Schweizer Hagel
Suisse Grêle
Grandine Svizzera

# Digitisation & Agricultural insurance

Hans Feyen, 21.05.2025

# Introduction

Hans Feyen, Swiss Hail.

Hans is currently Chief Underwriting Officer and Head of R&D at Schweizer Hagel. He holds a Masters degree in Agricultural Engineering from the Catholic University of Leuven, Belgium, and a PhD in Soil Physics from ETH Zurich. Hans has spent most of his career in reinsurance, natural hazard modelling and risk transfer for agriculture.

# Outline

- → Introduction Swiss Hail Insurance (who we are, products)
- → Climate change (impacts, insurability)
- → Identifying the true cost of the insurance policy
- → Digitisation (opportunities / issues)

# Who are we:
# a self-help organization of agricultural producers

Swiss Hail was founded by farmers in **1880** as a self-help organization (mutual). It is the leading crop insurer in **Switzerland** and is also one of the leading agricultural multi-peril insurers in Europe. Crops in **Liechtenstein, France, Italy, Portugal (and Serbia)** are also insured through its branches.

The company is organized as a cooperative and distributes excess profits to its members in the form of premium refunds.

**Numbers**

| | **Switzerland and subsidiaries (FL, F, I)** |
|---|---|
| **Insured land area** | 1’158’510 ha |
| **Sum insured** | CHF 4.1 billion |
| **Premium volume** | CHF 143.2 million |
| **Number of full-time equivalent employees** | 76.9 |

# Swiss Hail covers 15 weather risks

Insurance trough with Swiss Hail guarantees **comprehensive protection for crop production**, enables planned risk management and supports the **livelihood of the farm**. Around 21,000 Swiss agricultural, fruit, vegetable, horticultural and wine businesses have placed their trust in Swiss Hail for over 140 years and insure their cultivated areas against Hail and other natural hazards.

| | |
|---|---|
| **Insurance penetration CH** | 70% of open arable land<br>30 to 80% of the permanent crop area (varies depending on crop and canton).<br>30% of the outdoor vegetables area |
| **Insured risks** | Hail \| Flooding & runoff \| Landslide & over-saturation \| Lightning, fire & earthquake \| Storm \| Snow pressure \| Drought \| Lack of and excessive precipitation \| Frost \| Heavy rain & sprawl \| Restoration of cultivated land. |

# Comprehensive insurance coverage for all crops (1)

**Arable crops** [cereals | corn | pulses | oilseeds | protein crops]
The advantage of the arable blanket insurance is that the entire open arable area, including restoration costs, is insured. The risks of drought, heavy rainfall and sprouting are also insured with the arable blanket insurance Plus. The organic and organic Plus blanket arable insurance policies address the special needs of organic farming. Since 2022, arable base has been offered, a less expensive insurance with reduced coverage and a higher deductible, which additionally protects against the risks of excessive or no precipitation.

**Gardening & Vegetable Gardening**
The blanket insurance covers all crops, as the land is occupied by several crops during the year. Crops in greenhouses can also be insured. The blanket insurance offers optimal protection for the entire cultivated area

**Nurseries & Flowers**
In nursery crops, there are high values per unit area. A loss event can cause considerable financial losses. The blanket tree nursery insurance offers comprehensive insurance cover.

**Fruit & Berries**
Even a light hailstorm can declassify the entire harvest, as the fruit is particularly sensitive. Crops under weather protection systems are also insurable, as even these systems do not guarantee complete protection. With the Climate Plus fruit and berry insurance, crops are also insured against damage caused by frost.

# Comprehensive insurance coverage for all crops (2)

**Wine**
For wineries, the entire crop is exposed to the weather throughout the year. Producers can lose the entire farm income due to hail or a natural hazards event.

**Tobacco**
Tobacco is one of the most hail-sensitive crops and cultivation involves high production and harvesting costs.

**Grassland**
The fewer cuts made, the greater the impact of the loss. With the grassland blanket climate insurance, yield losses due to drought are also insured.

**Weatherproofing**
Anti-hail nets, rain roofs and side protection nets can also be insured, as these can also be damaged by severe weather. In addition, covered crops can also be insured at a lower rate.

# Animal disease insurance

**Animals**
Due to the global movement of goods and international trade, the animal disease risk for livestock farms is increasing. Notifiable animal diseases and transmissible diseases can endanger the existence of a farm and the operating costs have to be borne by producers. An insurance can help to compensate the financial loss of the animals. We currently offer insurance for laying hens, breeding and fattening pigs, and dairy cattle against a variety of epidemics.

**Important to know:**

- **Underwriting stop Foot and Mouth Disease – it is our major concern**
- **ASF getting closer and we expect it to arrive in CH in the next few years**

# Indemnity based as well as parametric coverages

## Acker Basis

| | |
|---|---|
| Gesamte Ackerfläche pro Kultur ist versichert | ✓ |
| Versicherungssumme wählbar | ✓ |
| Hagelschäden sind versichert | ✓ |
| Elementarschäden sind versichert | ✗ |
| Vor- und Nachkulturen sind versichert | ✗ |
| Wiederherstellungskosten sind während der Kulturdauer gedeckt | ✓ |
| Übermässiger und fehlender Niederschlag sind gedeckt | ✓ |

Mehr erfahren

## Acker Regen

| | |
|---|---|
| Gesamte Ackerfläche pro Kultur ist versichert | ✓ |
| Versicherungssumme wählbar | ✓ |
| Hagelschäden sind versichert | ✗ |
| Elementarschäden sind versichert | ✗ |
| Vor- und Nachkulturen sind versichert | ✗ |
| Wiederherstellungskosten sind während der Kulturdauer gedeckt | ✗ |
| Fehlende Niederschläge sind gedeckt | ✓ |

Mehr erfahren

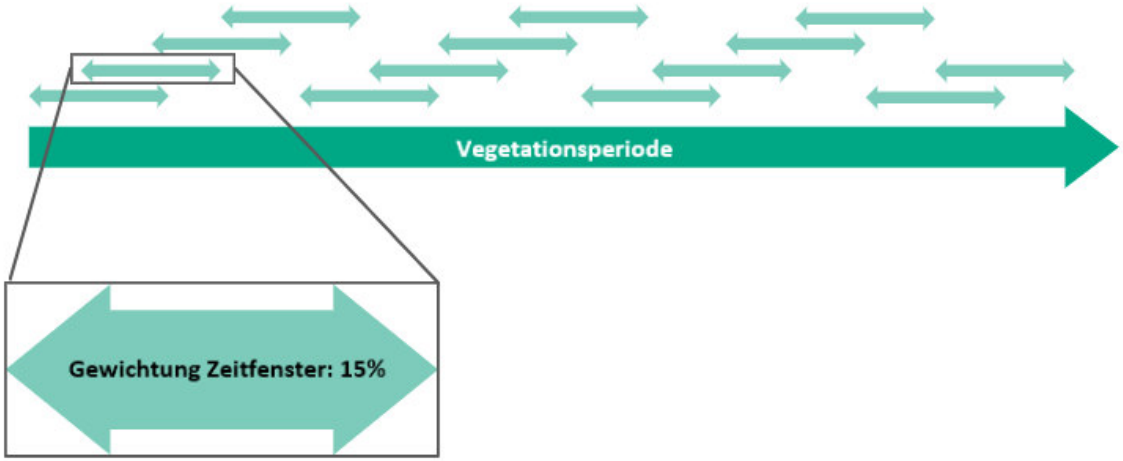
## Pauschal KLIMA

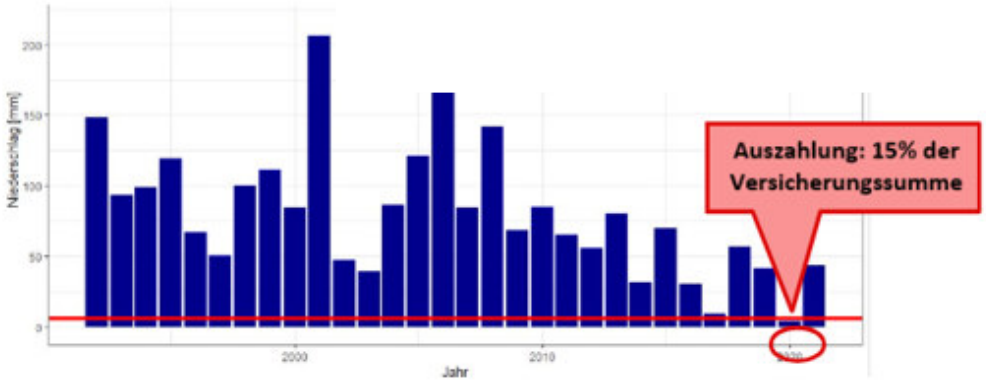
| | |
|---|---|
| Gesamte Grasfläche versichert | ✓ |
| Vertraglich vereinbarte Arenwerte | ✓ |
| Schneedruckschäden gedeckt | ✗ |
| Wiederherstellungskosten *sind ganzjährig gedeckt* | ✓ |
| Trockenheit ist versichert | ✓ |

Mehr erfahren

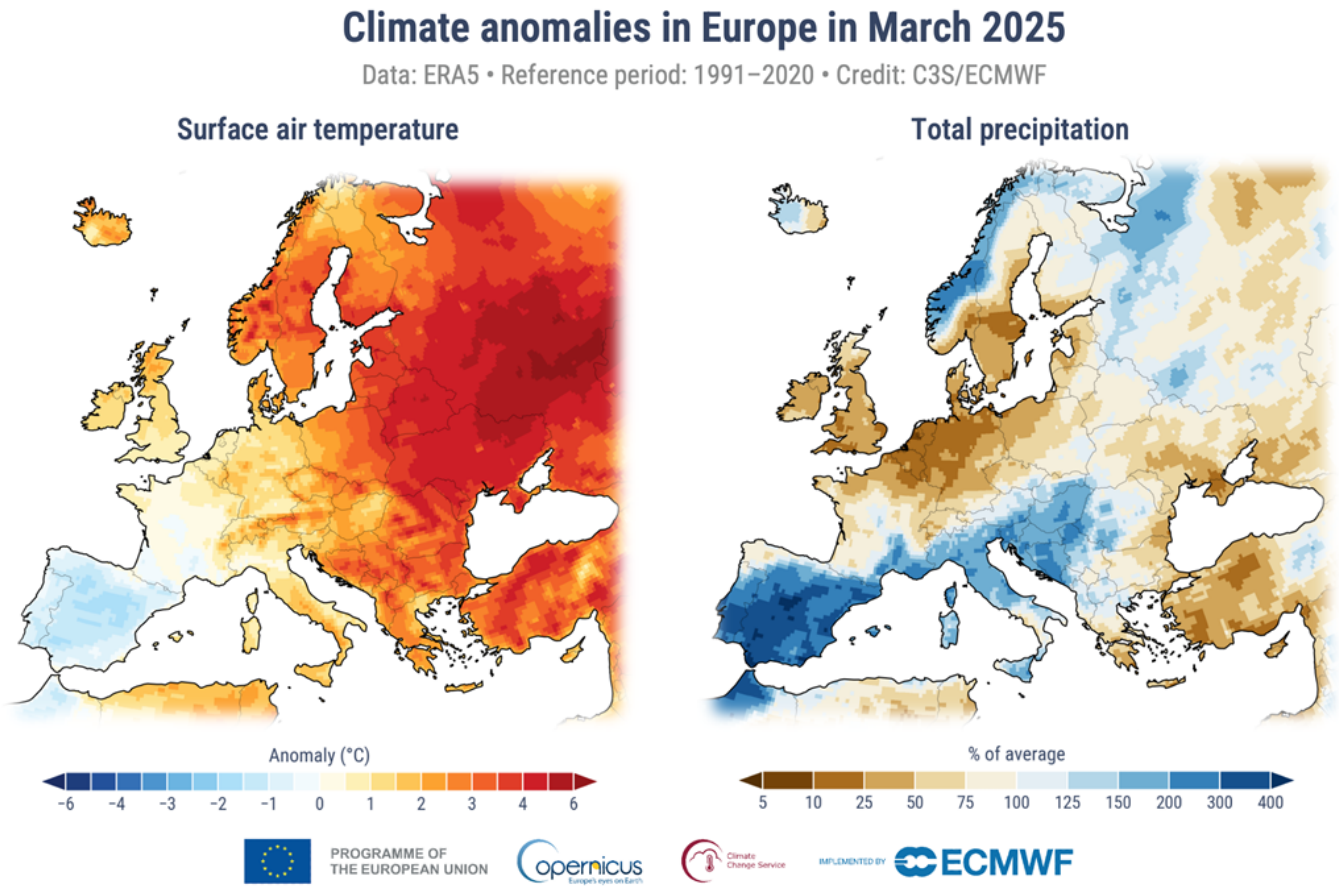
Index based on Precipitation / Water balance
Resolution: $km^2$

# Parametric coverages (e.g. AckerRegen)

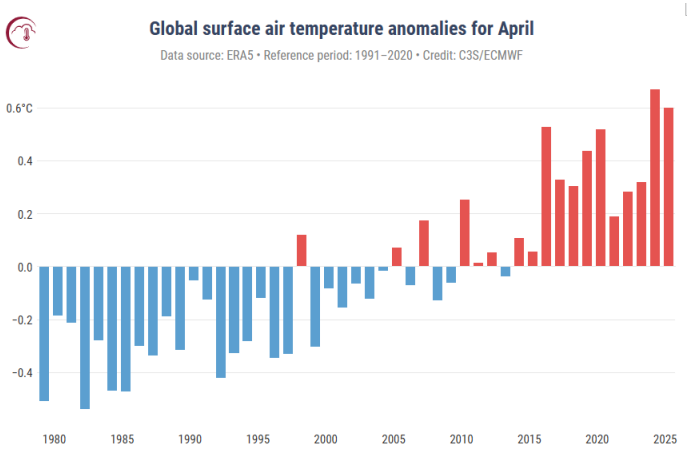



# Climate change – off the radar, but still there!

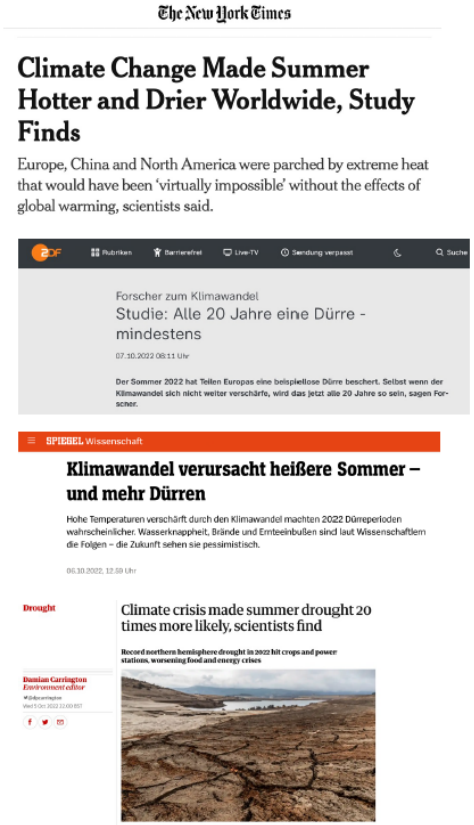



**Avoiding / Reducing heat impact is difficult!**



# The impact of climate change

## Sommer 2022: Attributionsstudie für Nordhemisphäre (ohne Tropen)



The New York Times

**Climate Change Made Summer Hotter and Drier Worldwide, Study Finds**

Europe, China and North America were parched by extreme heat that would have been 'virtually impossible' without the effects of global warming, scientists said.

ZDF

Forscher zum Klimawandel

Studie: Alle 20 Jahre eine Dürre - mindestens

07.10.2022 08:11 Uhr

Der Sommer 2022 hat Teilen Europas eine beispiellose Dürre beschert. Selbst wenn der Klimawandel sich nicht weiter verschärfe, wird das jetzt alle 20 Jahre so sein, sagen Forscher.

SPIEGEL Wissenschaft

**Klimawandel verursacht heißere Sommer – und mehr Dürren**

Hohe Temperaturen verschärft durch den Klimawandel machten 2022 Dürreperioden wahrscheinlicher. Wasserknappheit, Brände und Ernteeinbußen sind laut Wissenschaftlern die Folgen – die Zukunft sehen sie pessimistisch.

06.10.2022, 12.59 Uhr

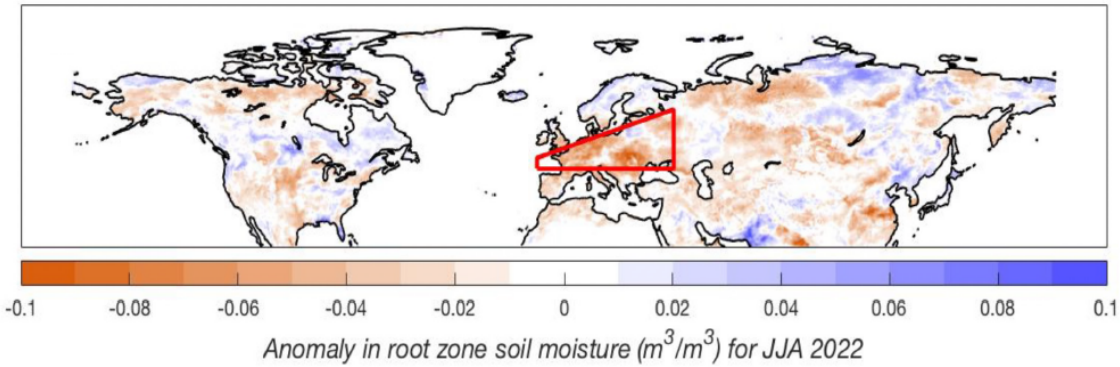
Drought

**Climate crisis made summer drought 20 times more likely, scientists find**

Record northern hemisphere drought in 2022 hit crops and power stations, worsening food and energy crises

Damian Carrington
Environment editor






**Wahrscheinlichkeit von 2022 NH Trockenheit:**

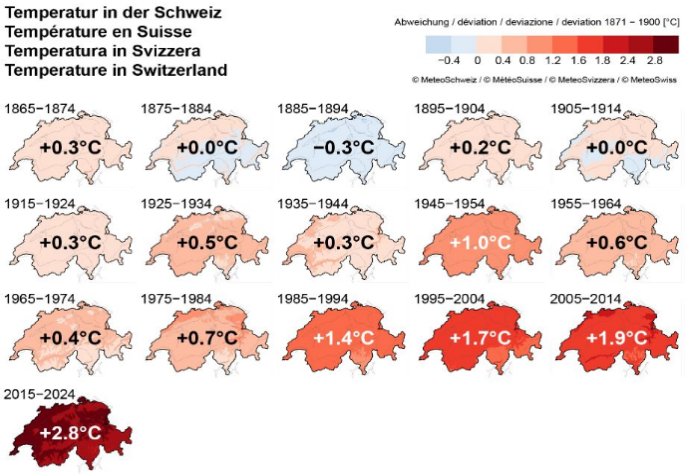
**Jetzt: 20x wahrscheinlicher (alle 20 Jahre gegenüber alle 400 ohne menschlichem Einfluss)**

*Schumacher et al. (WWA report)*

*https://www.worldweatherattribution.org/high-temperatures-exacerbated-by-climate-change-made-2022-northern-hemisphere-droughts-more-likely/*

# The impact of climate change on crop insurance

MeteoSwiss, webpage




The impact of heath damages in the crop production is increasing, and it is hard to mitigate

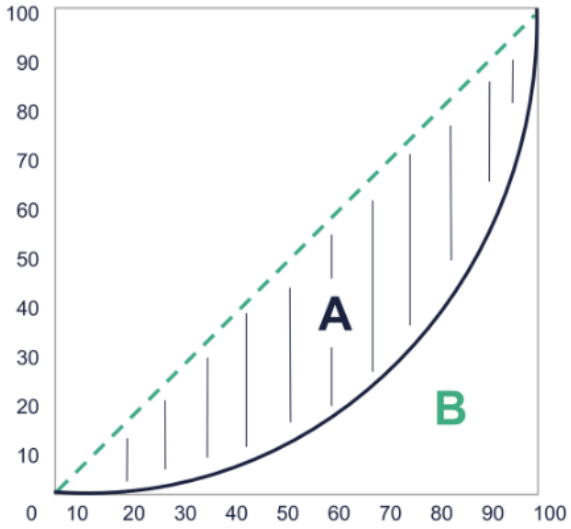
11. April 2025

**Erste Frostmeldungen**

Frühjahrsfrost gefährdet Obstkulturen

Start of growing season (GDD's) ever earlier

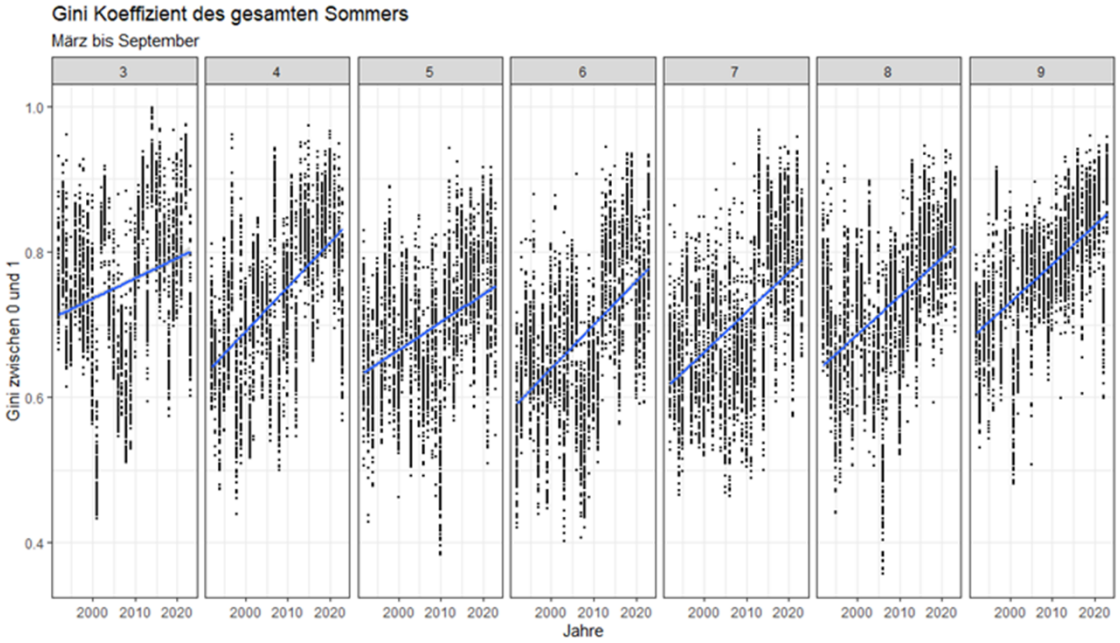
# Rainfall gets ever more unequally distributed (Gini Coefficient)




$$GINI = \frac{A}{A + B}$$

**Interpretatie**

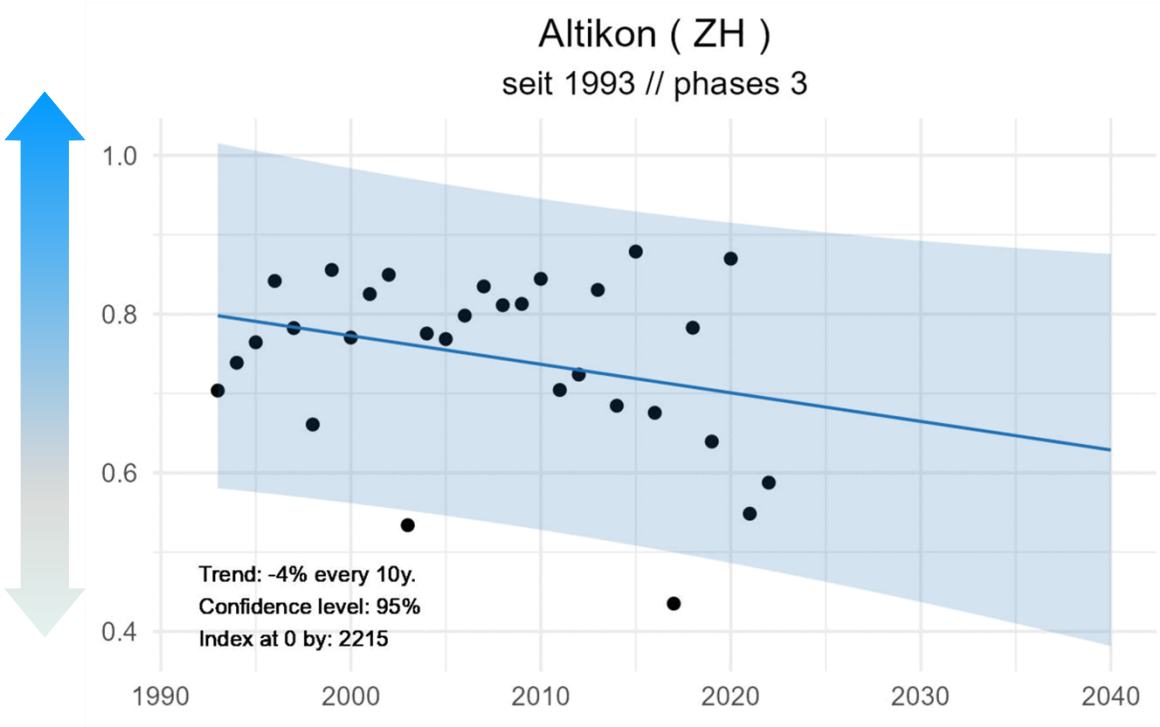
- 0 = 'perfecte gelijkheid'
- 1 = 'perfecte ongelijkheid'




Gini-Coefficient = Rainfall inequality over a period of time

Increase in Gini = Longer dry periods and more intense rainfall events

# Can we insure climate change?



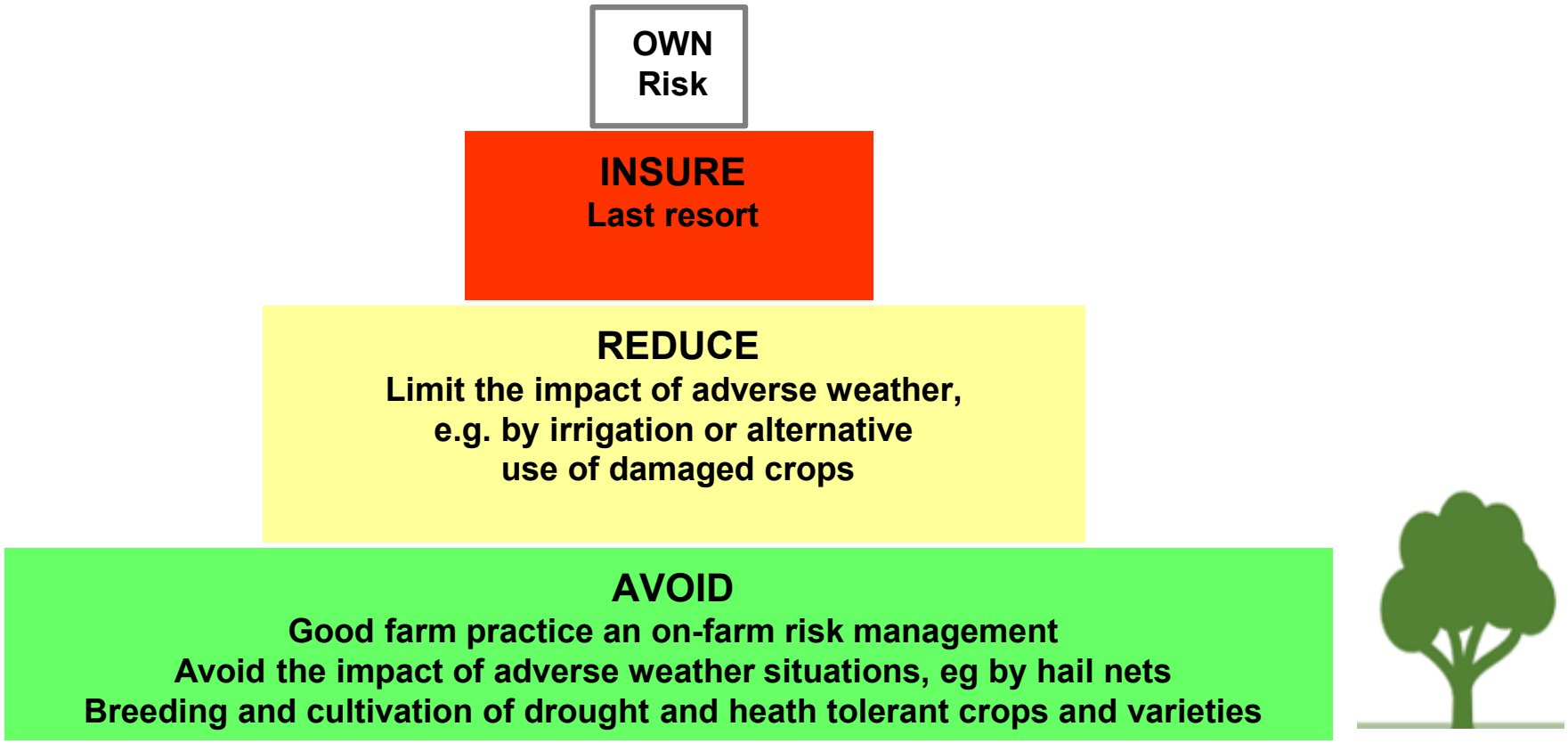

## No, we can’t!

We insure deviations from expected (yield, rainfall, soil moisture,…)

Detrending and making a “prediction” of what to expect

Prediction for y+1, not for 2040 → smooth development rather than large jumps

# Our approach to insuring agricultural risks



# Adapt Programme / AgroImpact

→ We often get asked, if we insure specific risks related to transition to more resilient farming practices? No, not yet…

Schweizer Hagel
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AgroImpact

**AgroImpact and Schweizer Hagel are pooling expertise and resources in a network of farms exposed to drought.**

**The aim is to deepen and broaden the understanding of drought damage and to support farms in implementing measures to increase climate resilience.**

**Swiss Hail Adapt Programme (in the making….)**

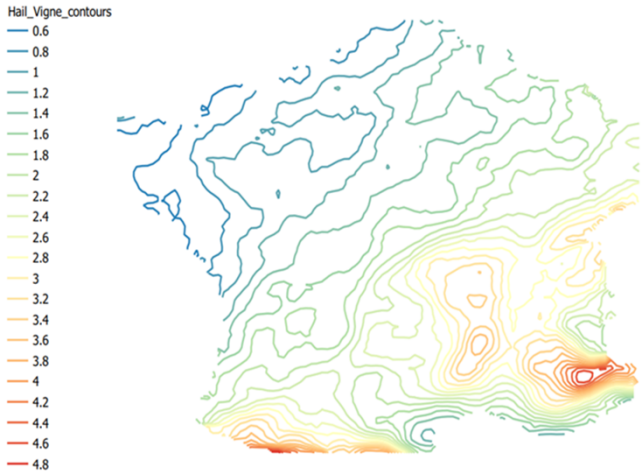
**Financial support to clients for climate adaptation**

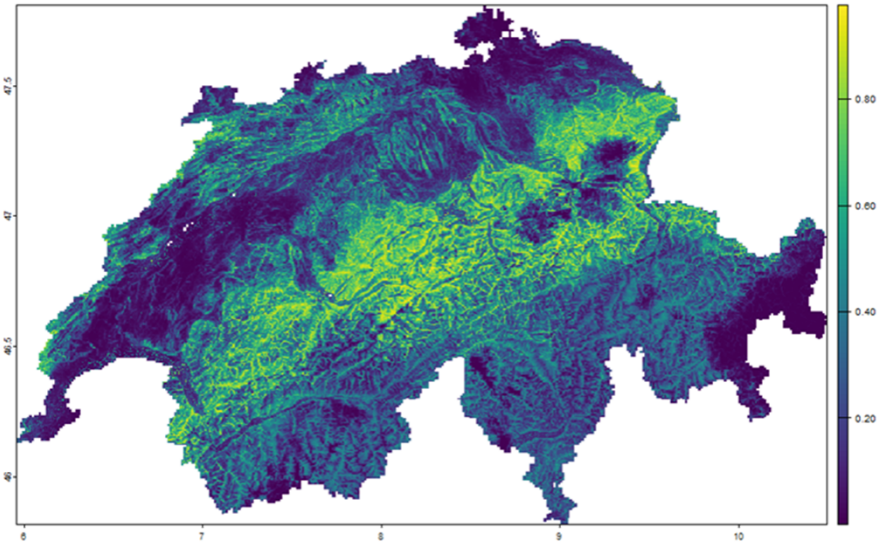
# Adequate insurance premium: our main lever!

→ Farmer pays the correct insurance premium for his own weather risk:

- Depending on: Location, Crop type & Perils covered, Product, ….
- Location: lat/lon, plot & (for now still mainly) commune

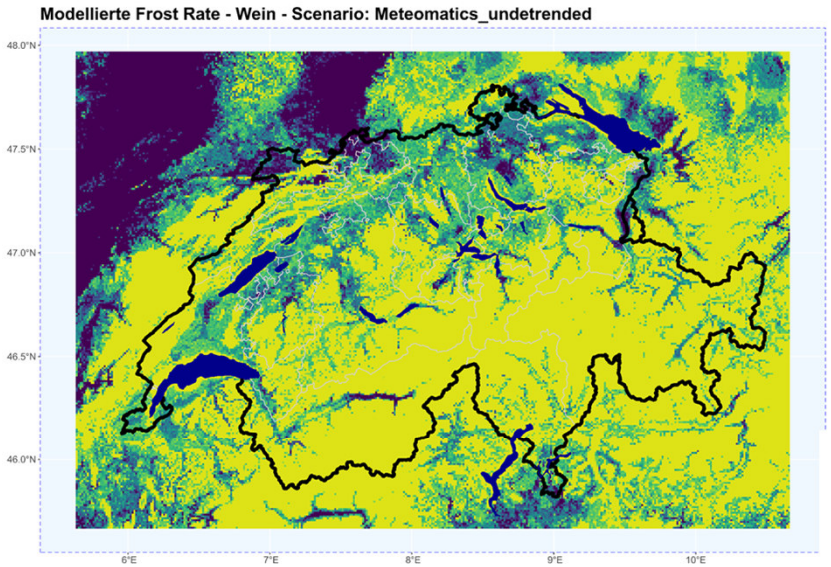
→ Risk maps per peril

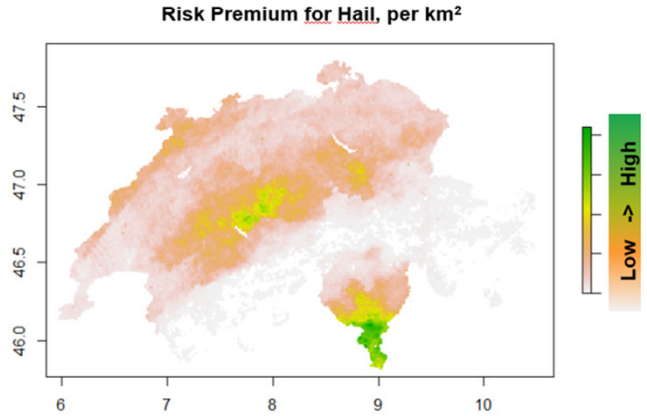


# Detailed tariffs (location, plot, farm)

→ **Move away from tariffs at political boundaries (e.g. commune)**



# Digitisation in agricultural insurance

→ **Digitization is pushing us forward….**

- Higher resolution exposure data
- New data sources (e.g. remote sensing)
- Increased weather data availability

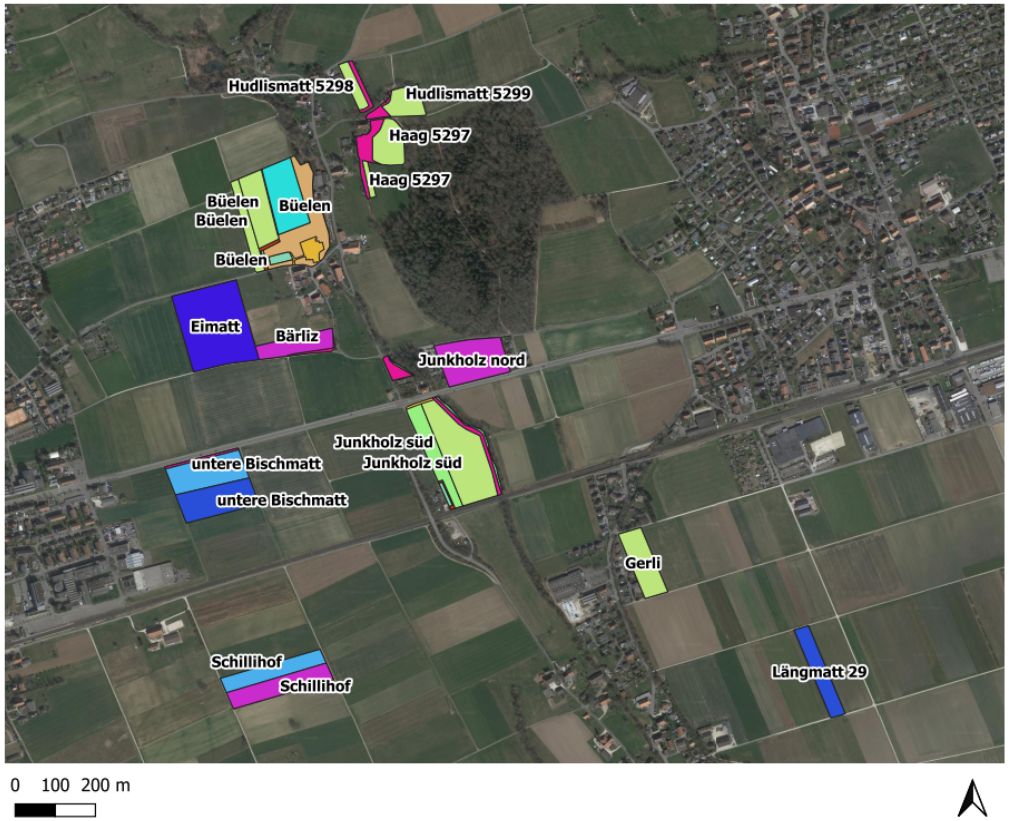
→ **… but also creating new opportunities**

- Tariffs at high spatial resolution
- Detailed services and information to clients and experts

→ **… as well as some issues**

- Data quality

# Higher resolution exposure data (in all countries)




- Data volume
  - 6 Gbyte in France
- Data management
  - Quality
  - Originating from various systems

lnf_nutzung_flaeche

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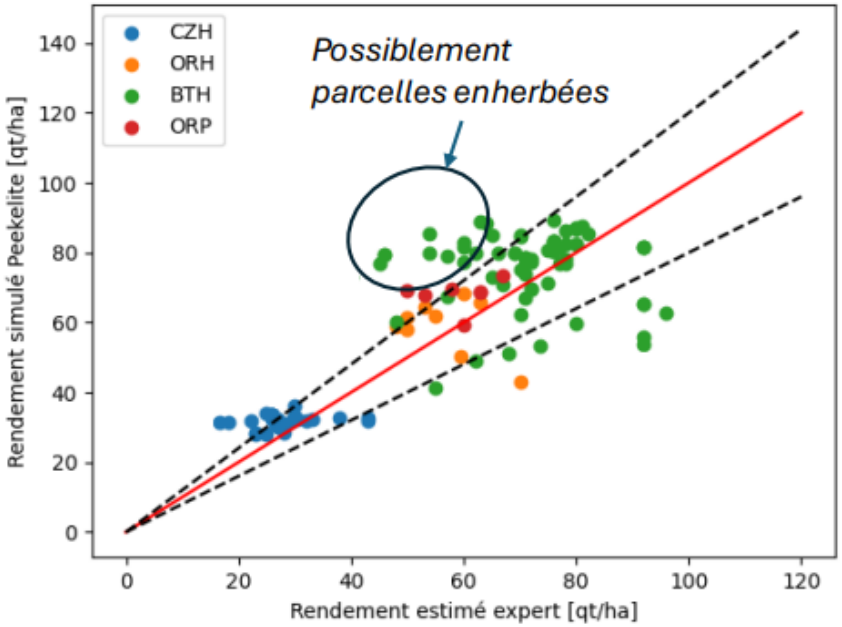
betrieb_bewirtschaftungseinheit

# Is satellite imagery useful (in an insurance context)?

→ **It depends on the use case (and the agricultural production structures)**

- Example France: yield prediction
- Example Switzerland: loss adjuster guidance



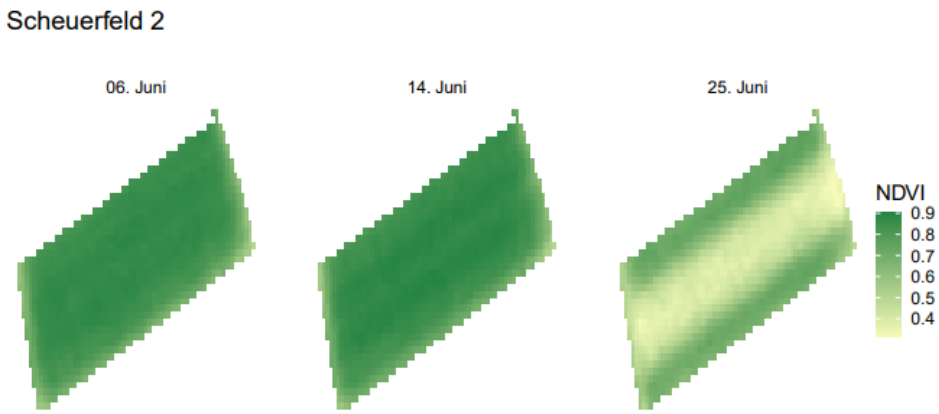
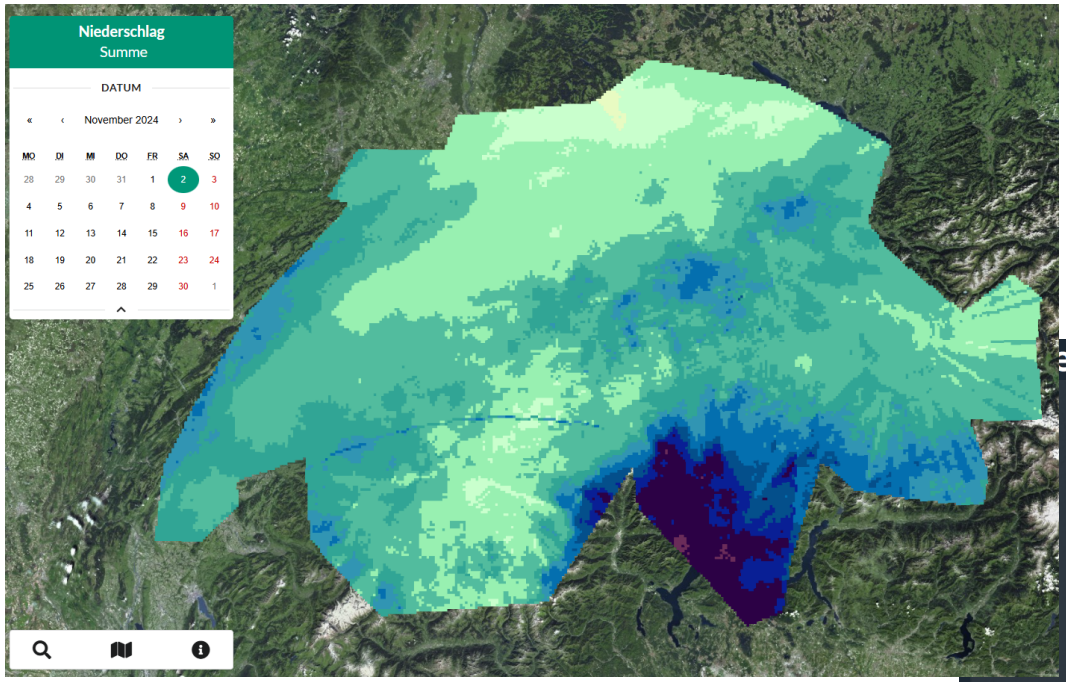
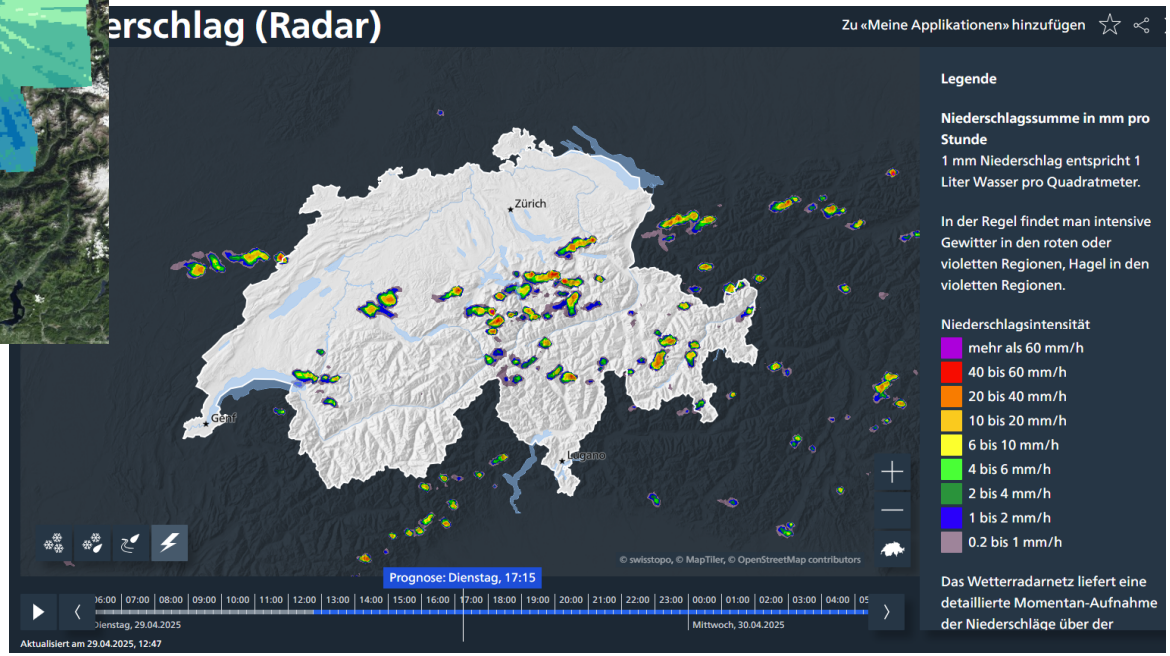




Abbildung 1: Scheuerfeld 2 NDVI

# High resolution weather data – they have their issues



# High resolution weather data – they have their issues


- For risk modelling, tarification as well as product settlement, reliable historical weather data are paramount (e.g. amount of precipitation, temperature)
- Given the small scale topography of Switzerland (and IT,PT,…), just using station data is not enough
- Interpolated data, however, are prone to bias and overfitting

→ adapt products and tarification approaches to become more resilient against insufficient data quality

- Aggregation over time reduces the bias
- Use station data to derive trends and volatility

# Thank you for your attention!