Predictive Analytics – Catastrophe Risk Management work-in-progress in the Insurance Industry

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Novi Sad, 29.11.2018

GENILLARD & CO

INSURANCE FACTORY

AGENDA

1	G&CO PROFILE
2	PREDICTIVE ANALYTICS
3	WORK-IN-PROGRESS
4	CATASTROPHE MANAGEMENT IN EUROPE
5	THE FUTURE OF WORK

BUSINESS UNIT CONSULTING: AREAS OF EXPERTISE

CYBER

- Market Surveys
- Workshops for Risk Management & Insurance
- Business Development for Insurers
- Design of Insurance Products
- Structure, Quotation and Placement of Reinsurance Programmes

NATURAL HAZARDS

- Deep understanding of Risk Analysis & Modelling Methodology
- H2020_Insurance oasis Horizon2020 Insurance
- Impact of Climate Change
- SmartCat Technology Approach
- Public-Private Approach
- Annual Best Practice Workshop with leading European Practitioners and Scientists

AGRICULTURE

- Holistic Market Risk Analysis
- Holistic Investor Risk Analysis
- Remote Sensing
- Agriculture Risk Academy (ARA) training programmes
- Agricultural Risk Metrics Platform (ARM)
- Public-Private Approach

OUR PROJECTS

- Focus on Risk Management & Risk transfer Solutions

- Our Clients are Institutions & Insurance Industry

- Research & Expert Network Natural Perils & Climate Change

- Public Private Partnership Approach (PPP)

- Focus Agriculture & Forest

- Europe-wide Activities, but primary focus on DACH, CEE & CIS Markets

- Project in course **H2020 Insurance**, including Danube Flood Model (University of Novi Sad involved!)

- Project in course „**Agriculture Risk Metrics**"

- Project in course „**Agriculture Risk Academy**"

- Project in course „**INN Forest Watch**" in Norway

- Project in course "**Dr. Tide**" – Apps for the insurance industry, "powered by AI"

OUR SERVICES FOR AGRICULTURE INSURERS

Data Management

Modelling

Analytics

Reinsurance

Database
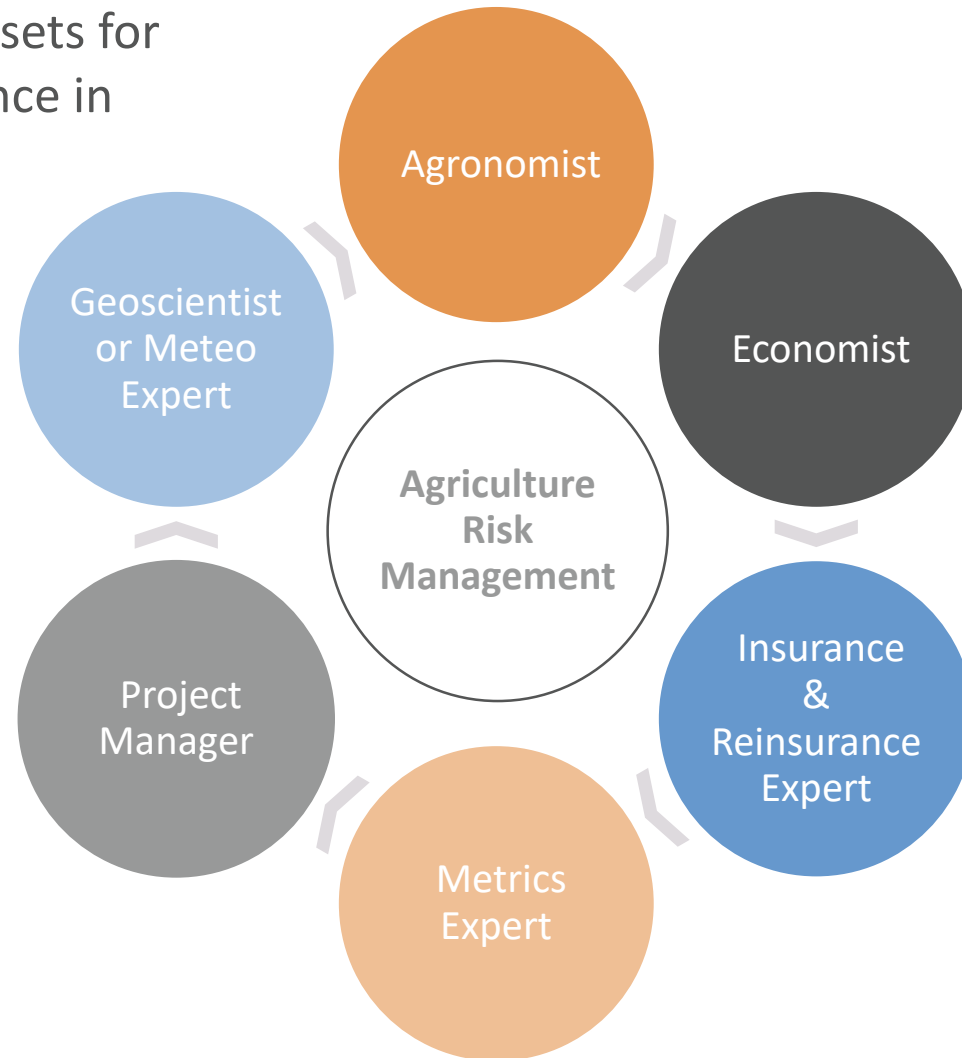Set up

Risk
Assessment

Portfolio
Analysis

Decision
Metrics

KNOW-HOW REQUIREMENT AGRO & NATCAT

Know-how & interacting skill sets for risk management and insurance in our core business
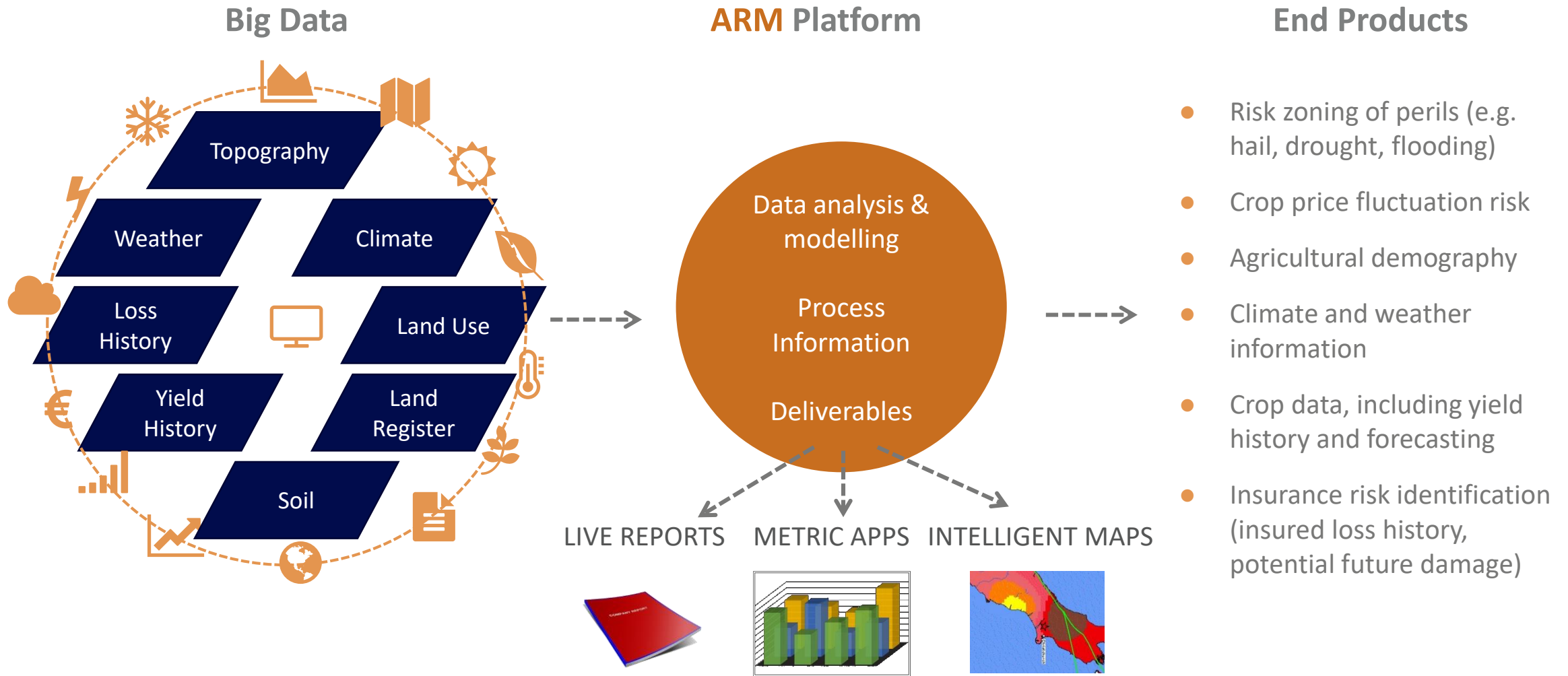
AGRICULTURE RISK METRICS (ARM)

We will build a platform that brings together our leading technicians and risk modelers and your aspiring practitioners.

Once implemented the **ARM** platform will host the following **key functionalities and provide services** delivering:

- **"Intelligent" mapping** of all farming in the country and allocation of risk zones together with satellite monitoring

- A **farming database** with historical and real-time data (farm structure, sociology, crop yields, loss history etc.)

- **Crop modelling** enabling yield forecasting

- **Natural perils modelling** including the impact of climate change

- **Crop price modelling**

- **Insurance risk model**

ARM – HOW IT WORKS

Big Data

- Topography
- Weather
- Climate
- Loss History
- Land Use
- Yield History
- Land Register
- Soil

ARM Platform

Data analysis & modelling

Process Information

Deliverables

LIVE REPORTS METRIC APPS INTELLIGENT MAPS

End Products

- Risk zoning of perils (e.g. hail, drought, flooding)
- Crop price fluctuation risk
- Agricultural demography
- Climate and weather information
- Crop data, including yield history and forecasting
- Insurance risk identification (insured loss history, potential future damage)

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OUR PARTNERS AND REFERENCES

Wageningen University and Research Center

# INSURTECH

Source: "obs/Capgemini"

ANALYTICS & TECHNOLOGY

- Interdisciplinary skills – increasing importance of IT & software

- helping customers to execute leadership in context of identifying and **leveraging business value in their data**

- "fail fast" culture, breaking with established processes and exploring new paths is important to **accelerate data driven business models**
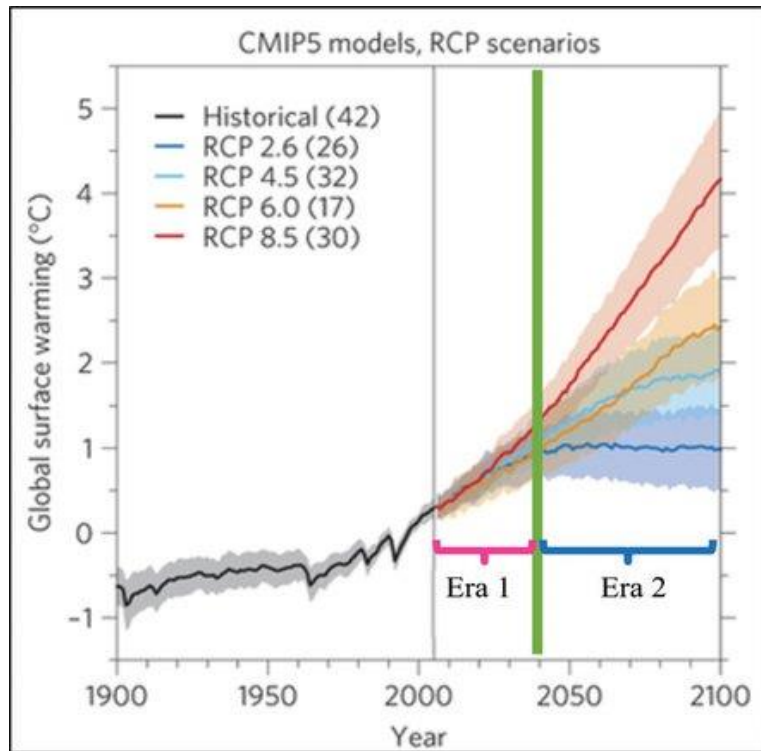
29.11.2018 Predictive Analytics - Christopher Genillard 11
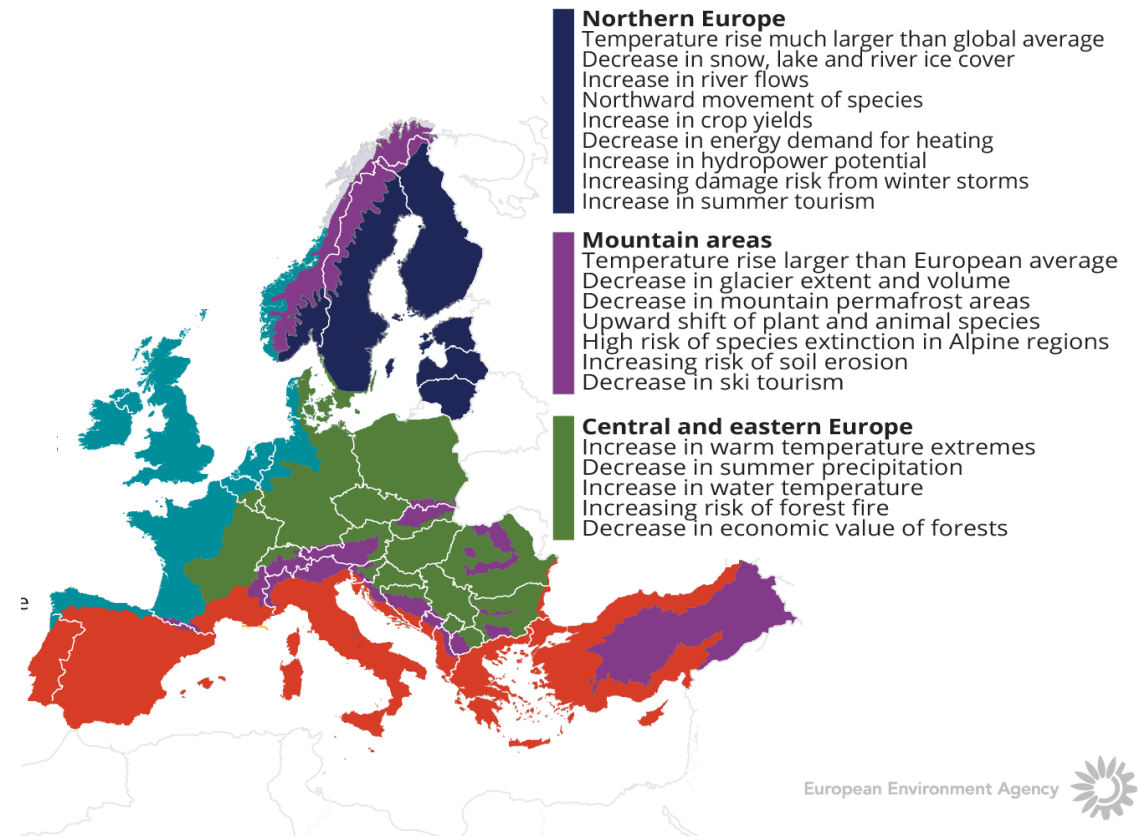
PREDICTIVE ANALYTICS
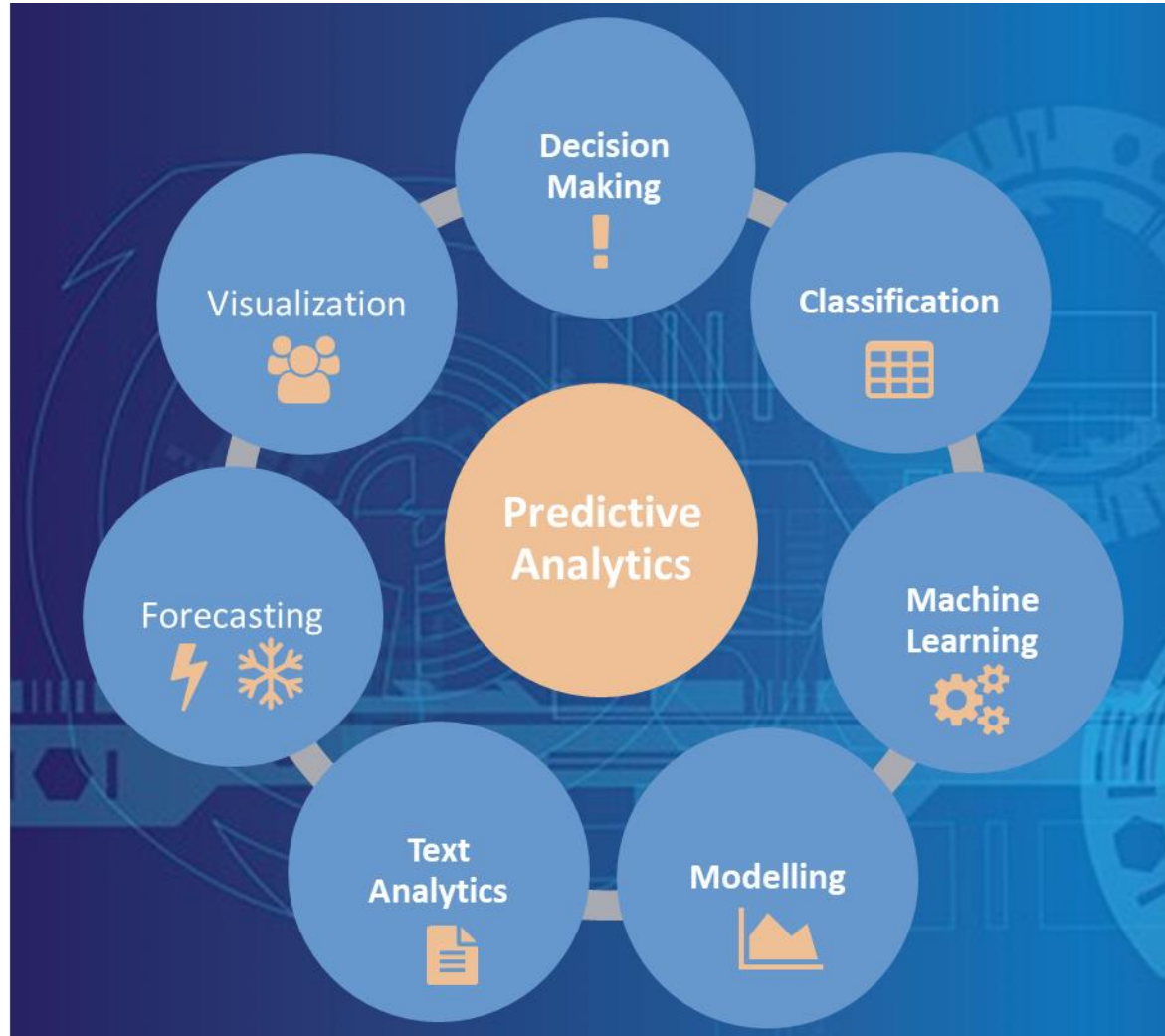
MODELLING AND FORECASTING

Modelling of Climate Change

Forecasting of Effects in Europe

Intergovernmental Panel on Climate Change

Northern Europe
Temperature rise much larger than global average
Decrease in snow, lake and river ice cover
Increase in river flows
Northward movement of species
Increase in crop yields
Decrease in energy demand for heating
Increase in hydropower potential
Increasing damage risk from winter storms
Increase in summer tourism

Mountain areas
Temperature rise larger than European average
Decrease in glacier extent and volume
Decrease in mountain permafrost areas
Upward shift of plant and animal species
High risk of species extinction in Alpine regions
Increasing risk of soil erosion
Decrease in ski tourism

Central and eastern Europe
Increase in warm temperature extremes
Decrease in summer precipitation
Increase in water temperature
Increasing risk of forest fire
Decrease in economic value of forests

European Environment Agency

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JRC-DISASTER RISK MANAGEMENT KNOWLEDGE CENTER

EU FLOOD DIRECTIVE

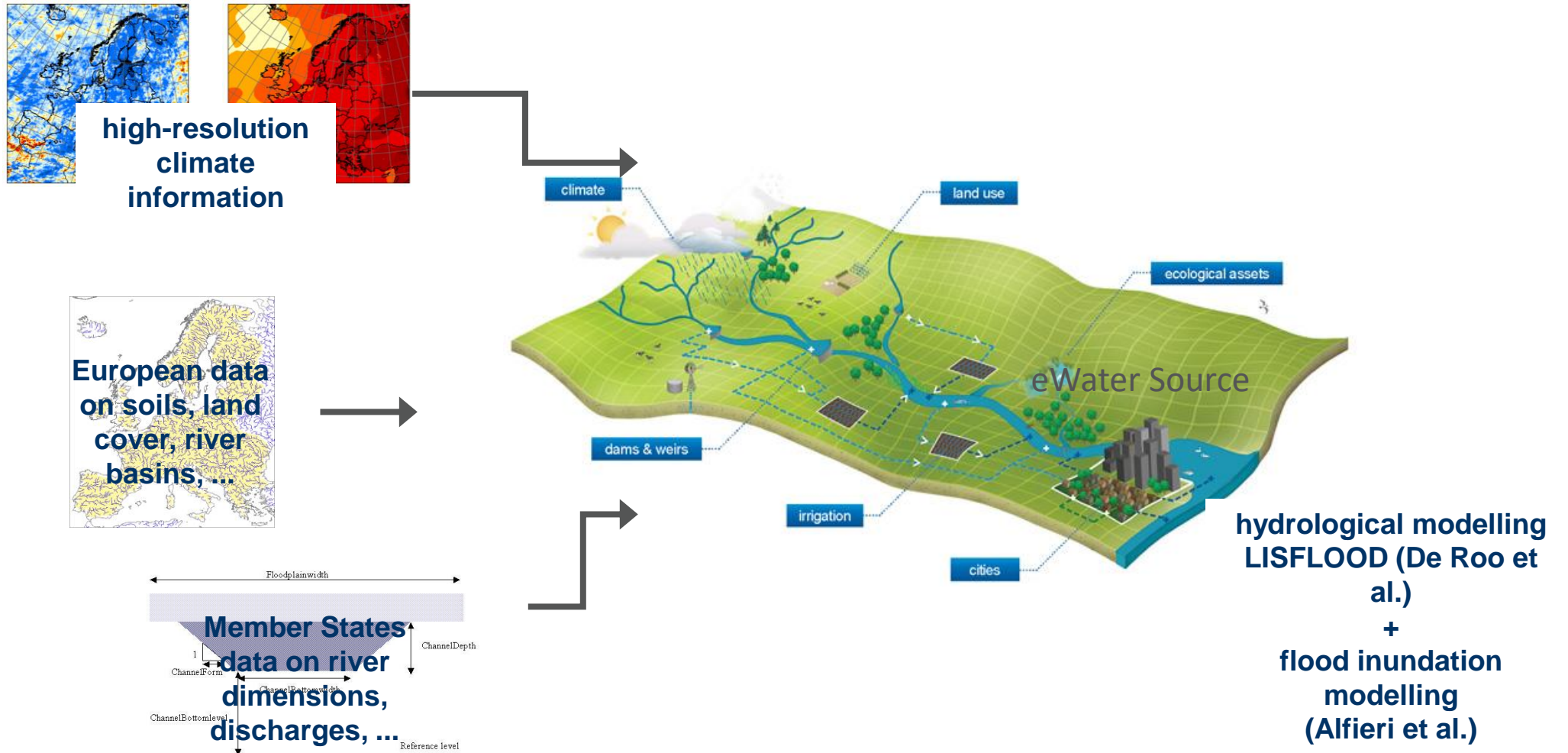**Identify - evaluate - react to flood risks...**

...and then repeat the cycle

1. Preliminary Flood Risk Assessments

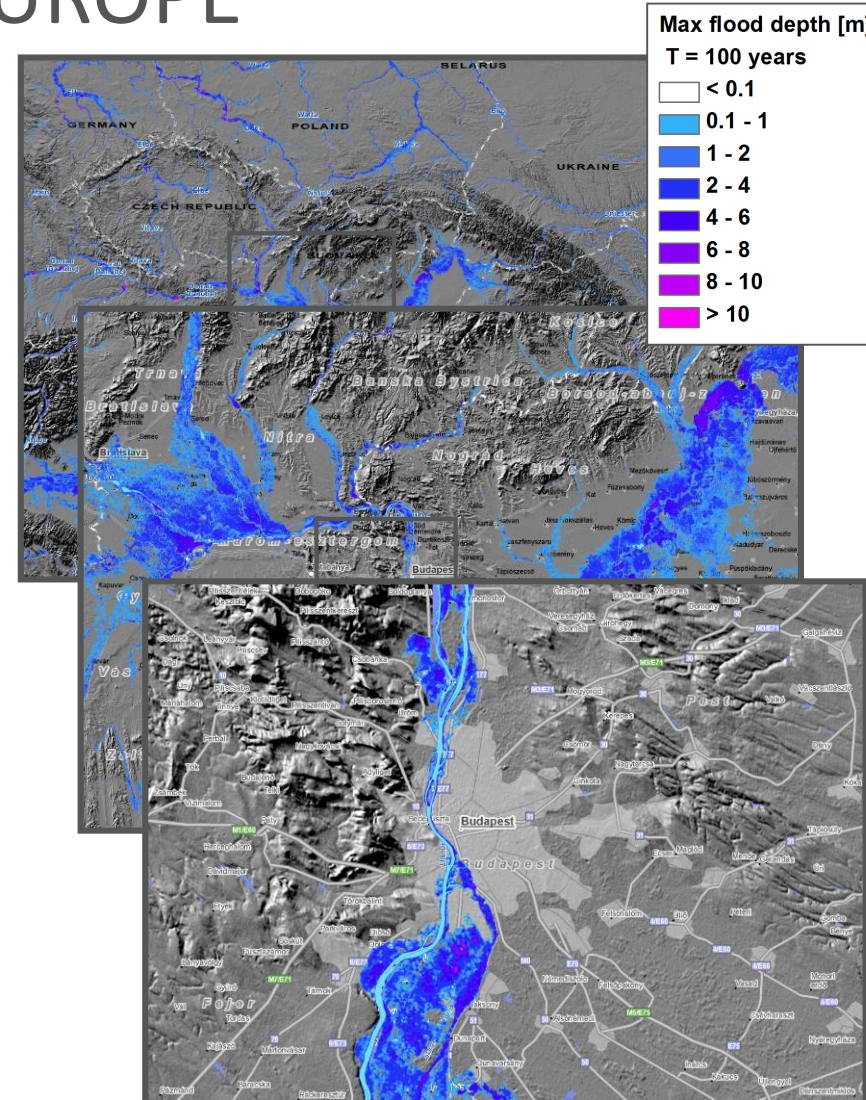2. Flood Hazard & Risk Maps

3. Flood Risk Management Plans

Review and update all three at 6-yearly cycles

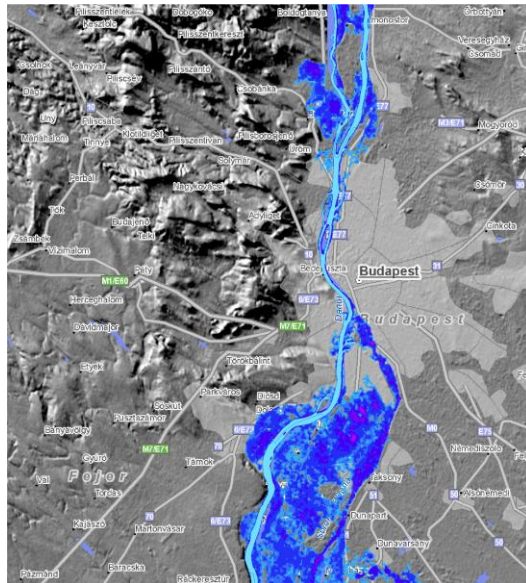29.11.2018 Predictive Analytics - Christopher Genillard

FLOOD HAZARD ESTIMATION

high-resolution climate information

European data on soils, land cover, river basins, ...

Member States data on river dimensions, discharges, ...

climate

land use

ecological assets

eWater Source

dams & weirs

irrigation

cities

hydrological modelling LISFLOOD (De Roo et al.)
+
flood inundation modelling (Alfieri et al.)

FLOOD HAZARD MAPPING IN EUROPE

Max flood depth [m]
T = 100 years
- < 0.1
- 0.1 - 1
- 1 - 2
- 2 - 4
- 4 - 6
- 6 - 8
- 8 - 10
- > 10

(Alfieri et al., Hydrological Processes, 2014)

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FLOOD IMPACT ESTIMATION

Flood hazard

Exposure

CORINE (EEA)
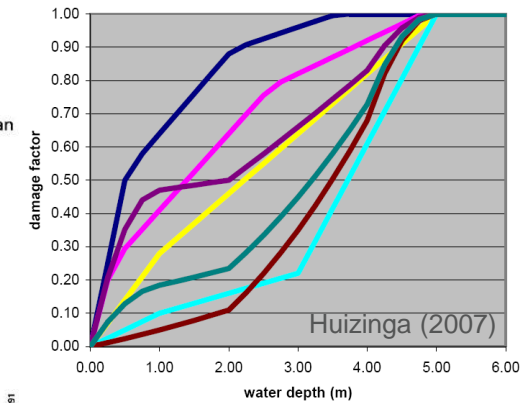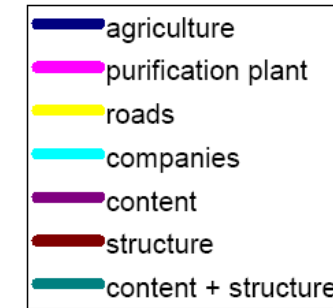
Vulnerability

Flood risk

→ **Direct economic damage of flood events**

→ **Number of people affected by flood events**

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DRMKC PERIODIC SCIENTIFIC REPORTS

- Over 4500 downloads

- 3 editions and over 2000 hardcopies printed and distributed
- New report foreseen already: **Science for DRM 2020**

- http://drmkc.jrc.ec.europa.eu/

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SERBIAN FLOODING 2013 – WHAT WAS YOUR EXPERIENCE ?

- Forecast?

- Early Warning?

- Learning Curve?

- Mitigation through investment in protection measures?

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THE FUTURE OF WORK

- National versus Global

- Industries with a Future? Food, Water, Renewable Energy, Technology, Health, Pharmaceutical, Transport, Green Systems

- Automation, Robotics, Artificial Intelligence

- Serbia´s Champions?

- Internships in Industry

- Languages

- Mentoring for what can be done with your skill-set

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- World Bank Labor Market Report West Balkans

- KfWDevelopment Bank - https://www.kfw-entwicklungsbank.de/Internationalfinancing/KfW-Development-Bank/Local-presence/Europe/Serbia/

- EU Science Hub JRC - https://ec.europa.eu/jrc/en/about/jrc-site/ispra

- Erasmus Programme - http://www.erasmusprogramme.com/study_abroad.php

- GIZ - https://www.giz.de/de/html/index.html

- Pannex Project - https://sites.google.com/site/projectpannex/home

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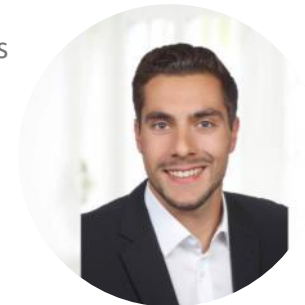Reinsurance Expert Agricultural Risks
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