Antelope in Austria

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Antelope Users Meeting 2019, Taormina

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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 these plans

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

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Seismology Group - tasks

- 24/7 on-call – rotatation 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 comissions
- (help to) operate the seismic networks in Bolzano and Brno
- monitoring of structures

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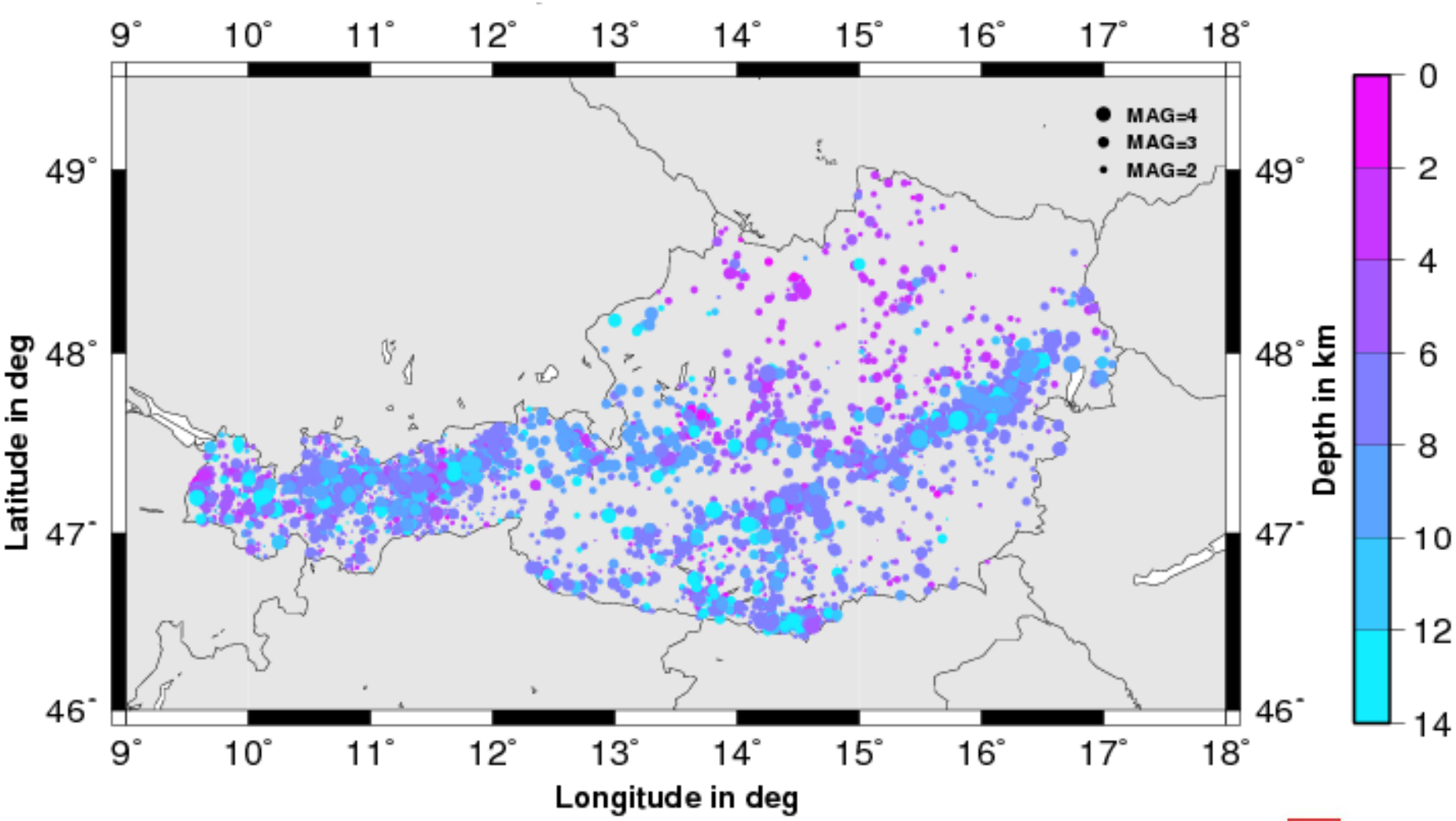
Earthquakes located in Austria since 1900



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

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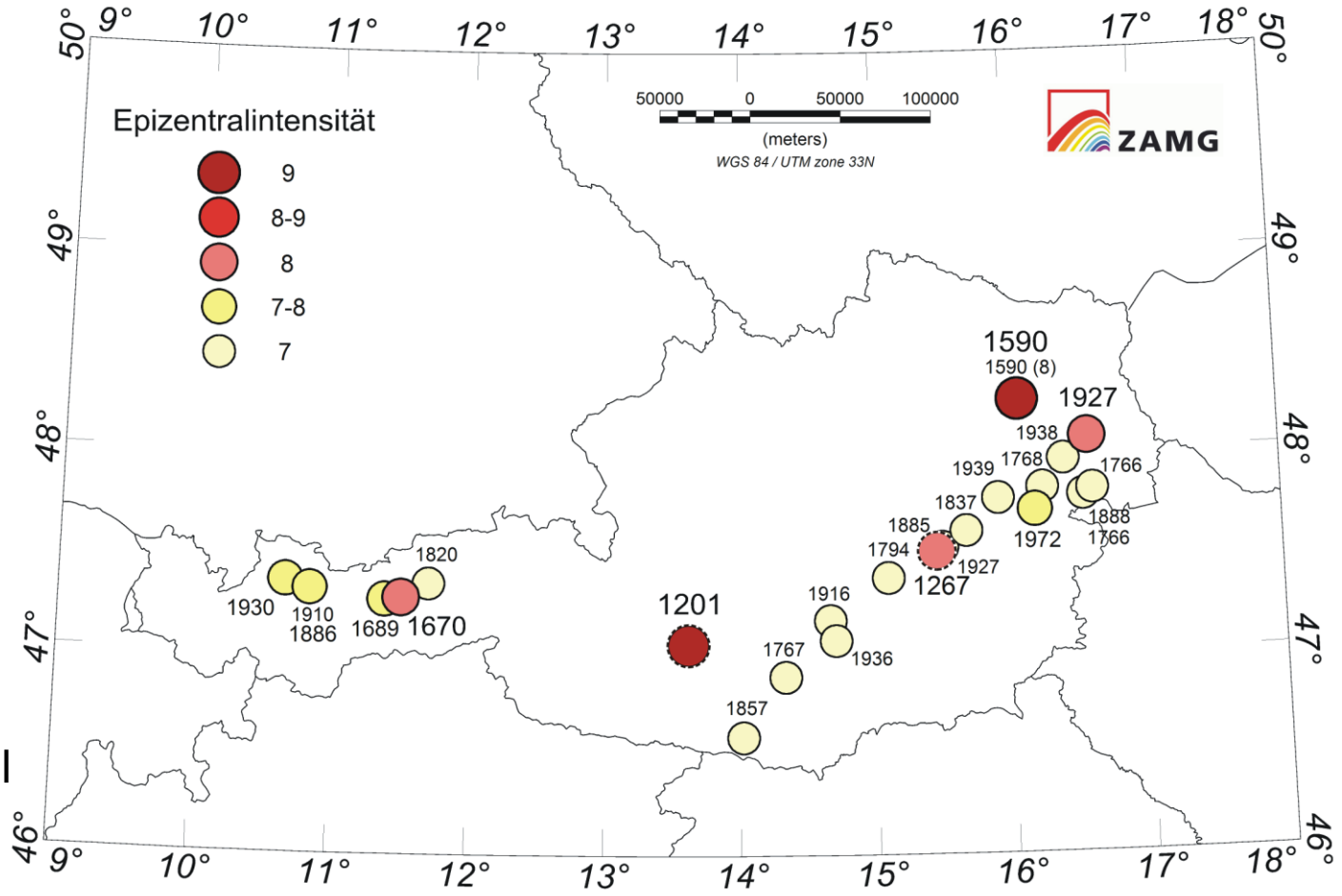
Historic Earthquakes with Heavy Damages

- 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)

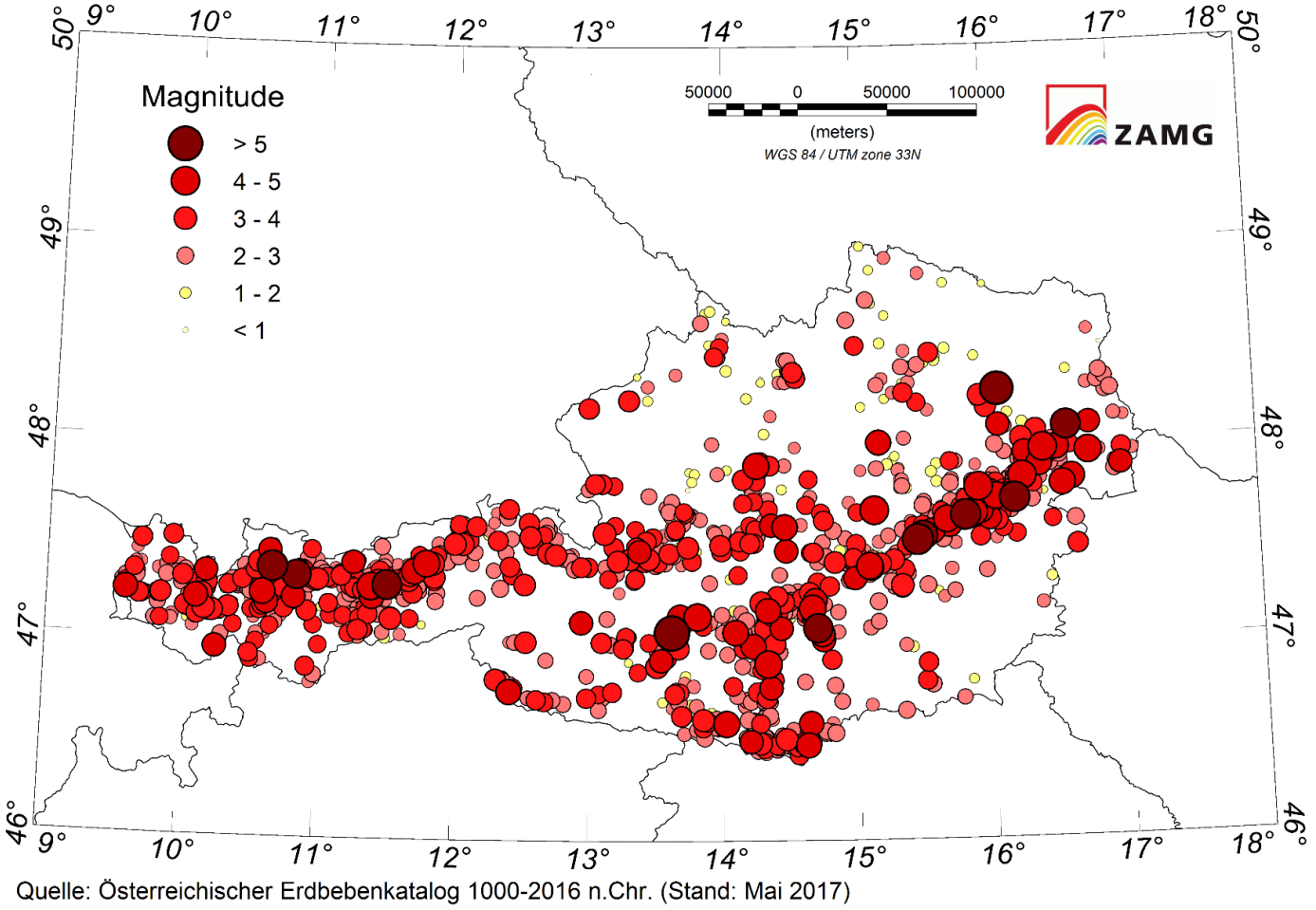


Quelle: Österreichischer Erdbebenkatalog 1000-2015 n.Chr. (Stand: Juni 2015)

Felt Earthquakes

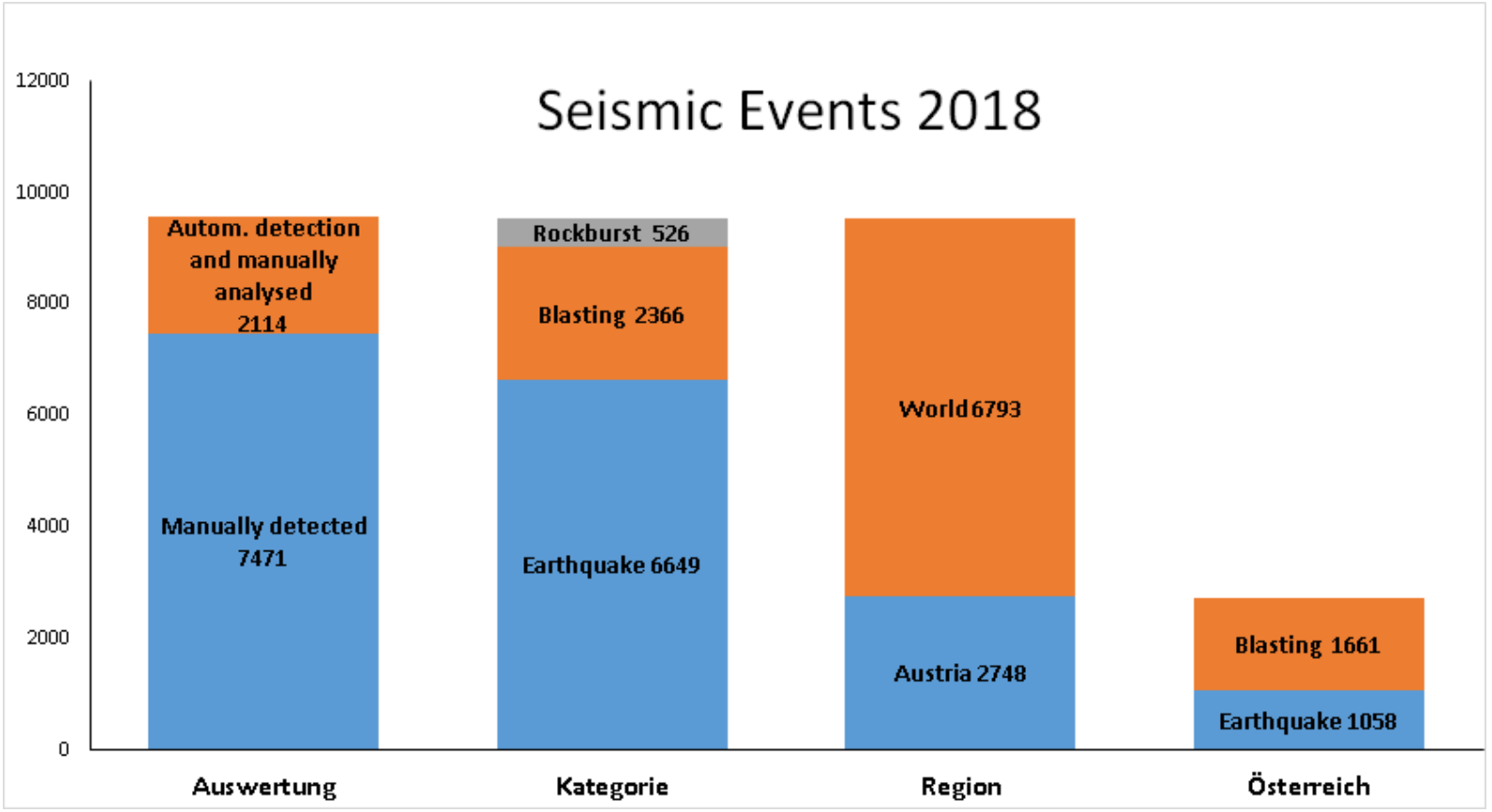
Felt Earthquakes in Austria

- 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)

processing - statistics



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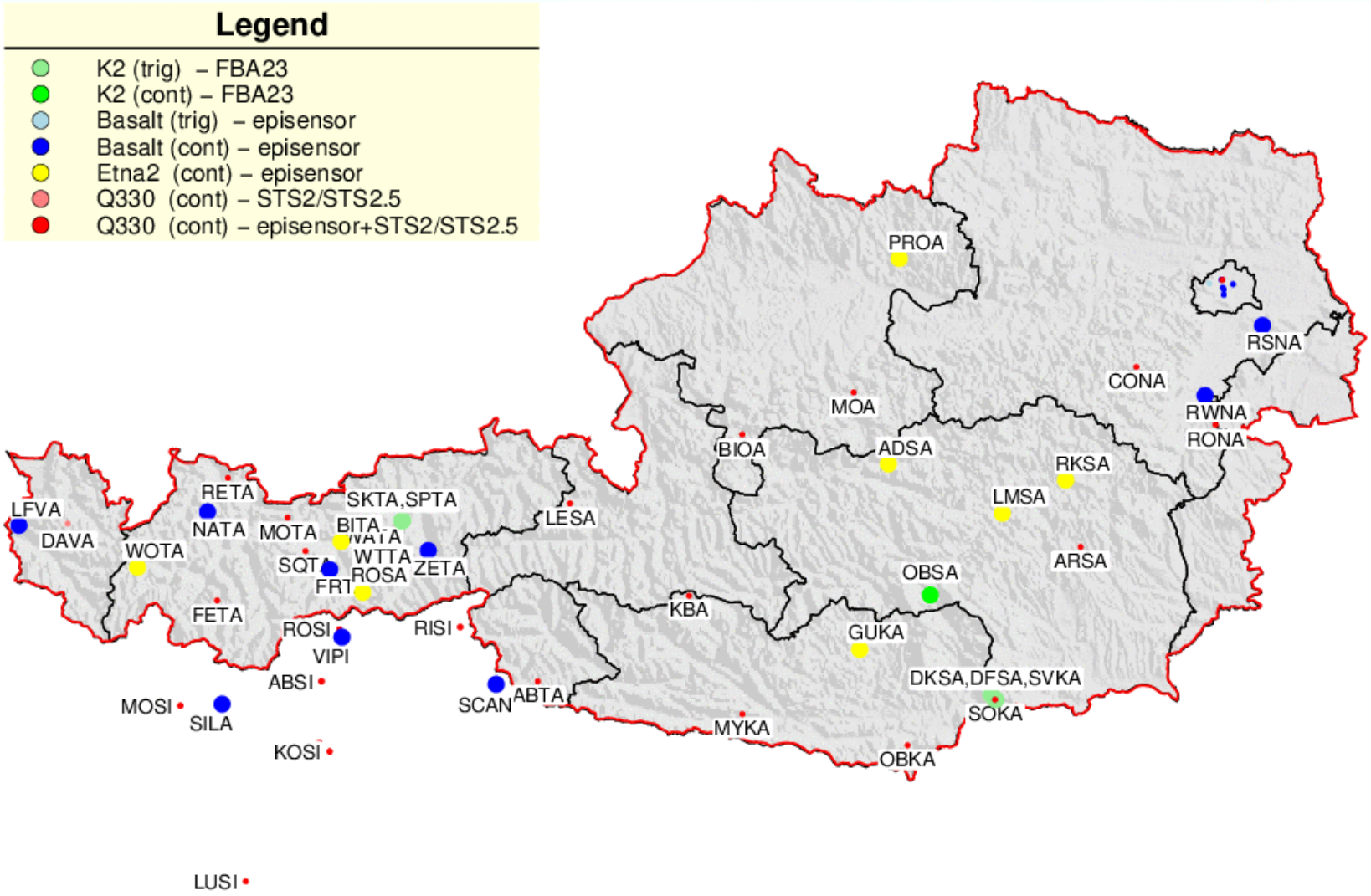
current network



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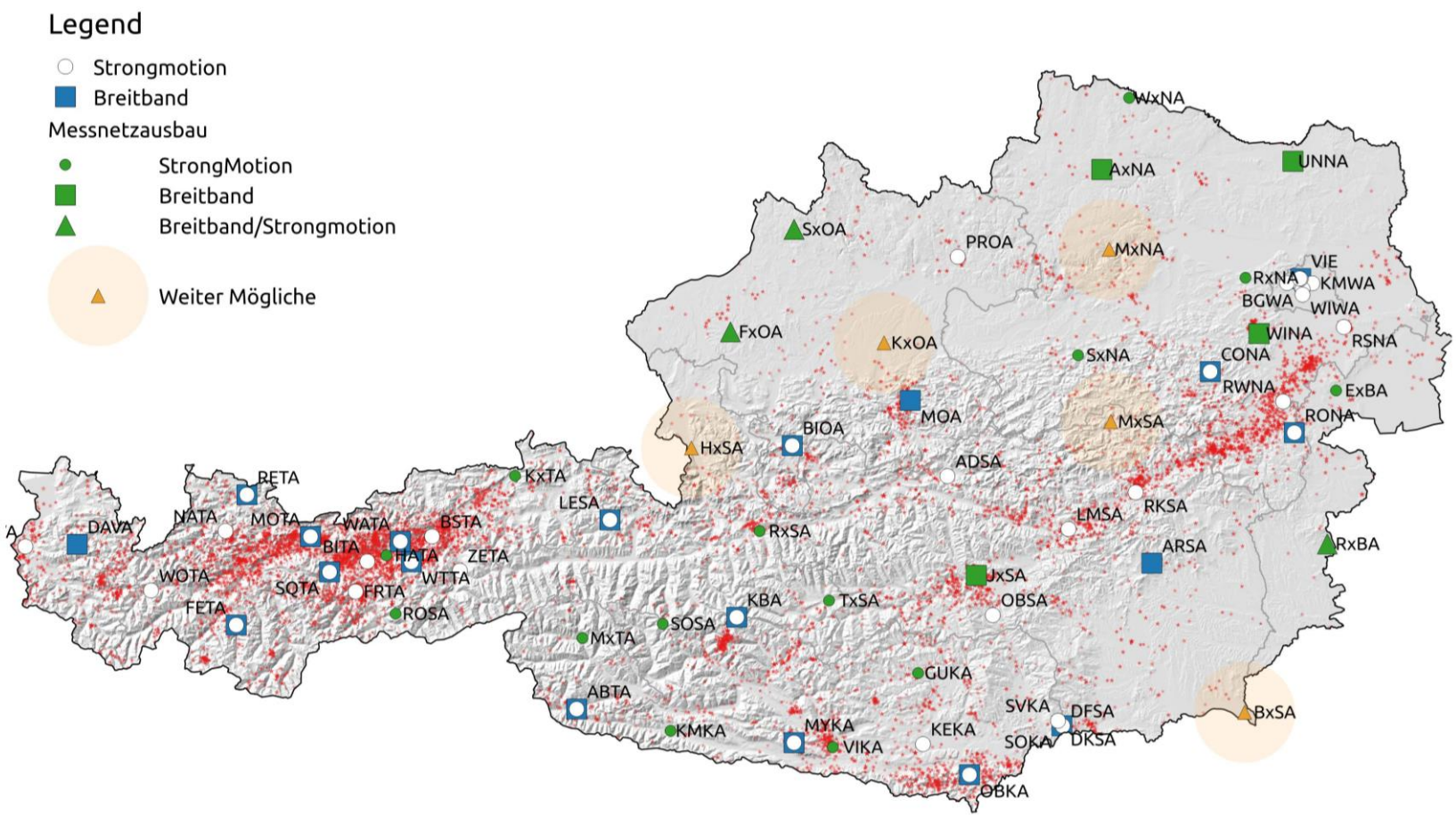
planned stations / upgraded stations



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station design - broadband

separate housings for power supply / communications equipment and digitizer

shielded housing for sensor

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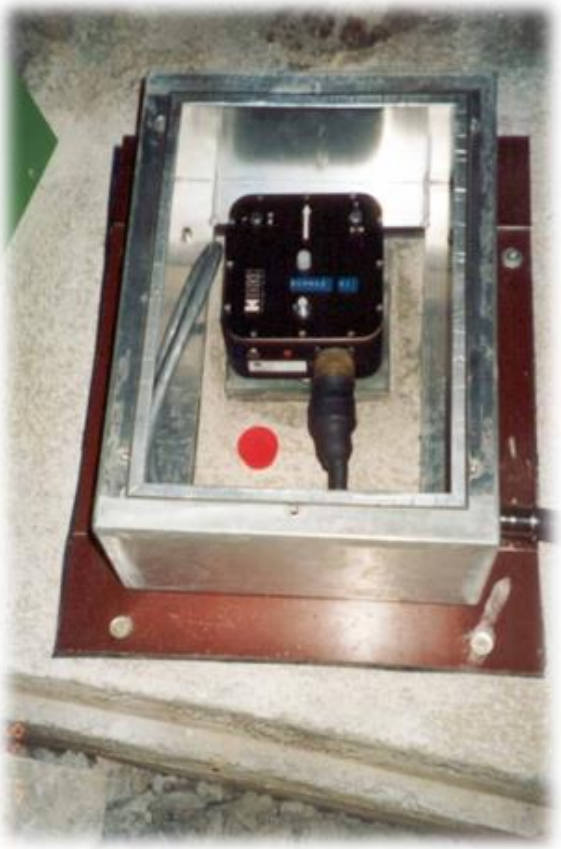
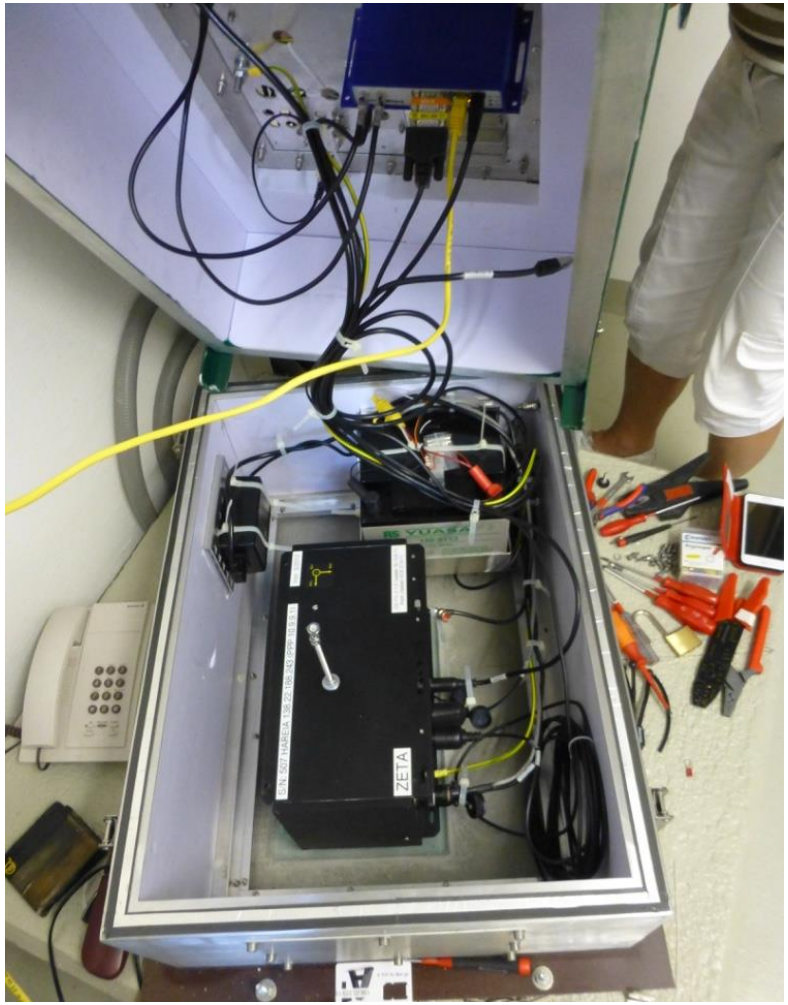
new design - RONA

station design – strong motion



station design – strong motion



station design – strong motion

complete design during ARMONIA project

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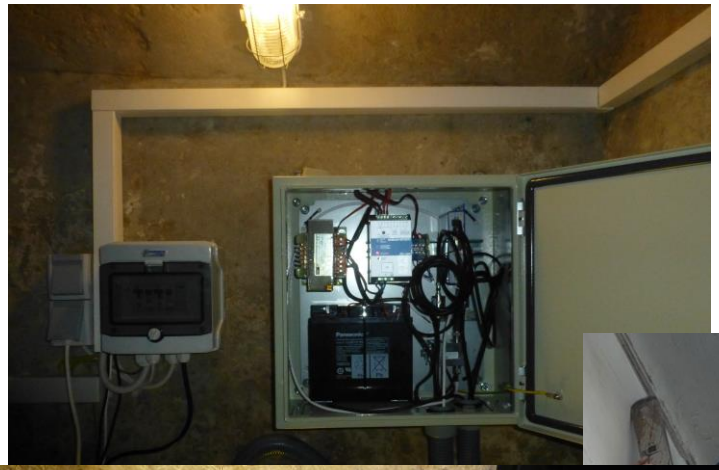
station design – strong motion



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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

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upgrading existing stations

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

need to replace gps cable from ligthning 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

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instrument testing

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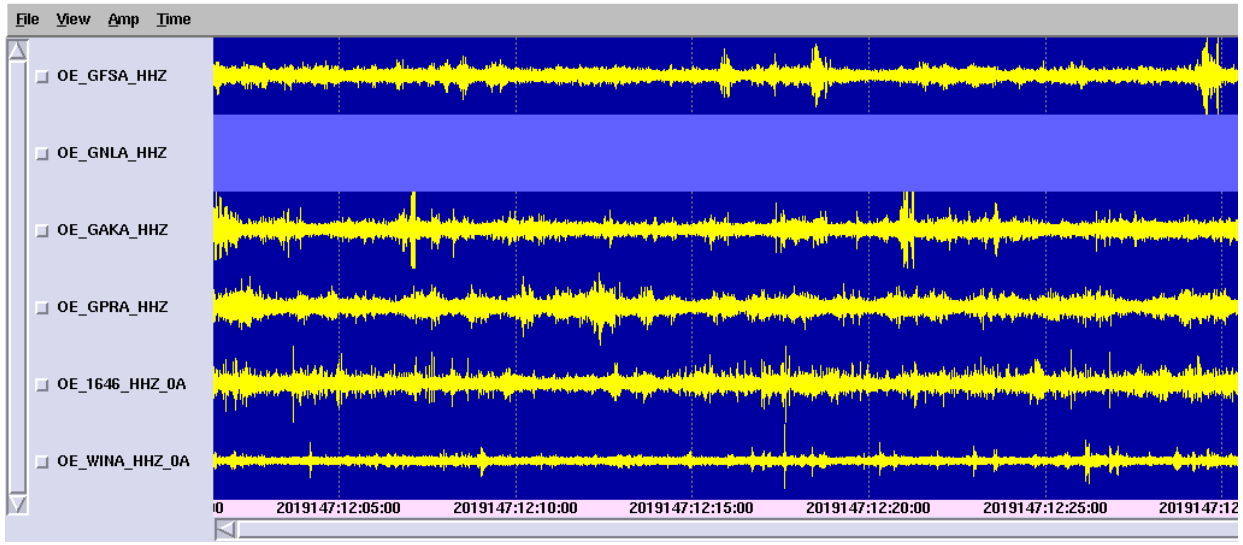
GeoTief

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

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IT – restructuring

currently, still some IT services managed within geophysical group

(except web-server and firewall)

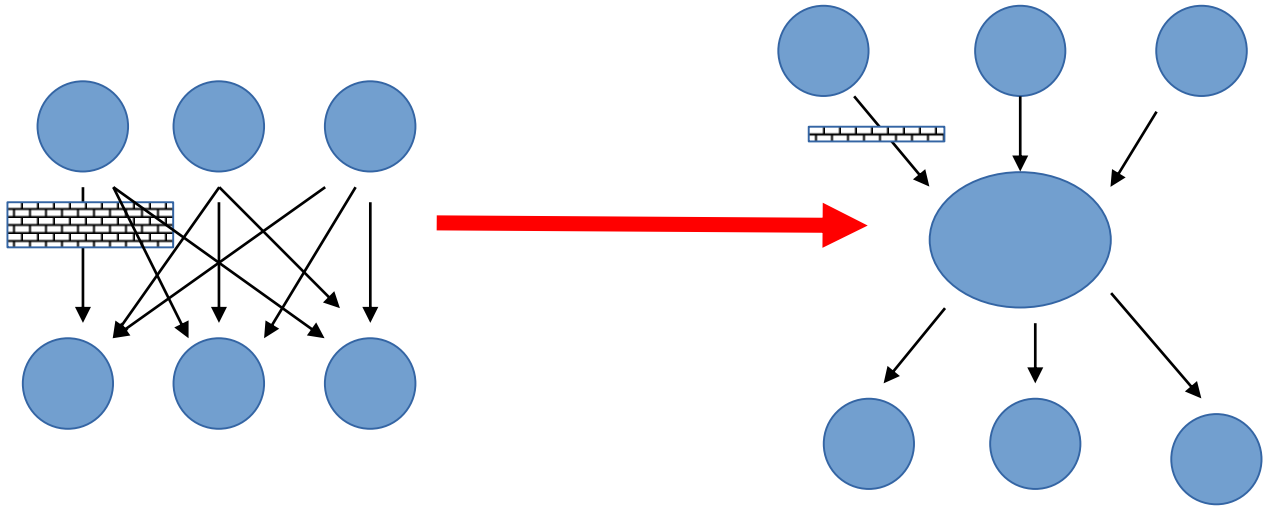
IT department tasked to take over - move from VMware to KVM

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



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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

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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 webservers
Ubuntu 18.04 for some personal workstations

Installation on Debian andUbuntu 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

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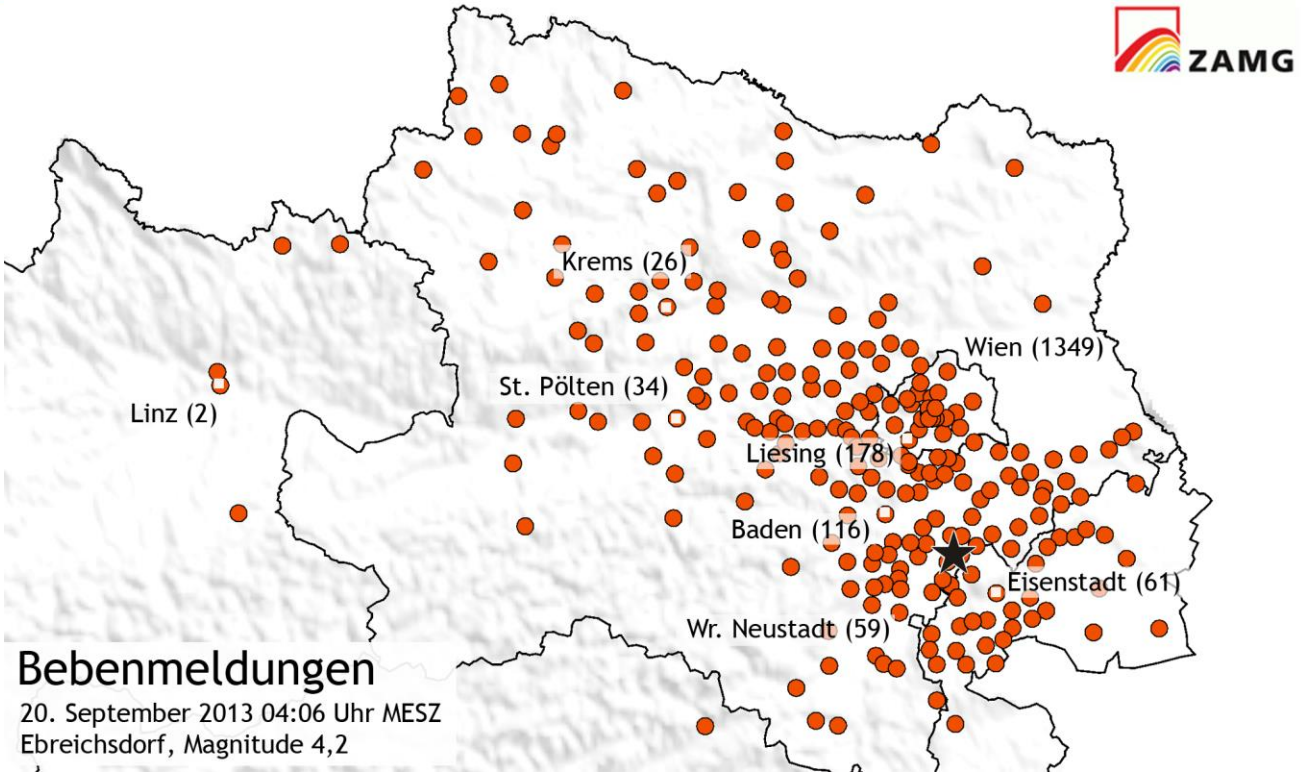
data exchange – macroseismic data



- QuakeML2.0 / Macroseimic 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

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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

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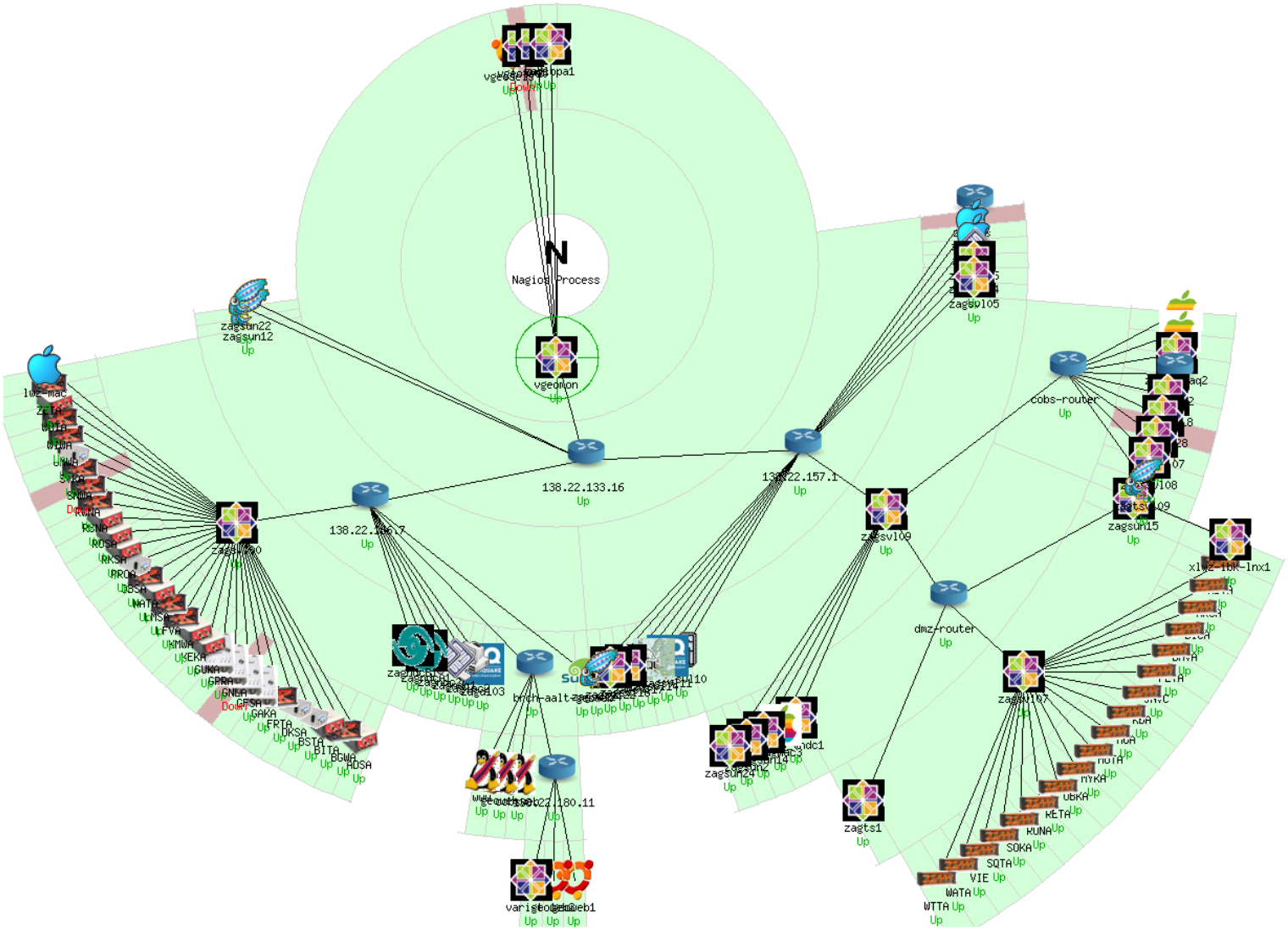
monitoring



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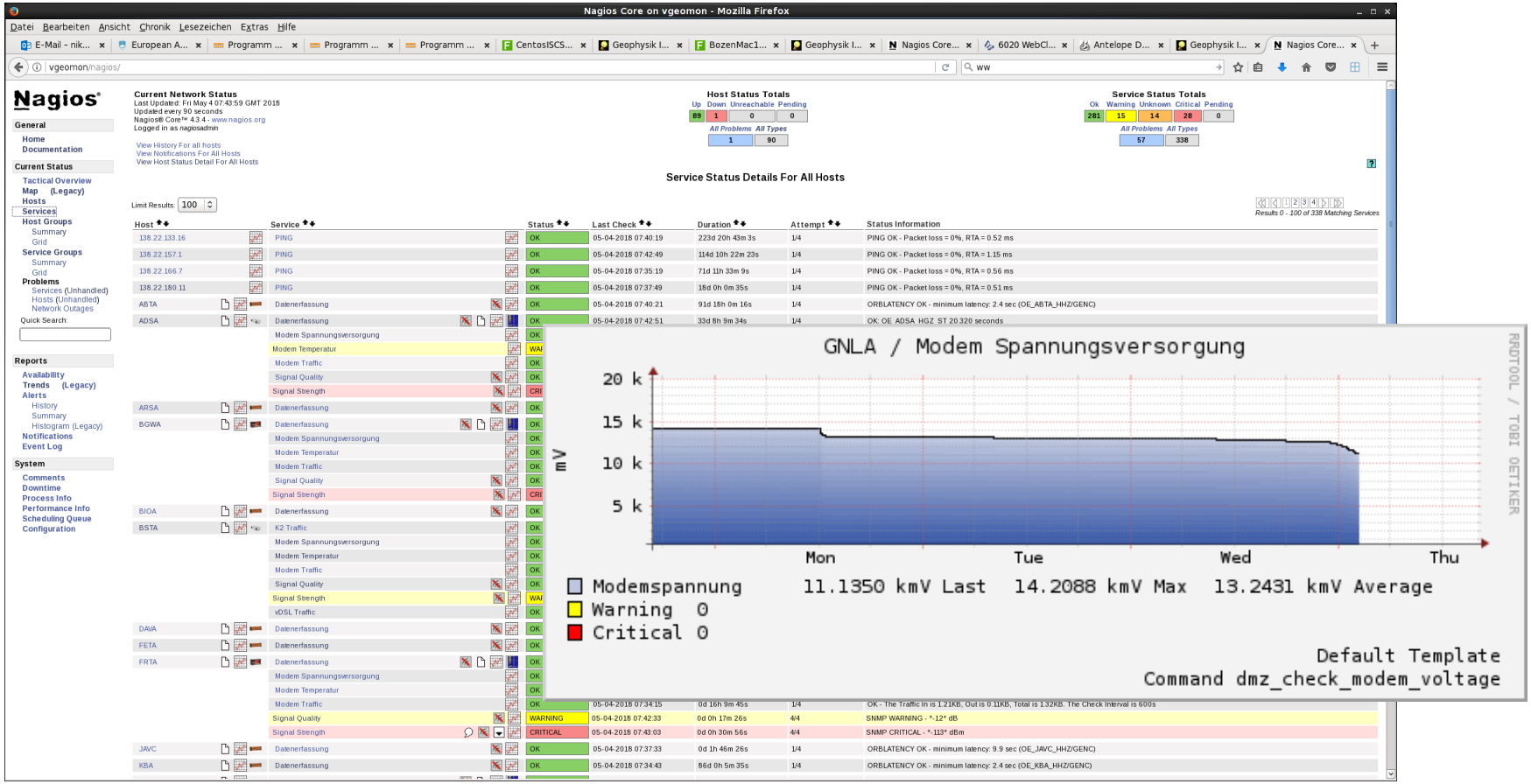
monitoring



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www.zamg.ac.at/cms/de/geophysik/erdbeben/aktuelle-erdbeben/karten-und-listen/bebendetails/welt/quakes/2016138_evid52701431

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Website durchsuchen
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
Herdzeit:	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:

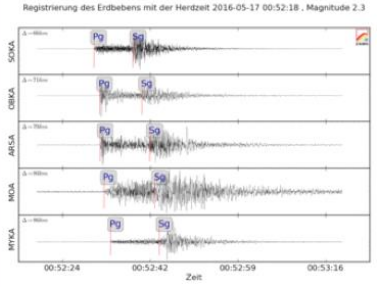
Am Dienstag, den 17. Mai 2016 ereignete sich nachts um 02:52 Uhr MESZ südlich von Unzmarkt, Steiermark, ein Erdbeben der Magnitude 2,3. Es wurde von einigen Personen leicht verspürt.

Schäden an Gebäuden sind bei dieser Stärke nicht zu erwarten.

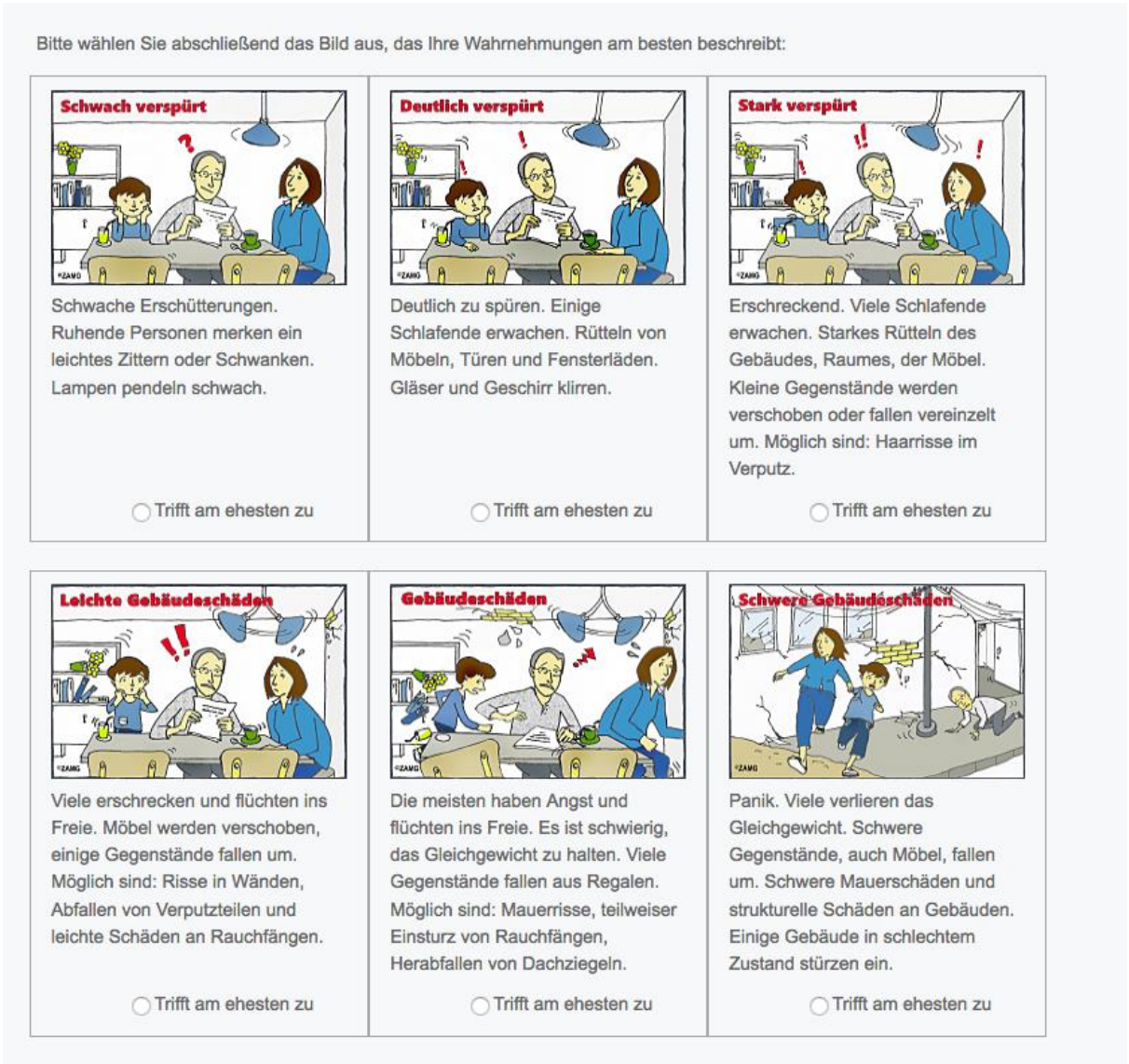
Verfasserin: Mag. Rita Meurers/Seismologin

Berichten Sie uns über Ihre Erdbebenwahrnehmung

Seismogramm



felt reports – images



include automatic solutions to event list

images for rapid assessment of intensities
- similar to EMSC app

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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

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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://kinemetrics.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

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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

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