Curriculum Units by Fellows of the Yale-New Haven Teachers Institute
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Introduction

The use of the term global change results from the fact that the Earth now, more than ever, appears to us as one entity. What happens in one part of the Earth affects the other. The sense of the globe as one has been imprinted on us because of three observations, although we were being prepared for that view by international communications and travel and World War II: (1) The vision of the Earth by astronauts returning from the moon. (2) The concept of plate tectonics and the coupling of the history of continents and oceans. (3) The anthropogenic release of certain gases, with possible environmental consequences, to the atmosphere" in which we live and move and have our being."

Most discussions of global change have been focusing on "global warming" or the ozone hole growth above the polar regions or other forms of global pollution. Global change is more than that—it is the essence of the history of the planet. Even larger changes in atmospheric composition, earth surface temperature and sea levels have occurred in the past than are projected for the immediate future based on current trends of human actions.

Through studies made by geologists, solid-earth geophysicists, paleontologists, oceanographers and atmospheric scientists we are capable of assessing the nature of global change over the Earth's history. Through these studies we can know the changes that have occurred in the past over timescales of tens, hundreds, thousands, tens of thousands and millions of years based on the record in rocks, ice and historical and archaeological sources. We can also discover the fundamental scientific processes responsible for determining the state of the environment. We do not, however, know all the feedbacks that affect climate change such as the role of cloud formation on the Earth's heat balance and the variability of the sun's energy output. Neither do we know the role of episodic events of cosmic or terrestrial origins capable of having dramatic effects on the environment and the history of life.

The study of global change therefore depends first on deciphering the record of global change, the effects on life, especially humans, and the prospects. Next, in order to understand the record and to project into the future, we will try to unders tand the processes and our limitations on understanding.

Only after we are secure in our knowledge of the record and causes of global change can we address the questions: What can we reasonably do to influence or ameliorate global change for the benefit of humans and how can we live with what we cannot change?

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