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GPS GSM COLLARS

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Environmental Studies

GPS GSM collars: Remote GPS-data transmission via cell phone net

We are already shipping the sixt generation of GPS-GSM collars!

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Basics about GPS GSM collars

A new technique worldwide, GPS GSM collar system, has been introduced since March 2002: GPS **data can be sent directly from the animals collar via a mobile radio network** GSM (Global System for Mobile Communication) much as an SMS (Short Message Service) is sent by a mobile/ cell/ hand phone. The location coordinates of the animals are momentarily sent by a GSM-modem integrated into the collar. **The data arrive directly at the user's office.** The prerequisite for the data transmission is that the area of investigation is partially covered by GSM (if you can use mobile phone at the investigation area the GSM coverage is ok).

Standard GPS GSM collar for **ungulates** (fourth generation), with Drop Off

The collar is basically a GPS-Plus collar with additional GSM option (**new** : the GSM-modem is housing in the top box of the collar), battery unit at the bottom.

Weigth: total collar weight: up from 420 g (without drop off), depending on collar size and amount of batteries.

Number of positions (collar with 2D batteries, weigth 680 g):
5000 at 0° C, worst case calculation with **180** seconds active GPS per localization, and **8200** at 0° C, average calculation with **90** seconds active GPS per localization.

The battery unit can be easily changed by the user.

GPS GSM collar for predator:

Special GPS GSM collar for lynx:

GPS GSM collar for elephants:

mean number of positions: 46000

Some more imagines of old collars

Data exchange via GSM network

The GPS fix data can be transmitted via the SMS where GSM coverage is partially or complete available. This cost effective solution can provide GPS data nearly in real time. The cost of one SMS is dependent on the GSM network provider and starts with some cents per SMS. Up to 7 GPS fix information can be stored in one SMS. The number of GPS fix positions transmitted with one SMS can be chosen by the user.

This service is available for the following GSM networks:

- **900 MHz and 1800 MHz, e.g. europe and**
- **900 MHz and 1900 MHz, e.g. north america**

Is your investigation site GSM covered? Look at:

http://www.gsmworld.com/roaming/gsminfo/index.shtml

The GPS fix data contains the following information:

Time and date of the GPS fix,

ECEF X, Y, Z coordinates (earth center earth fix) and lattitude, longitude and height (WGS84) coordinates of the GPS fix

DOP, 2D, 3D and 3D validated (3D+) status of the fix

Ambient temperature during the GPS fix

Battery voltage of main and beacon battery

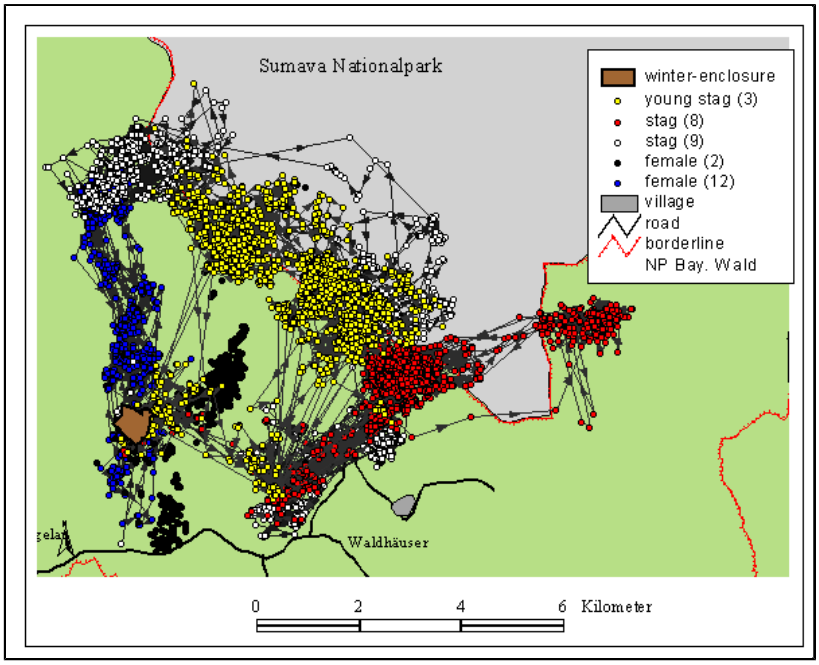
In **areas with poor GSM coverage** the transmission of data via the SMS service is more effective like transmission of data via GSM data service. The user can choose one of three options for SMS transmission (factory settings):

- Transmission of one Position per SMS (the SMS will be transmitted to the customer directly after a GPS fix). This is the most cost intensive option, but the customer will get the GPS data nearly in real time.
- Transmission of seven positions per SMS (the SMS will be transmitted to the customer after each seventh GPS fix). This is the less cost intensive option, but the customer will get the GPS data not until the seventh GPS fix.
- Transmission of seven positions per SMS with repetition in case of no GSM coverage (the SMS will be transmitted to the customer after each seventh GPS fix when GSM coverage is available). When no GSM coverage is available, the GPS fix data will be retransmitted next time when GSM coverage is available. This is the most secure option to get maximum of data via GSM network.

The GPS-GSM collar can be additionaly provided with UHF download option and different accessories.

Project example: red deer tracking

The following picture shows an example of a tracking study on red deer with GPS GSM collars in the Bavarian Nationalpark, Germany.



Location points of 6 red deer (legend: age in bracket; n=8678 fixes) connected in chronological order, after leaving the winter enclosure, May 13 - December 1, 2004
©Basisdaten der Nationalparkverwaltung Bayerischer Wald

more about this project at:
http://www.environmental-studies.de/projects/1/red1.html

If you are interested in current projects with this collar type: choose “Tracking projects” at the button navigation bar, or visit this site: Projects.

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