

GHWHP IQ DWIR Q #R I#WKH#HVP IF#Q SXW#Q #
IUDQ FH#R U#WKH#Q XFOHDU#SR Z HU#SODQ WV#
VDIHW\#

UHI XODWR U\#R QWH[W/#K\SR WKHVIV#DQG
XQFHUWDIQWIV#WUHDWP HQW

C. Berge-Thierry , E. Cushing, O. Scotti and F. Bonilla

Iqwlxw#iru#Jdglr#rj lfd#Surhfwlrq#dgg#Qxfndu#dihw|/#

Iudqfh#

R xwqghv#

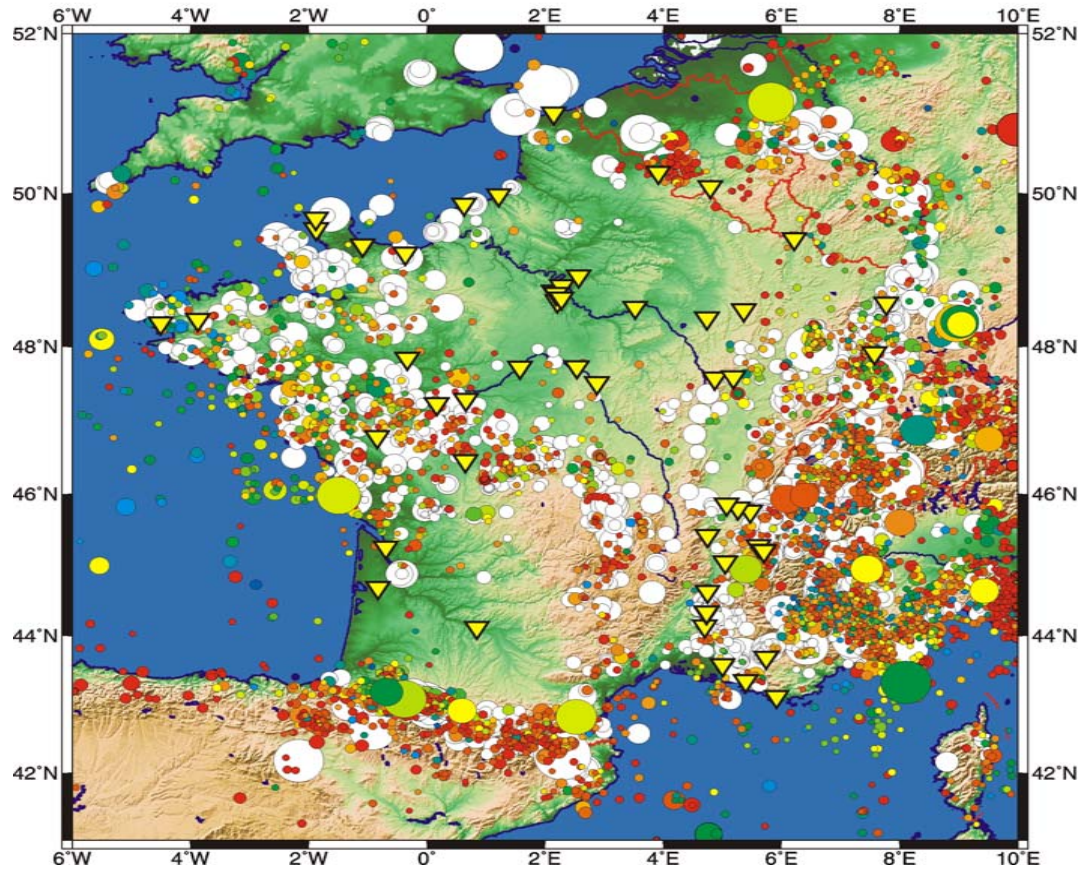
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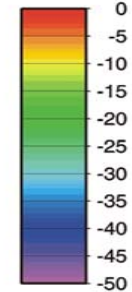
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71Ghwup bqlwlf#dgg#suredelbwlf#frp schp hqwdulw| #

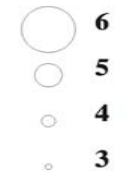
P h w r s r o d q # u h q f k # w h u u r u / # d # p r g h u d w h # d q g # x l h # g l i x v h # h l y p l f w /



GHSWK #np ,



Magnitude



▽ Q X F C H D U # S O D Q W



I q w u x p h q w d # h l y p l f w /



K l w r u l f d # h l y p l f w /



G l i l f x o w r # d n # h l y p l f # n y h q w # d q g # l f w l y h # d x o w

Vhlp If#K d}dug#Dwhvp hqw#lqg#Uhgfk#qxfndu#hjxowlrq

✓ lq#kh#1<:3v##0ehj lqqlqj#ri#kh#Uhgfk#Q xfdndu#hvhdufk#surjudp #
0dgg#iluw#Q SS#ru#qhuj|#surgfxfwlrq#exlw#lqfh#1<:8

✓ iluw#hjxowlrq#ghyrwghw#r#kh#KD#, lUhgfk#Vdihw|#Jxdn " 4<;4

✓ uhyvlrq#ri#kh#JIV#; 4#lqfh#1<<:#p rwlydwngte|#kh#p suryp hqw#lq#

☐ Fkdudfwhul}lqj#lfwlyh#dxow

☐ Hwlp dwlqj#kh#p djqlwxgh#ri#klwrulfdchyhqw

☐ Suhglfwlqj#kh#wurqj#p rwlrq#kvlqj#kh#qxp huxvgdw#hfrughg#q Hxursh

☐ Dffrxqwlqj#ru#kh#Vh#hihfw#

+P h{ lfr#1<;8#Qrp d0Sulwd 4<;<#Q ruwkulghj#1<<7#Nreh#1<<8# ,

✓ qhz #Vdihw|#xdn#qdp hg#JIV#5334034#dgrswng#lq#5334

P dlq#whsv#ri#kh#Vdihw/#Uxdn#UIV#5334034,#ghwhup bqlwlf#lssurdfk

Vwhs#1

- Ghilqh#rxufh#rqhv#ru#dxow
- Ghilqh#kh#,, Uhihuhqfh " hyhqw#v,#UH,
- Ghilqh#kh#qhuj|#P djqlwxgh,#dqg#kh#orfowlrq#
ri#khvh#hyhqw#G lwdqfh/#ghswk,

+Orfowlrq/#P djqlwxgh_{UH1}



X qfhuwdbqlhv

Vwhs#5

^Vdihw|#P dñj bqv^

- „ P K ISH1" +£ #VO4,##UH#k lwhg#fcrvh#wr#kh#vwh
- lqfuhdv#kh#P K ISH1#P djqlwxgh#. 3 B,#wr#ghilqh#kh#
„ VMH1# 0Vdih#kxwgrz q#IT #£ VO5,



P d l q # w h s v # r i # k h # v d i h w / # U x d n # U I V # 5 3 3 4 0 3 4 ,

Step 3

- Define the site geology (rock ? Soil ?)
- Geometry (topography, basin, 1D, 2D, 3D ?)

RFS 2001

Step 4

Paleoseismological study

RFS 2001

Step 5

Compute the **mean** response spectra (SSE, paleoevent)
Using an attenuation relationship, or **SPECIFIC STUDY**

Consider a Minimal Level of 0,1g

RFS 2001

R ulj lq#i#kh#xqfhuw lqwhv#dvrflbwg#wr#

⊗ wkh#gdw/#

⊗ wkh#qgrz dngjh#wdwh#

⊗ dgg#wkh#Ekrvhq#p hwrgrarj |

Fkdudfwhul}ljj#kxh#rxufh#rghv##fdvh#ri#dkljk#ghirp dwtqr#frqwh{w

San Andreas fault

geologic map

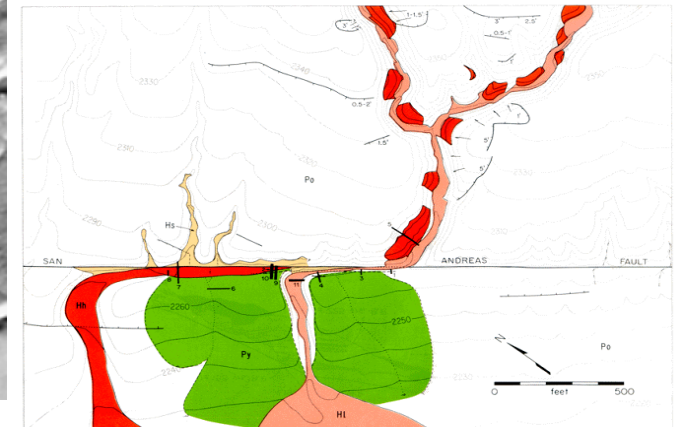
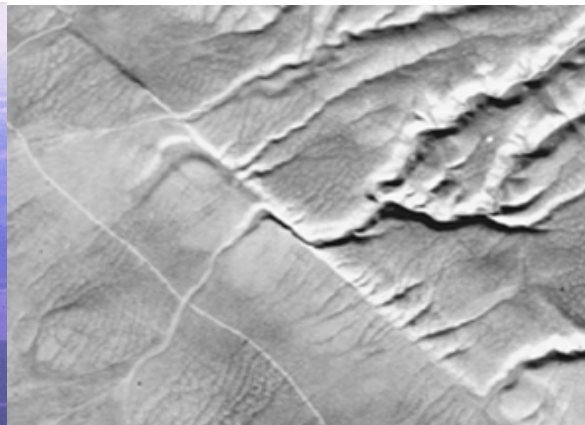
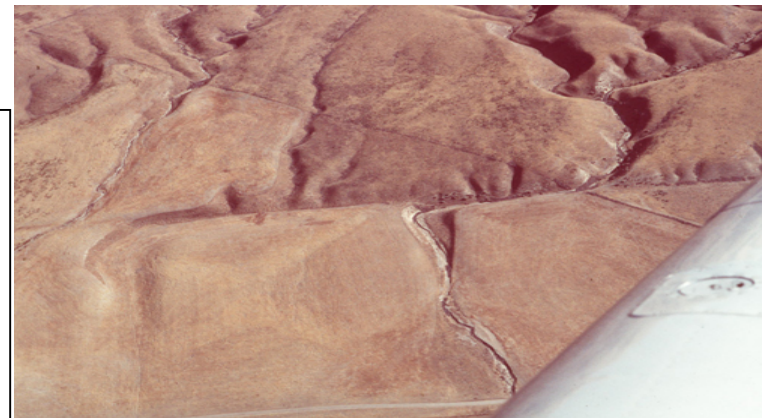


Figure 2. Geologic map of Wallace Creek. Contours of topographic base map show elevation (in feet) above sea level.

change in
topography
and drainage
across fault

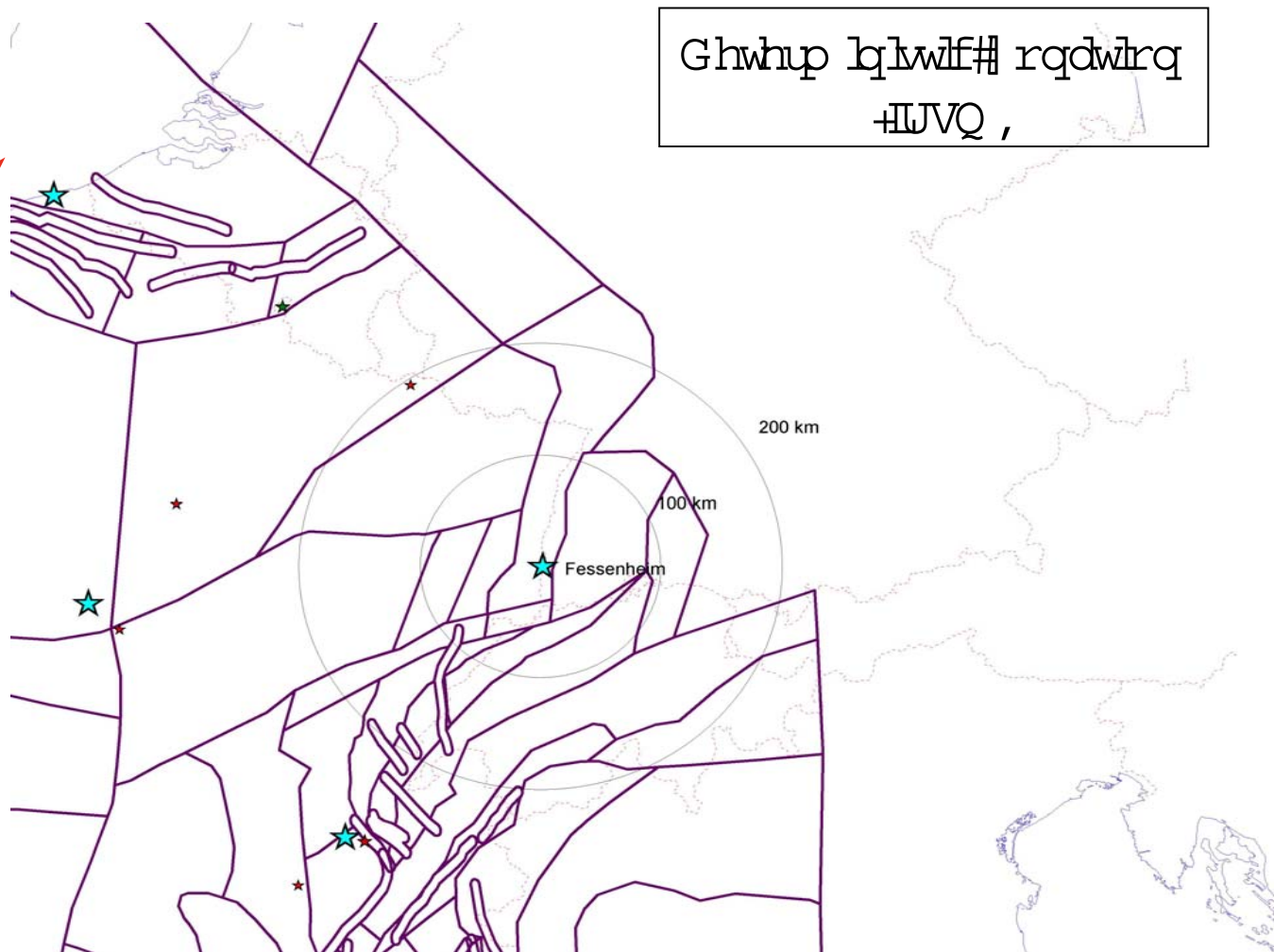


offset stream

from: Shelton

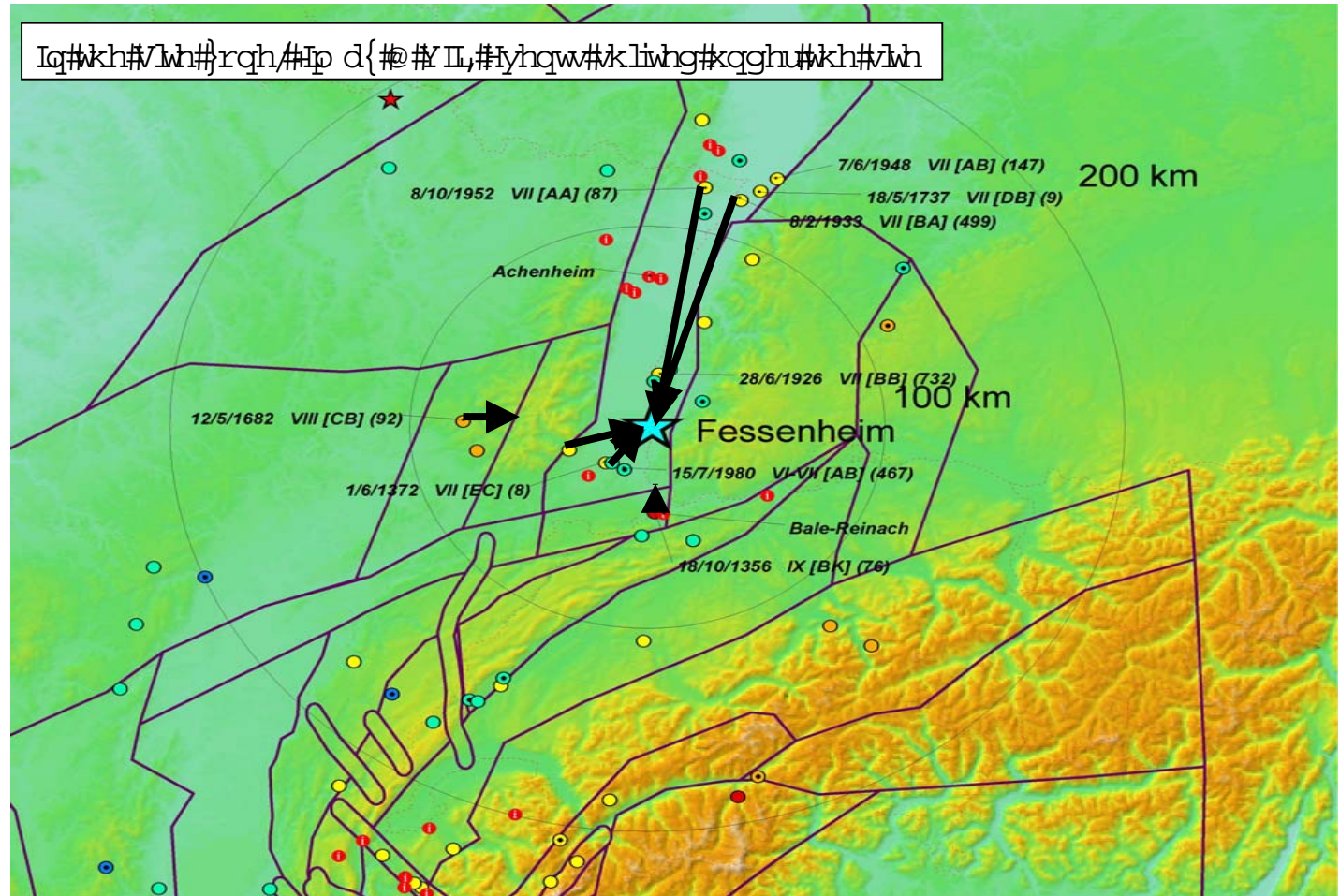
from: <http://www.gps.caltech.edu/~sieh/research>

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frqwh{w# l#k#ljk#hurvlrq#dwh



Vhdufk.lqj#kh#, Uhuhqfh#yhw" #ghlgh#v#kh#p rwb#jjuhwlyh#ru#kh#v#h#
 #lqwhqv#l/,# khq#k.lihg#ghdu#kh#v#h

K lwruifd#h#p lf#w| #
 dgg#
 }rqdwlrq

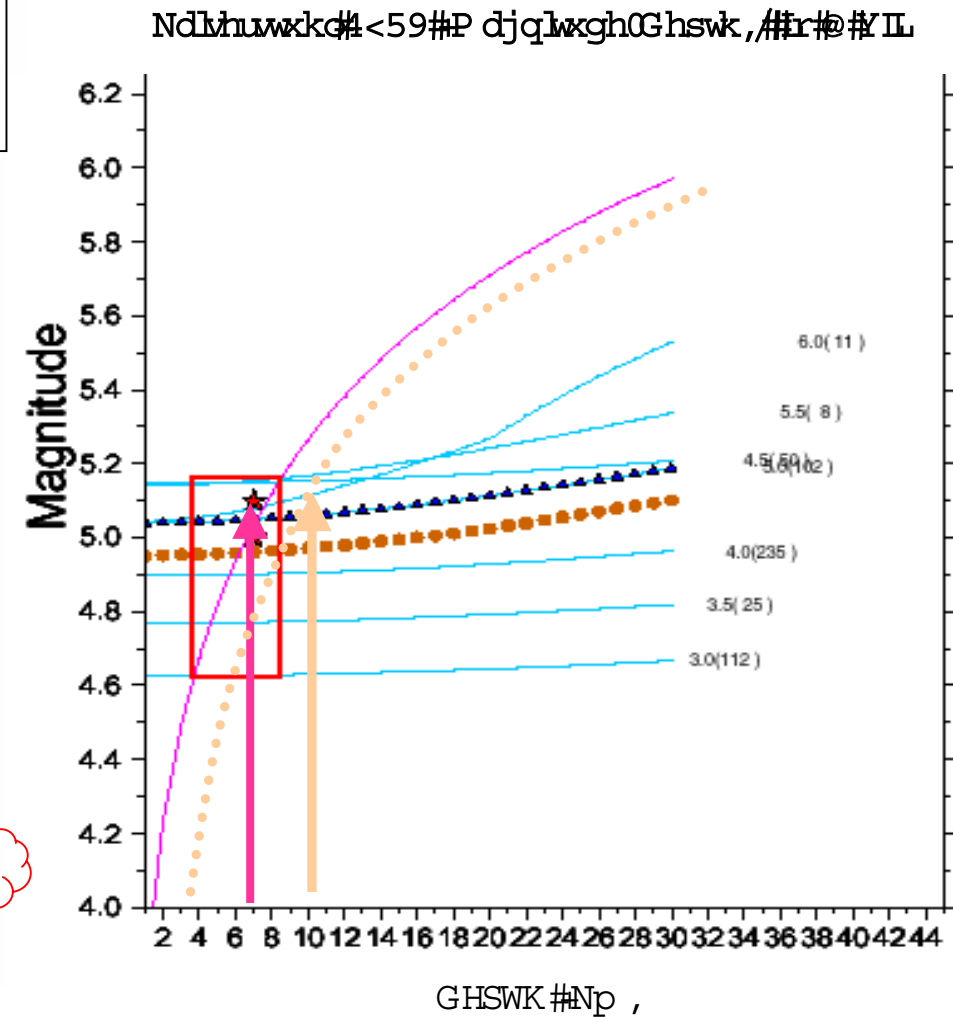
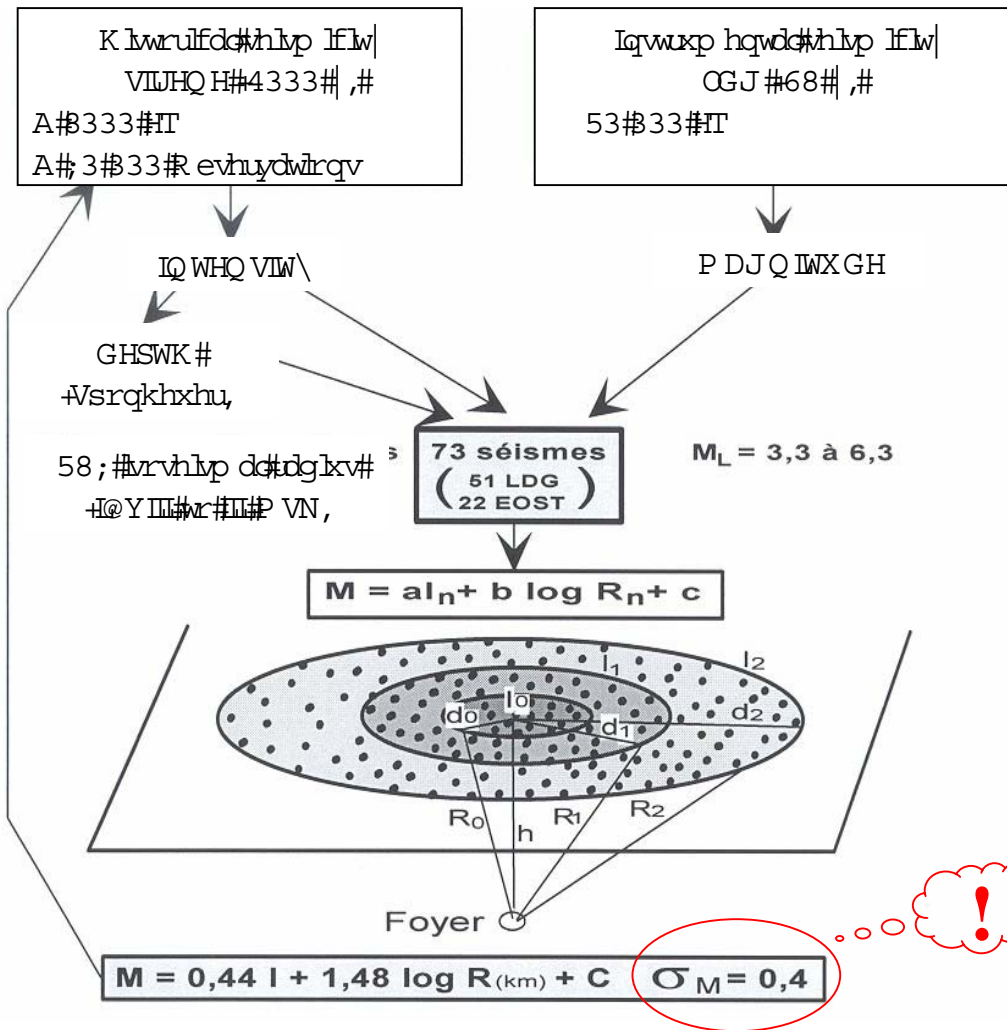


Vhdufwlqj#P K SH#@##lqwhqv#l/ #rqdwlrq#erxqgdulhv,#



Gdw#2#qrz dngjh
 X qfhuwlbqlhv

Fkdudfwul}lqj#kh#, Uhuhqfh#yhw" #urp #qwhqv\w/#gdw#r#p djqlwxgh2ghswk



Suhglfwlqj#kxh#hlyp lf#p rwlrq#p hdq#lffhøldwlrq#hvsrqvh#shfwuxp

$$\log(PSA(f)) = \boxed{a(f) \cdot M} + \boxed{b(f) \cdot R - \log(R)} + \boxed{c(i, f)} + \boxed{+ \sigma}$$

Vrxufh
Z dyh#Sursdjdwlrq
Vlwh
Qrw#hwldqhg
#UIV,

α frhiilflhqw#d/#e#bqg#f/#urp #358#wr#57#K }

αedvhg#rq#d#98#krul}rqwdqgdwd#
 0,, Hxurshdq " gdw#Dp eudvh|v#w#d/#5333`/#
 0dgg#19(#r#KVD#P A9,#gdw

αgdw#fowvlihg#iror z lqj#d#rq#v#63p ,#fulwhulrq/

d,# Yv#A#33#p 2v# urfn,

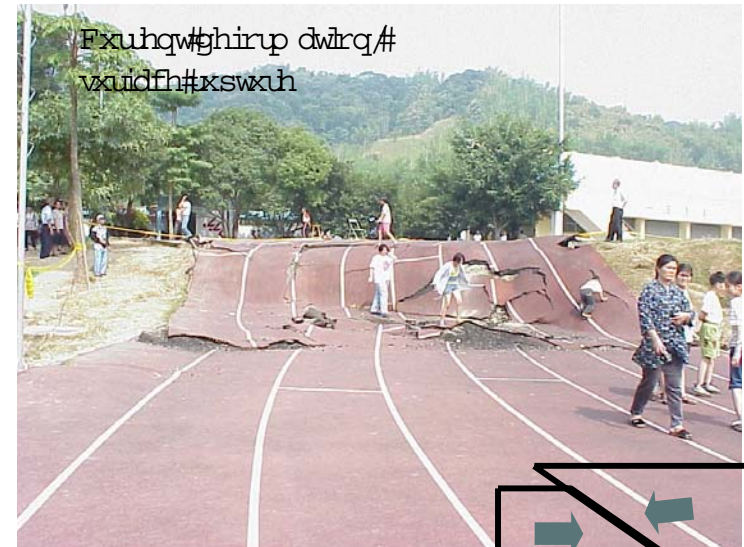
e,# 633#p #v#p #33#p 2v# wrb

Dwhqxdwlrq#høwlrqvkl#Ehujh0Wk.lhu| #w#d/#5336,

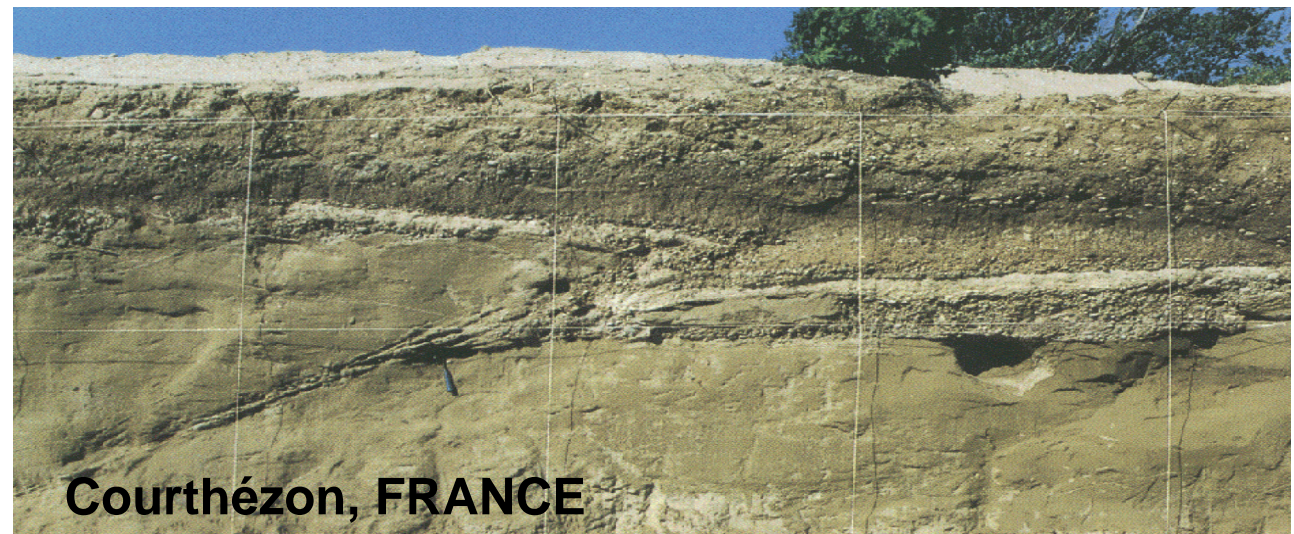
αI#v#h#z lk#v#p #633p 2v#Q R W#SSOIF'DEQH

Vhdufk.bj#r#srwled#sddhrhyhgw

P z @ : 17
Wdáz dg#5333

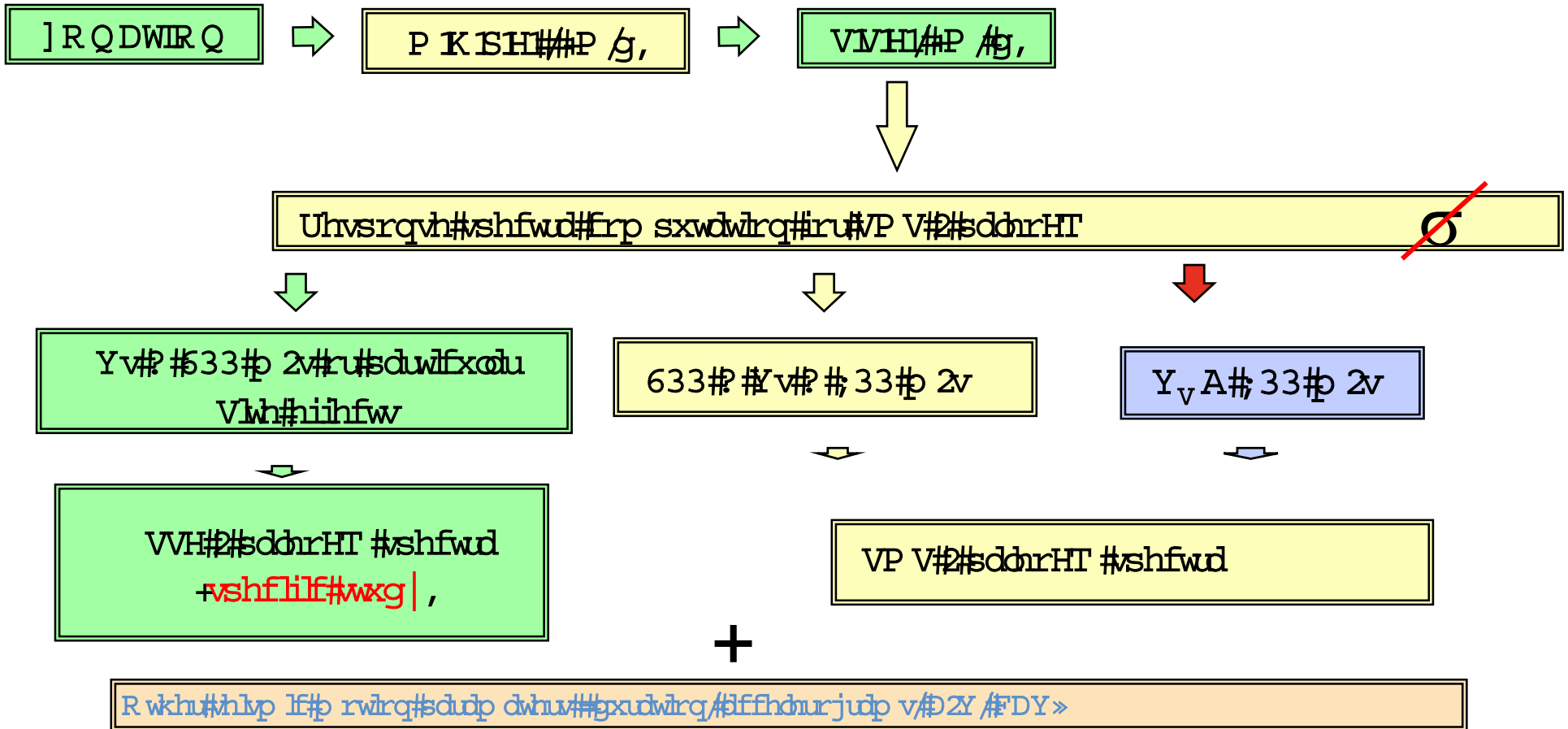


Iqyhuh#dxov



Courthézon, FRANCE

Vhlp lf# rwrq#frp sxwdrq#UIV#5334034,



Compare SMS/Paleo to Minimal 0.1g Level

Vdihw/#p duj'bv#huxv#xqfhwdlqwlhv

Q v k l i w l g j # h i h u h g f h # n y h g w # g h d u # k h # v l h # P K S H I,



! }rgdwlrg#erxqgdulhv#ghshqgdqw#

➤ #wurgjd, #khwhurjhgrxv iurp #b#vwh#wr#dorwkuh.

0P KSH1#r#VH1#P dj#@.#3B,=#

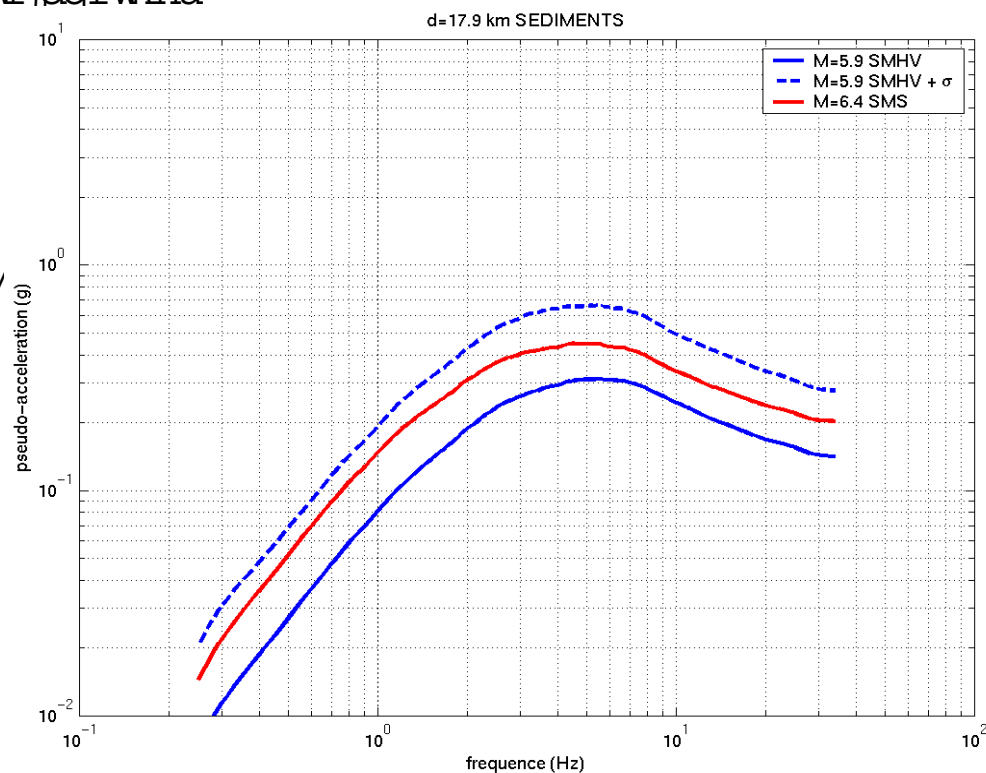


➤ krp rjhghrxvp duj b#iru#lo#vhw/

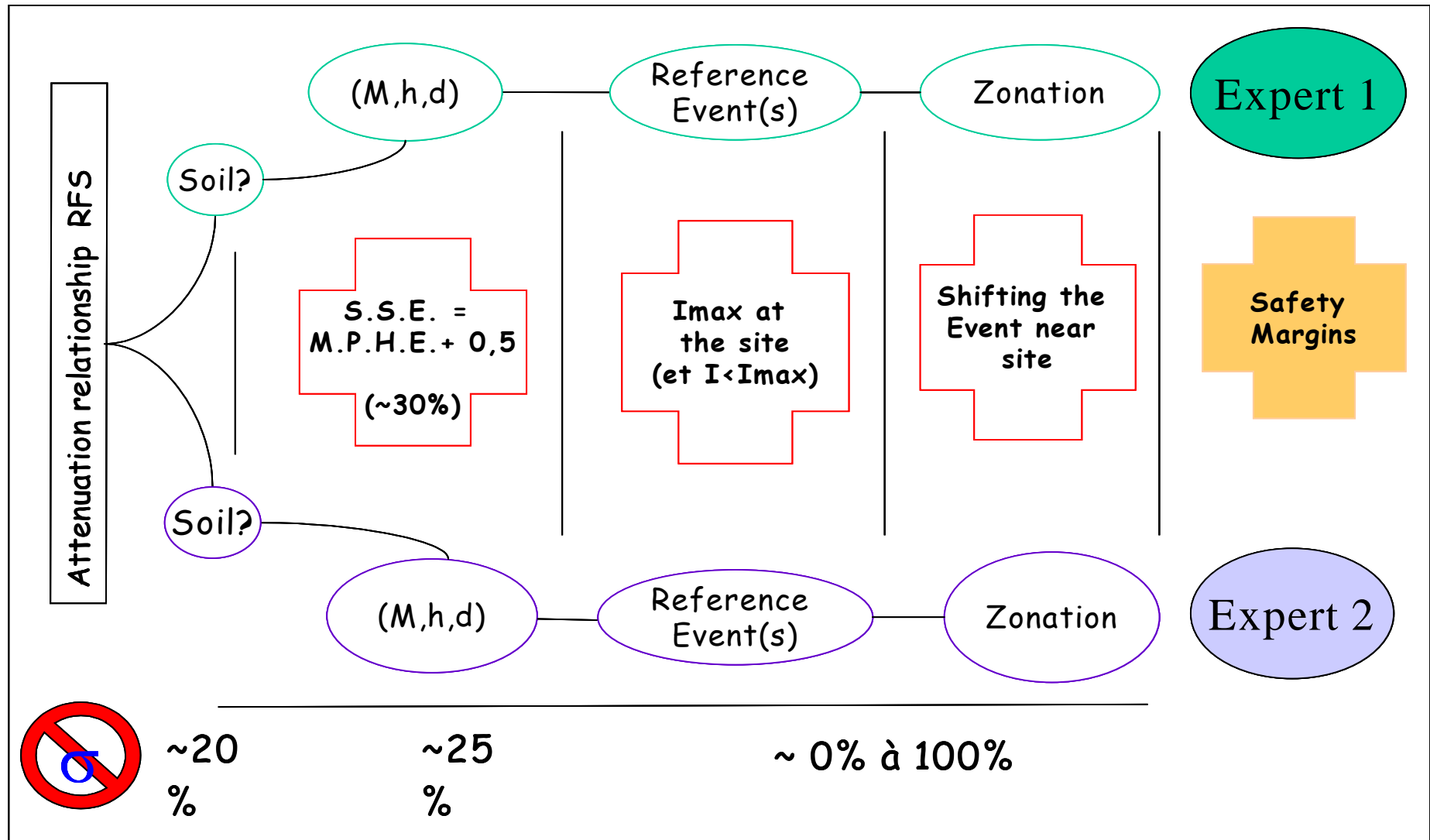


⚠ wk.lv# duj lg##? #5

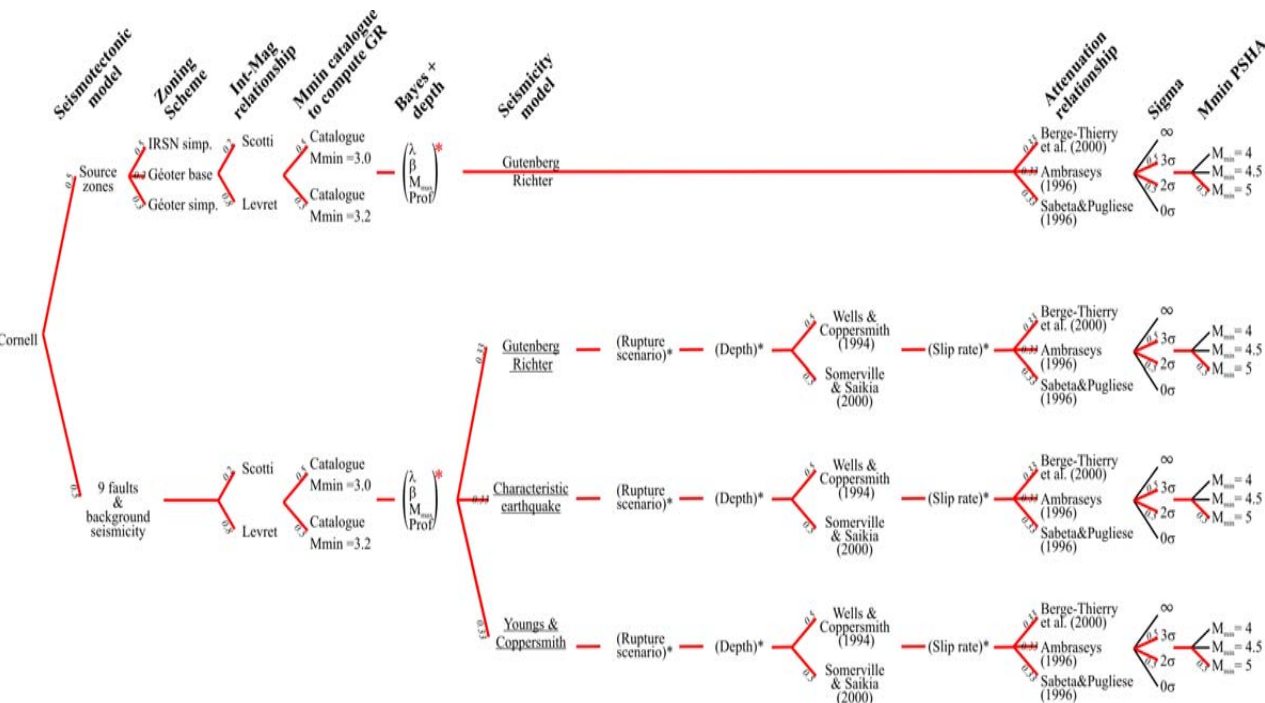
⌘p lq p d#dryh#3 14#j#dw\$JD#67#K },



Wkh#, e_bdu/ " ghwhup b_lwlf#ssurdfk



surede bwl f#dissurdfkhv#xvbj#rjlf#uhhv



α frp elqbj#fuhgleh# | srwkhv#

α sursdj dwlj#xqfhuwlbwlhv=

Clément C., Bonilla L.F., Scotti O., Baize S. (2004).
site-specific probabilistic seismic hazard study for the tricastin nuclear power plant,
FRANCE. XXXIX General assembly of ESC- Potsdam, Germany, 2004.

α Frp sdulqj#ghwhup bqlwlf#VKD#vr#surede bwl###
dhvhv

α D#jrrg#vrckhsbj#ghflvrq#bqkh#udp hz run#r#i#
vdihw

