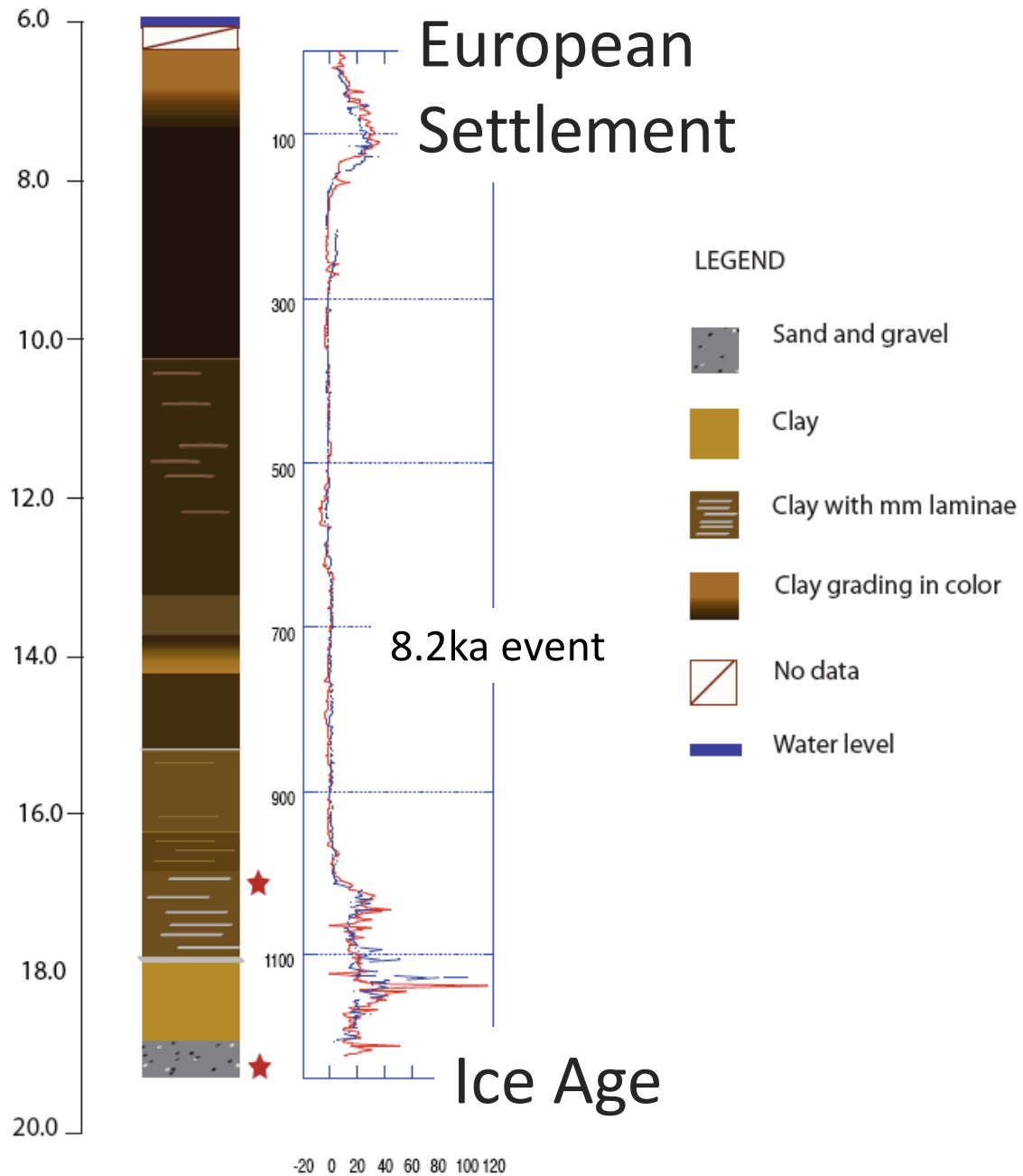


Depth (m)

Master Core

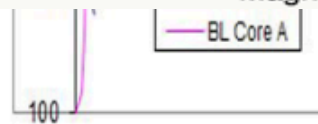
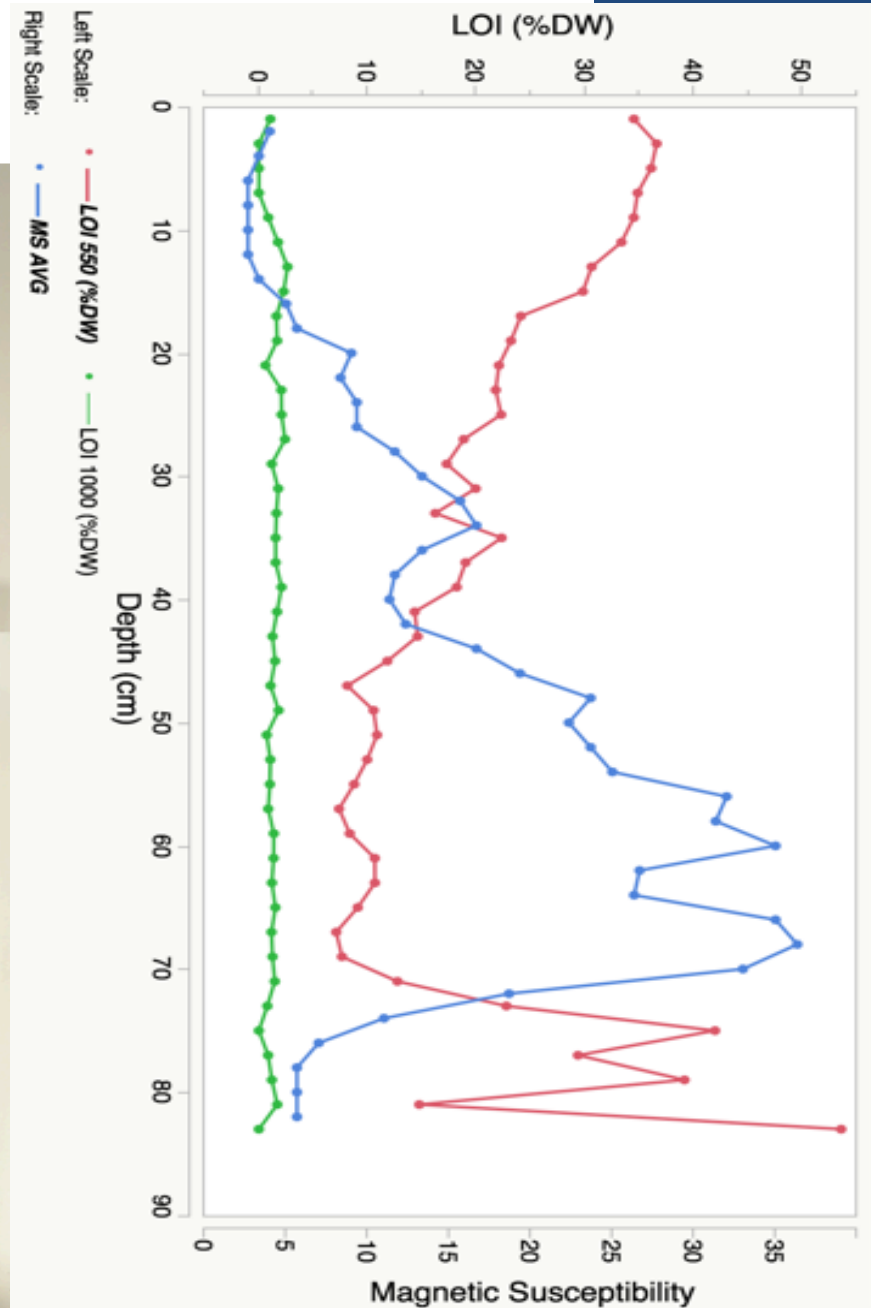
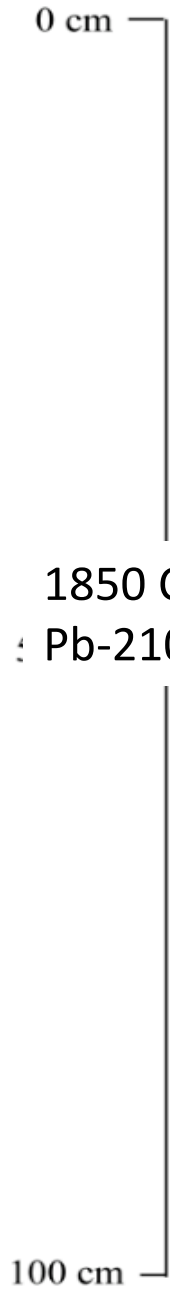
Magnetic Susceptibility

Long Lake



Depth (Centimeters)

Master Core



# Wayne / Holmes Lake District

Round  
Lake

Long  
Lake

Browns Lake  
Bog

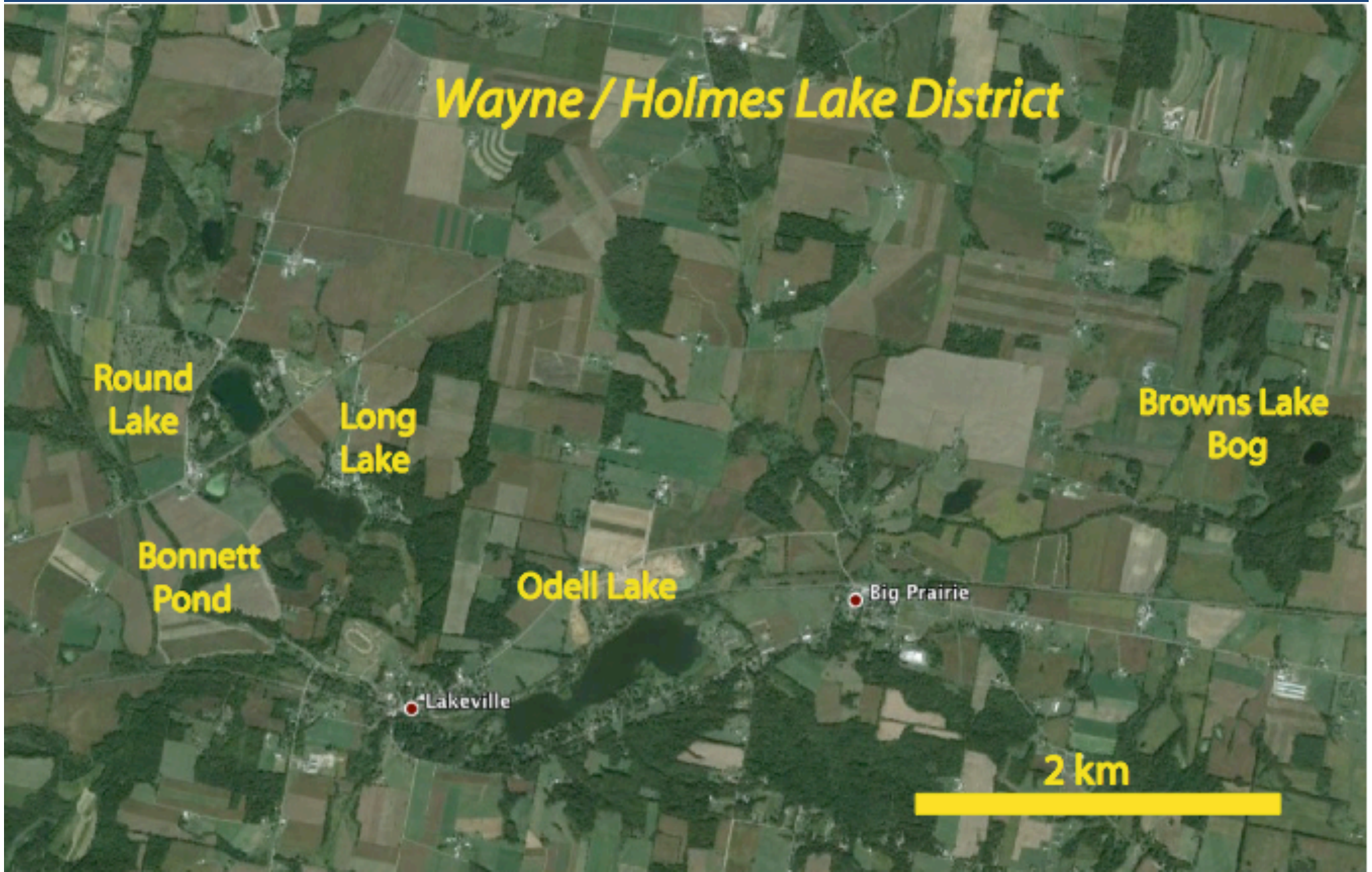
Bonnett  
Pond

Odell Lake

Big Prairie

Lakeville

2 km





# Landscape Development

3/8/200





# Outwash



4/1/2000 20:3



# Outwash Stratigraphy





# Kettle Formation



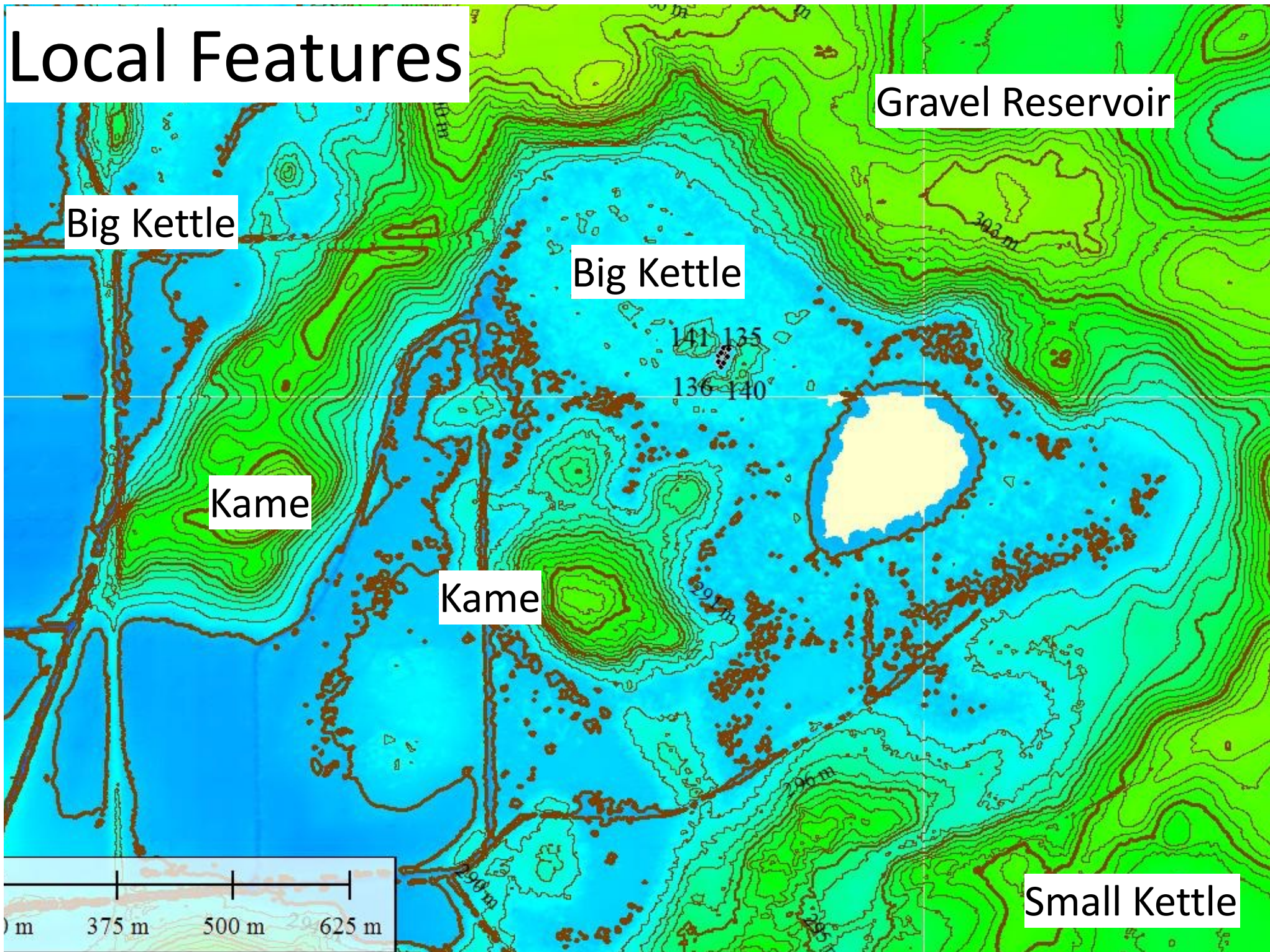


# Kame Stratigraphy





# Local Features





**Gelisol**

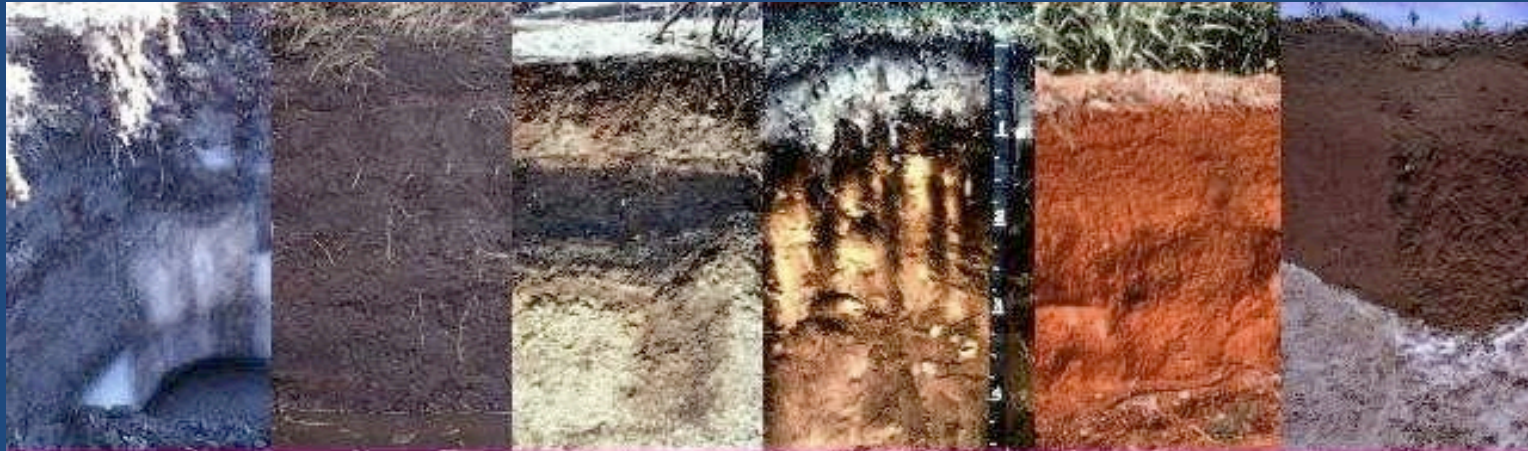
**Histosol**

**Andisol**

**Spodosol**

**Oxisol**

**Aridisol**



**Vertisol**

**Ultisol**

**Mollisol**

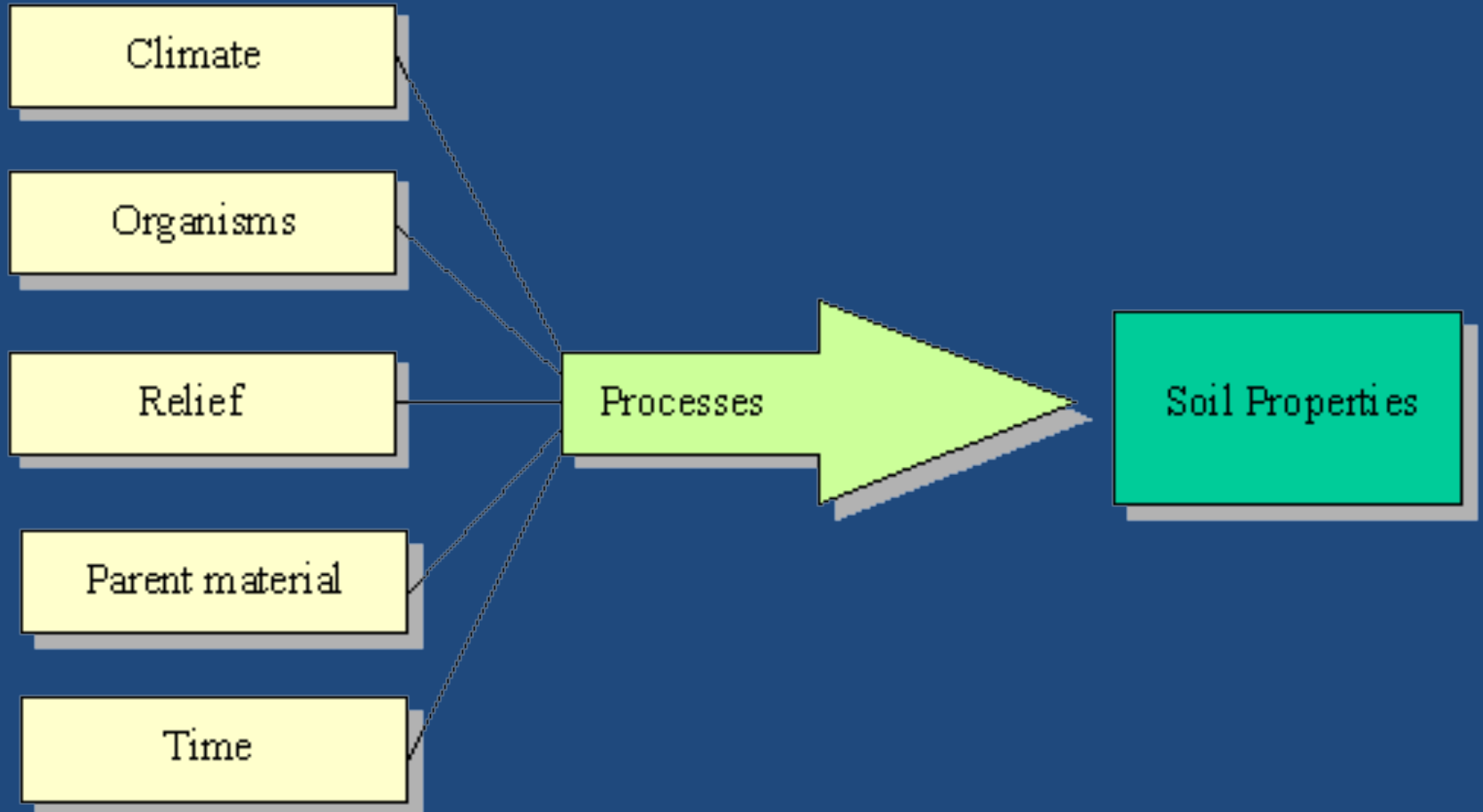
**Alfisol**

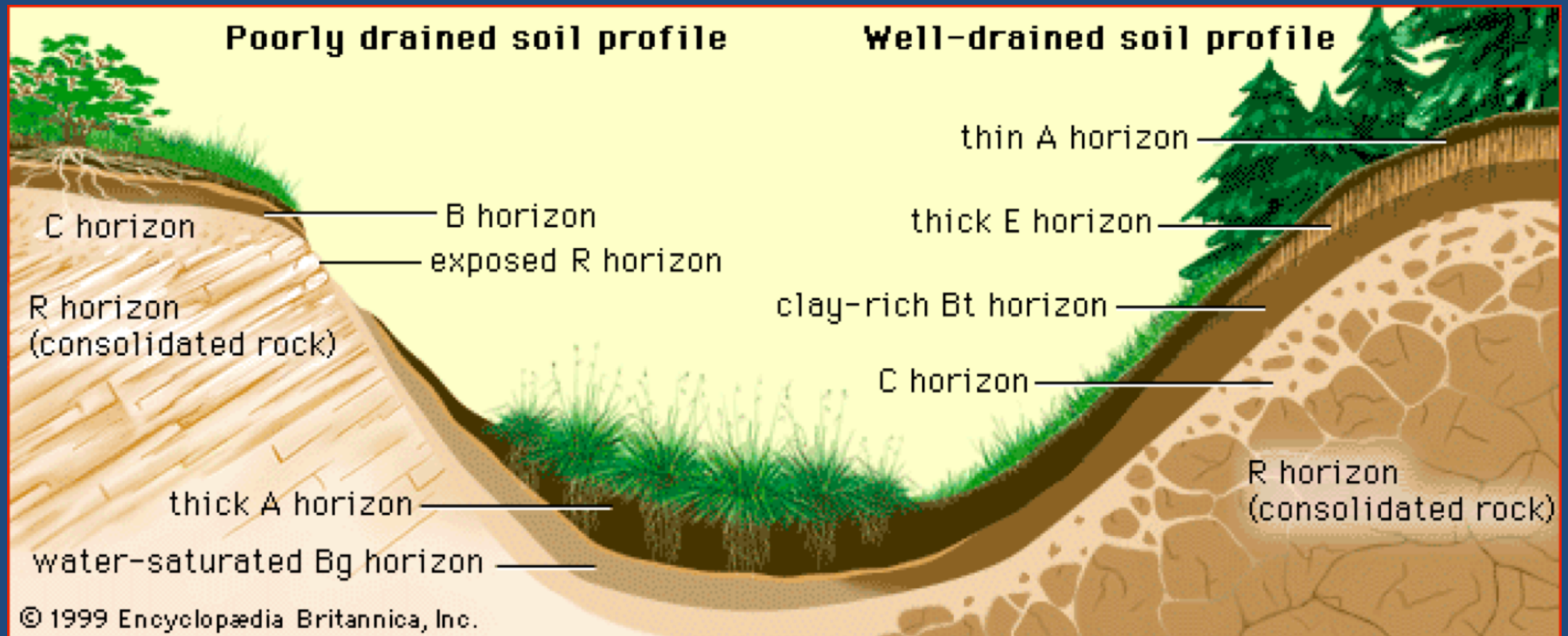
**Inceptisol**

**Entisol**



# Soil Formation







## The Histosols



Histosols are formed by accumulation of organic matter in a water-logged basin or under a cold humid climate which inhibits the decomposition of plant and animal remains.

This soil formed under conditions of water saturation. Water stands in the bottom of pit.



## Global Distribution of Histosols





# The Spodosols



Spodosols are probably the most photogenic soils. They are acid characterized by a subsurface accumulation of humus and Al & Fe oxides.

Typically they have a light-colored E horizon overlying a reddish-brown spodic horizon.



## The Oxisols

Oxisols are found in the tropics, generally yellowish to reddish in color, deep, loamy to clayey. These soils contain few weatherable minerals and are often rich in Fe and Al oxides.

There are only minor differences in properties with depth.





## Global Distribution of Oxisols





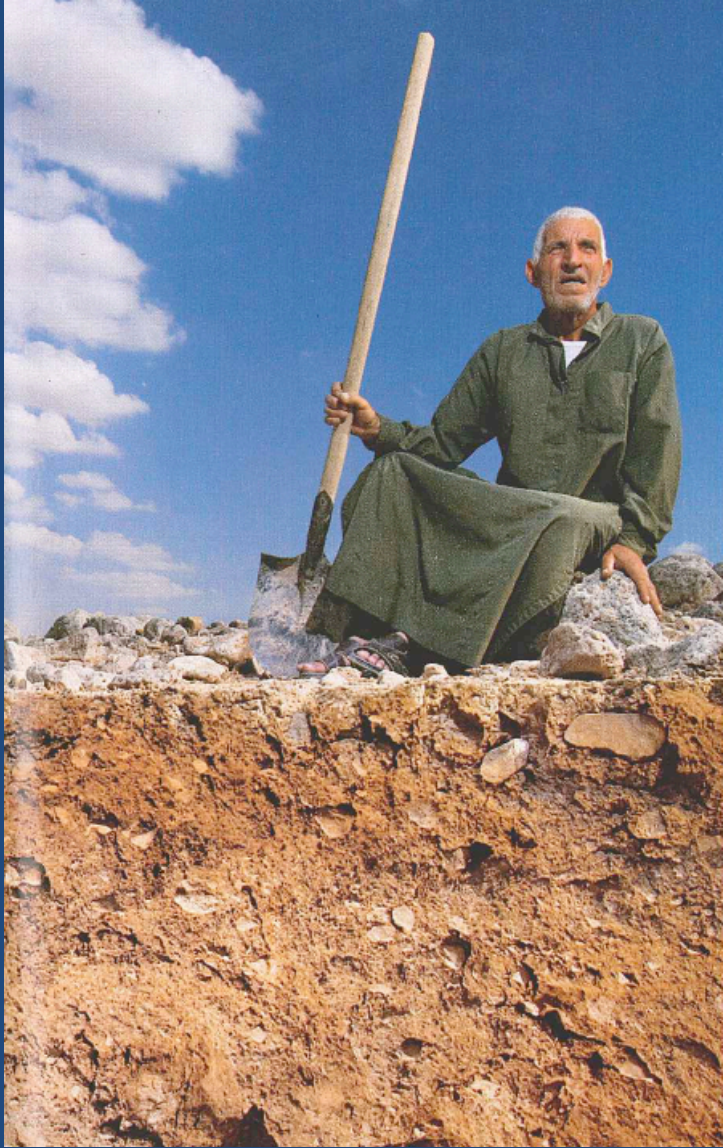
# The Aridisols



Aridisols occur in arid regions and the soil does not moisten for more than a few weeks a year. Under such conditions, salts and other minerals accumulate in the subsurface.

This white layer in the subsoil is a calcic horizon or accumulation of calcite.



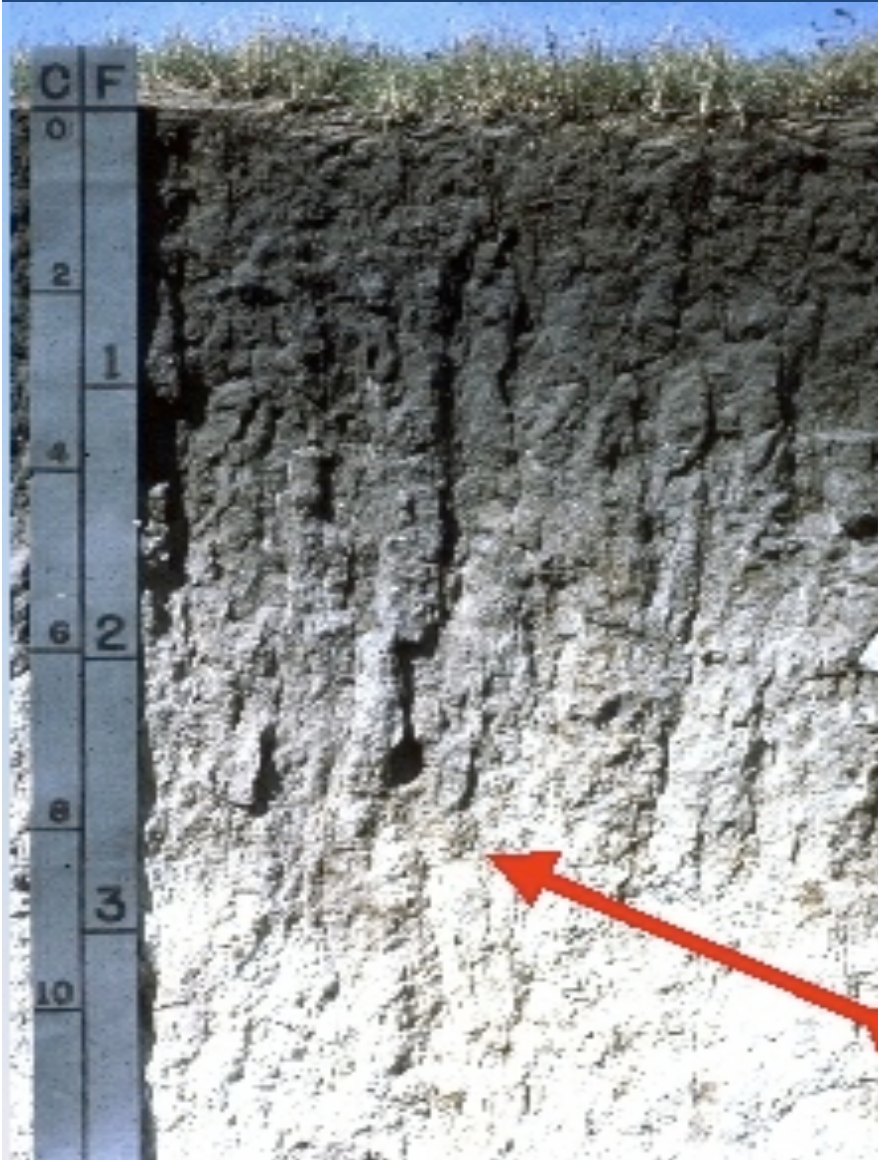


## Global Distribution of Aridisols



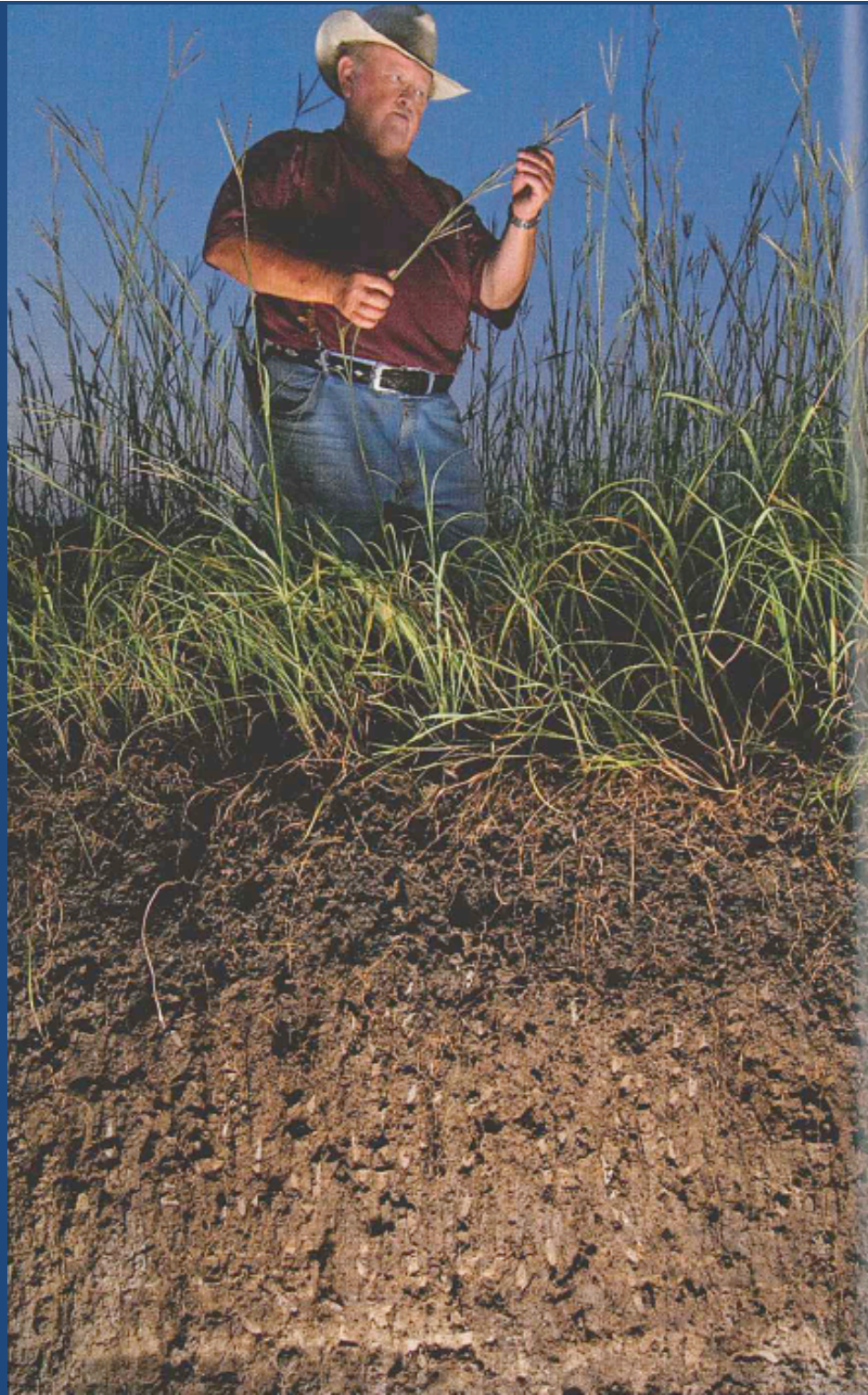


# The Mollisols



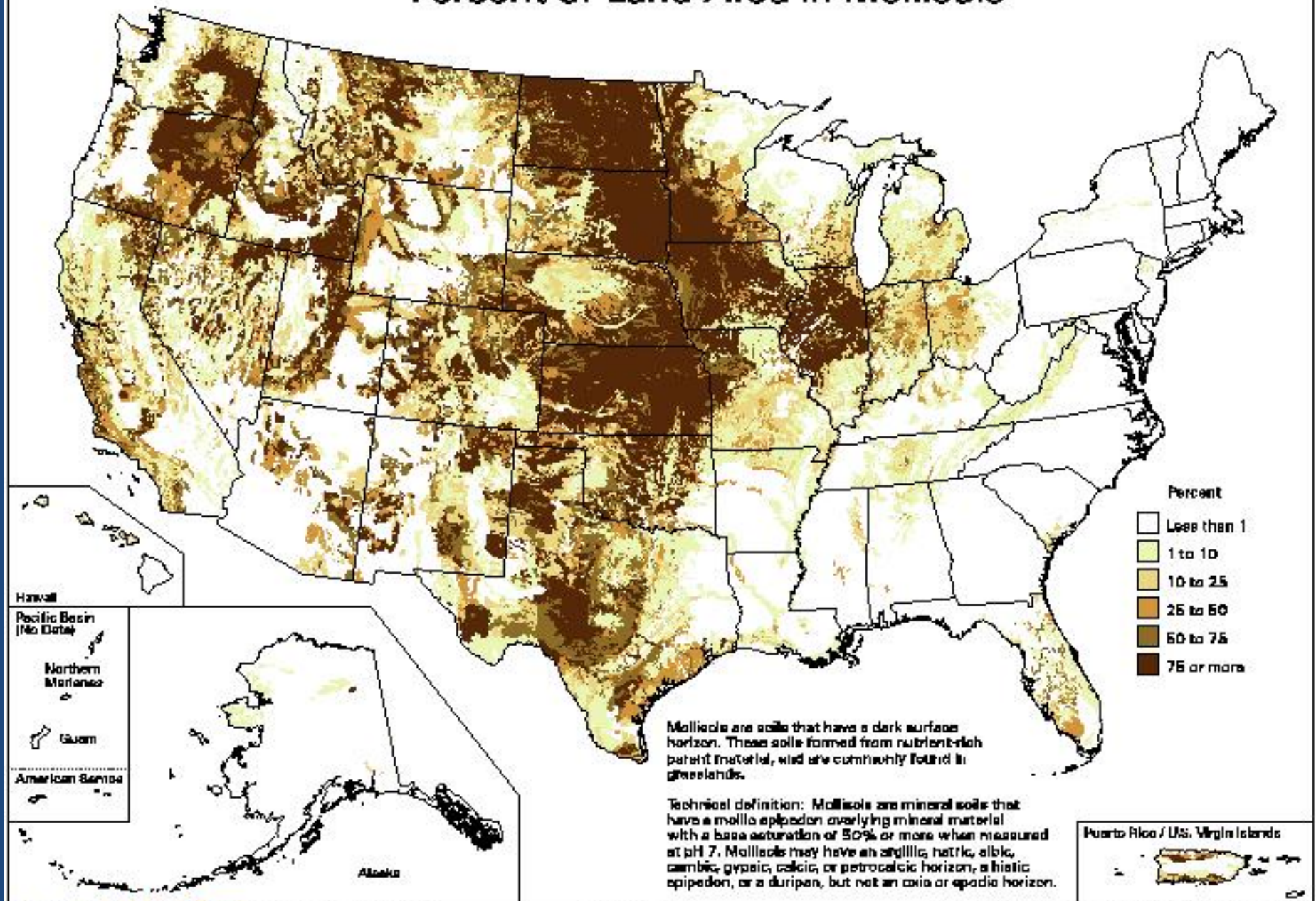
Mollisols are soils of the Prairie; they have a thick dark surface horizon, very friable and easy to cultivate. They are among some of the most important and productive agricultural soils in the world.

The white subsoil is due to the accumulation of calcium carbonates

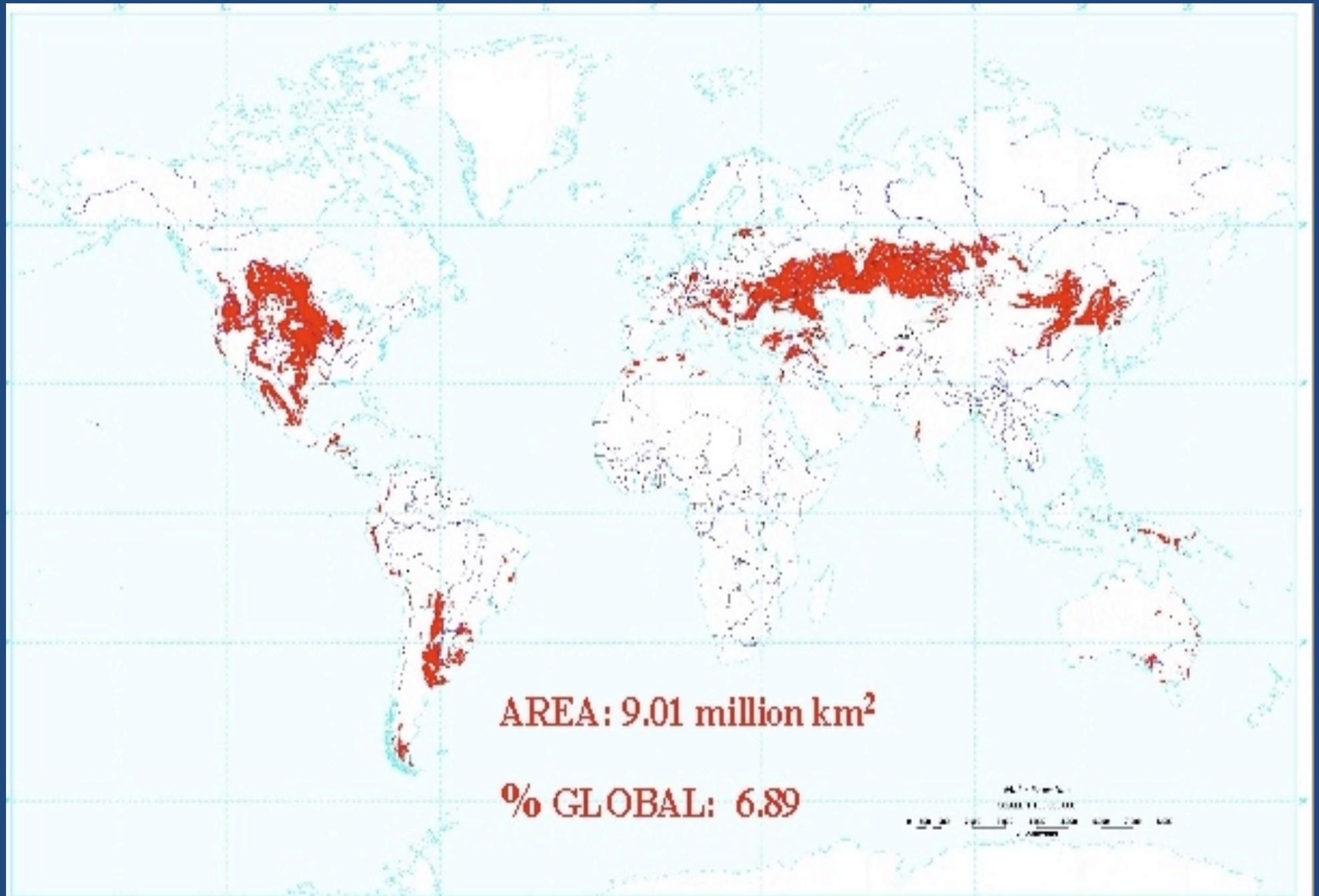




# Percent of Land Area in Mollisols

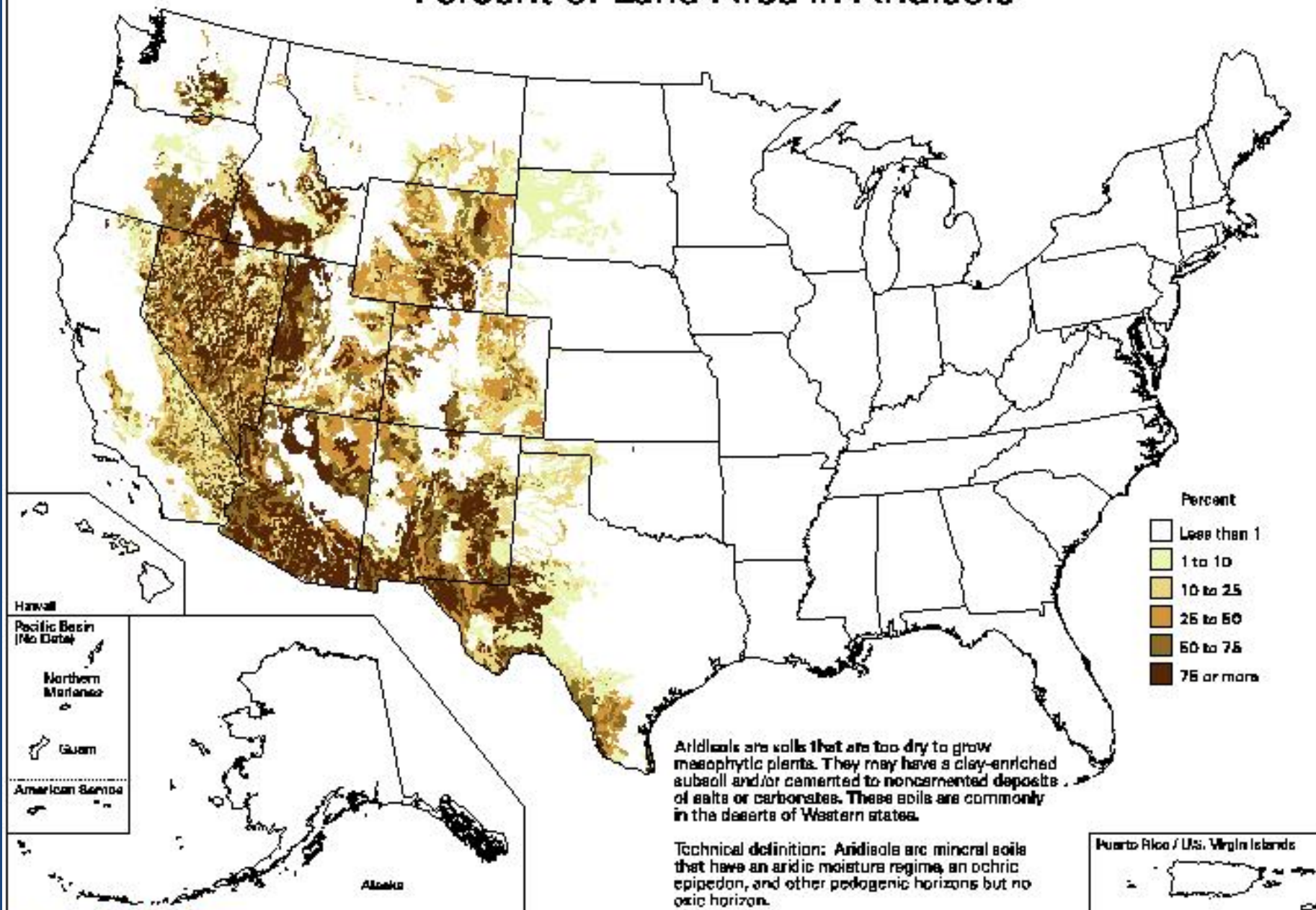


## Global Distribution of Mollisols





# Percent of Land Area in Aridisols



U.S. Department of Agriculture  
Natural Resources Conservation Service  
Resource Assessment Division  
Washington DC June 1989

Map ID: m4030  
For proper interpretation, see Explanation of Analysis for this map at our web site. Search for "USDASOTL" to locate our map index.

Data Source: Soil Survey Staff, 1988 Dominant Soil Orders and Suborder Soil Taxonomy 1998, United States of America. Maps and Soil Photographs, USDA NRCS, National Soil Survey Center, Lincoln, NE. NB6C 5502-698-01

**Alfisols** form in semiarid to humid areas, typically under a hardwood forest cover. They have a clay-enriched subsoil and relatively high native fertility. "Alf" refers to aluminium (Al) and iron (Fe).





# Alfisols



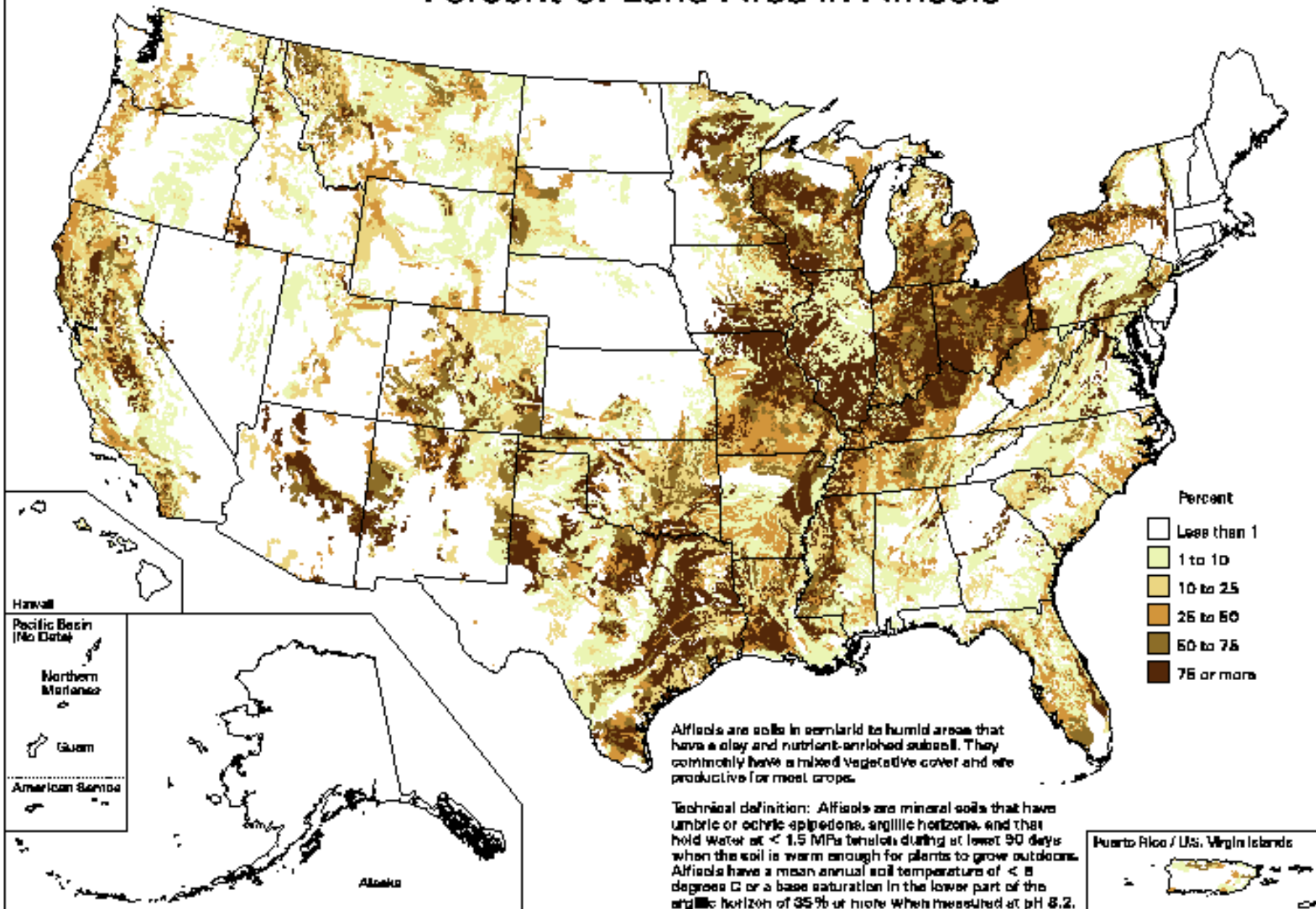
## Soil Order and Yield

	Mollisol Iowa	Alfisol Ohio	Ultisol Georgia	Oxisol Brazil
Corn Yield	175 bu	150 bu	140 bu	130 bu
Additional Fertilizer & Lime Costs			\$20	\$30





# Percent of Land Area in Alfisols



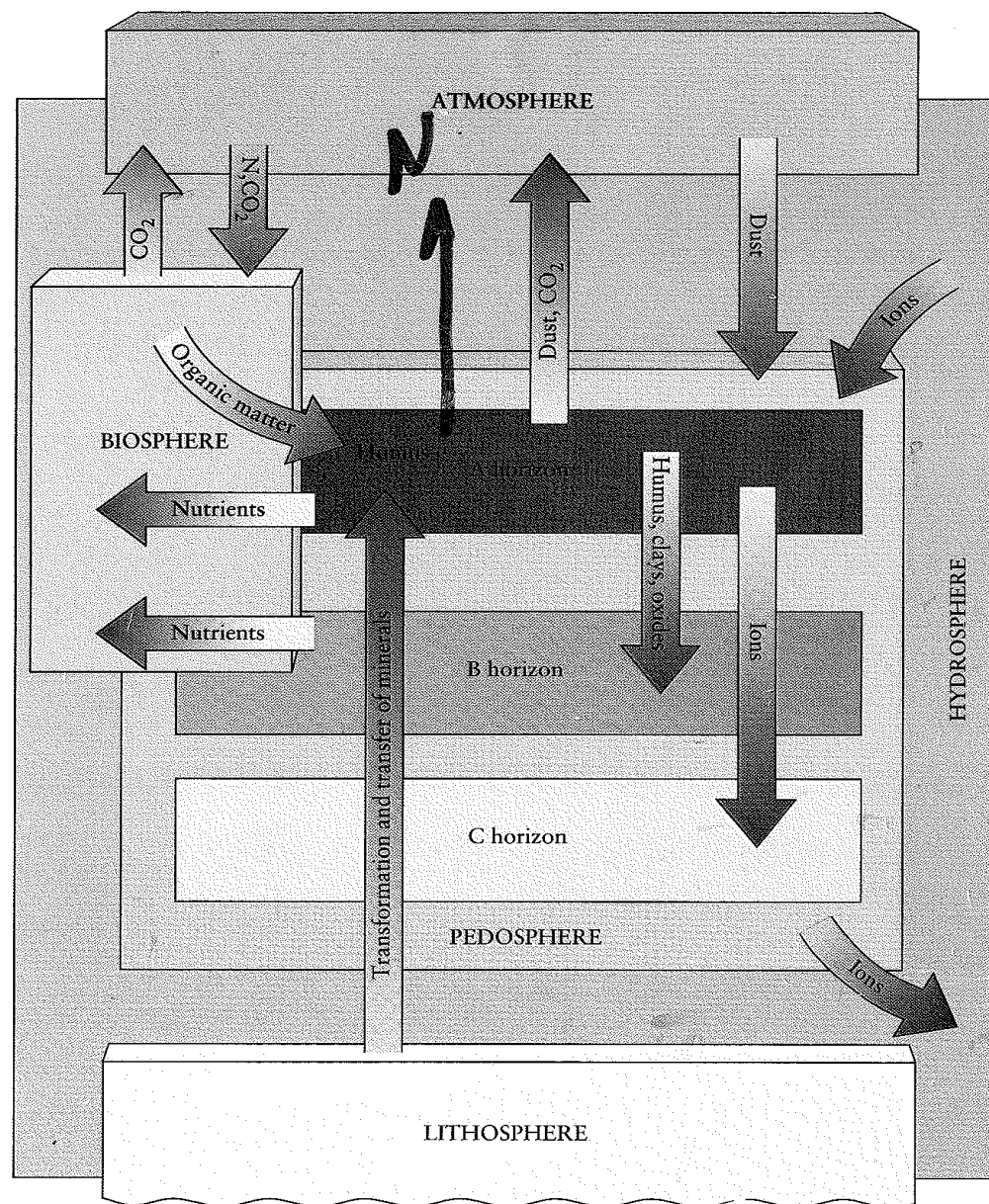




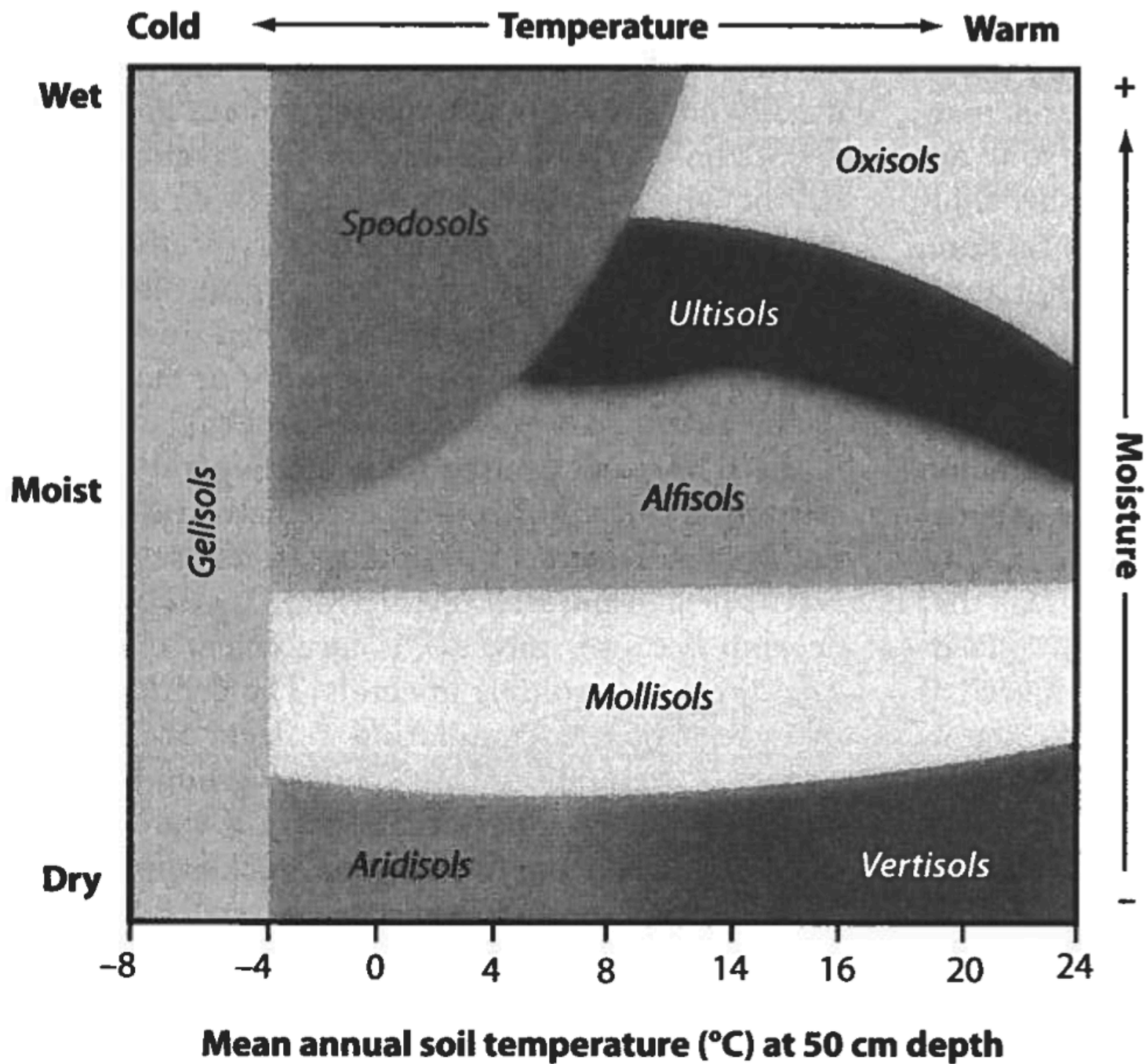








**Figure 6-12**  
 Dorothy Merritts, Andrew de Wet, Kirsten Menking  
 ENVIRONMENTAL GEOLOGY: AN EARTH SYSTEM SCIENCE APPROACH



Mean annual soil temperature (°C) at 50 cm depth