

Antelope in Austria

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Antelope Users Meeting 2019, Taormina



ZAMG

Zentralanstalt für
Meteorologie und
Geodynamik

ZAMG Geophysics - Structure

ZAMG – Central Institution for Meteorology and Geodynamics

there are plans to combine ZAMG with the Federal Geological
Institution of Austria (GBA), but political situation might affect
plans

these

Geophysical Department at ZAMG

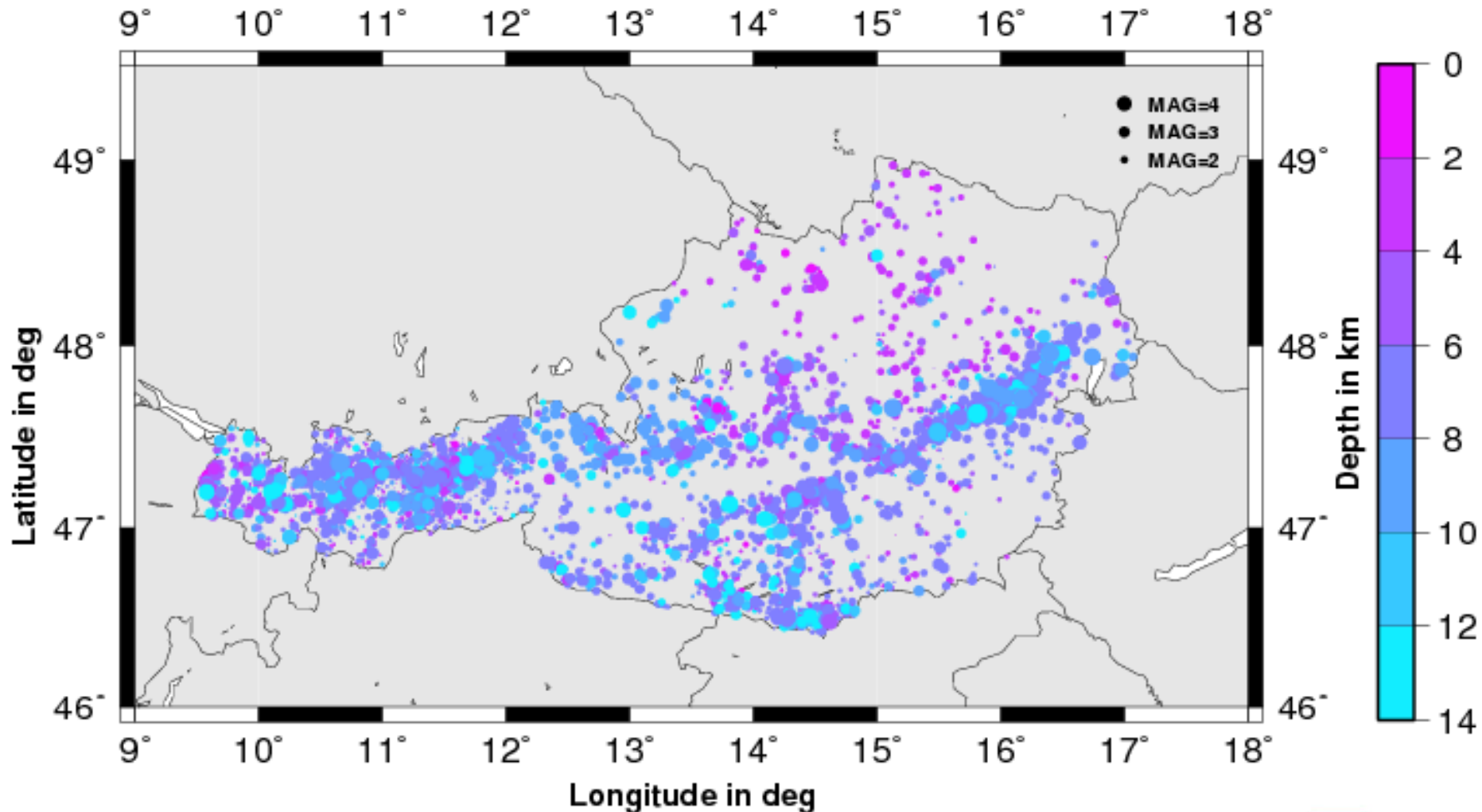
- Conrad Observatory
- Geomagnetism and Gravimetry
- Applied Geophysics – Engineering Geophysics and Archeology
- Geophysical Electronics – most broadband stations
- Seismology
 - NDC
 - Historical Research
 - Earthquake Service
 - various Projects
 - strong motion and some other stations

Seismology Group - tasks



- 24/7 on-call – rotation among 7 (soon 9!) staff members
- advise austrian civil protection
- ARISTOTLE – advise ERCC on Seismic Hazard
- NDC
- provide earthquake information to the public
- maintain a seismic network
- maintain a seismological archive
- share data and products
- participate in various national and international commissions
- (help to) operate the seismic networks in Bolzano and Brno
- monitoring of structures

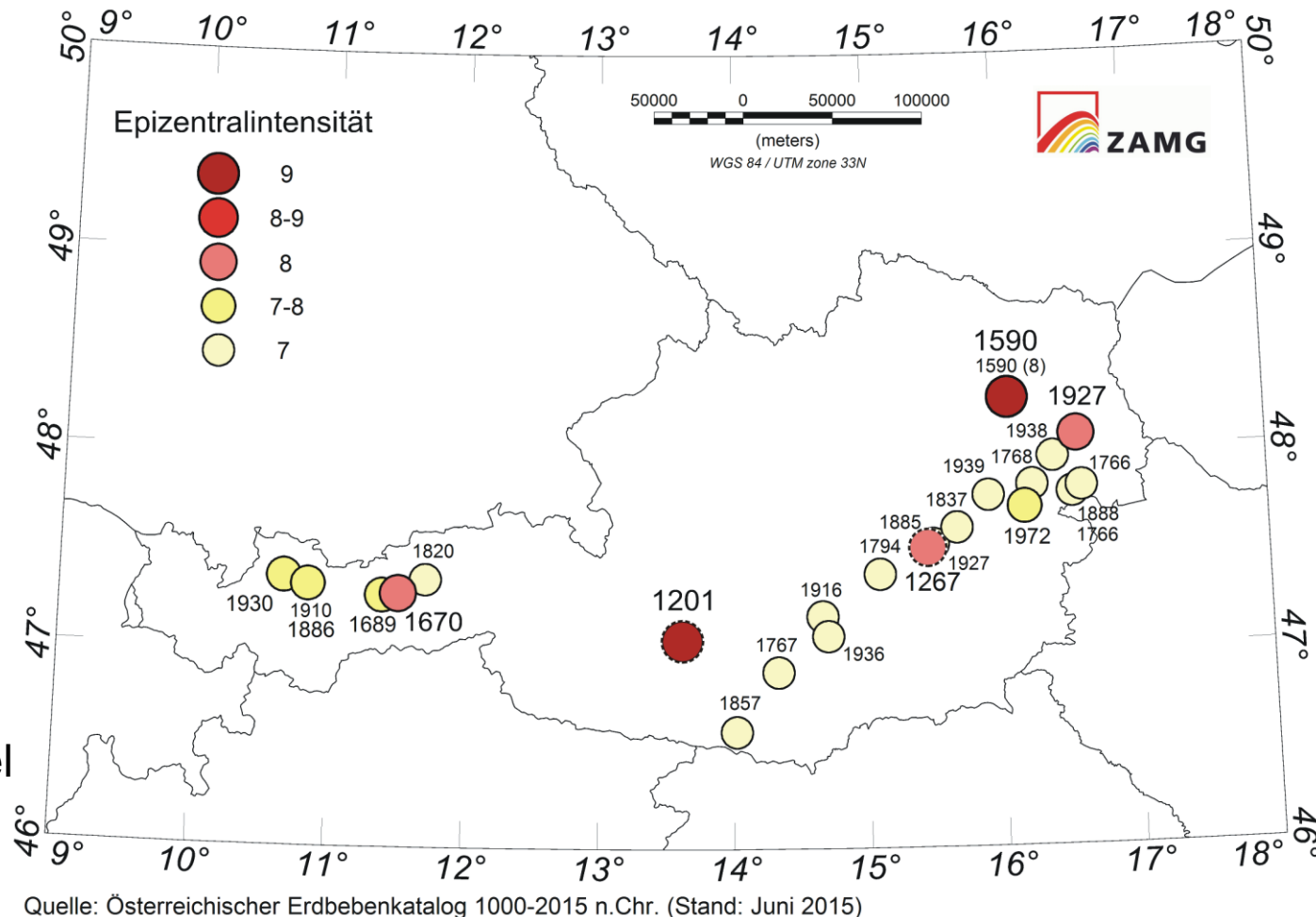
Earthquakes located in Austria since 1900



Over 10000 earthquakes located in Austria and recorded at ZAMG since 1900.

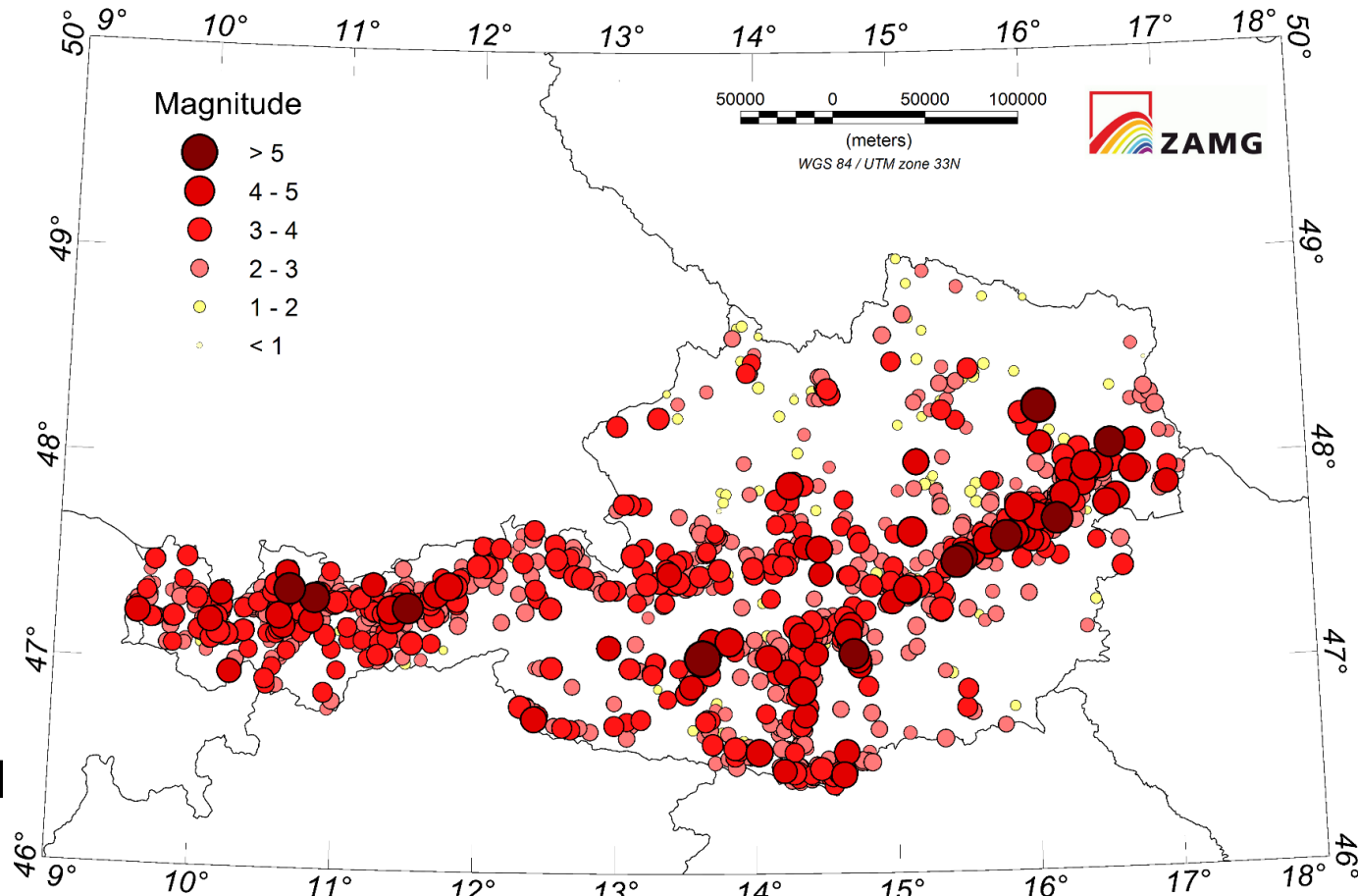
Historic Earthquakes with Heavy Damages

- Destructive:
last one 1590
Riederberg, near
Vienna
- Heavily Damaging:
1927 Schwadorf
(return period >100y)
- Damaging:
1972 Seebenstein
(return period ~30y)
- Slightly Damaging:
2013 Bad Eisenkappel
(return period 2-3y)



Felt Earthquakes in Austria

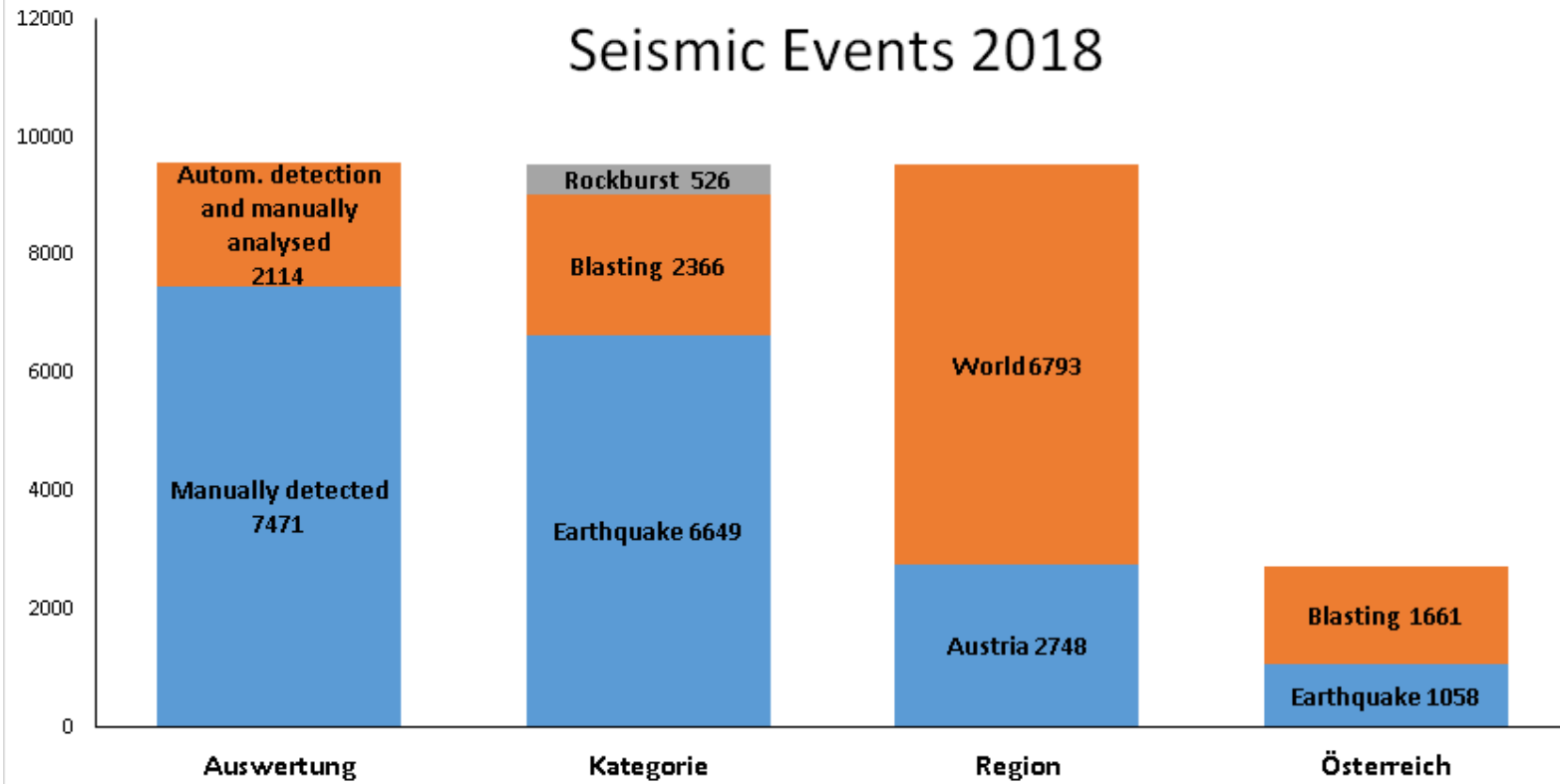
- A combination of historical earthquake information and instrumental recordings of ground motion
- More than 2450 felt earthquakes and their impact are documented since 1000 a.D.



Quelle: Österreichischer Erdbebenkatalog 1000-2016 n.Chr. (Stand: Mai 2017)



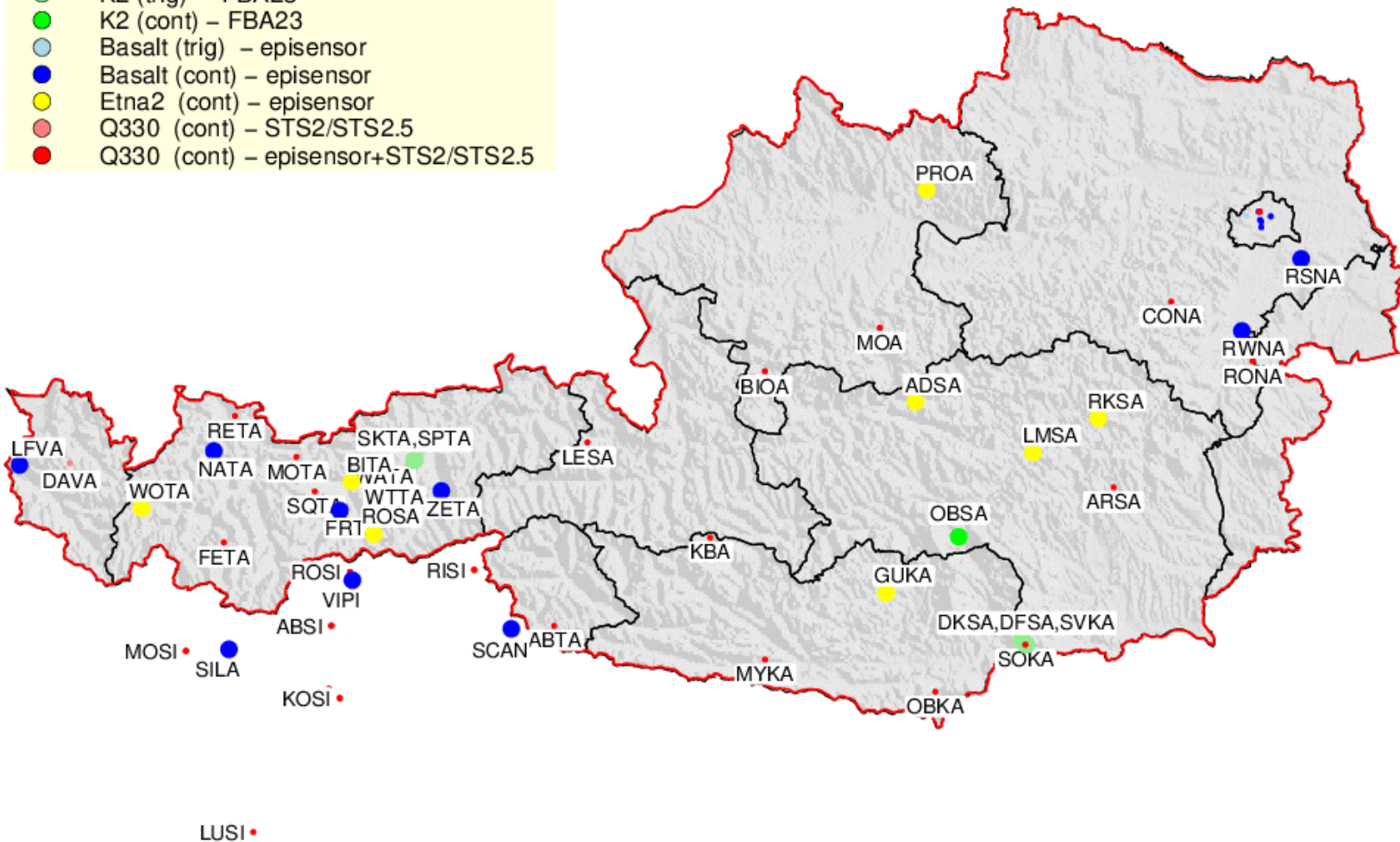
Seismic Events 2018



current network

Legend

- K2 (trig) – FBA23
- K2 (cont) – FBA23
- Basalt (trig) – episensor
- Basalt (cont) – episensor
- Etna2 (cont) – episensor
- Q330 (cont) – STS2/STS2.5
- Q330 (cont) – episensor+STS2/STS2.5



LUSI •

station design - broadband



separate housings for power supply / communications equipment and digitizer

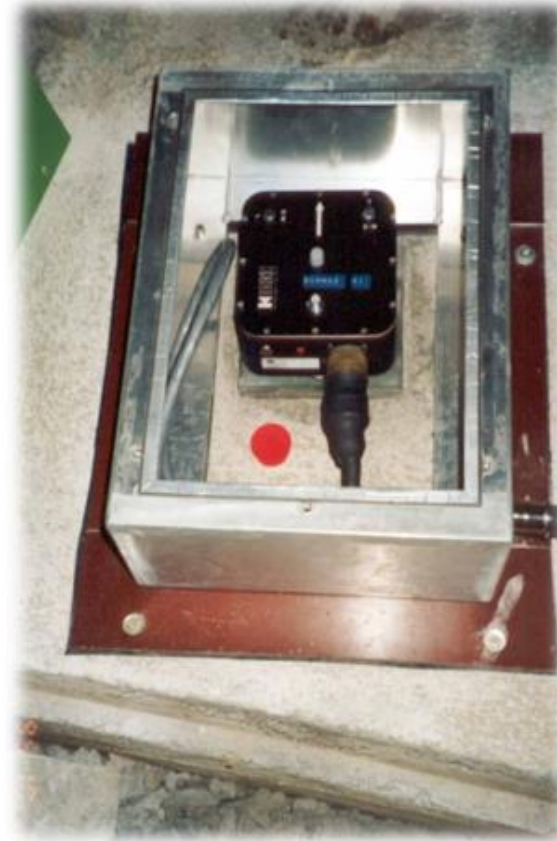
shielded housing for sensor

new design - RONA



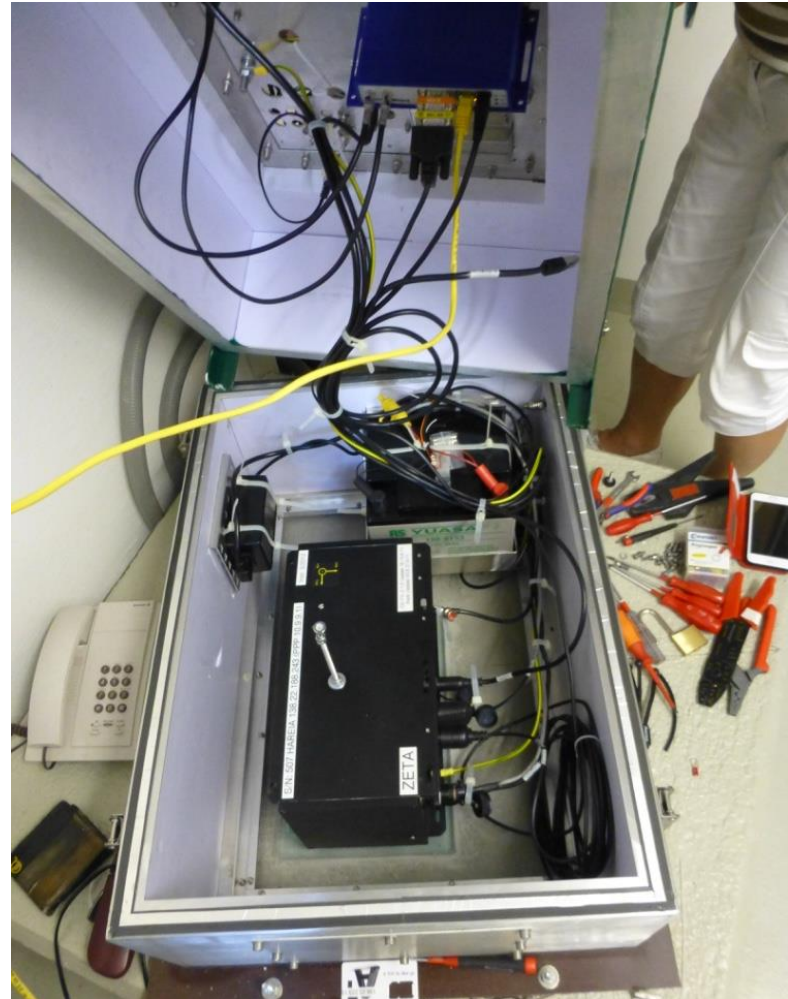
station design – strong motion

5/28/14
Folie 7



station design – strong motion

5/28/14
Folie 7





complete design
during ARMONIA
project

station design – strong motion



upgrading old stations



on sites with 4
Channels:
replace FBA23
and K2 with Basalt

new cabling from
additional sensor
to Basalt

new glassplate
needed

replace telephone
with mobile

hope to last
another 20 years

upgrading existing stations



on sites with only 3 channels,
replace K2/FBA23 with Etna2

need to replace gps cable from
lightning protection to datalogger

replace dial-up telephone with
mobile modem

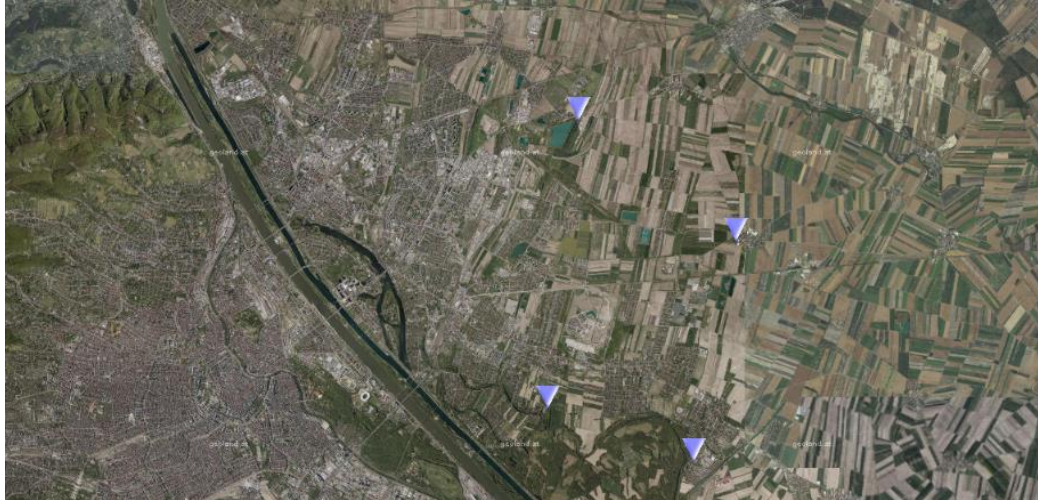
housing already over 20 years
old, but still ok

hope to last another 20 years

instrument testing



GeoTief

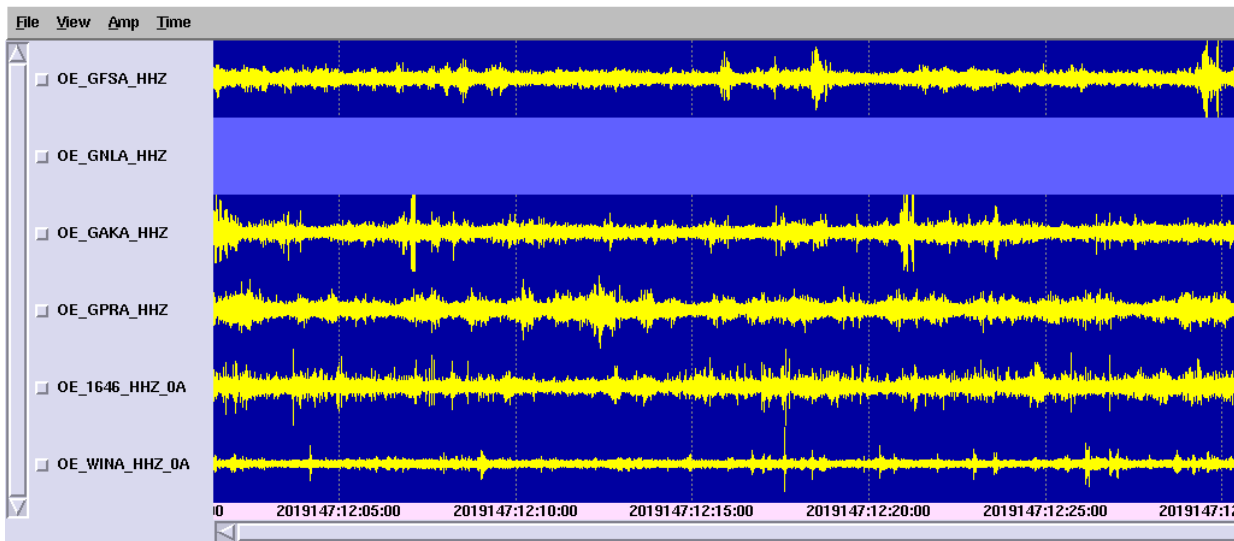


Zentauren, 30 Minuten Graphik aktualisiert um: Monday, 27-May-2019 12:32:01 UTC

seismic background
monitoring

geothermal exploration site
prior to drilling

Nanometrics Centaur
Trillium 20

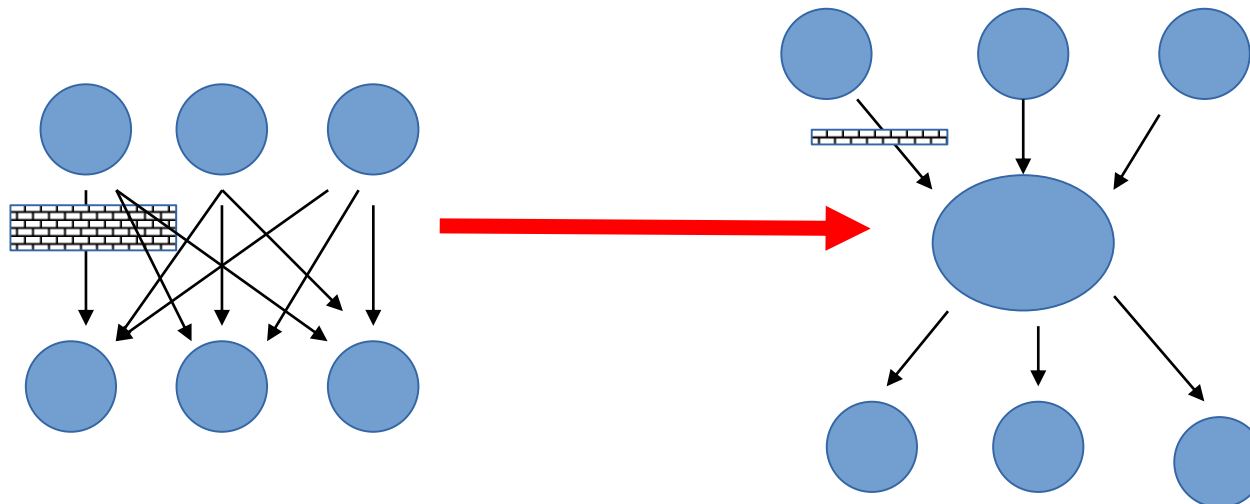


IT – restructuring

currently, still some IT services managed within geophysical group
(except web-server and firewall)

IT department tasked to take over - move from VMware to KVM
only one firewall

new design, one big data concentrator will hopefully make things easier
all machines redundant – different clouds on separate hardware
dmz completely separated from internal hardware



system setup

- init script, shell script, consists of package selection commands and basic configuration
 - default users
 - basic nagios setup
 - access to network storage
- (very few) different types of computer
 - Antelope/non-Antelope
 - special applications like webserver
 - mostly CentOS7
 - Debian 9 for webserver
 - Ubuntu 18.04 for personal workstations
- stored on wiki, easy to adapt with every installation
- use as much as possible package managers
 - yum on CentOS, apt on Ubuntu, macports on Macs

sysadmin – Antelope on other linux flavours

need to install on Debian 9 and Ubuntu 18.04
main system still on CentOS 7

Debian 9 for webserver

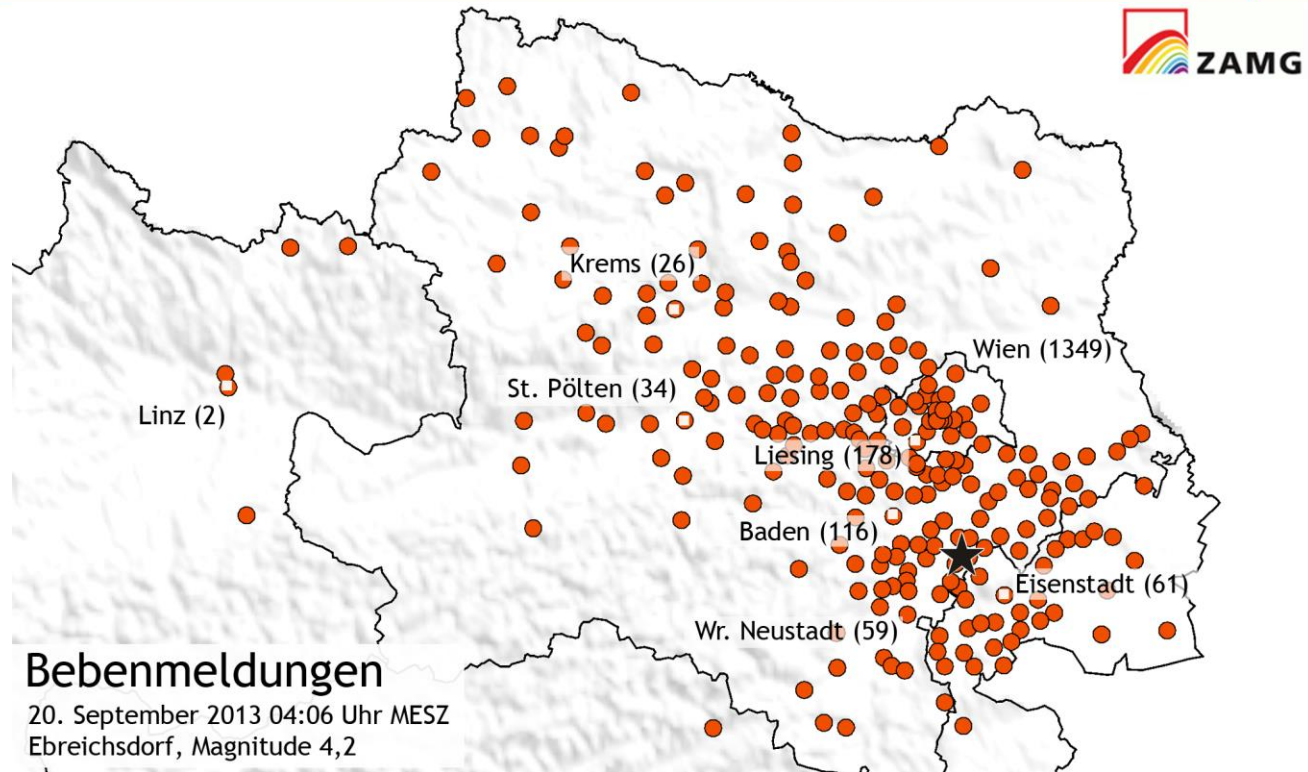
Ubuntu 18.04 for some personal workstations

Installation on Debian and Ubuntu possible with some dirty tricks:

- replace bsdtar with other tar
- link libssl to „right“ place: ln -s libssl1.0.0 libssl.so.10
- copy some libraries from CentOS
libicudata.so.50 libicui18n.so.50 libicuuc.so.50 libpng15.so.15
libXfont.so.1 libcrypto.so.10 libnettle.so.4

makes sysadmin rather complicated: needs testing before each patch

data exchange – macroseismic data



- QuakeML2.0 / Macroseismic Package for data exchange
- email / webservice / webpage ?
- raw data and interpretation results ?

webservices

new app online since AUG 17 – iOS version still needs some fixes

new app will soon be replaced by another brand new app, this time both on iOS and Android – data import

redesigned webform for felt-reports online for 2 year

images for instant assessment – wait for stronger event to evaluate

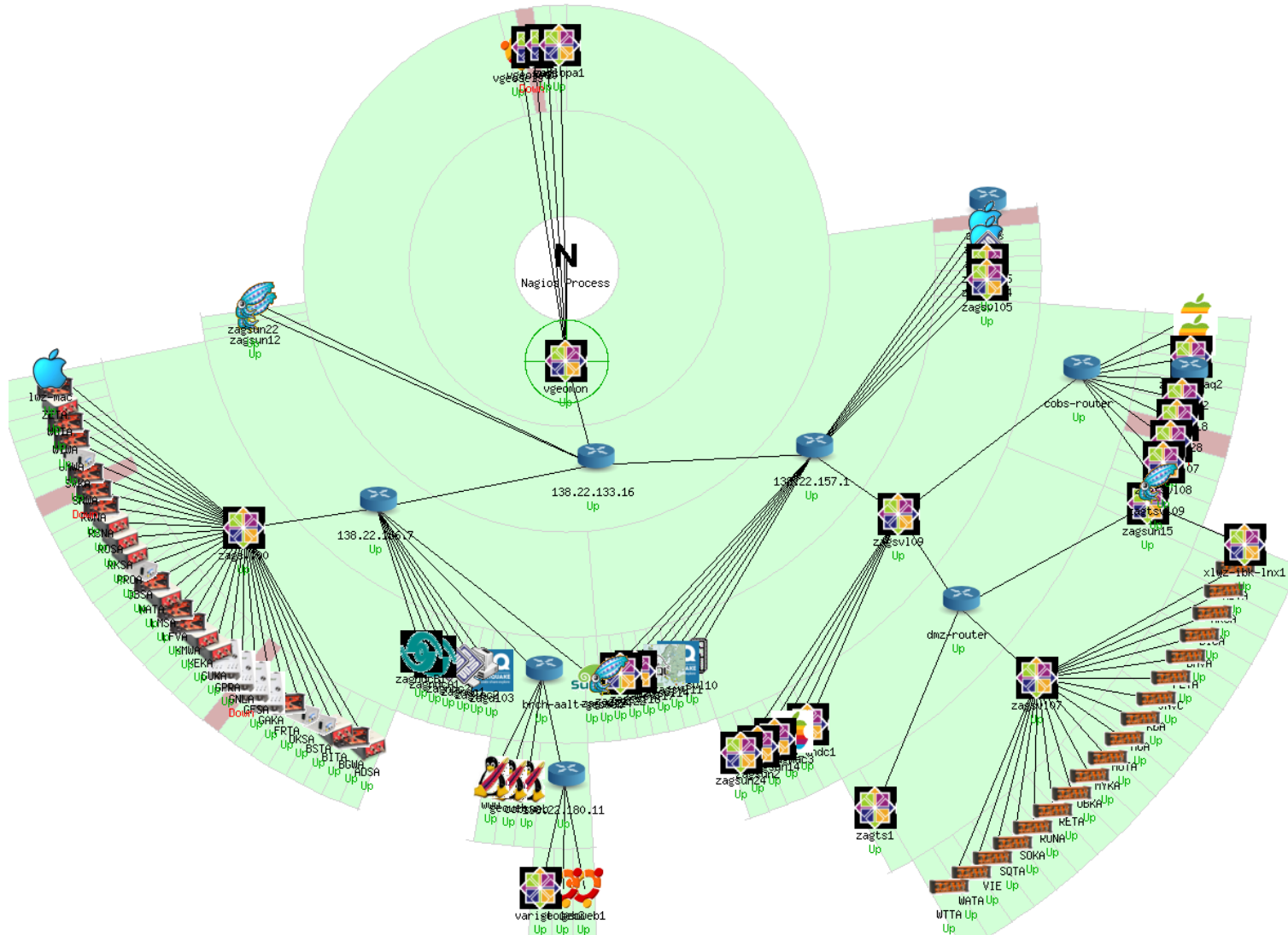
FDSN-type webservices (some available only after IT restructuring)

- station
- event
- dataselect
- app (homepage reformatted in GeoJSON)
- shakemap – introduced by Stefan Weginger for ARISTOTLE
- felt reports
- macroseismic data

databases

- metadata – sensors / digitizers
- AEC – Austrian Event Catalogue (all events from history to present, daily update)
- continuous waveforms – since late 1997, ~20T now, ~ 6G/day
- triggered events for strong-motion instruments
 - continuous data acquisition wherever possible
- event based subsets
- special datasets (EASI, AlpArray, SWATH-D, GeoTief, SeisRock)
- macroseismic data – felt reports, maps, MDPs
- fault plane solutions (fplane, moment)
- historic paper records (preserve scans – digitize later)
- extensions to css3.0 (missing stuff like azimuth gap, rms) – css3.1 compatibility
- gis
 - nearest places, enclosing polygons, distance to borders

monitoring



monitoring

Nagios Core on vgeomon - Mozilla Firefox

Current Network Status
 Last Update: Fri May 4 07:43:59 GMT 2018
 Updated every 90 seconds
 Nagios® Core™ 4.3.4 - www.nagios.org
 Logged in as nagiosadm

Host Status Totals
 Up: 28, Down: 1, Unreachable: 0, Pending: 0
 All Problems: 1, All Types: 90

Service Status Totals
 Ok: 201, Warning: 15, Unknown: 14, Critical: 28, Pending: 0
 All Problems: 57, All Types: 338

Service Status Details For All Hosts

Host	Service	Status	Last Check	Duration	Attempt	Status Information
138.22.133.16	PING	OK	05-04-2018 07:40:19	223d 20h 43m 3s	1/4	PING OK - Packet loss = 0%, RTA = 0.52 ms
138.22.157.1	PING	OK	05-04-2018 07:42:49	114d 10h 22m 23s	1/4	PING OK - Packet loss = 0%, RTA = 1.15 ms
138.22.166.7	PING	OK	05-04-2018 07:35:19	71d 11h 33m 9s	1/4	PING OK - Packet loss = 0%, RTA = 0.56 ms
138.22.180.11	PING	OK	05-04-2018 07:37:49	16d 0h 0m 35s	1/4	PING OK - Packet loss = 0%, RTA = 0.51 ms
ABTA	Datenerfassung	OK	05-04-2018 07:40:21	91d 18h 0m 16s	1/4	ORBLATENCY OK - minimum latency: 2.4 sec (OE_ABTA_HHZ/GENC)
ADSA	Datenerfassung	OK	05-04-2018 07:42:51	33d 8h 9m 34s	1/4	OK: OE ADSA HGZ ST 20.320 seconds

GNLA / Modem Spannungsversorgung

11.1350 kmV Last 14.2088 kmV Max 13.2431 kmV Average

Default Template
 Command dmz_check_modem_voltage

Host	Service	Status	Last Check	Duration	Attempt	Status Information
ARSA	Datenerfassung	OK				
BGWA	Datenerfassung	OK				
BIOA	Datenerfassung	OK				
BSTA	K2 Traffic	OK				
DAIA	Datenerfassung	OK				
FETA	Datenerfassung	OK				
FRTA	Datenerfassung	OK				
JAVC	Datenerfassung	OK	05-04-2018 07:37:33	0d 1h 46m 26s	1/4	ORBLATENCY OK - minimum latency: 9.9 sec (OE_JAVC_HHZ/GENC)
KBA	Datenerfassung	OK	05-04-2018 07:34:43	86d 0h 5m 35s	1/4	ORBLATENCY OK - minimum latency: 2.4 sec (OE_KBA_HHZ/GENC)



- Ihr Wetterfoto
- Ihre Unwettermeldung
- Ihr Erdbebenbericht
- Ihre Meinung
- News

Suche

Erweiterte Suche...

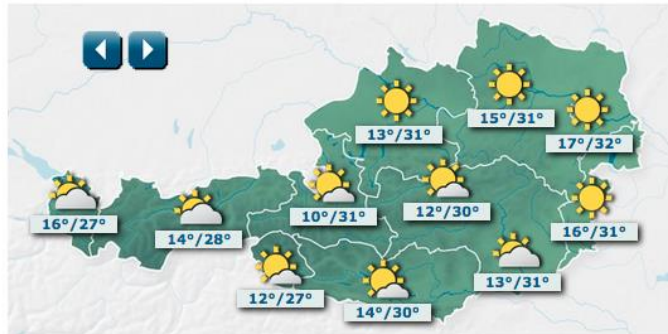
Die ZAMG ist eine
Forschungseinrichtung des



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Meteorologie und Geodynamik
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Telefon: +43 1 36 0 26
E-Mail ***

Aktuell

Prognose für heute Vormittag



Wetterwarnungen



Aktuelle Erdbeben



Klimatothek



Webcam Wien Hohe Warte



Conrad Observatorium



Ausstellung: Museum NÖ



Hello to the Antelope Users

ZAMG /// NEWS



29.05.2017

Frühling 2017: einer der zehn wärmsten der Messgeschichte
Vorläufige Frühlingbilanz: Temperatur 1,5°C über dem vieljährigen Mittel. Niederschlag -10 Prozent, Sonne +15 Prozent. [mehr](#) ***



23.05.2017

Klimaschutz als Chance für wirtschaftliche und gesellschaftliche Entwicklung
Forscherinnen und Forscher des Climate Change Centre Austria (CCA) appellierten am 18. Österreichischen Klimatag an die Politik. [mehr](#) ***



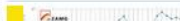
17.05.2017

Ein neuer online-Fragebogen für Erdbeben-Wahrnehmungen
Das Formular ist auf dem aktuellsten Stand von Wissenschaft und Technik. [mehr](#) ***



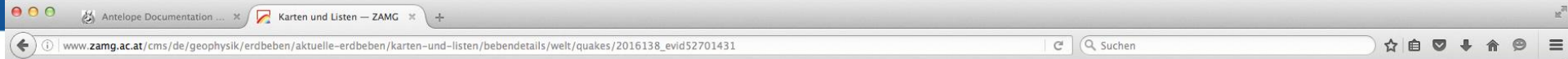
16.05.2017

Klimawandel in Städten: neue internationale Kooperation
13 internationale Institutionen starteten eine Zusammenarbeit, um Maßnahmen zur Anpassung an den Klimawandel in Großstädten zu untersuchen. [mehr](#) ***



00.05.2017

Homepage



- Aktuell
- Wetter
- Klima
- Umwelt
- Geophysik**
- Forschung
- Produkte
- Facebook

- Erdbeben
 - Aktuelle Erdbeben
 - Karten und Listen
 - Erdbebenmeldung
 - NEWS und Beiträge
 - Ihr Erdbebenbericht
 - Ihr Erdbebenbericht
 - Verhaltensratgeber
 - Erdbeben in Österreich
 - Der Erdbebendienst
 - Historische Erdbeben
 - Erdbebenarchiv
 - Informationsmaterial
 - Live-Seismogramm
- Magnetik
- Angewandte Geophysik
- Conrad Observatorium
- Gravimetrie
- Nationales Datenzentrum
- Geophysik - Forschung
- Produkte und Services
- Lexikon
- Live - Seismogramm
- News
- Team und Kontakte

Suche

Erweiterte Suche...

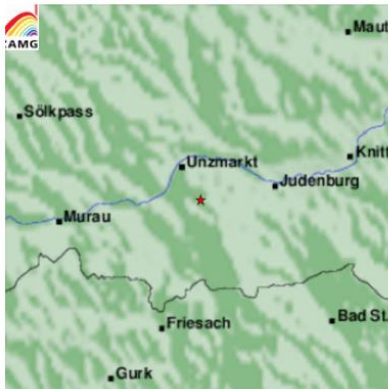
Die ZAMG ist eine Forschungseinrichtung des **bmwfw**

Geophysik / Erdbeben / Aktuelle Erdbeben / Karten und Listen

Erdbeben - Karten und Listen

- Österreich
- Europa
- Welt**
- Legende

Erdbeben bei Unzmarkt / Steiermark, M 2.3



Datum:	17. Mai 2016
Herzzeit:	00:52:18 UTC (02:52 MESZ)
Magnitude:	2.3 (ml)
Herdtiefe:	3 km
Epizentrum:	47.15°N, 14.49°O (GoogleMaps)
Entfernungen:	6 km SSO von Unzmarkt 13 km W von Judenburg 23 km NNO von Friesach 24 km O von Murau 61 km NNO von Klagenfurt
Quelle:	ZAMG

Erdbebenmeldung

Der Österreichische Erdbebendienst der Zentralanstalt für Meteorologie und Geodynamik meldet:

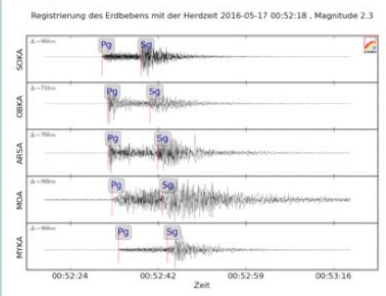
Am Dienstag, den 17. Mai 2016 ereignete sich nachts um 02:52 Uhr MESZ südlich von Unzmarkt, Steiermark, ein Erdbeben der Magnitude 2.3. Es wurde von einigen Personen leicht verspürt.

Schäden an Gebäuden sind bei dieser Stärke nicht zu erwarten.

Verfasserin: Mag. Rita Meurers/Seismologin







[Berichten Sie uns über Ihre Erdbebenwahrnehmung](#)

Seismogramm



felt reports – images

Bitte wählen Sie abschließend das Bild aus, das Ihre Wahrnehmungen am besten beschreibt:

<p>Schwach verspürt</p>  <p>Schwache Erschütterungen. Ruhende Personen merken ein leichtes Zittern oder Schwanken. Lampen pendeln schwach.</p> <p><input type="radio"/> Trifft am ehesten zu</p>	<p>Deutlich verspürt</p>  <p>Deutlich zu spüren. Einige Schlafende erwachen. Rütteln von Möbeln, Türen und Fensterläden. Gläser und Geschirr klirren.</p> <p><input type="radio"/> Trifft am ehesten zu</p>	<p>Stark verspürt</p>  <p>Erschreckend. Viele Schlafende erwachen. Starkes Rütteln des Gebäudes, Raumes, der Möbel. Kleine Gegenstände werden verschoben oder fallen vereinzelt um. Möglich sind: Haarrisse im Verputz.</p> <p><input type="radio"/> Trifft am ehesten zu</p>
<p>Leichte Gebäudeschäden</p>  <p>Viele erschrecken und flüchten ins Freie. Möbel werden verschoben, einige Gegenstände fallen um. Möglich sind: Risse in Wänden, Abfallen von Verputzteilen und leichte Schäden an Rauchfängen.</p> <p><input type="radio"/> Trifft am ehesten zu</p>	<p>Gebäudeschäden</p>  <p>Die meisten haben Angst und flüchten ins Freie. Es ist schwierig, das Gleichgewicht zu halten. Viele Gegenstände fallen aus Regalen. Möglich sind: Mauerrisse, teilweiser Einsturz von Rauchfängen, Herabfallen von Dachziegeln.</p> <p><input type="radio"/> Trifft am ehesten zu</p>	<p>Schwere Gebäudeschäden</p>  <p>Panik. Viele verlieren das Gleichgewicht. Schwere Gegenstände, auch Möbel, fallen um. Schwere Mauerschäden und strukturelle Schäden an Gebäuden. Einige Gebäude in schlechtem Zustand stürzen ein.</p> <p><input type="radio"/> Trifft am ehesten zu</p>

include automatic solutions to event list

images for rapid assessment of intensities

- similar to EMSC app

things we are (still) working on

- responsive redesign of internal website
- various apps based on traceview (picker)
- python rewrite of dbloc2 plugins
- evaluate smrspalarm as a replacment for threshold based triggering
- many more strong motion sites, few more broadband sites
- simple design for broadband installations
- installations on Conrad observatory, Sonnblick observatory
- improve monitoring and especially alerting
- site characterization

communication ?

All,

Altus instruments will start reporting incorrect time as of Sunday July 1 due to the second GPS rollover. Here is some suggested information from Ian and I to respond to customer inquiries about the problem.

Please share with others as you see fit.

Altus instruments are 27 year old technology, which has been announced as end-of-life long ago, and has been posted on our corporate website:

- Web site : <https://kinematics.com/wp-content/uploads/2017/07/ATLUS-Obsolescence.pdf>

The Altus was patched 19 years ago for the first week 1024 rollover in November 1998, this patch was issued 40 weeks ahead of the first GPS rollover and thus expired 40 weeks before the second rollover (as of end of day June 30, 2018) and Altus units using GPS as of that date will report incorrect time by a factor of 1024 weeks (effectively reporting time in 1999). This is an artifact of the GPS satellite system implementation and really has nothing specifically to do with

wishes

plugins for dbloc2 / dbe

support for &ref() or even &Literal() in new pf-Stuff (pfe, BUPf)

increase filesize for external files when calling stuffPkt

stationXML2db

clients for webservices – import waveforms, catalogs, metadata

Thank you for your attention

