

Titan's Surface Diversity and Ongoing Processes-A Review.

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Titan's landscapes exhibit a wealth of surface diversity that rivals the glossary for a textbook on Earth's geomorphological styles and geological processes. Long before Cassini-Huygens' arrival, evidence suggested that Titan's surface might harbor liquid hydrocarbons, methane and ethane, in the form of lakes, seas, or even oceans. And, as the surface gradually became visible to the Huygens Probe on its slow descent, it became clear that liquids had been quite active in sculpting and dissecting the terrains: a network of dendritic channels densely drapes the highlands located a few kilometers north of the landing site. This led Tomasko and colleagues to lead off the title of their Huygens report with "Rain, winds and haze ..." And not only were winds responsible for the Probe's erratic change in direction as it neared the surface but soon we discovered that they also drive vast seas of longitudinal dunes eastward, wrapping the equatorial zone. Current thinking is that the dunes consist of coarse grains of solid hydrocarbons, perhaps mixed with water ice, that saltate in the slow-moving dense atmosphere. And, although we did not find vast methane-ethane oceans, we did find polar lakes and seas, vast in the north and sparse in the south. Elsewhere impact, tectonic, and, more arguably, volcanic features appear to be ubiquitous. The subjects of Titan's geology continue to cascade into a host of new details of the subjects of process and geomorphology; the collection terms, familiar to terrestrial science, continues to grow.

References:

Tomasko, M. G., et al. (2005) "Rain, winds and haze during the Huygens probe's descent to Titan's surface". *Nature*, Vol. 438, pp.775-778.