

75th International Executive Council meeting & 9th Asian Regional Conference

Integrated analysis of hydrological processes and water quality in a cyclic irrigation system

Fumi OKURA^{1*}, Kana KURIHARA², Tasuku KATO²

¹ Japan International Research Center for Agricultural Sciences, Japan

² Faculty of Agriculture, Tokyo University of Agriculture and Technology, Japan

Background

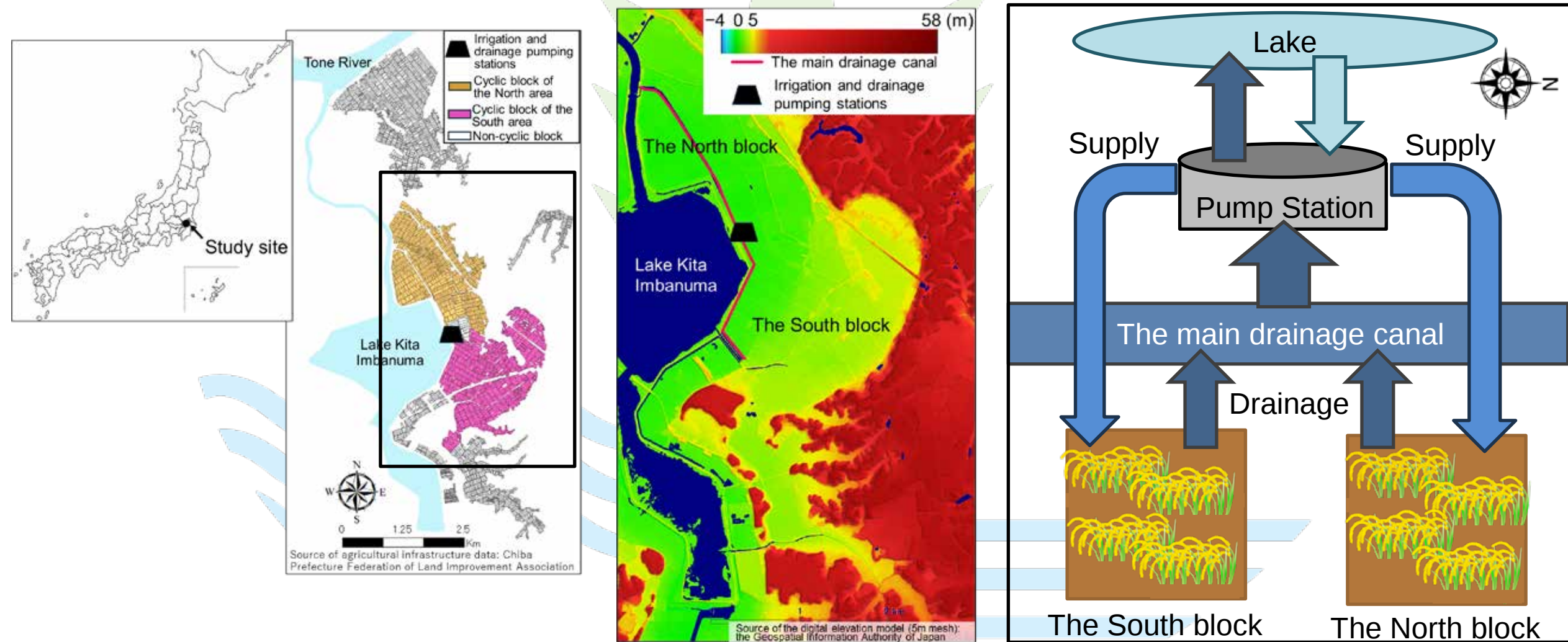
Cyclic irrigation system

- .. Flat and low-lying paddy fields
- .. **Reuse drainage water** for irrigation
- .. Effective in **conserving water quality of natural water bodies**

Objective

Comprehend hydrological interconnections and water quality in flat and low-lying paddy fields

Research Area



75th IEC Meeting & 9th Asian Regional Conference

1-7 September 2024, Sydney, Australia

The South Block

Methodology

Analyze Water balance and water quality
from Apr. to Sep. 2022 and 2023

The North Block

Farm drain

Water
Level

EC

Pumping
Station

Farm drain

Water
Level

EC

EC

ADCP

ADCP

The South side

The North side

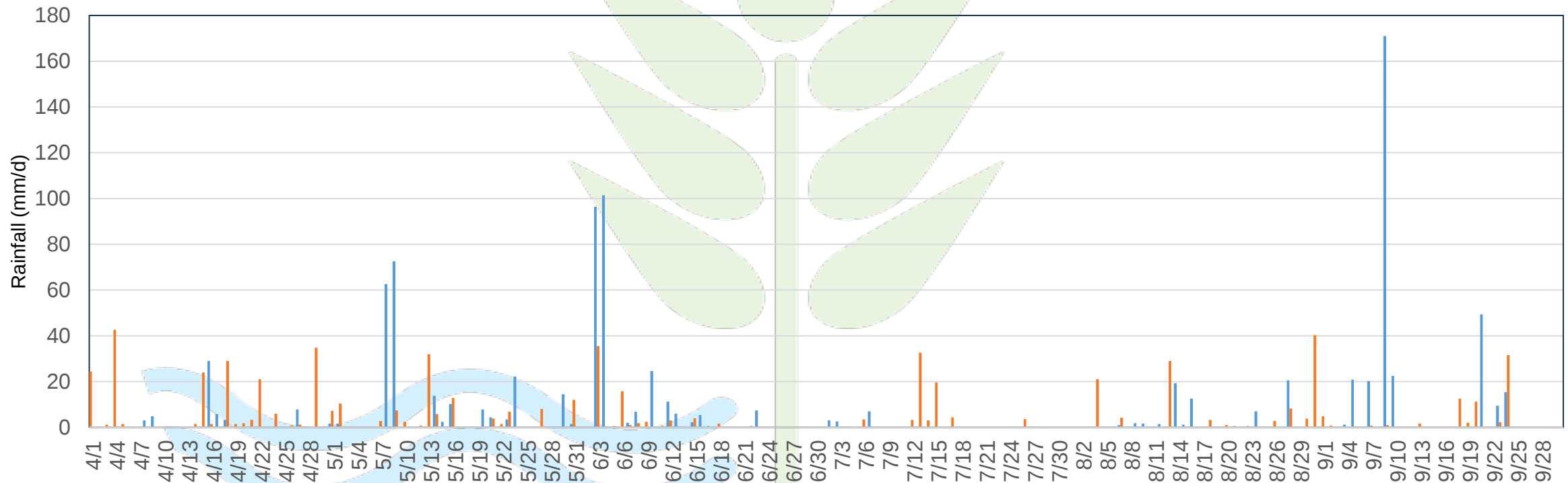
The main drainage canal

.. ADCP: every 3 hours

.. EC, water level, rainfall: every hour

Rainfall of 2022 and 2023

2022 2023



Rainfall amount from Apr. to Aug.:

2022 (561mm) < 2023 (617mm) < 30-year average (638 mm)

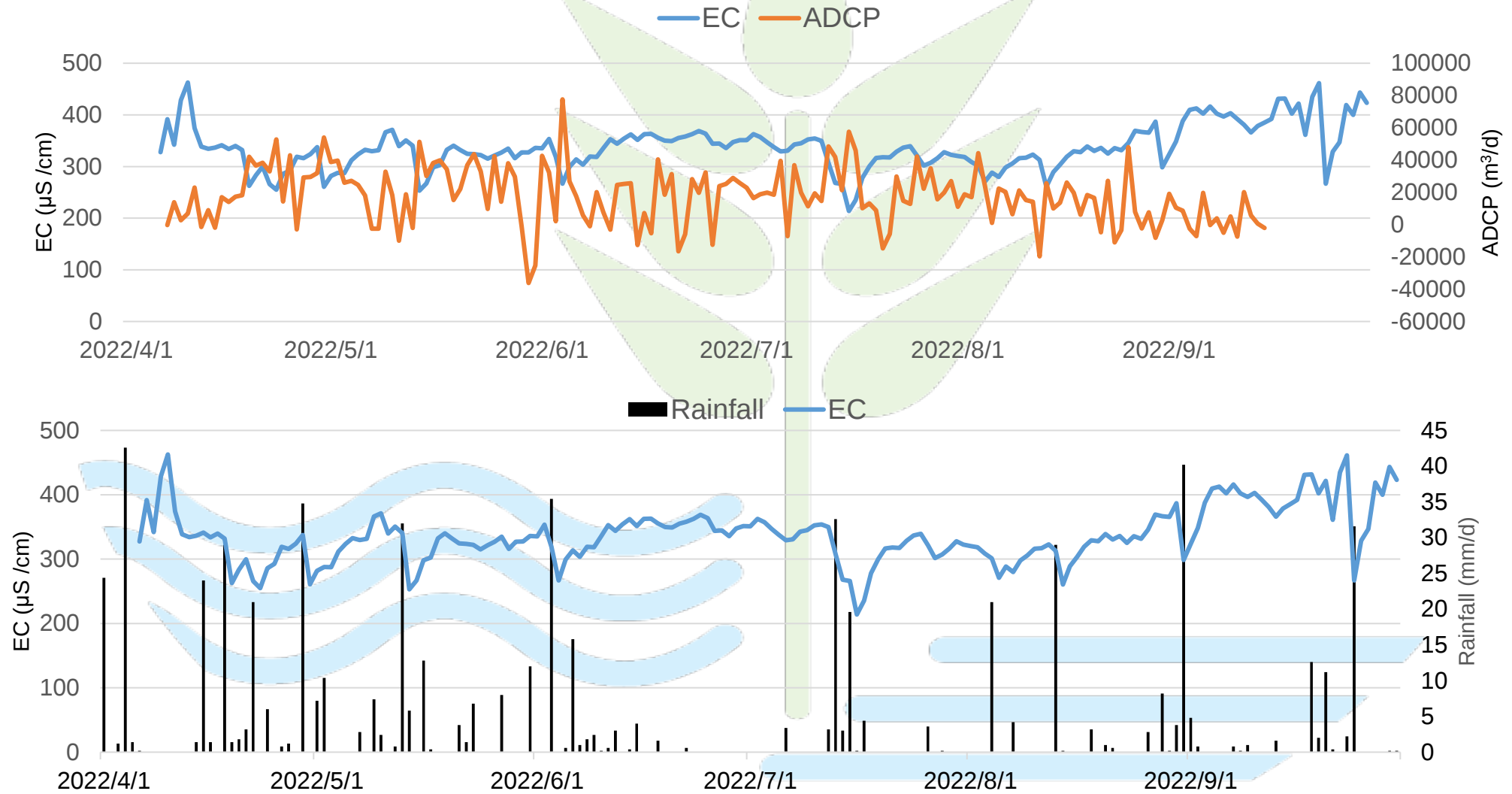
The South Block

The main drainage canal

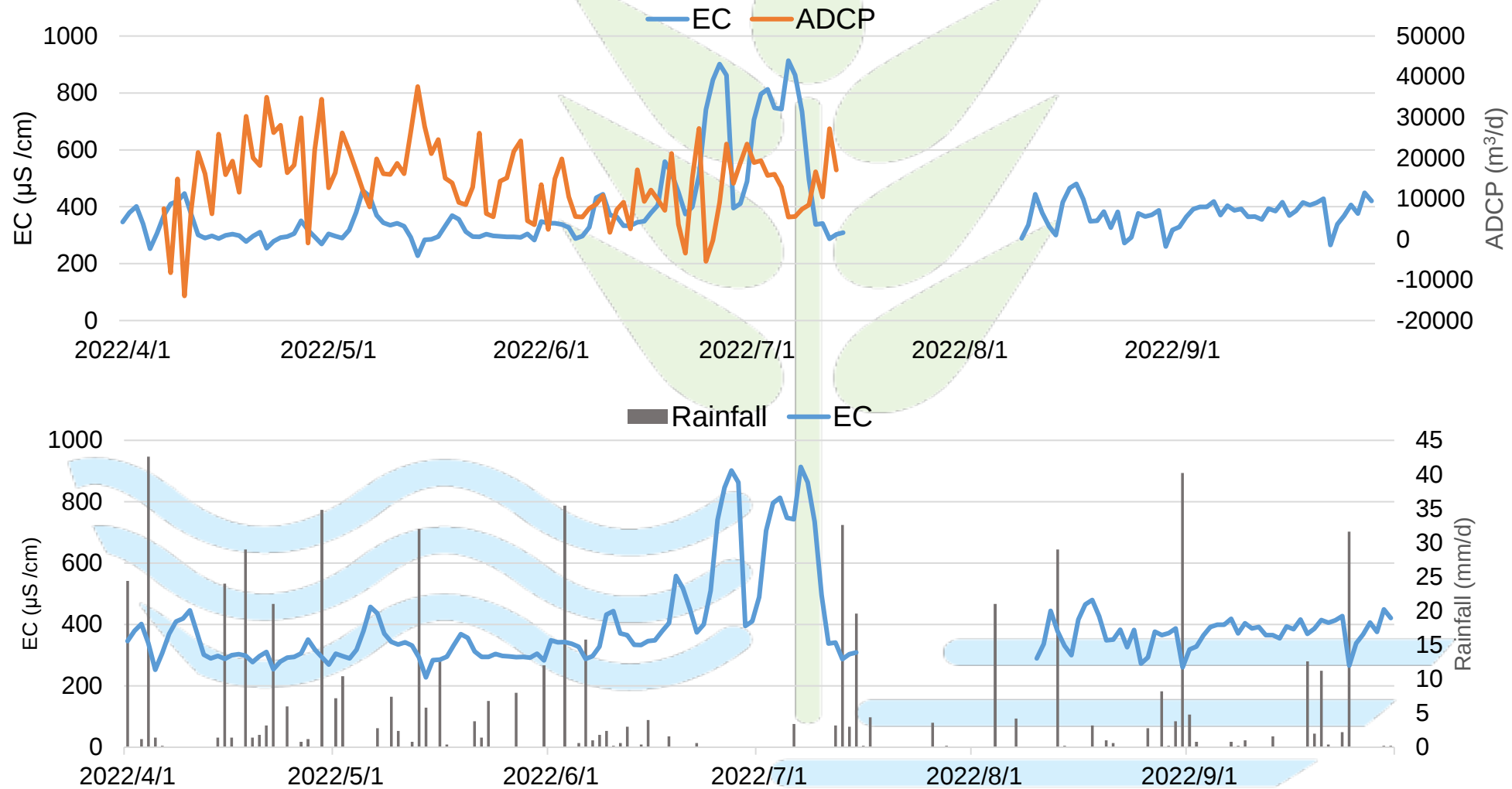
The North Block

The South side The North side

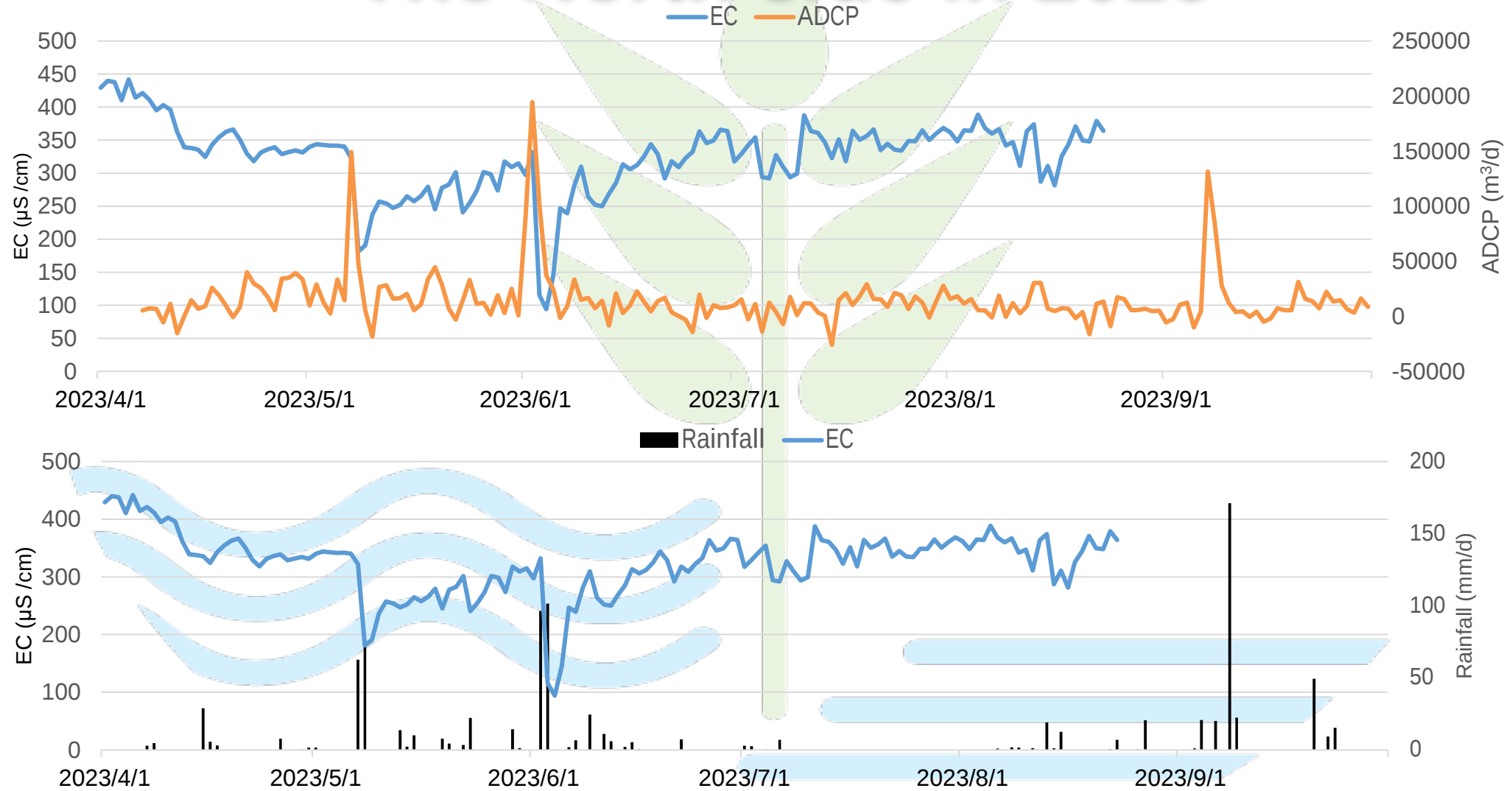
The North side in 2022



The South side in 2022

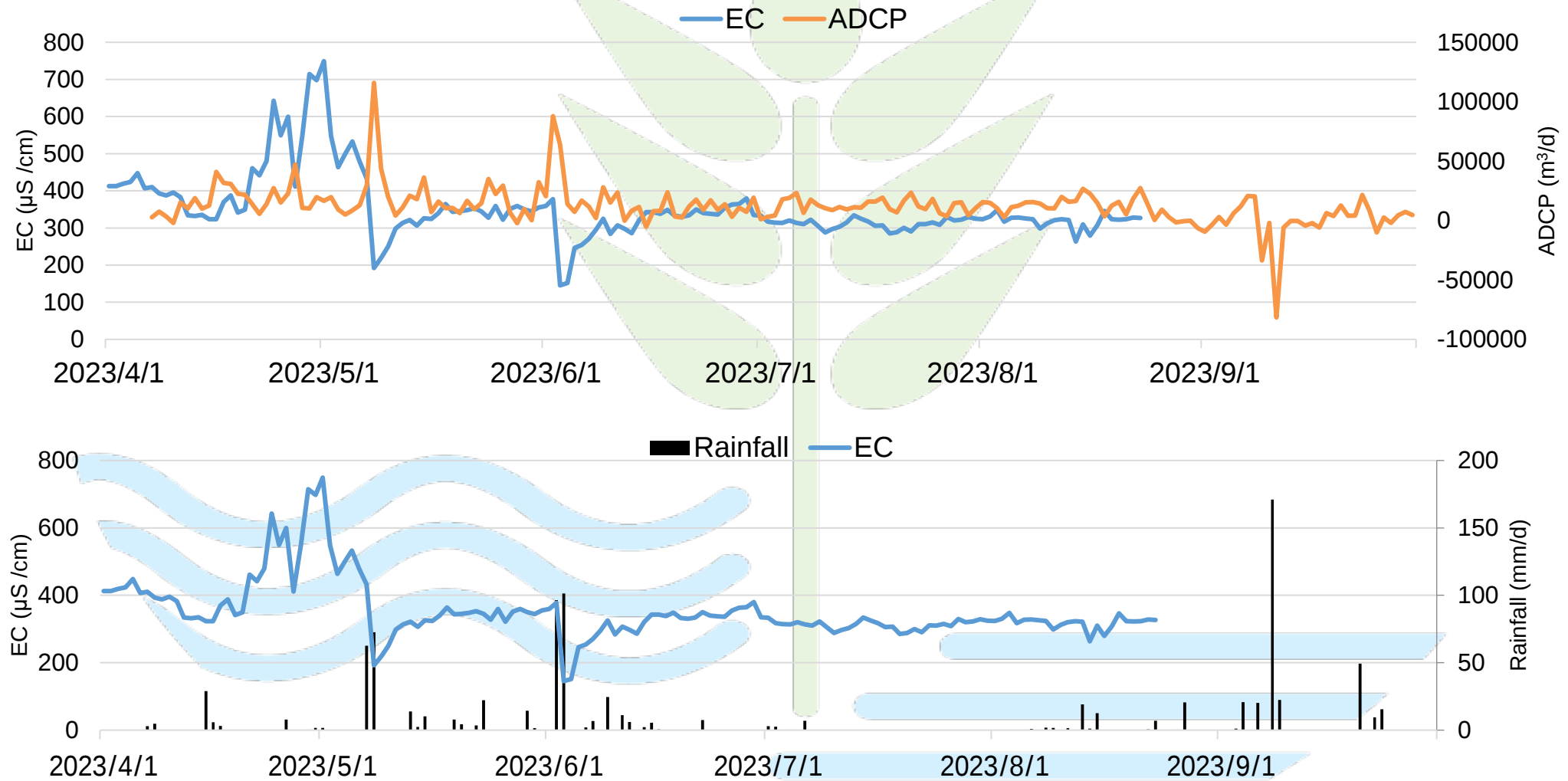


The North side in 2023



The South side in 2023

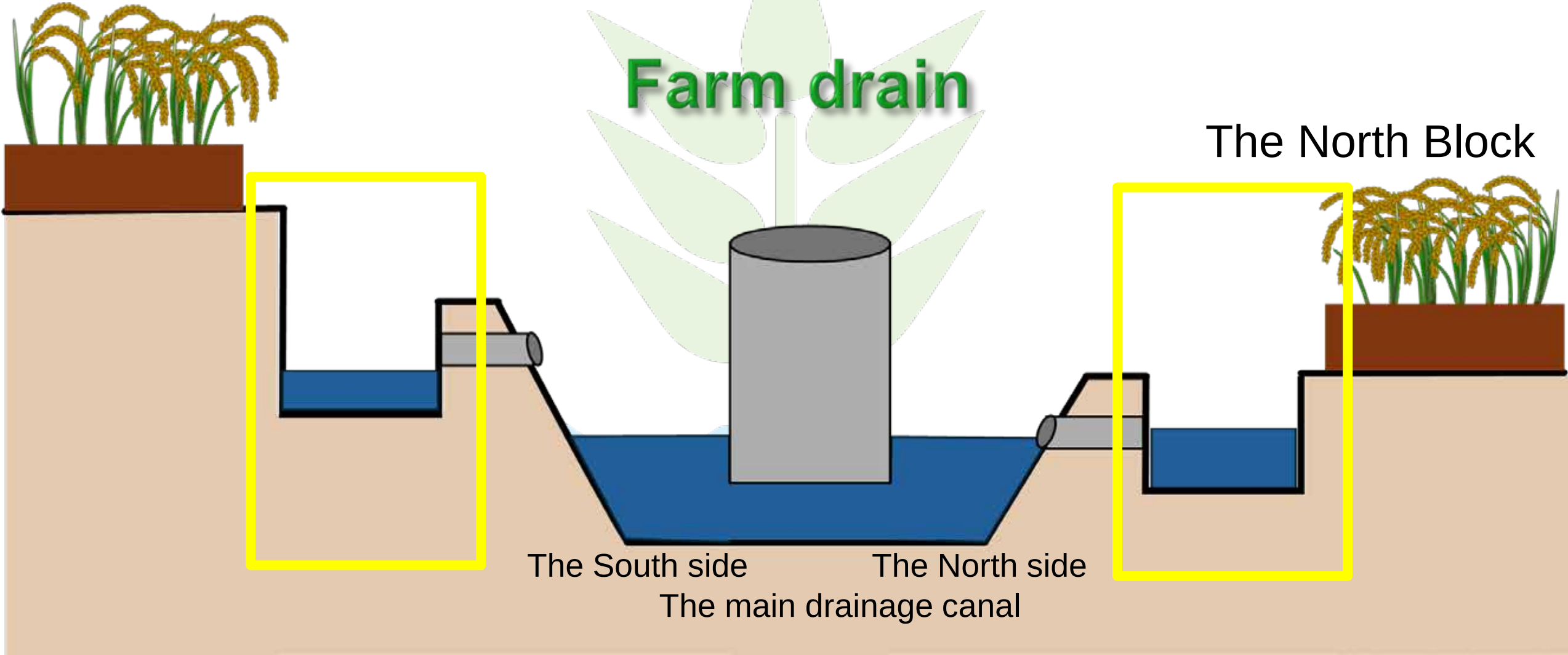
2023



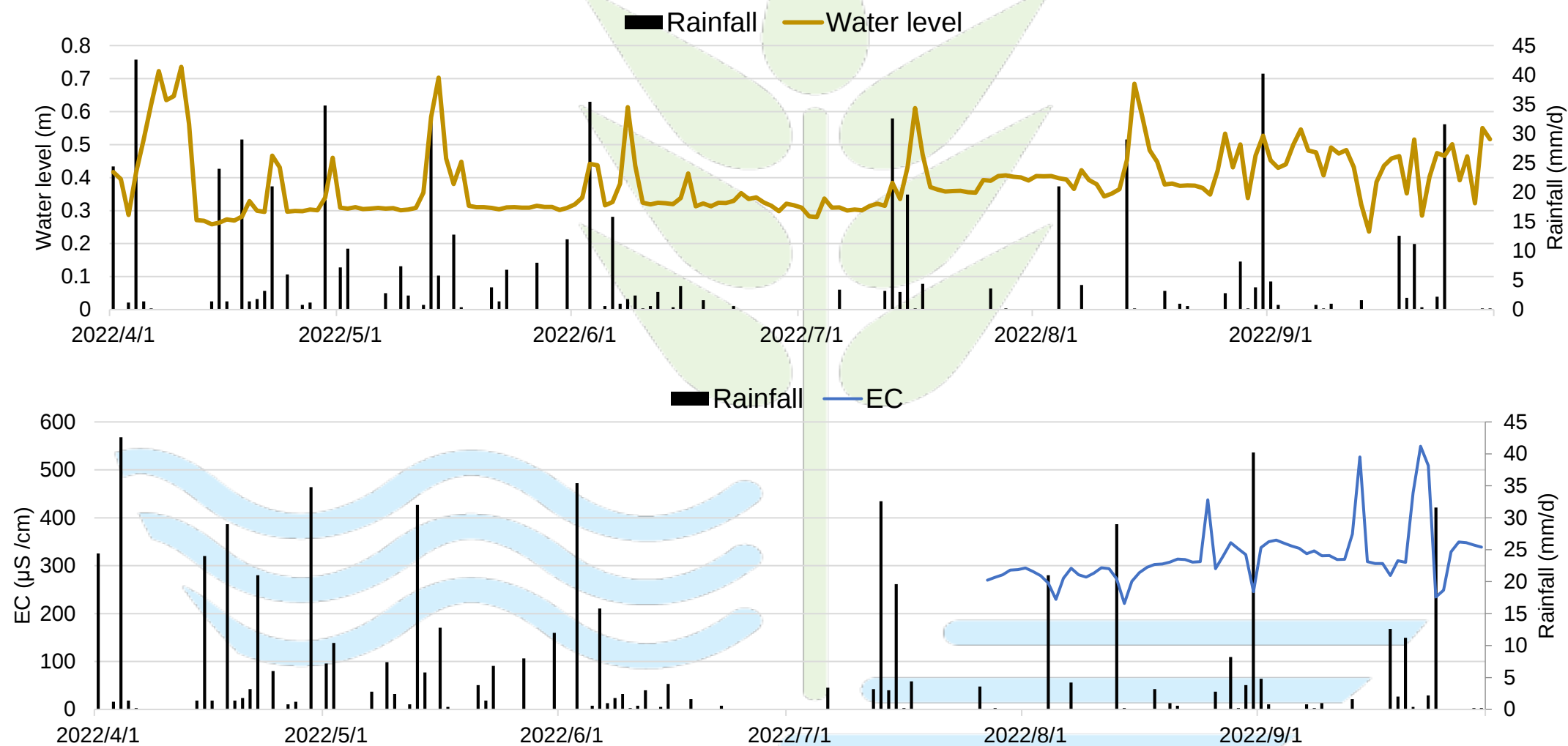
The South Block

Farm drain

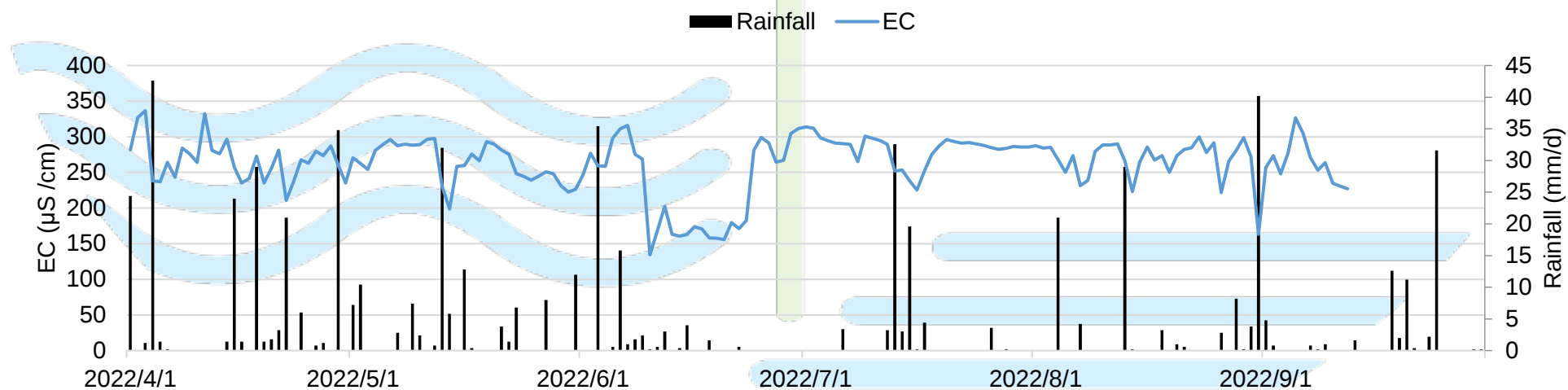
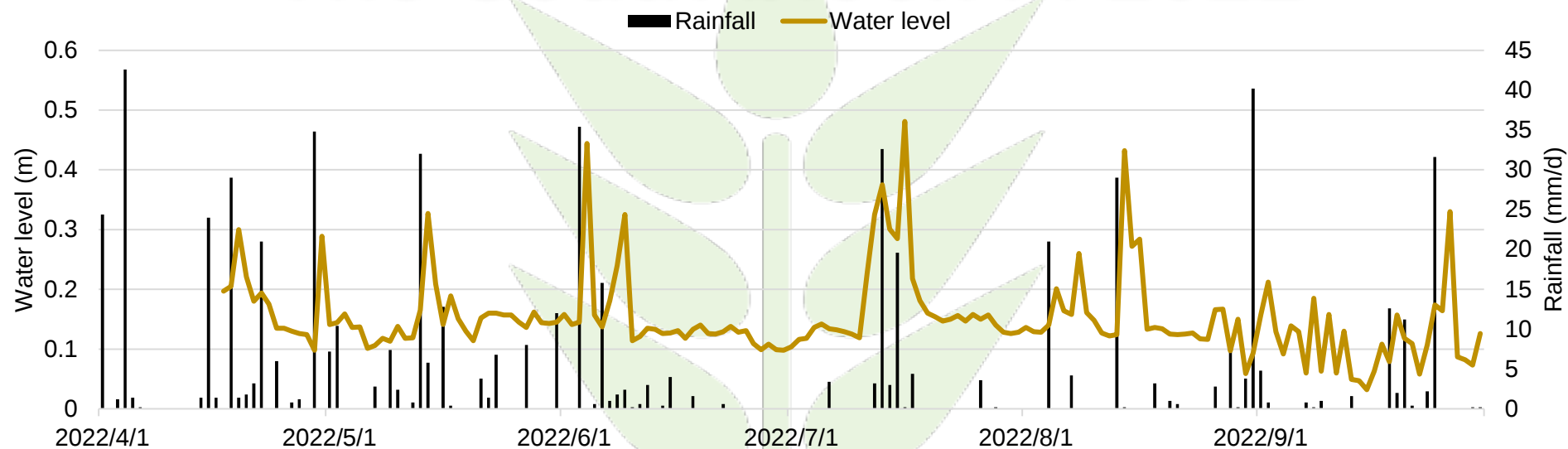
The North Block



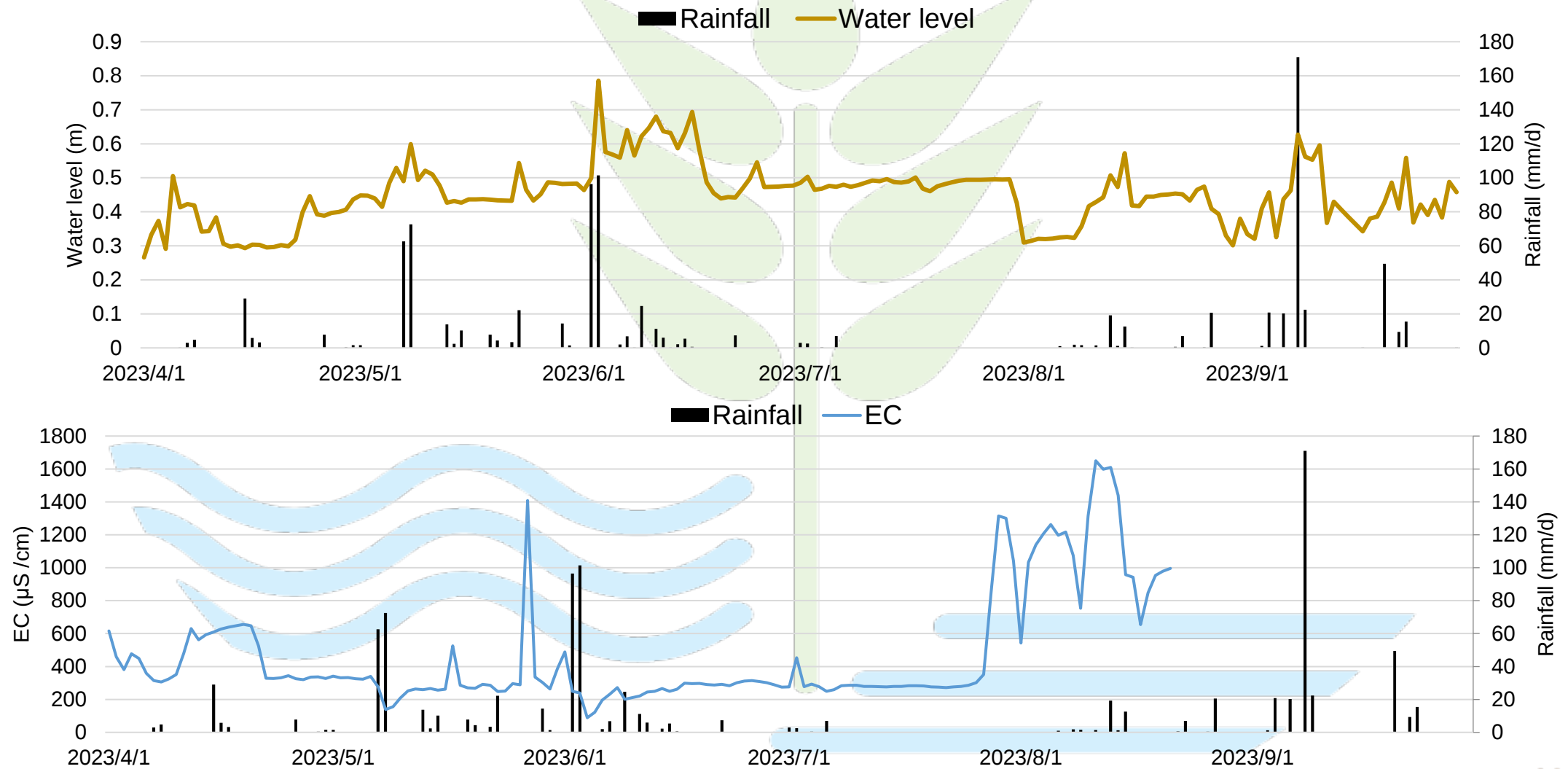
The North block in 2022



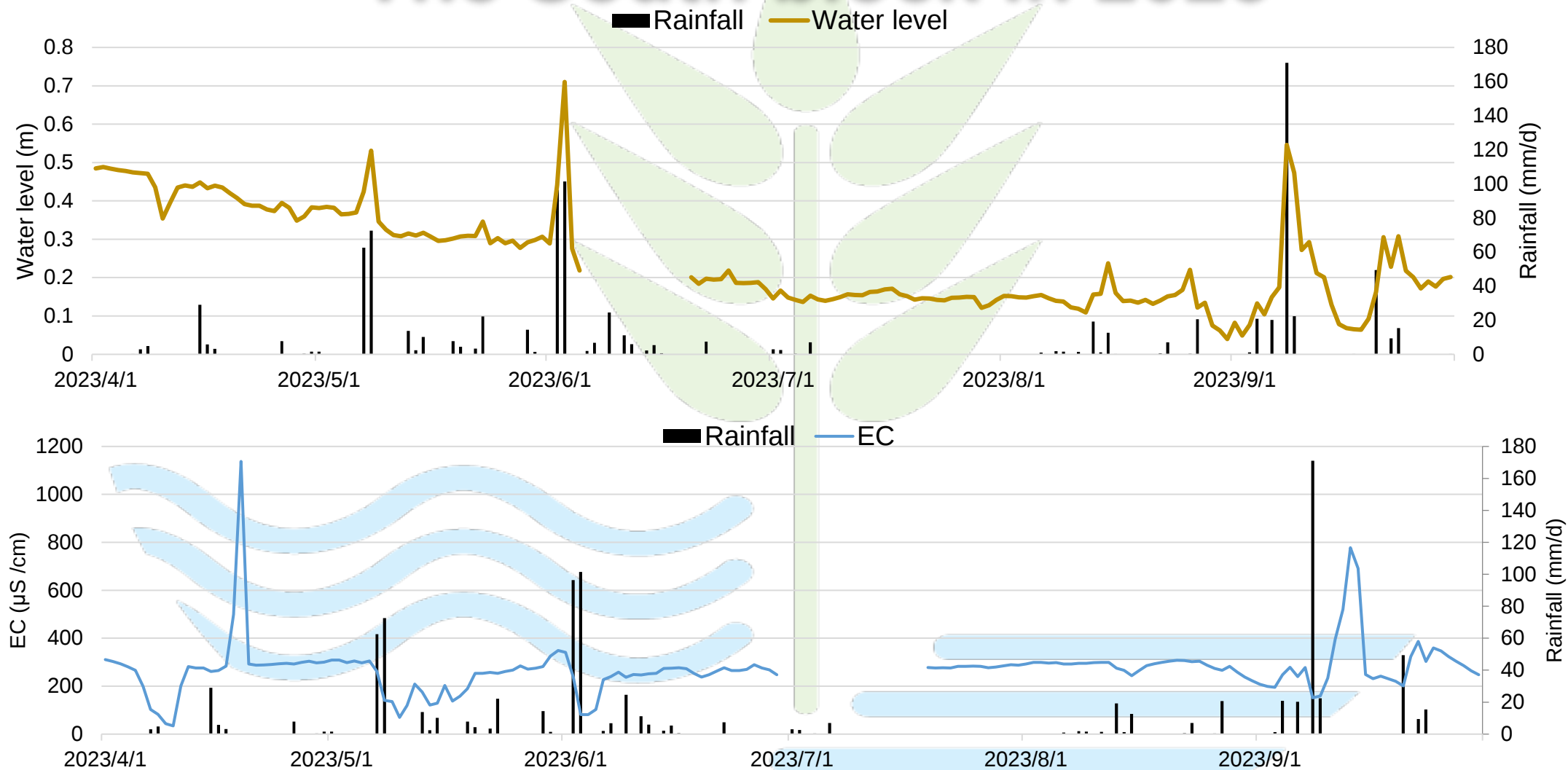
The South block in 2022



The North block in 2023



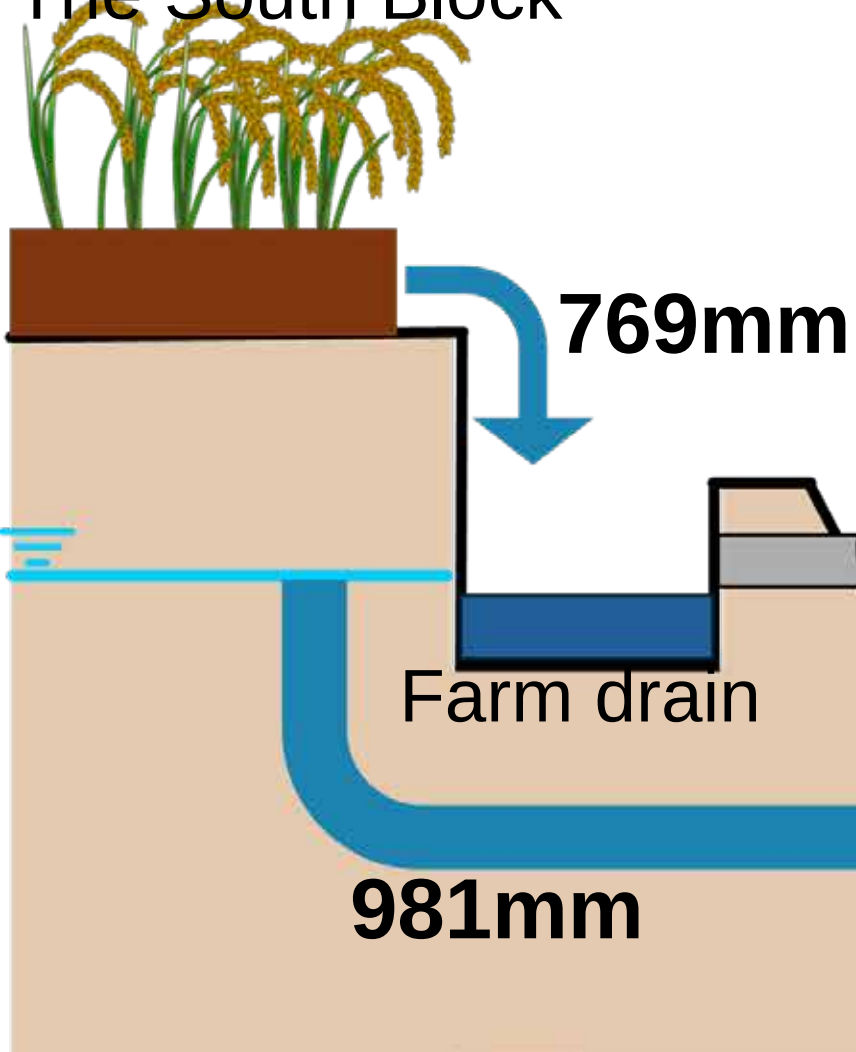
The South block in 2023



Water balance in 2022

From April 14
to August 25

The South Block



410mm

591mm

Pumping
Station

The North Block

1137mm

Farm drain

918mm

The main drainage
canal

Summary

- .. Rainfall decreased EC and increased flow rate and water level
- .. In the South, lateral > surface and smooth discharge, and more responsive EC and flow rate
- .. In the North, lateral < surface and poor discharge, and with little rainfall, organic decomposition increased EC
- .. Water quality differences seem to be attributed to differences in the discharge process differences (lateral and surface flow)



Thank you very much