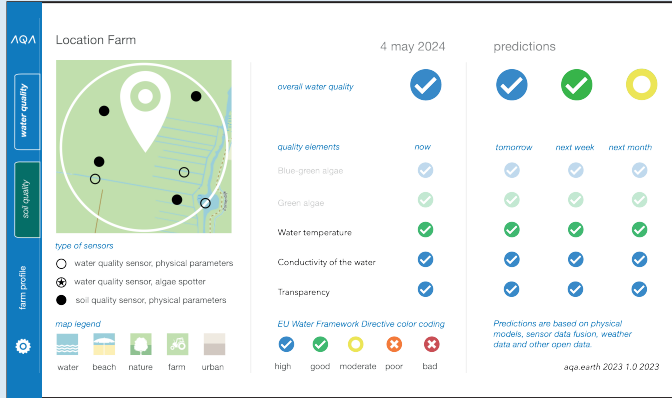


sustainable farming

Dashboard with soil & water quality predictions based on sensor data fusion and physics based models:

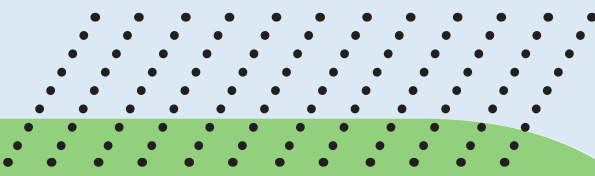


The European Water Framework Directive presents an opportunity for farmers to adopt sustainable agricultural methods, such as biological farming, precision farming and alternative nutrient management.

By presenting soil & water quality in a dashboard we empower farmers to optimize their practices and increase productivity while minimizing environmental impact in terms of reduced pesticide and nutrient usages.



Farming operations



Weather conditions

Washout



Soil sensors

Soil sensors measuring soil organic matter through sensor fusion.

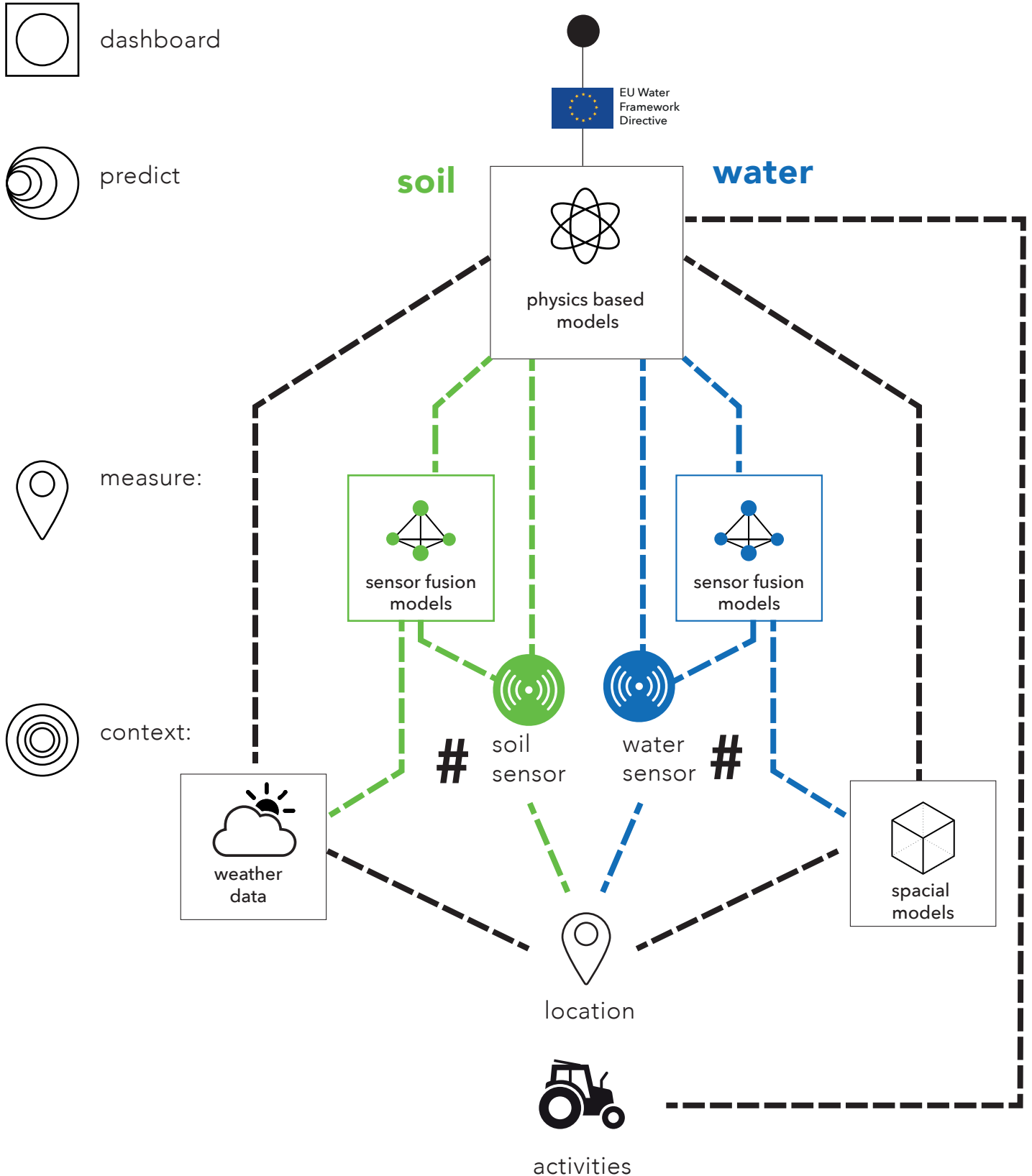
Water sensors

Water sensors measuring pesticide, nitrate and phosphate concentrations in the surface water through sensor fusion.

Our solution helps farmers optimize soil organic matter, reducing nutrient and pesticide washout to surface and groundwater. This enhances biodiversity, strengthens nature's resilience, and improves soil's drought tolerance and pesticide breakdown.

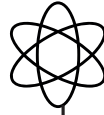
sustainable farming

Dashboard with soil & water quality predictions based on sensor data fusion and physics based models:



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physics based models



Physics based soil model accounting for:

- precipitation,
- irrigation,
- evaporation,
- drainage

Water Balance

- texture,
- porosity,
- hydrolic conductivity

Soil Properties

- mineralization,
- immobilization,
- leaching of nutrients i.e.,
- total phosphorous,
- total nitrogen

Nutrient Cycling

- biological activity,
- decomposition of soil organic matter,
- nutrient release,
- micropollutant decomposition and release

Organic Matter Dynamics

- nitrification,
- denitrification,
- phosphorous fixation

Nutrient Transformations

- nutrient uptake by plants,
- nutrient demand and
- root distribution in the soil

Plant Uptake

- Long term and short term changes in soil properties,
- nutrient availability,
- organic matter content
- and micropollutants

Time Dynamics

soil

Physics based surface water model accounting for:

Surface Water Balance

- precipitation,
- surface runoff,
- instream,
- outstream,
- evaporation

Water Quality Parameters

- dissolved oxygen,
- pH,
- turbidity,
- nutrient concentrations

Nutrient Cycling and Transformations

- uptake by plants,
- nutrient release,
- assimilation,
- decomposition of micropollutants

Sediment Transport

- erosion,
- sedimentation,
- resuspension of sediments

Biological Interactions

- Interactions between water quality parameters and aquatic organisms i.e., (algae, aquatic plants, fish, invertebrates)

Hydrological Connectivity:

- Connectivity between surface water and soil systems,
- nutrient leaching,
- sediment interactions

Time Dynamics

- changes of surface water quality considering;
- seasonal changes,
- hydrological events (storms, droughts),
- pollutant sources

water

physics based models



CirclnWater

Supporting European SMEs to bring water-smart solutions to market



Co-funded by the European Union

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