

Geology Cards

Evidence from now buried landforms from the surface of Earth from about 4.4 to 2.5 billion years ago shows a prevalence of two substances, iron pyrite and uraninite. These two minerals are very reactive with oxygen.

Between 2.5 and 1.8 billion years ago, massive deposits of iron oxides called banded iron formations (BIFs) have been found in staggering abundance all over the world. These distinctive, dense accumulations of alternating black and rusty red layers hold 90% of the world's iron ore reserves. Hundreds of other new minerals—oxidized ores of manganese, copper, nickel, uranium, and more—also appear in the rock record for the first time during this period.

The period on Earth that geologists call the “boring billion” extended from 1.8 to 0.8 billion years ago. During this time there is little geologic evidence of a change in the oxygen concentration in the atmosphere. Ocean water from the beginning of this era through the present day are thought to have very little dissolved iron in them.

Beginning around 800 million years ago (0.8 billion) there is another, less prominent, set of banded iron formations. A bit later in this period scientists have discovered preserved bubbles of atmosphere in amber that allow for direct measurements of oxygen concentration.