

## **The Evolving Role of Geoscientists in Climate Change Science**

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### **ABSTRACT**

In the on-going debate concerning natural versus anthropogenic drivers of modern climate change, a long-term geologic perspective is greatly needed. As geologists, we study and learn from the deep past, often in hundreds of thousands to hundreds of millions of years. We study the current geologic processes and use the principle of uniformity to recognize that the same processes and laws in operation today were also valid and operating in the past. One of the first principles we learned as undergraduates was "The present is the key to the past". In climate science, the geologist's role should be to use the corollary of this scientific principle to reverse the typical usage and apply the knowledge of the Earth's climate history to better predict what may happen in the future: "The past is the key to the future".

Much of the climate science used to bolster the notion that anthropogenic greenhouse gases are the primary driver of the current warming trend use only the relatively short period of instrumentation-based data. Direct measurements of carbon dioxide only began in 1958 at the Mauna Loa Observatory and thermometer-based temperature data extend back to the mid-19th century. The historical length of this data is just a blink of the eye to a geologist and provides a much skewed perspective on the relationship between CO<sub>2</sub> and temperature. A long-term geologic view is required to properly analyze the planet's climate history in order to better predict what may occur in the future.

A review of long-term climate history clearly shows that both temperature and CO<sub>2</sub> have risen and fallen dramatically and regularly for the last 600 million years and that changes over the last 100 or so years are neither unusual nor unprecedented. All of those past climate changes were 100% naturally driven and the processes driving the past changes did not suddenly end at the beginning of the Industrial Revolution.

In today's politically charged atmosphere surrounding the climate-change debate, a geologic fact-based perspective is sorely needed.