

Lo straordinario valore scientifico dei gessi



Regione Emilia-Romagna



SITO ISCRITTO NELLA
LISTA DEL PATRIMONIO
MONDIALE NATURALE

**CARSISMO E
GROTTE NELLE
EVAPORITI
DELL'APPENNINO
SETTENTRIONALE**



Stefano Lugli



UNIMORE
UNIVERSITÀ DEGLI STUDI DI
MODENA E REGGIO EMILIA

Gesso



Trapani – salina



Strati annuali



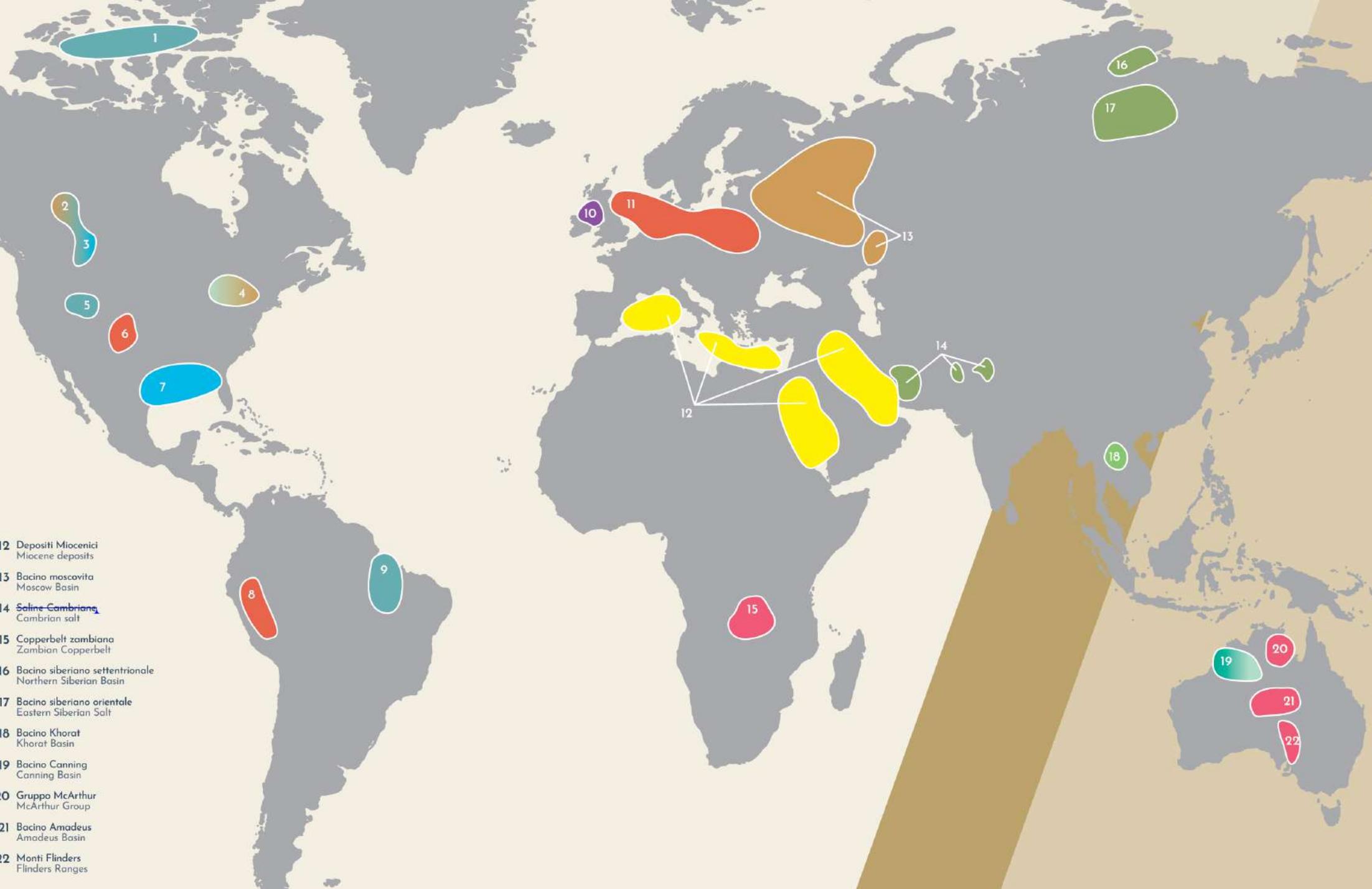
Batteri colorati



Orologio geologico

Storia della vita

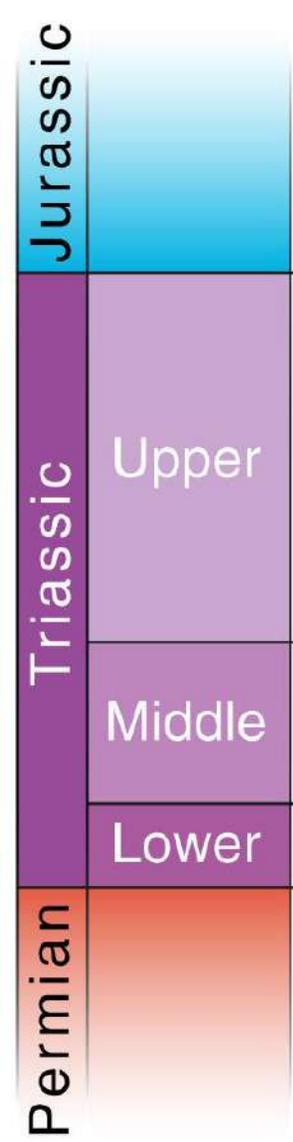
Evaporiti antiche



- 12 Depositi Miocenici
Miocene deposits
- 13 Bacino moscovita
Moscow Basin
- 14 Saline Cambriane
Cambrian salt
- 15 Copperbelt zambiano
Zambian Copperbelt
- 16 Bacino siberiano settentrionale
Northern Siberian Basin
- 17 Bacino siberiano orientale
Eastern Siberian Salt
- 18 Bacino Khorat
Khorat Basin
- 19 Bacino Canning
Canning Basin
- 20 Gruppo McArthur
McArthur Group
- 21 Bacino Amadeus
Amadeus Basin
- 22 Monti Flinders
Flinders Ranges

...esempi straordinari di importanti fasi della storia della Terra

Triassic gypsum



201.3±0.2

Temperate

Upper

Panthalassa Ocean

~237

Arid

Middle

Pangaea

Tethys Ocean

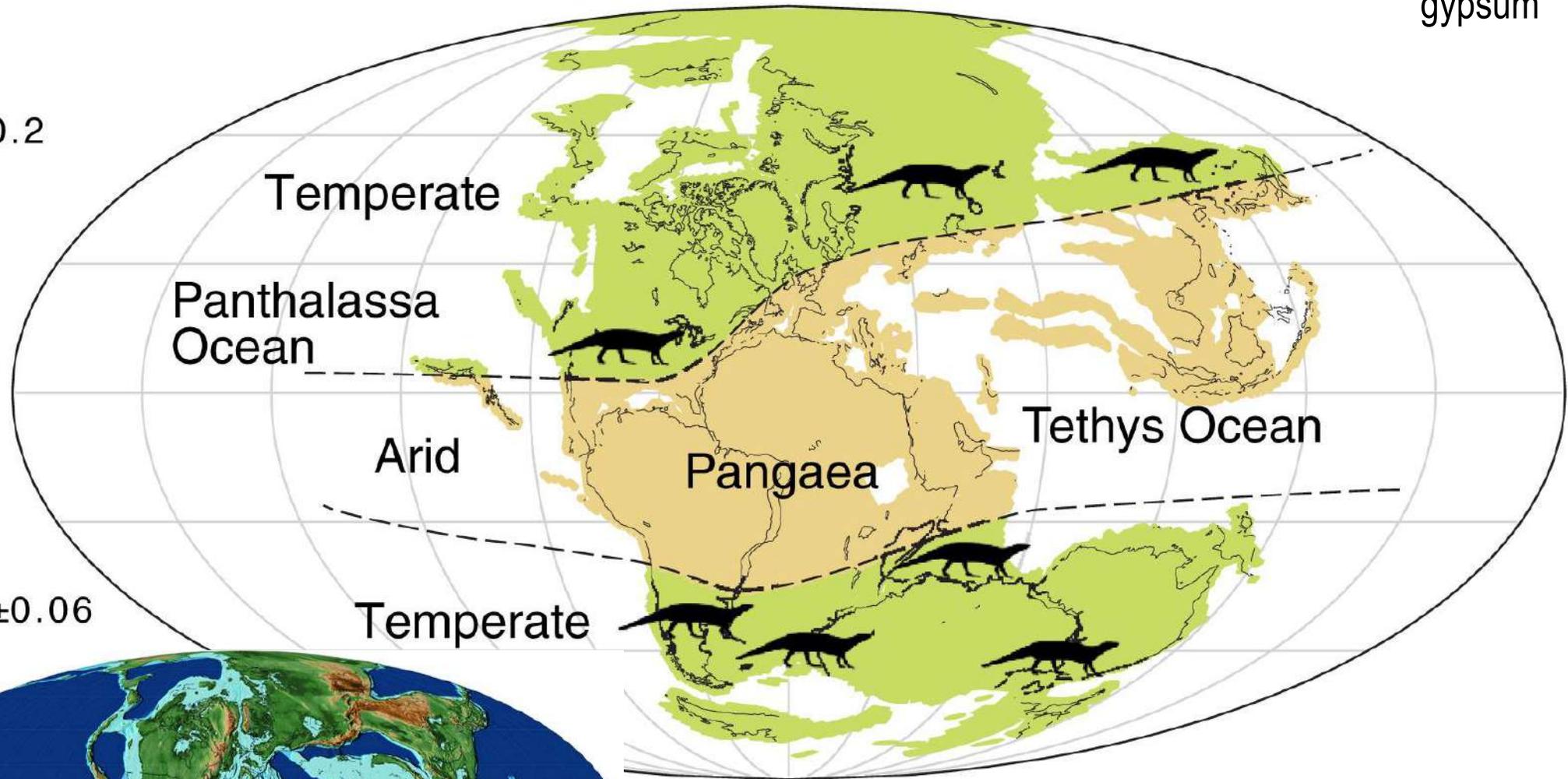
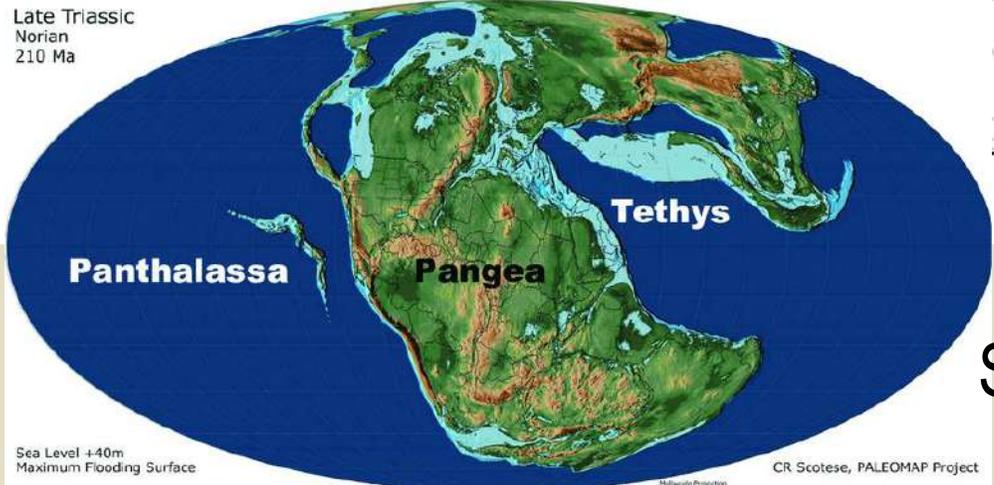
247.2

Temperate

Lower

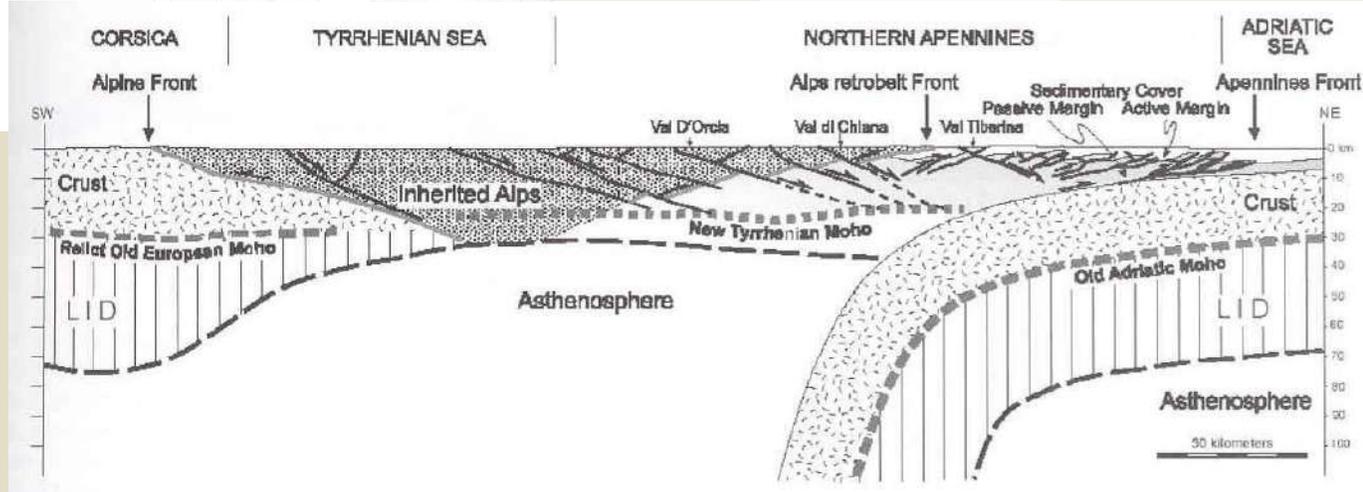
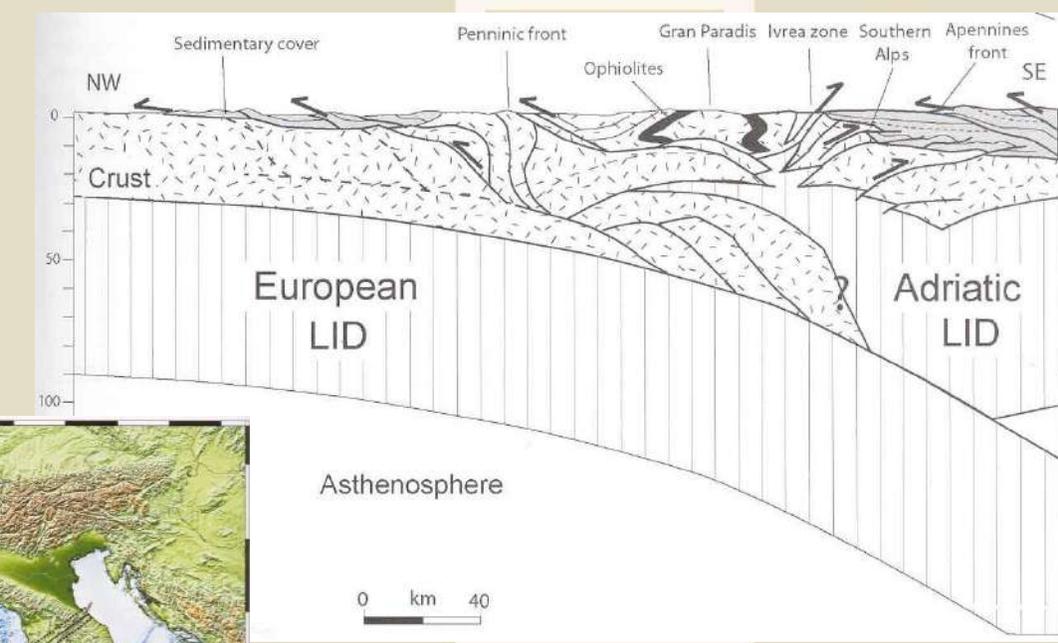
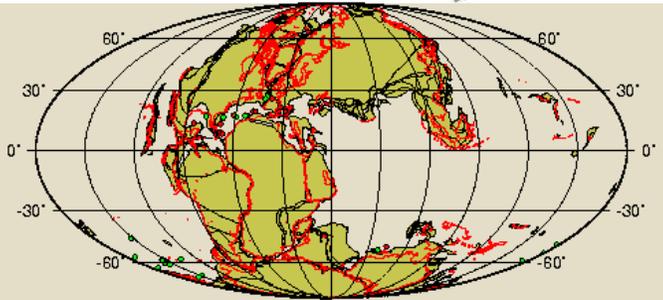
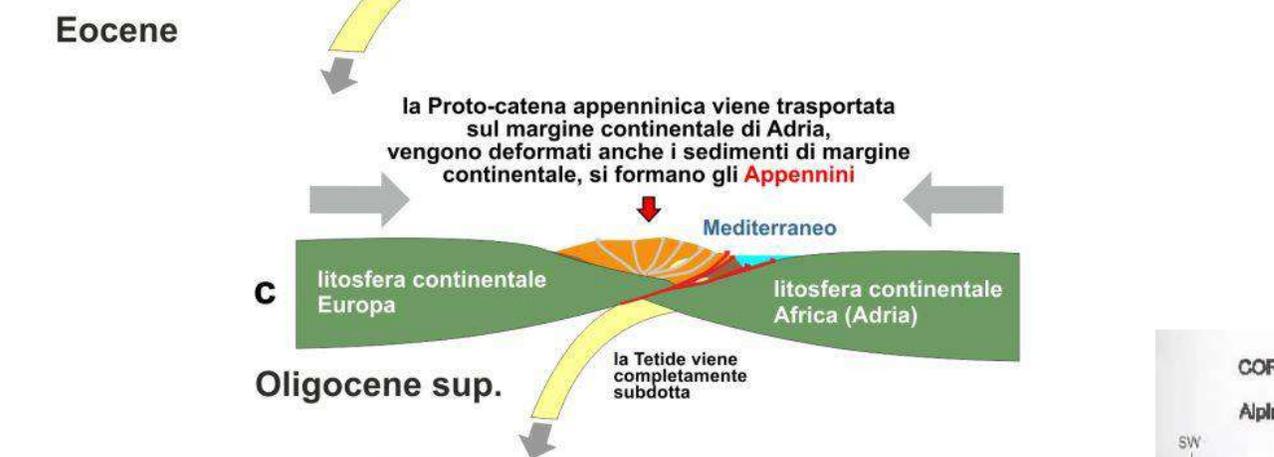
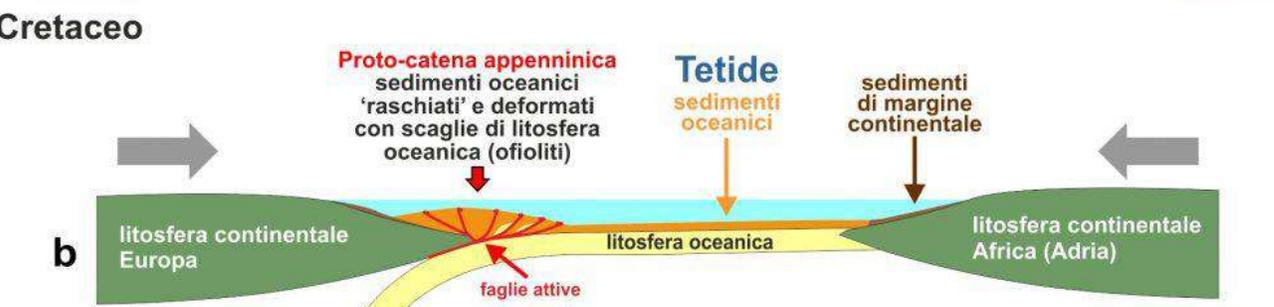
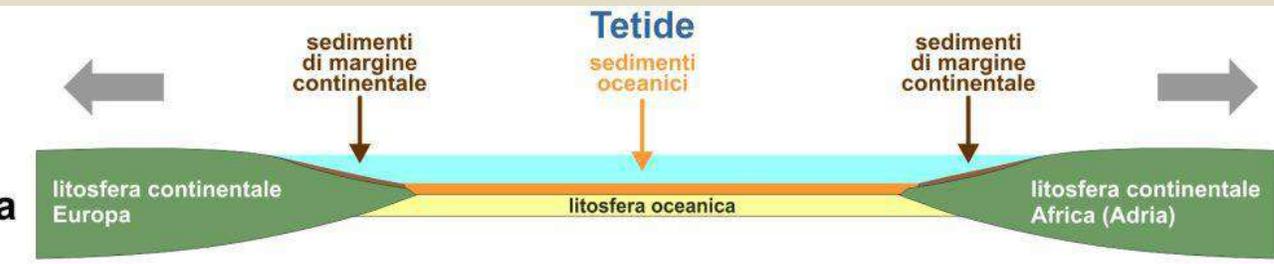
252.17±0.06

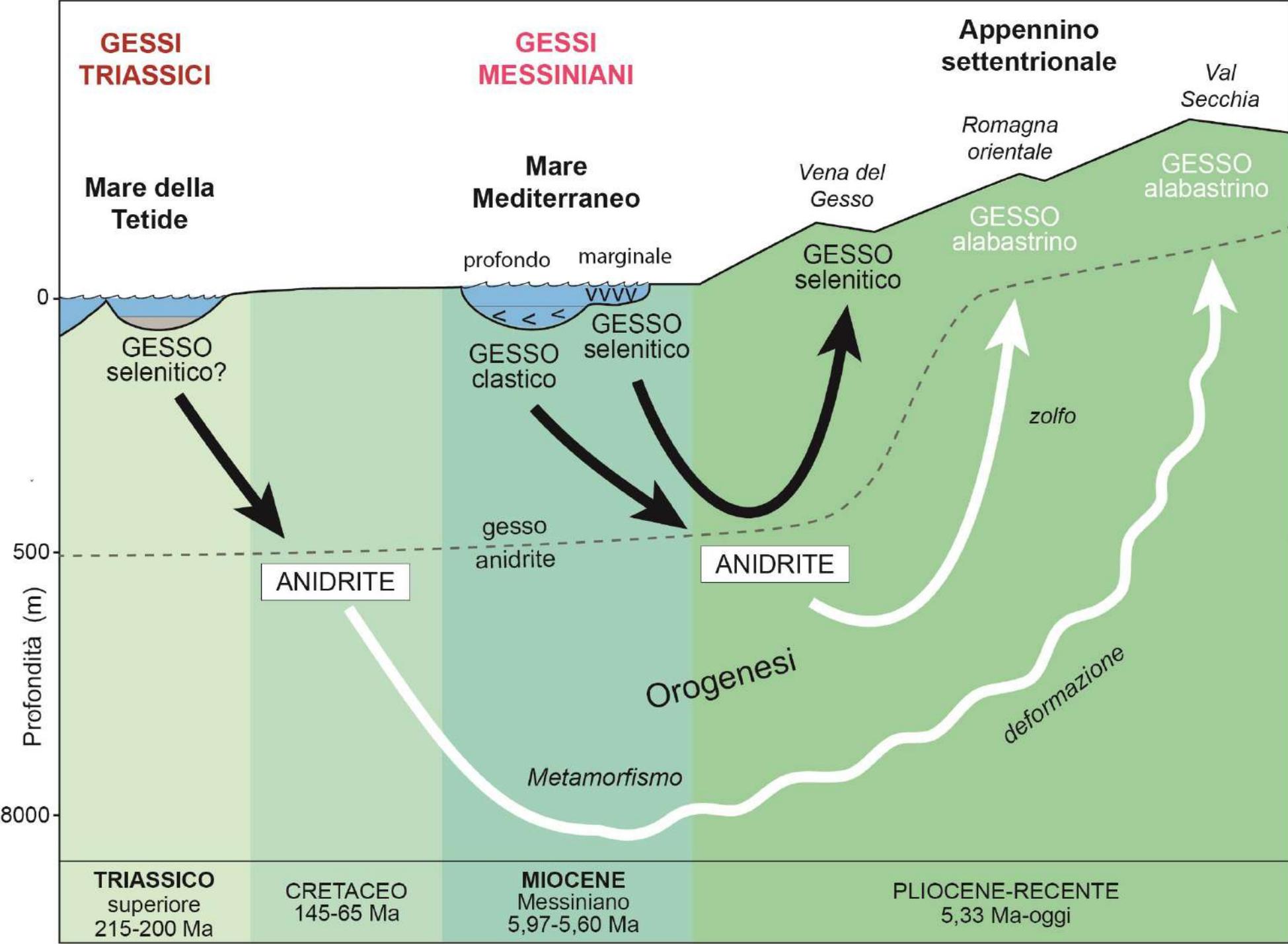
Late Triassic
Norian
210 Ma



Current Biology

Smembramento del super-continente Pangea





Gesso
 $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$

Anidrite
 CaSO_4

Gesso
triassico

gesso
 $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$

anidrite
 CaSO_4



processi geologici attivi....

Deformazione tettonica

idratazione dell'anidrite
a formare gesso

Aumento di volume

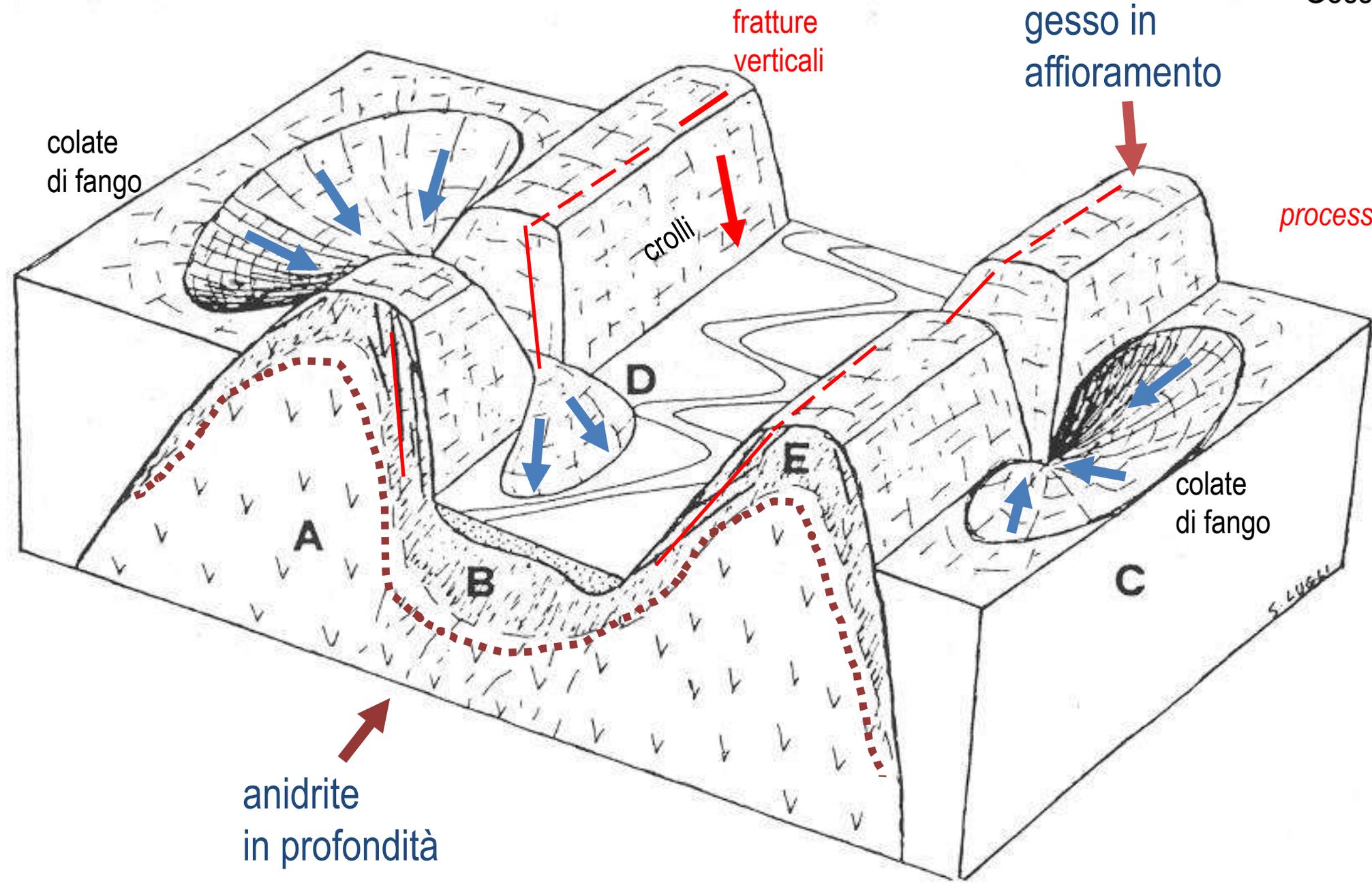
processi geologici attivi...

Triassic
gypsum

Paesaggio evaporitico spettacolare

Foto P. Lucci





processi geologici attivi....



10/12/2023



10/3/2023

Foto P. Lucci

processi geologici attivi....

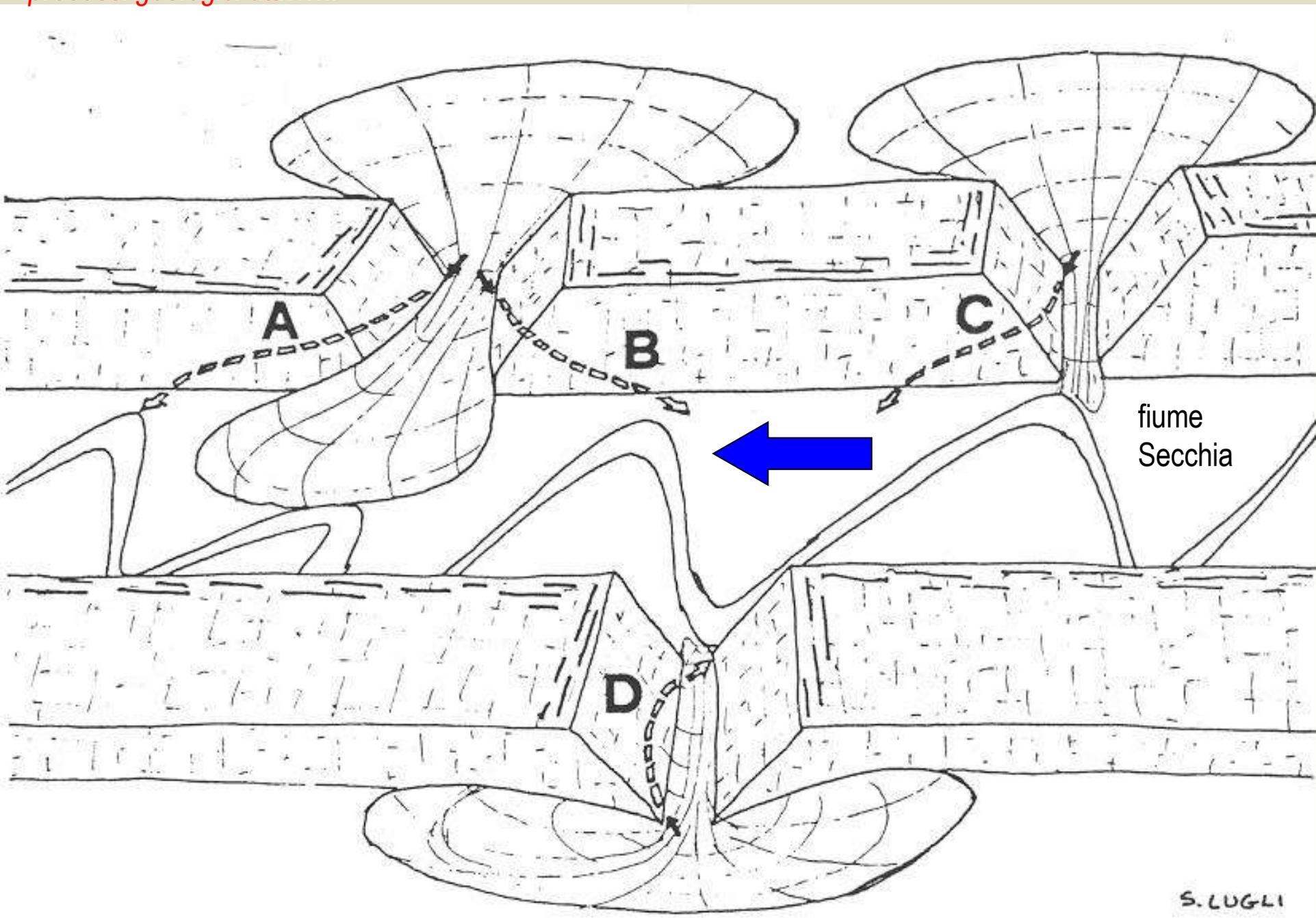


10/12/2023



10/3/2023

Foto P. Lucci



Anse ipogee

circolazione carsica
unica al mondo

S. LUGLI

processi geologici attivi....

Tanone Grande della Gacciolina
sala M. Bertolani (Birillo)

Gesso
triassico

**Rapida evoluzione
per crollo**

non eguagliata
in altre parti del
mondo



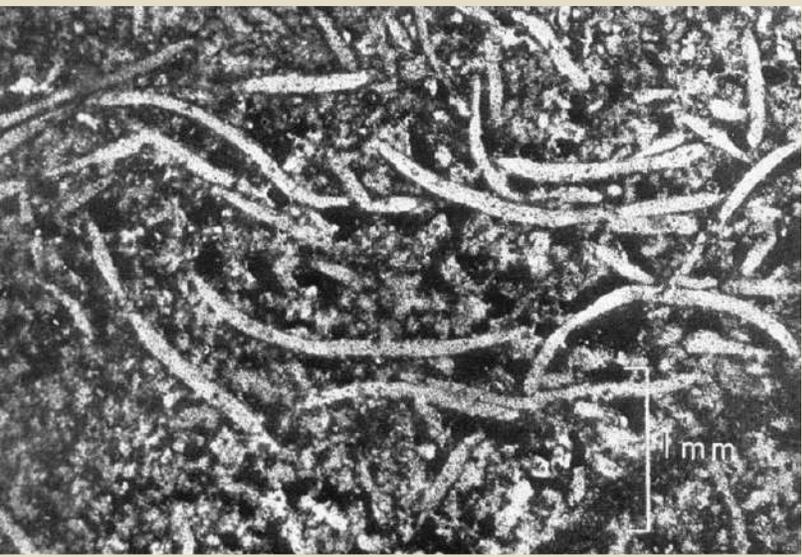
100 m lunghezza, 28 m di larghezza, 18 m altezza

...esempi straordinari di importanti fasi della storia della Terra



Gesso
messiniano

...compresa la storia della vita



Geobiology

Geobiology (2010)

DOI: 10.1111/j.1472-4669.2009.00230.x

Ribosomal RNA gene fragments from fossilized cyanobacteria identified in primary gypsum from the late Miocene, Italy

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¹Dipartimento di Scienze della Terra e Geologico-Ambientali, Università degli Studi di Bologna, Bologna, Italy

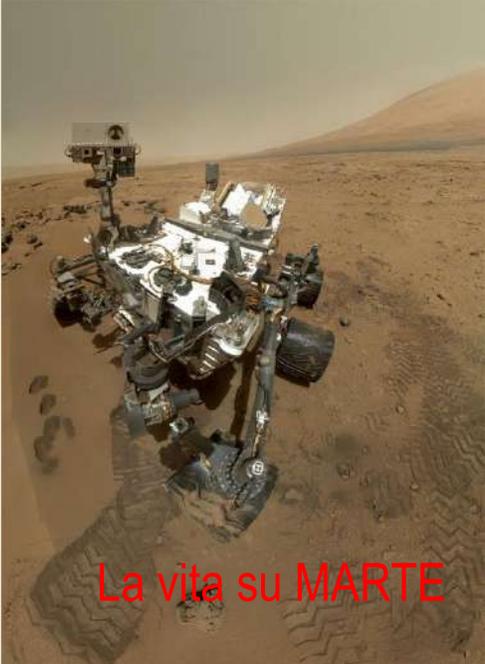
²ISMAR (CNR), Bologna, Italy

³Dipartimento di Scienze della Terra, Università degli Studi di Modena e Reggio Emilia, Modena, Italy

⁴Dipartimento di Scienze della Terra, Università degli Studi di Parma, Parma, Italy

⁵Department of Earth and Space Sciences, University of Washington, Seattle, WA, USA

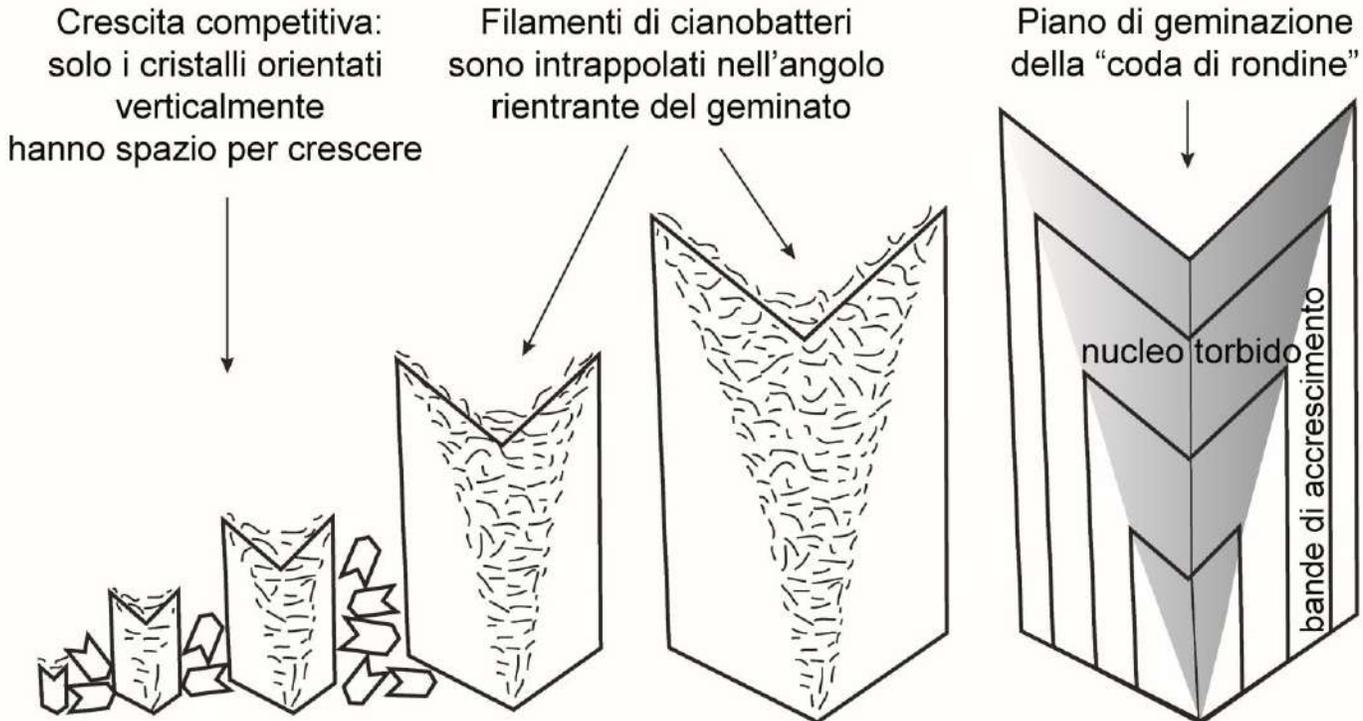
⁶Geomicrobiology Department, ICBM, C/O University of Oldenburg, Oldenburg, Germany



I cristalli di gesso

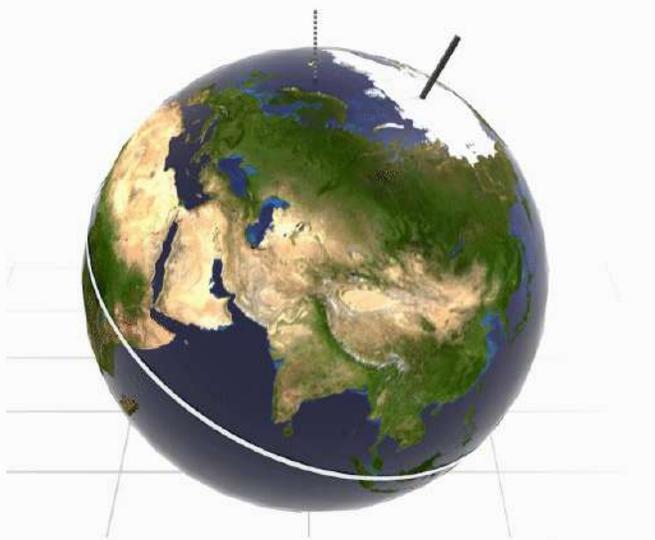
Gesso messiniano

- coda di rondine
- ferro di lancia



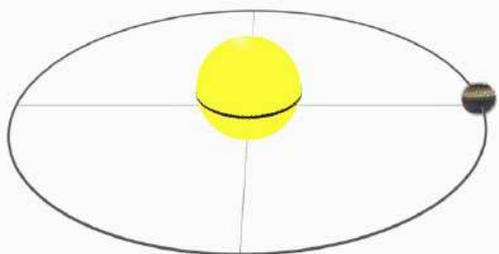
Cambiamenti climatici

Axial Precession (Wobble)
26,000-year cycles



climate.nasa.gov

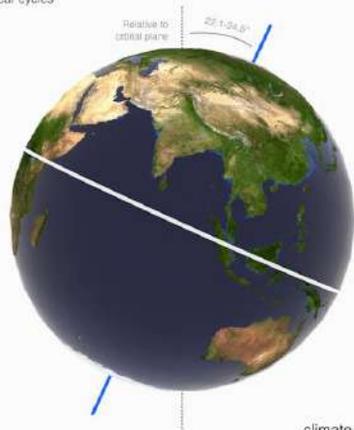
Changes in Eccentricity (Orbit Shape)
100,000-year cycles



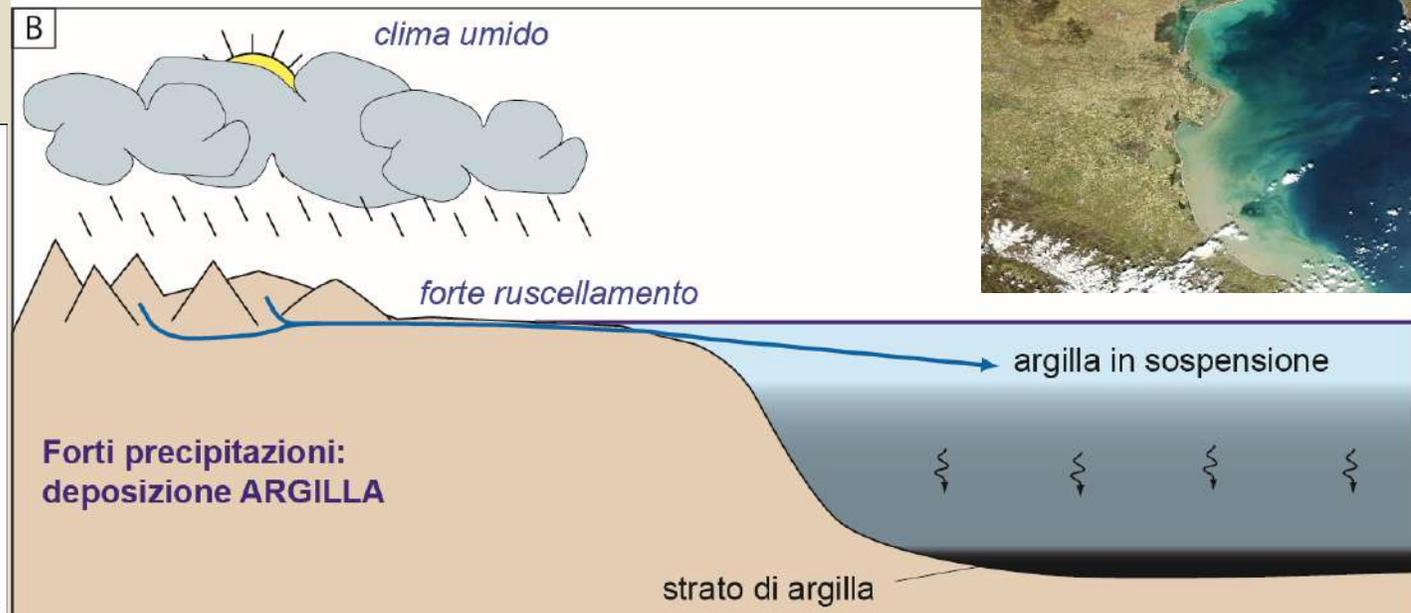
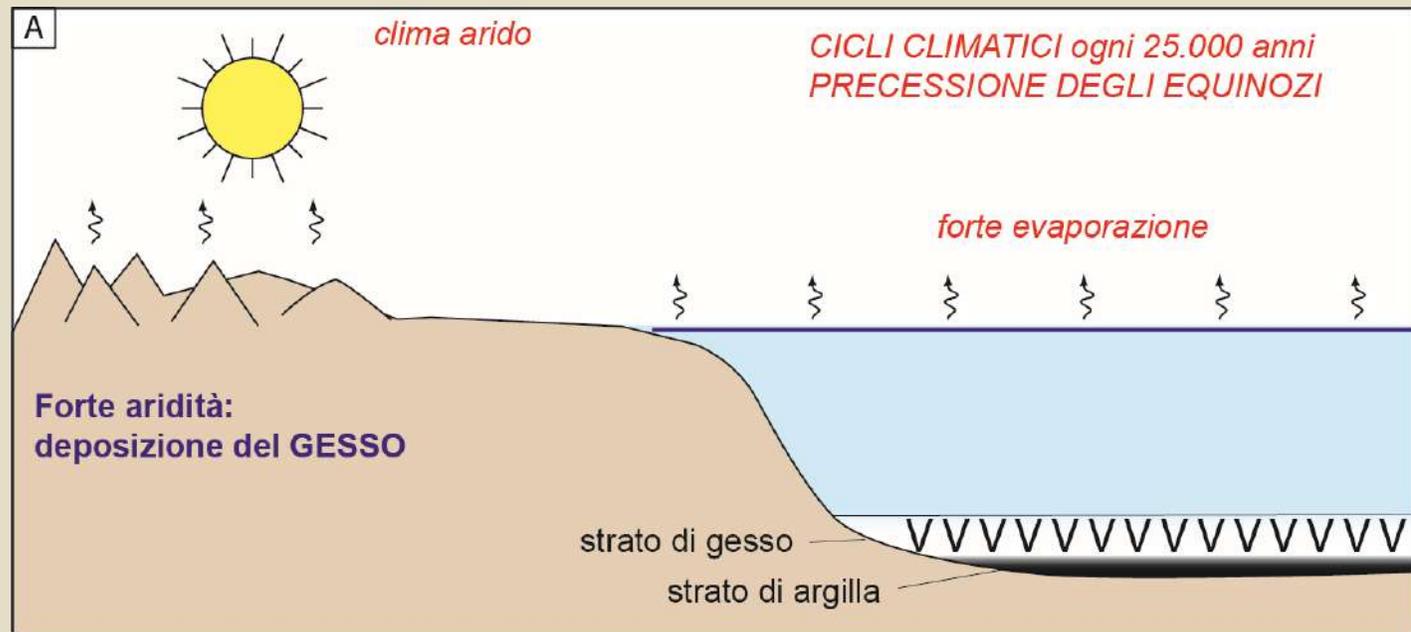
*Changes in eccentricity exaggerated so the effect can be seen. Earth's orbit shape varies between 0.0034 (almost a perfect circle) to 0.058 (slightly elliptical).

climate.nasa.gov

Changes in Obliquity (Tilt)
41,000-year cycles



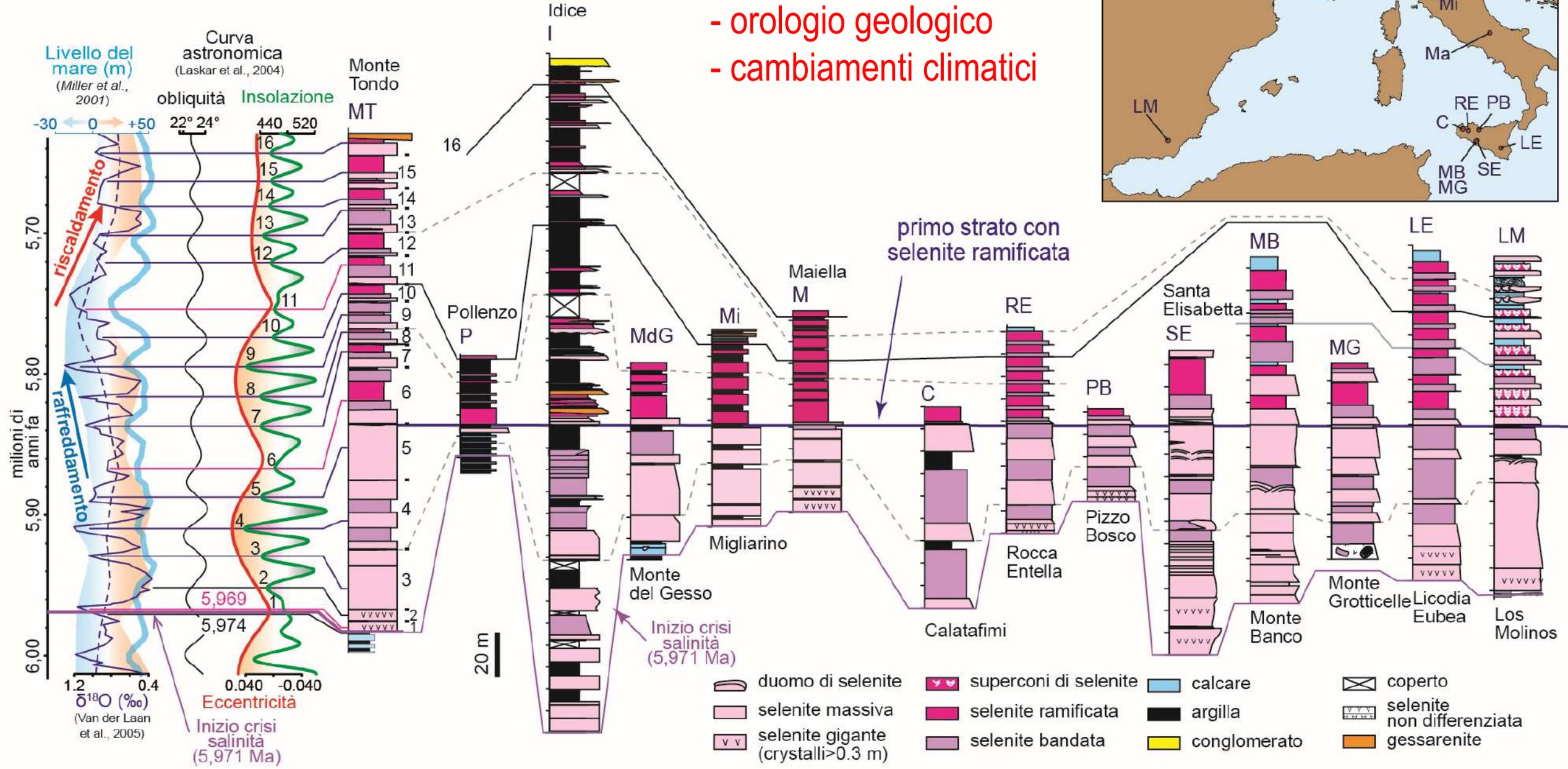
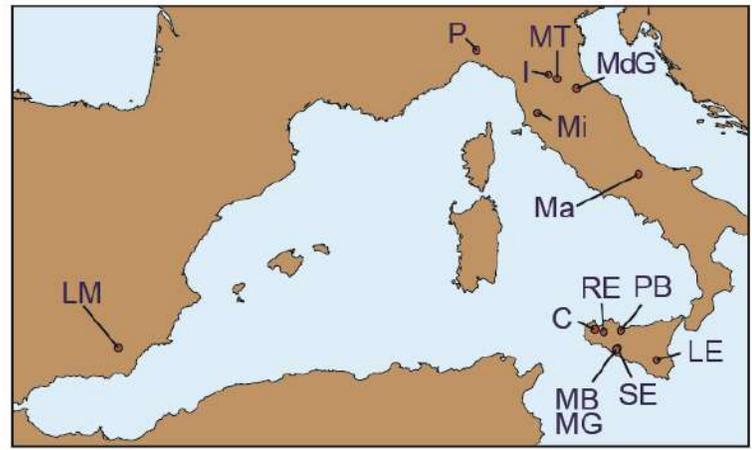
climate.nasa.gov



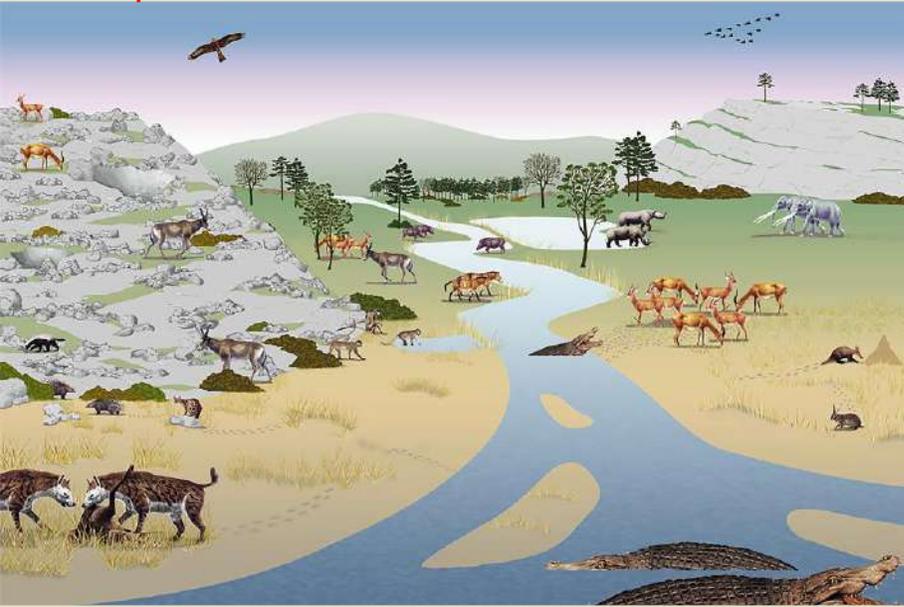
...esempi straordinari di importanti fasi della storia della Terra

Astrocronologia

- orologio geologico
- cambiamenti climatici



...compresa la storia della vita



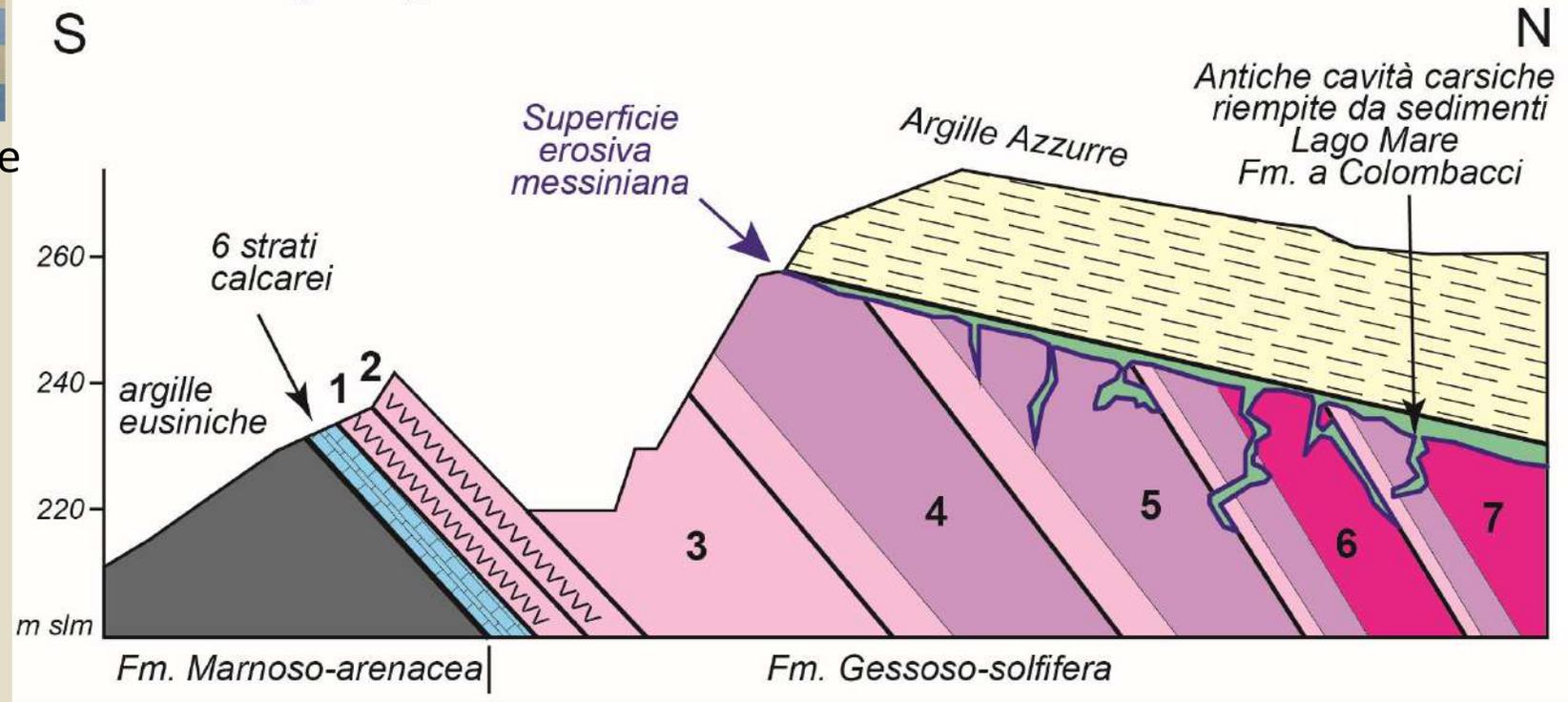
fauna continentale di riferimento mondiale



Plioviverrops faventinus
(P. Lucci)



Parco Museo geologico cava Monticino

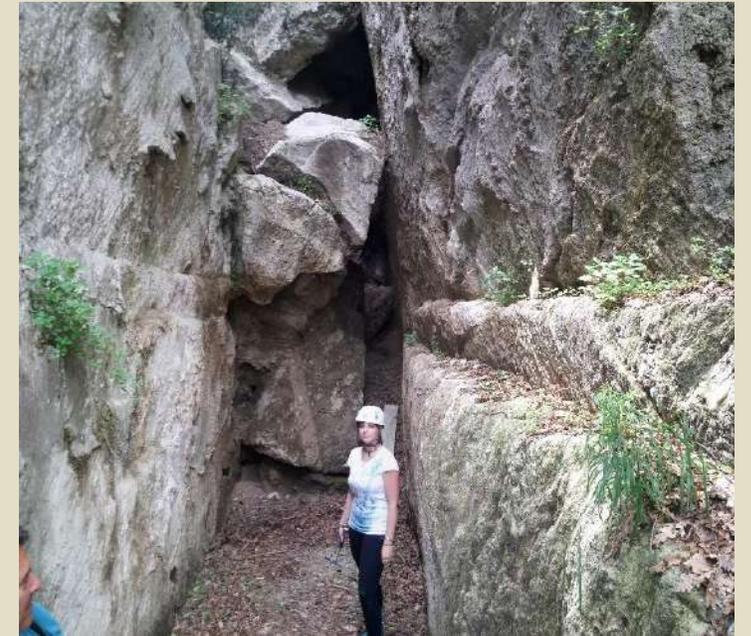


Gessi primari inferiori (Lugli et al., 2010)	argilla	calcare	selenite gigante	selenite massiva	selenite bandata	selenite ramificata
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Gesso messiniano

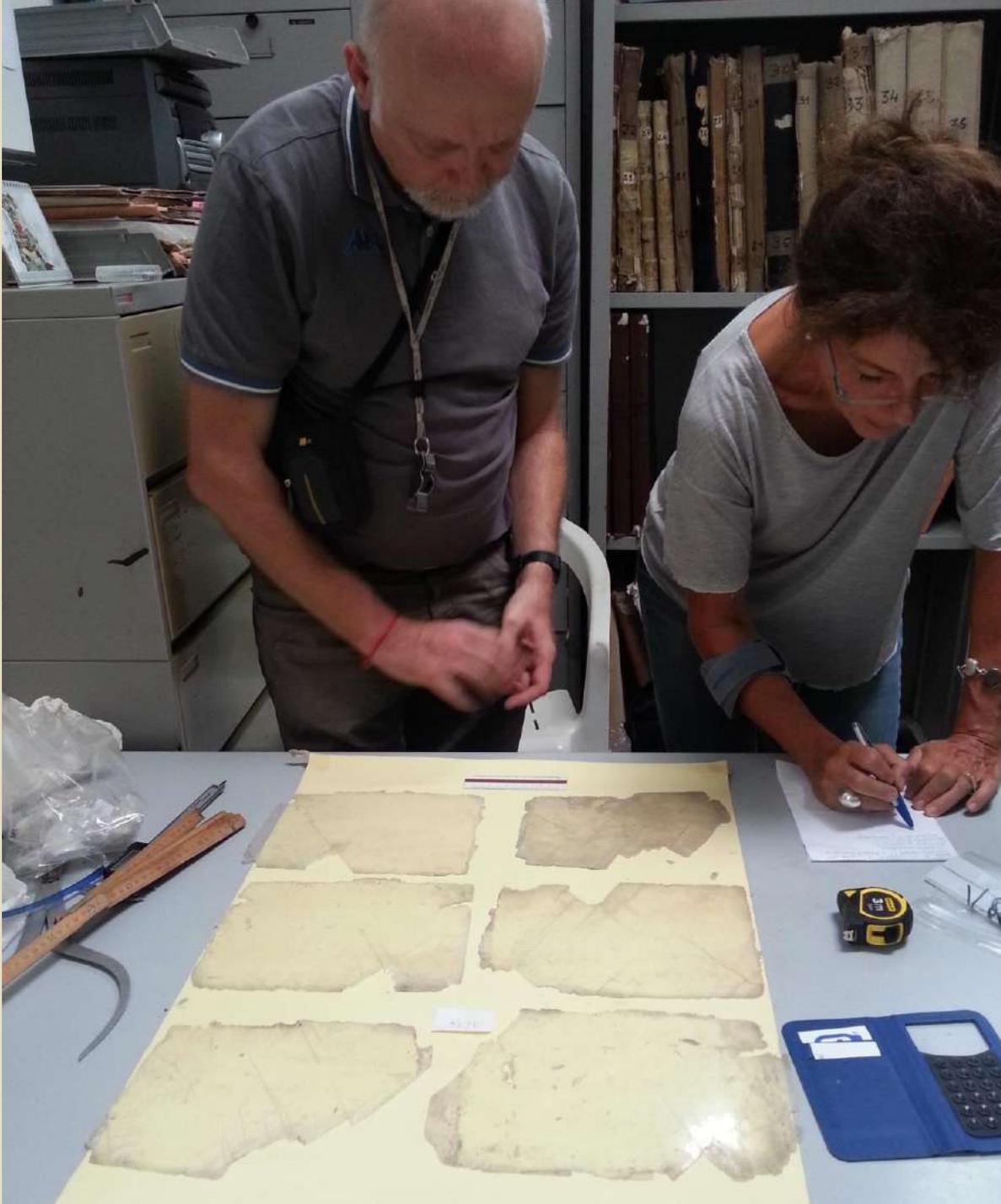
Lapis specularis

Antiche cave Romane



*Lapis
specularis*

Gesso
messiniano



27 x 17,5 x 0,17 cm

Pompei

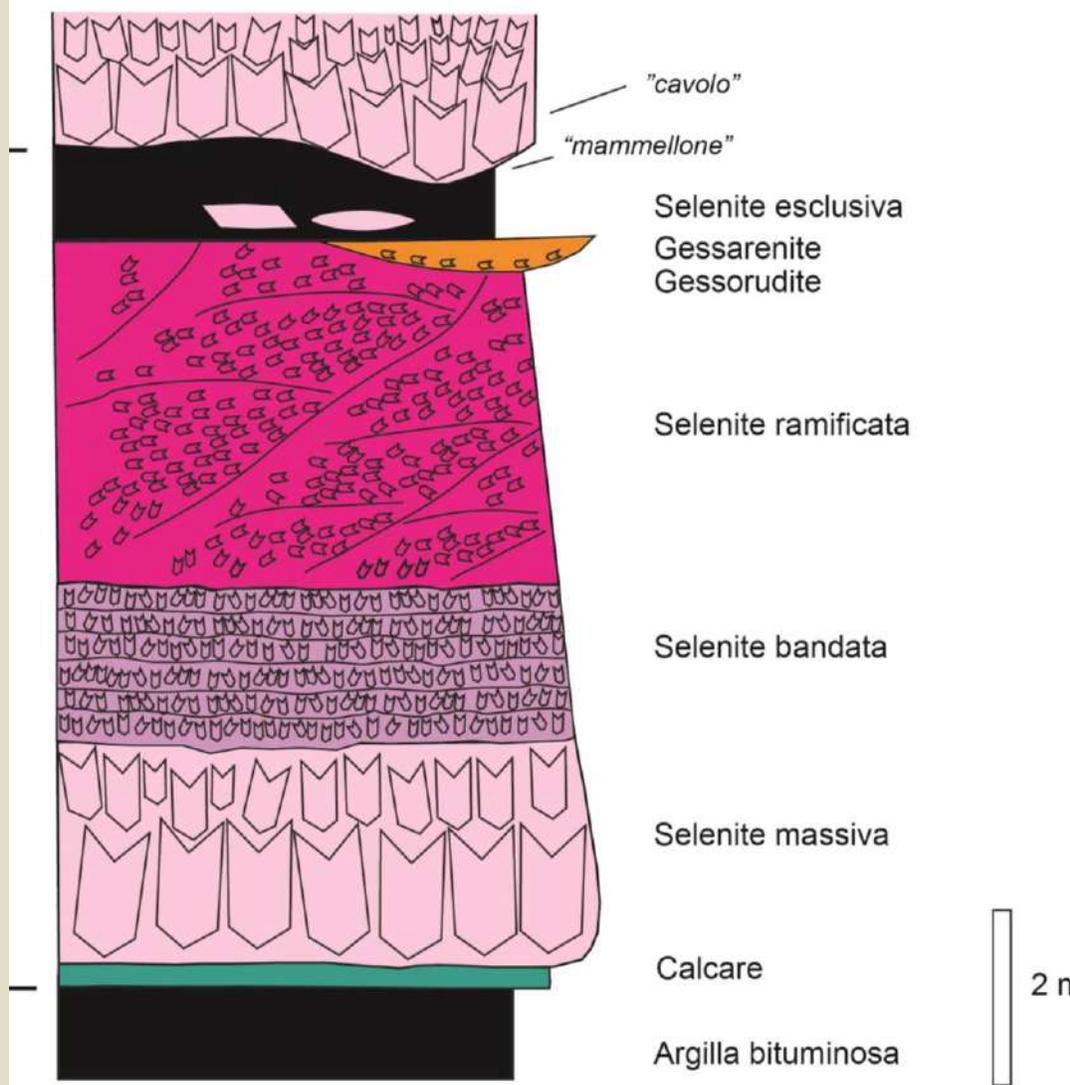
*Domus Paquius
Proculus*



paesaggio sotterraneo con miliardi di cristalli luccicanti

Architettura degli strati: cambiamenti climatici

Le grotte espongono in modo spettacolare le caratteristiche geologiche



Straordinario paesaggio
sotterraneo con miliardi
di cristalli luccicanti
Quasi come una **notte
stellata**

Rio Basino



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