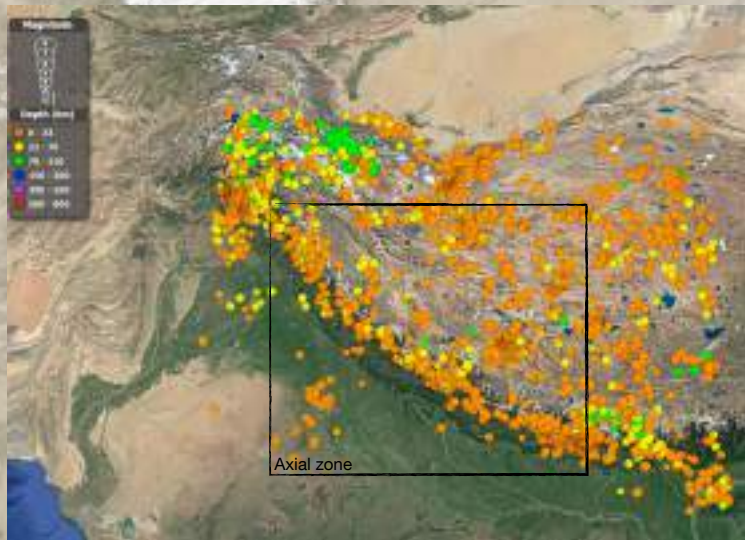


A consequence of Tectonic... but still unpredictable



Requesting database of seismic events



Where ? In Nepal area
When ? In the 2005-Today period
What ? Earthquakes $M > 2.5$

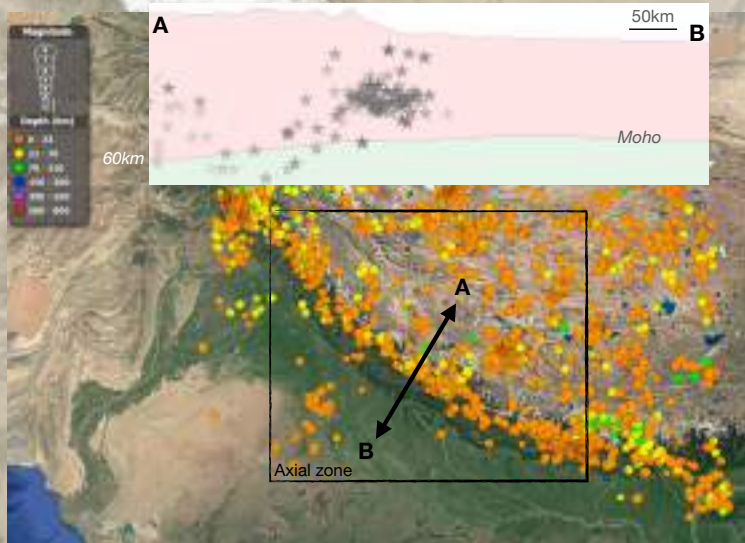
1000 events

Seismic hazard
Superficial quakes in axial zone

Geolocation of Hypocenter

Highlighting structure of orogen

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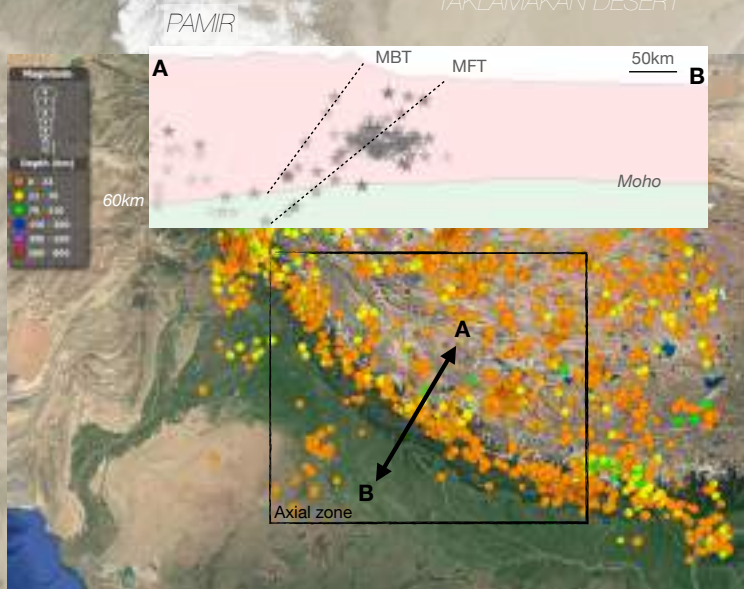
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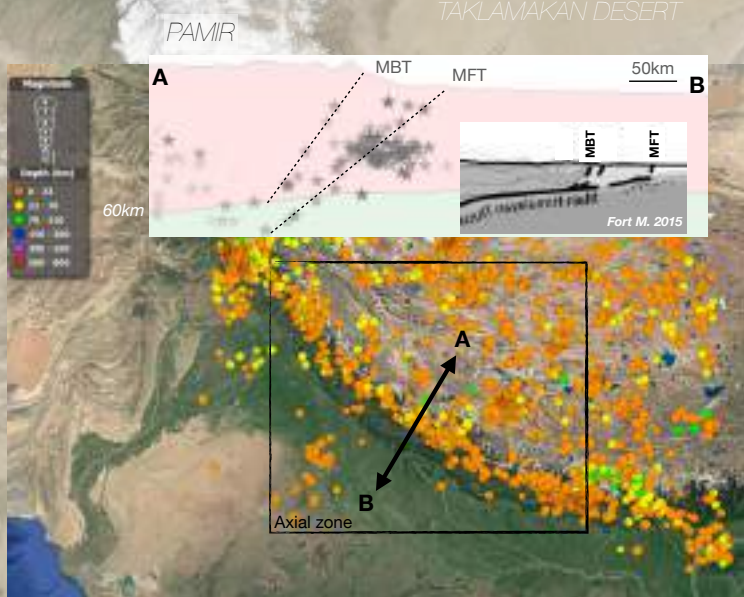
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Unpredictable but statistically probable or not

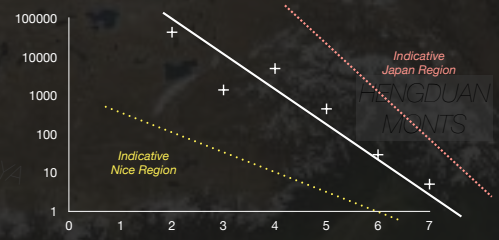
Gutenberg-Richter recurrence Law :

$$\log_{10} N(M) = A \cdot (M) + B$$

$N(M)$ is the number of event of magnitude M

For Himalayan region during 15 years

A and B are specific of the region



For one M7, it's recorded 10 M6, 100 M5, 1000 M4

SISMOBOX TASK 3 : IS AN EARTHQUAKE PREDICTIBLE ?

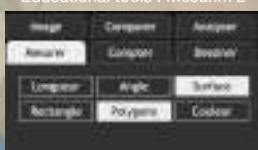


Recording energy released from source



With Mesurim 2

Educational tools : Mesurim 2



Good way to illustrate the random part of the seismic cycle

But the geometry of the experiment is far from reality. Be careful to what is understood by children

A consequence of Tectonic... but still unpredictable

Unpredictable but statistically probable or not

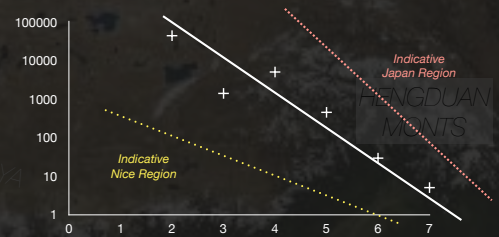
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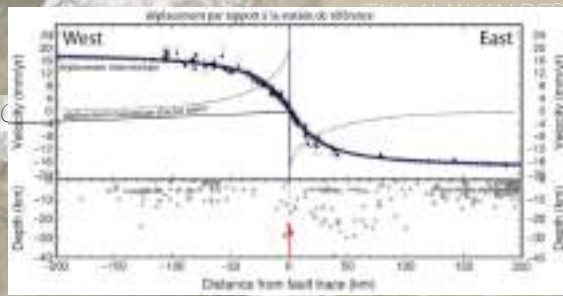
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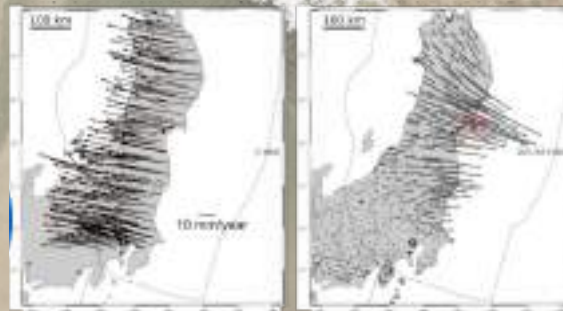


For one M7, it's recorded 10 M6, 100 M5, 1000 M4

Nothing really unpredictable ?



After Vernant, 2015



Interseismic motion

coseismic motion

Thinking about what is really unpredictable

EVENT TEMPORALLY
PREDICTABLE

EVENT SPATIALLY
PREDICTABLE

VOLCANOES

EARTHQUAKES

Initiating
parameters

Induced
Effects

Focused scale

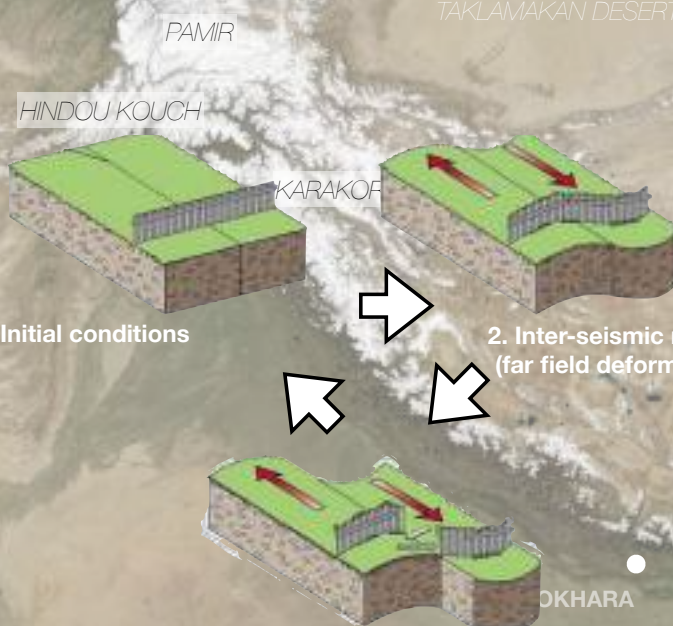


Diffuse scale



THE EARTHQUAKES ARE TEMPORALLY UNPREDICTABLE
BUT THEIR EFFECT ARE POTENTIALLY WELL CONSTRAINED

Nothing really unpredictable ?



1. Initial conditions

2. Inter-seismic motion
(far field deformation)

3. Co-seismic motion
(The earthquake)

Thinking about what is really unpredictable

EVENT TEMPORALLY
PREDICTABLE

EVENT SPATIALLY
PREDICTABLE

Initiating
parameters

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Focused scale




Diffuse scale




THE EARTHQUAKES ARE TEMPORALLY UNPREDICTABLE
BUT THEIR EFFECT ARE POTENTIALLY WELL CONSTRAINED

Working on vulnerability



Gaziantep earthquake (Turkey and Iran, 2023)



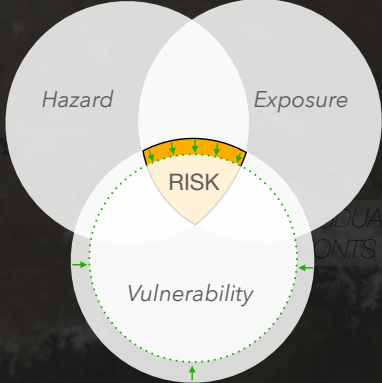
Chiapas earthquake (Mexico, 2017)

Consequence spatially maximized

Thinking about what is really unpredictable


Local and regional seismic properties : **Can be maximized**

Human activities : Can be evaluated

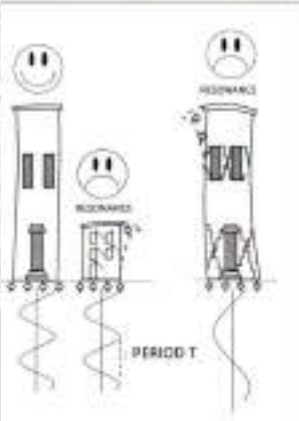


Upstream personal and public decisions : **Can be optimized**

SISMOBOX TASK 4 : SOME INNER PROPERTIES OF THE BUILDINGS ?



Illustrating the resonance frequency and parasismic buildings




PERIOD

The tools allow to illustrate ground properties as site effects...

Consequence spatially maximized

Working on vulnerability : 3 scale at least



PERSONS
The adapted reflexes

HOME

PUBLIC SPHERE

Ground and Inner properties
Good adaptations

Crisis management

YOU ARE THE MAIN EDUCATIONAL WAYPOINT, SO LET'S DO IT

Working on vulnerability : 3 scales at least

PERSONS
The adapted reflexes

HOME
Ground and Inner properties
Good adaptations

PUBLIC SPHERE
Crisis management

What to do before ? Be vigilant in some details at home (wall-mounted shelves, emergency kit)
What to do during an earthquake ? In several seconds, good habits can save
What to do after ? Get out of the way then help the others depending your competence

POKHARA

THANK YOU !