PLANETARY PERSPECTIVES
Report of Working Group Number 4:

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The study of global megageomorphology from a planetary perspective requires that, philosophically, we view the Earth as a planet like any other; one among a number of bodies of varied size and composition which, together with the Sun, form the Solar System.

A first step in the study of the Earth from the planetary perspective is the development of global distribution maps of such factors as landforms, tectonics, and of key processes operating on Earth. Data of other types, such as gravity and magnetism, should also be included and, so far as possible, multiple data sets should be developed. The mapping is not an end in itself but must be followed by good science. The compilation of maps would serve as a catalyst for research and a basis for interpretation. They could be used scientifically to document changes such as glacial variations and their relationships to climate, volcanic eruptions and their effects, and coastal alterations. Slow and rapid changes should be studied together with the relationships between scale and the rapidity of change.

Investigations of global tectonics looking at plate edges and particularly plate interiors should be increased with investigations of such things as river cutting and the development of recent grabens. A study of the relationship of geomorphology (ie: surficial processes) to lithology and structure is needed. The planetary perspective can also help in the identification and investigation of exotic features such as suspect terrains. We need a global synoptic view to study many topics, such as glacial mass balance, through monitoring of the West Antarctic Ice Sheet and its relationship to world climate. We also need to investigate the relationship between major geological events and the biosphere.

Exploration of the Moon and other planets of the Solar System has provided us with images showing large areas of these bodies and the variety of landform features and processes found on their surfaces. The identification of terrestrial analogs is a major tool in studying the features we see on other bodies, although we should beware of applying a strict uniform-itarianism in this context. Just as we must use caution in saying "The present is the key to the past", we now need to test the hypothesis that the Earth is the key to the Solar System. For example, can we really use such things as the observations of Earth from SIR-B to interpret the landforms of Venus?

On the other hand, our understanding of terrestrial features, particularly those of the geologic past which have been obliterated by subsequent processes, can be enhanced by the identification of analogs to these features on other planetary bodies. They can help us deal with such questions as the importance of cratering in the early history of the Earth, the significance of chaotic events, the character and importance of early volcanism and the distribution of landforms through time and space.

Global geomorphology, from the planetary perspective, involves all of geology, including the lithology and structure of the whole earth. At the global scale, geomorphology is the starting point of geology.