

# Innovations in Agricultural Weather Insurance

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## 1 Motivation

- Agricultural production is exposed to a variety of **climate risks**



Fig. 1. Thunderstorm; Jon Liu/ stockvault.net

- Exacerbated through **climate change** [1]
- Weather insurance** proposed as adaptation strategy [2]
- Payout in case of bad weather [3]
- However: Low uptake** rates without subsidization

## 4 Nudging Farmers to insure

- Farmers' **insurance choice** showed to be **irrational**
- Nudging** farmers to insure
- Using **cumulative prospect theory** preferences [4]

### Nudge

«A small feature in an environment that attracts our attention, and influences the behavior we make.»

-Richard Thaler  
 Behavioral Economics, University of Chicago

## 2 Conceptual Background

### Research Goal

Improving existing weather insurance schemes, by making products more attractive to farmers.

### Methods

- Quality** loss insurance
- Insurance payments** suited to farmers **behavioral needs**.
- Big data** usage

## 5 Big Data



Fig. 4 Wheat emergence stage 1961 - 1990

### Growth Observations

- Observations of plants' phenological development stage [6]
- Finding vulnerable growth periods
- Flexible timings over the years

## 3 Quality Loss Insurance

- Major income losses due to weather related, **low yield quality** outcomes
- So far not considered in weather insurance
- Modelling** quality shortcomings using weather data
- Insuring** the modeled quality

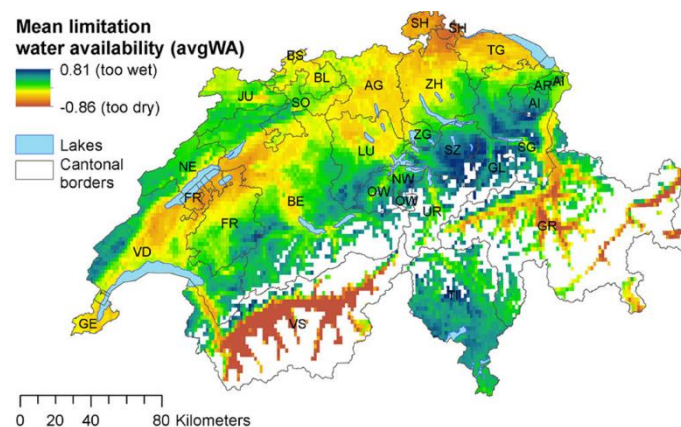


Fig. 2 Suitability of water availability for winter wheat production in Switzerland. Figure taken from [4]

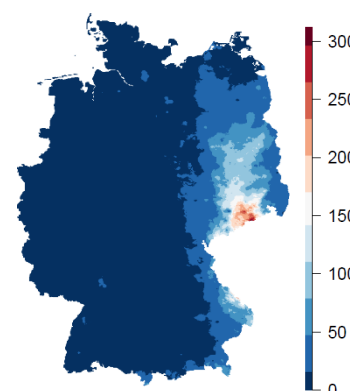


Fig. 5 Precipitation sum 12.08.2002 (Grid Model Output)

### Weather Grid

- High resolution precipitation grid
  - Precise on-farm weather time series
- **Free of charge, transparent, real-time**
- **R packages made available**

## 6 References

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