

A satellite view of Earth showing the Americas, with the text "Medical Ecology Spring 2007" overlaid in white serif font.

Medical Ecology
Spring 2007

Medical Ecology

This course is presented in 2 parts:

- A. Part 1: Land use, health risks
and ecological services
and functions
- B. Part 2: The Vertical Farm Project
- C. The mid-term examination
counts as 50% of the final grade
- D. The Vertical Farm report counts as
50% of the final grade

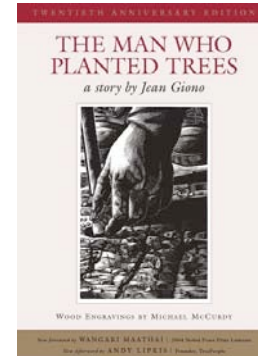
Learning objectives:

Students completing Medical Ecology will be able to:

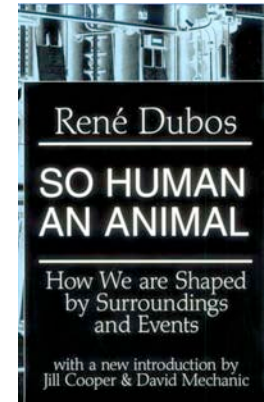
1. Independently evaluate the original literature on land use and health risk assessment.
2. Calculate their own personal ecological foot print.
3. Fully grasp the concept of urban sustainability and environmental justice.
4. Visualize the future of cities from the perspective of urban agricultural initiatives.

Required Reading:

1. *The Man Who Planted Trees*
by Jean Giono



2. *So Human An Animal*
by Rene Dubos

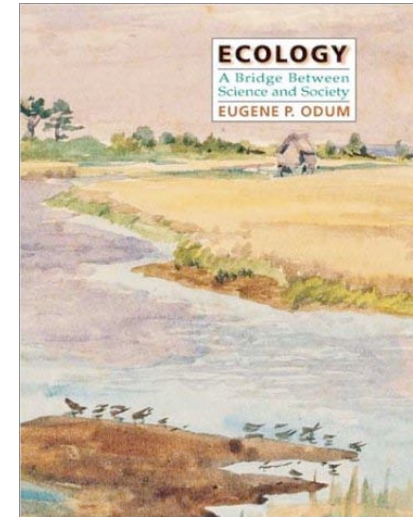


3. The Stern Report on climate change
(online at www.verticalfarm.com)

Highly Suggested Reading*

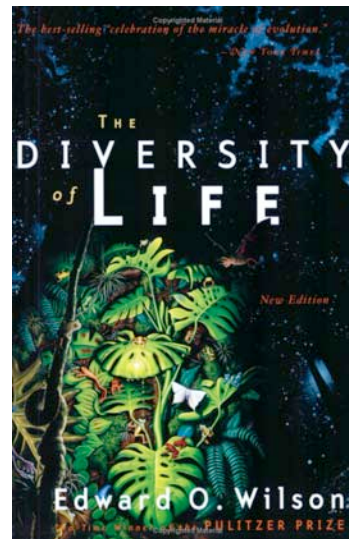
Ecology: a bridge between science and society

By Eugene P. Odum



The Diversity of Life

By Edward O. Wilson



* Especially for those without a background in the ecological sciences



Basic Sciences:

Geology

Ecology

Oceanography

Hydrology

Biochemistry and Molecular Biology

Physics

Atmospheric Sciences

Chemistry

Remote Sensing

Click on any Basic Science to obtain useful links

Applied Sciences:

Biostatistics

Medical Sciences

Epidemiology

Anthropology

Agronomy

Environmental Health Sciences

Socio-Medical Sciences

Toxicology

Medical Geography

Click on any Applied Science to obtain useful links

An aerial photograph of a lush green forested landscape. The terrain is hilly and shows various signs of human activity. In the upper left, there is a rectangular area with a grid-like pattern, possibly a plantation or a cleared area. A network of thin, light-colored paths or roads winds through the forest. In the lower right, there are several circular, terraced-like patterns, which could be agricultural fields or mining operations. The overall scene is a mix of natural forest and human-modified land.

Land Use

Agriculture

Mining

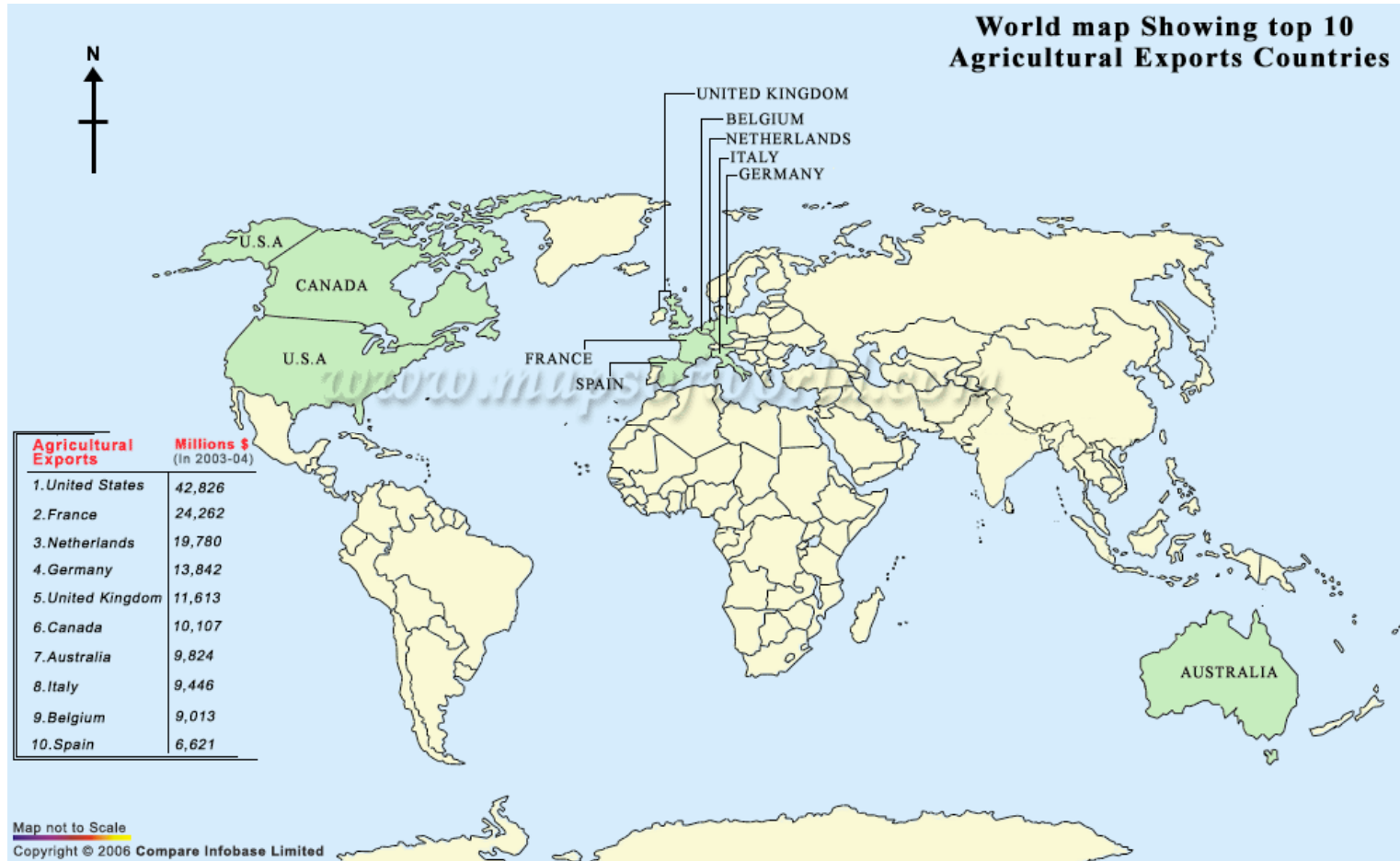
Urbanization

11% of the terrestrial landscape is used for farming. This represents nearly 80% of the land that can be farmed. The rest is mountains, desert, and forests.

90% of the world's freshwater is used for agriculture!



Much of what we grow is for export



Agriculture



Mining uses a lot of water, too

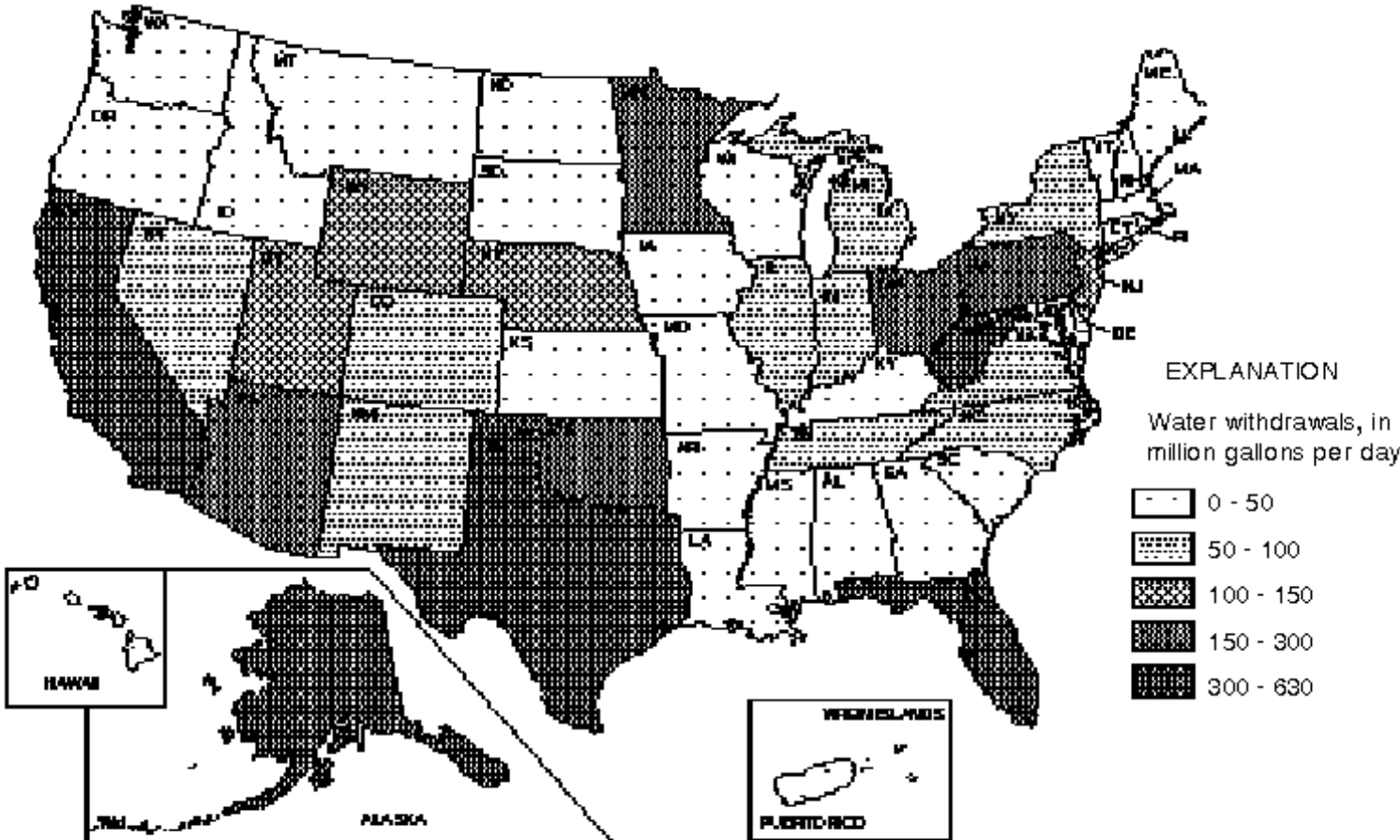
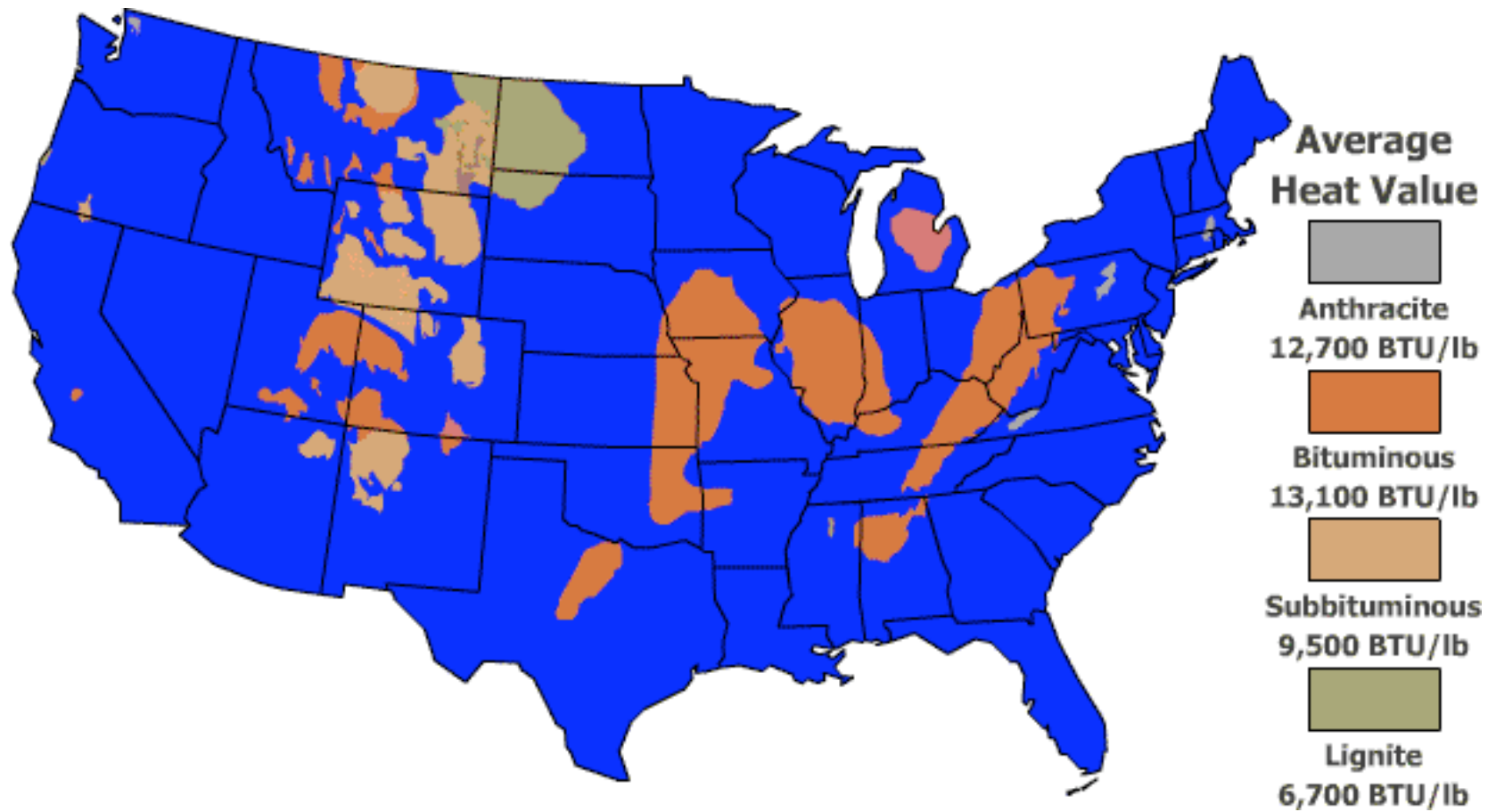
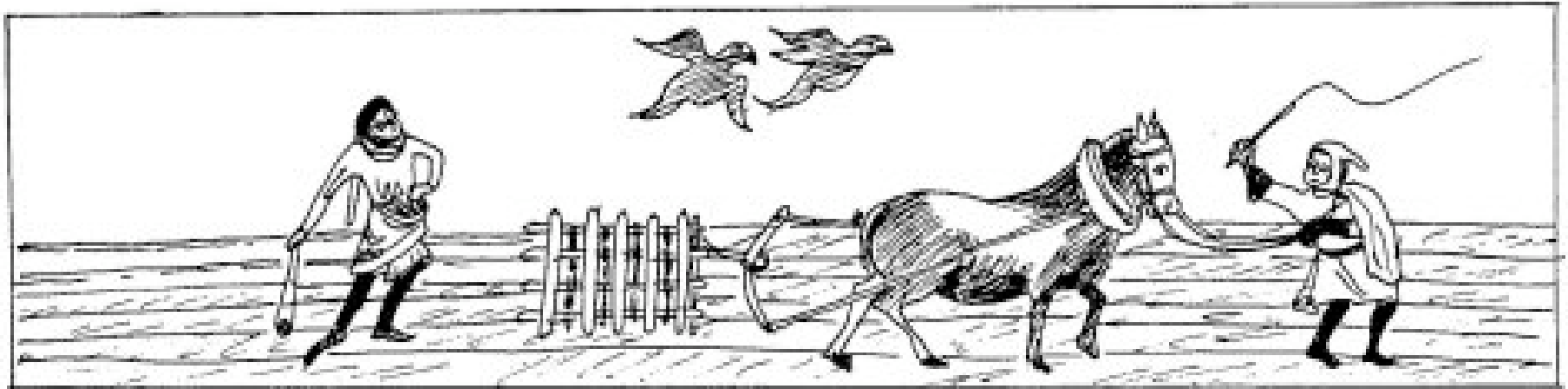


Figure 24. Mining withdrawals (fresh, saline) by State, 1990.

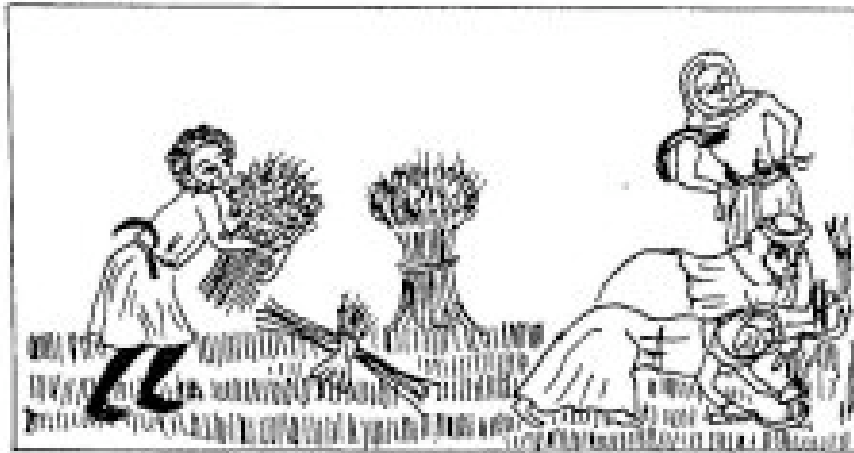
US Coal Mines



A very brief history of agriculture



Harrowing



Harvesting



Threshing

Fertile Crescent



This region gave birth to Middle Eastern civilization more than 8,000 years ago. Plant and animal domestication, irrigation, and new tools launched an agricultural revolution that transformed roaming hunter-gatherers into a socially complex, permanent society.



Native
American
Connections

■ Explore Big Horn Medicine Wheel

- What Purpose do Medicine Wheels Serve?
- What are Medicine Wheels?
- Where do the Sun and Stars Rise and Set?
- Sun Watchers Today
- Activities
- Resources



NASA Ancient Observatories

Traditions of the Sun

Exploratorium

<http://images.google.com/imgres?imgurl=http://solar-center.stanford.edu/AO/images/machu-picchu-gilbert.jpg&imgrefurl=http://solar-center.stanford.edu/AO/&h=399&w=532&sz=56&tbnid=QnWbTNTc6mrkjM:&tbnh=96&tbnw=129&hl=en&start=6&prev=/images%3Fq%3Danasazi%2Bcalendar%26svnum%3D10%26hl%3Den%26lr%3D%26ie%3DUTF-8%26c2coff%3D1>

Newgrange Solar Observatory, Ireland



4,000 years old

Stonehenge, England



4,000 years ago

Stonehenge from above



Sundial from Qumran



Sophisticated Farming Technologies in Egypt



3,000 years ago



Bhutan rice harvest



Winnowing buckwheat in Bhutan



Bhutan lettuce harvesting



Bhutan harvest celebration



Cambodian farmers harvesting rice



Incan Terraces



Machu Picchu Solar Observatory



Aztec Sun Calendar



Anasazi Sun Dagger Calendar





photo by Ivan Glick



John Dere, Caterpillar, etc.

*Old Order Hutterites, Mennonites,
Amish, and Brethren*



*On the Backroad
to Heaven*

DONALD B. KRAYBILL
CARE F. BOWMAN

Just Add Water



August 23, 1993



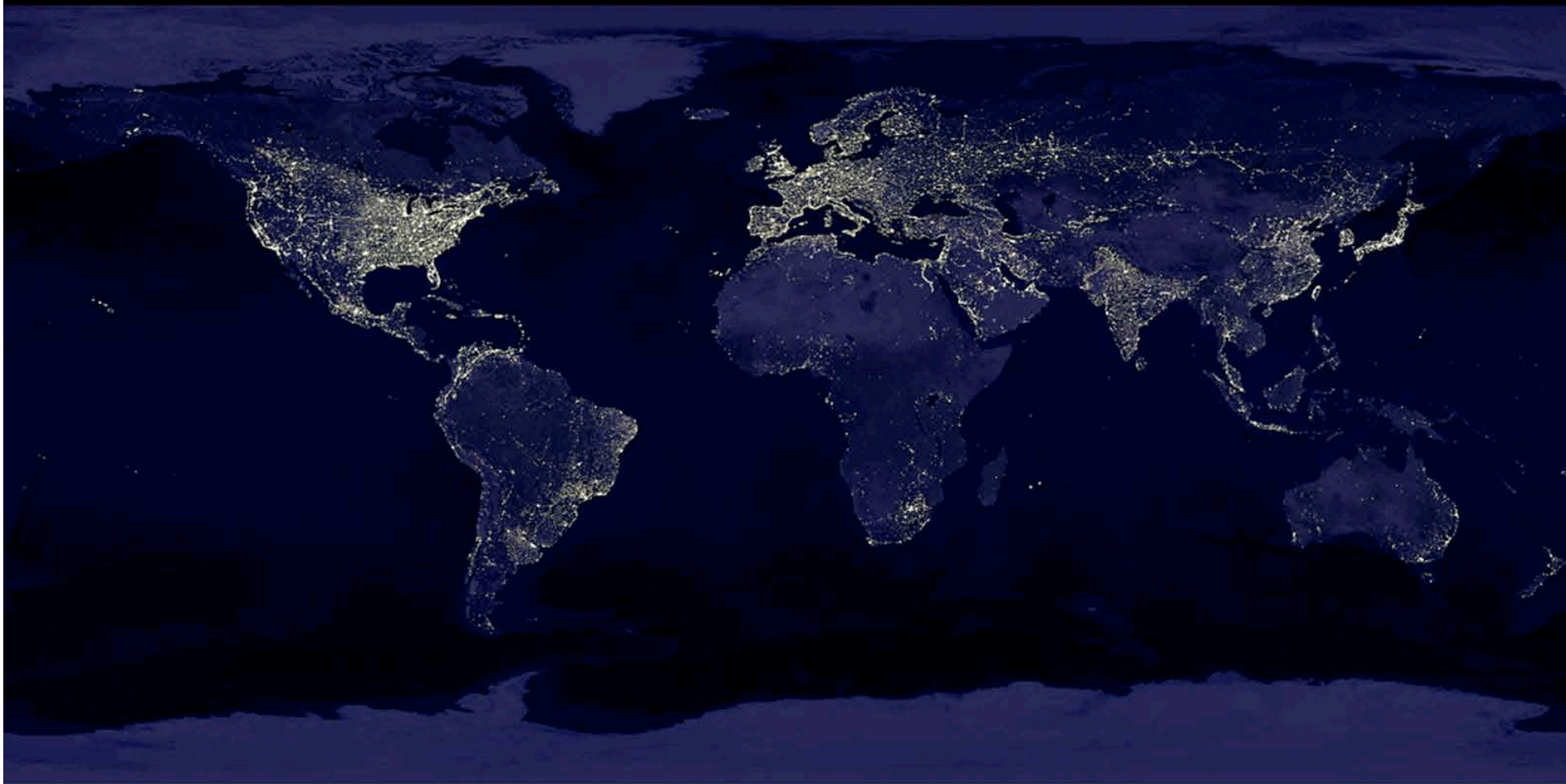
August 24, 2002

Urbanization



We Are Here!

Night on Earth



This image of Earth's city lights was created with data from the Defense Meteorological Satellite Program (DMSP) Operational Linescan System (OLS). Originally designed to view clouds by moonlight, the OLS is also used to map the locations of permanent lights on the Earth's surface.

Image Credits: Craig Mayhew and Robert Simmon, NASA GSFC based on DMSP data



Learn more about the Earth Observing System (<http://eos.nasa.gov/>)
Learn more about the Earth at the Earth Observatory (<http://earthobservatory.nasa.gov/>)
Get more Earth images at the Visible Earth (<http://visibleearth.nasa.gov/>)

Population of the whole world

