New Raster Version of the Circumpolar Arctic Vegetation Map (CAVM)

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Conclusions

1. Successful mapping method. Unsupervised classification and modeling created a realistic map of vegetation distribution, using the same circumpolar legend developed for the CAVM.

2. Greater spatial resolution. The 1-km pixel raster CAVM provides much finer resolution than was possible with the original hand-drawn vector map.

References


Results

Comparison of original CAVM and new Raster CAVM

The proportions of the land cover units on the two maps differed, mostly due to the spatial resolution of the two maps. There was four times as much water on the new raster map compared to the vector map, since many water bodies smaller than the vector minimum polygon size could be mapped. Mountainous areas were mapped in much greater detail on the raster map, leaving less in the mountain complex types. Differences in interpretation can be seen in the reduction in low shrub tundra. The raster map now shows this type mainly occurring in narrow bands along river valleys.

Comparison of AVHRR and MODIS NDVI

The average NDVI of vegetation types on the Raster CAVM was very similar for both AVHRR and MODIS data. The lowest values occur in barren types (B1-4), and the highest values in dwarf-shrub types (S1, S2). Graminoid types that include shrubs (G3, G4) also have relatively high NDVI, as do wetland types that occur in the more southern areas that also have shrubs (W3).

Climate

Average summer warmth index (SWI) (°C) of vegetation types on the Raster CAVM show expected increases within the graminoid (G), shrub (P) and wetland (W) types. The coldest type (B1), occurs along with G1 in farthest north areas.