



Base Cartography Inventory

Background

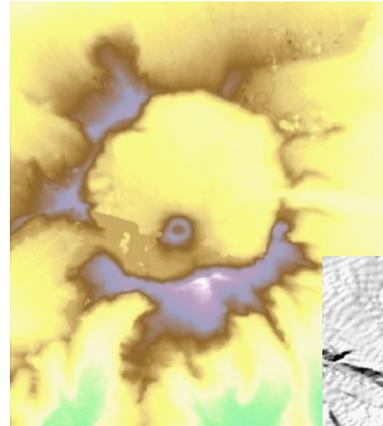
Twelve baseline inventories have been identified by the Inventory and Monitoring Program of the National Park Service. These inventories are considered the minimum information needed to effectively manage and protect natural resources within parks. The Base Cartography Inventory serves as the basis and background that other inventories build upon. Spatial displays and analyses provide an efficient and cost-effective way for park managers and planners to utilize complex natural resource information. For example, by incorporating relatively basic information about topography and vegetation communities into a spatial analysis, managers can locate potential habitats for endangered species or predict the likely course of a wildfire (National Park Service, 2009).

In Alaska, a regional approach to conducting and managing the base cartography inventory is most effective because of the large area coverage and remote nature of many of the national parks within Alaska. The regional approach focuses on integrating the management of the base cartography inventory with inventories for soil and vegetation to maximize efficiency.

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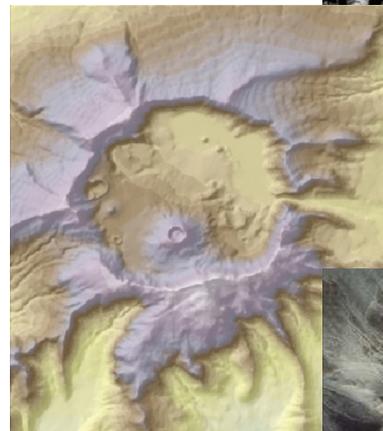
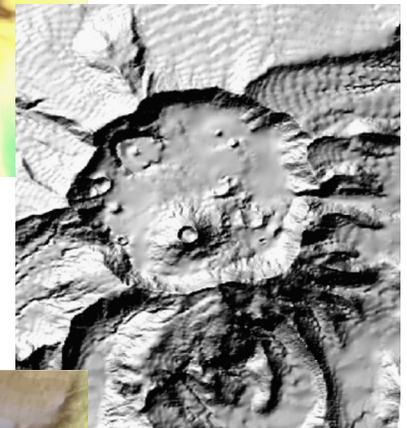
Mapping Alaska's Parks

The Base Cartography Inventory for the Alaska region of the National Park Service includes the acquisition and use of two primary geospatial datasets - Digital Elevation Models (DEMs) and high-resolution (1m pixels, or less) ortho-rectified aerial photography and/or satellite imagery. Currently in Alaska, USGS 1:63,360 topographic maps are the standard mapping base available across the region. These topographic maps are based on 1950s, 1960s, and 1970s photography and technology and often do not accurately reflect significant landscape changes that have occurred over time. Changes in water bodies, shorelines, glaciers, rivers, and human development all negatively influence the ability to accurately map inventories when using these base maps. To provide current mapping quality image data, the Base Cartography Inventory acquires high quality DEMs and current high-resolution imagery which are used to produce ortho-rectified (corrected for topographic distortion) aerial photography and satellite products that meet 1:24,000 scale National Map Accuracy Standards.



Digital Elevation Data

Hillshade Derived from Digital Elevation Data

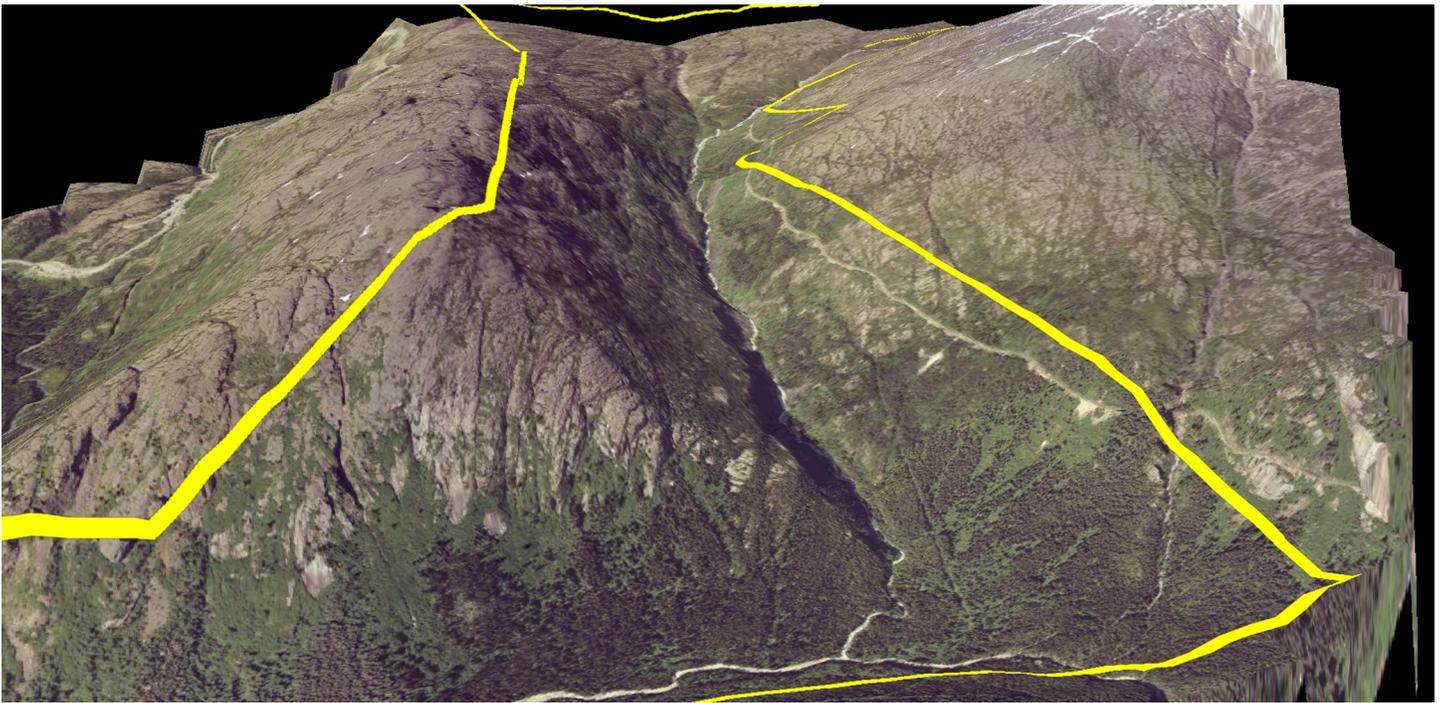


Hillshade and Digital Elevation Data

True-Color Ortho-rectified Image



The images above show the Aniakchak National Monument and Preserve caldera represented in the four products of the Base Cartography Inventory. The inventory acquires high quality digital elevation data and imagery for all national parks in Alaska. Digital Elevation Models (DEM) are combined with high resolution imagery to produce true-color and near infrared ortho-rectified imagery.



The Base Cartography Inventory has many applications. The image above shows a 3D model of the White Pass area of Klondike Gold Rush National Historical Park (park boundary noted in yellow). The model was developed by combining a digital elevation model with high-resolution aerial photography. It is being used to plan vegetation field inventory work, including transect site selection and travel routes to be taken by researchers, for the upcoming field season.

Status

The Inventory Program acquires and develops digital elevation models (DEMs) and ortho-image products through the use of commercial satellite and aerial imagery vendors and/or interagency agreements with USGS. The best available DEMs are obtained from several sources and can be derived using technologies such as LIDAR, IFSAR, and Stereo Imagery. Base imagery is obtained primarily through IKONOS, and several sources are used to obtain high-resolution aerial photography. To date, approximately 18 million acres (33%) of Alaska parklands have ortho-rectified high-resolution imagery. The remaining 37 million acres (67%) have high resolution base imagery acquired and are awaiting improved DEMs for the ortho-rectification process to occur. Imagery acquired in 2010 completed the first region-wide collection for all the parks. It is anticipated that ortho-rectification processing of this imagery will continue opportunistically as improved DEMs become available to produce 1:24,000 scale ortho-rectified products, which will be compliant with the National Mapping Accuracy Standards.

To further promote the development of high quality cartography, the Inventory Program also participates in ongoing Statewide Digital Mapping Initiative (SDMI) and Alaska Geographic Data Committee (AGDC) ortho-imagery and DEM mapping initiatives by establishing cooperative partnerships with other State and Federal agencies. In addition, the program makes use of the President's U.S. Commercial Remote Sensing Space Policy (CRSSP) to leverage collaborative acquisitions and purchases of imagery and DEM products when possible.

Base Cartography Inventory

Applications of Base Cartography

Ortho-rectified imagery provides a foundation for project planning and mapping. DEMs and ortho-rectified imagery serve as foundations for other inventories, including the vegetation and soil inventories. They are used in developing models of habitats and ecosystems. They facilitate project planning, data analysis, and verification of geographic information systems (GIS) data layers. They are also often required prior to initiating other inventories. For example, pre-fieldwork activities often utilize ortho-rectified imagery to identify sample locations. These sample locations are then evaluated for slope, aspect, and elevation using DEMs.

The ortho-rectified imagery developed in this inventory also has applications beyond scientific studies and field work. Planning for emergency response, trail development or maintenance, and back country travel are all activities to which ortho-imagery can be applied. Information can also be used to develop interpretive and educational materials to connect the public to park resources.

For more information on natural resource inventories:

National website: <http://science.nature.nps.gov/im/>

National Park Service. 2009. Strategic plan for natural resource inventories: FY 2008 - FY 2012. Natural Resource Report NPS/NRPC/NRR—2009/094. National Park Service, Fort Collins, Colorado.

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