MAGDELESA Project

Quality Study on FAD fishery products

Sampling Protocol "Temperature follow-up"
Storing methods for collected data

Study – context and objectives

MAGDELESA is an experimental and multidisciplinary project which aims at studying conditions for management and for valorising sustainable development of moored Fish Aggregating Device (FAD) in the Lesser Antilles and Haiti. Its main purpose is to increase scientific and technical knowledge as well as share skills needed for coordinated management within countries concerned by the development of shared marine resources.

During the last years, small-scale fishing has clearly evolved towards pelagic fishing namely caught under FADs. The quality of FAD fishery products must be controlled, from capture to consumption, in order to guarantee safety of those seafoods placed on the consumer market.

Through this project, we aim at identifying the main causes of quality deterioration seen in large pelagic species captured around FADs. To this end, on each island, fish flesh temperatures will be measured, as well as changes in quality, by the use of organoleptic codes at different stages, from capture to consumption. The collected data will be completed, in Martinique, by determination of specific composition of fish flesh. Contaminant and histamine levels will be measured internal parasites identified. These results will be communicated and debated in a workshop towards ensuring sage products that comply with existing regulations

Follow-up of temperature of fish flesh and quality changes

These 2 parameters will be measured by an observer on board a fishing boat.

1. Temperature tracking of the flesh of fish on sale

Temperature recorders will be provided to each island, to carry out the study. A technical document for installing the programme and operating the recorder is included in A**ppe**ndix **1**. A**ppe**ndix **2** explains the different steps for programming the recorder, so as to ensure that data collection is homogenised on a Caribbean-wide level.

Temperature records will be logged for three species that are commonly captured around FADs: big specimen of yellow-fin tuna (*Tunnus albacares*) weighing over 25kg, blue marlins (*Makaira nigricans*) and blackfin tuna (*Tunnus atlanticus*).

A survey form (**Appe**ndix **3**) will be used to reference the collected data. It is made up three sections – the first concerns fishing boats, the second concerns the fishing trip itself and the third concerns temperature readings. This form should be printed on water-proof paper and filled out using a lead pencil.

Whenever a large pelagic species is caught, each action carried out by the skipper of the fishing vessel should be noted in detail by the on-board observer and several temperature measurements should be taken on the same fish, up to the time of its sale.

The temperature recorder is fitted with two independent probes. The red temperature probe will be used to monitor changes in the ambient temperature (hold or icebox, according to where the fish is stored) and the white probe will measure the surface temperature of the fish's flesh.

**Equipment to prepare before boarding**

Temperature tracking equipment can be stored in a water-tight box or container. This equipment should include:

- One or more temperature tracking forms printed on water-proof paper
- A lead pencil and a clipboard for taking notes at sea
- A water-proof camera
- A recorder already programmed and ready for use as indicated in Appendix 2
- The activation key (stored separately from the recorder)
- A tape measure and a scale
- A GPS
- A watch

Actions to be carried out at sea

1. The top of the tracking form should be completed upon departure, notably the first section "Vessel identification".

2. The second section can be completed upon arrival at the FAD. Attention should be paid to the WGS84 reference datum and to the programming of the GPS, so as to ensure that coordinates are taken in the Degrees/Minutes/Seconds format. The surface temperature of the water can also be measured by immersing one of the probes <u>without activating the recording function</u>.

3. The third section can be filled upon the capture of a large pelagic fish (yellow-fin tuna, black-fin tuna or blue marlin) and various observations (type of evisceration, gaffing, rinsing, etc.) as well as the time can be noted.

4. When the work of the fisherman has been completed (before the fish is subject to onboard conditioning) make a small cut on the surface of the fish's skin, on the tail (in the white muscle) and <u>insert the white probe</u> to a depth of a few centimetres.
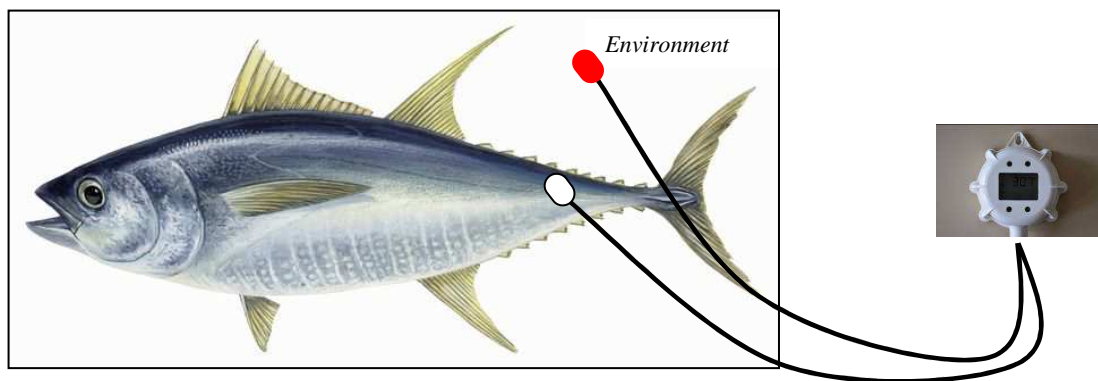
5. <u>Activate the thermometer using the magnetic key</u> (the green LED will flash). Recording will start 10 seconds after activation.

6. Place the thermometer next to the fish (in the icebox or on the deck of the boat, according to where the fish is stored on board), while making sure that the red probe is placed in the ambient environment (air in the icebox or air circulating on deck).

7. If anything is done to the fish being monitored (for example – humidification in the hold, etc.), take note of what is being done and of the time.

8. Note the landing time and follow the fish to its point of sale or storage (cold room, deep-freezing tunnel). Leave the sensors connected and take notes of the time, until the fish is sold or until the T1 probe (white) registers the temperature of the place of storage.

9. Fill in the missing information on the temperature tracking form (landing time, time when fishing stops, size and weight of fish, etc.).

10. If the fish is sold the following day, come back to the point of sale to monitor its sale and note the time at which recording stopped.

Taking photographs to illustrate the fishing trip

Photographs must be taken by the observer during the fishing trip, so that the collected data can be compared.

These photographs must be taken as shown below and named in the same way. They should be included in the "Pictures" section of the folder containing the other documents concerning the fishing trip:

(Example of photographs taken during a fishing trip in Martinique (code MA), on September 8th 2011)

Boat

MG_MA_20110908_BOAT

Hold

MG_MA_20110908_ICEBOX

FAD

MG_MA_20110908_FAD

Fixing the bait

MG_MA_20110908_BAIT

Fish being monitored

MG_MA_20110908_FISH

Evisceration

MG_MA_20110908_EVISC

Placing the probes

MG_MA_20110908_PROBE

Sale

MG_MA_20110908_SALE

Actions to be carried out upon return to laboratory

1. Put the recorder thermometer on the transmitter (as explained in Appendix 1) and launch the programme.

2. There are two possible scenarios:
   a. The recorder has completed the logging of measurements; the display shows "LOG DONE". Go directly to step 3
   b. The recorder is still memorising; the display shows "LOG". Click on **Complete logging**

3. Click on [Get data]. The log report will open up and the downloading of data will begin (this may take several minutes).

4. Click on "Record" and indicate the date of the fishing trip in the title of the document (for example – 20110908.xls) save under C/HI141000.

5. Click on [Shut Dn], and remove the recorder (which should be switched off).

6. Close the programme.

7. Open the folder where the document is saved (Start/C-Drive/HI141000).

8. Copy the document (in our example – 20110908.xls) and paste it in the folder "Magdelesa/Quality study/Temperature tracking" (see Appendix 2 Data collection).

9. Rename it as follows: **MG_MA_20110908.xls**

MAGDELESA Project code   Partner island code   Date (yyyymmdd)
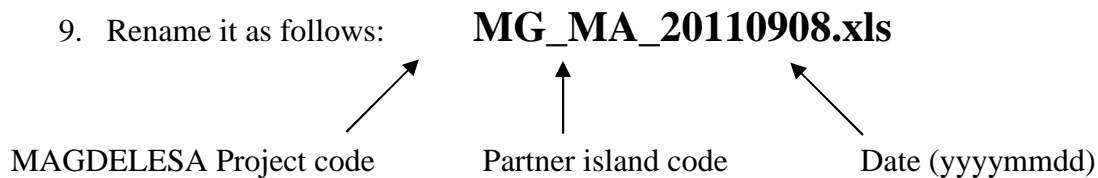
10. Open the document. There should be two tabs, one named "Report" and the other "Data".

11. Insert a tab in second position and name it "Tracking form".

12. Copy and paste the source file (which would have been sent in advance by the IFREMER in Martinique) and enter the information from the field form onto this tab.

13. Go to the data tab, insert a row at the very top and in the first column enter "Date/time", in the second enter "Internal Temperature", in the third enter "Ambient Temperature", and in the fourth "Comments".

14. Find the times at which actions were noted on the field form (for e.g.: Placed in ice box at 10:26 am; Humidification at 2:32pm) and enter them in the "Comments" column.

15. Save the document.

16. You can now clean the recorder and the probes with a damp cloth.

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Appendix 1: Technical Document
Use of the HI 141 JH Temperature Recorder

1. List of equipment provided

The equipment provided by the project for tracking temperatures consists of the following:
- An infrared temperature recorder fitted with an LCD screen and two probes (1 white and 1 red)
- A magnetic activation key
- An RS 232 USB adapter
- A USB flash drive for installing the programme
- A CD for installing the programme
- Instructions

2. Programme installation

a) Plug the USB flash drive into your computer. After a few seconds it will be detected.
b) Open the folder "HI141000".
c) Double click on SETUP.EXE.
d) When the first window opens up click on OK.
e) A second window will open, click on the computer logo, without changing the installation destination.
f) A final window will open up to inform you that the installation was successful. Click on OK.
g) The programme is now installed.
h) Remove the USB flash drive

3. Installation of the USB/RS232 transmitter
NB: this step is optional if you have an RS232 interface on your computer

i) Insert the HI92250 USB drivers disc installation CD. Close the programme window.
j) Connect the USB/RS232 adapter to your computer.
k) An "Add new hardware wizard" window will open up. Select "Install from a list or specific location". Click on "Next".
l) A second window will open up. Select "Search removable media" and unselect "Include this location in the search".
m) Click on "Next" to launch the search for drivers on the CD.
n) The window will close and indicate that the programme has been installed.
o) Another window will open up. Repeat steps k) to n).

4. Use of the Transmitter/Recorder system

p) Start by connecting the RS232 cable of the transmitter to the USB/RS232 adapter and tighten the two screws in the side.
q) Plug the adapter into the USB port of your computer.
r) Place the recorder face down on the transmitter, ensuring that the lugs are aligned as shown in the photo.

s) Launch the programme (to do so click on: Start/All programmes/HI141000 0.9.4)
t) The home page of the programme will appear.
u) You have to bookmark the USB port where the transmitter is plugged in. Click on "OK", then on Search/Apply and OK
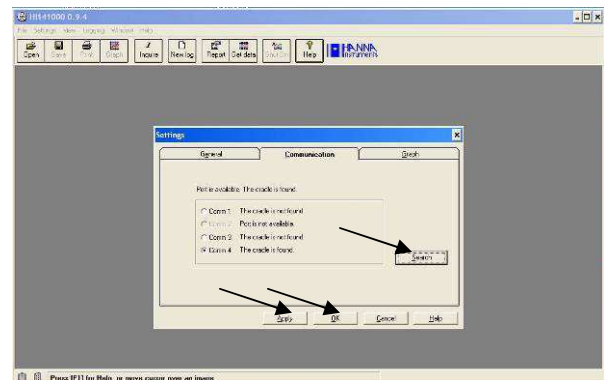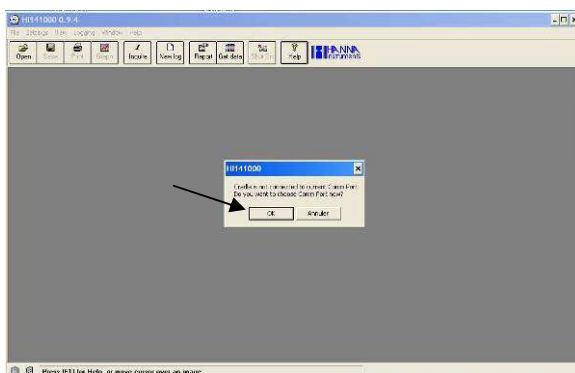
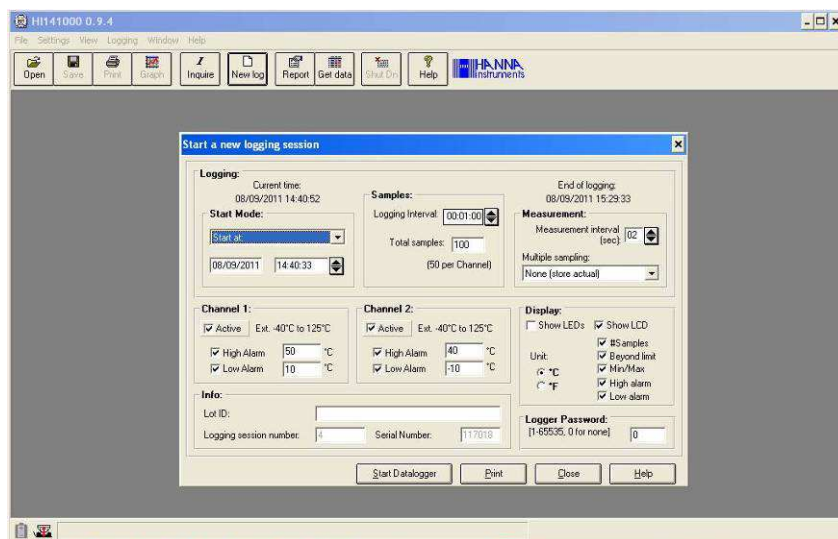Your connection has now been detected.

The main menu offers the principal functions of the programme.

Click on the [Inquire] logo to access the features of the recorder. The series number will appear. You will be asked to note it on the field tracking form.
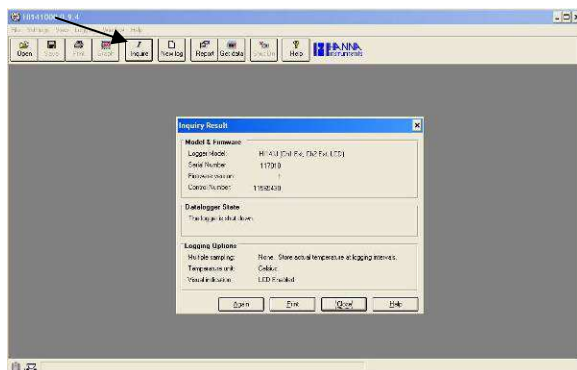
To start logging, click on [New log].
A settings window will open up.

You can choose the settings for your log.

The "Start Mode" box allows the user to define the beginning of the log. A drop-down choice of possibilities is offered to the observer. In our case, where the exact time of capture is not known, it is preferable to start with the magnetic key.

Caution: *The recorder will be activated upon coming into contact with the magnetic key. To ensure that activation does not take place in an untimely fashion, be sure to store both items separately.*

In order to homogenise the data collected on different partner islands, Appendix 2 describes how to programme the thermometer and how to file temperature records.

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Appendix 2: Technical Document
Programming of the HI 141 JH Temperature recorder and Methodology for filing data

1) Standardized recorder settings

Once the programme is launched and the recorder placed on the transmitter, you can choose the settings for your next logging session.

START MODE
Select Magnetic key + Delay by and enter 10 seconds
The logging session will begin 10 seconds after activation by the magnetic key.

SAMPLES
Set the logging interval time at one minute and the total number of samples at 14 400 (which will cover the entire day of the fishing trip as well as the four following days during which the fish may be sold).

CHANNEL 1 and CHANNEL 2
Activate both probes. Set the high and low alarm values as indicated (-10°C, 50°C). For information, temperature probe 1 is white, probe 2 is red.
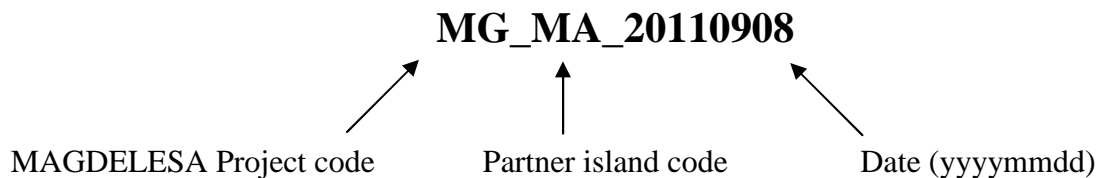
DISPLAY
Select, as indicated, the information that will appear on the recorder.
Degrees Celsius (°C) will be the temperature unit used throughout the study.

INFO
Enter the lot identification code. This type of identification code was chosen to simplify the filing of data.

MG_MA_20110908

MAGDELESA Project code   Partner island code   Date (yyyymmdd)

The codes for the Caribbean islands are as follows:
Martinique: MA
Guadeloupe: GU
Dominica: DO
St Vincent & the Grenadines: VI
Grenada: GR
St Kitts and Nevis: KN
Haiti: HA

LOGGER PASSWORD
You have the option of setting a password. If you decide to do so, make sure to make note of it, so as not to forget it. The default password is 0 (zero).

Once the logging settings have been defined and verified, click on START DATALOGGER.

The data is recorded in the thermometer. You can remove the thermometer from the transmitter. The "WAIT TO LOG" alert should appear on the LCD screen of the recorder. This will change to "LOG" when it is activated by the magnetic key.

2) <u>Methodology for filing data</u>

To simplify the classification of the data collected, a folder should be created on the desktop of the observer's computer (or on the network). This folder should be named MAGDELESA_ "Island code" *(for example MAGDELESA_DO for Dominica.*

Within this folder, you should create another folder called "Quality Study" and within "Quality Study", another folder called "Temperature tracking".

The latter should contain all of the data collected and, notably, the tracking forms, thermometer data and photos.

A folder must be opened for each fishing tip and named as follows:

MG_MA_20110908

MAGDELESA Project code   Partner island code   Date (yyyymmdd)
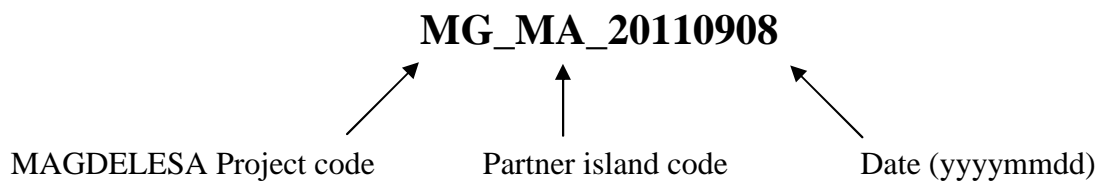
(For example, for a fishing trip on November 17th 2011 in St Vincent, the file will be named: MG_VI_20111117)

Insert a sub-folder called "Pictures" into this folder, containing the photos taken during the fishing trip (and referenced as described on page 4).

The Excel document corresponding to this trip must also be saved in this folder. It should have three tabs: tab 1 – the HI141000 Report; tab 2 – the tracking form; tab 3 – the formatted temperature data (see pages 5-6).
IFREMER will send you a model folder along with the recorder.
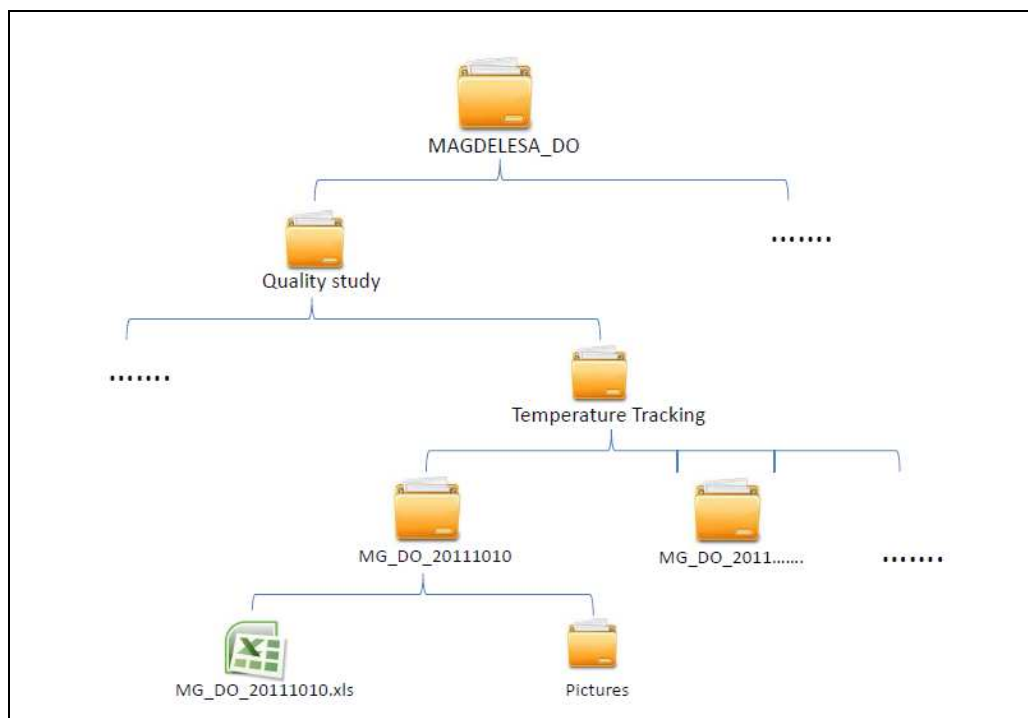
MAGDELESA – Quality Study – Temperature tracking

Date : …. / …. / 20….

Vessel Identification

Observer:

Name of vessel: …………………… **Type of hull:** ……………………
Registration n°: …………………. **Hold:** Y/N **Volume:** ……… L
Name of captain: ……………….. **Colour of hold:** ………………..
N° of men aboard: ……… **Type of onboard refrigeration:** …………..
Port of depart./arrival (if different): ………………. **Time of departure:** **time of arrival:**

Description of fishing trip

Number of FAD visited: ……..

GPS Position (WGS84, DMS) **:** N …. ° ….' …. …. / W …. ° ….' …. ….

Gear used: **Trolling line** **Drifting buoys** **Jigging** **Other:** ………..

Start of fishing: …………….. **End of fishing:** …………………..

Temperature readings

Recorder series n°: …………….. **Temperature of water at surface:** ……. °C
Recording start time: ……………..

Species tracked: .... **Fork length:** ………….. cm **Weight:** …… kg

PP / PV / PEV

Critical action	Time	Temperature white probe	Observations
Capture			Gaffed/harpooned
Slaughter			Slaughter method
Evisceration			Internal organs/gills/blood
			Rinsing Y / N
Onboard conditioning			Icebox / Hold
			Banana leaves / jute sack
			Other: …………
Landing			
Sale			Direct sale / Market sale
			Icebox / Cold room /
			Deep freezing
End of sale			

Data entry into the base **Date:** / / **Signature**