Plate Climatology Theory

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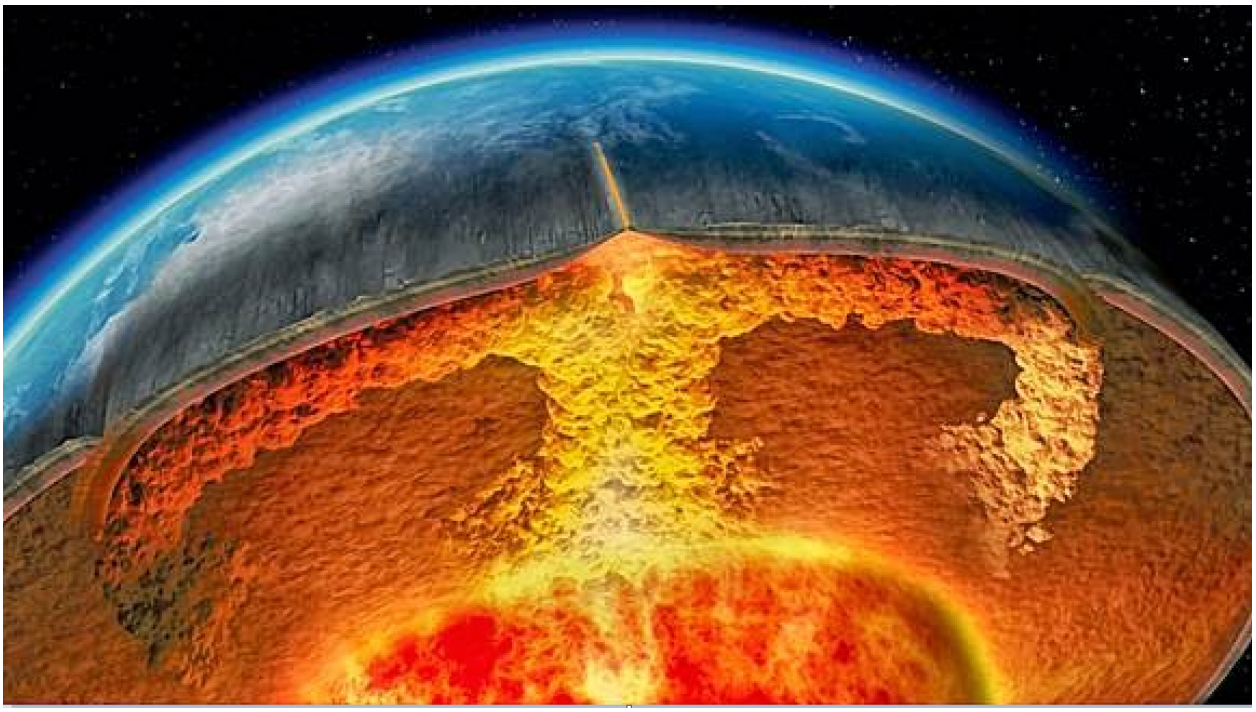
Geologist, James Edward Kamis presents a fascinating new theory as how volcanic activity and other geothermal impacts play a previously ill-considered role on earth's climate.

Below, the concept of "Plate Climatology" is proposed.



Synopsis

The Sun, quite obviously, is the first order driver of Earth's climate, but a much neglected second order driver can contribute significantly to short term variations. The theory proposed herein is that periods of active Earth tectonism can be correlated to periods of active climate change and climate related events.

Increased global tectonic activity equates to more faulting and crustal plate movement which leads to more global heat release from faults, fractures and volcanoes that are more active.

Altered heat input equates to climate change.

This effect has been largely hidden from scientific investigation because the primary heat release is within underexplored / monitored deep ocean regions; deep ocean rifts (Plate pull-apart boundaries), fumaroles, traverse faults, and other faults. Ocean temperatures, densities, and chemical compositions are altered by this

varying tectonic activity. The "Altered Oceans" then influence or drive climate changes and climate related events.

Many connections between Geology / Climate are explored and explained in this theory. The aim of publishing this theory is to accomplish two objectives:

1.) Raise awareness of the strong connection between Geology and Climate and:

2.) Act as a catalyst for future research.

This paper is especially germane in light of the current discussion concerning man-made global warming, also referred to as man-made climate change and the ongoing 18-year global warming pause.

1. General Theory of Plate Climatology

The theory proposed herein provides a platform to join what are now several independently researched branches of science; Geology, Climatology and Meteorology. Geological phenomena are thought of as unrelated and unimportant to climate, especially modern-day climate. This notion is likely to be proven incorrect. Many current / modern weather phenomena are directly tied to current geological events; local continental glacial melting, local droughts, local warming ocean, La Nina, and El Nino to name a few.

The proposed Plate Climatology theory is exactly that, a theory and not a proven fact, yet deserves strong consideration amongst all scientists involved in the discussions surrounding current climate events.

2. Sub-Ocean Tectonism, Volcanism, Heat Flow, and Fluid Expulsion

This theory proposes that sub-oceanic tectonism, volcanism, heat flow, and fluid expulsion have a strong influence on worldwide climates, as exemplified by the El Niño and La Niña climate phenomenons.

These phenomenons originate as deep ocean temperature anomalies in the western Pacific and as they migrate east, they become progressively shallower. This can be interpreted as strong evidence that the control / origin of these phenomena is heat and chemical bearing fluids from deep-sea volcanoes, vents, faults, and fractures. In essence, increased sub-oceanic crustal plate movement, or increased sub-oceanic volcanism in the western Pacific leads to release of large amounts of heat and fluids. El Nino's and La Nina's are born, migrate east and directly affect the climate of the North American continent.

Another specific example is the most recent California drought. Meteorologists have concluded that an unusually persistent high-pressure ridge in the Gulf of Alaska has affected North American storm tracks. Storms with much needed rain have by-passed California. It is herewith theorized that this unusually persistent high-pressure ridge is related to a geological phenomenon, specifically the increased volcanic activity associated with the Pacific Plate Subduction Zone. This increased activity is both oceanic and continental in nature and has altered / locked oceanic and atmospheric conditions in the northern Gulf of Alaska.

In fact, recently published data indicates that the water in the Gulf of Alaska is warmer than surrounding areas. Additionally, unusual fish species have been noted in the Gulf. They are likely present in response to heating of the overall ocean column… again likely related to geological / deep sea vent heating. This fits well with the proposed theory.

In general, there is little or no monitoring of most of the heat and fluid releases in any of the deep oceans, so the effect of deep ocean heat releases has been larger hidden / ignored. Additionally, some have argued that even if this heat and fluid release exists, it stays trapped in the deep ocean. Yet many forces act to vertically mix the ocean water column – tsunamis, volcanic eruptions (small and large), density flows, and sub-oceanic vortexes.

From a geologist's point of view, it has been obvious for a long time that Sub-Ocean Tectonism, Volcanism, Heat Flow, and Fluid Expulsion are a major driver of Climate.

3. Continental Tectonism, Volcanism, and Heat Flow

Continental tectonism, volcanism, and heat flow have a moderate influence on worldwide climate, however locally the effect can be strong. A good example is the connection / influence of tectonically generated heat release beneath Continental Glacial Ice Masses. Examples include; Mount Kilimanjaro / East African Rift, Greenland / Mid-Atlantic Rift, Antarctic Ice Masses / Western and Eastern Antarctic Continental Heat Flow. This phenomenon may also be happening in southern Greenland.

For years the scientific establishment has been unable to explain why specific western Antarctic glaciers were retreating / melting at unusually high rates relative to the majority of other Antarctic glaciers. Nearly ten years ago the author started arguing that the unusual retreat of these local glaciers was related to local geological fault heat. Recently scientists have indeed measured increased heat flow in these local areas.

I also believe that continental land-based heat and fluid release along fault zones can have a limited effect on local weather patterns. Such as the active volcanoes along the Cascade Range, which emit varying amounts of; heat, particulate matter, and chemicals into the local atmosphere. We are all very aware of the weather and climatological effect large scale eruptions have on local and worldwide weather. However to date no one has considered that lesser volcanic events can have an influence on local weather patterns. This is very likely happening.

4. The Relationship between Major Worldwide Deep Ocean Currents and Tectonism / Volcanism

Major worldwide deep ocean currents, such as the Gulf Stream, are affected by variations in sub-sea tectonism, volcanism, heat flow, and fluid release.

Major shifts in deep ocean currents, such as the Gulf Stream, have long been thought to be associated exclusively with changes in continental surface water discharge. Although this obviously has some influence, the theory proposed here suggests that the major reason these currents shift, often suddenly, is Plate Tectonism. Significant periods of Crustal Plate movement can lead to major heat and ocean density changes. This in turn leads to changes in deep sea currents.

Additionally, this tectonism can lead to increased numbers of Tsunami's which act to rapidly mix the ocean's water column vertically. Once this mixing happens, it can easily lead to, or add to, the shifting of major deep ocean currents.

Scientists have long noticed that altering deep ocean currents can lead to major climate changes. My theory suggests that more often than not these major changes are related geological phenomenon.

5. The Relationship of Oceanic Plankton Levels and Ocean CO2 Concentrations with Deep Ocean Tectonics / Volcanism

Worldwide deep ocean tectonic activity and associated heat and fluid release have a much greater effect on plankton levels and ocean CO2 concentrations than previously thought.

Chemosynthesis is a fascinating new branch of biology. It is now well known that deep ocean vents have biologic communities associated with them. These vents release significant amounts of heat and chemicals which supply food for numerous biological communities. The number of vents and their overall effect on the ocean is largely unknown, save a few isolated areas. Ongoing research shows that there is likely significantly more heat and chemical release than previously thought. The implications of Chemosynthesis have not been fully appreciated. However, it is in essence a confirmation that geologically driven deep ocean geological events are likely to be significant.

Given that deep ocean chemosynthesis exists, it is a logical next step to theorize that increased heat anomalies in the oceans also have an effect / alter shallow plankton blooms. More heat leads to more plankton, more CO**2** consumption, and more oxygen generation.

Increased ocean heat may also lead increased ability to absorb CO**2**.

The atmospheric implications are obvious; more oxygen and less CO**2** lead to warming changes that are indirectly related to deep ocean geological events.

Summary

The overall theory contends that periods of active Earth tectonics and volcanism can be correlated to periods of active climate change and climate related events. To describe this new theory, the term “Plate Climatology” is proposed.

This short paper will hopefully spawn a new era of joint research between geologists, climatologists, and meteorologists. The time is long overdue for scientists to join forces in an effort to more accurately describe what drives climate over and above the Sun.

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James Edward Kamis is a Geologist and AAPG member of 40 years and has always been fascinated by the probable connection between Geology and Climate. Years of casual research / observation have convinced him that the Earth’s Heat Flow Engine, which drives the outer crustal plates, is also an important second order driver of the Earth’s climate. The term **”Plate Climatology”** is coined to describe this connection. (The word **Plate** from Plate Tectonics)