The SSE-EU programme for Educational Seismology

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South Eastern Europe and Turkey exhibit the highest seismicity in the Mediterranean Basin and the North Anatolian Fault System. For this reason a consortium of schools from 5 countries have recently developed the "Students Study Earthquakes" (SSE) project, under the European Union-Erasmus framework.

The established SSE network of schools in South Eastern Europe and Turkey, monitor and study real-time earthquake data from 10 seismological stations that are located in schools at Bulgaria, Cyprus, Greece, Italy and Turkey. Each station employs the TC1 vertical seismometer, especially designed for educational purposes and easily assembled by teachers and children. At each educational seismological station the real time earthquake waveforms are collected by a Windows PC supported with Arduino Drivers and the Amaseis, Winquake and SeisGram2K60_SCHOOL, analysis tools. This data are shared amongst the network of schools and teachers play a key role in developing and applying innovative educational tools, inorder to stimulate the interest of students in seismology in earthquake prone regions

The first results of the SSE project concerning the recent seismicity in South Eastern Europe and Turkey, will be demonstated in this presentation and an evaluation of the network detection capabilities and student-teacher interaction will be discussed. These results are also disseminated to the public via the Erasmus+ Project Results Platform and the SSE web page.

Project Title: Schools Study Earthquakes (SSE)

Key Action: Cooperation for innovation and the exchange of good practices

Action Type: Strategic Partnerships for school education

Start Date: 01-09-2015
End Date: 31-08-2017
Duration in months: 24

**Coordinating Organization**:
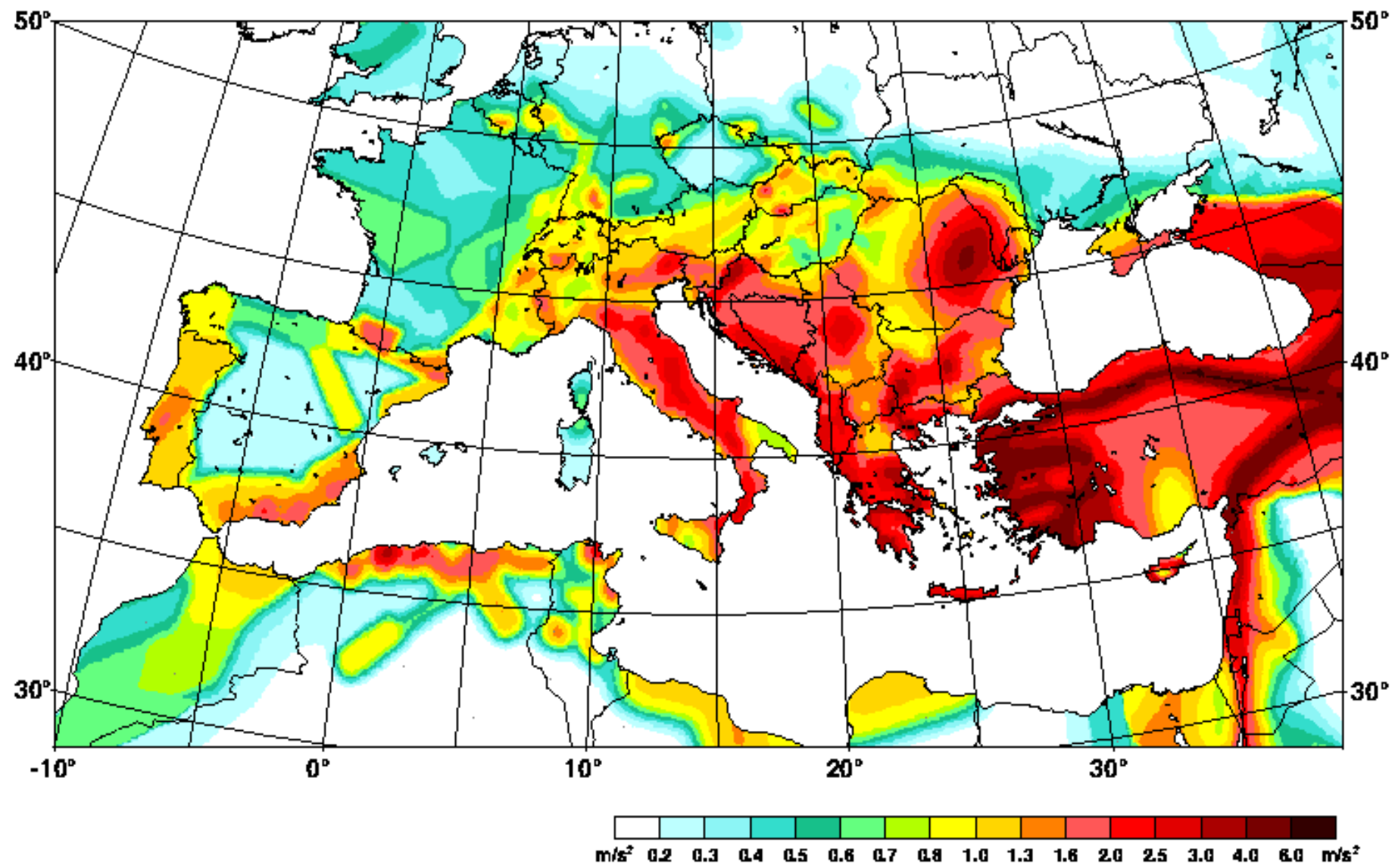NATIONAL OBSERVATORY OF ATHENS

Partners

- UNIVERSITY OF CYPRUS
  Cyprus
- Fondazione IDIS-Città della Scienza
  Italy
- BAHCESEHIR EGITIM KURUMLARI ANONIM SIRKETI
  Turkey
- ELLINOGERMANIKI AGOGI SCHOLI PANAGEA SAVVA AE
  Greece
- NATIONAL RESEARCH NETWORK ASSOCIATION
  Bulgaria

SSE Project Participant Countries

Recent Seismicity

2016-09-02 07:00

EMSC
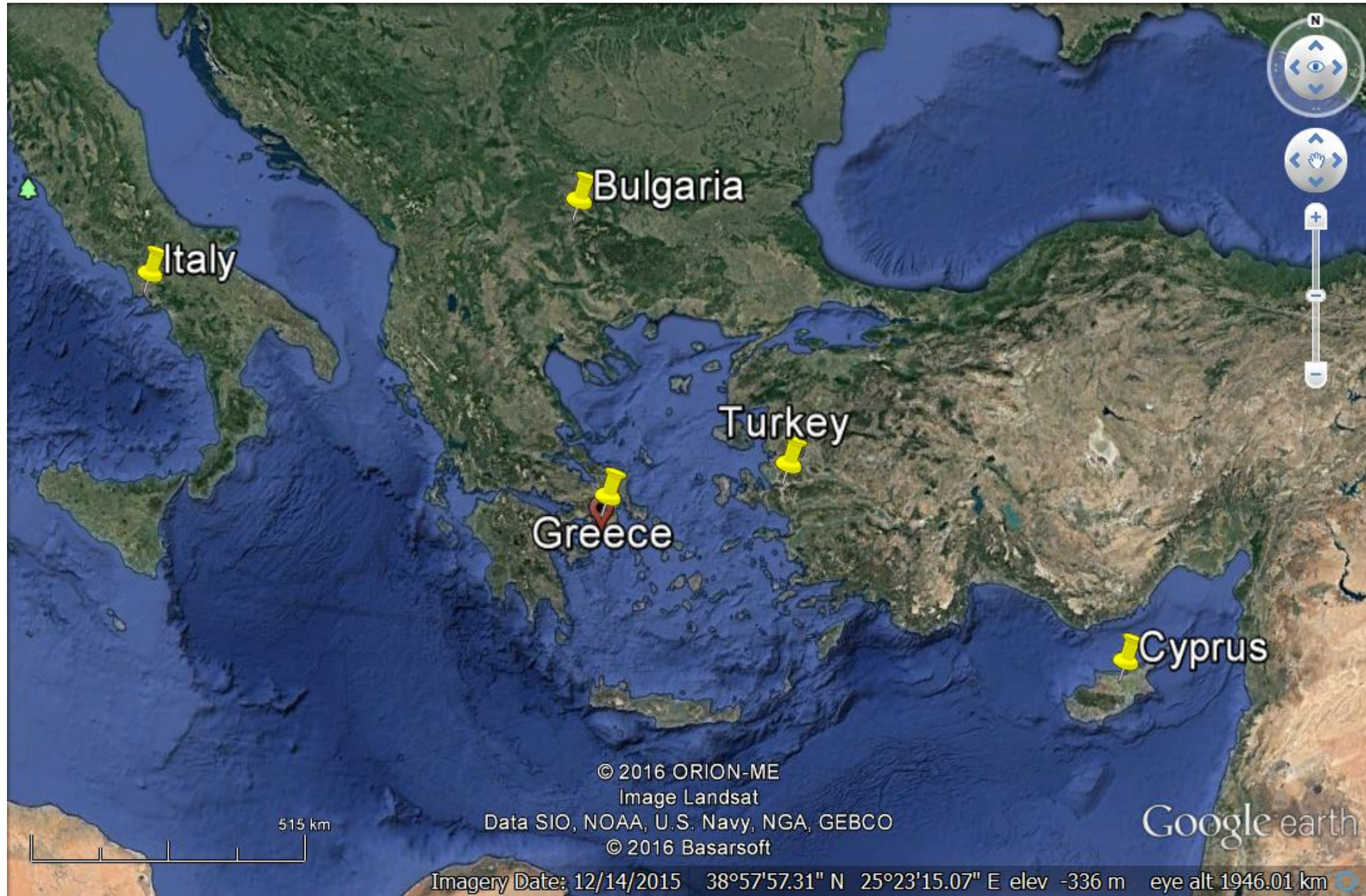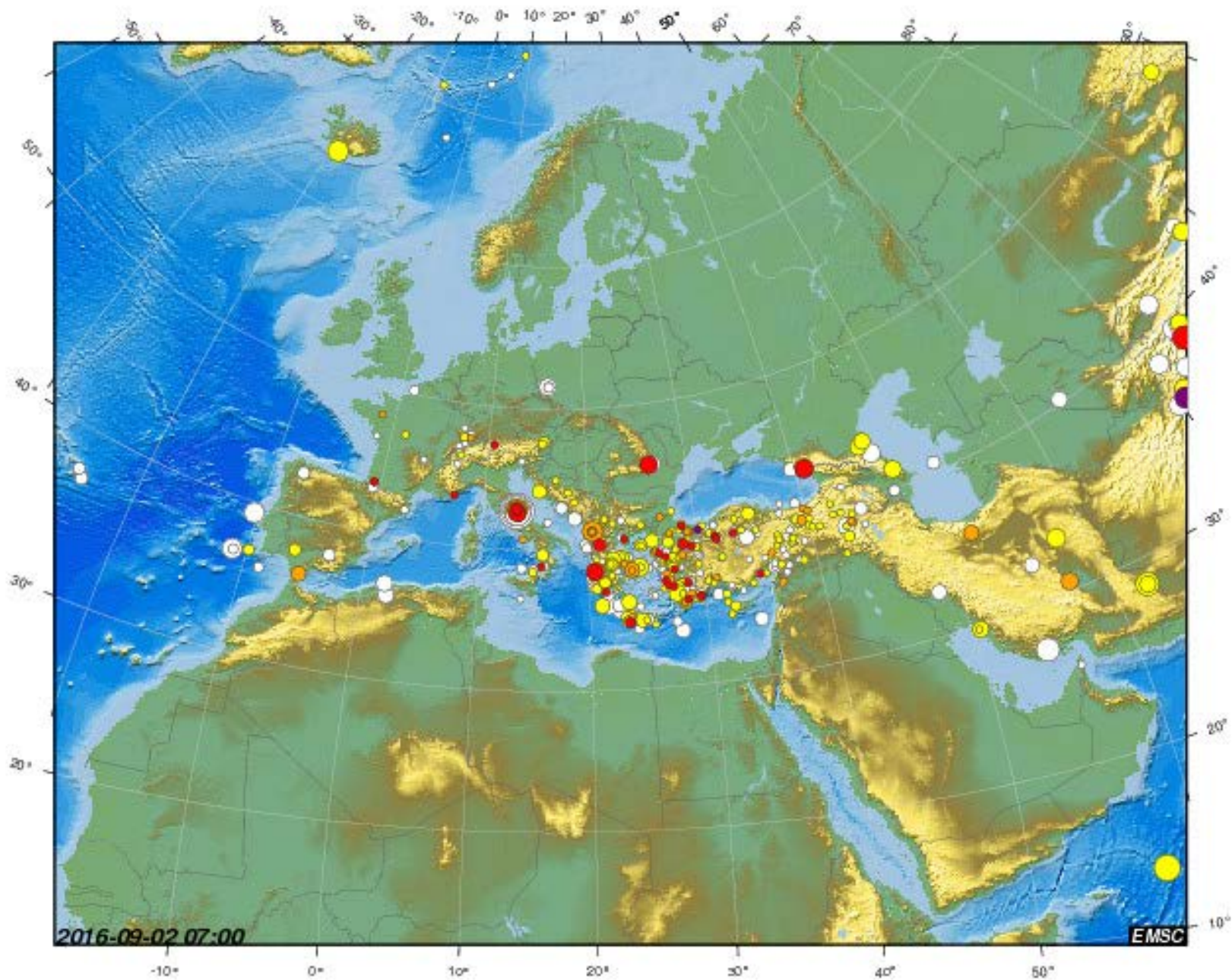
GOALS

- **Raise youth awareness** about scientific research and innovation **through Inquiry-based Science Education.**

- **For young students to understand the social impact of earthquakes and the need for protection policies and procedures.**

- **Connection with School Science Curriculum**

Physics
Geology
Geography
Mathematics

Implementation stages

1. **Formation of student teams**

The SSE project addresses High School students (age 15-18 years)

2. **Motivating students**

   With videos, presentations, discussions in class,
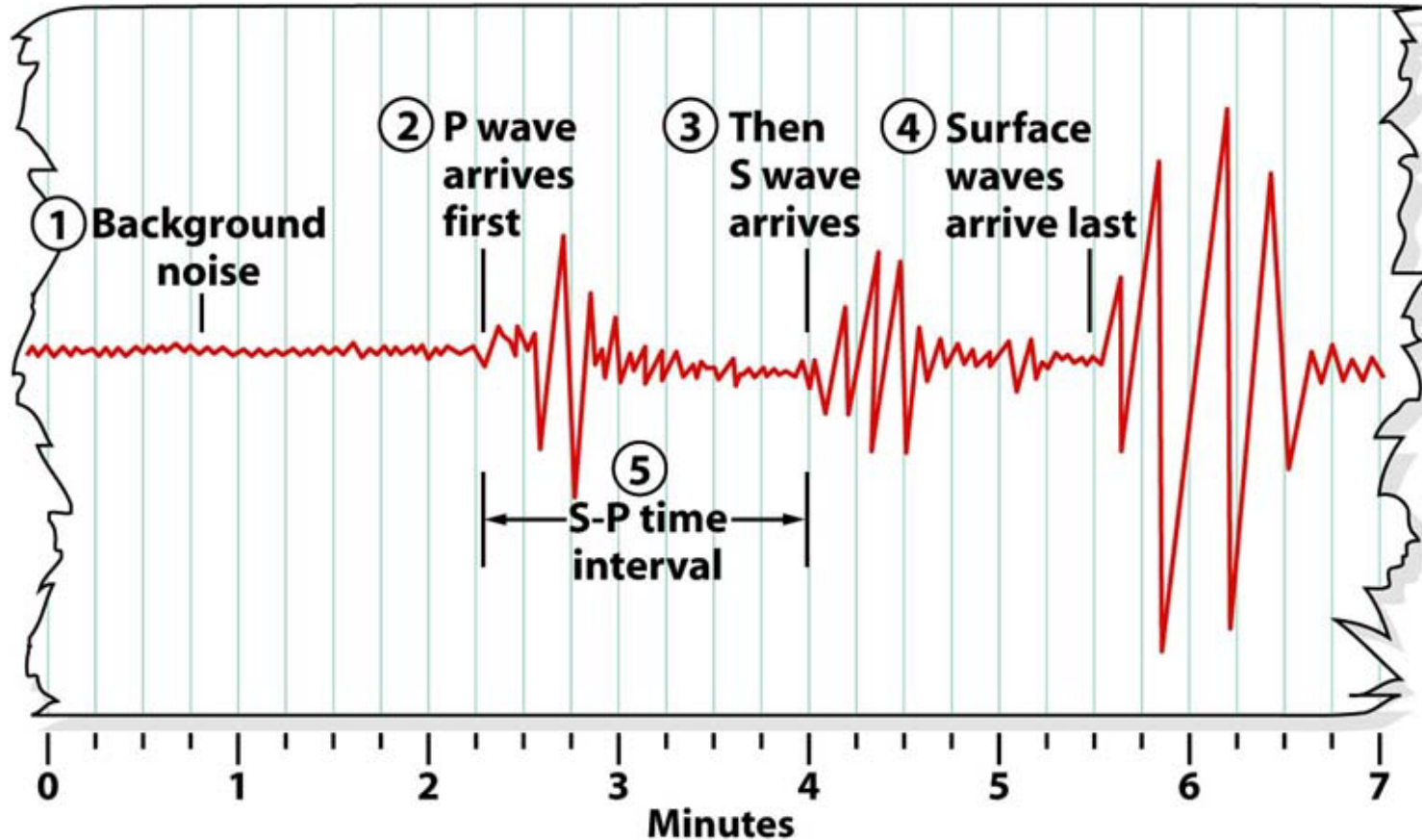   visits to Seismological Institutes etc.

3. **Creation of lesson plans**

   Lesson plans prepared and provided to class must help students to comprehend the following:

   - what is an earthquake and what causes them to happen,
   - the types of seismic waves,
   - the main parameters of an earthquake event (location, depth, magnitude) and how to calculate them from a typical seismogram.

Lesson Plan-Introductory Manual

① The earthquake happens at time 0. ② The first P waves arrive a little over 2 minutes later. ③ The first S waves arrive 4 minutes later.

② P wave arrives first

③ Then S wave arrives

④ Surface waves arrive last

① Background noise

⑤ —S-P time— interval

Minutes

0   1   2   3   4   5   6   7

④ The surface waves, which travel the long way around Earth's surface, arrive last.

⑤ The S-P interval, here slightly less than 2 minutes, tells the seismologist how far away the earthquake was.

Implementation stages

4. Installation of seismographs

5. Familiarity with the use of seismographs

- Students and teachers learn how to operate and use a digital seismograph. Scientists from the Institute of Geodynamics or University give seminars for this purpose.

6. Analysis of seismograms

- Student teams start recording seismograms, collect and analyze data to calculate earthquake parameters

7. Collaboration between teams

- Once every 2-3 weeks (or after an earthquake) all school teams participate in an online meeting to present their results,
to discuss problems and difficulties,
to exchanging ideas and experiences

Πατήστε εδώ

Interactive Activities

Earthquake Time and Distance – Epicenter

Click here

Earthquakes - Timer Activity

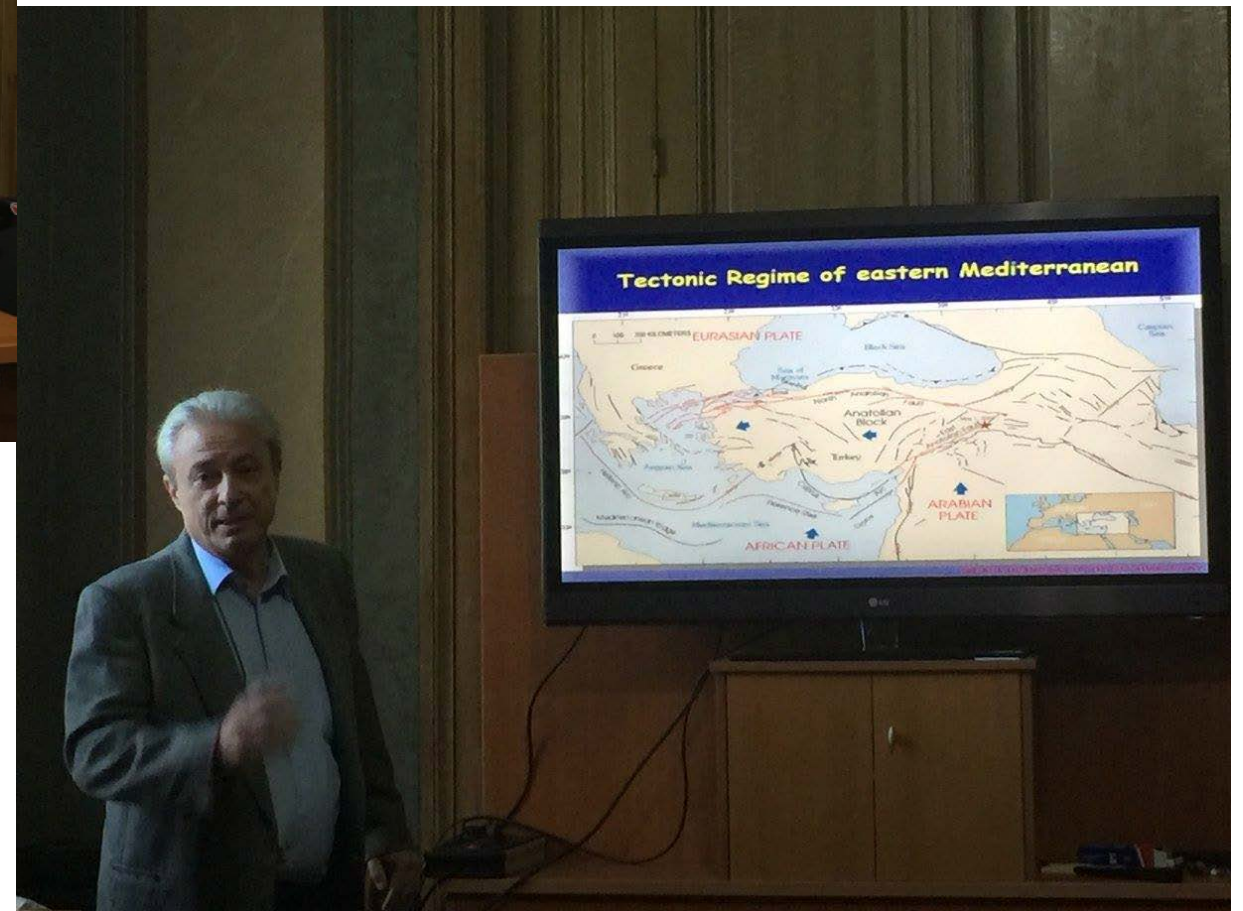Click here

Earthquake Magnitude and Energy

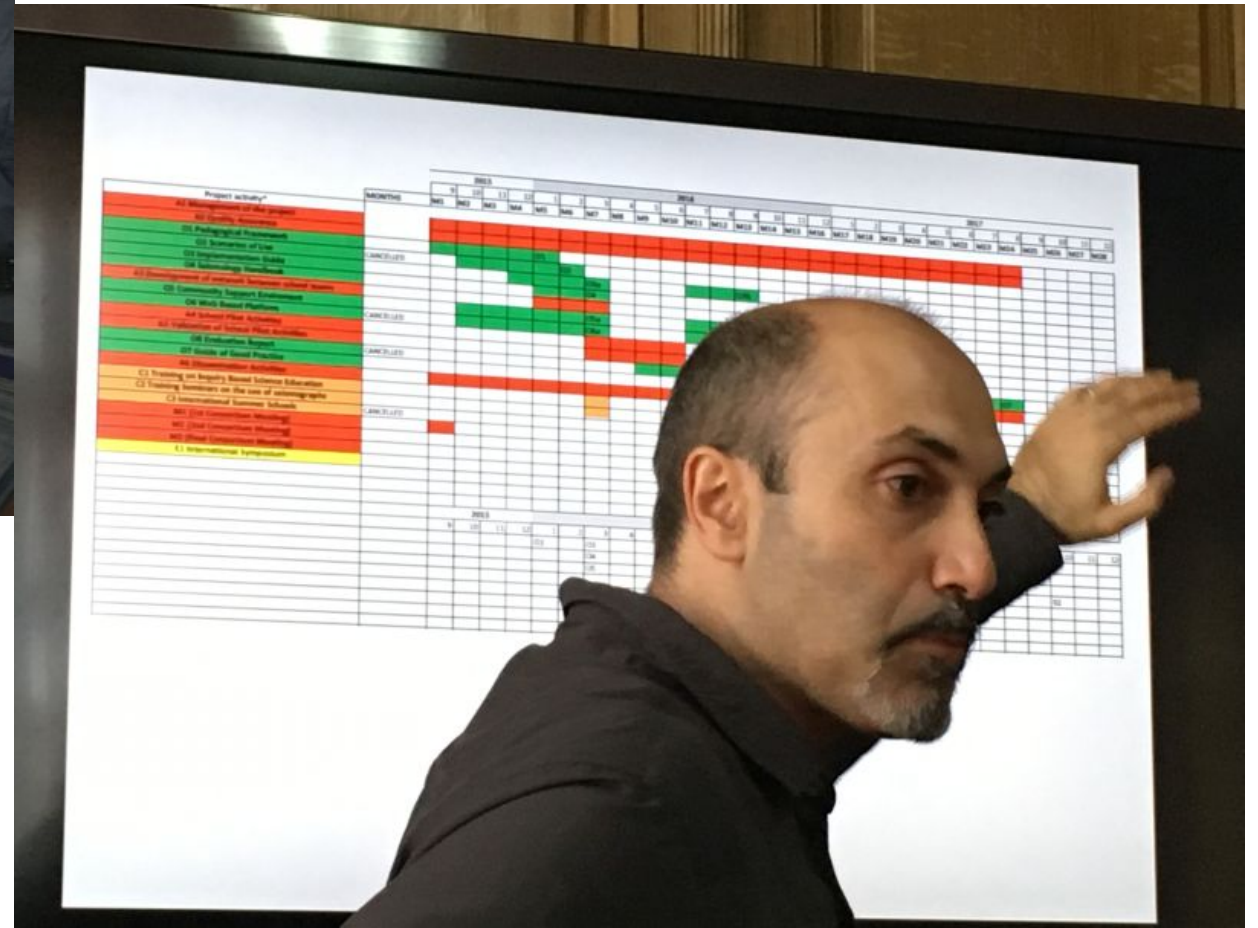Click here

Earthquakes and Tectonic Plates

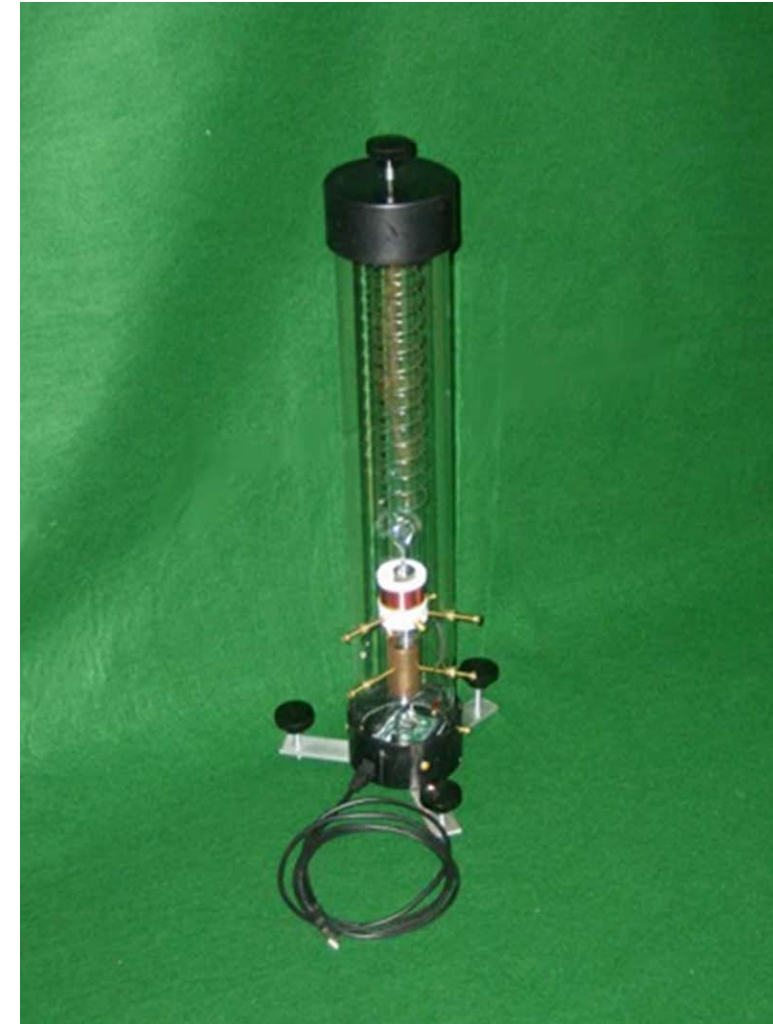Click here

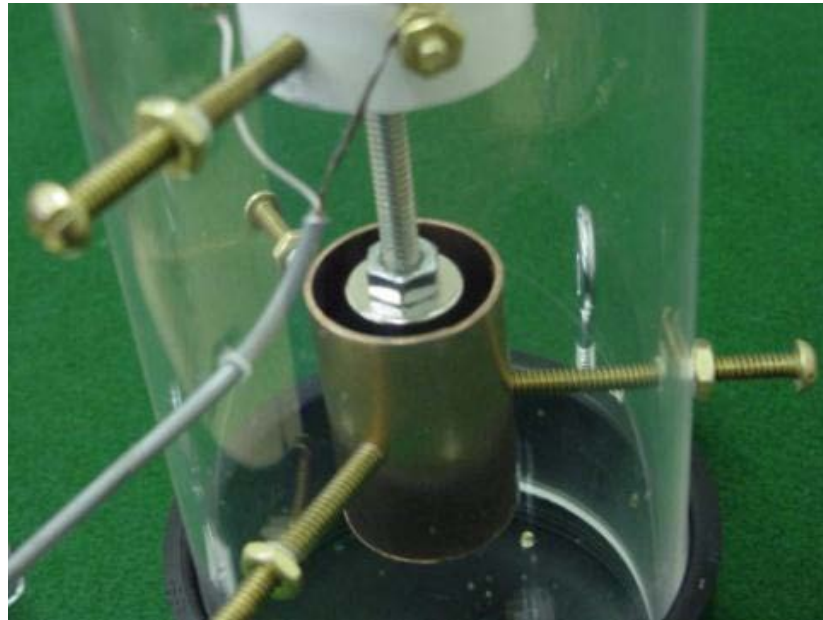# SSE Partner Training Workshop at NOA, June 2016

Training Workshop at NOA

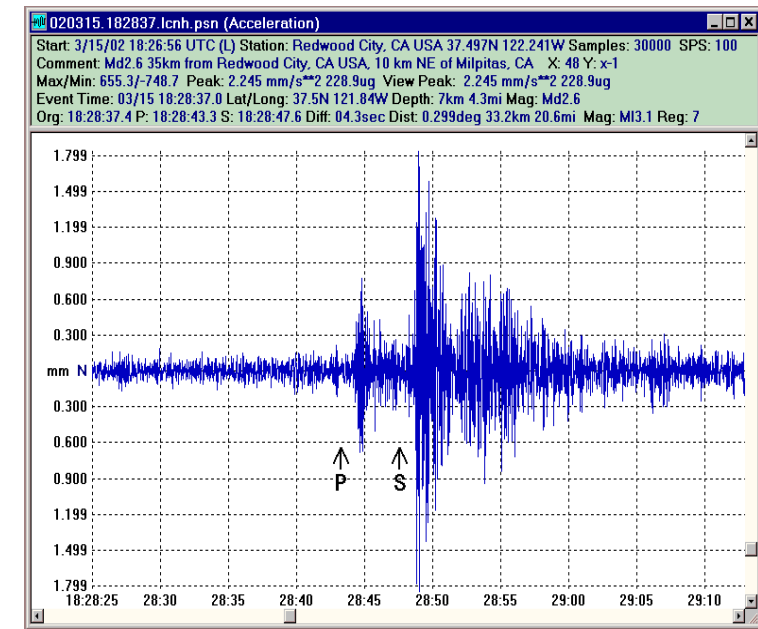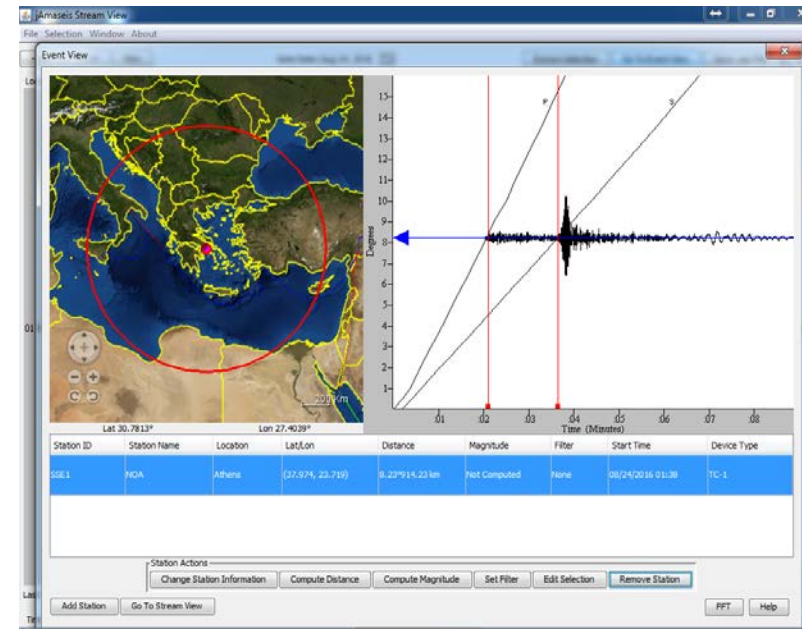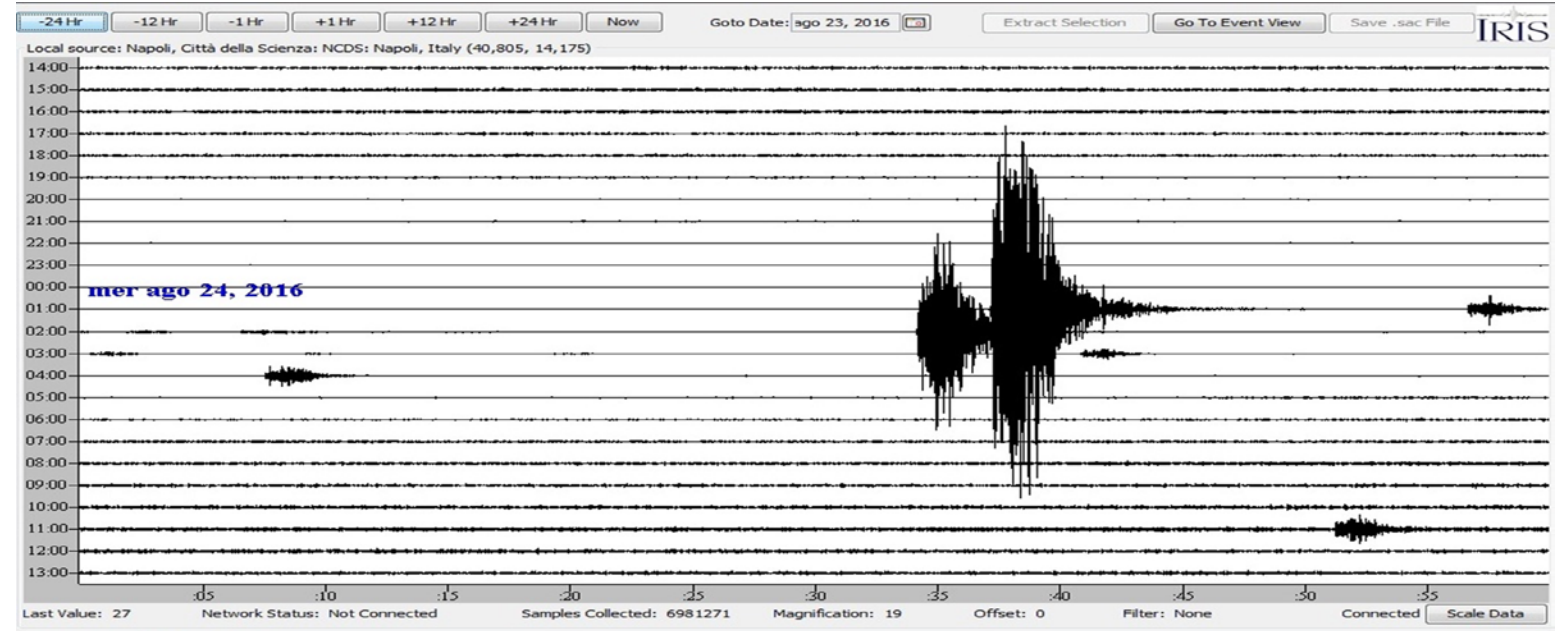# Teacher Training In Partner Countries

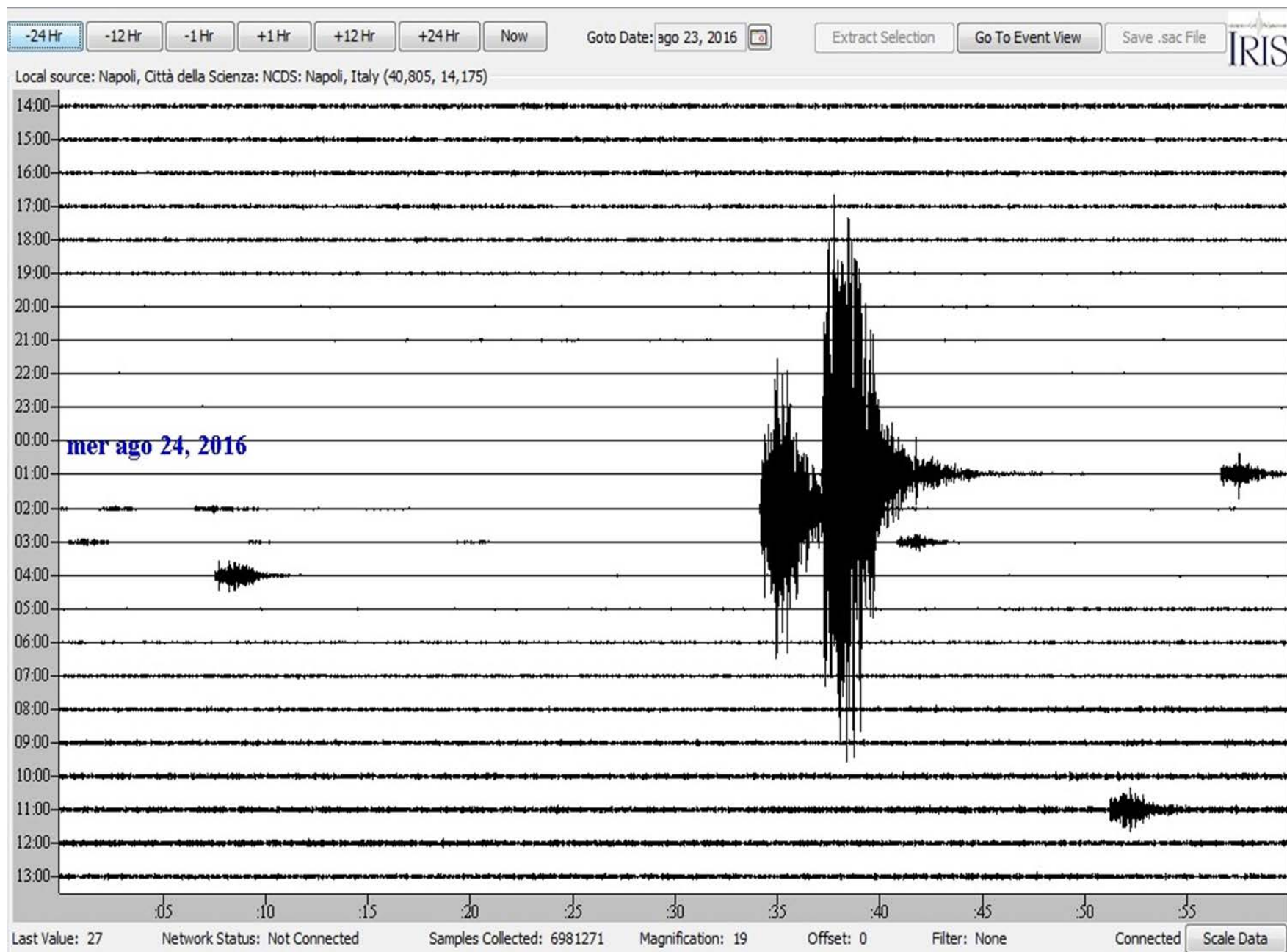# TC-1 EDUCATIONAL SEISMOMETER

TC-1 EDUCATIONAL SEISMOMETER

Software programs for data analysis : Arduino, JamaSeis, Winquake, Seisgram2k

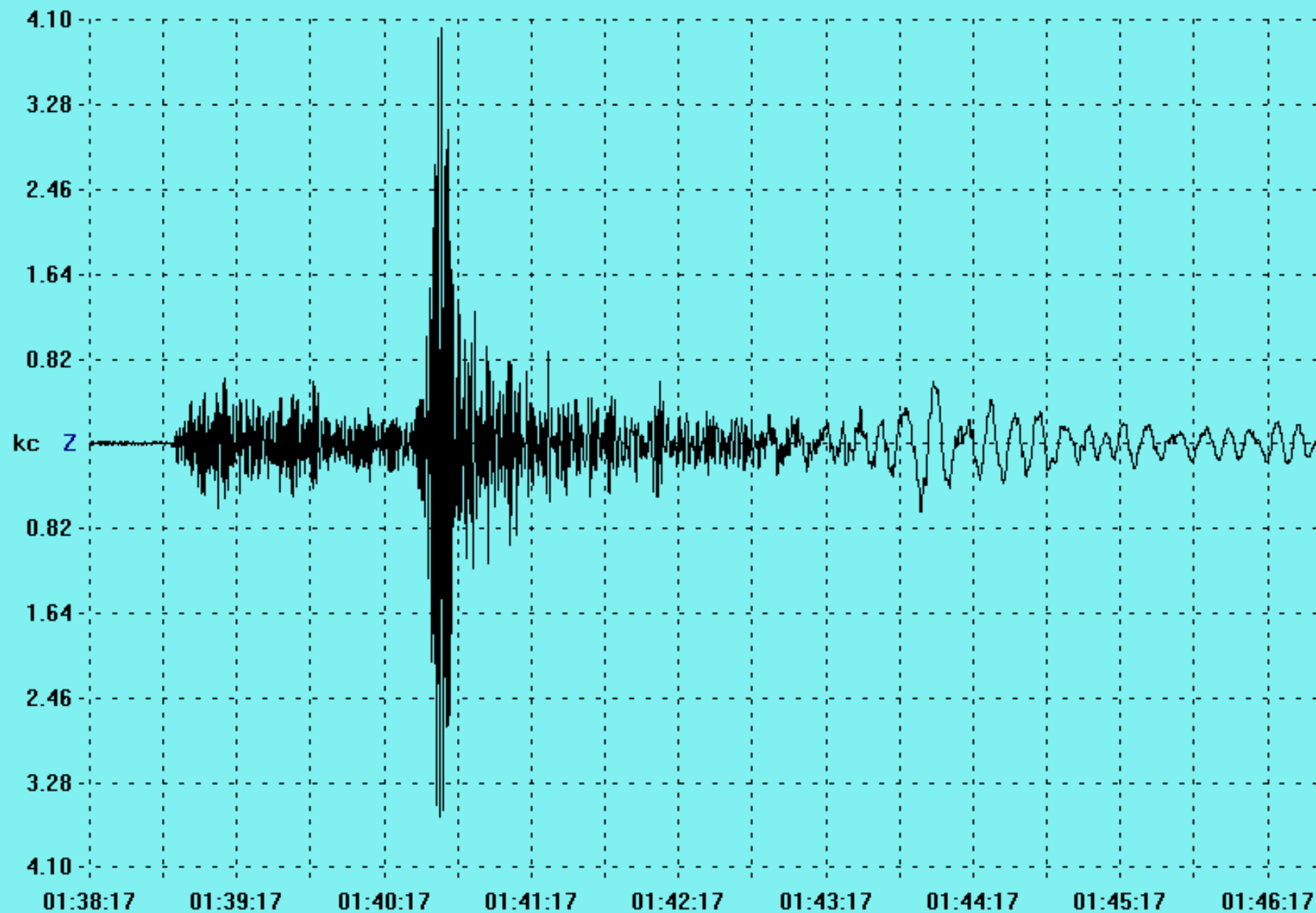# 24-8-2016, M=6.2, Central Italy

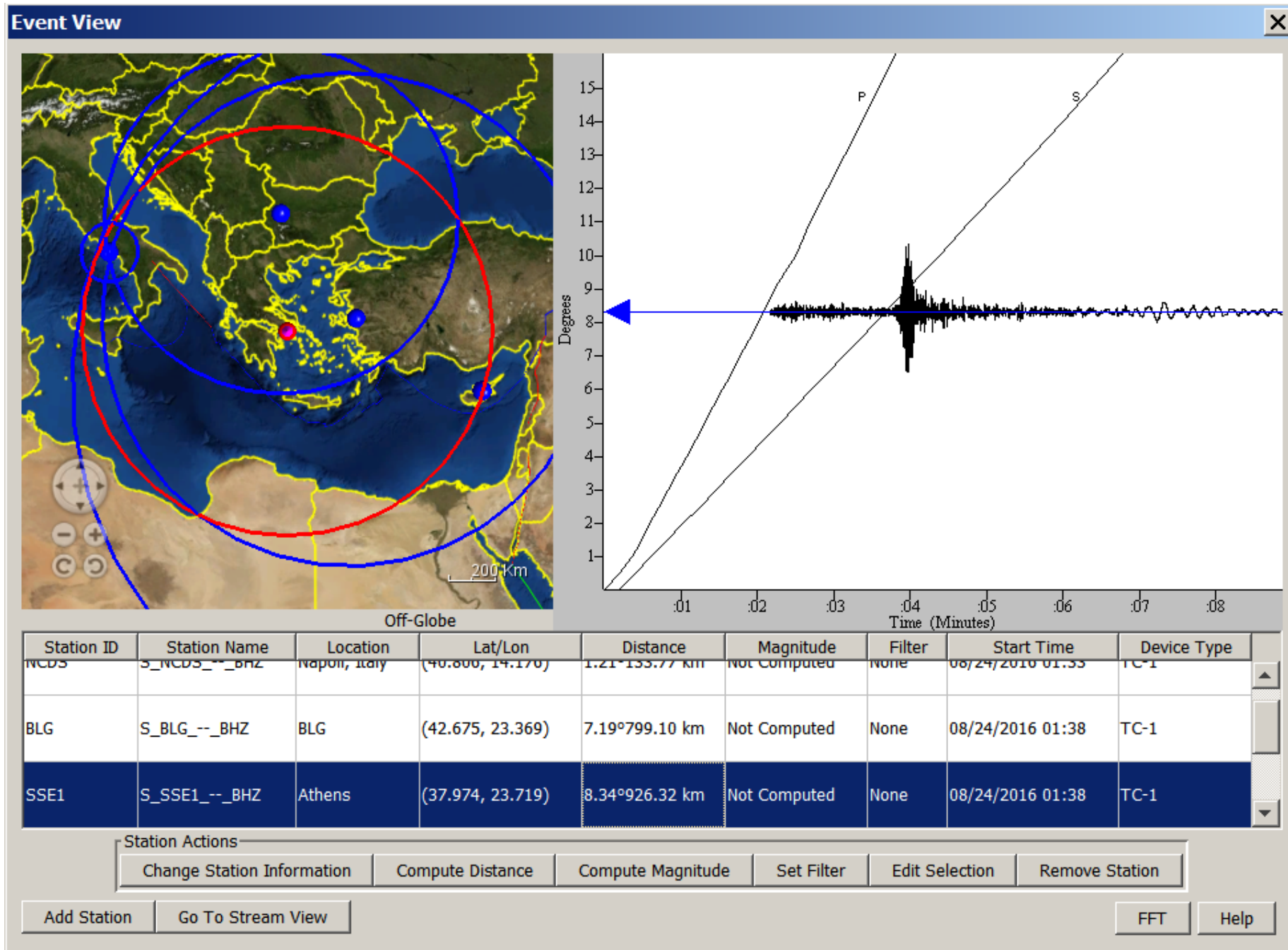# 24-8-2016, M=6.2, Central Italy

File: 1608240138SSE1.sac
Start: 8/24/16 1:38:16 UTC Station: SSE1 37.974N 23.718E View Samples: 9386 SPS: 18.772071
Max/Min: 4017/-3613 X: 8:20.0 Y: 4.1kc

24-8-2016, M=6.2, Central Italy, SSE network data

Event View

Off-Globe

Station ID	Station Name	Location	Lat/Lon	Distance	Magnitude	Filter	Start Time	Device Type
NCDS	S_NCDS_--_BHZ	Napoli, Italy	(40.800, 14.170)	1.21-133.77 km	Not Computed	None	08/24/2016 01:33	TC-1
BLG	S_BLG_--_BHZ	BLG	(42.675, 23.369)	7.19°799.10 km	Not Computed	None	08/24/2016 01:38	TC-1
SSE1	S_SSE1_--_BHZ	Athens	(37.974, 23.719)	8.34°926.32 km	Not Computed	None	08/24/2016 01:38	TC-1

Station Actions

Change Station Information | Compute Distance | Compute Magnitude | Set Filter | Edit Selection | Remove Station

Add Station | Go To Stream View | FFT | Help

Local seismicity

Fri May 20, 2016 00:00 UTC to Sat May 21, 2016 00:00 UTC

SSE1

IRIS

Teleseismic events, 29-7-2016, M=7.1, North of Ascension Island

File: 1608290437SSE1.sac
Start: 8/29/16 4:37:37 UTC Station: SSE1 37.974N 23.718E Samples: 68451 SPS: 18.772227
Max/Min: 912/-1106 X: 1:00:45 Y: 1.2kc

sse-project.eu
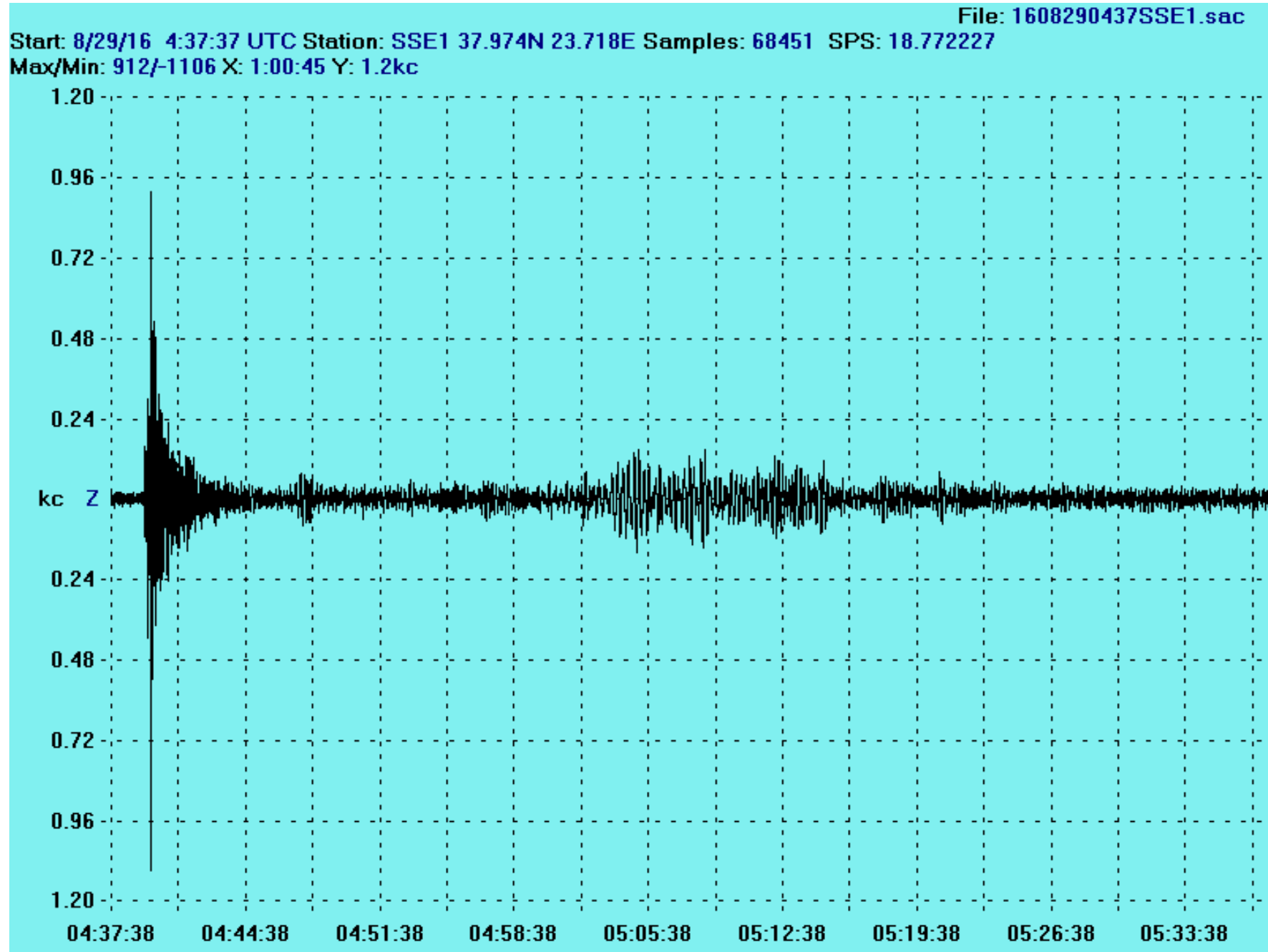
School Visit at NOA

About the project

The "Schools Study Earthquakes" (SSE) is supported by Erasmus+ Program under the key action Cooperation for innovation and the exchange of good practices. It focuses on the study in the reality of classroom practice of a physical phenomenon with great societal impact and proposes pedagogical practices based on inquiry-based methods that are more effective in science education. The objective of this combination is on one hand to increase children's and students' interest in science, on how science is made and how it affects every-day life, and on the other to stimulate teacher motivation on up-taking innovative teaching methods, subjects and practices to enrich and renew the science curriculum. The SSE project also provides increased opportunities for cooperation and collaboration between schools across different areas and countries and encourage relationships between stakeholders of both formal and informal education. It also proposes to build a network of schools that will study real data, do real analysis of real situations and real earthquake phenomena in real time. Teachers are key players in the renewal of science education and among other methods, being part of a network allows them to improve the quality of their teaching and supports their motivation. Networks can be used as an effective component of teachers' professional development, are complementary to more traditional forms of in-service teacher training and stimulate morale and motivation which then is passed to learners and have

Thank You !