UNIVERSITY OF CAMBRIDGE
Department of Geography

Environmental Systems Analysis

Ulf Büntgen *et al.*

Department of Geography, University of Cambridge, UK

Swiss Federal Research Institute WSL, Birmensdorf, Switzerland

CzechGlobe and Department of Geography, Masaryk University, Brno, Czech Republic

Mycology

Ungulates

Plague

Beringia

Volcanos

Driftwood

Lateglacial

Mycology

Ungulates

Plague

Beringia

Volcanos

Driftwood

Lateglacial

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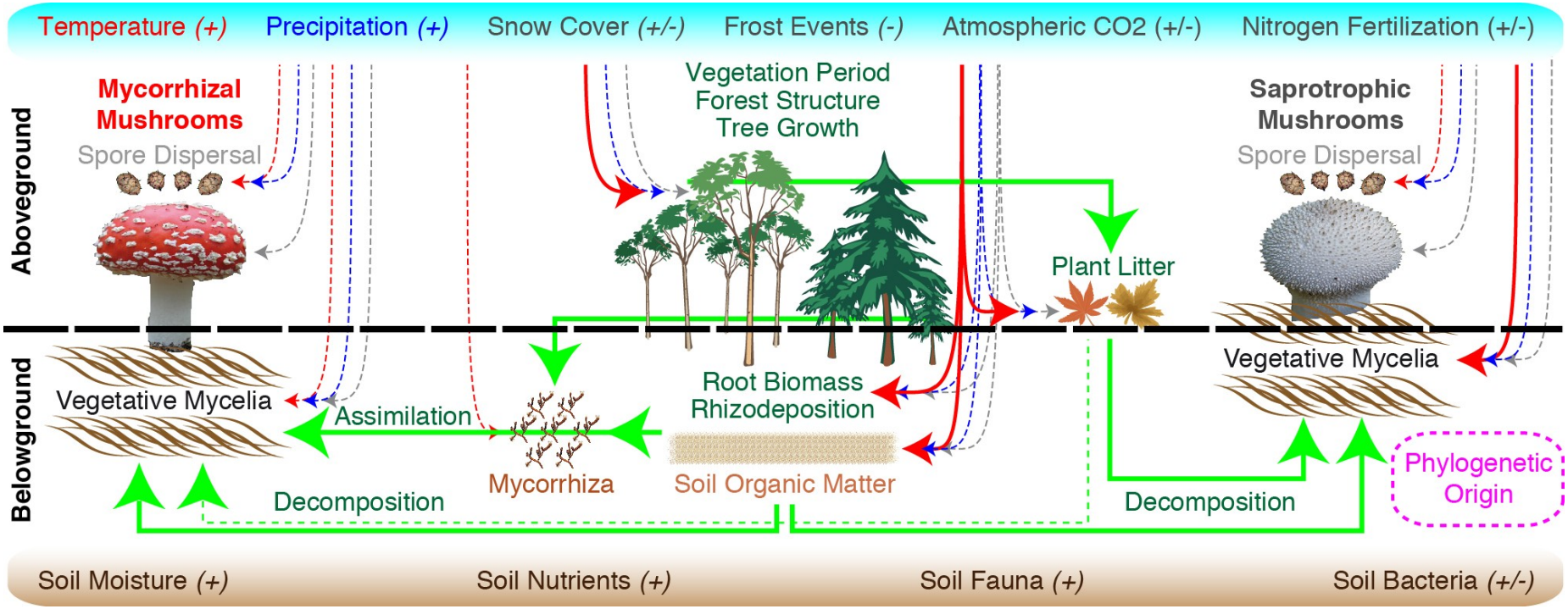
Unraveling environmental drivers of a recent increase in Swiss fungi fruiting



Büntgen et al. (2013) Global Change Biology

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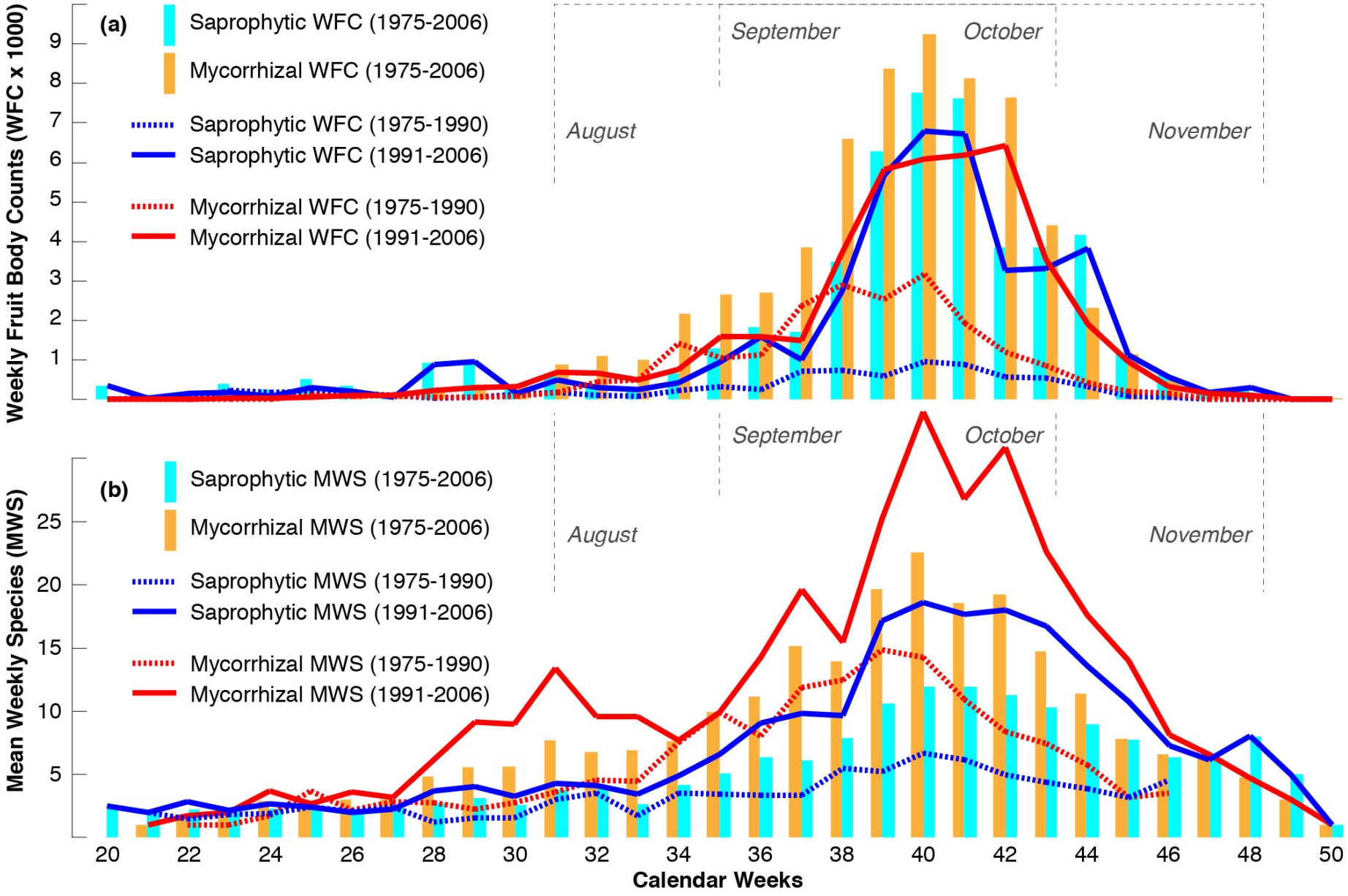

Büntgen et al. (2013) Global Change Biology

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Drought-induced decline in Mediterranean truffle harvest

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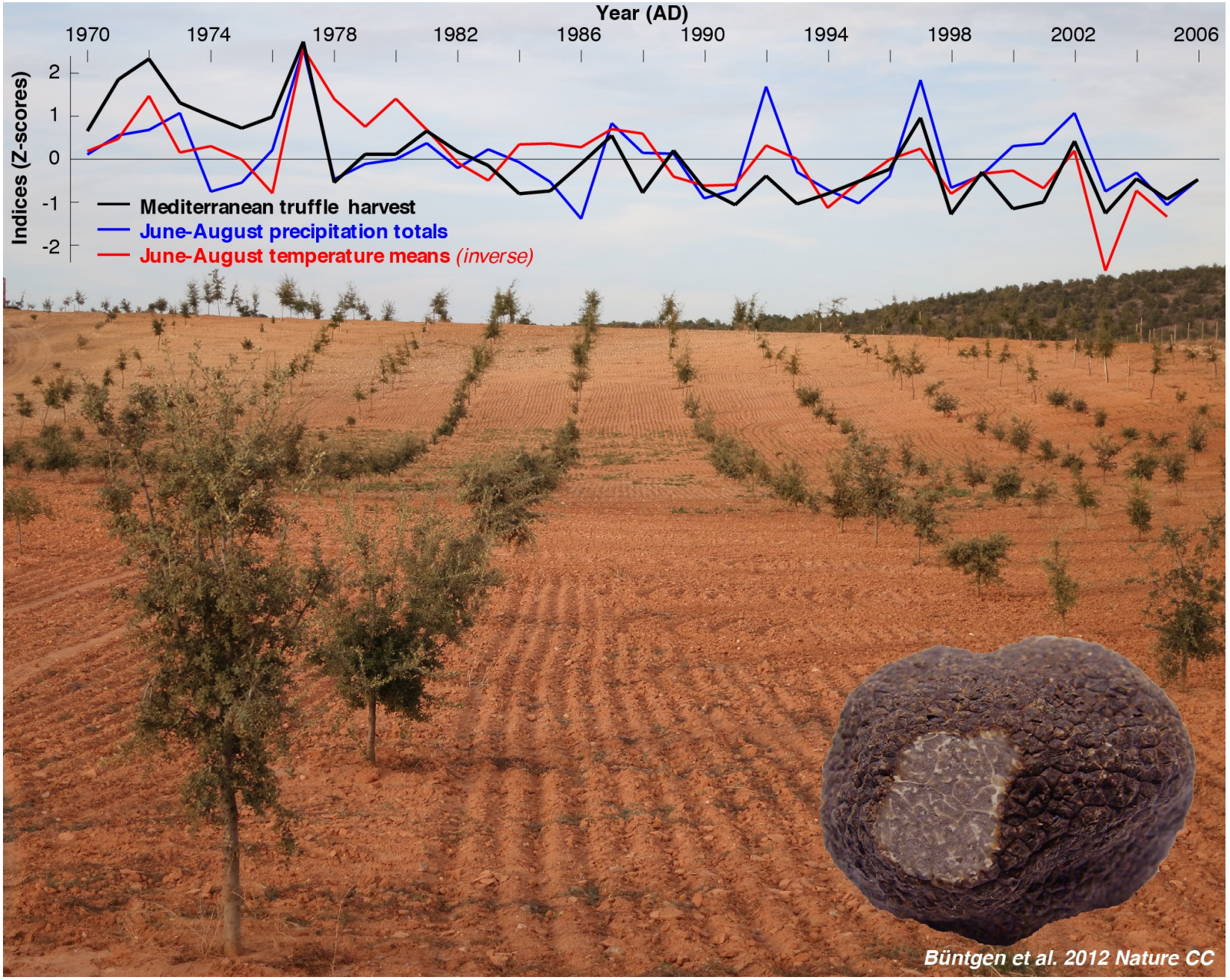
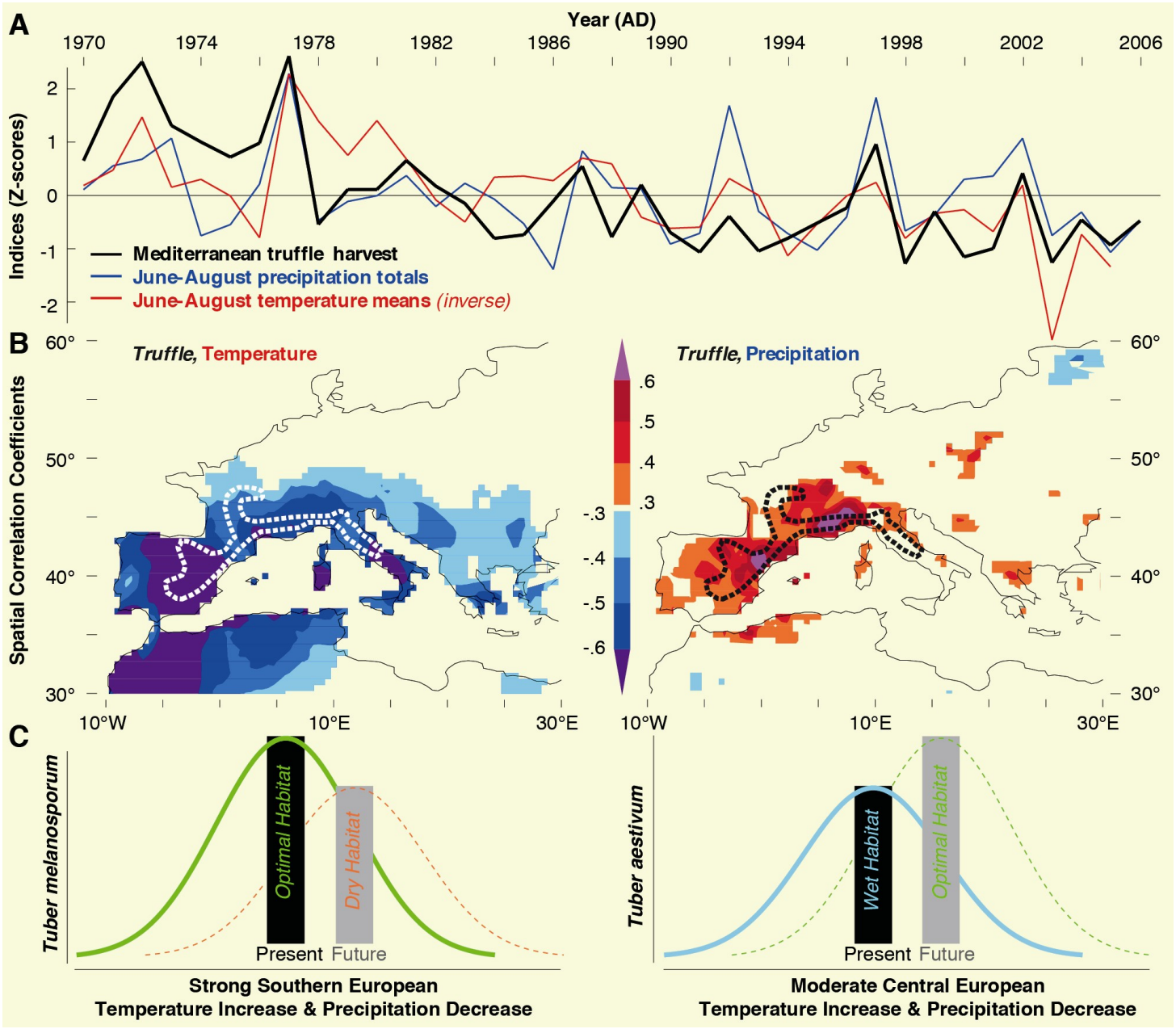
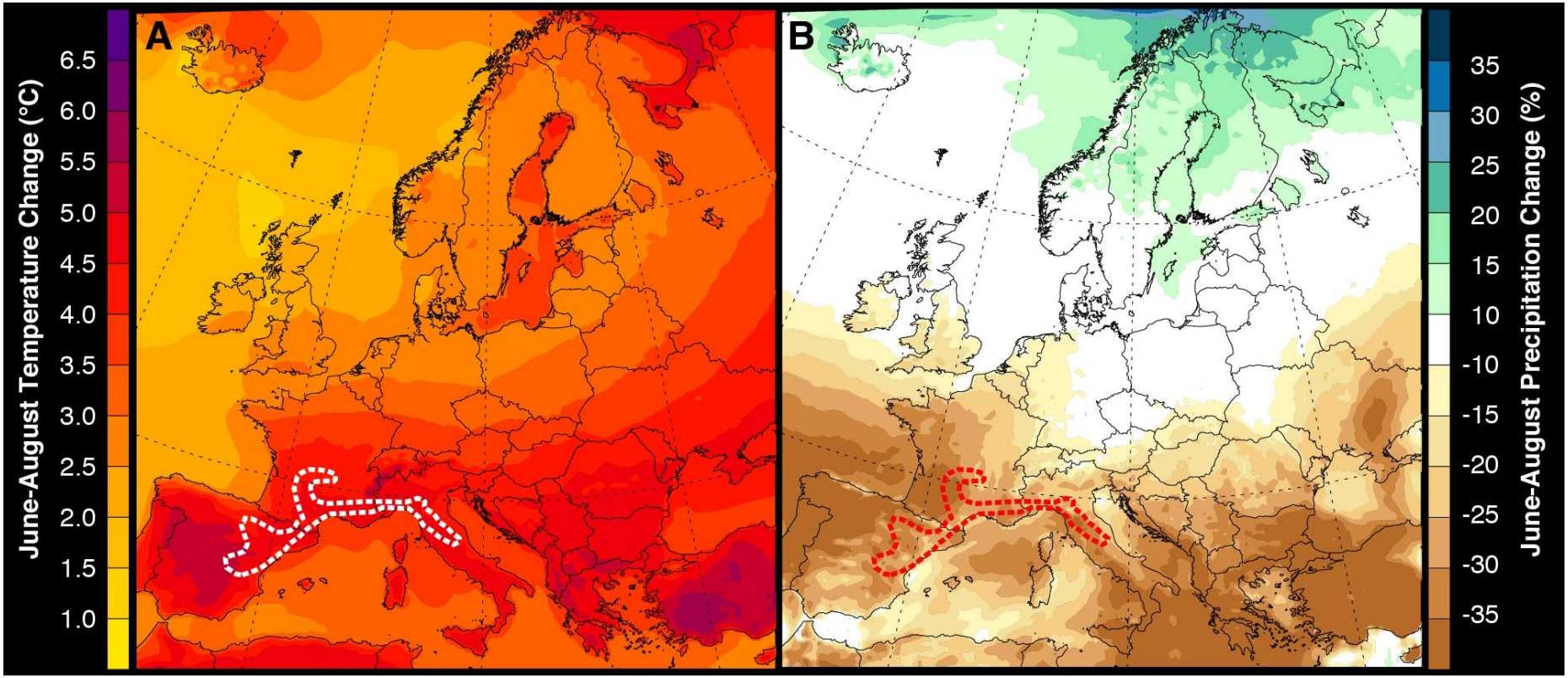
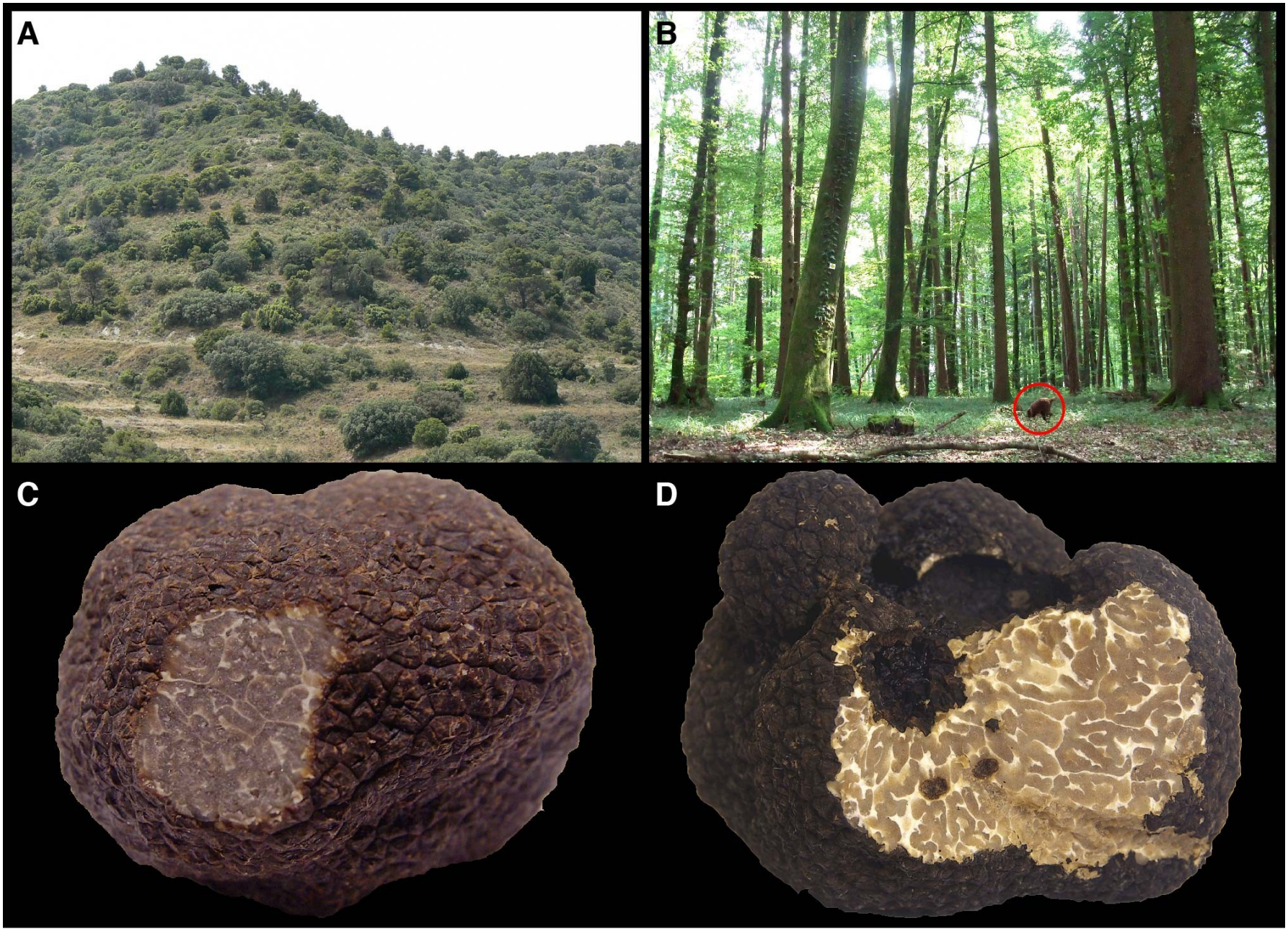




Büntgen et al. (2012) Nature Climate Change



Büntgen et al. (2012) Nature Climate Change



Büntgen et al. (2012) Nature Climate Change

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Mycology

Ungulates

Plague

Beringia

Volcanos

Driftwood

Lateglacial

Rings beyond forests

Büntgen et al. (2014) Ecology Letters

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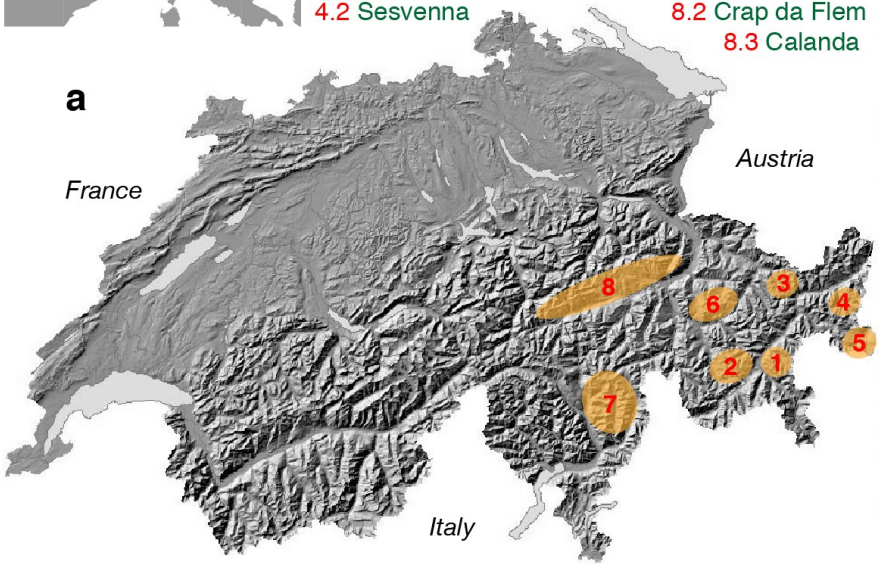
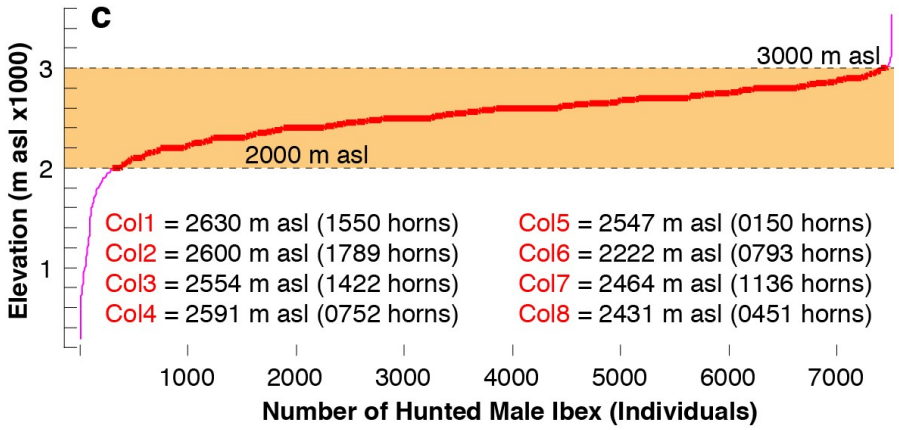
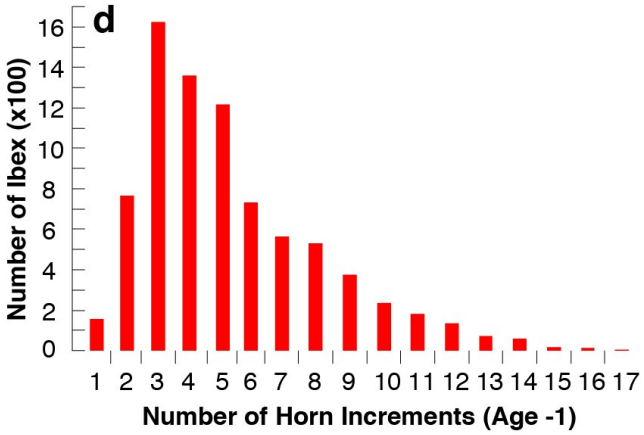
1.1 Albris
2.1 Val Bever
2.2 Julier South
2.3 Julier North
3.1 Flüela
3.2 Fergen Seetal
3.3 Falknis
4.1 Macun
4.2 Sesvenna
5.1 Umbrail
6.1 Rothhorn/Weissfluh
6.2 Howchwang
7.1 Safien-Rheinwald
7.2 Mesocco
7.3 Vals
7.4 Caschlegia
8.1 Oberalp-Frisal
8.2 Crap da Flem
8.3 Calanda







Büntgen et al. (2014) Ecology Letters

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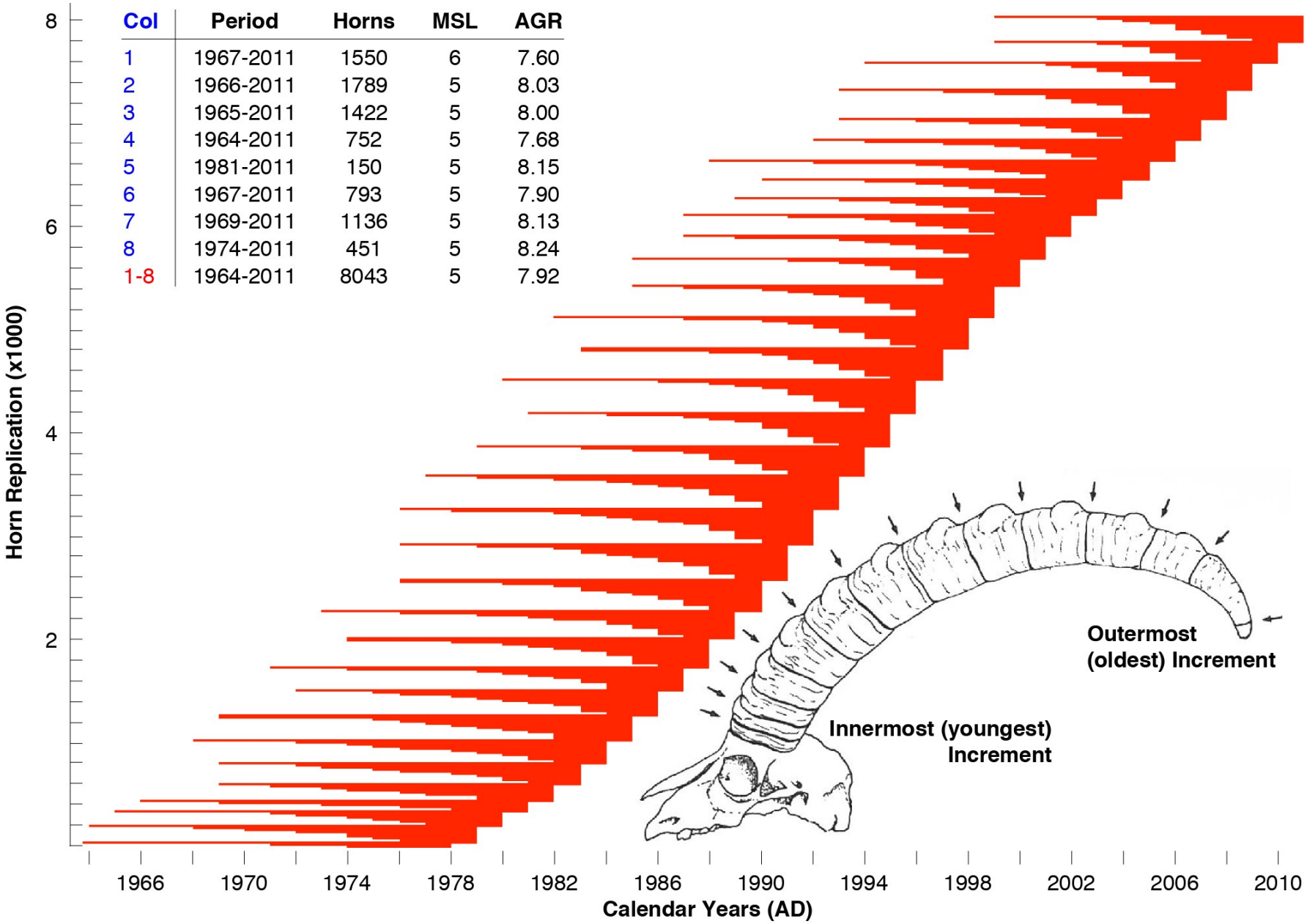
Col	Period	Horns	MSL	AGR
1	1967-2011	1550	6	7.60
2	1966-2011	1789	5	8.03
3	1965-2011	1422	5	8.00
4	1964-2011	752	5	7.68
5	1981-2011	150	5	8.15
6	1967-2011	793	5	7.90
7	1969-2011	1136	5	8.13
8	1974-2011	451	5	8.24
1-8	1964-2011	8043	5	7.92



Büntgen et al. (2014) Ecology Letters

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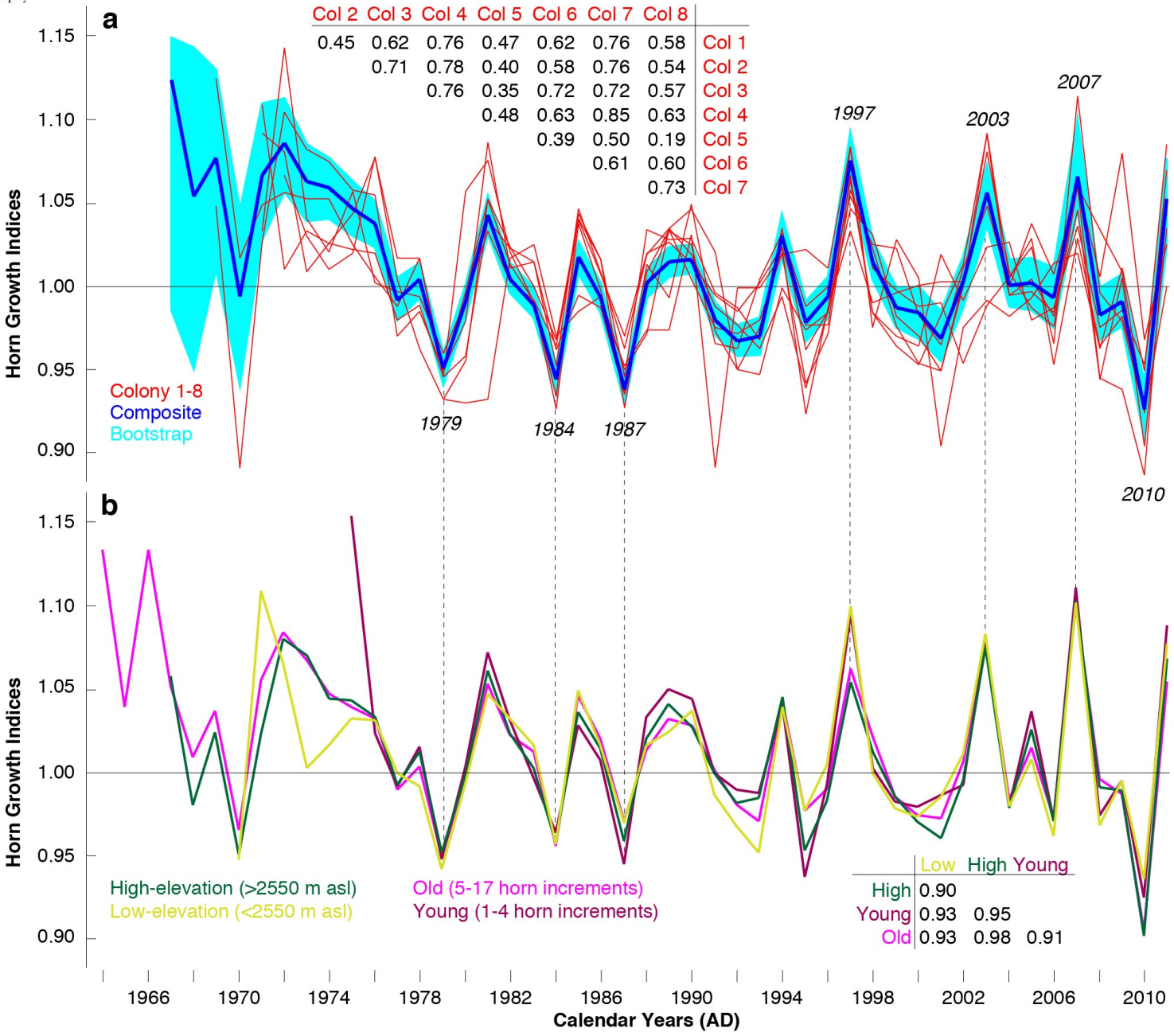

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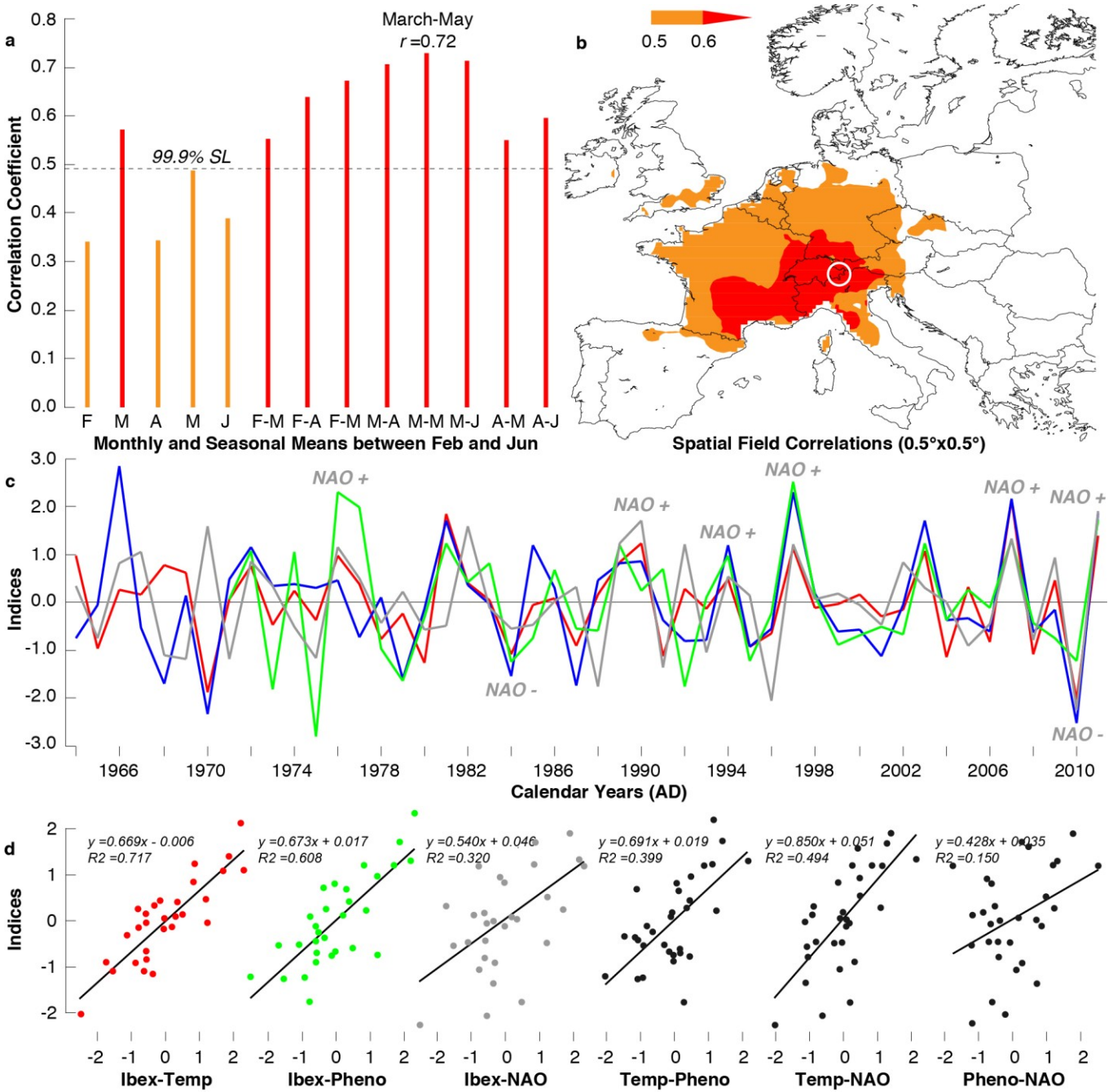

Büntgen et al. (2014) Ecology Letters

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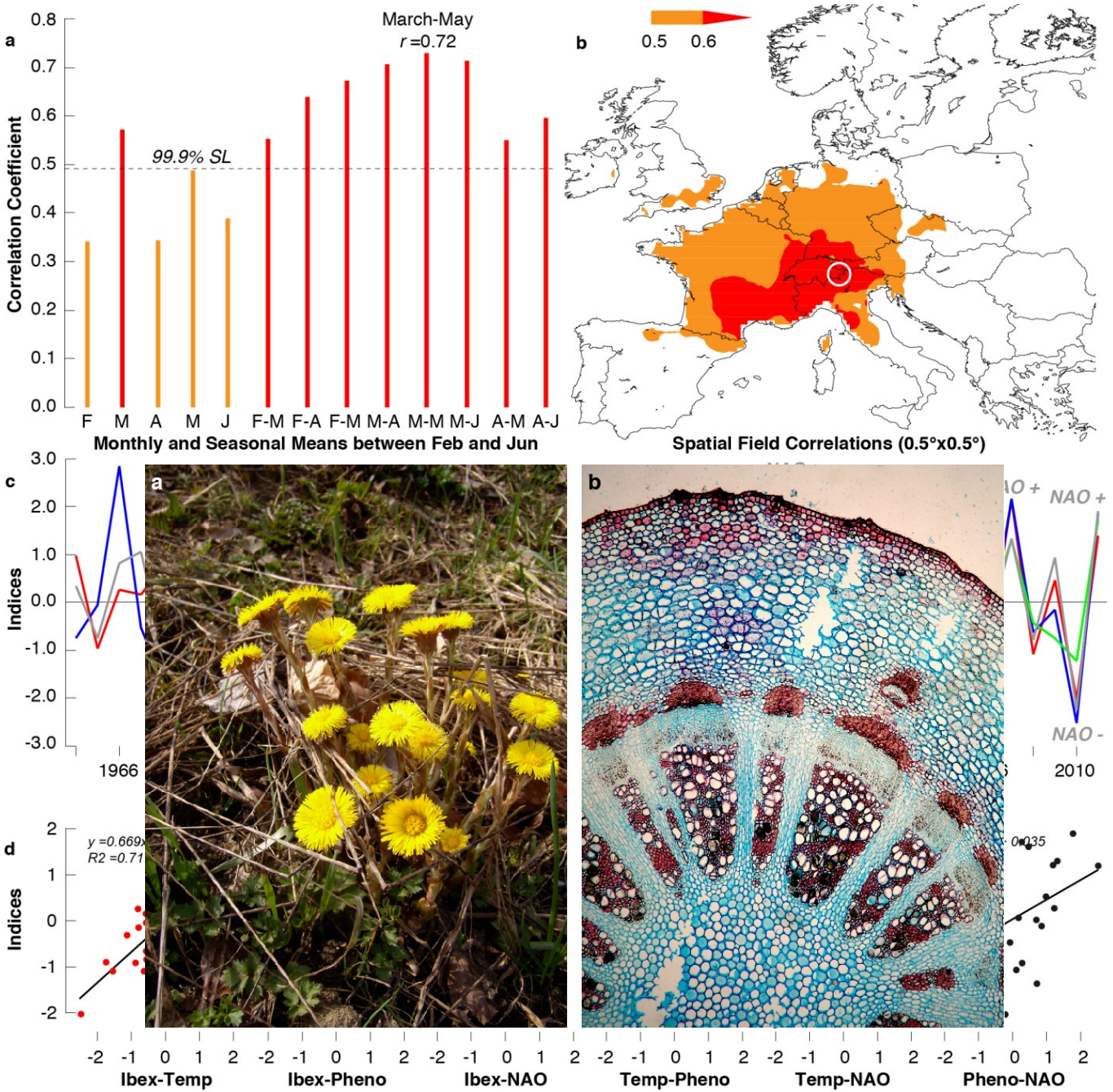
Department of Geography



Büntgen et al. (2014) Ecology Letters

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Elevational range shifts in four mountain ungulate species from the Swiss Alps




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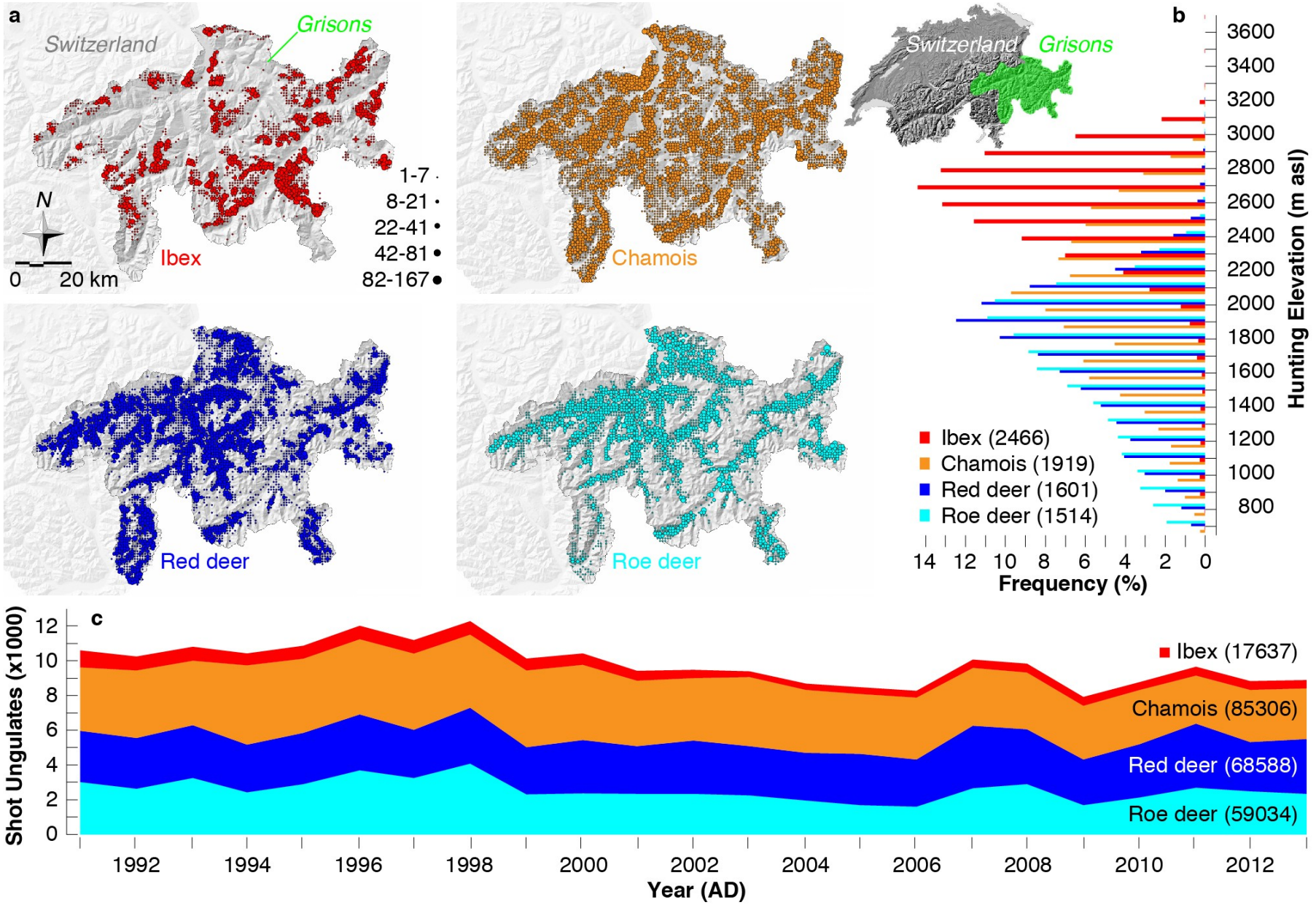
Department of Geography



Büntgen et al. (2017) Ecosphere

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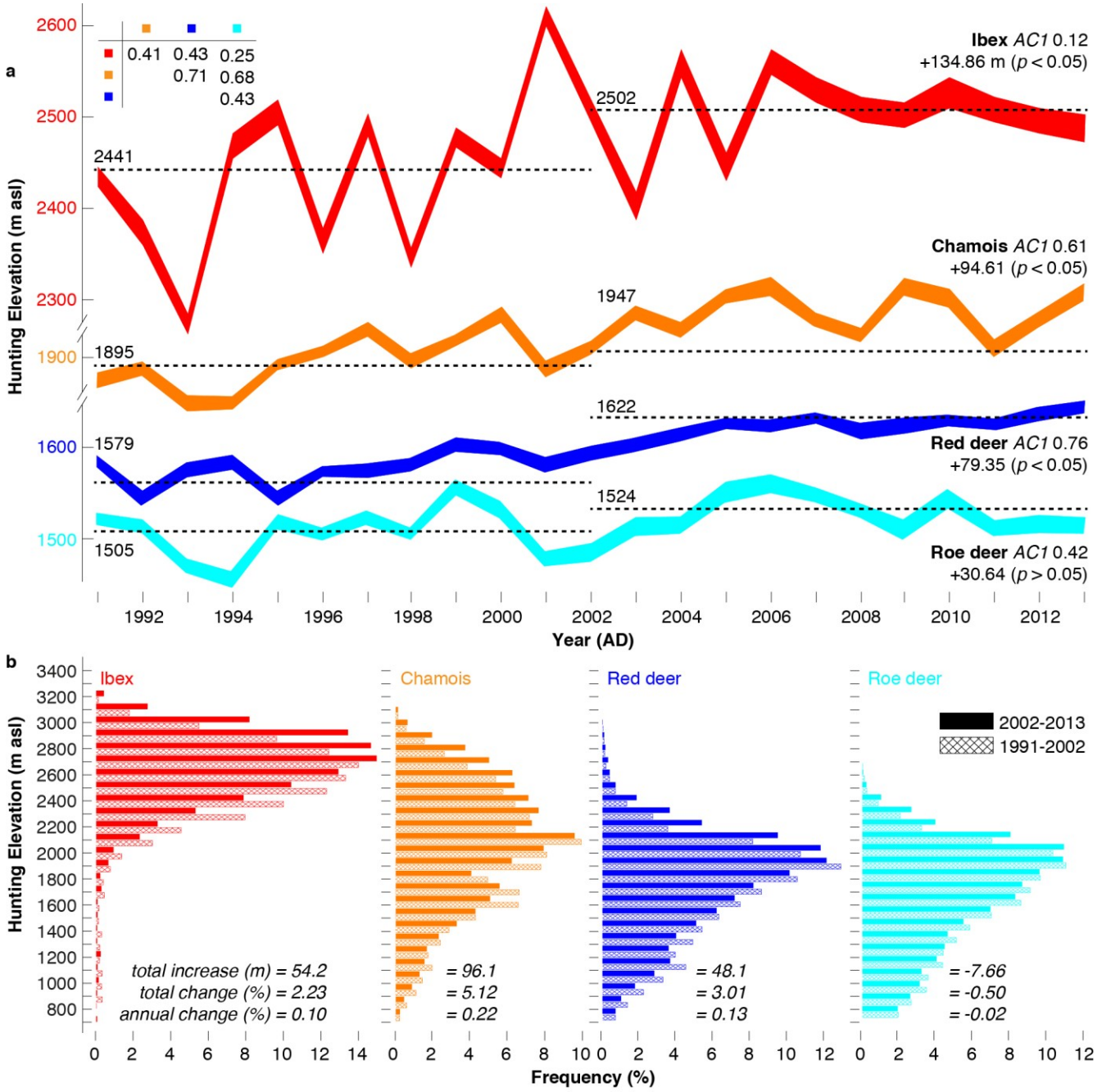

Büntgen et al. (2017) Ecosphere

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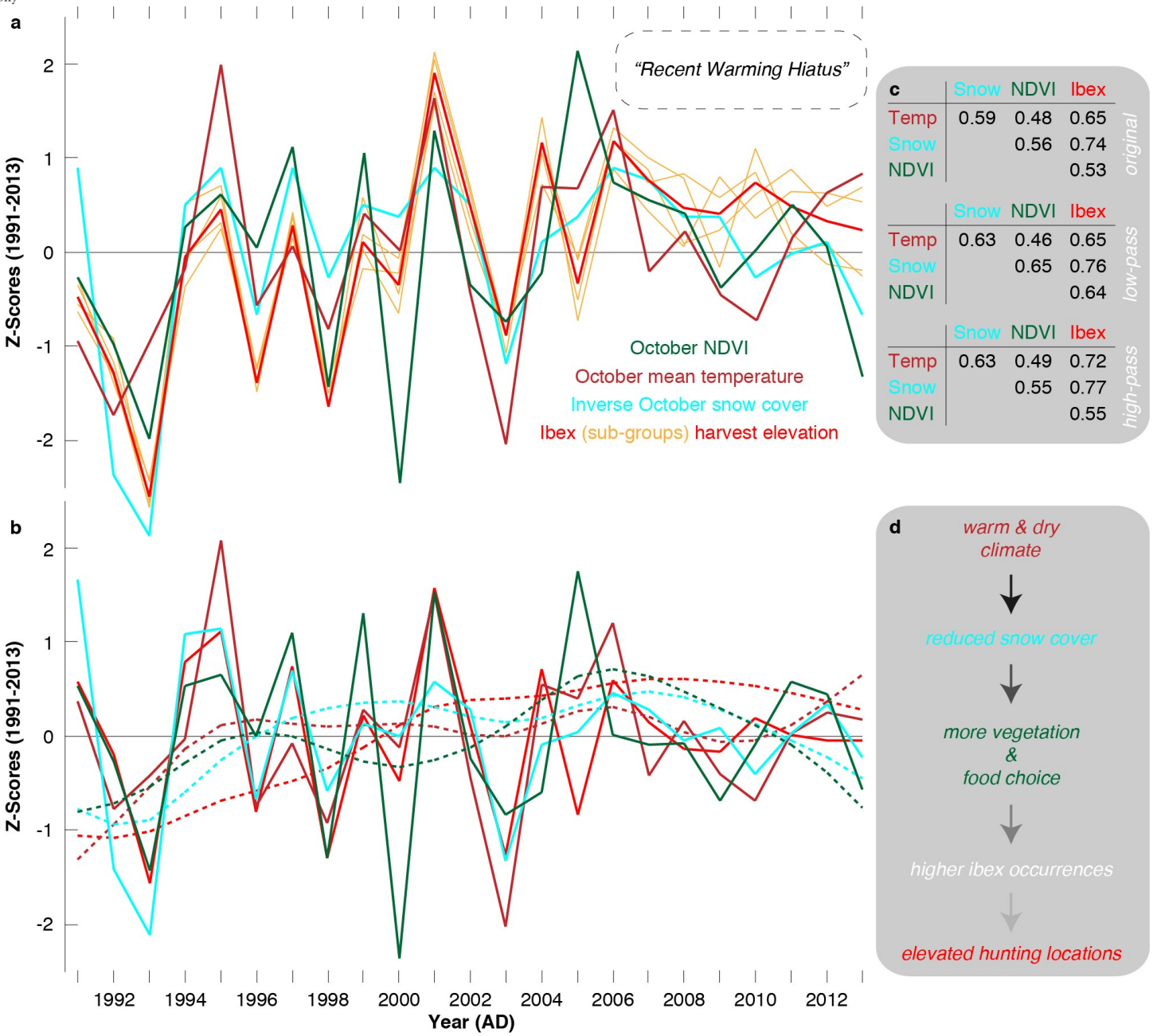

c

	Snow	NDVI	Ibex	
Temp	0.59	0.48	0.65	original
Snow		0.56	0.74	
NDVI			0.53	
	Snow	NDVI	Ibex	
Temp	0.63	0.46	0.65	low-pass
Snow		0.65	0.76	
NDVI			0.64	
	Snow	NDVI	Ibex	
Temp	0.63	0.49	0.72	high-pass
Snow		0.55	0.77	
NDVI			0.55	

d

warm & dry climate
↓
reduced snow cover
↓
more vegetation & food choice
↓
higher ibex occurrences
↓
elevated hunting locations

Büntgen et al. (2017) Ecosphere

Mycology

Ungulates

Plague

Beringia

Volcanos

Driftwood

Lateglacial

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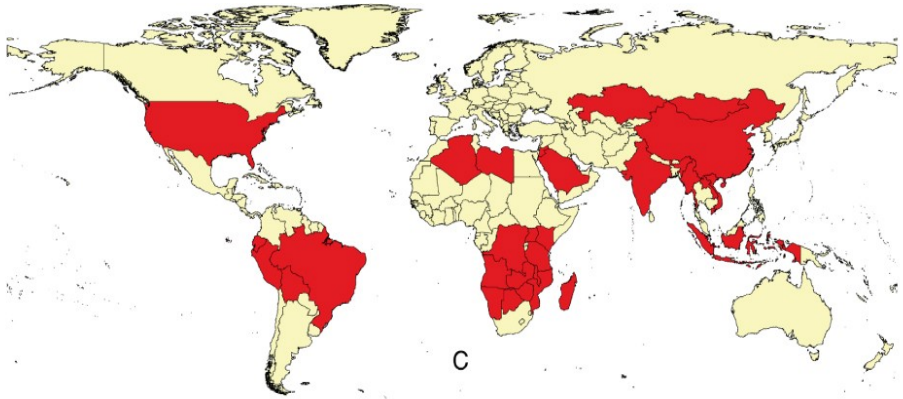
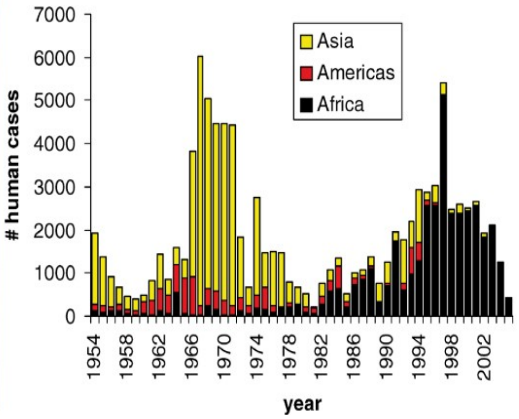
Tracing the origin of the Black Death

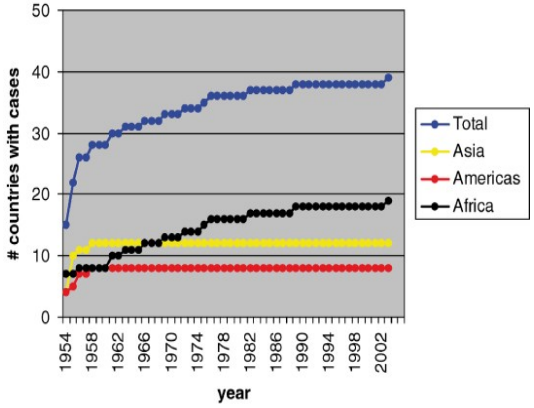
A



B



C



Büntgen et al. (2012) Clinical Infectious Diseases

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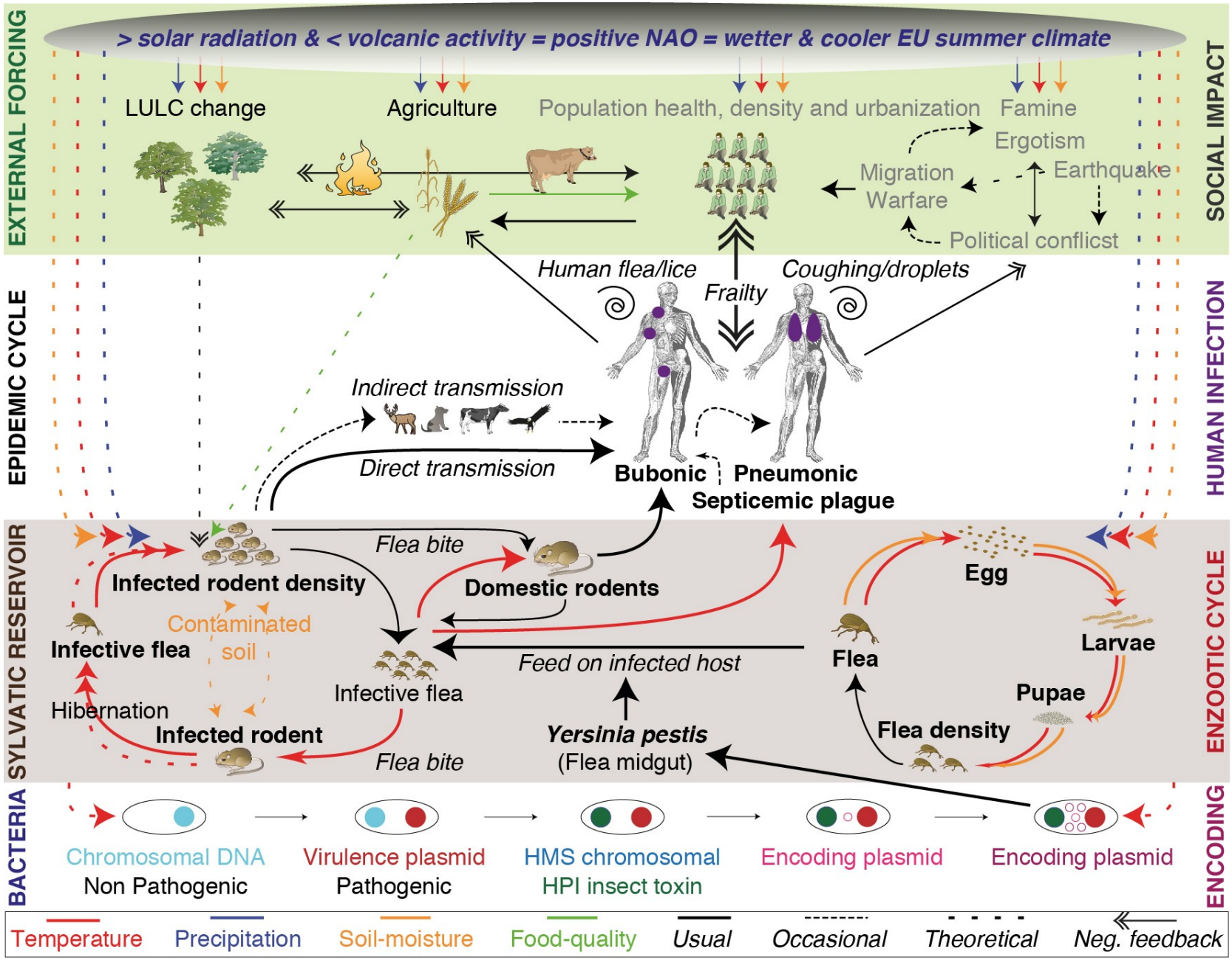

Büntgen et al. (in prep)

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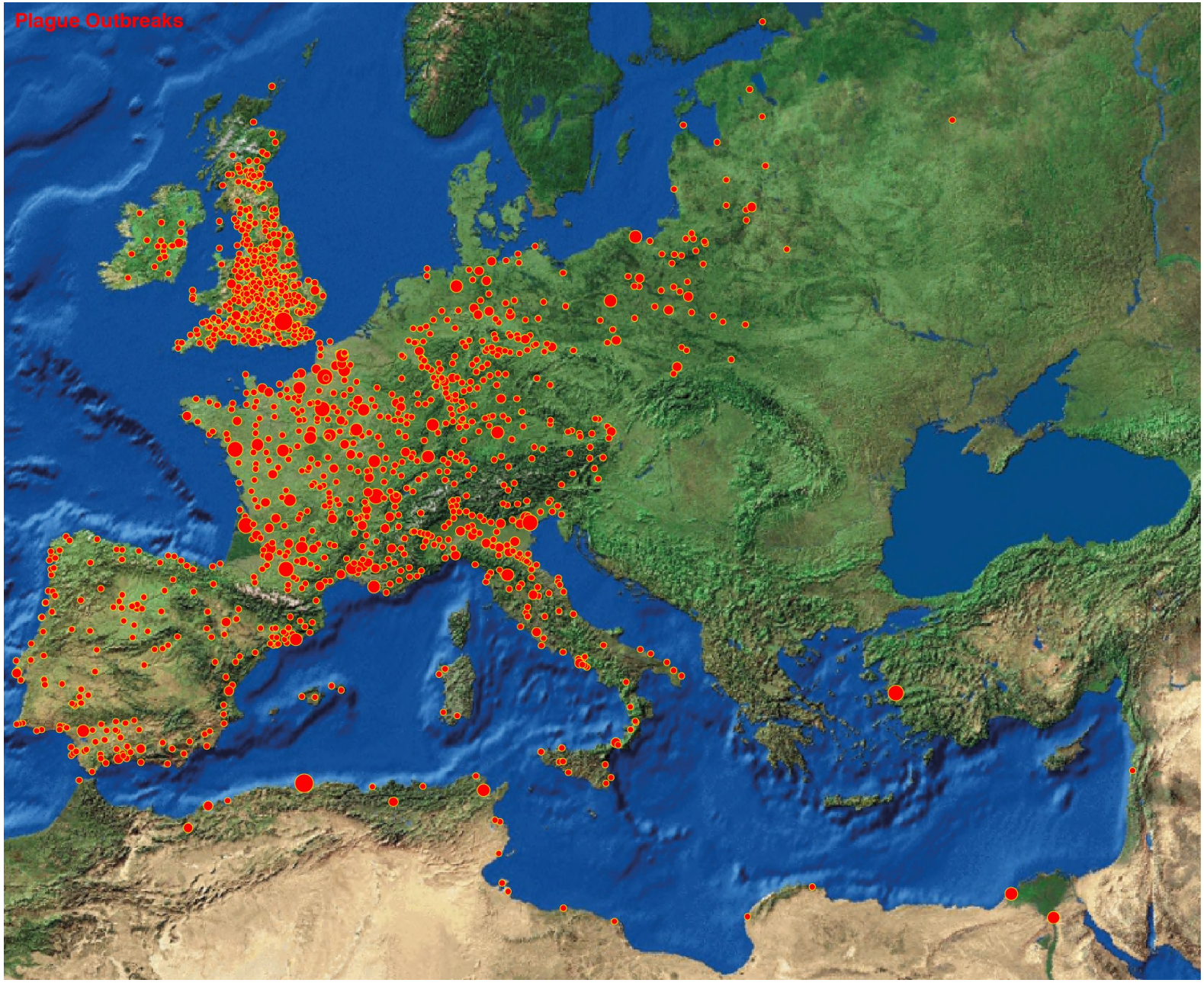

Büntgen et al. (2012) Clinical Infectious Diseases

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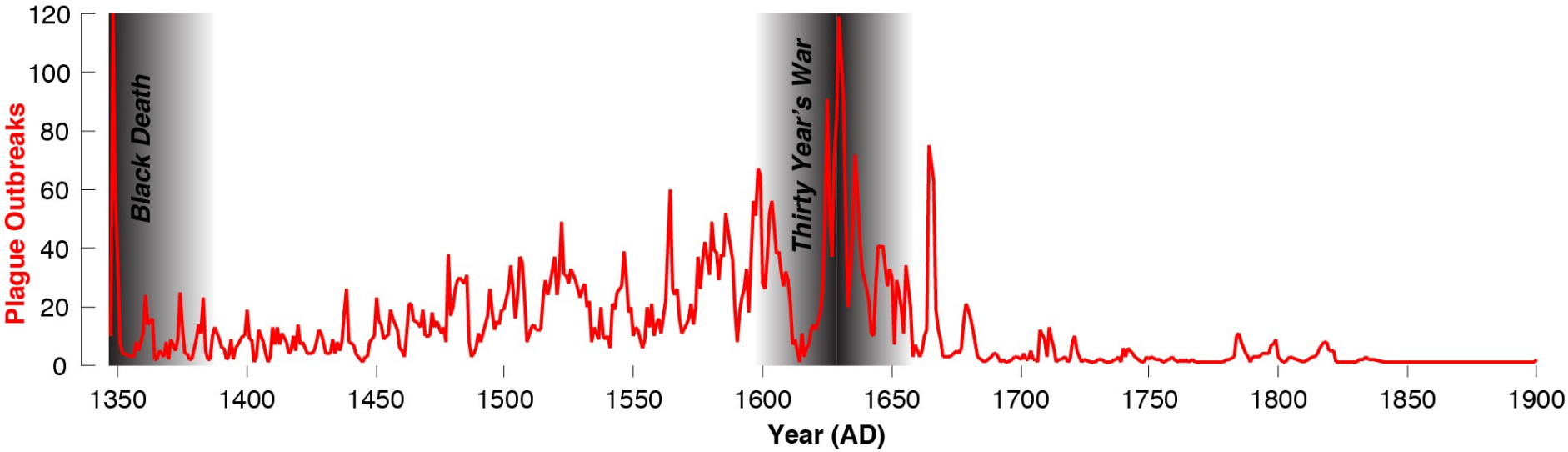

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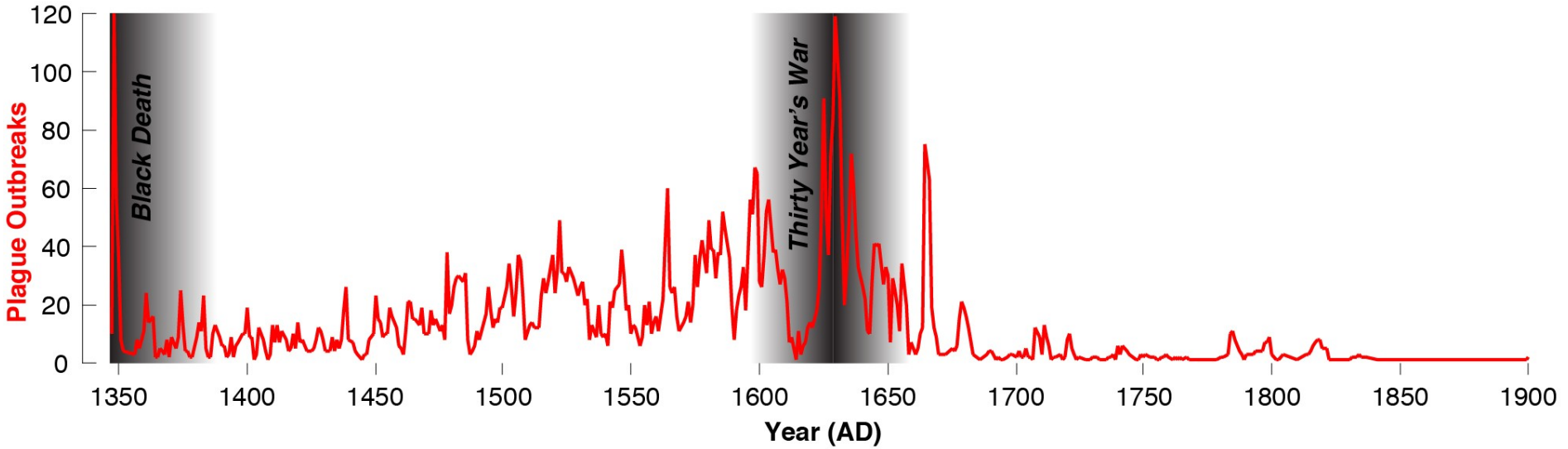

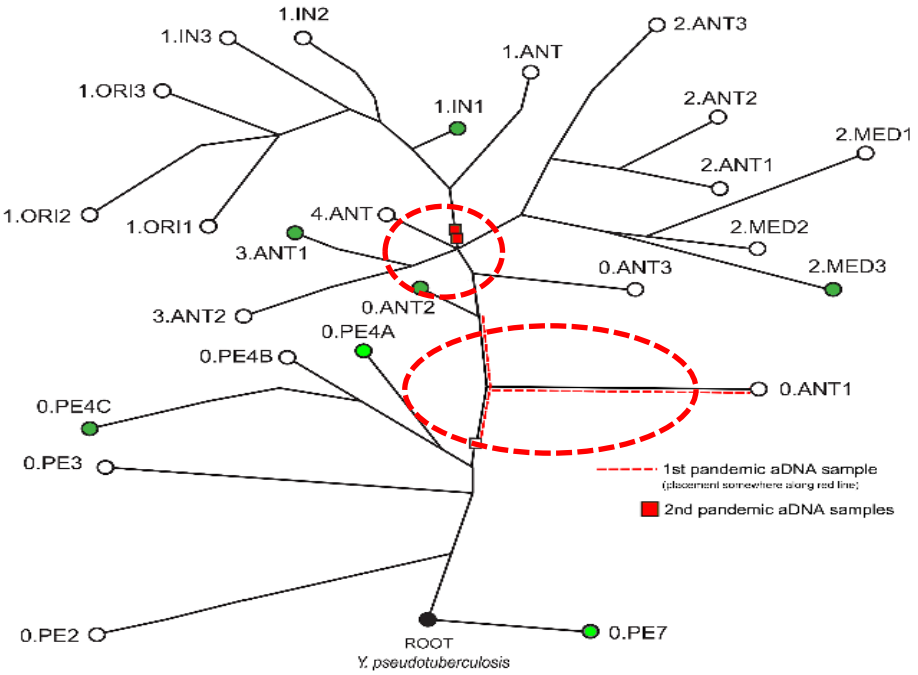

Büntgen et al. (2012) Clinical Infectious Diseases

Kausrud et al. (2010) BMC Biology

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Schmid et al. (2015) PNAS

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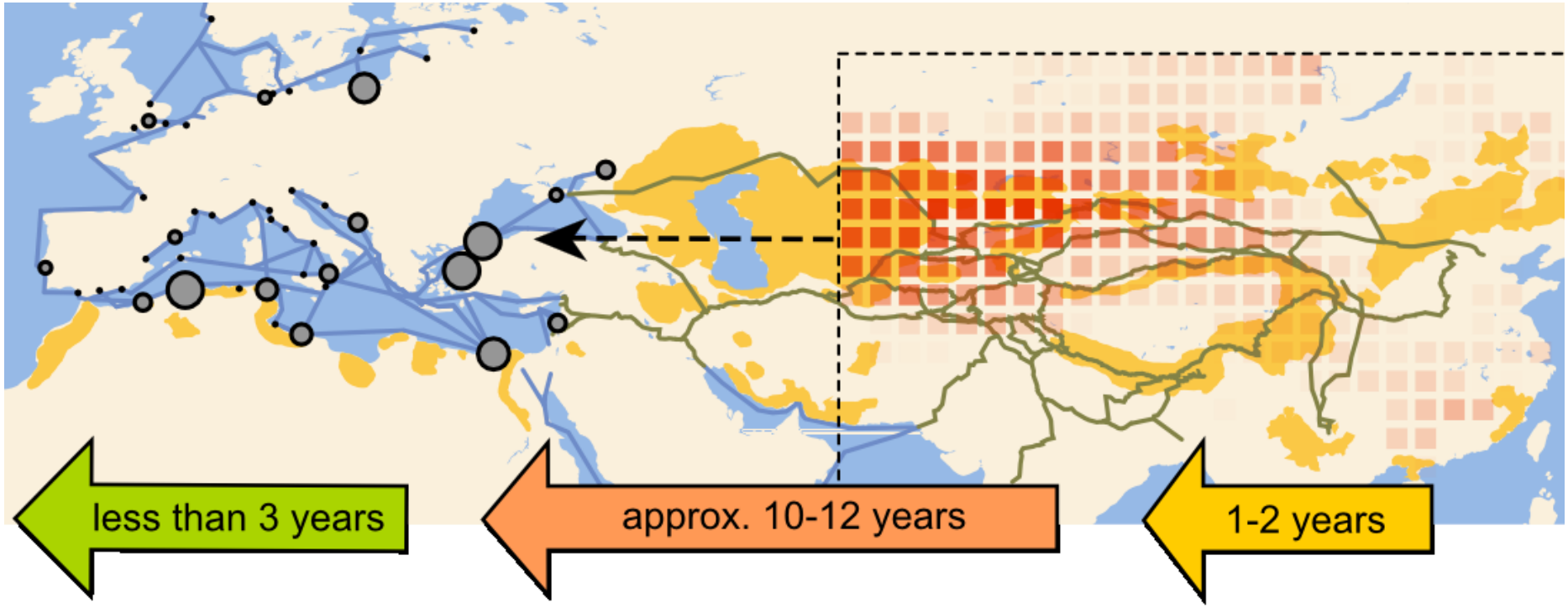
Department of Geography

The climatic pulse of Asia

Climate-driven plague outbreaks in Asia were repeatedly introduced into medieval Europe



Schmid et al. (2015) PNAS

Mycology

Ungulates

Plague

Beringia

Volcanos

Driftwood

Lateglacial

Bridge over troubled water – Valuing Russia's scientific landscape

Environmental change not only implies research needs but also offers collaborations between Russia and the international scientific community


MERCURY
Р-91-64-ЯЯ

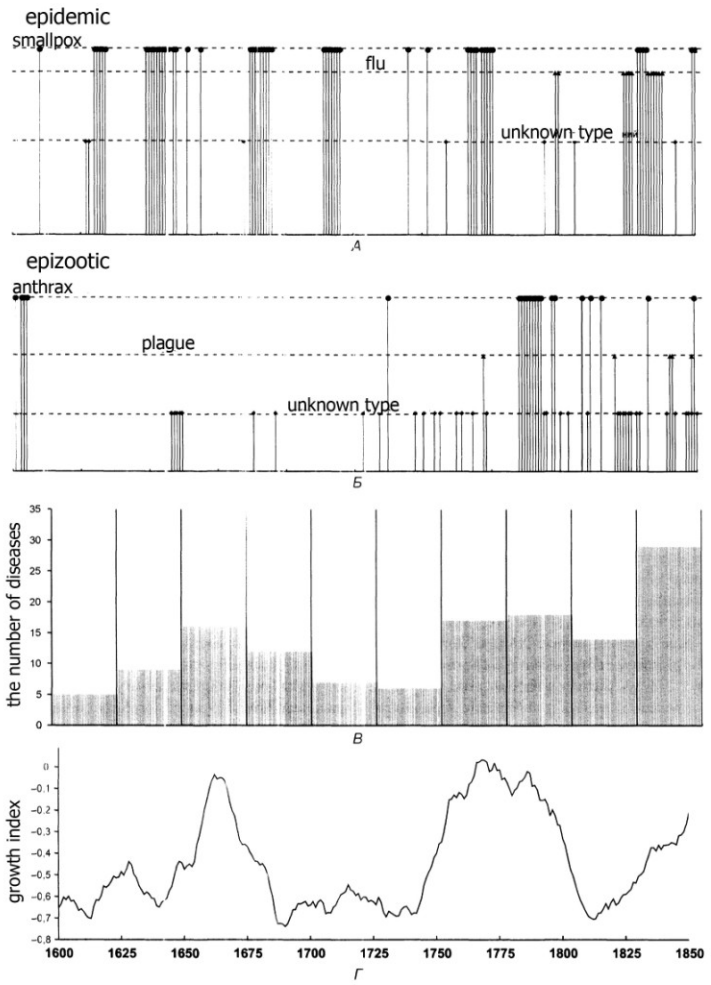
Climate change and zoonotic infectious diseases at high-northern latitudes: warming-induced recent anthrax outbreaks in Siberia

Climate change and zoonotic infectious diseases at high-northern latitudes: warming-induced recent anthrax outbreaks in Siberia

Climate change and zoonotic infectious diseases at high-northern latitudes: warming-induced recent anthrax outbreaks in Siberia

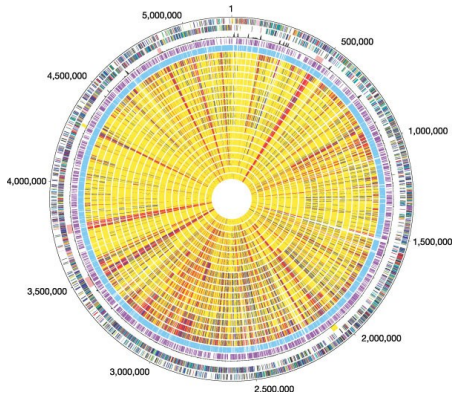
Climate change and zoonotic infectious diseases at high-northern latitudes: warming-induced recent anthrax outbreaks in Siberia

142



Outbreaks of epidemics (А) and epizootic (Б) diseases, the total number of outbreaks (В) and the variations of temperature in northern Eurasia (Г)

Bacillus anthracis

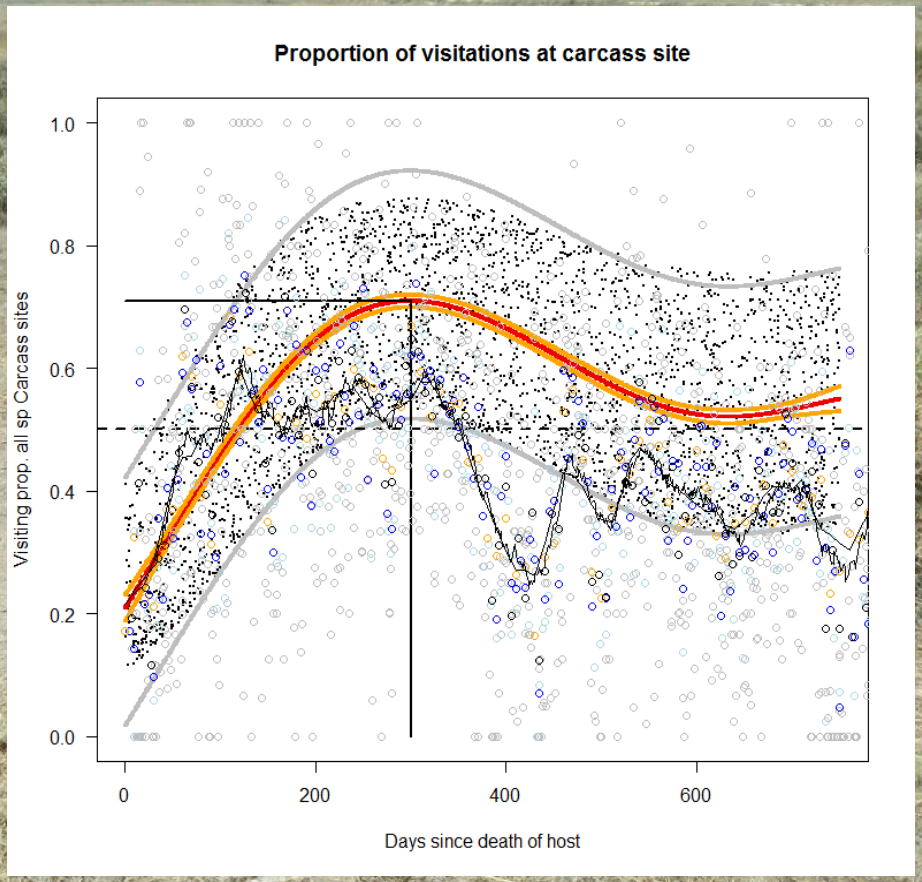


"мора" в 1546 г. (с повторением в 1576–1577 гг.) в Мексике погибло ок. 2 млн жителей (некоторые из Антильских островов полностью обезлюдели). Масштабы потерь можно представить, если исходить из того, что в 1568 г. численность населения этой страны составляла ок. 2 650 тыс. чел. [Бродель, 1986, с. 47–48]. Не менее высокая смертность отмечалась и в более поздний период. По данным французского мореплавателя Лаперуза, в 1786 г., на о-ве Пасхи численность населения, вышедшего ему навстречу, составляла ок. 2 тыс. чел., а после эпидемии оспы в 1863 г. на острове осталось всего 111 чел. [Хейердал, 2003, с. 30]. Таким образом, про-

B. anthracis concentrations in the wildlife of Etosha NP, Namibia

B. anthracis concentrations in the wildlife of Etosha NP, Namibia

B. anthracis concentrations in the wildlife of Etosha NP, Namibia



Reconstructing the Beringia “standstill hypothesis” and extinction patterns of the (woolly) mammoth fauna


СВФУ

Although anatomically defined, about 98% of all bone-remains from the Yakutian mammoth fauna are not (yet) dated


410 G.
9.84 KG.
12.60 KG.
11

Bridge over troubled water – Valuing Russia’s scientific landscape

Mycology

Ungulates

Plague

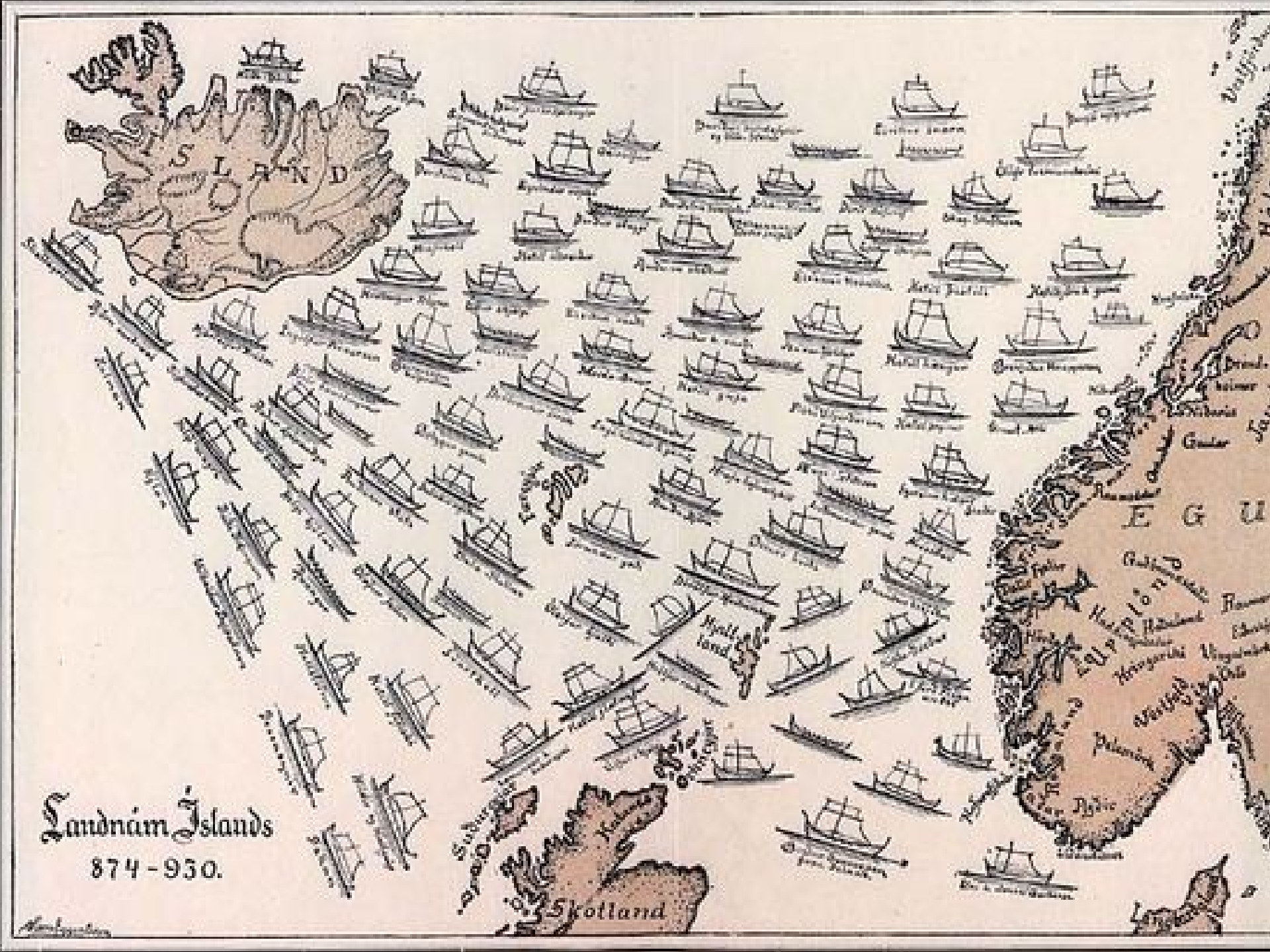
Beringia

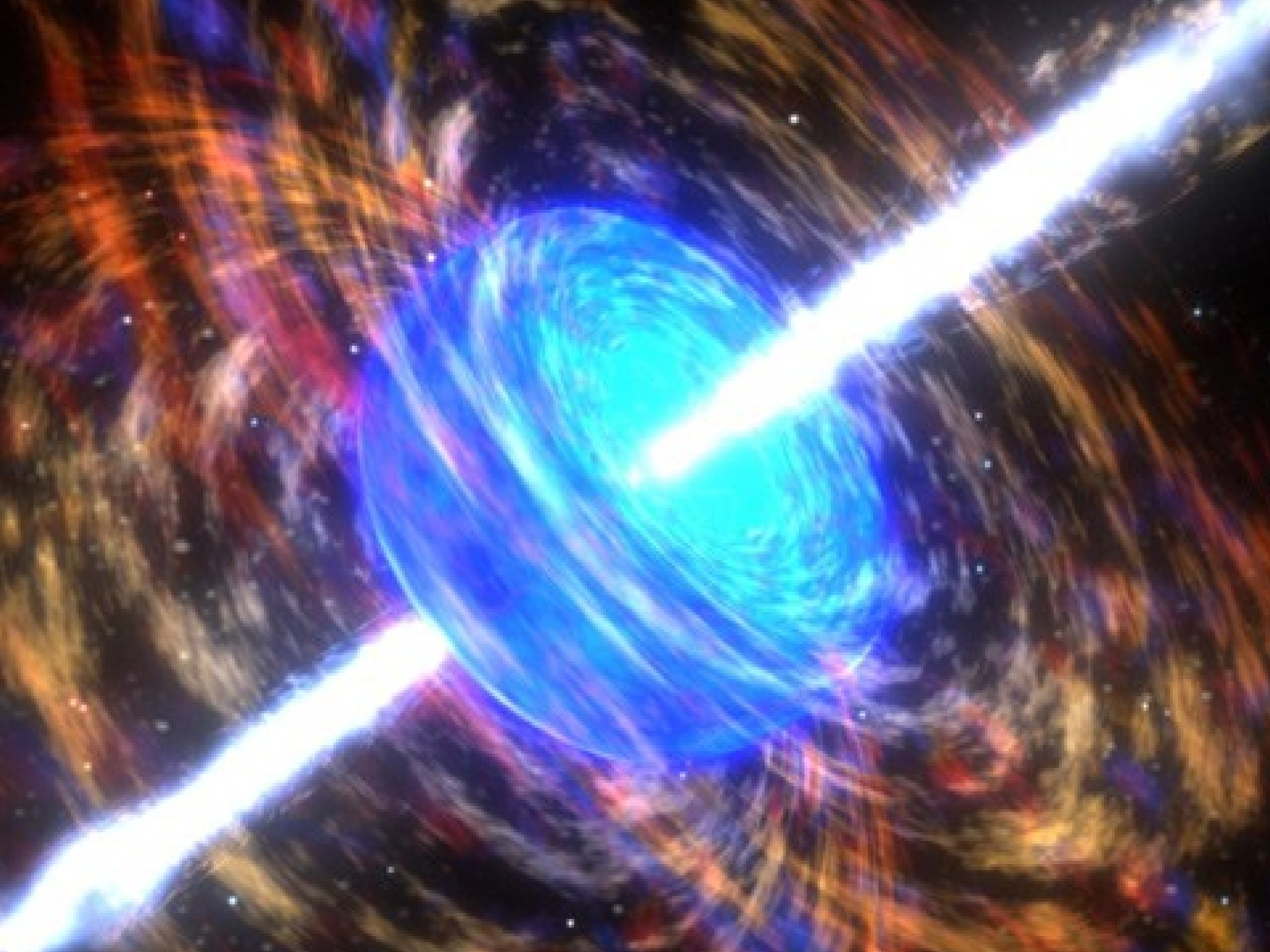
Volcanos

Driftwood

Lateglacial

Dating volcanic eruptions


ISLAND
Skotland
Landnám Íslands
874-930.



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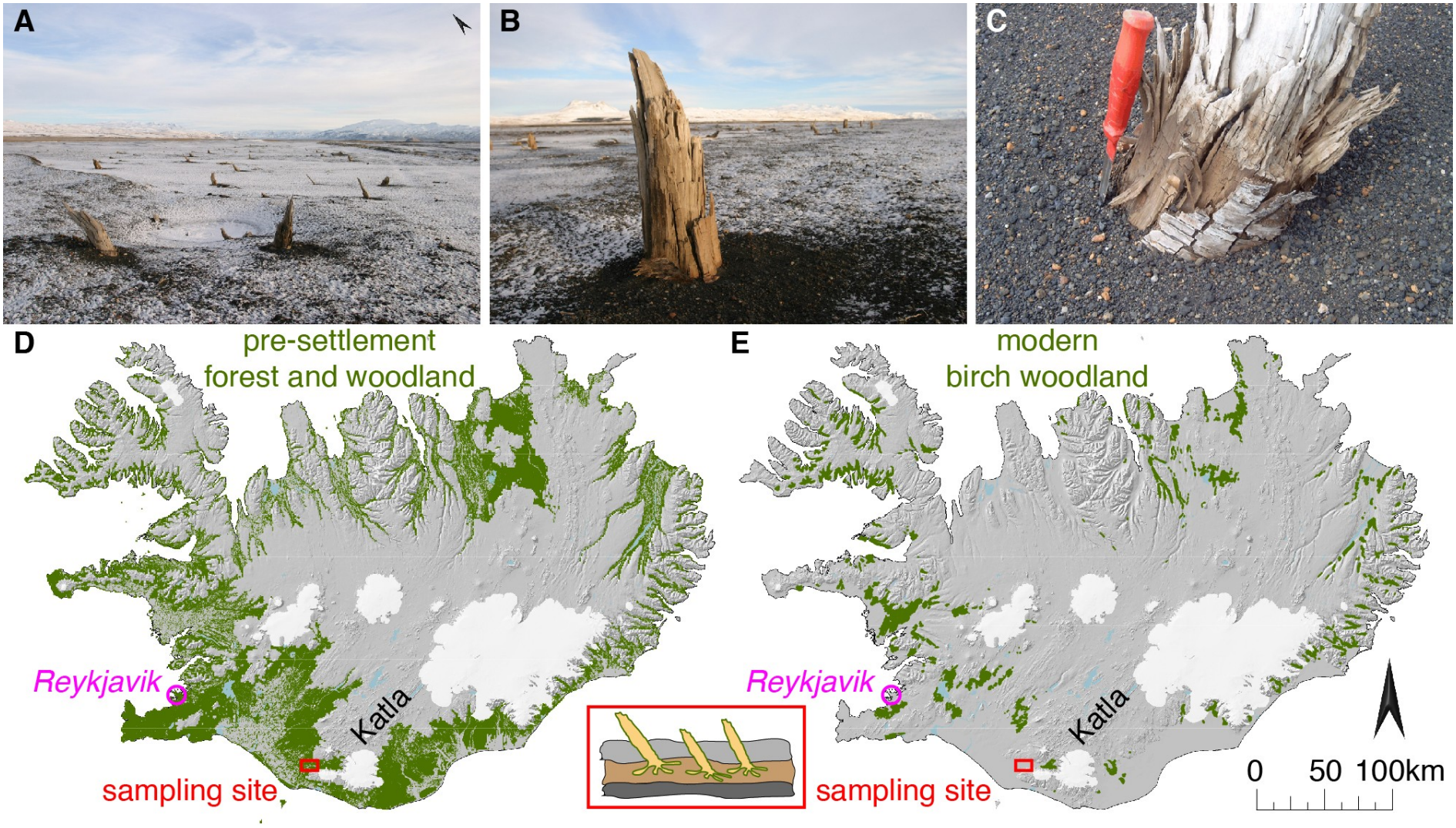

Büntgen et al. (2017) Geology

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MICADAS - Mini Carbon Dating System (https://www.ionplus.ch/products/micadas/)

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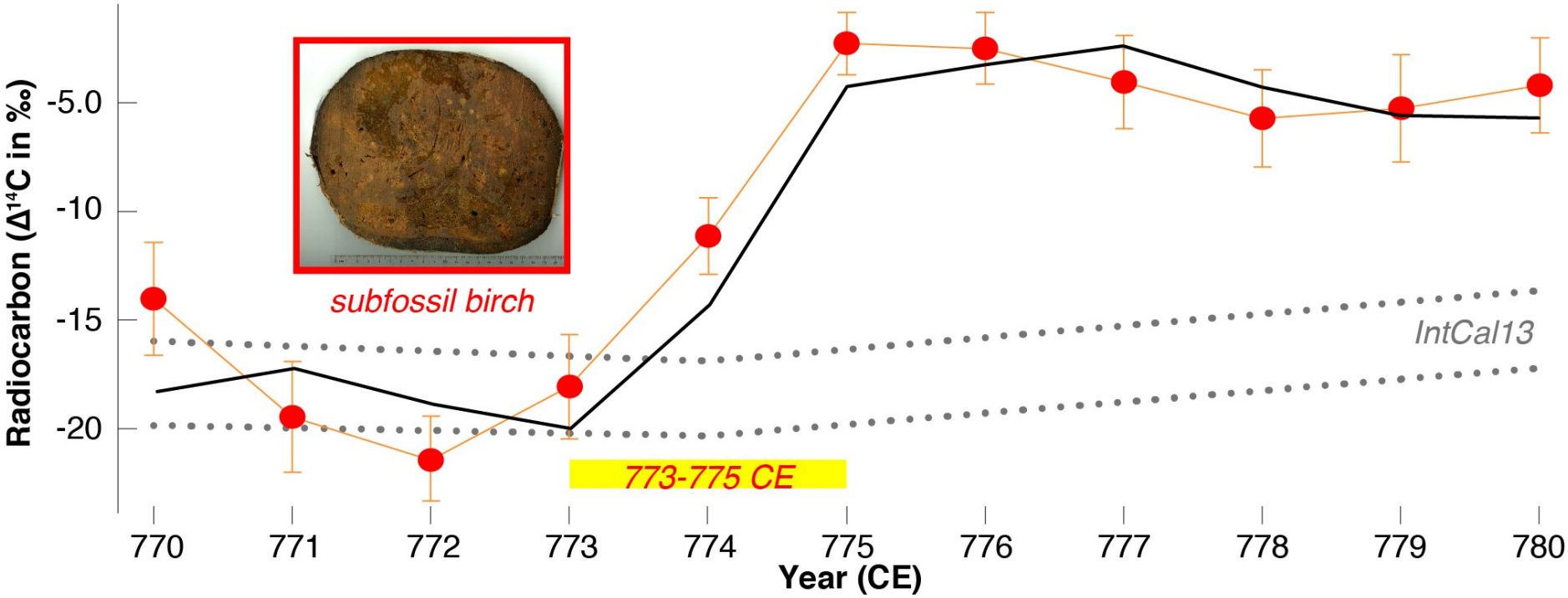

Büntgen et al. (2017) Geology

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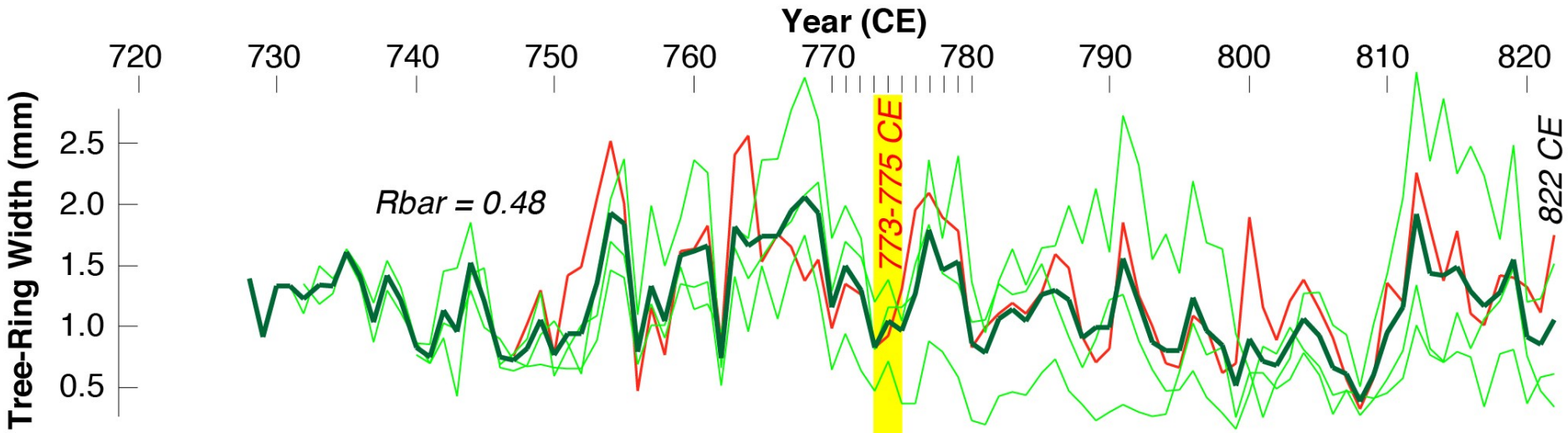

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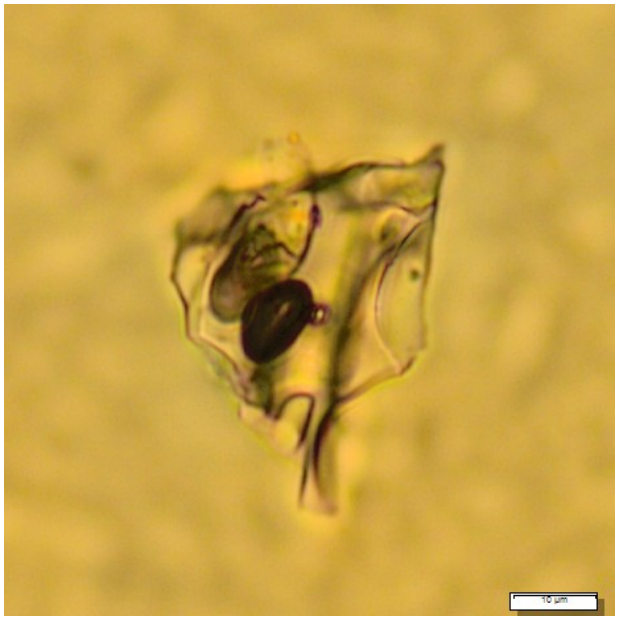
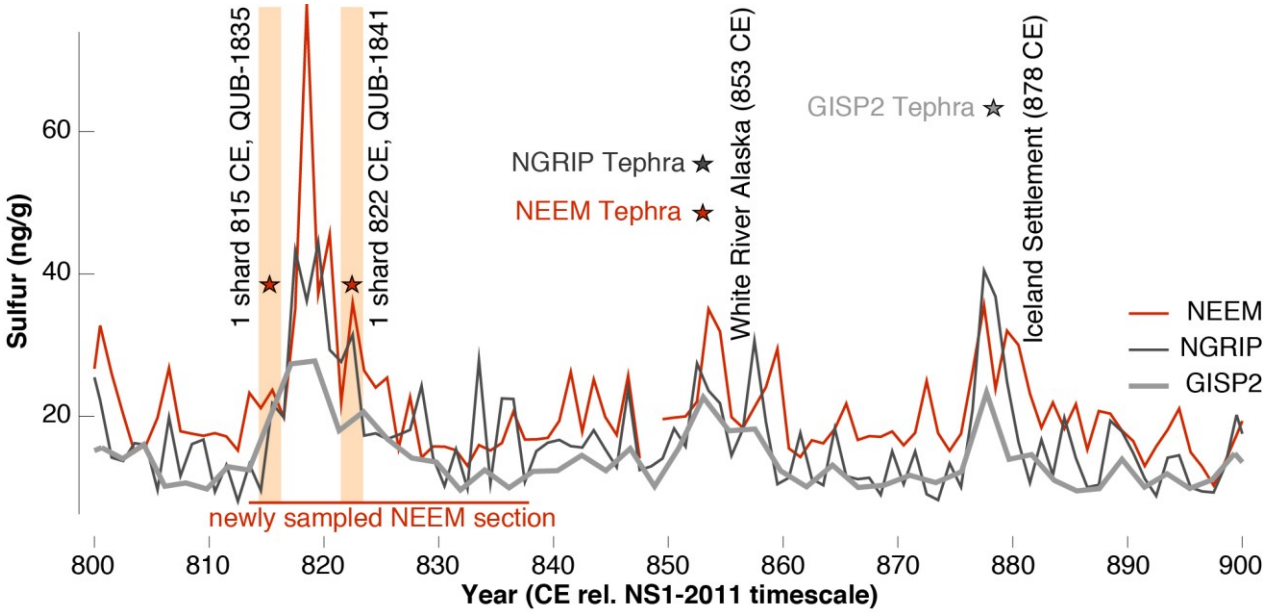




Büntgen et al. (2017) Geology

Multi-proxy dating of Iceland's major pre-settlement Katla eruption to 822/3 CE reveals:

- abrupt summer cooling in 824 CE reported from NH tree-ring reconstructions and written historical sources from Europe and China

- the oldest, precisely dated, high-latitude volcanic eruption

- insight into the existence of pre-historic woodland cover

- the nature of volcanism before Iceland's permanent settlement began

Into the Inferno

by Werner Herzog and Clive Oppenheimer

Mycology

Ungulates

Plague

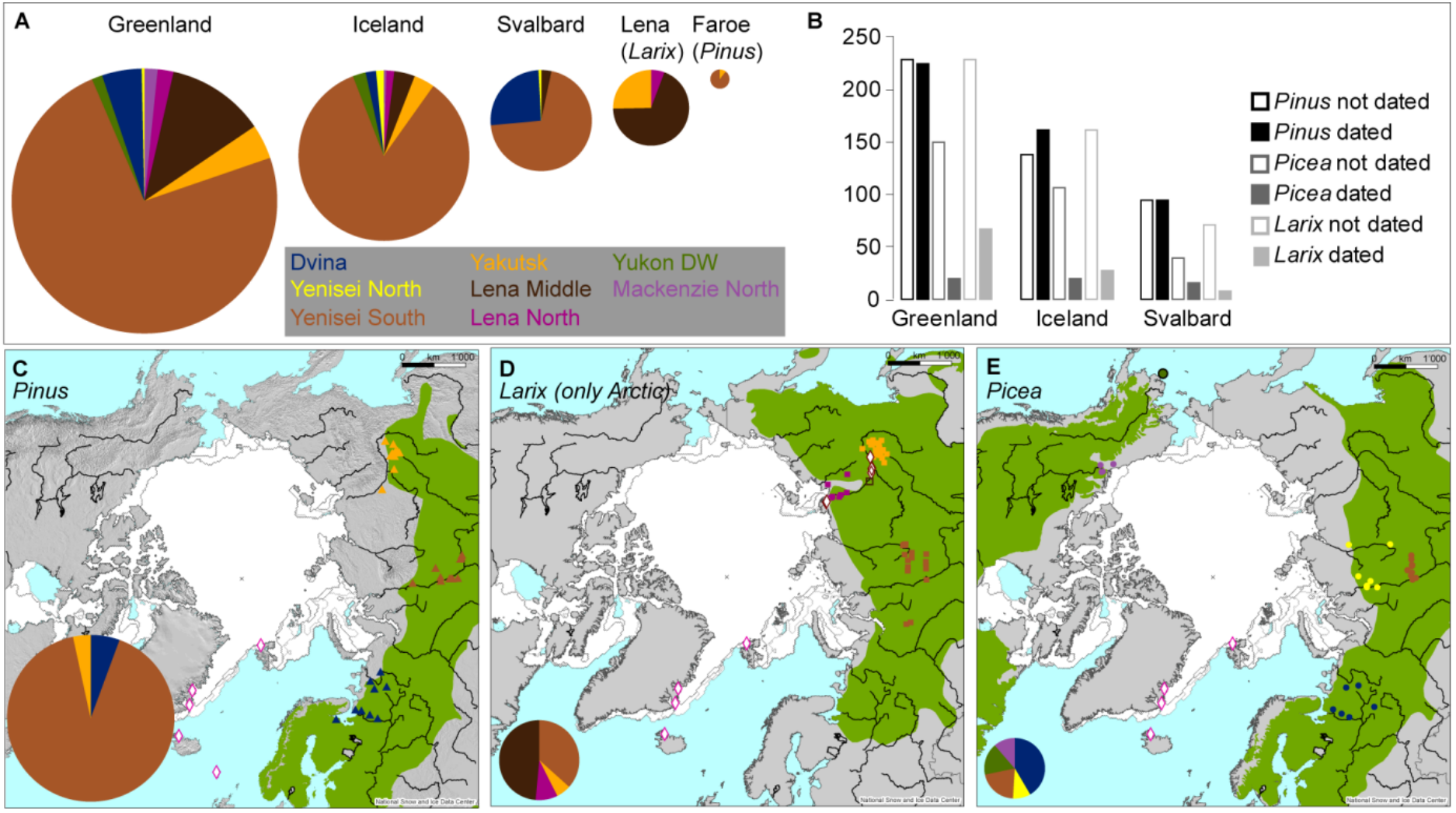
Beringia

Volcanos

Driftwood

Lateglacial

Tracing ocean currents



Hellmann et al. (2017) Quaternary Science Reviews

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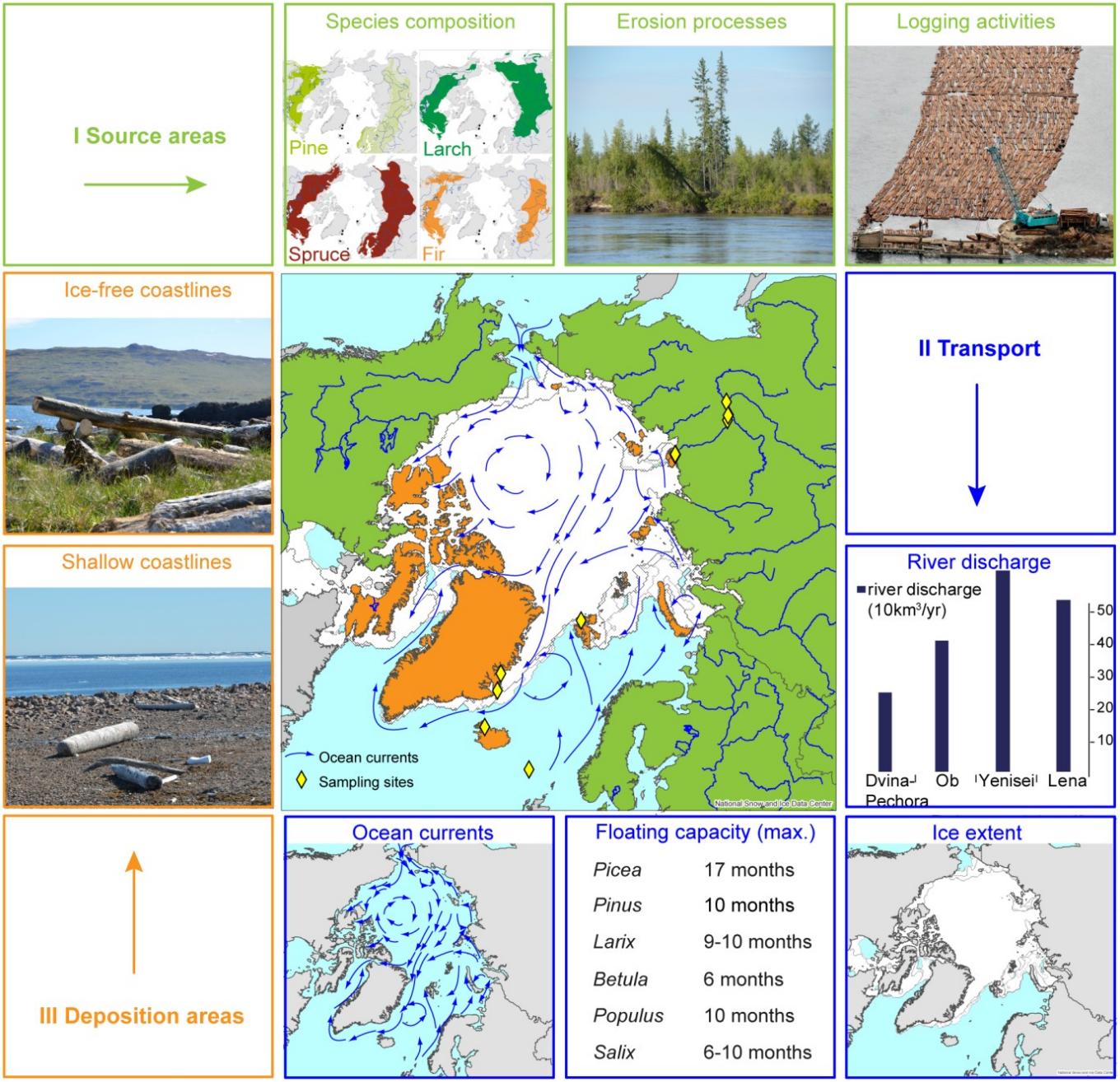
Department of Geography



Hellmann et al. (2017) Quaternary Science Reviews

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Department of Geography

Hellmann et al. (2017) Quaternary Science Reviews

Mycology

Ungulates

Plague

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Volcanos

Driftwood

Lateglacial

Reinig et al. (in revision) Quaternary Science Reviews


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AGIR
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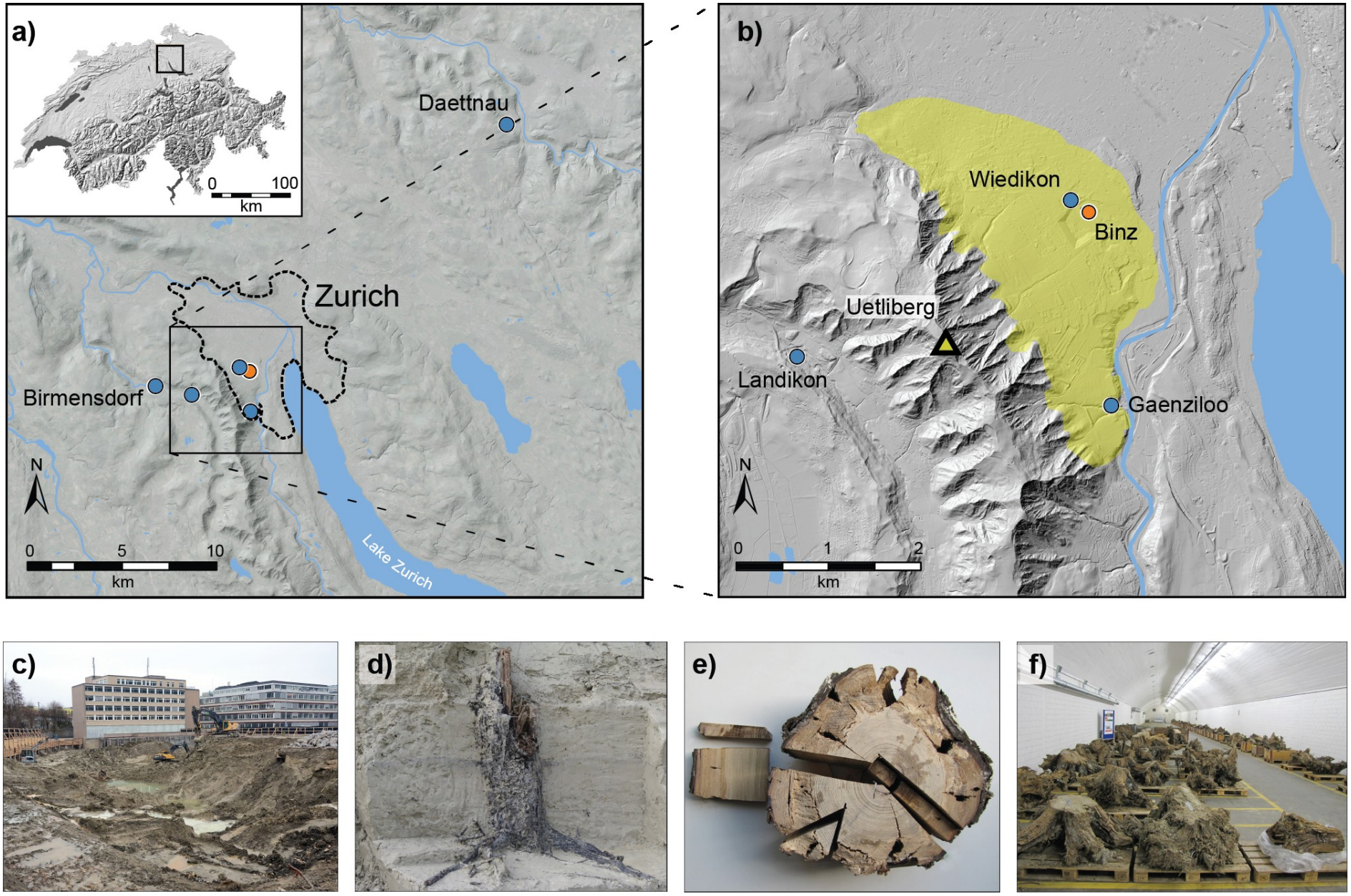

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Department of Geography

New Binz Material

New Binz Material contains 256 pines spanning ~2'200 years

Swiss LG Chrono contains ~150 pines spanning ~1'600 years

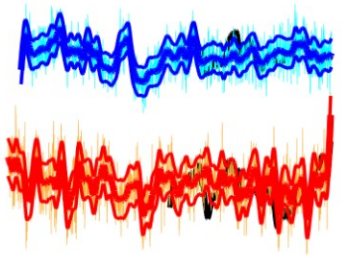
European Pine Chrono contains ~510 pines spanning 7'942-10'360 BC

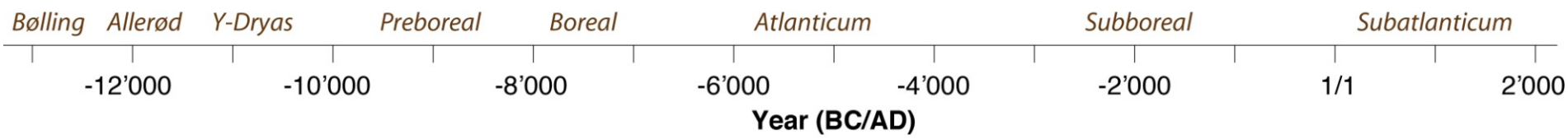
Southern-German Oak Chrono contains ~6'000 oaks back to 8'480 BC

Swiss LG (floating)

European Pine Chronology

Absolutely dated S-German Oak chronology





Reinig et al. (in revision) Quaternary Science Reviews

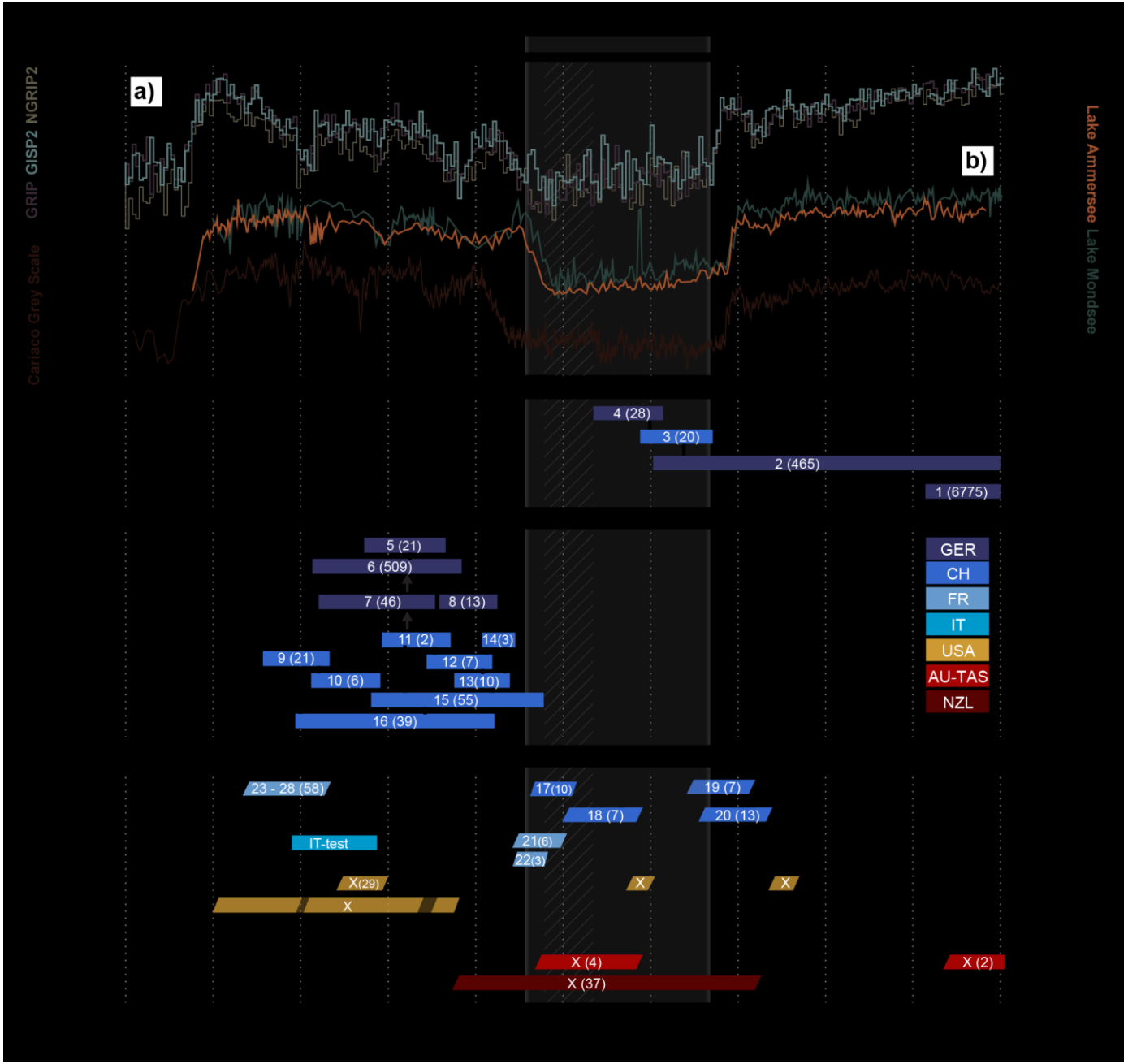
disc a

disc b

disc c

Reinig et al. (in revision) Quaternary Science Reviews

Lendvay et al. (in press) New Phytologist



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UNIVERSITY OF CAMBRIDGE
Department of Geography

Thanks