

Using GPS

The aims of this chapter

This section provides an overview of the benefits to researchers of Global Positioning Systems (GPS) and instruction on their operation.

Section 1. GPS as a research and campaign tool

Section 2. Technical and practical information

Section 3. Your checklist

SECTION 1. GPS AS A RESEARCH AND CAMPAIGN TOOL

What is GPS?

GPS is used to accurately pinpoint the user's location in the world. By responding to satellite signals, the GPS receiver can determine a latitude and longitude position and therefore the user's location. With signals from four or more satellites some receivers can also determine altitude (height above sea-level).

By continuously updating your position, receivers can provide information on your speed and direction of travel and some models have features that allow you to re-trace your journey (a useful function for research undertaken in path or road-less areas).

When is GPS useful to researchers?

As well as assisting field researchers as a means to navigate in unfamiliar territory, GPS can aid research and verification by providing geographical location and pinpointing where a problem or incident is occurring.

GPS has been effectively used to demonstrate that illegal activities are taking place in national parks and community-owned lands. For example, campaigners used a combination of video and GPS to demonstrate that illegal logging was occurring within indigenous peoples' reserves in the Brazilian Amazon. GPS can also be used to provide evidence that banned or harmful practices are taking place within commercial concessions such as timber, mining or fisheries areas.

☛ Before reading this section, try and identify the circumstances in which GPS could have been useful to your work. Have there been occasions when you have been unable to prove that a problem was occurring in a certain location, for example within a logging concession, on community lands or in a National Park?

NOTE If you think that a GPS receiver would be helpful in your research and advocacy, EJF may be able to supply you or your organisation with one. Please send a brief (1 page) proposal outlining why and when you need to use GPS together with your contact details to ejfoundation@cs.com

Visual evidence and verification

Maps

To be truly meaningful and effective your data (geographical co-ordinates) usually needs to be compared to a detailed and large-scale map such as an up-to-date and accurate map of timber concessions, community land or park boundaries. Otherwise you will simply have a set of geographical co-ordinates that are meaningless to your 'audience'.

There are exceptions to this, for example, if you simply wanted to demonstrate that a harmful activity is taking place within a certain distance to a community then your GPS receiver can allow you to compare 2 or more locations and their proximity.

Receivers also allow 'waypoints' to be entered into their memory. These can be used to identify locations of communities or instances of illegal activities (such as clearances in a National Park caused by illegal loggers) and can be referred back to in the future. It is useful to make a note of these 'waypoints' in your field notes, for example, writing down the geographical location and details such as what was happening there, when, and by whom or what.

Film and photos

Remember that if you want to use GPS to prove that a problem is occurring in a specific location, you should take a photograph or video that shows this. So, for example, if you find a fishpond that has been illegally pumped dry then you may need to take a series of shots to include a close-up of the GPS co-ordinates and a wider shot that shows the receiver (and co-ordinates) next to the pond.

Of course you will also need to be able to locate the co-ordinates on a map to conclusively demonstrate where the problem was occurring and indicate who or what might have been responsible for it.

SECTION 2. TECHNICAL AND PRACTICAL INFORMATION

Understanding how to use GPS

Always read the GPS instruction manual carefully and practice using your receiver before you begin your field research. Finding your geographical location should be as simple as switching on your receiver and choosing the 'position' page. Remember that you can switch the receiver on or off at any time – you will need to regain a satellite signal but your information should be stored.

These are the basic functions of the Garmin GPS 12 receiver – others will differ as to how they display information.

1. Turn the GPS on to gain the welcome screen. (In dark conditions you may require backlighting, but beware that this drains batteries quickly).
2. Gain a signal - this can take up to about 50 seconds if the receiver is cold. Ensure that you are in a position to be able to receive a signal. Once the receiver gains a signal it will display the position page and show you the co-ordinates for your location.
3. Choose your page - the receiver will have various screens or pages that you can move between such as:

Satellite – shows the battery levels, the satellites that are currently overhead and the strength of their signals. You need to be able to receive a signal from 2 or more satellites to obtain your co-ordinates.

Position - once the GPS has gained a signal it will move to this screen and show your co-ordinates and other information such as direction and speed of travel.

Map – shows your route as you move with the receiver. Your position is normally marked by a diamond in the centre of the screen and previous positions and 'waypoints' (see below) are joined by a line (showing your route).

Compass – shows your course with an arrow pointing to the waypoint that you have selected as your destination. The Garmin GPS 12 has a TracBack function that allows you to retrace your journey in unfamiliar areas.

Waypoints

You can store information on specific locations as 'waypoints' (the GPS 12 allows up to 500 points to be stored). These are especially useful if you want to remember particular locations such as the location of an illegal logging camp; or remote communities) or for navigation. Mark your waypoints on the receiver – give locations simple names and make a note of these with any other essential or useful information in your field notebook.

IMPORTANT NOTES

Precision

GPS has an 'inbuilt' mechanism which means that it, although relatively accurate, the geographical position that your receiver provides is only precise to a range of 10-15 metres. (This is a function of GPS' military usage.)

In many instances this will not be a problem, but bear in mind that if you are near a border or boundary (of a protected area, concession or community lands) then it becomes far harder for you to state absolutely that the problem was occurring within that specified area.

GPS has become more accurate as a result of developments over recent months so check with manufacturers to see what range the receiver is accurate to.

Gaining a signal

GPS uses signals from satellites that will penetrate thin material and glass but not through thick materials, stone, metal, thick vegetation (including very dense tree canopies) or people. GPS receivers will be ineffective in buildings and can only receive a clear signal in a car or other vehicle if placed next to the windscreen.

The GPS may have trouble receiving a signal if it is surrounded by buildings or people or under a tree canopy. Leave the GPS in a clear position away from obstructions or hold it at arms length to allow it to gain a signal.

SECTION 3. YOUR GPS CHECKLIST

GPS receivers are relatively expensive pieces of equipment (about US\$150-\$200) so consider how you would want to use the technology before you buy one.

Once you have decided to use GPS as part of your research work remember to:

- ✓ Learn to use your GPS before you begin your field research.
- ✓ Check what maps are available – including those detailing concessions, protected areas or local community lands. Are these up-to-date and can you rely on their accuracy?
- ✓ Will you need visual evidence, such as film or photos to verify that a problem is occurring?

In the field:

- ✓ Ensure that you have plenty of battery power and spare batteries available.
- ✓ Gain a signal by standing away from dense objects.