Reflections on Water: Visualizing Human-Riverine Interaction

A quest for inspiration in the audio-visual community

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With a special thanks to Jonas Löwgren, Niklas Rönnberg and all those wonderful people who explored thoughts on rivers, water and flooding over the last year.

Paleo-landscape reconstruction with a focus on human-riverine interaction has become an important field of study with climate change related phenomena such as





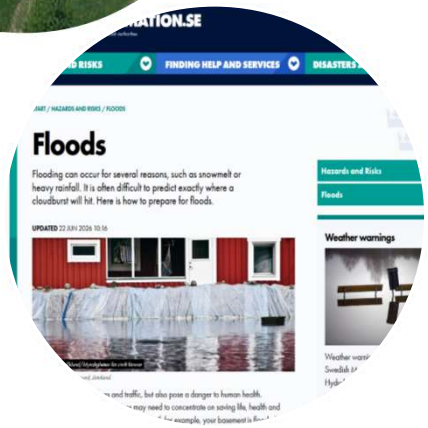
flooding

and droughts.

Such events show, how,



even in a technically developed society,



nature cannot always be controlled.

Paleo-landscape reconstructions of human-environmental interaction examines

the reciprocal relation between environmental and human induced changes in the landscape over long periods of time

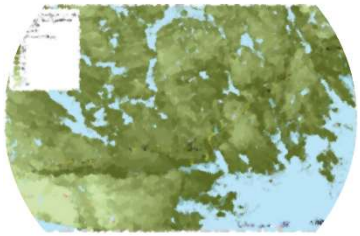
and places today's developments in a long-term context



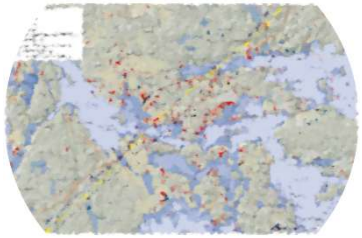
with possibilities of modelling future develop-ments.



such as hydrological changes



between 4000-1000 and 500 BCE,



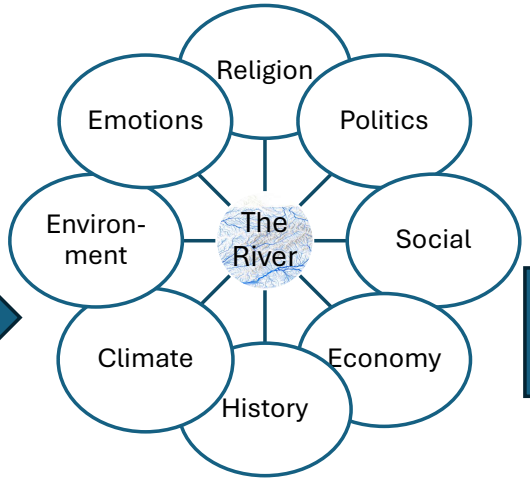
and settlements in Norrkoping kommun
(Arkeologerna, Anna Plikk)



or historical, impactful events, such as storms,

Reconstructing human-riverine environments means

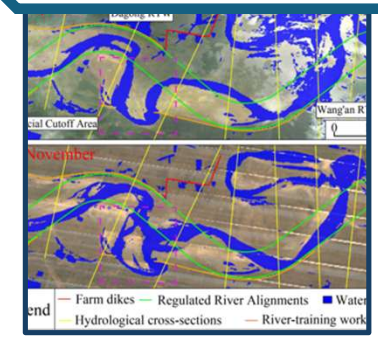
working with complex data, related to



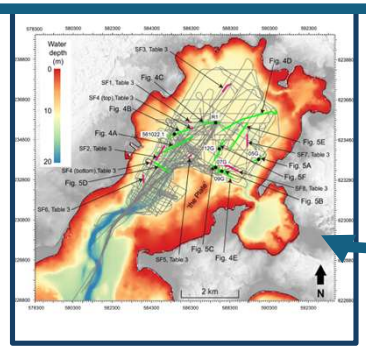
and requires a multi-disciplinary approach:

Multi-disciplinary
Pollen research
Geomorphology
Biogeochemistry
Climatology
History
Remote sensing
Material cultural studies
Cartography
Linguistics

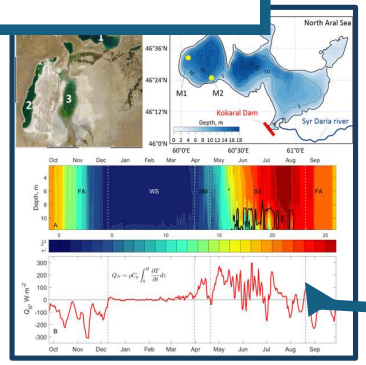
Visualisation methods have been developed as a tool for



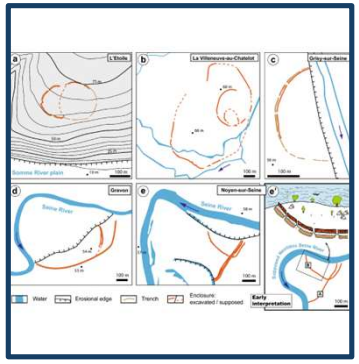
data collection



analyses



synthesis



and presentation

Techniques such as

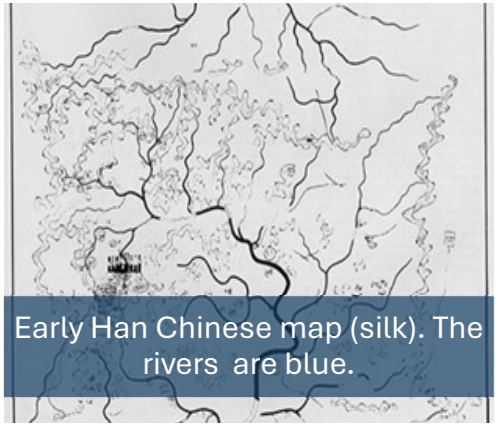
deep mapping in GIS platforms

or multi-proxi tables

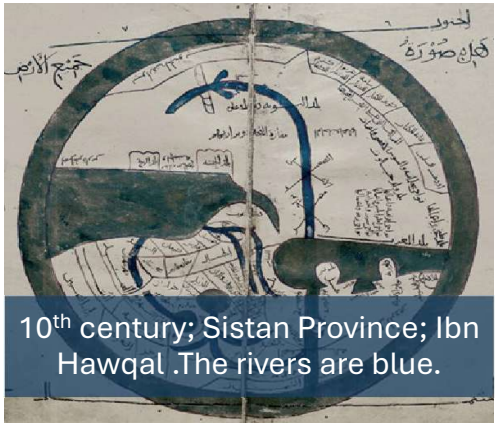
allow the integration and comparison of different categories of data.

about human-riverine interaction, but

rivers often become linear features with solid (blue) colours/textures, following millennia of cartographical traditions.



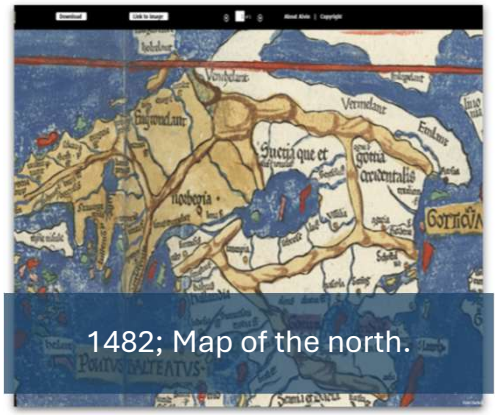
Early Han Chinese map (silk). The rivers are blue.



10th century; Sistan Province; Ibn Hawqal .The rivers are blue.



1200's; The peutinger Map. The Roman empire.



1482; Map of the north.

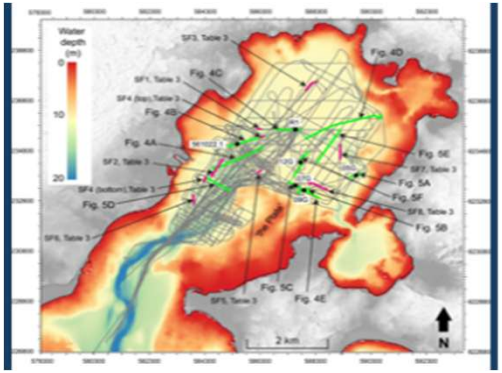


1808; Kinda Kanal



1803; Map of Sweden. Rivers are thin black lines.

Very little of the complexity of either the river or the human perception of a river thus remains.

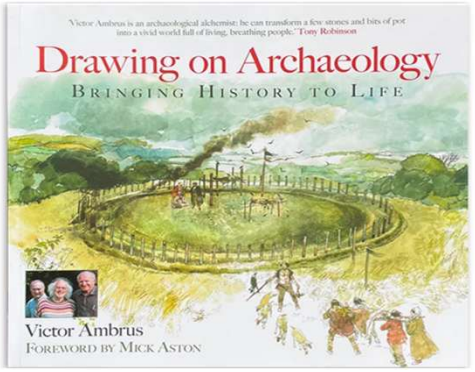


A stack of integrated layers of complex data, such as this map of Danish Kattegat,



does not show the colors, texture, and complex landscape which human eyes observe.

Unified symbols replace lived experience, an art which has been developed in archaeological traditions for years.



That more complex representations are needed in order to communicate human-environmental interaction, follows from

two recent exhibitions in Nijmegen and Bonn on human-riverine interaction along the Waal (De Bastei) and the Rhine (LVR-Landesmuseum), where museologists, archaeologists, artists and volunteers highlighted



the material characteristics of the river-agency,



The diversity of economic resources and social structures,



the religious, and emotional role,



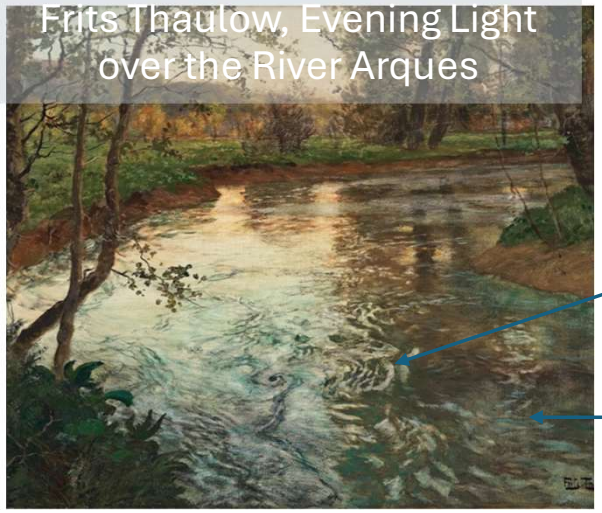
a political border, a corridor mitigating contact.

And artists have long tried to picture

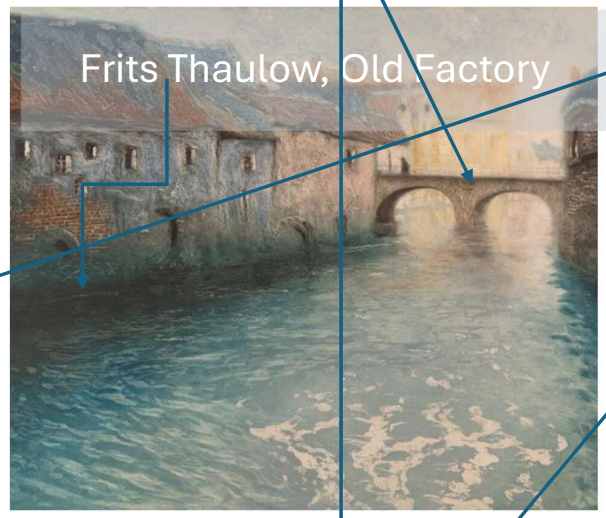
human constructions along water,

the diverse material characteristics of water,

Frits Thaulow, Evening Light over the River Arques



Frits Thaulow, Old Factory



Allard van Everdingen, A mill



seasonal changes,

human activities on and interaction with water,

Abraham Storck, De nieuwe Maas



Albert Cuijck The milkmaid and De Maas



and the river in a more complex and integrated landscape.

The sound of water has been an important source of inspiration in musical traditions:



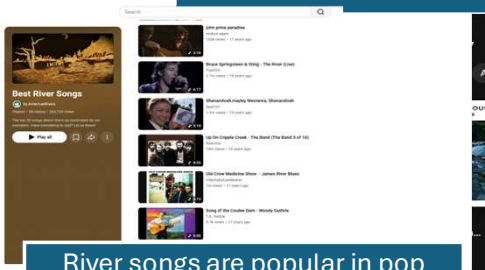
A connections between flute and water is very old.



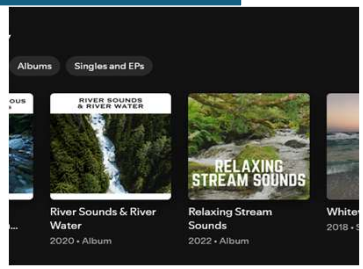
Frederic Mendelssohn wrote music based on his visit to the Fingal caves
1829



Claude Debussy ‘s La Mer represents the sea
1905

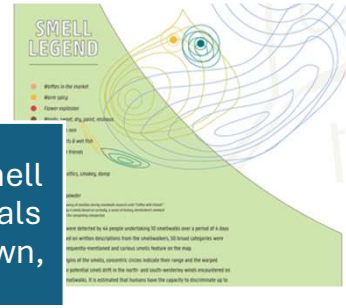


River songs are popular in pop music: The 50 best river songs on youtube



and in
New Age Music

The impact of other sensory experiences, are important, such as



the smell of canals in a town,



especially when it is a very bad one.

However, as soon as human impressions and experiences are emphasized, the role of complex data, numbers, and complex data integration are backgrounded.

So, this paper is initiated to open up the discussion, and ask you- as experts in the field-:

New methods provide new grounds for exploration:

Methods such as simulation have been used in hydrology to grasp changing water dynamics, and the impact of flooding

XR is being used to explore lived experience, and multiple perspectives

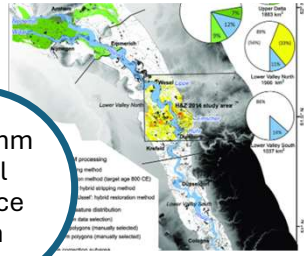
Increasing capacity within GIS based platforms allows to connect complex multivariate data

(How) Can we bridge and visualize

complex human-istic sensory data



environmental science data



the past



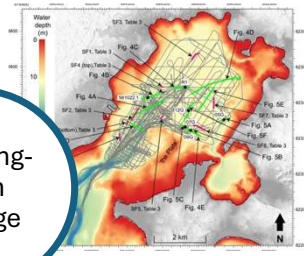
the present and the future



a moment in time



and long-term change



so that paleo-landscape reconstruction can contribute to sustainable future modelling

?

Page 2 https://lkpg.news/2024/01/17/ny-skyfallskartering-klar-for-linkopings-kommun/ Photo: Tommy Pettersson; https://www.corren.se/nyheter/inrikes/miljo/artikel/flera-vattendrag-torkar-ut-ser-riktigt-risigt-ut/r1we4k3l Foto: Fredrik Sandberg /TT; Pål-Nils Nilsson / Riksantikvarieämbetet https://sv.wikipedia.org/wiki/Fil:Bergs_slussar_-_KMB_-_16000300030331.jpg; https://www.krisinformation.se/en/hazards-and-risks/floods2/Foto: Johan Eklund/Myndigheten för civilt försvar.	Page 3 Plikk, A., https://arkeologerna.com/bloggar/uppdrag-ostlanken/landet-som-kom-upp-ur-havet-fran-vik-till-kohage; Jacobsson, O. The co-development of agriculture and flood–related problems in the parishes of Högsby and Mörlunda, Sweden, 1600–1800. *Water Hist* 12, 477–500 (2020). https://doi.org/10.1007/s12685-020-00265-1	Page 4 Qin, M.; Liu, J.; Liu, X.; Xu, H.; Bai, Y. An Integrated Remote-Sensing Framework for Channel Dynamics Monitoring in Braided Rivers. *Remote Sens.* 18, 1552 (2026). https://doi.org/10.3390/rs18101552; Andresen, K.J., Boldreel, L.O., Bennike, O., Pearce, C., Fruergaard, M., Ernstsen, V.B., Kroon, A., Posth, N.R. and Seidenkrantz, M.-S. Palaeolandscape reconstruction of a shallow coastal embayment in Kattegat, Denmark—influence of sea-level changes during the latest Pleistocene and Holocene. *Boreas* 55: 560-584 (2026). https://doi.org/10.1111/bor.70047; Kirillin, G. B., Shatwell, T., and Izhitskiy, A. S. Consequences of the Aral Sea restoration for its present physical state: temperature, mixing, and oxygen regime. *Hydrol. Earth Syst. Sc*i. 29, 3569–3588 (2025). https://doi.org/10.5194/hess-29-3569-2025; Grimaud, JL., Gouge, P., Huyghe, D. *et al.* Lateral river erosion impacts the preservation of Neolithic enclosures in alluvial plains. *Sci Rep* 13, 16566 (2023). https://doi.org/10.1038/s41598-023-43849-6.	Page 5 Bulling, A. Gutkind. "Ancient Chinese Maps." *Expedition Magazine* 20. 2 (January, 1978): Accessed September 11, 2026. https://www.penn.museum/sites/expedition/ancient-chinese-maps Ibn Hawqal's KMMS world map from Kitāb Sūrat al-Ard (Book of the Image of the World). 10th Century. Topkapi Saray Museum, Istanbul. Ahmet 3346, fols. 3b-4a. In: Sarabandikachyani, S. Sistan Mapped: A History of Cartographic Representations of a Borderland Region. Barnes, G., Satterfield, B. (eds.) 112th *ASCA, Disruptors on the Edge,* 382-390 (2024).; Peutinger Map, Vienna, Österreichische Nationalbibliothek, code 324-photo 1. photo by Facsimile finder; Alvin: Karta över Norden 1482; Charta öfwer en del af kinda härad uti Östergötland; Alvin - Charta öfver Sverige.
Page 6 https://www.debastei.nl/nl/pers-romeinse-waalschatten https://www.visitaarhus.com/aarhus-region/plan-your-trip/kalo-castle-ruins-gdk605879 Photo: Nationalpark Mols berge; Ambrus, V. Drawing on Archaeology. Bringing History to Life (2006). ISBN9780752431444; https://www.debastei.nl/nl/pers-romeinse-waalschatten; A3 Plakatmotiv "Der Rhein. Leben am Fluss" © LVR-Landesmuseum Bonn 2006; https://www.roemer.nrw/en/romes-flowing-frontiers	Page 7 Frits Thaulow, Evening light over the river Arques Frits Thaulow, Old Factory Alland van Everdingen, A mil Abraham Storck, De nieuwe Maas Albert Cuijck, The milkmaid and De Maas	Page 8 https://sensorymaps.com/publications/#; Punch 1855 XXIX, 26.	Page 9 Van der Meulen, K.M. Cohen, H.J. Pierik, J.J. Zinsmeister, Middelkoop, H., LiDAR-derived high-resolution palaeo-DEM construction workflow and application to the early medieval Lower Rhine valley and upper delta. *Geomorphology V*. 370, 107370 (2020); https://doi.org/10.1016/j.geomorph.2020.10737; 1884 reprint of 'chapbook' (Steve Rippon) https://www.livinglevels.org.uk/stories/2018/12/10/the-great-flood-1607.