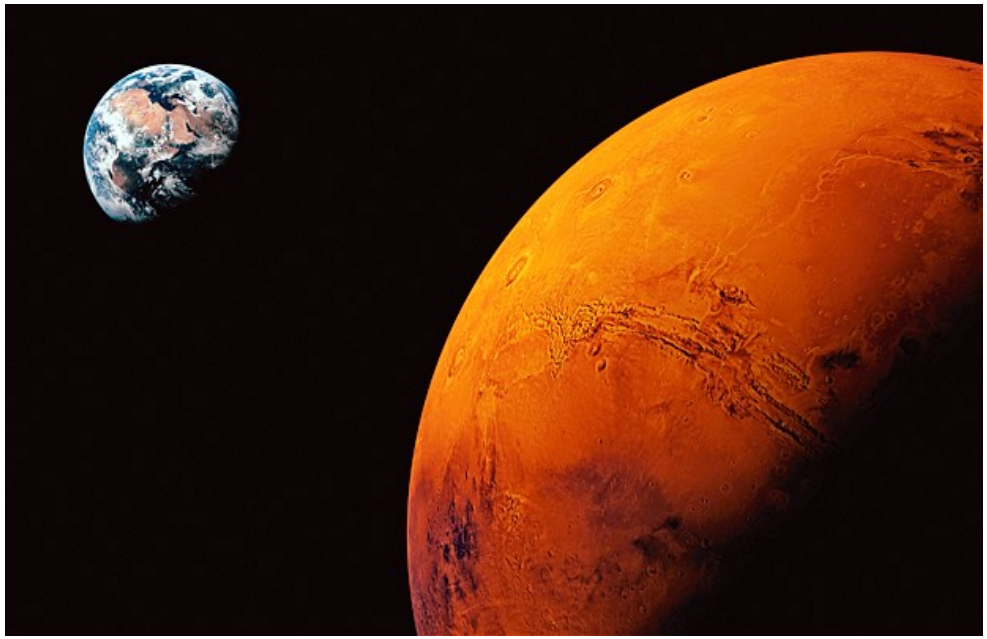
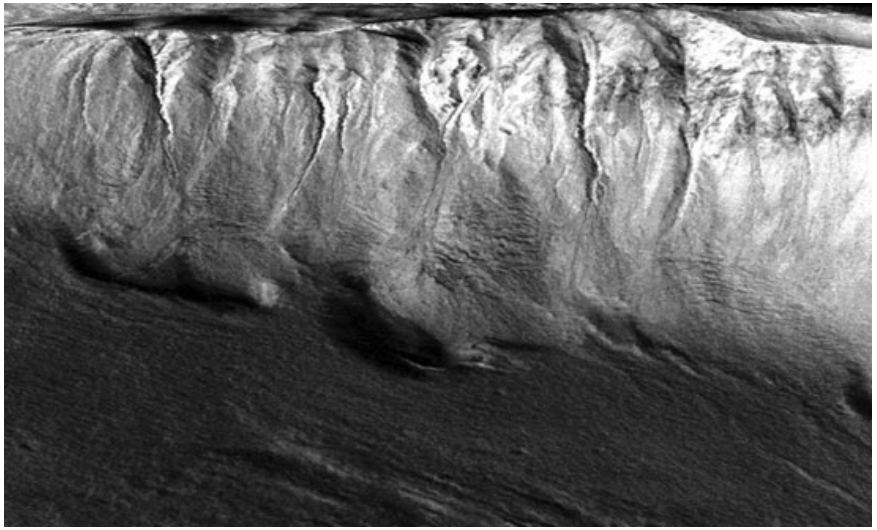


Is There Liquid Water on Mars?

Do Glaciers on Mars Melt into Liquid Water?

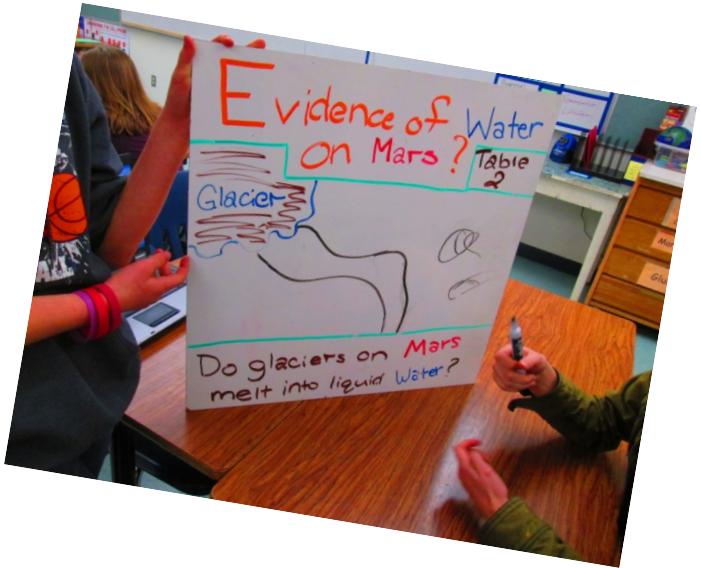
IMAGINE

taking a trip through space to Mars to find a new kind of life! Water could mean life. We need water to live. Water on Mars could lead us to finding new life forms, or even areas we could settle at or travel to.



How we got there…

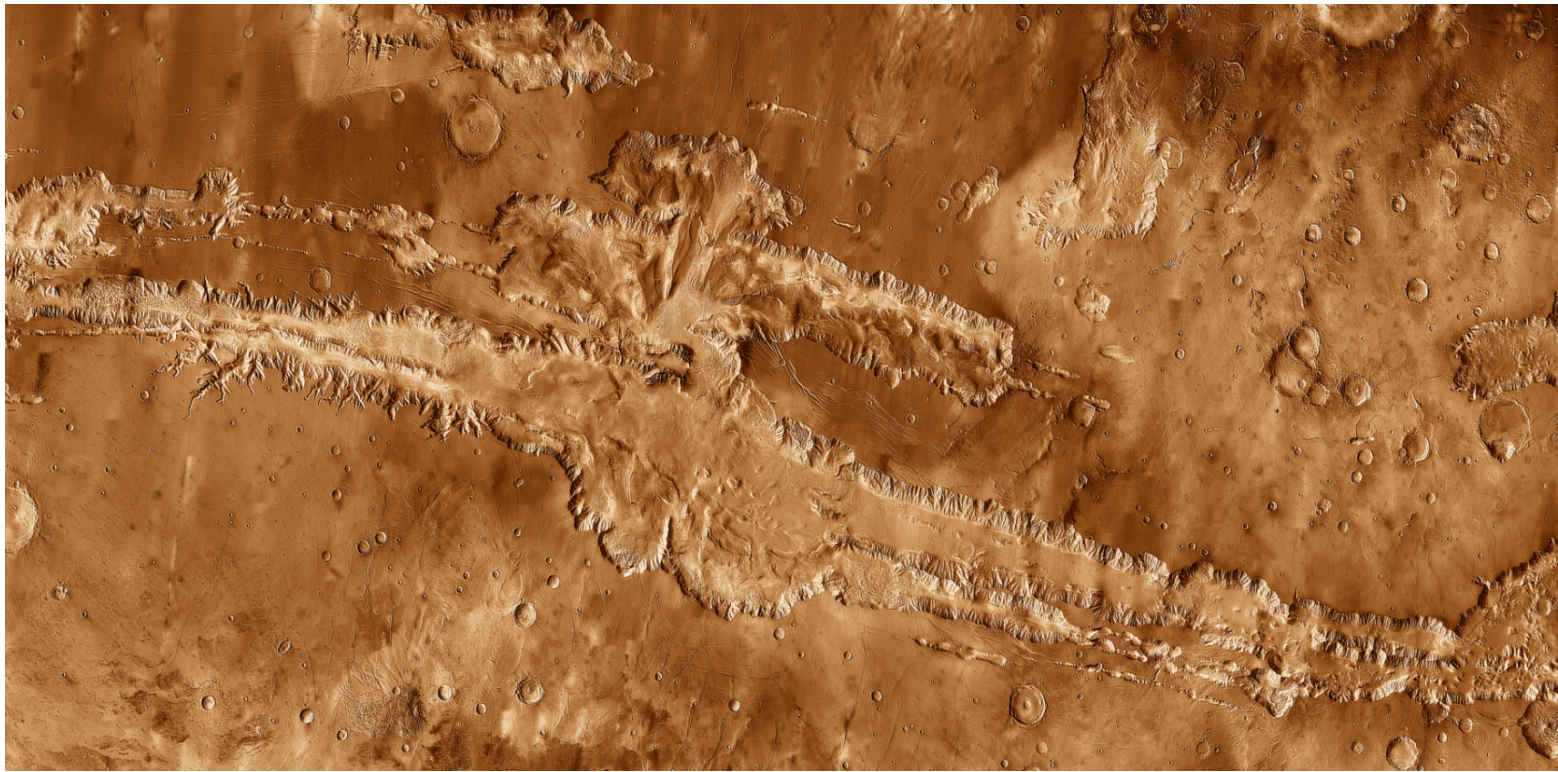
- Is there liquid water on Mars?
- Do the glaciers on Mars melt into liquid water?
- Are there channels and/or canyons near the glaciers on Mars?



Canyon Formation on Mars

The largest canyon on Mars, Valles Marineris, is thought to have formed by a tectonic crack in the Martian crust and erosion from wind. However, at the eastern end of the canyon, a few channels seem to have been formed by water.

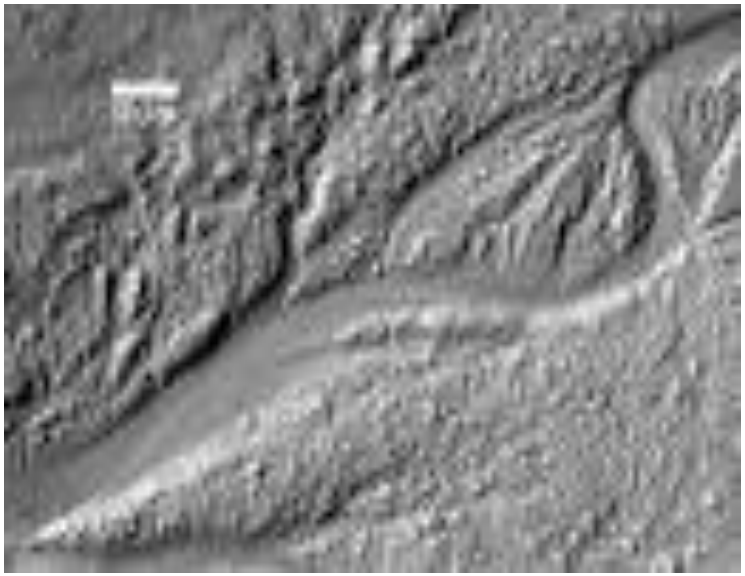
Canyon- a deep gorge typically one with a river flowing through It on Earth.



Channels

- A length of water wider than a strait, joining two larger areas of water, especially two seas
- Likely formed by consistent flow of water over a long period of time
- Has a meandering or curvy shape

Channels found on Mars

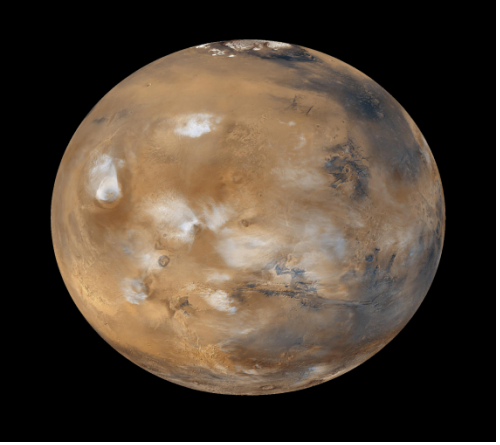


Glaciers On Mars Intro

When the average person thinks about glaciers, they immediately think water that has turned into ice. What if the Martian glaciers don't actually melt into water, what if they sublimated instead? Glaciers on Mars are most likely made out of Carbon Dioxide.

<u>Sublimation:</u> The transformation of a solid into a gas phase without first becoming a liquid.

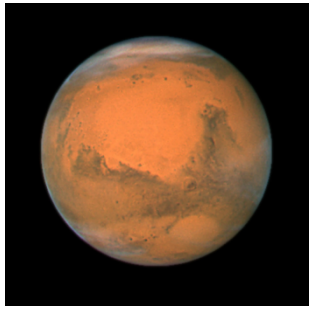
If the glaciers were to melt into water with a warm enough temperature, would canyons and channels appear around it? This question is pretty indistinct, given that we don't know exactly how some of the channels and canyons were formed, but it might help to look toward the glaciers.



In conclusion, the glaciers of Mars may look similar to the ones on Earth, but what happens to the glaciers when they are heated to the right temperature? Do channels and canyons form from the water flow, or do the glaciers turn immediately into a gas? These are the questions that will help shape our knowledge about Mars.

Procedure

1. Go to the J-Mars THEMIS app. (Go to “my computer, then to C-drive, then to J-Mars THEMIS.)
2. Find pictures with glaciers in them. (You can look near north and south pole or at high altitudes, on J-Mars or you can go to “THEMIS.asu,” go to the image galleries and look for images by topic, go to polar ice cap and or canyons or channels, get and image ID and enter it into J-Mars to get an exact location.)
3. Mark on a chart how many pictures you’ve looked at. (do this through out the experiment so we can compare them to the number of canyons and channels, on the analysis slide.)
4. Count how many images that have channels and canyons near the glacier. (to be counted near a glacier, the canyons and channels must be touching, perpendicular, or 12km away.)
5. Mark on the same chart as the number of pictures, the number of images that have channels and canyons in it you counted.
6. Repeat steps two through five as many times as possible.
7. Make a bar graph of the data.



(Mars)

Suggestions

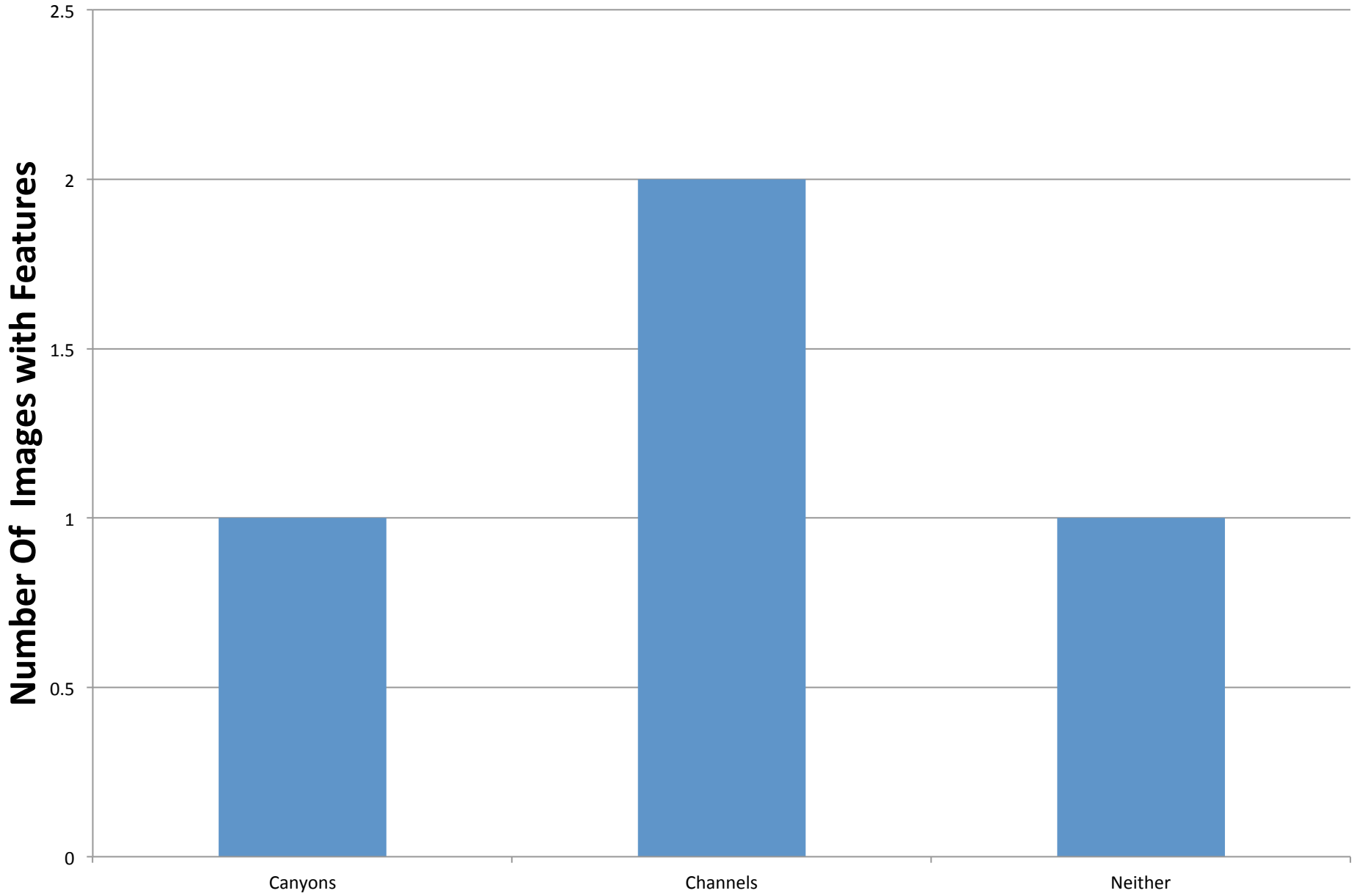
- How could we find glaciers?
- How could we find channels?
- How could we find canyons?
- What area is best to find glaciers, with channels and canyons altogether?

(Northern Polar Ice Caps)

Example Data

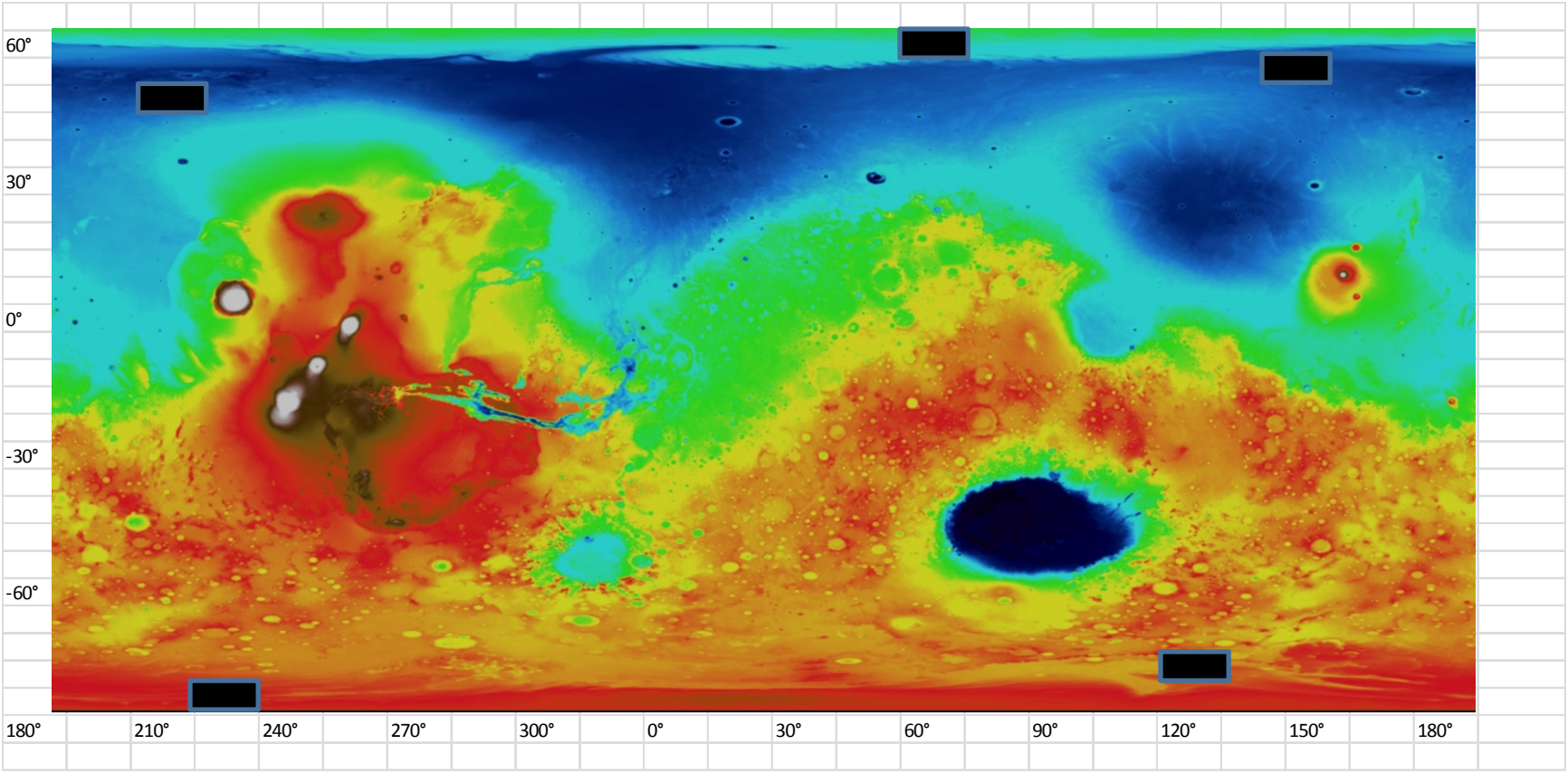
Image ID	-	V4783479	V4763947	V0094620	V5488102	V3320481
Latitude Locati	-	30.2 E	209.41 W	67.2 W	121.92 W	5.06 E
Longitude Loca	-	230.43 N	90.32 S	312.87 N	11.4 S	88.21 S
# of Channels	-	2	1	4	1	0
# of Canyons	-	3	0	3	0	1

Channels and Canyons found in images with glaciers. (Simulated data)



Coordinate Plane

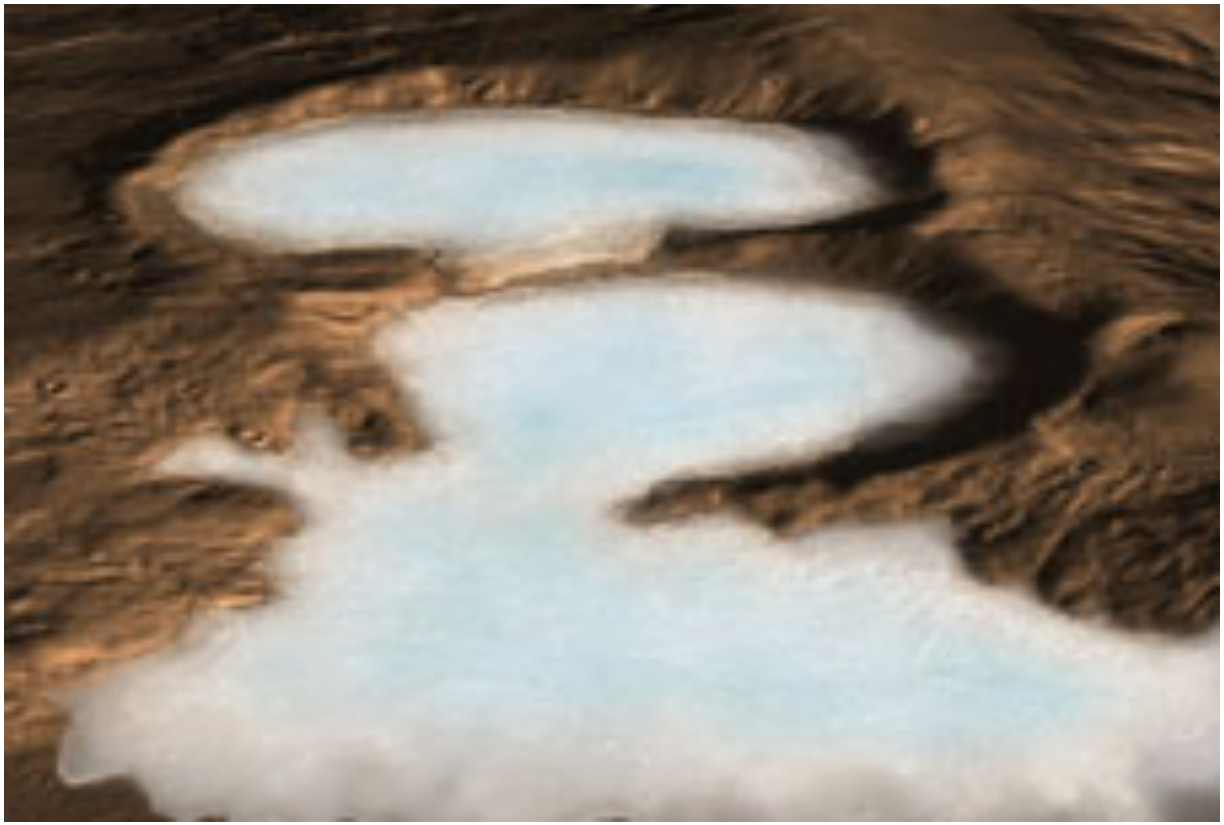
*The black boxes show where we took the pictures



Conclusion

We want to know if glaciers on Mars melt into liquid water.

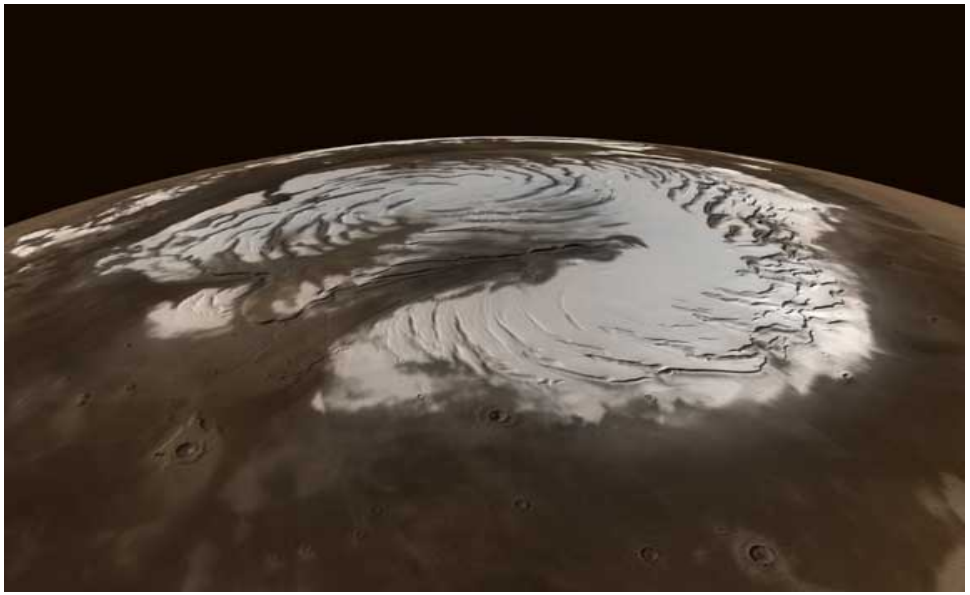
This picture shows a glacier which was found at much lower latitudes then any other ice identified on Mars. Also near the glaciers it looks like there are channels.



Why We Want to Use the Satellite

We would like a satellite to give us an additional image so we can learn more about the glaciers on Mars, when they melt, and if they produce liquid water. For example, we could take a new picture of a glacier that we already looked at and see if it melted, stayed the same, or grew.

This shows a glacier that is in the North Pole, that look like there are channels connect.



References

Universities Space Research Association. (n.d.). Retrieved January 26, 2015, from http://www.usra.edu/

MSIP: Welcome to the Mars Student Imaging Project. (n.d.). Retrieved January 26, 2015, from http://marsed.mars.asu.edu/msip

JMARS, computer application

Breaking Science News | Sci-News.com

Science 2.0 - ® The world's best scientists, the Internet's smartest readers.

History, Travel, Arts, Science, People, Places | Air & Space Magazine. (n.d.). Retrieved January 26, 2015, from http://www.airspacemag.com/ist/?next=/

(n.d.). Retrieved January 26, 2015, from http://www.nasa.gov/

Antarctic Glaciers. (n.d.). Retrieved January 26, 2015, from http://www.antarcticglaciers.org/

References pg.2

Physical Sciences. (n.d.). Retrieved January 26, 2015, from http://www.open.ac.uk/science/physical-science/

Space and NASA News – Universe and Deep Space Information | Space.com. (n.d.). Retrieved January 26, 2015, from http://www.space.com/

Cold-based mountain glaciers on Mars: Western Arsia Mons. (n.d.). Retrieved January 26,62015, from http://geology.gsapubs.org/content/31/7/641.short

National Geographic: Images of Animals, Nature, and Cultures. (n.d.). Retrieved January 26, 2015, from http://www.nationalgeographic.com/

Do You Like SQL Server? (n.d.). Retrieved January 26, 2015, from http://dryicenetwork.com/