HIGH IMPACT WEATHER

Zentralanstalt für Meteorologie und Geodynamik

Avalanche Warning and Weather Forecast

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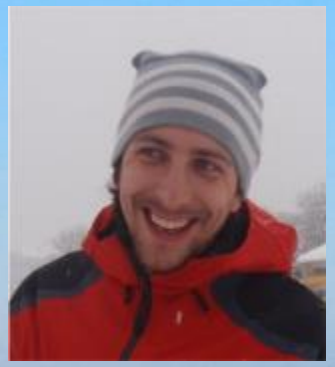


www.zamg.at
www.lawine-steiermark.at
www.lawinenwarndienst-niederoesetrreich.at

Overview

- Fields of activities
- Avalanche bulletin
- Numerical weather prediction
- Extended-range weather situations
- Case studies

Avalanche Warning Service

ZAMG

Customer Service Styria

Avalanche Service Styria (since 1997)

Avalanche Service Lower Austria (since 2006)

- ZAMG (Central Institute of Meteorology and Geodynamics), Customer Service Styria
- Working by order of the state Styria and Lower Austria

Fields of activities

- Support and promotion of avalanche commissions (more than 40)
- Avalanche advice outside secured ski slopes and path (avalanche bulletin)
- Avalanche accident investigation (cooperation with the alpine police)
- Preparation of snow profiles
- Disaster control by order of the state
- Avalanche blasting
- Operating of an alpine weather station network
- Publishing of seasonal reports (austria, styria, lower austria)
- Preparation and attendance of symposia (ISSW, Interprevent)
- Scientific projects (NH-WF, Snow Drift, NÖVOG)
- Preparation and holding of education courses

The daily avalanche bulletin

- The daily bulletin comprises the most important information (danger level map, detailed textual description)
- It is divided in 5 main parts

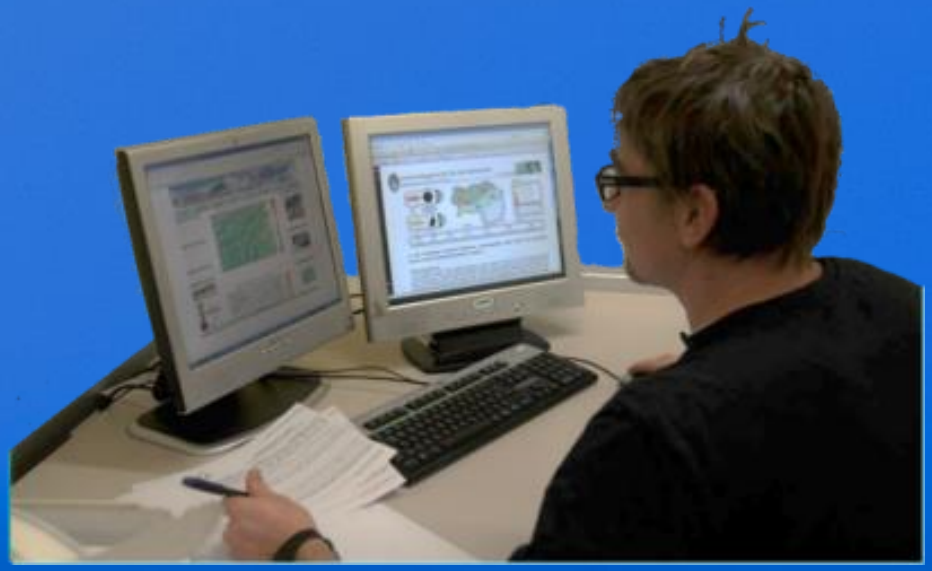
1. Headline
2. Avalanche Danger
3. Snow Layering
4. Weather
5. Short Term Development

European Avalanche Danger Scale

Danger level	Icon	Snowpack stability	Avalanche triggering probability
5 - Very high		The snowpack is poorly bonded and largely unstable in general.	Numerous large-sized and often very large-sized natural avalanches can be expected, even in moderately steep terrain.
4 - High		The snowpack is poorly bonded on most steep slopes.	Triggering is likely even from low additional loads** on many steep slopes. In some cases, numerous medium-sized and often large-sized natural avalanches can be expected.
3 - Considerable		The snowpack is moderately to poorly bonded on many steep slopes*.	Triggering is possible, even from low additional loads** particularly on the indicated steep slopes*. In some cases medium-sized, in isolated cases large-sized natural avalanches are possible.
2 - Moderate		The snowpack is only moderately well bonded on some steep slopes*, otherwise well bonded in general.	Triggering is possible primarily from high additional loads**, particularly on the indicated steep slopes*. Large-sized natural avalanches are unlikely.
1 - Low		The snowpack is well bonded and stable in general.	Triggering is generally possible only from high additional loads** in isolated areas of very steep, extreme terrain. Only sluffs and small-sized natural avalanches are possible.

Formation of the avalanche bulletin

INPUT → DAILY BULLETIN



Weather and avalanche observer

Brunnalm — Datum der Meldung: Mi, 20.11.2013

Datum und Uhrzeit der Beobachtung	Gruppe I Wetter	Gruppe II Schneedecke	Gruppe III Schneedecke	Gruppe IV Lawinen
Mi, 20.11.2013 / 15:00	03 5 8	060 00	6 3 000 1	0 2

Kleine Rutsche aus dem Steilgelände beobachtet,
nordseitig kammnahe Einwehungen

- [ ] Nur Anmerkungen
- [x] Automatisch weiterhüpfen
- [ ] Meldungen je Tag anzeigen

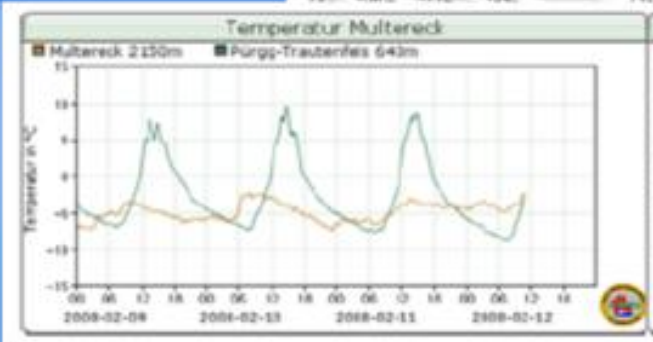
Eingabe Speichern

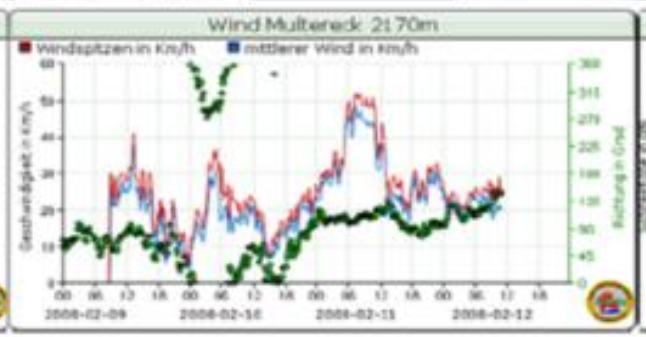
Datum/Zeit	WX-Akt.	WX-Verl.	Bew.	Schnee	NSchnee	Oberfl.Ch.	Oberfl.Fr.	Einsinktiefe	Tr.Sch.	Lawinen	L.-Gefahr	Entf.
So, 07.04.2013 06:30 Uhr				60 cm	0 cm	verbreitet Schmelzharsch, tragfähig	glatt	0 cm	keiner	keine	mäßig	X
Fr, 05.04.2013 06:30 Uhr				65 cm	0 cm	verbreitet Schmelzharsch, brüchig	glatt	4 cm	vereinzelt	keine	mäßig	X
Do, 04.04.2013 06:30 Uhr				67 cm	0 cm	locker, frisch, trocken	Oberflächenreif	5 cm	verbreitet	keine	mäßig	X
Mi, 03.04.2013 06:30 Uhr				67 cm	2 cm	locker, frisch, trocken	glatt	5 cm	verbreitet	keine	mäßig	X
Mo, 01.04.2013 06:30 Uhr				68 cm	4 cm	locker, frisch, trocken	Windgangeln	5 cm	verbreitet	keine	erheblich	X
Zusatzinformation: gester Sturm												
Fr, 29.03.2013 06:30 Uhr				68 cm	0 cm	verbreitet Schmelzharsch, brüchig	glatt	8 cm	vereinzelt	keine	mäßig	X
Do, 28.03.2013 06:30 Uhr				80 cm	0 cm	verbreitet Schmelzharsch, tragfähig	Oberflächenreif	101 cm	keiner	vereinzelt	mäßig	X
Mi, 27.03.2013 06:00 Uhr				82 cm	8 cm	locker, frisch, trocken	glatt	13 cm	vereinzelt	keine	mäßig	X

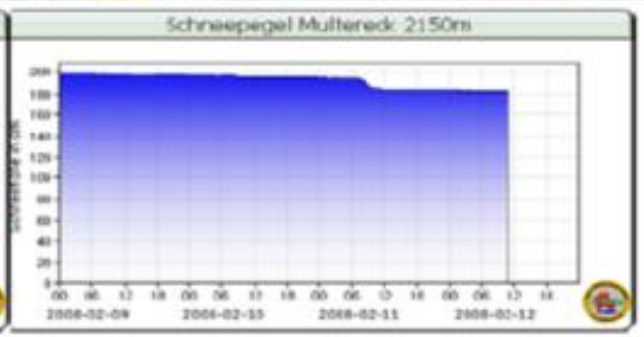
Automatic meteorological weather stations

Parameters we measure

- Temperature (air & snow)
- Humidity
- Depth of snow
- Wind (Direction & Speed)
- Radiation

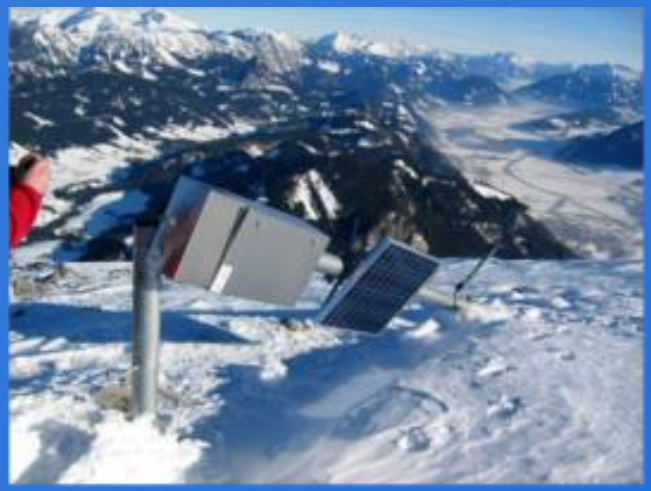






Automatic meteorological weather stations

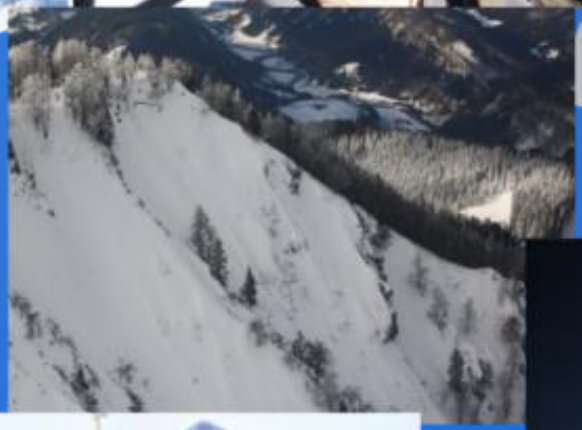
- Station service in winter is ambitious



Terrain investigations




Terrain investigations

- Snow profiles, snow layering

Other sources

- Forum at the avalanche service homepage

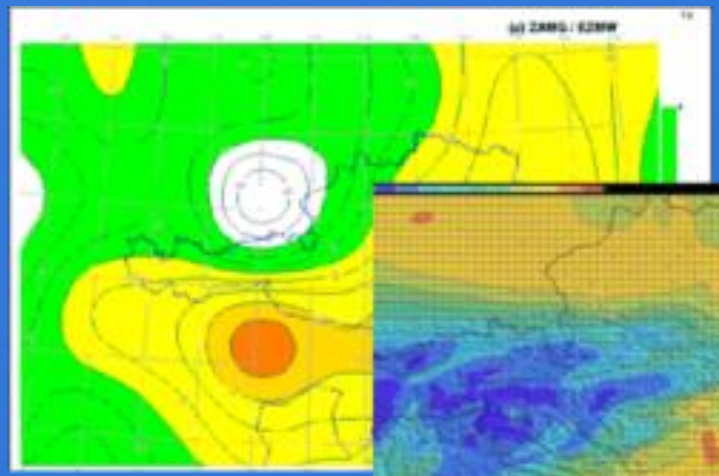
Reports from people

@

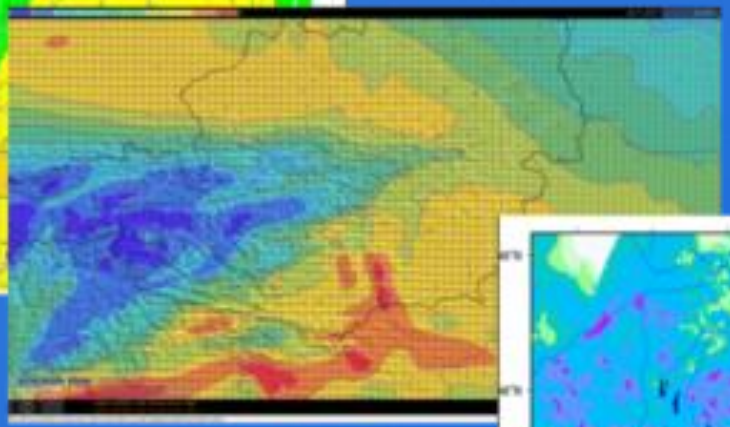
Weather forcasting

- Models we use in the daily avalanche forecast

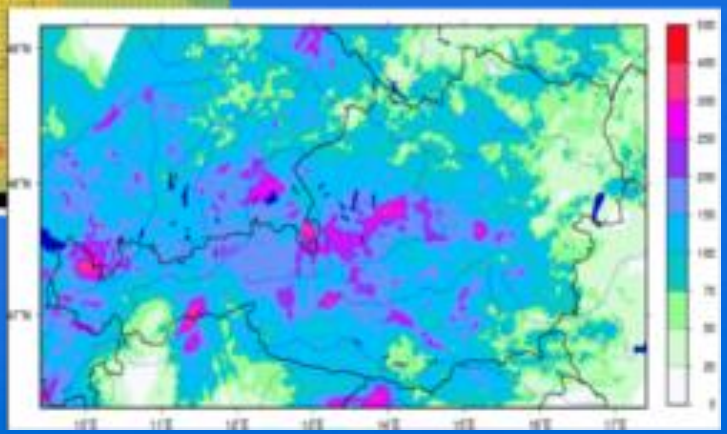
ECMWF, GFS, COSMO, UKMO, ALADIN Europe, ALADIN Austria, ALARO5, AROME, INCA



ECMWF



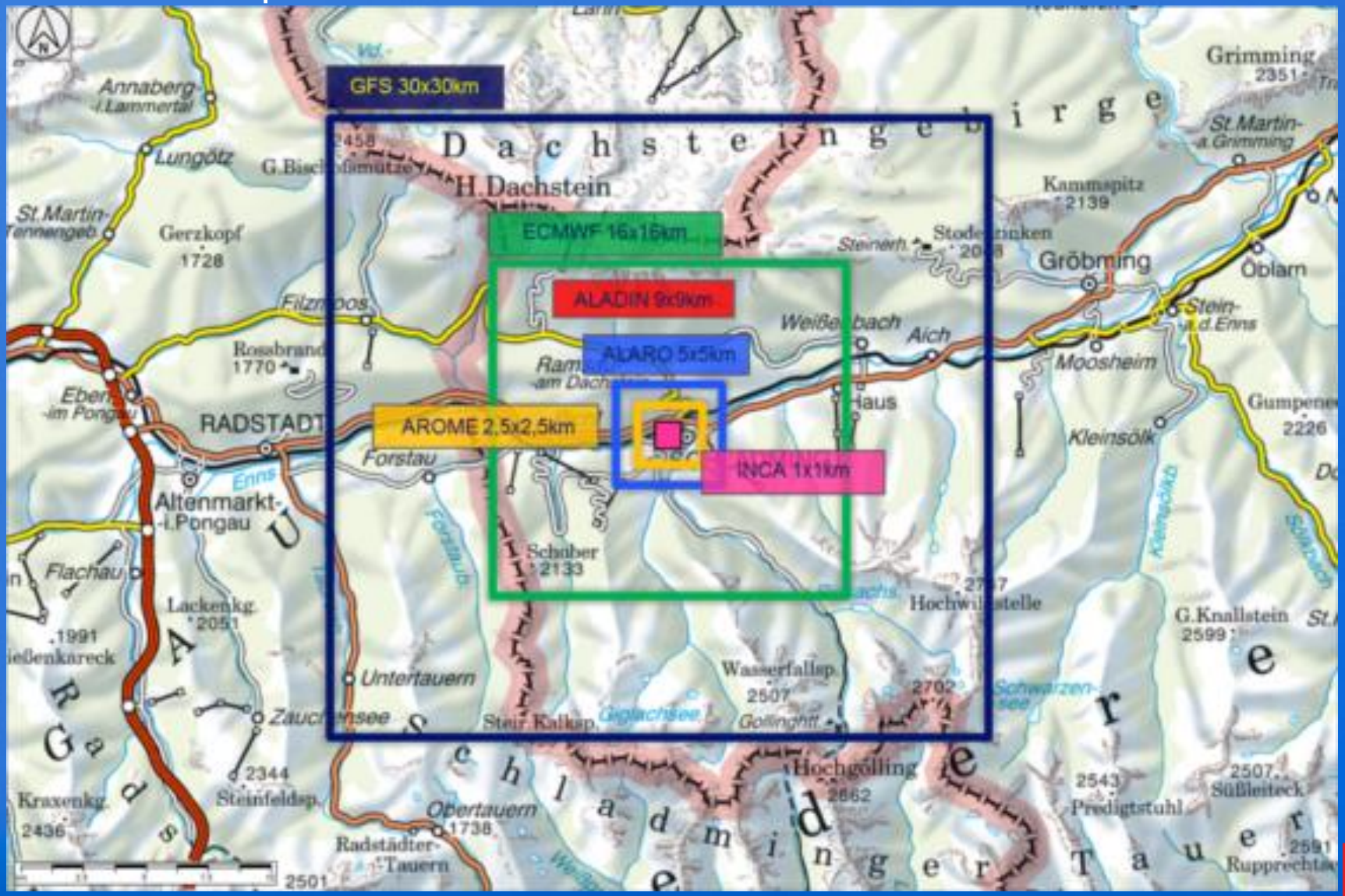
ALARO5



INCA

Numerical weather prediction

- Different spatial resolution



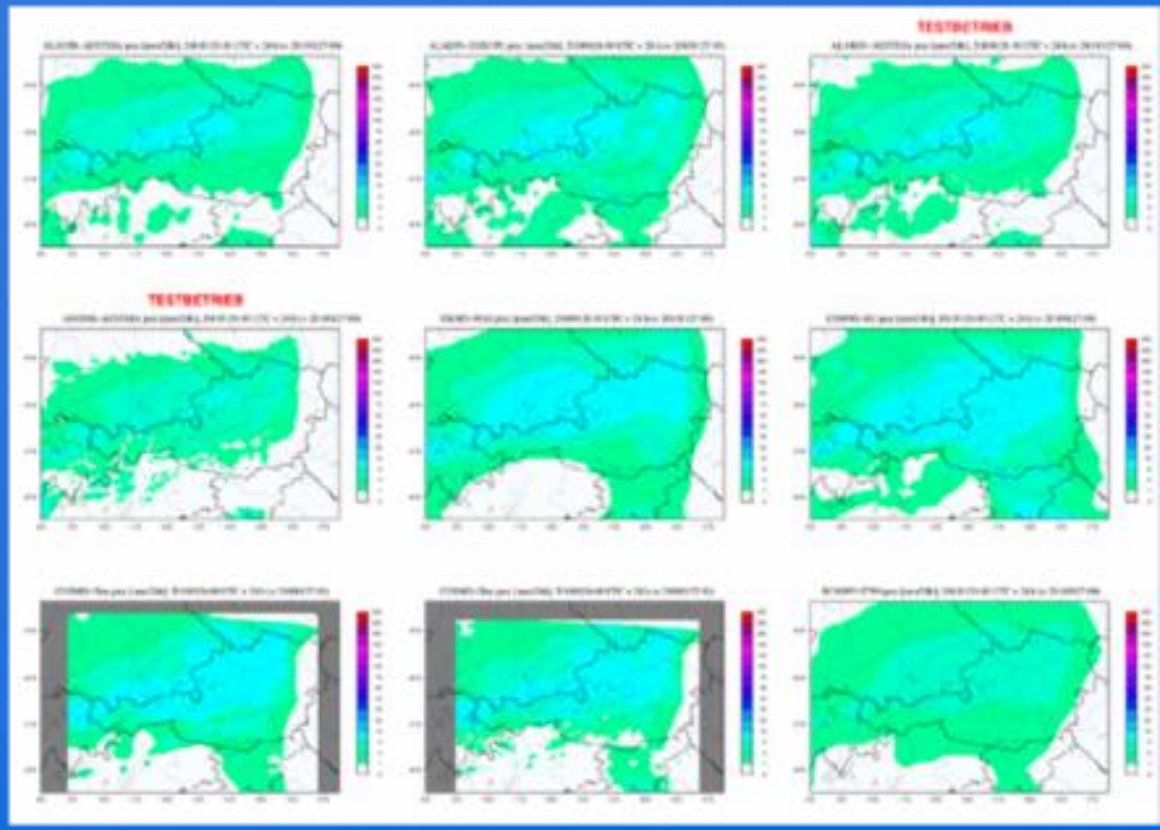
Numerical weather prediction

- Two examples of different views of model-outputs

13.83 47.76 649 Or

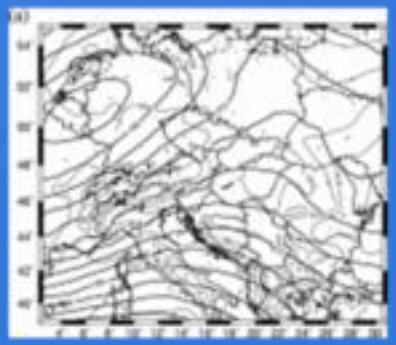
QFA AGL : Mittwoch, 2.Februar 2005 0 UTC ALADIN-AUSTRIA

Termin	MI.2.Feb 2005				DO.3.Feb 2005				FR.
Zeit UT	00	06	12	18	00	06	12	18	00
N	7	8	8	8	8	8	8	8	5
Nh	0	3	5	5	0	0	0	0	0
Nm	3	6	7	7	7	5	5	0	0
Nl	6	8	7	7	7	7	7	8	5
N-CU	0	7	0	2	1	0	3	8	0
SBW-IX	8.7	12.7	13.4	11.3	10.1	10.8	11.7	12.9	12.7
ALBL.T	-8	-8	-8	-7	-6	-6	-5	-6	-7
VOC -CUF	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL
RR		11.5	14.5	20.8	24.7	25.6	20.4	13.5	3.3
RR-str		7.9	13.8	20.6	24.7	25.6	19.3	9.8	2.9
CONV		3.6	0.8	0.2	0.0	0.0	1.1	3.7	0.4
SN		11.5	14.5	20.8	24.7	25.6	20.4	13.5	3.3
SN--RA	1	1	1	1	1	1	1	1	1
QAO 300	02061	01061	01049	01048	01058	01055	00041	36035	00031
QAO 500	01028	00035	00034	35035	35034	00038	01035	01033	01025
QAO 700	33016	31017	31019	32022	32022	33021	33017	33014	34012
QAO 850	31007	30010	29009	29010	29012	30012	32010	00007	34003
QAO 925	31003	29003	29003	28003	29004	31004	33004	00003	01000
QAN	31003	29003	29003	28003	29004	31004	32004	00002	00000
QANmax	9	10	10	9	14	14	12	8	2
T 300	-51	-52	-53	-53	-51	-50	-50	-50	-51
T 500	-33	-29	-27	-28	-29	-28	-27	-27	-29
T 3000m	-20	-20	-18	-15	-16	-16	-14	-15	-15
T 2000m	-12	-13	-11	-10	-10	-10	-9	-8	-10
T 1500m	-9	-9	-8	-7	-7	-7	-4	-5	-7
T 1000m	-5	-5	-4	-4	-3	-3	-2	-3	-5
T 800m	-3	-4	-3	-2	-2	-2	-1	-2	-3
T 700m	-3	-4	-3	-2	-1	-1	-1	-2	-3
T 500m	-2	-2	-1	-1	0	0	1	0	-2
T 2m	-8	-9	-8	-8	-7	-6	-5	-6	-8
T DMO	-3	-4	-3	-3	-2	-2	-1	-1	-4
Max-ADI	1	1	2	3	3	4	4	3	2
Min Max		-4		-2		-3		-1	
FRGRT	209	216	204	197	402	410	427	257	274
W500 cm	-10.2	-4.8	3.3	13.0	6.5	2.1	-7.2	-11.4	-4.3
W700 --	11.4	11.0	19.9	26.6	29.7	31.5	16.9	7.4	2.8
WB50 s	13.4	15.2	12.8	13.9	19.5	24.0	23.9	13.6	2.9
H 700	2961	2964	2967	2971	2976	2986	3007	3025	3033
H 1000	209	216	205	196	199	207	225	255	275
RF 300	21	59	82	76	30	37	20	21	12
RF 400	46	94	98	99	51	39	54	19	13
RF 500	16	86	99	99	08	33	27	43	21
RF 700	93	96	100	100	100	100	98	70	21
RF 850	94	98	99	99	100	100	100	100	97
RF 925	94	97	98	98	99	99	99	99	93



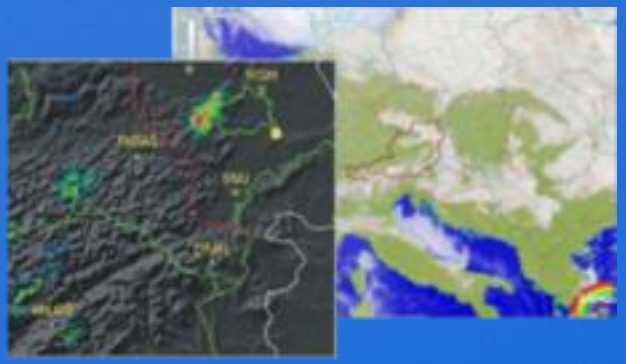
Numerical weather prediction - INCA

- INCA = Integrated Nowcasting through Comprehensiv Analysis



Model forecasts

Station observations



Radar and satellite data

High-resolution topography data

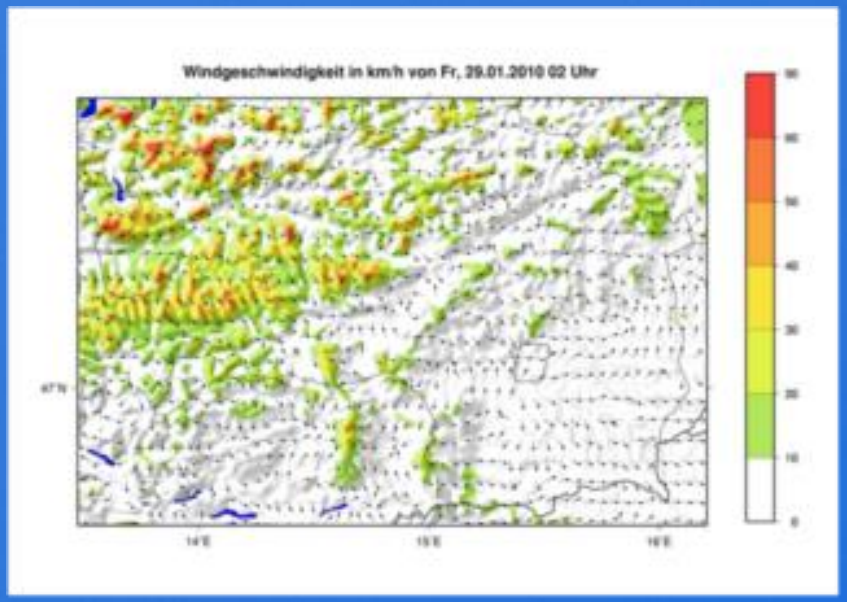
INCA

High-resolution analysis and nowcasting fields

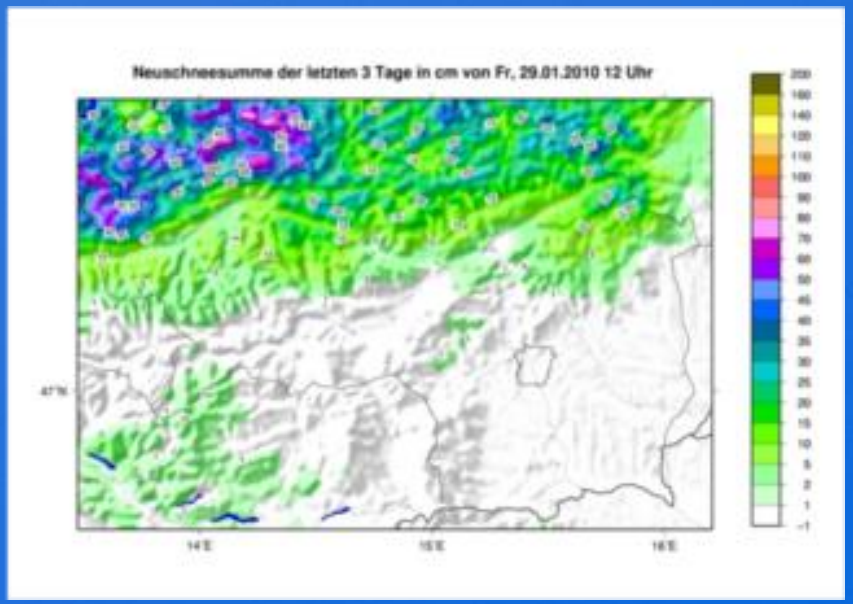
Dt=1h (15min), Dx=1km

Numerical weather prediction - INCA

- INCA - analysis



Windspeed and –direction



3 days accumulated snow

Numerical weather prediction - INCA

- INCA - forecast

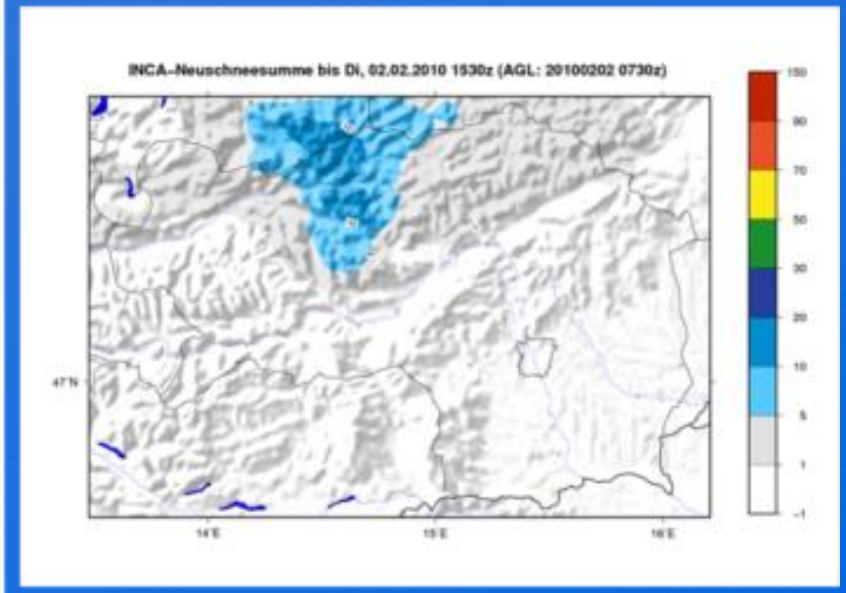
INCA forecast for one point

INCA – Prognose AGL: 20100202 07 UTC (c) by ZAMG, LVD Stmk/Noe

Ort: Loser Hoehe: 1570 m Orog: 1529 m LON/LAT: 13.78 47.66 (*) Arnold'sche NS-Formel

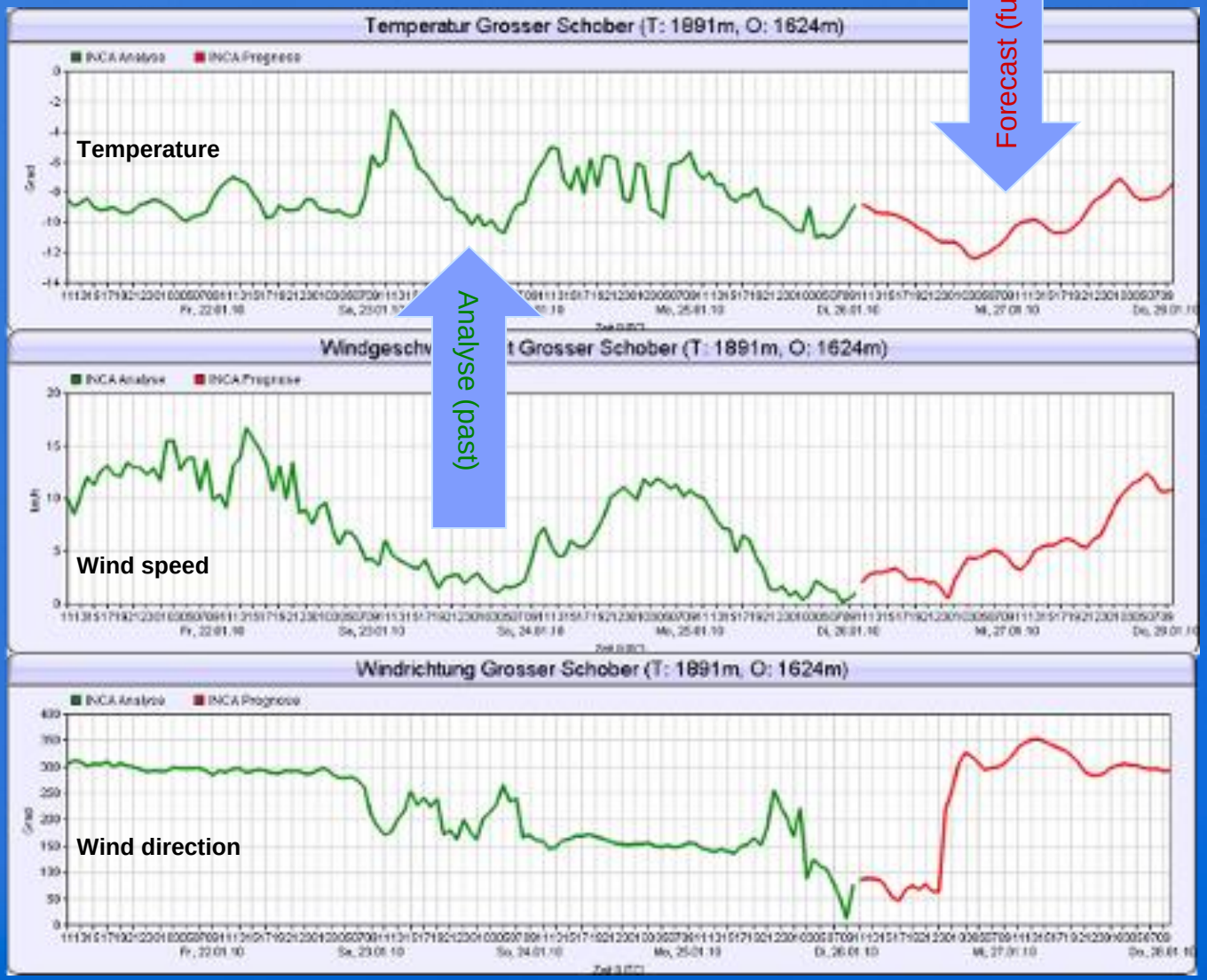
DATUM	ZEIT UTC	T [C]	RF [%]	WIRI	WIGE [kmh]	SFG [m]	FROST [m]	Nied [mm]	SNied [mm]	SCHN [cm]	SSCH [cm]	SCHN* [cm]	SSCH* [cm]
Di, 02.02.10	0700	-9.7	92	W	24.4	0	100	0.6	0.6	0.6	0.6	1.5	1.5
Di, 02.02.10	0800	-9.6	91	NW	25.4	0	200	0.6	1.2	0.6	1.2	1.5	3.0
Di, 02.02.10	0900	-9.6	89	NW	25.7	0	200	0.1	1.3	0.1	1.3	0.2	3.2
Di, 02.02.10	1000	-9.5	84	W	25.0	0	200	0.1	1.4	0.1	1.4	0.2	3.5
Di, 02.02.10	1100	-9.5	77	W	23.3	0	200	0.1	1.5	0.1	1.5	0.2	3.8
Di, 02.02.10	1200	-9.5	69	W	18.9	0	100	0.2	1.7	0.2	1.7	0.5	4.3
Di, 02.02.10	1300	-9.4	61	W	14.8	0	0	---	1.7	---	1.7	---	4.3
Di, 02.02.10	1400	-9.2	52	W	12.4	0	100	---	1.7	---	1.7	---	4.3
Di, 02.02.10	1500	-9.0	46	W	10.9	0	200	---	1.7	---	1.7	---	4.3
Di, 02.02.10	1600	-8.8	45	W	9.9	0	200	---	1.7	---	1.7	---	4.3
Di, 02.02.10	1700	-8.5	49	SW	9.3	0	300	---	1.7	---	1.7	---	4.3
Di, 02.02.10	1800	-8.3	56	SW	8.9	0	300	---	1.7	---	1.7	---	4.3
Di, 02.02.10	1900	-8.2	61	S	10.7	0	200	---	1.7	---	1.7	---	4.3
Di, 02.02.10	2000	-7.9	60	S	12.2	0	100	---	1.7	---	1.7	---	4.3
Di, 02.02.10	2100	-7.5	58	S	14.2	0	100	---	1.7	---	1.7	---	4.3
Di, 02.02.10	2200	-7.0	57	S	15.6	0	100	---	1.7	---	1.7	---	4.3
Di, 02.02.10	2300	-6.8	59	S	15.9	0	100	---	1.7	---	1.7	---	4.3
Mi, 03.02.10	0000	-6.6	62	S	15.9	0	0	---	1.7	---	1.7	---	4.3
Mi, 03.02.10	0100	-6.4	66	S	14.4	0	0	0.1	1.8	0.1	1.8	0.2	4.5
Mi, 03.02.10	0200	-5.9	68	S	13.8	0	100	0.1	1.9	0.1	1.9	0.2	4.7
Mi, 03.02.10	0300	-5.2	67	S	13.5	0	200	0.1	2.0	0.1	2.0	0.2	4.9
Mi, 03.02.10	0400	-4.7	67	SW	11.0	100	400	0.2	2.2	0.2	2.2	0.4	5.3
Mi, 03.02.10	0500	-4.5	73	SW	9.9	100	600	0.3	2.5	0.3	2.5	0.6	5.9
Mi, 03.02.10	0600	-4.5	80	SW	10.5	100	600	0.6	3.1	0.6	3.1	1.2	7.1
Mi, 03.02.10	0700	-4.3	85	W	12.0	200	700	0.7	3.8	0.7	3.8	1.4	8.5
Mi, 03.02.10	0800	-4.1	87	W	13.7	300	600	0.8	4.6	0.8	4.6	1.6	10.1
Mi, 03.02.10	0900	-3.9	86	W	16.3	400	800	0.9	5.5	0.9	5.5	1.8	11.9
Mi, 03.02.10	1000	-3.8	85	W	19.3	400	900	1.4	6.9	1.4	6.9	2.8	14.7
Mi, 03.02.10	1100	-3.7	85	W	22.7	400	900	1.4	8.3	1.4	8.3	2.8	17.5
Mi, 03.02.10	1200	-3.7	86	W	27.4	400	900	1.6	9.9	1.6	9.9	3.2	20.7
Mi, 03.02.10	1300	-3.8	86	W	30.5	400	900	1.8	11.7	1.8	11.7	3.6	24.3
Mi, 03.02.10	1400	-4.0	86	NW	31.7	400	800	1.7	13.4	1.7	13.4	3.4	27.7
Mi, 03.02.10	1500	-4.3	85	NW	31.0	300	800	1.8	15.2	1.8	15.2	3.6	31.3
Mi, 03.02.10	1600	-4.6	84	NW	28.0	300	800	1.5	16.7	1.5	16.7	3.0	34.3
Mi, 03.02.10	1700	-4.8	84	NW	24.6	200	700	1.2	17.9	1.2	17.9	2.4	36.7
Mi, 03.02.10	1800	-5.0	83	NW	21.1	200	700	1.2	19.1	1.2	19.1	2.4	39.1
Mi, 03.02.10	1900	-5.2	82	NW	18.1	100	600	0.9	20.0	0.9	20.0	1.8	40.9
Mi, 03.02.10	2000	-5.2	82	NW	16.0	100	600	0.8	20.8	0.8	20.8	1.6	42.5
Mi, 03.02.10	2100	-5.2	82	NW	14.1	100	500	0.8	21.6	0.8	21.6	1.6	44.1
Mi, 03.02.10	2200	-5.1	83	W	12.9	100	600	0.5	22.1	0.5	22.1	1.0	45.1
Mi, 03.02.10	2300	-4.8	84	W	12.4	100	600	0.5	22.6	0.5	22.6	1.0	46.1
Do, 04.02.10	0000	-4.5	86	W	11.8	200	600	0.5	23.1	0.5	23.1	1.0	47.1
Do, 04.02.10	0100	-4.1	87	W	11.1	200	700	0.2	23.3	0.2	23.3	0.4	47.5
Do, 04.02.10	0200	-3.7	87	W	9.9	300	800	0.2	23.5	0.2	23.5	0.4	47.9
Do, 04.02.10	0300	-3.3	82	W	7.9	400	1000	0.1	23.6	0.1	23.6	0.2	48.1
Do, 04.02.10	0400	-2.9	75	W	5.2	500	1100	---	23.6	---	23.6	---	48.1
Do, 04.02.10	0500	-2.7	70	SW	3.7	600	1200	---	23.6	---	23.6	---	48.1
Do, 04.02.10	0600	-2.5	66	S	4.2	600	1200	---	23.6	---	23.6	---	48.1
Do, 04.02.10	0700	-2.1	62	S	6.9	600	1300	---	23.6	---	23.6	---	48.1

INCA - new snow forecast for the next 8h



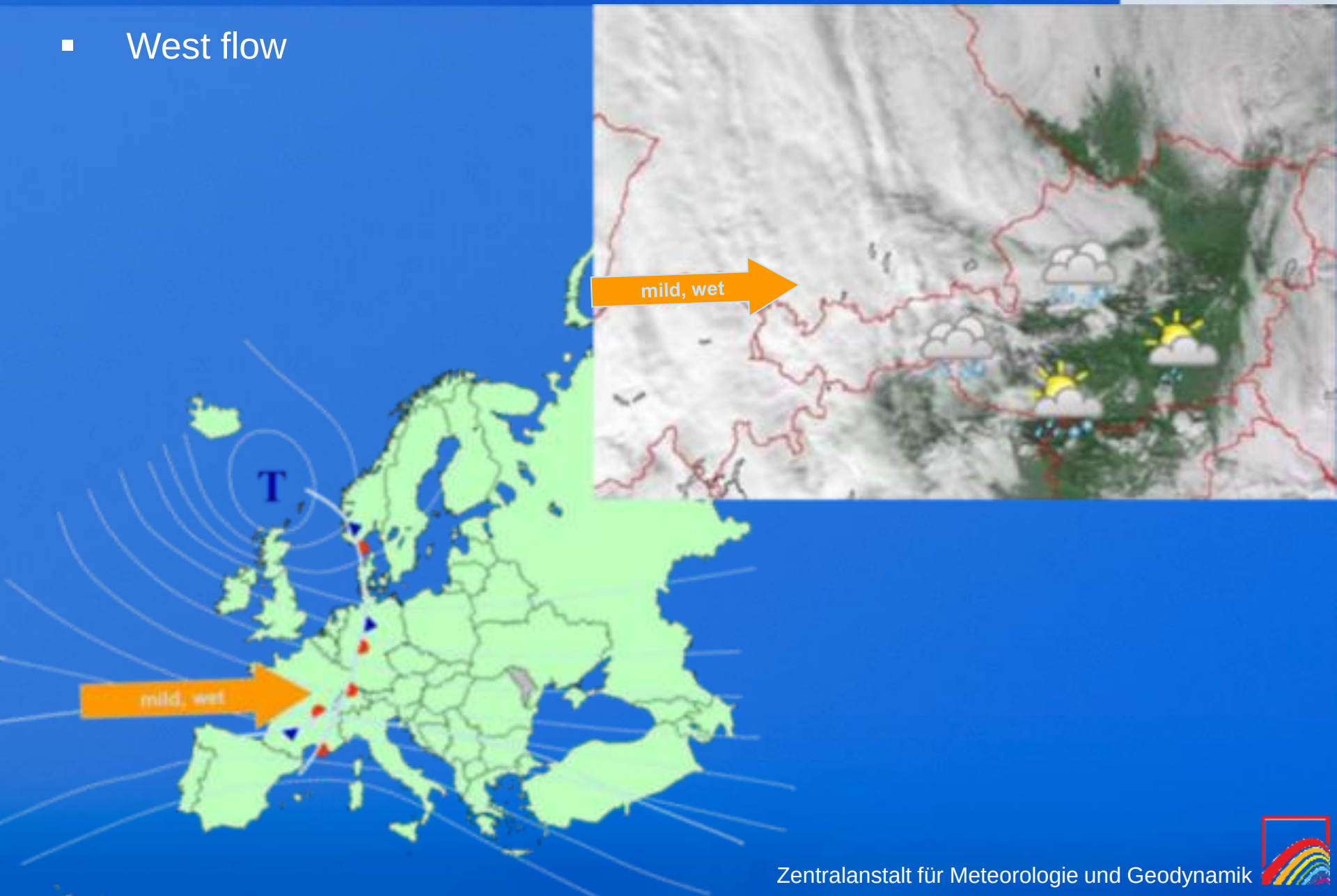
Numerical weather prediction - INCA

- INCA - forecast



Weather situations

- West flow

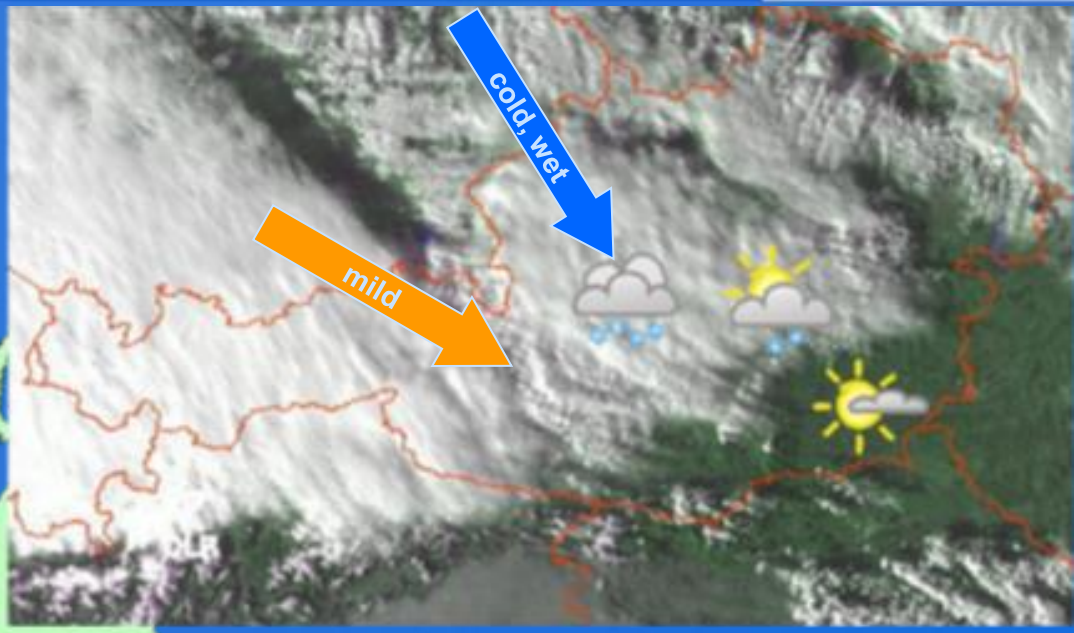


Weather situations

- West flow

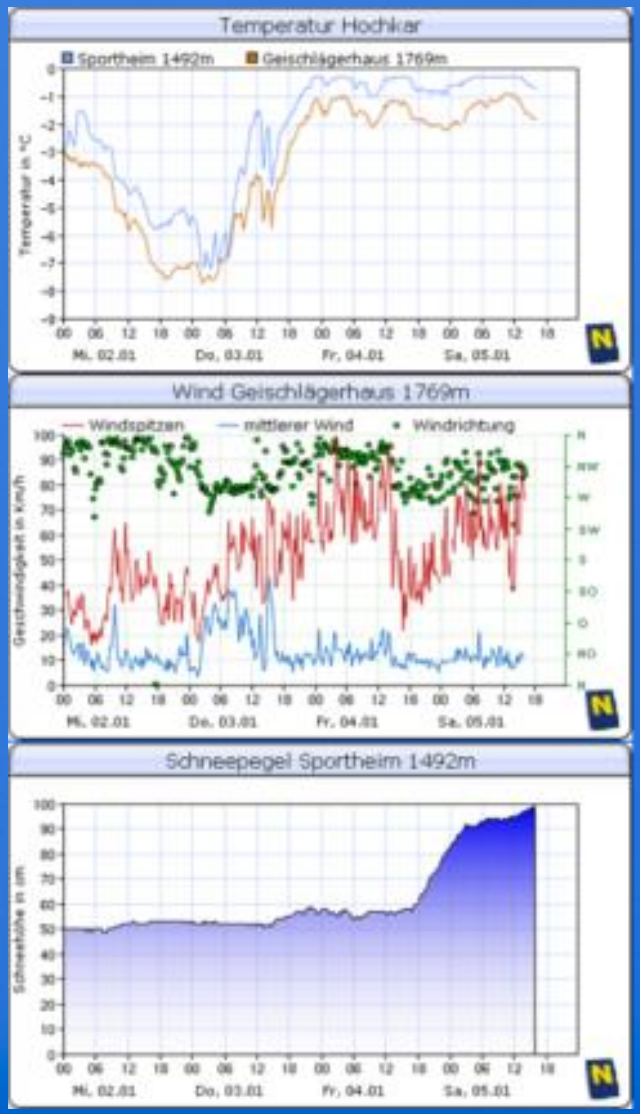
Weather situations

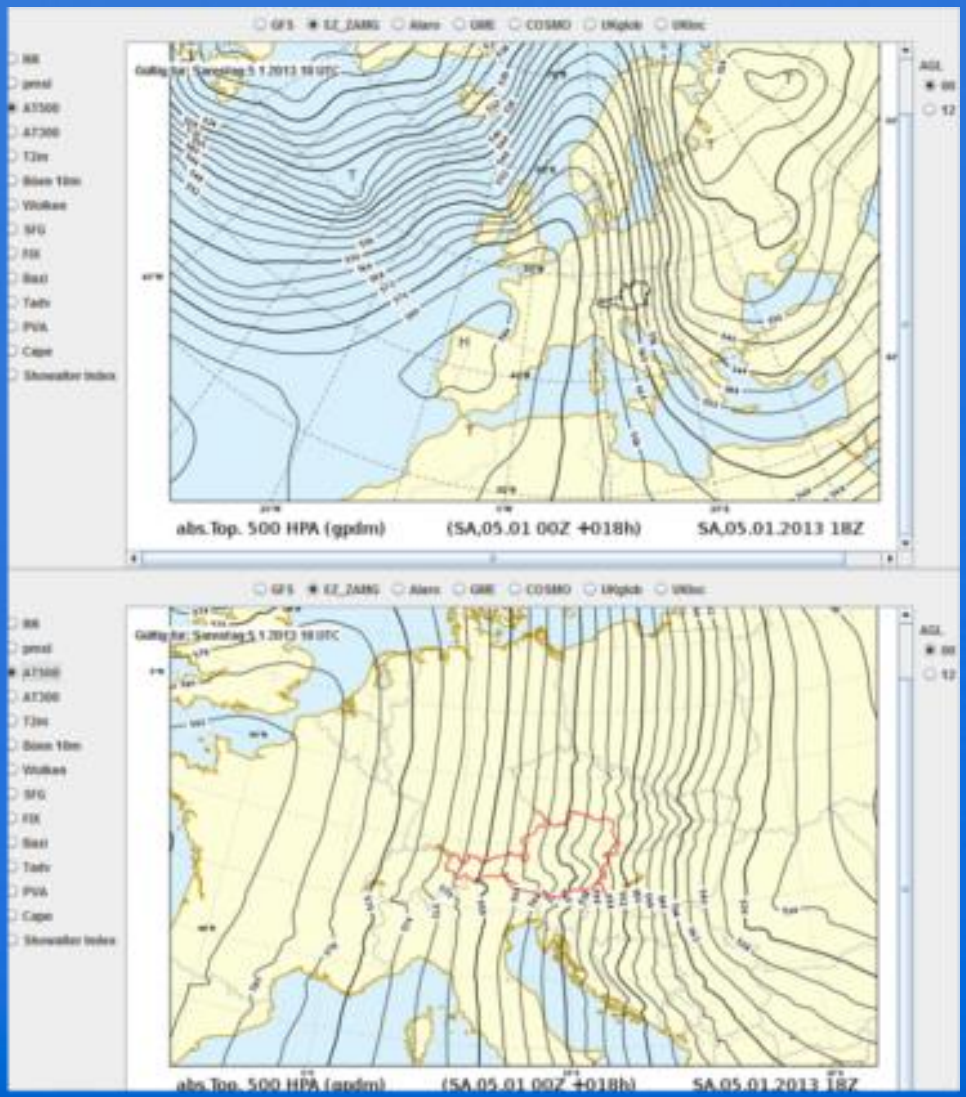
- North-west flow



Weather situations

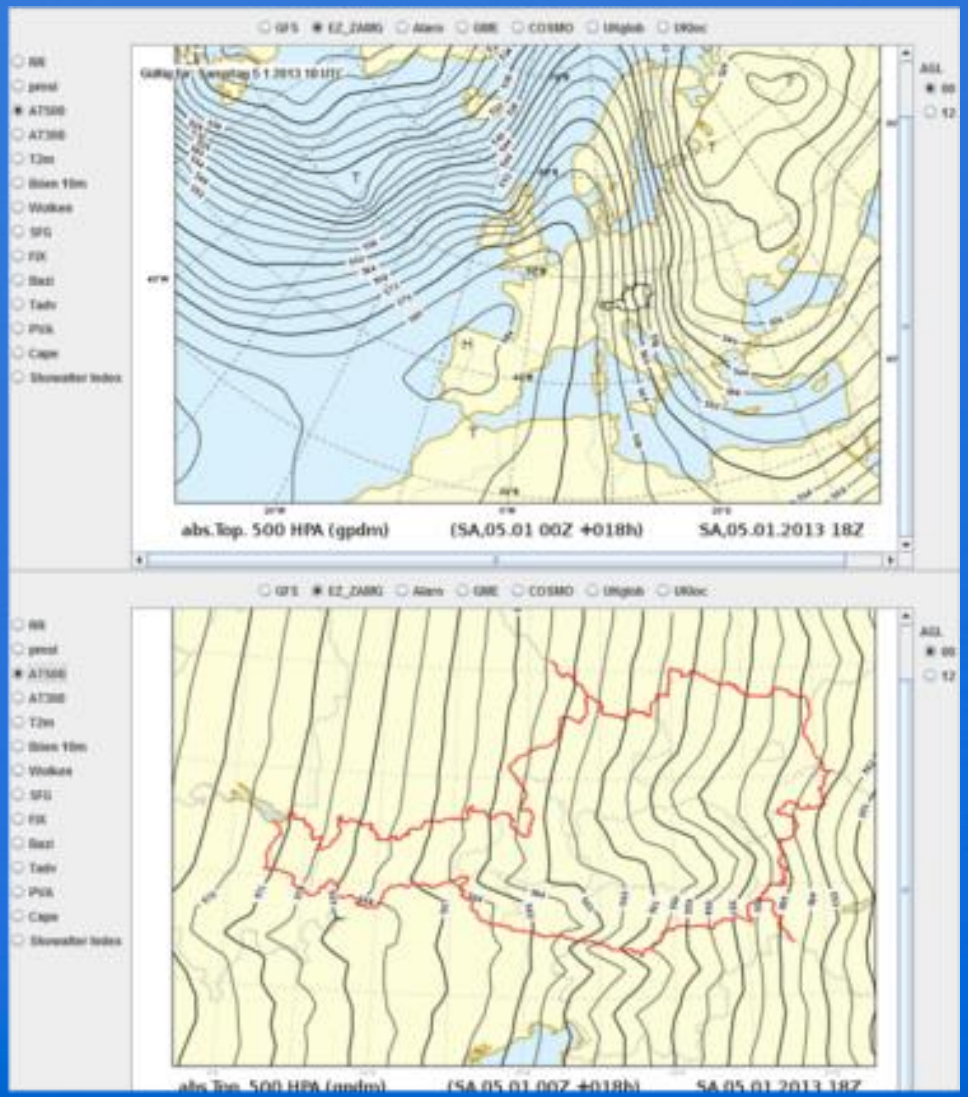
- North-west flow: stow in the northern reagions





Weather situations

- North-west flow: north foehn in the southern reagions



Weather situations

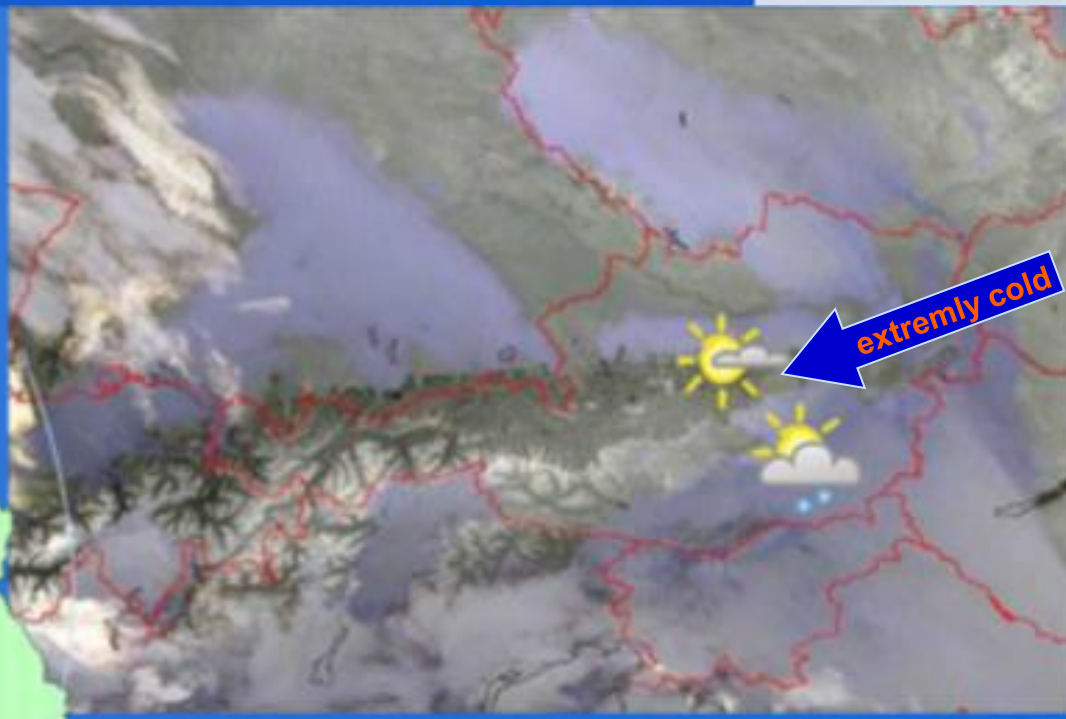
- North flow

Weather situations

- North flow: cornice

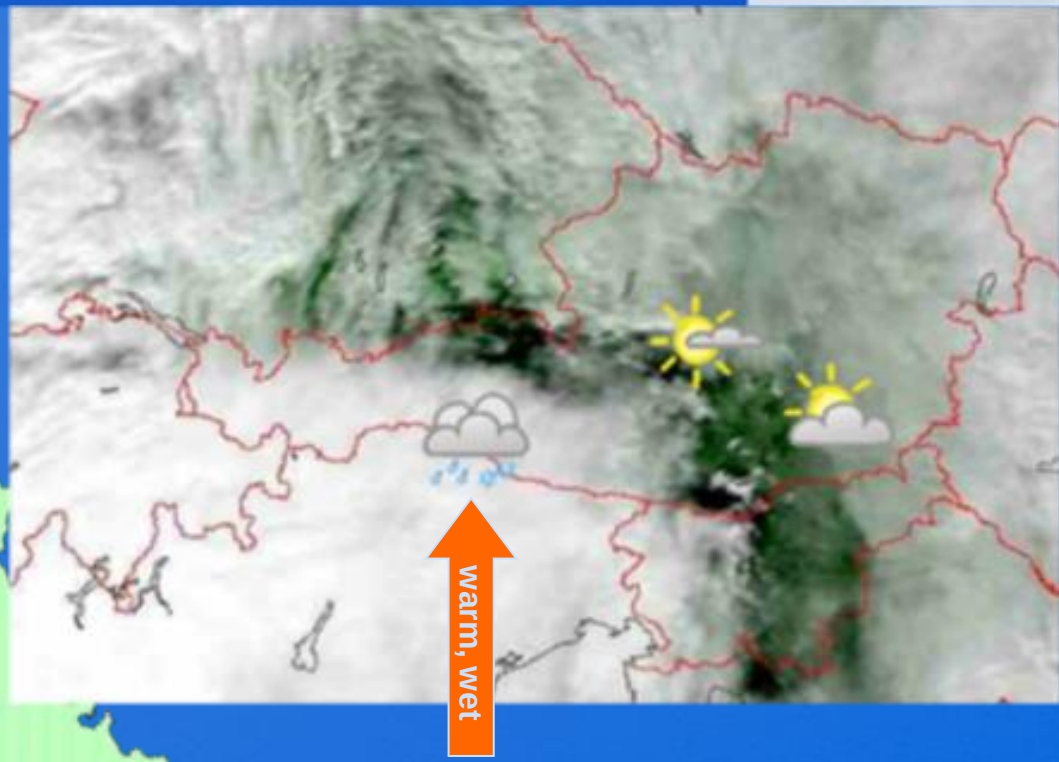
Weather situations

- East flow



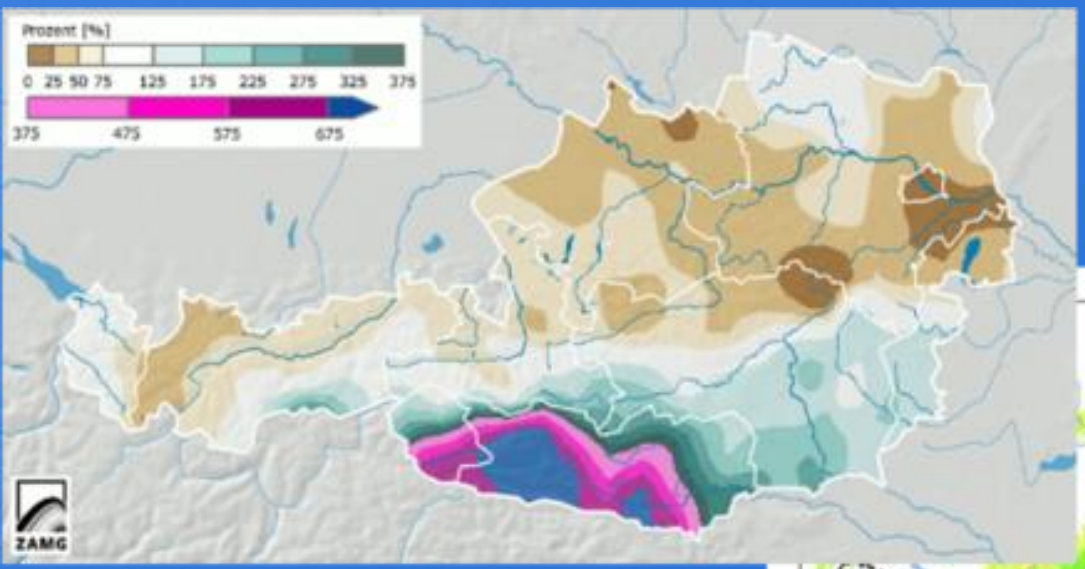
Weather situations

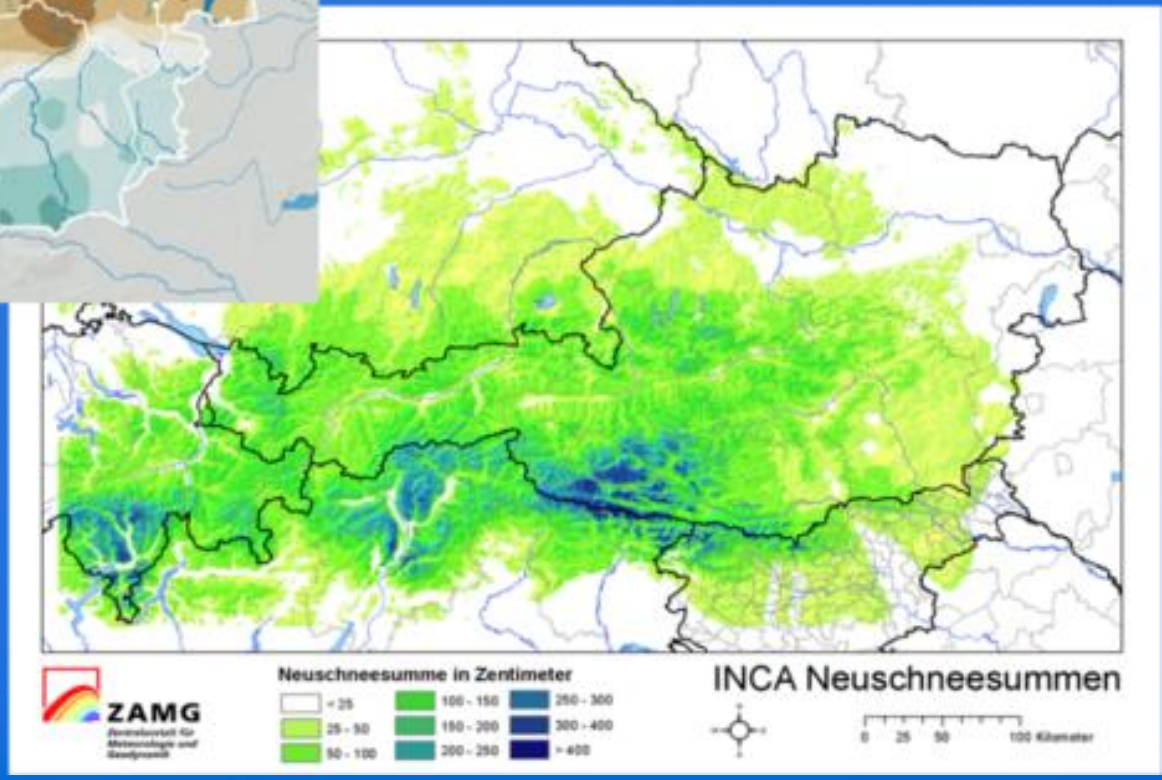
- South flow



Weather situations

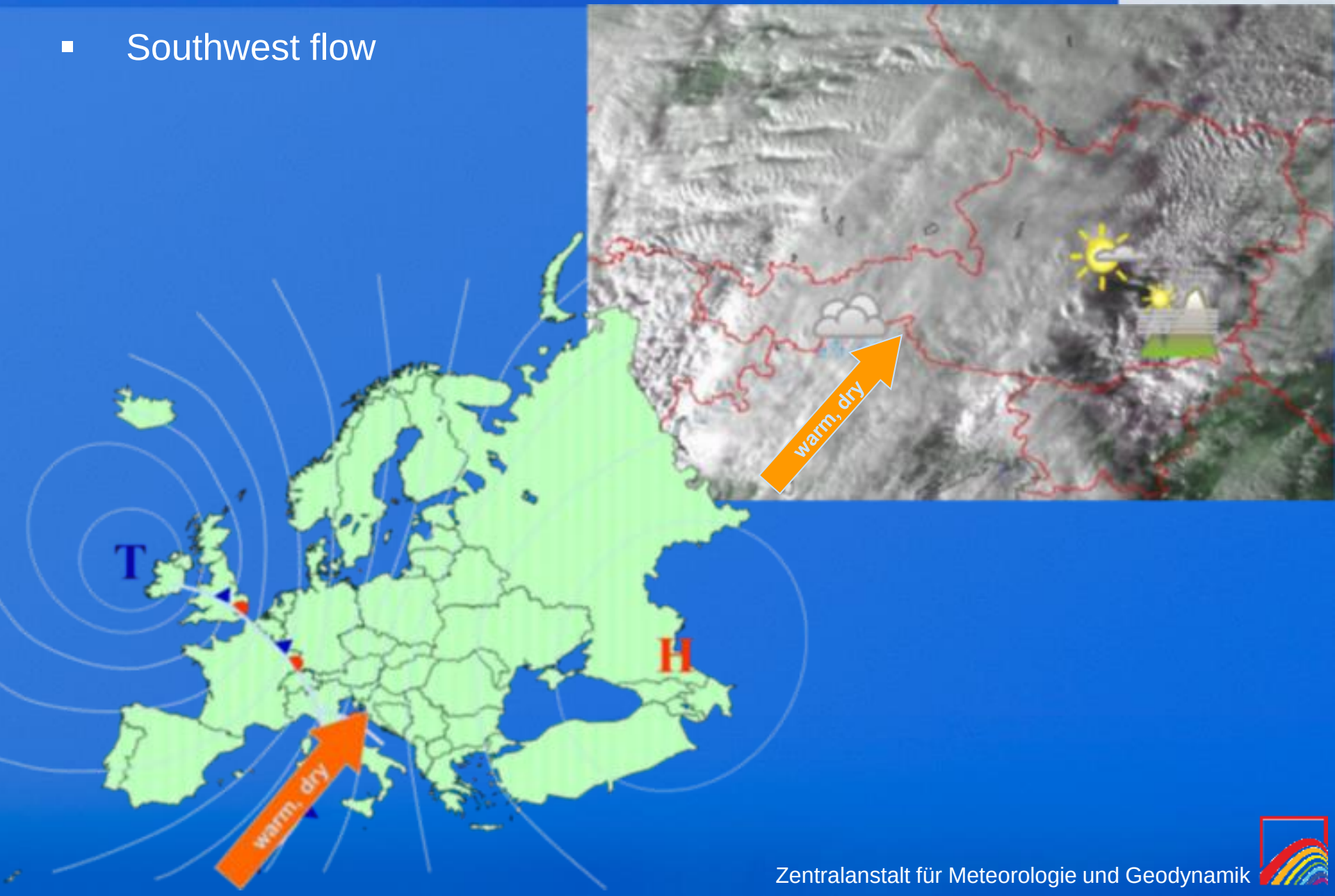
- South flow: February 2014





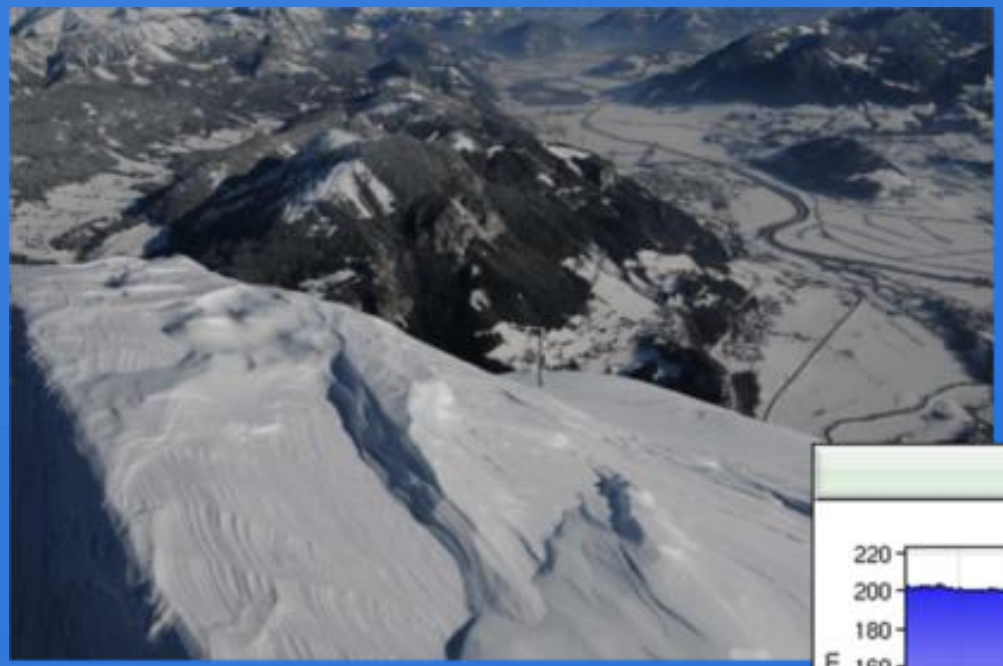
Weather situations

- Southwest flow



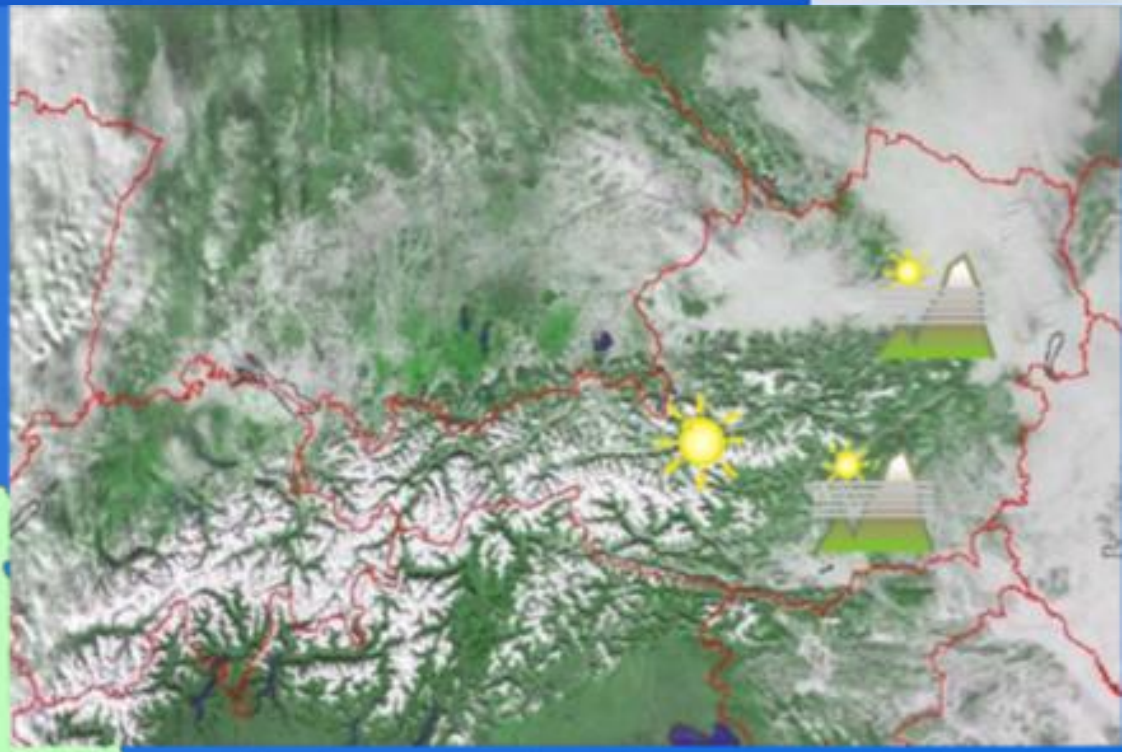
Weather situations

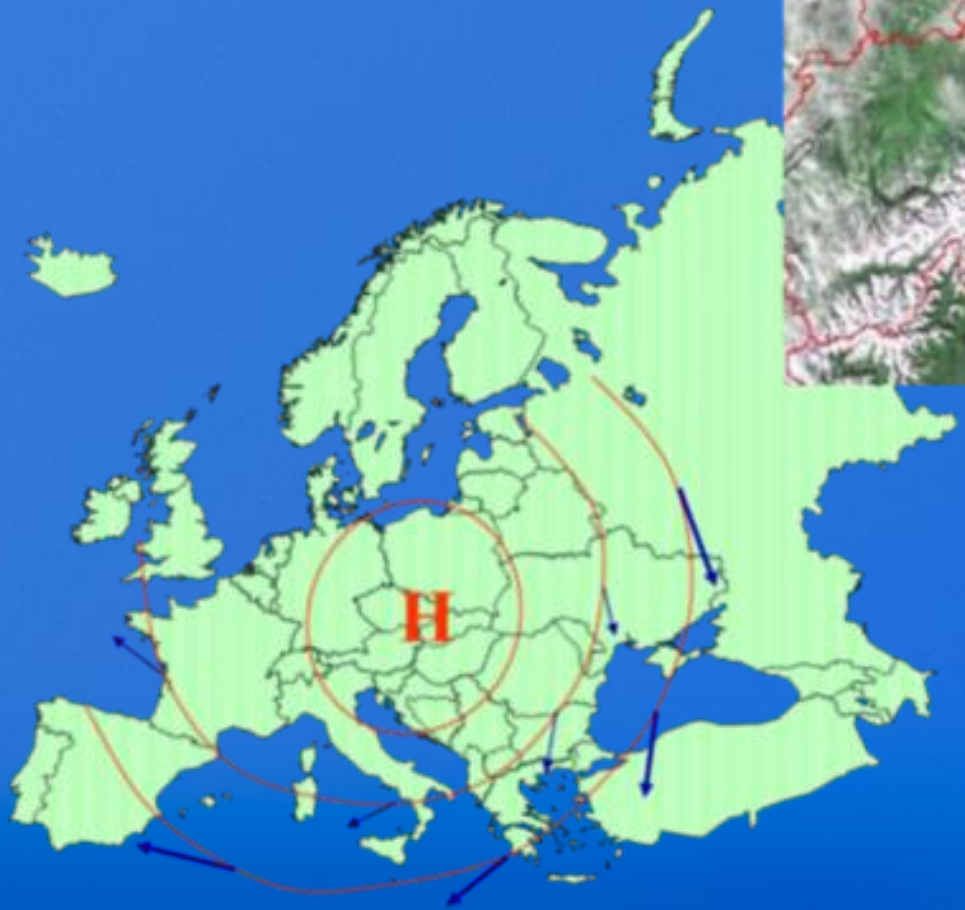
- Southwest flow



Weather situations

- High pressure over central europe



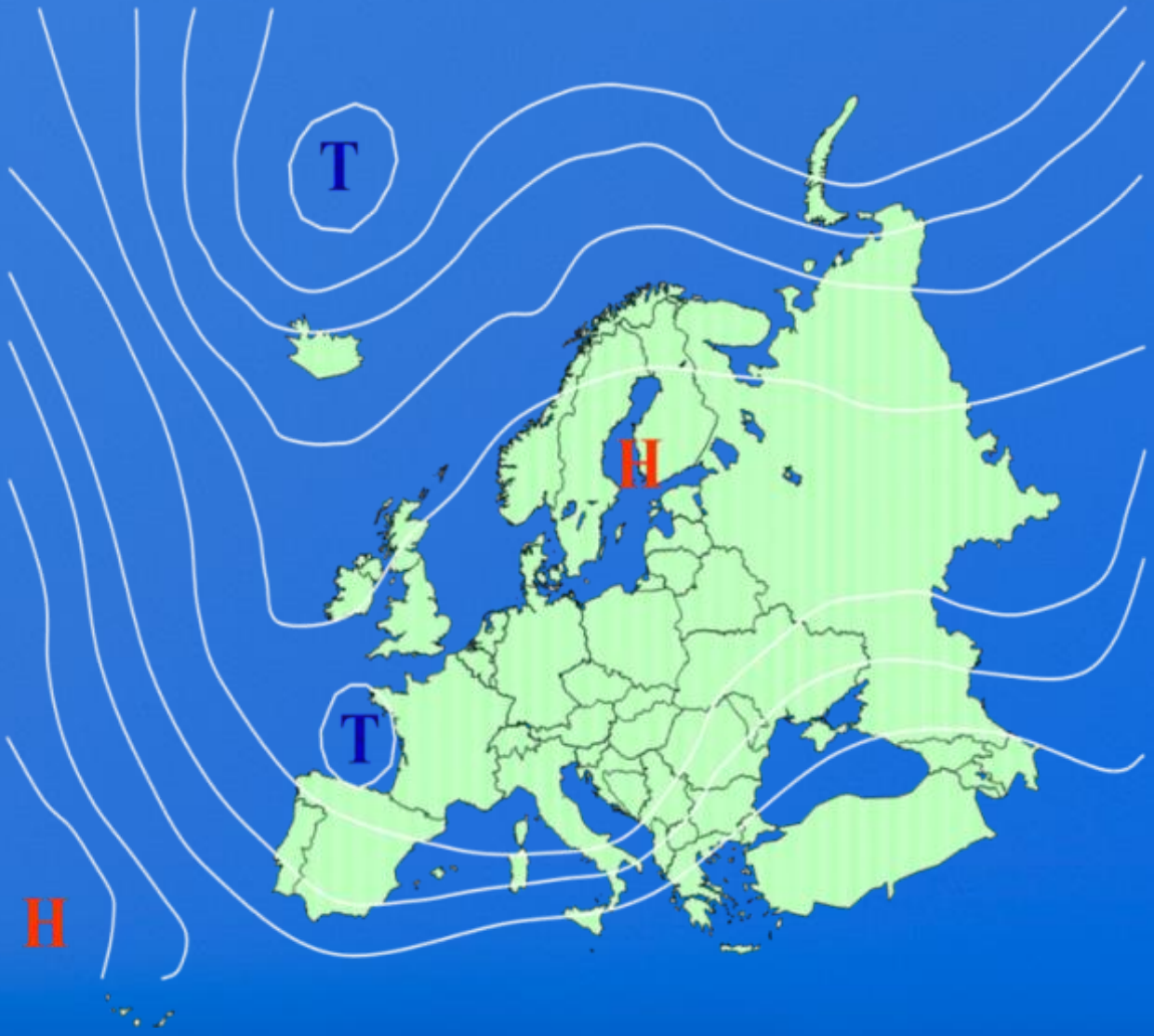


Weather situations

- High pressure over central europe: hoar frost

Weather situations

- Vb - trajectory

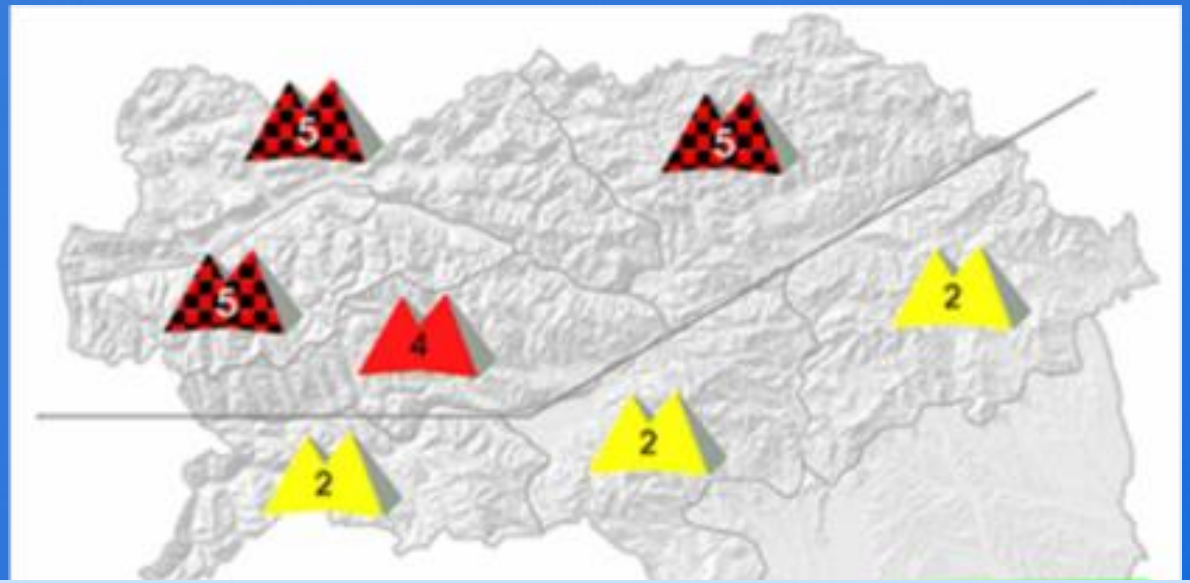


Case studies

- Februar 2005

- 2005 Styria was affected by catastrophic avalanches like no other federal state in Austria
- It began with the passage of a cold front from January 18th to January 19th. This cold front started a phase of adverse weather including partly heavy snowfall. From February 2nd to February 4th precipitation intensified
- Along the Northern Alps as well as on the Northern declivity of the “Niederen Tauern” avalanches were triggered which can be categorised as “once-in-a-hundred-years-event”
- Already on January 31st danger level 4 was issued. On February 2nd danger level 5 was finally issued in the afternoon, windspeed up to 100 km/h was observed
- More than 200 avalanches
- 300 People were evacuated from Planneralm

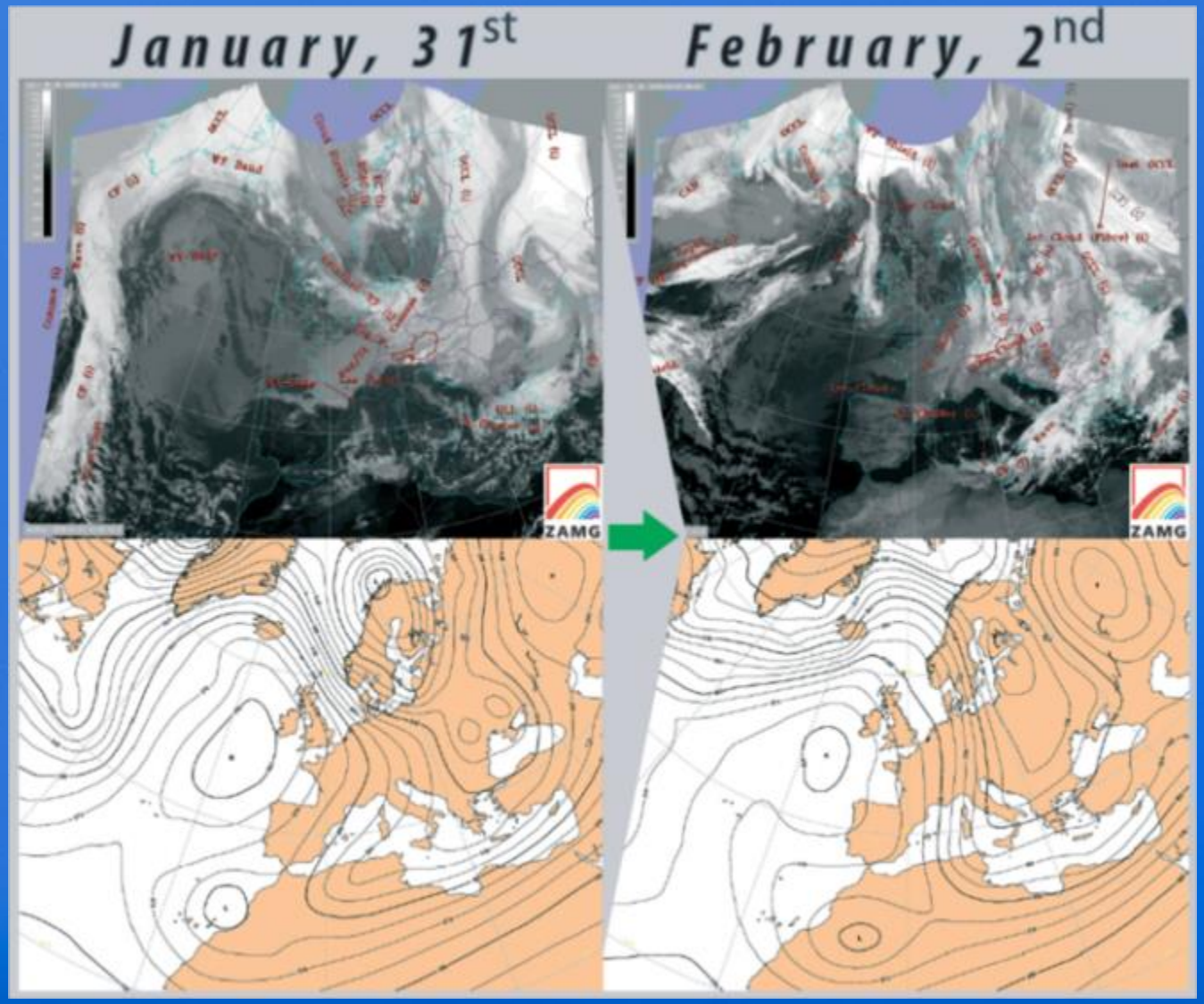
- Februar 2005



Avalanche danger levels
on 02.02.2005, 5 pm

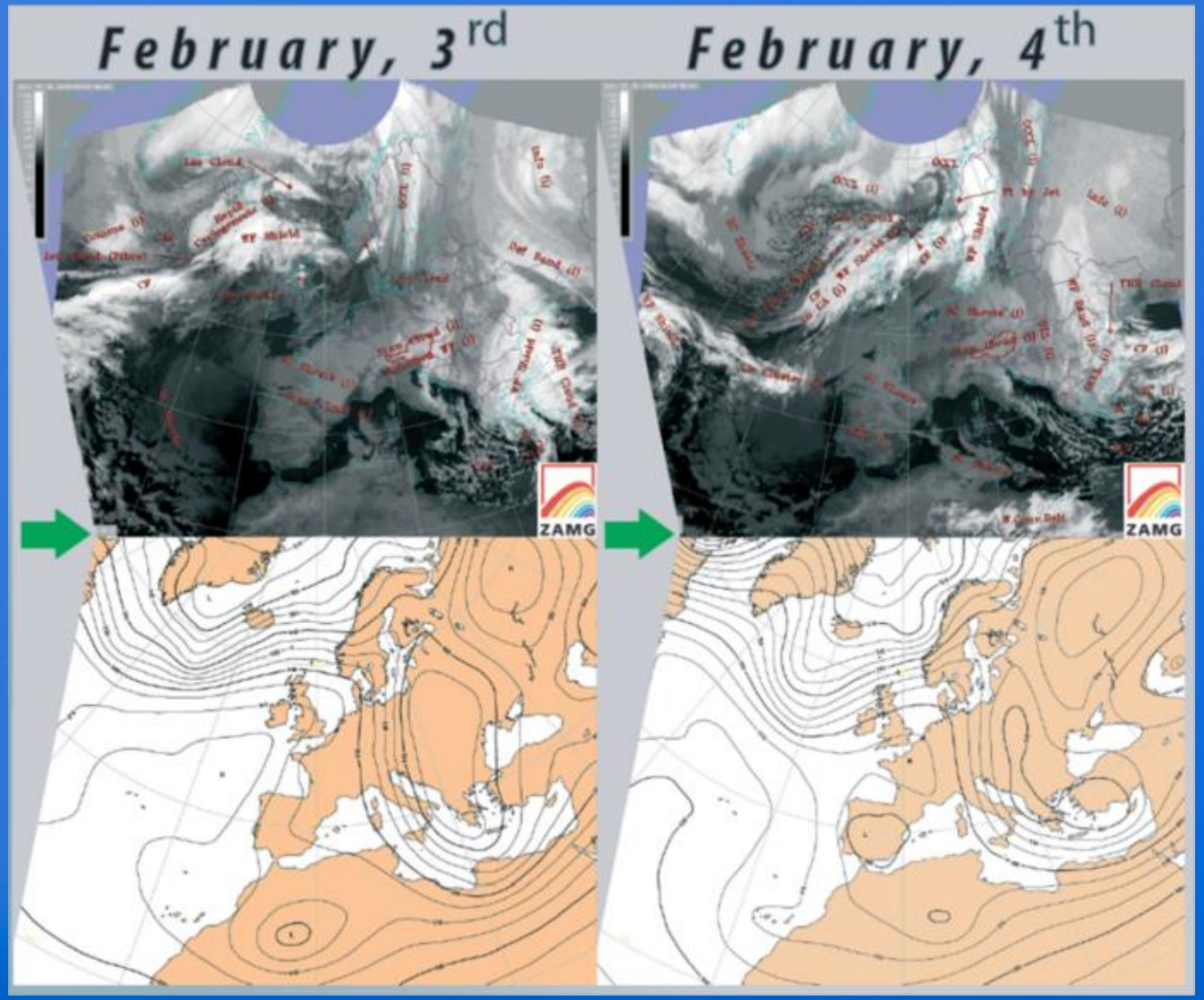
Case studies

- Februar 2005



Case studies

- Februar 2005



Case studies

- Februar 2005

Danger Scale
Development

Date	Time	General	Nordalpen West	Nordalpen Ost	Niedere Tauern
31.1.05	7:30 a.m.	3	3	3	3
1.2.05	7:30 a.m.	3	4	3	3
	3:30 p.m.	3	4	4	3
2.2.05	7:30 a.m.	4	4	4	3
	3:30 p.m.	4	5	5	4
3.2.05	7:30 a.m.	4	5	5	4
	4:00 p.m.	5	5	5	5
4.2.05	7:30 a.m.	5	5	5	5
	5:00 p.m.	4	4	4	4
5.2.05	7:30 a.m.	4	4	4	4
6.2.05	7:30 a.m.	4	4	4	4

Accumulate snow on meteorological stations

Datum	Tauplitz	Eisenerzer Ramsau	Brunnalm
01. Feb	104	27	15
02. Feb	65	47	30
03. Feb	120	92	40
04. Feb	53	55	25
05. Feb	3	0	0
Summe	**345**	**221**	**110**

Forecast and measurements

Date	Forecats (24h)	Max. observation
31.01.2005	**70 cm**	50 to 100 cm
01.02.2005	**50 to 70 cm**	65 cm
02.02.2005	**100 cm**	120 cm
03.02.2005	**60 cm**	55 cm

Case studies

- Februar 2005

Planneralm

Niederstuttern

Planneralm

02.05. – 04.05.

- About 120 registered naturally triggered avalanches
- Evacuation of exposed infrastructure
- A lot of closed roads and railways

Case studies

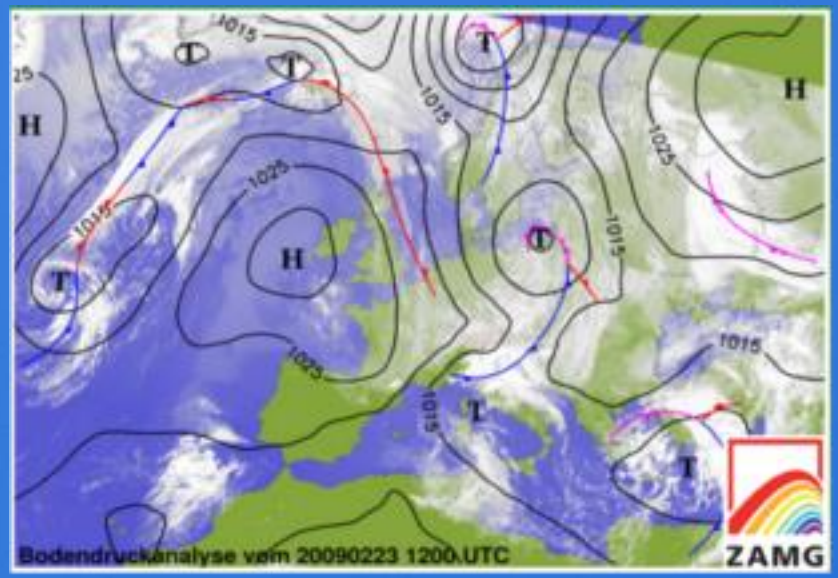
- Februar 2009

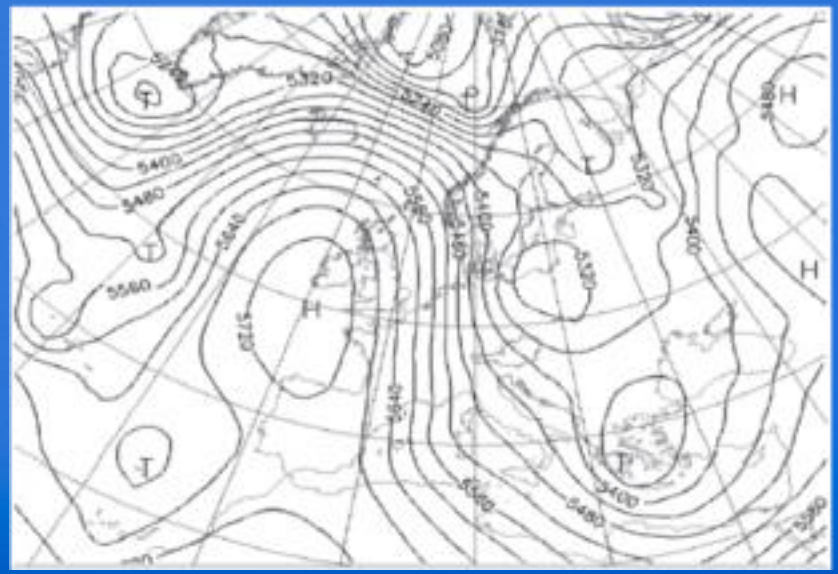
- 2009 Styria and Lower Austria was affected by catastrophic avalanches
- Three weeks with NW-flow
- Strong wind, huge fresh-snow affected danger level 4 and 5 along the northern alps
- In February 2009 we had **11** days with danger level 3, **16** days with danger level 4 an **1** day with danger level 5

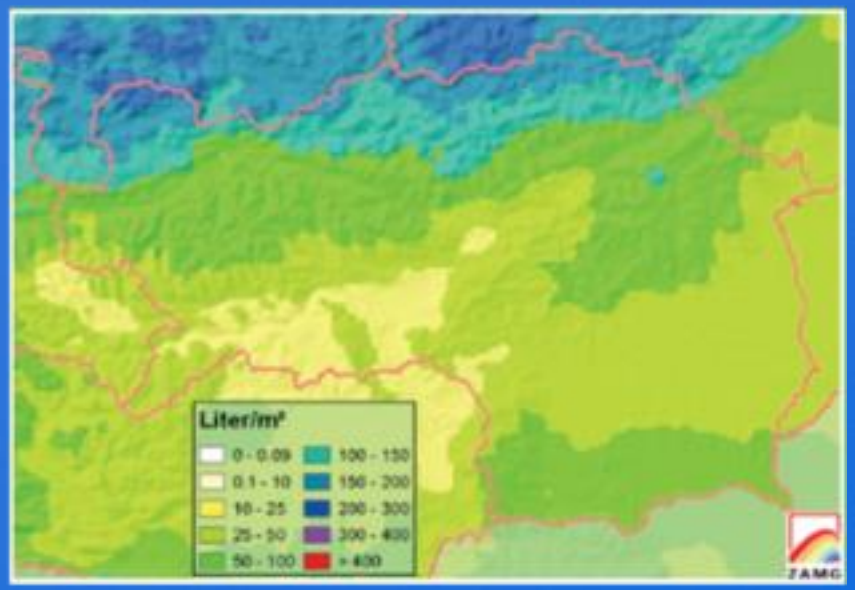
- Two kinds of avalanches were expected:
  - Natural release of wet snow avalanches in lower regions
  - Natural release of dry-snow slab avalanches in higher regions

Case studies

- Februar 2009







Typical synoptic-situation in February 2009

Left-top: msl-pressure with satellite and fronts
on 23.02.09, 12 UTC

Left-bottom: 500hPa Geopotential
on 23.02.09, 12 UTC

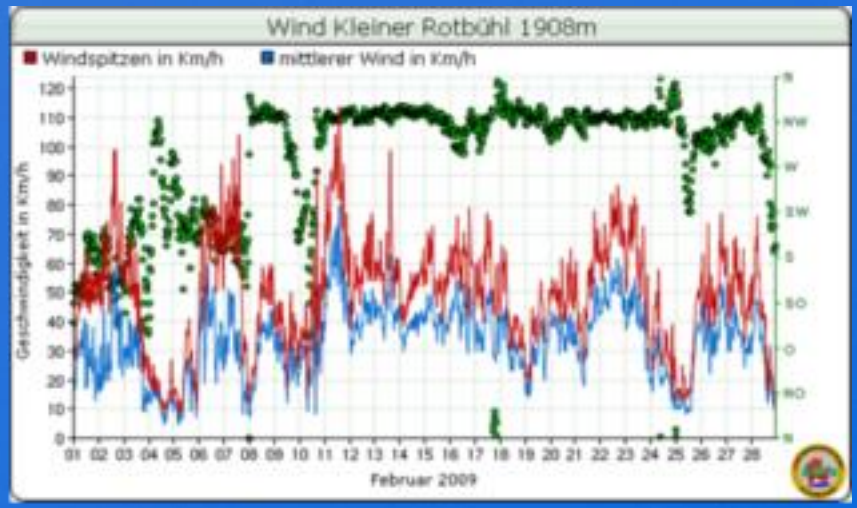
Right-top: Total amount of precipitation in February 2009

Case studies

- Februar 2009

snowdepth

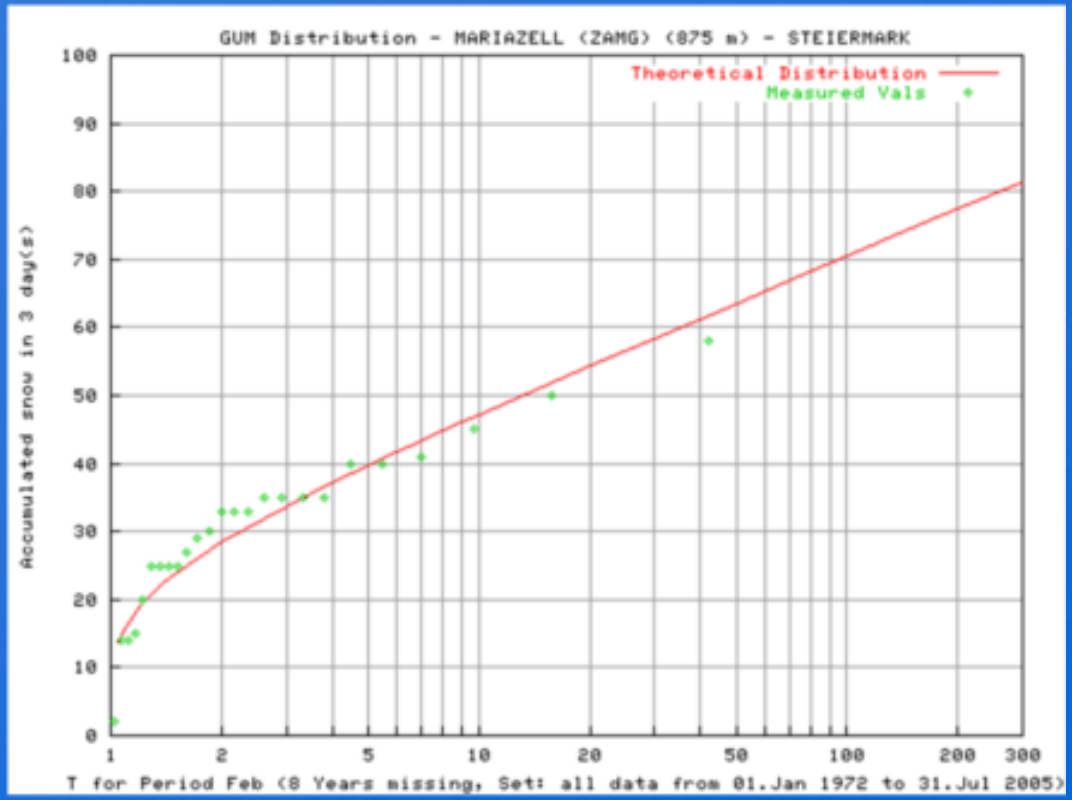
windspeed, -direction



Case studies

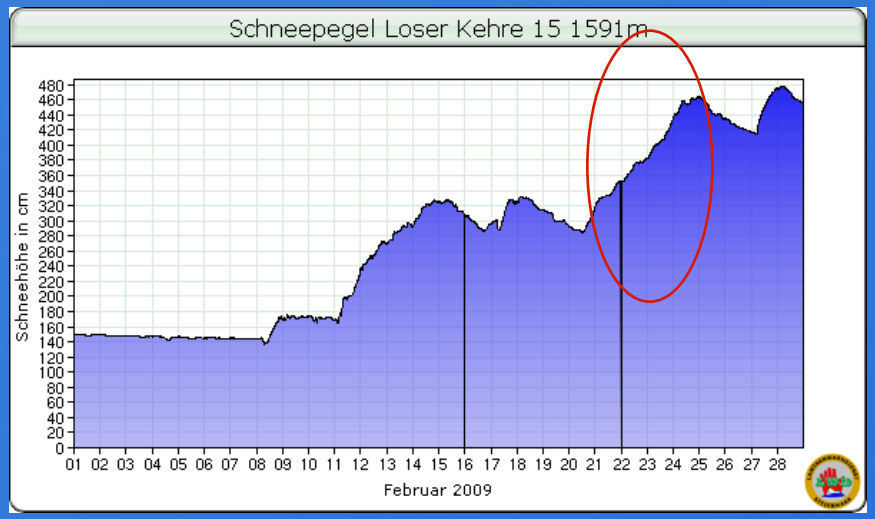
- Februar 2009

acc. fresh-snow [cm]	Veitsch	Hieflau	Tauplitz	Hohentauern	Wildalpen	Eisenerzer Ramsau	Seetaler
01.02.2009	0	2	2	3	2	7	2
02.02.2009	3	2	5	9	2	7	8
03.02.2009	12	2	5	24	2	10	18
04.02.2009	12	2	5	24	2	10	18
05.02.2009	12	2	5	24	2	10	18
06.02.2009	12	2	5	24	2	10	18
07.02.2009	12	2	5	24	2	10	18
08.02.2009	12	2	10	28	2	15	23
09.02.2009	24	20	34	50	6	47	34
10.02.2009	24	20	40	51	6	47	34
11.02.2009	24	22	55	57	6	47	34
12.02.2009	32	36	107	85	13	77	34
13.02.2009	38	74	145	95	25	104	34
14.02.2009	46	92	181	107	36	149	34
15.02.2009	52	110	205	121	49	187	34
16.02.2009	52	112	210	121	50	187	34
17.02.2009	64	123	238	123	65	202	34
18.02.2009	104	149	278	158	99	244	37
19.02.2009	112	153	284	161	106	257	37
20.02.2009	116	153	284	163	106	261	37
21.02.2009	126	181	326	173	139	293	37
22.02.2009	161	229	362	203	165	338	40
23.02.2009	181	248	393	211	177	371	45
24.02.2009	211	286	448	229	205	414	54
25.02.2009	219	305	460	243	222	433	56
26.02.2009	219	305	460	243	222	433	56
27.02.2009	231	320	482	245	225	438	56
28.02.2009	266	340	516	271	229	465	56

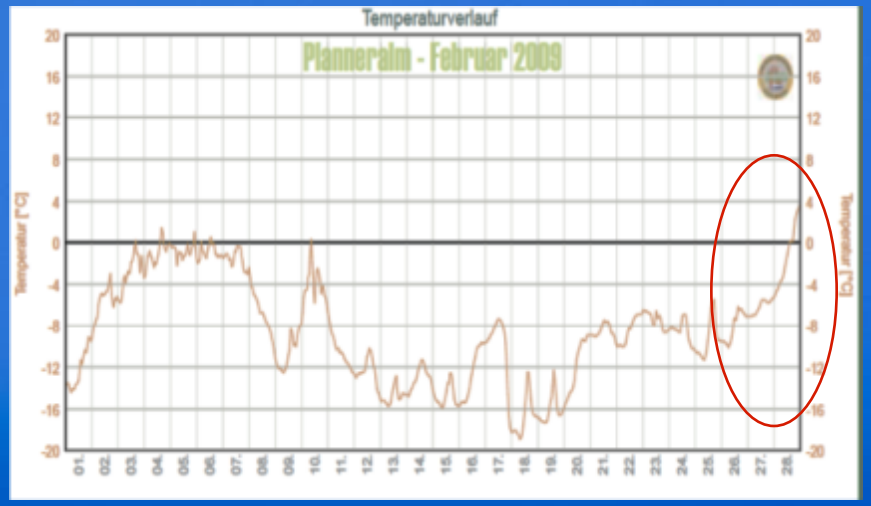


Case studies

- Februar 2009



- Naturally triggered avalanches at 24.02.
- Melt-freeze crust (January) + fresh snow
- Danger level 5



- Naturally triggered avalanches at 28.02.
- Raising temperature + fresh snow
- Danger level 4

Case studies

- 24.02.2009: Melt-freeze crust (January) + fresh snow

Pfaffenstein

Eisenerz

Gesäuse

Case studies

- 28.02.2009: Raising temperature + fresh snow

Großer Schober

Kleinsölk

Fleißgraben, St. Nikolai i. Sö.

Case studies - verification

- And the forecasts, especially snow?

ECMWF

11356 OS Bad Aussee 13.78 47.62 665 Orog : 1192

AGL : Sonntag, 22.Februar 2009 00 UTC ZAMG/ECMWF (0.25 Grad) Tage 0-2

Termin	SO,22.Feb 2009				MO,23.Feb 2009				DI,24.Feb 2009			
Zeit UT	00	06	12	18	00	06	12	18	00	06	12	18
N	8	8	8	8	8	8	8	8	8	8	6	8
Nh	7	7	8	7	1	0	0	0	0	0	0	0
Nm	7	8	8	8	5	7	8	7	8	8	6	8
Nl	8	8	8	8	8	8	4	8	8	8	5	8
N-CU	1	0	1	0	2	2	4	2	1	2	4	2
SHW-IX	14.1	14.5	13.7	10.4	8.8	6.4	5.7	4.9	4.4	2.8	4.8	9.1
AUSL.T	-3	-4	1	-2	-1	-2	1	-3	-3	-4	2	-3
WX -CUF	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	SNSH	NIL	NIL
RR		2.7	3.1	2.7	3.7	4.8	4.6	1.6	2.5	8.1	4.9	1.8
RR-str		2.4	2.3	2.6	3.6	3.8	1.6	0.8	2.4	7.0	1.5	0.4
CONV		0.3	0.8	0.1	0.1	1.0	3.0	0.8	0.1	1.1	3.4	1.4
SN		2.7	3.1	2.7	3.7	4.8	4.6	1.6	2.5	8.1	4.9	1.8
SN--RA	100	200	500	500	600	500	400	200	200	200	500	200
QAO 300	01053	36041	36028	35029	33029	32028	35023	36022	01021	02026	04026	04036
QAO 500	02036	36028	36024	36020	33020	32028	33020	35013	34014	34016	04016	04022
QAO 700	33015	33015	33015	32018	31019	30022	30014	31017	31015	33012	35007	34008
QAO 850	31007	30007	29006	29008	29008	30009	30009	28006	29006	33006	35005	33004
QAO 925	31002	30001	30002	29002	29002	30003	30004	28001	27001	32002	34002	30001
QAN	30002	30002	30002	29002	29002	30003	30005	28003	28002	32003	34002	31002
QANMax		13	14	13	14	17	23	19	13	13	14	10
T 300	-51	-51	-53	-50	-53	-53	-52	-53	-53	-49	-50	-52
T 500	-25	-24	-23	-25	-26	-29	-32	-33	-33	-35	-34	-29
T 3000m	-16	-14	-13	-11	-13	-15	-16	-16	-16	-17	-17	-17
T 2000m	-10	-10	-8	-7	-7	-8	-9	-9	-9	-10	-9	-10
T 1500m	-7	-7	-5	-4	-4	-5	-5	-6	-6	-6	-5	-6
T 1000m	-4	-3	-1	-1	-1	-2	-2	-3	-3	-3	-1	-3
T 800m	-2	-2	0	0	0	0	-1	-2	-2	-2	0	-2
T 700m	-2	-2	1	1	1	0	0	-1	-1	-1	0	-1
T 500m	0	0	2	2	2	2	1	0	0	0	2	0
T 2m	-4	-5	-2	-3	-2	-3	-2	-5	-4	-5	-2	-5
Tk 2m												
T GND	0	-1	2	1	1	0	1	-1	-1	-1	1	-1
Max-ADI	2	2	4	5	5	4	4	3	3	3	4	3
Min Max		-1		2		0		1		-1		1
FROST	400	500	800	800	900	800	700	500	600	500	800	500
W500 cm	-14.7	-11.8	-2.3	-8.0	-12.8	-10.2	-2.6	-6.2	-4.1	6.5	-1.5	-1.3
W700 --	0.0	-0.4	3.7	4.6	5.0	9.4	3.3	0.0	2.6	17.3	2.0	1.8
W850 s	5.8	4.7	4.0	4.7	5.0	8.7	7.4	2.1	3.1	9.8	7.7	4.9
H 700	3009	2991	2985	2971	2948	2918	2915	2918	2917	2921	2958	2981
H 1000	236	211	185	163	138	117	122	131	129	139	167	203
RF 300	83	62	100	36	91	39	33	44	38	17	27	34
RF 400	96	93	98	77	60	44	42	33	47	35	26	17
RF 500	65	96	41	52	53	95	100	86	100	100	63	16
RF 700	97	100	97	100	85	100	99	99	100	100	89	100
RF 850	100	100	87	100	99	99	75	98	99	99	67	98
RF 925	90	97	78	99	99	98	66	95	98	99	59	94

ALADIN AUSTRIA

11356 BAD AUSSEE 13.78 47.61 670 Orog : 1570

QFA AGL : Sonntag, 22.Februar 2009 0 UTC ALADIN-AUSTRIA

Termin	SO,22.Feb 2009				MO,23.Feb 2009				DI,24.Feb 2009				M
Zeit UT	00	06	12	18	00	06	12	18	00	06	12	18	00
N	8	8	8	8	8	7	8	8	8	8	8	7	7
Nh	6	3	7	4	2	1	1	0	0	0	0	0	6
Nm	7	7	5	7	6	4	7	7	7	7	7	2	0
Nl	5	7	6	7	7	7	8	8	7	7	8	7	4
N-CU	0	2	0	0	0	0	5	5	4	0	5	2	2
SHW-IX	15.0	15.3	12.8	10.2	8.7	7.4	7.1	6.4	5.3	4.6	6.2	10.7	12.3
AUSL.T	-7	-7	-5	-5	-5	-5	-6	-6	-7	-7	-7	-7	-7
WX -CUF	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL
RR		3.0	4.5	6.4	8.4	7.6	8.2	7.3	7.1	8.1	8.8	5.0	1.5
RR-str		2.9	4.4	6.3	8.4	7.6	6.4	4.9	4.5	7.3	7.6	4.0	1.2
CONV		0.1	0.1	0.1	---	0.0	1.8	2.4	2.6	0.8	1.3	1.0	0.4
SN		3.0	4.5	6.4	8.4	7.6	8.2	7.3	7.1	8.1	8.8	5.0	1.5
SN--RA	1	1	6	91	99	21	1	1	1	1	1	1	1
QAO 300	01052	00040	00029	35025	33030	30027	34024	35021	01023	01034	02041	03040	02031
QAO 500	01036	00030	36023	34022	33019	32026	33024	33019	35018	35022	01024	03026	03019
QAO 700	32017	31019	32019	31021	30021	30022	30019	30019	30016	31019	32014	32011	35007
QAO 850	33004	31004	31004	30006	30005	30006	30005	30005	30005	31005	32004	35002	30002
QAO 925	33004	32003	31004	30005	30004	30005	30005	30005	30005	31004	32003	35002	31002
QAN	33003	32002	31003	31004	30003	30004	31004	30004	30003	31003	32002	35002	31001
QANMax	10	8	8	12	11	13	12	12	11	11	8	6	3
T 300	-52	-51	-52	-50	-52	-52	-53	-53	-53	-50	-50	-52	-54
T 500	-25	-24	-24	-25	-27	-29	-30	-31	-33	-34	-32	-29	-27
T 3000m	-12	-14	-12	-12	-12	-14	-16	-16	-16	-16	-17	-17	-10
T 2000m	-10	-10	-8	-7	-7	-7	-9	-9	-9	-10	-10	-10	-10
T 1500m	-6	-6	-5	-4	-4	-5	-6	-6	-6	-6	-6	-7	-6
T 1000m	-4	-4	-2	-1	-1	-2	-3	-3	-3	-3	-3	-4	-4
T 800m	-2	-2	0	0	0	0	-1	-2	-2	-2	-1	-2	-2
T 700m	-2	-2	0	1	1	1	0	0	-1	-1	-1	-2	-2
T 500m	0	-1	2	3	3	2	1		1	1	1	0	0
T 2m	-7	-7	-5	-5	-5	-5	-6	-6	-7	-7	-6	-7	-7
T GND	-1	-1	1	1	1	1	0	-1	-1	-1	-1	-1	-1
Max-ADI	3	3	5	6	6	5	4	4	4	3	4	3	3
Min Max		-2		1		-1		1		-2		-1	
FROST	231	211	604	798	779	758	553	557	363	367	390	204	226
W500 cm	-9.4	-5.4	-5.1	-9.9	-12.2	-10.2	-6.1	-6.3	-6.9	4.8	1.2	-2.2	-1.2
W700 --	2.3	2.4	2.3	5.4	4.8	11.1	3.9	5.1	5.0	17.8	9.6	4.3	-1.7
W850 s	3.7	1.3	1.8	4.4	3.9	6.3	5.0	4.9	3.7	5.0	5.3	1.7	-2.9
H 700	3009	2992	2987	2975	2958	2931	2926	2928	2934	2937	2959	2982	3008
H 1000	238	217	191	170	151	131	141	146	154	159	182	211	233
RF 300	82	57	91	64	75	61	16	22	17	18	16	55	69
RF 400	90	91	70	83	24	27	79	70	34	45	25	22	71
RF 500	87	94	55	90	76	23	92	94	87	95	50	11	23
RF 700	92	98	98	98	98	99	98	98	98	99	99	98	49
RF 850	92	94	94	96	96	97	96	97	96	97	96	94	91
RF 925	92	93	93	95	96	96	96	96	95	96	96	94	90

Case studies - verification

- And the forecasts, especially snow?

  Avalanche bulletin forecast for the region “Totes Gebirge”: **70 to 100cm**

11356 OS Bad Aussee 13.78 47.62 665 Orog : 1192

AGL : Sonntag, 22.Februar 2009 00 UTC ZAMG/ECMWF (0.25 Grad) Tage 0-2

Termin	SO,22.Feb 2009				MO,23.Feb 2009				DI,24.Feb 2009			
Zeit UT	00	06	12	18	00	06	12	18	00	06	12	18
N	8	8	8	8	8	8	8	8	8	8	6	8
Nh	7	7	8	7	1	0	0	0	0	0	0	0
Nm	7	8	8	8	5	7	8	7	8	8	6	8
Nl	8	8	8	8	8	8	4	8	8	8	5	8
N-CU	1	0	1	0	2	2	4	2	1	2	4	2
SHW-IX	14.1	14.5	13.7	10.4	8.8	6.4	5.7	4.9	4.4	2.8	4.8	9.1
AUSL.T	-3	-4	1	-2	-1	-2	1	-3	-3	-4	2	-3
WX -CUF	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	SNSH	NIL	NIL
RR		2.7	3.1	2.7	3.7	4.8	4.6	1.6	2.5	8.1	4.9	1.8
RR-str		2.4	2.3	2.6	3.6	3.8	1.6	0.8	2.4	7.0	1.5	0.4
CONV		0.3	0.8	0.1	0.1	1.0	3.0	0.8	0.1	1.1	3.4	1.4
SN		2.7	3.1	2.7	3.7	4.8	4.6	1.6	2.5	8.1	4.9	1.8
SN--RA	100	200	500	500	600	500	400	200	200	200	500	200
QA0 300	01053	36041	36028	35029	33029	32028	35023	36022	01021	02026	04026	04036
QA0 500	02036	36028	36024	36020	33020	32028	33020	35013	34014	34016	04016	04022
QA0 700	33015	33015	33015	32018	31019	30022	30014	31017	31015	33012	35007	34008
QA0 850	31007	30007	29006	29008	29008	30009	30009	28006	29006	33006	35005	33004
QA0 925	31002	30001	30002	29002	29002	30003	30004	28001	27001	32002	34002	30001
QAN	30002	30002	30002	29002	29002	30003	30005	28003	28002	32003	34002	31002
QANMax		13	14	13	14	17	23	19	13	13	14	10
T 300	-51	-51	-53	-50	-53	-53	-52	-53	-53	-49	-50	-52
T 500	-25	-24	-23	-25	-26	-29	-32	-33	-33	-35	-34	-29
T 3000m	-16	-14	-13	-11	-13	-15	-16	-16	-16	-17	-17	-17
T 2000m	-10	-10	-8	-7	-7	-8	-9	-9	-9	-10	-9	-10
T 1500m	-7	-7	-5	-4	-4	-5	-5	-6	-6	-6	-5	-6
T 1000m	-4	-3	-1	-1	-1	-2	-2	-3	-3	-3	-1	-3
T 800m	-2	-2	0	0	0	0	-1	-2	-2	-2	0	-2
T 700m	-2	-2	1	1	1	0	0	-1	-1	-1	0	-1
T 500m	0	0	2	2	2	2	1	0	0	0	2	0
T 2m	-4	-5	-2	-3	-2	-3	-2	-5	-4	-5	-2	-5
TK 2m												
T GND	0	-1	2	1	1	0	1	-1	-1	-1	1	-1
Max-ADI	2	2	4	5	5	4	4	3	3	3	4	3
Min Max		-1		2		0		1		-1		1
FROST	400	500	800	800	900	800	700	500	600	500	800	500
W500 cm	-14.7	-11.8	-2.3	-8.0	-12.8	-10.2	-2.6	-6.2	-4.1	6.5	-1.5	-1.3
W700 --	0.0	-0.4	3.7	4.6	5.0	9.4	3.3	0.0	2.6	17.3	2.0	1.8
W850 s	5.8	4.7	4.0	4.7	5.0	8.7	7.4	2.1	3.1	9.8	7.7	4.9
H 700	3009	2991	2985	2971	2948	2918	2915	2918	2917	2921	2958	2981
H 1000	236	211	185	163	138	117	122	131	129	139	167	203
RF 300	83	62	100	36	91	39	33	44	38	17	27	34
RF 400	96	93	98	77	60	44	42	33	47	35	26	17
RF 500	65	96	41	52	53	95	100	86	100	100	63	16
RF 700	97	100	97	100	85	100	99	99	100	100	89	100
RF 850	100	100	87	100	99	99	75	98	99	99	67	98
RF 925	90	97	78	99	99	98	66	95	98	99	59	94

ECMWF

ALADIN-A

60mm

ECMWF

33mm

11356 BAD AUSSEE 13.78 47.61 670 Orog : 1570

QFA AGL : Sonntag, 22.Februar 2009 0 UTC ALADIN-AUSTRIA

Termin	SO,22.Feb 2009				MO,23.Feb 2009				DI,24.Feb 2009			
Zeit UT	00	06	12	18	00	06	12	18	00	06	12	18
N	8	8	8	8	8	7	8	8	8	8	8	7
Nh	6	3	7	4	2	1	1	0	0	0	0	0
Nm	7	7	5	7	6	4	7	7	7	7	7	2
Nl	5	7	6	7	7	7	8	8	7	7	8	7
N-CU	0	2	0	0	0	0	5	5	4	0	5	2
SHW-IX	15.0	15.3	12.8	10.2	8.7	7.4	7.1	6.4	5.3	4.6	6.2	10.7
AUSL.T	-7	-7	-5	-5	-5	-5	-6	-6	-7	-7	-7	-7
WX -CUF	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL
RR		3.0	4.5	6.4	8.4	7.6	8.2	7.3	7.1	8.1	8.8	5.0
RR-str		2.9	4.4	6.3	8.4	7.6	6.4	4.9	4.5	7.3	7.6	4.0
CONV		0.1	0.1	0.1	---	0.0	1.8	2.4	2.6	0.8	1.3	1.0
SN		3.0	4.5	6.4	8.4	7.6	8.2	7.3	7.1	8.1	8.8	5.0
SN--RA	1	1	6	91	99	21	1	1	1	1	1	1
QA0 300	01052	00040	00029	35025	33030	30027	34024	35021	01023	01034	02041	03040
QA0 500	01036	00030	36023	34022	33019	32026	33024	33019	35018	35022	01024	03026
QA0 700	32017	31019	32019	31021	30021	30022	30019	30019	30016	31019	32014	32011
QA0 850	33004	31004	31004	30006	30005	30006	30005	30005	30005	31005	32004	35002
QA0 925	33004	32003	31004	30005	30004	30005	30005	30005	30005	31004	32003	35002
QAN	33003	32002	31003	31004	30003	30004	31004	30004	30003	31003	32002	35002
QANMax	10	8	8	12	11	13	12	12	11	11	8	6
T 300	-52	-51	-52	-50	-52	-52	-53	-53	-53	-50	-50	-52
T 500	-25	-24	-24	-25	-27	-29	-30	-31	-33	-34	-32	-29
T 3000m	-12	-14	-12	-12	-12	-14	-16	-16	-16	-16	-17	-17
T 2000m	-10	-10	-8	-7	-7	-7	-9	-9	-9	-10	-10	-10
T 1500m	-6	-6	-5	-4	-4	-5	-6	-6	-6	-6	-6	-7
T 1000m	-4	-4	-2	-1	-1	-2	-3	-3	-3	-3	-3	-4
T 800m	-2	-2	0	0	0	0	-1	-2	-2	-2	-1	-2
T 700m	-2	-2	0	1	1	1	0	0	-1	-1	-1	-2
T 500m	0	-1	2	2	3	2	1	0	1	1	1	0
T 2m	-7	-7	-5	-5	-5	-5	-6	-6	-7	-7	-6	-7
T GND	-1	-1	1	1	1	1	0	-1	-1	-1	-1	-1
Max-ADI	3	3	5	6	6	5	4	4	4	3	4	3
Min Max		-2		1		-1		1		-2		-1
FROST	231	211	604	798	779	758	553	557	363	367	390	204
W500 cm	-9.4	-5.4	-5.1	-9.9	-12.2	-10.2	-6.1	-6.3	-6.9	4.8	1.2	-2.2
W700 --	2.3	2.4	2.3	5.4	4.8	11.1	3.9	5.1	5.0	17.8	9.6	4.3
W850 s	3.7	1.3	1.8	4.4	3.9	6.3	5.0	4.9	3.7	5.0	5.3	1.7
H 700	3009	2992	2987	2975	2958	2931	2926	2928	2934	2937	2959	2982
H 1000	238	217	191	170	151	131	141	146	154	159	182	211
RF 300	82	57	91	64	75	61	16	22	17	18	16	55
RF 400	90	91	70	83	24	27	79	70	34	45	25	22
RF 500	87	94	55	90	76	23	92	94	87	95	50	11
RF 700	92	98	98	98	98	99	98	98	98	99	99	98
RF 850	92	94	94	96	96	97	96	97	96	97	96	94
RF 925	92	93	93	95	96	96	96	96	95	96	96	94

ALADIN AUSTRIA

Case studies - verification

- And the forecasts, especially snow?

  Avalanche bulletin forecast for the region “Totes Gebirge”: **70 to 100cm**

11356 OS Bad Aussee 13.78 47.62 665 Orog : 1192

AGL : Sonntag, 22.Februar 2009 00 UTC ZAMG/ECMWF (0.25 Grad) Tage 0-2

Termin	SO,22.Feb 2009				MO,23.Feb 2009				DI,24.Feb 2009			
Zeit UT	00	06	12	18	00	06	12	18	00	06	12	18
N	8	8	8	8	8	8	8	8	8	8	6	8
Nh	7	7	8	7	1	0	0	0	0	0	0	0
Nm	7	8	8	8	5	7	8	7	8	8	6	8
Nl	8	8	8	8	8	8	4	8	8	8	5	8
N-CU	1	0	1	0	2	2	4	2	1	2	4	2
SHW-IX	14.1	14.5	13.7	10.4	8.8	6.4	5.7	4.9	4.4	2.8	4.8	9.1
AUSL.T	-3	-4	1	-2	-1	-2	1	-3	-3	-4	2	-3
WX -CUF	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	SNSH	NIL	NIL
RR		2.7	3.1	2.7	3.7	4.8	4.6	1.6	2.5	8.1	4.9	1.8
RR-str		2.4	2.3	2.6	3.6	3.8	1.6	0.8	2.4	7.0	1.5	0.4
CONV		0.3	0.8	0.1	0.1	1.0	3.0	0.8	0.1	1.1	3.4	1.4
SN		2.7	3.1	2.7	3.7	4.8	4.6	1.6	2.5	8.1	4.9	1.8
SN--RA	100	200	500	500	600	500	400	200	200	200	500	200
QAO 300	01053	36041	36028	35029	33029	32028	35023	36022	01021	02026	04026	04036
QAO 500	02036	36028	36024	36020	33020	32028	33020	35013	34014	34016	04016	04022
QAO 700	33015	33015	33015	32018	31019	30022	30014	31017	31015	33012	35007	34008
QAO 850	31007	30007	29006	29008	29008	30009	30009	28006	29006	33006	35005	33004
QAO 925	31002	30001	30002	29002	29002	30003	30004	28001	27001	32002	34002	30001
QAN	30002	30002	30002	29002	29002	30003	30005	28003	28002	32003	34002	31002
QANMax		13	14	13	14	17	23	19	13	13	14	10
T 300	-51	-51	-53	-50	-53	-53	-52	-53	-53	-49	-50	-52
T 500	-25	-24	-23	-25	-26	-29	-32	-33	-33	-35	-34	-29
T 3000m	-16	-14	-13	-11	-13	-15	-16	-16	-16	-17	-17	-17
T 2000m											-9	-10
T 1500m											-5	-6
T 1000m											-1	-3
T 800m											0	-2
T 700m											0	-1
T 500m											2	0
T 2m											-2	-5
TK 2m												
T GND											1	-1
Max-ADI											4	3
Min Max												1
FROST											800	500
W500 cm	-14.7	-11.8	-2.3	-8.0	-12.8	-10.2	-2.6	-6.2	-4.1	6.5	-1.5	-1.3
W700 --	0.0	-0.4	3.7	4.6	5.0	9.4	3.3	0.0	2.6	17.3	2.0	1.8
W850 s	5.8	4.7	4.0	4.7	5.0	8.7	7.4	2.1	3.1	9.8	7.7	4.9
H 700	3009	2991	2985	2971	2948	2918	2915	2918	2917	2921	2958	2981
H 1000	236	211	185	163	138	117	122	131	129	139	167	203
RF 300	83	62	100	36	91	39	33	44	38	17	27	34
RF 400	96	93	98	77	60	44	42	33	47	35	26	17
RF 500	65	96	41	52	53	95	100	86	100	100	63	16
RF 700	97	100	97	100	85	100	99	99	100	100	89	100
RF 850	100	100	87	100	99	99	75	98	99	99	67	98
RF 925	90	97	78	99	99	98	66	95	98	99	59	94

conversion factor

precipitation → snow

~ 30

ALADIN-A

60mm

ECMWF

33mm

measured

Taupitz (1500m)

86cm

11356 BAD AUSSEE 13.78 47.61 670 Orog : 1570

QFA AGL : Sonntag, 22.Februar 2009 0 UTC ALADIN-AUSTRIA

Termin	SO,22.Feb 2009				MO,23.Feb 2009				DI,24.Feb 2009			
Zeit UT	00	06	12	18	00	06	12	18	00	06	12	18
N	8	8	8	8	8	7	8	8	8	8	8	7
Nh	6	3	7	4	2	1	1	0	0	0	0	0
Nm	7	7	5	7	6	4	7	7	7	7	7	2
Nl	5	7	6	7	7	7	8	8	7	7	8	7
N-CU	0	2	0	0	0	0	5	5	4	0	5	2
SHW-IX	15.0	15.3	12.8	10.2	8.7	7.4	7.1	6.4	5.3	4.6	6.2	10.7
AUSL.T	-7	-7	-5	-5	-5	-5	-6	-6	-7	-7	-7	-7
WX -CUF	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL
RR		3.0	4.5	6.4	8.4	7.6	8.2	7.3	7.1	8.1	8.8	5.0
RR-str		2.9	4.4	6.3	8.4	7.6	6.4	4.9	4.5	7.3	7.6	4.0
CONV		0.1	0.1	0.1	---	0.0	1.8	2.4	2.6	0.8	1.3	1.0
SN		3.0	4.5	6.4	8.4	7.6	8.2	7.3	7.1	8.1	8.8	5.0
SN--RA	1	1	6	91	99	21	1	1	1	1	1	1
QAO 300	01052	00040	00029	35025	33030	30027	34024	35021	01023	01034	02041	03040
QAO 500	01036	00030	36023	34022	33019	32026	33024	33019	35018	35022	01024	03026
QAO 700	32017	31019	32019	31021	30021	30022	30019	30019	30016	31019	32014	32011
QAO 850	33004	31004	31004	30006	30005	30006	30005	30005	30005	31005	32004	35002
QAO 925	33004	32003	31004	30005	30004	30005	30005	30005	30005	31004	32003	35002
QAN	33003	32002	31003	31004	30003	30004	31004	30004	30003	31003	32002	35002
QANMax	10	8	8	12	11	13	12	12	11	11	8	6
T 300	-52	-51	-52	-50	-52	-52	-53	-53	-53	-50	-50	-52
T 500	-25	-24	-24	-25	-27	-29	-30	-31	-33	-34	-32	-29
T 3000m	-12	-14	-12	-12	-12	-14	-16	-16	-16	-16	-17	-17
T 2000m	-10	-10	-8	-7	-7	-7	-9	-9	-9	-10	-10	-10
T 1500m	-6	-6	-5	-4	-4	-5	-6	-6	-6	-6	-6	-7
T 1000m	-4	-4	-2	-1	-1	-2	-3	-3	-3	-3	-3	-4
T 800m	-2	-2	0	0	0	0	-1	-2	-2	-2	-1	-2
T 700m	-2	-2	0	1	1	1	0	0	-1	-1	-1	-2
T 500m	0	-1	2	3	3	2	1	1	1	1	1	0
T 2m	-7	-7	-5	-5	-5	-5	-6	-6	-7	-7	-6	-7
T GND	-1	-1	1	1	1	1	0	-1	-1	-1	-1	-1
Max-ADI	3	3	5	6	6	5	4	4	4	3	4	3
Min Max												-1
FROST	231											204
W500 cm	-9.4											-2.2
W700 --	2.3											4.3
W850 s	3.7											1.7
H 700	3009											2982
H 1000	238											211
RF 300	82											55
RF 400	90											22
RF 500	87											11
RF 700	92	96	96	96	96	99	98	98	98	97	97	98
RF 850	92	94	94	96	96	97	96	97	96	97	96	94
RF 925	92	93	93	95	96	96	96	96	95	96	96	94

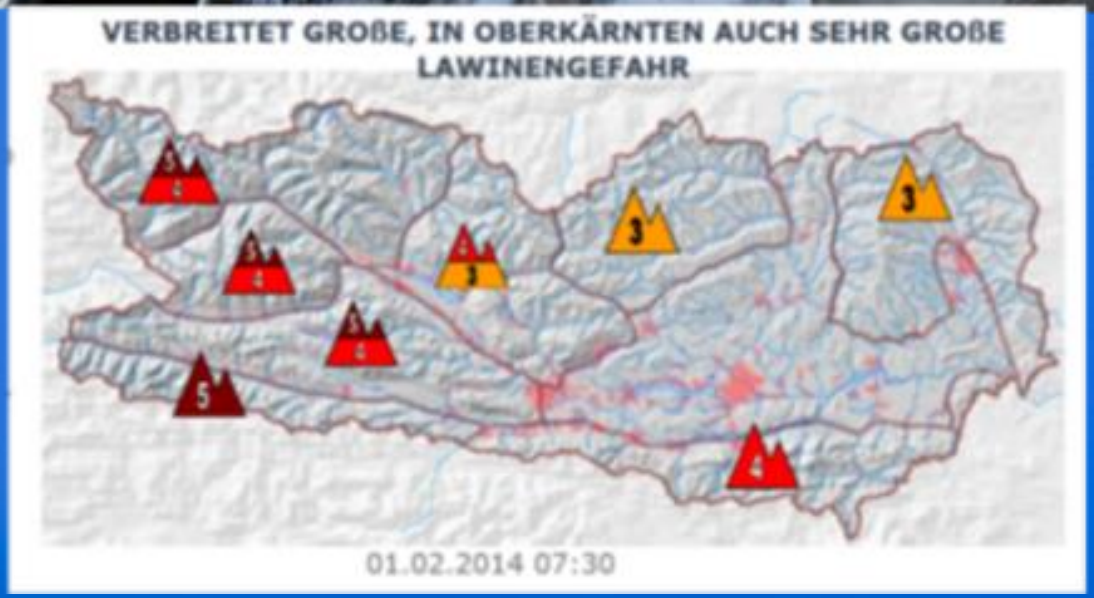
conversion factor

precipitation → snow

~ 14

Case studies

- February 2014: Danger level 5 in carinthia



Pictures: avalanche service carinthia

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Lower Austria

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