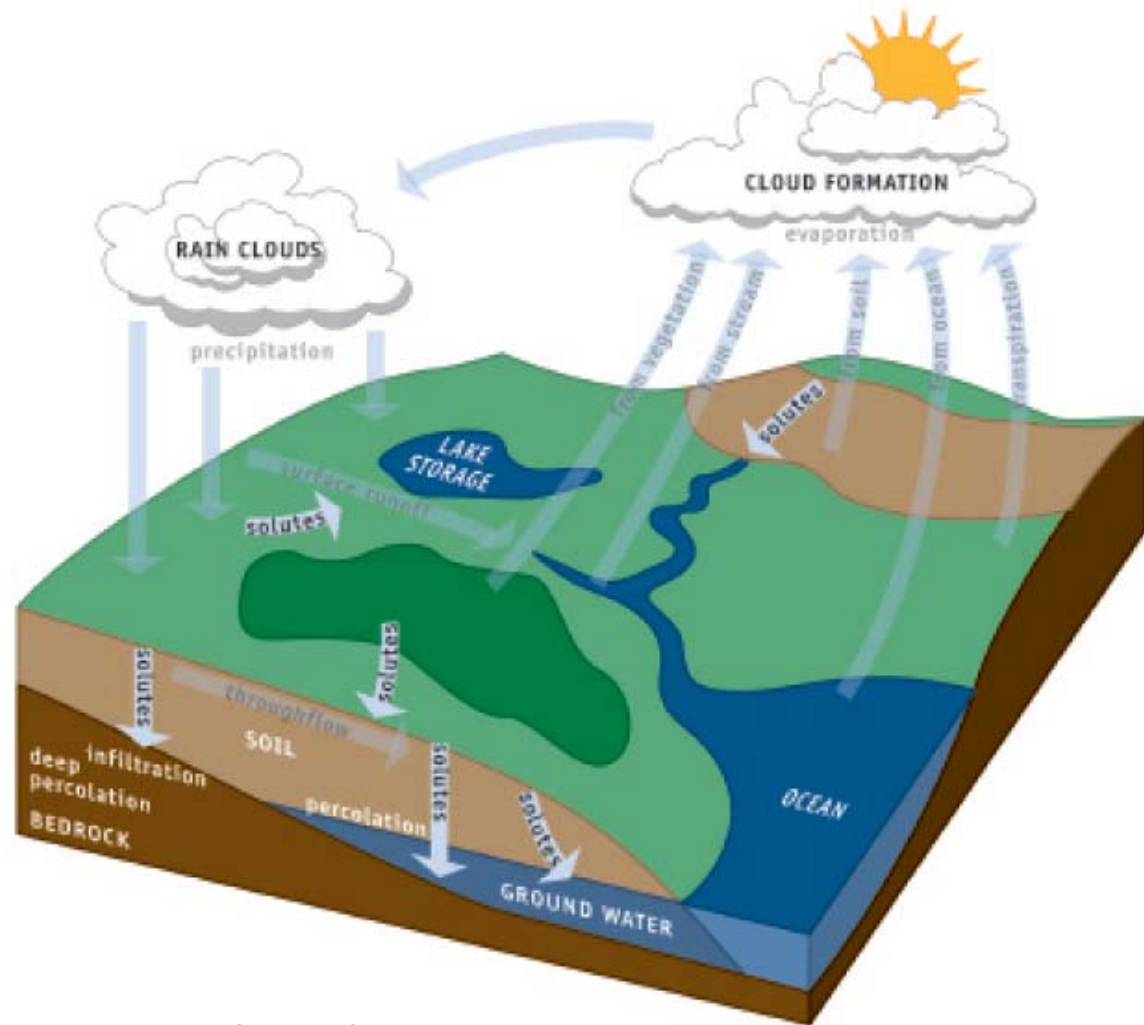


ΔΙΕΡΓΑΣΙΕΣ ΣΤΗΝ ΚΡΙΣΙΜΗ ΖΩΝΗ

Αριάδνη Αργυράκη

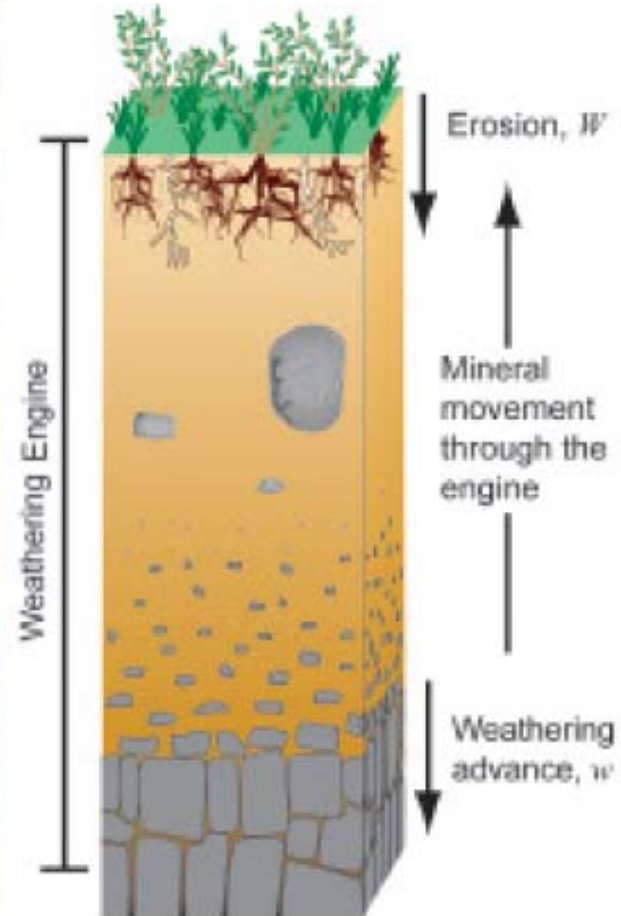
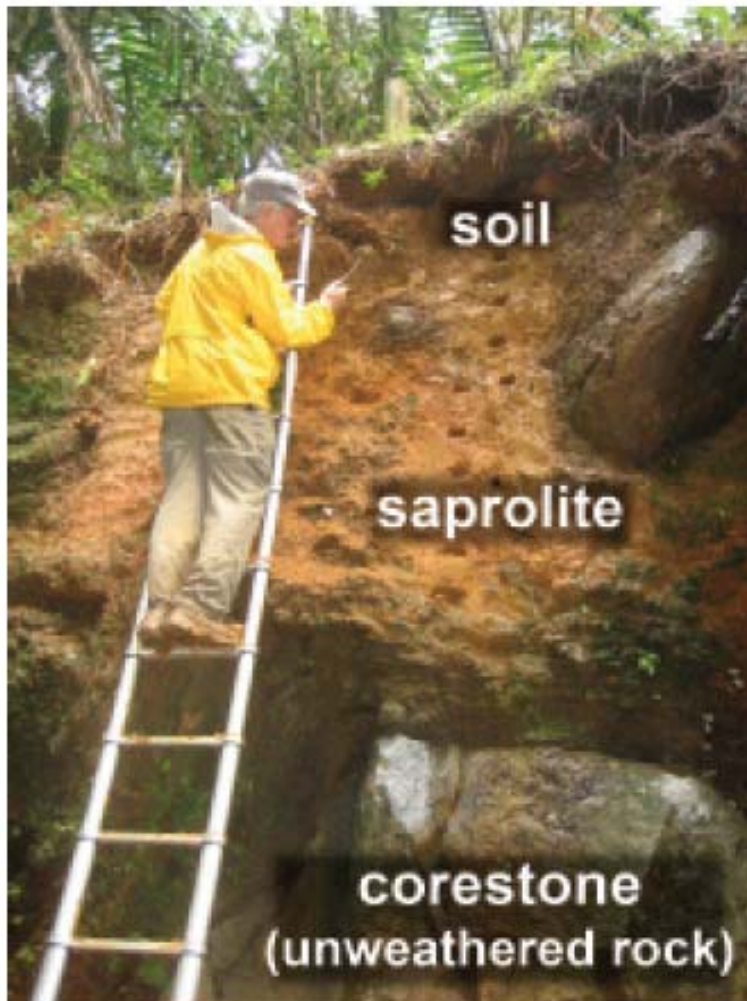
Κρίσιμη Ζώνη (*Critical Zone*) - ορισμός

- Ο όγκος του επιφανειακού στρώματος της λιθόσφαιρας, από την επιφανειακή βλάστηση έως τη βάση του υπόγειου νερού (Brantley et al, 2006).
- Μίγμα αέριας & υγρής φάσης, έμβιου κόσμου, οργανικού υλικού και πετρώματος.
- Άμεση αλληλεπίδραση οργανισμών και ανόργανων γήινων υλικών.



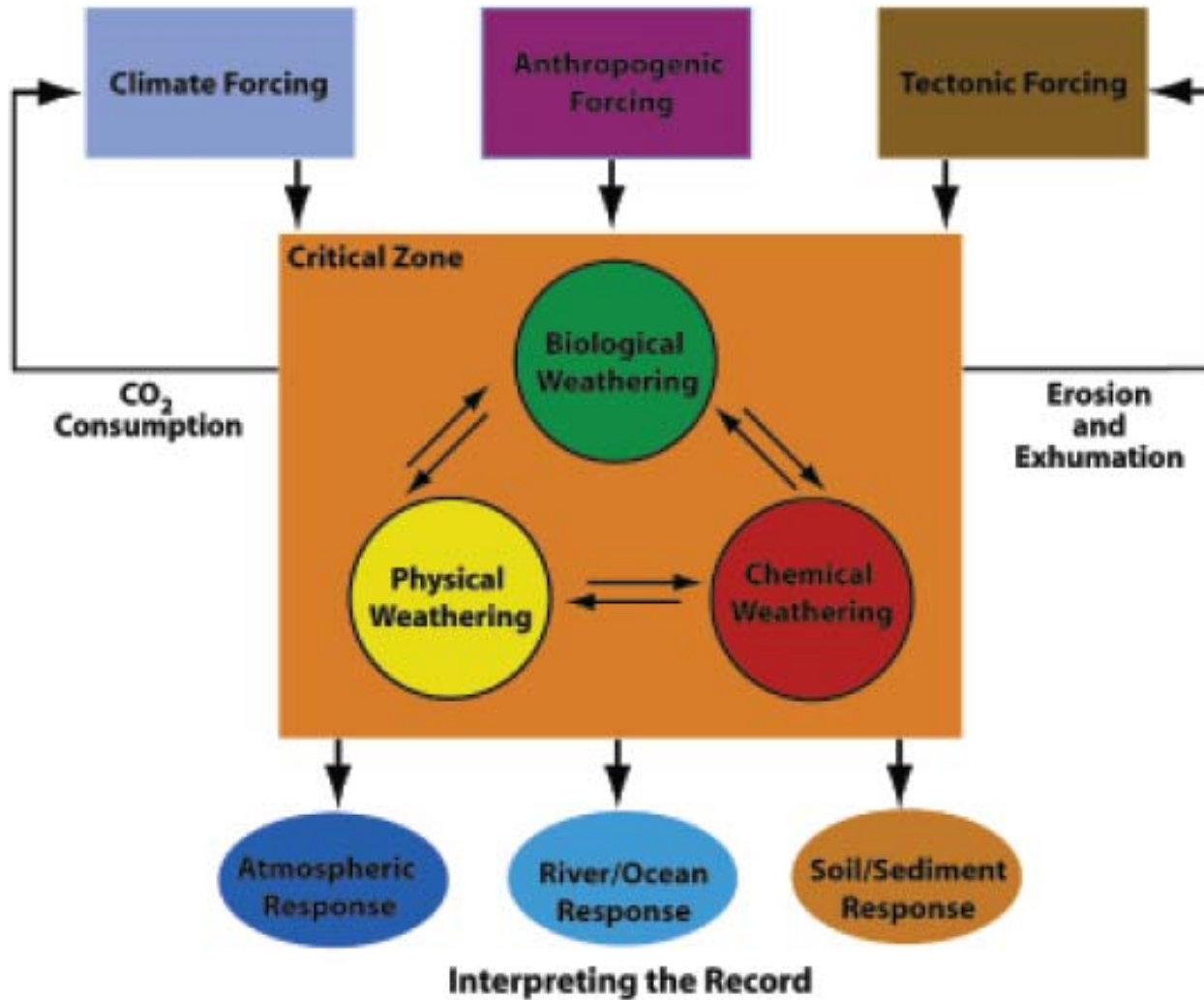
Elements (2007), vol.3, 307-314

‘Αντιδραστήρας’ τροφοδοτούμενος με υλικό του πετρώματος



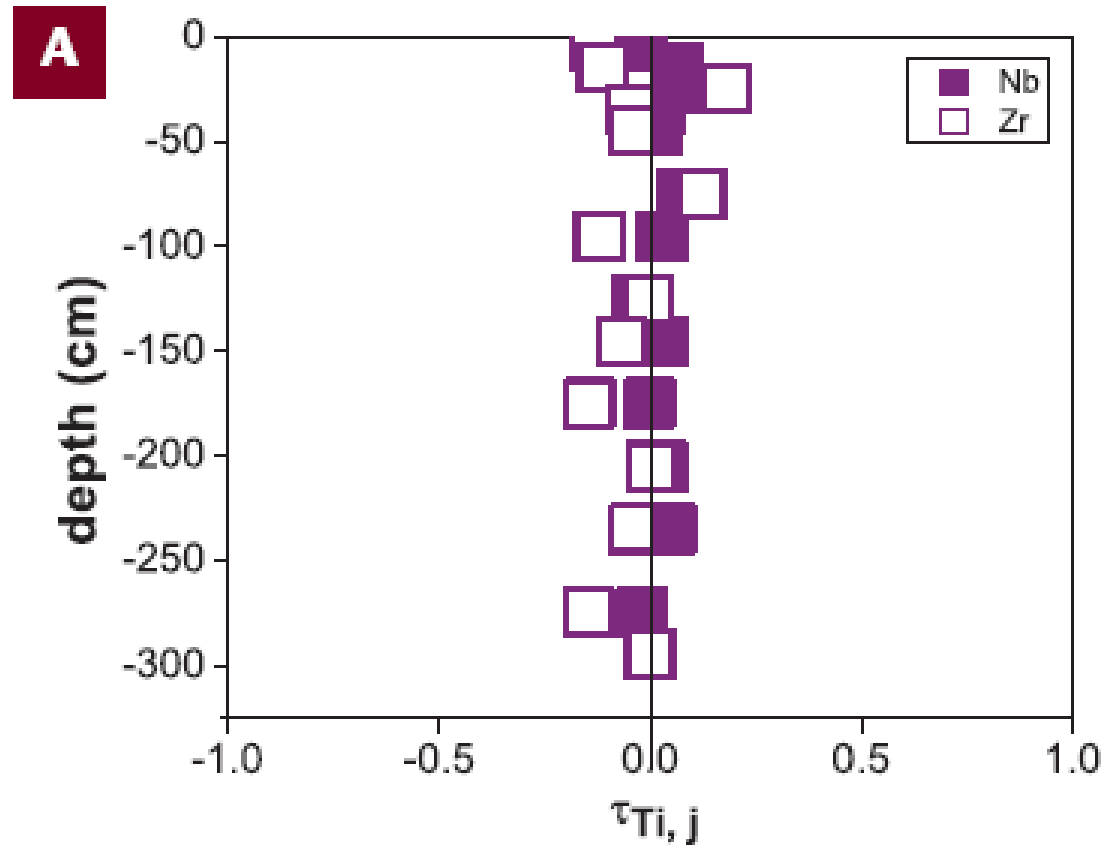
Elements (2007), vol.3, 307-314

Οι παράμετροι του συστήματος

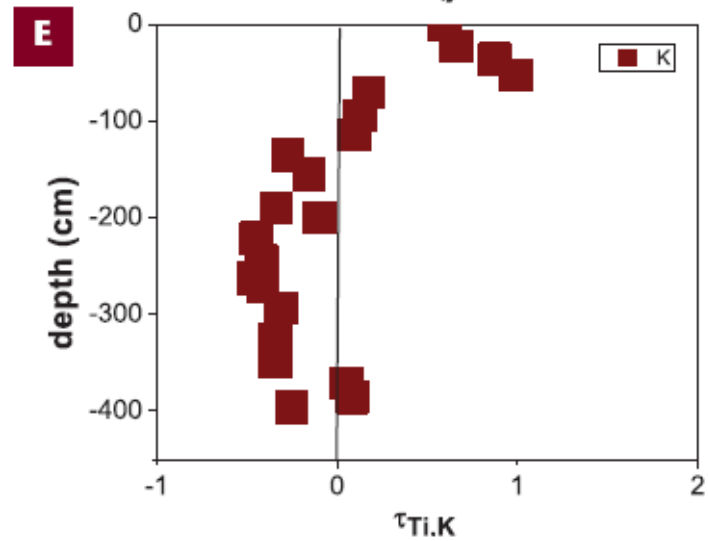
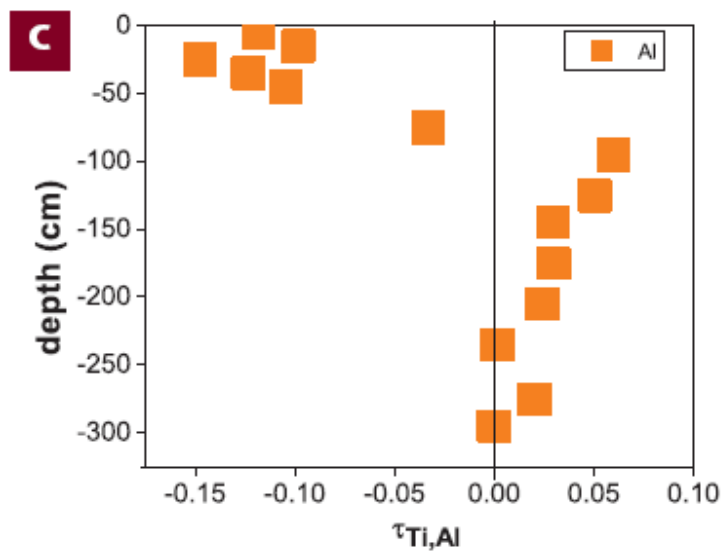
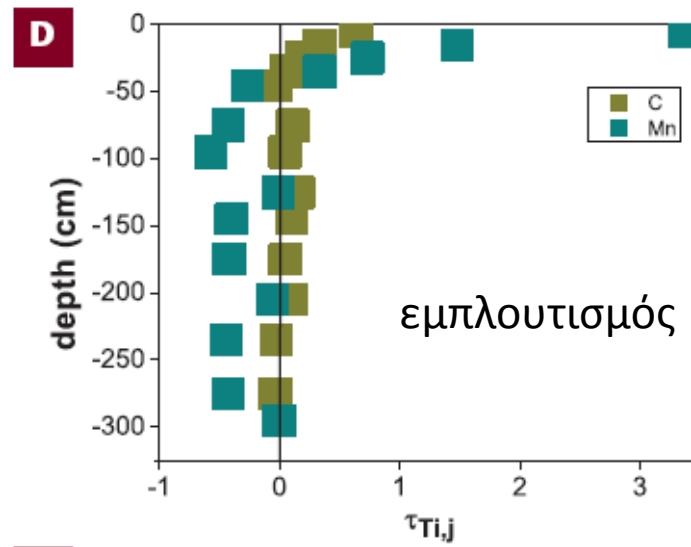
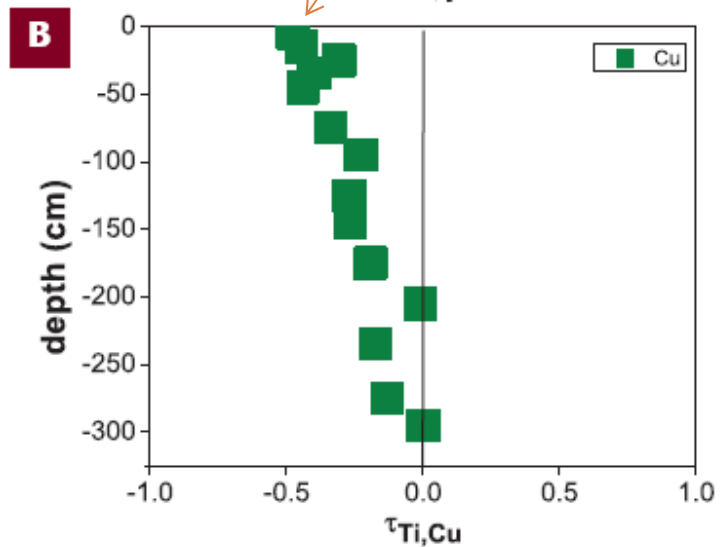


Προφίλ κανονικοποιημένης συγκέντρωσης

$$\tau_{i,j} = \frac{C_{j,w}}{C_{j,p}} \frac{C_{i,p}}{C_{i,w}} - 1$$



απεμπλουτισμός



Ρυθμοί αποσάθρωσης

TABLE 1 ESTIMATED SOIL EROSION RATES

Location	Type of land	Soil erosion rate (mm/100 y)	Reference
Global	World average	7*	Troeh and Thompson (1993)
	Agricultural	60	Wilkinson and McElroy (2007)
Europe	Continent	80 [§]	Yang et al. (2003)
North America	Continent	56 [§]	Yang et al. (2003)
South America	Continent	51 [§]	Yang et al. (2003)
Africa	Continent	29 [§]	Yang et al. (2003)
Australia	Continent	19 [§]	Yang et al. (2003)
Asia	Continent	81 [§]	Yang et al. (2003)

TABLE 2**EXAMPLES OF ESTIMATED REGOLITH FORMATION RATES**

Rock type	Location	Rate (mm/100 y)	Method	Reference
Quartz diorite	Puerto Rico	5.8	Mass balance	White et al. (1998)
Basalt	Costa Rica	2.9	Mass balance	Sak et al. (2004)
Greywacke/ sandstone/ chert/ greenstone	San Gabriel Mountains, California, USA	1.5–10.7	^{10}Be , ^{26}Al , and curvature observations	Heimsath et al. (1997)
Granulite/ amphibolite	Sri Lanka	0.2–0.7**	^{10}Be	von Blanckenburg et al. (2004)
Schist	Coweeta, North Carolina, USA	3.8	Mass balance	Velbel (1986)
World average	Global	7*		Troeh and Thompson (1993)

Κλίμακα παρατήρησης



FIGURE 1 Solid-fluid interface character varies over all scales. For a given lithology, climate, and landscape position, interface composition depends on biogeochemical conditions at the pore scale. Within a typical soil aggregate (center, right), reactive surfaces include (A) natural organic matter, (B) nanoporous silicate minerals, (C) mineral-microbe complexes, (D) secondary aluminosilicate clays and their surface organic coatings, and (E) oxide and/or carbonate coatings.

Επιφάνειες αλληλεπίδρασης ρευστής-στερεάς φάσης σε μικροκλίμακα

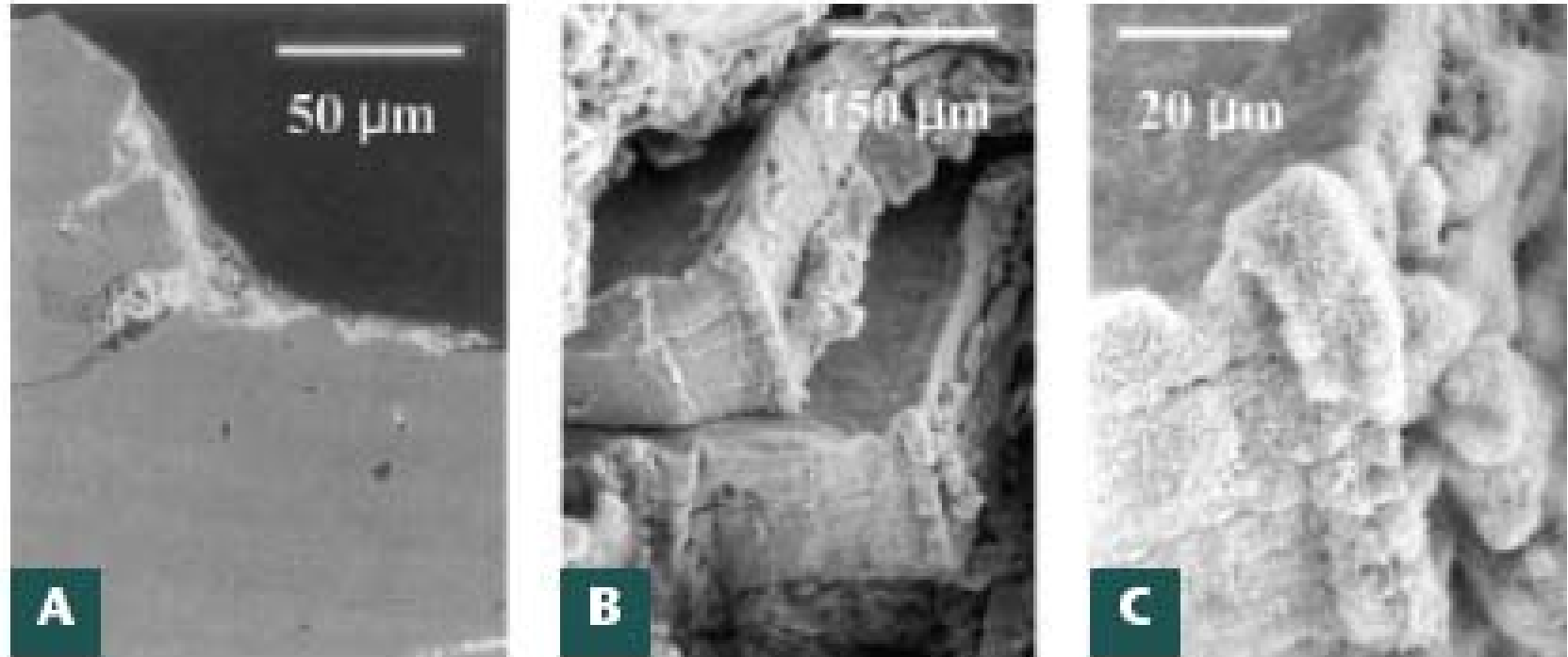
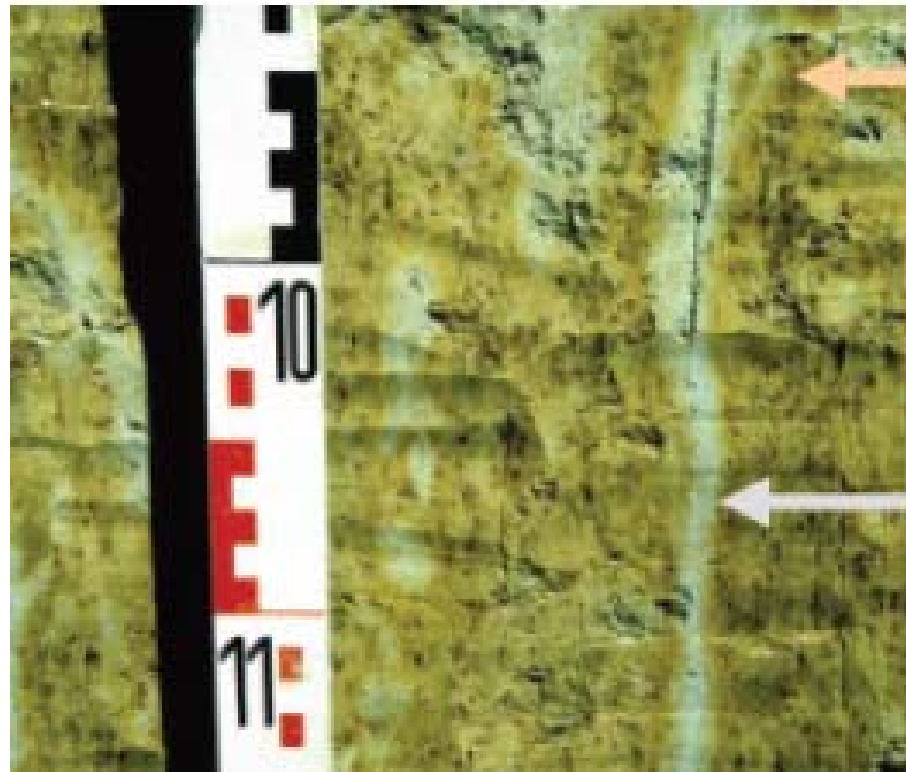
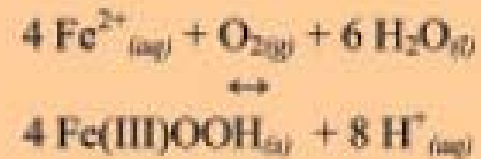


FIGURE 3 Incongruent dissolution and accretion on interfaces. (A) Backscatter electron image of surface coatings of poly-crystalline Fe and Al oxyhydroxide on quartz from Cape Cod aquifer sand (Coston et al. 1995); (B) weathering of primary biotite grains and formation of secondary halloysite in a granitic gneiss saprolite and (C) close-up of (B) showing tubular halloysite on edge surfaces of the weathering biotite (Kretzschmar et al. 1997).

Διεργασίες οξειδοαναγωγής- ο βιολογικός παράγοντας

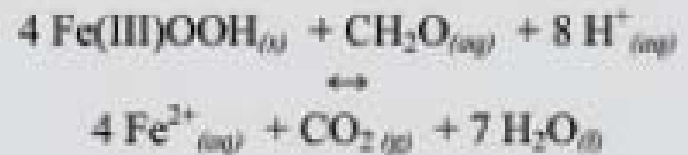


Iron Oxidation Zone



(e.g., *Gallionella*, *Leptothrix*)

Iron Reduction Zone



(e.g., *Aeromonas*, *Bacillus*, *Geobacter*, *Clostridium*)