



A whole world systems perspective by Tom Morris Division of Natural Sciences Fullerton College

Planetary Biology is a perspective that considers life in the context of the whole planet. This viewpoint springs from the proposition that, given enough time, the collective operations of living things can transform the planetary surface environment. For example, by influencing the mix of gases in the atmosphere, by expediting cloud formation over a forest, or by changing the planet's albedo. On Earth, life has woven itself into the fabric of a dynamic whole world system where it has been a pervasive influence - over hundreds of millions of years. Not to be dismissed as simply a cosmetic accessory to a rocky world, life is a diverse, highly interactive, integral, and defining property of the whole world. The current state of Earth's surface environment is the result of biological processes and geological processes acting together over long spans of time.

This diagram presents a working model of Planetary Biology on Earth. It lays out the qualitative interactions between about 80 different phenomena. The goal of this model is to help visualize and comprehend how the many interactions between life and the planet influence the planetary surface environment.

## Planetary Biology and Astrobiology

In order to best assess "life" on other worlds (when we discover it), we are going to want to understand how that alien life is interacting with its home world in fruitful ways that result in life's persistence on that world.

This will be a very challenging task. But we can guide the work by applying the principles of Planetary Biology from our own world as a model, as a template toward developing an organized plan for investigating other life-bearing worlds.

Overall, this diagram presents a comprehensive and comprehensible abstract model of Earth as a whole world system - a model that helps us explain why our home world is so special.

For more information on this topic, visit PlanetaryBiology.com

## How to Read this Diagram

