

References

Anthropologie

VAN MALDEGEM 2021

Elliot van Maldegem et al., *Population collapse or human resilience in response to the 9.3 and 8.2 ka cooling events, A multi-proxy analysis of Mesolithic occupation in the Scheldt basin (Belgium)*. [Journal of Anthropological Archaeology](#) **64** (2021), 101348, 1–15.

JAnthArch64-a101348-Supplement.zip

This paper explores the impact of environmental, e.g. sea level rise, and climatic events, e.g. abrupt cooling events, on Mesolithic populations (ca. 11,350 to 6600 cal BP) living in the western Scheldt basin of Belgium and Northern France. The Mesolithic in this study-area has been extensively studied during the last few decades, leading to an extensive database of radiocarbon dates ($n = 418$), sites ($n = 157$) and excavated loci ($n = 145$). A multi-proxy analysis of this database reveals important changes both chronologically and geographically, which are interpreted in terms of population dynamics and changing mobility and land-use. The results suggest a population peak and high residential mobility in the Early Mesolithic, followed by a population shift and increased intra-basin mobility in the Middle Mesolithic, possibly triggered by the rapid inundation of the North Sea basin. The situation during the Late Mesolithic remains less clear but a possible reduction in the mobility seems likely. Currently there is little evidence supporting a causal link between these diachronic changes in human behavior and the 9.3 and 8.2 ka cooling events. Most of the observed changes seem more in response to long-term climatic and environmental changes during the Early and Middle Holocene, hinting at considerable resilience.

Keywords: Summed Probability Distributions | Climate events | Mesolithic | Prehistoric demography | Hunter-gatherer mobility | NW-Europe

Elliot Van Maldegem, Hans Vandendriessche, Jeroen Verhegge, Joris Sergeant, Erwin Meylemans, Yves Perdaen, Florian Laurysen, Erik Smolders & Philippe Crombé

OJEDA-GRANADOS 2021

Claudia Ojeda-Granados et al., *Dietary, Cultural, and Pathogens-Related Selective Pressures Shaped Differential Adaptive Evolution among Native Mexican Populations*. [Molecular Biology and Evolution](#) (2021), preprint, 1–16. DOI:10.1093/molbev/msab290.

MolBiolEvol2021.12-Ojeda-Granados-Supplement.zip

Native American genetic ancestry has been remarkably implicated with increased risk of diverse health issues in several Mexican populations, especially in relation to the dramatic changes in environmental, dietary, and cultural settings they have recently undergone. In particular, the effects of these ecological transitions and Westernization of lifestyles have been investigated so far predominantly on Mestizo individuals. Nevertheless, indigenous groups, rather than admixed Mexicans, have plausibly retained the highest proportions of genetic components shaped by natural selection in response to the ancient milieu experienced by Mexican ancestors during their pre-Columbian evolutionary history. These formerly adaptive variants have the potential to represent the genetic determinants of some

biological traits that are peculiar to Mexican people, as well as a reservoir of loci with possible biomedical relevance. To test such a hypothesis, we used genome-wide genotype data to infer the unique adaptive evolution of Native Mexican groups selected as reasonable descendants of the main pre-Columbian Mexican civilizations. A combination of haplotype-based and gene-network analyses enabled us to detect genomic signatures ascribable to polygenic adaptive traits plausibly evolved by the main genetic clusters of Mexican indigenous populations to cope with local environmental and/or cultural conditions. Some of these adaptations were found to play a role in modulating the susceptibility/resistance of these groups to certain pathological conditions, thus providing new evidence that diverse selective pressures have contributed to shape the current biological and disease-risk patterns of present-day Native and Mestizo Mexican populations.

Keywords: adaptive evolution | disease susceptibility | Native Mexican populations.

Claudia Ojeda-Granados, Paolo Abondio, Alice Setti, Stefania Sarno, Guido Alberto Gnechi-Ruscione, Eduardo González-Orozco, Sara De Fanti, Andres Jiménez-Kaufmann, Héctor Rangel-Villalobos, Andrés Moreno-Estrada & Marco Sazzini

ZHU 2021

Dan Zhu, Eric D. Galbraith, Victoria Reyes-García & Philippe Ciais, *Global hunter-gatherer population densities constrained by influence of seasonality on diet composition*. [Nature Ecology & Evolution 5 \(2021\), 1536–1545](#).

The dependence of hunter-gatherers on local net primary production (NPP) to provide food played a major role in shaping long-term human population dynamics. Observations of contemporary hunter-gatherers have shown an overall correlation between population density and annual NPP but with a 1,000-fold variation in population density per unit NPP that remains unexplained. Here, we build a process-based hunter-gatherer population model embedded within a global terrestrial biosphere model, which explicitly addresses the extraction of NPP through dynamically allocated hunting and gathering activities. The emergent results reveal a strong, previously unrecognized effect of seasonality on population density via diet composition, whereby hunter-gatherers consume high fractions of meat in regions where growing seasons are short, leading to greatly reduced population density due to trophic inefficiency. This seasonal carnivory bottleneck largely explains the wide variation in population density per unit NPP and questions the prevailing usage of annual NPP as the proxy of carrying capacity for ancient humans. Our process-based approach has the potential to greatly refine our understanding of dynamical responses of ancient human populations to past environmental changes.

Bibel

GARFINKEL 2021

Yosef Garfinkel, Jon W. Carroll, Michael Pytlik & Madeleine Mumcuoglu, *Constructing the Assyrian Siege Ramp at Lachish, Texts, Iconography, Archaeology and Photogrammetry*. [Oxford Journal of Archaeology 40 \(2021\), 417–439](#).

This research examines the Assyrian siege ramp at Lachish, the only such known from the ancient Near East and the oldest in the world. The combination of different sources (texts, iconography and archaeology) enables us to reconstruct how

this monumental war installation was erected. We used photogrammetric analysis, facilitated through small Unmanned Aerial System (sUAS) imagery, to digitally map the landscape and evaluate different potential scenarios with regard to the construction and use of the ramp.

JOOSTEN 2020

Jan Joosten, *A Pseudo-Classicism in Esther*. In: AARON J. KOLLER, MORDECHAI Z. COHEN & ADINA MOSHAVI (Hrsg.), *Semitic, Biblical, and Jewish Studies in Honor of Richard C. Steiner*. (Jerusalem 2020), 219–234.

Over and beyond the questions raised by individual instances, pseudo-classicisms in LBH reveal one important aspect of how Hebrew evolved during the postexilic period. Written Hebrew changed under the influence of Aramaic, the language of administration and commerce. It changed, as do all languages, due to internal developments. But there was an additional factor: Hebrew changed in the direction of becoming the language of an increasingly text-oriented religious community. To write in Hebrew required, in at least some situations, linking up with earlier literature of a national-religious nature. Even in the Persian period, Hebrew was well on its way to becoming a “holy tongue”, a language whose canonical expression is found in ancient writings, a language in which every element is saturated with meaning, a language that, although partly forgotten, was alive in tradition and thus available for renewed use in new compositions.

PROPP 1993

William H. Propp, *That Bloody Bridegroom (Exodus IV 24-6)*. *Vetus Testamentum* **43** (1993), 495–518.

Energie

EMBLEMSVÅG 2021

Jan Emblemsvåg, *Wind energy is not sustainable when balanced by fossil energy*. *Applied Energy* **305** (2021), 117748, 1–20.

Highlights:

- Life-cycle analyses of wind in grids have many significant shortcomings today.
- Wind displaces far less emissions than typically assessed today.
- Wind does reduce emissions but insufficiently to qualify as sustainable.
- Policy must focus on developing low carbon dispatchable energy sources.
- Policy must focus on systemic sustainability and less on renewable energy per se.

Ensuring access to affordable, reliable, sustainable and modern energy for all is one of the Sustainable Development Goals. Some countries have therefore invested significantly in wind energy, but emissions, which is a common measure for sustainability in this context, have not fallen significantly. Reductions between 20 % and 40 % are typical. We therefore test the hypothesis that wind energy reduces emissions compared to using gas turbines when life-cycle emissions are included. The Irish grid is studied due to its record-high wind penetration. The model is based on high resolution grid data covering four years and input from 828 Life-Cycle Assessment cases to allow detailed analysis of demand, supply, life-cycle emissions and their changes due to the increased ramping of gas turbines and increased grid reserves required to maintain grid reliability when wind is deployed. Indirect effects are included to some extent. The model is sampled 10,000 times using Monte Carlo simulations. The results show that emissions are reduced by 10–20 %, which

supports the hypothesis. However, with an average wind penetration of 34 % in 2019, reaching many times the 65 % limit for non-synchronous generation set by the system operator to maintain grid reliability, such modest reductions logically imply that achieving an affordable, low-carbon grid using wind together with fossil energy balancing is infeasible with today's technology, emissions and costs. This key finding is transferable to other grids where wind has large penetration and requires fossil energy balancing. Thus, wind energy is not sustainable when balanced by fossil fuel generators.

Keywords: Levelized Cost of Energy (LCOE) | Life Cycle Assessment (LCA) | Subsidies | Uncertainty analyses | Monte Carlo simulations

Klima

FRANKE 2022

James A. Franke et al., *Agricultural breadbaskets shift poleward given adaptive farmer behavior under climate change*. [Global Change Biology](#) **28** (2022), 167–181.

Modern food production is spatially concentrated in global “breadbaskets.” A major unresolved question is whether these peak production regions will shift poleward as the climate warms, allowing some recovery of potential climate-related losses. While agricultural impacts studies to date have focused on currently cultivated land, the Global Gridded Crop Model Intercomparison Project (GGCMI) Phase 2 experiment allows us to assess changes in both yields and the location of peak productivity regions under warming. We examine crop responses under projected end of century warming using seven process-based models simulating five major crops (maize, rice, soybeans, and spring and winter wheat) with a variety of adaptation strategies. We find that in no-adaptation cases, when planting date and cultivar choices are held fixed, regions of peak production remain stationary and yield losses can be severe, since growing seasons contract strongly with warming. When adaptations in management practices are allowed (cultivars that retain growing season length under warming and modified planting dates), peak productivity zones shift poleward and yield losses are largely recovered. While most growing-zone shifts are ultimately limited by geography, breadbaskets studied here move poleward over 600 km on average by end of the century under RCP 8.5. These results suggest that agricultural impacts assessments can be strongly biased if restricted in spatial area or in the scope of adaptive behavior considered. Accurate evaluation of food security under climate change requires global modeling and careful treatment of adaptation strategies.

Keywords: adaptation | AgMIP | climate change | crop modeling | GGCMI

James A. Franke, Christoph Müller, Sara Minoli, Joshua Elliott, Christian Folberth, Charles Gardner, Tobias Hank, Roberto Cesar Izaurralde, Jonas Jägermeyr, Curtis D. Jones, Wenfeng Liu, Stefan Olin, Thomas A. M. Pugh, Alex C. Ruane, Haynes Stephens, Florian Zabel & Elisabeth J. Moyer

KANNENBERG 2021

Steven A. Kannenberg, Avery W. Driscoll, Paul Szejner, William R. L. Anderegg & James R. Ehleringer, *Rapid increases in shrubland and forest intrinsic water-use efficiency during an ongoing megadrought*. [PNAS](#) **118** (2021), e2118052118.

[pnas118-e2118052118-Supplement.pdf](#)

Globally, intrinsic water-use efficiency (iWUE) has risen dramatically over the past century in concert with increases in atmospheric CO₂ concentration. This

increase could be further accelerated by long-term drought events, such as the ongoing multidecadal “megadrought” in the American Southwest. However, direct measurements of iWUE in this region are rare and largely constrained to trees, which may bias estimates of iWUE trends toward more mesic, high elevation areas and neglect the responses of other key plant functional types such as shrubs that are dominant across much of the region. Here, we found evidence that iWUE is increasing in the Southwest at one of the fastest rates documented due to the recent drying trend. These increases were particularly large across three common shrub species, which had a greater iWUE sensitivity to aridity than *Pinus ponderosa*, a common tree species in the western United States. The sensitivity of both shrub and tree iWUE to variability in atmospheric aridity exceeded their sensitivity to increasing atmospheric [CO₂]. The shift to more water-efficient vegetation would be, all else being equal, a net positive for plant health. However, ongoing trends toward lower plant density, diminished growth, and increasing vegetation mortality across the Southwest indicate that this increase in iWUE is unlikely to offset the negative impacts of aridification.

Keywords: climate change | drought | iWUE | stable isotopes | tree rings

Significance: Photosynthesis involves a tradeoff between the uptake of carbon and the loss of water. Intrinsic water-use efficiency is an indicator of this tradeoff that is pivotal for understanding plant responses to climate change. Global increases in atmospheric CO₂ concentration have increased intrinsic water-use efficiency, but this relationship is also modulated by water availability. Here, we have identified that a severe, multidecadal drought in the American Southwest has caused some of the largest increases in plant water-use efficiency ever observed. The increase was particularly large in shrubs, which dominate much of the landscape in the region. Given that water scarcity in the American Southwest is expected to worsen, these relationships have important implications for plant health and carbon and water cycling.

MONTEATH 2021

Alistair J. Monteath, Benjamin V. Gaglioti, Mary E. Edwards & Duane Froese, *Late Pleistocene shrub expansion preceded megafauna turnover and extinctions in eastern Beringia*. [PNAS 118 \(2021\), e2107977118](#).

[pnas118-e2107977118-Supplement.pdf](#)

The collapse of the steppe-tundra biome (mammoth steppe) at the end of the Pleistocene is used as an important example of top-down ecosystem cascades, where human hunting of keystone species led to profound changes in vegetation across high latitudes in the Northern Hemisphere. Alternatively, it is argued that this biome transformation occurred through a bottom-up process, where climate-driven expansion of shrub tundra (*Betula*, *Salix* spp.) replaced the steppe-tundra vegetation that grazing megafauna taxa relied on. In eastern Beringia, these differing hypotheses remain largely untested, in part because the precise timing and spatial pattern of Late Pleistocene shrub expansion remains poorly resolved. This uncertainty is caused by chronological ambiguity in many lake sediment records, which typically rely on radiocarbon (¹⁴C) dates from bulk sediment or aquatic macrofossils—materials that are known to overestimate the age of sediment layers. Here, we reexamine Late Pleistocene pollen records for which ¹⁴C dating of terrestrial macrofossils is available and augment these data with ¹⁴C dates from arctic ground-squirrel middens and plant macrofossils. Comparing these paleovegetation data with a database of published ¹⁴C dates from megafauna remains, we find the postglacial expansion of shrub tundra preceded the regional extinctions of horse (*Equus* spp.) and mammoth (*Mammuthus primigenius*) and began during

a period when the frequency of ^{14}C dates indicates large grazers were abundant. These results are not consistent with a model of top-down ecosystem cascades and support the hypothesis that climate-driven habitat loss preceded and contributed to turnover in mammal communities.

Keywords: megafauna | eastern Beringia | keystone species | palaeoecology | steppe-tundra

Significance: Megafauna strongly influence vegetation structure, and population declines can alter ecosystem functioning. Overhunting of grazing megafauna is argued to have driven the collapse of widespread, northern steppe-tundra and its replacement by woody vegetation at the end of the ice age. However, in Alaska and Yukon, mammoth and horse became extinct around the time that steppe-tundra was replaced by shrub tundra, leaving it unclear whether this vegetation change caused, or was caused by, reduced megafauna populations. Comparison of accurately dated pollen records with a radiocarbon-dated bone chronology shows that shrubs began expanding before grazer populations declined. This indicates that climate was the primary control of steppe-tundra persistence and that climate-driven vegetation change may pose threats to faunal diversity in the future.

ZAVALA 2021

Miguel A. Zavala, *Excess plant growth worsens droughts*. [Nature Ecology & Evolution](#) **5** (2021), 1474–1475.

As global temperature and climate variability increase, overshoot droughts resulting from previously high plant growth could intensify climate–vegetation feedbacks.

ZHANG 2021

Yao Zhang, Trevor F. Keenan & Sha Zhou, *Exacerbated drought impacts on global ecosystems due to structural overshoot*. [Nature Ecology & Evolution](#) **5** (2021), 1490–1498.

[NatEcoEvo05-1490-Supplement.pdf](#)

Vegetation dynamics are affected not only by the concurrent climate but also by memory-induced lagged responses. For example, favourable climate in the past could stimulate vegetation growth to surpass the ecosystem carrying capacity, leaving an ecosystem vulnerable to climate stresses. This phenomenon, known as structural overshoot, could potentially contribute to worldwide drought stress and forest mortality but the magnitude of the impact is poorly known due to the dynamic nature of overshoot and complex influencing timescales. Here, we use a dynamic statistical learning approach to identify and characterize ecosystem structural overshoot globally and quantify the associated drought impacts. We find that structural overshoot contributed to around 11 % of drought events during 1981–2015 and is often associated with compound extreme drought and heat, causing faster vegetation declines and greater drought impacts compared to non-overshoot related droughts. The fraction of droughts related to overshoot is strongly related to mean annual temperature, with biodiversity, aridity and land cover as secondary factors. These results highlight the large role vegetation dynamics play in drought development and suggest that soil water depletion due to warming-induced future increases in vegetation could cause more frequent and stronger overshoot droughts.

Mittelpaläolithikum

PERESANI 2021

Marco Peresani et al., *A taste for the unusual*. *Green, flat pebbles*

used by late Neanderthals. *Journal of Anthropological Archaeology* **64** (2021), 101368, 1–22.

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Neanderthals collected unusual, sometimes colorful mineral materials from different sources. Several green serpentinite smooth pebbles with a flat shape and use modifications were unearthed at Fumane Cave in northern Italy. This study explores cognitive and functional criteria that influenced the selection and use of unique pebbles based on their regional geology, morphology, petrology, use wear, and residues. Besides the attraction for green materials, there is no evidence for the use of soft green and flat pebbles, like those from Fumane Cave, during the Middle Palaeolithic. Moreover, these materials were collected by Neanderthals only from ca. 44 ka cal BP, despite the large availability of green serpentinite pebbles in the alluvial beds near the cave. Ultimately, we provide new data to understand the role of aesthetic and technological factors in shaping the human behavioral range in the Middle Paleolithic.

Keywords: Neanderthal | Pebbles | Serpentinite | Use-wear and residue analysis | Bone | Italy

Marco Peresani, Stefano Bertola, Isabella Caricola, Stella Nunziante Cesaro, Rossella Duches, Paolo Ferretti, Davide Margaritora, Elena Marrocchino, Negar Eftekhari Carmela Vaccaro, Andrea Zupancich & Emanuela Cristiani

Neolithikum

IBÁÑEZ-ESTÉVEZ 2021

Juan J. Ibáñez-Estévez et al., *Sickle gloss texture analysis elucidates long-term change in plant harvesting during the transition to agriculture*. *Journal of Archaeological Science* **136** (2021), 105502, 1–25.

Archaeobotanical and genetic analysis of modern plant materials are drawing a complex scenario for the origins of cereal agriculture in the Levant. This paper presents an improved method for the study of early farming harvesting systems based on the texture analysis of gloss observed on sickle blades through confocal microscopy. Using this method, we identify different plant harvesting activities (unripe, semi-ripe and ripe cereal reaping and reed and other grass cutting) quantitatively and evaluate their change during the time when plant cultivation activities started and domesticated crops appeared in the Levant (12 800–7000 cal BC). The state of maturity of cereals when harvested shifted over time from unripe, to semi-ripe and finally to ripe. Most of these changes in harvesting techniques are explained by the modification of crops during the transition to agriculture. The shift in plant harvesting strategies was neither chronologically linear nor geographically homogeneous. Fully mature cereal harvesting becomes dominant around 8500 cal BC in the Southern Levant and one millennium later in the Middle Euphrates, which accords with the appearance of domestic varieties in the archaeobotanical record. The change in plant harvesting method fits better with the gradualist model of explanation of cereal agriculture than with the punctual one.

Keywords: Harvesting | Neolithic | South West Asia | Usewear | Confocal microscopy

Juan J. Ibáñez-Estévez, Patricia C. Anderson, Amaia Arranz-Otaegui, Jesús E. González-Urquijo, Anne Jörgensen-Lindahl, Niccolò Mazzucco, Fiona Pichon & Tobias Richter

ITAHASHI 2021

Yu Itahashi, Mary C. Stiner, Omur Dilek Erdal, Güneş Duru, Yılmaz Selim Erdal, Yutaka Miyake, Demet Güral, Minoru Yoneda , *The impact of the transition from broad-spectrum hunting to sheep herding on human meat consumption, Multi-isotopic analyses of human bone collagen at Aşıklı Höyük, Turkey*. *Journal of Archaeological Science* **136** (2021), 105505, 1–10.

JAS136-a105505-Supplement.pdf

At Aşıklı Höyük, one of the earliest Pre-pottery Neolithic mound sites in Central Anatolia, a shift in animal utilization from broad-spectrum exploitation of diverse animal species to a concentration on managed caprines has been observed. Changes in the balance of meat to plant foods over the same time frame remain an open question. In this study, carbon and nitrogen isotopic analyses of bulk collagen and compound-specific nitrogen isotopic analysis of amino acids were undertaken for the human remains to elucidate the dietary impact of the hunting to herding transition over a span of about 1000 years. The results showed that animal protein consumption did not change very much as managed sheep became the main source of meat. The contribution of animal protein to the total human diet at Aşıklı Höyük is similar to comparison data on later Neolithic farmers in Anatolia measured in previous studies. The early development of ungulate management and the increasing focus on just a few prey species do not appear to have forced drastic changes in the extent human carnivory from the early Pre-pottery Neolithic to the early Pottery Neolithic. However, human individuals showed similar isotopic compositions within the same buildings at Aşıklı, suggesting variation in food consumption by household.

Keywords: Domestication | Caprine management | Paleodiet | Neolithic period | Anatolia | Stable isotopes | Amino acid

Yu Itahashi, Mary C. Stiner, Omur Dilek Erdal, Güneş Duru, Yılmaz Selim Erdal, Yutaka Miyake, Demet Güral, Minoru Yoneda & Mihriban Özbaşaran

Politik

MEARSHEIMER 2014

John J. Mearsheimer, *Why the Ukraine Crisis Is the West's Fault, The Liberal Delusions That Provoked Putin*. *Foreign Affairs* **93** (2014), v, 77–89.

According to the prevailing wisdom in the West, the Ukraine crisis can be blamed almost entirely on Russian aggression. Russian Pres Vladimir Putin, the argument goes, annexed Crimea out of a long-standing desire to resuscitate the Soviet empire, and he may eventually go after the rest of Ukraine, as well as other countries in eastern Europe. In this view, the ouster of Ukrainian Pres Viktor Yanukovich in February 2014 merely provided a pretext for Putin's decision to order Russian forces to seize part of Ukraine. The crisis there shows that realpolitik remains relevant – and states that ignore it do so at their own peril. The US and European leaders blundered in attempting to turn Ukraine into a Western stronghold on Russia's border. The West's triple package of policies -NATO enlargement, EU expansion, and democracy promotion – added fuel to a fire waiting to ignite. Although the full extent of US involvement has not yet come to light, it is clear that Washington backed the coup.