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# Operational GMES services for Pillar 4 of the Danube Strategy

**Franz Jaskolla**

**NEREUS High-level Workshop:  
Danube Strategy & Space  
Technologies**

**Brussels, June, 16, 2011**

All the space you need



# Core Elements of the Danube Strategy

- 4 Pillars
- 3 “No’s”
- **Bottom-up Approach**

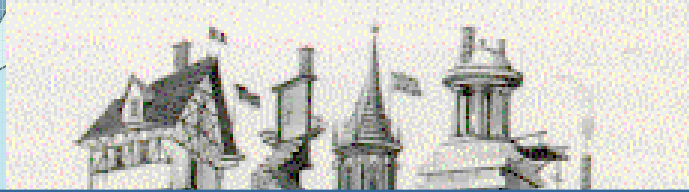
# GMES – Global Monitoring for Environment & Security

- What is GMES?
  - Joint programme of the European Commission & European Space Agency
  - 2nd pillar of European space strategy
- Objectives
  - Support of institutional European users – e.g. reporting obligations, environmental challenges, emergency response etc.

***GMES is defined, implemented and steered by user needs from European, national and regional level***

# Institutional

**An appropriate Governance Model  
is a must  
to consider the different and fragmented interests**



NTEX



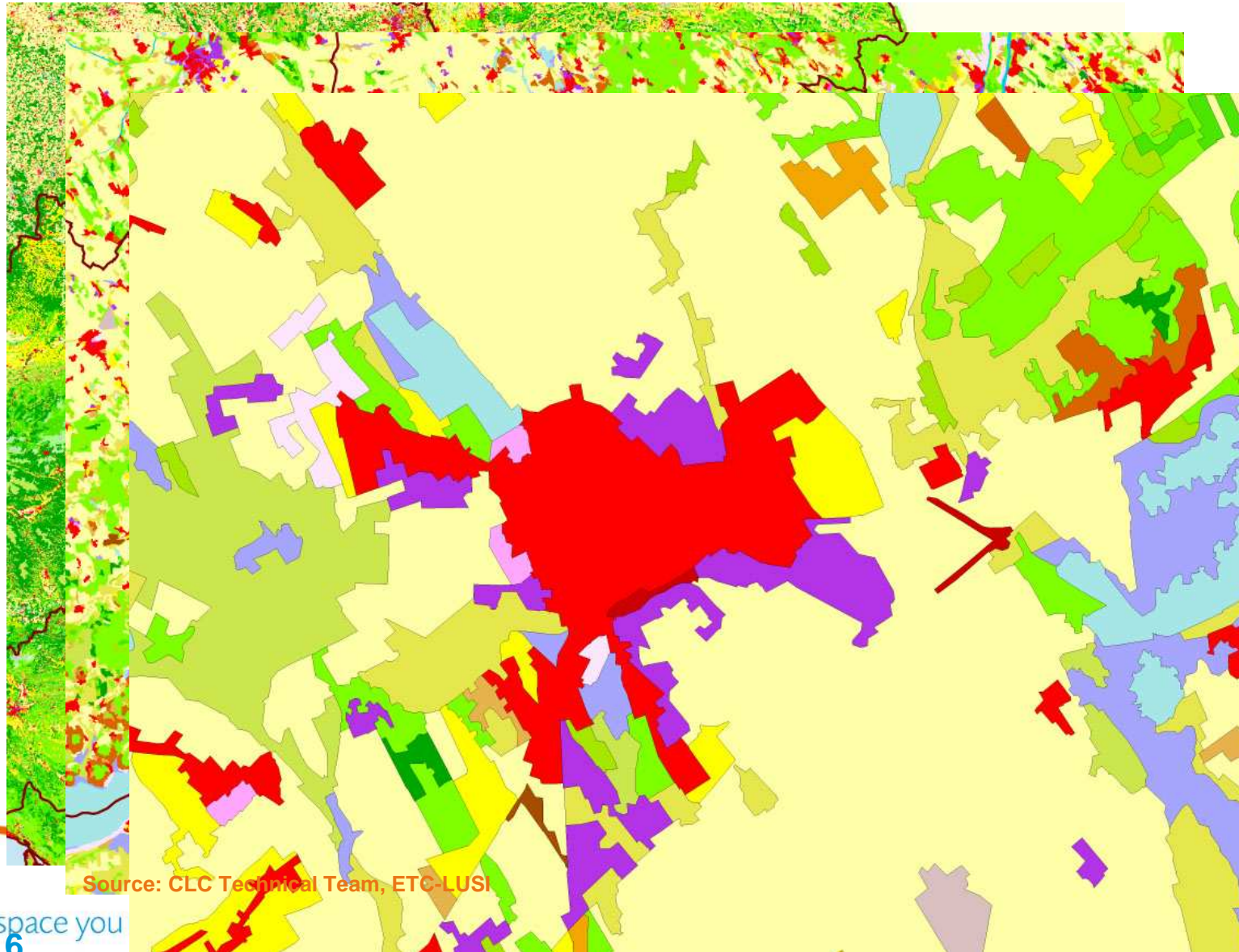
DG  
search

# Why we need geo-information

- Natural framework conditions independent from administrative / political boundaries
- Cross-border challenges
- Demand for high actuality
- Common content and standards for comparable results

# Example – Land Monitoring Semless database for Europe

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Source: CLC Technical Team, ETC-LUSI

# GMES Core Services \*)

## ■ Land

- Update of European Landcover Basis CLC
- Update & extension of Urban Atlas
- New so-called HR layers - spatial resolution (20 m) and validated at 1ha grid cell
  - **HR biophys. parameters (incl. calibration of Image2012!)**
  - **Sealing**
  - **Forest: cover + density + species**
  - **Wetlands**
  - **Grasslands**
  - **Water**

\*) following the GMES Initial Operations work programme 2011 - 2013

# Soil sealing - example Germany

## Germany - Increase of soil sealing 2006 - 2009

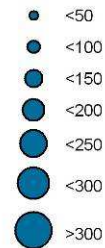
Area entities: Landkreise (NUTS 3)

Soil Sealing increase related to  
Total sealed area

### Legend

#### Absolute soil sealing increase

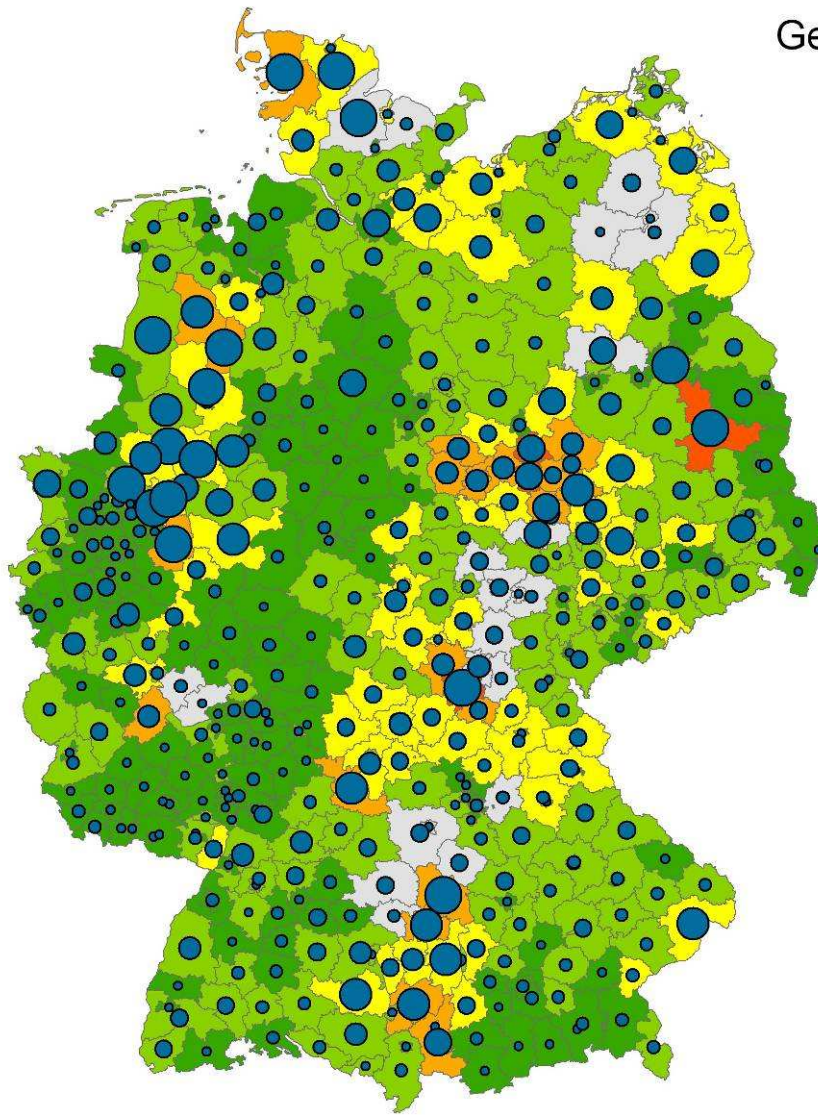
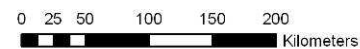
ha



#### soil sealing increase in relation to total sealed area



Light grey areas:  
Cloud cover >10%. Sealing increase  
values here are not representative





# Soil sealing – change detection in the Berlin area

Berlin 2009



# GMES Core Services

## Emergency

- **Action 1 - support users in the field of crisis management**, in particular Civil Protection, Humanitarian Aid and External Action communities by providing information based on space data combined with other sources of data - both natural disasters (floods, forest fires, earthquakes, tsunamis, volcanoes, landslides, storms..) and man-made disasters (industrial, nuclear accidents, terrorism attack etc.), inside and outside the EU
  - **First priority during the emergency response phase**, i.e.
    - – (i) emergency response maps produced in rush mode
    - – (ii) geographic reference maps made available in rush mode
  - **Second priority - to support the other phases of the crisis management cycle**, providing pre-disaster or recovery mapping products,
  
- **Action 2 - Early Warning Systems - sustainability of the Early Warning Systems (EWS) EFAS (European Flood Alert System) at European level.**

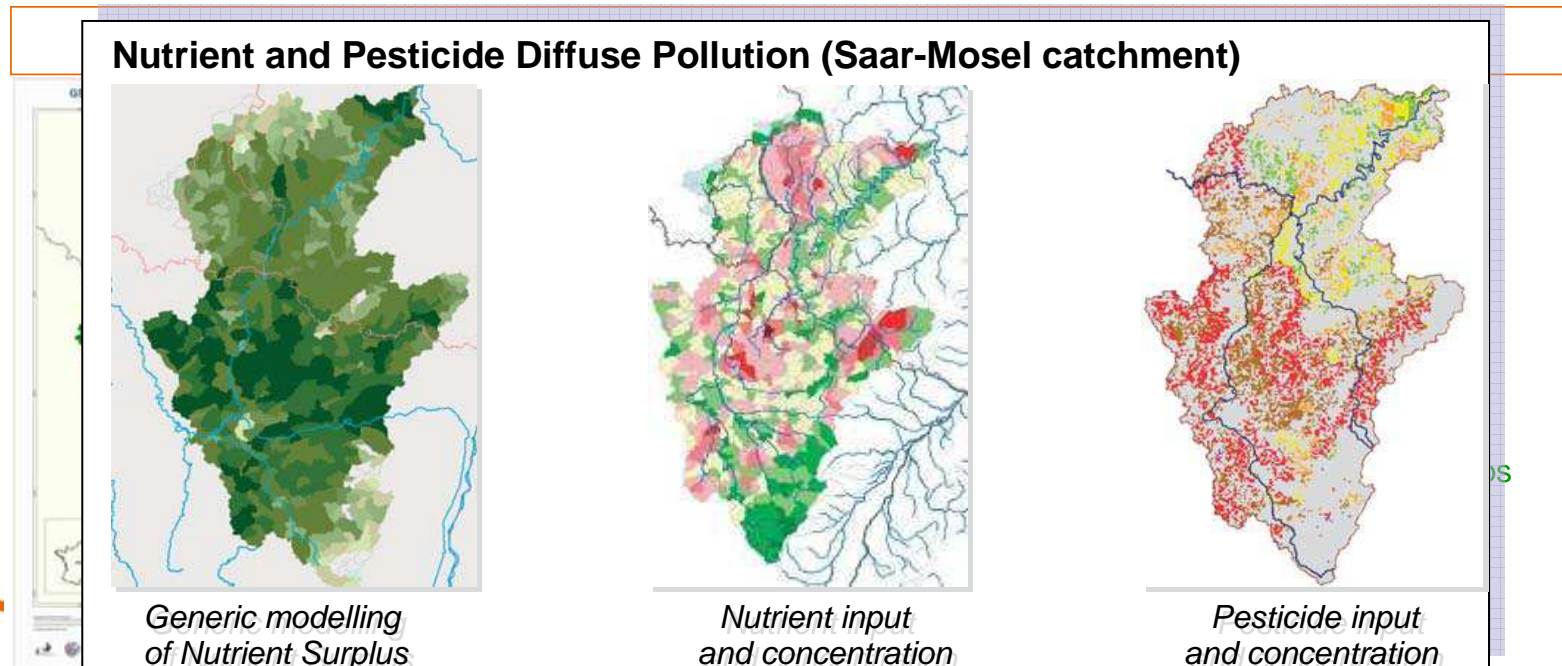
\*) following the GMES Initial Operations work programme 2011 - 2013

# GMES Emergency Response Service



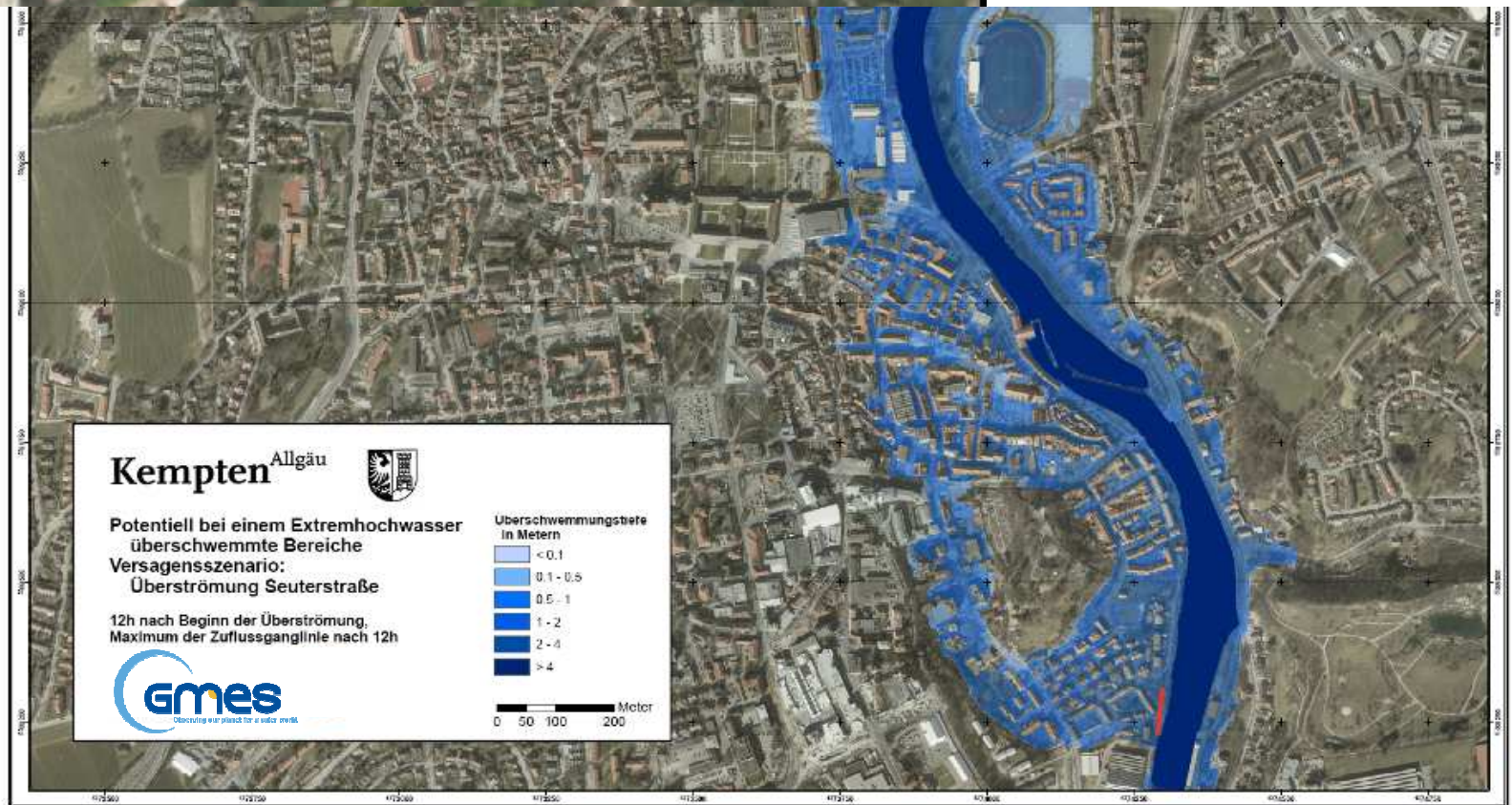
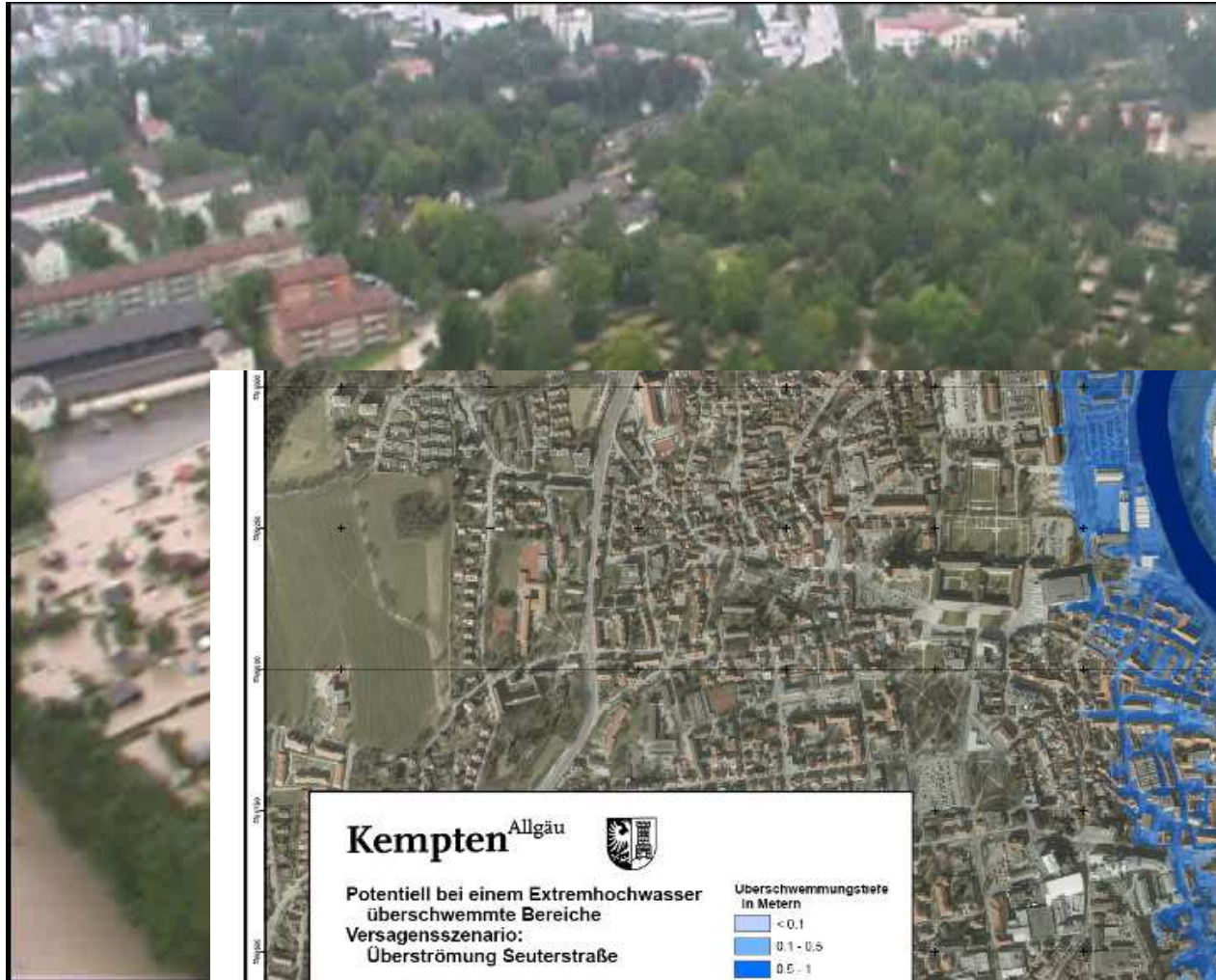
# GMES Downstream Services Water Quality Management

- Assess impact of farmers / industry activity in a given region (ex: restricting arable land use to minimize fertilization intensity and corresponding fertilizers discharge to water bodies)
- Designed for ecological/environmental units: pollution doesn't stop at administrative borders



# GMES Downstream Services - Emergency Hazard map

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# GMES Downstream Services - Emergency Flood Risk Simulation



- Clogging scenario
- Total time of simulation: 24 hrs
- Integration into operational system of civil protection unit in Kempten

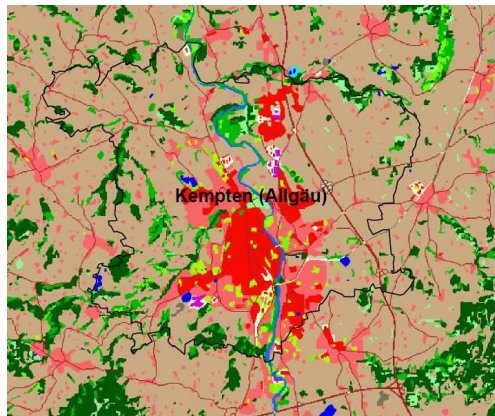
# GMES Downstream Services - Emergency Asset Maps

Input:

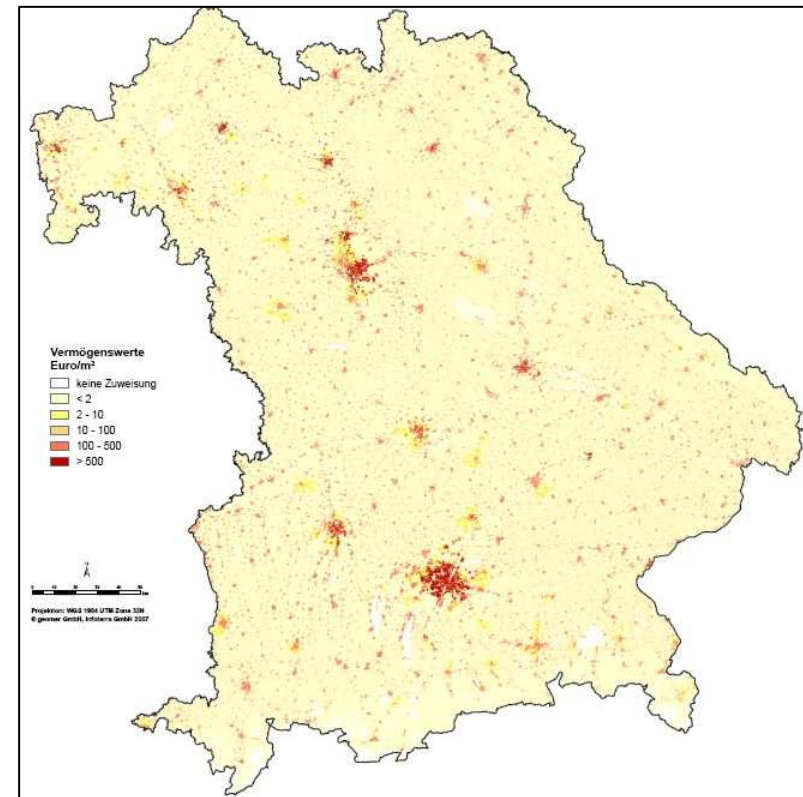
Landcover information

+

Official statistics at community level



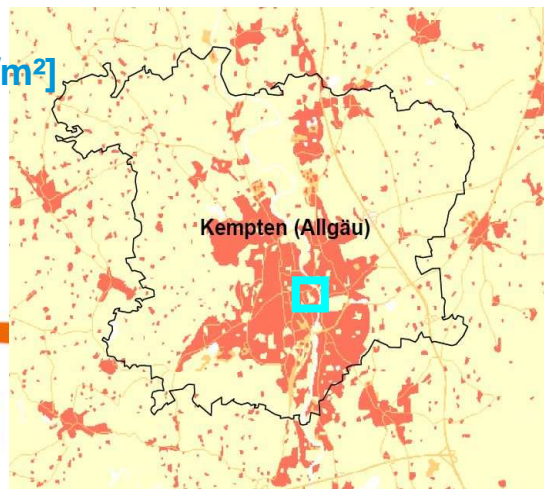
A	B	C	D	E	F	G	H	I	J	K	L	M
Community (ID)	Auto-mobiles	Motor-cycles	Household goods	Residential buildings	Livestock (Urban area)	Livestock (Grassland)	Net capital agriculture (Urban area)	Net capital agriculture (Agricultural area)	Net capital industry	Net capital (Service sector)	Inventories (Industry)	Inventories (Service sector)
9161000	2671,47	56,58	12622,88	15242,46	4,77	1,80	428,14	161,53	213882,23	619630,71	64164,67	30361,50
9162000	20013,52	460,32	129120,50	155916,38	1,90	0,72	2731,25	1030,45	771469,91	10071137,03	231440,97	493485,71
9163000	986,17	26,91	6109,15	7376,96	5,64	2,13	131,03	49,43	41522,76	387457,55	12456,83	18985,42
9171111	209,60	5,64	1397,60	1675,26	4,28	1,62	22,15	8,26	3977,63	199119,62	3075,29	5346,69
9171112	301,54	7,54	2179,17	2631,41	0,59	0,22	46,14	17,41	60611,97	78943,67	19163,56	3669,29
9171113	179,96	5,37	1172,65	1416,00	6,46	2,44	0,00	0,00	14026,73	34677,25	4208,02	1659,19
9171114	73,60	2,74	486,72	586,52	0,17	0,06	0,00	0,00	577,69	3776,92	173,31	185,07
9171115	23,05	1,36	165,49	199,83	6,00	2,26	0,00	0,00	152,02	273,97	45,61	13,42
9171116	23,64	1,02	146,19	176,53	2,31	0,87	0,00	0,00	217,90	391,39	65,37	19,18
9171117	151,25	6,39	1014,11	1224,57	5,01	1,89	12,92	4,67	1707,73	12270,11	512,32	601,24



Asset Map for the Land Bayern

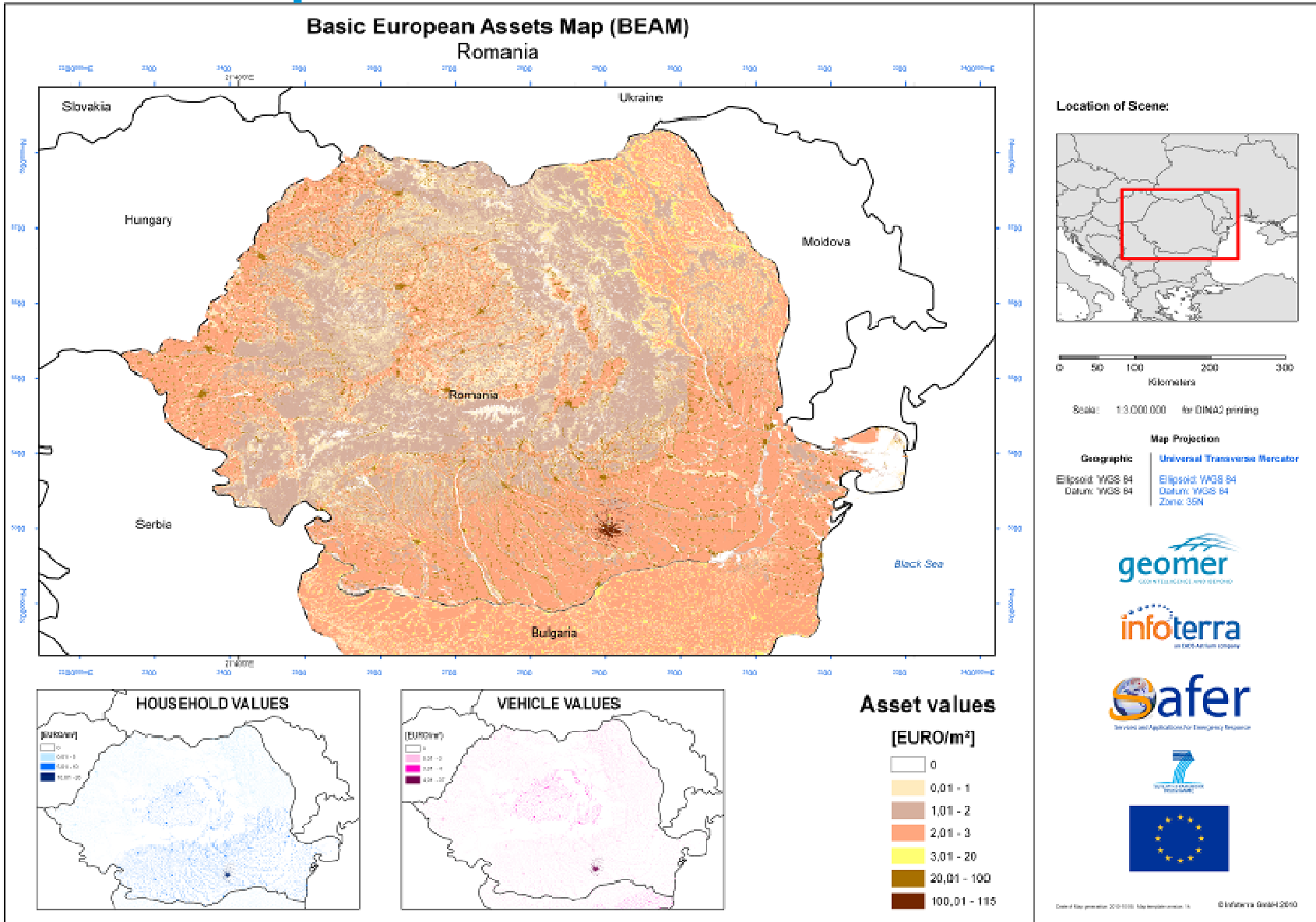
Result:

Asset Map [€/m<sup>2</sup>]



# GMES Downstream Services - Emergency Asset Maps

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# GMES Downstream Services - Emergency Damage Potential Maps

Input:  
Asset Map



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Flood Extent  
Map



Result:

Areas with

- high
- medium and
- low

Damage potential (€/km<sup>2</sup>)

# Conclusions

- GMES Services support all phases of the risk management cycle – from European to local level by:
  - Rapid mapping incl. damage assessment
  - Flood hazard / risk mapping
  - Assets mapping
  - Flood Information System
- Geo-products of GMES Services support the implementation of EU Directives (Water, Flood)
- GMES Services will support the success of the Danube Strategy
  - Improving living conditions of citizens
  - Supporting economic growth through creating new jobs in the field of geoinformation



# Thank You for Your Attention!