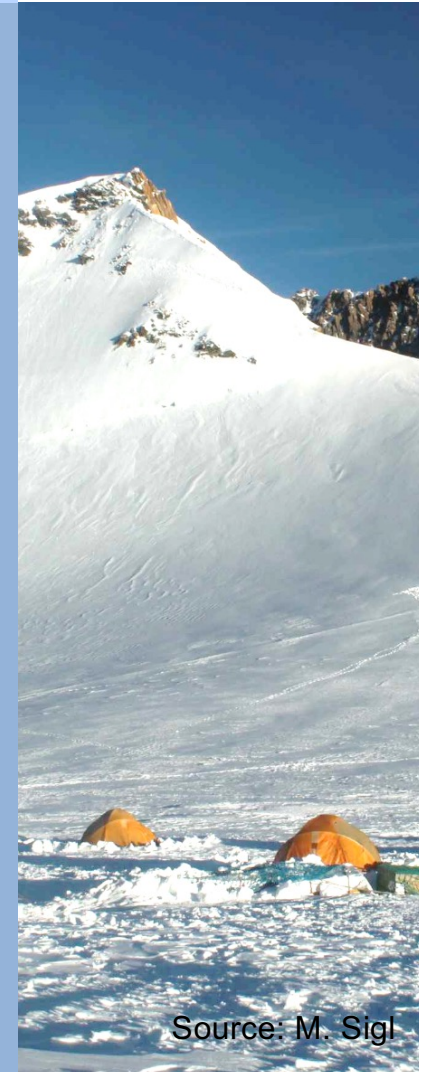


Eiskerngeschichten über vergangene Vegetations- und Landnutzungsdynamiken

Sandra Brügger

Symposium "Prix de Quervain" 2019



Source: M. Sigl

Einleitung

- > Unkontrollierte, zerstörerische Feuer
 - Ökologische & gesellschaftliche Kosten
 - Klimawandel: Feuermanagement

CBS NEWS

Tens of thousands ordered to evacuate after wildfire explodes in Southern California

ENVIRONMENT 07/26/2018 06:02 am ET | Updated Jul 26, 2018

Fire, Fire Everywhere: The 2018 Global Wildfire Season Is Already Disastrous

A warming planet has exacerbated a dire global fire threat brought on by growing cities, poor urban planning and more combustible landscapes.

NATURAL DISASTERS

Greenland's Biggest Fire Is a "Warning" for Its Future

Bolivia September 2014

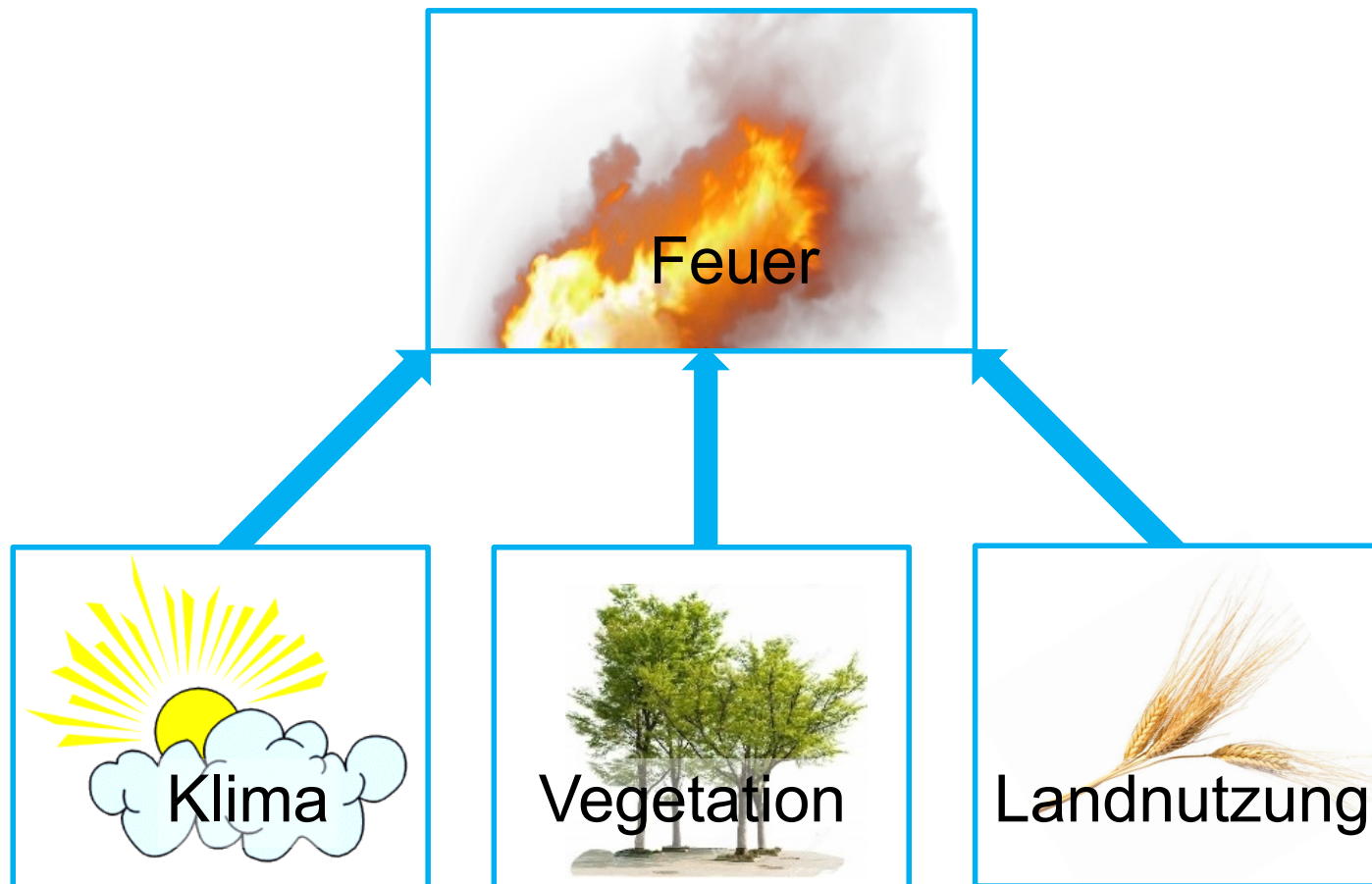


REUTERS/Sam Mircovich



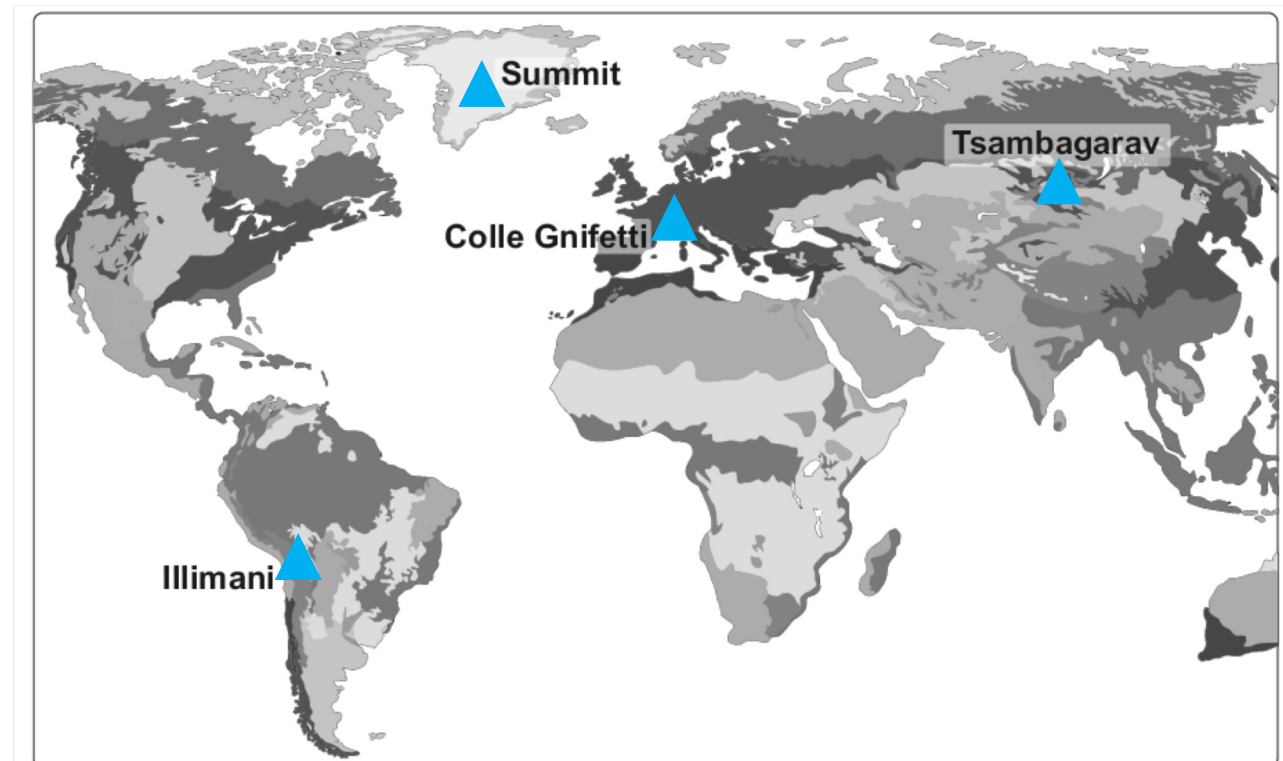
Einleitung

- > Feuer-Klima Beziehungen sind komplex



Einleitung

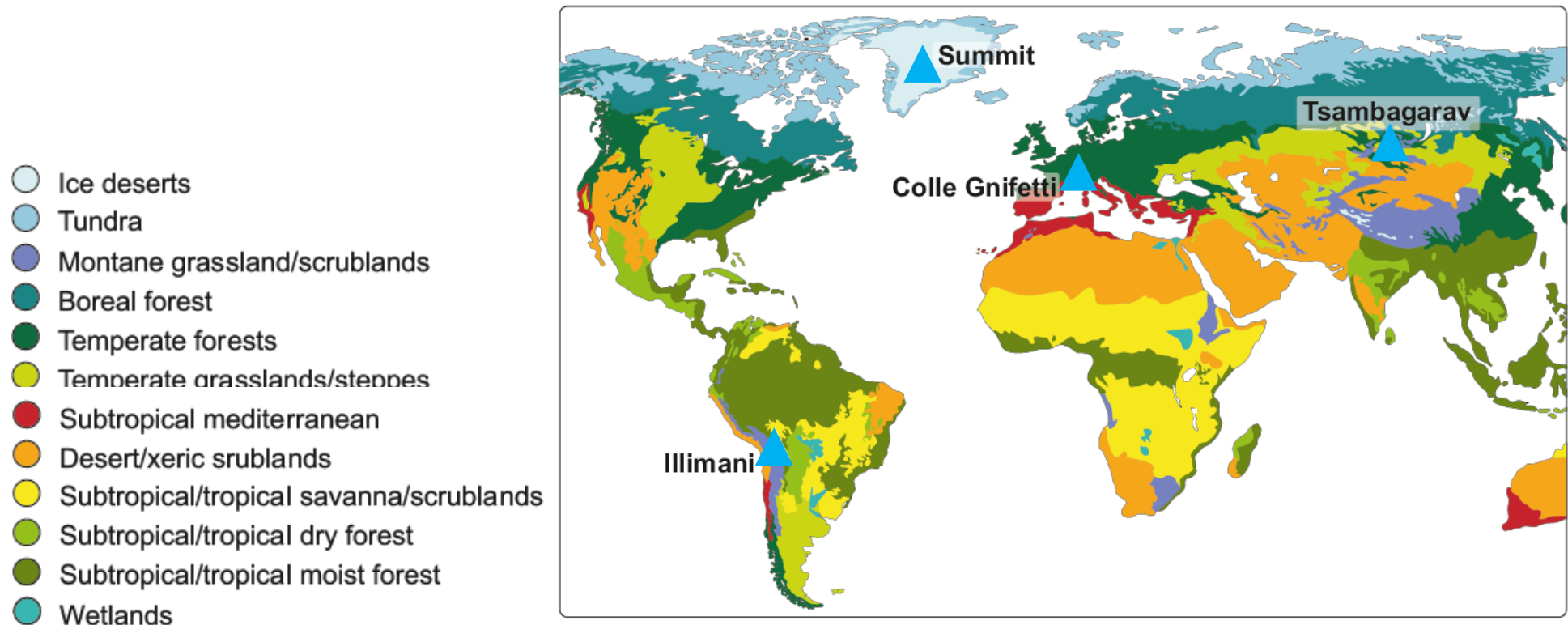
Ziel: Untersuchung von Langzeitinteraktionen zwischen Feuer, Vegetation, Landnutzung und Klima mit palynologischen Methoden in Eiskernen



Einleitung

Ziel: Untersuchung von Langzeitinteraktionen zwischen Feuer, Vegetation, Landnutzung und Klima mit palynologischen Methoden in Eiskernen

- > global verteilte Eiskerne
- > viele verschiedene Biome
- > identische Methoden



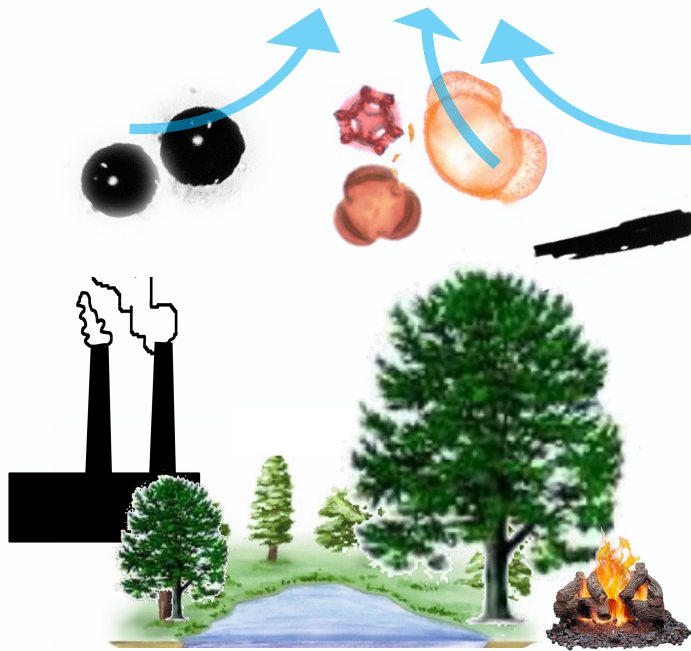
Einleitung



Colle Gnifetti

Einleitung

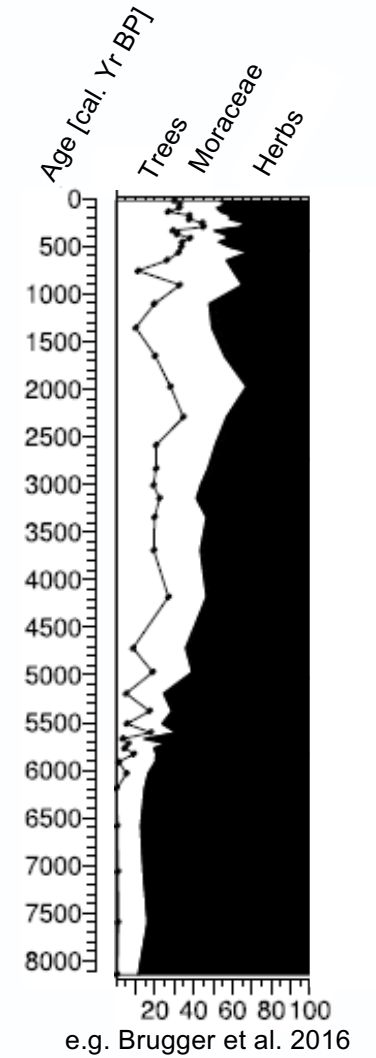
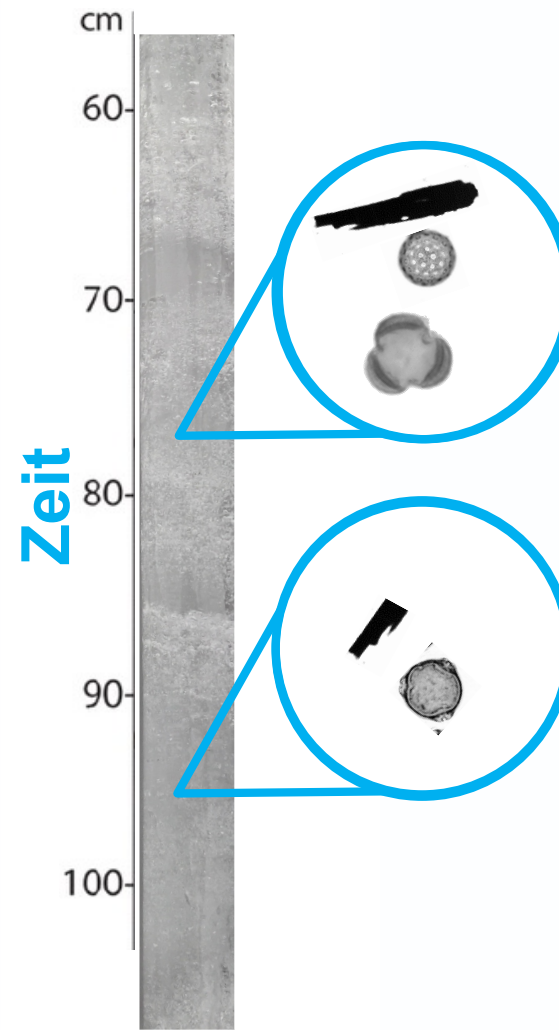
Gletscher



Eiskern

Mikroskop

Umweltgeschichte



Einleitung



Vegetationsgeschichte
& Landnutzung

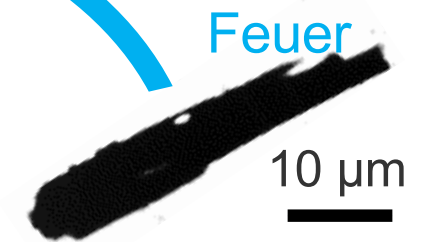


Source: M. Sigl

Eiskerne

- ✓ Präzise Chronologien
- ✓ Zeitlich hochaufgelöst
- ✓ Grossflächige Umweltrekonstruktionen

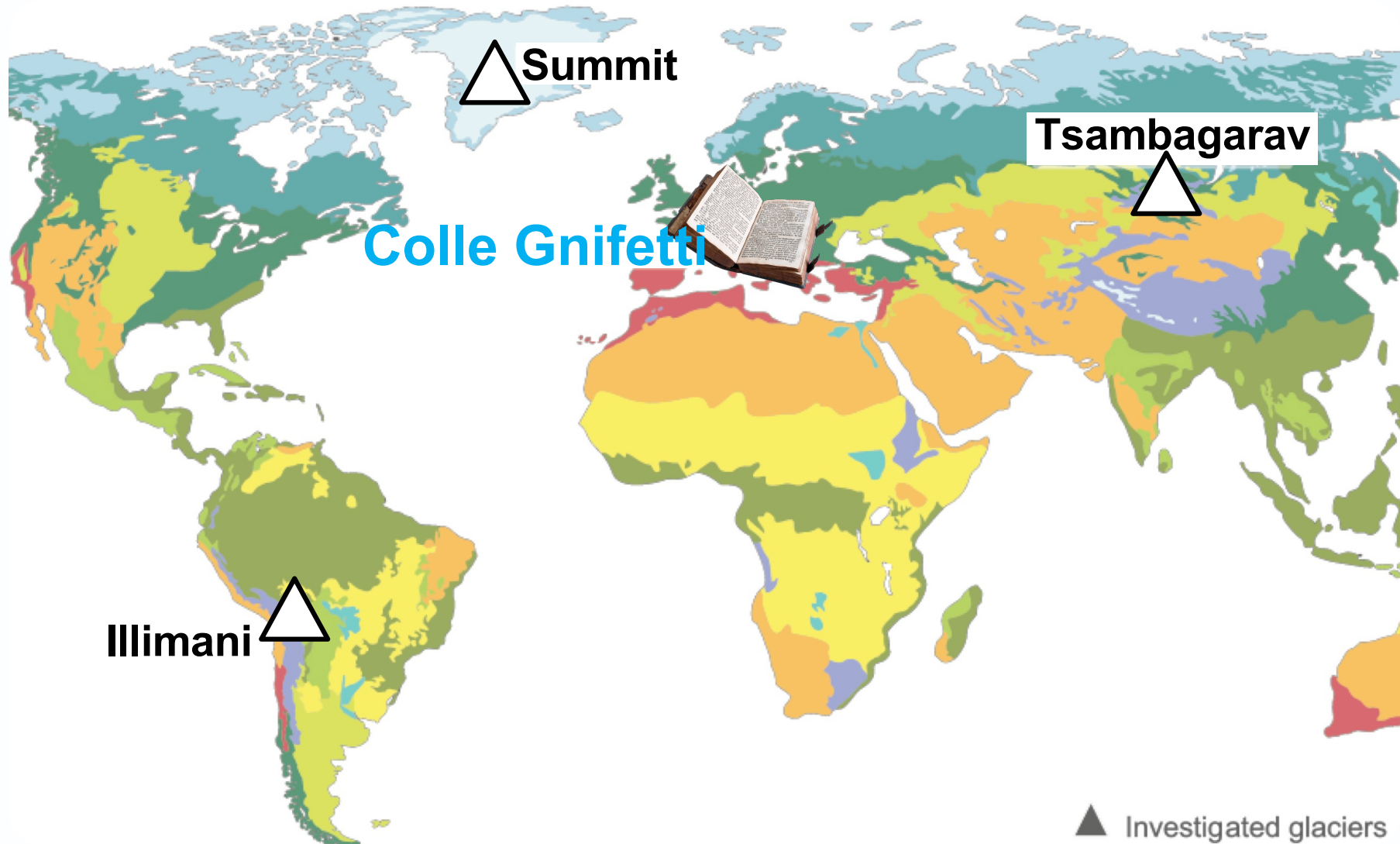
Industrielle
Verschmutzung
SCP = Spheroidal
carbonaceous
particles



Feuer

10 µm

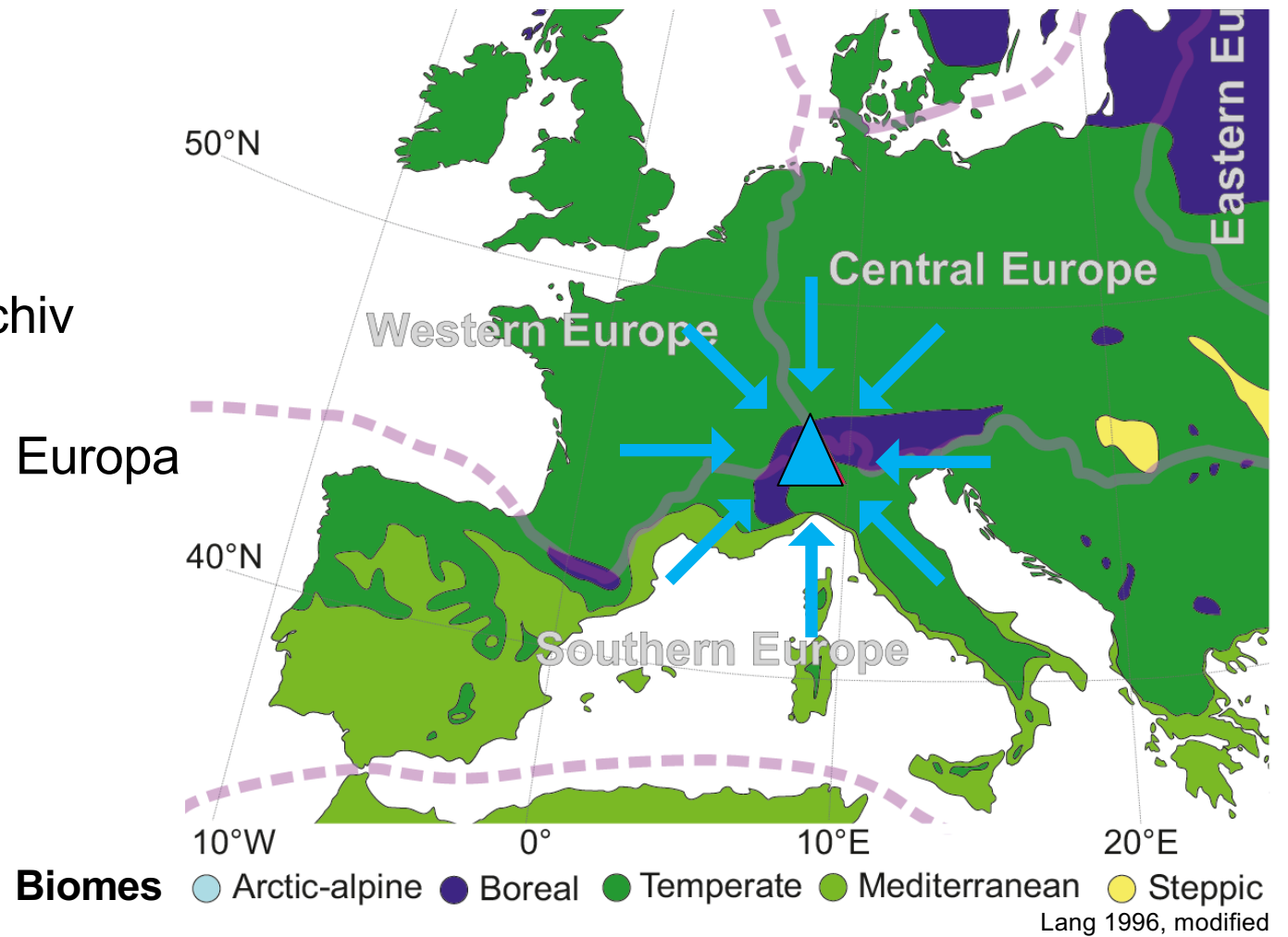
Einleitung



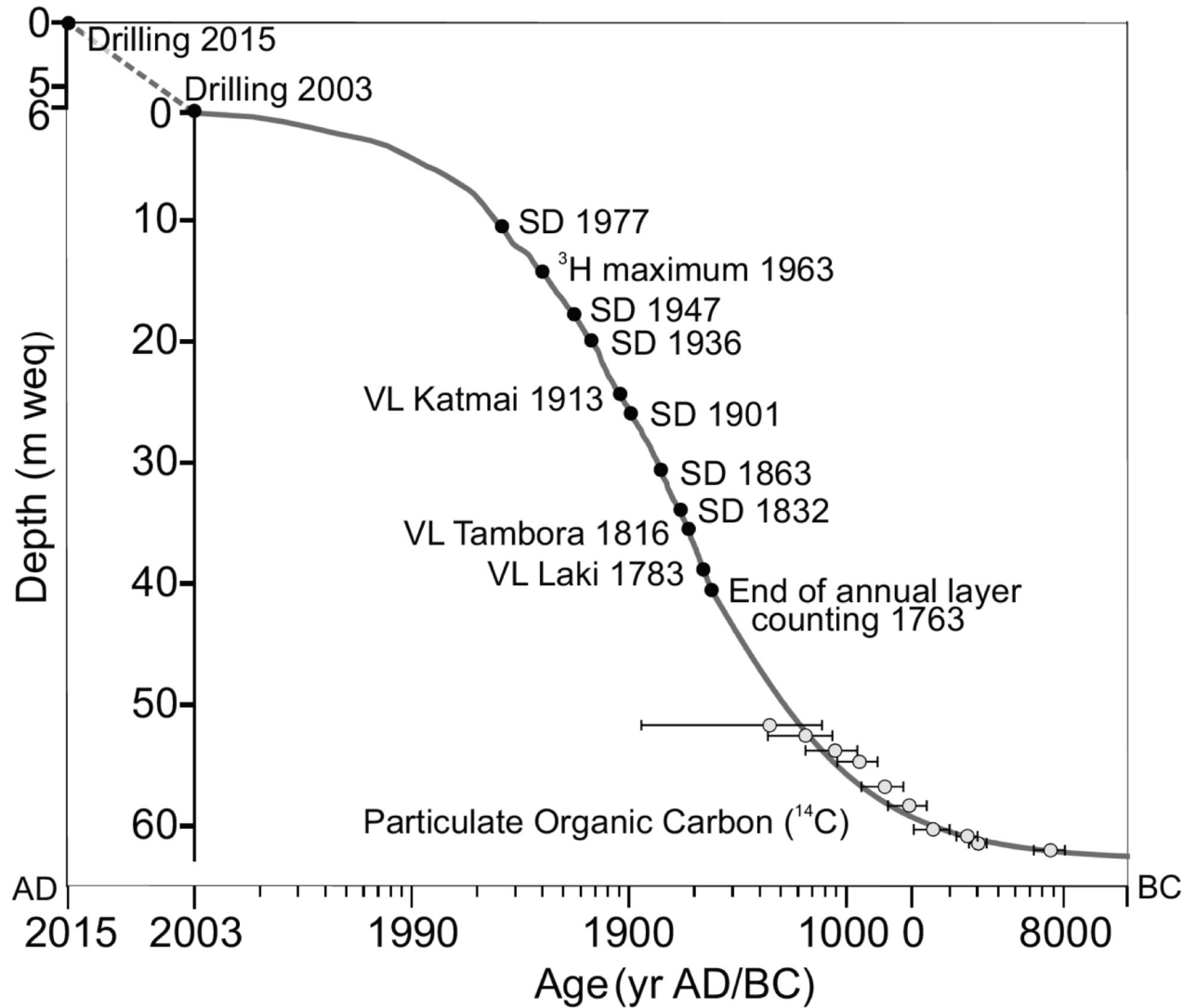
1. Europäische Landnutzung
2. Globale Feuergeschichte

Colle Gnifetti

- > Monte Rosa
- > 4450m asl
- > einzigartiges Archiv
 - Höhe
 - Zentrum von Europa

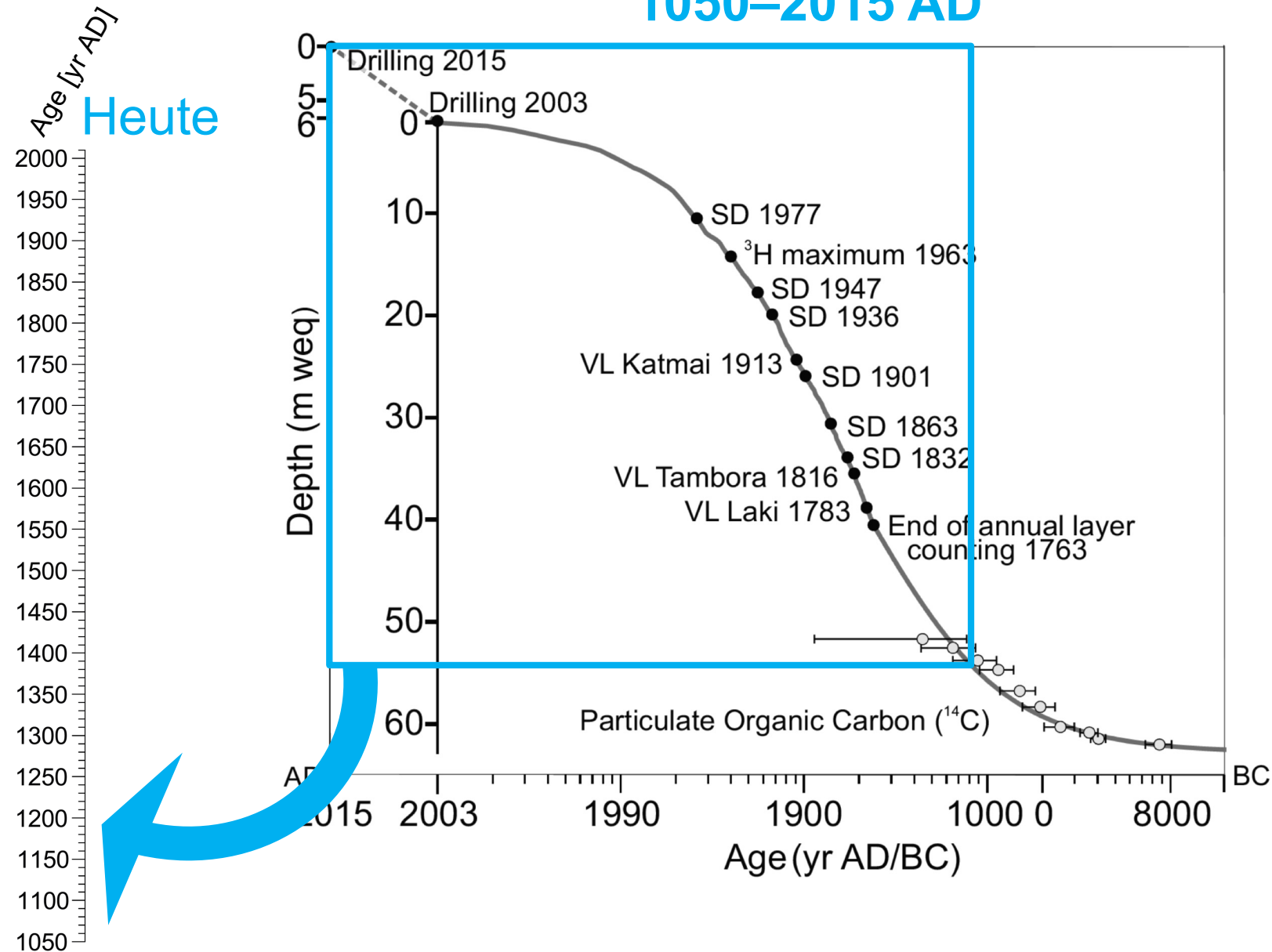


Chronologie

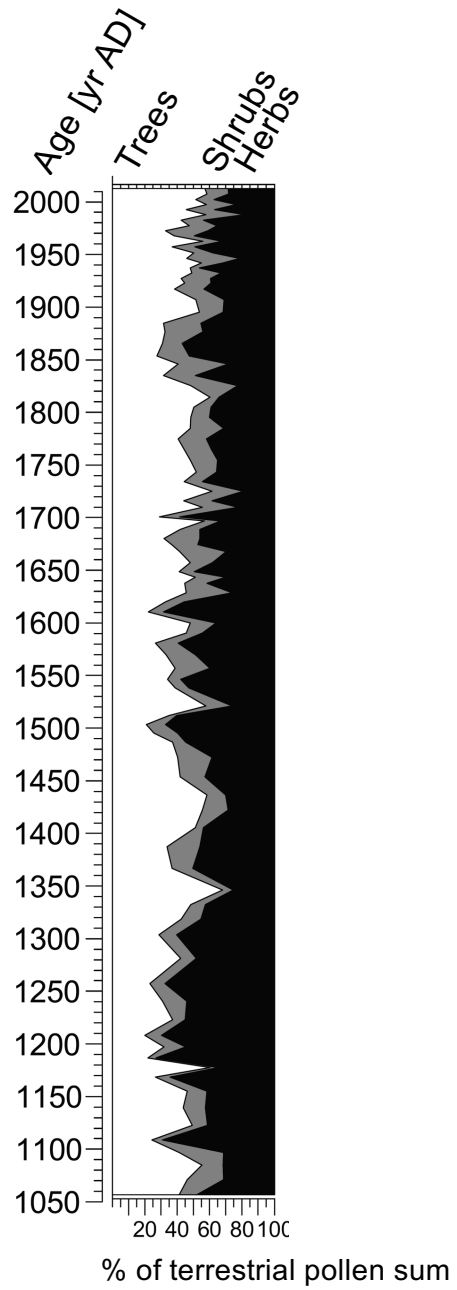


Chronologie

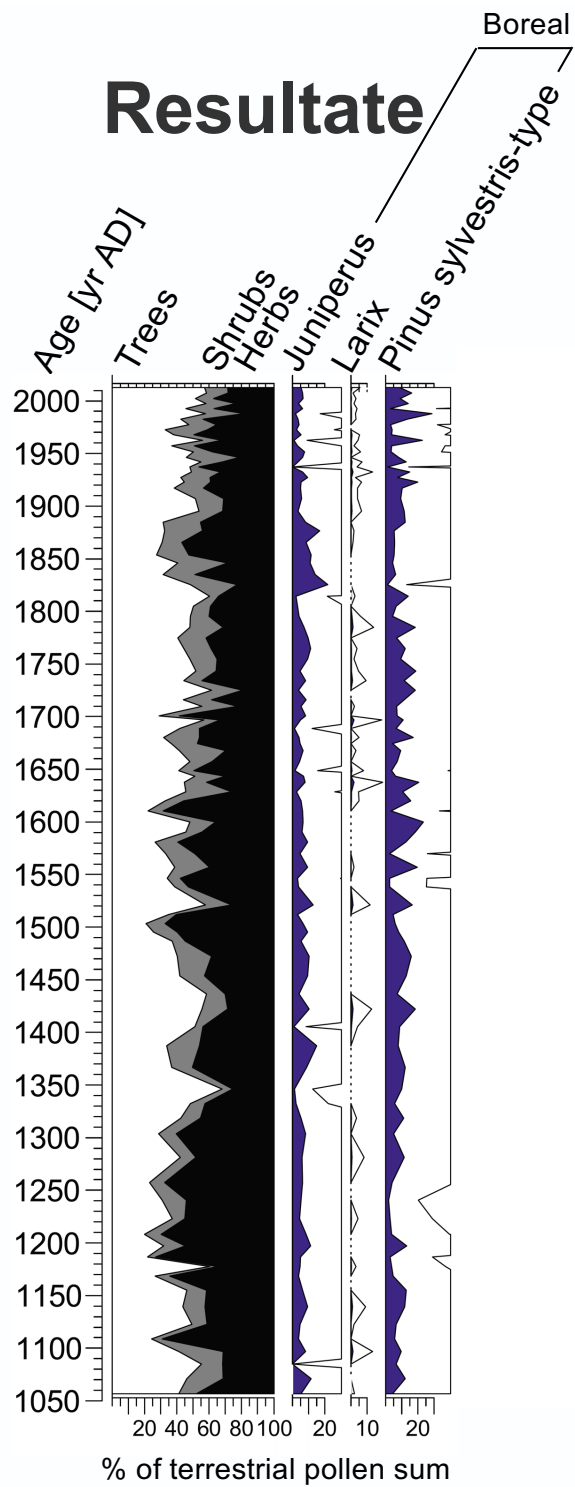
Palynologische Studie 1050–2015 AD



Resultate

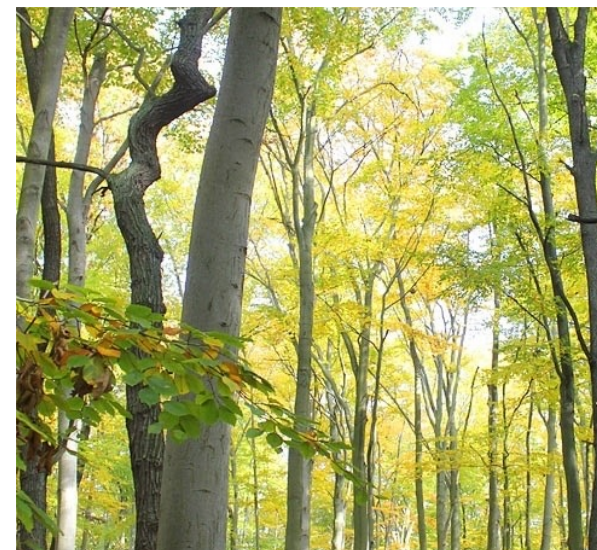
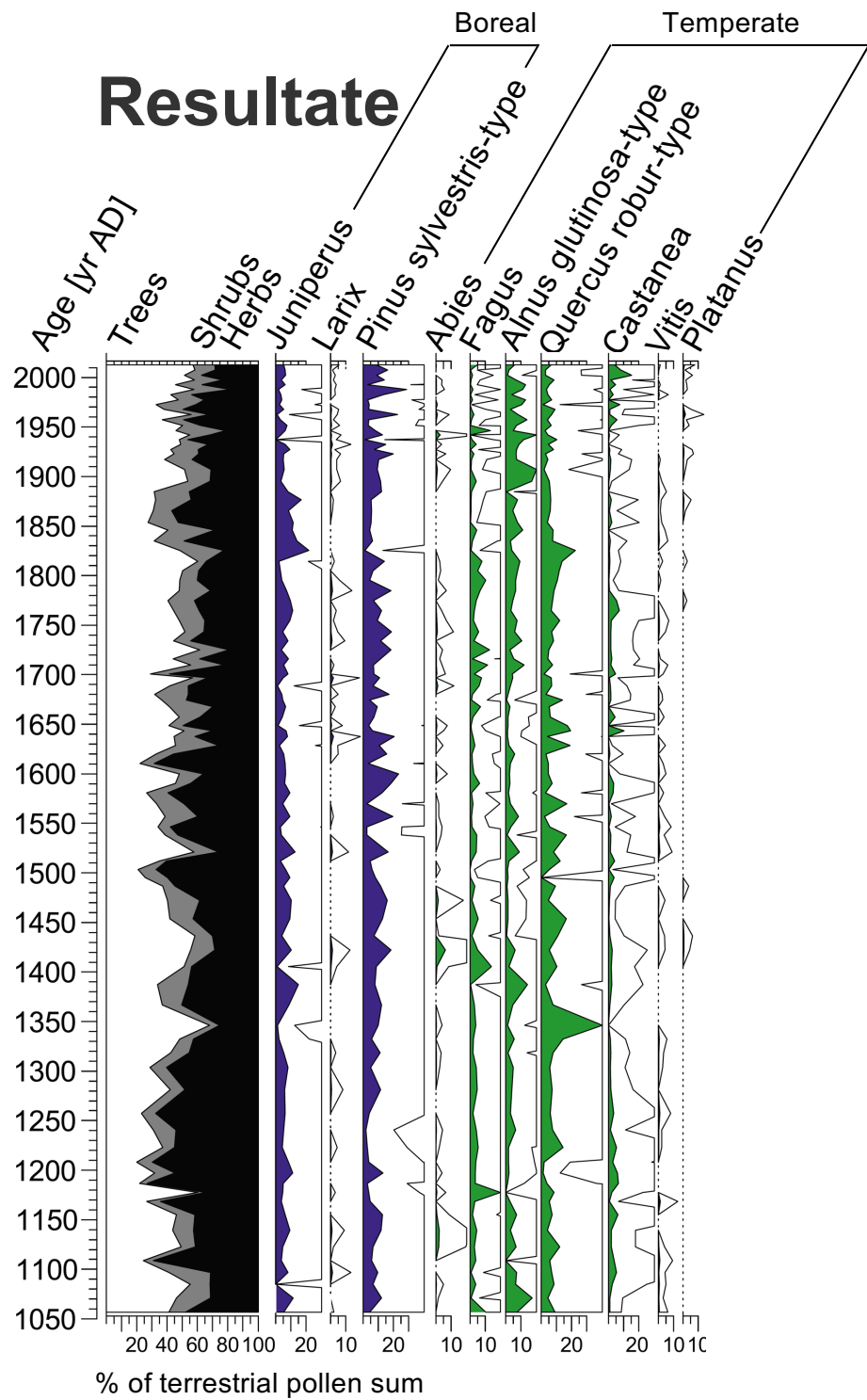


Resultate



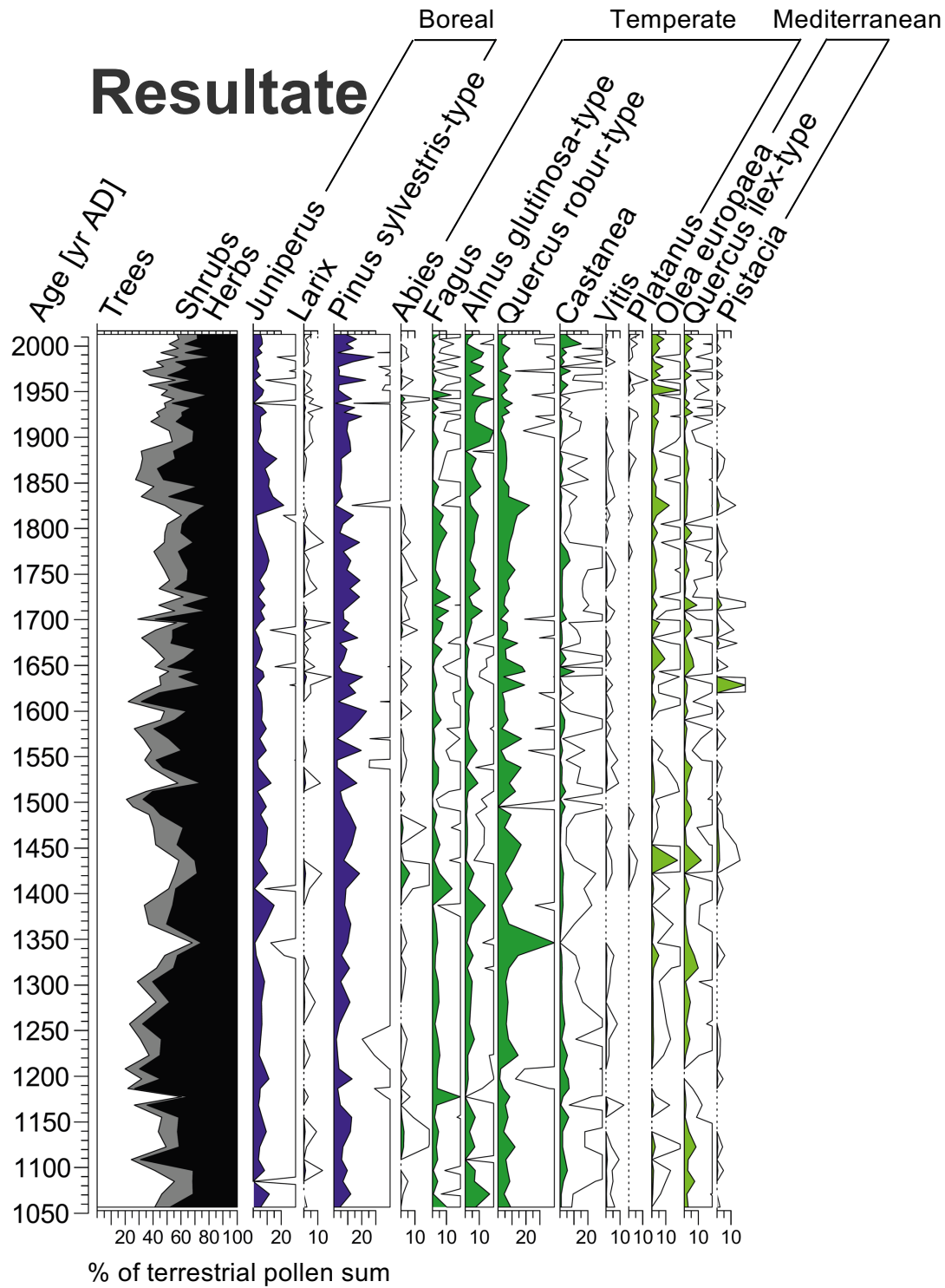
Subalpine forest

Resultate



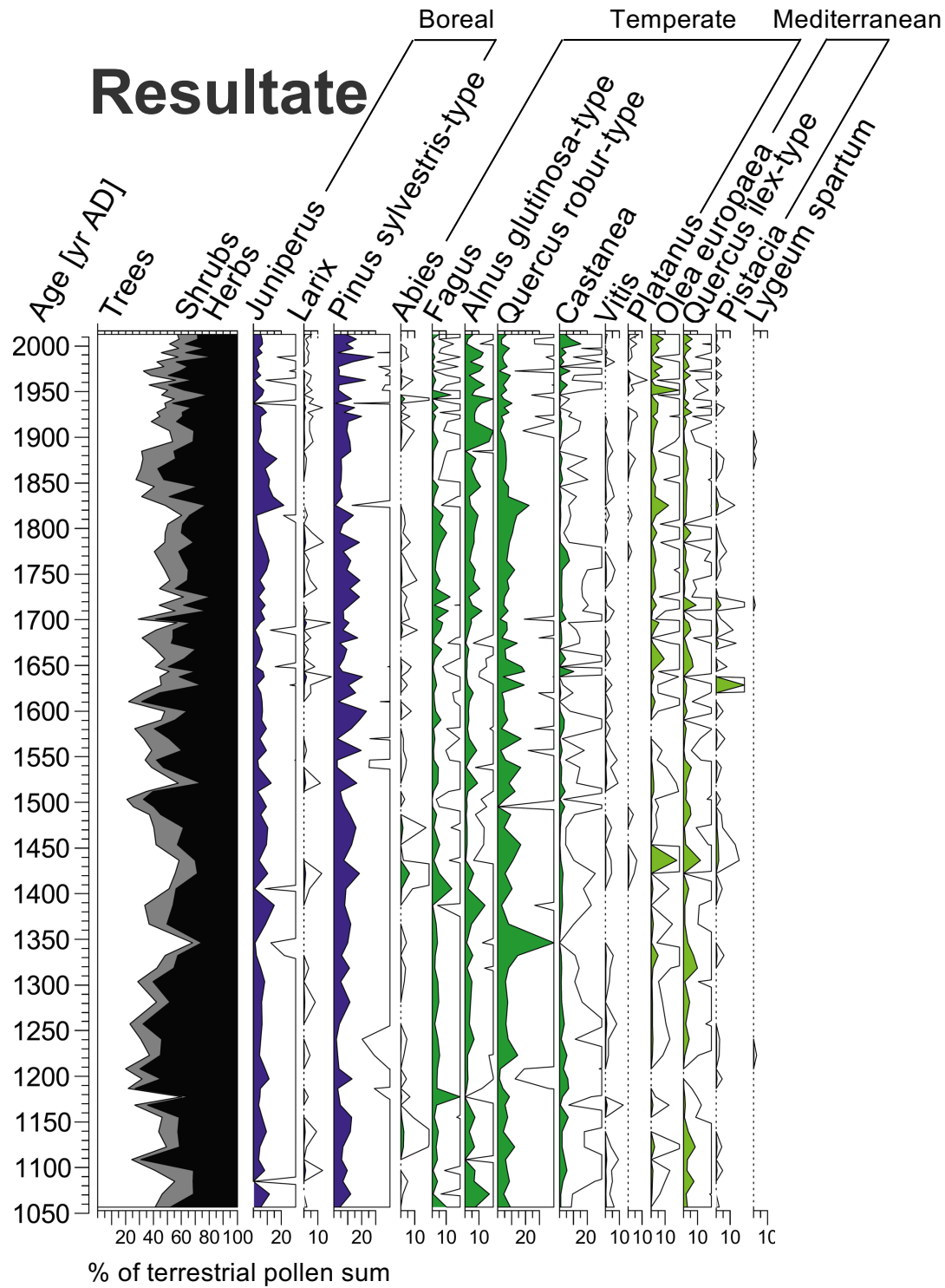
Temperate beech oak forest

Resultate



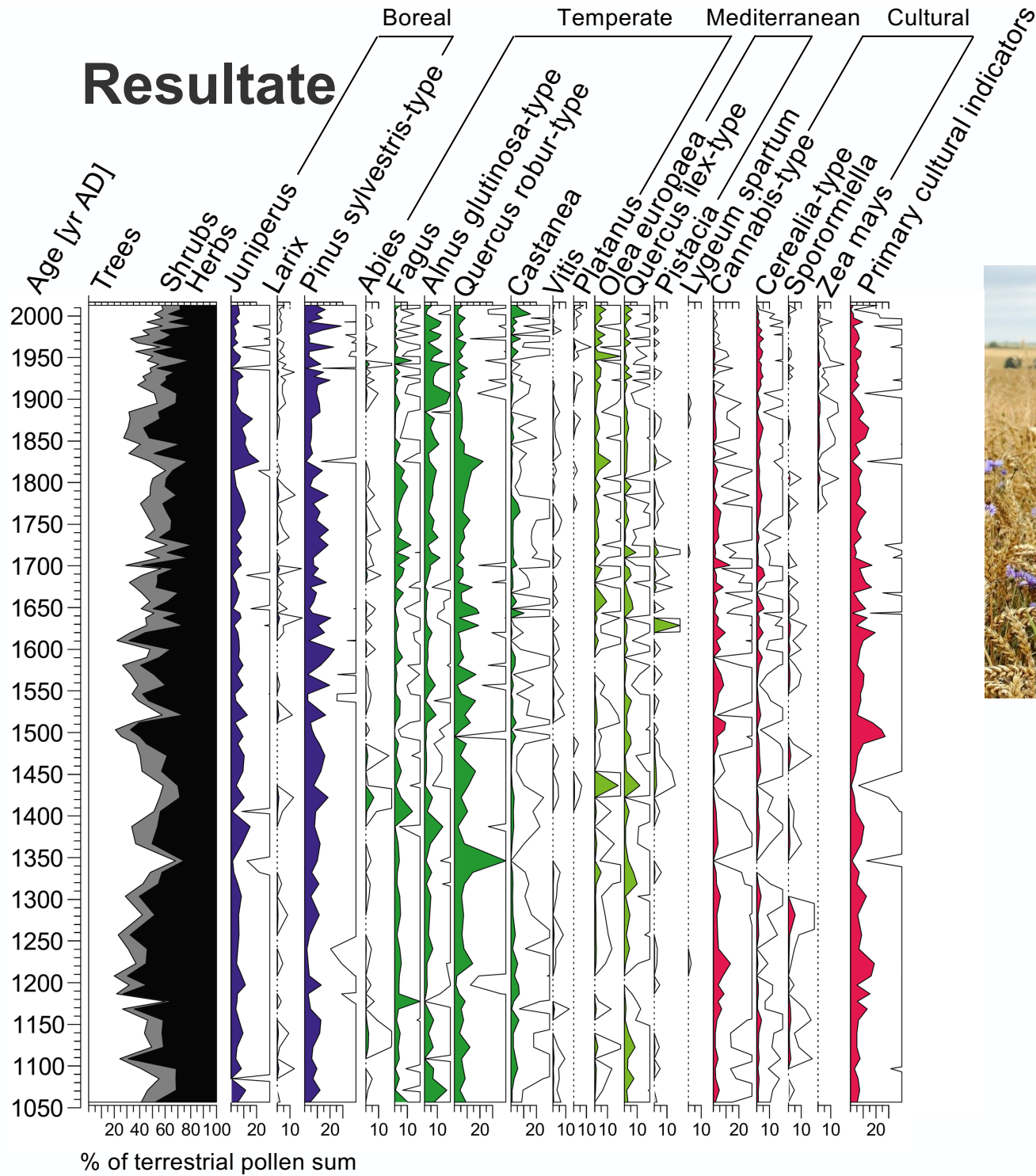
Evergreen oak forest

Resultate

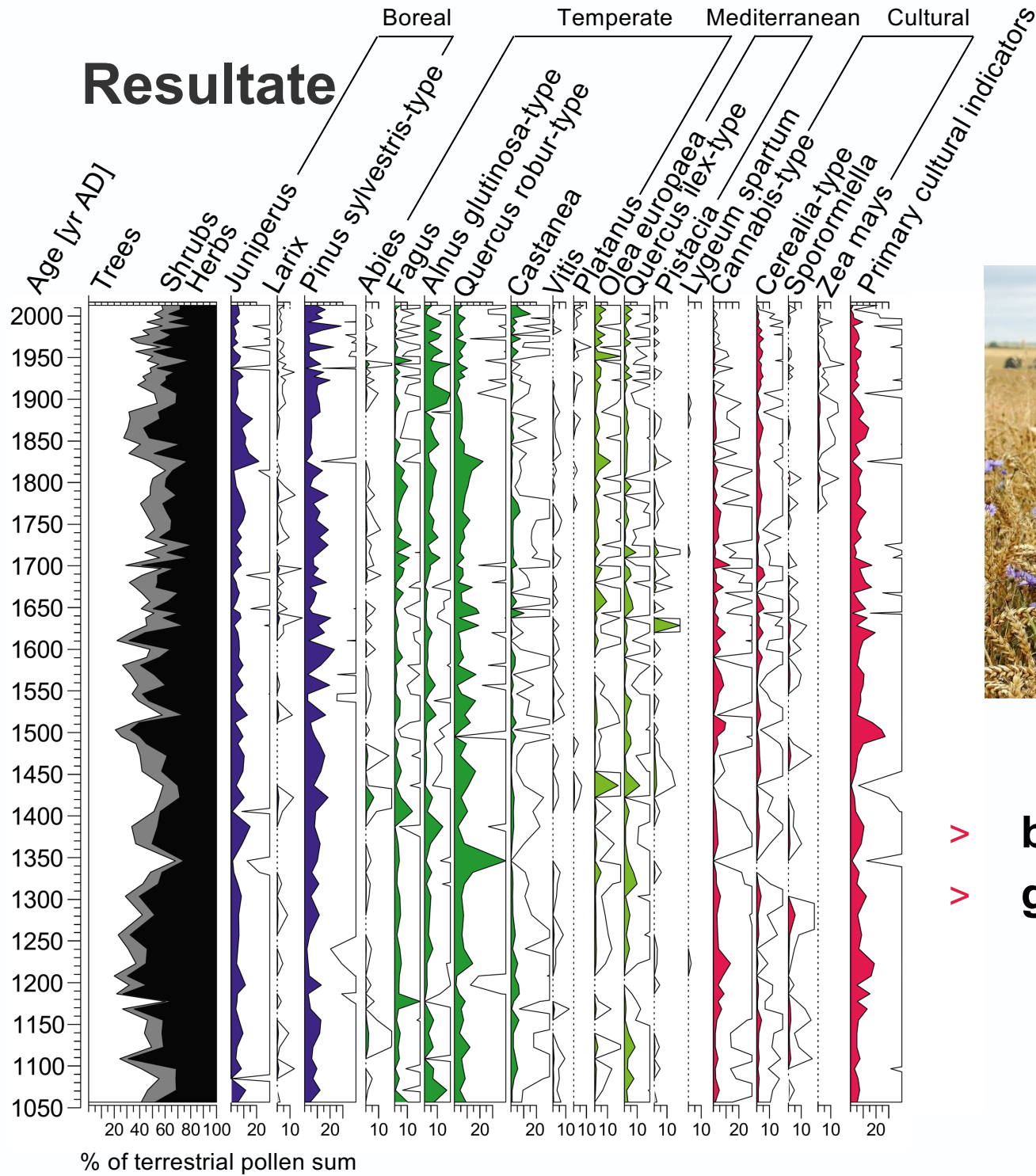


Lygeum spartum (Source: H. Woude)

Resultate

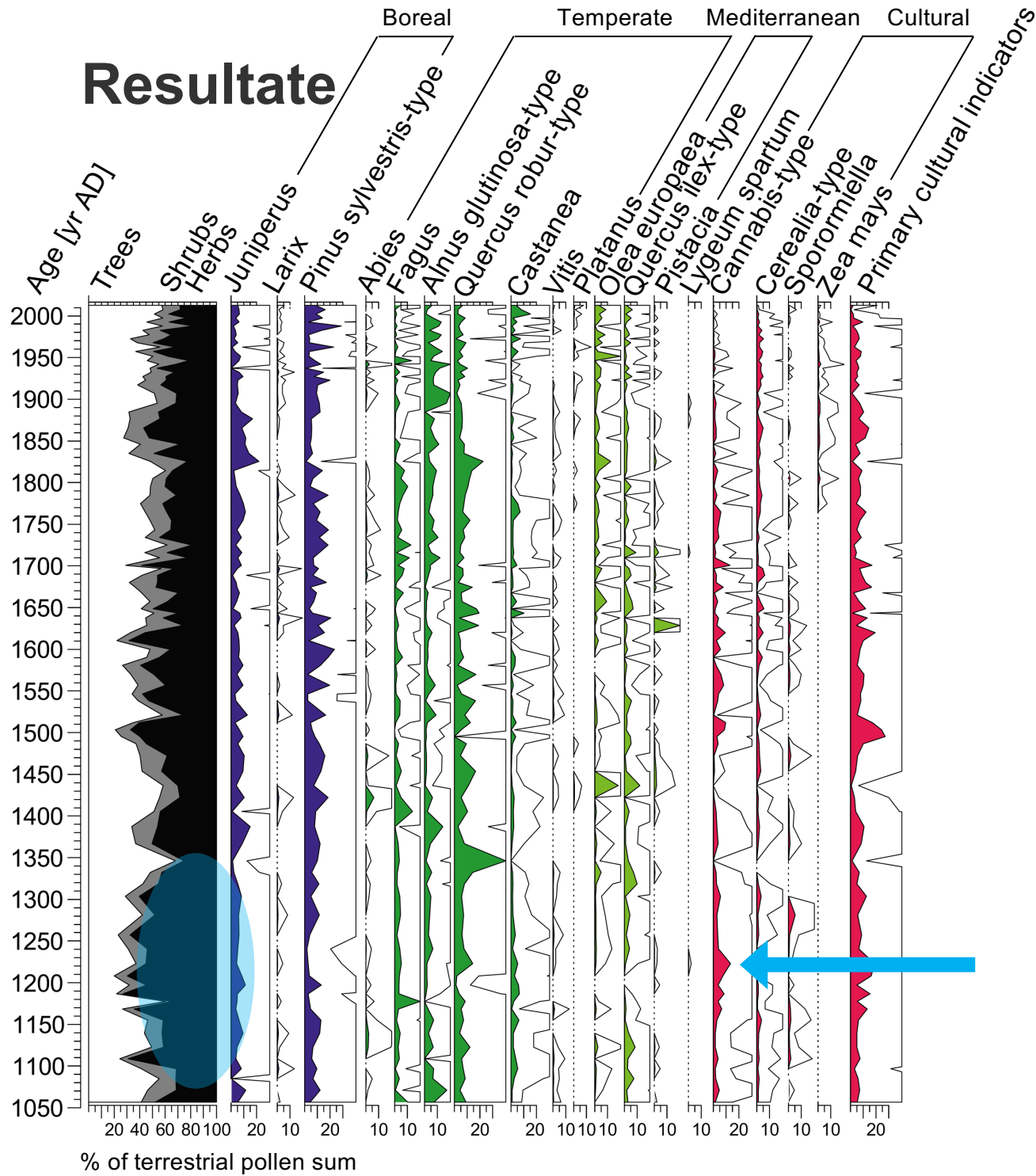


Resultate

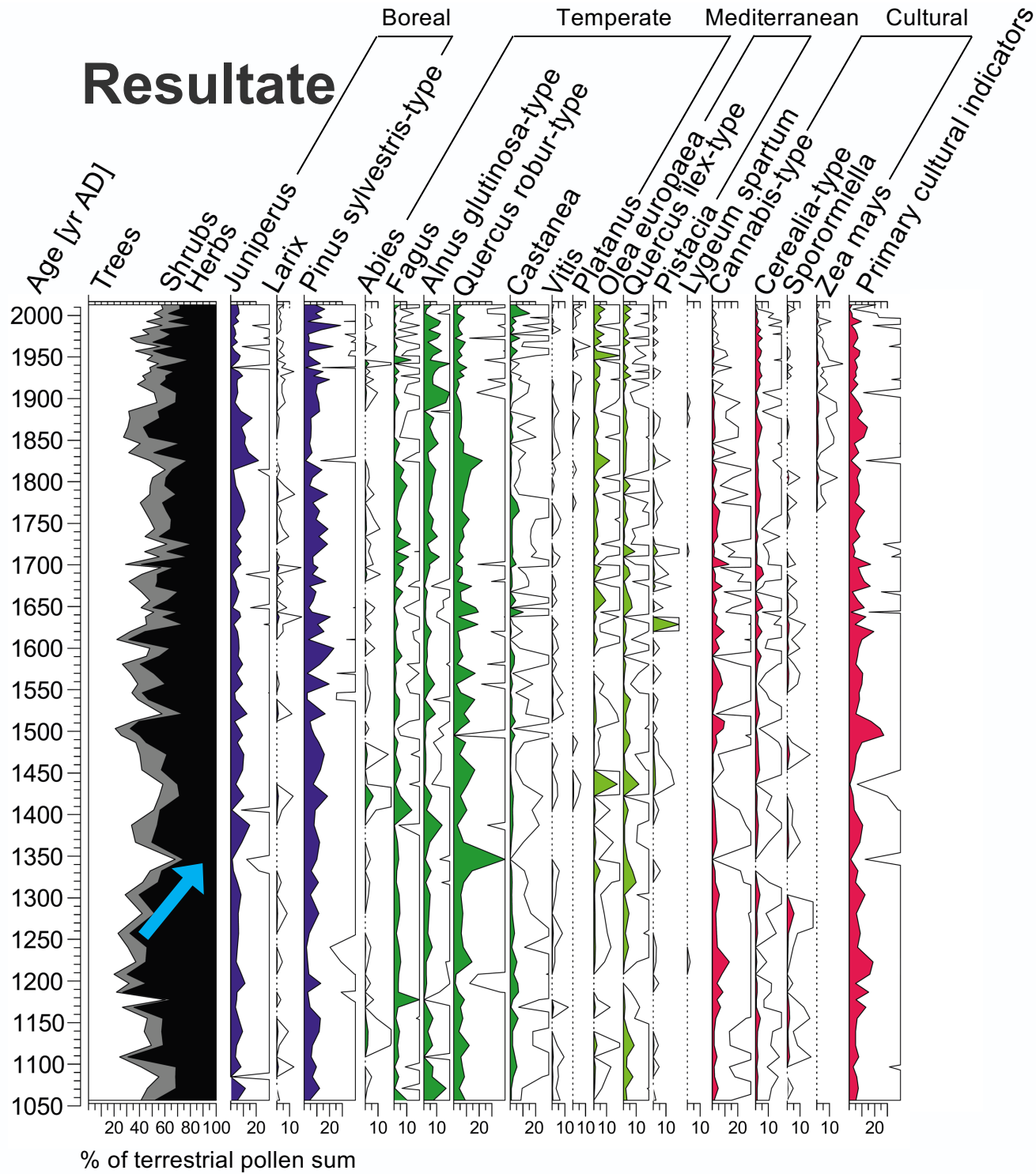


- > **beeindruckende Vielfalt**
- > **grosses Einzugsgebiet**

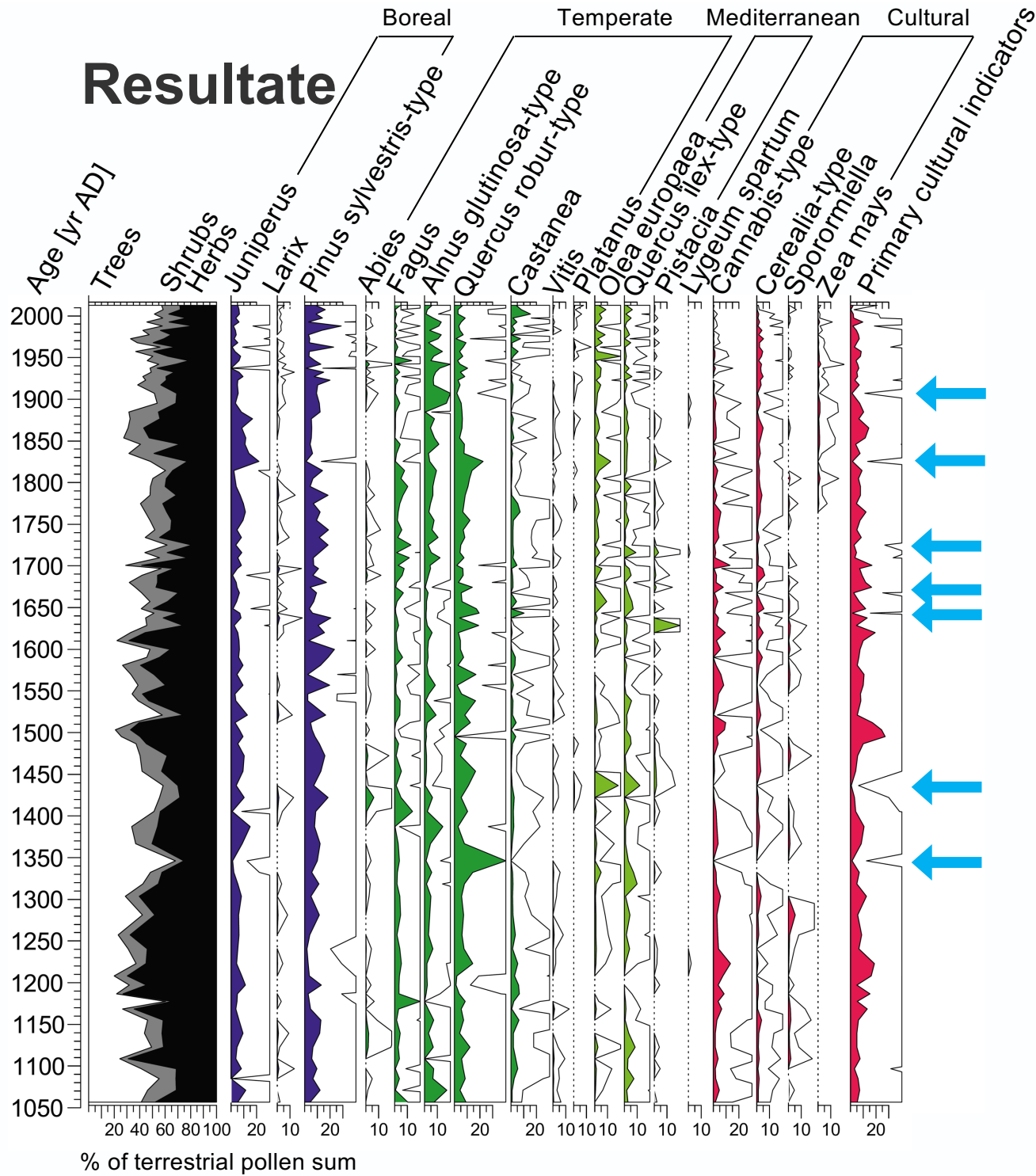
Resultate



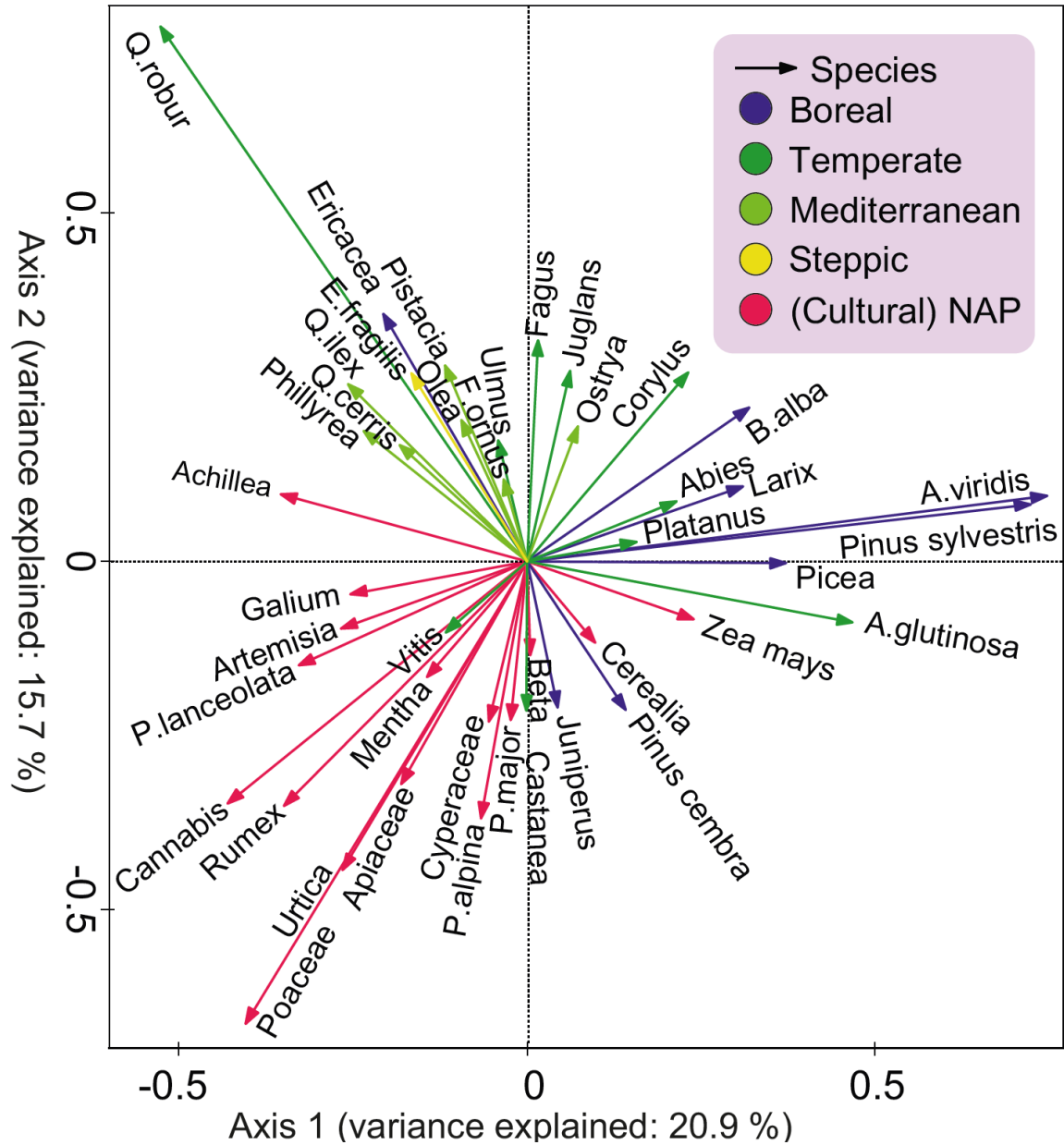
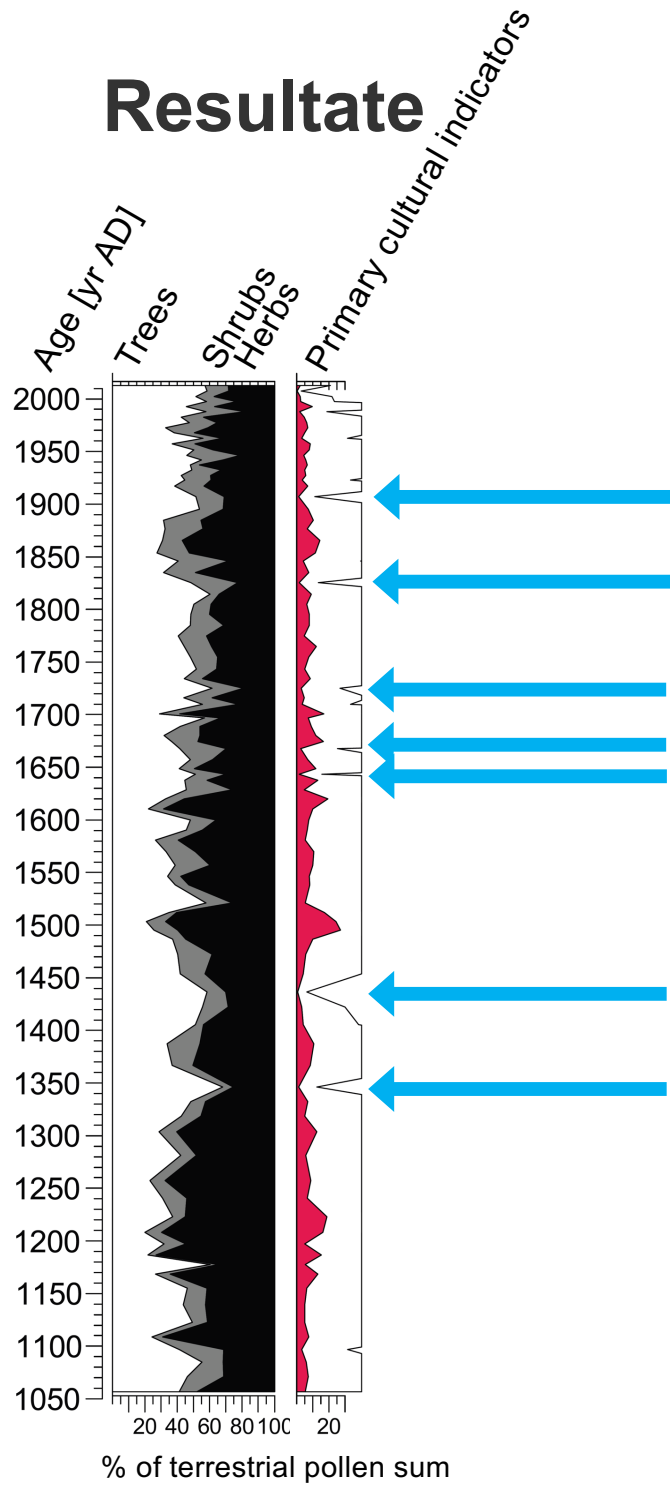
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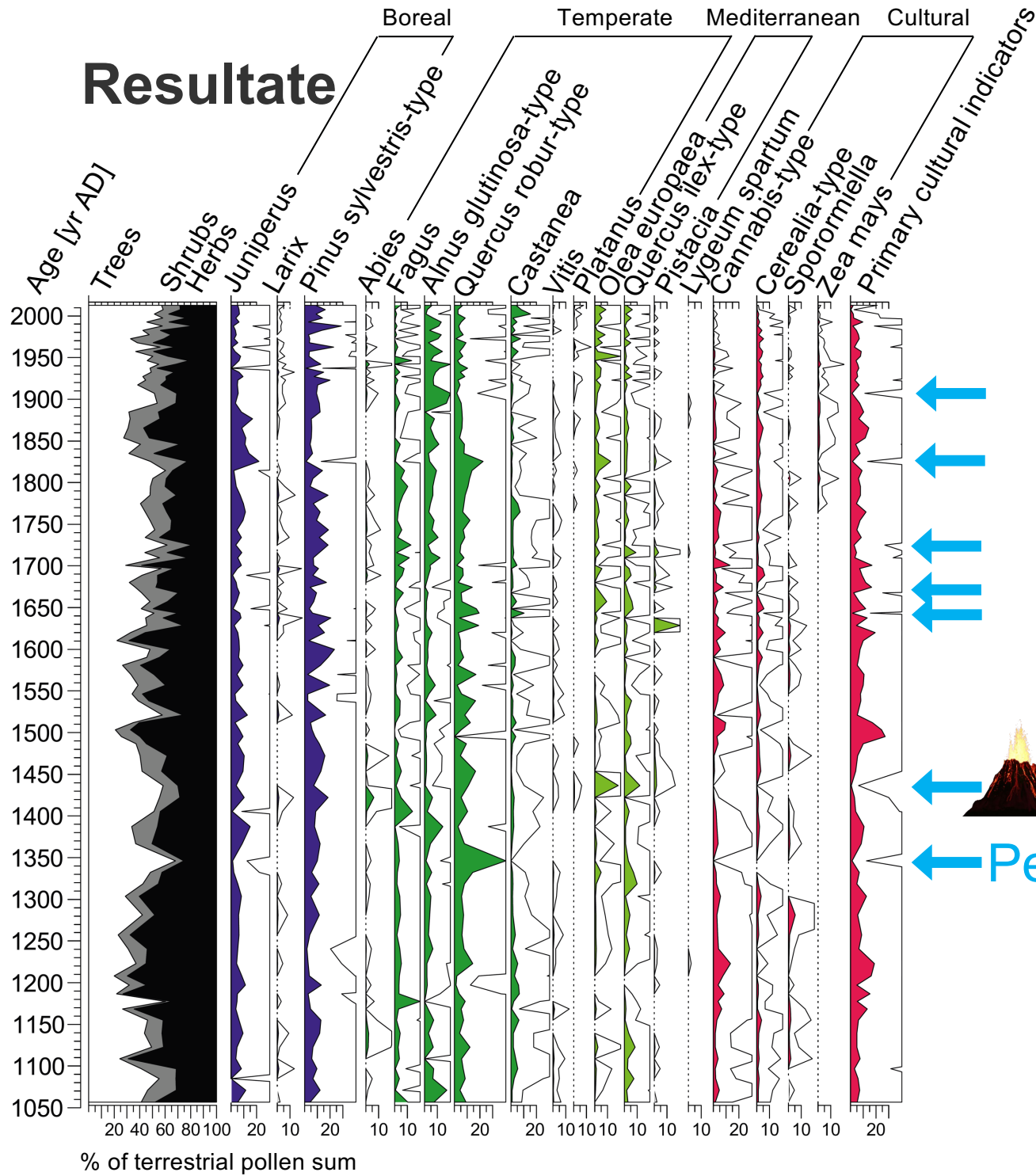
Resultate



Resultate



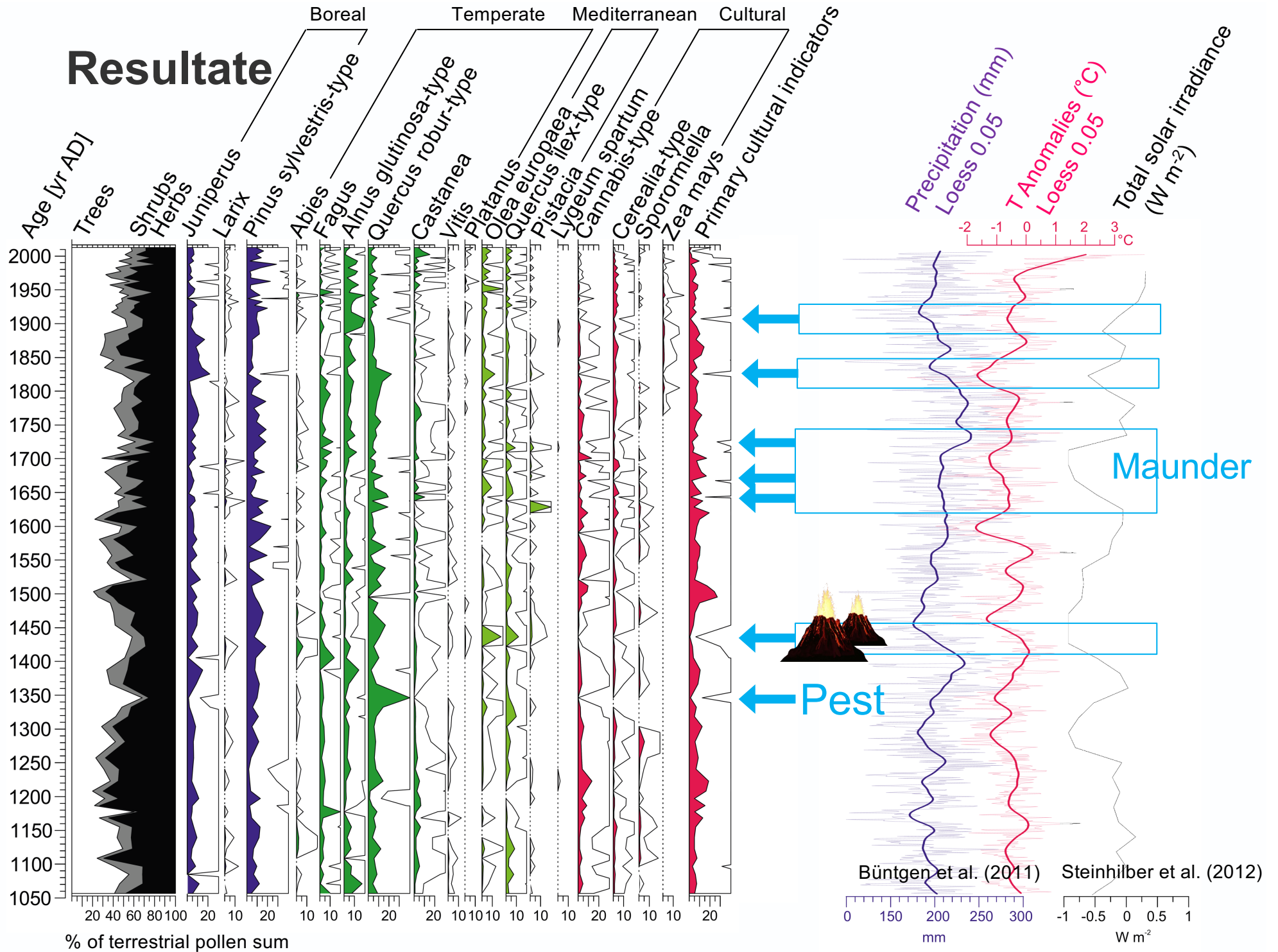
Resultate



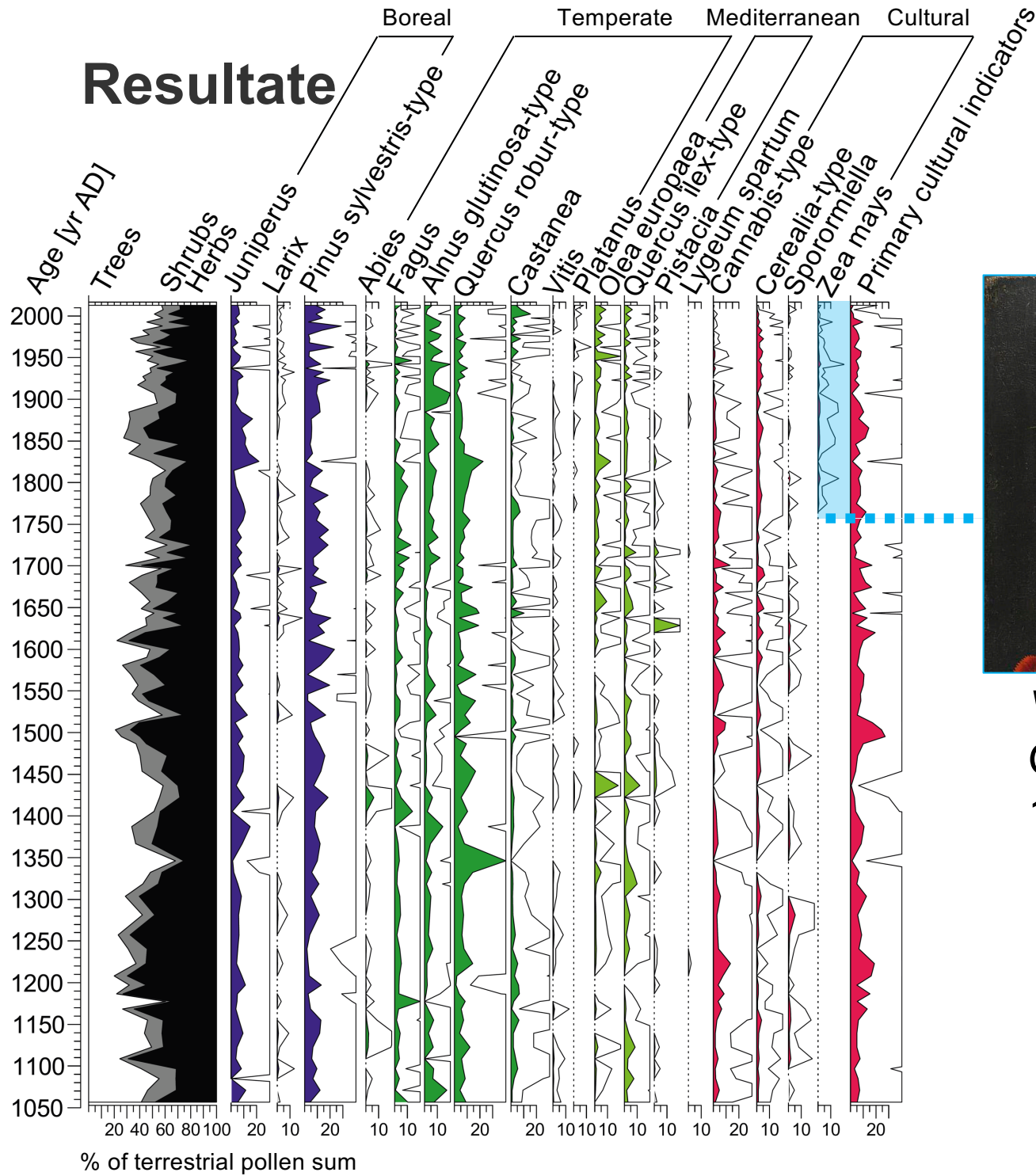
Vulkaneruptionen
1450er

Pest

Resultate

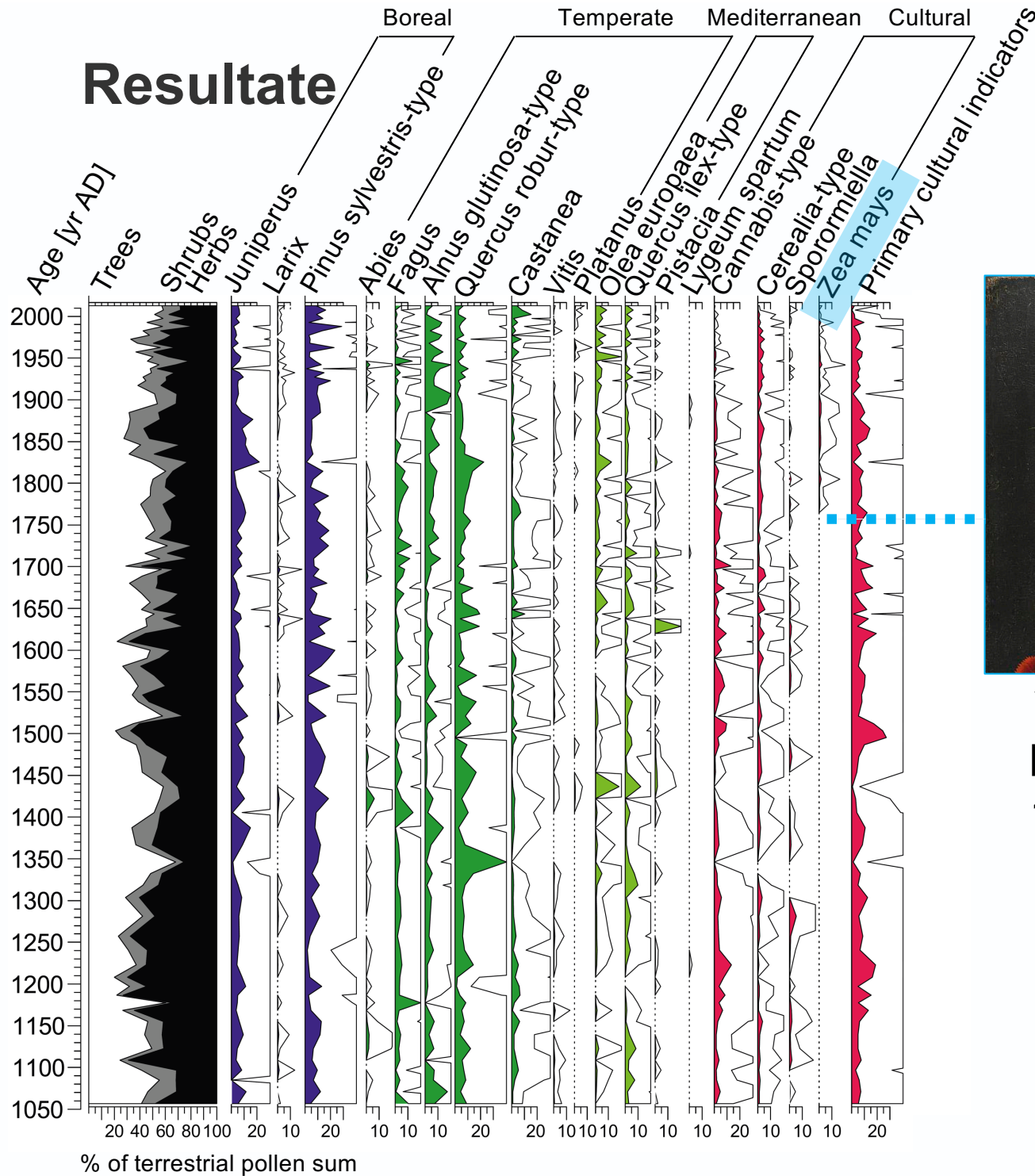


Resultate



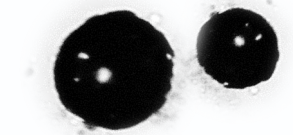
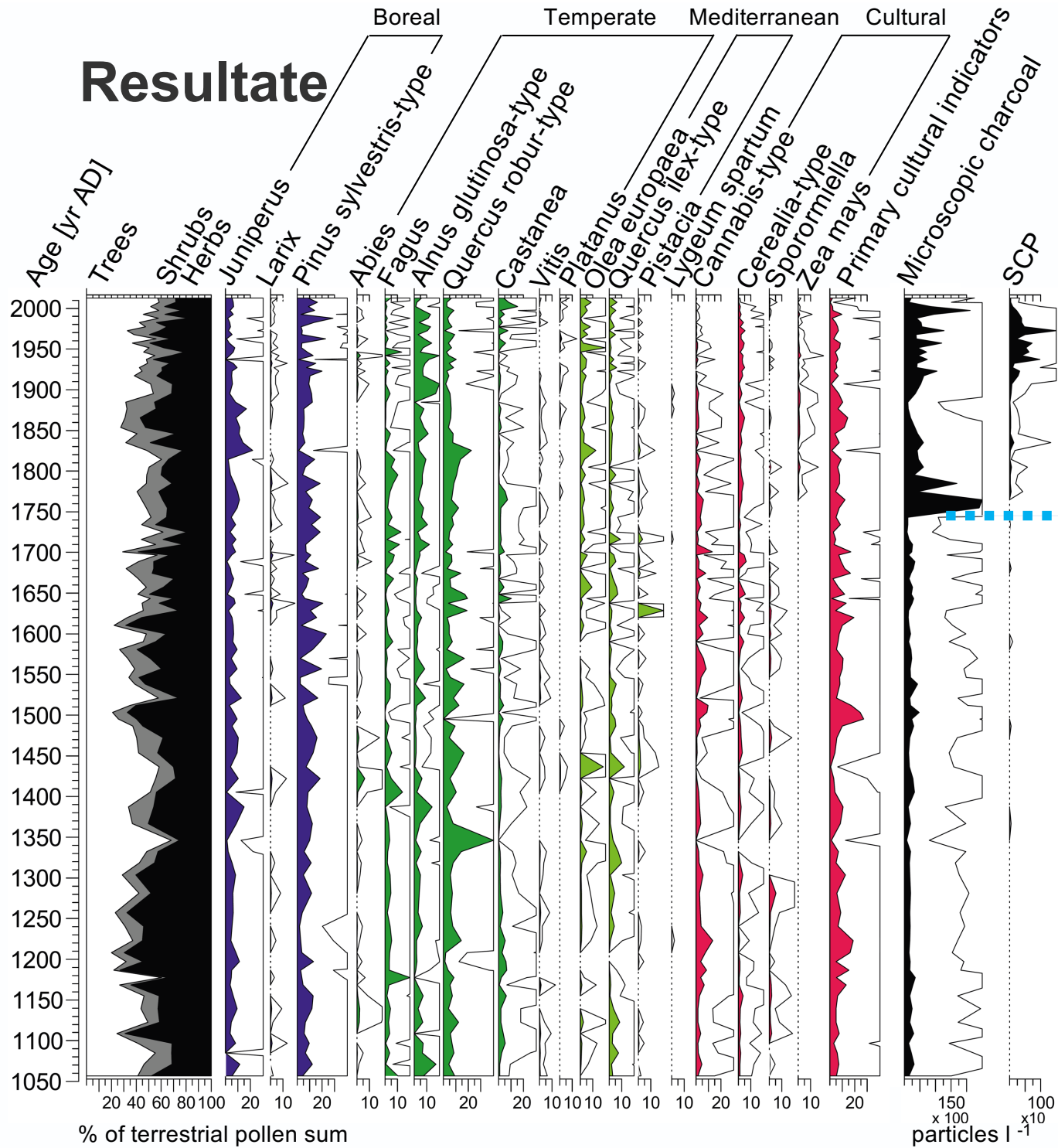
Vertumnus (summer)
Giuseppe Arcimboldo
1590-1591

Resultate



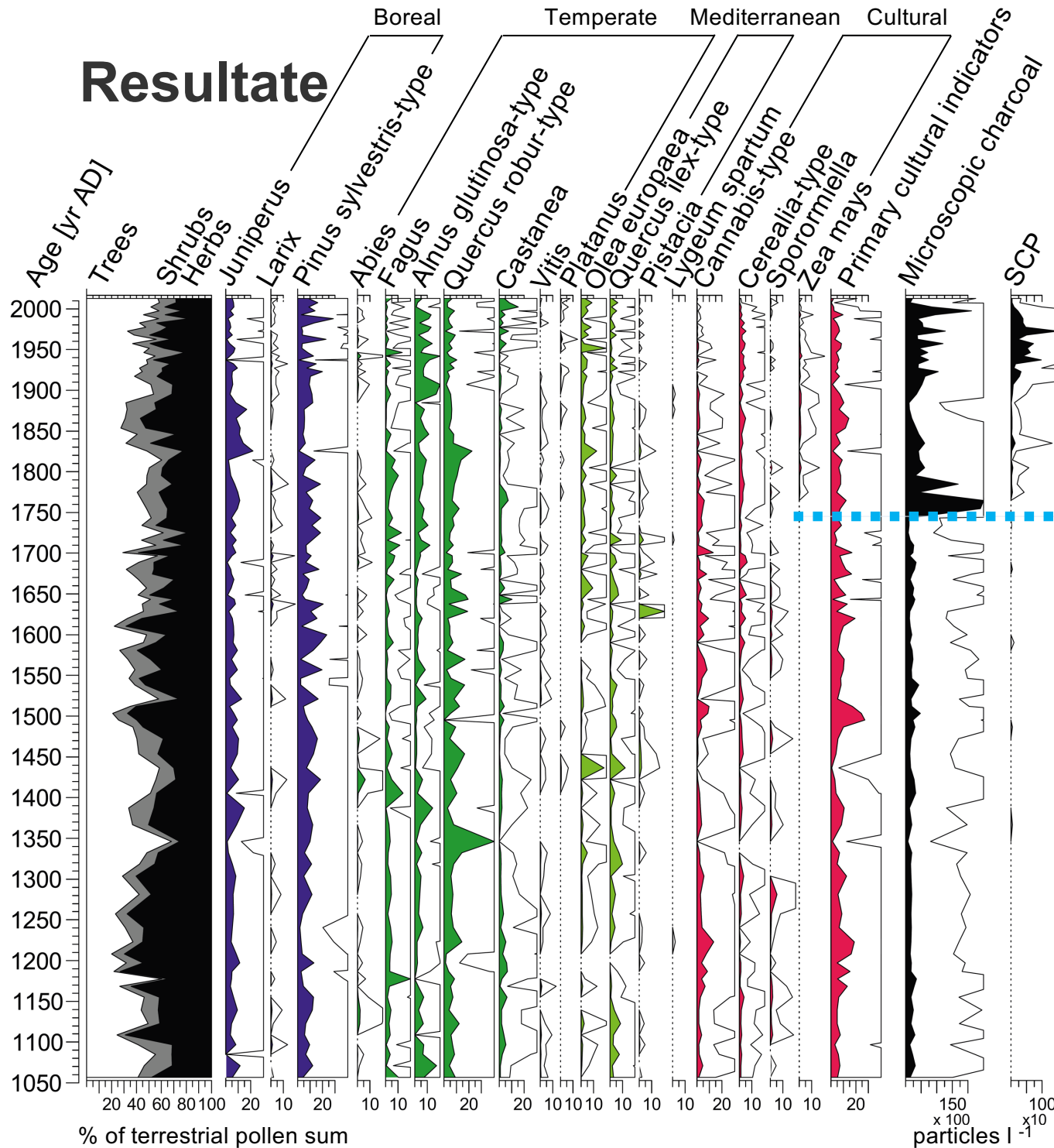
Vertumnus (summer)
by Giuseppe Arcimboldo
1590-1591

Resultate



1750 AD

Resultate

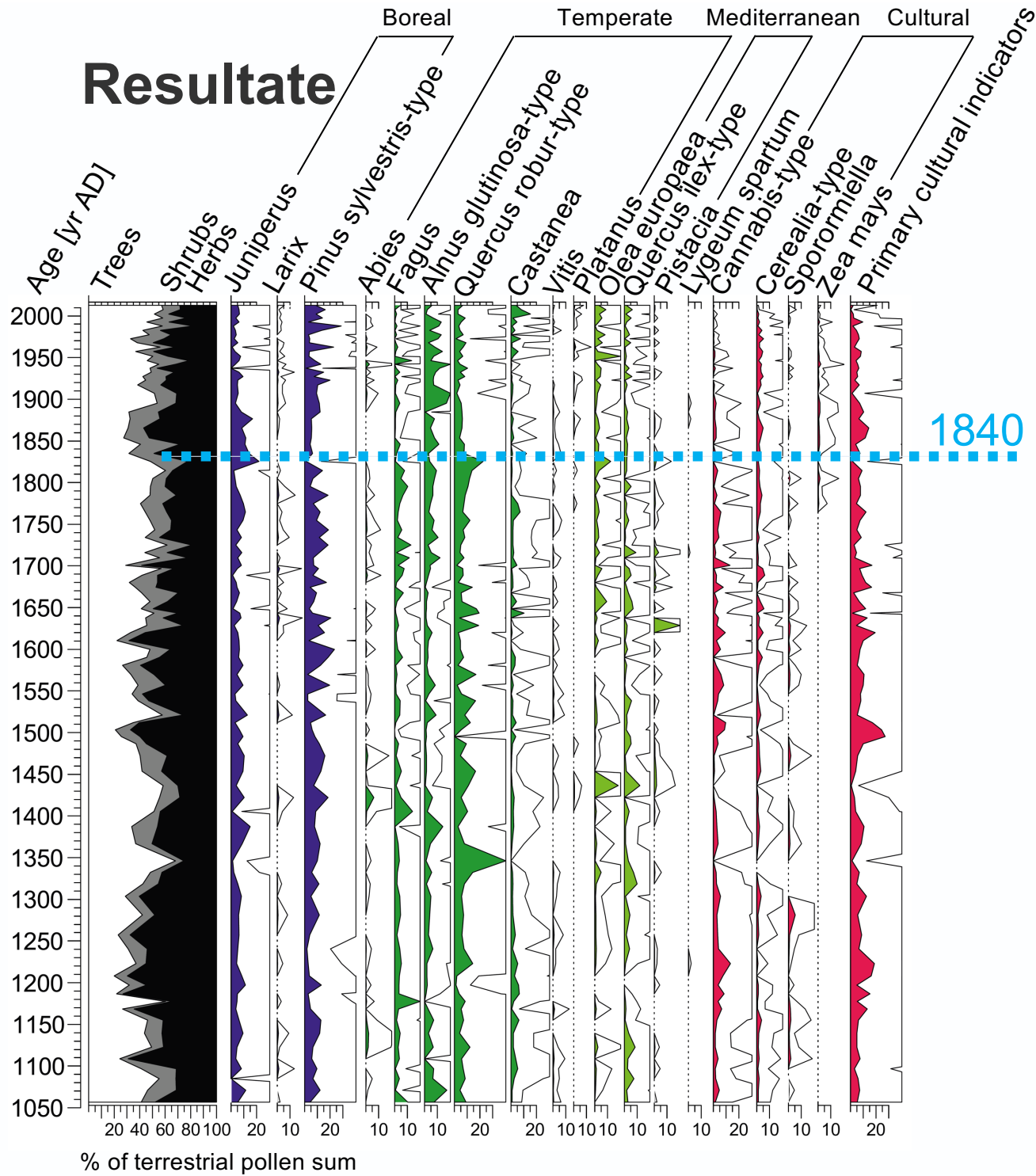


1750 AD



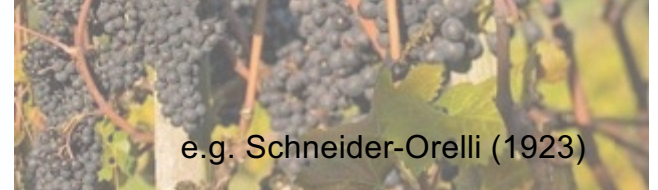
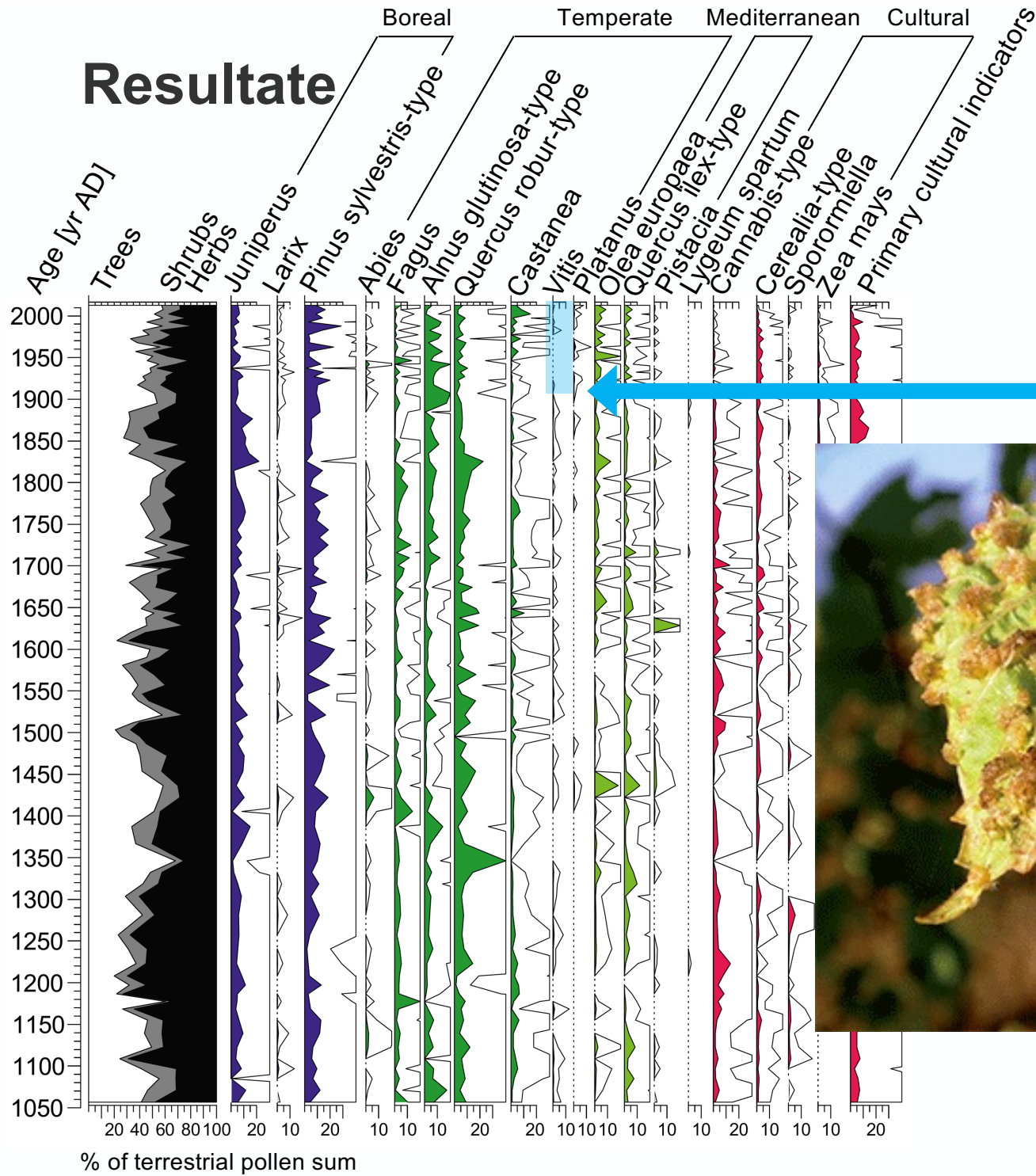
**vor-1750 AD als
Baseline für
vorindustrielle
Bedingungen**

Resultate



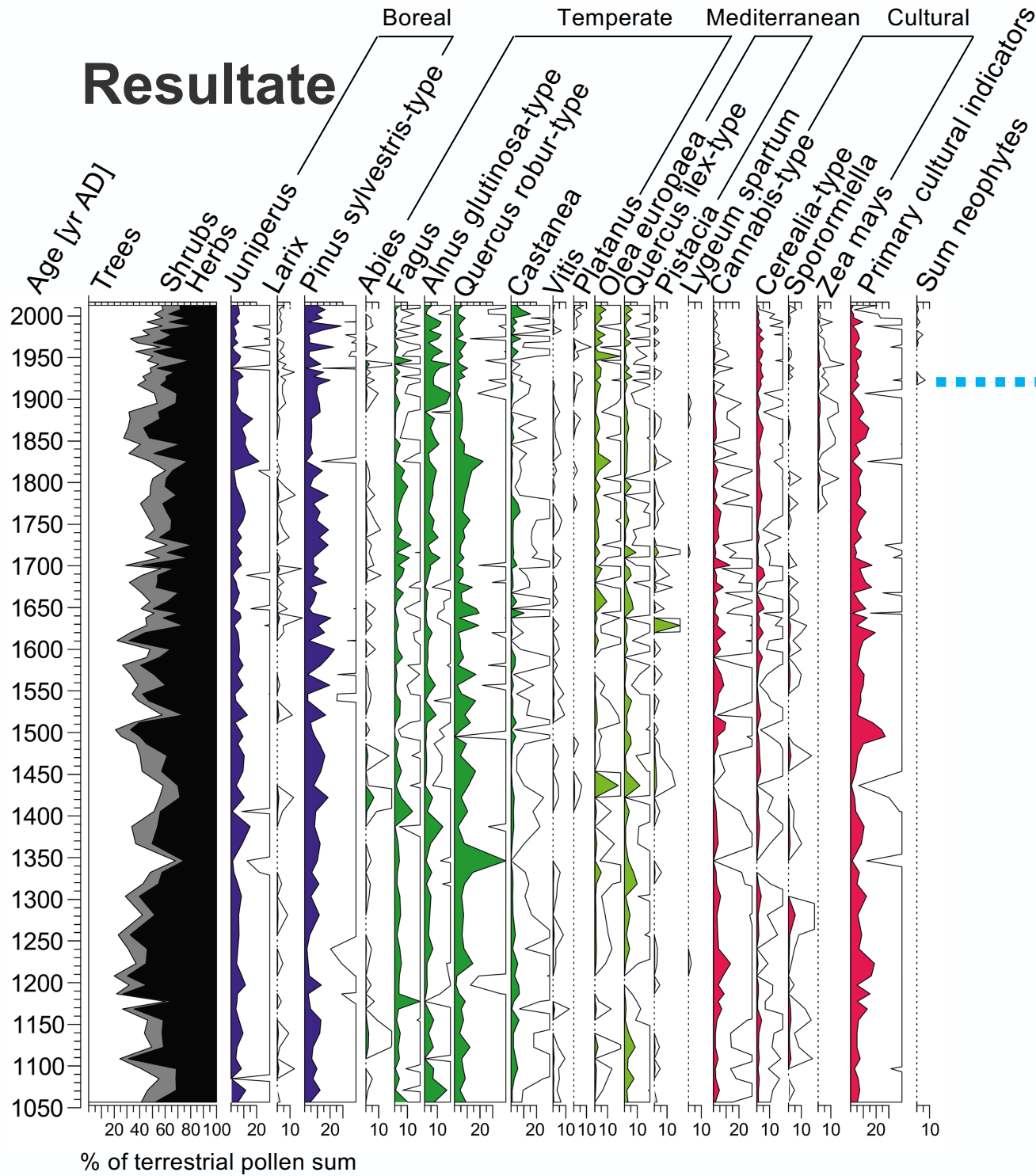
1840 Industrialisierung CH
Waldrodungen

Resultate



e.g. Schneider-Orelli (1923)

Resultate

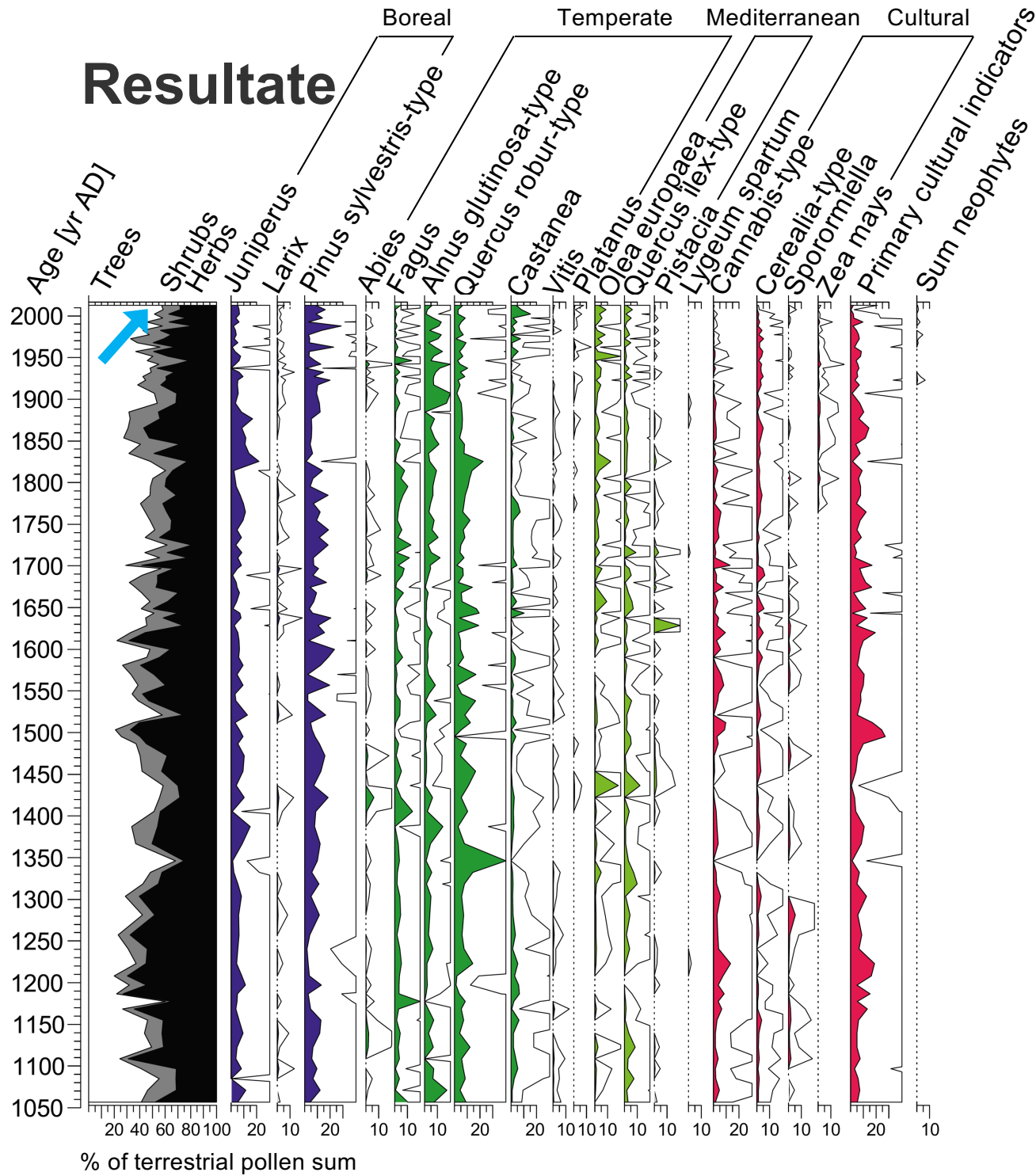


..... Neophytenausbreitung



e.g. *Fallopia japonica*

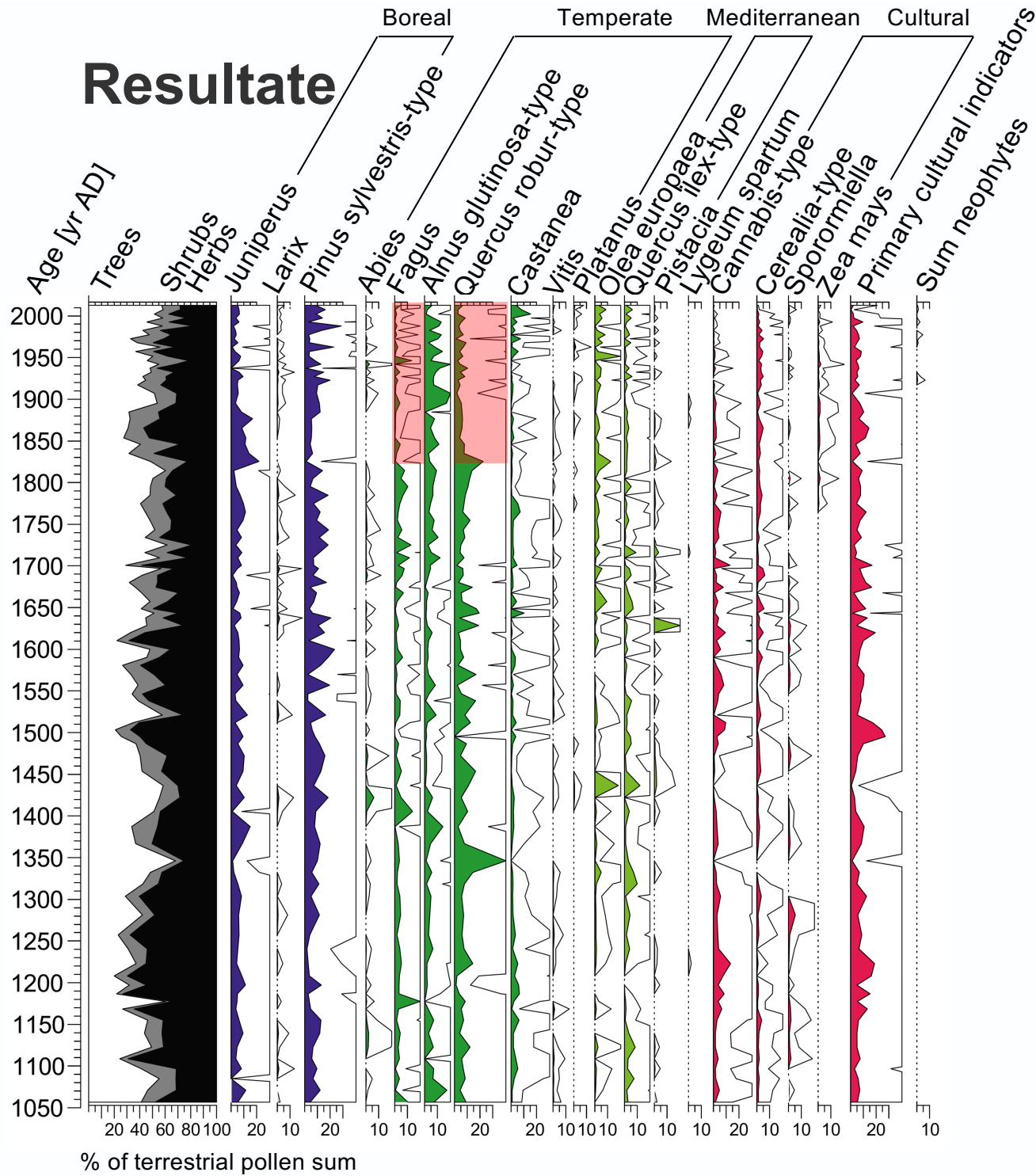
Resultate



aufgegeben

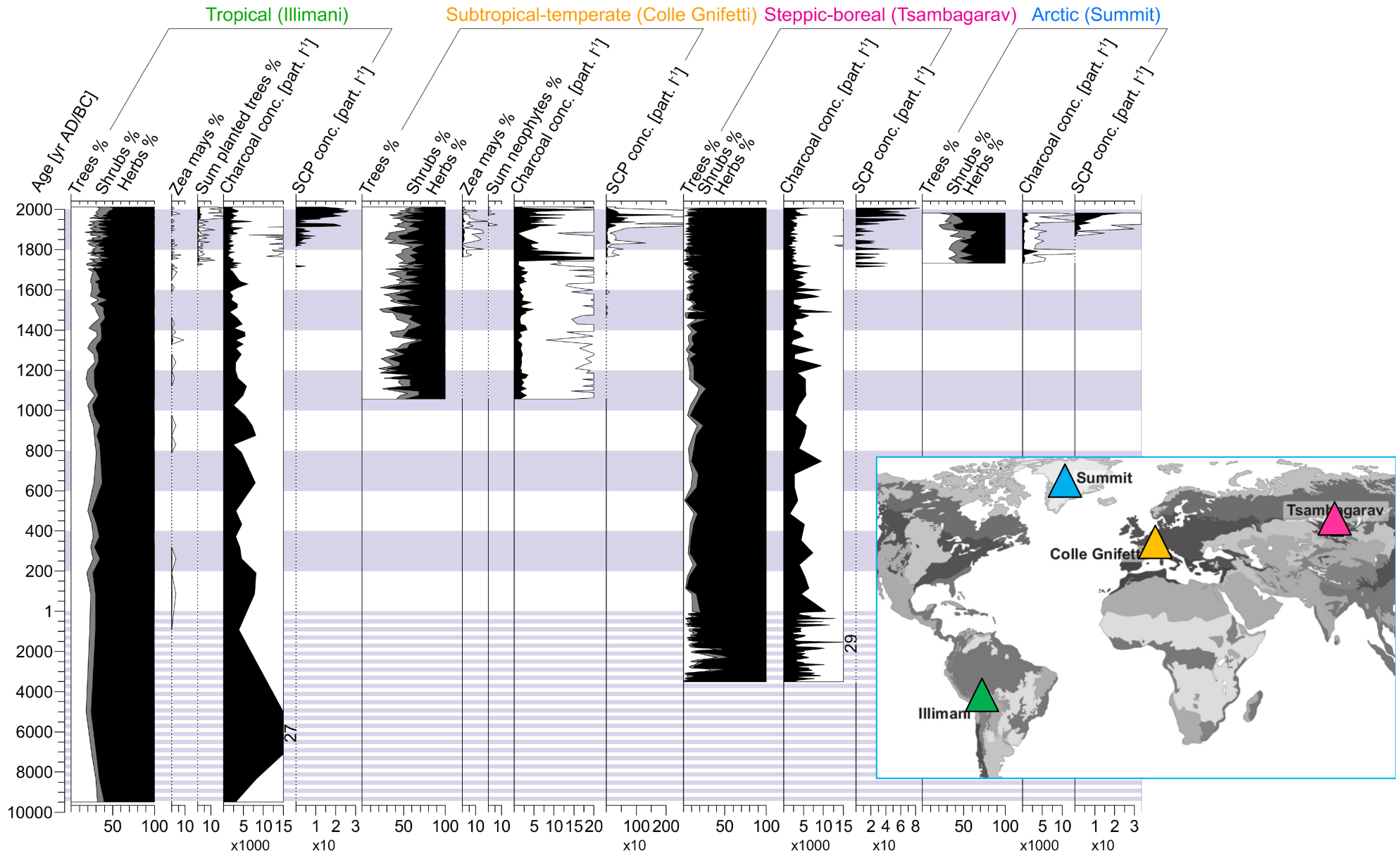
Berghänge

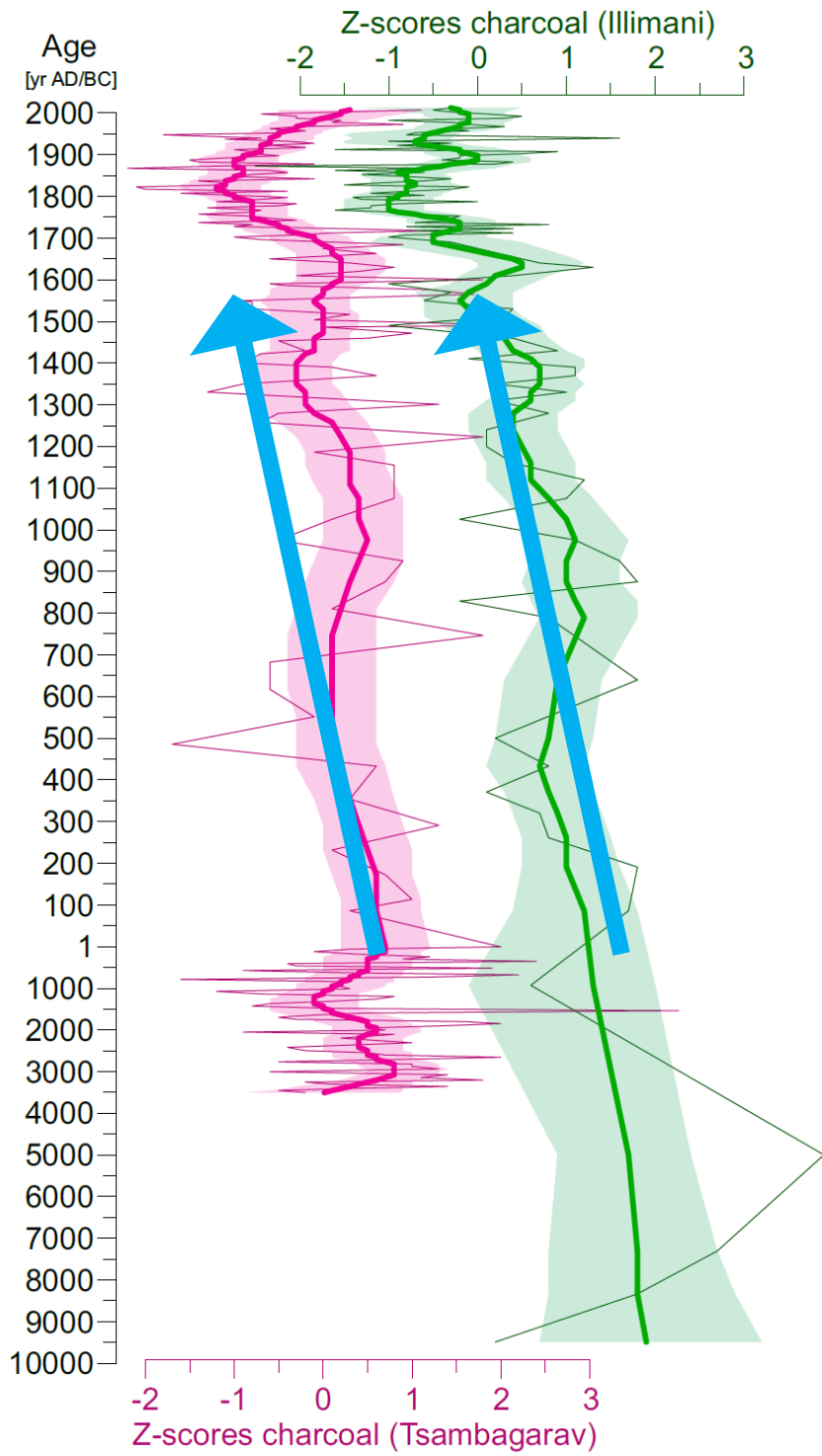
Resultate



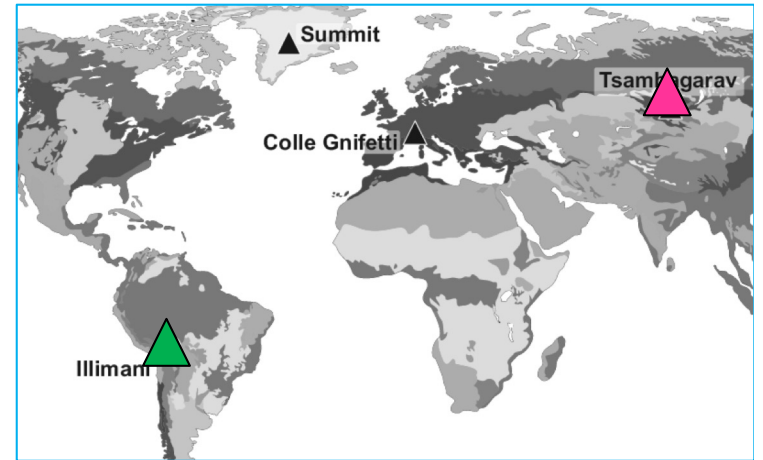
1. Europäische Landnutzung

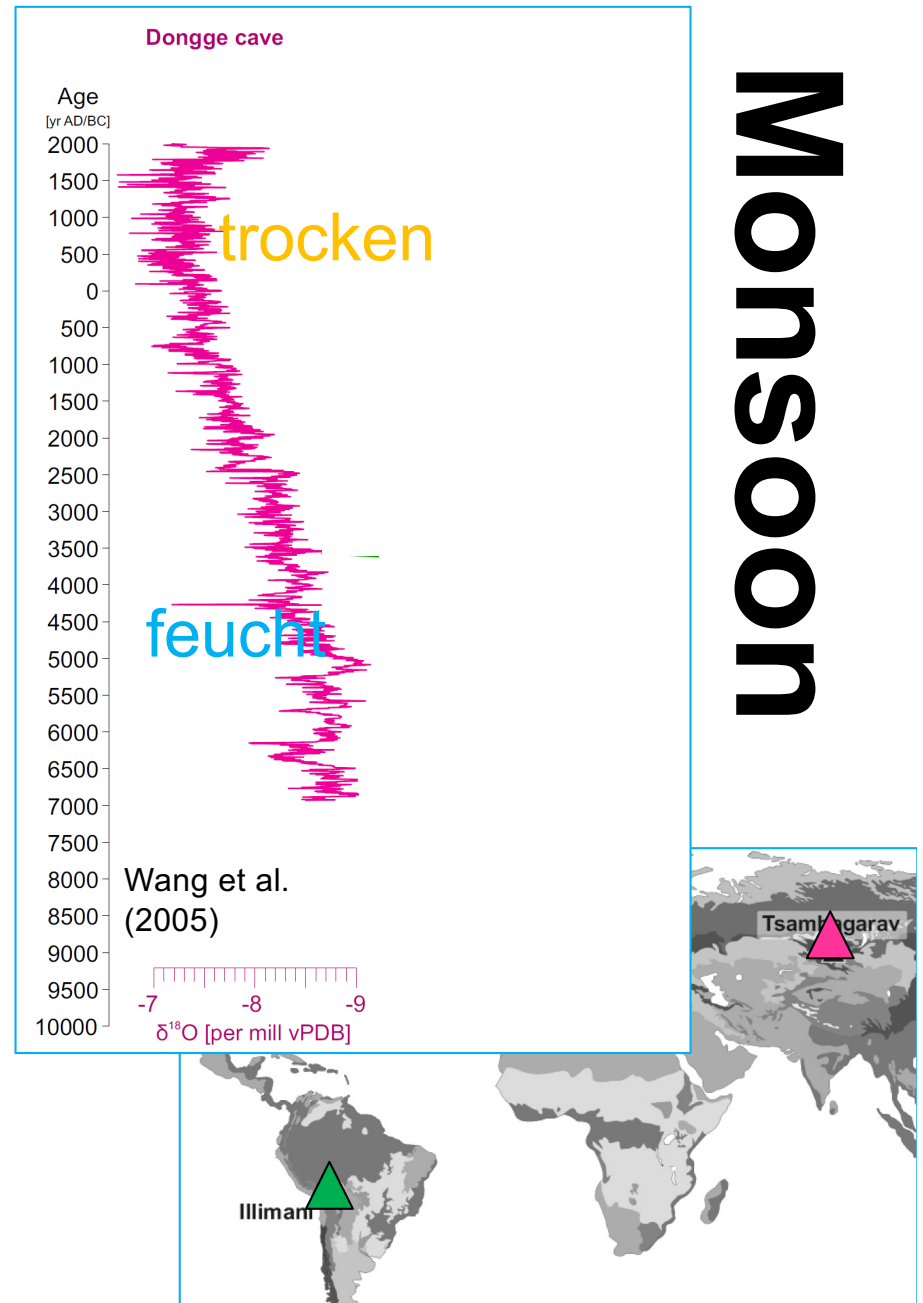
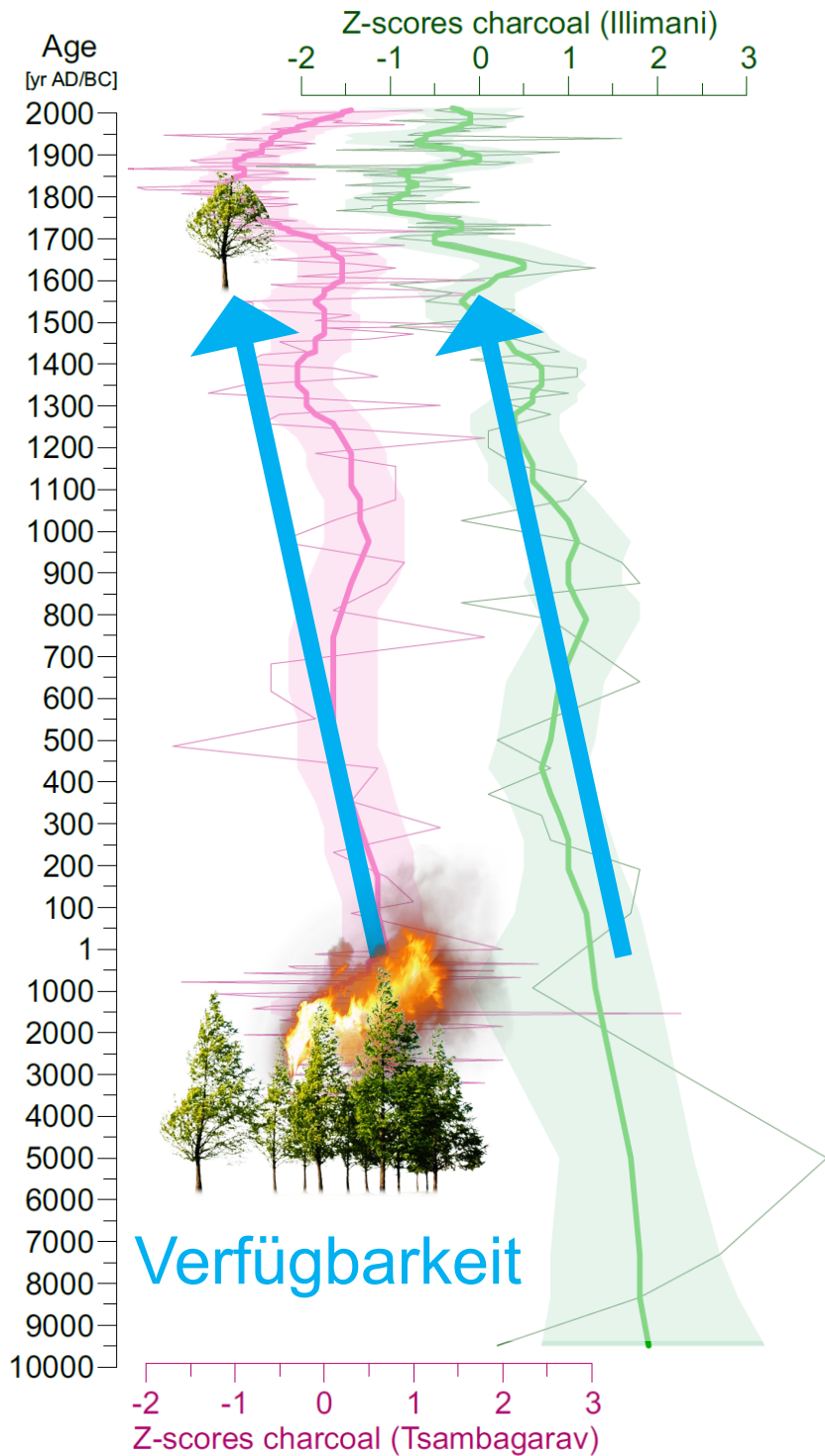
2. Globale Feuergeschichte

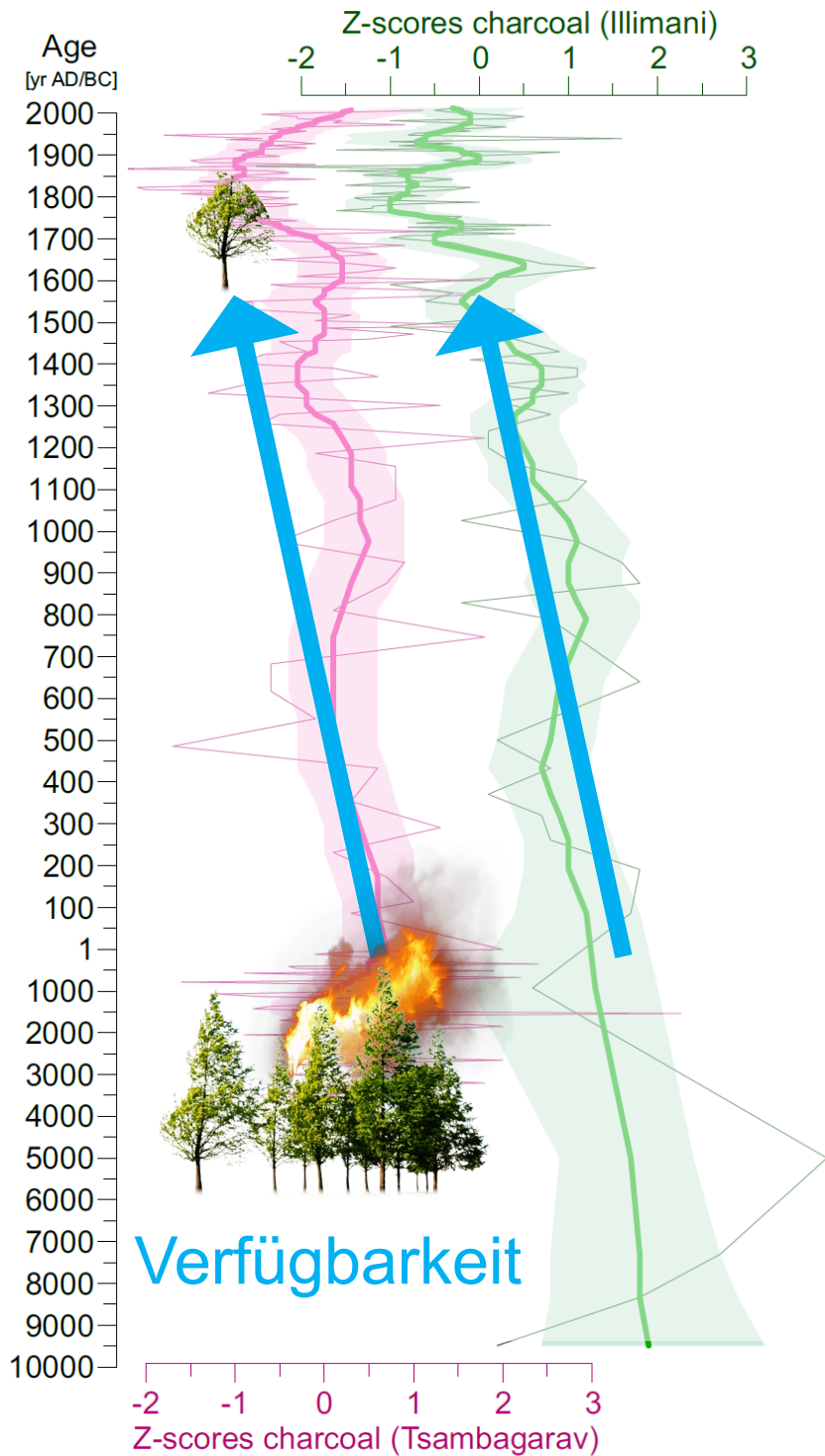




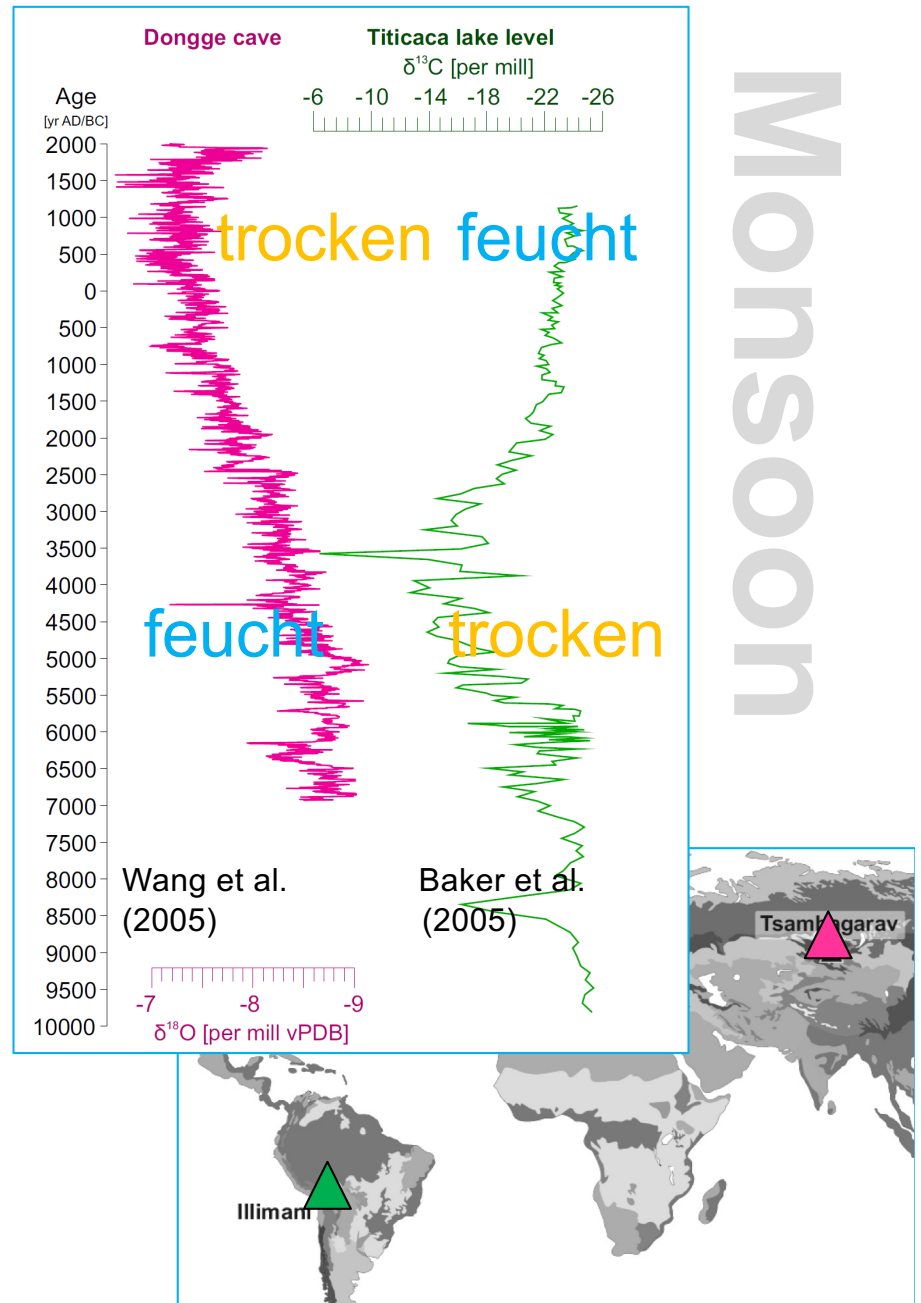
Feueraktivität

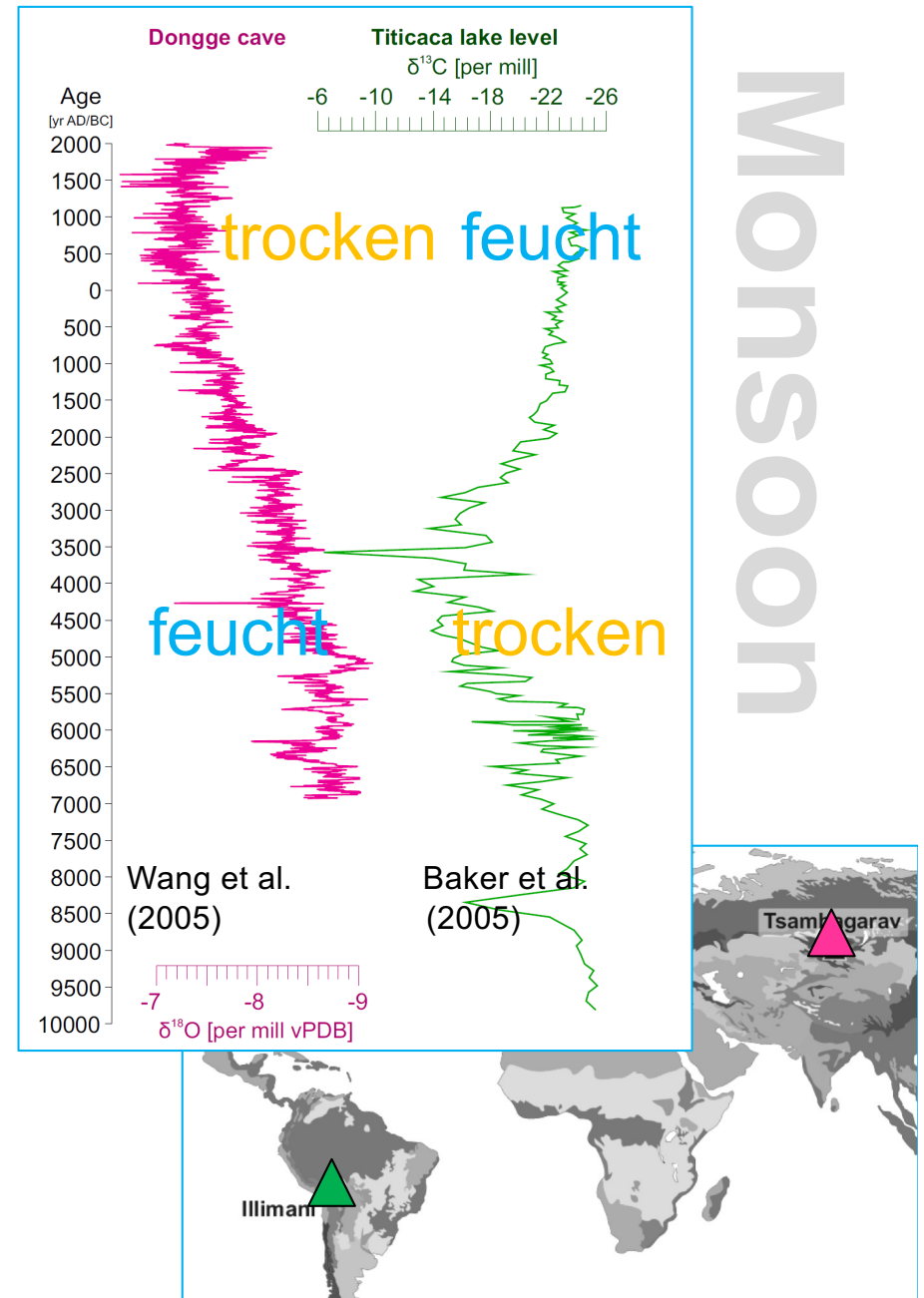
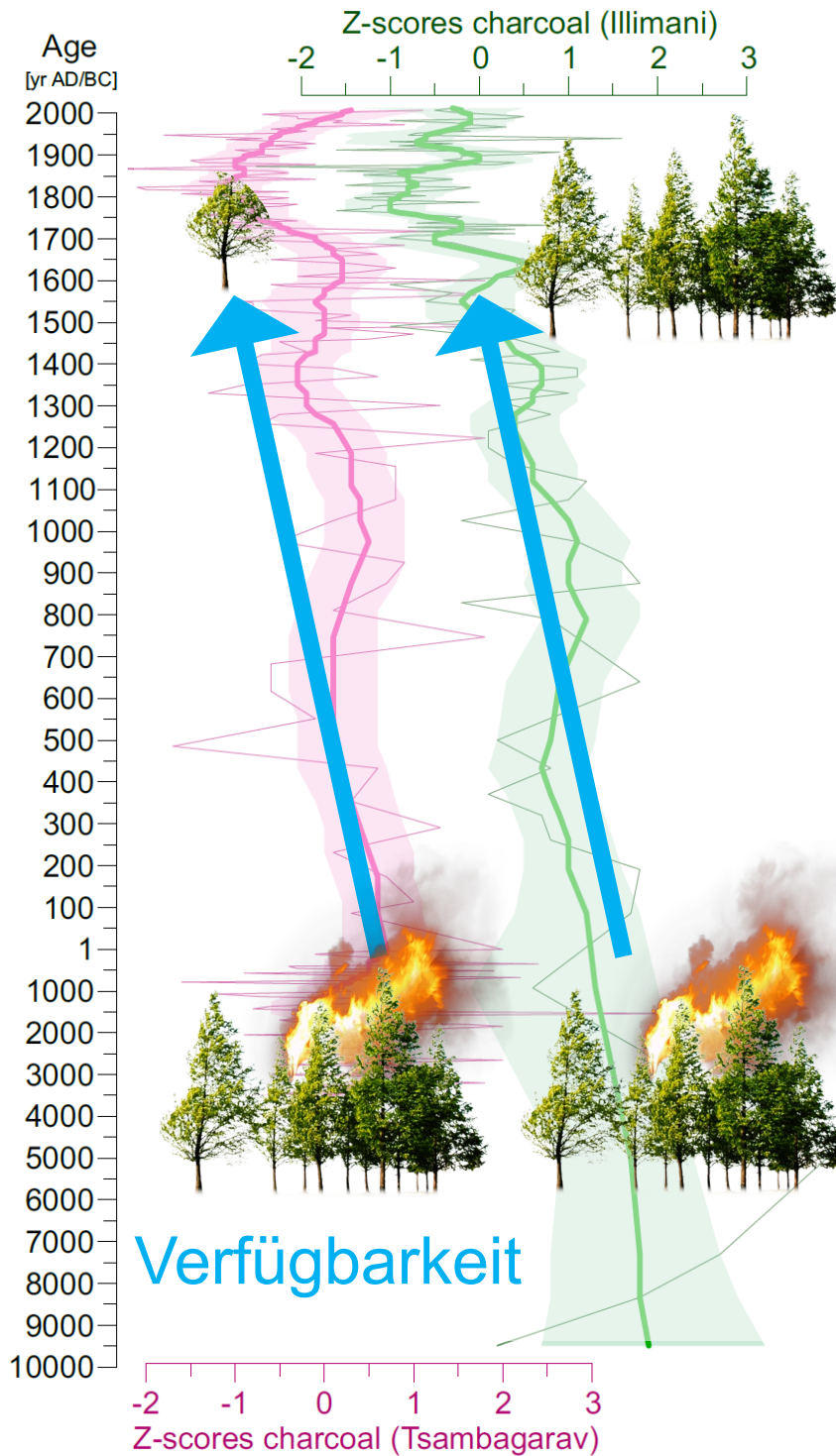


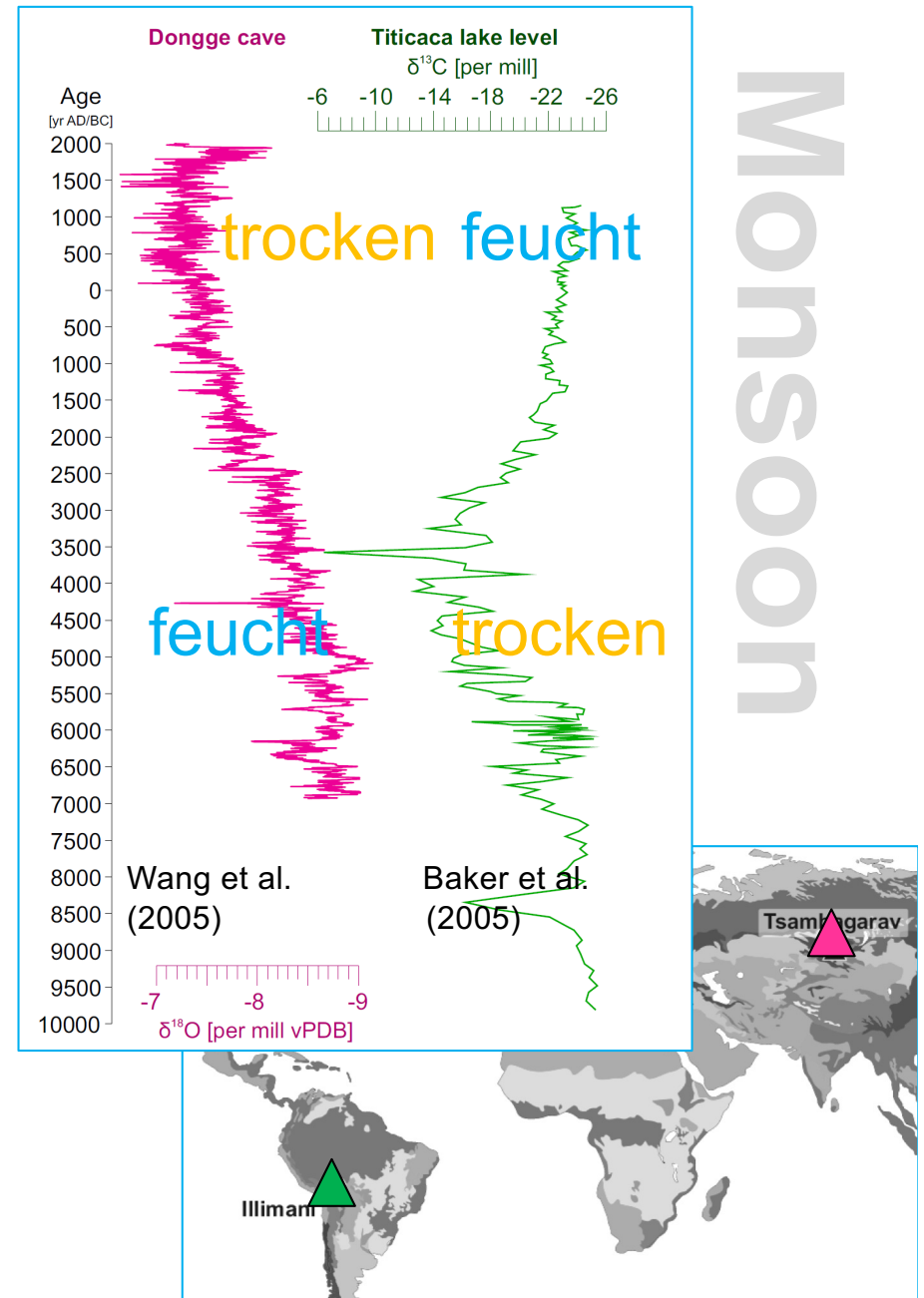
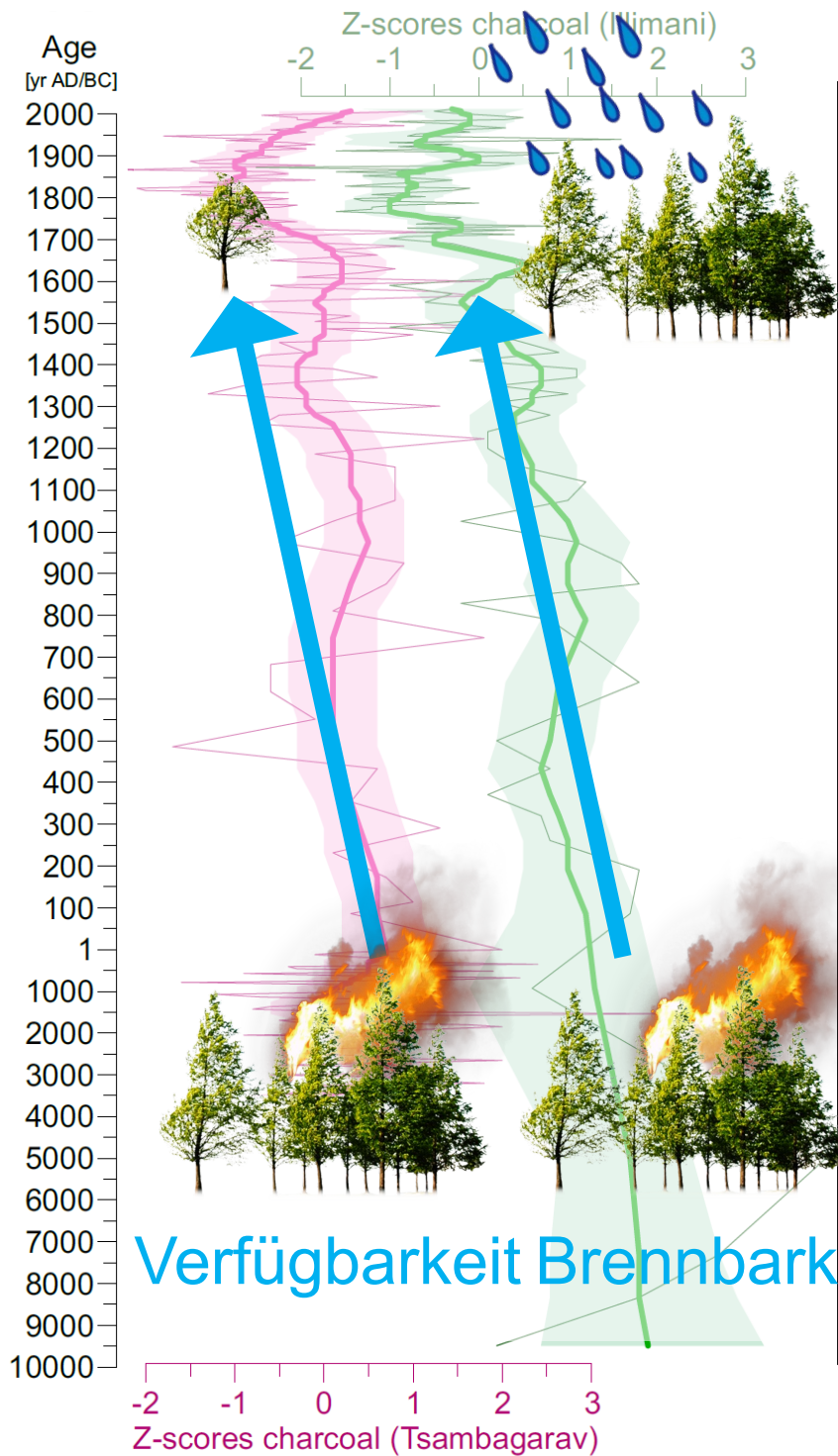




Feueraktivität

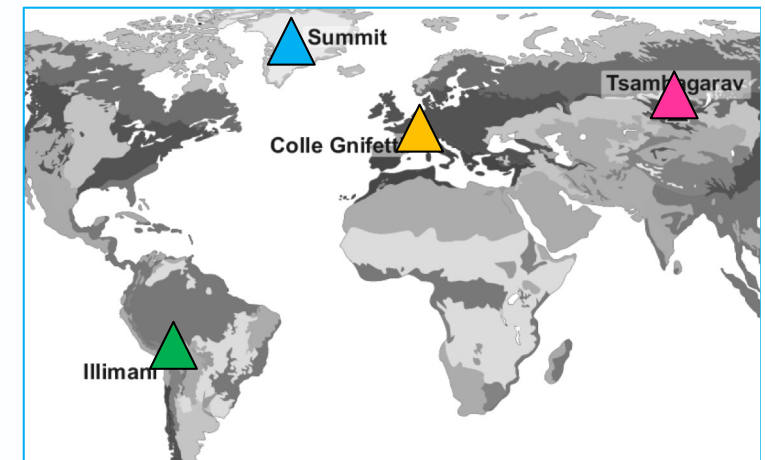






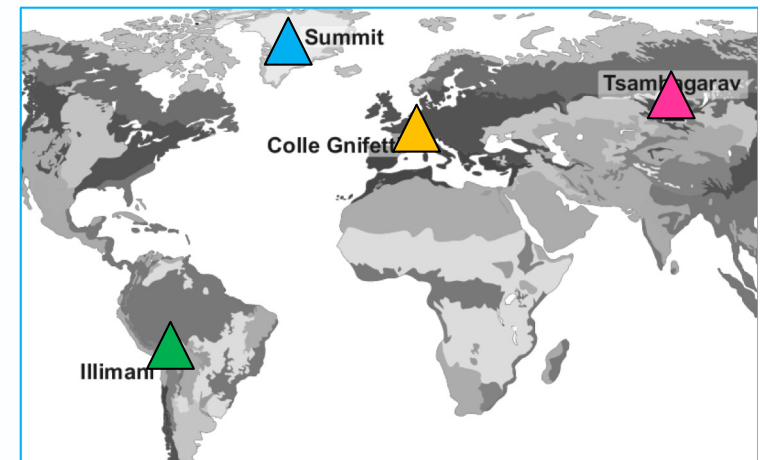
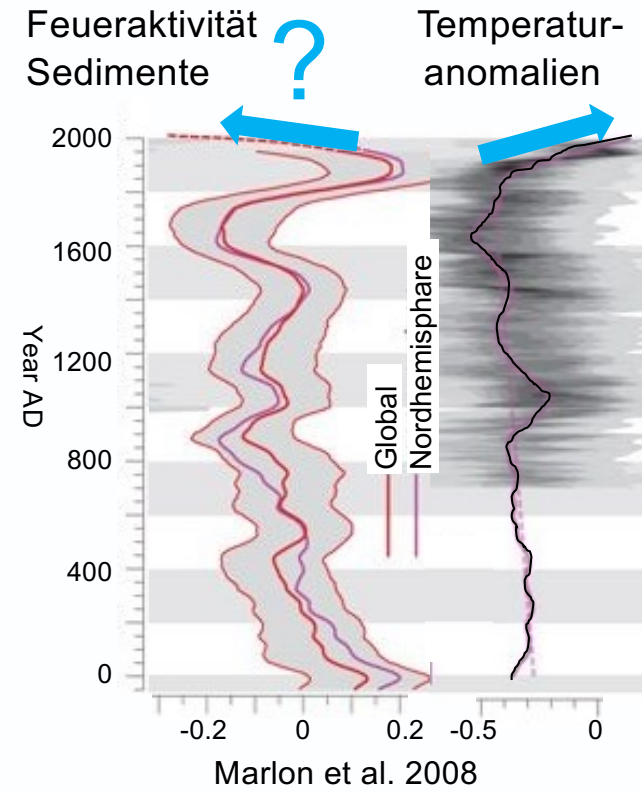
Globale Feuergeschichte

> Feueraktivität vs. Klima



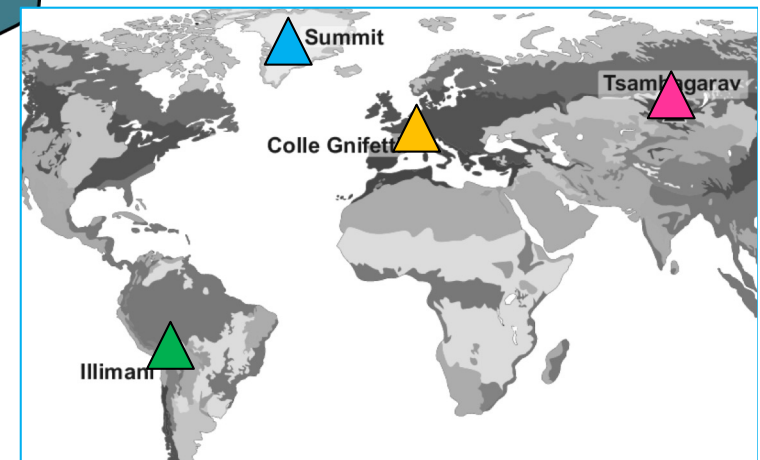
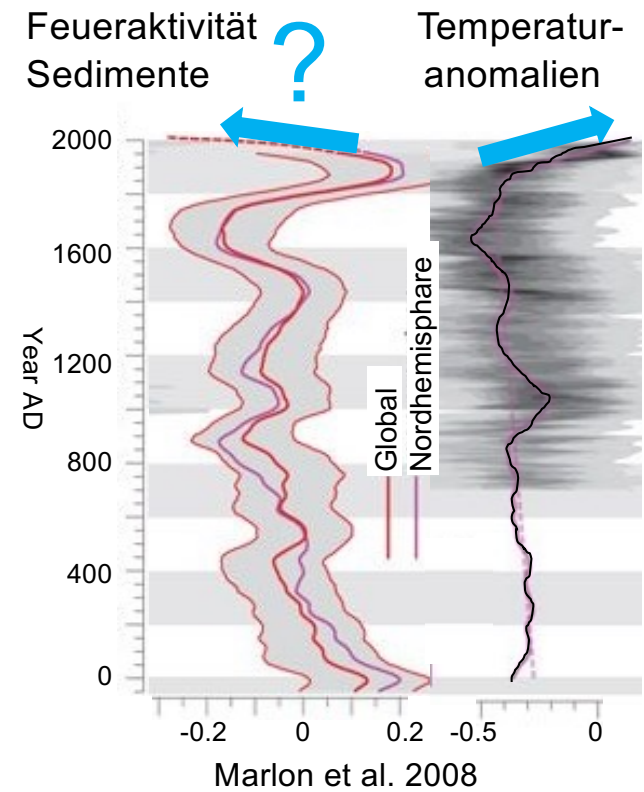
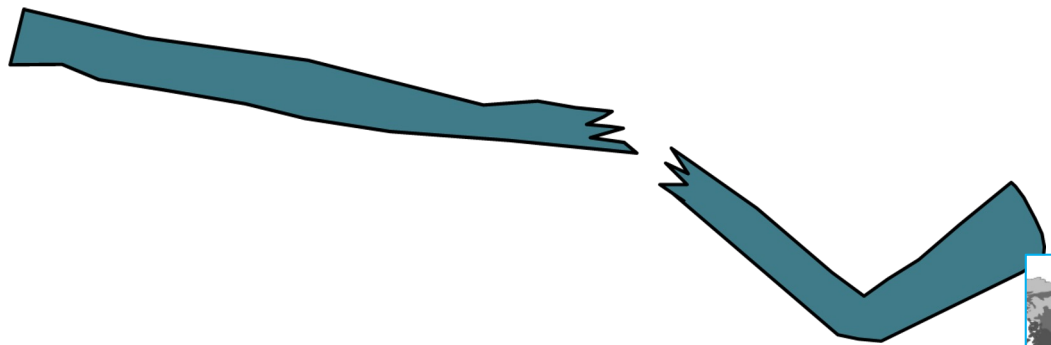
Globale Feuergeschichte

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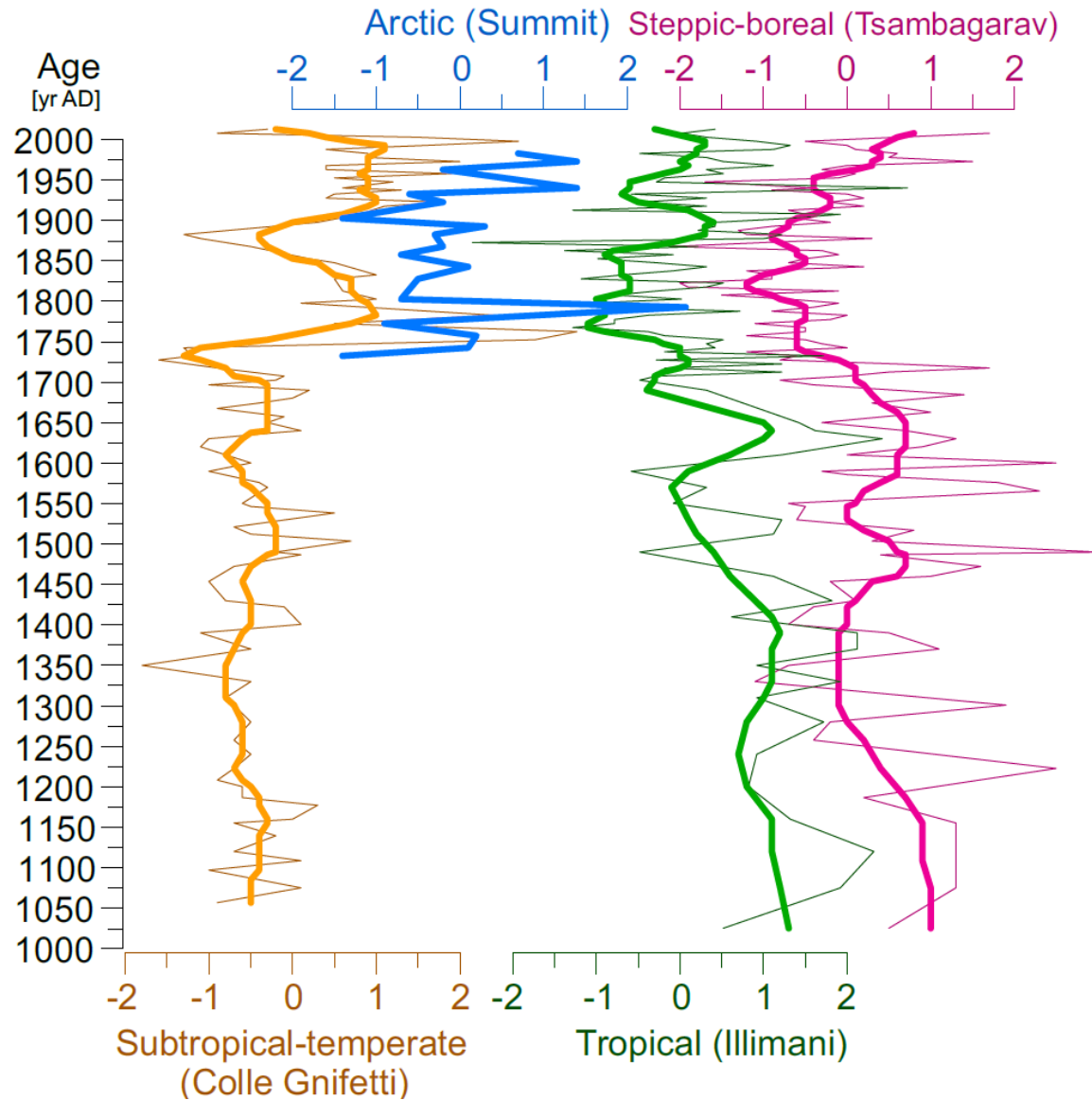
Globale Feuergeschichte

- > Feueraktivität vs. Klima
- > «Broken fire hockey stick»-Hypothese

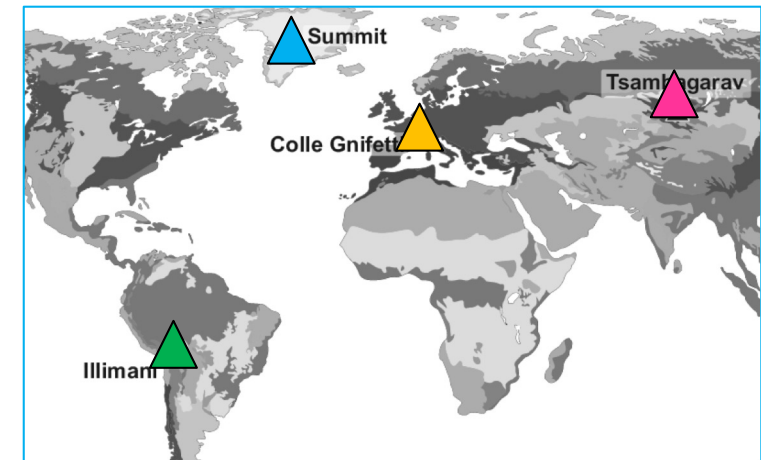
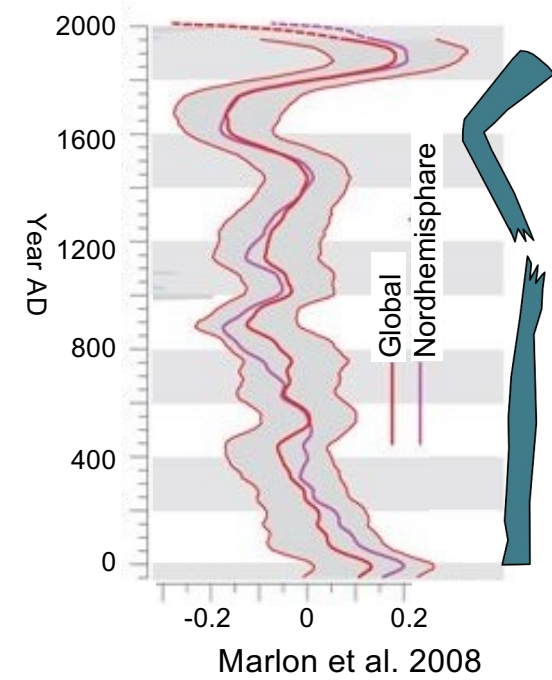


Globale Feuergeschichte

Holzkohle in Eiskernen

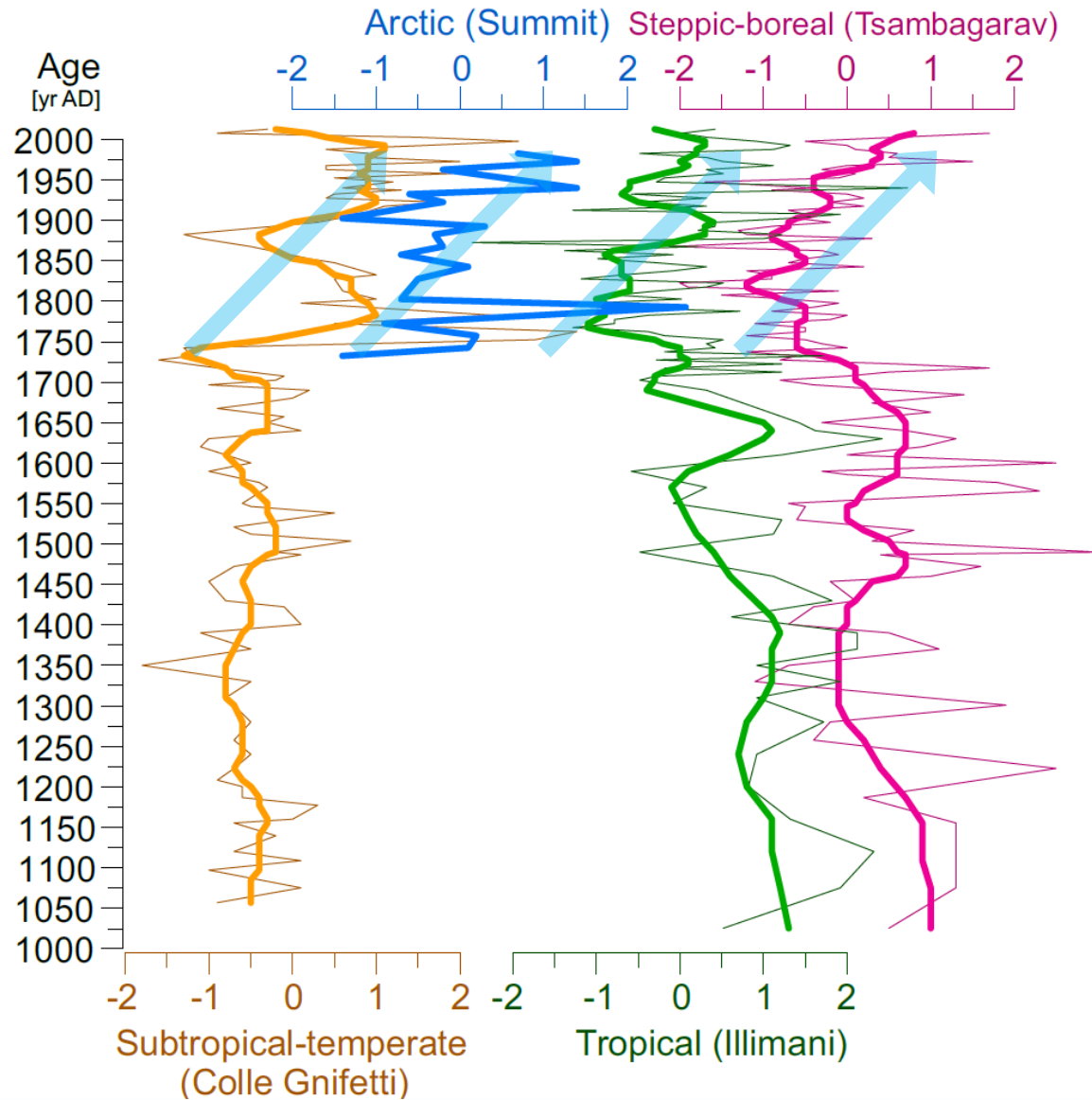


Feueraktivität Sedimente ?

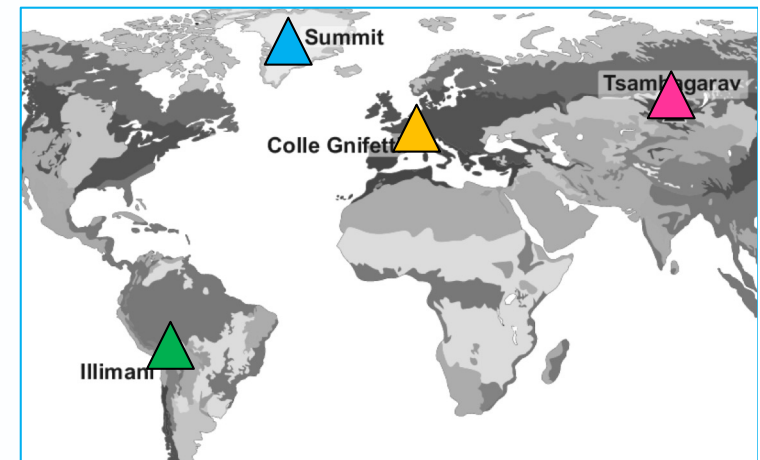
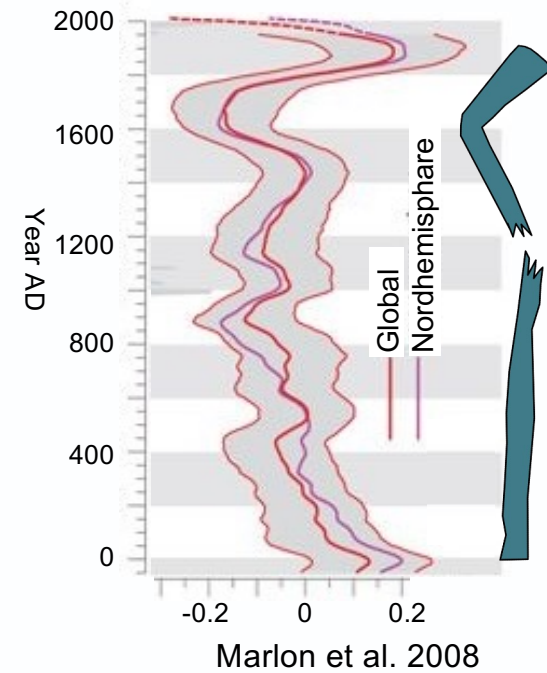


Globale Feuergeschichte

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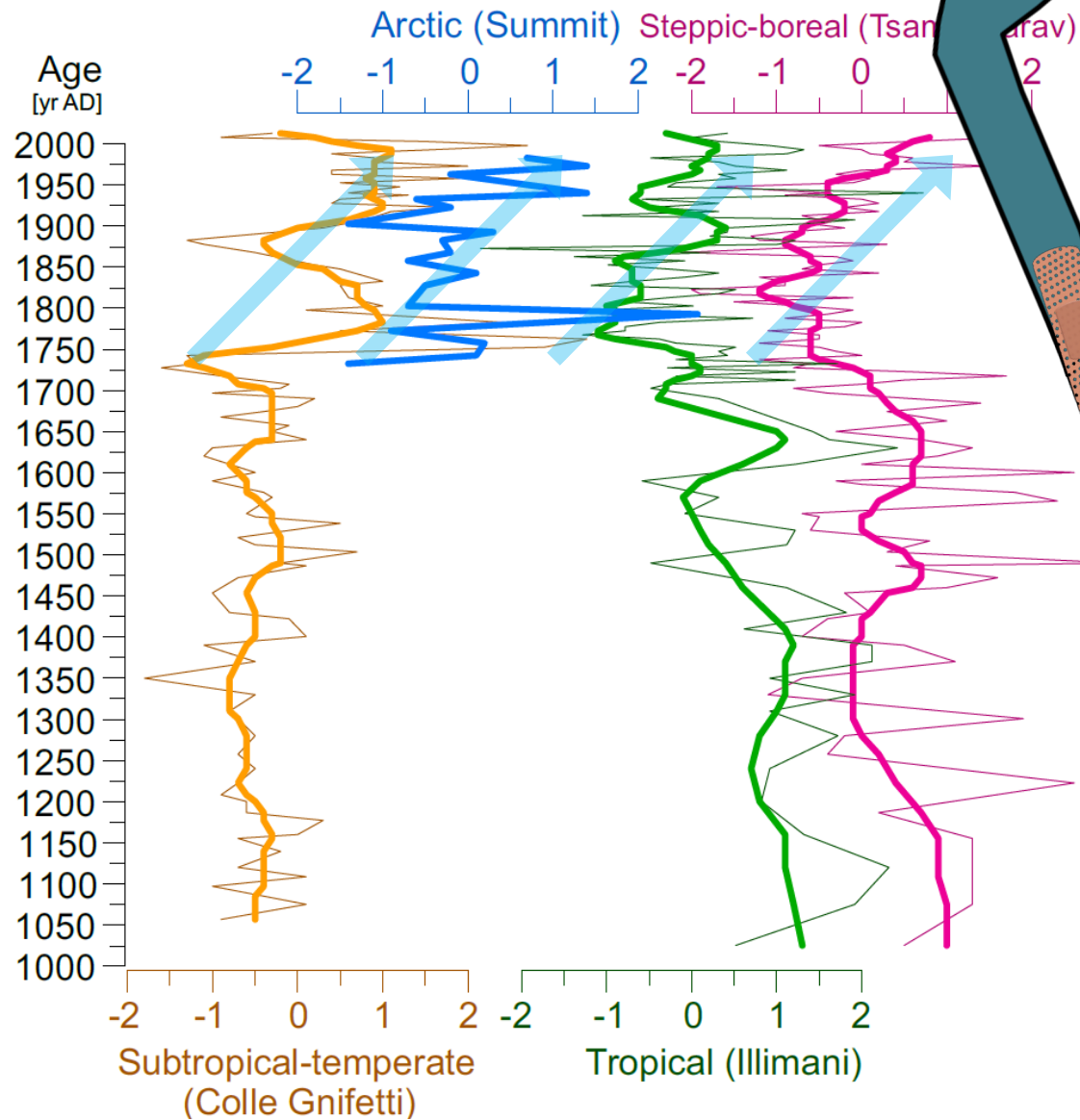


Feueraktivität Sedimente ?

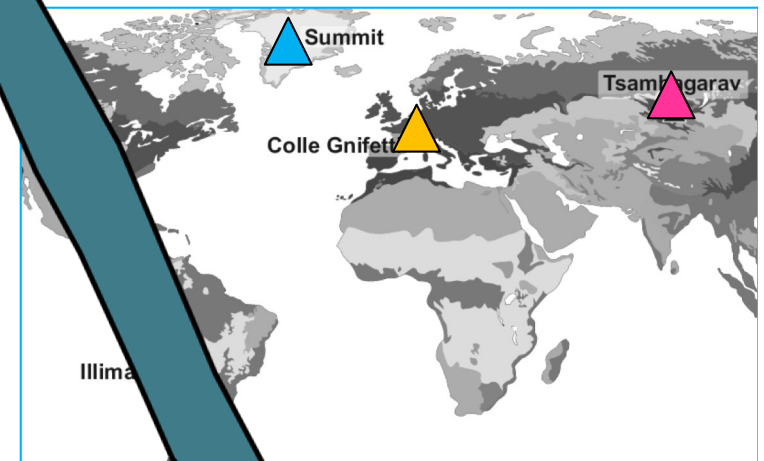
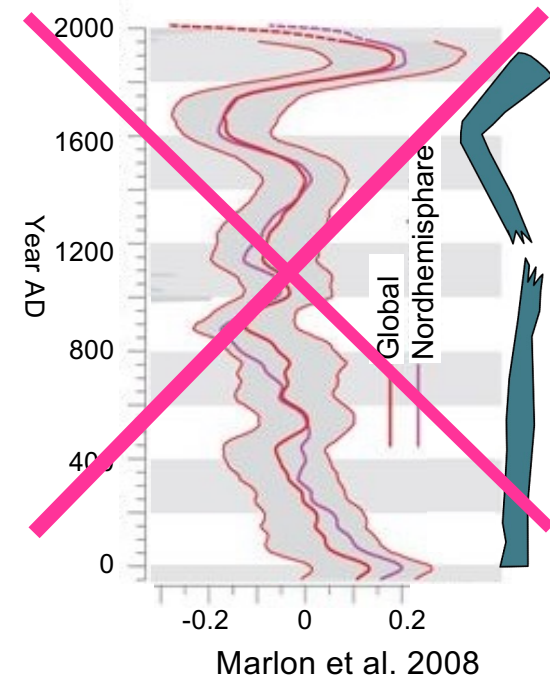


Globale Feuergeschichte

Holzkohle in Eiskernen



Feueraktivität ?
Sedimente



Zusammenfassung

- > Feuer-, Vegetations-, Landnutzungs- & Klimainteraktionen sind komplex

Sinergia project
Paleo fires

u^b
UNIVERSITÄT
BERN
OESCHGER CENTRE
CLIMATE CHANGE RESEARCH

PAUL SCHERRER INSTITUT
PSI

Funded by

FNSNF

FONDS NATIONAL SUISSE
SCHWEIZERISCHER NATIONALFONDS
FONDO NAZIONALE SVIZZERO
SWISS NATIONAL SCIENCE FOUNDATION

Zusammenfassung

- > Feuer-, Vegetations-, Landnutzungs- & Klimainteraktionen sind komplex
- > Colle Gnifetti:
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 - Kombination kontinuierlicher Eiskerndaten mit historischen Quellen

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- > Globale Feuergeschichte
 - Niederschlag wichtiger als Temperatur für holozäne Feueraktivität

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**Power of ice palynology
to reconstruct
large-scale
environmental history**



Sinergia project
Paleo fires

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SCHWEIZERISCHER NATIONALFONDS
FONDO NAZIONALE SVIZZERO
SWISS NATIONAL SCIENCE FOUNDATION

Wie Pollenkörner im Eis steckenbleiben...

