



Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
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Bundesamt für Umwelt BAFU
Bundesamt für Meteorologie und Klimatologie MeteoSchweiz
Bundesamt für Landestopografie swisstopo

From data to decision support:

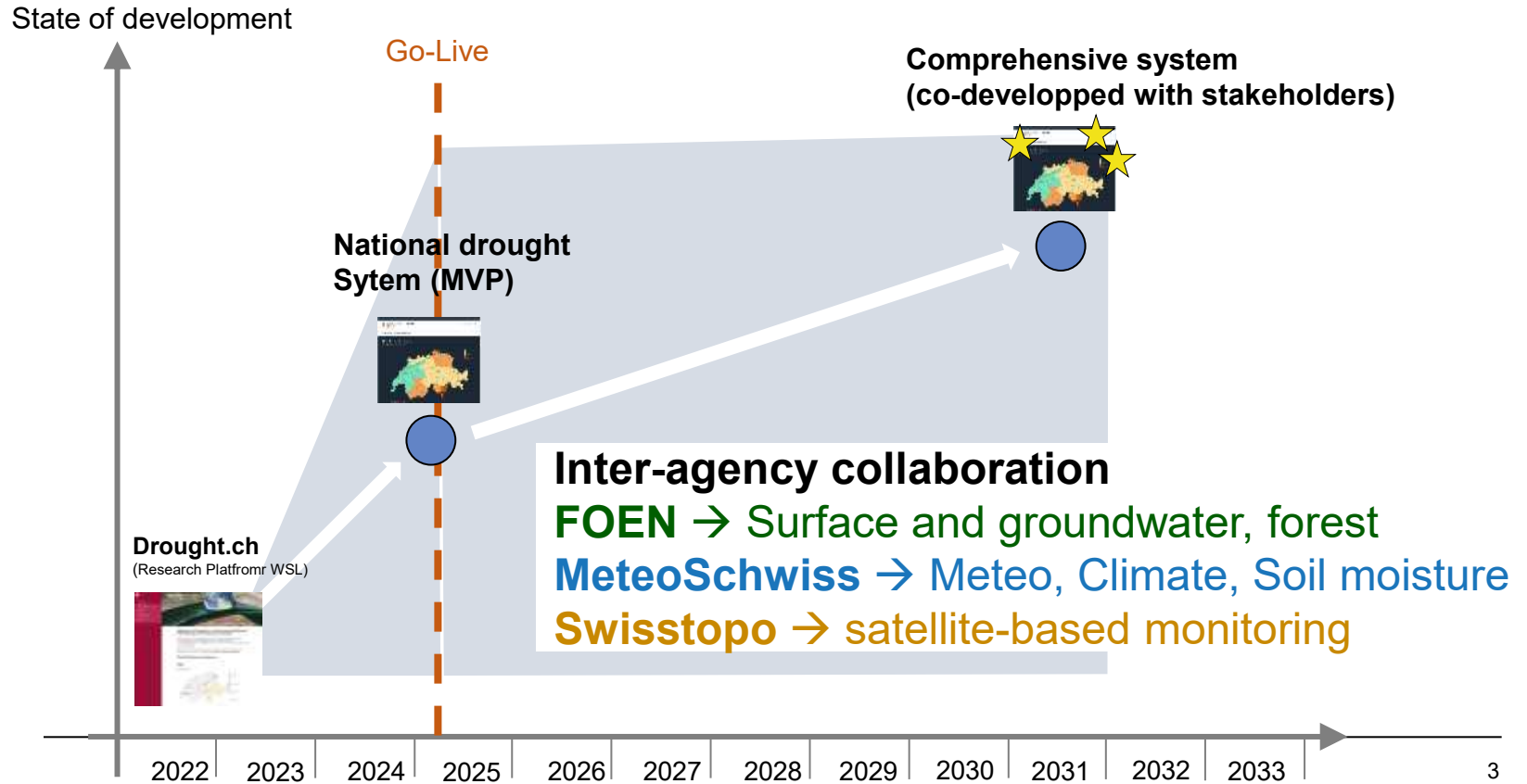
The Swiss drought early warning and monitoring system

Earth System Data for Impactful Applications
Swiss National GAW/GCOS Symposium
26th March 2026





The mission (Mandate by Federal Council 2022)





Challenges: what is a drought?

Meteorological
Drought (P)



Agricultural
Drought (P-ET)



Hydro(geo)logical
Drought (Q, GW)

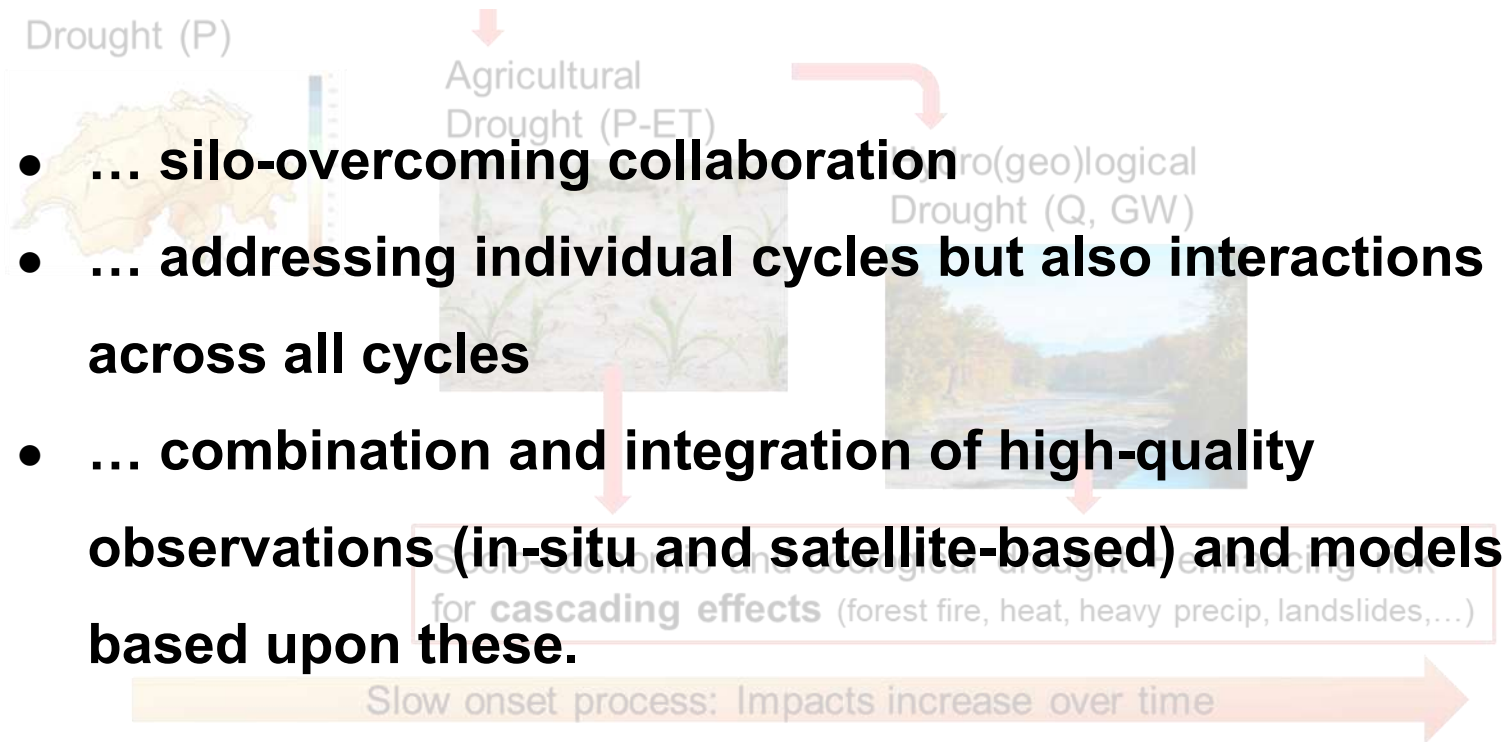


Socio-economic and ecological drought + enhancing risk
for **cascading effects** (forest fire, heat, heavy precip, landslides,...)

Slow onset process: Impacts increase over time

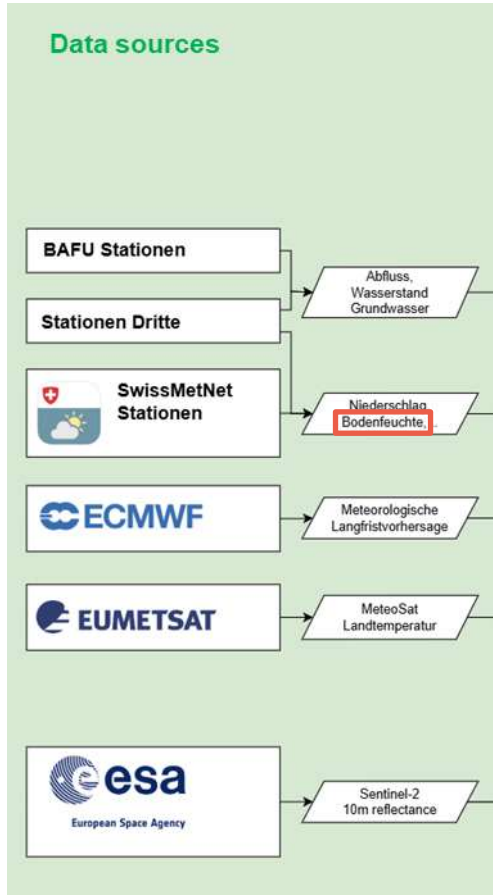


Monitoring and understanding «drought» as phenomena necessarily requires...





From data...

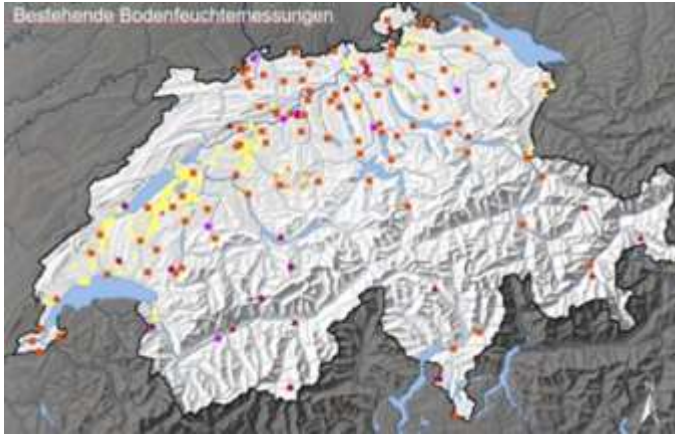




Example: Soil moisture network



Existing: >400 partner stations



Homogenization
& centralization



MCH
DWH

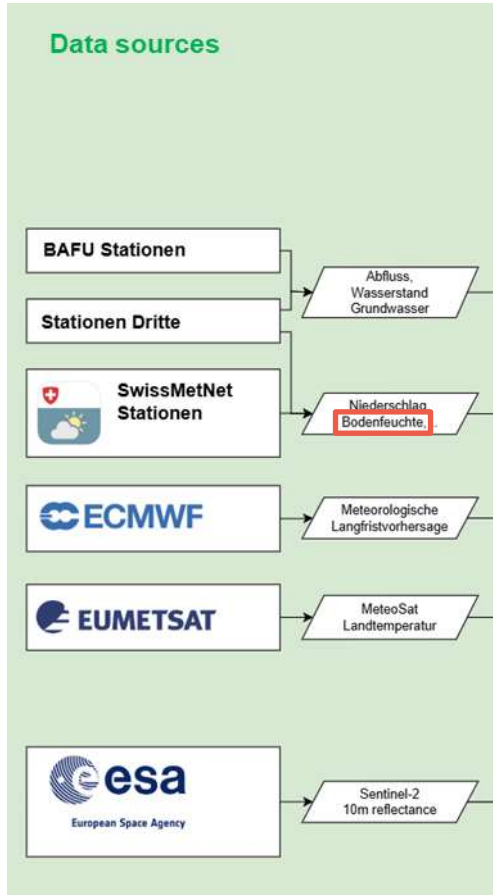
New: national reference stations



Aim: a comprehensive, quality-controlled set of in situ soil moisture data for Switzerland, suitable for a wide range of applications

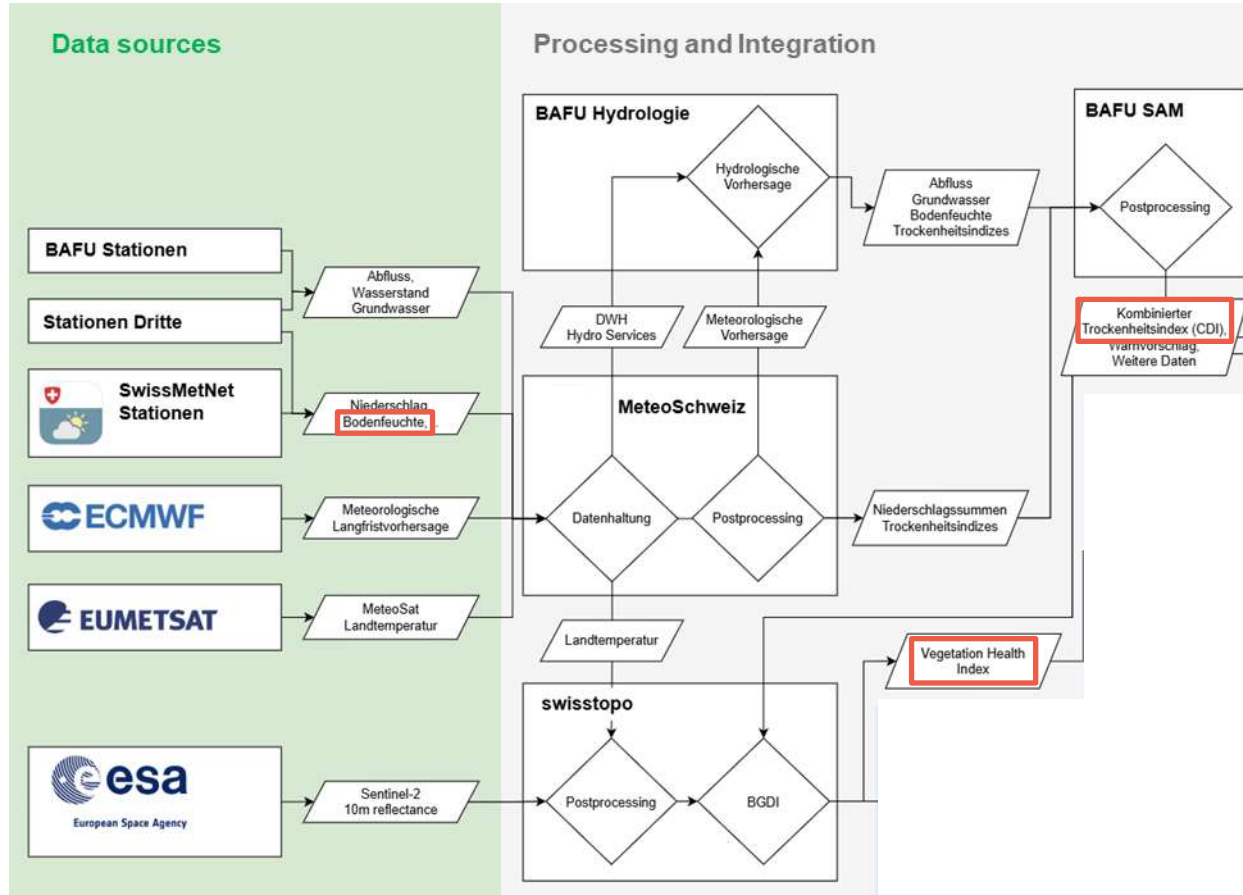


From data...





... to decision support

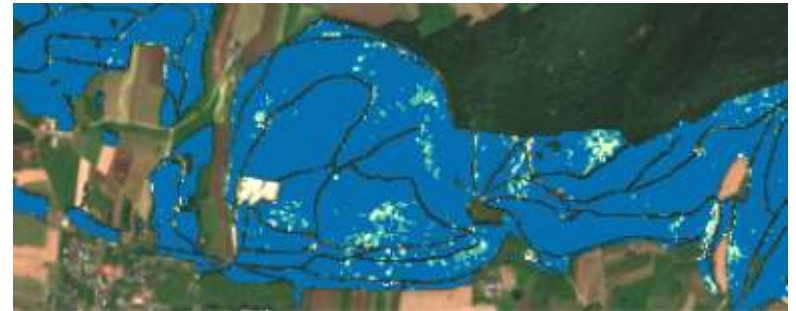
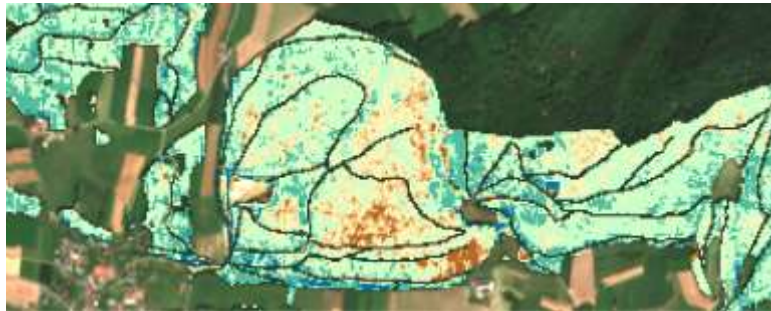




Vegetation stress map 10x10m, daily



- swissEO VHI
- Extremely stressed
 - Severely stressed
 - Stressed
 - Lightly stressed
 - Normal
 - Good
 - Excellent
 - No data



Credits: swisstopo

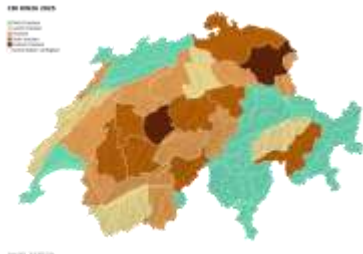


Combined drought index (CDI)

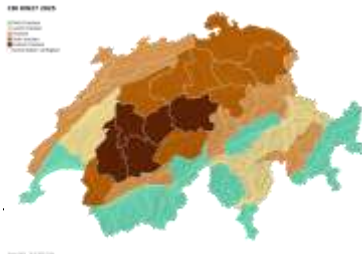
Interviews with users → need for a unified combined drought index as a basis for coordinated water management

- Summarizes the **various dimensions of drought** (precipitation totals, river runoff, and modelled soil moisture)
- Is calculated for each of the **38 warning regions**
- Provides a **general assessment** of the current situation
- Provides a **4-week forecast**, which also serves as the main basis for the warnings

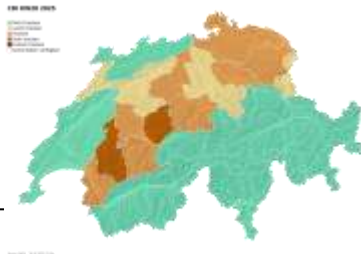
W0 (26.6.25)



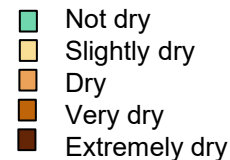
W+1



W+2

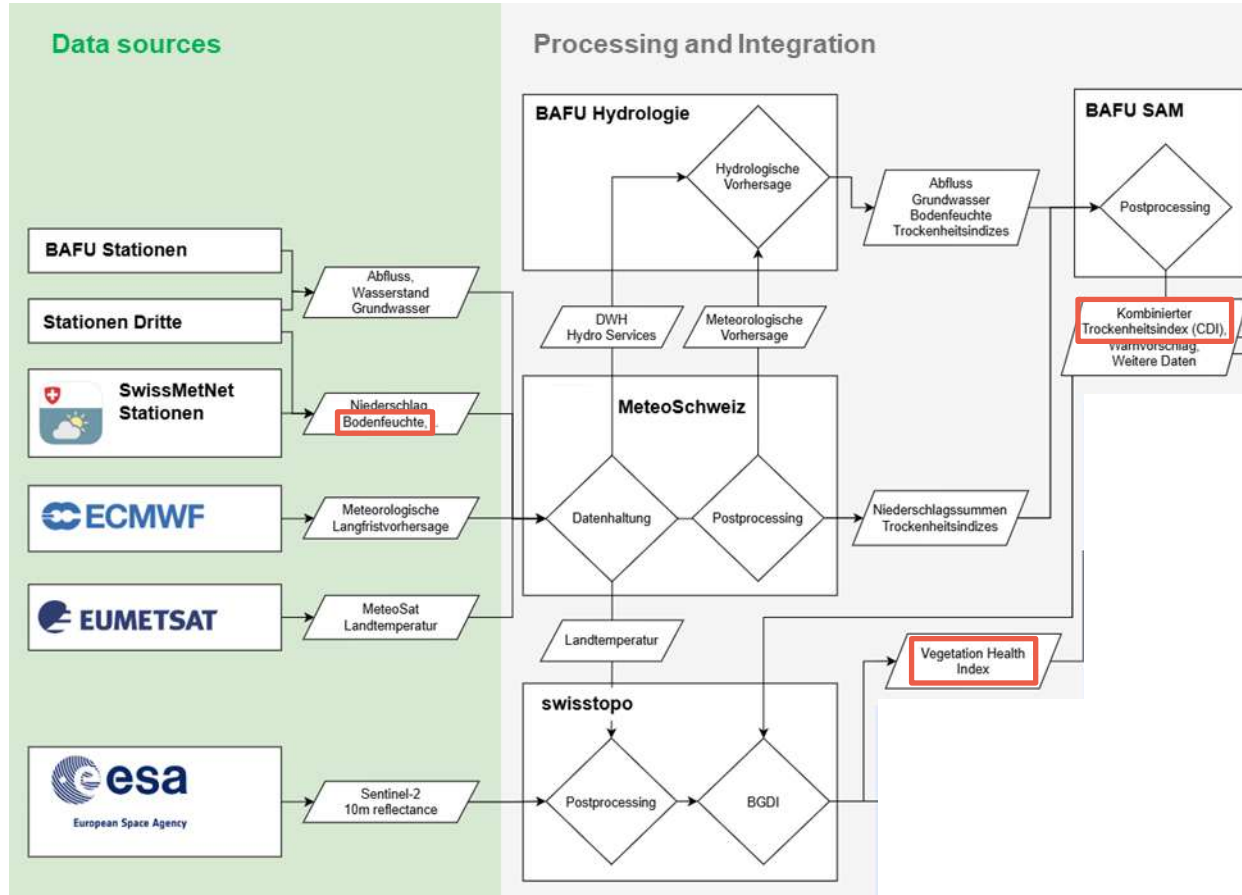


W+3



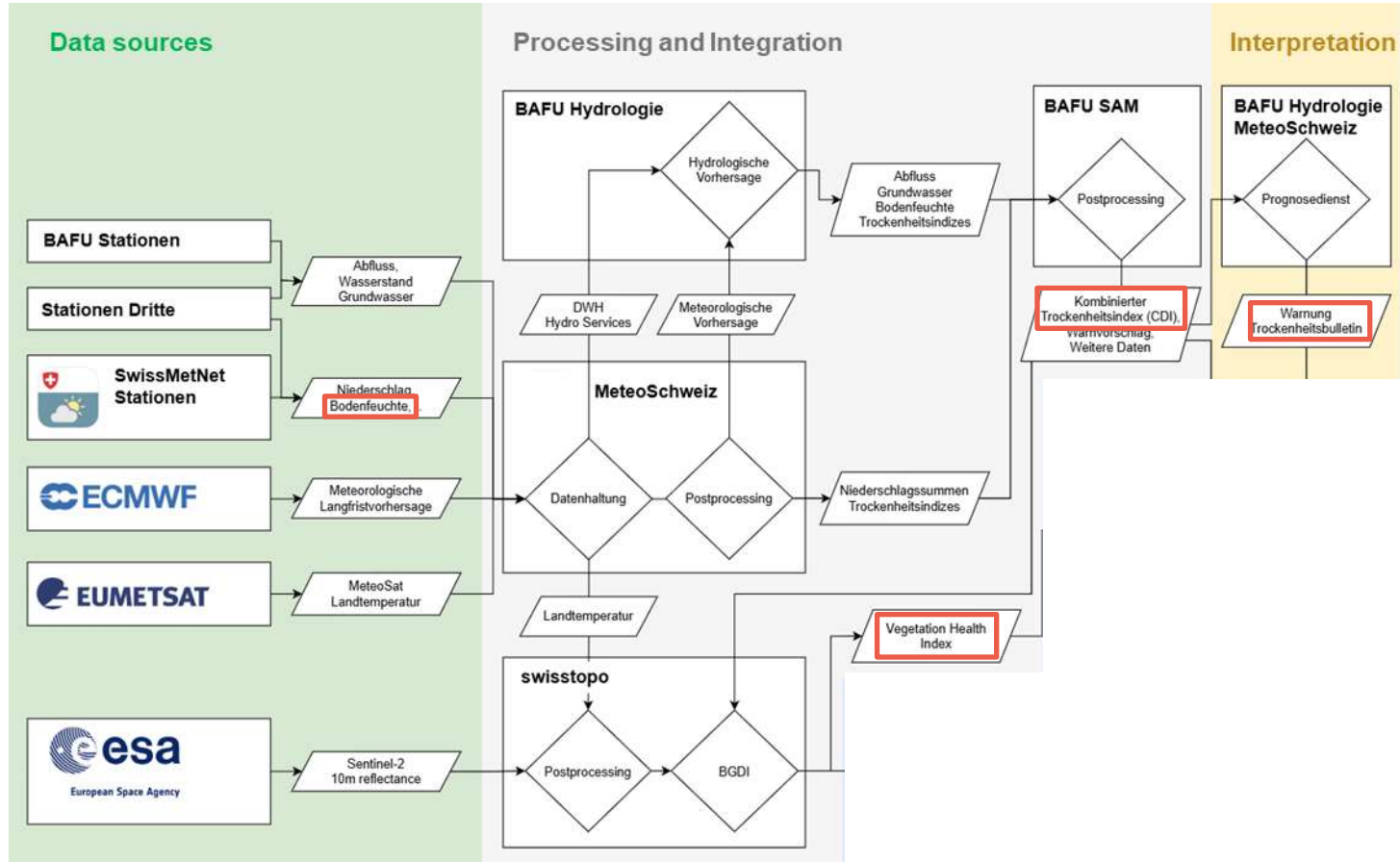


... to decision support





... to decision support





CDI and drought warnings

- Not dry
- Slightly dry
- Dry
- Very dry
- Extremely dry



- No or low danger
- Moderate danger
- High danger

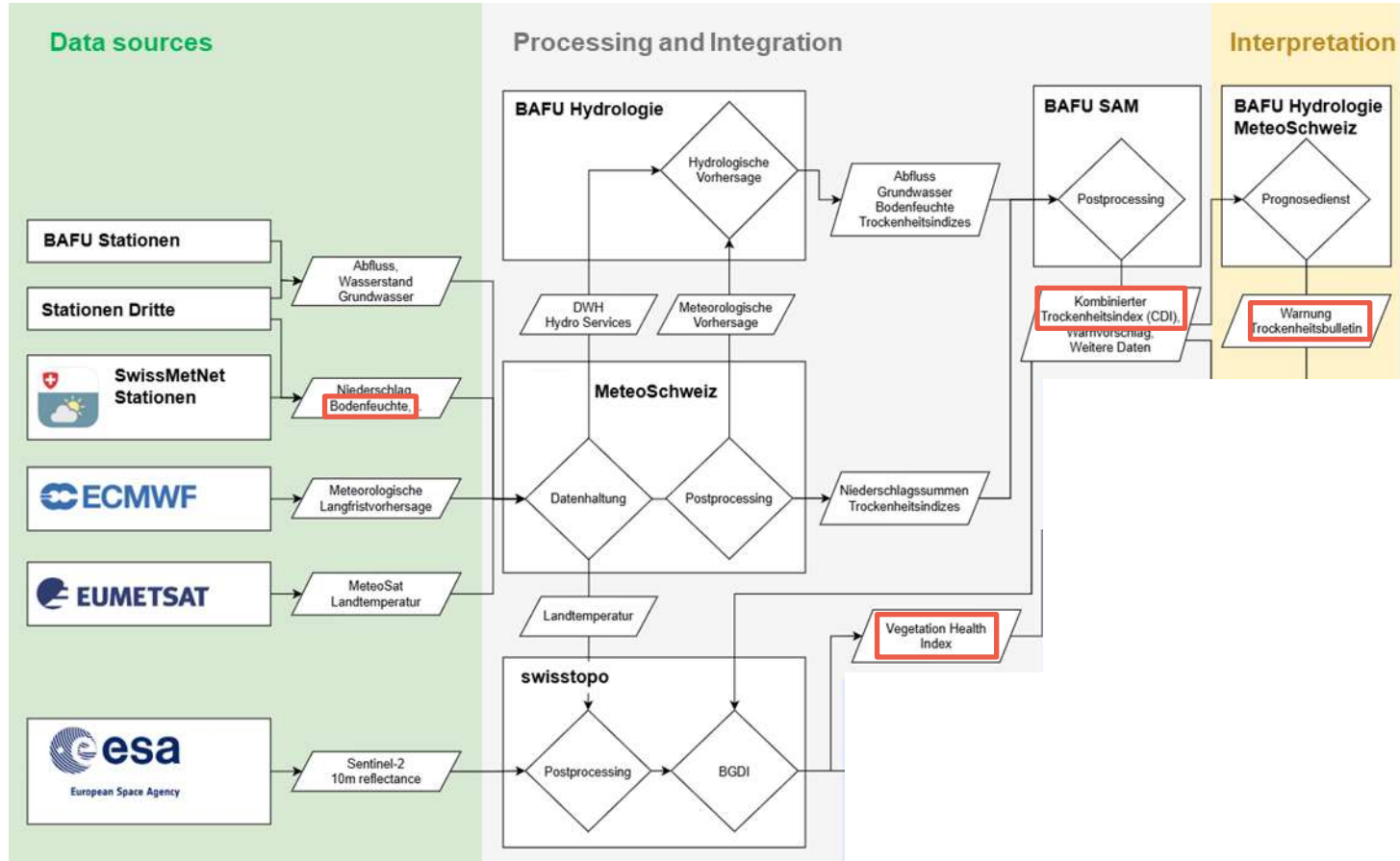


- 5 levels
- Automatically calculated and predicted for each week
- Provides an assessment of the rarity of a multifactorial water deficit
- Provides a basis for decision-making
- Updated daily

- 3 levels (traffic light system)
- Evaluated by experts
- Takes into account the duration and intensity of an event
- Can consider other factors depending on the situation (e.g., low sea levels, lack of snow)

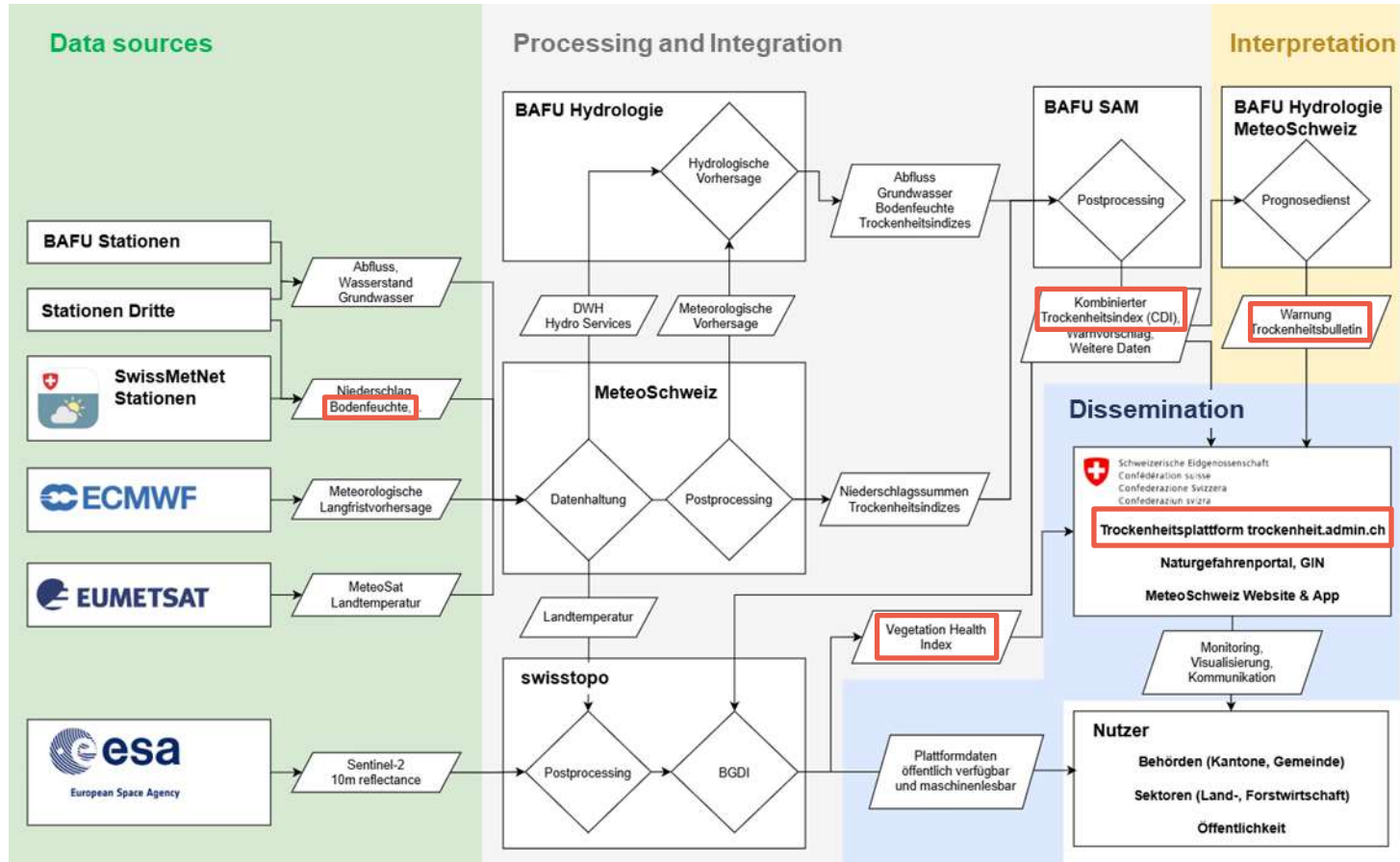


... to decision support





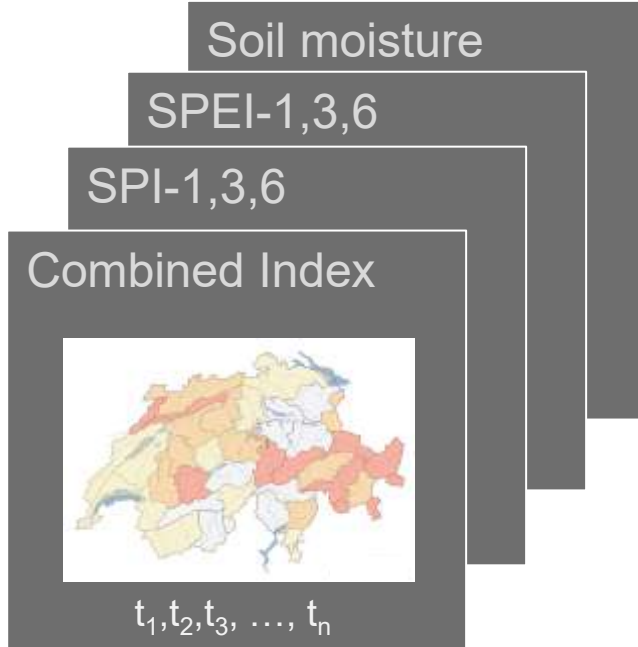
From data to decision support



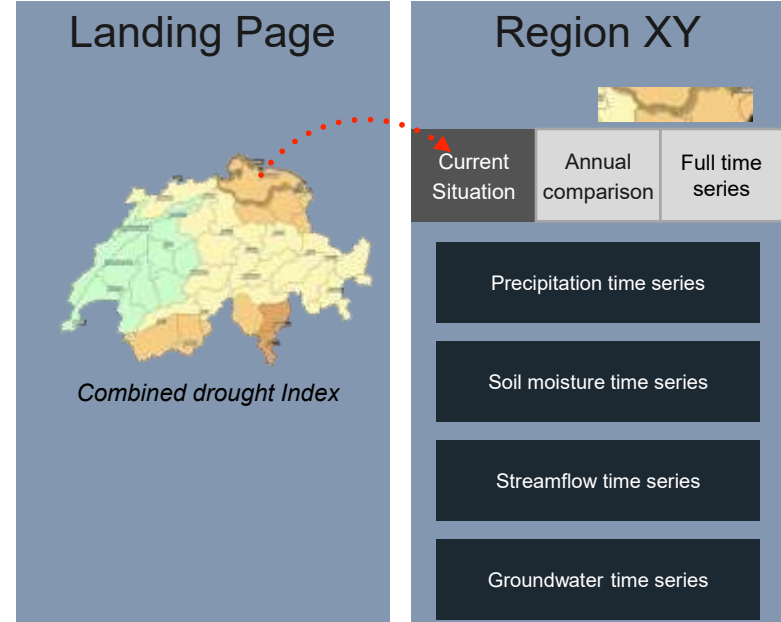


User-centered design

«Science-driven» design



«User-centred» design

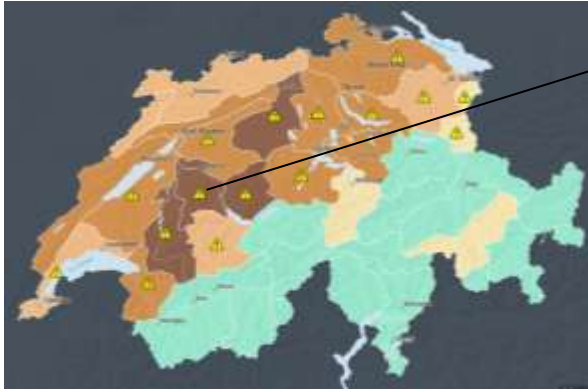




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National Drought Platform and Warnings

June 2025: First drought warning



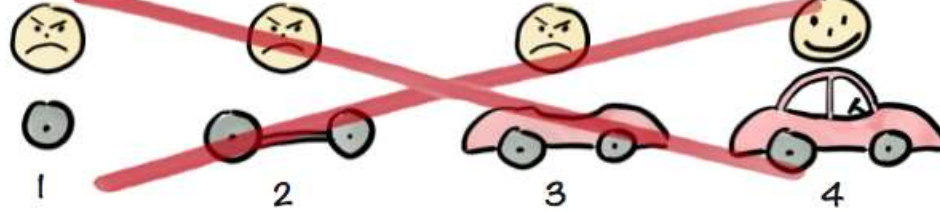
Warning Level 2: 26.6. – 24.7.



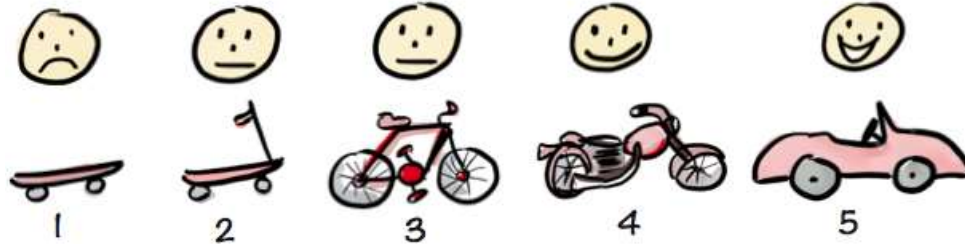


Outlook

Not like this....



Like this!



«Minimum
Viable Product»
Approach



We are here

<https://blog.crisp.se/>



Take home

- **No such system without high-quality observational data**
- **Monitoring drought requires interdisciplinarity of Earth System monitoring through innovative, silo-overcoming collaboration undermined by broad expertise (MeteoSwiss, swisstopo, FOEN, research)**
- **User-centered design** of the system is key
- The platform **showcases a good example** of how the combination and integration of different types of high-quality earth observation data **serves as a decision tool (value-added service)**





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Luca Benelli
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Hélène Salvi
Therese Bürgi
Carlo Scapozza
Petra Schmocker
Massimilano Zappa
uvm.**



Thank you!

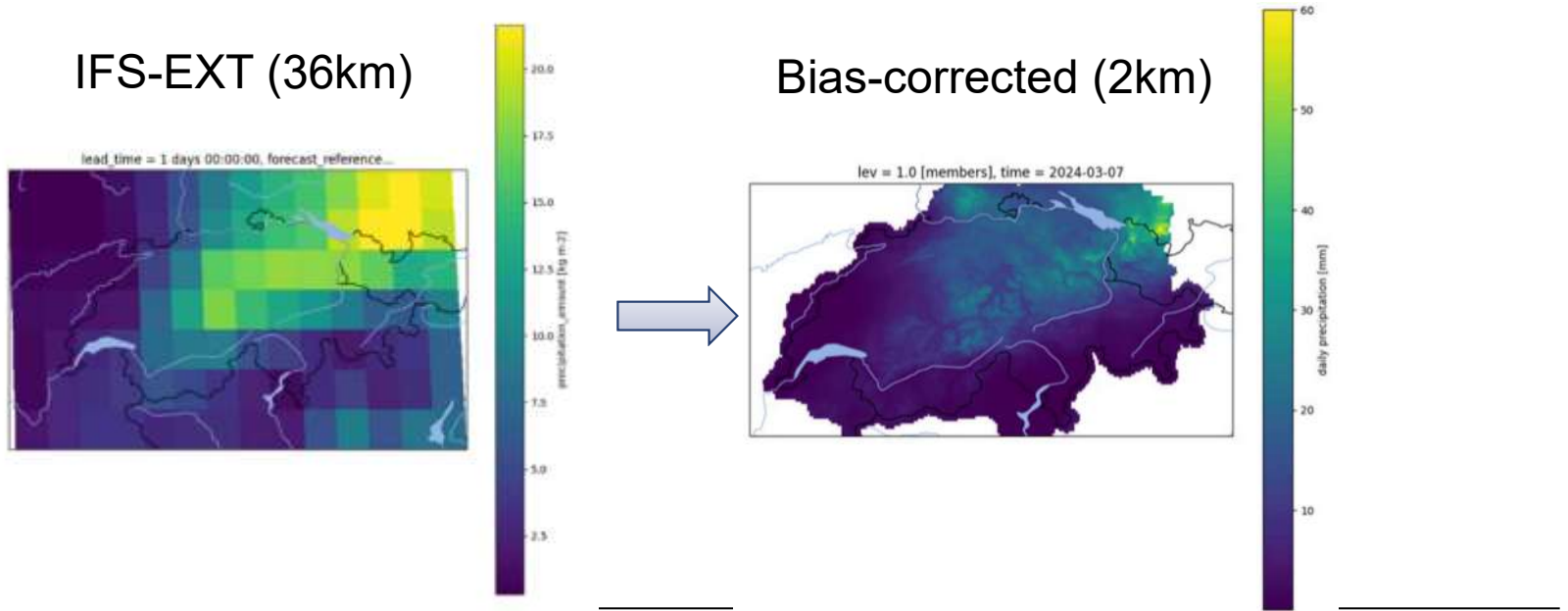
Visit www.drought.admin.ch





Forecasts

The 101 ensemble members of the ECMWF ENS EXT forecast (+46 days) are statistically downscaled to 2km resolution





Forecasts

Niederschlagssumme der letzten 30 Tagen - östliches Mittelland
Bias-corrected 6-week forecast from 2022/07/15 (51 members)

