Agrochemicals transport in the field scale:
the case study of a subsurface drainage system in the Kishon Catchment, Israel

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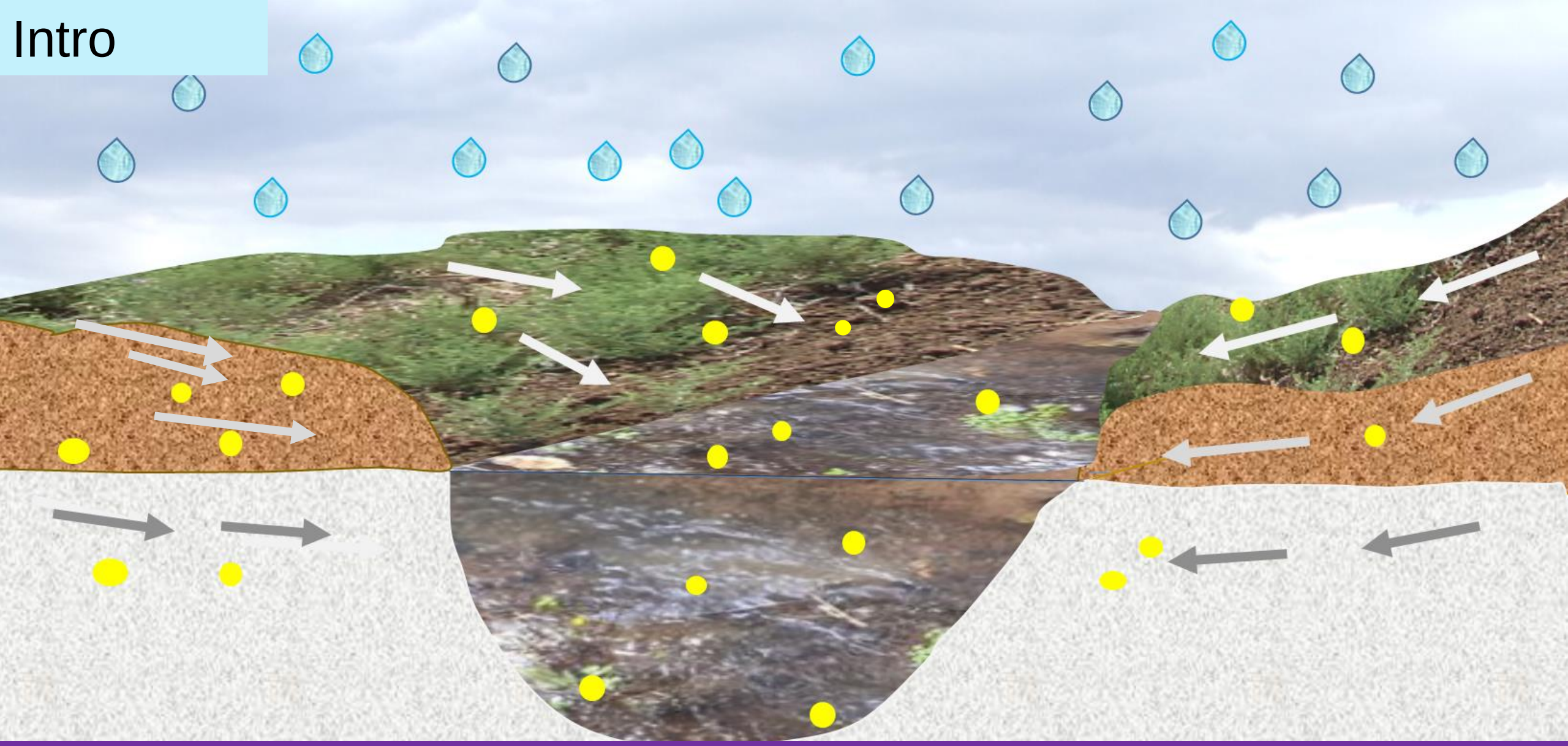
2- Department of Geography and Environmental Studies, University of Haifa

3- Department of Geography and Environmental Development, Ben-Gurion University

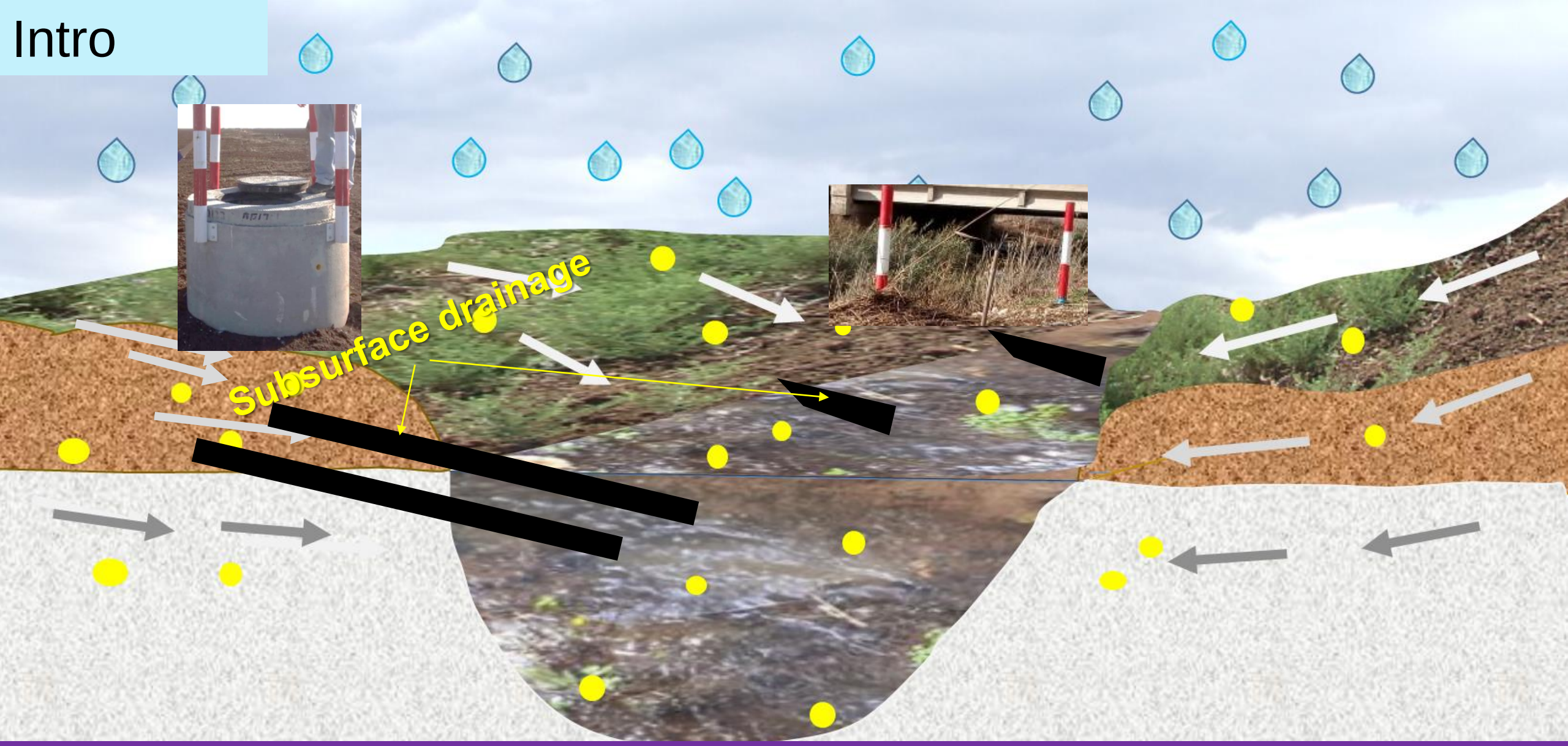
EGU2022 25/5/2022

Intro



Research question: **How do agro-pollutants propagate during storm in fields with subsurface drainage system ?**

Intro



Research question: **How do agro-pollutants propagate during storm in fields with subsurface drainage system ?**

Intro

Subsurface drainage system
(2-3 m depth)

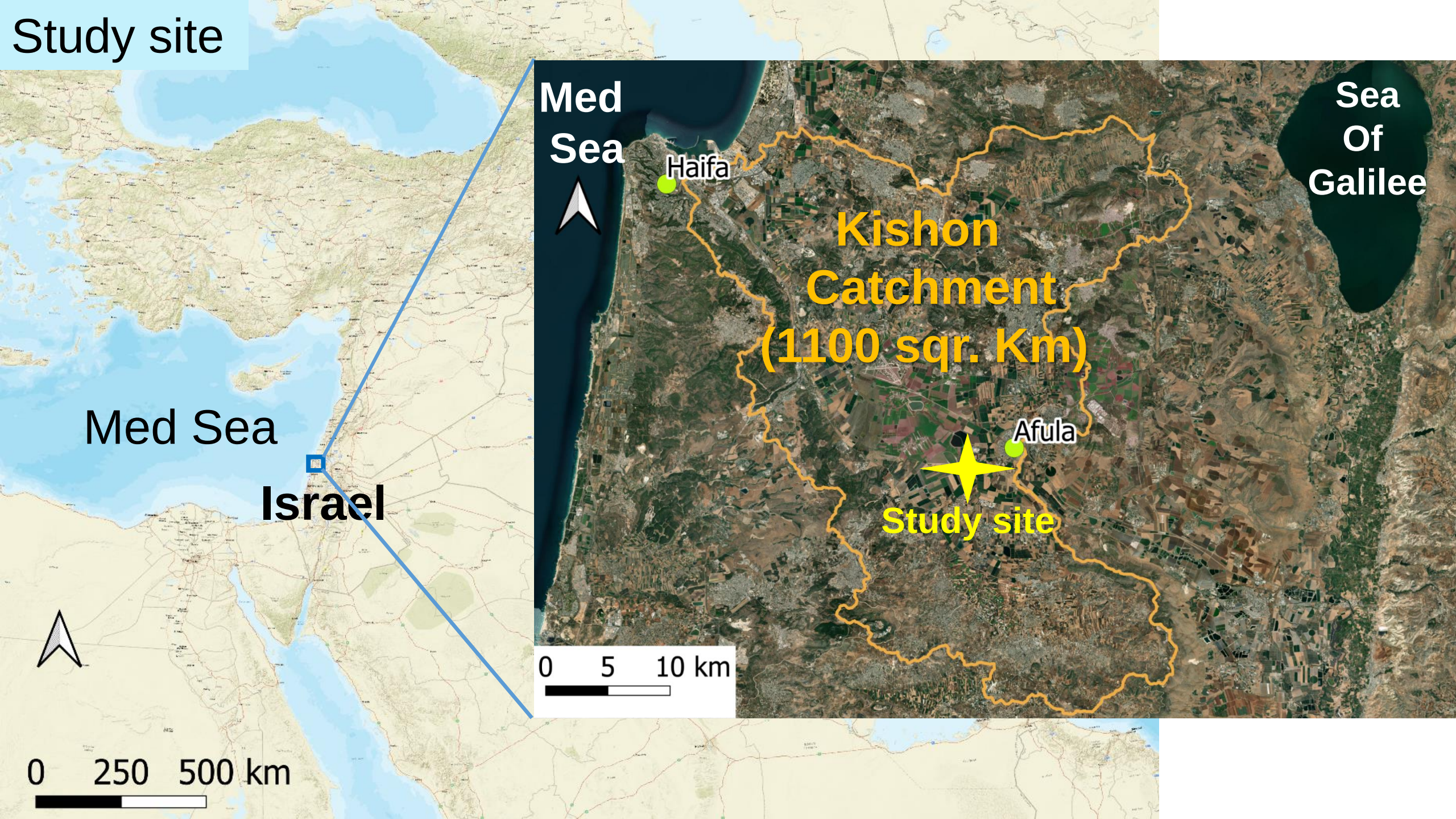
High groundwater table

Photos credit:

מטר
הנדסה חקלאית
יורם טורציון

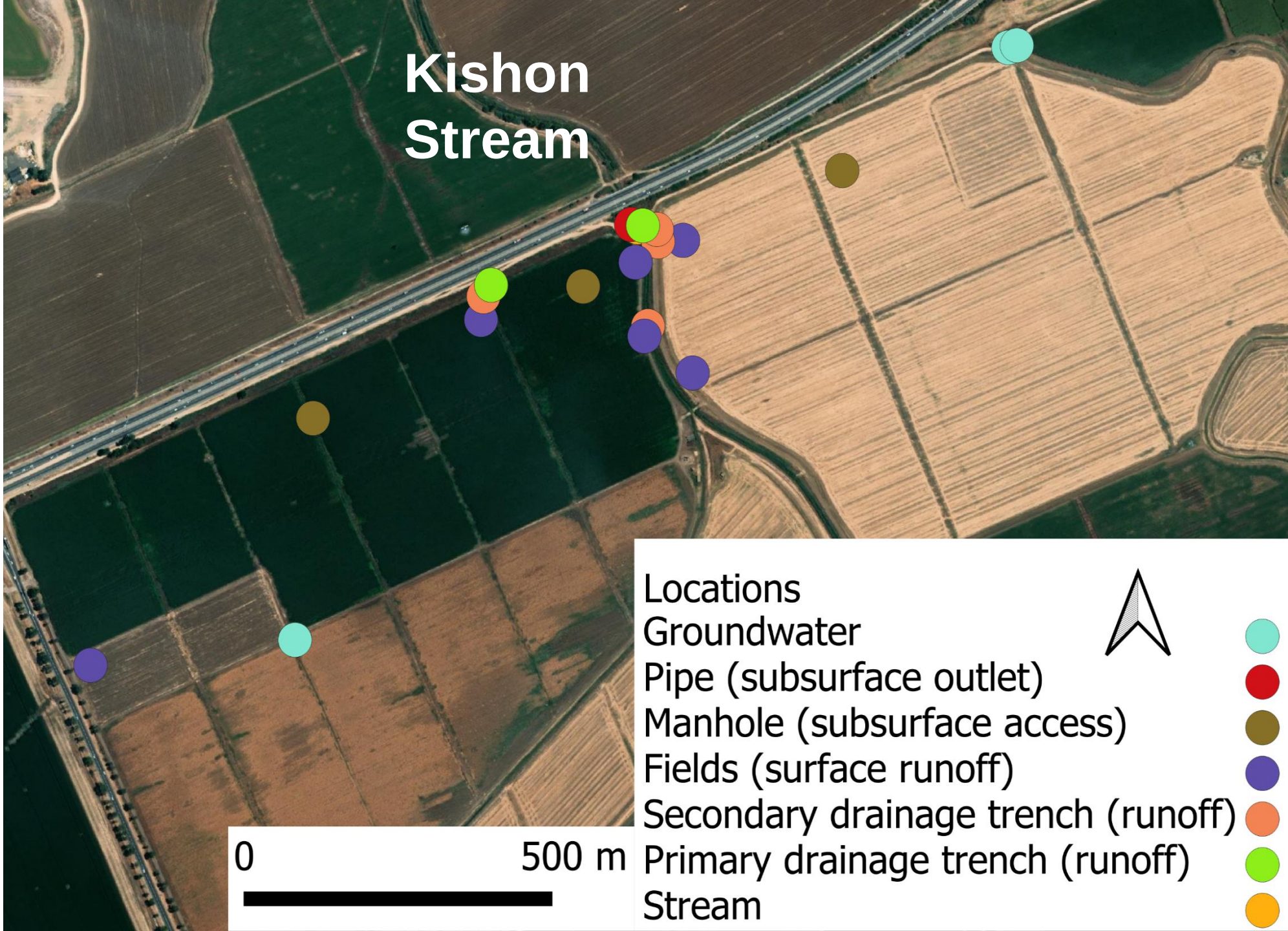
Intro


Sharing is encouraged
Subsurface discharge pipe
Kishon Stream
Water from subsurface system discharge directly to the stream


Study site
Med Sea
Israel
0 250 500 km
Med Sea
Haifa
Sea Of Galilee
Kishon Catchment (1100 sqr. Km)
Afula
Study site
0 5 10 km

Methods

Flowpaths sampling locations:



Methods

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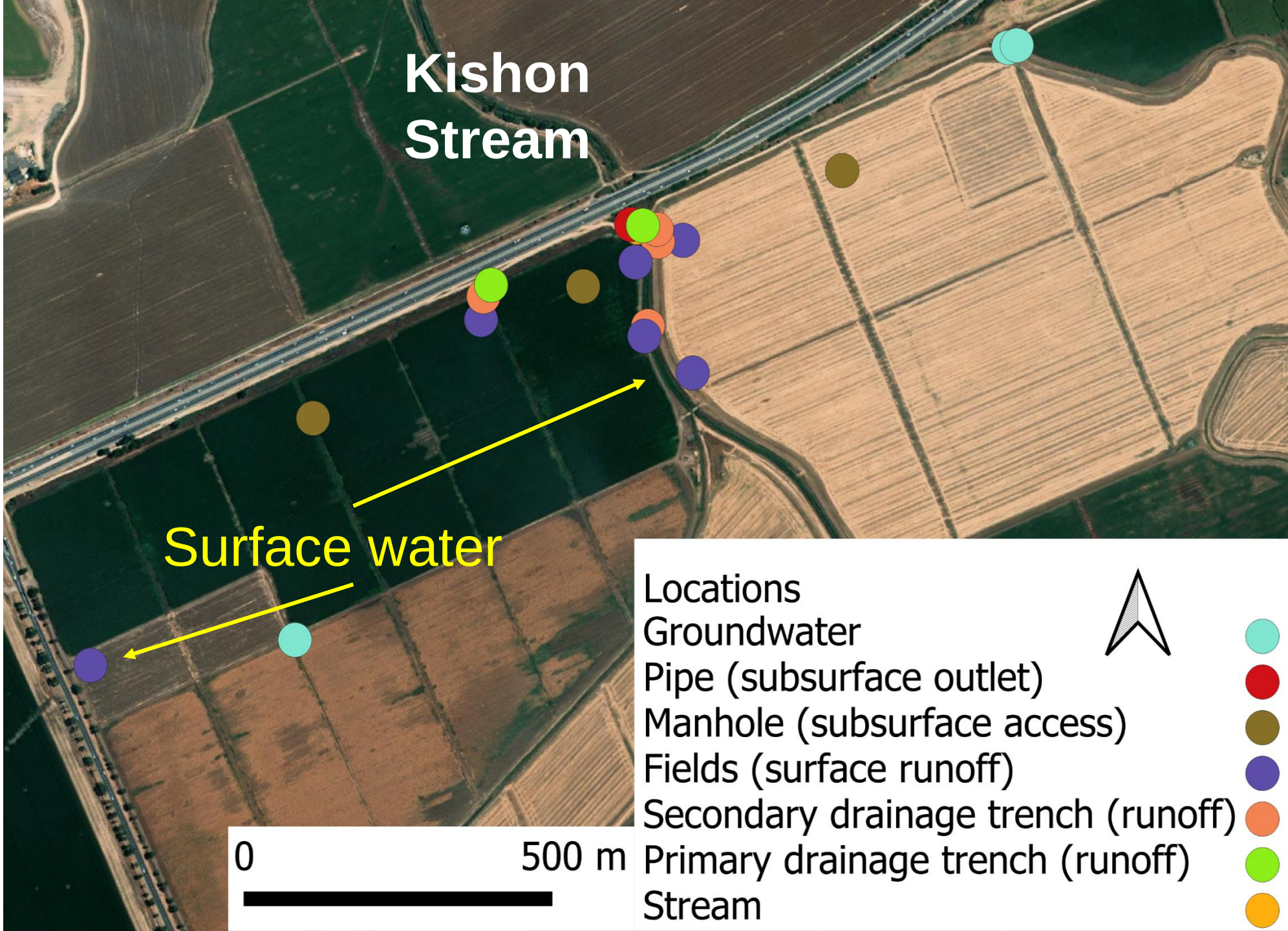
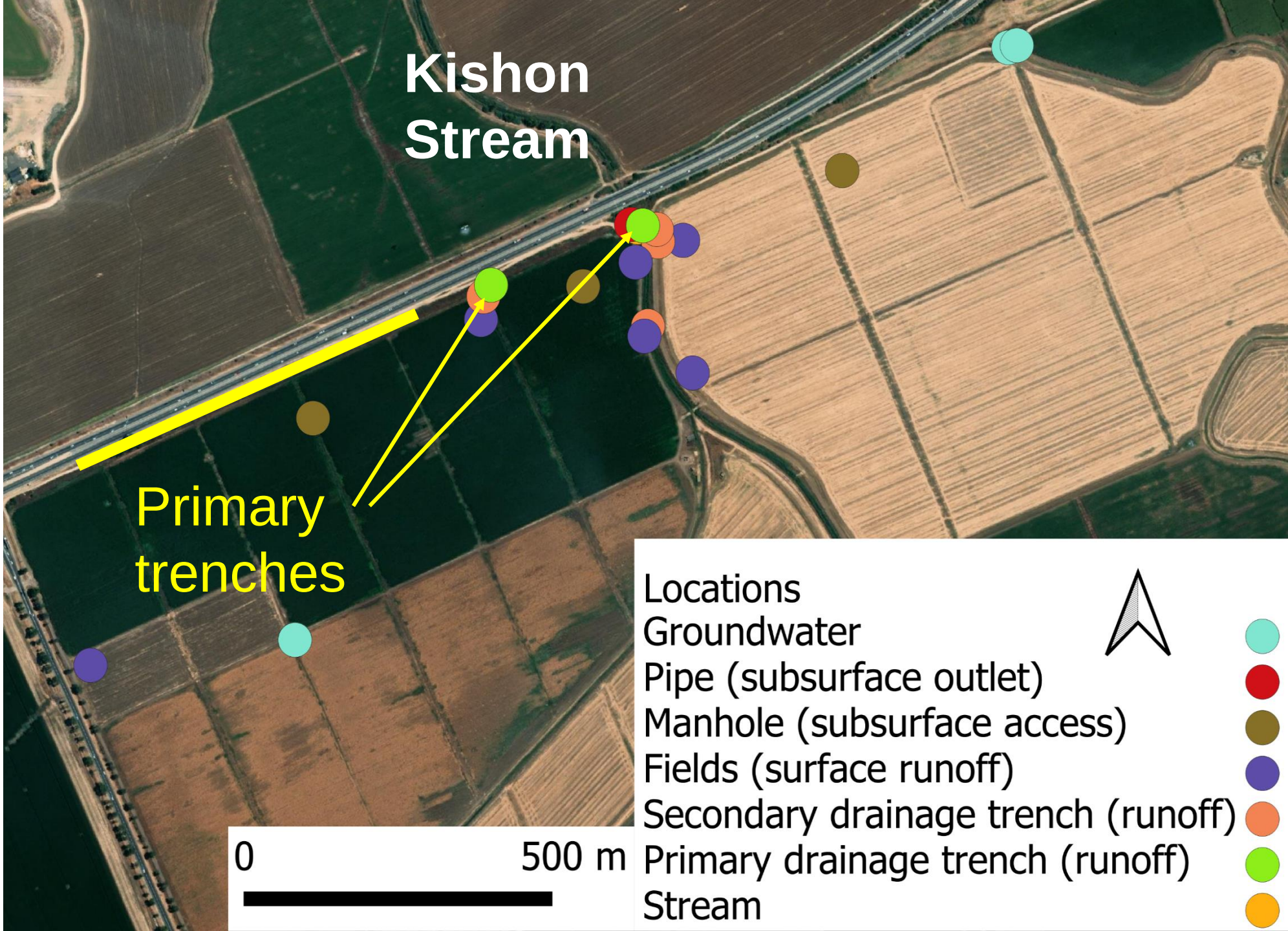


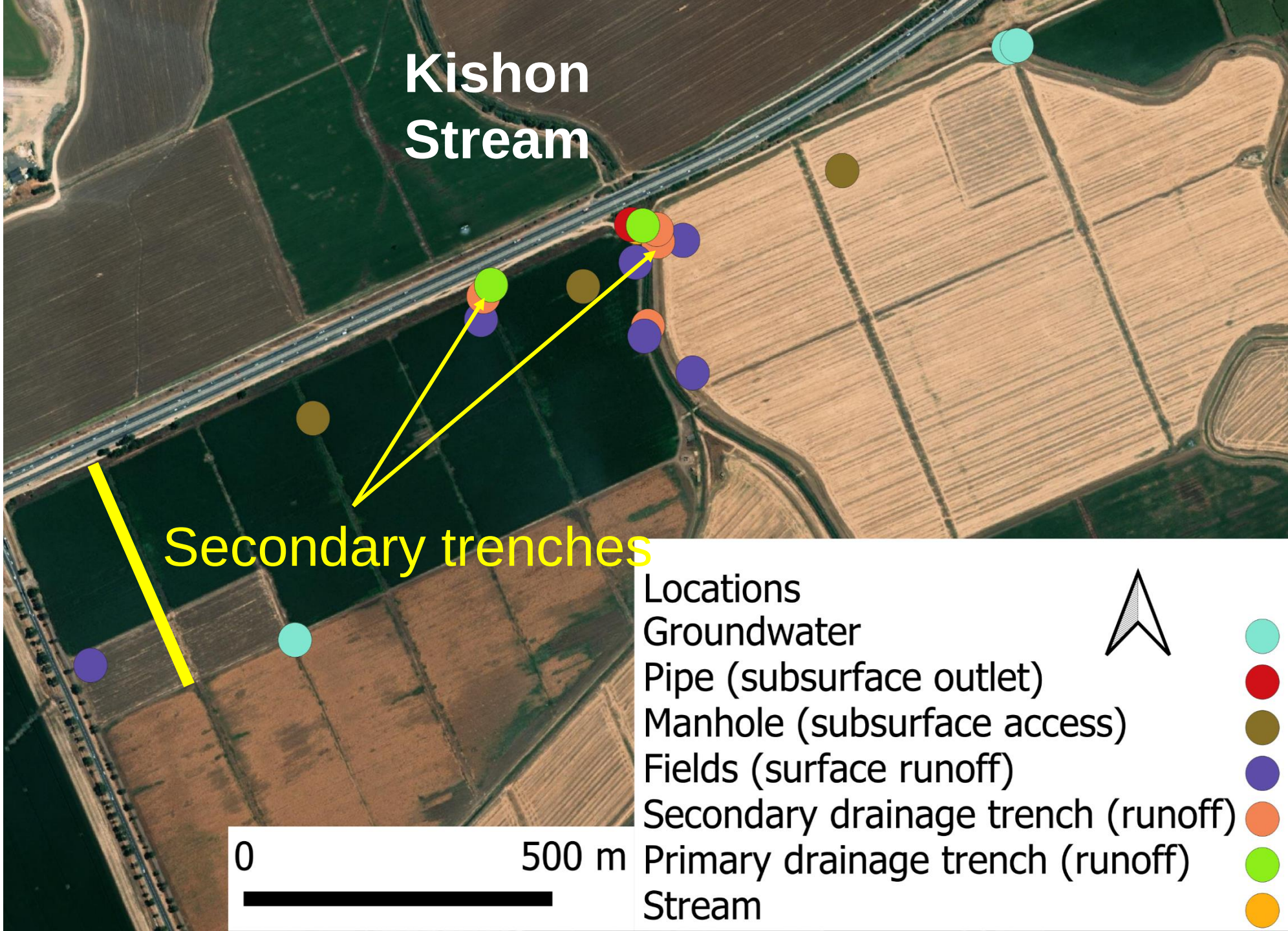
Methods

Flowpaths sampling locations:



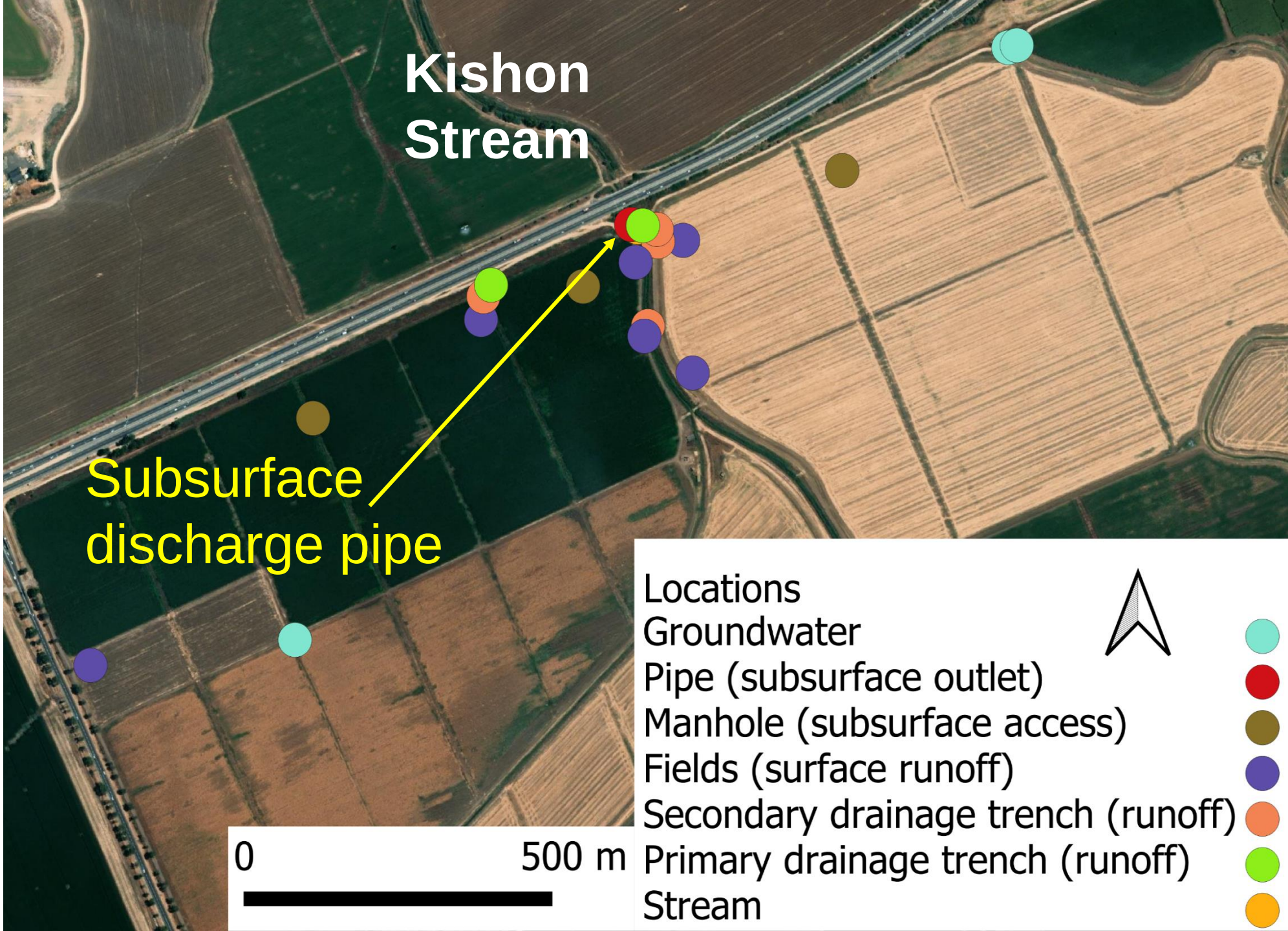
Methods

Flowpaths sampling locations:



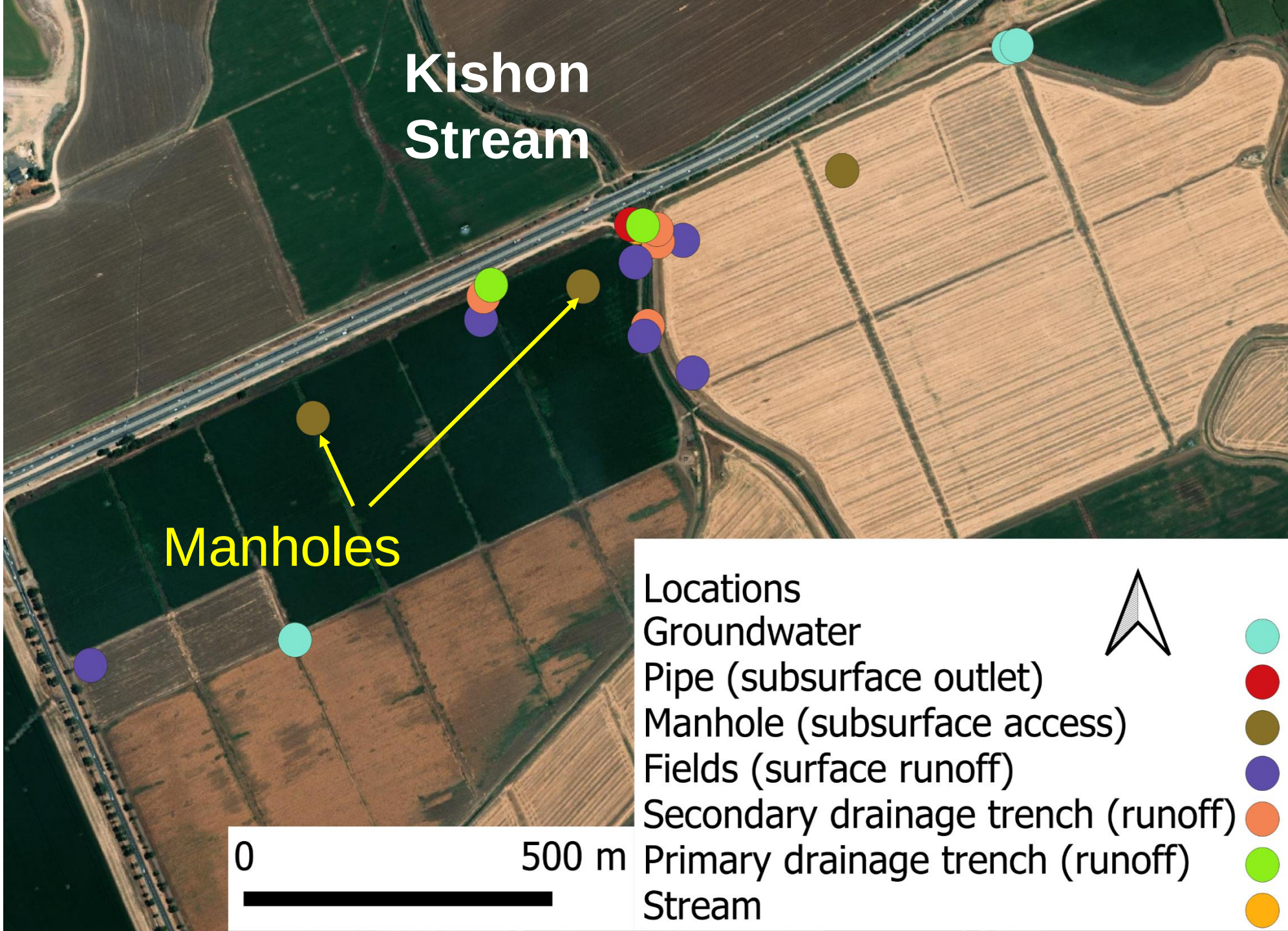
Methods

Flowpaths sampling locations:



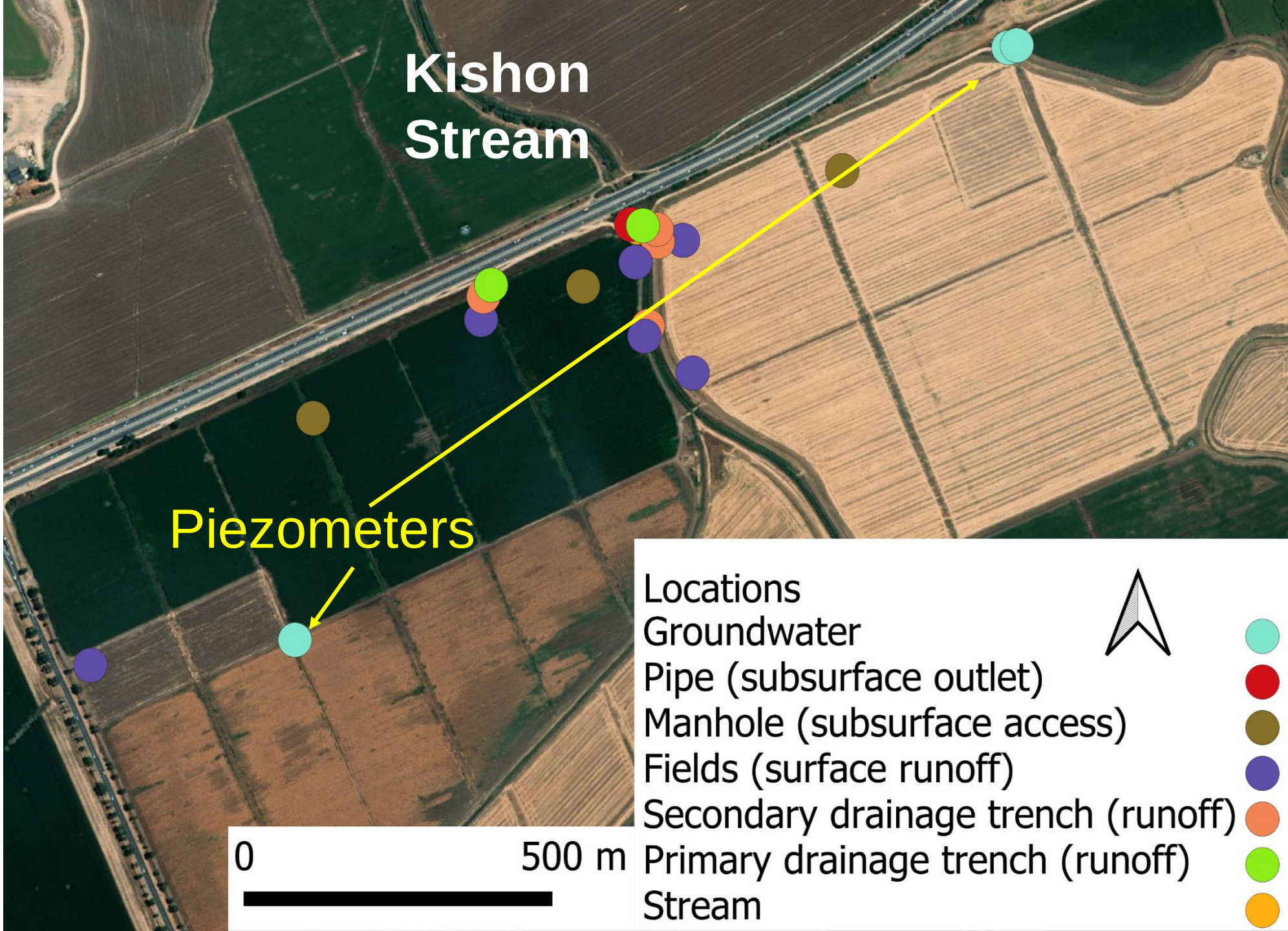
Methods

Flowpaths sampling locations:



Methods

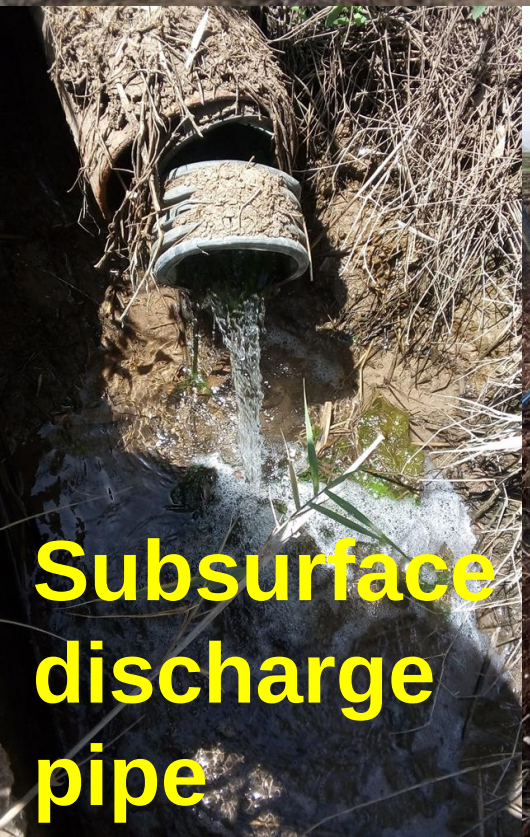
Flowpaths sampling locations:



Methods


Manhol
e


Main and secondary
drainage trenches

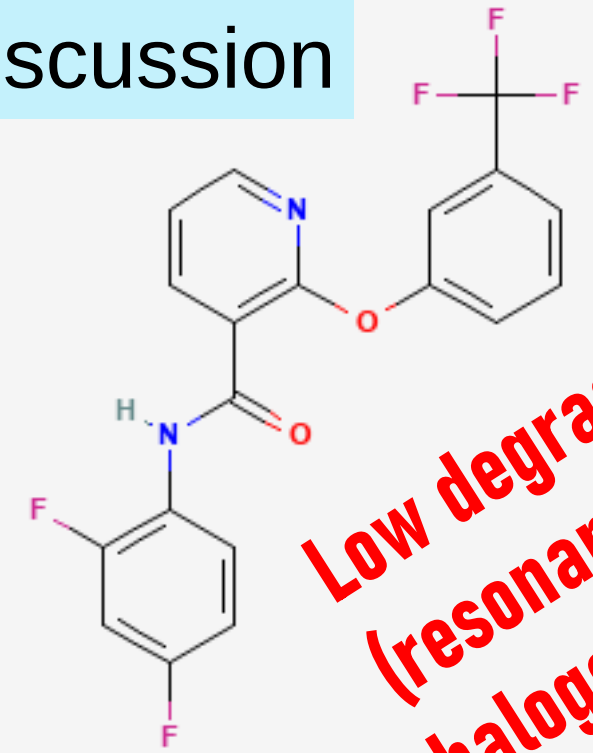

Subsurface
discharge
pipe


Piezometer

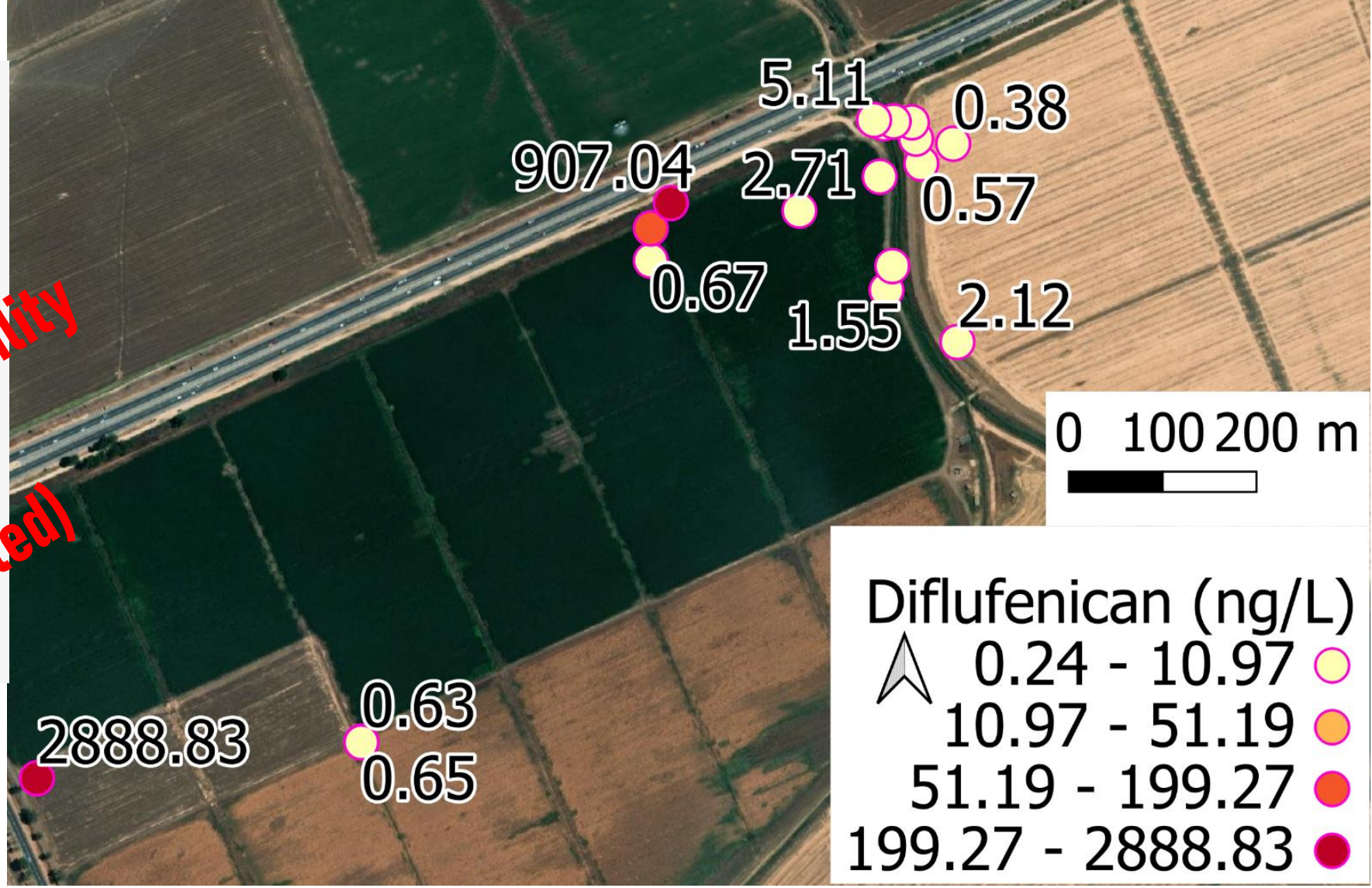

RCU


RCU

Results & discussion



Low degradability (resonance, halogenated)



Diflufenican

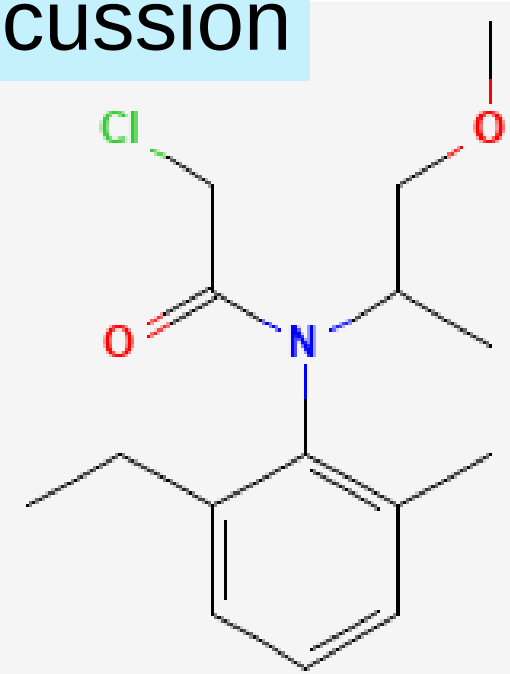
MW: 394.3

Koc: 5504

Immobile

Diflufenican was applied before 23/10/2019

Results & discussion

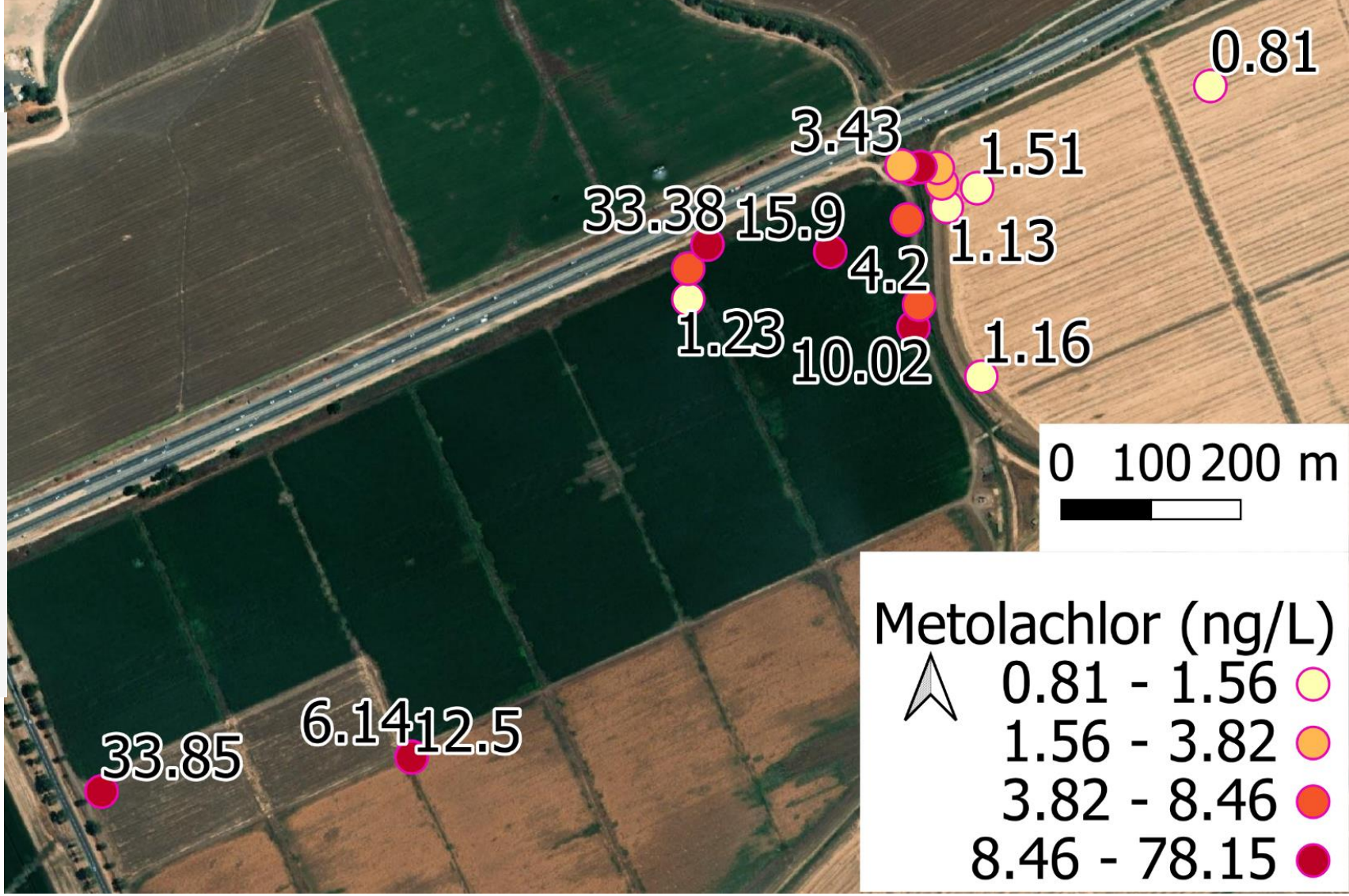


Metolachlor

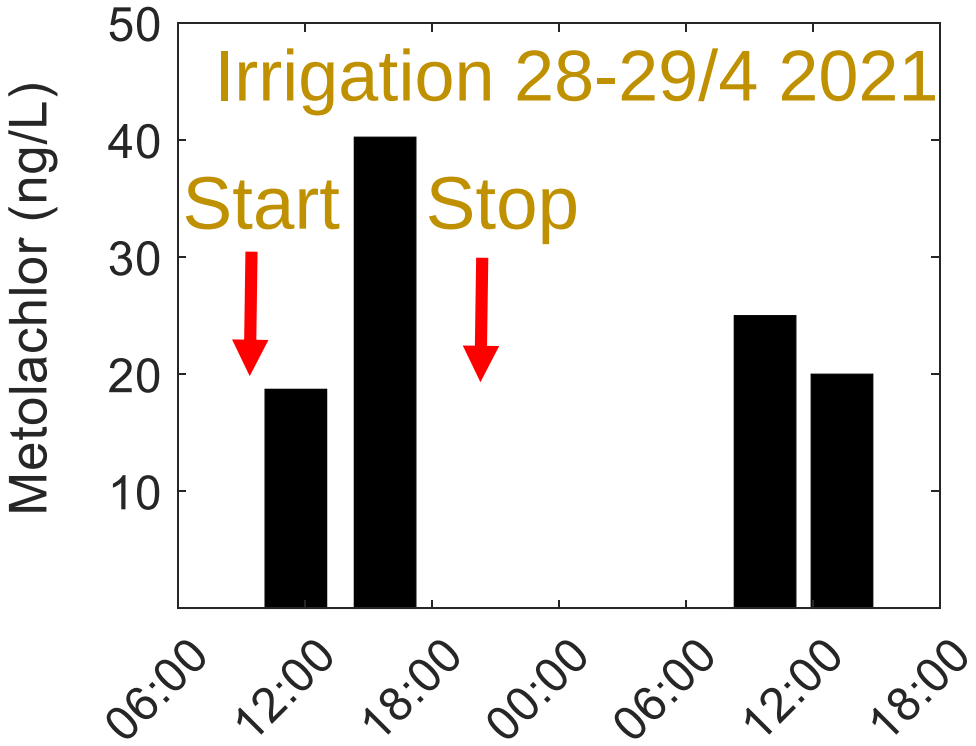
MW: 283.79

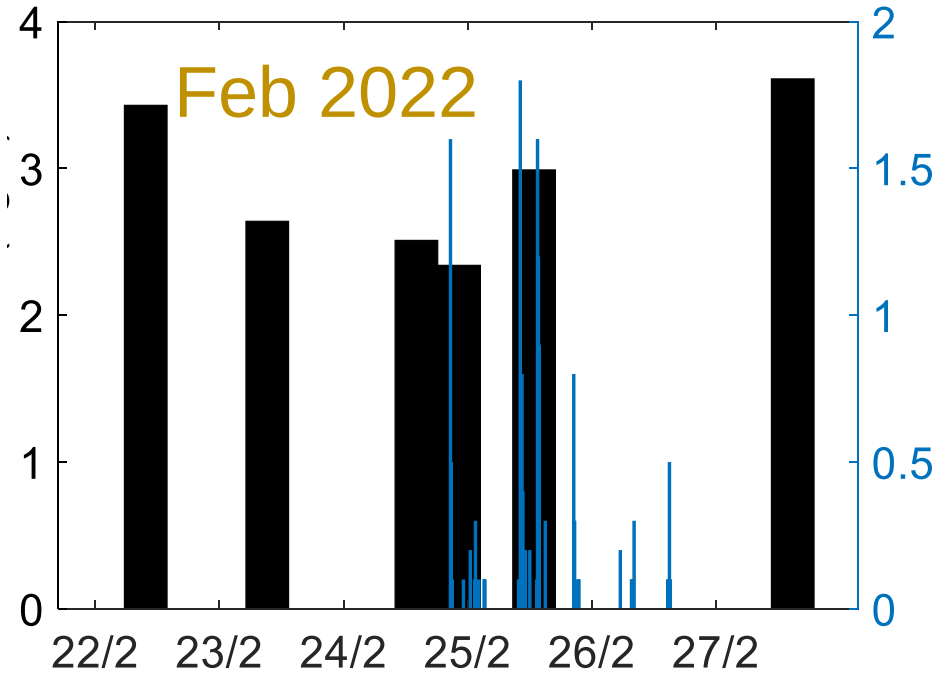
Koc:22-2020

Mobile



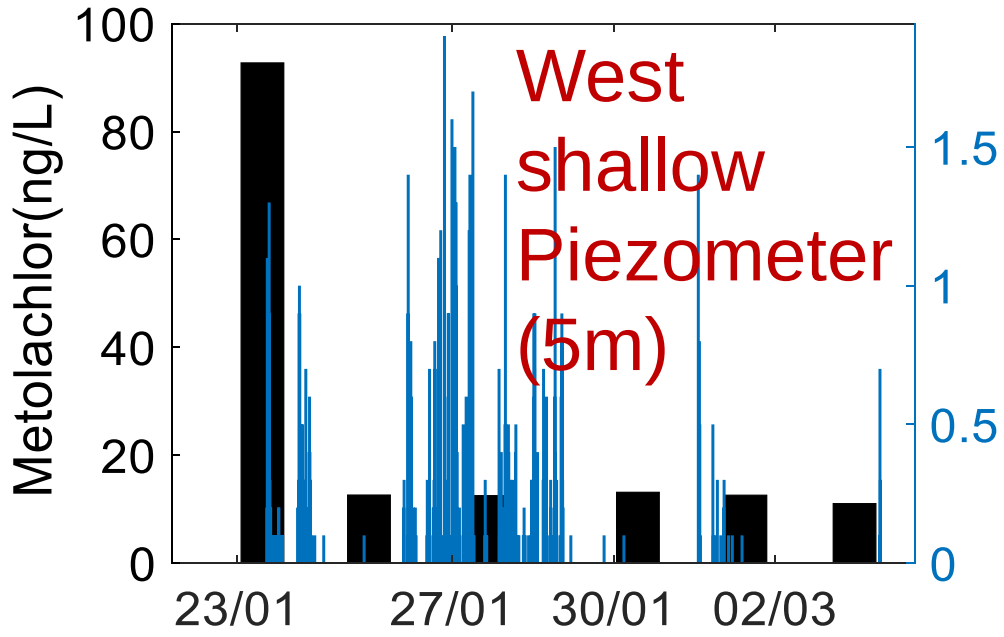
Metolachlor was applied at the West field on 11/3/2020

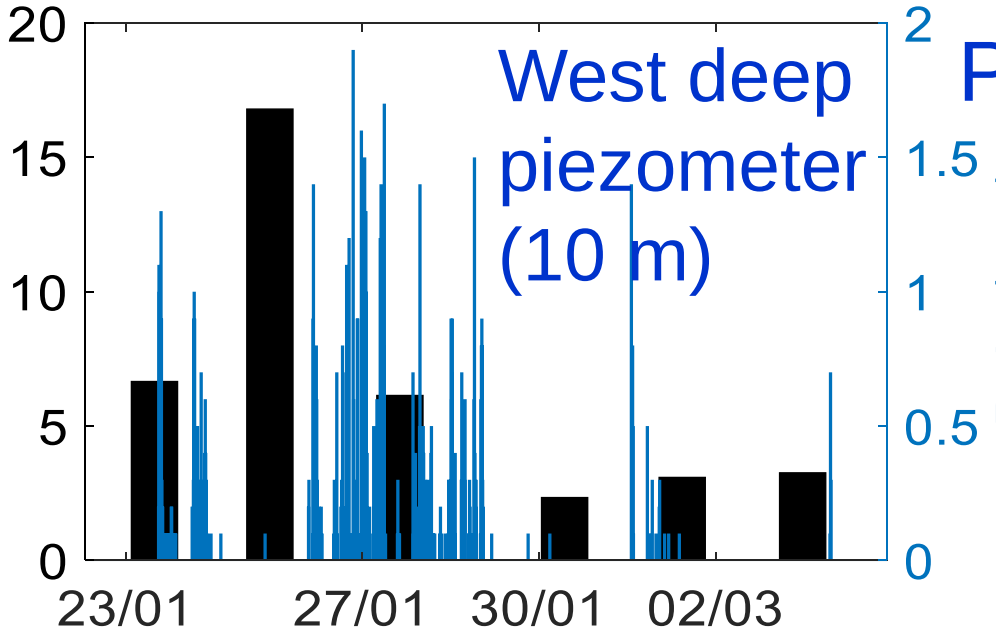




Metolachlor dynamics

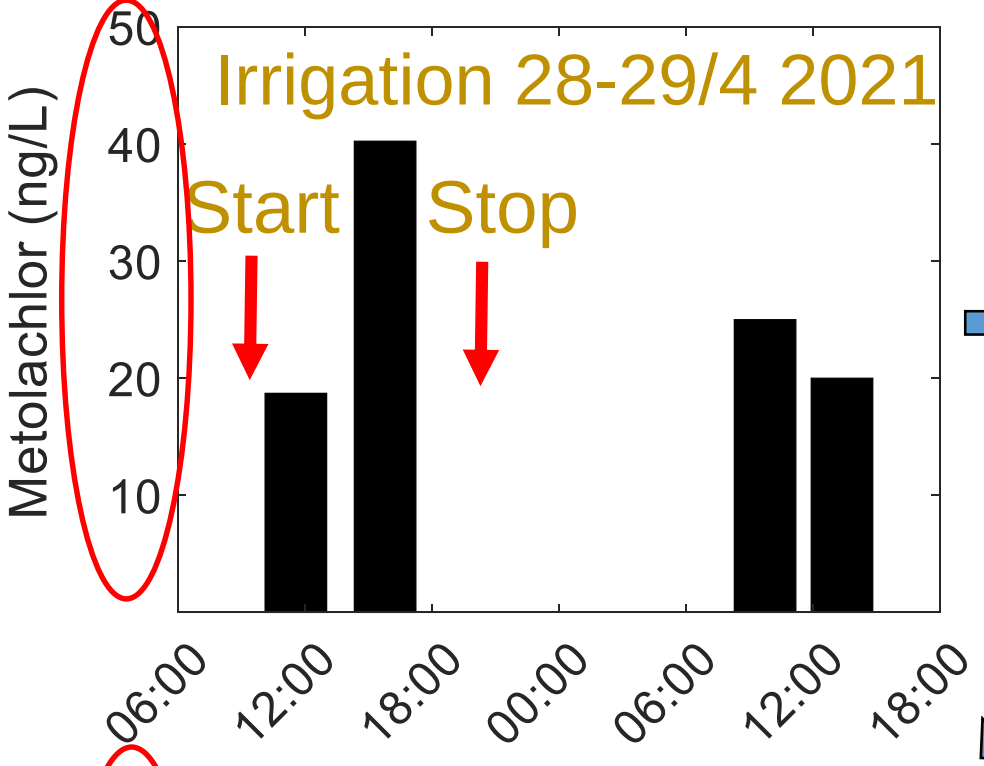
Subsurface discharge pipe

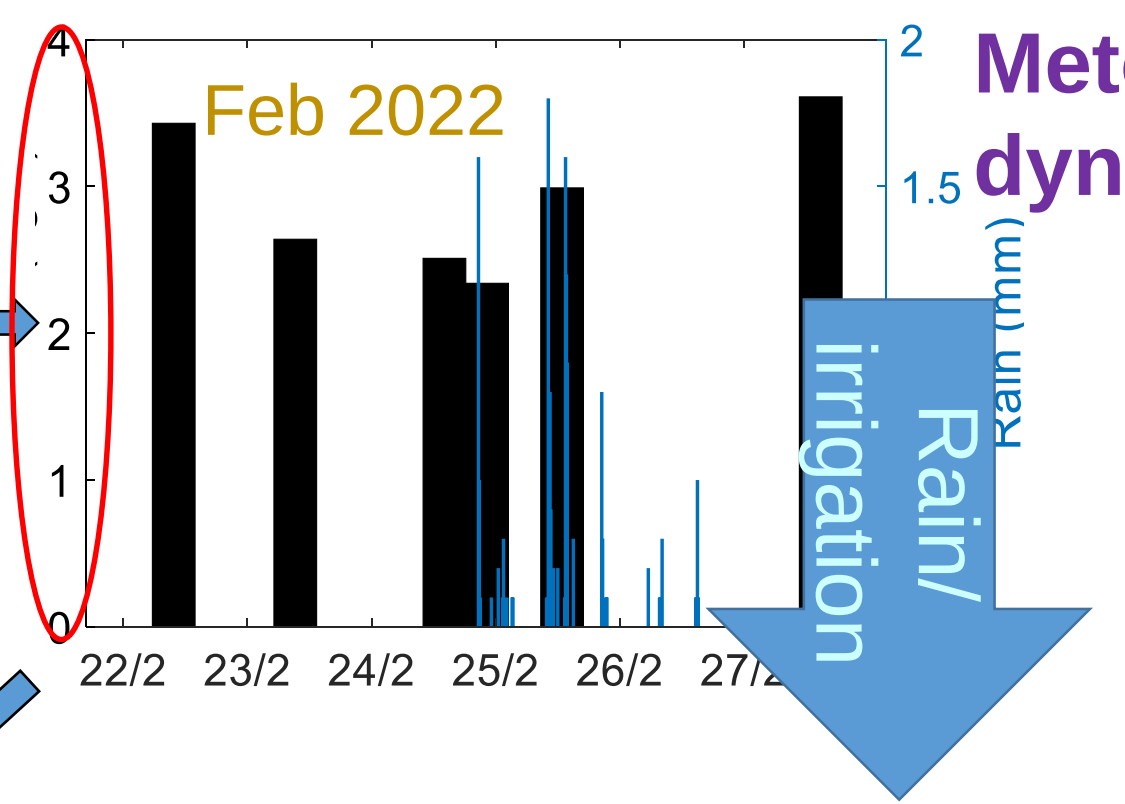




Piezometers Jan 2022

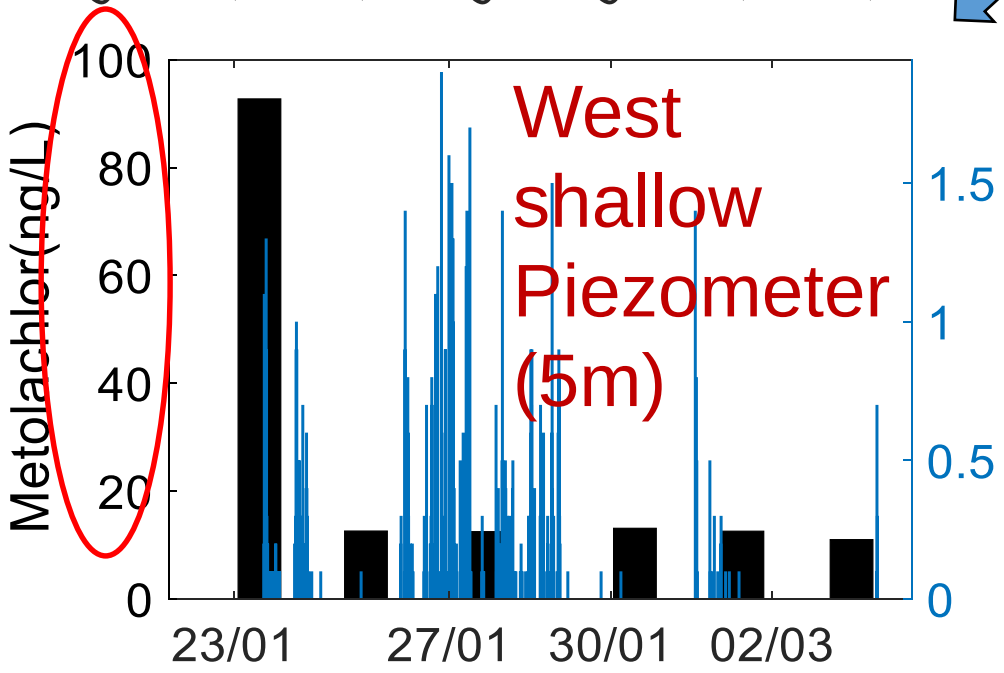
Results & discussion





Metolachlor dynamics

Rain/ irrigation



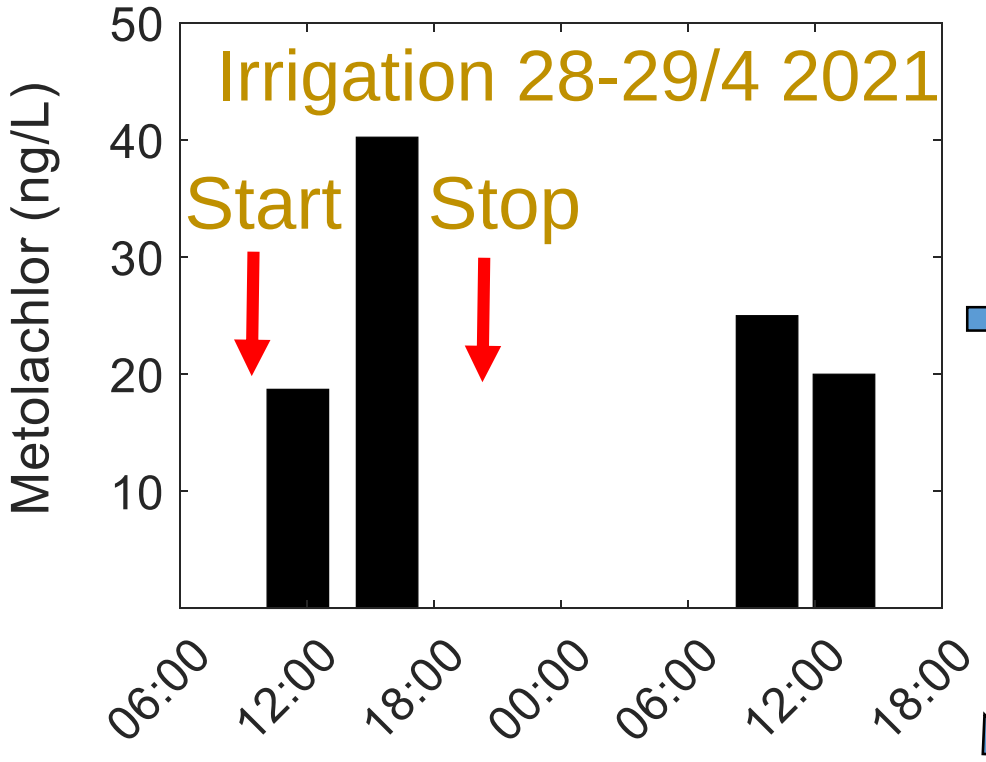
Soil surface Pollutants storage

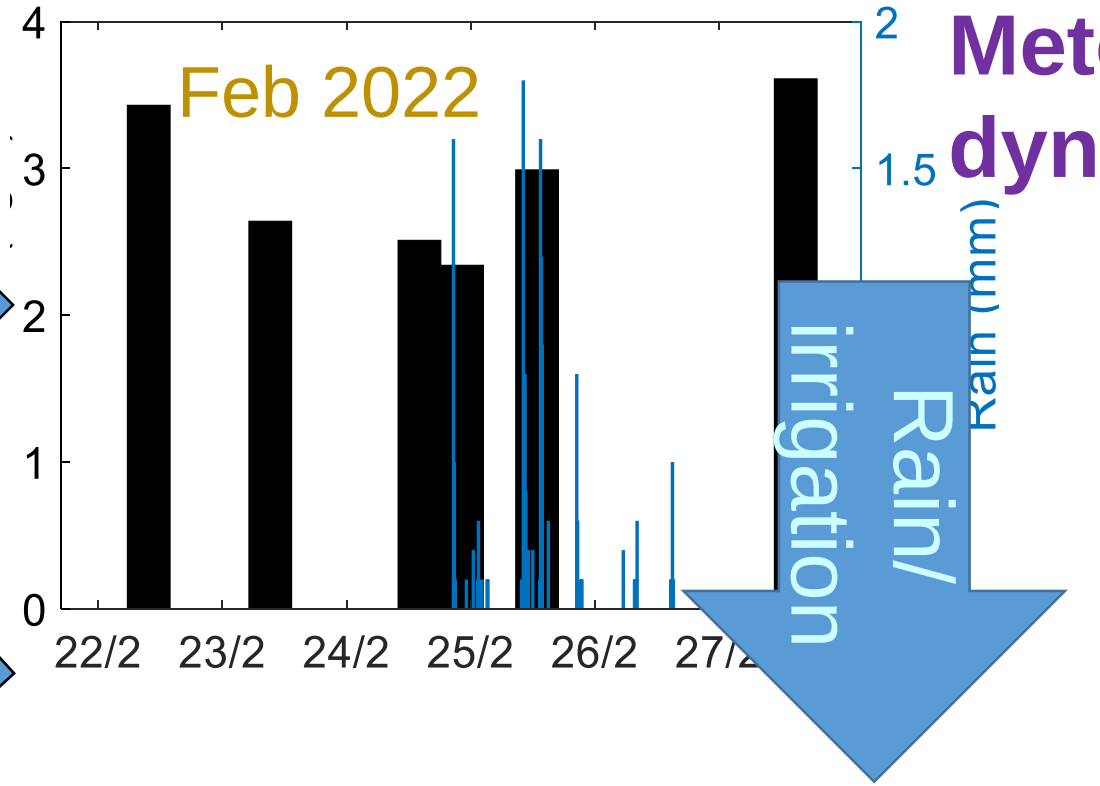
Subsurface

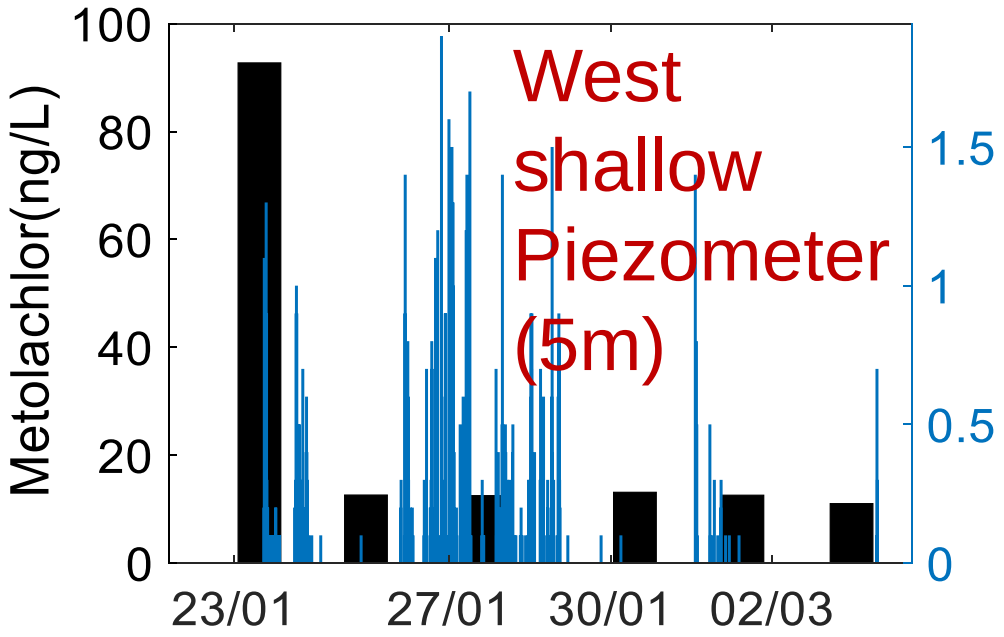
Shallow groundwater

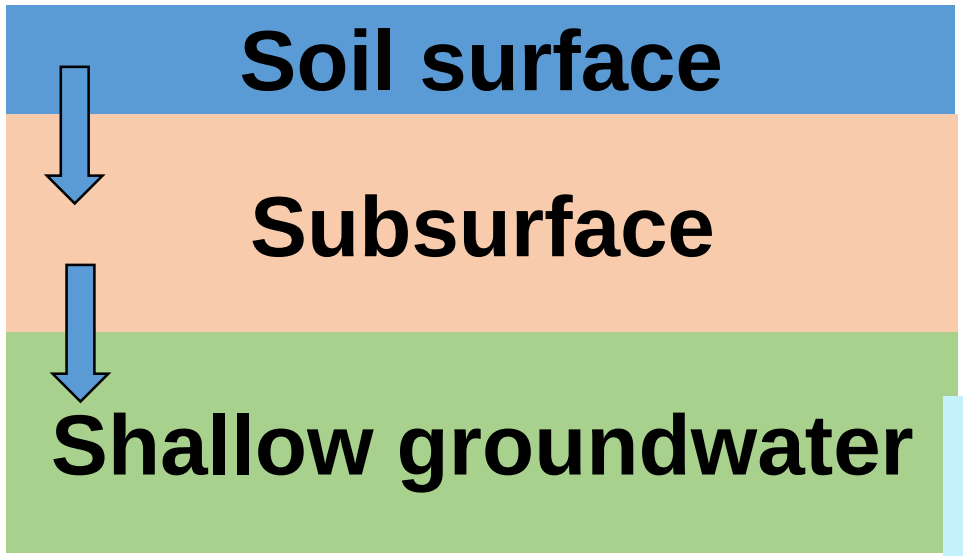
Results & discussion

Metolachlor dynamics

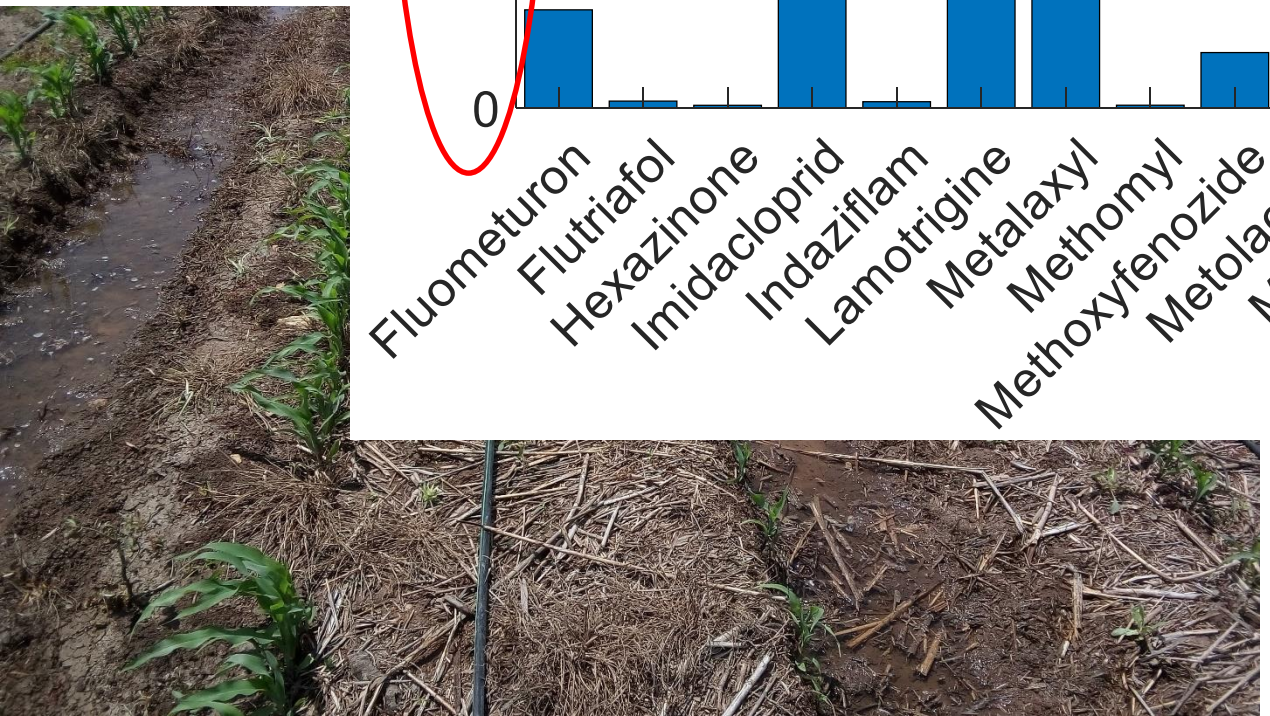


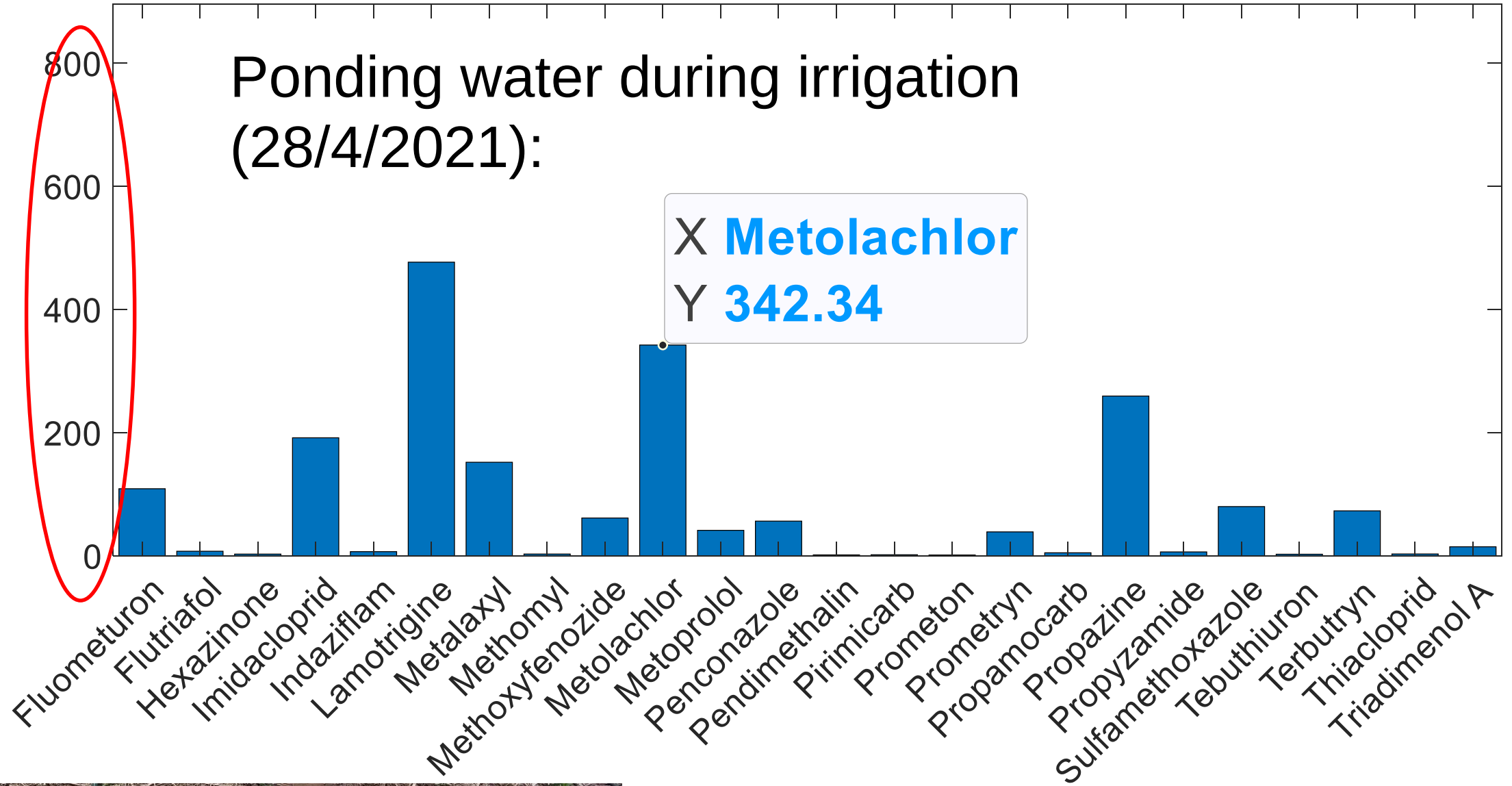






Results & discussion

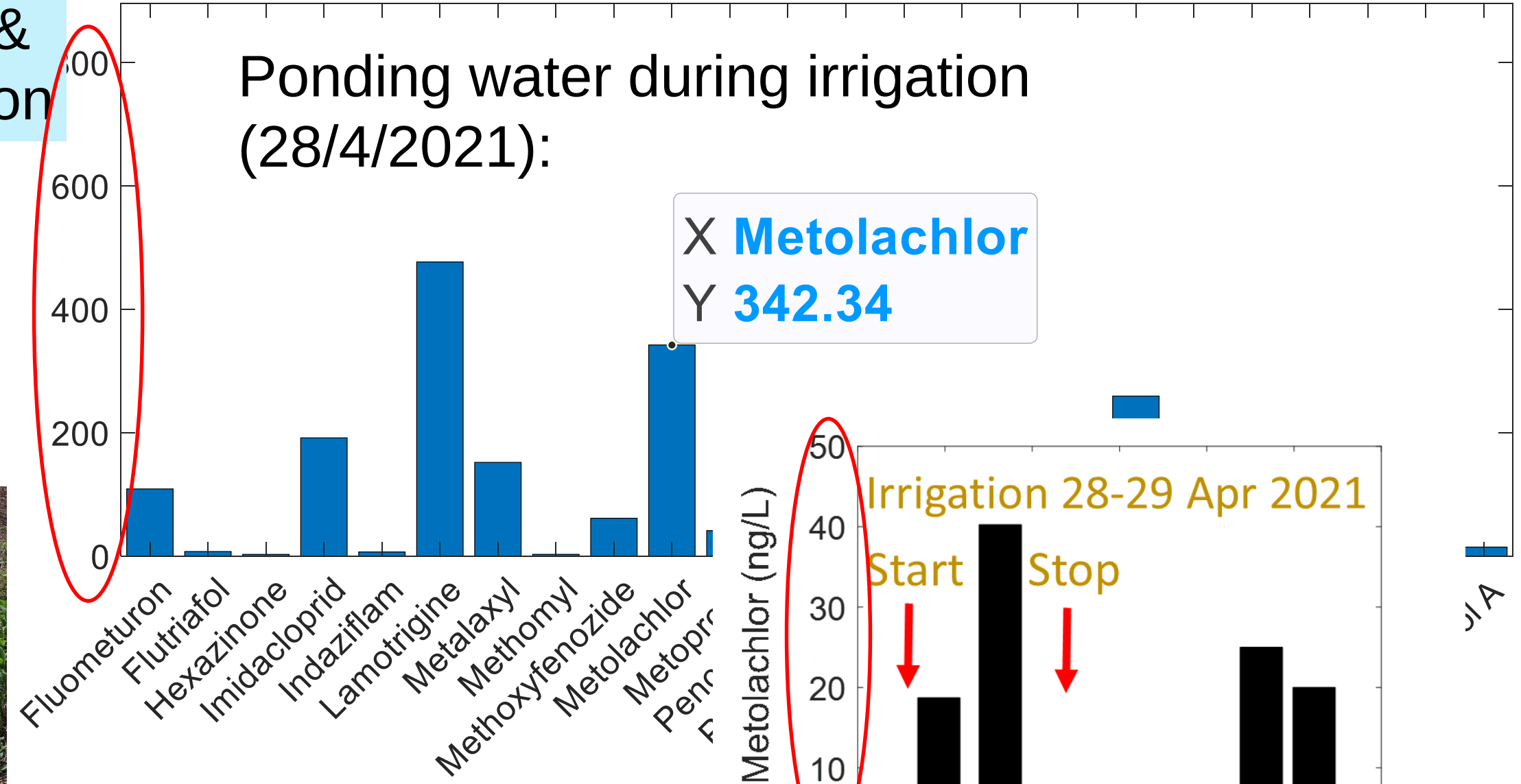


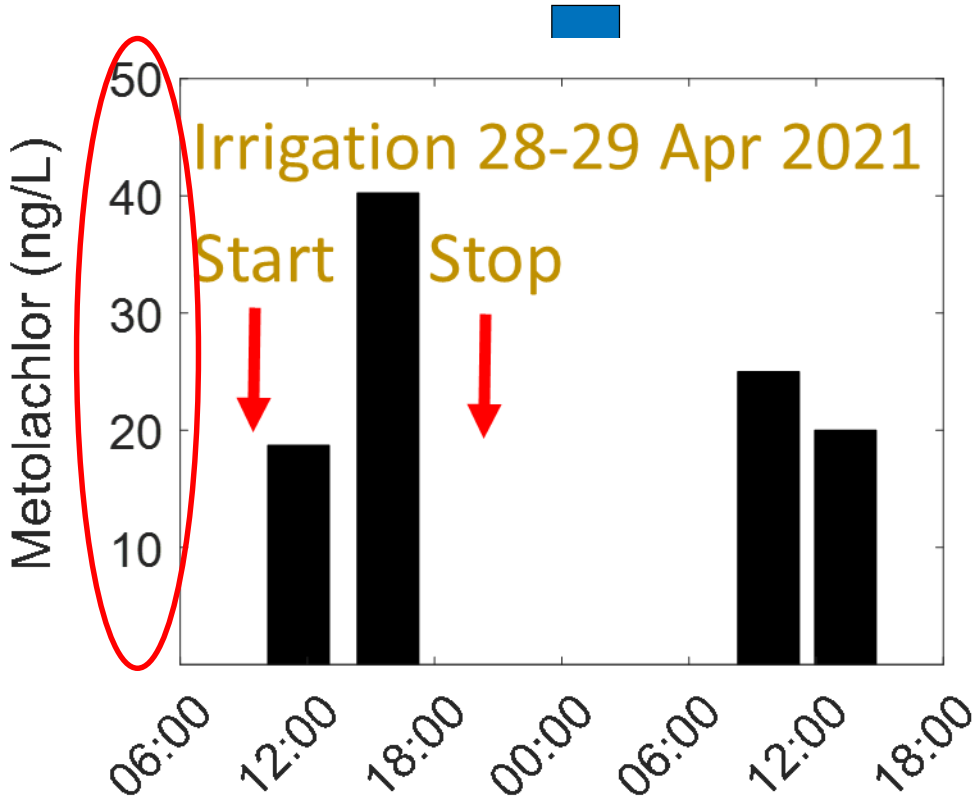


Results & discussion

Results & discussion

Ponding water during irrigation (28/4/2021):

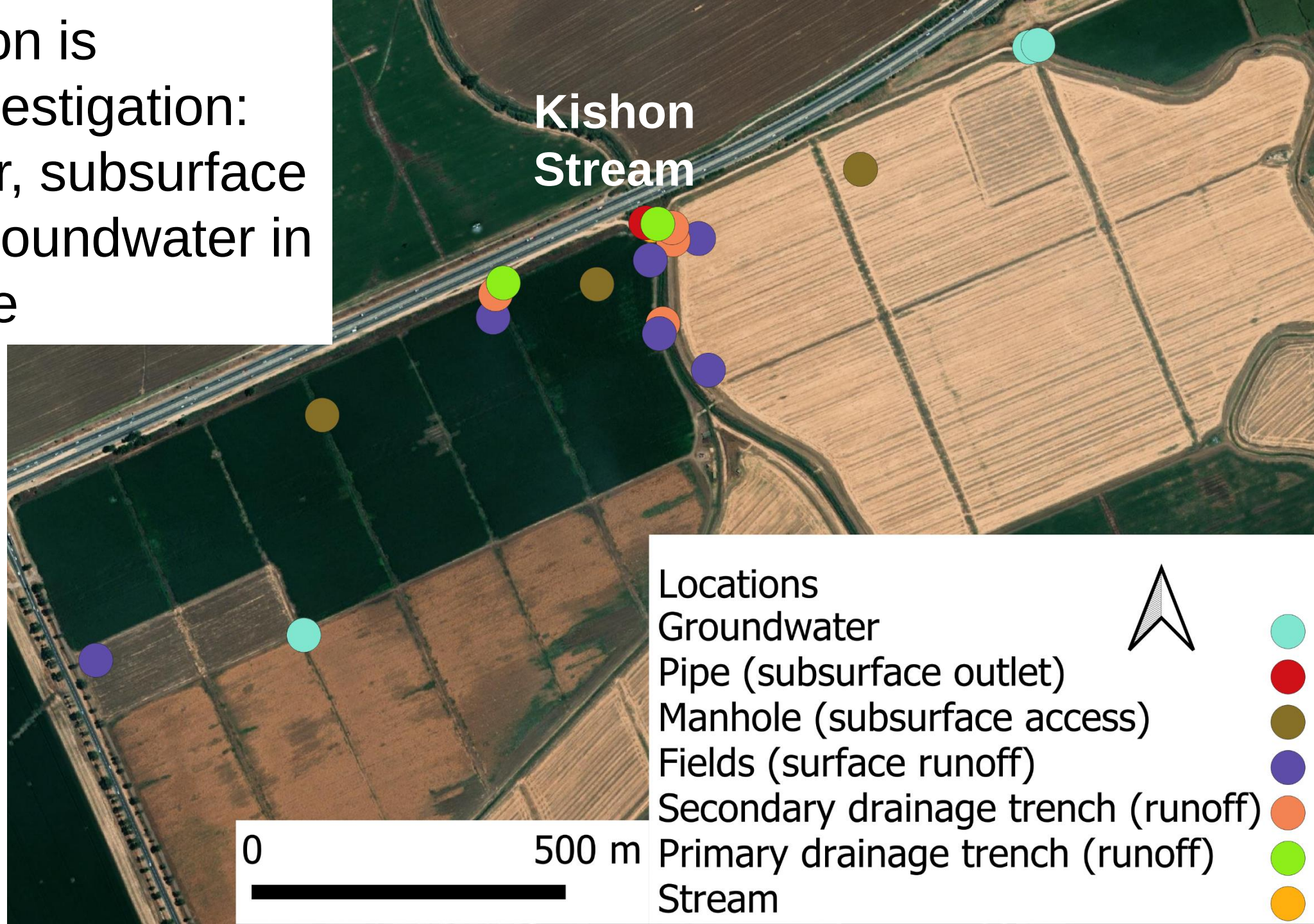




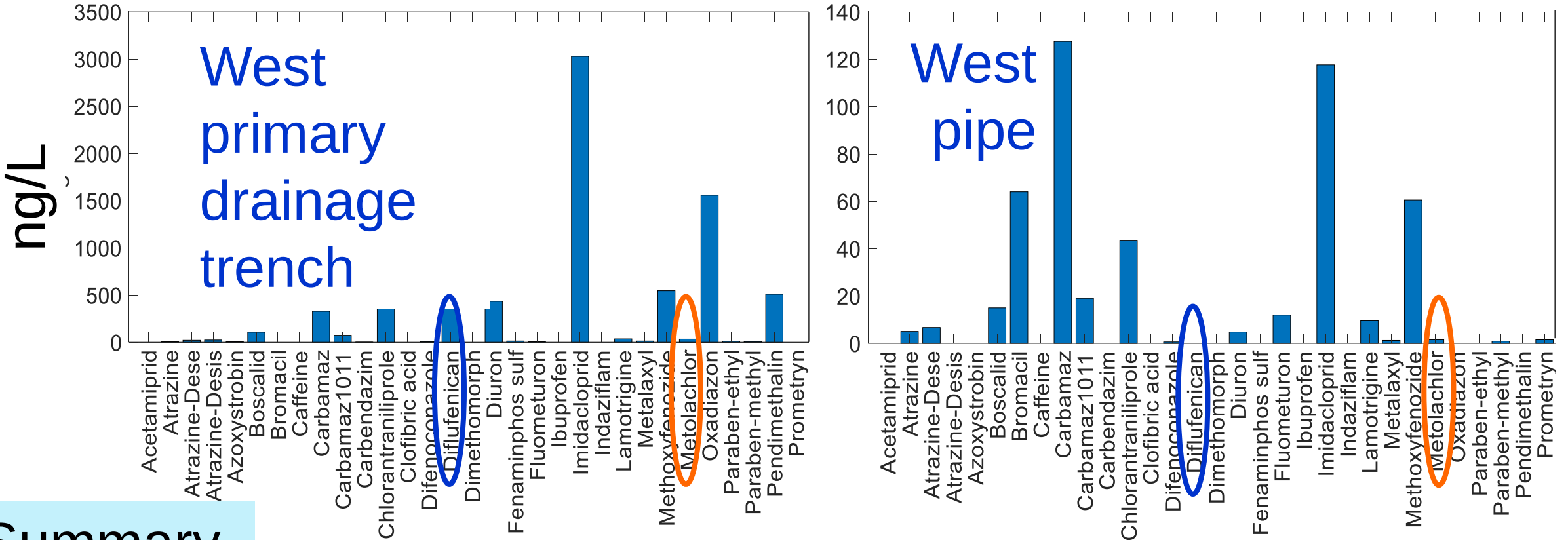
To summarize:

The innovation is flowpaths investigation: surface water, subsurface water, and groundwater in the field scale

Summary



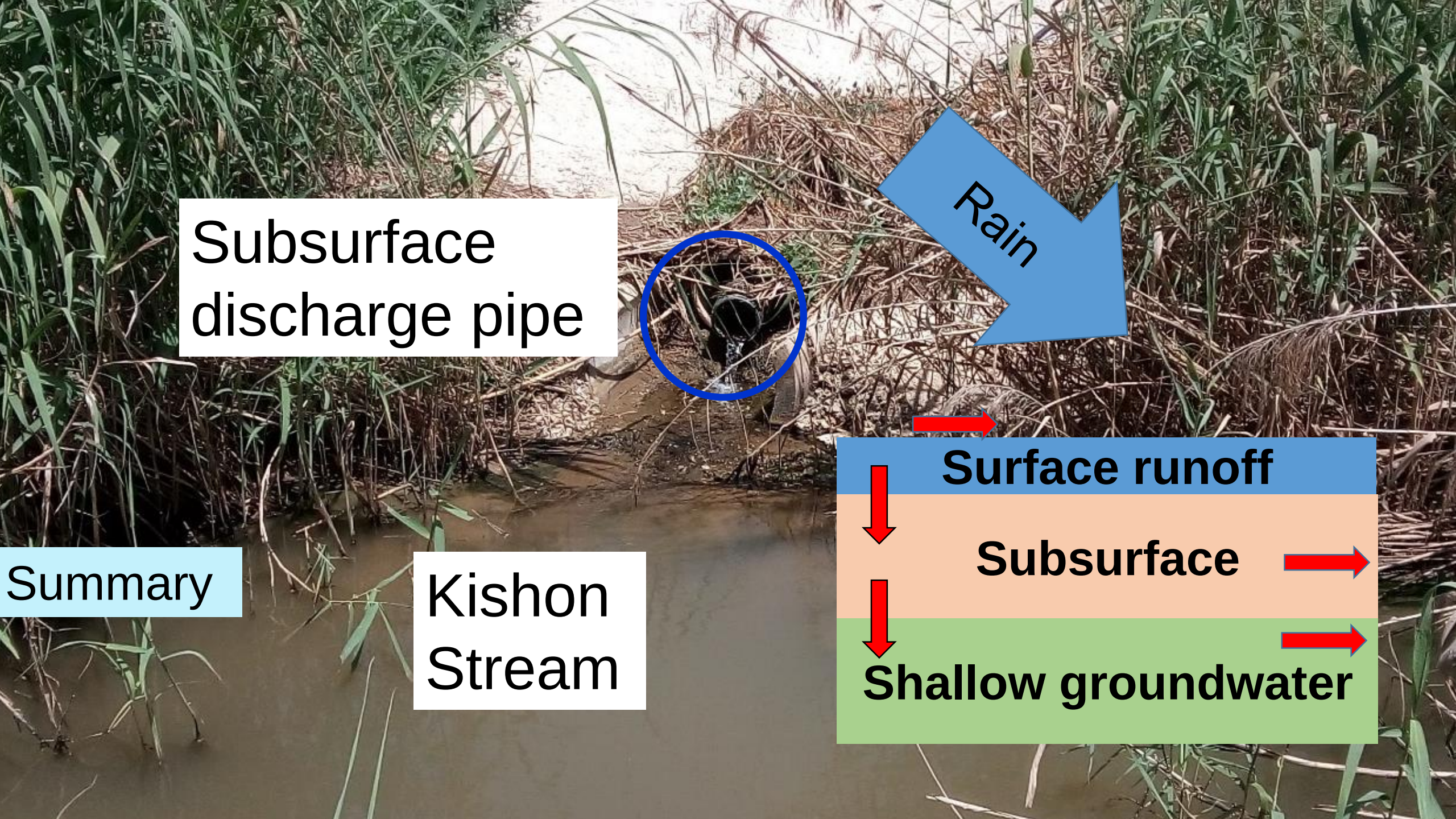
Pesticides concentration in the main runoff channel (West field)and the west pipe

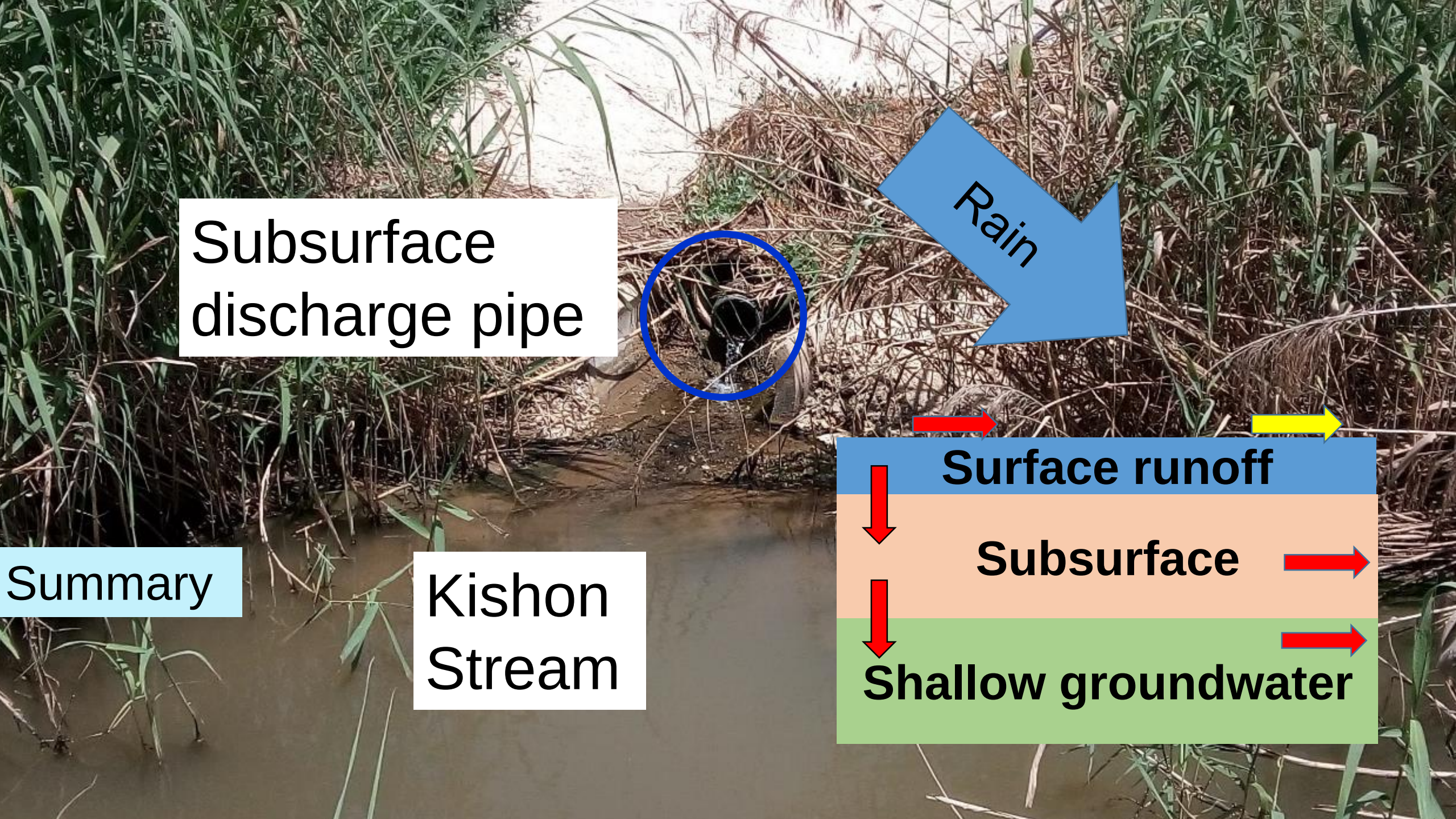


Summary

Metolachlor

Diflufenican


Subsurface discharge pipe
Rain
Surface runoff
Subsurface
Shallow groundwater
Summary
Kishon Stream


Subsurface discharge pipe
Rain
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Summary
Kishon Stream

The presented work was supported by IDIT - PhD Program for Outstanding Social Sciences Researchers, The Herta & Paul Amir Faculty of Social Sciences, University of Haifa.

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קתדרת חייקין לגאואסטרטגיה
The Chaikin Chair for Geostrategy

The campaign was supported by Minisry of

Environmental Protection and the Kishon- Streams and

Drainage Authority

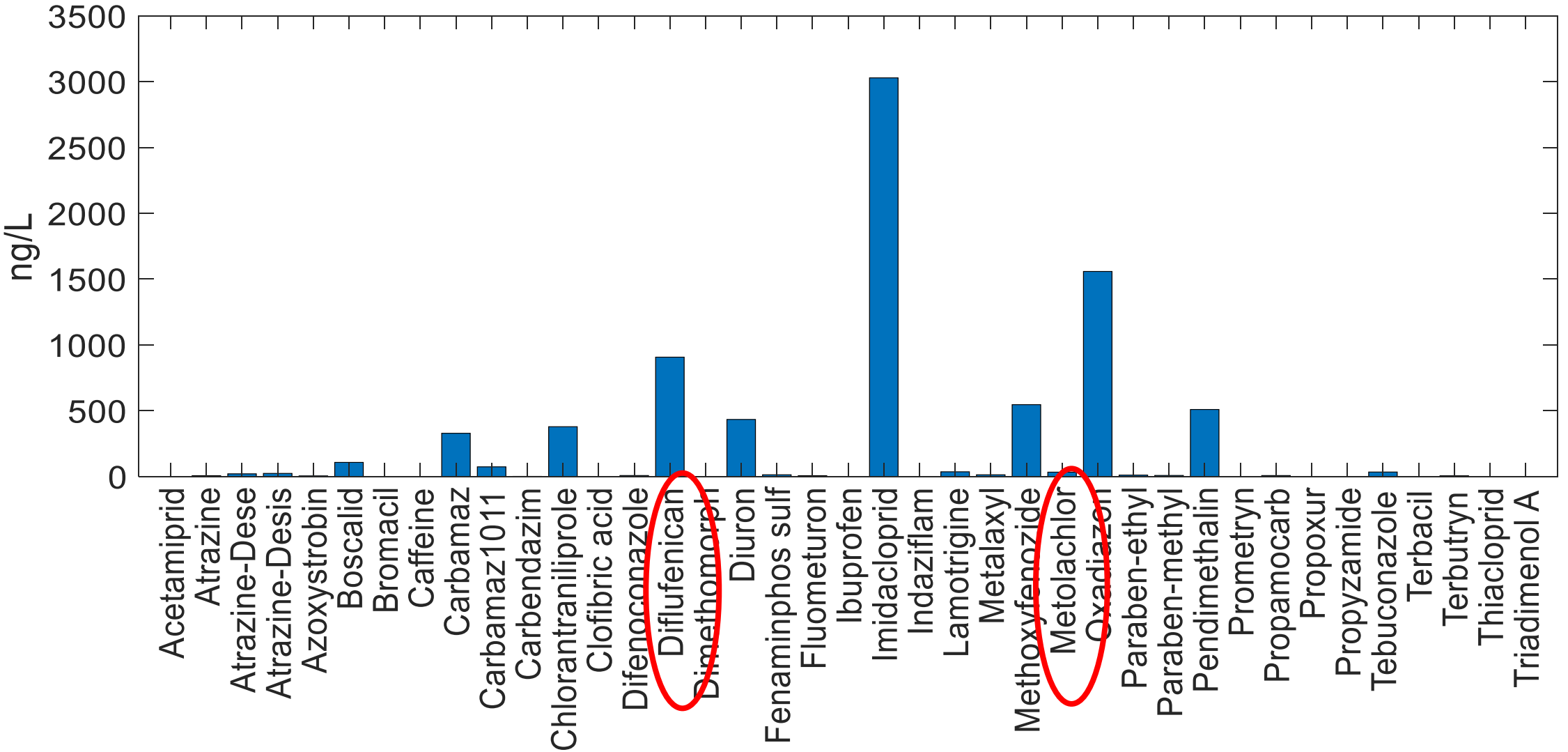

Thank you for your attention

Shulamit Nussboim

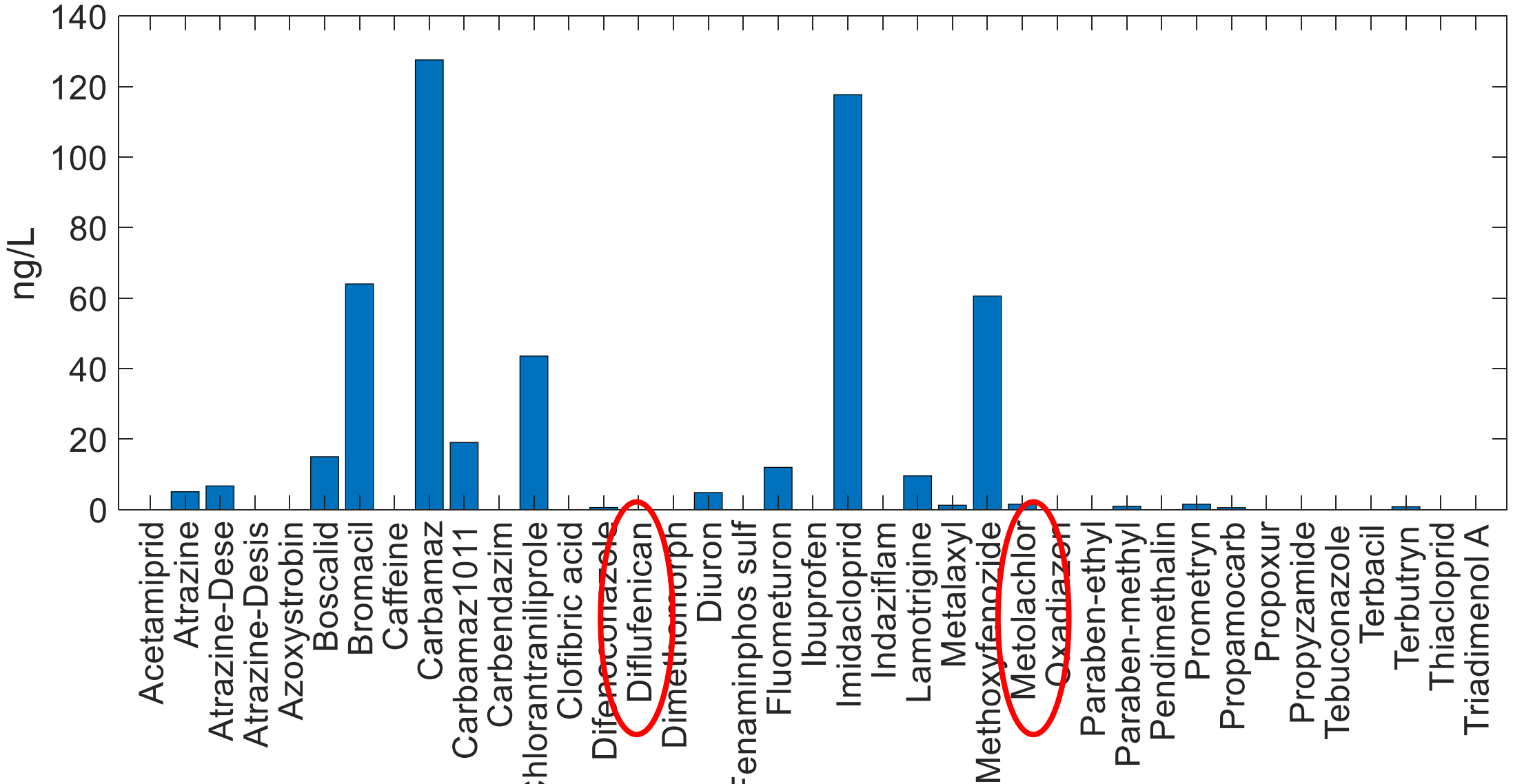
Mobile:972-52-4343825
E mail: shulamitnus@gmail.com

Thank you for your attention

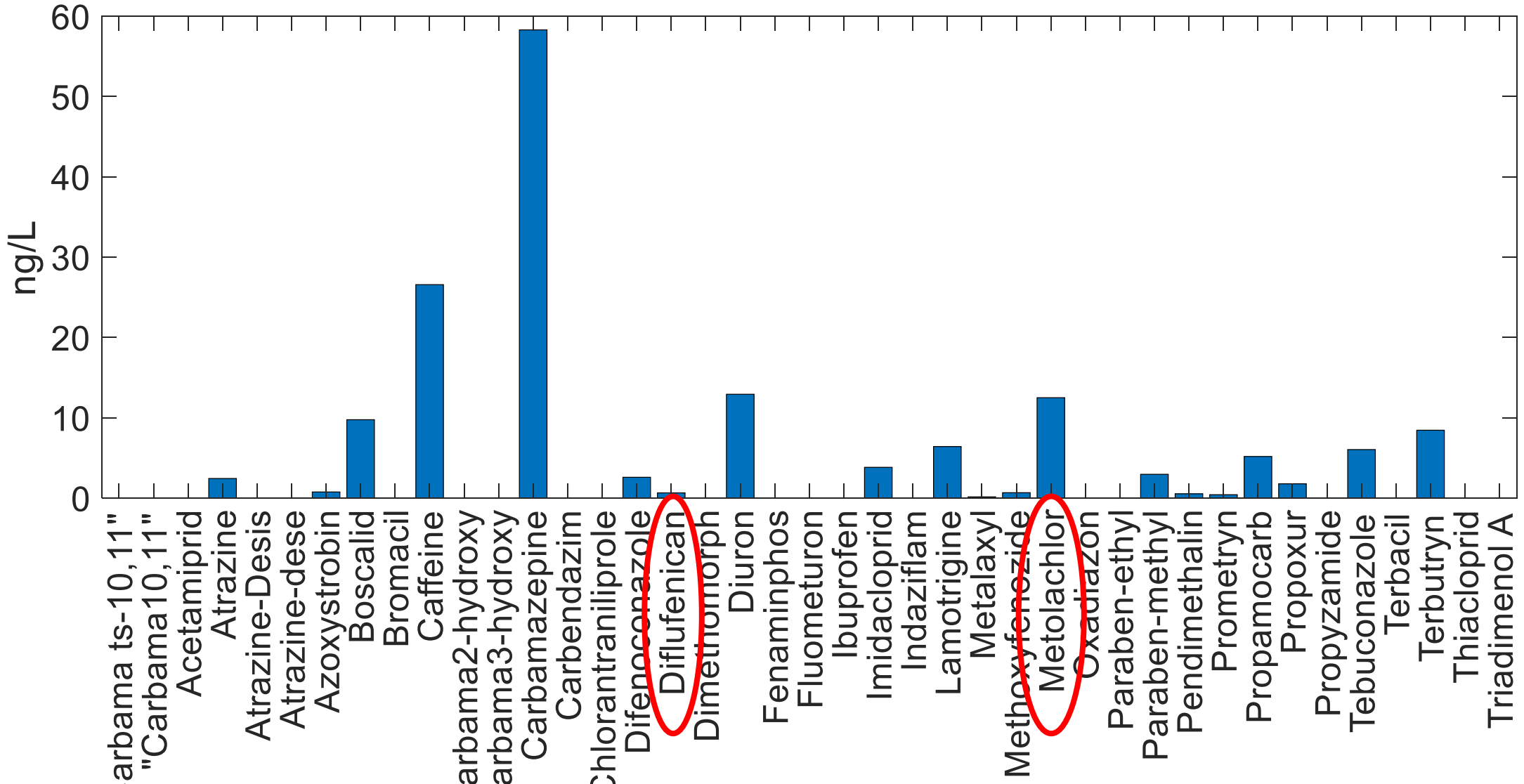
Pesticides concentration in the main runoff channel (West field)

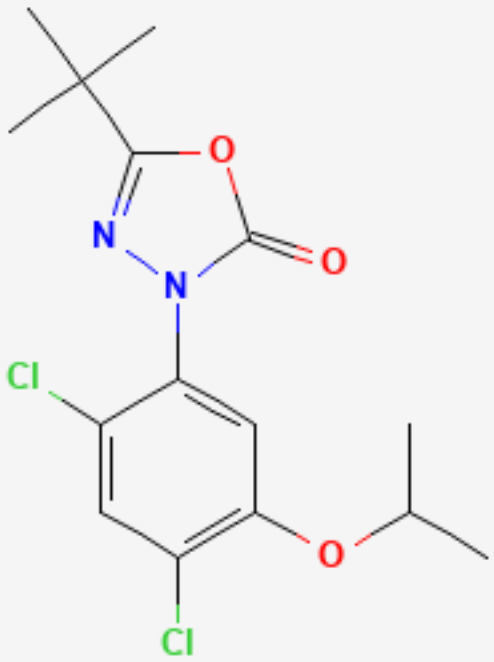


Pesticides concentration in the West pipe



Pesticides concentration in the Shallow aquifer





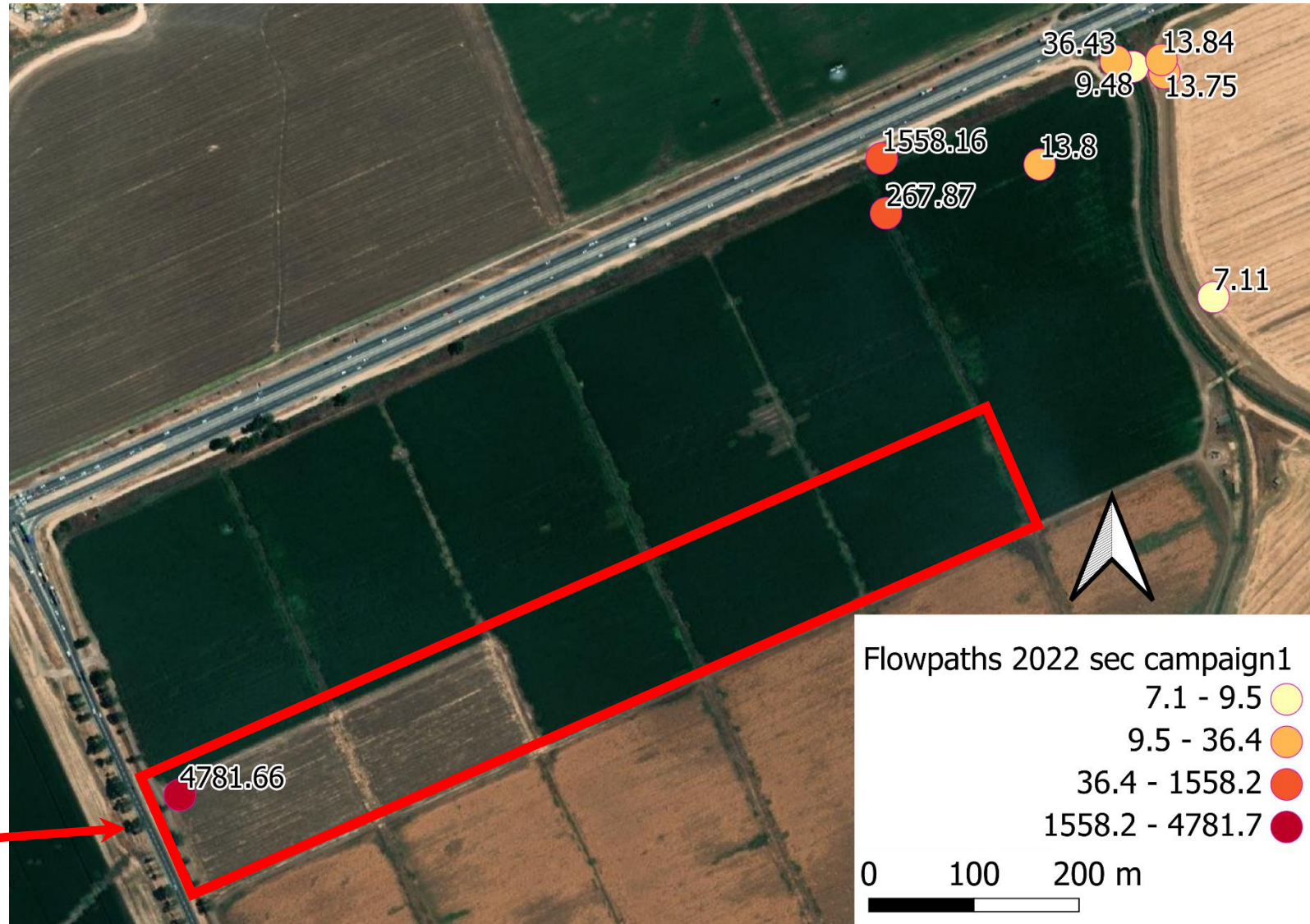
Oxadiazinon

MW: 345.2

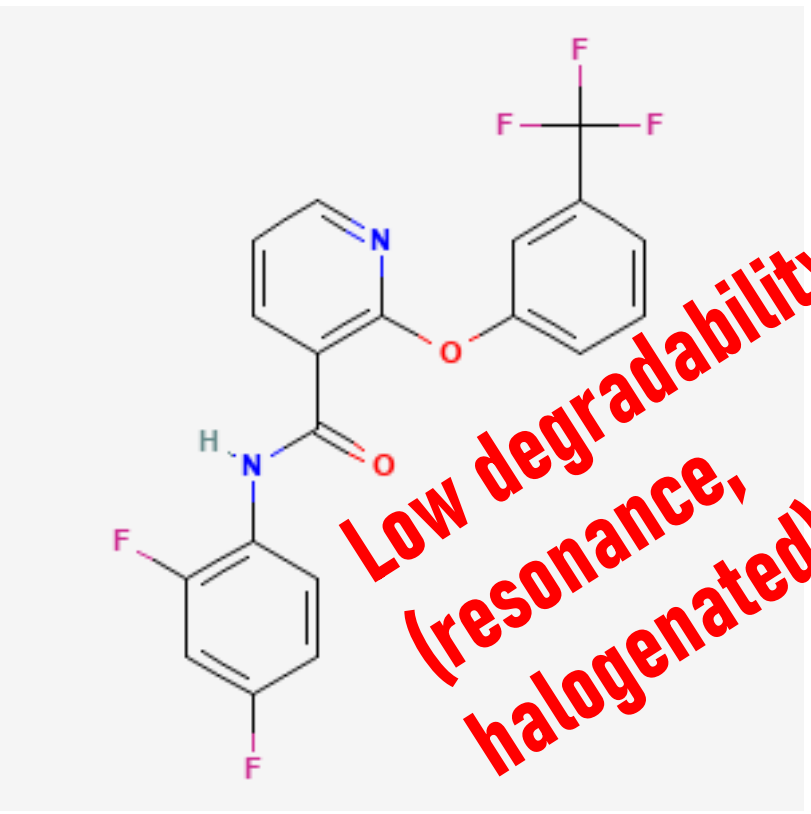
Koc: 676 to 3,236

https://pubchem.ncbi.nlm.nih.gov/

Oxadiazinon was applied at the onion plot on 10/01/2020



Onion plot



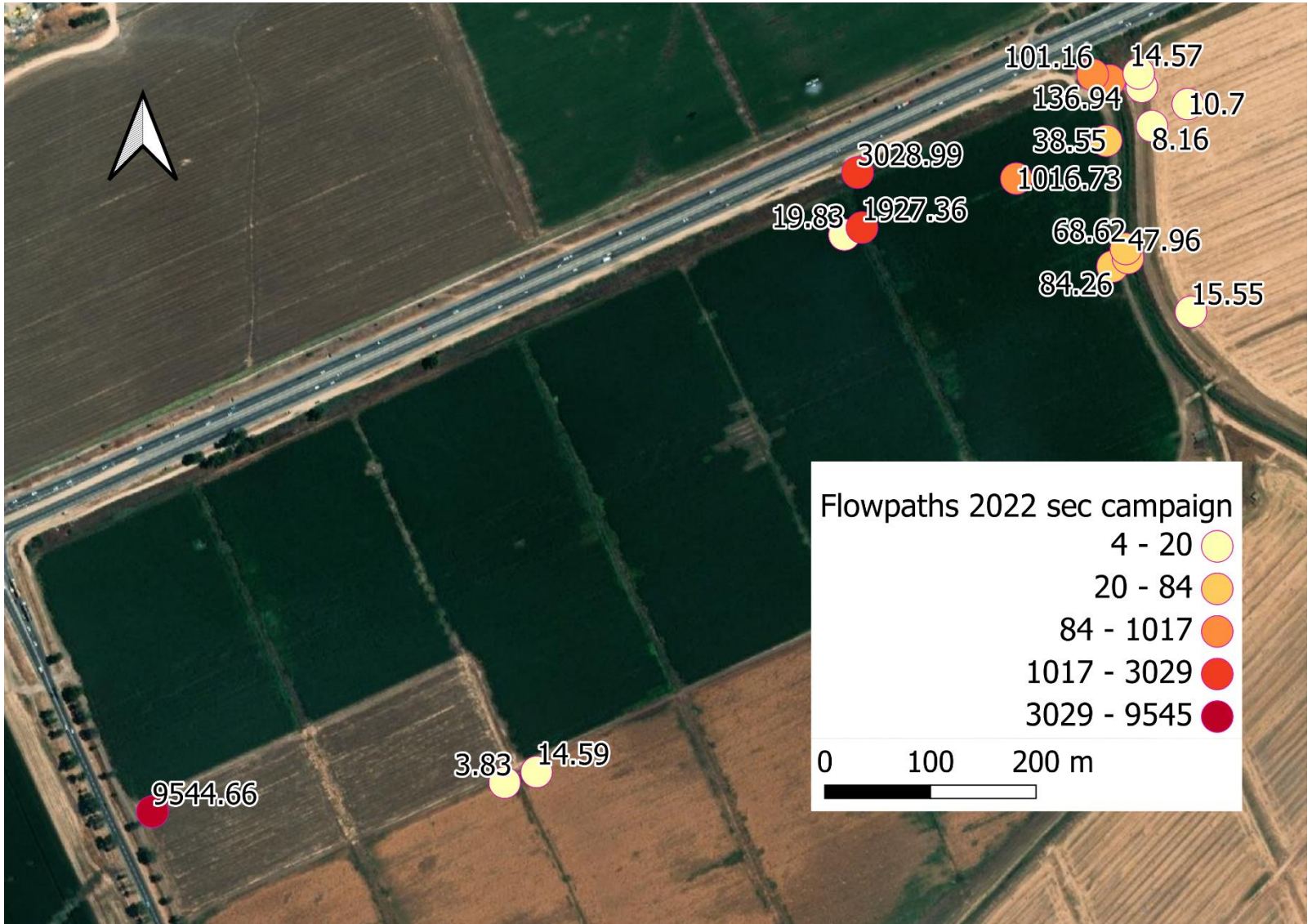
Diflufenican

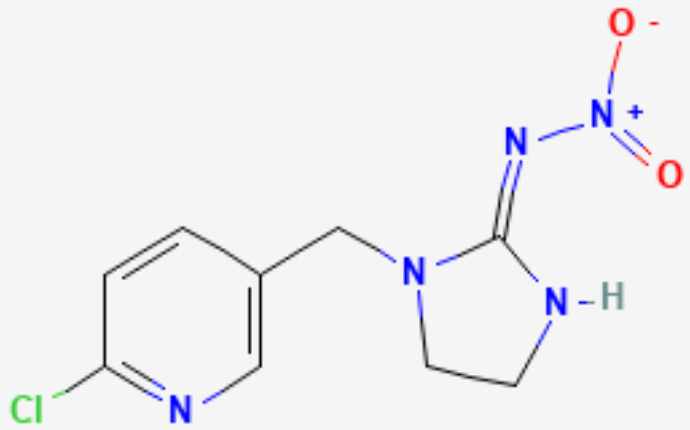
MW: 394.3

Koc:5504

https://pubchem.ncbi.nlm.nih.gov/

Diflufenican was applied before 23/10/2019





Imidacloprid

MW: 255.66

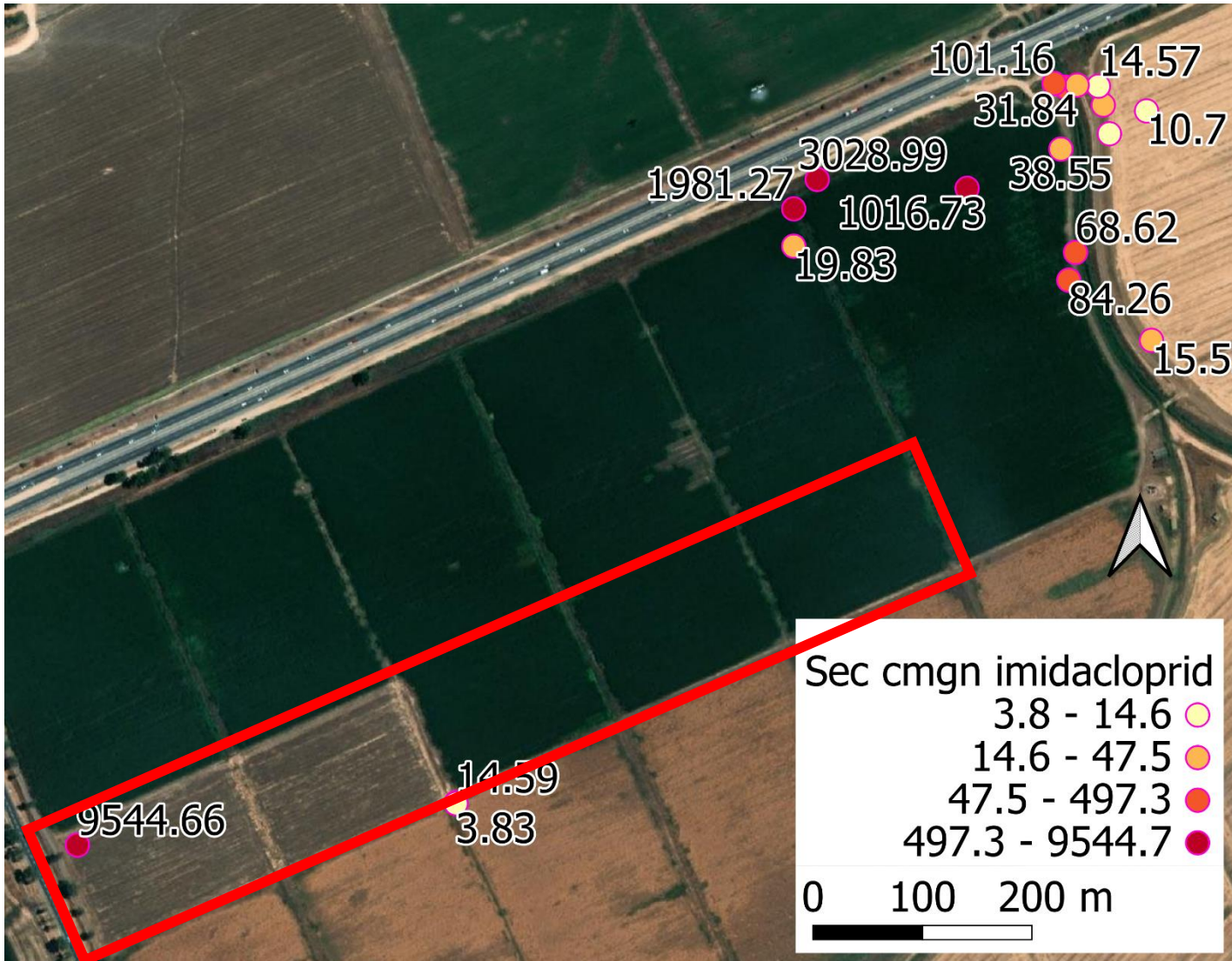
Koc:156-800

Pka: 11.12

https://pubchem.ncbi.nlm.nih.gov/

Imidacloprid was applied at the onion plot on 22.11.21

Onion plot →



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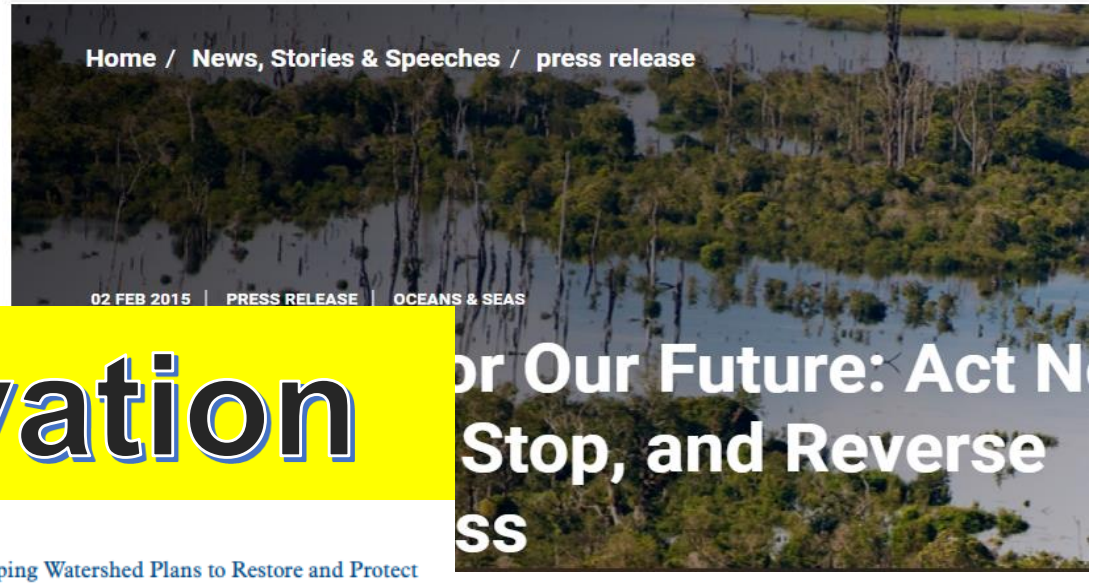
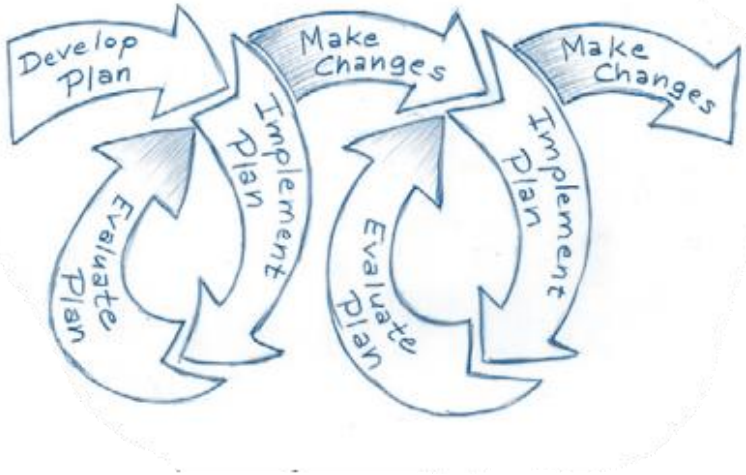
UN environment programme 50 1972-2022

Who we are | Where we work | What w



Motivation



is document is one chapter from the EPA "Handbook for Developing Watershed Plans to Restore and Protect Waters," published in March 2008. The reference number is EPA 841-B-08-002. You can find the entire ument **http://www.epa.gov/owow/nps/watershed_handbook**.

Handbook for Developing Watershed Plans to Restore and Protect Our Waters