



Comunidad de Regantes
Campo de Cartagena

www.crcc.es





General Data

Establishment year	1952
First irrigation	1979
Surface of irrigable area (has.)	41,294
Community members	9,896
Yearly water supply(Hm ³)	141.9
Max Resources from the Tagus-Segura diversion (Hm ³)	122
Max Resources from the Segura basin (Hm ³)	4.2
Max Resources from the Mojón desalination plant. (Hm ³)	2.2
Max Resources from wastewater treatment plants (Hm ³)	11.68





1979 Changed it all

Water arrives



Source: regmurcia.com



1.015 Million € / 41.500 jobs (2017)



1979 Changed it all

Water arrives

- **Tagus-Segura Water Transfer's regulation policy**

Water is dispensed into the transfer system on a monthly basis, depending on the total water supply available in the reservoirs of Entrepeñas and Buendía at the beginning of every month. Four levels are used to specify the distribution volume for each transfer, with a maximum annual quantity.

- **Allowed areas**
- **Allocation of utilization rights on water: water concessions**

Signing Up

1. **Inside Perimeter**
2. **Land Use**





Main Infrastructure



Channel Length (Km)	64
Channel Capacity (m ³)	300,000
Maximum flowrate (m ³ /s)	18
Service roads (Km)	778
Irrigation tapping points	7,106
Pipes (1600.. 80)	1,033
Pumping stations	9
Remote stations	957
Capacity of our reservoirs (19) (m ³)	2,090,863

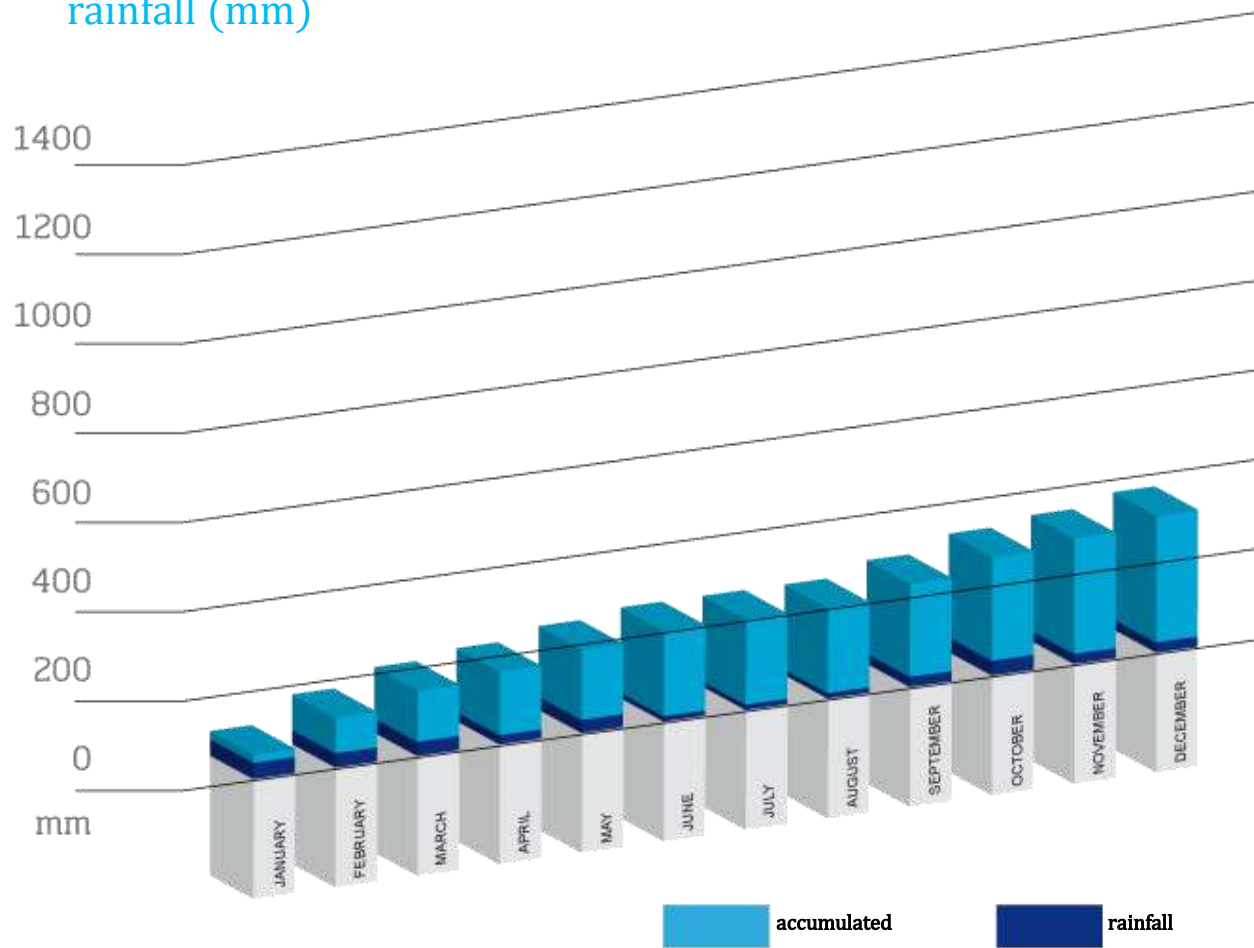


average
temperature (°C)

Average temperature	17-18°
Maximum average temperature	31-33°
Minimum average temperature	4-5°
Number of hours when average temperatures are lower than 0°	20



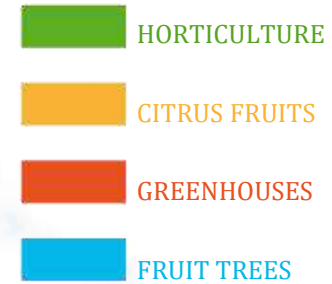
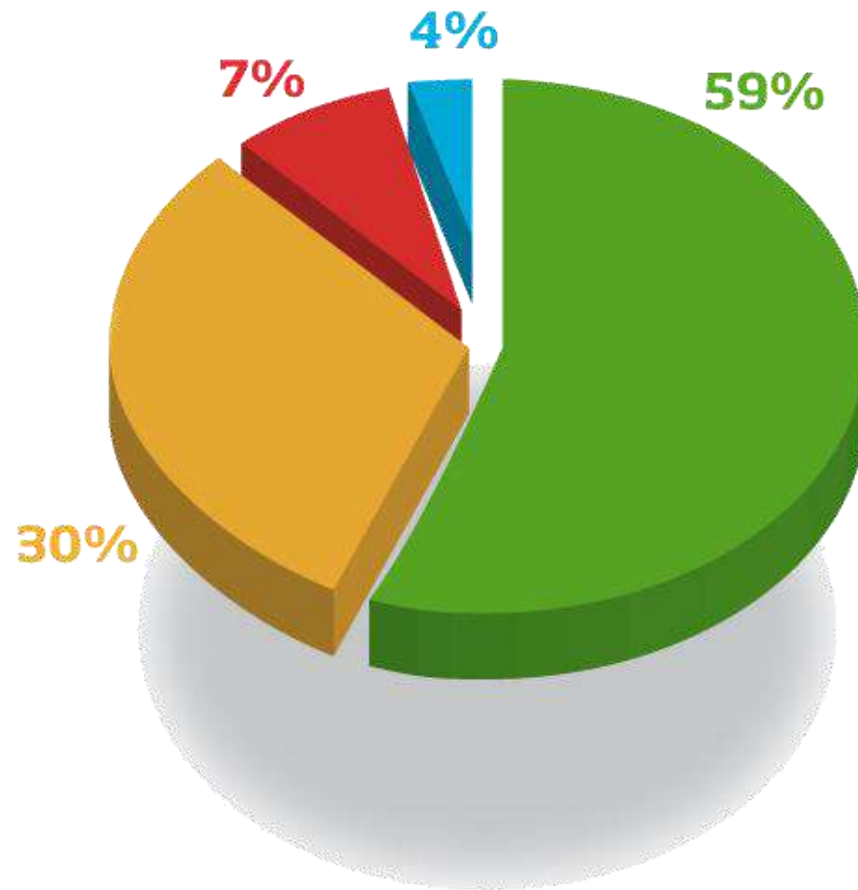
annual
rainfall (mm)





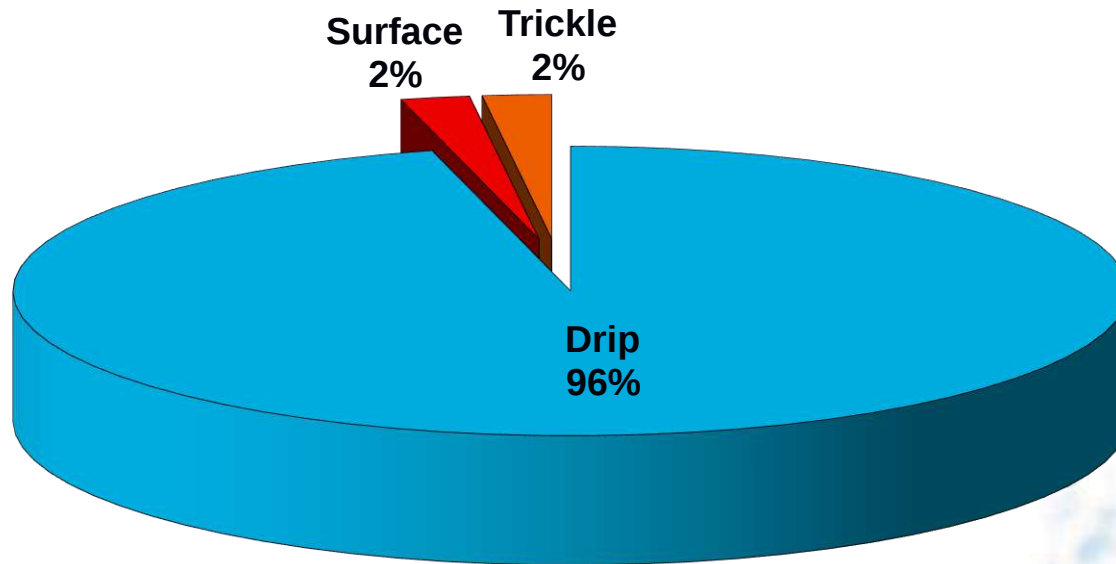
Crops

crop distribution





Irrigation systems

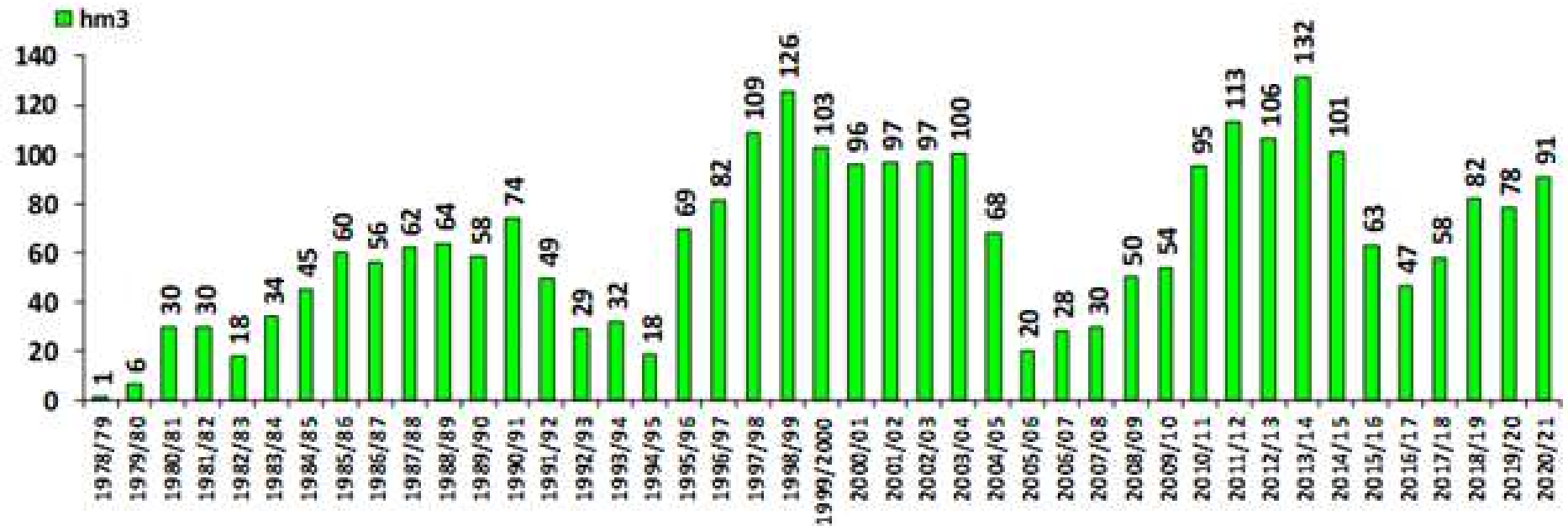




Volume of water distribution

volume distributed by CRCC

hydrologic year (October – September) 1978/79-2020/21

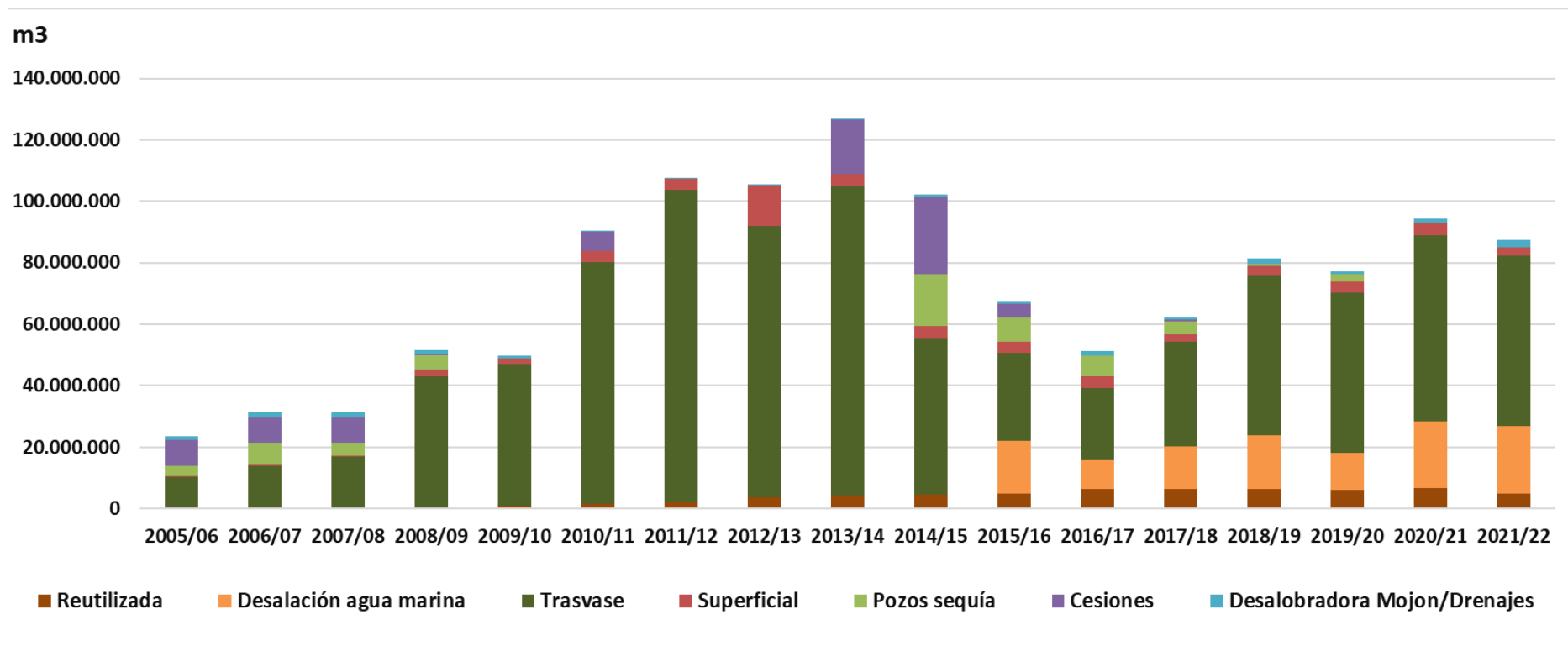




Volume of water distribution

Water Mix distributed by CRCC

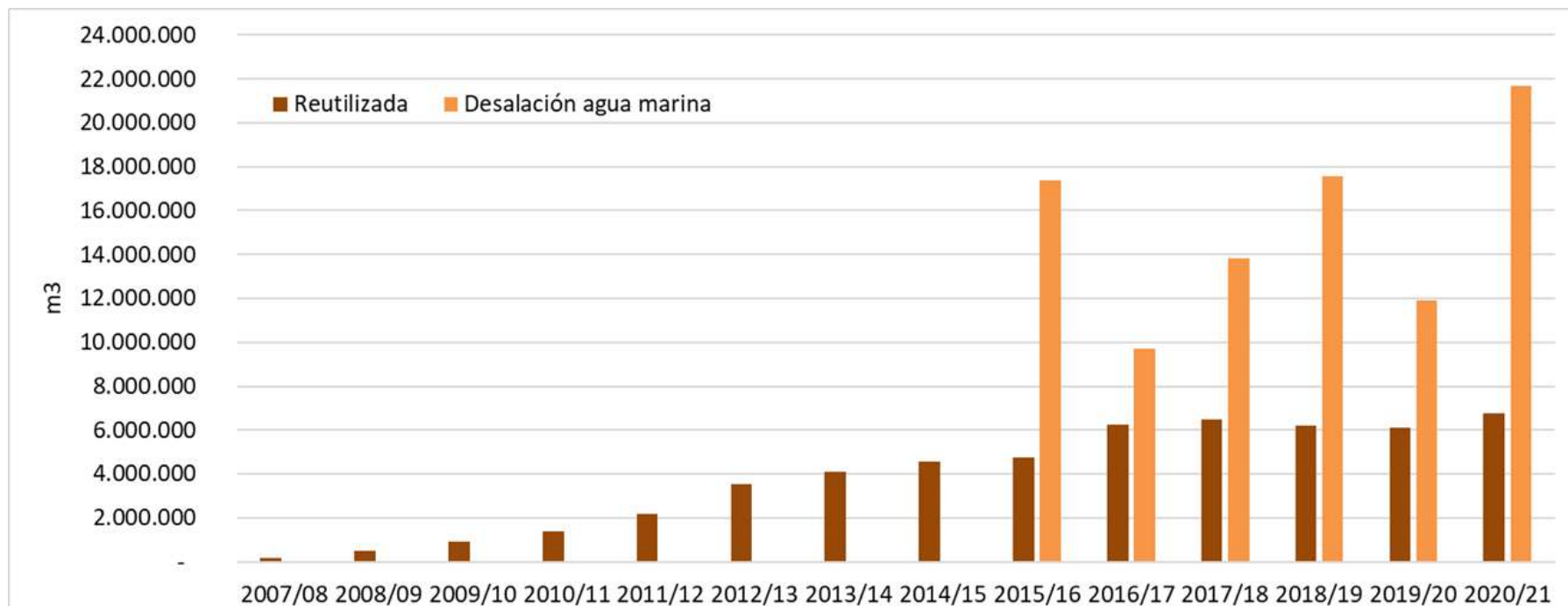
hydrologic year (October – September) 1978/79-2021/22





Volume of water distribution

Water Mix distributed by CRCC hydrologic year (October – September)





m³ price

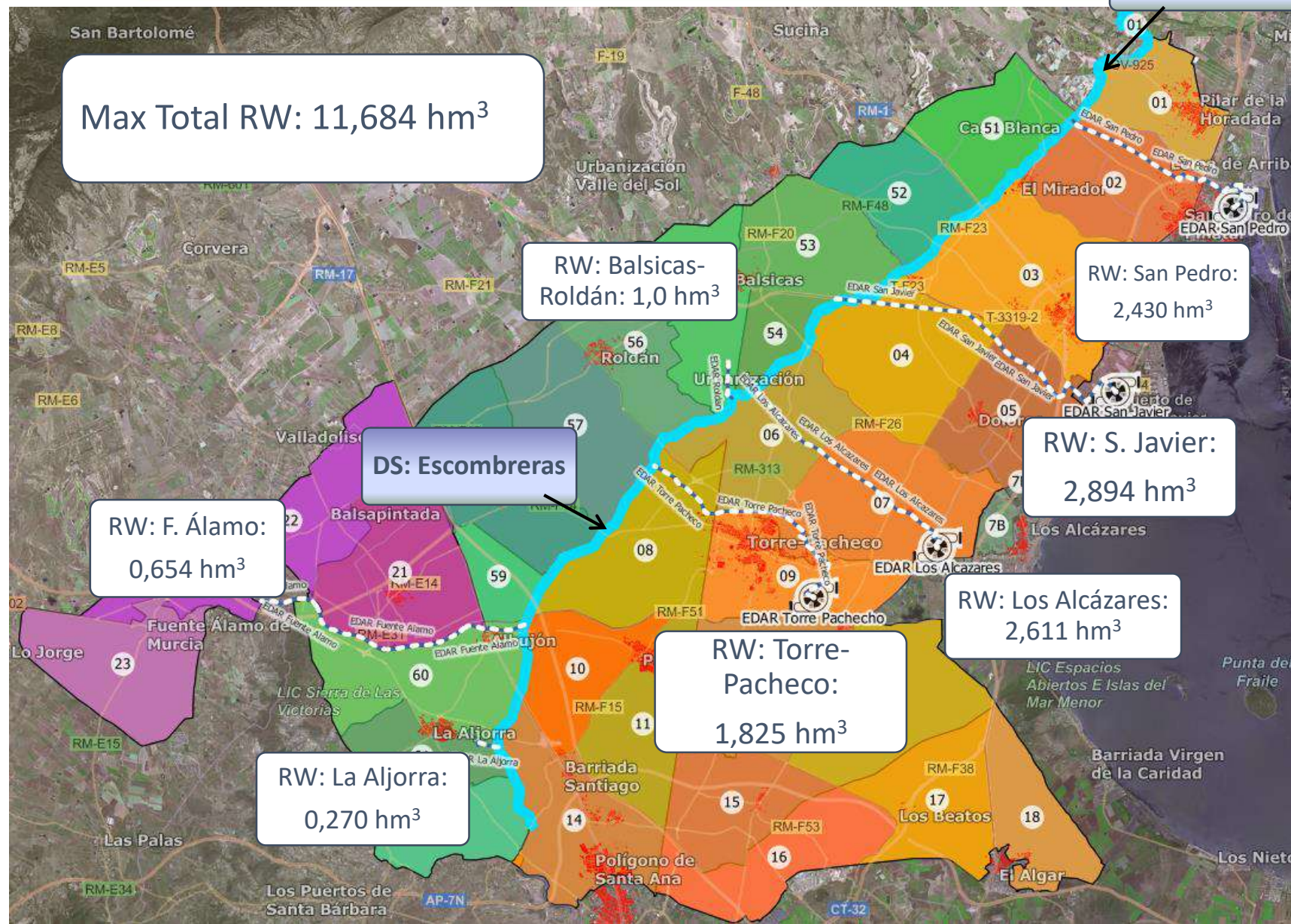


Prices 2023 CRCC:

- Z.R. Oriental y Occidental: 0,410 €/m³
- Z.R. Cota-120: 0,4340 €/m³

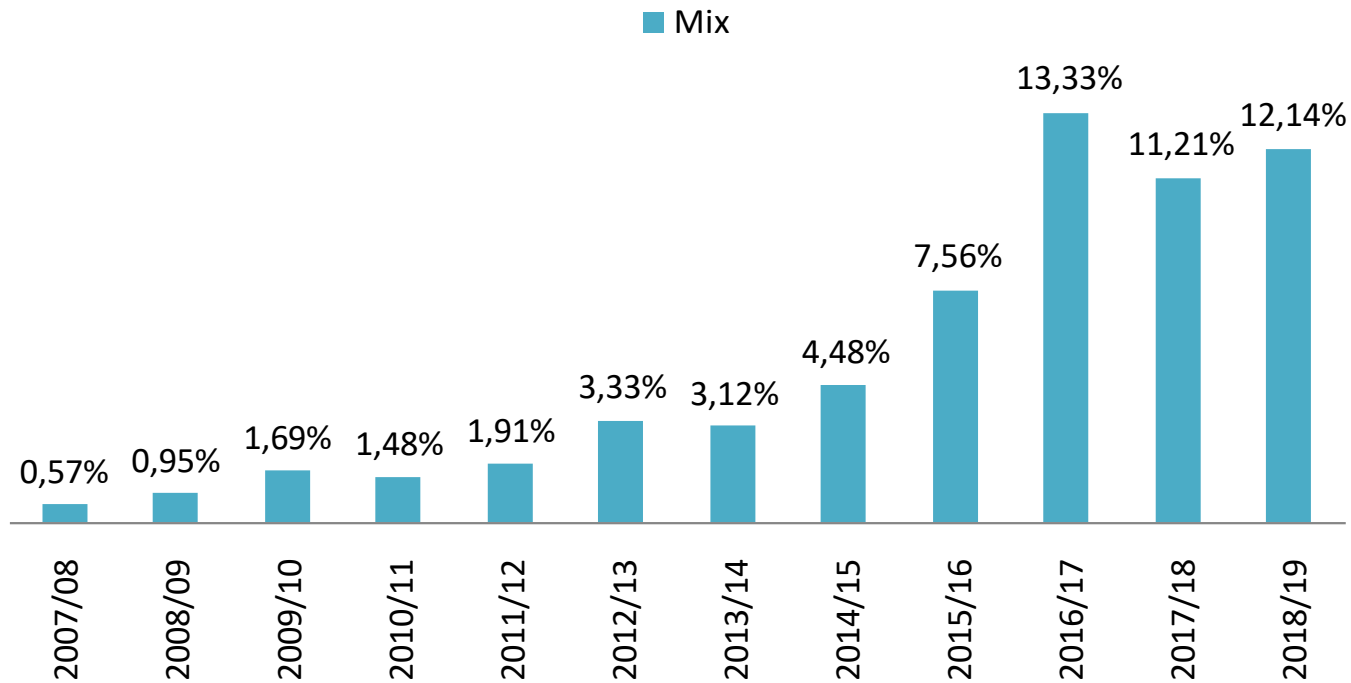


Reclaimed Water Use & Desalination





Reclaimed Water Use



Minimum requirements
Spanish legislation for water reuse
applications (R.D. 1620 / 2007)

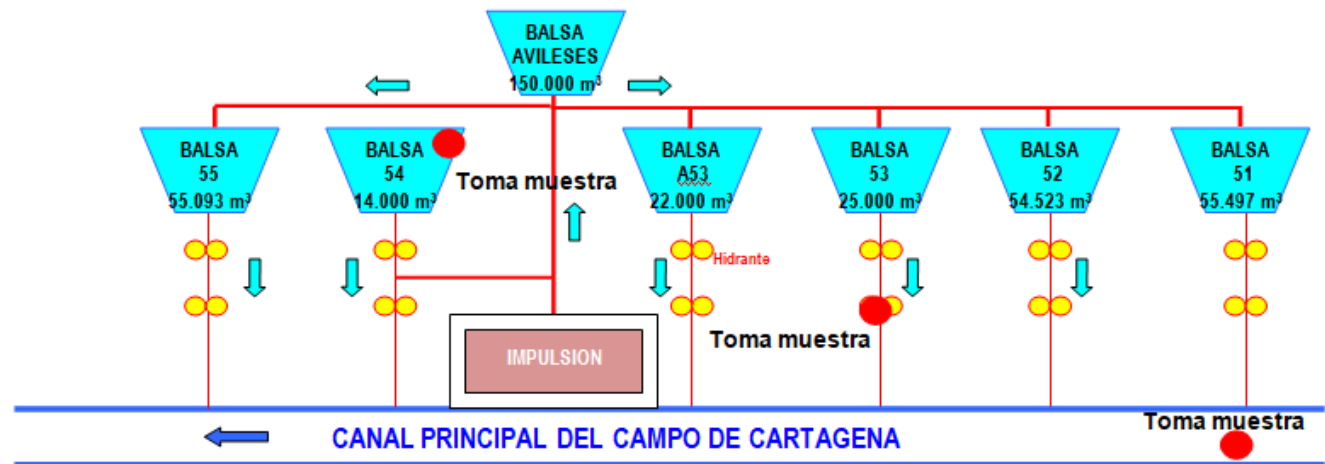
Type of crop	E. coli	Helminths	Suspended solids	Turbidity
Contact water-product and eaten raw i.e.: Lettuces,	100 units/100 mL	1 egg/10 L	20 mg/L	2 NTU
Contact water-product and food processed i.e.: Potatoes	1000 units/100 mL	1 egg/10 L	35 mg/L	---
No contact water-product i.e.: Apples	10000 units/100 mL	1 egg/10 L	35 mg/L	---



Reclaimed Water Use

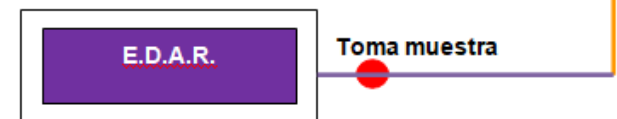
Quality Control Plan

1. Issues & Control Book
2. Sample Points: water reservoirs, canal and hydrants



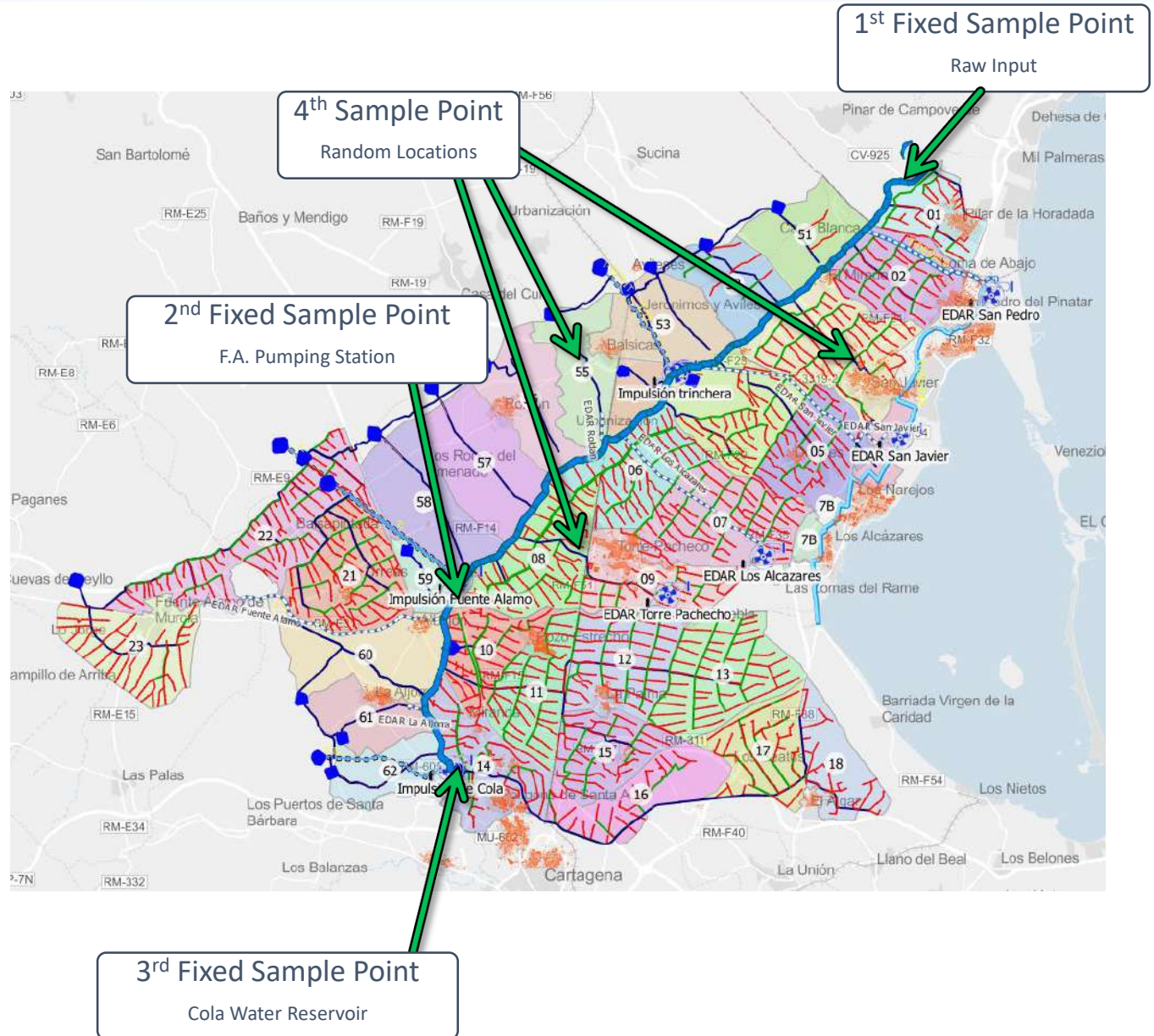
WWTP Sample Interval

- | | |
|---------------------|---------|
| • I. Nematodes | 15 days |
| • E. Coli: | 7 days |
| • Suspended Solids: | 7 days |
| • Turbidity | 7 days |





7 days





Challenges

“The Mix”

- **High EC** **Mix: < 1,200 uS/cm**

TS transfer: 900 uS/cm

Desalinated water: 220 uS/cm

RW*: **4,000- 8,000 uS/cm**

- **Nutrients (nitrogen and phosphorous)**

- Lack of oxygen/ H₂S: confined underground spaces

- **Portable gas detector**

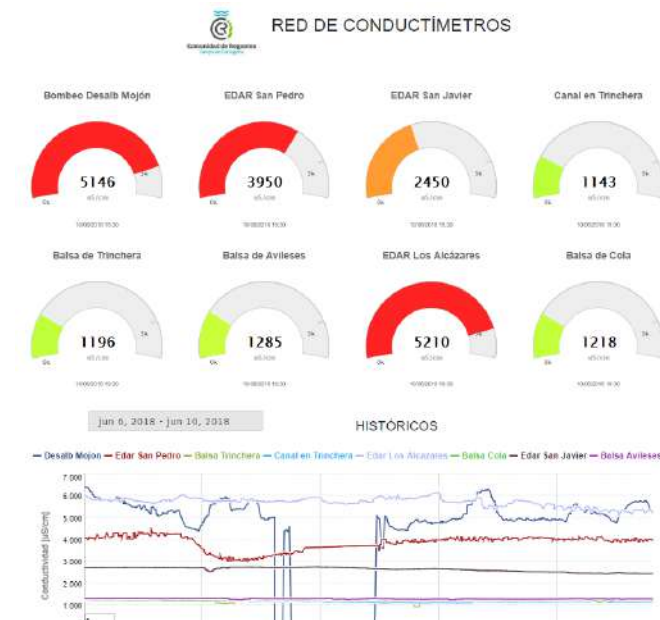
- **Moving elements out**

- Water reservoirs: excessive algae growth

- **Ultrasound irradiation-coagulation**

- **Copper based compounds**

- **Boron** **Mix: < 0,5 mg/L**

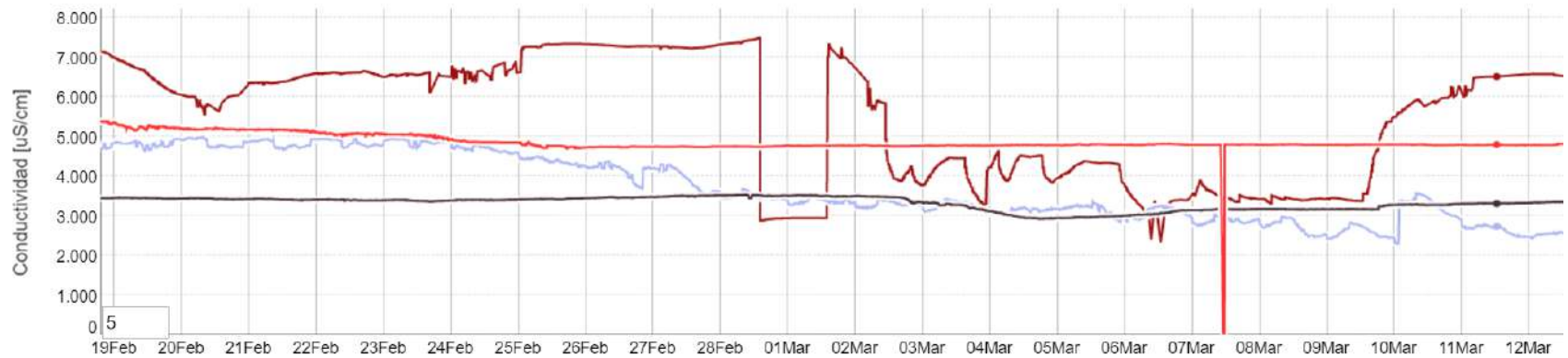




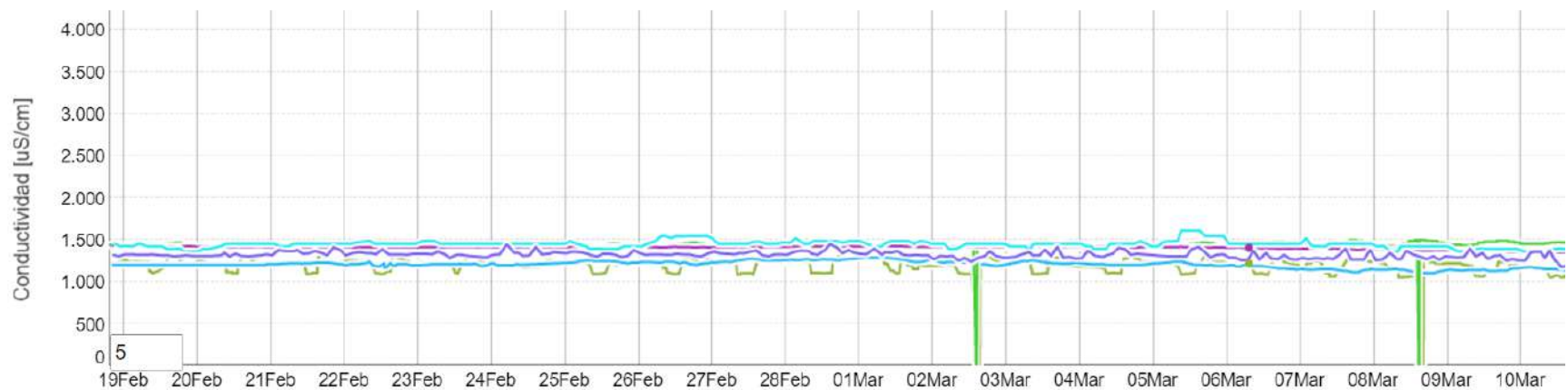
Challenges

“The Mix”

2023/03/11 12:43: **Edar San Pedro**: 6522 **Edar Los Alcazares**: 2740 **Edar San Javier**: 3312 **Edar T. Pacheco**: 4804



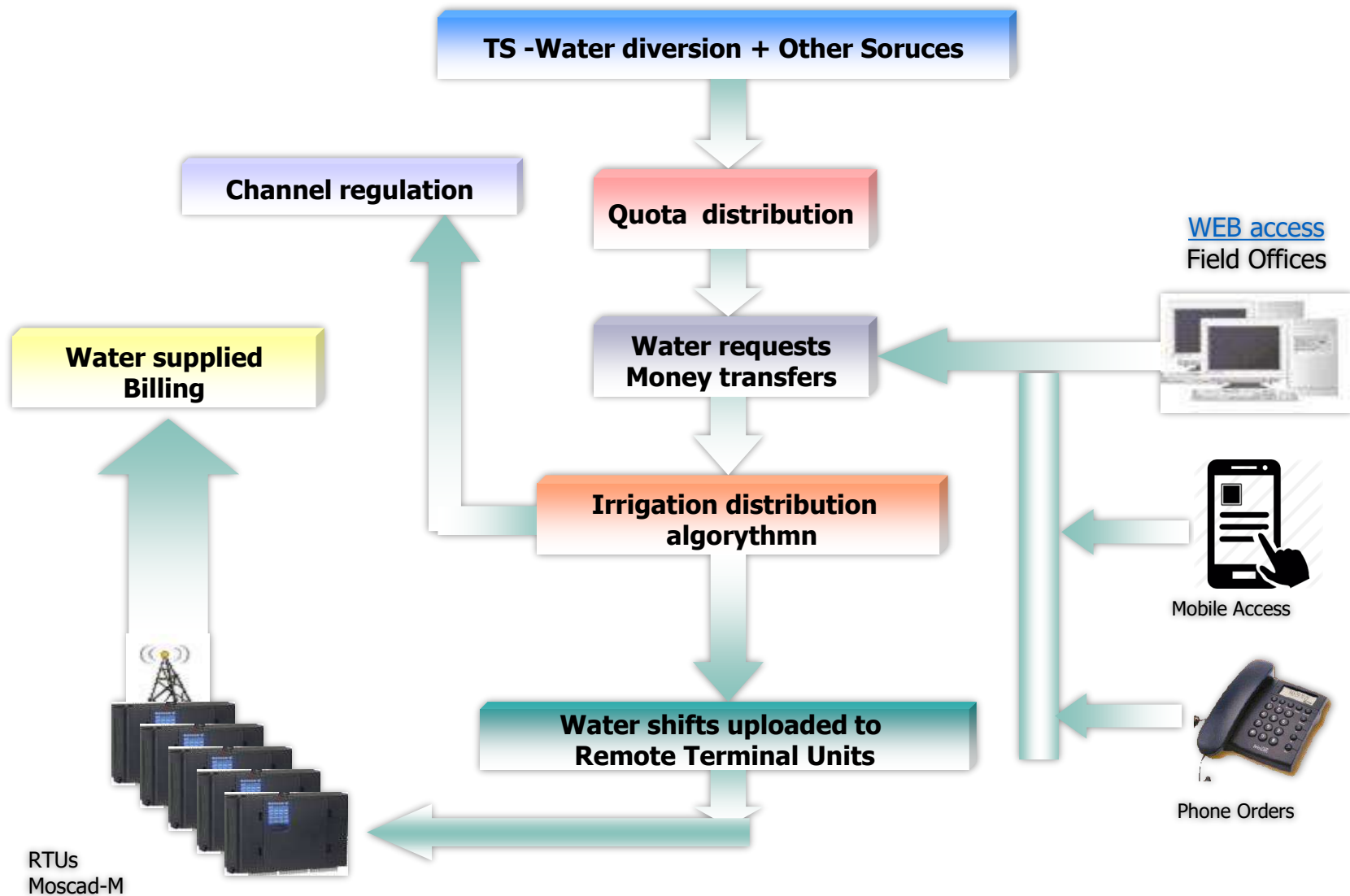
2023/03/06 07:34: **Balsa Trinchera**: 1218 **Balsa Cola**: 1400 **Balsa Avileses**: 1402





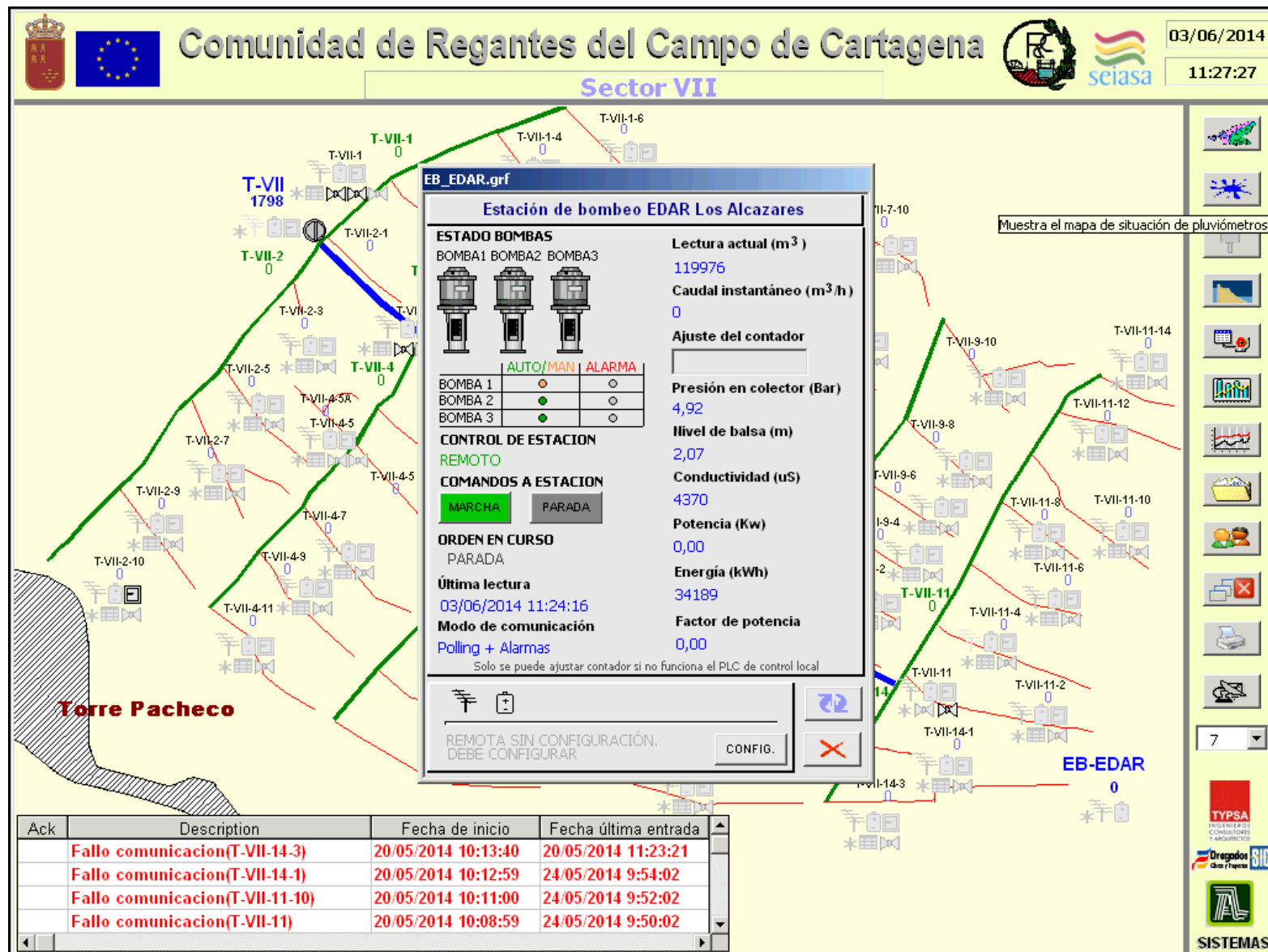


C R C C - Flowchart





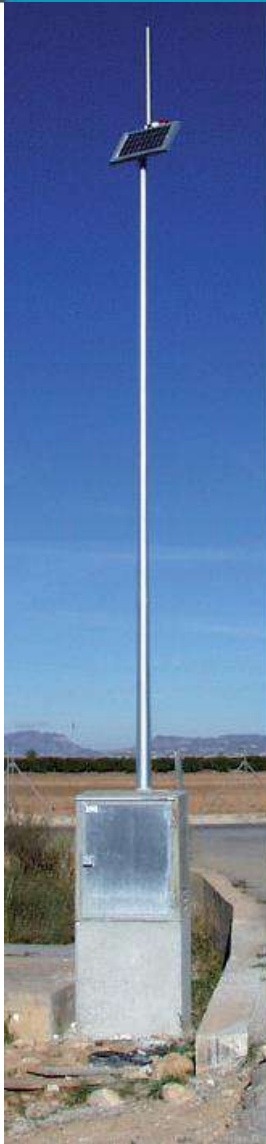
Telecontrol System- SCADA







Remote stations





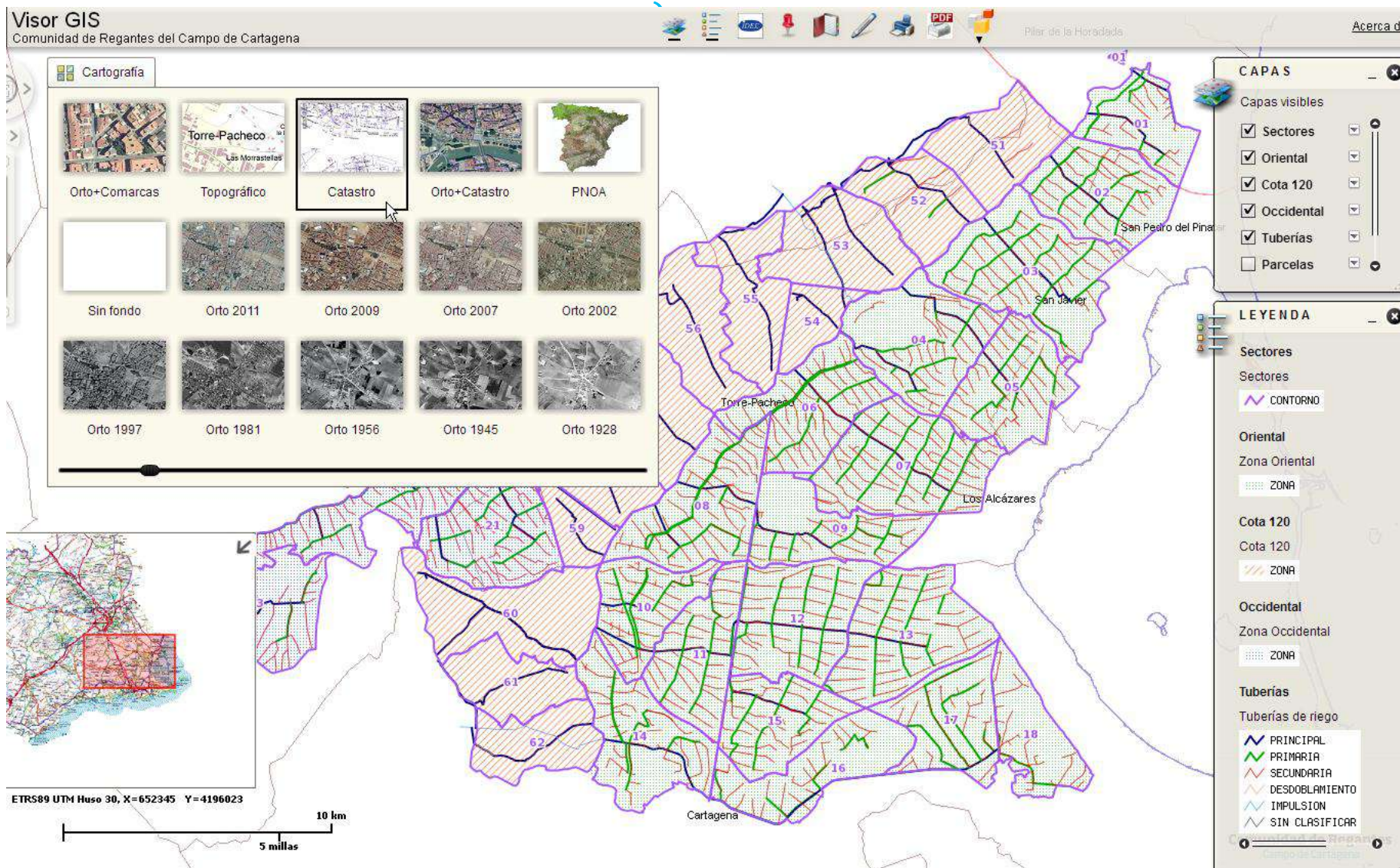
Hydrants





GIS

<http://gis.crcc.es> (free access)





Water Reservoir Monitoring

COLA (S. XIV) 11:00:53 03/06/2014



CÁNTARA (Imp. F.A.) 11:00:56 03/06/2014



BALSA BAJA (S. XXI) 11:00:27 03/06/2014



BALSA ALTA (S. XXII + COTA-120) 11:00:42 03/06/2014



TRINCHERA (S. 51-55) 11:00:47 03/06/2014



EDAR LOS ALCAZARES



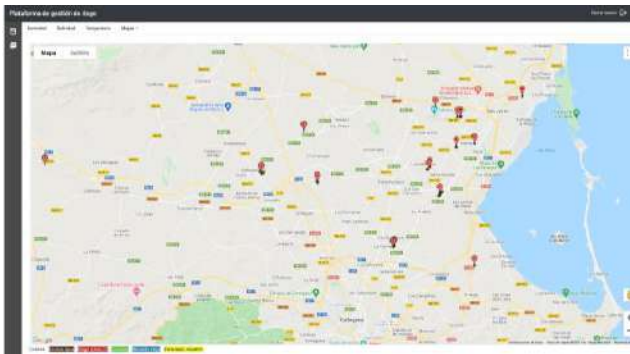
<http://camaras.crcc.es>

(Free Access)

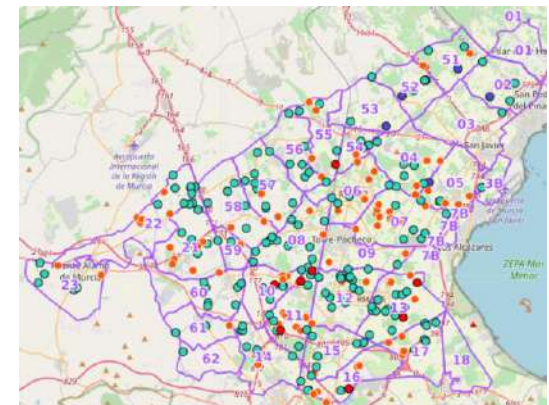


Smart Farming

- UPCT project: 47 monitored sites. Lemon tree, mandarin tree, orange tree, potato, melon, broccoli, lettuce, pepper



- CARM project. Smart Agriculture Technologies and Aquifer Control in the CRCC of the CARM: 500 selected sites, electronic probes measuring humidity in different soil profiles, electrical conductivity, ambient temperature and relative humidity as well as soil ones.





Smart Farming

Temperatura Amb.
23 °C

Humedad Relativa
60 %



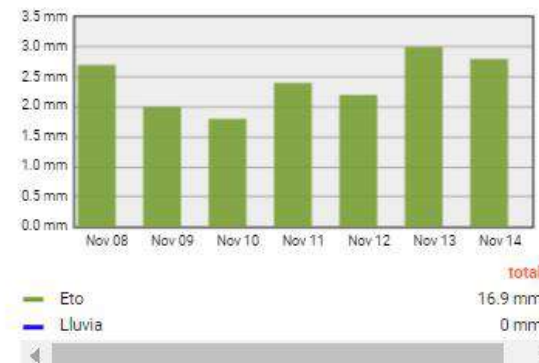
C.E. Suelo Sup.
3.5 dS/m

C.E. Suelo Prof.
4.9 dS/m

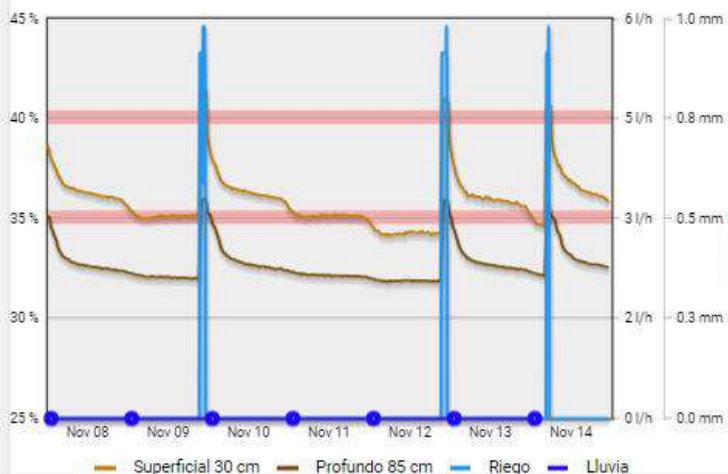
Humedad Volumétrica



Eto y Precipitaciones



Humedad Volumétrica



Activo Fecha Bateria

2023-11-14 11:00:00 96 %

Necesidades Hídricas Teóricas Semanales
63 m3/ha

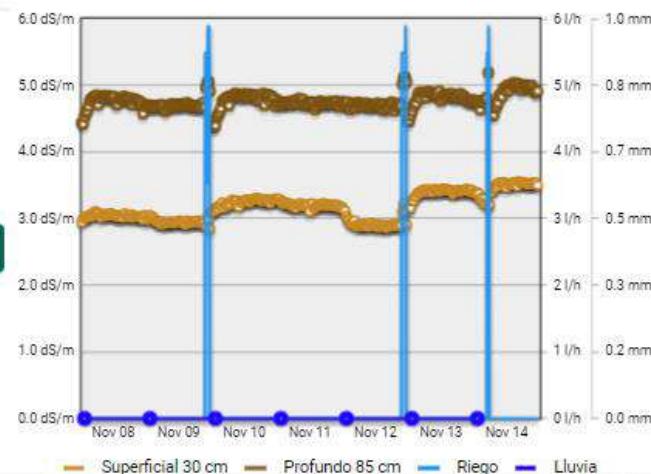
Datos Adicionales

Visor Satélite

Radar Meteorológico

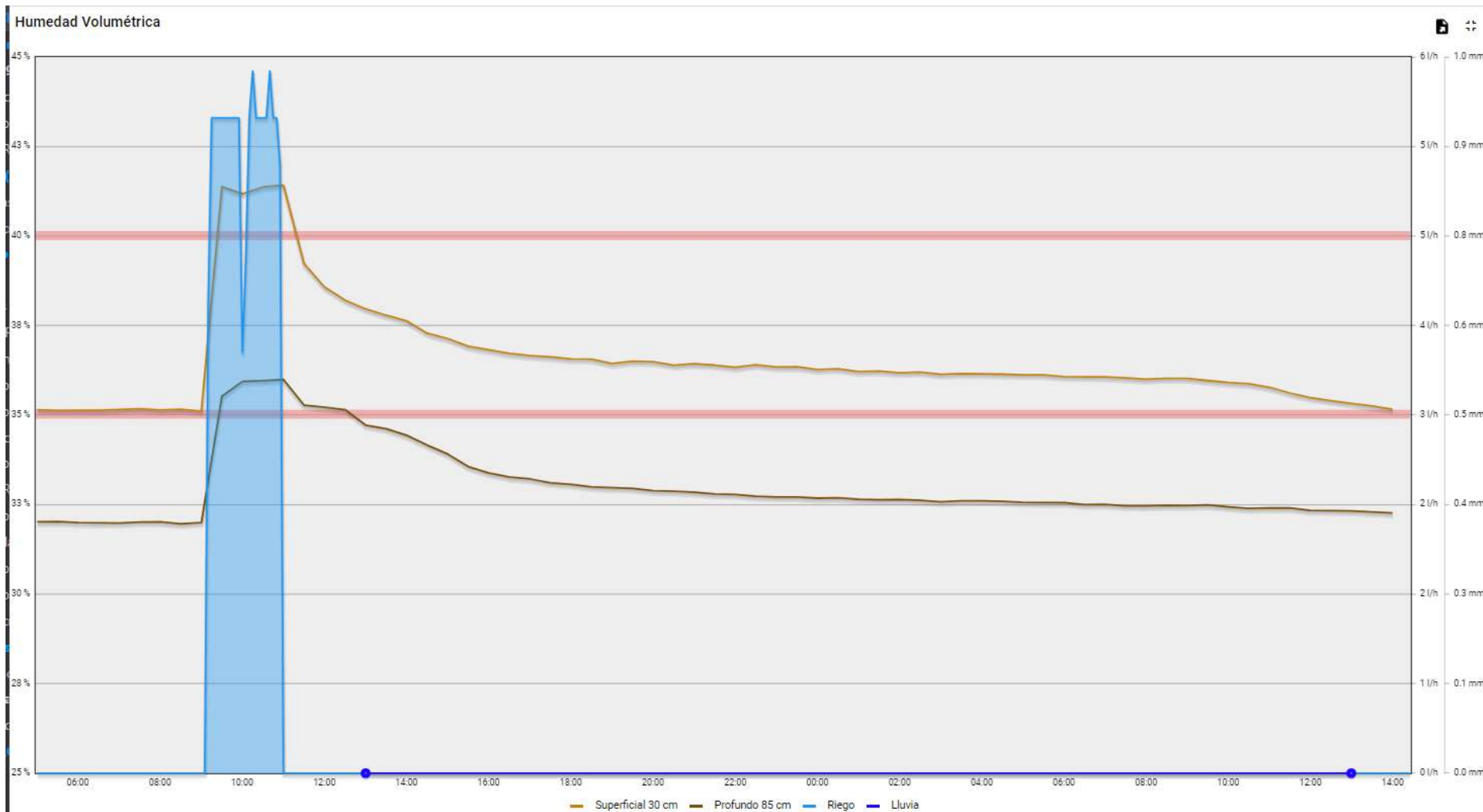


C.E. Suelo





Smart Farming



Thank you for your Attention



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