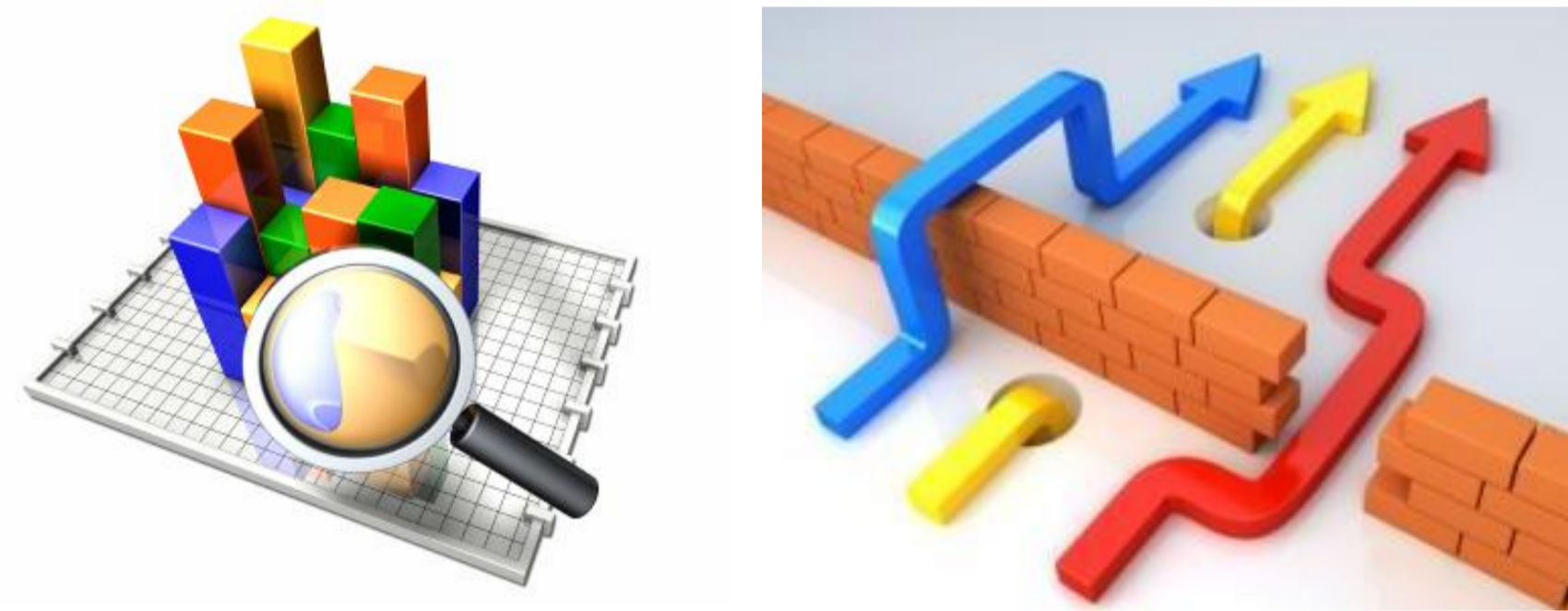


M. Kunz (1,3), J. Zschau (2,3), F. Wenzel (1,3), B. Khazai (1,3), T. Kunz-Plapp (1,3), J.E. Daniell(1,3), W. Trieselmann (2,3)

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 (2) Helmholtz Centre Potsdam – German Research Centre for Geoscience GFZ, Germany,  
 (3) Center for Disaster Management and Risk Reduction Technology (CEDIM)

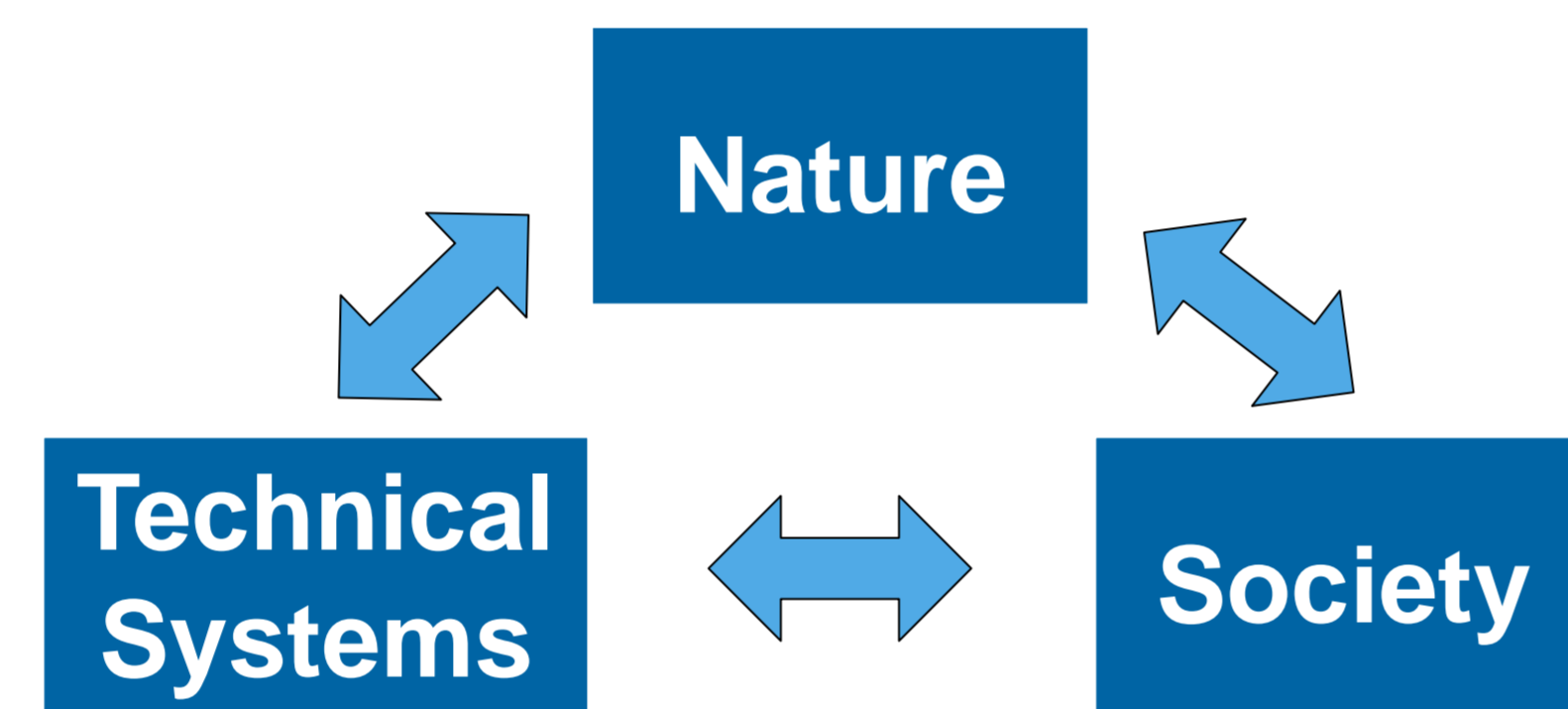
## CEDIM Research Strategy

- Forensic Disaster Analysis in near real-time (CEDIM FDA)
- Aims are to identify major risk drivers and mechanisms most relevant for an **extreme event** to become a **disaster**.
- CEDIM develops own models and uses recent technology developments in combination with databases of historical.
- CEDIM analyzes disasters triggered by geophysical (**earthquake, volcanic eruption**) and hydro-meteorological (**floods, storms**)



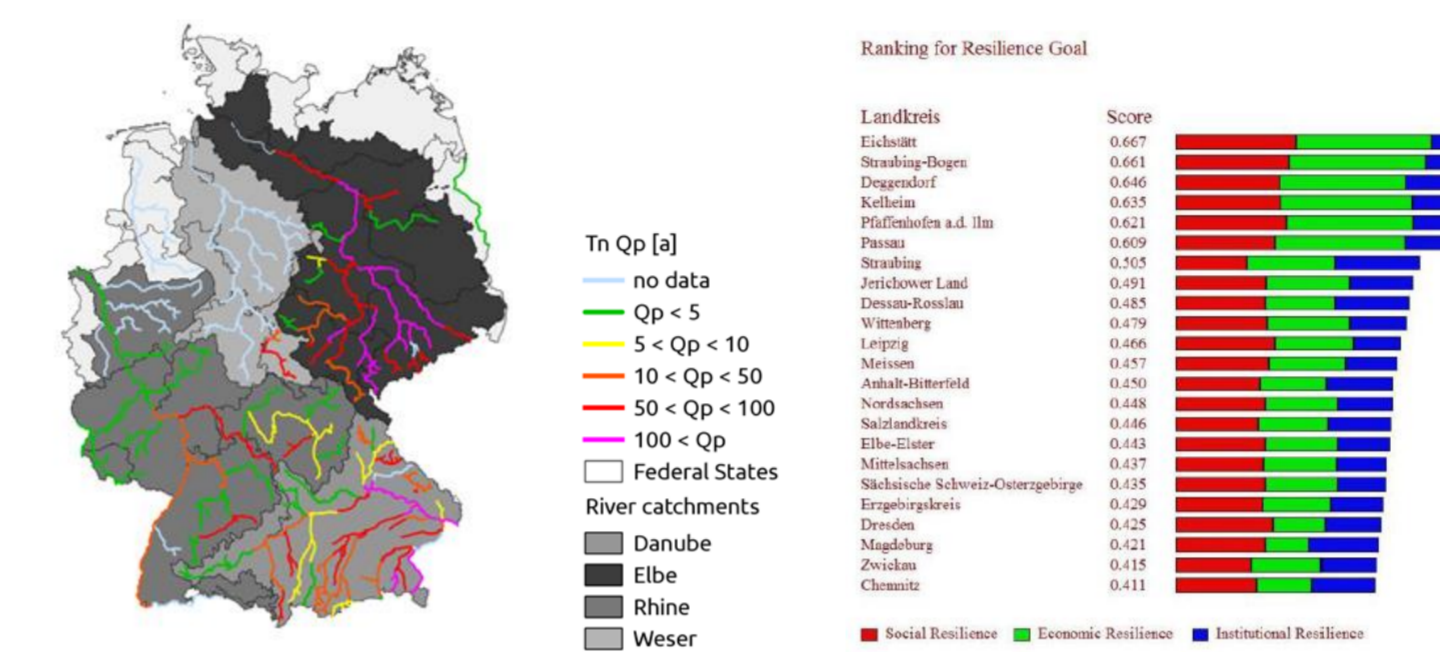
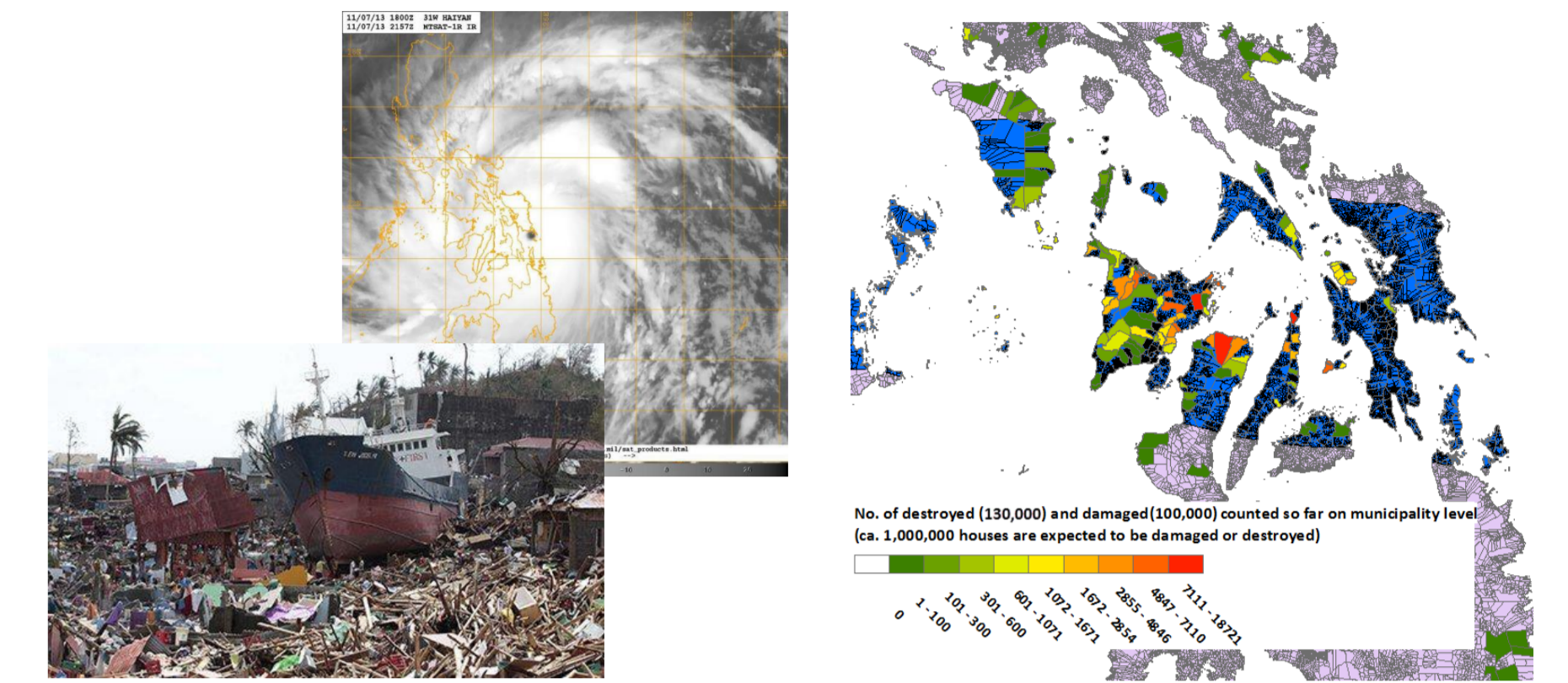
## Scientific questions

- How does an extreme event turn into a catastrophe?
- What are the critical factors for **loss** of life, infrastructure damage, and economy?
- What can we **learn** from past disasters?
- What are the critical **interactions** between **natural hazard, socio-economic situation** and **technical systems**?



## Examples

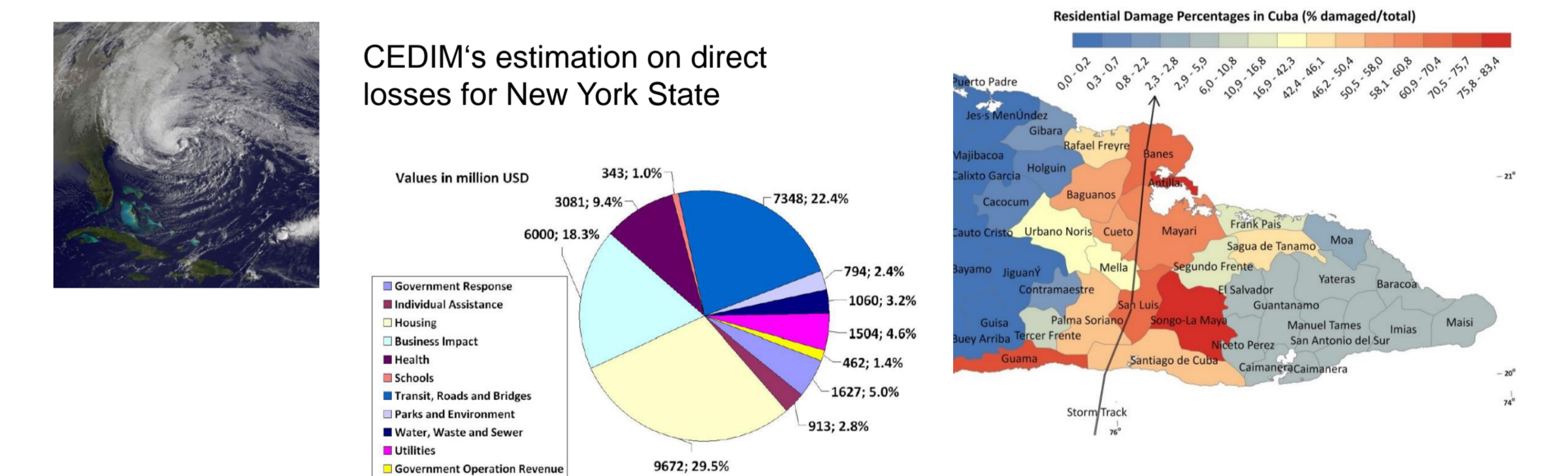
**Super Typhoon Haiyan/Yolanda 2013, Philippines**  
**Record wind speeds during landfall**; analyses of hazard situation, comparison with history; CEDIM estimation of losses (direct and indirect) and fatalities; building structure and damage; shelter modeling



## June Floods 2013, Central Europe

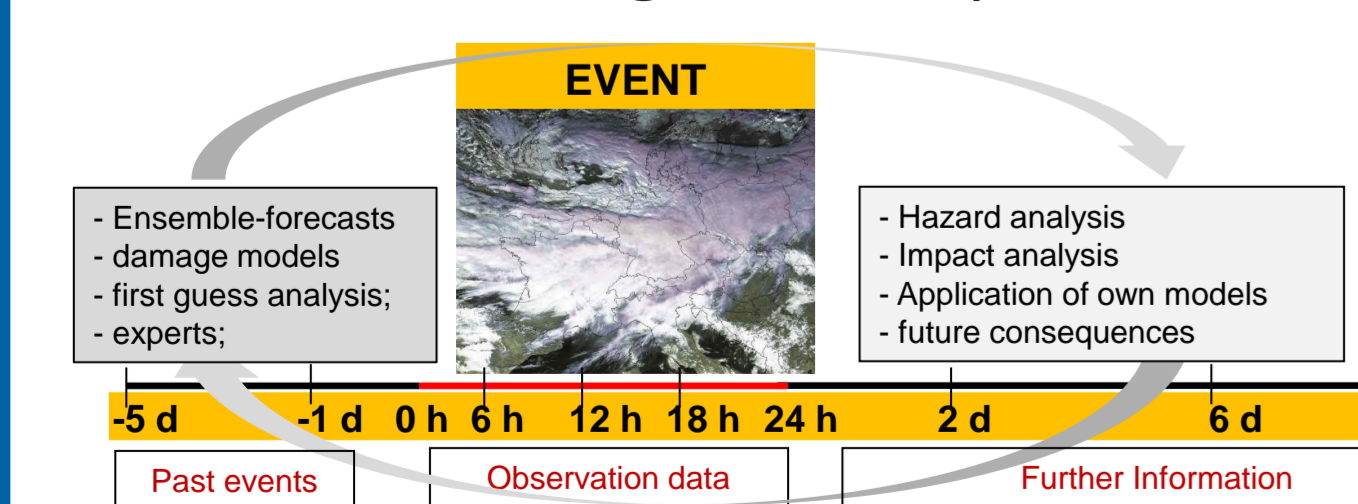
**Extreme flooding**; In-depth hazard analysis and comparison with historic events (precipitation, runoff); assessment of traffic interruption; quantification of resilience by an index-based method

**Hurricane Sandy (October 2012)**  
**Hit one of the poorest (Haiti) and richest (USA) countries**; CEDIM analyses on meteorological and hydrological conditions, social impacts, direct and indirect losses, consequences of power outages

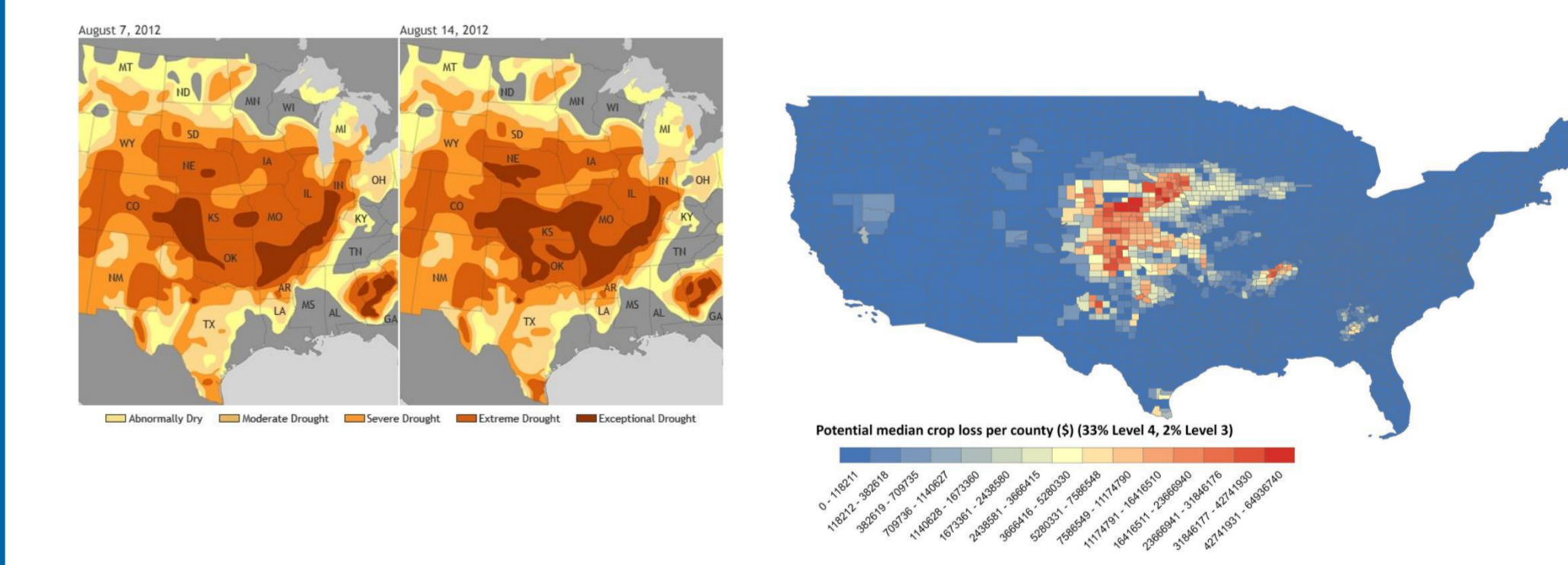
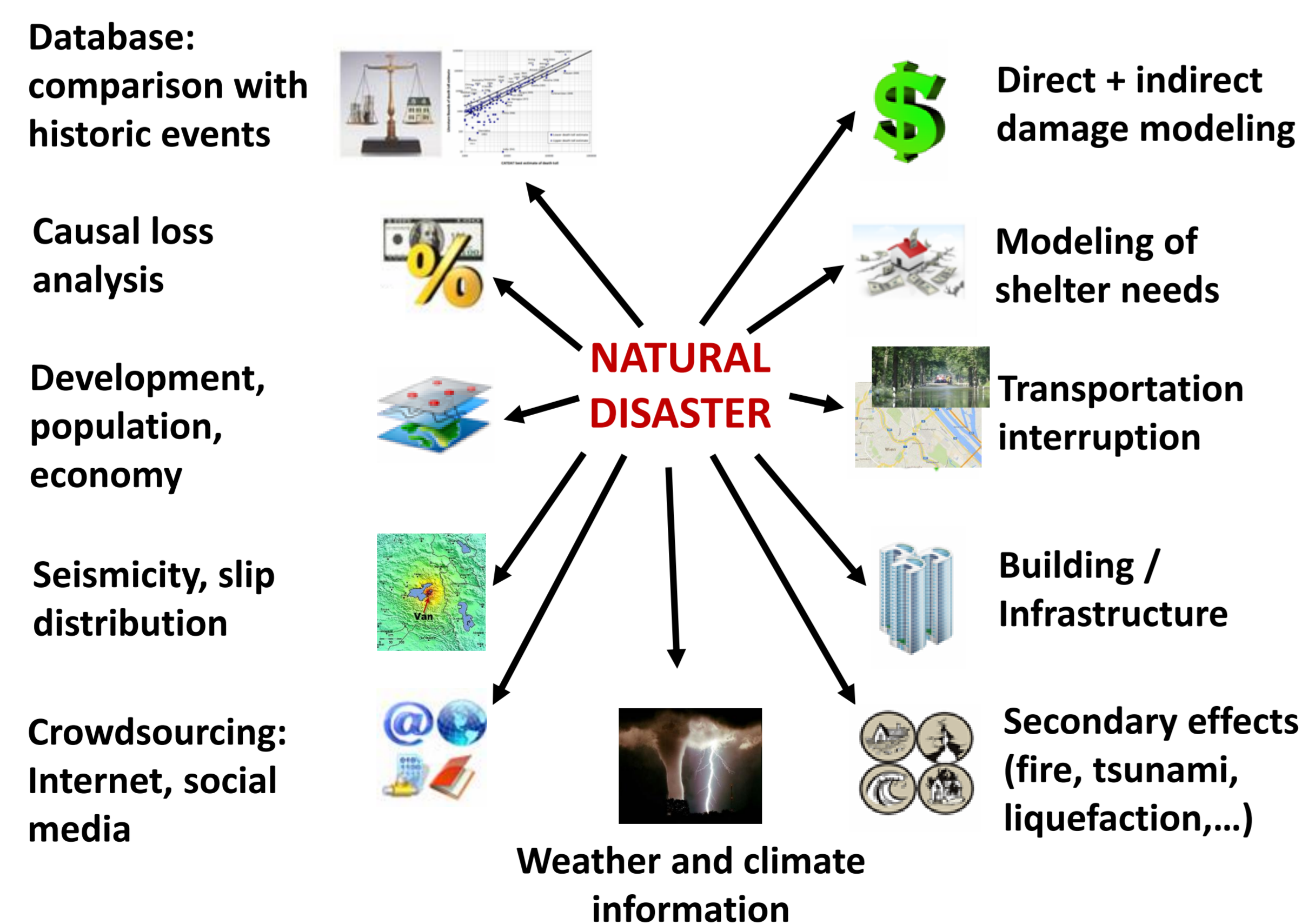


## Approach

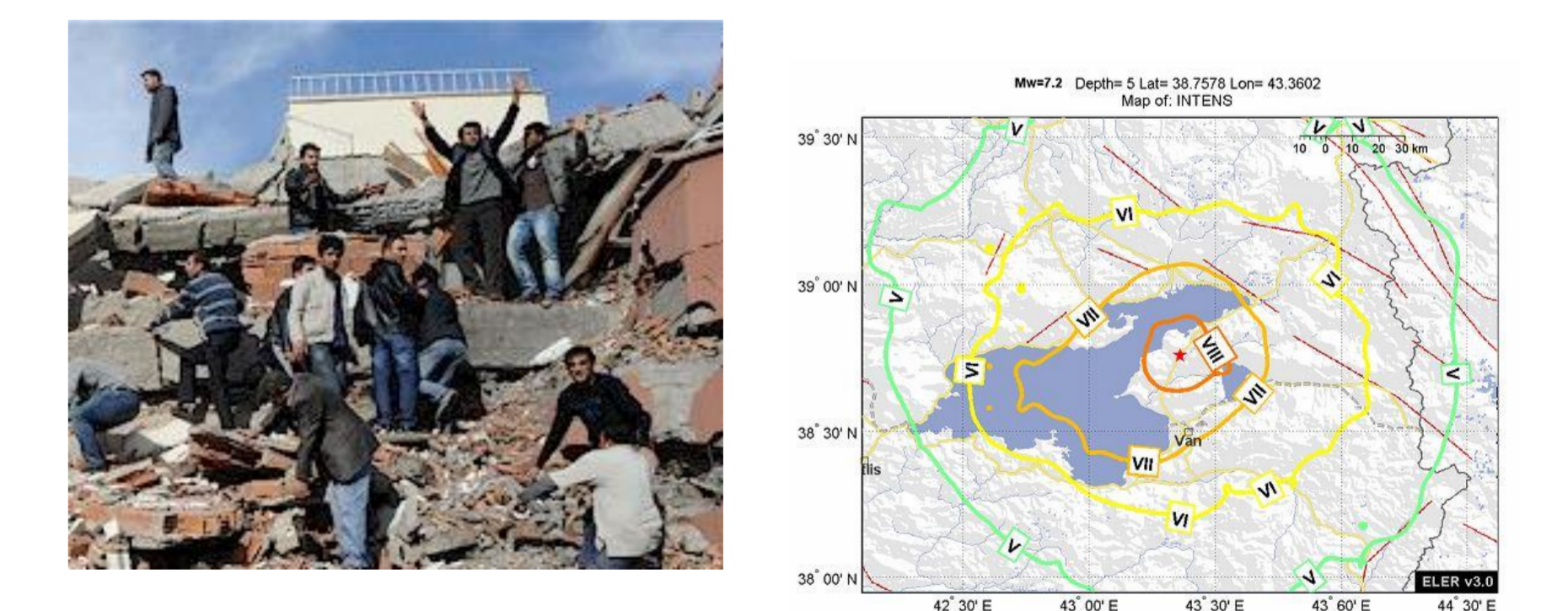
- Development and application of models and methods for rapid assessment of catastrophes
- Collecting, compiling and assessing available information and knowledge **in near real-time**
- Multidisciplinary approach
- Comprehensive and scientific disaster evaluation (hazard and damage characteristics, cascades,...)
- Short- and long-term impacts



## Data, Methods and Information



**Drought and record Heat in the U.S. (2012)**  
**Third-warmest summer since monitoring began**;  
 CEDIM analyses of meteorological situation, damage and loss estimations, focus on agricultural sector



## Earthquake Eastern Turkey (October 2011)

**M 7.2 earthquake in Van, Eastern Turkey**  
 CEDIM's pilot case study to test the near real-time FDA approach. In the affected region almost 2300 buildings collapsed and more than 570 people died.

All CEDIM FDA reports are available on: [www.cedim.de](http://www.cedim.de)

## References

Merz, B., F.Elmer, M.Kunz, B.Müher, K.Schröter, S.Uhlemann-Elmer The extreme flood in June 2013 in Germany, *La Houille Blanche* 01/2014; doi: 10.1051/lhb/2014001  
 Kunz, M., B Müher, T Kunz-Plapp, J E Daniell, B Khazai, F Wenzel, M Vannieuwenhuysse, T Comes, F Elmer, K Schröter, J Fohringer, T Münzberg, C Lucas, J Zschau: Investigation of superstorm Sandy 2012 in a multi-disciplinary approach. *Natural Hazards and Earth System Sciences* 2013; 13:2579-2598. DOI:10.5194/nhess-13-2579-2013