

UEF Meeting 2014

# Severe weather warning system at the Austrian Meteorological Service (ZAMG)

UEF Meeting Reading, 4<sup>th</sup> – 6<sup>th</sup> of June 2014

Zentralanstalt für Meteorologie und Geodynamik



**Mag. Christian Csekits**

ZAMG

Tel.: ++43 1 36026/2311 or /2302

Fax: ++43 1 36026/73

Email: [christian.csekits@zamg.ac.at](mailto:christian.csekits@zamg.ac.at)

Internet: <http://www.zamg.ac.at>



# Content

- Introduction
- Severe weather warnings for the public
- Severe weather warnings for the government (civil protection agencies, crisis management)
- Severe weather warnings for private clients (e.g. business companies)
- Case Study: Flood and storm in May 2014 over Austria
- Concluding results



# Content

- **Introduction**
- Severe weather warnings for the public
- Severe weather warnings for the government (civil protection agencies, crisis management)
- Severe weather warnings for private clients (e.g. business companies)
- Case Study: Flood and storm in May 2014 over Austria
- Concluding results



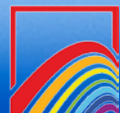
## Introduction

- 1 main centre (Vienna, 3 federal states; E)
- 4 regional departments:
  - Salzburg (2 federal states; N and NW)
  - Innsbruck (2 federal states; W)
  - Graz (1 federal state; SE)
  - Klagenfurt (1 federal state; S)



## Introduction

- Night: warning activities centralised in Vienna
  - Day: every day in the morning weather conference via WebEx
- \* arrangement of the warnings (localisation, duration, intensity of the phenomena)



# Content

- Introduction
- **Severe weather warnings for the public**
- Severe weather warnings for the government (civil protection agencies, crisis management)
- Severe weather warnings for private clients (e.g. business companies)
- Case Study: Flood and storm in May 2014 over Austria
- Concluding results



## Severe weather warnings for the public

- Severe weather warnings published on our webpage for the next 5 days:
  - \* Strong wind
  - \* heavy precipitation (rain and/or snow)
  - \* freezing rain
  - \* thunderstorms
  - \* heat waves
  - \* cold spell
  - \* forest fires (3 days)
  - \* pollen count (3 days)



# Content

- Introduction
- Severe weather warnings for the public
- **Severe weather warnings for the government (civil protection agencies, crisis management)**
- Severe weather warnings for private clients (e.g. business companies)
- Case Study: Flood and storm in May 2014 over Austria
- Concluding results





## Severe weather warnings for the government

- high impact weather information on webpage
- weather bulletins (more spatial and temporal details)
- continuous telephone calls
- web portals providing meteorological data with high spatial resolution of 1km for the next 6 hours, updated every 15 minutes (INCA)
- additional info in cases of nuclear/biological/chemical accidents (bulletins, trajectories, pollutant content)



# Severe weather warnings for the government

**ZAMG**  
Zentralanstalt für Meteorologie und Geodynamik

Aktuell Wetter Klima Umwelt Geophysik Forschung Produkte Facebook

### Windböen: Analyse von Donnerstag 10:20 Lokalzeit

Temperatur Niederschlag Wind Böen Bewölkung Gewitter

km/h  
>150  
150  
140  
130  
120  
110  
100  
90  
80  
70  
60  
50  
40  
30  
20  
10  
-1  
-0

Donnerstag 10:20

© Zentralanstalt für Meteorologie und Geodynamik  
1190 Wien, Hohe Warte 38  
Telefon: +43 1 36 0 26  
E-Mail \*\*\*

Die ZAMG ist eine Forschungseinrichtung des  
**bmwfw**  
Bundesministerium für Wissenschaft, Forschung und Wirtschaft



# Severe weather warnings for the government

ZENTRALANSTALT FÜR METEOROLOGIE UND GEODYNAMIK  
 Teilrechtsfähige Einrichtung des Bundes  
 Abteilung Wetter / Kundenservice Tel (01) 36 0 26/2311 Fax (01) 368 45 70



**Windverhältnisse am Neusiedlersee  
 für die  
 Landessicherheitszentrale Burgenland (LSZ)**  
<http://www.lsz-b.at>

Mailadresse: [leitstelle@lsz-b.at](mailto:leitstelle@lsz-b.at)

Fax: 02682661001199

Ausgegeben am: Do, 15.05.2014

Zeitraum: 06-14 Uhr

Zeitraum	6-8 Uhr	8-10 Uhr	10-12 Uhr	12-14 Uhr
zu erwartende Windböen	>= 60 km/h	>= 60 km/h	>= 60 km/h	>= 60 km/h
die Windböen aus	Nordwest	Nordwest	Nordwest	Nordwest
Gewitter möglich?*	nein	nein	nein	nein

\*Bei Gewittern sind Windböen bis 80km/h möglich.

**Bemerkungen zu Wind oder Gewittern am Neusiedlersee:**

**Wetteraussichten für Burgenland-Gesamt bis morgen in der Früh:**

Bei starker bis geschlossener Bewölkung regnet es immer wieder, teils auch anhaltend und intensiv. Dazu bläst kräftiger bis stürmischer Wind aus Nordwest, besonders im Mittelburgenland sind heftige Böen zu erwarten. Frühtemperaturen 7 bis 11 Grad, tagsüber maximal 10 bis 13 Grad.

**Spezielle Aussichten für den Neusiedlersee:**

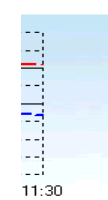
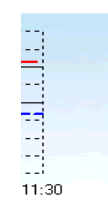
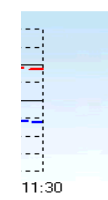
**Aktuelle Warnungen:**

Regen, Sturm

Vorhersage f

Aktualisiert:  
Gebiete mit V

Datengr



10:30 Uhr



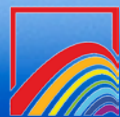
# Content

- Introduction
- Severe weather warnings for the public
- Severe weather warnings for the government (civil protection agencies, crisis management)
- **Severe weather warnings for private clients (e.g. business companies)**
- Case Study: Flood and storm in May 2014 over Austria
- Concluding results



## Severe weather warnings for private clients

- high impact weather information on webpage
- snow warnings ( $\geq 0,5\text{cm}$  snow depth) for road cleaning companies
- ‘acute’ warnings for the next few hours (support service for events, e.g. Lifeball, Vienna Philharmonic Summer night concert, etc.): wind speed, thunderstorms and/or hail/heavy rain
- web portals providing meteorological data with high spatial resolution of 1km for the next 6 hours, updated every 15 minutes (INCA)



# Severe weather warnings for private clients


**ZAMG**

 Zentralanstalt für  
 Meteorologie und Geodynamik

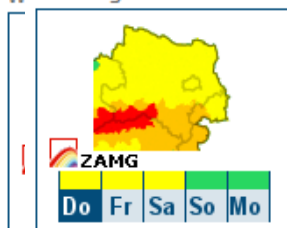
Wettermeldungen

24 Stunden

3-Tages-Prognose

Warnungen

## W Warnungen:



## Wetterportal Wiener Adventzauber

	Fr/Fri ( 16.5. )			Sa/Sat ( 17.5. )			So/Sun ( 18.5. )		
	Vormittag/ Morning	Nachmittag/ Afternoon	Abend/ Evening	Vormittag/ Morning	Nachmittag/ Afternoon	Abend/ Evening	Vormittag/ Morning	Nachmittag/ Afternoon	Abend/ Evening
Wetter/ Weather									
Temperatur/ Temperature (°C)	10 / 12	11 / 13	10 / 13	9 / 12	11 / 13	10 / 12	11 / 17	15 / 18	11 / 15
Mittlerer Wind/ Mean Wind (km/h)	30 - 35	25 - 30	20 - 25	30 - 35	25 - 30	20 - 25	20 - 25	5 - 10	5 - 10
Windspitzen/ Wind Gusts (km/h)	50 - 55	45 - 50	40 - 45	55 - 60	60 - 65	50 - 55	50 - 55	35 - 40	15 - 20
Niederschlags- wahrscheinlichkeit/ Probability of rain (%)	>95	>95	>95	>95	>95	>95	30	35	40

Bitte beachten Sie, dass dies automatisch erzeugte Vorhersagen sind. Die Daten werden ein Mal am Tag erneuert.

© ZAMG 2012

 GROUP ON  
 EARTH OBSERVATIONS

 Die ZAMG ist eine  
 Forschungseinrichtung des

BMW F

 © 2012 Zentralanstalt für  
 Meteorologie und Geodynamik  
 Met  
 1190 Wien, Hohen Warte 38  
 115  
 Telefon: +43 1 36 0 26  
 Tel  
 E-Mail  
 E-

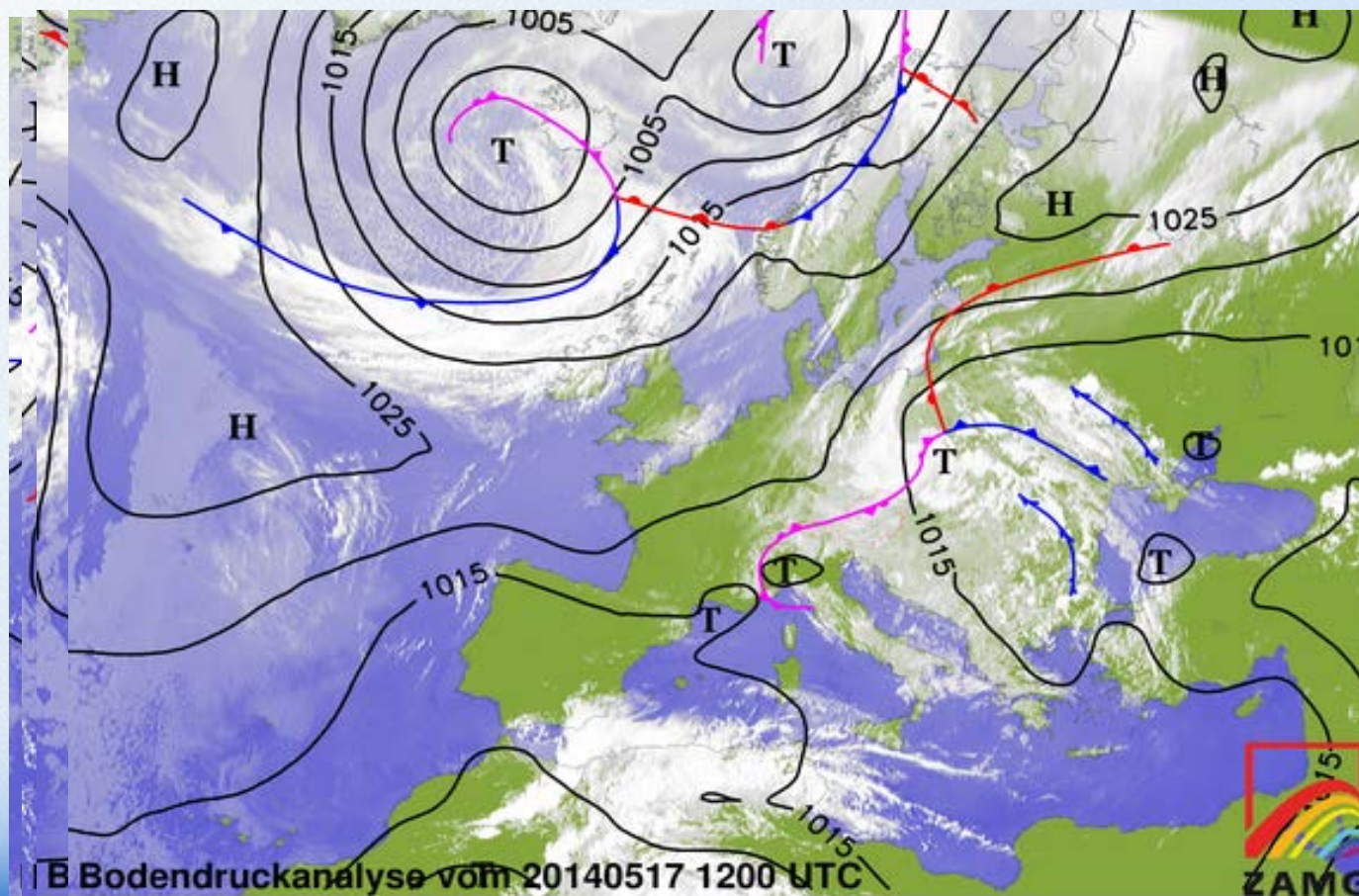

# Content

- Introduction
- Severe weather warnings for the public
- Severe weather warnings for the government (civil protection agencies, crisis management)
- Severe weather warnings for private clients (e.g. business companies)
- **Case Study: Flood and storm in May 2014 over Austria**
- Concluding results



# Case Study

## Synoptic situation: May 14 to 17





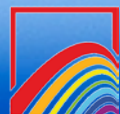
## Case Study

### Synoptic situation: May 14 to 17

- nearly stationary upper level low over many days
- nearly stationary front over Austria
- north-easterly flow with ‚Stau-effects‘ north of the Alps

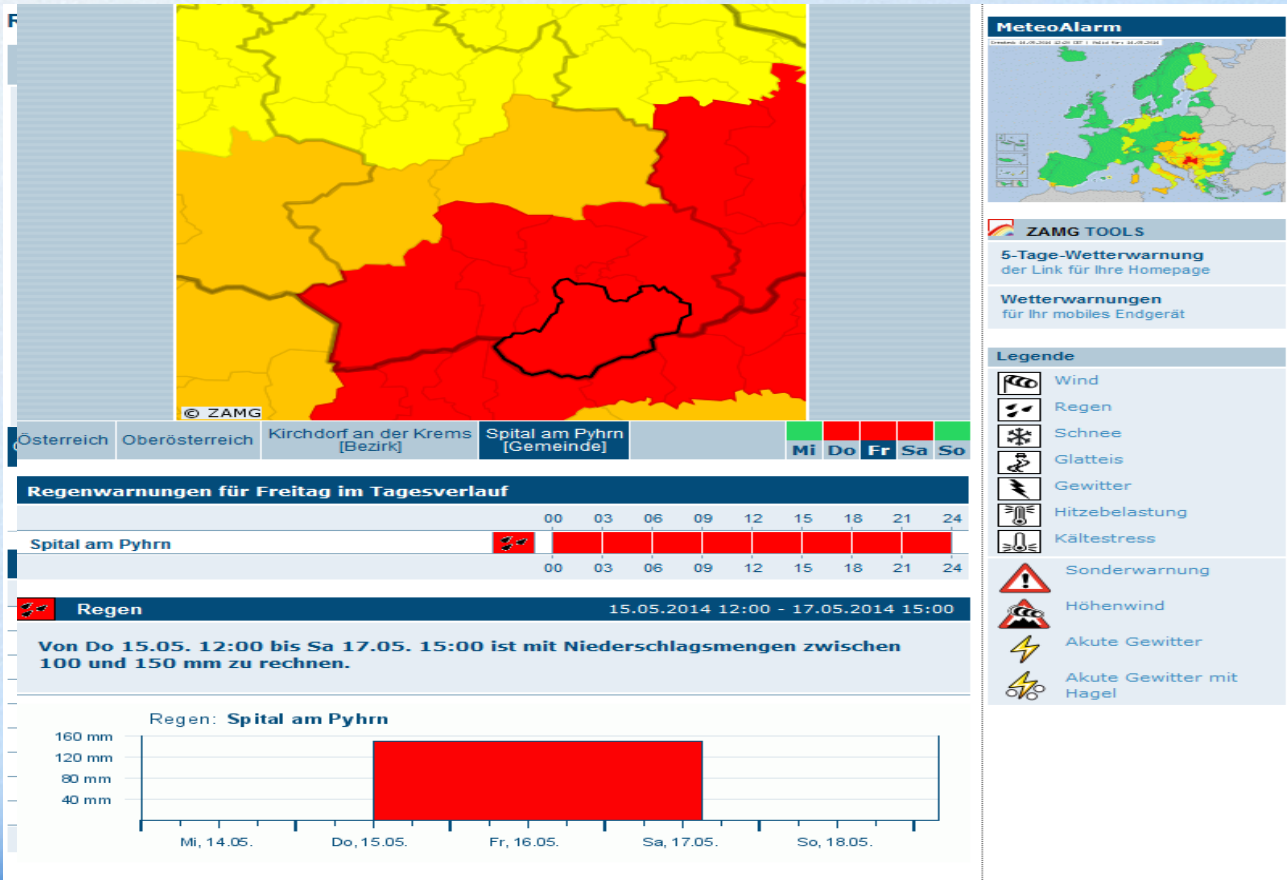
 heavy Precipitation north of the Alps

 strong wind in SE-parts of Austria



# Case Study

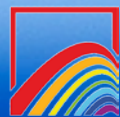
## Precipitation: May 15 to 17 (issued May 12/14: 150/250mm)



# Case Study

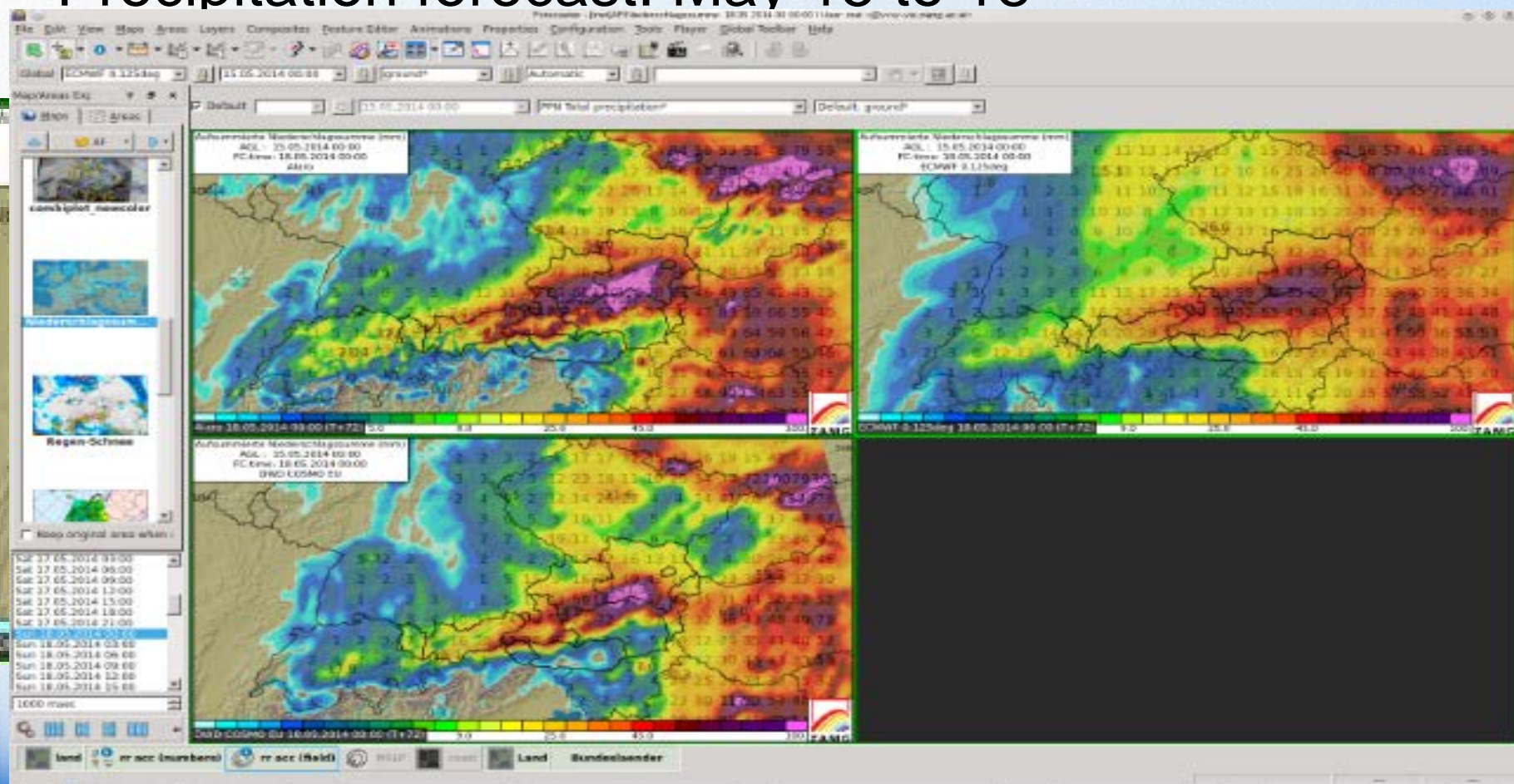
 <b>Wind</b>		
Farbe	Bedeutung	
grün	keine Gefahr	
gelb	potentielle Gefahr	Ereignis tritt seltener als 12-mal pro Jahr auf oder überschreitet 60 km/h
orange	Gefahr	Ereignis tritt seltener als dreimal pro Jahr auf
rot	extreme Gefahr	Ereignis tritt nur einmal in 4 Jahren auf

 <b>Regen</b>		
Farbe	Bedeutung	
grün	keine Gefahr	
gelb	potentielle Gefahr	Ereignis tritt seltener als 12-mal pro Jahr auf
orange	Gefahr	Ereignis tritt seltener als dreimal pro Jahr auf
rot	extreme Gefahr	Ereignis tritt nur einmal in 4 Jahren auf



# Case Study

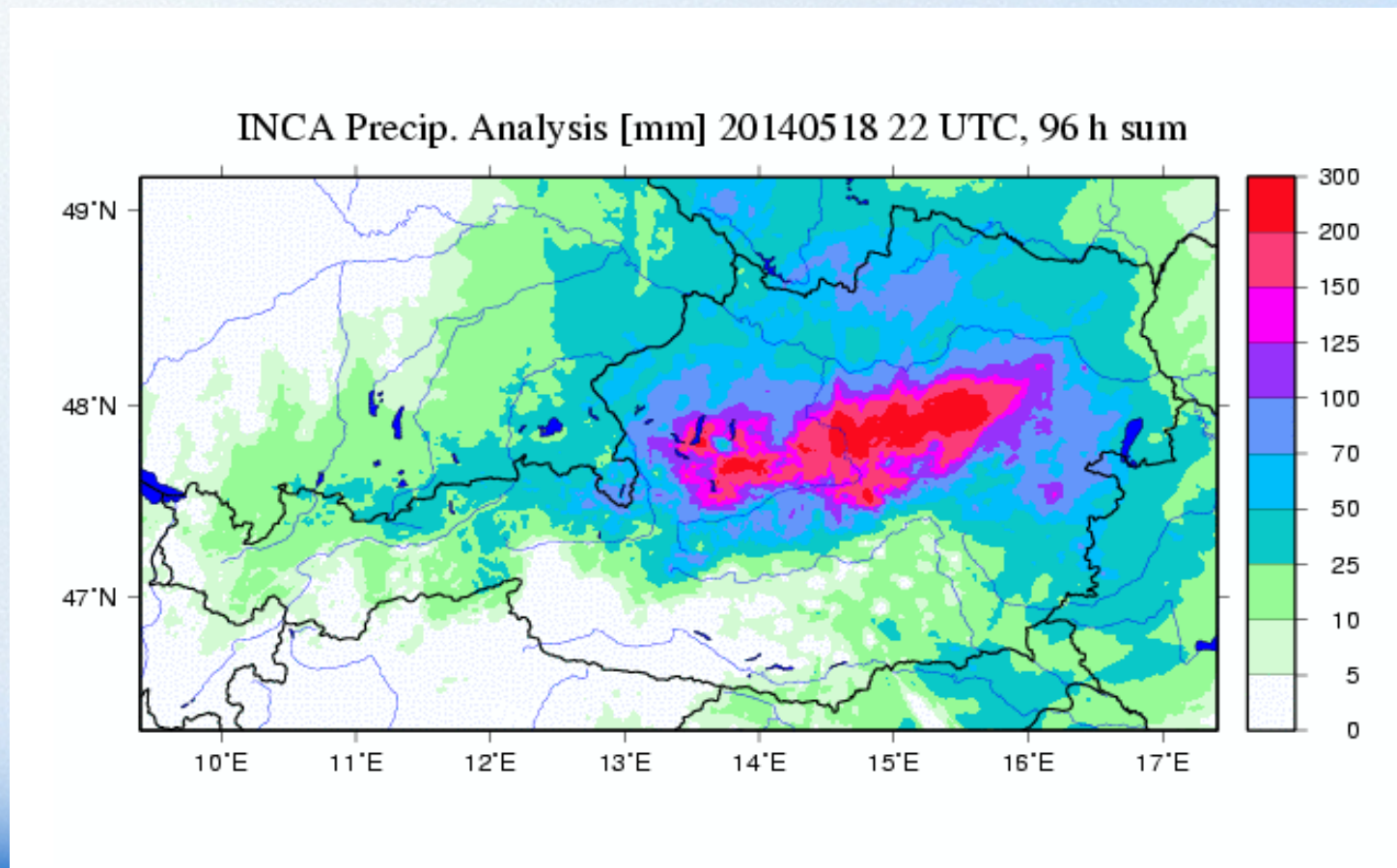
## Precipitation forecast: May 15 to 18





# Case Study

## Precipitation analysis: May 15 to 18



## Case Study

### Precipitation forecasts:

- Precipitation field in all models good
- Highest precipitation amounts well forecasted by local models (Alaro, Cosmo-EU, UK)
- Global models underestimate precipitation in the luv of the Alps and overestimate precipitation in the lee of the Alps



# Case Study

## Wind: May 14 to May 16: issued on May 11

**Windwarnungen für Donnerstag im Tagesverlauf**

Ort	00	03	06	09	12	15	18	21	24
Hochneukirchen-Gscheid	Wind	Wind	Wind	Wind	Wind	Wind	Wind	Wind	Wind

**Wind** 14.05.2014 09:00 - 16.05.2014 20:00

Von Mi 14.05. 09:00 bis Fr 16.05. 20:00 ist mit Windspitzen bis 120 km/h zu rechnen.

**Wind: Hochneukirchen -Gscheid**

Tag	Windspitze (km/h)
Mi, 14.05.	~70
Do, 15.05.	~100
Fr, 16.05.	~80

**Legende**

- Wind
- Regen
- Schnee
- Glatteis
- Gewitter
- Hitzebelastung
- Kältstress
- Sonderwarnung
- Höhenwind
- Akute Gewitter
- Akute Gewitter mit Hagel



## Case Study

### Wind forecasts:

- Especially local models (e.g. Alaro) overestimate wind gusts
- ECMWF best model forecast





# Content

- Introduction
- Severe weather warnings for the public
- Severe weather warnings for the government (civil protection agencies, crisis management)
- Severe weather warnings for private clients (e.g. business companies)
- Case Study: Flood and storm in May 2014 over Austria
- **Concluding results**



## Conclusion

- Localisation of precipitation good
- Amounts of precipitation too small, especially absolute maxima
- Local models give better precipitation forecasts than global models
- Forecaster increased precipitation amounts due to knowledge of critical weather situation (Stau north of the Alps, nearly stationary lows and fronts)
- Very good wind gust forecasts by ECMWF model



# Any questions?





# THANK YOU VERY MUCH FOR YOUR ATTENTION!



@ heute.at



@oe24.at



@ heute.at

