Wind-Driven Erosion and Exposure Potential at Mars 2020 Rover Candidate Landing Sites

Mars 2020 Rover and Motivation

- Where will the next NASA Mars rover land in 2020?
- 8 candidate sites have been recently considered by NASA for a mission that will explore astrobiologically-relevant ancient environments.
- One important site criterion will be to identify geologic units that have young exposure ages (due to high erosion rates) and haven’t been exposed to prolonged space radiation. These locations would possibly allow any organic materials to remain undegraded.
- Here, we assessed candidate landing-sites for the Mars 2020 Rover mission for potential erosion by active aeolian bedforms.

Image Credit: NASA/JPL-Caltech

Highlights

- Candidate landing-sites for the Mars 2020 Rover mission were assessed using repeat HiRISE images for potential erosion by active aeolian bedforms of ripples and dunes.
- Of the three down-selected sites NE Syrtis then Jezero crater showed the most evidence for ongoing sand transport and erosion potential with active aeolian bedforms on and around the sites.
- The Columbia Hills site lacked evidence for sand movement from local bedforms based on HiRISE data and in situ investigation by the Spirit rover, suggesting current abrasion there rates are low.