

Integrating Nowcasting with crisis management and risk prevention in a transnational framework (INCA-CE)

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Central Institute for Meteorology and Geodynamics



INCA-CE
Nowcasting for Central Europe



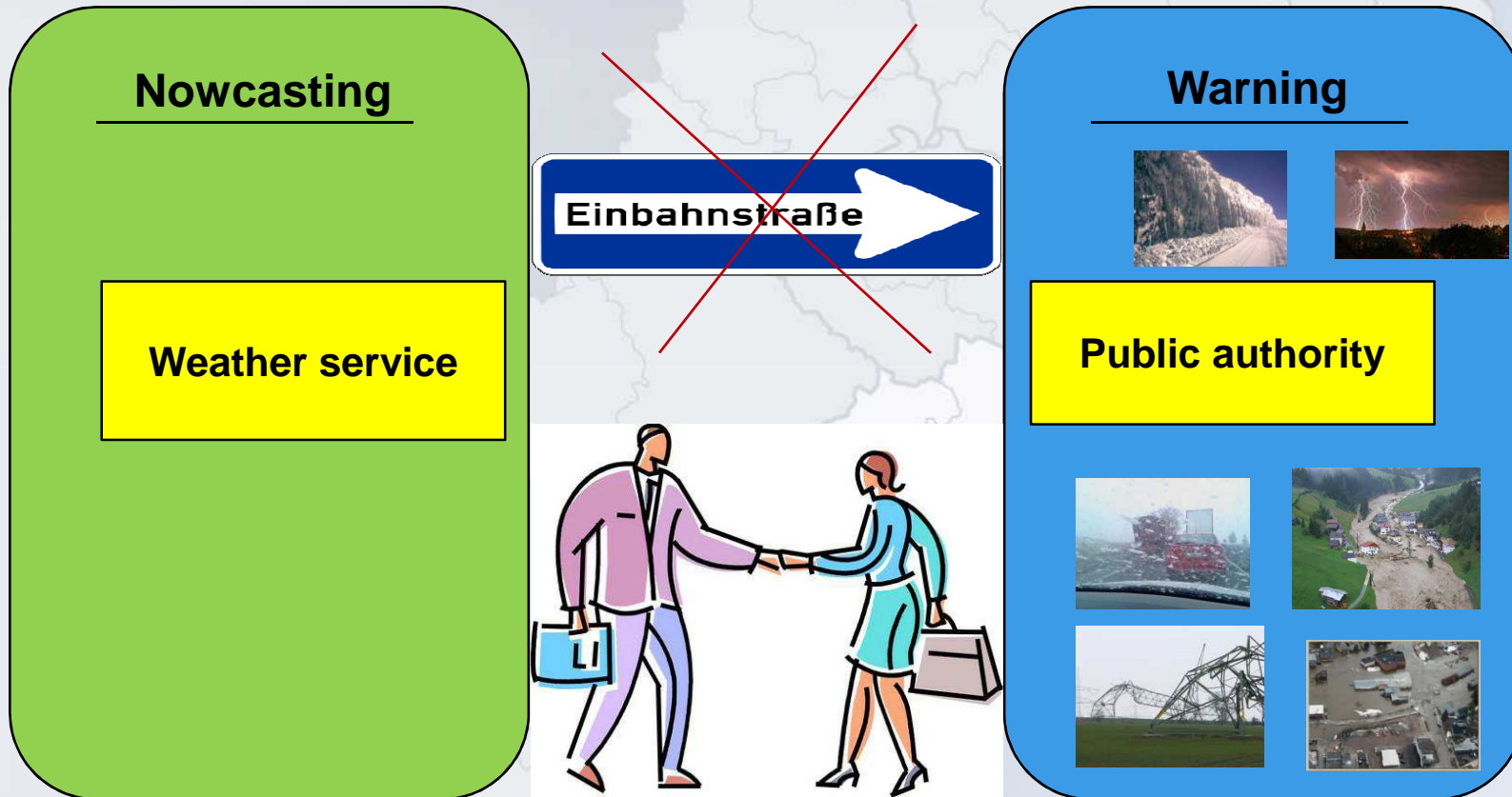
The Challenge of Severe Weather Warnings

More detailed and accurate weather warning in time and space

Better coordination between weather service and crisis management

Optimised strategies of using weather warning information

INCA-CE: multidisciplinary collaboration



INCA-CE: transnational framework



INCA-CE: WMO/WWRP FDP

A Forecast Demonstration Project of World Meteorological Organization (WMO), World Weather Research Programme (WWRP)



Integrating Nowcasting with crisis management and risk prevention in a transnational framework

INCA-CE: international R&D on nowcasting

A state-of-the-art, very high-resolution in time and space, application-oriented, real-time analysis and nowcasting system INCA

Operational implementation at each partner

Common efforts on research and maintenance

24 institutions from meteorology, hydrology, crisis management, road safety, fire brigade, police, ministries etc.



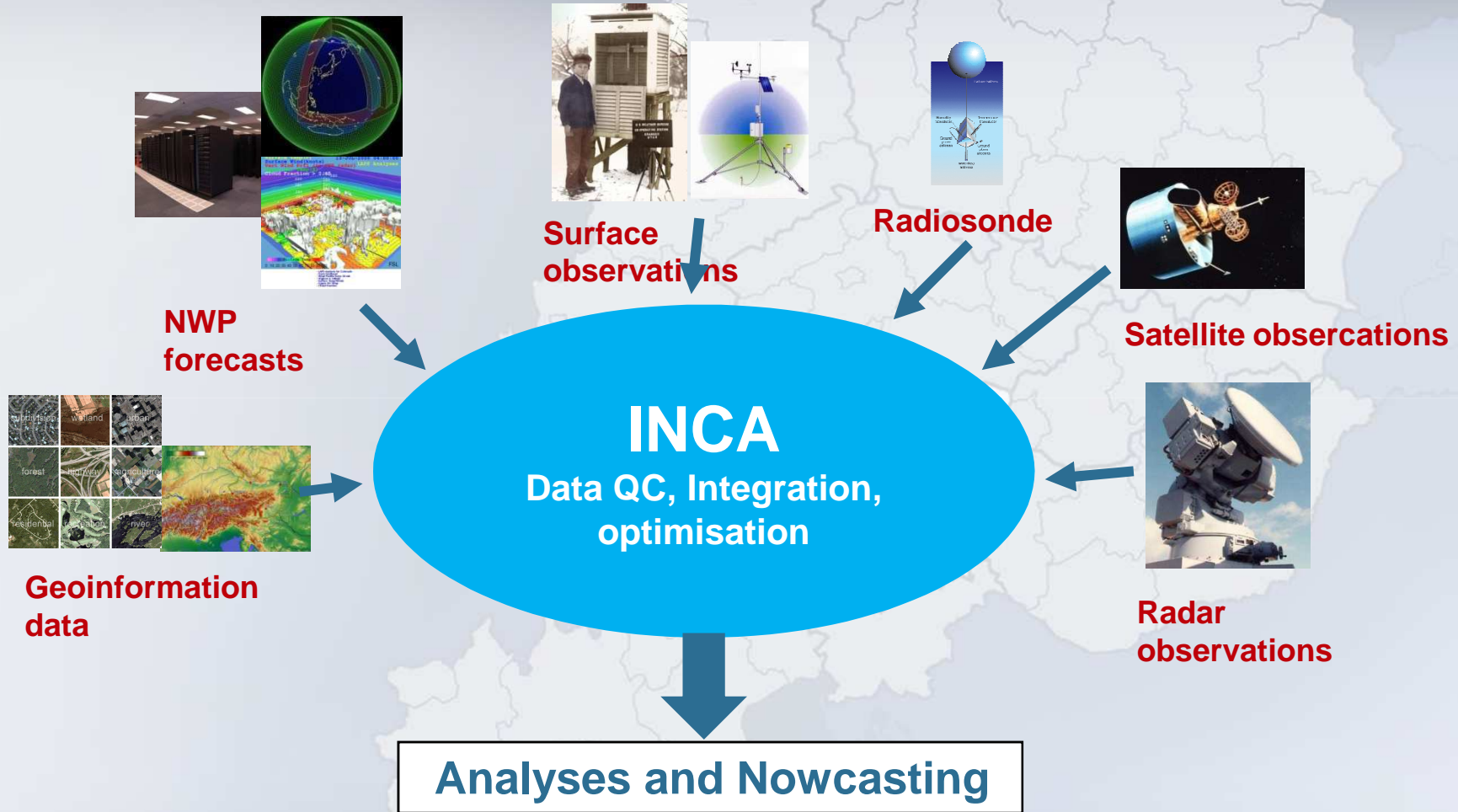
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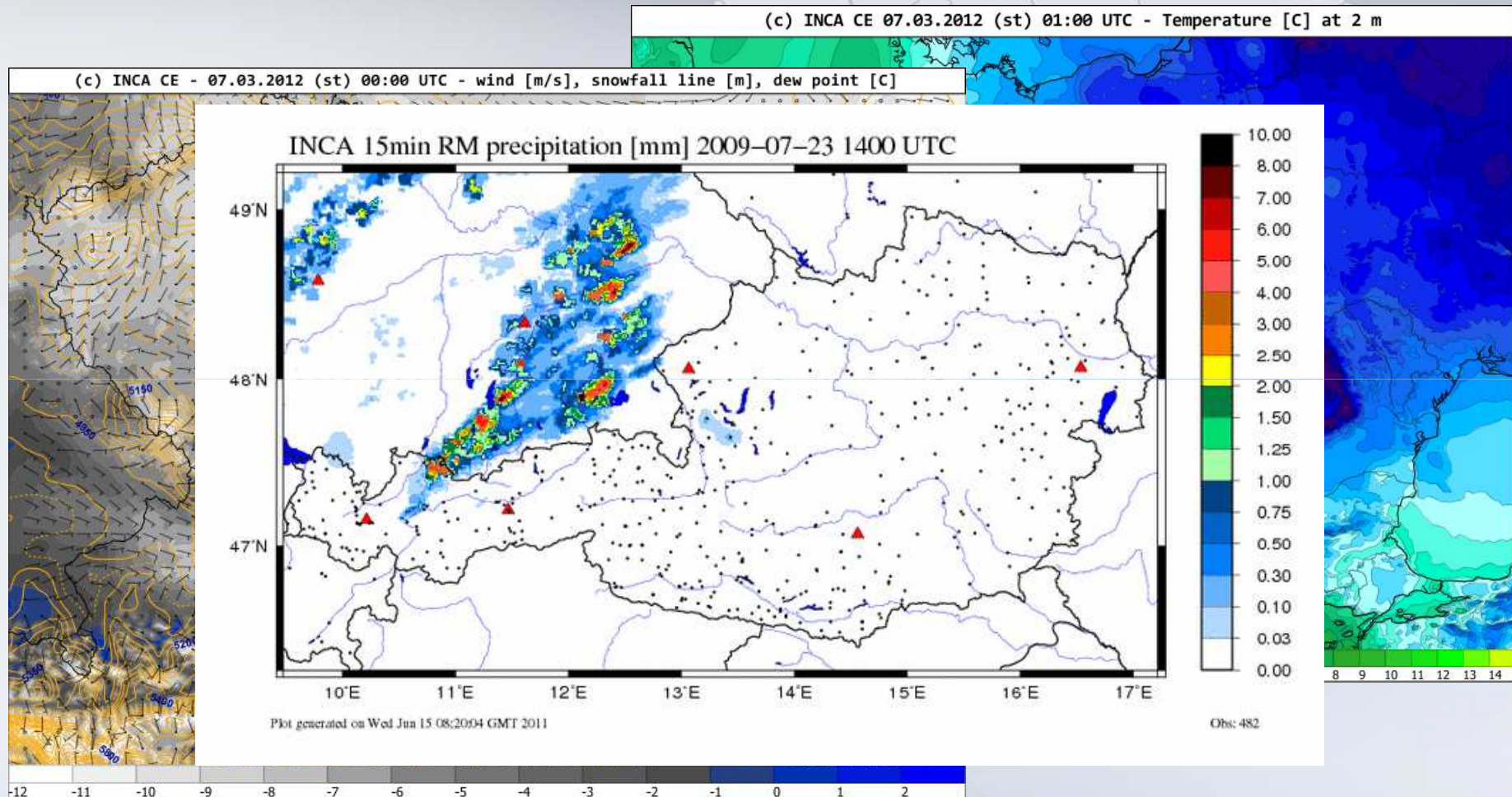
INCA-CE
Nowcasting for Central Europe



INCA: Integrated Nowcasting through Comprehensive Analysis



INCA analysis & forecast



INCA-CE: implementation over Central Europe

A Nowcasting Initiative for Severe Weather Warnings and Improved Communication Strategies on a trans-national Level

The INCA-CE project is funded by



- Project budget: 3.3 million € (4.7 million US\$)
- Project Lead: ZAMG
- www.inca-ce.eu

INCA-CE: Relevance

Operational Hydrology

Prediction of heavy rainfall and associated flooding risks will help to set up efficient procedures in the management of mitigating actions for the protection of buildings, roads, and other infrastructure.

Civil protection

Civil protection will benefit from a more comprehensive assessment of meteorological threats, and a more detailed and timely forecast, leading to more efficient warning protocols and dissemination strategies.

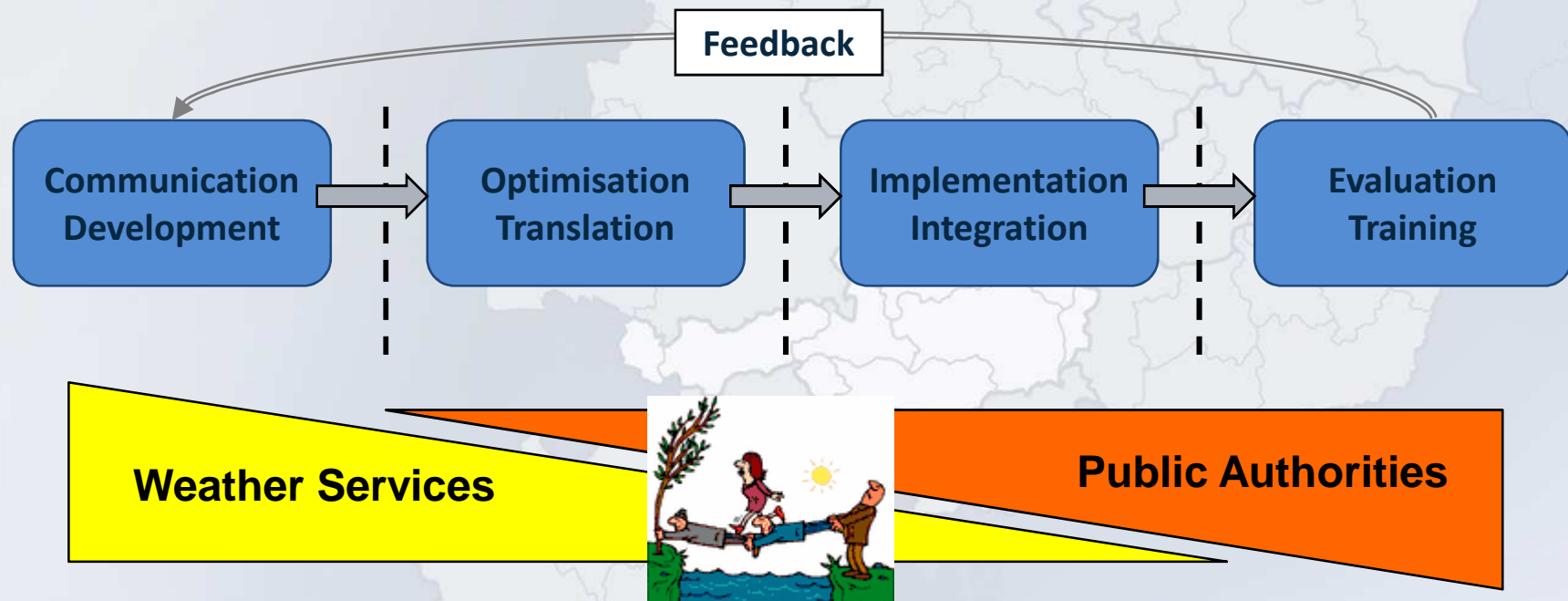
Road management

Road safety will be enhanced by a more detailed road weather forecast made available both to the road management authorities as well as to the general public.

While the frequency and strength of critical weather events and natural disasters cannot be reduced, a state-of-the-art information and warning system will be developed to better support public and private institutions in case of severe events

INCA-CE project concept

Building bridge between nowcasting and crisis management



WWRP/WMO FDP INCA-CE realization

The WMO/WWRP FDP will be conducted in 2012-13 over Central Europe (CE) with 4 implementation phases:

1. Development of transnational strategy in road safety, civil protection and operational hydrology. **(01. – 05. 2012)**
 - Compilation and evaluation of regional methods currently in use.
 - Provide solution strategies for optimal use of nowcasting and weather warnings in crisis management and risk prevention.
2. Optimization of nowcasting system **(01. 2012– 06. 2013)**
 - INCA development towards to the need of crisis management and risk prevention.
 - Algorithmic extension; standard input and output interfaces.
 - Improvement in data flow, quality control, computational efficiency.
 - Observational data exchange in real time.

WWRP/WMO FDP INCA-CE realization

3. Forecast Demonstration of the developed strategy and optimized nowcasting system through pilot implementations **(06. 2012–09. 2013)**
 - National-scale application and testing of the nowcasting system and warning strategies at user level.
 - Establishment of structured feedback channels for final evaluation

4. Evaluation and feedback **(06. 2012–09. 2013)**
 - Elaboration and compilation of transnational results, guidelines and recommendations
 - Evaluation, feedback circle between nowcasting provider and crisis management and risk prevention
 - Training for better understanding the warning strategies and nowcasting system

INCA-CE core outputs

**Optimised transnational
warning strategies,
guidelines**

**A state-of-the-art, very high-resolution in time and
space, application-oriented, real-time analysis and
common nowcasting system INCA**

**Nowcasting products translated
into user relevant information**

**Nowcasting moduls for
hydrology, civil protection
and road management**

**Communication, feedback,
training mechanism between
nowcasting provider and
application**

**Real time obs. Exchange,
standardized input/output
interface, data flow, QC etc.**

INCA-CE core output



Development of strategy for civil protection

Crisis management – structure, tasks and the weather information chain in the partner countries

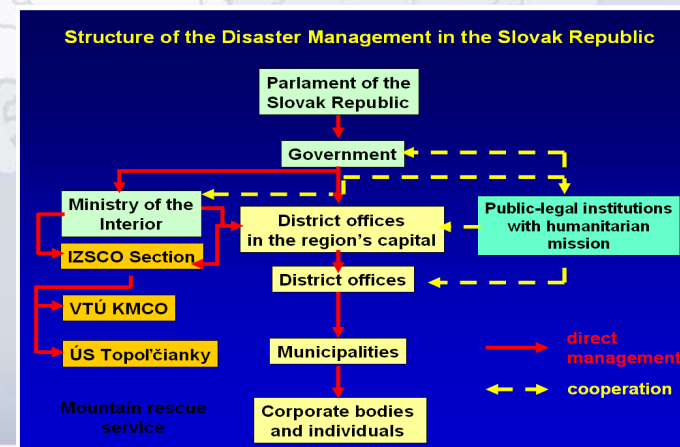
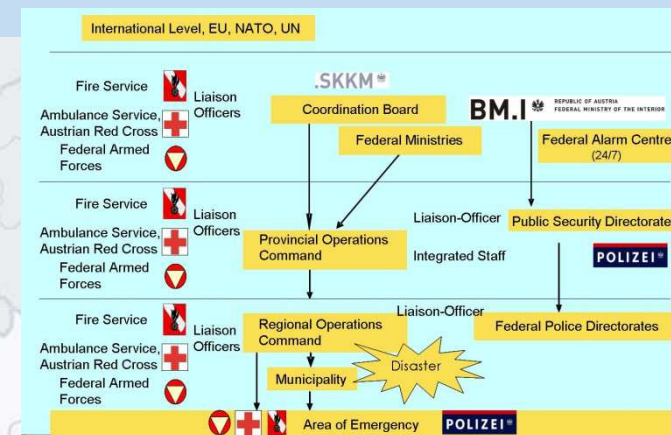
Organization on country and regional level

Main tasks with high weather impact

Communication methods and alert systems

Requirements and use of weather information

Cross-border cooperation, evaluation of the operations



Example: Civil Protection

■ Recommendations

- INCA-SWING (Severe Weather INTERpretation Guide)

Basic meteorological terms explained to the general public and Civil Protection authorities -> **increased meteorological understanding**

- INCA-MCPEX (Meteorological Civil Protection EXercise)

Organization of practical exercises and trainings -> **information chain and communication tested**

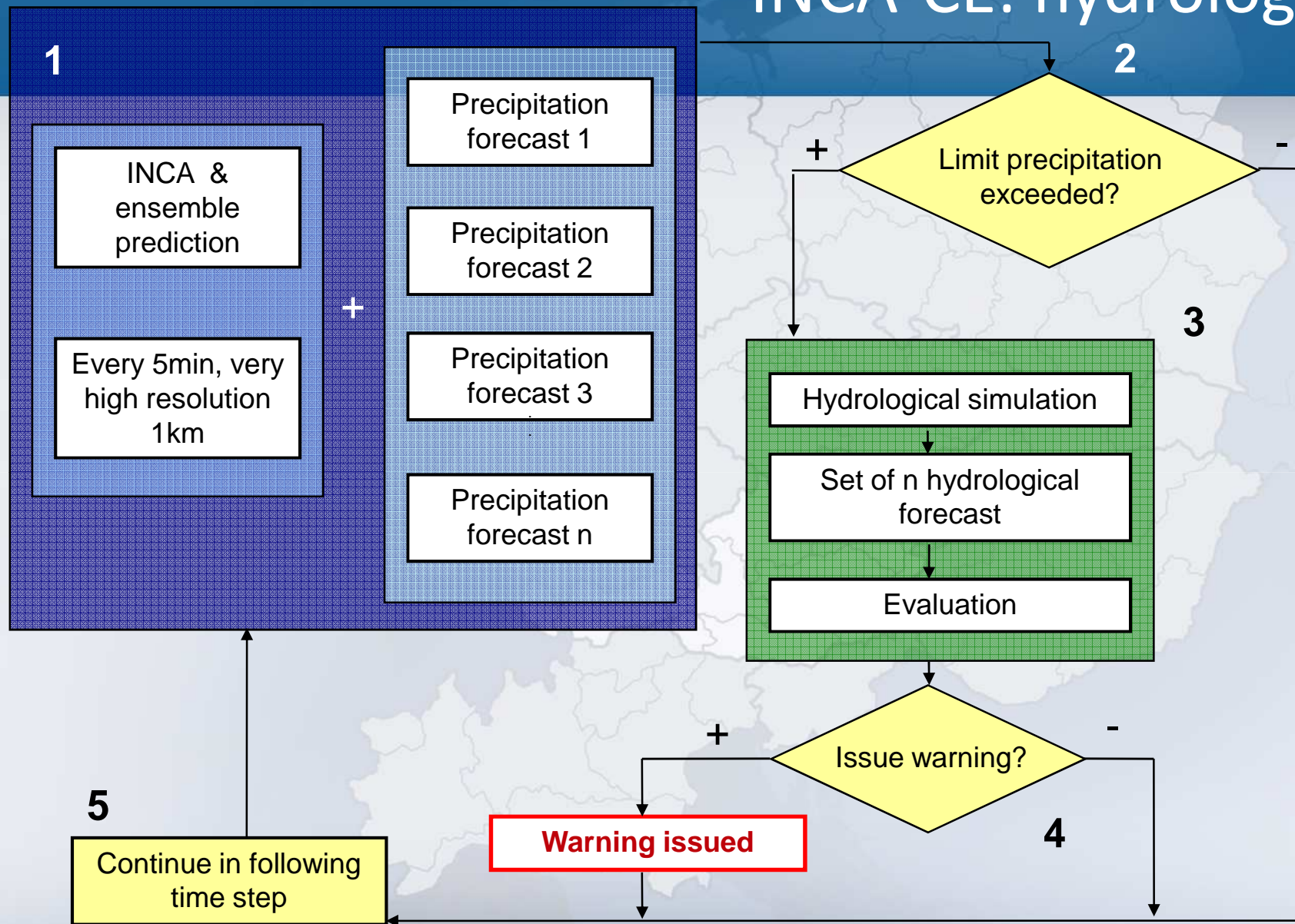
- INCA-ISW (Impact of Severe Weather)

Cross-border, real-time exchange of information about weather related damages to improve the preparedness and forecasting, predominantly in the bordering regions -> **Increased forecasting time of fast developing weather phenomena; more accurate specification of mesoscale aspects of large scale events**

Road safety: requirement on INCA forecast

INCA forecasted parameter	Importance for forecast of road conditions	Resolutions	Required resolution (accuracy)
Total precipitation [kg/m ²]	very	30 min / 1 km	30-60 min
Solid precipitation [kg/m ²]	very	30 min / 1km	30-60 min
Precipitation type [1,2,3,4]	very	30 min / 1km	30-60 min (>90% event probability)
Sun percentage [%]	very	30 min / 1km	30-60 min
Temperature (2.0 m above ground) [K]	very	60 min / 1km	60 min (RMSE < 2 K)
Dew point temperature (2.0 m above ground) [K]	moderately	60 min / 1km	60 min
Temperature (surface) [K]	very	60 min / 1km	60 min (RMSE < 2 K)
Relative humidity (2.0 m above ground) [%]	moderately	60 min / 1km	60 min
u component of wind (10.0 m above ground) [m/s]	very	60 min / 1km	30-60 min (RMSE < 2 m/s)
v component wind (10.0 m above ground) [m/s]	very	60 min / 1km	30-60 min (RMSE < 2 m/s)
Other INCA parameters	moderately	60 min / 1km	60 min

INCA-CE: hydrology



Summary

In frame of INCA-CE project 24 international institutions, not only from weather services, but also from hydrological services, public authorities of crisis management, civil protection and road management, will work together on:

- more detailed and accurate nowcasting system
- optimised strategies for using weather warning information by decision-maker of various social and economic sectors
- coordinated warning of severe weather

Save Life!

Save Cost!

Reduce Risks!