

Vindbaarheid van vispassages

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Vlaanderen
is wetenschap

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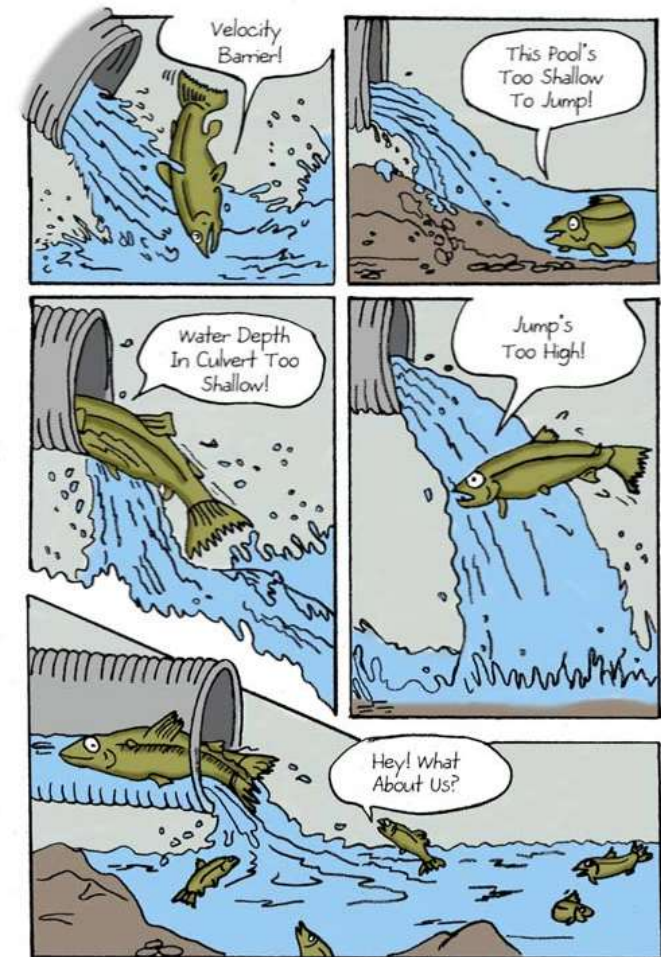
RIBES

Probleem: vispassages werken niet zoals het hoort

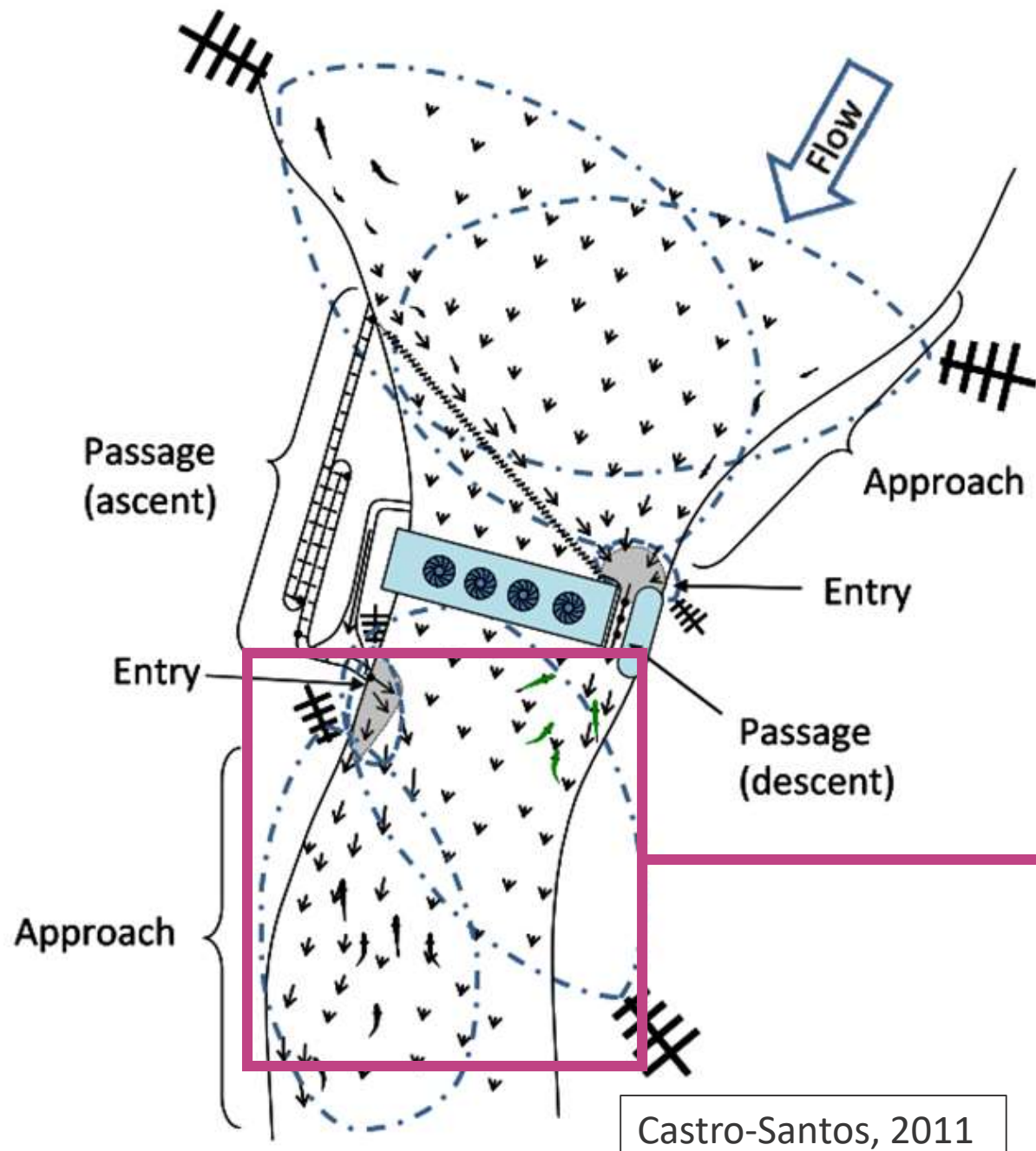
- ▶ Een efficiënte vistrap
 - Werkt voor verschillende soorten / types zwemmers grote en kleine vissen en verschillende levensstadia
 - Laat een bepaald / voldoende percentage van de populatie passeren
- ▶ Wat bepaalt de efficiëntie?

Alles wat het succes van de volgende vier processen bepaald:

- Aantrekking vissen
- Inzwemmen vistrap
- Doorzwemmen vistrap
- Uitzwemmen vistrap (predatie risico)



WSDOT-Redrawn from *Fish Passage Short Course*, John Runyon



Castro-Santos, 2011

Oplossing: een goed werkende vispassage

- Aantrekking vissen
- Inzwemmen vistrap
- Doorzwemmen vistrap
- Uitzwemmen vistrap (predatie risico)

Ons onderzoek:

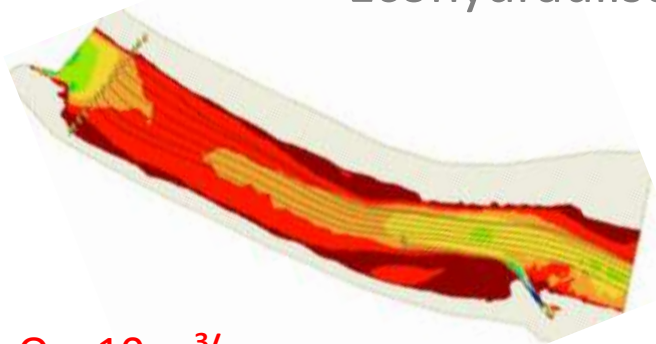
- Approach
- Entry

Stroomopwaartse
vismigratie

Situering onderzoek: wat wij ons afvragen en onderzoeken?

► Doel

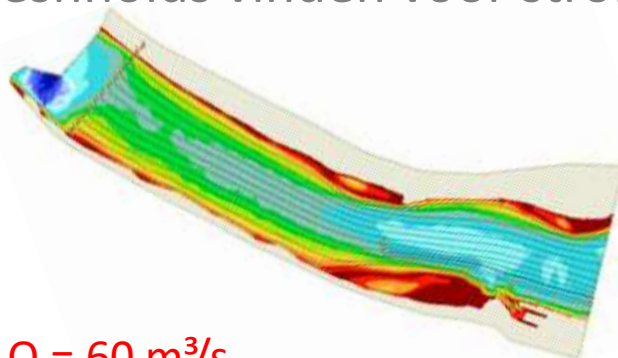
- Basiskennis verzamelen over het individuele zoekgedrag
- Gelinkt aan de omgeving
 - Stroomsterkte
 - Stroomgradiënt
 - Bathymetrie
 - Diepte
- Ecohydraulische treshholds vinden voor stromingen en stroompatronen



$Q = 10 \text{ m}^3/\text{s}$

Ong. 10%

model-vissen vinden vistrap



$Q = 60 \text{ m}^3/\text{s}$

Ong. 5%

model-vissen vinden vistrap



CASiMiR

Computer Aided Simulation Model for Instream Flow and Riparia

Samenwerking binnen Europa

Fishfriendly Innovations and Technology for Hydro_{power}



Horizon 2020
Programme



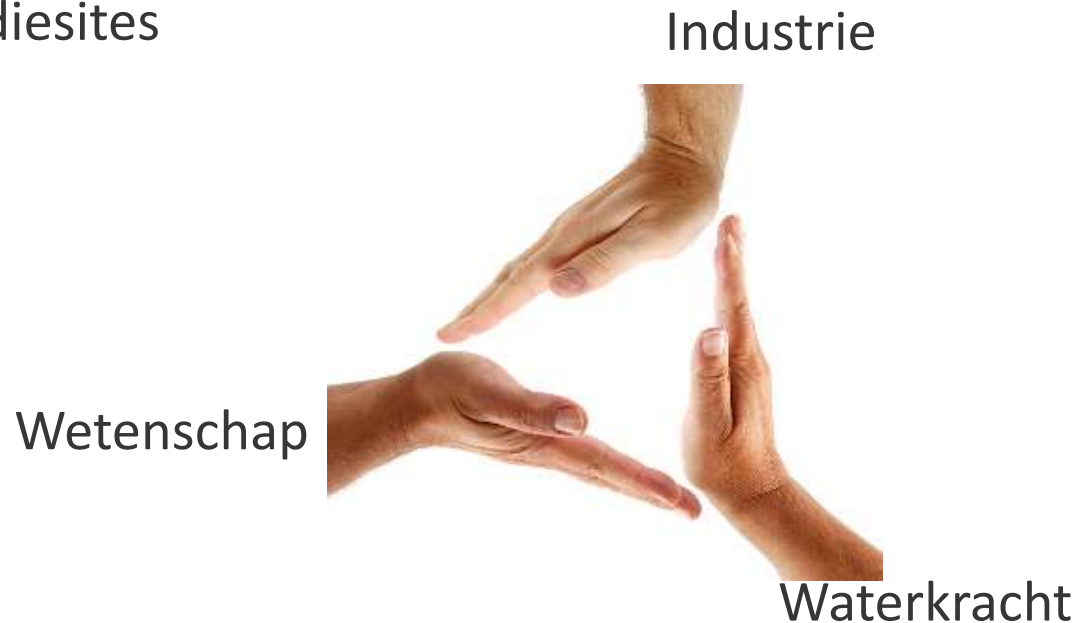
Horizon 2020
Programme



FITHydro

Fithydro – wetenschap en industrie voor duurzame waterkracht

- ▶ <https://www.youtube.com/@fithydro4758/videos> !!!!
 - <https://www.youtube.com/watch?v=7tH8a0D3caE>
- ▶ Fithydro wiki pagina: <https://www.fithydro.wiki/>
- ▶ 15 test cases = 15 studiesites



Case studie Iler rivier (Altusried, Duitsland)

GERMANY
River Map



stromrichting

Samenwerking binnen Europa



Visgedrag

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AUGSBURG
UNIVERSITY

Tobias Eppe



Thomas Lechner

vemco

Dale Webber & Stephanie Smedbol



Vistelemetrie, vangst, tagging, analyse tracks

Ecohydraulica

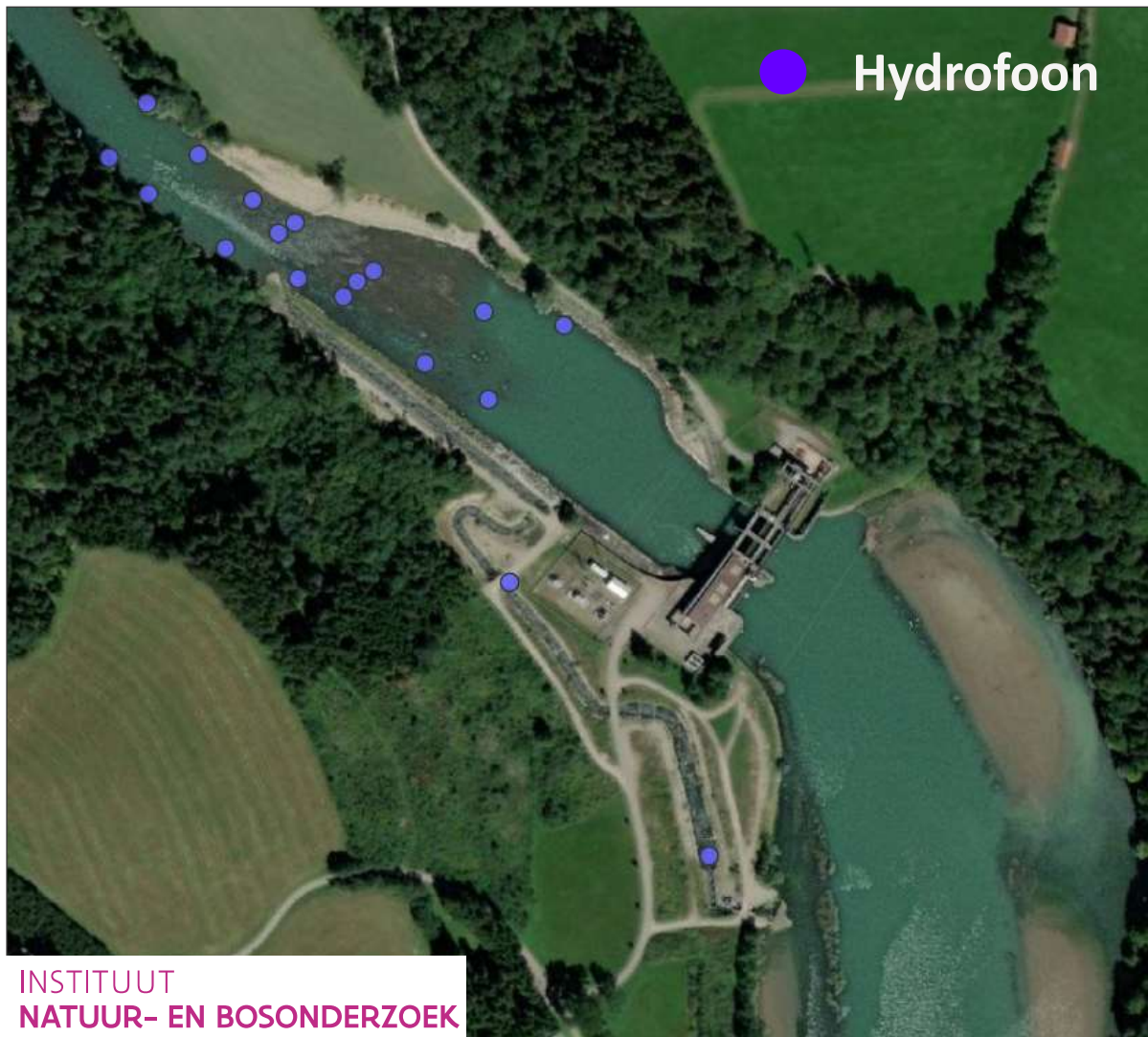


Matthias Schneider, Ianina Kopecki & Tobias Hägele



Stroming, diepte, bathymetrie, substraat

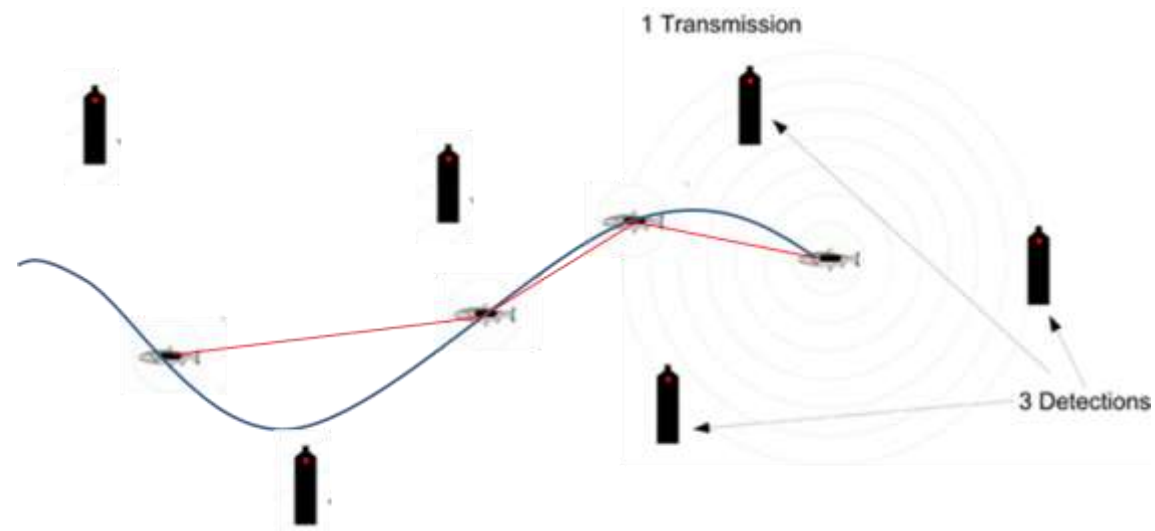
Methode: Visgedrag



Akoestische telemetrie



Trilateratie





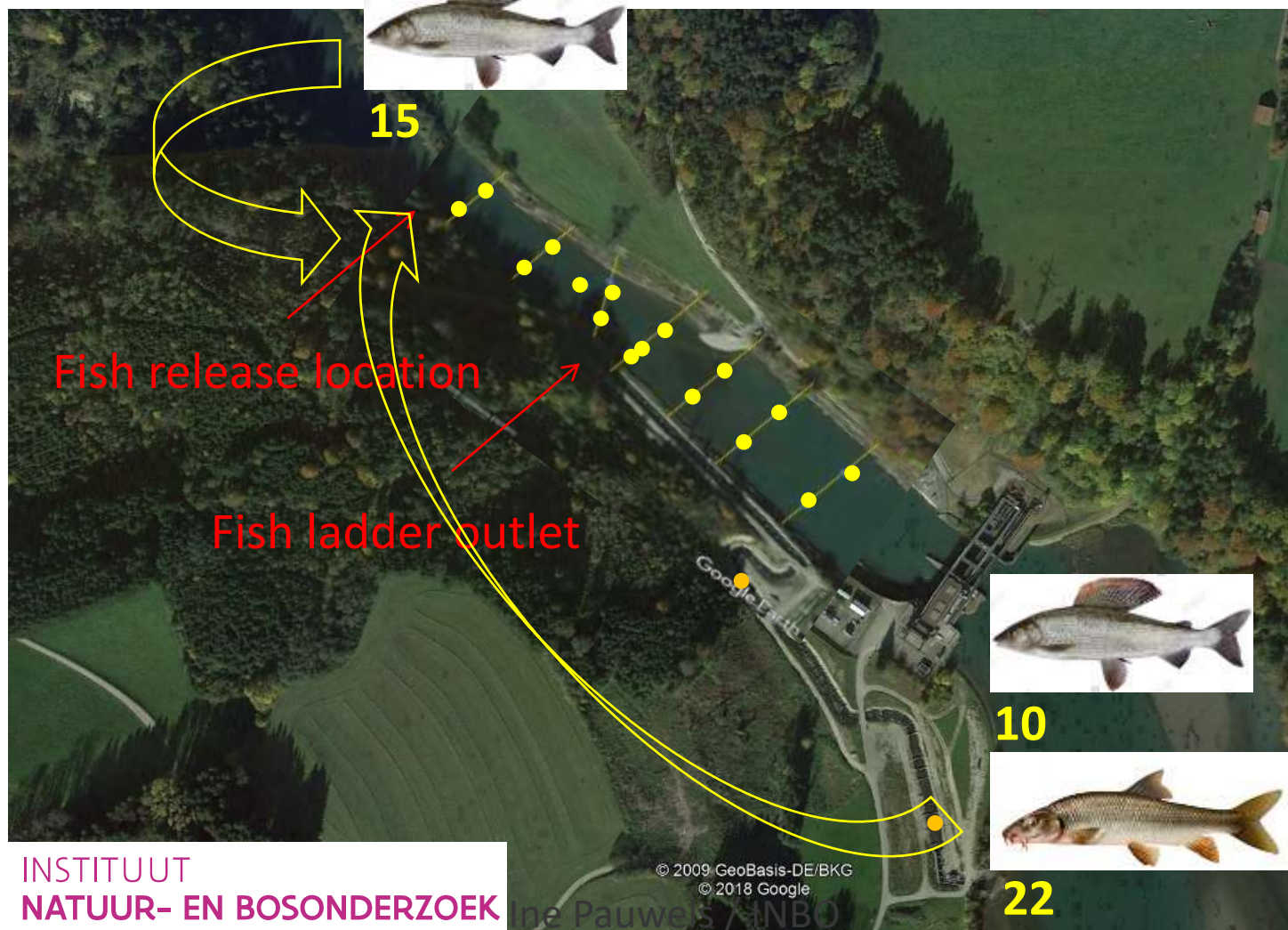
Drone pictures: Flussbau IC-group



Methode: Visgedrag



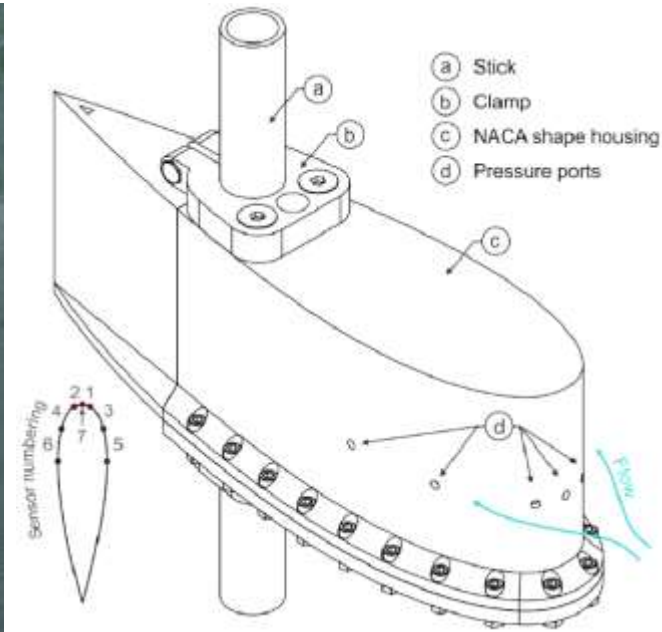
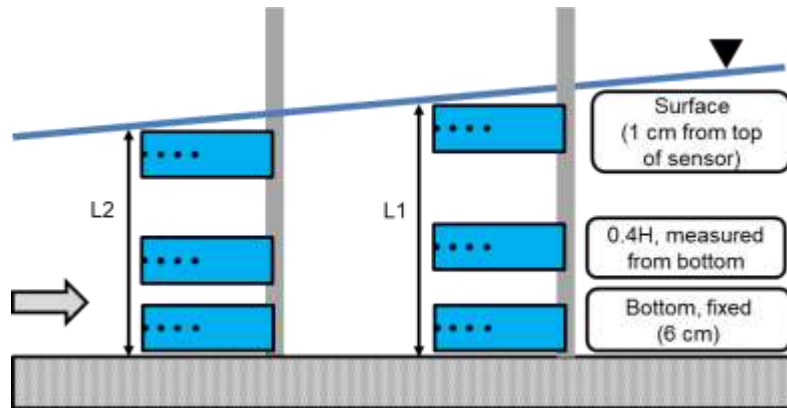
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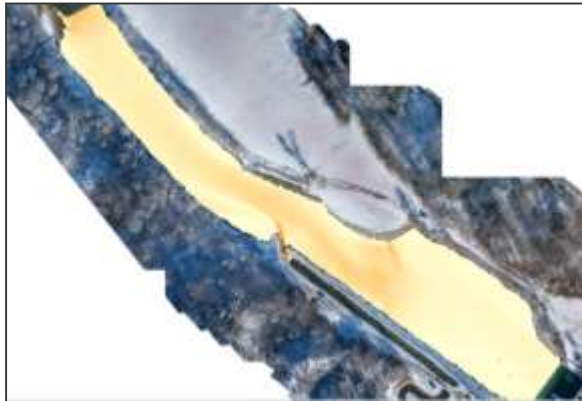
Methode: Eco-hydraulica en bathymetrie

LLP (Lateral Line Probe)

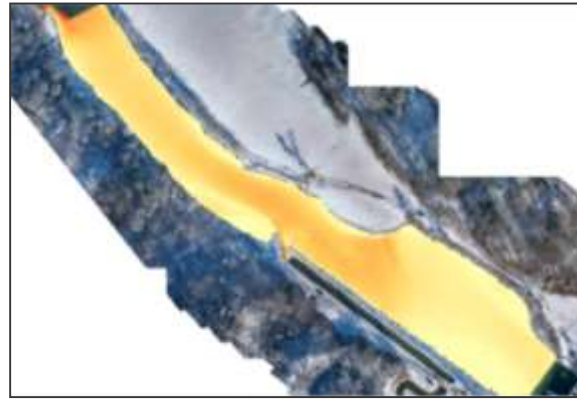
en ADV metingen in de jet stream



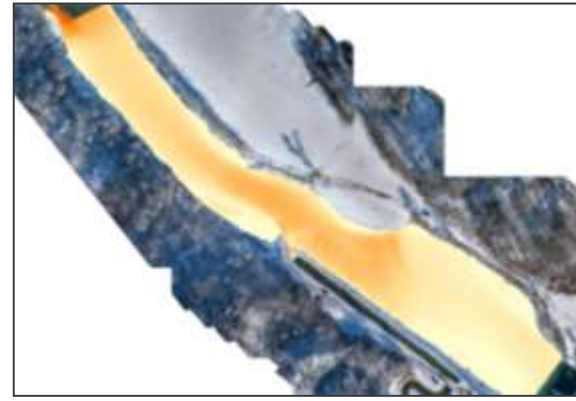
Methode: Eco-hydraulica en bathymetrie



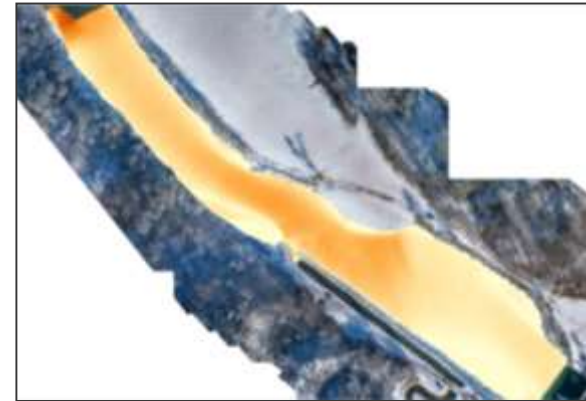
10 m³/s



20 m³/s



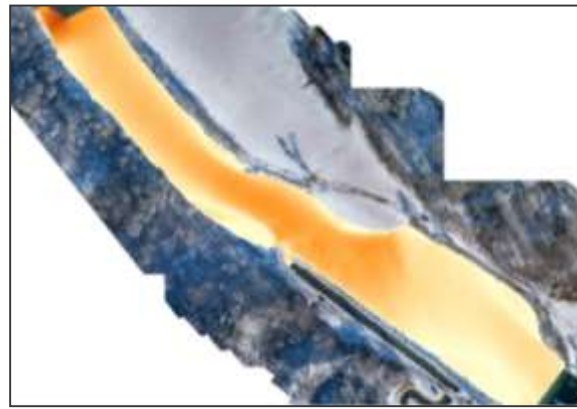
30 m³/s



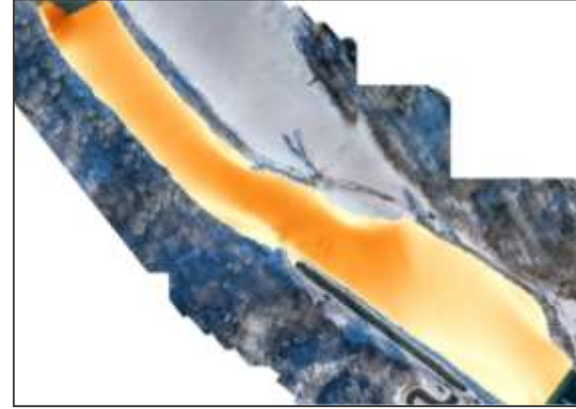
40 m³/s



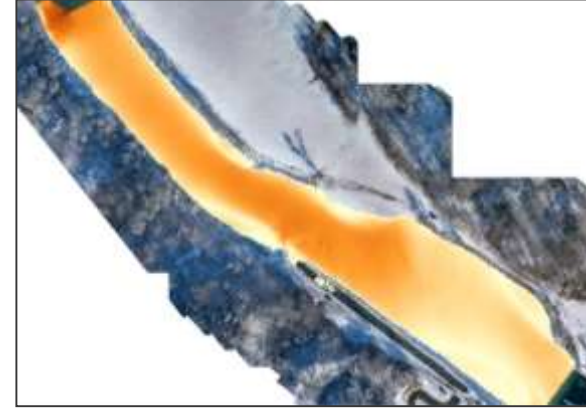
50 m³/s



60 m³/s

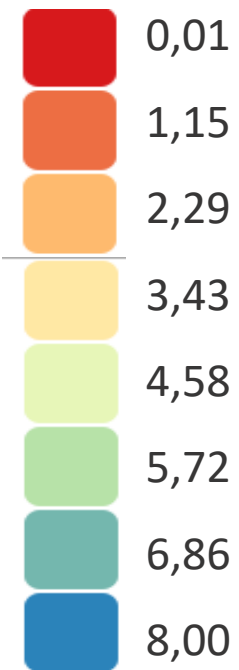
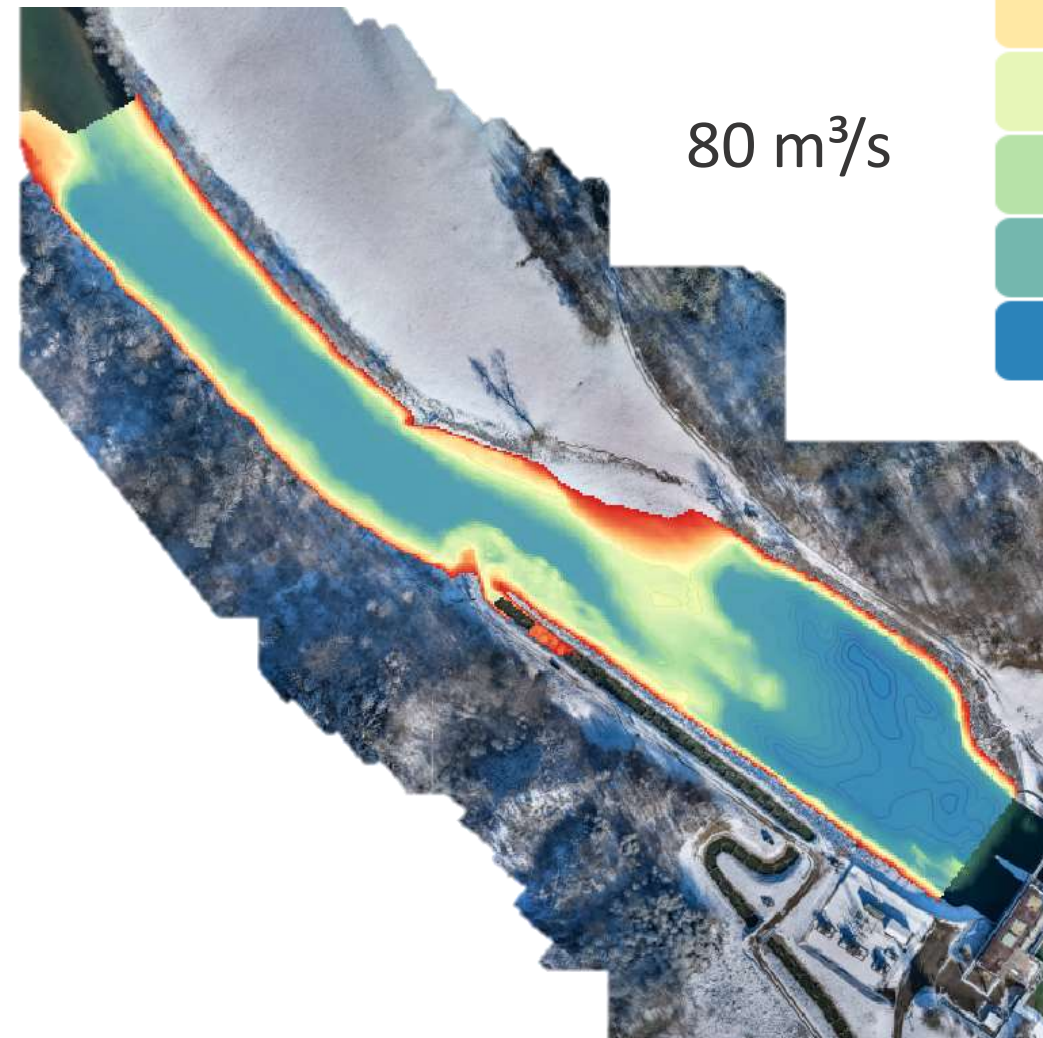
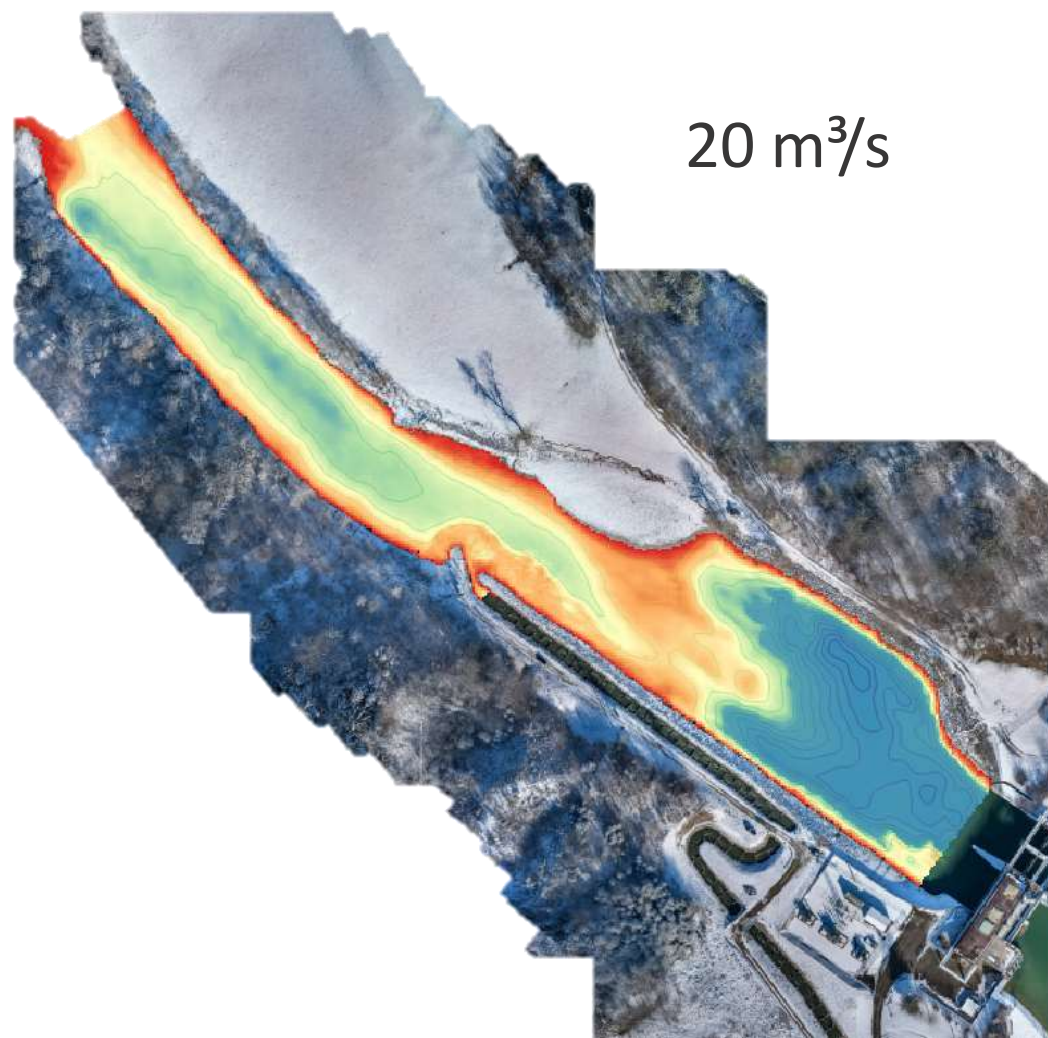


70 m³/s

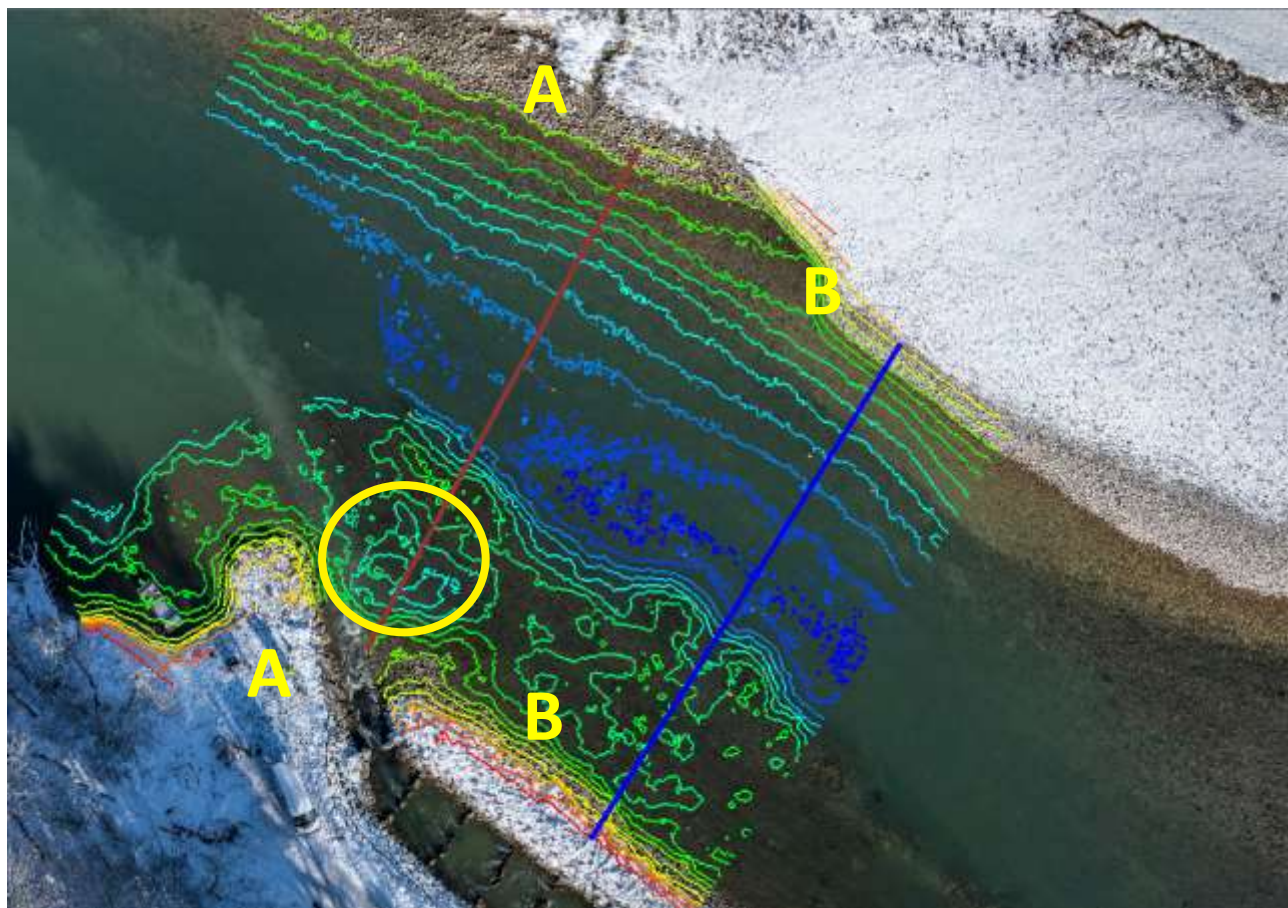


80 m³/s

Methode: Eco-hydraulica en bathymetrie



Methode: Eco-hydraulica en bathymetrie



Stenen \varnothing 0.5 m

Datasets



Gevangen:

- Rivier (e-fishing)

Gezenderd:

- 4 april

Halfweg de vistrap:

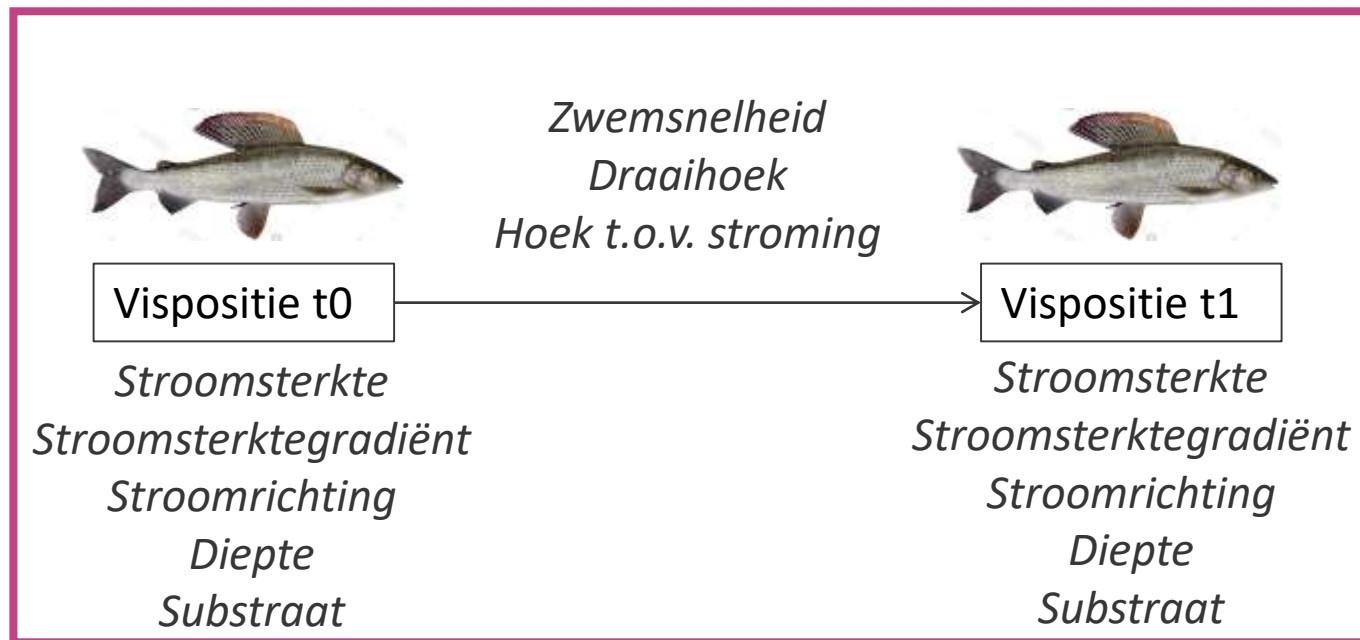
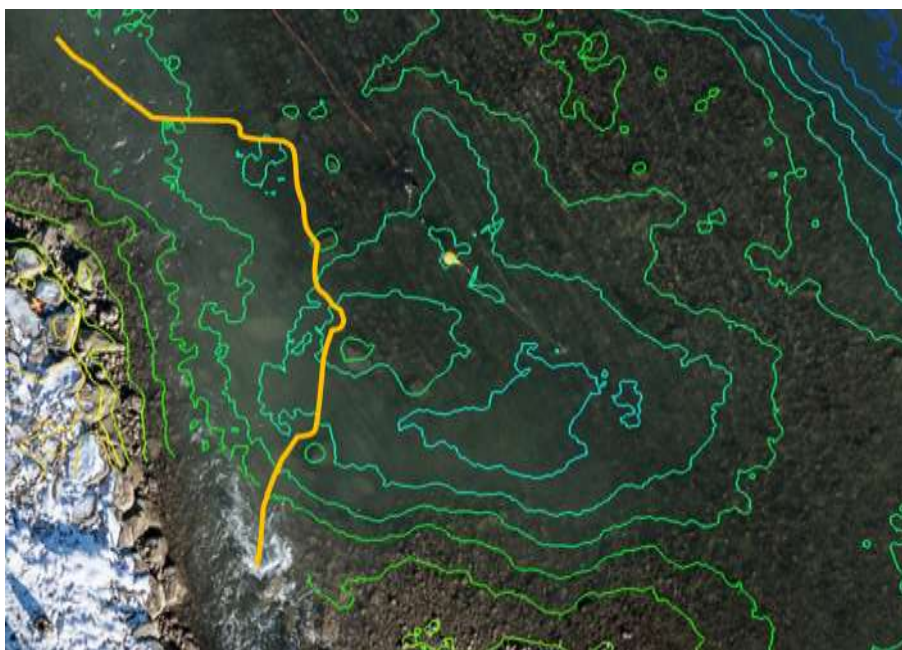
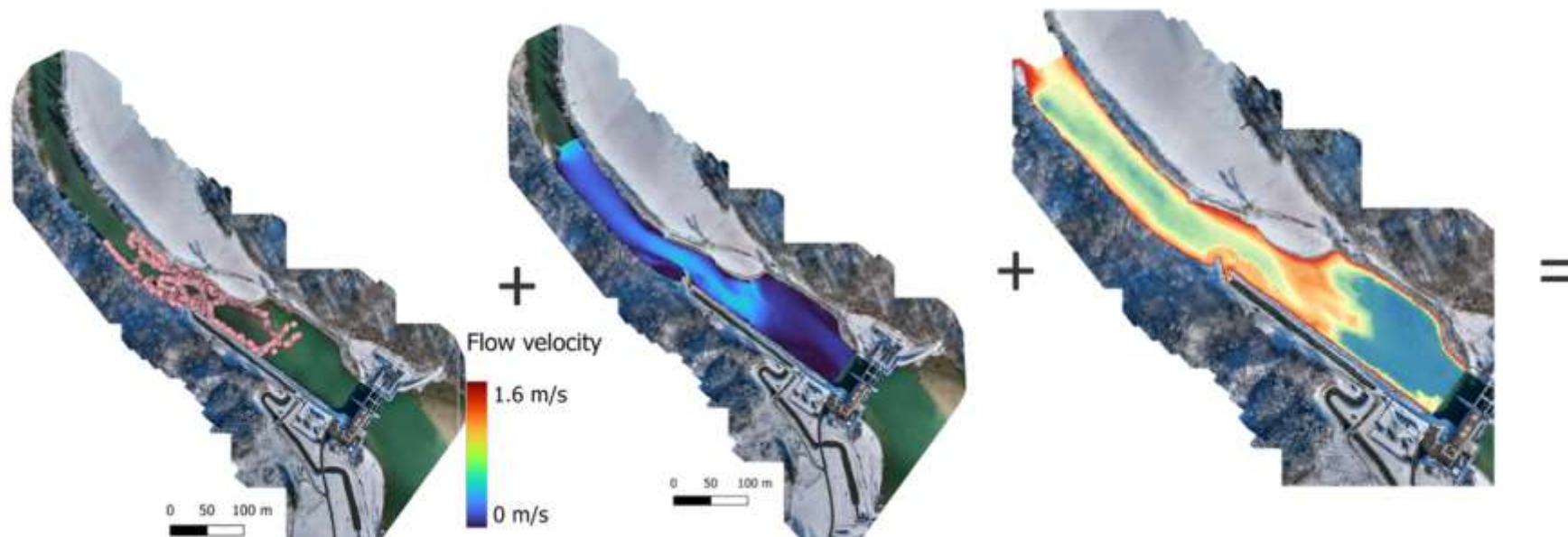
- 8 april 17u30-
18u30

Bovenaan de vistrap:

- 8 april 18u45-
19u10



Datasets



Data analyse → Uitdagend !!!



Data analyse → Uitdagend !!! → Hulplijn!

▶ RIBES project

River flow regulation, fish **BE**haviour and **S**tatus

The logo for the RIBES project, featuring the word "RIBES" in a bold, blue, sans-serif font. A stylized white fish icon is integrated into the letter "I".

<https://www.msca-ribes.eu/>

▶ ETN COST actie

European Tracking Network



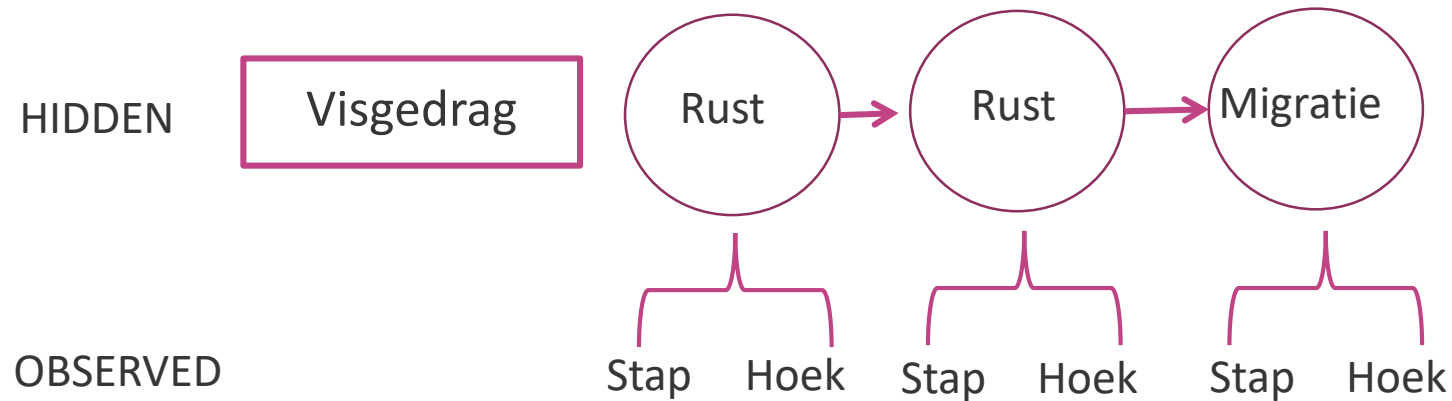
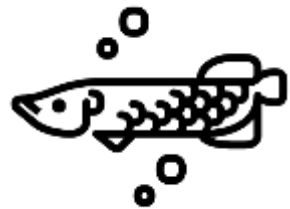
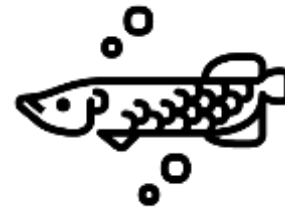
<https://europeantrackingnetwork.org/en>



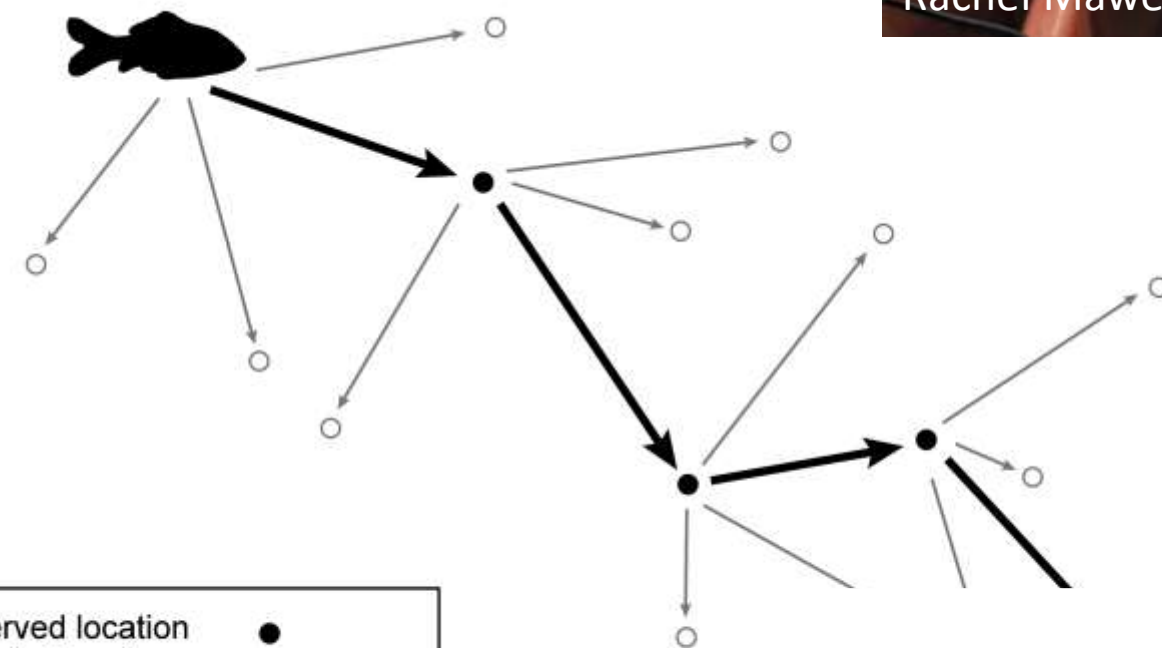
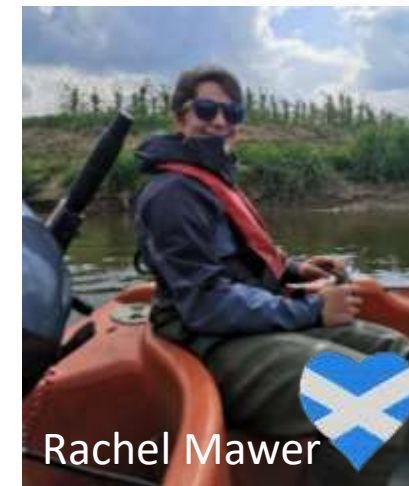
Data analyse: Hidden Markov Models



Jelger Elings



Data analyse: Step Selection Functions

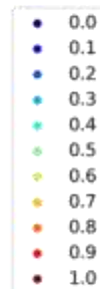
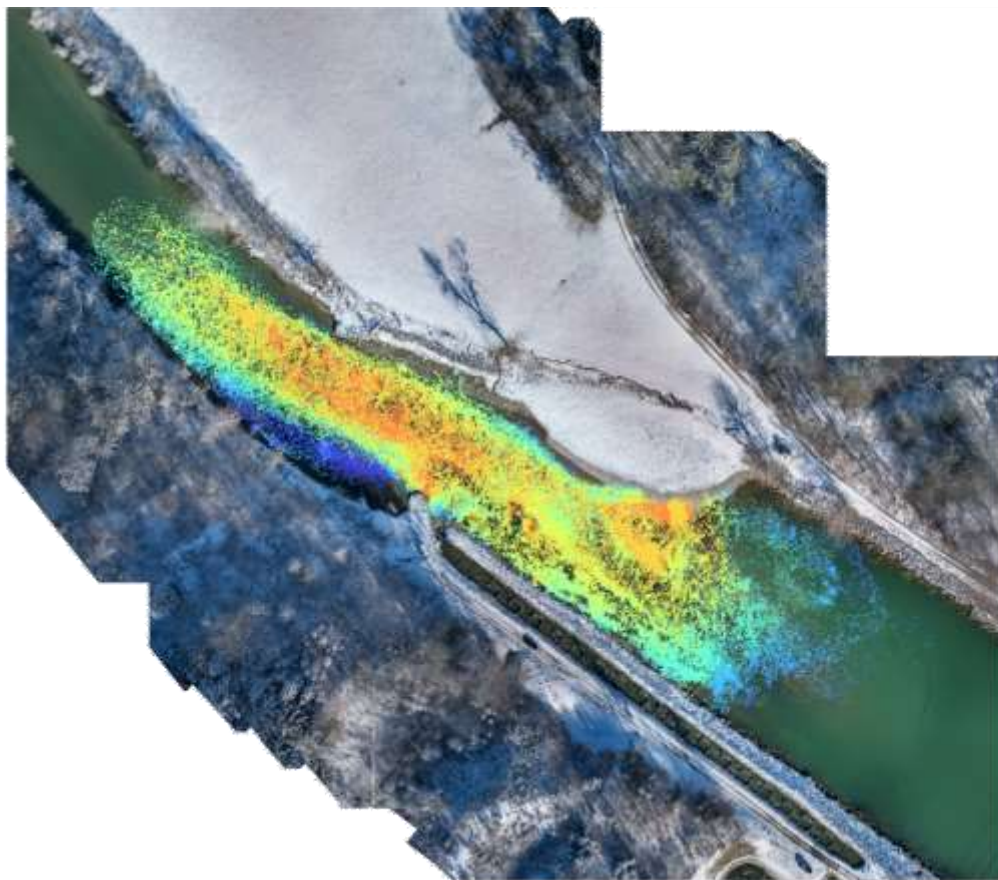


Observed location	●
Potential location	○
True step	→ (thick)
Random step	→ (thin)

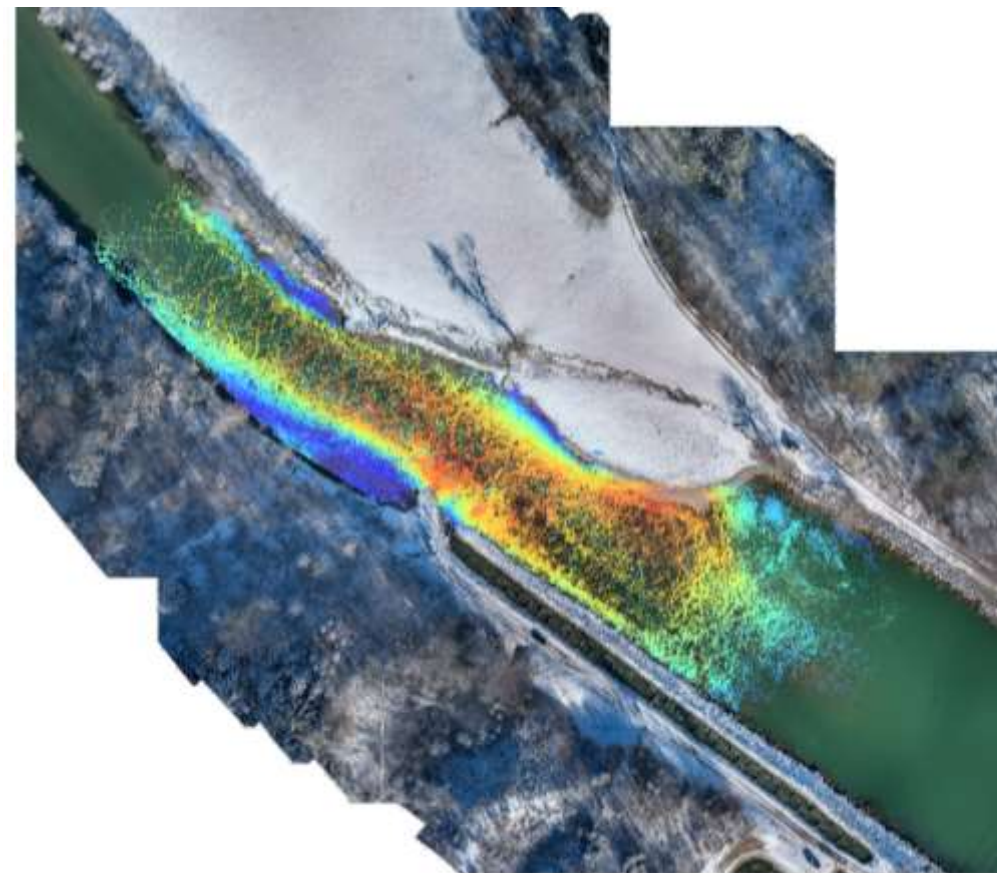


Resultaten (algemeen)

Barbeel

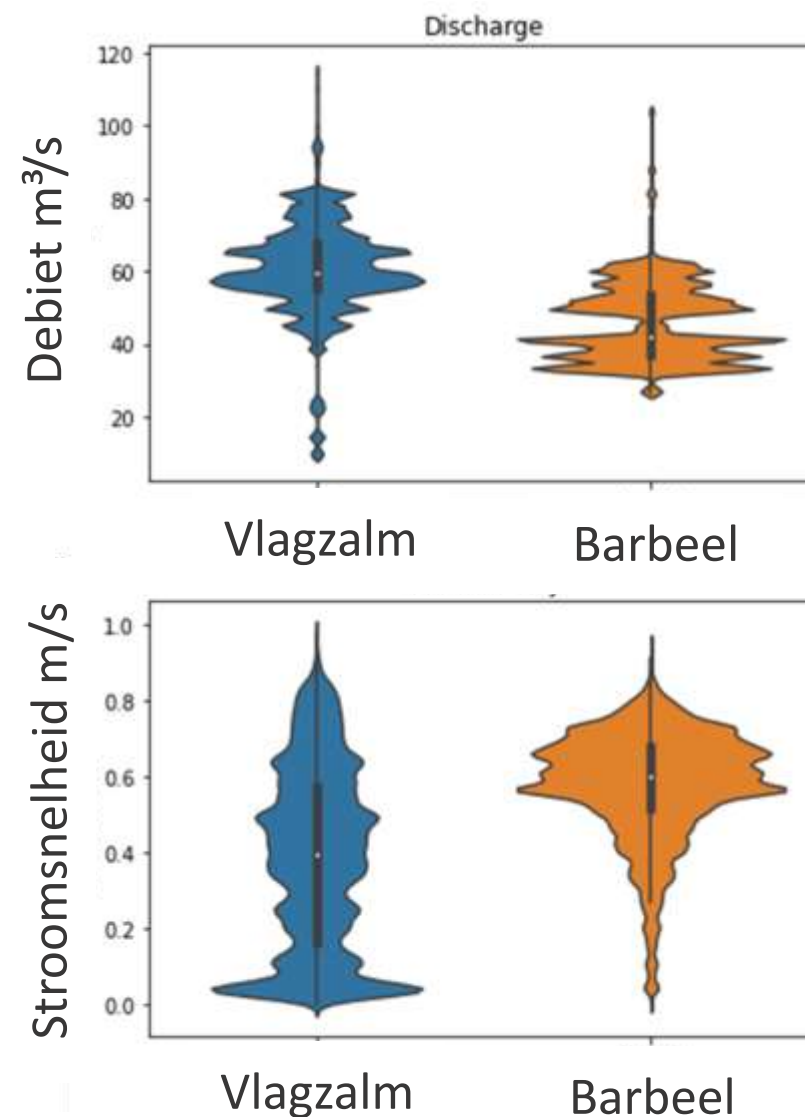


Vlagzalm



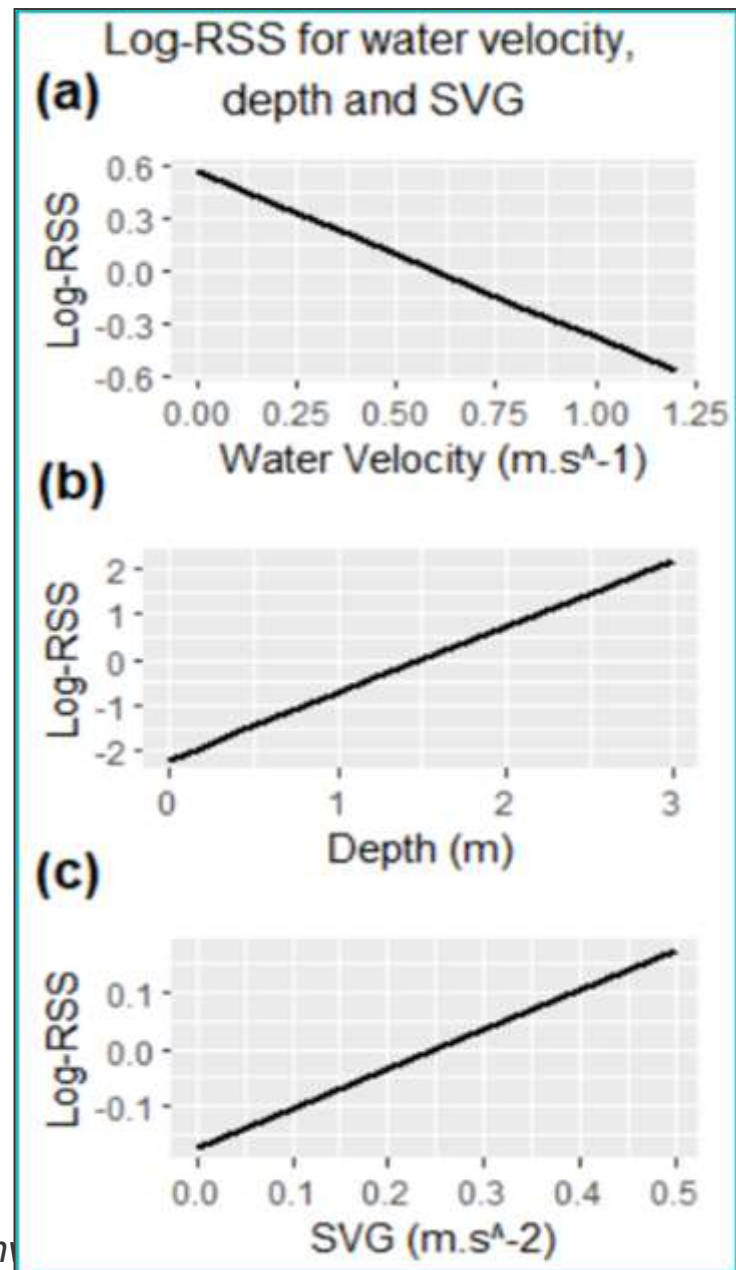
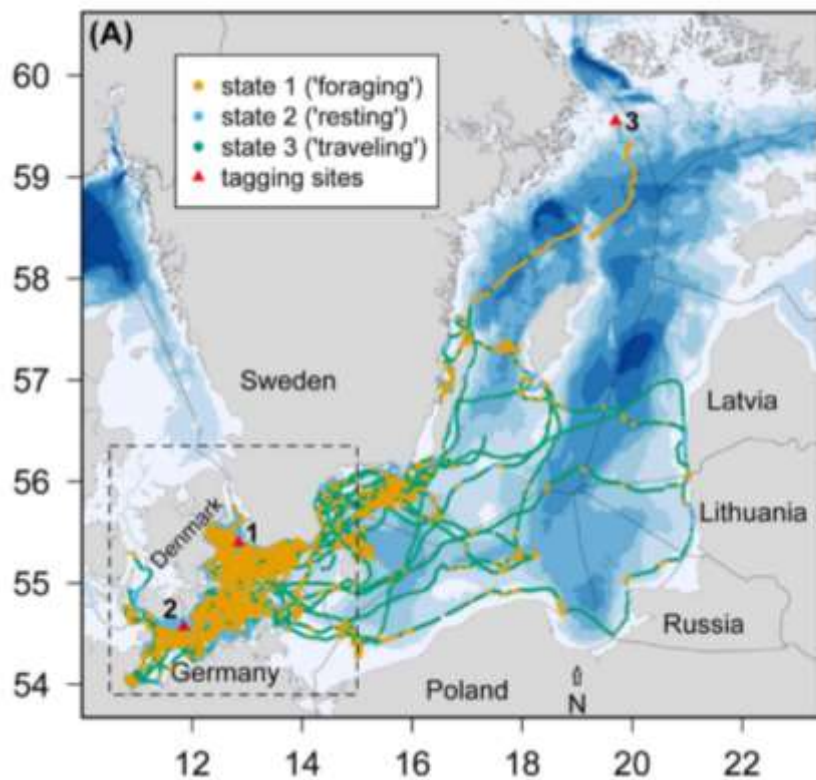
Resultaten (algemeen)

Hoewel vlagzalm voorkwam bij hogere debieten, zijn ze te vinden bij lagere stroomsnelheden dan barbeel



Resultaten specifiek

► Zie posters van Jelger en Rachel



Bron: van Beest et al. Classifying grey seal behaviour in relation to environmental variables using a multivariate hidden Markov model. *Sci. Rep.* 9. <https://doi.org/10.1038/s41598-019-42109-w>

Conclusies internationaal samenwerken

- ▶ De juiste experts voor het onderzoek
- ▶ Samenwerking verschillende sectoren
 - **WETENSCHAP**
 - Levert kennis
 - Leert realiteit ingenieurs/industrie/operators
 - **INDUSTRIE**
 - Levert state-of-the-art technologie aan wetenschap en operators
 - Kan zelf nieuwe tools ontwikkelen (via testen in real life)
 - **WATERKRACHT OPERATOREN**
 - Krijgen 'awareness' over de ecologische impact
 - Leren vismigratie-oplossingen toepassen (how to ?)





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Bedankt voor uw aandacht

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