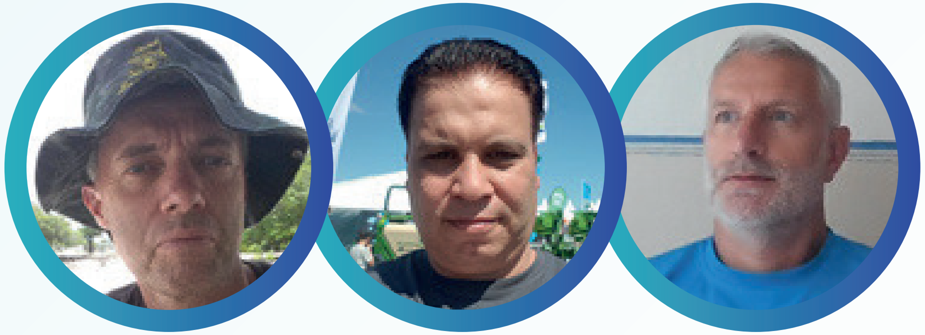
Entscheidungsunterstützungssysteme für die Planung auf lokaler Ebene



Mats Söderström, Omran Alshihabi, Faruk Djodjic
Schwedische Universität für Agrarwissenschaften

Waterdrive
Interreg Baltic Sea Region
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WITH FINANCIAL SUPPORT OF THE RUSSIAN FEDERATION

Multifunktionalität, gesunder Boden

Können wir Endbenutzern erweiterte Modellierungsdaten präsentieren und sie für einen Entscheidungsunterstützungsprozess zugänglich und nutzbar machen? in diesem Zusammenhang – Quantifizierung von Wirkungen von Maßnahmen

im Feld/im Feld?

Auswirkungen von Maßnahmen auf Nährstoffverlust Reduktion ab (angepasste) Modellierung

Herunterskalieren auf lokal Ebene mit sehr ausführlich digital geografische Daten und automatisierte Methoden

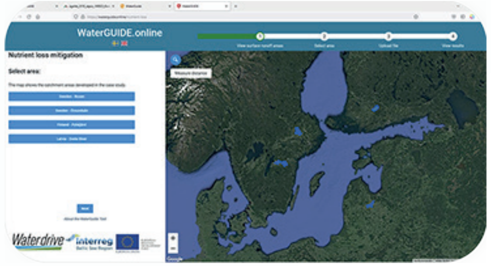
Stellen Sie die Daten zur Verfügung an den Endverbraucher – Berater, Landwirte, in einer interaktiven System

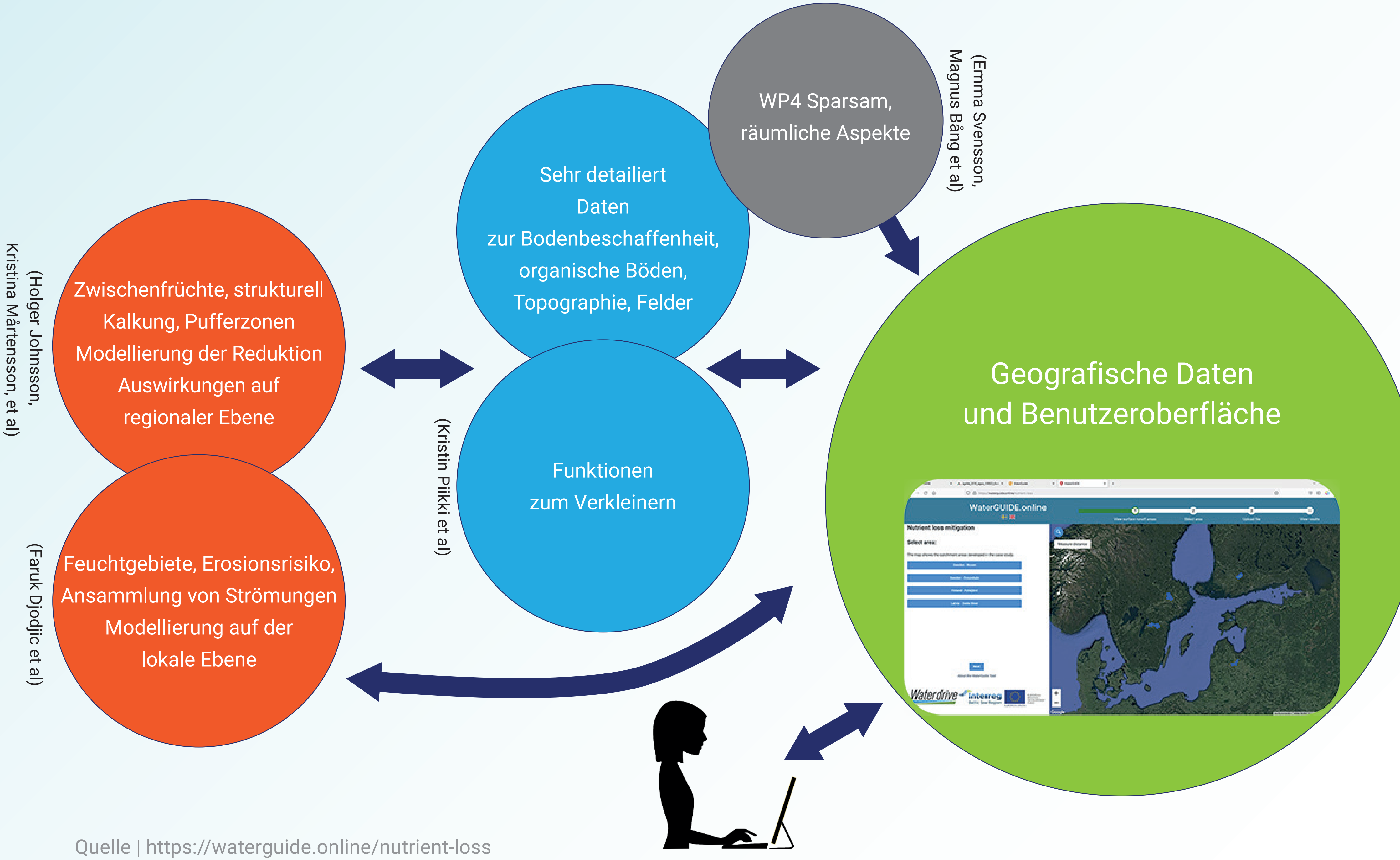
Finland x 1

Latvia x 1

Sweden x 2

WaterGUIDE.online


WaterGUIDE.online
Nutrient loss mitigation
Select area:
Waterdrive
interreg
Baltic Sea Region



Zwischenfrüchte, strukturell Kalkung, Pufferzonen Modellierung der Reduktion Auswirkungen auf regionaler Ebene

(Holger Johnsson, Kristina Mårtensson, et al)

Feuchtgebiete, Erosionsrisiko, Ansammlung von Strömungen Modellierung auf der lokale Ebene

(Faruk Djodjic et al)

Sehr detailiert Daten zur Bodenbeschaffenheit, organische Böden, Topographie, Felder

Funktionen zum Verkleinern

(Kristin Pilkki et al)

WP4 Sparsam, räumliche Aspekte

(Emma Svensson, Magnus Bång et al)

Geografische Daten und Benutzeroberfläche

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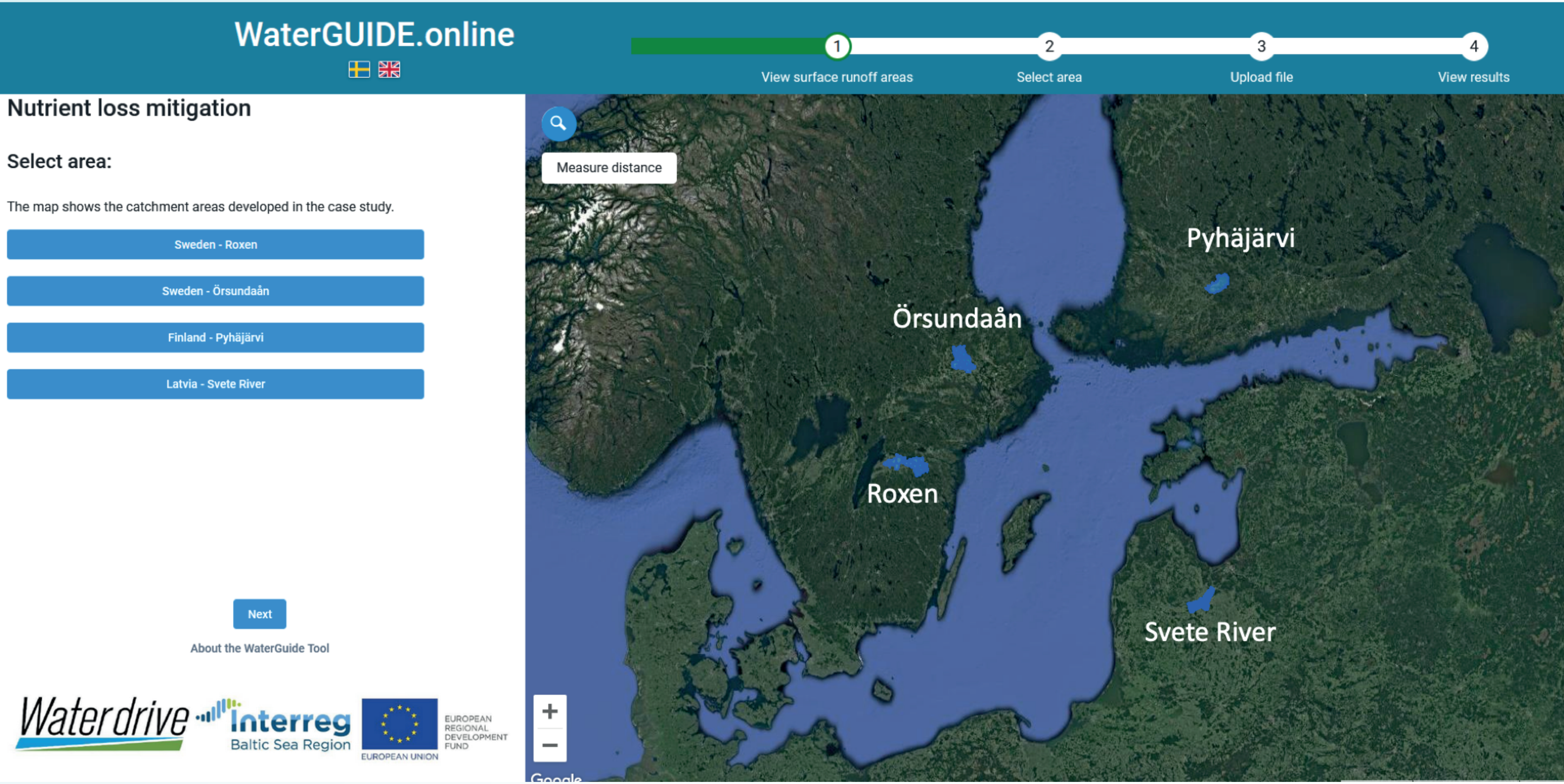
Nutrient loss mitigation
Select area:
Waterdrive
interreg
Baltic Sea Region

Quelle | https://waterguide.online/nutrient-loss

https://waterguide.online/nutrient-loss


WaterGUIDE.online
1
View surface runoff areas
2
Select area
3
Upload file
4
View results
Measure distance
Pyhäjärvi
Örsundaån
Roxen
Svete River
+
−
Google
Sweden - Roxen
Sweden - Örsundaån
Finland - Pyhäjärvi
Latvia - Svete River
Next
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Waterdrive
Interreg
Baltic Sea Region
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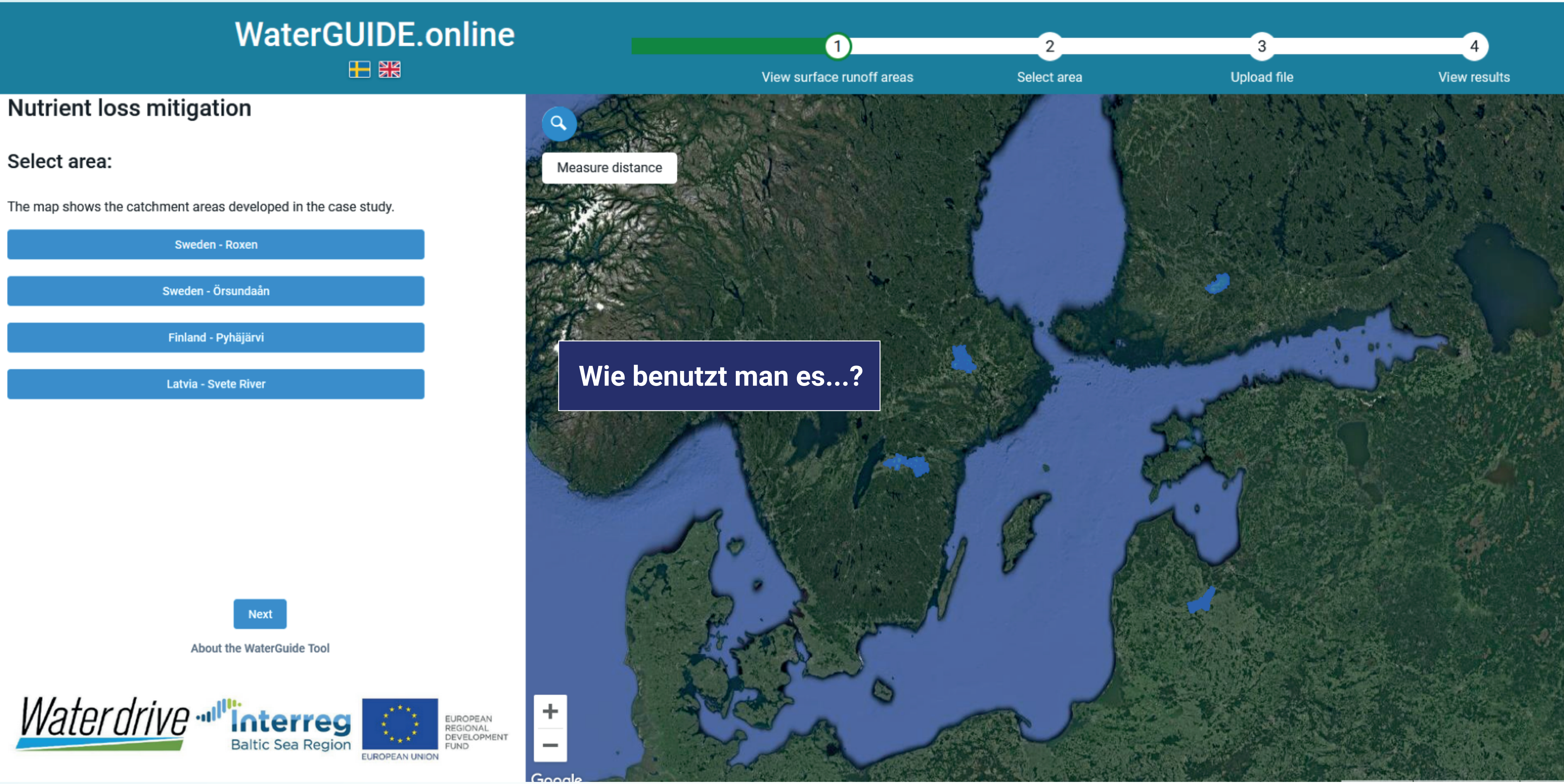
Nutrient loss mitigation

Select area:

The map shows the catchment areas developed in the case study.

https://waterguide.online/nutrient-loss


WaterGUIDE.online
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Sweden - Örsundaån
Finland - Pyhäjärvi
Latvia - Svete River
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Google

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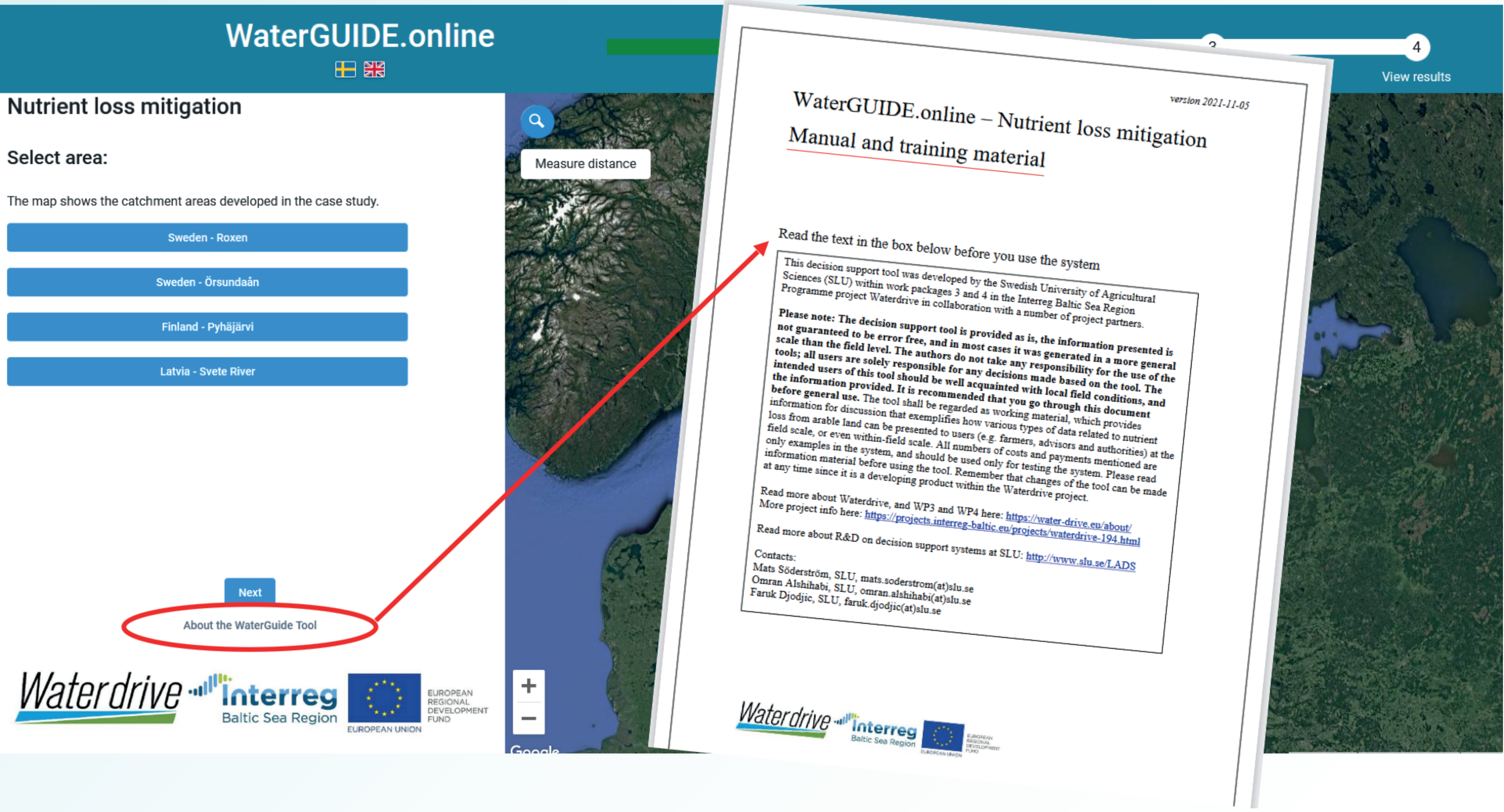
Wie benutzt man es...?

https://waterguide.online/nutrient-loss



Nutrient loss mitigation

Select area:

The map shows the catchment areas developed in the case study.

version 2021-11-05

WaterGUIDE.online – Nutrient loss mitigation
Manual and training material

Read the text in the box below before you use the system

This decision support tool was developed by the Swedish University of Agricultural Sciences (SLU) within work packages 3 and 4 in the Interreg Baltic Sea Region Programme project Waterdrive in collaboration with a number of project partners.

Please note: The decision support tool is provided as is, the information presented is not guaranteed to be error free, and in most cases it was generated in a more general scale than the field level. The authors do not take any responsibility for the use of the tools; all users are solely responsible for any decisions made based on the tool. The intended users of this tool should be well acquainted with local field conditions, and the information provided. It is recommended that you go through this document before general use. The tool shall be regarded as working material, which provides information for discussion that exemplifies how various types of data related to nutrient loss from arable land can be presented to users (e.g. farmers, advisors and authorities) at the field scale, or even within-field scale. All numbers of costs and payments mentioned are only examples in the system, and should be used only for testing the system. Please read information material before using the tool. Remember that changes of the tool can be made at any time since it is a developing product within the Waterdrive project.

Read more about Waterdrive, and WP3 and WP4 here: https://water-drive.eu/about/
More project info here: https://projects.interreg-baltic.eu/projects/waterdrive-194.html

Read more about R&D on decision support systems at SLU: http://www.slu.se/LADS

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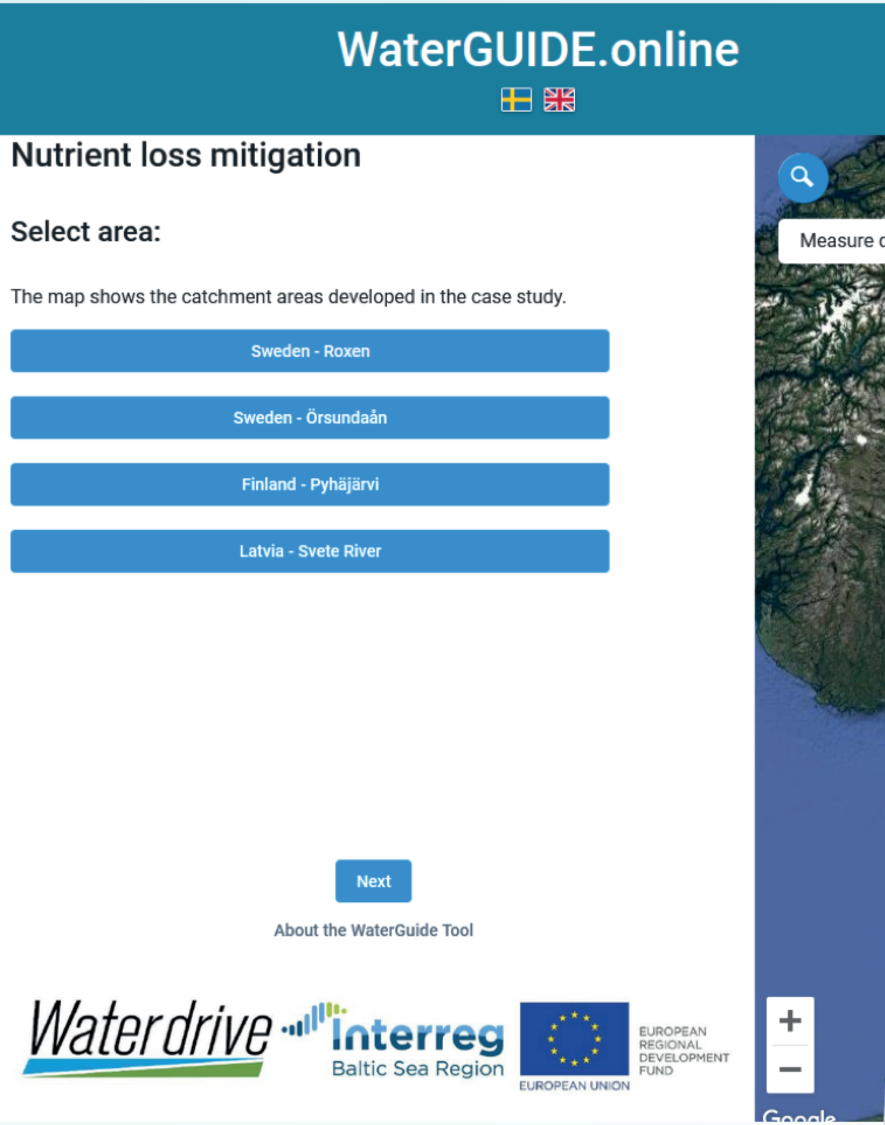
Faruk Djodjic, SLU, faruk.djodjic(at)slu.se

https://waterguide.online/nutrient-loss


WaterGUIDE.online
Measure distanc
Sweden - Roxen
Sweden - Örsundaån
Finland - Pyhäjärvi
Latvia - Svete River
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View results
Google

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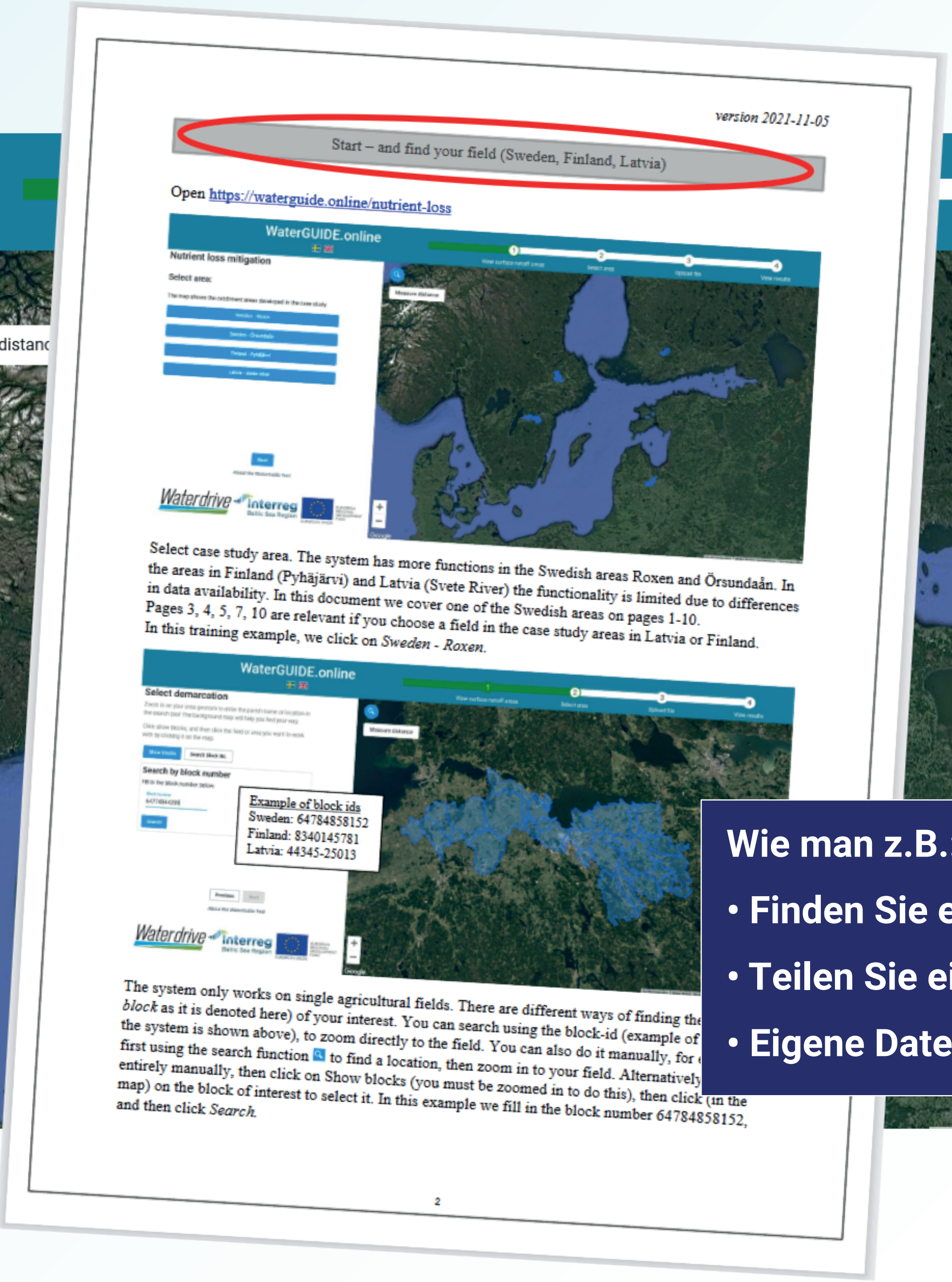

version 2021-11-05

Start – and find your field (Sweden, Finland, Latvia)

Open https://waterguide.online/nutrient-loss

Select case study area. The system has more functions in the Swedish areas Roxen and Örsundaån. In
the areas in Finland (Pyhäjärvi) and Latvia (Svete River) the functionality is limited due to differences
in data availability. In this document we cover one of the Swedish areas on pages 1-10.
Pages 3, 4, 5, 7, 10 are relevant if you choose a field in the case study areas in Latvia or Finland.
In this training example, we click on *Sweden - Roxen.*

Example of block ids
Sweden: 64784858152
Finland: 8340145781
Latvia: 44345-25013

The system only works on single agricultural fields. There are different ways of finding the
block as it is denoted here) of your interest. You can search using the block-id (example of
the system is shown above), to zoom directly to the field. You can also do it manually, for
first using the search function 🔍 to find a location, then zoom in to your field. Alternatively
entirely manually, then click on Show blocks (you must be zoomed in to do this), then click (in the
map) on the block of interest to select it. In this example we fill in the block number 64784858152,
and then click *Search.*

2

WaterGUIDE.online
Nutrient loss mitigation
Select area:
Select demarcation
Search by block number
Measure distance
Waterdrive
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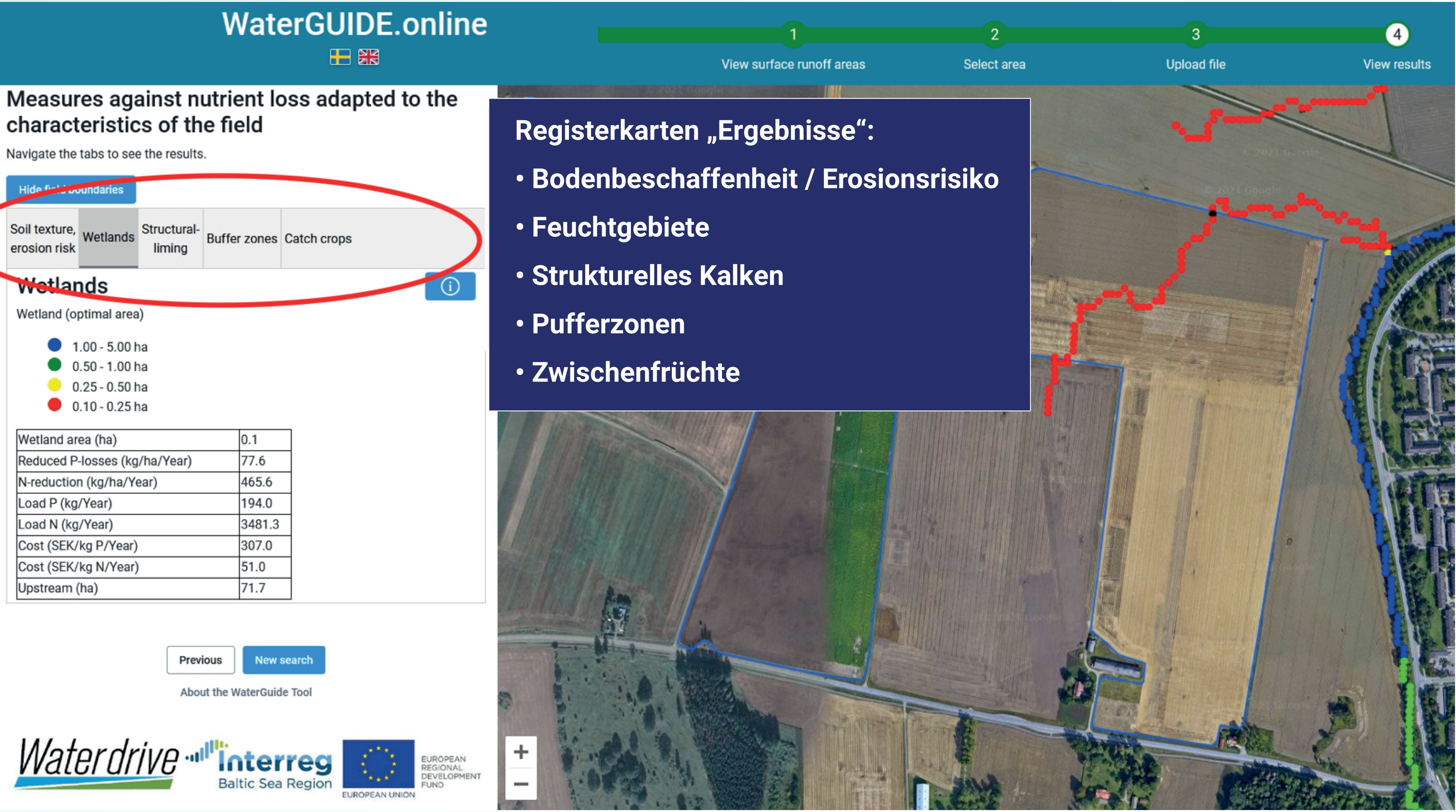
Baltic Sea Region

Wie man z.B.:

- **Finden Sie ein Feld**
- **Teilen Sie ein Feld**
- **Eigene Daten hochladen**



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1 View surface runoff areas

2 Select area

3 Upload file

4 View results

Measures against nutrient loss adapted to the characteristics of the field

Navigate the tabs to see the results.

Hide field boundaries
Soil texture, erosion risk
Wetlands
Structural-liming
Buffer zones
Catch crops

Wetlands

Wetland (optimal area)

- 🟦 1.00 - 5.00 ha
- 🟩 0.50 - 1.00 ha
- 🟨 0.25 - 0.50 ha
- 🟥 0.10 - 0.25 ha

Wetland area (ha)	0.1
Reduced P-losses (kg/ha/Year)	77.6
N-reduction (kg/ha/Year)	465.6
Load P (kg/Year)	194.0
Load N (kg/Year)	3481.3
Cost (SEK/kg P/Year)	307.0
Cost (SEK/kg N/Year)	51.0
Upstream (ha)	71.7

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New search
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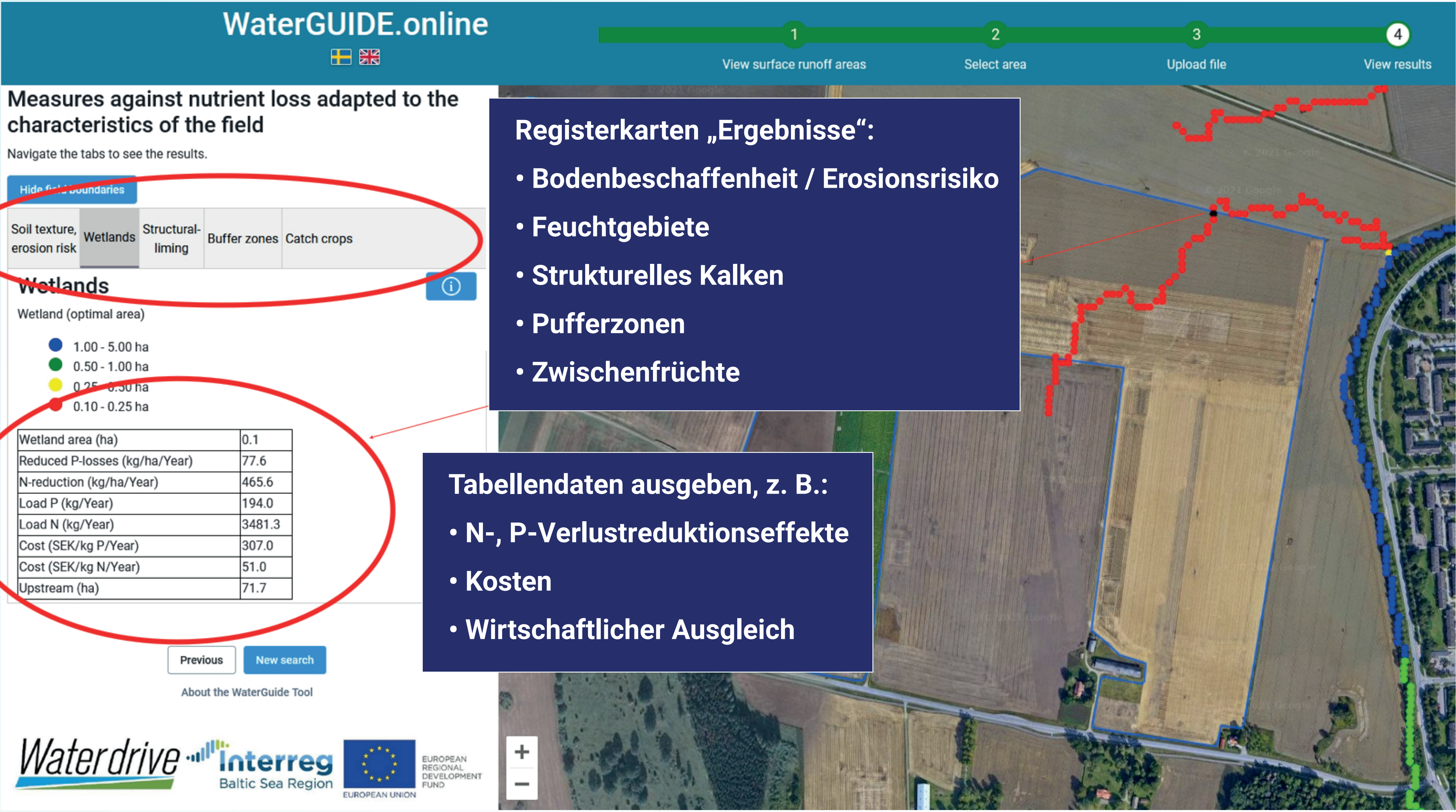
Registerkarten „Ergebnisse“:

- **Bodenbeschaffenheit / Erosionsrisiko**
- **Feuchtgebiete**
- **Strukturelles Kalken**
- **Pufferzonen**
- **Zwischenfrüchte**


WaterGUIDE.online
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Measures against nutrient loss adapted to the characteristics of the field

Navigate the tabs to see the results.

Wetlands

Wetland (optimal area)

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🟡	0.25 - 0.50 ha
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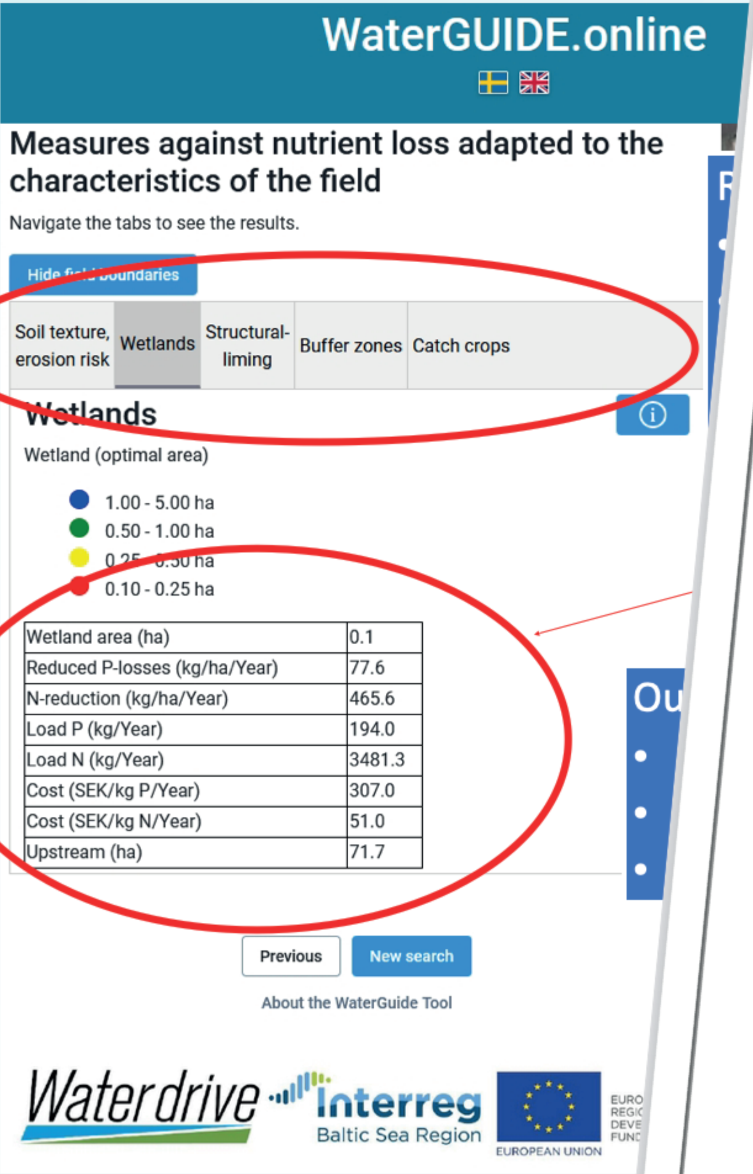
Registerkarten „Ergebnisse“:

- Bodenbeschaffenheit / Erosionsrisiko
- Feuchtgebiete
- Strukturelles Kalken
- Pufferzonen
- Zwischenfrüchte

Tabellendaten ausgeben, z. B.:

- N-, P-Verlustreduktionseffekte
- Kosten
- Wirtschaftlicher Ausgleich



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Measures against nutrient loss adapted to the characteristics of the field

Navigate the tabs to see the results.

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Soil texture, erosion risk
Wetlands
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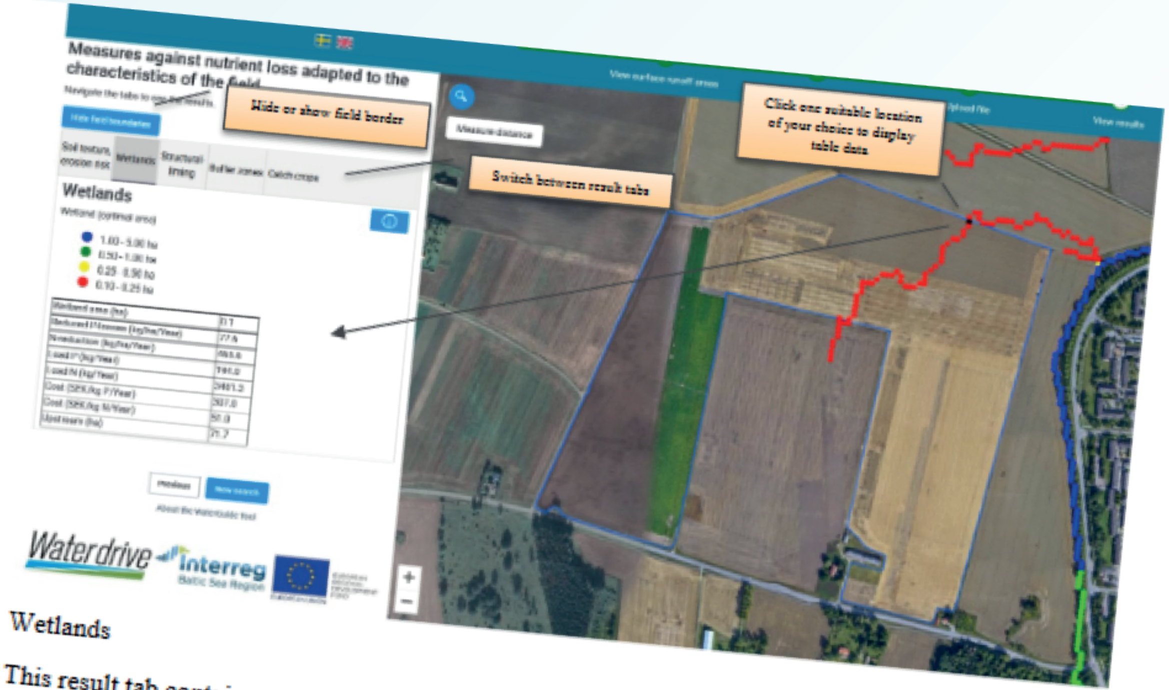


Hide or show field border
Click one suitable location of your choice to display table data
Switch between result tabs
Measure distance
View surface runoff areas
Upload file
View results

Wetlands

This result tab contain modelled values for potential locatio
selected field are shown to provide overvi
is shown. This depends on the modelled fi
are interested in to display detailed inform
optimal size is shown):

Verwenden Sie die Dokumentation für erläuternder Text und Verweise

- Wetland area (ha): Calculated optimal wetland size, based on a hydrological load where 100 m (100 m³ water/m² wetland and year) is assumed to optimal. For run-off modelled values per sub-catchment are used. Only wetlands within a calculated optimal size range of 0.1-5.0 ha are displayed.
- P-reduction (kg/ha/year): Potential reduction in kg P/year in kg/ha wetland. Calculated according to Weisner et al. (2016).
- N-reduktion (kg/ha/year): As above but for nitrogen (N).
- Load P (kg/year): Load in kg P/year for the potential wetlands. Calculatiosn are based on the average runoff and HELCOM Pollution Load Compilation 7 (PLC-7) type concentrations in the subcatchment (Hansson et al., 2019).
- Load N (kg/year): As above but for N.
- Cost (SEK/kg P/year): Potential cost in SEK/kg P/year for the wetland locations. Calculations are based on the following assumptions: a construction cost of 350,000 SEK/ha wetland and 20 years (17,500 SEK/year); maintenance cost 4,000 SEK/ year; tenant costs depending on region (2,334 SEK/year where Roxen is location and 1,486 SEK/year where Örsundaån is located; from Statistics Sweden (SCB) in 2018).
- Cost (SEK/kg N/year): As above but for N.
- Upstream (ha): Calculated upstream drainage area in ha to a wetland location.

Please note: In reality, other locations for wetland may be more suitable due to local conditions not included in the modelling. The map shows the results from the modelling based on the data used and assumptions made.

More information in Djodjic et al. (2020)

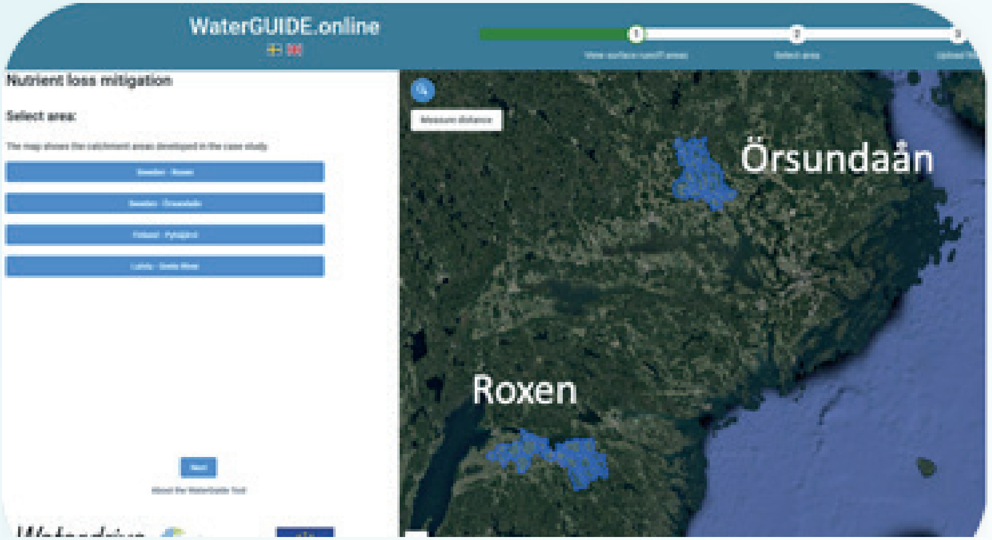
Zurück zur regionalen Ebene...

Regionale Daten

Herunterskalieren

Lokale Daten

Lokale Daten für regionale Überblick in einem Dashboard



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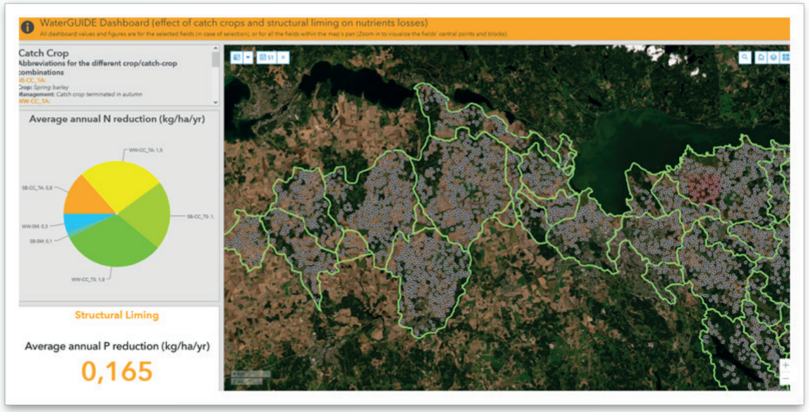
Nutrient loss mitigation

Select area:

The map shows the catchment areas developed in the case study

https://waterguide.online/nutrient-loss



WaterGUIDE Dashboard (effect of catch crops and structural liming on nutrients losses)

All dashboard values and figures are for the selected fields (in case of selection), or for all the fields within the map's pan (Zoom in to visualize the fields' central points and blocks)

Catch Crop

Abbreviations for the different crop/catch-crop combinations

SB-CC_TA:

Crop: Spring barley

Management: Catch crop terminated in autumn

WW-CC_TA:

Average annual N reduction (kg/ha/yr)

Structural Liming

Average annual P reduction (kg/ha/yr)

0,165

https://bit.ly/waterguide_dashboard

Roxen-Bereich:

3379 Felder >2 ha Ackerland

Örsundaån-Gebiet:

2418 Felder >2 ha Ackerland

Beispiel: Wirkung von

- **Zwischenfrüchte bei reduziertem N-Verlust**
- **Strukturelles Kalken bei reduziertem P-Verlust**

Abschließende Bemerkungen

- Sehen Sie dies als Prototyp – nicht vollständig, erster Versuch
- Herausforderung zum Herunterskalieren – sowohl für Forscher als auch für Benutzer
- Enormer Datenbedarf – lokale Daten sollten zur Modellierung passen, viele Daten fehlen
- Leicht zu missinterpretieren – Tests und Training erforderlich
- Geeignet für Gruppendiskussionen – ein Teil der Entscheidungsunterstützung, nicht der einzige
- Neue Möglichkeiten – Wenn Sie anfangen, werden neue Möglichkeiten/Bedürfnisse offensichtlich

https://waterguide.online/nutrient-loss | https://bit.ly/waterguide_dashboard

Entscheidungsunterstützungssysteme für die Planung auf lokaler Ebene

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