Università degli Studi di Ferrara

Dipartimento di Studi Umanistici

Ecologia Preistorica

Prof. Marco Peresani

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Lezione 17 – L'Olocene

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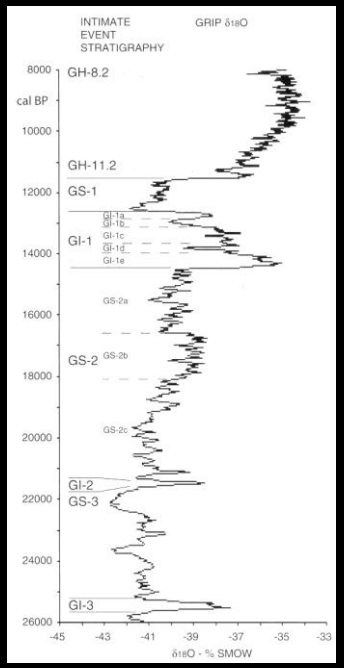
Formal definition and dating of the GSSP (Global Stratotype Section and Point) for the base of the Holocene using the Greenland NGRIP ice core, and selected auxiliary records

MIKE WALKER,[1*] SIGFUS JOHNSEN,[2] SUNE OLANDER RASMUSSEN,[2] TREVOR POPP,[2,3] JØRGEN-PEDER STEFFENSEN,[2] PHIL GIBBARD,[4] WIM HOEK,[5] JOHN LOWE,[6] JOHN ANDREWS,[7] SVANTE BJÖRCK,[8] LES C. CWYNAR,[9] KONRAD HUGHEN,[10] PETER KERSHAW,[11] BERND KROMER,[12] THOMAS LITT,[13] DAVID J. LOWE,[14] TAKESHI NAKAGAWA,[15] REWI NEWNHAM[16] and JAKOB SCHWANDER[17]



The Greenland ice core from NorthGRIP (NGRIP) contains a proxy climate record across the Pleistocene–Holocene boundary of unprecedented clarity and resolution. Analysis of an array of physical and chemical parameters within the ice enables the base of the Holocene, as reflected in the first signs of climatic warming at the end of the Younger Dryas/Greenland Stadial 1 cold phase, to be located with a high degree of precision.

JOURNAL OF QUATERNARY SCIENCE (2019) **00**(0) 1–14 ISSN 0267-8179. DOI: 10.1002/jqs.3097

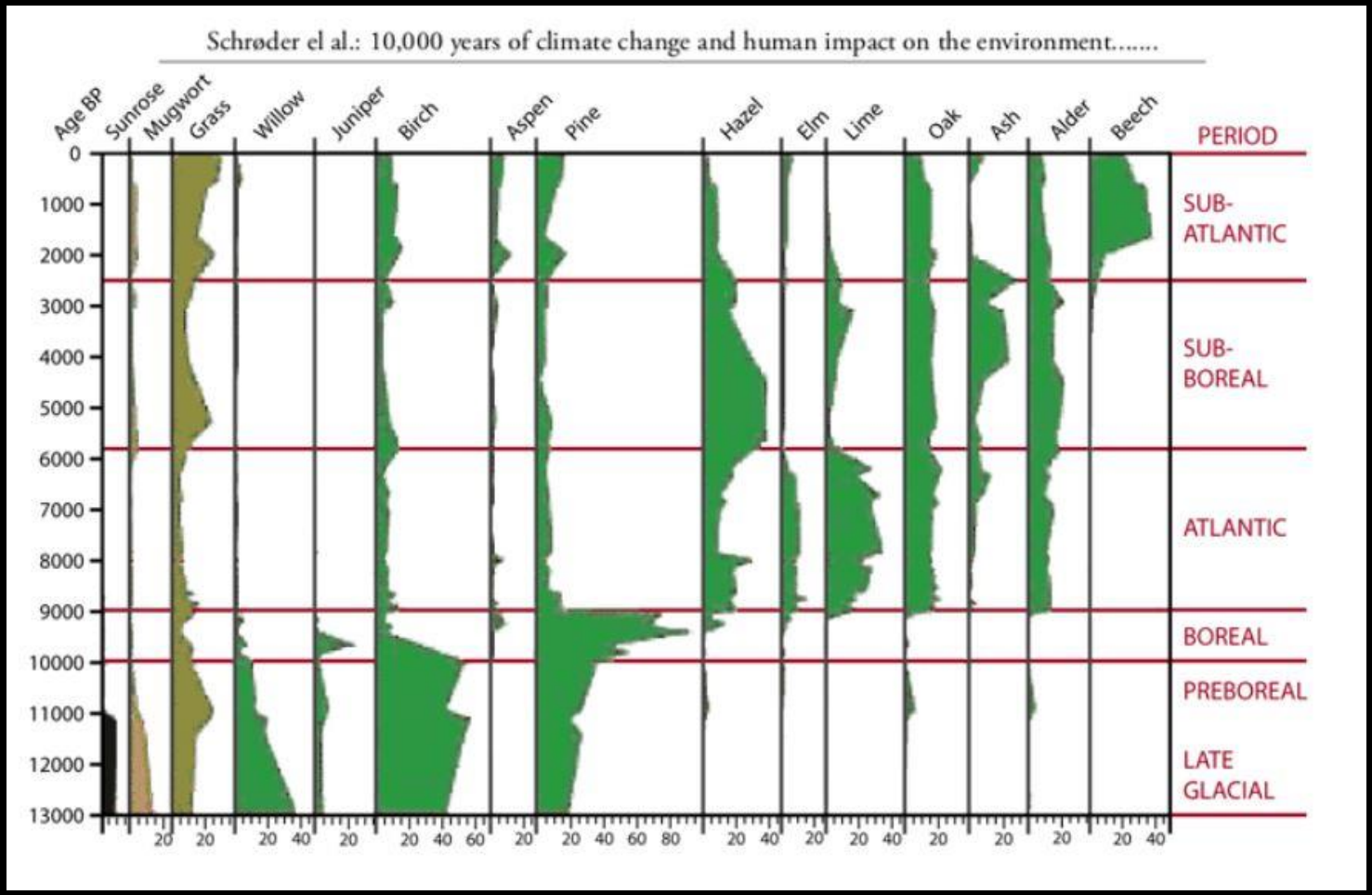
JQS Journal of Quaternary Science QRA Quaternary Research Association

Subdividing the Holocene Series/Epoch: formalization of stages/ages and subseries/subepochs, and designation of GSSPs and auxiliary stratotypes

MIKE WALKER,[1,2*] MARTIN J. HEAD,[3] JOHN LOWE,[4] MAX BERKELHAMMER,[5] SVANTE BJÖRCK,[6] HAI CHENG,[7,8] LES C. CWYNAR,[9] DAVID FISHER,[10] VASILEIOS GKINIS,[11] ANTONY LONG,[12] REWI NEWNHAM,[13] SUNE OLANDER RASMUSSEN[11] and HARVEY WEISS[14]

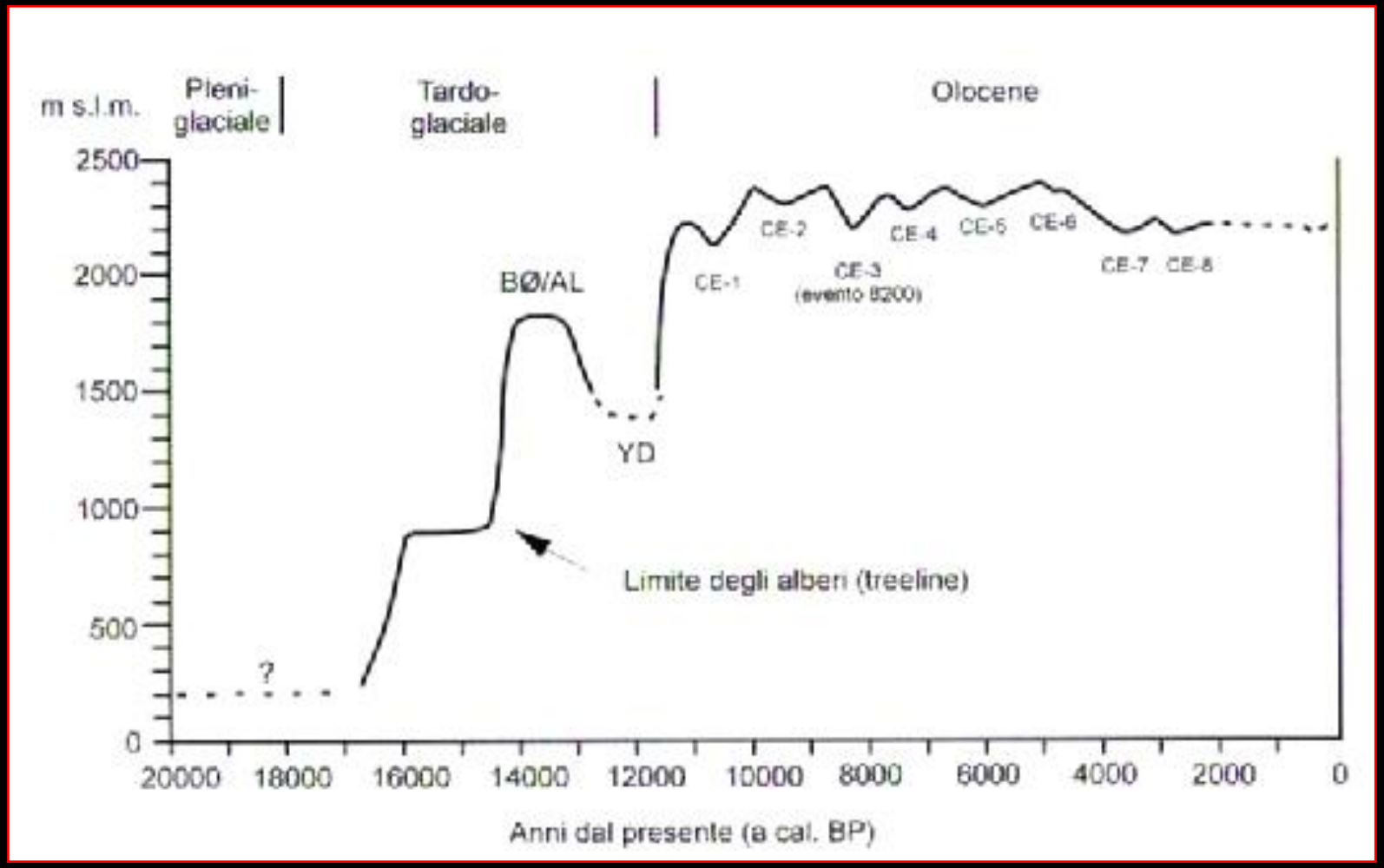
Eon	Era	Period	Epoch	Subepoch	Age	
Phanerozoic (pars)	Cenozoic (pars)	Quaternary (pars)	Holocene	Late	Meghalayan	present
				Middle	Northgrippian	4250 a b2k
				Early	Greenlandian	8236 a b2k
						11,700 a b2k

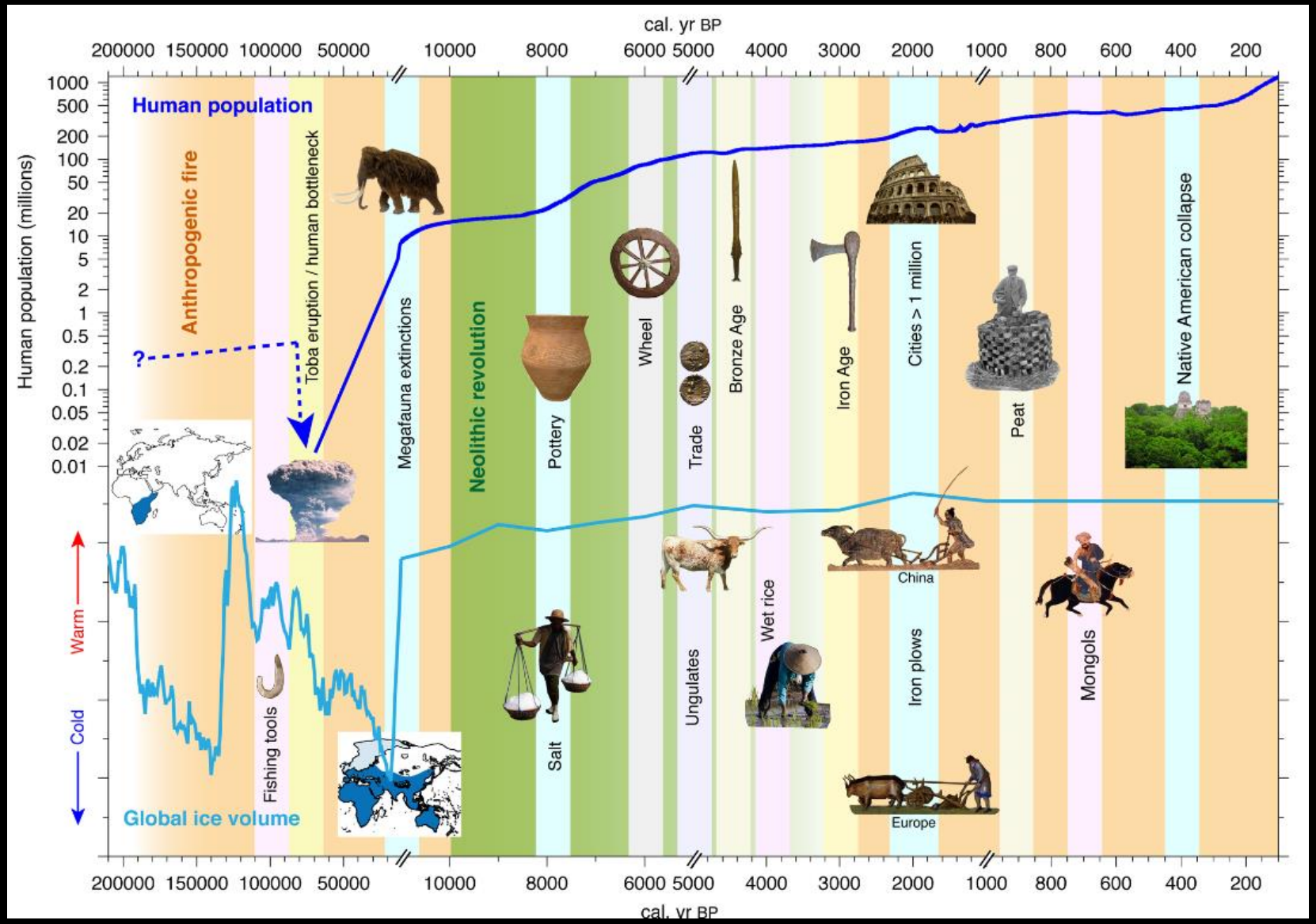
Suddivisione biostratigrafica tradizionale dell'Olocene basata sulla zonazione pollinica del nordEuropa



Il quadro ecologico mondiale nell'Olocene

La risalita del limite superiore degli alberi



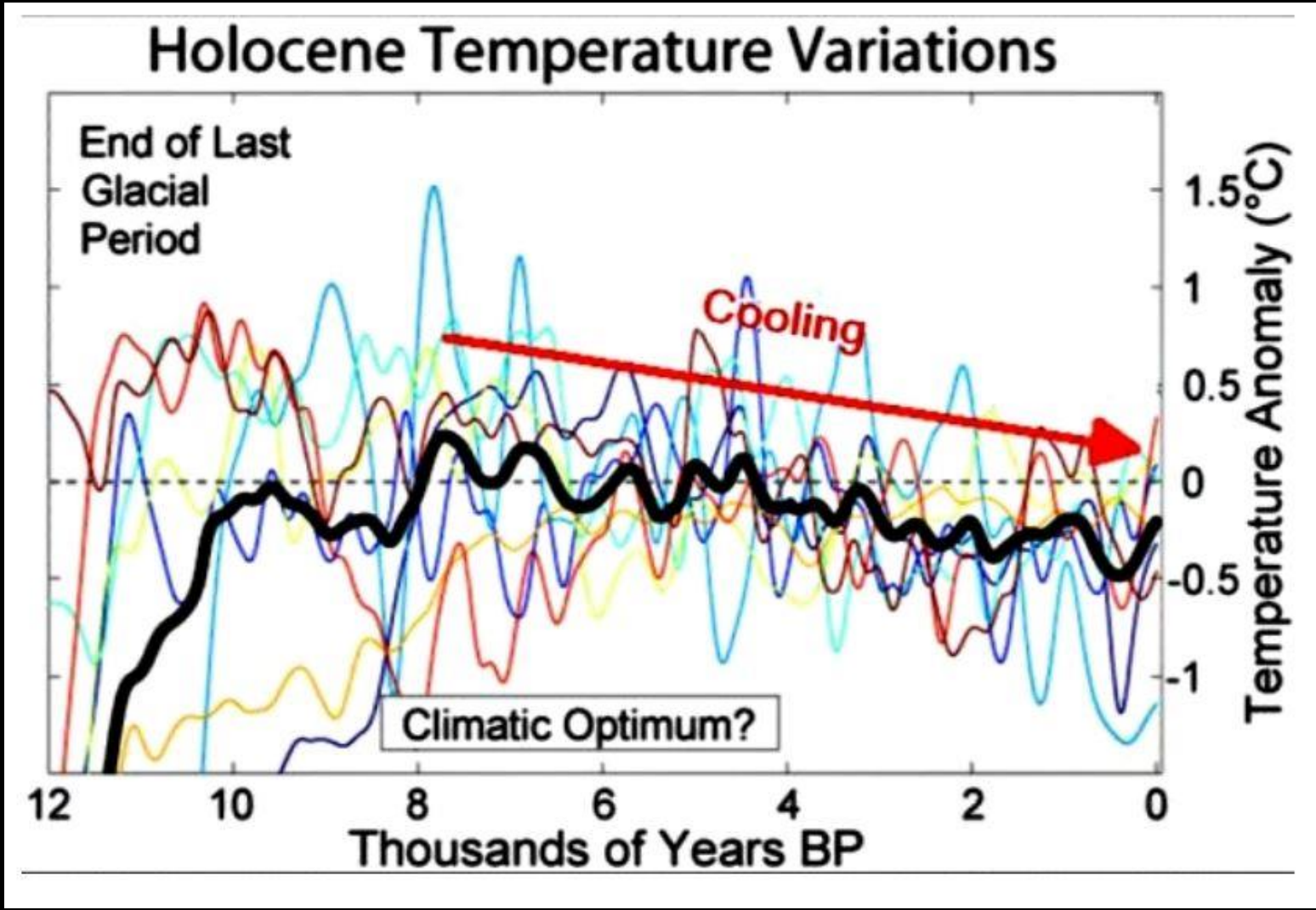

cal. yr BP
200000 150000 100000 50000 10000 8000 6000 5000 4000 3000 2000 1000 800 600 400 200
Human population
Human population (millions)
1000 500 200 100 50 20 10 5 2 1 0.5 0.2 0.1 0.05 0.02 0.01
Anthropogenic fire
?
Toba eruption / human bottleneck
Megafauna extinctions
Neolithic revolution
Pottery
Wheel
Trade
Bronze Age
Iron Age
Cities > 1 million
Peat
Native American collapse
Warm
Cold
Global ice volume
Fishing tools
Salt
Ungulates
Wet rice
China
Iron plows
Europe
Mongols
200000 150000 100000 50000 10000 8000 6000 5000 4000 3000 2000 1000 800 600 400 200
cal. yr BP

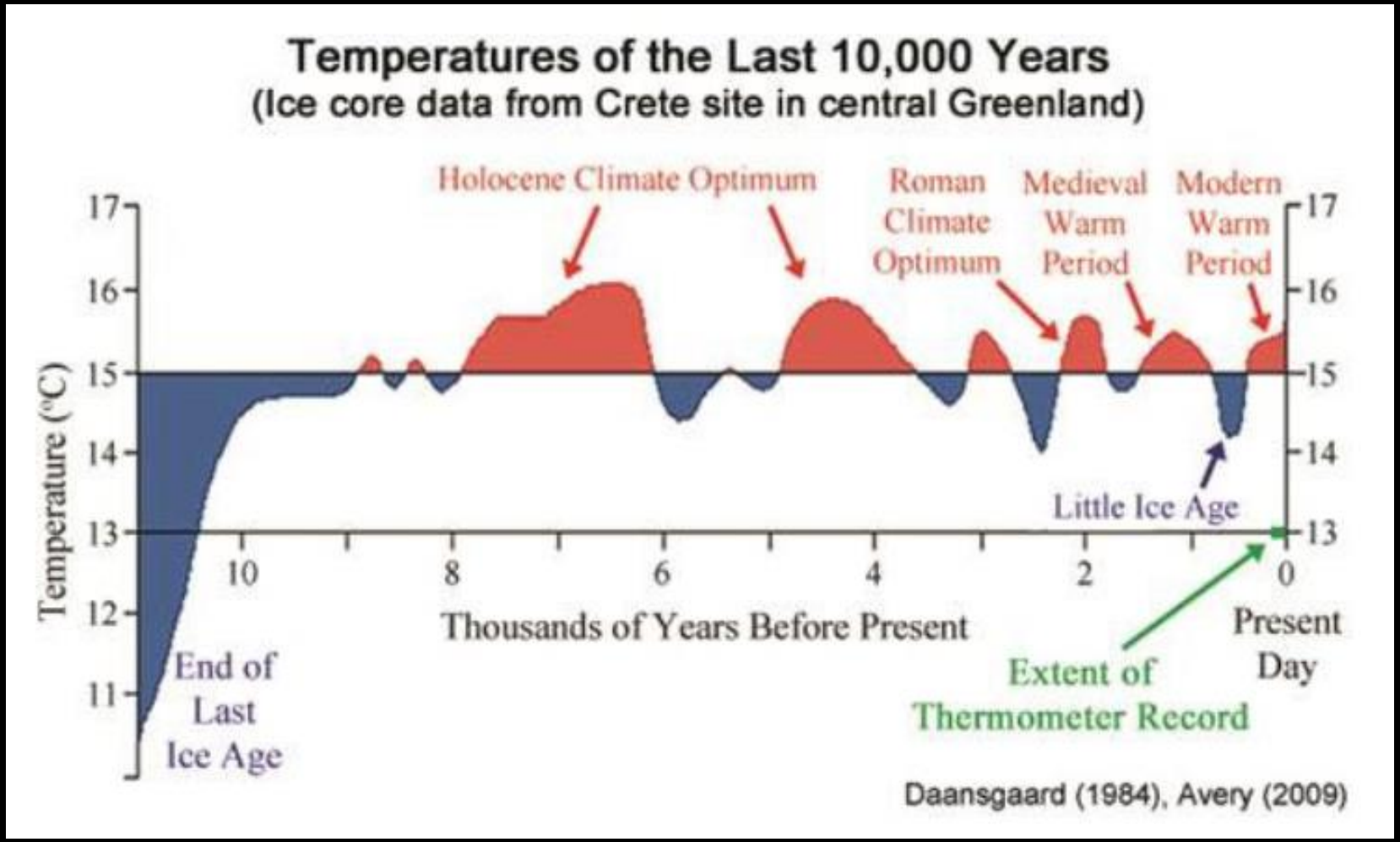
The Optimum Climatic Map of Italy

By Antonioli F. & Vai G.B. Eds.

- **lithological, geological and geomorphological units**

Faune e ambienti della foresta termofila


Holocene Temperature Variations
End of Last Glacial Period
Cooling
Climatic Optimum?
1.5
1
0.5
0
-0.5
-1
Temperature Anomaly (°C)
12
10
8
6
4
2
0
Thousands of Years BP


Temperatures of the Last 10,000 Years
(Ice core data from Crete site in central Greenland)
Holocene Climate Optimum
Roman Climate Optimum
Medieval Warm Period
Modern Warm Period
Little Ice Age
Temperature (°C)
17
16
15
14
13
12
11
10
8
6
4
2
0
Thousands of Years Before Present
Present Day
End of Last Ice Age
Extent of Thermometer Record
Daansgaard (1984), Avery (2009)

Holocene climatic instability: A prominent, widespread event 8200 yr ago

Contents lists available at ScienceDirect

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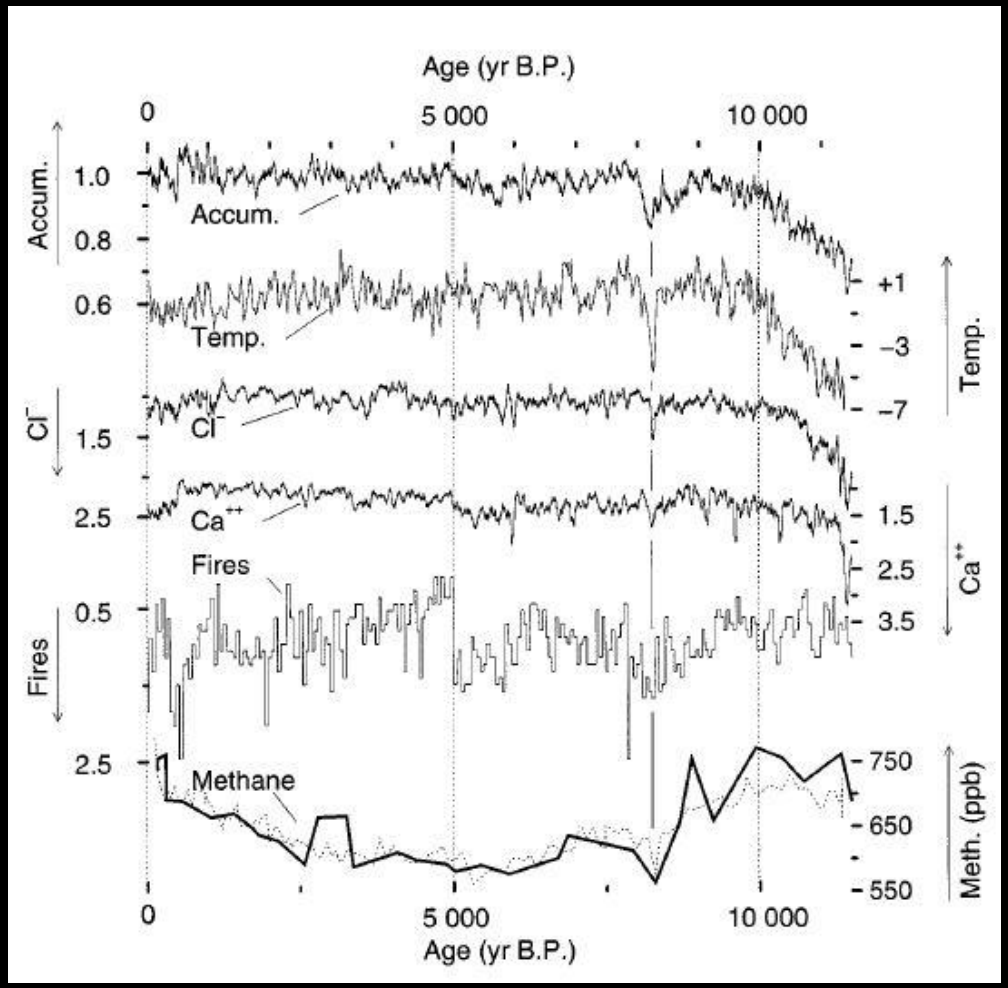
The 8.2 ka BP Holocene climate change event and human population resilience in northwest Atlantic Europe

Seren Griffiths [a,*], Erick Robinson [b]



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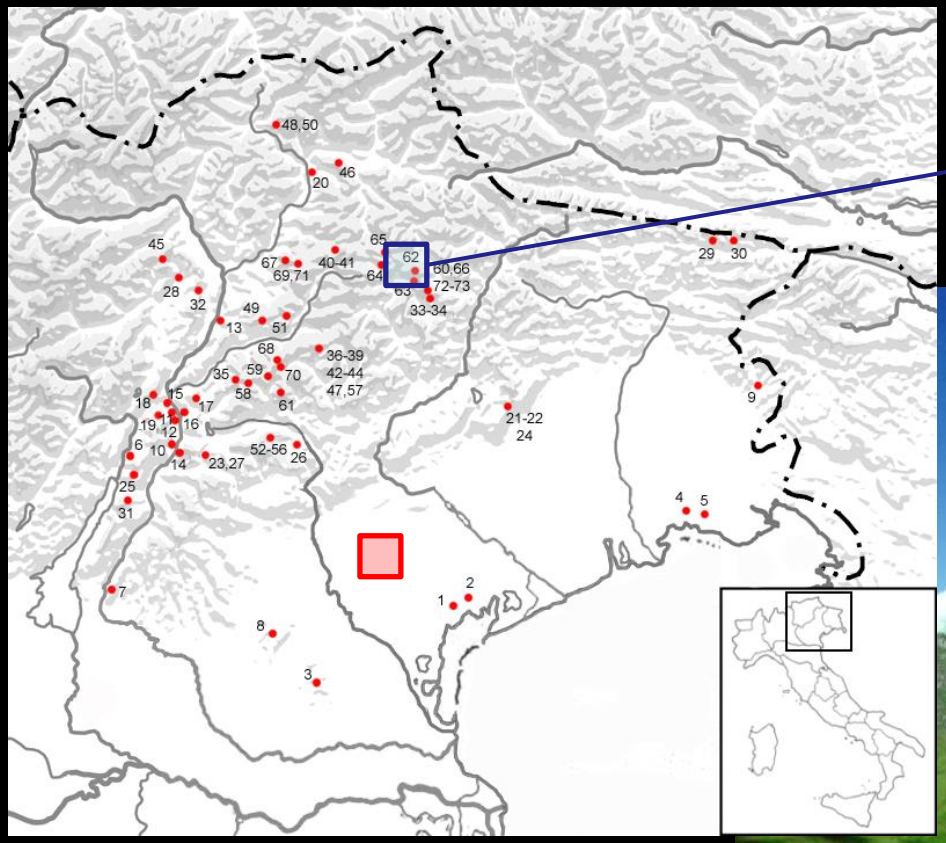
4.2 ka BP Event Workshop

Pisa, 2018

L’evento arido 4.2 ka BP fu uno dei più severi eventi climatici dell’Olocene. Inizato intorno al 2200 BC, esso probabilmente durò l’intero XXII secolo A.C. The L’aridificazione imporvvisa che si sviluppò tra 4.2 e 3.9 ka BP e il raffreddamento sono registrati alla scala globale, in molti archive ad alta risoluzione, ma le sue cause, il timing preciso, le qualità e la quantificazione restano enigmatiche.

Due casi-studio sull'Olocene

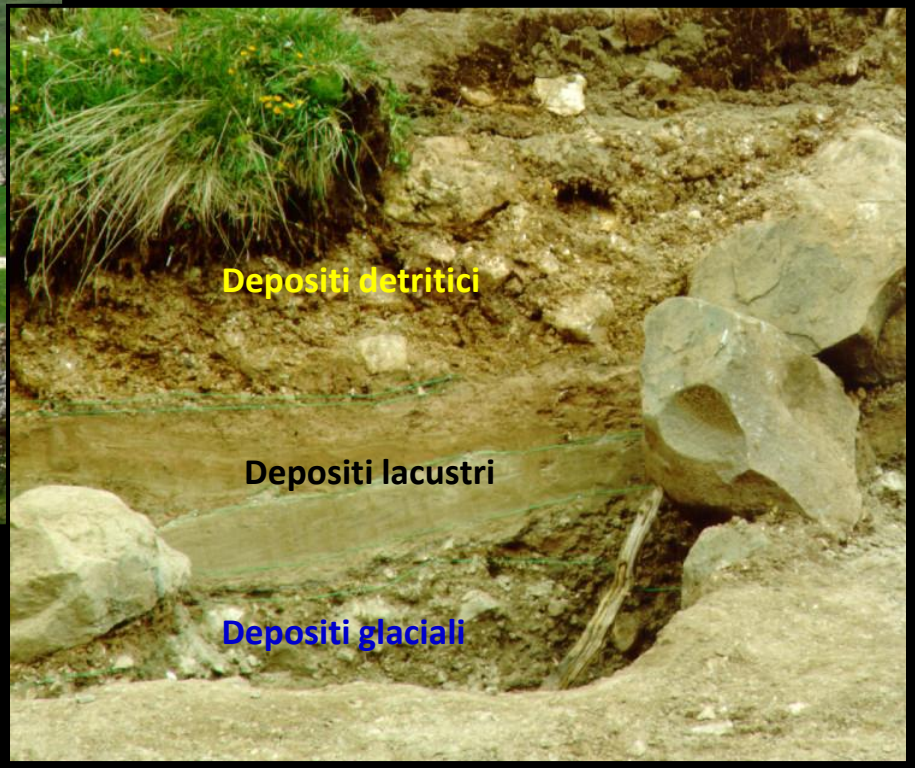
I caso: i siti mesolitici dell'Italia nord-orientale



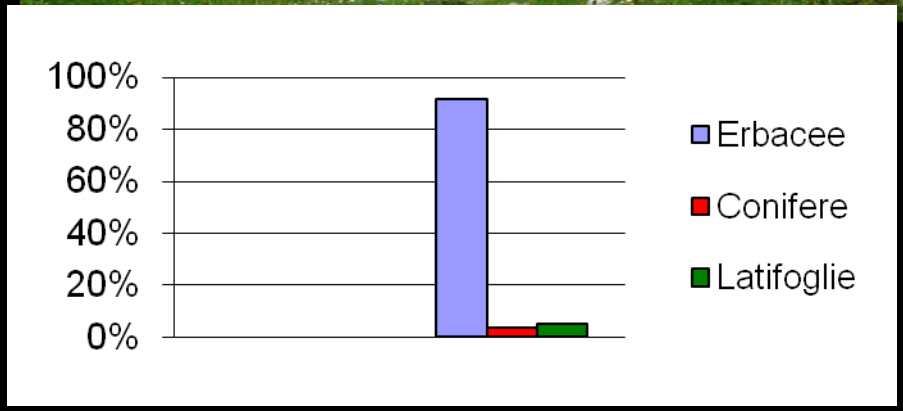
Principali siti mesolitici dell'Italia nord-orientale (quadrato rosso: Sorgenti del Sile)

Mondeval de Sora (Belluno)

Indagini paleoambientali

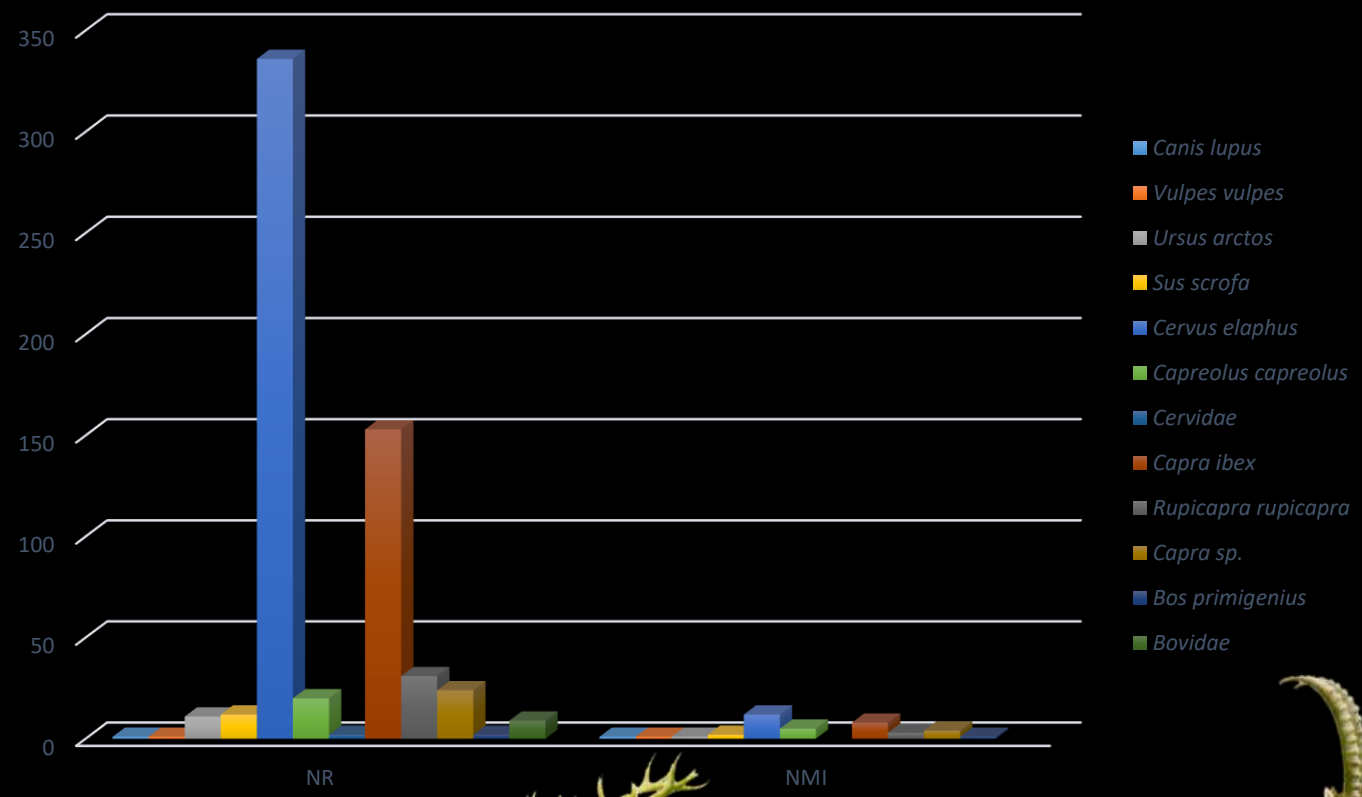


P. Mozzi 1992



Analisi polliniche (US 4b)

Sett. I,US 8 – Composizione dell'insieme faunistico

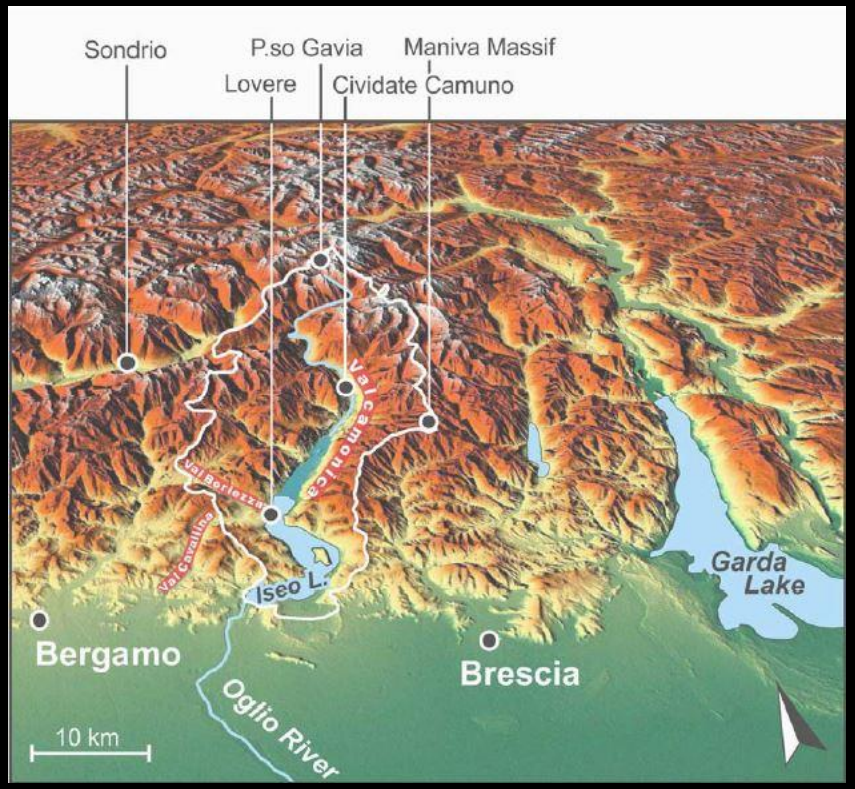


NR: 2284 > 2 cm
NR det: 591 – 26% NR

NMI: 12

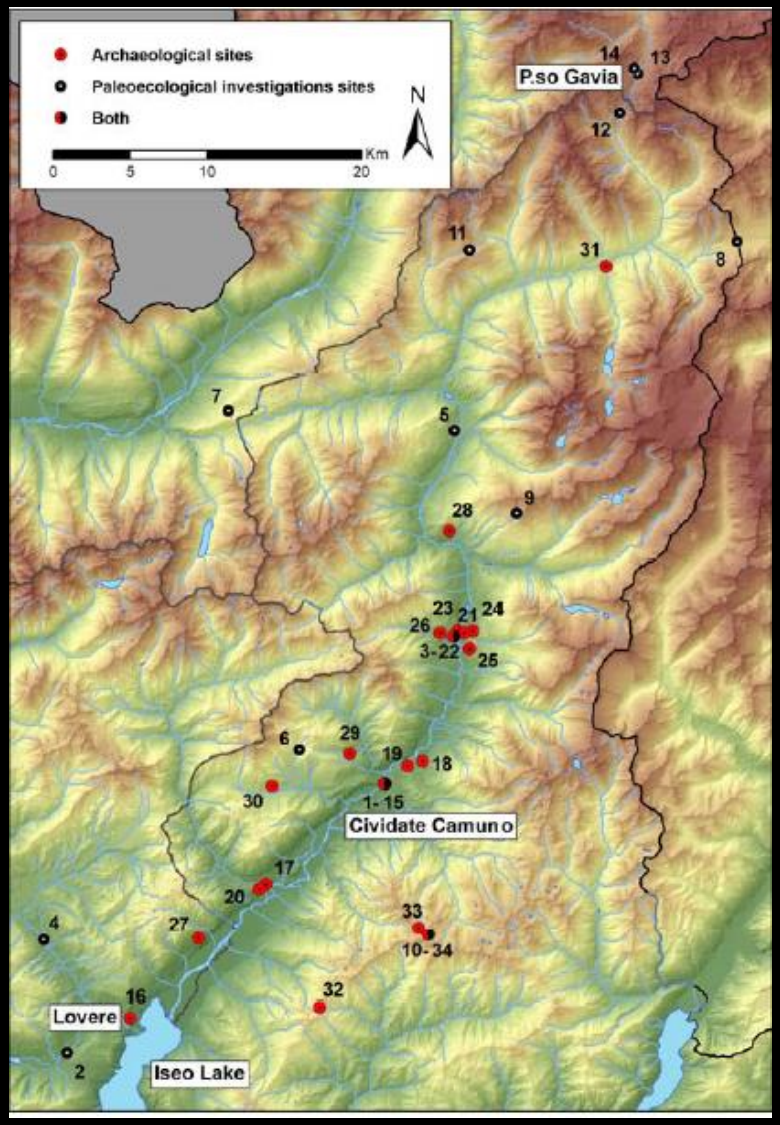
NMI: 8

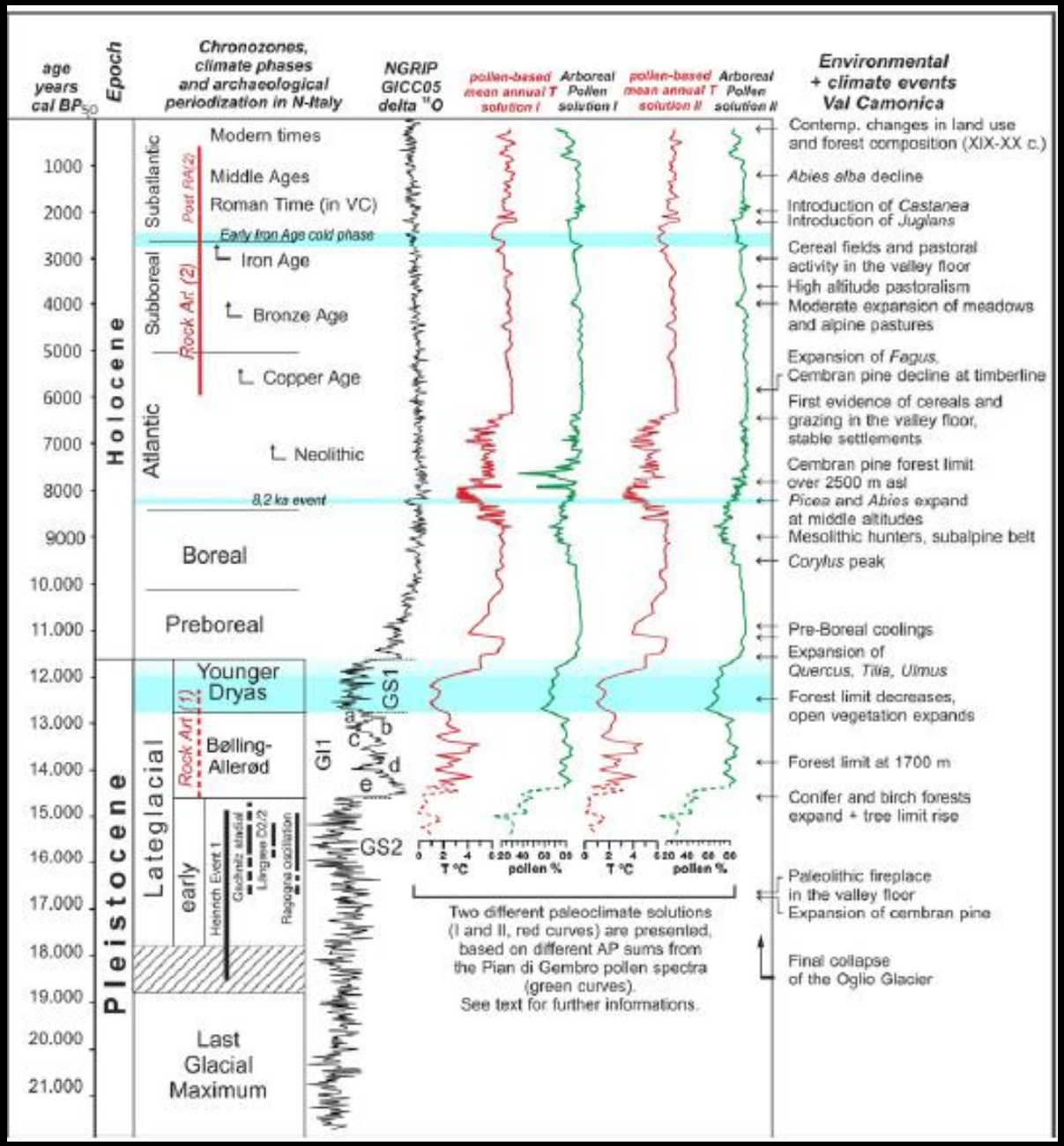
Il caso: ecologia e cambiamenti ambientali in Valcamonica



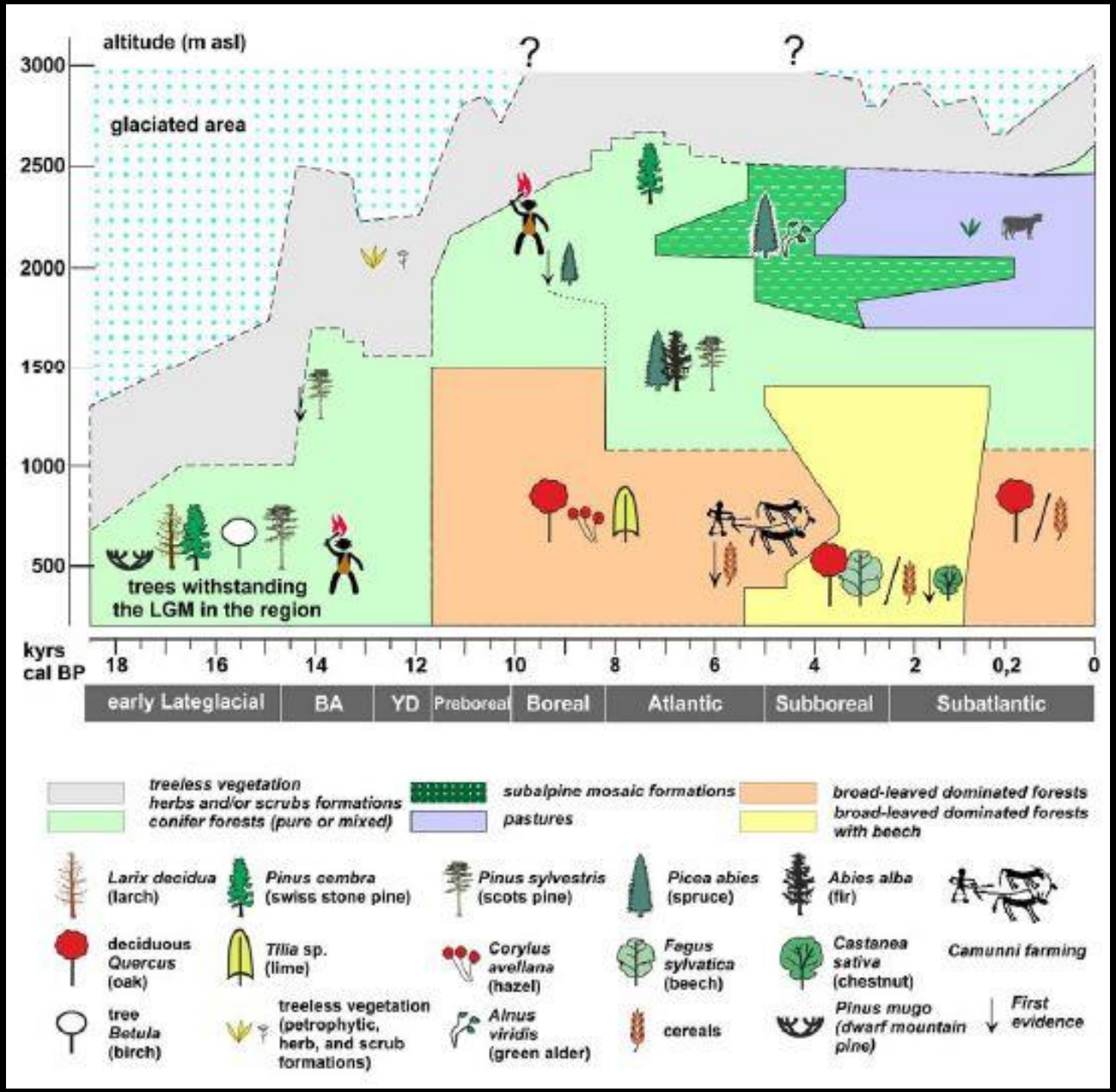
Available online http://amq.aiqua.it
ISSN (print): 2279-7327, ISSN (online): 2279-7335
Alpine and Mediterranean Quaternary, 29 (1), 2016, 19 - 34

ECOLOGICAL CHANGES AND HUMAN INTERACTION IN VALCAMONICA, THE ROCK ART VALLEY, SINCE THE LAST DEGLACIATION





Schema stratigrafico che reassume I principali eventi registrati nelal vegetazione, clima e storia culturale della Valcamonica dall'ultima deglaciazione.
La barre azzurre indicano fasi fredde avvenute durante gli ultimi 12 mila anni cal BP e registrate sia nel record isotopico NGRIP che nella serie pollinica del bacino di Pian di Gembro.



Biosketch – storia della vegetazione della Valcamonica, 18.500 anni fa. La ricostruzione della vegetazione è rapportata al tempo e all'altitudine, a mostrare lo sviluppo temporale delle fasce vegetazionali. La risoluzione spaziale degli ecosistemi dipende dalla disponibilità dei record fossili all'altitudine di interesse.