

SOILS 4463,
Soil and Water Conservation
and Management

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The Importance of Soils

- Throughout history the importance of soils have been overlooked to the detriment of civilizations
- Even in the U.S. air and water are the popular fundamental resources and soils are overlooked by the public?
- However, soils are fundamentally critical to the human condition

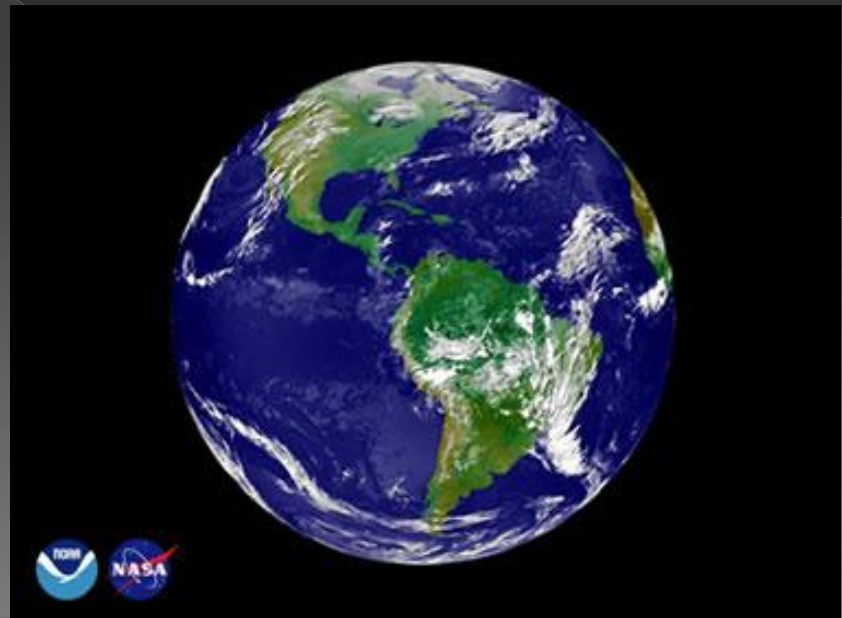
Functions of Soil

- ◉ Soils provide for the production of:
 - > Food, Fiber, Fuel, and Feed.
- ◉ Soils have various urban uses
 - > Housing, recreation, waste disposal
- ◉ Soils regulate water flow through the terrestrial water cycle



Functions of Soil

- ◉ Soils serve as a filter for water
- ◉ Soils are involved in regulating air temperature and climate
- ◉ Soils may serve as a sink for CO_2 and CH_4



Impacts of Soil Management

- ◉ Management of soils influences
 - > Water availability in aquifers and surface waters.
 - Runoff, drainage, and evapotranspiration.
 - > Water quality
 - Nutrients, sediment, pesticides
 - > Air quality
 - Dust, volatile gases such as NH_3 and greenhouse gases.

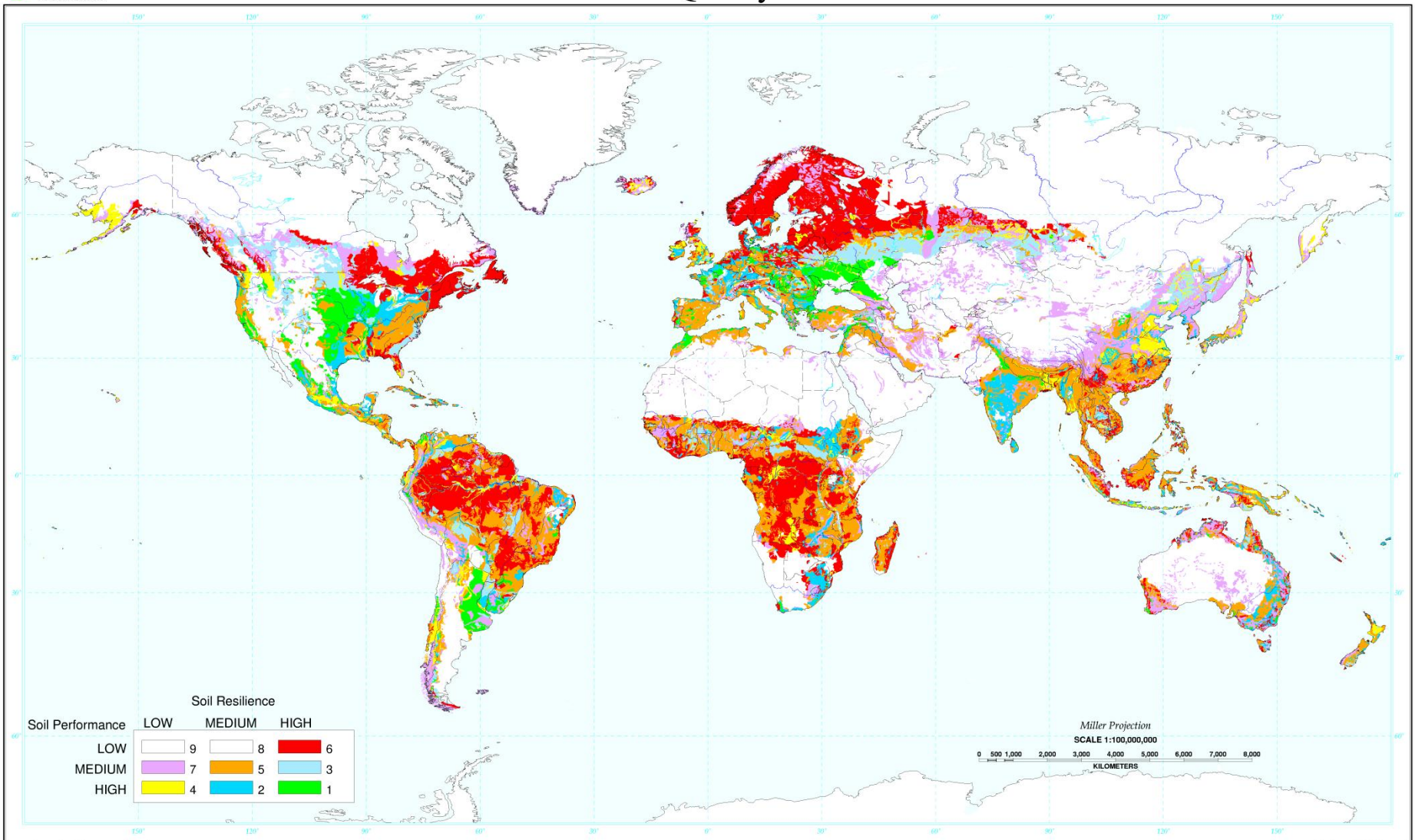
Global Soil Resources

- ◎ Cropland
 - > ~12% of the land surface is “suitable” for food and fiber production
- ◎ Grazing Lands
 - > ~24% is used for grazing
- ◎ Forested
 - > ~31%
- ◎ Not usable (desert and ice covered)
 - > ~33%

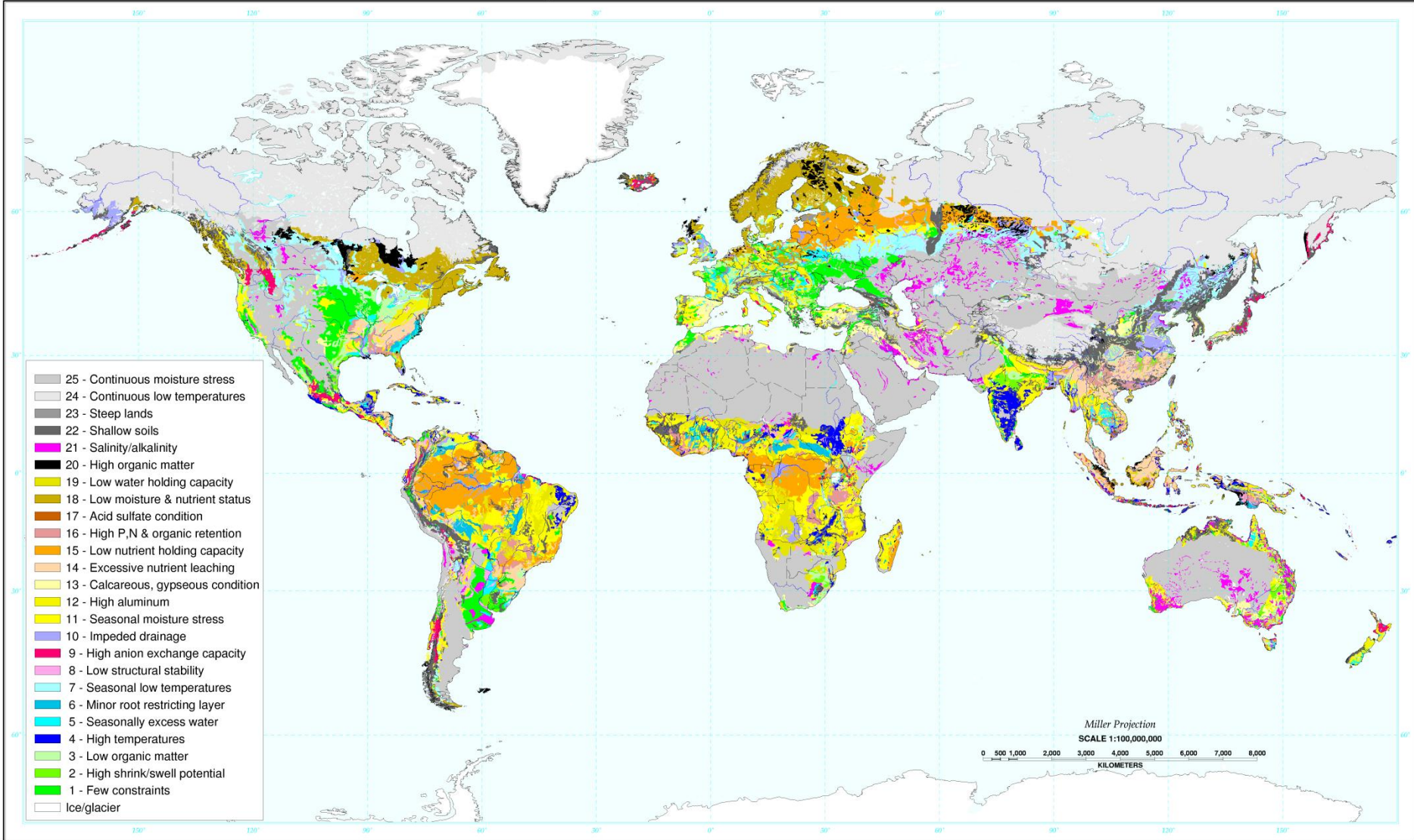
Global Soil Resources

- 32.2 billion acres of land on the earth's surface
- 9.9 billion acres (29.5%) is too dry to support cultivation
- 5 billion acres (15.5%) occur in the cold tundra zone
- 14.8 billion acres (46.0%) of land that “**COULD**” be cultivated
- 4.1 billion acres (12.7%) of land is free from constraints for crop production
- 12.3 billion acres (38 %) of land that is currently cultivated (World Resources Institute, 1997) they refer to this domesticated

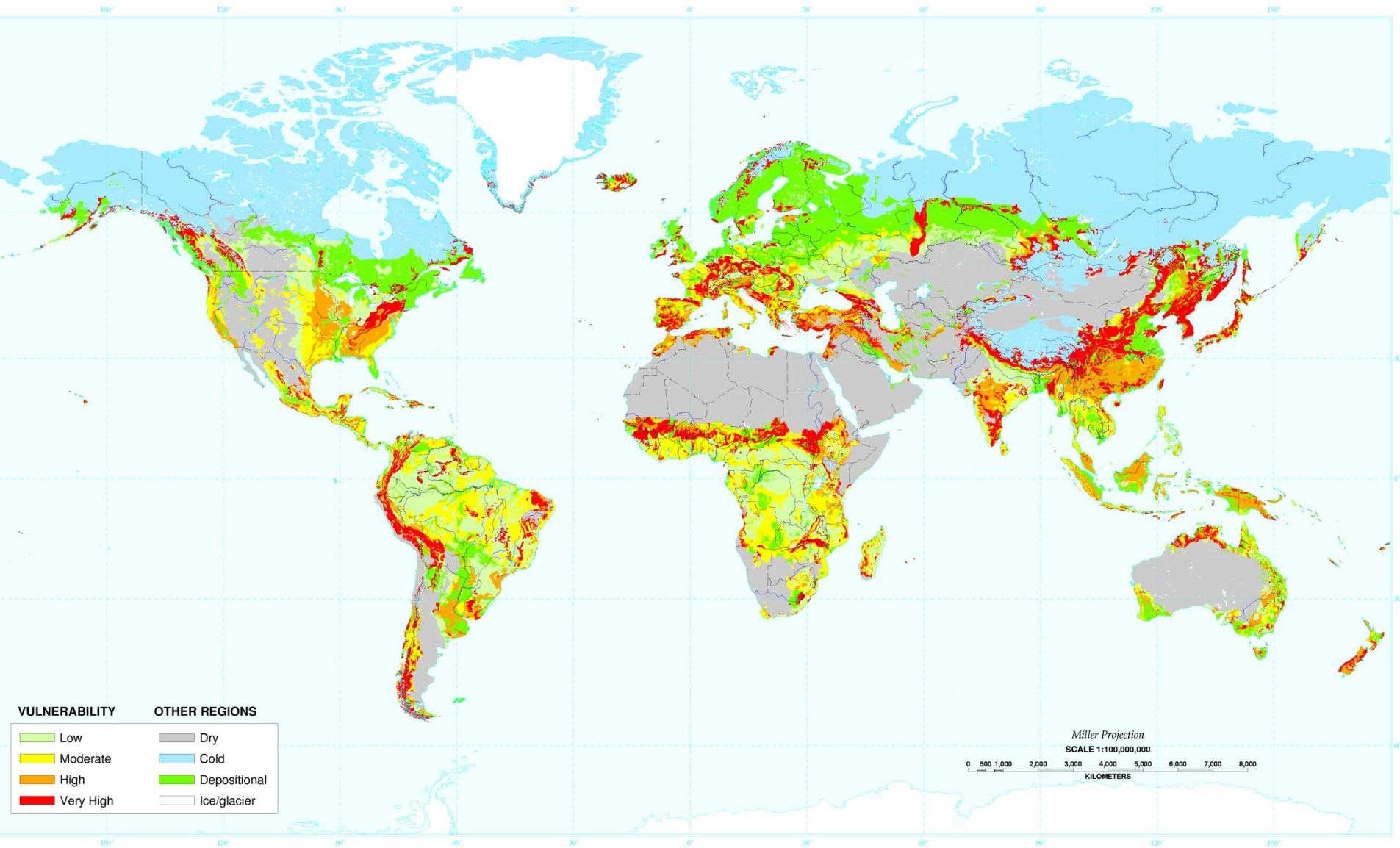
Inherent Land Quality Assessment



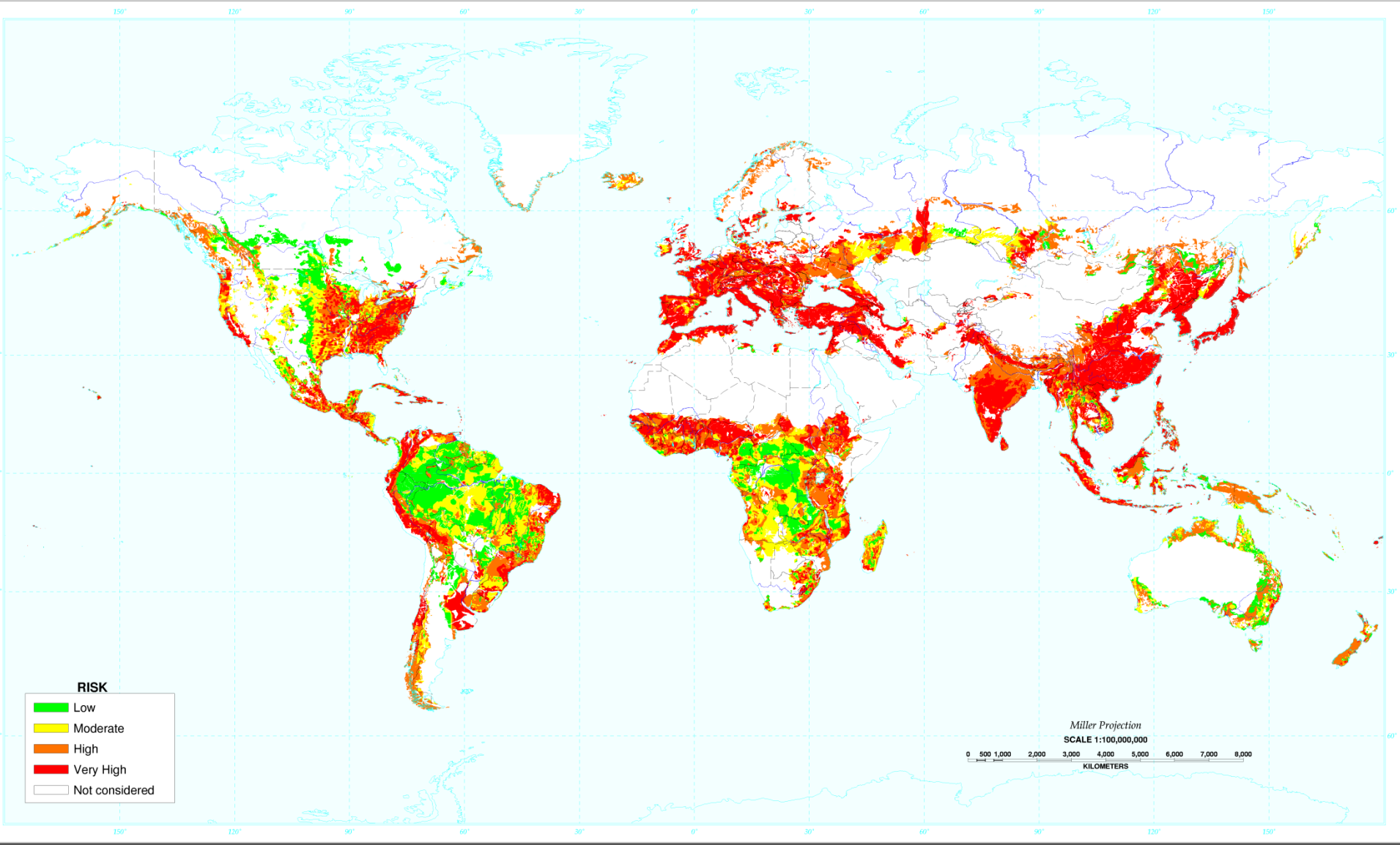
Major Land Resource Stresses



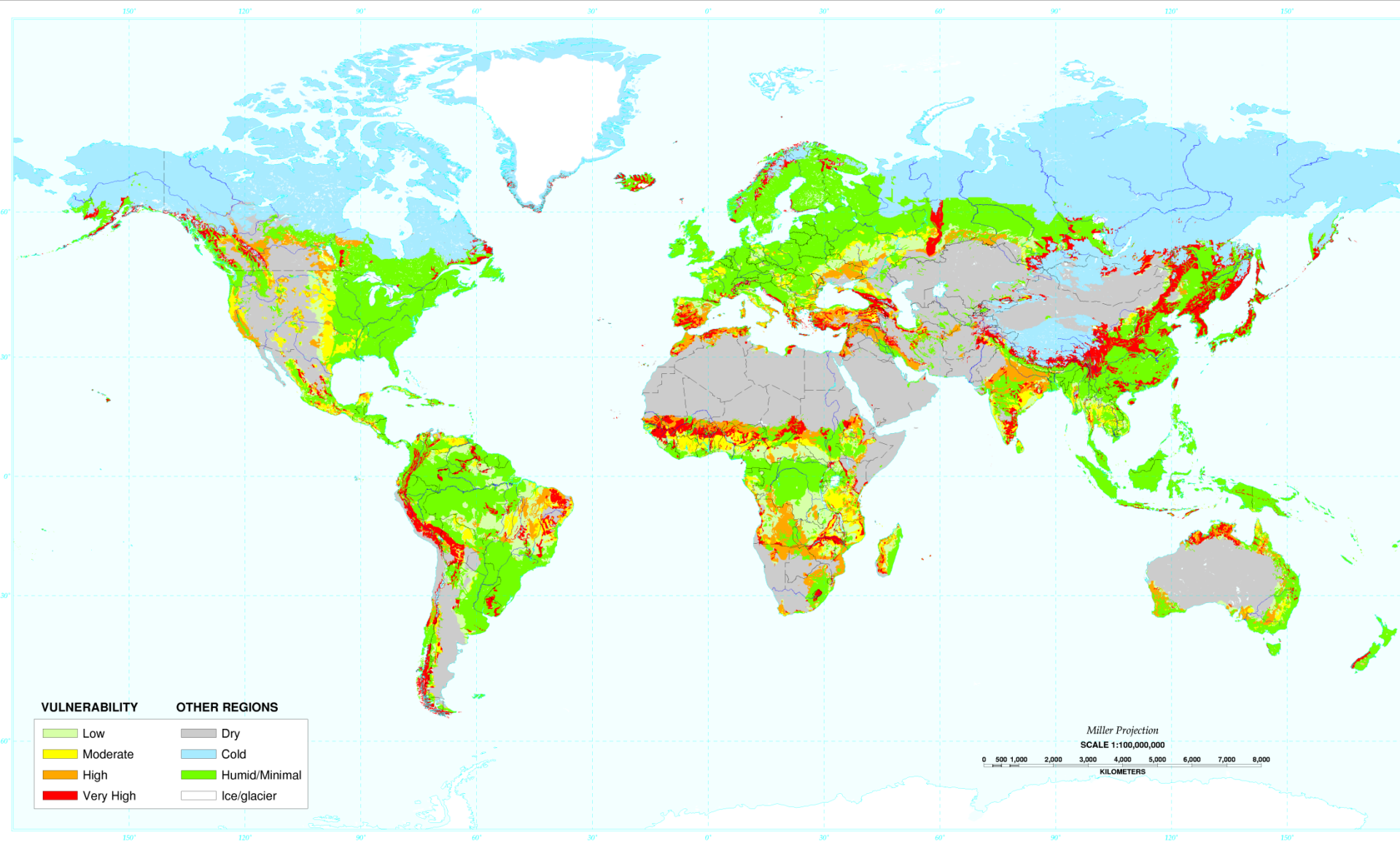
Water Erosion Vulnerability



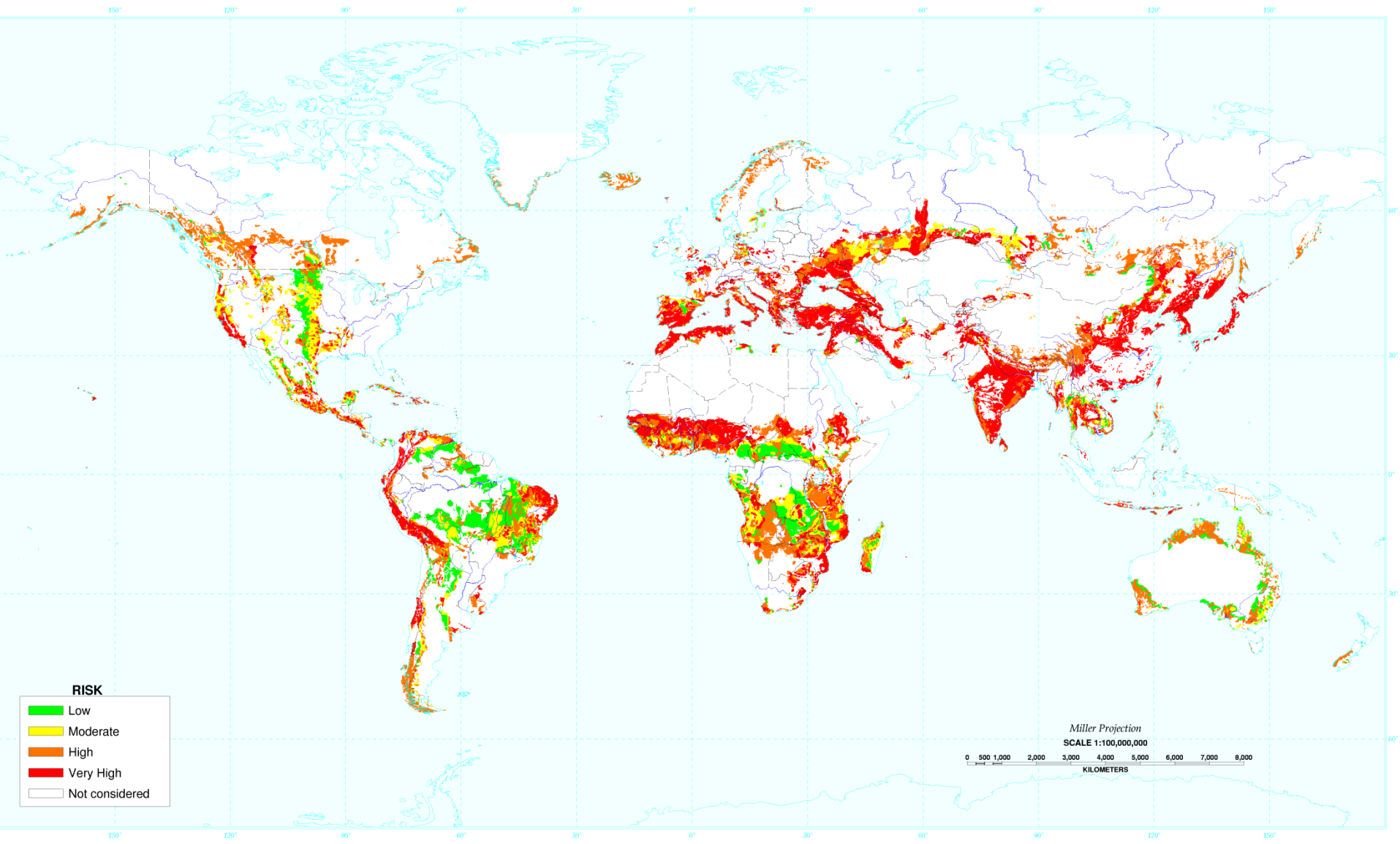
Risk of Human Induced Water Erosion



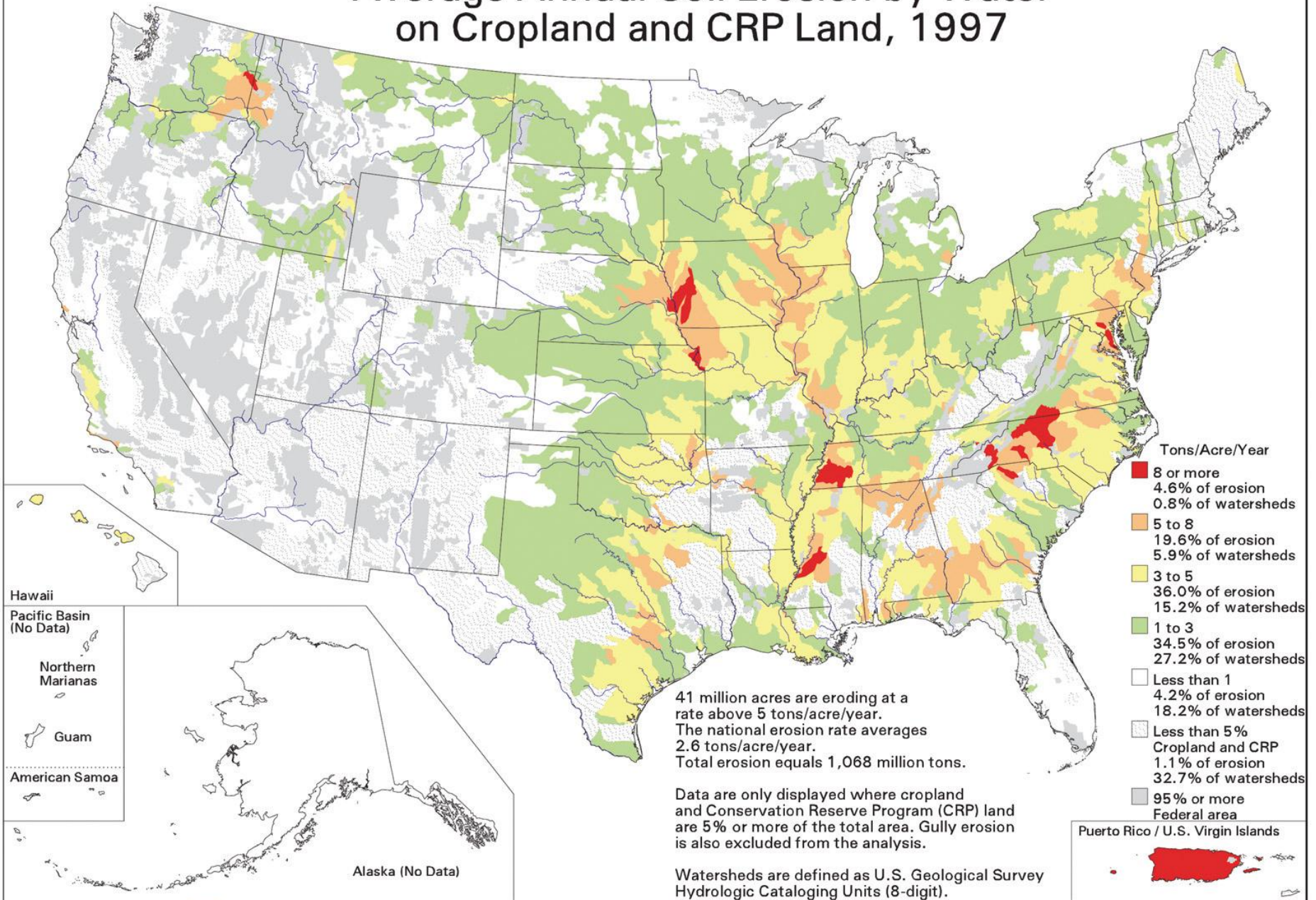
Wind Erosion Vulnerability



Risk of Human Induced Wind Erosion



Average Annual Soil Erosion by Water on Cropland and CRP Land, 1997



Average Annual Soil Erosion by Wind on Cropland and CRP Land, 1997

