



ITALIAN SEISMOLOGICAL
INSTRUMENTAL and PARAMETRIC
DATA-BASE

ISIDe



ISIDe, the Italian Seismic Data Base

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<http://iside.rm.ingv.it>



Distribute:

- *Quasi-real-time* revised locations produced by the INGV national seismic surveillance.
- Triggered seismic signals from the entire Italian National Seismic Network.
- Bulletin revised locations since April 16^o 2005.

To:

- Scientific community (but...)



first INGV, CNT earthquake workflow for ML 2.5 and above

- within 2 minutes
 - Communication to the Civil Protection Agency of the occurrence of an earthquake. Generic information about the closest main town and strength of the earthquake.
- within 5 minutes
 - Communication of a preliminary (most of the time automatic) location and magnitude
- within 30 minutes
 - Communication of the revised location and ML magnitude.
 - Publication of maps and data.

- We publish, through the *ISIDe* web-page, **all** the revised hypocentral parameters and magnitudes.
- We collect and distribute triggered signals in SAC format.

Possibility to access the signals directly via ftp at:

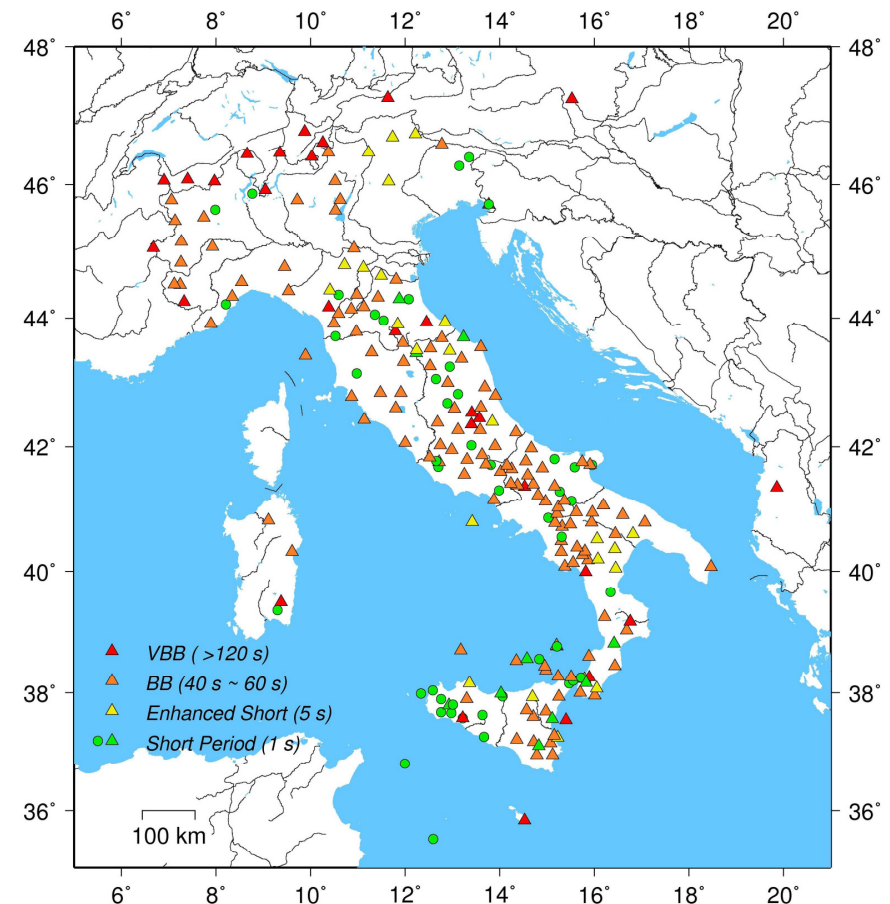
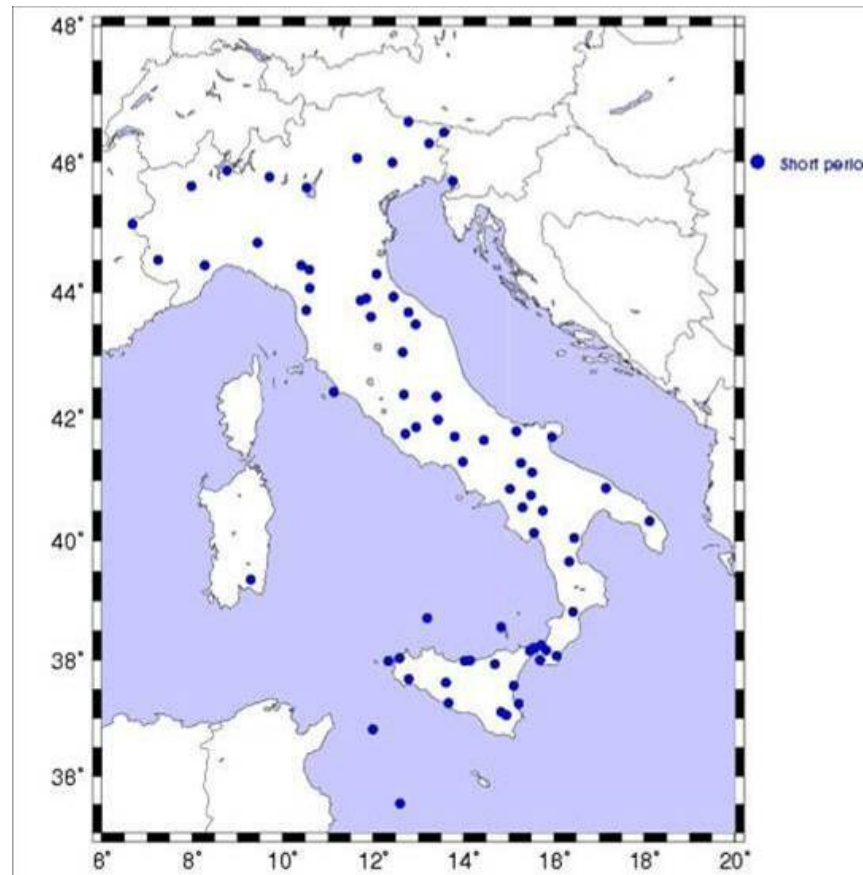
<ftp://iside.rm.ingv.it/events/yyyy/mm/dd/>



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ISIDe

a new Italian Seismic Bulletin since April 16^o 2005





Before 2005-Apr-16

- Magnitudes from short period **vertical** sensors (S-13):
 - Search of the maximum amplitude of the S-13 signal and corresponding period.
 - Approximate displacement from the transfer function of the S-13 at that period.
 - Approximate Wood-Anderson amplitude.

After 2005-Apr-16

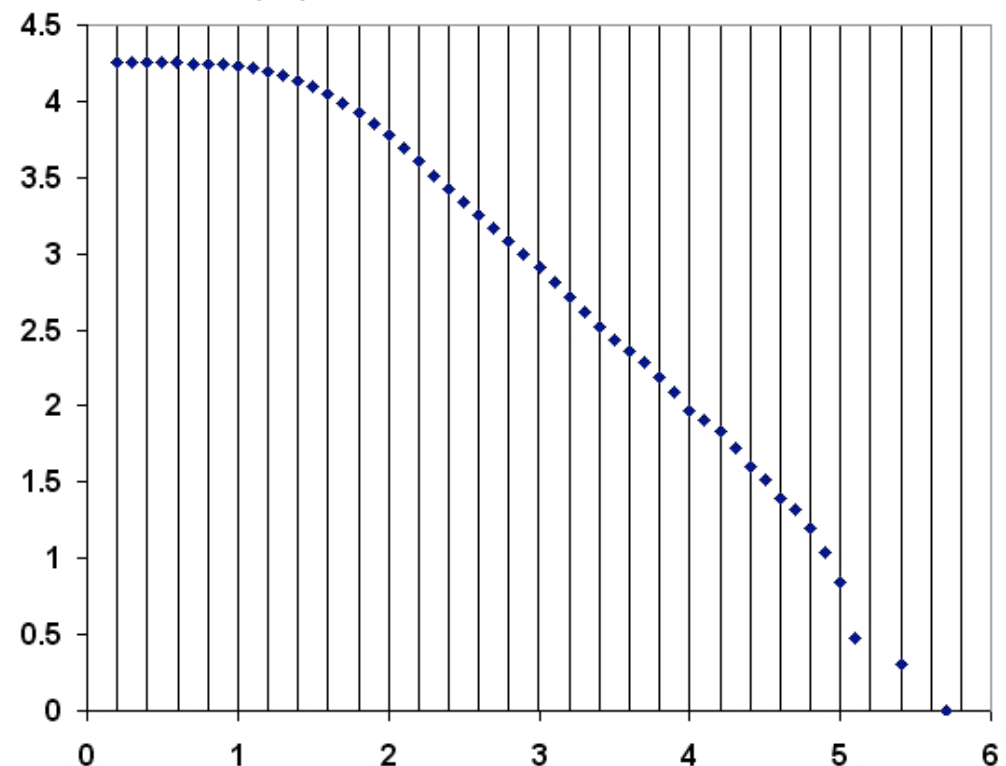
- Magnitudes from broad band **horizontal** seismometers:
 - Full Wood-Anderson signal reconstruction.
 - Hutton-Boore correction.



The minimum magnitude of completeness of the Italian Seismic Bulletin reduced from $M_c \approx 2.3$ in year 2000 to $M_c \approx 1.8$ in 2006 (Amato & Mele 2008).

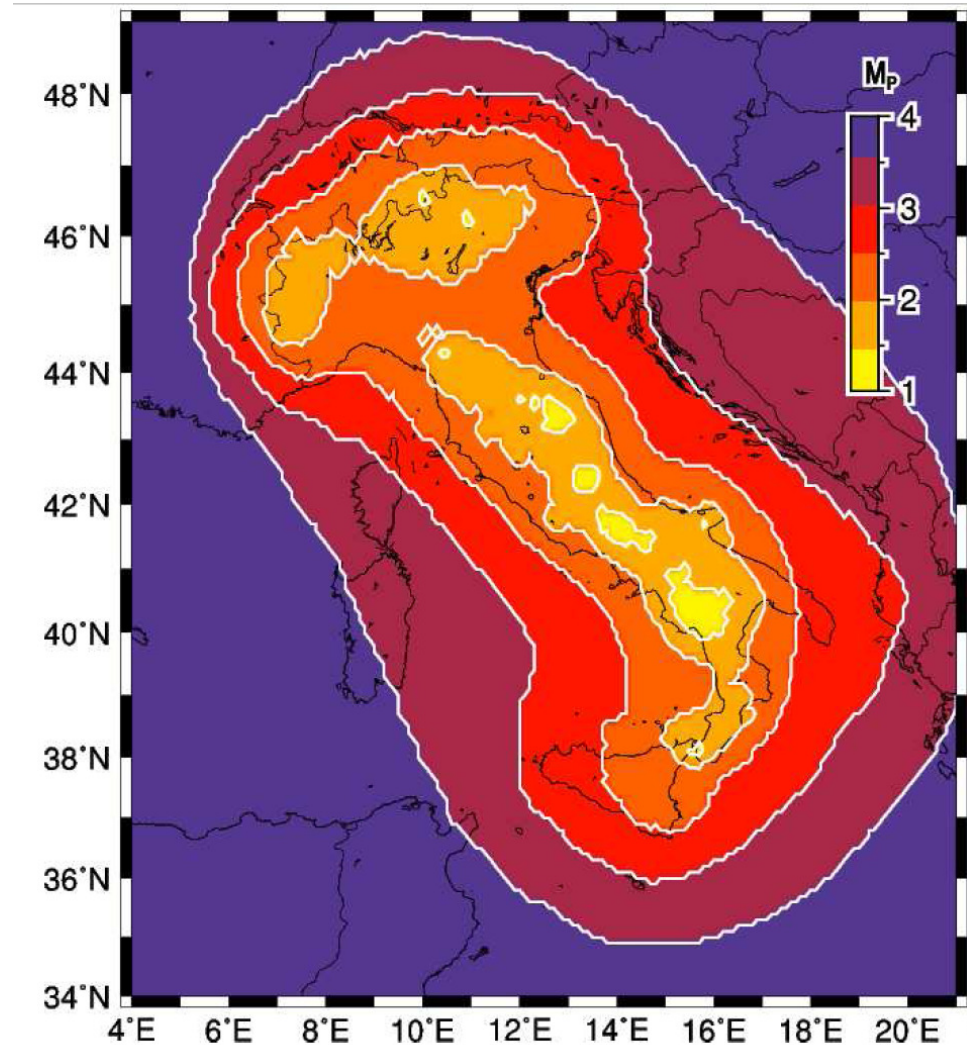
M_c appears close to 1.8 in the period 2005-2008.

Gutenberg-Richter distribution
(Apr 2005 - 2008)





Schorlemmer et al. showed that the detection capability of the Italian National Seismic Network and the minimum magnitude of completeness of the catalogue is highly variable from place to place, ranging from $M \approx 1.5$ in some restricted areas of the southern Apennines to $M \approx 2.9$ in western Sicily.



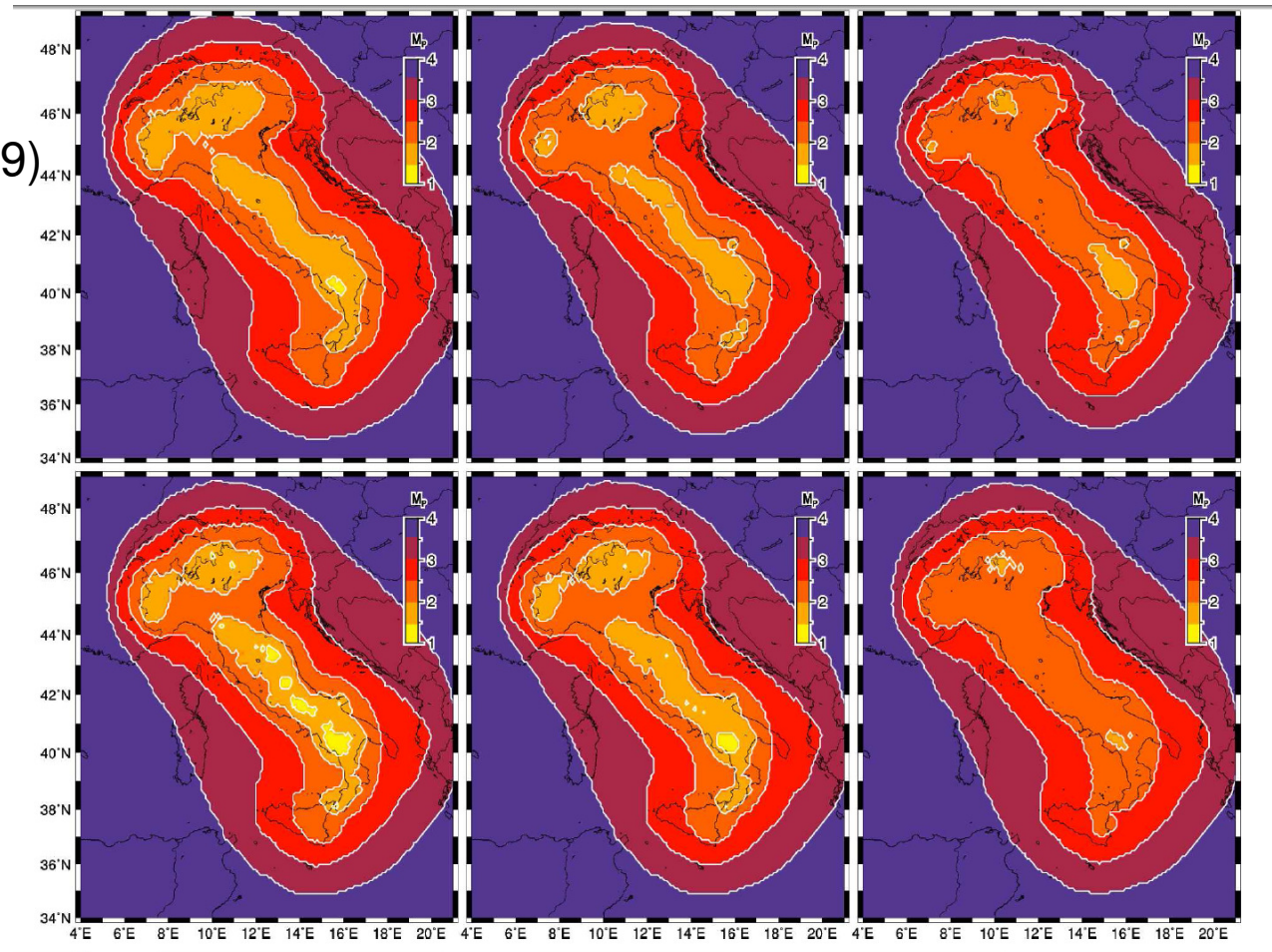


Mc at 30 km depth,

$P = (0.99, 0.999, 0.99999)$

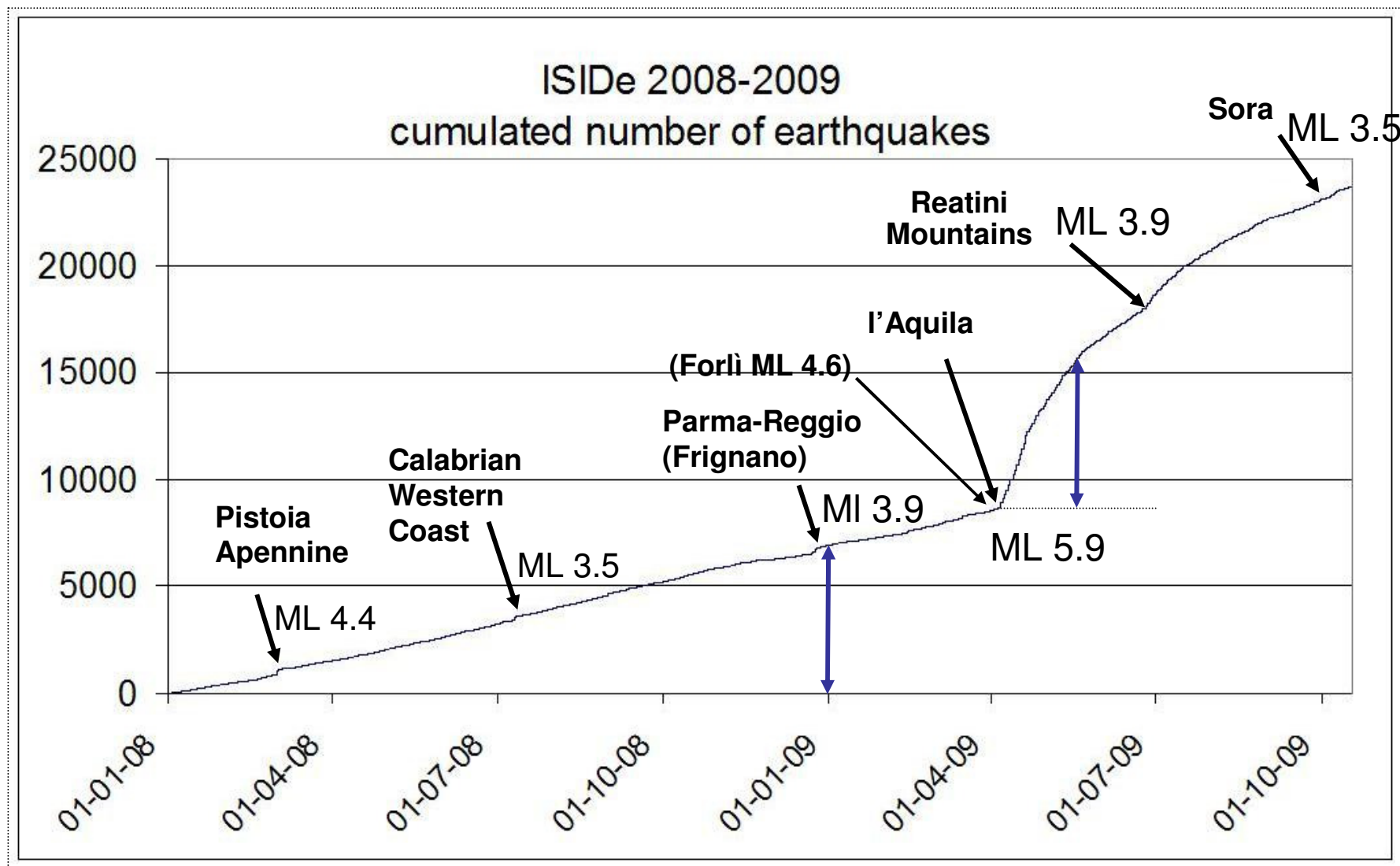
Mc at $P=0.999$,

depth = (0, 15, 60) km





- 4.5 years of Italian seismicity
- 38000 earthquakes
 - ~ 6000 earthquakes/year
 - ~ 12000 l'Aquila sequence earthquakes
- Usual Bulletin delay: 1-2 months
- Current delay: 6 months



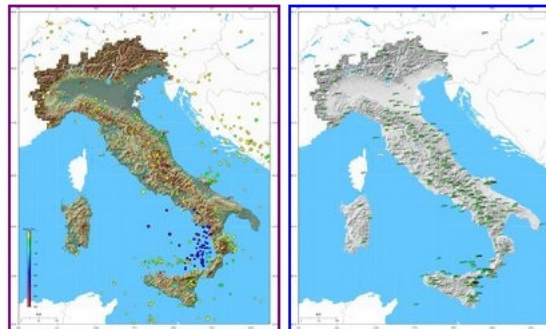


- 2274 events located by the Seismic Surveillance in the first 10 days after l'Aquila earthquake.
- ≈ 5200 events in the Bulletin in the first 10 days after l'Aquila earthquake.
- 5058 in April.
- ≈ 8700 in April.



THE ITALIAN SEISMIC BULLETIN

The "**Italian Seismic Bulletin**", is part of ISIDe, the *Italian Seismic Instrumental and parametric Data-basE*. It will include in a close future earthquake parameters obtained merging *quasi-real time* location data with the **Italian Seismic Bulletin**. Our intention is to provide the best revised information about the Italian very recent seismicity, as soon as it is available, together with up-to-date knowledge about the past seismicity.
[continue...](#)





Earthquakes data

? Date: ☐ Disable

From: To:

? Magnitude: ☐ Disable

Min: Max:

? Town and geographic area: ☐ Disable

- ☒ Lat. Lon. min and max
☐ Lat. Lon and distance
☐ Town and distance

Latitude Min: Latitude Max:
Longitude Min: Longitude Max:

Advanced research

? Select if you want also the url for sac file

☐ Show url sac file

? Depth (km): ☒ Disable

Min: Max:

? Select the magnitude to filter on

- ☒ Magnitude
☐ Md
☐ MI
☐ M
☐ MB
☐ MW
☐ MS

? Select the additional fields to show

☐ Origin time error



? Select the additional fields to show

- ☐ Origin time error
- ☐ Latitude error
- ☐ Longitude error
- ☐ Depth error
- ☐ Preferred Magnitude error
- ☐ Md
- ☐ Error Md
- ☐ MI
- ☐ Error MI
- ☐ M
- ☐ Error M
- ☐ MB
- ☐ Error MB
- ☐ MW
- ☐ Error MW
- ☐ MS
- ☐ Error MS

? Select the map options

- ☐ View town
- ☒ No town
- ☐ Color map
- ☒ Grey map

Search

Reset



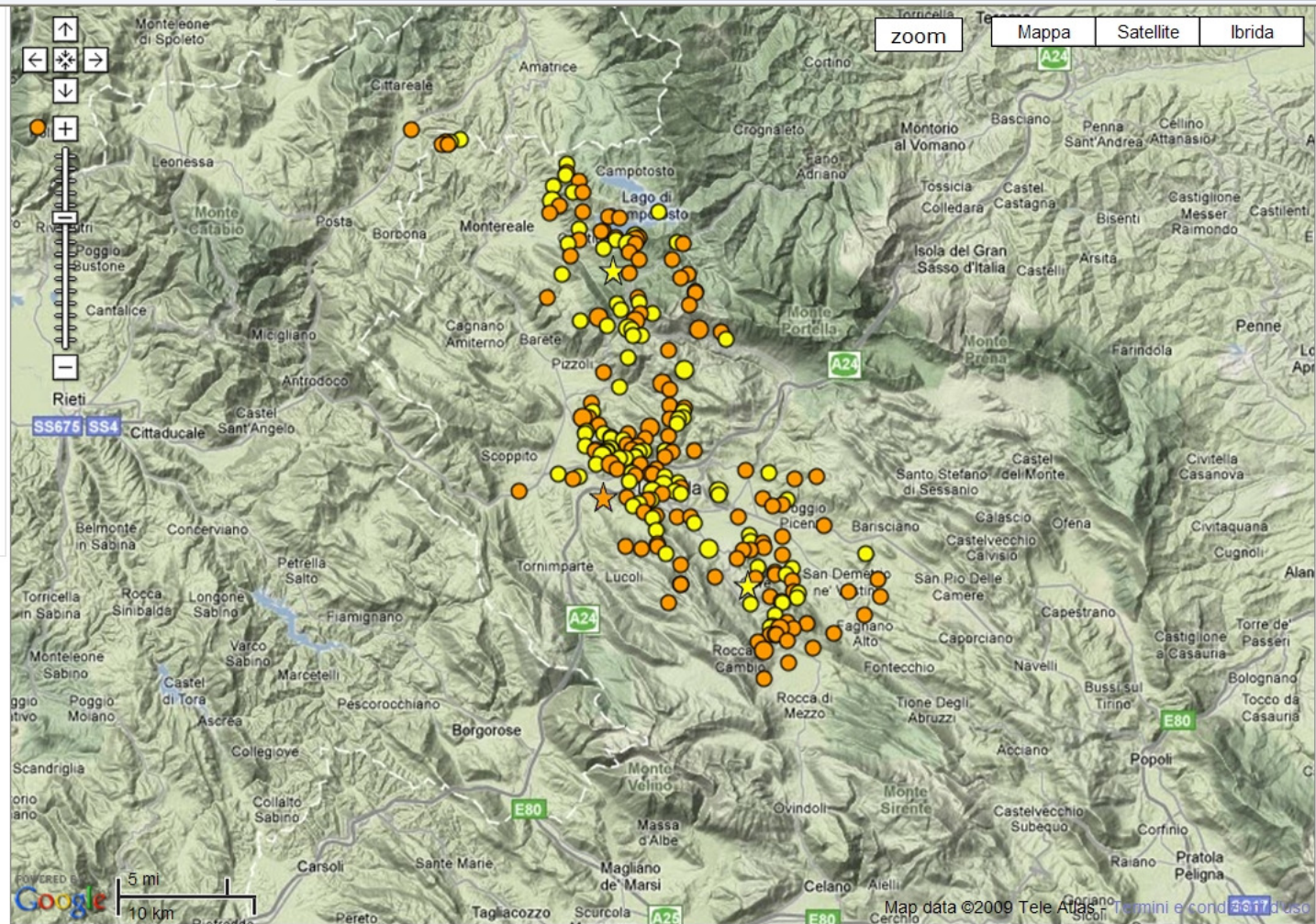
ISIDE - Italian Seismological Instrumental...

Magnitude

- ☆ M $\geq$ 5.0
- M < 5.0
- M $\leq$ 4.0
- M $\leq$ 3.0
- M $\leq$ 2.0
- M $\leq$ 1.0

Depth (km)

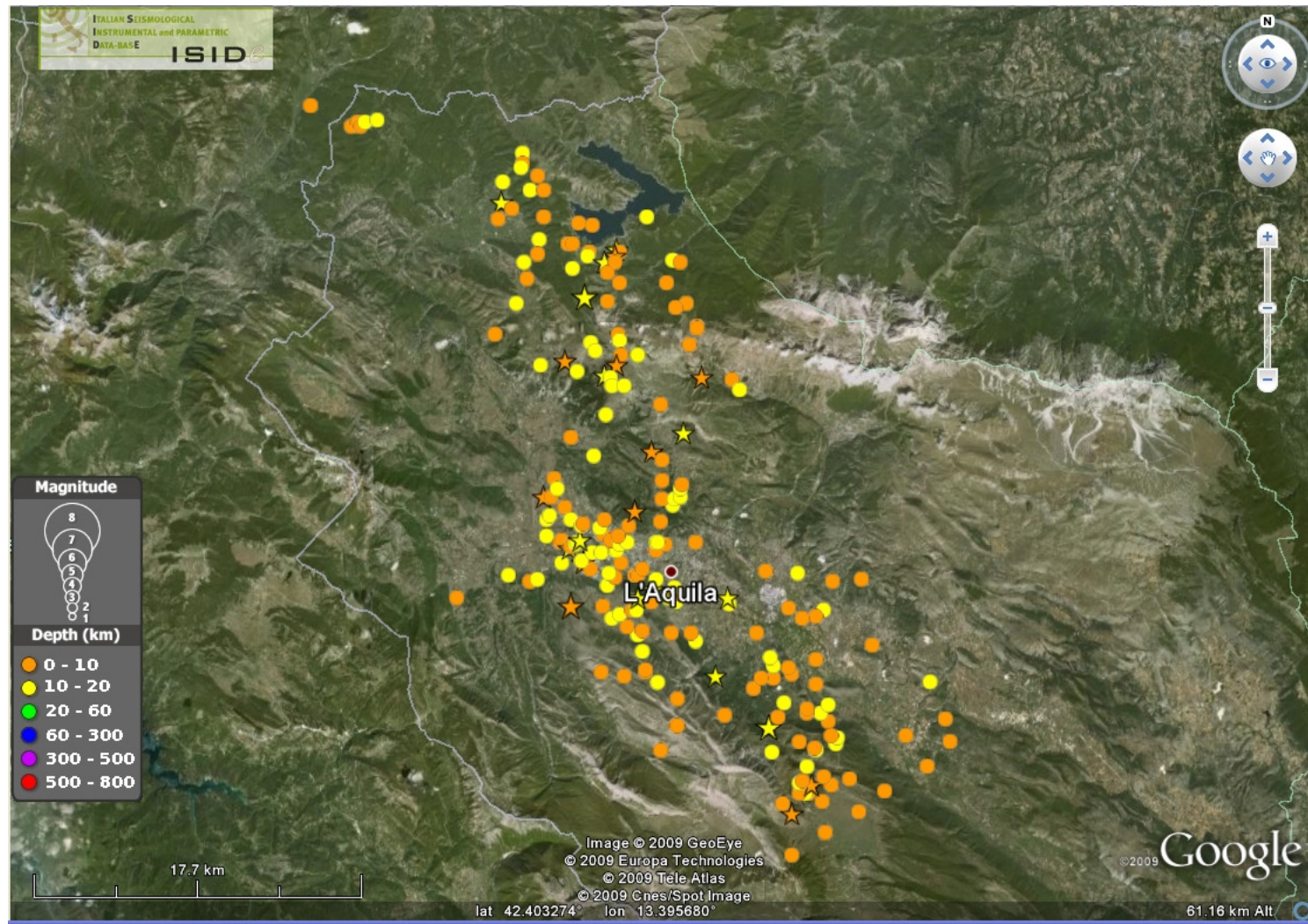
- 0 - 10
- 10 - 20
- 20 - 60
- 60 - 300
- 300 - 500
- 500 - 800

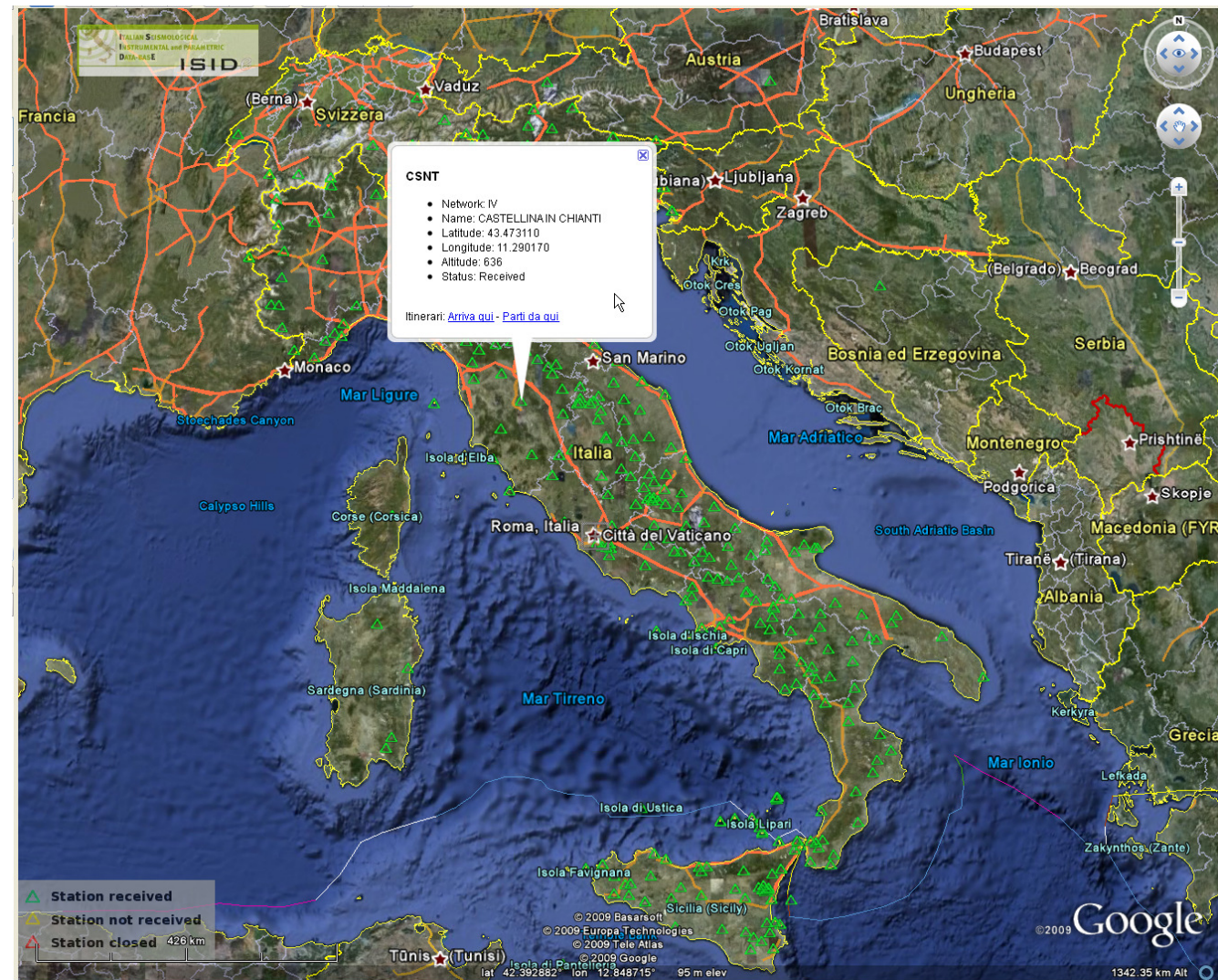




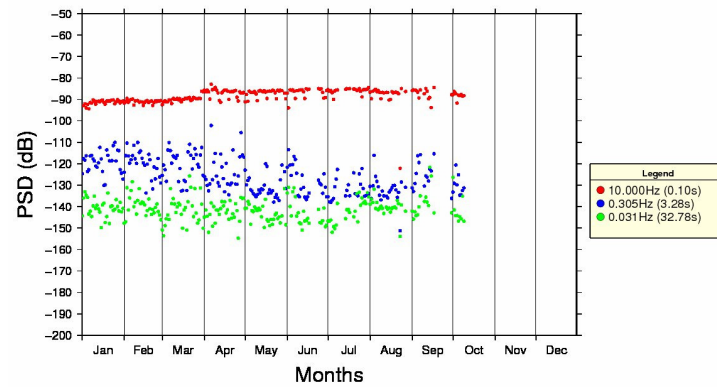
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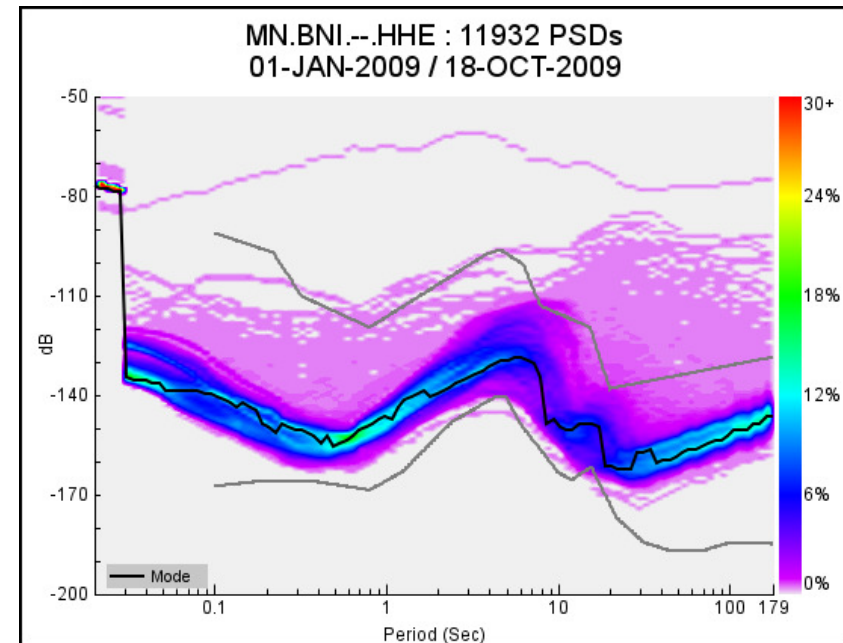
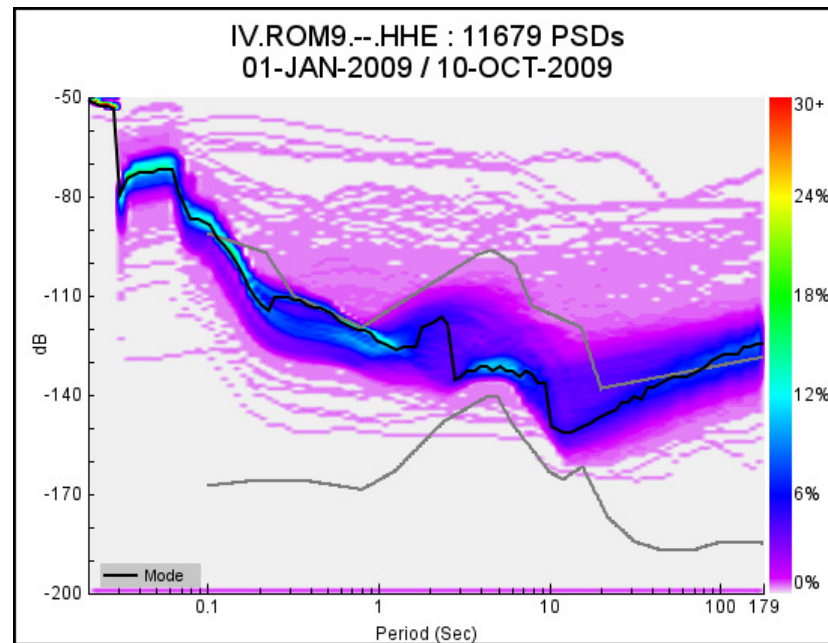
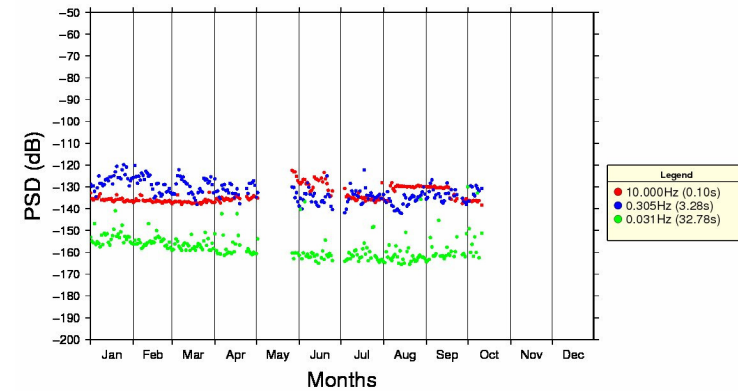


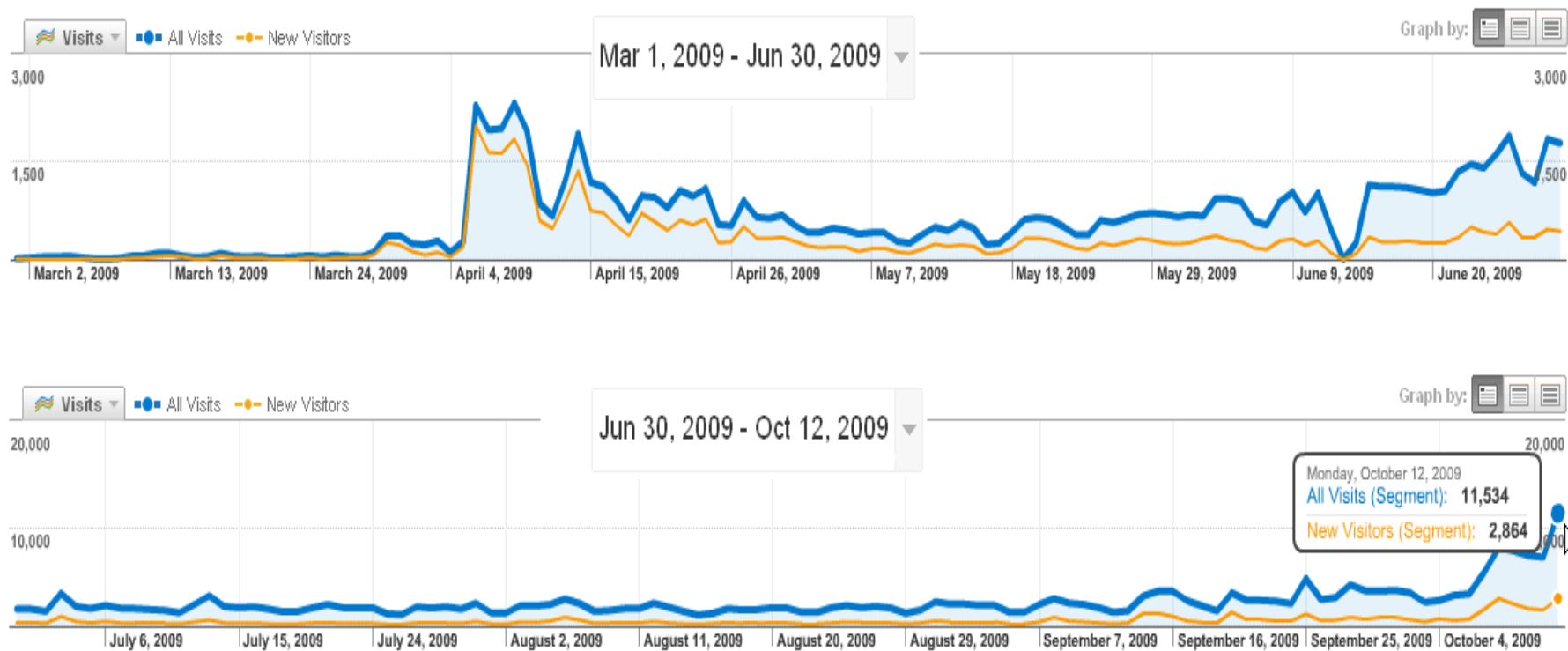


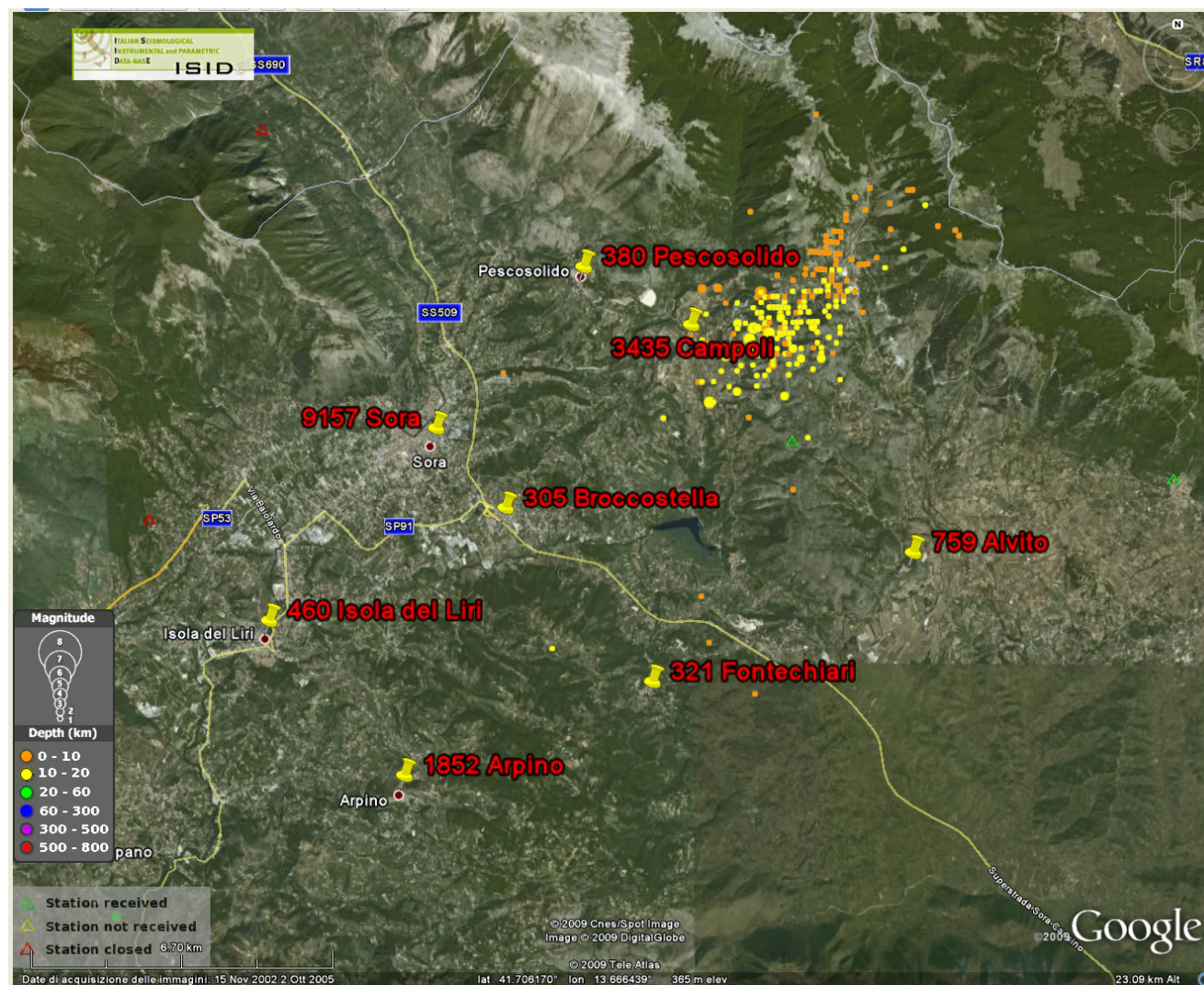
2009_IV.ROM9.--.HHE



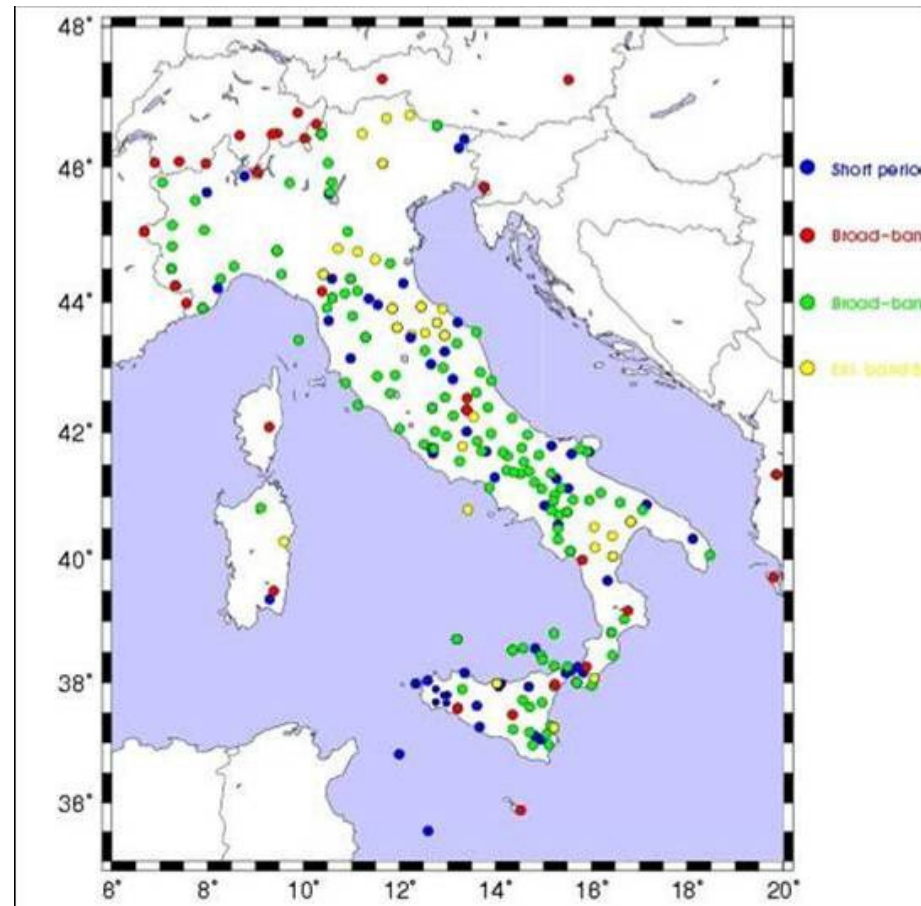
2009_MN.BNI.--.HHE







Thank you

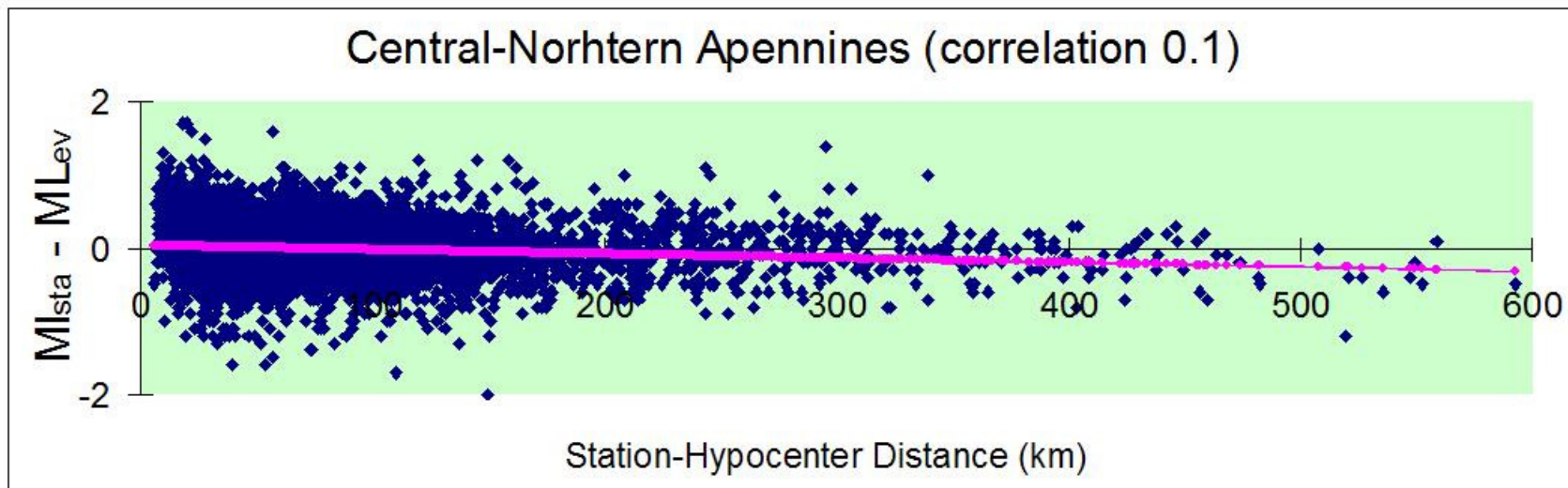
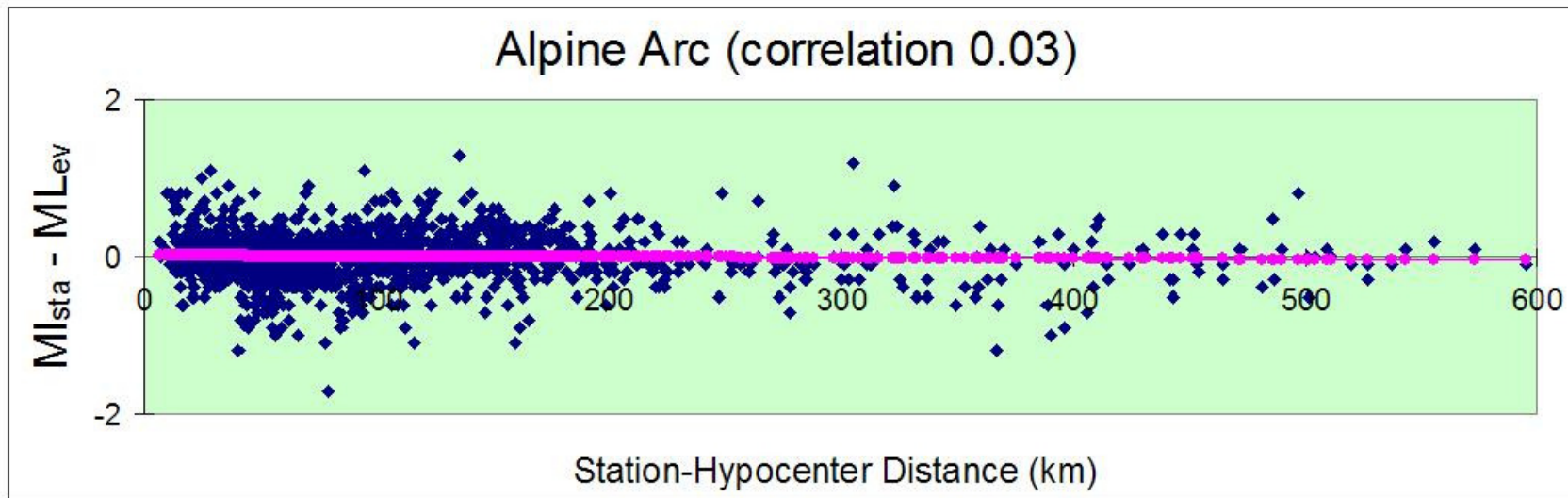


Location algorithm

- Inversion with SVD.
- Dynamic weighting with residuals and distances.
- Dynamic choice of the number of eigenvectors used in the solution (max/min ratio of the eigenvalues).
- Flat earth approximation.
- Crustal Model: 2 layers and a halfspace
 - thicknesses: (11.1 km+ 26.9 km) total 38 km
 - P-velocities: 5.km/s, 6.5km/s, 8.05km/s

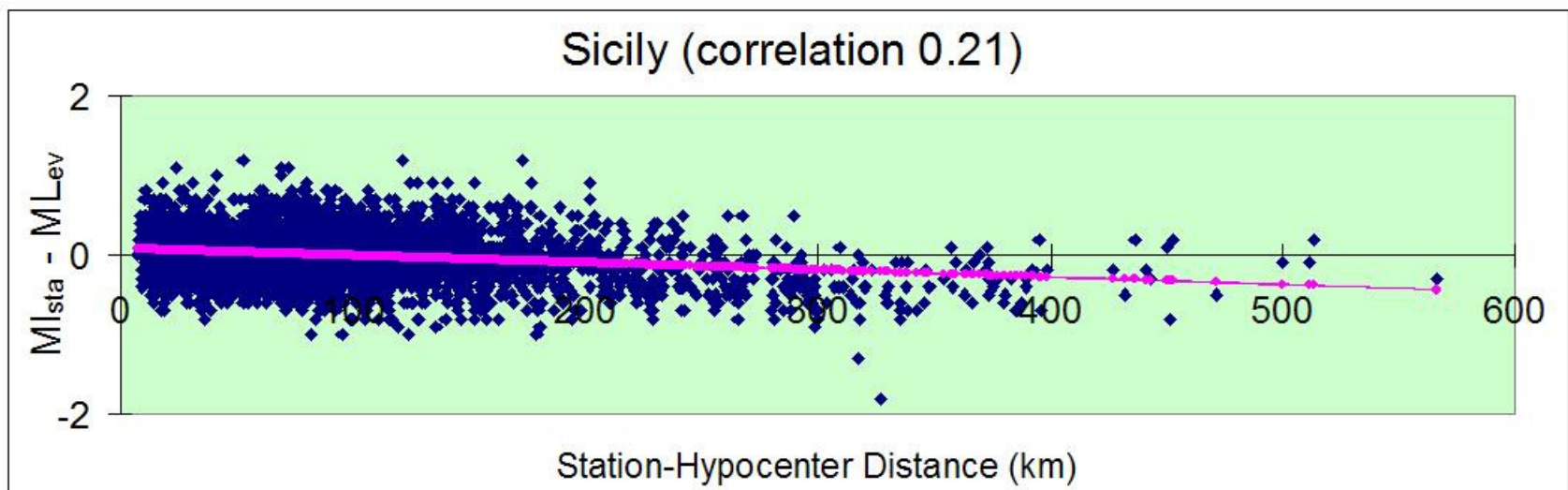
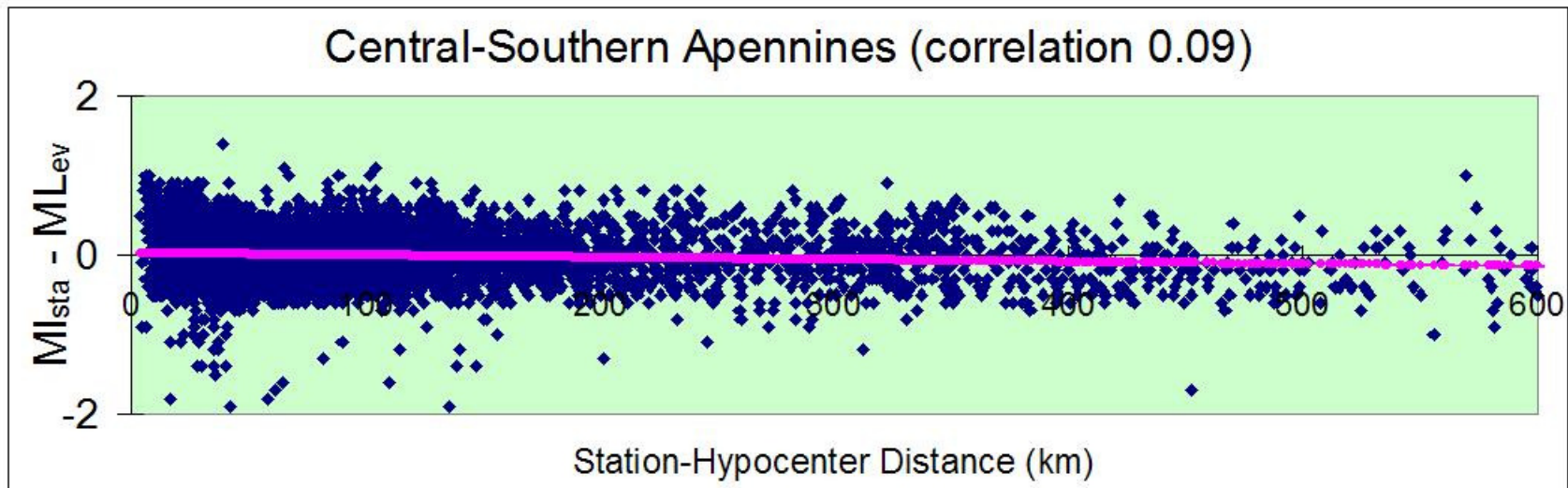
Is the Hutton Boore good for Italy?

#1



Is the Hutton Boore good for Italy?

#2



Real – Time delays

- First automatic location at about 30 seconds after the earthquake.
- First automatic ML at about 50 seconds after the earthquake.
- Last automatic location/ML at about 3-4 minutes after the earthquake.

Agreement between INGV and the Civil Protection Agency

- First communication of the event and of the province of the event within 2 minutes.
- First communication of parameters (location and ML) within 5 minutes.
- Revised location and magnitude within 30 minutes.