Línea de acción 5

Análisis de escenarios de derrames

Procesamiento de datos de derivadores superficiales

Reporte de datos

Experimento de Dispersión en Aguas Profundas

(DWDE)

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Resumen

Este documento contempla una recopilación de los datos finales recolectados y posteriormente procesados de 207 derivadores que fueron utilizados en el oeste del Golfo de México durante el experimento denominado “Experimento de Dispersión en Aguas Profundas” (DWDE por sus siglas en inglés), como parte del Proyecto titulado “Implementación de redes de observación oceanográficas (físicas geoquímicas, ecológicas) para la generación de escenarios ante posibles contingencias relacionadas con la exploración y producción de hidrocarburos en aguas profundas del Golfo de México” del Consorcio de Investigación del Golfo de México (CIGoM), financiado por el Fondo Sectorial CONACYT-SENER-Hidrocarburos.

Los derivadores superficiales son boyas flotantes con un sistema de arrastre anclada a un metro de profundidad, rastreadas por GPS y con un termistor, los cuales registran la posición (y velocidad) y temperaturas de las corrientes oceánicas superficiales con un intervalo de muestreo de una hora.

El objetivo principal de esta medición lagrangiana es el de caracterizar la dispersión de las partículas sobre la capa superficial en las aguas profundas de la región del noroeste del golfo de México (en la región del Cinturón Plegado Perdido), con la intención de entender los procesos físicos involucrados en el transporte y mezcla de trazadores pasivos, para proporcionar un conjunto de datos que ayuden a evaluar y mejorar las parametrizaciones de submesoescala en las simulaciones de trayectorias de partículas obtenidas a partir de modelos numéricos oceánicos en las regiones de aguas profundas del Golfo de México.

Se realizaron cuatro experimentos en dos años (2016-2017) y para dos temporadas cada año (primavera y otoño), utilizando tres tipos diferentes de derivadores: Microstar, CODE y DORIS. Los derivadores fueron lanzados en grupos de tres, formando un triángulo de ~ 100 m de lado, y cada grupo separado entre sí por ~ 50 km uno del otro en tres transectos perpendiculares a la línea de costa sobre el talud continental.

Este documento consta de una primera parte donde se detallan los experimentos para la toma de datos, los tipos de aparatos utilizados y sus características, y el procesado de los datos, mientras que, la segunda parte del documento, presenta un breve análisis de las trayectorias registradas por las boyas de deriva, relacionadas con datos de altimetría para el nivel de mar en periodos de 15 días, y por último las trayectorias individuales de cada derivador, organizadas por experimento y tripleta.

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INTRODUCCION

This report presents the data collected from all the surface drifters launched as part of the Deep-Water Dispersion Experiment (DWDE) during four cruises, within the framework of the Consorcio de Investigación del Golfo de México (CIGoM) megaproject funded by the Mexican government via Fondo Sectorial SENER-CONACYT-Hidrocarburos. The main objective of this Lagrangian experiment is to characterize surface particle dispersion in the deep waters of the northwestern Gulf of Mexico (Perdido Fold Belt region), with the intention of understanding the physical processes involved in the transport and mixing of passive tracers, in order to provide a dataset to assess the accuracy of numerical model predictions, and improve the parameterizations of submesoscale features in simulated particle trajectories obtained from ocean models in the deep water regions of the Gulf of Mexico.

The four field experiments were performed in two years (2016-2017) and two seasons for both years (spring and fall), using three different type of drifters (Microstar, CODE and DORIS) launched on triplets.

All the cruises took place on the R/V Pelican, an oceanographic vessel owned by the Louisiana Universities Marine Consortium (LUMCON) and part of the fleet of Universities National Oceanographic Laboratory System (UNOLS), USA.

CRUISES CALENDAR AND DRIFTERS

	MICROSTAR	CODE	DORIS
DWDE1 *June 15 to 26, 2016*	45	-	-
DWDE2 *October 12 to 22, 2016*	45	-	10
DWDE3 *April 22 to May 1, 2017*	-	45	11
DWDE4 *November 4 to 14, 2017*	8	43	-

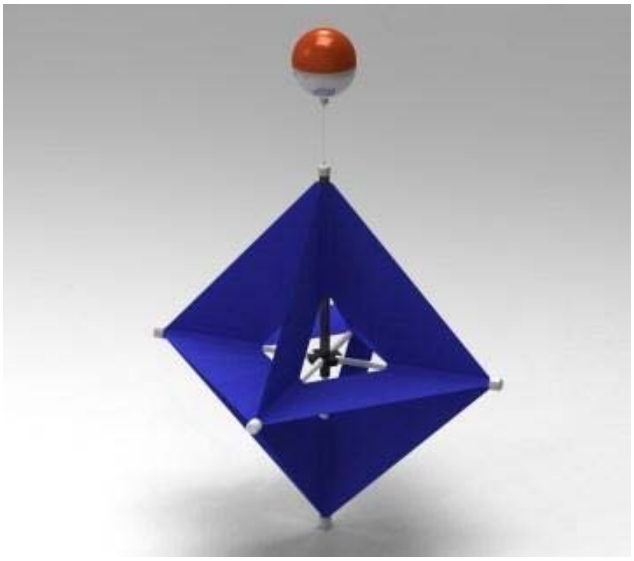
MICROSTAR DRIFTERS

The Microstar surface drifters are floating buoys instrumented with a GPS, a thermostat, a strain sensor and an Iridium satellite antenna. A diamond shape drogue is attached to the superficial sphere to create the drag necessary to reduce wind slip, allowing the buoy to move with the currents at approximately 1m depth.

Each device includes a ball shape plastic surface float with 20 cm diameter and 2.4 kg weight and a polyester *Corner-radar-reflector* type drogue system of 2.2 kg in weight, which allows the launching from a boat, both annexed by a one meter long synthetic fiber rope that joins the surface float to the floating kite.

The buoy has a 12-volt alkaline batteries pack, and real-time Iridium telemetry with global coverage that includes a uBlox GPS receiver and an Iridium SBD-2 transmitter-receiver. The surface float also has a temperature sensor in the lower half of the sphere with an accuracy of ± 0.1 ° C and measuring range of -2 to 38 ° Celsius, and a "strain" sensor that measure the deformation on the rope that joins the sphere with the drogue system, and allows us to fix the moment when the buoy lost its drogue.

The values given by the strain sensor don’t have real units, but are a count of 0 to 255 representing an approximation of the deformation due to the floating kite pulling down. If the value falls sharply, it is considered that the kite was lost.

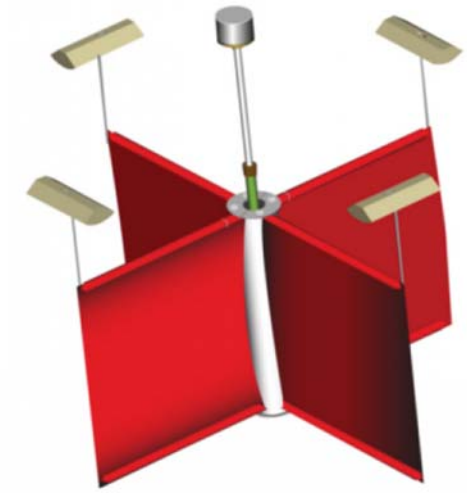


The sampling rate for the strain sensor is 2 seconds during 5 minutes, every 4 transmissions, hence the values are the same for every four consecutive transmissions. The value is basically the maximum "strain" observed during that 5-minute sampling period.

The buoys record their time position (the first 48 hours every 10 minutes) with a GPS and these data are transmitted to the receiver via satellite every 8 hours, using the Iridium system. These instruments are manufactured by Pacific Gyre.

CODE DRIFTERS

CODE drifters, like the Microstar, are designed to take small scale measurements and allow to measure currents and temperature of the most superficial layer of the ocean. These drifters are designed in small size (weight less than 7 kg), for deployment both from boat and from air. The drogue system to minimize the wind effect has a particular design of four crossed sails that submerge less than one meter depth, leaving only the antenna on the surface to transmit the data. Like the other Microstar buoys the temperature sensor has an accuracy of up to ± 0.05 ° C, and use the Iridium telemetry service for data transmission. These buoys also register their position every 10 minutes during the first 48 hours, moving to one hour sampling rate after this time.



The principal difference between CODE and Microstar is the way to fix the time when the drogue is lost. Despite the fact that CODE doesn't have a strain sensor, the drogue system, as it's not hanging, is difficult to be lost by storms or fish bites. Instead, it will suffer damage, in which case the central structure, where the

electronics is found, ends up sinking and therefore stops recording data. These instruments are manufactured by MetOcean Telematics.

DORIS DRIFTERS

The DORIS surface drifters are drifting buoys instrumented with a GPS, thermistor, drogue and an Iridium satellite antenna. A spherical drogue is attached to the buoy in order to create the necessary drag to reduce the wind slip, allowing the buoy to move with currents approximately at one meter depth. DORIS is a drifter with a measurement capacity of several weeks. It is a low cost buoy specifically designed to be configured by the user allowing several sampling intervals and drogue depth. These instruments are manufactured by Instituto de Investigaciones Oceanológicas, Universidad Autónoma de Baja California in Mexico.

DRIFTER DEPLOYMENTS

A total of 207 surface drifters were released in the Perdido deepwater region. The original deployments configuration was triplets launched at 15 sampling points, but two shallow and three deep stations were added after the first cruise due to DORIS drifters availability and Microstar drifters from previous releases that were recovered.

The deployment configuration (see Figure 1) responds to a particular objective. The region between 24°N and 26°N is a preferential zone where most of Loop Current Eddies arrives and remains stationary until dissipates, in front of the continental shelf. On the other hand, this region is where the Mexican oil industry already has wells identified with exploration potential, so within the context it is an area of particular interest for the megaproject.

Three sampling transects perpendicular to the coast were proposed, with the intention to measure how particle dispersion varies along and across the continental slope. Also three

stations perpendicular to the transects (parallel to the coastline) to help add smaller scale passive tracer deformations.

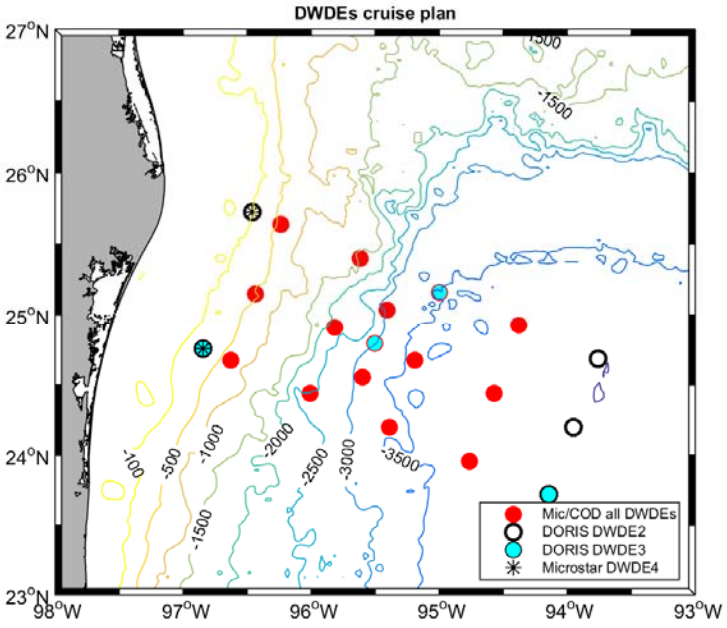


Figure 1. Nominal positions for drifter triplets launches.

DRIFTERS DATA PROCESSING

The drifter data processing can be summarized in three steps: transmission, recovery and quality controls:

a) Buoy data transmission from device to provider: Date (year, month, day, hour, minute and second), position (latitude and longitude), temperature and voltage. For Microstar drifters, there is an additional field called "strain", which is the tension of the drogue system. The transmission is via Iridium satellite communication service for all drifters.

b) CICESE retrieves the data published by the provider. Python scripts were developed to download the information of all the drifters. The execution of the download scripts is scheduled to run daily.

c) Processing the information using Python scripts hosted on a linux internal server from CICESE. These scripts run at the end of the download

scripts. They basically separate the records by buoy number and by date, selecting the data of interest for subsequent processing. It is worth mentioning that the structure of buoy records is different for each supplier, that is, they have different quantity and order of columns, however, local storage was standardized so that local information is homogeneous. The data to be stored in order are: buoy number, date (year, month day, hour, minute, seconds), latitude, longitude, temperature, "strain" (only for the case of microstar) and voltage. The scripts validate if the information is not duplicated, that it is incremental with respect to time and that the information that had delays in its publication is added. A file is saved for each buoy, and contains all the information ordered by time. Since we have a standardized data repository, a netcdf and an xml file is created for each text file separate by drifter name. Both files are added to an ERDDAP server that is capable of displaying a catalog of all the georeferenced information available. This server is not yet available to the public.

The raw data may contain some inconsistencies, as a result from errors in gps location, communication or package formation, etc., so in order to obtain a final product free of “bad” data, three quality controls are applied. The first two are performed automatically with python scripts and run daily after data download. The last quality control is manually done every certain period.

In the first quality control, a cc0 file is generated for every raw file, where the data on board the vessel (based on the launch date and time), repeated data (same time) and those points that are outside the Gulf of Mexico region (18, -98) and (31, -80) have been eliminated.

In the second quality control, a cc1 file is generated for each cc0 file. In this step hourly speed (in m / s) and angle (in degrees with respect to the north) are calculated by the centered differences method and this information is added as columns. Then the data are

interpolated to obtain a one minute resolution time series and keep the hourly data at minute 0. This allows filling gaps of the original trajectory and having a smoother trajectory at intervals of one hour. Five binary columns are added that are used as criteria to define bad data: "earth", "drogue system", "rap3ms", "gap" and "peak". Two of these indicators (earth and rap3ms) will be marked (that is, this will be rewritten as NaN in a next step), in case the position is on land or the speed is faster than 3 m / s. The other 3 indicators: peaks of speed (difference between consecutive records two times greater than standard deviation), "strain" with value less than 10 (limit established to consider that the drogue was lost and applicable only to the Microstar buoys) and data interpolation of gaps greater than 6 hours are left for the review of the third quality control.

The third quality control (cc2 files) is manual and eliminates obviously bad data that has passed the second quality control, such as: an isolated speed peak, data that shows that the drifter behavior is due to being in a boat (straight trajectories, e.g.), or data that are the result of a poor GPS position.

The result of the manual processing is the final file that will be used for the surface current analysis and the figures shown in the following sections.

DRIFTER TRAJECTORY SUMMARY

The following tables shows the trajectory log for all drifters with the launch position and time and the last good data position and time, extracted from the validated data.

The drifters average lifetime is about three to four months. Some exceed this average by transmitting for almost 11 months, as is the case of buoy 13 of the DWDE1 experiment. A group of 15 drifters, launched during the DWDE2 experiment, transmitted less than a month and lost the drogue during the first days due to bad weather (strong winds and high waves). This was one of the main reasons to change the devices (Microstar to CODE) after DWDE2, although after finishing the four DWDEs experiments, it turns out that the Microstar have a longer lifetime than CODE drifters, likely given that Microstar drifters continue transmitting without a drogue, while CODE drifters stop when the drogues system gets broken, although we cannot discard that the electronics of the

CODE drifters, in particular the GPS, is sturdier. DORIS drifters lifetime was in general less than one month, for the first experiment (DWDE2) and about two months for the DWDE3 after design improvements.

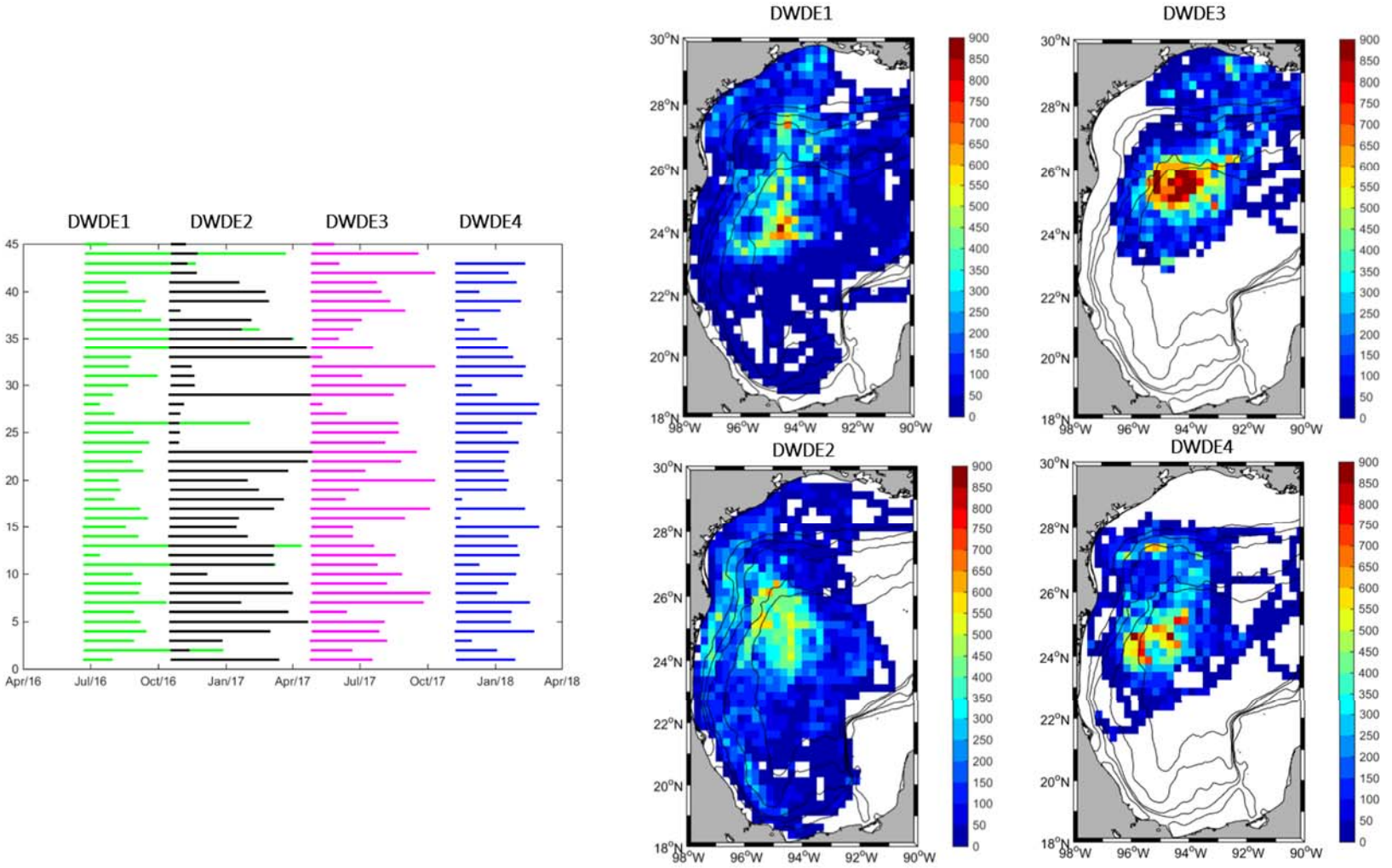


Figure 2. Temporal (a) and spatial (b) coverage for all DWDE drifters. The spatial coverage is represented by the number of hourly data in bins 0.25 by 0.25 wide.

DWDE 1

MICROSTAR DRIFTERS

				FIRST DATA POINT				LAST DATA POINT			
Station	Triplet #	NAME	Drifter	Date dd/mm/yy	Time	Lat	Long	Date dd/mm/yy	Time	Lat	Long
E1	T01-1		13	21/06/2016	18:49	23.93306	-94.78529	11/4/2017	11:00	29.0607	-95.1325
E1	T01-2		14	21/06/2016	18:51	23.93272	-94.78439	2/9/2016	23:00	25.2322	-97.3328
E1	T01-3		15	21/06/2016	18:53	23.93328	-94.78431	16/08/2016	5:00	29.1902	-94.8378
E2	T02-1	Ekman	38	22/06/2016	2:58	24.19801	-95.38746	6/9/2016	4:00	28.3634	-96.2792
E2	T02-2	Roberta	37	22/06/2016	2:59	24.19933	-95.38667	3/10/2016	1:00	26.6216	-97.2138
E2	T02-3	Erbey	39	22/06/2016	3:02	24.19807	-95.38576	12/9/2016	1:00	28.0078	-96.6814
E3	T03-1	Sofía	1	22/06/2016	9:43	24.43846	-96.00729	29/07/2016	1:20	26.5000	-94.5269
E3	T03-2	Alana	24	22/06/2016	9:46	24.43679	-96.00855	17/09/2016	2:00	25.4530	-97.1977
E3	T03-3	Romsi	6	22/06/2016	9:49	24.43696	-96.00693	27/08/2016	10:00	29.3676	-94.6358
E4	T04-1	Alejandra	41	22/06/2016	17:09	24.71158	-96.61025	16/08/2016	20:00	29.6959	-93.4672
E4	T04-2	Amy	11	22/06/2016	17:10	24.71044	-96.60948	7/3/2017	23:00	24.0465	-97.7290
E4	T04-3	Edy	40	22/06/2016	17:12	24.71028	-96.61111	19/08/2016	5:00	28.7158	-95.3034
E6	T05-1	Paulina	12	22/06/2016	23:22	25.15708	-96.42162	12/7/2016	14:00	23.1909	-96.2442
E6	T05-2	María	33	22/06/2016	23:23	25.15780	-96.42070	23/08/2016	8:00	29.5116	-94.3163
E6	T05-3	Fernanda	32	22/06/2016	23:26	25.15685	-96.42060	20/08/2016	22:00	26.5642	-93.4121
E7	T06-1	Mike	9	23/06/2016	3:32	24.90982	-95.80902	6/9/2016	4:00	28.2610	-96.4432
E7	T06-2	Lugia	2	23/06/2016	3:33	24.90979	-95.80809	26/12/2016	1:00	22.3192	-96.5708
E7	T06-3	Natalia	23	23/06/2016	3:35	24.90908	-95.80809	7/9/2016	1:00	27.6437	-97.0765
E8	T07-1	Mateo	28	23/06/2016	6:17	24.55521	-95.60022	12/7/2016	0:50	24.2566	-94.4834
E8	T07-2	Nansen	22	23/06/2016	6:18	24.55446	-95.59990	25/08/2016	12:00	29.5406	-94.2585
E8	T07-3	Zues	3	23/06/2016	6:20	24.55474	-95.59910	27/08/2016	18:10	29.3604	-94.1281
E9	T08-1	Wilson	10	23/06/2016	8:09	24.79232	-95.50338	25/08/2016	10:00	27.7881	-96.9699

E9	T08-2	Bear	4	23/06/2016	8:10	24.79390	-95.50268	13/09/2016	1:00	27.0827	-97.3028
E9	T08-3	Kahsi	5	23/06/2016	8:13	24.79302	-95.50204	5/9/2016	5:00	28.7099	-95.5830
E10	T09-1	Sailor Willy	29	23/06/2016	10:04	25.03682	-95.40512	29/07/2016	20:00	27.0742	-94.6598
E10	T09-2	M.C. Honey L.T	25	23/06/2016	10:05	25.03780	-95.40501	26/08/2016	20:00	29.4792	-94.3697
E10	T09-3	Cappo	30	23/06/2016	10:08	25.03703	-95.40383	19/08/2016	18:00	29.5700	-93.6037
E11	T10-1	Audrey	21	23/06/2016	13:01	24.67236	-95.18721	9/9/2016	2:00	27.9135	-96.8408
E11	T10-2	Millo	8	23/06/2016	13:02	24.67111	-95.18637	3/9/2016	21:00	26.6674	-97.2074
E11	T10-3	Diego	17	23/06/2016	13:04	24.43354	-94.57550	4/9/2016	7:00	27.1445	-97.1841
E12	T11-1	Dasha	20	23/06/2016	17:13	24.43354	-94.57550	6/8/2016	4:00	24.9357	-96.6698
E12	T11-2	Donna	19	23/06/2016	17:14	24.43279	-94.57608	9/8/2016	4:10	25.8158	-95.4118
E12	T11-3	Alex	7	23/06/2016	17:16	24.43283	-94.57527	10/10/2016	19:00	26.4972	-97.1702
E13	T12-1	Ernesto	26	24/06/2016	0:31	24.93060	-94.38857	31/01/2017	18:30	24.4890	-94.5048
E13	T12-2	Emiliano	27	24/06/2016	0:32	24.93005	-94.38798	1/8/2016	0:00	27.8817	-91.0999
E13	T12-3	Gram	18	24/06/2016	0:34	24.92993	-94.38896	1/8/2016	0:00	27.8811	-91.0997
E14	T13-1	Rodney	31	24/06/2016	7:58	25.17680	-95.01347	28/09/2016	10:00	26.7931	-97.2826
E14	T13-2	Triskel	35	24/06/2016	7:58	25.17652	-95.01413	1/4/2017	5:00	27.8270	-97.0497
E14	T13-3	Perdida	16	24/06/2016	8:00	25.17617	-95.01352	15/09/2016	21:00	27.0461	-97.3070
E15	T14-1	Dulce	42	24/06/2016	14:57	25.41903	-95.58942	01/11/02016	9:00	21.1160	-96.1388
E15	T14-2	Guiligan	43	24/06/2016	14:57	25.41960	-95.58887	19/11/2016	2:00	25.7748	-87.6364
E15	T14-2	Eli	36	24/06/2016	15:00	25.41927	-95.58805	13/02/2017	10:00	27.8915	-97.0121
E16	T15-1	Pelican	45	24/06/2016	21:22	25.63657	-96.23658	23/07/2016	15:00	28.0518	-91.6251
E16	T15-2	Pokebola	34	24/06/2016	21:23	25.63648	-96.23815	25/02/2017	6:00	24.9440	-97.5498
E16	T15-3	Teddy	44	24/06/2016	21:25	25.63792	-96.23743	21/03/2017	4:00	24.1893	-92.5144

DWDE 2

MICROSTAR DRIFTERS

				FIRST DATA POINT				LAST DATA POINT			
Station	Triplet #	NAME	Drifter s/n #	Date dd/mm/yy	Time deploy	Lat	Long	Date dd/mm/yy	Time deploy	Lat	Long
E1	T01	Kumiai	62	18/10/2016	12:25	24°01.299 N	94°48.960 W	12/2/2017	22:00	25.6046	-97.2167
E1	T01	Aliosha	53	18/10/2016	12:28	24°01.305 N	94°49.24 W	4/12/2016	0:00	24.8455	-97.5837
E1	T01	Ivan Hg	54	18/10/2016	12:26	24°01.346 N	94°48.991 W	5/3/2017	16:01	23.7717	-97.5197
E2	T02	Zues	3	18/10/2016	21:11	24°15.942 N	95°27.142 W	12/3/2017	0:00	24.7379	-97.6132
E2	T02	Sailor Willy	29	18/10/2016	21:13	24°15.975 N	95°27.209 W	10/11/2016	11:00	18.7175	-95.5542
E2	T02	REA	73	18/10/2016	21:14	24°16.032 N	95°27.184 W	17/11/2016	21:00	18.4747	-94.1162
E3	T03	Vidal	74	19/10/2016	5:18	24°27.52 N	96°01.748 W	17/11/2016	16:00	18.4797	-94.2721
E3	T03	Amaia	75	19/10/2016	5:19	24°27.485 N	96°01.711 W	13/11/2016	11:00	18.3789	-93.6255
E3	T03	Anabela	85	19/10/2016	5:21	24°27.473 N	96°01.760 W	20/11/2016	6:00	18.1543	-94.4864
E4	T04	Patricio	86	19/10/2016	12:19	24°42.078 N	96°38.120 W	7/11/2016	21:00	22.4414	-97.6175
E4	T04	NC-boya-2	87	19/10/2016	12:20	24°42.037 N	96°38.083 W	21/11/2016	12:00	18.4317	-93.5069
E4	T04	Maboule	88	19/10/2016	12:21	24°42.023 N	96°38.135 W	5/11/2016	23:00	24.2956	-97.1730
E6	T05	Alejandro	67	16/10/2016	20:44	25°08.933 N	96°25.932 W	27/10/2016	6:00	25.3561	-97.3629
E6	T05	Saúl	68	16/10/2016	20:45	25°08.879 N	96°25.915 W	28/10/2016	8:00	24.8401	-97.5863
E6	T05	Mawi Love	69	16/10/2016	20:47	25°08.908 N	96°25.868 W	27/10/2016	10:00	25.3201	-97.3832
E7	T06	Lola	76	17/10/2016	1:09	24°54.899 N	95°48.710 W	25/04/2017	16:01	28.3360	-96.4206
E7	T06	Angel	77	17/10/2016	1:10	24°54948 N	95°48.700 W	18/04/2017	19:20	29.2958	-94.7786
E7	T06	Iker	78	17/10/2016	1:12	24°54.909 N	95°48.659 W	29/03/2017	9:00	29.4723	-94.5868
E8	T07	Chester	79	17/10/2016	4:07	24°33.334 N	95°36.008 W	20/01/2017	21:00	22.3948	-97.4575
E8	T07	Max	80	17/10/2016	4:08	24°33.288 N	95°35.979 W	2/2/2017	20:00	18.1643	-94.5270
E8	T07	Asun	82	17/10/2016	4:10	24°33.322 N	95°35.949 W	26/02/2017	5:01	25.3154	-97.3852

E9	T08	Sol del Sur	84	17/10/2016	5:50	24°47.611 N	95°30.174 W	17/01/2017	0:01	26.0796	-97.4698
E9	T08	Daenerys	83	17/10/2016	5:50	24°47.636 N	95°30.165 W	21/02/2017	20:00	18.7230	-95.5630
E9	T08	Miwilin	46	17/10/2016	5:52	24°47.605 N	95°30.128 W	25/12/2016	19:00	19.1838	-95.7296
E10	T09	Maimat	47	17/10/2016	7:38	25°02.258 N	95°24.310 W	28/02/207	1:00	27.7844	-97.0962
E10	T09	Porkyto	48	17/10/2016	7:39	25°02.318 N	95°24.327 W	20/04/2017	19:00	28.5519	-96.0901
E10	T09	Valkiria	49	17/10/2016	7:41	25°02.259 N	95°24.248 W	24/03/2017	21:00	29.2992	-94.7747
E11	T10	Kabad	50	17/10/2016	10:39	24°40.457 N	95°11.594 W	19/01/2017	21:00	21.1862	-97.0947
E11	T10	Connor	51	17/10/2016	10:40	24°40.411 N	95°11.565 W	30/03/2017	8:00	28.6342	-95.8799
E11	T10	Mat	52	17/10/2016	10:42	24°40.468 N	95°11.526 W	24/03/2017	8:00	29.0263	-95.1843
E12	T11	Malinche	58	17/10/2016	15:05	24°26.227 N	94°34.405 W	13/01/2017	4:00	25.7660	-97.0250
E12	T11	Boyalmar	59	17/10/2016	15:06	24°26.197 N	94°34.350 W	16/01/2017	6:00	27.3538	-97.3245
E12	T11	Kontiki	60	17/10/2016	15:07	24°26.249 N	94°34.334 W	5/3/2017	15:00	26.6990	-97.3222
E13	T12	Te-boya-mar	57	15/10/2016	15:58	24°55.736 N	94°22.630 W	28/01/2017	21:00	18.7036	-95.2285
E13	T12	Audrey Jr.	65	15/10/2016	15:59	24°55.697 N	94°22.670 W	19/04/2017	15:00	21.9709	-97.6197
E13	T12	Analu	64	15/10/2016	16:01	24°55.750 N	94°22.690 W	24/03/2017	16:00	28.8407	-95.4650
E14	T13	Tex-Tux	55	15/10/2016	23:40	25°09.503 N	94°59.149 W	4/3/2017	3:00	27.2162	-97.3621
E14	T13	Dalifin	56	15/10/2016	23:40	25°09.440 N	94°59.49 W	5/3/2017	0:03	18.7209	-95.3241
E14	T13	Chuky	66	15/10/2016	23:42	25°09.471 N	94°59.201 W	11/6/2017	15:00	28.5360	-96.1253
E15	T14	Chapis	61	16/10/2016	7:27	25°25.793 N	95°37.579 W	18/03/2017	21:00	19.2183	-95.9071
E15	T14	Tita Pili	63	16/10/2016	7:27	25°25.831 N	95°37.572 W	28/01/2017	9:00	26.4784	-97.2015
E15	T14	Alba	72	16/10/2016	7:29	25°25.826 N	95°37.645 W	25/04/2017	0:00	27.2635	-97.3492
E16	T15	Alebrije	70	16/10/2016	13:57	25°39.858 N	96°14.826 W	29/10/2016	14:00	25.9554	-97.1480
E16	T15	Turkenio	71	16/10/2016	13:59	25°39.801 N	96°14.884 W	2/11/2016	23:00	25.8034	-97.1177
E16	T15	Kalid	81	16/10/2016	14:00	25°39.859 N	96°14.892 W	29/10/2016	6:00	25.9184	-97.1398

DORIS DRIFTERS

				FIRST DATA POINT				LAST DATA POINT			
Station	Triplet #	NAME	Drifter s/n #	Date dd/mm/yy	Time	Lat	Lon	Date dd/mm/yy	Time	Lat	Lon
E13b	T16	Rosa Pilar	549960	15/10/2016	4:00	24.7007	-93.7435	29/10/2016	21:00	22.8513	-93.4382
E13b	T16	Bom-boyager	325310	15/10/2016	2:42	-	-	-	-	-	-
E13b	T16	C-boya	320070	15/10/2016	2:44	-	-	-	-	-	-
E17	T17	Chuchita	327230	16/10/2016	17:00	25.7442	-96.4690	21/10/2016	21:00	25.5257	-96.8472
E17	T17	Ena	321230	16/10/2016	17:00	25.7445	-96.4688	3/11/2016	0:00	21.8254	-97.3063
E17	T17	Tsekub	322340	16/10/2016	17:00	25.7424	-96.4697	9/11/2016	17:00	18.8678	-95.6421
E12.b	T18	Rekowata	325070	17/10/2016	19:39	-	-	-	-	-	-
E12.b	T18	Mary ann	323230	17/10/2016	21:00	24.2100	-93.9597	13/11/2016	2:00	20.0133	-95.6932
E12.b	T18	Nahim	323360	17/10/2016	21:00	24.2122	-93.9599	9/11/2016	18:00	23.9333	-93.3705
E1.b	T19	Blitz	323320	18/10/2016	5:00	-	-	-	-	-	-
E1.b	T19	Alfa-Teric	329230	18/10/2016	5:00	23.7730	-94.2480	13/11/2016	2:00	25.0598	-94.4037
E1.b	T19	María	323240	18/10/2016	6:00	23.7869	-94.2750	15/11/2016	6:00	24.4260	-95.0319
E5	T20	Manna	327060	19/10/2016	16:00	24.7584	-96.8466	14/11/2016	23:00	20.0153	-92.2133
E5	T20	Foix	322320	19/10/2016	14:42	-	-	-	-	-	-
E5	T20	Tara	328320	19/10/2016	15:00	24.7588	-96.8472	14/11/2016	6:00	18.4122	-93.5255

DWDE 3

CODE DRIFTERS

				FIRST DATA POINT				LAST DATA POINT			
Station	Triplet #	NAME	Drifter s/n #	Date dd/mm/yy	Time	Lat	Lon	Date dd/mm/yy	Time	Lat	Lon
E01	T-01	KAY	600	25/04/17	14:00	23.9675	-94.7731	6/8/2017	18:00	28.3210	-93.1824
E01	T-01	ARAGONITA	400	25/04/17	13:21	23.9671	-94.7724	16/07/17	6:00	28.0317	-94.6668
E01	T-01	TIAGO	2600	25/04/17	14:00	23.9681	-94.7712	19/06/17	22:00	28.5726	-89.7236
E02	T-02	LUCI	630	25/04/17	23:00	24.2142	-95.4050	11/6/2017	18:00	28.5240	-91.5951
E02	T-02	BOYA-PASAR	6610	25/04/17	23:00	24.2133	-95.4040	9/5/2017	11:00	25.8098	-96.1712
E02	T-02	PATTYSNAPS	5600	25/04/17	23:00	24.2138	-95.4038	9/5/2017	15:00	25.7009	-96.3031
E03	T-03	DOMINGA	2640	26/04/17	7:00	24.4809	-96.0221	2/10/2017	6:00	27.7467	-92.2552
E03	T-03	ATLANTIS	4610	26/04/17	7:00	24.4807	-96.0216	2/8/2017	18:00	25.1098	-90.7499
E03	T-03	NAUTILUS	640	26/04/17	7:00	24.4800	-96.0228	23/09/17	16:00	27.4454	-93.0761
E04	T-04	CHIXCHULUB	3630	26/04/17	15:00	24.7397	-96.6155	6/7/2017	21:00	25.6850	-92.4914
E04	T-04	SHACKLETON	7640	26/04/17	15:00	24.7400	-96.6140	28/07/17	23:00	28.0786	-86.9999
E04	T-04	FRAGATA	4660	26/04/17	15:00	24.7396	-96.6153	11/6/2017	14:00	23.6303	-94.8831
E06	T-05	MAR	480	27/04/17	0:00	25.1493	-96.4328	19/06/17	5:00	26.1625	-95.7911
E06	T-05	WICHO	5630	27/04/17	0:00	25.1490	-96.4323	2/7/2017	14:00	28.3357	-90.6258
E06	T-05	DON GOYO	1720	27/04/17	0:00	25.1497	-96.4323	18/07/17	17:00	28.6588	-90.2406
E07	T-06	PAINANI	5610	27/04/17	5:00	24.9156	-95.8240	14/08/17	0:00	25.7047	-93.7257
E07	T-06	COCUYO	1400	27/04/17	5:00	24.9150	-95.8234	6/8/2017	6:00	26.6581	-95.1939
E07	T-06	DOMI	9600	27/04/17	5:00	24.9153	-95.8253	1/6/2017	15:00	25.3997	-93.1846
E08	T-07	QWERTY	8630	27/04/17	8:00	24.5557	-95.6071	16/10/17	10:00	25.8282	-95.8521
E08	T-07	MACUSO	1610	27/04/17	8:00	24.5554	-95.6060	23/07/17	10:00	23.9949	-93.2343
E08	T-07	BALANDRA	8620	27/04/17	8:00	24.5564	-95.6055	22/07/17	5:00	28.6194	-86.0931

E09	T-08	OSAIO	7630	27/04/17	10:00	24.7948	-95.5090	9/8/2017	15:00	26.0817	-90.5181
E09	T-08	TONATIUH	6620	27/04/17	10:00	24.7956	-95.5090	16/07/17	23:00	24.4574	-93.0174
E09	T-08	GUBIDXA	1620	27/04/17	10:00	24.7950	-95.5109	16/08/17	16:00	24.6948	-93.1887
E10	T-09	KURDEV	2630	27/04/17	12:00	25.0401	-95.4091	29/08/17	8:00	24.0112	-90.4804
E10	T-09	ARGONAUTA	4630	27/04/17	12:00	25.0406	-95.4087	20/08/17	16:00	23.8409	-84.0311
E10	T-09	CUETO	9610	27/04/17	12:00	25.0401	-95.4076	16/09/17	15:00	24.5455	-82.2704
E11	T-10	P´OP´OOT	3610	27/04/17	15:00	24.6729	-95.2119	28/06/17	3:00	24.5256	-93.8830
E11	T-10	ODISEO	620	27/04/17	15:00	24.6721	-95.2113	1/8/2017	18:00	24.1314	-94.8383
E11	T-10	SAMUEL	7620	27/04/17	15:00	24.6734	-95.2104	29/08/17	12:00	27.8915	-87.5853
E12	T-11	C-BOYASADA	2620	27/04/17	19:00	24.4392	-94.5786	19/06/17	22:00	28.4279	-89.7100
E12	T-11	KARLA	3600	27/04/17	19:00	24.4388	-94.5779	10/6/2017	0:00	28.0102	-90.8891
E12	T-11	MIQUEAS	5620	27/04/17	19:00	24.4403	-94.5777	30/08/17	21:00	28.9198	-94.6011
E13	T-12	KRAKEN	610	28/04/17	5:00	24.9519	-94.4003	25/07/17	18:00	28.1783	-91.6952
E13	T-12	IZUEL	1600	28/04/17	5:00	24.9511	-94.4005	25/08/17	17:00	28.3038	-91.1928
E13	T-12	VOLVERÁ	6630	28/04/17	5:00	24.9515	-94.4013	31/05/17	20:00	25.8611	-93.7951
E14	T-13	BELIER	7600	28/04/17	13:00	25.1951	-94.9867	19/06/17	23:00	25.4681	-93.1152
E14	T-13	ERANDI	3690	28/04/17	13:00	25.1943	-94.9864	24/08/17	3:00	23.3428	-93.7128
E14	T-13	DUSH	6600	28/04/17	13:00	25.1948	-94.9875	14/10/17	14:00	26.8192	-96.6632
E15	T-14	XAYAH	720	28/04/17	23:00	25.3766	-95.4912	3/10/2017	1:00	26.3073	-93.2075
E15	T-14	EXCANEKA	3620	28/04/17	23:00	25.3762	-95.4918	17/10/17	8:00	24.0684	-95.0710
E15	T-14	TRUGA	4620	28/04/17	23:00	25.3771	-95.4916	20/08/17	23:00	28.6257	-87.7923
E16	T-15	PANCHA	4420	29/04/17	5:00	25.6722	-96.2241	14/09/17	3:00	28.1145	-95.3442
E16	T-15	BOYIN-BOYETE	9630	29/04/17	5:00	25.6721	-96.2236	25/05/17	17:00	26.5451	-91.9277
E16	T-15	KUKULKÁN	7610	29/04/17	5:00	25.6718	-96.2247	1/7/2017	20:00	29.1103	-93.3278

DORIS DRIFTERS

				FIRST DATA POINT				LAST DATA POINT			
Station	Triplet #	NAME	Drifter s/n #	Date dd/mm/yy	Time	Lat	Lon	Date dd/mm/yy	Time	Lat	Lon
E01.b	T19	GRAFOS	326250	25/04/2017	0:00	23.7231	-94.1433	1/5/2017	1:00	23.7799	-93.6059
E01.b	T19	DERIVA GENICA	322210	25/04/2017	0:00	23.7232	-94.1430	2/7/2017	11:00	25.7907	-92.3068
E01.b	T19	WORLD PEACE	324080	25/04/2017	0:00	23.7243	-94.1438	19/05/2017	21:00	25.1237	-95.9933
E05	T20	ELMO	326110	26/04/2017	18:00	24.7632	-96.7605	23/06/2017	8:00	28.4827	-96.2282
E05	T20	BOYAGER	874520	26/04/2017	19:00	24.8051	-96.8246	6/6/2017	6:00	28.2945	-96.4913
E05	T20	BOYANCE	328170	26/04/2017	18:00	24.7824	-96.8380	20/05/2017	14:00	28.3545	-94.9990
E09	T18	EL CORAL	773850	27/04/2017	11:00	24.7956	-95.5192	10/7/2017	11:00	25.0602	-93.7617
E09	T18	LUCA	320070	27/04/2017	11:00	24.7934	-95.5160	30/04/2017	4:00	25.5695	-95.2590
E09	T18	PIBE	329200	27/04/2017	11:00	24.7955	-95.5199	30/07/2017	16:00	23.7452	-93.2567
E14	T16	XANATH	325230	28/04/2017	14:00	25.1939	-94.9801	8/7/2017	20:00	24.7344	-93.2496
E14	T16	EL VIEJO	329070	28/04/2017	14:00	25.1940	-94.9802	15/07/2017	19:00	27.4552	-92.7687

DWDE 4

				FIRST DATA POINT				LAST DATA POINT			
Station	Triplet #	NAME	Drifter s/n #	Date dd/mm/yy	Time	Lat	Lon	Date dd/mm/yy	Time	Lat	Lon
E01	T-01	SANDUNGA	2080	07/11/17	10:00	23.9659	-94.7855	31/01/2018	15:00	27.2124	-96.2031
01	T-01	FRIDA	2050	07/11/17	10:00	23.9657	-94.7842	8/12/2017	5:00	24.3171	-96.0821
E01	T-01	CID	2920	07/11/17	10:00	23.9665	-94.7835	28/01/2018	21:00	22.0713	-97.1920
E02	T-02	NEMO	4040	07/11/17	18:00	24.2218	-95.4009	14/11/2017	14:00	24.2381	-94.6215
E02	T-02	LUCY IN THE SKY	5060	07/11/17	18:00	24.2213	-95.4007	12/1/2018	4:00	26.4116	-94.5110
E02	T-02	DORY	900	07/11/17	18:00	24.2218	-95.3988	20/02/2018	5:00	26.5103	-90.2930
E03	T-03	ITZAMNA	3100	08/11/17	1:00	24.4546	-96.0146	16/01/2018	19:00	27.5970	-91.0711
E03	T-03	NEPTUNO	5010	08/11/17	1:00	24.4535	-96.0146	10/1/2018	13:00	26.1531	-96.0185
E03	T-03	POSEIDON	3280	08/11/17	1:00	24.4546	-96.0127	12/11/2017	20:00	24.9479	-96.0677
E04	T-04	ARGOS	6890	08/11/17	8:00	24.6901	-96.6236	27/11/17	22:00	26.0438	-94.9543
E04	T-04	TEQUILA	7910	08/11/17	8:00	24.6891	-96.6242	8/12/2017	6:00	26.3988	-95.7669
E04	T-04	CHONA	80	08/11/17	8:00	24.6887	-96.6236	27/11/17	23:00	26.0451	-94.9456
E05	T-05	PEREGRINA	9130	08/11/17	14:00	25.1601	-96.4304	16/01/2018	17:00	27.6823	-92.5500
E05	T-05	DOñA FLOTILDA	9140	08/11/17	14:00	25.1613	-96.4286	8/2/2018	5:00	26.1623	-92.5823
E05	T-05	CAMARADA	4050	08/11/17	14:00	25.1592	-96.4331	14/01/2018	4:00	24.8503	-93.5545
E07	T-06	VICENTE FERRERIRA	7130	08/11/17	19:00	24.9150	-95.8107	31/12/17	21:00	23.3907	-95.0533
E07	T-06	VERA	5150	08/11/17	20:00	24.9181	-95.8169	15/01/2018	7:00	25.5180	-93.3639
E07	T-06	CHESTER	9010	08/11/17	19:00	24.9148	-95.8103	2/2/2018	15:00	26.8603	-96.7351
E08	T-07	SELKIE	1020	08/11/17	22:00	24.5579	-95.5992	20/01/2018	19:00	25.4069	-95.4576
E08	T-07	REGINA	5080	08/11/17	22:00	24.5587	-95.5992	17/01/2018	5:00	25.0222	-96.5938
E08	T-07	PETRONILA	4950	08/11/17	23:00	24.5655	-95.5960	17/01/2018	1:00	24.8556	-96.5156
E09	T-08	EPHYRA	1890	09/11/17	0:00	24.7968	-95.4990	16/01/2018	13:00	27.5131	-94.5384

E09	T-08	LISA	1050	09/11/17	0:00	24.7974	-95.4981	1/1/2018	2:00	24.4355	-96.2471
E09	T-08	GILGIOLA	6910	09/11/17	0:00	24.7969	-95.4998	4/2/2018	23:00	26.1001	-94.3283
E10	T-09	WAVE RUNNER	5090	09/11/17	2:00	25.0343	-95.3964	30/01/2018	13:00	25.5610	-95.3748
E10	T-09	LUPITA	8940	09/11/17	2:00	25.0350	-95.3960	5/1/2018	19:00	26.3959	-96.6258
E10	T-09	HEISENBERG	5900	09/11/17	2:00	25.0336	-95.3963	4/2/2018	4:00	24.7922	-94.8732
E11	T-10	ALBATROS	40	09/11/17	5:00	24.6757	-95.1762	1/1/2018	7:00	23.7513	-95.6386
E11	T-10	LISBOYA	9050	09/11/17	5:00	24.6767	-95.1760	8/12/2017	8:00	23.7176	-95.8724
E11	T-10	LAGRANBOYA	9090	09/11/17	5:00	24.6752	-95.1772	27/1/2018	17:00	24.1374	-88.0430
E12	T-11	MAKO	5950	09/11/17	9:00	24.4293	-94.5644	23/02/2018	19:00	26.6577	-97.3079
E12	T-11	NANI	6010	09/11/17	9:00	24.4307	-94.5645	27/2/2018	7:00	26.8130	-96.3540
E12	T-11	DAMIAN	1900	09/11/17	9:00	24.4313	-94.5640	26/01/2018	23:00	24.7546	-95.9809
E13	T-12	CHIMICHANGA	4010	09/11/17	16:00	24.9212	-94.3735	7/2/2018	23:00	28.7090	-89.7976
E13	T-12	MARTINA	6950	09/11/17	16:00	24.9218	-94.3733	8/2/2018	19:00	23.8976	-97.4052
E13	T-12	MCBUOYFACE	3110	09/11/17	16:00	24.9227	-94.3744	27/2/2018	7:00	22.6905	-94.3041
E14	T-13	CORBIN	6100	10/11/17	0:00	25.1451	-94.9899	1/1/2018	3:00	24.9599	-94.0262
E14	T-13	FLOATING BEAR	30	10/11/17	0:00	25.1449	-94.9907	25/01/2018	22:00	25.5649	-95.5240
E14	T-13	UNICORN PUG	7080	10/11/17	0:00	25.1455	-94.9902	15/01/2018	20:00	28.1030	-95.6377
E15	T-14	POPEYE	7060	10/11/17	8:00	25.3996	-95.6115	23/01/2018	0:00	24.9369	-94.7218
E15	T-14	GRANDPAW	920	10/11/17	8:00	25.4004	-95.6123	19/01/2018	23:00	24.0495	-93.8493
E15	T-14	MAFALDA	1030	10/11/17	8:00	25.4005	-95.6121	14/02/2018	18:00	23.4042	-93.6664
E16	T-15	Beta (MC)	89	10/11/17	15:00	25.6312	-96.2582	17/11/17	18:00	25.3156	-97.3856
E16	T-15	Golfina (MC)	78	10/11/17	15:00	25.6332	-96.2583	28/11/17	1:00	24.2277	-97.7143
E16	T-15	Yunuen (MC)	25	10/11/17	15:00	25.6320	-96.2592	24/11/17	16:00	24.5210	-97.6729
E17	T-17	BobloE3 (MC)	36	10/11/17	17:00	25.7264	-96.4834	16/11/17	18:00	25.4188	-97.3274
E17	T-17	Mixtli	8900	10/11/17	17:00	25.7245	-96.4849	17/11/17	20:00	25.7182	-97.1428
E06	T-20	SALLY (MC)	14	08/11/17	10:00	24.7694	-96.8438	24/02/2018	8:00	24.7118	-95.1826
E06	T-20	ERNESTO (MC)	26	08/11/17	10:00	24.7682	-96.8441	18/04/2018	5:00	25.0526	-96.9728
E06	T-20	ALFA (MC)	72	08/11/17	10:00	24.7672	-96.8423	11/3/2018	5:00	24.4448	-93.8082
E06	T-20	LALO (MC)	90	08/11/17	11:00	24.7800	-96.8363	11/4/2018	21:00	24.2484	-97.6267

FIFTEEN DAY DRIFTERS TRAJECTORIES

Below are the trajectory plots of the 207 drifters launched during DWDE1, DWDE2, DWDE3 and DWDE4, separated into periods of 15 days. The colors represent the hourly speed, which allows to observe not only the presence of oceanic structures or eddies, but also the currents intensity. The contours in black show the mean sea level anomaly for the fifteen day periods. The thickest contour represents the zero anomaly value. Given the great dispersion of drifters by marine currents, we can obtain a large spatial coverage to map the state of the surface current fields during the period of the experiments.

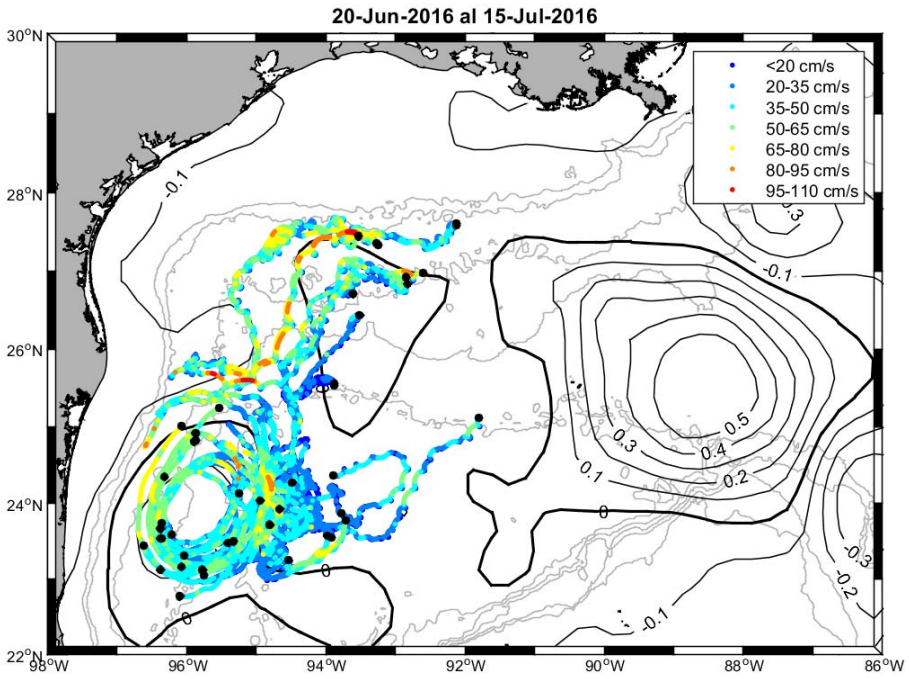
In terms of drifters that can be used to describe the mesoscale structures present in the region, it should be noted that with all experiments there is practically two years of continuous measurements (see figure 2). If we look at the figures, the Loop Current anticyclonic eddies tend to keep most of the drifters trapped inside for a while offshore of the Tamaulipas shelf break. In August 2016, a pair of drifters registered another anticyclone recently detached from the Loop Current. With the buoys released at DWDE2 it was possible to observe this mesoscale structure movement towards the west, in particular November and December 2016 where very intense currents were observed associated with this eddy´s circulation, as well as the north-south deformation as a consequence of the interaction with the Campeche semi-permanent cyclone and with the continental slope.

During the first stages in DWDE2 and DWDE3, the devices remain inside the anticyclonic circulation and don’t show much exchange towards the north, which was more effective for the DWDE1 buoys (July and August 2016). It was only after May 2017 that the drifters begin to move towards the north. On the other hand, some devices crossed the continental slope to the west and reached the shelf. These drifters registered a very intense current to the south and close to the coast (see months of November and December 2016).

Again, the buoys launched during the DWDE3 shows the presence of the Loop Current anticyclone with lower intensity currents compared to the months of November and

December 2016, when the eddy was in the central Gulf of Mexico. The drifters in DWDE3 document the period when the eddy is interacting with the continental slope.

The case of the DWDE4 buoys is slightly different from previous cruises, since a Loop Current anticyclone is present, however the main structure is an intense cyclone located north of the anticyclone (in the contours of sea level anomalies it is possible to observe how this cyclone has grown and evolved since July 2017). During the months of November, December and even January 2017-2018, this dipole can be seen in the trajectory of the drifters, which has more intense currents in the areas where the opposite polarity eddies approach each other.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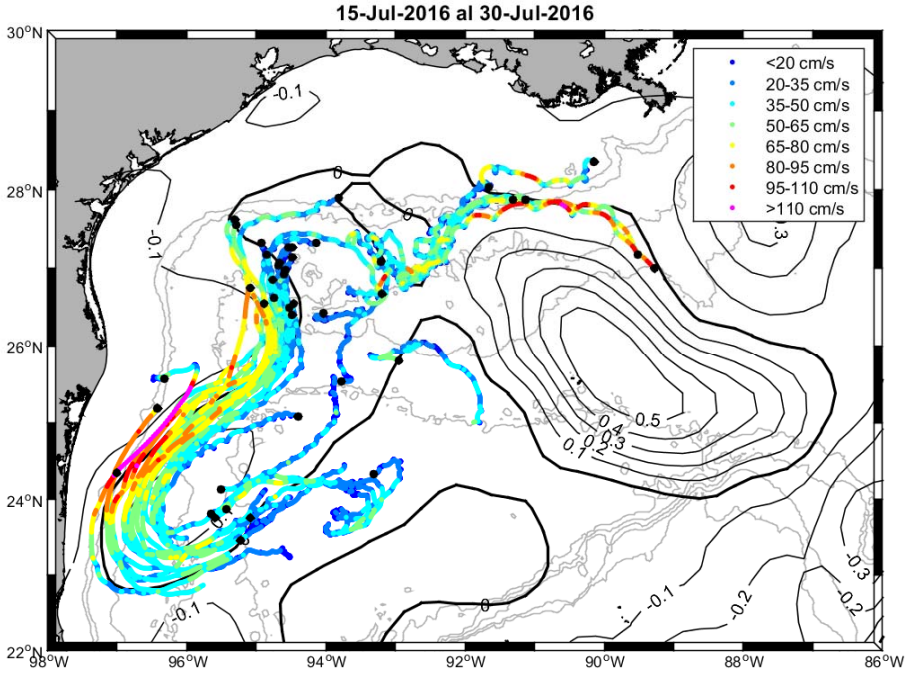
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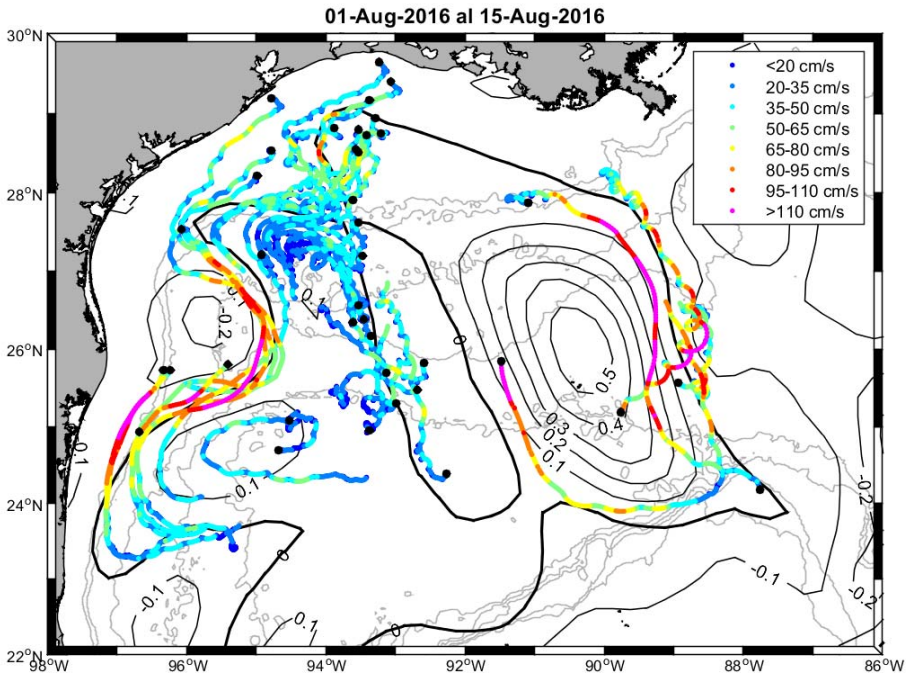
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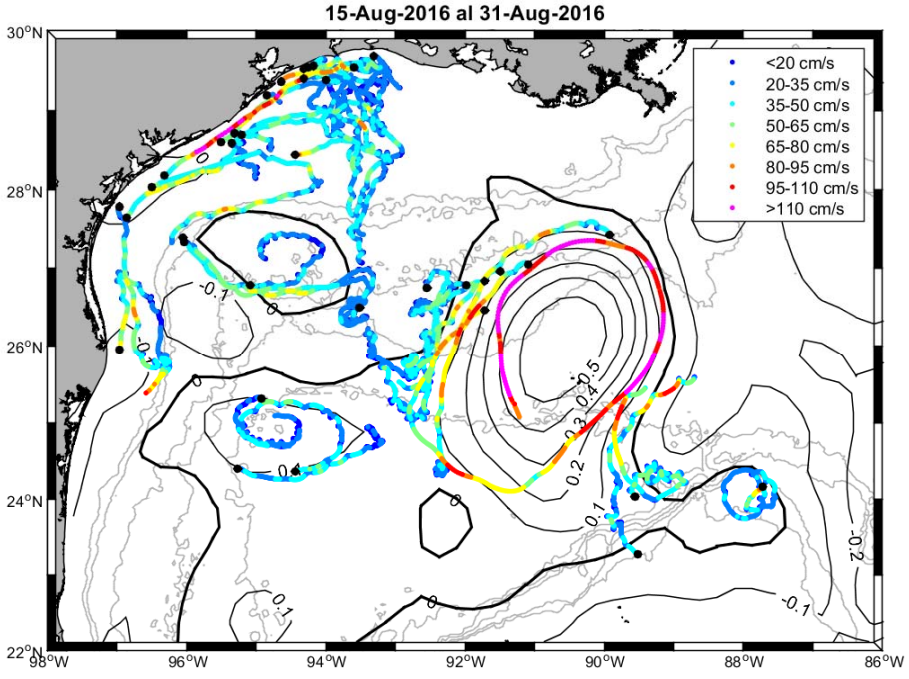
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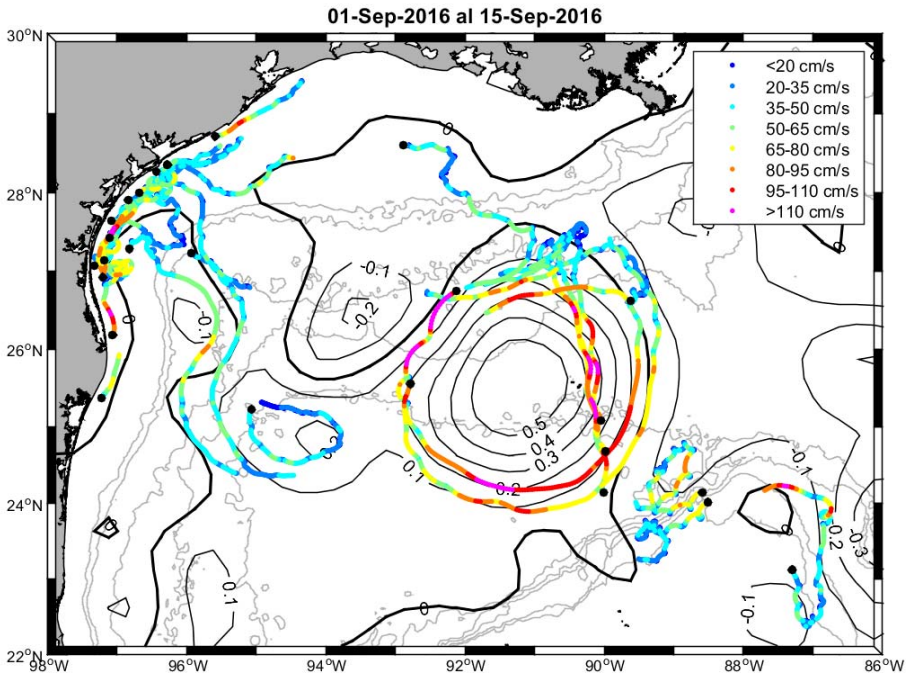
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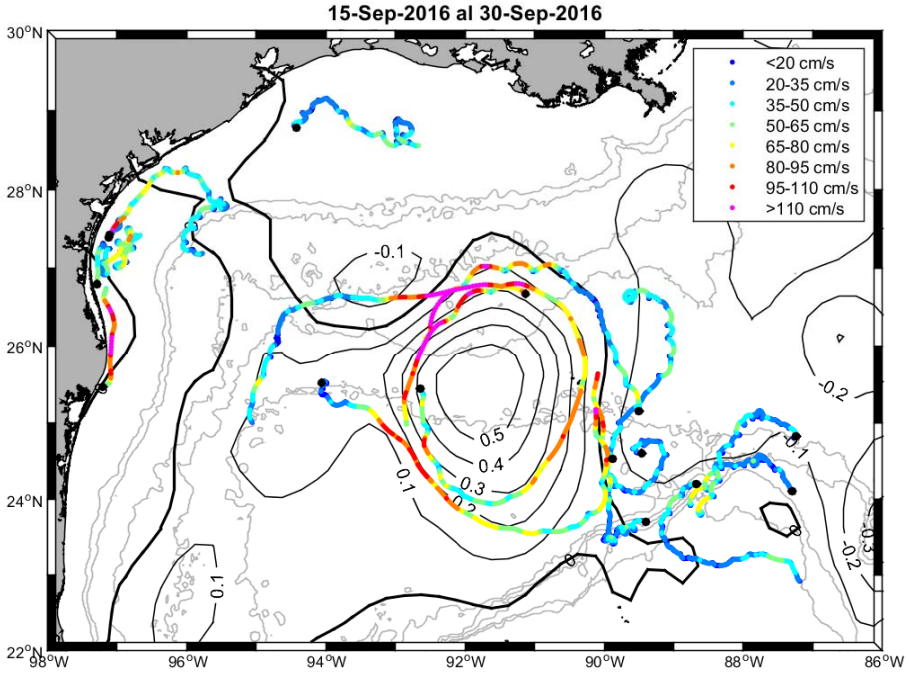
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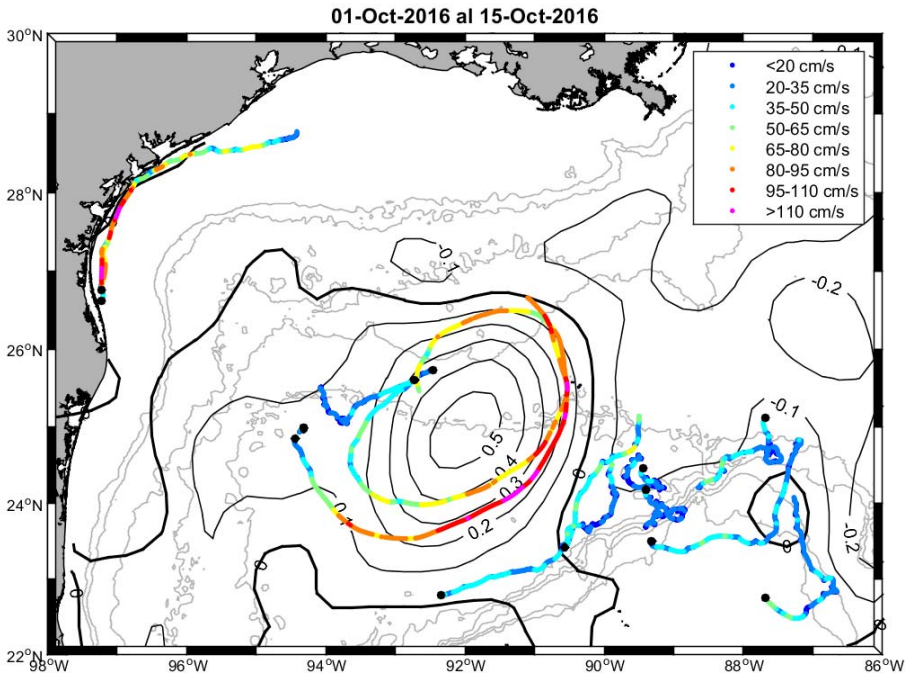
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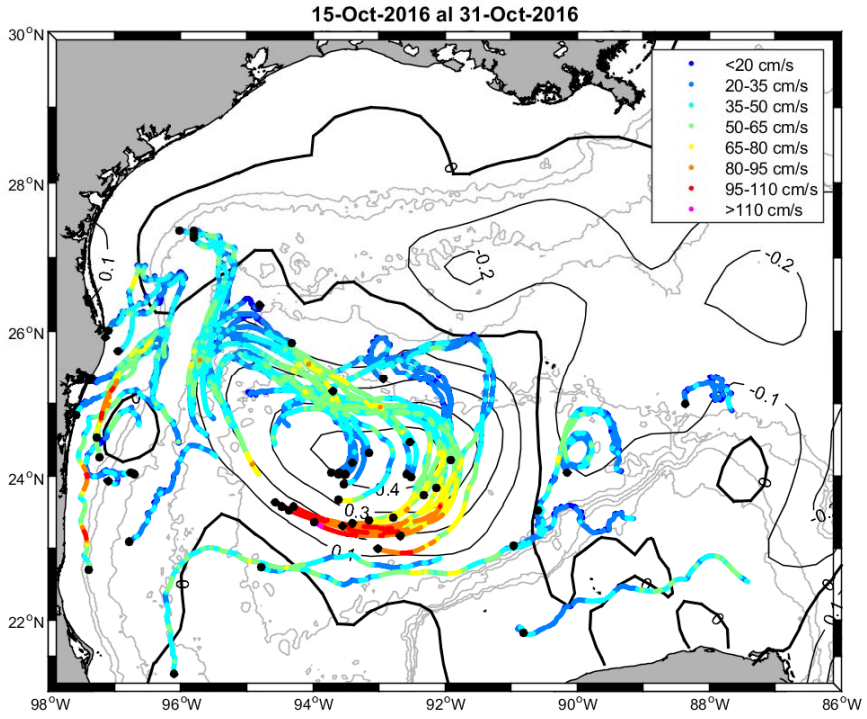
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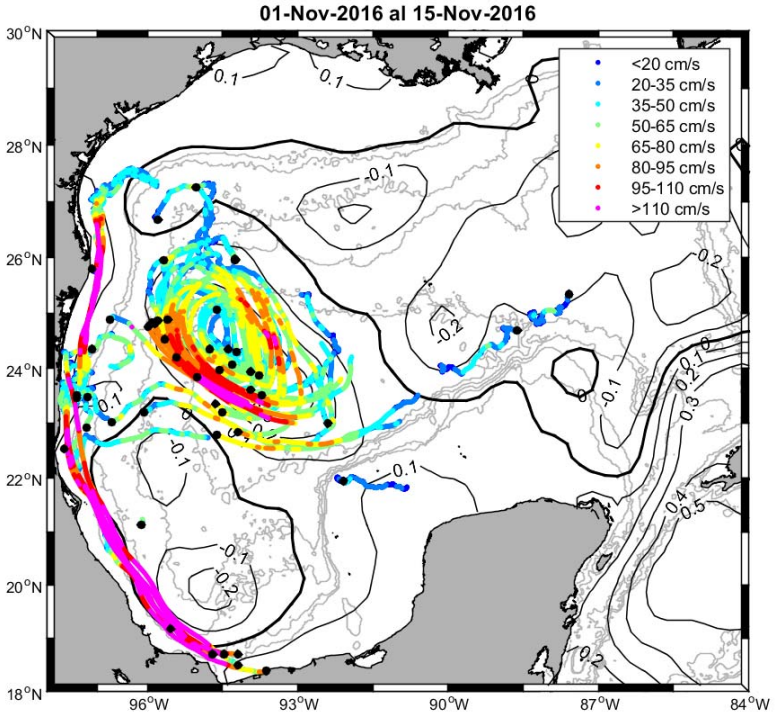
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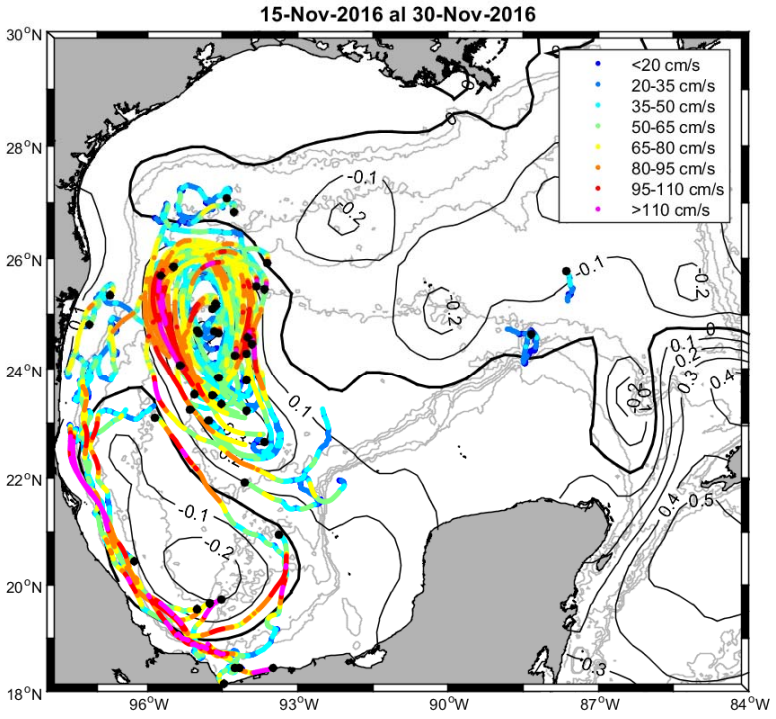
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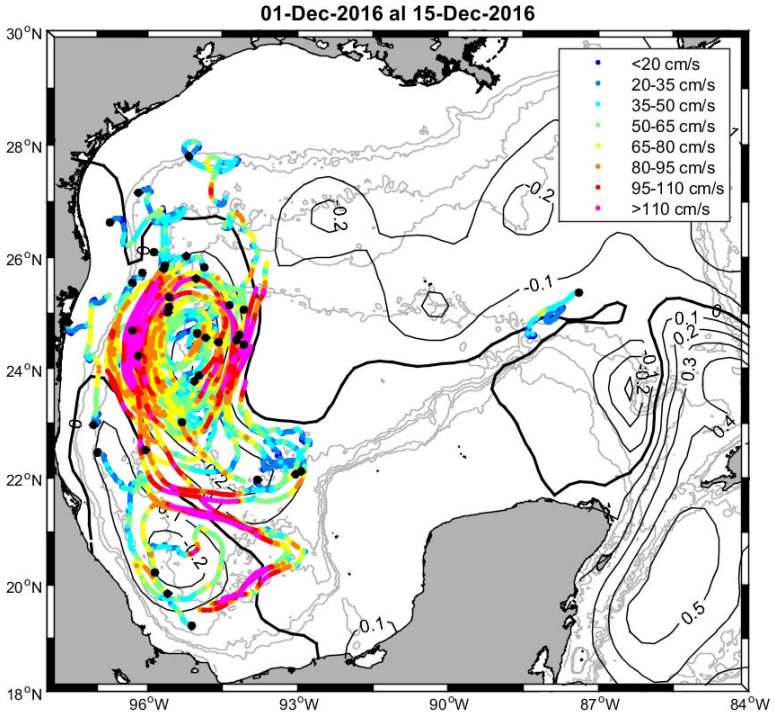
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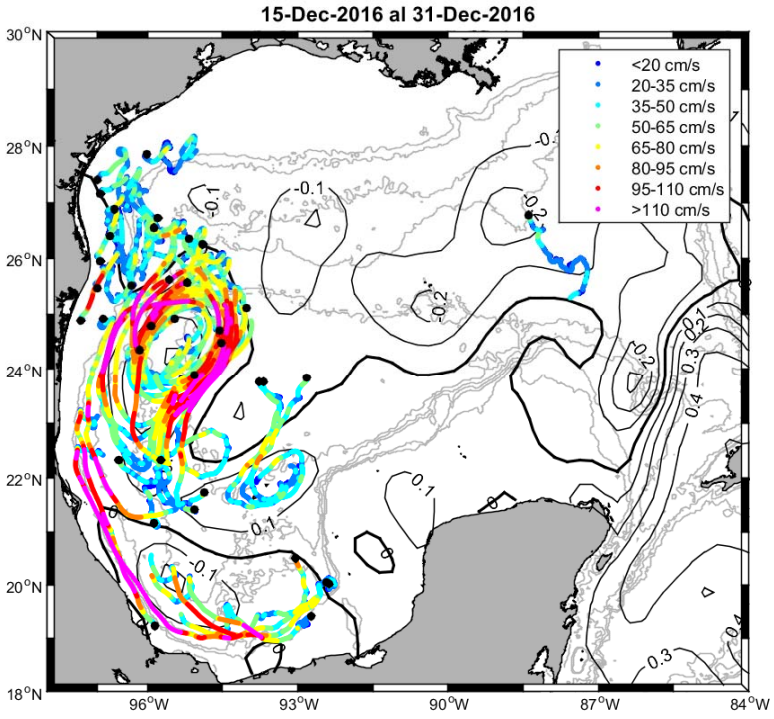
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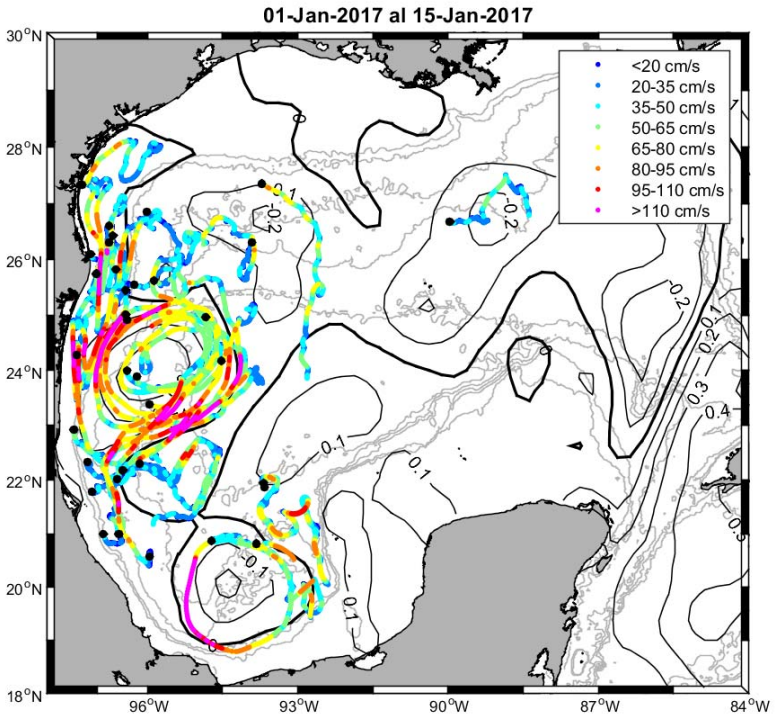
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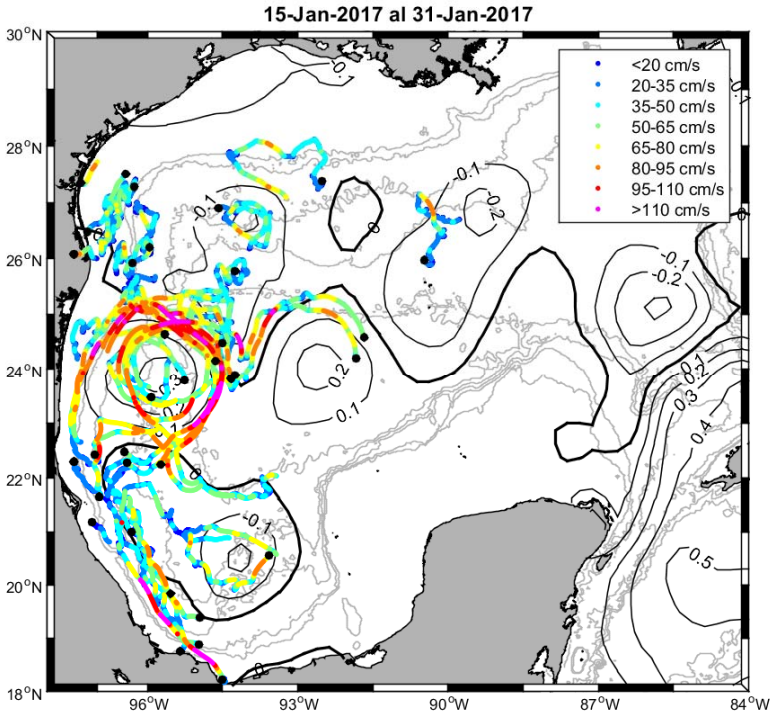
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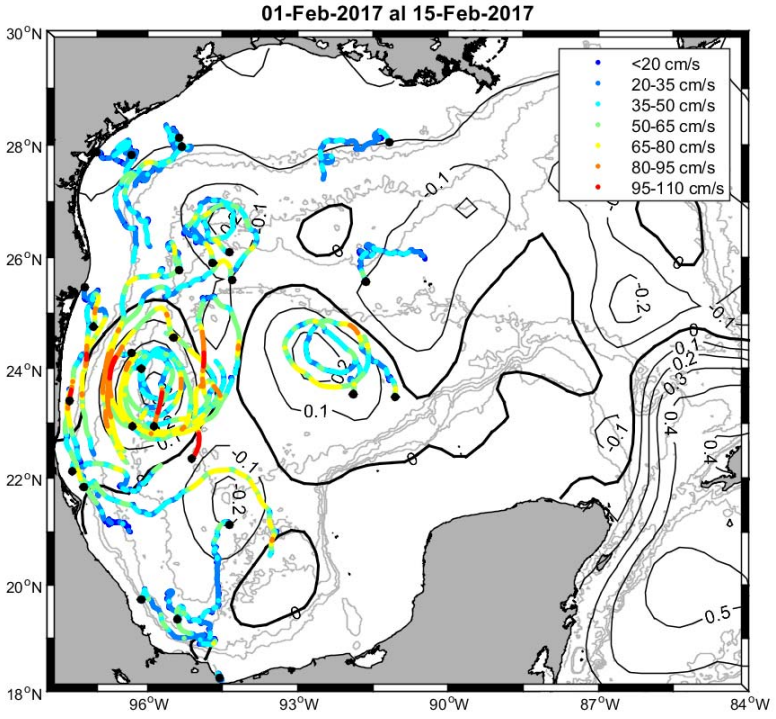
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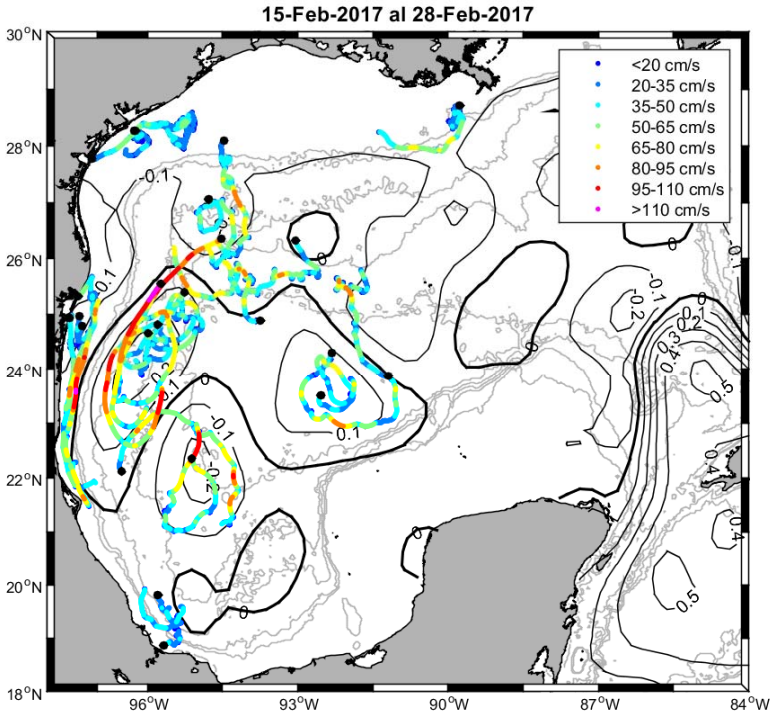
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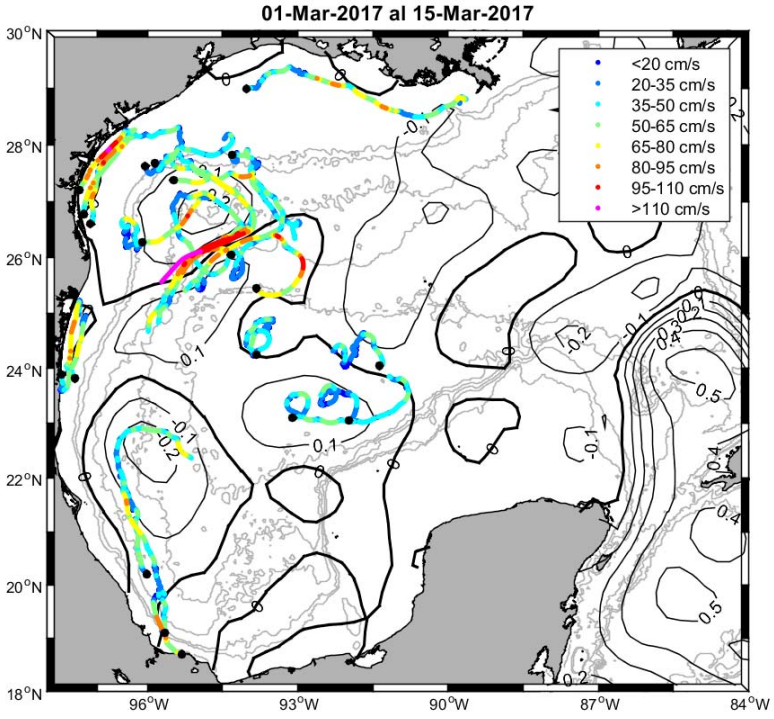
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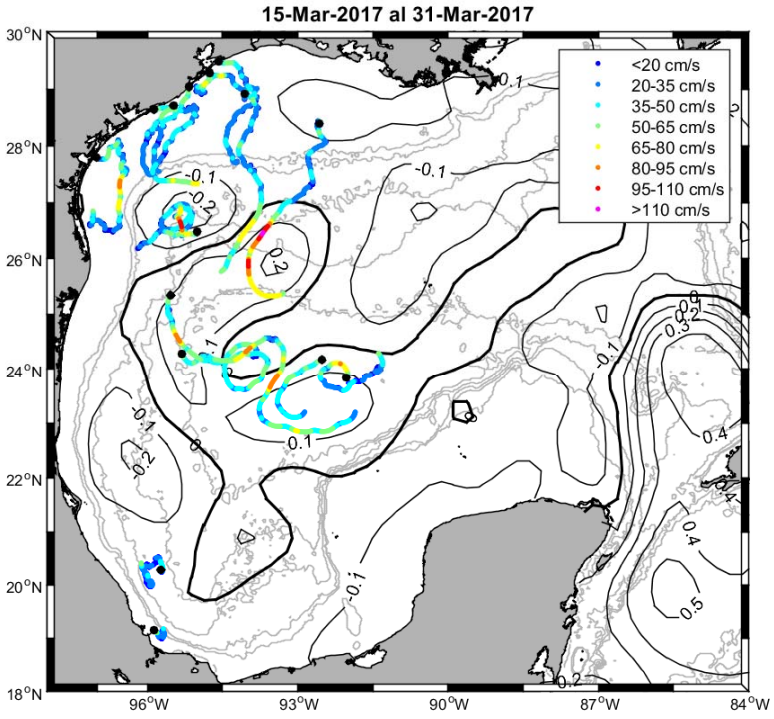
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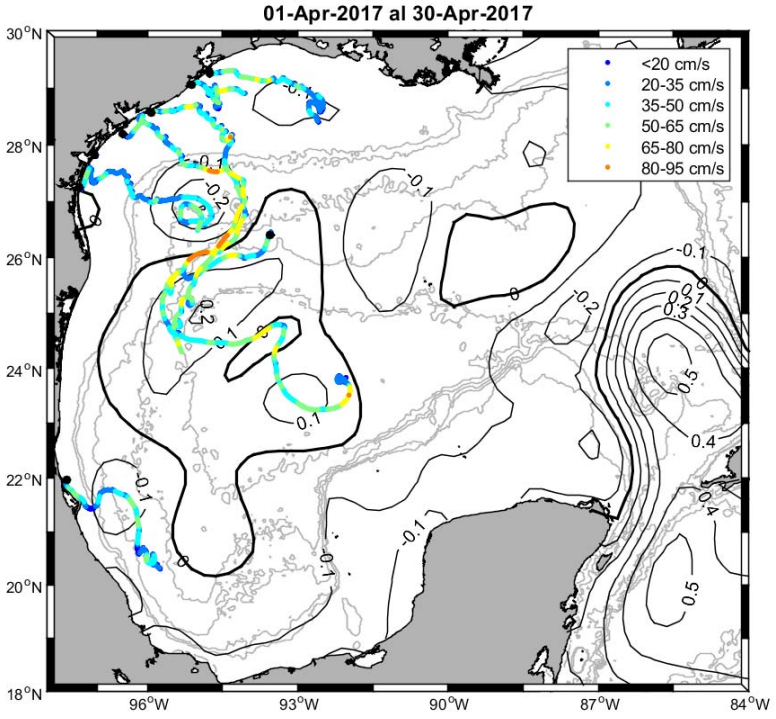
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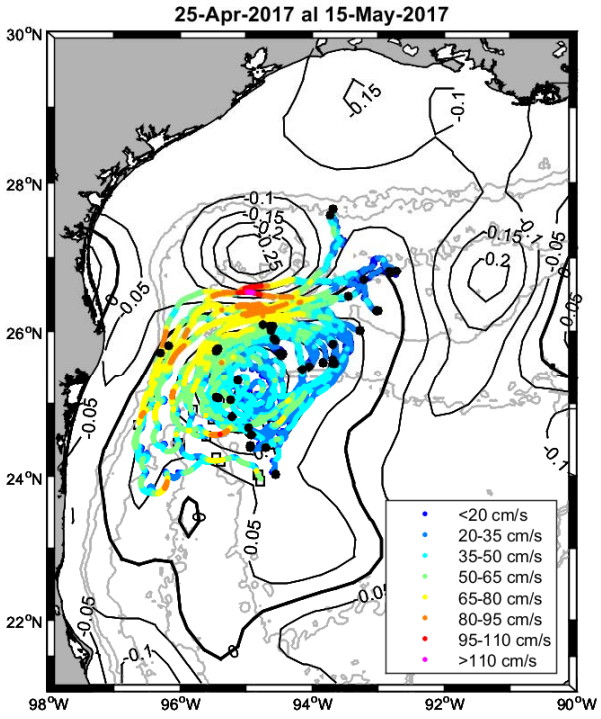
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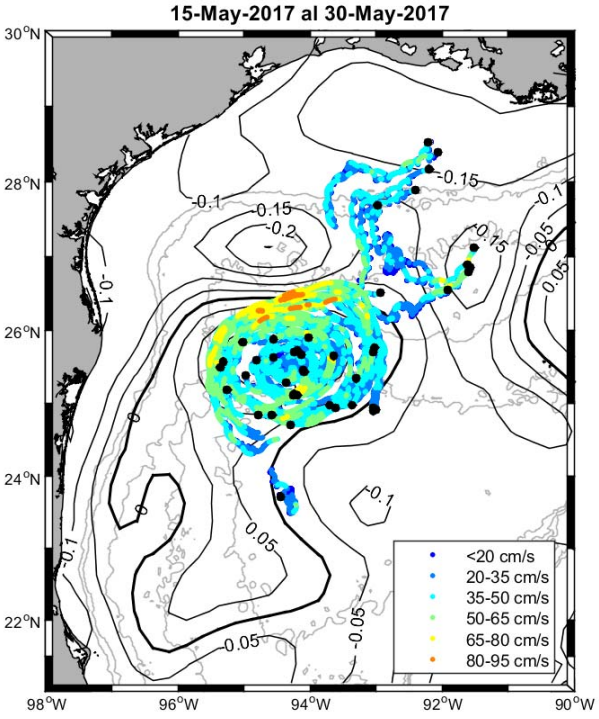
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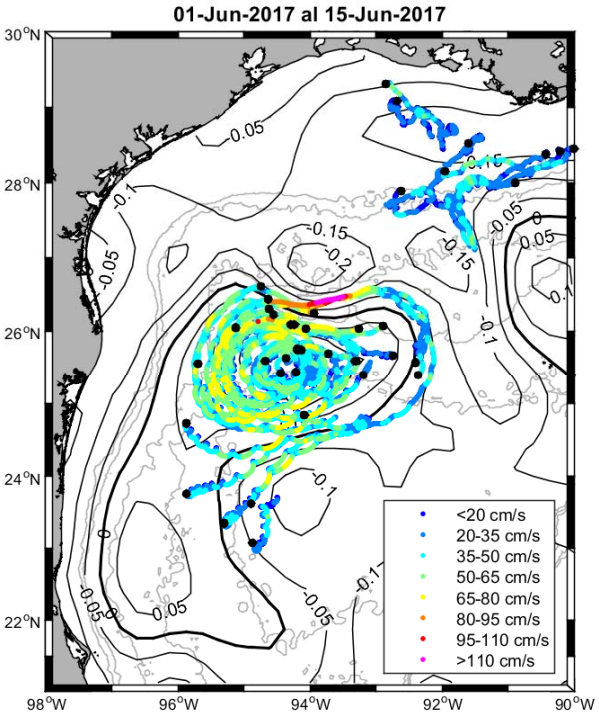
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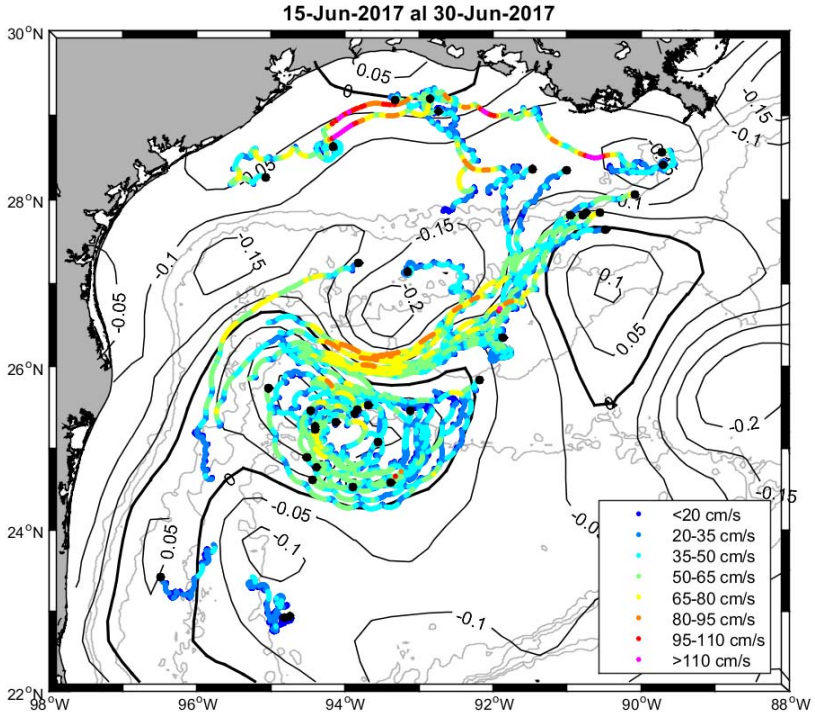
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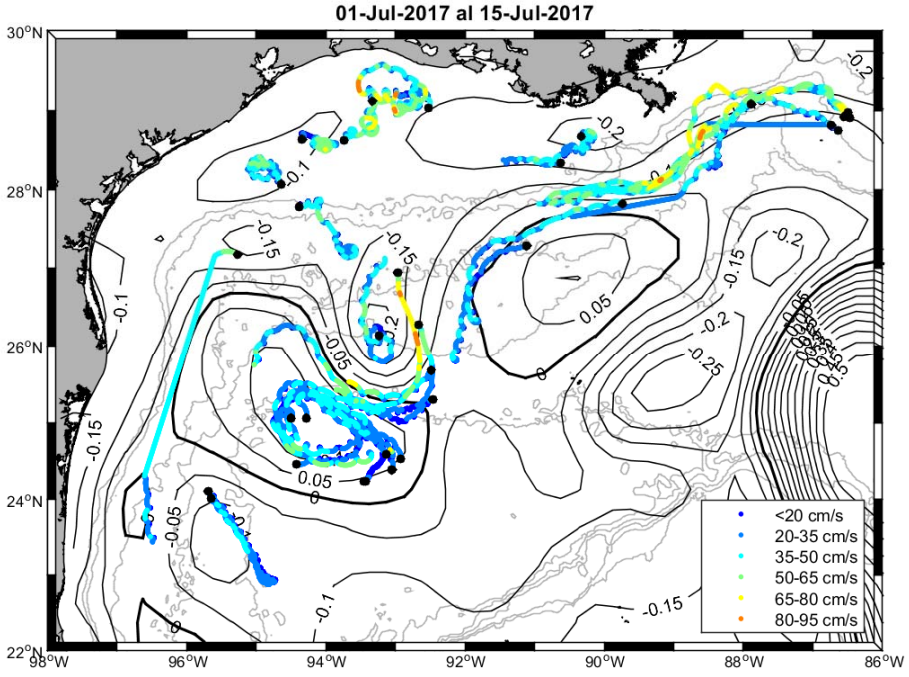
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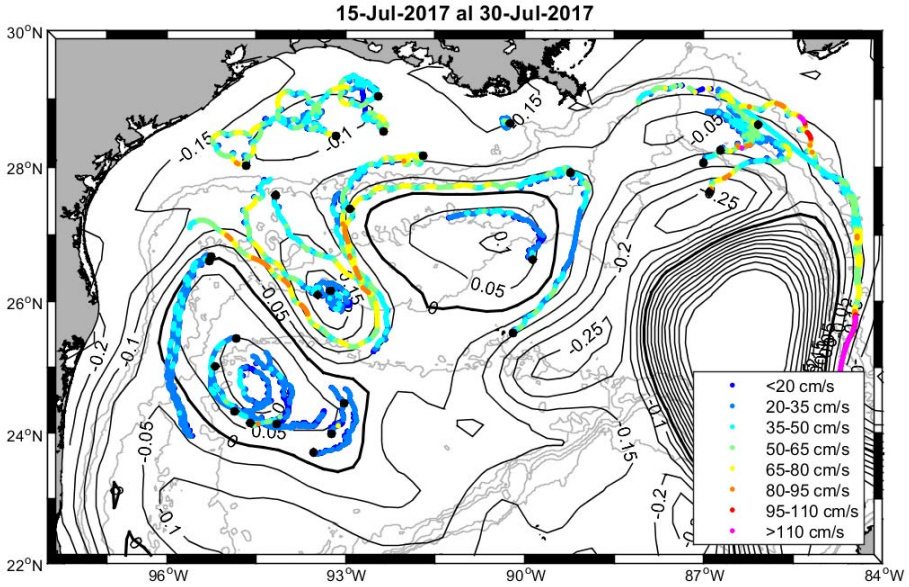
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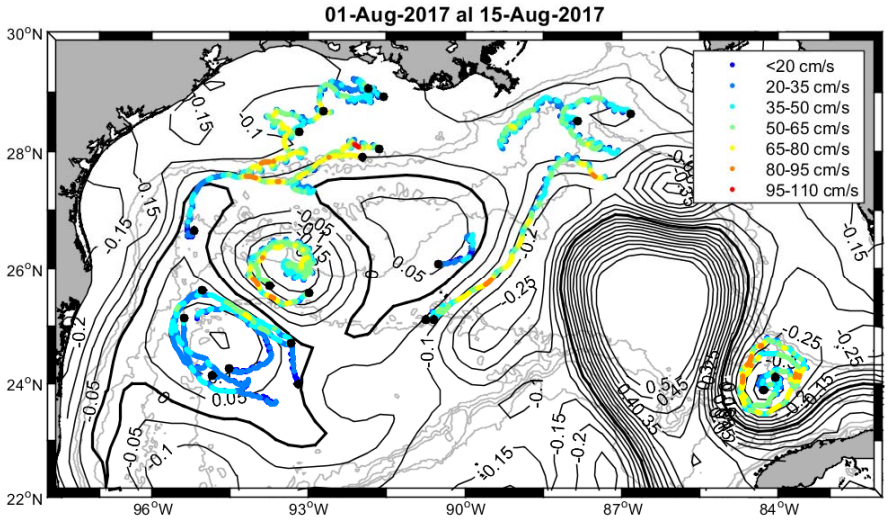
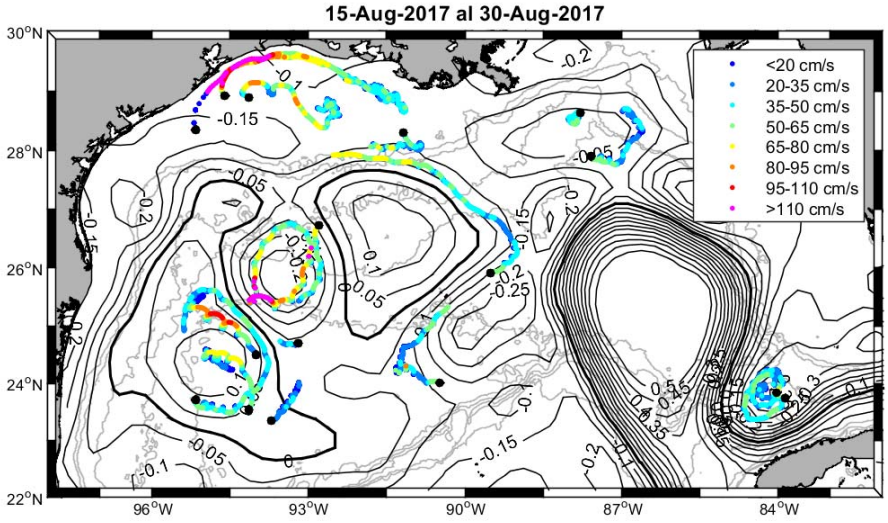
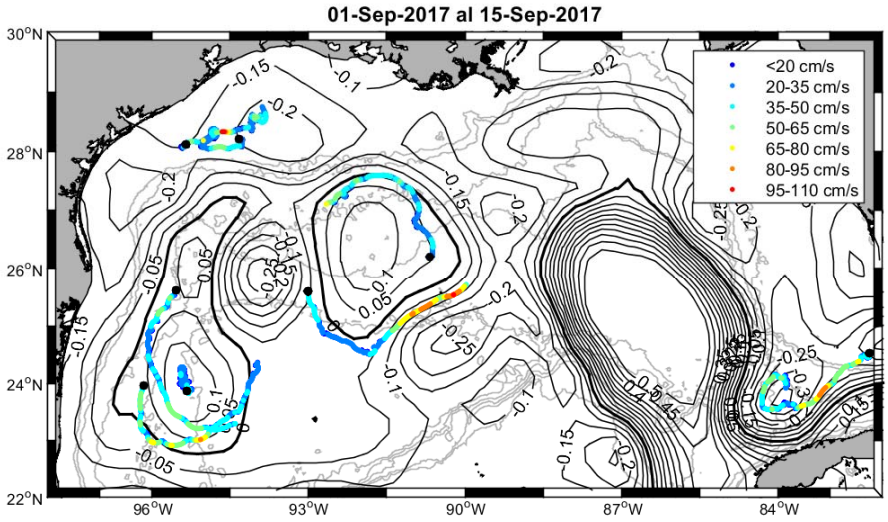
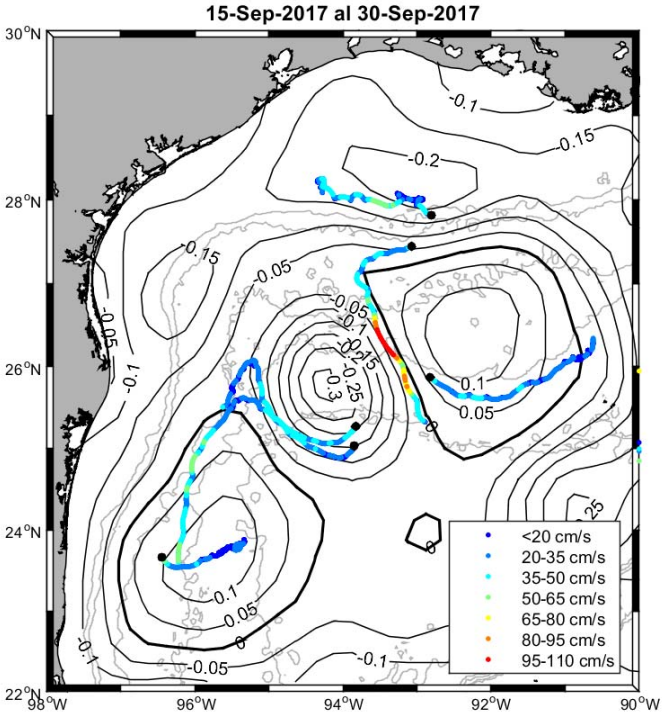
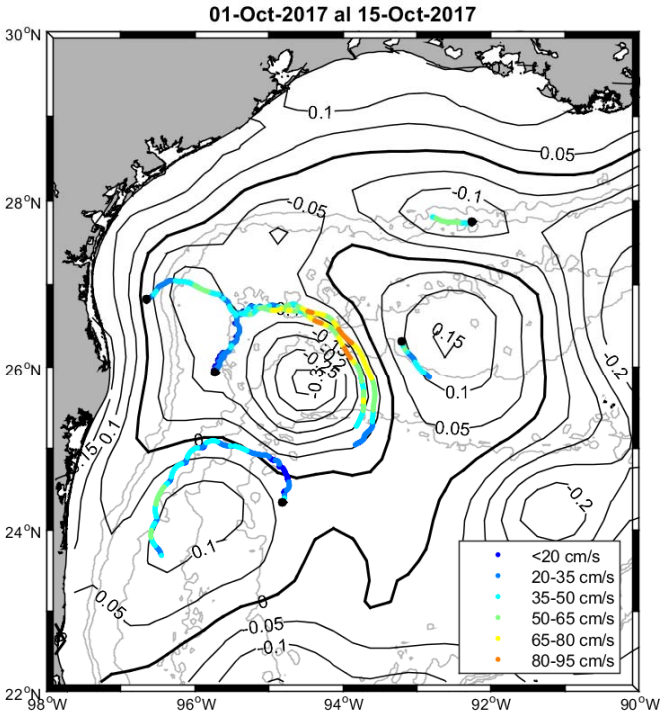
95-110 cm/s
>110 cm/s

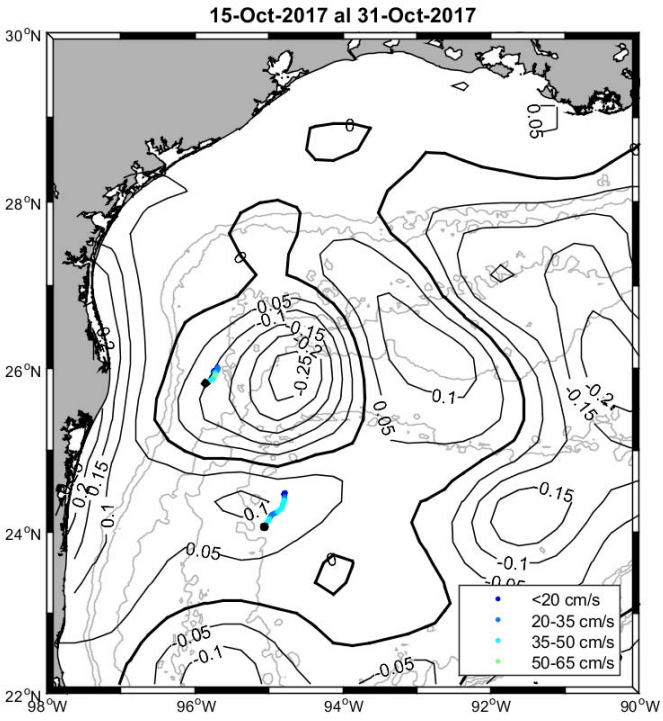

01-Aug-2017 al 15-Aug-2017
30°N
28°N
26°N
24°N
22°N
96°W
93°W
90°W
87°W
84°W
<20 cm/s
20-35 cm/s
35-50 cm/s
50-65 cm/s
65-80 cm/s
80-95 cm/s
95-110 cm/s

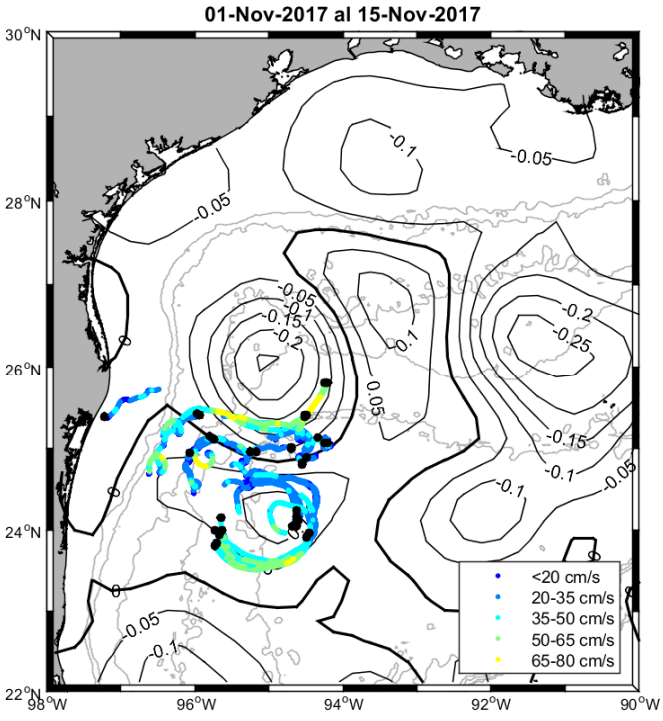

15-Aug-2017 al 30-Aug-2017
<20 cm/s
20-35 cm/s
35-50 cm/s
50-65 cm/s
65-80 cm/s
80-95 cm/s
95-110 cm/s
>110 cm/s
30°N
28°N
26°N
24°N
22°N
96°W
93°W
90°W
87°W
84°W

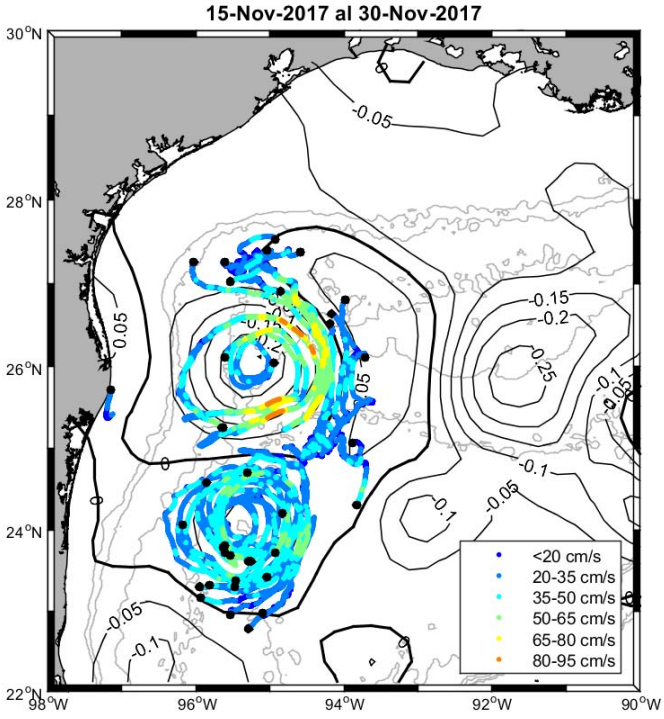

01-Sep-2017 al 15-Sep-2017
<20 cm/s
20-35 cm/s
35-50 cm/s
50-65 cm/s
65-80 cm/s
80-95 cm/s
95-110 cm/s
30°N
28°N
26°N
24°N
22°N
96°W
93°W
90°W
87°W
84°W

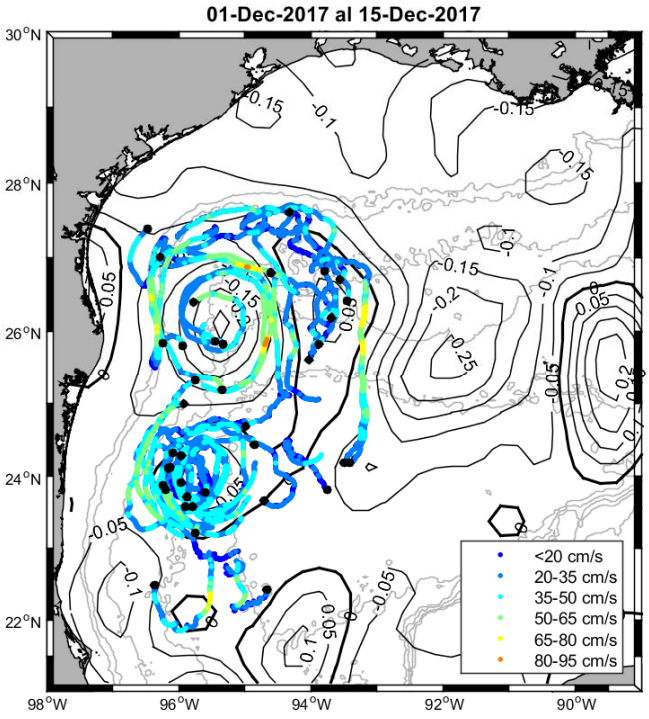

15-Sep-2017 al 30-Sep-2017
30°N
28°N
26°N
24°N
22°N
98°W
96°W
94°W
92°W
90°W
<20 cm/s
20-35 cm/s
35-50 cm/s
50-65 cm/s
65-80 cm/s
80-95 cm/s
95-110 cm/s

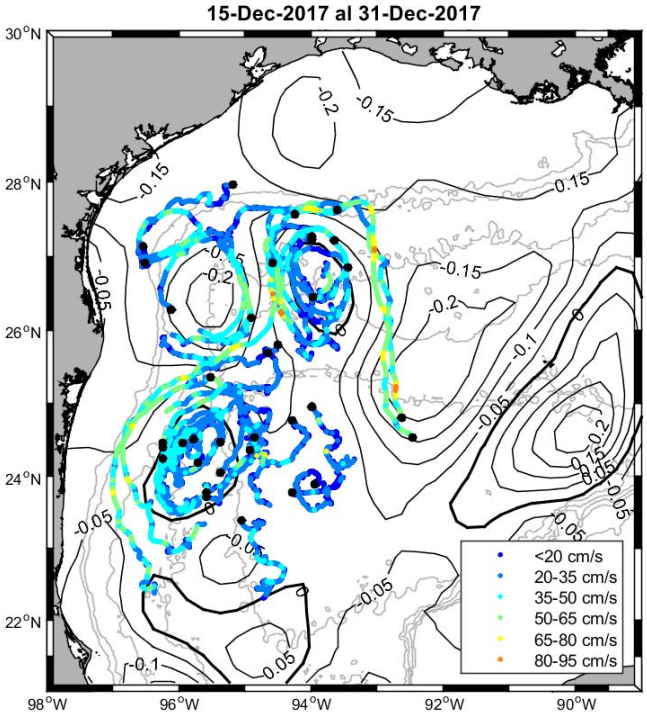

01-Oct-2017 al 15-Oct-2017
30°N
28°N
26°N
24°N
22°N
98°W
96°W
94°W
92°W
90°W
<20 cm/s
20-35 cm/s
35-50 cm/s
50-65 cm/s
65-80 cm/s
80-95 cm/s

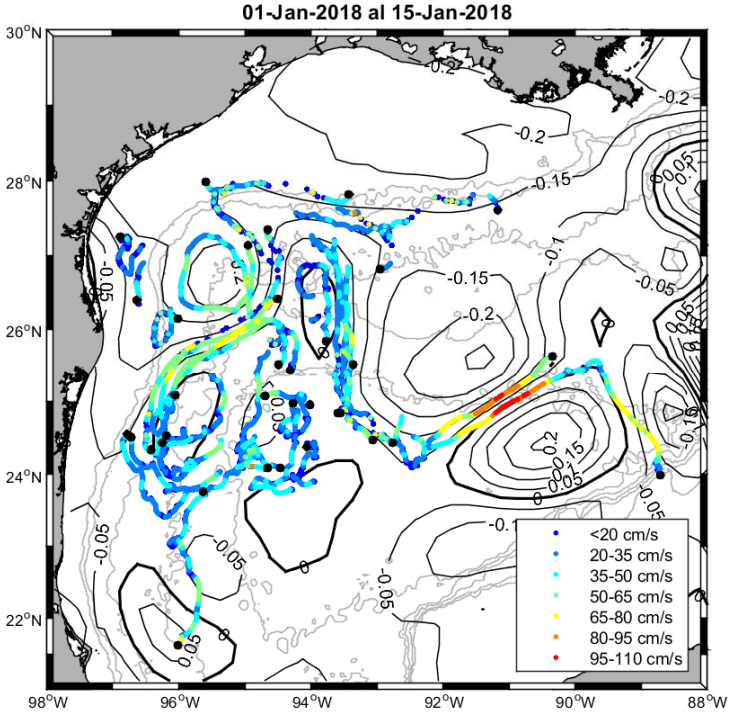

15-Oct-2017 al 31-Oct-2017
30°N
28°N
26°N
24°N
22°N
98°W
96°W
94°W
92°W
90°W
<20 cm/s
20-35 cm/s
35-50 cm/s
50-65 cm/s

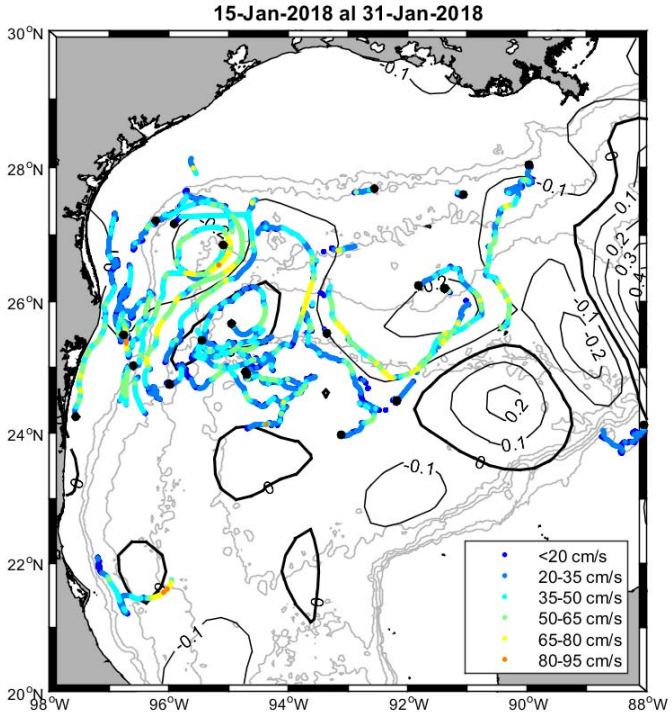

01-Nov-2017 al 15-Nov-2017
30°N
28°N
26°N
24°N
22°N
98°W
96°W
94°W
92°W
90°W
<20 cm/s
20-35 cm/s
35-50 cm/s
50-65 cm/s
65-80 cm/s

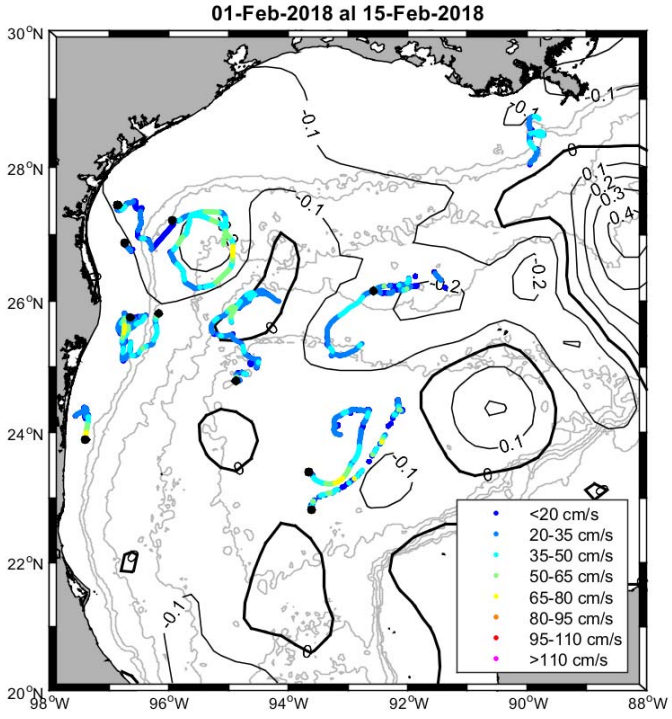

15-Nov-2017 al 30-Nov-2017
30°N
28°N
26°N
24°N
22°N
98°W
96°W
94°W
92°W
90°W
<20 cm/s
20-35 cm/s
35-50 cm/s
50-65 cm/s
65-80 cm/s
80-95 cm/s

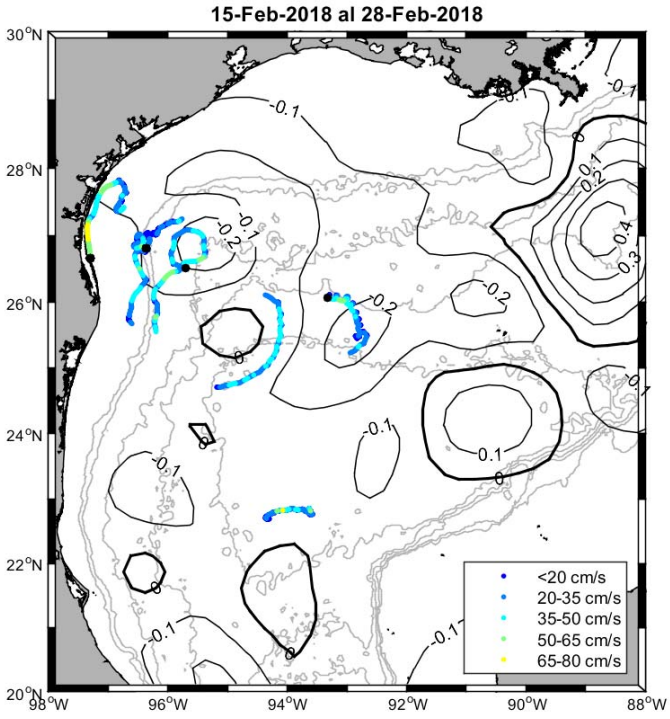

01-Dec-2017 al 15-Dec-2017
30°N
28°N
26°N
24°N
22°N
98°W
96°W
94°W
92°W
90°W
<20 cm/s
20-35 cm/s
35-50 cm/s
50-65 cm/s
65-80 cm/s
80-95 cm/s

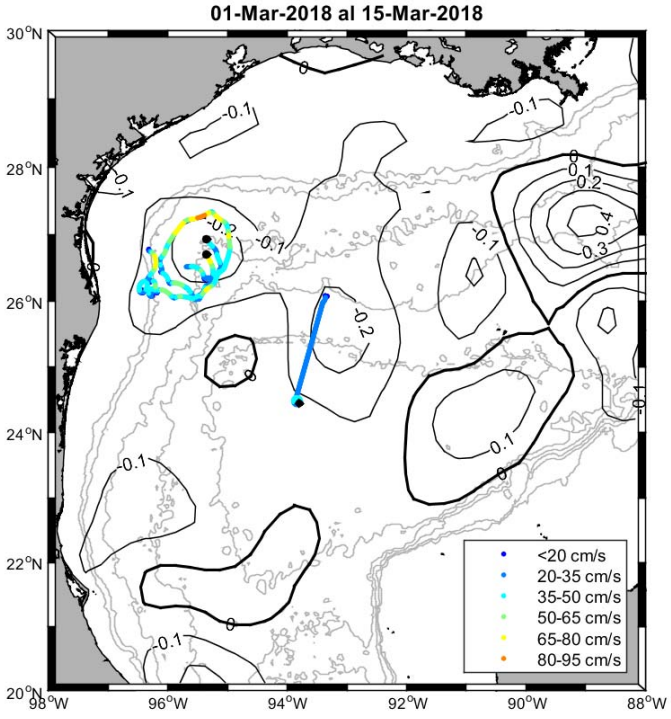

15-Dec-2017 al 31-Dec-2017
30°N
28°N
26°N
24°N
22°N
98°W
96°W
94°W
92°W
90°W
<20 cm/s
20-35 cm/s
35-50 cm/s
50-65 cm/s
65-80 cm/s
80-95 cm/s

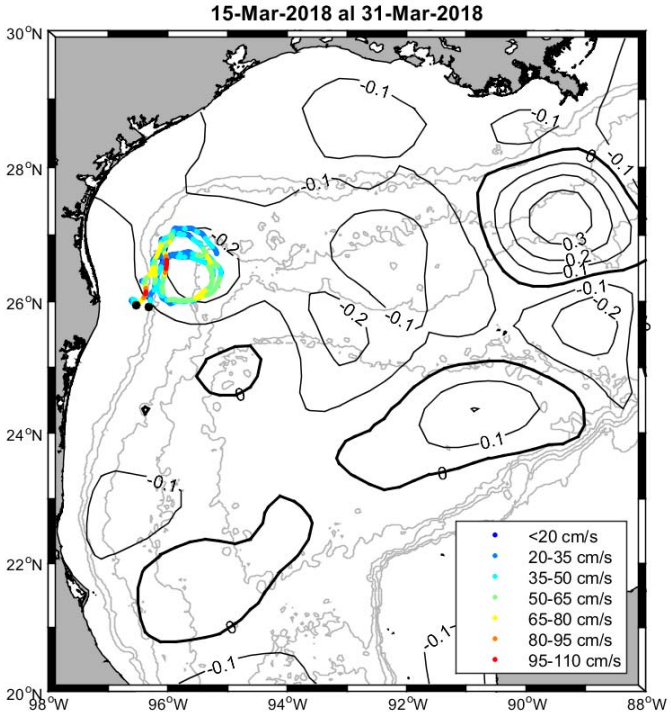

01-Jan-2018 al 15-Jan-2018
30°N
28°N
26°N
24°N
22°N
98°W
96°W
94°W
92°W
90°W
88°W
<20 cm/s
20-35 cm/s
35-50 cm/s
50-65 cm/s
65-80 cm/s
80-95 cm/s
95-110 cm/s

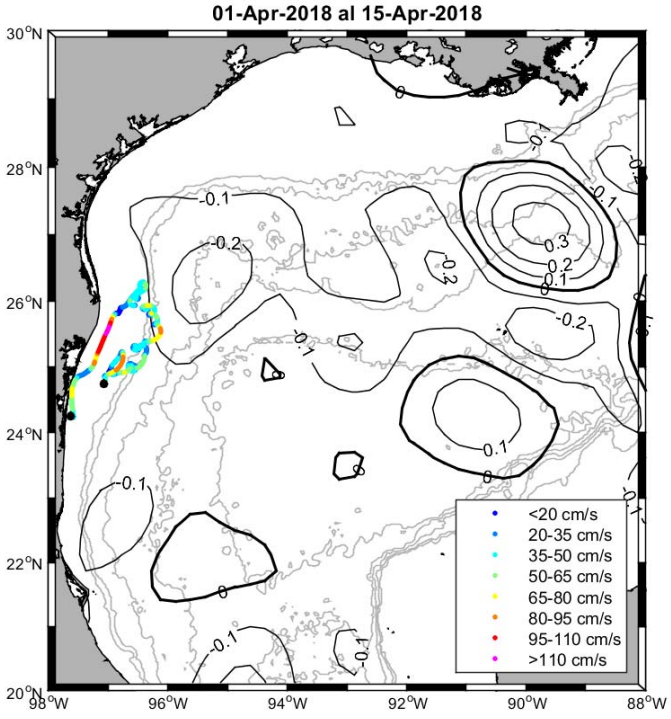

15-Jan-2018 al 31-Jan-2018
30°N
28°N
26°N
24°N
22°N
20°N
98°W
96°W
94°W
92°W
90°W
88°W
<20 cm/s
20-35 cm/s
35-50 cm/s
50-65 cm/s
65-80 cm/s
80-95 cm/s


01-Feb-2018 al 15-Feb-2018
30°N
28°N
26°N
24°N
22°N
20°N
98°W
96°W
94°W
92°W
90°W
88°W
<20 cm/s
20-35 cm/s
35-50 cm/s
50-65 cm/s
65-80 cm/s
80-95 cm/s
95-110 cm/s
>110 cm/s


15-Feb-2018 al 28-Feb-2018
30°N
28°N
26°N
24°N
22°N
20°N
98°W
96°W
94°W
92°W
90°W
88°W
<20 cm/s
20-35 cm/s
35-50 cm/s
50-65 cm/s
65-80 cm/s


01-Mar-2018 al 15-Mar-2018
30°N
28°N
26°N
24°N
22°N
20°N
98°W
96°W
94°W
92°W
90°W
88°W
<20 cm/s
20-35 cm/s
35-50 cm/s
50-65 cm/s
65-80 cm/s
80-95 cm/s


15-Mar-2018 al 31-Mar-2018
30°N
28°N
26°N
24°N
22°N
20°N
98°W
96°W
94°W
92°W
90°W
88°W
<20 cm/s
20-35 cm/s
35-50 cm/s
50-65 cm/s
65-80 cm/s
80-95 cm/s
95-110 cm/s


01-Apr-2018 al 15-Apr-2018
30°N
28°N
26°N
24°N
22°N
20°N
98°W
96°W
94°W
92°W
90°W
88°W
<20 cm/s
20-35 cm/s
35-50 cm/s
50-65 cm/s
65-80 cm/s
80-95 cm/s
95-110 cm/s
>110 cm/s

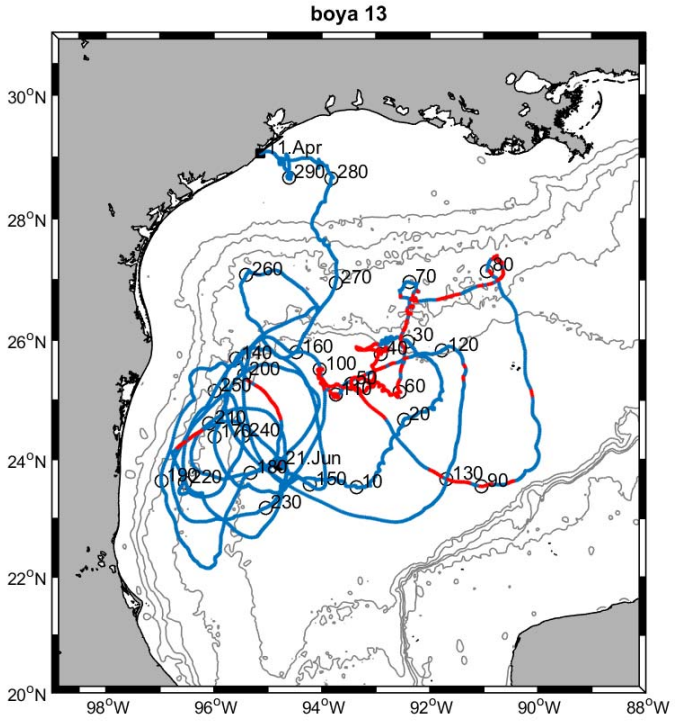
INDIVIDUAL DRIFTER PLOTS

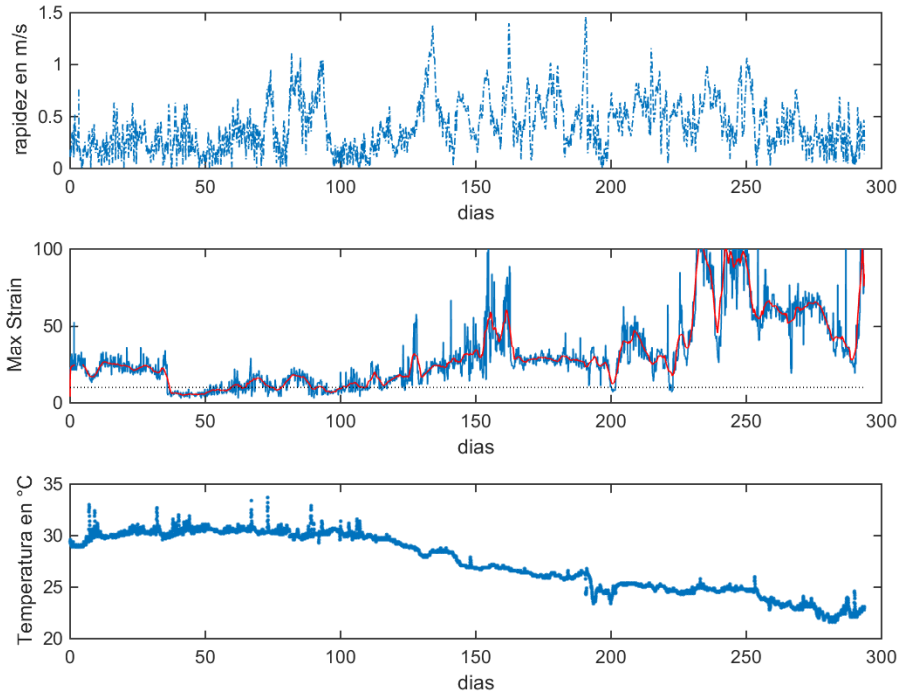
Individual trajectories have been plotted for each drifter. The first panel is the drifter trajectory from the launch date to the last good data date, with one point every ten days. The trajectories in red represents the positions where the strain sensor value is less than 10 (only for Microstar drifters). The panel below is the time series for speed, strain sensor values and temperature for Microstar drifters and speed, battery voltage and temperature for CODE and DORIS. For the strain sensor plots, a running average was calculate and plot in red. In the cases where this average drops sharply, it is considered that this is the moment when the drogue was lost. Note that in several figures the first data of maximum "strain" (just after launch) have values less than 10. These values are due to what was discussed in section 2, the sensor measurement is made every 4 transmissions, so the value represents the measurement when the instrument was still on the deck.

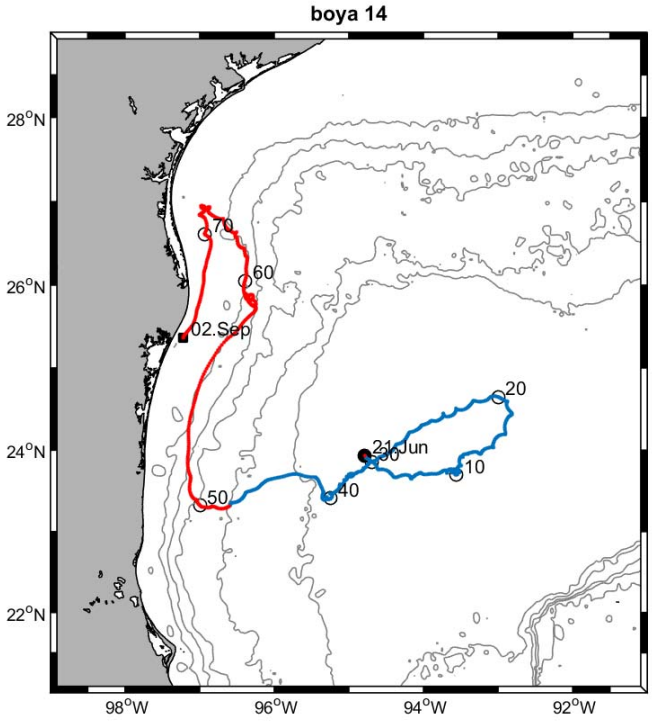
The plots have been organized by cruise and triplet.

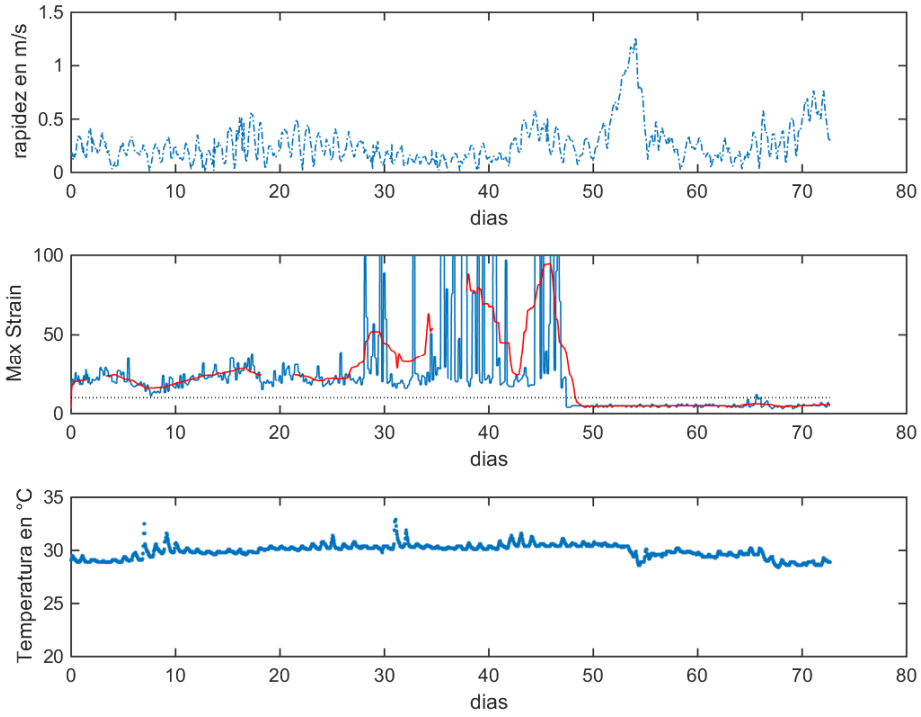
DWDE1

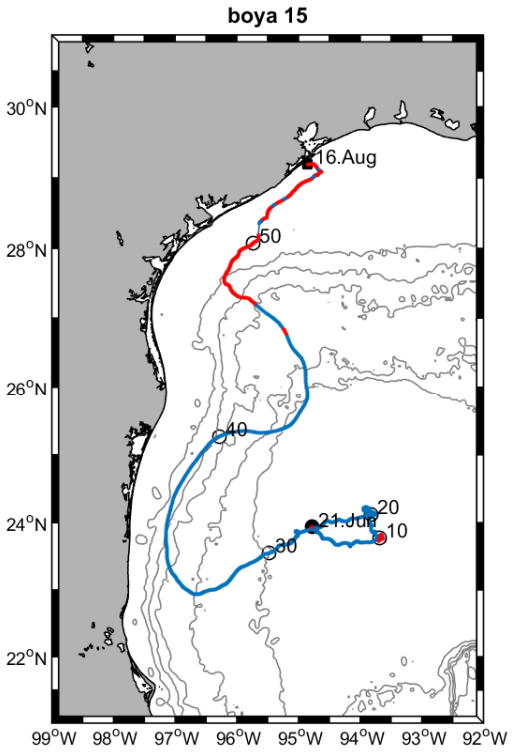
1.1.1. TRIPLET01

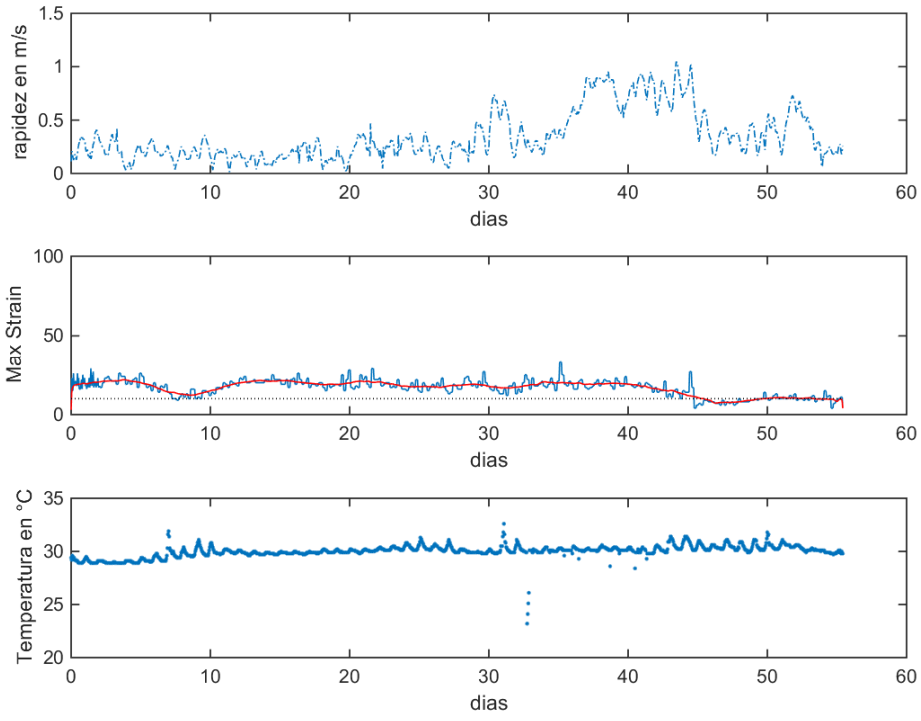




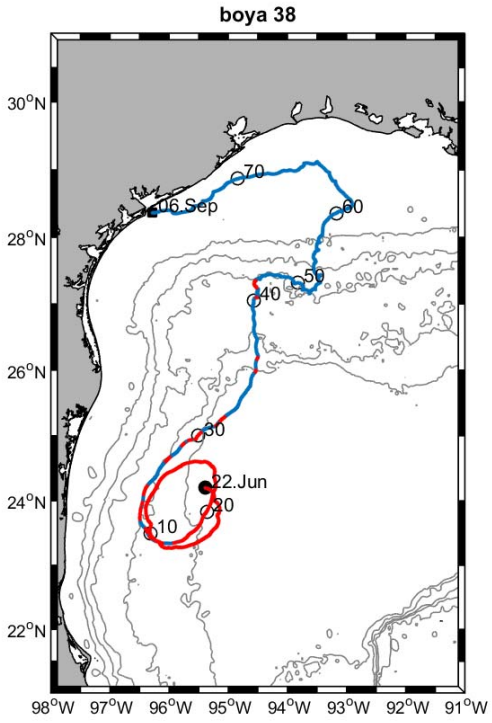

boya 14
28°N
26°N
24°N
22°N
98°W
96°W
94°W
92°W
70
60
02.Sep
20
21.Jun
30
10
40
50

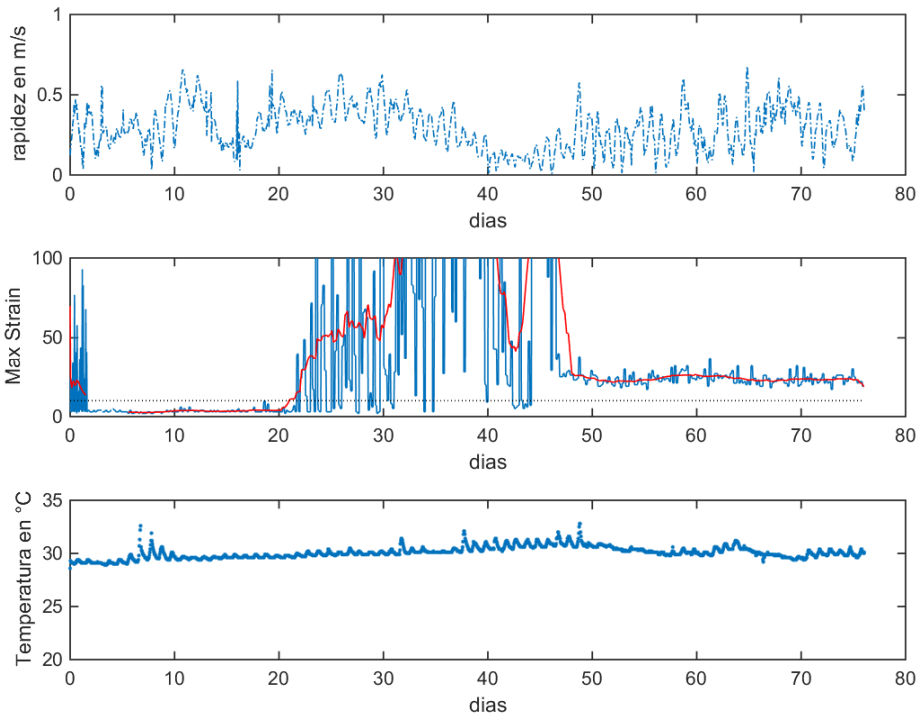

rapidez en m/s
1.5
1
0.5
0
0
10
20
30
40
50
60
70
80
dias
Max Strain
100
50
0
dias
Temperatura en °C
35
30
25
20
dias

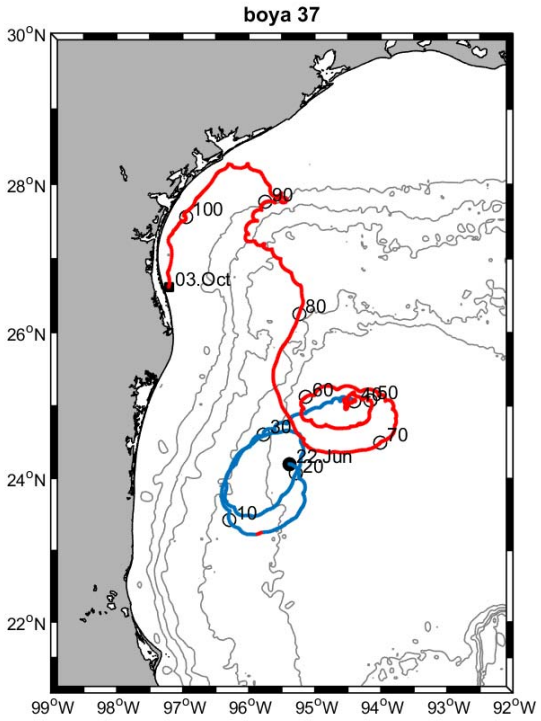

boya 15
30°N
28°N
26°N
24°N
22°N
99°W
98°W
97°W
96°W
95°W
94°W
93°W
92°W
16.Aug
50
40
30
21.Jul
20
10

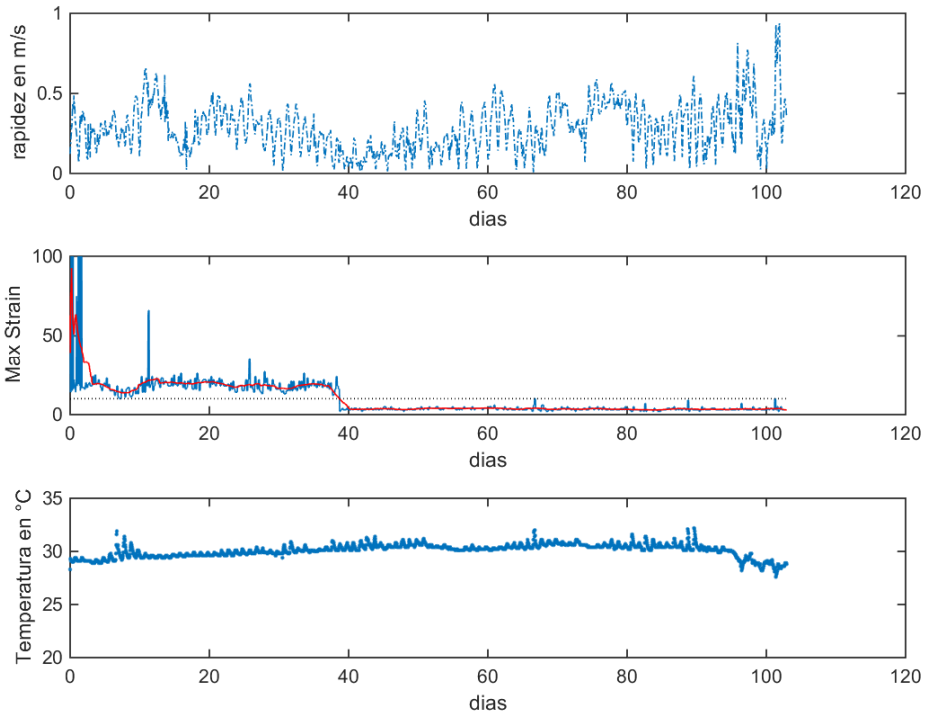

rapidez en m/s
dias
Max Strain
dias
Temperatura en °C
dias

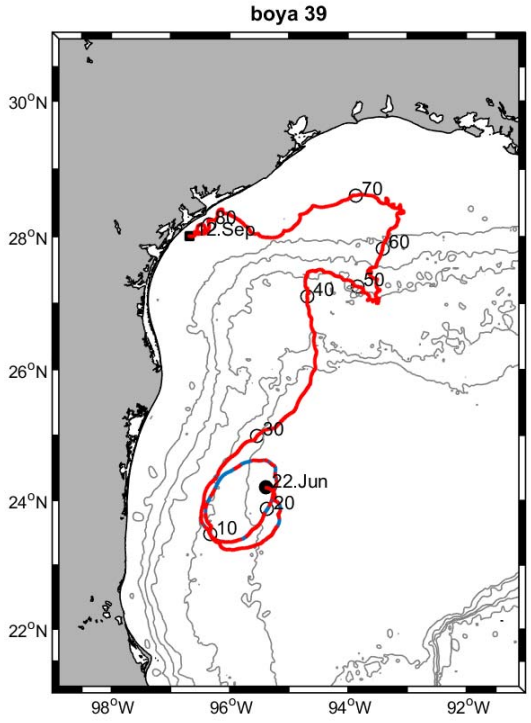
1.1.2. TRIPLET 02

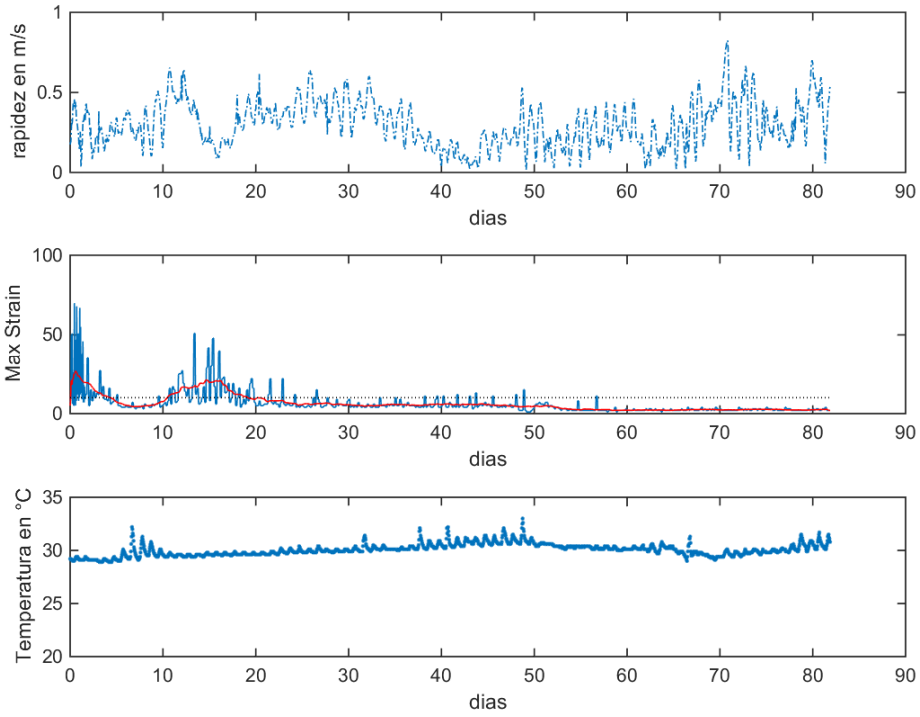




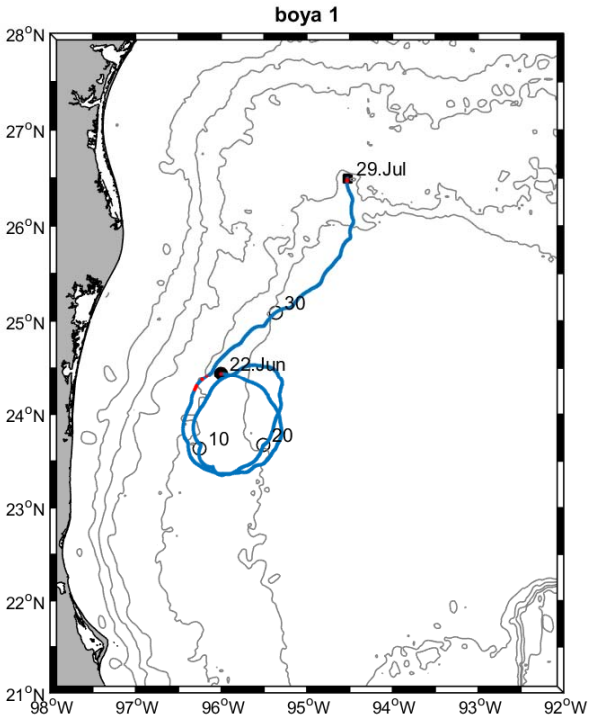

boya 37
30°N
28°N
26°N
24°N
22°N
99°W
98°W
97°W
96°W
95°W
94°W
93°W
92°W
03.Oct
22 Jun
10
20
30
40
50
60
70
80
90
100

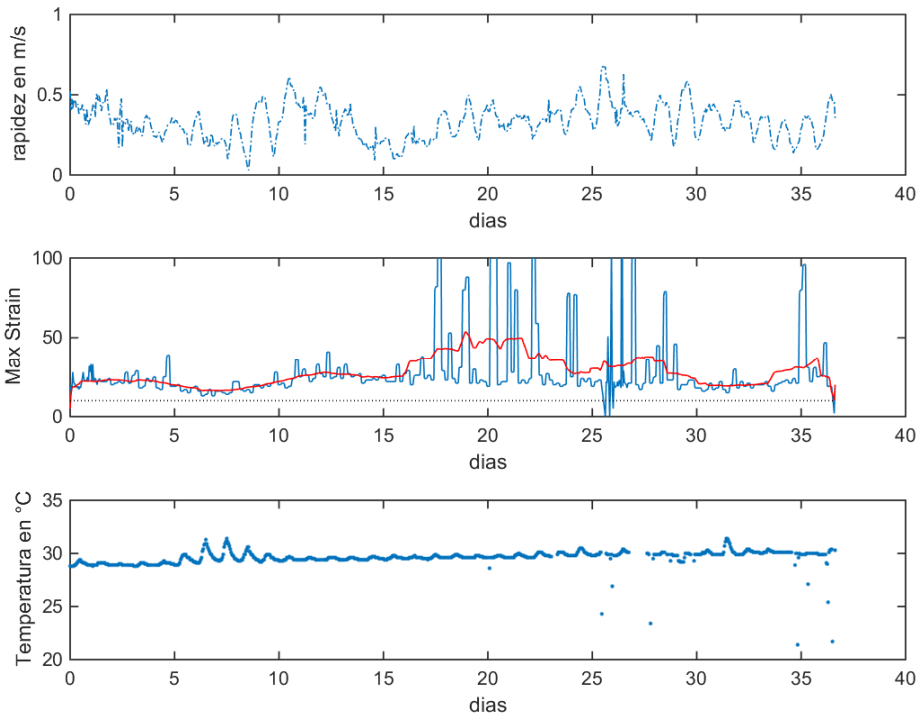

rapidez en m/s
dias
Max Strain
dias
Temperatura en °C
dias

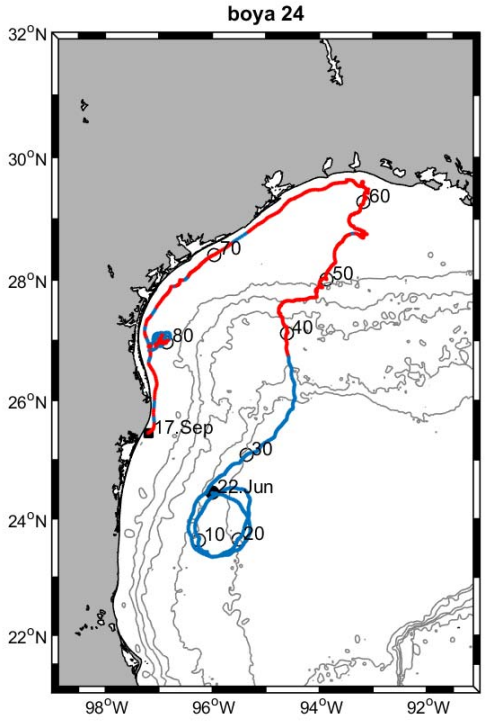

boya 39
30°N
28°N
26°N
24°N
22°N
98°W
96°W
94°W
92°W
12.Sep
70
60
50
40
30
22.Jun
20
10

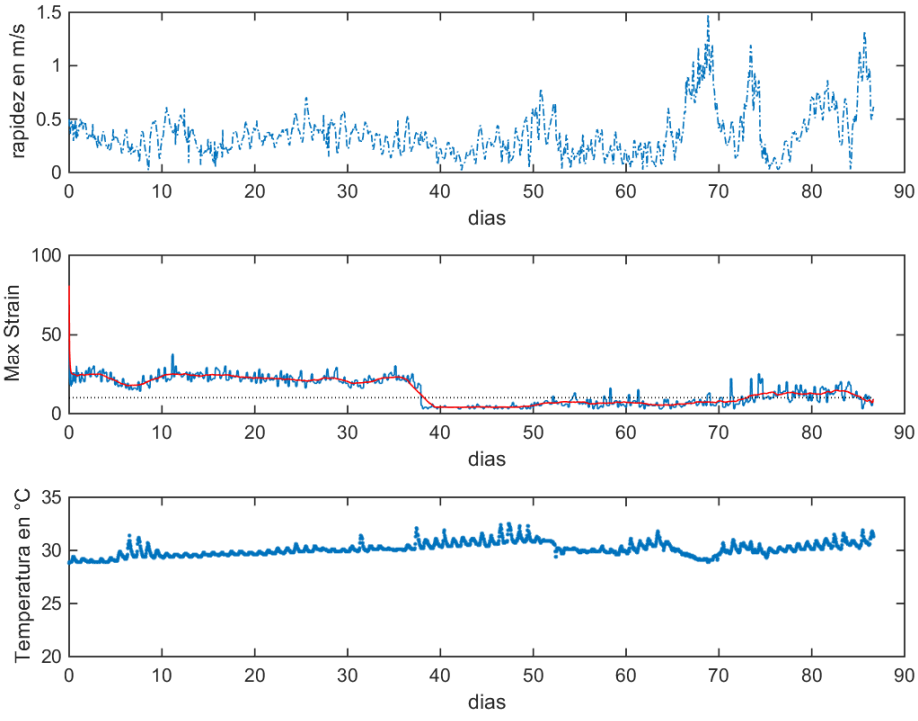

rapidez en m/s
dias
Max Strain
dias
Temperatura en °C
dias

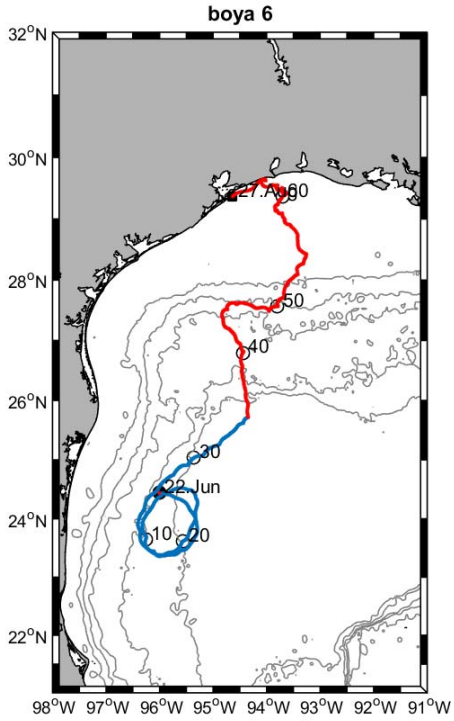
1.1.3. TRIPLET 03

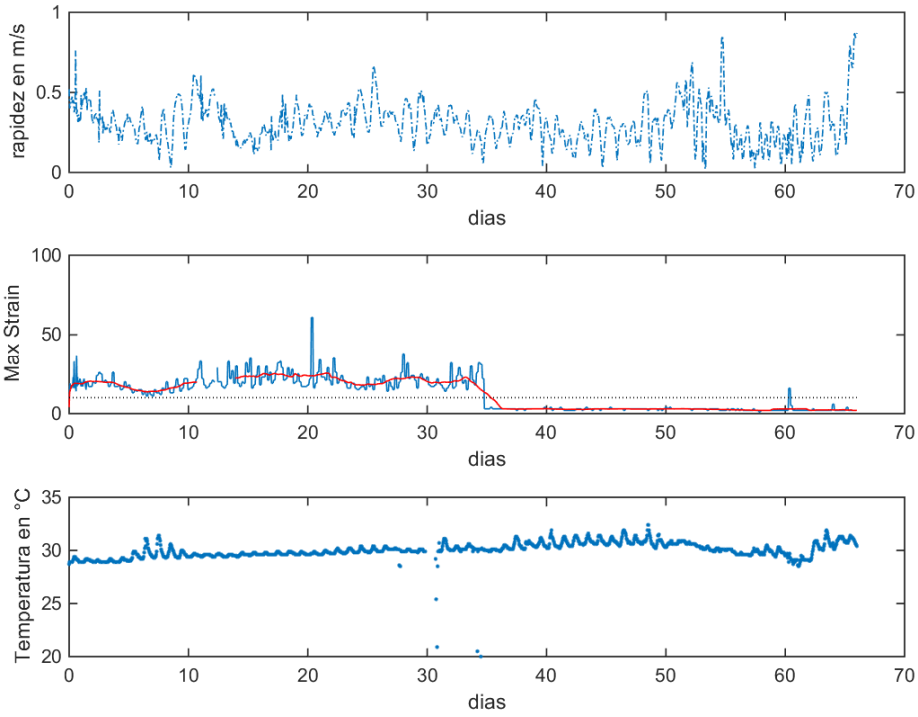




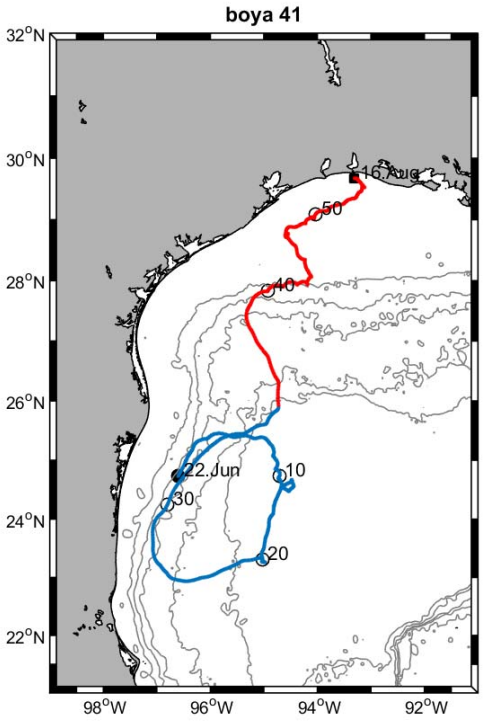

boya 24
32°N
30°N
28°N
26°N
24°N
22°N
98°W
96°W
94°W
92°W
60
0
50
40
80
17 Sep
30
22 Jun
10
20

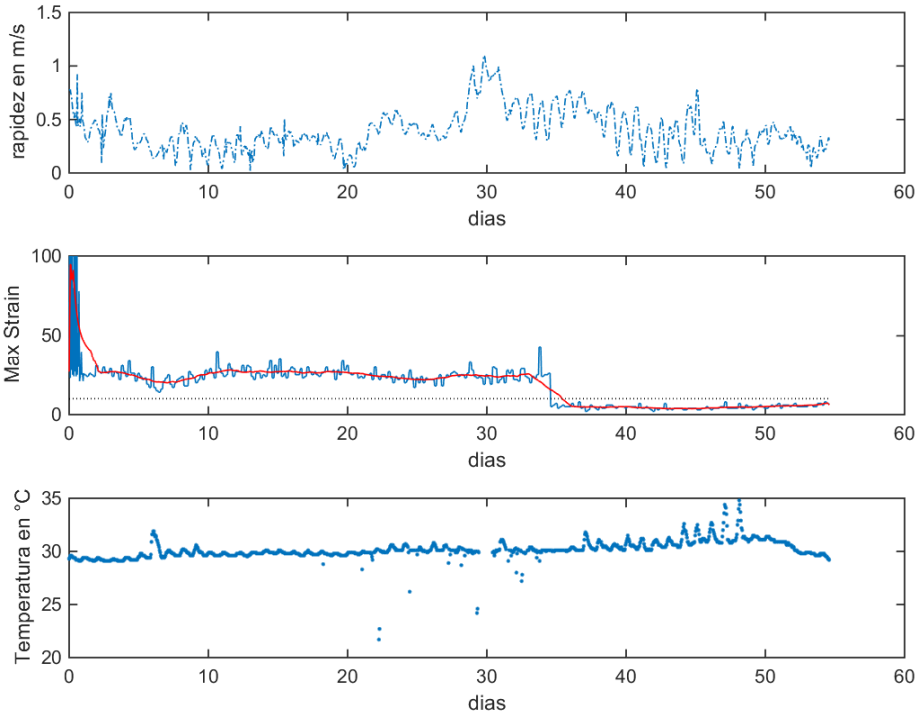

rapidez en m/s
dias
Max Strain
dias
Temperatura en °C
dias

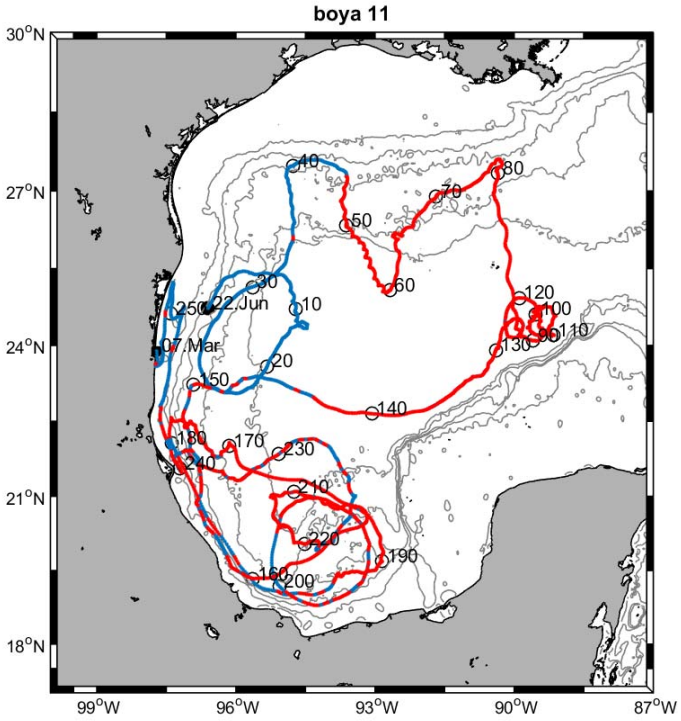

boya 6
32°N
30°N
28°N
26°N
24°N
22°N
98°W 97°W 96°W 95°W 94°W 93°W 92°W 91°W
27 Aug
60
50
40
30
22 Jun
10
20

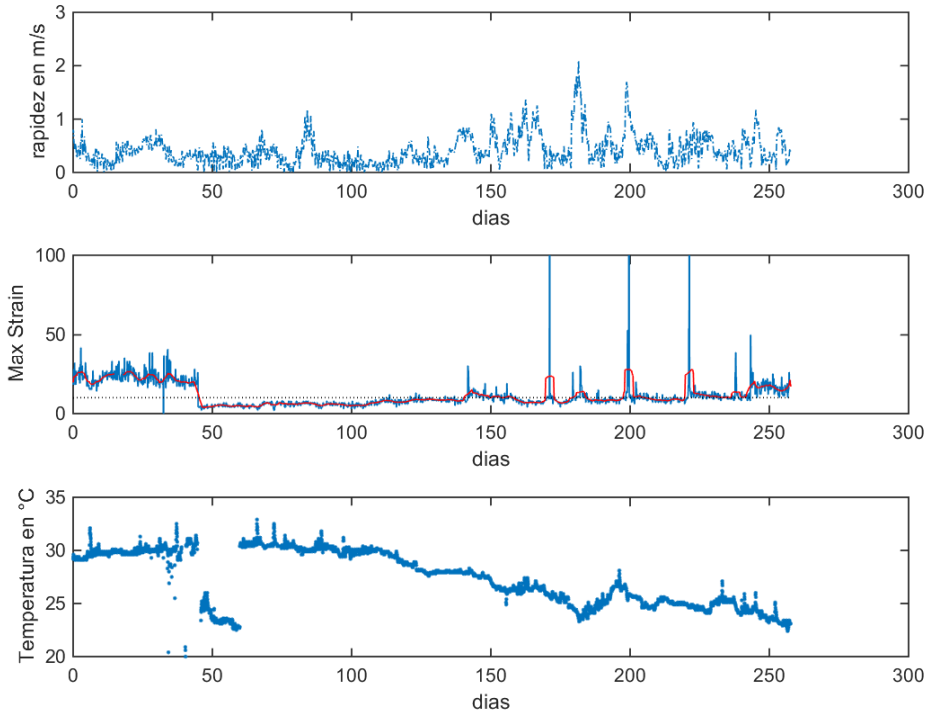

rapidez en m/s
0
0.5
1
0 10 20 30 40 50 60 70
dias
Max Strain
0
50
100
0 10 20 30 40 50 60 70
dias
Temperatura en °C
20
25
30
35
0 10 20 30 40 50 60 70
dias

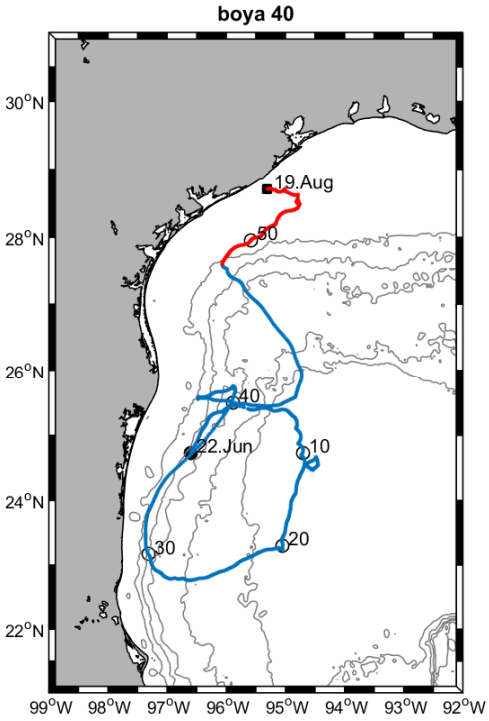
1.1.4. TRIPLET 04

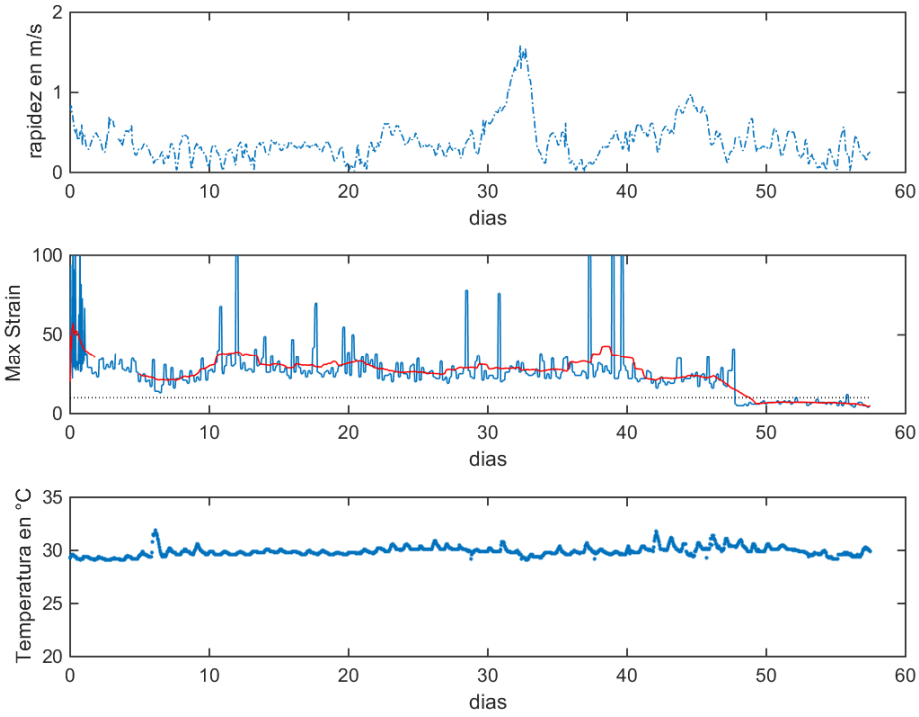




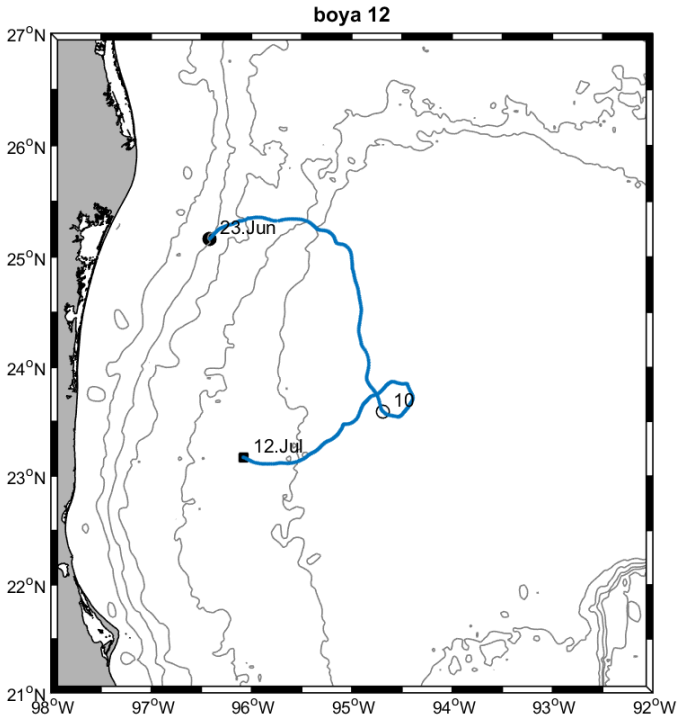

boya 11
30°N
27°N
24°N
21°N
18°N
99°W
96°W
93°W
90°W
87°W
07.Mar
22.Jun

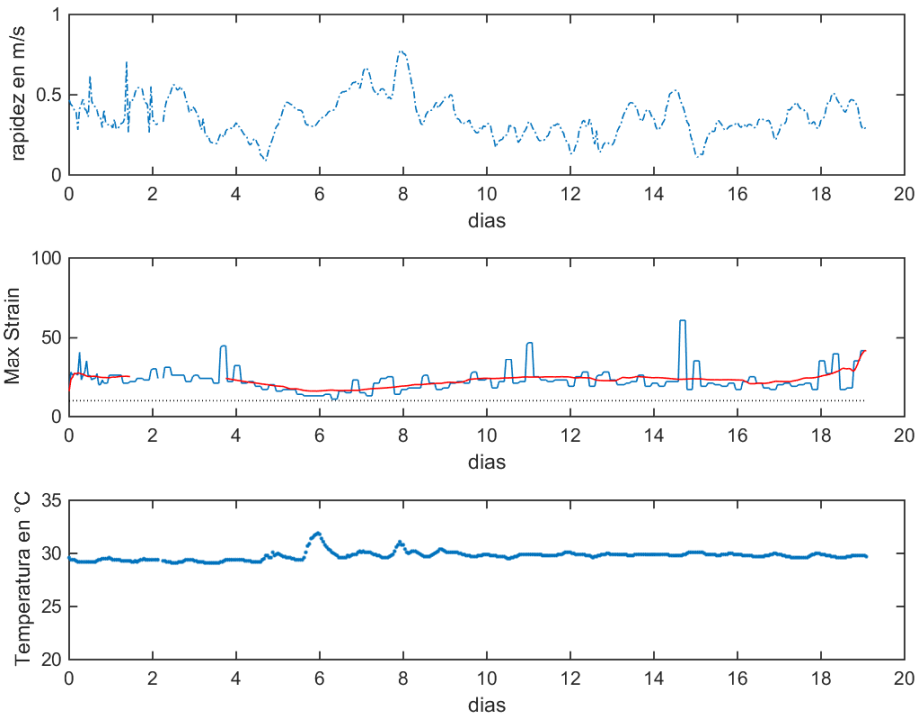

rapidez en m/s
Max Strain
Temperatura en °C
dias

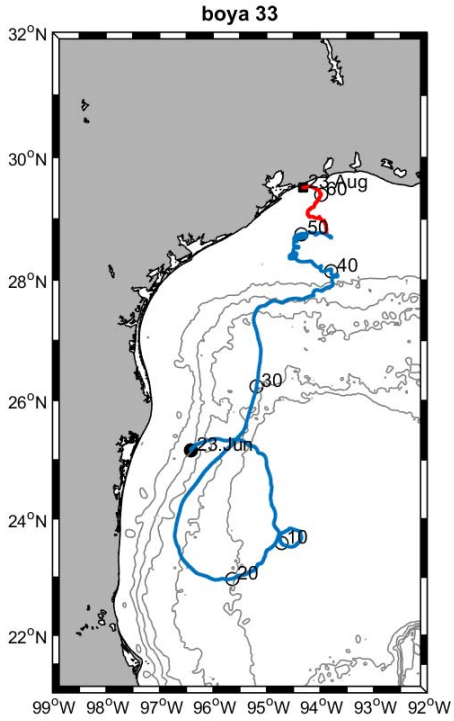

boya 40
30°N
28°N
26°N
24°N
22°N
99°W
98°W
97°W
96°W
95°W
94°W
93°W
92°W
19.Aug
50
40
22.Jun
10
30
20

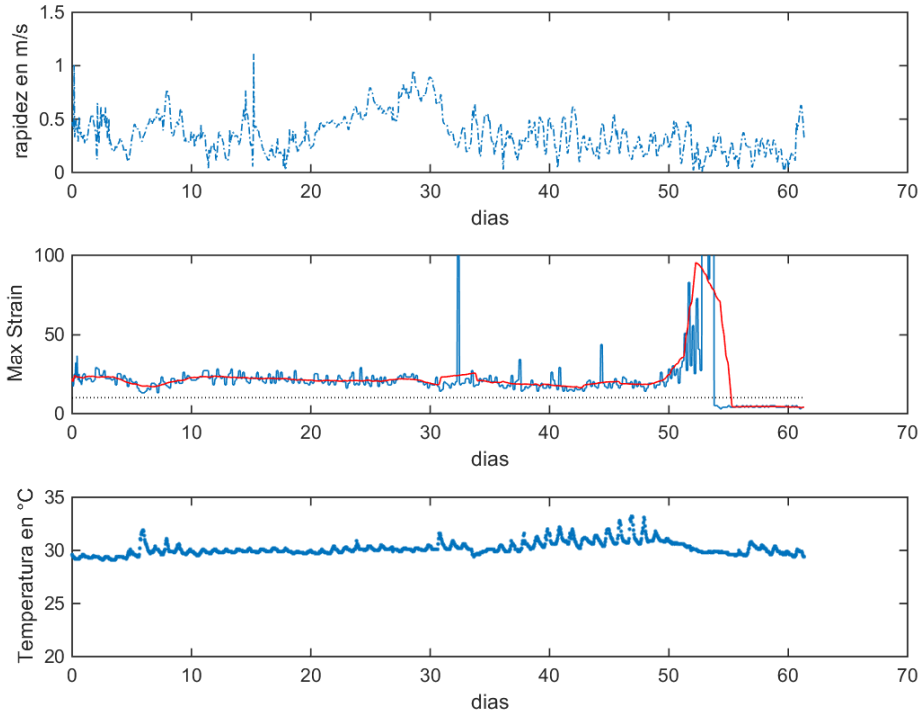

rapidez en m/s
dias
Max Strain
dias
Temperatura en °C
dias

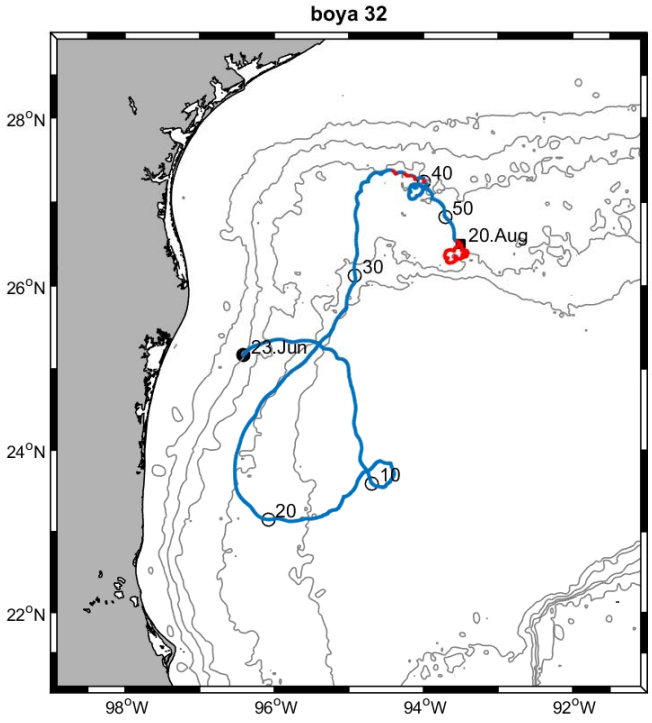
1.1.5. TRIPLET 05

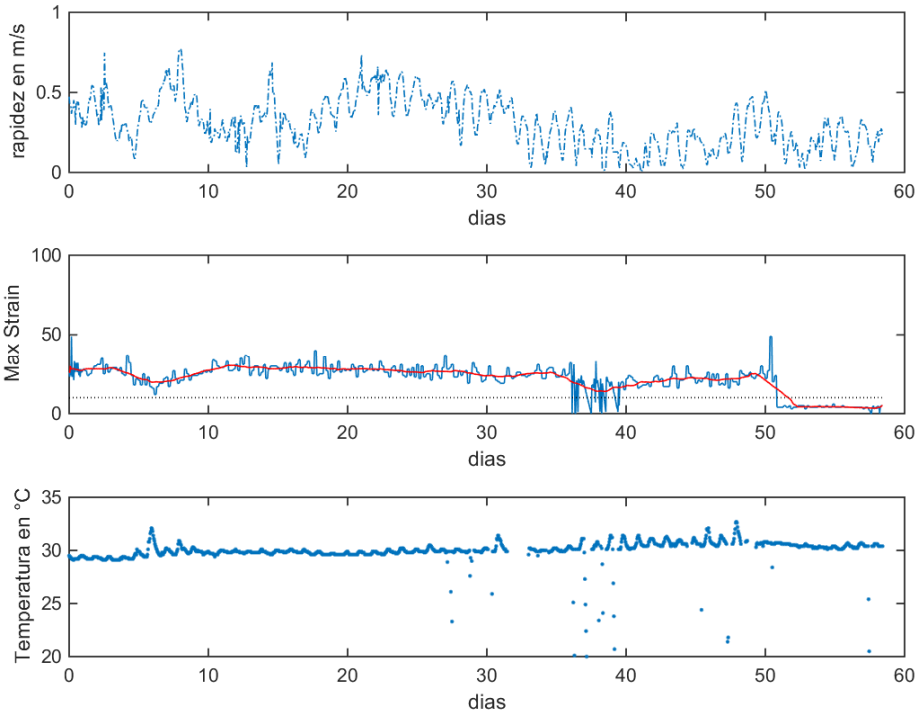




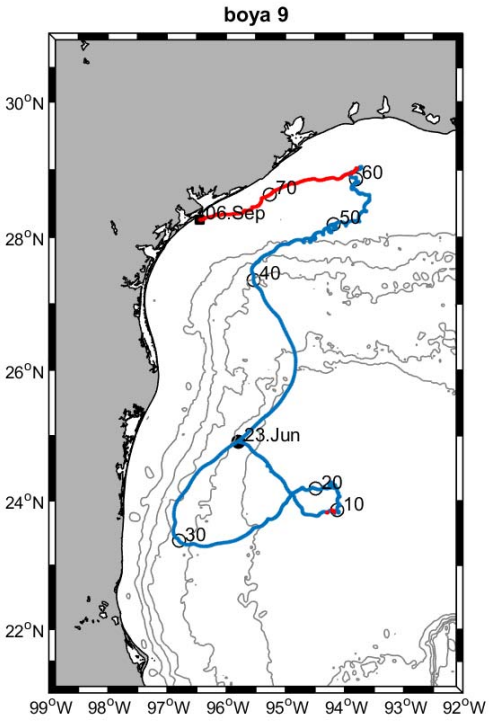

boya 33
32°N
30°N
28°N
26°N
24°N
22°N
99°W 98°W 97°W 96°W 95°W 94°W 93°W 92°W
23 Aug
50
40
30
23 Jun
10
20

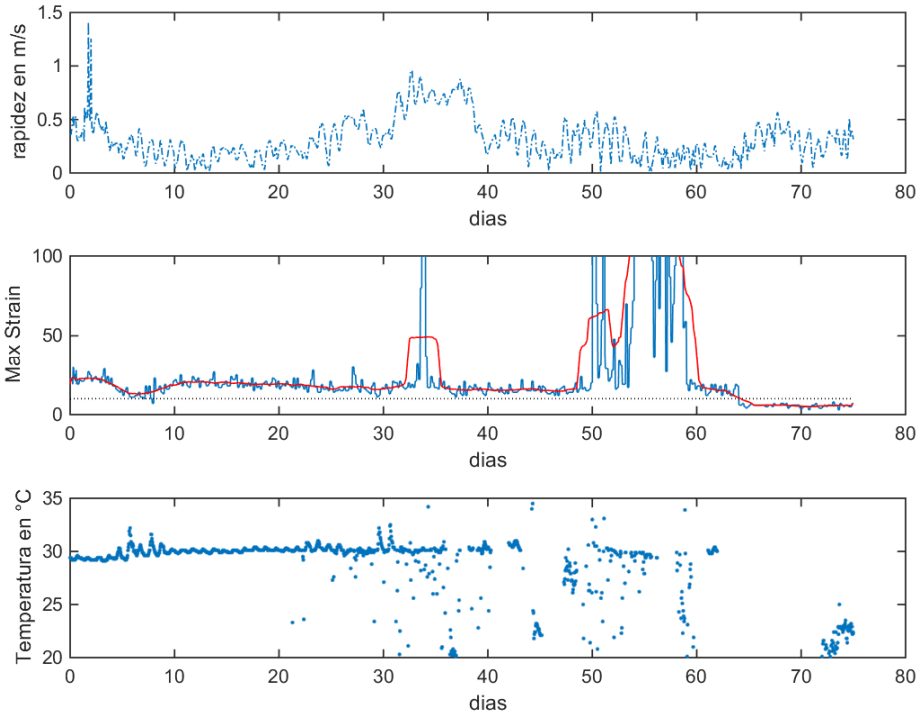

rapidez en m/s
dias
Max Strain
dias
Temperatura en °C
dias

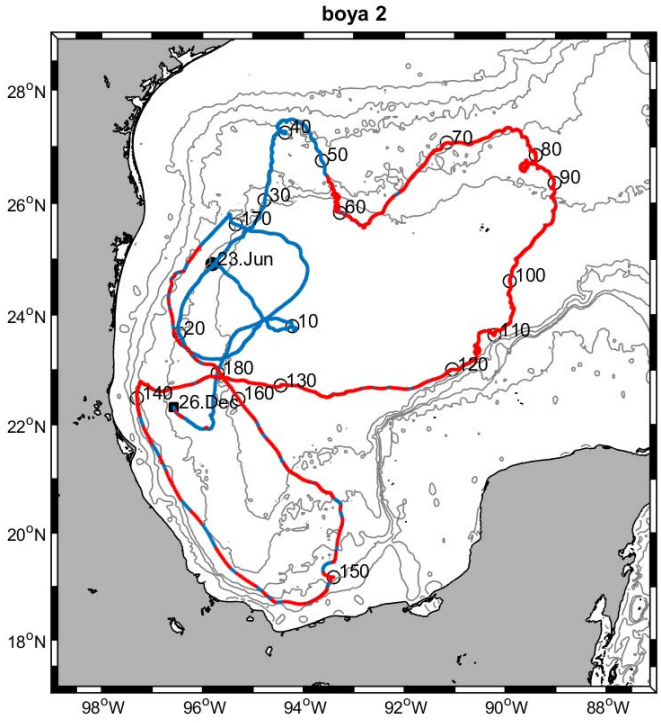

boya 32
28°N
26°N
24°N
22°N
98°W
96°W
94°W
92°W
40
50
20.Aug
30
23.Jun
10
20

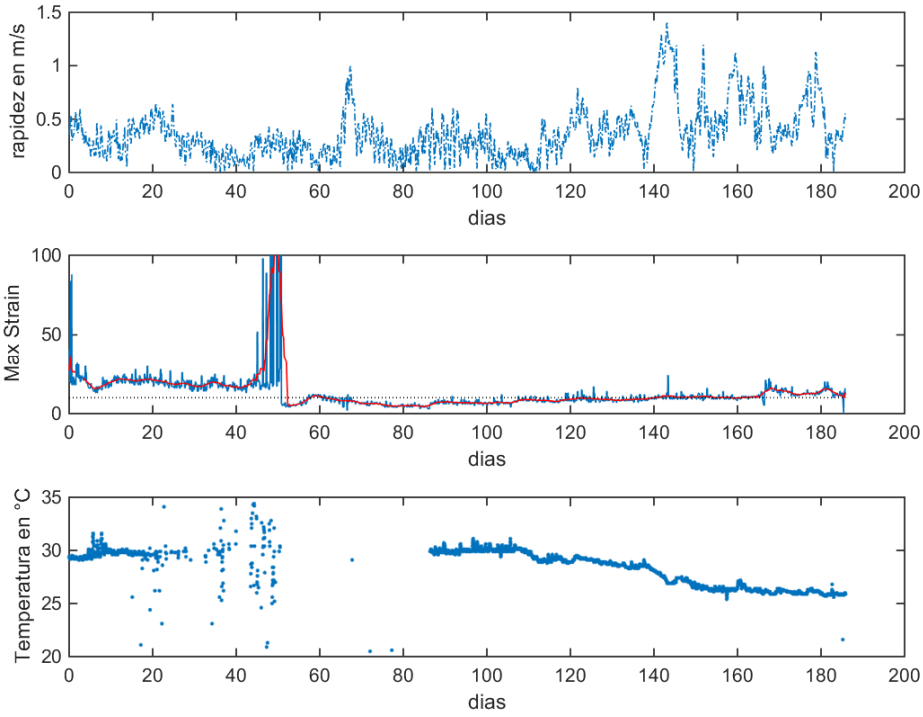

rapidez en m/s
dias
Max Strain
dias
Temperatura en °C
dias

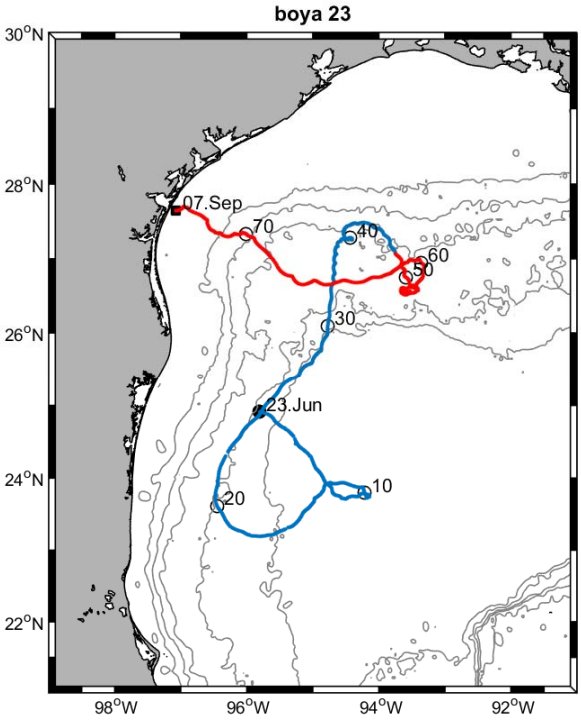
1.1.6. TRIPLET 06

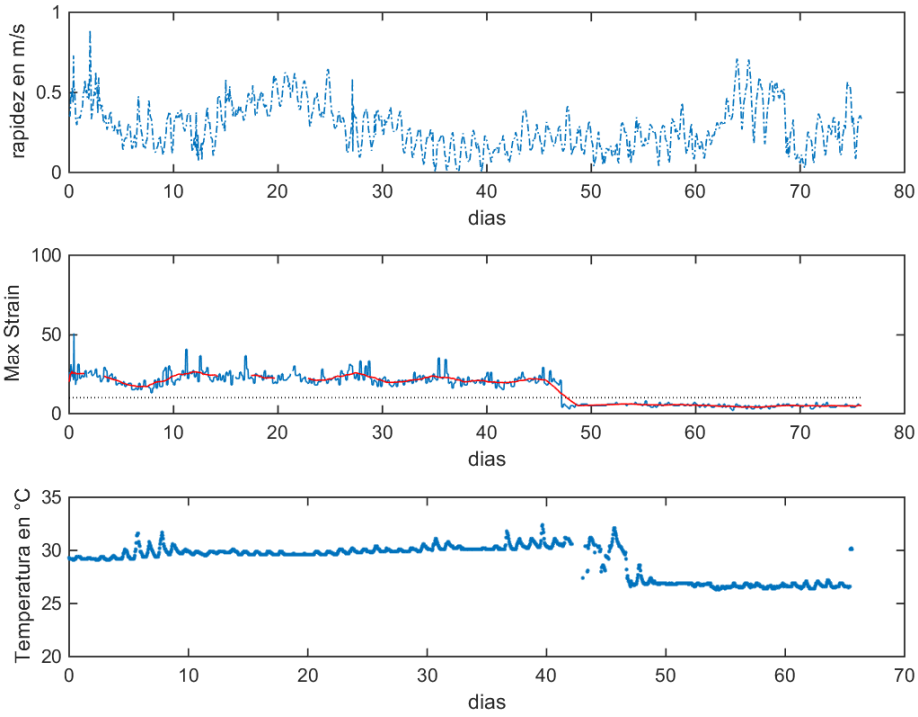




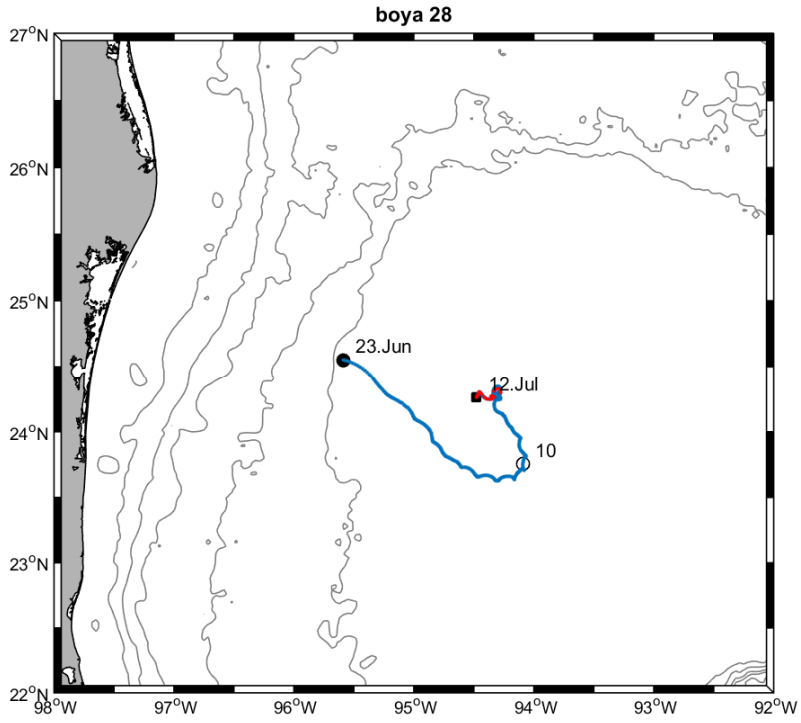

boya 2
28°N
26°N
24°N
22°N
20°N
18°N
98°W
96°W
94°W
92°W
90°W
88°W
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160
170
180
23.Jun
26.Dec

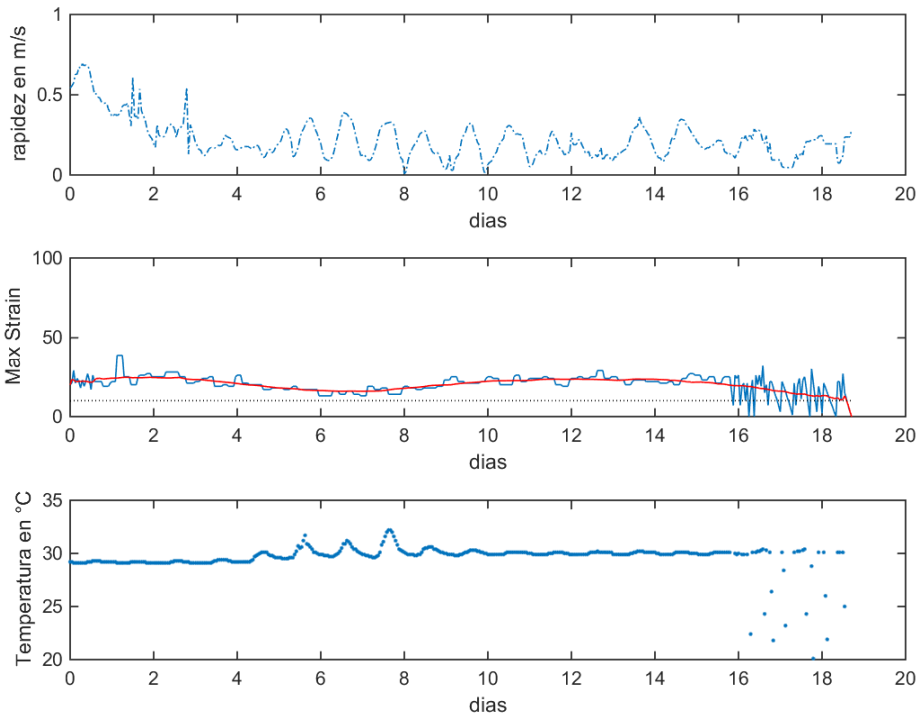

rapidez en m/s
Max Strain
Temperatura en °C
dias

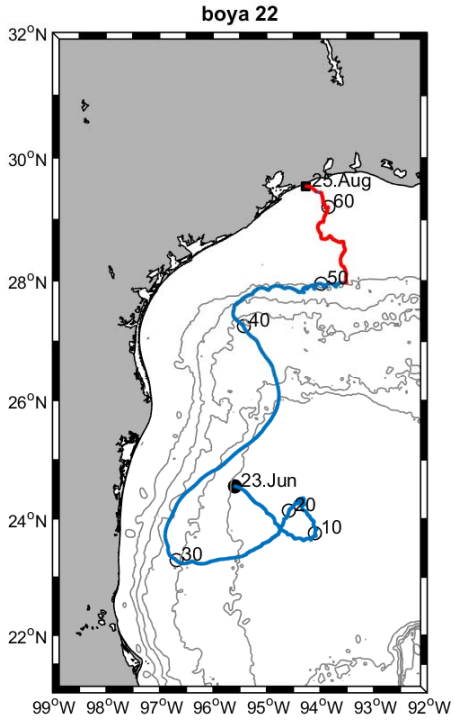

boya 23
30°N
28°N
26°N
24°N
22°N
98°W
96°W
94°W
92°W
07.Sep
70
40
60
50
30
23.Jun
10
20

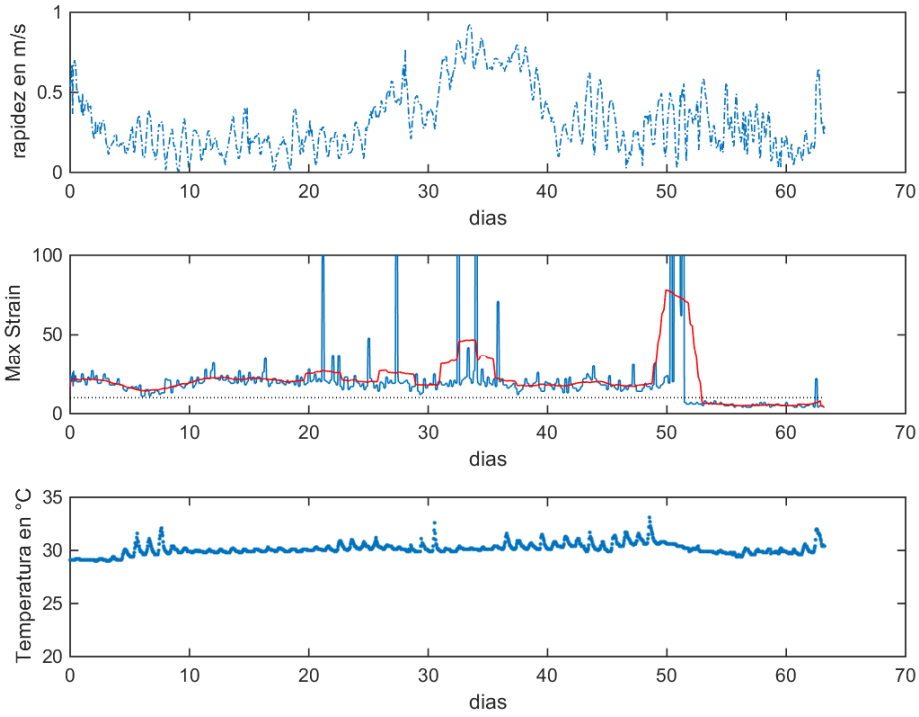

rapidez en m/s
dias
Max Strain
dias
Temperatura en °C
dias

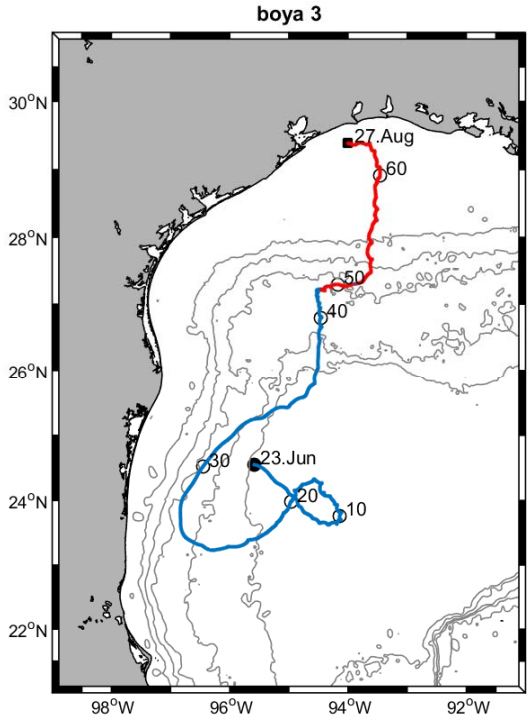
1.1.7. TRIPLET 07

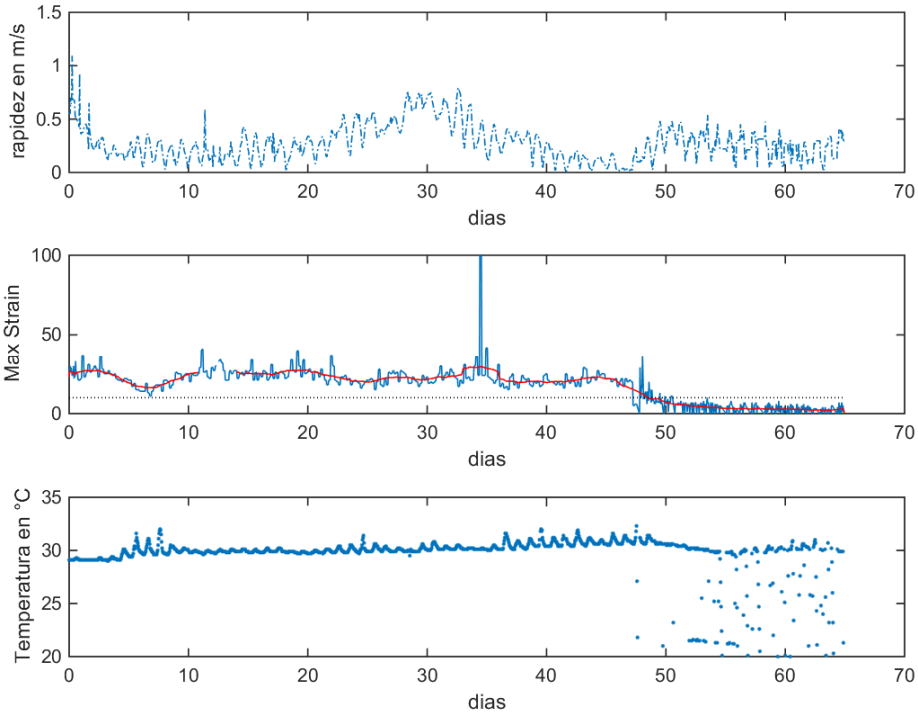




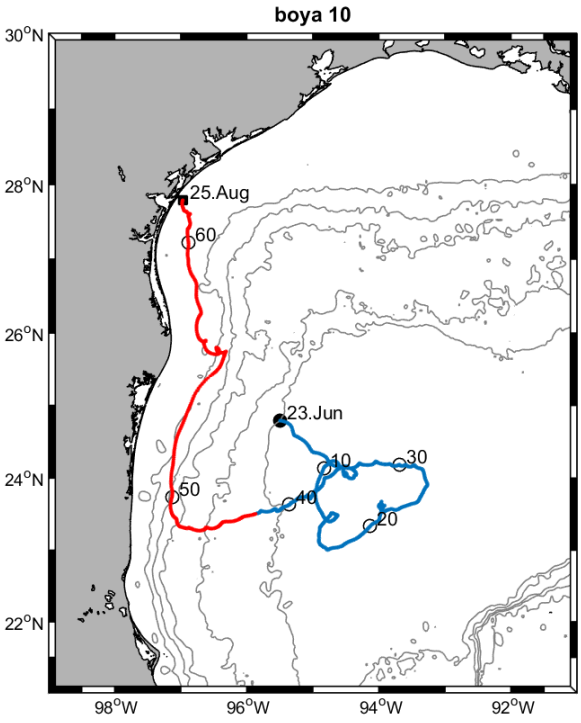

boya 22
32°N
30°N
28°N
26°N
24°N
22°N
99°W 98°W 97°W 96°W 95°W 94°W 93°W 92°W
25.Aug
60
50
40
23.Jun
20
10
30

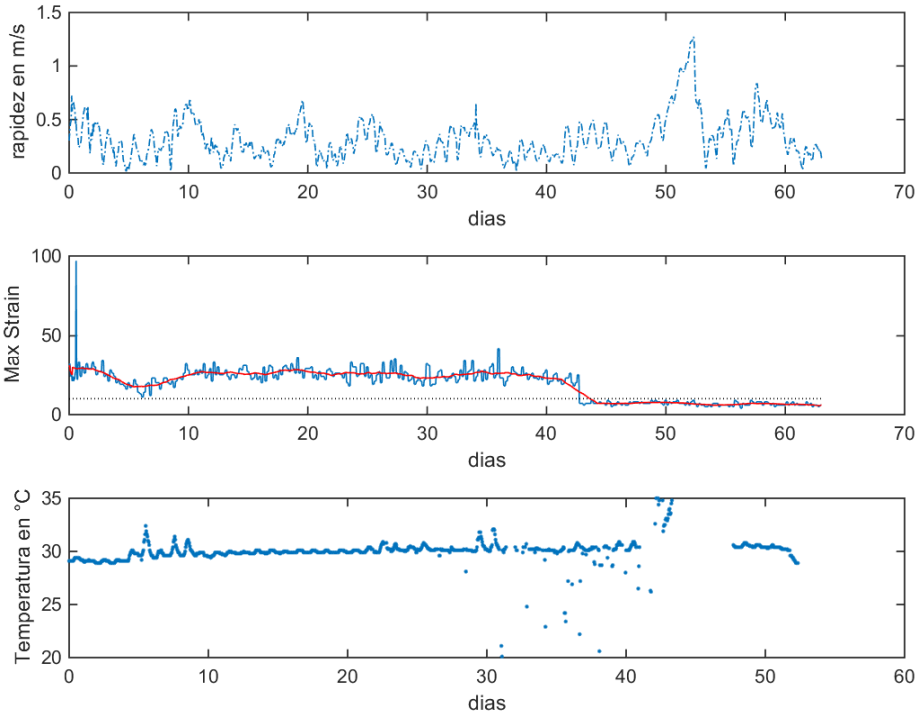

rapidez en m/s
dias
Max Strain
dias
Temperatura en °C
dias

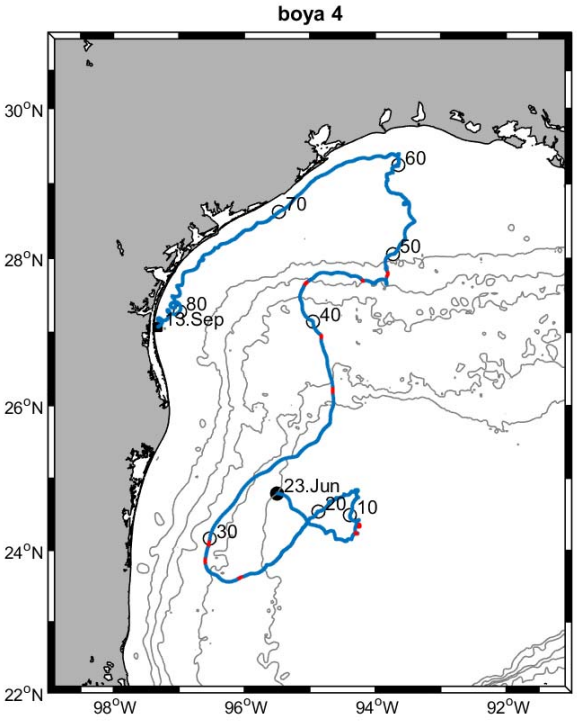

boya 3
30°N
28°N
26°N
24°N
22°N
98°W
96°W
94°W
92°W
27.Aug
60
50
40
30
23.Jun
20
10

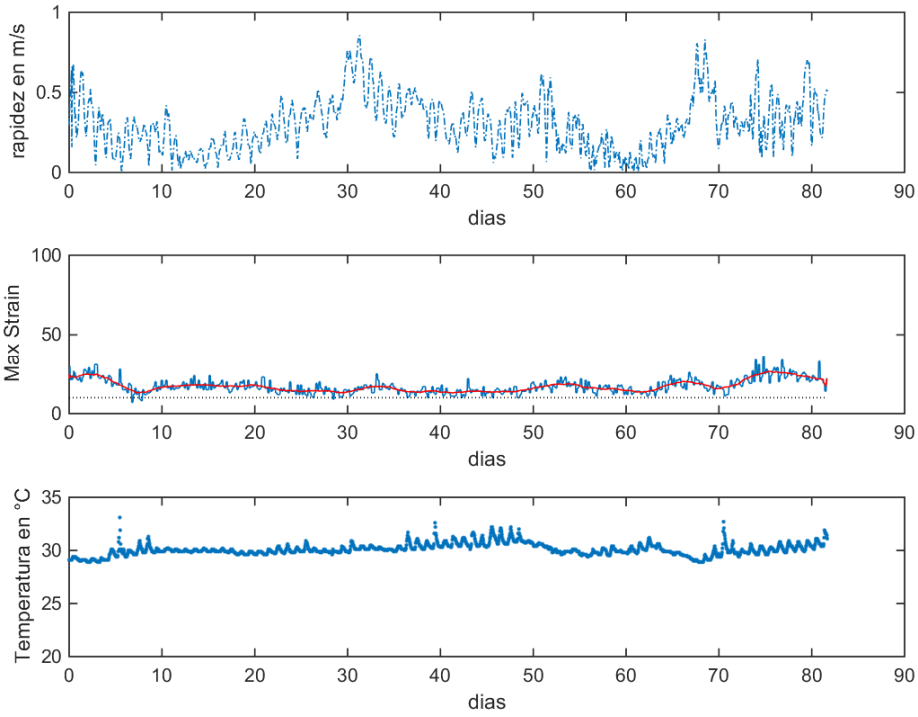

rapidez en m/s
1.5
1
0.5
0
0
10
20
30
40
50
60
70
dias
Max Strain
100
50
0
0
10
20
30
40
50
60
70
dias
Temperatura en °C
35
30
25
20
0
10
20
30
40
50
60
70
dias

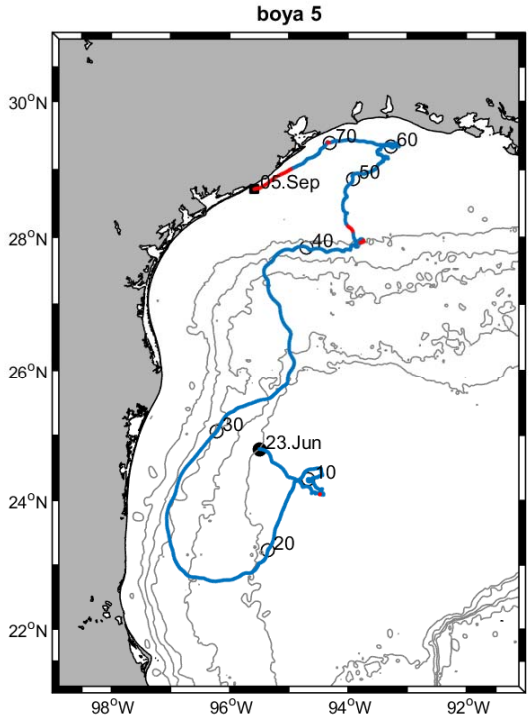
1.1.8. TRIPLET 08

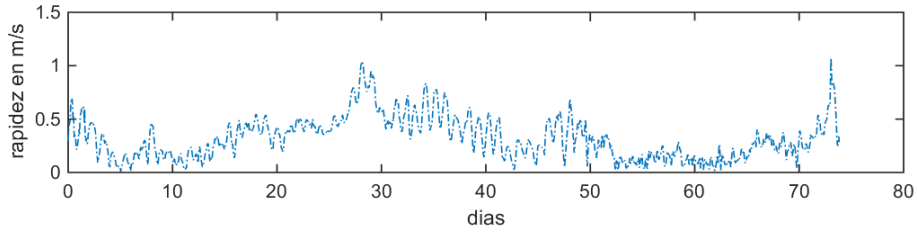


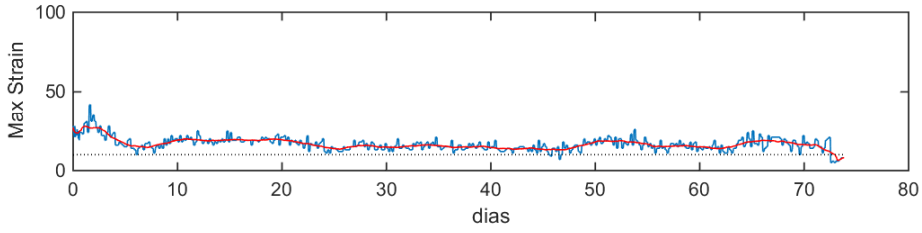


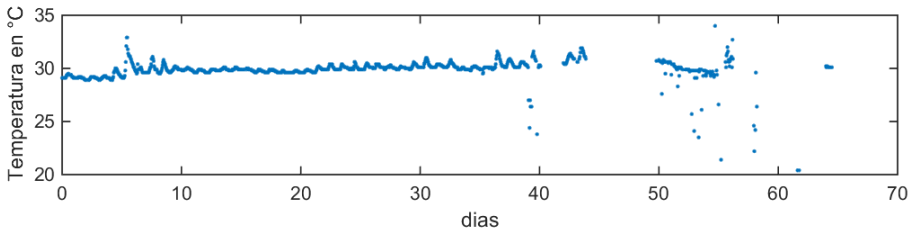

boya 4
30°N
28°N
26°N
24°N
22°N
98°W
96°W
94°W
92°W
60
70
50
80
13.Sep
40
23.Jun
20
10
30


rapidez en m/s
dias
Max Strain
dias
Temperatura en °C
dias

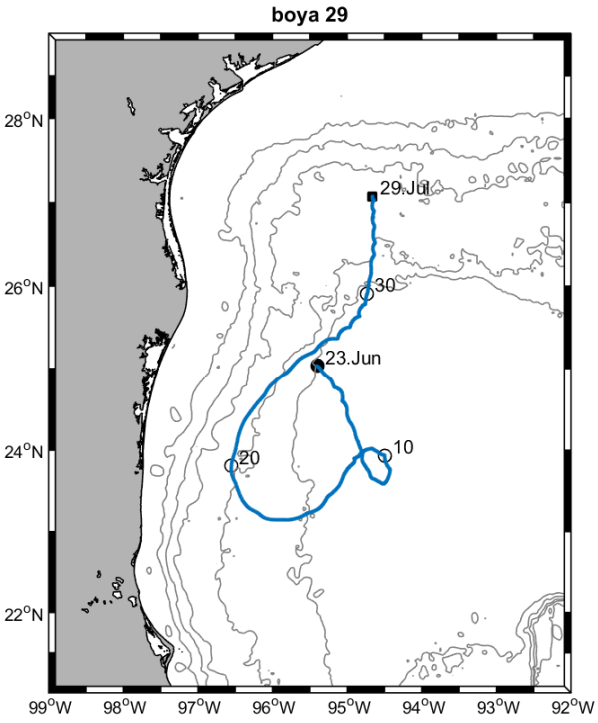

boya 5
30°N
28°N
26°N
24°N
22°N
98°W
96°W
94°W
92°W
70
60
50
05.Sep
40
30
23.Jun
10
20

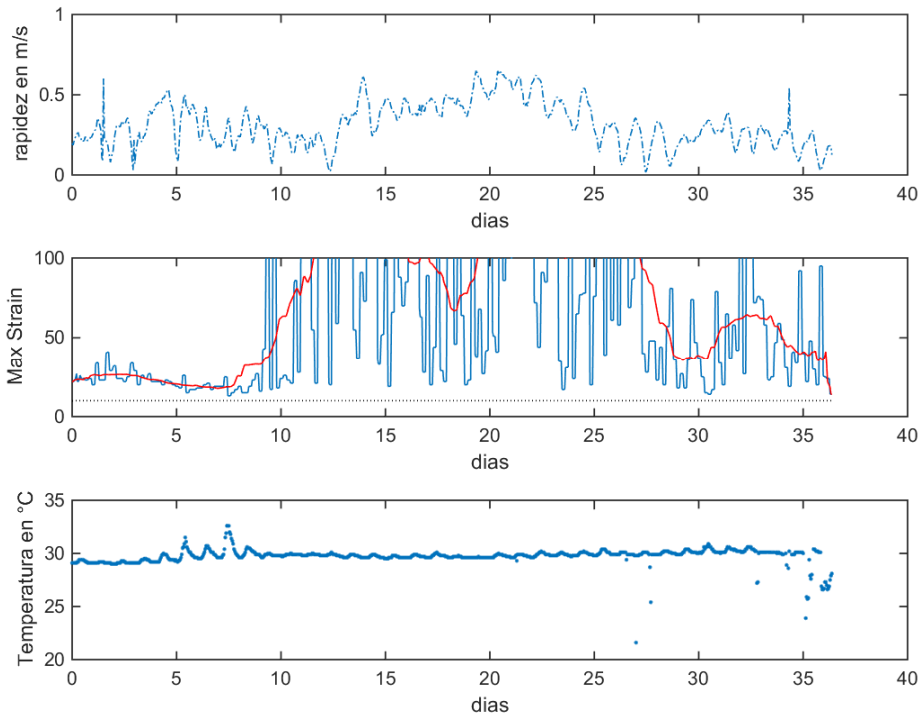

rapidez en m/s
1.5
1
0.5
0
0
10
20
30
40
50
60
70
80
dias

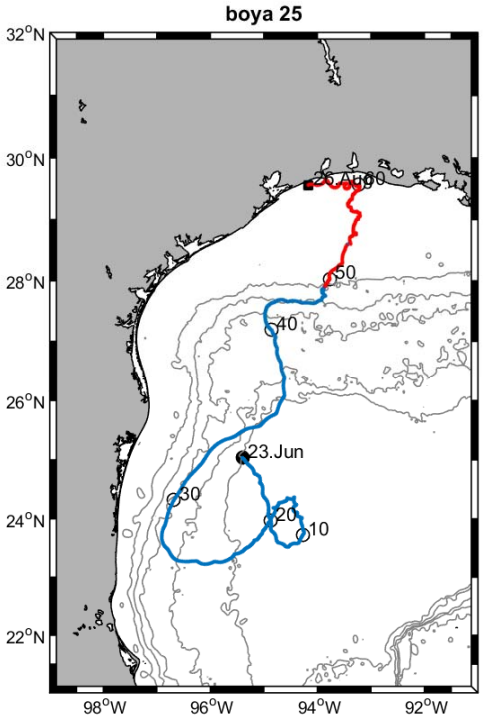

Max Strain
100
50
0
0
10
20
30
40
50
60
70
80
dias

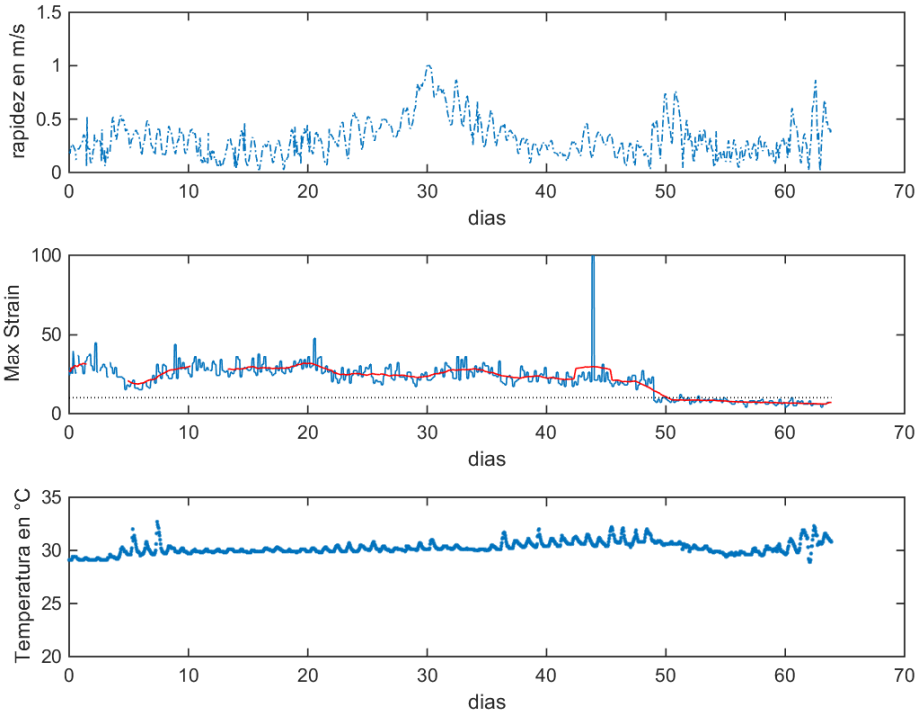

Temperatura en °C
35
30
25
20
0
10
20
30
40
50
60
70
dias

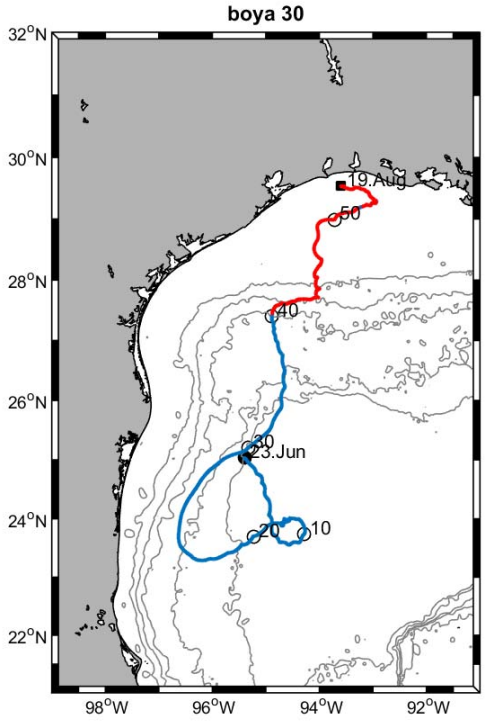
1.1.9. TRIPLET 09

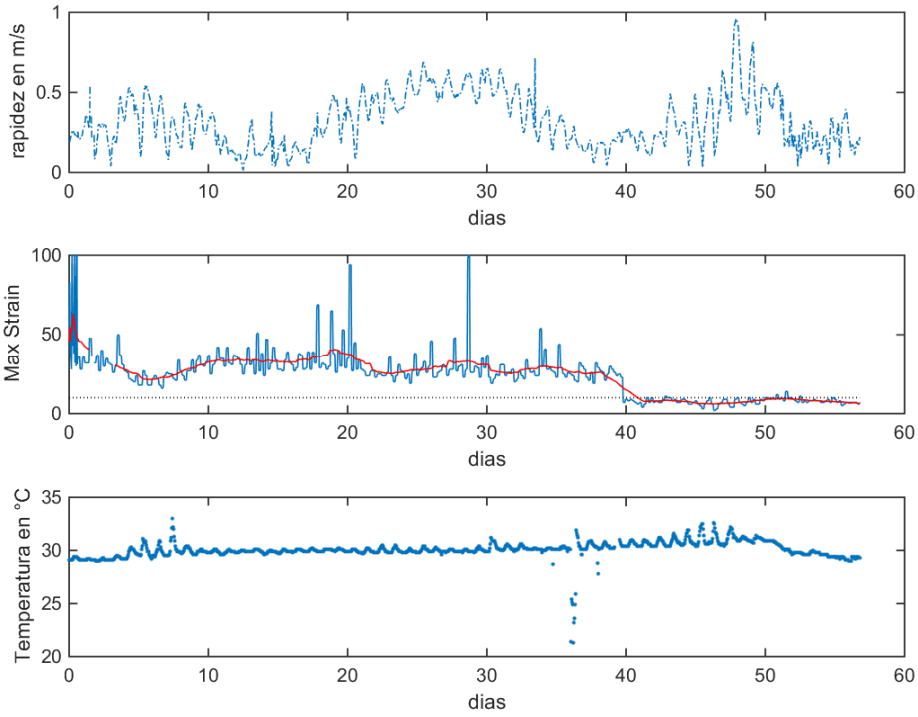




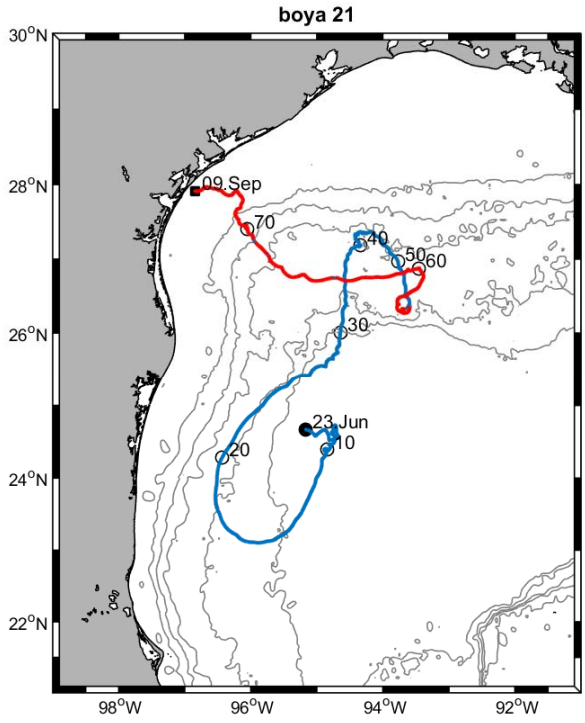

boya 25
32°N
30°N
28°N
26°N
24°N
22°N
98°W
96°W
94°W
92°W
25.Aug
50
40
23.Jun
30
20
10

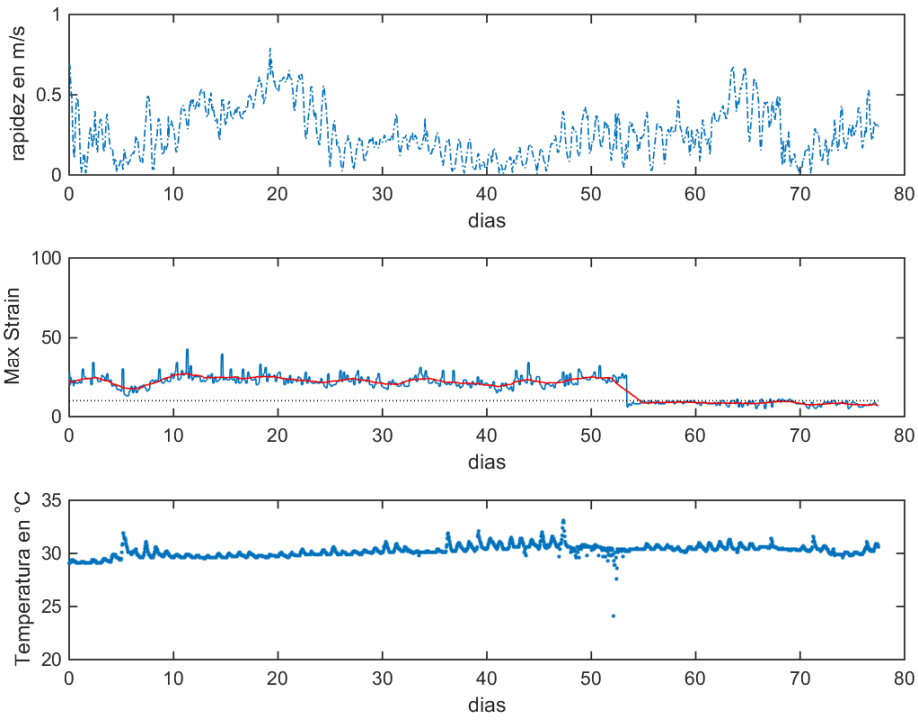

rapidez en m/s
dias
Max Strain
dias
Temperatura en °C
dias

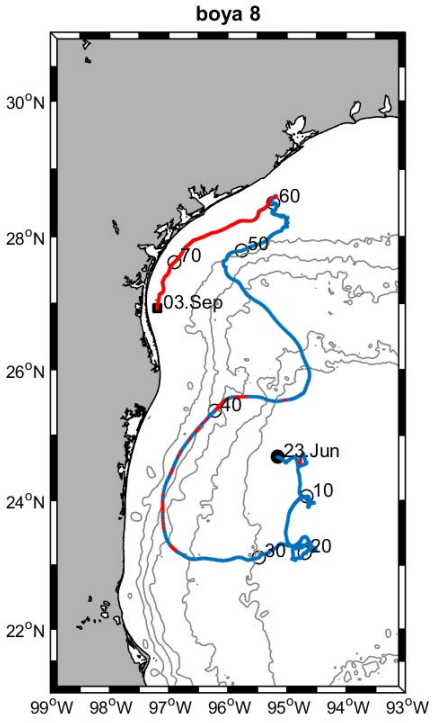

boya 30
32°N
30°N
28°N
26°N
24°N
22°N
98°W
96°W
94°W
92°W
19.Aug
50
40
30
23.Jun
20
10

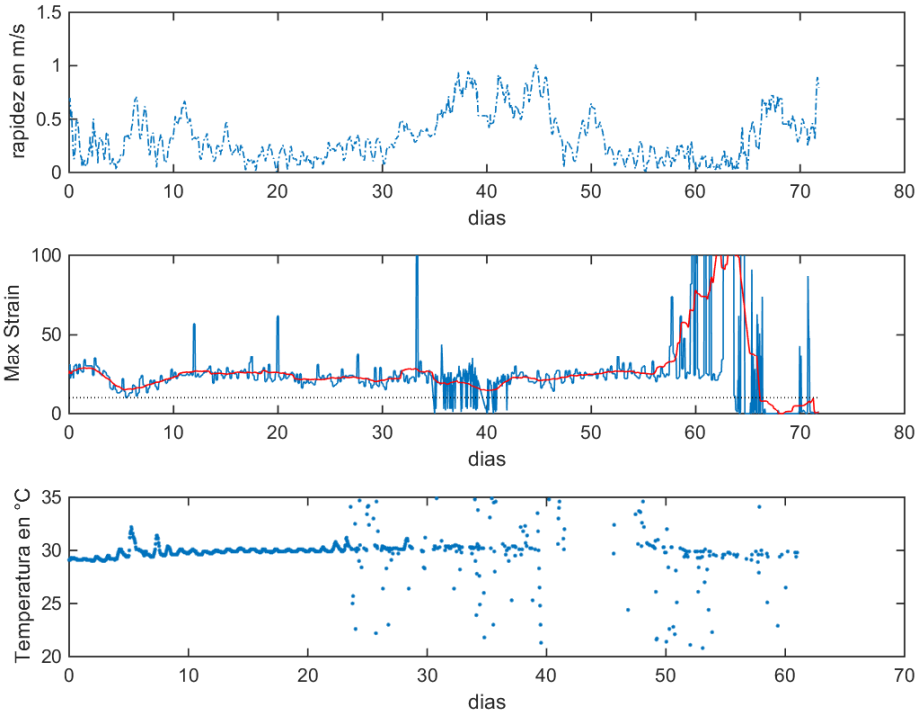

rapidez en m/s
dias
Max Strain
dias
Temperatura en °C
dias

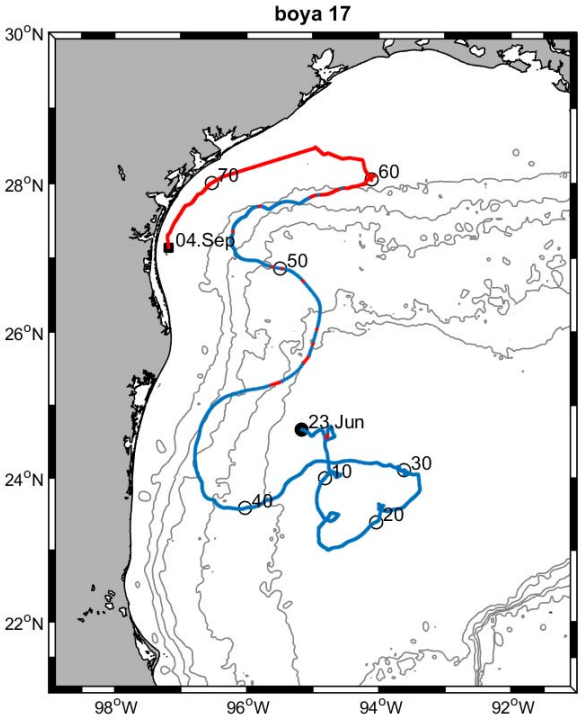
1.1.10. TRIPLET 10

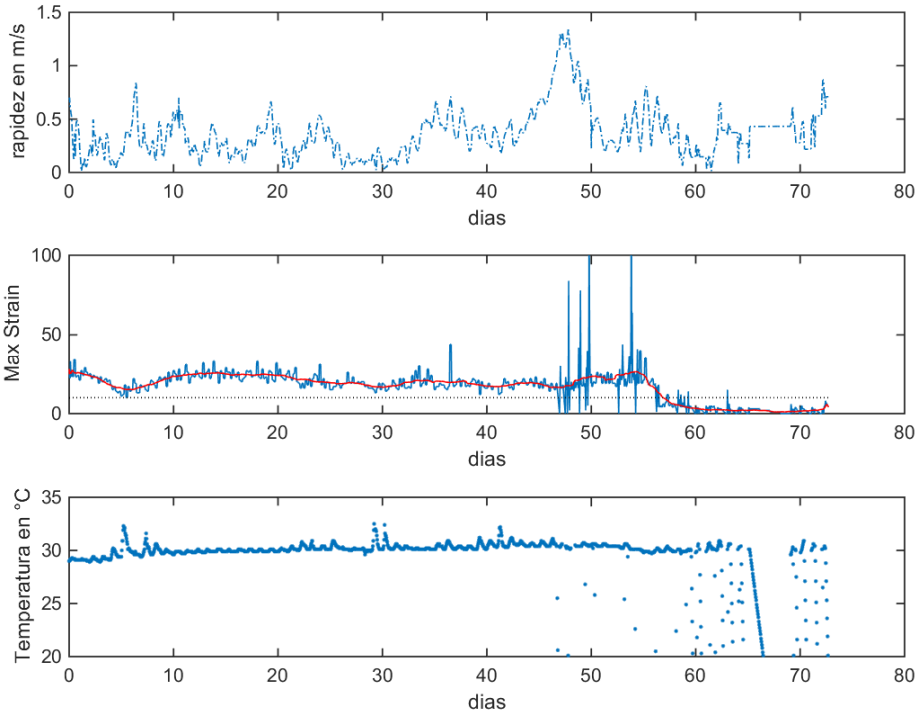




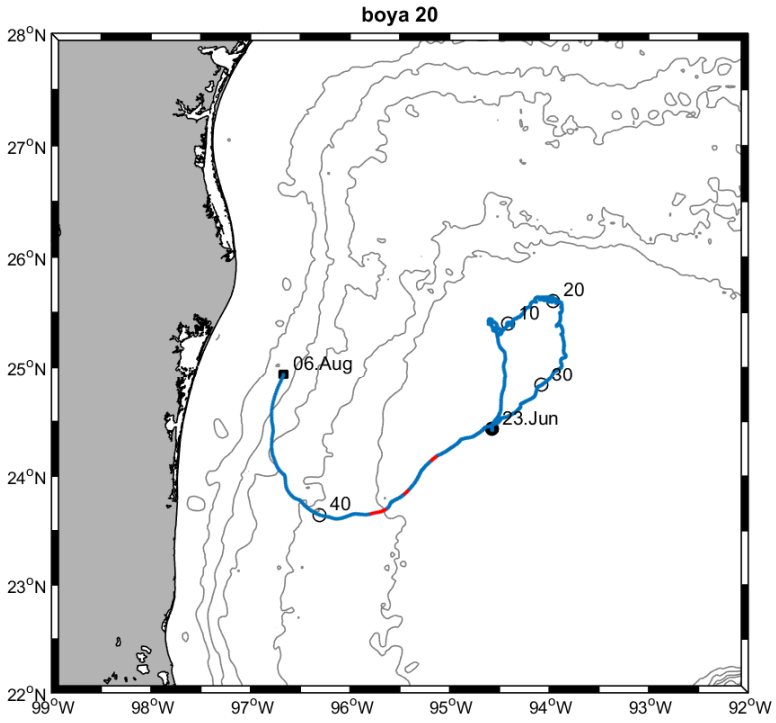

boya 8
30°N
28°N
26°N
24°N
22°N
99°W
98°W
97°W
96°W
95°W
94°W
93°W
60
50
70
03.Sep
40
23.Jun
10
30
20

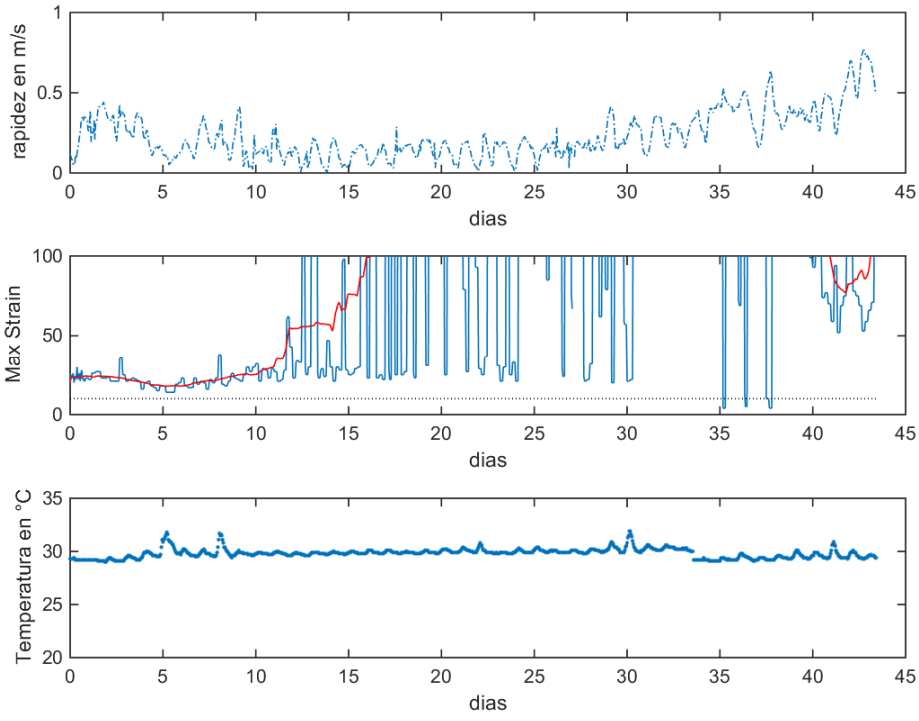

rapidez en m/s
dias
Max Strain
dias
Temperatura en °C
dias

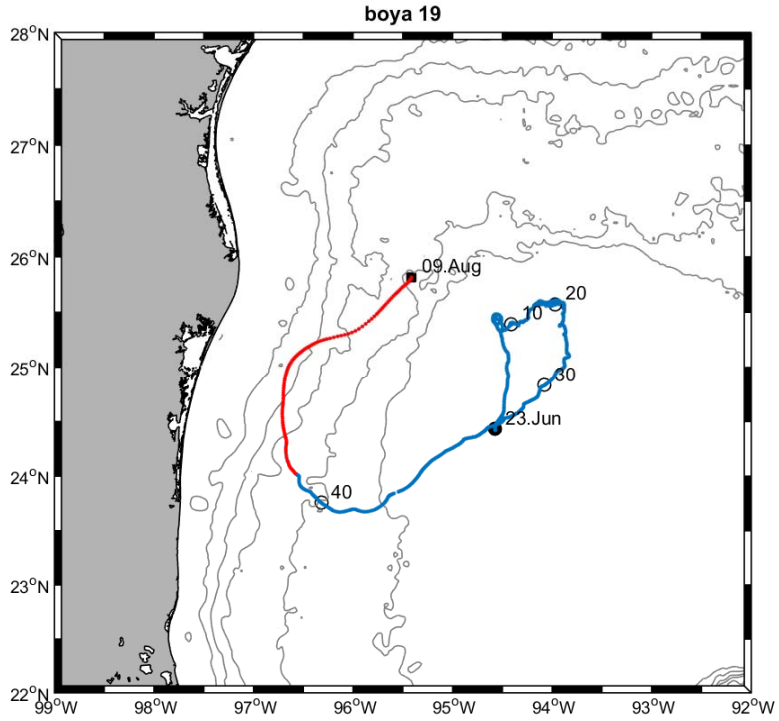

boya 17
30°N
28°N
26°N
24°N
22°N
98°W
96°W
94°W
92°W
70
60
04.Sep
50
23.Jun
30
10
40
20

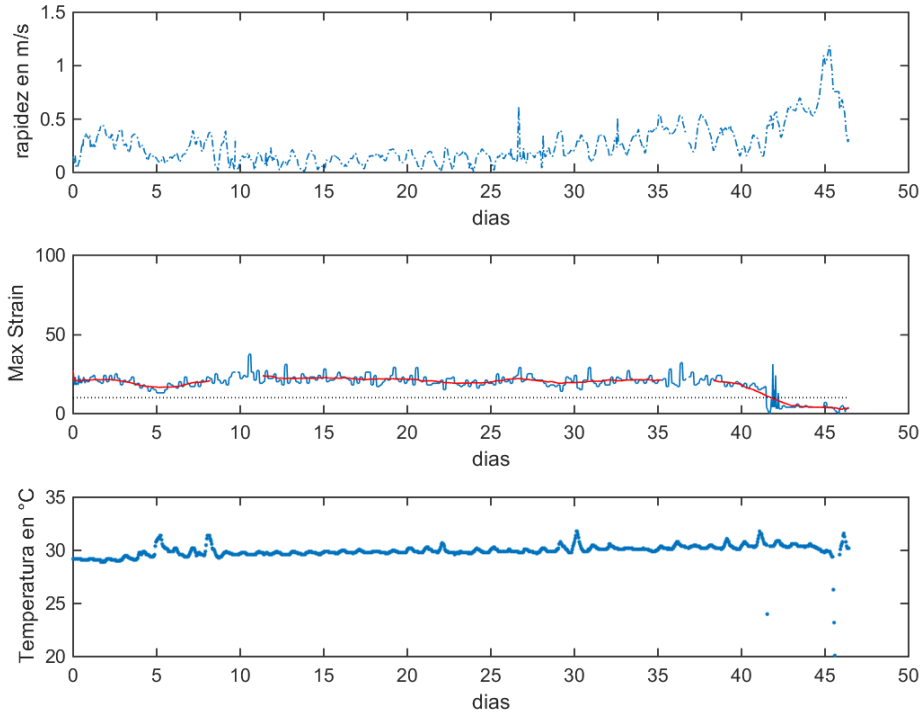

rapidez en m/s
dias
Max Strain
dias
Temperatura en °C
dias

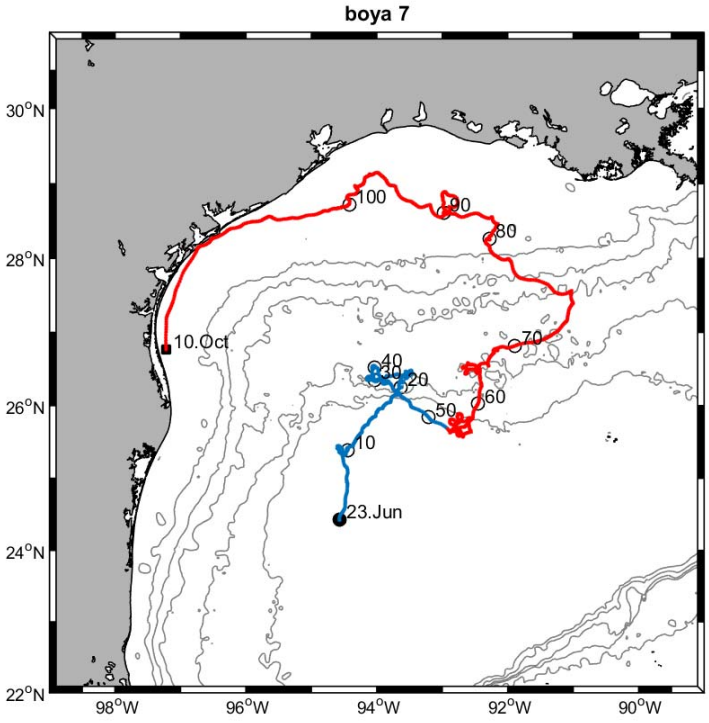
1.1.11. TRIPLET 11

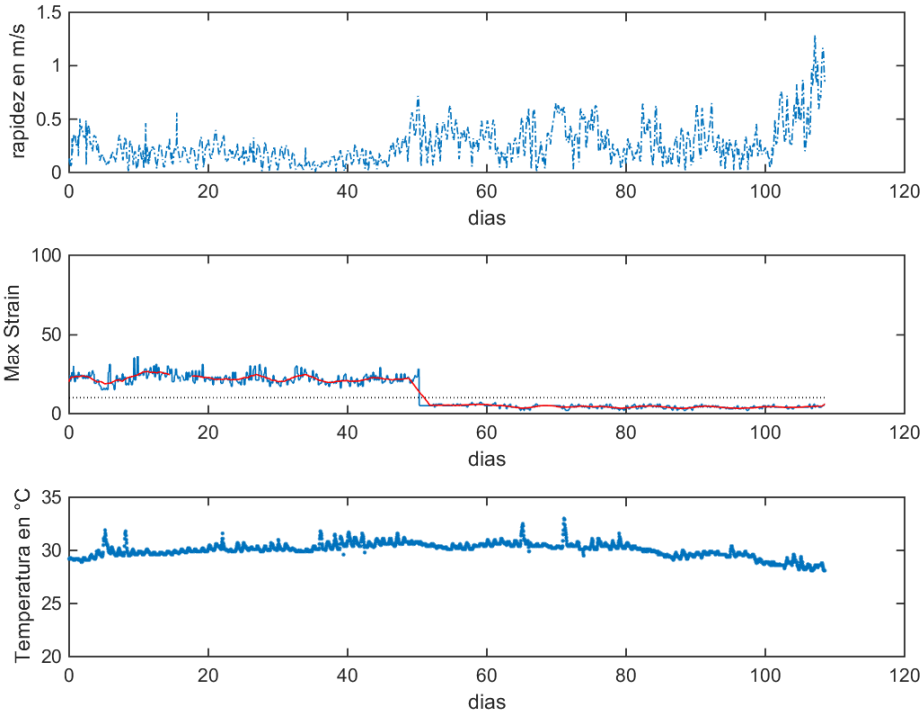




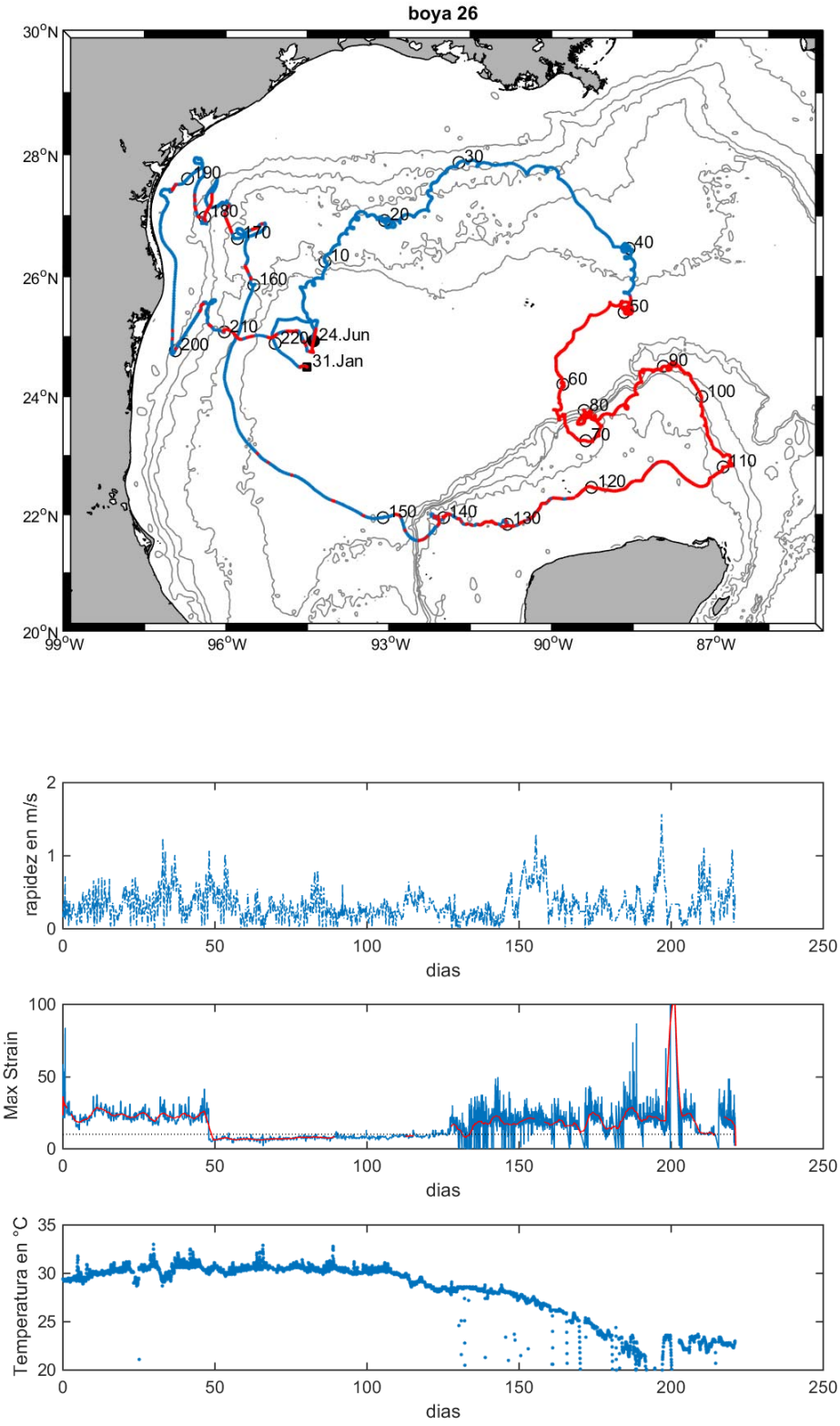

boya 19
28°N
27°N
26°N
25°N
24°N
23°N
22°N
99°W
98°W
97°W
96°W
95°W
94°W
93°W
92°W
09.Aug
20
10
30
23.Jun
40

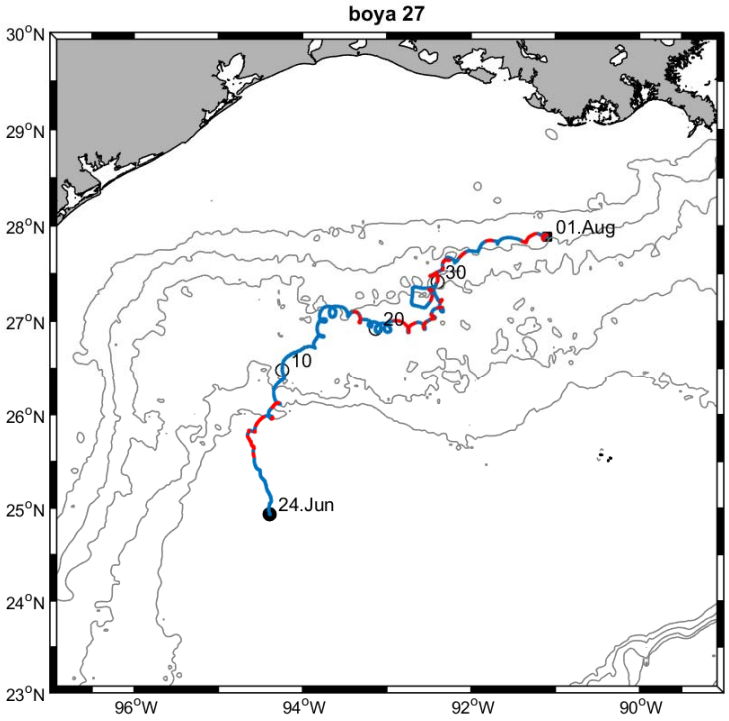

rapidez en m/s
1.5
1
0.5
0
0
5
10
15
20
25
30
35
40
45
50
dias
Max Strain
100
50
0
dias
Temperatura en °C
35
30
25
20
dias

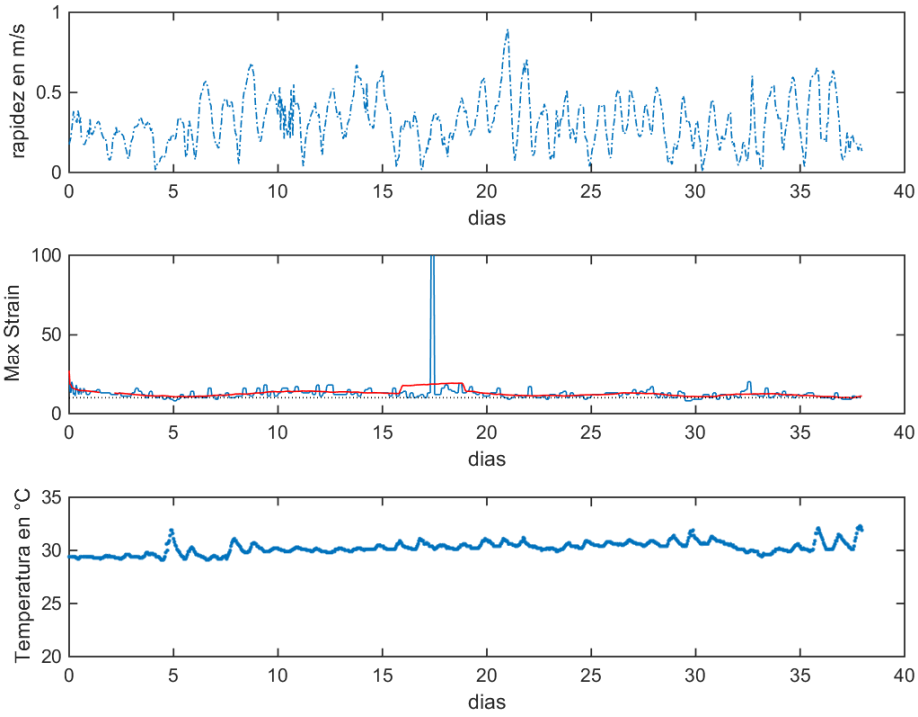

boya 7
30°N
28°N
26°N
24°N
22°N
98°W
96°W
94°W
92°W
90°W
100
90
80
70
60
50
40
30
20
10
10.Oct
23.Jun

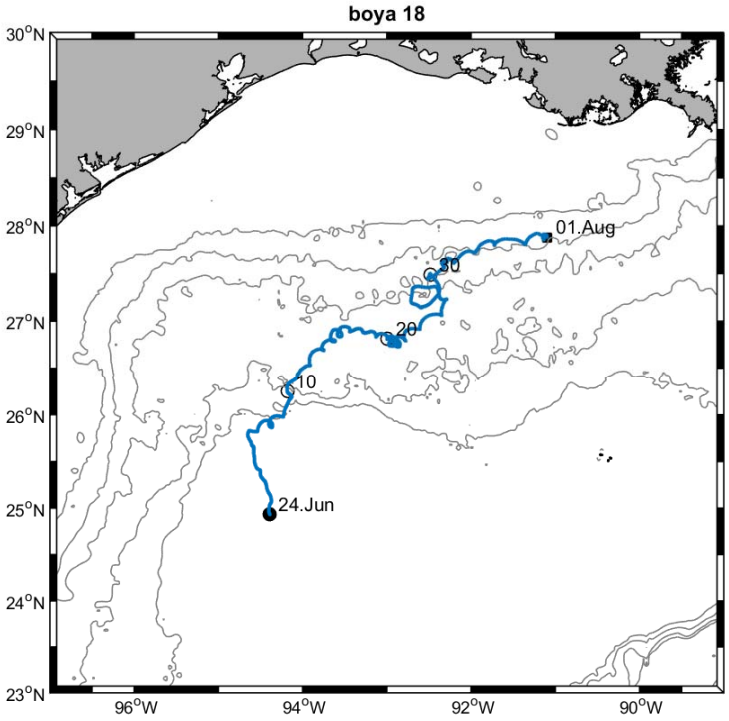

rapidez en m/s
1.5
1
0.5
0
0
20
40
60
80
100
120
dias
Max Strain
100
50
0
0
20
40
60
80
100
120
dias
Temperatura en °C
35
30
25
20
0
20
40
60
80
100
120
dias

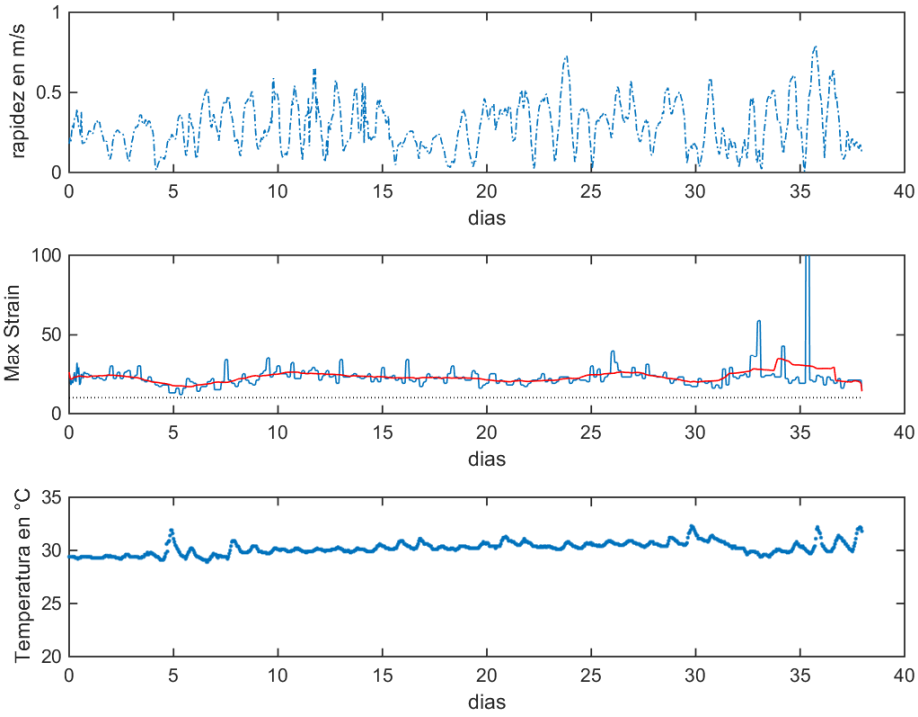
1.1.12. TRIPLET 12



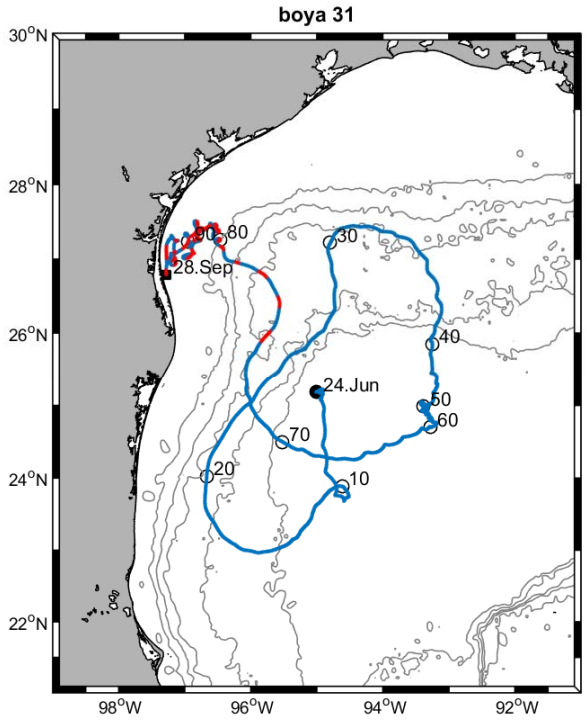

boya 27
30°N
29°N
28°N
27°N
26°N
25°N
24°N
23°N
96°W
94°W
92°W
90°W
01.Aug
30
20
10
24.Jun

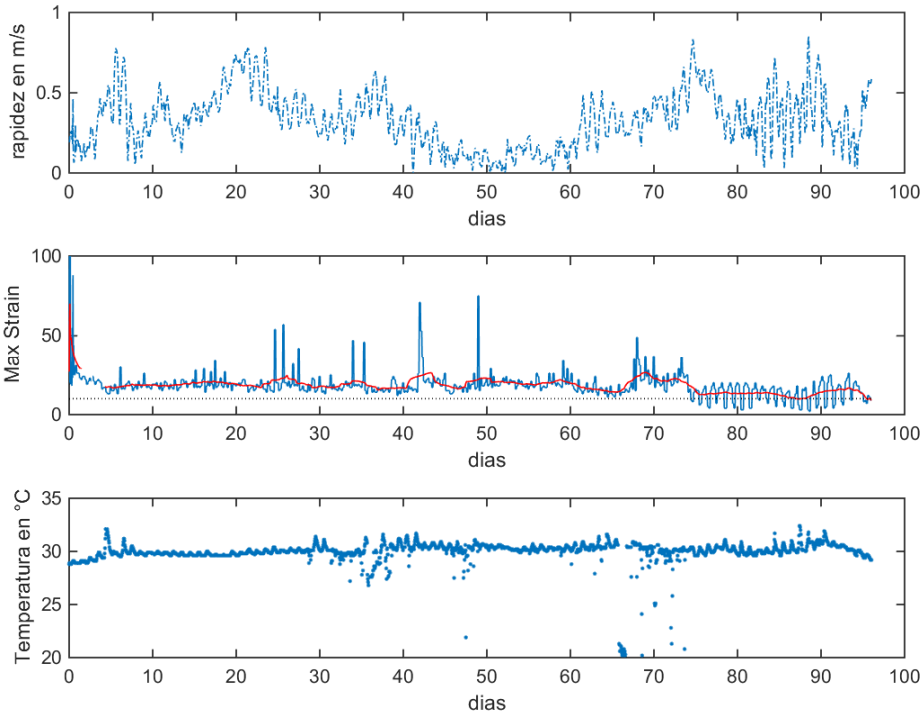

rapidez en m/s
dias
Max Strain
dias
Temperatura en °C
dias

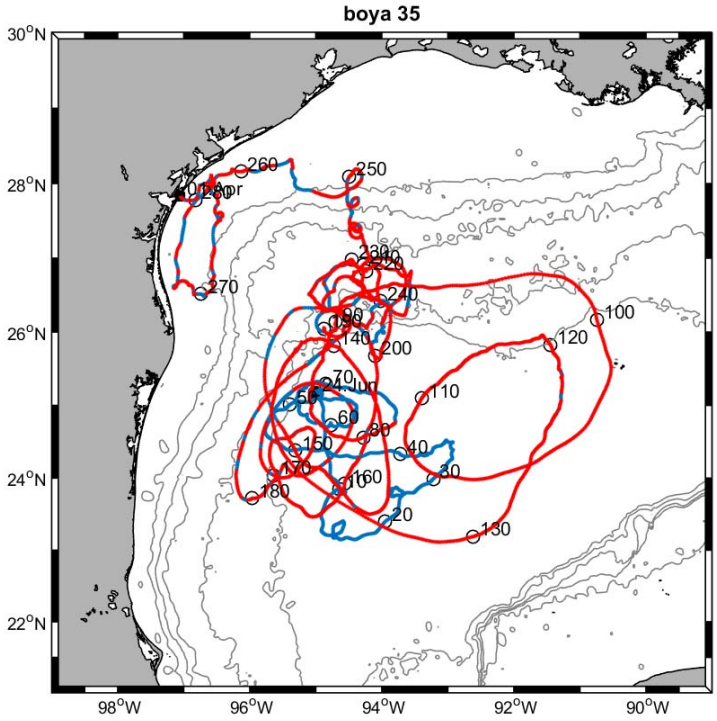

boya 18
30°N
29°N
28°N
27°N
26°N
25°N
24°N
23°N
96°W
94°W
92°W
90°W
01.Aug
30
20
10
24.Jun

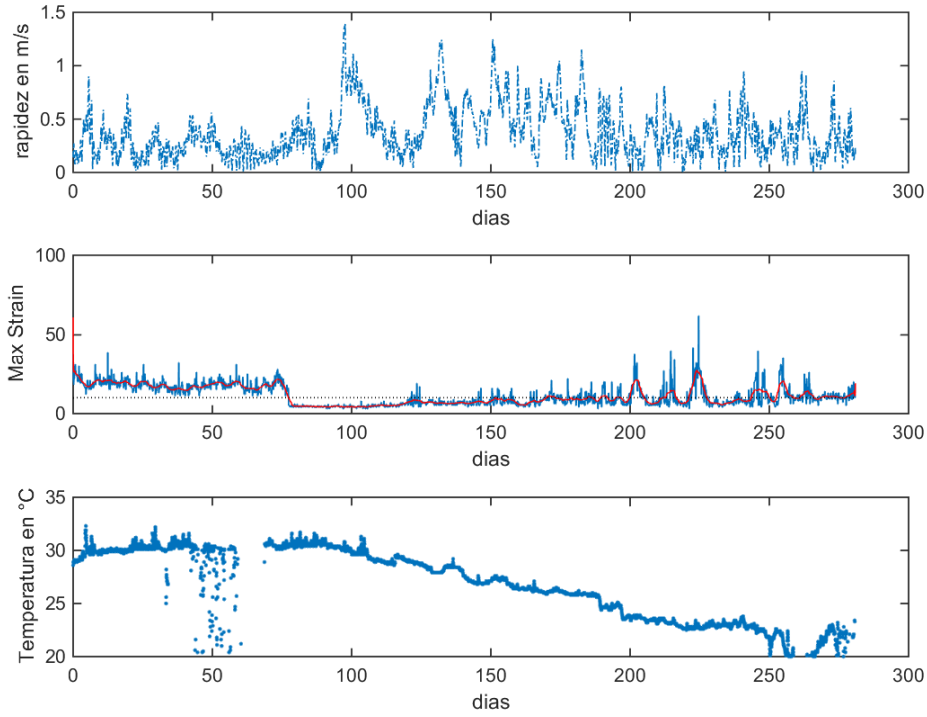

rapidez en m/s
dias
Max Strain
dias
Temperatura en °C
dias

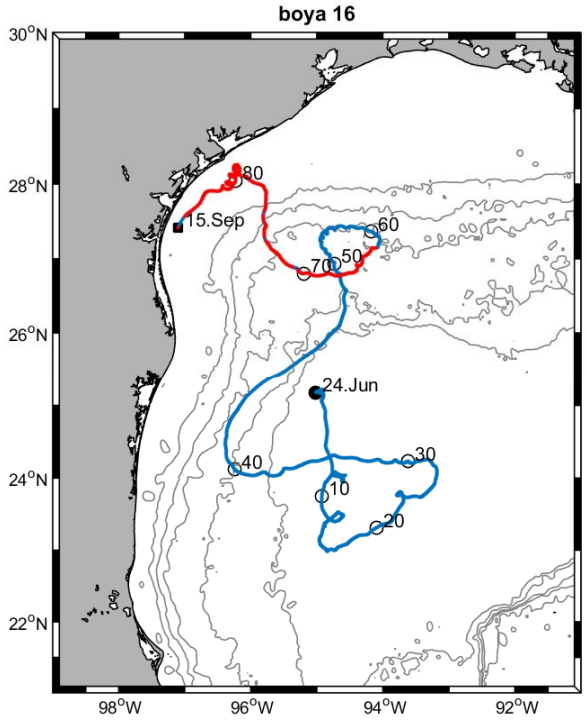
1.1.13. TRIPLET 13

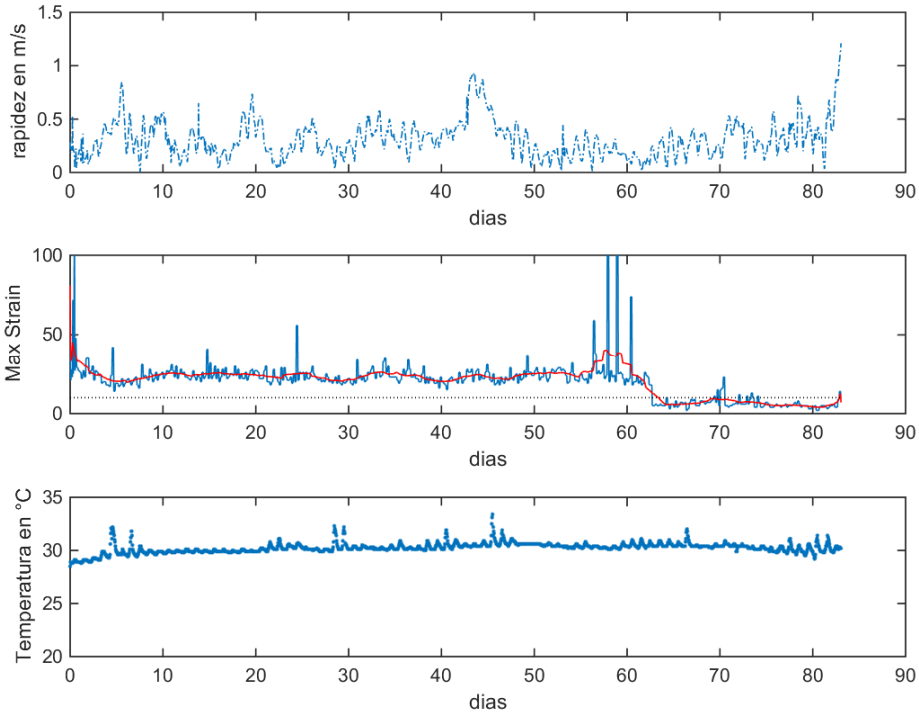




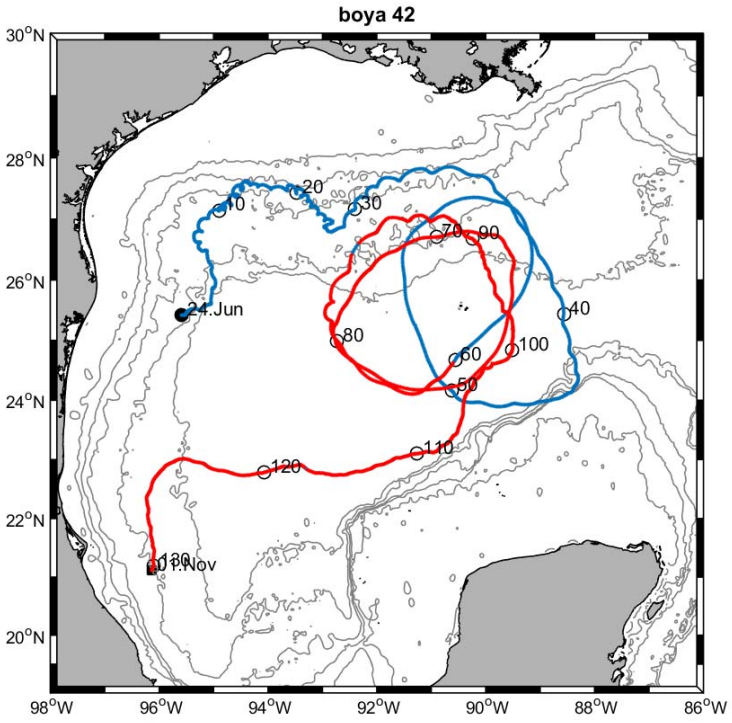

boya 35
30°N
28°N
26°N
24°N
22°N
98°W
96°W
94°W
92°W
90°W

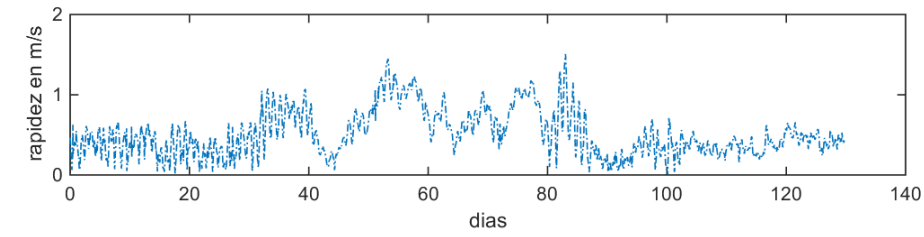

rapidez en m/s
dias
Max Strain
dias
Temperatura en °C
dias

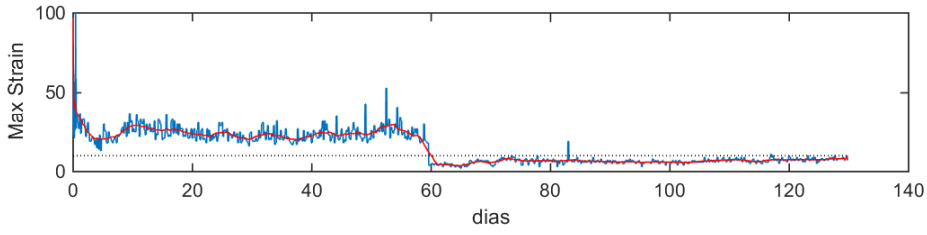

boya 16
30°N
28°N
26°N
24°N
22°N
98°W
96°W
94°W
92°W
80
15.Sep
60
50
70
24.Jun
40
30
10
20

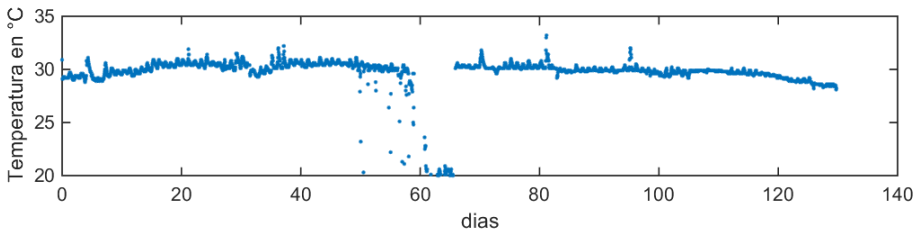

rapidez en m/s
dias
Max Strain
dias
Temperatura en °C
dias

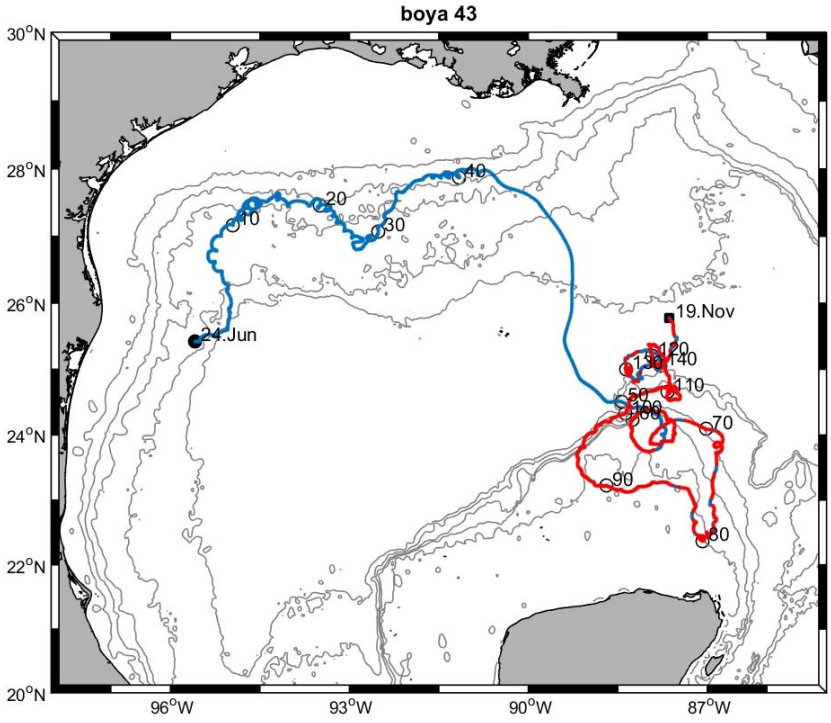
1.1.14. TRIPLET 14

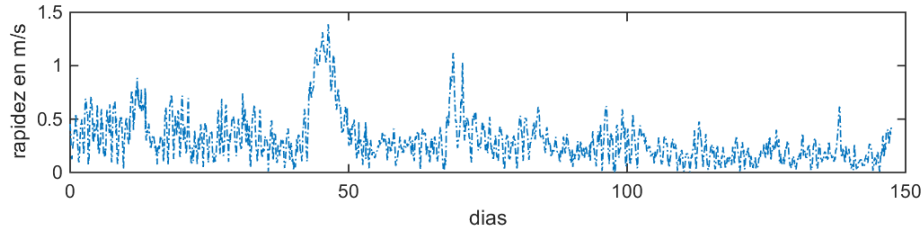


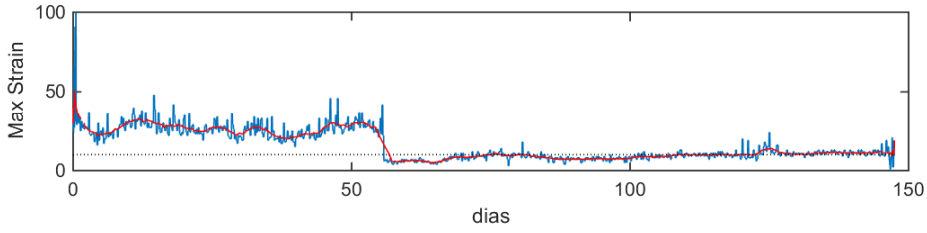


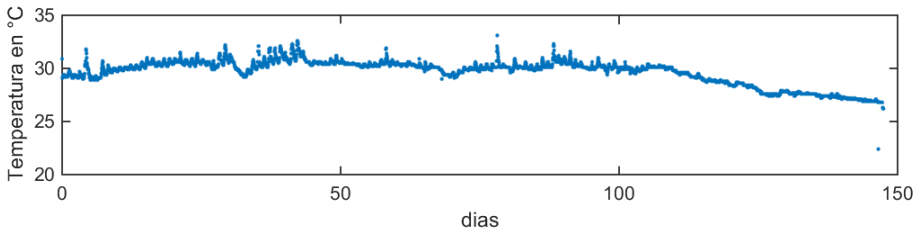


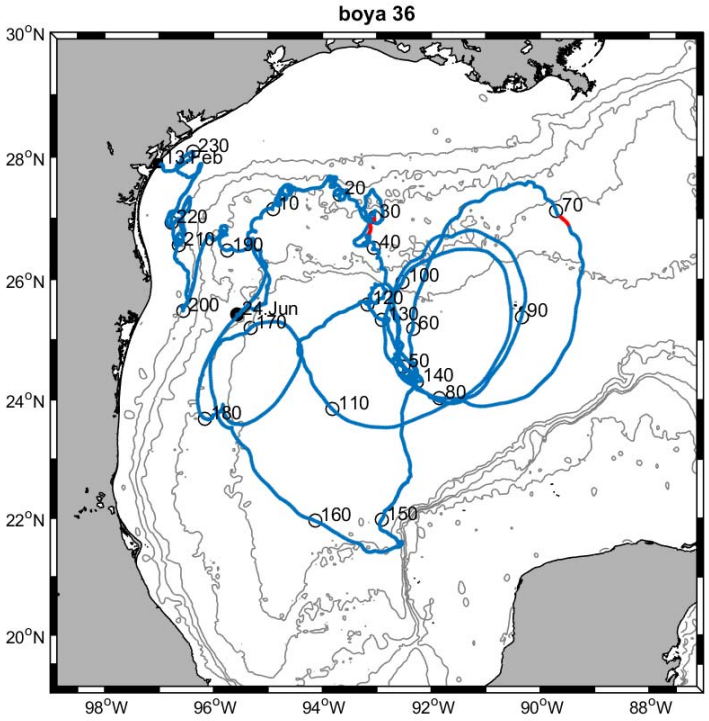


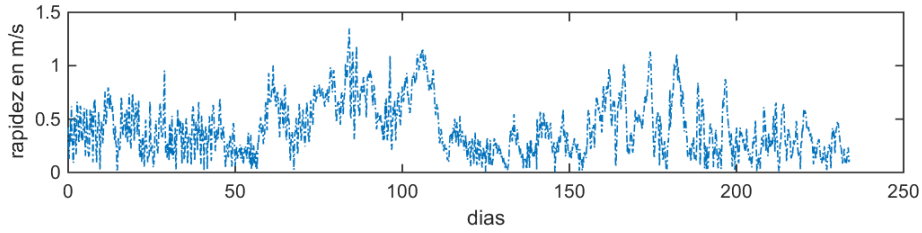

boya 43
30°N
28°N
26°N
24°N
22°N
20°N
96°W
93°W
90°W
87°W
24.Jun
19.Nov
10
20
30
40
50
60
70
80
90
100
110
120
130
140

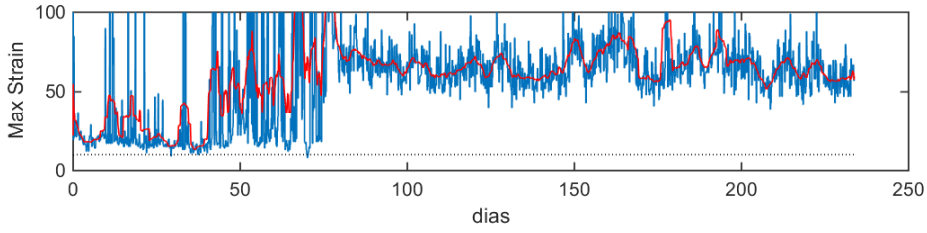

rapidez en m/s
1.5
1
0.5
0
0
50
100
150
dias

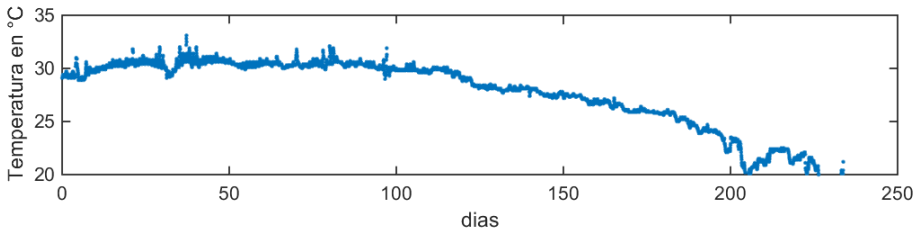

Max Strain
100
50
0
0
50
100
150
dias


Temperatura en °C
35
30
25
20
0
50
100
150
dias

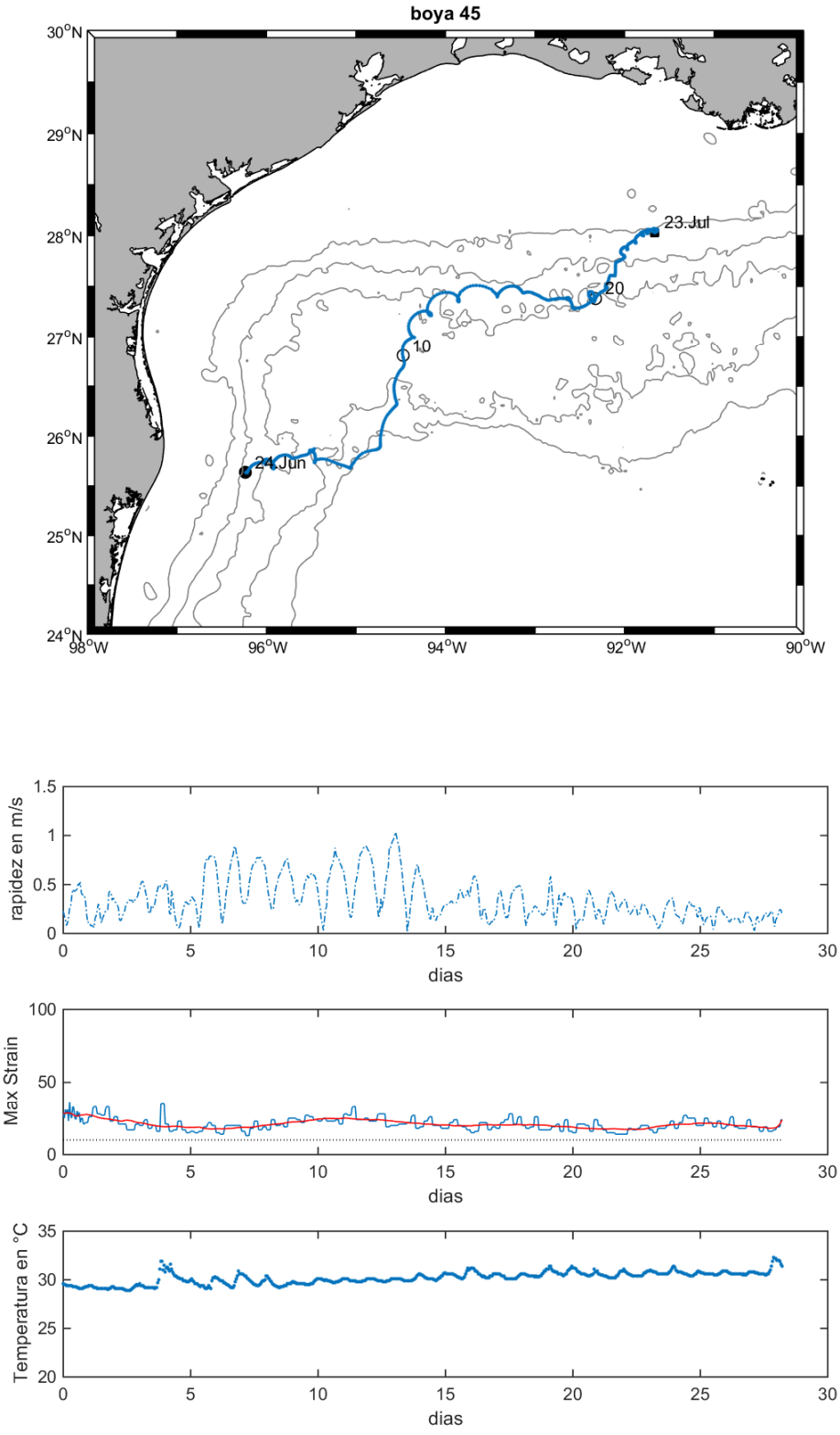

boya 36
30°N
28°N
26°N
24°N
22°N
20°N
98°W
96°W
94°W
92°W
90°W
88°W
31 Feb
24 Jun
230
220
210
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10

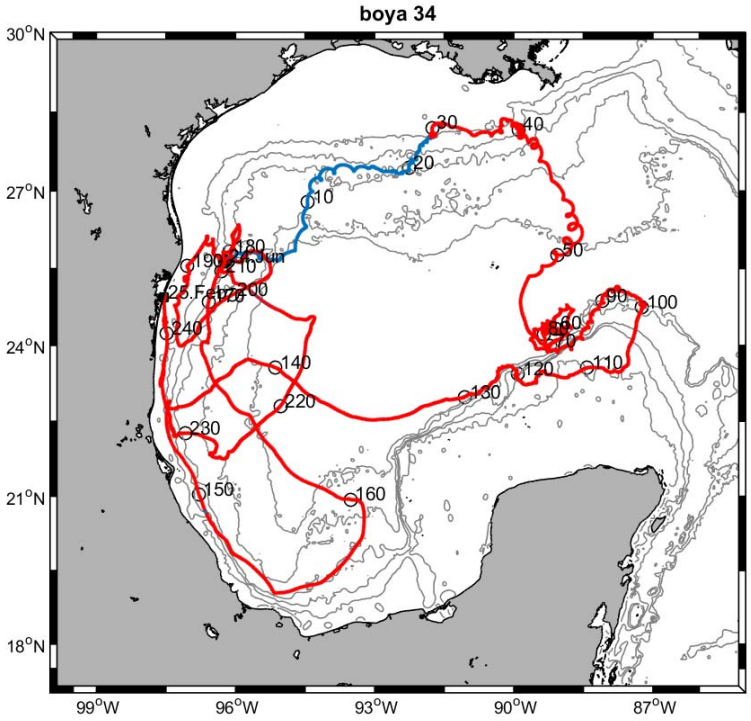

rapidez en m/s
1.5
1
0.5
0
0
50
100
150
200
250
dias

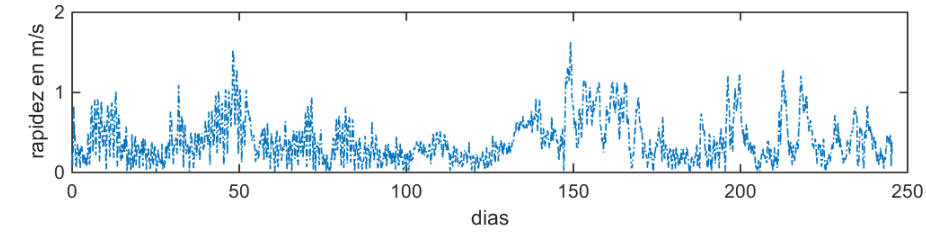

Max Strain
100
50
0
0
50
100
150
200
250
dias

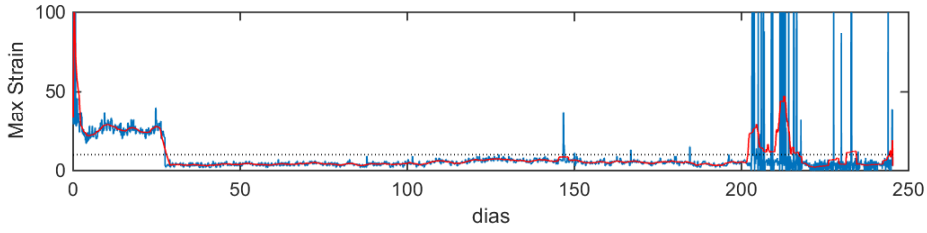

Temperatura en °C
35
30
25
20
0
50
100
150
200
250
dias

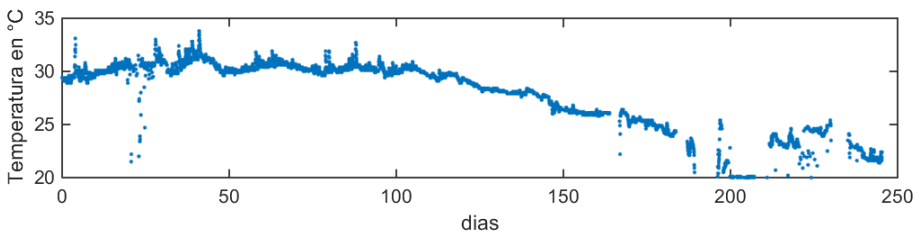
1.1.15. TRIPLET 15

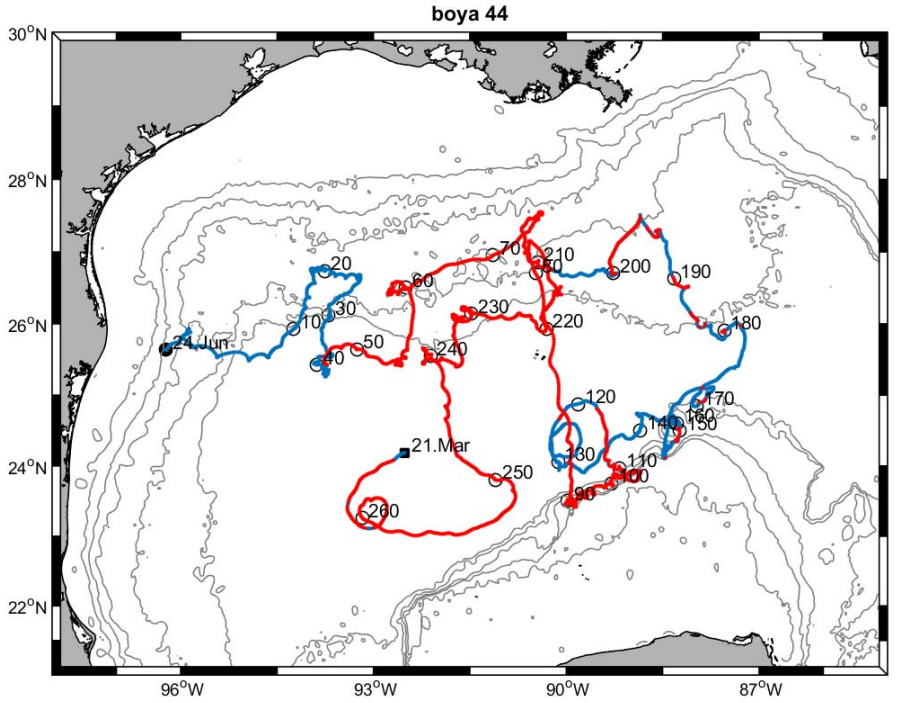


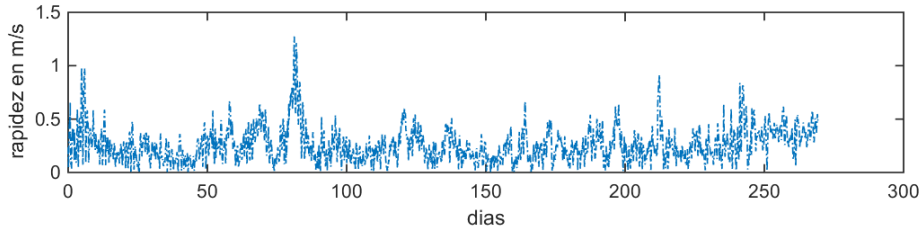

boya 34
30°N
27°N
24°N
21°N
18°N
99°W
96°W
93°W
90°W
87°W
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160
180
190
200
220
230
240
25 Feb 08

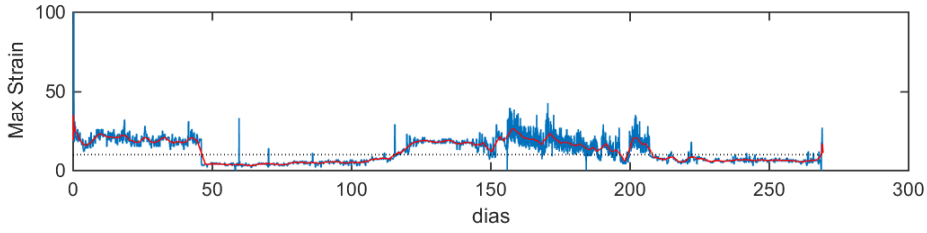

rapidez en m/s
dias

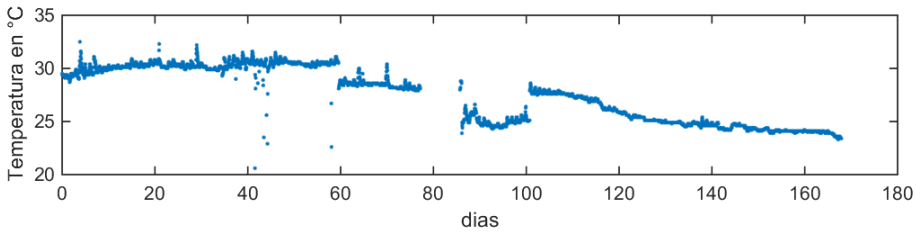

Max Strain
dias


Temperatura en °C
dias


boya 44
30°N
28°N
26°N
24°N
22°N
96°W
93°W
90°W
87°W
24.Jun
21.Mar
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160
170
180
190
200
210
220
230
240
250
260

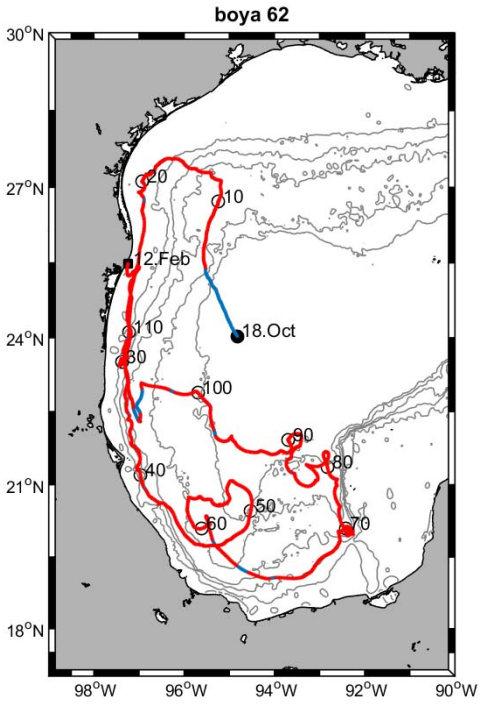

rapidez en m/s
dias

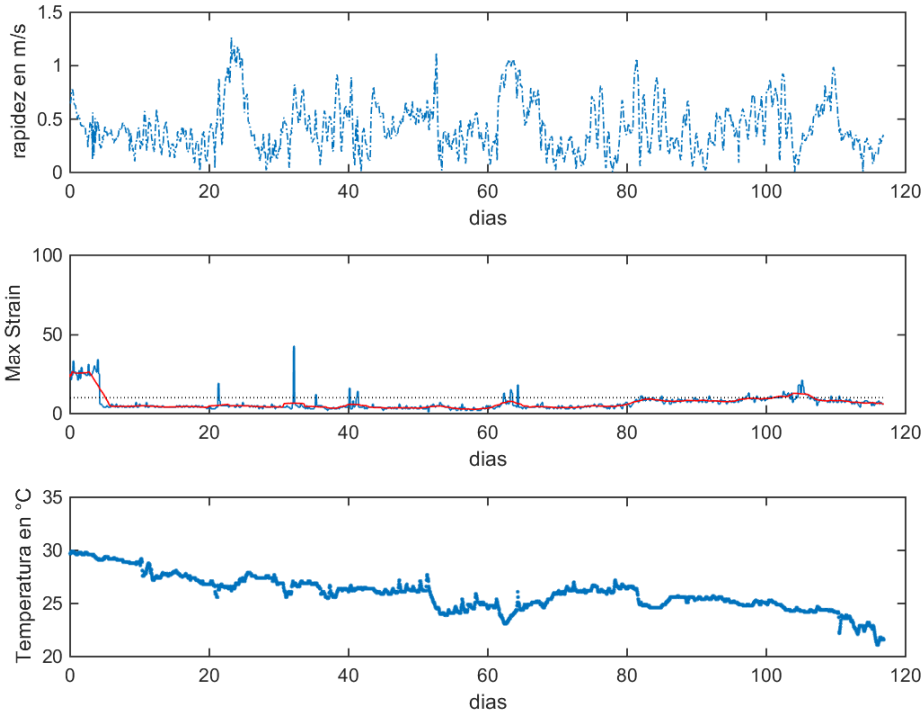

Max Strain
dias

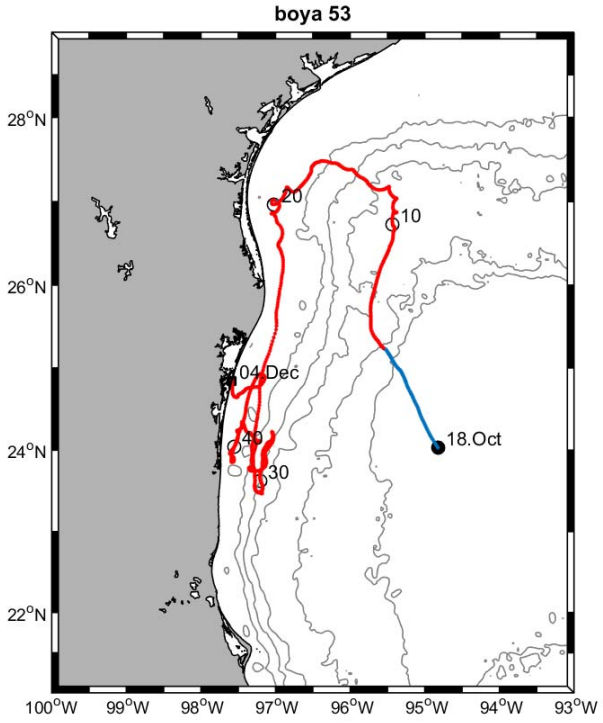

Temperatura en °C
dias

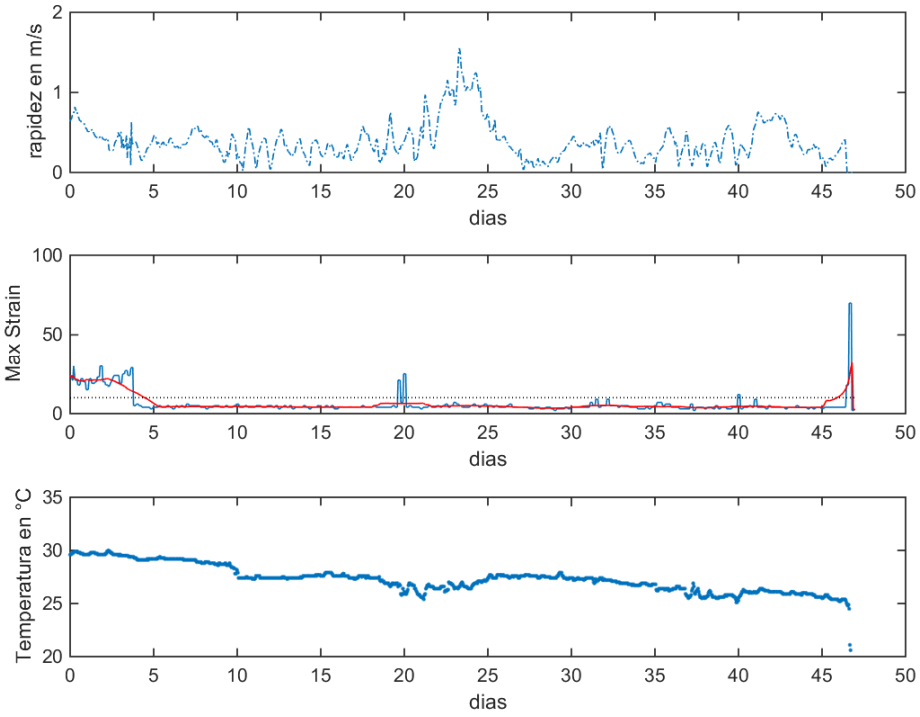
DWDE 2

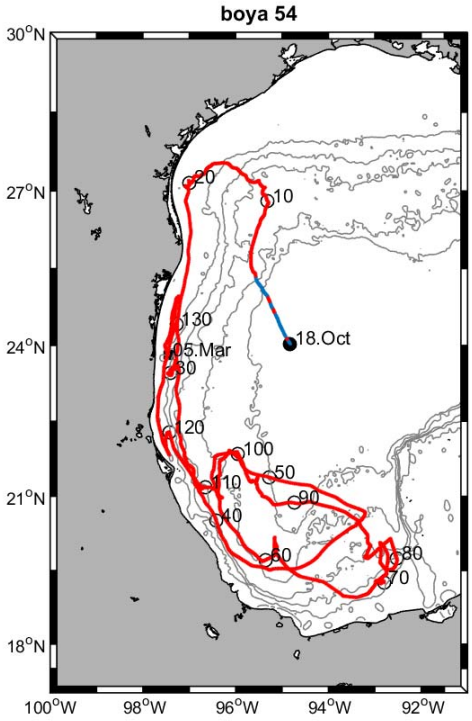
1.1.1. TRIPLET 01

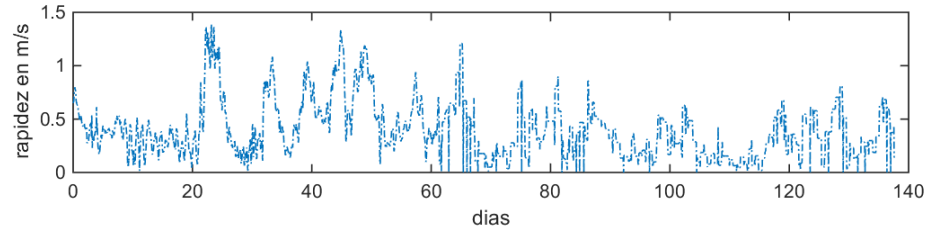


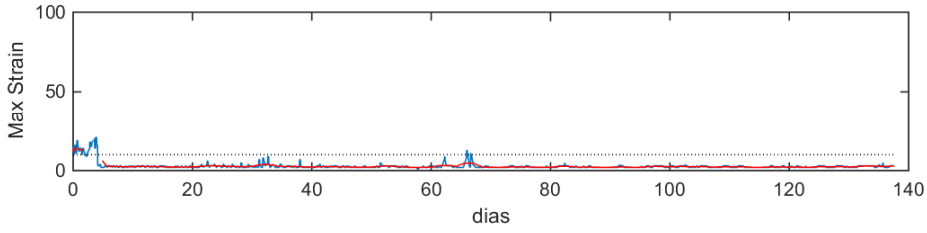


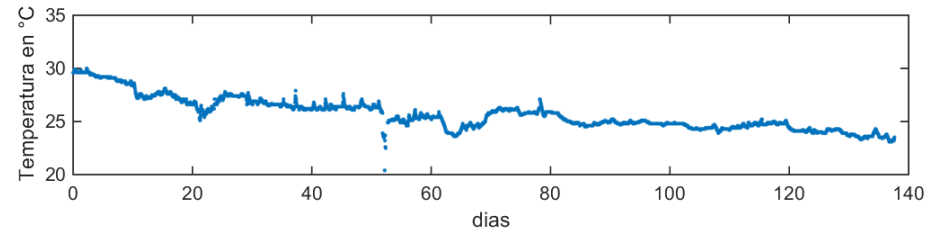

boya 53
28°N
26°N
24°N
22°N
100°W
99°W
98°W
97°W
96°W
95°W
94°W
93°W
20
10
04 Dec
40
30
18.Oct


rapidez en m/s
dias
Max Strain
dias
Temperatura en °C
dias

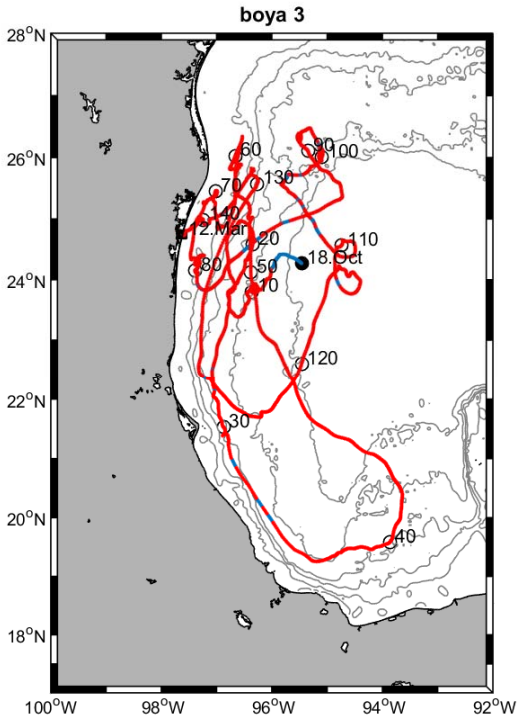

boya 54
30°N
27°N
24°N
21°N
18°N
100°W
98°W
96°W
94°W
92°W
20
10
130
18.Oct
05.Mar
30
120
100
50
110
90
40
60
80
70

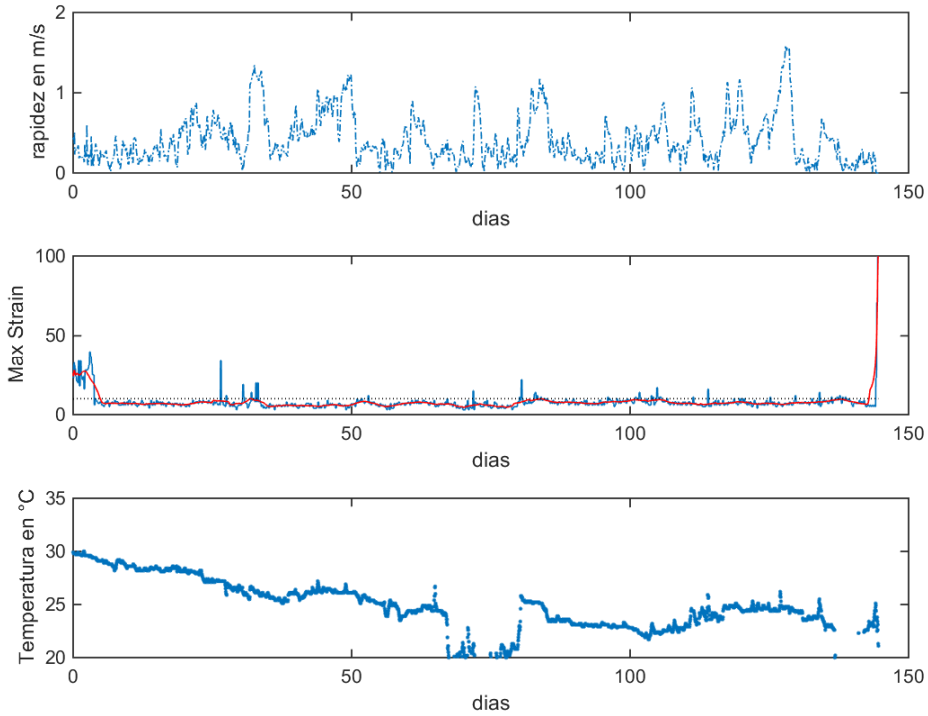

rapidez en m/s
1.5
1
0.5
0
0
20
40
60
80
100
120
140
dias

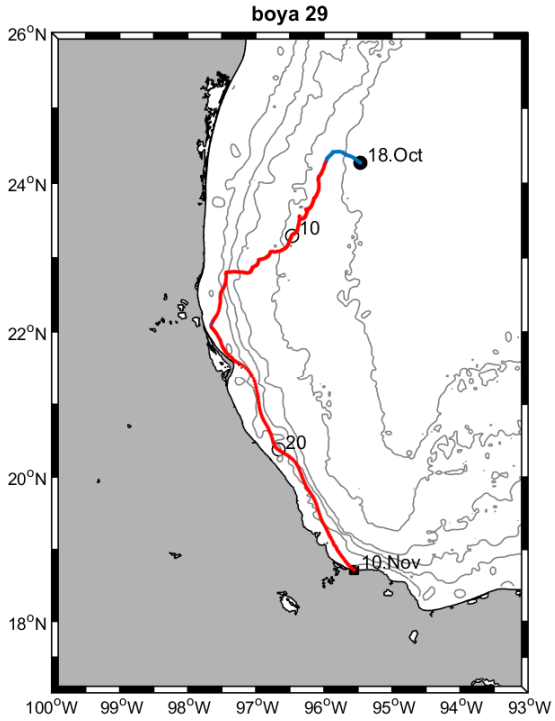

Max Strain
100
50
0
0
20
40
60
80
100
120
140
dias

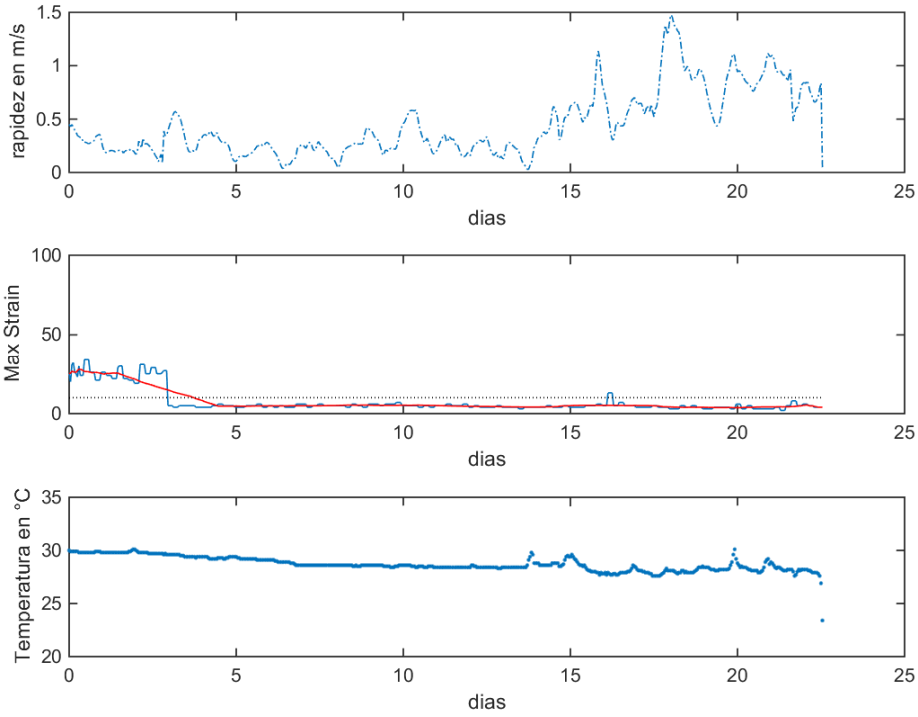

Temperatura en °C
35
30
25
20
0
20
40
60
80
100
120
140
dias

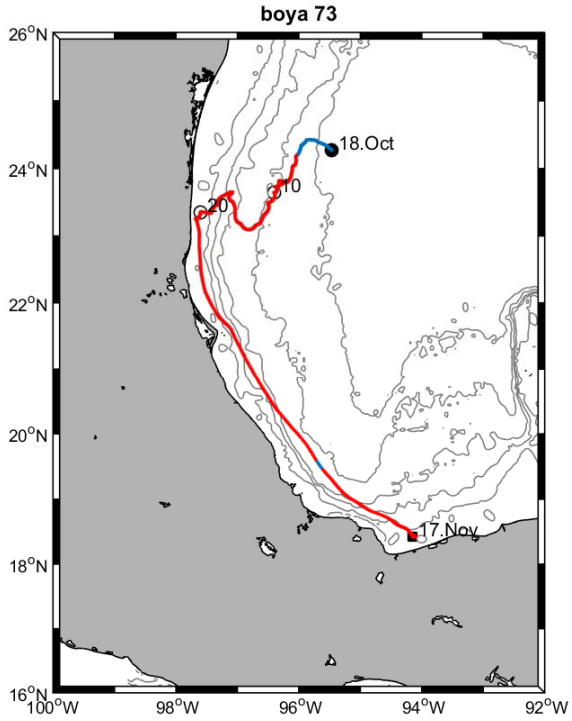
1.1.2. TRIPLET02

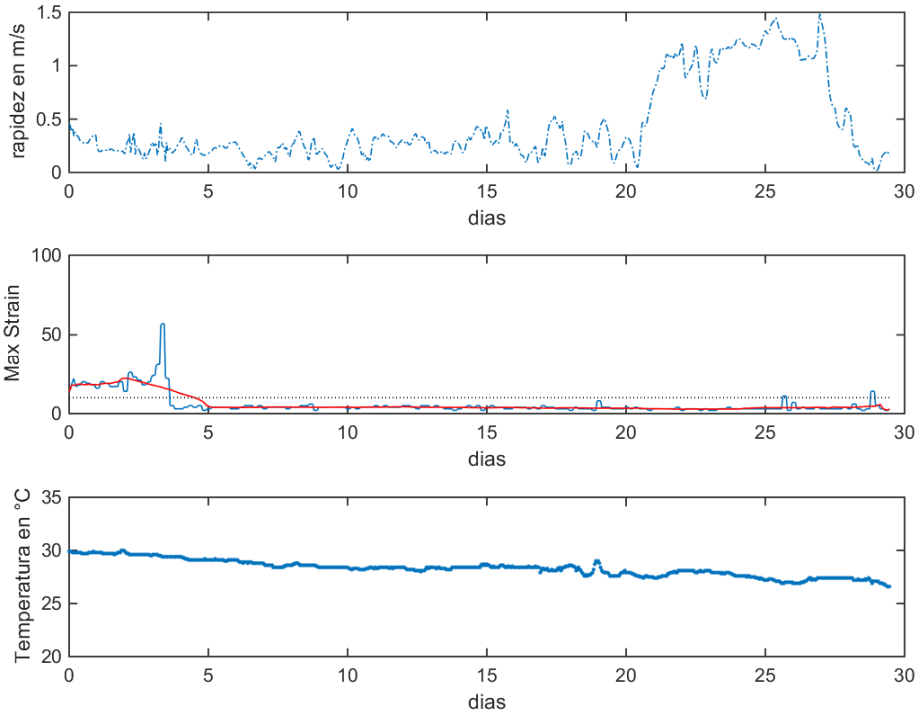




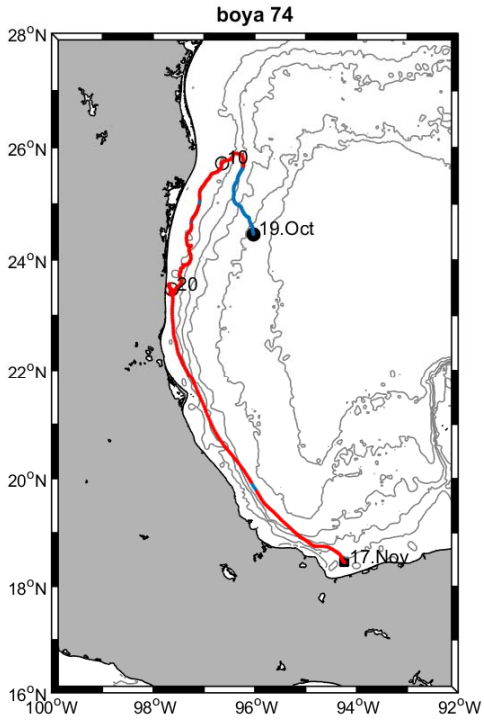

boya 29
26°N
24°N
22°N
20°N
18°N
100°W
99°W
98°W
97°W
96°W
95°W
94°W
93°W
18.Oct
10
20
10.Nov

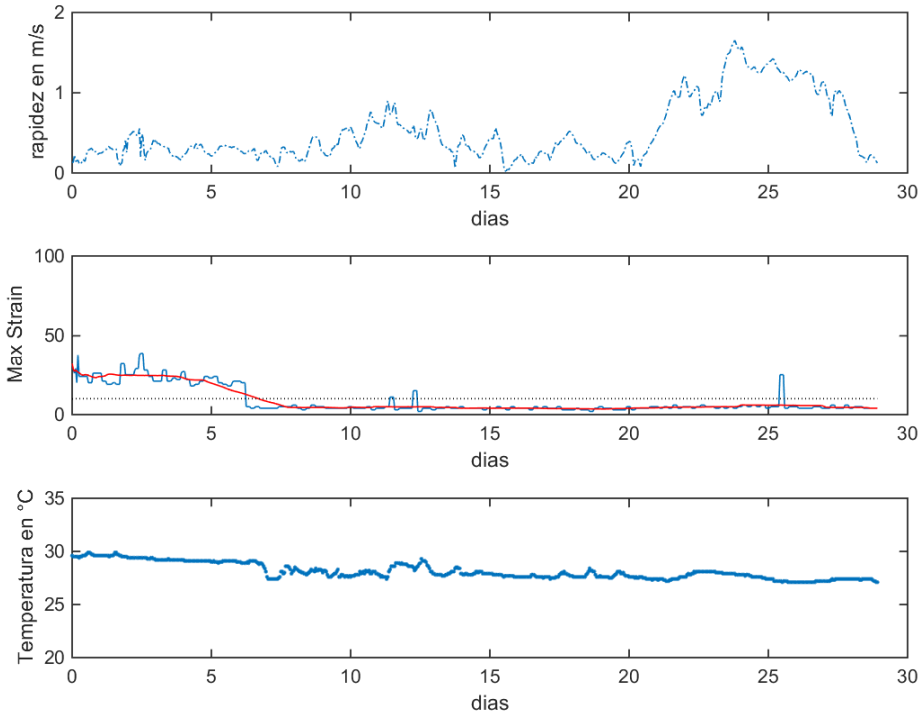

rapidez en m/s
dias
Max Strain
dias
Temperatura en °C
dias

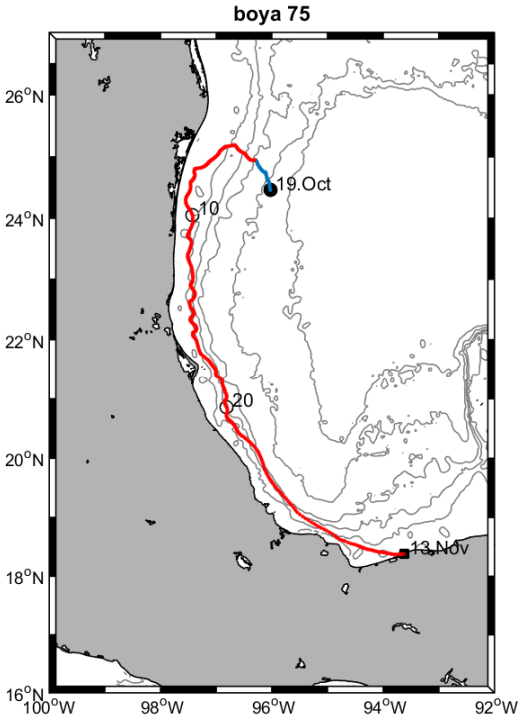

boya 73
26°N
24°N
22°N
20°N
18°N
16°N
100°W
98°W
96°W
94°W
92°W
18.Oct
10
20
17.Nov

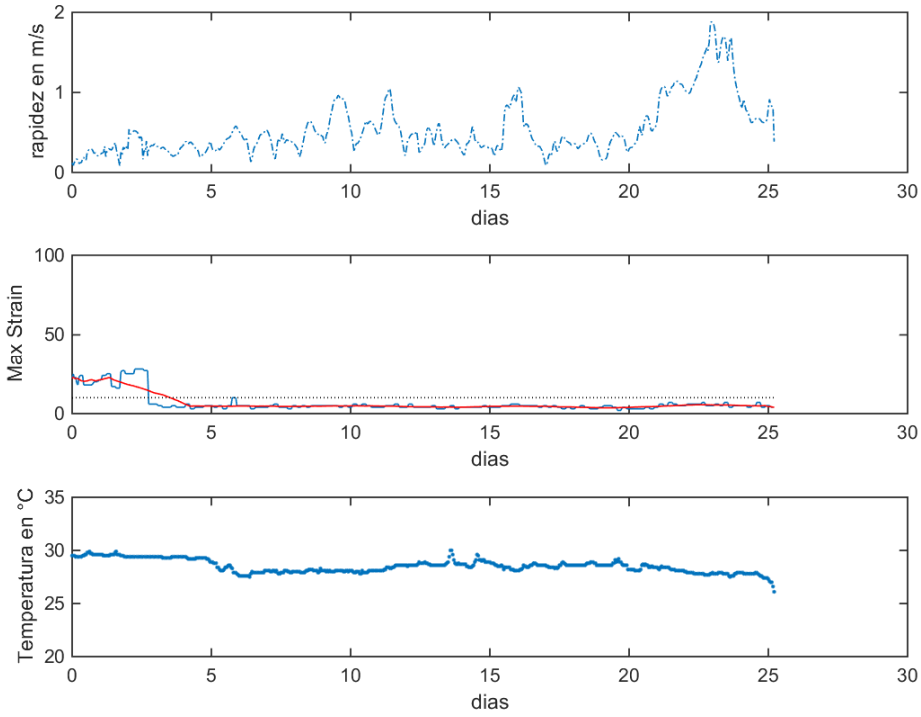

rapidez en m/s
dias
Max Strain
dias
Temperatura en °C
dias

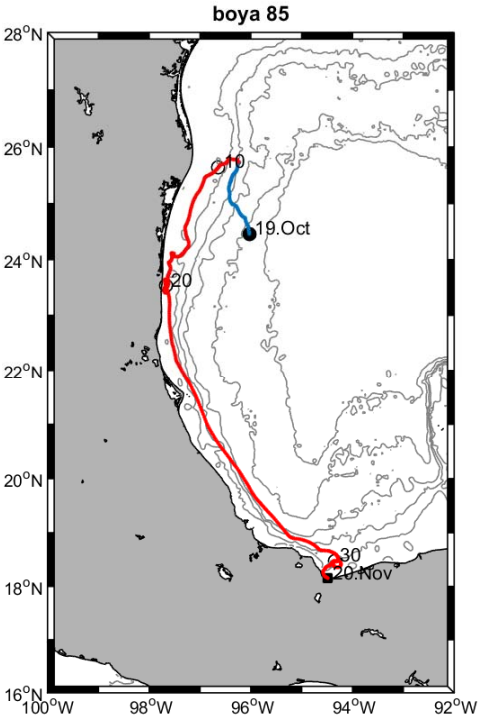
1.1.3. TRIPLET 03

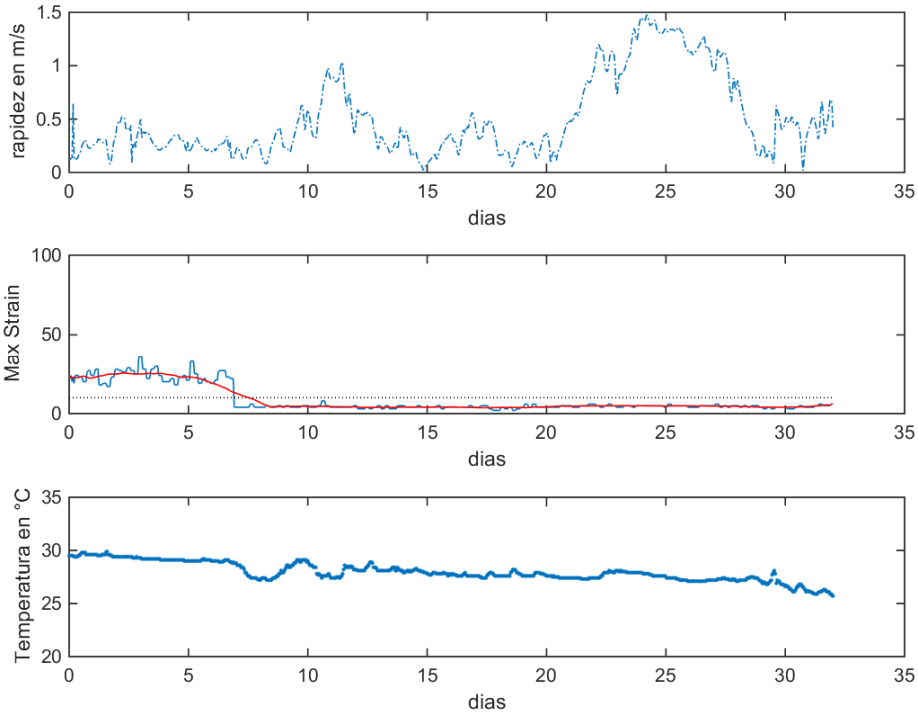




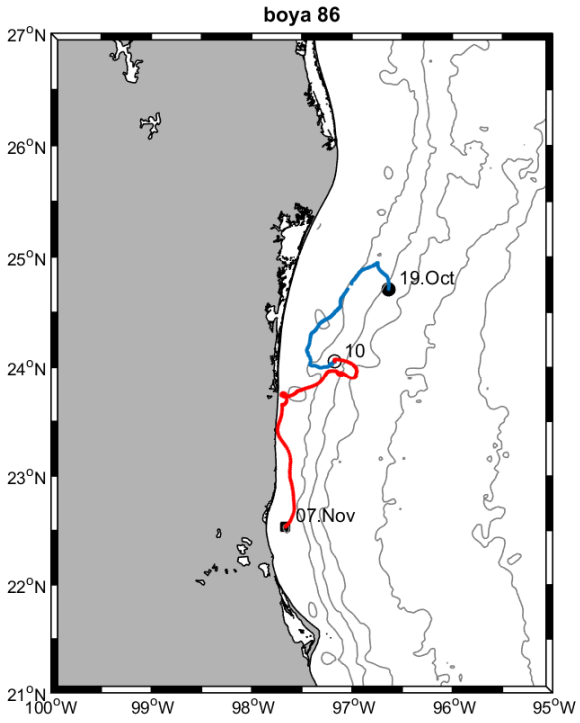

boya 75
26°N
24°N
22°N
20°N
18°N
16°N
100°W
98°W
96°W
94°W
92°W
19.Oct
10
20
13.Nov

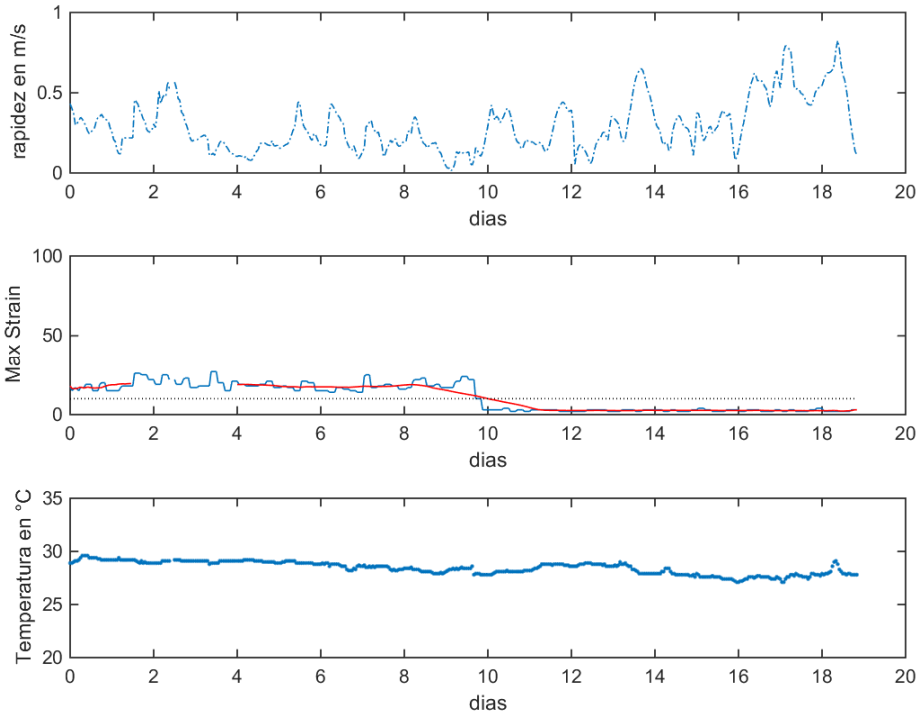

rapidez en m/s
dias
Max Strain
dias
Temperatura en °C
dias

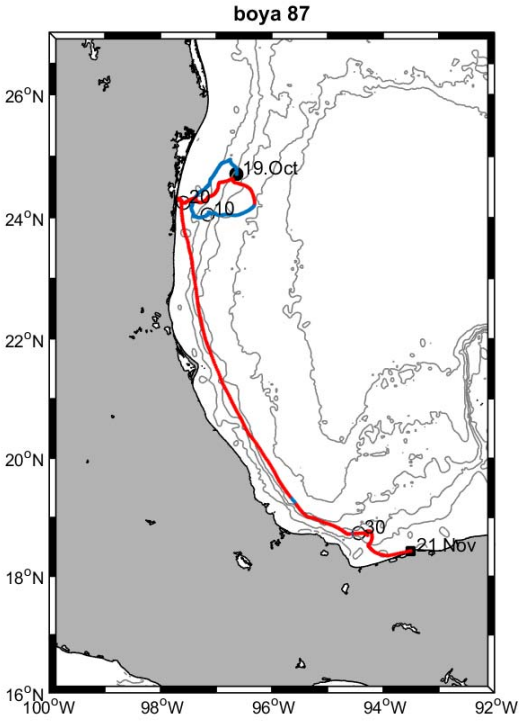

boya 85
28°N
26°N
24°N
22°N
20°N
18°N
16°N
100°W
98°W
96°W
94°W
92°W
19.Oct
20
30
20.Nov

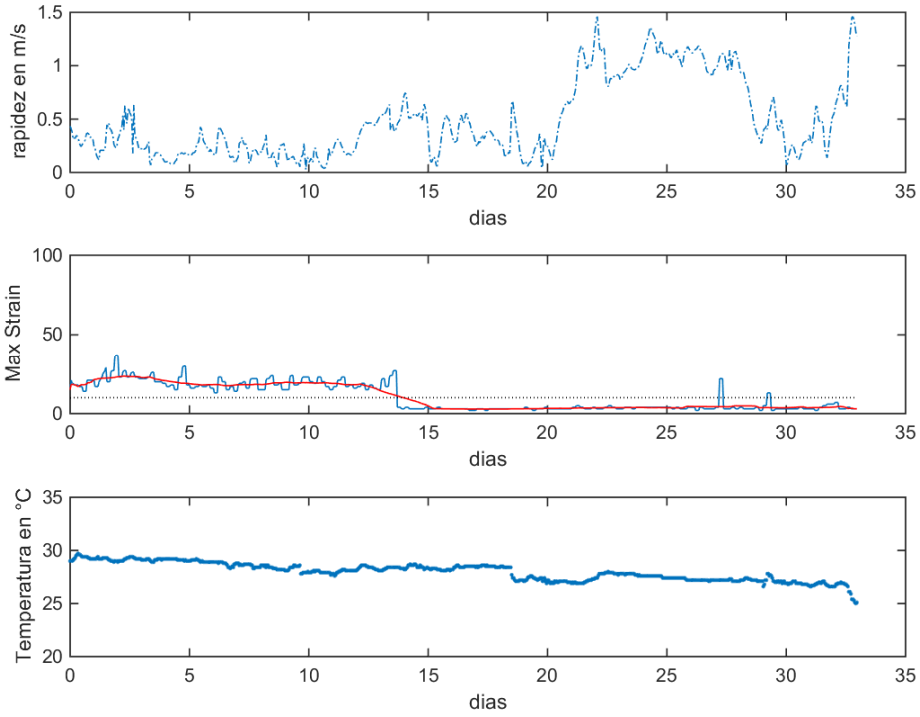

rapidez en m/s
dias
Max Strain
dias
Temperatura en °C
dias

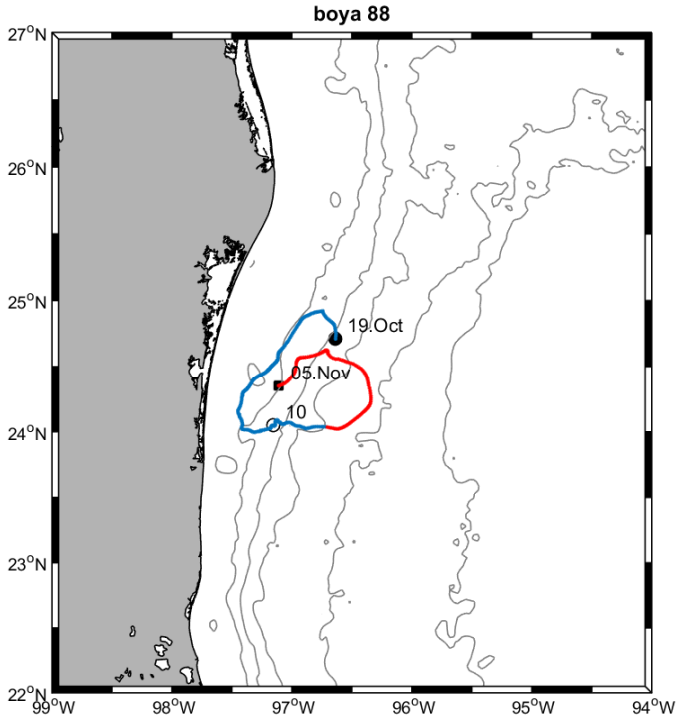
1.1.4. TRIPLET 04

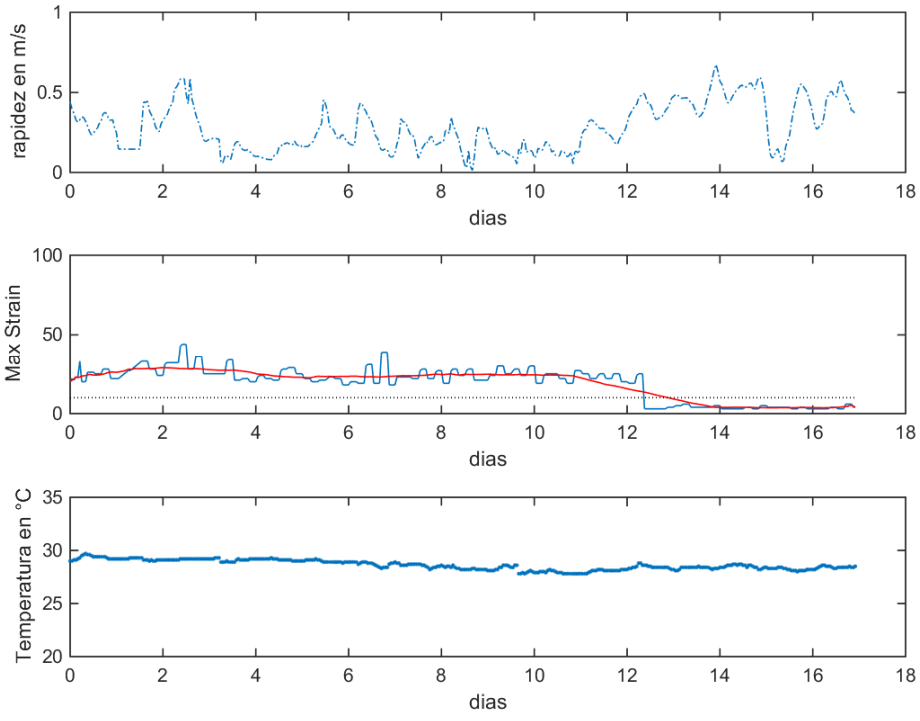




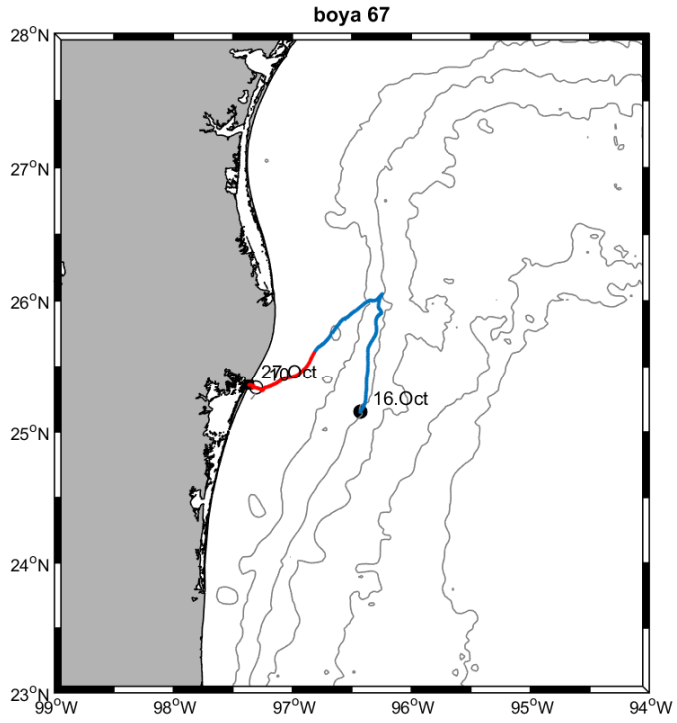

boya 87
26°N
24°N
22°N
20°N
18°N
16°N
100°W
98°W
96°W
94°W
92°W
19 Oct
20
10
30
21 Nov

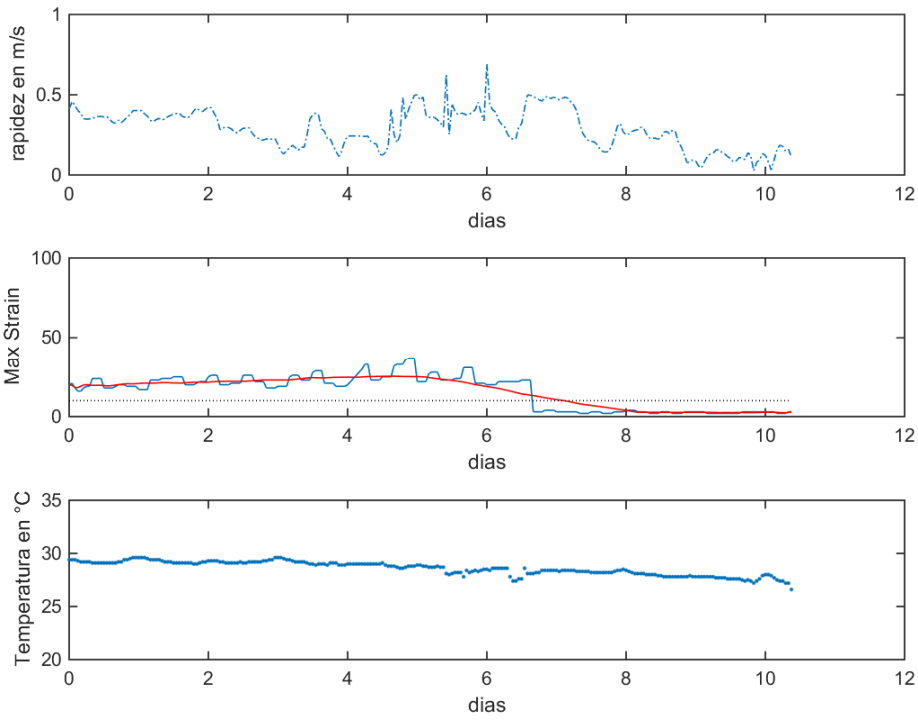

rapidez en m/s
dias
Max Strain
dias
Temperatura en °C
dias

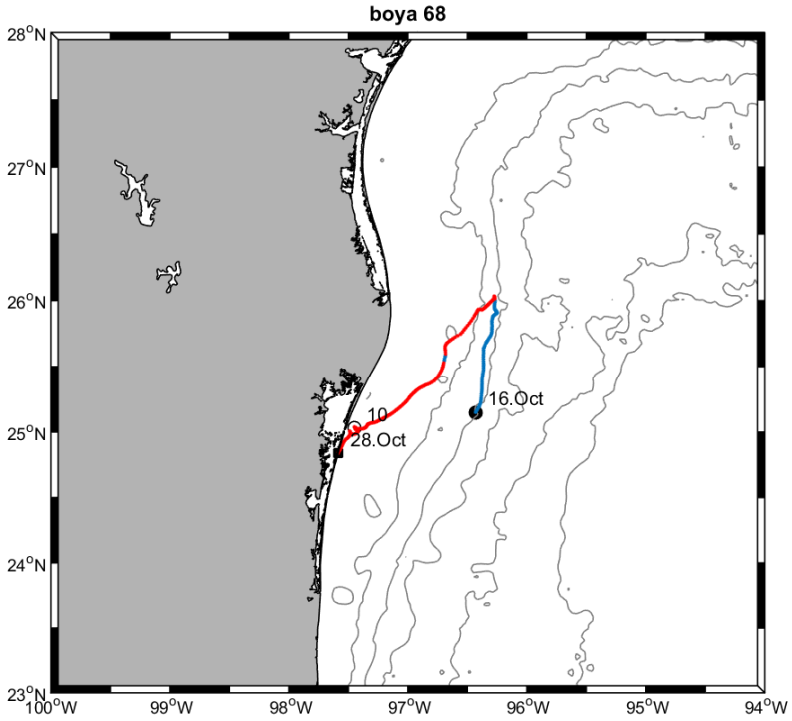

boya 88
27°N
26°N
25°N
24°N
23°N
22°N
99°W
98°W
97°W
96°W
95°W
94°W
19.Oct
05.Nov
10

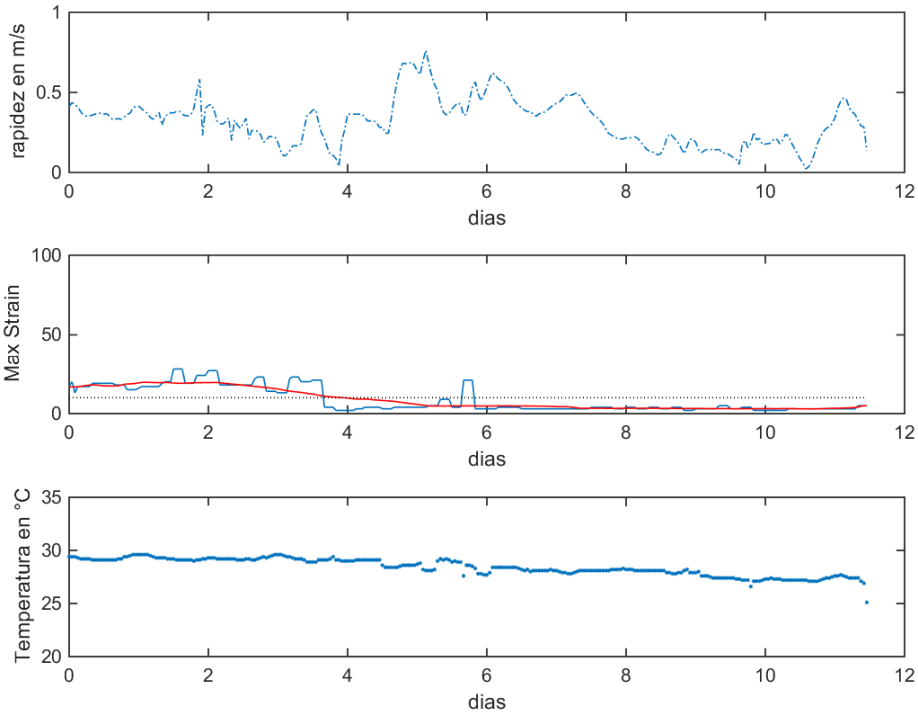

rapidez en m/s
dias
Max Strain
dias
Temperatura en °C
dias

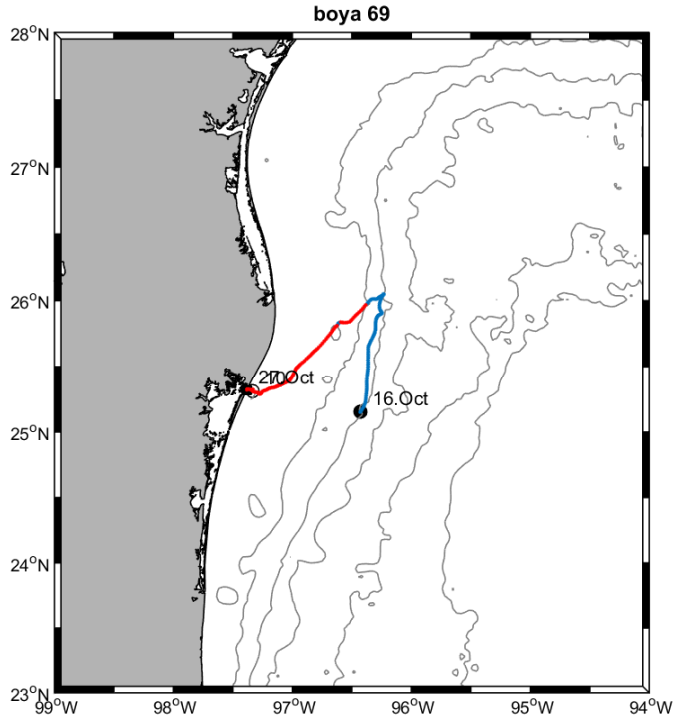
1.1.5. TRIPLET 05

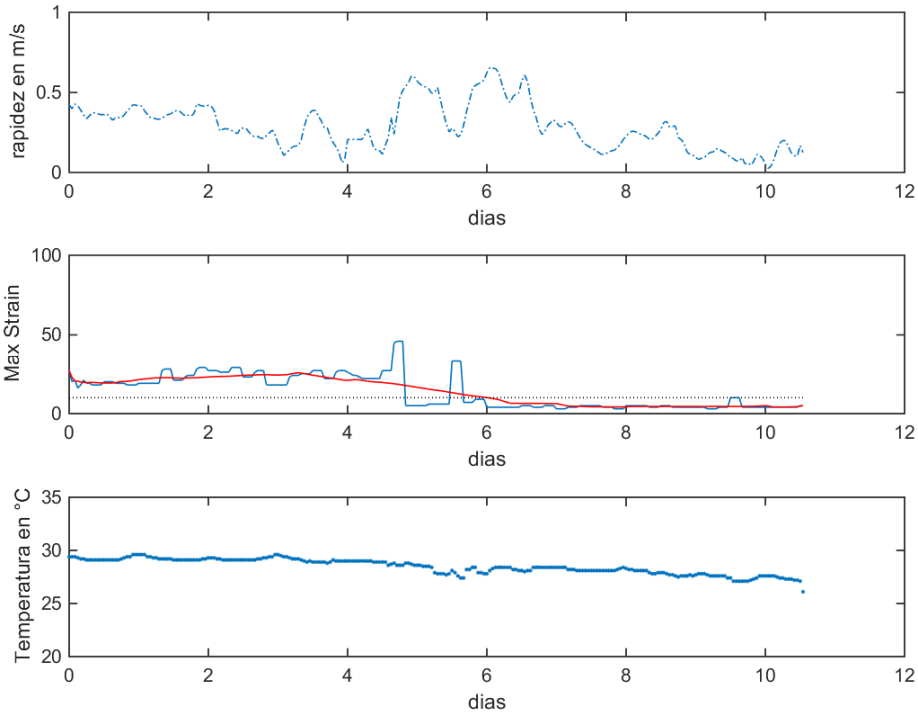




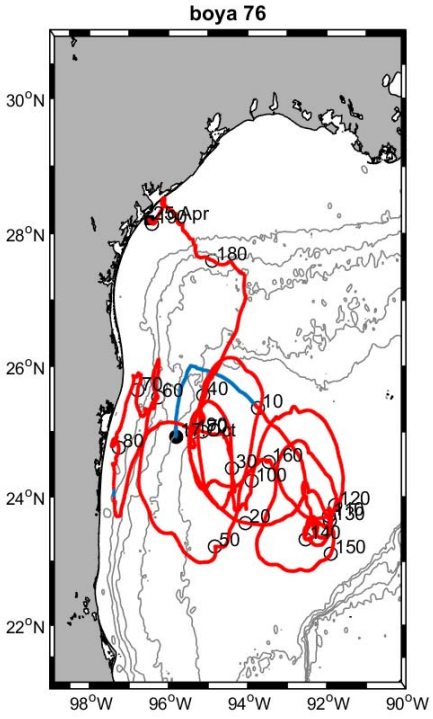

boya 68
28°N
27°N
26°N
25°N
24°N
23°N
100°W
99°W
98°W
97°W
96°W
95°W
94°W
10
28.Oct
16.Oct

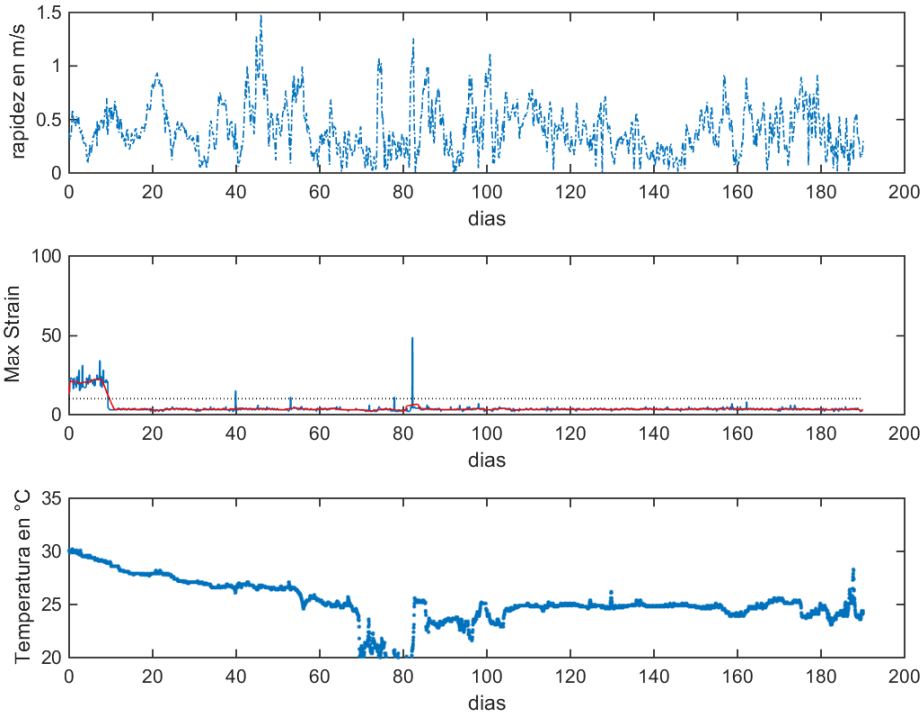

rapidez en m/s
dias
Max Strain
dias
Temperatura en °C
dias

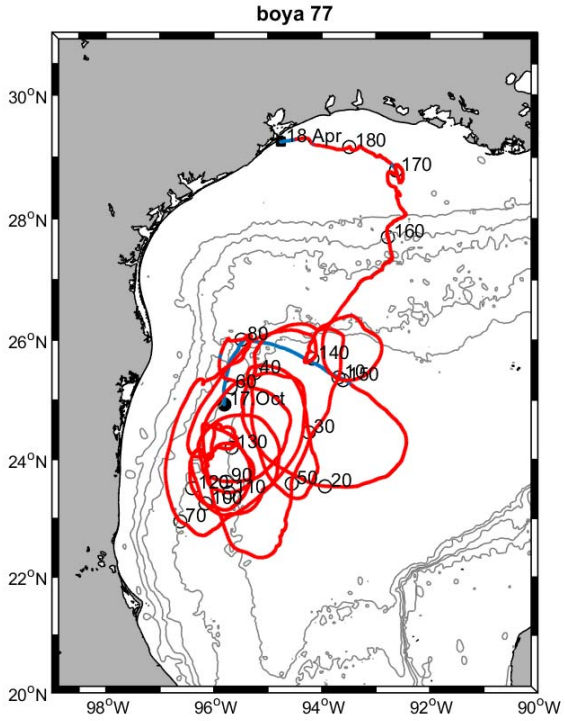

boya 69
28°N
27°N
26°N
25°N
24°N
23°N
99°W
98°W
97°W
96°W
95°W
94°W
16.Oct

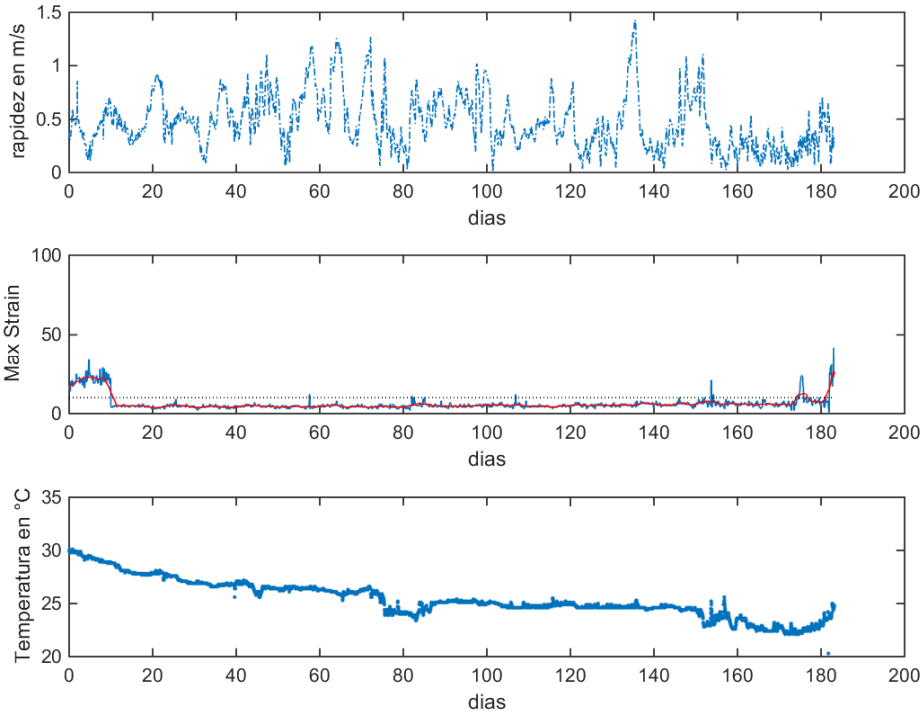

rapidez en m/s
dias
Max Strain
dias
Temperatura en °C
dias

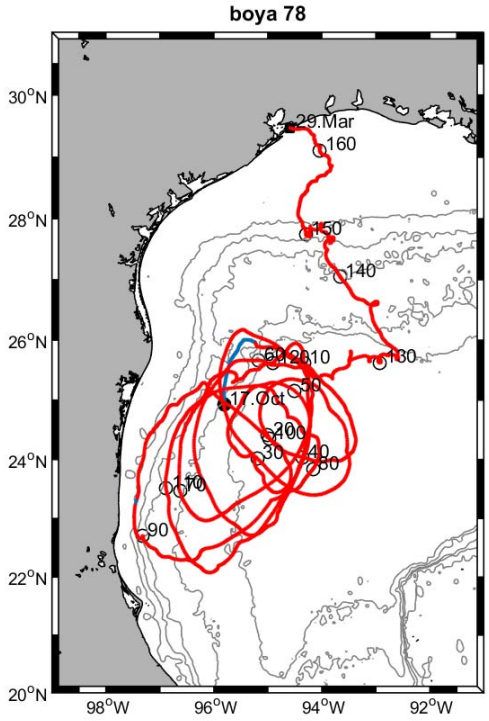
1.1.6. TRIPLET 06

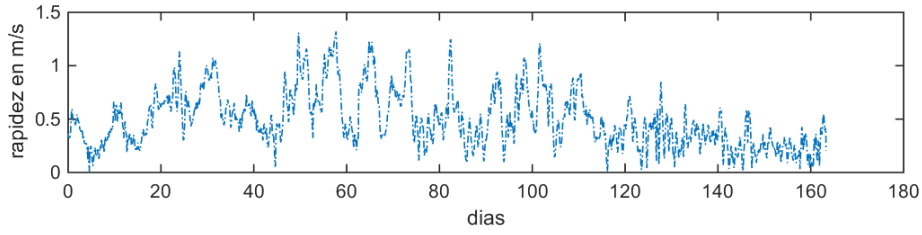


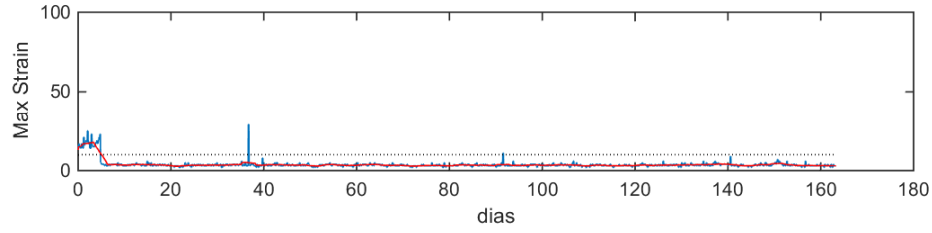


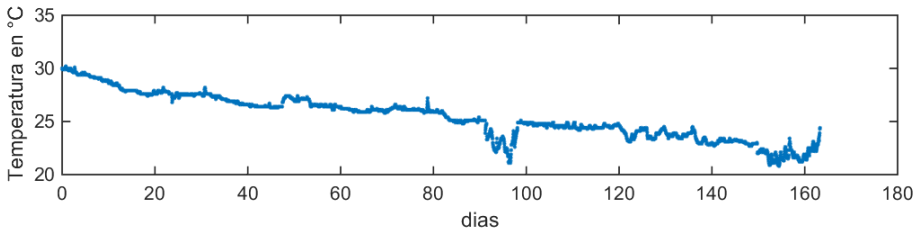

boya 77
30°N
28°N
26°N
24°N
22°N
20°N
98°W
96°W
94°W
92°W
90°W
18 Apr
180
170
160
80
140
40
150
90
17 Oct
30
130
90
120
110
50
20
190
70


rapidez en m/s
1.5
1
0.5
0
0
20
40
60
80
100
120
140
160
180
200
dias
Max Strain
100
50
0
0
20
40
60
80
100
120
140
160
180
200
dias
Temperatura en °C
35
30
25
20
0
20
40
60
80
100
120
140
160
180
200
dias

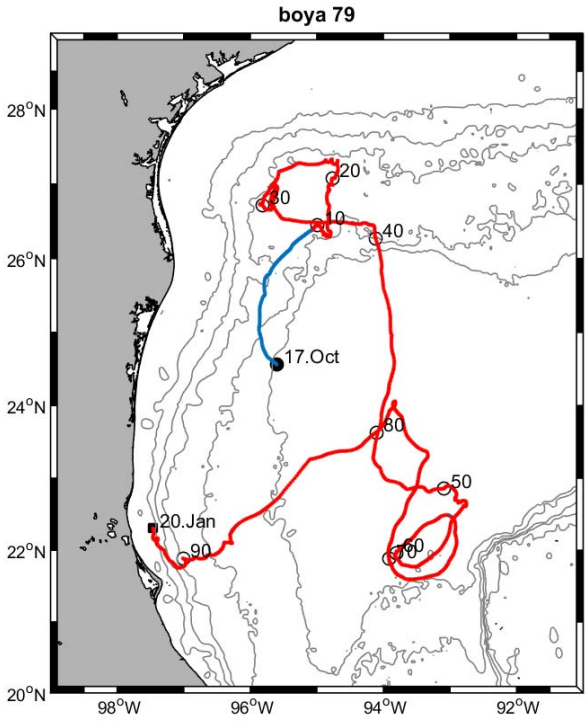

boya 78
30°N
28°N
26°N
24°N
22°N
20°N
98°W
96°W
94°W
92°W
29.Mar
160
150
140
130
17.Oct
90

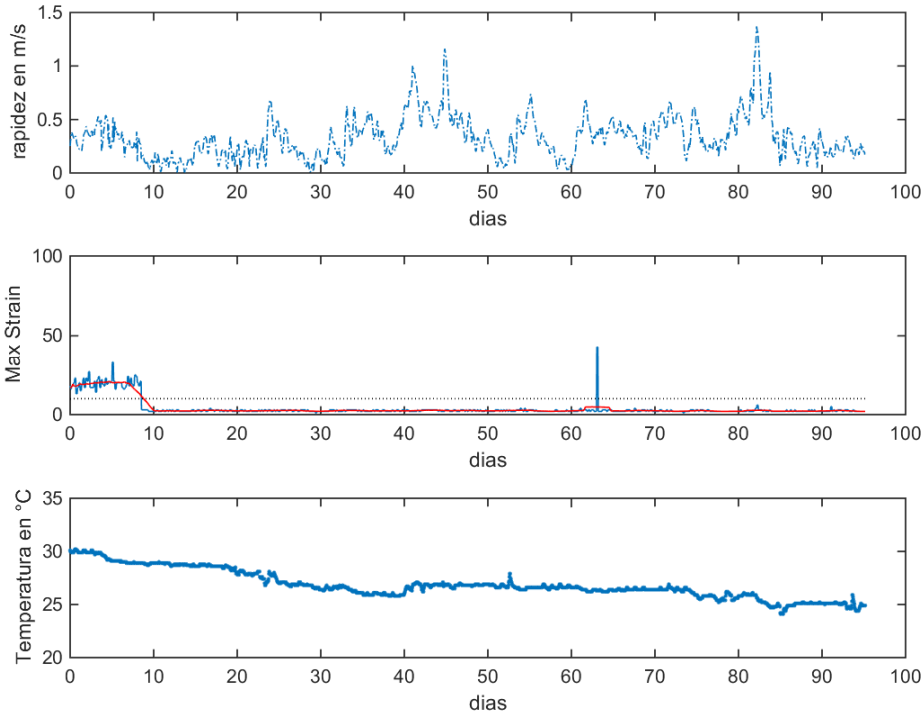

rapidez en m/s
1.5
1
0.5
0
0
20
40
60
80
100
120
140
160
180
dias

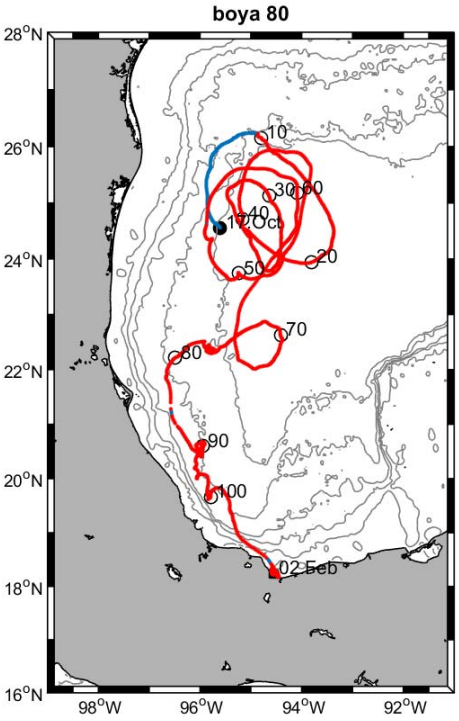

Max Strain
100
50
0
0
20
40
60
80
100
120
140
160
180
dias

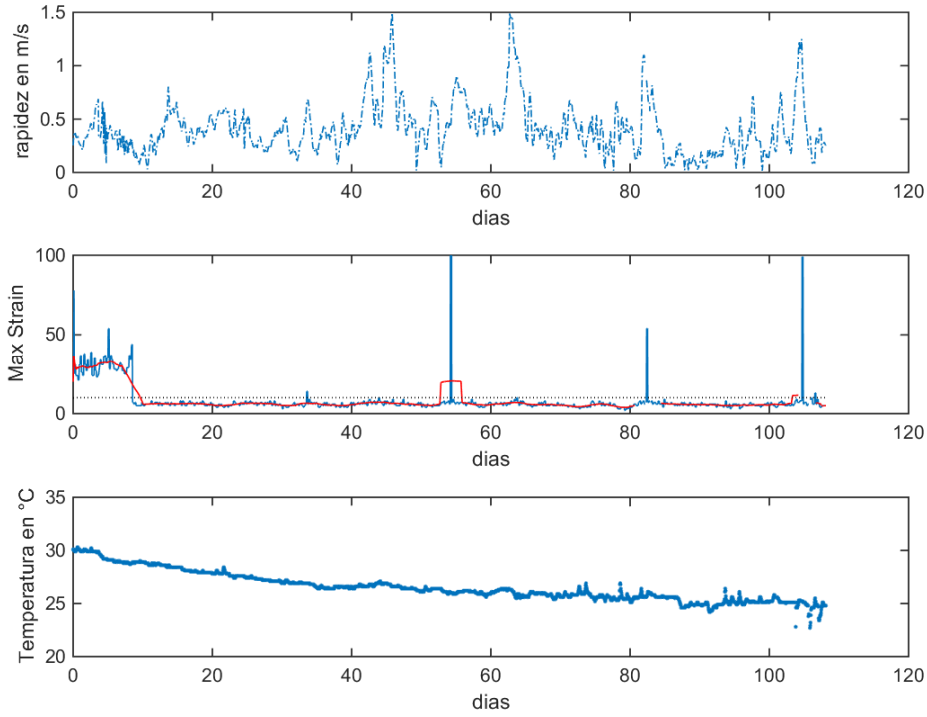

Temperatura en °C
35
30
25
20
0
20
40
60
80
100
120
140
160
180
dias

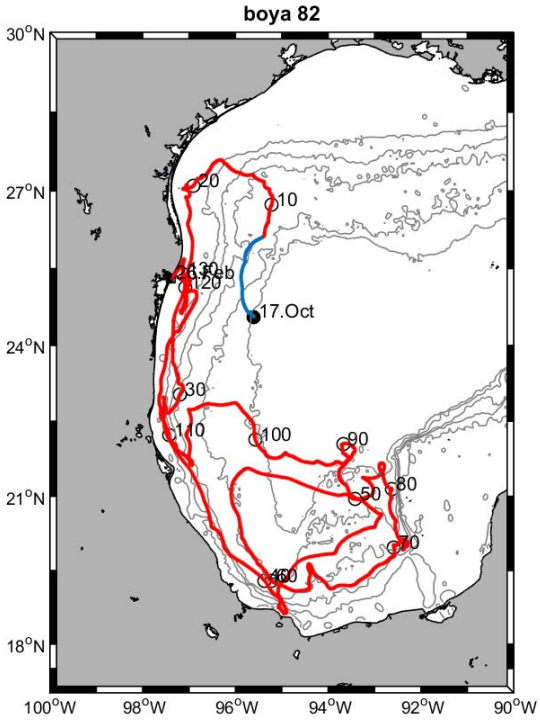
1.1.7. TRIPLET 07

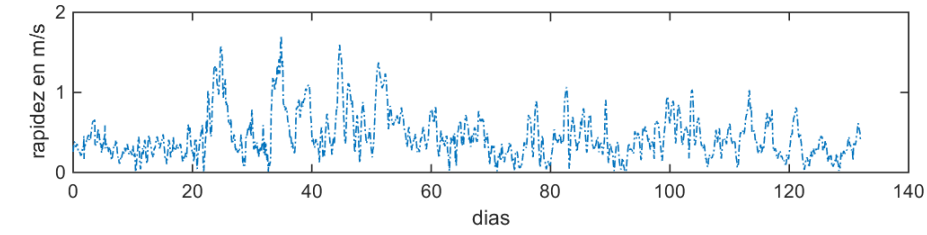


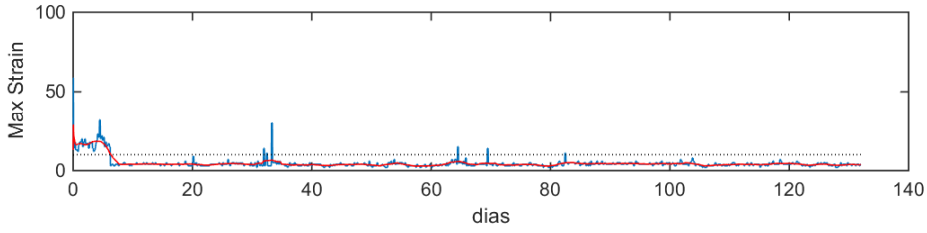


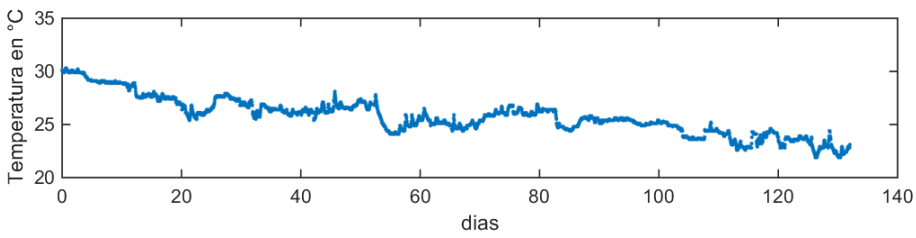

boya 80
28°N
26°N
24°N
22°N
20°N
18°N
16°N
98°W
96°W
94°W
92°W
10
30
60
40
1 Oct
20
50
70
80
90
100
02 Feb


rapidez en m/s
1.5
1
0.5
0
0
20
40
60
80
100
120
dias
Max Strain
100
50
0
0
20
40
60
80
100
120
dias
Temperatura en °C
35
30
25
20
0
20
40
60
80
100
120
dias

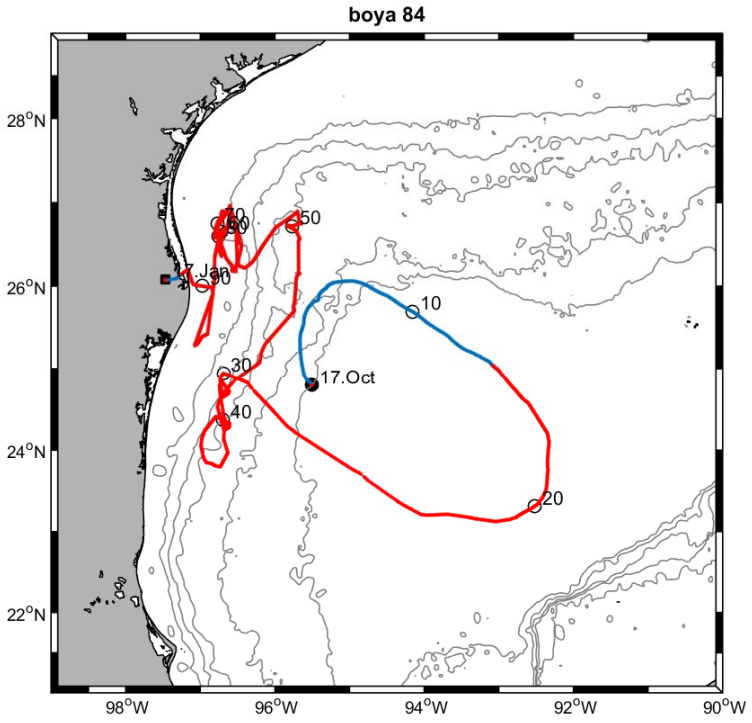

boya 82
30°N
27°N
24°N
21°N
18°N
100°W
98°W
96°W
94°W
92°W
90°W
20
10
17.Oct
30
110
100
90
80
50
70
60

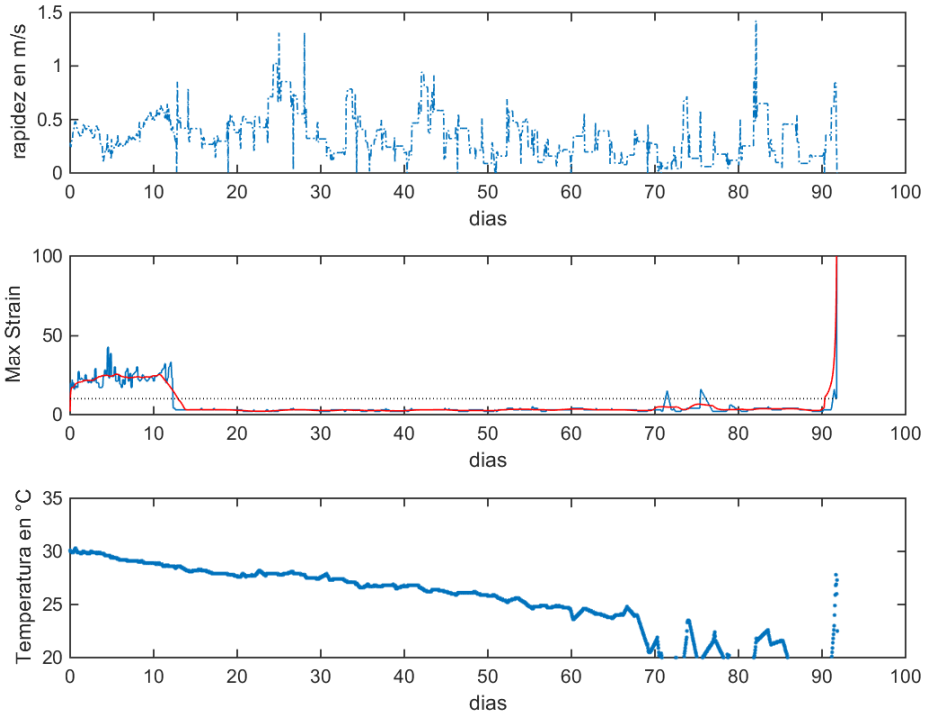

rapidez en m/s
dias

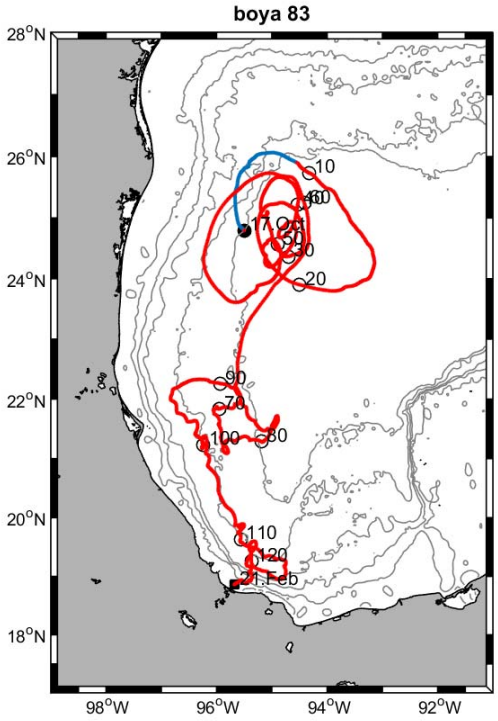

Max Strain
dias

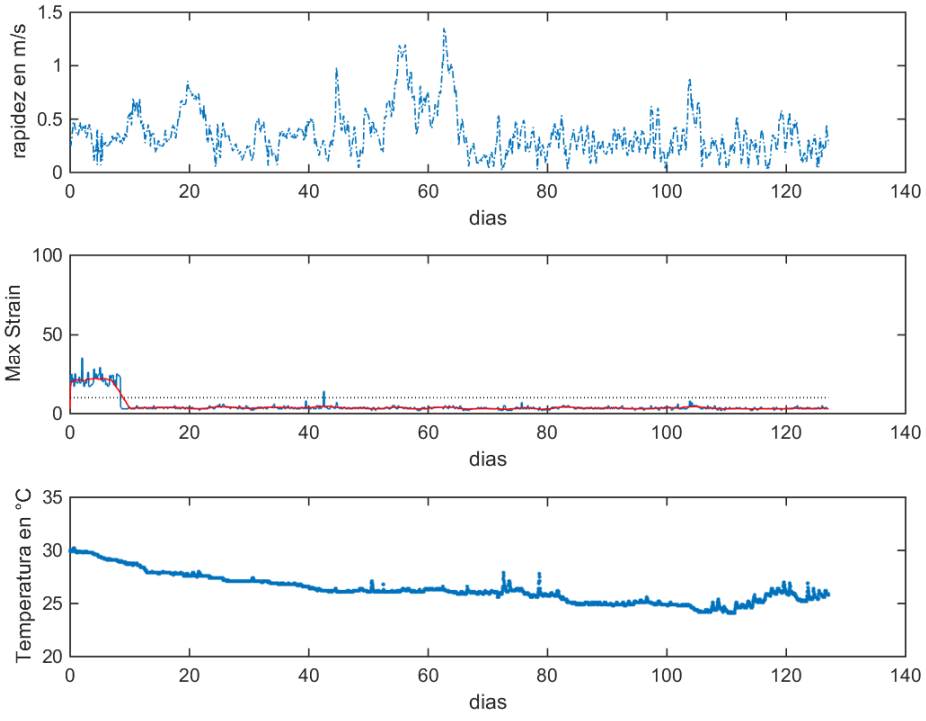

Temperatura en °C
dias

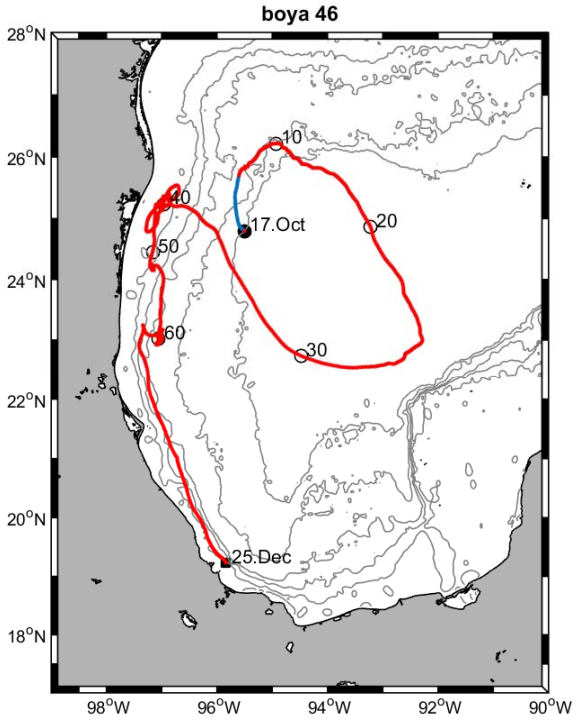
1.1.8. TRIPLET 08

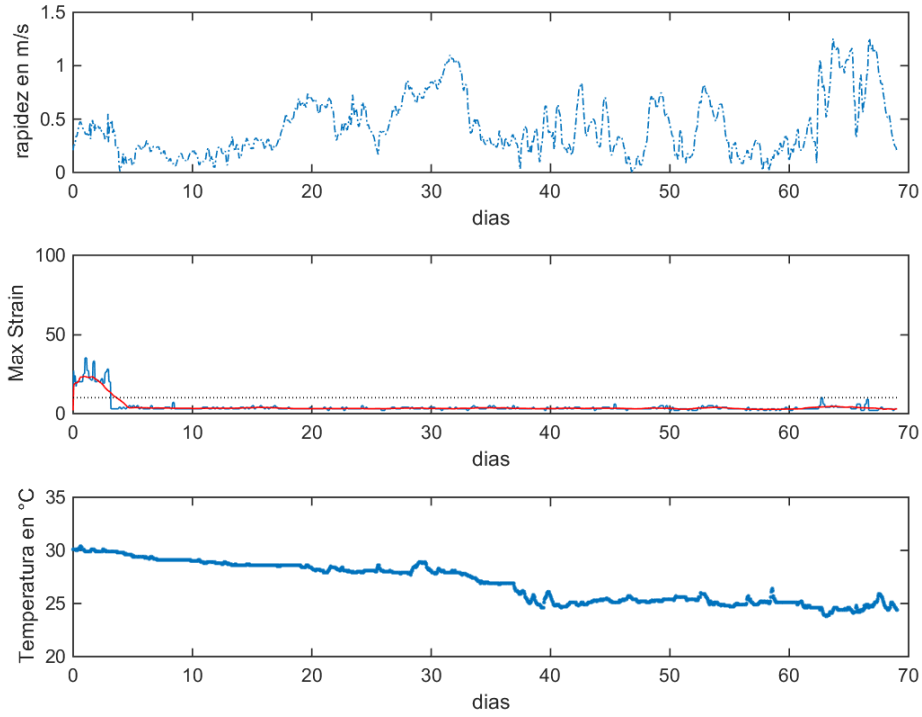




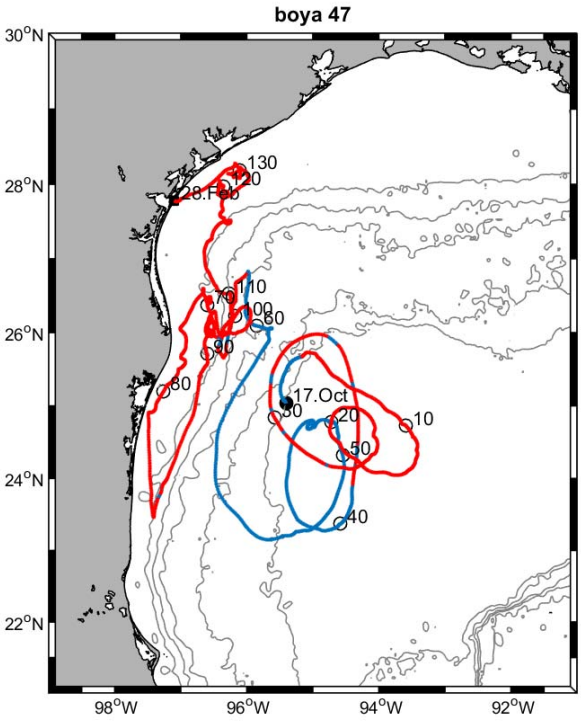

boya 83
28°N
26°N
24°N
22°N
20°N
18°N
98°W
96°W
94°W
92°W
10
17
20
20
90
70
100
80
110
120

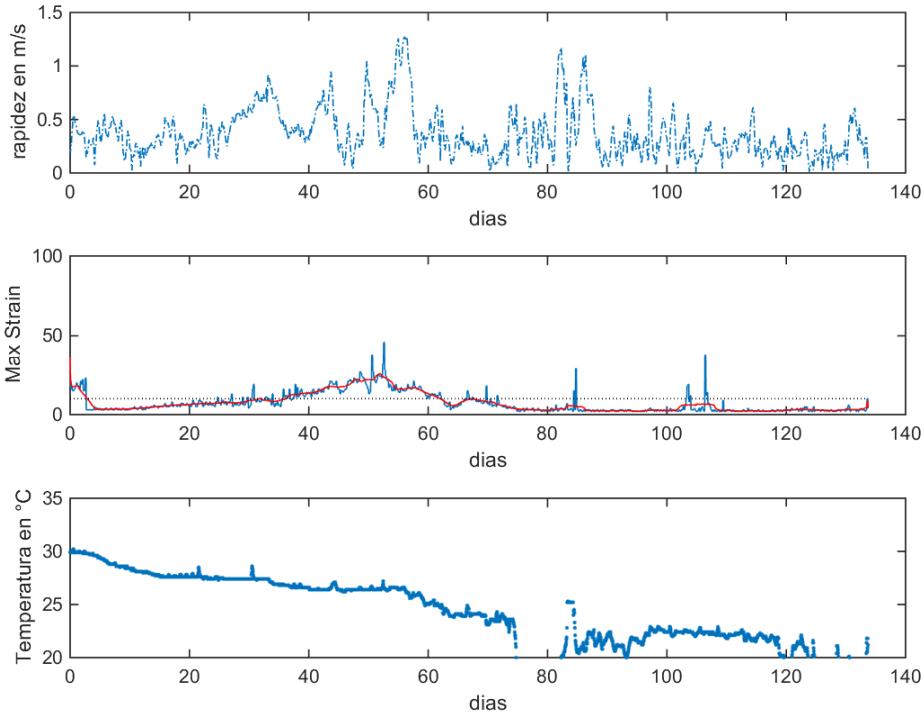

rapidez en m/s
dias
Max Strain
dias
Temperatura en °C
dias

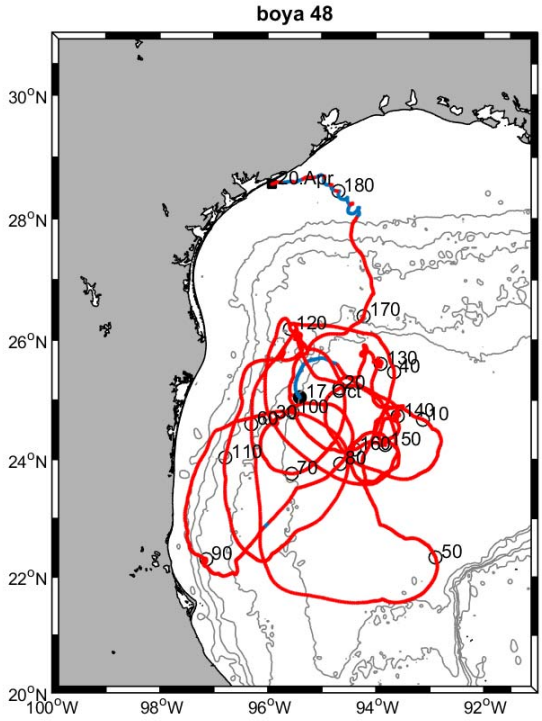

boya 46
28°N
26°N
24°N
22°N
20°N
18°N
98°W
96°W
94°W
92°W
90°W
10
20
30
40
50
60
17.Oct
25.Dec

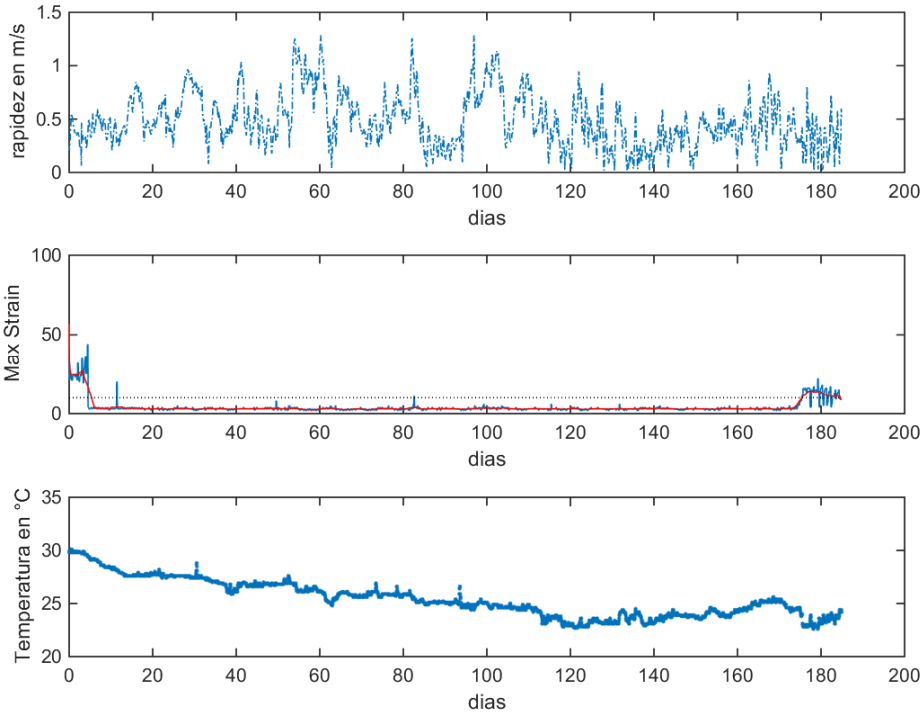

rapidez en m/s
dias
Max Strain
dias
Temperatura en °C
dias

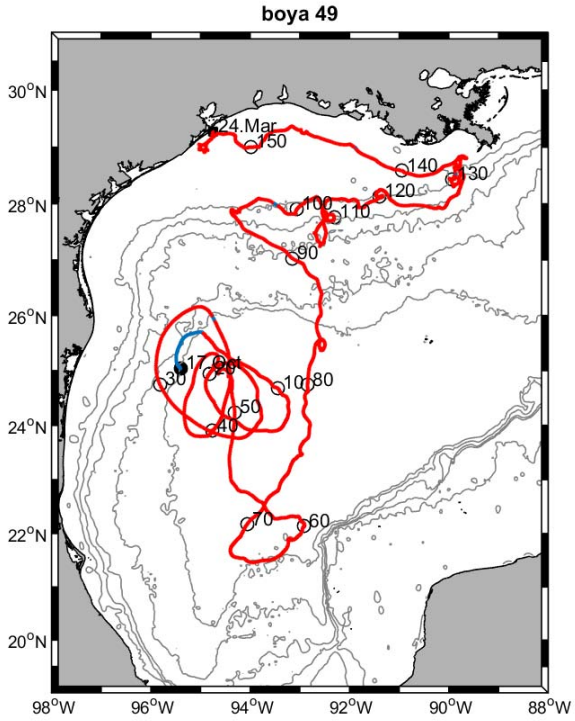
1.1.9. TRIPLET 09



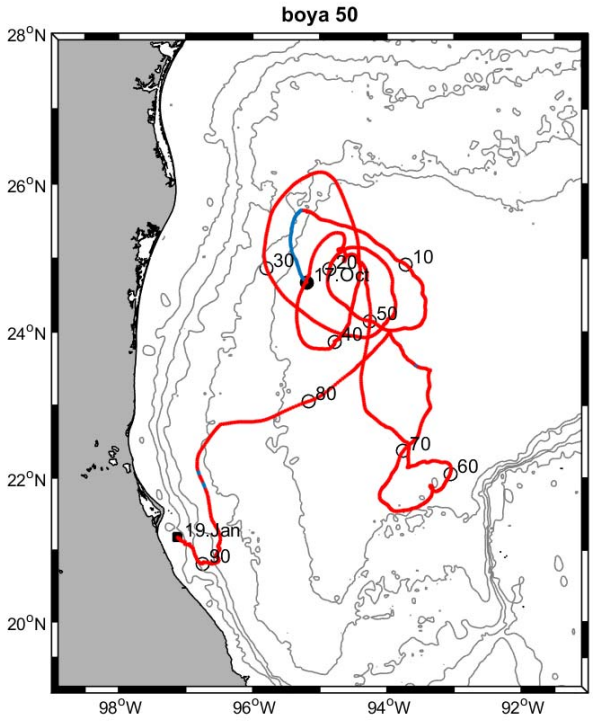


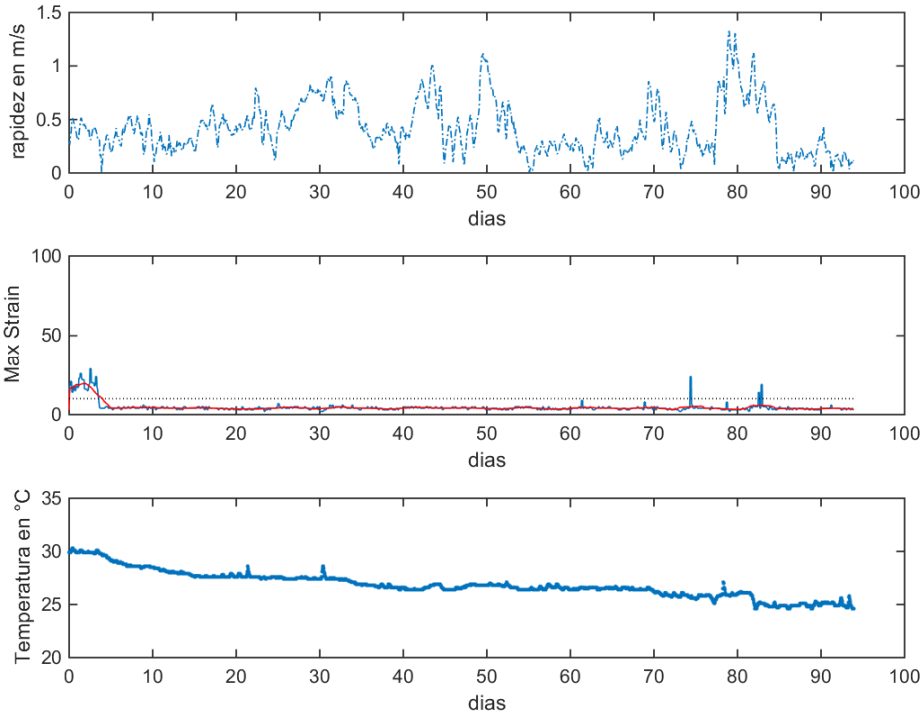

boya 48
30°N
28°N
26°N
24°N
22°N
20°N
100°W
98°W
96°W
94°W
92°W
20 Apr
180
170
120
130
40
17 Oct
20
100
30
60
140
10
150
160
80
110
70
90
50

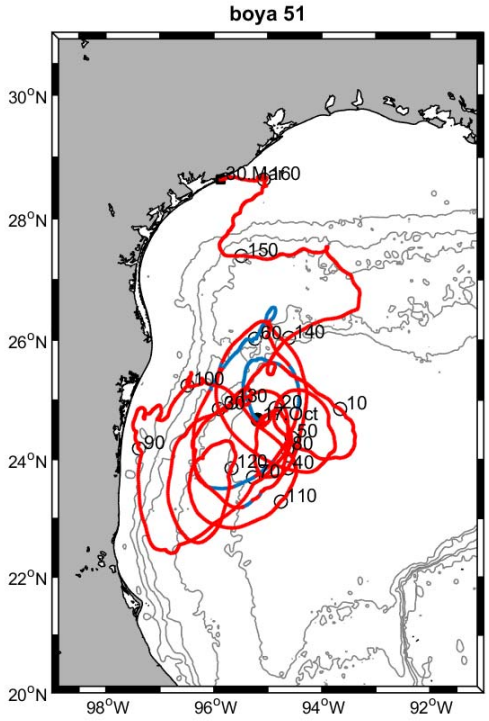

rapidez en m/s
dias
Max Strain
dias
Temperatura en °C
dias

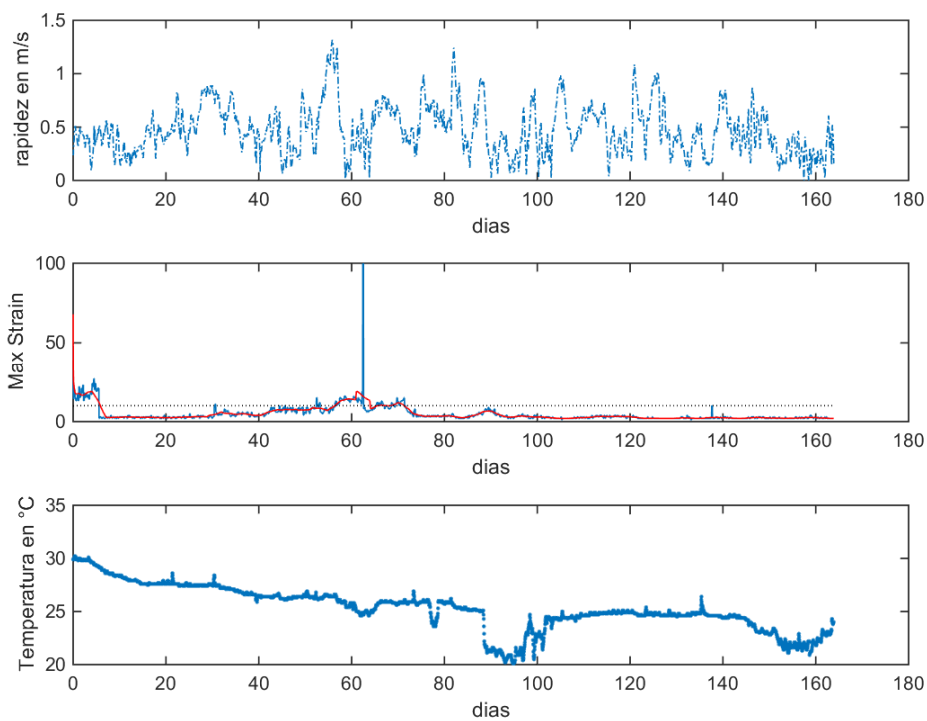

boya 49
30°N
28°N
26°N
24°N
22°N
20°N
98°W
96°W
94°W
92°W
90°W
88°W
24.Mar
150
140
130
120
110
100
90
80
70
60
50
40
30
17
rapidez en m/s
dias
Max Strain
dias
Temperatura en °C
dias

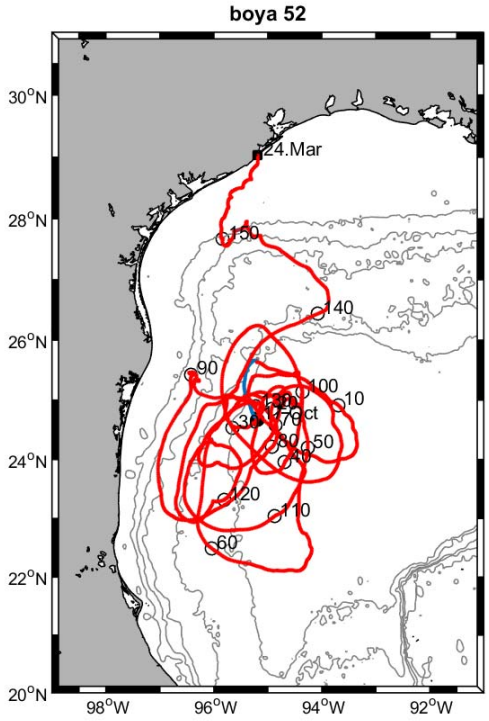
1.1.10. TRIPLET 10

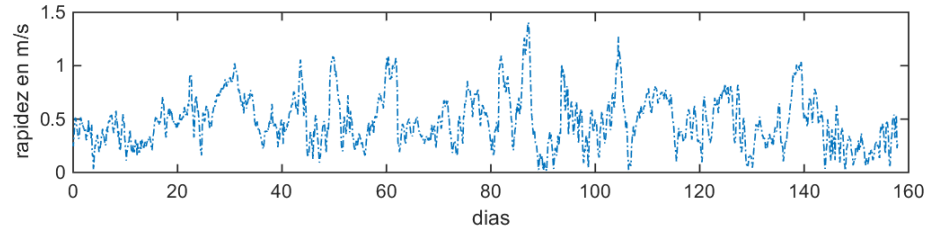


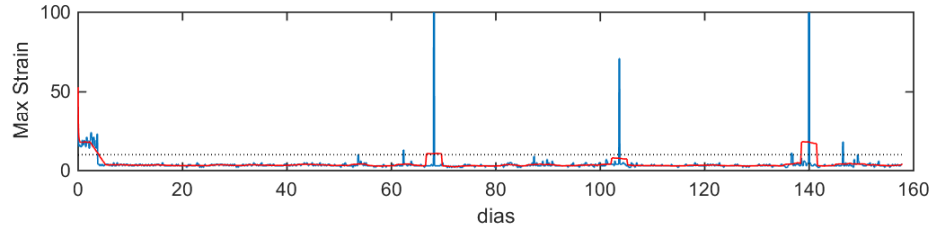


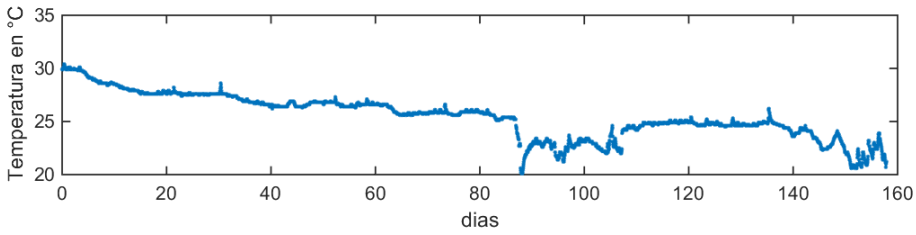

boya 51
30°N
28°N
26°N
24°N
22°N
20°N
98°W
96°W
94°W
92°W
30 Mar
160
150
140
100
90
120
110
10
17 Oct
20
30
40
50
60
70


rapidez en m/s
dias
Max Strain
dias
Temperatura en °C
dias

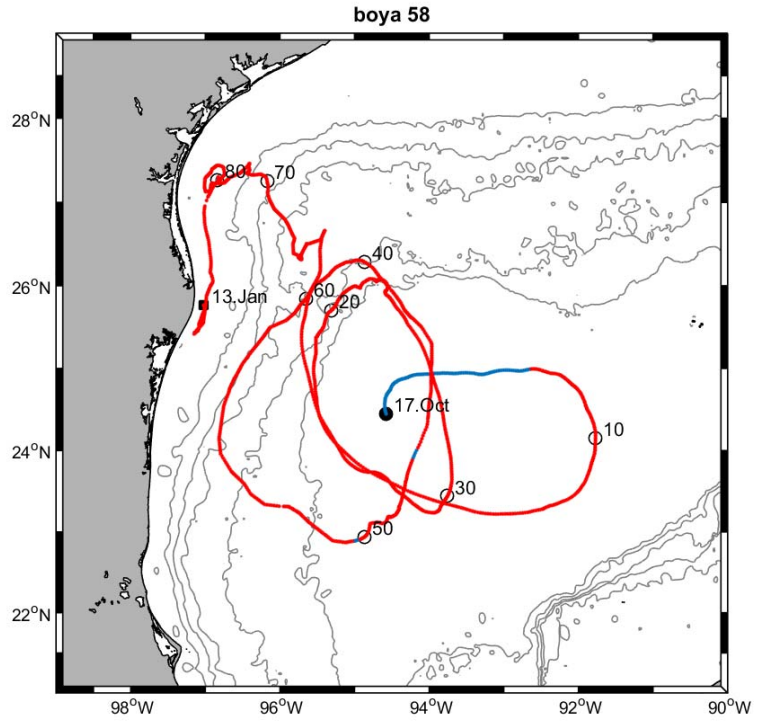

boya 52
30°N
28°N
26°N
24°N
22°N
20°N
98°W
96°W
94°W
92°W
24.Mar
130
140
90
100
10
50
40
120
110
60

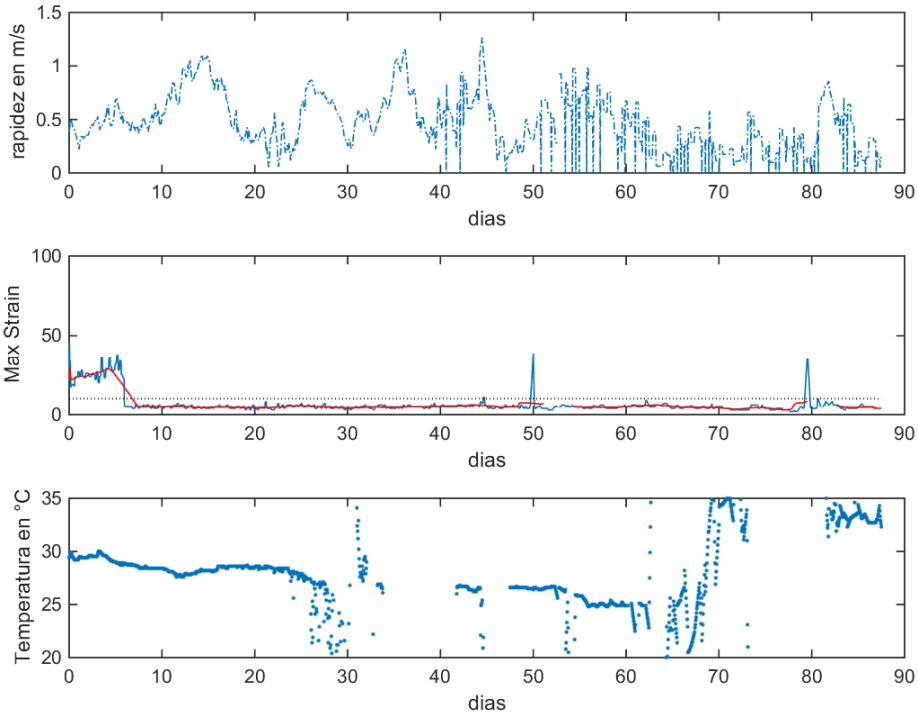

rapidez en m/s
1.5
1
0.5
0
0
20
40
60
80
100
120
140
160
dias

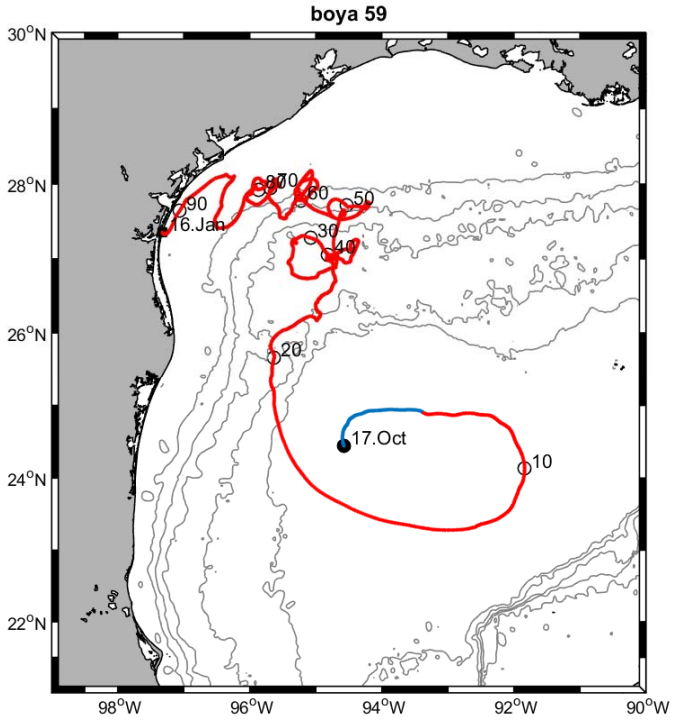

Max Strain
100
50
0
0
20
40
60
80
100
120
140
160
dias

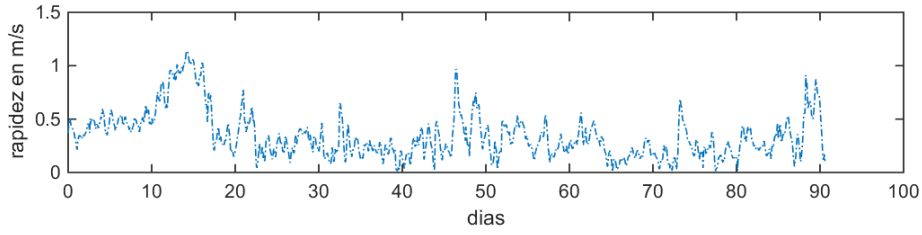

Temperatura en °C
35
30
25
20
0
20
40
60
80
100
120
140
160
dias

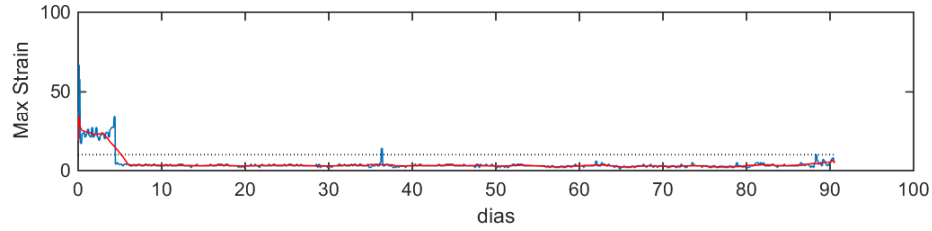
1.1.11. TRIPLET 11

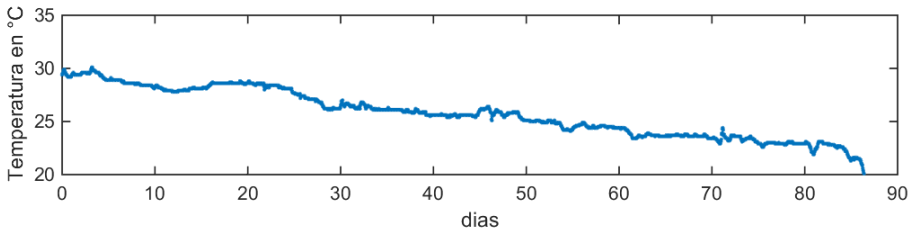


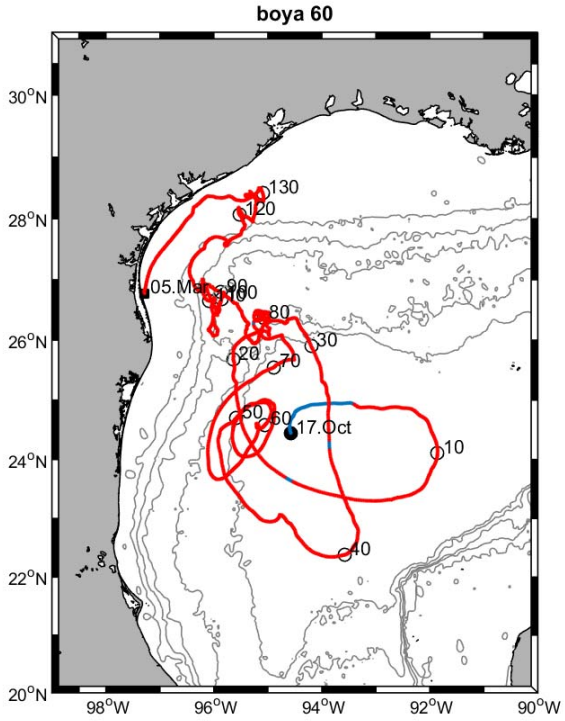


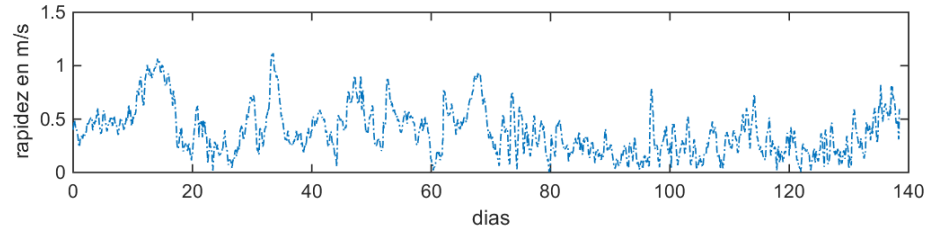

boya 59
30°N
28°N
26°N
24°N
22°N
98°W
96°W
94°W
92°W
90°W
90
16.Jan
80
70
60
50
40
30
20
17.Oct
10

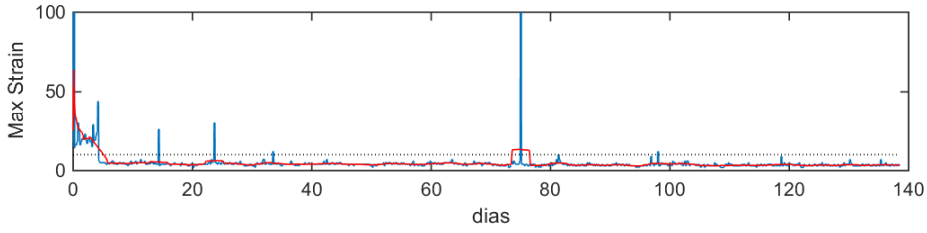

rapidez en m/s
1.5
1
0.5
0
0
10
20
30
40
50
60
70
80
90
100
dias

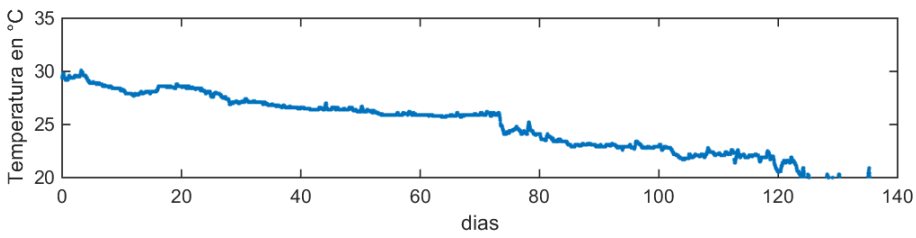

Max Strain
100
50
0
0
10
20
30
40
50
60
70
80
90
100
dias


Temperatura en °C
35
30
25
20
0
10
20
30
40
50
60
70
80
90
dias

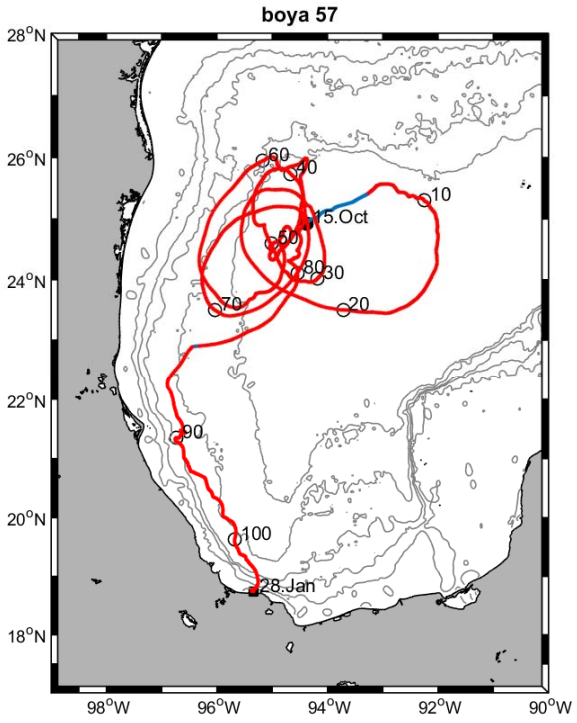

boya 60
30°N
28°N
26°N
24°N
22°N
20°N
98°W
96°W
94°W
92°W
90°W
130
120
05.Mar
90
100
80
30
20
70
50
60
17.Oct
10
40

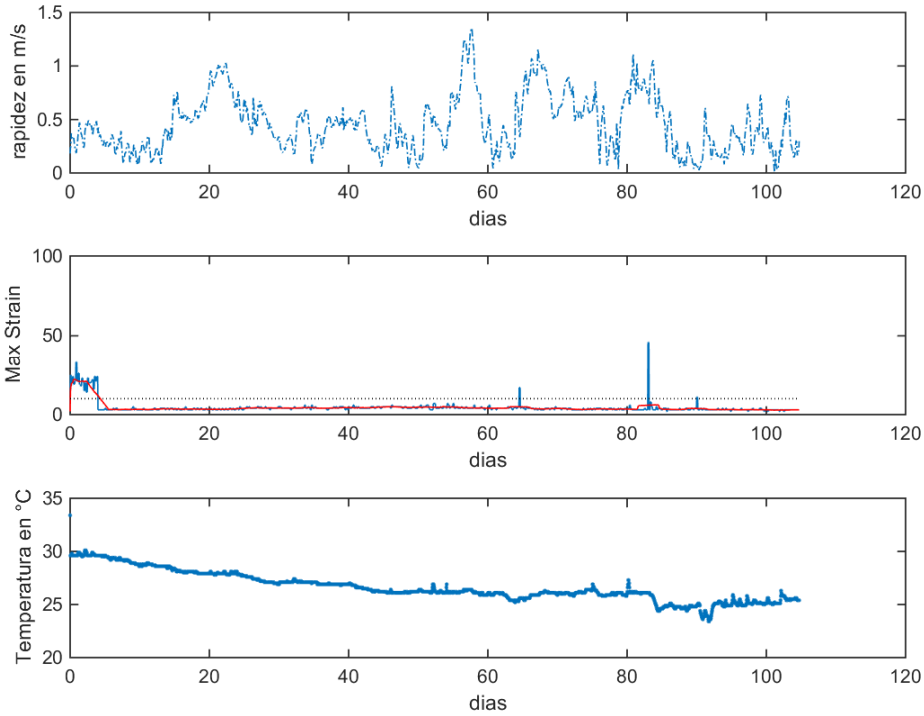

rapidez en m/s
1.5
1
0.5
0
0
20
40
60
80
100
120
140
dias

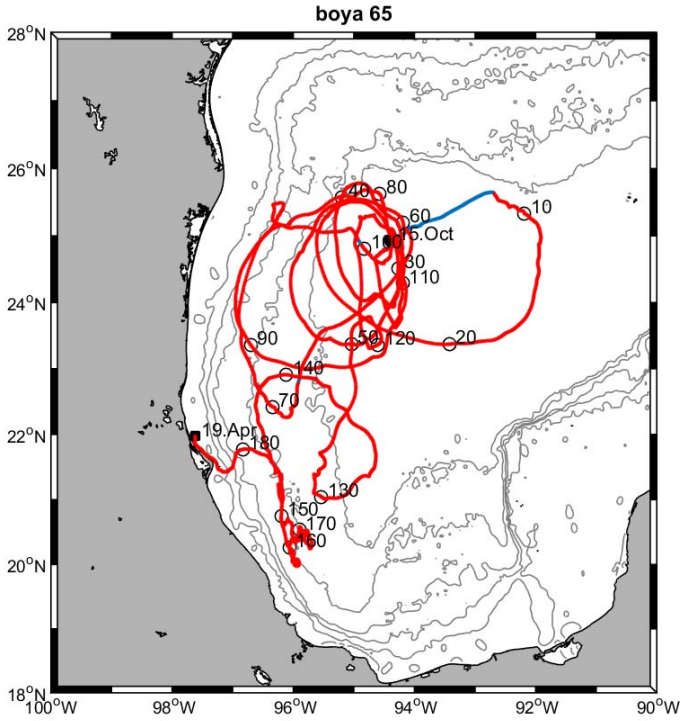

Max Strain
100
50
0
0
20
40
60
80
100
120
140
dias

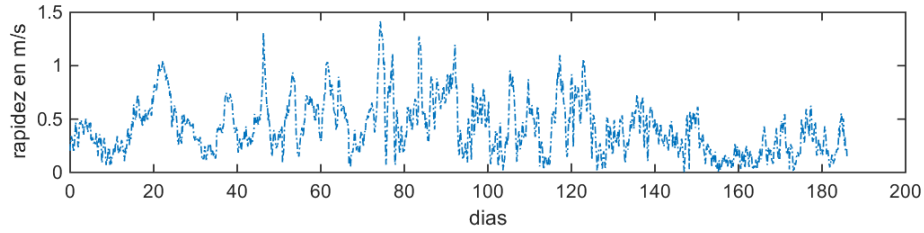

Temperatura en °C
35
30
25
20
0
20
40
60
80
100
120
140
dias

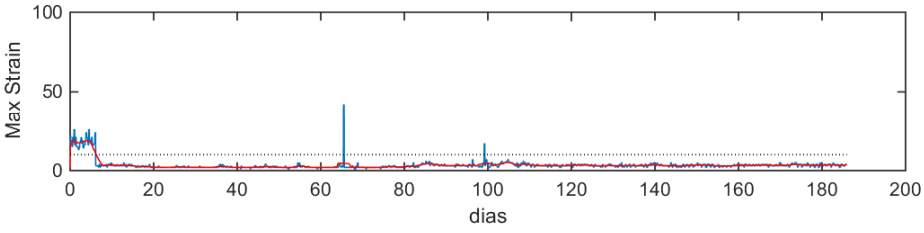
1.1.12. TRIPLET 12

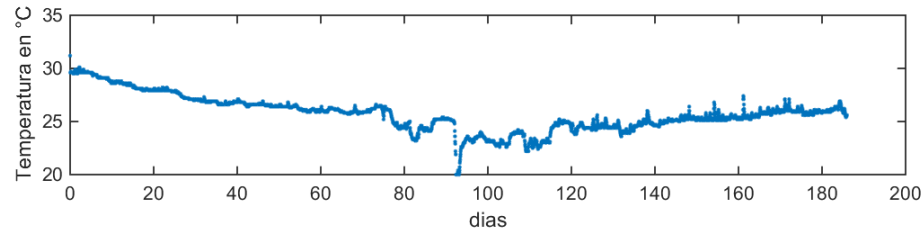


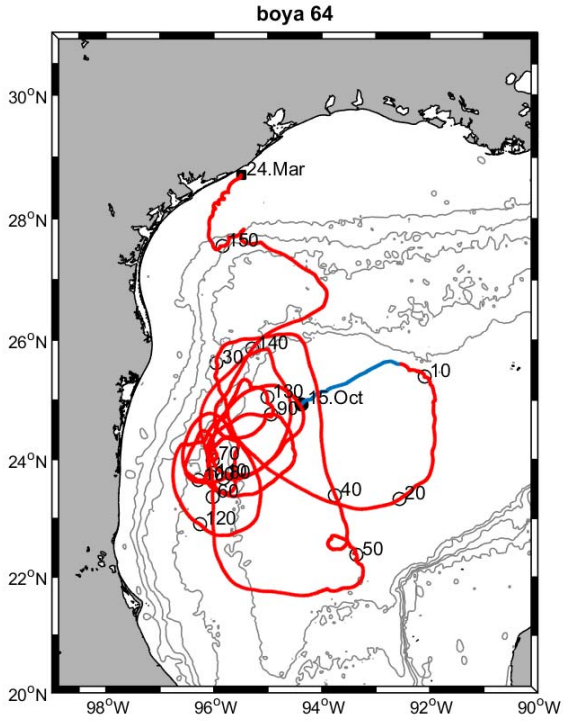


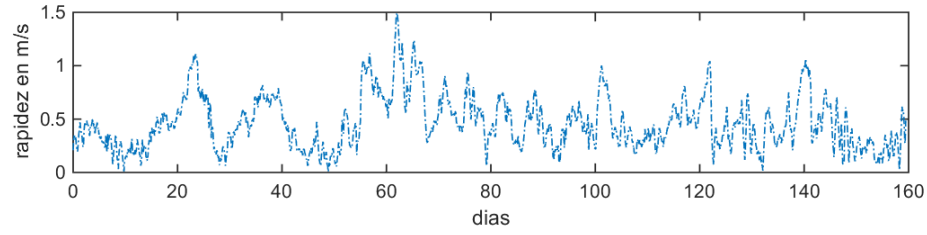

boya 65
28°N
26°N
24°N
22°N
20°N
18°N
100°W
98°W
96°W
94°W
92°W
90°W
40
80
10
60
15.Oct
160
30
110
90
50
120
20
140
70
19.Apr
180
130
150
170
160

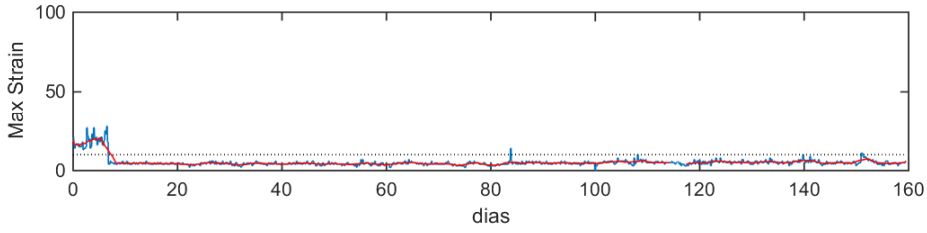

rapidez en m/s
1.5
1
0.5
0
0
20
40
60
80
100
120
140
160
180
200
dias

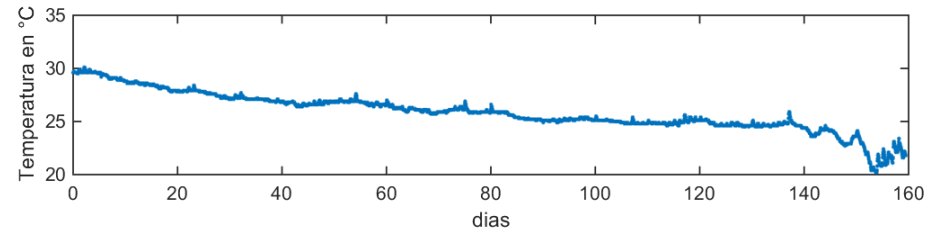

Max Strain
100
50
0
0
20
40
60
80
100
120
140
160
180
200
dias


Temperatura en °C
35
30
25
20
0
20
40
60
80
100
120
140
160
180
200
dias

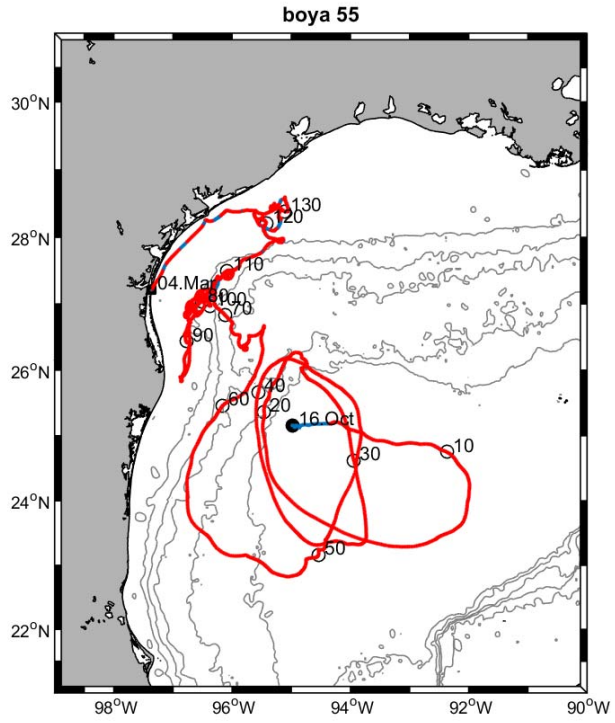

boya 64
30°N
28°N
26°N
24°N
22°N
20°N
98°W
96°W
94°W
92°W
90°W
24.Mar
150
140
30
10
130
15.Oct
90
70
60
40
20
120
50

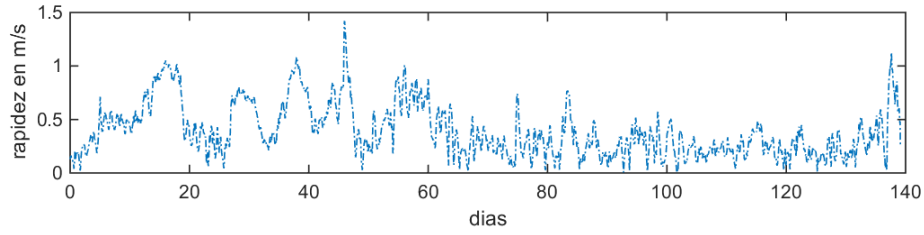

rapidez en m/s
1.5
1
0.5
0
0
20
40
60
80
100
120
140
160
dias

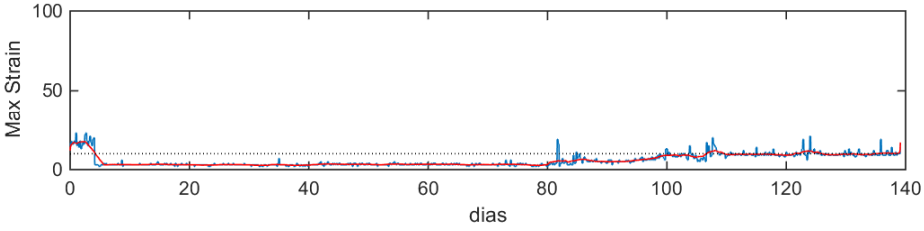

Max Strain
100
50
0
0
20
40
60
80
100
120
140
160
dias

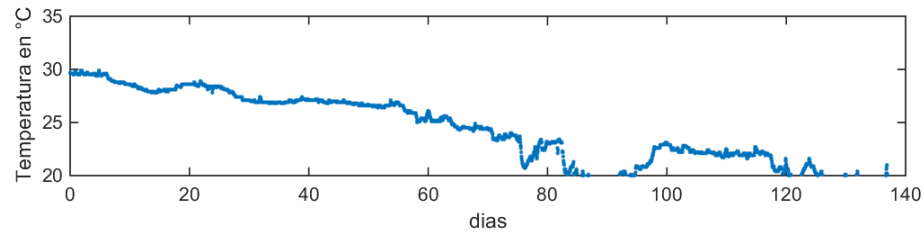

Temperatura en °C
35
30
25
20
0
20
40
60
80
100
120
140
160
dias

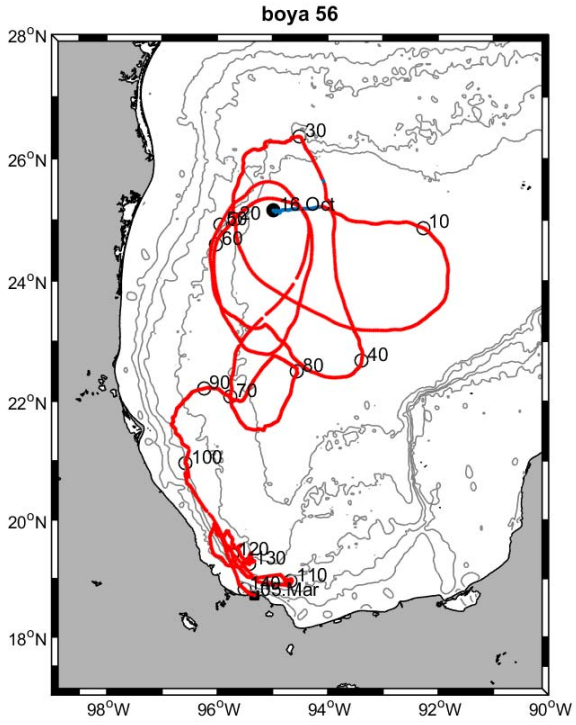
1.1.13. TRIPLET 13

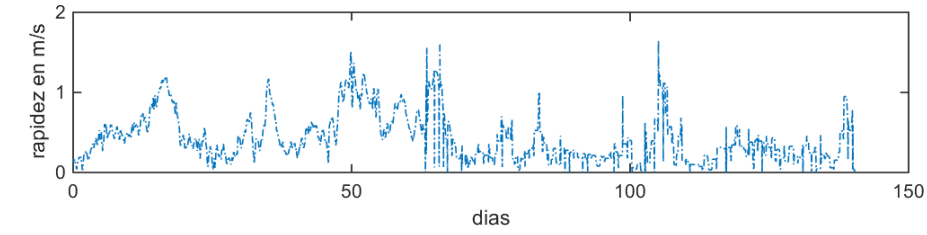


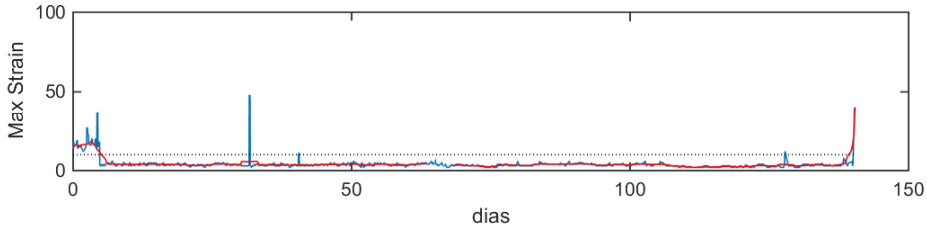


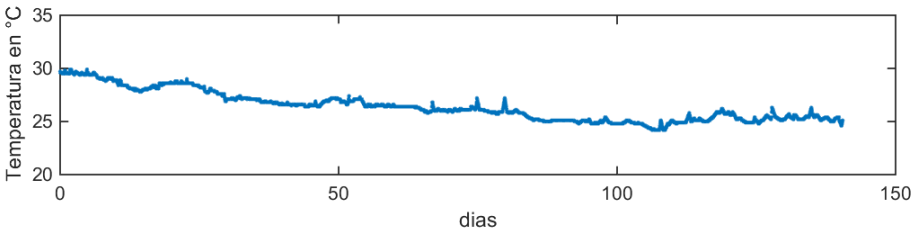


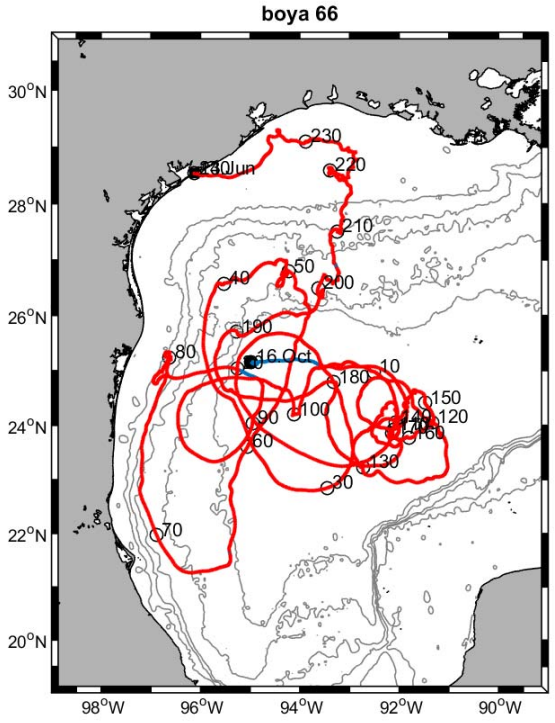


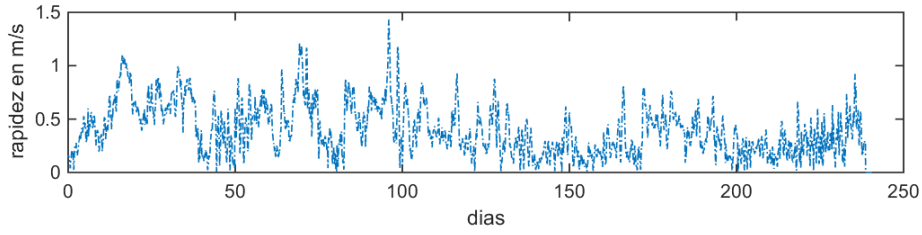

boya 56
28°N
26°N
24°N
22°N
20°N
18°N
98°W
96°W
94°W
92°W
90°W
16 Oct
05 Mar
10
30
40
50
60
70
80
90
100
110
120
130

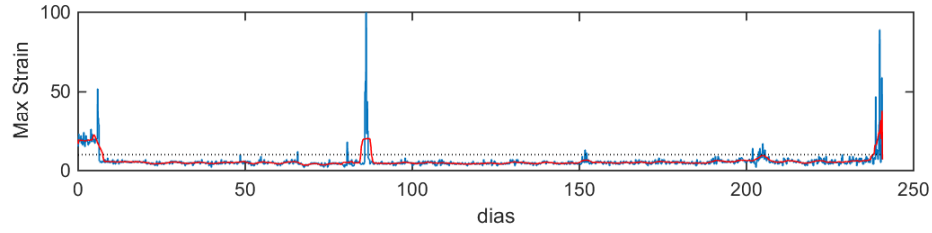

rapidez en m/s
dias

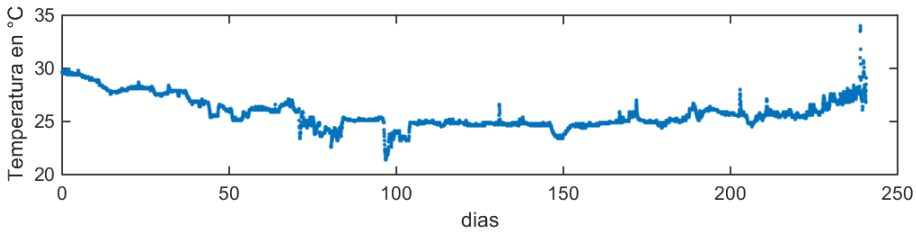

Max Strain
dias


Temperatura en °C
dias

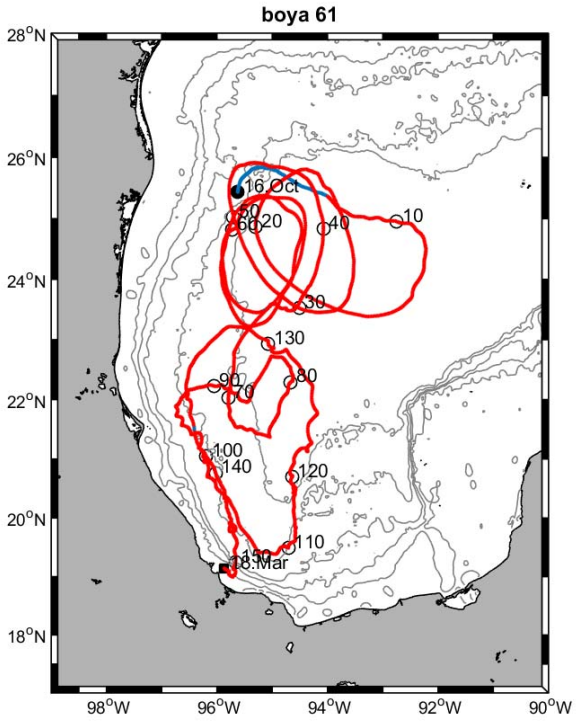

boya 66
30°N
28°N
26°N
24°N
22°N
20°N
98°W
96°W
94°W
92°W
90°W
230
220
210
200
190
180
150
140
130
120
110
100
90
80
70
60
50
40
30
10
16 Oct
30 Jun

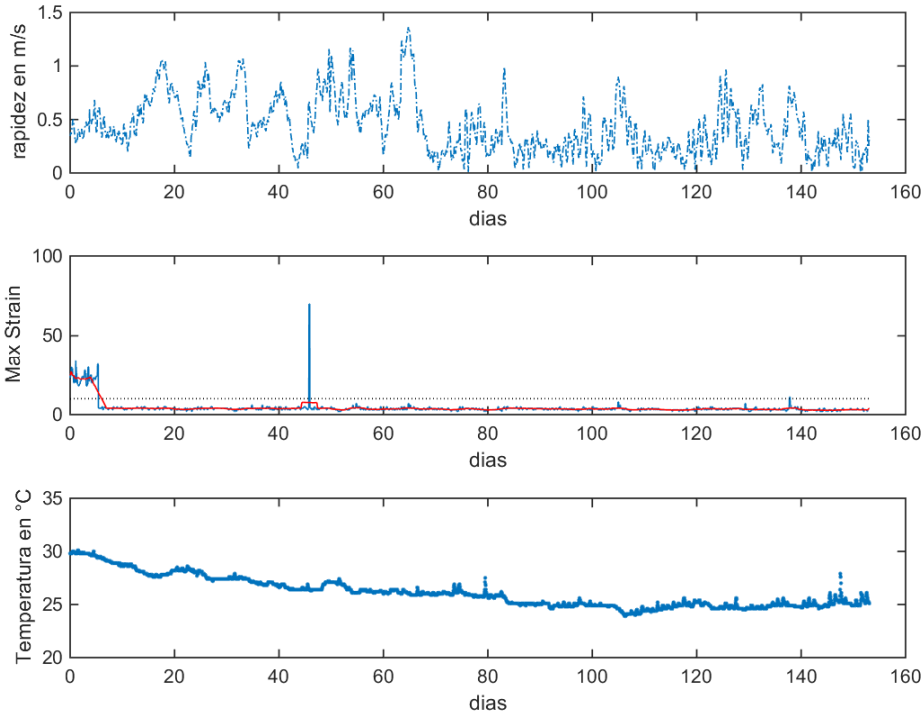

rapidez en m/s
1.5
1
0.5
0
0
50
100
150
200
250
dias

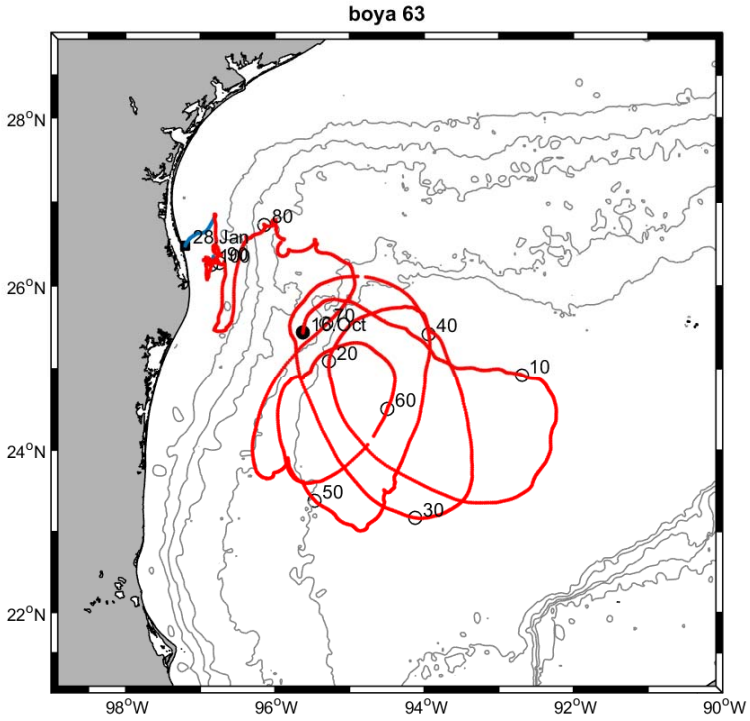

Max Strain
100
50
0
0
50
100
150
200
250
dias

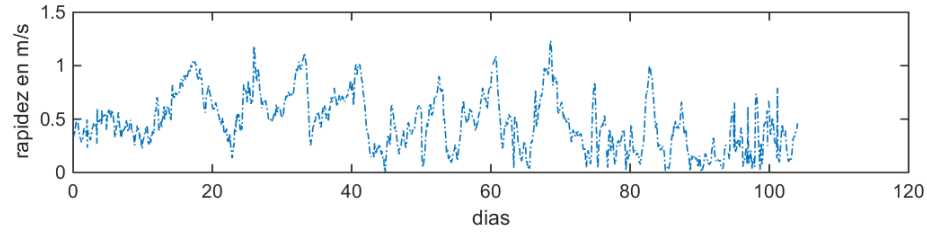

Temperatura en °C
35
30
25
20
0
50
100
150
200
250
dias

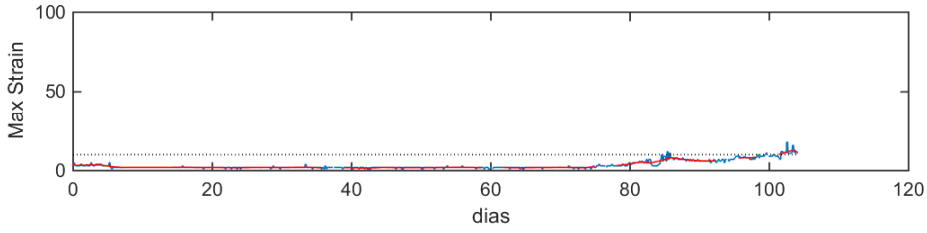
1.1.14. TRIPLET 14

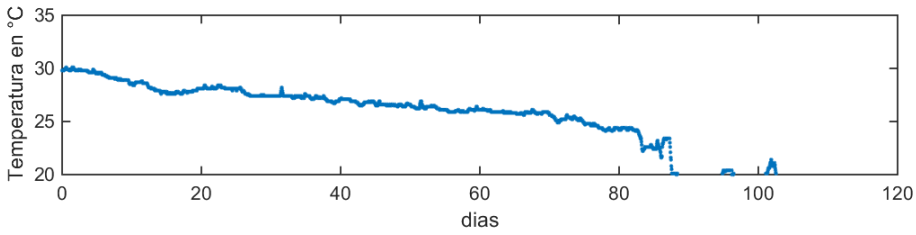


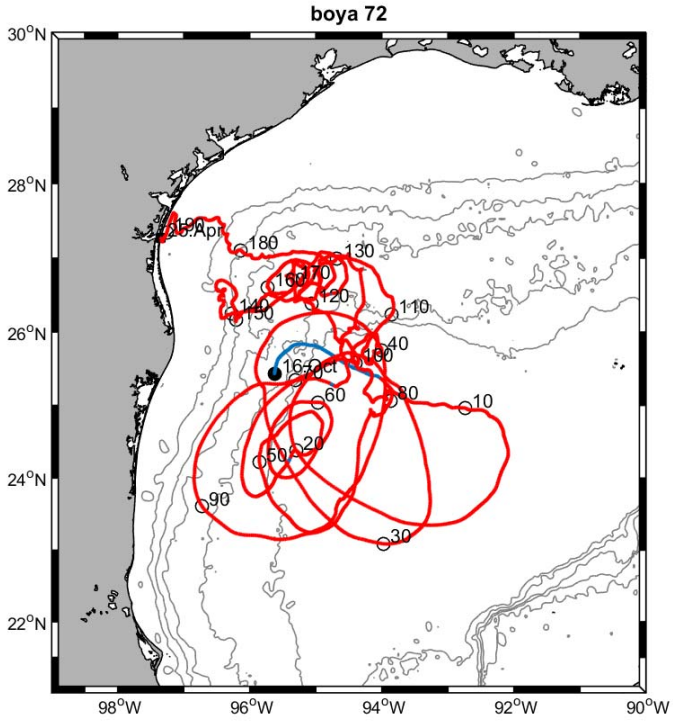


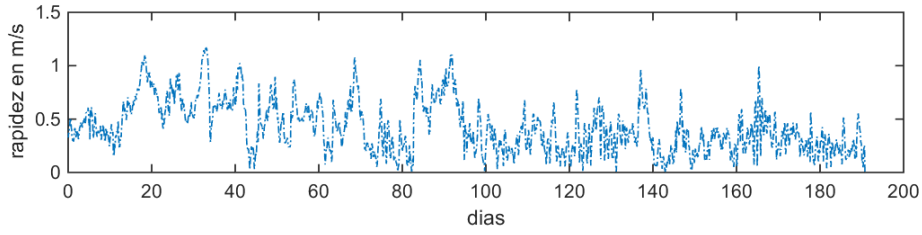

boya 63
28°N
26°N
24°N
22°N
98°W
96°W
94°W
92°W
90°W
28 Jan
80
90
70
16 Oct
40
20
10
60
50
30

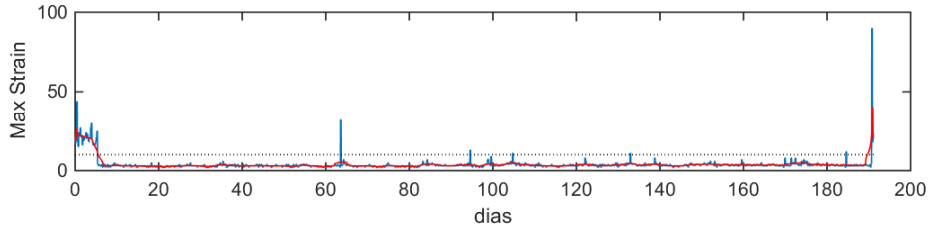

rapidez en m/s
1.5
1
0.5
0
0
20
40
60
80
100
120
dias

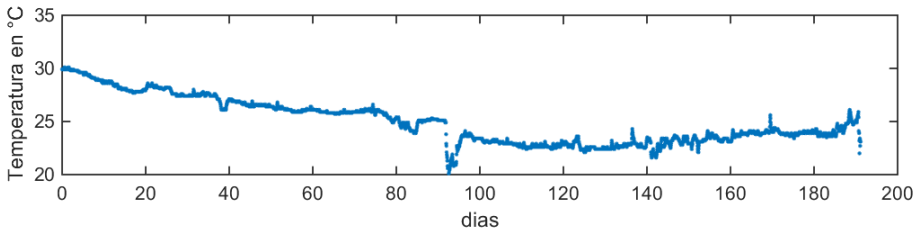

Max Strain
100
50
0
0
20
40
60
80
100
120
dias


Temperatura en °C
35
30
25
20
0
20
40
60
80
100
120
dias

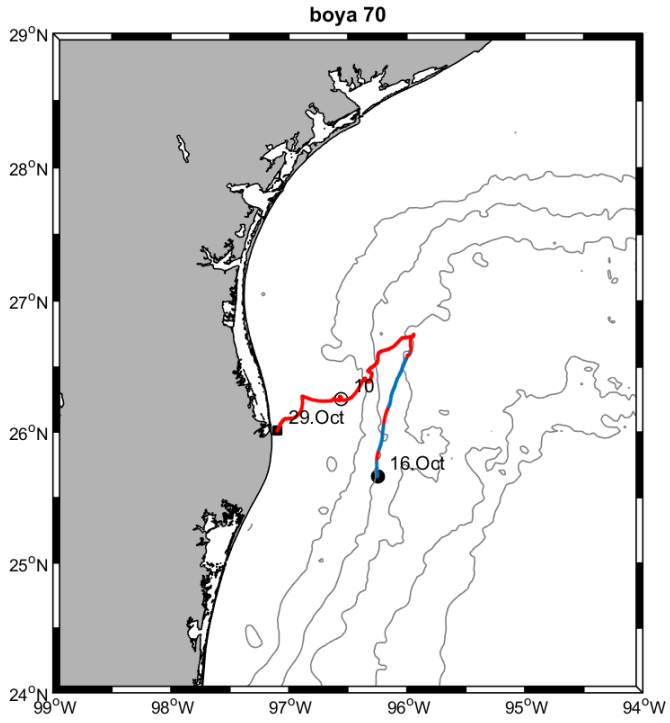

boya 72
30°N
28°N
26°N
24°N
22°N
98°W
96°W
94°W
92°W
90°W
16-Apr
180
130
170
160
120
140
150
110
40
100
16-Oct
50
60
80
10
20
90
30

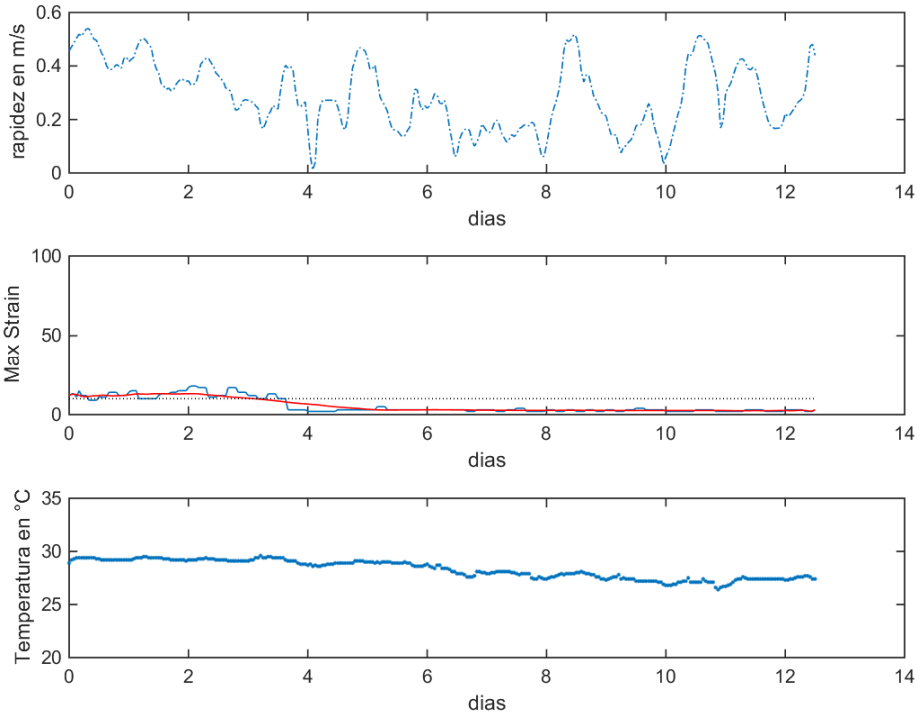

rapidez en m/s
1.5
1
0.5
0
0
20
40
60
80
100
120
140
160
180
200
dias

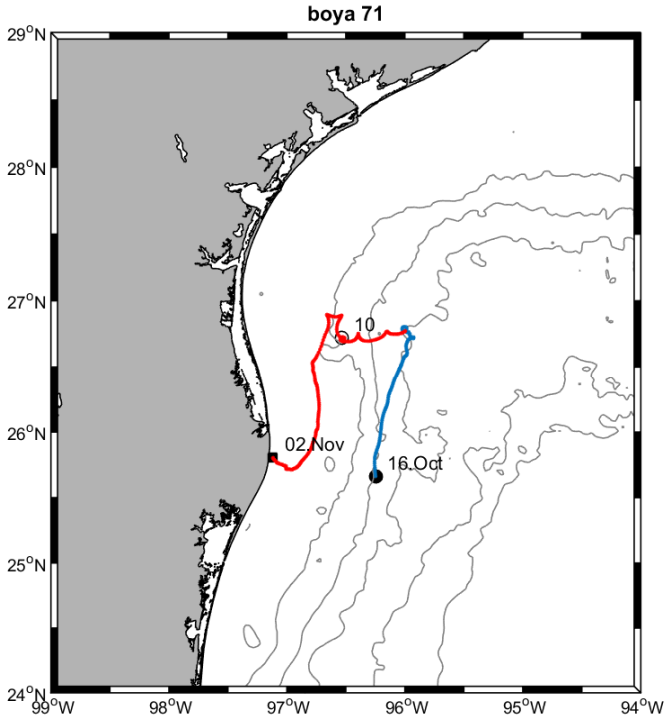

Max Strain
100
50
0
0
20
40
60
80
100
120
140
160
180
200
dias

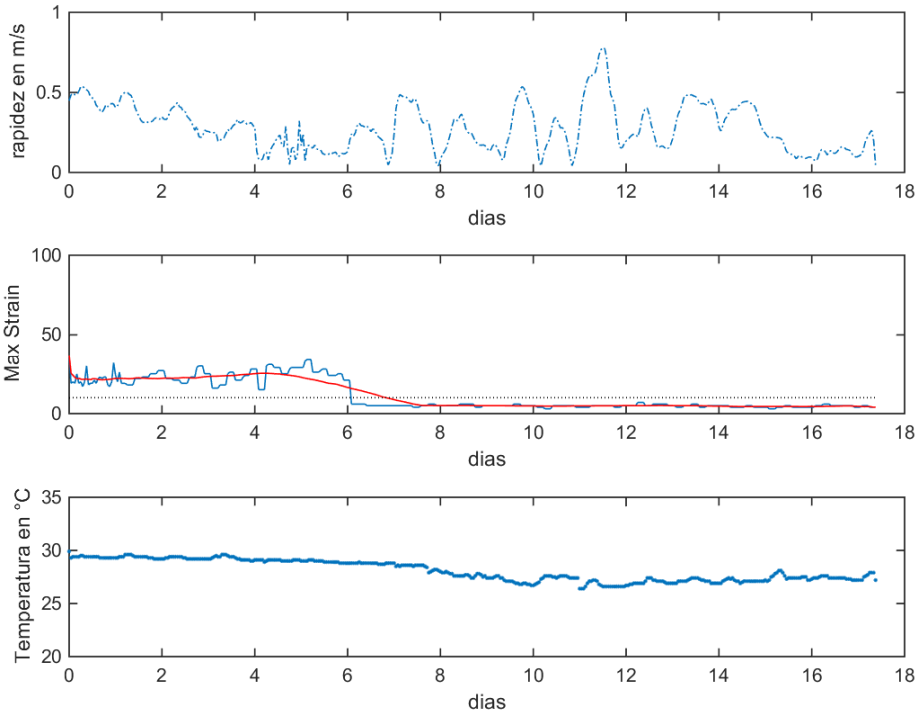

Temperatura en °C
35
30
25
20
0
20
40
60
80
100
120
140
160
180
200
dias

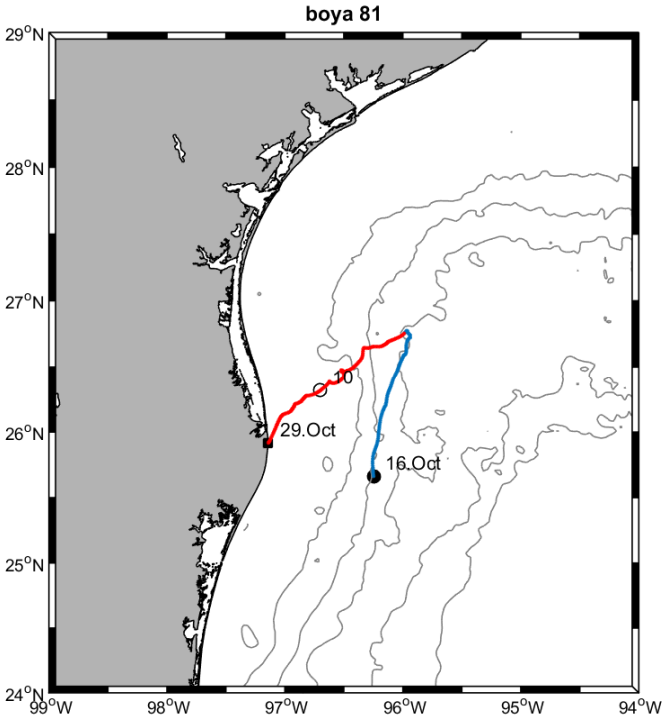
1.1.15. TRIPLET 15

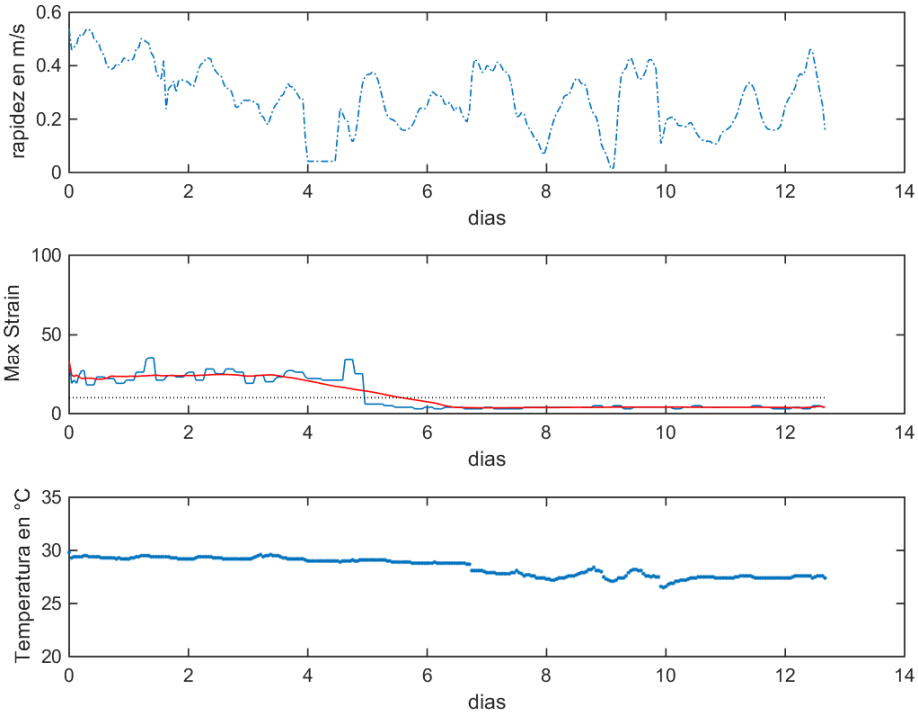




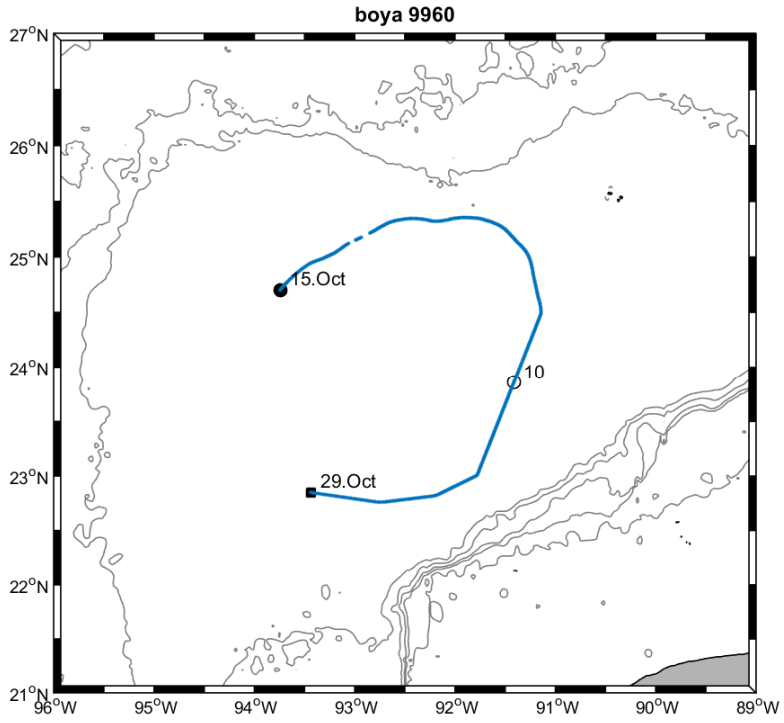

boya 71
29°N
28°N
27°N
26°N
25°N
24°N
99°W
98°W
97°W
96°W
95°W
94°W
10
02 Nov
16 Oct

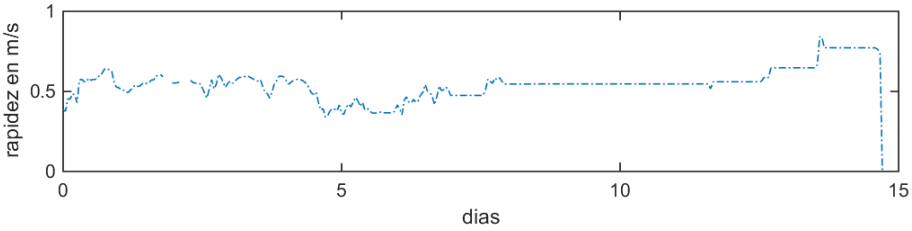

rapidez en m/s
dias
Max Strain
dias
Temperatura en °C
dias

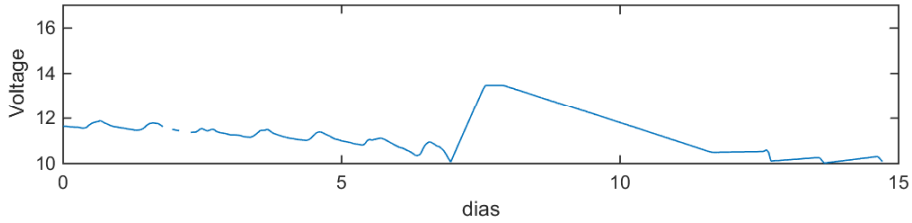

boya 81
29°N
28°N
27°N
26°N
25°N
24°N
99°W
98°W
97°W
96°W
95°W
94°W
10
29.Oct
16.Oct

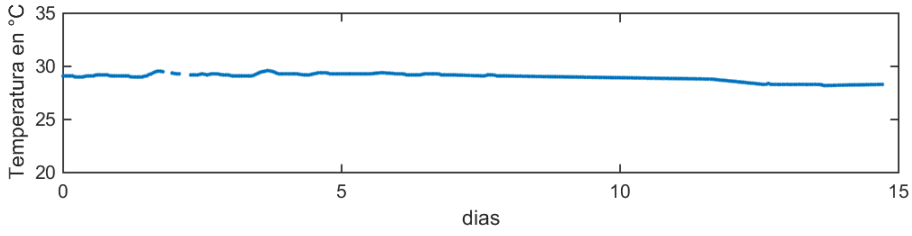

rapidez en m/s
0.6
0.4
0.2
0
0
2
4
6
8
10
12
14
dias
Max Strain
100
50
0
0
2
4
6
8
10
12
14
dias
Temperatura en °C
35
30
25
20
0
2
4
6
8
10
12
14
dias

1.1.16. TRIPLET 16 (DORIS)

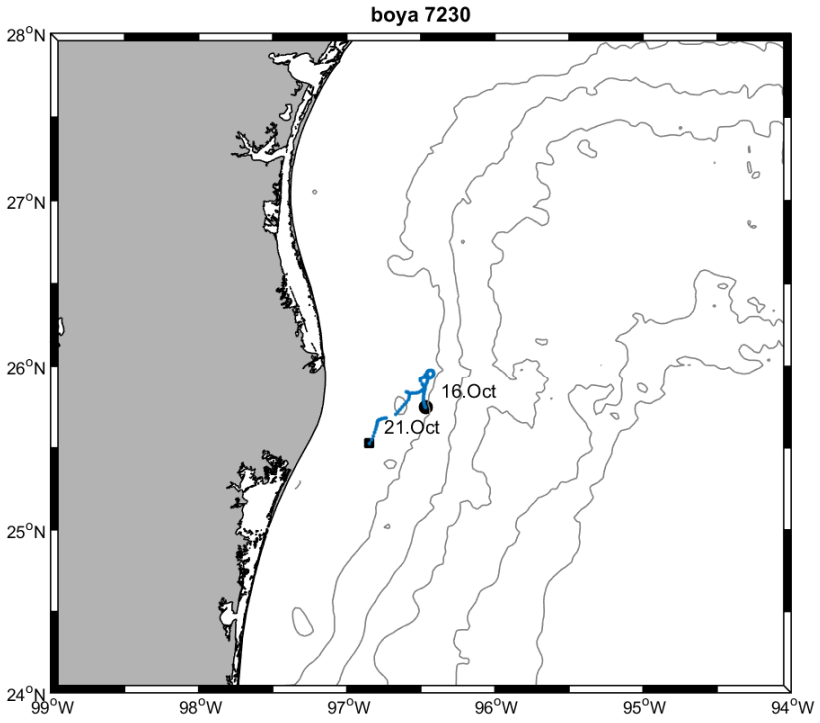


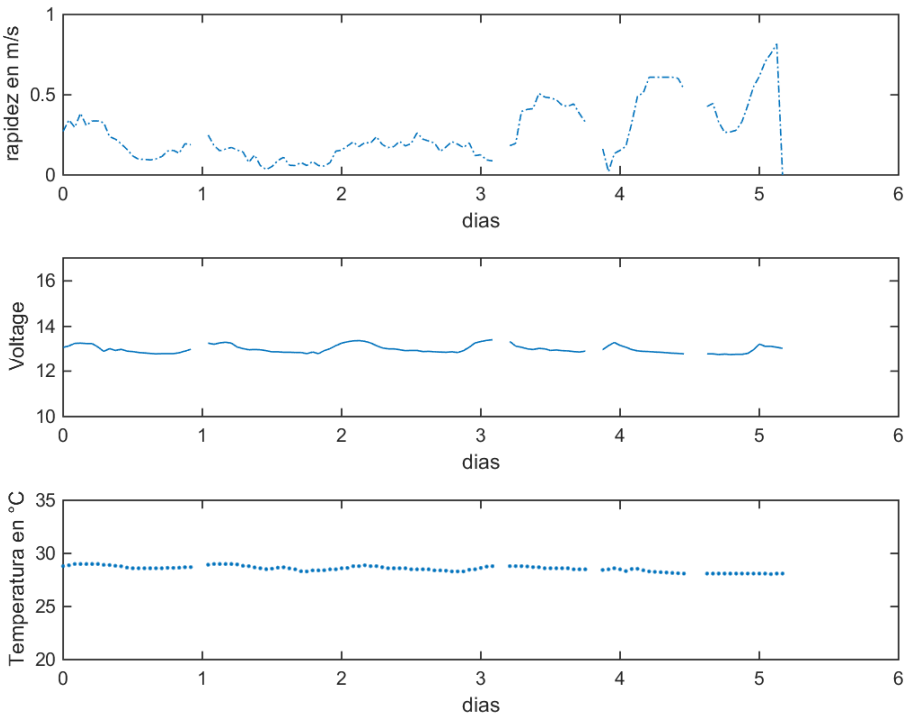


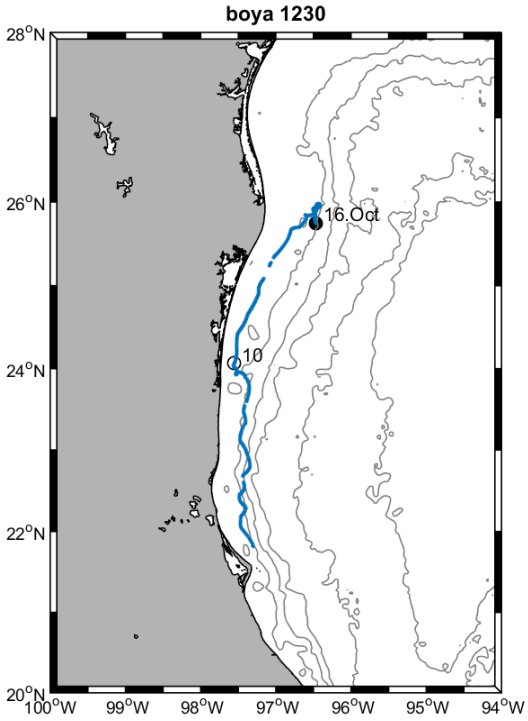


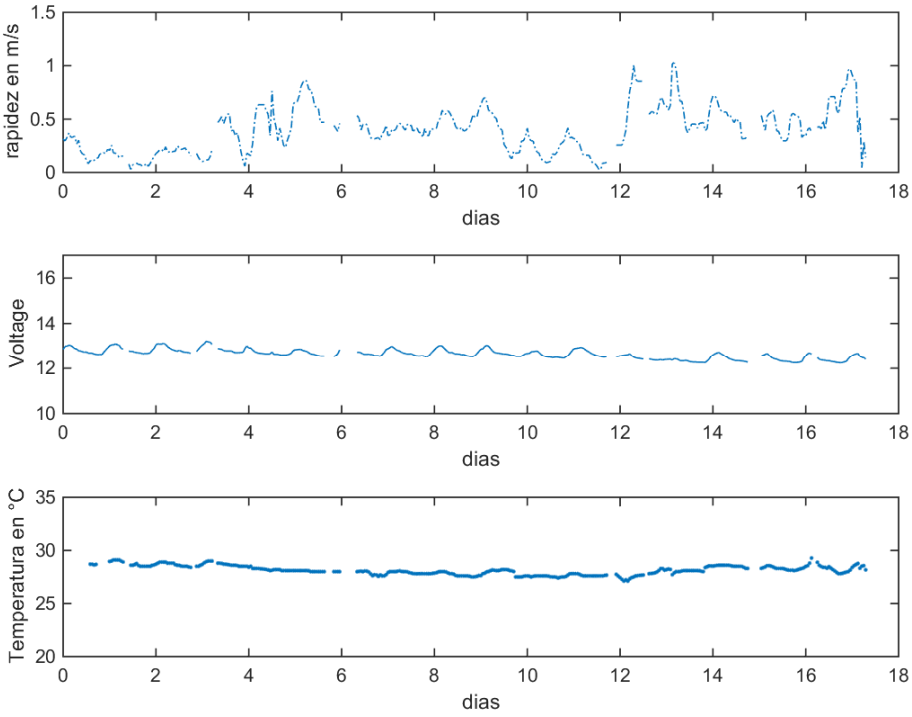


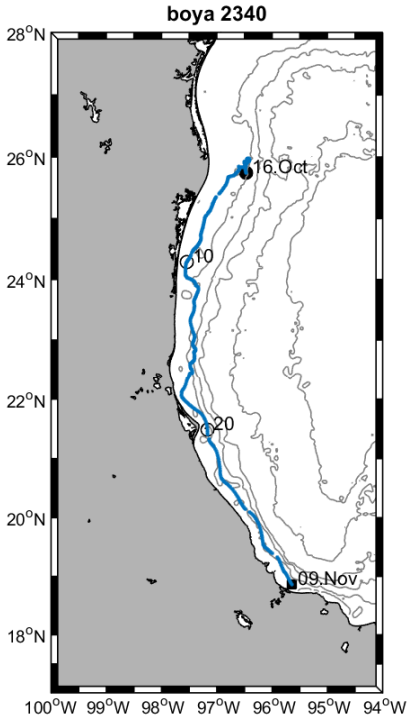
1.1.17. TRIPLET 17 (DORIS)

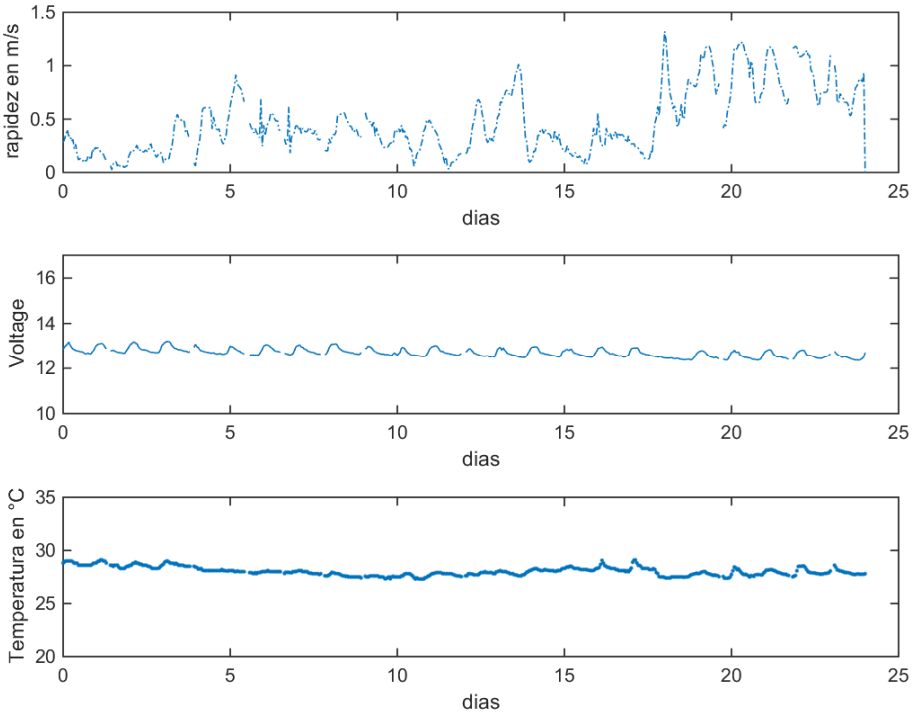




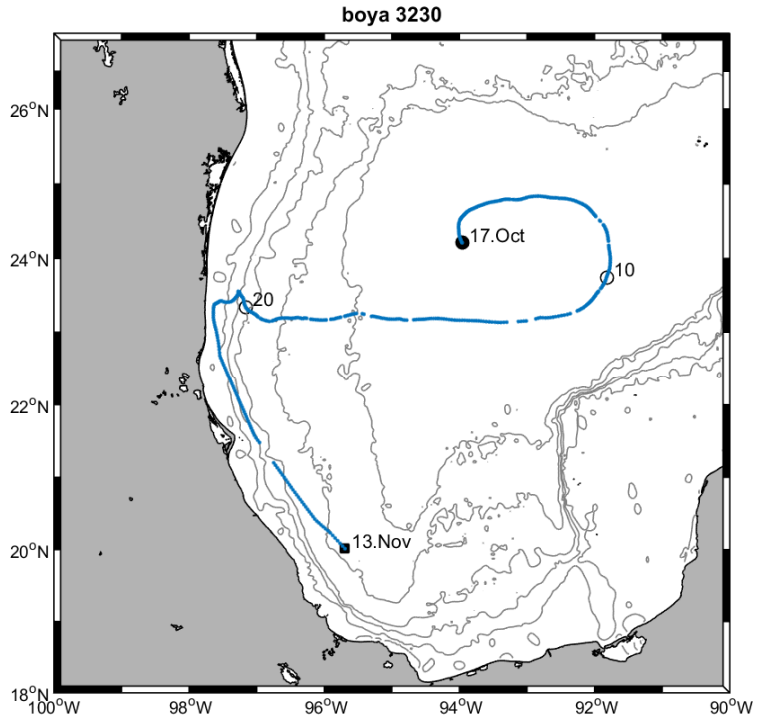

boya 1230
28°N
26°N
24°N
22°N
20°N
100°W
99°W
98°W
97°W
96°W
95°W
94°W
16.Oct
10

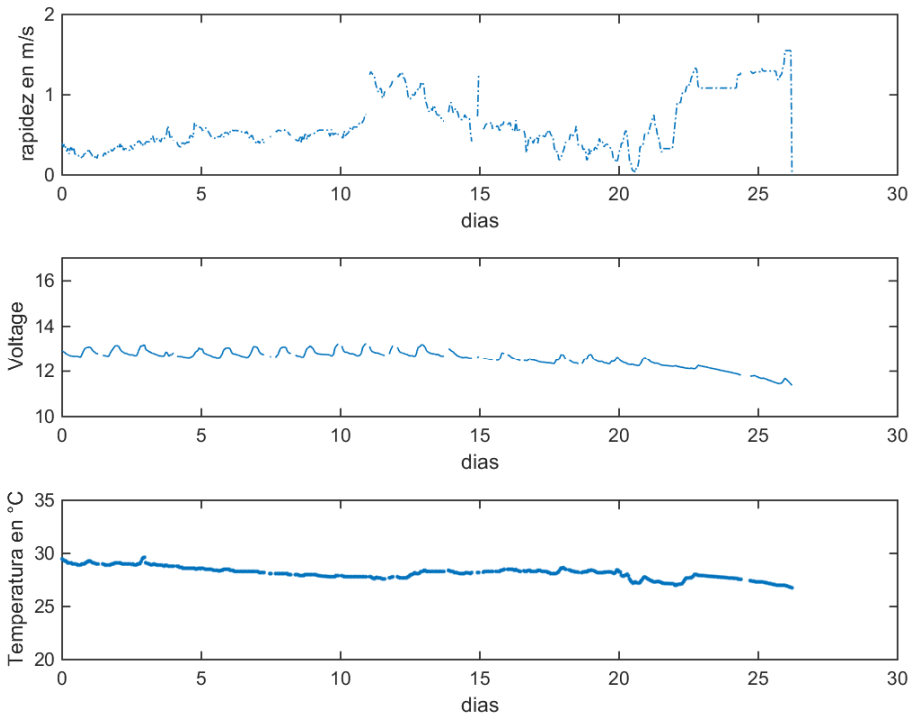

rapidez en m/s
dias
Voltage
dias
Temperatura en °C
dias

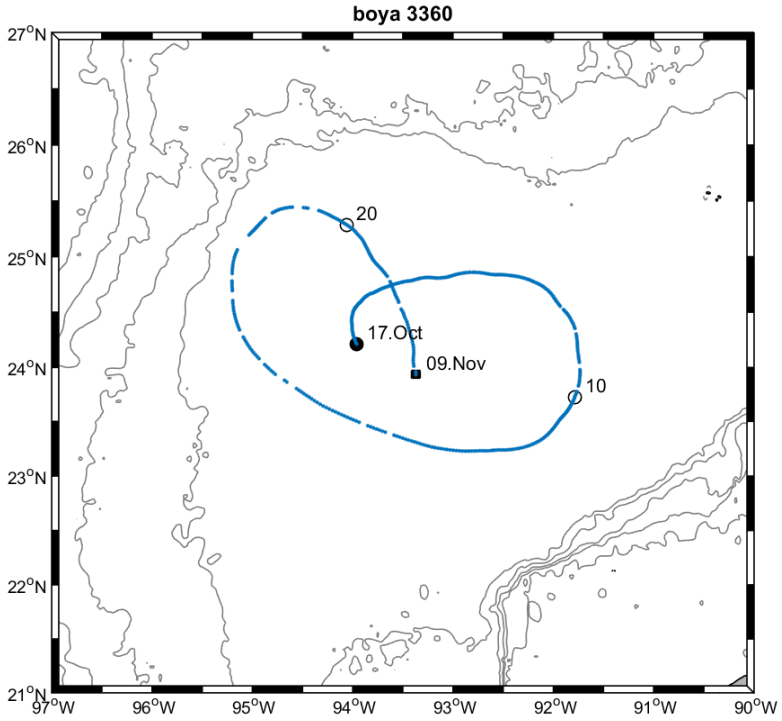

boya 2340
28°N
26°N
24°N
22°N
20°N
18°N
100°W 99°W 98°W 97°W 96°W 95°W 94°W
16.Oct
10
20
09.Nov

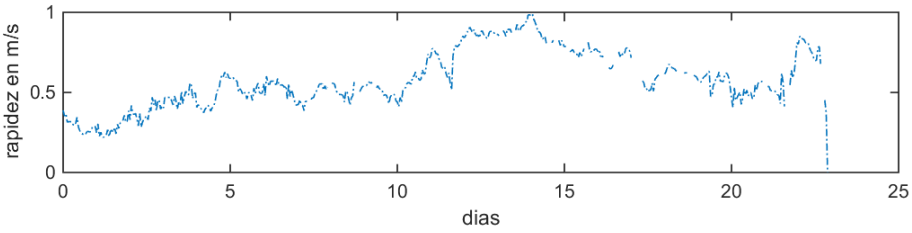

rapidez en m/s
1.5
1
0.5
0
0 5 10 15 20 25
dias
Voltage
16
14
12
10
0 5 10 15 20 25
dias
Temperatura en °C
35
30
25
20
0 5 10 15 20 25
dias

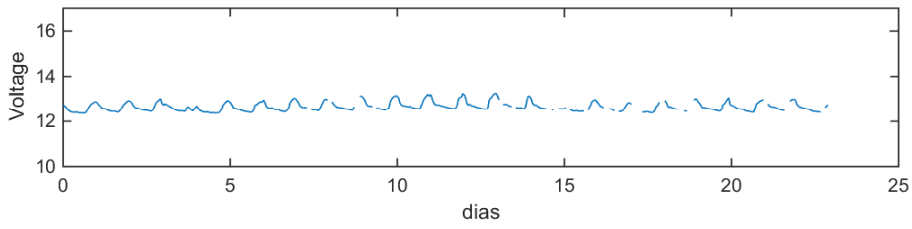
1.1.18. TRIPLET 18 (DORIS)

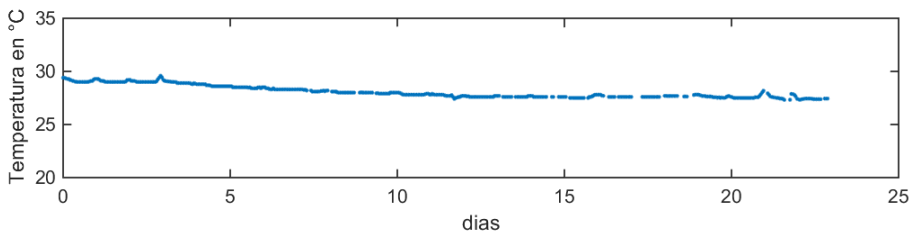




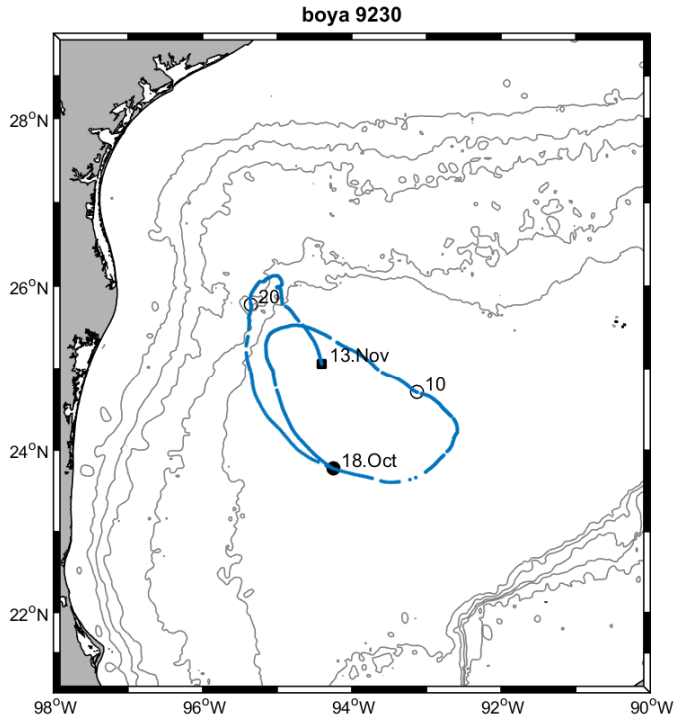

boya 3360
27°N
26°N
25°N
24°N
23°N
22°N
21°N
97°W
96°W
95°W
94°W
93°W
92°W
91°W
90°W
20
17.Oct
09.Nov
10

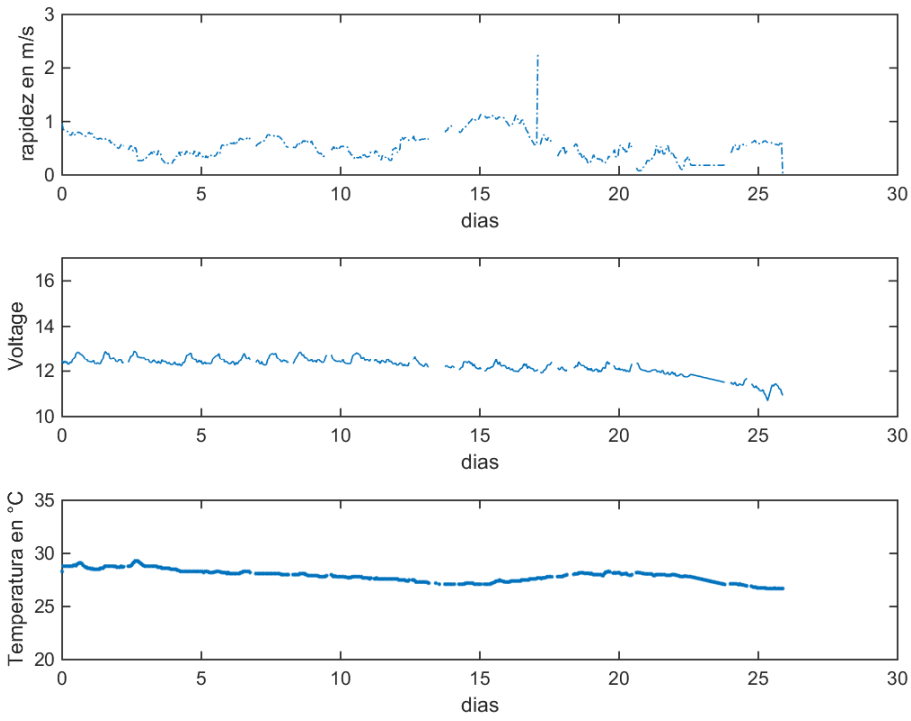

rapidez en m/s
0
0.5
1
0
5
10
15
20
25
dias

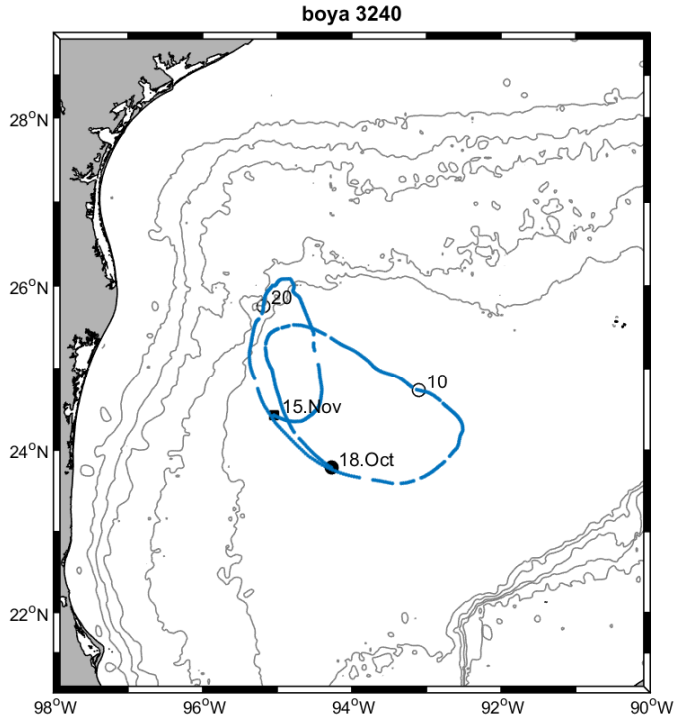

Voltage
10
12
14
16
0
5
10
15
20
25
dias

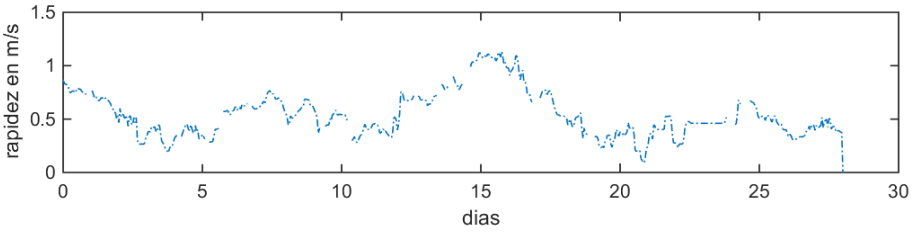

Temperatura en °C
20
25
30
35
0
5
10
15
20
25
dias

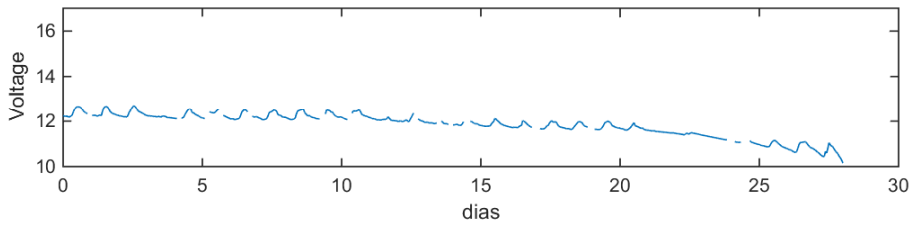
1.1.19. TRIPLET 19 (DORIS)

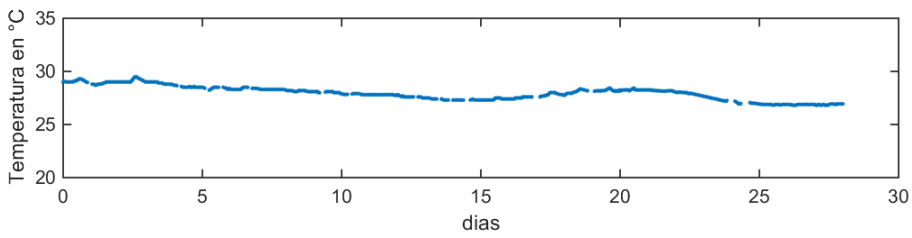




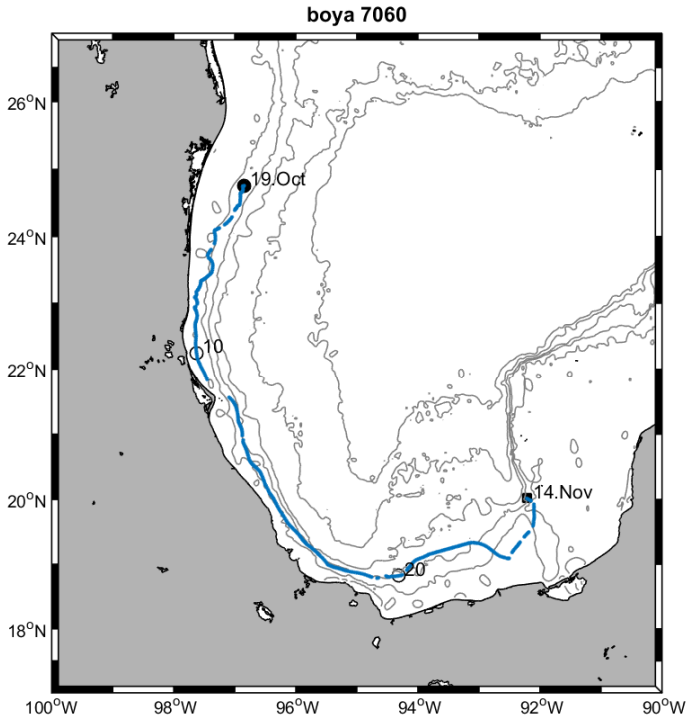

boya 3240
28°N
26°N
24°N
22°N
98°W
96°W
94°W
92°W
90°W
20
10
15.Nov
18.Oct

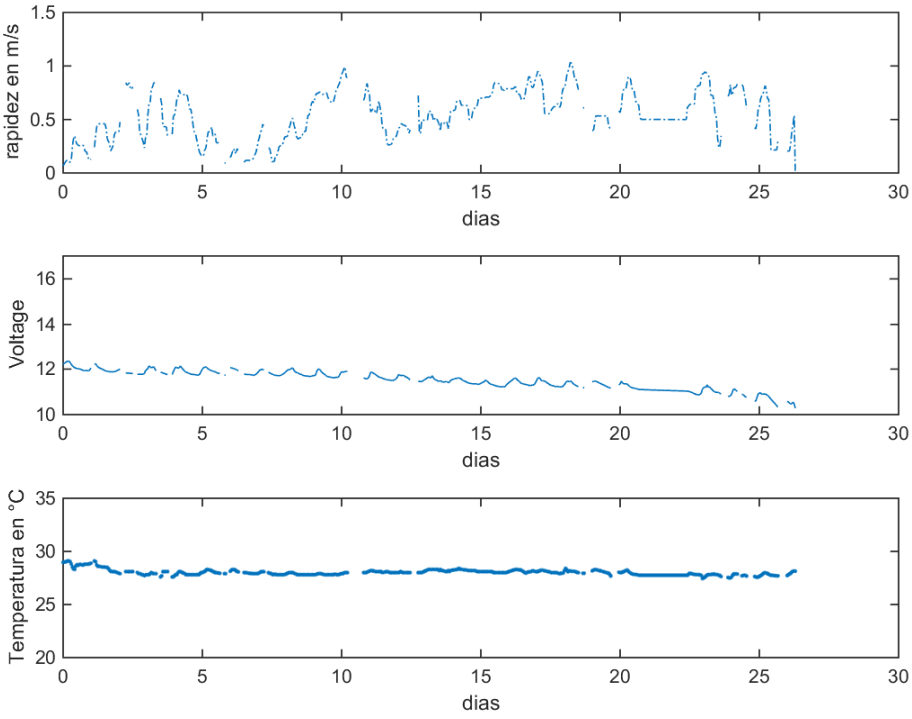

rapidez en m/s
1.5
1
0.5
0
0
5
10
15
20
25
30
dias

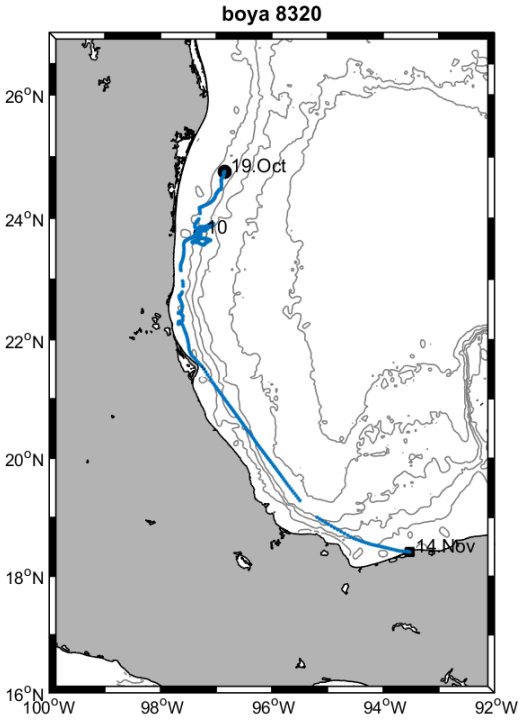

Voltage
16
14
12
10
0
5
10
15
20
25
30
dias

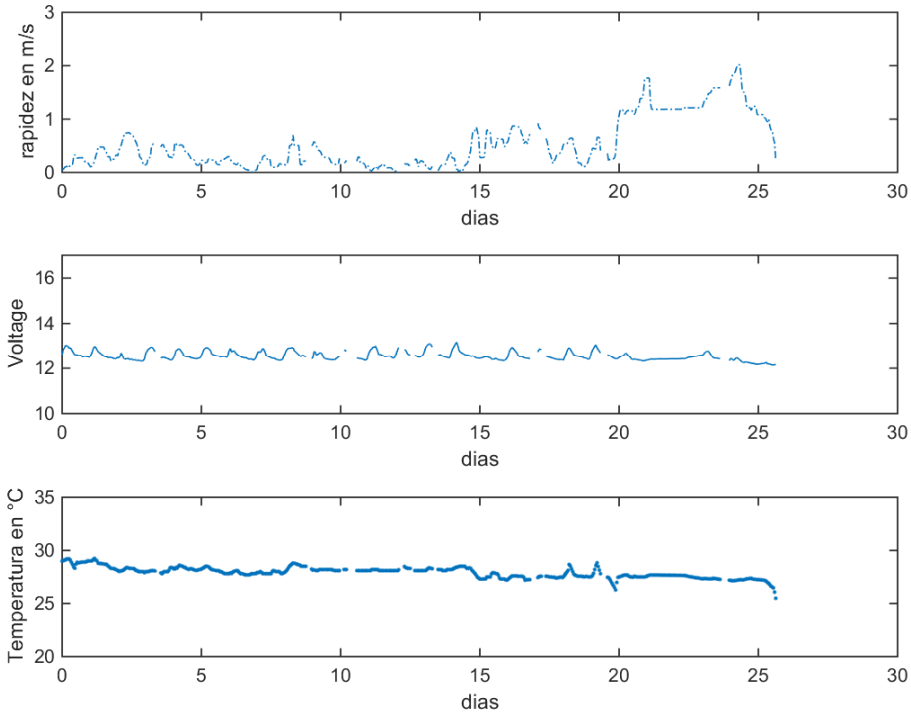

Temperatura en °C
35
30
25
20
0
5
10
15
20
25
30
dias

1.1.20. TRIPLET 20 (DORIS)



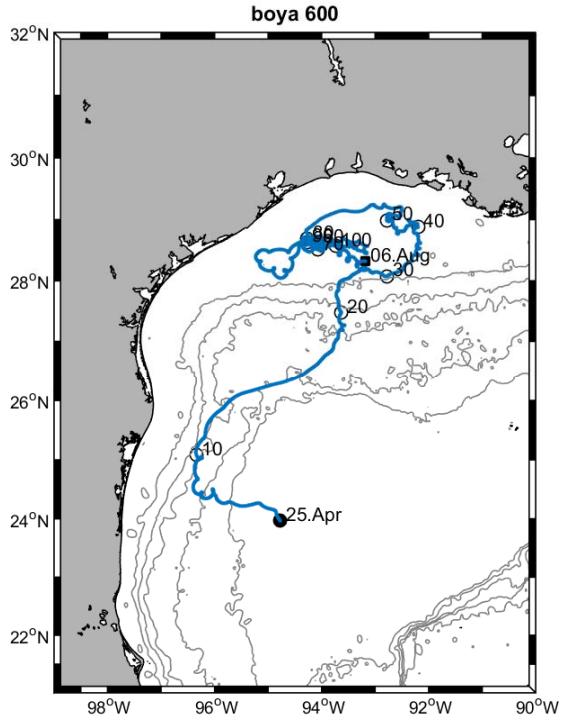


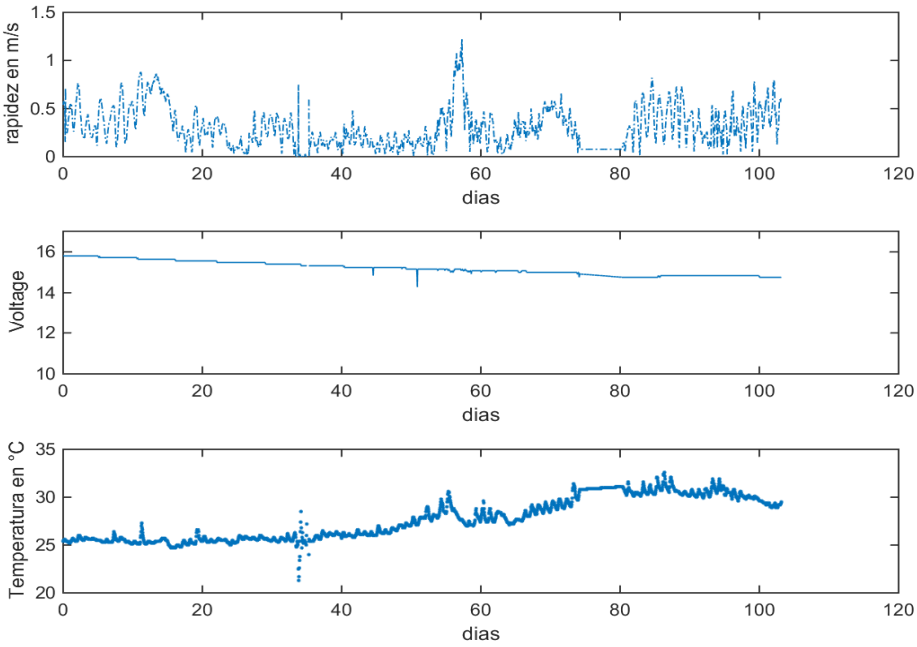

boya 8320
26°N
24°N
22°N
20°N
18°N
16°N
100°W
98°W
96°W
94°W
92°W
19 Oct
10
14 Nov

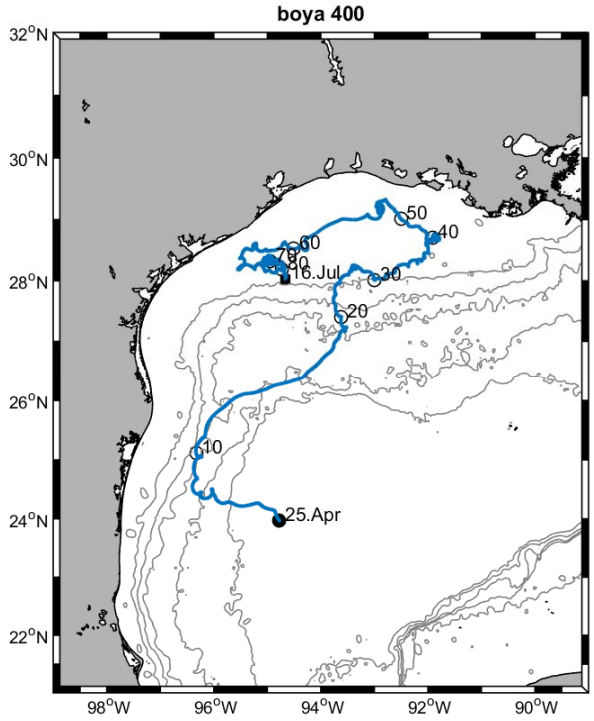

rapidez en m/s
dias
Voltage
dias
Temperatura en °C
dias

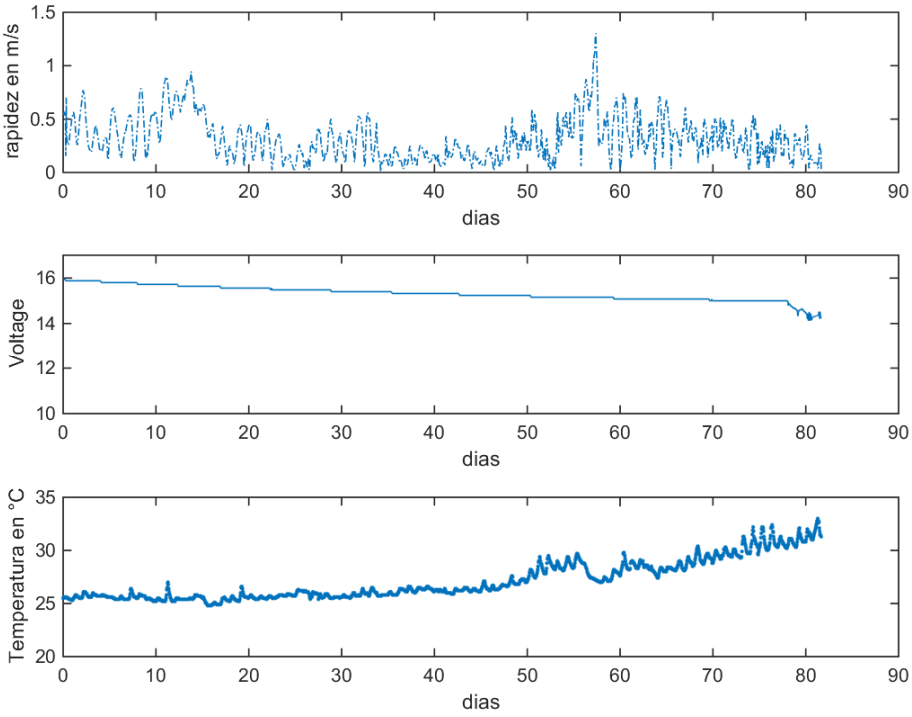
DWDE 3

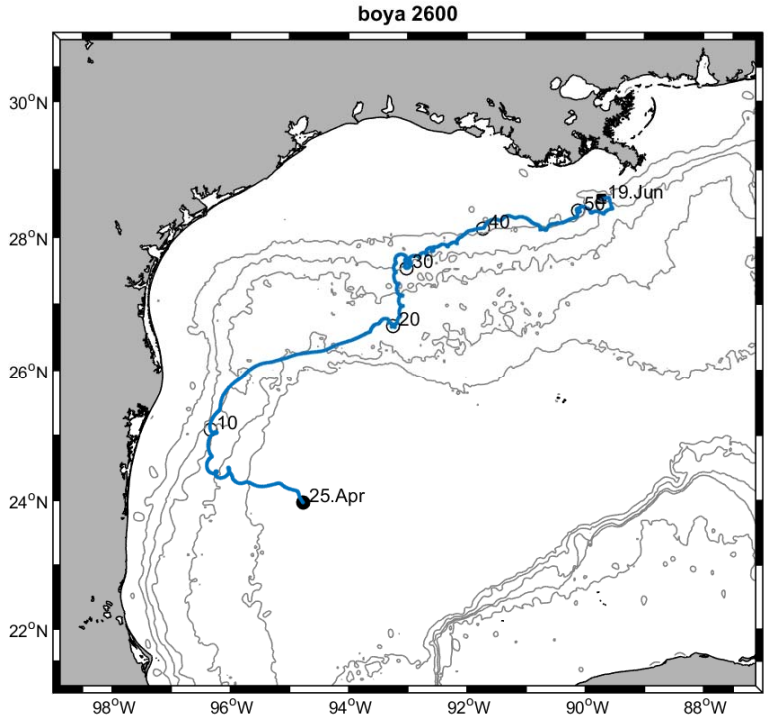
1.1.1. TRIPLET 01

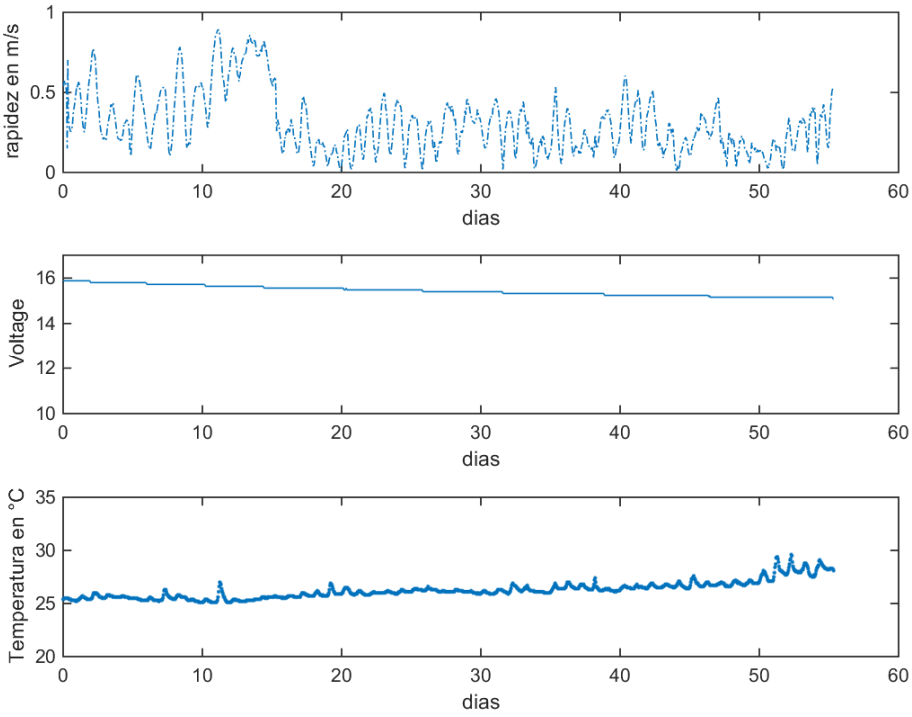




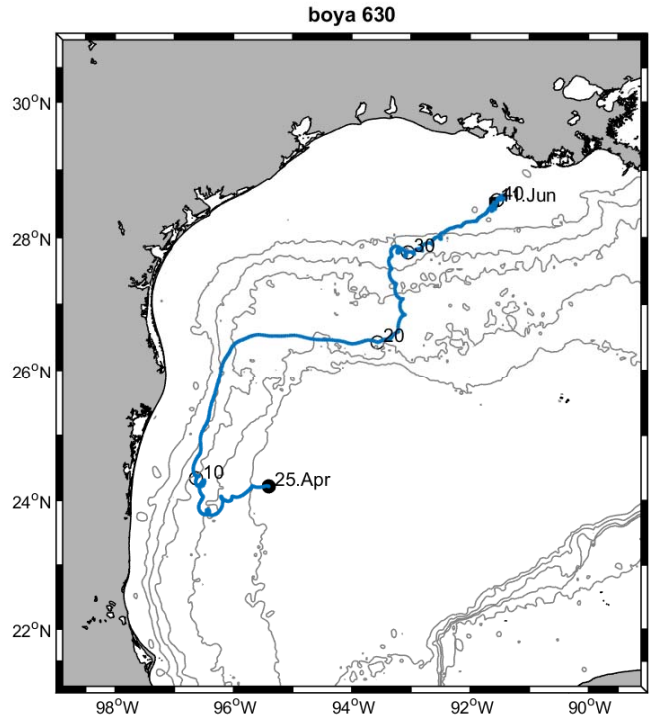

boya 400
32°N
30°N
28°N
26°N
24°N
22°N
98°W
96°W
94°W
92°W
90°W
50
40
60
70
80
16.Jul
30
20
10
25.Apr

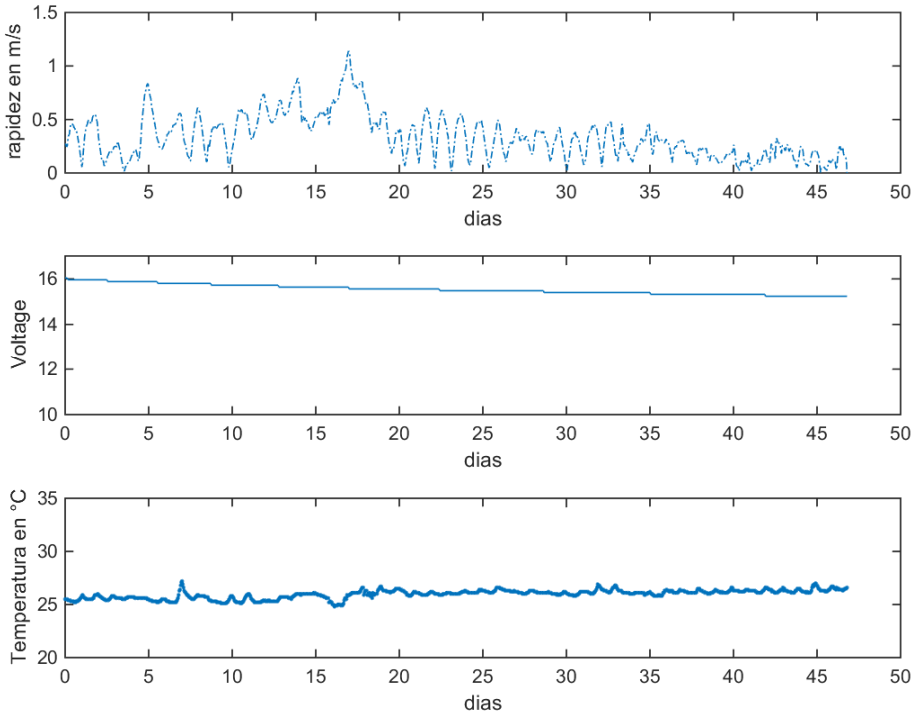

rapidez en m/s
dias
Voltage
dias
Temperatura en °C
dias

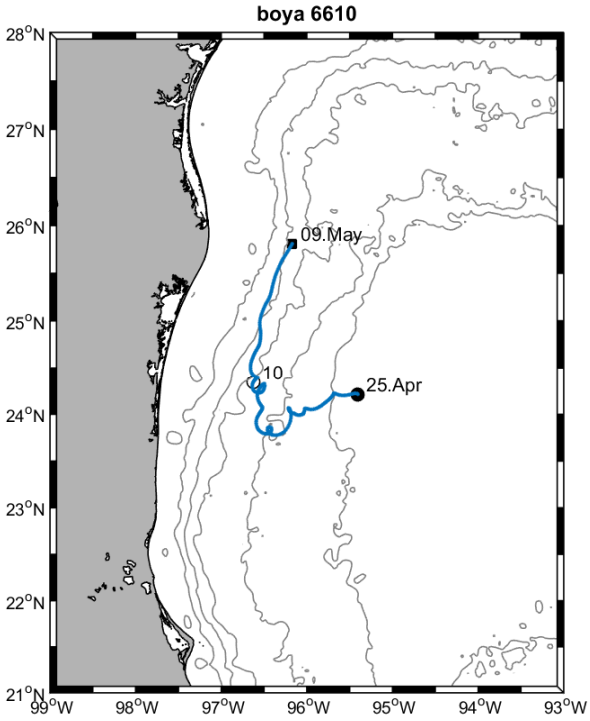

boya 2600
30°N
28°N
26°N
24°N
22°N
98°W
96°W
94°W
92°W
90°W
88°W
19.Jun
50
40
30
20
10
25.Apr

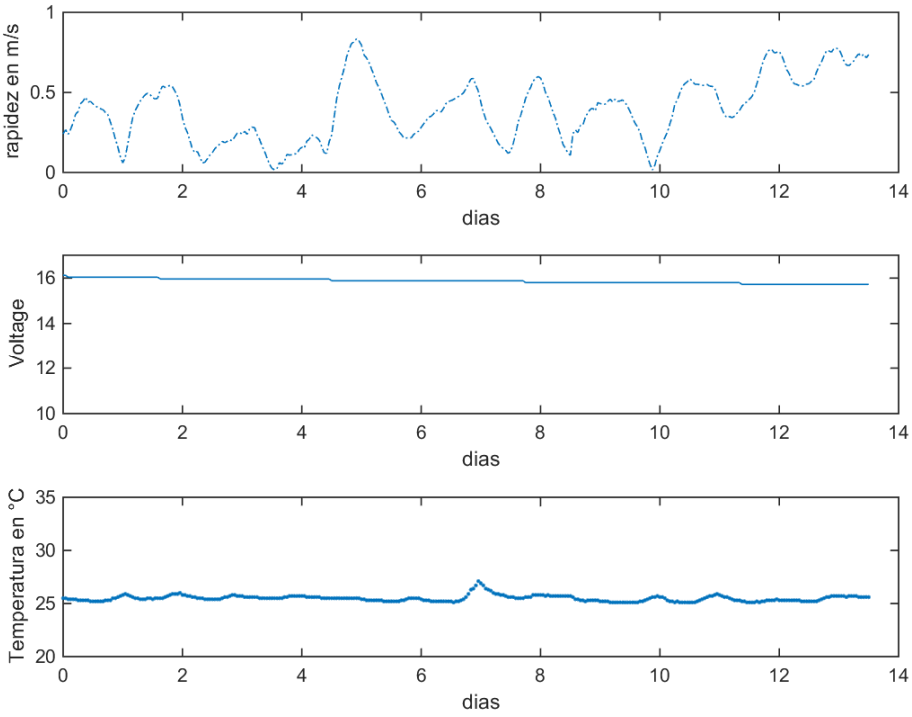

rapidez en m/s
dias
Voltage
dias
Temperatura en °C
dias

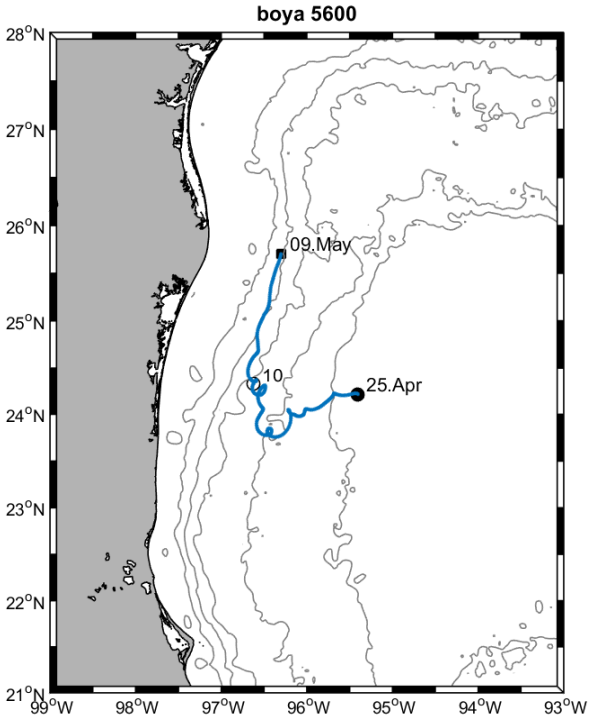
1.1.2. TRIPLET 02

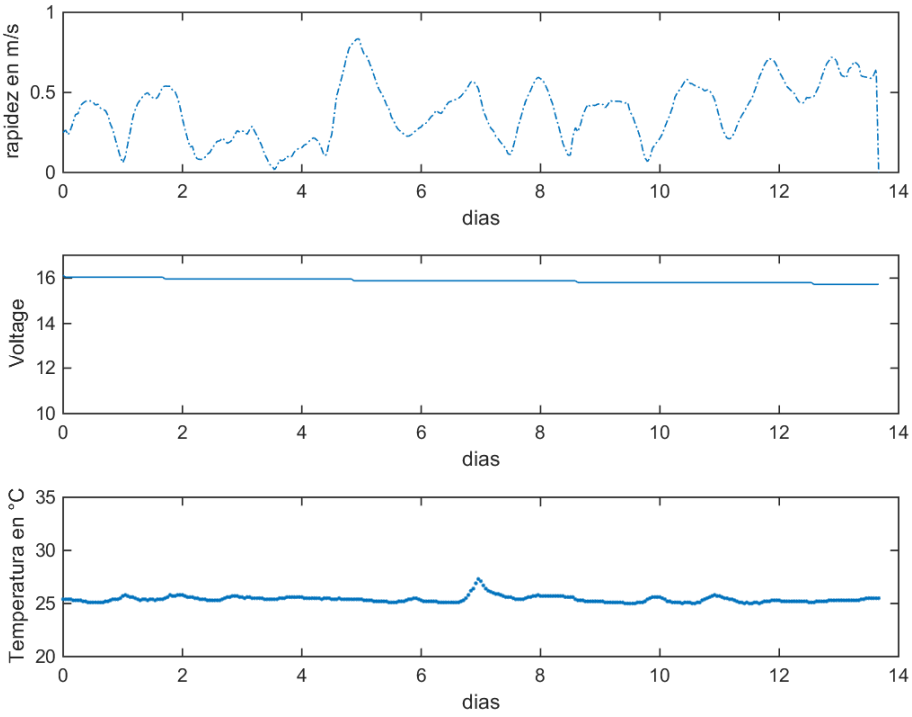




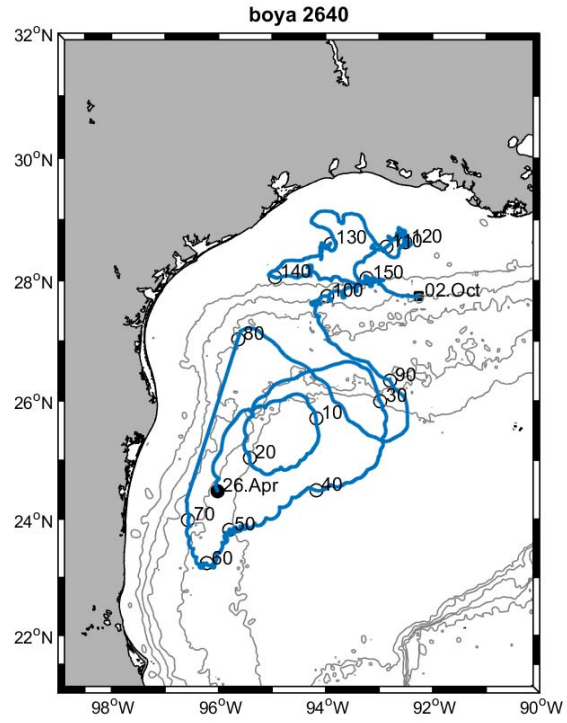

boya 6610
28°N
27°N
26°N
25°N
24°N
23°N
22°N
21°N
99°W
98°W
97°W
96°W
95°W
94°W
93°W
09.May
10
25.Apr
-40

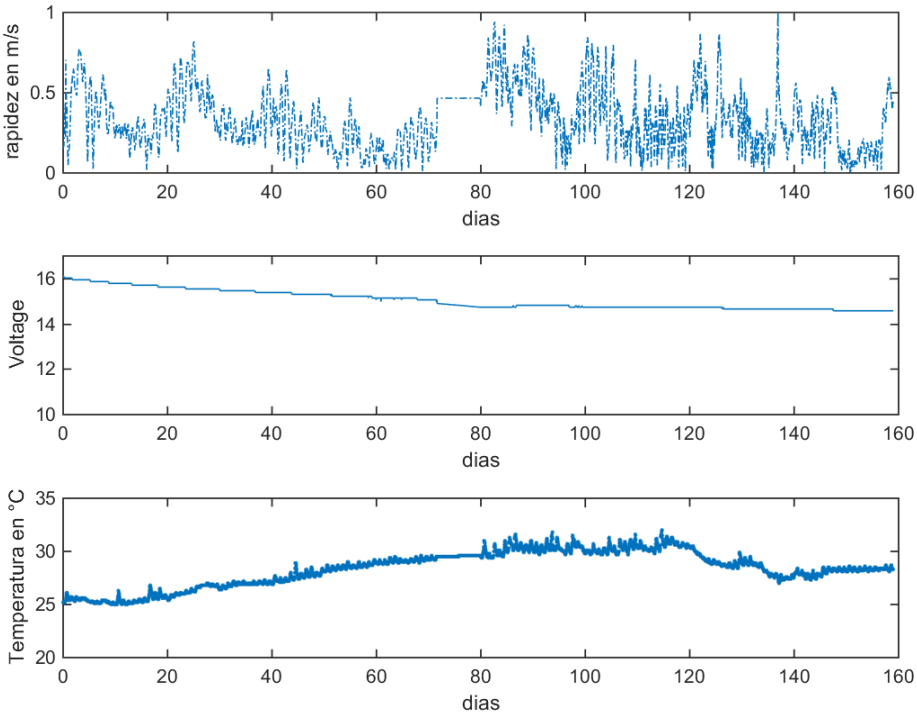

rapidez en m/s
dias
Voltage
dias
Temperatura en °C
dias

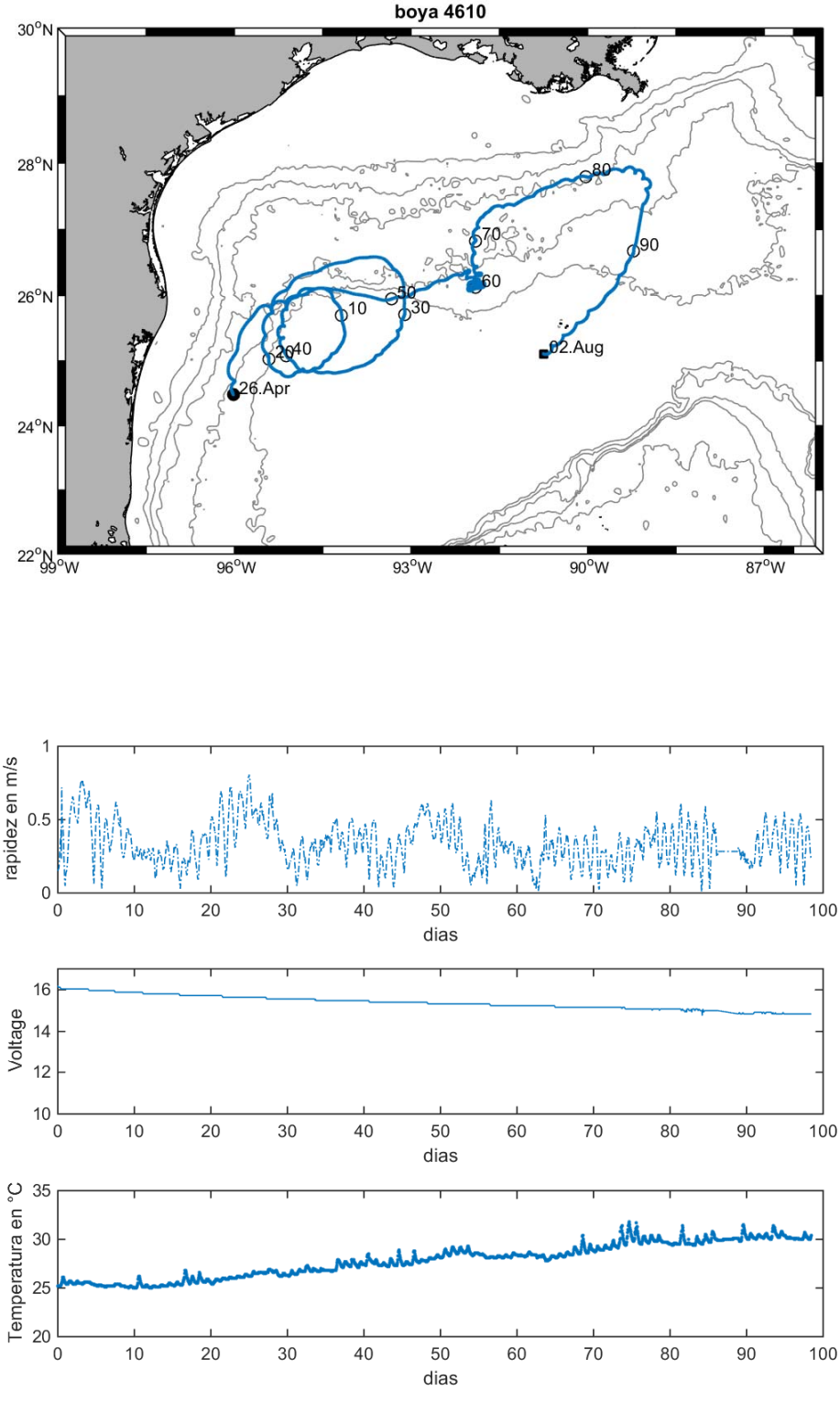

boya 5600
28°N
27°N
26°N
25°N
24°N
23°N
22°N
21°N
99°W
98°W
97°W
96°W
95°W
94°W
93°W
09.May
10
25.Apr
-40

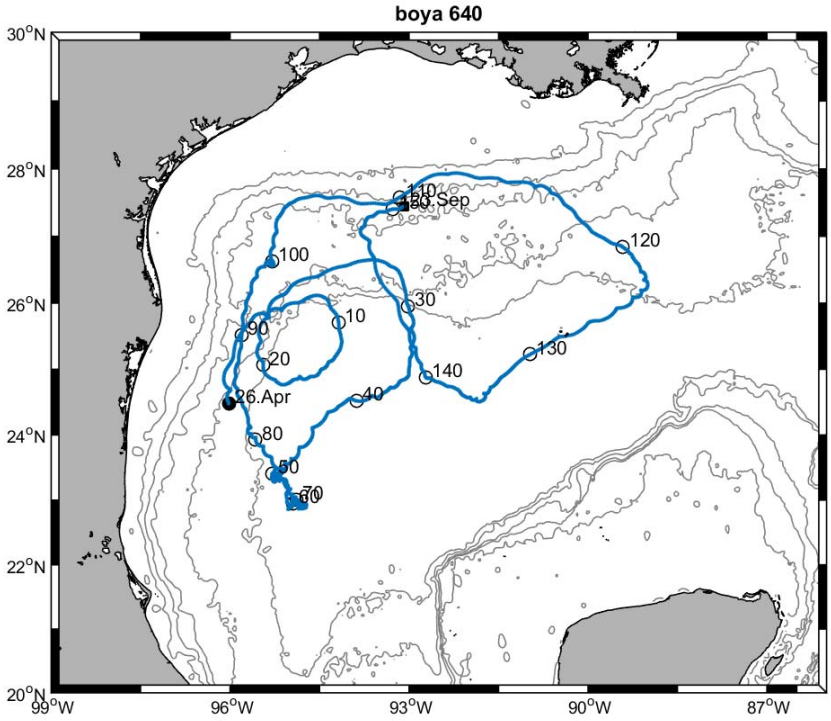

rapidez en m/s
dias
Voltage
dias
Temperatura en °C
dias

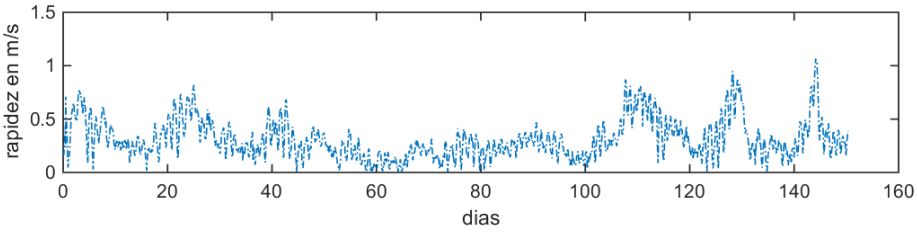
1.1.3. TRIPLET 03

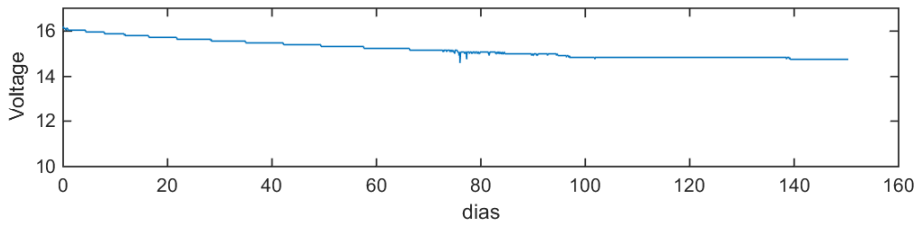


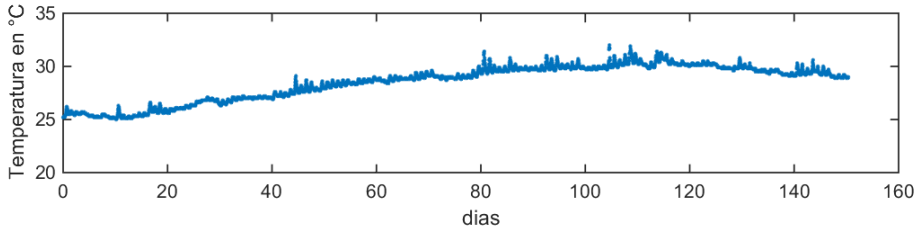



boya 4610
30°N
28°N
26°N
24°N
22°N
99°W
96°W
93°W
90°W
87°W
80
70
90
60
50
30
10
40
20
02.Aug
26.Apr
rapidez en m/s
dias
Voltage
dias
Temperatura en °C
dias

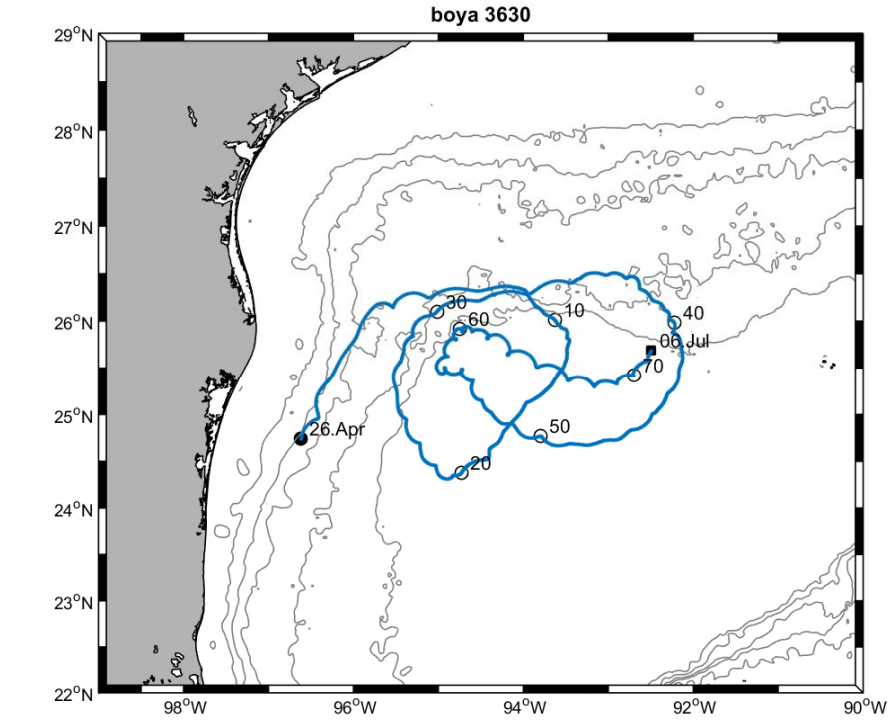

boya 640
30°N
28°N
26°N
24°N
22°N
20°N
99°W
96°W
93°W
90°W
87°W
110
30.Sep
120
100
30
10
90
130
20
140
26.Apr
40
80
50
70
60

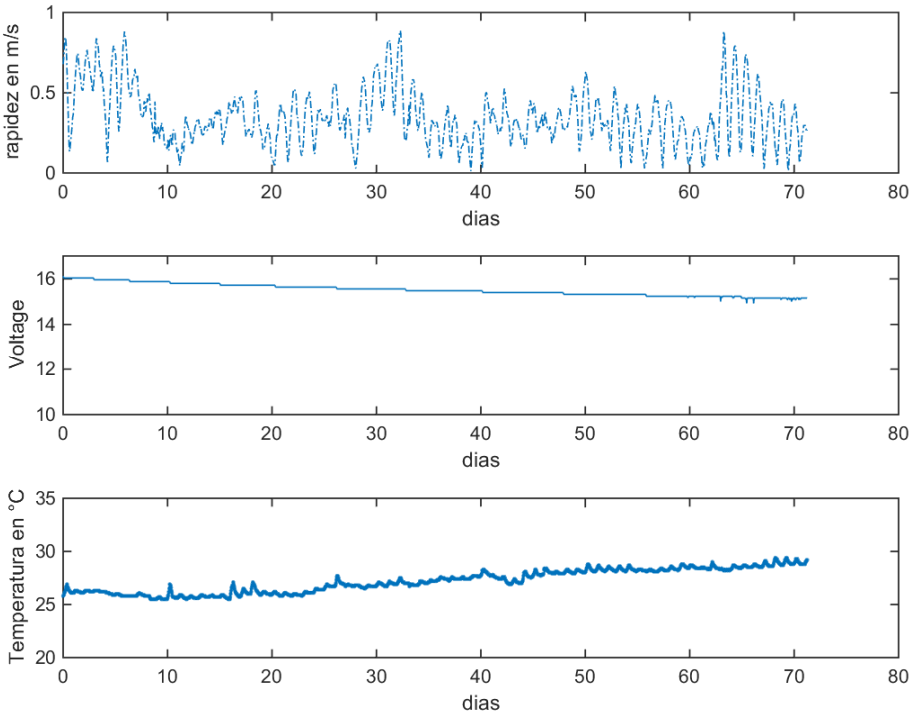

rapidez en m/s
1.5
1
0.5
0
0
20
40
60
80
100
120
140
160
dias

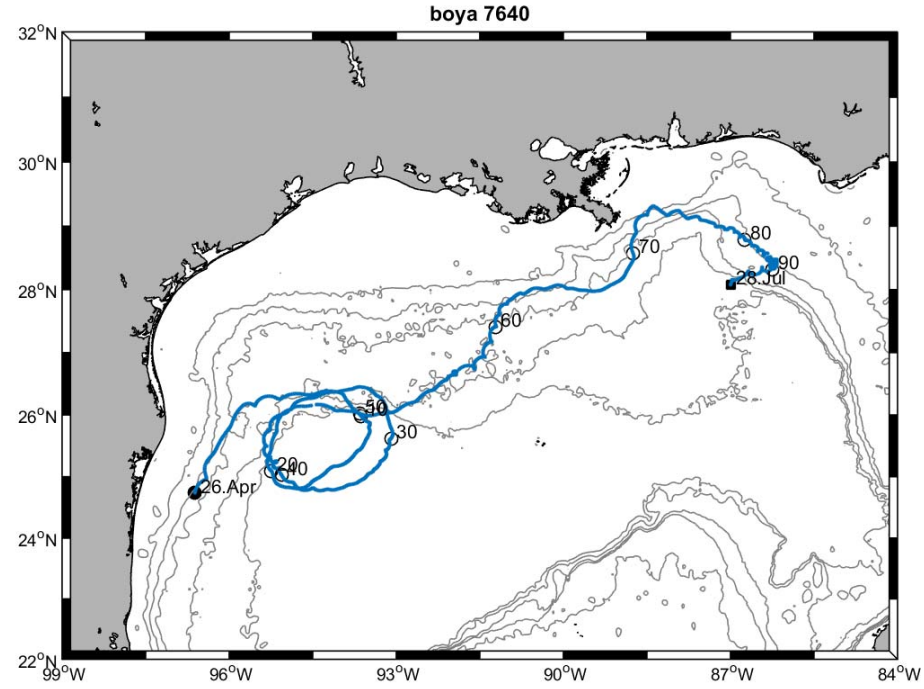

Voltage
16
14
12
10
0
20
40
60
80
100
120
140
160
dias

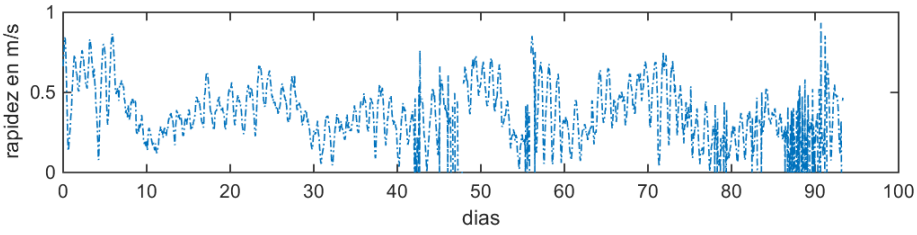

Temperatura en °C
35
30
25
20
0
20
40
60
80
100
120
140
160
dias

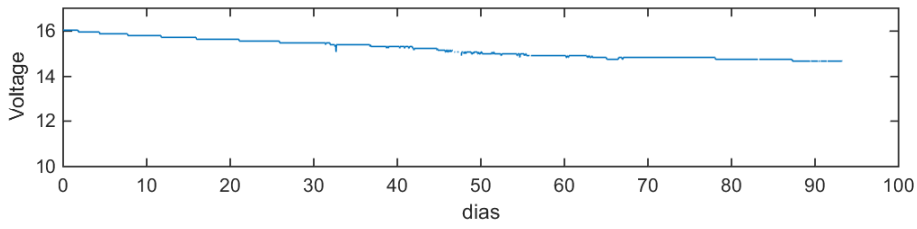
1.1.4. TRIPLET 04

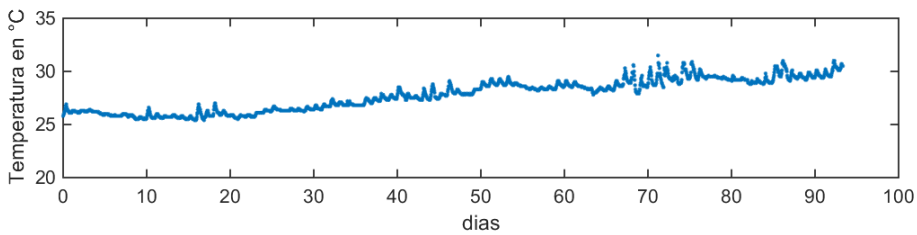


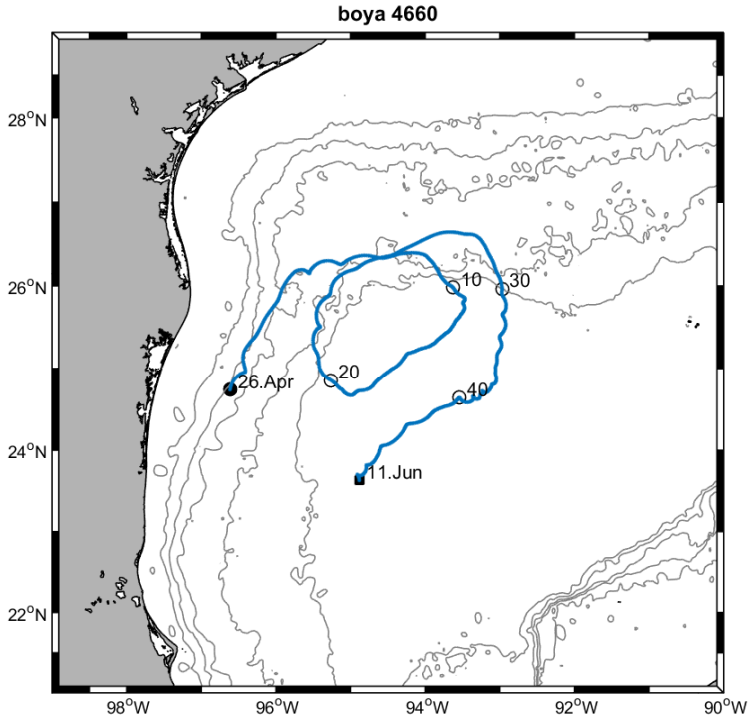


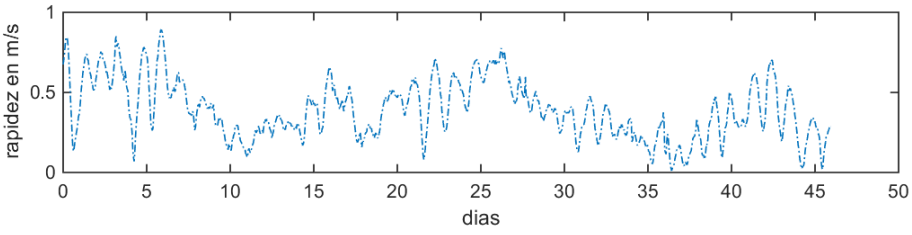

boya 7640
32°N
30°N
28°N
26°N
24°N
22°N
99°W
96°W
93°W
90°W
87°W
84°W
26.Apr
28.Jul
10
20
30
40
50
60
70
80
90

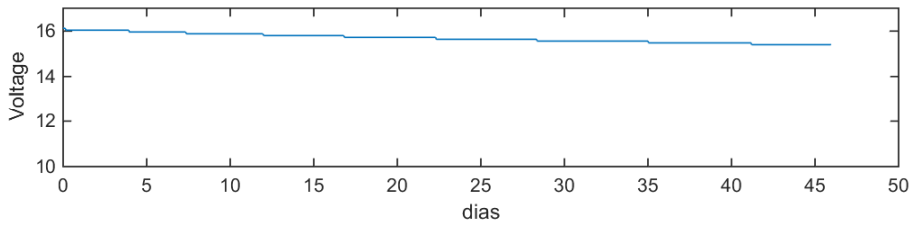

rapidez en m/s
dias

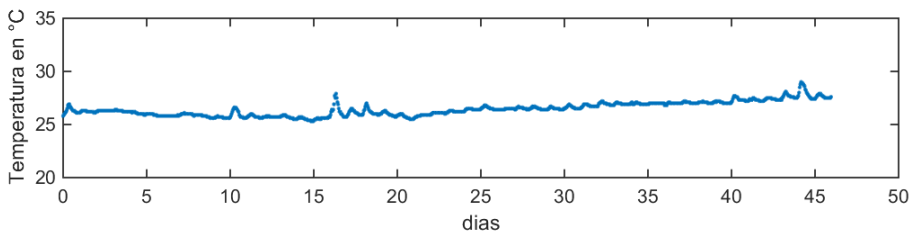

Voltage
dias


Temperatura en °C
dias

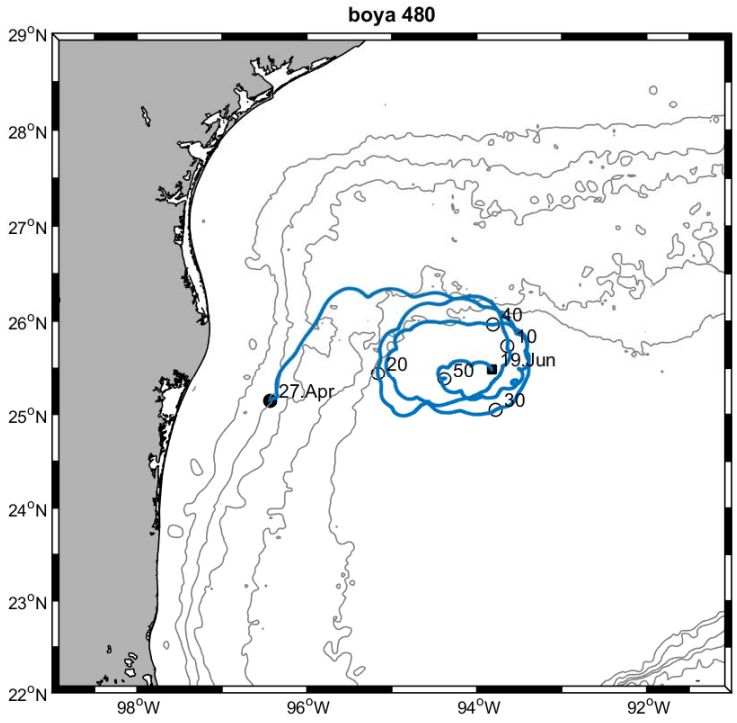

boya 4660
28°N
26°N
24°N
22°N
98°W
96°W
94°W
92°W
90°W
26.Apr
10
20
30
40
11.Jun

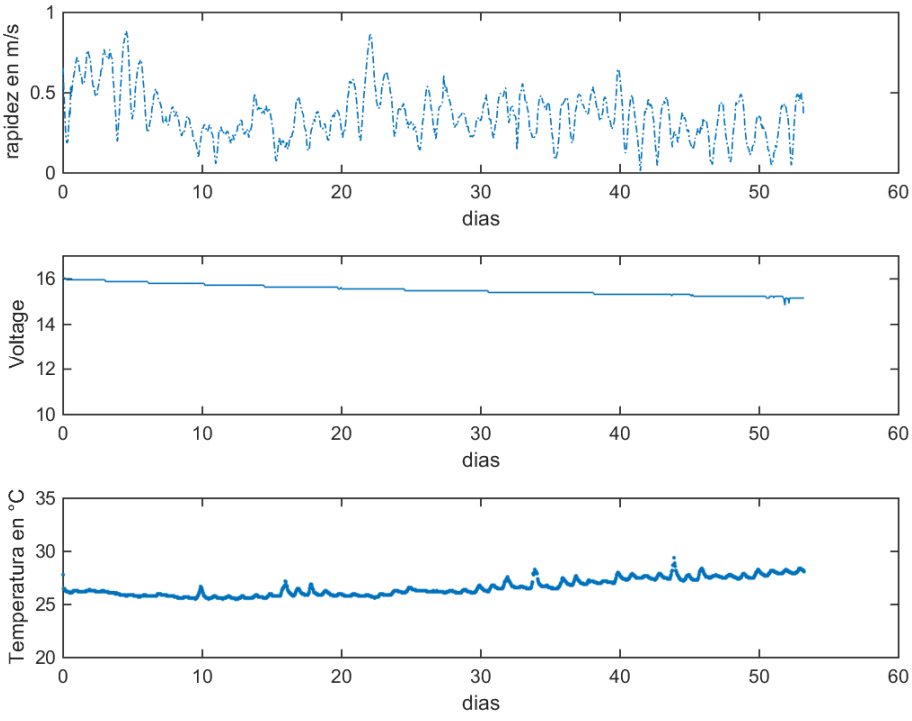

rapidez en m/s
dias

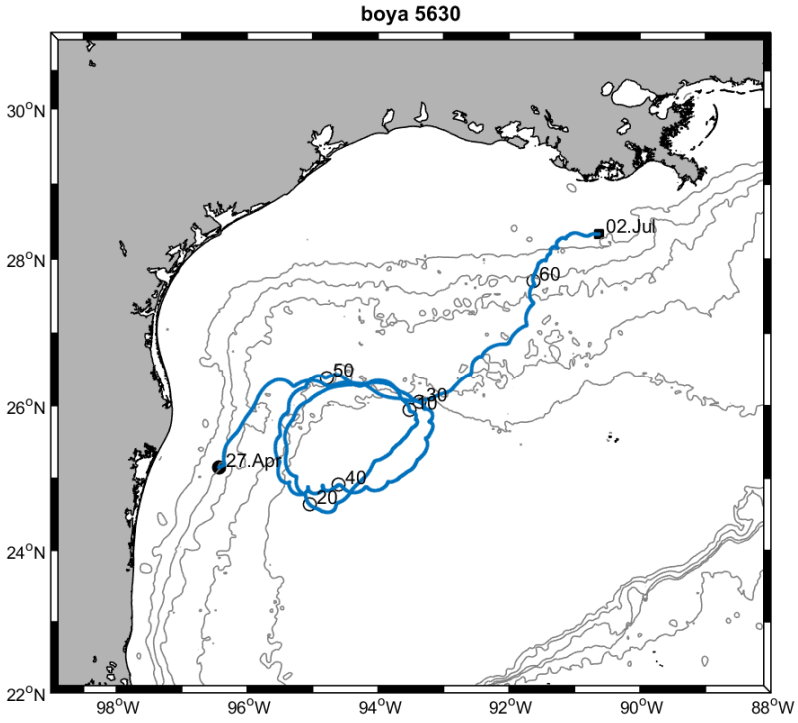

Voltage
dias

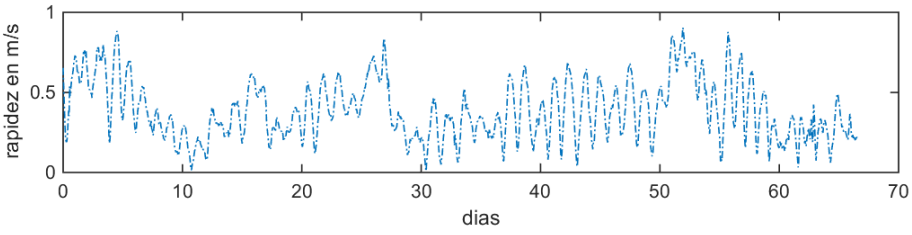

Temperatura en °C
dias

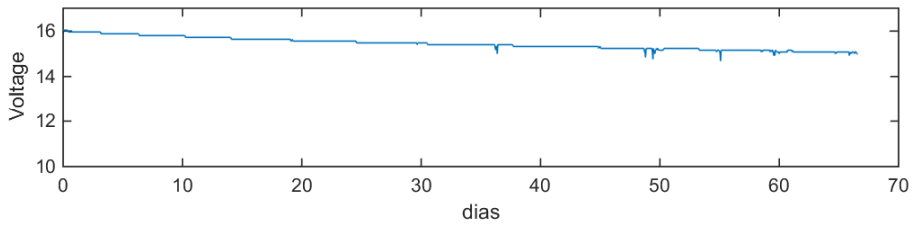
1.1.5. TRIPLET 05

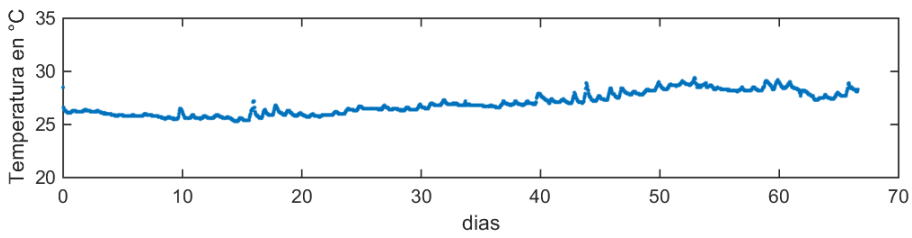


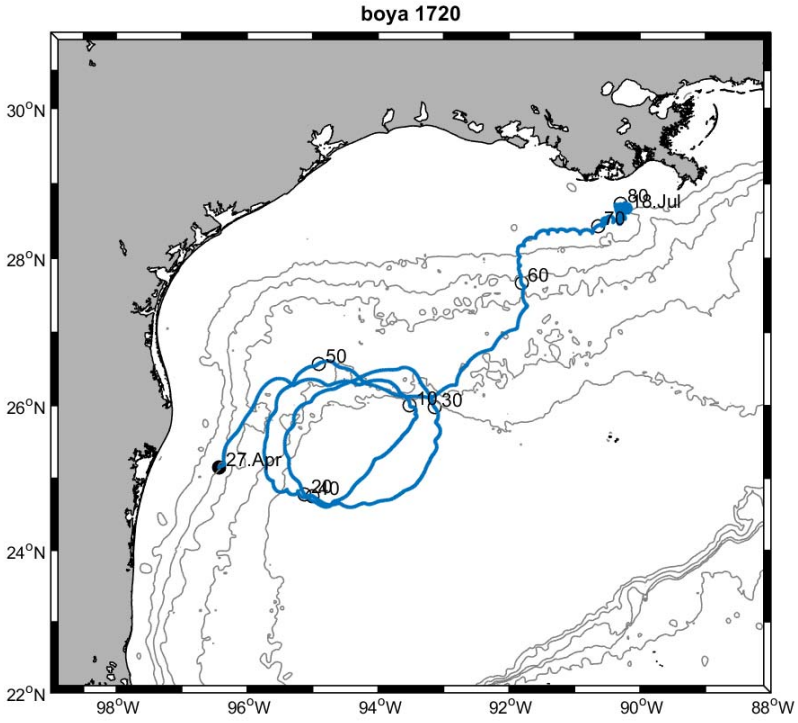


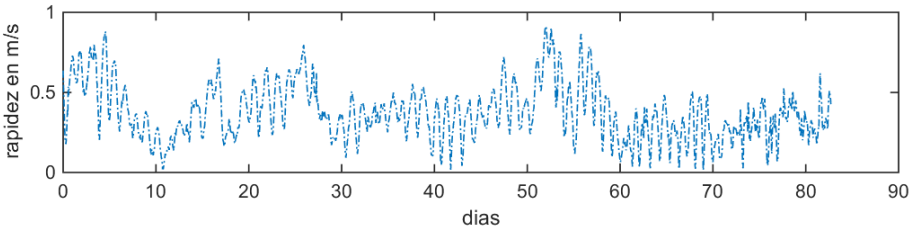

boya 5630
30°N
28°N
26°N
24°N
22°N
98°W
96°W
94°W
92°W
90°W
88°W
02.Jul
60
50
30
10
27.Apr
40
20

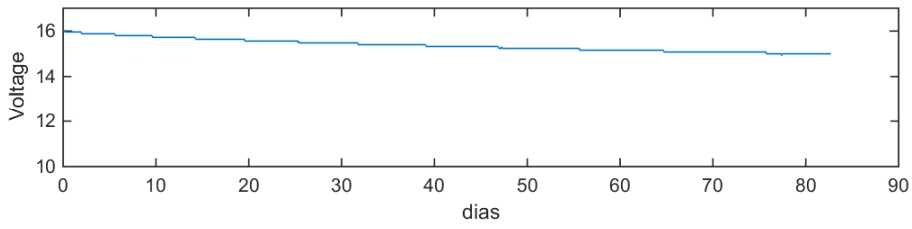

rapidez en m/s
1
0.5
0
0
10
20
30
40
50
60
70
dias

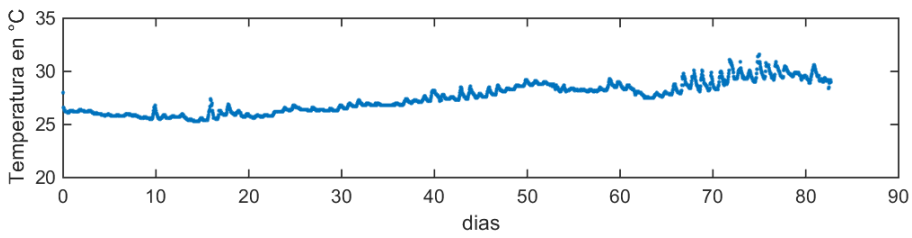

Voltage
16
14
12
10
0
10
20
30
40
50
60
70
dias


Temperatura en °C
35
30
25
20
0
10
20
30
40
50
60
70
dias

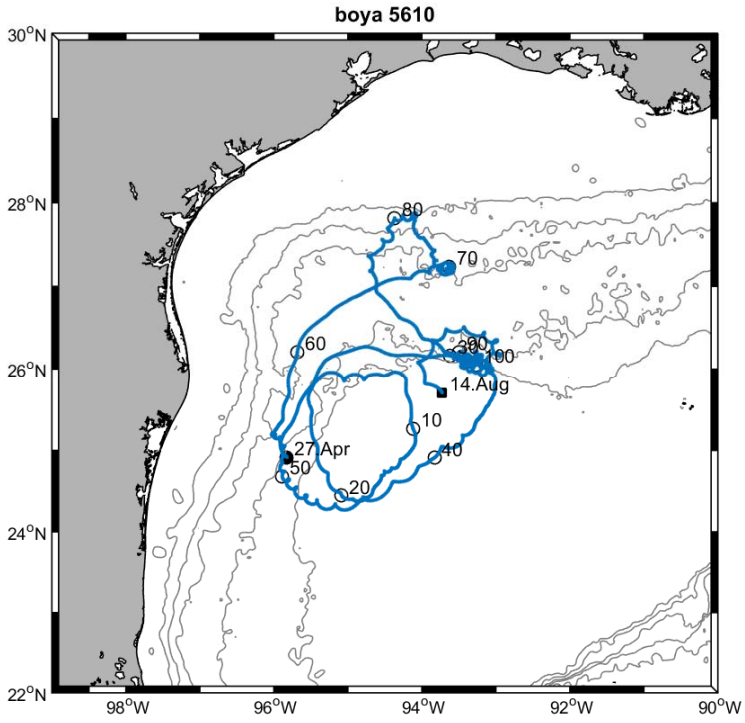

boya 1720
30°N
28°N
26°N
24°N
22°N
98°W
96°W
94°W
92°W
90°W
88°W
80
18.Jul
70
60
50
18.30
27.Apr
40

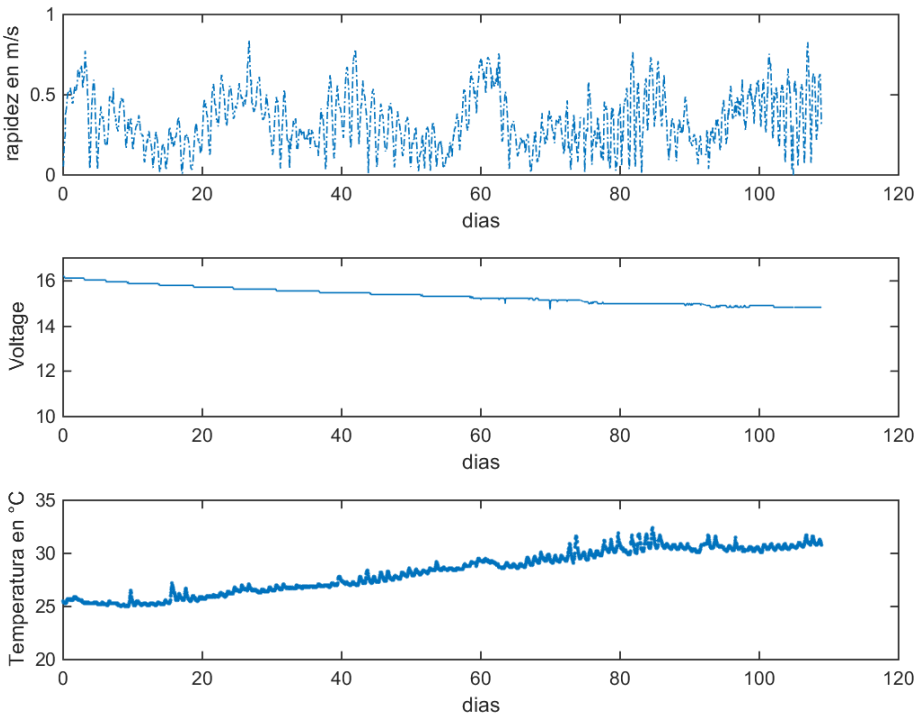

rapidez en m/s
1
0.5
0
0
10
20
30
40
50
60
70
80
90
dias

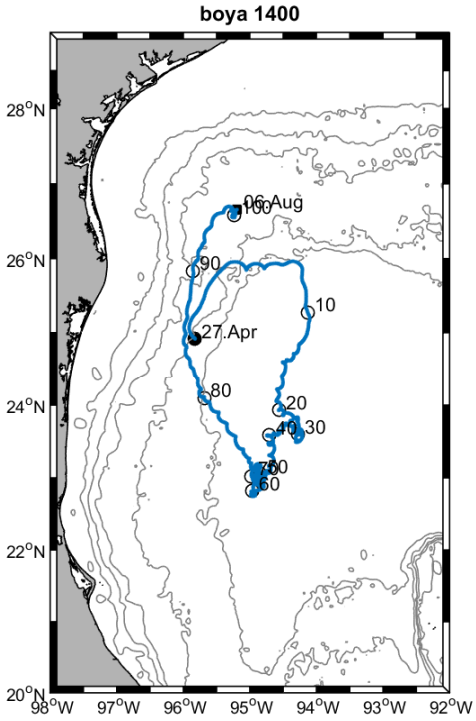

Voltage
16
14
12
10
0
10
20
30
40
50
60
70
80
90
dias

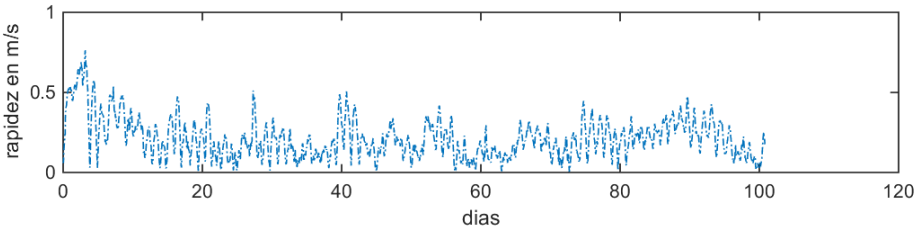

Temperatura en °C
35
30
25
20
0
10
20
30
40
50
60
70
80
90
dias

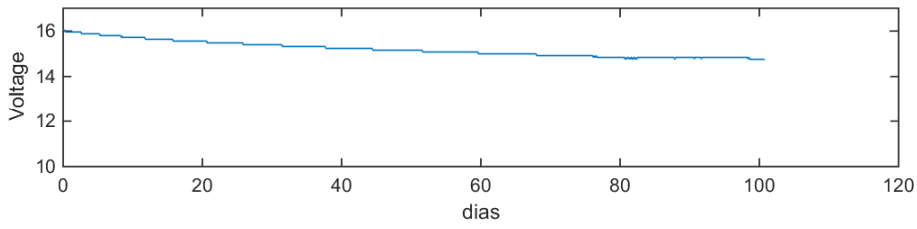
1.1.6. TRIPLET 06

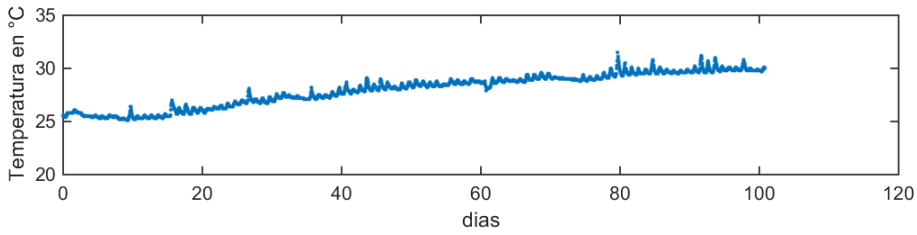


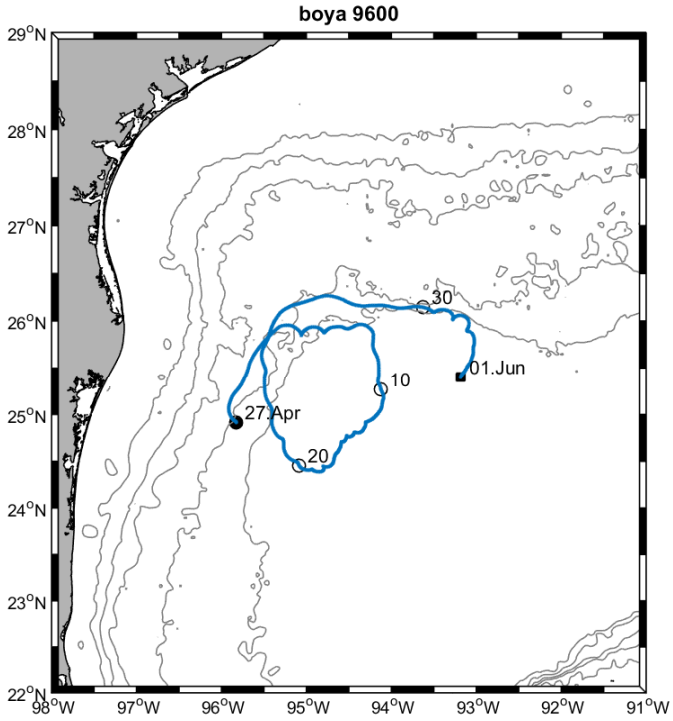


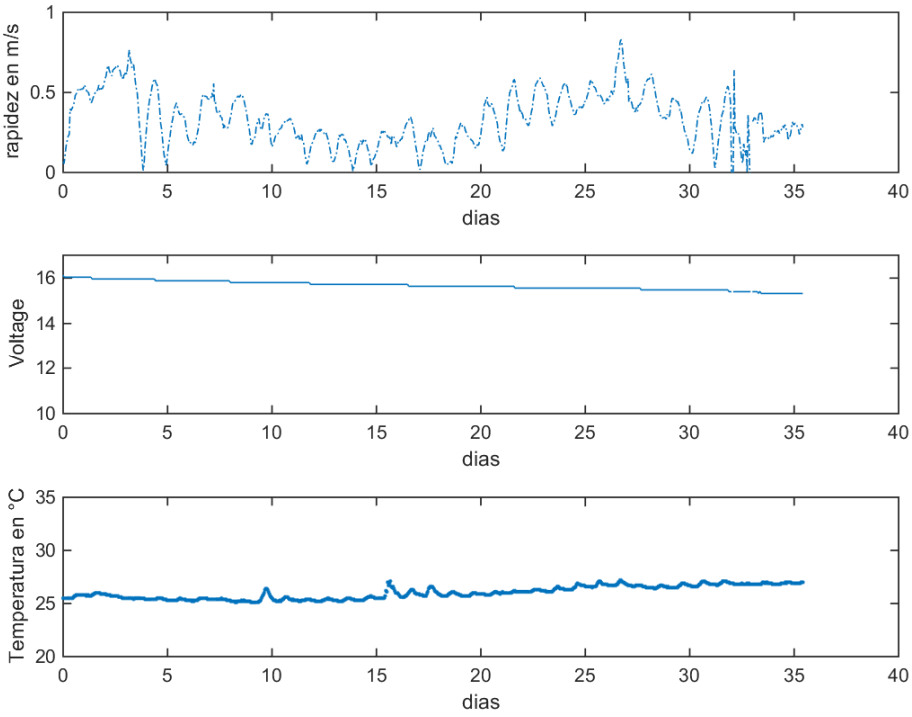

boya 1400
28°N
26°N
24°N
22°N
20°N
98°W
97°W
96°W
95°W
94°W
93°W
92°W
06 Aug
100
90
10
27 Apr
80
20
40
30
70
60


rapidez en m/s
1
0.5
0
0
20
40
60
80
100
120
dias

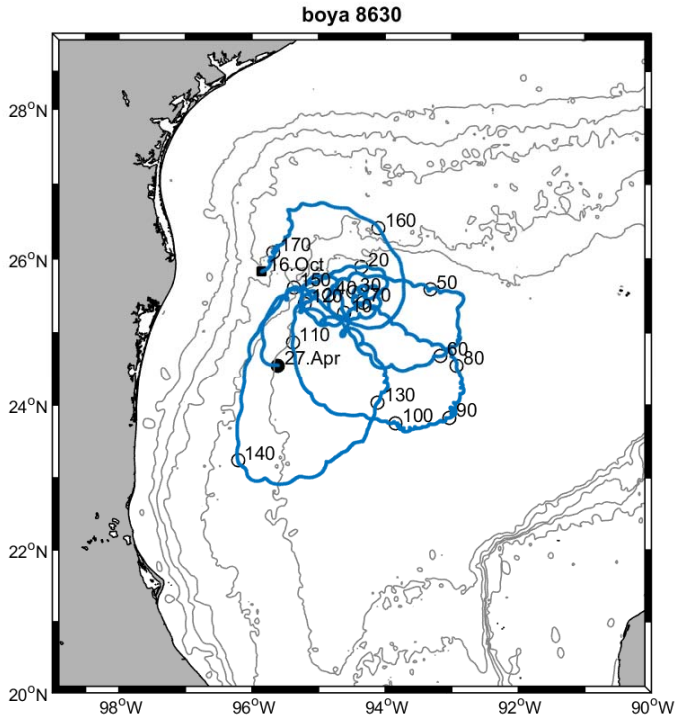

Voltage
16
14
12
10
0
20
40
60
80
100
120
dias

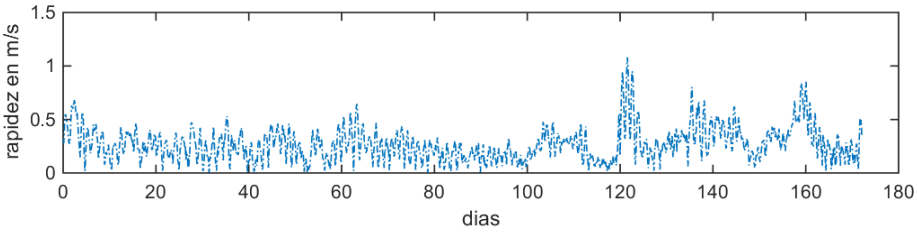

Temperatura en °C
35
30
25
20
0
20
40
60
80
100
120
dias

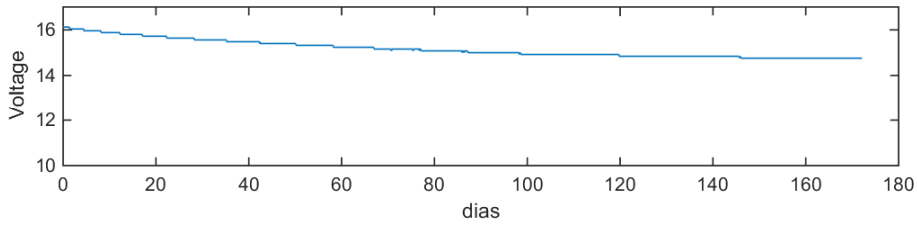

boya 9600
29°N
28°N
27°N
26°N
25°N
24°N
23°N
22°N
98°W
97°W
96°W
95°W
94°W
93°W
92°W
91°W
30
01.Jun
10
27.Apr
20

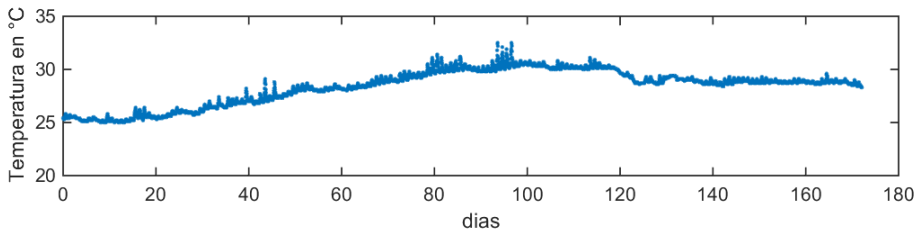

rapidez en m/s
0
0.5
1
0
5
10
15
20
25
30
35
40
dias
Voltage
10
12
14
16
dias
Temperatura en °C
20
25
30
35
dias

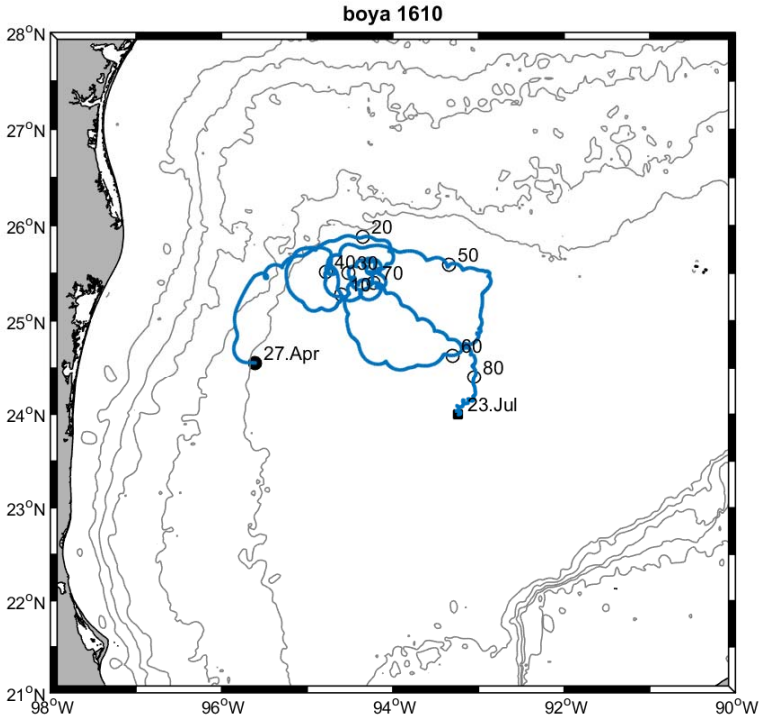
1.1.7. TRIPLET 07

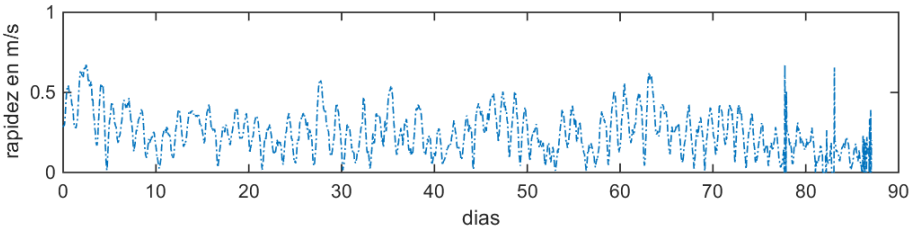


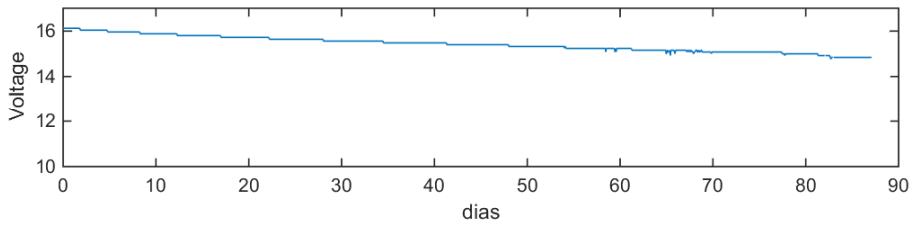


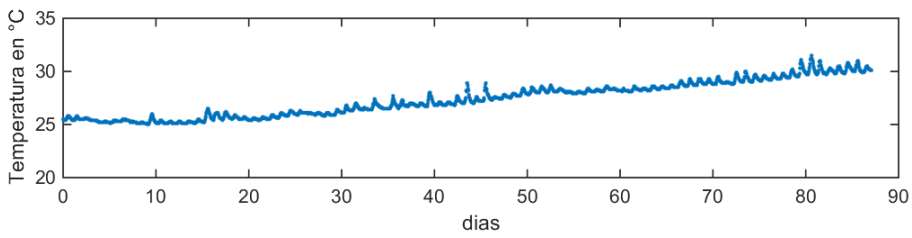


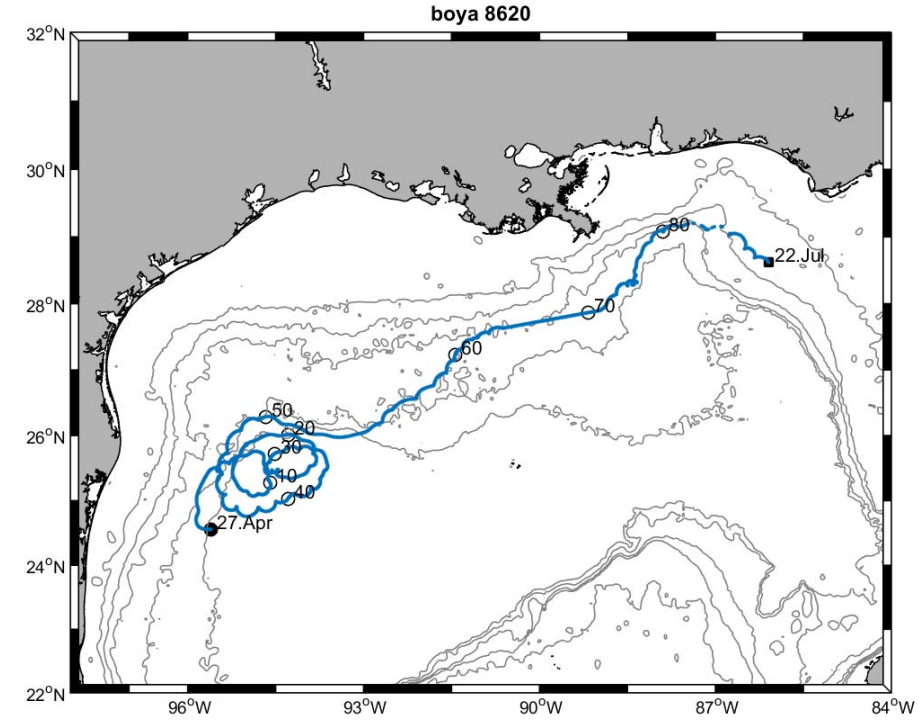


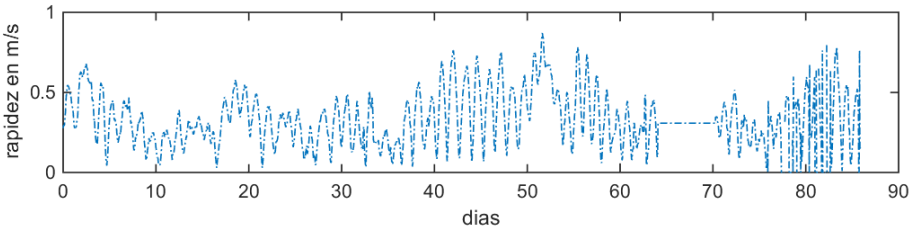

boya 1610
28°N
27°N
26°N
25°N
24°N
23°N
22°N
21°N
98°W
96°W
94°W
92°W
90°W
20
30
40
50
60
70
80
27.Apr
23.Jul

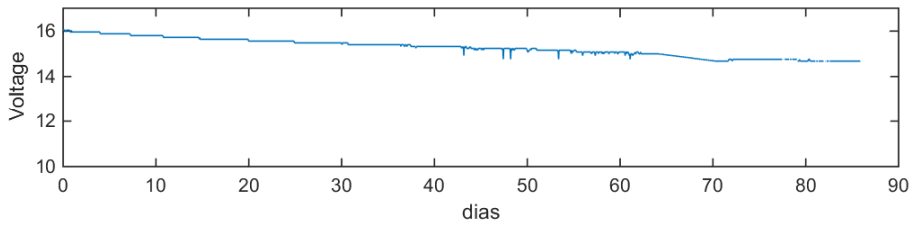

rapidez en m/s
dias

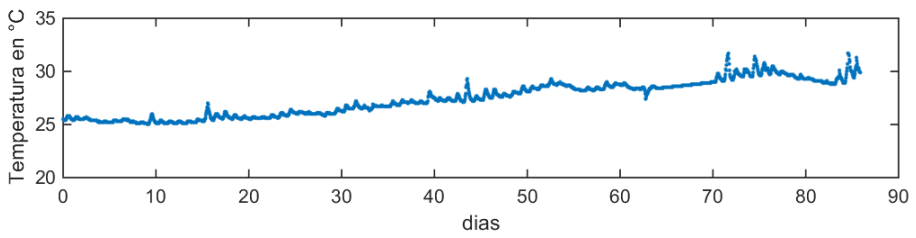

Voltage
dias


Temperatura en °C
dias

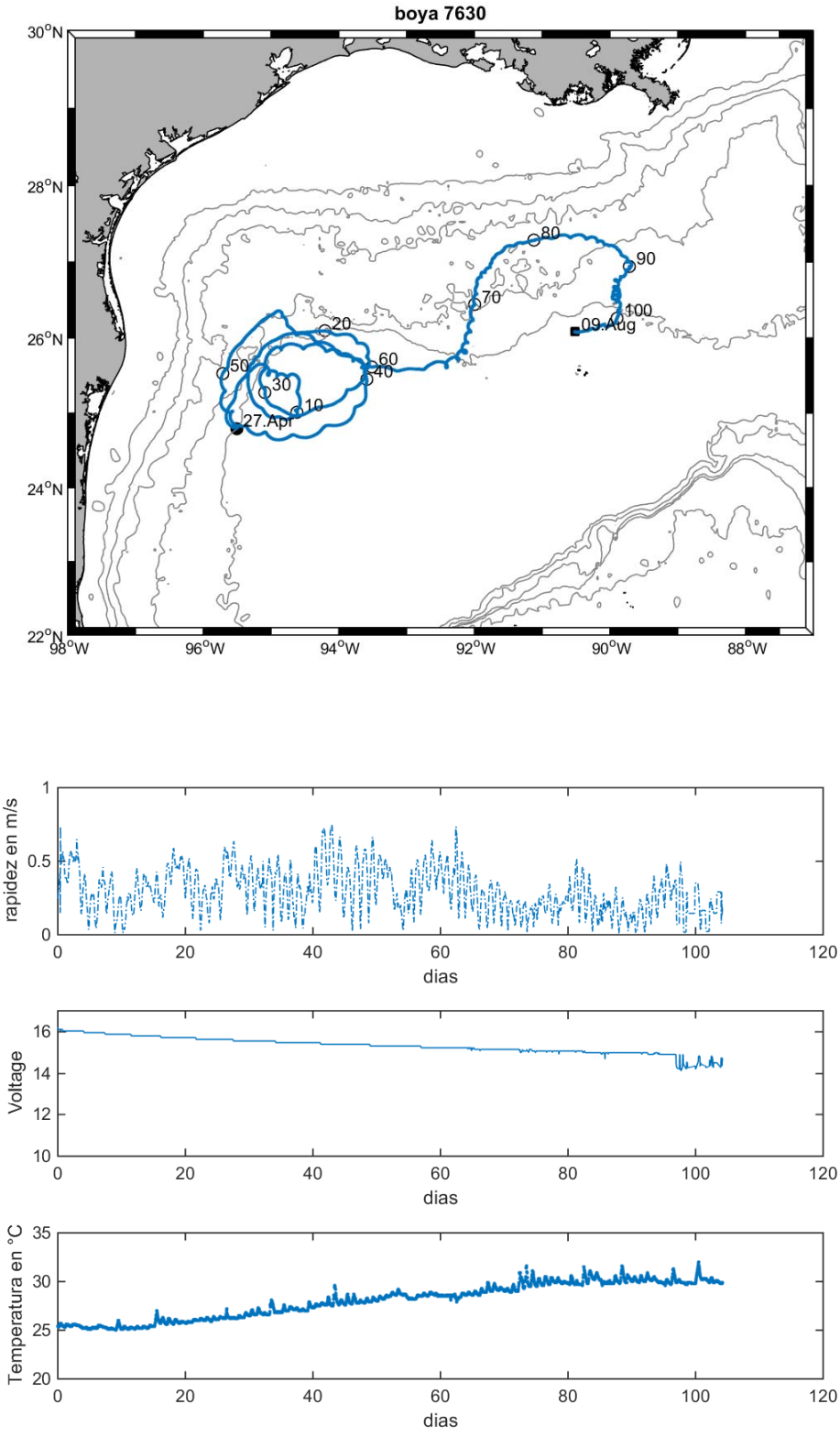

boya 8620
32°N
30°N
28°N
26°N
24°N
22°N
96°W
93°W
90°W
87°W
84°W
80
22.Jul
70
60
50
20
30
10
40
27.Apr

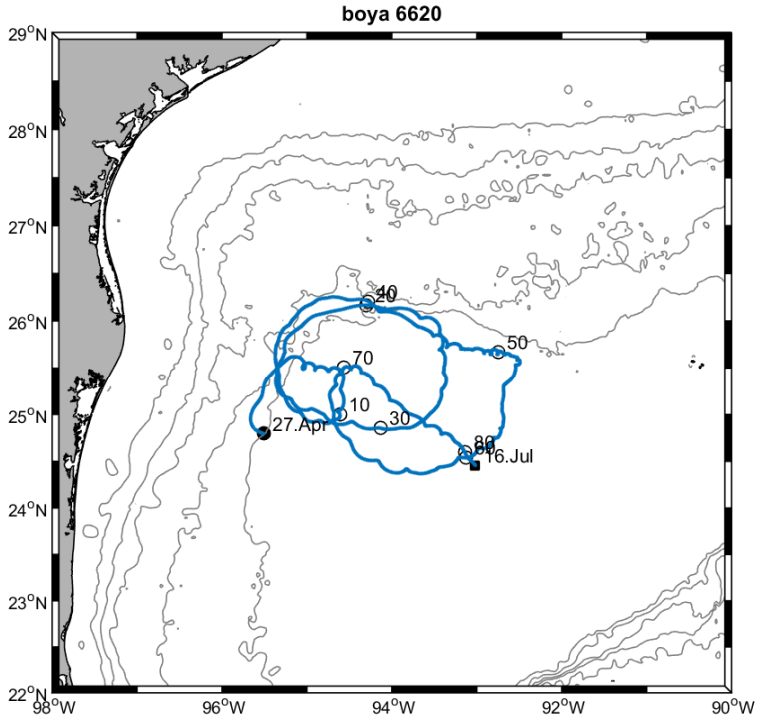

rapidez en m/s
1
0.5
0
0
10
20
30
40
50
60
70
80
90
dias

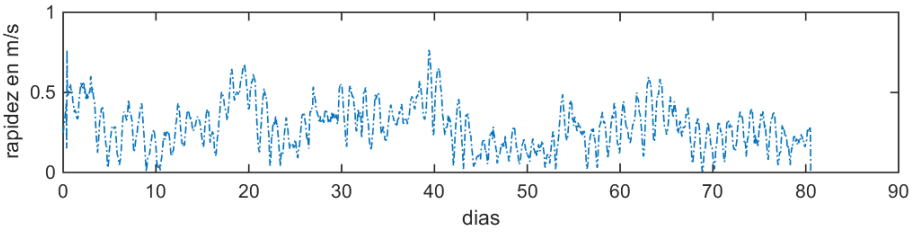

Voltage
16
14
12
10
0
10
20
30
40
50
60
70
80
90
dias

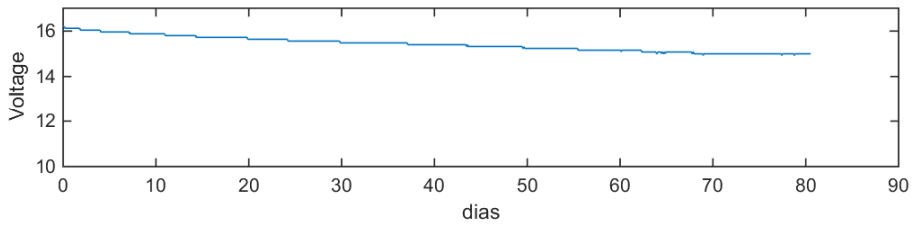

Temperatura en °C
35
30
25
20
0
10
20
30
40
50
60
70
80
90
dias

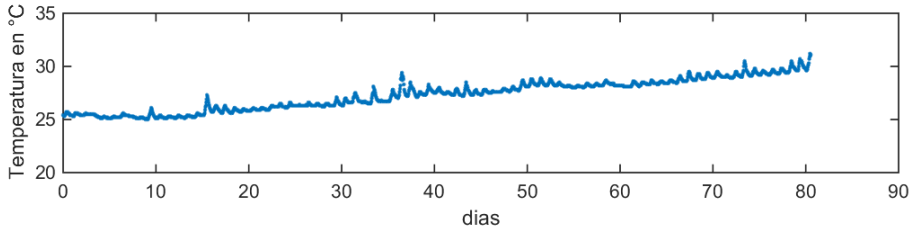
1.1.8. TRIPLET 08

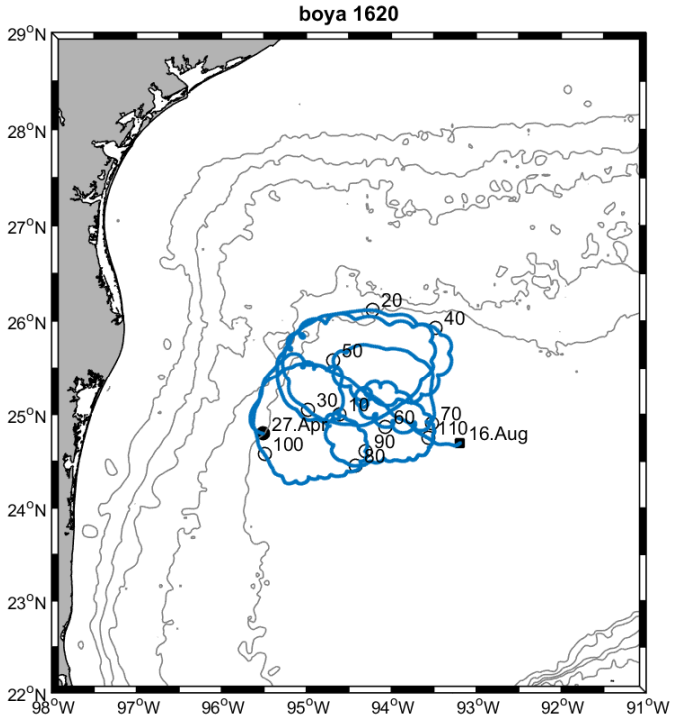


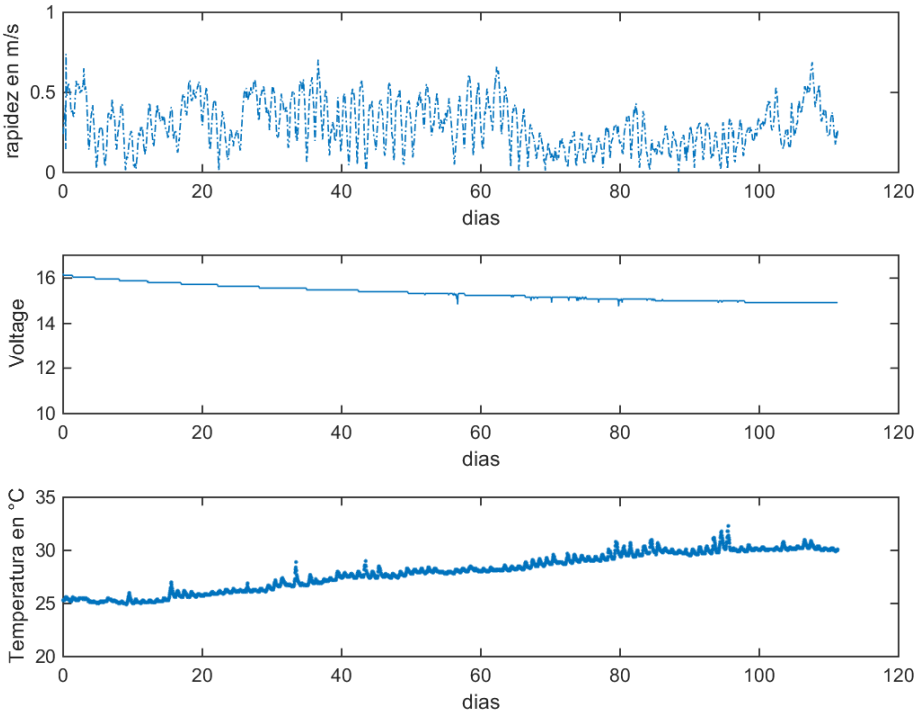

boya 6620
29°N
28°N
27°N
26°N
25°N
24°N
23°N
22°N
98°W
96°W
94°W
92°W
90°W
40
20
50
70
10
30
27.Apr
16.Jul


rapidez en m/s
1
0.5
0
0
10
20
30
40
50
60
70
80
90
dias

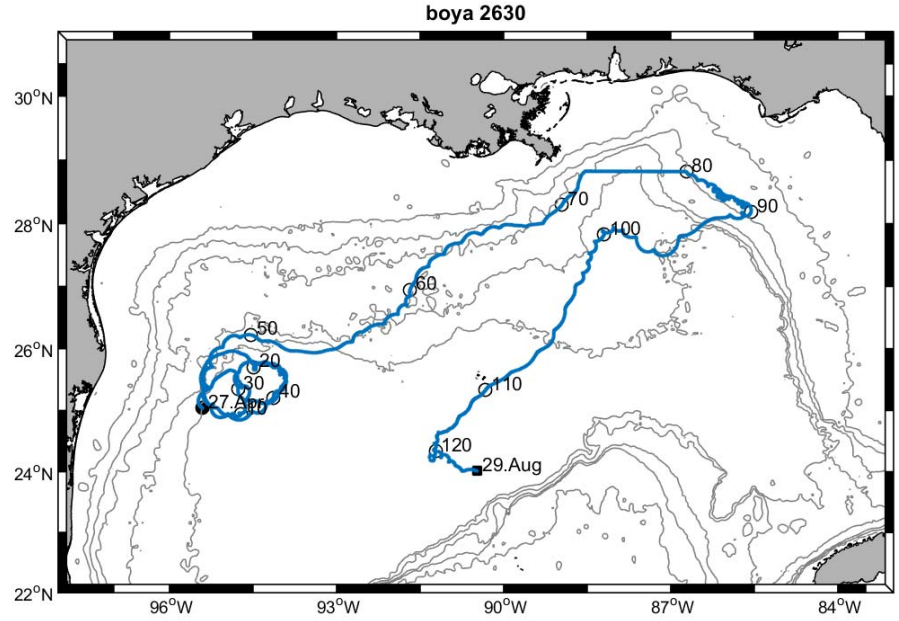

Voltage
16
14
12
10
0
10
20
30
40
50
60
70
80
90
dias

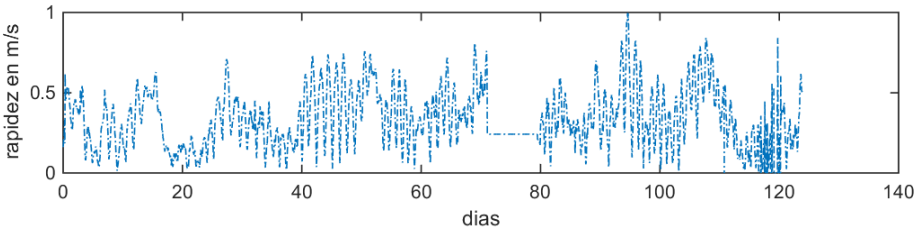

Temperatura en °C
35
30
25
20
0
10
20
30
40
50
60
70
80
90
dias

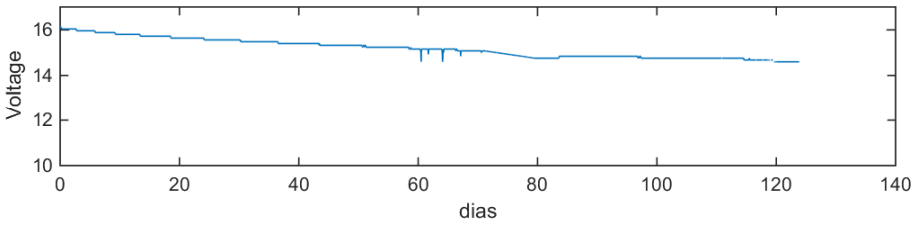

boya 1620
29°N
28°N
27°N
26°N
25°N
24°N
23°N
22°N
98°W
97°W
96°W
95°W
94°W
93°W
92°W
91°W
20
40
50
30
10
60
70
110
27.Apr
16.Aug
100
90
80

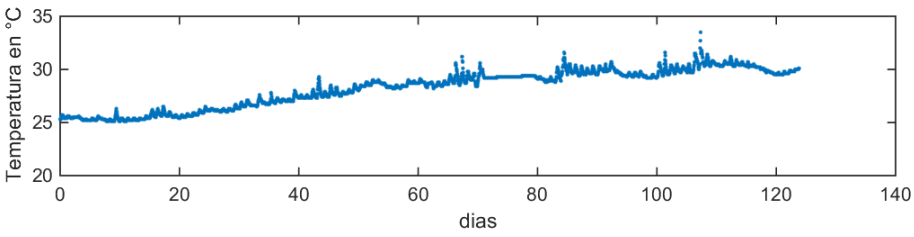

rapidez en m/s
0
0.5
1
0
20
40
60
80
100
120
dias
Voltage
10
12
14
16
dias
Temperatura en °C
20
25
30
35
dias

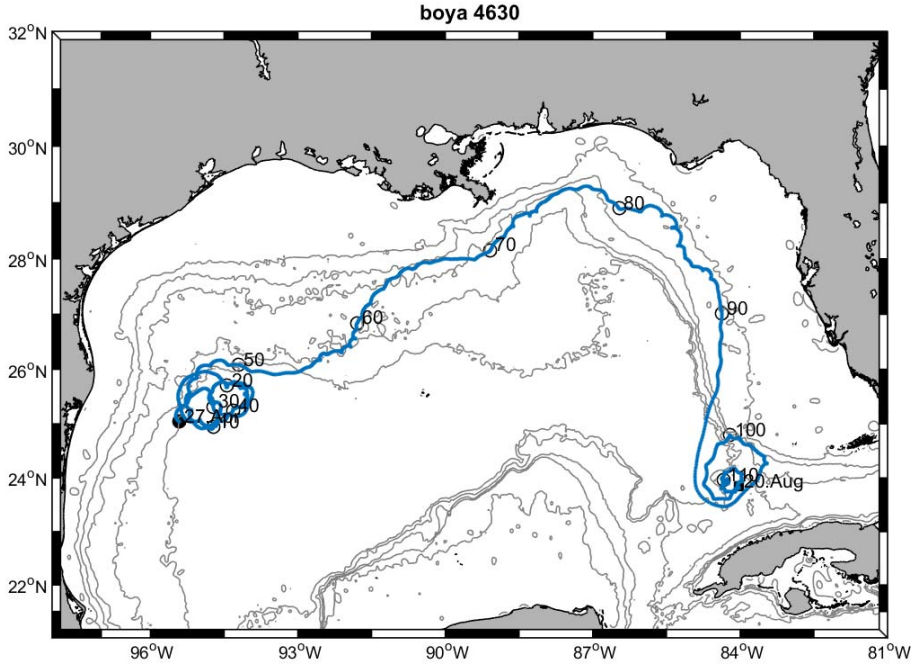
1.1.9. TRIPLET 09

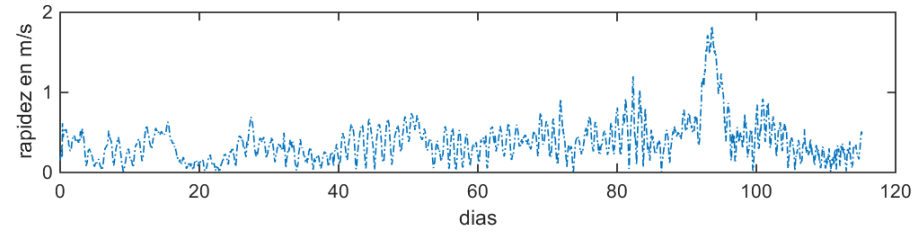


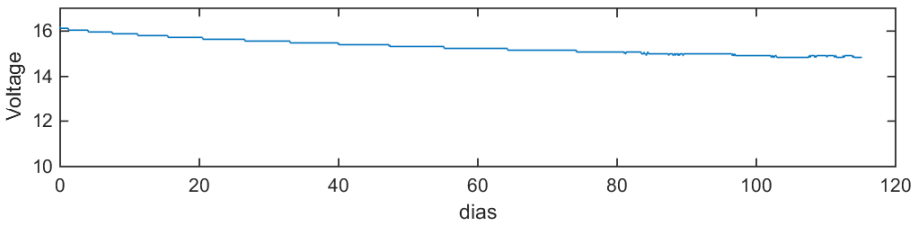


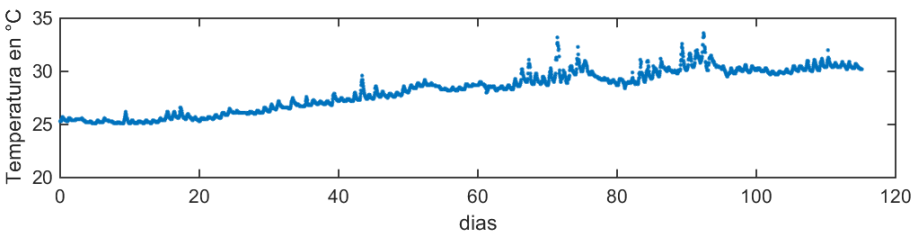


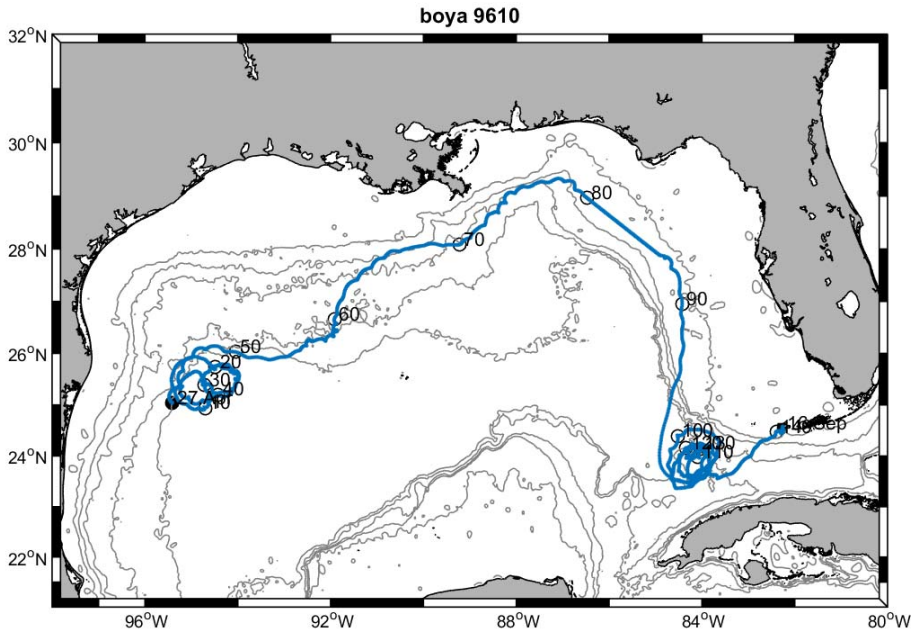


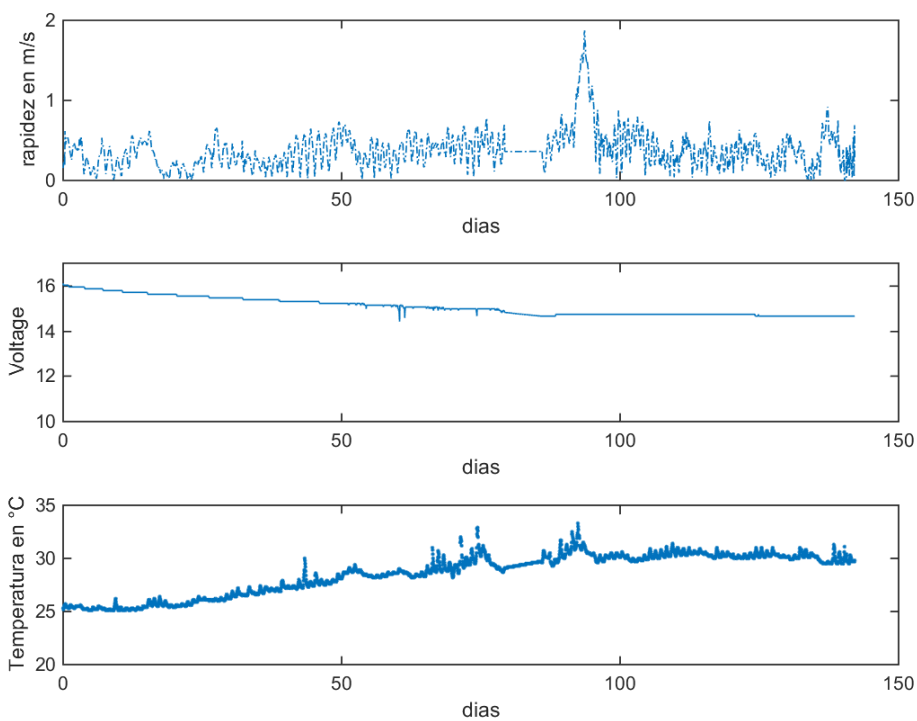

boya 4630
32°N
30°N
28°N
26°N
24°N
22°N
96°W
93°W
90°W
87°W
84°W
81°W
10
20
30
40
50
60
70
80
90
100
110
120 Aug


rapidez en m/s
dias

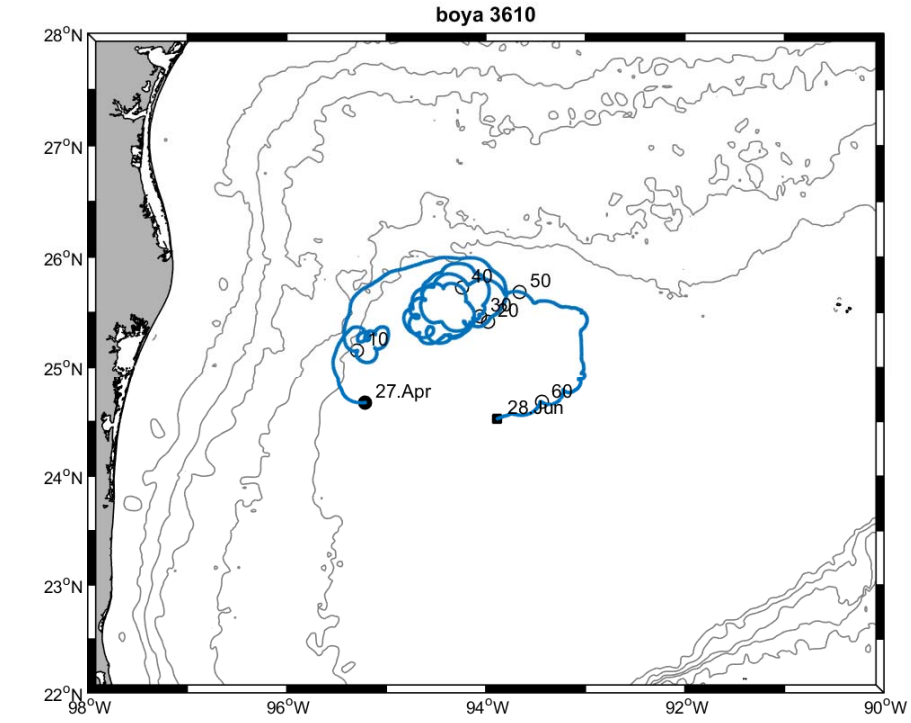

Voltage
dias

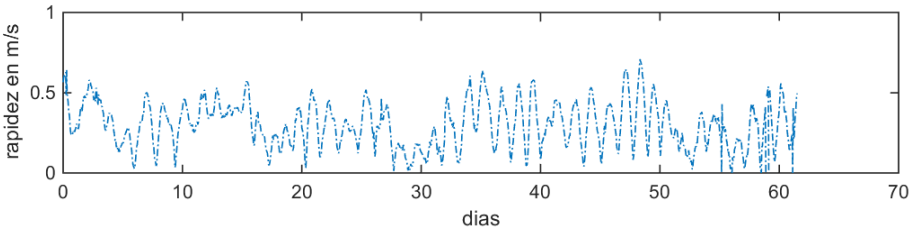

Temperatura en °C
dias

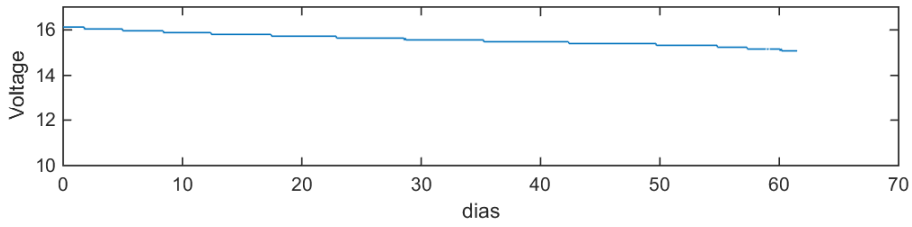

boya 9610
32°N
30°N
28°N
26°N
24°N
22°N
96°W
92°W
88°W
84°W
80°W
80
70
60
50
20
30
90
100
110
Sep

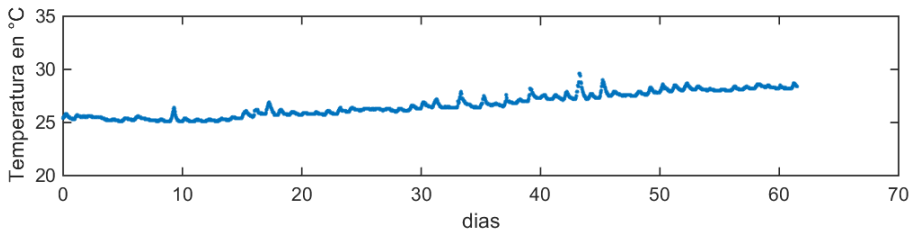

rapidez en m/s
dias
Voltage
dias
Temperatura en °C
dias

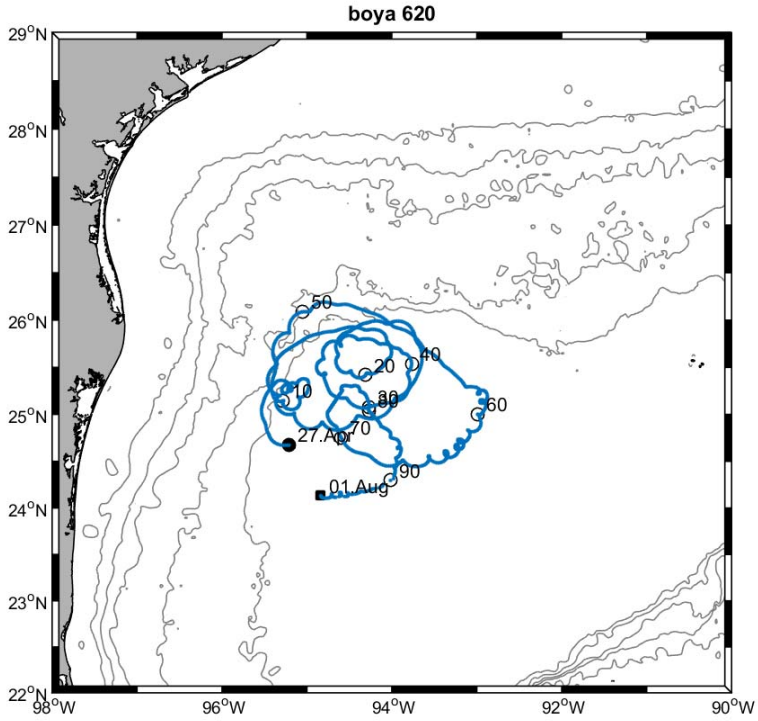
1.1.10. TRIPLET 10

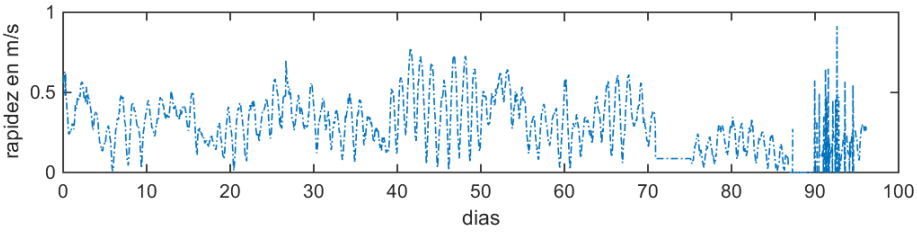


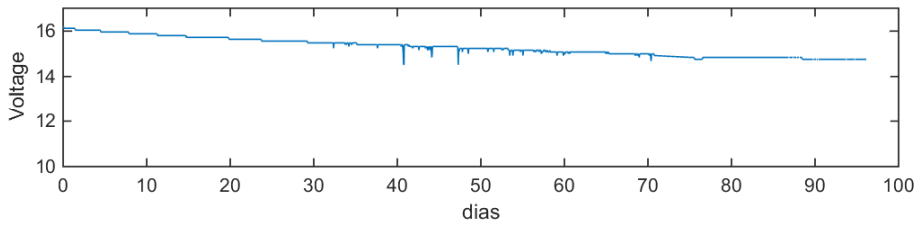


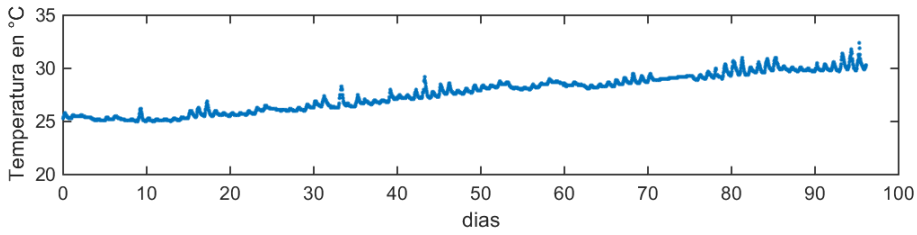


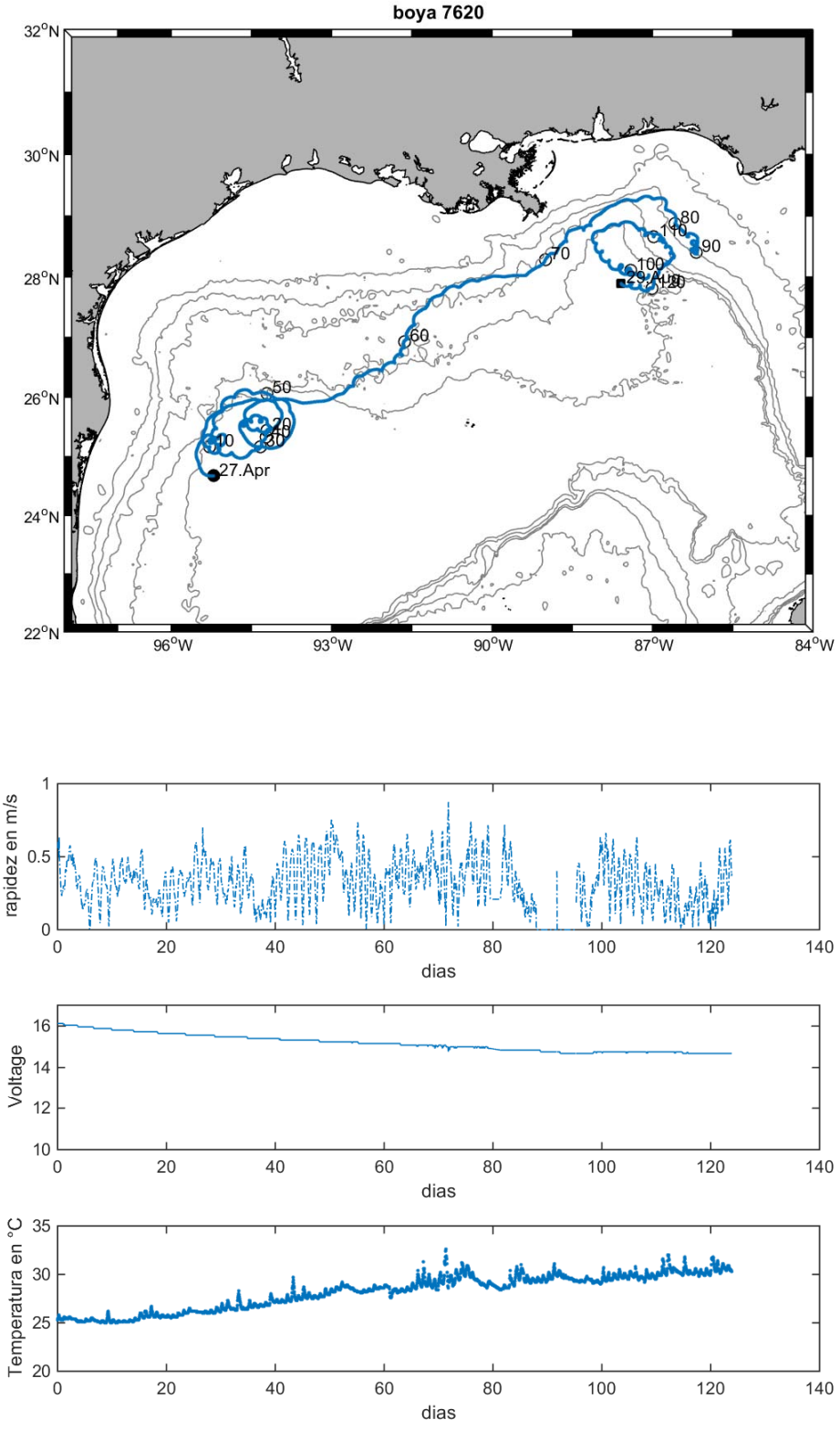



boya 620
29°N
28°N
27°N
26°N
25°N
24°N
23°N
22°N
98°W
96°W
94°W
92°W
90°W
50
40
20
10
30
60
27.Apr
70
90
01.Aug

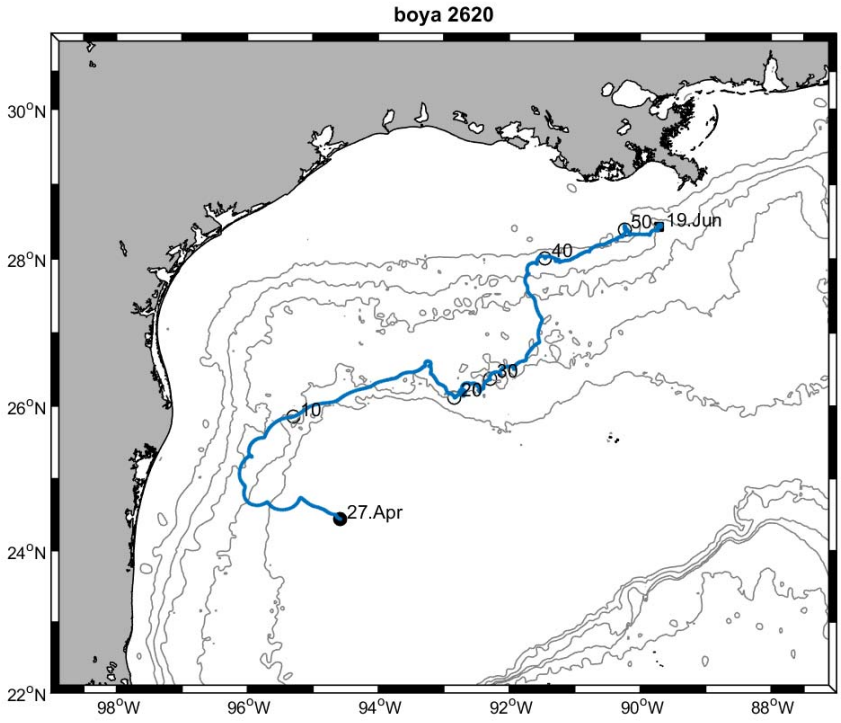

rapidez en m/s
1
0.5
0
0
10
20
30
40
50
60
70
80
90
100
dias

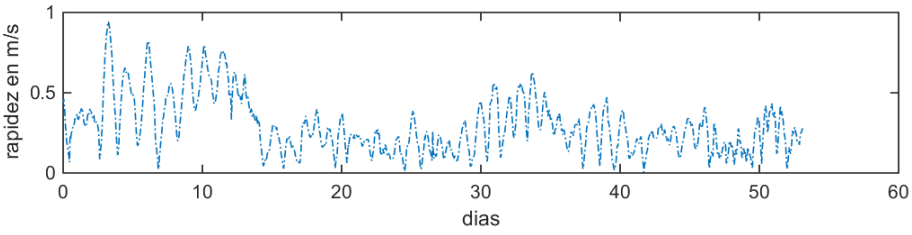

Voltage
16
14
12
10
0
10
20
30
40
50
60
70
80
90
100
dias

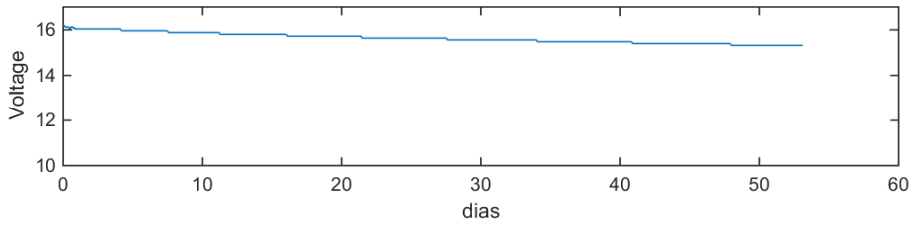

Temperatura en °C
35
30
25
20
0
10
20
30
40
50
60
70
80
90
100
dias

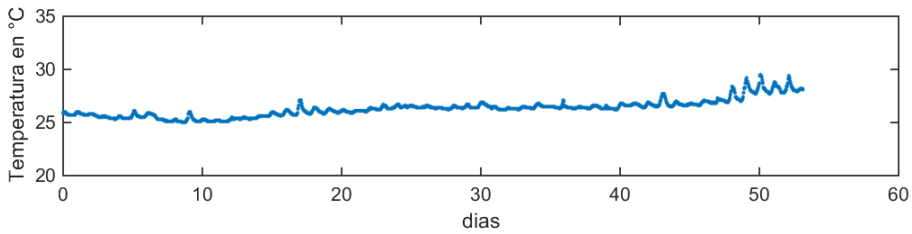

boya 7620
32°N
30°N
28°N
26°N
24°N
22°N
96°W
93°W
90°W
87°W
84°W
27.Apr
rapidez en m/s
dias
Voltage
dias
Temperatura en °C
dias

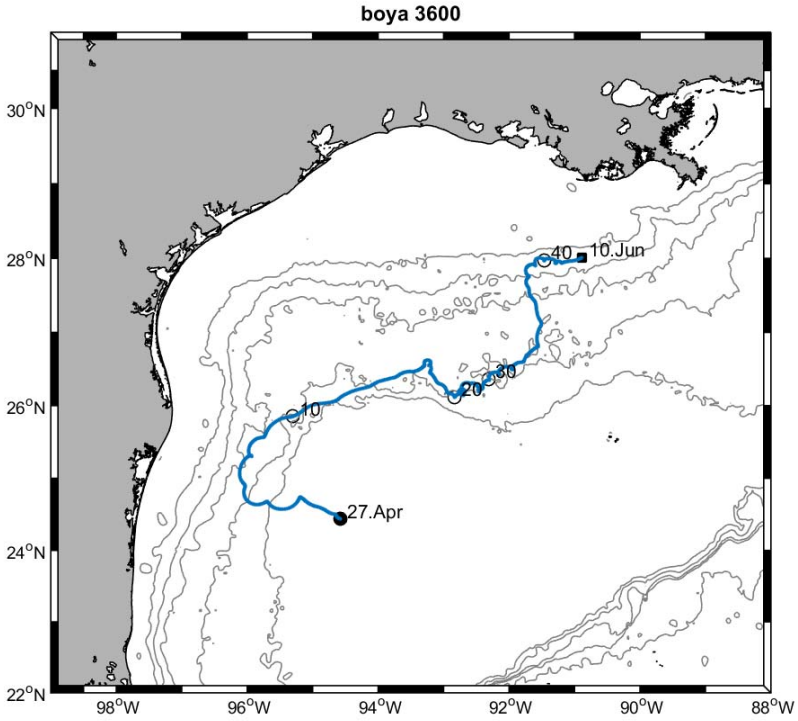
1.1.11. TRIPLET 11

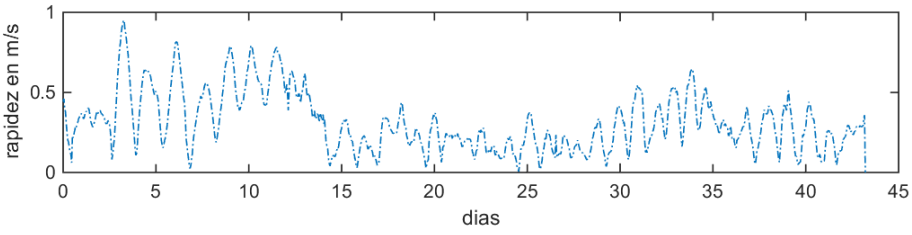


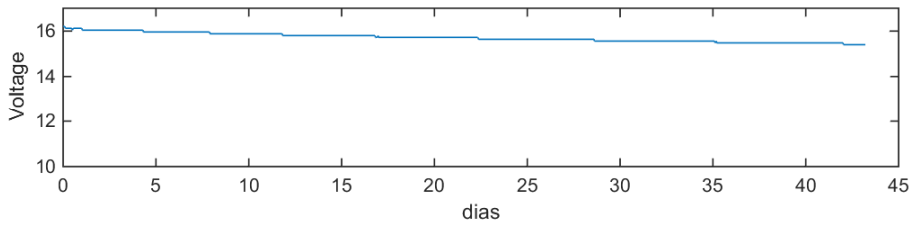


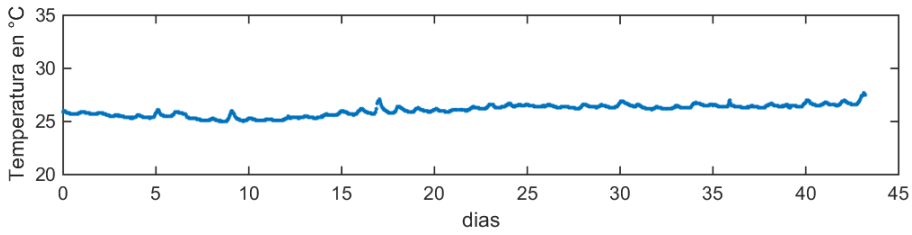


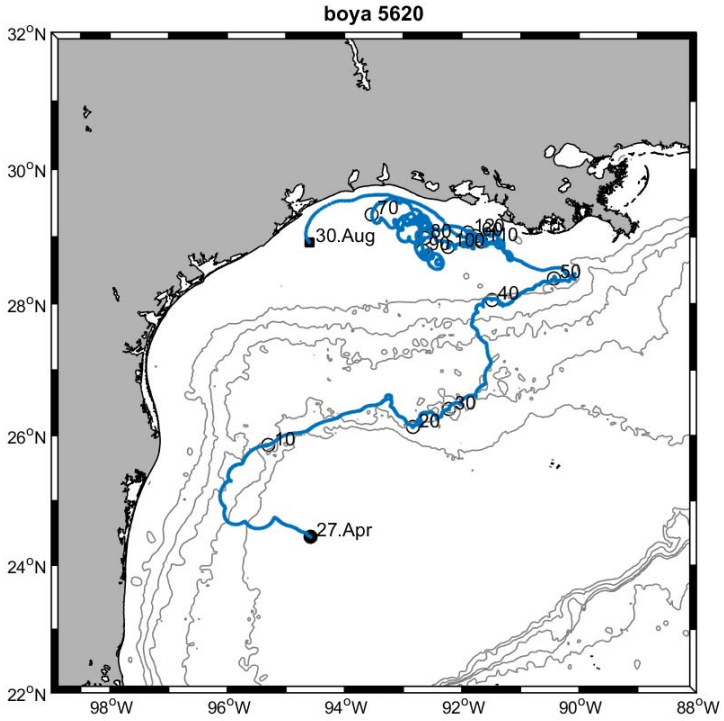


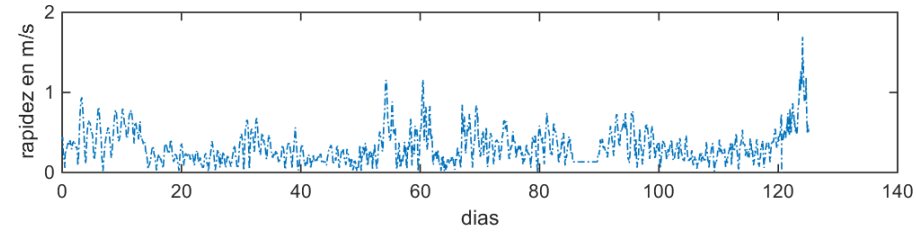

boya 3600
30°N
28°N
26°N
24°N
22°N
98°W
96°W
94°W
92°W
90°W
88°W
40
10.Jun
30
20
10
27.Apr

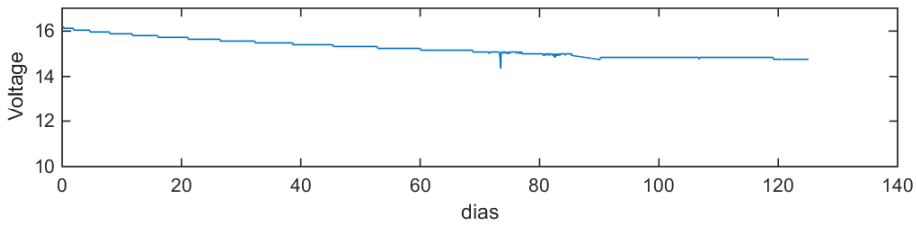

rapidez en m/s
1
0.5
0
0
5
10
15
20
25
30
35
40
45
dias

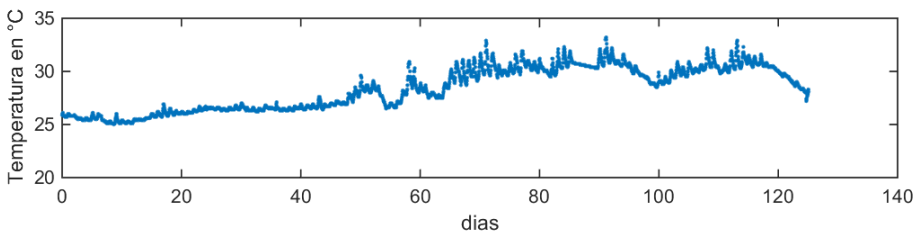

Voltage
16
14
12
10
0
5
10
15
20
25
30
35
40
45
dias


Temperatura en °C
35
30
25
20
0
5
10
15
20
25
30
35
40
45
dias

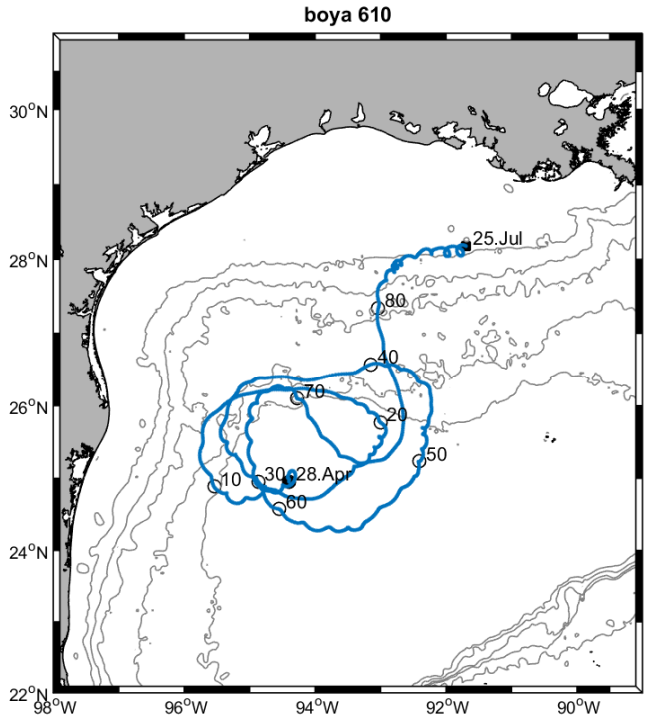

boya 5620
32°N
30°N
28°N
26°N
24°N
22°N
98°W
96°W
94°W
92°W
90°W
88°W
30.Aug
27.Apr
70
60
50
40
30
20
10

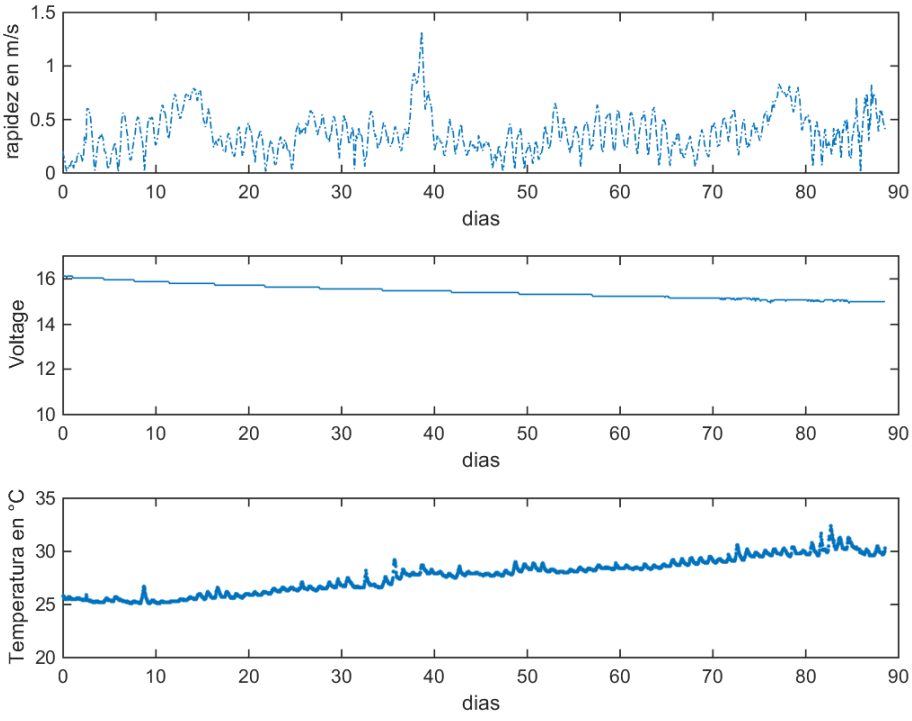

rapidez en m/s
dias

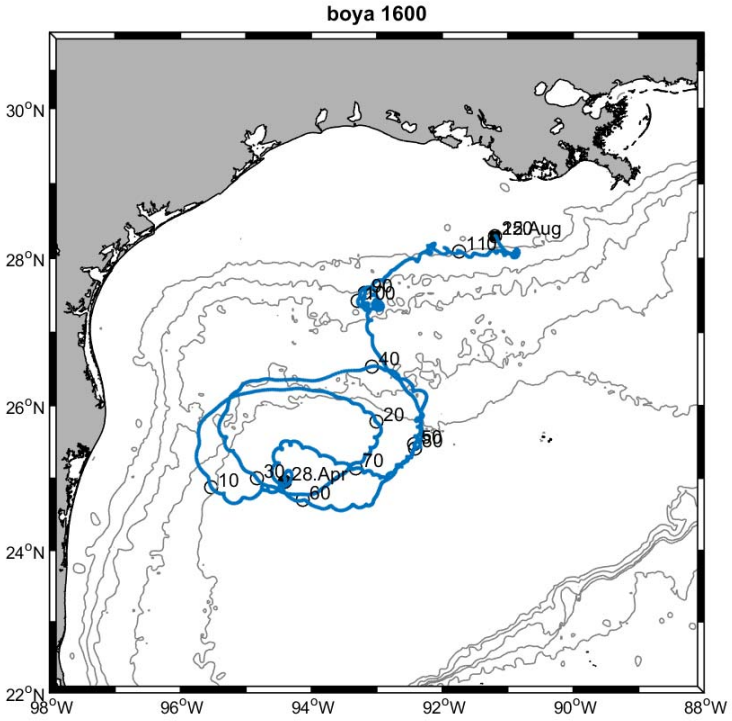

Voltage
dias

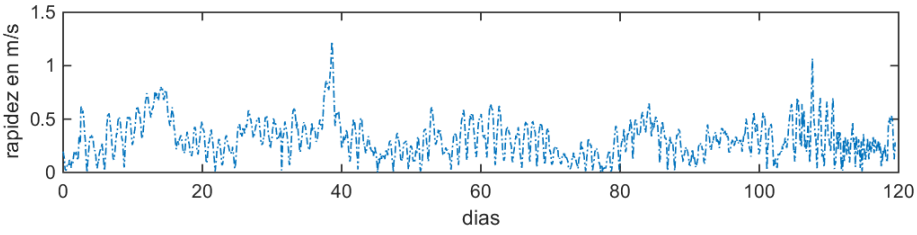

Temperatura en °C
dias

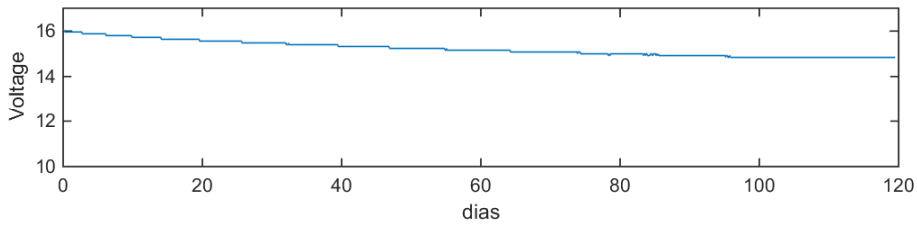
1.1.12. TRIPLET 12

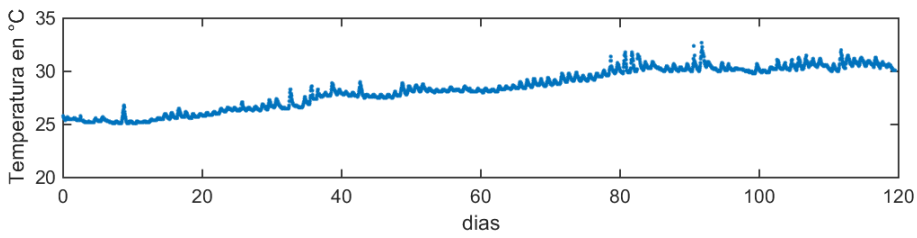


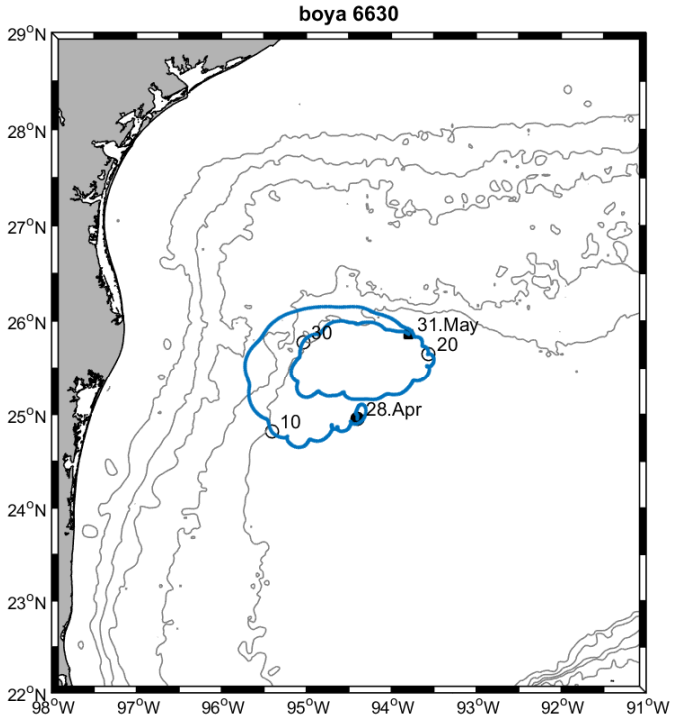


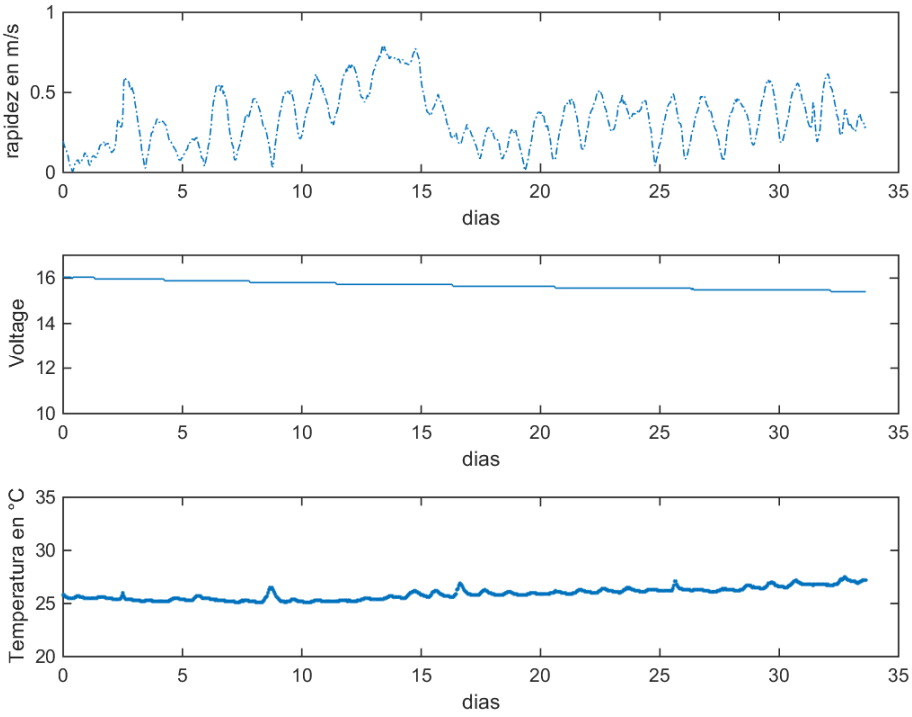

boya 1600
30°N
28°N
26°N
24°N
22°N
98°W
96°W
94°W
92°W
90°W
88°W
28.Apr
28.Aug


rapidez en m/s
1.5
1
0.5
0
0
20
40
60
80
100
120
dias

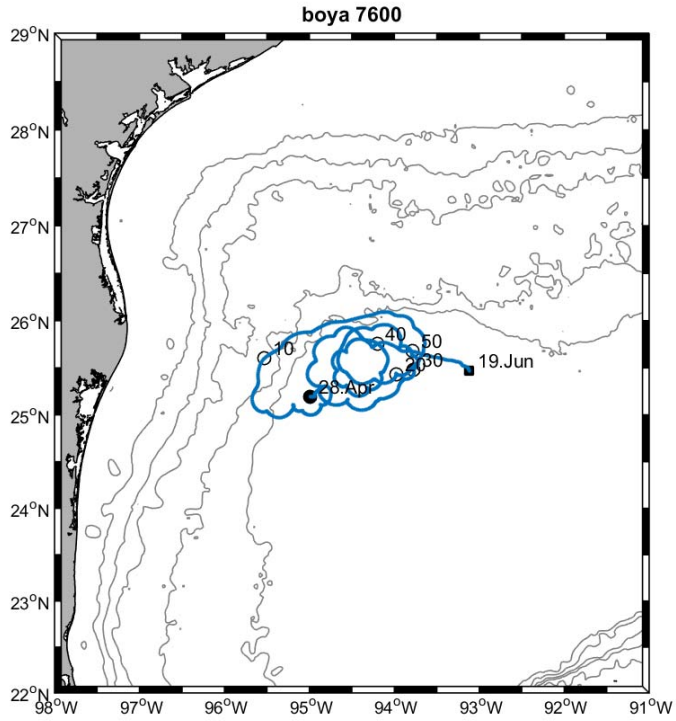

Voltage
16
14
12
10
0
20
40
60
80
100
120
dias

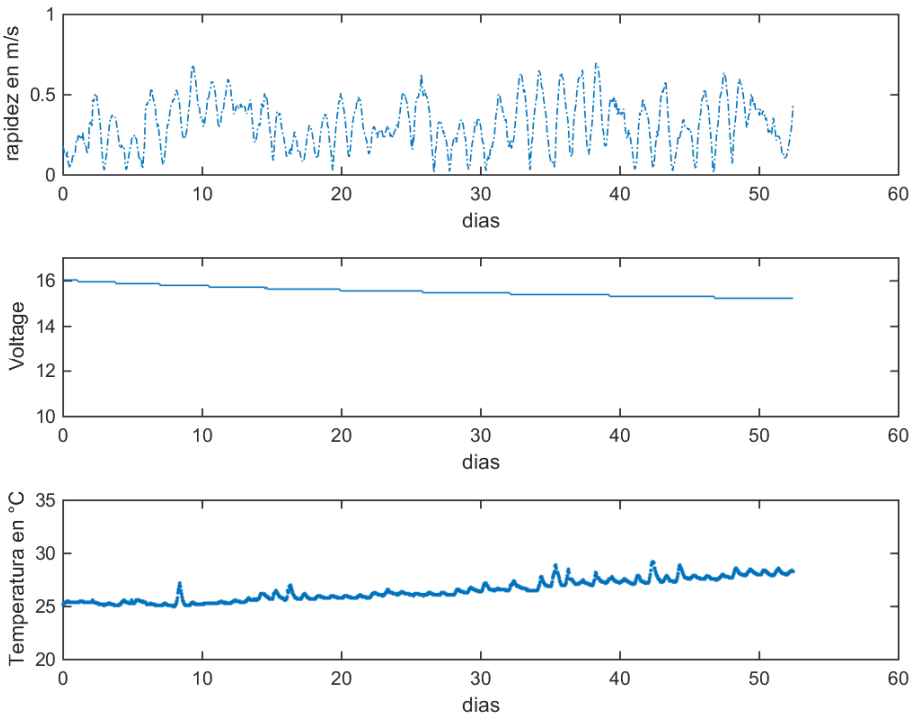

Temperatura en °C
35
30
25
20
0
20
40
60
80
100
120
dias

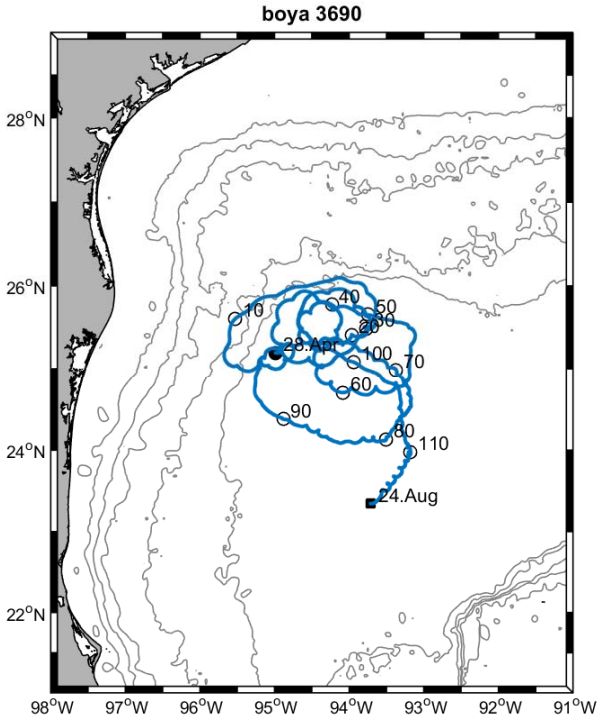

boya 6630
29°N
28°N
27°N
26°N
25°N
24°N
23°N
22°N
98°W
97°W
96°W
95°W
94°W
93°W
92°W
91°W
30
31.May
20
10
28.Apr

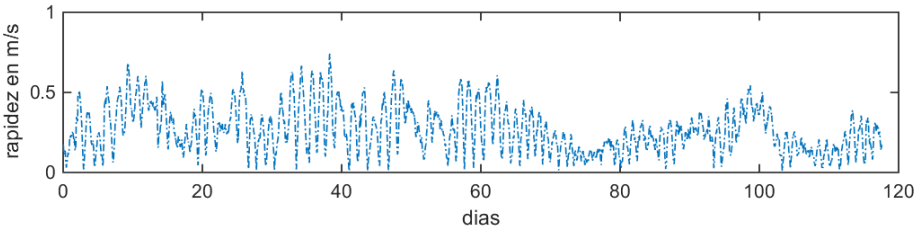

rapidez en m/s
dias
Voltage
dias
Temperatura en °C
dias

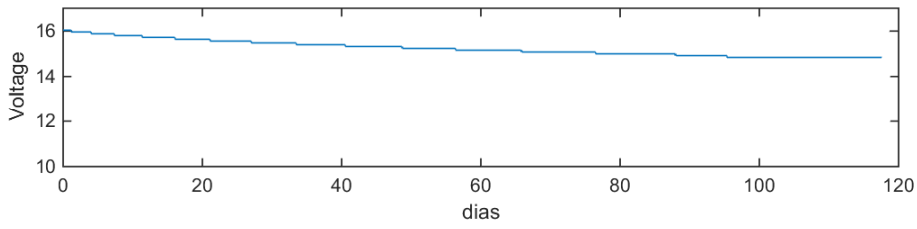
1.1.13. TRIPLET 13

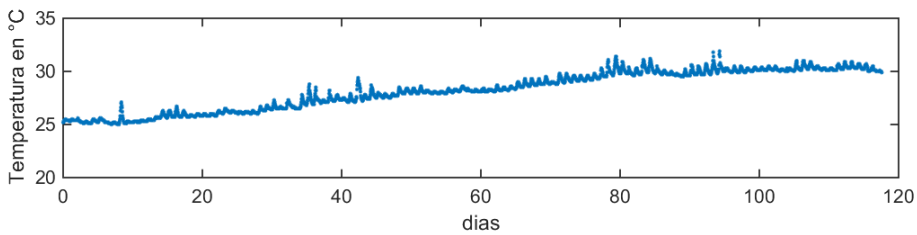


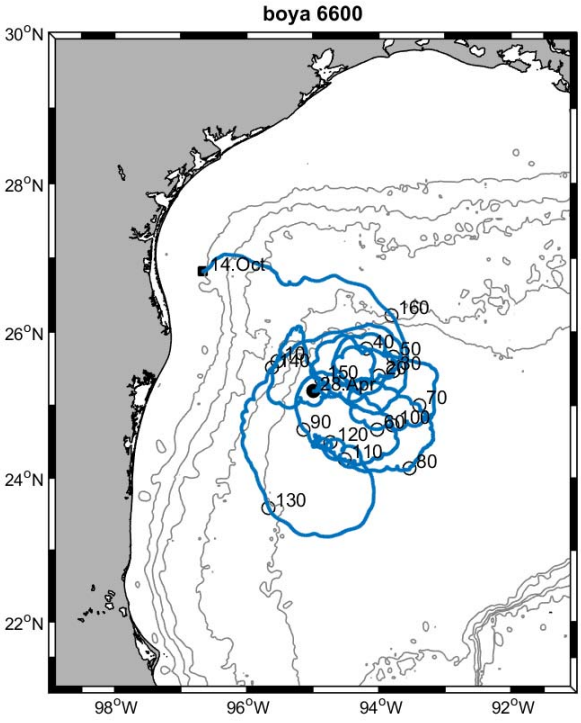


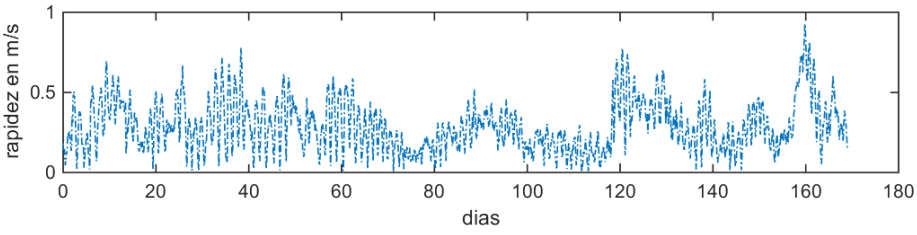

boya 3690
28°N
26°N
24°N
22°N
98°W
97°W
96°W
95°W
94°W
93°W
92°W
91°W
10
40
50
20
30
28.Apr
100
70
60
90
80
110
24.Aug

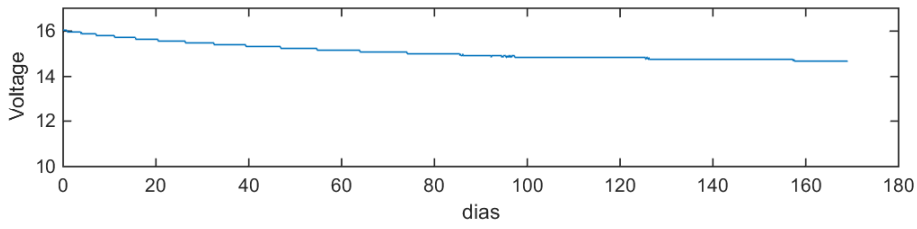

rapidez en m/s
1
0.5
0
0
20
40
60
80
100
120
dias

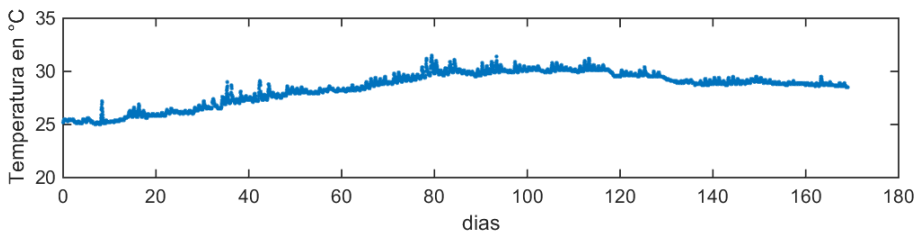

Voltage
16
14
12
10
0
20
40
60
80
100
120
dias


Temperatura en °C
35
30
25
20
0
20
40
60
80
100
120
dias

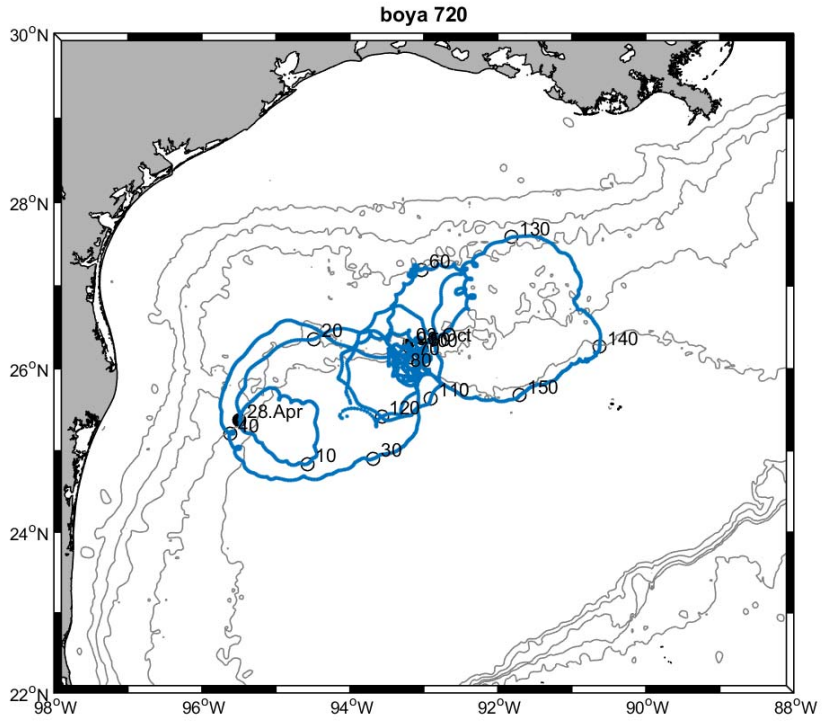

boya 6600
30°N
28°N
26°N
24°N
22°N
98°W
96°W
94°W
92°W
14 Oct
160
40
50
10
140
150
70
90
120
60
100
110
80
130

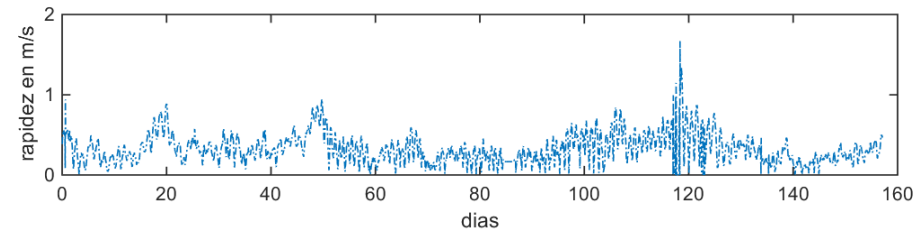

rapidez en m/s
1
0.5
0
0
20
40
60
80
100
120
140
160
180
dias

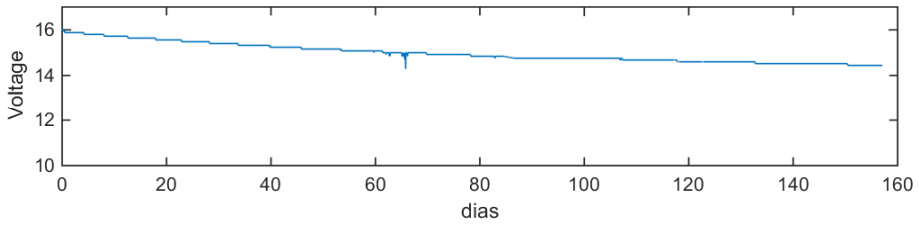

Voltage
16
14
12
10
0
20
40
60
80
100
120
140
160
180
dias

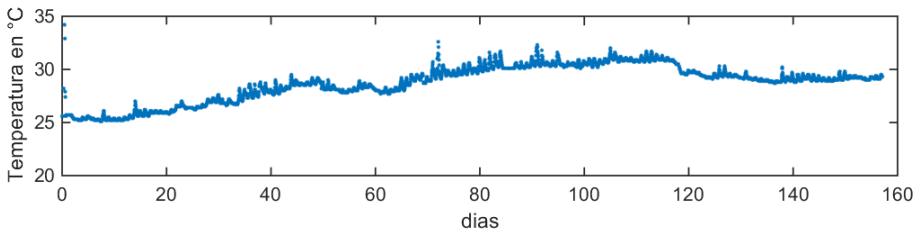

Temperatura en °C
35
30
25
20
0
20
40
60
80
100
120
140
160
180
dias

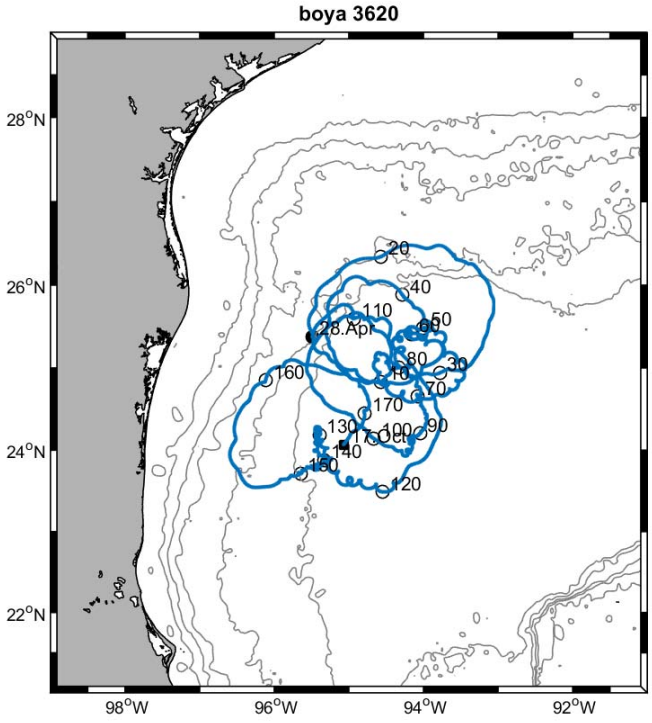
1.1.14. TRIPLET 14

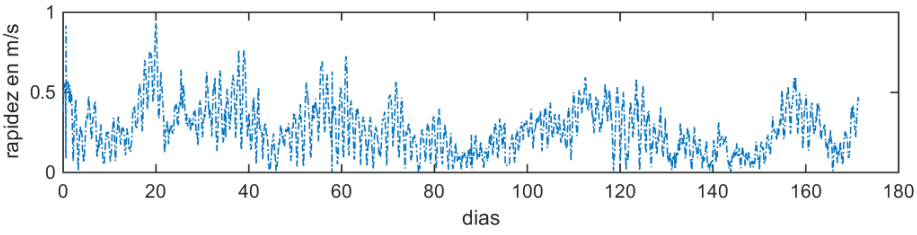


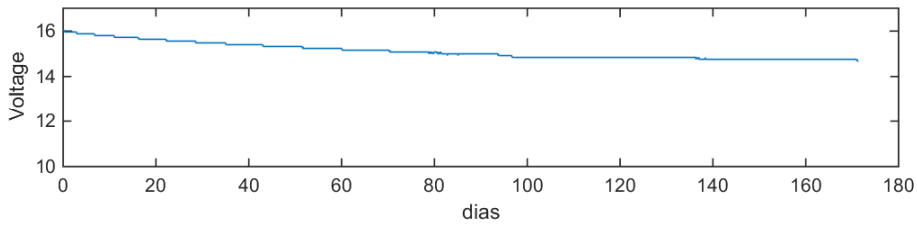


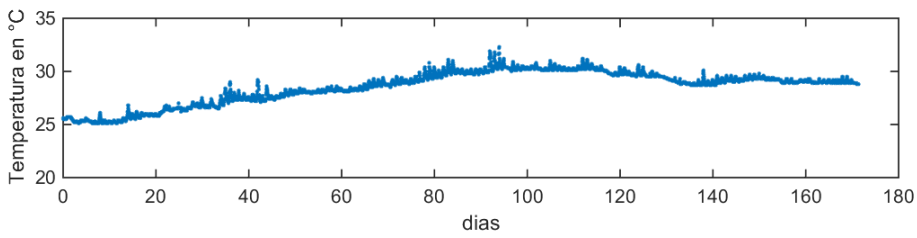


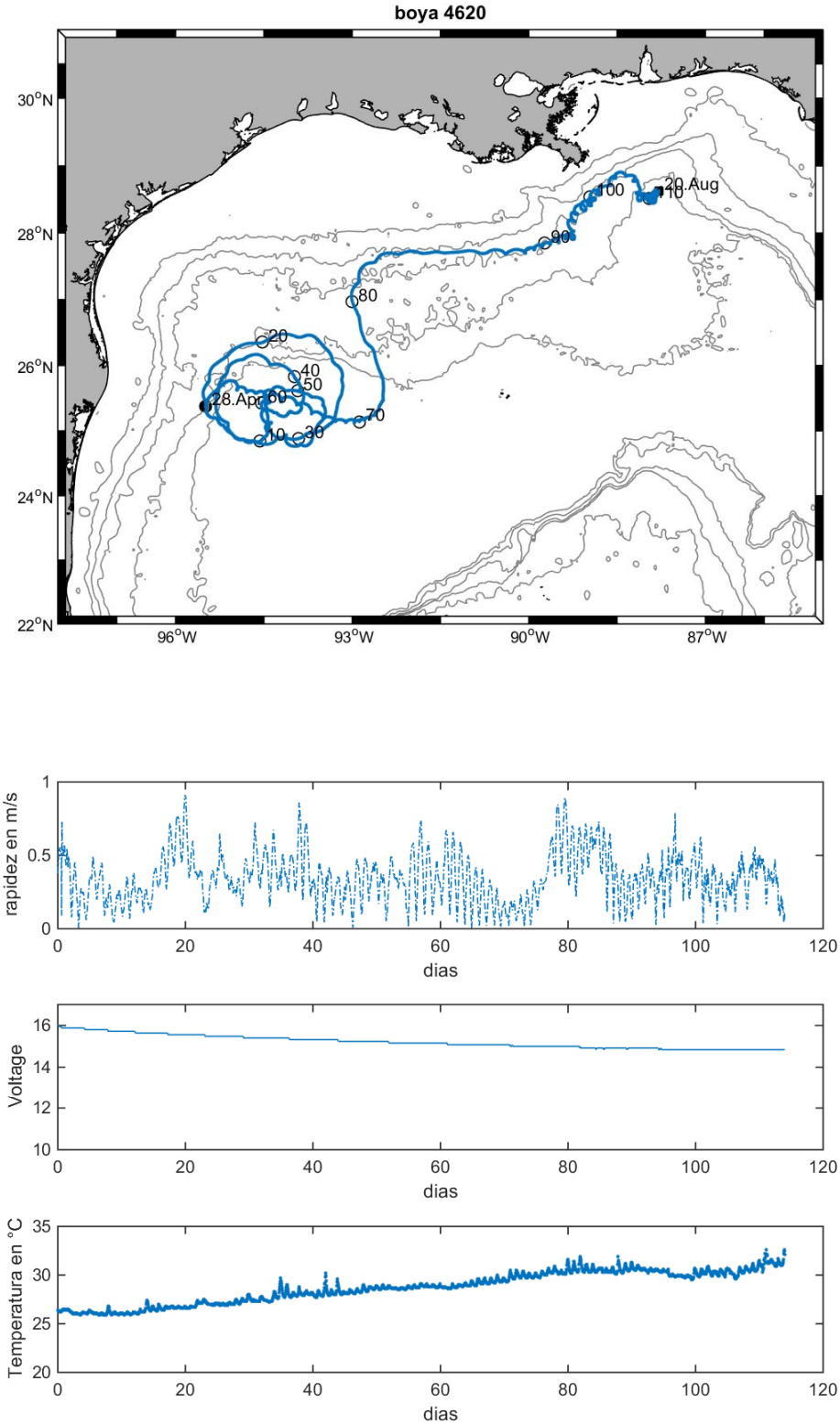



boya 3620
28°N
26°N
24°N
22°N
98°W
96°W
94°W
92°W
28.Apr
20
40
110
50
60
80
30
160
10
70
170
130
100
90
140
180
120

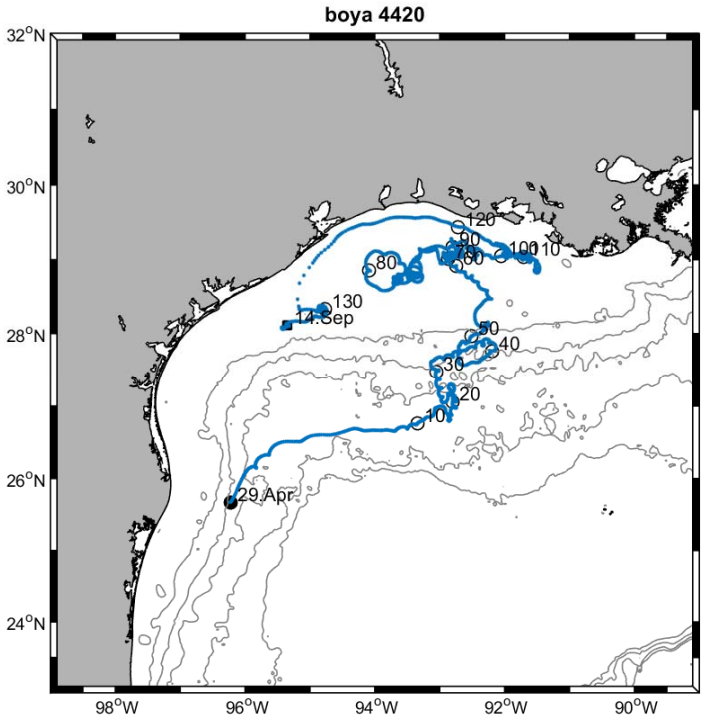

rapidez en m/s
dias

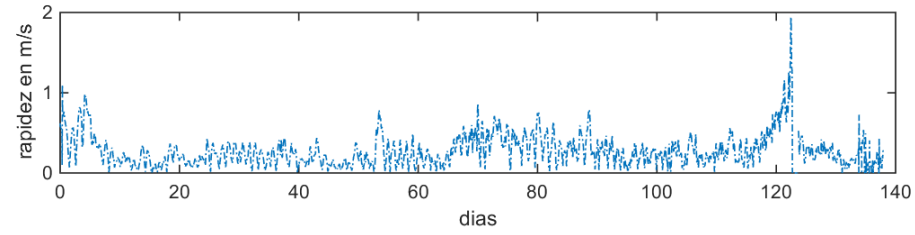

Voltage
dias

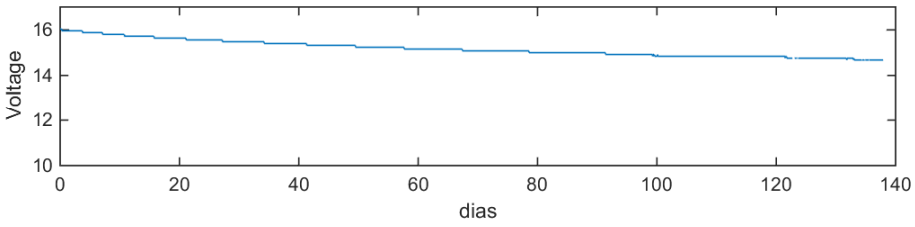

Temperatura en °C
dias

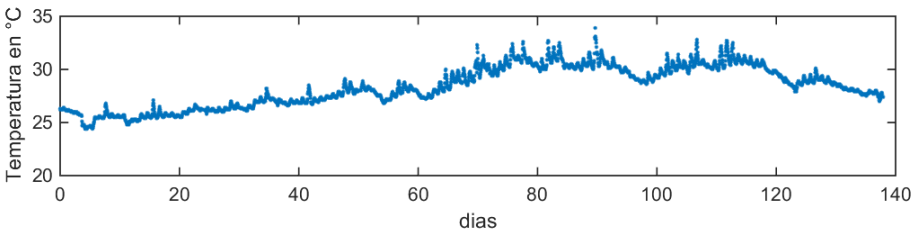

boya 4620
30°N
28°N
26°N
24°N
22°N
96°W
93°W
90°W
87°W
28.Apr
20.Aug
rapidez en m/s
Voltage
Temperatura en °C
dias

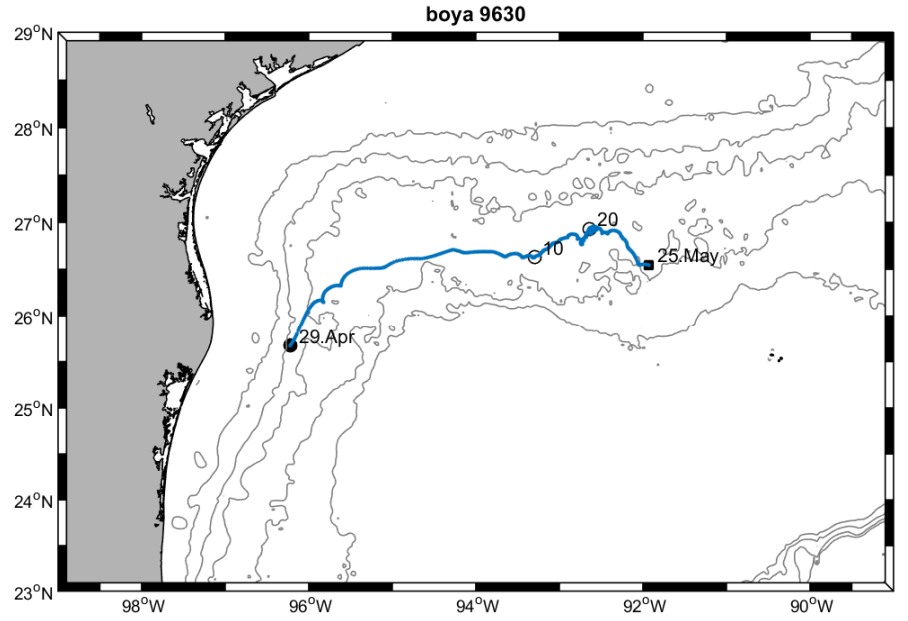
1.1.15. TRIPLET 15

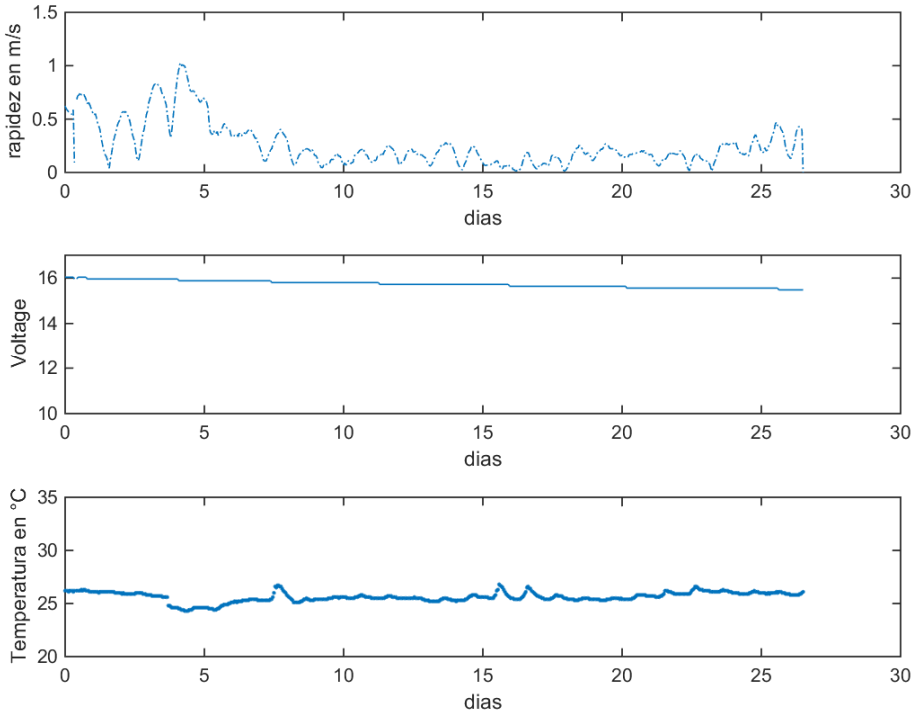


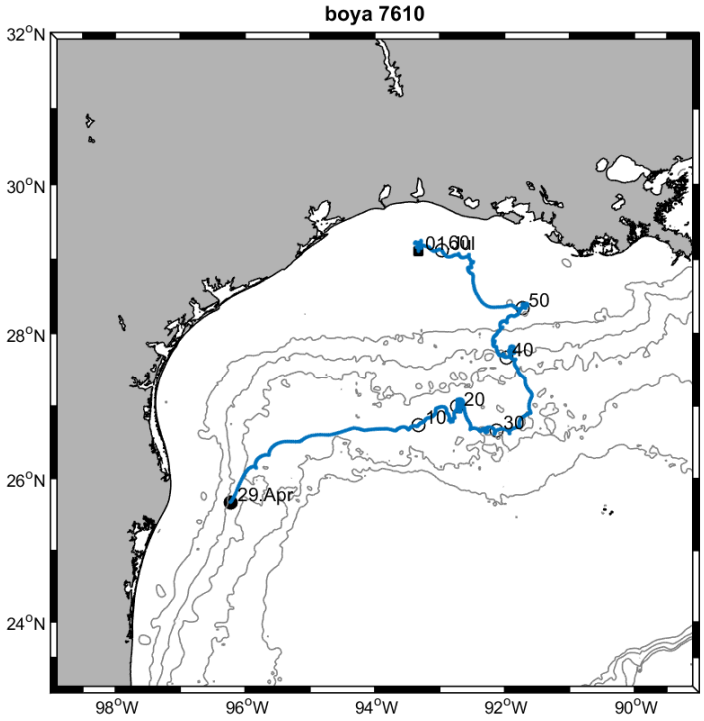


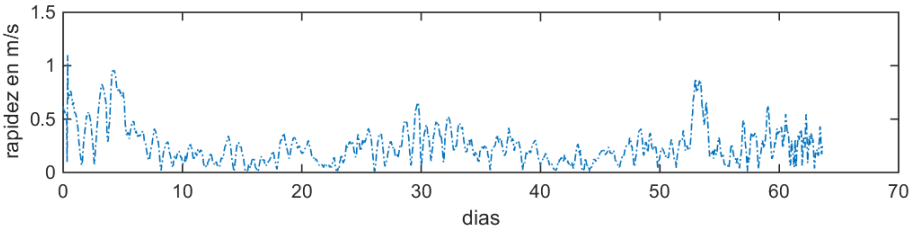


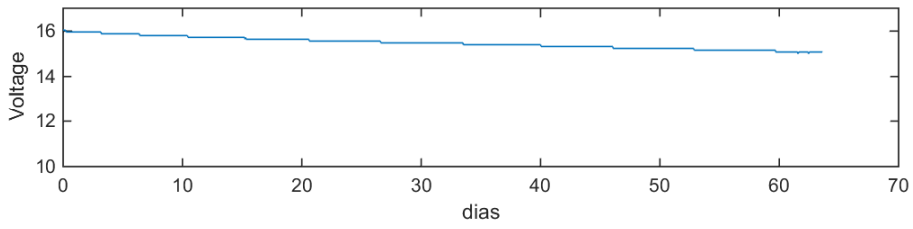


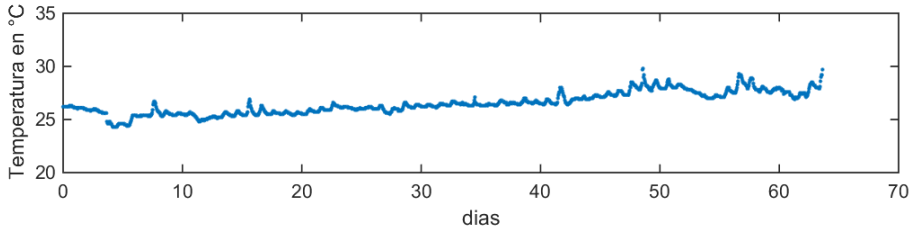

boya 9630
29°N
28°N
27°N
26°N
25°N
24°N
23°N
98°W
96°W
94°W
92°W
90°W
20
10
25 May
29 Apr


rapidez en m/s
1.5
1
0.5
0
0
5
10
15
20
25
30
dias
Voltage
16
14
12
10
0
5
10
15
20
25
30
dias
Temperatura en °C
35
30
25
20
0
5
10
15
20
25
30
dias

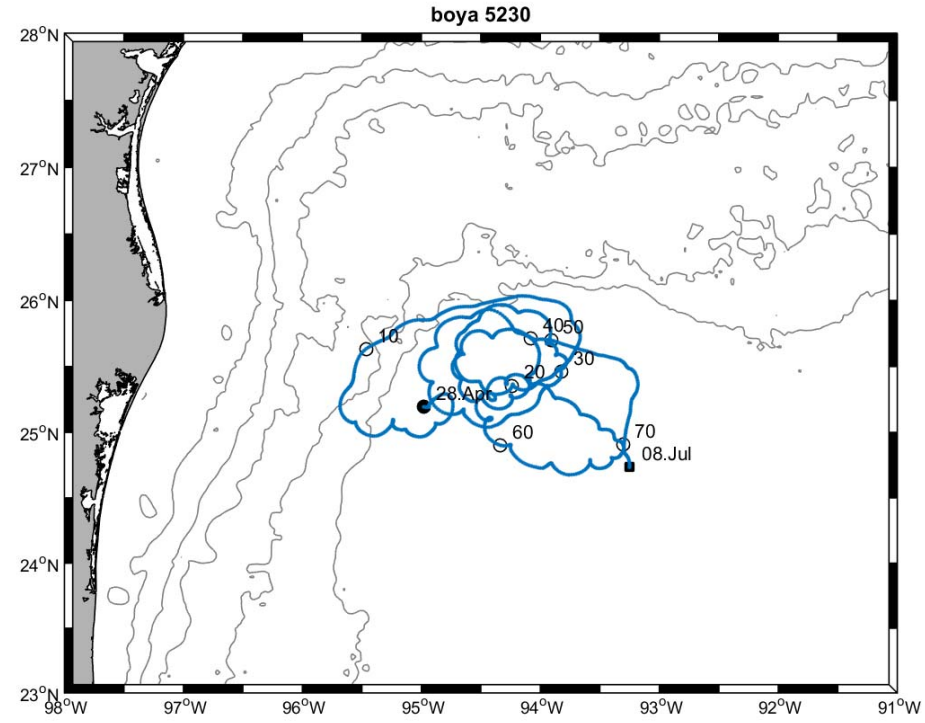

boya 7610
32°N
30°N
28°N
26°N
24°N
98°W
96°W
94°W
92°W
90°W
01 Mar
50
40
20
10
30
29 Apr

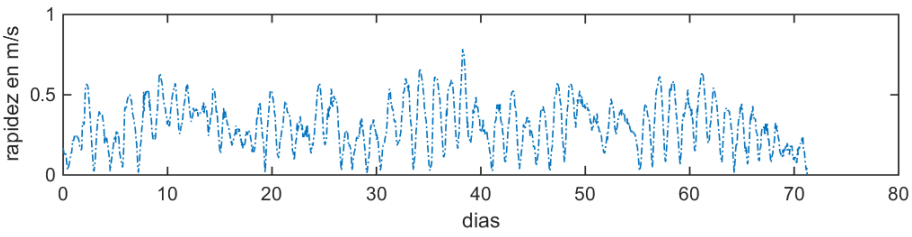

rapidez en m/s
1.5
1
0.5
0
0
10
20
30
40
50
60
70
dias

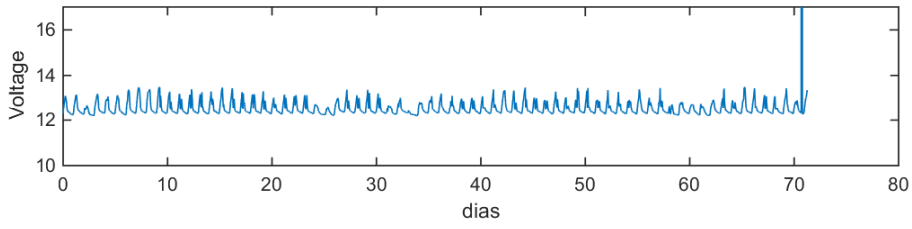

Voltage
16
14
12
10
0
10
20
30
40
50
60
70
dias

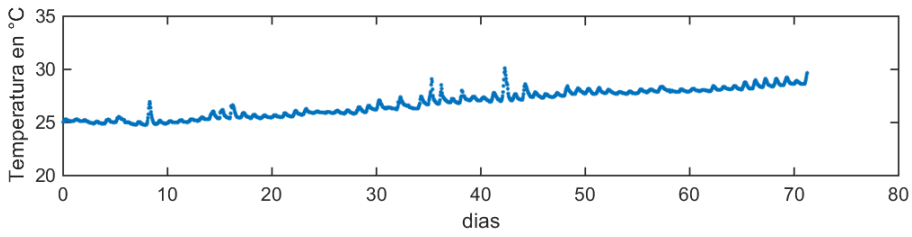

Temperatura en °C
35
30
25
20
0
10
20
30
40
50
60
70
dias

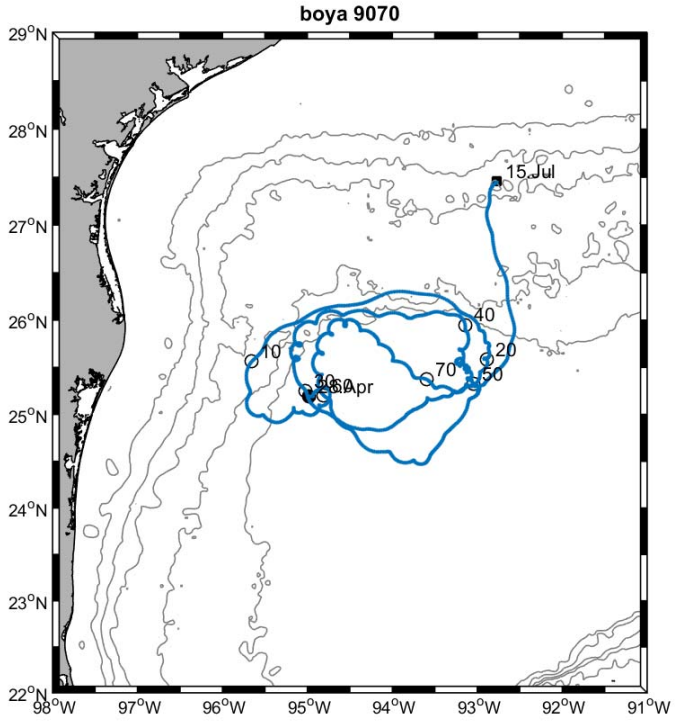
1.1.16. PAIR 16 (DORIS)

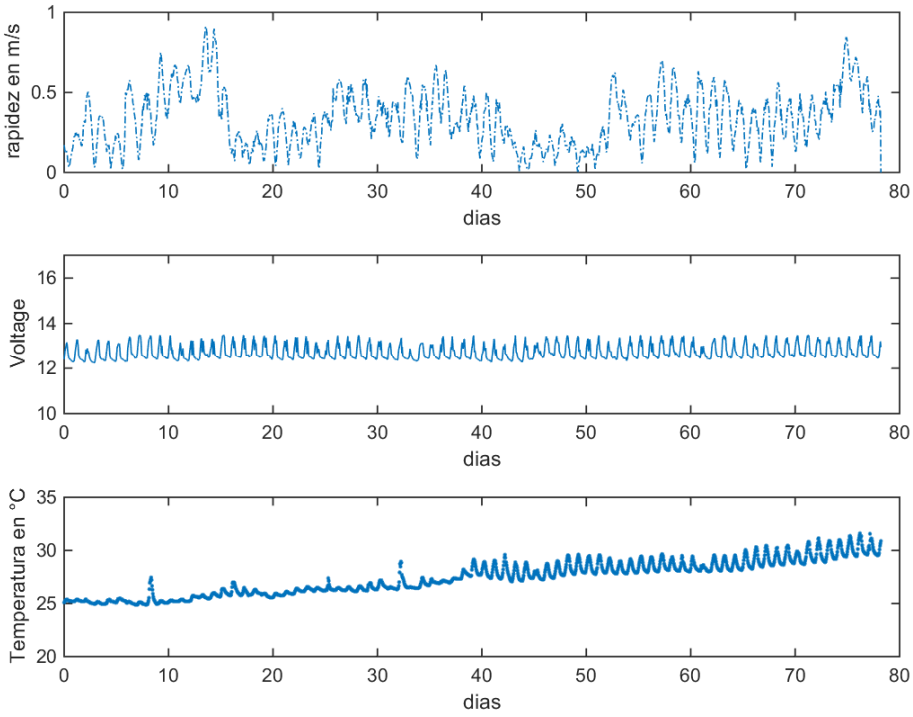




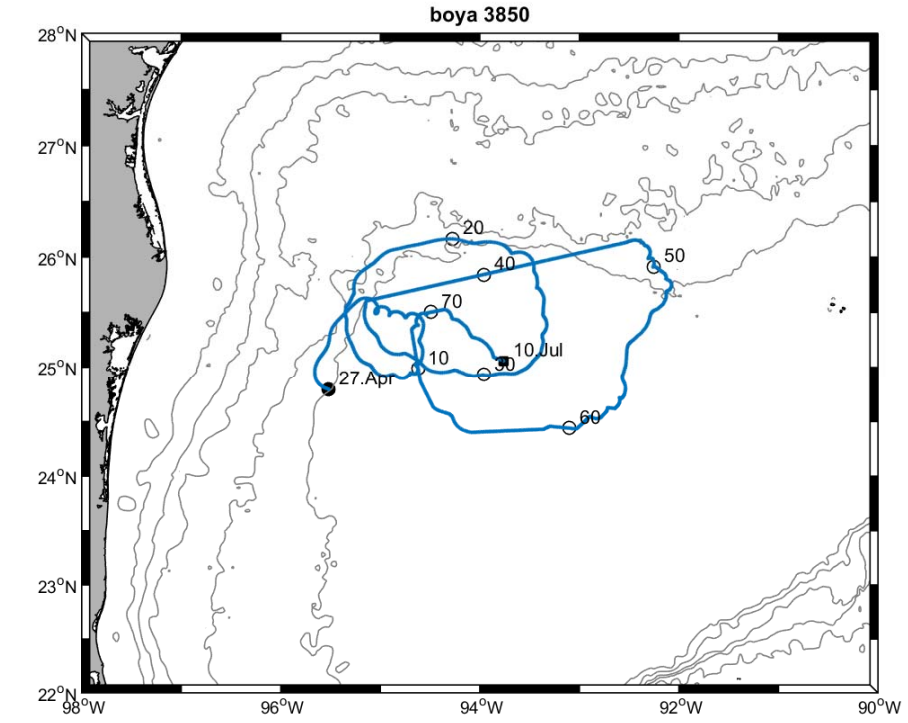


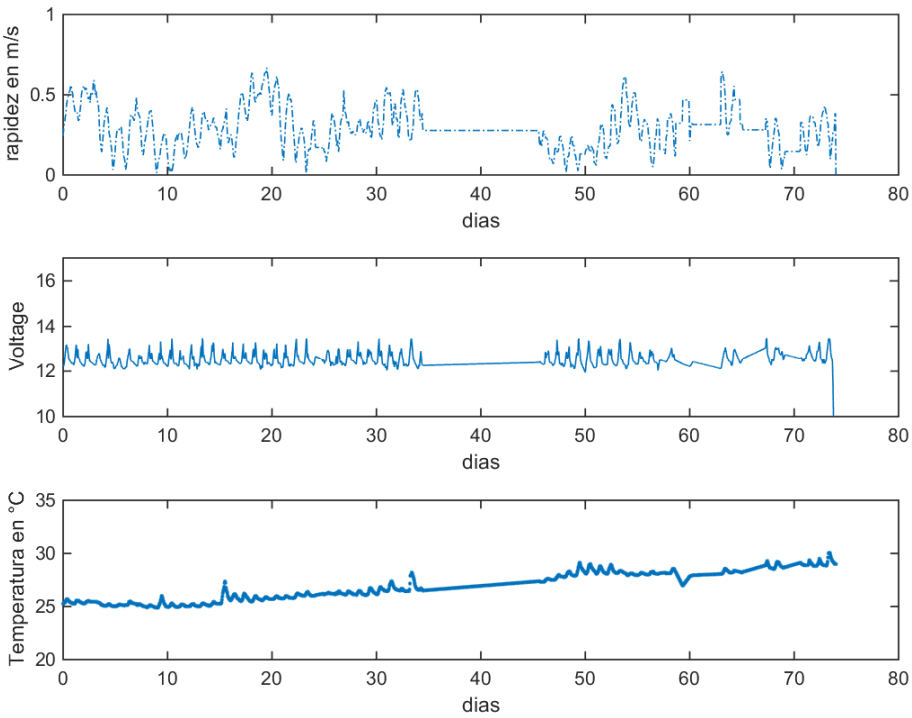


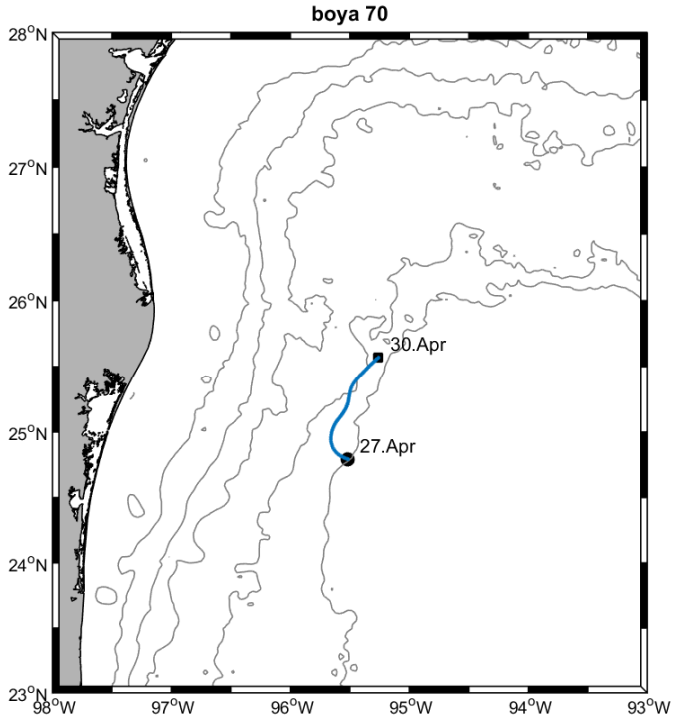

boya 9070
29°N
28°N
27°N
26°N
25°N
24°N
23°N
22°N
98°W
97°W
96°W
95°W
94°W
93°W
92°W
91°W
15 Jul
40
10
20
70
50
30
Apr

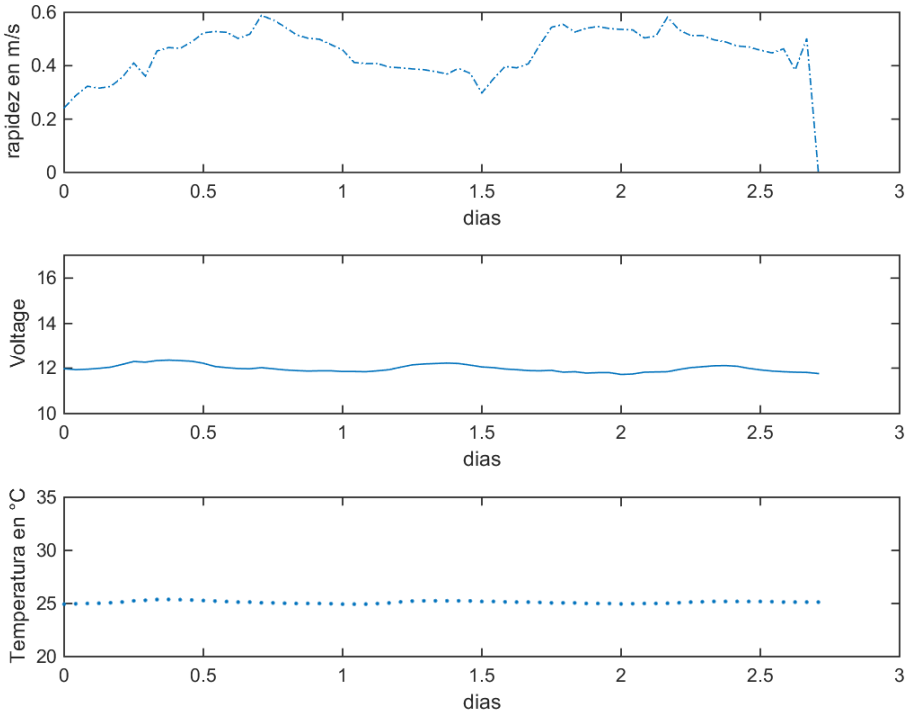

rapidez en m/s
dias
Voltage
dias
Temperatura en °C
dias

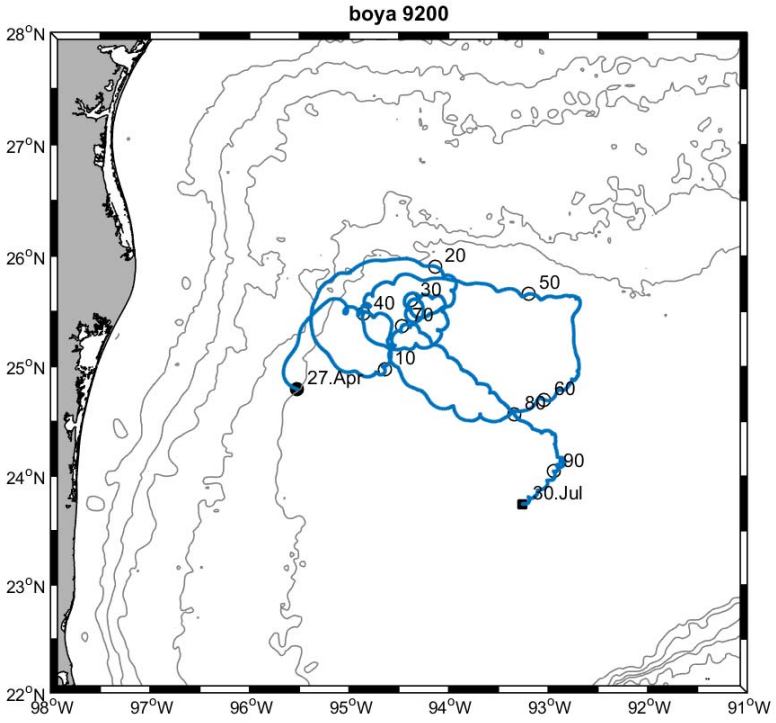
1.1.17. TRIPLET 18 (DORIS)

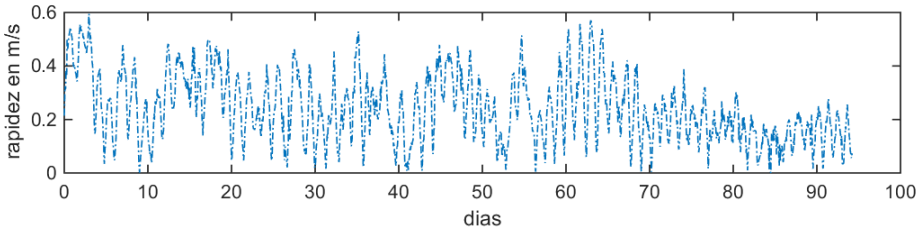


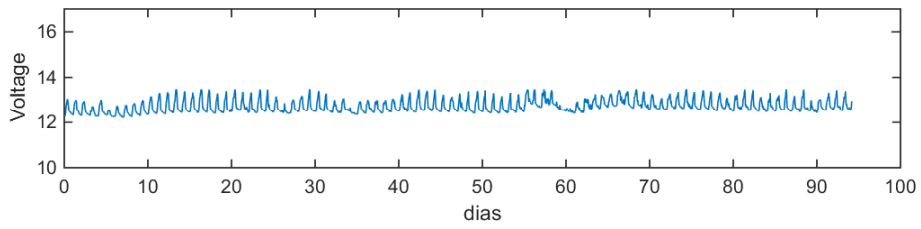


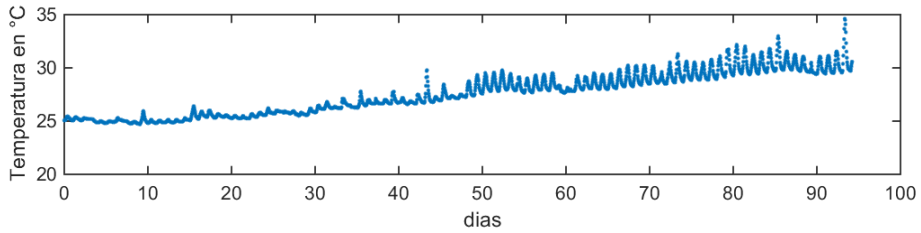

boya 70
28°N
27°N
26°N
25°N
24°N
23°N
98°W
97°W
96°W
95°W
94°W
93°W
30.Apr
27.Apr


rapidez en m/s
0
0.2
0.4
0.6
0
0.5
1
1.5
2
2.5
3
dias
Voltage
10
12
14
16
dias
Temperatura en °C
20
25
30
35
dias

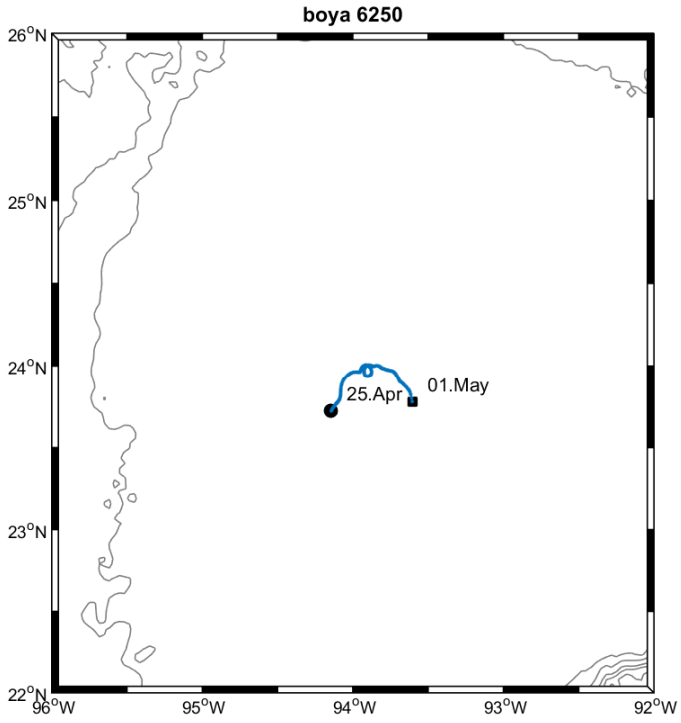

boya 9200
28°N
27°N
26°N
25°N
24°N
23°N
22°N
98°W
97°W
96°W
95°W
94°W
93°W
92°W
91°W
20
50
30
40
70
10
27.Apr
60
80
90
30.Jul

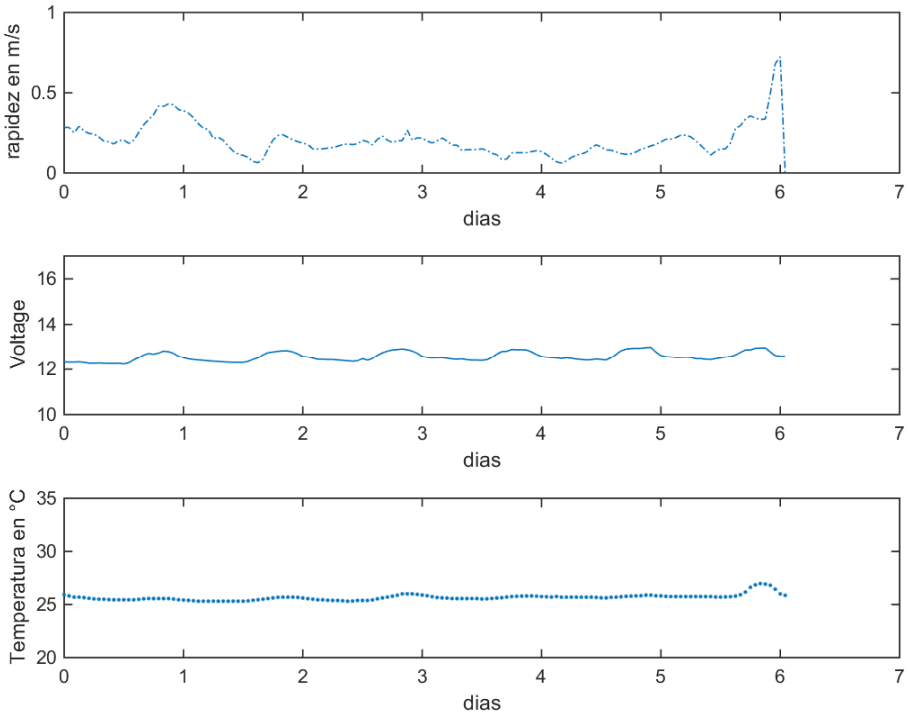

rapidez en m/s
0.6
0.4
0.2
0
0
10
20
30
40
50
60
70
80
90
100
dias

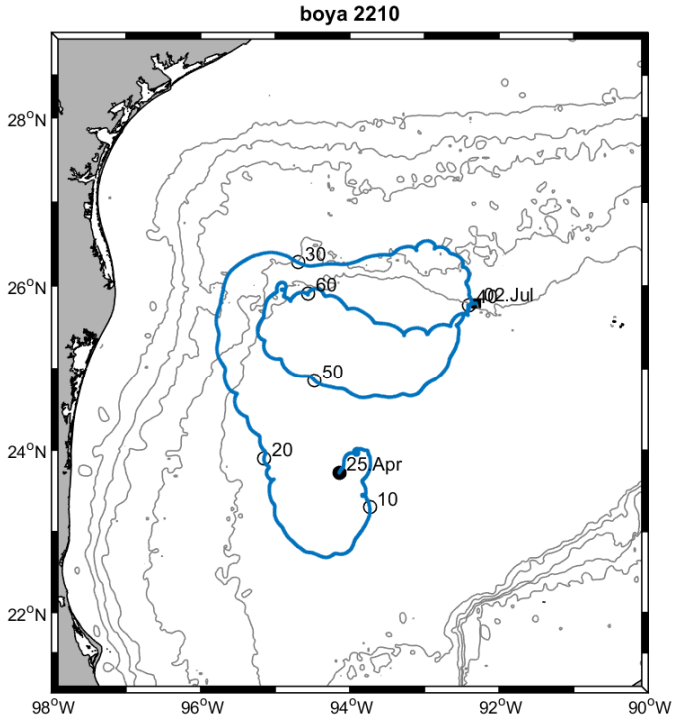

Voltage
16
14
12
10
0
10
20
30
40
50
60
70
80
90
100
dias

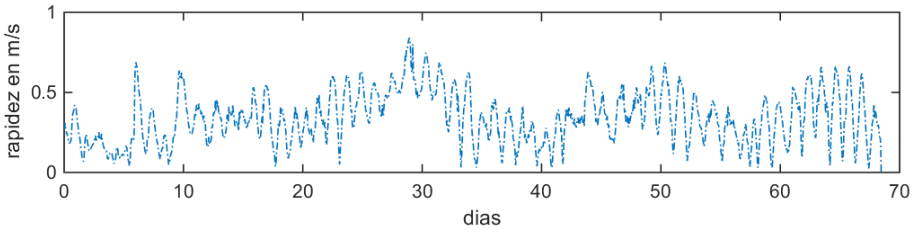

Temperatura en °C
35
30
25
20
0
10
20
30
40
50
60
70
80
90
100
dias

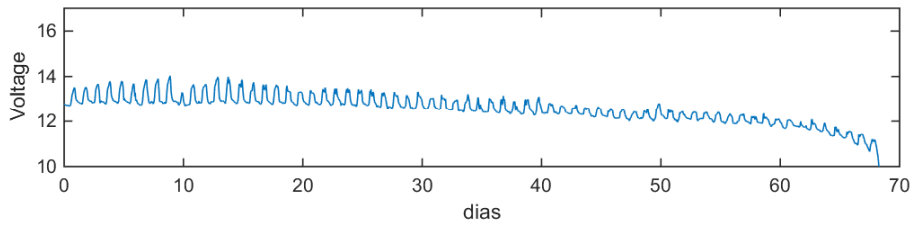
1.1.18. TRIPLET 19 (DORIS)

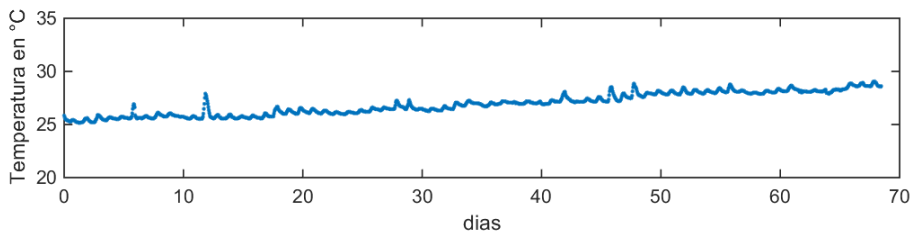


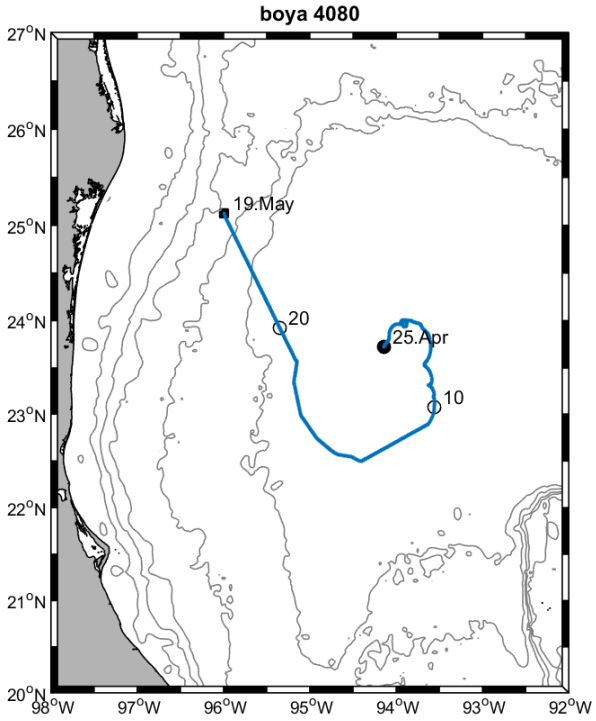


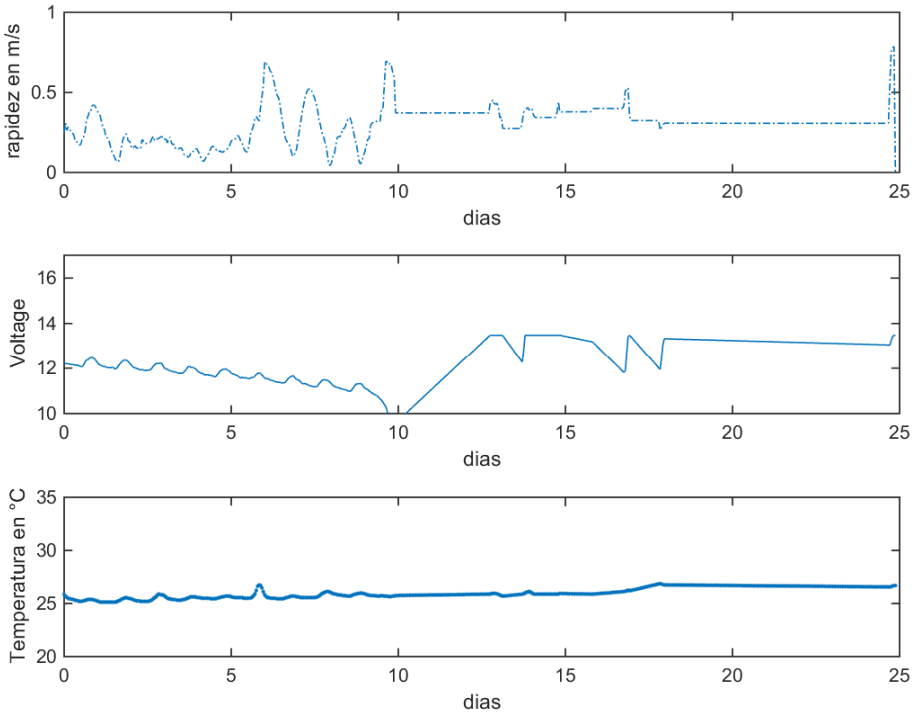

boya 2210
28°N
26°N
24°N
22°N
98°W
96°W
94°W
92°W
90°W
30
60
02 Jul
50
20
25 Apr
10


rapidez en m/s
0
0.5
1
0
10
20
30
40
50
60
70
dias

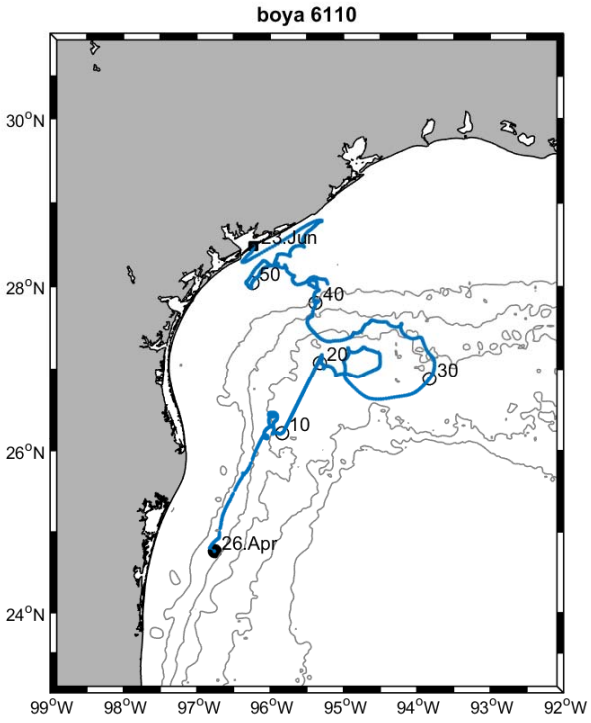

Voltage
10
12
14
16
0
10
20
30
40
50
60
70
dias

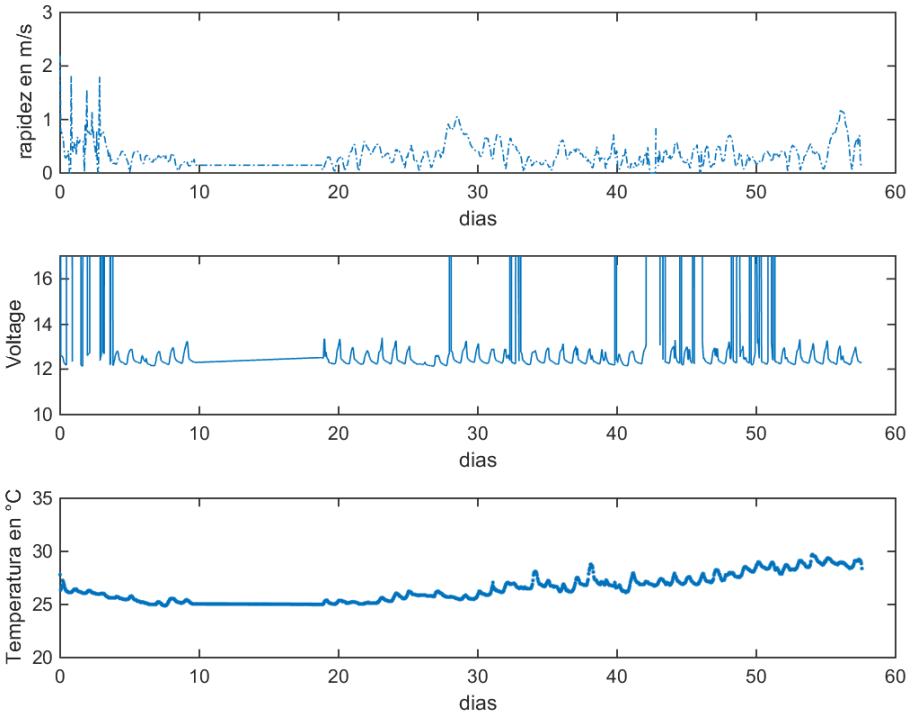

Temperatura en °C
20
25
30
35
0
10
20
30
40
50
60
70
dias

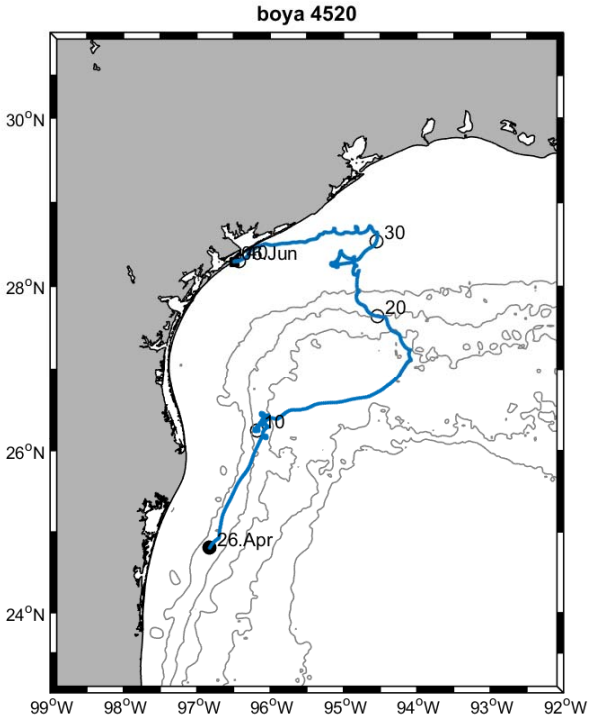

boya 4080
27°N
26°N
25°N
24°N
23°N
22°N
21°N
20°N
98°W
97°W
96°W
95°W
94°W
93°W
92°W
19.May
20
25.Apr
10

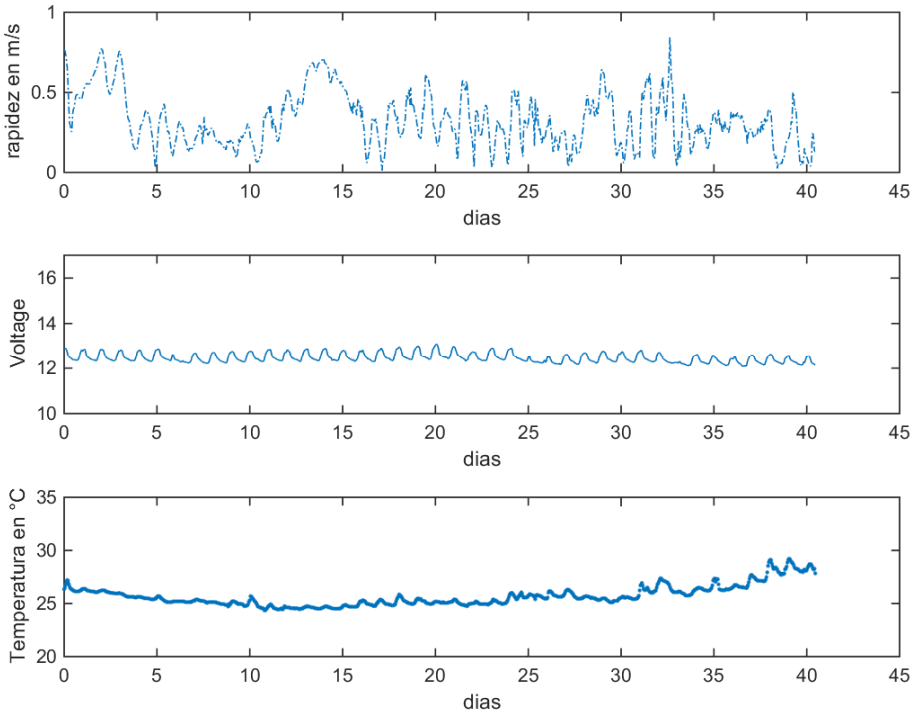

rapidez en m/s
dias
Voltage
dias
Temperatura en °C
dias

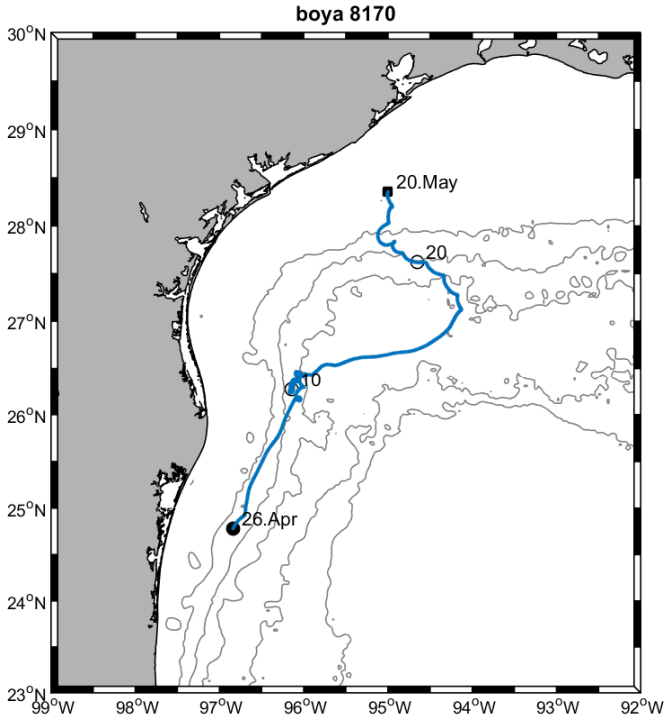
1.1.19. TRIPLET 20 (DORIS)

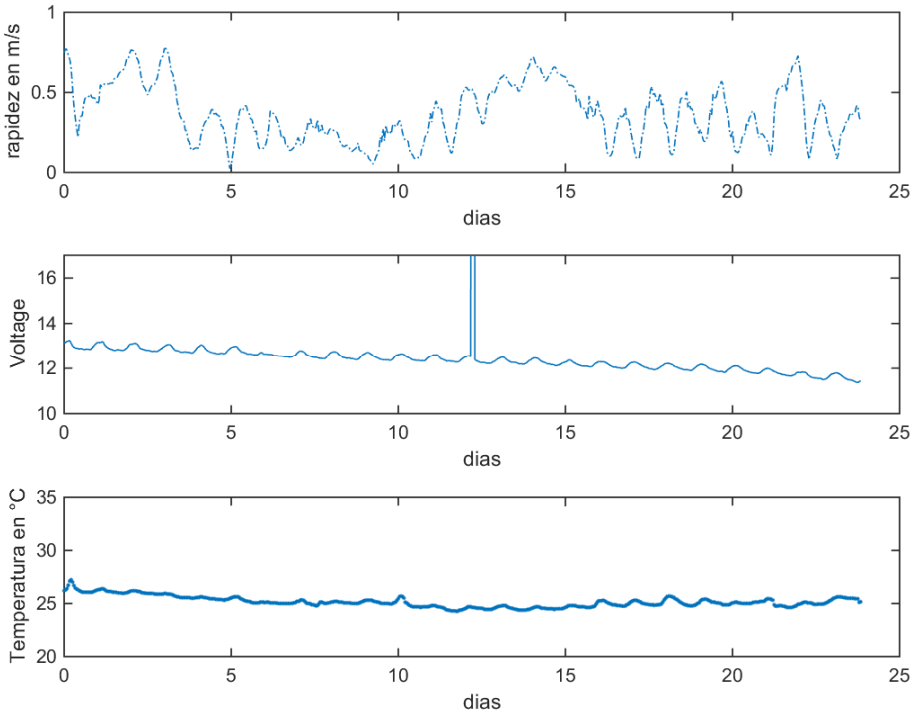





boya 4520
30°N
28°N
26°N
24°N
99°W
98°W
97°W
96°W
95°W
94°W
93°W
92°W
30
20
10
26.Apr

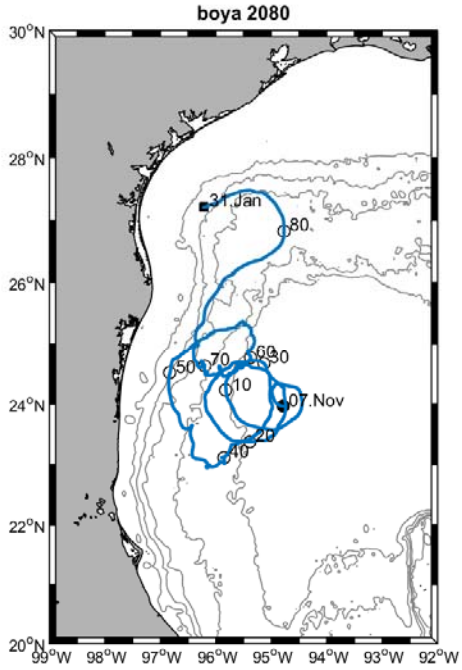

rapidez en m/s
dias
Voltage
dias
Temperatura en °C
dias

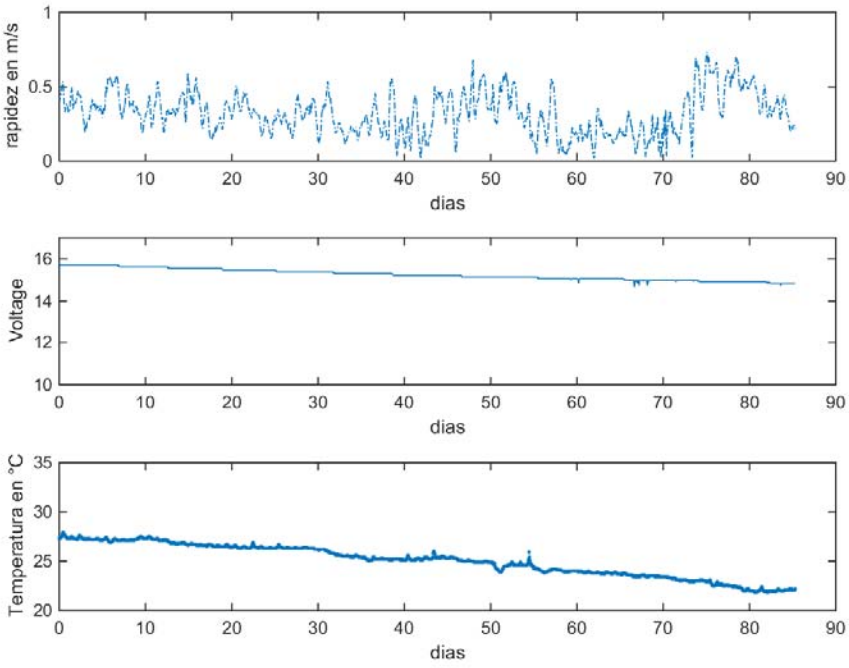

boya 8170
30°N
29°N
28°N
27°N
26°N
25°N
24°N
23°N
99°W
98°W
97°W
96°W
95°W
94°W
93°W
92°W
20.May
20
10
26.Apr

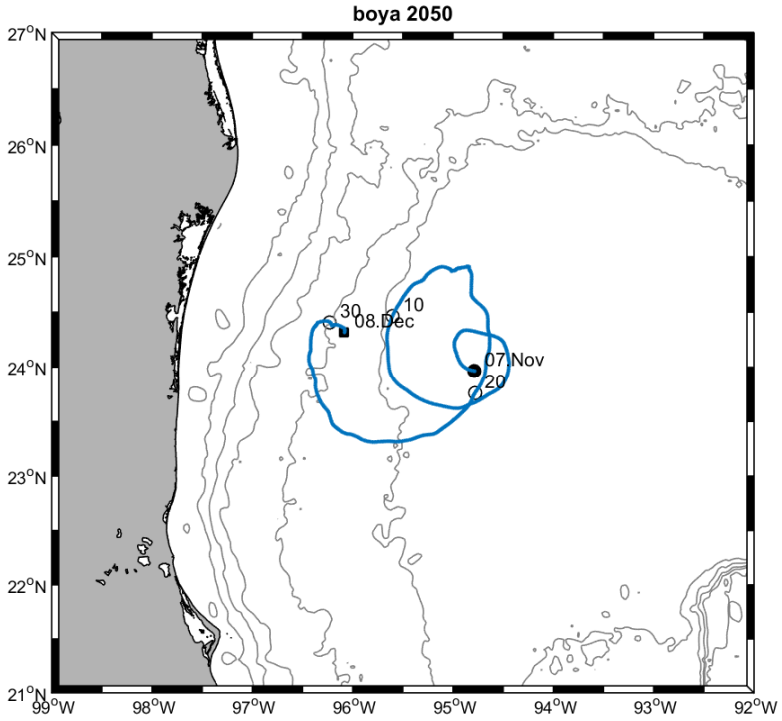

rapidez en m/s
0
0.5
1
0
5
10
15
20
25
dias
Voltage
10
12
14
16
0
5
10
15
20
25
dias
Temperatura en °C
20
25
30
35
0
5
10
15
20
25
dias

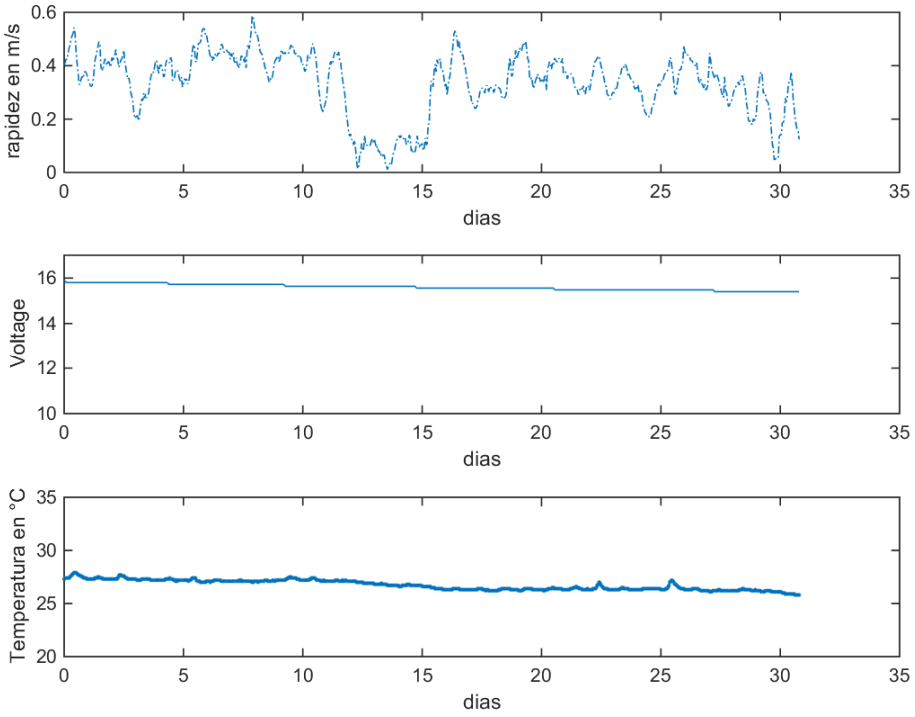
DWDE 4

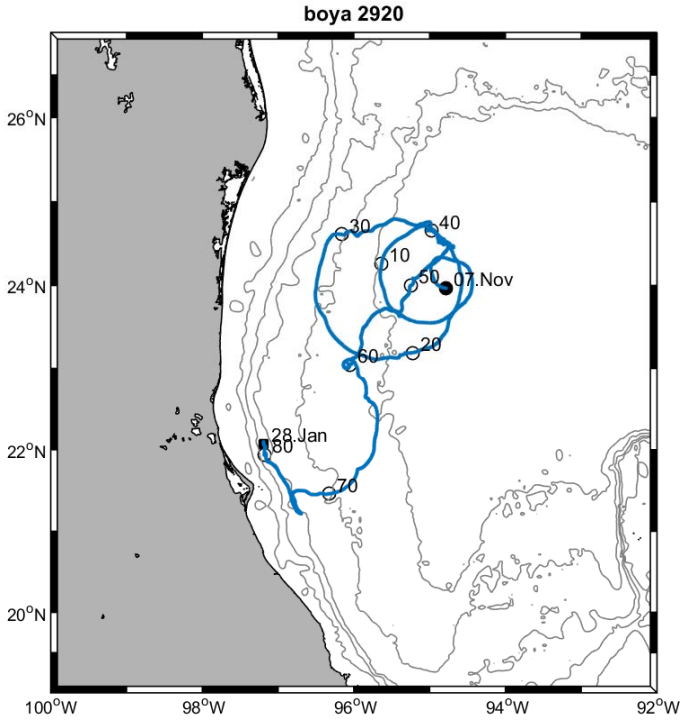
1.1.1. TRIPLET 01

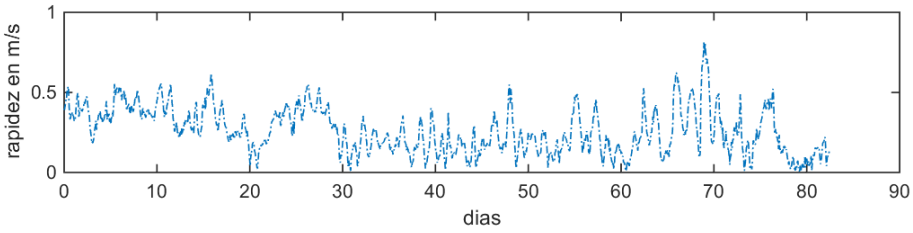


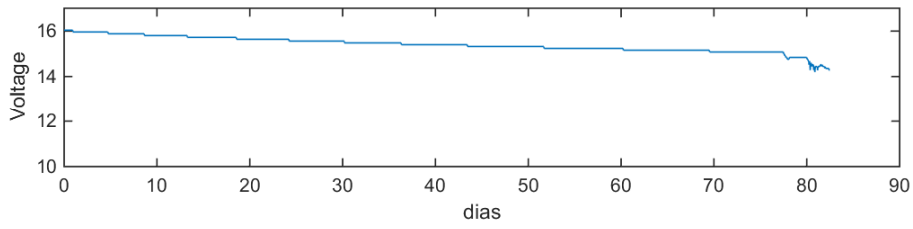


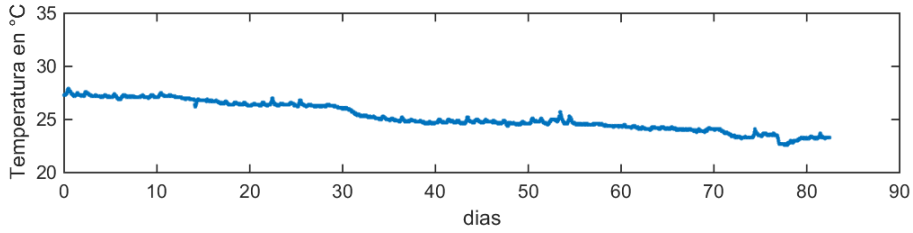

boya 2050
27°N
26°N
25°N
24°N
23°N
22°N
21°N
99°W
98°W
97°W
96°W
95°W
94°W
93°W
92°W
30
08.Dec
10
07.Nov
20


rapidez en m/s
0.6
0.4
0.2
0
0
5
10
15
20
25
30
35
dias
Voltage
16
14
12
10
0
5
10
15
20
25
30
35
dias
Temperatura en °C
35
30
25
20
0
5
10
15
20
25
30
35
dias

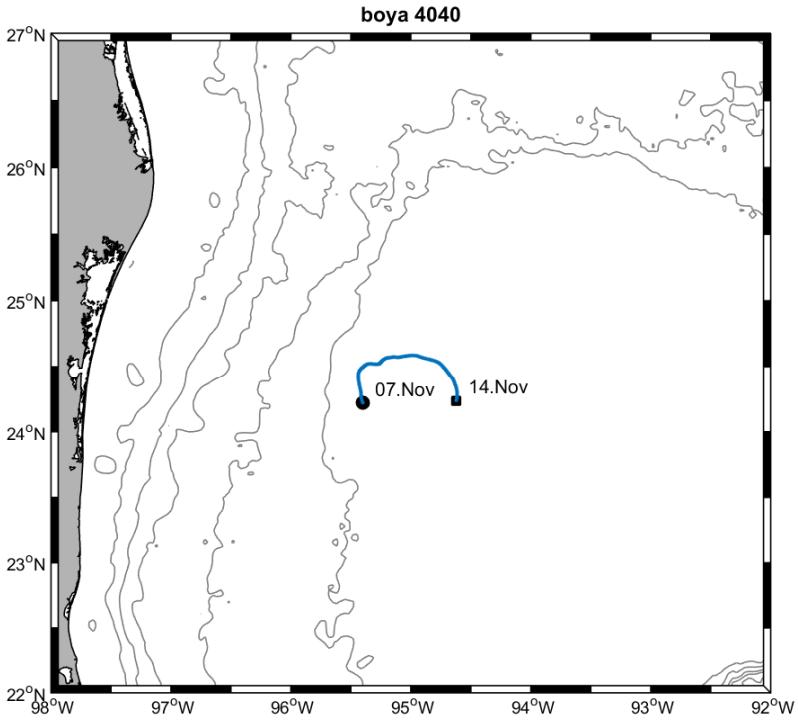

boya 2920
26°N
24°N
22°N
20°N
100°W
98°W
96°W
94°W
92°W
30
40
10
50
07.Nov
20
60
28.Jan
80
70

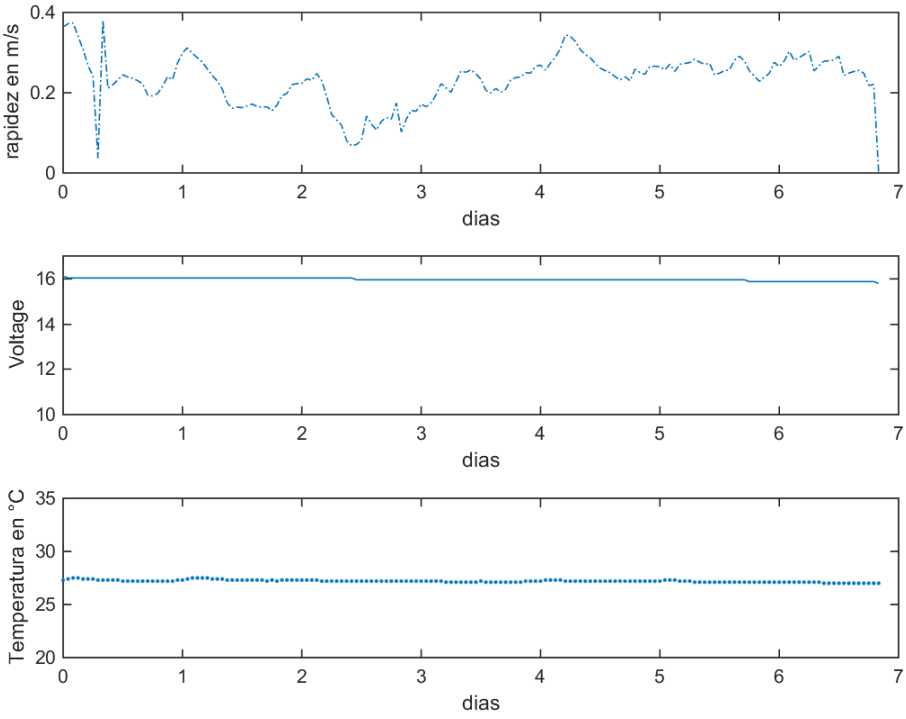

rapidez en m/s
dias

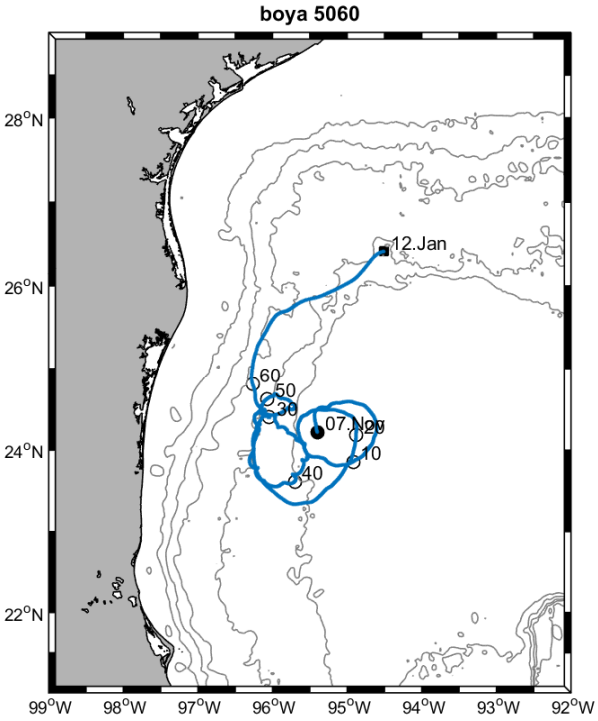

Voltage
dias

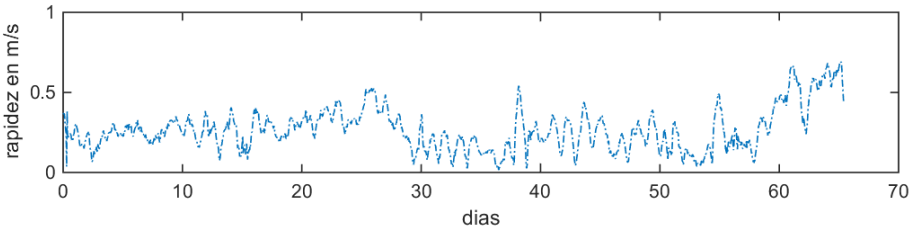

Temperatura en °C
dias

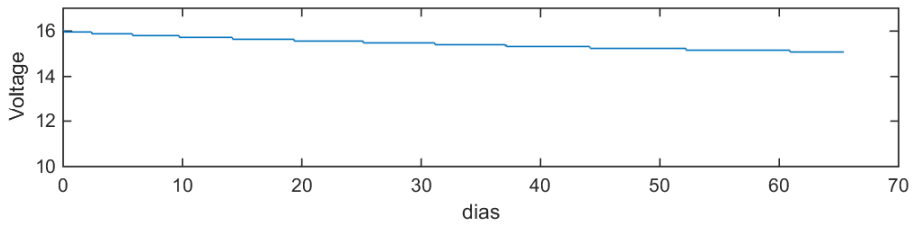
1.1.2. TRIPLET 02

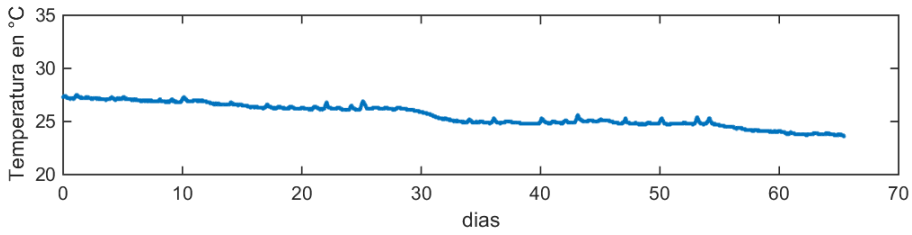


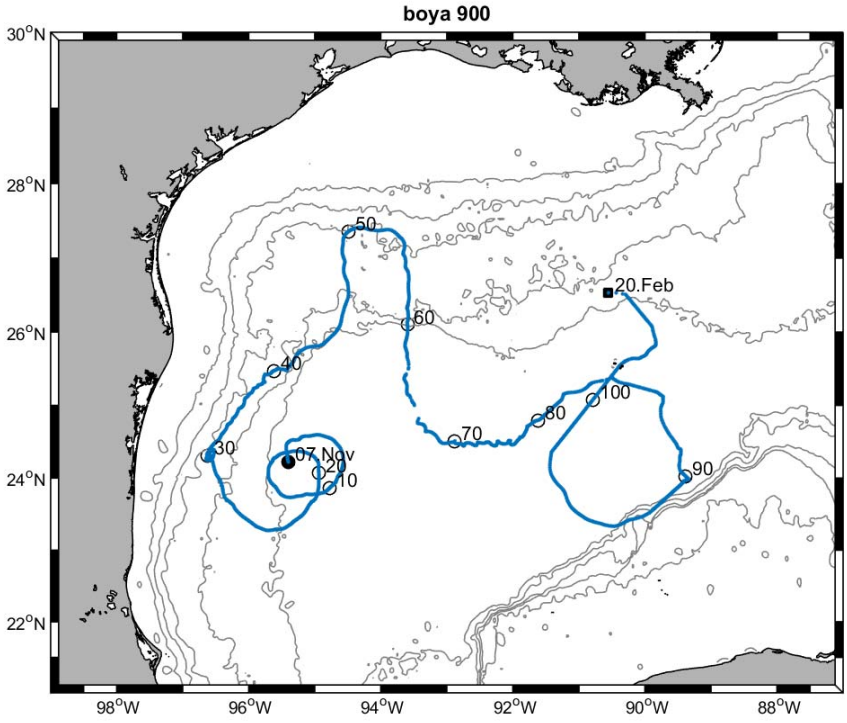


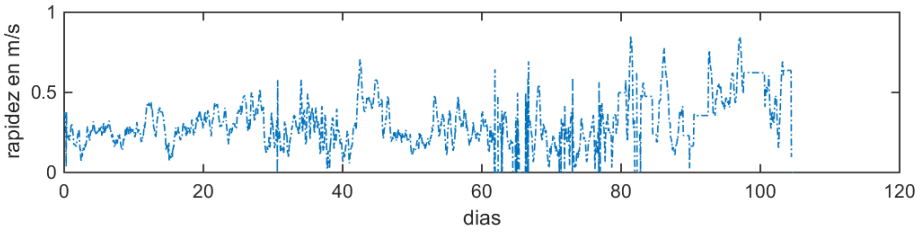

boya 5060
28°N
26°N
24°N
22°N
99°W
98°W
97°W
96°W
95°W
94°W
93°W
92°W
12.Jan
07.Nov
60
50
30
20
10
40

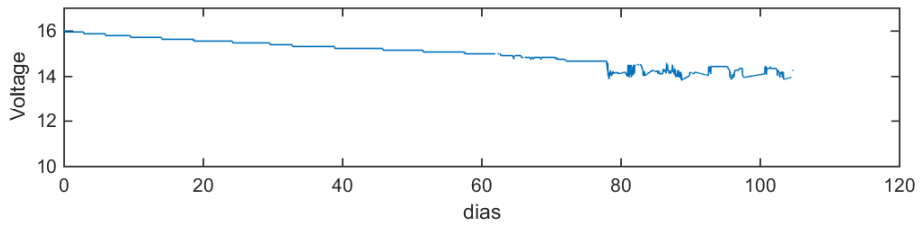

rapidez en m/s
1
0.5
0
0
10
20
30
40
50
60
70
dias

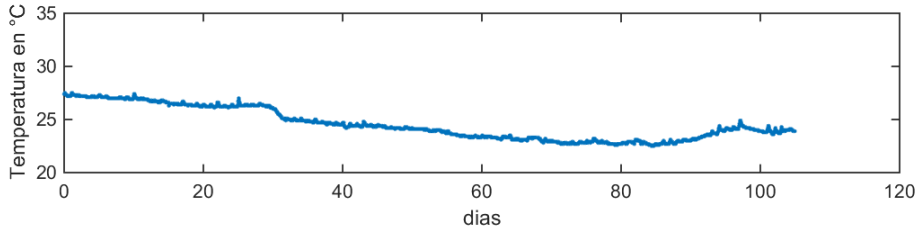

Voltage
16
14
12
10
0
10
20
30
40
50
60
70
dias


Temperatura en °C
35
30
25
20
0
10
20
30
40
50
60
70
dias

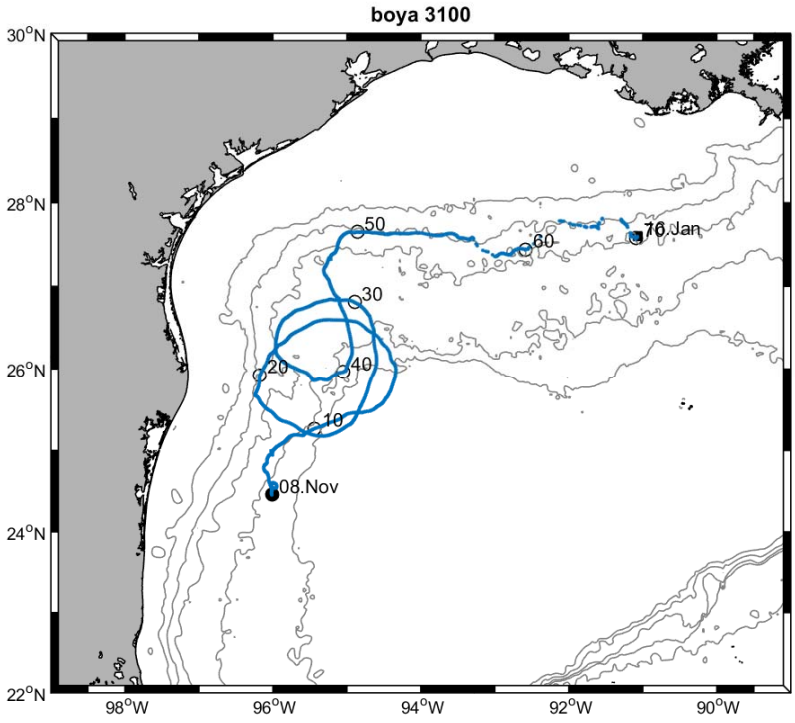

boya 900
30°N
28°N
26°N
24°N
22°N
98°W
96°W
94°W
92°W
90°W
88°W
50
60
40
30
07.Nov
20
10
70
80
100
20.Feb
90

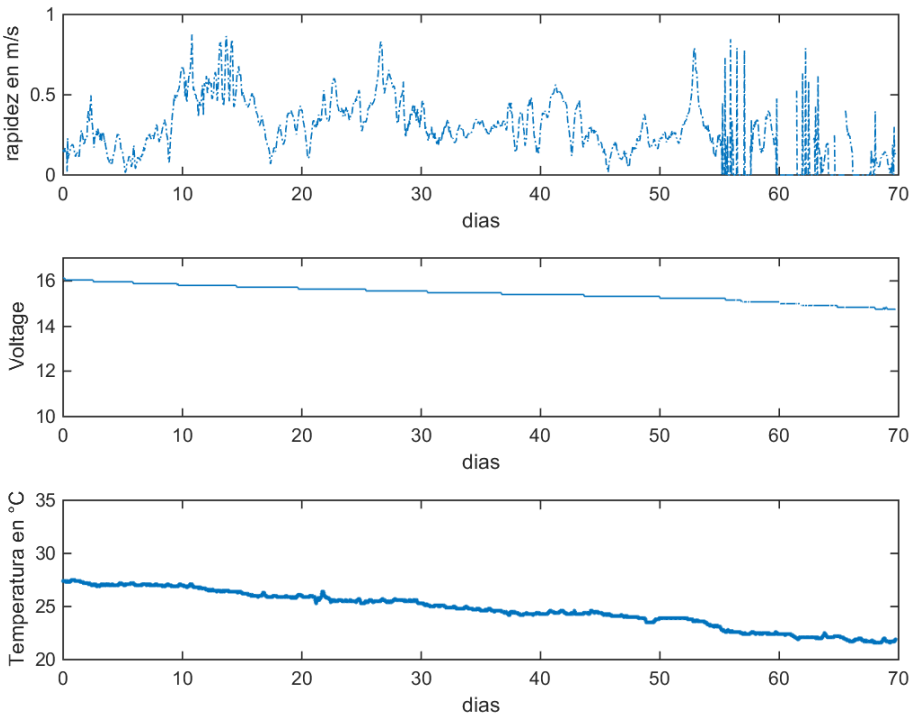

rapidez en m/s
1
0.5
0
0
20
40
60
80
100
120
dias

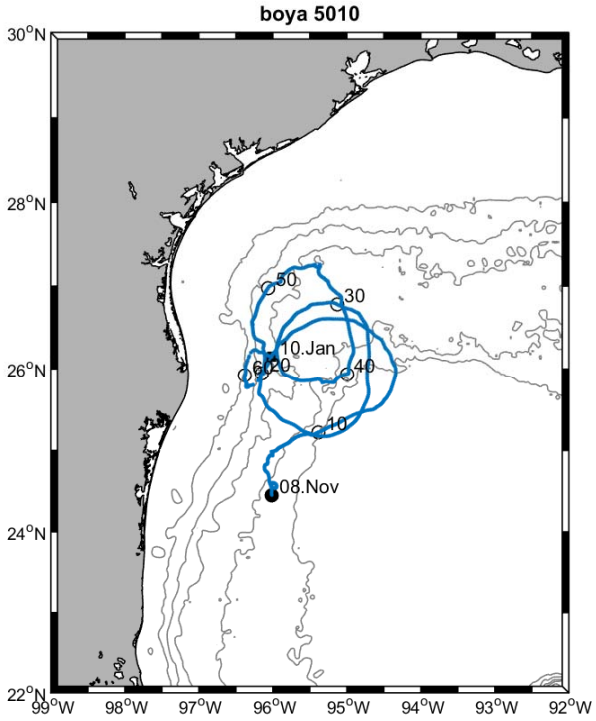

Voltage
16
14
12
10
0
20
40
60
80
100
120
dias

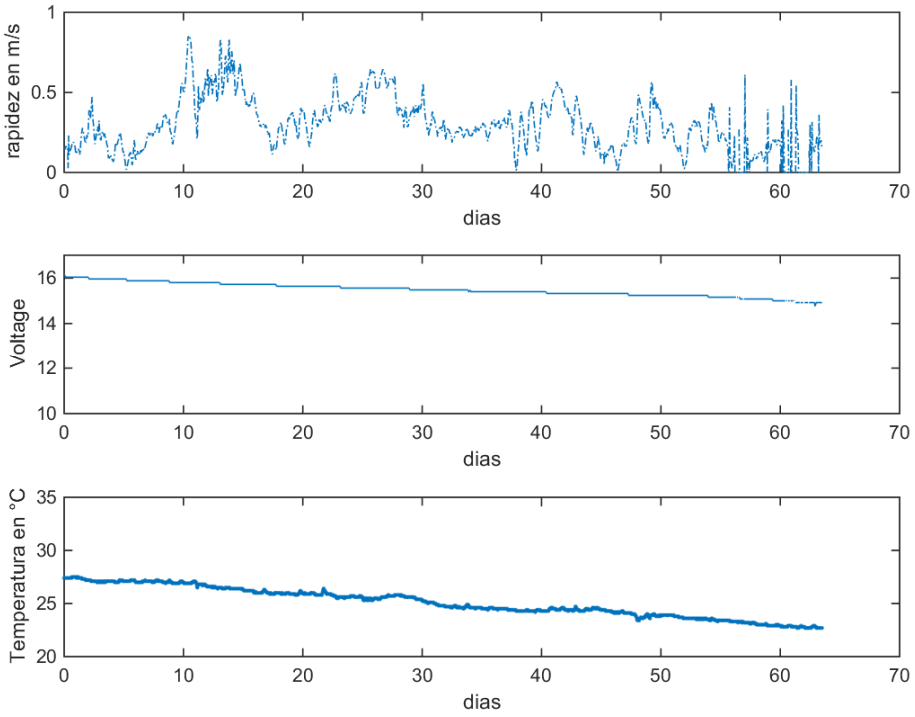

Temperatura en °C
35
30
25
20
0
20
40
60
80
100
120
dias

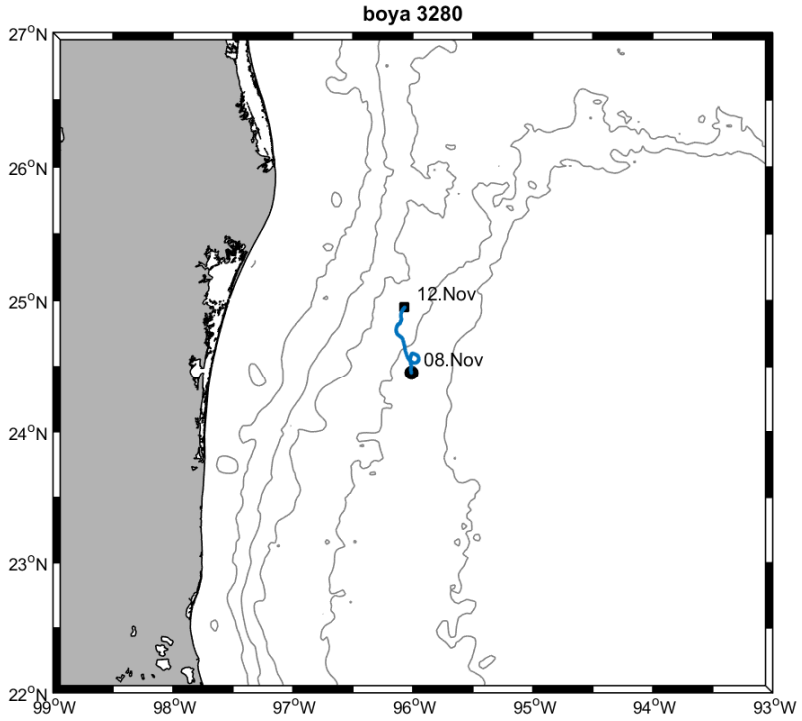
1.1.3. TRIPLET 03

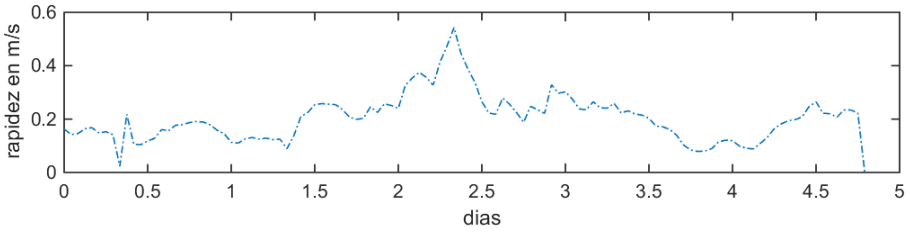


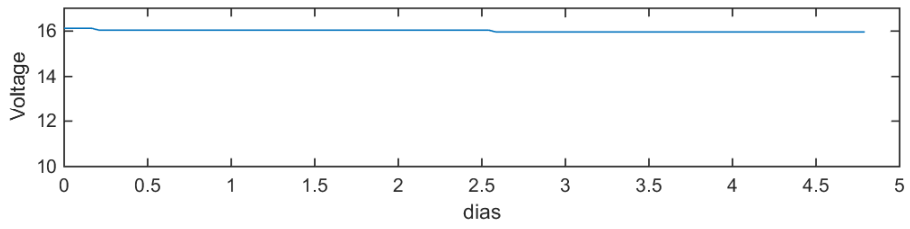


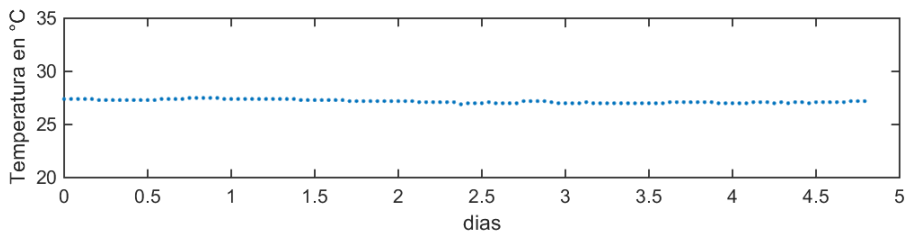

boya 5010
30°N
28°N
26°N
24°N
22°N
99°W
98°W
97°W
96°W
95°W
94°W
93°W
92°W
50
30
10.Jan
60
20
40
10
08.Nov


rapidez en m/s
dias
Voltage
dias
Temperatura en °C
dias

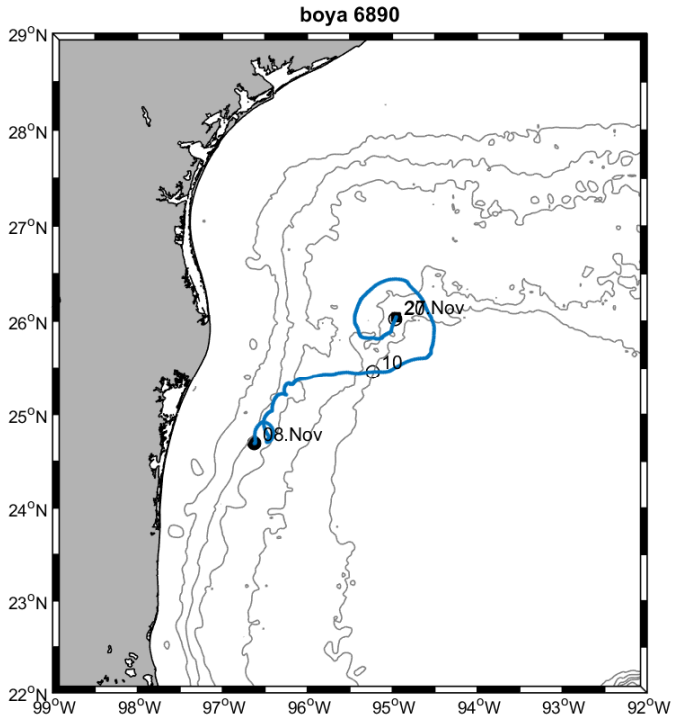

boya 3280
27°N
26°N
25°N
24°N
23°N
22°N
99°W
98°W
97°W
96°W
95°W
94°W
93°W
12.Nov
08.Nov

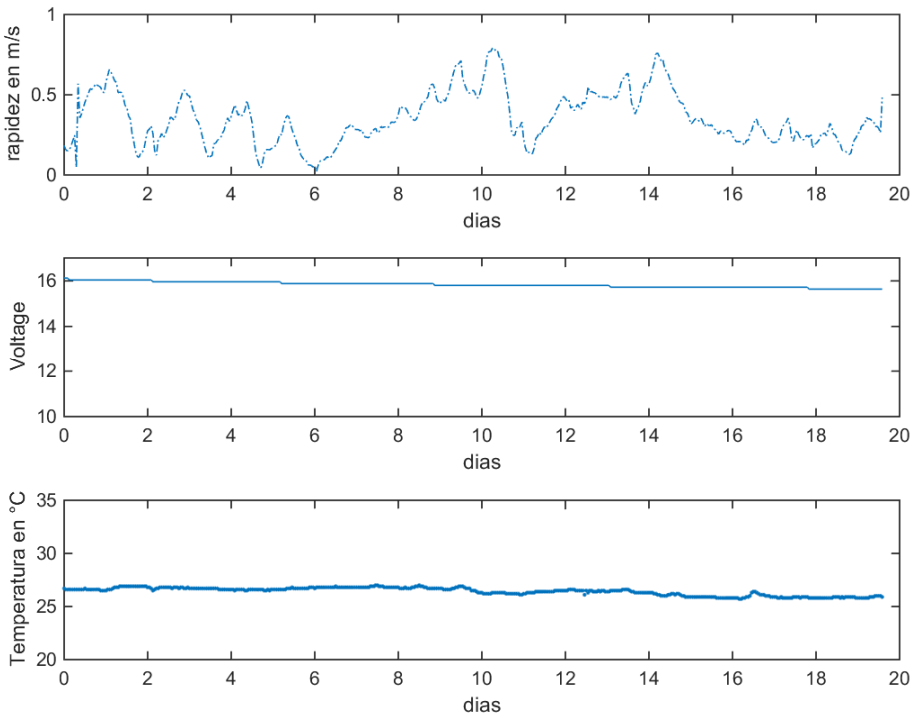

rapidez en m/s
0.6
0.4
0.2
0
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5
5
dias

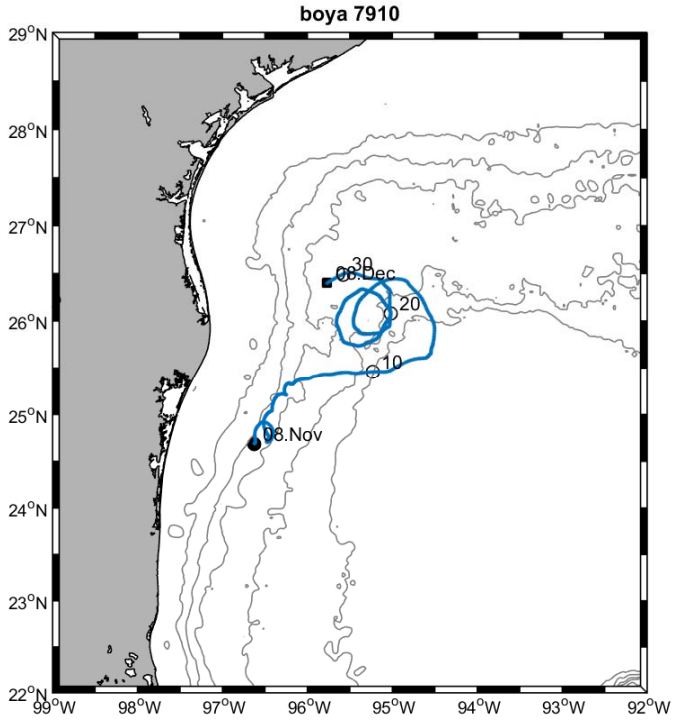

Voltage
16
14
12
10
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5
5
dias

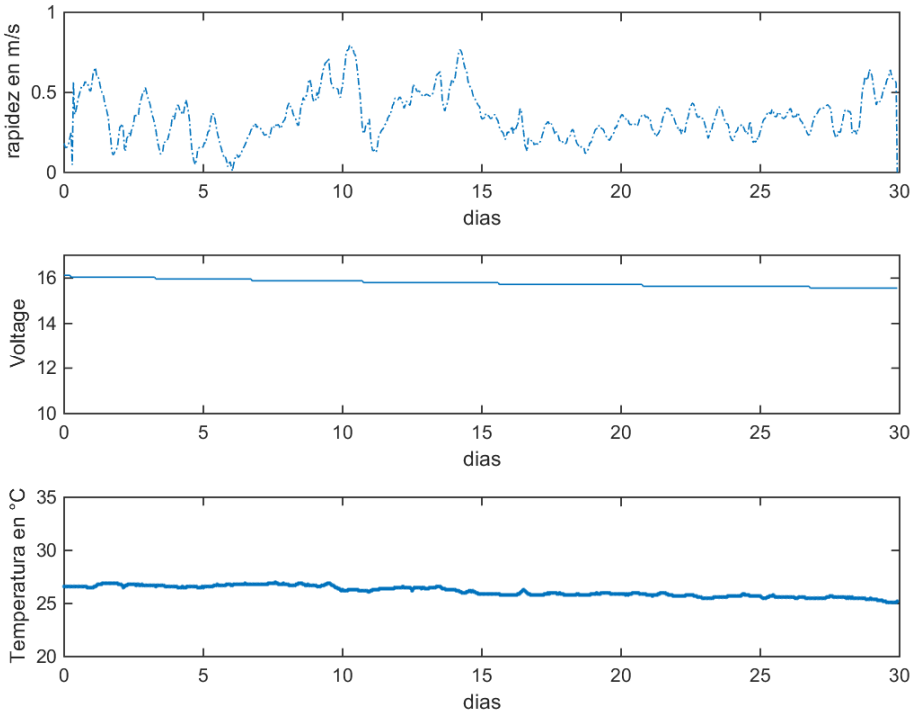

Temperatura en °C
35
30
25
20
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5
5
dias

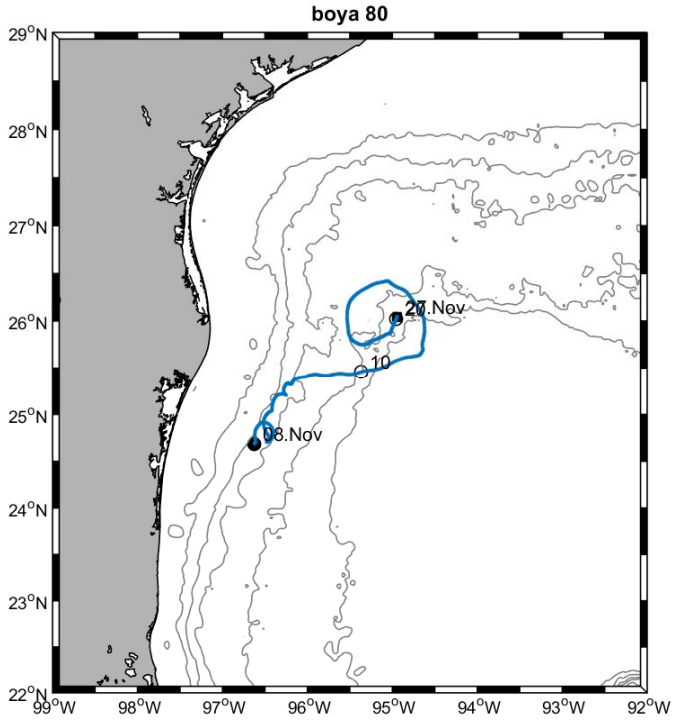
1.1.4. TRIPLET 04

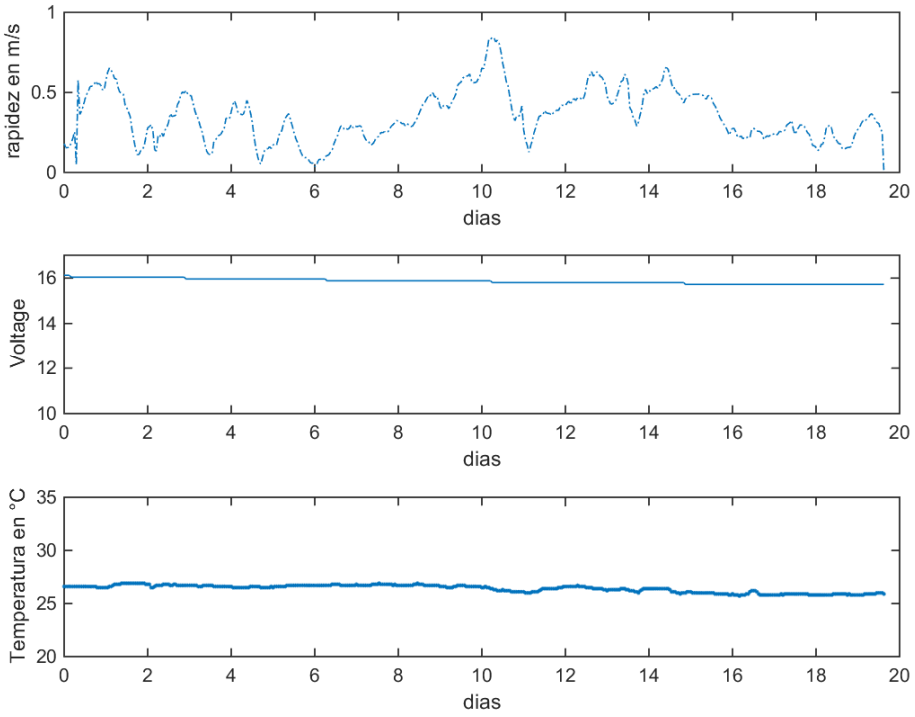




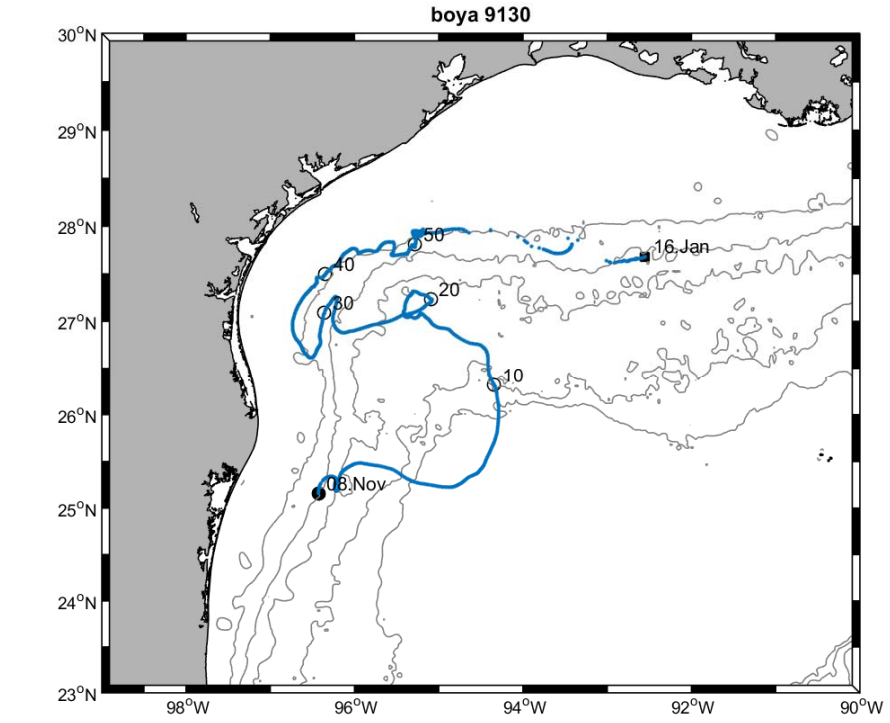

boya 7910
29°N
28°N
27°N
26°N
25°N
24°N
23°N
22°N
99°W
98°W
97°W
96°W
95°W
94°W
93°W
92°W
30
08.Dec
20
10
08.Nov

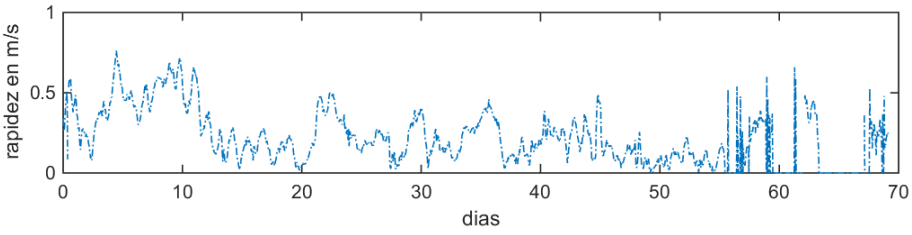

rapidez en m/s
1
0.5
0
0
5
10
15
20
25
30
dias
Voltage
16
14
12
10
0
5
10
15
20
25
30
dias
Temperatura en °C
35
30
25
20
0
5
10
15
20
25
30
dias

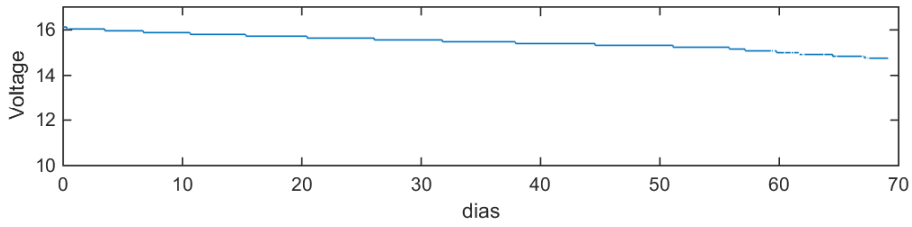

boya 80
29°N
28°N
27°N
26°N
25°N
24°N
23°N
22°N
99°W
98°W
97°W
96°W
95°W
94°W
93°W
92°W
27.Nov
10
08.Nov

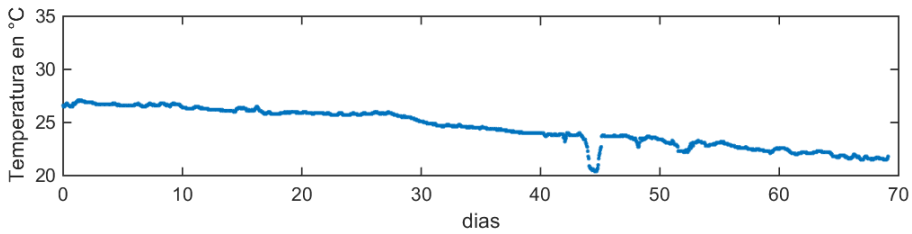

rapidez en m/s
dias
Voltage
dias
Temperatura en °C
dias

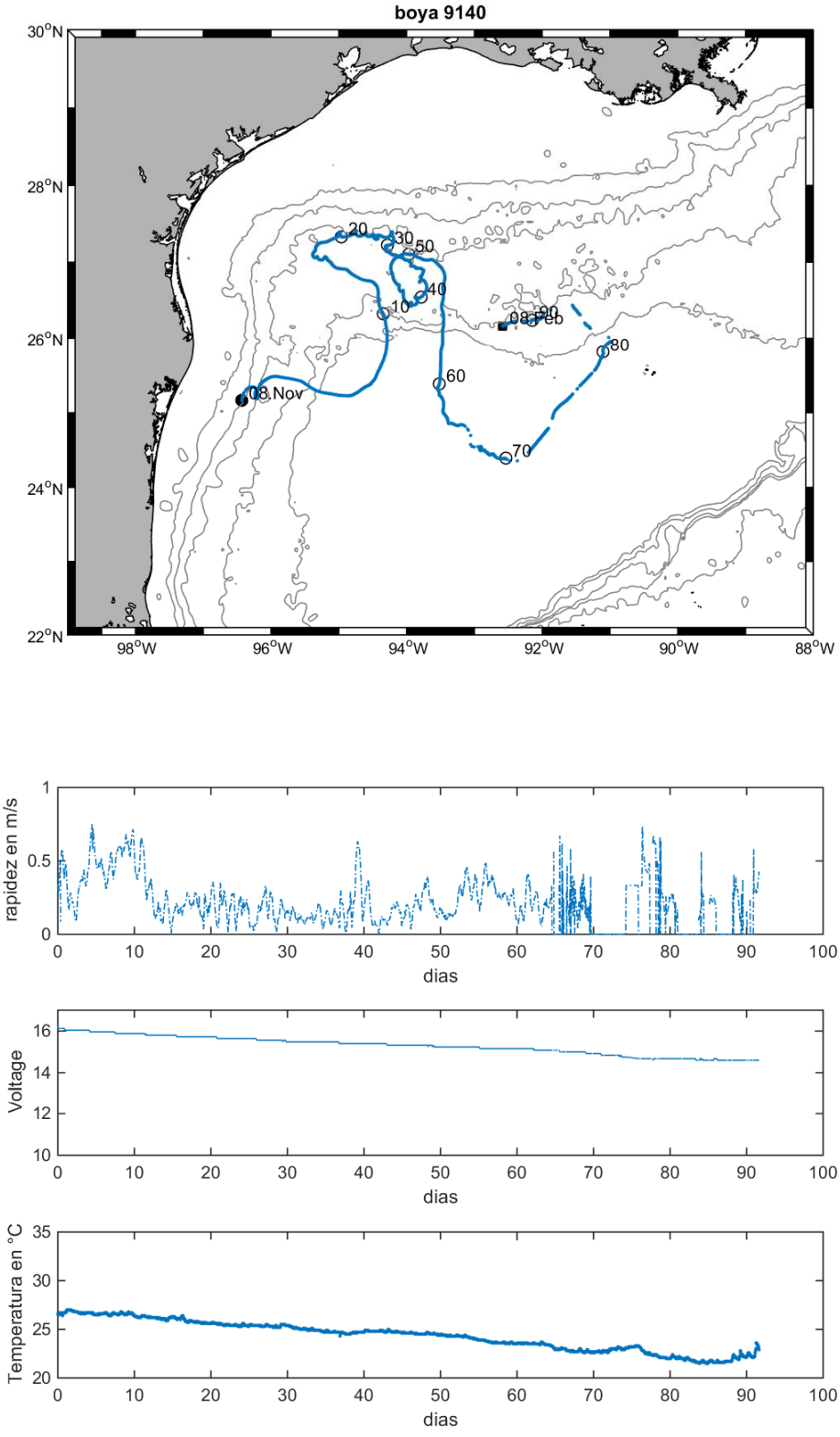
1.1.5. TRIPLET 05

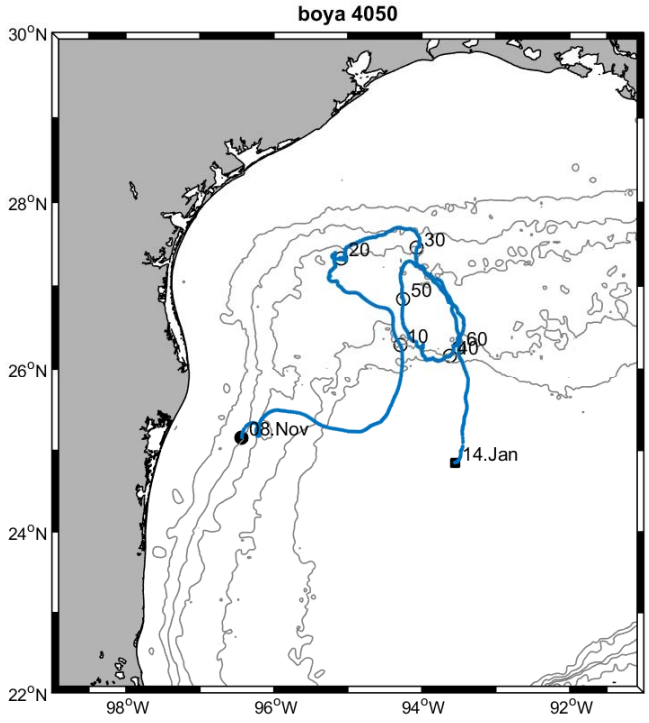


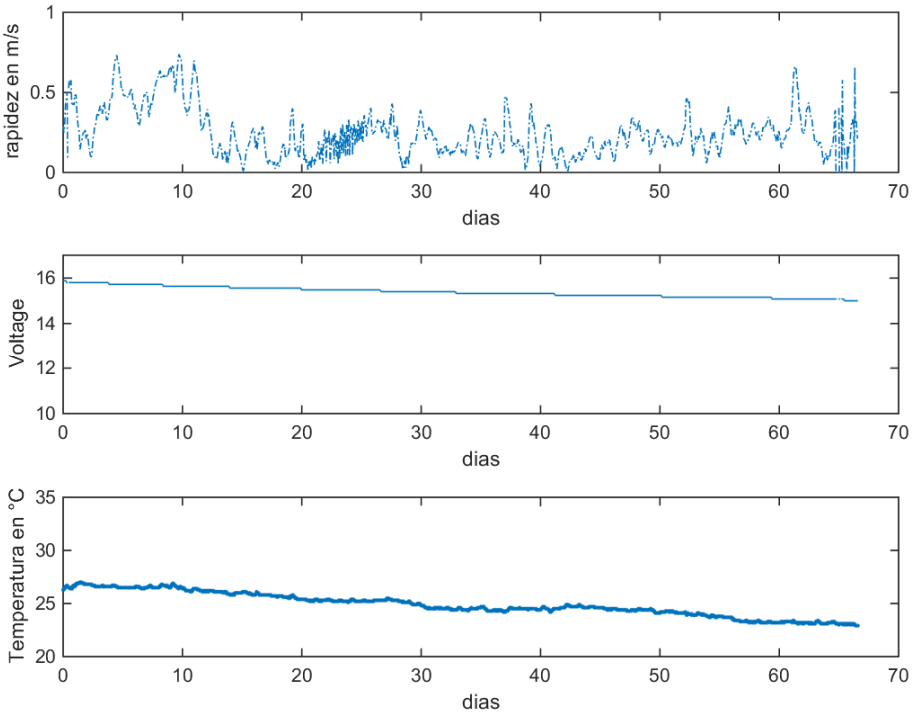




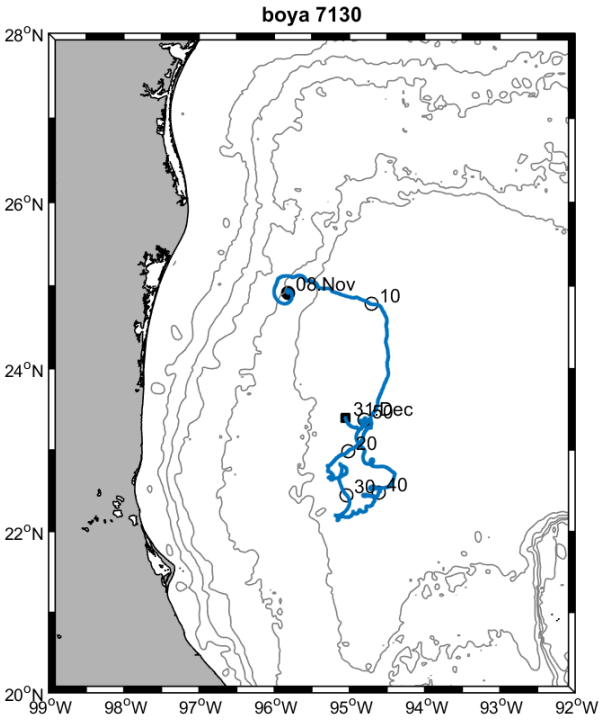


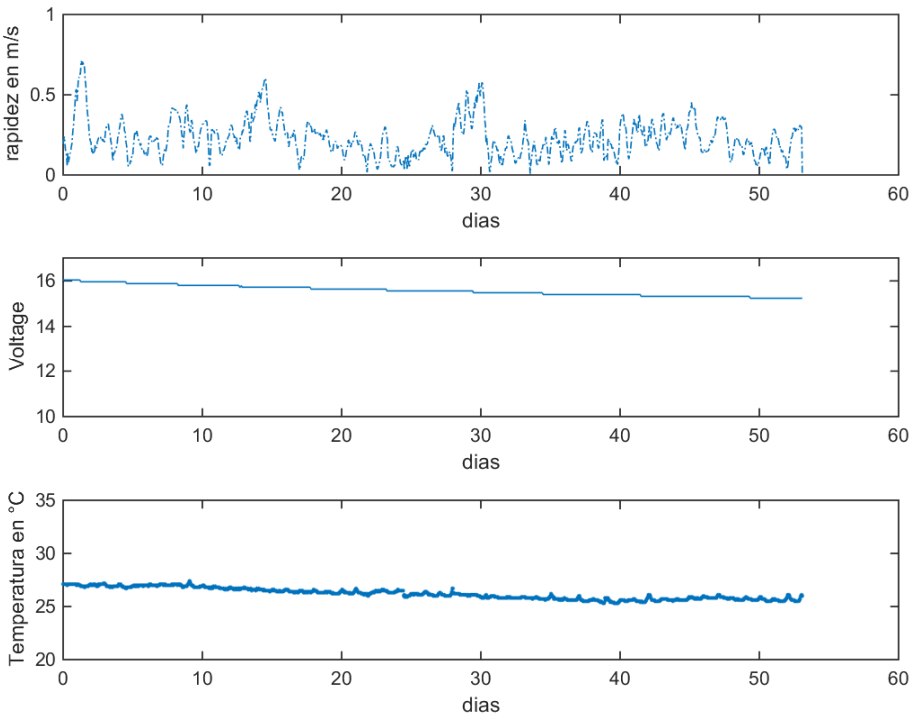

boya 9140
30°N
28°N
26°N
24°N
22°N
98°W
96°W
94°W
92°W
90°W
88°W
20
30
50
40
10
90
08 Feb
80
60
08 Nov
70
rapidez en m/s
1
0.5
0
0
10
20
30
40
50
60
70
80
90
100
dias
Voltage
16
14
12
10
0
10
20
30
40
50
60
70
80
90
100
dias
Temperatura en °C
35
30
25
20
0
10
20
30
40
50
60
70
80
90
100
dias

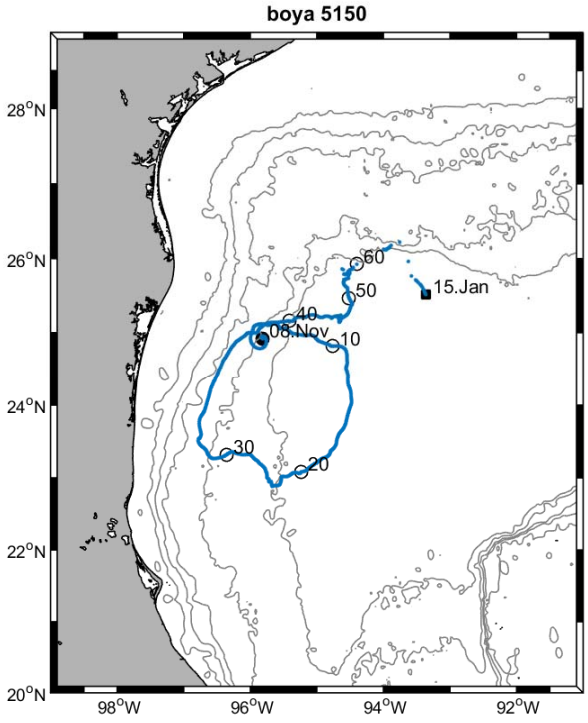

boya 4050
30°N
28°N
26°N
24°N
22°N
98°W
96°W
94°W
92°W
20
30
50
10
60
40
08.Nov
14.Jan

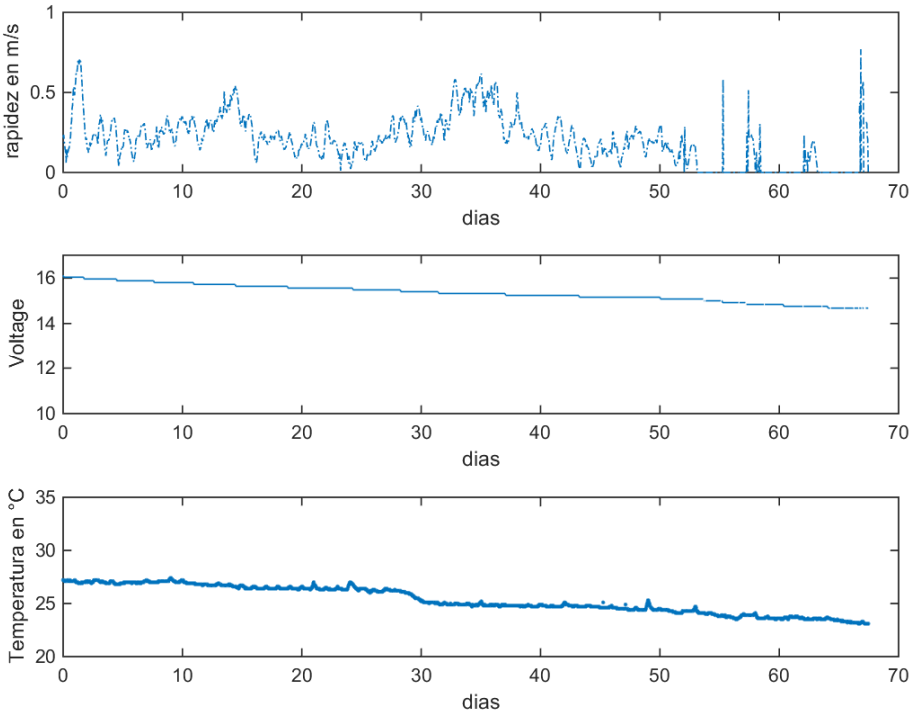

rapidez en m/s
dias
Voltage
dias
Temperatura en °C
dias

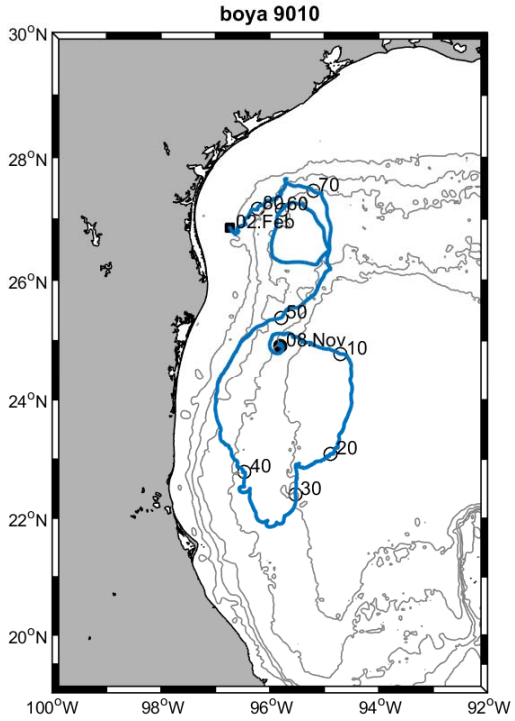
1.1.6. TRIPLET 06

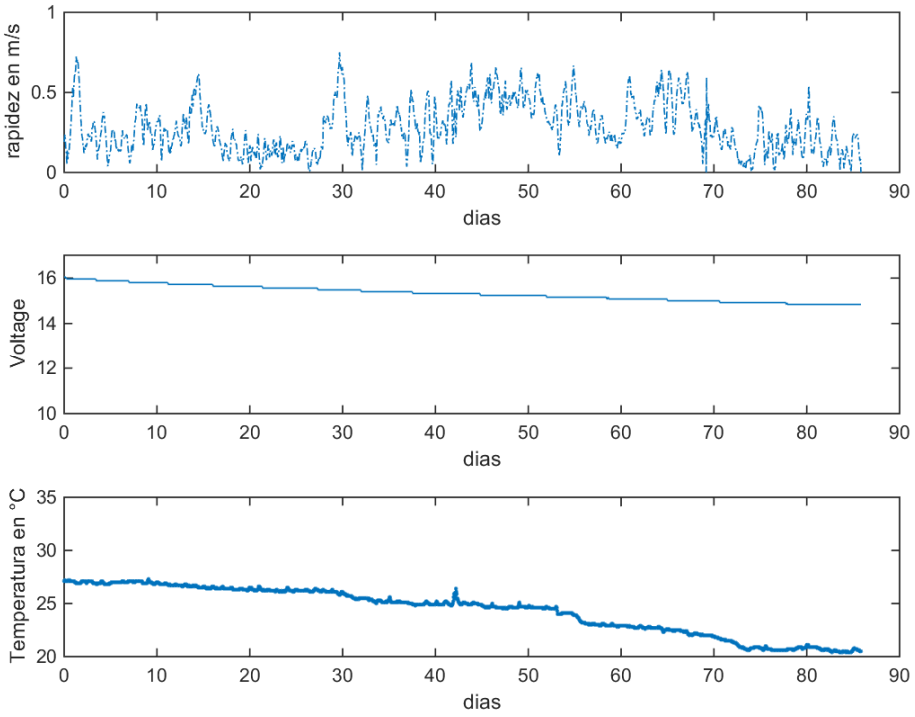




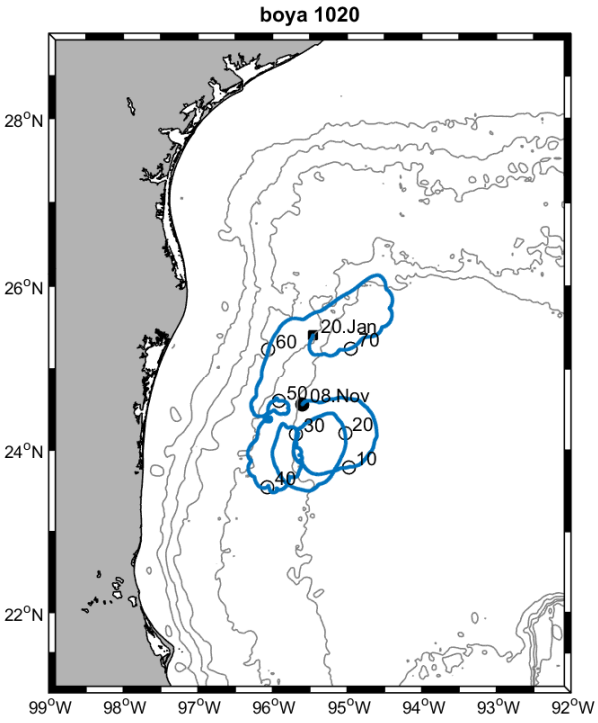

boya 5150
28°N
26°N
24°N
22°N
20°N
98°W
96°W
94°W
92°W
60
50
40
10
30
20
15.Jan
08.Nov

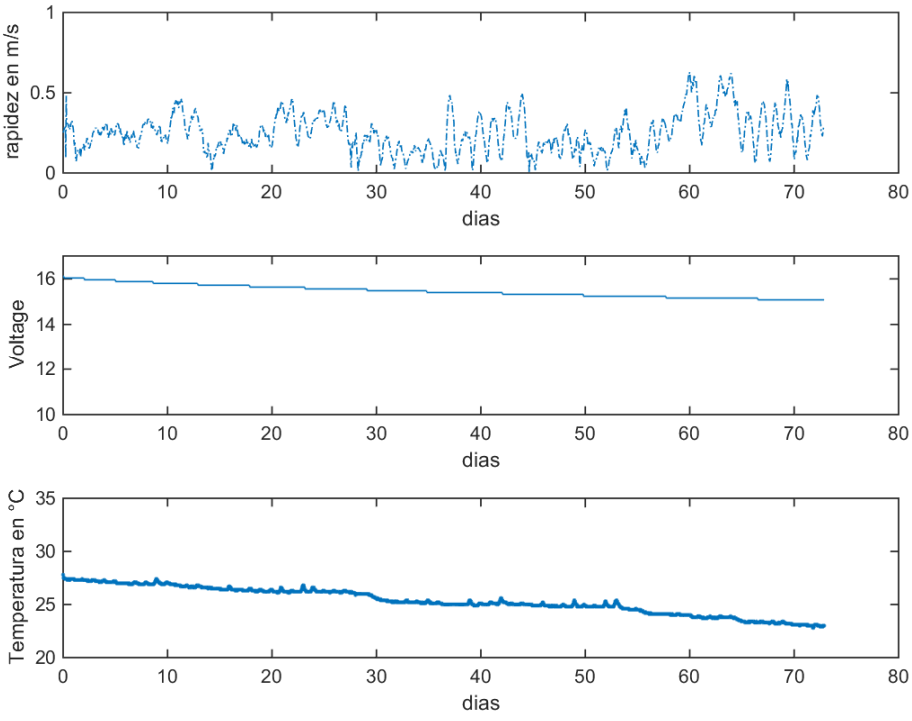

rapidez en m/s
dias
Voltage
dias
Temperatura en °C
dias

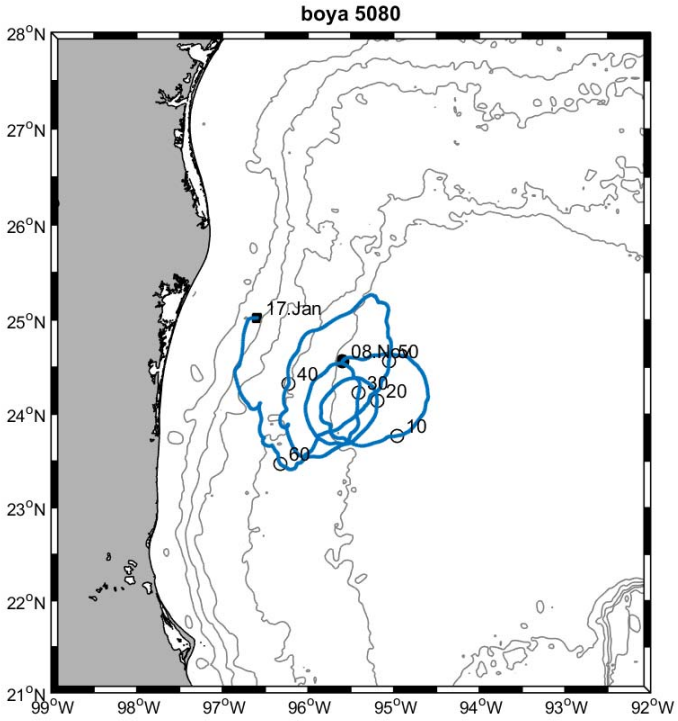

boya 9010
30°N
28°N
26°N
24°N
22°N
20°N
100°W
98°W
96°W
94°W
92°W
70
60
02.Feb
50
06.Nov
10
20
40
30

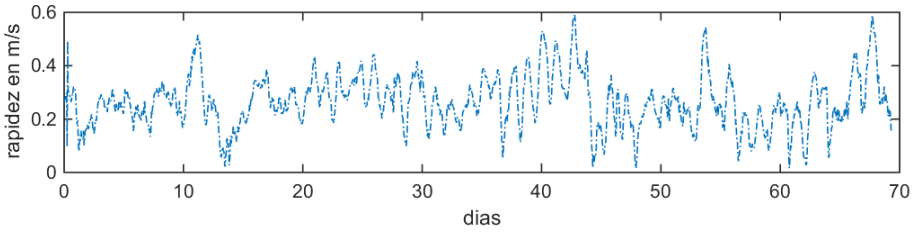

rapidez en m/s
dias
Voltage
dias
Temperatura en °C
dias

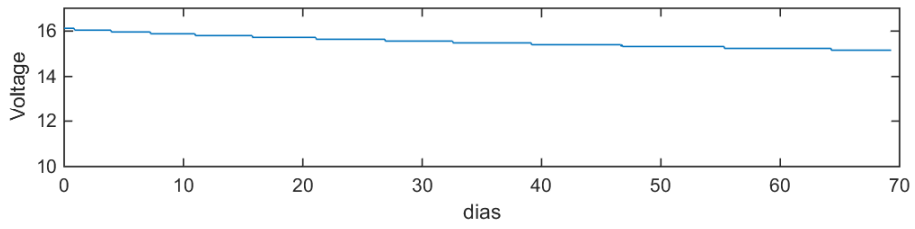
1.1.7. TRIPLET 07

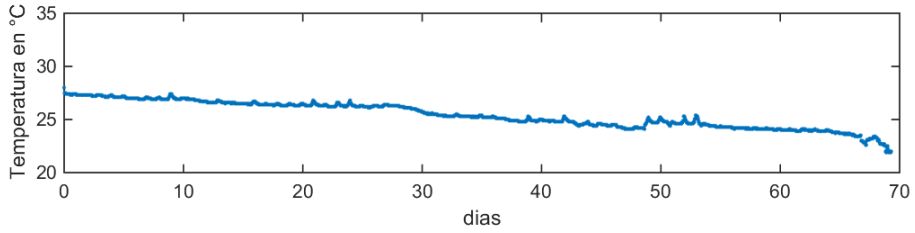


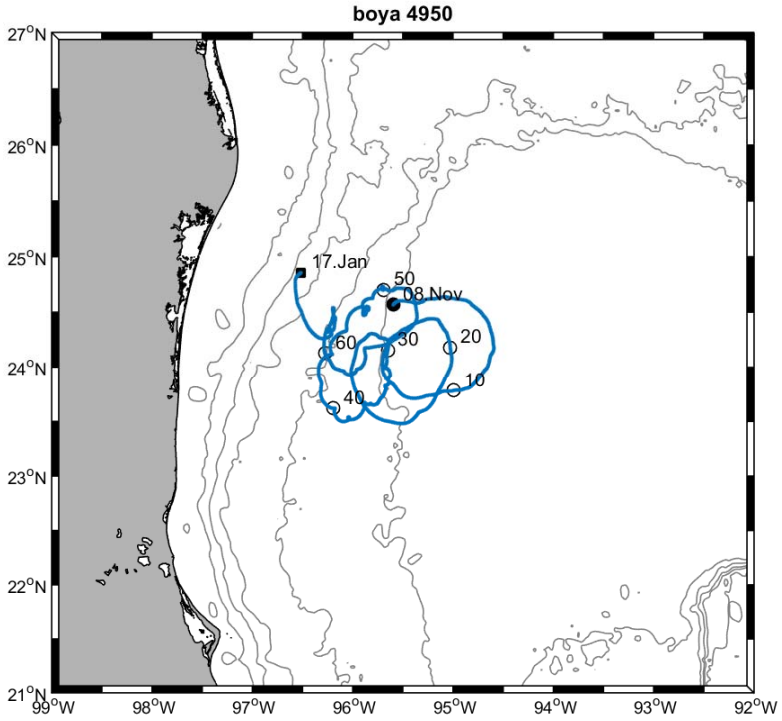


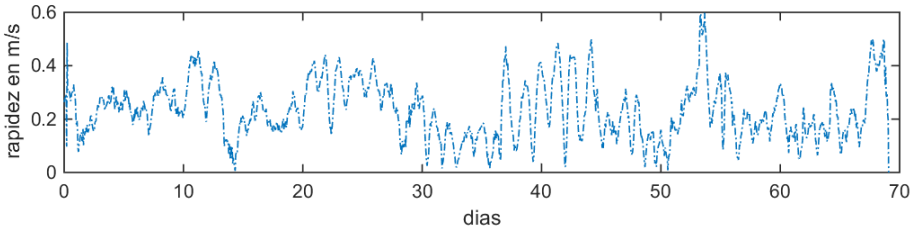

boya 5080
28°N
27°N
26°N
25°N
24°N
23°N
22°N
21°N
99°W
98°W
97°W
96°W
95°W
94°W
93°W
92°W
17 Jan
08 Nov
50
40
30
20
10
60

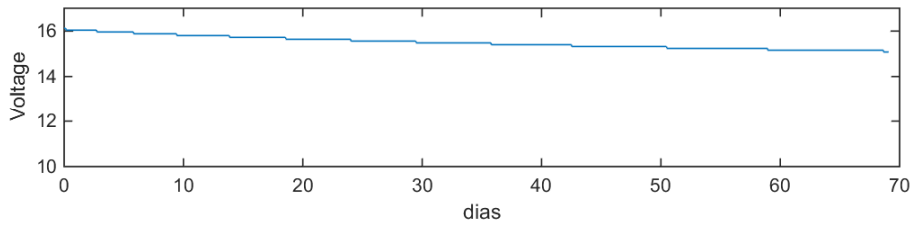

rapidez en m/s
0.6
0.4
0.2
0
0
10
20
30
40
50
60
70
dias

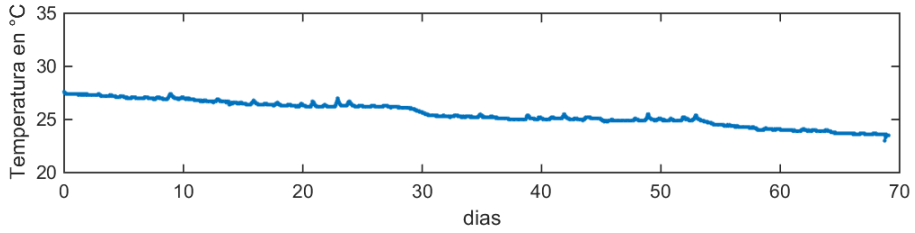

Voltage
16
14
12
10
0
10
20
30
40
50
60
70
dias


Temperatura en °C
35
30
25
20
0
10
20
30
40
50
60
70
dias

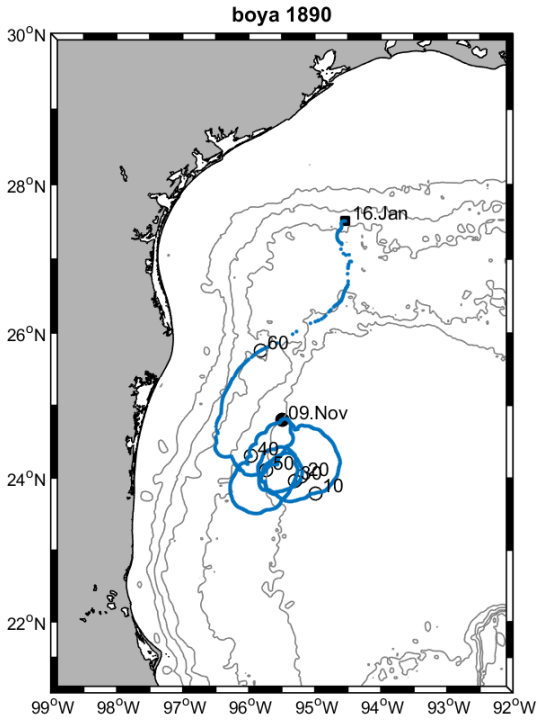

boya 4950
27°N
26°N
25°N
24°N
23°N
22°N
21°N
99°W
98°W
97°W
96°W
95°W
94°W
93°W
92°W
17.Jan
08.Nov
50
60
30
20
10
40

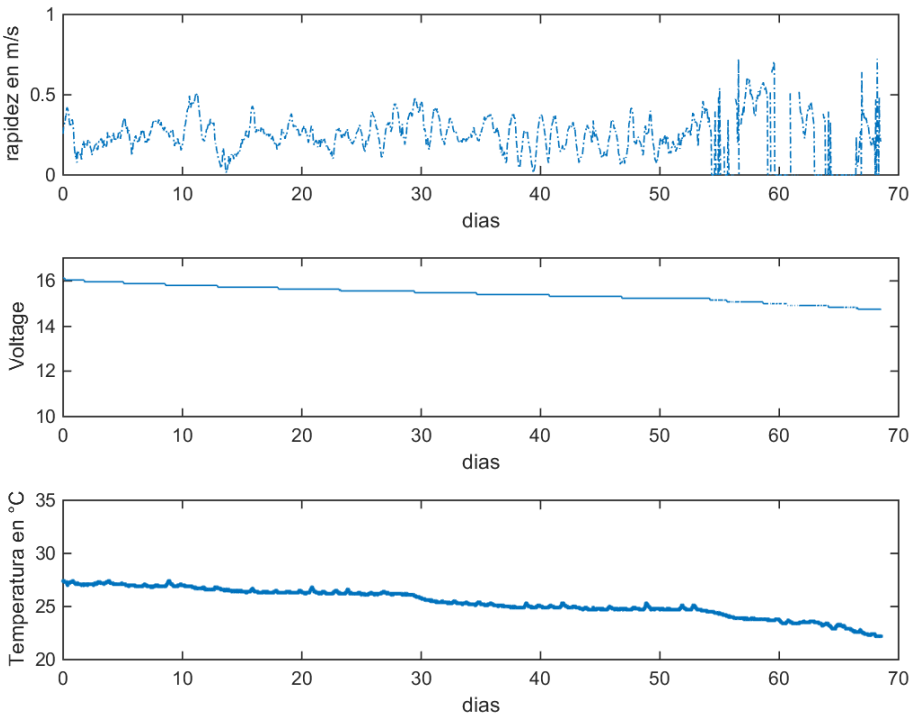

rapidez en m/s
0.6
0.4
0.2
0
0
10
20
30
40
50
60
70
dias

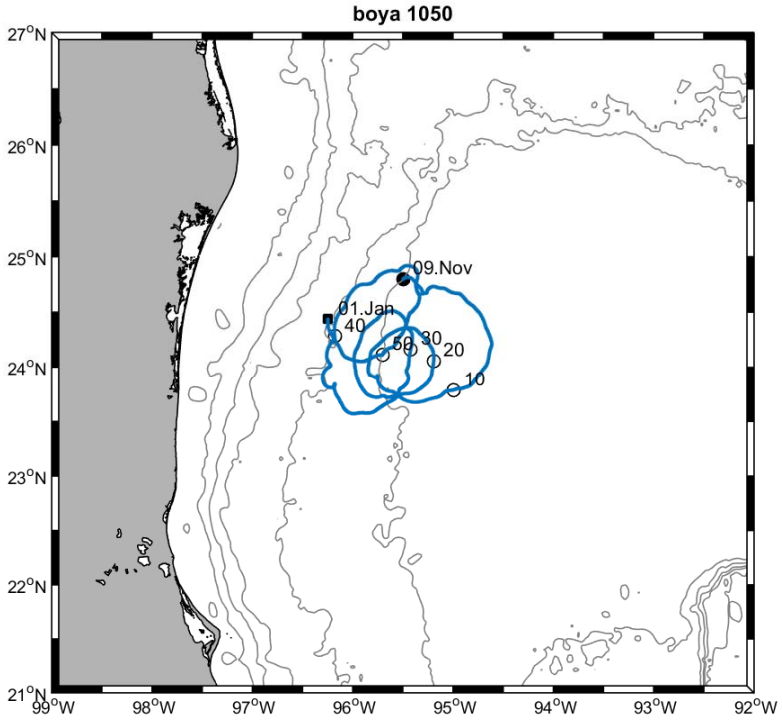

Voltage
16
14
12
10
0
10
20
30
40
50
60
70
dias

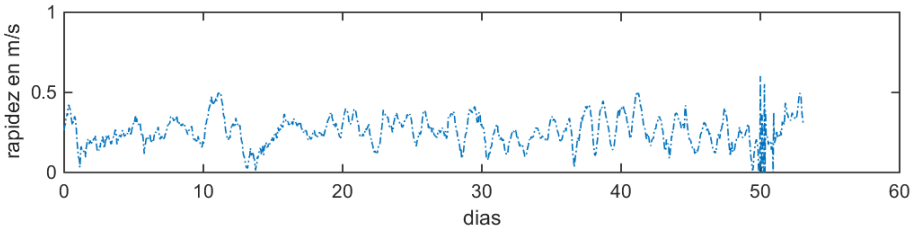

Temperatura en °C
35
30
25
20
0
10
20
30
40
50
60
70
dias

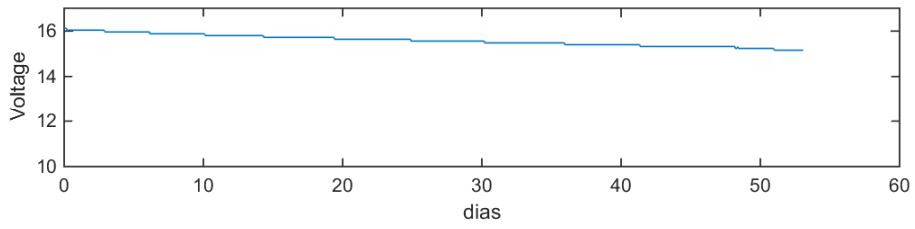
1.1.8. TRIPLET 08

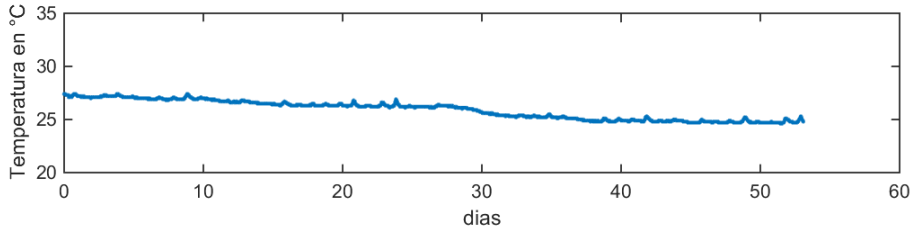


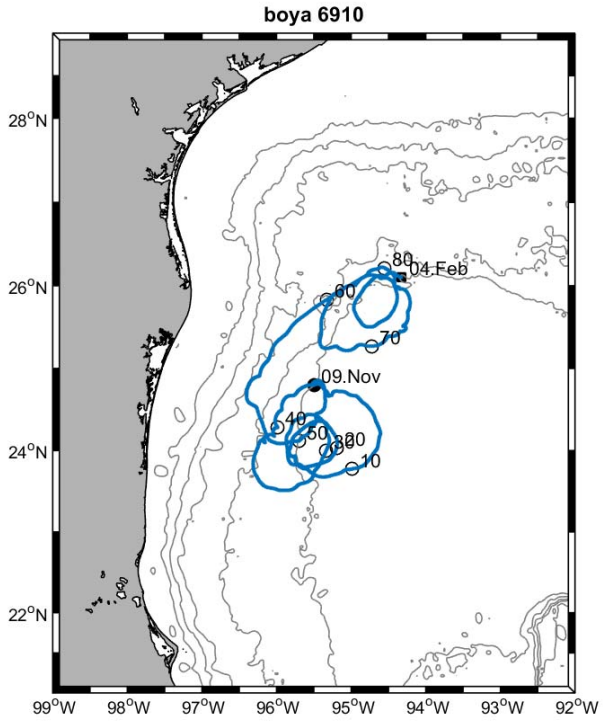


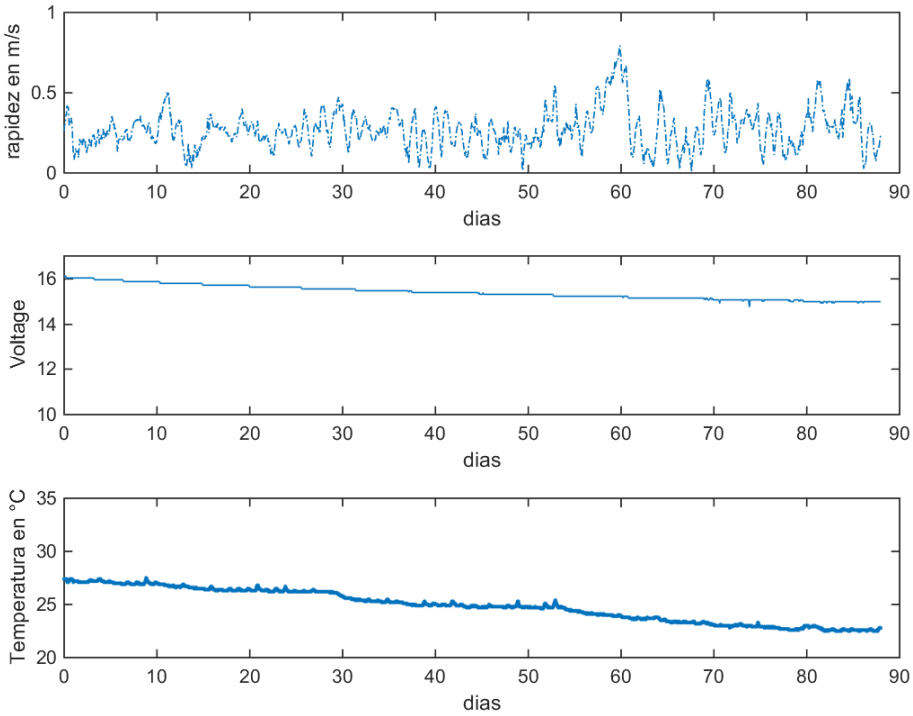

boya 1050
27°N
26°N
25°N
24°N
23°N
22°N
21°N
99°W
98°W
97°W
96°W
95°W
94°W
93°W
92°W
09.Nov
01.Jan
40
50
30
20
10


rapidez en m/s
1
0.5
0
0
10
20
30
40
50
60
dias

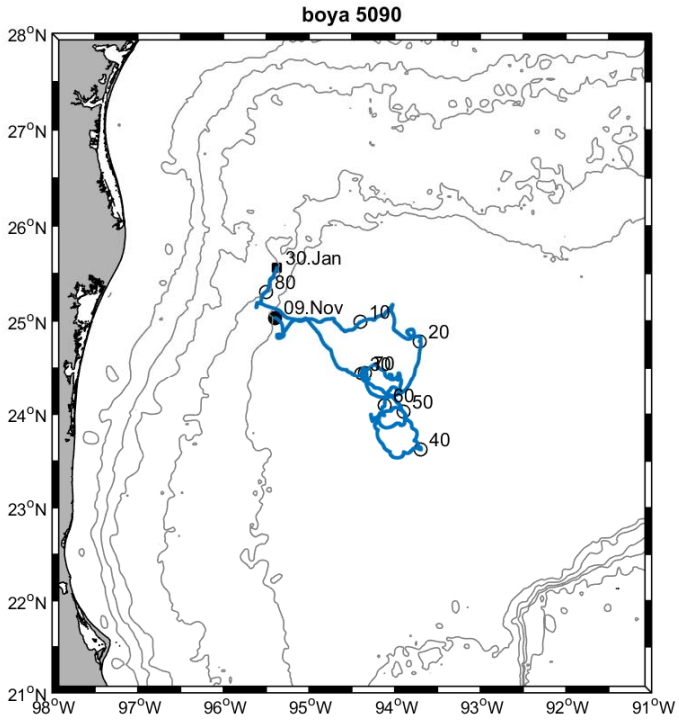

Voltage
16
14
12
10
0
10
20
30
40
50
60
dias

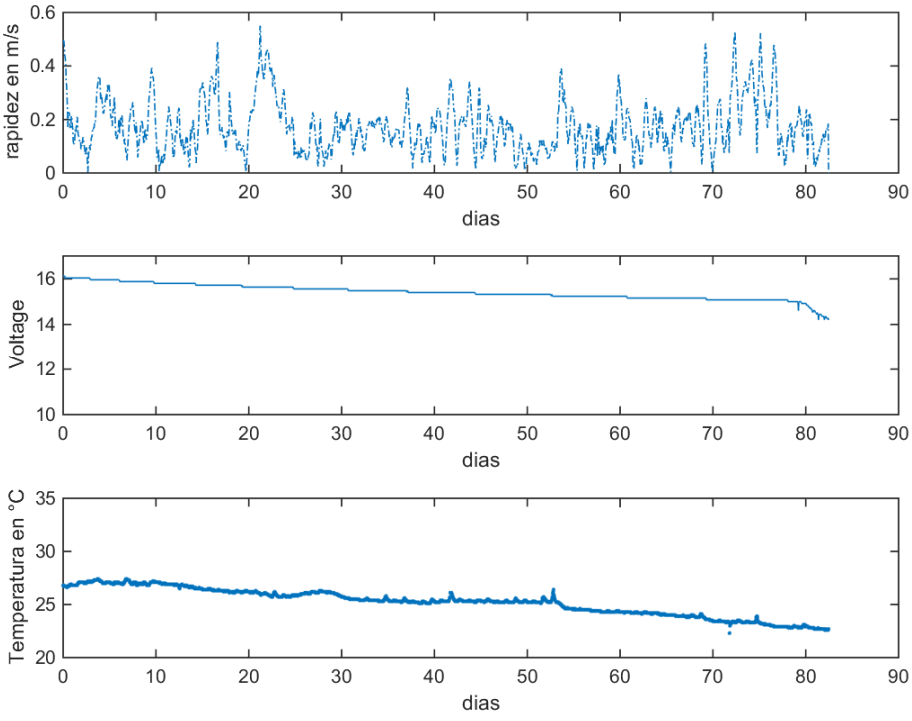

Temperatura en °C
35
30
25
20
0
10
20
30
40
50
60
dias

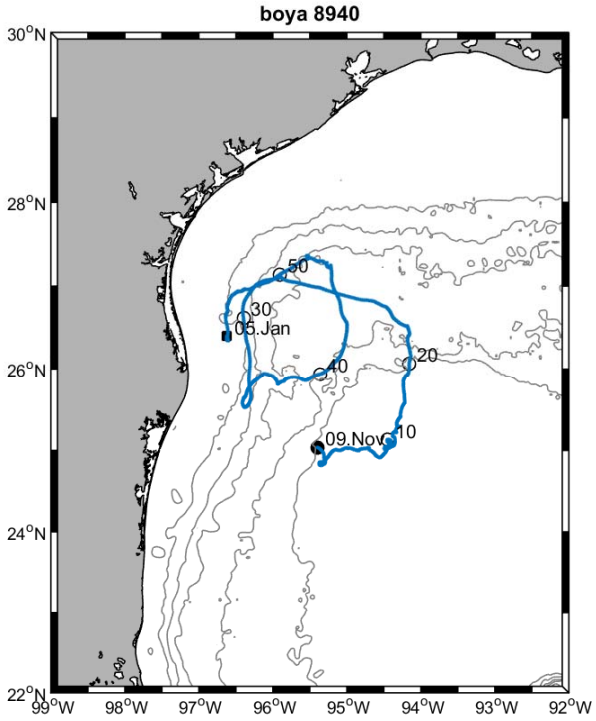

boya 6910
28°N
26°N
24°N
22°N
99°W
98°W
97°W
96°W
95°W
94°W
93°W
92°W
80
04.Feb
60
70
09.Nov
40
50
30
20
10

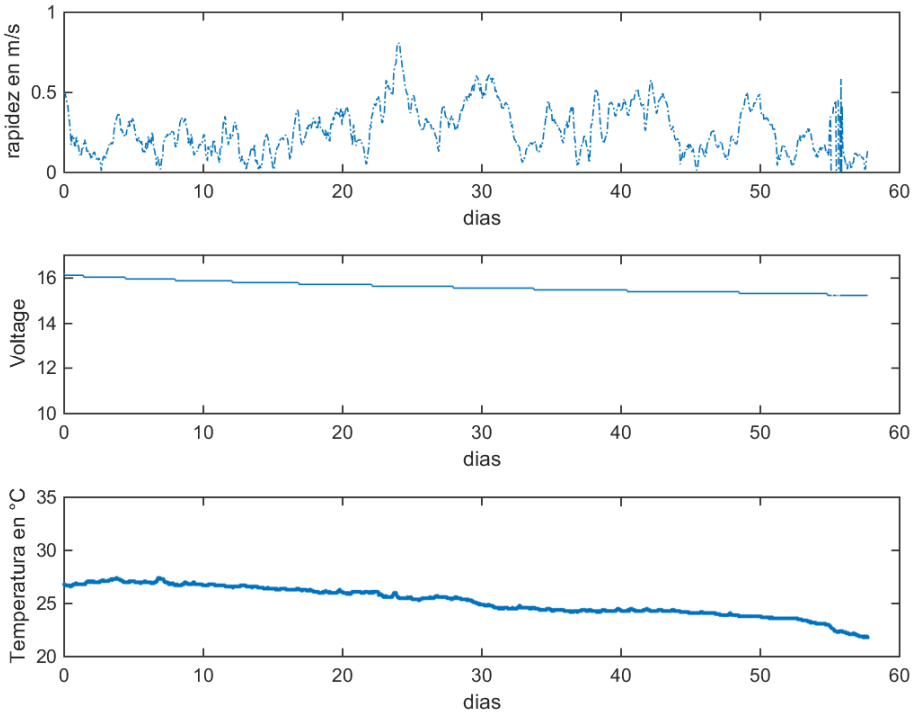

rapidez en m/s
dias
Voltage
dias
Temperatura en °C
dias

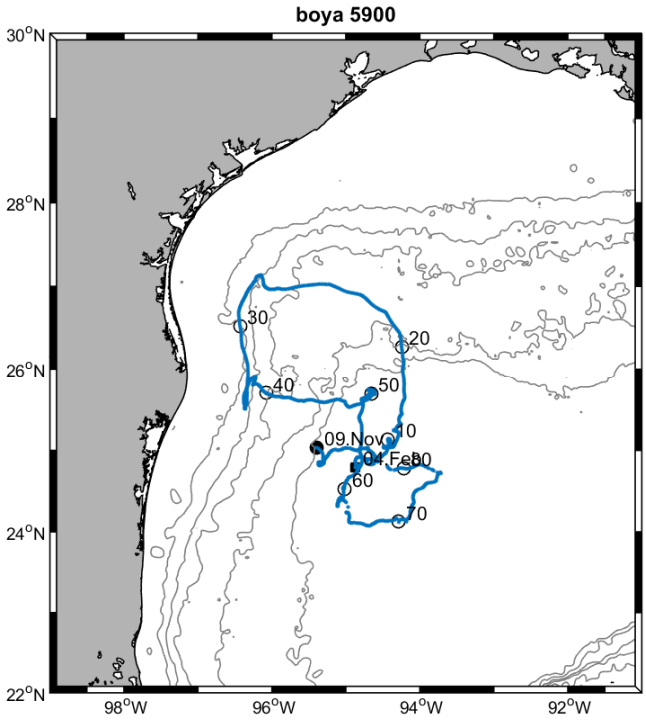
1.1.9. TRIPLET 09

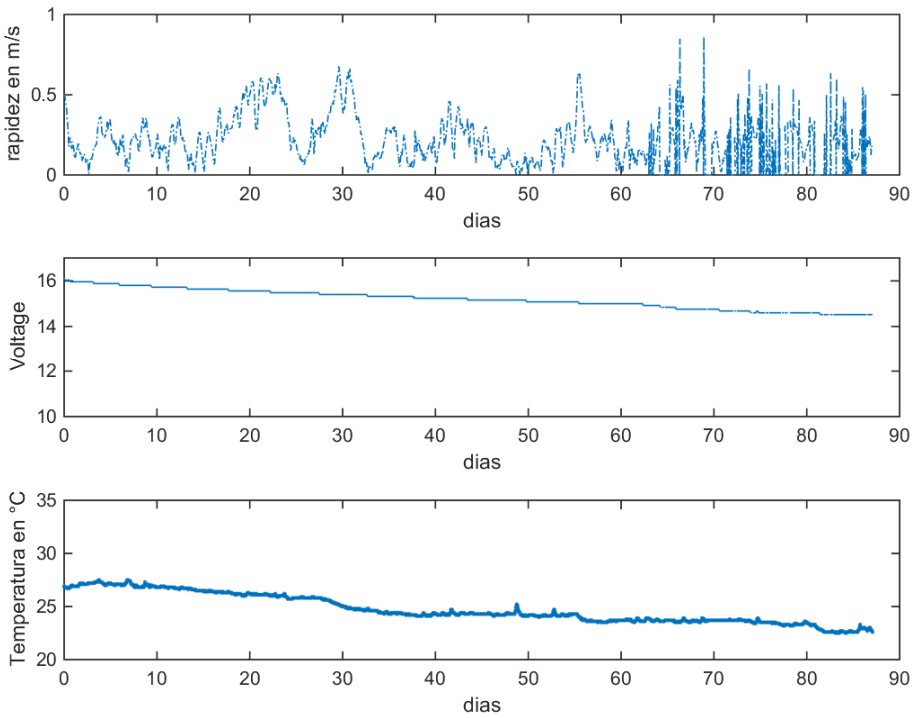




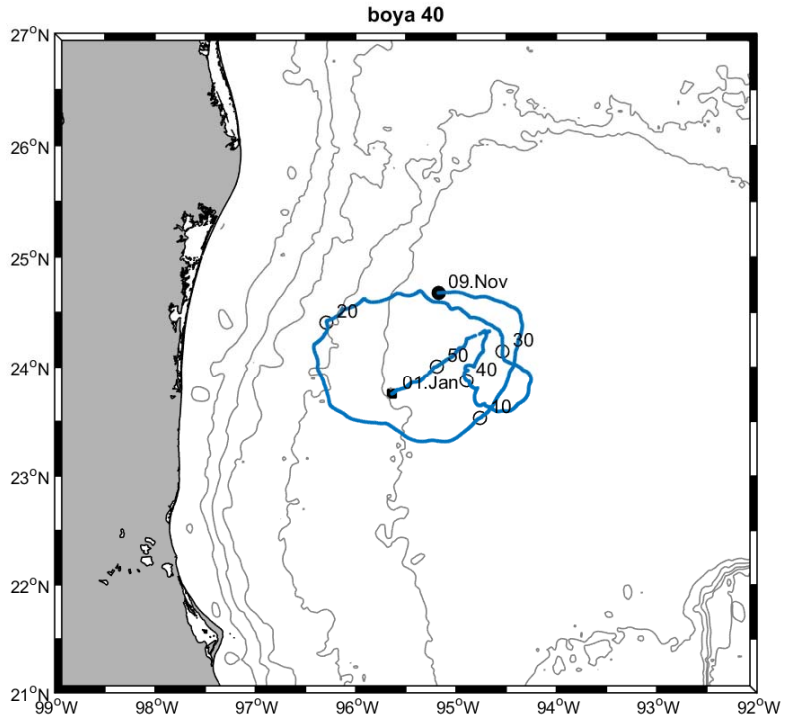

boya 8940
30°N
28°N
26°N
24°N
22°N
99°W
98°W
97°W
96°W
95°W
94°W
93°W
92°W
50
30
05.Jan
40
20
09.Nov
10
60

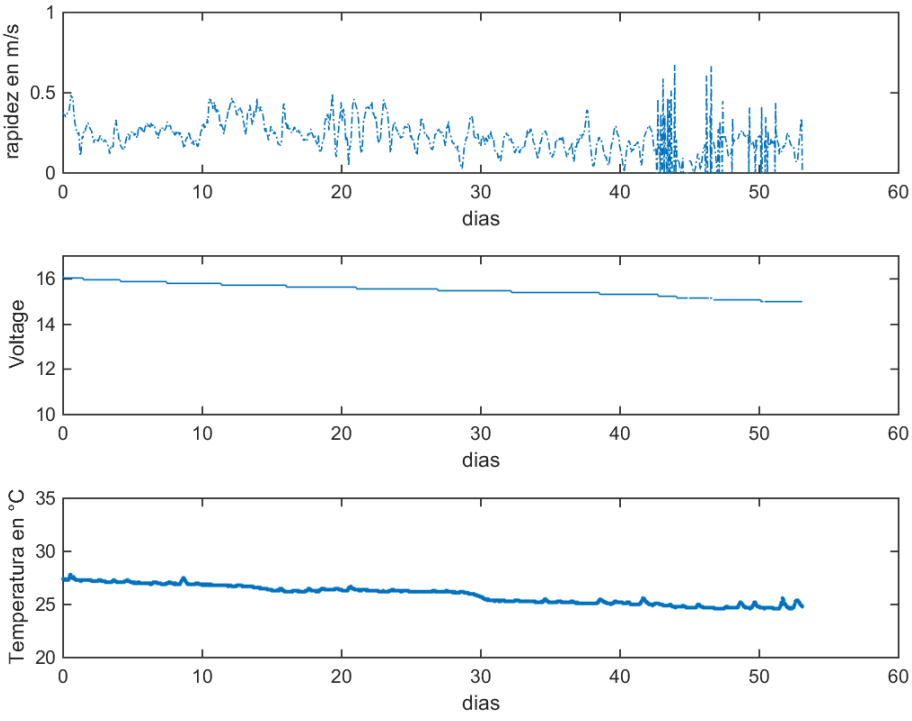

rapidez en m/s
1
0.5
0
0
10
20
30
40
50
60
dias
Voltage
16
14
12
10
0
10
20
30
40
50
60
dias
Temperatura en °C
35
30
25
20
0
10
20
30
40
50
60
dias

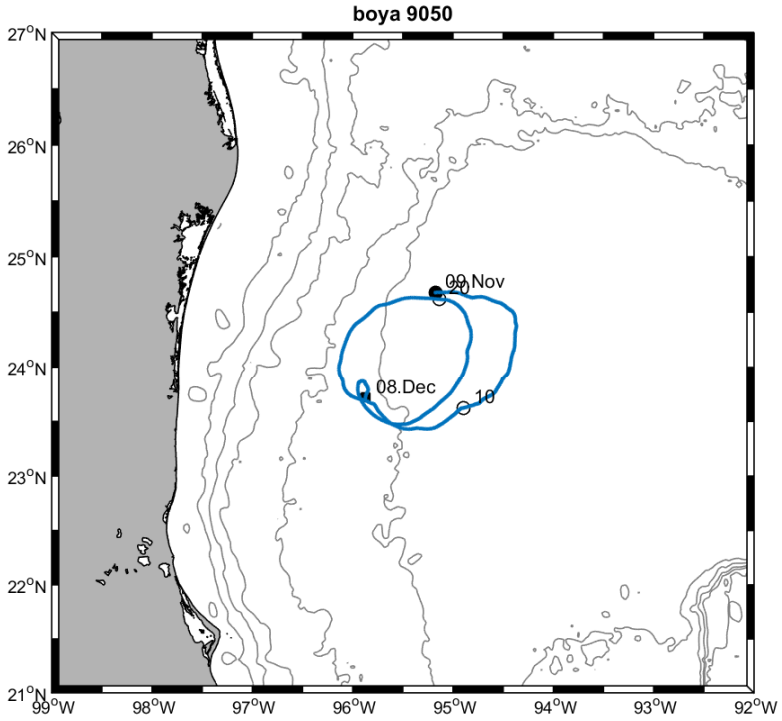

boya 5900
30°N
28°N
26°N
24°N
22°N
98°W
96°W
94°W
92°W
30
20
40
50
10
09.Nov
04.Feb
80
60
70

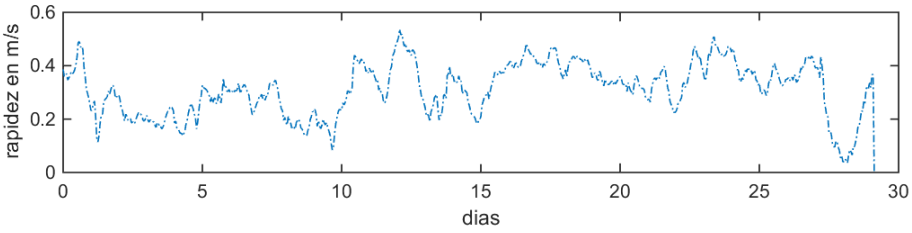

rapidez en m/s
dias
Voltage
dias
Temperatura en °C
dias

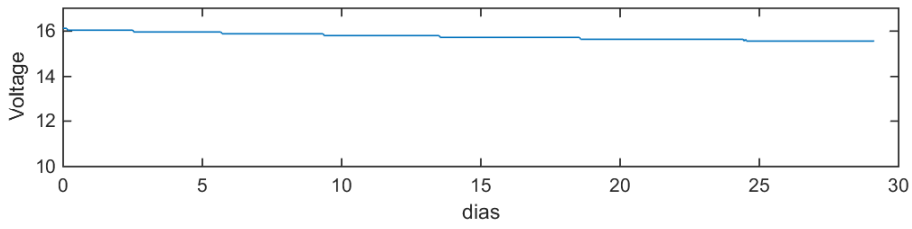
1.1.10. TRIPLET 10

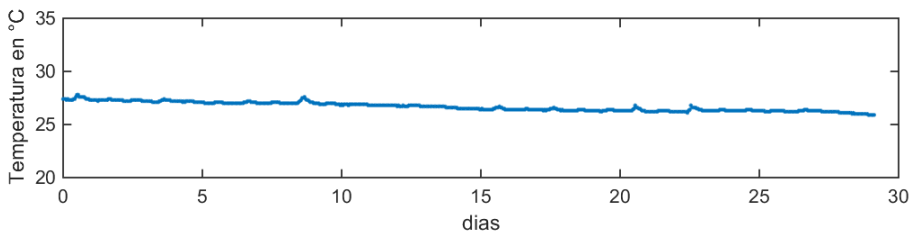


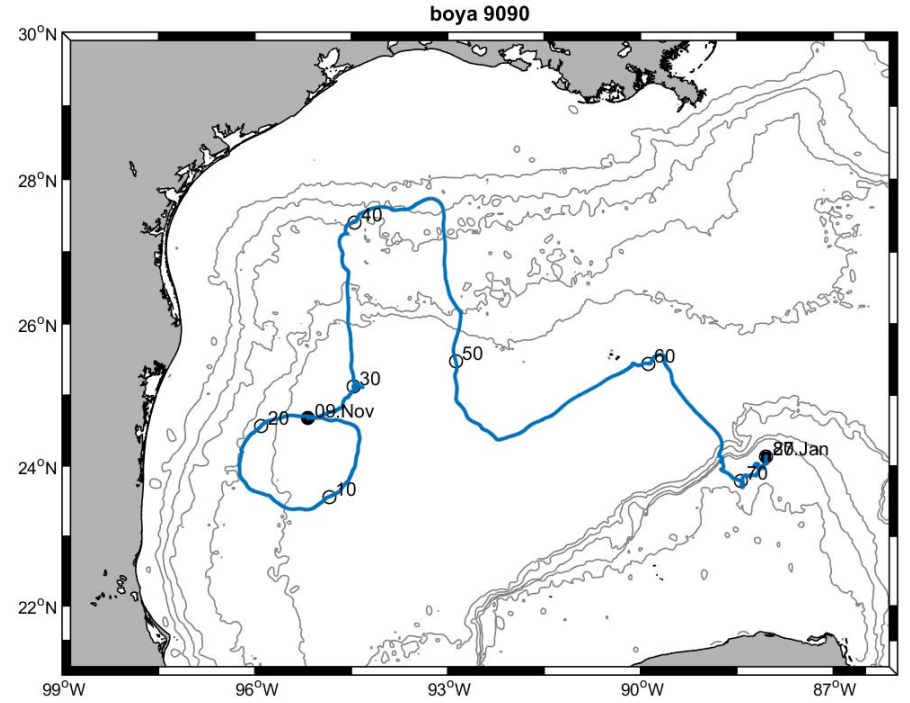


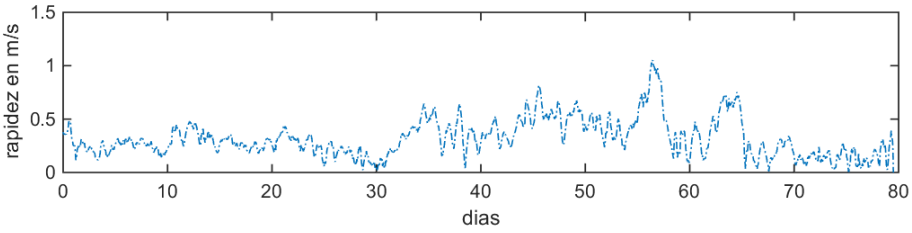

boya 9050
27°N
26°N
25°N
24°N
23°N
22°N
21°N
99°W
98°W
97°W
96°W
95°W
94°W
93°W
92°W
09.Nov
08.Dec
10

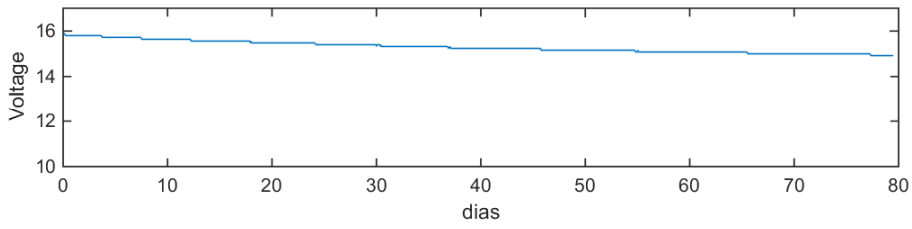

rapidez en m/s
0.6
0.4
0.2
0
0
5
10
15
20
25
30
dias

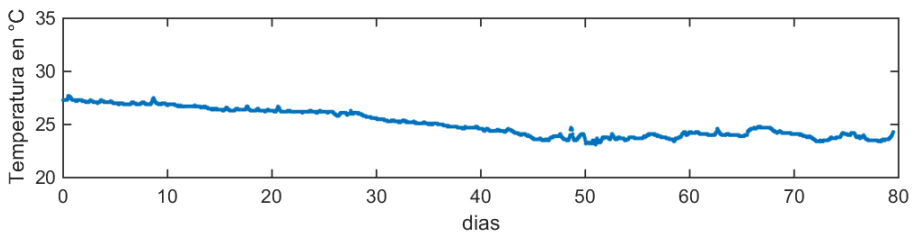

Voltage
16
14
12
10
0
5
10
15
20
25
30
dias


Temperatura en °C
35
30
25
20
0
5
10
15
20
25
30
dias

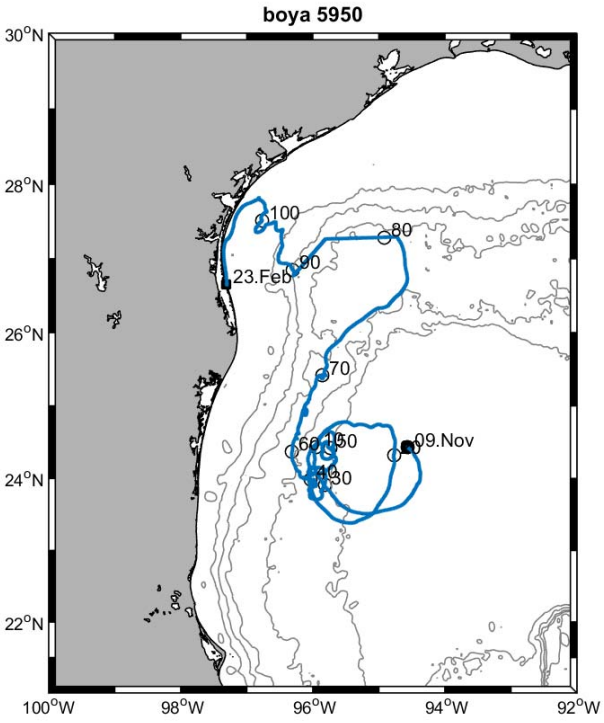

boya 9090
30°N
28°N
26°N
24°N
22°N
99°W
96°W
93°W
90°W
87°W
10
20
30
40
50
60
70
09.Nov
27.Jan

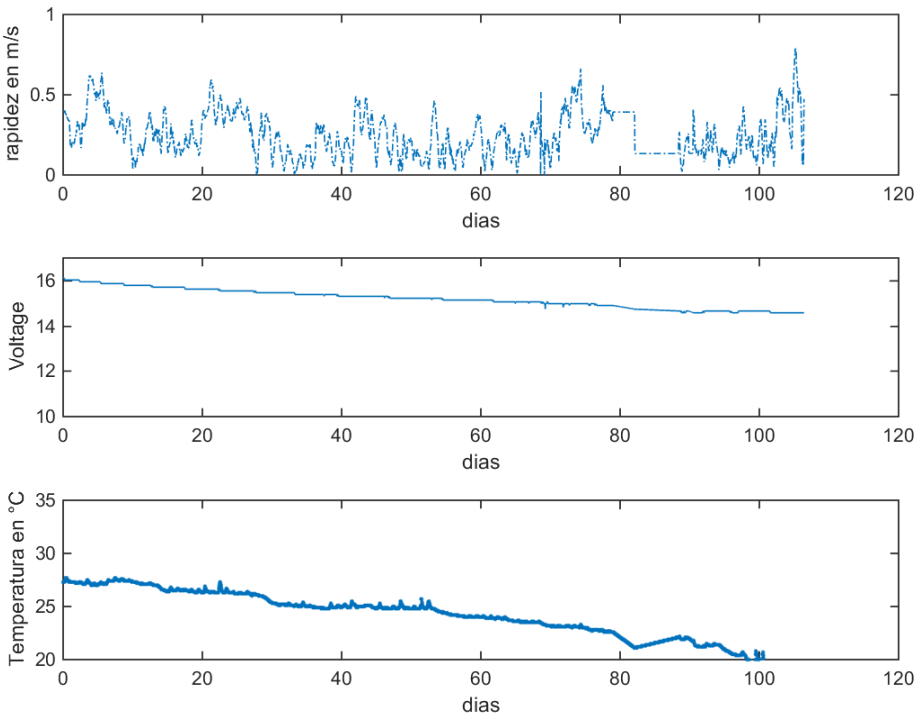

rapidez en m/s
dias

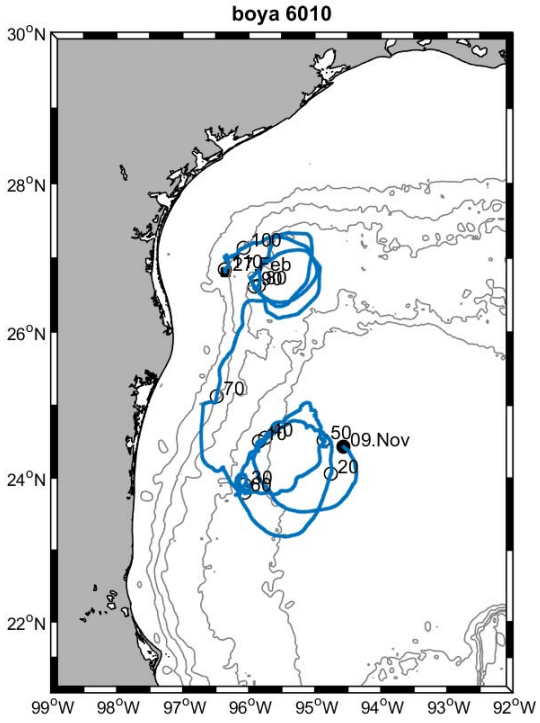

Voltage
dias

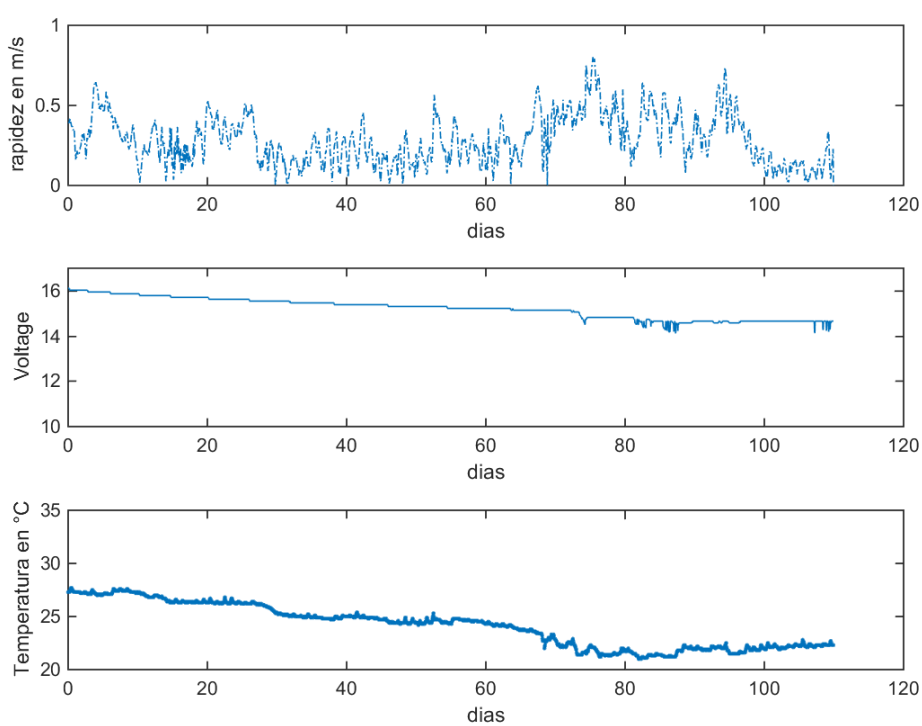

Temperatura en °C
dias

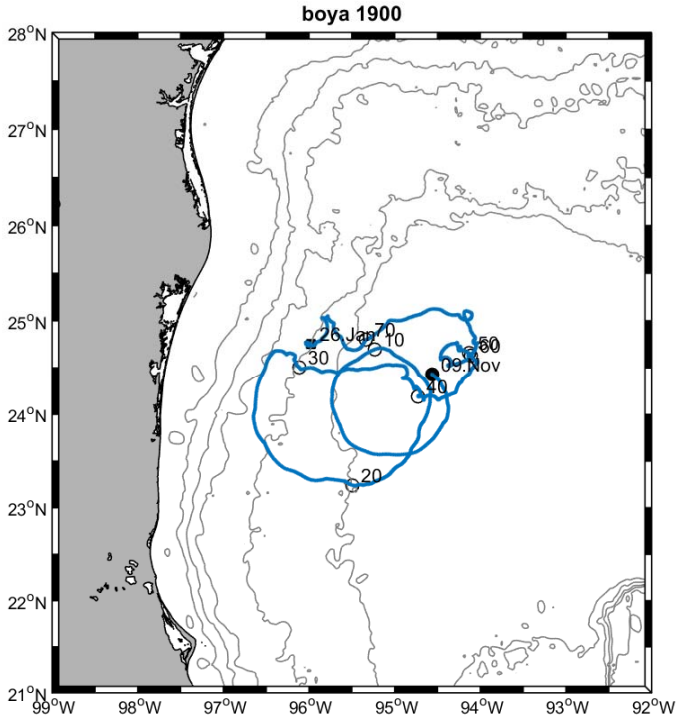
1.1.11. TRIPLET 11

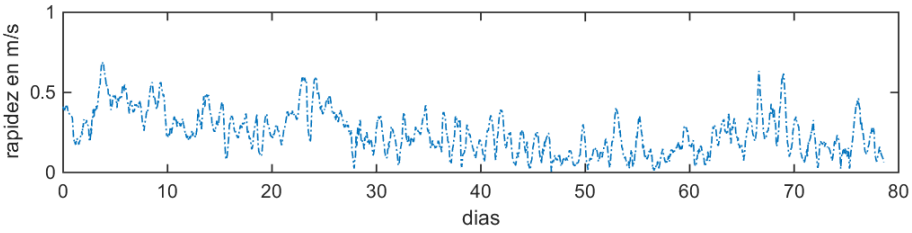


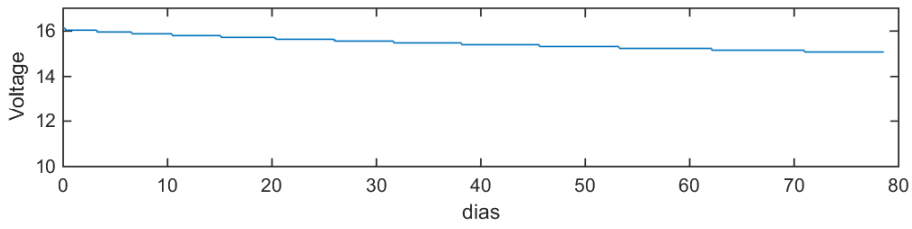


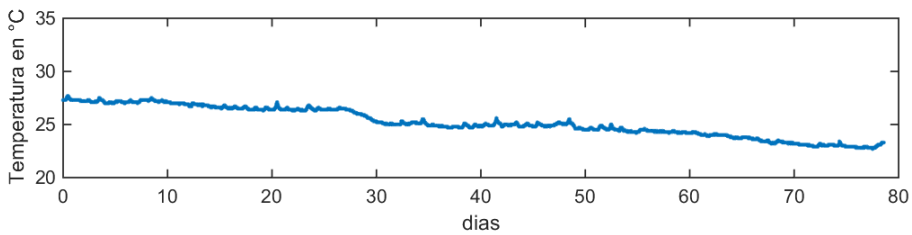

boya 6010
30°N
28°N
26°N
24°N
22°N
99°W
98°W
97°W
96°W
95°W
94°W
93°W
92°W
100
70
50
09.Nov
20


rapidez en m/s
dias
Voltage
dias
Temperatura en °C
dias

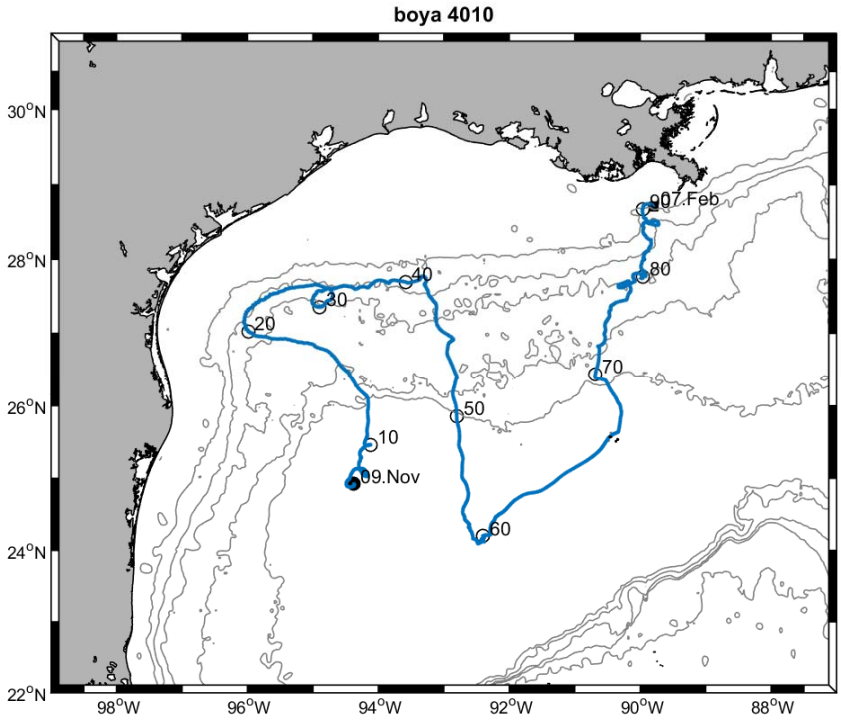

boya 1900
28°N
27°N
26°N
25°N
24°N
23°N
22°N
21°N
99°W
98°W
97°W
96°W
95°W
94°W
93°W
92°W
26 Jan
09 Nov
10
20
30
40
50
60
70

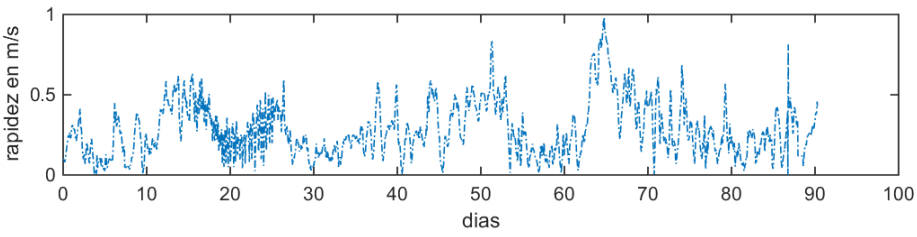

rapidez en m/s
0
0.5
1
0
10
20
30
40
50
60
70
80
dias

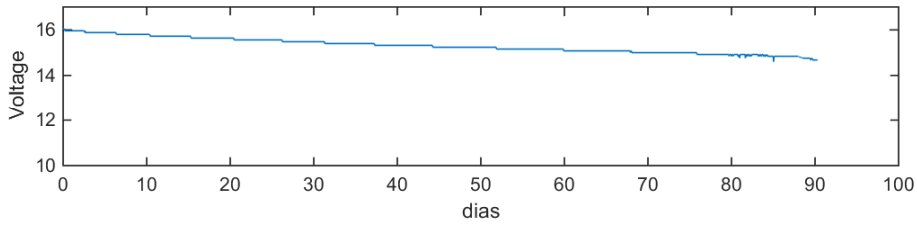

Voltage
10
12
14
16
0
10
20
30
40
50
60
70
80
dias

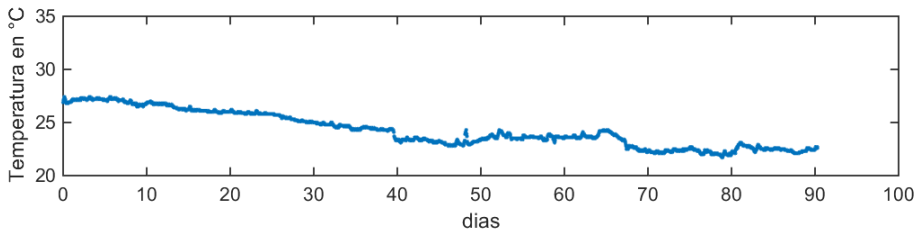

Temperatura en °C
20
25
30
35
0
10
20
30
40
50
60
70
80
dias

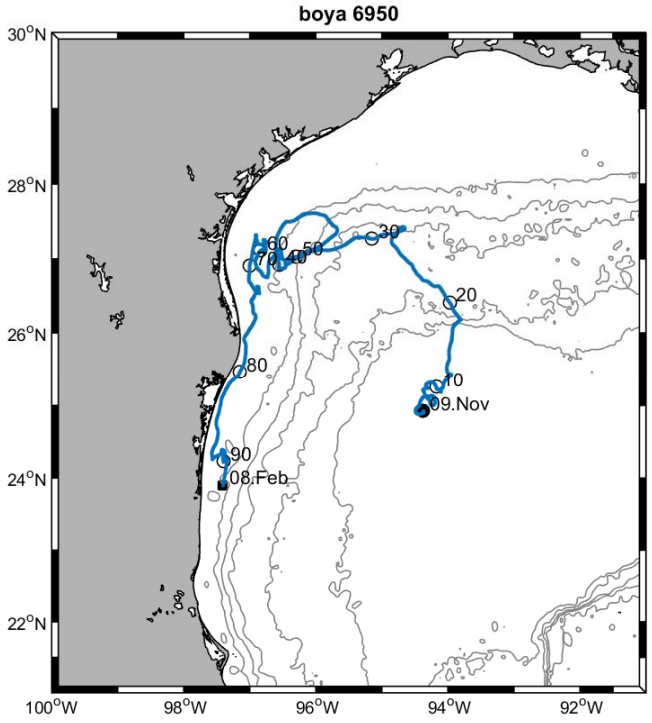
1.1.12. TRIPLET 12

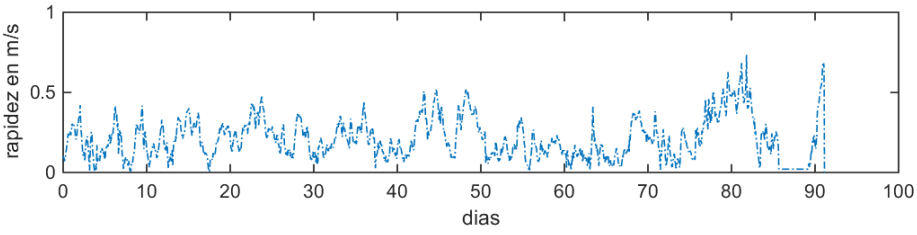


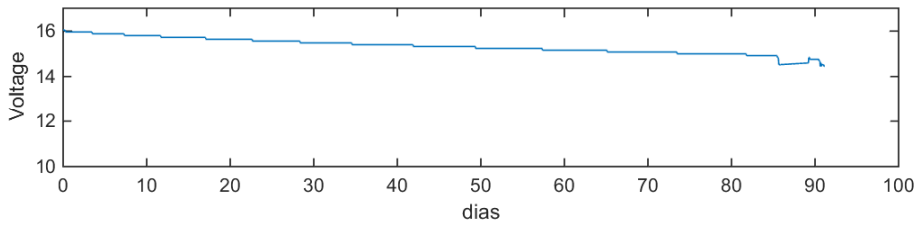


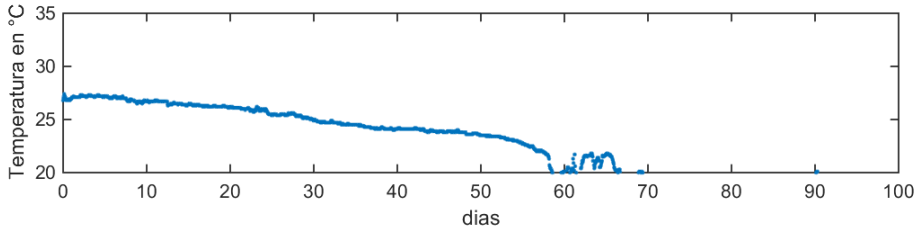


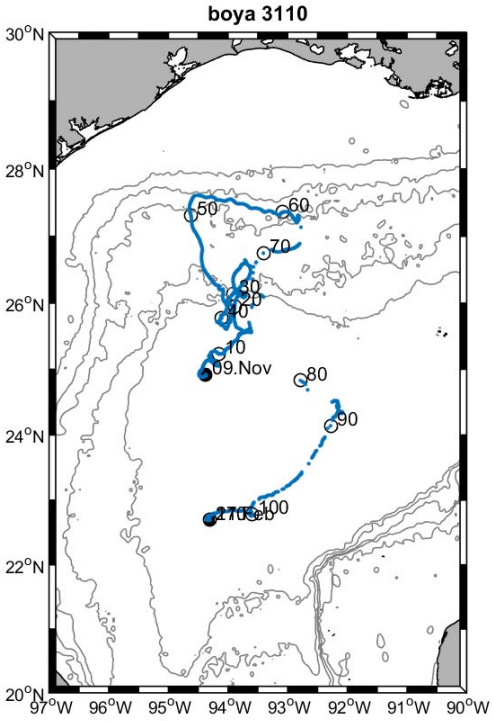


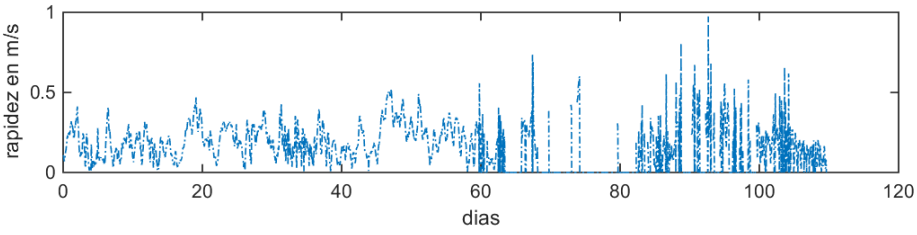

boya 6950
30°N
28°N
26°N
24°N
22°N
100°W
98°W
96°W
94°W
92°W
60
50
40
30
20
80
70
09.Nov
90
08.Feb

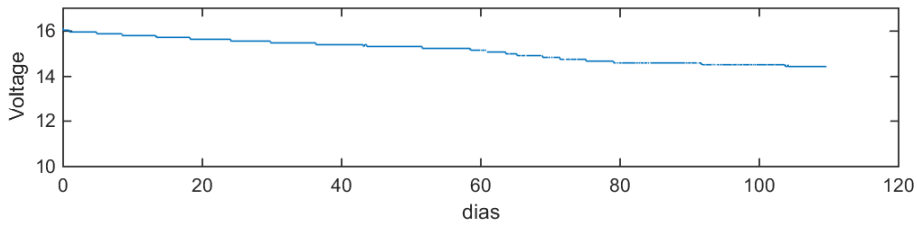

rapidez en m/s
1
0.5
0
0
10
20
30
40
50
60
70
80
90
100
dias

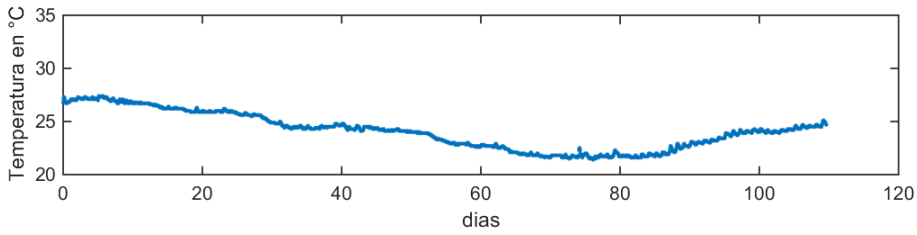

Voltage
16
14
12
10
0
10
20
30
40
50
60
70
80
90
100
dias


Temperatura en °C
35
30
25
20
0
10
20
30
40
50
60
70
80
90
100
dias

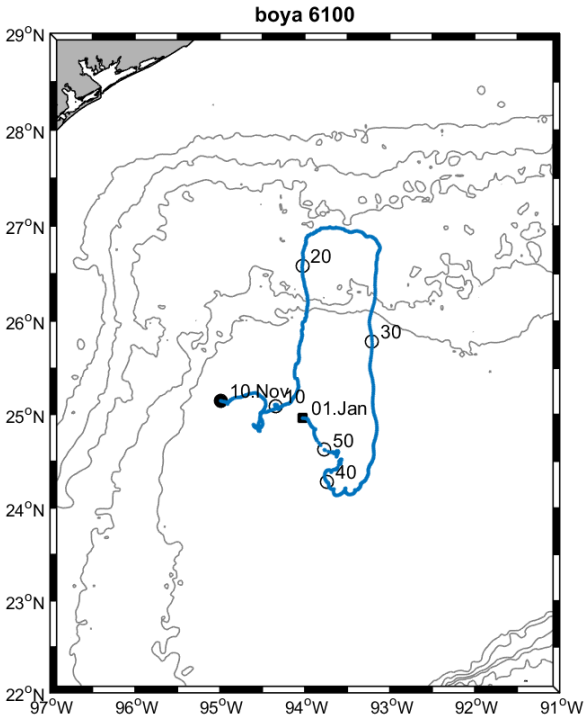

boya 3110
30°N
28°N
26°N
24°N
22°N
20°N
97°W
96°W
95°W
94°W
93°W
92°W
91°W
90°W
50
60
70
80
90
100
10
09.Nov

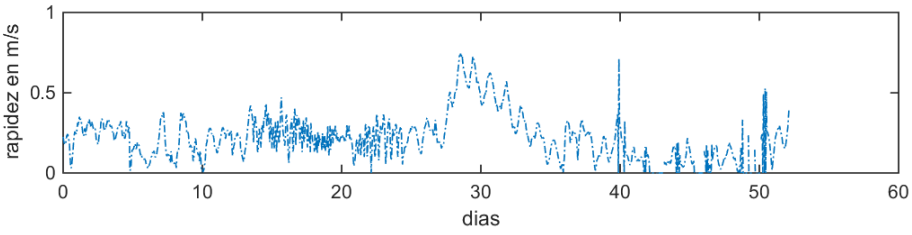

rapidez en m/s
1
0.5
0
0
20
40
60
80
100
120
dias

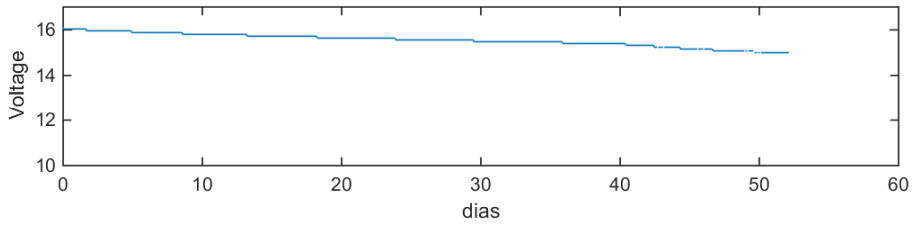

Voltage
16
14
12
10
0
20
40
60
80
100
120
dias

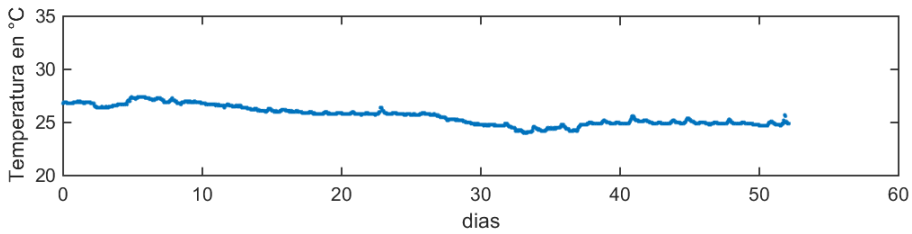

Temperatura en °C
35
30
25
20
0
20
40
60
80
100
120
dias

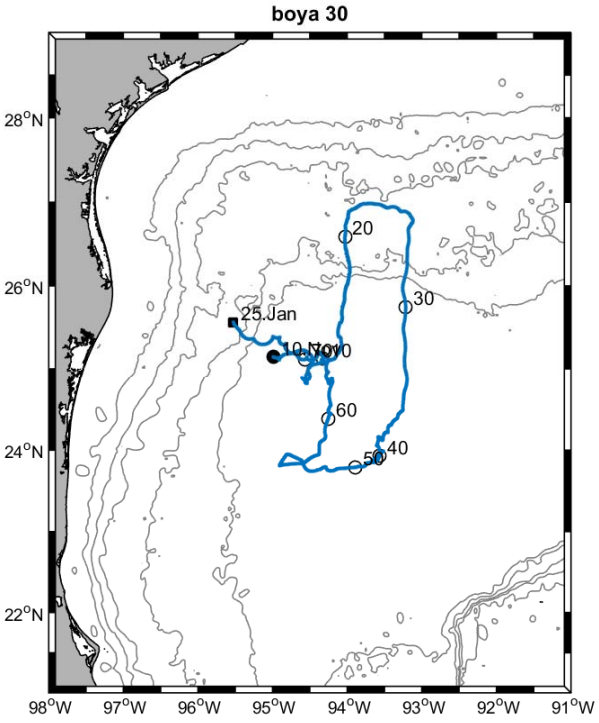
1.1.13. TRIPLET 13

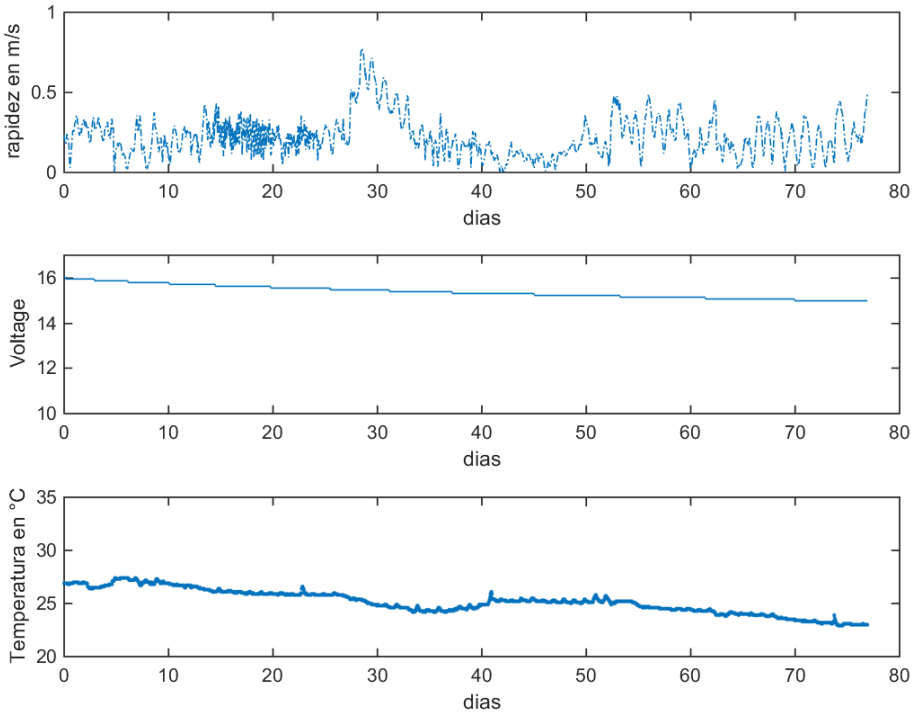


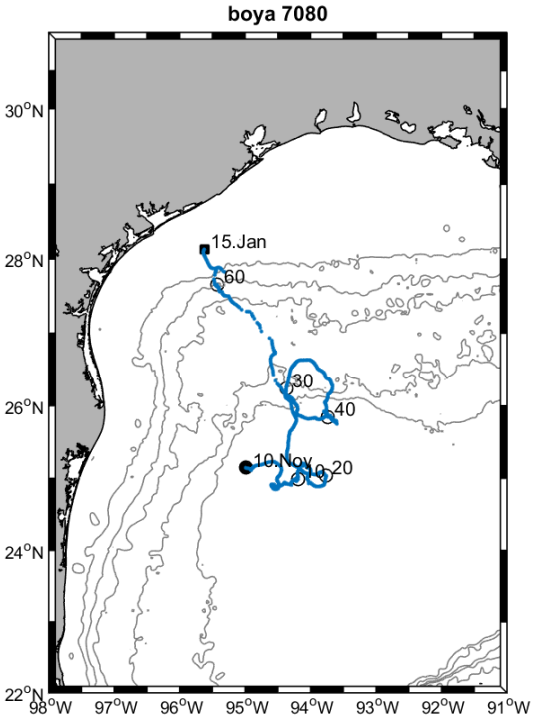


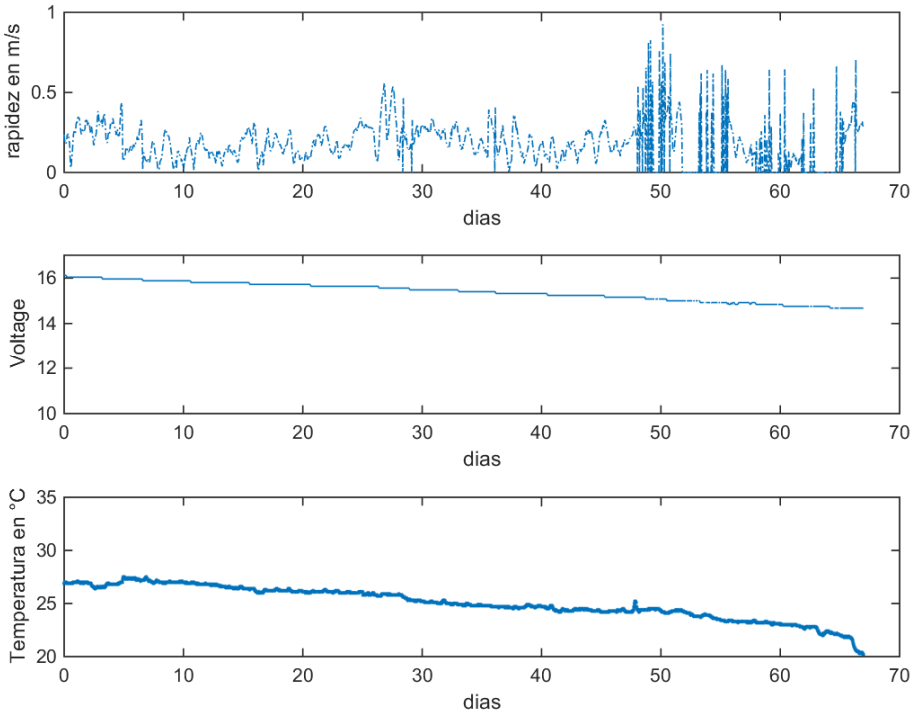




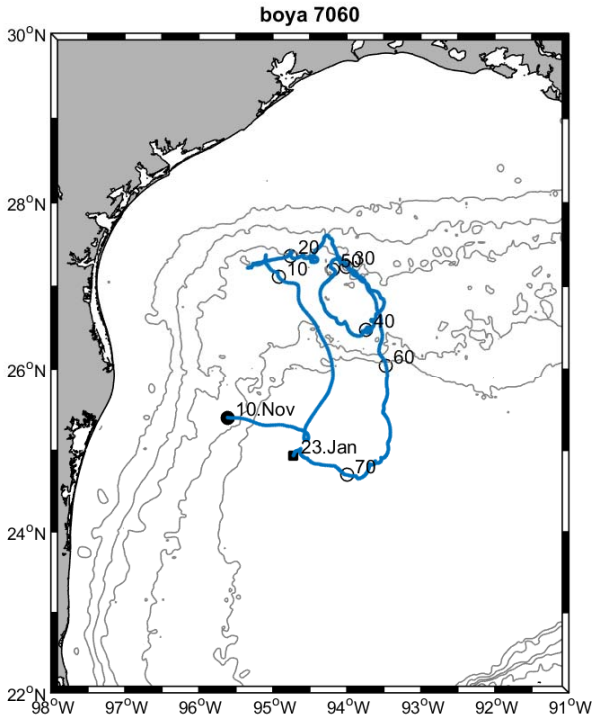

boya 30
28°N
26°N
24°N
22°N
98°W
97°W
96°W
95°W
94°W
93°W
92°W
91°W
20
30
25.Jan
40
60
50

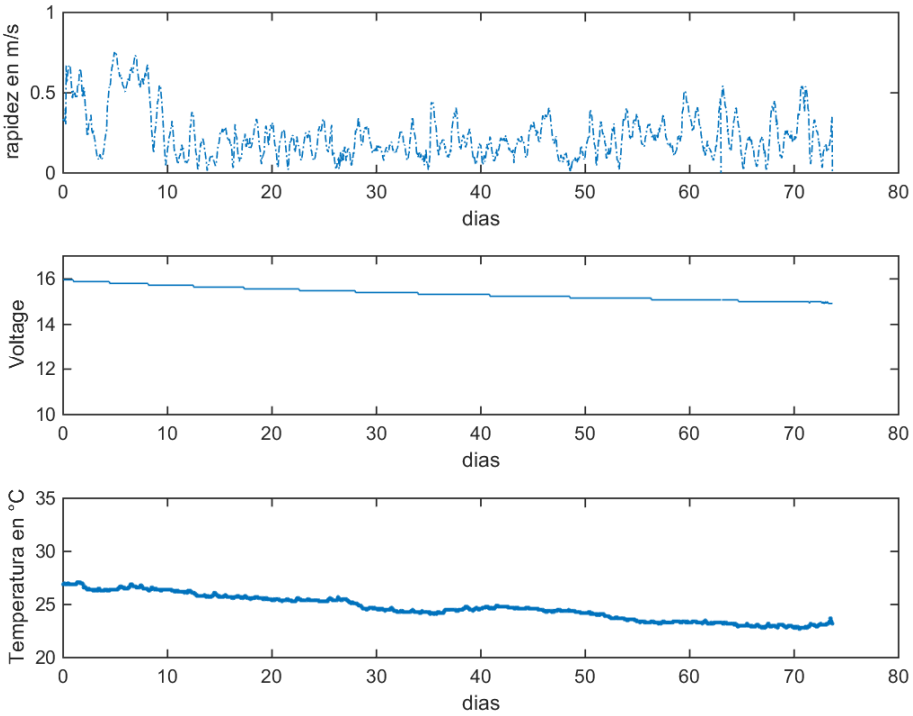

rapidez en m/s
dias
Voltage
dias
Temperatura en °C
dias

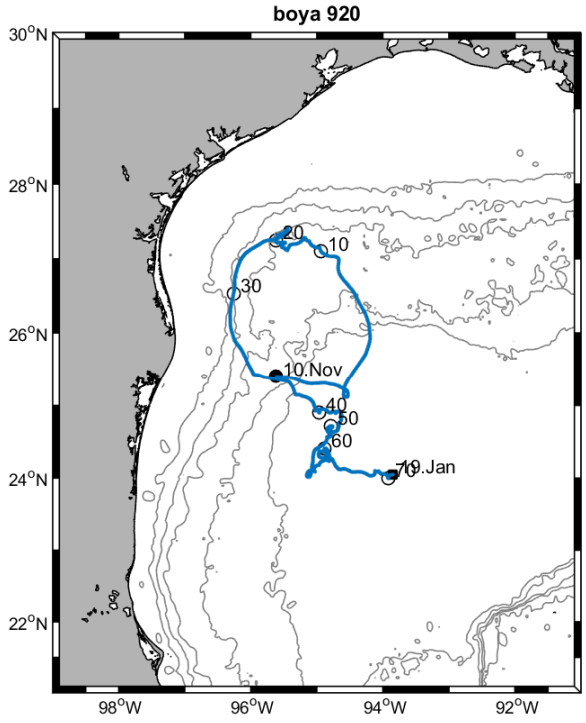

boya 7080
30°N
28°N
26°N
24°N
22°N
98°W
97°W
96°W
95°W
94°W
93°W
92°W
91°W
15.Jan
60
30
40
10.Nov
0
20

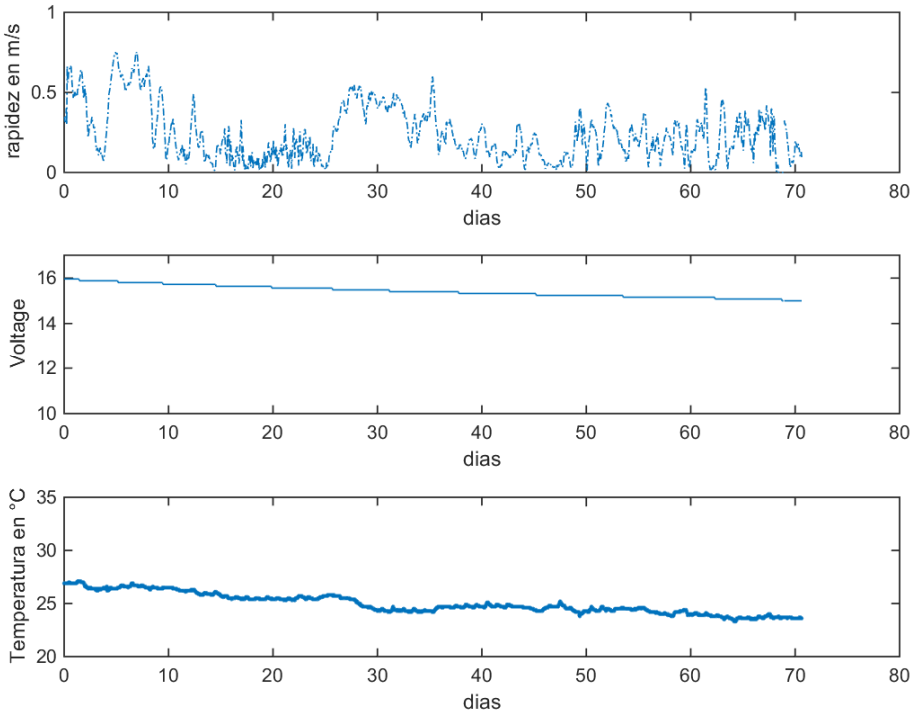

rapidez en m/s
0
0.5
1
0
10
20
30
40
50
60
70
dias
Voltage
10
12
14
16
0
10
20
30
40
50
60
70
dias
Temperatura en °C
20
25
30
35
0
10
20
30
40
50
60
70
dias

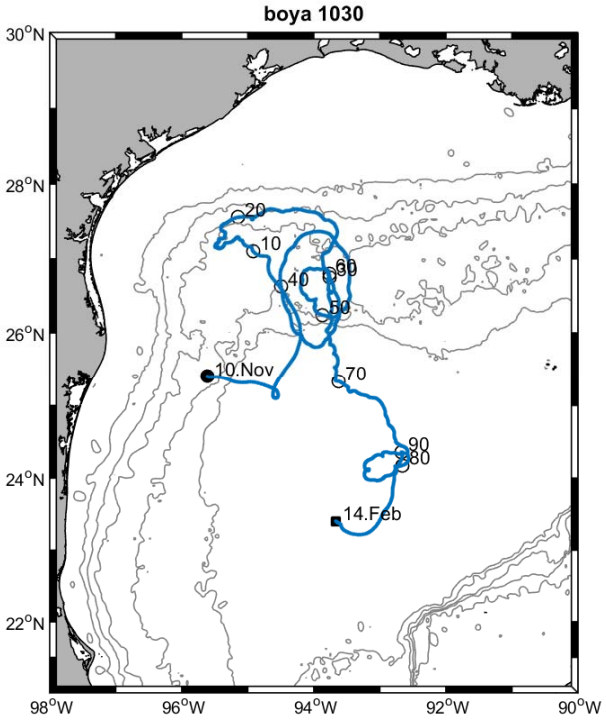
1.1.14. TRIPLET14

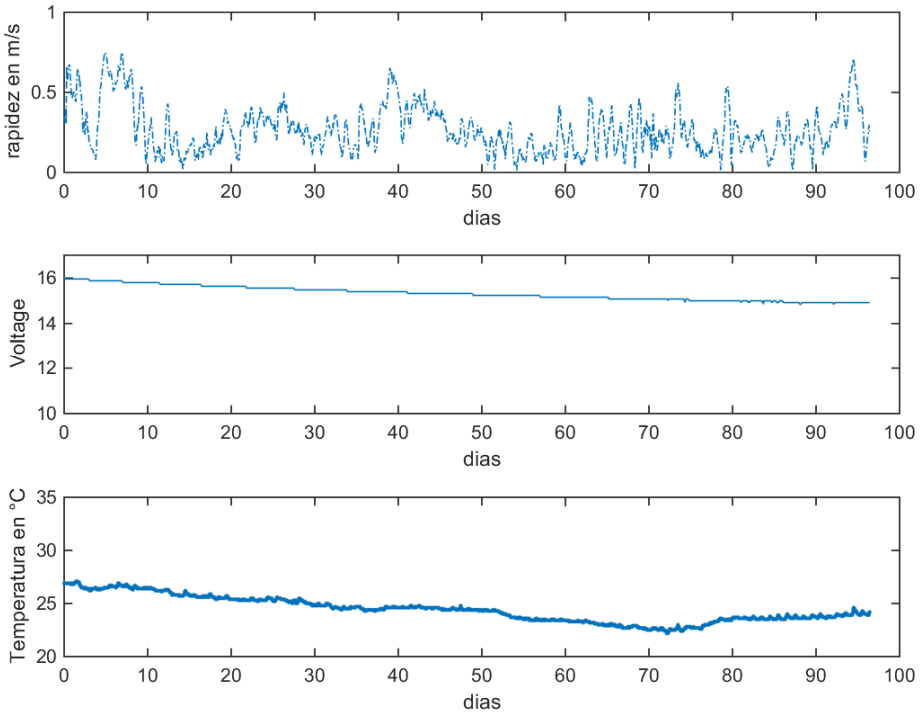




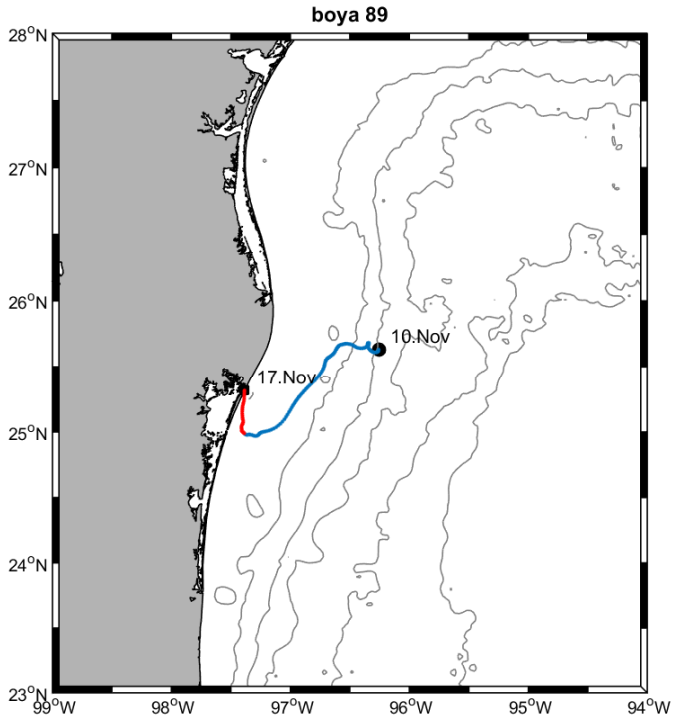

boya 920
30°N
28°N
26°N
24°N
22°N
98°W
96°W
94°W
92°W
20
10
30
10.Nov
40
50
60
70
9.Jan

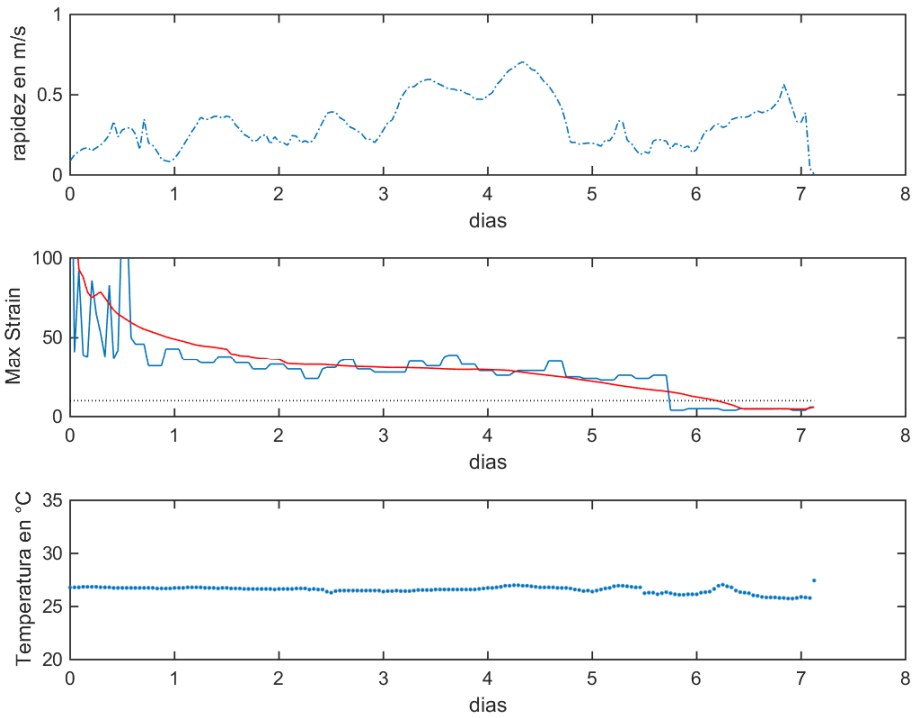

rapidez en m/s
dias
Voltage
dias
Temperatura en °C
dias

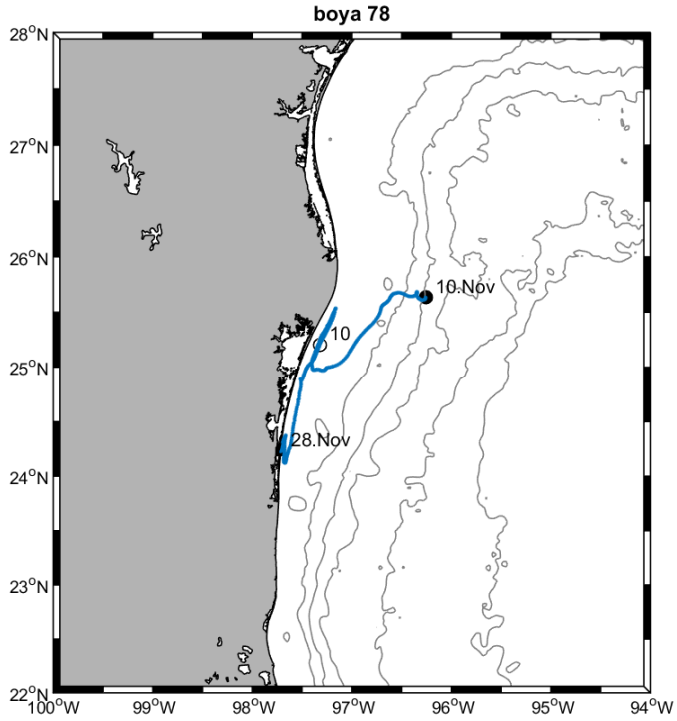

boya 1030
30°N
28°N
26°N
24°N
22°N
98°W
96°W
94°W
92°W
90°W
20
10
40
60
50
10.Nov
70
90
80
14.Feb

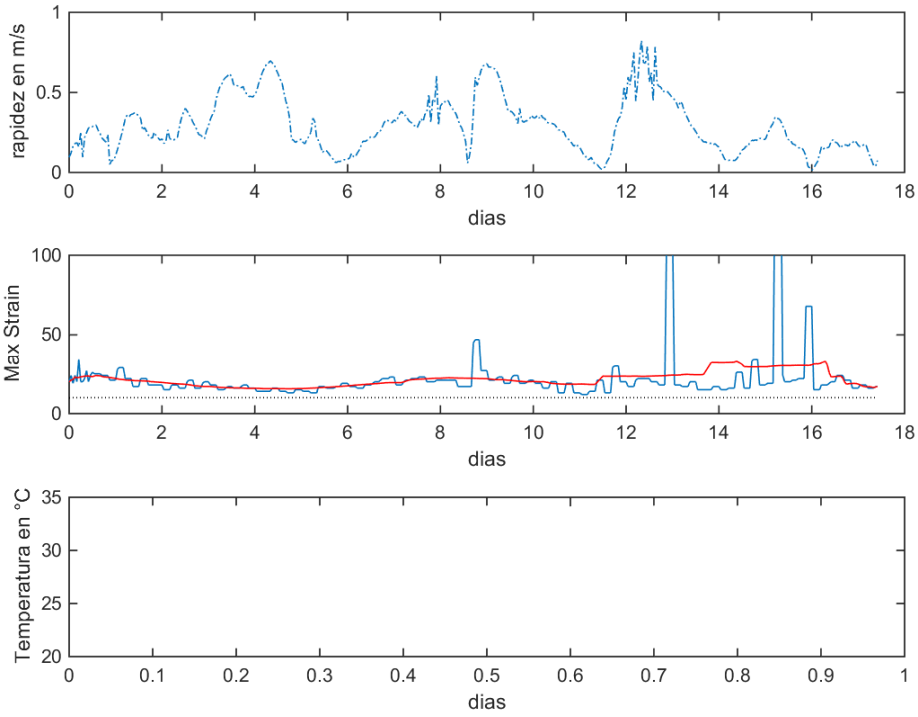

rapidez en m/s
dias
Voltage
dias
Temperatura en °C
dias

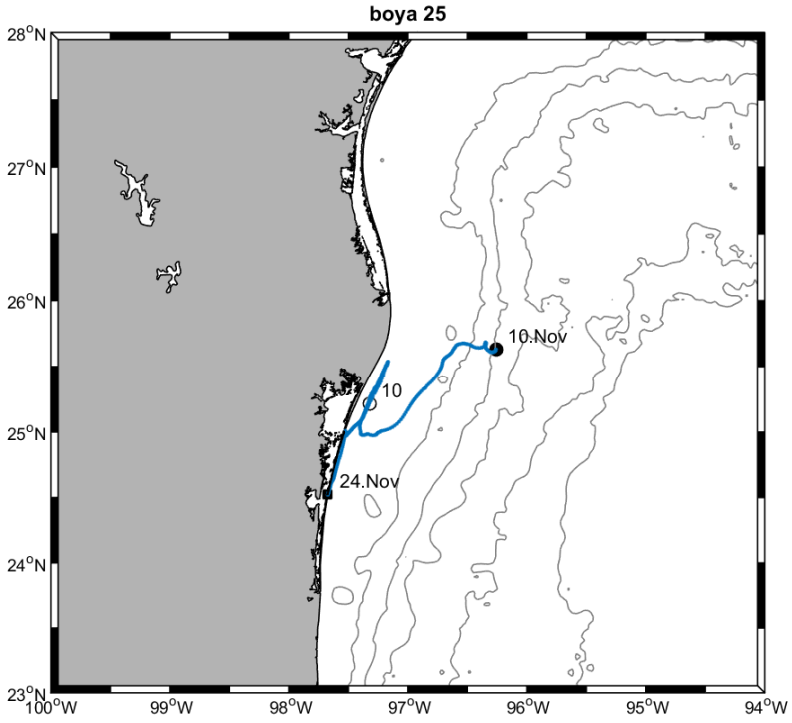
1.1.15. TRIPLET 15

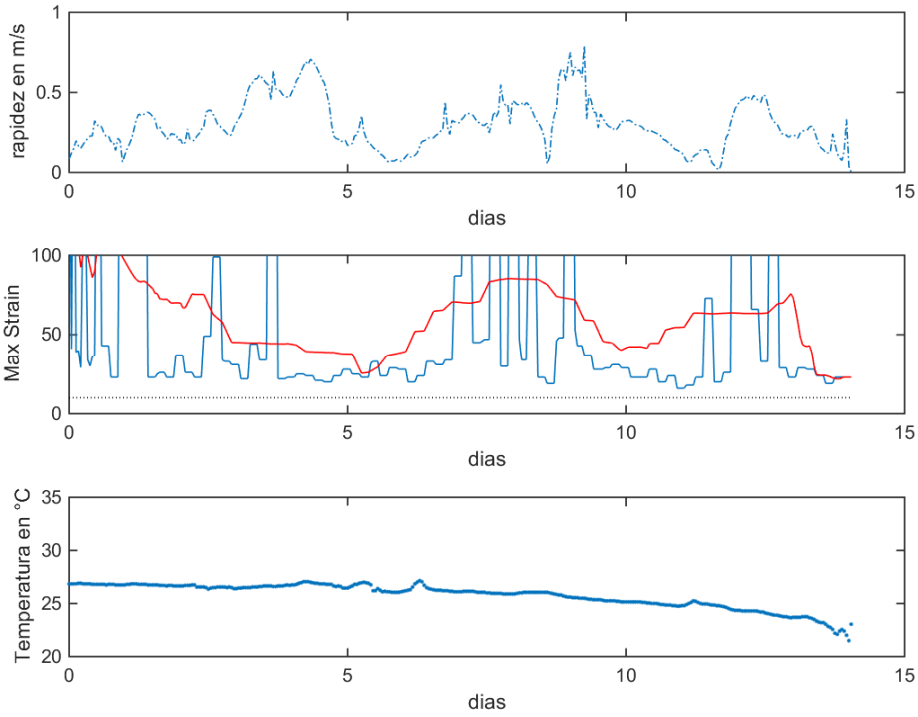




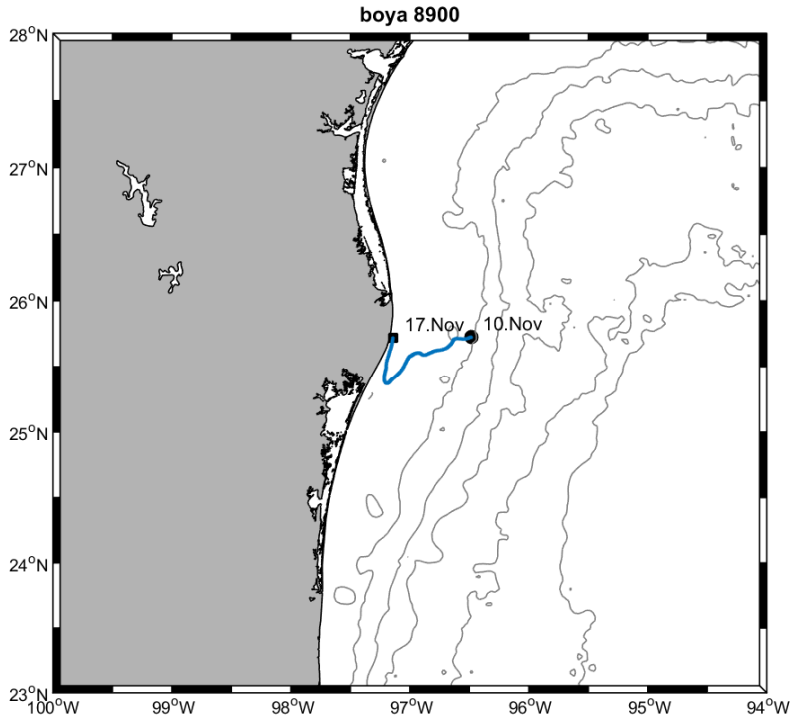

boya 78
28°N
27°N
26°N
25°N
24°N
23°N
22°N
100°W
99°W
98°W
97°W
96°W
95°W
94°W
10.Nov
10
28.Nov

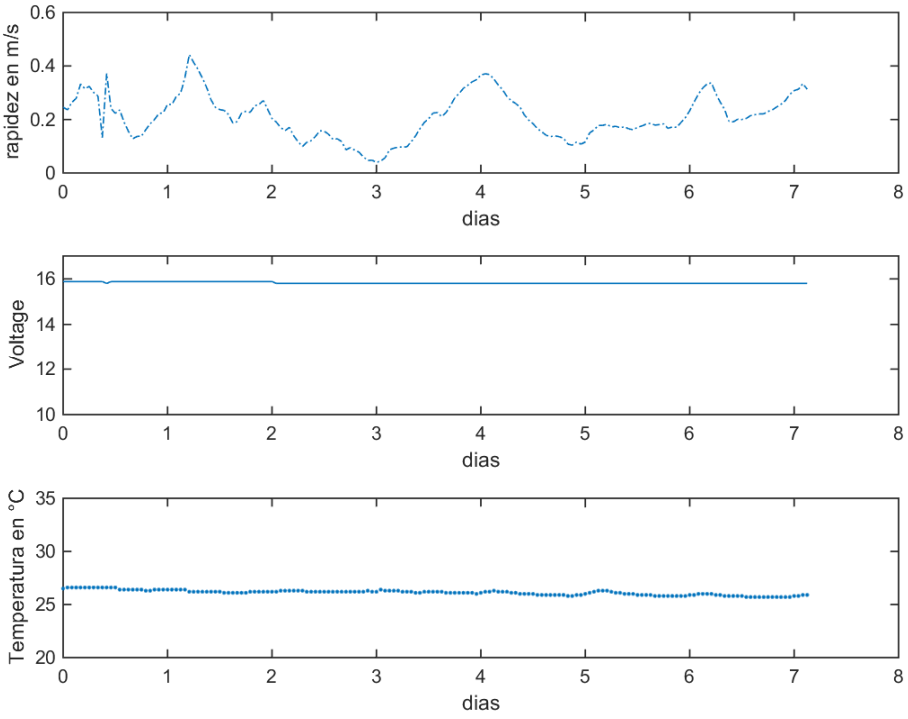

rapidez en m/s
dias
Max Strain
dias
Temperatura en °C
dias

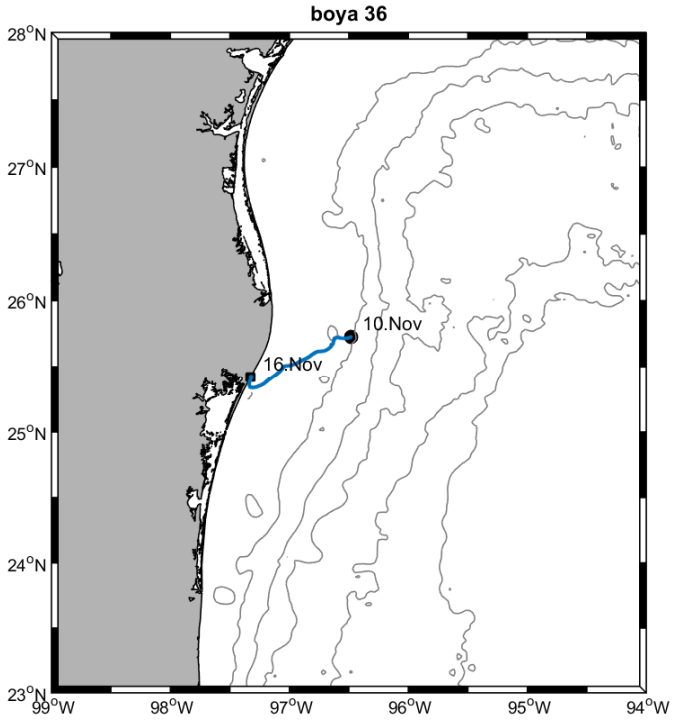

boya 25
28°N
27°N
26°N
25°N
24°N
23°N
100°W
99°W
98°W
97°W
96°W
95°W
94°W
10.Nov
10
24.Nov

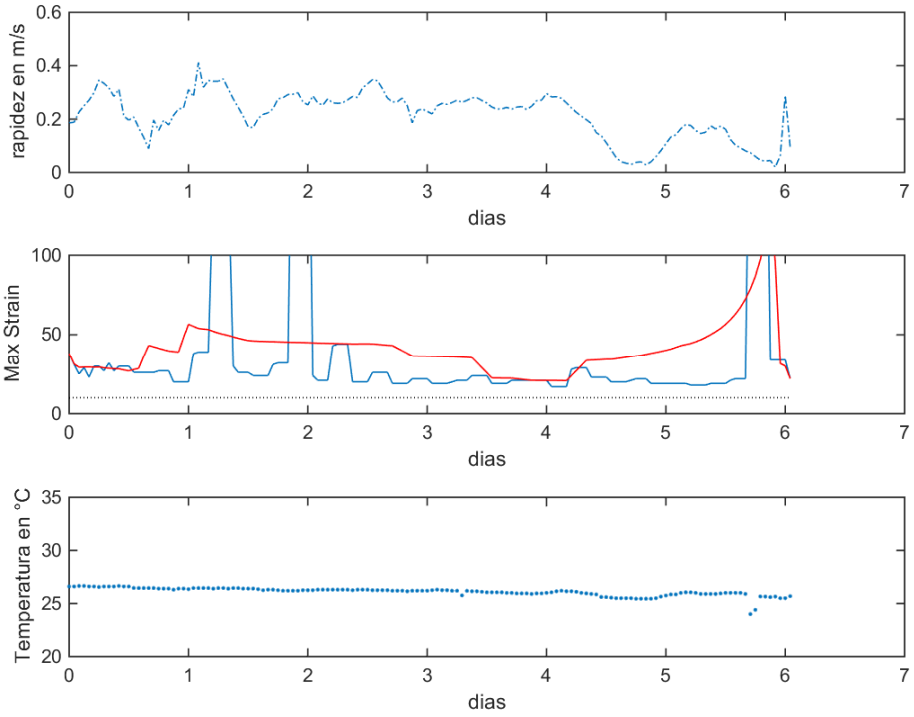

rapidez en m/s
0
0.5
1
0
5
10
15
dias
Max Strain
0
50
100
0
5
10
15
dias
Temperatura en °C
20
25
30
35
0
5
10
15
dias

1.1.16. PAIR 17

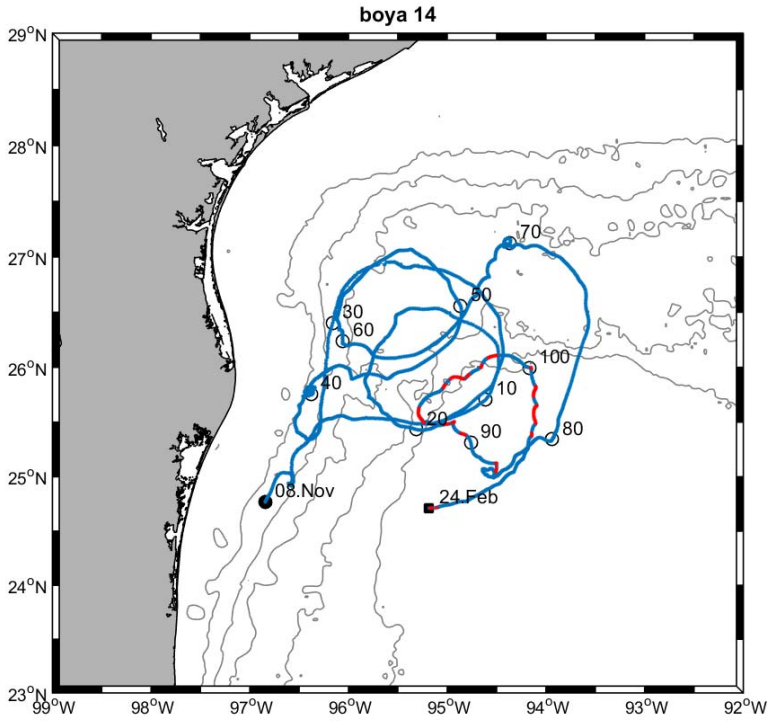

boya 8900
28°N
27°N
26°N
25°N
24°N
23°N
100°W
99°W
98°W
97°W
96°W
95°W
94°W
17.Nov
10.Nov

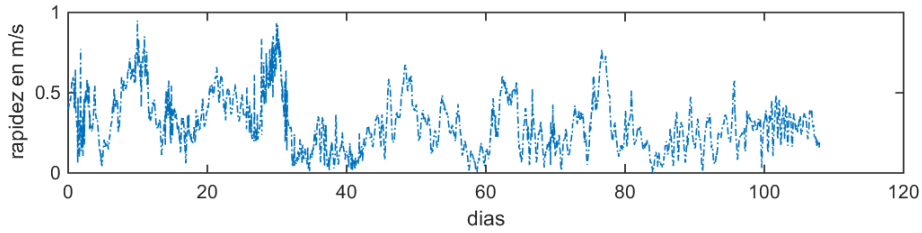

rapidez en m/s
0
0.2
0.4
0.6
dias
Voltage
10
12
14
16
dias
Temperatura en °C
20
25
30
35
dias
0
1
2
3
4
5
6
7
8

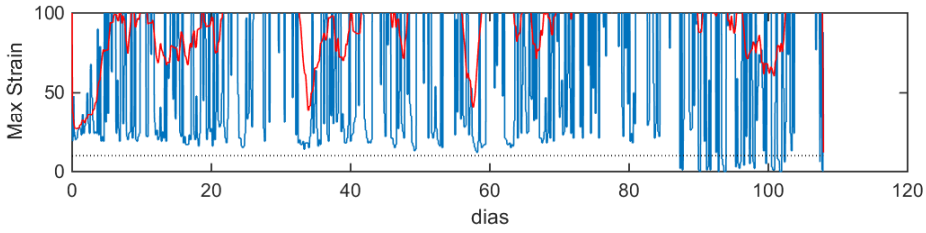

boya 36
28°N
27°N
26°N
25°N
24°N
23°N
99°W
98°W
97°W
96°W
95°W
94°W
10.Nov
16.Nov

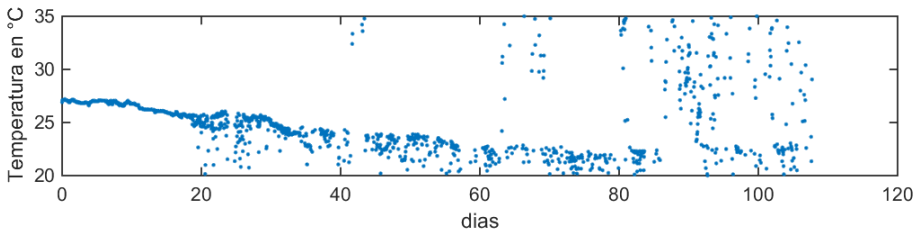

rapidez en m/s
0.6
0.4
0.2
0
0
1
2
3
4
5
6
7
dias
Max Strain
100
50
0
dias
Temperatura en °C
35
30
25
20
dias

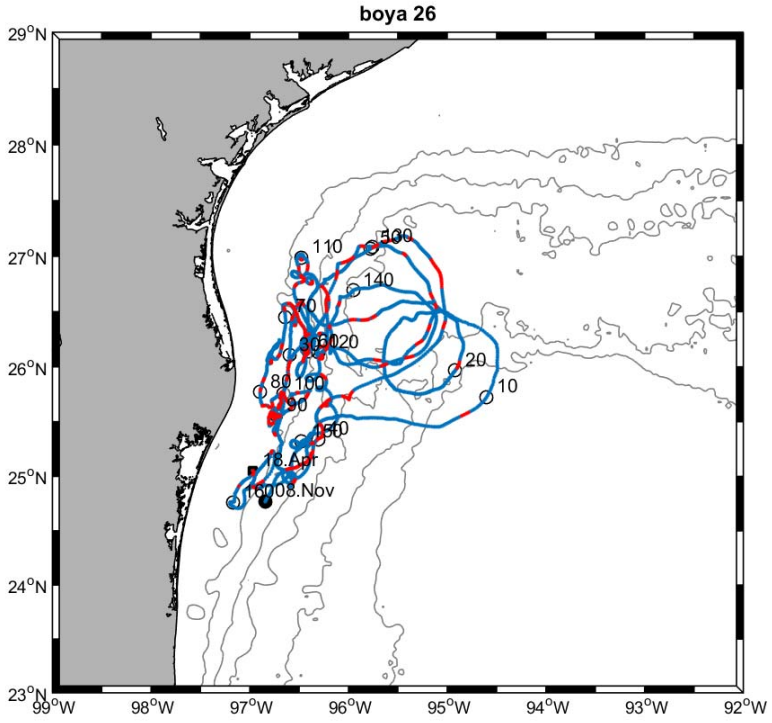
1.1.17. CUADRUPLET 20

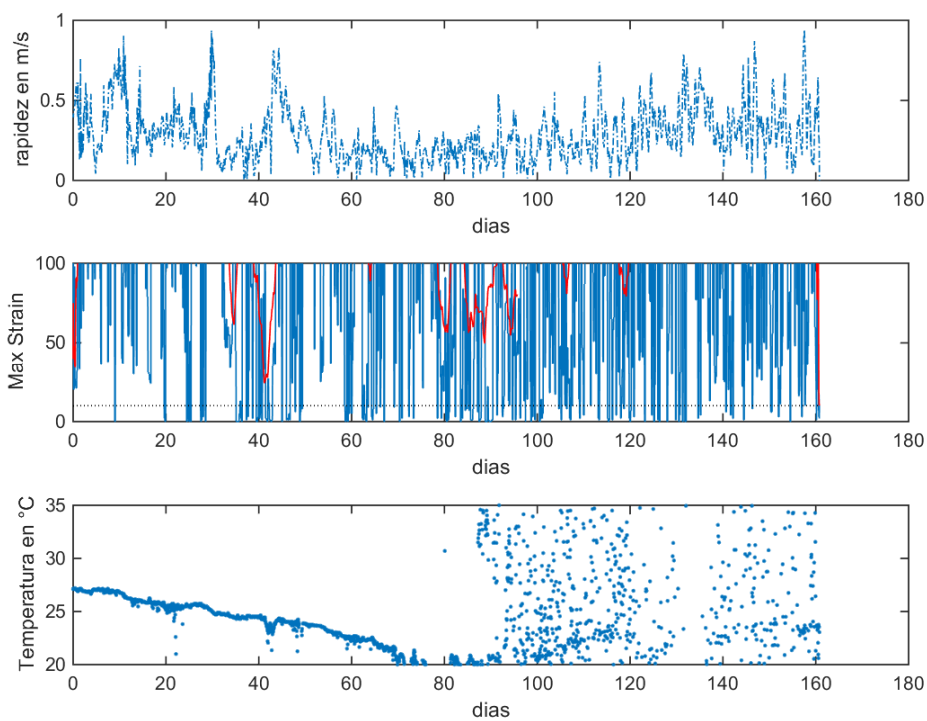


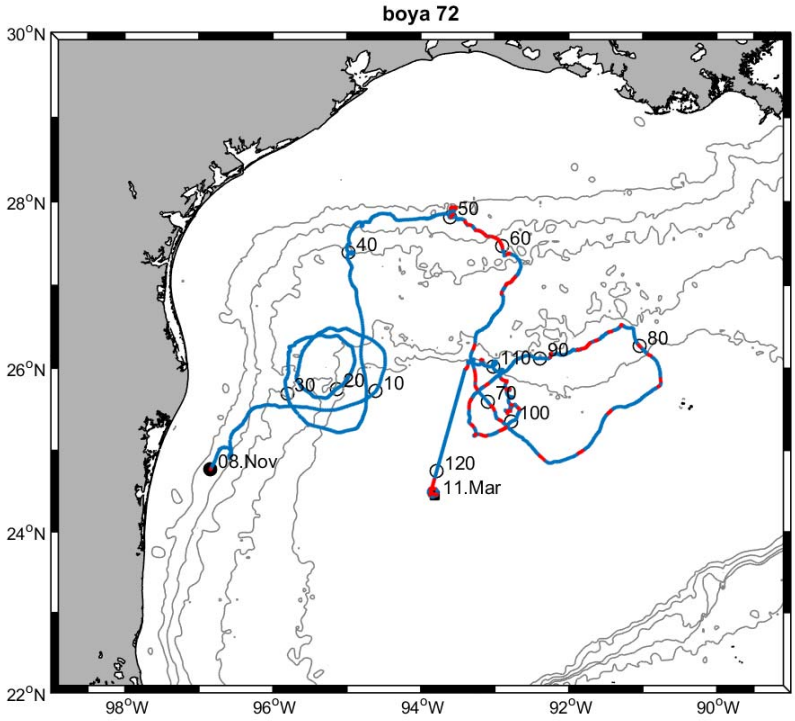


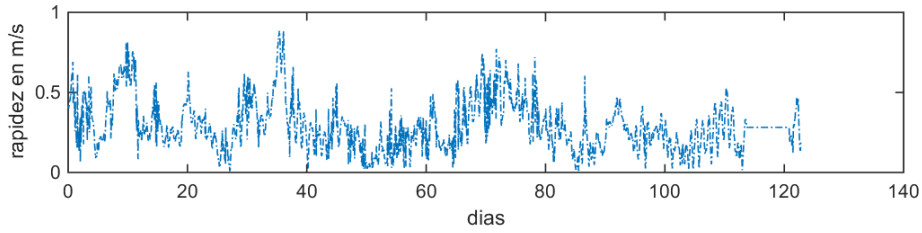


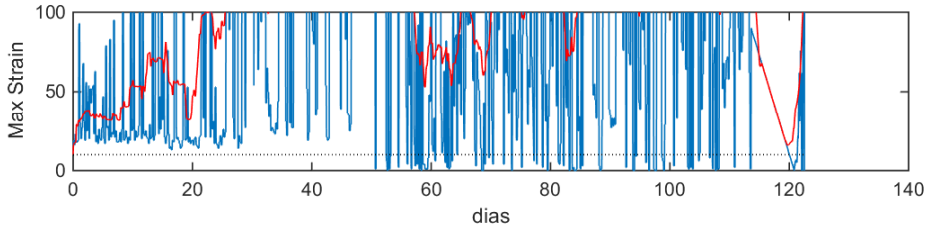


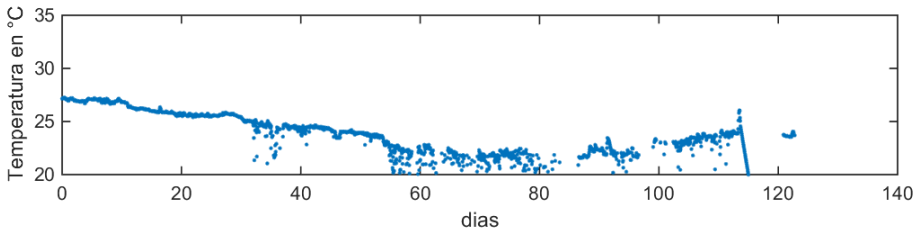

boya 26
29°N
28°N
27°N
26°N
25°N
24°N
23°N
99°W
98°W
97°W
96°W
95°W
94°W
93°W
92°W
110
140
70
20
10
80
100
90
18.Apr
08.Nov

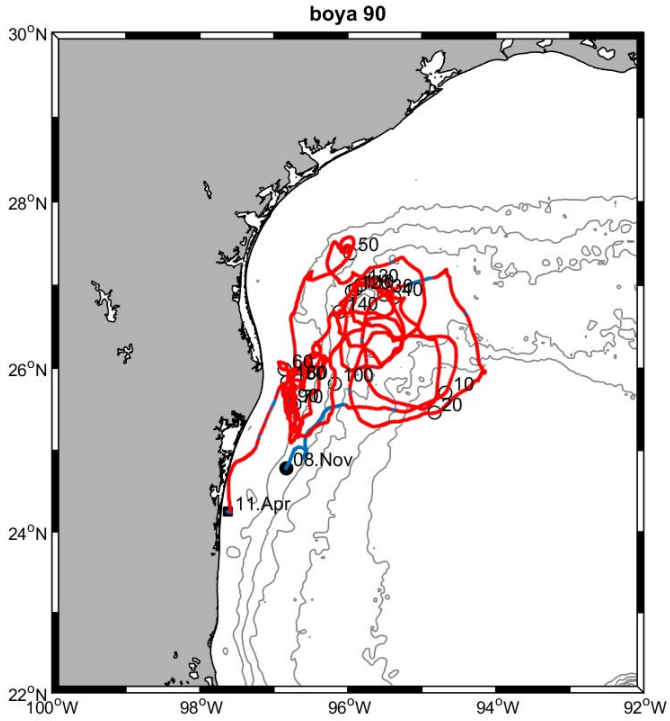

rapidez en m/s
dias
Max Strain
dias
Temperatura en °C
dias

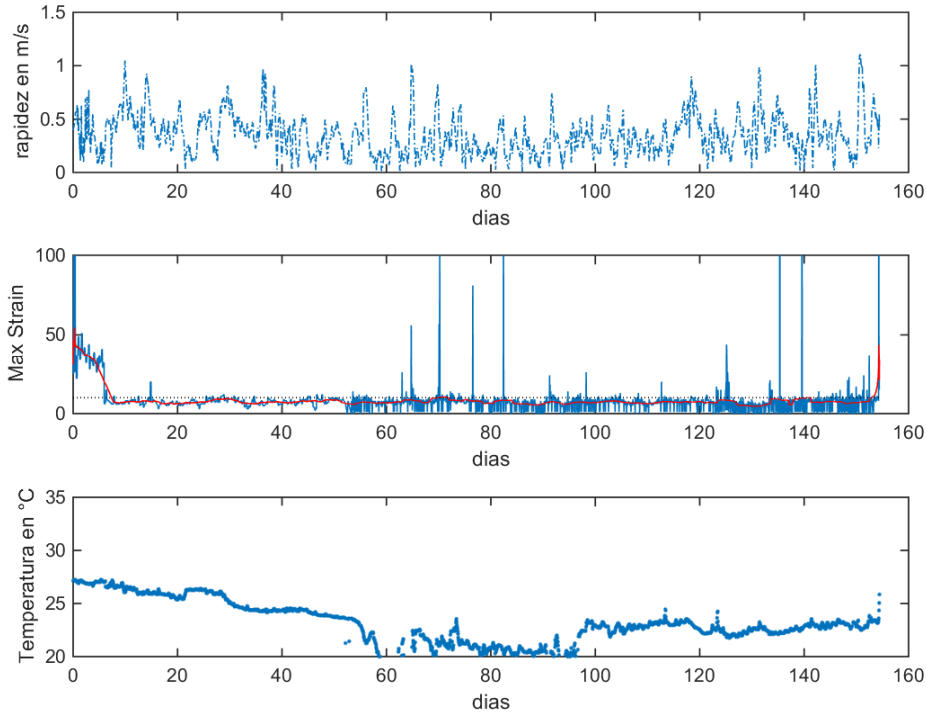

boya 72
30°N
28°N
26°N
24°N
22°N
98°W
96°W
94°W
92°W
90°W
50
40
60
80
90
110
30
20
10
70
100
08.Nov
120
11.Mar


rapidez en m/s
dias


Max Strain
dias


Temperatura en °C
dias


boya 90
30°N
28°N
26°N
24°N
22°N
100°W
98°W
96°W
94°W
92°W
50
40
60
150
100
90
10
20
08.Nov
11.Apr


rapidez en m/s
1.5
1
0.5
0
0
20
40
60
80
100
120
140
160
dias
Max Strain
100
50
0
0
20
40
60
80
100
120
140
160
dias
Temperatura en °C
35
30
25
20
0
20
40
60
80
100
120
140
160
dias

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CIGoM

Consorcio de Investigación del Golfo de México

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"Implementación de redes de observación oceanográficas (físicas, geo-químicas, ecológicas) para la generación de escenarios ante posibles contingencias relacionadas a la exploración y producción de hidrocarburos en aguas profundas del Golfo de México"
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CONACYT-SENER-Hidrocarburos

Esta es una contribución del
Consorcio de Investigación del Golfo de México

SENER
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