



Digital Shaded-Relief Image of Alaska

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Map Notes

This shaded-relief image was produced by the computer processing of 56 million terrain heights contained in a digital elevation model of Alaska. The model was constructed by digitizing elevation contours from published 1:250,000-scale topographic maps and then converting the contour data to a matrix of elevation values. The matrix consists of 21,303 cells in the east-west direction and 8,372 cells in the north-south direction. The distance between cells, or picture elements (pixels), is 300 m (0.19 mi) on the ground, which corresponds to 6.12 mm (0.005 in.) on the map. Image processing software was used to compute a directional brightness value (contour-light intensity) for each pixel. This value is based on a mathematical relation between sun position and local ground slope and aspect direction. The view or appearance of terrain can be changed by varying the location of the sun. The best contrast of both terrain and high-water topography was obtained by azimuthing this image and illuminating it from three different directions—northwest, north, and northeast—at a constant sun 25° above the horizon. The lightest areas represent the fully illuminated steep slopes, the intermediate gray tones show gentle topography, and the darkest tones are steep areas in shadow. A vertical exaggeration of 2x has been applied to further enhance high-relief features. That is, hills appear twice as high as they really are and valleys twice as deep. Terrain features as small as 600 m (0.37 mi) across on the ground can be distinguished in this image. See accompanying pamphlet for discussion of physiographic features and technical details. Data compiled by M.D. Fleming.

ALASKA EQUAL-AREA CONIC PROJECTION
SCALE 1:250,000
ELEVATION IN METERS

