**Instructions to collect and import data from the iButtons**

*Collecting the remaining iButton sensors in the field*

1. After the farmer (Don Alvaro – 85 79 66 79) has been contacted to collect the sensors they can find (within a maximum of two days), it is important to go to the field within 2-3 days to find the remaining sensors.
2. The number of the sensors (6-digit numbers beginning with 337 or 338) that have been found can be entered in the script on the next page, to remove these from the total and afterwards create a KML and GPX of the remaining sensors.
3. The \*.gpx file can be placed in the GPX folder of a Garmin GPS, creating some waypoints that can be used to find the approximate location of the sensors.
4. The iButtons can store around 35 days of data, which means the process of collecting and importing data has to take less than 4 days in order to have 1 full month of data that can be used for my thesis.

*Importing data from the iButton Hygrochron sensors*

1. Download and install the OneWireViewer. All information about how to do this on a Windows based system can be found at <http://www.maximintegrated.com/en/app-notes/index.mvp/id/4373>. This software does not work on other operating systems.
2. Create a new folder named ‘Aquiares’ and within this create two more folders, one named ‘temperature’, and one named ‘humidity’.
3. Plug in the iButton adapter and push 1 or 2 iButtons in the receptor (it requires some force to keep them in place, but the adapter does not get damaged by doing this).
4. It will be important to save the right data with the right name, so please find out how the adapter reads the data (whether a certain place in the adapter always gets the same place in the *Device list*, or whether this is based on the time when they are entered).
5. Open the software and press on the device from which you want to download data, and after this press the Mission tab. Here you find the temperature and humidity data logs.
6. Save the temperature log with the number as name (e.g. 337641.csv) as CSV in the temperature folder and do the same for the humidity data. Always do this in the same order to avoid storing the data in the wrong folder (although overwriting will create an error message). If you add two sensors to the adapter (which will definitely speed up the process), make sure the data has the name of the correct sensor.

**R-Script to remove the recovered sensors from the total**

##--------------------------------Find-sensors--------------------------------##

## This script can be used to remove the already recovered sensors from the list

## of all sensors that have been located in the field. This script will create a

## \*.KML file (saved in the working directory), which can be opened with Google.

## This \*.KML file can be converted to a \*.GPX file (default format in most GPS)

## in order to be able to find the remaining sensors in them field with the GPS.

##---------------------------------v.01-09-14---------------------------------##

*# Load libraries & set the workspace*

**setwd** ("~/thesis/data/GIS/") # folder where the csv is located

**registry** <- "iButtonIDs.csv" # name of the file with locations

**library**(rgdal)

**library**(sp)

*# Read the file of all the sensors that have been placed*

**loc** <- read.csv(registry)

*# Enter the numer of the sensors that have been found (see 'loc'- file).*

*# Enter the 6-digit numbers within quotation marks, seperated by comma.*

**recovered.sensors** <- c("33760F", "337614")

*# Remove the recovered sensors from the list of all the placed sensors.*

**loc** <- loc[ ! loc$Number %in% c(recovered.sensors), ]

**l** <- loc

*# Create spatial objects from the sensors (\*.KML and \*.GPX files)*

**coordinates**(l) = ~X+Y

**sensors** <- SpatialPointsDataFrame(l, loc)

**proj4string**(sensors) = "+proj=longlat +datum=WGS84"

**writeOGR**(sensors, dsn="sensors\_left.kml", layer= "sensors", driver="KML")

# Go to http://kml2gpx.com/ to convert the KML file to a GPX object.