

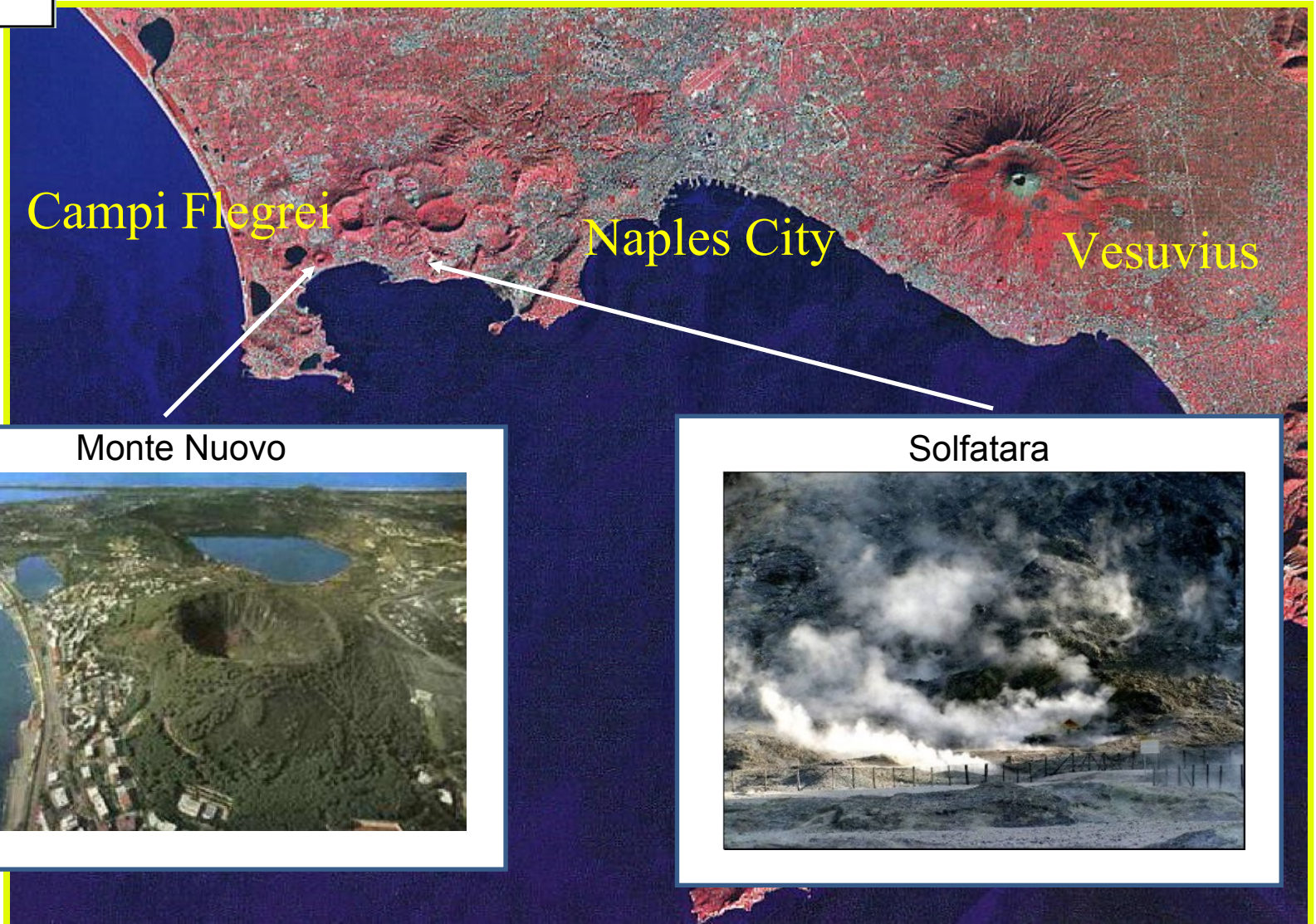
Advances in the extension of the Campi Flegrei geophysical monitoring system to the seafloor

Giovanni Iannaccone ¹, Sergio Guardato ¹, Maurizio
Vassallo ²,
Luca Elia ², Massimo Orazi ¹, Rosario Peluso ¹, Laura
Beranzoli ¹

¹ Istituto Nazionale di Geofisica e Vulcanologia

² AMRA scarl

The Neapolitan volcanic area



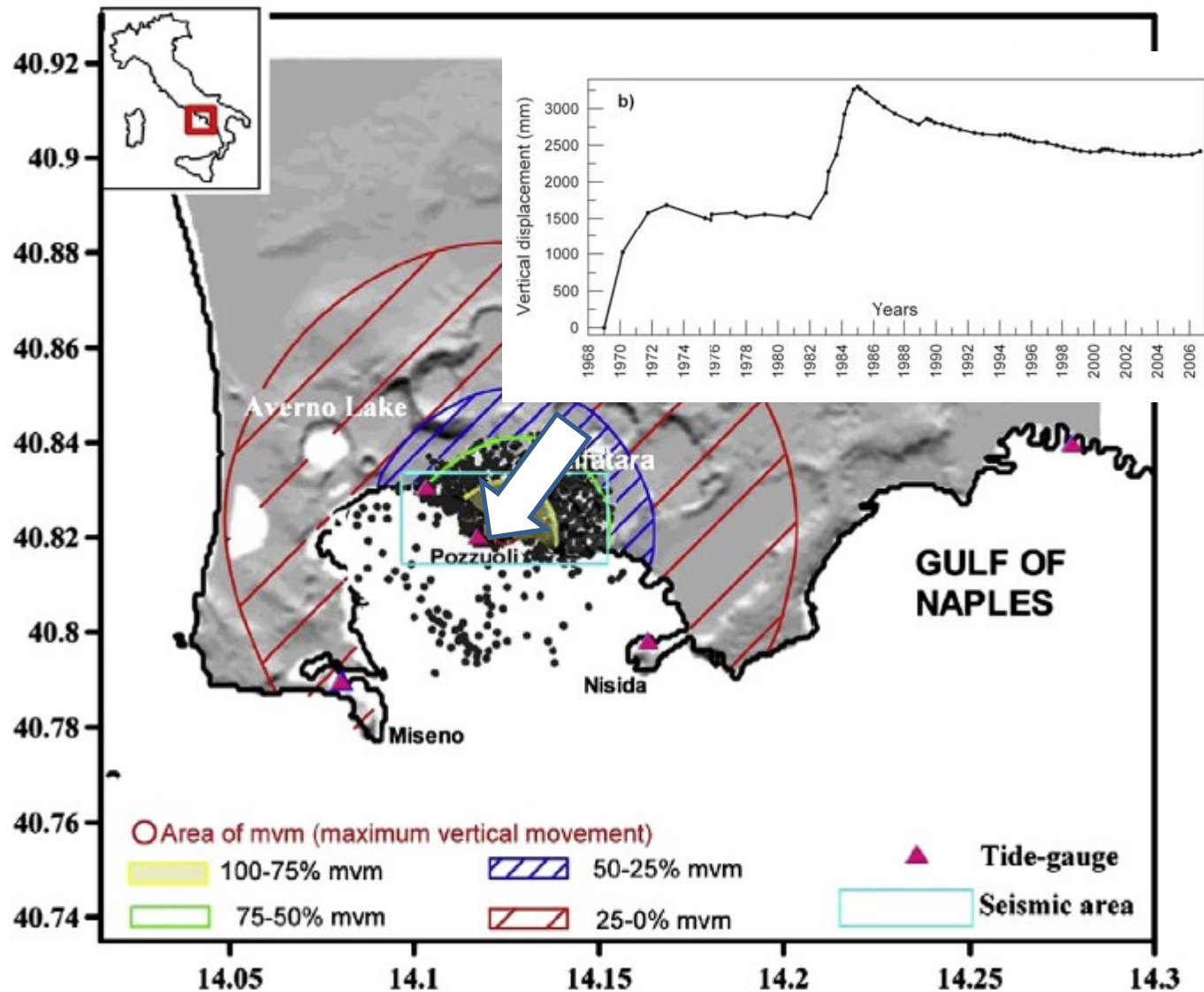
Monte Nuovo



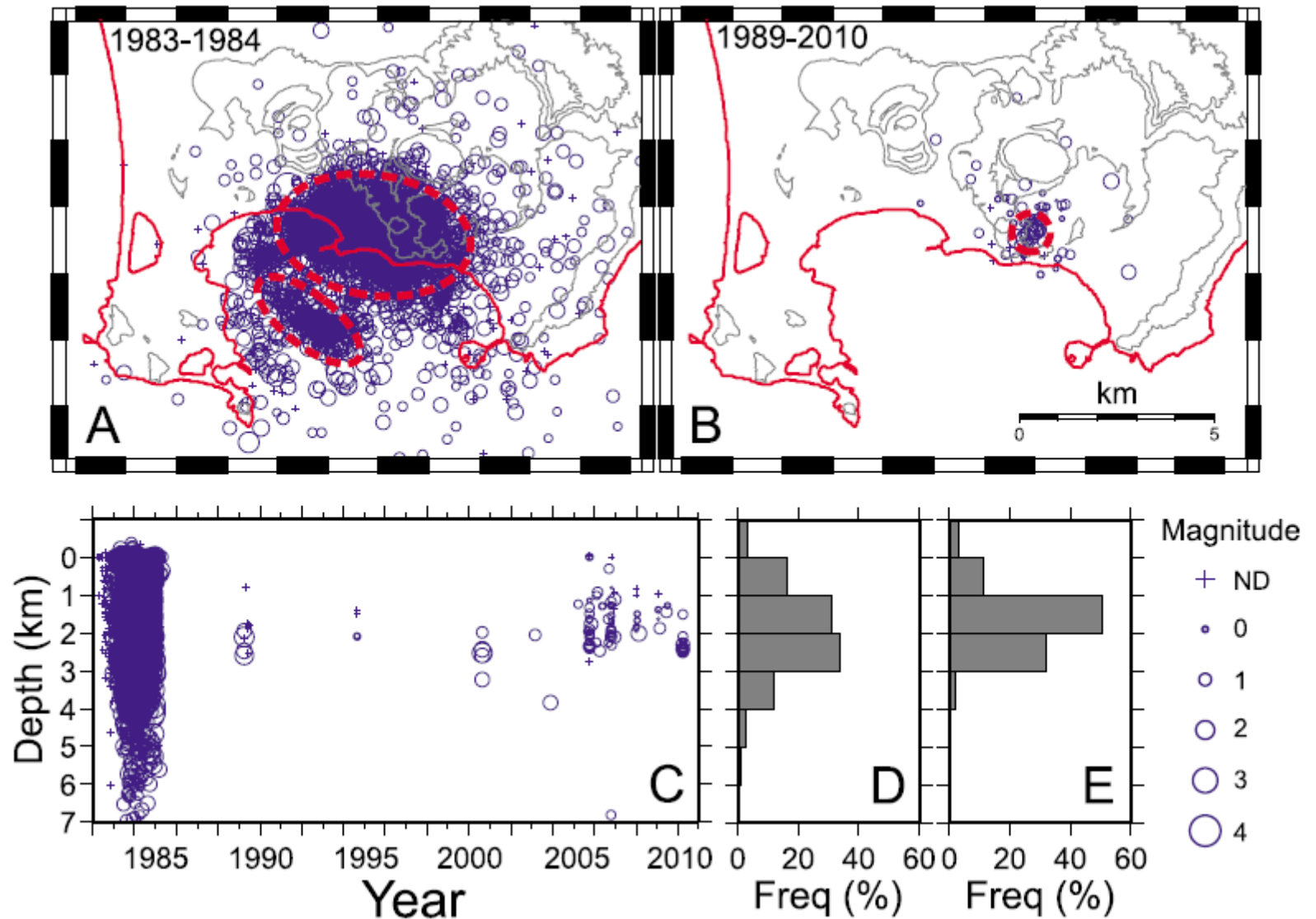
Solfatara



Pattern of soil deformation (vertical component)

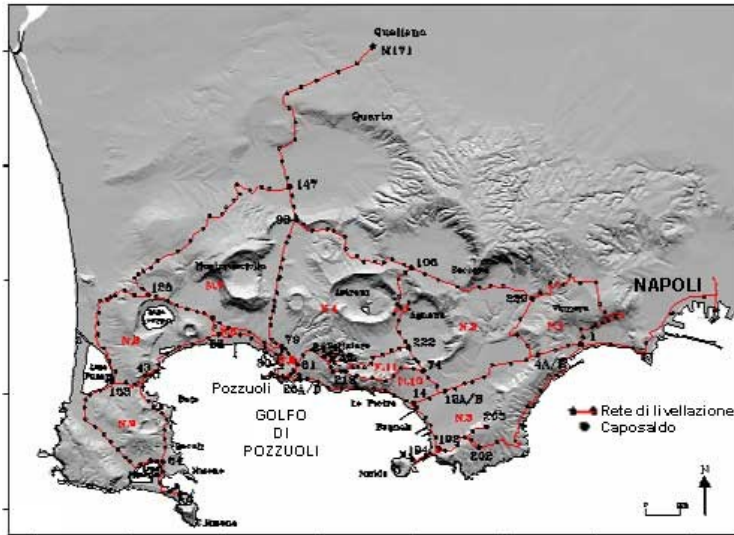


Seismicity of the Campi Flegrei area

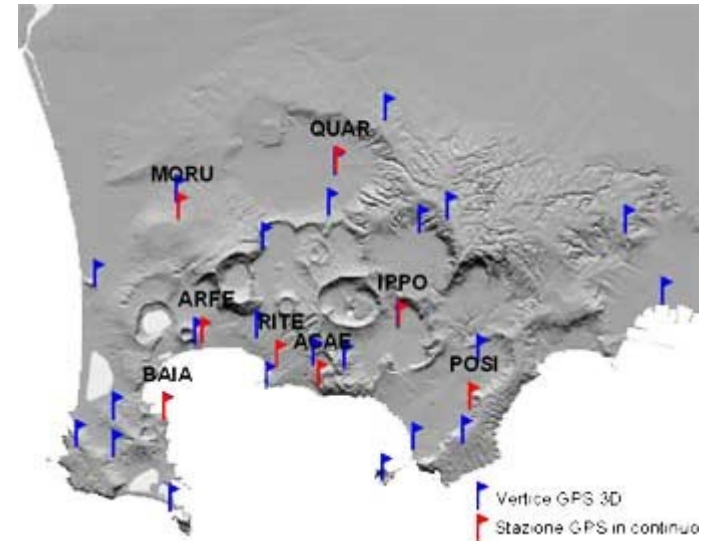


Campi Flegrei monitoring networks

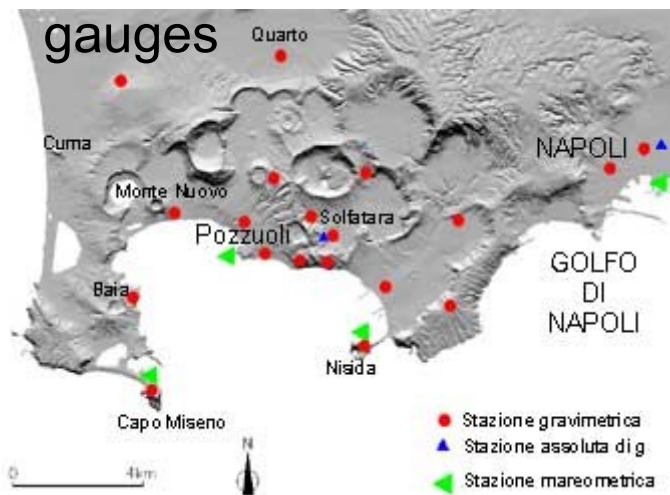
Levelling



GPS



Gravity and Tide gauges

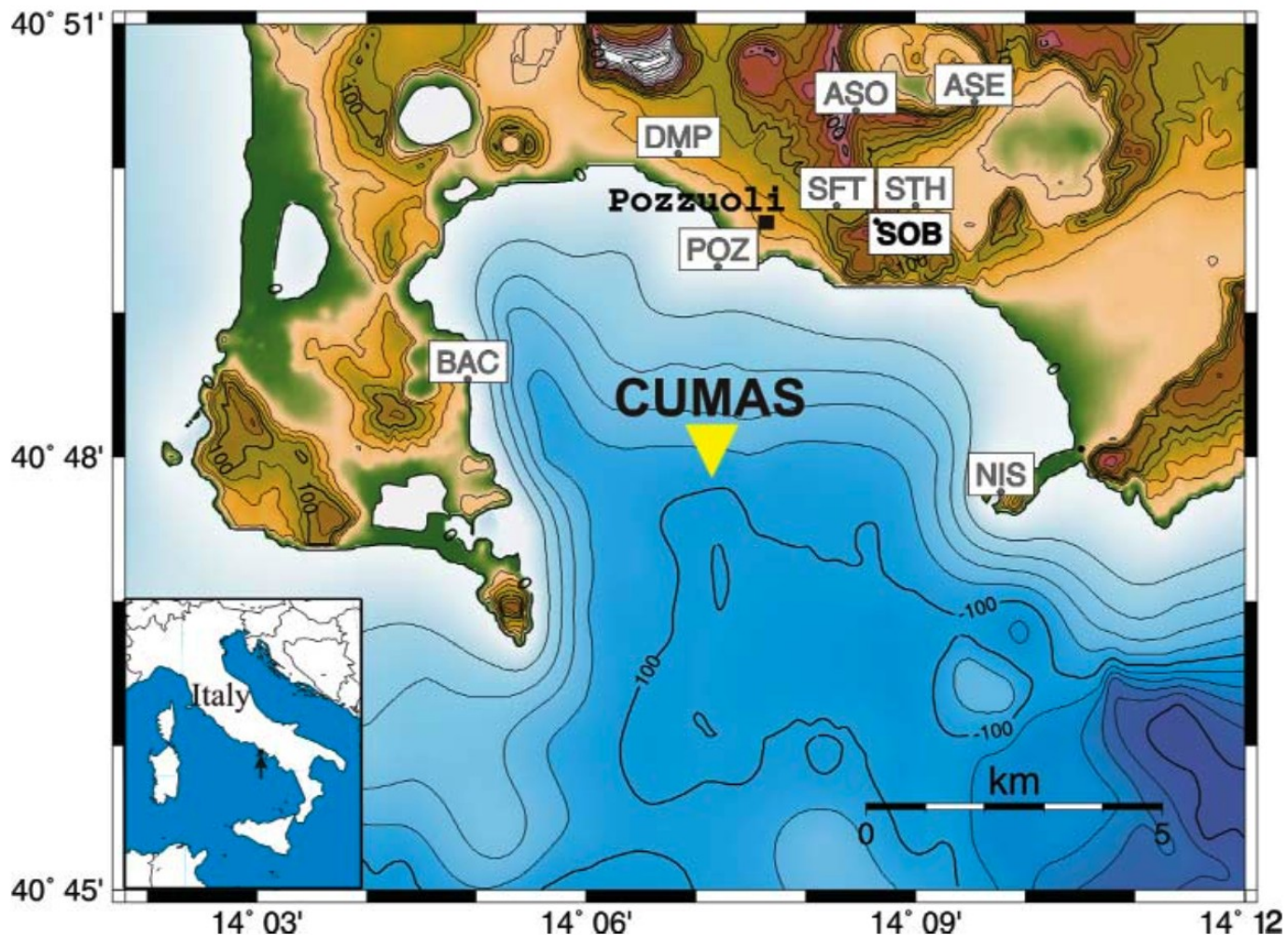


Seismic

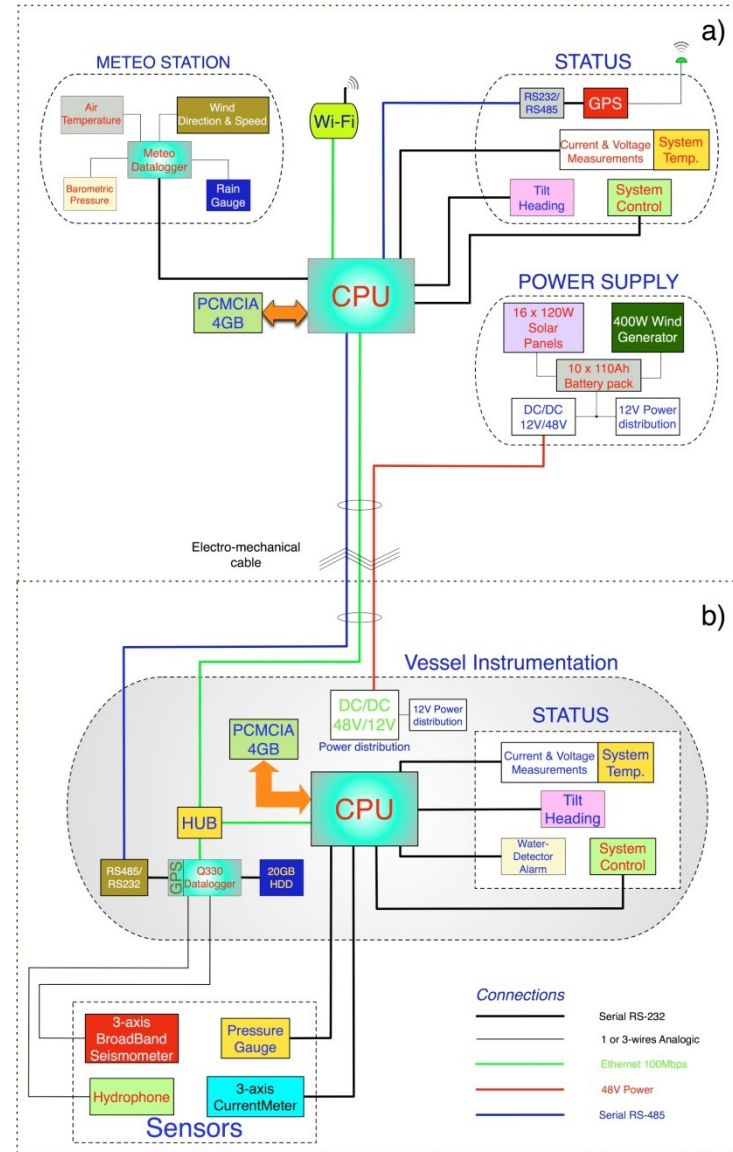
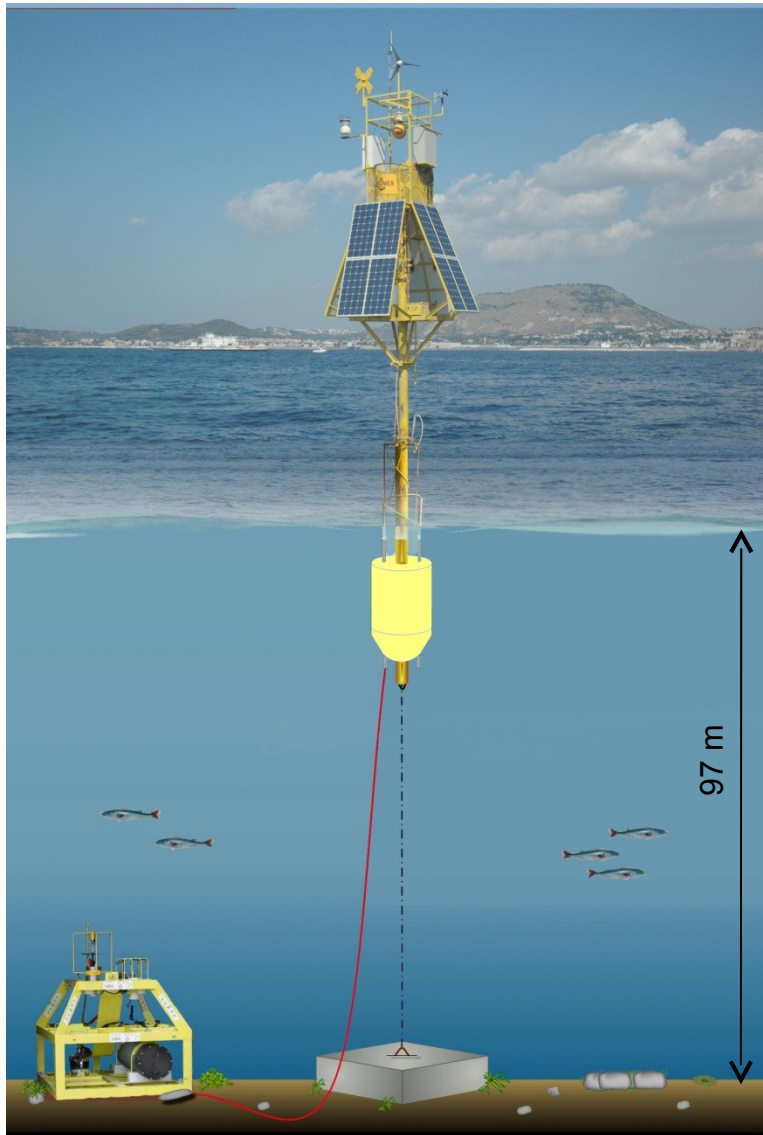


CUMAS a first step to the extension to the sea bottom of the geophysical monitoring system of the Campi Flegrei area
(CUMAS=Cabled Underwater Multidisciplinary Acquisition System)

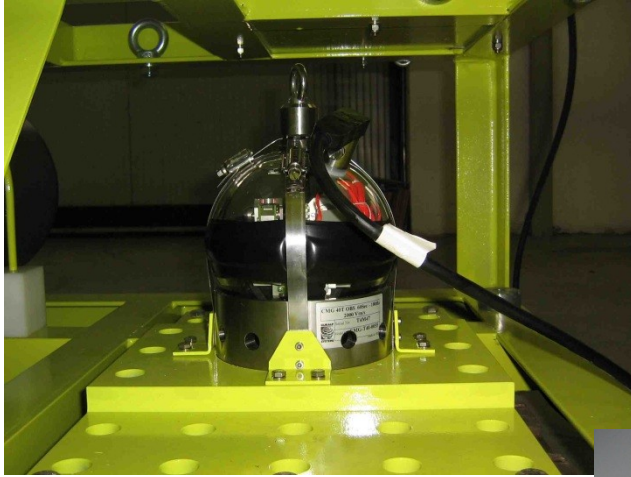
May 2008



Layout and general architecture

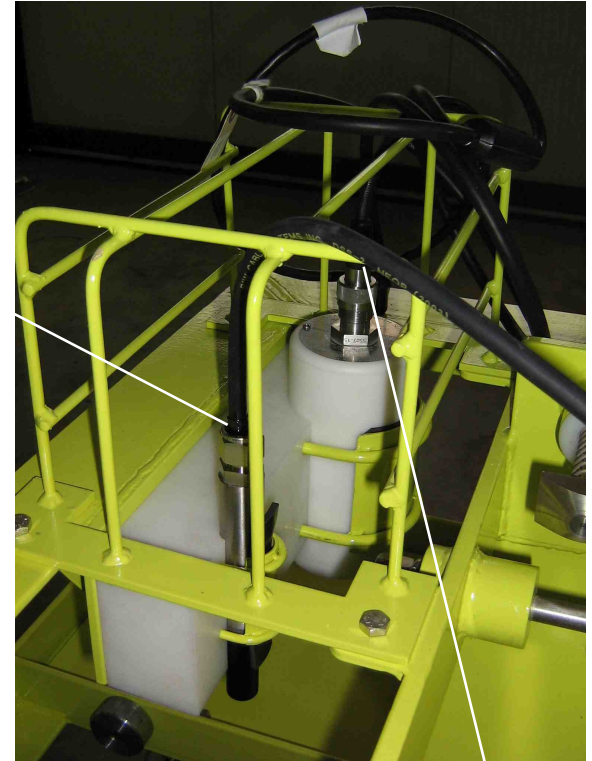


Sea bottom module: geophysical sensors



Guralp CMG-40T OBS
3 components mid range broad-band
0.033-50 Hz
Sensitivity: 2000 V/m/s
+/- 50° levelling system

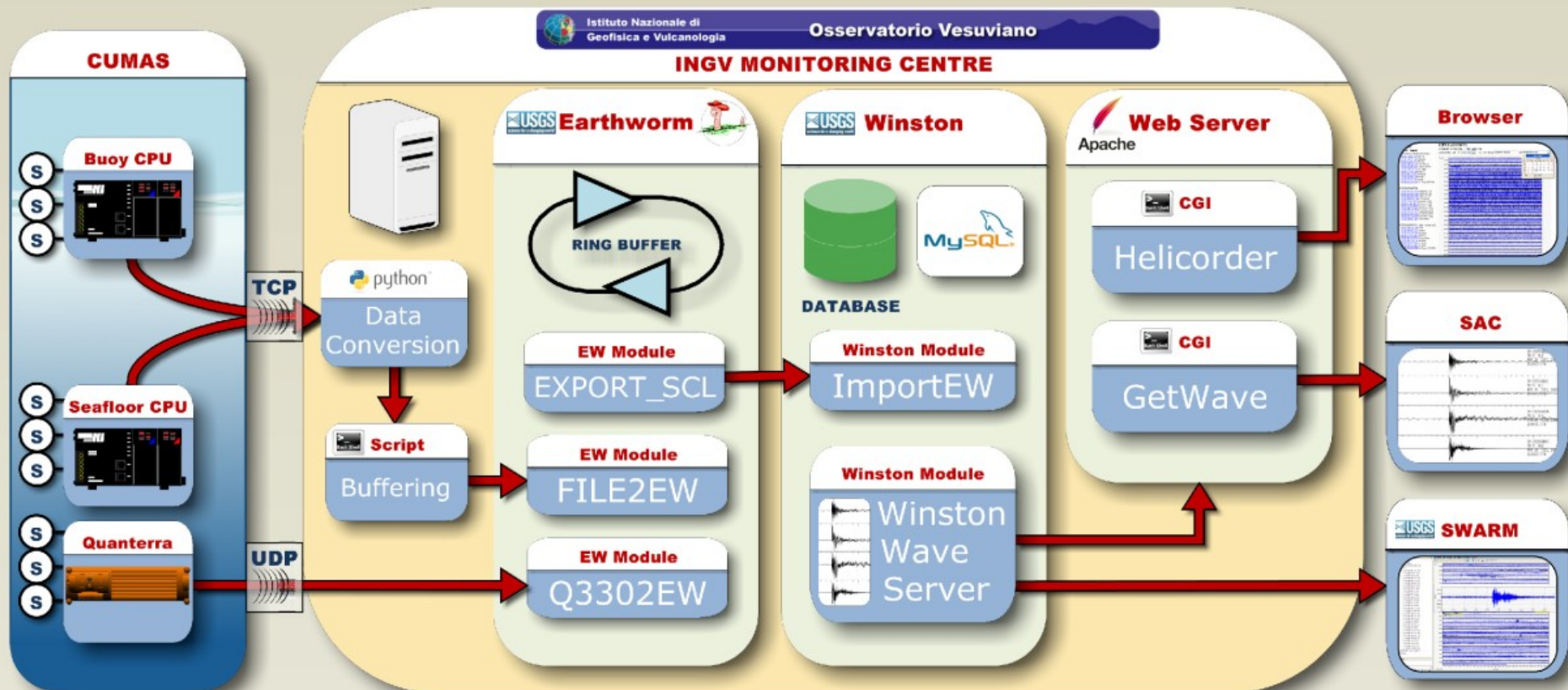
Hydrophone



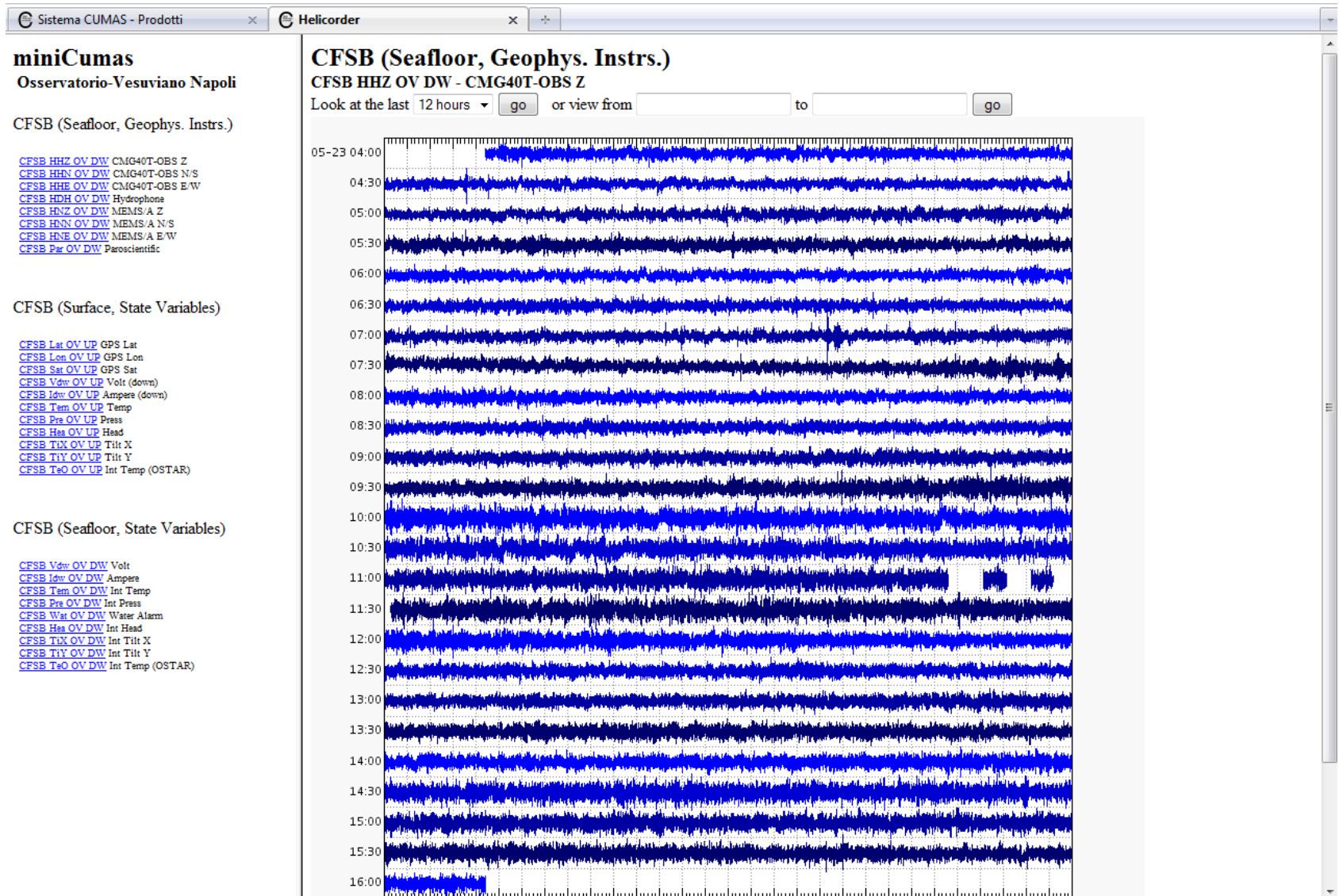
Pressure sensor
Series 8000 Paroscientific

Single point three component acoustic
wave/current meter
3D-ACM Falmouth Scientific, Inc.

Data management system



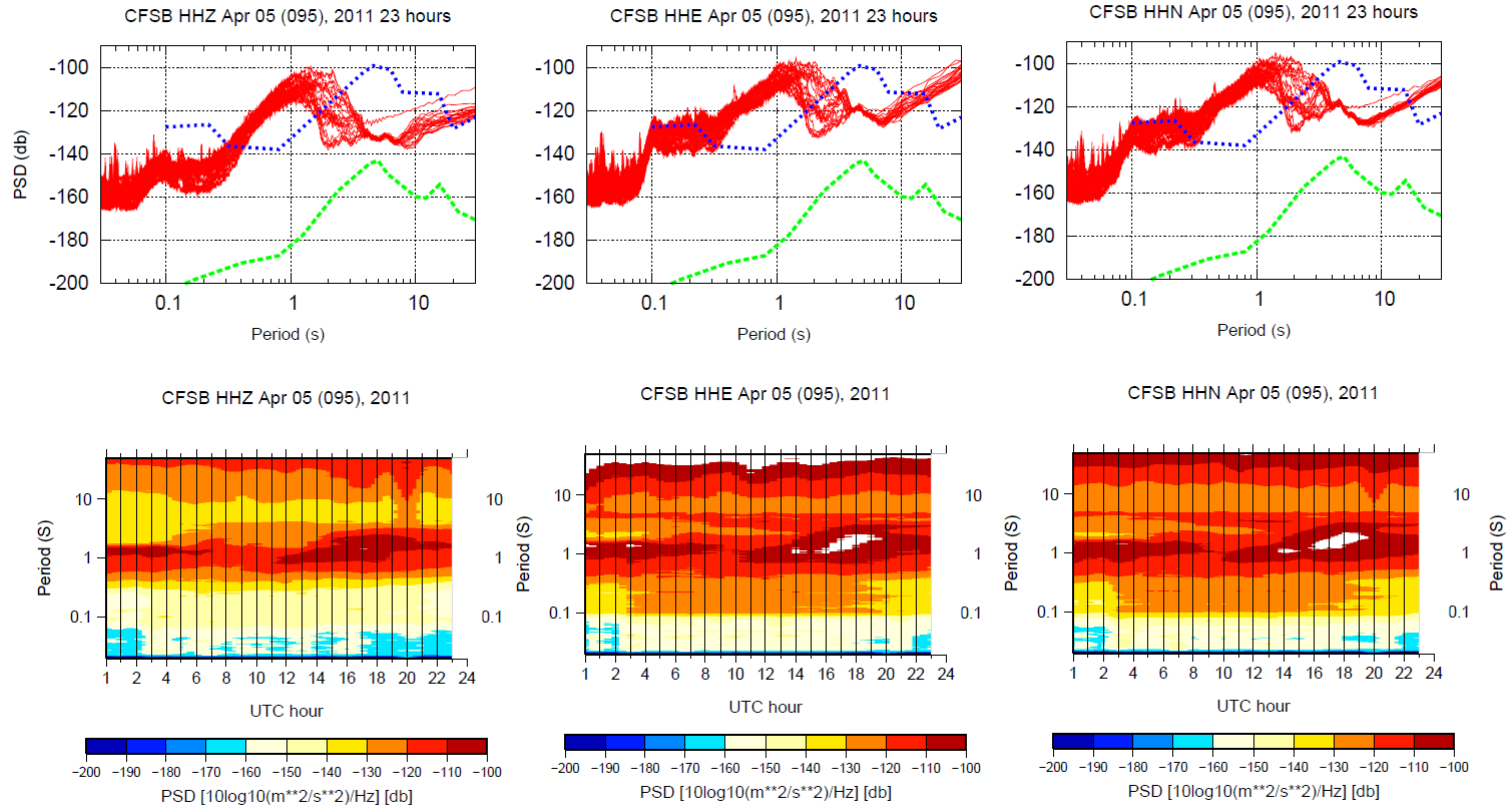
The database of the continuous waveforms (scientific and status sensors)



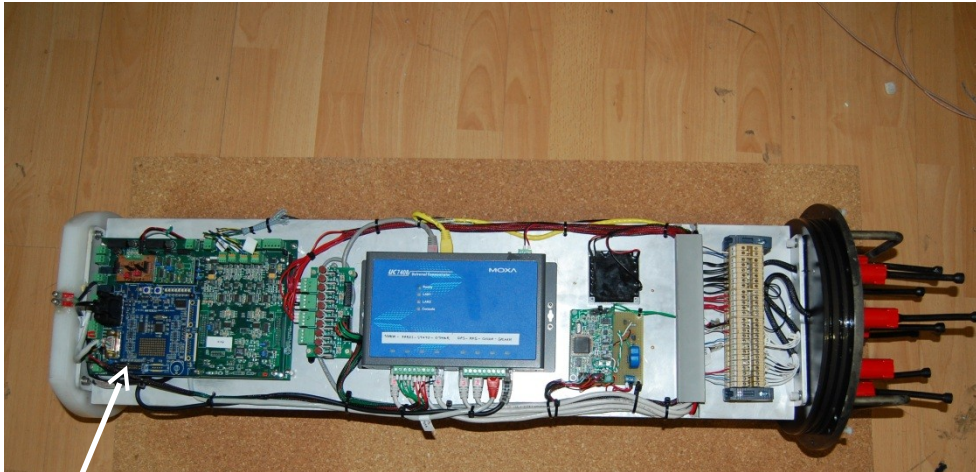
INGV-Vesuvius Observatory Monitoring Center



PSD and spectrograms daily computed for the broad-band sensor

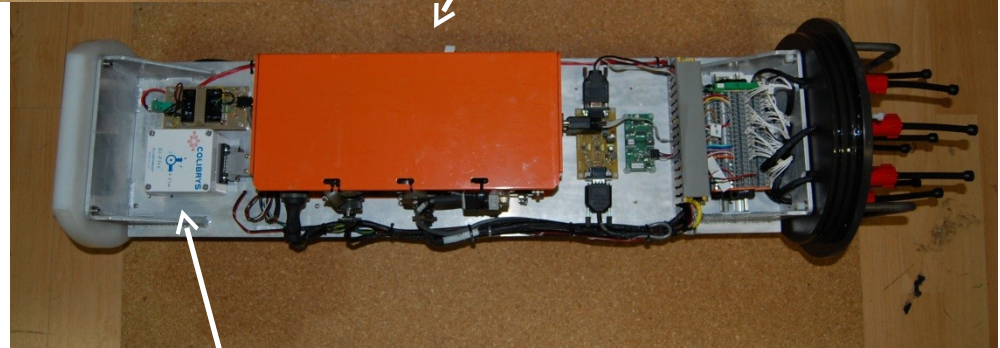


Present version of CUMAS with a new sensor and acquisition system in the vessel



GILDA (low power acquisition system, 24bit 3 channels; mems)

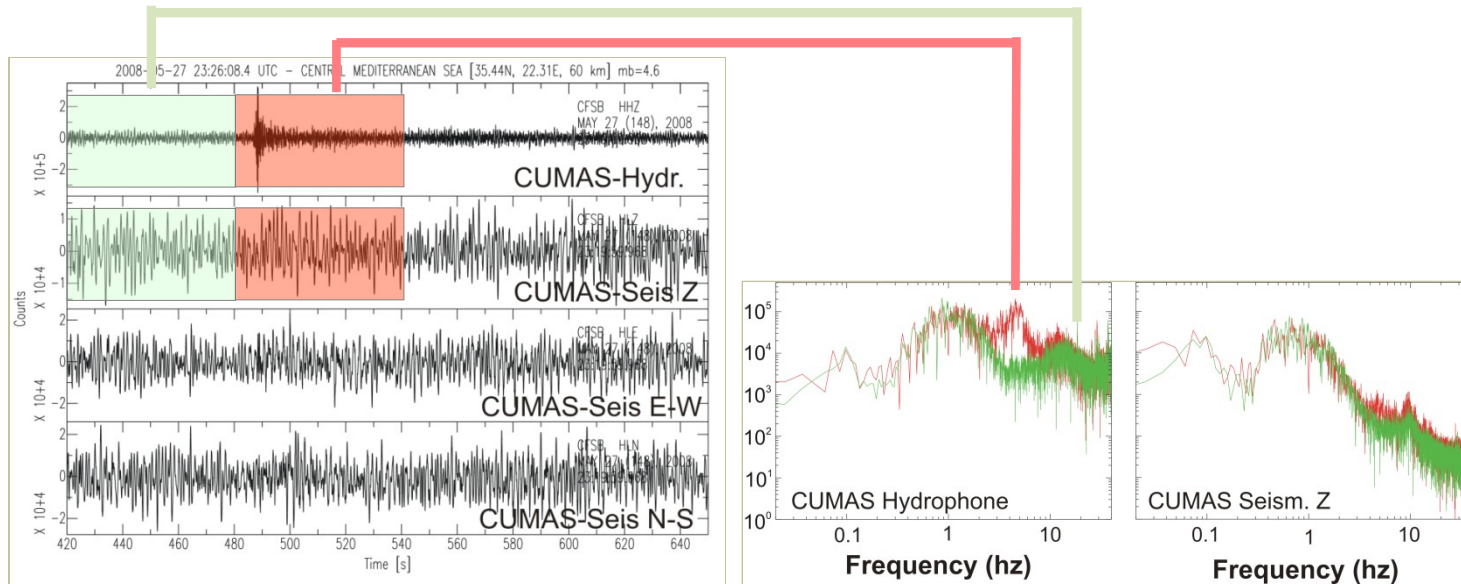
Quanterra Q330 (CMG40T+hydrophone)



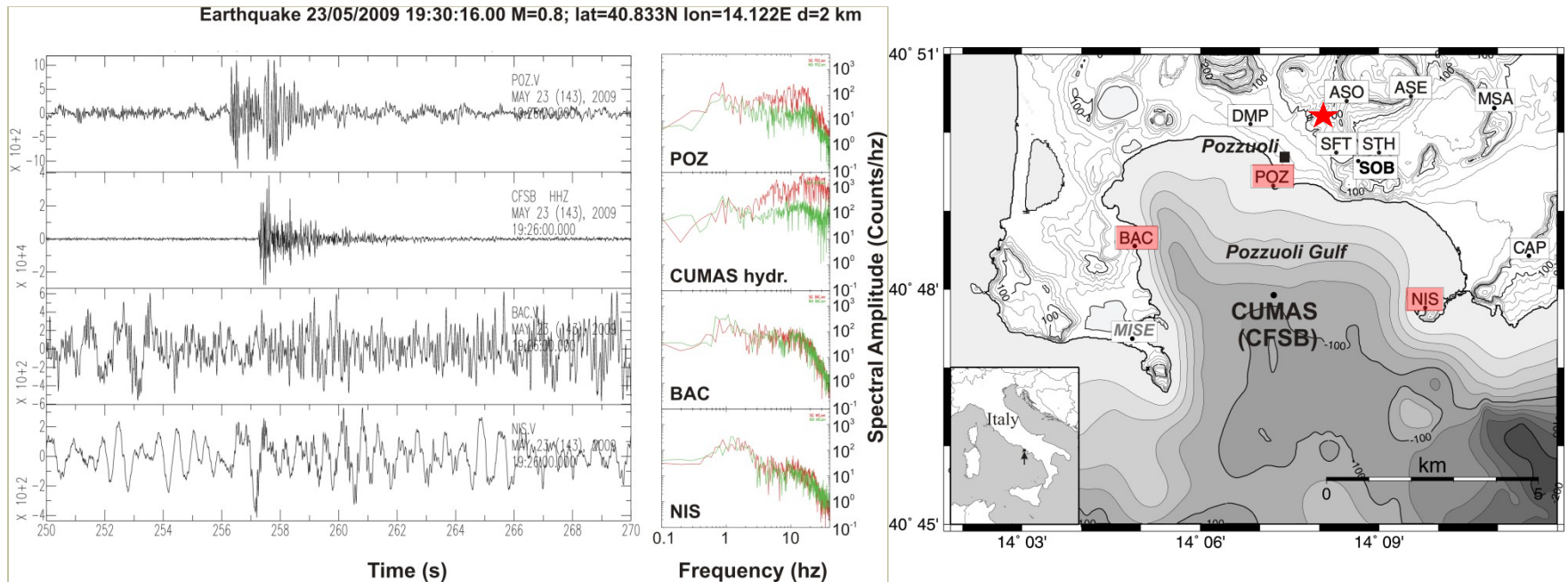
Accelerometer (mems technology 3C)

A quick look to the data acquired by CUMAS

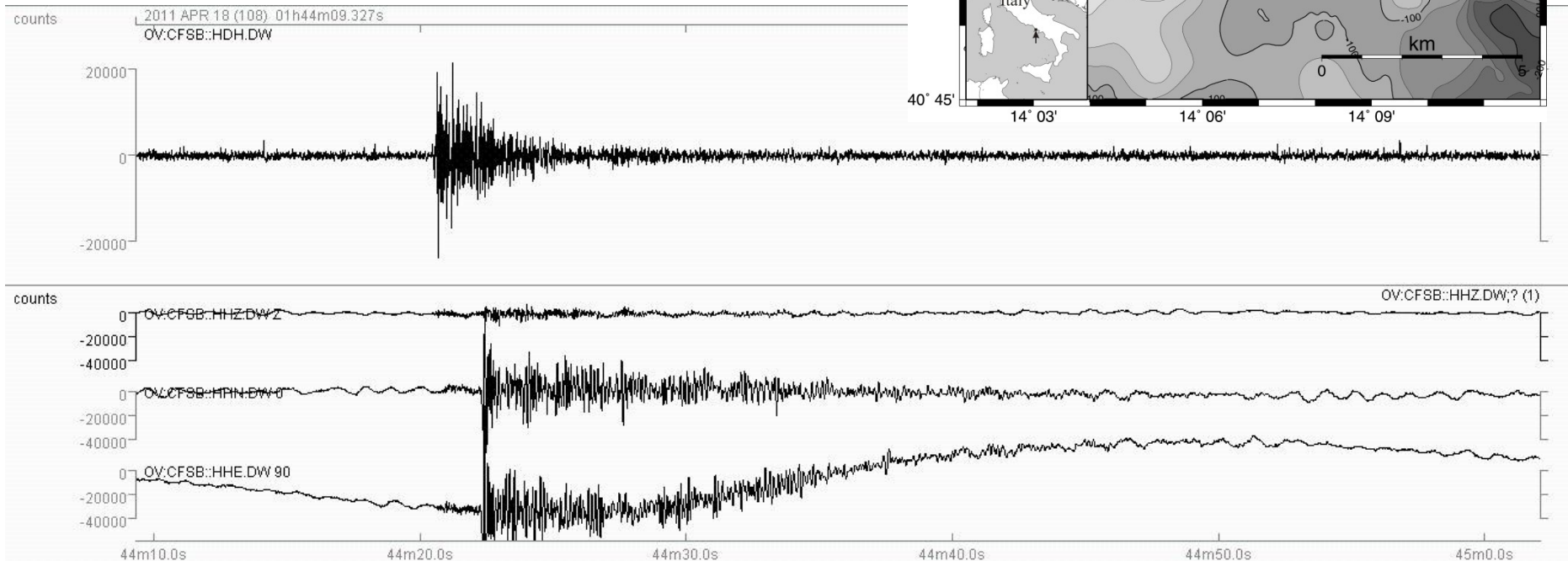
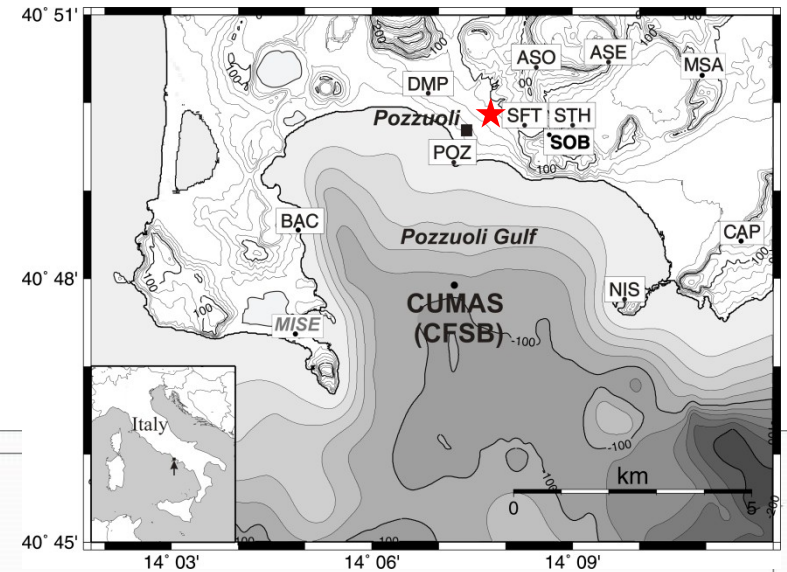
Seismometer and hydrophone: comparison of records of a regional earthquake (Greece)



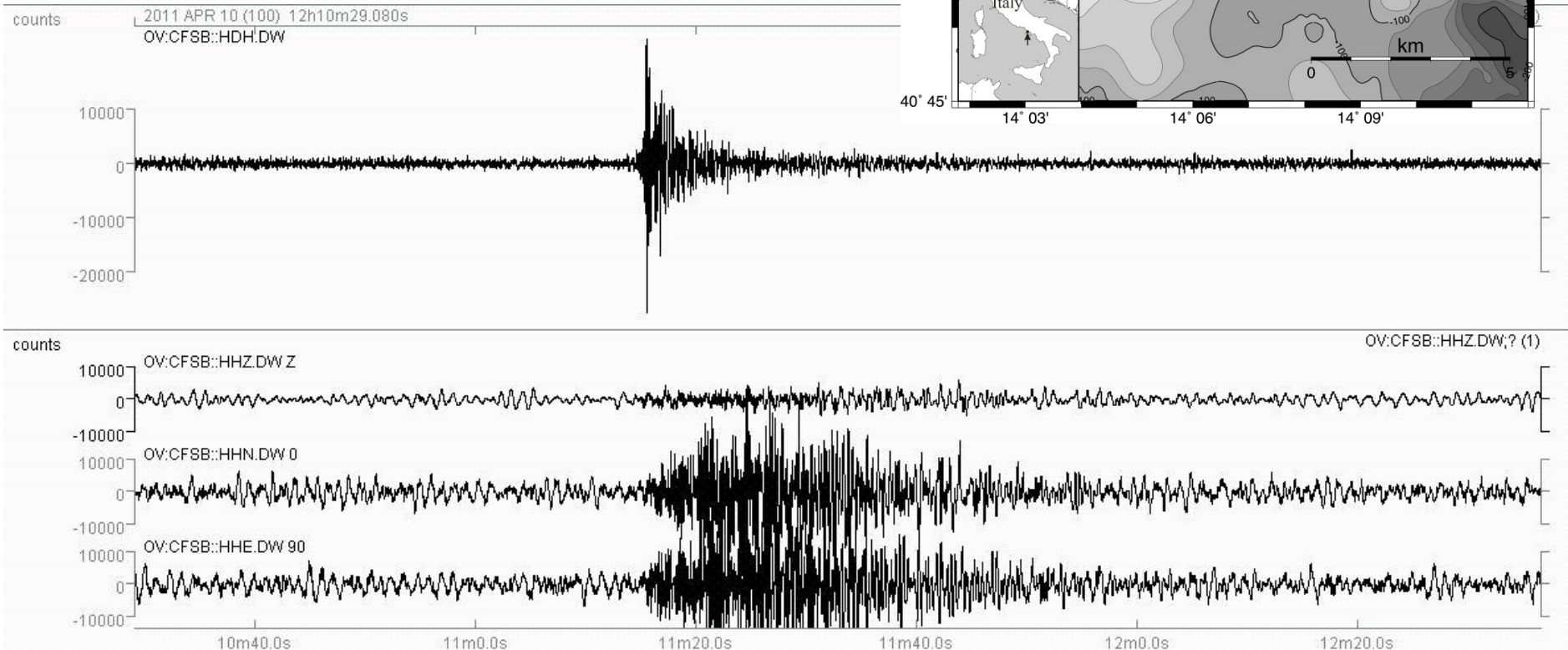
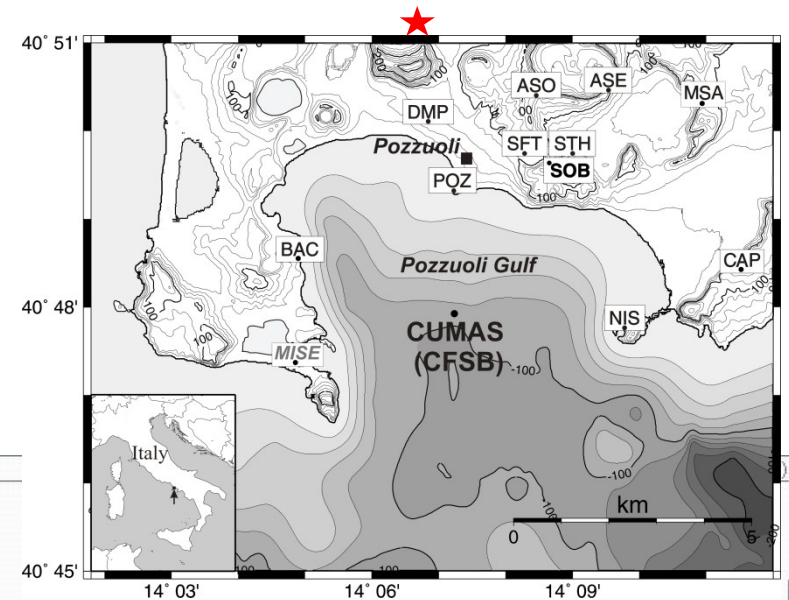
Seismometer and hydrophone: Comparison of records of a local earthquake (M=0.8)



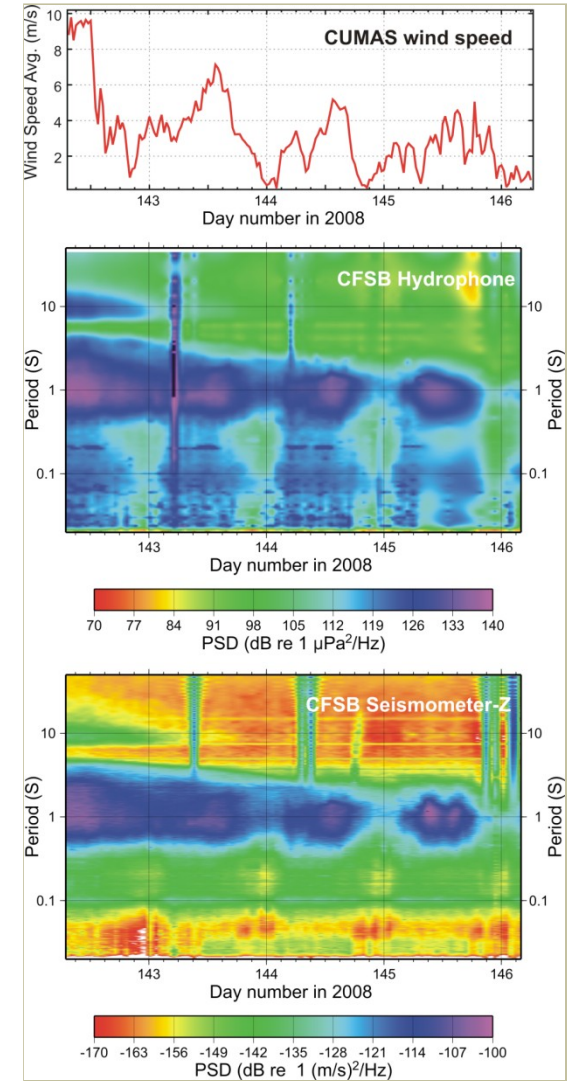
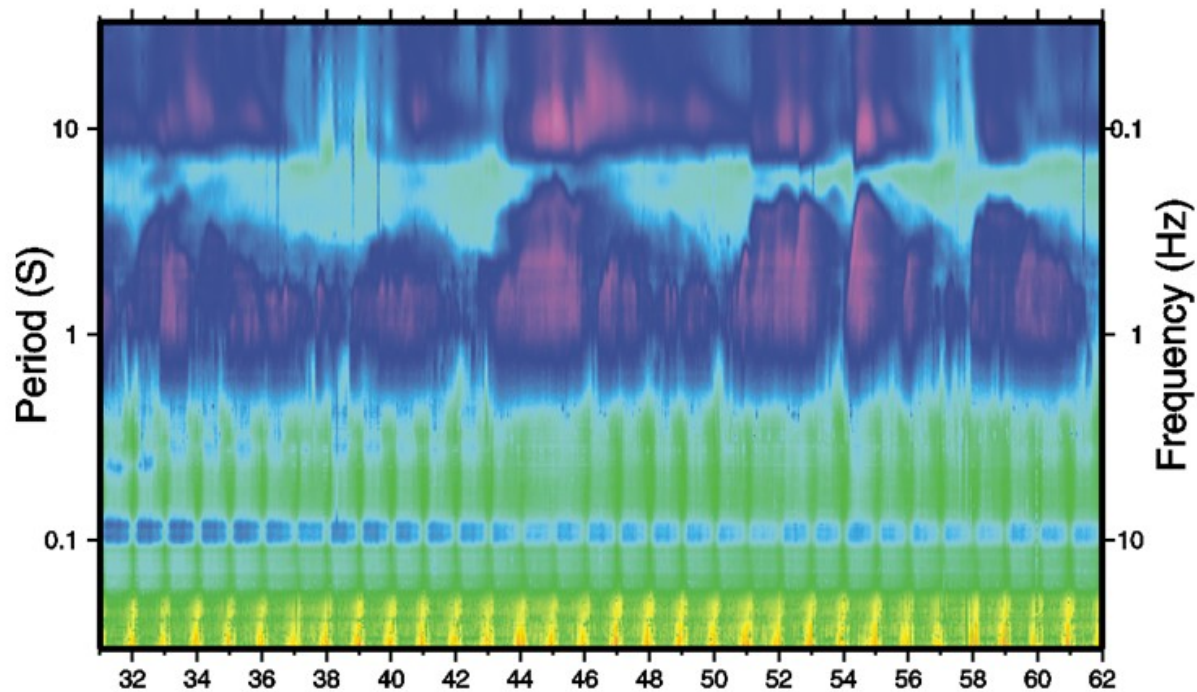
Seismometer and hydrophone: Comparison of records of a local earthquake ($M = 0.3$)



Seismometer and hydrophone: Comparison of records of a local earthquake ($M = 1.4$)



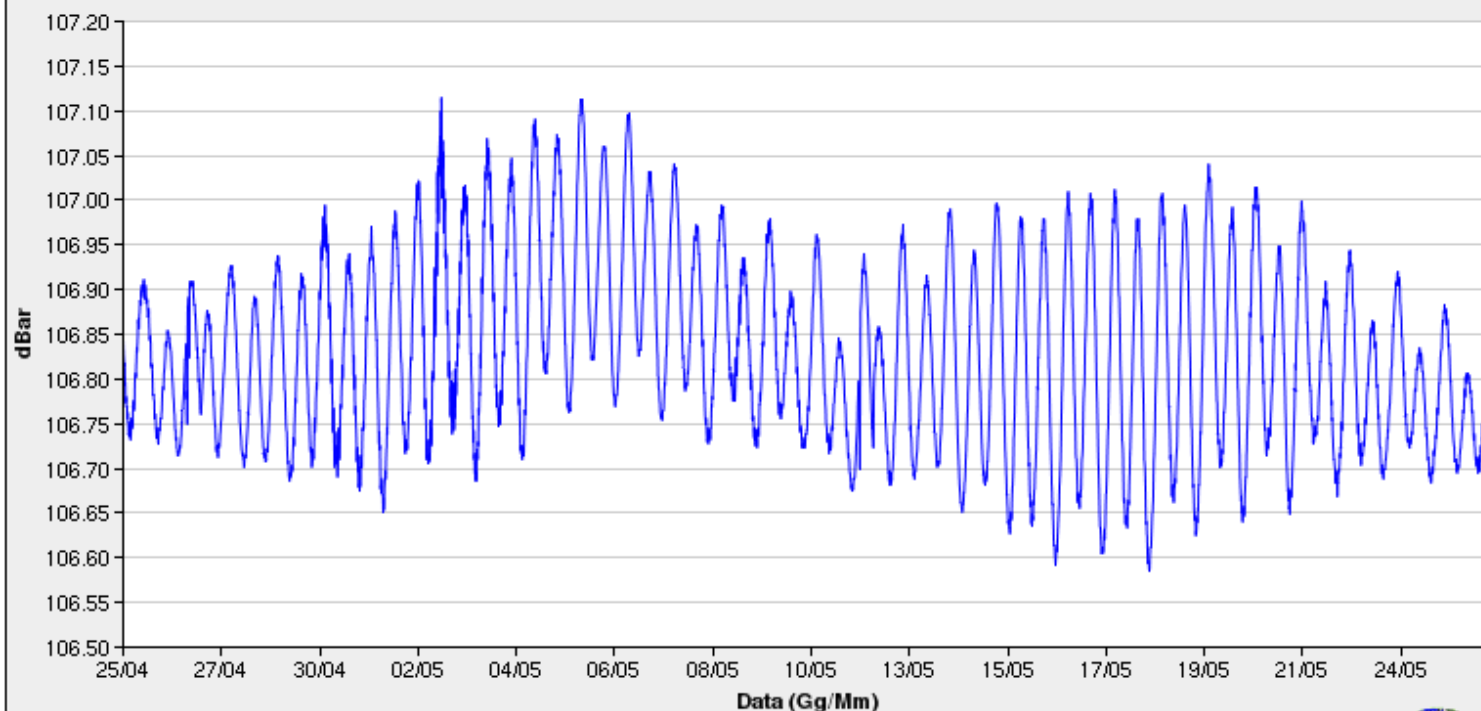
Seismic and acoustic noise and wind velocity



Sea bottom pressure data (Paroscientific sensor)

Version 1.1 (25.05.2011) — sergio.guadato@ov.ingv.it

Dati del Pressostato dal 2011/04/26 al 2011/05/26



N. Campioni utili = 2590271

Pressione media = 106.83 dBar

Punti sul grafico = 4317 (1 sample/10 min)

Minima = 106.58 dBar

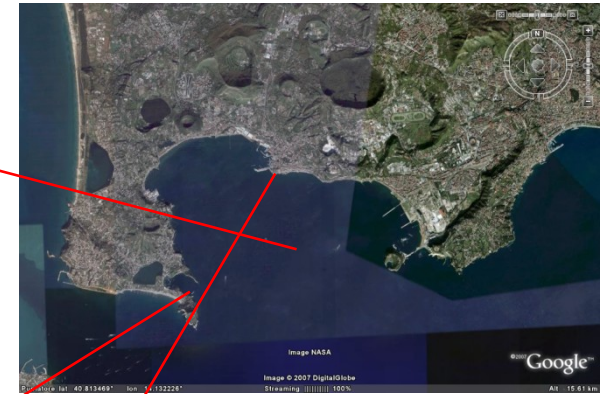
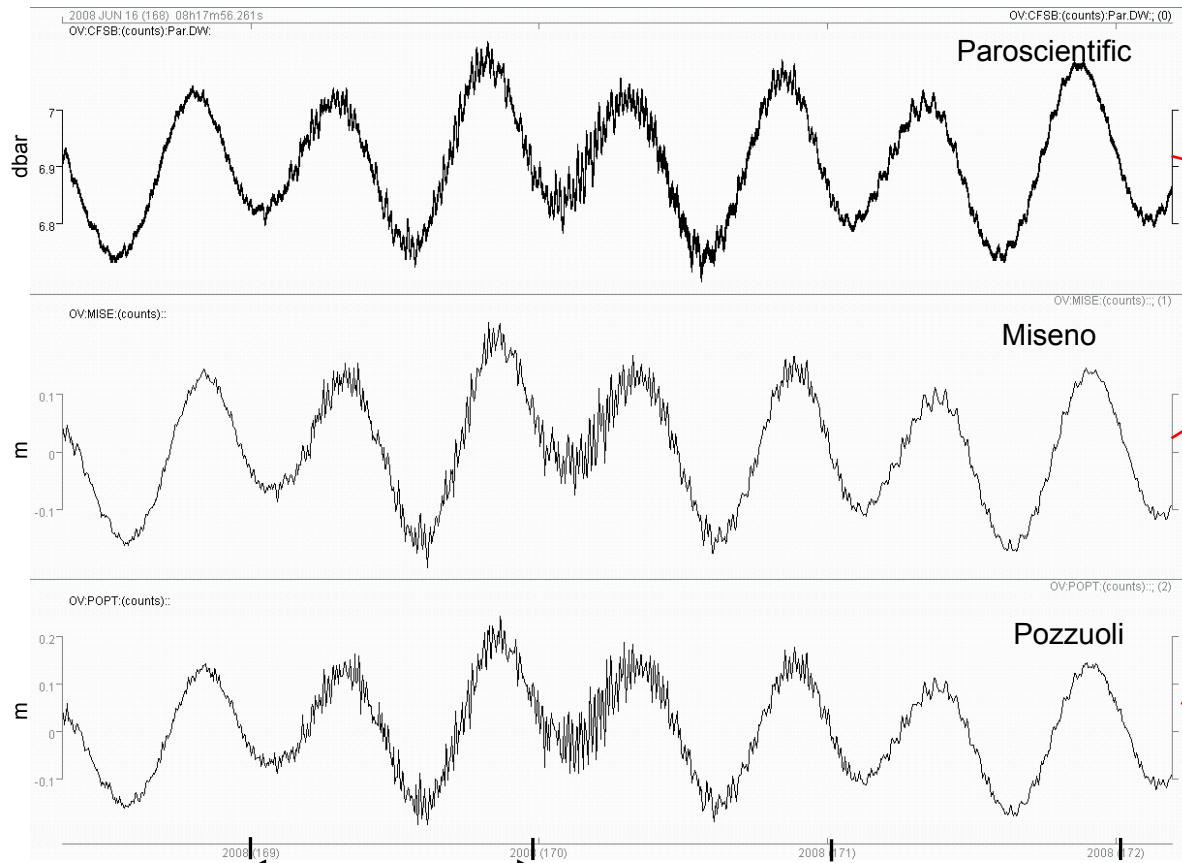
Massima = 107.11 dBar

N. Giorni di dati utili = 31



Osservatorio Vesuviano - Stazione CFSB :: Lat. 40° 47' 87" N :: Long. 14° 07' 19" E (Pozzuoli-Naples Italy)

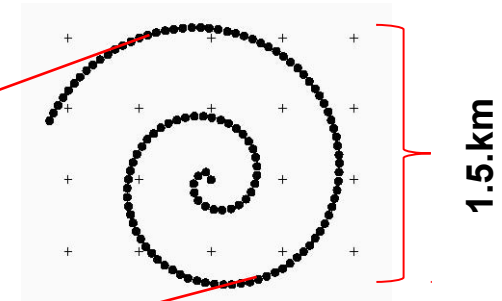
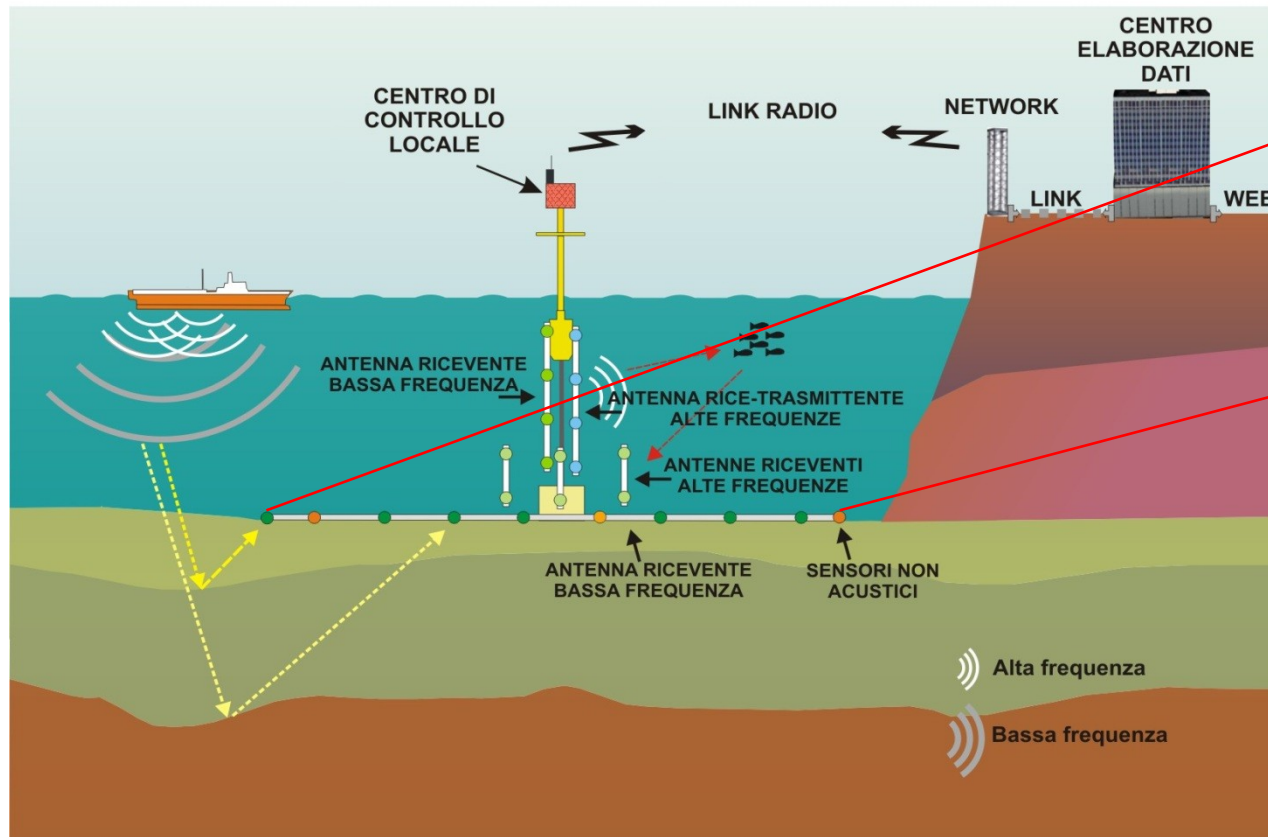
Comparison of sea-bottom pressure data with tide gauges data



24 h

The future development on the sea bottom of the monitoring system of the Campi Flegrei volcanic area

Two projects for the design, development and testing a Sub-marine High Resolution Antenna for tracking medium changes beneath volcanoEs (SNAKE)
(submitted in advanced phase of evaluation)



Partners:

WASS SpA
University of Naples
University of Grenoble
INGV

