SeIsmic monitoring and vulneraBilitY framework for civiL protection

Overview of the state of the project

Prof. Dr. Stefano Parolai
Project coordinator

The SIBYL Consortium

German Research Centre for Geosciences, Potsdam, Germany (coordinator)

AMRA S.c.a.r.l., Naples, Italy

Aristotle University of Thessaloniki, Thessaloniki, Greece

Technical University of Berlin, Berlin, Germany

Total budget: 637,848 EUR

EU requested contribution: 478,386 EUR (75%)

Civil Protection Authorities SIBYL will endeavor to interact with

Federal Agency for Technical Relief (Germany)

Federal Agency for Civil Protection and Disaster Assistance (Germany)

Bundesamt für Bevölkerungsschutz und Katastrophenhilfe

National Service of Civil Protection (Italy)

PROTEZIONE CIVILE
Presidenza del Consiglio dei Ministri
Dipartimento della Protezione Civile

General Secretariat for Civil Protection (Greece)

Aims of SIBYL

SIBYL is setting out to develop an operational framework for Civil Protection (CP) authorities to rapidly and cost-effectively assess the seismic vulnerability of the built environment.

This framework will advise CP authorities as to the most appropriate preventative actions for cases where:

- There is a need for short-notice vulnerability assessment in a pre-event situation.
- For the monitoring of the build environment's dynamic vulnerability during a seismic sequence.

The fundamental problem!

Seismic swarms and foreshocks <u>require CP authorities to rapidly assess the vulnerability of an area's structures.</u>

- Especially important for areas with little or no data about the vulnerability, seismic hazard, etc..

  (The case even for the most developed countries).
- Need for real-time information as the crises unfolds.
- Requirement for the dynamic tagging of structures that are deemed unsafe.
- Such information will advise populations if they can return home, while helping plan emergency accommodation.

However, state-of-the-art data acquisition methods generally are costly and expertise intensive.

Heritage of SIBYL

The many and varied aspects of SIBYL call upon the experience gained from a number of previous projects.

SAFER
Seismic eArly warning For EuRope

REAKT

Earthquake early warning system development.

MATRIX

Temporal changes in vulnerability

SENSUM

Applying remote sensing and in situ imaging.

SYNER-G

Structural vulnerability.

Work flow and tasks

TASK A: Task management and reporting to the commission.

TASK B: Rapid data collection and integration

TASK C: Rapid and low cost in-situ building vulnerability assessment.

TASK D: Real-time monitoring during a seismic sequence.

TASK E: Training and capacity building

TASK F: Task publicity.

Project activities so far

- EC ECHO Kick-off-meeting (Brussels, Belgium, 20.01.2015).
- Preliminary planning and technical meeting (Potsdam, Germany, 28.01.2015).
- Website established.

  www.sibyl-project.eu

- First period report (Sep. 2015).
- Dissemination plan developed (will be discussed/reviewed this afternoon).

Comments on first period report

- EC ECHO seemed in general satisfied with the progress of the project.
- They expressed some concerns about outstanding deliverables (we have dealt/dealing with this).
- Requested we keep updating the webpage (see discussion this afternoon).
- Very interested in how the communication with CP was going, and how it could be improved/expanded upon.

  (topic of discussion this afternoon)
- Some concern at the relatively low amount of spending so far, but this was explained adequately.

Field activities

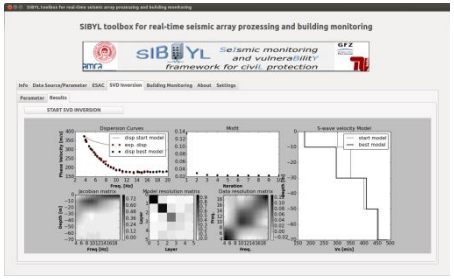
- Field work in Thessaloniki, Greece (Sep./Oct. 2015).
  Involved inspections and monitoring of the administration and Faculty of Philosophy buildings of AUTH, 2D array measurements and the maintenance of the network in the AHEPA hospital.

- Field work in Cologne, Germany (Dec. 2015).
  Inspection and monitoring of selected school buildings in the area, and undertaking 2D array measurements in the vicinity.

Some detailed activities

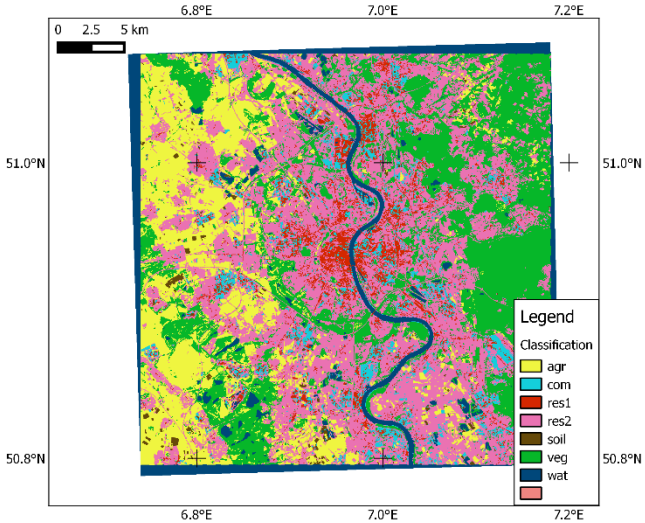
- Development of an interface between the SISM (simplified integral structural model) and conventional vulnerability models.
- Structural model validation and verification by the use of operational modal analysis e.g., the instrumented AUTH buildings (Administration, Faculty of Philosophy building) using ambient noise measurements.
- Numerical modeling of the buildings based on the available documentation plans and in-situ measurements.
- Finite element model updating to match the numerical with the experimental results through sensitivity modal analysis.
- Site characterization of the foundation soil.
- Installation and data dissemination of the SOSEWIN stations in the hospital in Thessaloniki
- Platform for real-time in situ analysis of data

Tool development



- SIBYL Toolbox for real-time ESAC array processing and building monitoring.

- A plugin for QGIS, SATEX, has been developed for processing Landsat and land use characterization.



- Routing tools for the planning of optimal in-situ omni-directional camera surveys.

- RRVS (Remote Rapid Visual Screening) expansion to a web-based tool and QGIS plugin.

End-user interaction

- As stated, EC ECHO are very interested in how this is progressing.
- A representative from THW (Germany) attended the technical meeting in Potsdam.
- Discussions were held with a THW representative in Cologne during the field activities.
- The proposed workshop in L'Aquila is at an advanced stage of planning.
- Other ideas or opportunities are welcome.

Next steps

- Next reporting period covers until the end of April, with the report therefore due at the end of June (60 days).
- L'Aquila workshop will be the next major opportunity for end-user interaction.
- A poster will be presented at the EGU.
- Other conference opportunities include the IAHS World Congress on Housing Sustainability and the European Seismological Commission General Assembly.
- Additional field activities??