



Mapping and Comparing Natural Landing Pads on Mars

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EARTH • ENERGY • ENVIRONMENT

Space Resources Roundtable

Objectives

- Constrain remote sensing data to minimize the hazards associated with Plume Surface Interactions
- Map the largest contiguous area at a given location that minimizes these hazards
- Compare landing sites, qualitatively and quantitatively
- Use Mars as a proof of concept

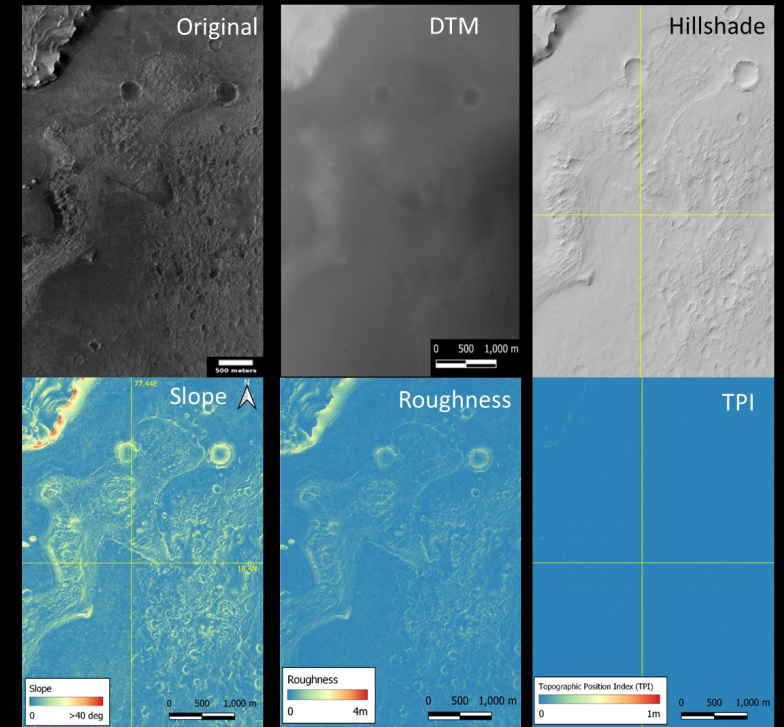
SHIELD Equations

- Mars Features / Variables
 - Slope
 - Roughness
 - Boulder Density / Rock Abundance
 - Thermal Inertia

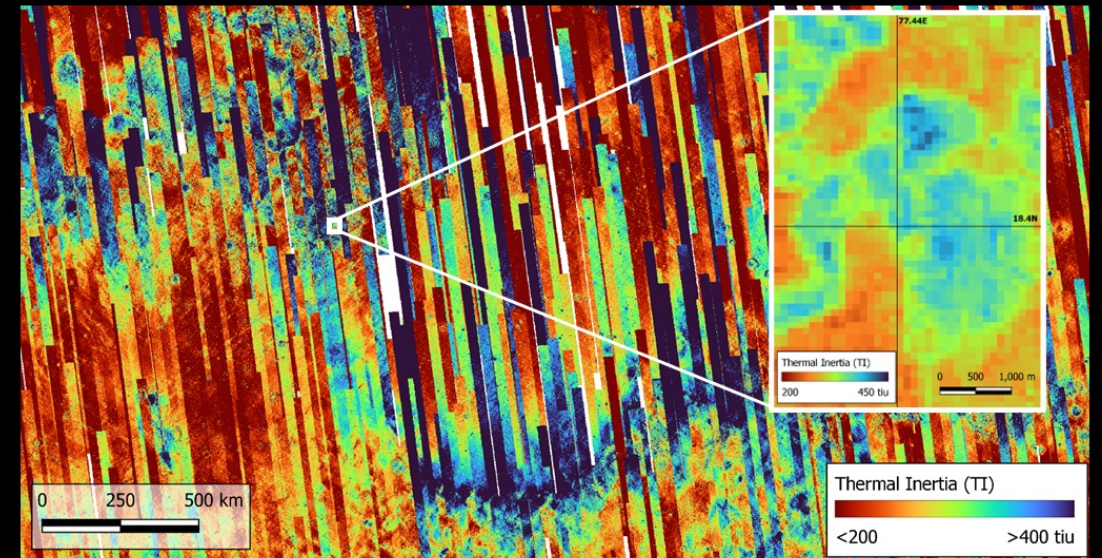
Mars Local Equation

$M_{\text{local}} = (M_T + M_S + M_R + M_{BD})/4$			Parameters
M_T – <i>thermal inertia</i>	THEMIS	100 mpp	50 – 1000 J m ⁻² K ⁻¹ s ^{-1/2}
M_S – <i>slope</i>	HRSC / CTX / HiRISE	0.25 – 6.00 mpp	0° – 10°
M_R – <i>roughness</i>	HRSC / CTX / HiRISE	0.25 – 6.00 mpp	0 – 4 m
M_{BD} – <i>boulder density</i>	HRSC / CTX / HiRISE	0.25 – 6.00 mpp	0 – 1 m TPI MBARS [Hood, 2019] TBP

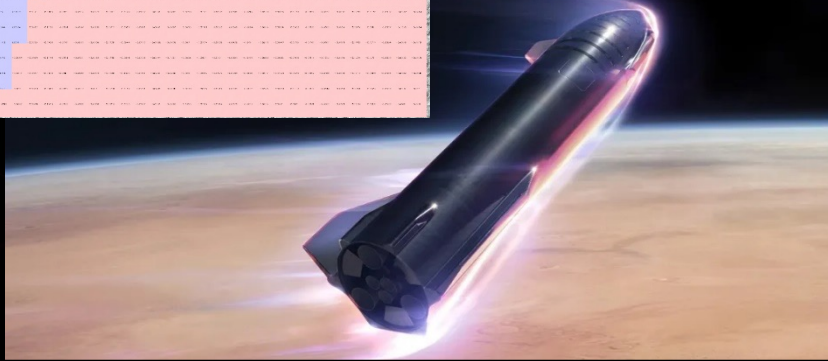
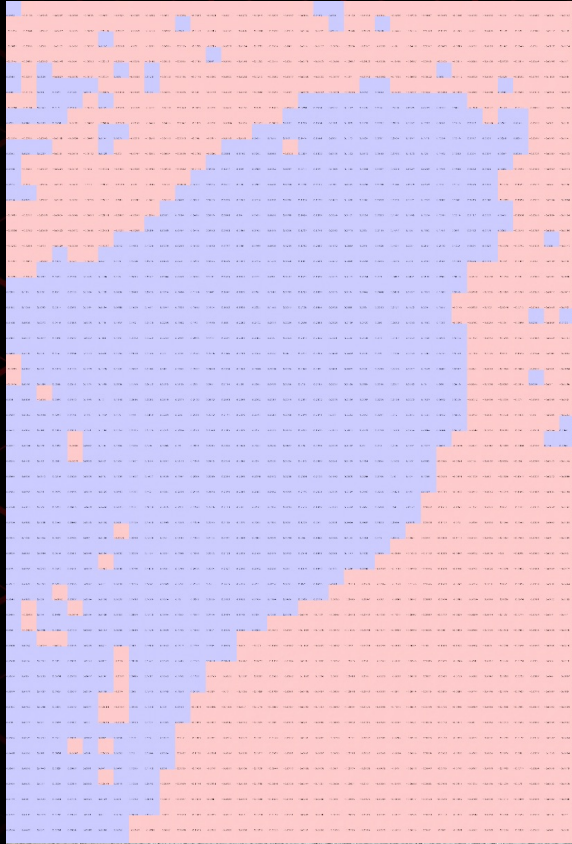
HiRISE



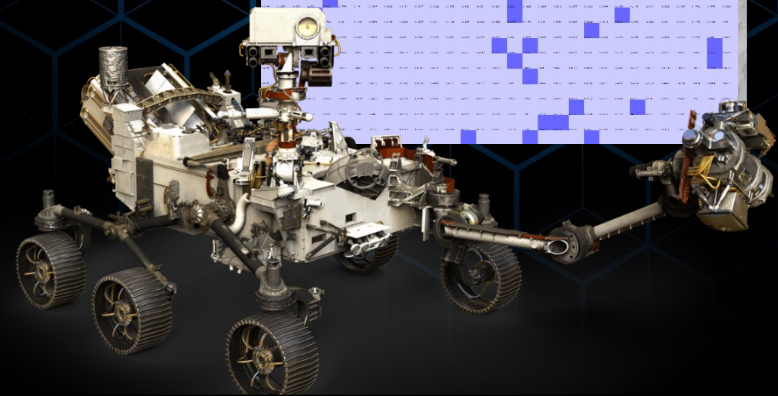
THEMIS



Phlegra Montes (PM-I)



Jezero Crater (JC-I)



-1 Least Optimal

Most Optimal +1