

Genetische biomonitoring



Programma

- DNA (meta)barcoding en environmental DNA (eDNA)
- Voorbeelden monitoring en EIA zoetwater
- Voorbeelden marien en EU Interreg project GEANS
- Knelpunten/behoeftes mbt monitoring en EIA



AATCGGACTTCGATTGGAAAC

DNA barcoding

Barcode of Life Database

Netherlands Center for Genetic Biodiversity Assessment

Voucher



Specimen ID: 003392 Museum ID: MNUO-1222
 Collection Code: City of Oulu
 Remarks: Associated Tags: No Tags

Specimen Images:



Specimen Images:

Date Collected: 2011-05-28
 Collector: Ari Kakkila

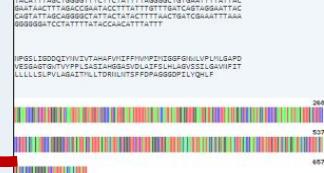
Elevation: 540 meters
 Accuracy: 500 meters
 Depth: 50 meters
 Depth Accuracy: 50 meters

Source: iBOL (WG1.7)
 GenBank AC0265102
 Genome: Mitochondrial
 eCircusace Subunit 1 5' Region

Sequence: (Basecalling by iBOL) [Sequence data] (Barcode) [Barcode sequence]
 License: Creative Commons - Attribution Non-Commercial (2012)
 License Holder: Marko Mutanen, University of Oulu
 Add Tags & Comments [Comments] Associated Tags: No Tags

Collection Site:
 Kaart [Map of Europe and surrounding regions, including Ireland, UK, France, Germany, Poland, Russia, and Ukraine, with collection localities marked.]

DNA Barcode



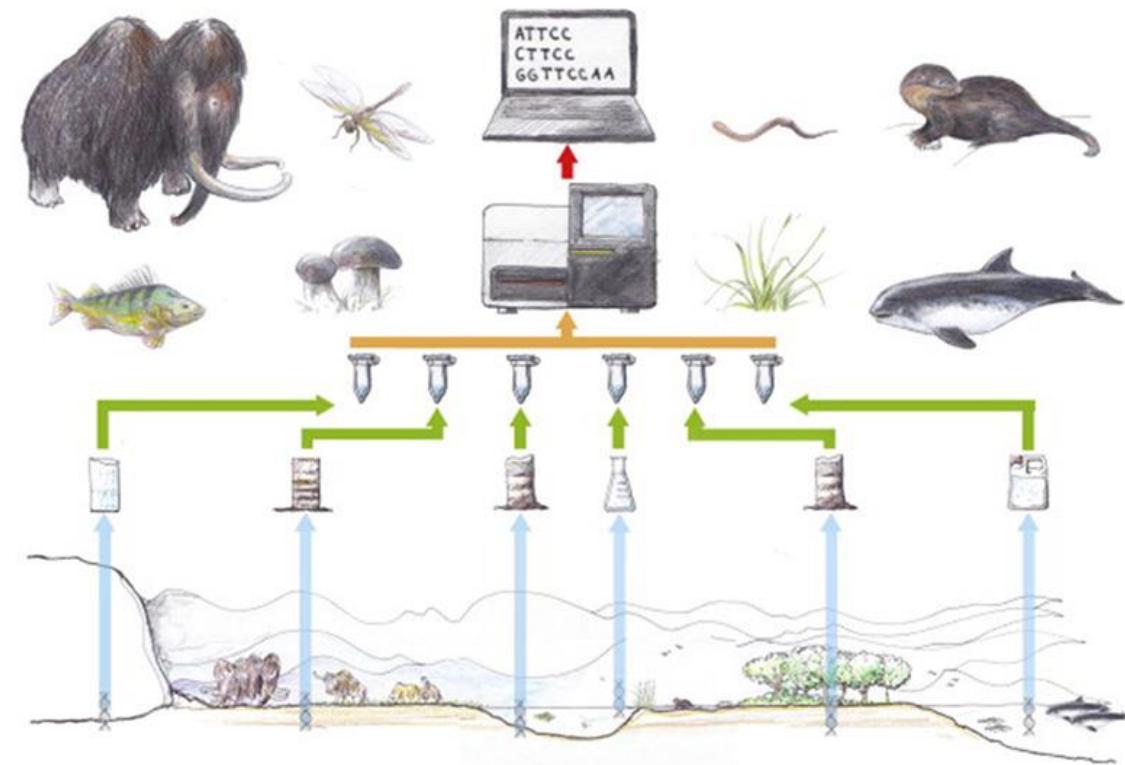
DNA metabarcoding

Netherlands Center for Genetic Biodiversity Assessment

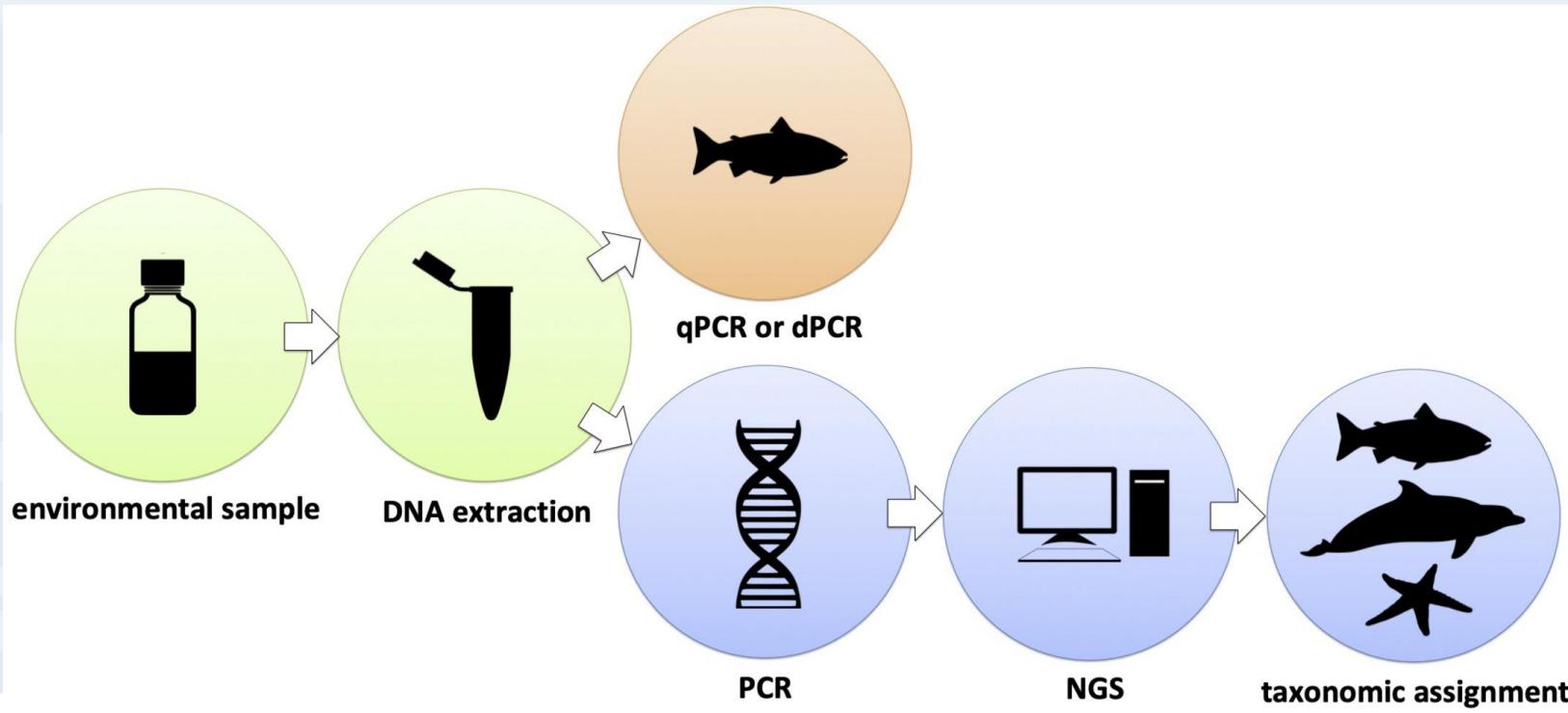


eDNA

Netherlands Center for Genetic Biodiversity Assessment

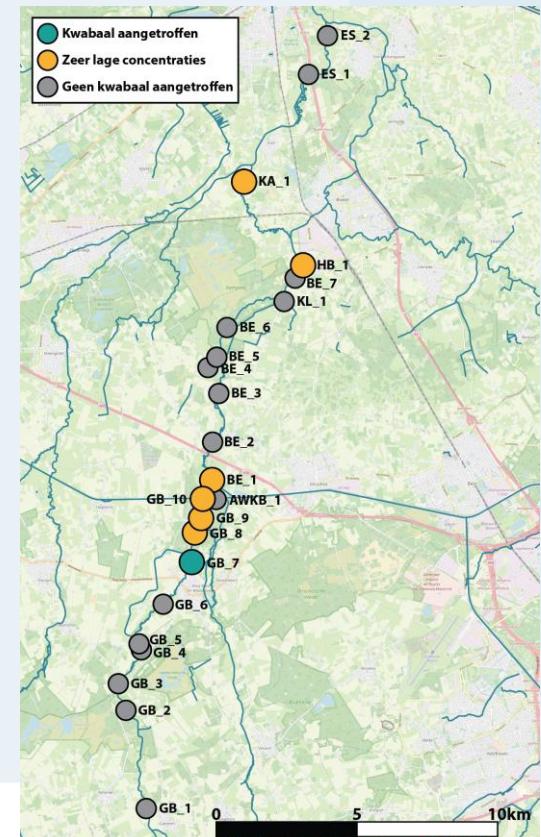
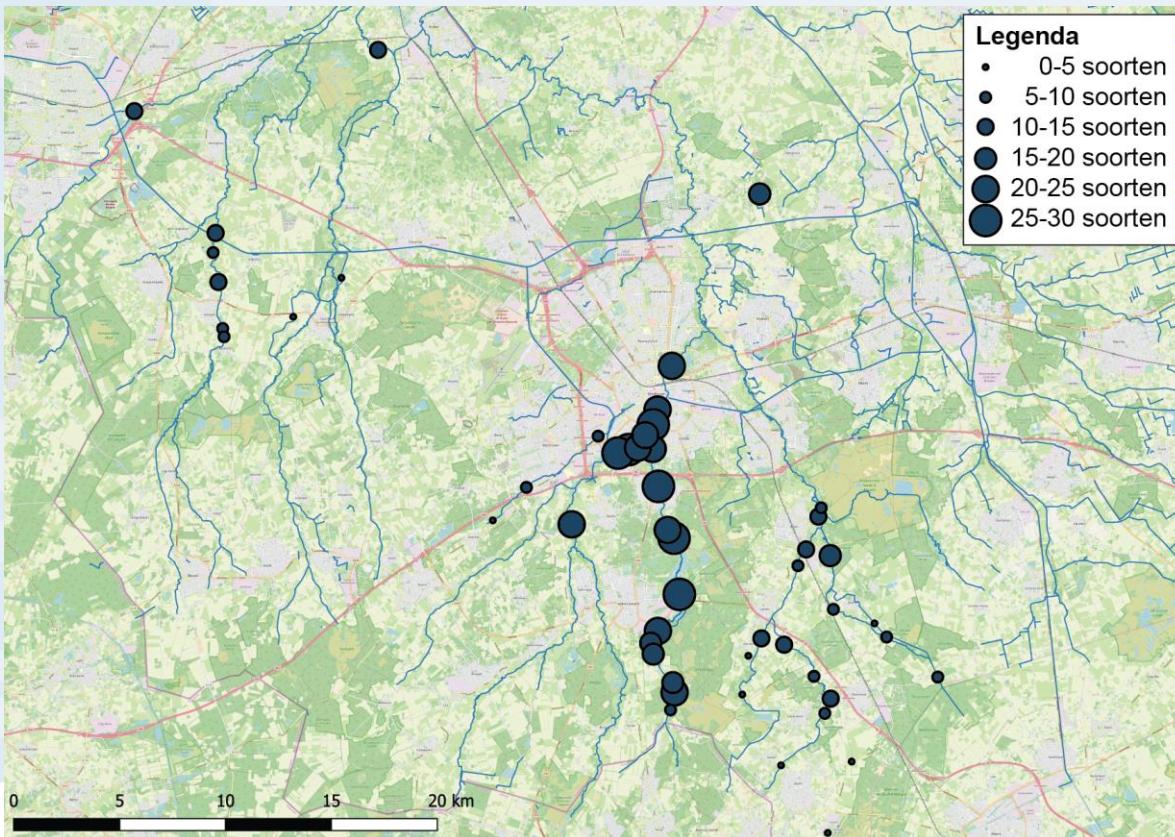


Één versus veel



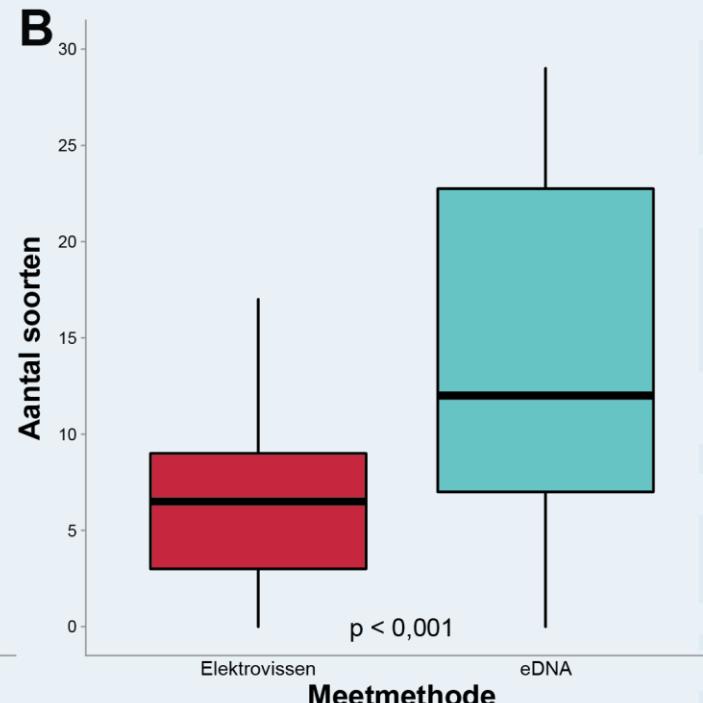
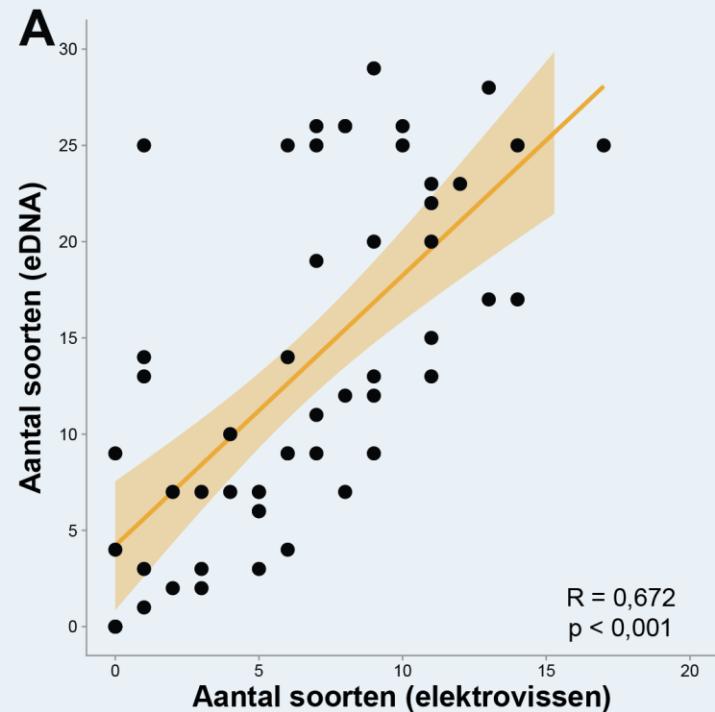
Één versus veel: vissen

Netherlands Center for Genetic Biodiversity Assessment

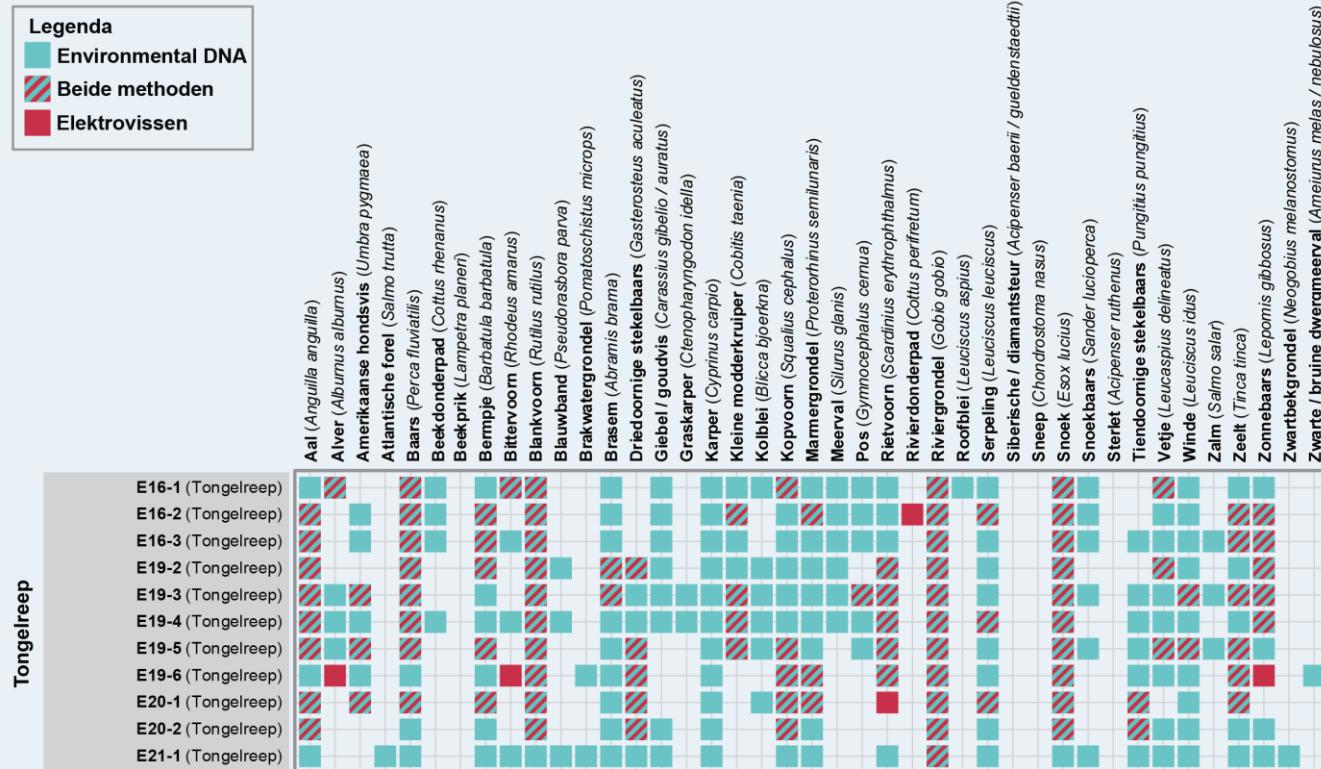


Vissen de Dommel

Netherlands Center for Genetic Biodiversity Assessment

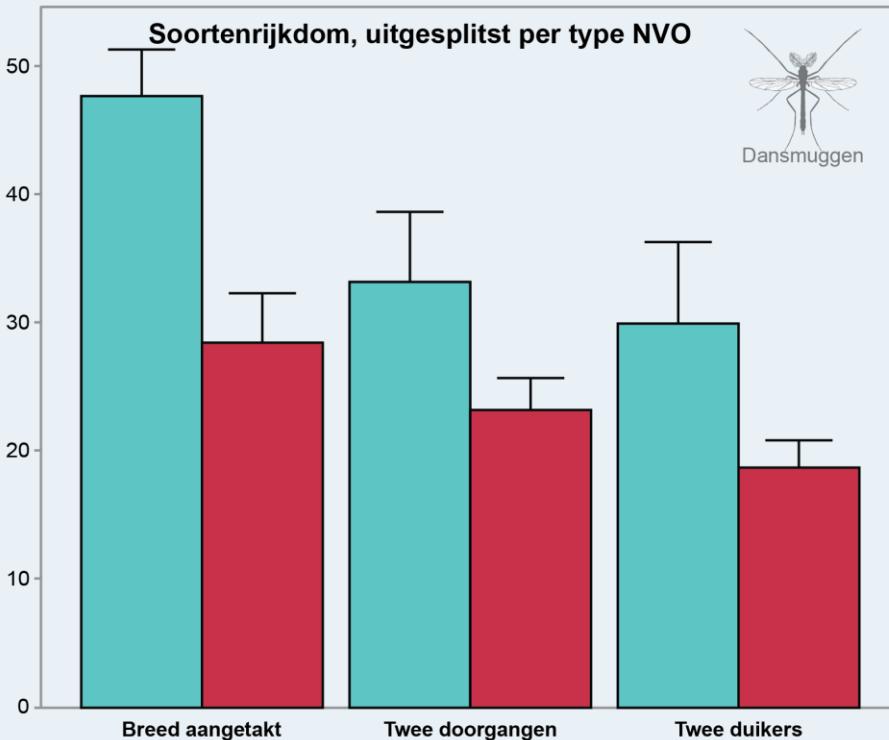
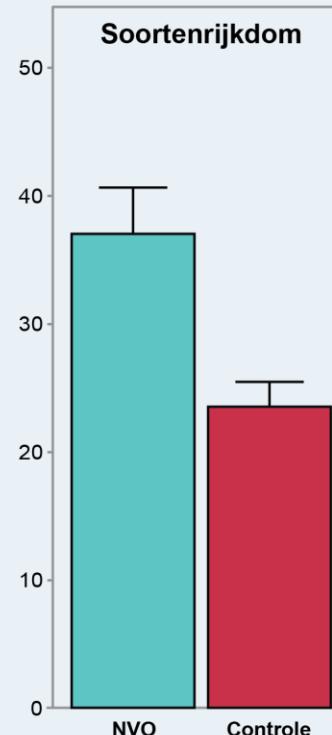


Vissen de Dommel



EIA dansmuggen NVO

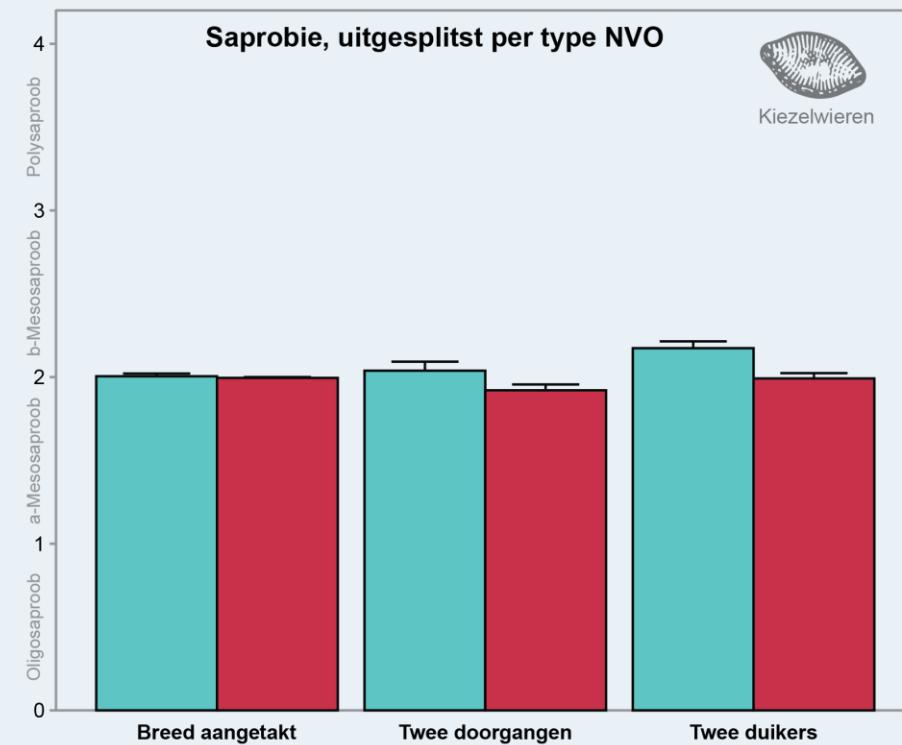
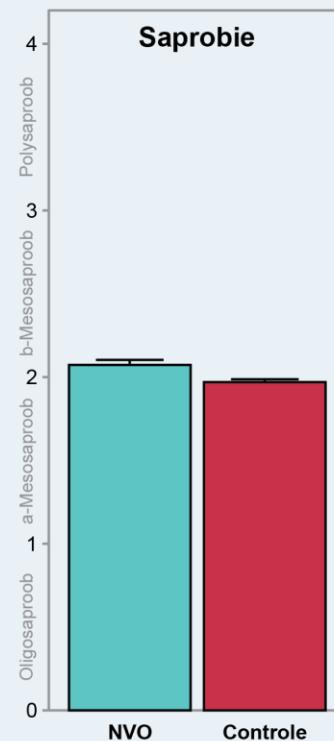
Netherlands Center for Genetic Biodiversity Assessment



→ Isolatie

EIA kiezelwieren NVO

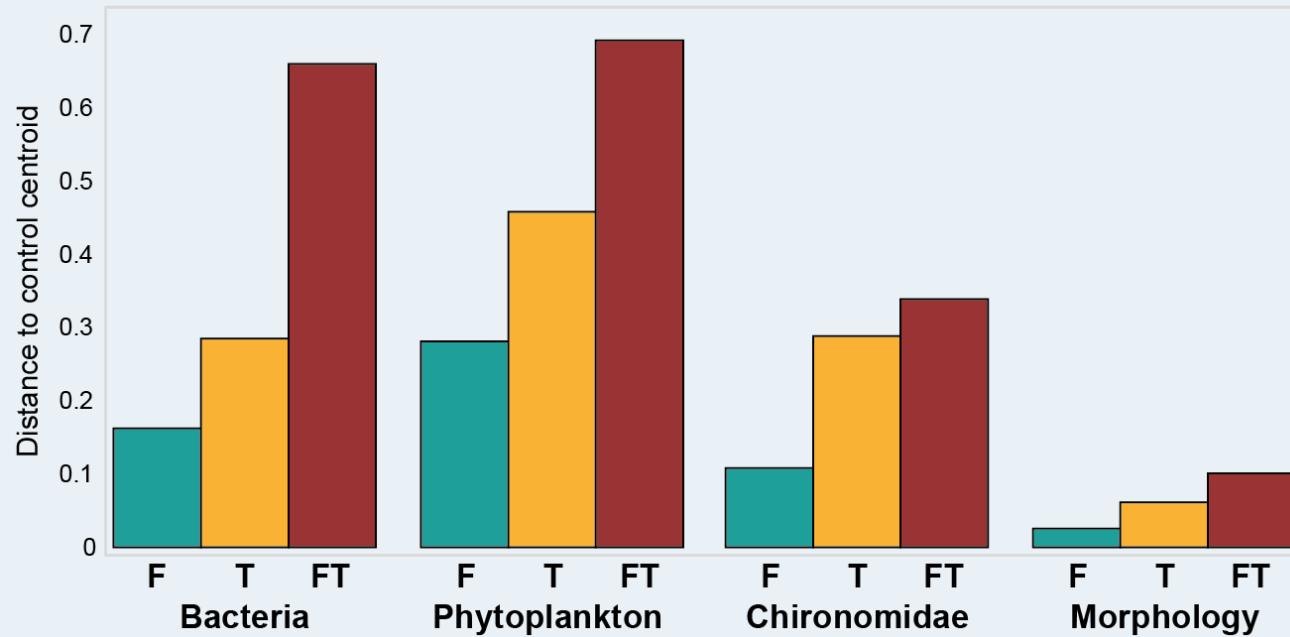
Netherlands Center for Genetic Biodiversity Assessment



→ Isolatie

EIA leefgemeenschappen

Netherlands Center for Genetic Biodiversity Assessment



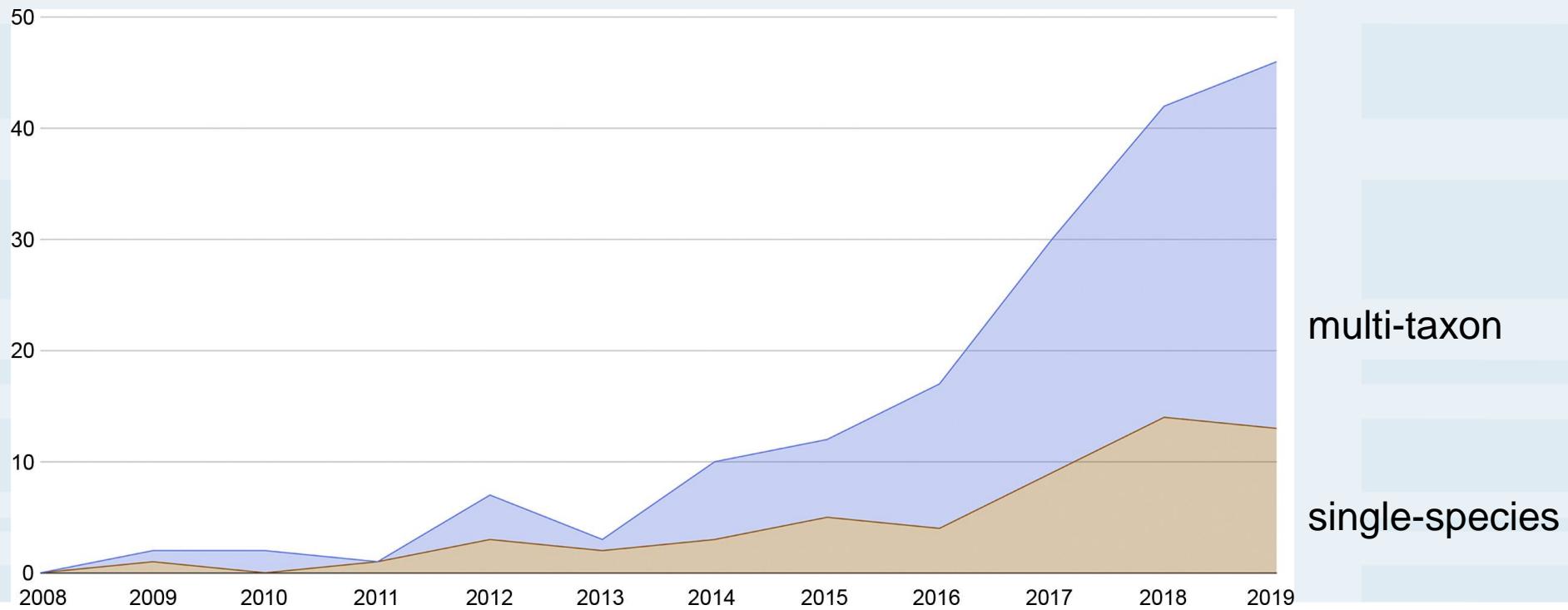
F = fertilizer

T = thiacloprid

FT = combi

Mariene eDNA studies

Netherlands Center for Genetic Biodiversity Assessment







©SIOPIC

Langsprietoeipootkreeftje

<https://scripps.ucsd.edu/zooplanktonguide/species/acartia-acanthacartia-tonsa>



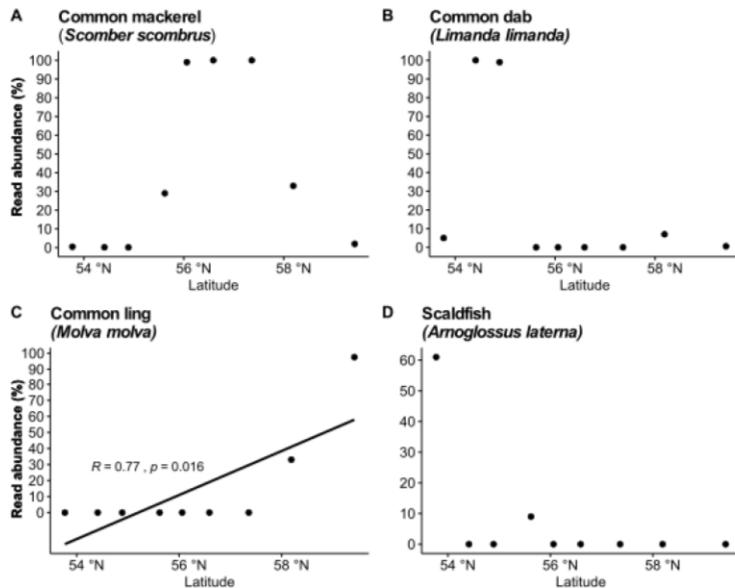
Larve zeepok

foto: Peter H. van Bragt

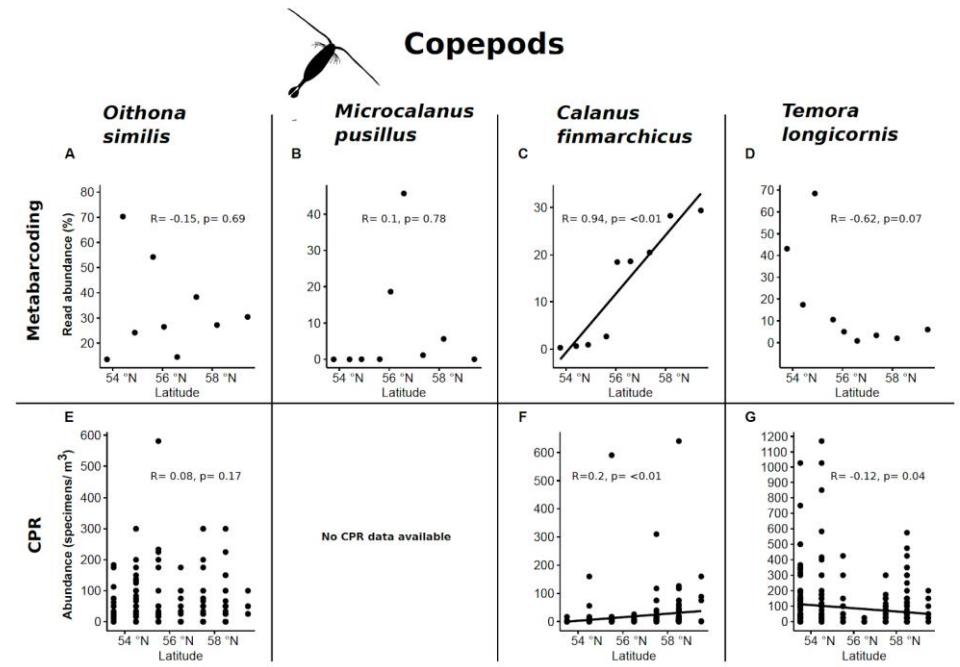
Noordzee Plankton

Netherlands Center for Genetic Biodiversity Assessment

Ray-finned fishes



Copepods



GEANS



Genetic tools for
Ecosystem health Assessment
in the North Sea region

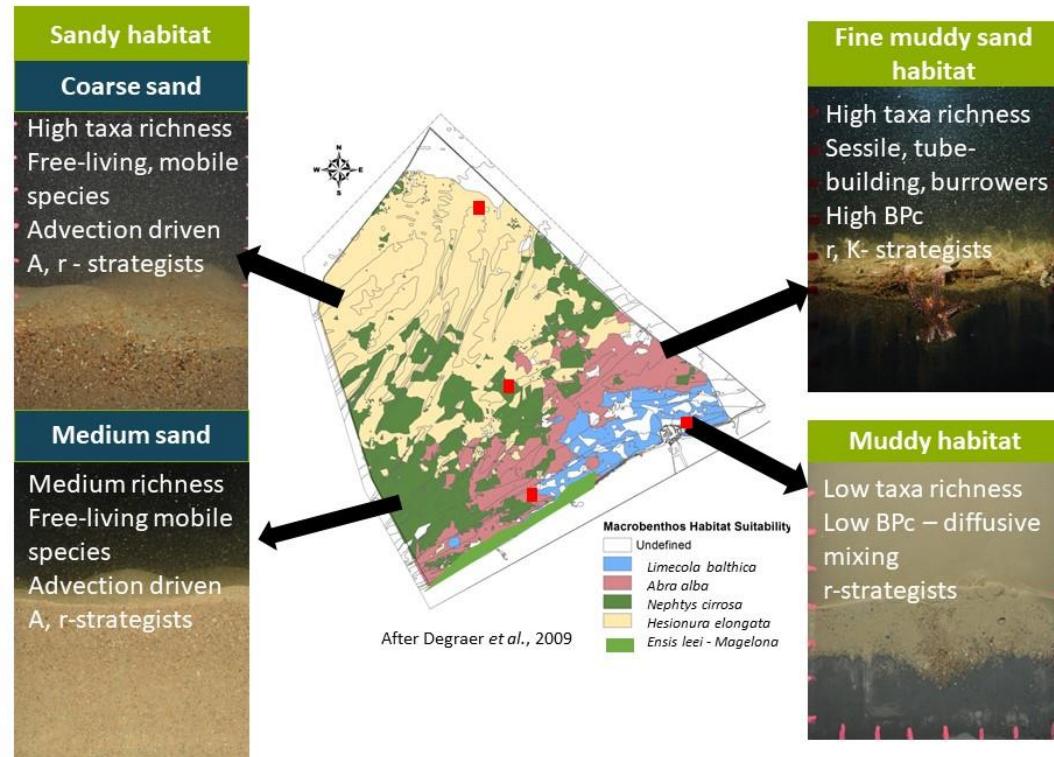
Technische testen

Samples available for the ringtest

- Van Veen from four macrobenthos communities in the Belgian part of the North Sea (red squares on graph) collected in 2017
- In each community: 3 replicate Van veens => 12 samples in total
- Four communities have different levels of diversity
- One replicate from each community has been identified morphologically (4 samples in total)
- After identification, samples were blended
- The remaining 8, not morphologically identified samples were also blended



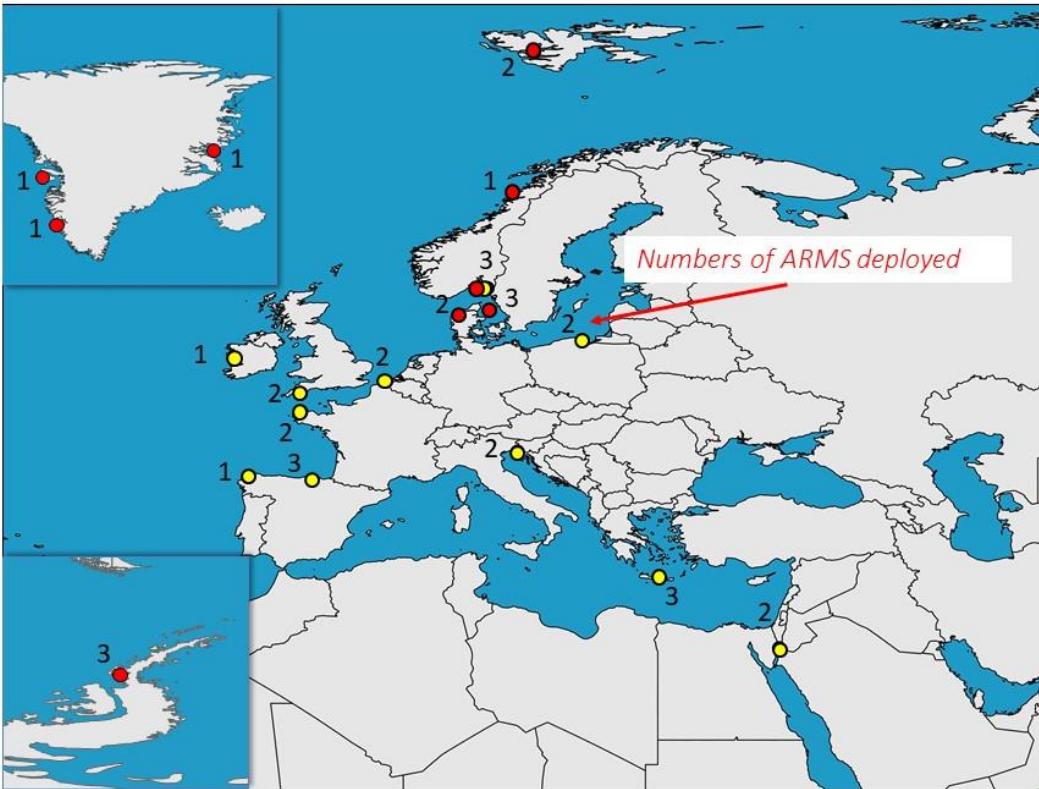
So we have macrobenthos soup from 12 samples, four of which were identified morphologically



Hard substraat

Netherlands Center for Genetic Biodiversity Assessment

ARMS sites in 2019



Zacht substraat

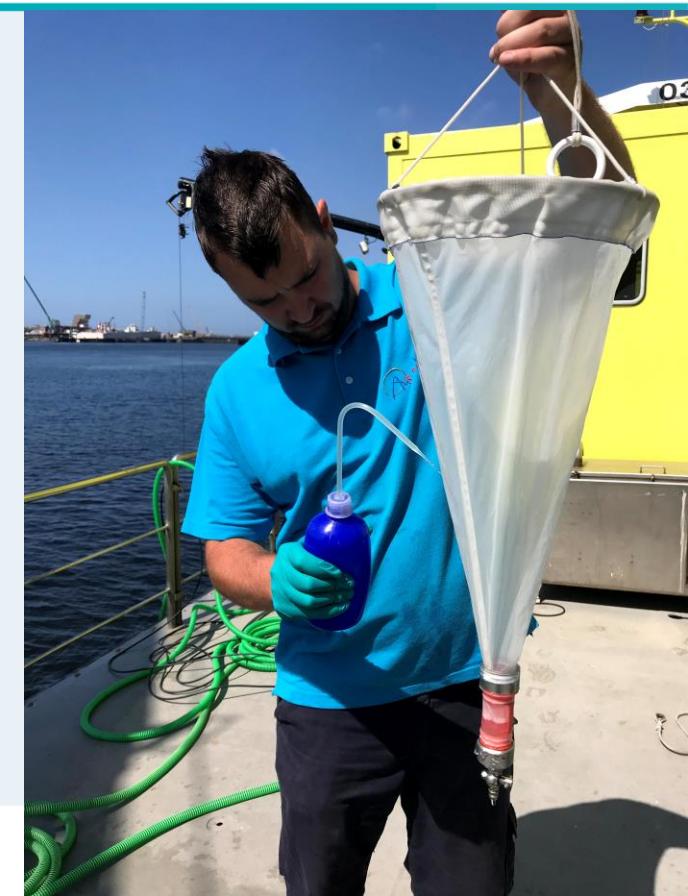
Netherlands Center for Genetic Biodiversity Assessment



doris.ffessm.fr © David BORG

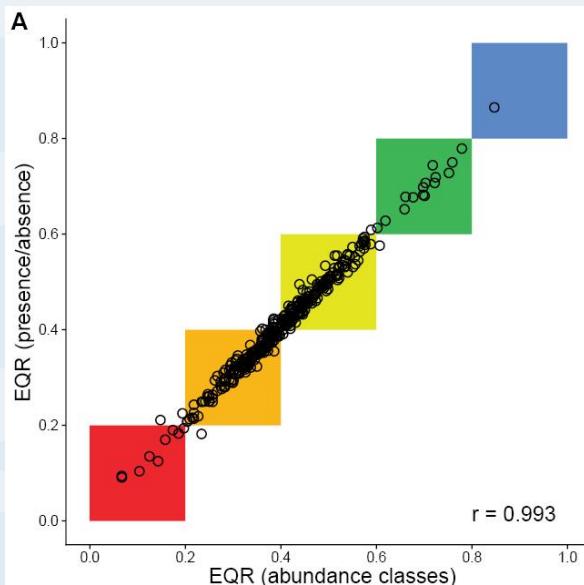
Uitheemse soorten

Netherlands Center for Genetic Biodiversity Assessment

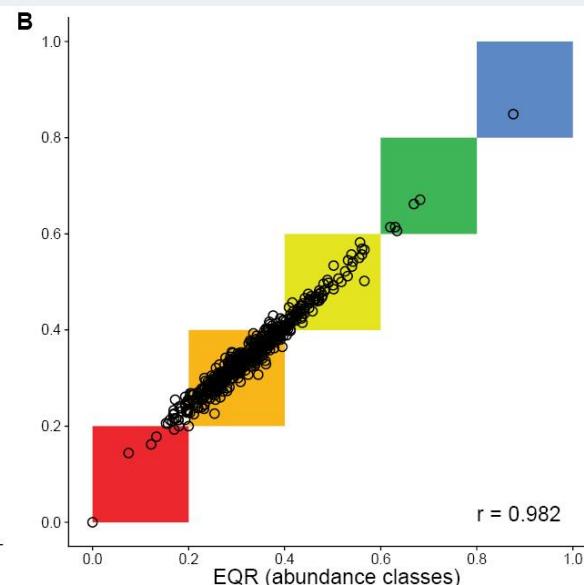


Abundantie

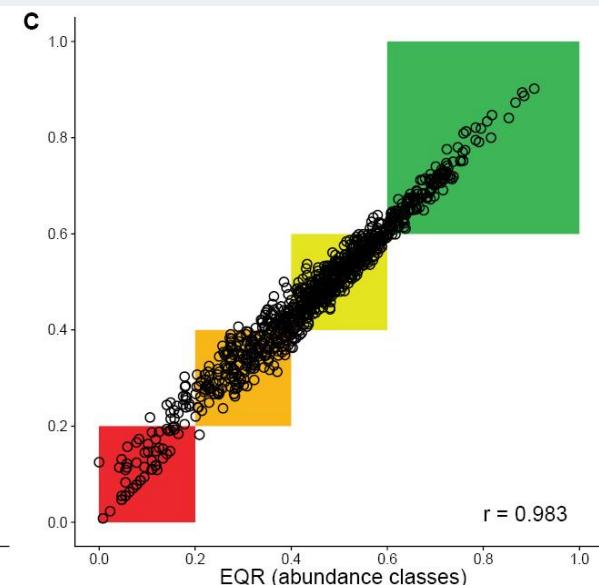
Netherlands Center for Genetic Biodiversity Assessment



Stilstaand water

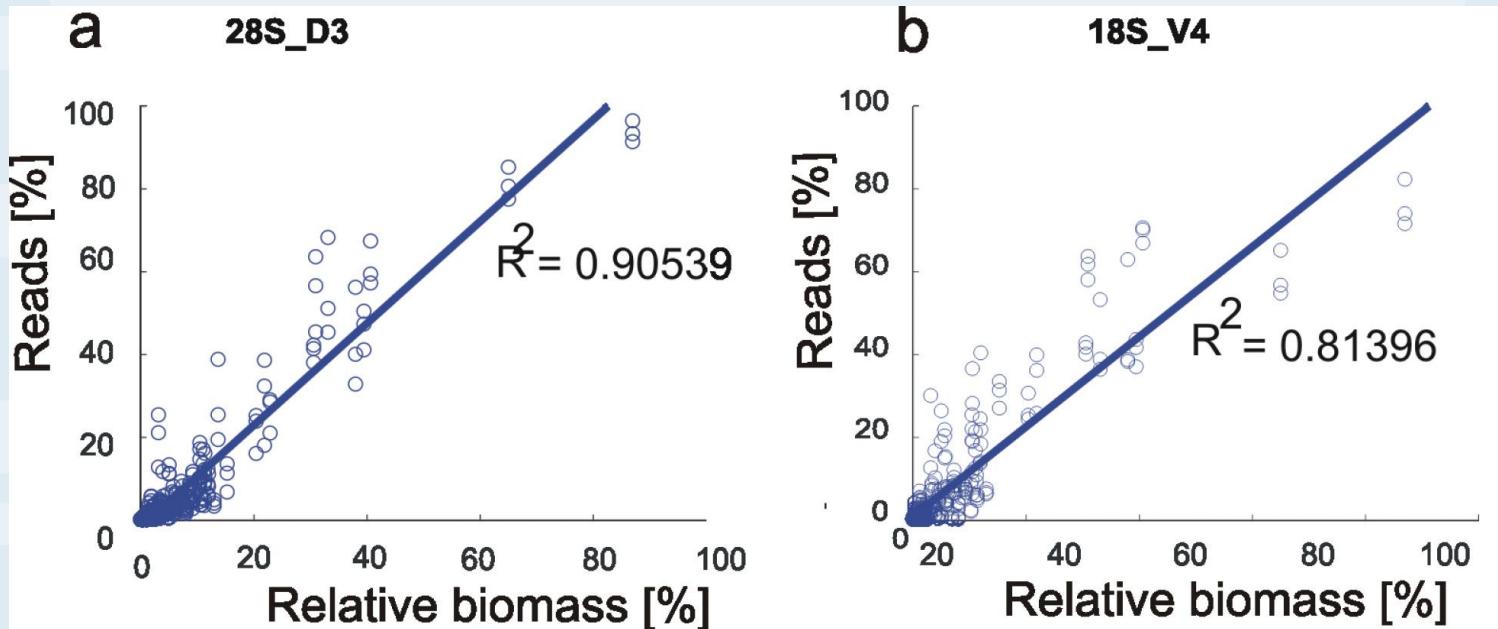


Stromend water



Kunstmatig water

Abundantie

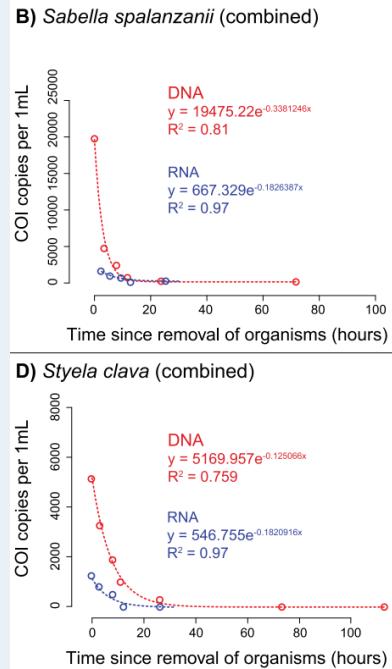


Nematoden (Schenck et al. 2019)

Afbraak en transport

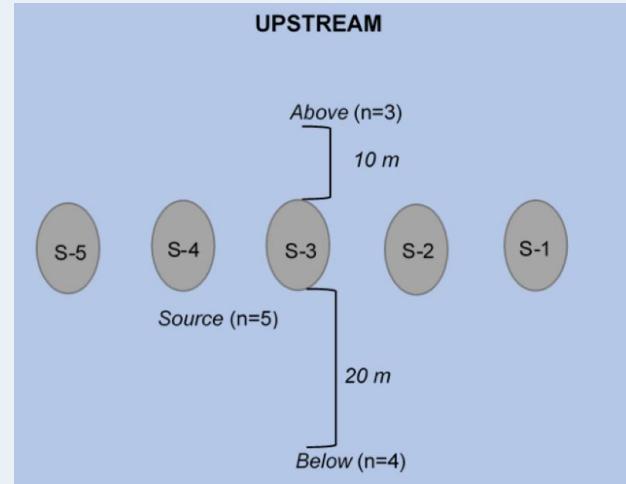
Netherlands Center for Genetic Biodiversity Assessment

Borstelworm
35h



Zakpijp
87h

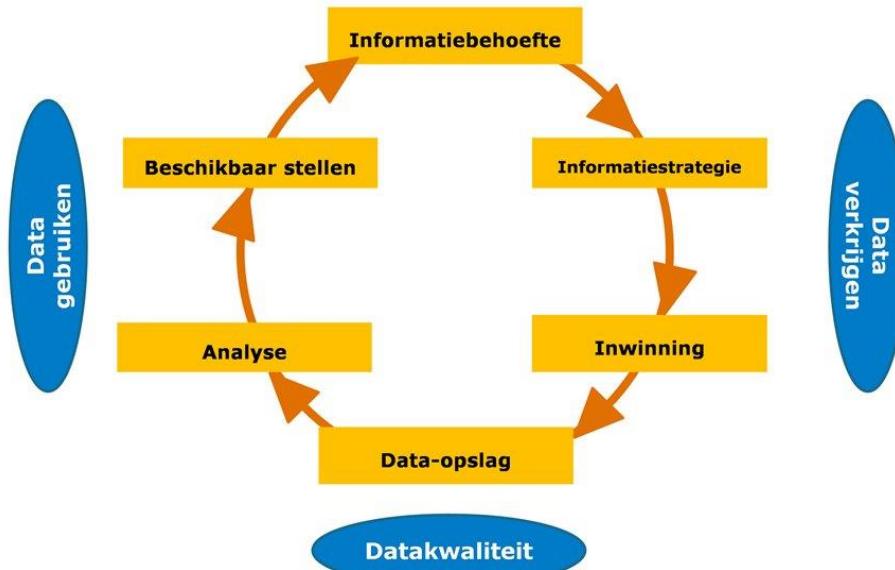
Wood et al. 2019



Curtis & Larson 2020

Knelpunten/behoeften

De informatiecyclus



- Doorlooptijd
- Compleetheid
- Detaillering
- Betrouwbaarheid
- Reproduceerbaarheid
- Meer meten (ruimte)
- Vaker meten (tijd)
- Kostenbesparing

Bedankt!



N