A landscape photograph of a constructed wetland. The foreground is dominated by dark, rippling water. In the middle ground, there are several tall, thin, leafless trees standing in the water. To the left and right, there are patches of tall, dry reeds. The background shows a line of trees and a blue sky with large, white, fluffy clouds. The overall scene is a natural, water-saturated environment.

LIFE NARMENA: Nature based  
remediation techniques for  
heavy metals in sediment -  
constructed wetlands  
2023-09-11, Axelle Mineur





**narmena**<sup>!</sup>  
Ruimte voor schone waterlopen





# Today's presentation

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- Context
- LIFE Narmena
- Winterbeek
  - Site history & methodology
  - Baseline monitoring
  - Construction works
  - Results
  - Future





# Context

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- BE & FL : densely populated => pressure
  - FL : 500+ aquatic & terrestrial sites => polluted heavy metals
  - Classical remediation:
    - Substantial waste
    - Soil erosion
    - Impact on nature
  - Dynamic nature of sediments + risk of flooding
-



# LIFE Narmena

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- NAture-based Remediation of MEtal pollutants in Nature Areas to increase water storage capacity
  - Objectives
    - Reduce bioavailable concentrations
    - Create water storage space for watercourses: natural flood control areas
    - Habitat for threatened species
-





# LIFE Narmena: pilot sites

- 3 natural reserves
- Along 3 water ways
  - Grote Calie: Cr & CrVI





# LIFE Narmena: pilot sites

- 3 natural reserves
- Along 3 water ways
  - Grote Calie: Cr & CrVI
  - Grote Laak: Cd







# LIFE Narmena: pilot sites

- 3 natural reserves
- Along 3 water ways
  - Grote Calie: Cr & CrVI
  - Grote Laak: Cd
  - Winterbeek: Cd







# LIFE Narmena: pilot sites

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- 3 natural reserves
- Along 3 water ways
  - Grote Calie: Cr & CrVI
  - Grote Laak: Cd
  - Winterbeek: Cd



=> They act as buffers !!!

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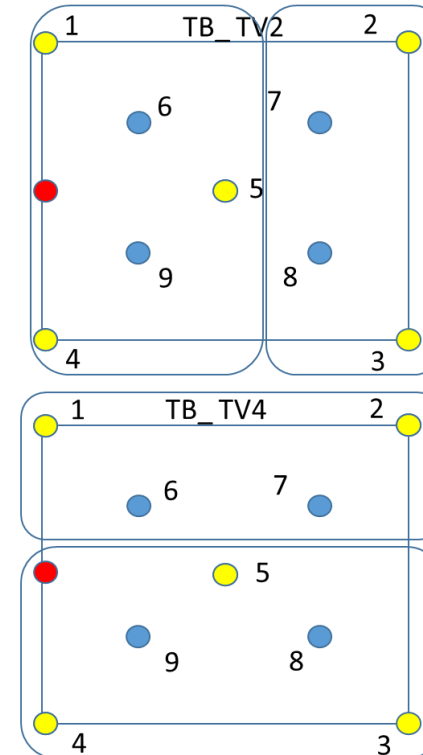
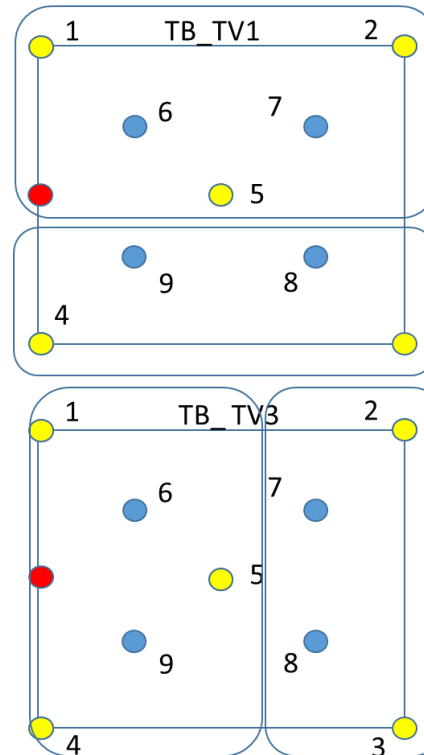






# Winterbeek: baseline monitoring

- Test zones: 6
- 4
  - 2 mixed samples
- 2
  - 2 mixed samples
  - 9 individual samples

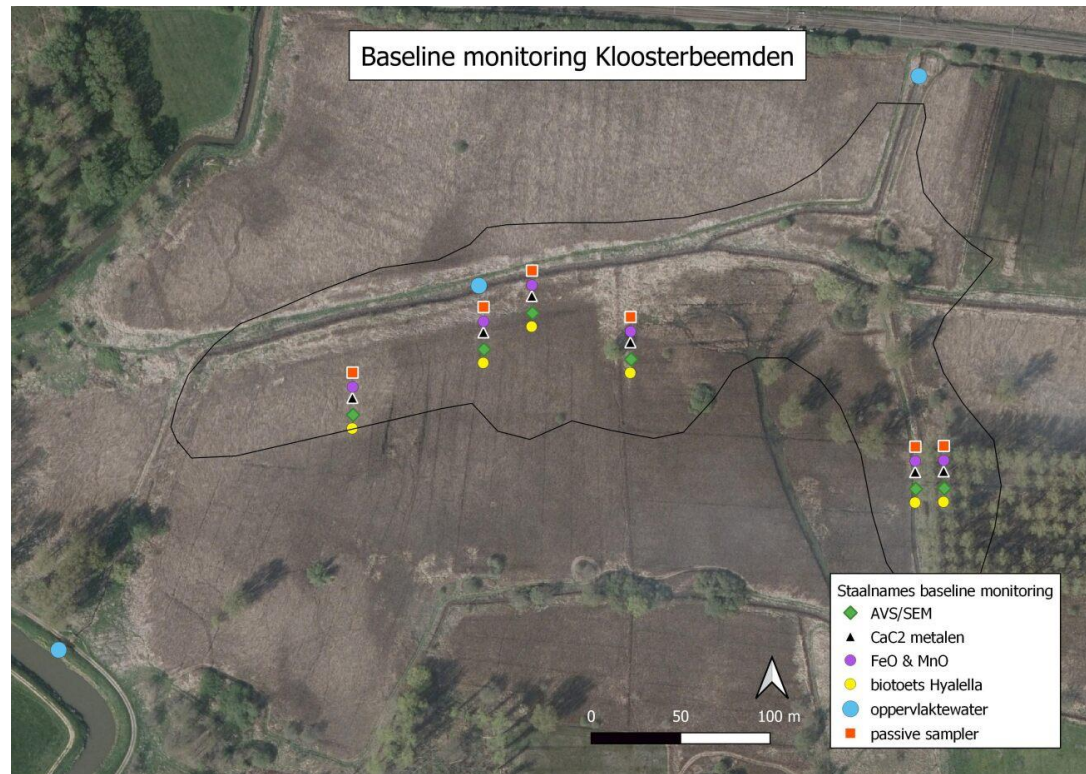


● Topstaal (0,0-0,2m-mv)

● Topstaal (0,0-0,2m-mv) + Dieptestaal (0,5-0,8 m-mv)



# Winterbeek: baseline monitoring





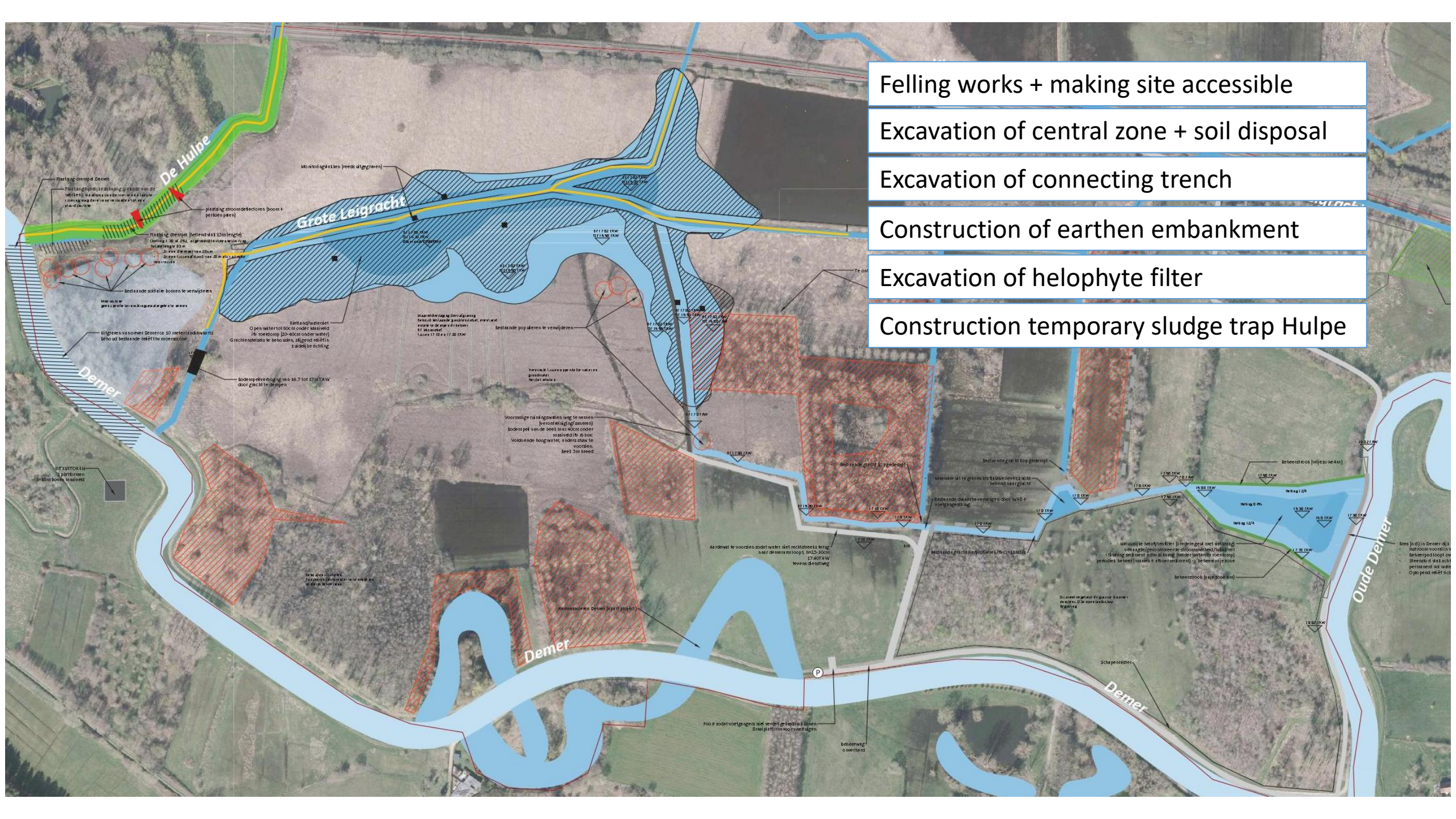


# Winterbeek: construction works

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- Start of works: 20/09/2022
  - Favourable weather conditions in autumn 2022
    - smooth operation
    - Works in Kloosterbeemden completed
  - 2023: start remediation of the Hulpe
-





- Felling works + making site accessible
- Excavation of central zone + soil disposal
- Excavation of connecting trench
- Construction of earthen embankment
- Excavation of helophyte filter
- Construction temporary sludge trap Hulpe

Bios (d) in Demer dijk  
- Natuur vooruit  
- Behoud van natuur  
- Behoud van water  
- Open gebied













# Winterbeek: results

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# Winterbeek: future

---

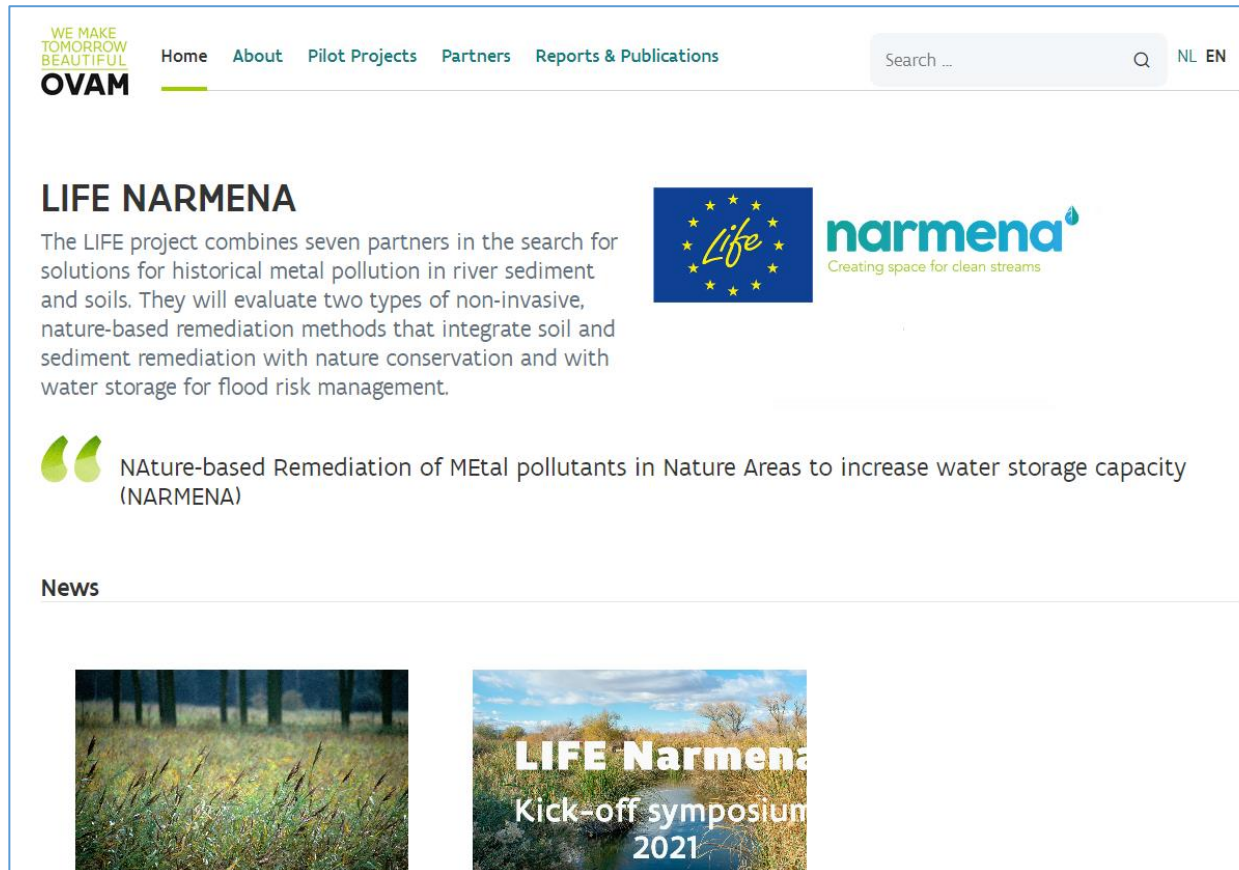
- Monitoring post-works: ongoing
  - Regrowth of reed and other plants
    - Maintenance
  - New ecosystem in nature reserves
    - Endangered & keystone species
  - Replication sites
-



# Partners



Follow the project:  
<https://ovam-english.vlaanderen.be/web/narmena>



The screenshot shows the OVAM website page for the LIFE NARMENA project. The page features the OVAM logo (with the tagline "WE MAKE TOMORROW BEAUTIFUL") and a navigation menu with links for Home, About, Pilot Projects, Partners, and Reports & Publications. A search bar and language options (NL, EN) are also present. The main content area is titled "LIFE NARMENA" and includes a paragraph describing the project's goal: "The LIFE project combines seven partners in the search for solutions for historical metal pollution in river sediment and soils. They will evaluate two types of non-invasive, nature-based remediation methods that integrate soil and sediment remediation with nature conservation and with water storage for flood risk management." To the right of this text are the logos for the LIFE program (a blue square with yellow stars and the word "Life" in script) and the NARMENA project (the word "narmena" in lowercase with a water drop icon and the tagline "Creating space for clean streams"). Below the main text is a quote icon and the text "Nature-based Remediation of MEtal pollutants in Nature Areas to increase water storage capacity (NARMENA)". A "News" section is visible at the bottom, featuring two image thumbnails. The first thumbnail shows a field of tall grasses. The second thumbnail shows a river scene with trees and the text "LIFE Narmena Kick-off symposium 2021".



**WE MAKE TOMORROW BEAUTIFUL**  
**OVAM**

Home About Pilot Projects Partners Reports & Publications

Search ... Q NL EN



## LIFE NARMENA

The LIFE project combines seven partners in the search for solutions for historical metal pollution in river sediment and soils. They will evaluate two types of non-invasive, nature-based remediation methods that integrate soil and sediment remediation with nature conservation and with water storage for flood risk management.



“ Nature-based Remediation of MEtal pollutants in Nature Areas to increase water storage capacity (NARMENA)

### News





# LIFE Narmena

2023-09-13

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**narmena**<sup>1</sup>  
Ruimte voor schone waterlopen

