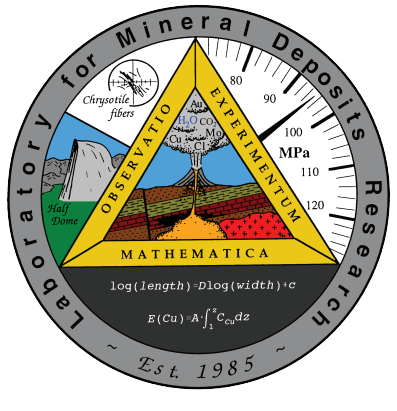
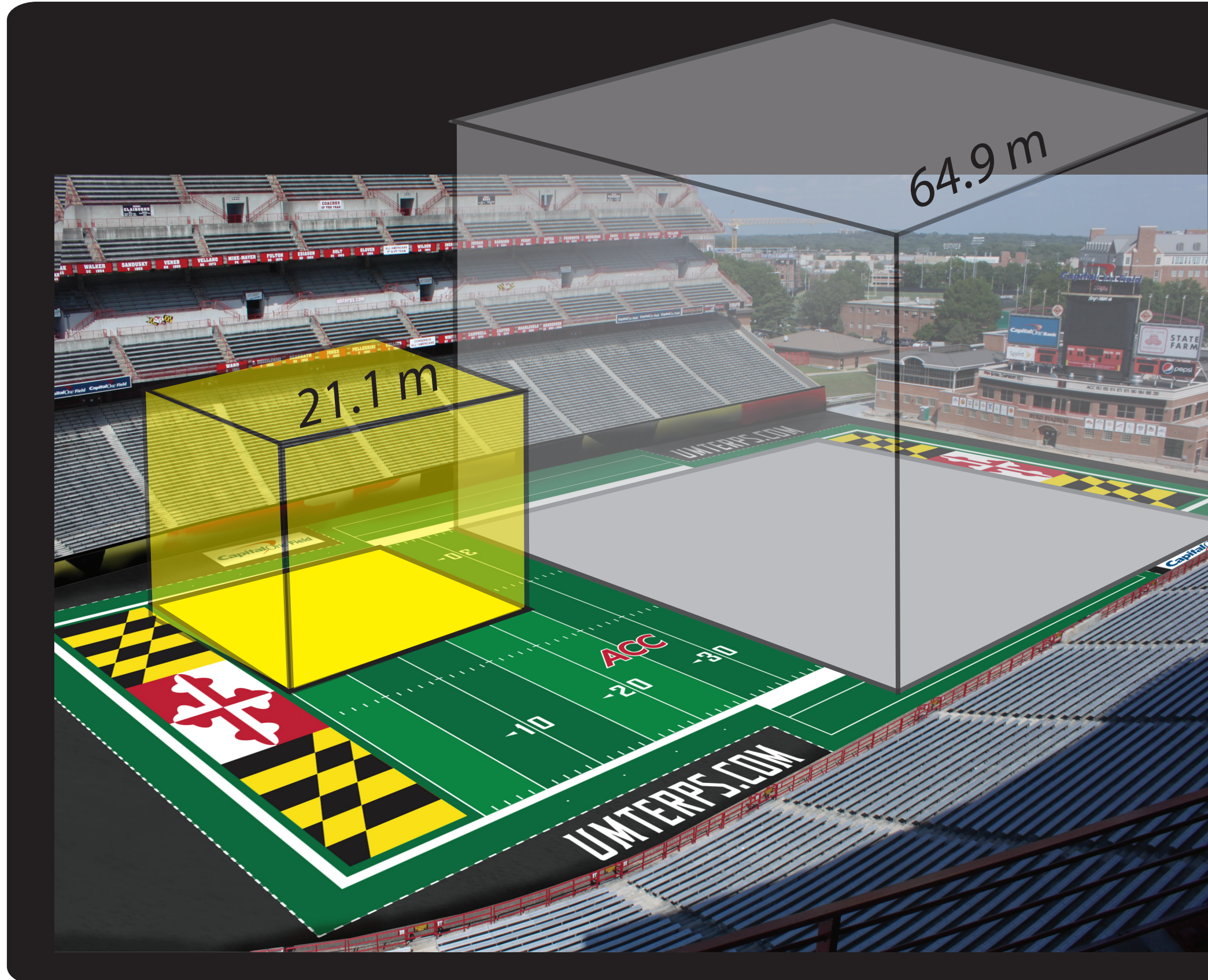


Minerals, Mining and Human Innovation



LMDR-Laboratory for Mineral Deposits Research

Understanding Metal Behavior Today in Order to Meet Tomorrows Demand



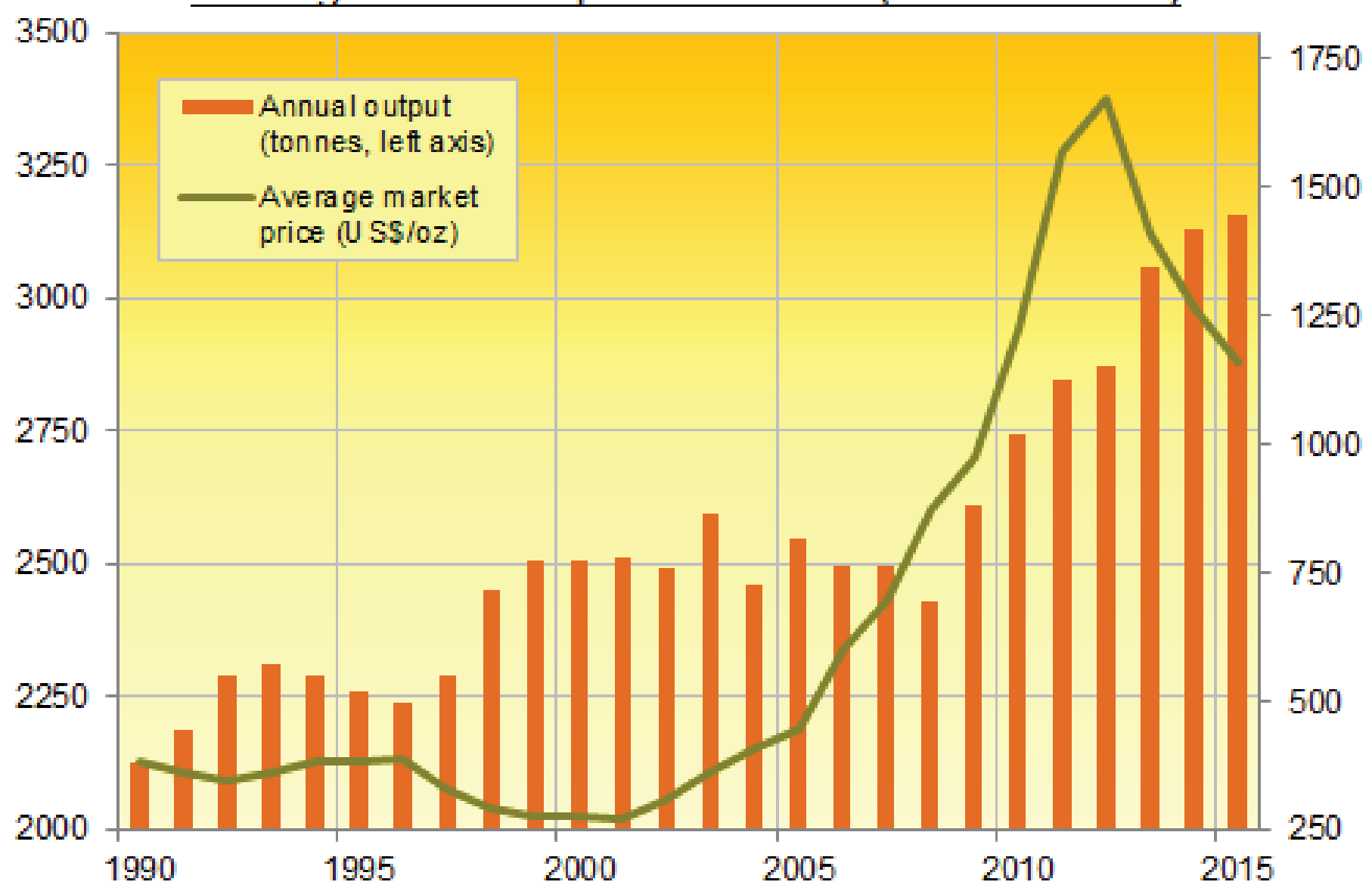
An estimate of the amount of gold that has ever been mined, as of April 29th 2017 at 10 am is 181,000 tonnes. If you were to take this gold and build a cube, it would be 21.1 meters tall.

$$[(181,000 \text{ tonnes} \times 1000 \text{ kg/tonne}) / 19,320 \text{ kg/m}^3]^{1/3} = 21.1 \text{ m}$$

An estimate of the amount of silver that has ever been mined, as of April 29th 2017 at 10 am is 2.87 million tonnes. If you were to take this silver and build a cube, it would be 64.9 meters tall.

$$[(2,870,000 \text{ tonnes} \times 1000 \text{ kg/tonne}) / 10,490 \text{ kg/m}^3]^{1/3} = 64.9 \text{ m}$$

World gold mine output since 1990 (estimate 2015)

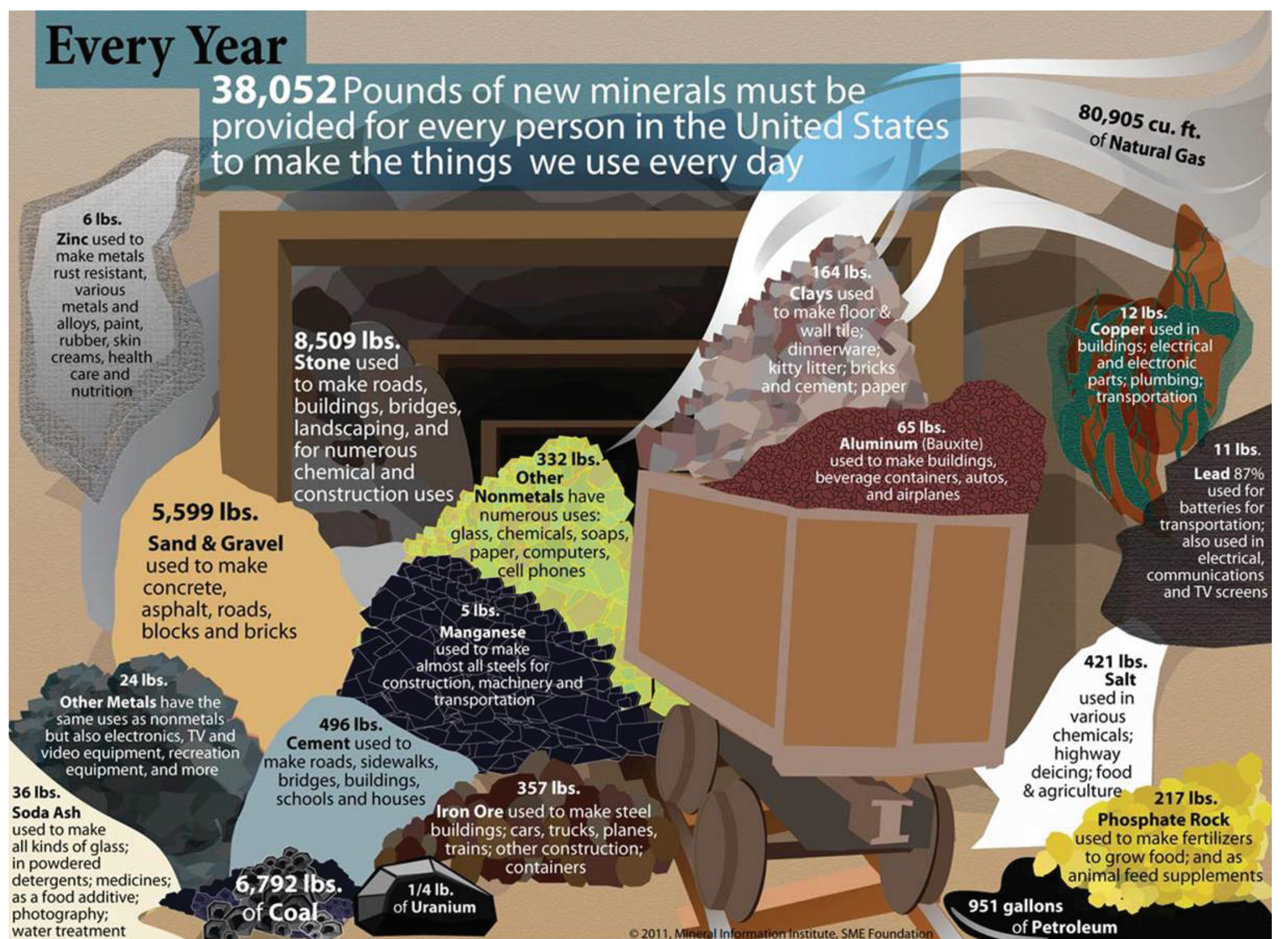


Source: BullionVault via World Gold Council, Thomson Reuters GFMS



Photo by David Unger

Are You a Consumer of the Earth's Rock and Mineral Goods?



13,000,000,000,000 pounds of earth resources will need to be mined to accommodate the needs of the population in the US-this year!



Photo by Paleontological Research Institution

The Marcellus Shale (two pictures shown to the left) is an oil and gas bearing sedimentary rock in Pennsylvania, West Virginia, New York, and Ohio. The Marcellus Shale is middle Devonian in age (~390 million years old). Its areal extent is 600 miles, with a thickness of up to 900 feet.

From the shale fuel phenomenon, we learn that "Natural Resources" are one part geology, one part economics, and one part human innovation/creativity: that is, we create resources by way of innovation. This is demonstrated well by the shale gas, (and oil), revolution. The shale revolution has contributed positively to the economy in the US; the lack of strong individual property rights in other countries is currently limiting development elsewhere. Many problems in the exploitation of these, and other Earth resources, can be solved by what used to be called the "Can Do" attitude: Innovation and Entrepreneurship.