Università degli Studi
di Genova

La Pericolosità Sismica del Territorio Piemontese

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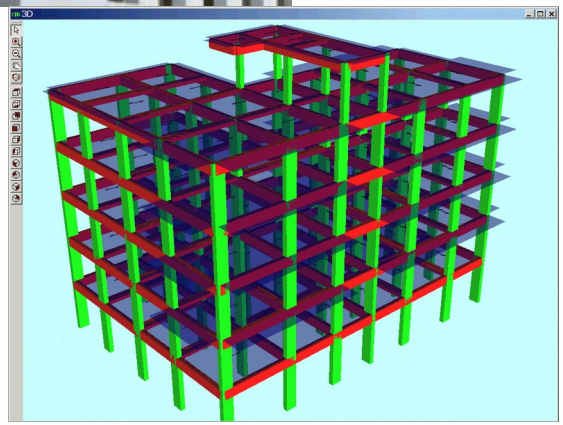
Seismic Risk

$$R = H * D * E$$

Il termine "rischio sismico" si riferisce al rischio di danneggiamento di un edificio, sistema o altra entità a causa dell'attività sismica. A fini gestionali, il rischio sismico è definito in termini di conseguenze economiche, sociali e ambientali (cioè perdite) associate al verificarsi di eventi calamitosi in una certa area in un determinato periodo di tempo.

*La danneggiabilità **D** quantifica, in termini economici (vulnerabilità) o di stati limite (fragilità), l'incapacità (di un sistema o di un'unità) di resistere agli effetti di un terremoto.*



Le norme sismiche intendono ridurre D e, di conseguenza, R

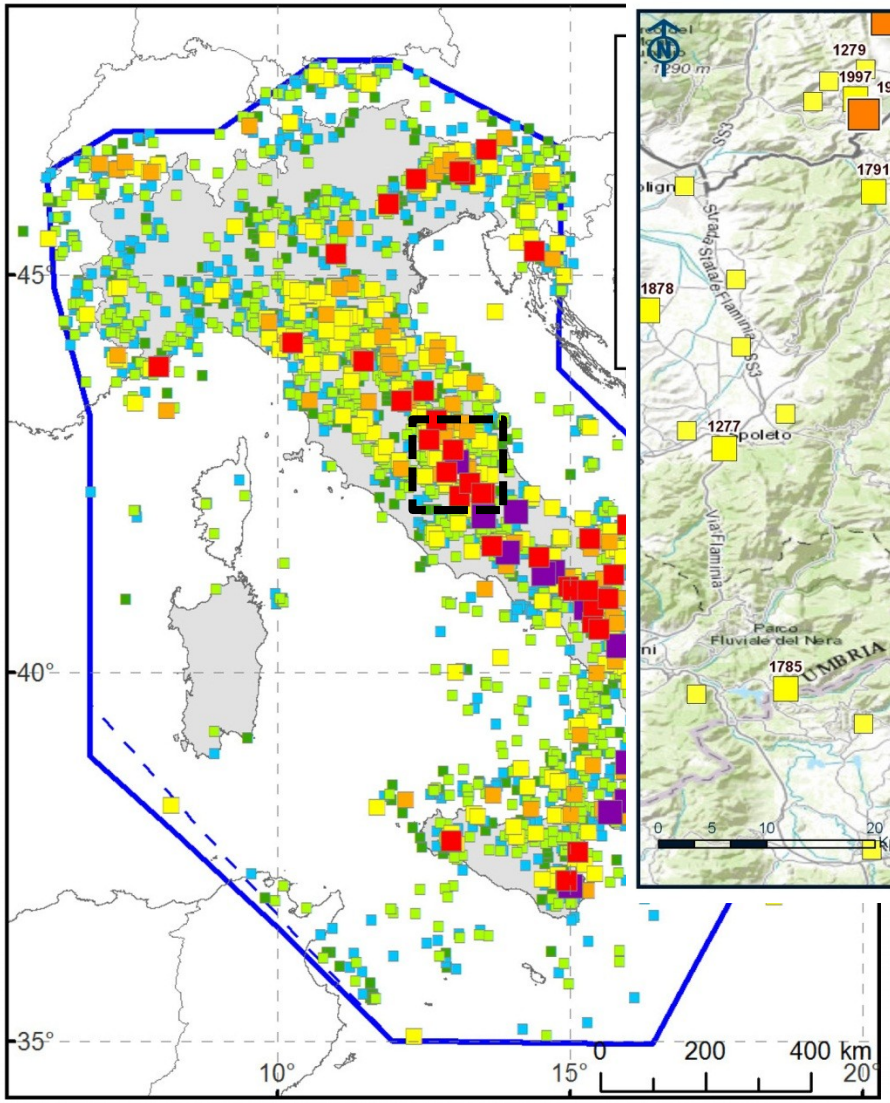
*L'esposizione **E** definisce i beni (strutture, risorse, persone, proprietà, ecc.) esposti a possibili perdite in caso di terremoto.*

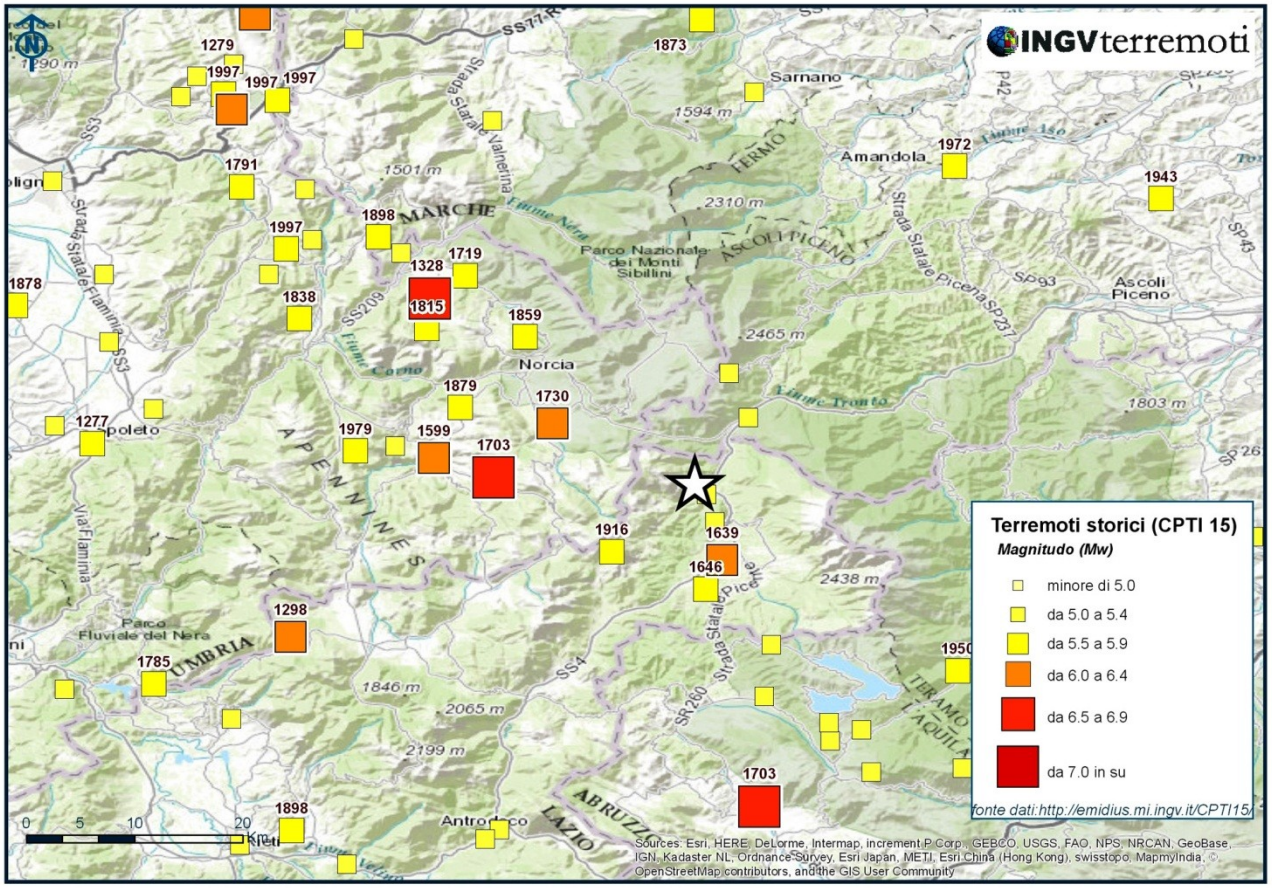
La microzonazione sismica ha lo scopo di ridurre il livello di esposizione e, di conseguenza, R

La pericolosità sismica (o Seismic Hazard) ***H*** *è intimamente correlata alle caratteristiche geologiche di un'area. È comunemente definita come la probabilità di superare un dato livello di scuotimento in un sito in un dato periodo di tempo.*

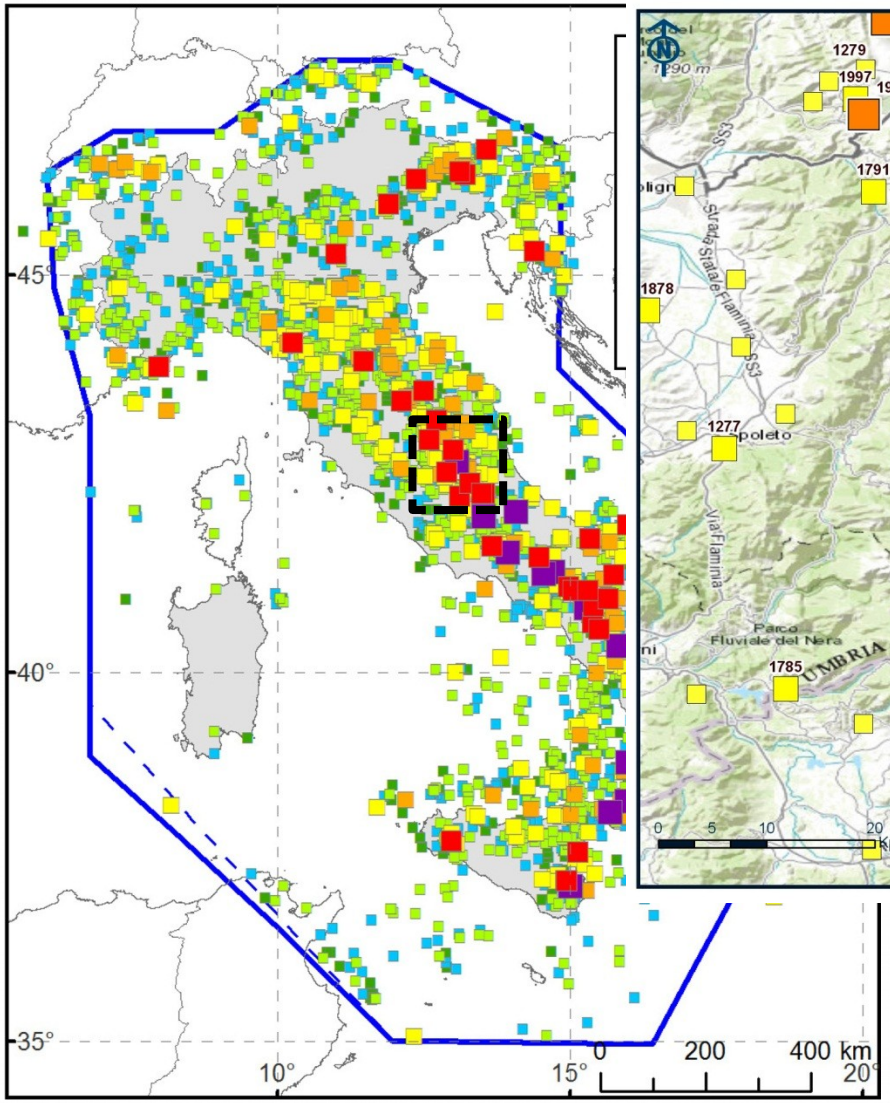
A differenza delle altre componenti nel calcolo del rischio, H non può essere ridotto!

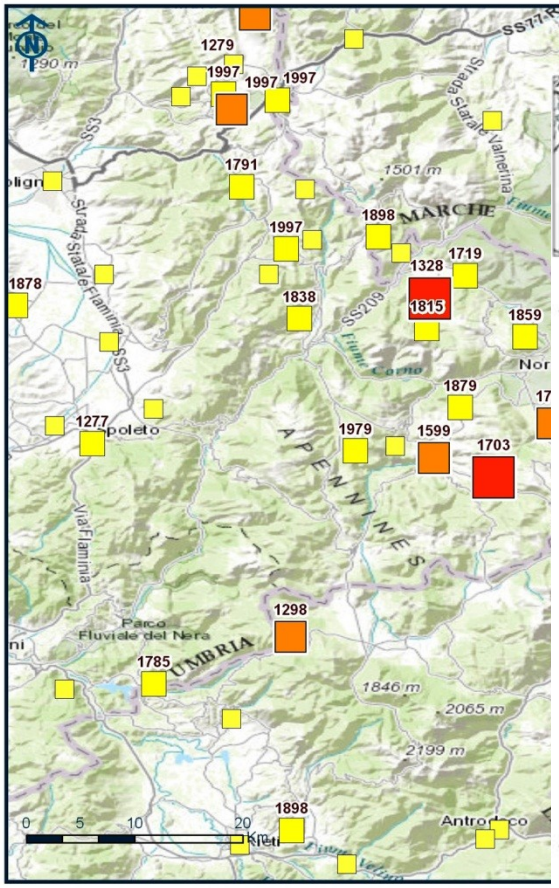
Pericolosità Sismica e Sismicità

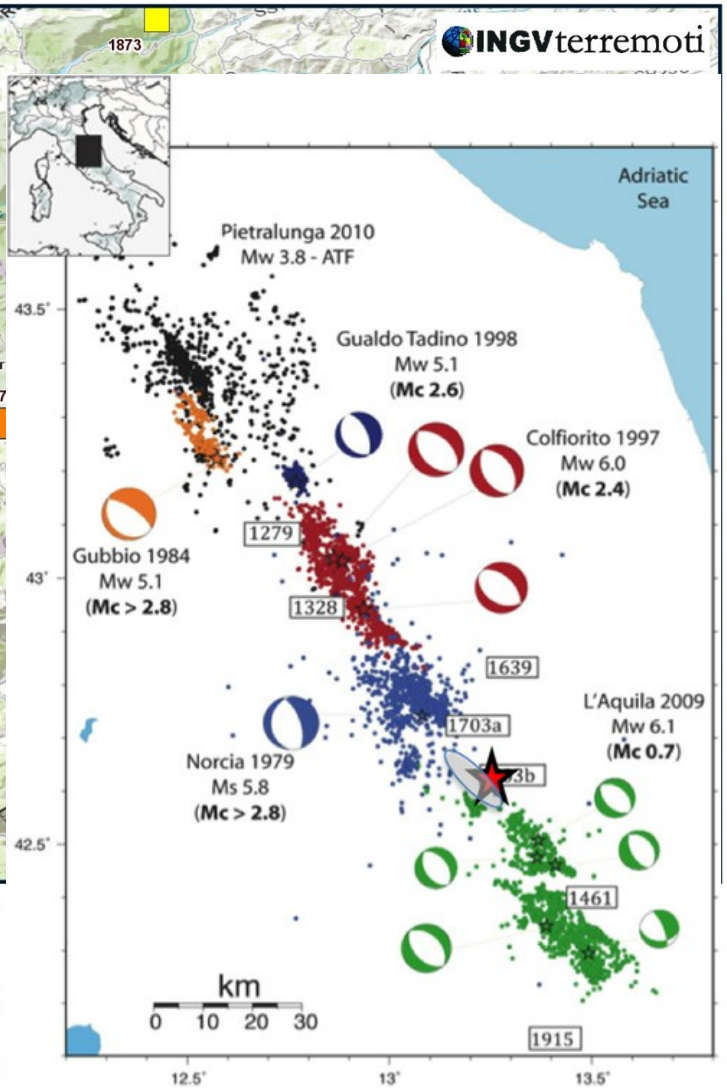




Pericolosità Sismica e Sismicità

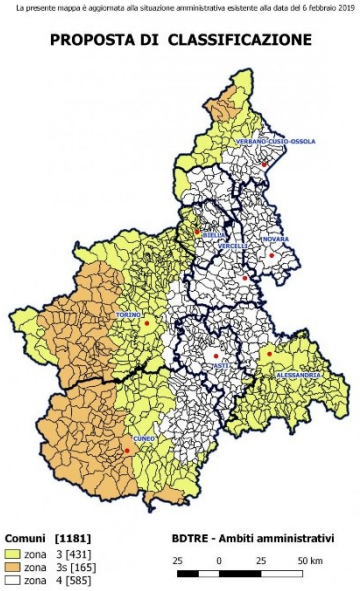




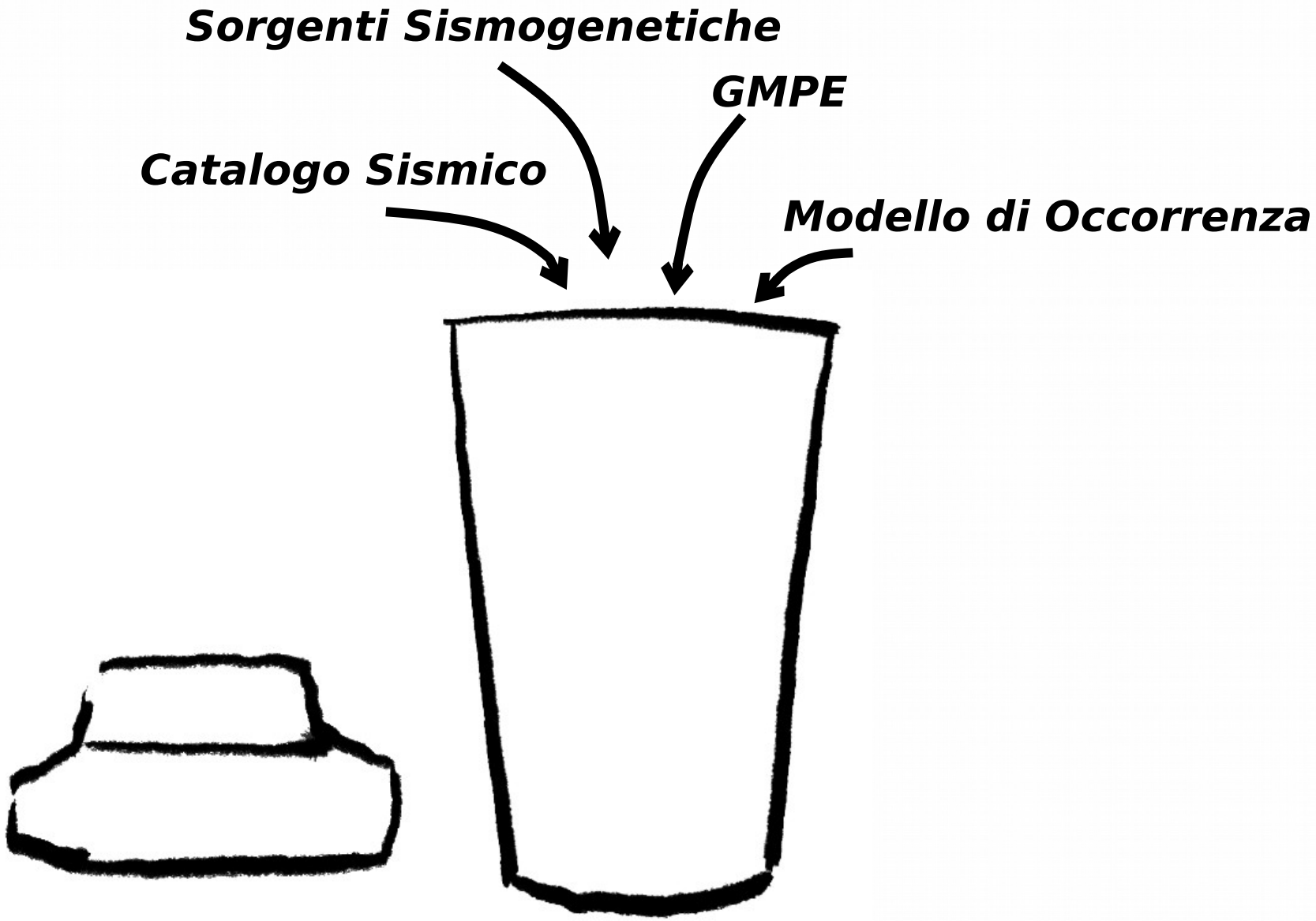


PSHA

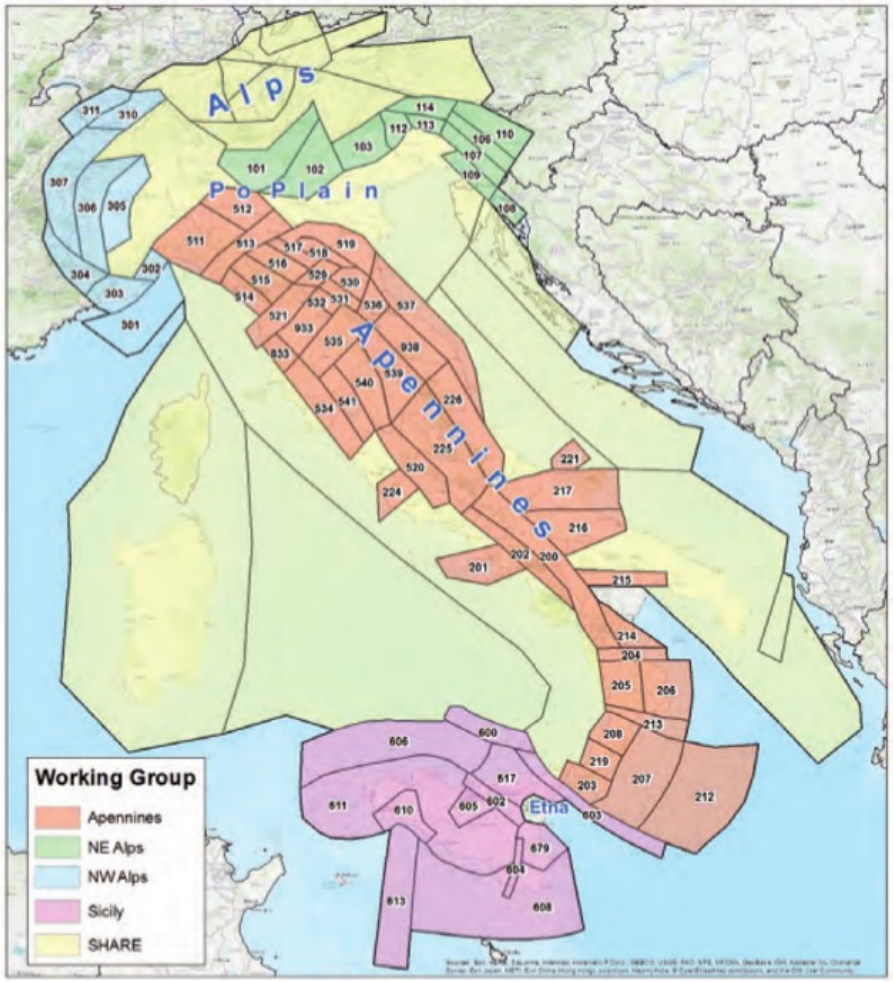
NORME TECNICHE PER LE COSTRUZIONI
Approvate con Decreto Ministeriale 17 gennaio 2018

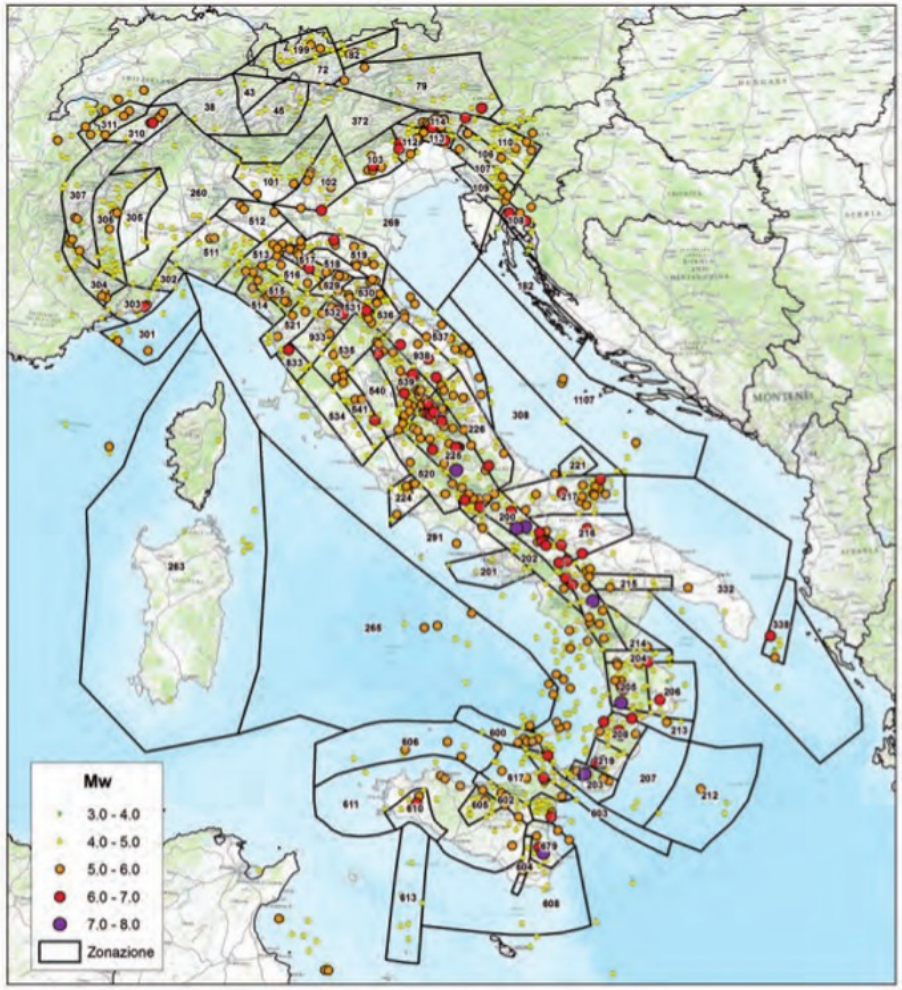

La presente mappa è aggiornata alla situazione amministrativa esistente alla data del 6 febbraio 2019
PROPOSTA DI CLASSIFICAZIONE
VERBANO-CUSIO-OSSOLA
VERCELLI
BIELLA
NOVARA
TORINO
ASTI
ALESSANDRIA
CUNEO
Comuni [1181]
zona 3 [431]
zona 3s [165]
zona 4 [585]
BDTRE - Ambiti amministrativi
25 0 25 50 km

Indirizzi e criteri per la
MICROZONAZIONE SISMICA
Parti I e II
Presidenza del Consiglio dei Ministri
Dipartimento della Protezione Civile

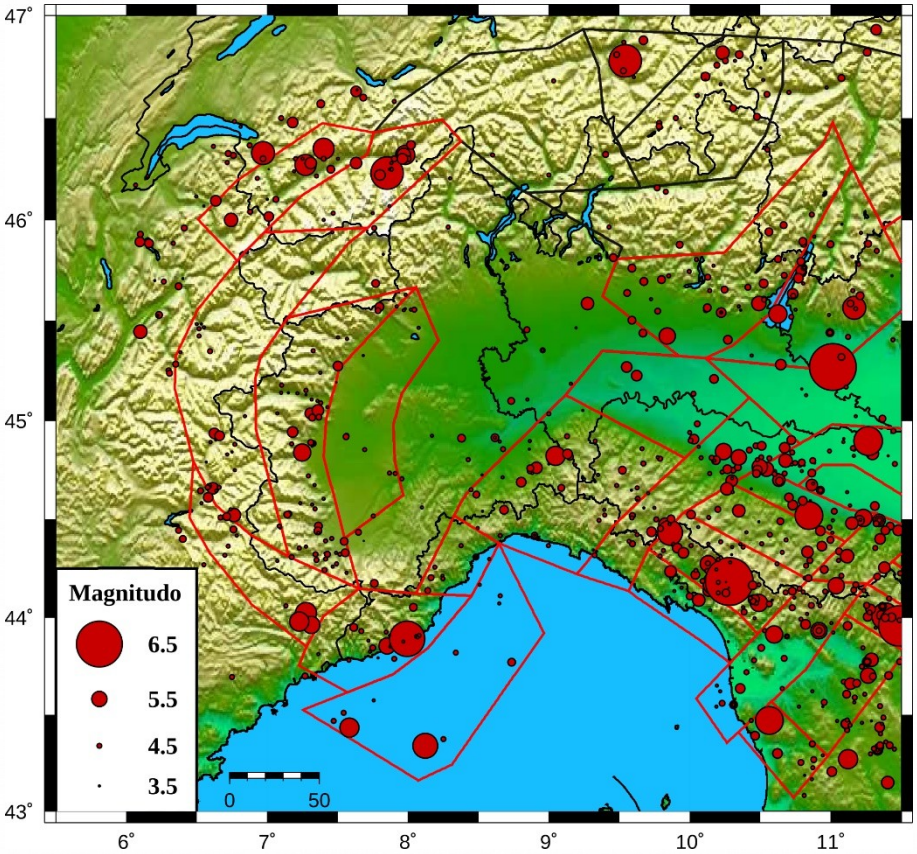

Sorgenti Sismogenetiche
GMPE
Catalogo Sismico
Modello di Occorrenza

Zonazione MA1_MPS19 (Santulin et al., 2017, BGTA)





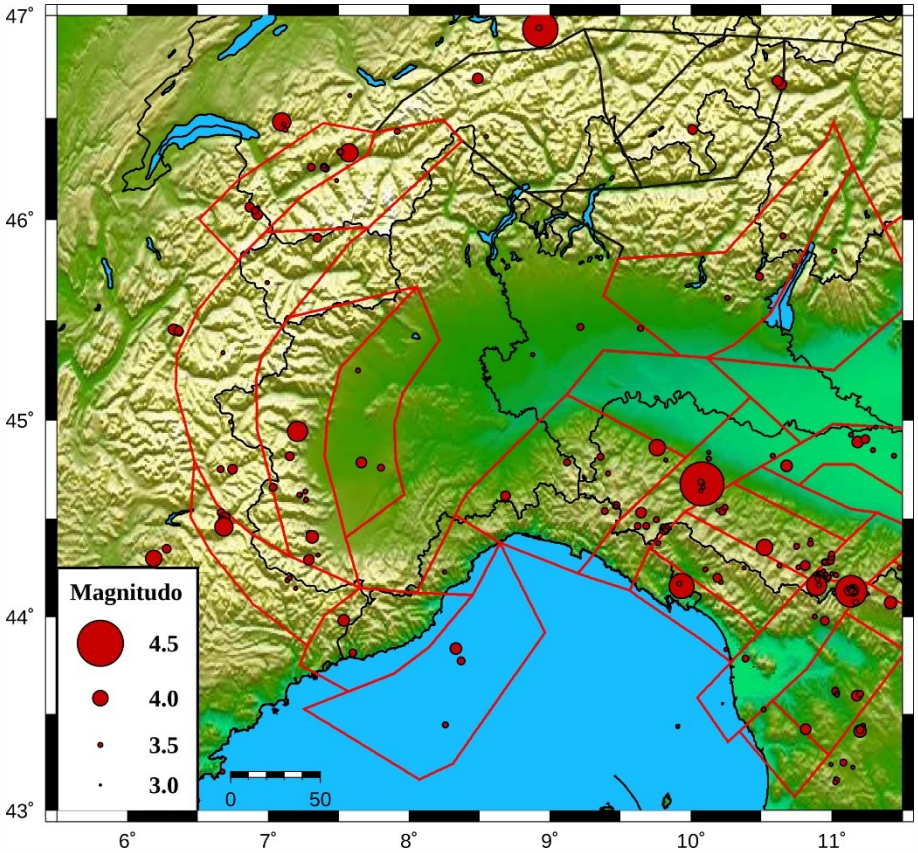
CPTI15 (1005 – 2014)



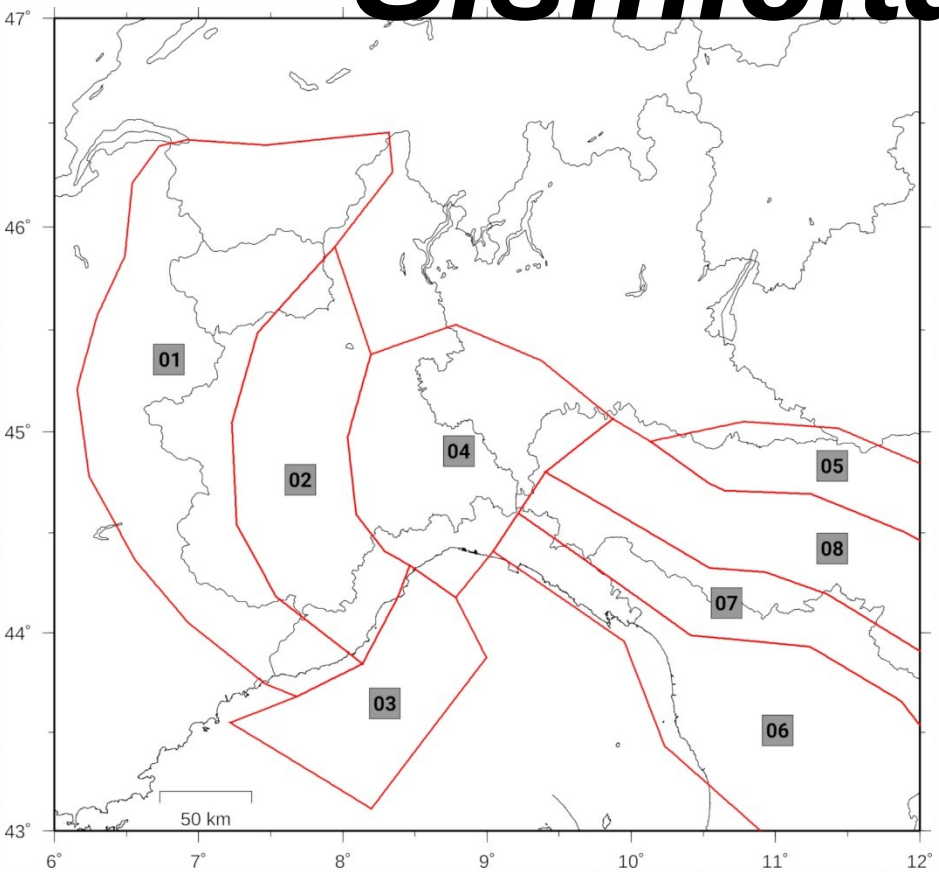
Passato Prossimo

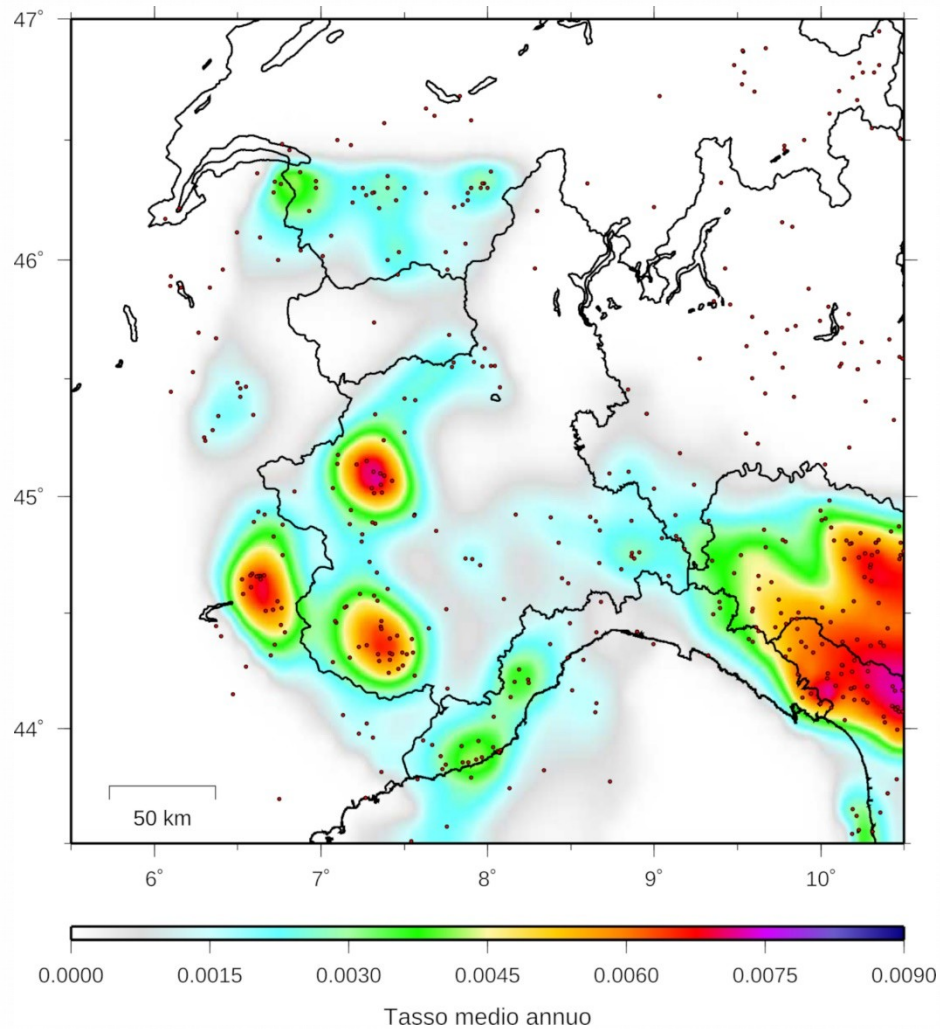
Passato Recente

RSNI (2015 – 2017)

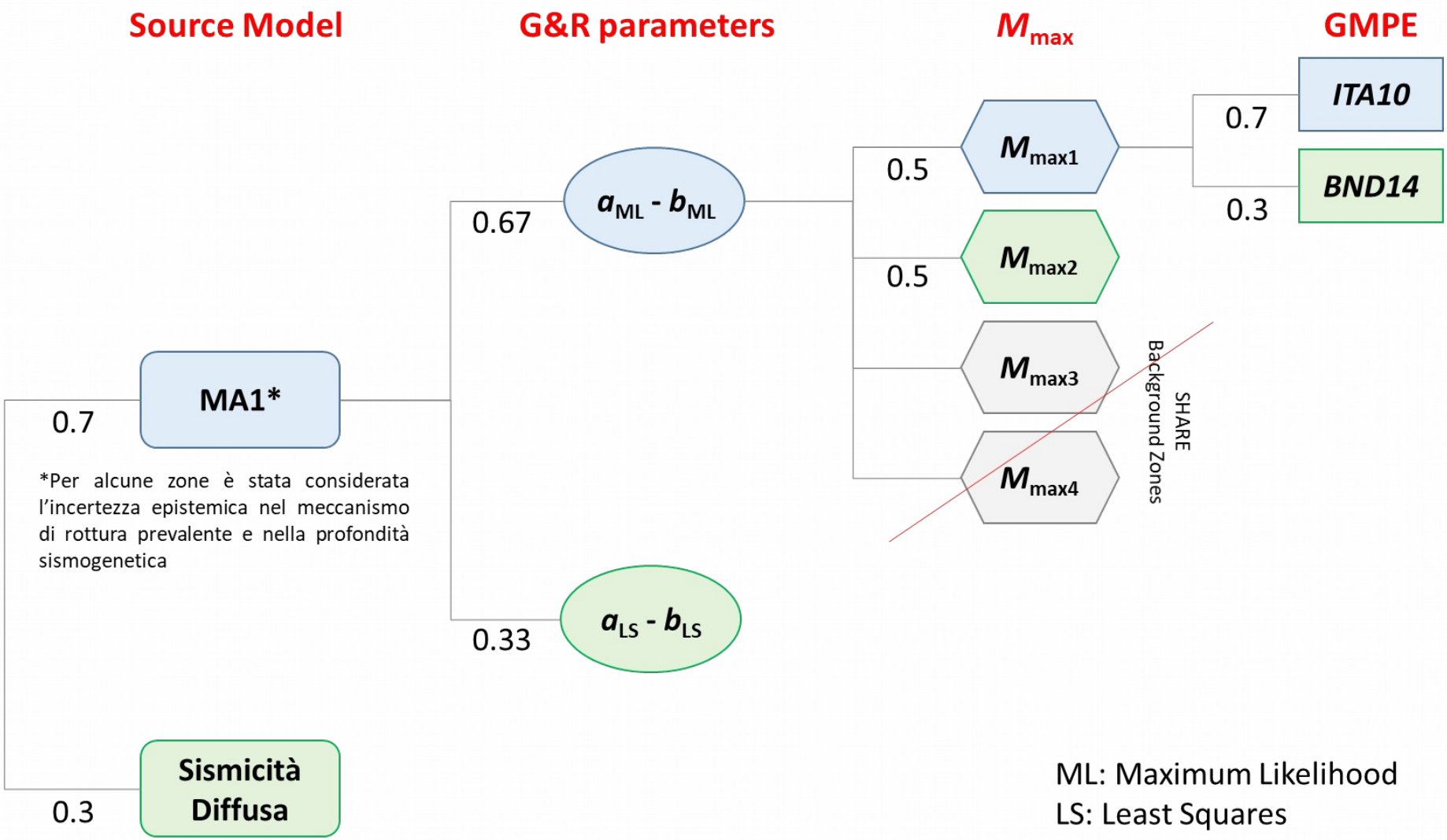


Sismicità Diffusa





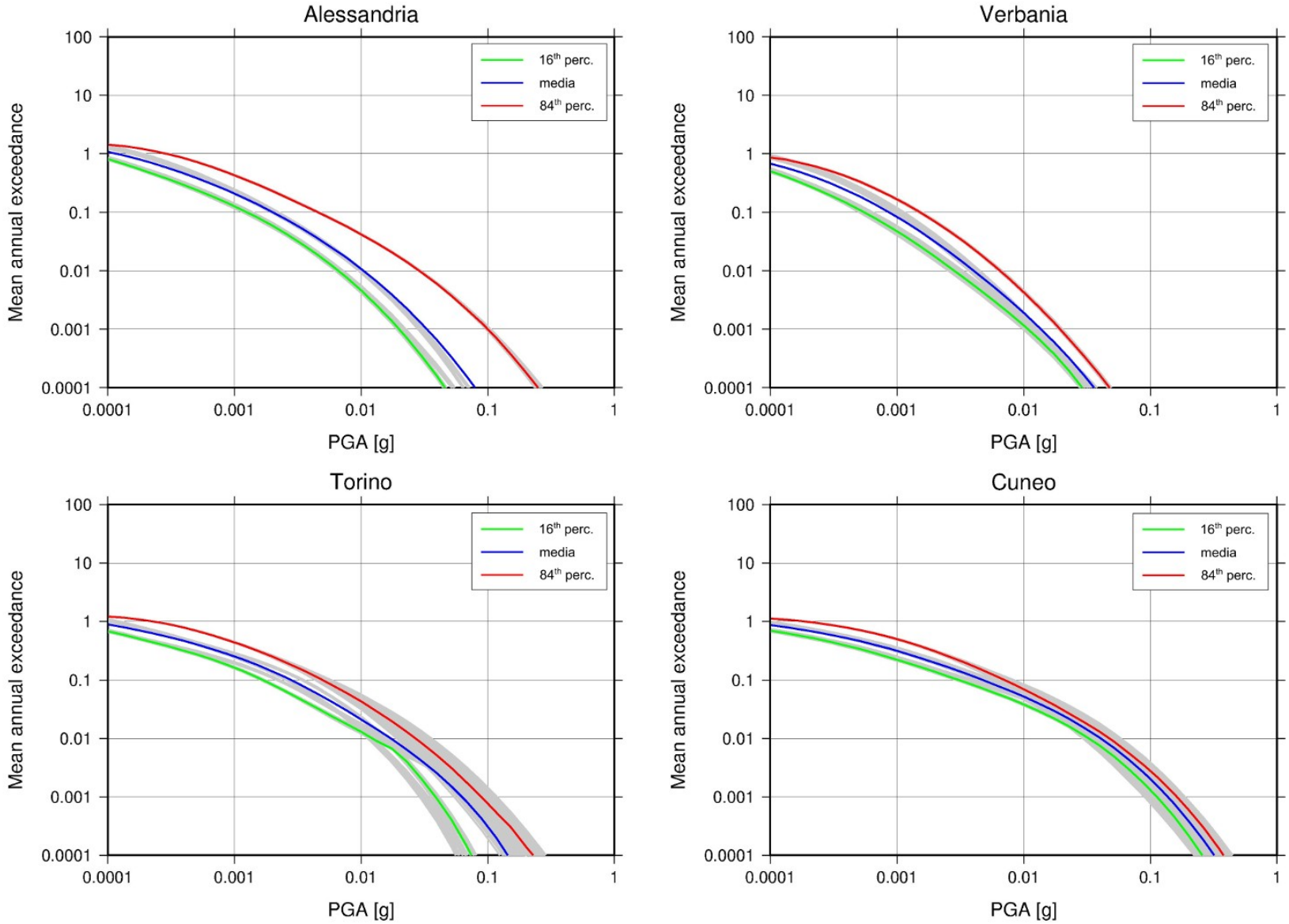
Incertezza Epistemica: Albero Logico



*Per alcune zone è stata considerata l'incertezza epistemica nel meccanismo di rottura prevalente e nella profondità sismogenetica

ML: Maximum Likelihood
LS: Least Squares

No pictures of the authors while shaking. Sorry!

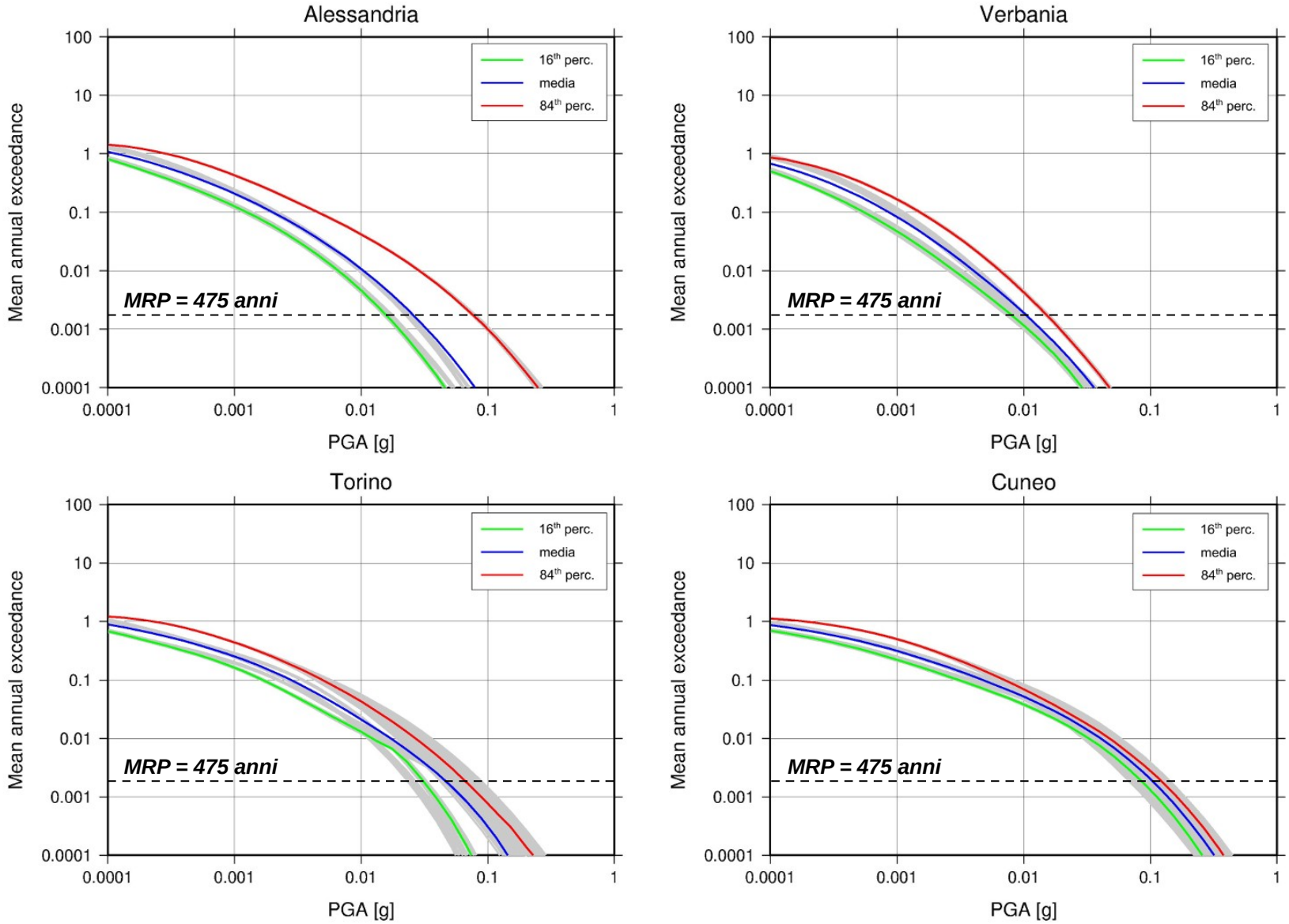

Alessandria
Verbania
Torino
Cuneo
16th perc.
media
84th perc.
Mean annual exceedance
PGA [g]
100
10
1
0.1
0.01
0.001
0.0001
0.0001
0.001
0.01
0.1
1

Periodi…

…di Ritorno: 30, 50, 72, 101, 140, 201, 475, 975, 2475 anni

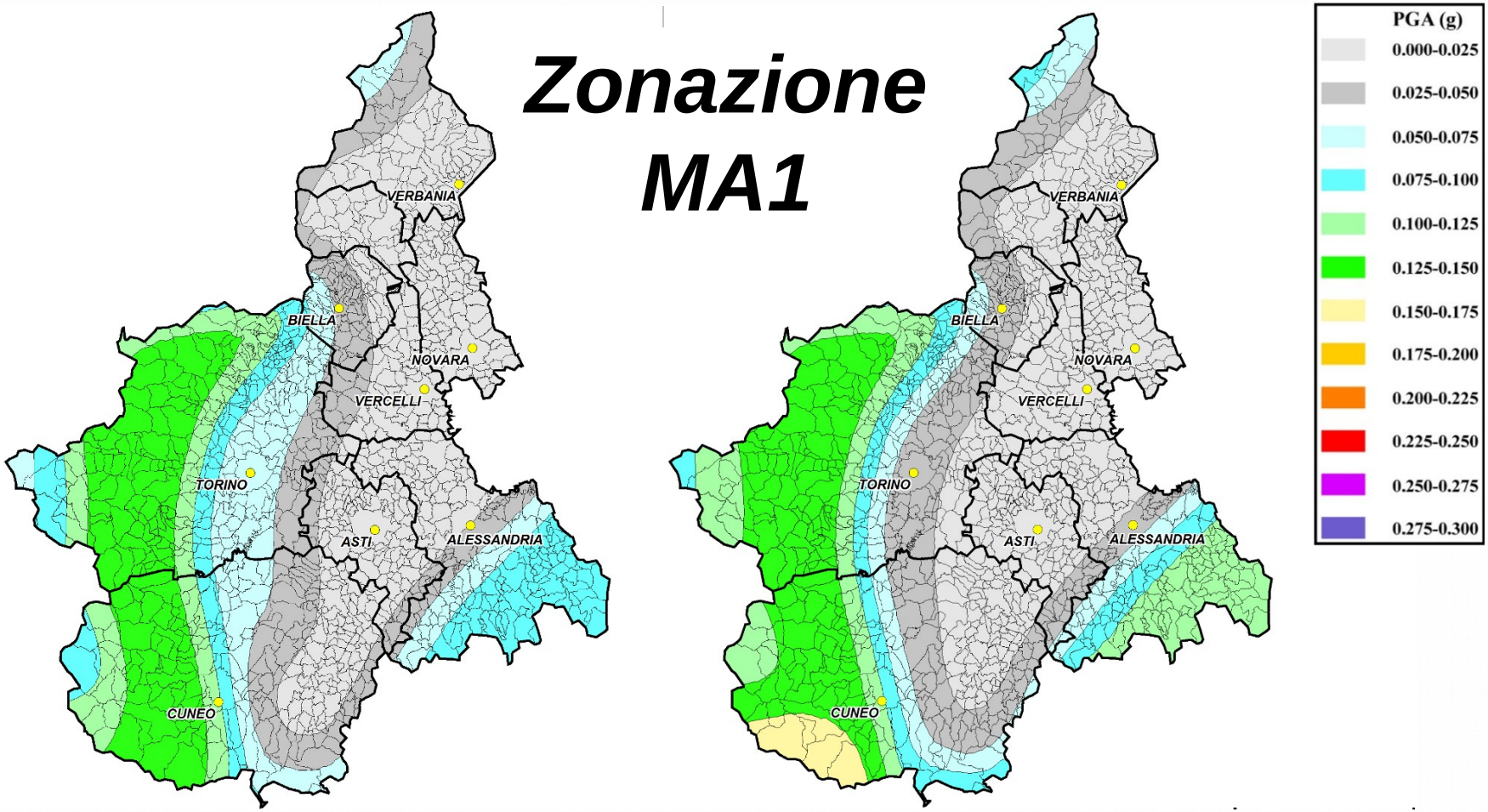
…Spettrali: PGA, 0.05, 0.1, 0.15, 0.2, …, 2 s

Classificazione Sismica


Alessandria
Verbania
Torino
Cuneo
16th perc.
media
84th perc.
MRP = 475 anni
Mean annual exceedance
PGA [g]
100
10
1
0.1
0.01
0.001
0.0001

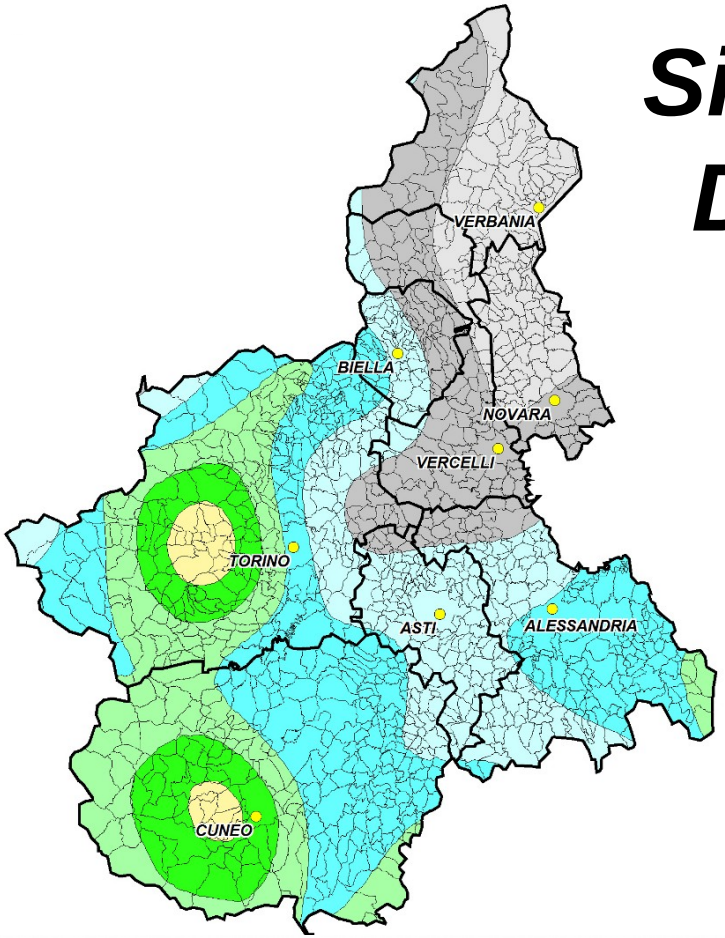
ITA10 VS BND14

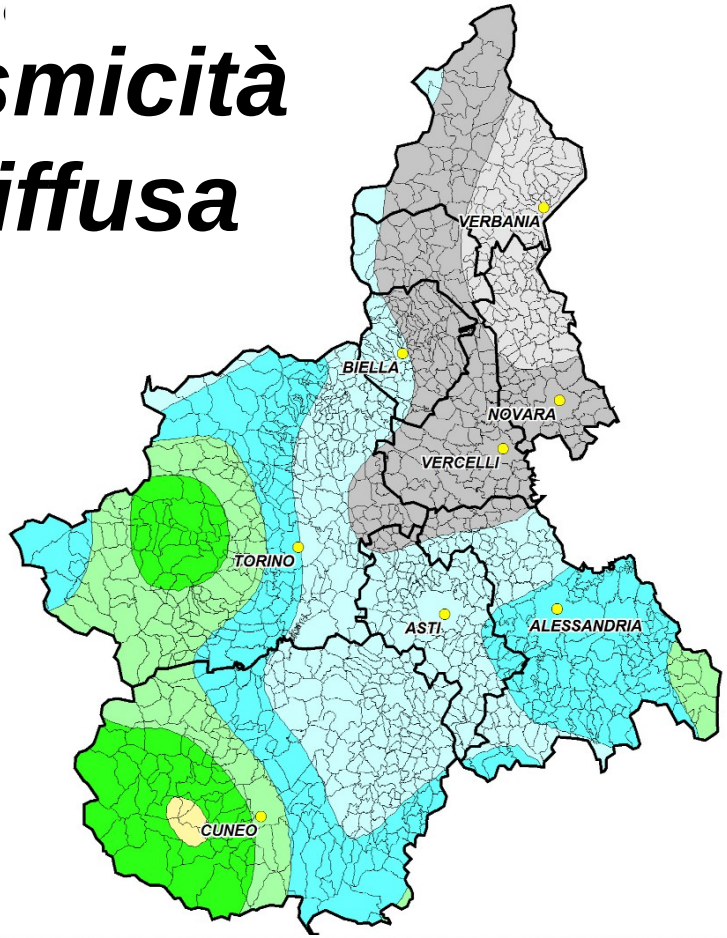
Zonazione MA1

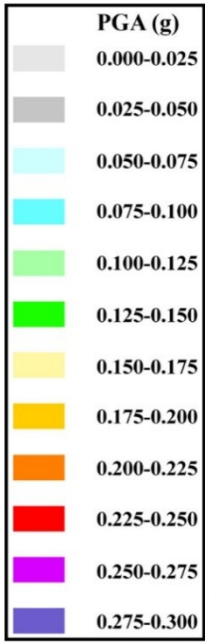


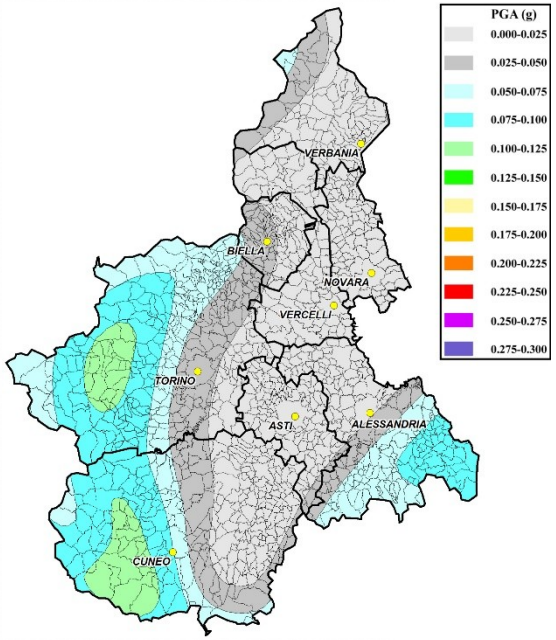
ITA10 VS BND14

Sismicità Diffusa



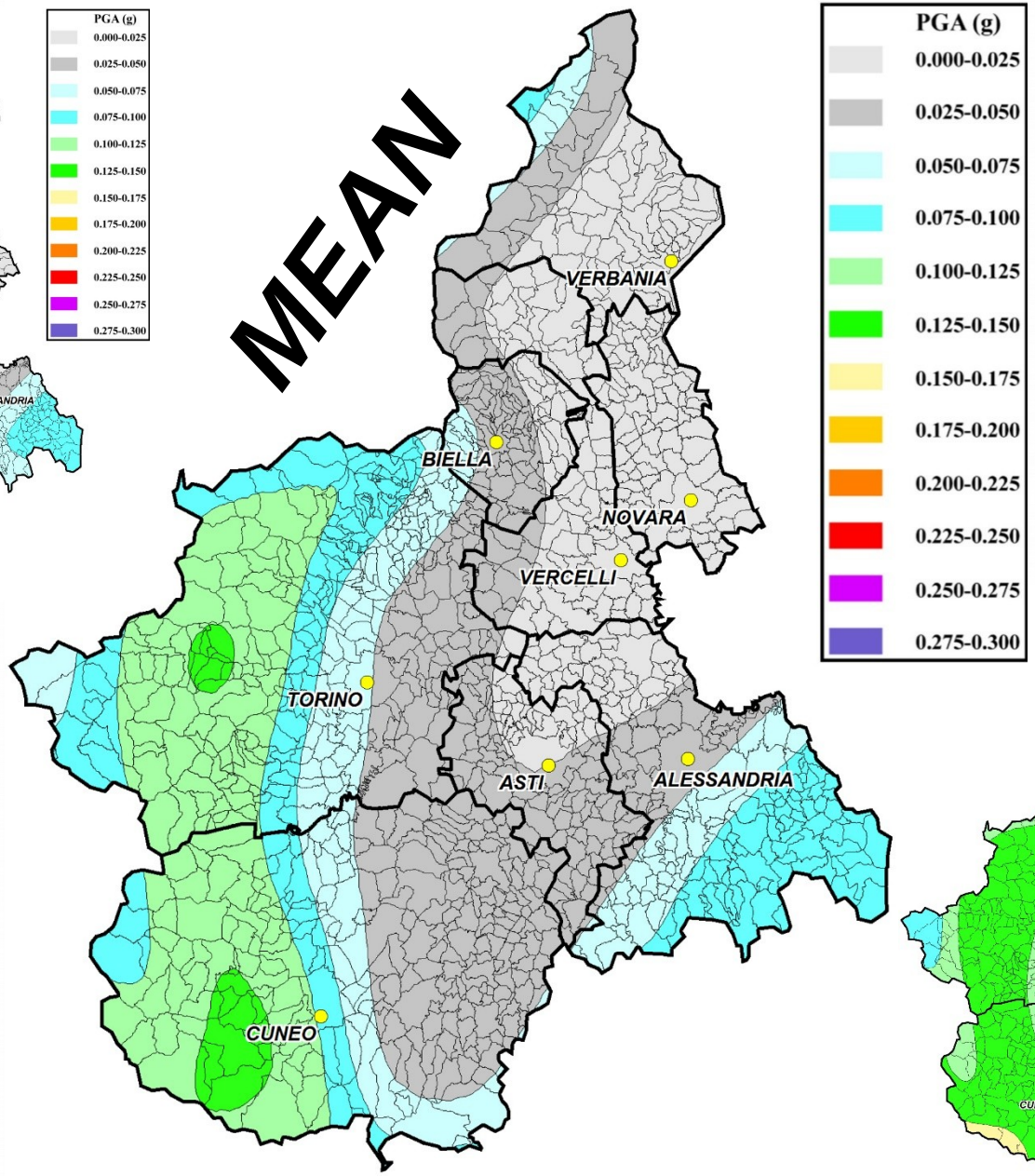




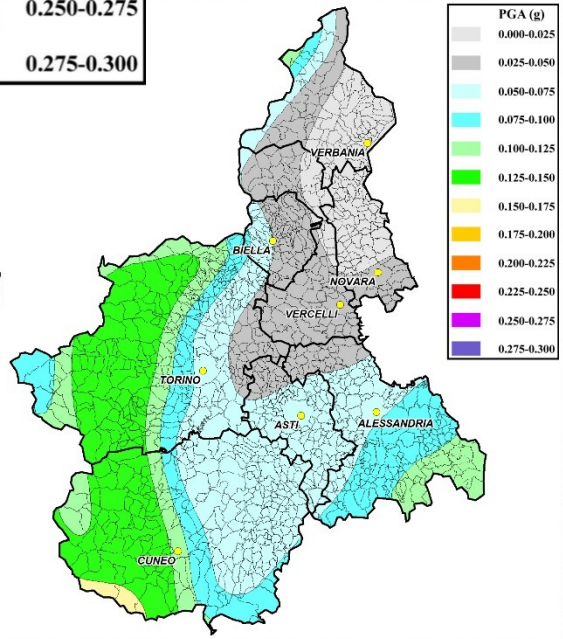


16mo percentile

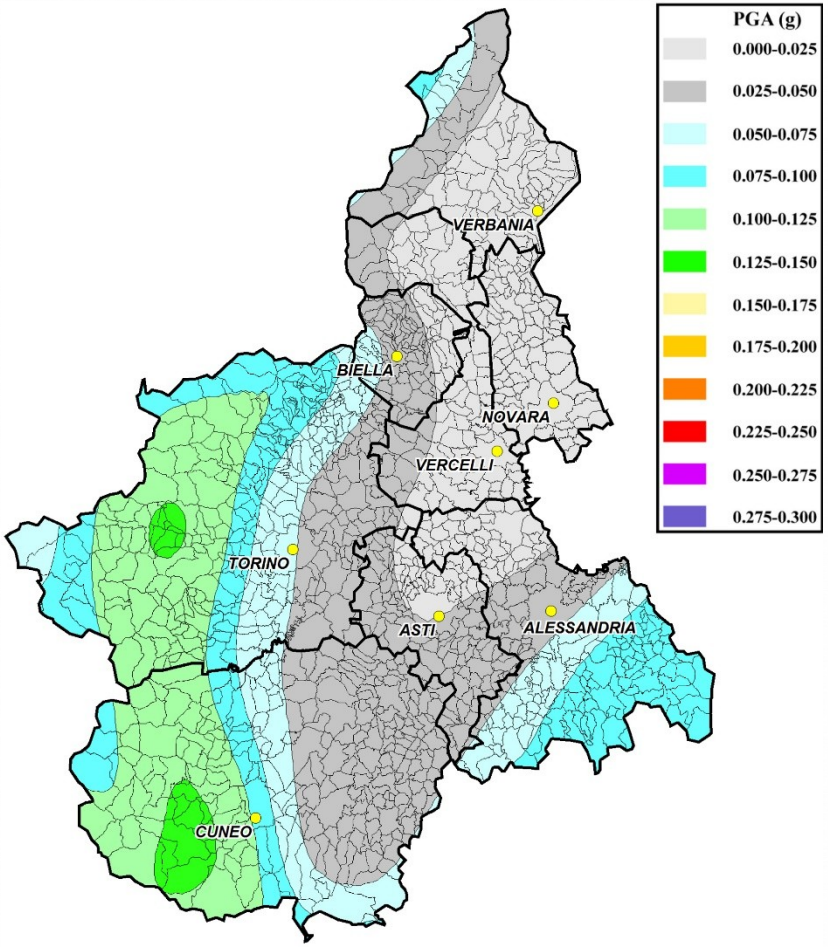
MEAN



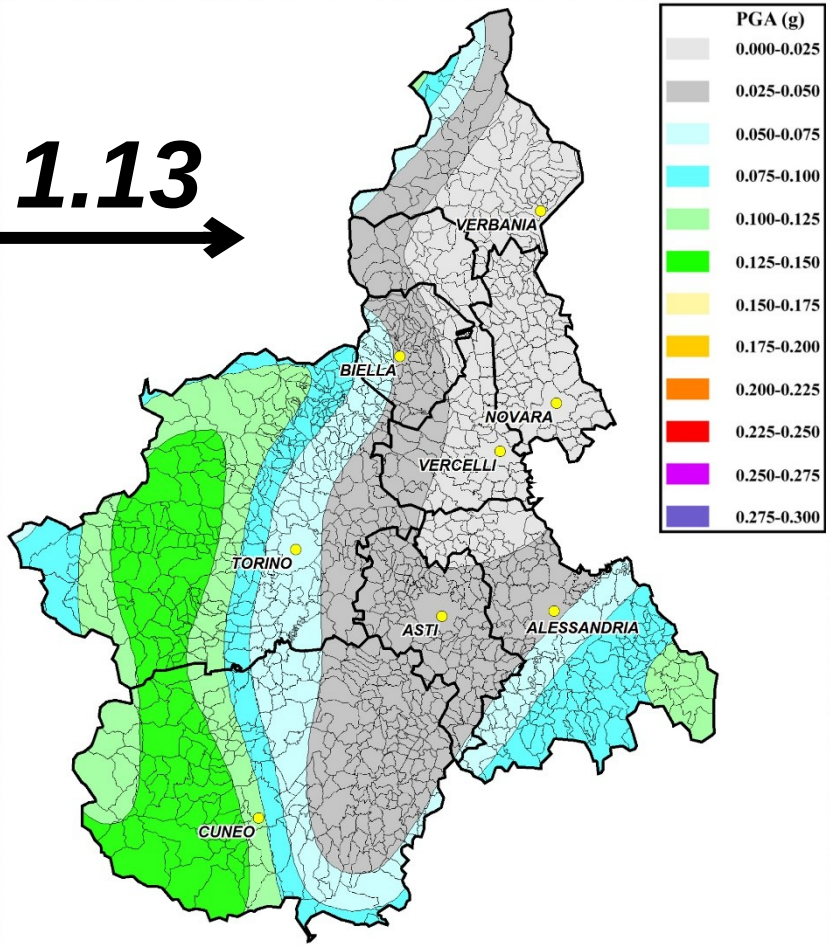
84mo percentile



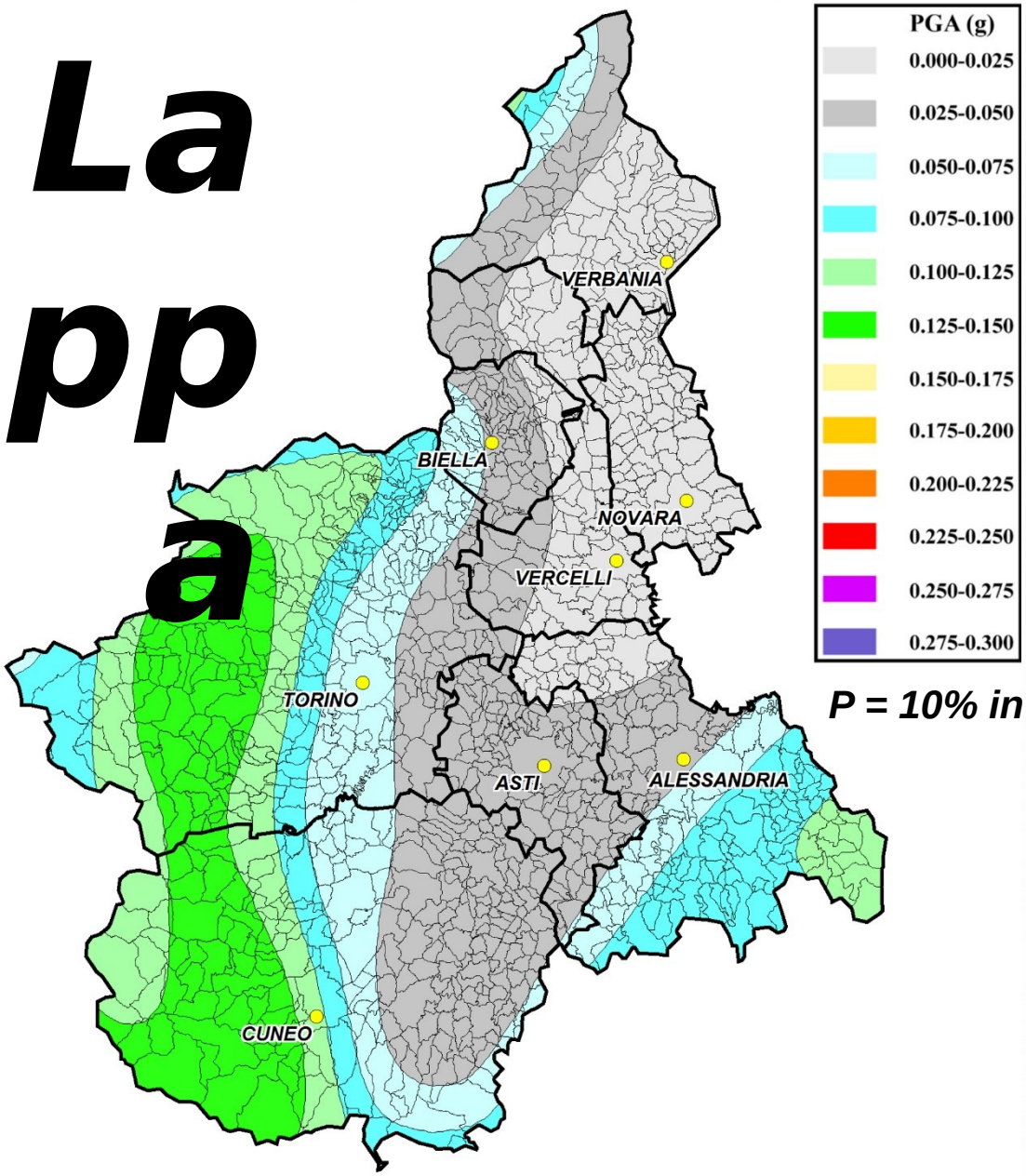
GeoMean VS MaxH



*** 1.13**

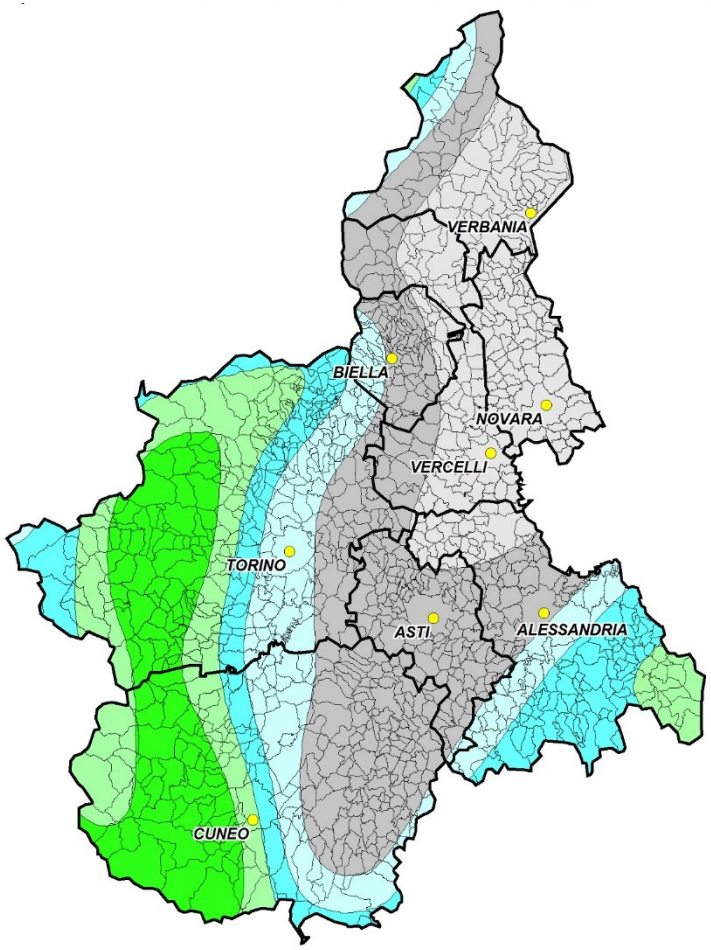


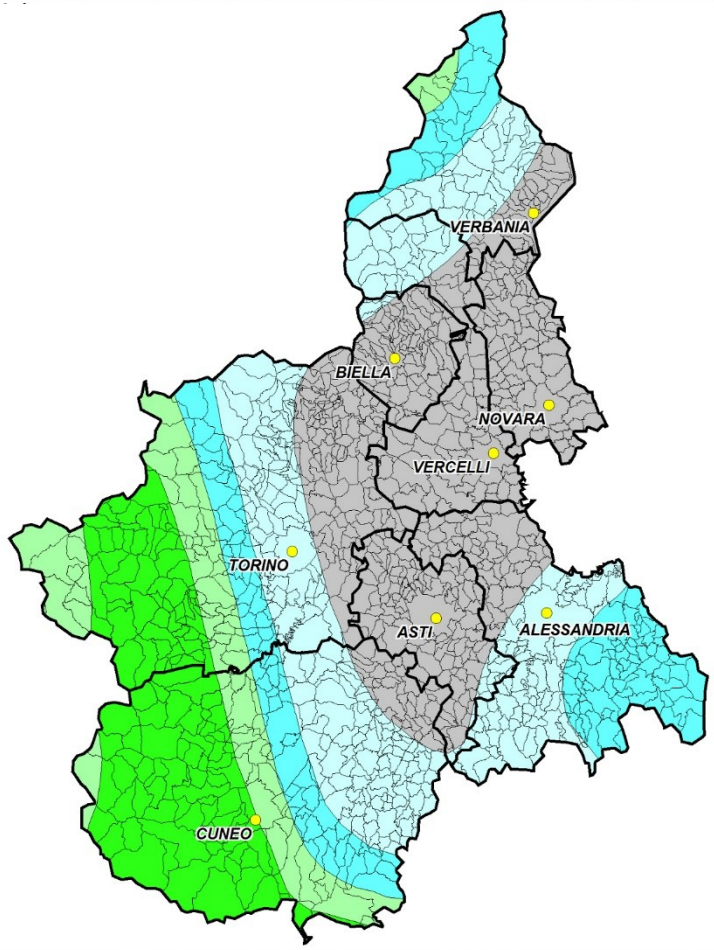
La Mappa

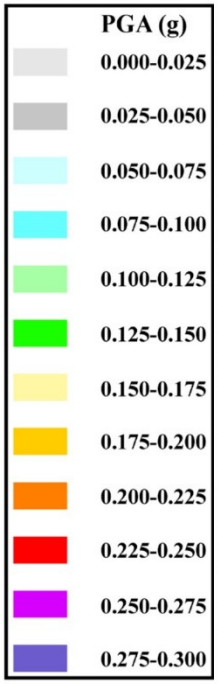


P = 10% in 50 anni

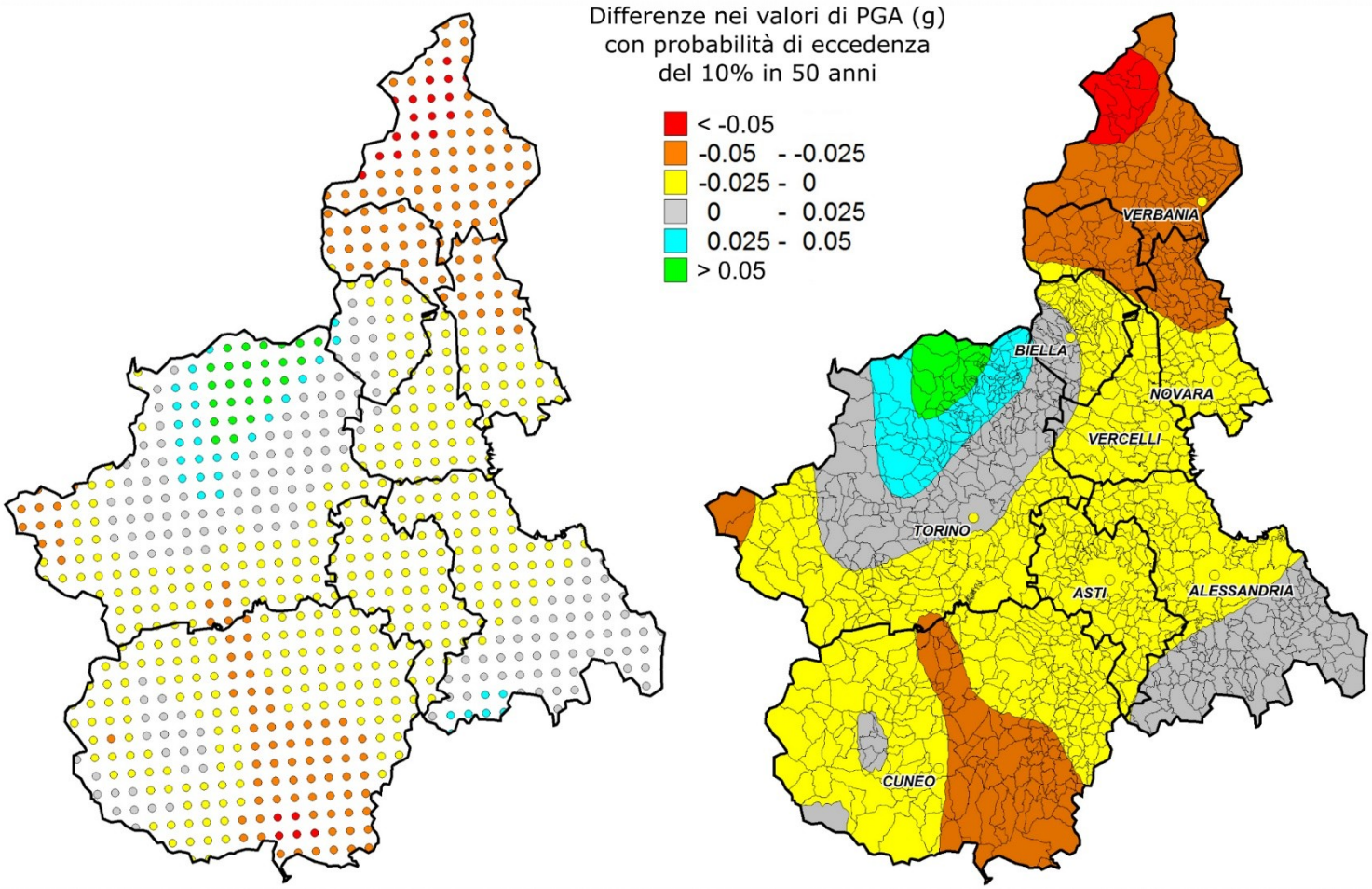
UNIGE VS MPS04







UNIGE – MPS04


Differenze nei valori di PGA (g)
con probabilità di eccedenza
del 10% in 50 anni
< -0.05
-0.05 - -0.025
-0.025 - 0
0 - 0.025
0.025 - 0.05
> 0.05
VERBANIA
BIELLA
NOVARA
VERCELLI
TORINO
ASTI
ALESSANDRIA
CUNEO

thank you
danke
謝謝
ngiyabonga
teşekkür ederim
gracias
спасибо
bedankt
dziękuję
obrigado
merci
go raibh maith agat
mochchakkeram
sukriya
kop khun krap
grazie
arigatô
takk
dakujem
terima kasih
감사합니다
ありがとう
ευχαριστώ
мерси
рахмат
Баярлалаа
faafetai lava
kiitos
dankie
dhanyavad
hvala
mauruuru
köszönöm
gràcie
bayarlalaa
enkosi
nanni
nandri
vinaka
спасибі
blagodaram
dank je
misaotra
matondo
paldies
grazzi
mahalo
tapadh leat
хвала
asante
manana
obrigada
murakoze
tenki
chokrane
mamnun
дякую
djiere dieuf
tau
akun
dankon
aciu
welalin
tack
barka
mersi
kia ora
spas
chnorakaloutioun
gratias ago
gràcies
sulpáy
taiku
sagolun
sobodi
dèkuji
mèsi
didi madloba
najis tuke
kam sah hamnida
rahmat
tanemirt
rahmet
diolch
dhanyavadagalu
shukriya
merce
trugarez
xièxie
তোমাকে ধন্যবাদ