

Surface Characterization Data for the ARM CART Sites

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The External Data Center (XDC), located at Brookhaven National Laboratory, is responsible for providing data to the Atmospheric Radiation Measurement (ARM) Program that is generated outside of the program and covers the Cloud and Radiation Testbed (CART) areas. One division of external data is surface characterization data. These data are maintained in a Geographic Information System (GIS) and provide visual geographic data about the ARM CART sites. The XDC has been collecting these data since the early 1990s. This paper details the new acquisitions for the 1997-1998 fiscal year.

The new acquisitions for both the Southern Great Plains (SGP) CART site and the North Slope of Alaska (NSA) CART site have mostly been Landsat Thematic Mapper (TM) data provided to the XDC by Bob Cahalon of the National Aeronautics and Space Administration (NASA) Goddard Space Flight Center (GSFC). The data include seven spectral bands—band 1: 0.45 μm to 0.52 μm , band 2: 0.52 μm to 0.60 μm , band 3: 0.63 μm to 0.69 μm , band 4:

0.76 μm to 0.90 μm , band 5: 1.55 μm to 1.75 μm , band 6: 10.40 μm to 12.50 μm , and band 7: 2.08 μm to 2.35 μm . The data are collected using a 30-m instantaneous field of view (IFOV), except band 6 (thermal) with a 120 IFOV. Figures 1 through 5 are each a composite of three spectral bands with band 7 drawn in red, band 4 drawn in green, and band 2 drawn in blue. The images are radiometrically and geometrically corrected, rotated and aligned to the Space Oblique Mercator projection.

The XDC produced a shaded-relief map of Alaska from a 300-m Digital Elevation Model (DEM) acquired from the U.S. Geological Survey. Figure 6 depicts the Alaskan terrain with many features visible including active faults, volcanoes, and glacial deposits. The scale of the map is 1:2,500,000. The azimuth angle was set to north (0°), the sun angle 25° , and the Z value equal to 2.

All newly acquired and previous surface characterization images can be found at <http://www.xdc.arm.gov>.

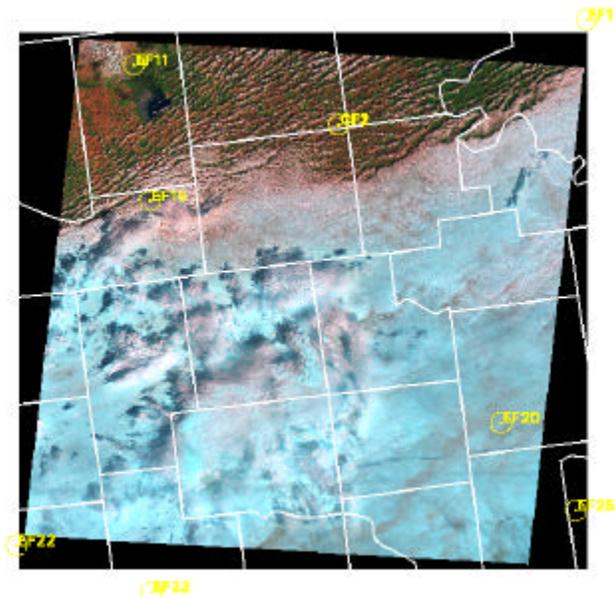


Figure 1a. This Landsat TM scene (composite of bands 7, 4, 2) was taken on September 24, 1996 (path 28/row 35) at 16:25 Greenwich Mean Time (GMT). The ARM SGP CART site facilities within the boundary of the scene are overlaid, as well as county boundary lines. The majority of the image is cloud covered. The darker top and upper left corner are the cloud free areas. (For a color version of this figure, please see http://www.arm.gov/docs/documents/technical/conf_9803/cialella-98.pdf.)

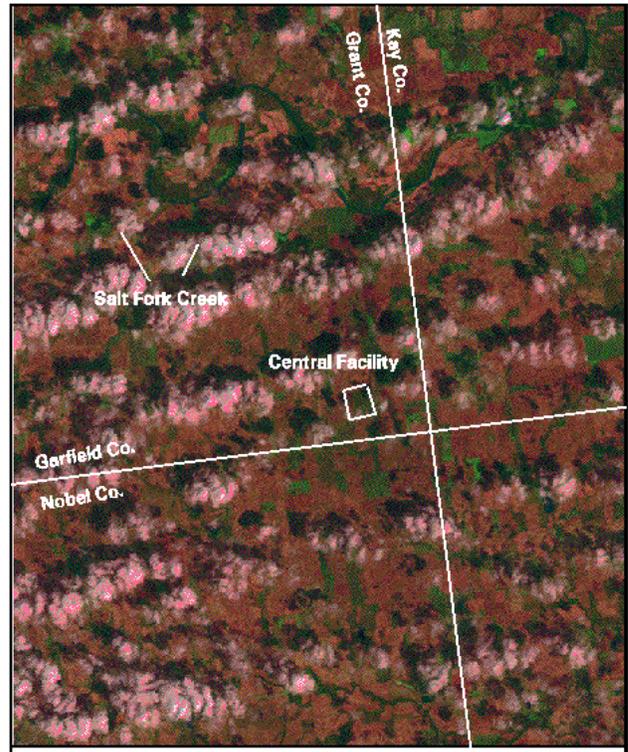


Figure 1b. The ARM SGP Central Facility and the four county lines nearby are overlaid onto a zoomed image of Figure 1a. The Salt Fork Creek (sine shaped dark 'S' curve) is indicated by pointers. The red/brown color is associated with cropland, light green with grassland and pasture, and dark green with shrubs and forest. The white/pink are clouds and the black are cloud shadows. (For a color version of this figure, please see http://www.arm.gov/docs/documents/technical/conf_9803/cialella-98.pdf.)

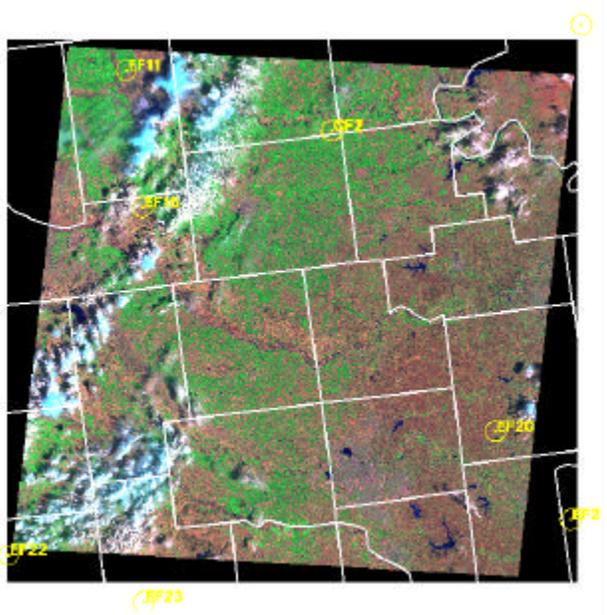


Figure 2a. This Landsat TM scene (composite of bands 7, 4, 2) was taken on April 20, 1997, (path 28/row 35) at 16:35 GMT. The ARM SGP CART Site facilities within the boundary of the scene are overlaid, as well as county boundary lines. (For a color version of this figure, please see http://www.arm.gov/docs/documents/technical/conf_9803/cialella-98.pdf.)

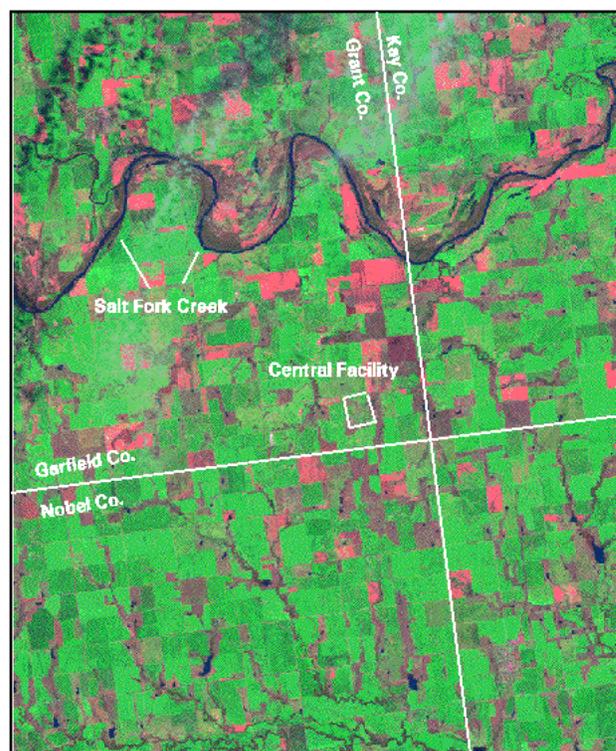


Figure 2b. The ARM SGP Central Facility and the four county lines nearby are overlaid onto a zoomed image of Figure 2a. The Salt Fork Creek (sine shaped dark blue 'S' curve) is indicated by pointers. The red/pink color is associated with cropland, light green with grassland and pasture, and dark green with shrubs and forest. (For a color version of this figure, please see http://www.arm.gov/docs/documents/technical/conf_9803/cialella-98.pdf.)

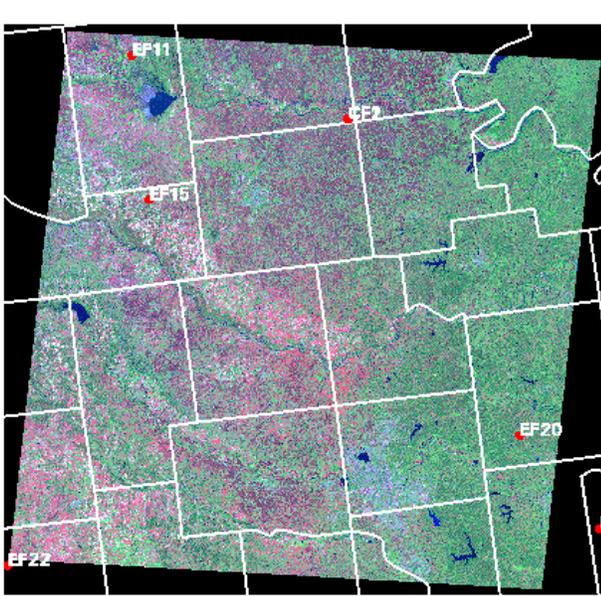


Figure 3a. This Landsat TM scene (composite of bands 7, 4, 2) was taken on September 27, 1997, (path 28/row 35) at 16:40 GMT. The ARM SGP CART site facilities within the boundary of the scene are overlaid, as well as county boundary lines. (For a color version of this figure, please see http://www.arm.gov/docs/documents/technical/conf_9803/cialella-98.pdf.)

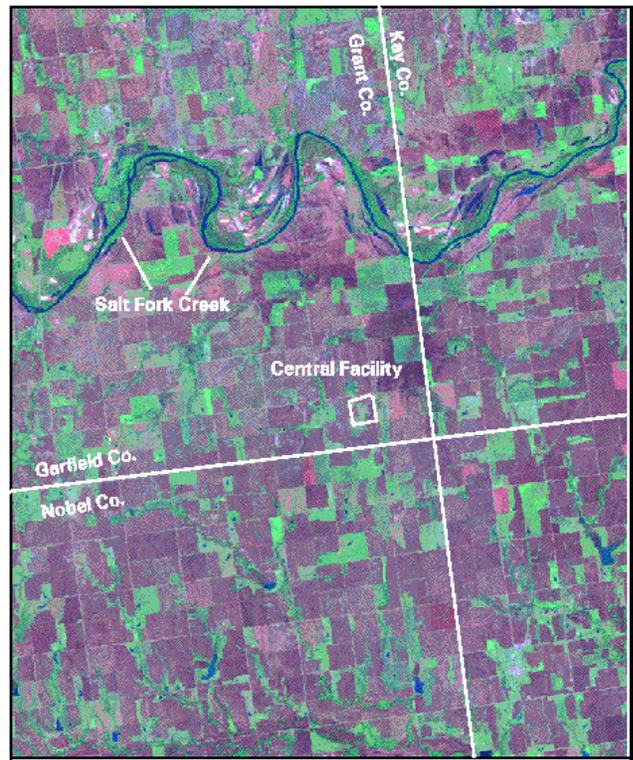


Figure 3b. The ARM SGP Central Facility and the four county lines nearby are overlaid onto a zoomed image of Figure 3a. The Salt Fork Creek (sine shaped dark 'S' curve) is indicated by pointers. The red/purple colors are associated with cropland, light green with pasture and grassland, dark green with trees and blue with water. (For a color version of this figure, please see http://www.arm.gov/docs/documents/technical/conf_9803/cialella-98.pdf.)

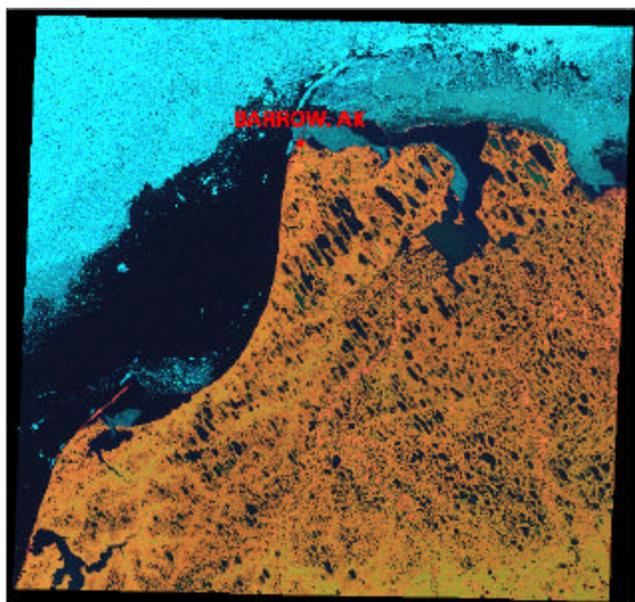


Figure 4. This Landsat TM scene (composites of bands 7, 4, 2) was taken on July 15, 1992, (path 80/row 10) at 21:27 GMT. The image is cloud free. The colors roughly correspond to the following: dark blue and blue—water, light brown—ground (unvegetated), green—vegetated, pink/red—roads, trails. Note the tear-shaped lagoons. (For a color version of this figure, please see http://www.arm.gov/docs/documents/technical/conf_9803/cialella-98.pdf.)

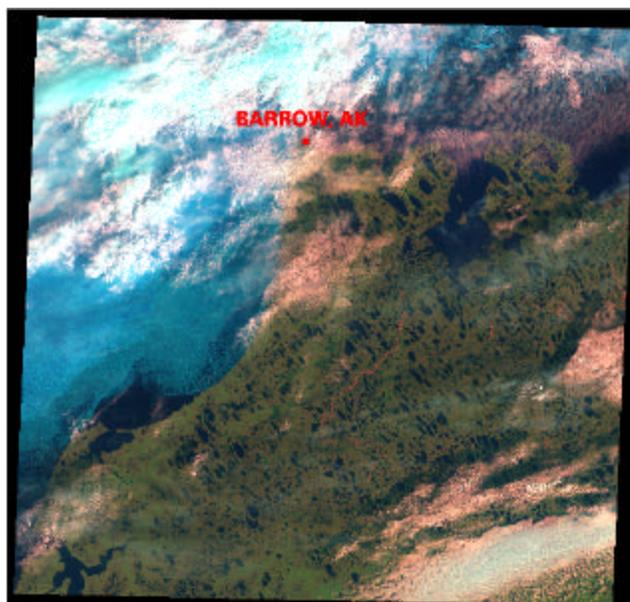


Figure 5. This Landsat TM scene (composites of bands 7, 4, 2) was taken on July 31, 1992, (path 80/row 10) at 21:26 GMT. The image is partially cloud covered, especially over the Barrow site. The colors roughly correspond to the following: dark blue and blue—water, green—vegetation, dark brown—soil (sparsely vegetated), dark pink/red—roads, trails, whitish/pink, lt. gray/green—clouds. (For a color version of this figure, please see http://www.arm.gov/docs/documents/technical/conf_9803/cialella-98.pdf.)

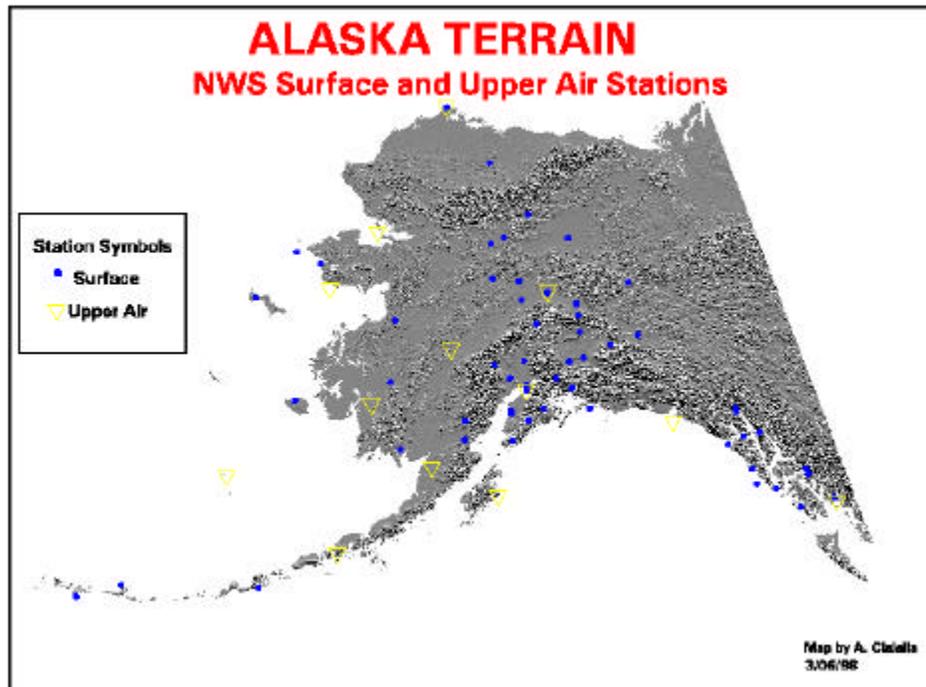


Figure 6. The National Weather Service (NWS) upper air and surface stations are overlaid onto this terrain map of Alaska based on a 300-m DEM produced by the U.S. Geological Survey. (For a color version of this figure, please see http://www.arm.gov/docs/documents/technicalconf_9803/cialella-98.pdf.)