#siglibre 2019

UTM
UNIDAD DE TECNOLOGÍA MARINA

CSIC
CONSEJO SUPERIOR DE INVESTIGACIONES CIENTÍFICAS

DISTRIBUCIÓN Y VISUALIZACIÓN WEB EN TIEMPO REAL DE DATOS DE ADQUISICIÓN CONTINUA EN BUQUES OCEANOGRÁFICOS

Juan Luis Ruiz Valderrama
Oriol Domingo Adell

I. INTRODUCCIÓN

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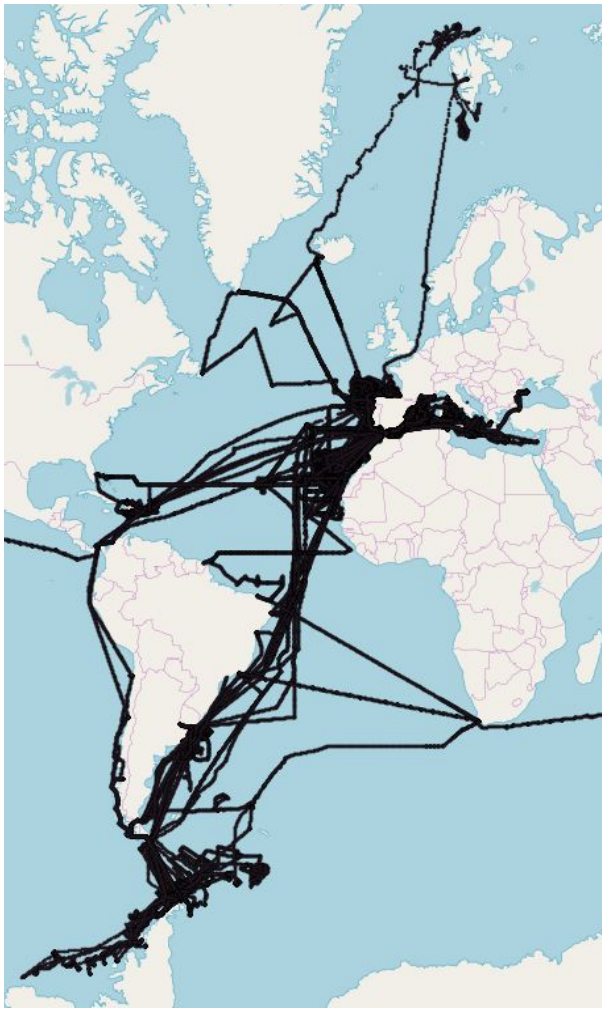
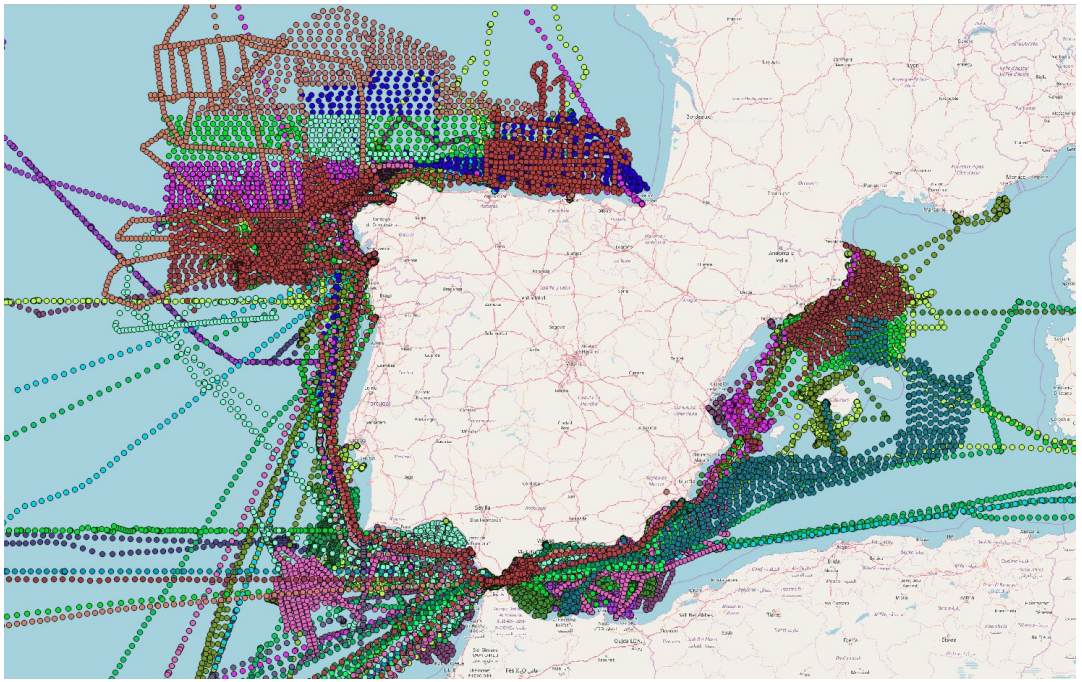
GOBIERNO DE ESPAÑA
MINISTERIO DE CIENCIA, INNOVACIÓN Y UNIVERSIDADES



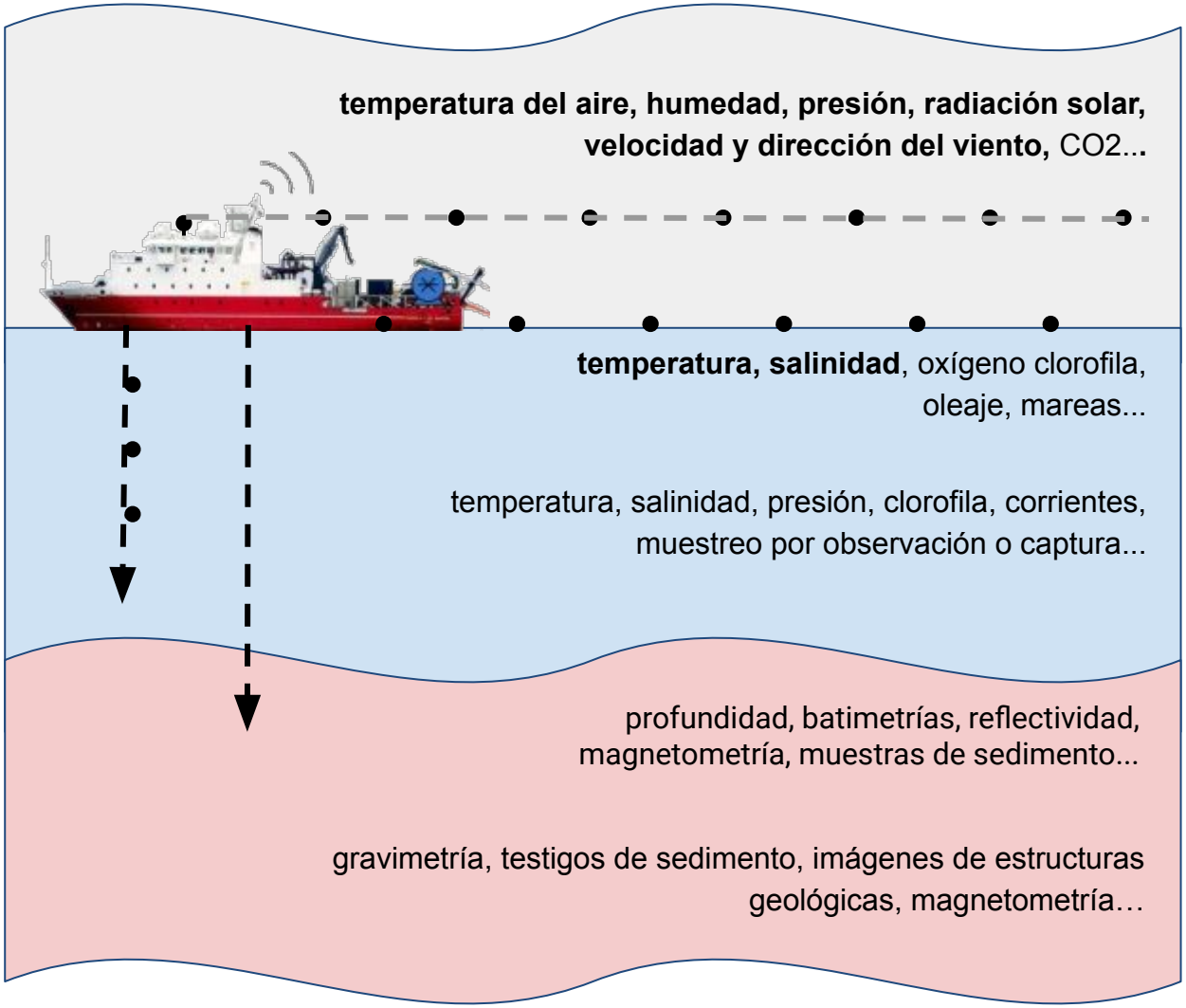


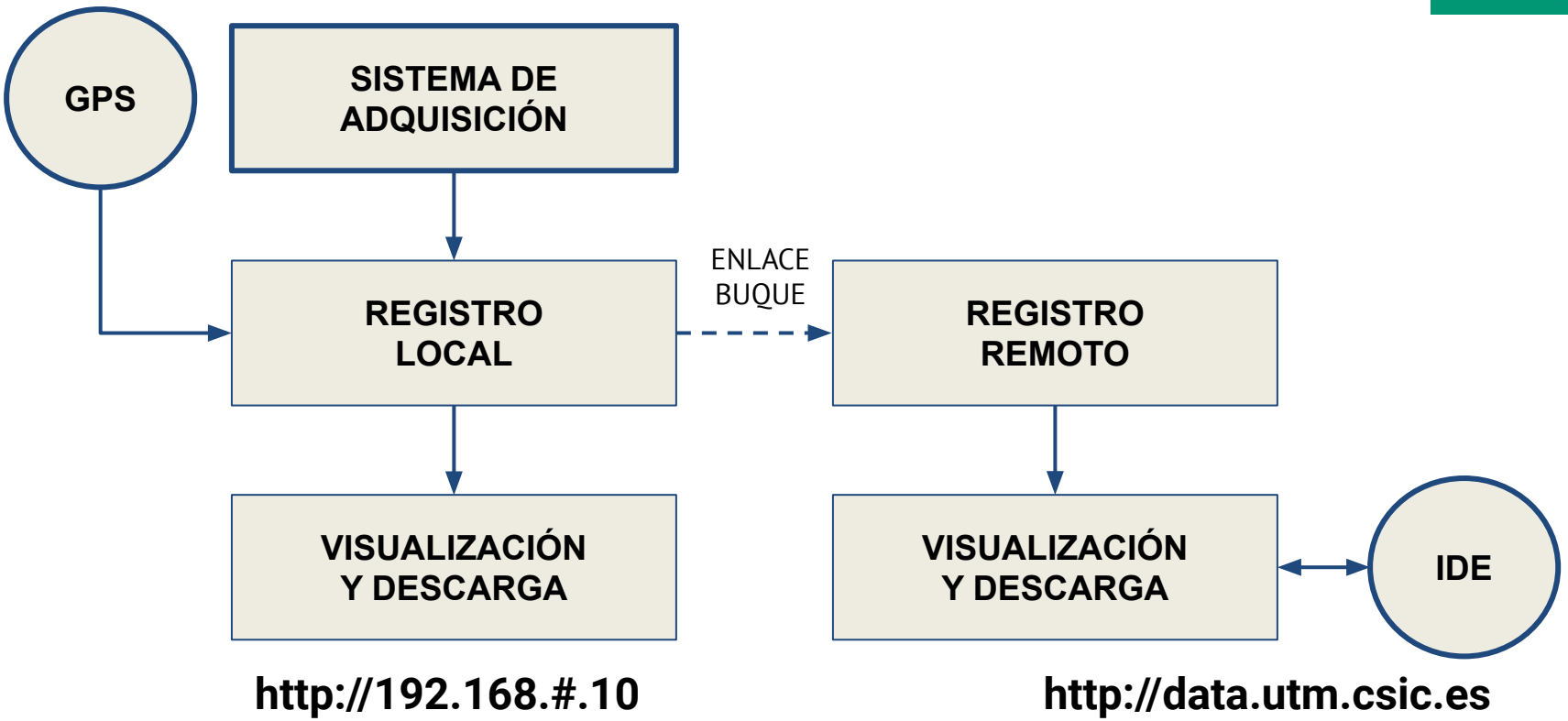
1991 - 2019

240 cruises

~ 30 TB

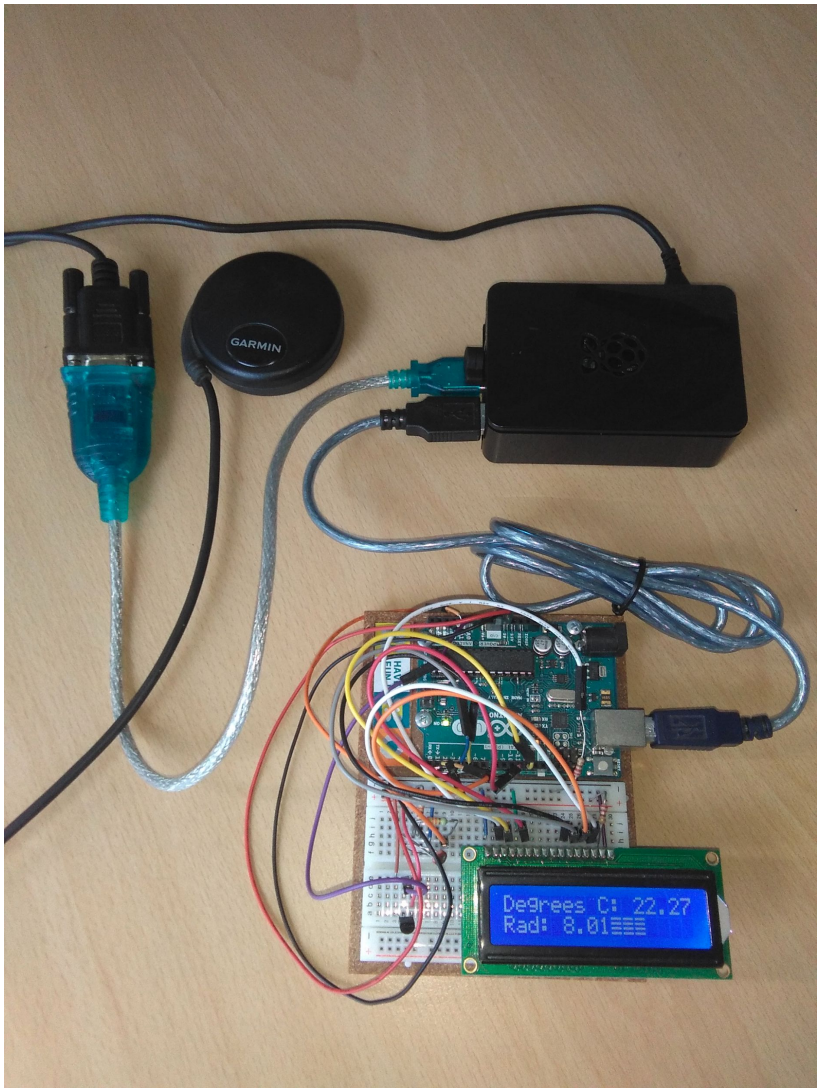
PHYSICS
BATHYMETRY
GEOLOGY
CHEMISTRY
BIOLOGY

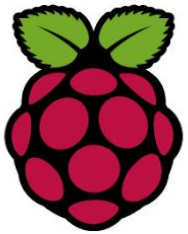

temperatura del aire, humedad, presión, radiación solar, velocidad y dirección del viento, CO2...
temperatura, salinidad, oxígeno clorofila, oleaje, mareas...
temperatura, salinidad, presión, clorofila, corrientes, muestreo por observación o captura...
profundidad, batimetrías, reflectividad, magnetometría, muestras de sedimento...
gravimetría, testigos de sedimento, imágenes de estructuras geológicas, magnetometría…
ATMÓSFERA
MET
SUPERFICIE DEL AGUA
TSS
COLUMNA DE AGUA
FONDO OCEÁNICO
SUBFONDO OCEÁNICO


GPS
SISTEMA DE ADQUISICIÓN
REGISTRO LOCAL
ENLACE BUQUE
REGISTRO REMOTO
VISUALIZACIÓN Y DESCARGA
VISUALIZACIÓN Y DESCARGA
IDE
http://192.168.#.10
http://data.utm.csic.es

II. REGISTRO

NMEA GPS





BASH
THE BOURNE-AGAIN SHELL

THE APACHE SOFTWARE FOUNDATION

php

ARDUINO

II. REGISTRO - Referencia temporal

#siglibre 2019

gps.sh: lectura, sincronización temporal, transformación de formato y registro de GPS

cat /dev/ttyUSB0

```
data@gps
File  Edit  View  Search  Terminal  Help
$GPGGA,092340,4123.1477,N,00211.7233,E,1,08
$GPGSA,A,3,02,06,12,14,,24,25,29,,32,,,2.3,
$GPGSV,3,1,12,02,26,093,18,06,16,054,18,12,
$GPGSV,3,2,12,19,04,037,20,24,44,126,19,25,
$GPGSV,3,3,12,31,06,306,19,32,40,287,37,09,
$GPRMC,092341,A,4123.1476,N,00211.7233,E,00
$GPGGA,092341,4123.1476,N,00211.7233,E,1,08
$GPGSA,A,3,02,06,12,14,,24,25,29,,32,,,2.3,
$GPGSV,3,1,12,02,26,093,18,06,16,054,18,12,
$GPGSV,3,2,12,19,04,037,20,24,44,126,20,25,
$GPGSV,3,3,12,31,06,306,18,32,40,287,37,09,
$GPRMC,092342,A,4123.1475,N,00211.7233,E,00
$GPGGA,092342,4123.1475,N,00211.7233,E,1,08
$GPGSA,A,3,02,06,12,14,,24,25,29,,32,,,2.3,
$GPGSV,3,1,12,02,26,093,18,06,16,054,18,12,
$GPGSV,3,2,12,19,04,037,20,24,44,126,21,25,
$GPGSV,3,3,12,31,06,306,18,32,40,287,38,09,
$GPRMC,092343,A,4123.1474,N,00211.7232,E,00
$GPGGA,092343,4123.1474,N,00211.7232,E,1,08
$GPGSA,A,3,02,06,12,14,,24,25,29,,32,,,2.3,
$GPGSV,3,1,12,02,26,093,15,06,16,054,18,12,62,039,30,14,30,307,43*72
$GPGSV,3,2,12,19,04,037,20,24,44,126,23,25,63,296,42,29,40,196,23*7A
$GPGSV,3,3,12,31,06,306,18,32,40,287,38,09,15,092,00,15,10,179,00*7D
$GPRMC,092344,A,4123.1473,N,00211.7232,E,000.0,212.2,270519,000.3,E*75
$GPGGA,092344,4123.1473,N,00211.7232,E,1,08,1.1,41.2,M,51.3,M,,*71
$GPGSA,A,3,02,06,12,14,,24,25,29,,32,,,2.3,1.1,2.0*38
```

```
#!/bin/bash

# Settings

gpsdev="/dev/ttyUSB0"
gpsset="4800 nl"

wwwpath="/var/www/html"
bakpath="/mnt/usb/gpsbak"

stty -F $gpsdev sane
stty -F $gpsdev $gpsset

# Set host clock
IFS=',';read -a rmc < <(cat $gpsdev|grep --line-buffered RMC)

y=20${rmc[9]:4:2};m=${rmc[9]:2:2};d=${rmc[9]:0:2}
H=${rmc[1]:0:2};M=${rmc[1]:2:2};S=${rmc[1]:4:2}

sudo date -s "$y/$m/$d $H:$M:$S" > /dev/null 2>&1

# Initialize auxiliar variables
lastmin=$M
lasthour=$H
```

RMC
recommended minimum data for gps

#siglibre 2019

gps.sh

```
data@gps: ~
File  Edit  View  Search  Terminal  Help
2019/05/27 09:36:23,41.3858,2.1951,0,337.0
2019/05/27 09:36:24,41.3858,2.1953,0,337.0
2019/05/27 09:36:25,41.3858,2.1953,0,337.0
2019/05/27 09:36:26,41.3858,2.1953,0,337.0
2019/05/27 09:36:27,41.3858,2.1953,0,337.0
2019/05/27 09:36:28,41.3858,2.1953,0,337.0
2019/05/27 09:36:29,41.3858,2.1953,0,337.0
2019/05/27 09:36:30,41.3858,2.1953,0,337.0
2019/05/27 09:36:31,41.3858,2.1953,0,337.0
2019/05/27 09:36:32,41.3858,2.1953,0,337.0
2019/05/27 09:36:33,41.3858,2.1953,0,337.0
2019/05/27 09:36:34,41.3858,2.1953,0,337.0
2019/05/27 09:36:35,41.3858,2.1953,0,337.0
2019/05/27 09:36:36,41.3858,2.1953,0,337.0
2019/05/27 09:36:37,41.3858,2.1953,0,337.0
2019/05/27 09:36:38,41.3858,2.1953,0,337.0
2019/05/27 09:36:39,41.3858,2.1953,0,337.0
2019/05/27 09:36:40,41.3858,2.1951,0,337.0
2019/05/27 09:36:41,41.3858,2.1951,0,337.0
2019/05/27 09:36:42,41.3858,2.1951,0,337.0
2019/05/27 09:36:43,41.3858,2.1951,0,337.0
2019/05/27 09:36:44,41.3858,2.1953,0,337.0
2019/05/27 09:36:45,41.3858,2.1953,0,337.0
2019/05/27 09:36:46,41.3858,2.1953,0,337.0
2019/05/27 09:36:47,41.3858,2.1953,0,337.0
2019/05/27 09:36:48,41.3858,2.1953,0,337.0
```

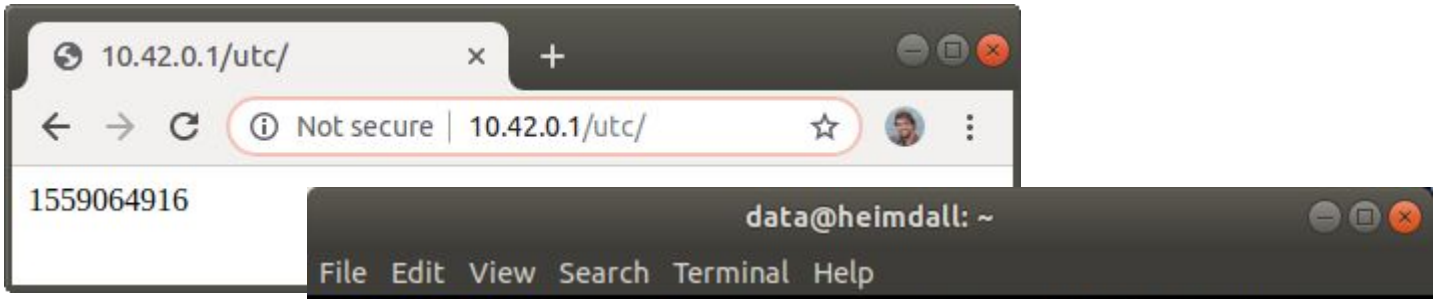
```
# Infinite loop
while true
do
        # Read GPS telegram as array (view end of the loop)
        IFS=',' read -a rmc

        # Extract date and time from GPS telegram
        y=20${rmc[9]:4:2};m=${rmc[9]:2:2};d=${rmc[9]:0:2}
        H=${rmc[1]:0:2};M=${rmc[1]:2:2};S=${rmc[1]:4:2}

        # Set host clock every hour
        if [[ $lasthour != $H ]]
                then
                lasthour=$H
                sudo date -s "$y/$m/$d $H:$M:$S" > /dev/null 2>&1
        fi

        # Convert geographical coordinates to degrees
        if [[ ${rmc[4]} == "S" ]]
                then latsign=-1
                else latsign=1
        fi
        lat=$(echo "scale=4;$latsign*(${rmc[3]:0:2}+${rmc[3]:2:5}/60)"|bc)
        if [[ ${rmc[6]} == "W" ]]
                then lonsign=-1
                else lonsign=1
        fi

        lon=$(echo "scale=4;$lonsign*(${rmc[5]:0:3}+${rmc[5]:3:5}/60)"|bc)
        #Speed Over Ground (knots) with 2 decimals
        sog=$(echo "scale=2;${rmc[7]}"|bc)
        # Course Over Ground (degrees) with 2 decimals
        cog=$(echo "scale=2;${rmc[8]}"|bc)

        # Final CSV time-coordinates record
        IFS='';gpsdata="$y/$m/$d $H:$M:$S,$lat,$lon,$sog,$cog"

        # Record for real time file with last value
        echo $gpsdata > $wwwpath/gps

        # Save every minute in a daily file
        if [[ $lastmin != $M ]]
                then
                lastmin=$M
                echo $gpsdata >> $bakpath/$y$m$d
        fi

# Read GPS device and filter by RMC telegram
done < <(cat $gpsdev|grep --line-buffered RMC)
```

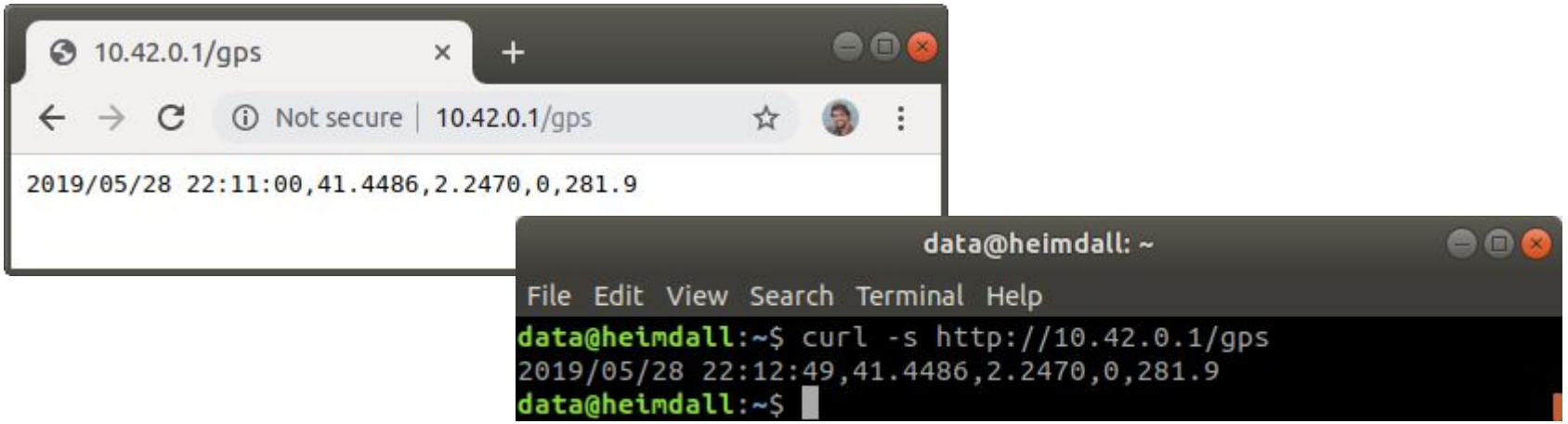
BASH

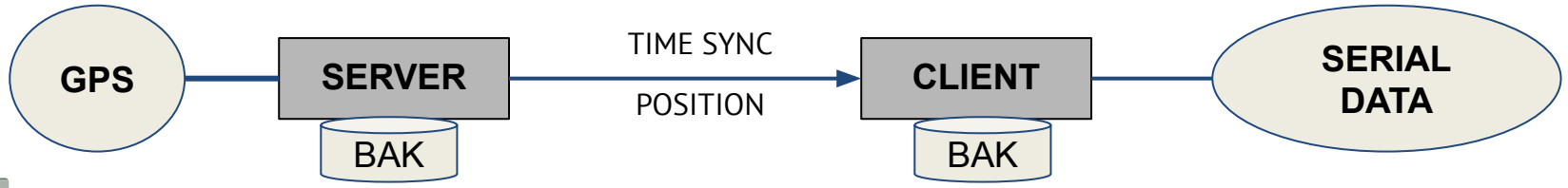
APACHE SOFTWARE FOUNDATION

BAK

```
<?php echo time(); ?>
```







II. REGISTRO - Integración de datos con GPS

#siglibre 2019

coda.sh: lectura, datación, posicionamiento y registro de datos en continuo

cat /dev/ttyACM0

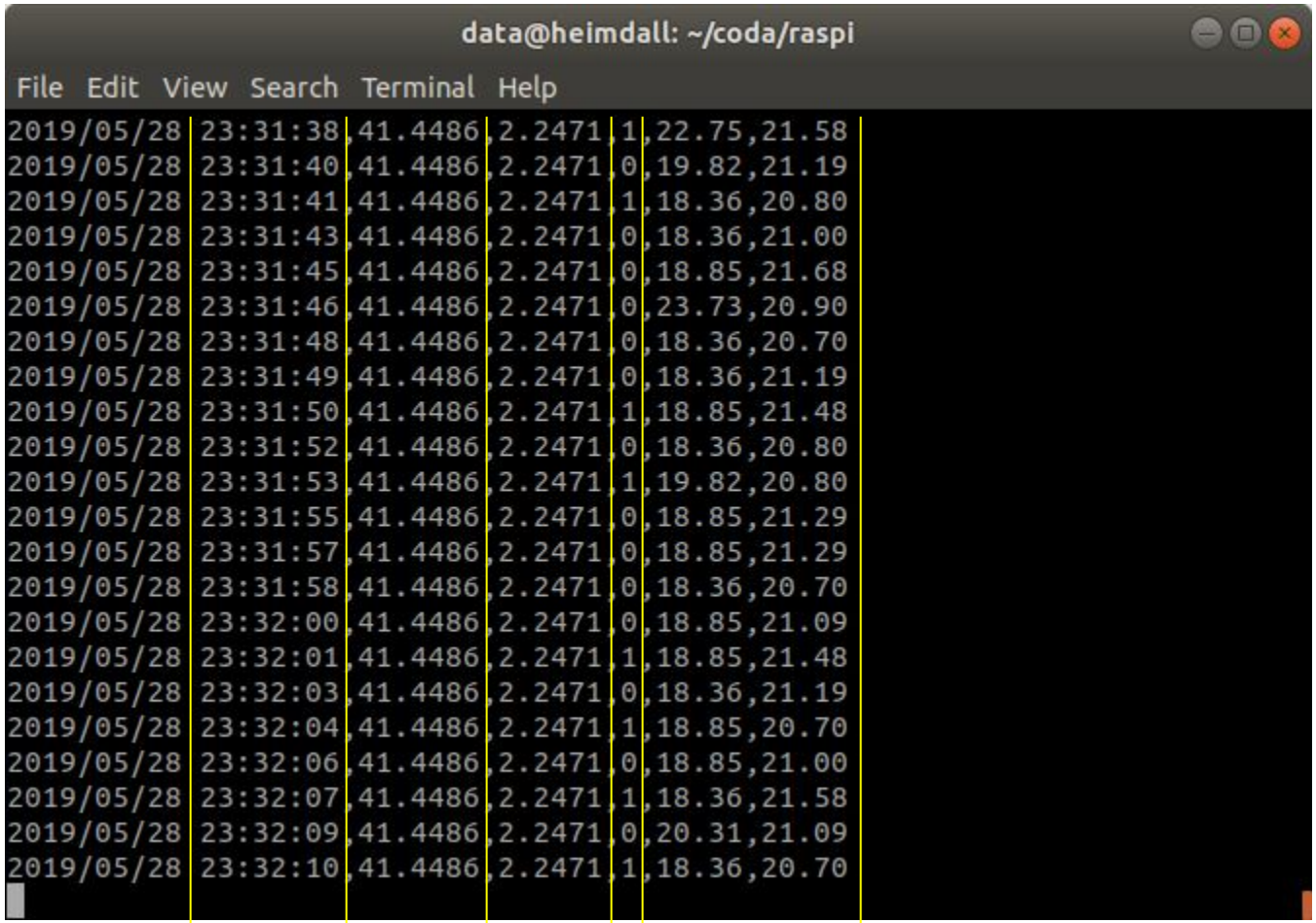
```
data@heimdall: ~
File  Edit  View  Search  Terminal  Help
data@heimdall:~$ cat /dev/ttyACM0
19.6,16.89
20.31,16.99
18.85,17.77
19.34,17.19
18.36,17.09
21.78,17.68
16.41,17.29
18.85,16.99
18.85,17.58
17.87,17.29
18.85,16.89
18.85,17.58
18.85,17.38
18.36,16.99
```

```
#!/bin/bash

# Settings

gpsserver="http://10.42.0.1"
codadev="/dev/ttyACM0"
codaset="9600 nl"

wwwpath="/var/www/html/coda/test"
bakpath="/var/www/html/coda/test/day"

stty -F $codadev sane
stty -F $codadev $codaset

# Set client clock
date -d @"$(curl -s $gpsserver/utc/)"

# Infinite loop
while true
do
        read coda

        # Local time
        local=$(date +%s)
        # Read remote GPS time-position reference
        IFS="," read -a gps < <(curl -s $gpsserver/gps)
        # Convert GPS time to Unix tiem
        remote=$(date -u -d "${gps[0]}" +"%s")
        # Compare local-remote time
        delay=$(($local-$remote))

        # Final CSV data with time-position
        IFS='' csv=${gps[0]},${gps[1]},${gps[2]},$delay,$coda

        # Record for real time with last value
        echo $csv > $wwwpath/last

        # Extract date and time from GPS telegram
        y=${gps[0]:0:4};m=${gps[0]:5:2};d=${gps[0]:8:2}
        H=${gps[0]:11:2};M=${gps[0]:14:2};S=${gps[0]:17:2}

        # Save every minute in a daily file
        if [[ $lastmin != $M ]]
                then
                lastmin=$M
                echo $csv >> $bakpath/$y$m$d
        fi

        # Set host clock every hour
        if [[ $lasthour != $H ]]
                then
                lasthour=$H
                date -d @"$(curl -s $gpsserver/utc/)" > /dev/null 2>&1
        fi

done < <(cat $codadev)
```

BASH

APACHE SOFTWARE FOUNDATION

BAK


data@heimdall: ~/coda/raspi
File Edit View Search Terminal Help
2019/05/28 23:31:38,41.4486,2.2471,1,22.75,21.58
2019/05/28 23:31:40,41.4486,2.2471,0,19.82,21.19
2019/05/28 23:31:41,41.4486,2.2471,1,18.36,20.80
2019/05/28 23:31:43,41.4486,2.2471,0,18.36,21.00
2019/05/28 23:31:45,41.4486,2.2471,0,18.85,21.68
2019/05/28 23:31:46,41.4486,2.2471,0,23.73,20.90
2019/05/28 23:31:48,41.4486,2.2471,0,18.36,20.70
2019/05/28 23:31:49,41.4486,2.2471,0,18.36,21.19
2019/05/28 23:31:50,41.4486,2.2471,1,18.85,21.48
2019/05/28 23:31:52,41.4486,2.2471,0,18.36,20.80
2019/05/28 23:31:53,41.4486,2.2471,1,19.82,20.80
2019/05/28 23:31:55,41.4486,2.2471,0,18.85,21.29
2019/05/28 23:31:57,41.4486,2.2471,0,18.85,21.29
2019/05/28 23:31:58,41.4486,2.2471,0,18.36,20.70
2019/05/28 23:32:00,41.4486,2.2471,0,18.85,21.09
2019/05/28 23:32:01,41.4486,2.2471,1,18.85,21.48
2019/05/28 23:32:03,41.4486,2.2471,0,18.36,21.19
2019/05/28 23:32:04,41.4486,2.2471,1,18.85,20.70
2019/05/28 23:32:06,41.4486,2.2471,0,18.85,21.00
2019/05/28 23:32:07,41.4486,2.2471,1,18.36,21.58
2019/05/28 23:32:09,41.4486,2.2471,0,20.31,21.09
2019/05/28 23:32:10,41.4486,2.2471,1,18.36,20.70
DATE
TIME
LAT
LON
DATA
DELAY

II. REGISTRO - Distribución de datos

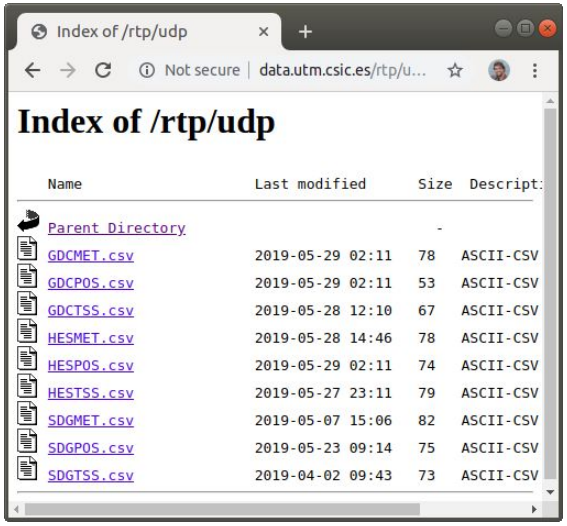
#siglibre 2019

ssh
rsync

VPN

UDP

http://data.utm.csic.es



III. VISUALIZACIÓN

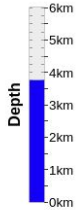
#siglibre 2019

REAL TIME PANEL
http://data.utm.csic.es/rtp

JavaScript · rgraph · dygraphs · OpenLayers

R/V HESPERIDES

28/05/2019 - 10:25:21



26°59.85' N , 18°7.69' W

NAVIGATION

28/05/2019 - 10:25:24

Speed:	8.80 Knots
Heading:	231.23 °
Depth:	3753.64 m
Lat:	26.99734 °
Lon:	-18.12835 °

METEOROLOGY

28/05/2019 - 10:25:07

Temperature:	24.17 °C
Pressure:	1015.16 hPa
Humidity:	72.86 %
Solar Radiation:	807.03 w/m^2
Wind Speed:	6.30 m/s
Wind Direction:	20.17 °

SEA WATER

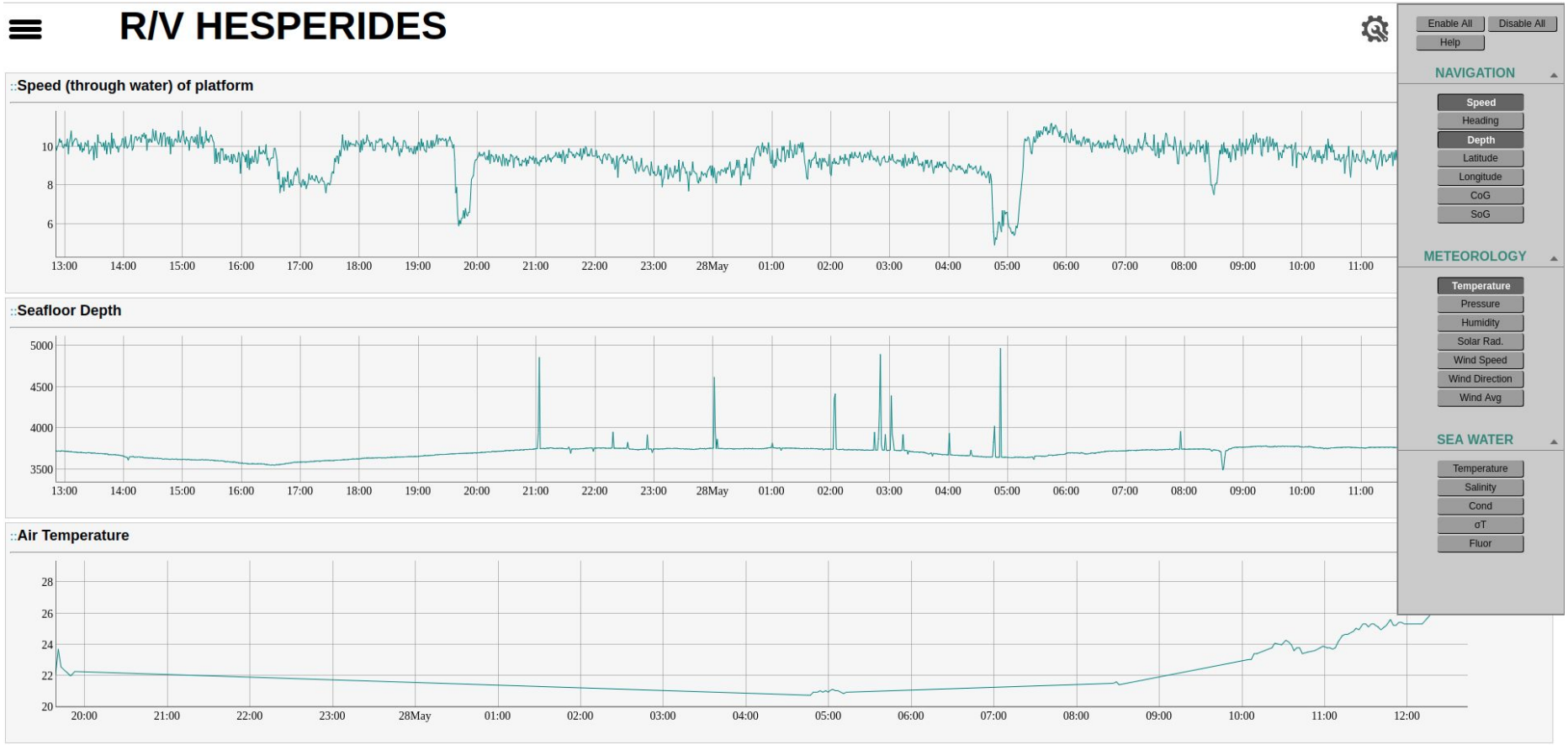
27/05/2019 - 21:11:19

Temperature:	22.43 °C
Salinity:	36.97
Conductivity:	52.92 mS/cm
Fluor:	0.28 V
σT:	25.59 kg/m^3

#siglibre 2019

LAST DATA

http://data.utm.csic.es/rtp/24h

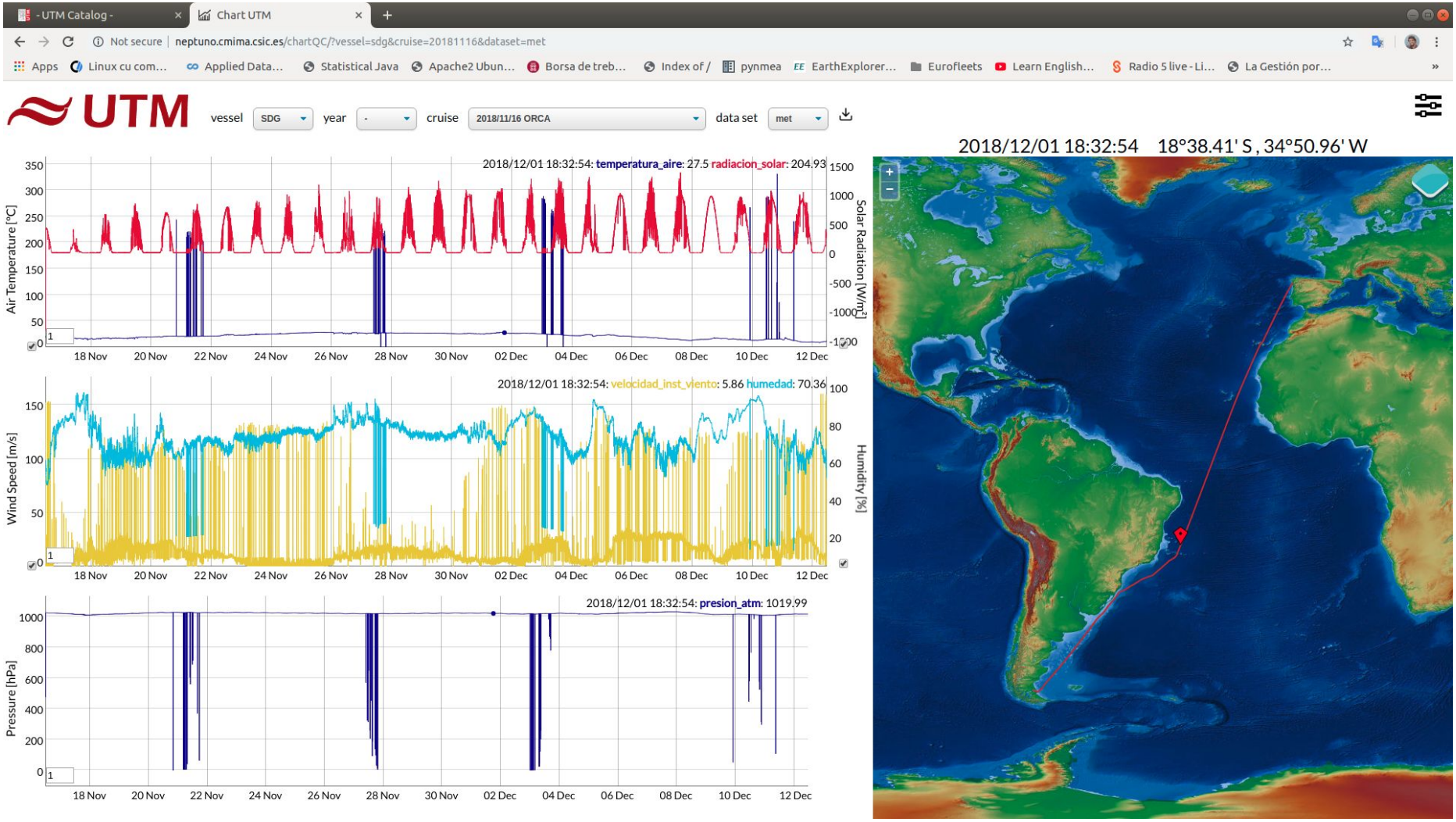


III. VISUALIZACIÓN - Series temporales georeferenciadas

#siglibre 2019

CRUISE DATA PLOT

http://data.utm.csic.es/plot

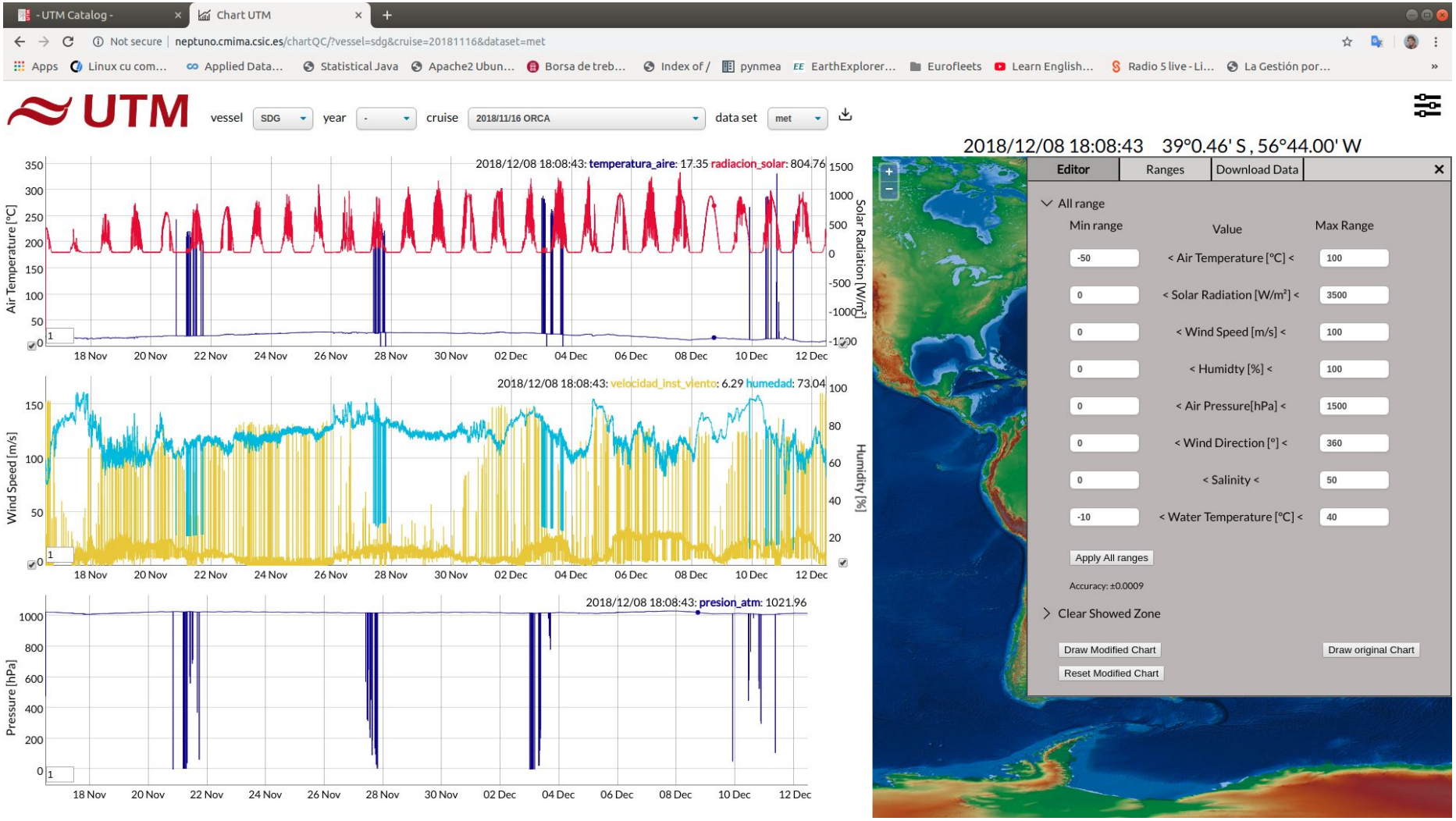


III. VISUALIZACIÓN - Control de calidad

#siglibre 2019

CRUISE DATA PLOT FOR QUALITY CONTROL

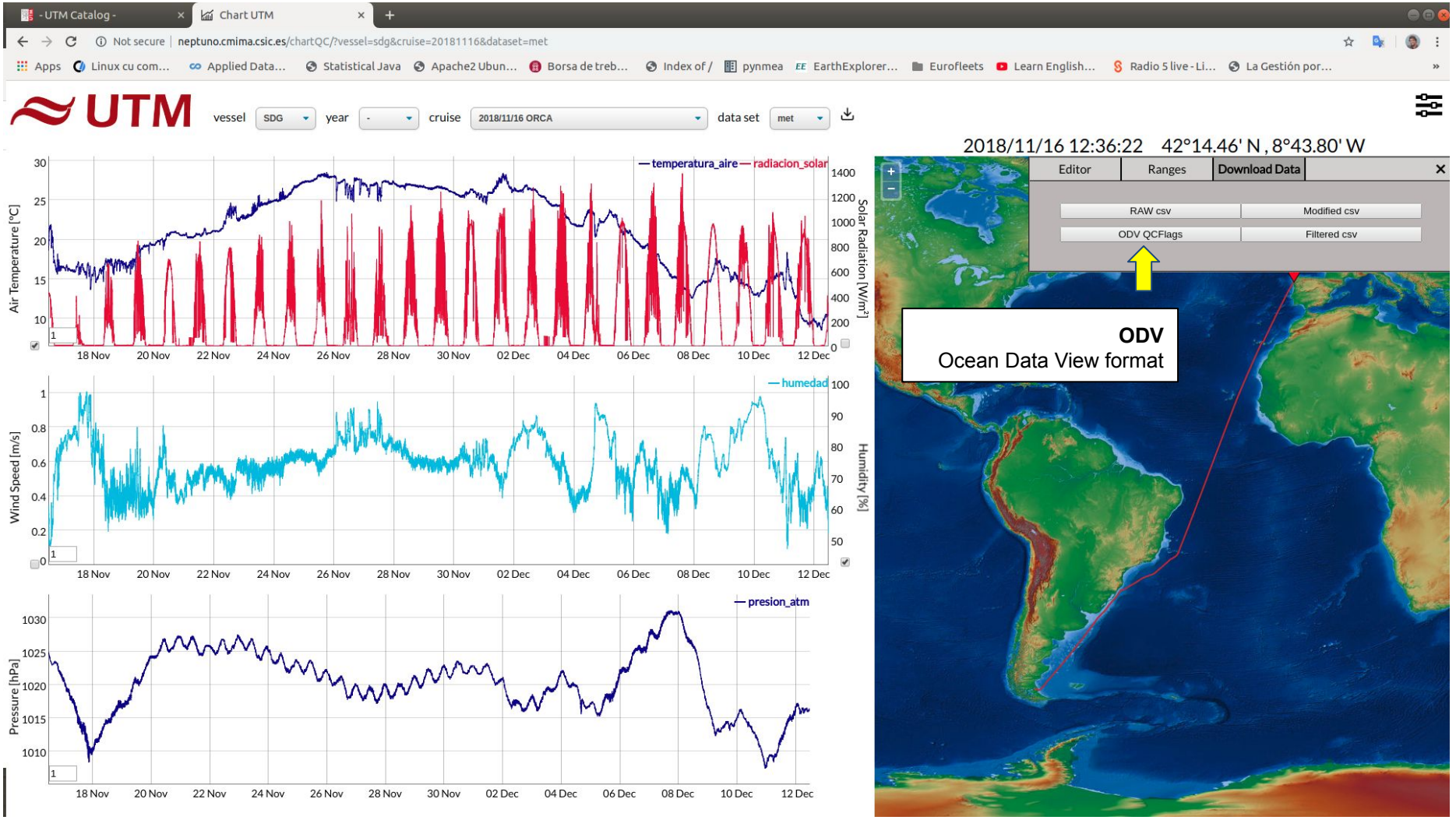
http://data.utm.csic.es/plot



#siglibre 2019

CRUISE DATA PLOT FOR QUALITY CONTROL

http://data.utm.csic.es/plot



IV. INFRAESTRUCTURA DE DATOS ESPACIALES

OPEN DATA SET
http://data.utm.csic.es/set

mod_autoindex

Index of /set/hes/20180529/open

Name	Last modified	Size	Description
Parent Directory		-	ZEE-2018
ts/	2019-04-24 10:30	-	Sea surface thermosalinograph
met/	2019-04-24 10:30	-	Weather station

UTM-CSIC Data Service - data@utm.csic.es

Index of /set/hes/20180529/open/met

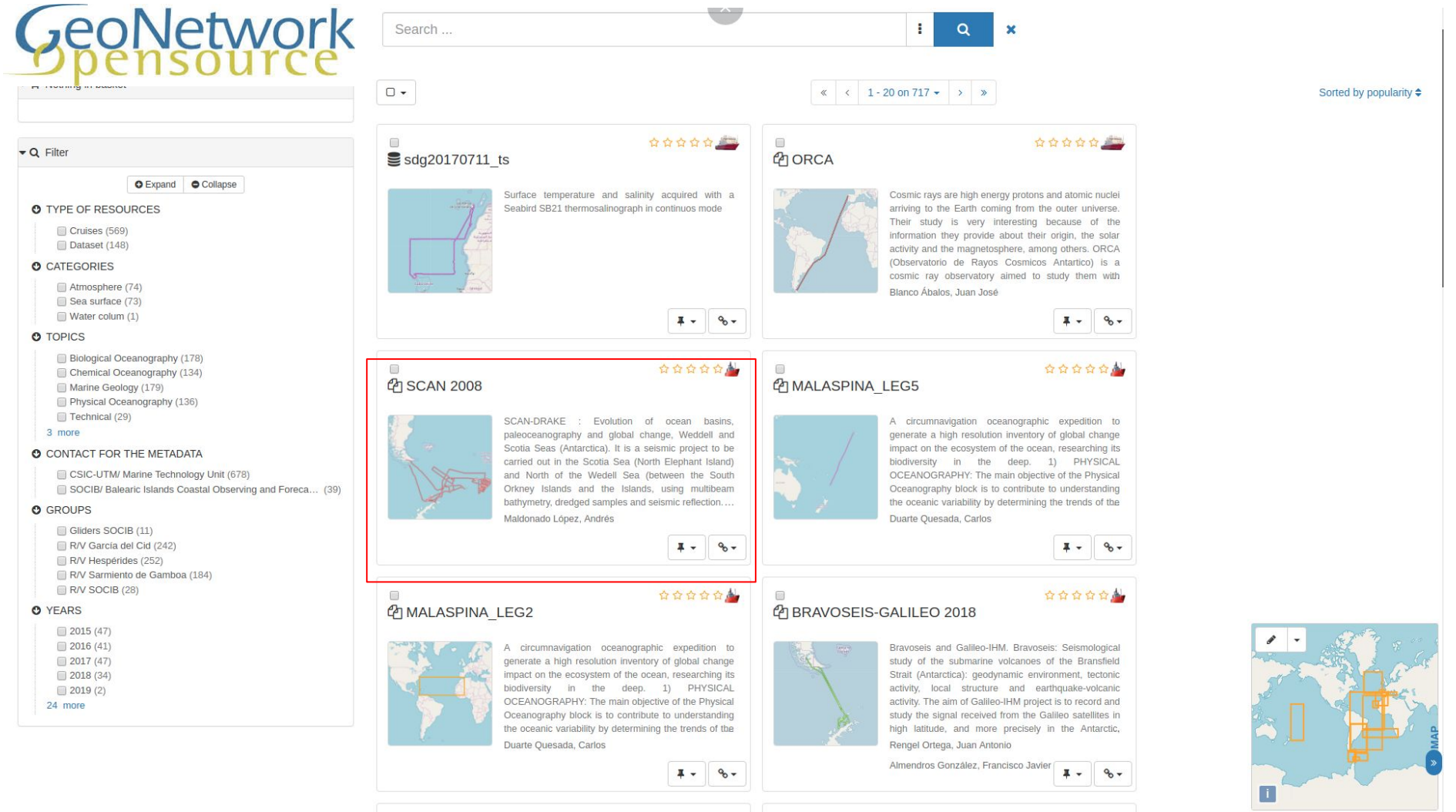
Name	Last modified	Size	Description
Parent Directory		-	ZEE-2018
view/	2019-04-11 09:36	-	Preview dataset
raw/	2019-04-24 10:30	-	ASCII-CSV Non-standar format without QC
odv/	2019-03-29 12:57	-	ASCII-TXT Open Data Viewer format with QC flags
csv/	2019-04-16 11:46	-	ASCII-CSV with QC filtered

UTM-CSIC Data Service - data@utm.csic.es

IV. IDE - Catálogo de campañas y datos

#siglibre 2019

GEONETWORK
http://data.utm.csic.es



IV. IDE - Catálogo de campañas y datos

#siglibre 2019

GEONETWORK
http://data.utm.csic.es

GeoNetwork Opensource

OPEN DATASET
http://data.utm.csic.es/set

GEONODE
http://data.utm.csic.es/maps

GeoNode

Back to search ‹ Previous Next › Download Display mode

SCAN 2008

SCAN-DRAKE : Evolution of ocean basins, paleoceanography and global change, Weddell and Scotia Seas (Antarctica). It is a seismic project to be carried out in the Scotia Sea (North Elephant Island) and North of the Wedell Sea (between the South Orkney Islands and the Islands, using multibeam bathymetry, dredged samples and seismic reflection.

Download and links

DOI CITATION: 10.20351/29HE20080125 http://data.utm.csic.es/set/hes/20080125/cite	Open link
DOCUMENTATION http://data.utm.csic.es/set/hes/20080125/doc	Open link
OPEN DATA http://data.utm.csic.es/set/hes/20080125/open	Open link
CRUISE MAP http://data.utm.csic.es/set/hes/20080125/map	Open link

About this resource

Marine Geology

GEMET - INSPIRE themes, version 1.0	• Oceanographic geographical features
SeaDataNet Ports Gazetteer	• Punta Arenas
International Standards Organisation countries	• Antarctica
ICES Platform Codes	• BIO Hesperides
SeaVoX Platform Categories	• research vessel

Overview

No ratings ★

See all feedbacks Add your review

Spatial extent

Temporal extent

Revision date
2008-01-25

Period
Fri Jan 25 2008 01:00:00 GMT+0100 ⏩ Fri Feb 29 2008 01:00:00 GMT+0100

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GEONETWORK
http://data.utm.csic.es

GeoNetwork Opensource

SeaDataNet Parameter Discovery Vocabulary	• Seismic reflection • Sediment acoustics • Sedimentary structure • Gravity • Magnetics • Bathymetry and Elevation • Acoustic backscatter in the water column • Sound velocity and travel time in the water column • Mineralogical composition • Cetacean behaviour • Temperature of the water column • Salinity of the water column • Air pressure • Air temperature • Atmospheric humidity • Solar Radiation • Wind strength and direction
SeaDataNet device categories	• >2000 Hz top-bandwidth sub-bottom penetrator and mud profiler systems • airgun array • hydrophones • gravimeters • magnetometers • multi-beam echosounders • multi-channel seismic reflection systems • rock dredges • bathythermographs • meteorological packages
Resource identifier	• urn:SDN:CSR:LOCAL:29HE20080125
Contact for the resource	**Andalusian Institute of Earth Sciences (IACT). CSIC and University of Granada** Facultad de Ciencias Avenida de Fuentenueva s/n, Granada, 18002, Spain • Point of contact : Maldonado López, Andrés

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SeaDataNet

34 countries
56 partners
110 data centers
650 originators

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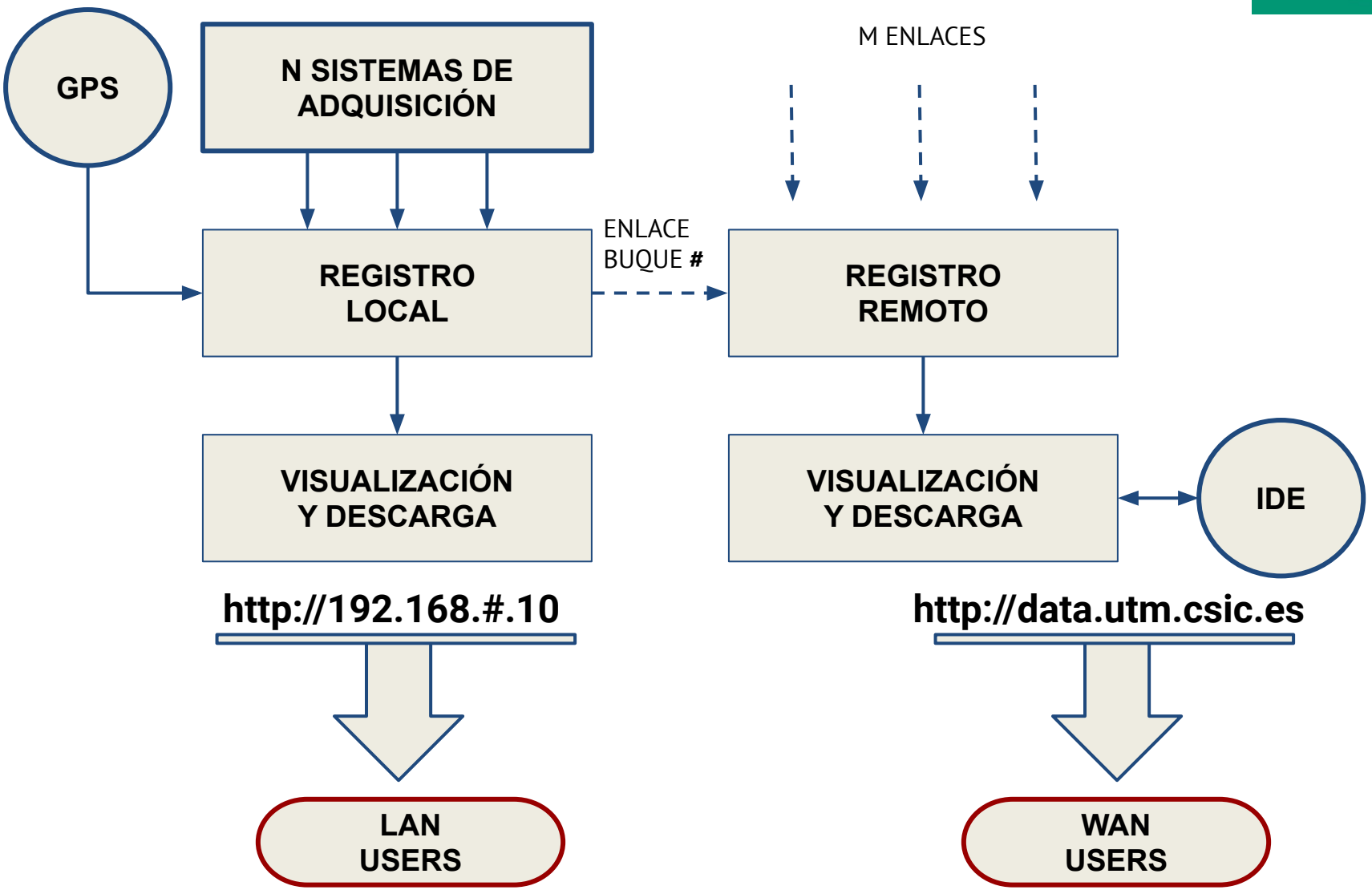
NATIONAL OCEANOGRAPHIC DATA CENTER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M ENLACES
ENLACE BUQUE #
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Gracias por su atención

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