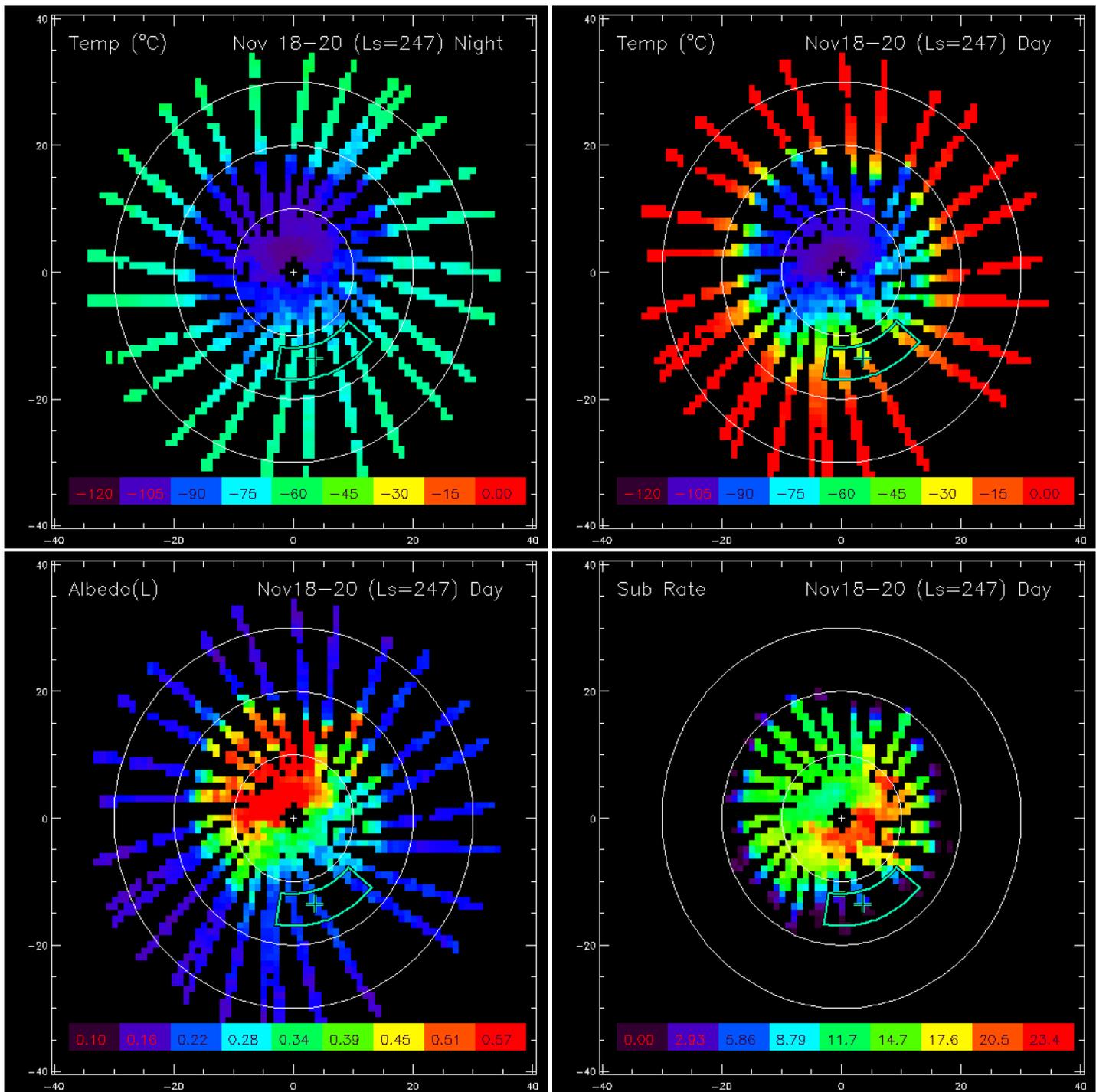


Mars Polar Landing Site TES Results

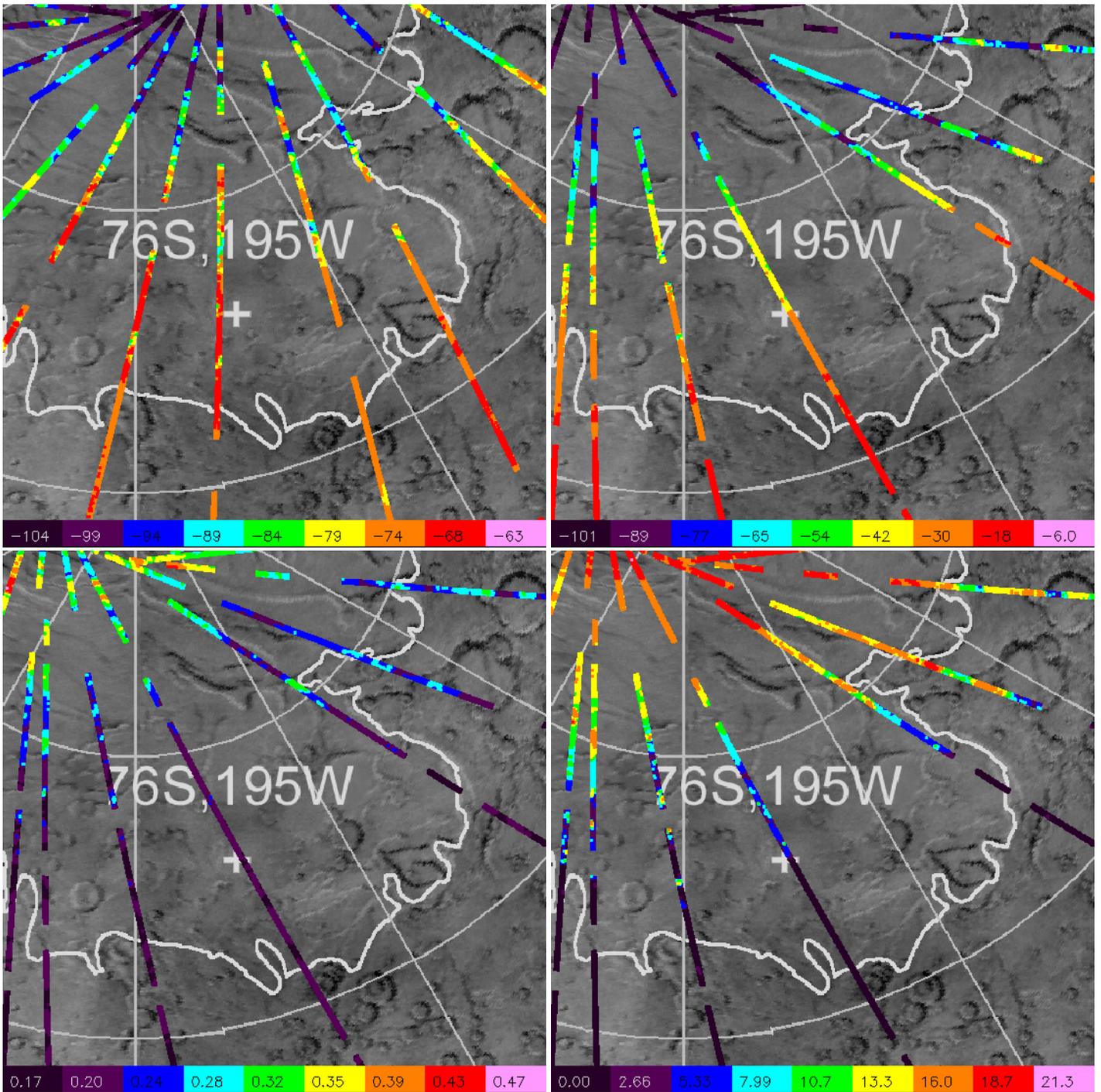
The Mars Polar Lander arrived at Mars on December 3, 1999. TES analysis of recent data from the mapping phase demonstrates that the spacecraft landing site was bare ground, free of -128°C (-200°F) dry ice that completely covered this region during the winter. The image to the left shows the 2pm and 2am temperatures of data within the landing site on December, 2, 1999. The plus sign marks the landing site. The thick white line shows the location of the polar layered deposits. Temperatures are given in Celsius. The temperature of CO_2 frost (dry ice) on Mars is 145K (-128°C), approximately -200°F . Temperatures above 200K show the absence of CO_2 frost. These temperatures were calculated from thermal radiation at a wavelength of $30\mu\text{m}$.

Temperatures at the South Polar Region and MPL Site Just Prior to MPL arrival

These temperatures are from the TES thermal bolometer which measures radiant energy from $6\mu\text{m}$ to $100\mu\text{m}$. This spectral region includes the strong $15\mu\text{m}$ atmospheric CO_2 band and the $9\mu\text{m}$ atmospheric dust band, so atmospheric temperatures can have a small effect on the measured temperature.



The first two images show the temperatures in the Martian south polar region just prior to the arrival of the Mars polar lander. The color transition from blue to green shows the current edge of the south polar cap. Circles are spaced at 10 degrees of latitude. 0° longitude is straight up. The third figure shows the current Albedo of the polar cap. The region that was made up of dark CO₂, or Cryptic CO₂, has sublimated away much quicker than other areas of the seasonal polar cap. The fourth image shows the sublimation rate of CO₂ in kg/day/m². The green outline marks the area considered for landing. Click on the image to see an enlarged view.



The first two images show the temperature data for the Martian Polar Landing region just prior to its arrival. The left image is 2 am data and the right image is 2 pm data. The third image is the Lambert albedo and the fourth image is the estimated sublimation rate in kg per square meter per day. There is no dry ice remaining in these zoomed-in images. The plus sign is the targeted landing site. Click on the image to see an enlarged view.

A comparison with historical data (MGS TES and Viking IRTM) reveals a polar cap that is receding in much the same manner in 1977, 1997, and 1999. This is good as the location and time of the Polar Landing was based polar temperature data from the IRTM, and later verified with TES pre-mapping data.