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# Testing for embryotoxic potentials in river water and sediment in the Nidda river system (Germany).

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## Background

Being a fairly average European river system, the **Nidda** and its major tributaries Horloff and Usa are characterized by **anthropogenic influences**, including discharges of wastewater treatment plants, diffuse emissions of agricultural chemicals and substance inputs from point sources like factories, rainwater overflow tanks, etc.




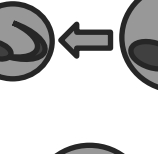

The **NiddaMan**-project investigates the consequences of those influences with the embryo test with *Danio rerio* (**DarT**) being the tool for evaluating the potential for **developmental toxicity** in the Nidda river system.

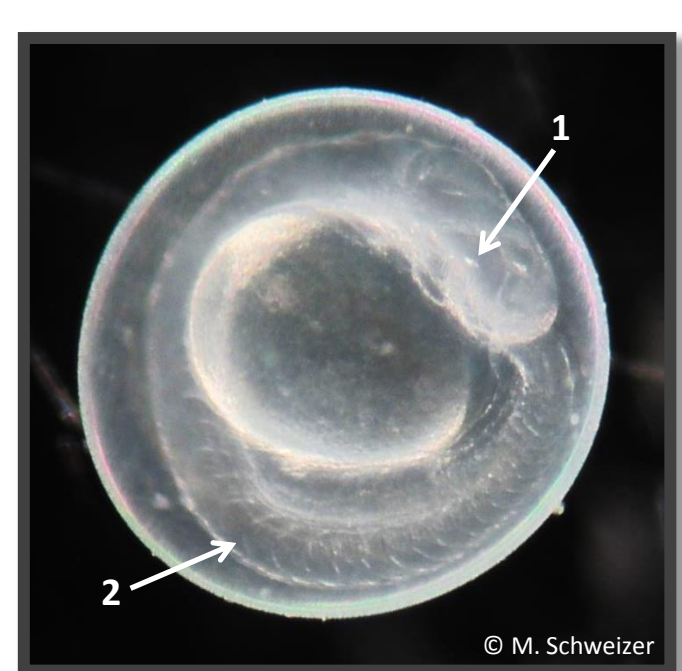
## Material & Methods

Test organism: *Danio rerio* (Zebrafish)

Exposed to: Water + sediment  
(from rivers Nidda, Horloff, Usa)

Endpoints:

- Mortality 
- Hatching rate 
- Heart rate 
- Developmental delay 
- Malformations (e.g. oedema) 



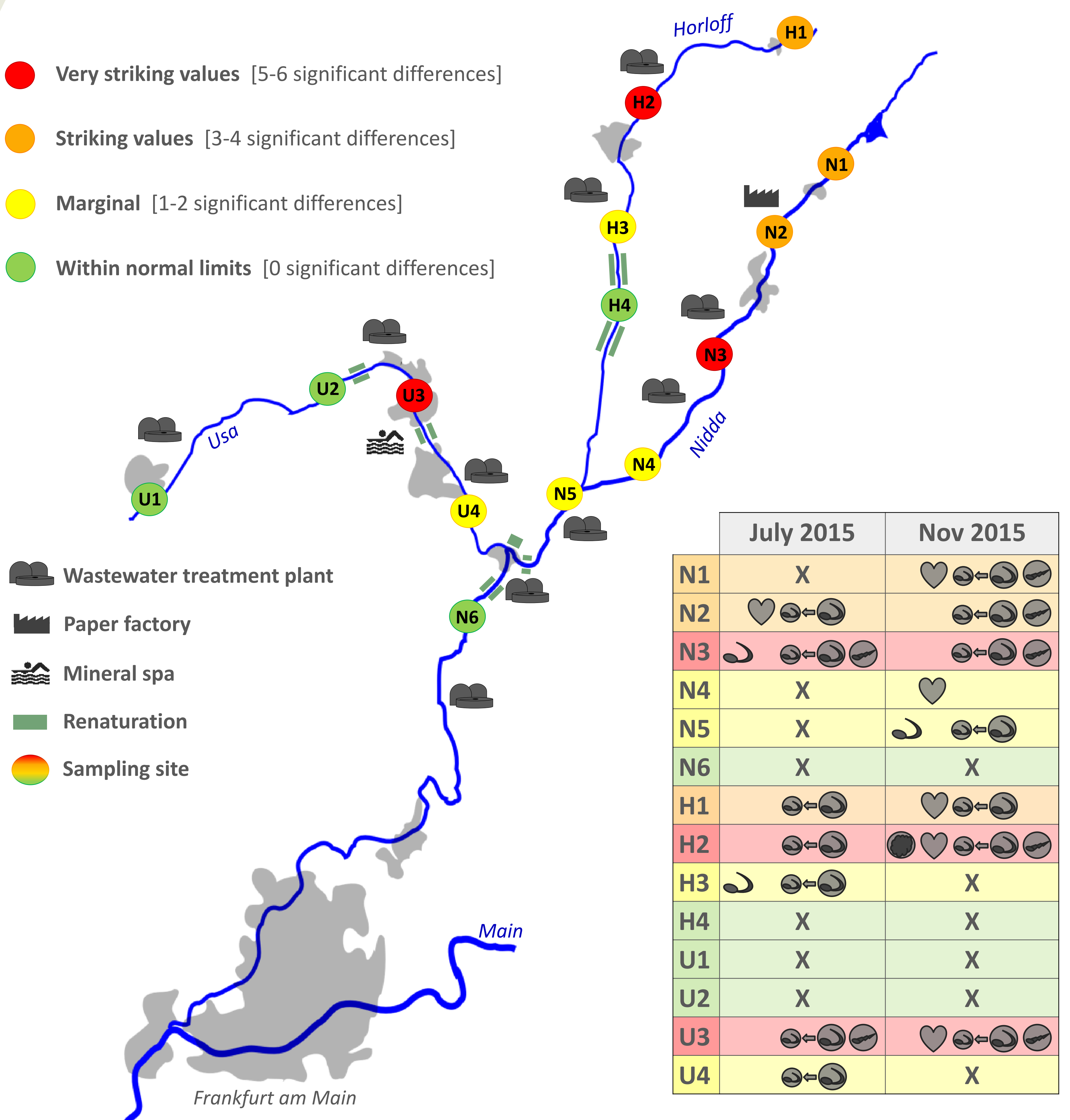
3 Heart  
4 Oedema (filled with blood)  
5 Yolk sac



1 Developing eye  
2 Somites

## Results

- Very striking values [5-6 significant differences]
- Striking values [3-4 significant differences]
- Marginal [1-2 significant differences]
- Within normal limits [0 significant differences]



Data set based on two sampling events in **July 2015** & **November 2015**.  
(Gets expanded by two more in 2016.)

For each sampling site and event **3 runs** were conducted.

**Endpoint symbols (and colours)** mark sites which show **significant differences** to the control in at least 2 runs in the respective category.

## Conclusion

- In the case of **Nidda** and **Horloff** sites **downstream** appear to be in a **better** condition **than upstream**. Possible factors might include **dilution** and the positive effect of **renaturation** helping to compensate effects of anthropogenic emissions.
- The **Usa** shows an expected pattern mostly with **better** condition **upstream**. The critical state of **U3** might be connected to its location characterized by surrounding **hospitals** and their **effluents**. The improvement from U3 to U4 likely has similar causes as in N and H.

## Acknowledgements:

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