. Ing. Dr. Verena Winiwarter

**Project website<sup>1</sup>** <http://www.umweltgeschichte.uni-klu.ac.at/index,3560,ENVIEDAN.html>

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<sup>1</sup> Projects that started after 01.01.2009 are required to have a website

# 1. Summary for public relations work

ENVIEDAN produced the first integrated environmental history of the Viennese Danube from 1500 to the early 20<sup>th</sup> century. The project was carried out by an interdisciplinary team of environmental historians, social ecologists and river morphologists. It created new scientific knowledge by demonstrating the longevity of the river's transformation from a dynamic fluvial system into a straight river channel with fixed banks. For reconstructing past hydro-morphological patterns and dynamics a new method, the "regressive-iterative-approach", was developed. The river's functions and roles were conceptualized as "socio-natural sites" in which humans and nature form hybrids that can be studied as co-evolutionary developments of practices and arrangements. Threats imposed by regular floods and the use of the river's kinetic energy for navigation and urban supply were a main driver for technical interventions into the riverscape throughout the whole study period. In contrast, other drivers such as military defense or the reclamation of urban land can be found only at specific times. The Danube and its urban tributaries were the main discharge system for urban waste for centuries. When urbanization and industrialization processes intensified in the course of the 19<sup>th</sup> century technical infrastructure became part of the wastewater arrangements.

Human perception of the Danube in Vienna was studied by comparative analysis of topographical sources of Danube landscapes (Andraschek-Holzer & Schmid 2011, 2012). Fluvial patterns and dynamics were reconstructed with historical maps, archival sources and GIS-tools (Hohensinner et al. 2013 a, b). Investigating the role of the Danube for defense in the 16<sup>th</sup> and 17<sup>th</sup> centuries provided new insights into the military role of urban rivers (Sonnlechner et al. 2013). Changing spatial patterns of urban development demonstrated the increasing importance of the floodplains especially in the 19<sup>th</sup> century (Haidvogel 2012, Haidvogel et al. 2013). Reconstructing the river's role for transport and discharge revealed fundamental changes in the urban metabolism (Gierlinger et al., 2013; Gingrich et al., 2012).

Results of ENVIEDAN are to date published in nine peer-reviewed journal articles and 12 other articles and book chapters. A thematic issue of *The International Journal of Water History* (volume 5/2 June 2013) is the most important product. ENVIEDAN was presented to a wide range of scientific communities at several international and national scientific conferences and workshops (altogether 31 presentations). The project was also made available to a larger public by articles and interviews in newspapers, journals and on national radio programs. Animated reconstructions are available on YouTube.

ENVIEDAN has laid the groundwork for two follow-up projects granted by the Austrian Academy of Sciences (Viennese Wood Supply) and the Austrian Science Fund FWF (URBWATER).

## Zusammenfassung

ENVIEDAN widmete sich der ersten integrativen Umweltgeschichte der Wiener Donau von 1500 bis zum Beginn des 20. Jahrhunderts. Das Projekt wurde von einem interdisziplinären Team aus UmwelthistorikerInnen, SozialökologInnen und Flussmorphologen bearbeitet. Es brachte neue Erkenntnisse zum Jahrhunderte dauernden Transformationsprozess von einer dynamischen Flusslandschaft zu einem begradigten Kanal mit stabilisierten Ufern. Für die Rekonstruktion historischer hydromorphologischer Muster wurde eine neue Methode entwickelt ("regressive-iterative-approach"). Die Funktionen des Flusses wurden als "sozio-naturale Schauplätze" konzeptualisiert. Dabei werden Menschen und Fluss als sozio-naturale Hybride gedacht, ihre gemeinsame Geschichte wird rekonstruiert, indem die Verkopplung von Praktiken und Arrangements untersucht wird. Bedrohungen durch regelmäßige Überflutungen und die Nutzung der kinetischen Energie des Flusses für die Versorgung waren über den gesamten Untersuchungszeitraum treibende Faktoren für technische Maßnahmen. Im Gegensatz dazu werden andere Treiber wie die Gewinnung von Siedlungszonen oder militärische Anforderungen nur in spezifischen Zeiträumen wichtig. Die Wiener Donau und ihre Zubringer dienten über den gesamten Untersuchungszeitraum als Hauptvorfluter für Abfälle und Abwasser. Im Zuge von Urbanisierung und Industrialisierung wurden im 19. Jahrhundert technische Infrastrukturen fixer Bestandteil dieser Arrangements. Die Synthese der gekoppelten Entwicklung von Stadt und Fluss basiert auf einer detaillierten Analyse mehrerer Forschungsthemen: Topographische Quellen zur österreichischen Donau zeigten die sich wandelnde Wahrnehmung (Andraschek-Holzer & Schmid 2011, 2012). Fluviale Muster und Dynamiken wurden mit Hilfe von historischen Karten, Plänen, schriftlichen Quellen und GIS-Methoden rekonstruiert (Hohensinner et al. 2013 a, b). Die Analyse der Funktion der Donau für die urbane Verteidigung im 16. und 17. Jahrhundert erbrachte neues Wissen zur militärischen Bedeutung von Flüssen (Sonnlechner et al. 2013). Die steigende Bedeutung der Auen wurde anhand der Entwicklung urbaner Zonen dargestellt (Haidvogel 2012, Haidvogel et al. 2013). Fundamentale Änderungen im urbanen Metabolismus zeigten sich durch die Rekonstruktion der Rolle des Flusses für die Ver- und Entsorgung der Stadt (Gierlinger et al., 2013; Gingrich et al., 2012).

Projektergebnisse wurden bis dato in 21 wissenschaftlichen Artikeln veröffentlicht (neun peer-reviewed), wobei ein Sonderheft der Zeitschrift *Water History* (Band 5/2 June 2013) das Hauptergebnis darstellt. ENVIEDAN wurde auf internationalen Kongressen und Workshops vorgestellt (31 Präsentationen) und über Zeitungsartikel und Radiosendungen einer größeren Öffentlichkeit vorgestellt. Animierte Rekonstruktionen sind auf YouTube verfügbar. Das Projekt ist Grundlage für zwei Folgeprojekte (Wiener Holz, gefördert durch die Österreichische Akademie der Wissenschaften; URBWATER gefördert vom Fonds zur Förderung der wissenschaftlichen Forschung).

## 2. BRIEF PROJECT REPORT

### 2.1 Report on the scientific work

#### 2.1.1 Information on the development of the research work

ENVIEDAN aimed at producing the first integrated environmental history of the Viennese Danube from Early Modern times until the beginning of the 20<sup>th</sup> century. The project's innovation was the interdisciplinary approach, the long-term study period and the spatially explicit analysis with the aid of GIS-tools. A team of environmental historians, social ecologists and experts in historical river morphology studied the changing functions and roles of the Danube in urban development.

ENVIEDAN used the concepts of "colonisation of natural systems" and "socio-natural sites" as a starting point. The latter investigates the co-evolutionary transformation of practices and arrangements, both understood as hybrids of society and nature. The particular strength of this concept lies in the ability to deal with socio-natural dynamics which play out over the long term of centuries. Furthermore, the magnitude and importance of pre-industrial interventions into rivers becomes tangible with such an approach. The concept of socio-natural sites avoids the analytical distinction of "nature" and "culture" which characterizes most other concepts used in environmental history and hence was used as the core-concept.

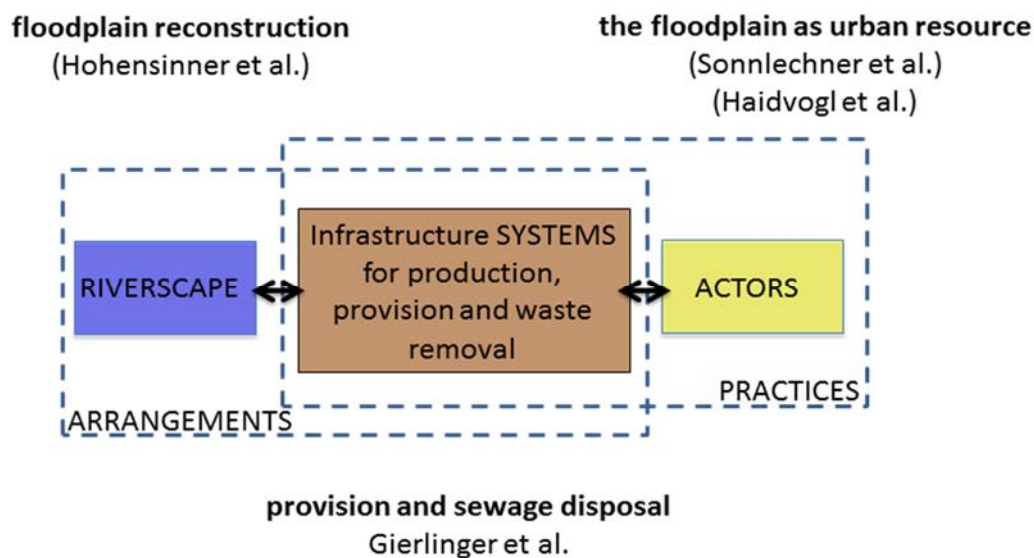
In accordance with the initial proposal, the project team reconstructed the dynamics of the fluvial landscape initiated by hydromorphological processes and technical interventions and analyzed them in conjunction with their functions for the provision of urban land, resource supply and waste discharge. Changing practices and arrangements were investigated together with human perceptions of the riverine landscape.

Changes in the project team due to maternity/paternity leaves or scholarships abroad could be alleviated by attracting excellent researchers as temporary replacements. They contributed an in-depth study of the Danube's role for urban defense in the early modern period as this was a major function of the Viennese Danube and the in depth study of waste discharge patterns by embedding the development of technical infrastructure into the urban sanitary discourse.

#### 2.1.2 Most important results and brief description of their significance

ENVIEDAN demonstrated the longevity of the transformation process from a dynamic riverscape with shifting land and water zones into a straight river channel with fixed banks. Threats imposed by regular floods and the use of the river's kinetic energy for navigation and urban supply were a main driver for technical interventions throughout the whole study period. The sovereign as well as urban and imperial institutions initiated these measures. They comprised a large part of the entire river system and not only the river arm next to the city center (*Donaukanal*) already in the 16<sup>th</sup> century. The shift to fossil energy sources made large-scale and unprecedented river engineering measures possible, improving flood protection and navigation in the second half of the 19<sup>th</sup> century. Nevertheless the importance of the Danube for supply with bulk goods – in particular wood – started to decline because the shift to coal as main energy source changed transport routes and transport means from ships and rafts to rail. Other drivers for changing practices and arrangements can be traced in specific periods only. The river's role for military defense was especially visible in the early modern period because of the threat from the Ottoman Empire. Main new driving forces appeared in the second half of the 19<sup>th</sup> century. The great Danube regulation accomplished between 1870 and 1875 simultaneously supported industrialization and urbanization which triggered a remarkable population growth. The latter boosted the need for urban land, the Danube floodplains became a target area for new residential buildings, industry and trade. Also the amount of nitrogen discharged into the river system through excreta and waste rose markedly.

The changing practices and arrangement summarized above were investigated in detail within the work-packages of the project. Figure 1 shows the conceptual links between the relevant topics, the main results are briefly described below.



*Fig. 1: Conceptual model elucidating the main elements of the Viennese Danube as a socio-natural site. The nexus between arrangements and practices is in infrastructure systems. The topics studied in detail in ENVIEDAN concentrate on floodplain reconstruction, the floodplain as a spatial resource for urban growth, as a site for the procurement of material resources for the city and on material supply and sewage disposal.*

To reconstruct the riverscape since 1529 a new GIS-based method was developed. The “regressive-iterative approach” uses historical maps and written documents. It combines analysis of fluvial processes and knowledge about the changing historical techniques of hydraulic engineering measures (Hohensinner et al. 2013a). The spatially explicit reconstruction of large parts of the Viennese Danube in the early modern period is a particularly innovative result. Accurate reconstructions are hitherto only available from the late 18<sup>th</sup> century onwards.

The reconstruction of the fluvial landscape brought new insights into the Danube’s evolution in the early modern period (Hohensinner et al. 2013b; Fig. 2). Since the 1500s, the river featured both phases of approach and retraction from the city center due to river morphological dynamics. These results call for re-interpreting the centuries-long struggle to maintain the navigability in the *Donaukanal*. Until 1565, its upper course was, in fact, the main Danube arm and not a side channel. Regulation efforts in the 16<sup>th</sup> and early 17<sup>th</sup> century pursued a much more ambitious goal than merely regulating a side arm: they intended to deflect the main Danube into its former bed closer to the city. Regulation efforts concentrated near Nußdorf, upstream from Vienna. Therefore, large parts of the Viennese riverscape were not directly affected by regulations prior to the early 19<sup>th</sup> century. Though large parts of the riverscape had already been stabilized in 1849 and were therefore open to the expanding city, the flood threat remained unresolved. The systematic transformation of much of the Viennese riverscape into settlement areas was finally made possible by the great Danube regulation 1870-1875. The comprehensive regulation measures were meant to secure the future development of Vienna for centuries. And indeed, the current and future scope of action for urban expansion, transportation routes, and sanitation – but also for remaining natural floodplain zones and urban open space – has been largely determined by this great regulation. It was, however undertaken on a river that had been substantially changed in preceding centuries, if not by the measures implemented so by their side-effects.



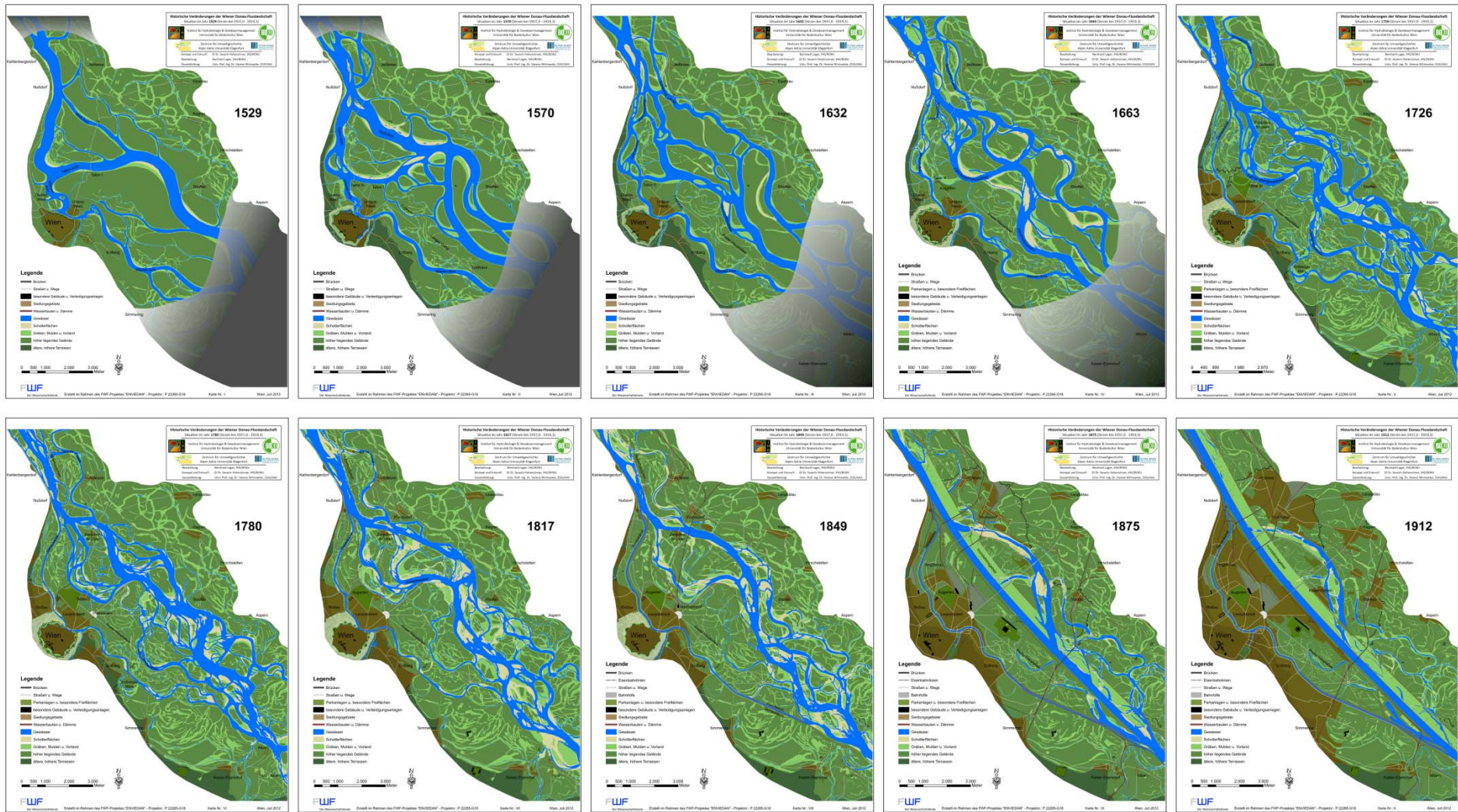


Fig. 2: The evolution of the Viennese Danube 1527 – 1912 as reconstructed in ENVIEDAN (see Hohensinner et al 2013b)

Hotspots of activity in the Viennese Danube floodplain were close to town in the 16<sup>th</sup> century, at Nußdorf and on the ephemeral islands of the floodplain. Sonnlechner et al. (2013) concentrate on important actors, including imperial authorities and landowners, and their motives to use, stabilize and change the riverscape in the 1600s. Transport and trade on ships using the Danube's kinetic energy, and over land to the north, which necessitated crossing the riverscape, were important practices. They required arrangements which changed the socio-natural site: bridges were erected and had to be rebuilt and maintained permanently. The same applies to bridgeheads, paths, catwalks, streets and toll stations. Due to military practices, settlement and fortification, the perception of the floodplain, if not the floodplain itself, were changed. The town adjacent to the Danube was fortified. Stone edifices and the arsenal were erected directly at the river which led to the problem of water undermining the built structures. Eventually, the floodplain became valuable for its resources for the fortification works. Sonnlechner et al. (2013) elucidate the ecological consequences of Vienna's transformation into a "Danube fortress" in the 16<sup>th</sup> and 17<sup>th</sup> century. Intensive timber harvesting, especially driven by coppice wood production, was started. The dynamic of the floodplain changed the forested area and caused legal problems that amplified as the resource increased in value.

The development of urban settlements was investigated as an example of changing land use regimes in the riverscape (Haidvogel et al 2013). Urban sprawl into the floodplains started on the island *Unterer Werd*, because of its relative stability. In the late 17<sup>th</sup> century settlement on the island was limited to the medieval core area. Although local constructions fixing the river banks and flood protection buildings had been erected until the 18<sup>th</sup> century, the main practice to mitigate the risks and impacts of the frequent floods was passive. Expensive infrastructure was erected at low-risk sites; during floods, humans moved upstairs, emergency food provisions had to be kept in each house. This changed in the 19<sup>th</sup> century. Practices to gain control over the arrangement dynamics began to dominate. From the 1830s onwards, the city expanded towards the north and northwest of the island. In the 1850s, the Danube floodplains were considered important land resources and the number of buildings increased in particular after the channelization of the river. The last decades of the 19<sup>th</sup> century mark a turning point in the urban development of Vienna. From then on, a large part of the settlement area would depend on a fully operating flood protection system. Urban infrastructure as an interface of arrangements and practices was studied based on an urban metabolic approach, but complementing it by investigating the changing perceptions of the waterscape as reflected in the debates of important historical actors such as authorities and commissions. Gierlinger et al. (2013) focus on the changing role of the urban waterscape for the provision of materials and the disposal of waste during the industrial transformation in Vienna in the 19<sup>th</sup> and early 20<sup>th</sup> century. In the second half of the 19<sup>th</sup> century, the transition from a solar-based energy system to the large scale use of coal triggered far-reaching changes in urban metabolism and in the city-river relationship. The whole urban waterscape, i.e. the Danube and its tributaries, played an important role for the urban metabolism of Vienna in the 19<sup>th</sup> century – a role that changed during the industrial transformation. The kinetic energy of the river was used for both the transportation of material into the city and the disposal of urban excreta. But there was a shift in importance from the supply of materials to the disposal of waste. The proportion of goods transported to the city on the water route declined, whereas the amount of nitrogen contained in wastewater discharged into the Danube rose by a factor of seven. The urban waterscape itself was transformed fundamentally. Almost all water bodies were rearranged into elements of the urban infrastructure. Prevention of epidemics was a major driver for this development. Parallel to the great Danube regulation in the 1870s, the city began to transform almost all of the Danube's small tributaries flowing through the city into sewage tunnels. Sewage and regulation were perceived as closely intertwined at the time when discussion about a comprehensive regulation began.

### **2.1.3 Information on the running of the project, use of the available funding and where appropriate any changes to the original project plan**

ENVIEDAN was scheduled for a period of 24 months from Mai 15<sup>th</sup> 2010 to Mai 14<sup>th</sup> 2012. Due to leaves of absence and changes of main project staff as well as extended documentation of literature, written and visual sources a cost-neutral project extension until December 14<sup>th</sup>, 2012 was requested and accepted by FWF.

The project involved one full professor of environmental history, Verena Winiwarter, as project leader and one full professor of social ecology, Fridolin Krausmann, as consultant for urban metabolism, resources supply, discharge patterns and material and energy flow analyses. Martin Schmid was involved as assistant professor working on changes in the representation and perception of the (Viennese) Danube landscape in topographical sources. Due to a six month scholarship at the Rachel Carson Center for Environment and Society in Munich and a paternity leave he was replaced for twelve months by Christoph Sonnlechner, an expert in medieval and early modern Viennese history. Sonnlechner worked as a post-doc researcher on the role of the Viennese Danube and its floodplains for military defence and resources supply in the 16<sup>th</sup> century. Two further Post-Doc researchers from the national research partner University of Natural Resources and Life Sciences, Vienna, Gertrud Haidvogel and Severin Hohensinner, investigated the fluvial morphology of the Viennese Danube and urban development in the Danube floodplains. A third post-doc researcher, Simone Gingrich, had to withdraw from the project due to her maternity leave. She was replaced by PhD student Sylvia Gierlinger, who analysed resource supply, waste and waste water discharge in the transition phase from a solar-based society to the fossil-based early industrial period in the 19<sup>th</sup> century. Six master theses focused on specific topics related to the main research subjects. Three of them are already completed, two will be completed in summer 2013, another one was interrupted due to a maternity leave in summer 2012 and will be completed in the second half of 2013/beginning of 2014 (see annex List 4).

No large equipment was needed and purchased for the execution of the project.

There were no significant deviations from the original project plan except those reported above regarding changes of personnel.

### **2.2. Personnel development – importance of the project for the scientific careers of those involved (including the project leader)**

ENVIEDAN was the first large interdisciplinary project of the Center of Environmental History Vienna since Verena Winiwarter was appointed as professor. It contributed to two strategically important goals of the Center and the professorship, i.e. the preparation of a synthetic environmental history of Austria and the environmental history of the entire Danube river system.

To date, the interdisciplinary research efforts of the ENVIEDAN project team were made visible in several scientific publications in English and German (21 in total, nine of them peer-reviewed) and presentations at international and national scientific conferences and workshops.

The project increased the expertise and international reputation of all team members in their specific research fields and in particular Verena Winiwarter's experience in successfully managing interdisciplinary cutting-edge research.

Martin Schmid produced important results for his "habilitation" thesis about the environmental history of the Danube to be submitted in autumn 2013.

Gertrud Haidvogel broadened her expertise in investigating historical land use changes in floodplains and her technical skills in GIS; Severin Hohensinner expanded his knowledge in historical fluvial morphology and his skills in using historical sources for reconstructing past riverscapes. Sylvia Gierlinger improved her expertise in urban metabolism and especially in investigating urban nitrogen flows. She produced parts of her cumulative PhD-thesis (urban nitrogen metabolism changes in Vienna in the industrial transformation phase).

Christoph Sonnlechner has a position at the City and Provincial Archives Vienna. The engagement in ENVIEDAN offered him the possibility to engage in scholarly work on the



environmental history of Vienna and on late medieval and early modern river-city interactions.

The project also supported six master students with grants.

ENVIEDAN intensified national co-operations (City and Provincial Archives Vienna, Vienna Urban Archaeology, Vienna Museum, the Lower Austrian State Library, Urban Water Management). The project deepened existing international co-operations with Sabine Barles, Université Paris 1 Panthéon-Sorbonne, and Martin Knoll, Technische Universität Darmstadt, and with several other key intuitions in the field through an international advisory board.

### **2.3 Effects of the project outside the scientific field**

Results of ENVIEDAN were made available to a wider public by means of articles and interviews in national Austrian newspapers and journals (Die Presse, Standard, vco Magazin) and national radio programmes. A project webpage was produced and videos showing the reconstructed riverscape were published via YouTube (see annex, list 1b). The project was presented at the Vienna Library and during a public event of the Center for Environmental History Vienna. In May 2012 a three-day workshop was organized with the Advisory Board members of the project.

The project results were integrated in university lectures and seminars of the project team, such as in the lectures “Environmental History” and “Environmental History of Aquatic Systems” (both at University of Natural Resources and Life Sciences, Vienna). Results of the projects were also presented and discussed in the introductory lecture “Umweltgeschichte Österreichs / Austrian Environmental History” (M. Schmid, V. Winiwarter), in the seminar “Umweltgeschichte von Flüssen / Environmental History of Rivers” (M. Schmid), the seminar and excursion “Connecting Vienna” for the Global Studies programme at the University of Vienna (M. Schmid together with Andrea Komlosy and Gerhard Strohmeier), and in a forthcoming excursion “Donau interdisziplinär” at the Institute of Geography, Alpen-Adria Universität Klagenfurt (M. Schmid together with H. Egner and G. Strohmeier).

In total 31 presentations were given during international and national conferences and workshops. Some of them were embedded in special sessions on river-city interactions organized by ENVIEDAN team members, such as the 11th Conference on Urban History “Cities and Societies in Comparative Perspective” of the European Association of Urban History (Prague, Czech Republic, 29th August - 1st September 2012), the 6<sup>th</sup> European Conference on Environmental History (Turku, Finland, June 28-July 2, 2011) or at the 48. Deutsche Historikertag (Berlin, 28. September 2010).

Two follow-up projects have been granted: Vienna’s Urban Waterscape 1683-1918. An environmental history. [URBWATER] (grant date: May 2013; funded by FWF) and “Enough wood for city and river? Vienna’s wood resources in dynamic Danube floodplains” (grant date May 2012, funded by Jubiläumsfonds der Stadt Wien für die Österreichische Akademie der Wissenschaften“, Nationalpark Donauauen GesmbH and Österreichische Bundesforste AG).

### 3. Information on project participants

not funded by the FWF			funded by the FWF (project)		
co-workers	number	Person-months	co-workers	number	Person - months
non-scientific co-workers			non-scientific co-workers	3	10
diploma students	1		diploma students	5	Not available
PhD students			PhD students	1	8,5
post-doctoral co-workers	2	16	post-doctoral co-workers	4	21,5
co-workers with "Habilitation" (professorial qualifications)			co-workers with "Habilitation" (professorial qualifications)		
professors	2	6	professors		

## 4. Attachments

### List 1

#### 1.a. Scientific publications<sup>2</sup>

##### 1.a.1. Peer-reviewed publications (journals, contribution to anthologies, working papers, proceedings etc.)

- 1) Gingrich S., G. Haidvogel & F. Krausmann (2012): The Danube and Vienna: urban resource use, transport and land use 1800 to 1910. *Regional Environmental Change* 12 (2), pp 283-294.
- 2) Winiwarter V., M. Schmid, S. Hohensinner & G. Haidvogel (2013): The Environmental History of the Danube River Basin as an Issue of Long-Term Socio-Ecological Research. In: Singh S.J., H. Haberl, M. Chertow, M. Schmid & M. Mirtl (eds.): *Long-Term Socio-Ecological Research. Studies in society - nature interactions across spatial and temporal scales (= Human - Environment Interactions, series edited by Emilio Moran, Volume 1)*, Springer, Dordrecht. pp. 103-122.
- 3) Gierlinger S., G. Haidvogel, S. Gingrich & F. Krausmann (2013): Feeding and Cleaning the city: The role of the urban waterscape in provision and disposal in Vienna during the industrial transformation. *Water History*.
- 4) **Haidvogel G., M. Horvath, S. Gierlinger, S. Hohensinner & Ch. Sonnlechner (2013): Urban land for a growing city at the banks of a moving river: Vienna's spread into the Danube floodplains from the late 17th century until 1912. *Water History*.**
- 5) **Hohensinner S., Ch. Sonnlechner, M. Schmid & V. Winiwarter (2013a): Two steps back, one step forward: Reconstructing the dynamic Danube riverscape under human influence in Vienna. *Water History*.**
- 6) **Hohensinner S., B. Lager, Ch. Sonnlechner, G. Haidvogel, S. Gierlinger, M. Schmid, F. Krausmann & V. Winiwarter (2013b): Changes in water and land: the reconstructed Viennese riverscape 1500 to the present. *Water History*.**
- 7) Neundlinger M., S. Gierlinger, G. Pollack & F. Krausmann (accepted): Viennese Waters and Sanitation Systems from Roman to Modern Times. In: Tvedt T. & T. Oestigaard (eds.): *From Jericho to Cities in the Seas. A History of Urbanization and Water Systems. A History of Water, Series 3, Vol. 1*, I.B. Tauris, London.
- 8) Sonnlechner Ch., S. Hohensinner & G. Haidvogel (2013): Floods, fights and a fluid river: The Viennese Danube in the 16th Century. *Water History*.
- 9) Winiwarter V., M. Schmid & G. Dressel (2013): Looking at half a millennium of co-existence: The Danube in Vienna as a challenge for an interdisciplinary environmental history. *Water History*.

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<sup>2</sup> The publication list must mention for each work: all authors; full title; series/journal title; year; volume; and page numbers. Furthermore, if publications are freely available in the internet, please add the URL of the publication.

### 1.a.2. Non peer-reviewed publications (journals, contribution to anthologies research reports, working papers, proceedings, etc.)

1. Andraschek-Holzer R. & M. Schmid (2011): Umweltgeschichte und Topographische Ansichten: Zur Wahrnehmung und Transformation von Flusslandschaften an der österreichischen Donau 1650-1950. Jahrbuch für Landeskunde von Niederösterreich 2009-2010, NF 75/76, S. 1-49.
2. Andraschek-Holzer R. & M. Schmid (2012): Umweltgeschichte und topographische Ansichten: Zur Transformation eines österreichischen Donauabschnitts in der Neuzeit. Mitteilungen des Instituts für Österreichische Geschichtsforschung 120, Teilband 1, S. 80-115.
3. Brabec S. (2012): Bericht über die Sachsen-Coburgischen Holztransporte nach Wien. In: Pro Civitate Austria NF 17, pp. 1-30.
4. Haidvogel G. (2012): The channelization of the Danube and urban spatial development in Vienna in the 19th and early 20th century. In: Castonguay S. & M. Evenden (eds.): Urban Rivers. Remaking rivers, cities and space in Europe and North America, University of Pittsburgh Press, Pittsburgh, pp. 113-129.
5. Hohensinner S. & B. Lager (accepted): Flussmorphologische Entwicklung im Bereich der Elendbastion. In: Urban Archaeology of Vienna (ed.), Archäologische Untersuchungen im Bereich der Elendbastion. Monographie.
6. Hohensinner S., B. Lager, Ch. Sonnlechner & V. Winiwarter (2012): Historische Wasserbauten an der Wiener Donau und ihren Zubringern 1200 – 1900. Verortung und Auswertung mittels ESRI ArcGIS. Internal database prepared in ENVIEDAN, Projekt-Nr. P 22265-G18.
7. Hohensinner, S. & M. Schmid (2013): The more dikes the higher the floods: Vienna and its Danube floods, c. 1700 to 1918. International Conference on Disasters Wet and Dry: Rivers, Floods, and Droughts in World History, Beijing, China, May 23-26, 2013; In: Rachel Carson Center for Environment and Society, LMU Munich & Center for Ecological History, Renmin University of China (eds.), Disasters Wet and Dry: Rivers, Floods, and Droughts in World History, Vol. II, 565-587.
8. Neundlinger M. (in press): "Der große Faden unserer zukünftigen Geschichte". Die Wiener Donau als sozionaturaler Schauplatz, 1744-1890. In: Pro Civitate Austriae (Österreichischer Arbeitskreis für Stadtgeschichtsforschung, Wien).
9. Schmid M., V. Winiwarter & G. Haidvogel (2010): Legacies from the past: The Danube's riverine landscapes as socio-natural sites. Danube News 21/12, S. 2-5.
10. Schmid M. & V. Winiwarter (2011): Umwelt Donau: Eine andere Geschichte. In: Der Donaulimes in Österreich (herausgegeben vom Institut für Österreichische Geschichtsforschung, Projektleitung A. Schwarcz, Redaktion S. Jilek), Wien o.J. (2011), S. 32-35.
11. Sonnlechner Ch. (2012): Das Wiener Rathaus als umwelthistorischer Erinnerungsort. In: Pils S. C., M. Scheutz, Ch. Sonnlechner & S. Spevak (Hg.), Rathäuser als multifunktionale Räume der Repräsentation, der Parteiungen und des Geheimnisses. Studienverlag, Innsbruck, Wien, Bozen (= Forschungen und Beiträge zur Wiener Stadtgeschichte 55), S. 255-268.
12. Schmid M. (in press): Stadt am Fluss: Wiener Häfen als sozio-naturale Schauplätze von der Frühen Neuzeit bis nach dem Zweiten Weltkrieg. In: Scheutz M., L. Morscher & W. Schuster (Hg.): Orte der Stadt im Wandel vom Mittelalter zur Gegenwart: Treffpunkte der Stadt, Verkehr und Fürsorge.

### **1.a.3. Stand-alone publications (monographies, anthologies)**

### **1.b. publications for the general public and other publications**

- 1) Haidvogel G. & V. Winiwarter (2011): Donau: Vom Fluss zur Wasserstraße. VCÖ Magazin 1/2011. S. 8. published
- 2) Winiwarter V. & G. Haidvogel (2011): Der Donauroum. BOKU 2/2011. S. 6-8. published
- 3) Im Fluss der Zeit - Die Geschichte der Donau, Der Standard, 15.08.2011. published.
- 4) Sie wollen einen natürlichen Fluss? Dann fahren Sie nach Kanada, Die Presse, 24.03.2012. published
- 5) Die Donau - eine Sendung über die historische Lebensader der Stadt Wien von Wolfgang Slapansky, Ö1 Dimensionen - die Welt der Wissenschaft, 26.06.2012. published
- 6) Vom Stadttor zum Flughafen. Die Stadt als sozial differenzierter Erfahrungsraum. Eine Sendung zur Tagung über Geschichtsforschung in Innsbruck von Wolfgang Slapansky, Ö1 Dimensionen - die Welt der Wissenschaft, 25.09.2012. published
- 8) Lager B. & S. Hohensinner (2012): Danube River in Vienna 1529 – 2010. Videoanimation basierend auf den rekonstruierten Zeitschnitten der Wiener Donau. Changing Danube river landscape in Vienna 1529 – 2010 (YouTube Video), <http://youtu.be/dHERpWgA84Y> . published
- 9) Hohensinner S. & B. Lager (2012): Flight over the Danube to Vienna 1570 - Flug über die Donau nach Wien 1570 (YouTube Video), <http://youtu.be/P4obckqKNEY> . published
- 10) Hohensinner S. & B. Lager (2012): Crossing the Viennese Danube in 1570 - Querung der Wiener Donau 1570 (YouTube Video), <http://youtu.be/RKpbhTnxnPY> . published
- 11) Hohensinner S. (2012): The struggle with the river: Vienna and the Danube from 1500 to the present. ARCADIA – Online Explorations in European Environmental History, <http://www.environmentandsociety.org/arcadia/struggle-river-vienna-and-danube-1500-present> . published
- 12) Wien und die Donau: Eine Scheinehe, Die Presse, 03.02.2013. published



## List 2 Project-related participation in international scientific conferences

### 2.1. Conference participations - invited lectures

- 1) Schmid M. (2011): An environmental History of the Danube 1500-1900. Lunchtime Colloquium, Rachel Carson Centre Munich, 19th May 2011.

### 2.2. Conference participations - lectures

- 1) Gingrich S., G. Haidvogel & F. Krausmann (2010): Driving force or phase-out model? Danube transport and resource supply in the industrialising city of Vienna 1800-1920. Water History Conference, Delft, The Netherlands, 16th – 19th June 2010.
- 2) Gingrich S. (2010): Das Energiesystem und die Landschaft: Die Donau als Verkehrsweg im 19. Jahrhundert. Umwelt Donau: Eine andere Geschichte, 30. Symposium des NÖ Instituts für Landeskunde, Ardagger, 6. - 8. Juli 2010.
- 3) Haidvogel G. (2010): Amphibische Landschaft Donau: von Fischen und Auen im Wandel der Zeiten. Umwelt Donau - Eine andere Geschichte, 30. Symposium des NÖ Instituts für Landeskunde, Ardagger, 6. - 8. Juli 2010.
- 4) Hohensinner S. (2010): Der Kampf mit der Dynamik: Schifffahrtshindernisse an der Donau im Machland. Umwelt Donau: Eine andere Geschichte, 30. Symposium des NÖ Instituts für Landeskunde, Ardagger, 6. - 8. Juli 2010.
- 5) Hohensinner S. (2010): Rekonstruktion einer Flusslandschaft: Das Machland seit dem 18. Jahrhundert. Umwelt Donau: Eine andere Geschichte, 30. Symposium des NÖ Instituts für Landeskunde, Ardagger, 6. - 8. Juli 2010.
- 6) Schmid M. (2010): Marsigli's Donau: Kriegshandwerk und Gelehrsamkeit an der mittleren Donau. Umwelt Donau: Eine andere Geschichte, 30. Symposium des NÖ Instituts für Landeskunde, Ardagger, 6. - 8. Juli 2010.
- 7) Winiwarter V. (2010): An environmental history of the Danube in pre-modern times. First Bulgarian Environmental History Workshop, Sofia, 12th November 2010.
- 8) Gierlinger S., S. Gingrich & F. Krausmann (2011): Vienna's nitrogen metabolism: food, feed, waste and sewage in the early phase of industrialisation (1869-1910). Nitrogen and global change conference, Edinburgh, Scotland, 11th -14th April 2011.
- 10) Neundlinger M. (2011): Second ESEH Summer School: Water-Culture-Politics, Perspectives in Environmental History. Invited Speaker on "Hybrid Histories of River-City-Relations – The Viennese Danube as Socio-Natural Site, 1700-1890", Venice, Italy, 20th – 25th June 2011.
- 11) Hohensinner S. (2011): Historical hydrological records: a key to understanding past Danube dynamics. Encounters of sea and land, 6th Conference of the European Society for Environmental History (ESEH), Turku, Finland, 28th June – 2nd July 2011.
- 12) Schmid M. (2011): Metabolism and perception: Vienna and the Danube 1500-1750. Encounters of sea and land, 6th Conference of the European Society for Environmental History (ESEH), Turku, Finland, 28th June – 2nd July 2011.
- 13) Winiwarter V. (2011): Early Modern Danube Floods reflected in English Newspapers. Encounters of sea and land, 6th Conference of the European Society for Environmental History (ESEH), Turku, Finland, 28th June – 2nd July 2011.
- 14) Hohensinner S. & B. Lager (2011): GIS-based reconstruction of historical river engineering measures at the Viennese Danube River since the 13th century. 16th

International Conference on Cultural Heritage and New Technologies, Vienna, Austria, 14th – 16th November 2011.

- 15) Haidvogel G. & V. Winiwarter (2011): Umweltgeschichte der Wiener Donau – ENVIEDAN. Vortragsreihe Hydrogeologie von Wien, 25. November 2011.
- 16) Schmid M., S. Hohensinner, Ch. Sonnlechner, S. Gierlinger, G. Haidvogel, S. Gingrich, F. Krausmann & V. Winiwarter (2012): "From Local to Global ... and back: An Environmental History of the Danube 1500-1900." From the Local to the Global: Ethics, Environmentalism, and Environmental History in an Interdependent World", Conference of the American Society for Environmental History (ASEH), Madison, Wisconsin, USA, 28th – 31st March 2012.
- 17) Neundlinger, M. (2012): Mensch, Umwelt, Region: Projekt zur Aufarbeitung der oberösterreichischen Umweltgeschichte. Invited Speaker on „Die Transformation der Wiener Donau – Vom Archivobjekt zur Umweltgeschichte“, Linz, Austria, 31st March 2012.
- 18) Neundlinger, M. (2012): Robust Control and Hydrological Hazards – A Common History of Danube Floods and the City of Vienna, 1744-1875. 15th International Conference of Historical Geographers, Prague, Czech Republic, 6th – 10th August 2012.
- 19) Gierlinger S., G. Haidvogel, F. Krausmann & S. Gingrich (2012): The transformation of a socio-natural site: urban development and river transport on the Viennese Danube (19th, early 20th century). Cities and societies in comparative perspective. Europ. Assoc. of Urban History, 11th Int. Conference, Prague, Czech Republic, 29th August – 1st September 2012.
- 20) Schmid, M. (2012): „Commentary on 5 papers written by S. Barles, A. V. Kraikovski and J. Lajus, S. Gierlinger et al, L. Lestel, S. Castonguay“ at 'Cities and Rivers – long term development of socio-natural sites', main session 04 (organised by D. Schott, M. Knoll and M. Schmid) for EAUH – European Association of Urban History, 11th International Conference on Urban History 'Cities & Societies in Comparative Perspective', Charles University Prague, Czech Republic, 29th August – 1st September 2012.
- 21) Sonnlechner Ch. & S. Hohensinner (2012): Becoming an ‚imperial river‘. Engineering and disputing the Viennese Danube in Early Modern Times. Cities and societies in comparative perspective. Europ. Assoc. Of Urban History, 11th Int. Conference, Prague, Czech Republic, 29th August – 1st September 2012.
- 22) Schmid M. (2012): "Stadt am Fluss: Wiener Häfen als sozio-naturale Schauplätze von der Frühen Neuzeit bis nach dem Zweiten Weltkrieg", Vortrag bei der Tagung "Orte der Stadt im Wandel vom Mittelalter bis zur Gegenwart" organisiert von L. Morscher, M. Scheutz und W. Schuster für Österreichischer Arbeitskreis für Stadtgeschichtsforschung, Stadtarchiv/Stadtmuseum Innsbruck und Institut für Österreichische Geschichtsforschung, Neues Rathaus, Innsbruck, 19.-21. September 2012.
- 23) Winiwarter V., & M. Schmid (2012): "Nature, Nurture or Socio-Natural Site? Conceptualizing Cities and their Resources in Environmental History", contribution to a roundtable "Die Ressourcen der Stadt: Konzepte zur Untersuchung der historischen Stadt als materielles Phänomen" organised by D. Schott (Darmstadt) with S. Barles (Paris), J. I. Engels (Darmstadt) and M. Knoll (Darmstadt) at the 49th Deutsche

Historikertag "Ressourcen - Konflikte", Johannes Gutenberg Universität Mainz, Deutschland, 26th September 2012.

- 24) Haidvogel G., S. Hohensinner, M. Schmid, Ch. Sonnlechner & V. Winiwarter (2012): Die Umweltgeschichte der Wiener Donau 1500-1890. 50. Minisymposium des Zentrums für Umweltgeschichte, Moderation: F. Krausmann, Alpen-Adria-Universität, IFF Wien, 8. November 2012.
- 25) Haidvogel G., S. Hohensinner & V. Winiwarter (2012): Die Donau – Eine bewegte Geschichte. Präsentation im Rahmen der Vortragsreihe „Fragen des Alltags – Antworten der Wissenschaft“, Wiener Hauptbücherei, 17. Dezember 2012.
- 26) Sonnlechner Ch. (2012): Umweltgeschichte der Wiener Donau als sozial-ökologische Langzeitforschung. Öffentlicher Vortrag, an der iff (Fakultät für interdisziplinäre Forschung und Fortbildung), Wien, 25. Jänner 2012.
- 27) Sonnlechner Ch. & H. Krause (2012): Archäologie und Umweltgeschichte – Wien, die Donau und der Umgang mit Wasser. Ein Fallbeispiel. Konferenz der Österreichischen Gesellschaft für Mittelalterarchäologie u.a. ‚Mittelalterarchäologie in Österreich – Eine Bilanz‘, Innsbruck, 3. Oktober 2012.
- 28) Sonnlechner Ch. (2011): Das Rathaus als umwelthistorischer Erinnerungsort. Internationale Tagung: ‚Rathäuser als multifunktionale Räume der Repräsentation, der Parteiungen und des Geheimnisses‘, 12. bis 14. Oktober 2011, im Wiener Stadt- und Landesarchiv in Zusammenarbeit mit dem Institut für Österreichische Geschichtsforschung und dem Verein für Geschichte der Stadt Wien, Wien, 13. Oktober 2012.
- 29) Hohensinner S. & M. Schmid (2013): The more dikes, the higher the floods: Vienna and its Danube floods, c. 1700 to 1918. International Conference ‘Disasters Wet and Dry: Rivers, Floods, and Droughts in World History’, Beijing, Renmin University of China, 23rd-26th May 2013.

### **2.3. Conference participations - posters**

- 1) Haidvogel G., V. Winiwarter, M. Schmid, M. Jungwirth & D. Pont: Long term socio-ecological research of the Danube River, discussion paper with poster at the International Conference on the Status and Future of the World's Large Rivers, 11-14 April 2011, Austria Center Vienna, Austria, 14 th April 2011.

### **2.4. Conference participations – other**

None

### List 3 Development of collaborations

<b>N</b>			Nature <b>N</b> (national); <b>E</b> (European); <b>I</b> (other international cooperation)
↓	<b>E</b>		Extent <b>E1</b> <b>low</b> (e.g. no joint publications but mention in acknowledgements or similar); <b>E2</b> <b>medium</b> (collaboration e.g. with occasional joint publications, exchange of materials or similar but no longer-term exchange of personnel); <b>E3</b> <b>high</b> (extensive collaboration with mutual hosting of group members for research stays, regular joint publications etc.)
		<b>D</b>	Discipline <b>D</b> within the discipline <b>T</b> transdisciplinary

<b>N</b>	<b>E</b>	<b>D</b>	<b>Collaboration partner / content of the collaboration</b>
↓	↓	↓	
<b>N</b>	<b>E2</b>	<b>T</b>	1) Name: <b>Bekesi Sandor</b> Title: <b>Dr.</b> Institution: <b>Wien Museum</b> Content: Assistance in archival research. Assistance in reproduction of selected archival documents. Discussion about joint exhibition in progress
<b>N</b>	<b>E2</b>	<b>T</b>	2) Name: <b>Ralph Andraschek-Holzer</b> Title: <b>Dr.</b> Institution: <b>Niederösterreichische Landesbibliothek, Topographische Sammlung</b> Content: Two joint publications on topographical pictures as sources for an interdisciplinary environmental history of the Danube; focus on changes in the perception of the river from the 17th to the 20th century
<b>E</b>	<b>E3</b>	<b>D</b>	3) Name: <b>Sabine Barles</b> Title: <b>Prof. Dr.</b> Institution: <b>Université Paris 1 Panthéon-Sorbonne</b> Content: Hosting of <b>Sylvia Gierlinger</b> as guest doctoral student, joint publication in progress
<b>E</b>	<b>E3</b>	<b>D</b>	4) Name: <b>Martin Knoll</b> Title: Institution: <b>Technical University Darmstadt, Institute of History</b> Content: <b>Dr. Knoll</b> participated in several project workshops, was research fellow at the Center for Environmental History Vienna; members of the project team jointly organised with him several conference sessions where <b>ENVIEDAN</b> was presented (e.g. <b>Deutscher Historikertag, European Association for Urban History in Prague</b> ).
<b>N</b>	<b>E3</b>	<b>D</b>	5) Name: <b>Christoph Sonnlechner</b> Title: <b>Dr.</b> Institution: <b>Wiener Stadt und Landesarchiv</b> Content: Assistance in archival research. Assistance in reproduction of selected archival documents. Common publications

**Note:** general scientific contacts and occasional meetings should not be considered as collaborations in the above sense.

**List 4 “Habitations” (professorial qualifications) / PhD theses / diploma theses**  
with an indication of the status (in progress / completed)

**4.1. Professorial Qualifications**

- 1) M. Schmid: Zu einer Umweltgeschichte der Donau / Towards an Environmental History of the Danube („Habilitation“ to be submitted to the Senat of Alpen-Adria Universität Klagenfurt in October 2013)

**4.2. PhD Theses**

- 1) Sylvia Gierlinger: „Der urbane Stickstoffmetabolismus von Wien zur Zeit der industriellen Transformation“ (in progress)

**4.3. Diploma Theses**

**Finished:**

- 1) Lager B. (2012): Historische hydromorphologische Veränderungen der Wiener Donau-Flusslandschaft 1529 - 2010. Master thesis, Institut für Hydrobiologie & Gewässermanagement, Universität für Bodenkultur Wien. Supervisor: DI Dr. Severin Hohensinner.
- 2) Neundlinger M. (2011): Stadt-Fluss-Geschichte als hybride Geschichte - Die Wiener Donau also sozio-naturaler Schauplatz, 1700-1890. Master thesis Alpen-Adria-Universität Wien - Graz - Klagenfurt. Supervisor: Ass. Prof. Dr. Martin Schmid.
- 3) Pollack G. (2012): Verschmutzt - verbaut - vergessen: Eine Umweltgeschichte des Wienflusses von 1780 bis 1910. Master thesis Alpen-Adria-Universität Klagenfurt, Graz, Wien. Supervisor: Ass.-Prof. Dr. Martin Schmid.

**In progress:**

- 4) Ertl Elisabeth (in prep.): Vegetation communities and forest use in the Viennese Danube flood plain around 1830. Institut für Hydrobiologie & Gewässermanagement, Universität für Bodenkultur Wien. Supervisor: Dr. Gertrud Haidvogel.
- 5) Guthyne-Horvath Marianna (in prep., maternity leave): Die Siedlungsentwicklung Wiens in der Aenzone der Donau 1704-2007. Institut für Hydrobiologie & Gewässermanagement, Universität für Bodenkultur Wien. Supervisor: Dr. Gertrud Haidvogel.
- 6) Hahmann A. (in prep.): Kostenstruktur historischer Wasserbaumaßnahmen an der Wiener Donau. Master thesis, Institut für Hydrobiologie & Gewässermanagement, Universität für Bodenkultur Wien. Supervisors: DI Dr. Severin Hohensinner, Ao.Univ.Prof. Dr. Herwig Waidbacher, Univ.-Prof. Ing. Dr. Verena Winiwarter.

## **List 5 Effects of the project outside the scientific field**

### **5.1. Organization of scientific events**

- 1) Haidvogel G., Hohensinner S. & V. Winiwarter V. (2012): Die Donau – Eine bewegte Geschichte. Präsentation im Rahmen der Vortragsreihe „Fragen des Alltags – Antworten der Wissenschaft“, Wiener Hauptbücherei, 17. Dez. 2012.
- 2) International Workshop with the members of the ENVIEDAN Advisory Board May 3rd-5th 2012, Vienna.
- 3) "Cities and rivers – long term development of socio-natural sites", co-organized main session by M. Schmid (together with Dieter Schott and Martin Knoll) at the 11th Conference on Urban History "Cities and Societies in Comparative Perspective" of EAUH - European Association of Urban History, Prague, Czech Republic, 29th August - 1st September 2012.
- 4) "City – River – Hinterlands: Urban Metabolism and the Danube river catchment 1500-1900", Session at the 6th conference of the European Society for Environmental History ESEH, Turku, Finland, June 28-July, 2, 2011, Session Organizer M. Schmid, Session with papers by M. Schmid (Austria), M. Knoll (Germany), S. Gingrich, G. Haidvogel and F. Krausmann (Austria)
- 5) Sektion Frühe Neuzeit 1 "Die Donau - Umweltgeschichte und Grenzüberschreitung" am 48. Deutscher Historikertag Berlin, Co-Organisator (organised by M. Schmid, V. Winiwarter und M. Knoll), Berlin, 28. September 2010, mit Beiträgen von V. Winiwarter (Österreich), M. Knoll (Deutschland), J. Mrgic (Serbien), M. Schmid (Österreich) und Kommentaren von A. Landwehr (Deutschland) und R. C. Hoffmann (Kanada)

### **5.2. Particular honours, prizes etc.**

none

### **5.3. Information on results relevant to commercial applications**

none

### **5.4. Other effects beyond the scientific field**

none

### **5.5. Relevance of the project in the organization of the relevant scientific discipline**

none



## **List 6. Applications for follow-up projects**

### **6.1 Applications for follow-up projects (FWF projects)**

- 1) Vienna's Urban Waterscape 1683-1918. An environmental history. [URBWATER].  
Project leader: Univ. Prof. Ing. Dr. Verena Winiwarter, IFF/Alpen-Adria Universität Klagenfurt. Type of project: Stand-alone project; submitted May 2012, resubmitted Dec. 2012; Status: granted in May 2013.

### **6.2 Applications for follow-up projects (Other national projects)**

- 1) Enough wood for city and river? Vienna's wood resources in dynamic Danube floodplains/Genug Holz für Stadt und Fluss. Wiens Holzressourcen in dynamischen Donauauen. Submitted to „Jubiläumsfond der Stadt Wien für die Österreichische Akademie der Wissenschaften“, additional funding by Nationalpark Donauauen GesmbH, Österreichische Bundesforste AG. Project leader Univ. Prof. Dr. M. Jungwirth, Institute of Hydrobiology and Aquatic Ecosystem Management/BOKU Vienna. Project granted in May 2012. Status: in progress until 31.9.2013.

### **6.3 Applications for follow-up projects (International projects)**

None