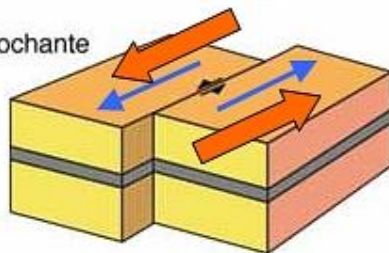


QUANTIFICATION DES AMPLITUDES ET DES TAUX DE DEFORMATION

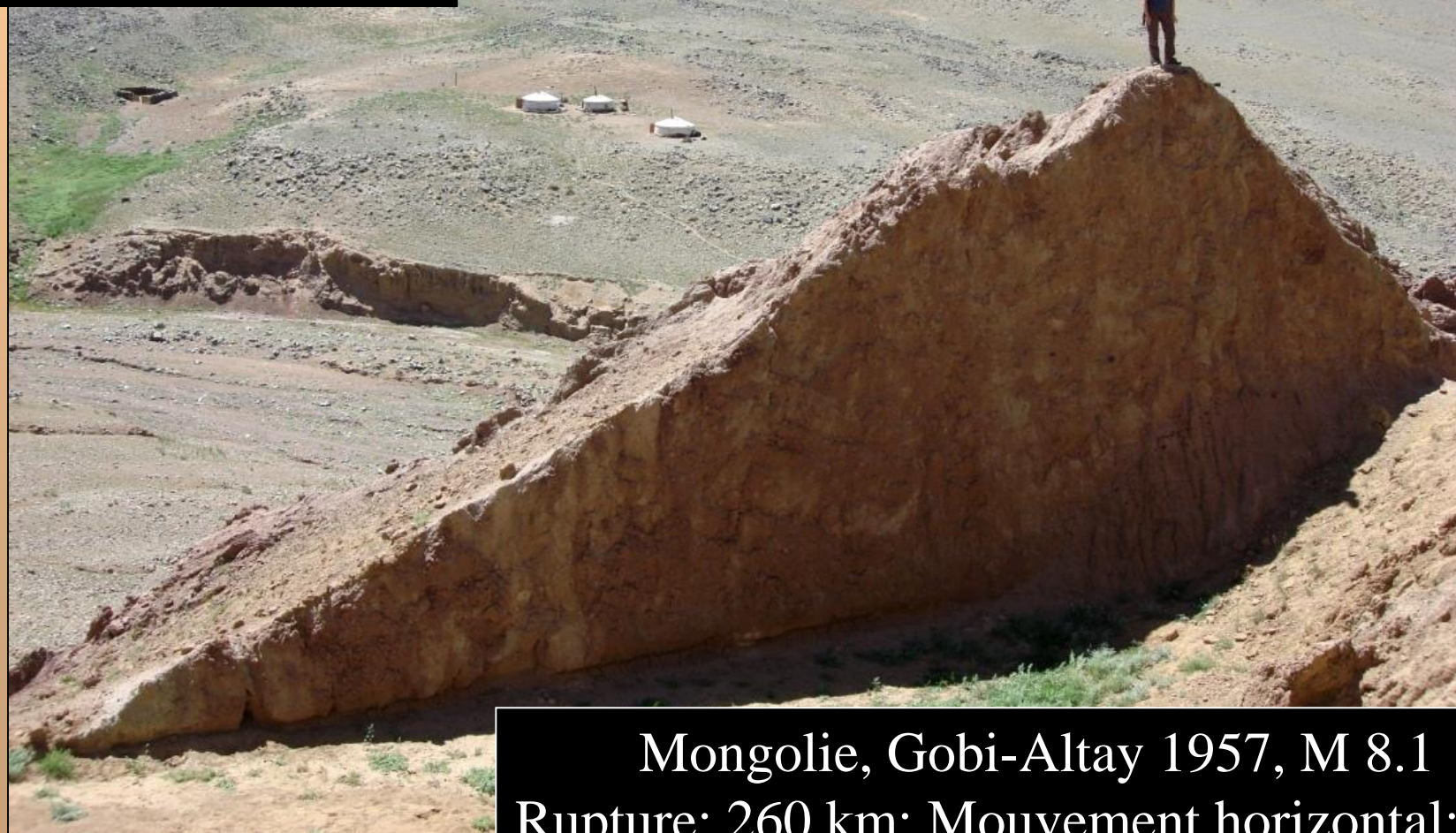


CONTEXTE DECROCHANT

Faille décrochante

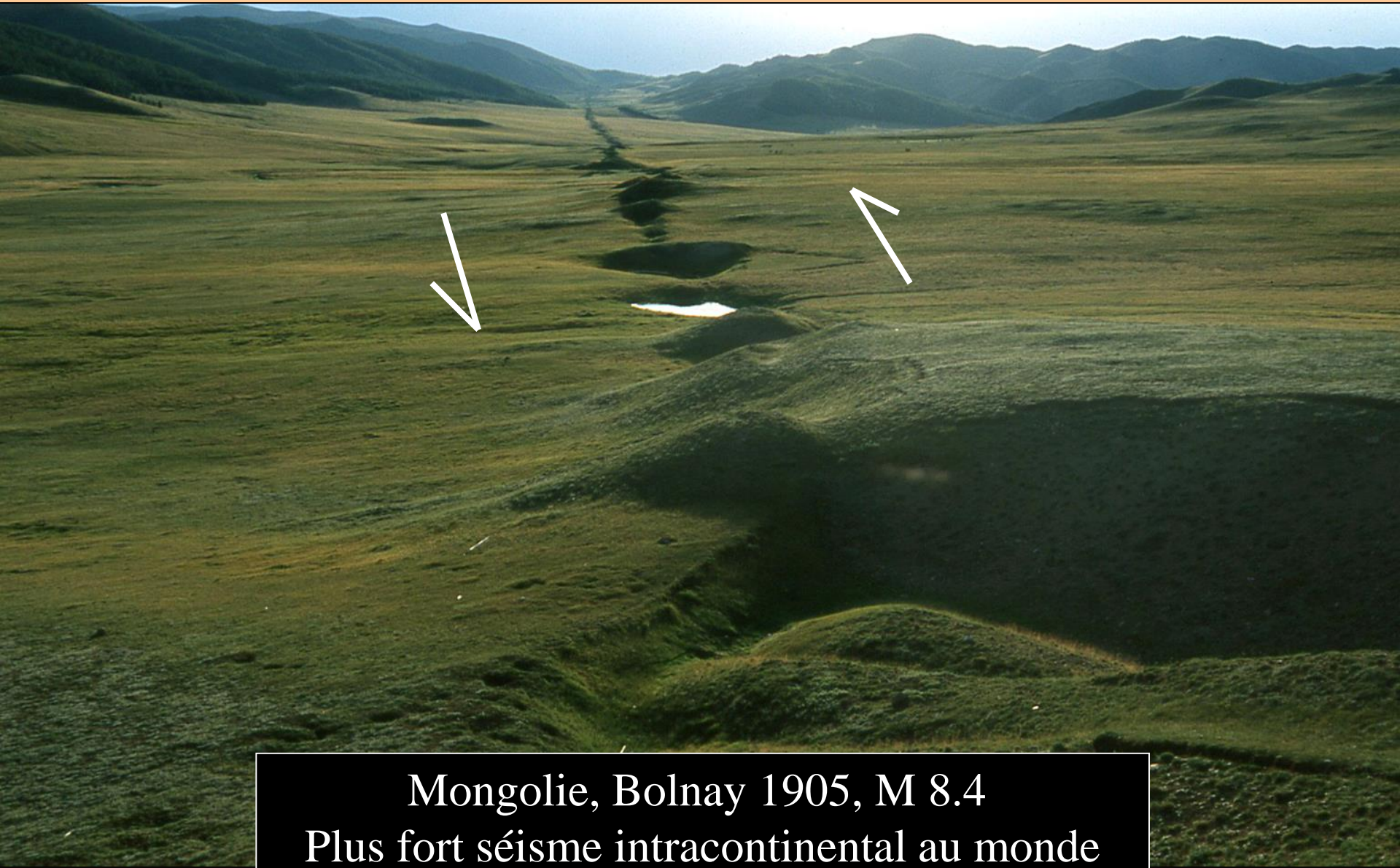


Déplacement co-sismique simple

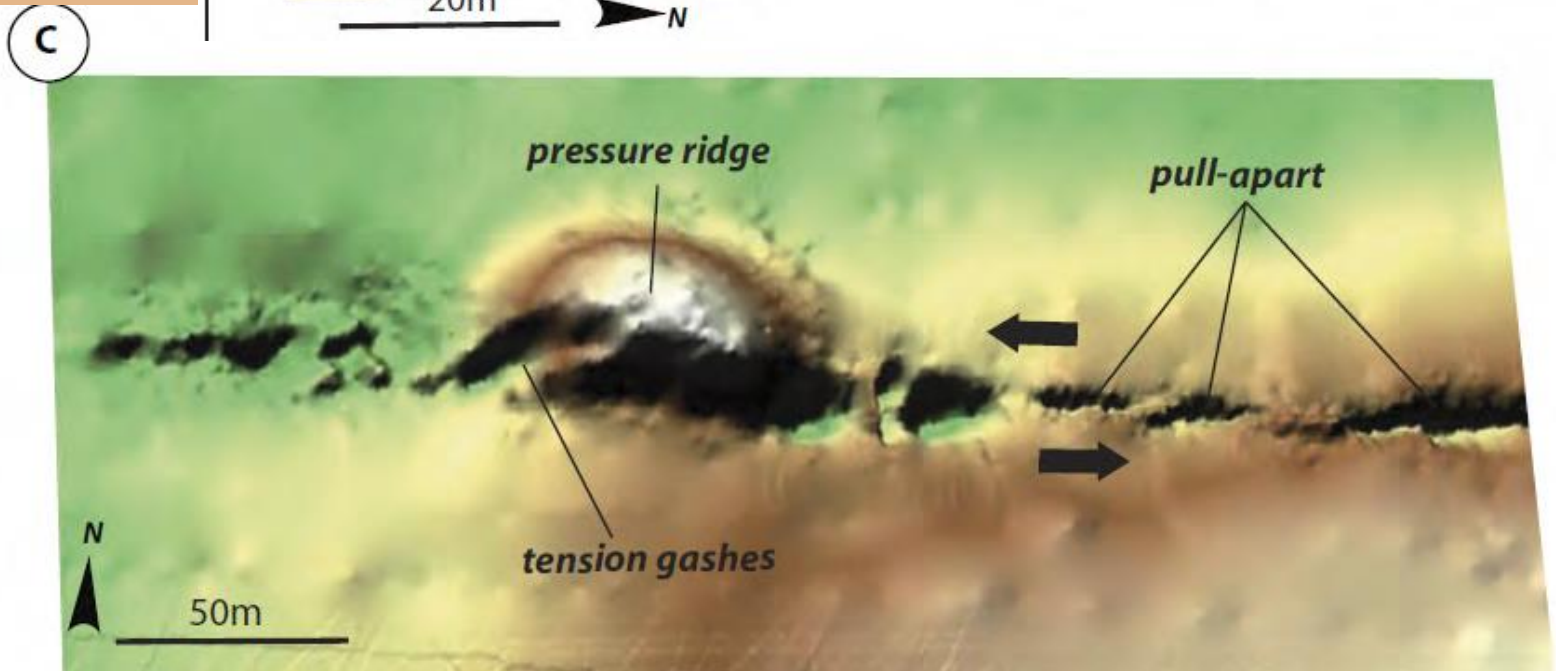
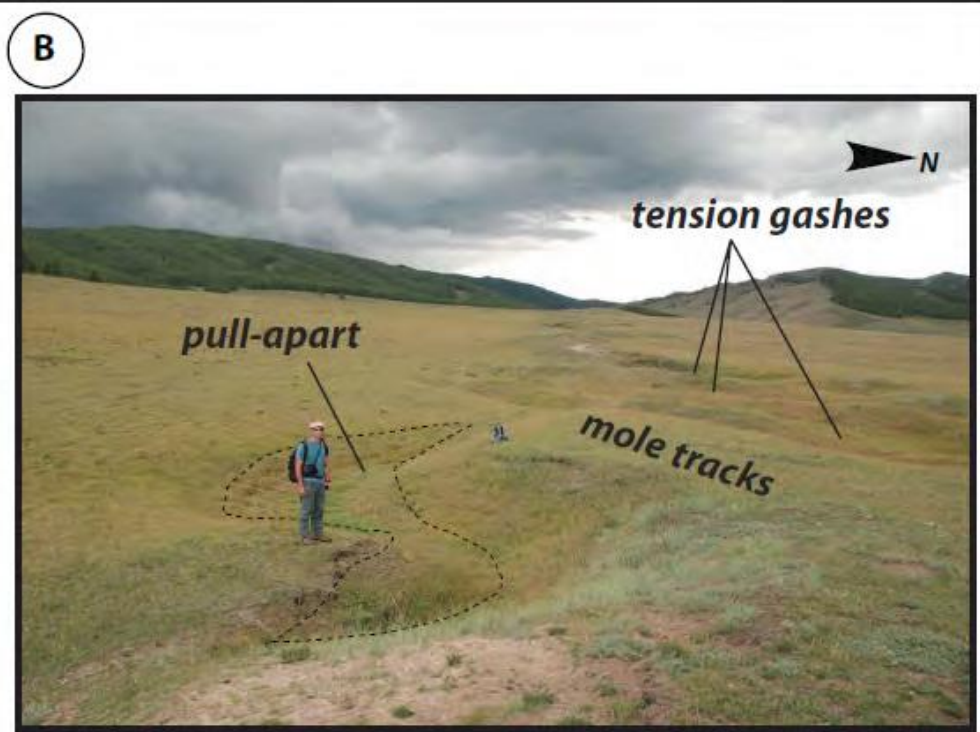
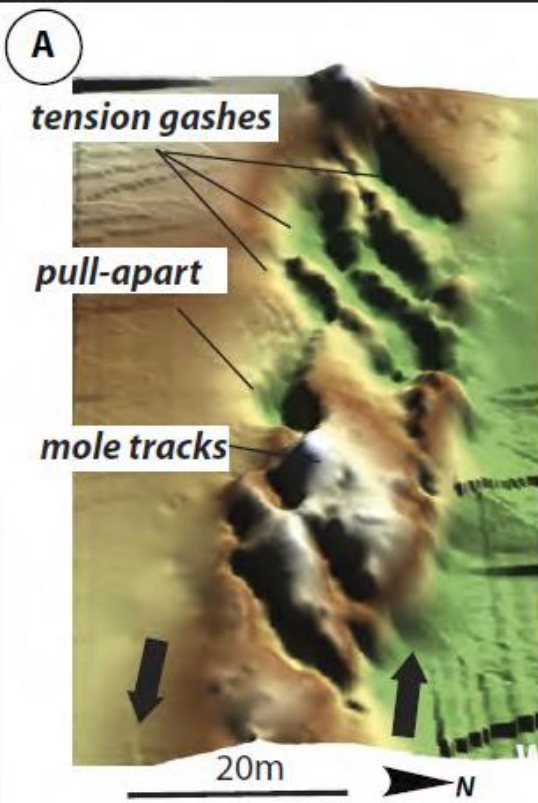


Mongolie, Gobi-Altay 1957, M 8.1
Rupture: 260 km; Mouvement horizontal: 5 m

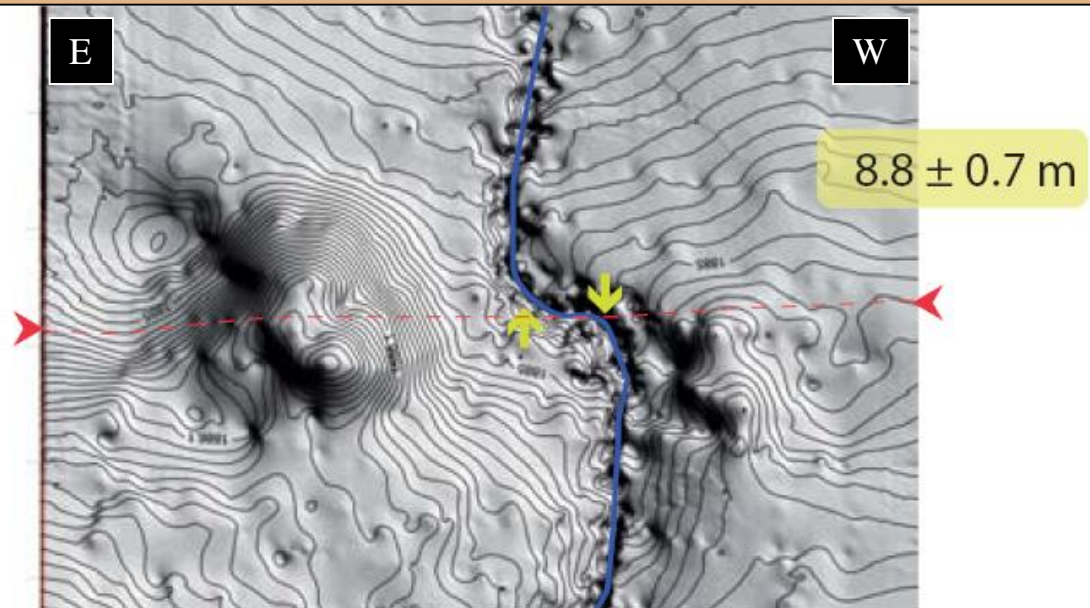
Déplacement co-sismique simple et cumulé

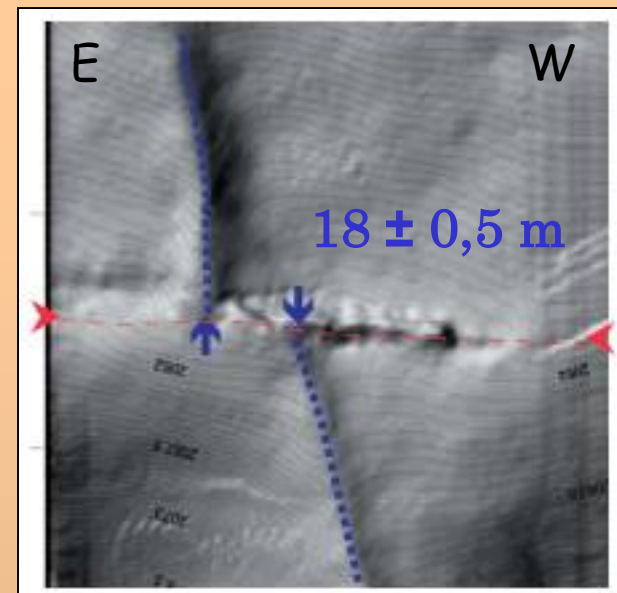
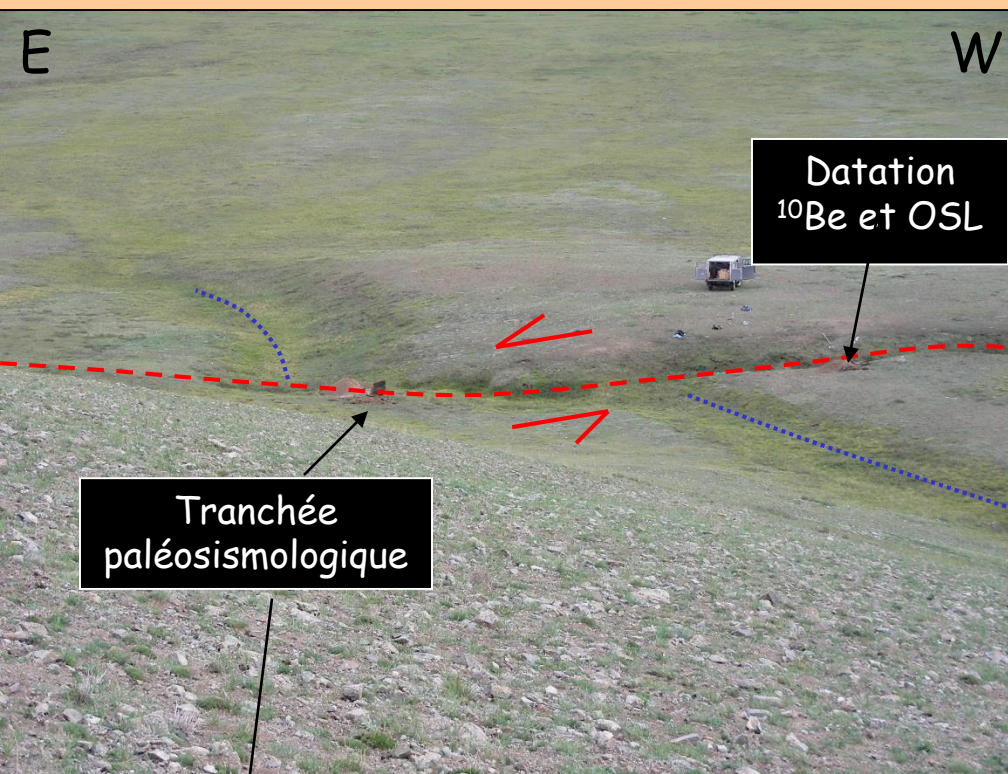


Mongolie, Bolnay 1905, M 8.4
Plus fort séisme intracontinental au monde
Rupture: 400 km; Mouvement horizontal: 9 m



Détermination du déplacement co-sismique de 1905 par analyse du décalage des rivières





Déplacement cumulé: 2 séismes

Mesure du décalage de l'incision affectant le cône alluvial ($18 \pm 0,5 \text{ m}$) divisée par l'âge d'exposition du cône ($5,2 \pm 0,3 \text{ ka}$):

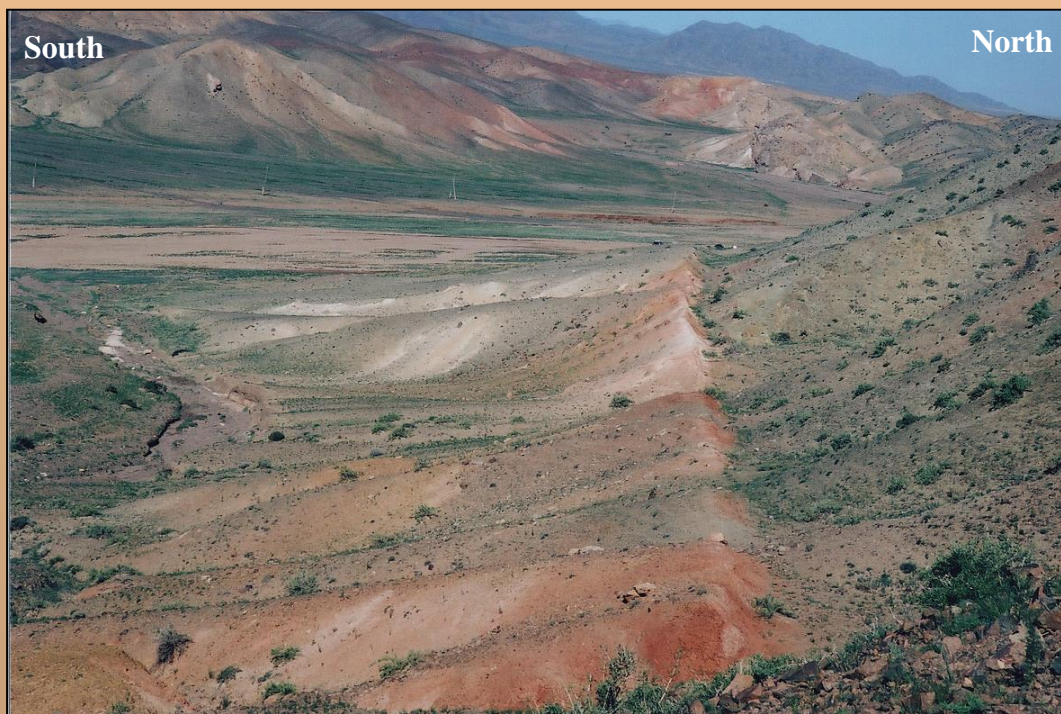
Vitesse holocène de la faille: $3,5 \pm 0,3 \text{ mm/an}$

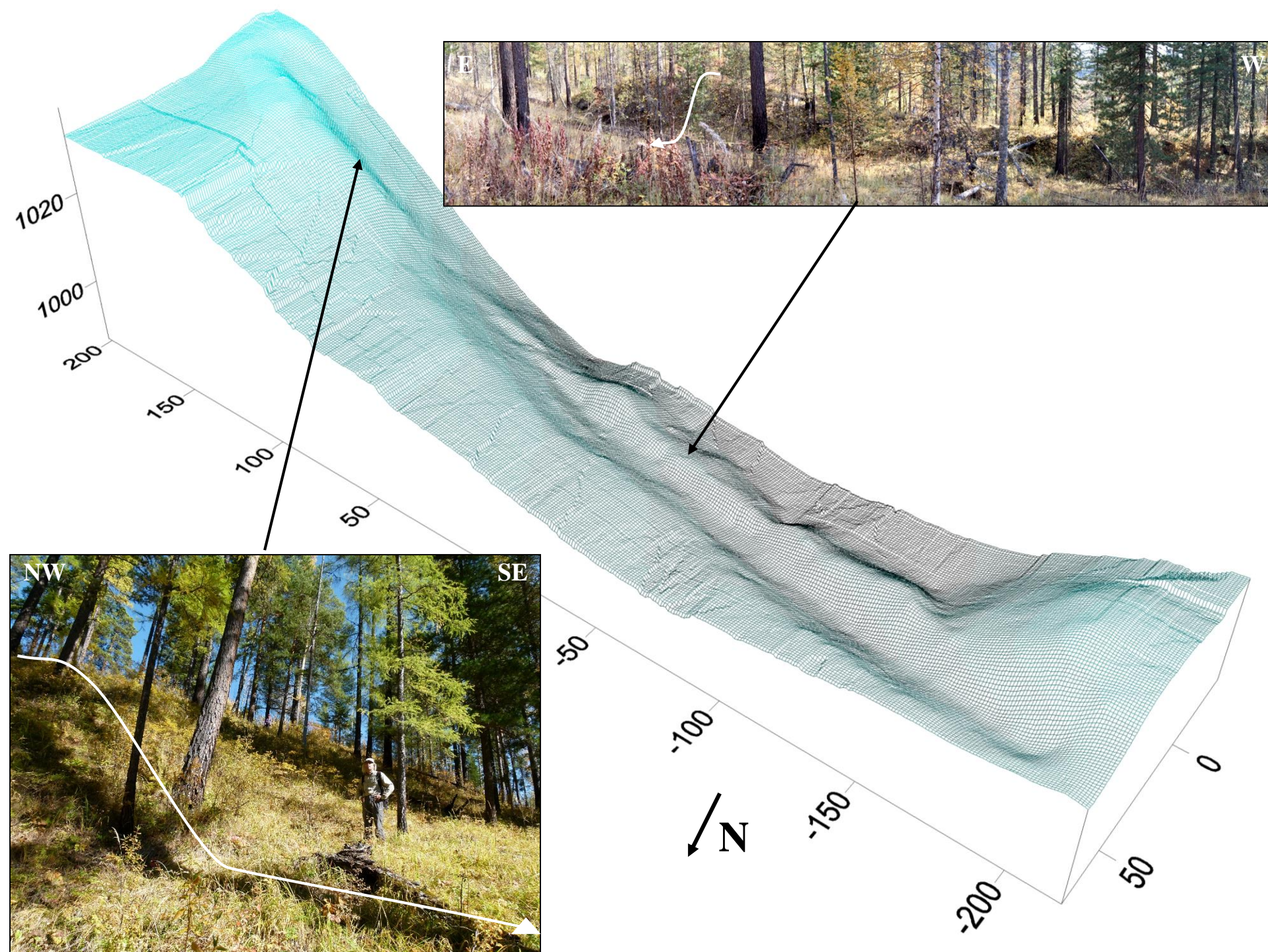


Analyse des ruptures et datation d'horizons sismo-sédimentaires dans des tranchées paléosismologiques:
Récurrence des séismes: 2000-3000 ans

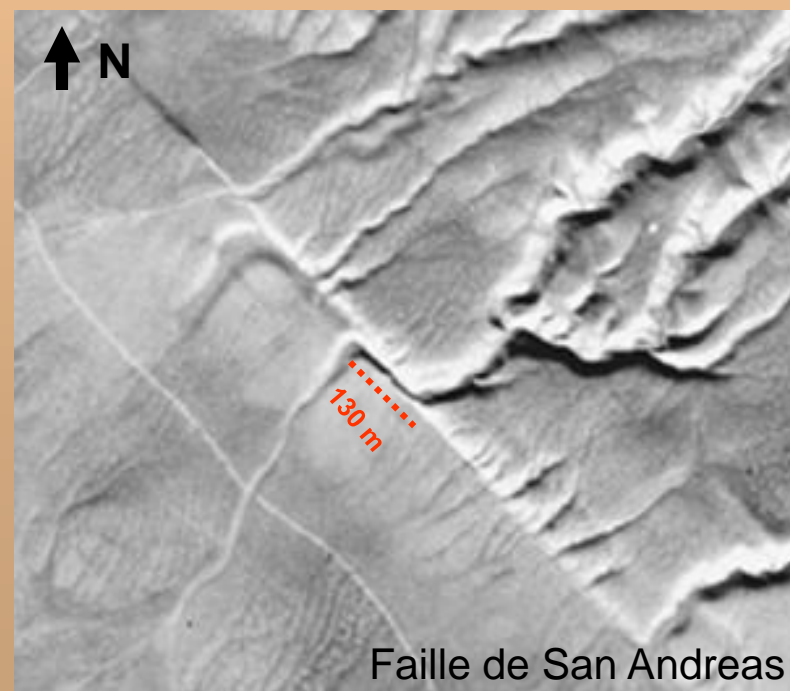
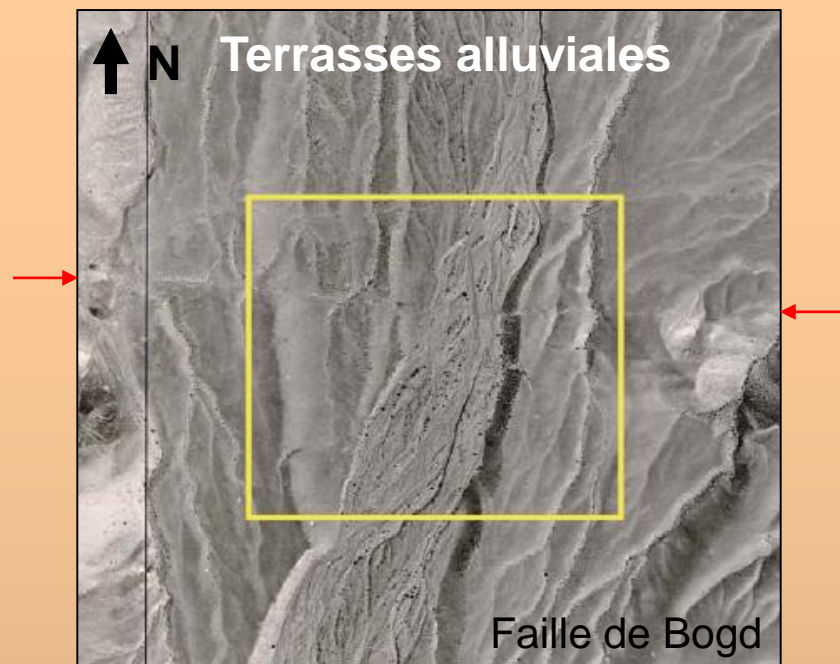
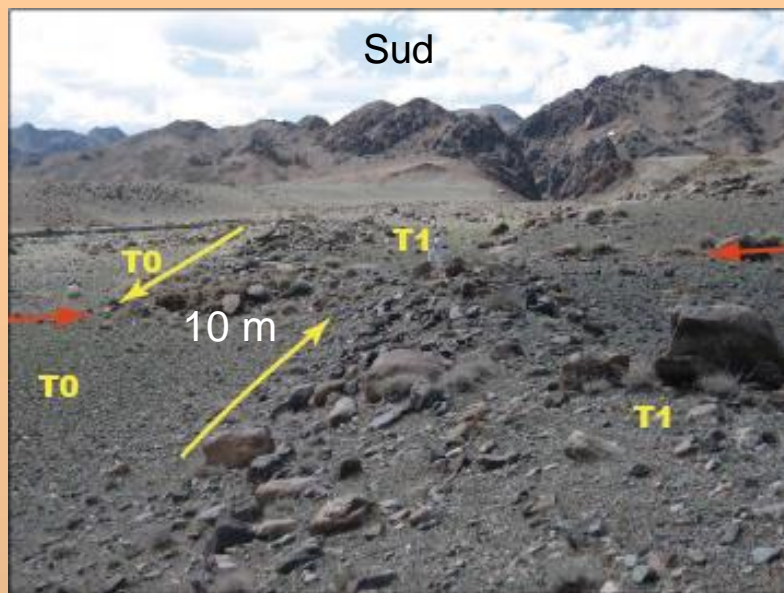
Contre-escarpements sur un versant : mouvement vertical apparent



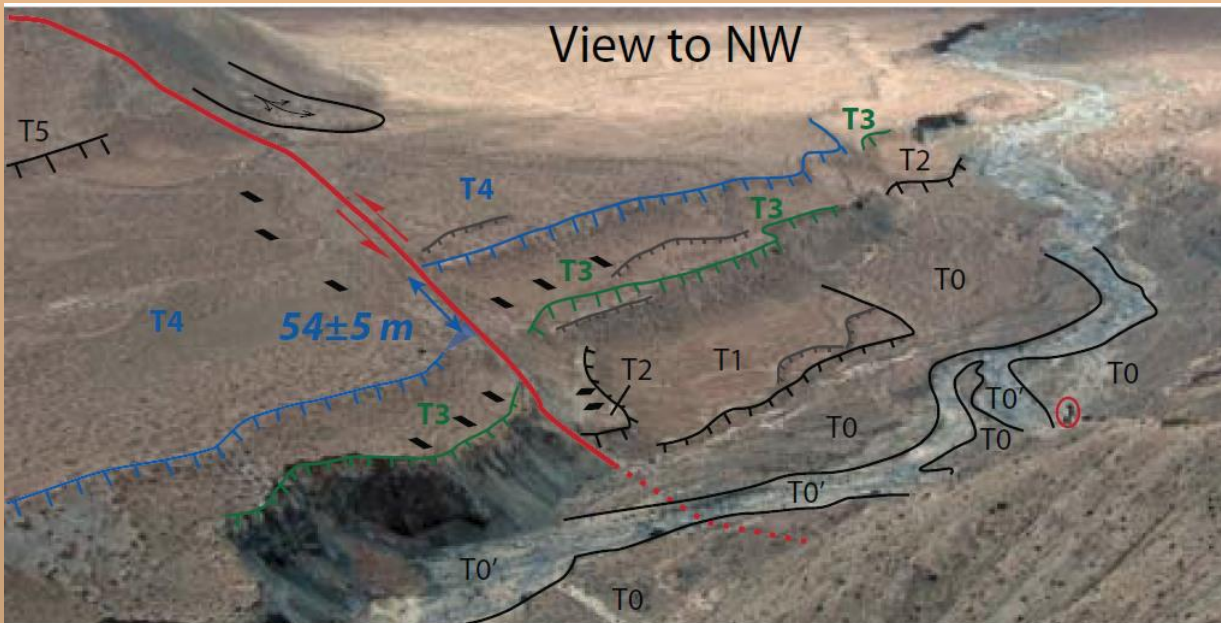
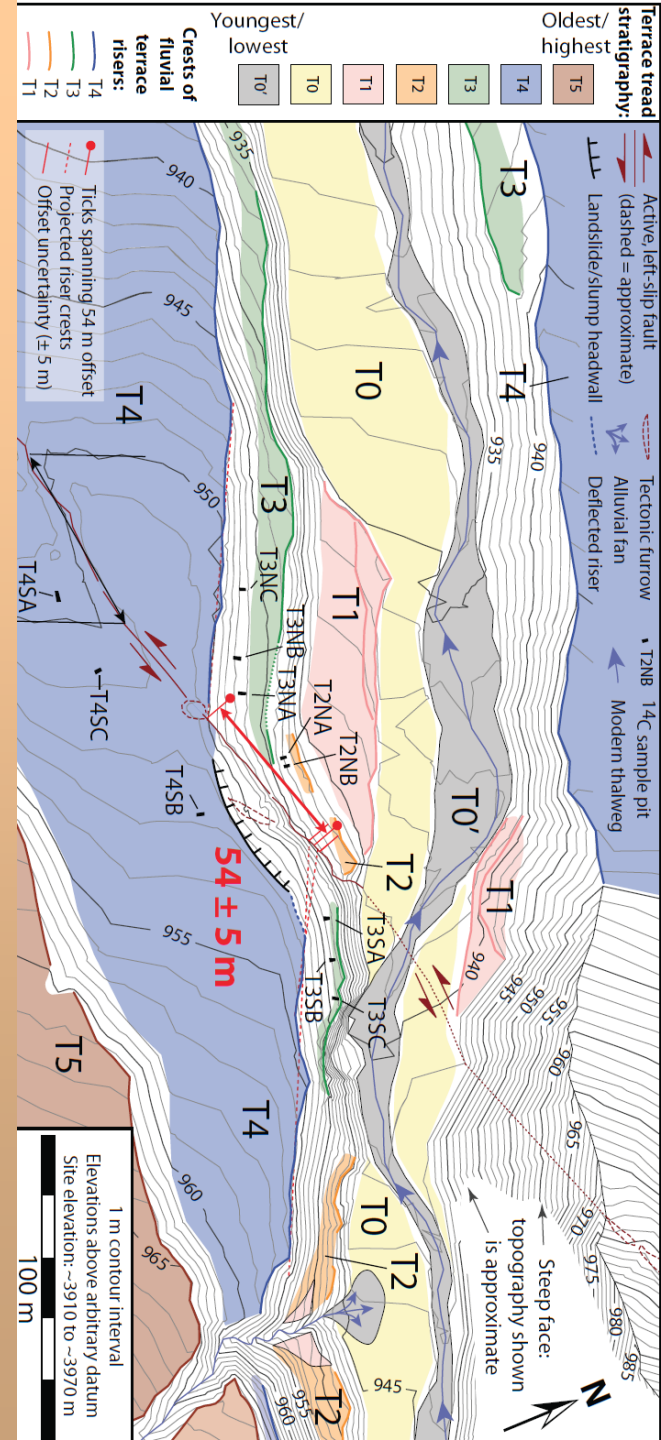
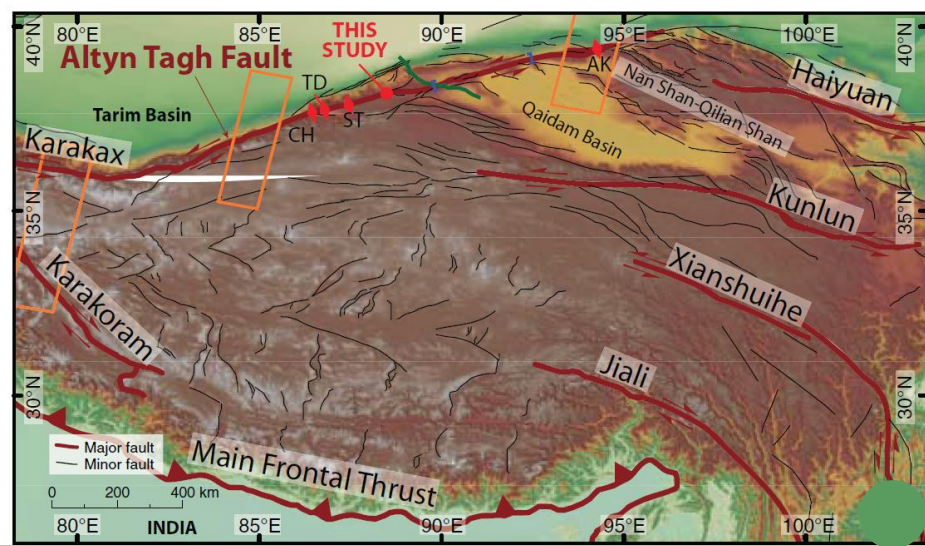


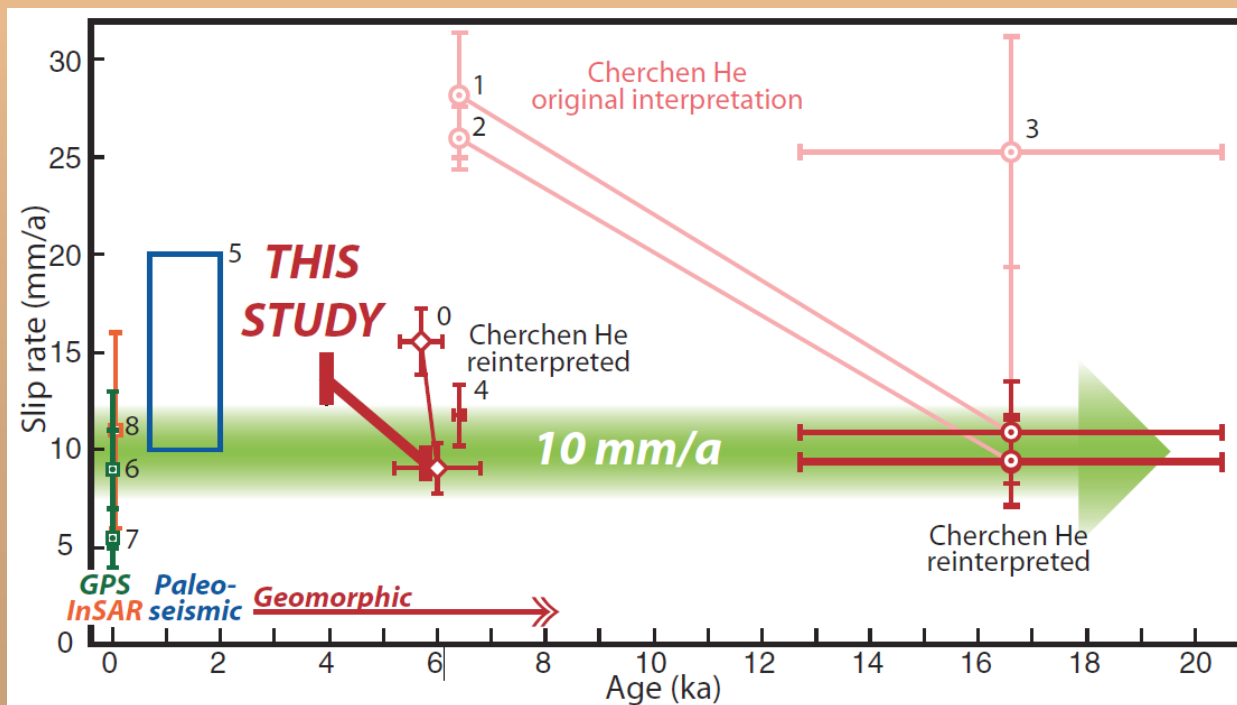
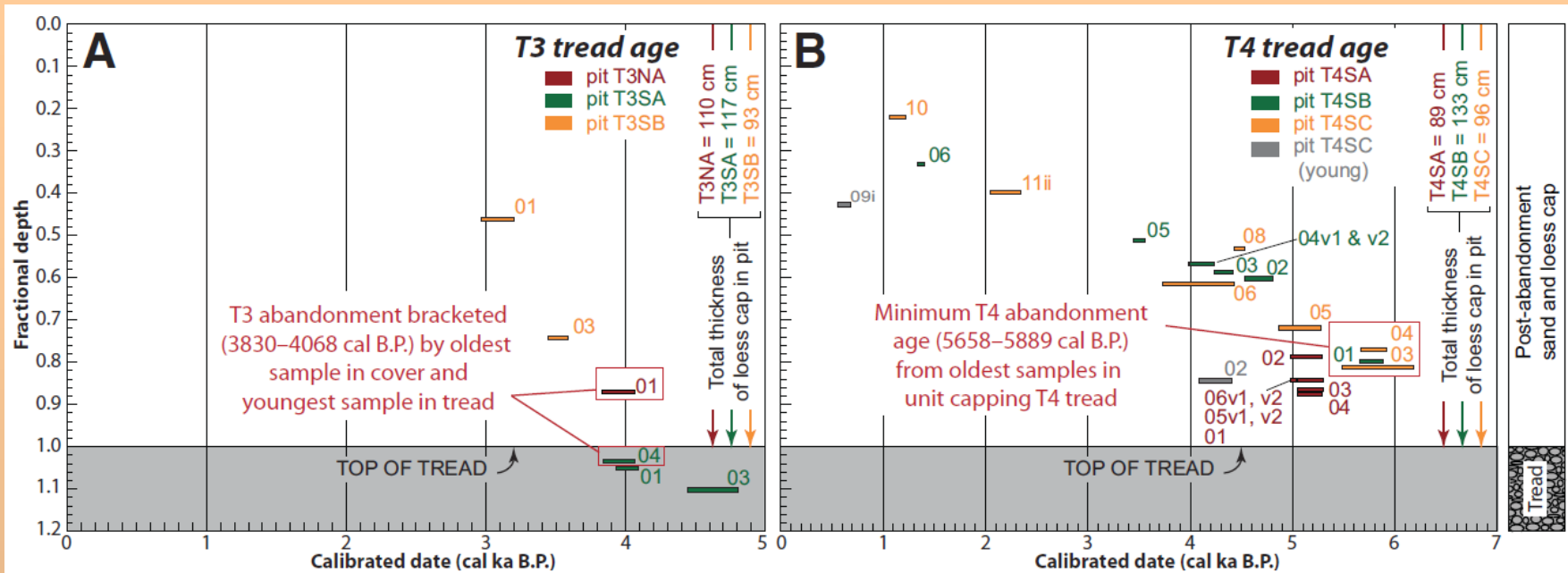


Déplacement cumulé (plusieurs séismes)



Vitesse de déplacement le long d'une faille (Slip rate)





Décalage d'apex de cônes alluviaux par rapport à leur exutoire d'origine



J-F. Ritz

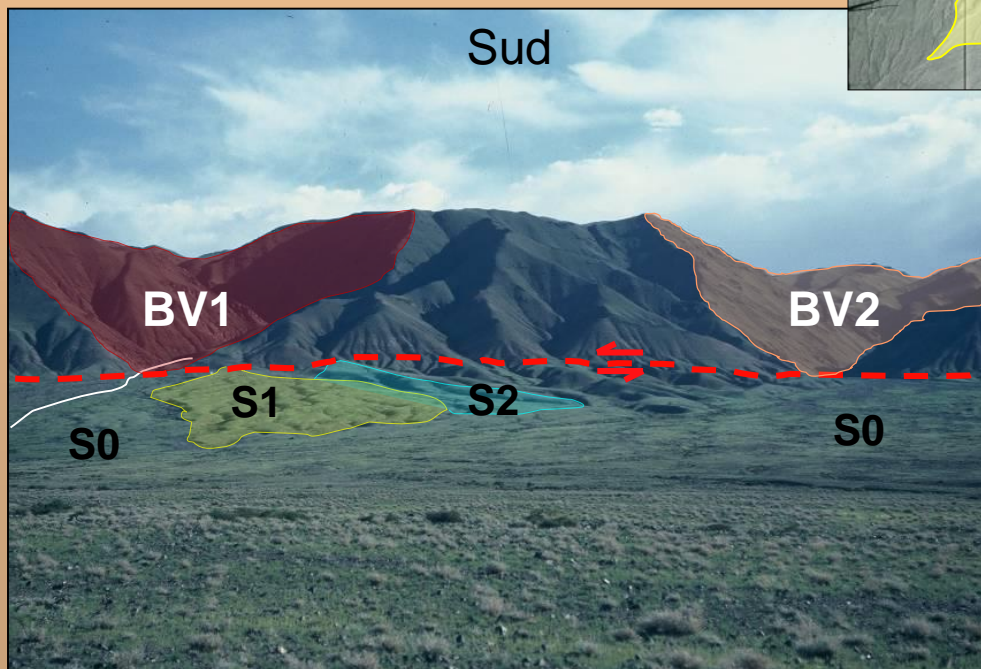
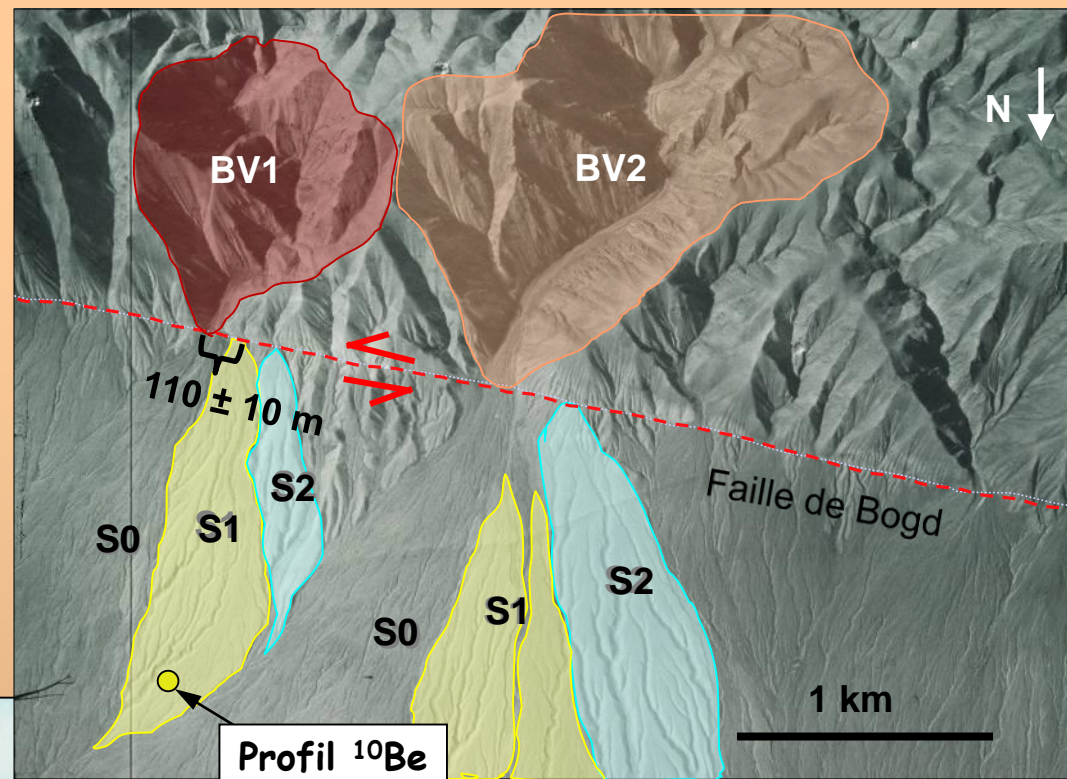
Gobi-Altay, Mongolie

Décalage d'apex de cônes alluviaux par rapport à leur exutoire d'origine

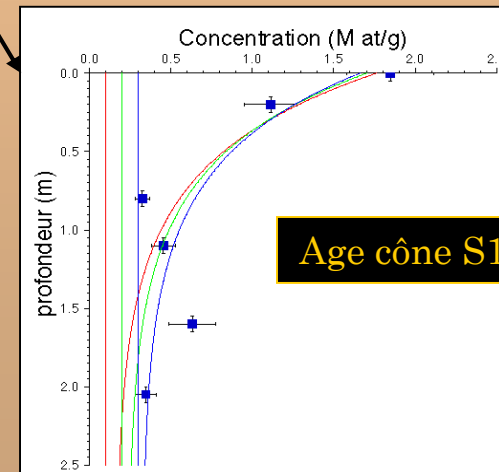


Gobi-Altay, Mongolie

Vitesse de déplacement de la faille au Pléistocène supérieur - Holocène



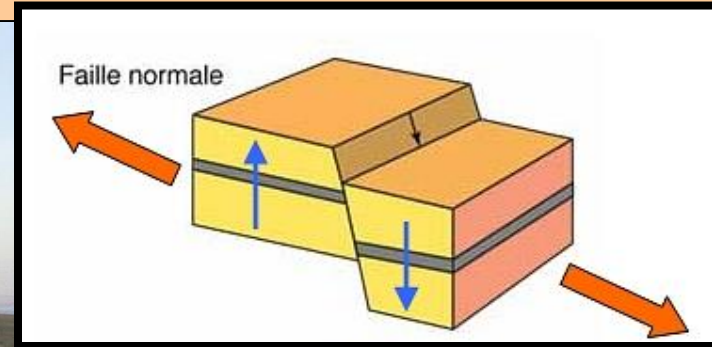
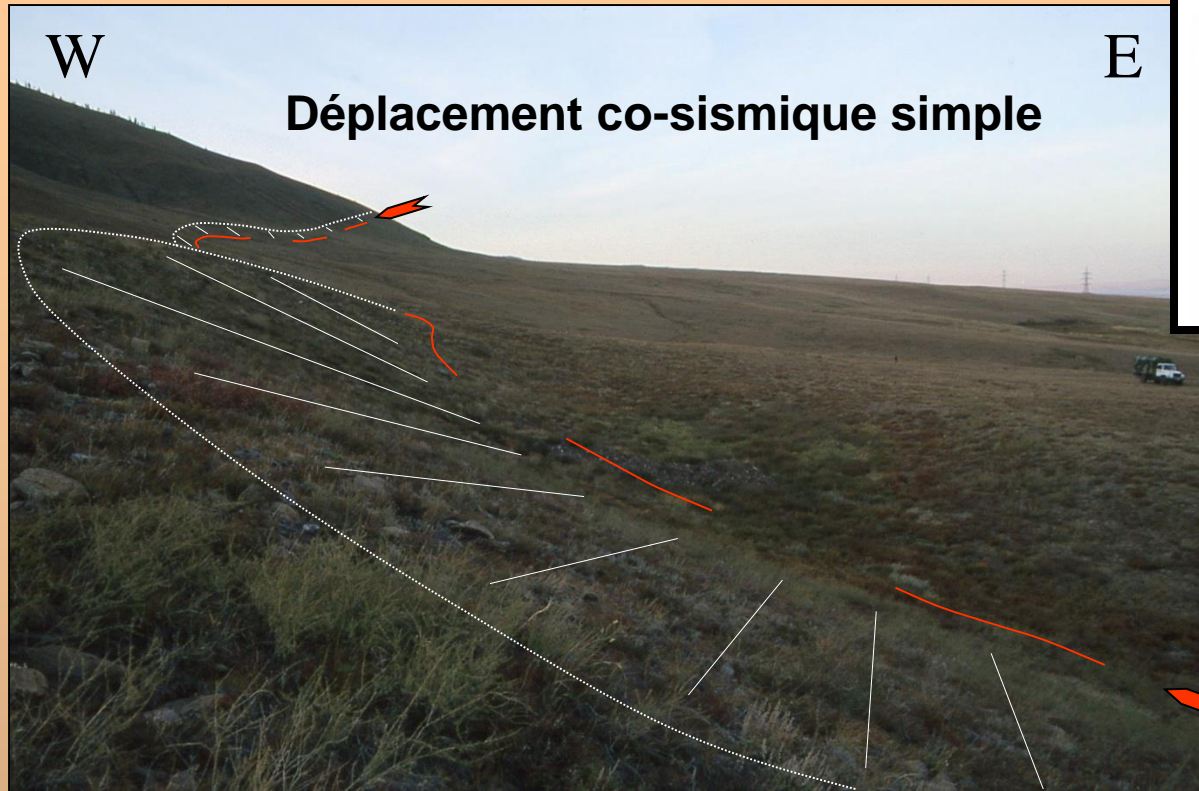
Profil ^{10}Be



Age cône S1: 125 ± 28 ka

Vitesse horizontale sur 125 ka : ~ 1 mm/an

CONTEXTE EXTENSIF

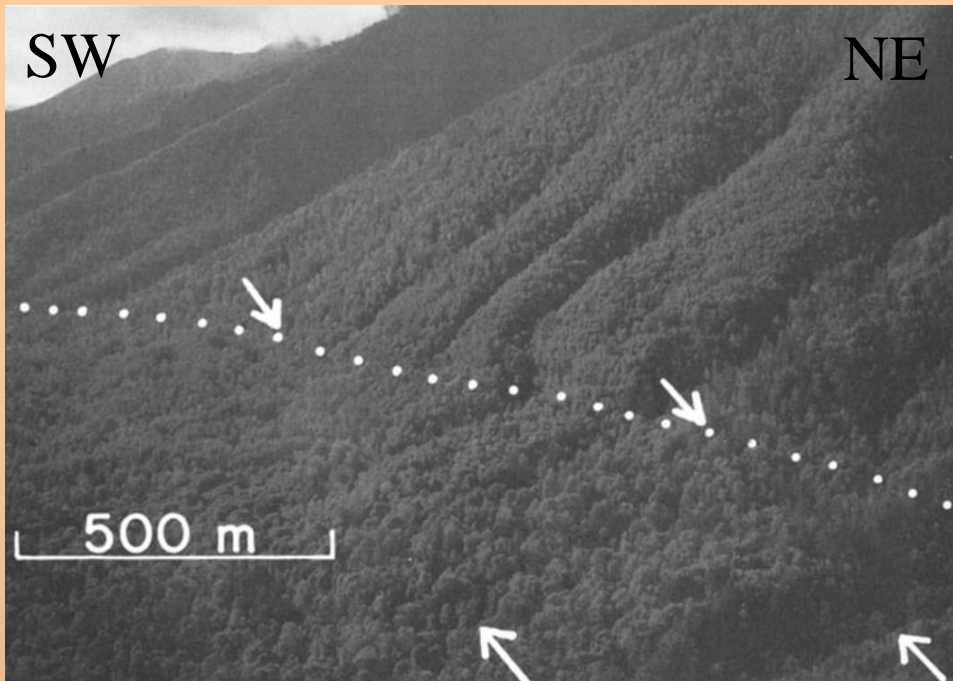


Sibérie, Transbaïkal,
il y a quelques siècles...
Mouvement vertical: 2-3 m

Déplacement cumulé cénozoïque: facettes triangulaires

Chaîne de Sayan, Sibérie





**Déplacement cumulé
pléisto-holocène**

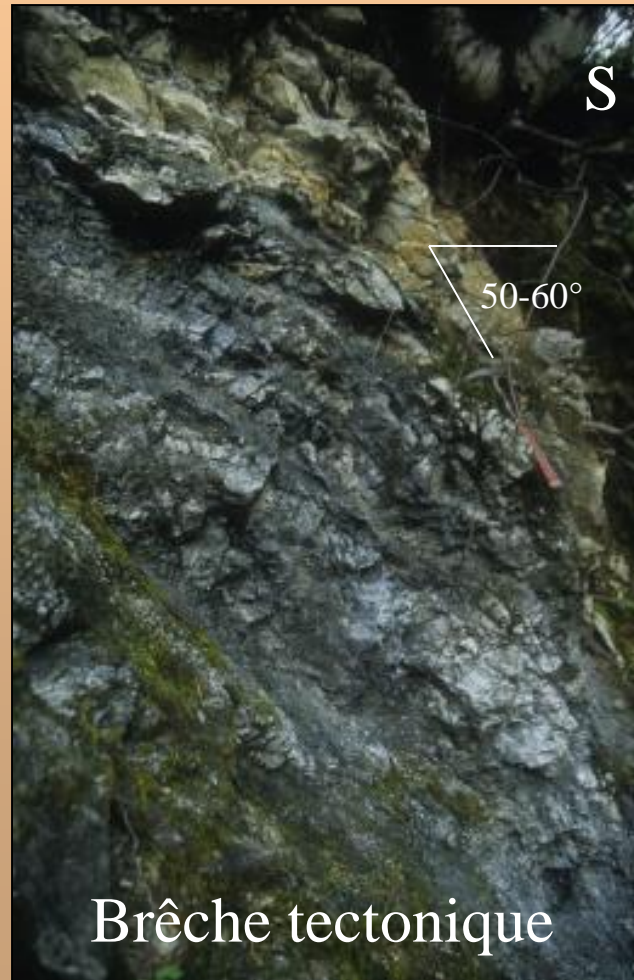
Mc Calpin & Khromovskikh,
1995



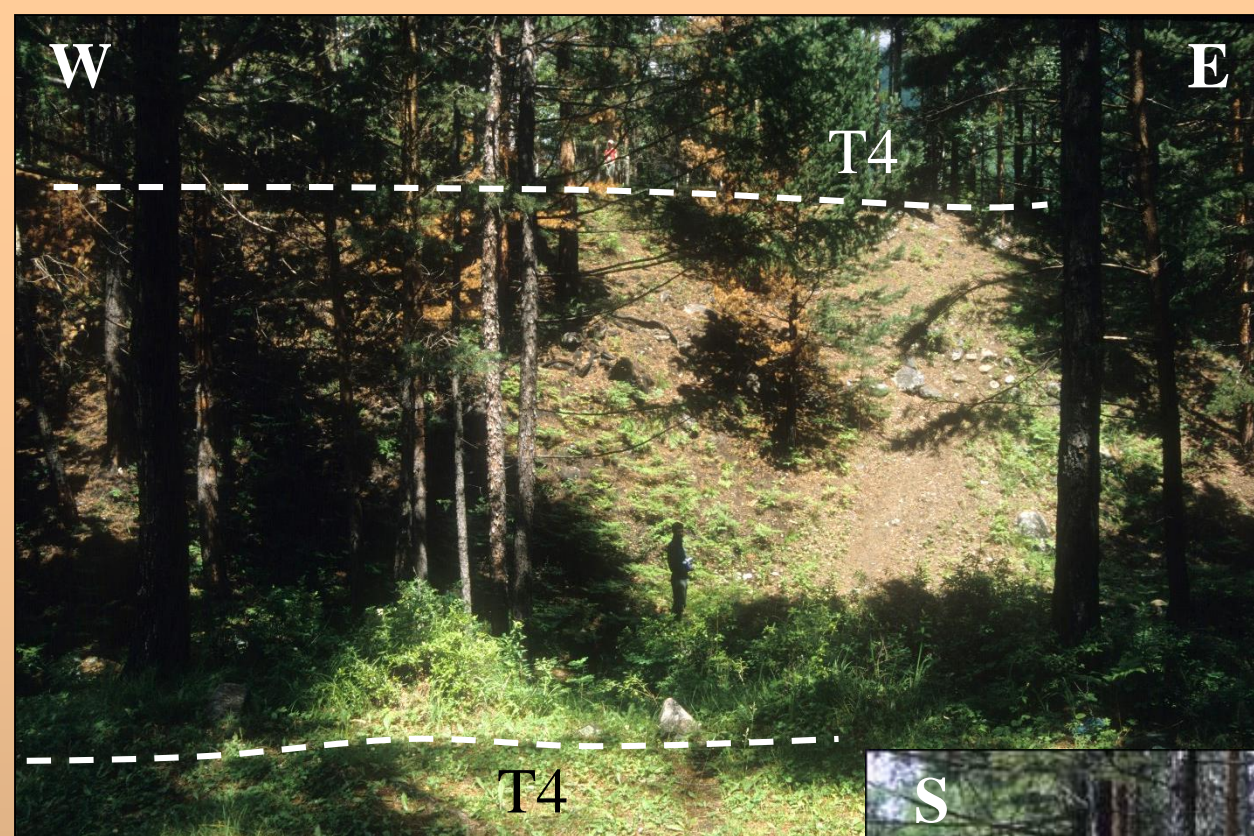
**Faille de Tunka,
Sibérie**



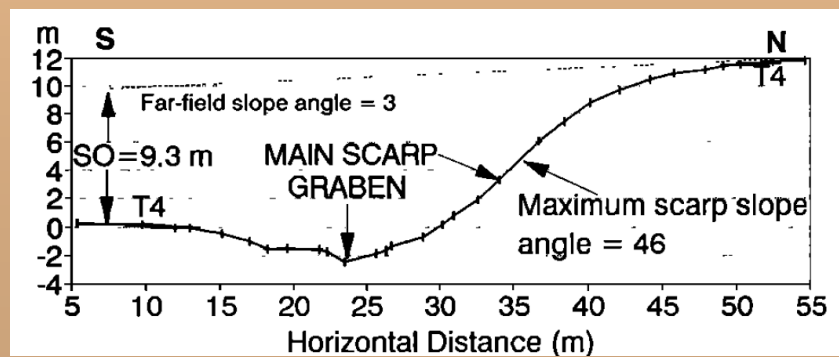
Socle carbonaté « intact »

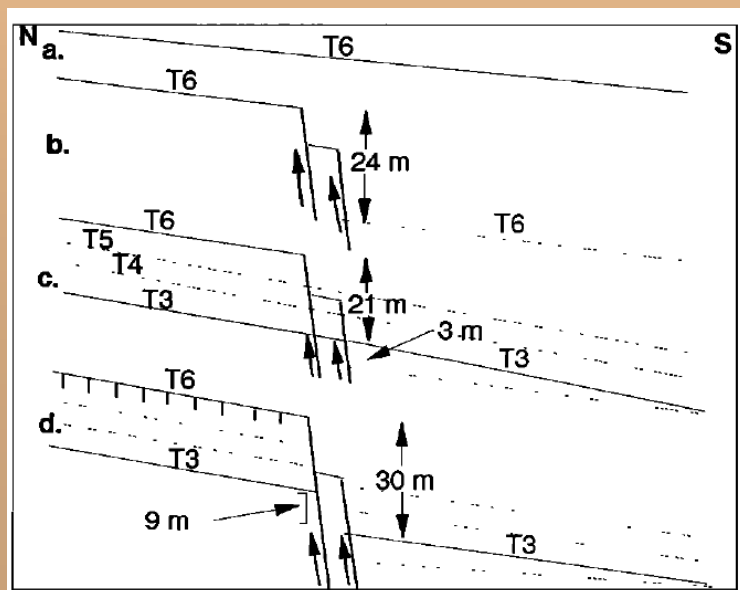
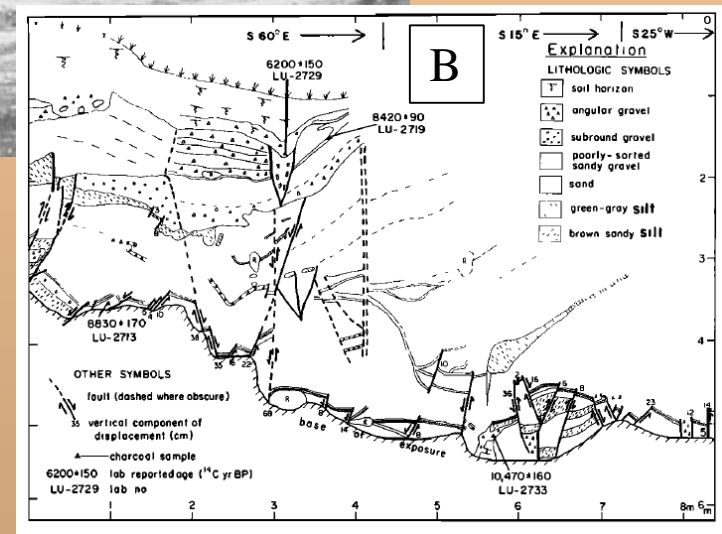
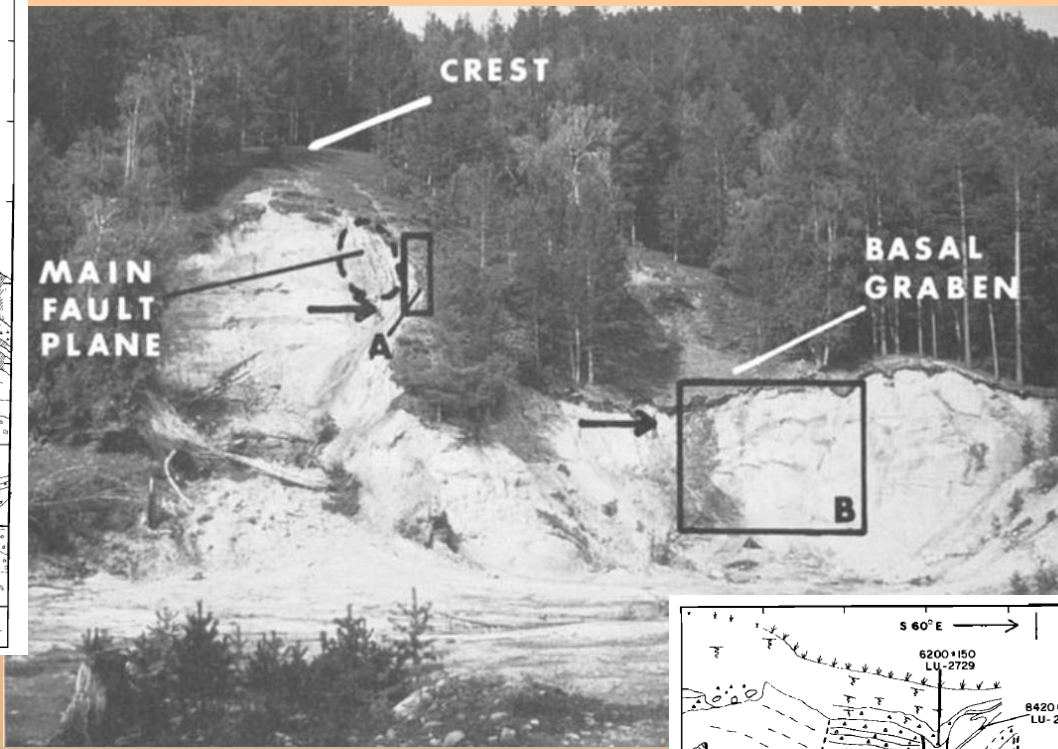
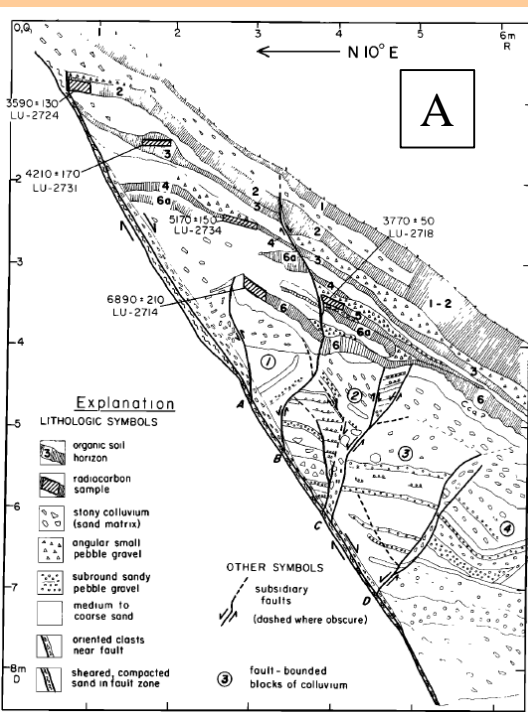


Brèche tectonique



Escarpement
tectonique

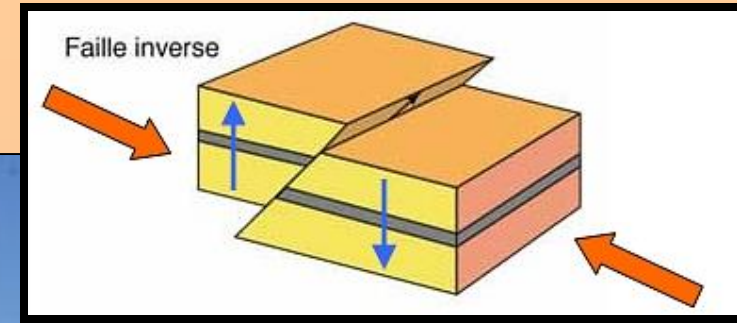




Mc Calpin & Khromovskikh, 1995

CONTEXTE COMPRESSIF

Déplacement co-sismique
simple



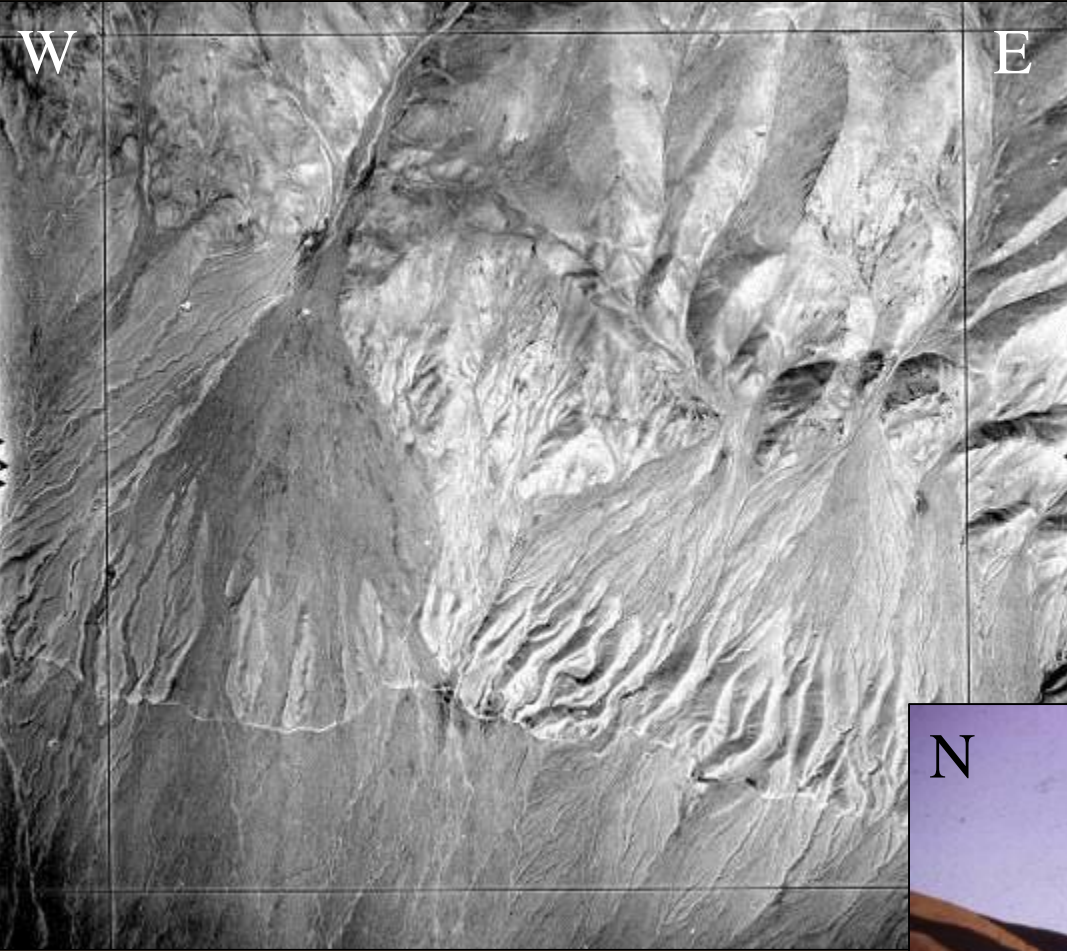
Mongolie, Gobi-Altay 1957, M 8.1
Mouvement vertical: 4 m



**Failles inverses:
déplacement co-sismique
simple**

Spitak, Arménie



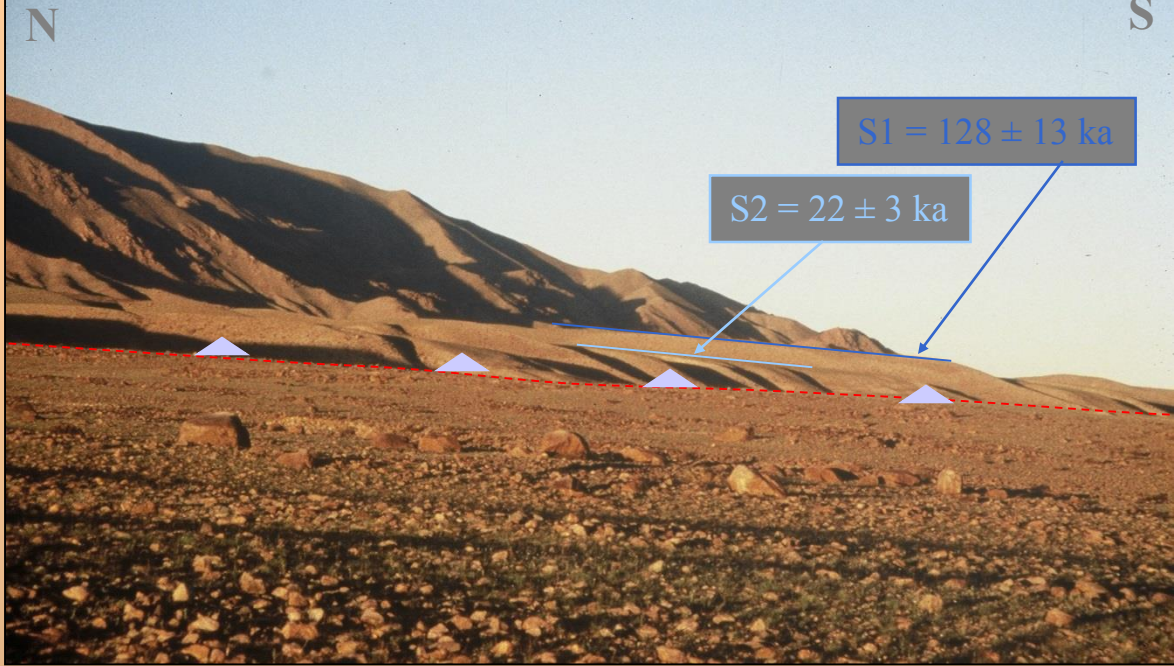


**Failles inverses:
déplacement
pléisto-holocène cumulé**

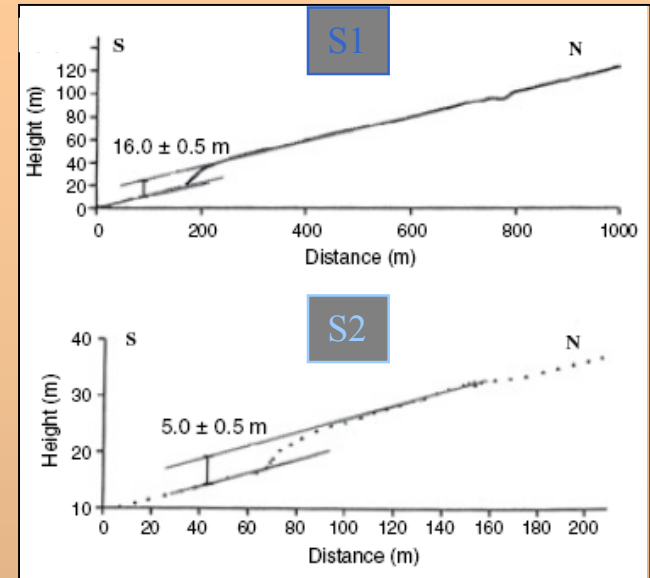
Gobi-Altay, Mongolie



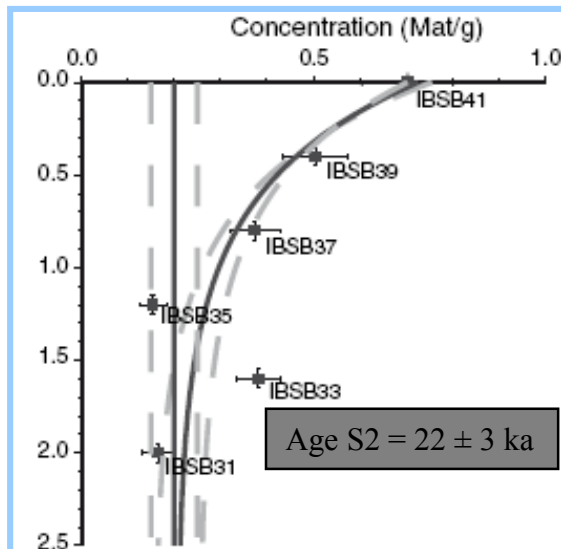
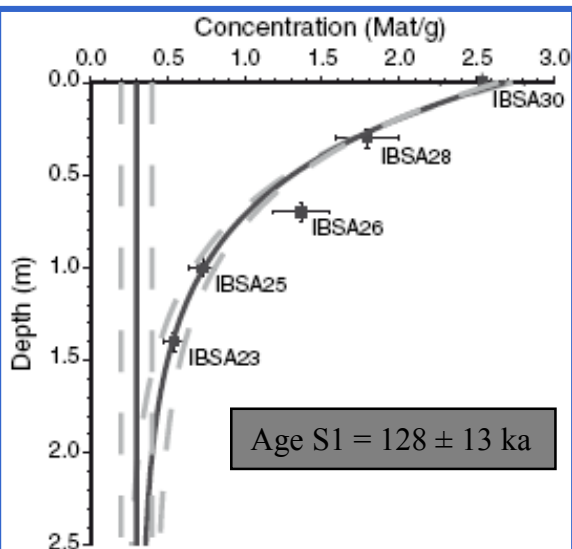
Faïlle inverse de Gurvan Bulag, Gobi-Altay, Mongolie



Profils topographiques traversant l'escarpement de faille



Datation des cônes S1 et S2 par ^{10}Be cosmogénique

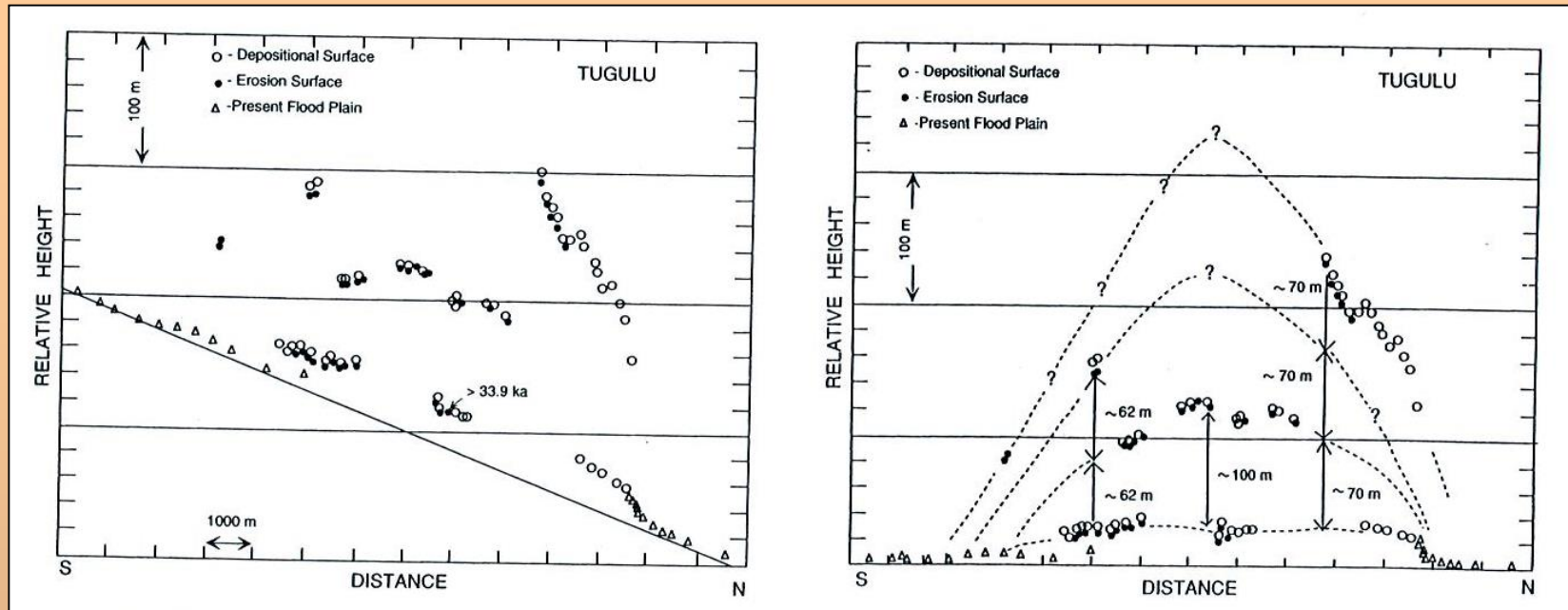


Vitesse verticale de la faille:

Sur 130 ka: $0,13 \pm 0,02 \text{ mm/an}$
Sur 20 ka: $0,23 \pm 0,05 \text{ mm/an}$

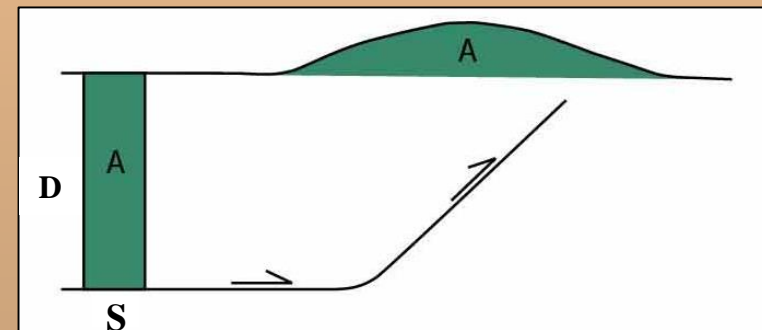
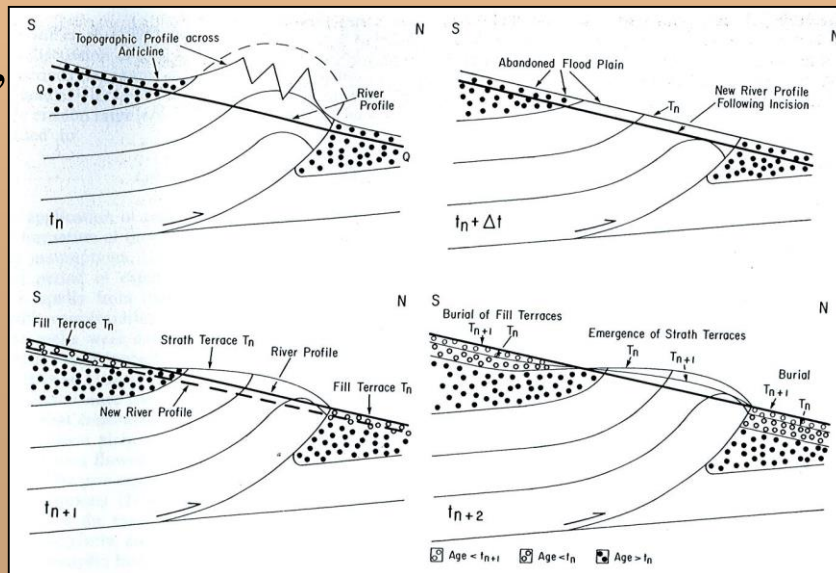
La vitesse a sensiblement augmenté sur les derniers 20 ka

Marqueurs morphologiques du plissement



Molnar et al., 1994

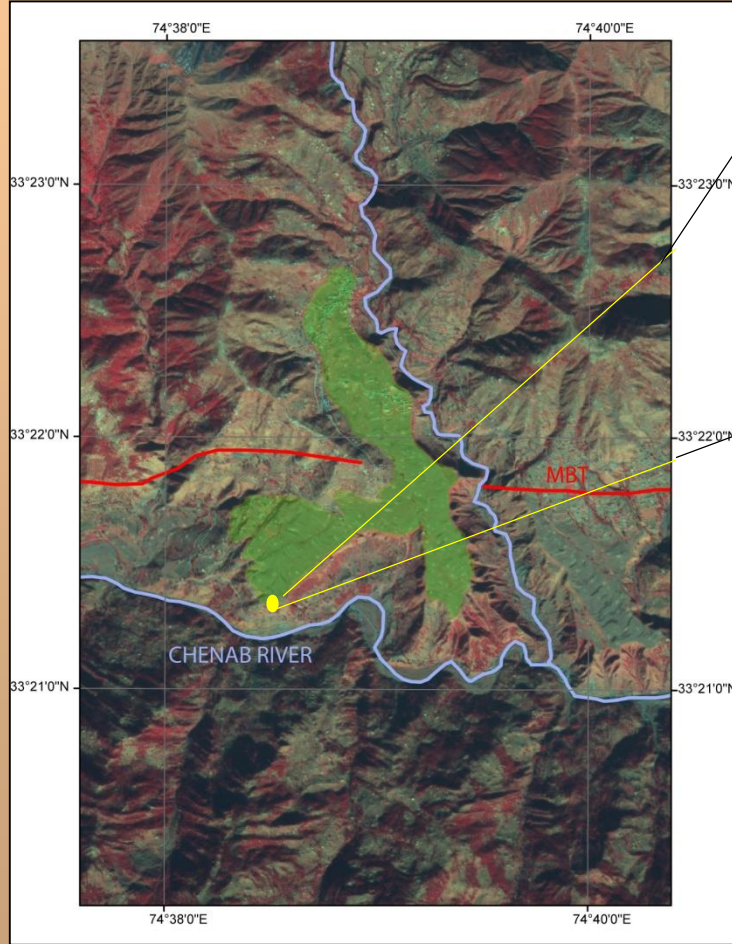
Tien Shan,
Chine



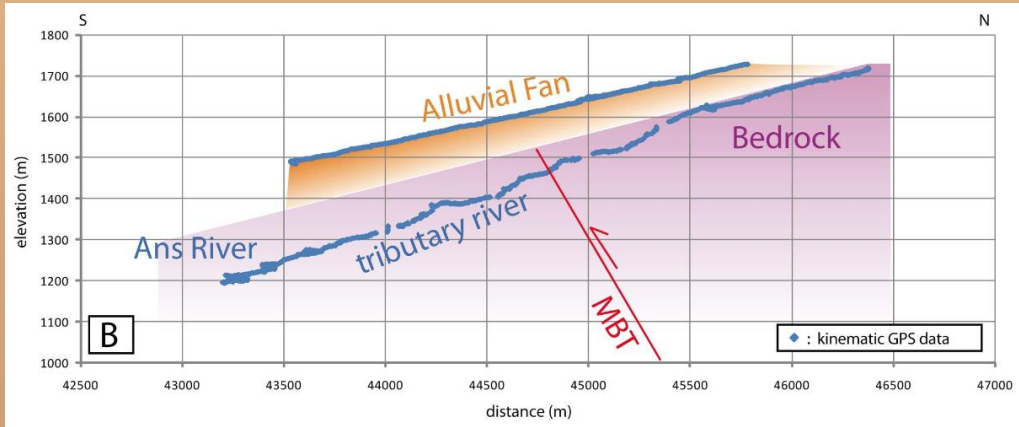
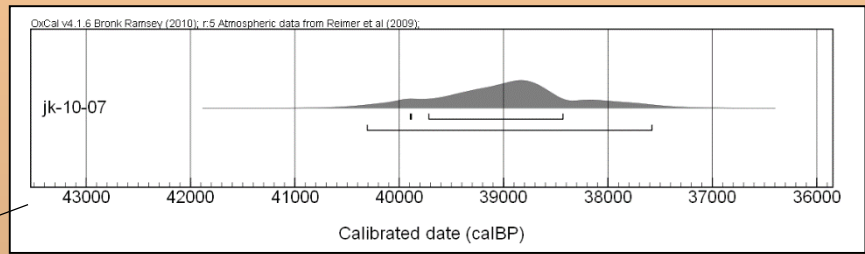
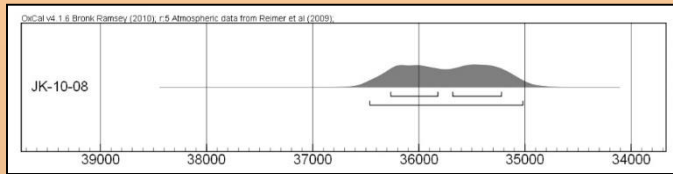
Excess area method (Hossack, 1979) :

$$S \text{ (km)} = A \text{ (km}^2\text{)} / D \text{ (km)}$$

Marqueurs morphologiques qui scellent le mouvement d'une faille active

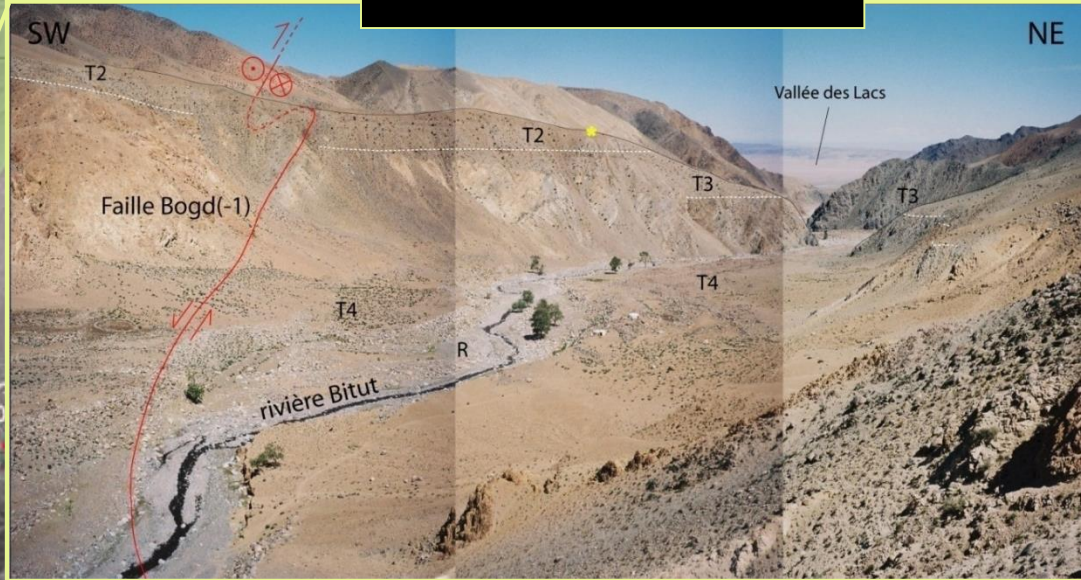


14 C Samples



Marqueurs morphologiques qui encadrent l'activité d'une faille

Terrasse T2 décalée



Terrasse T3 pas décalée

