Smart Water Amriswil
Smart regional water management

7. F&E-Konferenz zu Industrie 4.0

Raphael Jud

25 January 2022

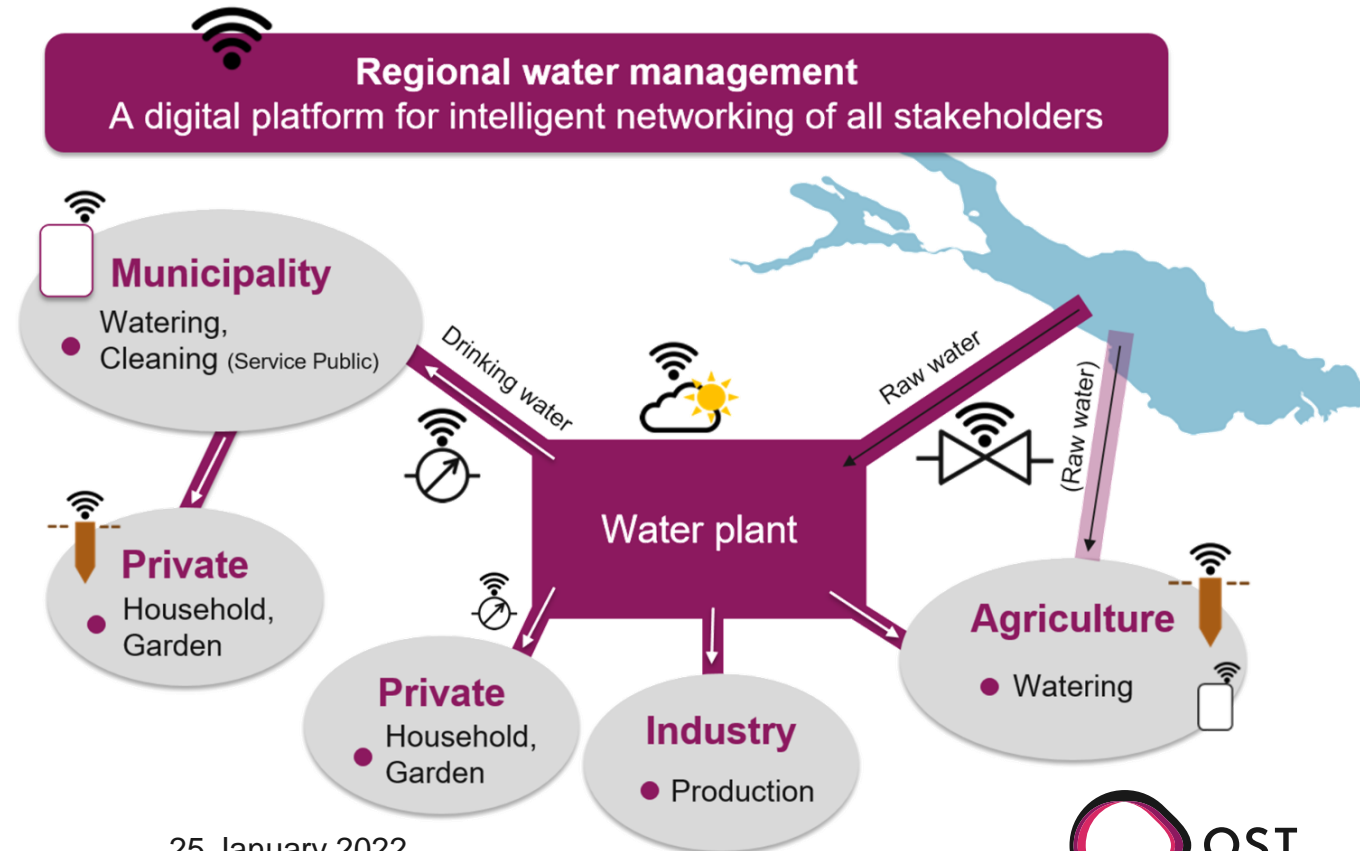IPEK - Institut für Operations, Engineering & PLM

Digital ecosystem "Intelligent regional water management"

**Can we design a platform that provides transparency
and prediction of freshwater usage in an area affected by dry summers?**

➔ **Raising awareness among all users**

➔ **Optimizing consumption & irrigation**

➔ **Balanced delivery of raw and drinking water**

@ Municipalities
@ Agriculture & industry
@ Water plants
@ Private households

Regional water management
A digital platform for intelligent networking of all stakeholders

Municipality
Watering,
● Cleaning (Service Public)

Private
Household,
● Garden

Drinking water

Water plant

Raw water

(Raw water)

Private
Household,
● Garden

Industry
● Production
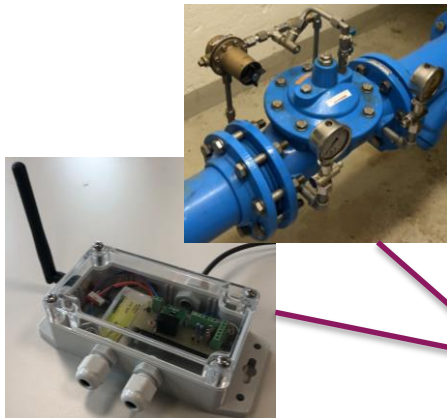
Agriculture
● Watering

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Sensors & data collection in trial region

Municipal **LoRaWan Network**
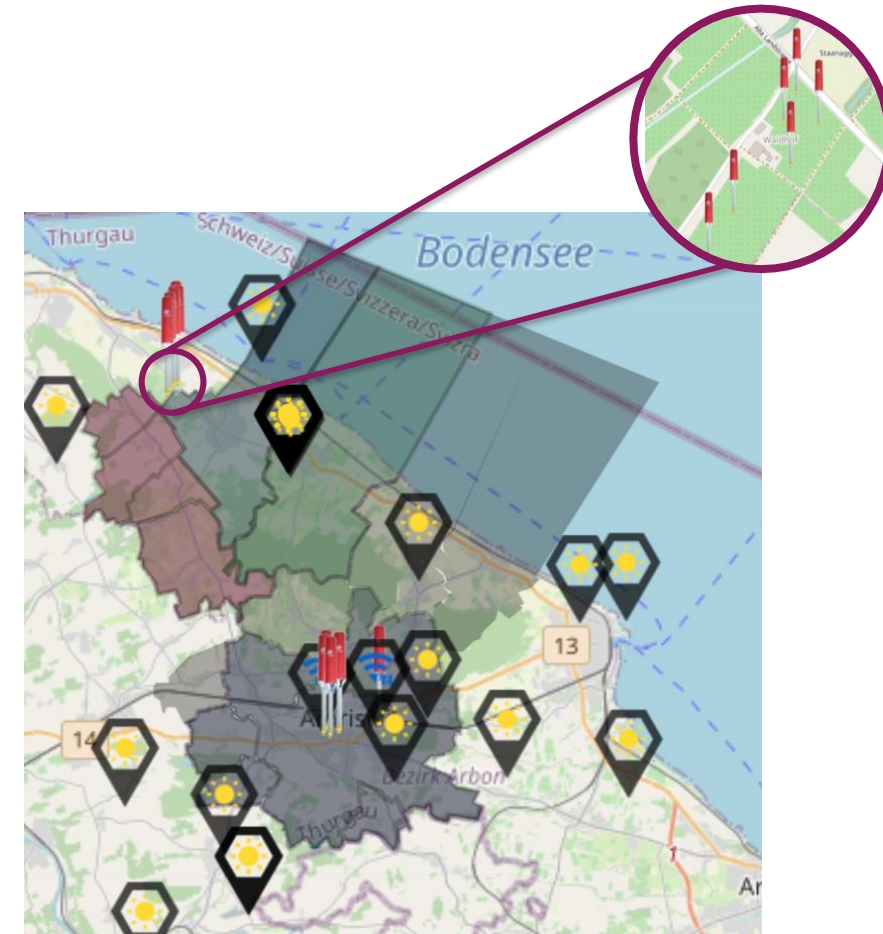
Soil sensors in defined micro areas

- Apple farm

- Soccer field

- Round about

- Municipal flower bed

Local weather stations based on newly developed LoRa-Kit, combined with existing weather stations (Meteoswiss, …)

Flow sensors based on existing pressure-reducing valves (digital retrofit)
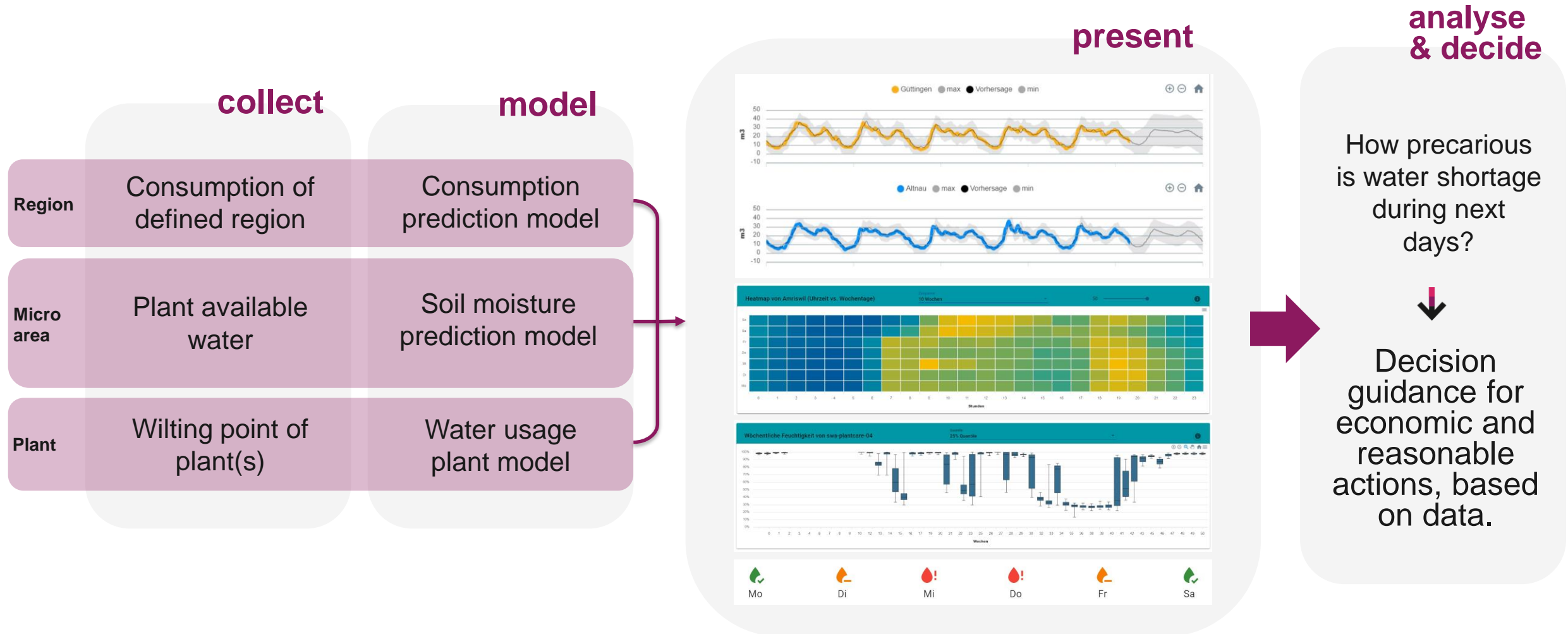
Data connection to a local water plant

Sensormap from frontend

Icons from NounProject.com

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Predict, Present and Analyse

From collection to visualization for decision guidance

present

analyse & decide

collect **model**

	collect	model
Region	Consumption of defined region	Consumption prediction model
Micro area	Plant available water	Soil moisture prediction model
Plant	Wilting point of plant(s)	Water usage plant model

How precarious is water shortage during next days?

Decision guidance for economic and reasonable actions, based on data.

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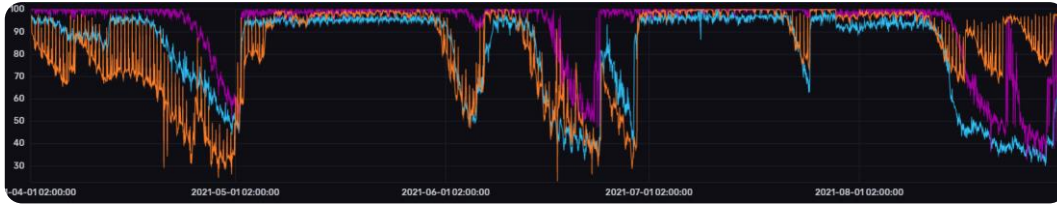
Still a lot data collection (& work) needed, until prediction models are stable

Learnings

- Soil drying is slower than expected and the summer 2021 was not ideal to obtain data for water shortage situations:

- Data availability & quality is very important for stable forecasts (model training)

- Battery management of sensors is an important task ;).
  Without working batteries, there is no data and no reliable prediction.

- Running LoRa-Network: lucky to have min. 2 Gateways within range per sensor.

- Events like hydrant usage (fire department) can not be predicted, but are detected much quicker

- Sensors installed in public places may be harmed:

Our Vision

- Municipalities and water plants are able to define actions on forecasts ahead of critical water shortages.

- Everyone is aware of the scarcity of water, thanks to visualized data and uses the resource responsibly.

Thank your for your attention 🙏

OST – Eastern Switzerland University for Applied Science

with   **IPEK**   - Institute for Engineering, Operations, PLM
          IET   - Institute for Energy Technology
          ILF   - Institute for Landscape and Open Space

&

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