

våtmarksguiden START SKÖTSEL GODA EXEMPEL LÄNKAR OM GUIDEN 🔍

Wetland conference 2013

Wetland jubilee in Nynäshamn 22-24 May 2013

– Documentation from the conference and other relevant material

Integrated constructed wetlands in Ireland

- > Rory Harrington: Landscape-scale water management in Ireland: The integrated constructed wetland (ICW) concept.
- > Film about Irish water management

Waterharmonica in The Netherlands

- > Ruud Kampf & Rob van den Boomen: 15 years with Waterharmonica in The Netherlands
- > Peter van der Wiele: Kristalbad – practical experiences, why a Waterharmonica?
- > Report: Waterharmonicas in the Netherlands (1996-2012)
- > Film: Kristalbad
- > Webpage: www.waterharmonica.nl

Waterharmonica in The Netherlands

- > Ruud Kampf & Rob van den Boomen: [15 years with Waterharmonica in The Netherlands](#)
- > Peter van der Wiele: [Kristalbad – practical experiences, why a Waterharmonica?](#)
- > Report: [Waterharmonicas in the Netherlands \(1996-2012\)](#)
- > Film: [Kristalbad](#)
- > Webpage: www.waterharmonica.nl

Constructed wetlands and birds – Fågelliv i anlagda våtmarker

- > Rapport: [Reningsvåtmarker och betydelse för fågellivet](#) (in Swedish/på svenska)
- > Poster: [Rikare fågelliv i](#)
- > [Allhagens våtmark i Nytt](http://vatmarksguiden.se/wetland-conference-2013/)

<http://vatmarksguiden.se/wetland-conference-2013/>



Lärorika studiebesök på
holländska vattenparker
för biologisk mångfald

• oktober 20, 2017

**En projektgrupp från Västerås, Uppsala
och Smedjebacken:**

Siri Sigrand + Susanna Hansen, Västerås Stad
Åsa Hedin + Karin Graham, Uppsala kommun
Irina Persson, Uppsala Vatten AB,
Lena Höglund, Mälarenergi,
Martina Andersson, WBAB



Abstract of my presentation

Lärorika studiebesök på holländska vattenparker för biologisk mångfald

Vattenparker för rening av dagvatten och spillvatten kan fylla flera funktioner. De kan bidra till ökad biologisk mångfald med växtlighet, insekter och djur. De kan även bli uppskattade besöksmål och rekreationsområden. En projektgrupp från Västerås, Uppsala och Smedjebacken har besökt Nederländerna, där det finns lång erfarenhet av multifunktionella vattenparker.

Som guide och exkursionsledare anlitas Ruud Kampf, Rekel Water. Han har utvecklat begreppet *Waterharmonica*, som är en typ av våtmarksanläggning som ytterligare renar vattnet från reningsverk genom naturliga biologiska processer (till exempel syresättning, filtrering och näringsupptag) innan vattnet släpps vidare. Dessutom är en *Waterharmonica* utformad så att den är attraktiv för djur och växter, både genom våtmarksmiljön i sig men också genom till exempel insektshotell och fladdermus- och fågelholkar. Anläggningarna anpassas också för besökare genom informationsskyltar, gångvägar, rastplatser och broar.

<https://www.richwaters.se/>

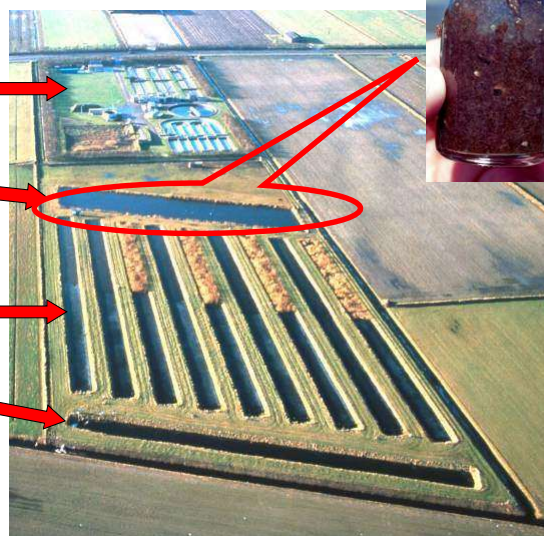
Eversteekoog, Texel

sewage
treatment plant

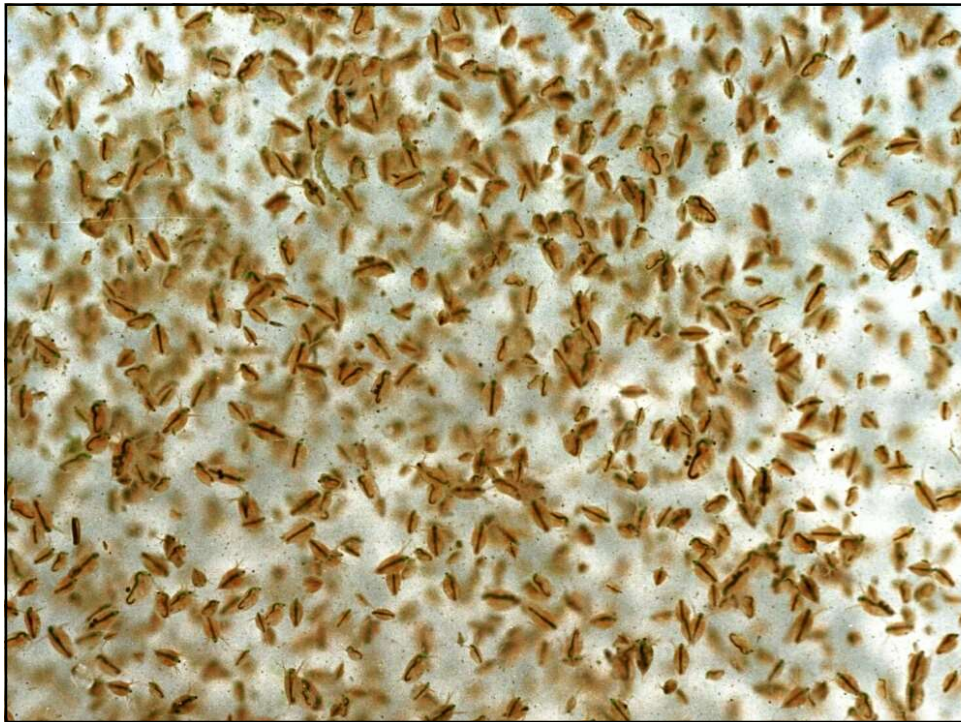
presettling basin

9 parallel ditches
with reed/cattail
and aquatic plants

discharge ditch



- constructed in 1994
- research project 1995 – 1999
- extended in 2012



Fish in the Eversteekooog constructed wetland



in first pond no fish

fish in ditches:

– but only after 3 days retention time

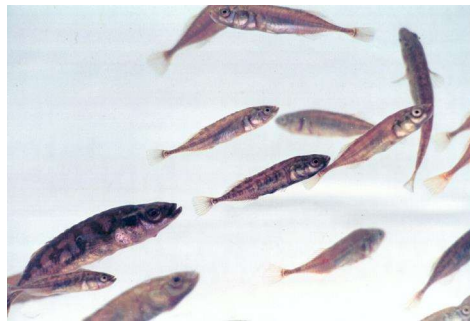
– after 10 days a lot of fish

up to 15 Stickleback per m²





Sticklebacks



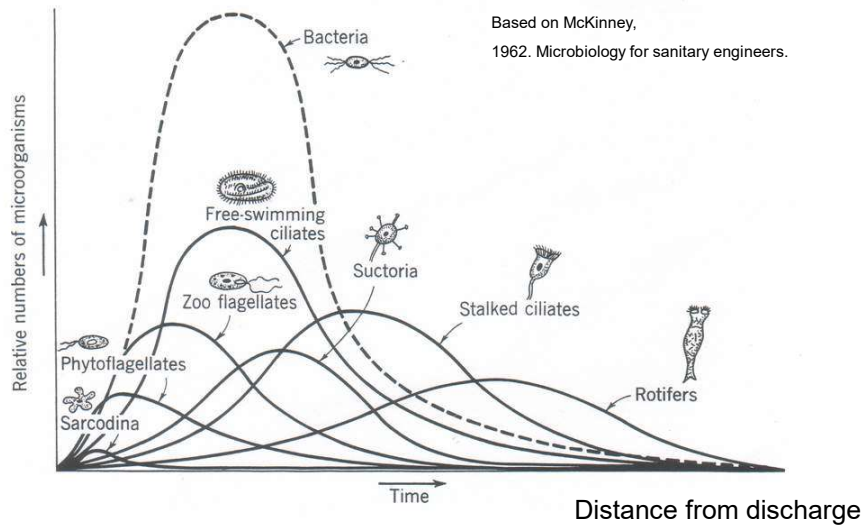
Natural processes = Food chains!



<http://www.intartiles.com/robertkennedy.htm>

natural system for improving quality of treated wastewater

Biological controlled self-purification



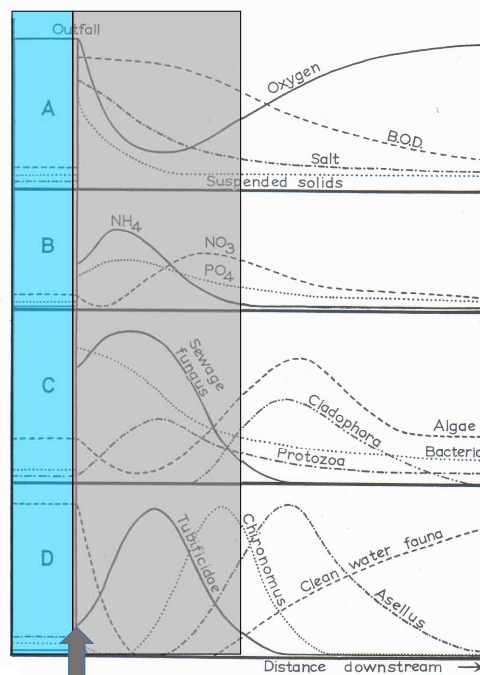
23 May 2013
Wetland Jubilee
20 years with wastewater treatment wetlands in Sweden!



Witteveen Bos

Influence of a wastewater discharge on natural waters

- A physical – chemical
- B nutrients
- C micro-organisms
- D macro-organisms



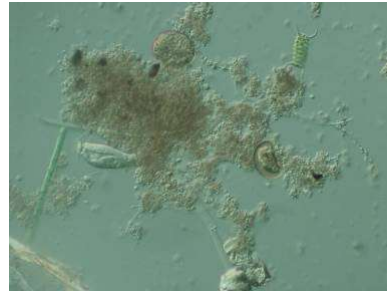
Based on Hynes, 1960 The biology of polluted waters

Good quality, but:

Treated wastewater

□ influence at effluent discharge:

- sludge particles, flocs
- loose bacteria
- odor, foam
- low O₂



“Dead water”, not satisfied with quality



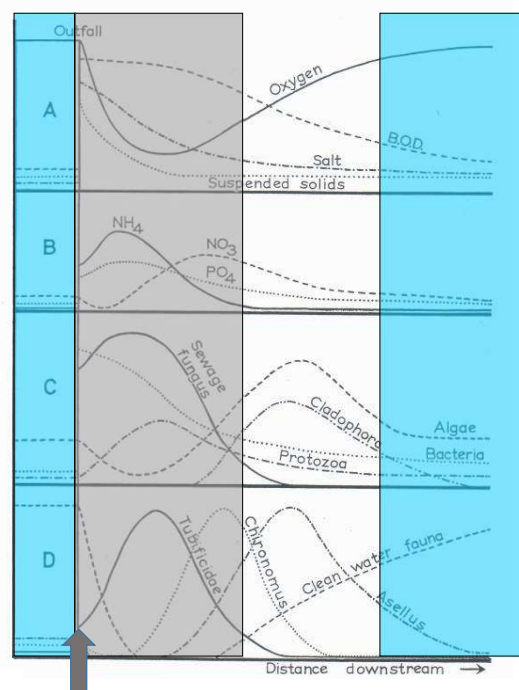
Influence of a wastewater discharge

A physical – chemical

B nutrients

C micro-organisms

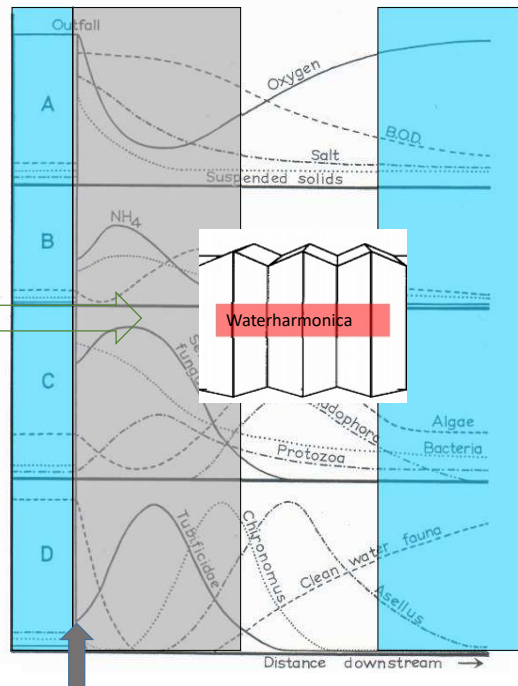
D macro-organisms



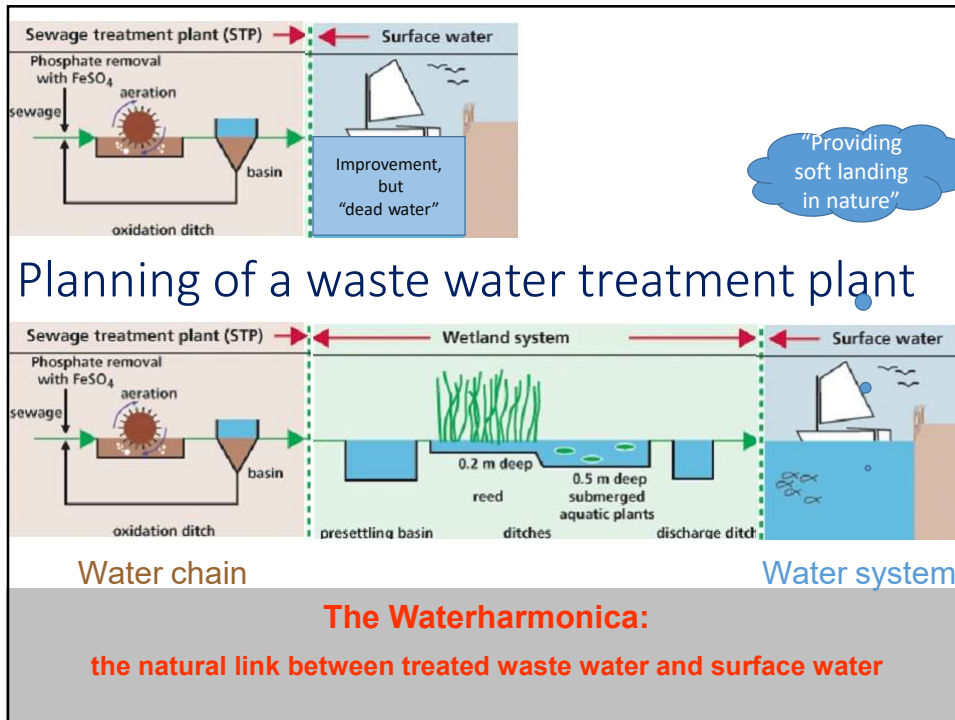
Based on Hynes, 1960 The biology of polluted waters

The Waterharmonica:

Bridge between sewage treatment and surface water



Based on Hynes, 1960 The biology of polluted waters

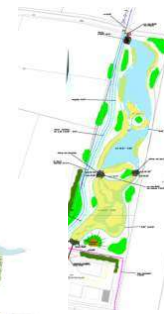


stowa

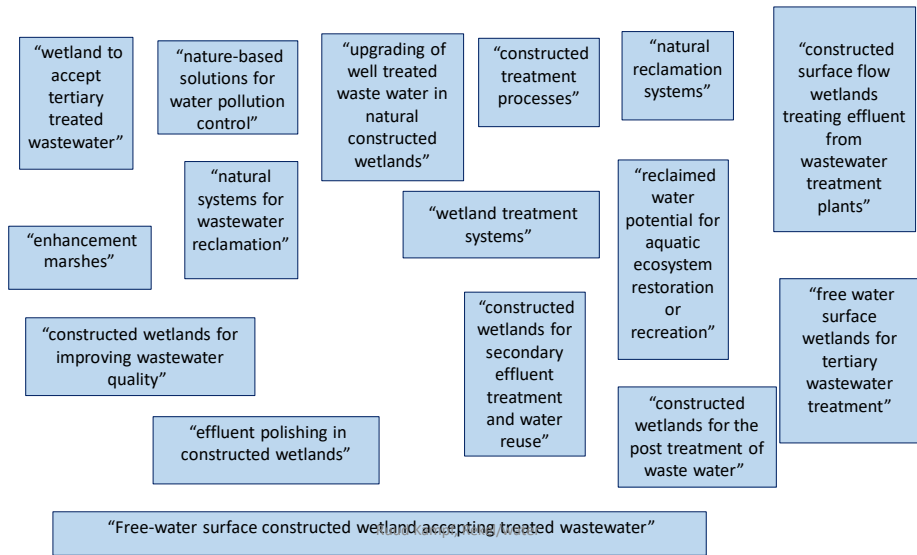
Added value



Clear water through nature



How to call a wetland to convert treated waste water into a usable surface water ?



Nog een paar namen voor systemen die lijken op een Waterharmonica

Technische Feuchtgebiete zur Nachreinigung von Abwasser

free water surface wetlands as tertiary sewage water treatment

svenska våtmarker för avloppsrening

Assimilation wetlands

Spillvatten Våtmarker

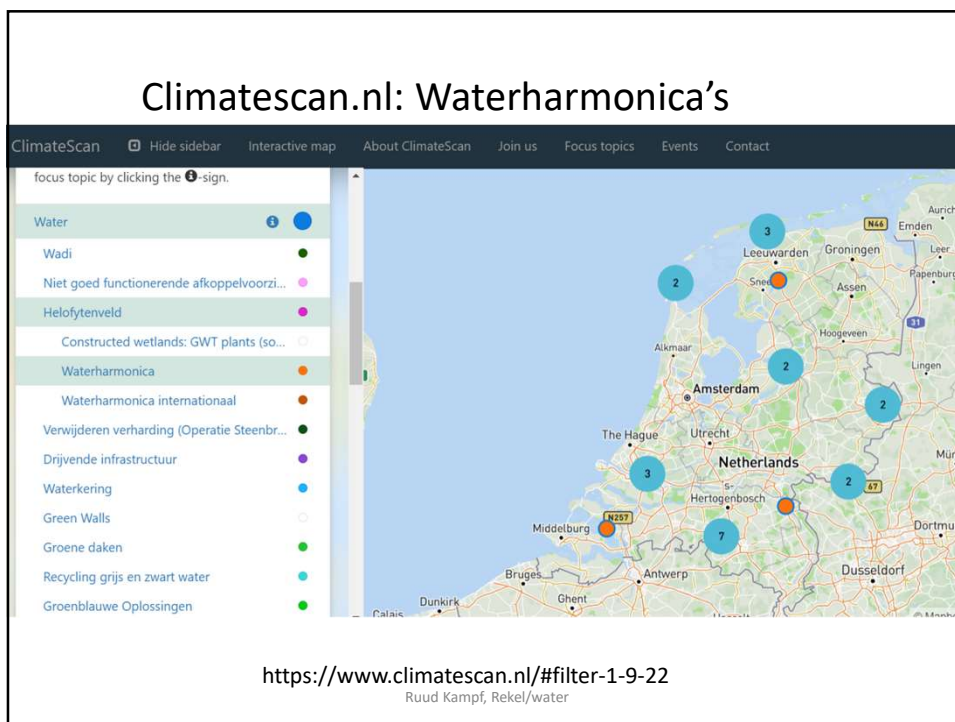
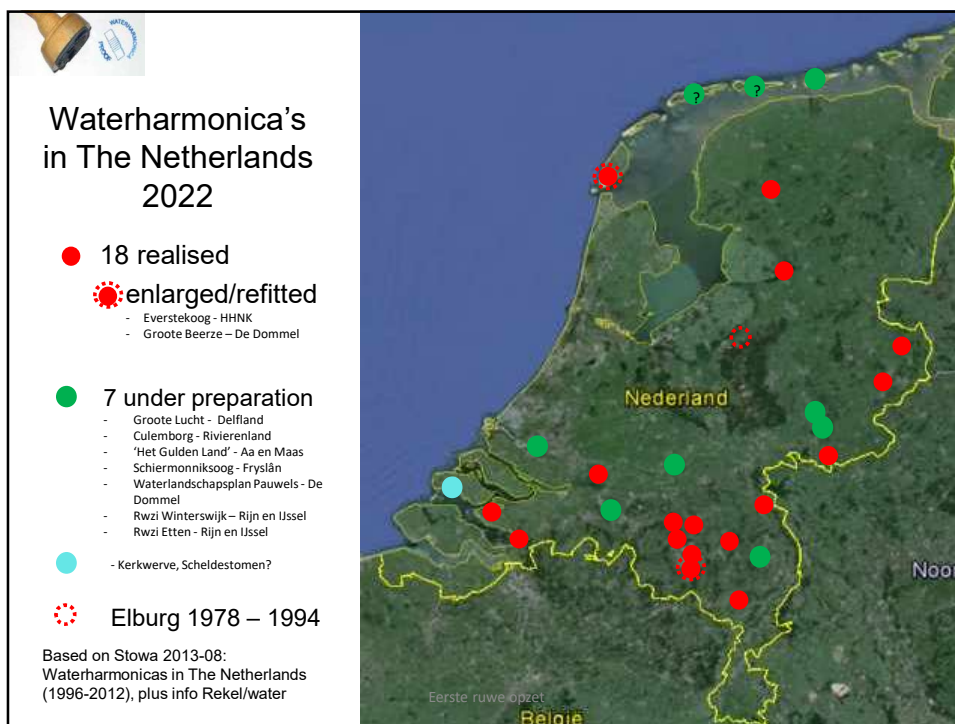
una zona umida di fitodepurazione di circa 110 ha, che diventerà un'area attrezzata fruibile per i diversi usi ricreativi e di educazione ambientale, un polmone verde che si congiungerà con le aree verdi

Zone libellule

free water surface constructed wetlands as polishing step in municipal wastewater reclamation and reuse

I just call it Waterharmonica's !





ClimateScan Hide sidebar Interactive map About ClimateScan Join us Focus topics Events Contact Login

Start typing here to search for projects

Legend Layers

Project quality
By default, ClimateScan hides lower quality projects from the map.

- Projects with photos & description ☆☆☆
- Projects with description ☆☆
- Show all projects ☆

Categories Disable filters

Click a topic to filter the markers on the map. You can get more information on a specific focus topic by clicking the icon.

Multifunctional stormwater park In Uppsala

<https://www.climatescan.nl/projects/8916/detail>

Waterharmonica – alikes - overview – 2022

Waterharmonica's and 'Waterhar...
Waterharmonica - input for www.climatescan.nl

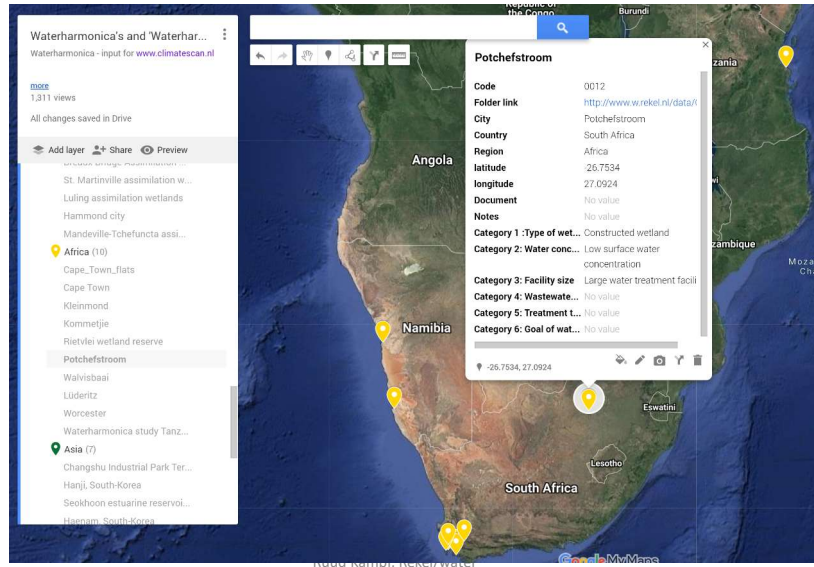
more
2,859 views
Last edit was on 17 August

Add layer Share Preview

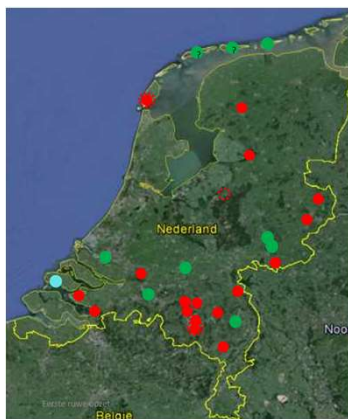
- Waterharmonica Netherlands - 20...
- Individual styles
- Elburg
- Eversteekooij
- Groote Beerze, Hapert
- Grou Aqualân
- Klaterwater, Efteling
- Kristalbad
- Land van Cuijk
- Ootmarsum
- Sint Maartensdijk
- Sint Oedenrode
- Soerendonk
- Tilburg-Noord
- Tilburg_Moerendonk

www.waterharmonica.nl
www.google.com/maps/d/edit?mid=1ldUqKDolCusiUcbJcLujr5zmjw

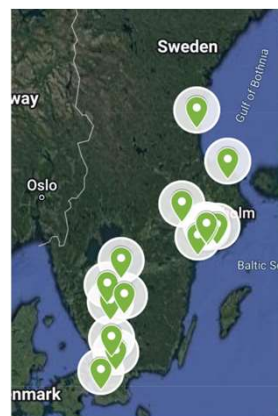
Waterharmonica – alikes - eerste overzicht - 2019



Waterharmonica's in The Netherlands

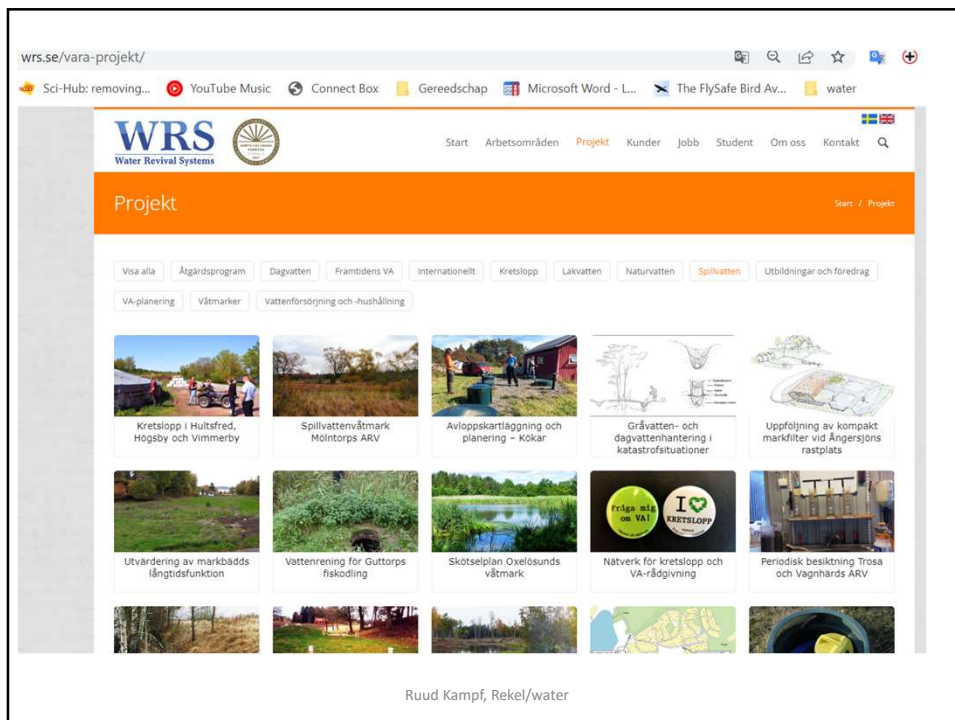


Spillvattenvåtmarker i Sverige



Maps not on the same scale...

Ruud Kampf, Rekel/water



What can we learn from Netherlands vs Sweden?

Basic ideas are the same

S: lower loadings

NL: more technical approach

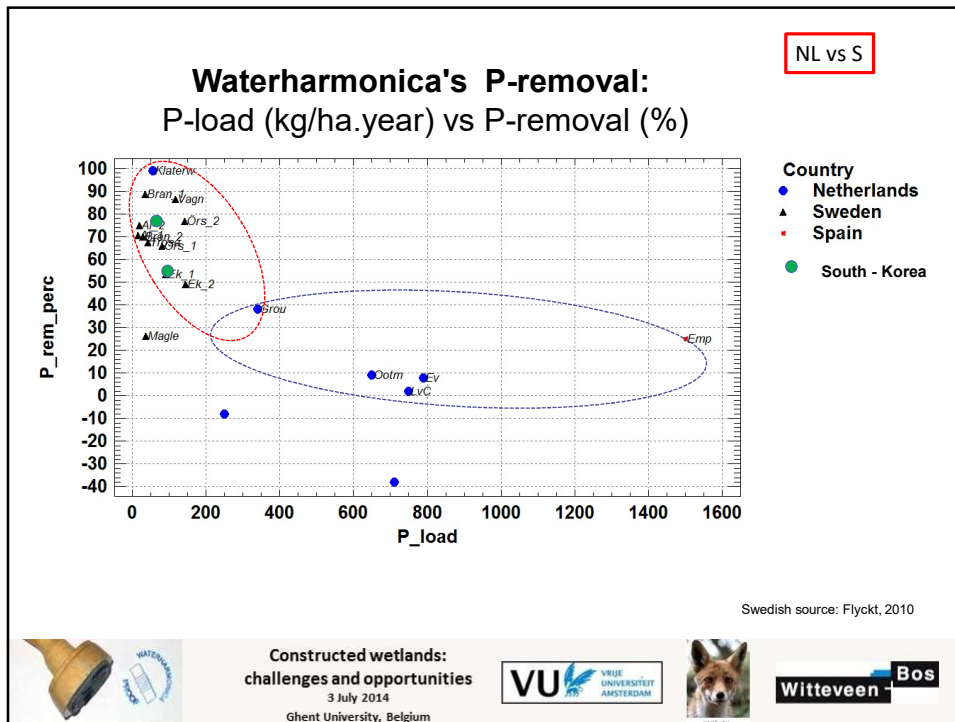
Ruud Kampf, Rekel/water

Typical effluent quality very low loaded activated sludge plant in The Netherlands

mg/l	Netherlands	Sweden
BOD	2 - 3	5 - 10
N H4	0.1 - 1	5 - 30
NO3	3 - 5	5 - 15
P-total	1 - 3	0.3 - 1

Better than many natural waters!!

But for example faecal coli: 400 - 800 per ml !



The Waterharmonica In The Netherlands:

over 15 year
1994 ? – 2013

May 2013

Wetland Jubilee

20 years with wastewater treatment wetlands in Sweden!

Witteveen Bos

23 May 2013
Wetland Jubilee
20 years with wastewater treatment wetlands in Sweden!

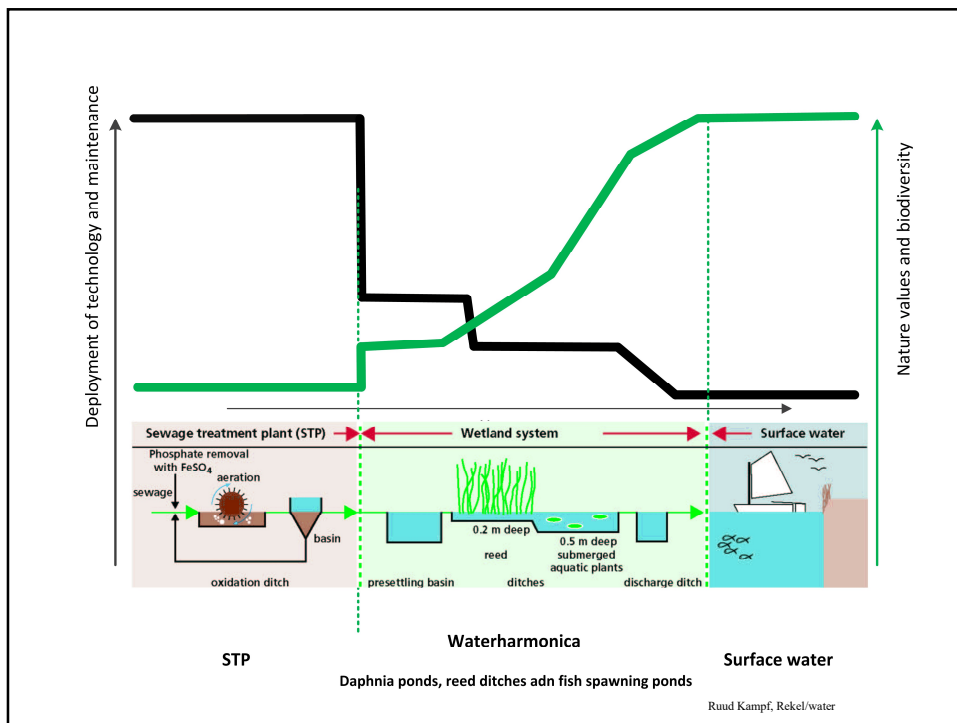
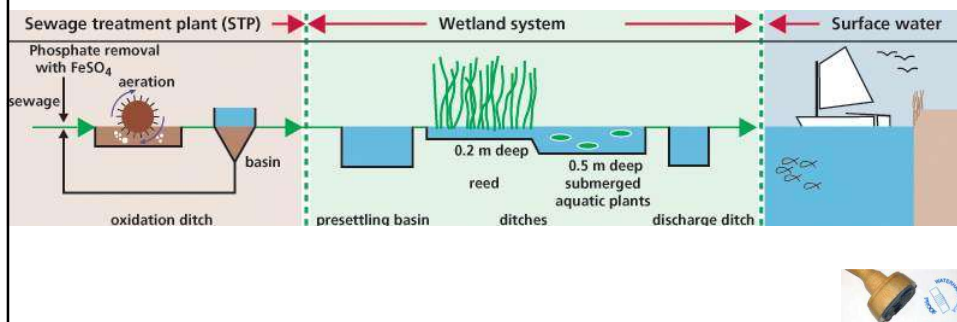
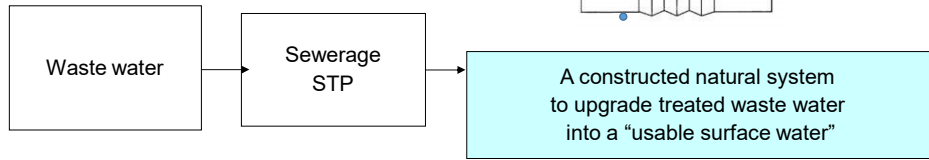
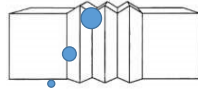
NATURAL CONSTRUCTED WETLANDS BETWEEN WELL-TREATED WASTE WATER AND USABLE SURFACE WATER

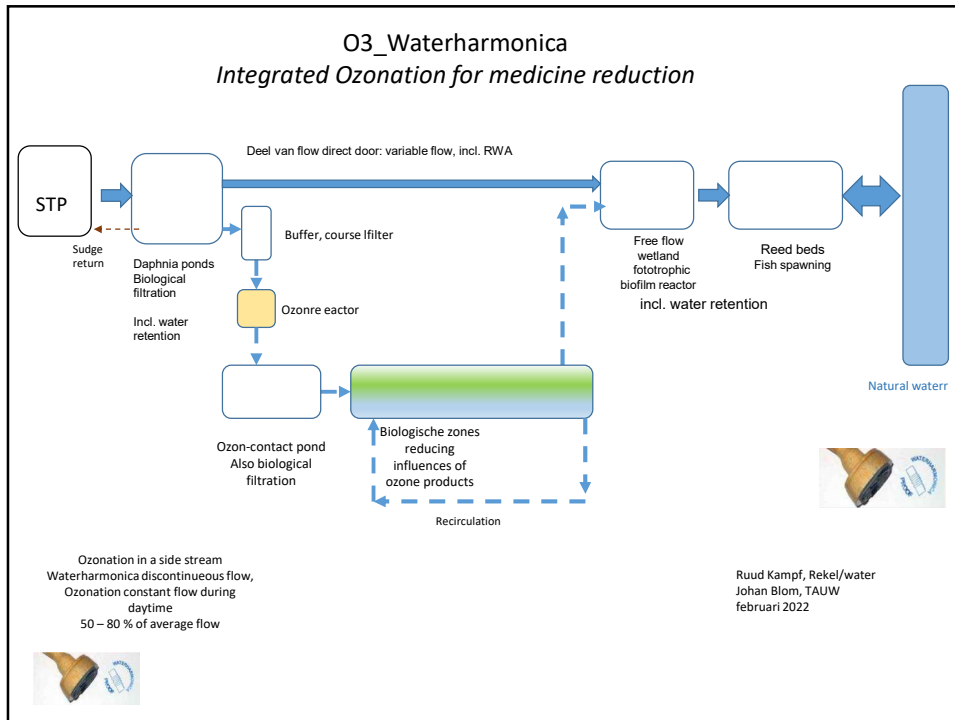
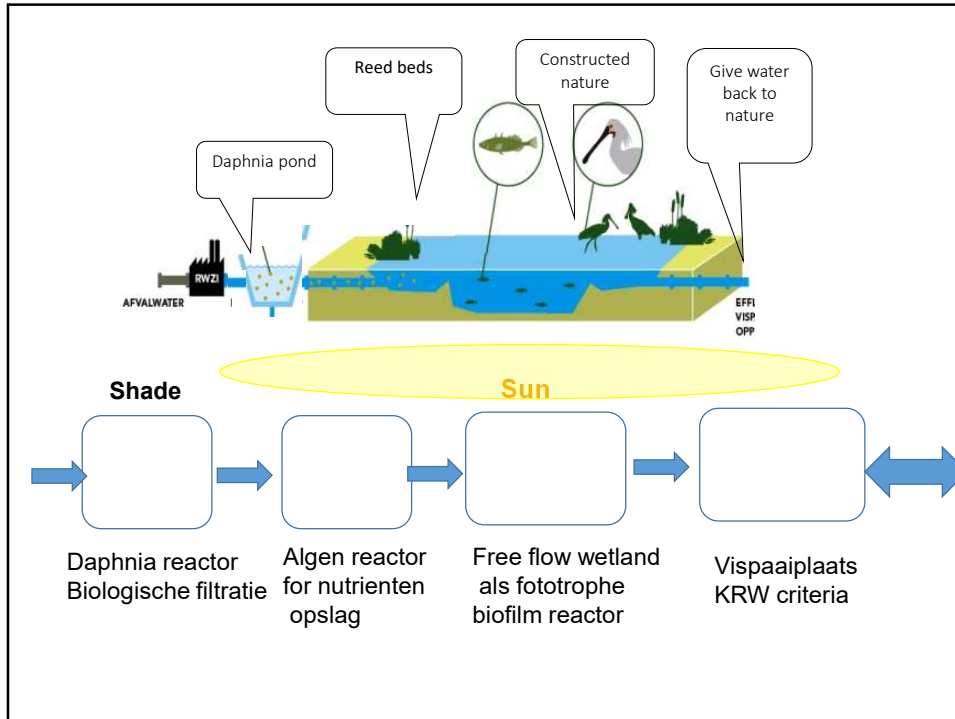
WATERHARMONICAS IN THE NETHERLANDS (1996-2012)

RAPPORT 08

Waterharmonica

"Providing soft landing in nature"





Tilburg

Waterharmonica Tilburg Noord

- max. Rise of water level 1.6 m
- Water storage 240,000 m³



StormWaterharmonica Moerenburg:

- temporary storage and treatment of wastewater during stormwater events
- maximum 0 -54,000 m³/day
- discharge in sewer system



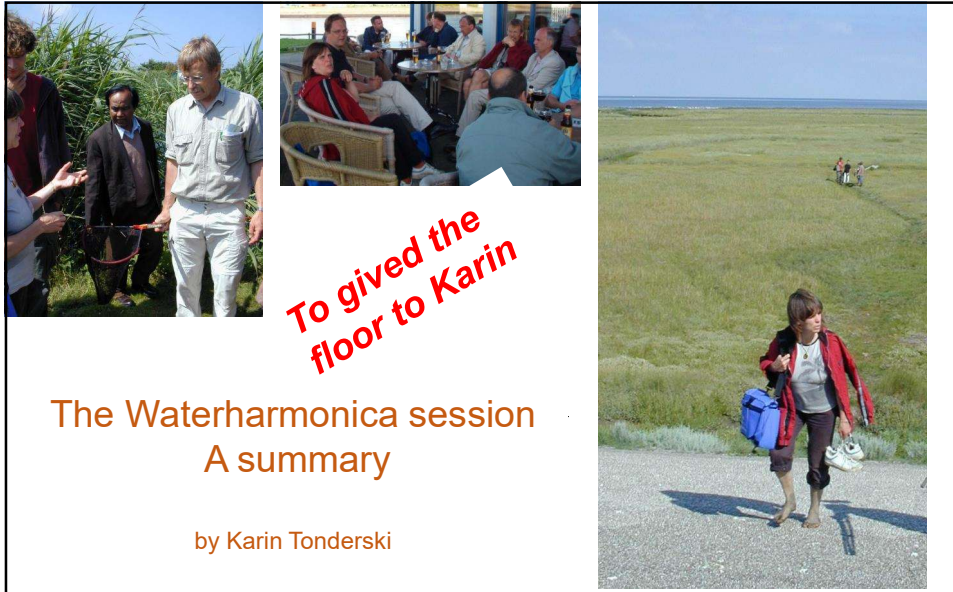
STP Tilburg Noord

- Flow:
 - dry weather: 54,000 m³/day
 - storm water: 275,000 m³/day



Stormwaterharmonica Tilburg-Moerenburg





To give the floor to Karin

The Waterharmonica session A summary

by Karin Tonderski

The 7th INTECOL International Wetlands Conference
Utrecht, The Netherlands 25-30 July 2004

http://www.waterharmonica.nl/conferences/intecol_utrecht/waterharmonica_session.htm

Some basic principles of Waterharmonica:

- Polishing and reuse of wastewater
- Integrating waterchain and watersystem
- Using ecological engineering concepts

http://www.waterharmonica.nl/conferences/intecol_utrecht/pdf/10_tonderski_final_conclusions.pdf

Possible consequences of Water Harmonica approach

- Contribute to wetland creation and restoration using wastewater
 - ⇒ spreading economic and environmental benefits to other citizens than the immediate landowners and wastewater managers

http://www.waterharmonica.nl/conferences/intecol_utrecht/pdf/10_tonderski_final_conclusions.pdf

Wastewater polishing wetland as part of lake restoration, Hässleholm SE.



http://www.waterharmonica.nl/conferences/intecol_utrecht/pdf/10_tonderski_final_conclusions.pdf

Water Harmonica in EU and North America

- Wise management of wastewater to promote hygienically safe surface water (for use and reuse), promote biodiversity and create recreational values
- ⇒ wastewater has to be managed using a catchment and ecosystem approach

**The Waterharmonica:
the link between wastewater and surface water**

http://www.waterharmonica.nl/conferences/intecol_utrecht/pdf/10_tonderski_final_conclusions.pdf

Waterharmonica task: Communicating knowledge in a usable form

- knowledge about how to use a catchment and ecosystem approach when managing wastewater
 - examples of successful, and less successful, cases of such management
 - access to technical and practical knowledge about design and management of e.g. constructed wetlands and aquaculture systems

http://www.waterharmonica.nl/conferences/intecol_utrecht/pdf/10_tonderski_final_conclusions.pdf

Water Harmonica task:

Providing a contact network of scientists and practitioners promoting this approach



http://www.waterharmonica.nl/conferences/intecol_utrecht/pdf/10_tonderski_final_conclusions.pdf



Ruud Kampf

Owner of Rekel/Water and Rekel/Kenya Ltd

Consultant: nature based methods for water reuse

Waterharmonica, Biological sanitation, Circular process engineering, etc.

Retired researcher Ecological Engineering Waternet, Amsterdam

Still to finish PhD Vrije Universiteit, department Animal Ecology, Amsterdam

Phone: +31 72 502 2998, mobile:+31 649 45 021, mobile Kenya: +254 718 14 99 44

Email: r@rekel.nl

Skype: rekel.nl



Researchgate: https://www.researchgate.net/profile/Ruud_Kampf

LinkedIn: <https://www.linkedin.com/in/ruudkampf/>

Photo's on Flickr: <https://www.flickr.com/photos/24911097@N03/collections>

Waterharmonica photo's on Flickr: <https://www.flickr.com/photos/waterharmonica/collections>

Some recent projects, presentations:

Waterharmonica: www.waterharmonica.nl

Stowa report Waterharmonica in the developing world: www.stowa.nl/publicaties/waterharmonica-developing-world

Stowa report Waterharmonica in The Netherlands: www.stowa.nl/publicaties/waterharmonica-netherlands-1996-2012

YIXING BRAINwave Source of Life and Water concepts: makan.nl/en/landschap/yixing-brainwave-waterharmonica-china/

International water management:

The role of wetlands in the urban water cycle, from Amsterdam to Kisumu, towards a green circular economy, or actually: how to deal with carbon in urban constructed wetlands: www.rekel.nl/water/landen/kenya/kisumu/

The role of Water Service Providers (WSP) in the urban water cycle towards a green circular economy in Kenya, seen from The Netherlands: www.waterharmonica.nl/publikaties/2019_10_3d_waspa_nairobi/The%20role%20of%20WASPA_2019_05_10_final_Kampf.pdf

From White to Green: a circular approach in a small Cooperative Dairy in Ndumberi, Kenya: [link](#)

Can the Cotton Oil industry in Mali take the lead in solving water, sanitation and waste problems with a circular approach with the community?: [link](#)

Partner of NUcoRICH in Eastern Africa

<http://www.cn-natural.com/EN/cooper.html>

The Waterharmonica in China: NUcoRICH - Nanjing University Research Institute (Changshu) Co., Ltd

Waterharmonica 活水链



Ruud Kampf, Rekel/water