

Research Assessment #5

Date: October 21, 2016

Subject: Astrobiology: *Water on Mars*

Sources:

1.) NASA. "Water on Mars." *NASA*. NASA, n.d. Web. 21 Oct. 2016.

Analysis:

One of the greatest aspects of Earth is its abundance of water. This molecule has provided the building blocks, evolution, and distribution of life here on our planet. Now we find ourselves looking beyond our own planet and into our vast universe in search of habitable planets. On that note, the planet that has been on the radar for many scientists is Mars. With rovers and satellites constantly analyzing the planet, we have discovered that Mars had the capability to carry water. In addition to this, they have found that Mars has large amounts of frozen water on and under the surface. This proves to be a revolutionary breakthrough in planetary science/astrobiology. There is now a possibility that that we may not be alone.

We see this big interest for Mars' ability to hold water and potentially life but how did this all get started? For many years, the geology of Mars indicated that some sort of fluid had flowed through them similar to here on Earth. On top of that,

scientists had found rocks and minerals that would only be found if water was there. This raised the curiosity of many scientists and drove them to investigate the planet more deeply. Astrobiologists also found out that Mars had hydrated minerals, which means that the compounds found in these minerals have the water molecule bound to them. Another key evidence that scientists had found was the presence of clay and carbonates on the Martian surface. These substances are usually formed in areas of intense geological activity underneath the planet's surface. The only way for it to reach the surface is erosion, thus providing another evidence that water played a big role in Mars.

Looking at all these scientific evidence, it is safe to assume that water was definitely present on the red planet but what is the significance of this discovery? Firstly, it is very clear that we are degrading the Earth. At this rate, the habitability of Earth will not last forever, therefore we need a place to live on another planet in order to survive. Right now, our best option is Mars. The water there could provide a lot for us. For example, it serves as a protection from the sun's harmful rays and as fuel when the hydrogen and oxygen atoms split. This situation is definitely far off into the future but Mars' water will provide great use in the next decade for space exploration. NASA currently is planning on sending astronauts to Mars. With the amount of frozen water Mars has, astronauts can use it for drinking purposes, fuel, and protection from the sun's radiation. For example, crew members could take the hydrated system and heat them up to extract water. Another place where astronauts can extract water for use is the deep pockets that may be within the Martian Crust. Mars has a greater surface gravity than Earth which allows water to leak down into the crust. Future crew members can drill into these areas to obtain water. The things discussed above are for

future missions to Mars but there is one thing that I believe that will give answers to many questions we may have. For example, with the striking similarity between Earth and Mars, we can learn a lot about our own planet. For instance, we can figure out how life originated on Earth and if it was possible for life to have been there on Mars prior to it becoming the red planet we see today. In short, we can fill in many gaps about our planet by studying Mars.