



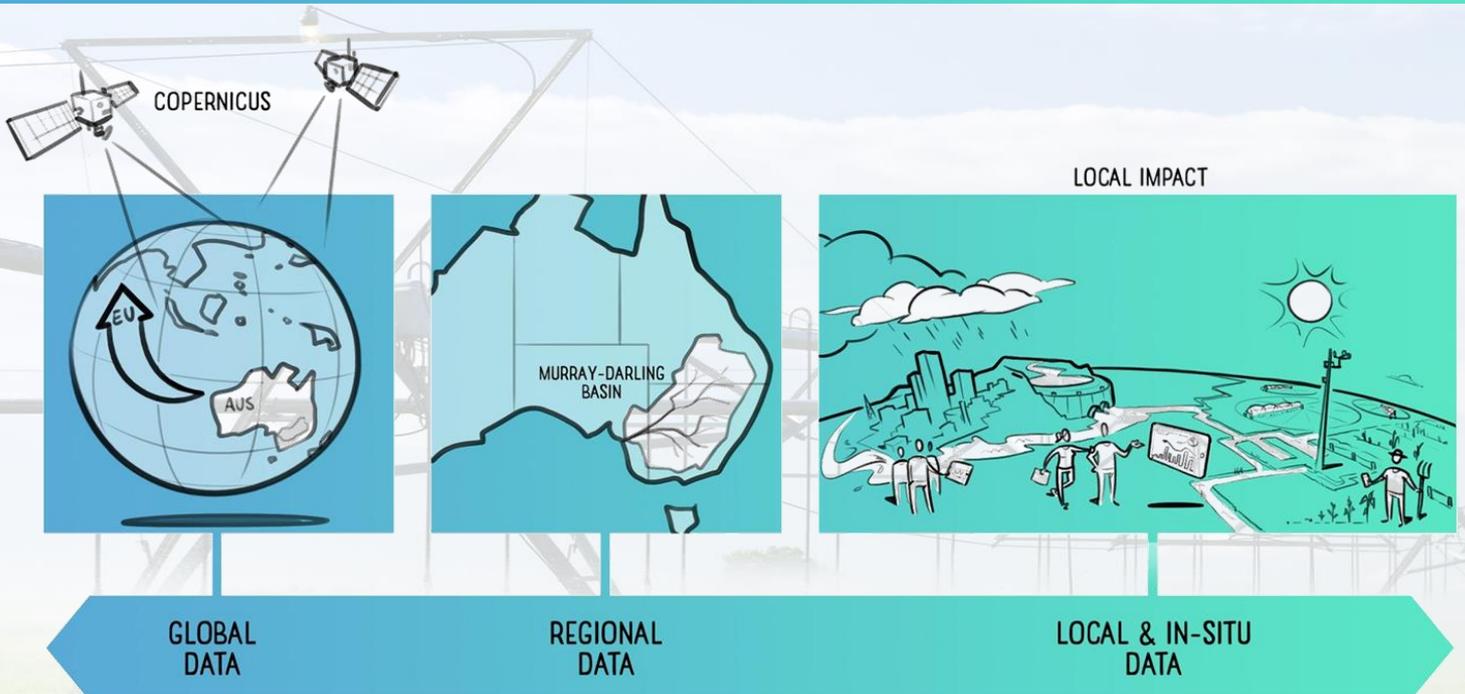
WaterSENSE

Making SENSE of the water value chain in Australia

www.watersense.eu | www.watersense.com.au

#MakingWaterSENSE

Newsletter 1- June 2020



LinkedIn: Project WaterSENSE

Twitter: @MakeWaterSENSE



This project has received funding from the Horizon 2020 research and innovation programme under grant agreement No 870344



What is the WaterSENSE project?

Making sense of the water value chain in Australia

Making sense of water in Australia is something that the world was forced to do in the last while, simply by watching the news. We heard about the recent droughts and its related fish kills and allegations of water misuse. Then we all watched in horror as a very dry Australia was burning. Finally, the rain brought some relief, but then to add insult to injury, the next day's news reports showed flooding due to massive downpours!



Novel Research

The WaterSENSE project will provide water availability and mapping services for any place in the world at different time and spatial resolutions, based on earth observation data, hydrological models and local field data. The results of these services will be open access to develop value-adding services.



Novel research in the project will develop scalable information services, based on advanced big-data processing algorithms, to determine variables such as evapotranspiration, irrigation water use, rainfall and soil moisture. Machine learning will be used where appropriate to allow automatic data processing and reduce uncertainty.



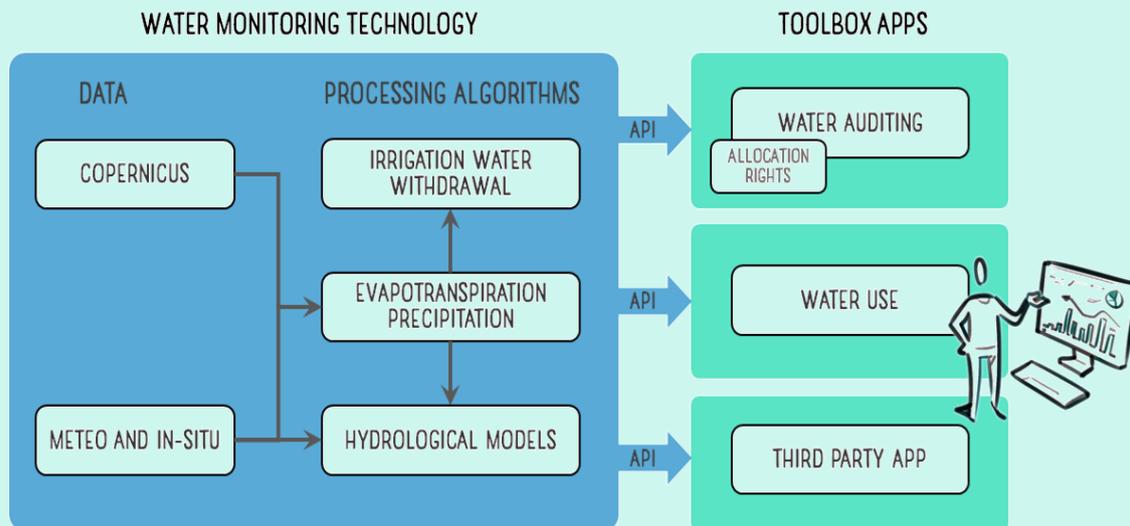
Goal of the WaterSENSE project

The goal of WaterSENSE is to **develop a modular, operational, water-monitoring system built on Copernicus EO data;**

- To provide water managers with a toolbox of reliable and actionable information on water availability and water use (**eg. Water use & compliance monitoring across an entire basin**);
- To support sustainable water management and transparency across the entire water value chain; and
- To start in Australia, South-Africa and The Netherlands; scalable to anywhere in the world.

Concept – WaterSENSE toolbox

- **Water Monitoring System:** Integrates Copernicus EO data, ground radar, models, in-situ data;
- **Water Management Toolbox:** makes data and services available to users.



WaterSENSE consortium members

The WaterSENSE consortium consists of 7 partners: eLEAF BV (Netherlands), Hydrologic Research (Netherlands), Water Technology (Australia), Hidromod (Portugal), hydro & meteo (Germany), the University of Sydney (Australia) and HCP International (Netherlands).



Lead Partner – eLEAF



Agriculture



Water Management



Crop Insurance

Satellite-based applications and data to optimise crop production and water management



This project has received funding from the Horizon 2020 research and innovation programme under grant agreement No 870344



eLEAF is a research focussed SME that provides satellite-based services for sustainable water management, agriculture and insurance. The core of eLEAF's technology is **Pixel Intelligence Mapping (PiMapping®)**, which generates satellite-based quantified time series such as crop water consumption, crop water stress, water productivity and biomass production. **Our water management products are aimed at water authorities and support them to quantify agricultural water use**, the largest consumer of the available water worldwide. We provide this data for single fields up to entire countries and basins. Every day, every week or every year. **Our agricultural products include our crop monitoring platform FieldLook**, which provides farmers with weekly updates on their crops' health and water use and visualises underperforming areas for immediate action. Starting as a precision-agriculture application, **FieldLook has gradually evolved into a powerful web portal communicating satellite-derived information on single fields up to entire river basins**. eLEAF is the project coordinator of WaterSENSE and is also responsible for the algorithm development work package.

Spotlight on the Project Coordinator, Remco Dost:

Remco, MSc, is a senior project manager at eLEAF and will be the WaterSENSE project coordinator. Remco is a hydrologist and geo-information architect by profession with over 15 years of experience in the application of Geographic Information Systems (GIS) and Remote Sensing (RS) for Earth Sciences. Remco has wide experience in coordinating complex research and innovation projects and in successfully steering large consortia. He has been project coordinator for the EU FP7-funded WatPLAN project, leading 7 consortium partners. He has also been involved in many other research project as case and work package leader e.g. the FP7 WEAM4i project. He is currently the project coordinator for the ESA-funded EO4SD project, a 2,5 M€ project with 8 consortium partners, aimed at global uptake of earth observation-based services in international financial institutions. He is well versed in EU financial and administrative project regulations.

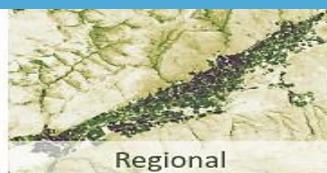


ETlook = PiMapping®

ETLook is a state-of-the-art energy balance model. It is an enhancement of the SEBAL model, residing within an automated data processing facility providing improved scalability and multi-image processing. Pixel Intelligence Mapping (PiMapping®) is a toolbox of algorithms based on satellite information and in-situ weather data that calculates physical processes to convert raw multispectral satellite imagery and meteorological data into quantitative information on water, vegetation and climate:

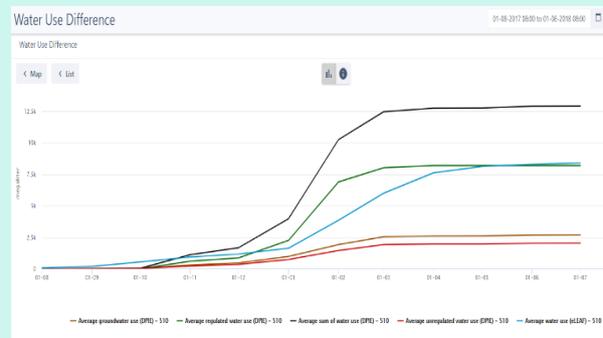
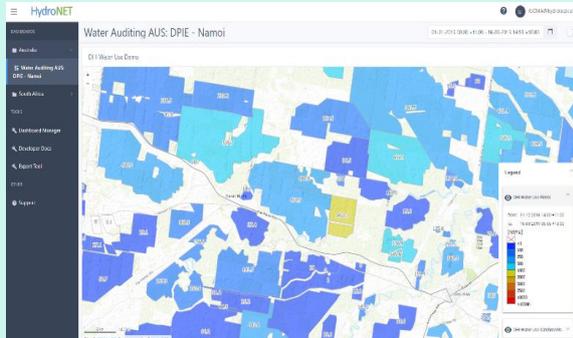


| | |
|---|--|
| Water: | Climate: |
| Actual ET; Precipitation; Topsoil moisture; Water stress; Water productivity; Water accounting; Irrigation performance... | Air temperature; Humidity; Wind speed; Cloud cover; Solar radiation; Surface temperature; Sensible heat flux (H); Latent heat flux (LE)... |
| Vegetation: | |
| Actual biomass production; Land cover; Harvest date; Sowing date; fPAR; Crop coefficient; Crop yield, Leaf Area Index; NDVI; Fraction Vegetation Cover... | |



Example Application

Water Use and Compliance Monitoring



WaterSENSE will deliver the essential value-added service of monitoring the compliance of local water use against water rights and regulations remotely across an entire basin: The water auditing application will be the first application developed in WaterSENSE. It will be demonstrated in the Namoi catchment of the Murray-Darling Basin in Australia. The application will use Copernicus EO data and the ETLook energy balance model (used by the Food and Agriculture Organization of the United Nations (FAO) to provide the following services:

- Satellite based compliance check
- Comparison of the actual crop evaporation (due to irrigation) with the authorised and/or metered water
- Easy identification of big or inefficient water users
- Per field or larger unit

FAO Standard

Advanced Energy Balance Modelling (Penman-Montieth)

Automated EO Image Processing

Features:

- Monitor water use in large areas;
- Monitoring at a regular intervals;
- Monitoring at field or crop scale;
- Monitoring is unbiased;
- Cross (national) border monitoring;

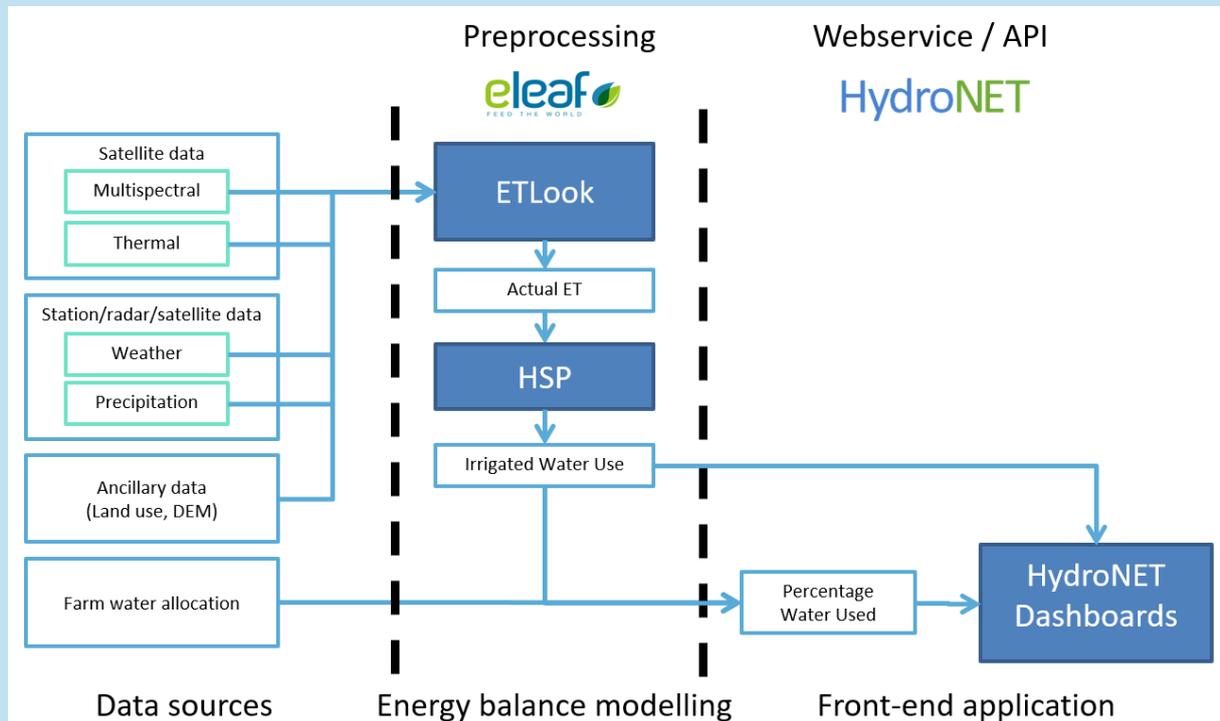
Impact:

- Compliance monitoring and enforcement;
- Improved water distribution;
- Awareness of water consumption;
- Water savings.

Participation of NRAR and the DPIE

Technology alone is not the solution. It is ultimately a societal challenge. Even the best information is useless unless we use it and are willing to act on it. The participation of the **Natural Resources Access Regulator (NRAR)** and the **Department of Planning, Industry and Environment (DPIE)** in WaterSENSE is therefore promising. It can show how new technology based on EO data can help implement policies to manage our water resources in a more sustainable way. This will become ever more important in the times to come.

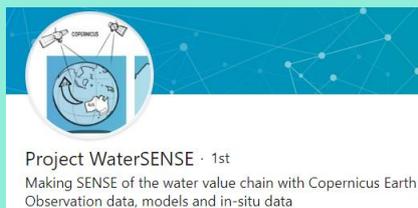
How do we calculate Irrigated Water Use?



More Detail on the ETLook and HSP models will be provided in the next newsletter.

Connect with us!

LinkedIn: [Project WaterSENSE](#)



Or contact:

Australia: Brian Jackson

brian.jackson@watertech.com.au

Phone: +61 3 8526 0800

Twitter: [@MakeWaterSENSE](#)



Global: Remco Dost

watersense@eleaf.com

Phone: +31 317 729003