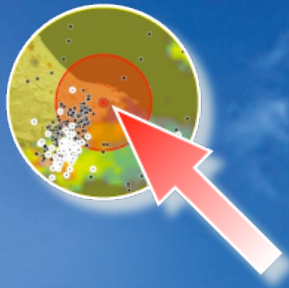# Case study of the 2013 Danube flood Test of the HAREN products by the Lower Austrian Civil Protection

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Tulln, Austria

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Provincial Government of Lower Austria
Department for Fire Service and Civil Protection
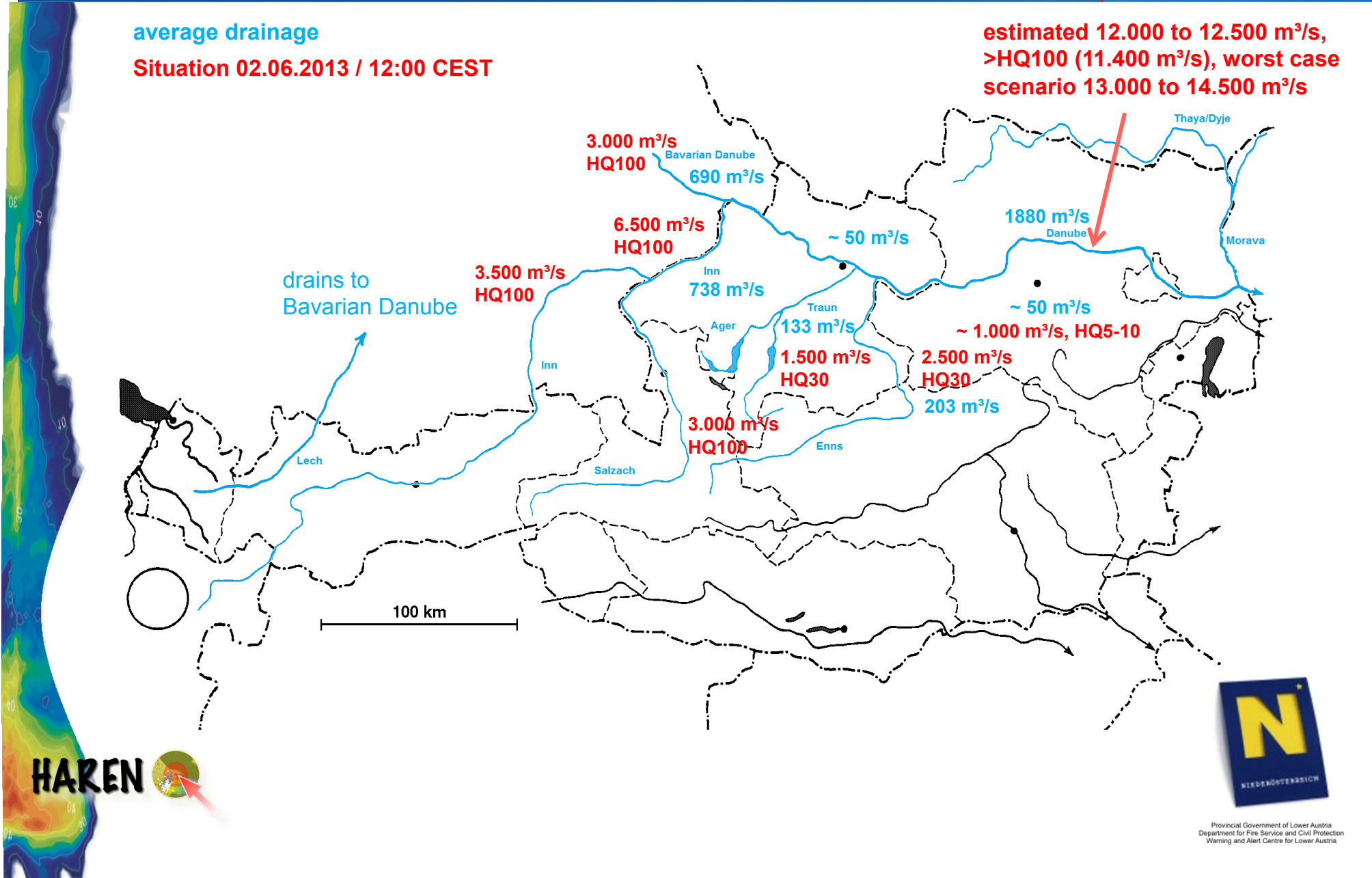Warning and Alert Centre for Lower Austria

average drainage

Situation 02.06.2013 / 12:00 CEST

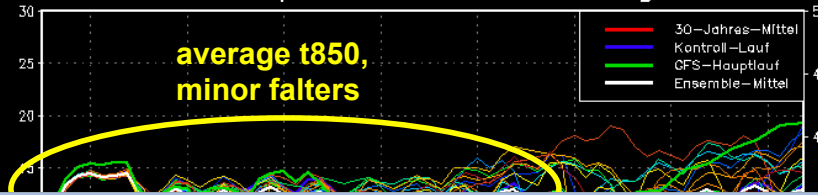**estimated 12.000 to 12.500 m³/s, >HQ100 (11.400 m³/s), worst case scenario 13.000 to 14.500 m³/s**

3.000 m³/s HQ100

Bavarian Danube
690 m³/s

Thaya/Dyje

6.500 m³/s HQ100

~ 50 m³/s

1880 m³/s
Danube

Morava

3.500 m³/s HQ100

drains to Bavarian Danube

Inn
738 m³/s

Traun
133 m³/s

~ 50 m³/s

~ 1.000 m³/s, HQ5-10

Ager

Inn

1.500 m³/s HQ30

2.500 m³/s HQ30

203 m³/s

3.000 m³/s HQ100

Enns

Lech

Salzach

100 km

HAREN

Wien Lat: 48 Lon: 16 Tue,02JUL2013 00Z
850 hPa Temp. in °C, 6h-Niederschlag in mm

30-Jahres-Mittel
Kontroll-Lauf
GFS-Hauptlauf
Ensemble-Mittel

average t850, minor falters

HAREN OPERA Mosa
Instant

2013-06-01 24:00 UTC

Wetter / Wetterwarnungen   erstellt: Sonntag, 02.06.2013 07:40
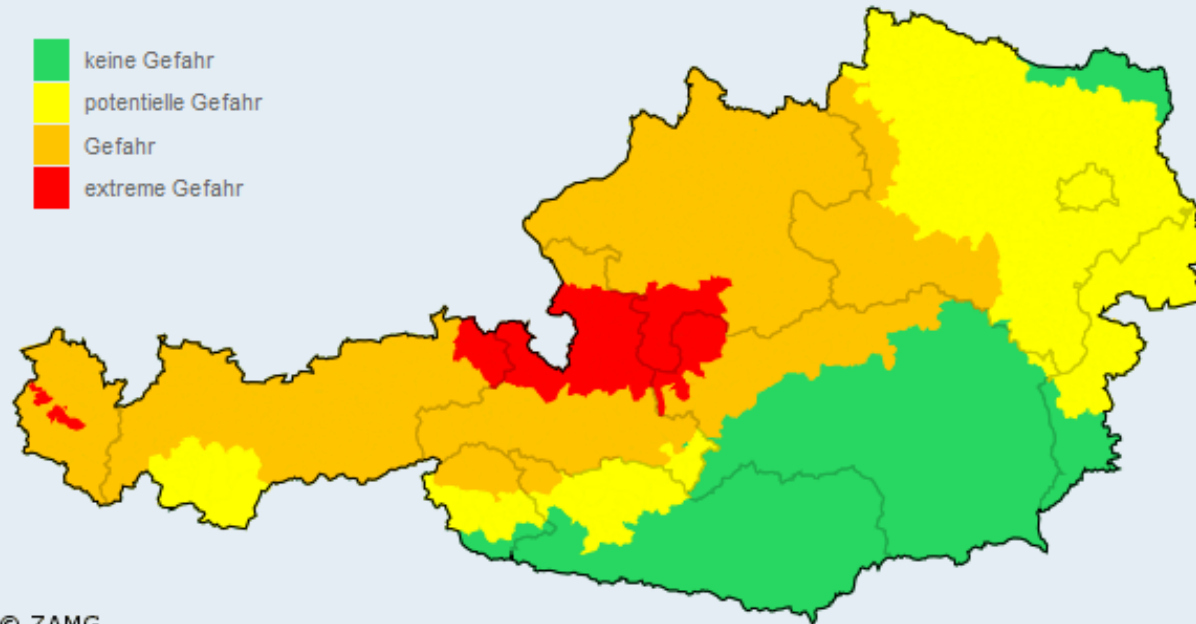
Alle Warnungen - heute Sonntag - Österreich

Alle Warnungen

keine Gefahr
potentielle Gefahr
Gefahr
extreme Gefahr

© ZAMG

Österreich   So Mo Di Mi Do

Kartendaten ©2013 Basarsoft, GeoBasis-DE/BKG (©2009), Google, basado en BCN IGN España - Nutzungsbedingungen

Center   Lon.:21.27 Lat.:60.44 X (Km utm):2368100.48 Y (Km utm).:8498593.83

2013-06-01 24:00 UTC

HAKEN

European Civil Protection

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14 15
21 22
28 29

on
HAREN)
AREN)

FINNISH METEOROLOGICAL INSTITUTE

ZAMG

high pressure, stable

Affected Rivers: Rhine, Inn, Salzach, Enns, Danube

990
980
970
3JUL 5JUL 7JUL 9JUL 11JUL
2013
Daten: Ensembles des GFS von NCEP   Wetterzentrale

NIEDERÖSTERREICH
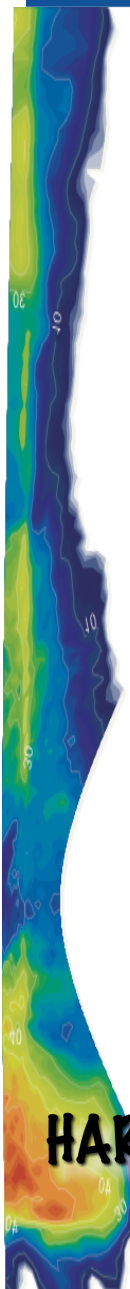
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Coverage of Austrian National Radar
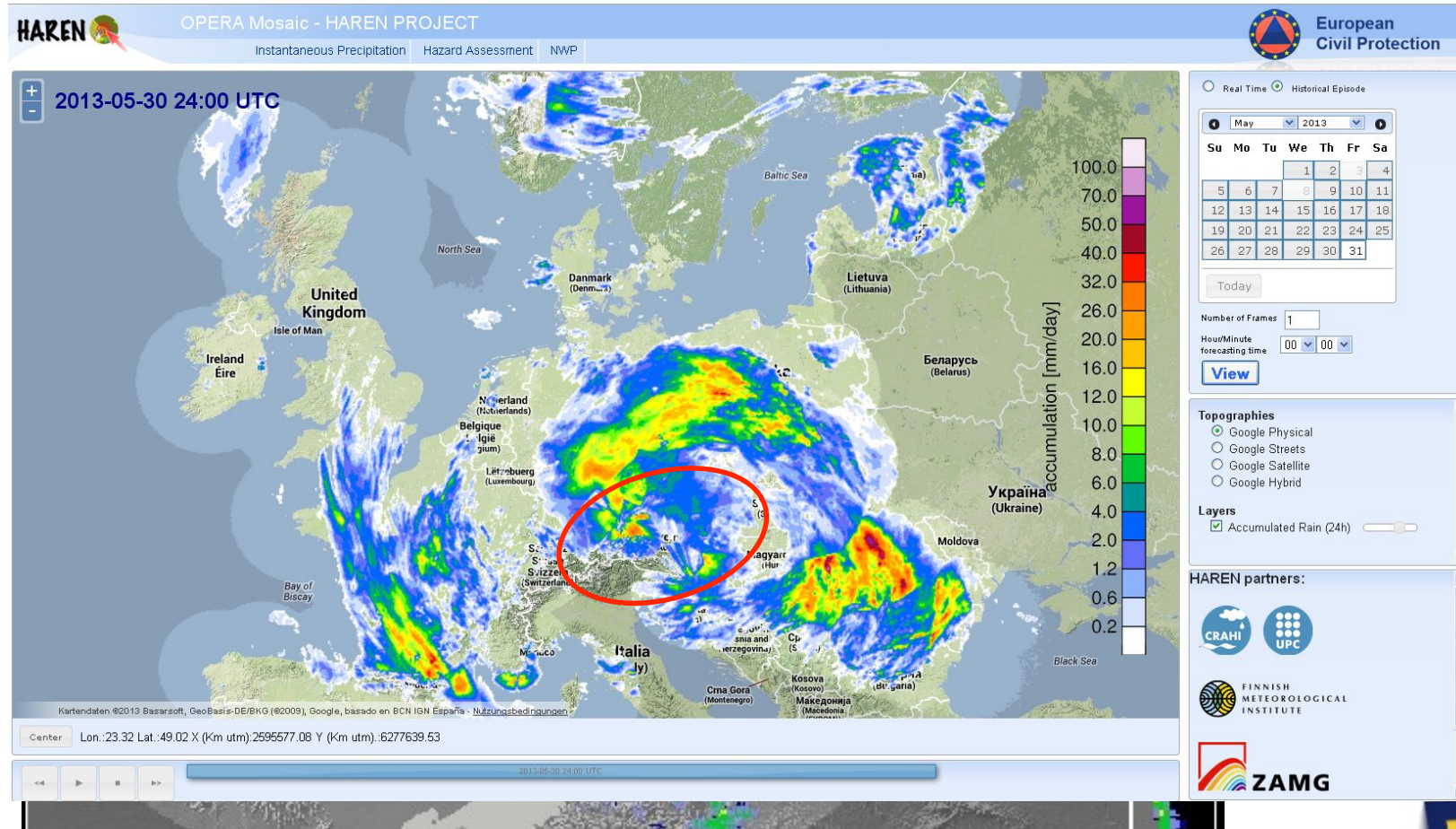
- If only national radars are used you need radar images of following countries for full coverage:
- Germany
- Czech Republic
- Poland
- Slowakia
- Hungary
- Slowenia

- But: National radars fail at outer coverage areas
- Handling of more radar image websites not useable

- Benefits of HAREN-Radar composites:
- Early detection of „Vb"-cyclones or antlantic systems with radar composites
- One website for overall view of a precipitation system, details can be visualisized on the national image
- Seamless transistion between the single national radars – compensation of deadspots, clutters and other misleading distortions
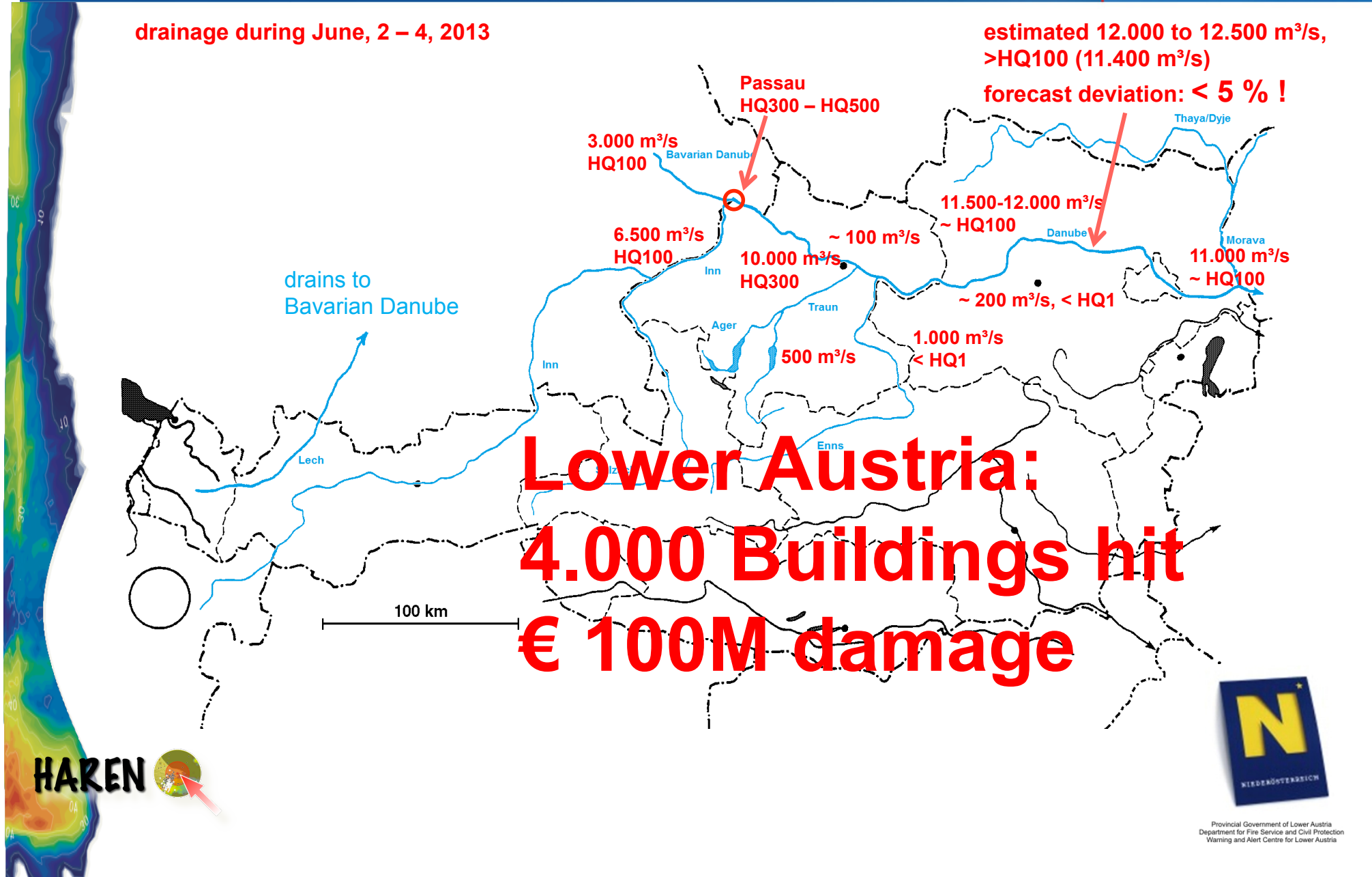
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drainage during June, 2 – 4, 2013

estimated 12.000 to 12.500 m³/s,
>HQ100 (11.400 m³/s)

forecast deviation: < 5 % !

Passau
HQ300 – HQ500

Thaya/Dyje

3.000 m³/s
HQ100   Bavarian Danube

11.500-12.000 m³/s
~ HQ100   Danube

Morava

6.500 m³/s
HQ100   ~ 100 m³/s

11.000 m³/s
~ HQ100

10.000 m³/s,
HQ300   Inn

drains to
Bavarian Danube

Traun   ~ 200 m³/s, < HQ1

Ager

Inn   500 m³/s   1.000 m³/s
< HQ1

Lech

Enns

Lower Austria:
4.000 Buildings hit
€ 100M damage

100 km

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Department for Fire Service and Civil Protection
Warning and Alert Centre for Lower Austria

- Analysis and forecast worked very well – "lightyears from the 2002-flood", numerous benefits from first tests and pilot applications used in the 2009 flood

- Strategy of "Timesteps – Preparing for Disaster" was developed at storm "Kyrill" in 2007, steady emprovements till now, but the general guideline is still actual

- Frequently contact to meteorologist – first contact 72 to 96 hours in advance to the impact, then once to twice a day

- Hydrologist should be "at the spot", integrated to disaster staff – common interpretation of precipitation graphics (actual radar data, precipitation sums)

- At close time before and during the impact all available data sources will be needed – instant comparison and plausibility checks

- Availableness, handling and performance of data sources are very important parameters for usage and acceptance – viewing of many sources and crosschecks within a short time!
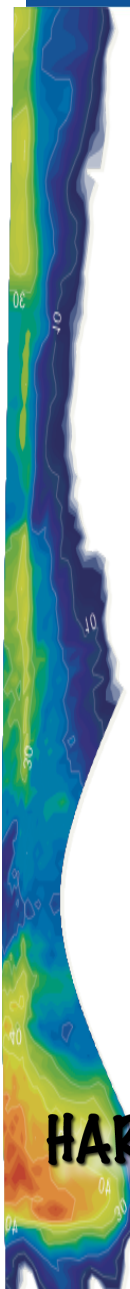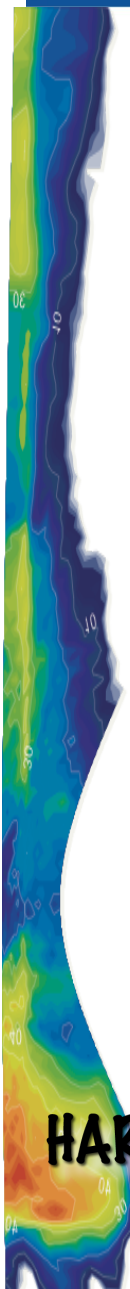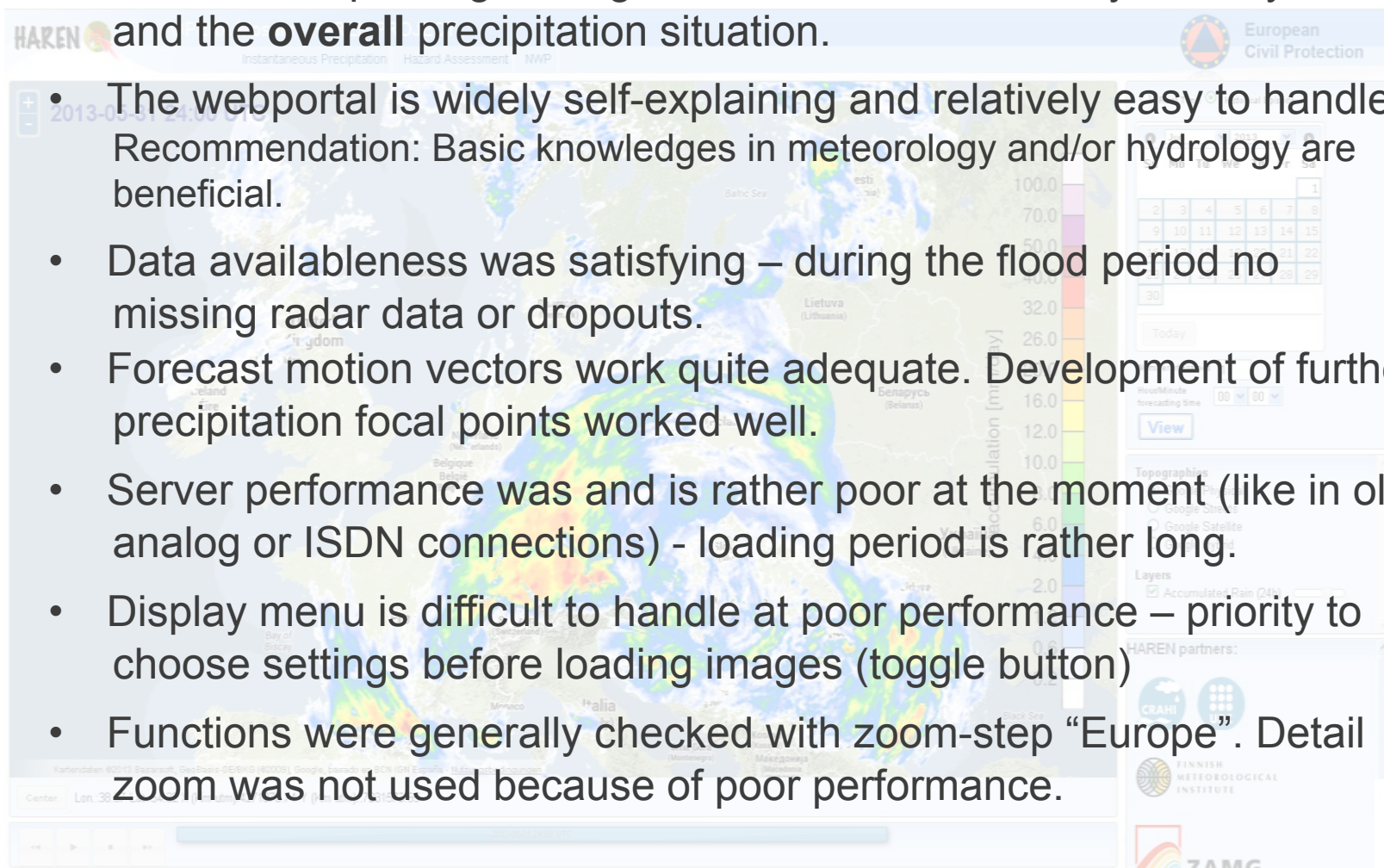
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- HAREN-webportal gave a good overview about the cyclone system and the **overall** precipitation situation.

- The webportal is widely self-explaining and relatively easy to handle Recommendation: Basic knowledges in meteorology and/or hydrology are beneficial.

- Data availableness was satisfying – during the flood period no missing radar data or dropouts.

- Forecast motion vectors work quite adequate. Development of further precipitation focal points worked well.

- Server performance was and is rather poor at the moment (like in old analog or ISDN connections) - loading period is rather long.

- Display menu is difficult to handle at poor performance – priority to choose settings before loading images (toggle button)

- Functions were generally checked with zoom-step "Europe". Detail zoom was not used because of poor performance.
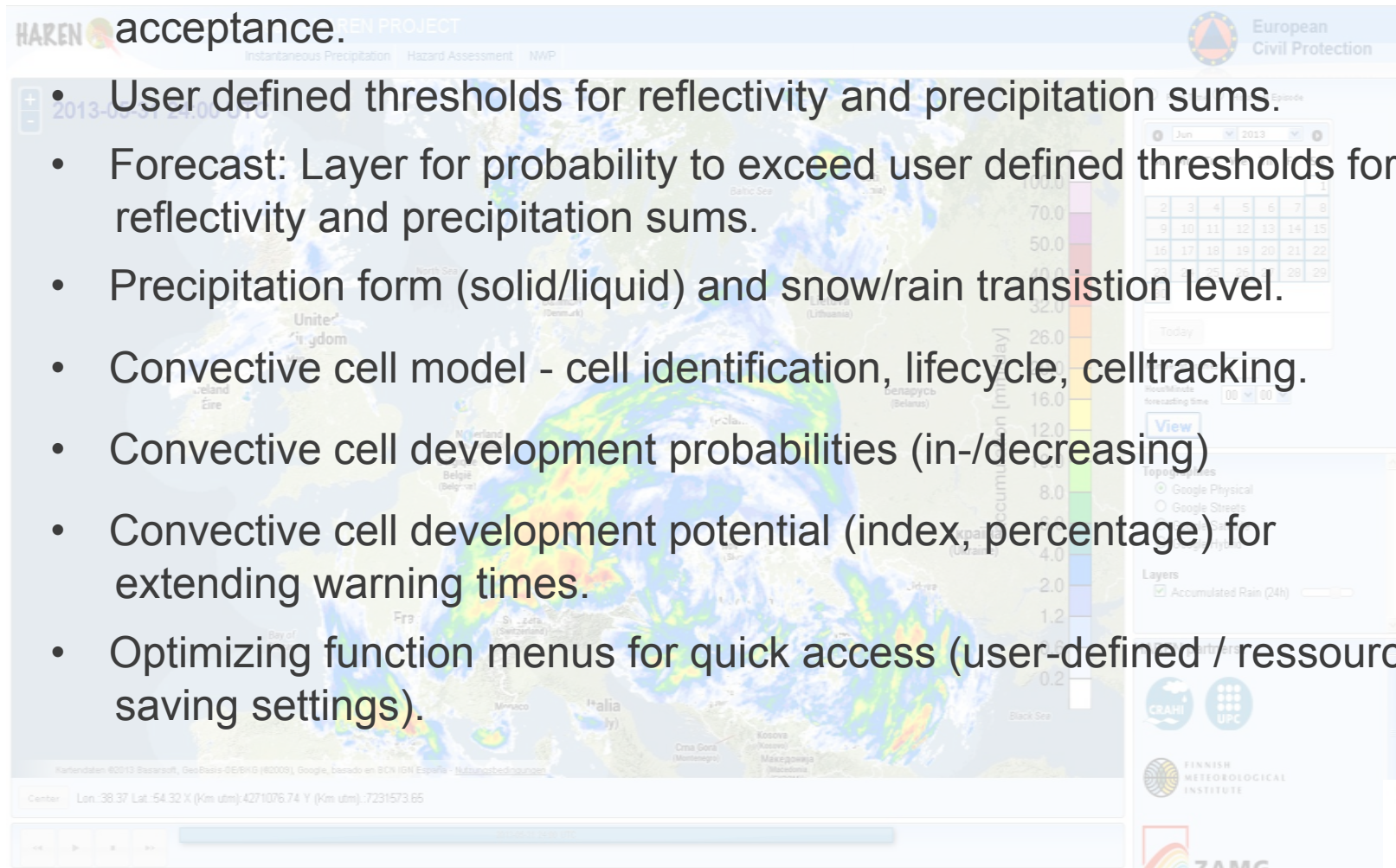
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HAREN – emprovements and future targets

7/10/13 Folie 9

- Sufficient internet connection is a basic requirement for high application acceptance.

- User defined thresholds for reflectivity and precipitation sums.

- Forecast: Layer for probability to exceed user defined thresholds for reflectivity and precipitation sums.

- Precipitation form (solid/liquid) and snow/rain transistion level.

- Convective cell model - cell identification, lifecycle, celltracking.

- Convective cell development probabilities (in-/decreasing)

- Convective cell development potential (index, percentage) for extending warning times.

- Optimizing function menus for quick access (user-defined / ressource saving settings).

Daily situation report at LWZ-Noe in Tulln

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