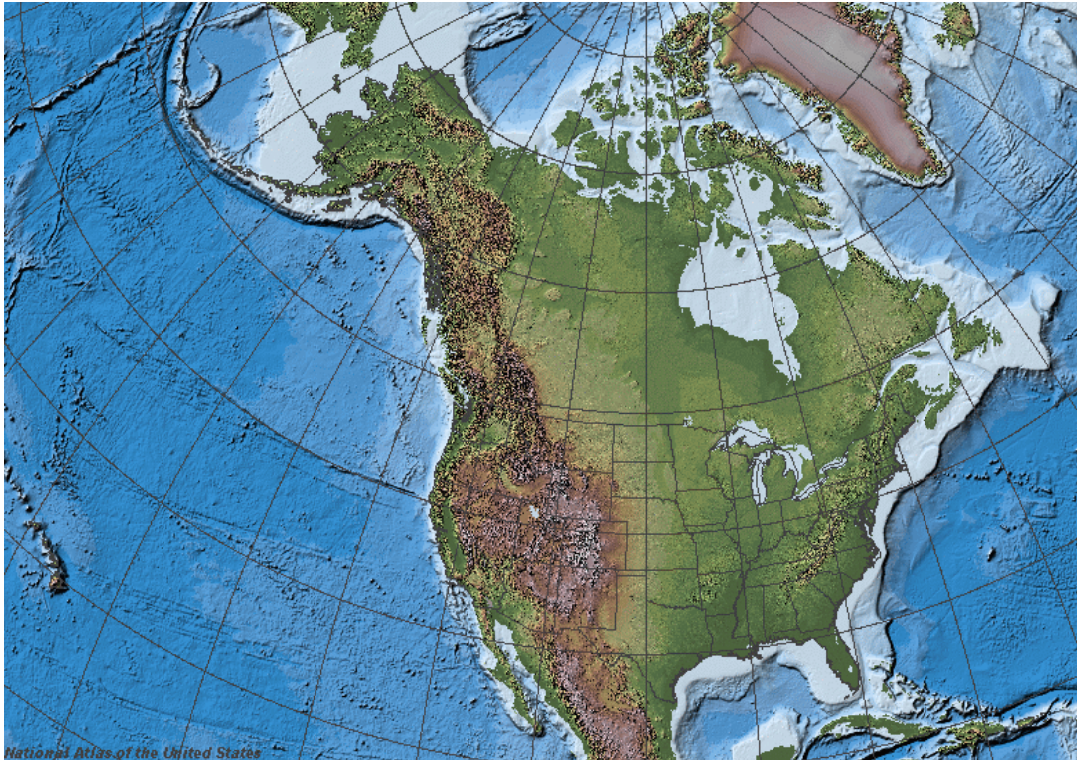


# Skin of the Earth

Among *Homo sapiens*, superficial pigment and folds of the skin create an illusion of significant difference among members of our species. By contrast, the epidermis of soil and vegetation that covers the raw tissue of our planet's crust creates an illusion of similarity among landscapes, hiding starkly contrasting patterns of rock layers that reveal constant movement of land and oceans throughout geologic history.



USGS image

Earth's thin crust stretches across the broad mantle, covering it with a thickness of only 3 miles (oceanic) to 30 miles (continental). By comparison, the mantle is 1,800 miles thick, the core 2,200 miles, with a planetary diameter of 8,000 miles. The veneer of rocky crust has constantly shifted, split, and folded, much of it melted and re-formed throughout geologic time - sculpted by tectonic activity and volcanic, erosive, sedimentary, and metamorphic forces. Geology, an organized science for only 180 years, has transformed our intuitive but erroneous perception that rock layers are static, fixed, and immobile. Only the unique ability of the human brain to wonder, observe, record, and deduce - and the social phenomenon of scientific inquiry - has enabled us to overcome the constraints of our narrow temporal frame of reference and read in rock language the convoluted details of our planet's past.

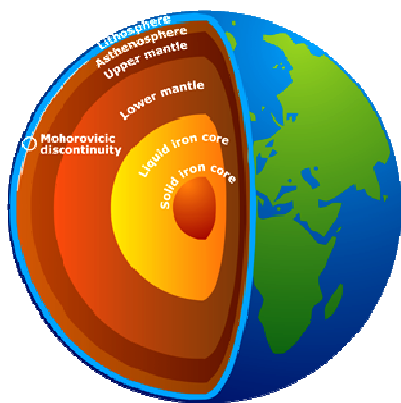
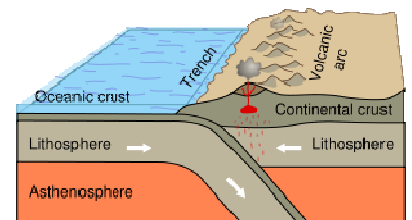
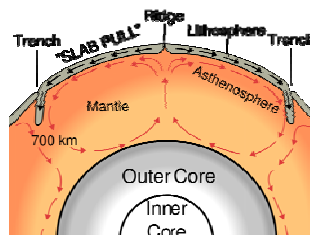
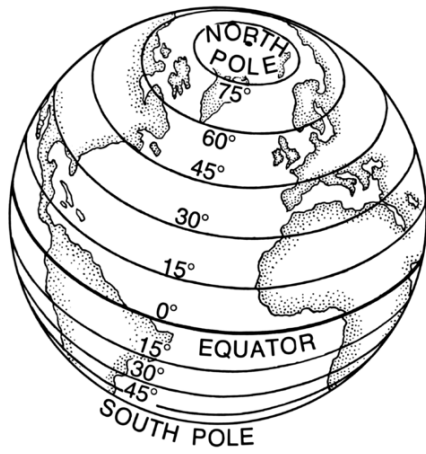
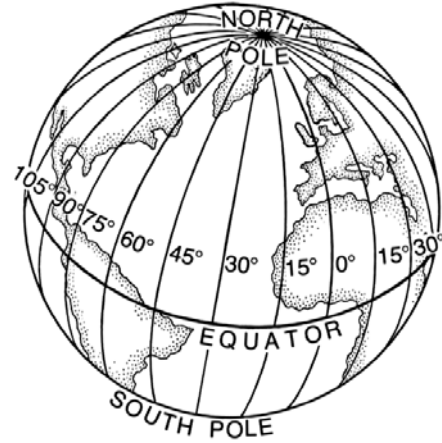


image source: www.flem-ath.com



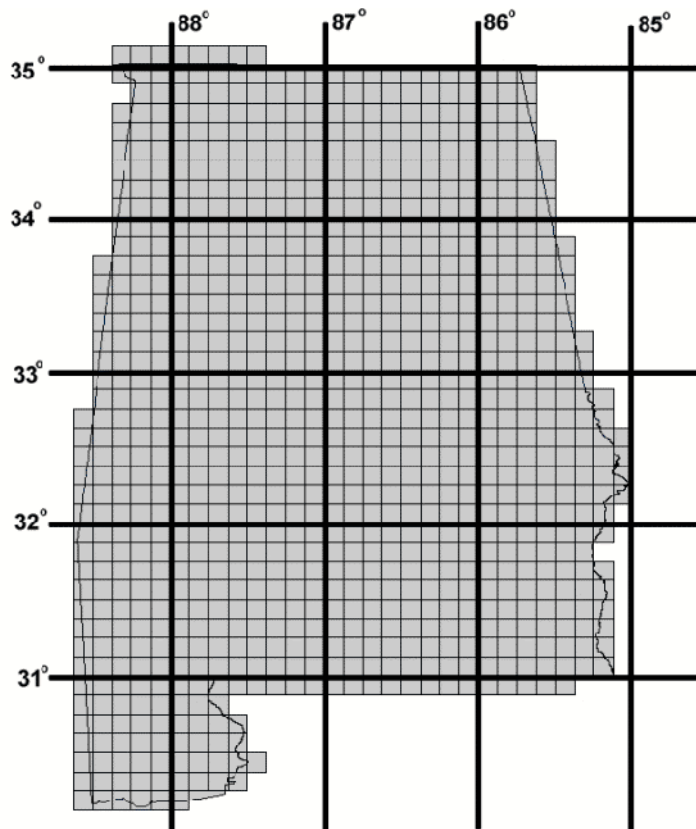


latitude



longitude

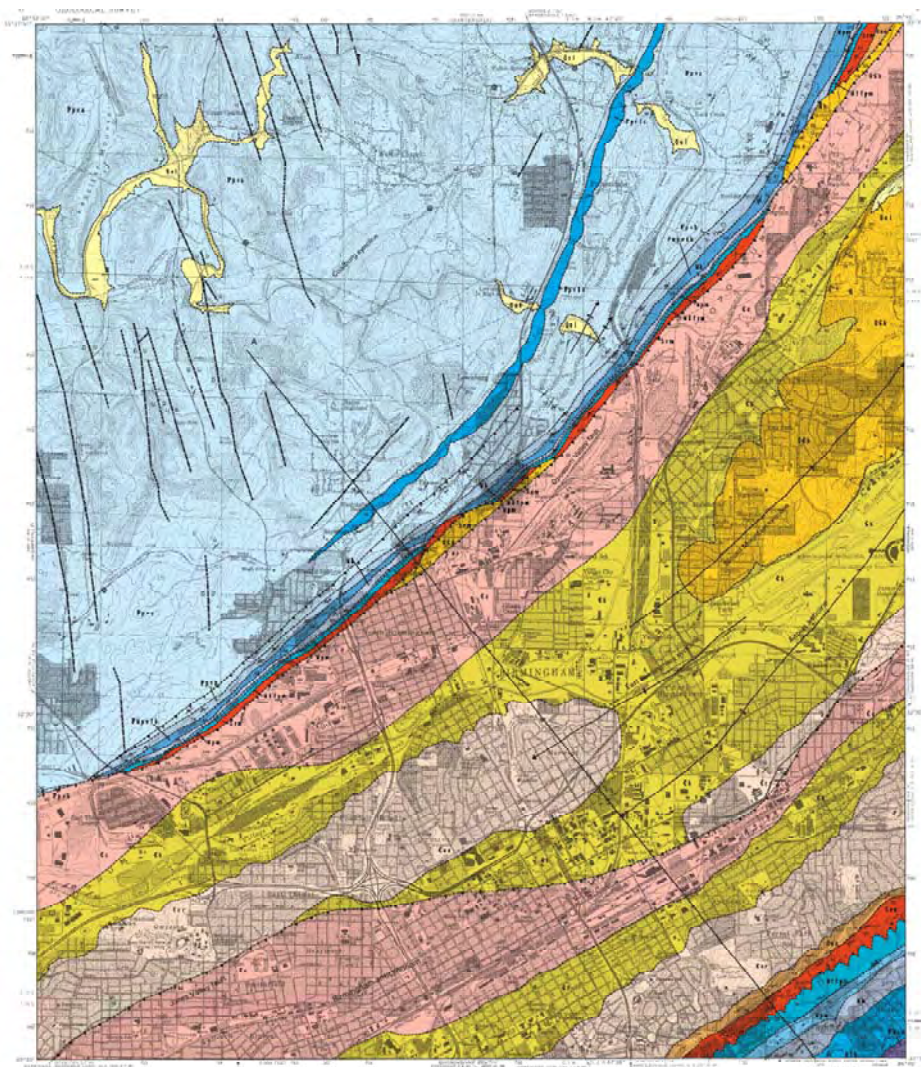
Geologic mapping of the planetary surface allows visualization of crustal elements that are often hidden just below the surface. Contiguous quadrangle maps of the U.S. are available, each displaying an area of 7.5 minutes latitude X 7.5 minutes longitude at a scale of 1:24,000 (1 in. = 2000 ft.). Since there are 60 minutes ( ' ) per degree ( ° ) of latitude - and each degree of latitude measures 69 miles - each of these maps covers 9 miles top to bottom. However, because longitudinal lines converge at the poles, distances subtended by longitudinal degrees vary according to global position ... at mid-North America (lat. 37° N), for example, 7.5 minutes of longitude measures 6.9 miles across.



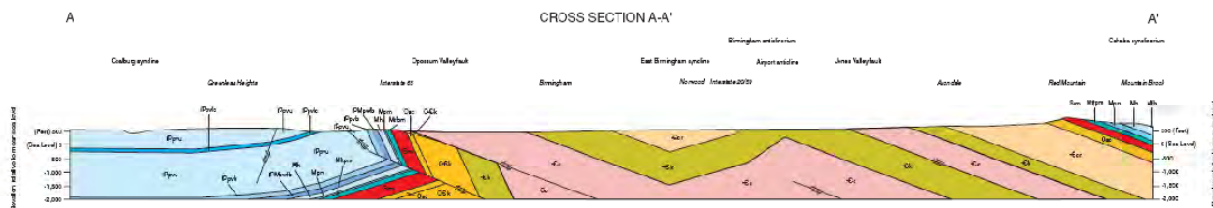
representative state grid, showing 7.5 minute quadrangle maps available (GSA / USGS)



For many quadrangles, surface geologic data is available, and mapped with accompanying cross-sectional views that expose the relationships among buried rock layers.



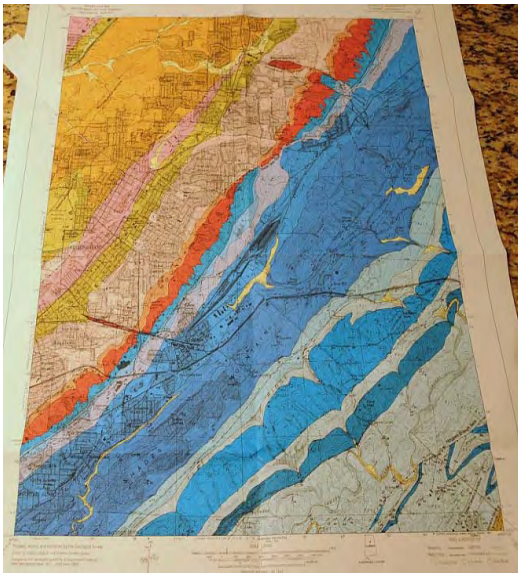
representative 7.5 minute geologic quadrangle series map (GSA / USGS )



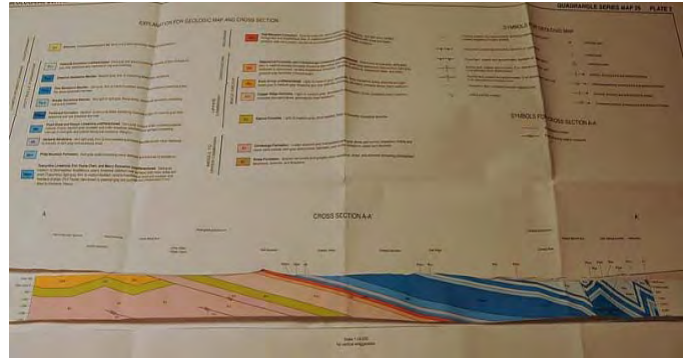
accompanying cross section

Examination and comparison of dates of formation / deposition / distortion of layers allows reconstruction of geologic history. Fossil evidence reports ancient ocean life where now mountains rise. Crumpled and tilted strata document collisions between continents now separated by vast oceans. Indeed, contemplation of the solid evidence right beneath our feet has made apparent Earth's true age and has been a major philosophical contribution of geology, informing us of our species' late arrival on the timeline of an ancient planet.





7.5 minute geologic quadrangle series map



accompanying geologic cross-section



geologic cross-section cut out and aligned with quadrangle series map