T3.4-P9

SAMS Software Functionality Enhancement

Marco Walter[1], Rolf Häfner[1] & Manfred Joswig[2]

(1) Sonicona, Tübingen, Germany; (2) Institute for Geophysics, University of Stuttgart, Germany

contact: Marco.Walter@sonicona.com

Introduction

The responsibility for SAMS software development has been switched from the Institute for Geophysics, University of Stuttgart, Germany to the software developing company Sonicona, Tübingen, Germany. In the contractual context Sonicona developed and implemented new features and enhancements to the present SAMS software version. The key features include improvements of the data management and OSI-specific verification requirements: (1) software tool for designing the layout of the SAMS network, (2) software tool for displaying the state of health of SAMS stations, (3) software tool to show data availability, (4) improved software tool for editing SAMS mini-array meta-data, (5) software tool to record, manage and display results of data processing and analysis. The software tools for network design and data availability are presented on this poster.

New software tool for designing the SAMS-network

The tool features an interactive map with contours of detection thresholds and location accuracy updated according to the actual spread of seismic stations, considering both tripartite small arrays and single three-component stations. Stations can be placed by subjective rating of installation priority, ease of access, workload of installation teams and safety concerns. Station properties can individually be preconditioned for e.g. local noise levels, infrastrucure, underground and topographic constrains. Several scenarios for station layout can be stored and compared instantaneously by single key stroke. The figures 1-4 illustrate some key features of the new software tool for designing the SAMS network.

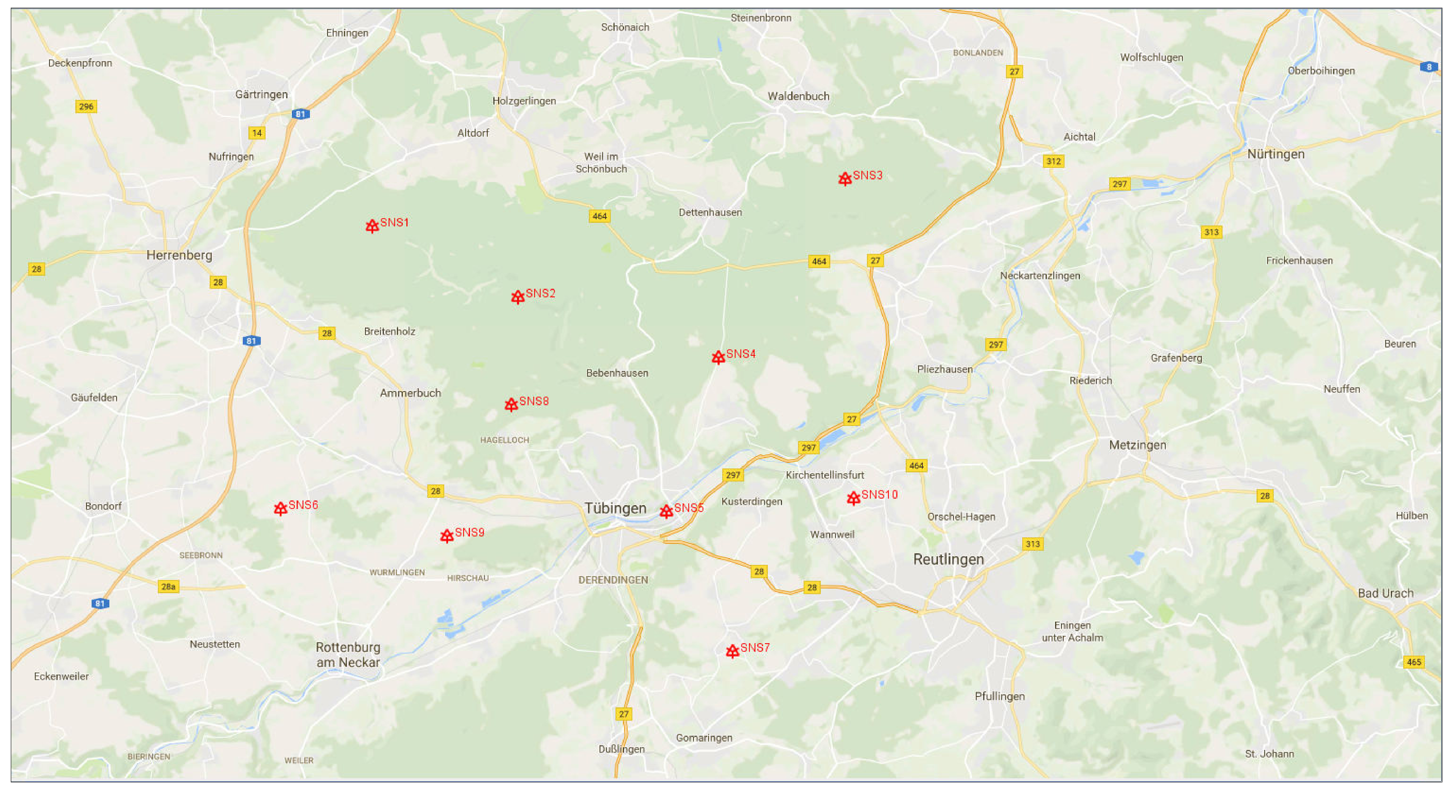
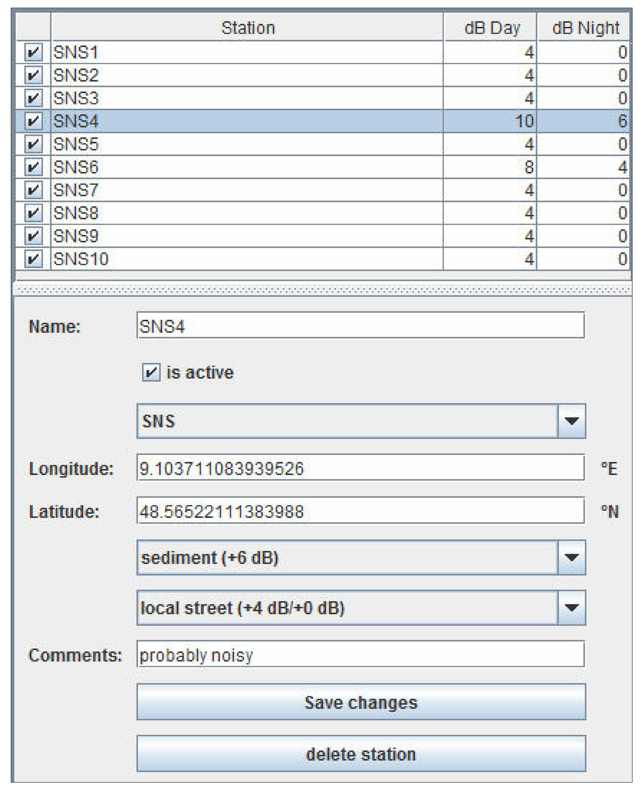


Figure 1. Definition of inspection area (in this case: fictive area around Tübingen, Germany): take a map (e.g. screenshot from Google), georeference the map and place the seismic stations, here: 10 seismic small arrays.



Station	dB Day	dB Night
SNS1	4	0
SNS2	4	0
SNS3	4	0
SNS4	10	6
SNS5	4	0
SNS6	8	4
SNS7	4	0
SNS8	4	0
SNS9	4	0
SNS10	4	0

Figure 2. Enter estimated station properties.

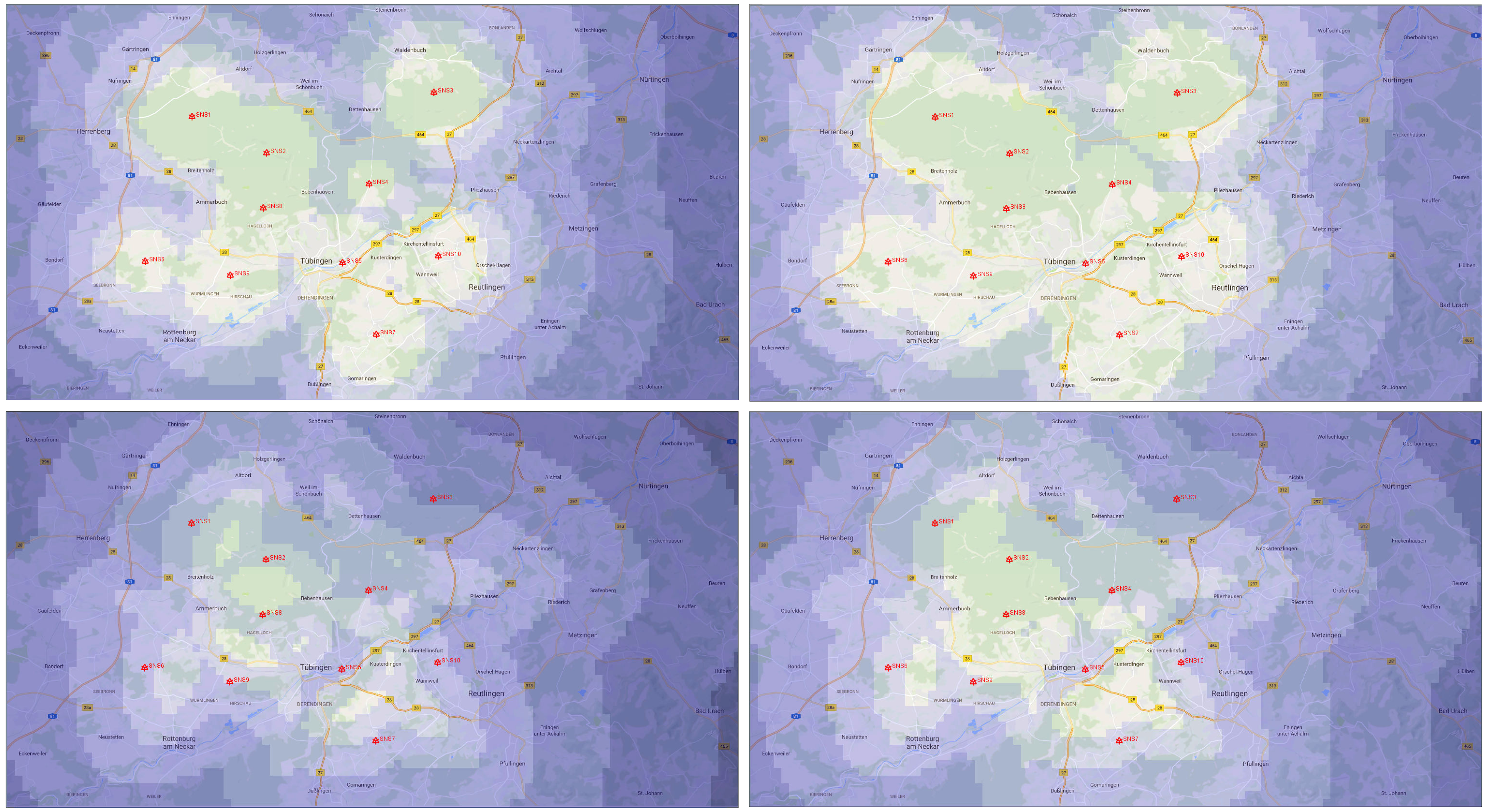


Figure 3. Simulated detection threshold for the given seismic network design: the transparenter, the better the detection threshold (range: -0.5 > Ml > -2.0). Left: at daytime, right: at nighttime, top: the signal needs to be detected at only one seismic small array, bottom: the signal needs to be detected at two seismic small arrays.

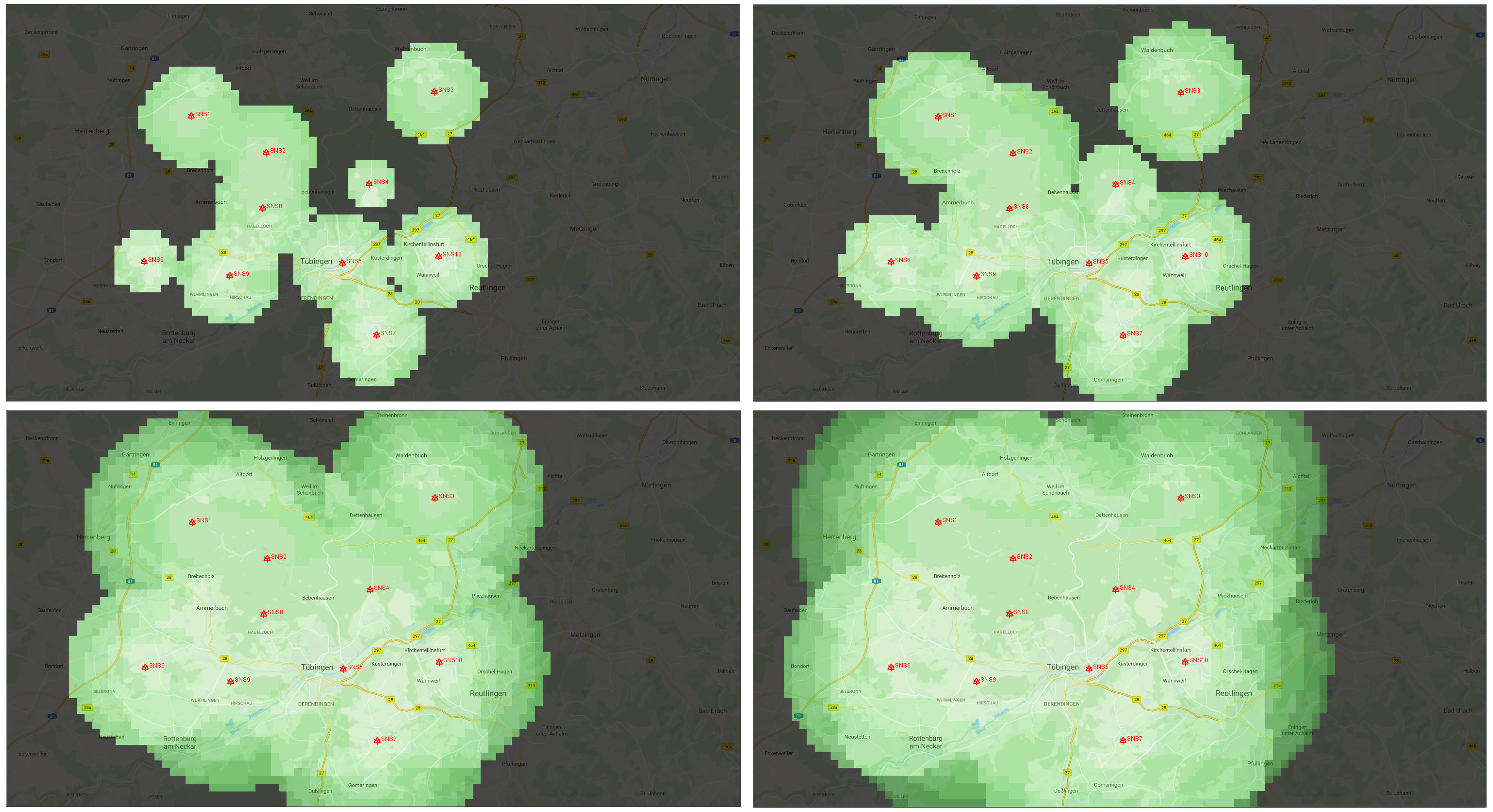


Figure 4. Uncertainty map for the given seismic network design and a given magnitude. The transparency illustrates the area where the given magnitude can be achieved. Left: at daytime, right: at nighttime, top: magnitude Ml = -2.0, bottom: magnitude Ml = -1.5.

Data availability plot

The availability of seismic data will be displayed as shown in Figure 5. The I95 noise values of each trace of each seismic small array (SNS) is color-coded and can be displayed at a glance. The data availability plot is updated in near-real-time as soon as the database contains new seismic data.

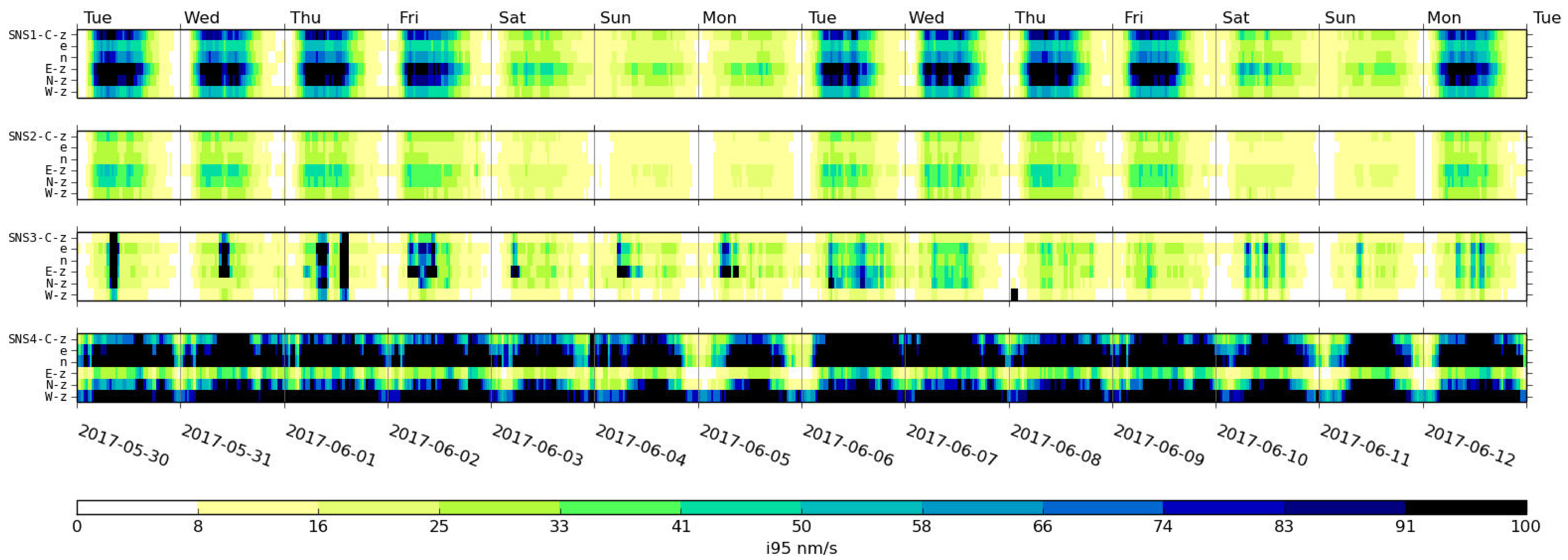


Figure 5. Data availability plot of 4 seismic small arrays (SNS) for the time period from 2017-05-30 to 2017-06-12. One can nicely identify the general state of health of the entire network as well as the changes of background noise (day/night, weekday/weekend), see figure 3 and figure 4.