MapServer Applications for Wildlife Education: Moose on the Loose

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Wildlife Resources Support Section

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Moose Collared and Released on Grand Mesa

January, 2006

Collared Moose Locational Data Emailed from ARGOS to CDOW

Moose Collar # 57649 and # 57650
February 26, 2006 - March 2, 2006

```
Prog 03059

57649  Date : 26.02.06 09:29:41  LC : 0  IQ : 58
     Lat1 : 39.096N  Lon1 : 107.454W  Lat2 : 39.479N  Lon2 : 109.327W
     Nb mes : 009  Nb mes>-120dB : 000  Best level : -121 dB
     Pass duration : 551s    NOPC : 2
     Calcul freq : 401 643460.3 Hz   Altitude : 2478 m
               05           50           00           00
               00

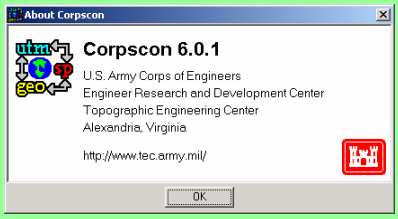
57649  Date : 26.02.06 10:40:41  LC : 1  IQ : 56
     Lat1 : 39.096N  Lon1 : 107.457W  Lat2 : 38.372N  Lon2 : 103.932W
     Nb mes : 007  Nb mes>-120dB : 000  Best level : -125 dB
     Pass duration : 561s    NOPC : 2
     Calcul freq : 401 643454.7 Hz   Altitude : 2474 m
               05           49           03           04
               00
```

Collared Moose Locational Data Captured to Corpscon Format

AC57649_022606_to_030206_batch - Notepad
File Edit Format View Help

```
AC57649_022606_092941,39.096,107.454
AC57649_022606_104041,39.096,107.457
AC57649_022606_111248,39.134,107.483
AC57649_022706_092052,39.091,107.448
AC57649_022706_102706,39.097,107.459
AC57649_022706_115038,39.098,107.471
AC57649_022806_072709,39.063,107.458
AC57649_022806_091049,39.104,107.476
AC57649_022806_101531,39.100,107.478
AC57649_022806_112638,39.107,107.483
AC57649_022806_115648,39.101,107.473
```

Collared Moose Locational Data Corpscon Used for Conversions



http://www.tec.army.mil/

Collared Moose Locational Data Corpscon Conversion to UTM

AC57649_022606_030206_utm - Notepad
File Edit Format View Help

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AC57649_022706_092052,288276.407,4329519.838
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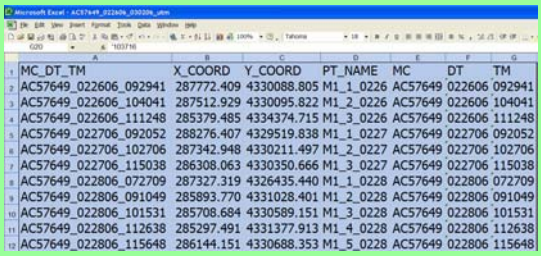
AC57649_022706_115038,286308.063,4330350.666
AC57649_022806_072709,287327.319,4326435.440
AC57649_022806_091049,285893.770,4331028.401
AC57649_022806_101531,285708.684,4330589.151
AC57649_022806_112638,285297.491,4331377.913
AC57649_022806_115648,286144.151,4330688.353
```

Collared Moose Locational Data
UTM Data to Spreadsheet

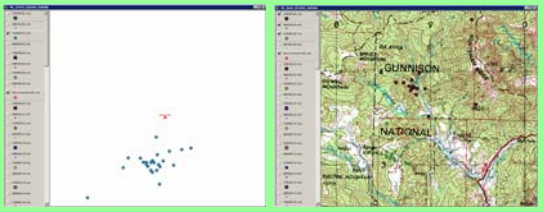


MC_DT_TM	X_COORD	Y_COORD	PT_NAME	MC	DT	TM
AC57649_022606_092941	287772.409	4330088.805	M1_1_0226	AC57649	022606	092941
AC57649_022606_104041	287512.929	4330095.822	M1_2_0226	AC57649	022606	104041
AC57649_022606_111248	285379.485	4334374.715	M1_3_0226	AC57649	022606	111248
AC57649_022706_092052	288276.407	4329519.838	M1_1_0227	AC57649	022706	092052
AC57649_022706_102706	287342.948	4330211.497	M1_2_0227	AC57649	022706	102706
AC57649_022706_115038	286308.063	4330350.666	M1_3_0227	AC57649	022706	115038
AC57649_022806_072709	287327.319	4326435.440	M1_1_0228	AC57649	022806	072709
AC57649_022806_091049	285893.770	4331028.401	M1_2_0228	AC57649	022806	091049
AC57649_022806_101531	285708.684	4330589.151	M1_3_0228	AC57649	022806	101531
AC57649_022806_112638	285297.491	4331377.913	M1_4_0228	AC57649	022806	112638
AC57649_022806_115648	286144.151	4330688.353	M1_5_0228	AC57649	022806	115648

Collared Moose Locational Data
Spreadsheet Data Export to DBF

Data Imported in ArcView via
"Add Event Theme" Procedure

Data Spot Checked for Outliers



Collared Moose Locational Data
Provided for Download as PDFs

Moose Tracking Coordinates
Moose/Collar #2
January 22, 2006 — January 28, 2006

Moose/Collar #2	Date	Latitude	Longitude
AC57650	012206	39.132	107.448
AC57650	012206	39.133	107.453
AC57650	012306	39.145	107.454
AC57650	012306	39.129	107.460
AC57650	012306	39.132	107.433
AC57650	012306	39.131	107.444
AC57650	012306	39.124	107.389
AC57650	012306	39.120	107.405
AC57650	012406	39.133	107.443
AC57650	012406	39.138	107.449
AC57650	012406	39.169	107.473
AC57650	012406	39.137	107.448
AC57650	012406	39.144	107.444
AC57650	012306	39.169	107.429
AC57650	012306	39.168	107.429
AC57650	012306	39.167	107.428
AC57650	012306	39.167	107.438
AC57650	012606	39.182	107.441
AC57650	012606	39.184	107.440

Instructions Provided for Using
NDIS WebSite to Plot Locational Data

Travelin' Moose

Using MapIt! to Track Two Moose in Northwestern Colorado

The Colorado Division of Wildlife (DOW) recently moved some moose from Utah to the Grand Mesa, near Grand Junction, Colorado. Two moose were fitted with radio collars that transmit signals to an earth-orbiting satellite. The signals contain information about the moose's location. The satellite records these signals and sends them back to the DOW.

You can follow the moose as they explore their new home! You will need the information collected by the satellite and our Web-based mapping program called ***MapIt!*** You can use the maps you create to learn about these moose. You will be able to tell how far the moose have traveled during a day, or over several days; where they seem to spend most of their time; and whether they ever come close to one another or keep their distance.

Join Us and Discover What It Means to be a Travelin' Moose!

Follow these directions to learn to use ***MapIt!*** This will get you started and give you tools to discover much more on your own! You will need:

1. These instructions
2. A printer, preferably color, to print maps that you create
3. A ruler and a pencil to measure and calculate how far the moose travel
4. A printout of current radio-collar location information for each moose (available from the links on the Grand Mesa Moose Tracking Page at http://wildlife.state.co.us/Education/StudentActivities/MooseTracking.htm.)

Maps Produced Using
NDIS WebSite to Plot Locational Data

Questions Asked Weekly
Regarding Moose Movements

Links to the most recent location information for both moose will be posted here every week as PDF files, looking similar to the image to the right. Plotting of coordinates—tracking the moose's movements—can be done with any map that displays latitude and longitude. For online, interactive mapping, try the Natural Diversity Information Source's *MapIt!* program. An introduction and beginning guide for using MapIt! with this moose tracking project is provided here.

You will also be asked questions, each week, about the moose that you can answer using your mapping skills. These will be found at the bottom of this page, and answers will be posted, too, so you can check your work.

Answers Posted Weekly Regarding Moose Movements

Seek and Discover

Answer #1 for Week 7: You were asked to plot one pair of coordinates from each day in Week 7 for each moose on the same MapIt! map. The question was "How close did moose #1 come to moose #2?" **The answer is:** ***Approximately*** 3 1/2 miles. You may have a different answer because you may not have used the same pairs of coordinates as on the map used to get this answer.

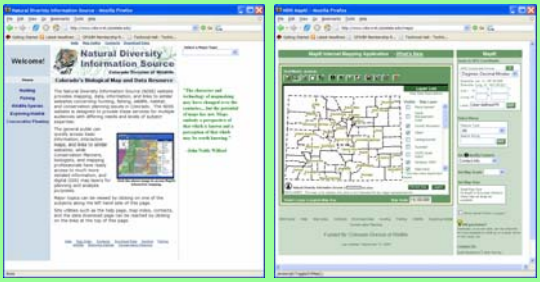
Answer #2 for Week 7: You were asked to plot every other coordinate for moose #2 on a new map, then asked "What was the "range" of moose #2 during Week 7?" (**Hint:** you may have had to look up the meaning of "range" when it's used in talking about animals.) **The answer is:** Moose #2, during Week 7, moved over a range of ***approximately*** 24 1/2 square miles.

Answer #1 for Week 6: The question was—What is the approximate elevation (or altitude) in which the moose are spending most of their time? In feet? In meters? (Hint—you may need to zoom in.) **The answer is:** Both moose are moving around at about 8200 to 8500 feet in altitude. That's approximately 2500 to 2600 meters. *(What's one reason for using meters to measure distance instead of feet?)*

Answer #2 for Week 6: The questions was—In what *Game Management Unit* are the moose? **The answer is:** 521.

See a map of Week 6 with coordinates for both moose plotted.

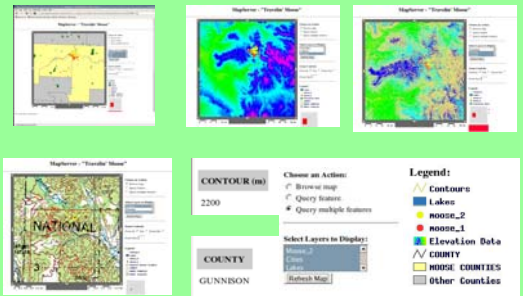
Application Based on CDOW NDIS Site - ArcIMS based- http://ndis.nrel.colostate.edu/maps/



Prototyping Also Done for Application Based on Open Source UMN-MapServer

UMN-MapServer based Travelin' Moose

Sample Screens:



Acknowledgements

- Stan Johnson - CDOW / NWRSC (GJ)
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  ESRI - ArcIMS based NDIS WebSite
- Steve Lime - University of Minnesota
  (and the other MapServer contributors)