

Perspective on Human Impacts on the Environment



By
W.D. McIlveen

Human Effects on the Environment



Australopithecus – early stage of human evolution in Africa



Stone axes at Olorgesailie, Kenya

Human Effects on the Environment



Stone Age

Paleolithic – 2.4 million years ago

Mesolithic – 15,000 to 11,500 years ago

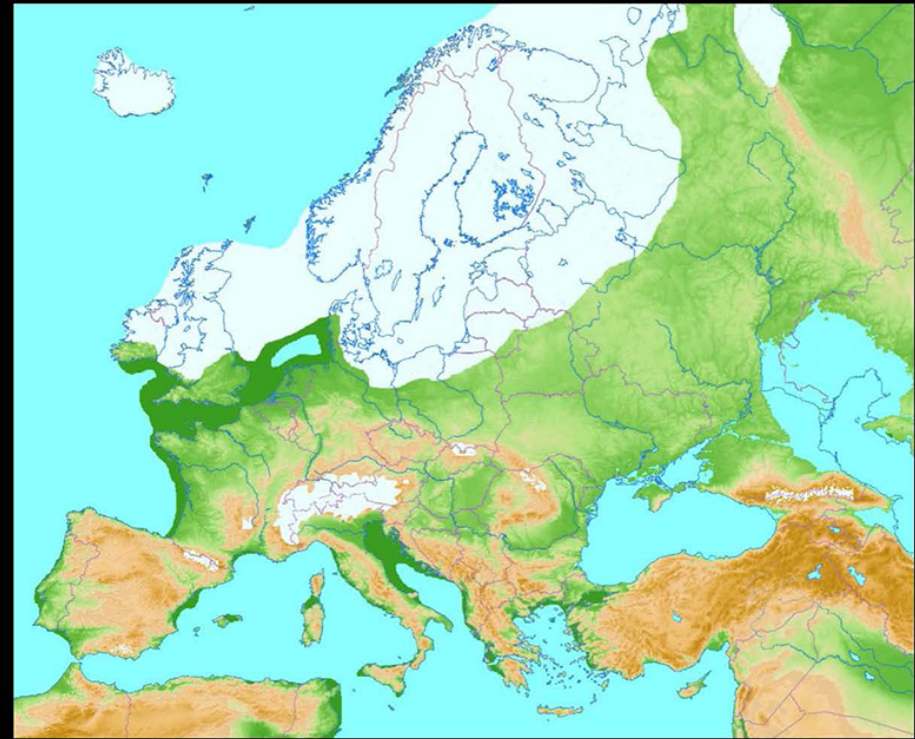
Neolithic – 12,000 to 4,500 BC

Neanderthals moved out of Africa about 500,000 years ago

Human Effects on the Environment

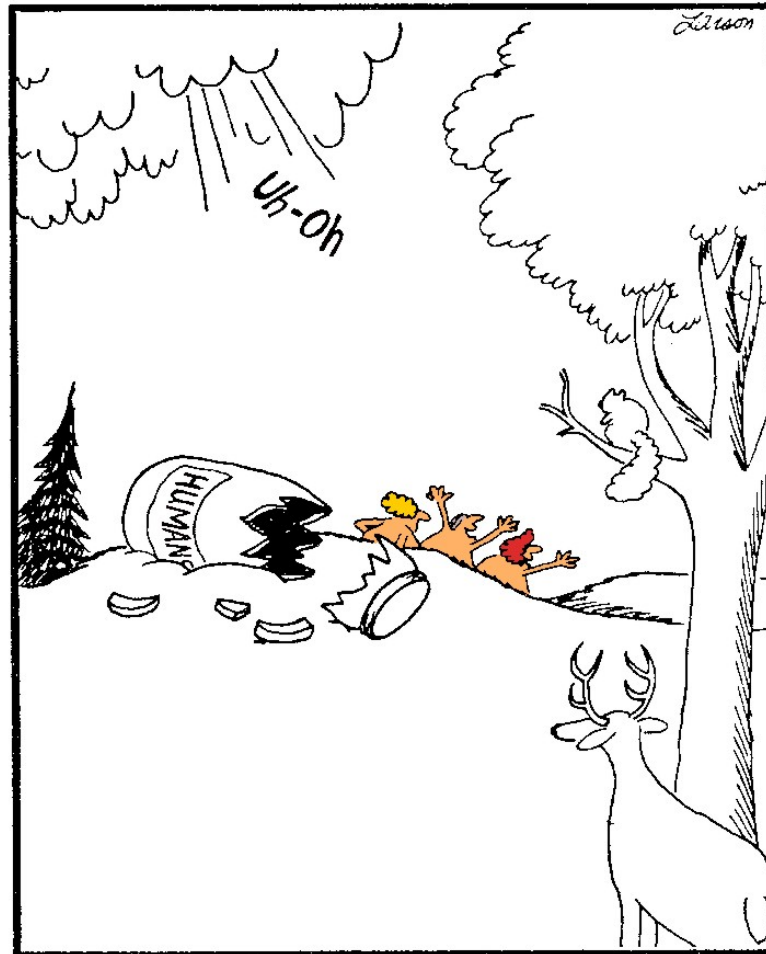


Early modern humans moved out of Africa
70-80,000 years ago



Upper Paleolithic Glacial Maximum – 20,000 BCE
Glaciation limited early spread of people

Human Effects on the Environment



Human Effects on the Environment

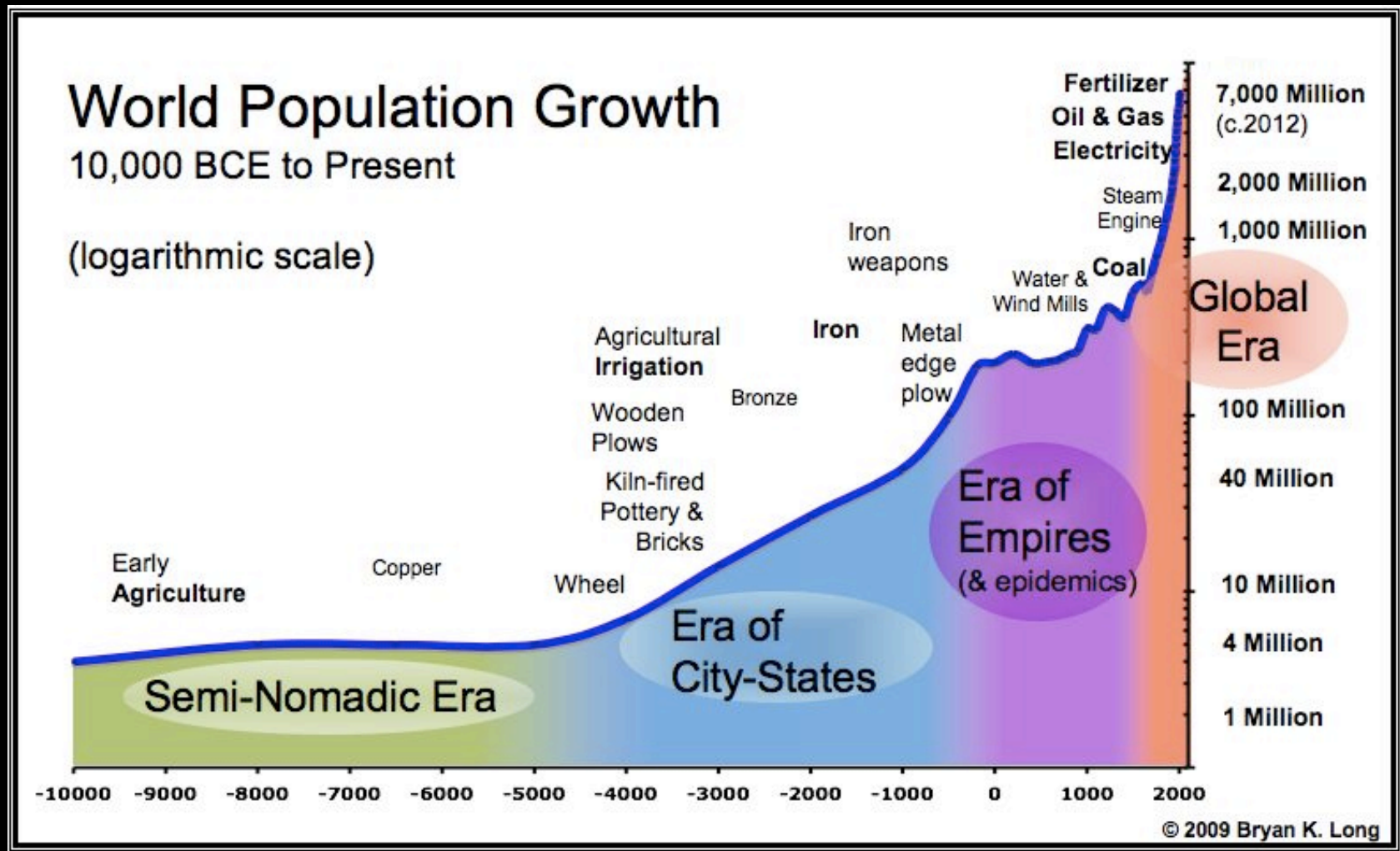


Bronze Age smelting

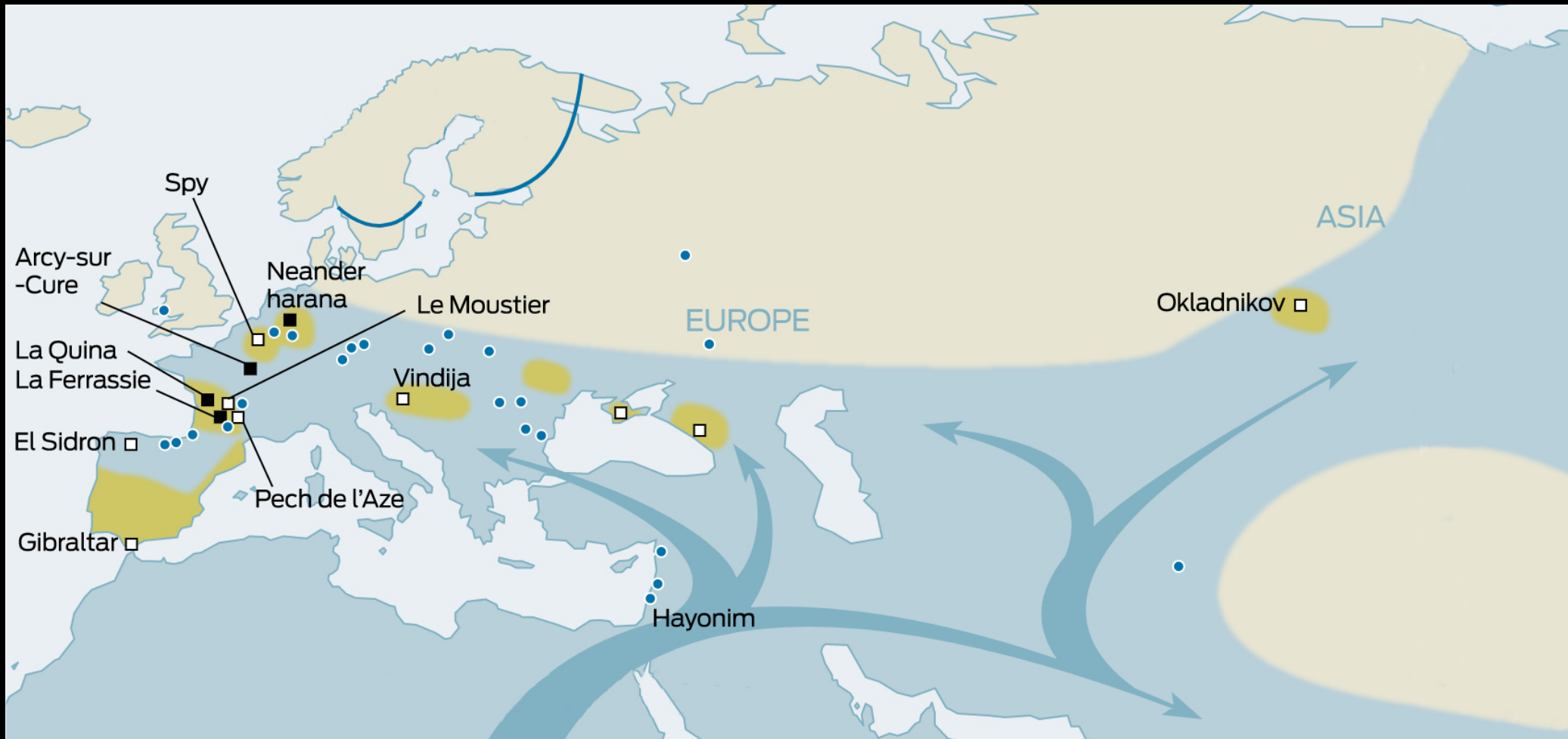
Bronze Age
3500 to 1200 BC

Iron Age
1200 to 600 BC

Human Effects on the Environment

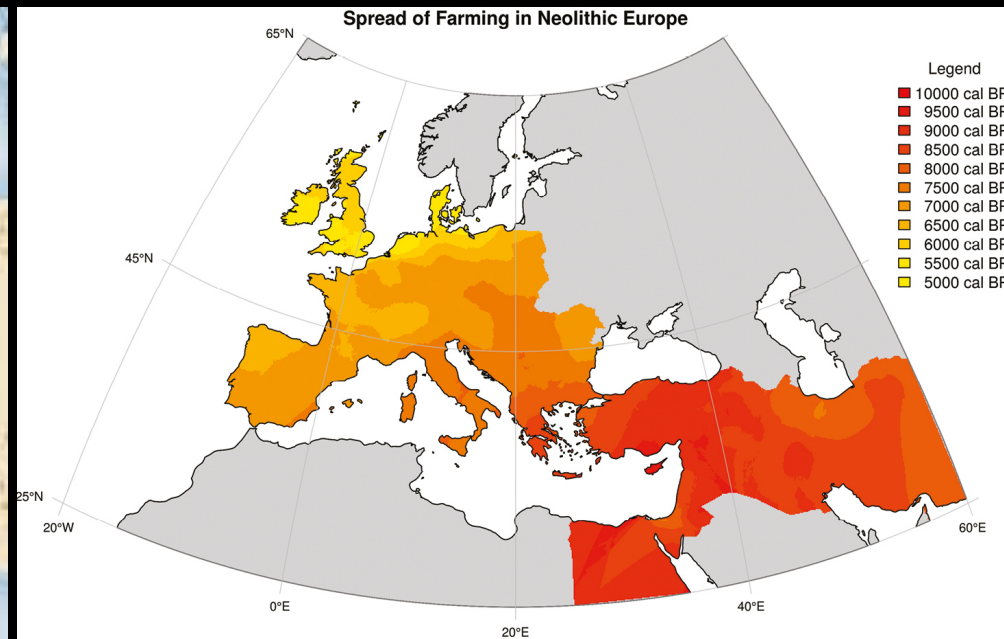


Human Effects on the Environment



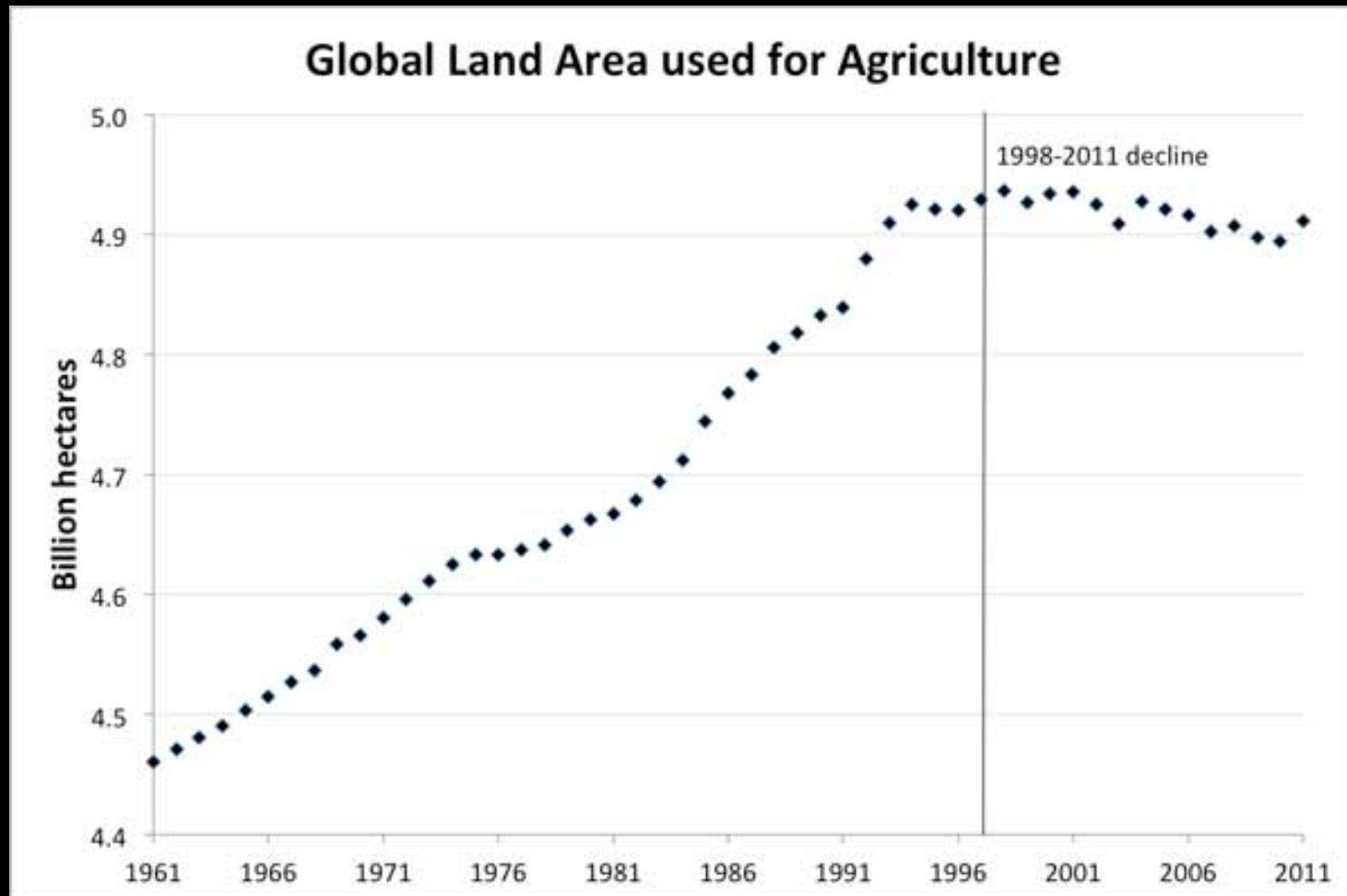
XXXX

Human Effects on the Environment



Spread of agriculture generally required clearing of wooded sites

Human Effects on the Environment



Land converted to agriculture is finite

Human Effects on the Environment

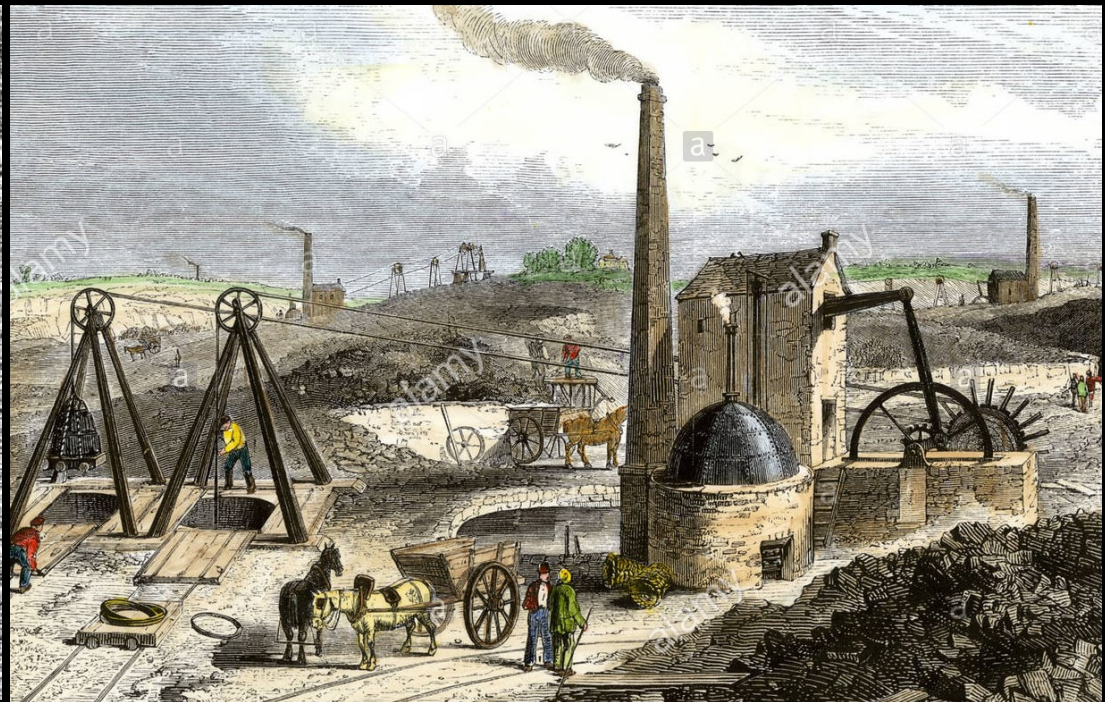
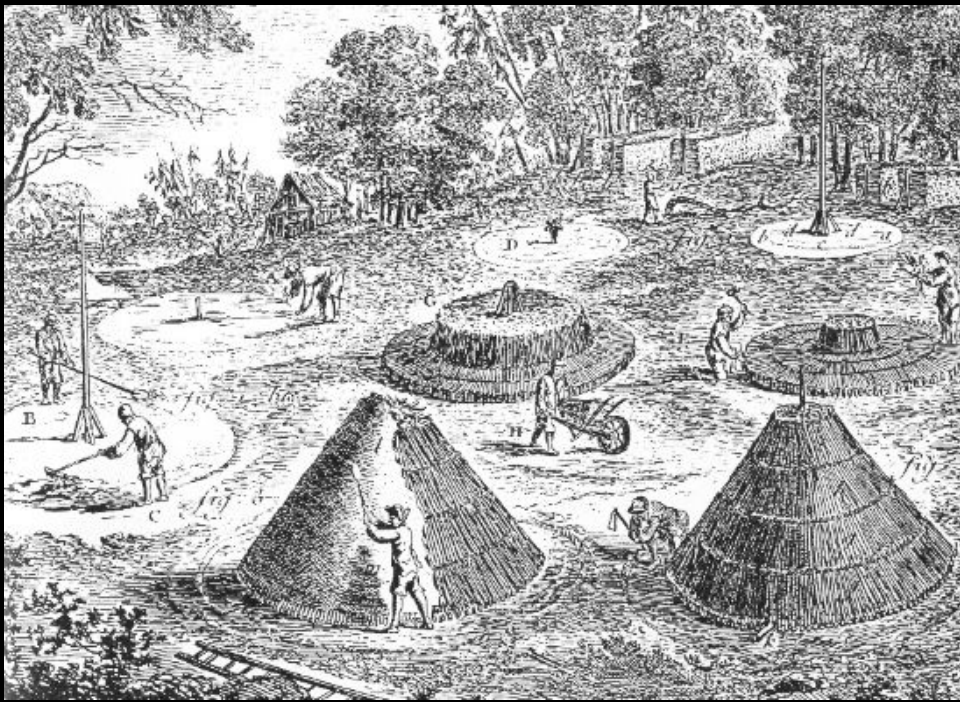


Early industry

Cave art showing men with bronze-age axes, Sweden

Development of industry demanded large quantities of wood as a source of energy
Early industry included smelting of ore for copper, iron, limestone for plaster

Human Effects on the Environment



When forests could no longer provide wood and charcoal, mining of coal was started
More recently, energy was obtained from water, electricity, oil, gas, wind and sunlight

Human Effects on the Environment



Major Impacts on the Environment

- Loss of forest cover
- Loss of habitat
- Erosion of topsoil
- Over-fishing
- Extinction of species
- Contamination of soil and water
- Invasive species
- Lower air quality
- Global warming

Human Effects on the Environment



Forest fires in Brazil, 2019



Fires in Indonesia, 2019

Fires associated with land clearing rain forest areas in 2019 were frequently mentioned in news headlines

Human Effects on the Environment



Erosion of soil from agricultural fields
(Part of same rain event that led to Walkerton incident)

Human Effects on the Environment

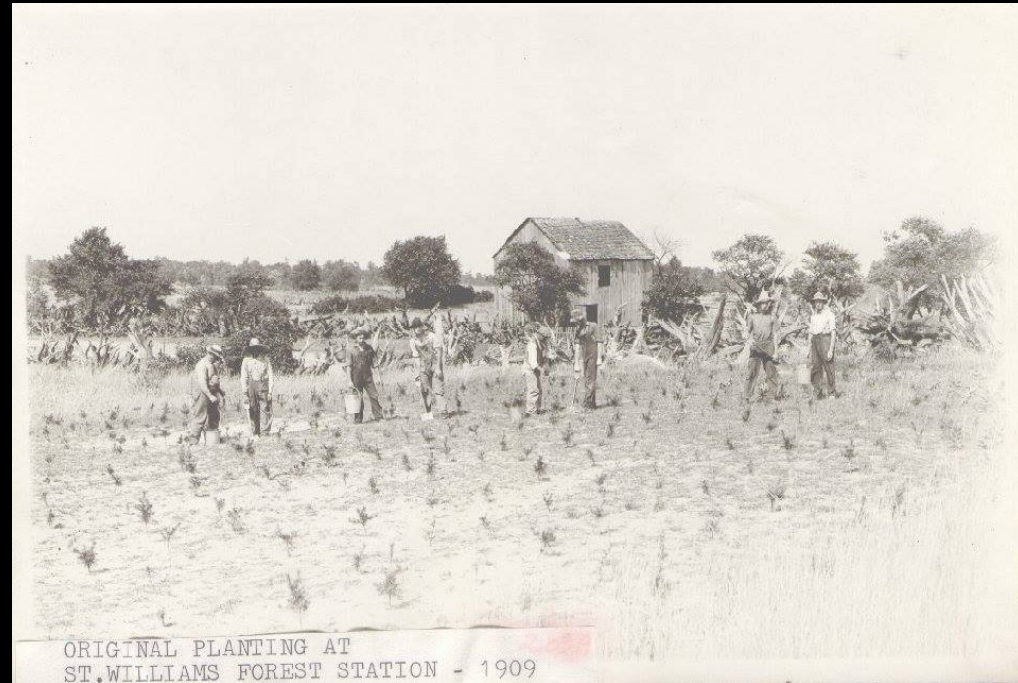


Soil erosion in Madagascar = Lost of topsoil, severe siltation of rivers

Human Effects on the Environment



Severe wind erosion of sandy soils in Northumberland, Norfolk, and Simcoe Counties at beginning of 1900s



Situation eventually led to development of tree nurseries and plantations in county forests by 1909

Human Effects on the Environment



Part of conifer plantation
at St. Williams, 2012



Human Effects on the Environment



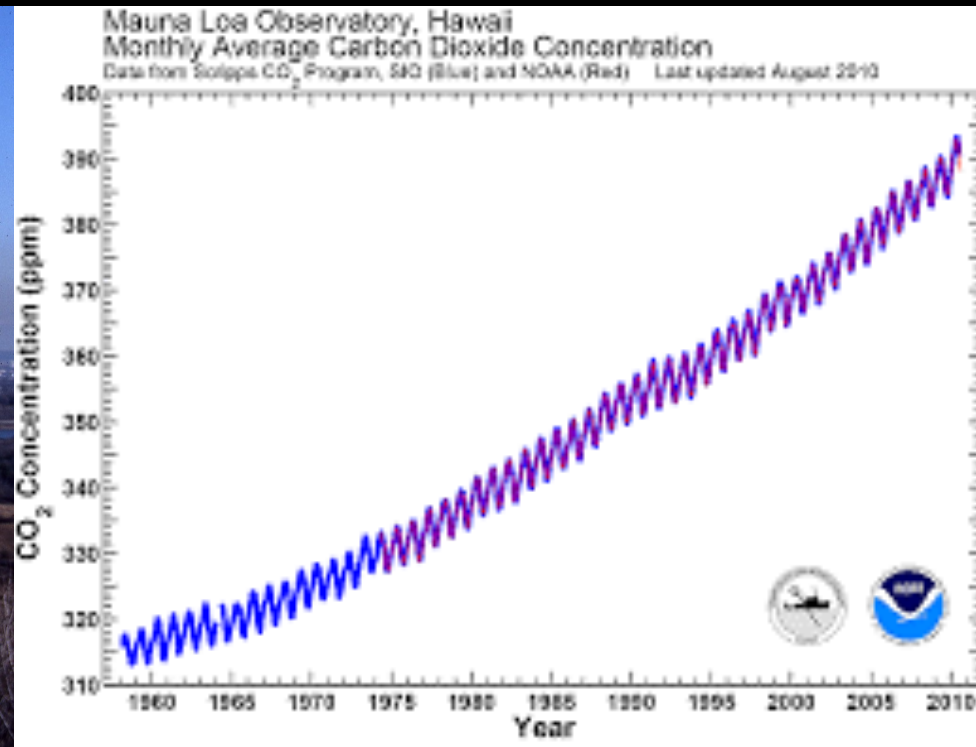
Many forms of water pollution exist

Phosphorus releases into water leads to excessive algae growth and a chain of negative impacts

Human Effects on the Environment



Air inversion over Hamilton forming smog



Burning of fossil and carbon-based fuels has increased global > global warming

Human Effects on the Environment



Severe climate change effects

Human Effects on the Environment



Forest fires are extremely variable from year to year but trend appears to be increasing
Costs and efforts of fire fighting are definitely increasing

Human Effects on the Environment



SO₂ and forest fire contributed to barren lands NE of Wawa

Human Effects on the Environment



Spreading lime on barren site, Sudbury, 1978



Treated site at Sudbury, ca 2010

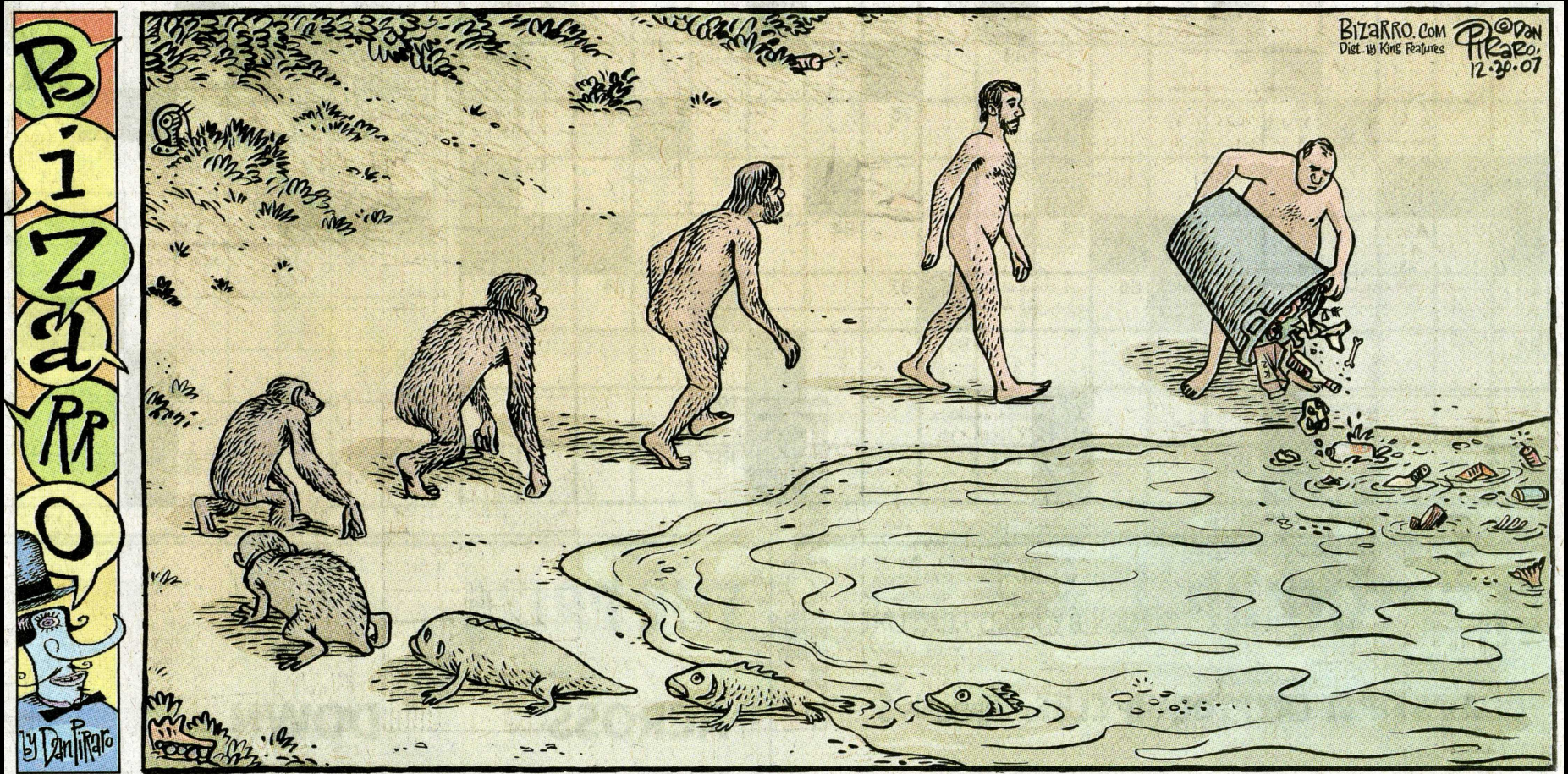
Human Effects on the Environment



Extinct species



Human Effects on the Environment



Disposal of waste

Human Effects on the Environment

Gas

CO₂
NO_x
Methane
Particulate
Asbestos
Many others

Liquid

Sewage
Industrial effluent
Black liquor
Hormones

Solid

Household
Industrial
Mining
Lumber
Yard waste

Various wastes have a wide range of toxicity and other properties that affect their suitability for handling, disposal, or recycling

Human Effects on the Environment

RECYCLING WASTE MATERIALS



LIGHT BULBS



PAPER



PLASTIC



ORGANIC



GLASS



BATTERIES



CLOTHES



METAL



E-WASTE



Human Effects on the Environment



Prior to MOE formation, individual apartment buildings had own incinerators

Human Effects on the Environment

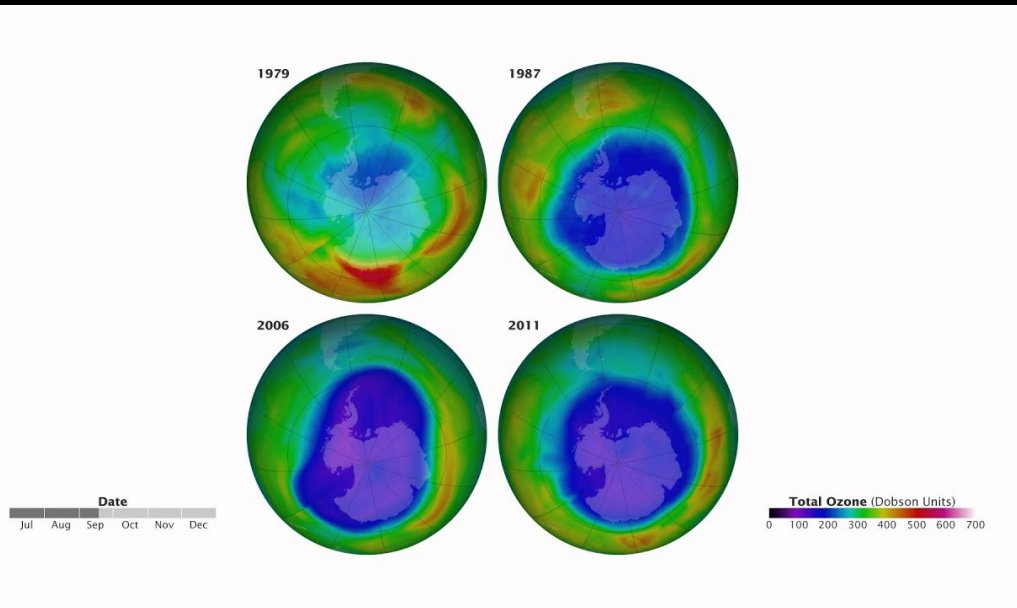


Hagersville tire fire, 1990



Soot on foliage Hagersville tire fire, 1990

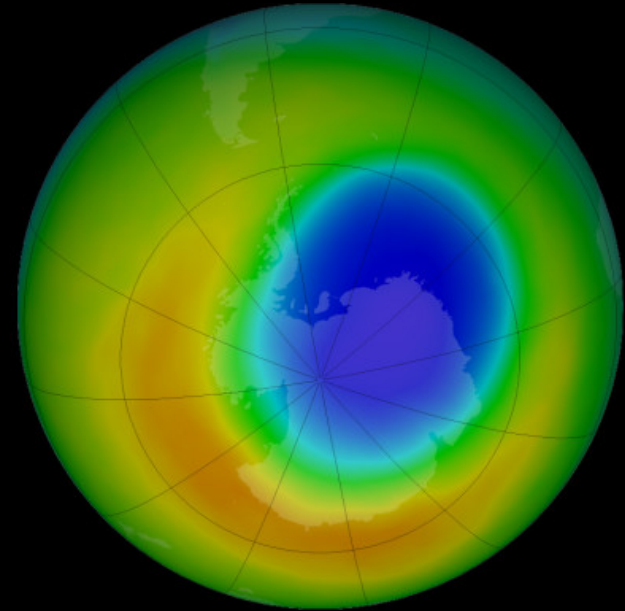
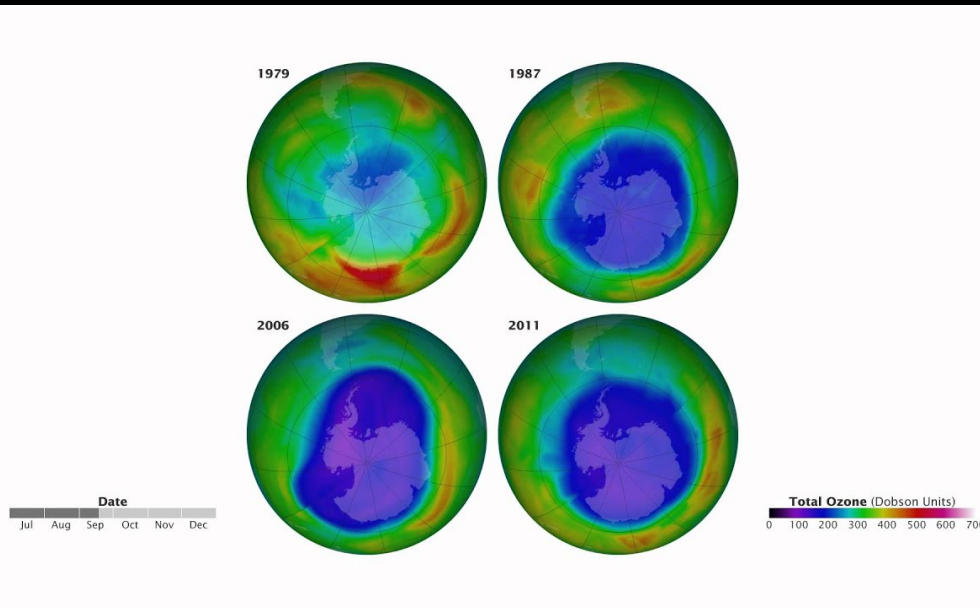
Human Effects on the Environment



CFCs from many sources was responsible for destruction of atmospheric ozone in the polar areas

Montreal Protocol agreement (1987) led to elimination of CFCs by 1989

Human Effects on the Environment



Good News!

Most-recent results from monitoring of the ozone hole in 2019 shows the hole is the smallest since 1985 indicating that the CFC ban is working

Human Effects on the Environment



“Rag-and-bone” men collected, paid for then re-sold recyclable items

Human Effects on the Environment



Toronto sent garbage to Michigan for landfilling 1998-2010
Agreement was made after plan to send garbage to closed Adams Iron Mine was stopped
Now shipped to city-owned Green Lane Landfill near London

Human Effects on the Environment



Methane 'toxicity' to plant roots
Berril-Trustam Landfill, Mississauga, 1972



Methane burner at former landfill site, 2004

Human Effects on the Environment



Formerly, all soft drinks were produced in glass - inert and recyclable
Now in aluminum cans (recyclable) or plastic bottles

Human Effects on the Environment



Options for handling existing plastic waste

(Incinerators have ash disposal problem)

Human Effects on the Environment



Plastic in ocean habitat



Plastic in beach drift, Rattray Marsh,
2018

Human Effects on the Environment



Litter in ditch in Windsor, 2011



Micro particles of plastic in water

Human Effects on the Environment



“Fly-tipping” = Improper local disposal of assorted wastes in public areas

Human Effects on the Environment



HNP Naturalists assisting with clean-up in Georgetown parks

Human Effects on the Environment



Thank You