Water use and wastewater management

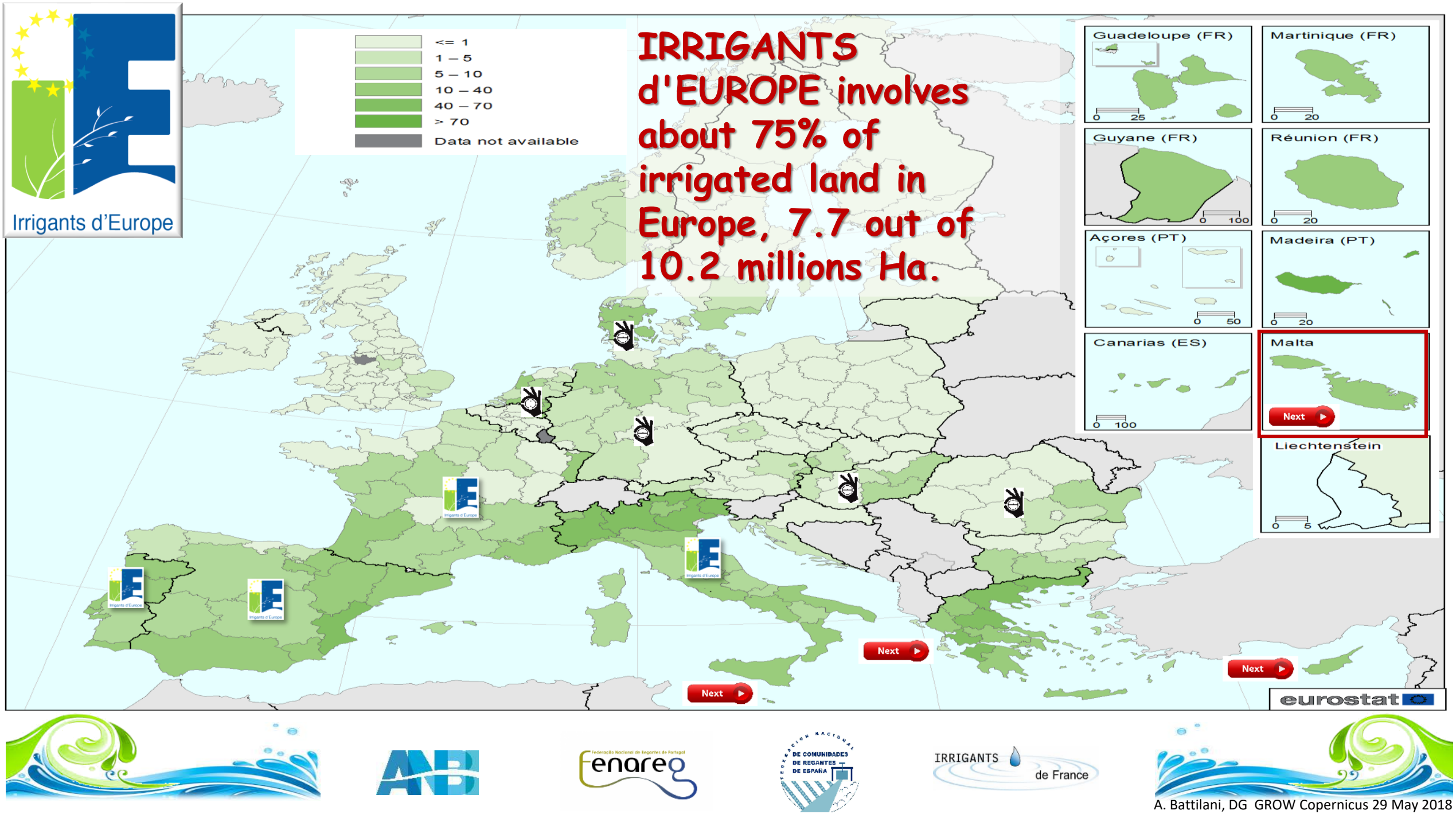
Irrigants d'Europe

fenareg

IRRIGANTS de France

The largest associations managing water in agriculture have created **IRRIGANTS d'EUROPE**. Founders include the national associations in charge of irrigation water management of the Member States were irrigation is most relevant:

- **ANBI** - Associazione Nazionale Consorzi di Gestione e Tutela del Territorio e Acque Irrigue (IT)
- **FENACORE** - Federacion Nacional de Comunidades de Regantes (ES)
- **Irrigants de France** (FR)
- **FENAREG** – Federaçao Nacional de Regantes de Portugal (PT).


Irrigants d'Europe
<= 1
1 – 5
5 – 10
10 – 40
40 – 70
> 70
Data not available
IRRIGANTS d'EUROPE involves about 75% of irrigated land in Europe, 7.7 out of 10.2 millions Ha.
Guadeloupe (FR)
Martinique (FR)
Guyane (FR)
Réunion (FR)
Açores (PT)
Madeira (PT)
Canarias (ES)
Malta
Next
Liechtenstein
Next
Next
Next
eurostat

- Irrigated agriculture has great potential in terms of production of public goods, it is supported by excellent technical capabilities, and still counts on untapped resources.
- Irrigation and water management are the keys to sustainable agriculture in a circular economy context, responding to the challenges of climate change and food security.
- Water use is now more sustainable: researches and investments were made to support environmentally friendly growth in the sector, which is now among the most advanced and innovative in the agricultural sector and beyond.
- Irrigated agriculture is a key driver for economic growth in rural environments, ready to implement advanced monitoring and management criteria based on big data for the implementation of precision agriculture

User	Category	Role
Irrigation Consortia	Public and Private	The main beneficiaries of the MOSES platform and services, mainly for optimal procurement and management of irrigation water to be provided to irrigation districts and individual farms/fields, in view of reduced costs and energy savings.
Service Companies in Water Management sector	Private	Advisors to farmers in irrigated districts; they can benefit from access to MOSES products to define and refine further services to farmers, including seasonal outlooks, and water cost assessments
Agricultural Extension Service	Public	Providing advisory bulletins or specific technical advice to farmers in irrigated districts; they can benefit from access to MOSES products to define and refine further extension services to farmers, including seasonal outlooks, and water cost assessments
Agri-Business Companies/ Farmer's Association	Private	MOSES services can be beneficial also to manage water procurement and management in large irrigated farms, farmers' consortia and irrigation districts, as well as Agri-Business companies depending on local irrigated crop production systems (e.g. tomato canning districts, pasta producers and so on).

Decisional action	Objective	Scale
Risk Management	Flood prevention; Drought management; River Minimum Vital Discharge	Basin/sub-basin
Planning and operation of water distribution system (Infrastructure planning and maintenance)	Intervention prioritization	Basin/sub-basin
Water procurement	Seasonal irrigation water request to basin authorities [e.g. CER, bringing water from the Po river to CBR]	Basin/sub-basin
Water allocation	Allocation planning e.g. CBR operating at district level	Basin/District
Water distribution	Area/crop specific water delivery planning; area/crop specific in season water distribution"	District/Multi scale

Time Scale	Rationale
Annual	For the management at higher level of large areas (basin)
Seasonal	For the management of sub-basin areas at Consortia/district level
Fortnight	For in-season operations in accordance with the schemes in the served area
Weekly	For in-season operations in accordance with the schemes in the served area
Decade	For in-season operations in accordance with the schemes in the served area

IRRIGATED AGRICULTURE IS ENGAGED IN INNOVATING

Irrigants d'Europe

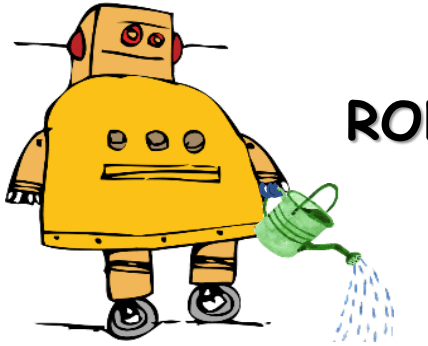
PRECISE IRRIGATION

Horizon Europe

INNOVATION

BIG DATA

AGRICULTURE 4.0



ROBOTICS

WATER REUSE AND QUALITY

INTEGRATION OF DATA SOURCES

Irrigants d'Europe

PRECISION IRRIGATION

FIGARO
PRECISION IRRIGATION TECHNOLOGIES

SITE-SPECIFIC IRRIGATION

Soil variability must be substantial:

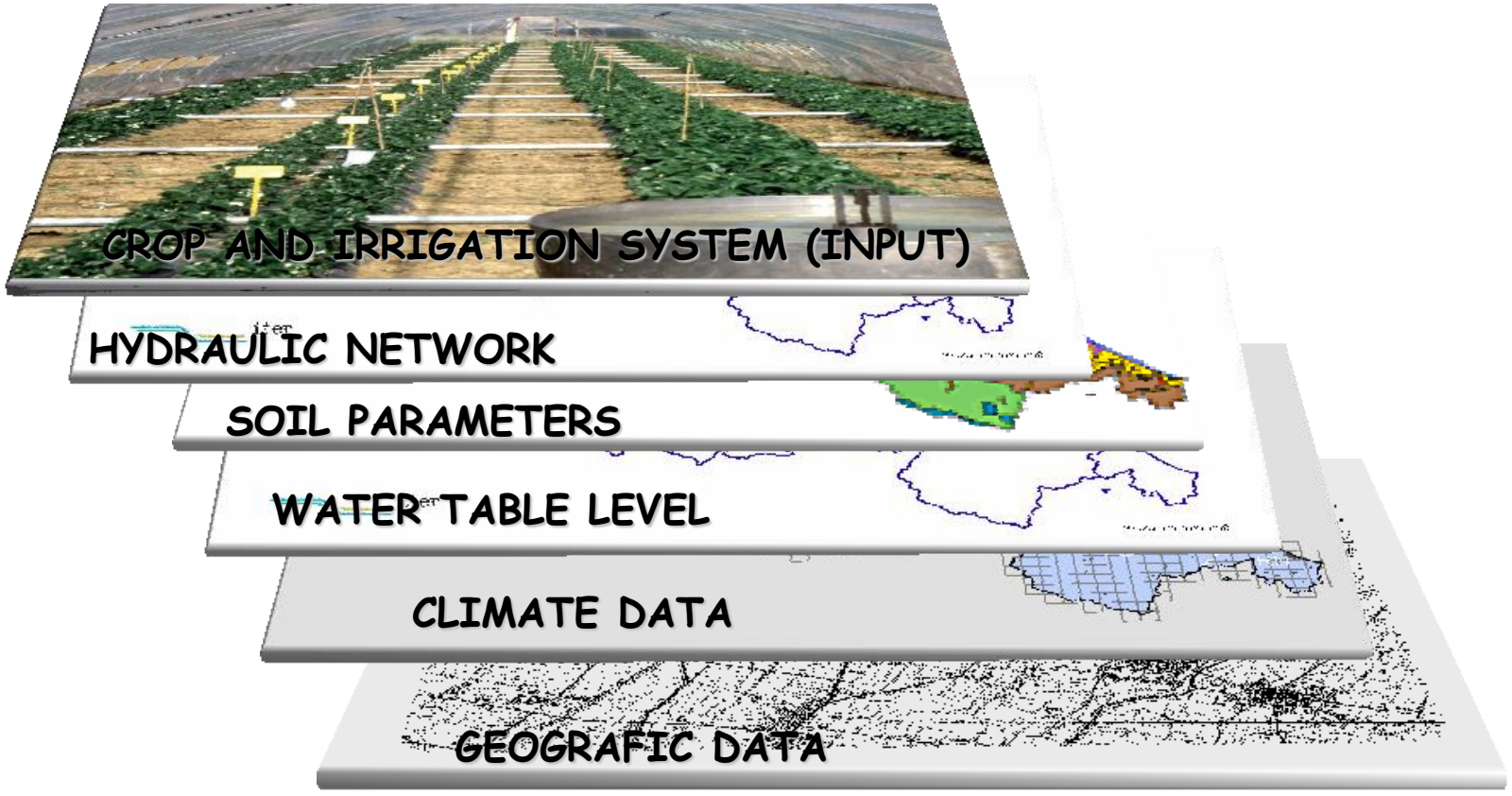
- **10% water saving where soil *AWC* varies by 50 mm**

- **15% water saving where soil *AWC* varies by 100 mm**

- **More than 15% water saving where soil *AWC* varies by > 100 mm**

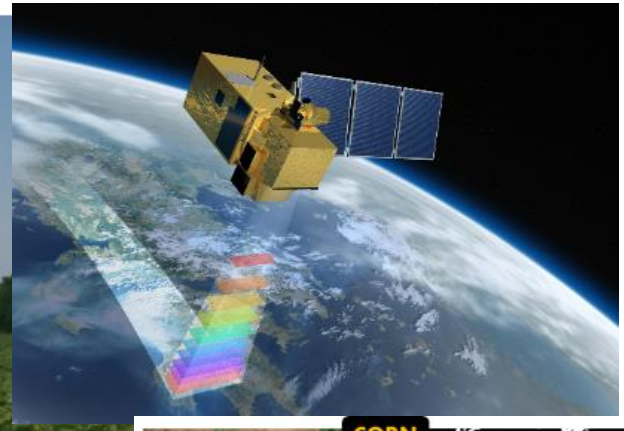
(Carolyn Hedley)

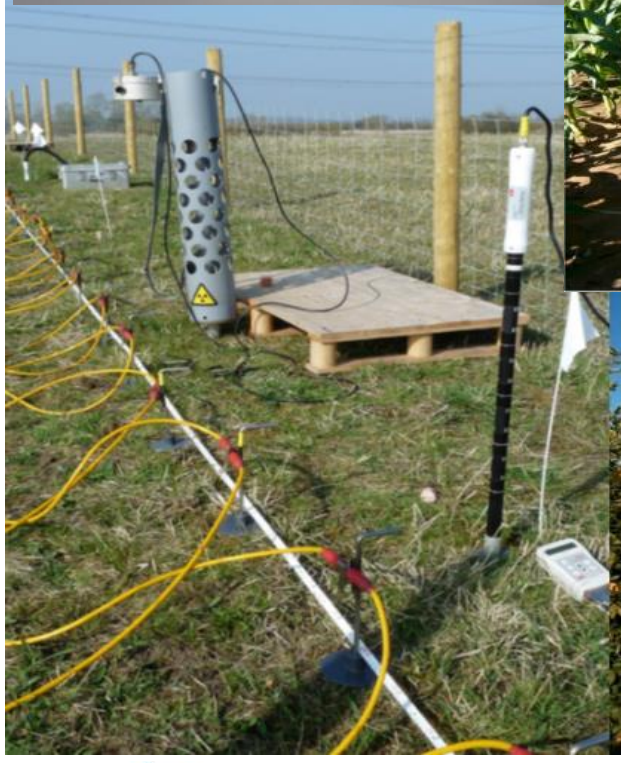
MANAGEMENT OF AVAILABLE BUT OFTEN INCOMPLETE AND FRAGMENTED KNOWLEDGE

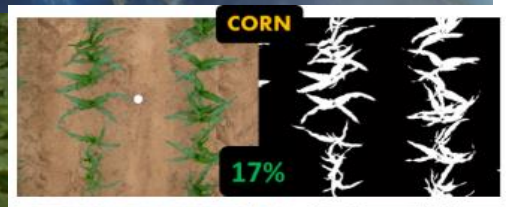


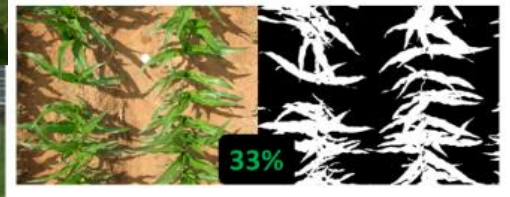
Current challenges in management of water for agriculture: matching science and practice on farm level

SENSING TECHNOLOGIES ALREADY APPLIED IN AGRICULTURE









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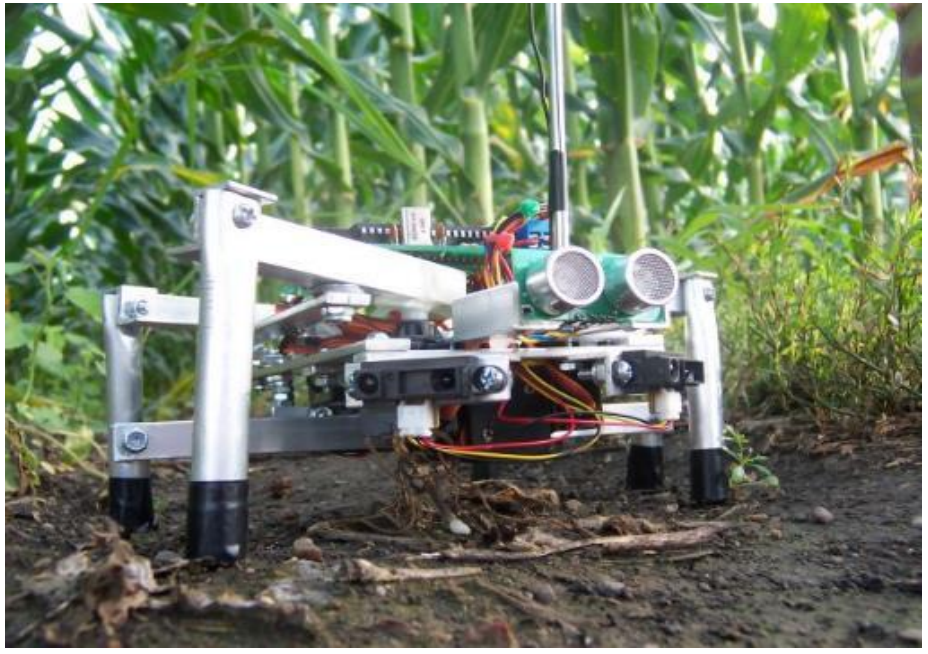


INTEGRATION OF DATA SOURCES

Field robots will provide an overview of the crops to determine their necessities using sensory vision or video.

Soil Sensors are in the process of becoming more widely used as they are an arrangement designed as a part of the robot to detect disease.

The new generation of field robots can implement Swarm Technologies operating as interlinked units exchanging information in real time to optimize their efficiency and self-learning capabilities.

Irrigants d'Europe

FIGARO
PRECISION IRRIGATION TECHNOLOGIES

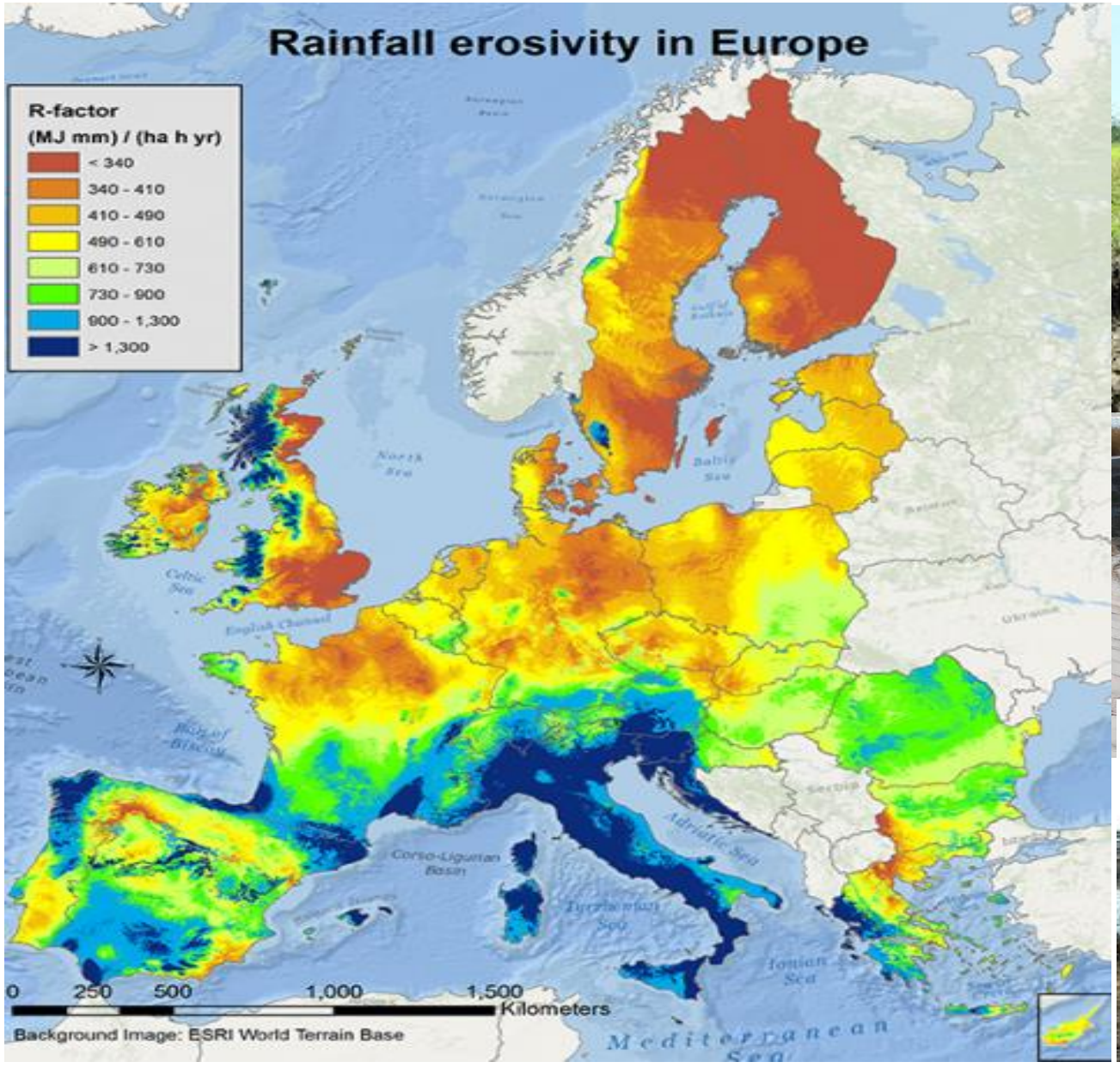
FRONTLINE INNOVATION

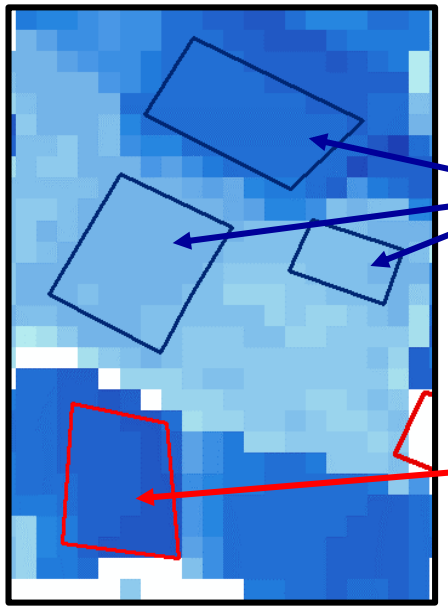
SOIL EROSION and DEGRADATION

DIRECT – SHORT/MEDIUM TERM

DIRECT – LONG TERM
INDIRECT/EXTENDED

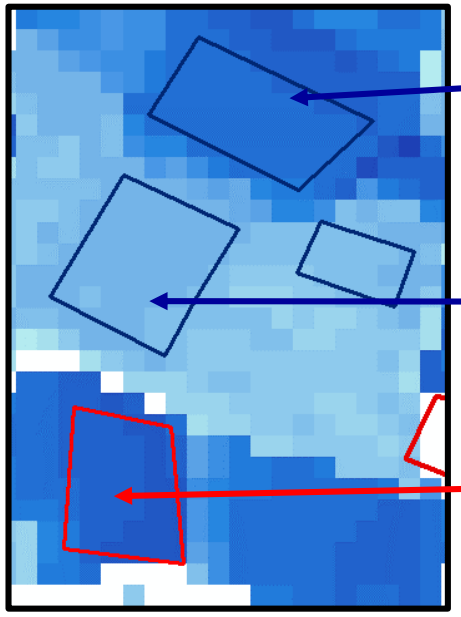
Irrigants d'Europe





Plots with water rights

Plot without water rights



Allowed water: 500mm/y
HidroMORE IWR: 425mm/y

Allowed water: 700mm/y
HidroMORE IWR: 300mm/y

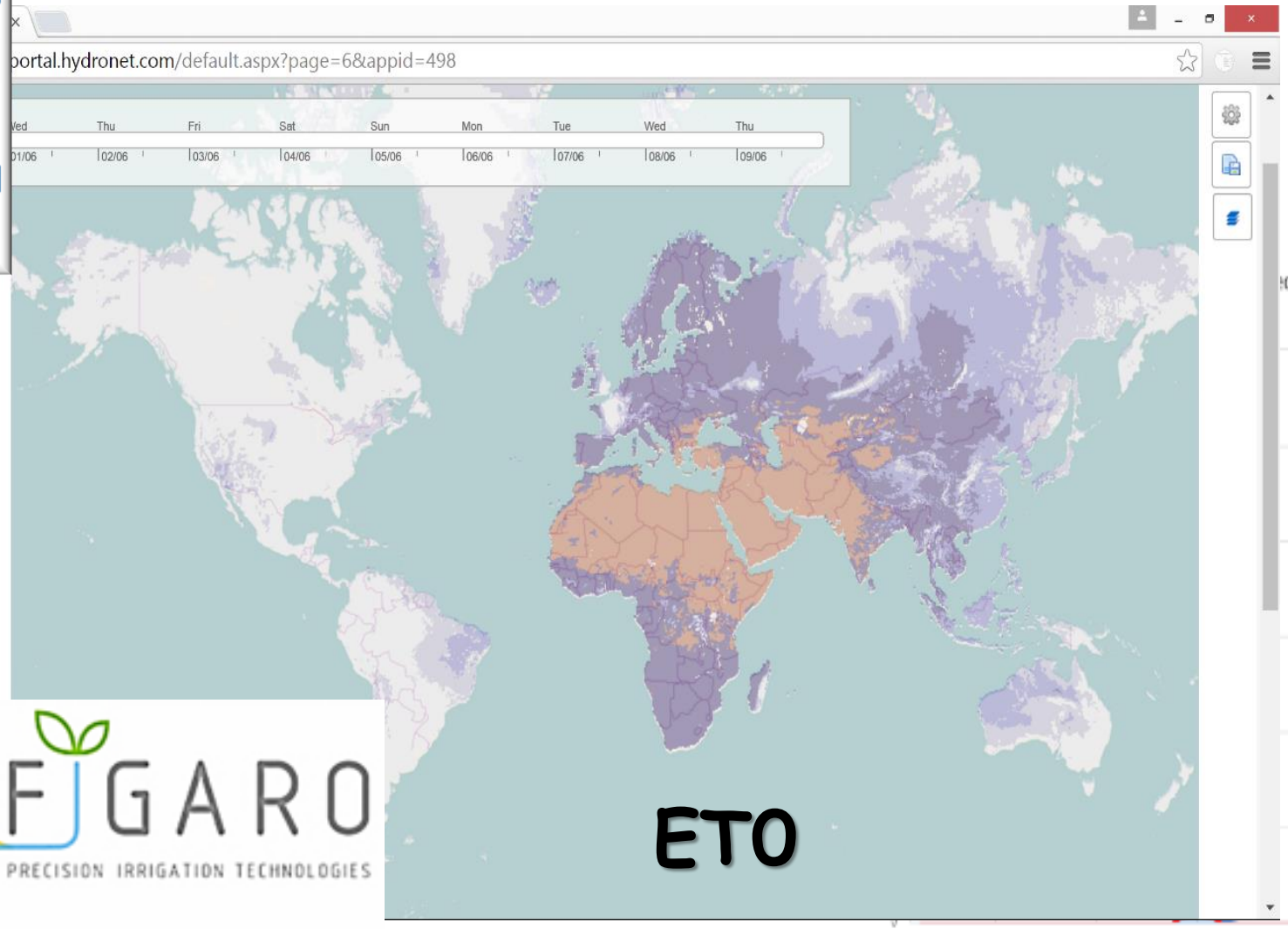
Allowed water: 500mm/y
HidroMORE IWR: 650mm/y

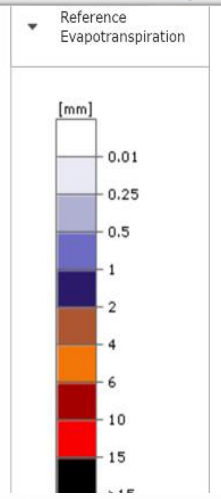
J. Garrido, A. Calera – UCLM Spain

MONITORING AND MAPPING WATER QUALITY FOR IRRIGATION, ENVIRONMENTAL PROTECTION AND WATER REUSE

RELIABLE WEATHER FORECASTING

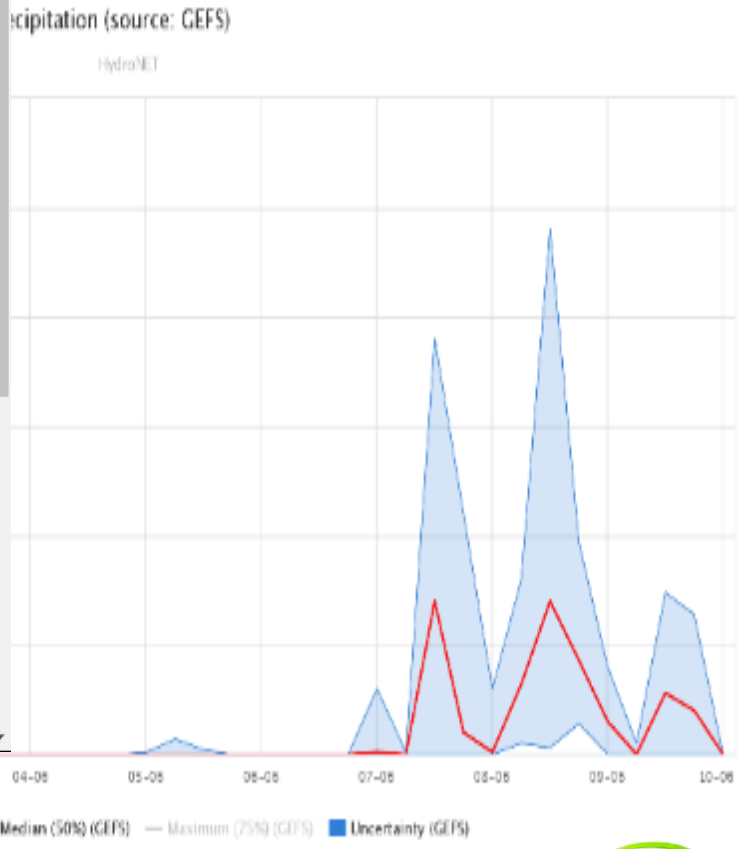
Irrigants d'Europe





ETO

PRECIPITATION



FIGARO
PRECISION IRRIGATION TECHNOLOGIES

A. Lobrecht - HYDROLOGIC

AEB

Fenareg

IRRIGANTS de France

SOIL PROPERTIES

SOIL TEXTURE

Better accuracy and validation. Utilization of local datasets to calibrate remote sensing data. Methodologies and tools for self-calibration by end users

SOIL MOISTURE

Higher spatial validation. Finer temporal interval. Introduce sub-plot scale (0-50m). Locally validated energy balances (SEBAL, TEBS, SEBS…).

SOIL ORGANIC CARBON, SALINITY AND CARBONATES

Higher spatial validation. Finer temporal interval. Further edevelop methods that are less dependent of soil calibration (i.e. reflectance spectroscopy cellulose/starch/lignine)

VEGETATION INDEXES

VEGETATION PATTERN & CROP MAPPING

Identification of vegetation patterns and density. Crop mapping (identification even at early stages)

PHOTOSINTHETIC VEGETATION

Higher spatial validation. Finer temporal interval. Vegetation indexes better related to crops (local calibration with ground data). Crop productivity forecasts. Total aboveground biomasses.

NONPHOTOSINTHETIC VEGETATION

Further develop methods allowing to define crop residues, woody stems or forest litter (i.e. Cellulose or Lignin-Cellulose adsorption index- CAI or LCA)

INTEROPERABILITY AND METHODOLOGIES

Syntactic Interoperability

Make systems capable of communicating and exchanging data in a performing a reliable way. Existing monitoring schemas, sensors networks, management models and DSSs aren't able to dialogue. Still even basic Syntactic Interoperability is lacking.

Semantic Interoperability

Develop systems capability to automatically interpret the information exchanged meaningfully and accurately in order to produce useful results as defined by the end users.

Data Assimilation/Integration Methods

Standardized methods to assimilate or integrate data into local existing services. Tools and guidelines.

PRACTICALITIES

Post Processed Data availability at smaller scale: actual size requires to download files > 10 GB. Non specialized end users often aren't equipped or skilled to manage these big files.

Standard Calibration/Validation Procedures: crop physiological parameters derived from Satellite Remote Sensing would need to be calibrated against ground truth. Standardized methods would help developing small local projects.

Support Small Medium Startups: small software houses are entering the market offering to farmers and water managers ICT platforms based on post-processed satellite data at the end user preferred scale.

CLOSING WORDS

- Irrigated agriculture is engaged in implementing circular economy and willing to explore new business models, but to do that effective, user friendly support and information products are needed.
- To respond to the challenges of climate change and food security Irrigated Agriculture is facing the challenge to improve water use productivity and efficiency while improving overall water quality.
- Targeted actions to better integrate information products into existing irrigation and water governance management tools are needed.
- Remote sensing could offer viable solutions for the new PAC payment criteria based on results achievement and performances.

IRRIGANTS d'EUROPE has been established to bring together the irrigated agriculture sector at European level, restoring legitimacy to the proper use of water resources in modern agriculture.

Required actions:

-Assessment of Irrigation systems and schemas efficiency
-Assessment of the positive externalities as, i.e., sustaining aquifers and water restitution to water bodies
-Key parameters availability for risk assessment analysis and water quality management in a broader hydrological context
-Assessment and risk analysis of the opportunities to enhance water storage


THANKS FOR YOUR ATTENTION
Irrigants d'Europe