Appendix A

Maps

The following maps are included in the attached DVDs.

A.1 Maps from Lima, Peru

- Juan Pablo II
- San Ignacio Loyola
- Canta Gallo I
- Canta Gallo II

A.2 Maps from the 2010 BP Oil Spill

- Port Fourchon, Louisiana
- North Chandeleur Islands, Louisiana
- South Chandeleur Islands, Louisiana
- Grand Isle Terre, Louisiana
- Long Beach, Missisippi

A.3 Maps from Georgia

- Mestia, Svaneti, Georgia

Appendix B

Illustrated Guide to Grassroots Mapping

An Illustrated Guide to

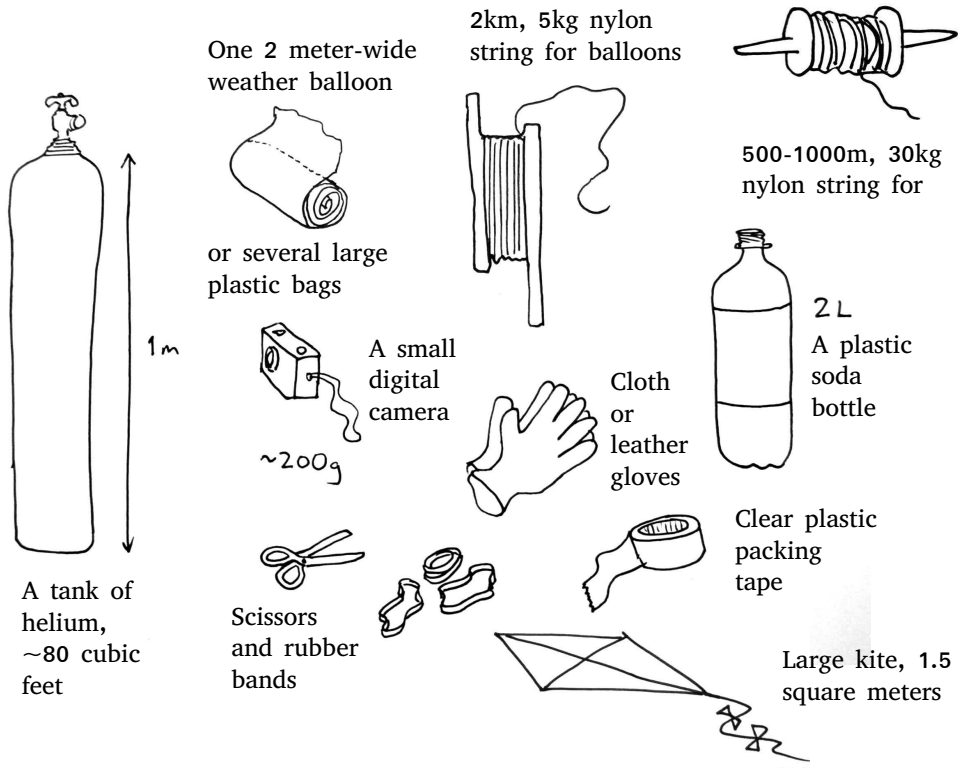
Grassroots Mapping with Balloons or Kites

By Jeffrey Warren (v1.1)

Do you want to make maps? Do you need satellite images but can't afford them? Do you want to see your home from above? Follow these instructions and you can, for as little as $100!

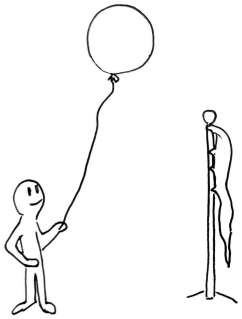
To learn more, visit http://grassrootsmapping.org

What you'll need:

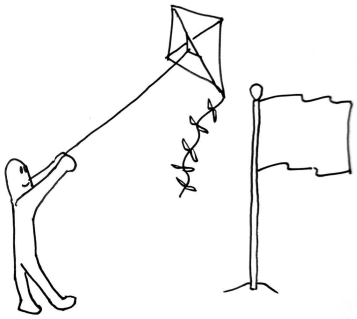


Balloon or kite?

Decide whether to use a balloon or a kite. Prepare for both; you won't know until the day comes:



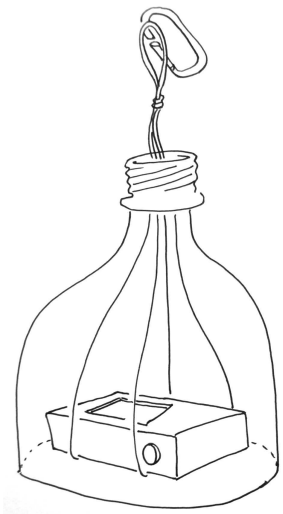
In wind below 10kph, fly a balloon.



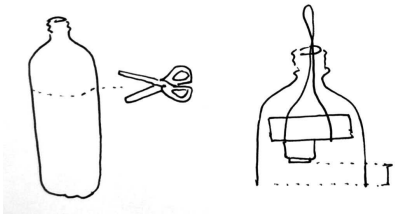
In wind above 10kph, fly a kite. Look at a flag to decide.

Build your camera capsule

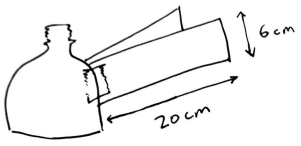
This simple protective cover stops your lens from hitting the ground, and protects your camera from hitting walls and trees.

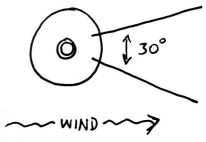


Cut a soda bottle in half and put the camera inside the top with the loop through the bottle neck.

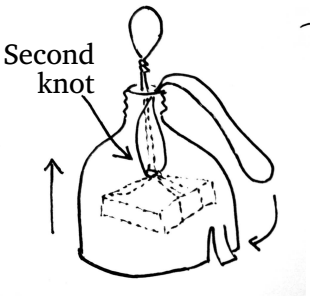


Tape on some cardboard 'wings' to stabilize it in the wind.





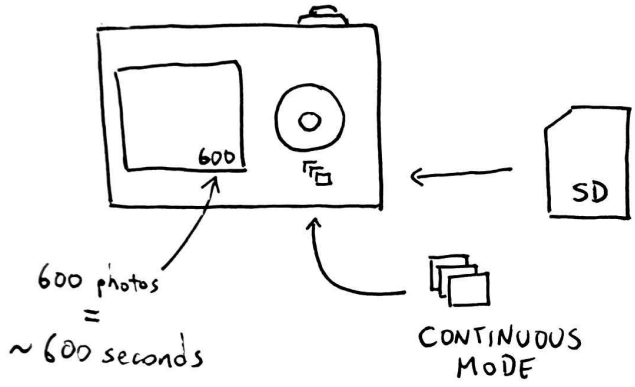
A rubber band through a second knot can be used to pull the camera snugly against the bottle.



Pull the rubber band out the top and hook it on a tab cut on the bottom of the bottle

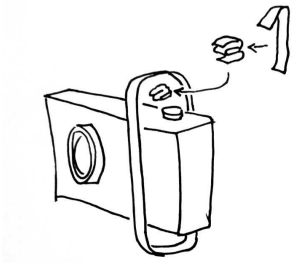
Prepare your camera

Any digital camera around 2-300 grams that has a 'continuous mode' can work. You can also use a Canon camera with the CHDK to trigger a photo every 5 seconds.



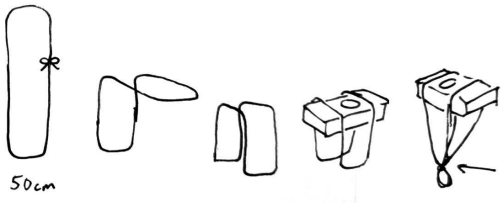
In 'Continuous Mode' a camera takes a picture every 1 second if the trigger is held down. Your display will show how many pictures you have.

To fly longer, you may need a newer battery, a larger memory card, or you can set your camera to a lower resolution.



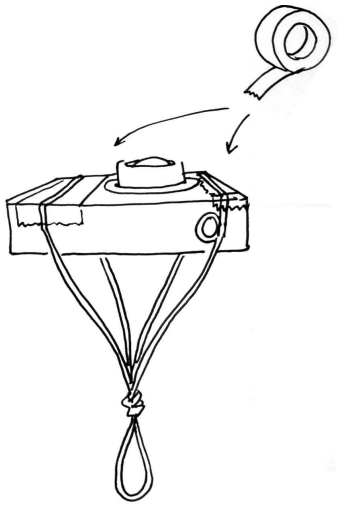
Wad up a bit of card paper or use a pencil eraser to hold down the camera trigger. Use a rubber band to hold it in place and apply pressure. Be sure the button is being pressed.

Move the rubber band to one side until you're ready to start.



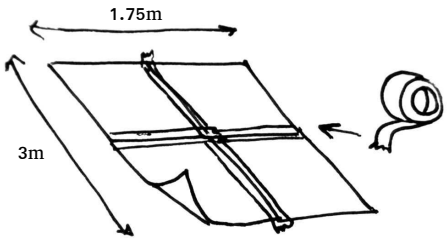
Fold a loop of string and tape it firmly onto your camera. Be sure the tape doesn't stop the lens from extending.

Press the tape down hard - its the only thing keeping your camera from slipping out of the string at 500 meters high!



Building and filling the balloon

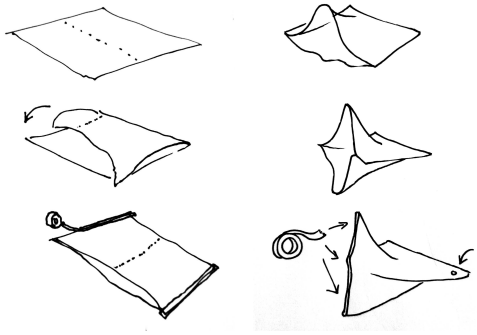
If you can't get a big enough balloon, you can make one from giant trash bags. White plastic works best - you'll need a 1.75m x 3m sheet.



Cut open the bags into rectangles, and tape them together into a larger rectangle.

Be sure to do this on a smooth, clean floor or a blanket so you don't puncture the bags.

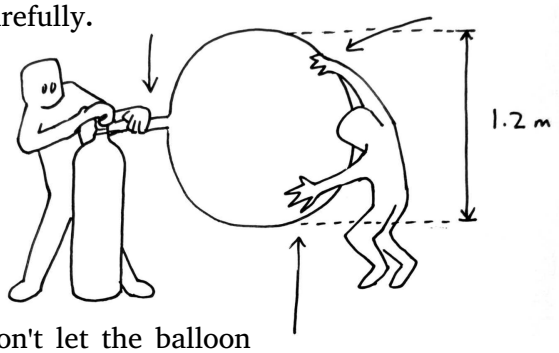
Fold the rectangle in half, and tape the sides. Open the 'pocket' until it closes vertically, then tape that shut too.



Punch a hole in one corner to fill the bag.

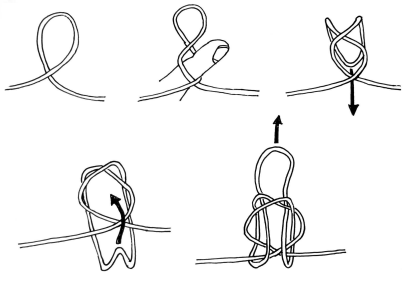
Hold the balloon onto the valve and fill slowly and carefully.

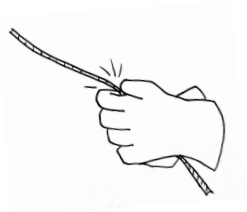
As the balloon fills it will rise and twist the neck, so hold it down gently.



Don't let the balloon touch the ground!

When you're ready to attach the camera to the kite or balloon string, tie a knot in a loop of string and clip on the camera.

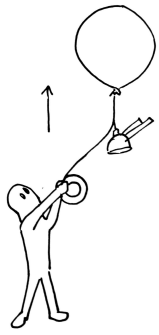




Always use gloves when flying kites - the string can burn your hands!

Flying your balloon or kite

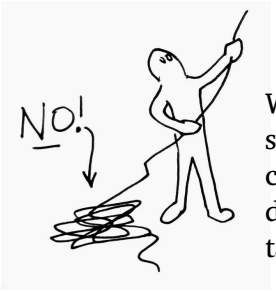
The highest wind is usually around 2pm, and the lowest is at dawn. Bring water and sunscreen if it's hot out, and charge your camera batteries the night before!



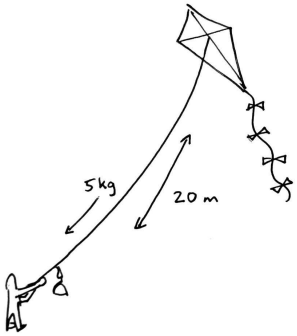
Let balloons rise as fast as you can. The wind will push them down as soon as you stop letting them rise.

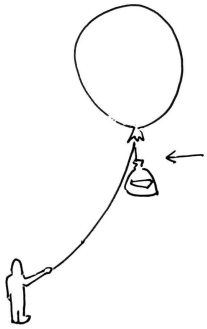
When using kites, be sure there is at least 5kg of pull, and let out 20 meters of string before making a loop and attaching the camera.

When using balloons, attach the camera just below the balloon.

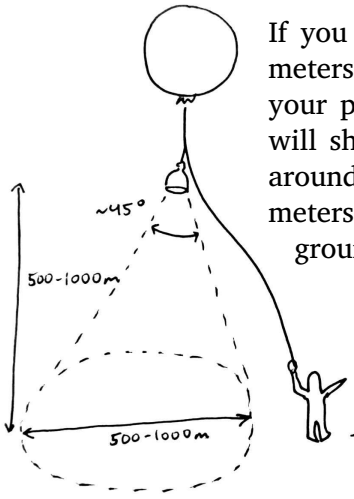


Wind the string carefully - don't let it tangle!





The camera has a field of view of roughly 45 degrees.



If you fly 1000 meters high, your pictures will show around 1000 meters on the ground.

Bring a GPS if you have one, and write down the latitude and longitude.

A small map usually takes around 2 hours to make.

Once the balloon is 500-1500 meters high, try walking around to take pictures of a greater area.

Appendix C

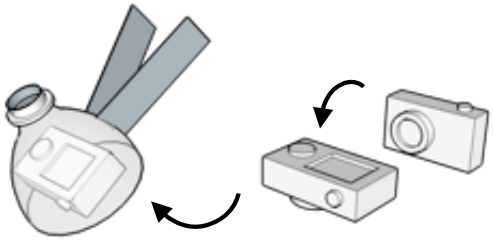
Guides and checklists to Grassroots Mapping for the BP Oil Spill

Mapping Checklist

Be sure everything is in your bag before leaving!

A Your bag should contain:

- ☑ **A camera with auto-shooting** (test it!)
- ☑ **TWO sets of FULLY CHARGED batteries**
- ☑ **1500' of string on a reel, no tangles**
- ☑ **At least one weather balloon in a protective ziploc** (two is best, or bring giant trash bags as backup)
- ☑ **Gloves to protect your hands from burn**
- ☑ **Duct tape AND clear packing tape**
- ☑ **Scissors or a knife**
- ☑ **Soft cotton string to tie everything together** (holds balloons better and cuts easier)
- ☑ **A soda bottle with wings:**



Optional:

- ☑ **A large kite (16 sq ft or more)**
- ☑ **A GPS or an iPhone or Android phone to get a latitude/longitude point**

(so we can make it into a map)

B You also need HELIUM from:

- ☑ **Louisiana Bucket Brigade HQ, 4226 Canal St, New Orleans**
- ☑ **Party City** (one $45 medium tank, $100 deposit)

Party City (9-9pm mon-sat, 11-6pm sun)
1545 Lapalco Boulevard
Harvey, LA 70058-3300
(504) 362-8008

Party City (9-9pm mon-sat, 11-6pm sun)
3009 Veterans Memorial Boulevard
Metairie, LA 70002-6046
(504) 831-9944

- ☑ **Anywhere else, just bring > 50 cubic feet, but small enough to carry.**

C Finally, bring people:

- ☑ **See GrassrootsMapping.org/volunteers**
- ☑ **Give them directions or carpool**
- ☑ **Teach them how, don't do it all yourself**

For more info, see GrassrootsMapping.org | To print more of these, see GrassrootsMapping.org/guides | For help, call 504.484.3433

Mapping Overview

A brief summary of the whole thing

A Starting your trip:

- **Louisiana Bucket Brigade is hosting the equipment bags -** go pick on up the night before and confirm that everything's there.
- **Be sure to bring some new people - folks who will hopefully lead their own trips soon**
- **Charge batteries the night before!**
- **Pick up helium at Party City - see Checklist for addresses**

B While you're mapping:

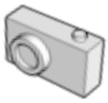
- **Try to map an area that's been mapped before, so we can compare.**
- **If you have an smartphone, enable the geotagging for the camera, and take a picture while you're flying**
  - **This will capture a location; submit the photo with your data and we'll be able to see where you were**
  - **To enable this on your iPhone, click the Settings icon > General > Location Services.**
  - **For Android, in the Camera app, press Menu, then Settings > Store location. Wait for the green 'GPS' icon:**

C Keep safety in mind:

- **Wear protective gear when dealing with contaminated water/land**
  - **protective suit, oil resistant gloves, safety goggles, face respirator, slip resistant boots**
- **Don't handle oiled wildlife unless you're trained to do so!**

D Before you go home:

- **Thank the boat captain! See if we could get another ride in the next few days**
- **Go over the checklist again to be sure you return everything**
- **Identify any potential trip leaders from your team, who could map on their own**
- **Leave a copy of your data with Louisiana Bucket Brigade**
- **Please make 3-5 reports on the Oil Spill Crisis Map (oilspill.labucketbrigade.org) when you get back from your trip!**
  - **Reports boats deploying boom, dolphins swimming in oil or sheen on the water**
  - **Focus on what you see or smell, your location and capture pictures or video clips.**
  - **Quick tip: simply take a picture of the GPS on the boat or write down the coordinates.**
  - **Submit these reports online or when you return to LABB to drop off your equipment.**



Camera Guidelines

Be sure you can use your camera before leaving!

This is for a: Canon SD1000

A Basic usage:

- **Test your camera before you leave!**
- **Just turn it on; it should flash a red icon and start snapping!**

(Logo)

- **You should see: "Intervalometer" and it should beep and snap a picture within a few seconds**
- **If it doesn't, take a picture normally, and it should start.**
- **To turn the camera off when you're done, just take out the battery.**
- **After flights, check your photos to see if they came out.**
  - **The camera should be in "auto" mode, so exposure etc. should be fine.**
  - **If images are blurry there may not be enough light, or it may be too windy.**

B Troubleshooting:

- **Check if the memory card is in the 'Locked' position. There's a little slider; lock it. The script won't run if it's not locked, weird, huh?**
- **If your camera keeps turning off by itself (either after a dozen shots, or sometimes in the middle of a flight) you need to charge the battery to 100%. If your battery is old, you may need a new battery.**
- **If you simply cannot get it to start auto-shooting, try:**
  - **Turn the camera off**
  - **Turn it on in "Review" mode**
  - **Press Menu and go down to the last option, which should be "Firmware update"**
  - **Click OK and quickly switch into "Capture" mode**
  - **You should see the red CHDK screen and it should start. You may need to manually take a picture to start it.**

C When you get home:

- **Save a copy of the images in a safe place: a CD/DVD or backup drive**
- **Then send us the pictures and we'll publish them. Choose:**
  - **Upload the data to *http://grassrootsmapping.org/upload***
  - **Put a copy on a USB key or a DVD, and get it to:**

    LA Bucket Brigade, 4226 Canal St. New Orleans, LA ZIPCODE

Balloon/Kite Flying Guide

The best way to learn is to do it with someone who's done it before

? Kite or Balloon?

- In general, kites are good in more than 15 mph and balloons in less than 10 mph wind. Check a weather website. Wind is highest at 2pm, lowest at dawn.
- Kites are expensive but balloons require helium.
- Kiting is hard. Learn from an experienced kiter, and try it closer to home before committing to a mapping trip.

K Kiting

- First get the kite flying. You need a large kite (more than 10 square feet, like a Sutton Flowform 16).
- Get the kite in the air at least 50 feet and make sure it's pulling more than 10 lbs consistently.
- Make a loop (take some slack and knot it) and clip the camera in its rig onto the loop. Start your camera and let it up.
- Keeping tension on the line, or pulling on it, makes the kite fly higher. Letting it out makes it drop, so do it slowly.
- Walk around to cover a large area.

B Ballooning

- If you're using a trash bag, tape the bag shut carefully with clear packing tape.
  - Puncture it 2 inches away from the seam, so the tape won't interfere with your filling.
  - Don't do this on rough ground or you'll puncture the trash bag.
- Pull the hole over the nozzle of the tank. bunch up some plastic around the nozzle and hold it tightly shut.
  - Watch out! Keep your fingers away from where the helium will come out!
- Starting very slowly, inflate the balloon. It should be about 5 feet wide, and should pull strongly up, i.e. 2-3 lbs. Use your height as a size guide.
  - Have a friend hold the balloon in place while it fills. Don't let it touch ANYTHING sharp!
  - Don't let go of the balloon! Always have someone in charge of holding on to it tightly!
- Tie off the balloon with a VERY good knot. Clove hitch recommended (youtube or google it). Practice this knot.
- Make a loop 6 inches below the balloon. Test all knots, and connect the camera.
- Turn on the camera and make sure it's auto-shooting; listen for beeps.
- Let the balloon rise as fast as you can; as soon as you resist it, the wind will blow it down.
- Walk around to cover a large area.

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Acronyms

API Application Programmer's Interface

BAP Balloon Aerial Photography

CEDRO Centro de Información y Educación para la Prevencinó del Abuso de Drogas

CHDK Canon Hacker Development Kit

COFOPRI Organization for the Formalization of Informal Property

EXIF Exchangeable Image File Format

GDAL Geospatial Data Abstraction Library

GeoTIFF Geographic TIFF

GIS Geographic Information Systems

GSS Geographic Stylesheets

HOT Humanitarian OpenStreetMap Team

JOSM Java OpenStreetMap Editor

KAP Kite Aerial Photography

KML Keyhole Markup Language

LABB Louisiana Bucket Brigade

MODIS Moderate Resolution Imaging Spectroradiometer

NOAA National Oceanic and Atmospheric Administration

OMC OpenMapsCaucasus

PGIS Participatory GIS, sometimes known as PPGIS or Public Participation GIS

SIPRI Stockholm International Peace Research Institute

SVG Scalable Vector Graphics

TIFF Tiled Image File Format

TMS Tiled Map Service

WMS Web Map Service

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