LEVEL	Basic
PEOPLE	1
BUDGET	$
WHEN	Anytime
REPEAT	As needed

MODULE 1

CREATING A MANAGEMENT MAP

IN A NUTSHELL

- Creating an electronic map that can be easily updated as needed and stored in perpetuity
- Map can be readily shared with volunteers, funders, supporters, on or offsite
- Can show features like monitoring points, tracks, management zones, weed infestations, hazards
- Makes use of free on-line tools like aerial photos and drawing tools

WETmak

WETLANDS MONITORING AND ASSESSMENT KIT

A map of monitoring sites (and other features) is essential for community restoration groups. It means that anyone can continue monitoring if those who set it up leave. While pins and string on a wall map or photo are ok, it's even better to have an electronic version that you can zoom in or out of, switch between aerial photo and topo, update quickly, and share with anyone, anywhere, anytime. An electronic version can also be saved as printouts or an image file to pop into reports and slide shows.

There are some great free tools on the web to create and share a basic map, so you don't need access to costly or complicated GIS software. Advanced users can even download electronic maps to smart-phones for use in the field if your site has phone coverage.

Equipment checklist

- [ ] Computer
- [ ] Internet access
- [ ] Google Earth download (optional)
- [ ] PDF burner programme
- [ ] GPS unit, batteries and manufacturer's instructions

Skills needed

- [ ] Computer/internet use
- [ ] Aerial photo interpretation

1. Before you start

1.1 Plan your map

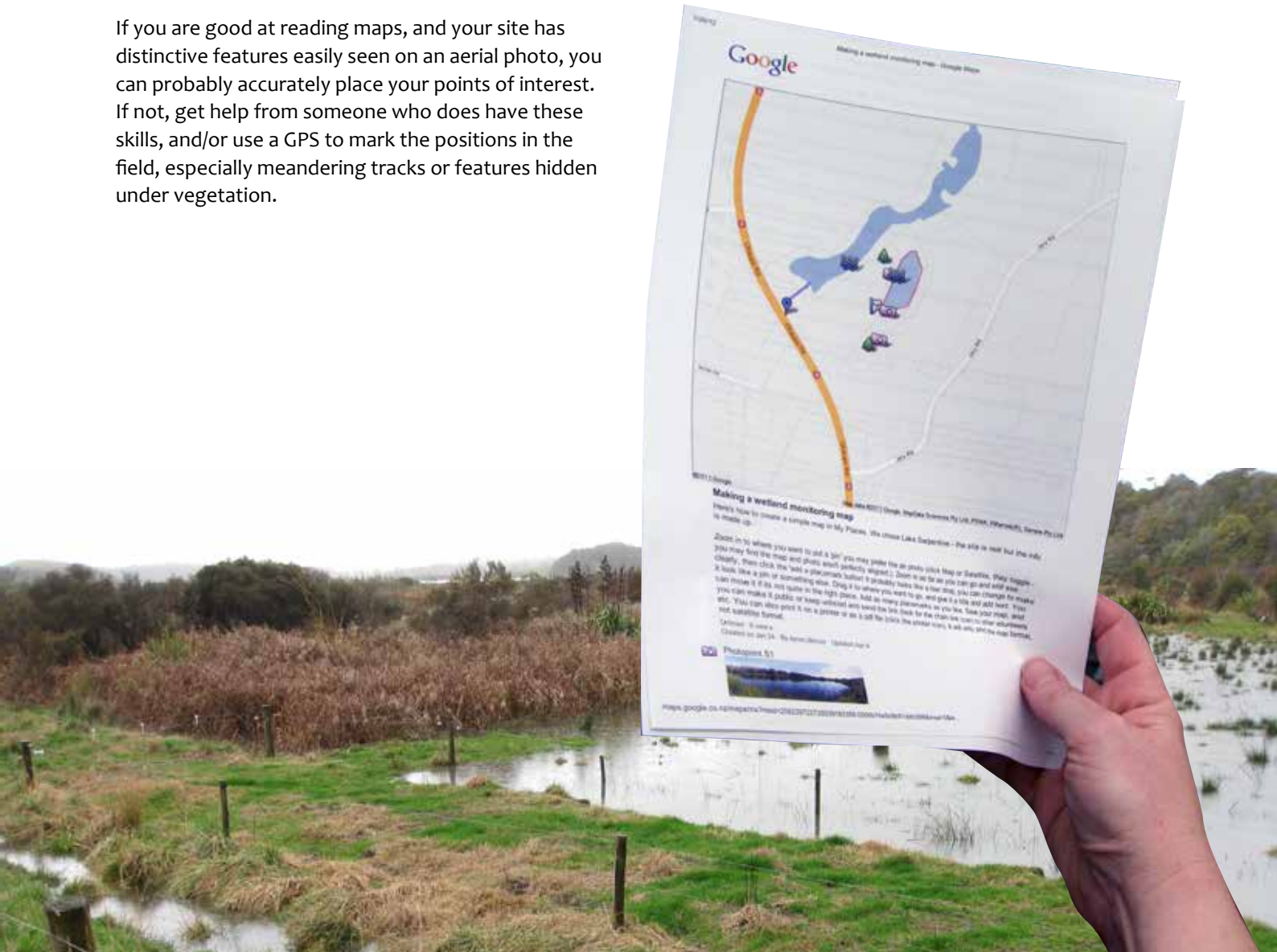
Work out the features you want to show on the wetland management map, such as:

- [ ] Entrance/parking area
- [ ] Office, tool shed or other buildings
- [ ] Walkways/ tracks
- [ ] Hazards
- [ ] Monitoring points (plots, photopoints, transects)
- [ ] Pest control lines
- [ ] Management zones
- [ ] Catchment boundary
- [ ] Waterways, inflows, outflows
- [ ] Vegetation types/ zones

If you are good at reading maps, and your site has distinctive features easily seen on an aerial photo, you can probably accurately place your points of interest. If not, get help from someone who does have these skills, and/or use a GPS to mark the positions in the field, especially meandering tracks or features hidden under vegetation.

TOP TIP:

Internet tools are being added and updated all the time. If it seems bewildering, ask the teens and pre-teens in your family to help keep you up to date with new sites and technology.



2. Making an electronic map

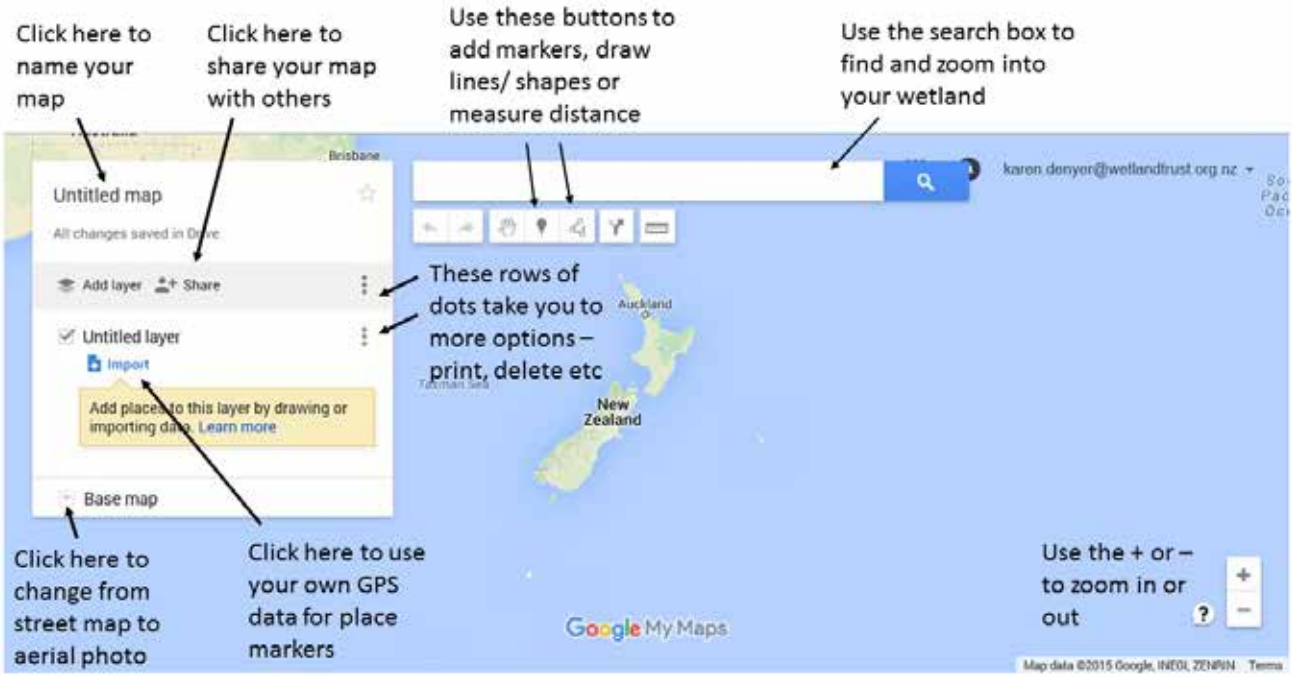
This section contains tips on creating a map using Google products because they are simple to use and most people are familiar with them. Other Search Engines like Bing and Yahoo have similar services, and new sites that allow you to make maps are being developed all the time, e.g. OpenStreetMap, ARCGis. **NOTE: Google Maps and Google Earth images are not 'live', they may be months or years old and may comprise adjacent photos of different age.** See the 'Useful websites/reading' for links to tutorials on creating a map using Google Maps.

2.1 Google Maps (GM)

Google Maps is a standard feature of Google. It is fairly basic, but has many advantages:

- Easy to quickly create your own map
- Email the link to other volunteers or staff – anyone with internet access can open it, and it's easy to understand
- Receivers can edit or add features, save as a new map and email the link back
- Viewers can switch between topo map, property boundary/road map, street view, and satellite imagery, and can zoom in or out
- Easy to get driving or walking directions to the site
- Use it to show volunteers where to park, where your monitoring plots are, etc

Some key features when creating a Google Map:



2.1.1 Set up an account

There are no fees, but you will need to set up a Google Account with a password so Google can store your maps for you. You can use the same account for other Google services. You may already have one set up.

2.1.2 Create a map file

Open the Google Maps (GM) homepage (type "Google maps NZ" in your internet browser). When the GM page opens, click on the menu button (it's a little row of three lines, top left hand side). Select "My Maps" from the menu, then select "Create Map". A box will open called "Untitled Map" – click on that and give your map a name, and a description if you wish, and save it.

Use the search box or the plus/minus buttons or your mouse to find and zoom in to your wetland. You can click the dropdown arrow next to "Base Map" and choose to have a street map or aerial photo as your backdrop (you can change them as often as you want). The aerial photo is better for working out where you are in detail, or for adding features.

2.1.3 Add features to the map

You can now add, move, or delete placemarkers, lines or shapes where you want to show features such as monitoring lines, planting zones, bait stations, hazards, parking areas - whatever you want to show people the location of. Click the "Untitled layer" button and give your layer a name – it might be Vegetation map, or Hazard register, or Pest monitoring stations, etc. You can have just one layer, or several in the same map.

To place markers, zoom in as far as you can towards the feature of interest, then click the 'Add marker' button ( ). Drag the crosshair to where you want to place the marker, and click again to 'place' it (you can move it if you wish). You can now give the feature a title and add text in the box that pops up. Add as many placemarkers as you like. You can also draw lines or shapes. Click the "Draw a line" button ( ) next to "Add mark", go to your feature (a pond, bush patch etc) and start clicking making little dots along or around the feature of interest. Double click the last one to finish it – to create a polygon/ shape double click on top of the first dot you made.

You can move, or delete place markers, lines or shapes, edit their descriptions, add photos, or change their colours or symbol – Google has a range to choose from, or you can even import your own symbol. Click the little paint can symbol ( ) next to the marker you want to change on the map legend to the left.

If you place a feature on the air photo then switch to map view it may not look in the right place because the maps and photos are not always perfectly aligned.

2.1.4 Add GPS data

The most accurate way to place data is to capture it on the ground using a GPS to create waypoints. If you have GPS data saved as a gpx, gdb or kml file you can import it directly into your Google map. Just select "Add layer" to your map, and you will see the option to "Import". Follow the prompts. Once your data appears, you can change the symbol colour/style and add more notes if you wish.

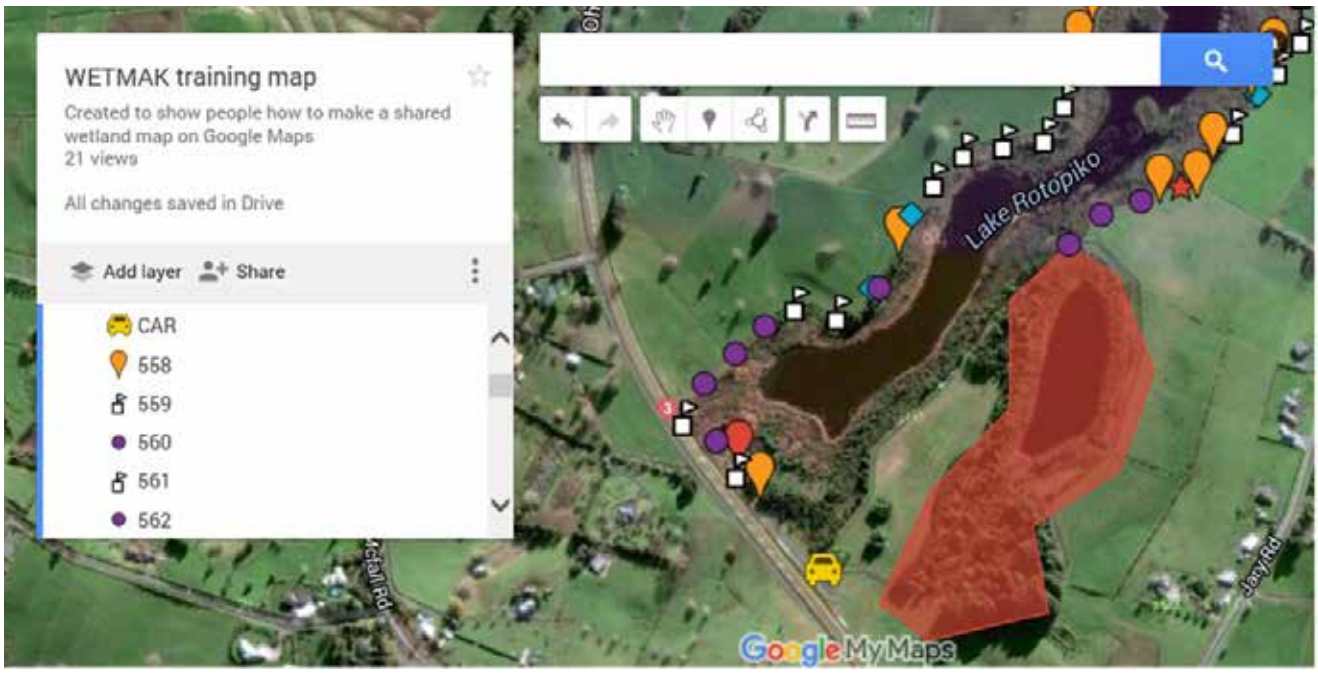
2.1.5 Save the map

Google saves the map automatically to your Google account, but you may want to save a copy in your own files. On the left hand side of the grey box with "Add layer" is a column of three buttons, which is another menu. From that you can print your map, make a pdf file, or export it as a " kml" file - a file that can be opened in Google Earth, or in Google Maps. Add today's date to the file name so you know it is the most recent version. If you want to create an image file to put into a report or on your web you can use the screen grab options (see section 2.4 of this module).

2.1.6 Share the map

You can make the map publicly available, or unlisted (only those you send the link to can open it) and can send the link to anyone you want. Click the "Share" button. You can also paste a link to your map on your website. You can update the map anytime but you only need to send out the link once – whenever someone opens it they will see your latest version.

Example of a management map made in Google Maps:



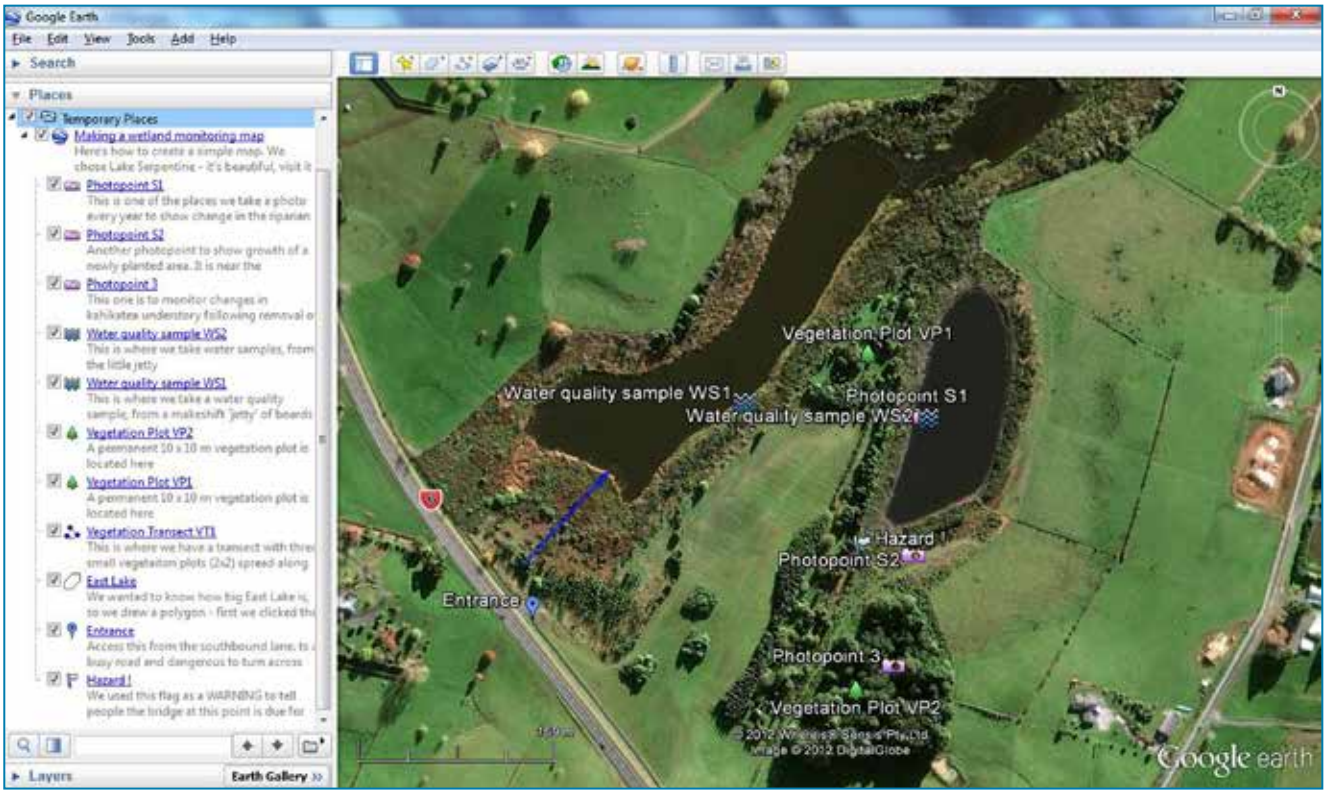
2.2 Google Earth (GE)

This is a tool that you must download from the web. The basic version is free but does use up some hard drive memory, and some companies may not give you access to it at work. Likewise, those you send the link to may not be able to open it unless they also have access to Google Earth. The advantages are that you can 'tilt' the view to see the site in 3d, handy to work out the terrain, especially if it's hard to distinguish the edge of your wetland because the adjacent vegetation looks similar. You can also open a 'street view' and see an actual photo of the site from the road or use the 'historical imagery' feature to zoom back and forwards in time to see how your site has changed. There are good tutorials you can access from the Google Earth page, and if you need advice, just write your question into an internet search box, someone is bound to have an answer somewhere on the web.

2.3 GPS Visualiser (GV)

This is another free product that is great if you have a GPS and want to see your waypoints and tracks on a map and on an aerial photo. You can also use this site to save the file as a kml that you can later import into Google Maps or Google Earth.

Example of a management map in Google Earth 3d format:



2.4 Save a map as a picture

You can print maps directly from Google Earth or Google Maps using the Print options. If you want an electronic copy, select PDF from the choice of printers. You will need to download a pdf reader if you don't have that option, it is free from http://get.adobe.com/reader/

However, you may also want to save your map as an image file (e.g. jpg or gif) to paste into a word document or powerpoint slide show. You can simply do a 'screen grab' - zoom in on your screen to the area of interest and simultaneously press these three buttons: Ctrl + Alt + PrntScrn. Then go to a blank powerpoint slide and paste the image. You can then right-click to get the 'Save File As' option (you may need to right click twice to get the box with that option). Use the down arrow next to the 'Save as type' window and save as JPEG file, not as the first one in the list (PNG file) because they are very large files. You can then open the file in Picture Manager and crop off the edges to tidy up the image, and insert it into a word or powerpoint file. There are more sophisticated ways as well that you can learn about by asking via the internet.

2.5 Store the data

- Save your Google Map file onto your hard drive as described in step 2.1.5.
- To save Google Earth files as .kml or .kmz file formats onto your hard drive. Choose File, Save, 'Save Place As'. Include the current date as part of the file name, e.g. Waiora Lagoon Map_07JAN12.kml
- If you have a web-site or Dropbox folder, store the file there, along with the relevant information.
- Send Google Map links to anyone who needs it. If you update it you wont need to send them a new link.
- Back-ups can be stored on DVD, also useful to send to others, but don't rely on them for permanent storage. Keep back-ups in a different location to the originals.
- Print out copies of each map (perhaps one showing the whole wetland and several zoomed in close ups to show more detail), and clip them together in a folder. Make sure the date is printed or written on them. Ideally the folder will contain all relevant information for your wetland, and there are several copies held at different locations. If your council or DOC office is involved in your site they may be willing to store hard and electronic copies on their systems, which will likely be archived in perpetuity.

2.6 Repeat

- Update the map as often as you need, for instance when you add new monitoring sites, or install a new track, or remove a hazard.
- If you want to keep an electronic copy of the original make sure you have a file of the original saved, make your changes, and then save as a new file name by keeping the site name, but changing the date, e.g. Waiora Lagoon_ 15JUN12. kml.

3. Interpret the data

Most people should be able to interpret the map. Make it easy by orienting printouts with north at the top, and labelling features like 'car park' to help people quickly work out where they are. Try to include part of the wetland boundary or a track if you print 'zoomed in' sections of the map, and draw the boundary of the zoomed area on a map of the whole site.

3.1 Report the data

There is no need to complete a wetland monitoring report for this module.

Useful websites/reading

Google Maps online guide
https://support.google.com/maps/?hl=en#

Google Maps http://maps.google.co.nz/
Google Earth www.google.com/earth/index.html

Shapes – calculate the area and perimeter of a shape you have drawn in Google Earth
www.earthpoint.us/Shapes.aspx

GPS Visualizer – allows you to load a file of GPS data onto a map www.gpsvisualizer.com/

Topomap – shows contour lines in more detail than on Google Maps or Google Earth
www.topomap.co.nz/

DOCgis online map viewing tool – on the DOC website. Has lots of useful data layers like land parcels, reserve boundaries, Land Cover database, topo maps, and some aerial photos. Can also be used to calculate areas and distances of shapes you draw. You may have to zoom in or out to activate a tool or layer. Your regional council may have a similar product – check their website.
http://gis.doc.govt.nz/docgis/