The Political Ecology of Nomadic Empires: From Dependency to Vulnerability
CLIMATE AND THE RISE
OF THE MONGOL EMPIRE
ORKHON VALLEY, CENTRAL MONGOLIA

NSF Project: Pluvials, Droughts, Energetics, and the Mongol Empire
WHAT IS THE EFFECT OF HIGH GRASSLAND PRODUCTIVITY, DETECTED THROUGH TREE RING ANALYSIS, ON NOMADIC “STATE FORMATION”?

Was high grassland productivity a factor in Chinggis Khan’s military conquests?
Genghis Khan: Good weather 'helped him to conquer'
Genghis Khan rode climate change to take over Asia

Weatherwatch: Climate helped Genghis Khan create the Mongol empire

Genghis Khan’s Secret Weapon Was Rain

Forget his fearsome reputation - Genghis Khan rose to power thanks to a period of wet and warm WEATHER
TWO SIGNIFICANT CLIMATE PERIODS: LONG DROUGHT (C.1180-1205) AND LONG ‘PLUVIAL’ (1211-1225)
Although some historians have considered a deteriorating climate as a possible factor that explained the initial drive of the Mongols against their sedentary neighbors (6), our tree-ring evidence now shows that rapid expansion of the Mongols after their unification is correlated with favorable climate conditions, which were conducive not just to increased pastoral production but to the political centralization and military mobilization that would make conquest possible. The successful campaigns of the Mongols between 1206 and 1225 against the Tangut, Jurchen, and central Asian regimes enabled the construction of a solid and sophisticated politico-military state, which in a more advanced state of the conquest could support itself not just with local resources but also with the exploitation of conquered regions (18).

Fig. 2. Reconstructed drought from (A) 900–2011 CE, (B) 1160–1300 CE, and (C) 1870–2011 CE. Moisture balance highlights include the extended 15-y Mongol Pluvial (1211–1225 CE; blue box) and 21st-century drought (yellow box). A shows 20-y spline of the annual reconstruction (red). Two-tailed 95% bootstrap confidence limits of the reconstruction (blue) and spline (orange) were scaled to the reconstructed scPDSI. The uncertainty of the reconstruction is shown in gray (±1 RMSE). The severe drought during the 1180s, the Mongol Pluvial (blue bar), and the significant drought during the movement of the empire capital to China in 1260 CE are presented in B. The multiple pluvial events during the 20th century and the reversal to the severe and extended 21st-century drought (yellow bar) are highlighted in C. Annual values (black) are plotted in B and C.
CHINGGIS KHAN’S MAJOR CAMPAIGNS OUTSIDE MONGOLIA:
AGAINST THE JIN DYNASTY: 1209, 1211-15
AGAINST KOREA: 1218
AGAINST XI XIA: 1207, 1226-27.
AGAINST KHWAREZM (CENTRAL ASIA): 1211, 1218
AGAINST RUSSIA: 1221-23
High Grassland Productivity Hypothesis

- Rapid economic recovery
- Reliable annual supply of horses
- High yield of land supporting centralized government and urbanization
- Agricultural production
- Stabilizing effect on politics (confirming charismatic leader)
Manfred Rösch · Elske Fischer · Tanja Märkle

**Human diet and land use in the time of the Khans—Archaeobotanical research in the capital of the Mongolian Empire, Qara Qorum, Mongolia**

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**Abstract** Archaeobotanical investigations at Qara Qorum (Karakorum), Mongolia, reveal information about diet and land use from the 13th to the 15th century A.D. People grew *Panicum miliaceum*, *Hordeum vulgare*, *Triticum aestivum* and *Setaria italica* in nearby irrigated fields but additionally imported all other known cereals, including *Oryza sativa*, in small amounts as well as oil and fibre plants and pulses. The most common oil and fibre plant was *Cannabis sativa*. At least ten species of vegetables and spices such as *Carum carvi*, *Coriandrum sativum*, *Apium graveolens*, *Beta vulgaris*, *Lycium chinense* and *Piper nigrum* were either gathered from the wild, grown locally or imported. Apart from some wild gathered species like *Pinus sibirica* and *Fragaria vesca*, most of the fruits and nuts as for instance *Vitis vinifera*, *Ficus carica*, *Ziziphus jujuba*, *Prunus dulcis*, *P. insititia*, *P. avium* and *P. persica*, *Cucumis melo* and *Juglans regia* must also have been imported from quite long distances. First pollen results from lake Ugii Nuur, 50 km north of Qara Qorum indicate a much earlier beginning of agriculture than in the high and late Medieval.

**Keywords** Mongolia · High and late medieval · Human diet and land use · Town and was constructed by Chinese craftsmen (Roth 2002) (Fig. 1). Wilhelm von Rubruk, a Franciscan monk, who came to visit Mongolia as an envoy of the French king Louis the Holy, described the town, its people and economy. The town lost its role as the empire’s capital A.D. 1264 when Qubilai Qayan became emperor of China and moved the residence to Beijing. During the long-lasting wars after the fall of the Yuan dynasty in China in A.D. 1368, the town was completely destroyed in the early 15th century and never rebuilt. In the 15th century the Buddhist monastery Erdene Zuu, which still exists today, was founded in its direct neighbourhood.

Excavations took place at the site 1948/49 by a Russian/Mongolian team (Kiyseliev et al. 1965), a Japanese survey in 1997 (Shiraishi 2001), and since 1999 by a German/Mongolian team, organized by the Mongolian Academy of Science, the German Archaeological Institute (Kommission für Allgemeine und Vergleichende Archäologie), and by the University of Bonn. The present excavations are situated in the Qayan’s palace and in the town-centre where the craftsmen and tradesmen used to live (Roth 2002; Erdenebat and Pohl 2002). The excavation will be continued until 2006. Afterwards, the results will be presented in an exposition when Mongolia celebrates the 800th anniversary of the capital’s foundation by Činggis Qayan.
In conclusion it is, *ex hypothesi*, my contention that a major climatic downturn did much to encourage an end to the infighting and vendettas among the Mongol clans and make possible their reorganization under Chinggis’ military authority. One might even argue, more vigorously, that for the Mongols in this situation, general reorganization and mutual burying of differences had become essential to survival. While it is indeed the case that the Mongols “. . . a nation of not more than a million people, conquered a multitude of other nations with a population of around 100 million”, their enthusiasm for the task of conquest may well have been fueled by a climatic defeat at their backs.
Ellsworth Huntington (1876-1947)

Ellsworth Huntington at the Mill Spring, California, tree ring study, 1911
The history of Eurasian nomads has been often conceived as explosions, eruptions, or reactions

“produced mechanically by the action upon the Nomads of either one or the other of two alternative external forces: either a pull exerted by one of the sedentary societies in the neighborhood of the Steppes, or else a push exerted by the climate of the Steppes themselves”
CONCLUDING REMARKS

A hypothesis has been presented here for a climate mechanism that could have incited the Huns and Avars to migrate west and invade late-Roman Europe in the 4th, 5th, and 6th centuries AD. This hypothesis uses a millennia-long tree-ring chronology from Dulan-Wulan in north-central China to show that a series of megadroughts probably occurred around those times in the homelands of the Huns and Avars. The cause of these megadroughts is then shown to be plausibly related to long-range ENSO forcing of climate, which influences March–June precipitation amounts in central Asia and northern China in the modern era. Two multi-millenial ENSO-sensitive tree-ring chronologies from New Mexico and New Zealand support this hypothesis by indicating that persistent drought-inducing La Niña-like conditions occurred around the time of the megadroughts and Hun-Avar migrations. To verify these hypotheses, more multi-millennial paleo records of hydroclimatic variability in central Asia are needed.
INNER ASIAN FRONTIERS AND DEPENDENCY THEORIES
Owen Lattimore
“I believe that while the environment strongly conditions a primitive society, it does not always make social evolution impossible. Moreover society, as it evolves, attempts to exercise choice and initiative in the use of the environment.... The study of geography should not be distorted in the attempt to make it explain the whole of any historical process.”

(Owen Lattimore, The Geographical Factor in Mongol History, 1938).
“Rule over nomads alone produced a surplus of sheep horses, wool and so forth that could be readily used in trade”

Owen Lattimore, *Inner Asian Frontiers of China*, 519
STEPPE AND SOWN: TWO SEPARATE WORLDS, DIVIDED BY ECOLOGY, ECONOMY, CULTURE AND POLITICS
The “dependency theory” assumes that nomads depend on agricultural products. Trade and pillage are the “drivers” of political change and generate imperial formations.
Dependency Theories

Functionalist and co-evolutionist theories assume that higher forms of political organization among the nomads are generated along the frontier between nomadic and sedentary people.

The Great Wall embodied the steppe/sown divide
Dependency Theory

Need for sedentary products

Formation of large states able to compete with China

Plunder and conquest

Dissolution (unexplained)
Some objections:

1. Economic variability within the “nomadic” world
2. The rise of a “steppe empire” is invariably preceded by intra-nomadic conflicts
3. Nomadic “power centers” far away form sedentary areas
Monumental graves of the Xiongnu period have been found faraway from the Great Wall.
Agricultural production in the Central Asian mountains: Tuzusai, Kazakhstan (410–150 B.C.)

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The site of Tuzusai is located in the Tien Shan Mountains of eastern Kazakhstan; occupation at the site between 410 B.C. and A.D. 150 represents the transition between the Saka and Wusun periods (Saka: 800–200 B.C.; Wusun: 200 B.C.–A.D. 400). Iron Age people of Central Asia are often described simply as mobile pastoralists, yet at Tuzusai, we have evidence that agriculture was practiced along with pastoral transhumance. This multiresource economic system combined pastoralism and hunting with the cultivation of a variety of crops. Our new finding is significant because Tuzusai has the first clear evidence for the presence of agriculture from the Iron Age of northern Central Asia. The diversity of crops grown at Tuzusai required varying labor and time inputs and a well-planned scheduling system.
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<td>Rouran, Xianbei, Türk</td>
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<tr>
<td>13th c.</td>
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<td>17th c.</td>
<td>Qing-Manchu</td>
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No historical correlation between the rise of powerful Chinese Dynasties and the rise of nomadic Empires.
VULNERABILITY
7,000 herder households from 8 provinces, with their 2.4 million livestock, have been forced to camp for the winter in neighbouring provinces. Another 790 households with 542,000 livestock, have moved into the border zone. 1,600 households, with 430,000 head, are wintering in the protected areas and national parks.

On 9 January 2001, a United Nations Disaster Assessment and Coordination (UNDAC) Team was dispatched by OCHA to assist the UN Disaster Management Team in Ulaanbaatar in a quick assessment of the situation, and in the development a United Nations and Government Appeal for International Assistance to Mongolia.
More than 17 per cent of Mongolia's livestock died as a result of the extreme weather conditions. The animals provide income, food and fuel for the country's herdsmen. Photo ©UNICEF/NYHQ2010-0455/Cullen
Drought in Inner Mongolia, 2011
Snow and freezing events cause an interaction between food unavailability and cold, if forage is inaccessible. Since blizzards often immobilize herds, the animals quickly weaken and die from hypothermia (Fernadez-Gimenez 1999). The impact of winter storms on livestock is different from that of drought. In drought animals starve, but in dzubuts forage becomes inaccessible due to deep snow cover and/or an icy impenetrable layer. Unable to continue grazing and thereby generate heat through rumen fermentation, digestion and metabolism, the animal’s lower critical temperature is exceeded as heat loss is greater than heat gain—‘in simple terms, the more an animal eats the more tolerant it will be to cold’ (Webster 1983:644). Livestock freeze to death due to heat loss rather than dying of starvation. The impact of dzubuts is immediate and usually cannot be escaped, but droughts take time to build up, giving herders time to move their animals to more abundant pastures, in some cases.
QUESTION: WHAT WAS THE POLITICAL RESPONSE TO CLIMATE VARIABILITY IN PAST NOMADIC SOCIETIES?

1. DROUGHTS

2. ‘PLUVIALS’
GENESIS AND GEOGRAPHY OF SOILS

Paleosol and Paleoenvironmental Conditions in the Lower Volga Steppes during the Golden Horde Period (13th–14th Centuries AD)

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Abstract—Paleosols buried under steppe kurgans of the Golden Horde period (13th–14th centuries AD) in the Lower Volga basin are characterized by an increased humus content, lower salinity and gypsum content, and higher magnetic susceptibility of the soil material in comparison with the paleosols buried in the preceding period and the background surface soils. A comparative analysis of the morphological, chemical, and magnetic properties of the buried and surface soils allows us to conclude that an increase in climatic humidity within this dry region took place in the period of the high Middle Ages, with a peak in the 13th–14th centuries AD. The climatic change was manifested in the soil evolution at the taxonomic levels of soil genera and soil subtypes (in the ecotone zones). On the basis of measured magnetic susceptibility values, the mean annual precipitation levels in the Golden Horde period have been reconstructed. According to our estimates, the mean annual precipitation in the Lower Volga basin in that time was 30–80 mm higher than at present. The favorable paleoenvironmental and paleosol conditions of the Golden Horde period were important factors that affected the ethnic and political situation in the Lower Volga region.

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Climate change and the expansion of the Scythian culture after 850 BC: a hypothesis

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Abstract

In south-central Siberia archaeological evidence suggests an acceleration of cultural development and an increase in the density of nomadic populations around 850 BC. We hypothesize a relationship with an abrupt climatic shift towards increased humidity caused by a decline of solar activity. Areas that initially may have been hostile semi-deserts changed into attractive steppe landscapes with a high biomass production and high carrying capacity. Newly available steppe areas could be invaded by herbivores, making them attractive for nomadic tribes. The central Asian horse-riding Scythian culture expanded, and an increased population density was a stimulus for westward migration towards southeastern Europe.

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Keywords: Carrying capacity; Chronology; Climate change; Eurasia; Migration; Scythian culture; Solar forcing
CHRONOLOGY AND POSSIBLE LINKS BETWEEN CLIMATIC AND CULTURAL CHANGE DURING THE FIRST MILLENNIUM BC IN SOUTHERN SIBERIA AND CENTRAL ASIA

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ABSTRACT. We reconstructed climate change during the second half of the Holocene for the Minusinsk (southern Siberia) and the Uyuk (Central Asia) valleys in the Eurasian steppe zone. Sediment cores from 2 lakes and a soil profile from the Arzhan-2 burial mount were investigated. We combined pollen and geochemical analyses and radiocarbon dating with the archaeological record. A sharp increase of human population density occurred at the transition from the Bronze Age to Iron Age (about 2700 cal BP). The most representative Scythian culture started in the Uyuk and the Minusinsk valleys after increased humidity and occupation capacity of the steppe zone during the 9th century BC.
Arzhan I, Tuva
9th-8th C. BCE
PAZYRYK CULTURE 5TH-3RD c. BCE
“Vulnerability” Hypothesis: some thoughts

1. Droughts do not necessarily cause migrations but higher rates of militarization and conflicts possibly resulting in political centralization

2. Some migrations can result from extended intra-nomadic conflicts

3. Pluvials may also favor migration and expansion due to higher levels of political centralization

4. The relationship between climate and steppe politics is relative to (1) duration of the crisis, (2) level of militarization within the nomadic society, (3) emergence of a centralized “state” and (4) resources that the state can rely on as it expands

5. The rate of expansion is relative to the productivity of the grassland.
Political ecology of nomads

- Tribal fragmentation or loose union
- Productivity downturn (drought, dzuud, etc.)
- Increased competition for resources
- Growth in militarization and warfare
- Remaking of political order, high grassland productivity
- Highly centralized government
- Tribute-conquest-taxation

Political ecology of nomads
"Pillage and plunder, yes ... but *don't harm* the environment!"