

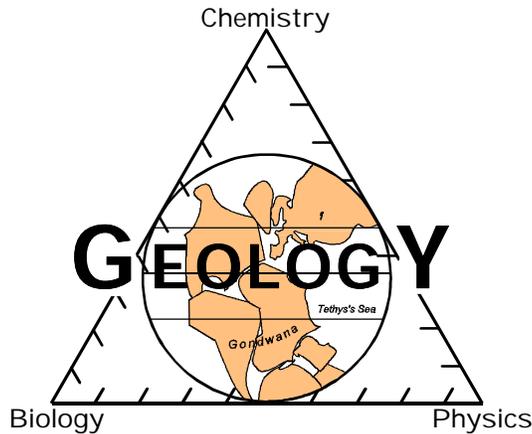
DECLARATION of GEOLOGY

Learning to Speak the Language of the Earth

Geology is the holistic study of the Earth. It views the Earth as a single environmental system consisting of the lithosphere (including surficial processes), biosphere, hydrosphere, and atmosphere, with an evolutionary life span of 4 billion years. Geology is the cardinal science, not because of

theoretical and experimental purity, but because only geology grapples with the full complexity of a world in which nothing exists in isolation—a world in which there are no independent variables.

From a geologic perspective, questions concerning the Earth and our relationships to it are not just about biology, or chemistry, or physics. The questions are about a biological perspective that sees life in the context of a long, complex evolutionary process that has both responded to changes in the Earth, and profoundly changed the Earth. They are about understanding the responses of minerals, rocks, and soils to ever changing mechanical, thermal, hydrologic, and atmospheric conditions—geochemistry, and geophysics. Geology is about the complete multidisciplinary and interdisciplinary integration of scientific knowledge that is essential to the



DON'T JUST LOVE YOUR MOTHER,
UNDERSTAND HER!

geological perspective and geological thinking.

Geology is not simply about the past it is also about change and continuity. Most of all it is about the long run. What society needs to learn from geology is that we cannot impose short-term thinking on long-term problems, or adopt policies that do

not recognize the Earth is embedded in ongoing evolutionary change. Geologic understanding is an antidote to the fragmented and piecemeal thinking that is characteristic of most human decision making, as well as the provincialism of narrow specialist-centered thinking about the environment, our relationship with the Earth, and of science in general. The perspective inculcated by geological understanding is as rare as it is vitally necessary in our society.

Earth environments and man's relationship to those environments cannot be understood in isolation. Environmental conditions that exist today are embedded in and reflect processes that can only be understood at time spans extending far beyond the short window of human experience, far beyond experiments run under controlled laboratory conditions and for time spans that are geologically

instantaneous. A geological perspective shows that human influence is paltry compared to changes the Earth has experienced. In the course of normal events, changes may occur that we are not prepared for, and whose impact we cannot yet predict. Yet, at the same time we may now have the capacity to trigger those events prematurely, events detrimental to us but a minor flutter to the Earth. Ignorance of a geologic understanding of the Earth and our relationship with it leaves us without the knowledge or wisdom to know how to think, behave, or act responsibly.

The study of geology tells us that geological processes are historical events; their magnitude, structure, cause, and consequences have been and are highly variable. Furthermore, these variations are patterned in ways we are only beginning to understand. The issues facing human civilization require synthesis and systems-thinking by individuals trained to know all the components, geological, biological, chemical, and physical, both ancient and modern. Likewise, geological knowledge as applied to specific, local geological conditions is essential for those concerned with natural hazards, civil engineering problems, impacts of global change, the responsible utilization of Earth's natural resources, pollution and waste disposal, and environmental planning and monitoring. Theories or belief systems that do not recognize the Earth as a complete, integrated system can never adequately prepare the human species to responsibly interact

with the Earth.

Geology reminds us we have to think in the long run about our condition; we must develop the ability to evaluate Earth processes at all scales of observation, from the microscopic to the global, to those occurring from microseconds to billions of years, and that range to every environmental extreme. Geology is the only discipline that is able to prepare people's minds to deal with these complexities, ambiguities, and life-as-we-know-it threatening problems that face us.

Knowledge of the Earth, provided through a geological perspective, is essential not only scientifically, but equally for all citizens. Only geology sees the Earth holistically enough to solve practical problems of resource and environmental management. Many heads of government, leaders of corporations, business managers, economic theorists, and voting citizens have very little understanding of how the Earth operates, or have a real understanding of the environmental issues we confront. It is not enough that we professional geologists and our students understand the Earth, we need citizens who are educated to think about problems from a whole Earth perspective, rather than the provincialism of human-centered concerns.

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