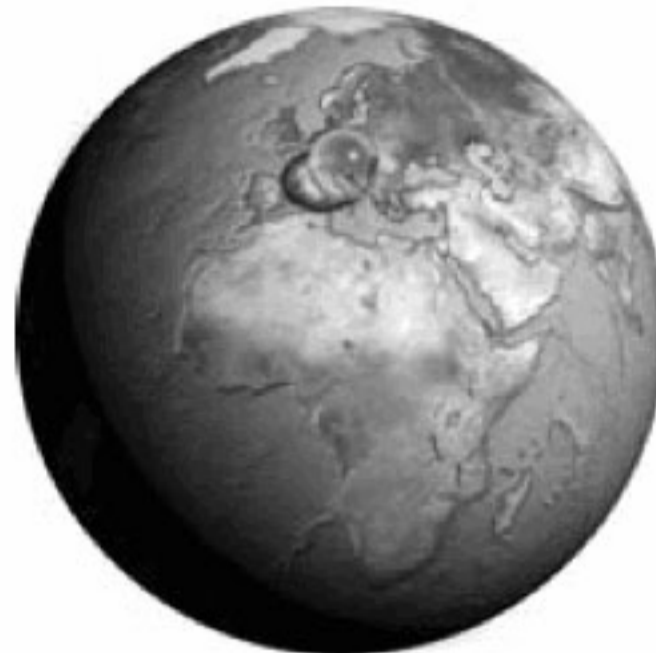
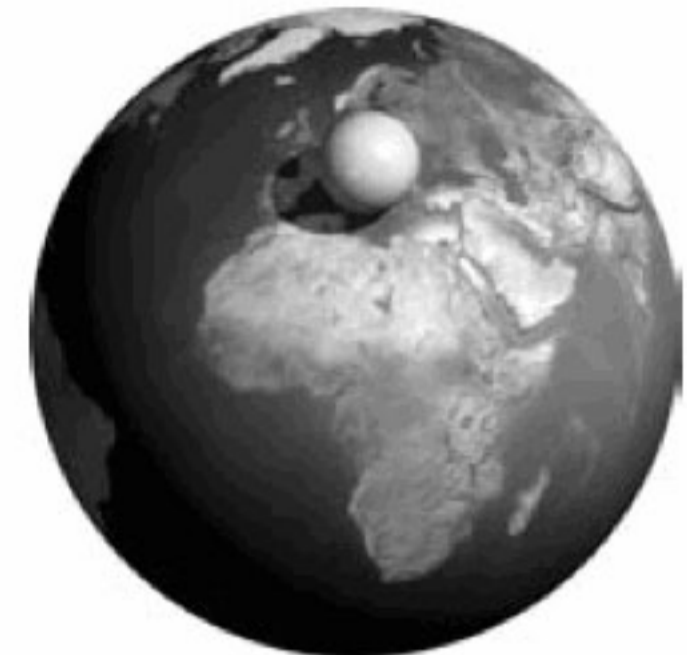


Getting to know our neighbourhood

Adam Nieman's Scale Explorer Project revisions the planet's finite natural resources – water and air



All the water in the world (1,4087 billion cubic kilometres of it) including sea water, ice, lakes, rivers, clouds, etc shown on the same scale as the Earth



All the air in the atmosphere (5140 trillion tonnes of it) gathered into a ball at sea level density shown on the same scale as the Earth

These images were created for a project called Scale Explorer: an interactive atlas of the universe that allows users to create their own conceptual maps of phenomena. It works by allowing users to frame their own questions about the relative sizes of things and display the answers in whatever way they find most meaningful.

Many physical, biological and social processes are too big, too small, too slow or too fast for us to have any direct experience of them. The problem with discussing the smallness of atoms or the vastness of space is that people find such talk alienating. (This is often the intention!)

Scale Explorer gives users a feel for phenomena rather than just listing facts. For instance, the atmosphere contains 5140 trillion tonnes of air but, for most of us, this fact alone would not help us understand climate change, say. A picture of how little space 5140 trillion tonnes of air takes-up though is more empowering.

So, if we collected all the water on Earth together into a ball, it would be just 1390 kilometres across. This is the space taken up by 1.4087 billion cubic kilometres of water – all the water in the oceans, all the fresh water in lakes and rivers, all the water in ice, all the water in the earth's crust, the atmosphere and in soil and plants. If we collected just the water in lakes and rivers, the ball would be 62 kilometres across – a tiny teardrop, too small to show up in the picture.

How about the air? The balloon shows what all the air in the atmosphere would look like gathered together at the density it is at sea-level. The atmosphere extends hundreds of kilometres above the surface of the planet but the density of air falls sharply with height. In fact, half of all the air in the atmosphere lies within just 5 kilometres of the surface. Gather all the air together, all 5140 trillion tonnes of it, and it will fill a sphere 1999 kilometres across.

The reason these pictures are surprising is that for most of human history we have assumed that the oceans and the air are, for all intents and purposes, infinite. We are used to thinking of the sea as an infinite sink. In fact, the average depth of the ocean is just 3.8 kilometres. If the Earth were the size of a football, then the oceans would be a thin film less than tenth of a millimetre thick. Air we take for granted, not as a thing in itself, but as empty space. Things 'disappear into thin air'. It is no wonder we just not used to thinking of air and water as finite resources.

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