Disaster risk management (DRM) as a global challenge for geographic data

No matter how complex the situation is, there is always an anchor of clarity: its geographic component.

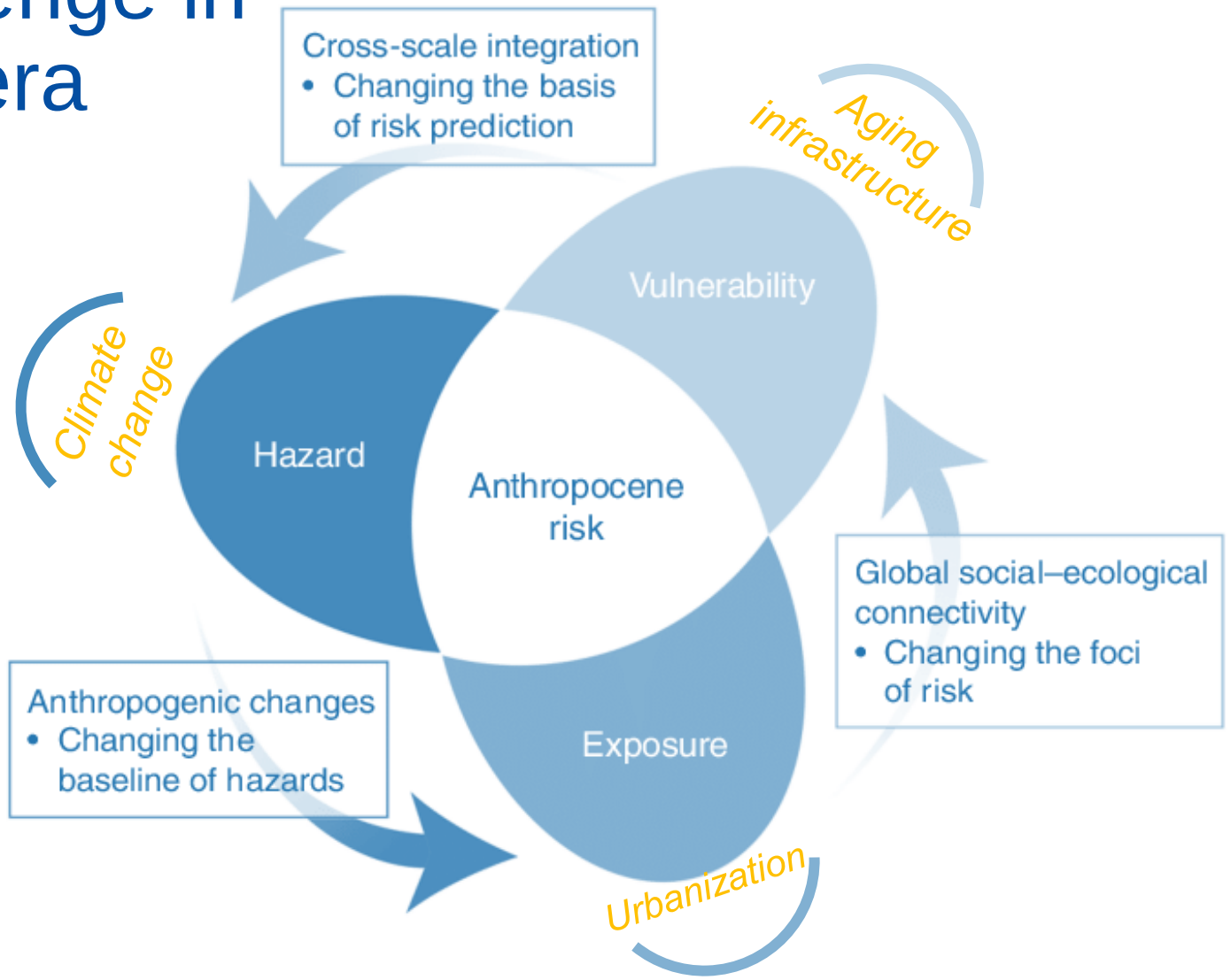
Tom De Groeve

Seventh Plenary Meeting of UN-GGIM: Europe, 22 June 2020 via webinar


A
N
T
H
R
O
P
O
C
E
N
E

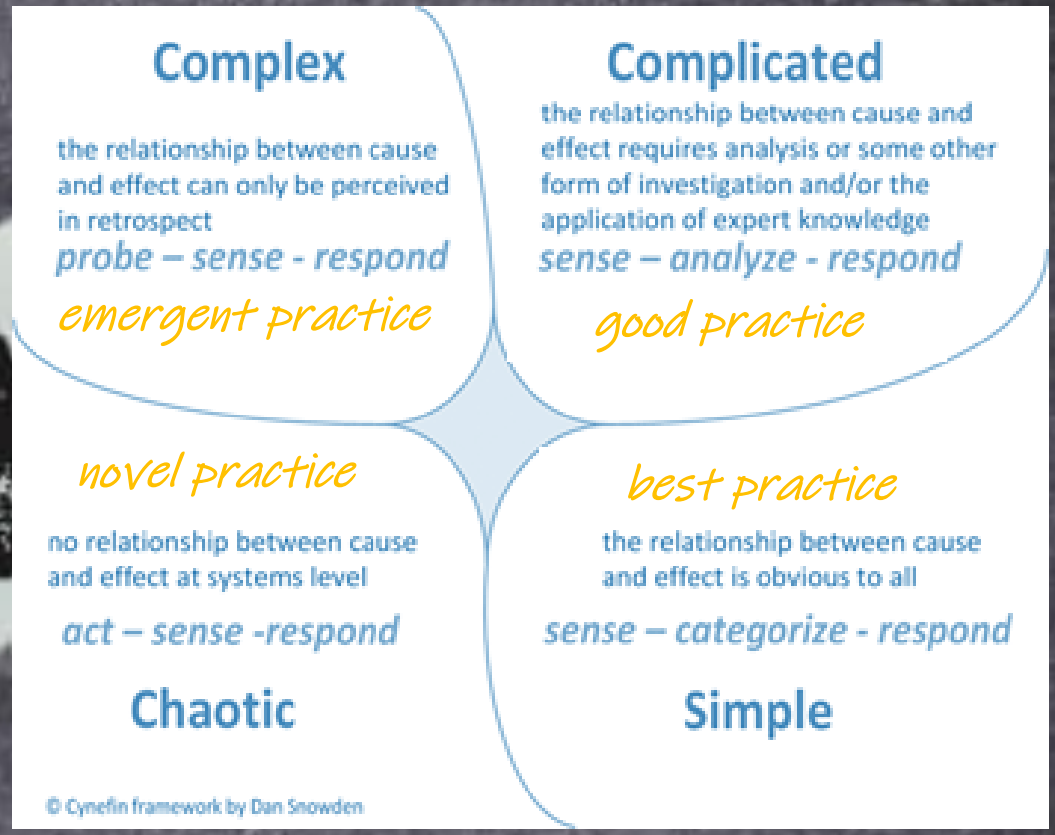
DRM has become an (even more!) global challenge in the Anthropocene era

The potential consequences of cross-scale systemic environmental risks with **global effects** are **increasing**.



Source: ***modified from*** Keys, P.W., Galaz, V., Dyer, M. et al. Anthropocene risk. Nat Sustain 2, 667–673 (2019). https://doi.org/10.1038/s41893-019-0327-x

The “knowability” of the new threats (and their interlinkages) ranges widely



Source: https://noop.nl/2008/08/simple-vs-complicated-vs-complex-vs-chaotic.html

No matter the level of complexity of the situation, when a disaster strikes, questions are recurrent, simple…

Where?

Severity?

Impact?

Access?

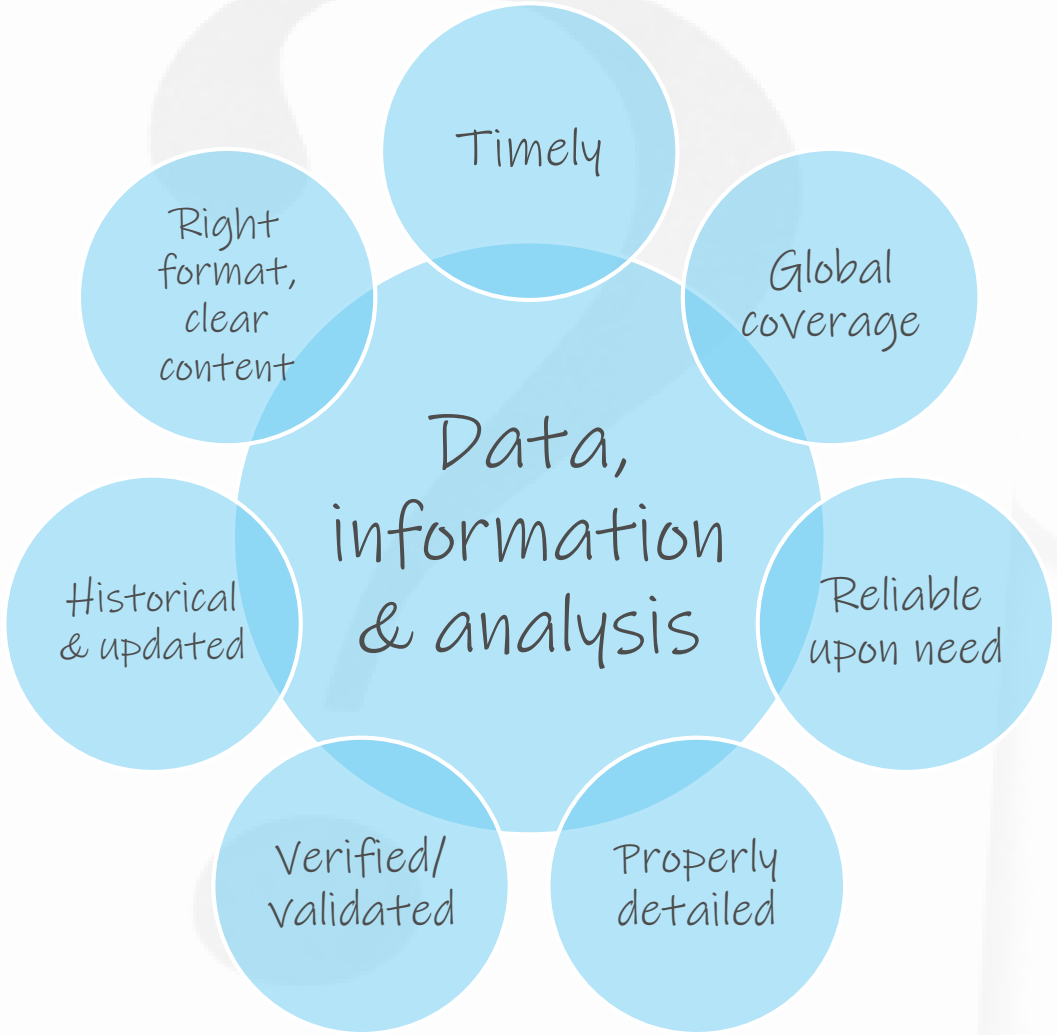
Duration?

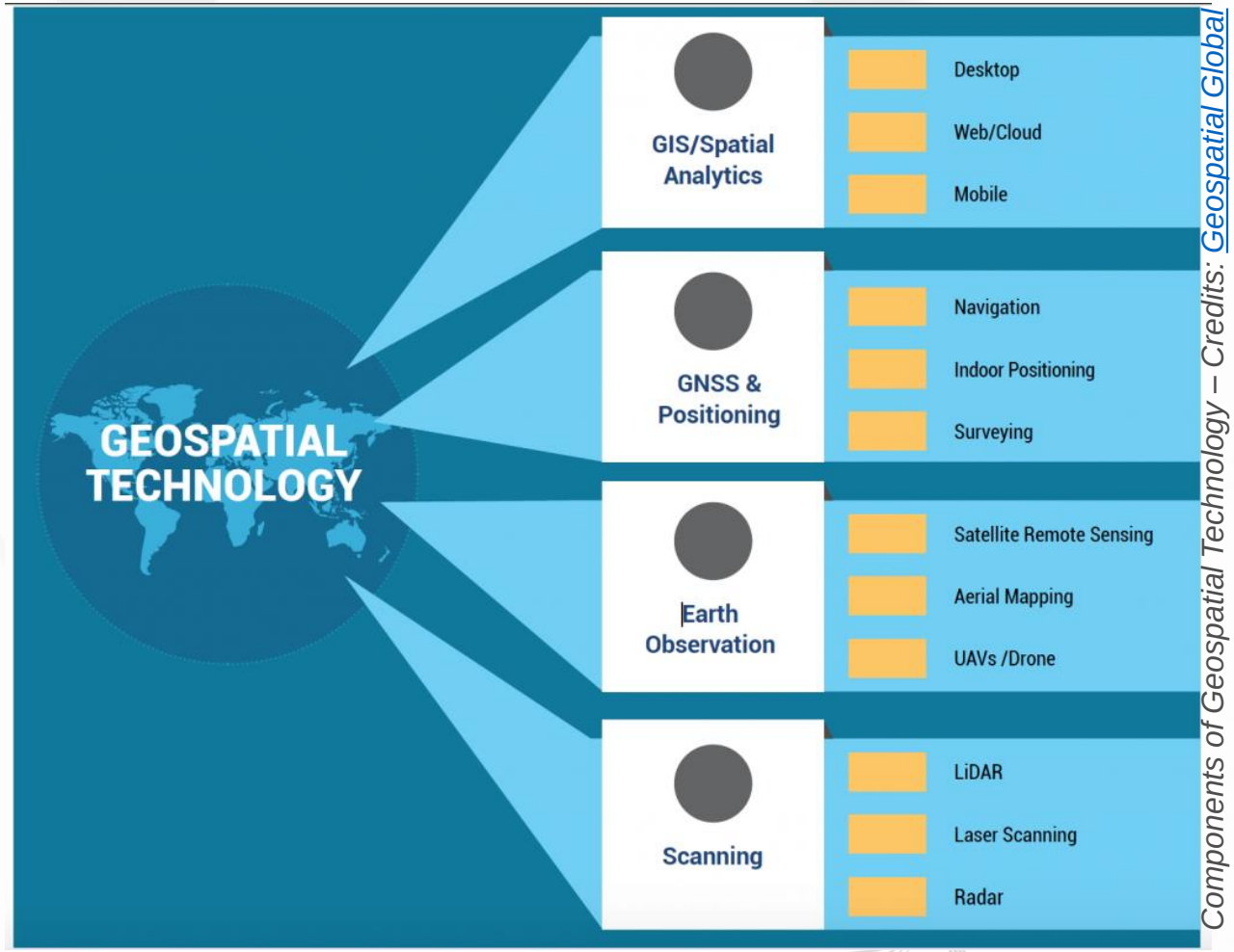
Evolution?

…and urgent!

European Commission

Difficult answers to simple questions





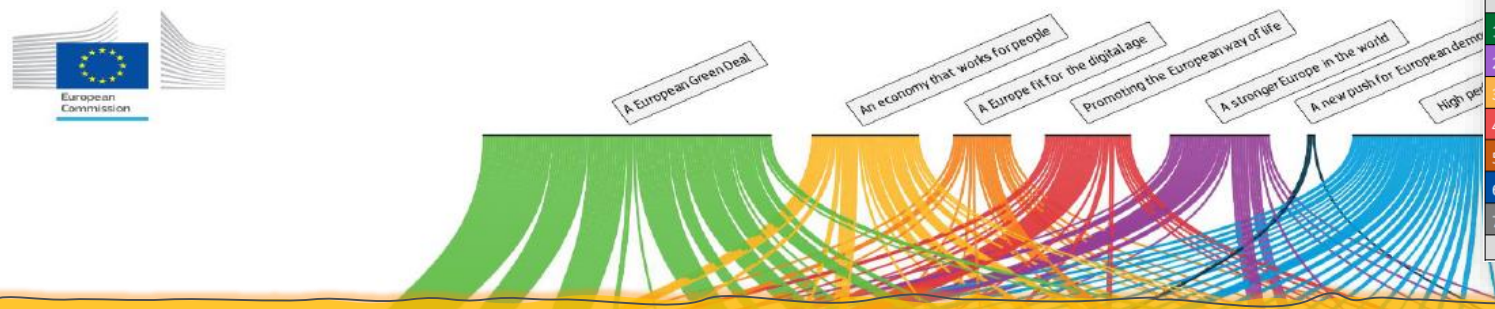
Components of Geospatial Technology – Credits: Geospatial Global Outlook Report 2017/ GeoBuiz Report 2017

European Commission

JRC Disaster Risk Management Unit

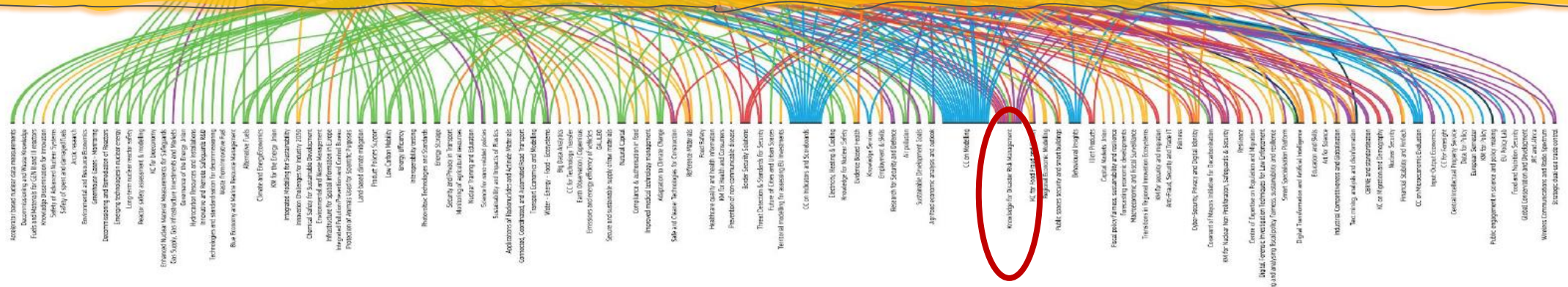
the DRM science advisors of a (very) complex system!

POLITICAL PRIORITY	No of Project Portfolios proposed	No of Projects proposed
1. European Green Deal	50	231
2. A Europe Fit for the Digital Age	14	66
3. Economy that Works for People	10	41
4. Promoting the European Way of Life	14	48
5. A Stronger Europe in the World	15	53
6. A New Push for European Democracy	6	17
7. High-performing, modern Commission	4	32
Total	113	490



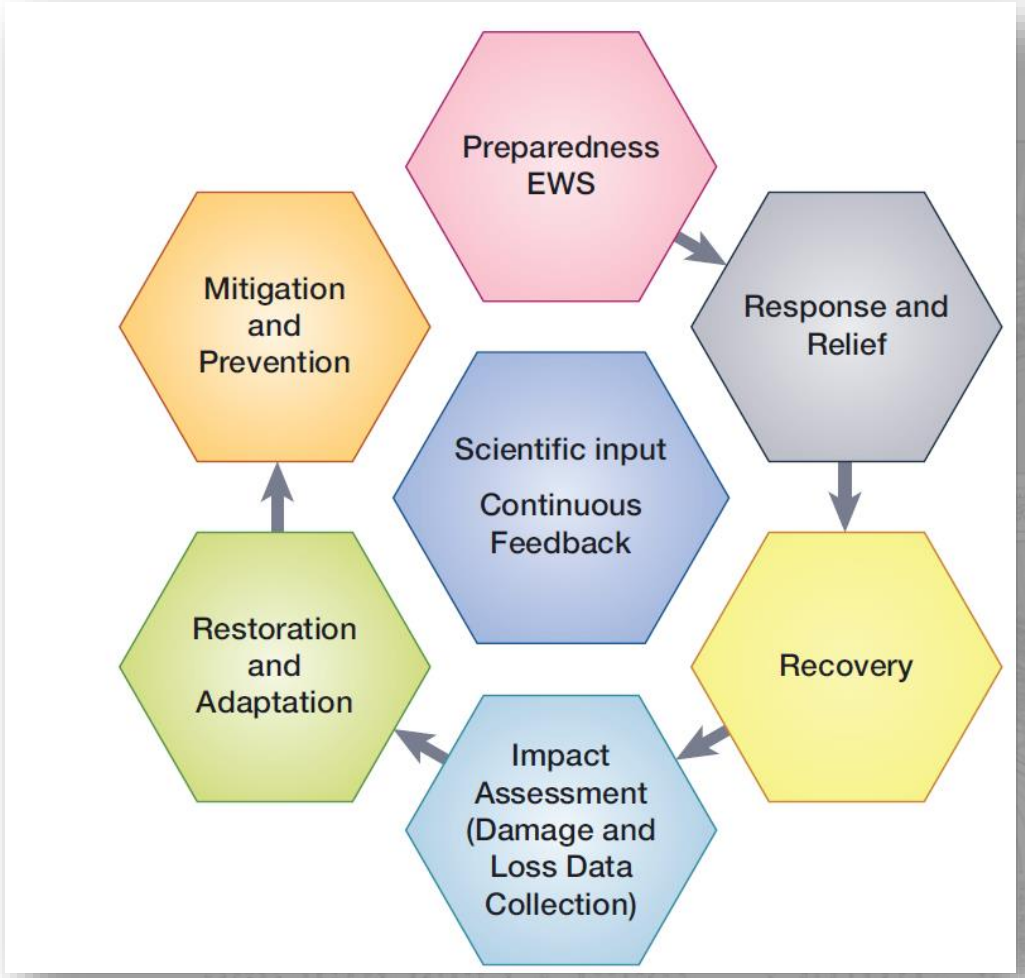
Our MISSION is to strengthen the EU's resilience to crises and disasters and the EU's aim to promote stability and peace through better management of risk.

Our RESEARCH covers earth observation, modelling, artificial intelligence and crisis management technologies and analysis.



JRC Disaster Risk Management Unit

we work for all phases of the DRM cycle & we inform all phases of the policy cycle

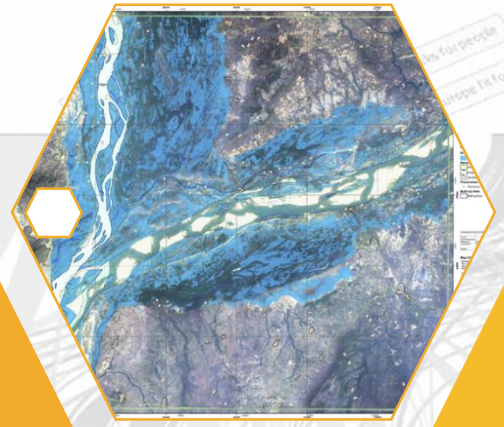


- ✓ *all* natural and man-made *hazards*
- ✓ *Integrated research* and *knowledge management* in climate, natural, technological, health and conflict risk *globally*.
- ✓ *Integrated systems* for risk analysis, situational awareness, early warning and collaborative decision-making.
- ✓ Monitoring, evaluation, *anticipation and communication of the impacts* of weather extremes and future climate change
- ✓ *Evaluation of the effectiveness of policies* and measures for DRR and sustainable development.

European Commission

JRC Disaster Risk Management Unit

The Unit is organized in 5 projects



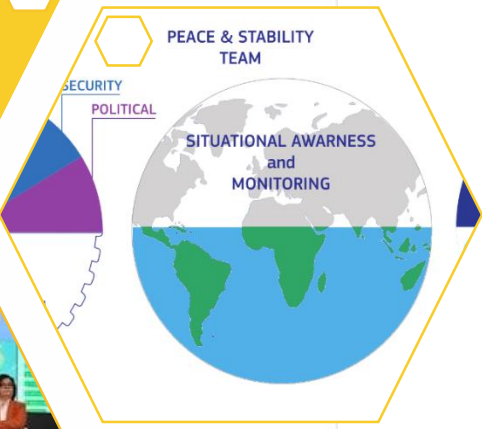
Copernicus Emergency Management Service

Disaster Risk Management Knowledge Centre

Global Human Settlement Layer

Crisis Management

External Security and Stability



European Commission

Our lessons learnt from 20 years of science advice…

…for upcoming/ongoing emergencies

As local as possible
As global as necessary

Speed, predictability, reliability

Trust

Clarity

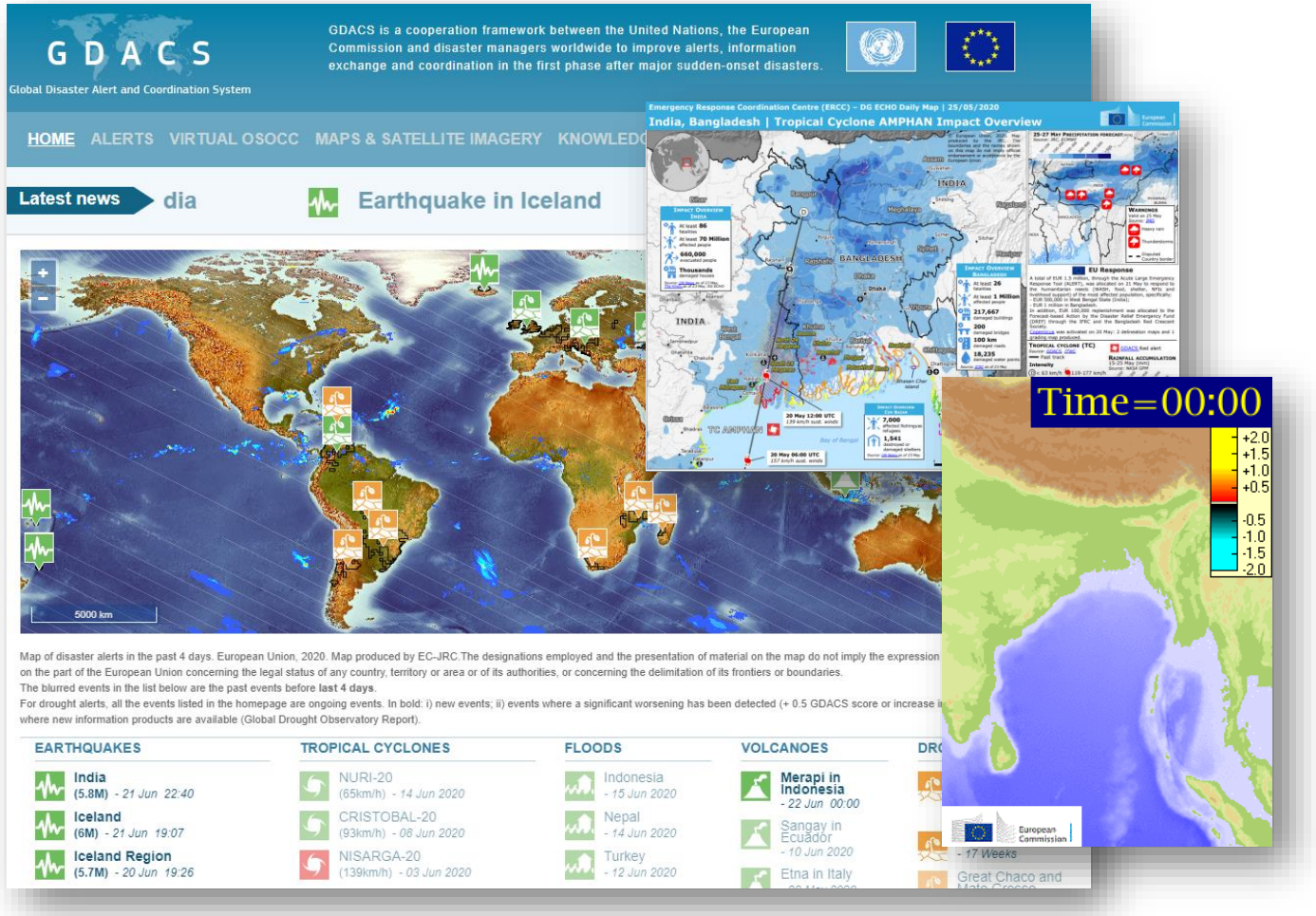
Uncertainty

Visual

European Commission

Global Disaster Alert and Coordinatin System

Right Information, Right Time, Right Format, Right Place



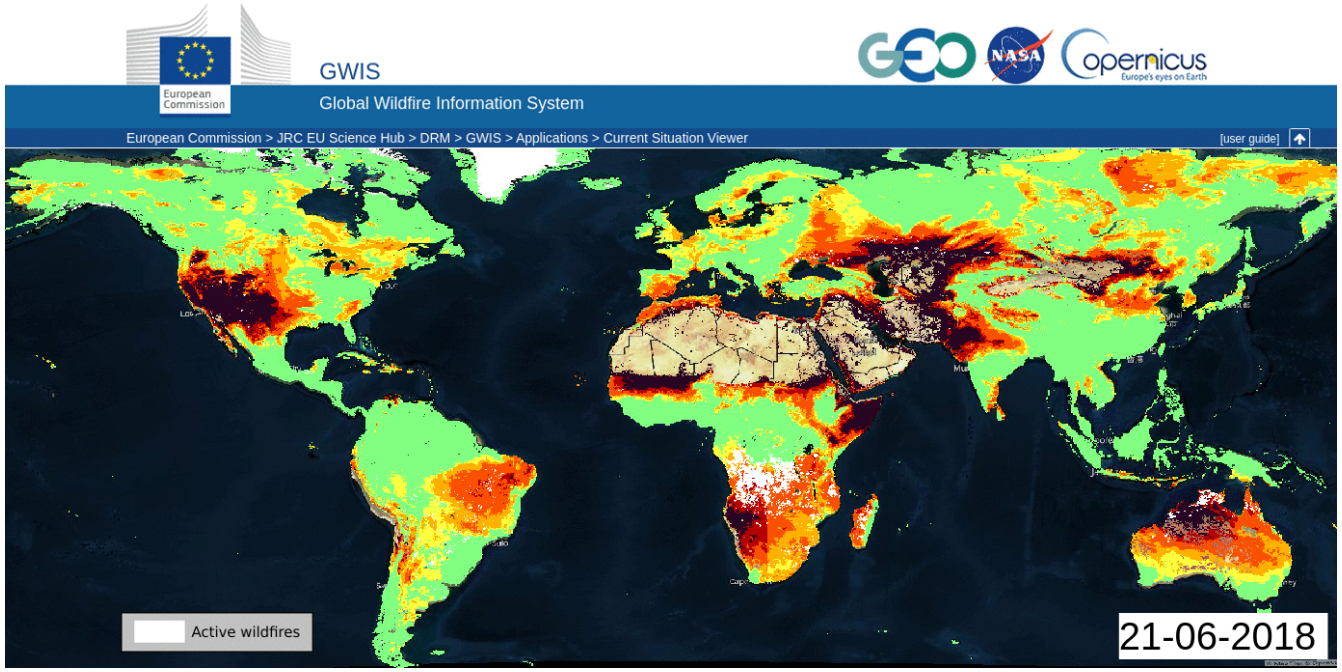
- **Automated GIS-based impact analysis** of earthquakes, cyclones, tsunamis, droughts, floods and volcanoes.
- **Actionable information** with Green-Orange-Red alert scores for humanitarian impact.
- A long-term **partnership** among EU and UN based on science

Example of a map produced by the JRC based on GDACS automatic information during cyclone AMPHAN in Bangladesh in May 2020

European Commission

Copernicus Emergency Mapping Rapid Mapping Service

Right Information, Right Time, Right Format, Right Place



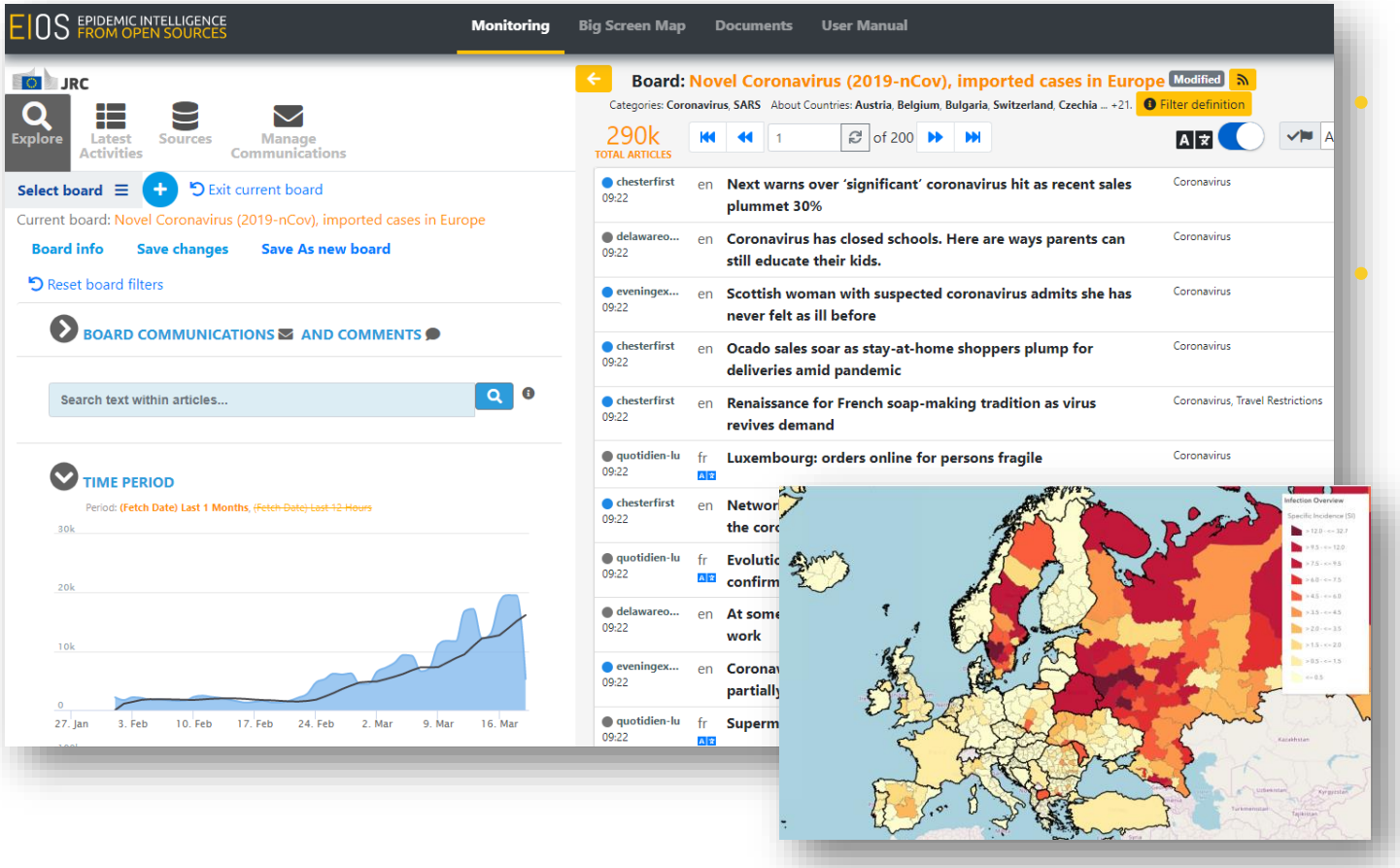
- All phases of disasters, combining **EO, in-situ data and modelling**
- Having access to **science advice under predictable service** level agreements is important.
- A major success story of the **trilateral partnership** among scientists, practitioners, private sector in the EU

Example of a wildfire monitoring over 1 year's time, from CEMS Global Wildfire Information System

European Commission

Epidemics Intelligence from Open Sources

Right Information, Right Time, Right Format, Right Place



Example of EIOS screen showing news volume on COVID-19 filtered for imported cases in Europe

Media monitoring of news on diseases and symptoms.

Spatio-temporal mapping for risk analysis with back. Detection of COVID in December.

A long-term **partnership** between EU and WHO based on science

One of tools for COVID-19 monitoring

European Commission

Our lessons learnt from 20 years of science advice…

…for DRM & DRR policies

Transparency

Openness

Uncertainty

Co-design

Flexibility

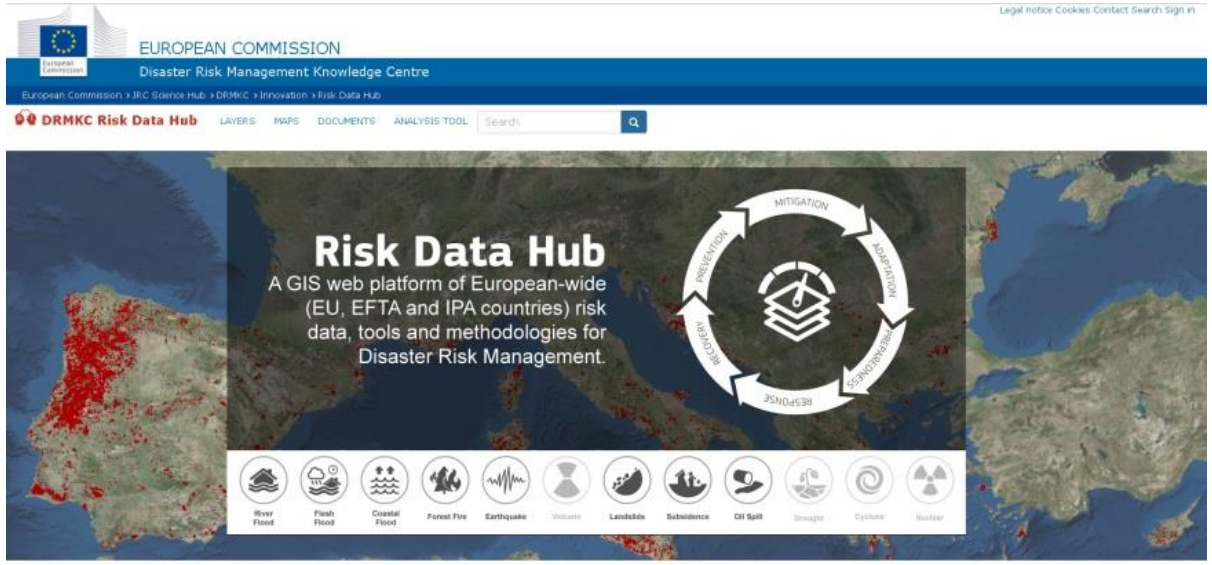
Non-emergency science work

European Commission

Risk Data Hub

Quality data are built on long term efforts

Risk Data Hub



Disaster Risk Management Knowledge Centre

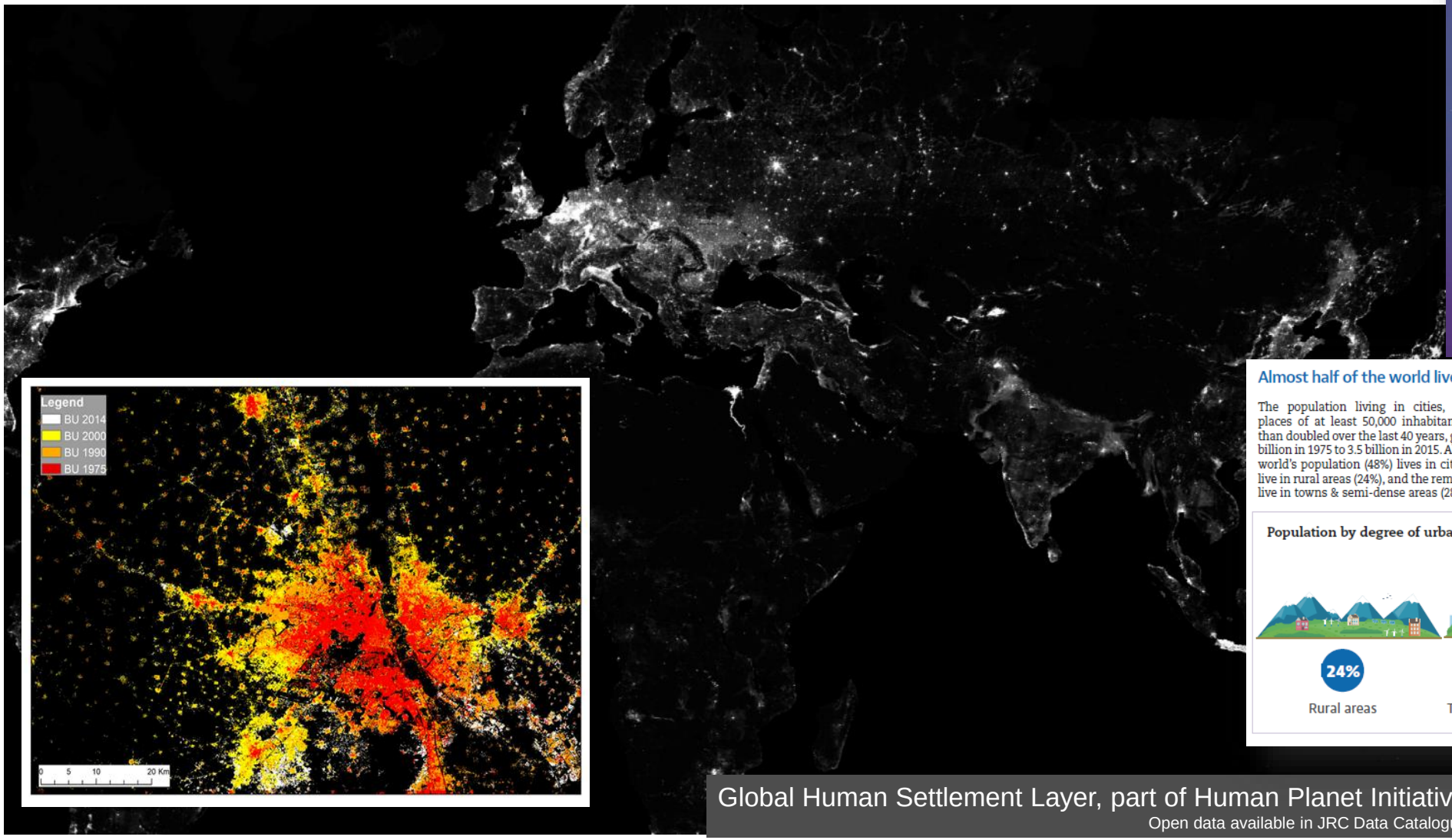
Loss data is the empirical basis for risk analysis

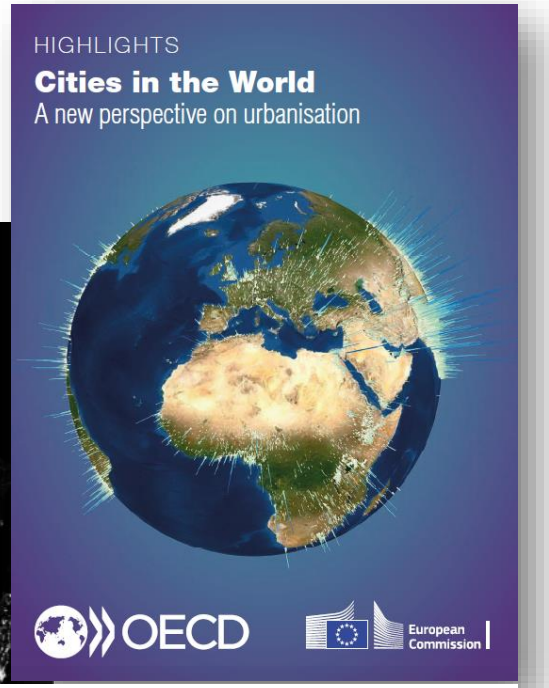
- **Guidelines** for recording, storing and sharing loss data
- **Tools** for Member States and Institutions
- **Data curation** in the DRM Knowledge Centre
- **Support** for building common evidence base in EU policy

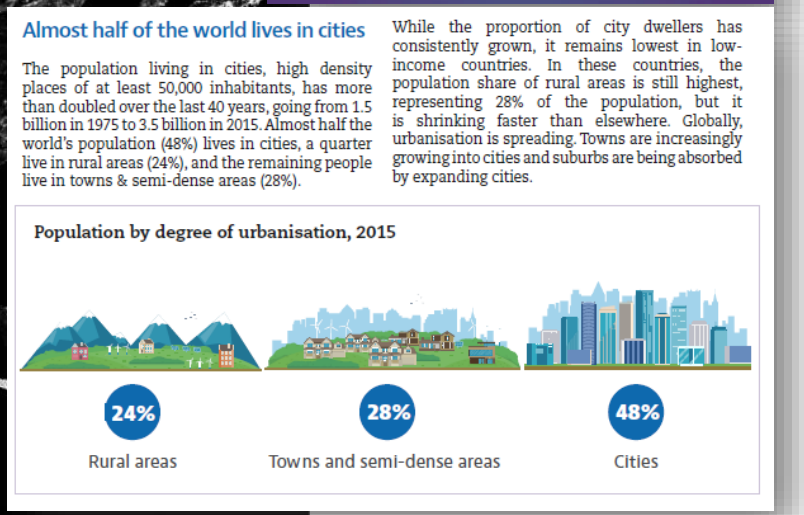
European Commission

Global Human Settlement Layer

Globally agreed definition of cities – from Space







Almost half of the world lives in cities

The population living in cities, high density places of at least 50,000 inhabitants, has more than doubled over the last 40 years, going from 1.5 billion in 1975 to 3.5 billion in 2015. Almost half the world's population (48%) lives in cities, a quarter live in rural areas (24%), and the remaining people live in towns & semi-dense areas (28%).

While the proportion of city dwellers has consistently grown, it remains lowest in low-income countries. In these countries, the population share of rural areas is still highest, representing 28% of the population, but it is shrinking faster than elsewhere. Globally, urbanisation is spreading. Towns are increasingly growing into cities and suburbs are being absorbed by expanding cities.

Population by degree of urbanisation, 2015

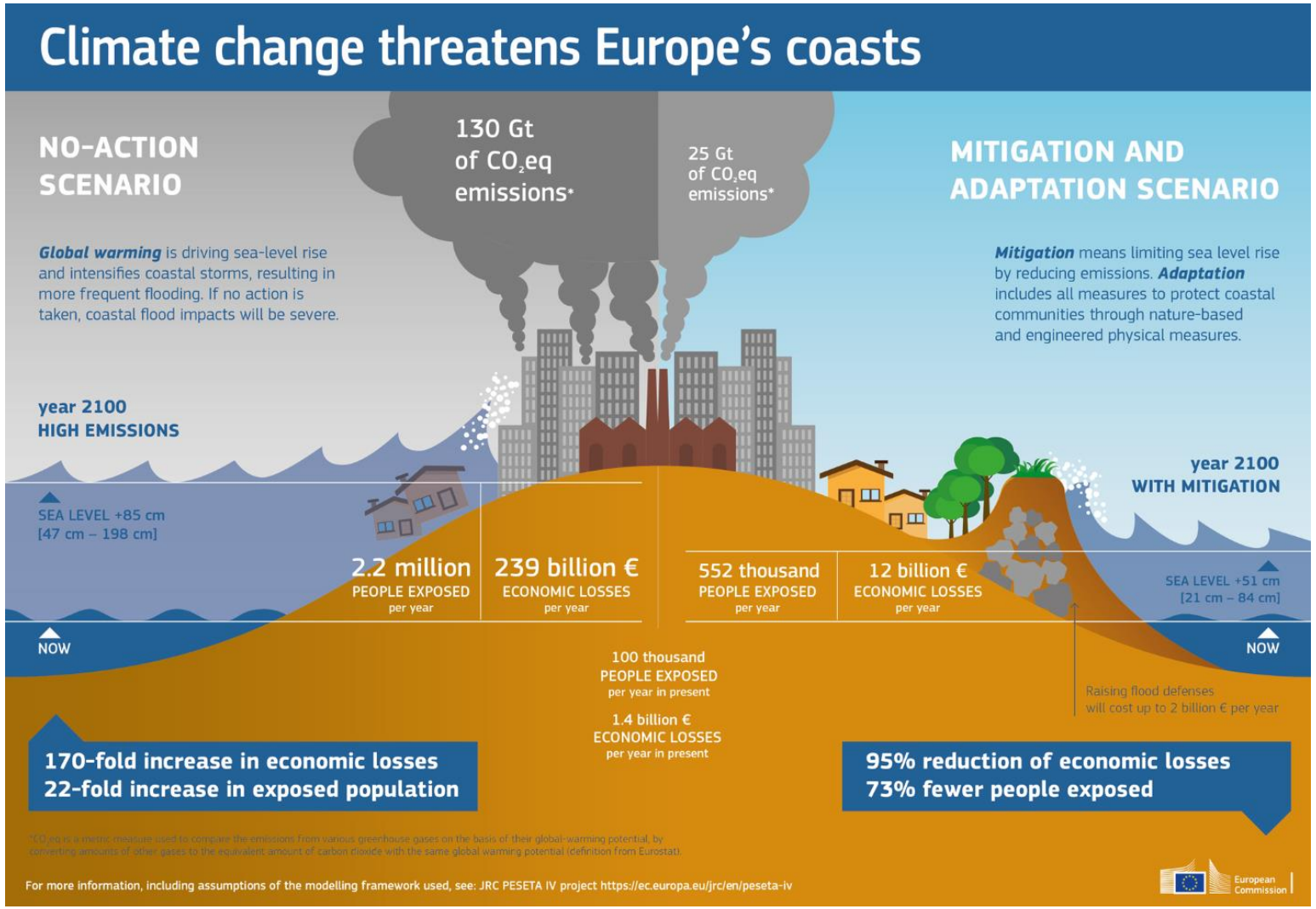
Global Human Settlement Layer, part of Human Planet Initiative

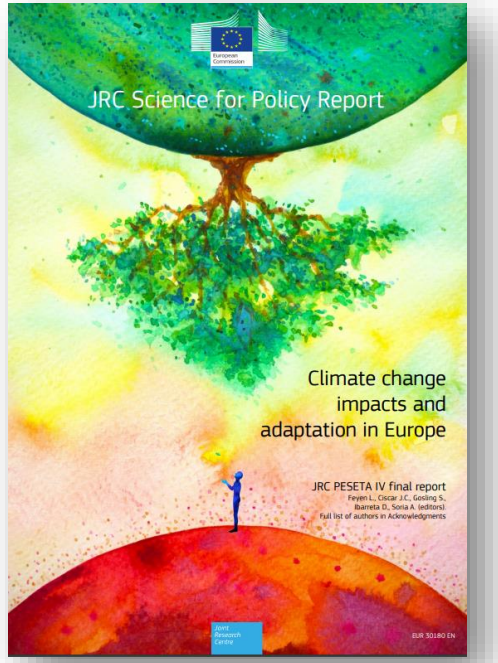
Open data available in JRC Data Catalogue

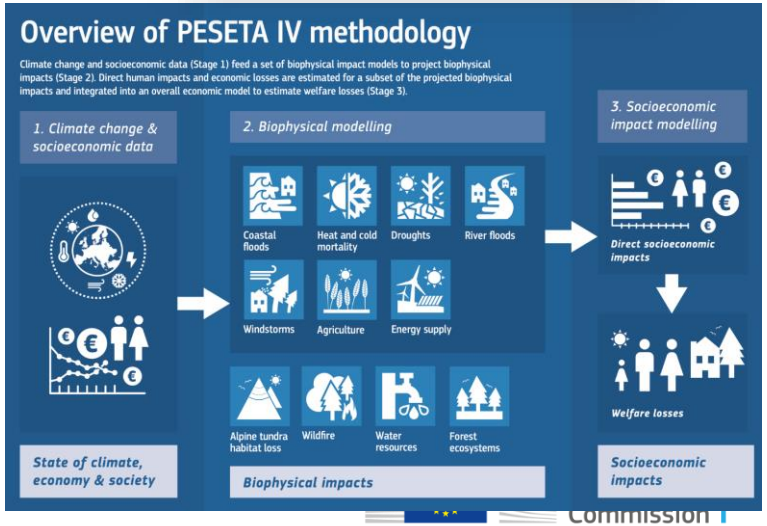
European Commission

PESETA IV – Climate impacts and adaptation

Future risk





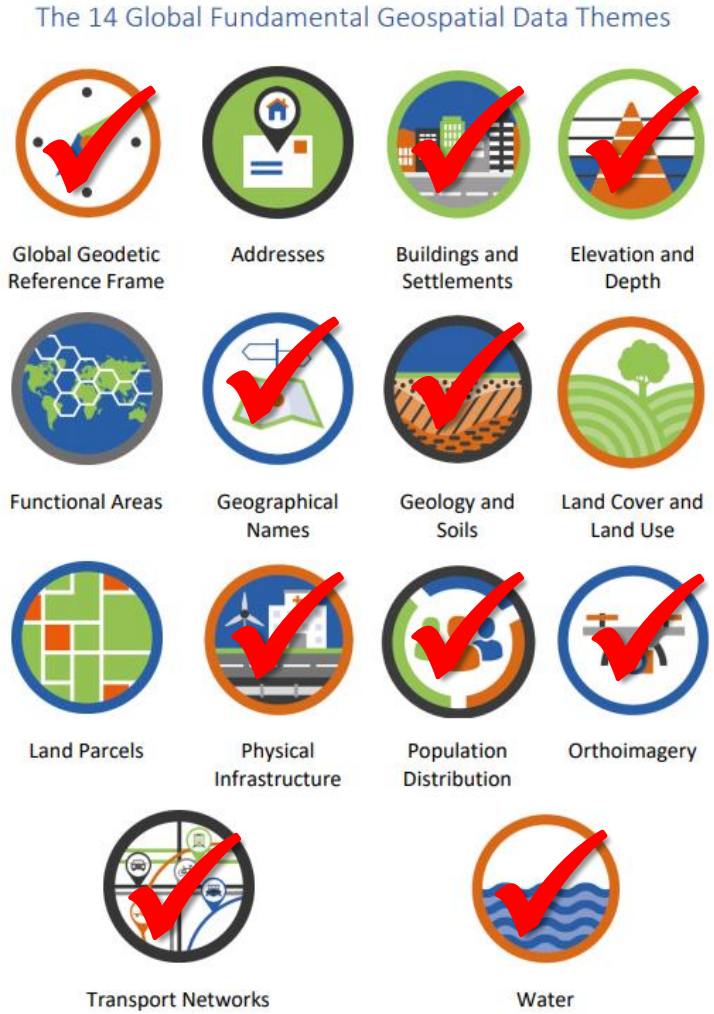


Conclusions – DRM & Global Geospatial Information Management

Fast, reliable (difficult) answers/evidences for (simple) questions in RESPONSE times

Flexibility is built on SOLID FOUNDATIONS of basic research and trustworthiness.

Provide EVIDENCE to gain the essential political support also in ordinary time



Keep in touch

EU Science Hub: ec.europa.eu/jrc

@EU_ScienceHub

EU Science Hub – Joint Research Centre

EU Science, Research and Innovation

Eu Science Hub

European Commission

Thank you

European Commission