Why study current activity?
- Surface activity is producing substantial changes on the surface that reshape modern geomorphology. (Primarily relevant to MEPAG Goal III.A1)
- Current activity leads to new understanding of processes, some of which are unique to Mars. (Goals II.A4, III.A1)
- We need to understand these processes to properly interpret landforms and determine their implications for recent climate. (Goals II.B2, II.B3, III.A1, III.A3)
- We are just starting to learn how Mars works in the present. What are we missing about the ancient past? How would current processes be reflected in the rock record? (Goals II.C2, III.A1, III.A3)
- Observing rates of change allows better understanding of the ages of landforms. (Goal III.A2)
- Current activity is closely linked to understanding habitability and Special Regions. (Goals I.A1, I.B1, IV.B3)
- This poster focuses on surface changes, but these are closely tied to atmospheric processes. (Goal II.A4)

Summary
- Present-day Mars has diverse, extensive surface changes. Surface activity occurs planet-wide.
- Understanding current activity is fundamental science for understanding surface processes.
- Sustained orbital monitoring combined with in situ studies are needed to further this objective.

Gully activity [1] is widespread and seasonally controlled, occurring in conjunction with frost. Changes include major channel incision, debris flow-like deposits, and initiation of new gullies [2-3]. Counter to expectations before monitoring studies, it is possible that gullies do not indicate past liquid water.

Vast fields of CO₂ vents occur every spring [6]. This process is creating new araneiform landforms [7] and also provides information on surface winds.

Hundreds of impact craters have been detected [1, 14]. Factor-of-several differences between the observed and predicted fluxes could be due to field secondaries or to changes in the impact rate [15]. New craters also serve as probes of mid-latitude ice [16], a key subject for future exploration and possible in situ resource utilization.

There is more activity on Mars than can be shown in one poster: dust devils and their tracks regularly change surface albedos [18]. Regional-scale albedo changes are also common [19]. Tens of thousands of new slope streaks form every year in dusty regions [20]. Weather and atmospheric processes are beyond the scope of this poster, but studies of active atmospheric escape have unlocked the history of atmospheric evolution [21], and the Martian atmosphere is dynamic, and variable from year to year [22].

Sand dunes and ripples are migrating planet-wide [12], an observation that has led to new discoveries about how salination works on Mars [13] (PIA21143, NASA/JPL-Caltech/MSSS).

Avalanches and blockfalls are frequent on the North Polar Layered Deposits [17], causing substantial slope retreat.

Swiss Cheese pits in the residual CO₂ cap are expanding [4], but the sign of the mass balance and implications for century-scale climate change are not clear [5].