

# Sustainability over Lunch?

Ellen Sandell, State MP for Melbourne

Professor David Karoly , Research Fellow MSSI



Your thoughts on the University's future sustainability plan

Thursday 5<sup>th</sup> May 12.15pm – 1.30pm Lowe Theatre  
Register: [go.unimelb.edu.au/u5ta](http://go.unimelb.edu.au/u5ta)

#UoMSustPlan

More Information: [sustainablecampus.unimelb.edu.au/about/sustainability-plan](http://sustainablecampus.unimelb.edu.au/about/sustainability-plan)



By Yvonnefm - Own work, CC BY-SA 3.0, <https://commons.wikimedia.org/w/index.php?curid=5443607>

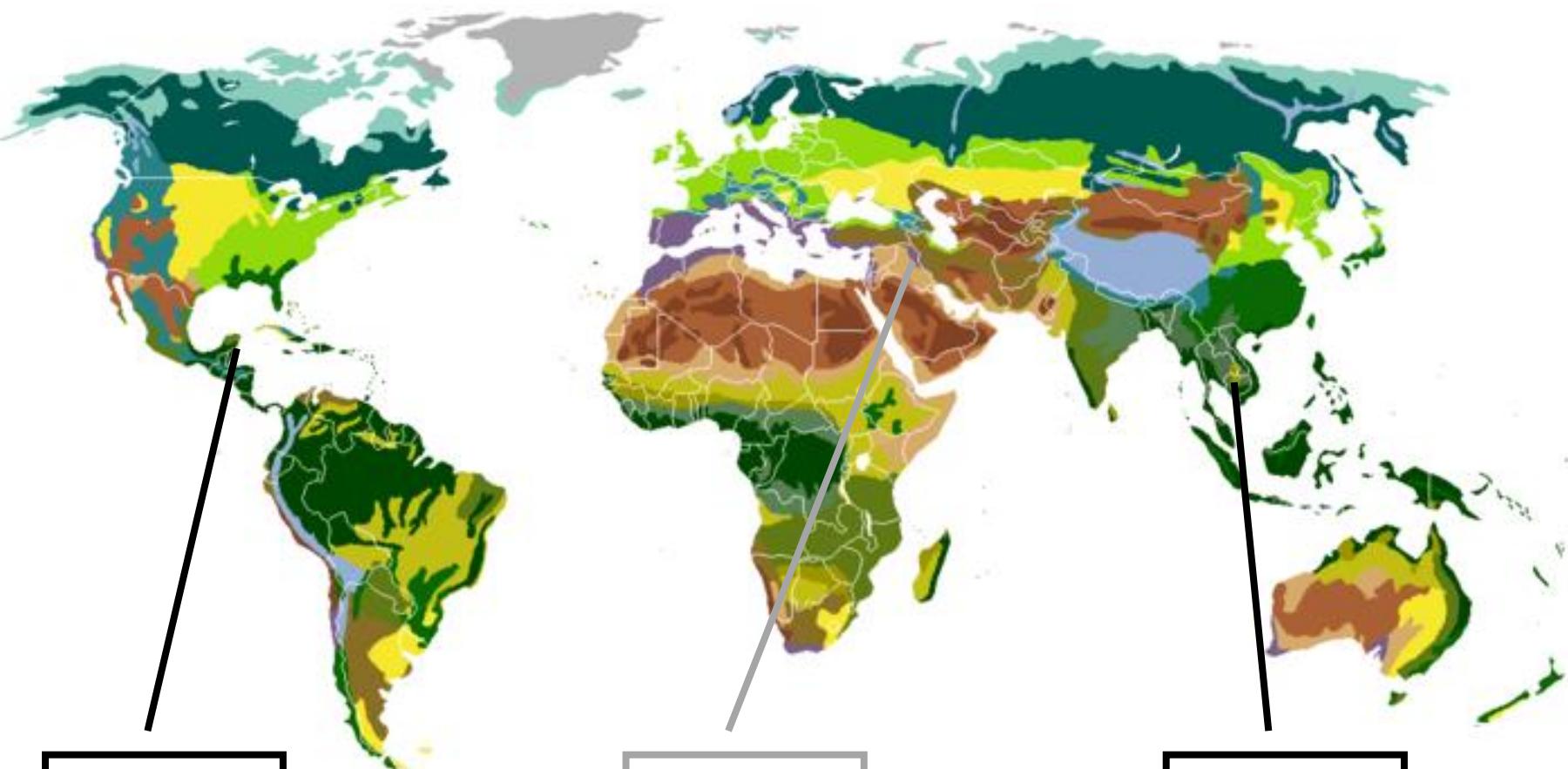
# Famine: the Geography of Scarcity

## Collapse of Civilizations

# Hypothetical example

| Causes of hypothetical famine | Butzer's socio-political model | Environmental determinism |
|-------------------------------|--------------------------------|---------------------------|
| Political instability         | Yes                            | No                        |
| Climate change                | Yes                            | Yes                       |
| Soil erosion                  | Partly                         | Yes                       |
| Disease outbreaks             | Partly                         | Partly                    |
| Centralisation                | No                             | No                        |
| Neo-liberal policies          | No                             | No                        |
| Excessive taxation            | Yes                            | No                        |

# Three examples of collapse



Classic  
Maya

Akkadian  
Empire

Khmer  
Empire

# Maya Civilisation

- Classic Maya civilisation of Mesoamerica declined around 800-900 AD
- Abandonment of major cities in south, such as Tikal
- Invasion, social upheaval, loss of trade routes, disease, drought, soil erosion and ecological collapse invoked

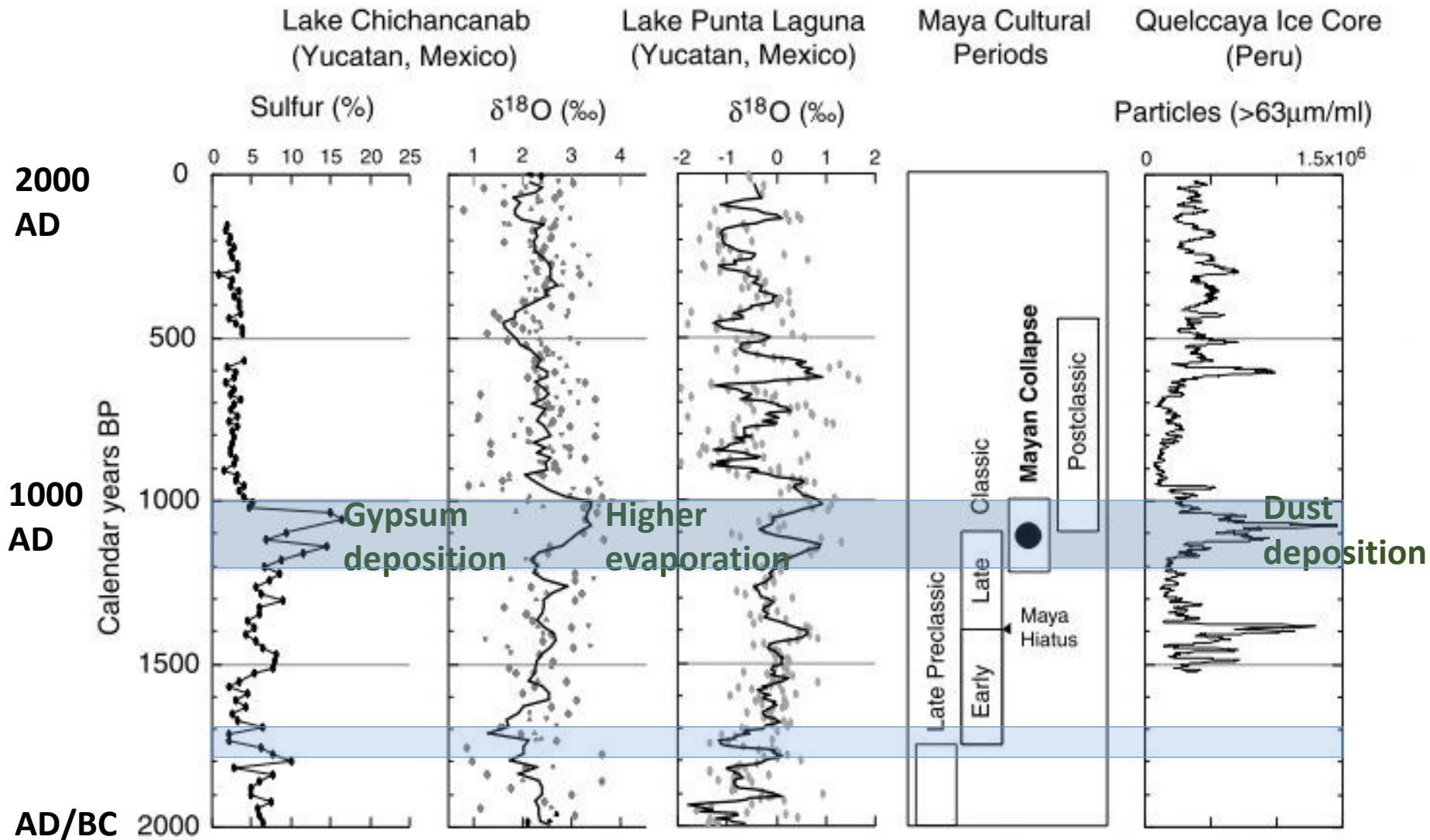




# Tikal, Guatemala



# Collapse of the Maya



# Did climate cause the collapse?

- Abandonment of southern cities appears to coincide with evidence for ~200-year drought
- These cities relied on surface water for agricultural and urban needs
- High population density = vulnerability?
- Does *coincidence* equate to *cause*?
- And was this a ‘collapse’? Mayan civilisation continued, albeit in a different form

# Angkor

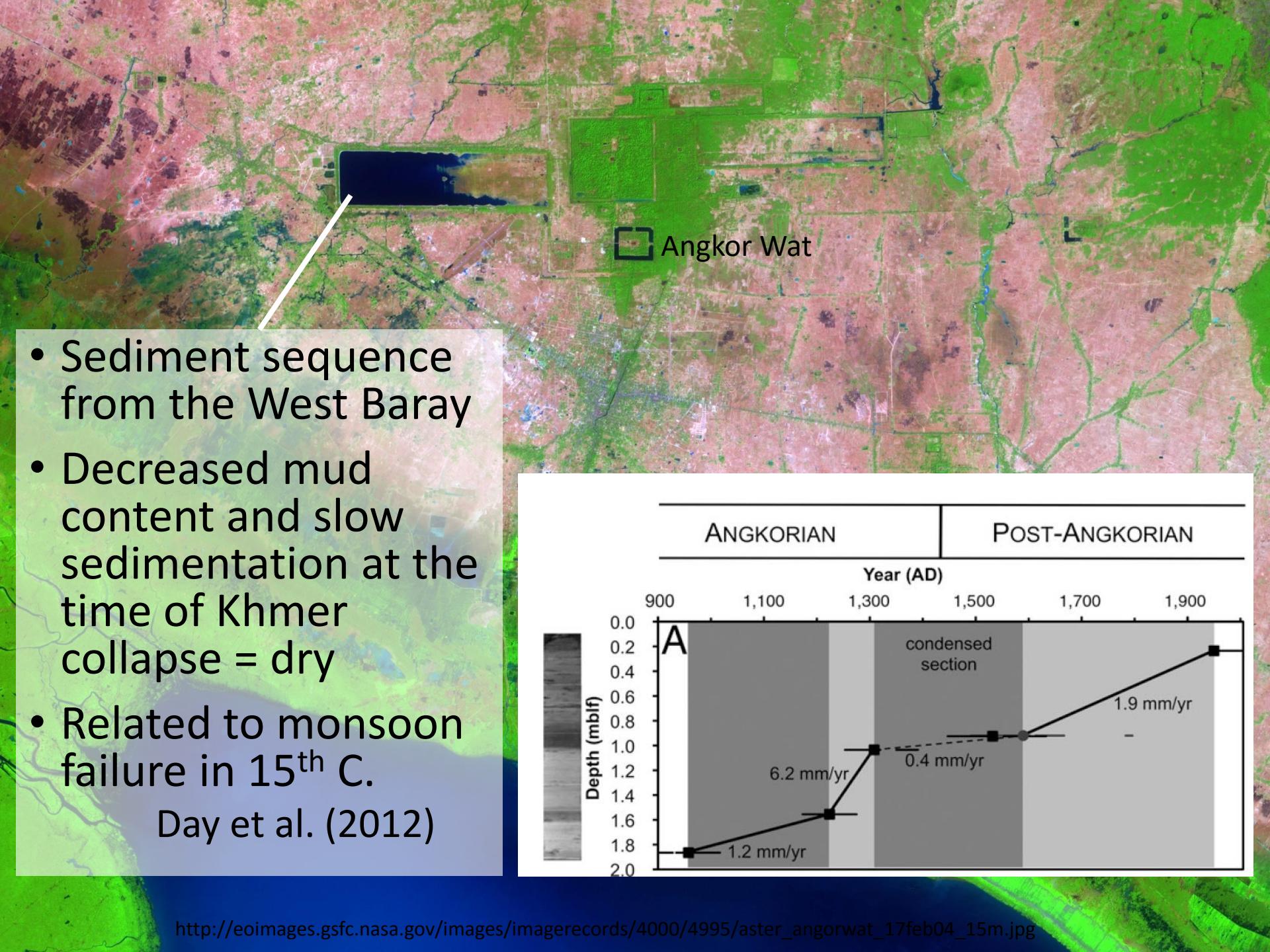
- Capital of the Khmer Empire from 9<sup>th</sup> century AD
- Largest pre-industrial urban centre in the world
- Extensive irrigation system to store monsoon rains
- Highly developed road system (= trade network)
- Collapse around 1431 AD (though monastery persisted)



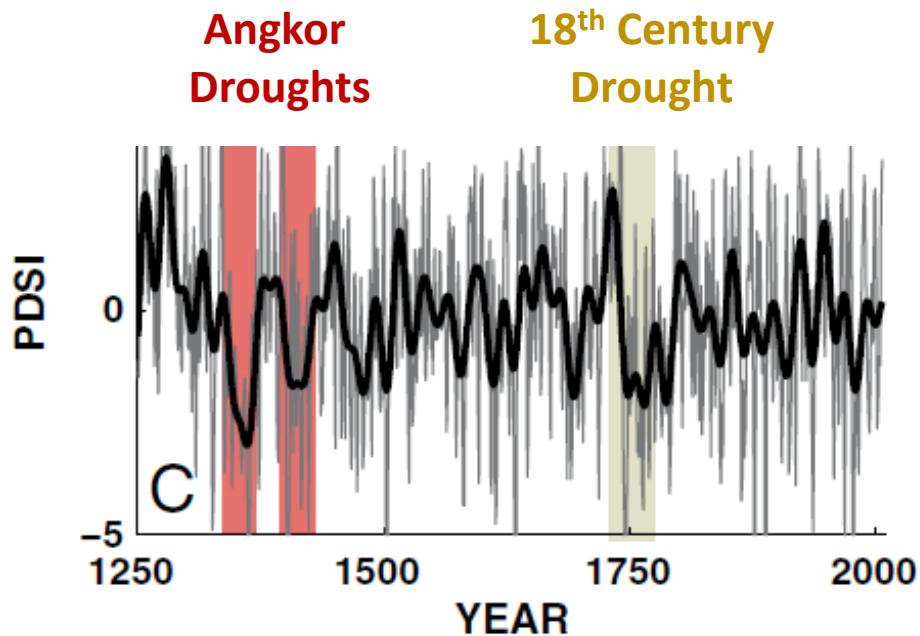
Sam Garza - Wikimedia Commons



- Sediment sequence from the West Baray
  - Decreased mud content and slow sedimentation at the time of Khmer collapse = dry
  - Related to monsoon failure in 15<sup>th</sup> C.
- Day et al. (2012)



# Tree-ring evidence



PDSI: Palmer Drought Severity Index

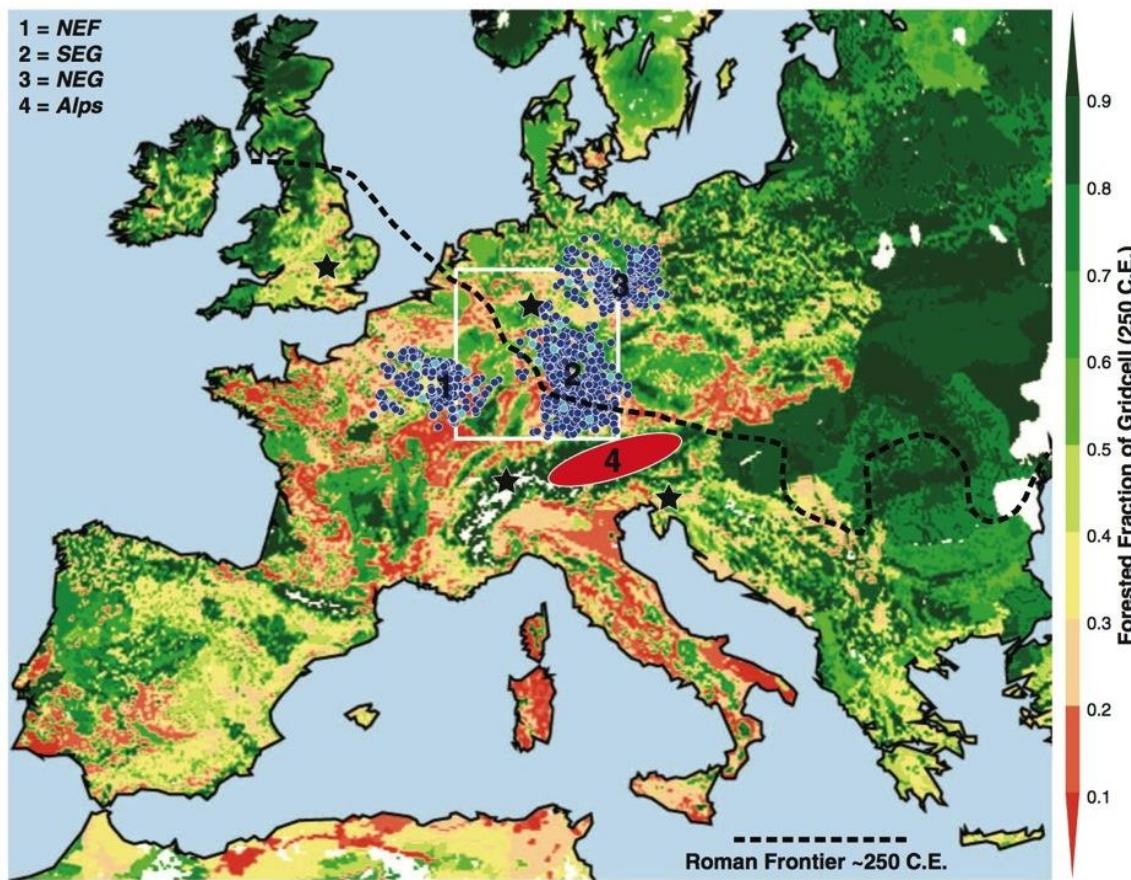
- Reduced rainfall linked to El Niño (ENSO)
- Could have led to Khmer collapse...
- But what about:
  - Political instability/war?
  - Religious movements?
  - Changes in trade and regional economy?

# The nature of the evidence

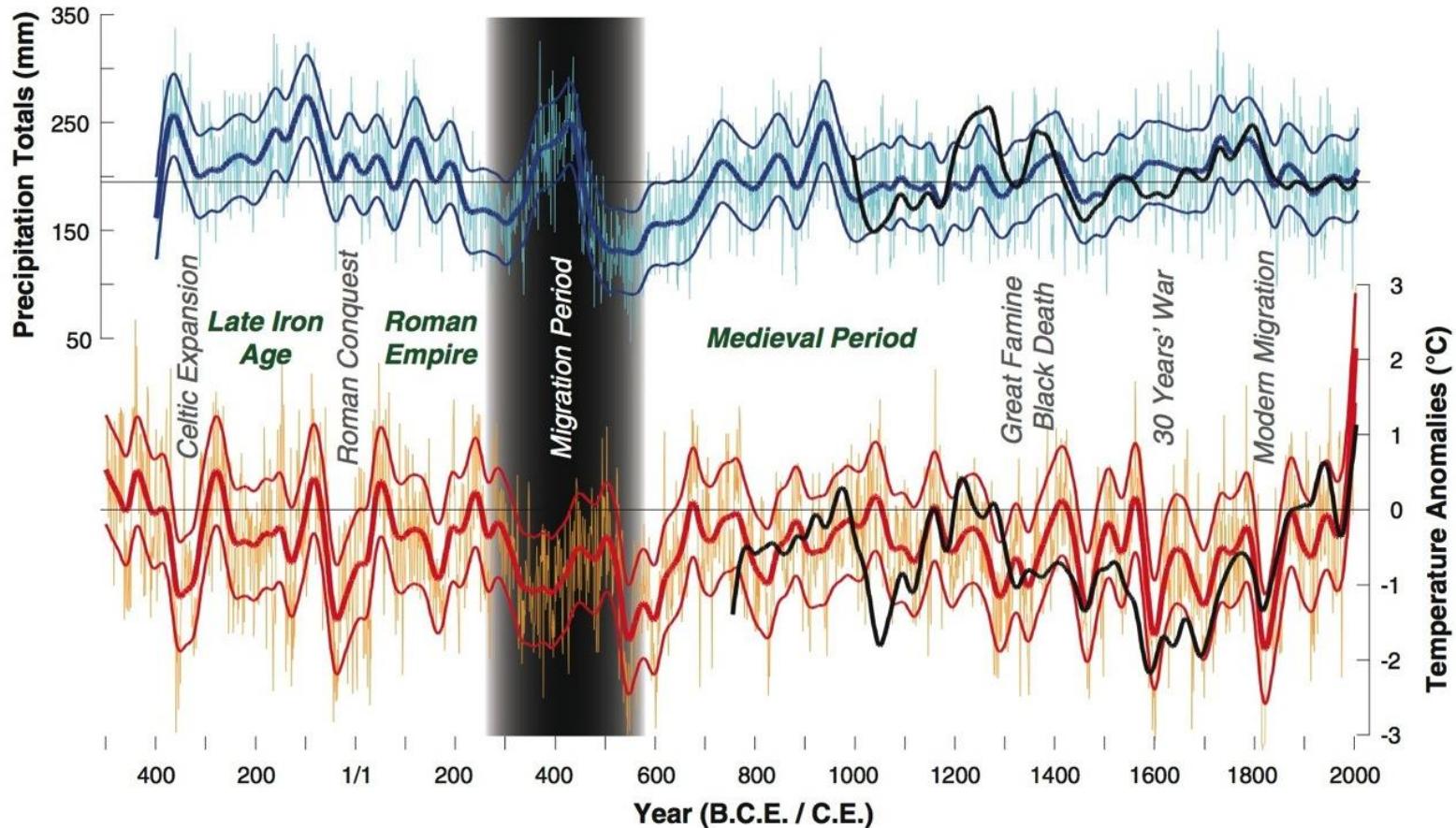
- Are our views of the past biased by the variable preservation of evidence?
- Physical processes preserved in natural archives
- Social processes preserved in written archives
- What if there was no writing?
- Or if writing was only by elites?
- How might this bias affect our understanding?
- How could biased understanding influence policy?

# Fall of the Roman Empire

**Fig. 1.** Location of the 7284 central European oak samples (blue) and the network of 1546 Alpine conifers (red), superimposed on a deforestation model of Roman land use and land cover around 250 C.E. (22). Black stars indicate the location of the independent tree-ring chronologies used for comparison (16–19); the white box denotes the area over which gridded precipitation totals were averaged and used for proxy calibration.



# Temperature and rainfall reconstructions from tree-rings



# Purported impacts of ENSO



- Plagues
- Fishery collapses
- Tropical famines
- Shipwrecks
- Wars in Africa
- Fires and cyclones in Australia
- Hitler's defeat at Stalingrad
- Napoleon's defeat at Moscow
- Sinking of the Titanic
- Polynesian arrival in New Zealand
- Discovery of Easter Island
- And many more...

# Environmental determinism

- “Environmental determinism assumes that the physical environment is the primary determinant of cultural forms. During the late 19th and early 20th century, some geographers claimed a link between imperialism and environmental determinism...”



# Environmental Determinism in Near Eastern Prehistory<sup>1</sup>

H. E. WRIGHT, JR.

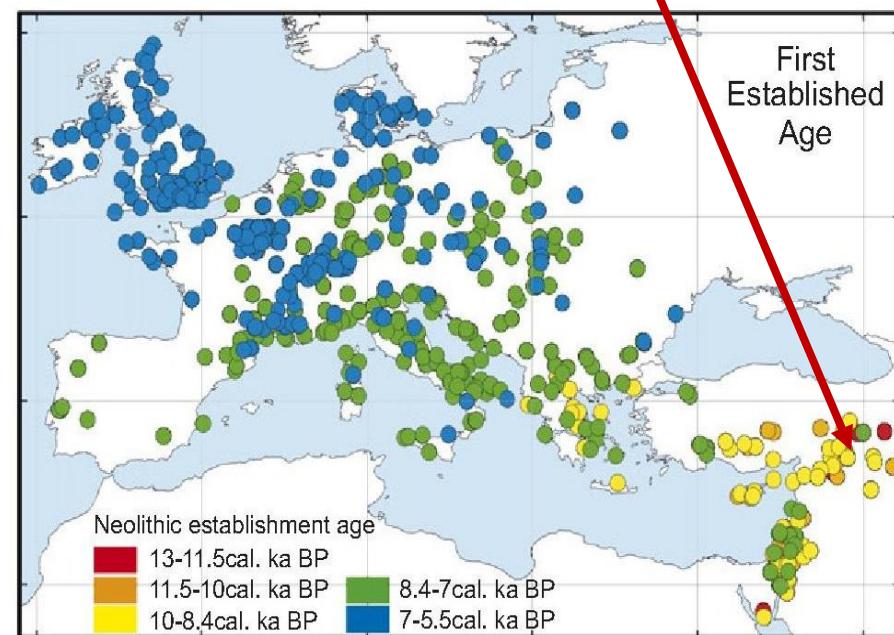
*Limnological Research Center, University of Minnesota, 310 Pillsbury Dr. S.E., Minneapolis, Minn. 55455-0219, U.S.A. 10 XII 92*

The great American geographer Ellsworth Huntington (1926), after his extensive travels in southwestern Asia ...

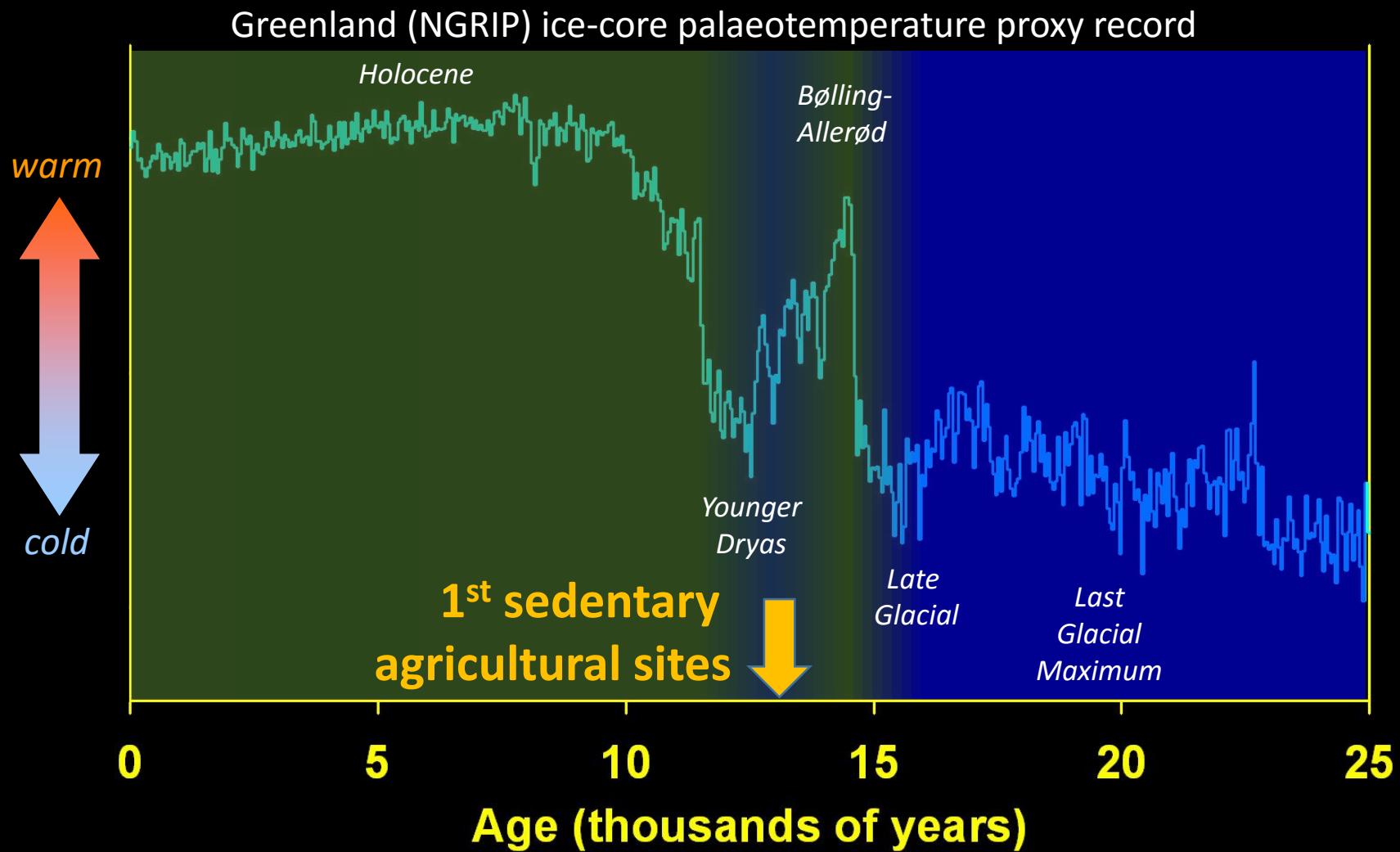
The southern Levant was the locus of these first steps toward plant domestication because it was located in a climatic transition zone that was sensitive to the key controls on seasonality, and the plants that were domesticated were those adapted to summer drought. The postulated sequence of events brings us back to the environmental deterministic approach of Childe, but now the hypothesis is based on substantial paleoecological data

Fertile Crescent

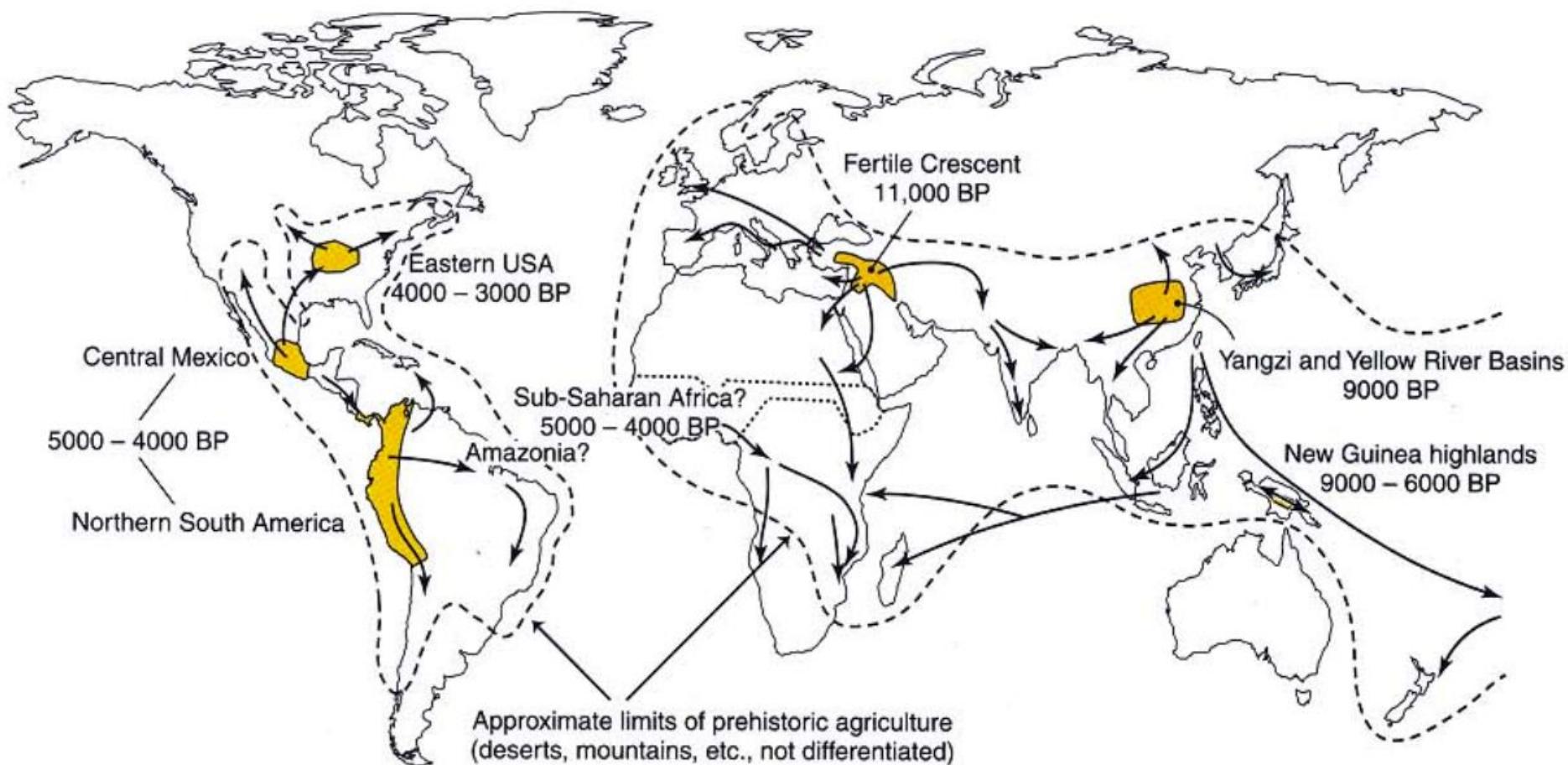
First Established Age



# Climate change and early farming



# Why not elsewhere?





# Enviro. determinism

- Aristotle (384-322 BC): “*in one direction [‘frigid zone’] no one lives because of the cold, in the other [‘torrid zone’] because of the heat*”
- Ideas experienced a renaissance in Europe following Darwin’s theories
- Exported to the USA by Ellen Churchill Semple (1863-1932)
- Ellsworth Huntington (1876-1947) became its leading proponent

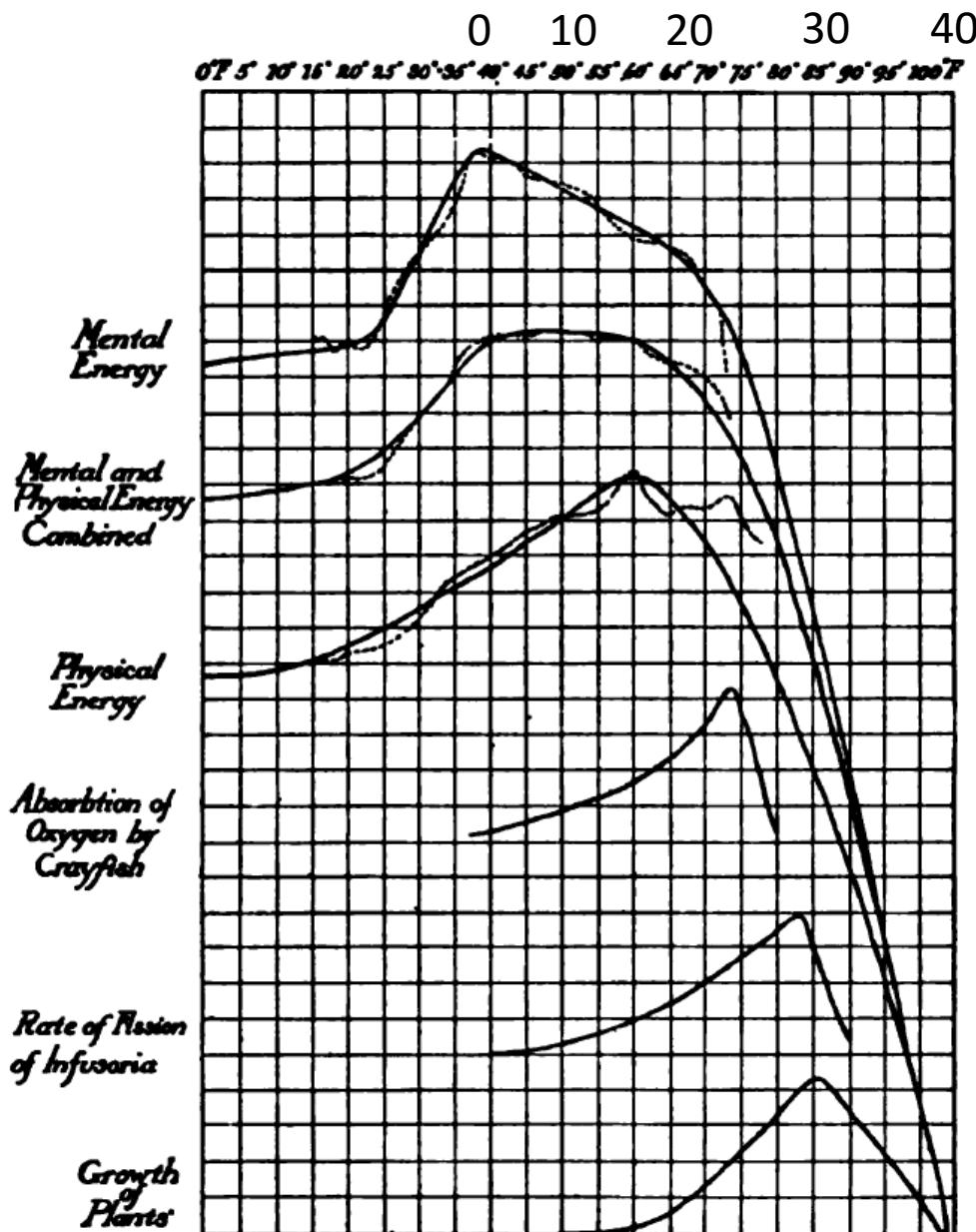


Figure 10. Mean Temperature and Vital Processes in Plants, Animals and Man

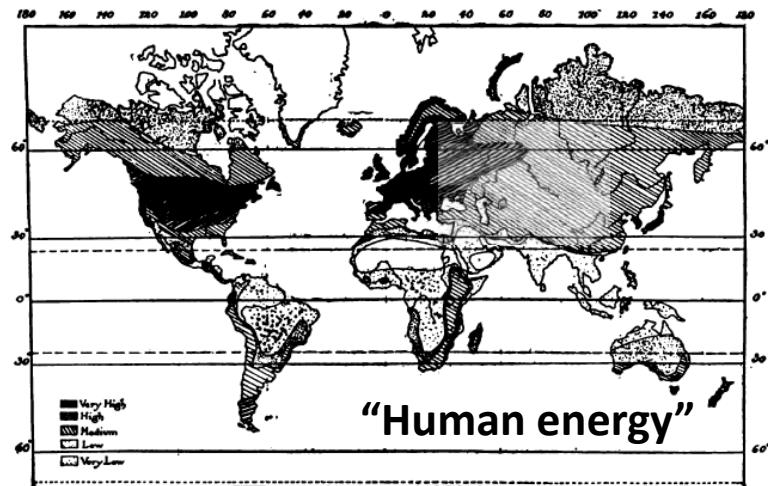


Figure 30. The Distribution of Human Energy on the Basis of Climate

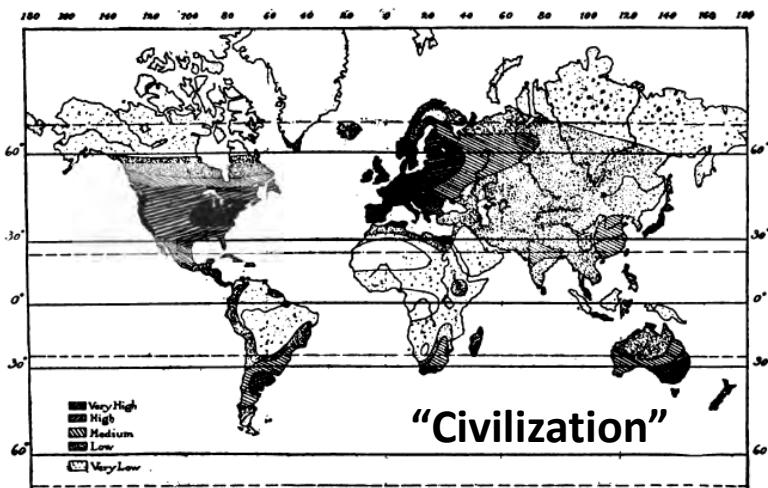


Figure 31. The Distribution of Civilization

Huntington (1915)

# Geography... or racism?

TABLE 2. THE RELATIVE EFFICIENCY OF WHITE AND  
NEGRO FARMERS IN THE NORTH AND SOUTH

|                   |              |
|-------------------|--------------|
| Northern whites,  | 100 per cent |
| Southern whites,  | 51 per cent  |
| Northern negroes, | 49 per cent  |
| Southern negroes, | 84 per cent  |

Huntington (1915)

Eugenics exhibit from 1926

SOME PEOPLE ARE  
BORN TO BE A BURDEN  
ON THE REST.

This light flashes every 15 seconds.

LEARN ABOUT HEREDITY  
YOU CAN HELP TO CORRECT  
THESE CONDITIONS.

AMERICA NEEDS

LESS OF THESE

MORE OF THESE

This light flashes every 48 seconds.

Every 48 seconds a person is born in the United States who will never grow up mentally beyond that stage of a normal 8 year old boy or girl.

This light flashes every 50 seconds.

Every 50 seconds a person is committed to jail in the United States. Very few normal persons ever go to jail.

This light flashes every 16 seconds.

Every 16 seconds a person is born in the United States.

This light flashes every 7½ minutes.

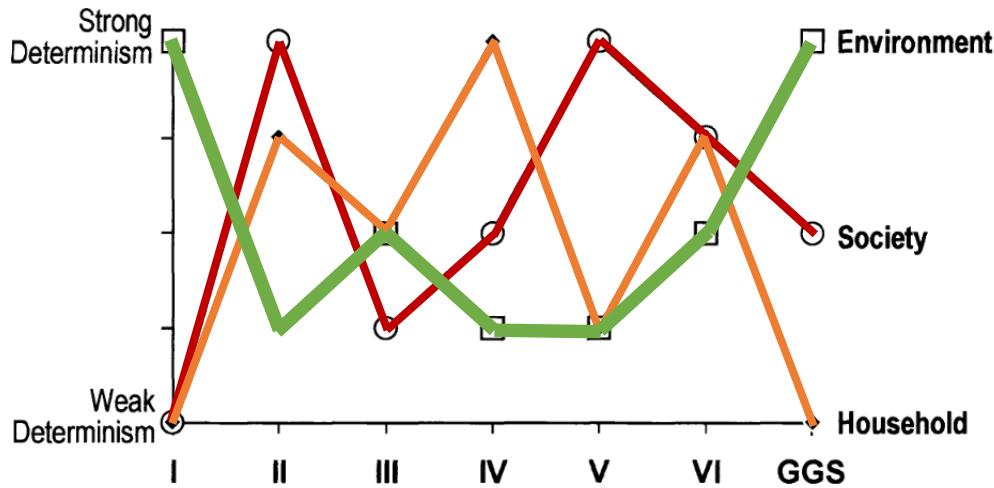
Every 7½ minutes a high grade person is born in the United States, who will have ability to do creative work and be fit for leadership. About 4% of all Americans come within this class.

# EUGENICS BUILDING

GOVERNOR'S  
TROPHY  
FITTEST FAMILY



# History of thought



- I Moment of Environmental Determinism (1860-1920)
- II Moment of Cultural Possibilism (1920-1960+)
- III Moment of Systems (1960-)
- IV Moment of Behavioralism (1965-)
- V Moment of Structuralism (1980-1990+)
- VI Moment of Integrative Human Ecologies (1987-)
- GGS Guns, Germs and Steel (1997)

JARED DIAMOND  
**GUNS  
GERMS  
& STEEL**

A short history  
of everybody  
for the last  
13,000 years



# Guns, Germs, and Steel

- [Video](#) begins with a question put to Jared Diamond in 1972 by a New Guinean politician named Yali... (the language/terminology may seem confronting!)

In spite of the most careful cultivation, however, a tree of the very finest variety may fail to produce good fruit. Too much rain or too little; prolonged heat or constant cloudiness; frost when the blossoms are opening, or violent wind and hail may all be disastrous. The choicest tree without water is worth less than the poorest where the temperature and rainfall are propitious.

Huntington (1915, p. 2)

# Criticisms

- Oversimplification of the complex relationship between humans and their environment
- Reduces human history and social actions to environmental factors
- Assumes that similar environments = similar people
- Cannot explain human ingenuity to cope with extreme environments
- Survival-of-the-fittest social narrative
- Eurocentric ideal of what constitutes ‘civilisation’
- Could have serious consequences for policy makers

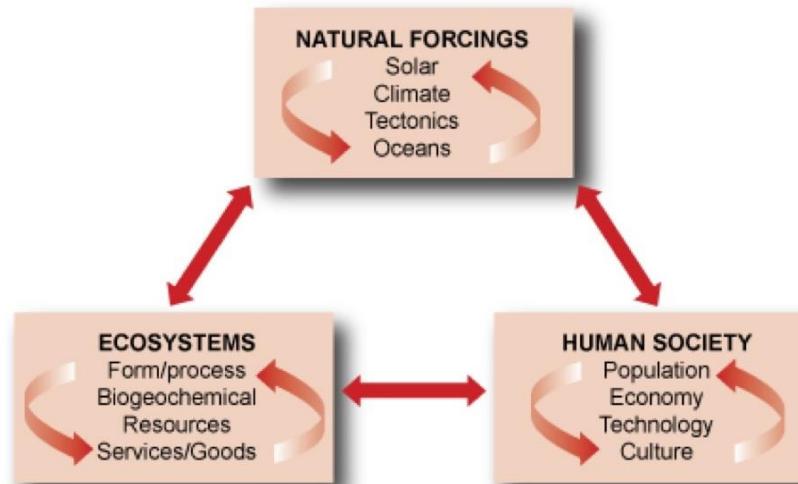
# Sound familiar?

- “If we can conquer climate, the whole world will become stronger and nobler”
- “For the sake of our children and our future, we must do more to combat climate change”



# Conclusions

- Environmental determinism has popular appeal and can rally support for environmental causes
- Yet simple explanations, despite their appeal, often don't advance understanding very much
- We need to examine the complexity of interactions between individuals, societies and environments



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## **EI Nino causes worst drought in Ethiopia since 1980s when 400,000 died of famine and Bob Geldof launched Live Aid**

By [CHRIS SUMMERS FOR MAILONLINE](#)

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