Interreg Sudoe

Co-funded by the European Union

TARGET

TerritoriAl stRateGy for watEr scarciTy

Technical approaches for safe and replicable water reuse: from continuous monitoring to decision-support tools

Antonio Ortiz Ruiz (UPC)

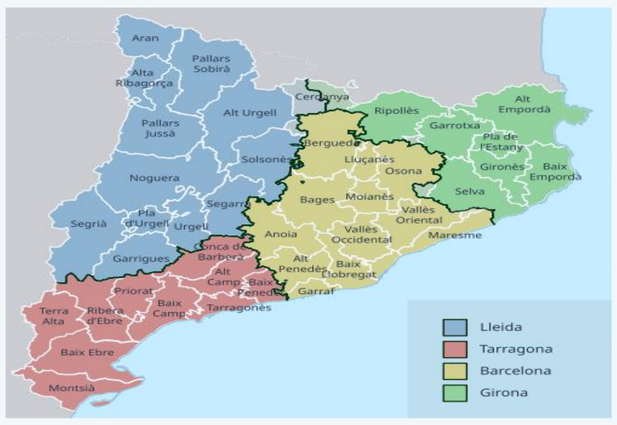


Online water quality monitoring, microbiological early warning, nature-based solutions assessment and replicability

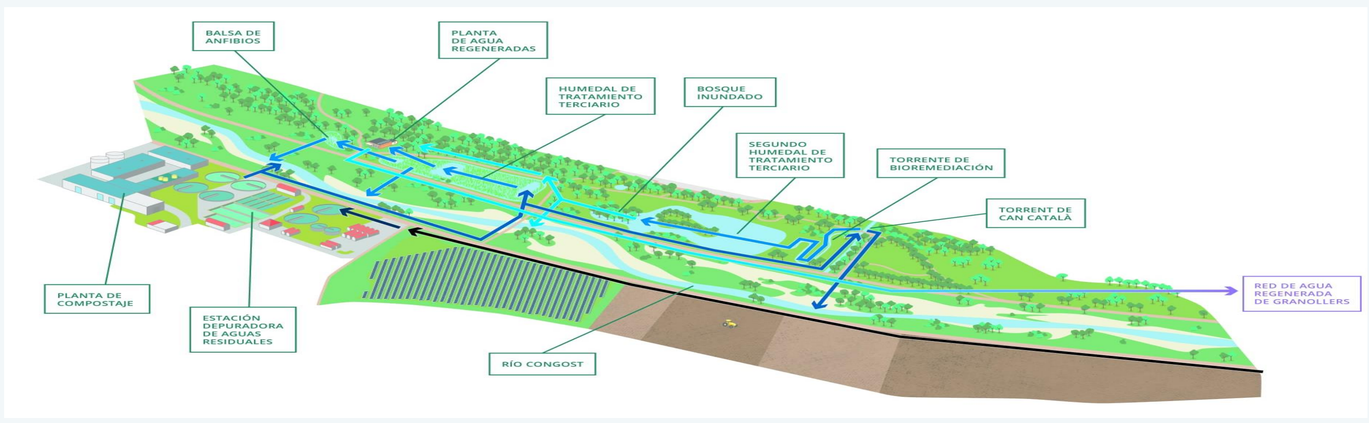
Bordeaux, 3 Novembre 2026

01 OBJECTIVES & DEMONSTRATION SITE

Integrate continuous water-quality monitoring, microbiological risk analysis, nature-based solutions (NbS) assessment and technical guidance for replication across the SUDOE area.



Catalonia · Granollers



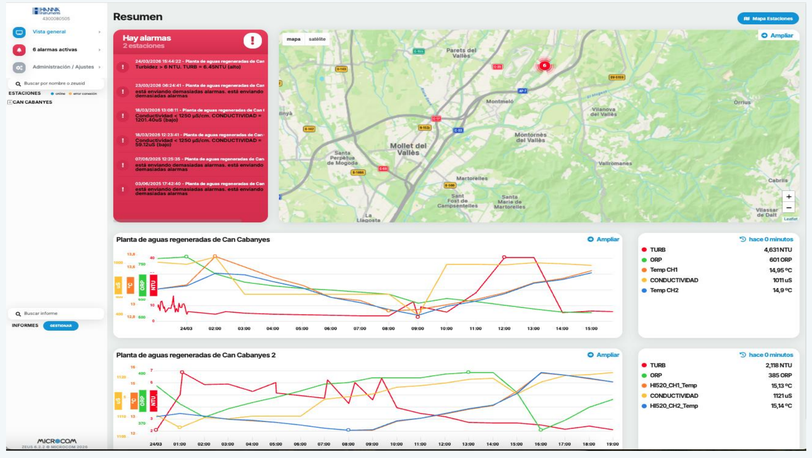
Can Cabanyes constructed wetland and water-reuse facilities

02 ONLINE MONITORING

Online monitoring points

Turbidity · redox potential · conductivity · temperatura

Real-time alarm notificaction

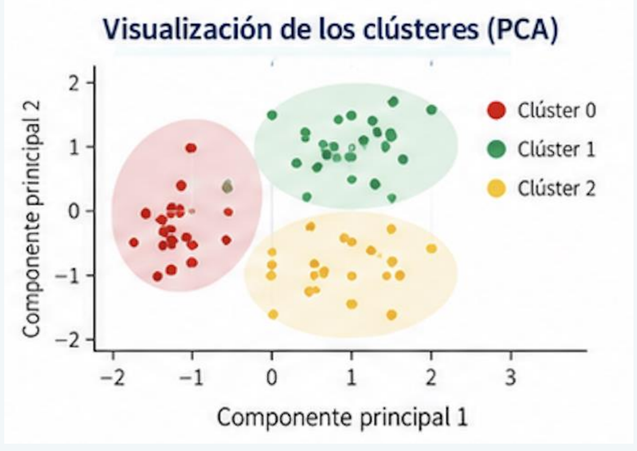


Operational lesson: automatic cleaning, calibration and sensor checks are essential for reliable data.

03 MICROBIOLOGICAL RISK ANALYSIS

112 complete daily records | 24 E. coli positive / 88 negative

Logistic regression: associations between physicochemical parameters and E. coli presence. McFadden pseudo-R^2 = 0.30.



Hierarchical clustering

Cluster 0: 25% positive

Cluster 1: 0% positive

Cluster 2: 12.5% positive

Observed frequencies, not validated weekly predictions.

04 MULTICRITERIA NbS ASSESSMENT

45 participants · 15 countries · 5 criteria · 4 alternatives

AHP criteria weighting (41 consistent responses) + SAW alternative scoring (45 responses)

Constructed wetlands	**3.993 / 5**
Sustainable drainage systems (SUDS)	**3.855 / 5**
Riverbank restoration	**3.757 / 5**
Managed aquifer recharge	**3.745 / 5**

95.8% of 4,000 resamples ranked constructed wetlands first; score differences remain uncertain.

05 REPLICABILITY & LESSONS LEARNED

SENSING & DATA ACQUISITION

Hydraulic suitability · sensors in series · online records · cleaning and biofilm control · flow checks · invalid-data identification

MICROBIOLOGICAL ALERT PROTOCOL

Local model fitting and validation · alert thresholds · verification and communication · responsibilities · response measures · periodic review

EPIDOR EPTB Dordogne · Le Grand Périgueux Communauté d'Agglomération · Agencia de Medio Ambiente y Agua de Andalucía Junta de Andalucía · NOVA Faculdade de Ciências e Tecnologia · République Française Liberté Égalité Fraternité · Cerema Climat & territoires de demain · Ajuntament Granollers · Barreiro Câmara Municipal · Universidad Complutense Madrid · UPC Universitat Politècnica de Catalunya BarcelonaTech · ecofilae

