

MEDUWA - Vecht(e) 2017-2020

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Stakeholder & Project Partner Meeting
Osnabrück, Germany, March 2 2018



MEDUWA

MEDizin Unerwünscht im WAsser

MEDicines Unwanted in WAter

MEDicijnen Uit het WAter



MEDUWA-Vecht(e)

To develop a package of socially responsible measures on the environmental cycle of human and veterinary medicines and antibiotic resistant micro-organisms.



Pilot area

Area floodplain: 3780 km².

Longitude Vecht(e) river: 170 km.

Water source: 46-48% from Germany; 54-52 % from the Netherlands.

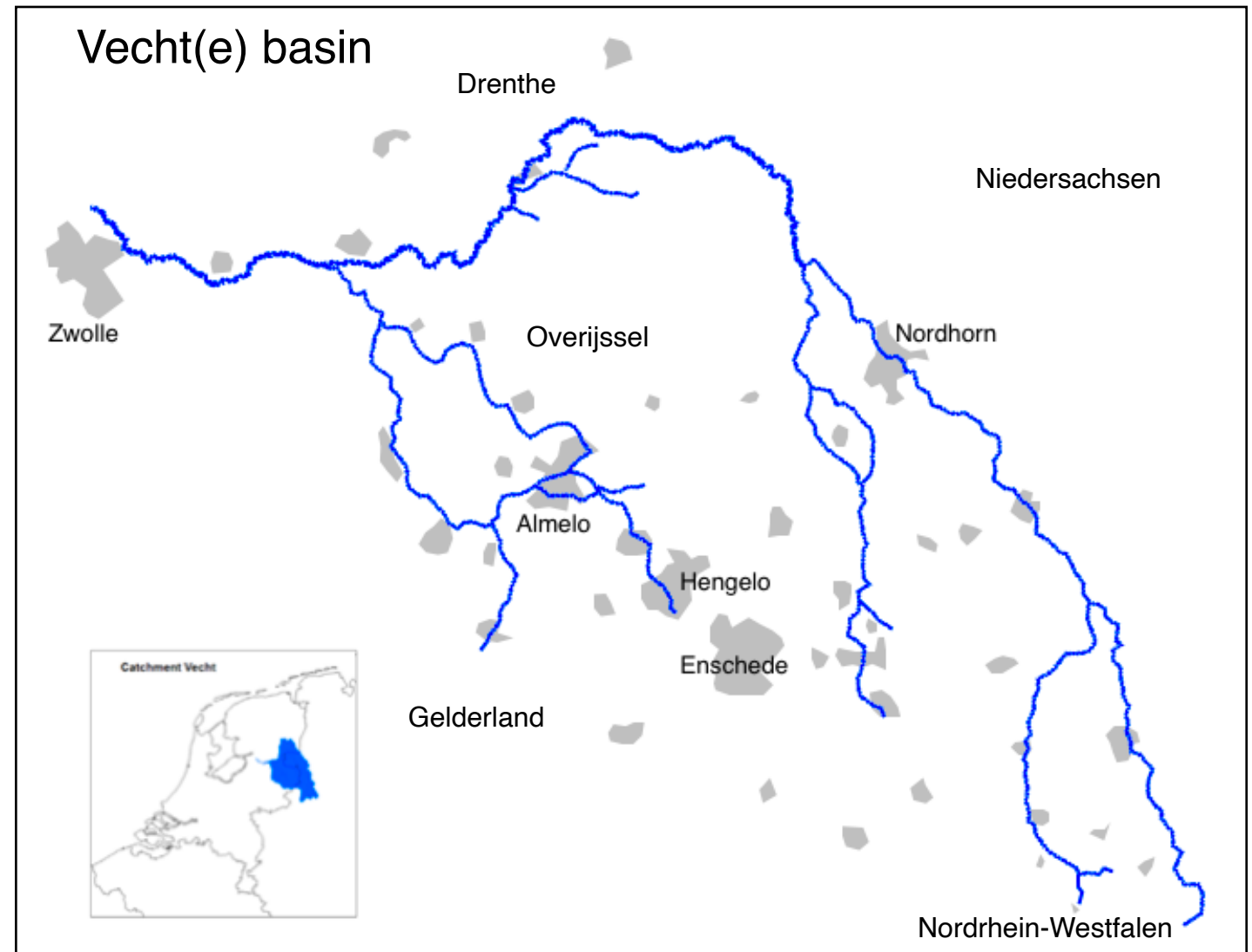
Main tributaries: Dinkel 89 km, Regge 50 km, Steinfurter Aa 46 km.

Dutch Provinces: Overijssel, Gelderland, Drenthe.

German Länder: Nordrhein-Westfalen, Niedersachsen.

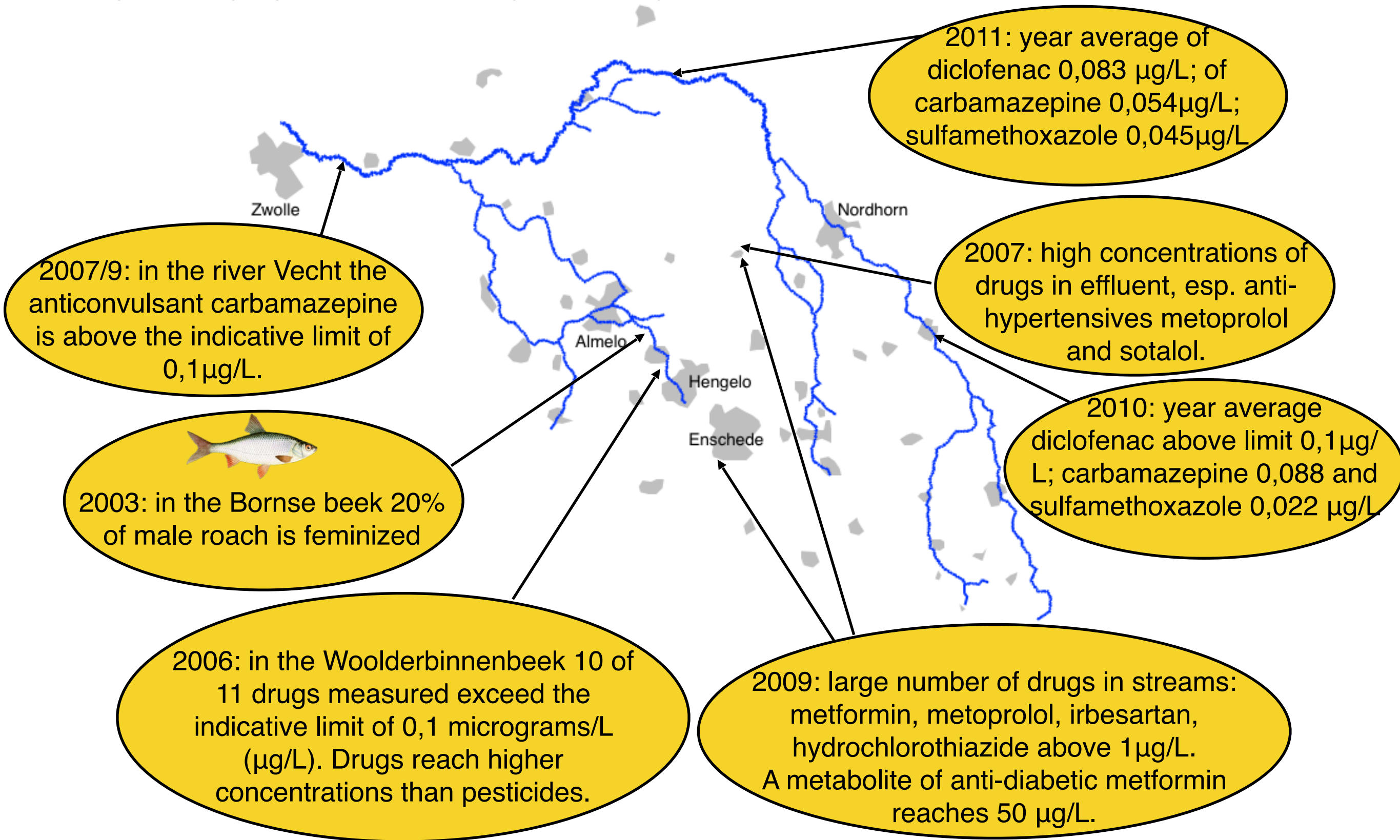
Total inhabitants: 1,15 Million (DE ± 336.000; NL ± 816.000).

Main municipalities (>20,000 inhabitants): Enschede, Zwolle, Hengelo, Almelo, Hardenberg, Nordhorn, Gronau, Hellendoorn, Coevorden, Ahaus, Steinfurt, Oldenzaal, Rijssen, Dalfsen, Dinkelland, Wierden, Losser, Borne, Tubbergen.



pharma-contamination in Vecht(e) basin

generating higher costs for sewage & drinking water treatment and animal & human health care



pre-MEDUWA pilot with regional pharmacists

substance	indication**	emission (kg/yr)	“elimination” in STP (in %)	maximal concentration STP-effluent (µg/L)
metformin	diabetes type 2	10.896	98	> 1 (guanylurea 40 - 56)
furosemide	asthma	1.181	?	?
mesalazin	colitis ulcerosa	824	?	?
valsartan	hypertension	697	95	0,1 - 1,0
hydrochlorothiazide	hypertension	301	± 38	> 1
losartan	hypertension	183	± 90	0,1 - 1,0
metoprolol	hypertension	154	± 43	> 1
atenolol	hypertension	149	± 70	0,1 - 1,0
omeprazole	dyspepsia	111	?	?
rosuvastatin	high cholesterol	67	?	?
diclofenac	arthritis	47	± 0	0,1 - 1,0
irbesartan	hypertension	10	± 0	> 1

** first indication following an official and independent source, www.fk.cvz.nl

local press on pharma contamination

(Dec 2017)

**Tubantia**

RegioAlgemeenSportVideoKoken & Eten

Enschede e.o. Hengelo e.o. **Almelo e.o.** Oldenzaal e.o. Reggestreek Achterhoek



▲ De Elsbeek is een van de beken waar met medicijnresten vervuild afvalwater in wordt geloost. © Annina Romita

De Twentse beken zijn het smerigst

ALMELO - De concentratie van medicijnresten in Twentse beken is tien keer zo hoog als elders in het land. Vissen veranderen van geslacht en vertonen afwijkend gedrag.

Redactie 16-12-17, 08:35

**Tubantia**

RegioAlgemeenSportVideoKoken & Eten

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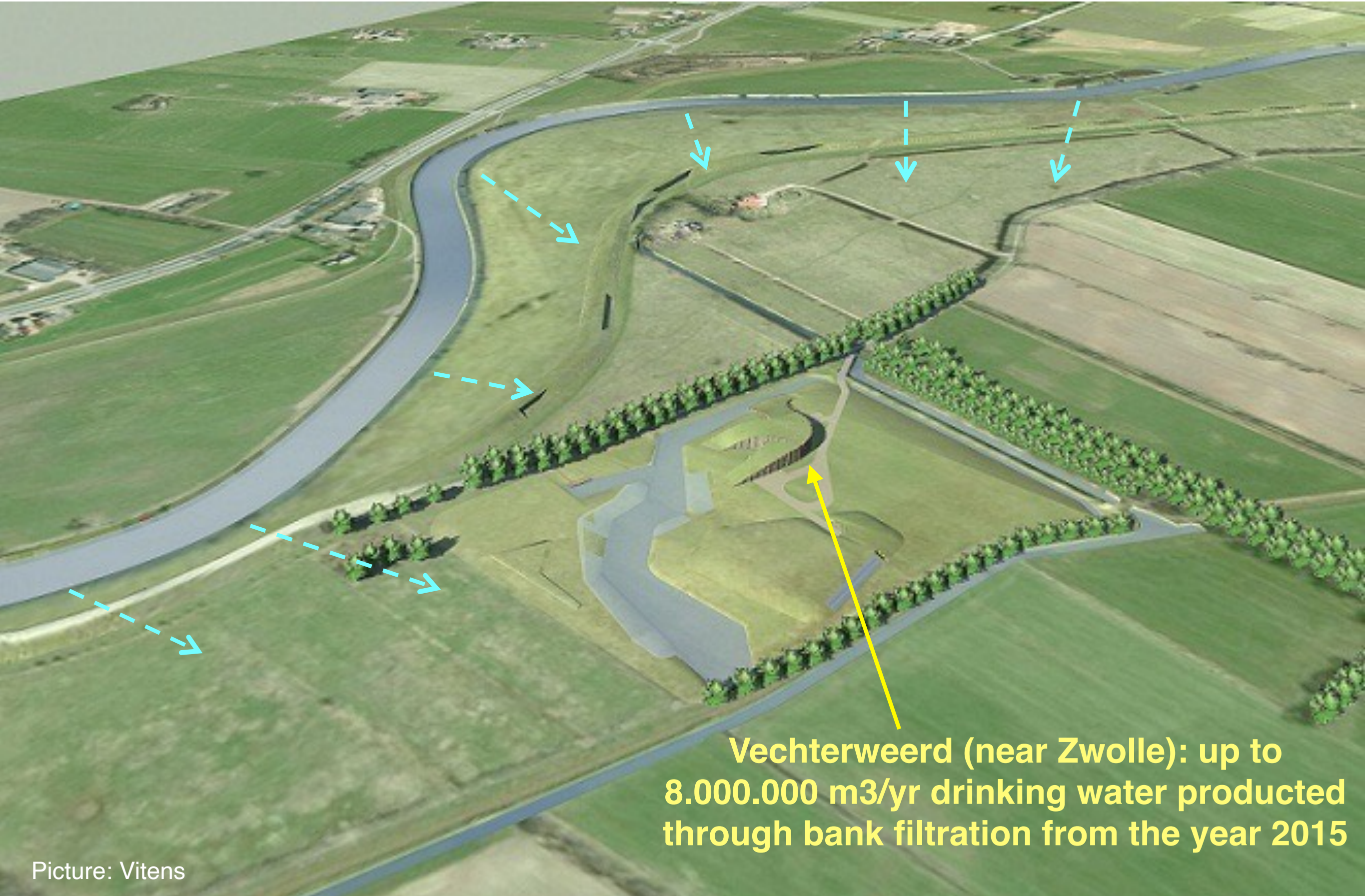
▲ Anke Durand (l.) en Nette Aarnink van Waterschap Vechtstromen. © Lenneke Lingmont

Vissen veranderen van geslacht door vervuilde Twentse beken

ALMELO - Het leven in de Twentse beken is steeds meer van slag door de toename resten van medicijnen en anticonceptiepil. Mannetjesvissen produceren eicellen en kreeftjes vertonen door antidepressiva ander gedrag.

Bert Hellegers 16-12-17, 08:41

the Vecht as an important drinking water source



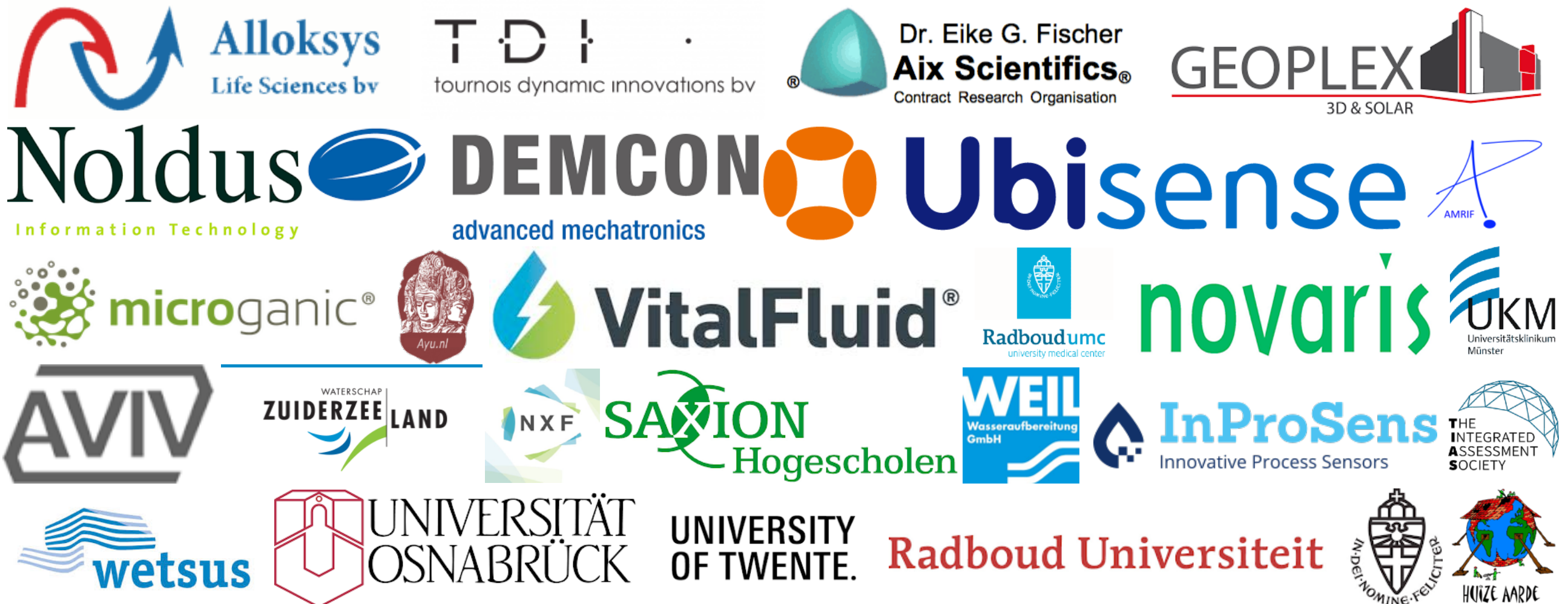
Vechterweerd (near Zwolle): up to 8.000.000 m³/yr drinking water produced through bank filtration from the year 2015

water tourism in Vechtdal is growing





inter-sectoral cross-border coalition for action & change



sponsors



EUROPEAN UNION
European Regional Development Fund

≡ provincie
Gelderland



Niedersächsische
Staatskanzlei

provincie  verijssel



Ministerie van Economische Zaken
en Klimaat

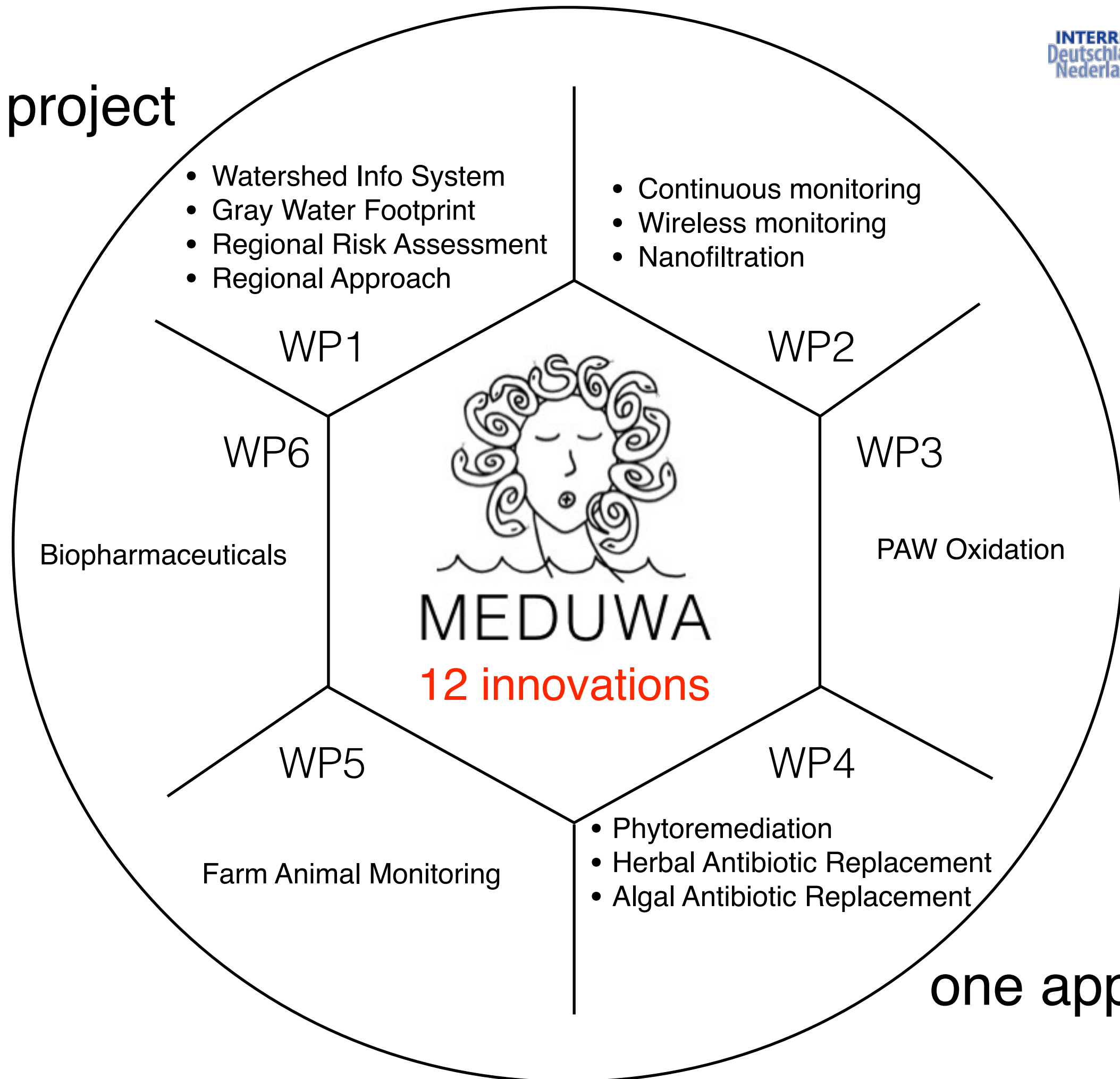
 PROVINCIE FLEVOLAND

Ministerium für Wirtschaft, Innovation,
Digitalisierung und Energie
des Landes Nordrhein-Westfalen



provinsje fryslân
provincie fryslân 

one project



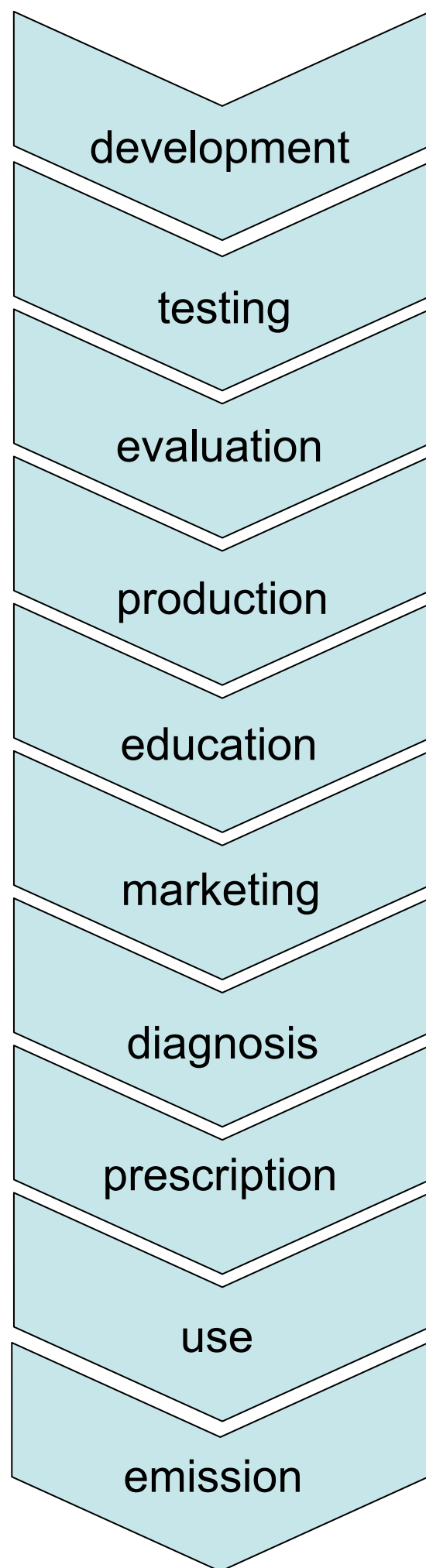
one approach

intervention classes in MEDUWA

WP	product	prevention	mitigation	measuring	simulation prediction	visualisation communication
1.1	Watershed info system					
1.2	Gray water footprint					
1.3	Risk assessment					
2.1	Automatic in-situ monitoring					
2.2	Wireless water monitoring					
2.3	Nanofiltration					
3	PAW oxidation					
4.1	Phytoremediation					
4.2	Herbal antibiotic replacement					
4.3	Algal antibibiotic replacement					
5	Wireless cattle monitoring					
6	Biopharmaceuticals					

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herbal antibiotic replacement

algal antibiotic replacement

biopharmaceuticals

regional risk assessment

gray water footprint

watershed information system

wireless cattle monitoring

wireless water monitoring

automatic in-situ monitoring

nanofiltration

phytoremediation

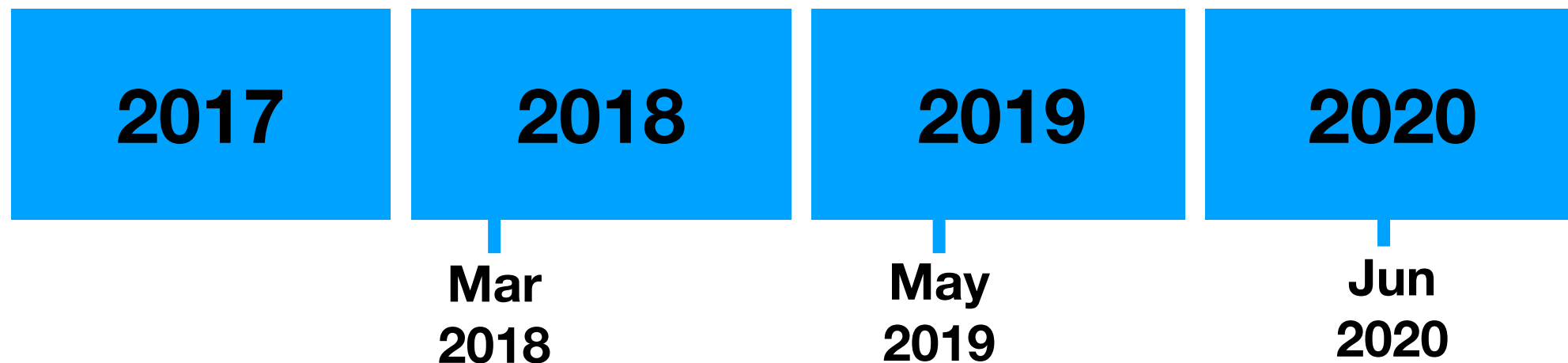
PAW oxidation

*also
prevention of
medicine use*

*prevention of
contamination*



planning of stakeholder meetings



to bring and collect information, give and get advice, co-create, assist with testing, collaborate in communication