

Use of Satellite Telemetry Data, GIS, and html to Create an Educational Display of Caribou Movements

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Abstract

It is often difficult to get an intuitive feel for the temporal aspect of caribou movements based on a map of caribou movements alone. We used satellite telemetry data collected from caribou cows of the Teshekpuk Lake Caribou Herd in north central Alaska over a ten-year period to create a user-friendly computer display of caribou movements. We used *ArcView GIS 3.1* and the *ArcView Tracking Analyst Extension* software to create animations of caribou movements. Animations were created showing the entire ten-year period, annual movements, seasonal movements, routes of individual caribou, and use of village subsistence hunting areas. Animations were compiled with text and pictures in an html framework to create a user-friendly interactive display. The display is portable and can be displayed on most computers with an up-to-date web browser.



Methods

- Satellite data were collected from 28 caribou of the Teshekpuk Lake herd between 1990-1999 as part of a joint study between the North Slope Borough, Alaska Dept. of Fish and Game, and U.S. Bureau of Land Management.
- Locations were entered into *ArcView GIS*.
- Village subsistence hunting areas were estimated for six villages based on available literature.
- Animations were created for the entire ten-year period, annual movements, seasonal movements, a sample of individual animals, and for hunting boundaries.

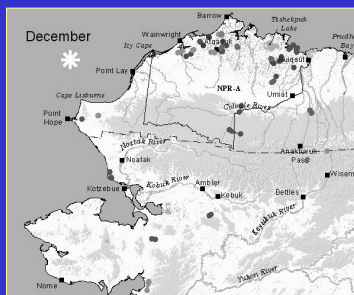


Figure 1. Movement of caribou during December, from annual movement animation.

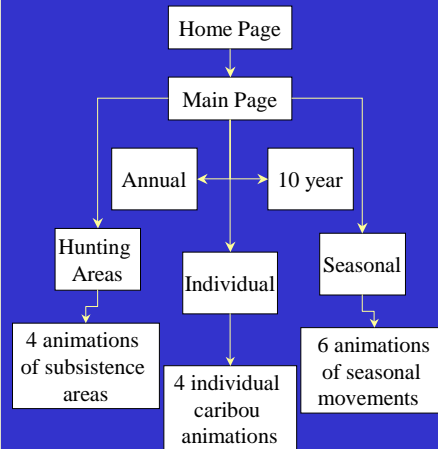


Figure 2. Flow chart of html page organization.

Software

- We created jpegs using *ArcView Tracking Analyst Extension*.
- Jpegs were converted to wmv files using *ImageN* and *Windows Media Encoder* software.
- Wmv files, text, and image files were combined in html framework using *Netscape Composer* to create a graphical user interface viewable on computers with up-to-date web browsers and *Windows Media Player*.

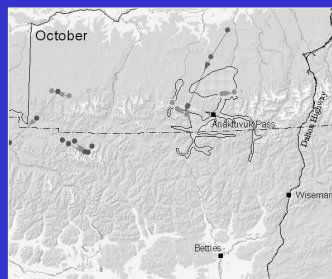


Figure 3. Caribou locations near village subsistence hunting area, from animation depicting movements near Anaktuvuk Pass, Alaska.

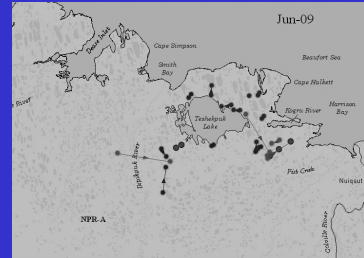


Figure 4. Movement of caribou during calving, from June movement animation. Green circles represent caribou that calved.

Results

- Caribou of the Teshekpuk Lake Herd showed large annual variation in wintering area.
- Animations reflect large differences in daily movement rates.
- Animations should be useful for educating the public about herd range, seasonal movements, annual variation.
- Caribou movement animations provide biologists with another tool to understand range and for identifying critical habitat.
- A useful presentation can be made with basic skills in GIS and html.



Conclusions

We present a simple method to create a user-friendly animation presentation of caribou movements. The presentation is portable and uses typical web browsing format. The use of animation allows users to get an intuitive feel of annual and seasonal caribou movements not evident from maps. Animations of the Teshekpuk Lake Caribou Herd display the large amount of annual variation in wintering areas, as well as the annual variation in daily movement rates.