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# POST-FIRE HYDROLOGICAL AND SEDIMENT DELIVERY DYNAMICS OF TWO MEDITERRANEAN NESTED CATCHMENTS

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Estudis de: Grau de Geografia

Paraules clau: Sediment delivery processes; wildfires; nested catchments; Mediterranean fluvial systems

UNIVERSITAT DE LES ILLES BALEARS

Curs Acadèmic: 2014-2015

## Abstract

A continuous monitoring network of nested catchments was set-up as soon as possible after the largest wildfire that affected Mallorca, which occurred in July 2013. The Sa Font de la Vila catchment is a Mediterranean afforested catchment of 4.8 $km^2$, which is located in the western part of the island. Altitudes range between the 71 to 515 m with an average gradient slope of 38%. The lithology is mainly composed by Keuper clays and loams in the bottom valleys with gentle gradient slopes ca. <10%. Meanwhile, Raethian dolomites and Lias limestones predominate in the upper parts of the catchment. The intensive agricultural use in the past is witnessed by the widespread occurrence of traditional soil conservation structures (i.e., terraces and valley bottom terraces), occupying 65% of the area. It was affected by 2 large wildfires in the last 20 years, i.e. in 1994 and 2013 affecting 44% and 71% of the area, respectively. The Sa Murtera is a headwater sub-catchment of 1.2 $km^2$ representative of lithology, land uses and fire affection. Altitudes range between the 185 to 515 m with an average gradient slope of 36%. In October 2013, the outlet of both the Sa Font de la Vila and Sa Murtera was instrumented with a gauging station, which recorded water level, average turbidity, electric conductivity and temperature at 15 minute intervals (average values based on 1 minute readings). Within the study area, also precipitation, air temperature and soil moisture content were measured also continuously with a meteorological station and a humidity probe.

The results indicate a very low sediment yield in the two post-fire hydrological years, showing important differences between the two nested catchments, although monitoring problems during the first year (2013-14) caused that results were only available from the Sa Font de la Vila. In this station, total runoff and sediment yield were 5 mm and 23 t $km^{-2}$ respectively, with a total sediment load of 111 t, although 99% was exported in the first event after the wildfire when 50 mm were accumulated in only 15 minutes. During the second post-fire year (October 2014-July 2015) in Sa Font de la Vila the total runoff was higher with 23 mm. However, the sediment yield was lower –0.5 t $km^{-2}$– showing a significant decrease. At Sa Murtera, the 31 mm of runoff and 3.3 t $km^{-2}$ of sediment yield showed greater results, indicating that most of the sediment yield from the upstream parts of the catchment must have been deposited before reaching the outlet of the Sa Font de la Vila. Despite the fire effects on erosion and delivery processes, sediment is therefore progressively trapped along the main channel during its transport due to the downstream gradient reduction.

**Keywords**: Sediment delivery processes; wildfires; nested catchments; Mediterranean fluvial systems

# Index

## 1. Introduction

Wildfires cause serious disturbances on the natural dynamics and processes, being considered one of the major elements which cause severe changes in the hydrological and the geomorphological cycles in fire-prone landscapes (Shakesby & Doerr, 2006). The modification or complete removal of the vegetation and litter cover –reducing the interception, infiltration, evapotranspiration, sediment trapping–, and the alteration of important physicochemical soil properties such as water repellence, structure stability, texture and particle size distribution (Certini, 2005; Mataix–Solera & Guerrero, 2007; Úbeda & Outeiro, 2009) can disrupt the channel-slope connectivity, the overland flow generation and the sediment yield during a period of alteration called window of disturbance (Prosser & Williams, 1998). Many studies have also documented the increase of overland flow generation, both Hortonian as saturation, in post-fire environments (Scott et al., 1998; Cosandey et al., 2005; Ferreira et al., 2005; Cerdà & Doer, 2005). This process is caused mainly by the reduction in the vegetation cover and the increasing of soil hydrophobicity which drastically reduces the response time during a rainfall-runoff event, especially during the first post-fire year (Candela et al., 2005). This scenario, and a lower aggregate stability, increases the sediment yield in hillslopes, as well as sediment delivery to and sediment fluxes within river channels, which can result to irreversible soil degradation situations, especially in semi-arid areas (Castillo et al., 1997).

The wildfire severity –expressed in terms of the relationship between fire duration and intensity–is a good indicator of the direct impacts magnitude on soil and vegetation cover, providing an indication of the modification degree in hydrological and erosion processes in the post-fire period (Vieira et al., 2015). As a result, it is possible to establish a relationship between the most severely burned areas with an increase of post-fire erosion risk (Gimeno-Garcia et al., 2007; Chafer, 2008). However, moderate fires do not cause significant changes in the soil and can be beneficial for some adapted ecosystems due to increasing its productivity by providing nutrients from the ash cover (Cromer, 1967). On the other hand, severe fires modify important parameters of soil (Certini, 2005), vegetation and litter cover (Gimeno-Garcia et al., 2007) causing a general increase of overland flow generation and the erosion risk.

The Mediterranean basin is a fire-prone environment (Pausas et al., 2008), evidencing strong forest fires regime during the mid and late Holocene (Carrion et al., 2003). The climate characterized by a warm dry summer season, is the main factor that controls the pyrogeography of the Mediterranean landscapes. In its turn, the irregular rainfall regime with great intensity events in short periods, significantly increases the risk of post-fire erosion. The native vegetation, always linked to the presence of fire, was adapted to a particular fire regime through mechanisms of regrowth and germination (Pausas & Verdú, 2005). Furthermore, some characteristics (e.g. volatile compounds, branch and leaves accumulation) of many Mediterranean pyrophyte species (e.g. *Pinus halepensis*) promote the fast spreading of the wildfires to ensure their community permanence against not adapted species. However, the human land use during millennia led to significant changes in the Mediterranean landscapes (Hooke, 2006). Deforestation and terracing with agricultural purposes of marginal lands changed for centuries the natural fire regime providing soil stability and reducing significantly the slope-to-channel sediment connectivity. In recent times, the abandonment of these traditional agricultural lands, as a result of the rural depopulation and the outsourcing of the economy, have generated afforestation processes in those areas previously occupied by crops in Mediterranean countries since the second half of the 20th century (Grimalt et al., 2002; Gates & Liess, 2000; Osem et al., 2010; Tomaz et al., 2013). In addition, little attention is paid on applying appropriate fire prevention measures which together with the effective fire suppression policies carried out in recent years has promoted unnatural fuel loads in the Mediterranean forests, intensifying the occurrence risk of Large Forest Fire (LFF) (i.e. > 500 ha.) which results in several changes in hydrological and geomorphological processes in the affected catchments.

The continuous monitoring of hydrological and flux sediment processes at catchment scale can provide more knowledge about the spatial and temporal evolution in a burned area. A nested-catchment approach allows the assessment of spatial variations in sediment delivery processes to better understand the relationship between the catchment area and the sediment yield. However, little research was conducted using this approach, considering the juxtaposition of contrasting topographies, rock types and land uses as well as hydrometeorological patterns in Mediterranean calcareous environments. Although wildfires tend to increase sediment delivery and sediment fluxes within river channels, recent studies have emphasized that there is a significant variation in hydrological and sediment transport processes at different temporal and spatial scales, even within the same catchment (Mayor et al., 2007; Owens et al., 2013; Moody et al., 2013; Vieria et al., 2015). Therefore, the nested catchments approach represents an accurate and reliable method to monitor runoff generation and sediment transport and its evolution over time at catchment scale.

The aim of this paper is to assess the hydrological and sediment delivery processes and its dynamics during two hydrological years (2013-2015) immediately after the largest wildfire occurred in the Balearic Islands (2,450 ha in July-August 2013, south-western part of Mallorca island) using the nested catchment approach in the period when the window of disturbance is usually more open. Specific objectives are (a) to analyse the flow and Suspended Sediment Concentrations (SSC) transport dynamics and his post-fire evolution; (b) to determine the different hydrological and sediment behaviour in the study area.

## 2. Study area

The Sa Font de la Vila (Fig. 1a and 1b) is a Mediterranean afforested catchment of 4.8 km$^2$, located in the Pariatge county (Andratx, western part of the Mallorca island), characterized by afforestation of former agricultural land. The lithology is mainly composed by Keuper clays and loams in the bottom valleys with gentle gradient slopes ca. <10%, which –together with the high field capacity of the soils– facilitate agricultural development. Meanwhile, Raethian dolomites and Lias limestones predominate in the upper parts of the catchment (Fig. 1f).The average gradient slope of Sa Font de la Vila catchment is 38% (Fig. 1g), although the 50% of the surface area presents gradients that do not exceed the 15%. In the case of Sa Murtera sub-catchment has an average gradient slope of 36%. The soils are classified as *BK45 -2bc*, corresponding to the *Calcic cambisol* category (FAO, 2006).

The climate is classified as Mediterranean temperate sub-humid at headwaters and warm sub-humid at the outlet applying the Emberger climatic classification method (Guijarro, 1986). The average temperature is 16.5ºC (1974-2010, data from AEMET-the Spanish Meteorological Agency). The mean annual rainfall is 517.8 mm y$^{-1}$ (1974-2010, data from AEMET), with an interannual coefficient of variation of 29%. High-intensity rainstorms with a recurrence period of 10 years may produce 85 mm in 24 hours.

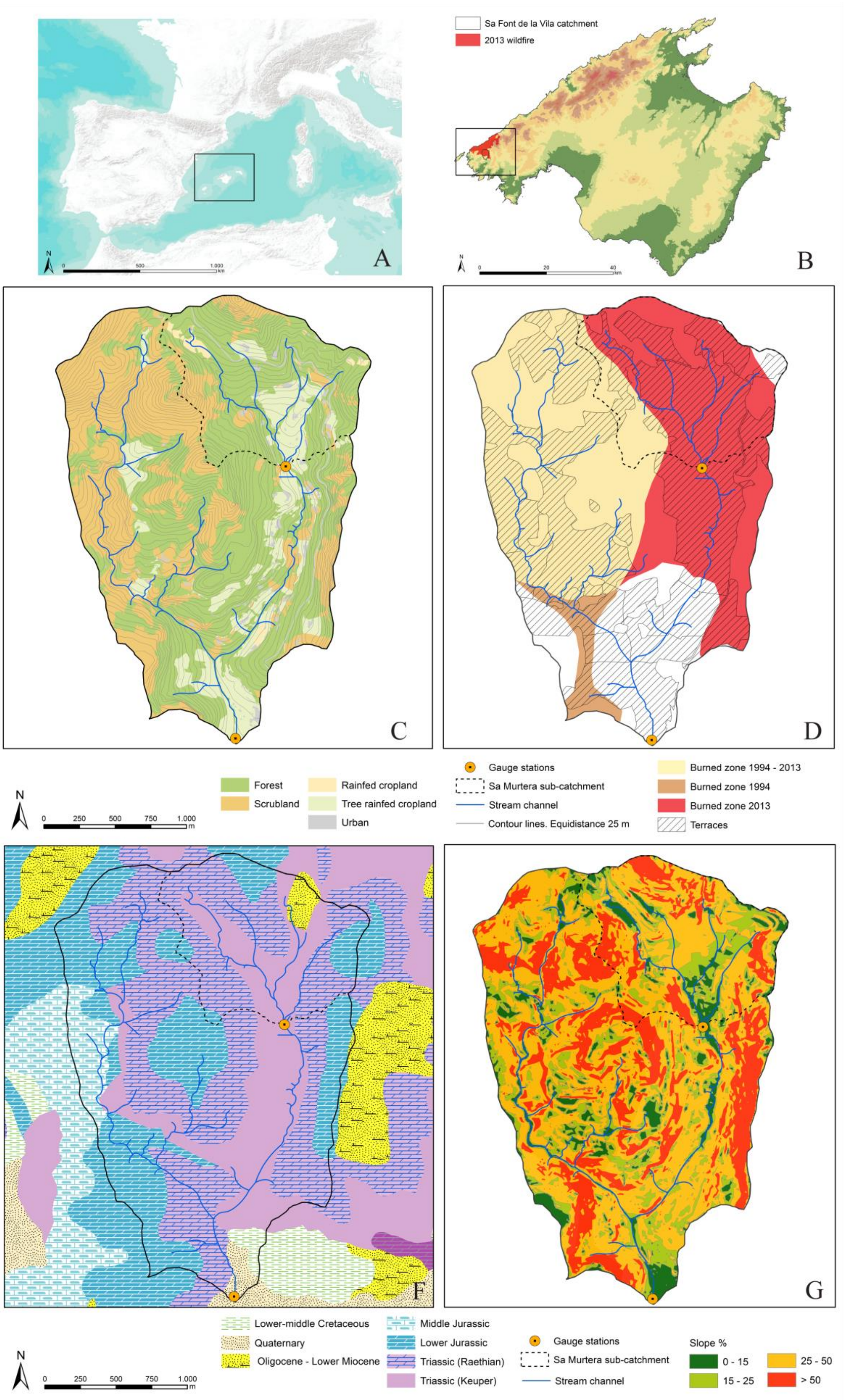

**Fig. 1.** (a) Map of the location of Mallorca island within the Mediterranean Sea; (b) location of the area affected of the July 2013 wildfire in the Pariatge county; (c) land uses, (d) 1994 and 2013 wildfire affection as well as soil conservation practices, (f) lithology and gradient slope of the Sa Font de la Vila catchment.

The Sa Font the la Vila catchment is covered almost entirely by natural vegetation (71%; Fig. 1c); i.e., 52% of forest and 19% of scrubland. The rest of the catchment is covered by tree (23%) and herbaceous (6%) rainfed crops. There is also a massive presence of traditional soil conservation structures (i.e., terraces and valley-bottom terraces) occupying the 65% of the total surface area indicating a preterit intense agricultural activity (Fig. 1d). The Sa Murtera sub-catchment presents forest land cover of 66%, scrubland (14%), tree rainfed (14%), urban (4%), rainfed cropland (2%) and a presence of terraces in the 65% of the area.

The catchment has been affected in the last twenty years by two major wildfires. In 1994, with an affection of 45% of its surface; whilst in 2013 reached 77% of affection, which more than half was already burned in 1994.In the case of the Sa Murtera sub-catchment, the 1994 event affected 17% of the area and 97% in 2013 (Fig. 1d).

## 3. Material and methods

### 3.1 Continuous monitoring network

Immediately after the 2013 wildfire, the catchment was instrumented with two gauging stations applying a nested approach for continuous measurement of water and sediment yield; i.e., Sa Murtera (the upstream site; hereinafter US, 1.1 km$^2$) and Sa Font de la Vila (the downstream site; hereinafter DS, 4.8 km$^2$).

The DS gauging station was installed in the dry stone walls built to retain the sediment from channel banks (Fig. 11), in a trapezoidal section of 6 meters at its widest part, 5 m at the base, a height of 2.5 m in the left margin and 2.8 m on the right. It is equipped with a *Campbell Scientific CR200X* data logger in which is stored at 15 minute intervals the average values – based on 1 minute readings– of water surface level, turbidity, electric conductivity and temperature collected by a *Campbell Scientific CS451-L* pressure probe, a *OBS-3+* turbidimeter with a double measurement range of 0-1.000/1.000-4.000 NTU, a *Hobo U24-001* logger conductivity and temperature probe with a read range from 0 to 10.000 μS cm$^{-1}$. Where instantaneous turbidity peaks were known to be spurious, manual manipulation and interpolation were used to correct the data (Wass and Leeks, 1999). Additionally, a rising-stage sampler of the type modified from Schick (1967) with twelve sampling bottles was installed to provide more information on SSC. The distance between bottles is 12 cm totalling a 200 cm stage, considering that the first one is located 21 cm above the riverbed.

The US is located at the north-west headwater part of the Sa Font de la Vila catchment at 185 m (Fig. 1). In this case, the channel section is irregular (see Annex figures) with a gauging section of 5 m at its widest part, 4 m at the middle, and 0.4 at the bottom part. The height is 1.74 m in the left margin and 4 m in the right one. The hydrological monitoring instrumentation is the same as the DS. A rising-stage sampler was also installed, although only equipped with 7 bottles and totalling 100 cm stage. A *Casella* tipping bucket rain gauge was also installed at US. This was positioned 1 m above the ground. It is connected to a *HOBO UA-003-64 Pendant Temp/Event* data-logger that recorded 0.2 mm precipitation increments and the air temperature every 15 min.

## 3.2 Field measurements and data computation

Stream discharge *($Q$)* was measured using an *OTT MF pro* inductive magnetic flow meter, with a measuring range of 0 to 6 m s$^{-1}$ and an accuracy of ±2% to develop and fit stage/discharge rating curves.

Manual depth-integrated SS samples were taken during storm events when possible and every week during low flows. These were collected in the middle of the channel, in the same section where turbidity probes and rising-stage samplers were installed. Differences may exist between manual and rising stage sampling points; previous studies in large rivers have reported differences between 10 and 20% (e.g., Batalla, 1993). However, direct observations indicate that water flows are rather turbulent through the section; any spatial difference of SSC within the section is considered negligible. All of these water samples were filtered by means of 0.45 µm cellulose esters, and filters were subsequently dried at room temperature and weighed by means of high-precision scales in order to determine SSC.

Turbidity probes were calibrated with commercial turbidity standards to check its long-term stability and the turbidity data were converted to a continuous record of SSC, using a site-specific concentration/turbidity calibration relationship. Suspended sediment concentrations used for calibration were measured in samples collected both manually and by rising-stage samplers. Suspended sediment loads were estimated by combining the records of suspended sediment concentration provided by the turbidity sensors with the continuous records of water discharge.

The analysis of the relationship between rainfall intensity and kinetic energy and its variations in time and space is important for erosion prediction (van Dijk et al., 2002). Thus, to determine the kinetic rainfall energy was used the equation described by Brown & Foster (1989) cited by Lobo & Bonilla (2015).

$$e = 0.29[1 - 0.72\ exp(-0.05i)] \qquad (1)$$

where $e$ is the kinetic energy of 1 rainfall mm expressed in Mj ha$^{-1}$ mm, and $i$ is the rainfall intensity expressed in mm hr$^{-1}$. Finally, it has been determined the rainfall erosivity ($R$) by multiplying the kinetic energy of each event and the reached maximum intensity within 30 minutes ($I_{30}$) expressing the result in MJ mm ha$^{-1}$ h$^{-1}$.

$$e * I_{30} = R \qquad (2)$$

In addition, were calculated the accumulate rainfall in 24 h return periods ($T$) using the Gumbel method.

$$\overline{X} = X - \frac{\Delta X}{\Delta n}\left[\ln\left(\frac{T}{T-1}\right) + Y_n\right] \qquad (3)$$

where $\bar{X}$ is the daily maximum rainfall in 24 hours for the return period $T$; $\Delta X$ is the standard deviation of the maximum rainfall data available; $X$ the average of daily maximum rainfall data available and $Y$n and $\Delta$n are factors that depend on the number of available data.

Because of monitoring problems in US, results were only available from DS during the first post-fire year (2013-2014). Likewise, for reasons of related with the deadline of Bachelor's Degree Final Project (TFG), the second hydrological year (2014-2015) was closed in July.

# 4. Results

## 4.1 Rainfall and runoff

The total annual rainfall was 517 mm in the first post-fire year (2013-2014) and 390 mm at the second (2014-2015). It were distributed in 9 events occurred between autumn and winter. The months in which higher rainfall values were recorded were November and December in both years, with 172 and 123 mm respectively in 2013, and 76 and 127 mm in 2014. The maximum daily amount of rainfall was 57 mm in 29th October 2013 (*T* 2.3 years) and 61 mm in January, 2015 (*T* 2.7 years). It is necessary to emphasize the first storm occurred after the wildfire (October 29, 2013), when 50 mm fell in 15 minutes reaching an intensity of 200 mm $h^{-1}$ and a rainfall erosivity of 2,886 MJ mm $ha^{-1}$ $h^{-1}$. However, rainfall intensities were generally low during the study period, with any event exceeding 30 mm $h^{-1}$. Accordingly, excepting the first event, the average rainfall intensity was 15 mm $h^{-1}$. The 4 major rainfall events in the 2013-2014 year were recorded in October, November and December, with intensities between 10 and 20 mm $h^{-1}$, and a *R* of 874 MJ mm $ha^{-1}$ $h^{-1}$. In the second year (2014-2015), 5 events were recorded, being distributed between November and February, 30 mm $h^{-1}$ was the higher intensity and 6 mm $h^{-1}$ the lower. Also, were registered low rainfall *R* values with an average of 193 MJ mm $ha^{-1}$ $h^{-1}$. Rainfall data series recorded at Palma (1964-2001 period) and Alfàbia (1994-2001) rain gauges, located 20 and 32 km respectively from the Sa Font de la Vila catchment, allow to verify that the rainfall intensities for the entire study period 2013-2015 are representative of the long term record: the average of the annual maximum 30-min rainfall intensities at these reference sites was 30.6 mm $h^{-1}$ in Palma and 24.9 mm $h^{-1}$ in Alfàbia (YACU, 2002), whereas it was 24.8 mm h during the study period.

## 4.2 Streamflow

A total of 9 flood events were recorded at DS during the two hydrological years, and 8 at US during the 2014-2015 year (Fig. 2). At DS, the runoff generated was 5 mm in the first post-fire year (Table 1) and 23 mm in the second one (Table 2). During the first post-fire year 4 events were recorded, occurred only during Autumn season (October, November and December), with *Q* peaks ranging the 0.08-1.5 $m^3$ $s^{-1}$. The annual average baseflow was 0.001 $m^3$ $s^{-1}$, clearly influenced by the intermittent fluvial regime; whilst the specific contribution was 0.170 $m^3$ s $km^{-2}$. In 2014-2015, 5 events were recorded with *Q* peaks ranging between 0.06 to 0.5 $m^3$ $s^{-1}$. The average baseflow was 0.004 $m^3$ $s^{-1}$ and the specific contribution 0.726 $m^3$ s $km^{-2}$.

In its turn, at US the runoff contribution was 31 mm in 2014-2015 (Table 3). The results indicate that US presented a slightly different hydrological behaviour with a greater presence of baseflow during the wet season clearly influenced by karstic spring which maintains an influent regime in the upper part of the catchment. Thus, the 8 flood events registered *Q* peaks ranging between 0.02 to 0.2 $m^3$ $s^{-1}$, with an average baseflow of 0.005 $m^3$ $s^{-1}$ and specific contribution of 4.2 $m^3$ s $km^{-2}$.

**Table 1.** Runoff volume, runoff, sediment load and sediment yield for the DS-Sa Font de la Vila station (2013-2014).

| Data | Rainfall (mm) | Runoff (mm) | Sediment load (kg) | Sediment yield (kg km$^{-2}$) |
|---|---|---|---|---|
| October | 64.2 | 0.8 | 110,872 | 23,098 |
| November | 171.8 | 1.4 | 145 | 30 |
| December | 122.8 | 2.9 | 321 | 67 |
| January | 42.6 | 0.0 | 0.0 | 0 |
| February | 22.8 | 0.0 | 0.0 | 0 |
| March | 21.8 | 0.0 | 0.0 | 0 |
| April | 50.4 | 0.0 | 0.0 | 0 |
| May | 8.4 | 0.0 | 0.0 | 0 |
| June | 12.4 | 0.0 | 0.0 | 0 |
| July | 0.0 | 0.0 | 0.0 | 0 |
| August | 0.0 | 0.0 | 0.0 | 0 |
| September | 0.0 | 0.0 | 0.0 | 0 |
| **Total** | **517.2** | **5.0** | **111,338** | **23,195** |

**Table 2.** Runoff volume, runoff, sediment load and sediment yield for the DS-Sa Font de la Vila station (2014-2015).

| Data | Rainfall (mm) | Runoff (mm) | Sediment load (kg) | Sediment yield (kg km$^{-2}$) |
|---|---|---|---|---|
| October | 13.6 | 0.0 | 0 | 0 |
| November | 76.2 | 0.0 | 0 | 0 |
| December | 126.8 | 0.6 | 147 | 31 |
| January | 95.0 | 8.1 | 1,197 | 249 |
| February | 53.0 | 7.8 | 356 | 74 |
| March | 2.0 | 5.2 | 433 | 90 |
| April | 2.8 | 1.5 | 109 | 23 |
| May | 9.8 | 0.0 | 0 | 0 |
| June | 10.6 | 0.0 | 0 | 0 |
| July | N/A | N/A | N/A | N/A |
| August | N/A | N/A | N/A | N/A |
| September | N/A | N/A | N/A | N/A |
| **Total** | **389.8** | **23.2** | **2,242** | **467** |

**Table 3.** Volume runoff, runoff, sediment load and sediment yield for the US-Sa Murtera station (2014-2015).

| Data | Rainfall (mm) | Runoff (mm) | Sediment load (kg) | Sediment yield (kg km$^{-2}$) |
|---|---|---|---|---|
| October | 13.6 | 0.8 | 18 | 15 |
| November | 76.2 | 0.0 | 39 | 33 |
| December | 126.8 | 8.2 | 2,309 | 1,940 |
| January | 95.0 | 5.6 | 903 | 759 |
| February | 53.0 | 5.8 | 755 | 635 |
| March | 2.0 | 6.0 | 0 | 0 |
| April | 2.8 | 3.7 | 0 | 0 |
| May | 9.8 | 1.2 | 0 | 0 |
| June | 10.6 | 0.0 | 0 | 0 |
| July | N/A | N/A | N/A | N/A |
| August | N/A | N/A | N/A | N/A |
| September | N/A | N/A | N/A | N/A |
| **Total** | **389.8** | **31.3** | **4,024** | **3,381** |

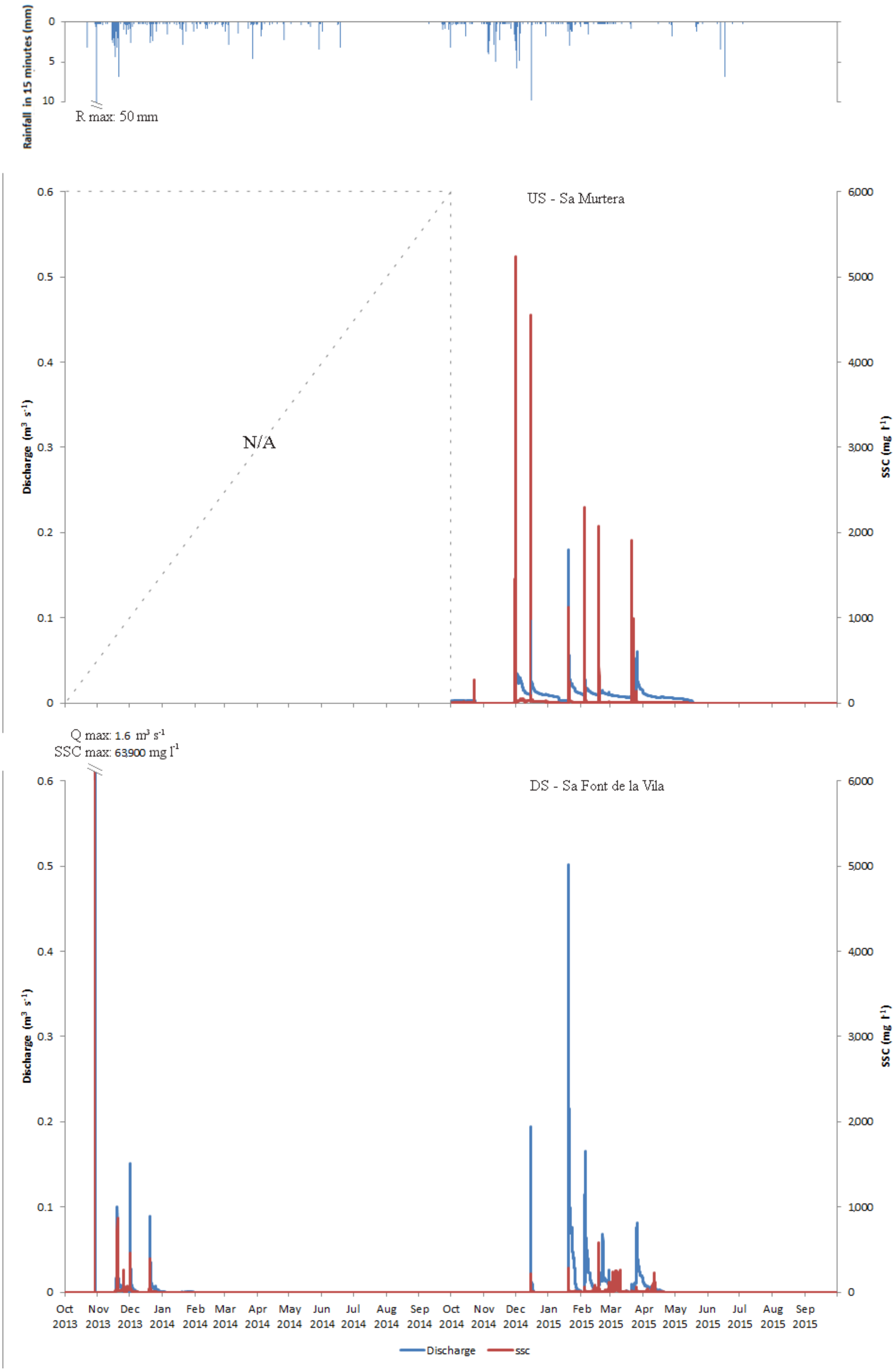

**Fig. 2.** Hydrograph, sedigraph and hyetograph based on 15-min recordings for the period 2013-2015 at US-Sa Murtera and DS-Sa Font de la Vila stations.

### 4.3 Suspended Sediment Delivery

Total suspended sediment load for DS in 2013-14 was 111 t, with a sediment yield of 23 t km$^{-2}$(Table 1). The 99% of the sediment was exported in the first event after the wildfire (October, 29) when the maximum of SSC during the study period was reached (34 g l$^{-1}$) with an average of 17 g l$^{-1}$as a response of a precipitation of 50 mm fell in 15 minutes. In the other 3 events, the SSC peaks were lower, ranging between 391 to 867 mg l$^{-1}$ and an average of 55 mg l$^{-1}$. During the second post-fire year the sediment load was lower ca. 2 t, resulting a sediment yield of 0.5 t km$^{-2}$for the entire catchment (Table 2). The SSC average in the 5 flood events occurred was 12 mg l$^{-1}$, with a maximum SSC of 551 mg l$^{-1}$(February, 2015). The maximum sediment load was exported in January (53%), with 1,196 kg, concentrated almost entirely on the 20th of January (1,022 kg). At US, only in 2014-2015, the sediment load reached 4 t with a sediment yield of 3.3 t km$^{-2}$ (Table 3). The 8 flood events averaged a SSC of 270 mg l$^{-1}$, with maximum SSC peaks ranging between 116 to 5,000mg l$^{-1}$. December was the month with the highest sediment load, ca. 2.3 t being the 57% of the total exported.

## 5. Discussion

According to the general dynamic of the environments affected by wildfires, the first few years after the fire is when the landscape is more susceptible to soil erosion and sediment transport (Shakesby and Doerr, 2006). In this way, higher sediment yields would be expected as indicator of erosion processes in a catchment affected by a severe wildfire, especially, in a high energetic climate such as the Mediterranean. However, the low results obtained after the first two monitored years indicate that other factors are involved in the sediment response of the catchment beyond the physicochemical soil changes and the reduction of the vegetation cover caused by the fire disturbance. As a result, the massive presence of soil conservation structures and the post-fire management may cause the negligible rates of sediment transport.The landscape response to a fire disturbance is basically determined by fire severity although a limited response in terms of SS fluxes in burnt catchments could be ascribed to a lack of a driving force such rainfall intensity (Owens et al., 2012). However, the rainfall intensities for the entire study period 2013-2015 have been determined as representative of the long term record. Conversely, the massive application of soil conservation practices –basically during the Modern Age– and the recent post-fire management actions (i.e., log barriers and mulching) to control and reduce runoff and sediment delivery from hillslopes to the fluvial drainage networks can be related with the very low sediment transport rates in the study area. Nevertheless, if the magnitude of the future flash-flood exceeds the threshold capacity of these structures, a general collapse can be produced, thereby accelerating the erosion processes and the derived damages (Estrany and Grimalt, 2014).

As far as the authors are aware, only two studies (Inbar et al., 1998; Mayor et al., 2007) reported lower sediment yield data (i.e., 0.036 and 3.7 t ha$^{-1}$ yr$^{-1}$ respectively) from other Mediterranean environments at burned catchment scale during the window of disturbance period. Thus, it is therefore difficult to judge whether the values reported are typical because most of the research was developed at hillslope and plot scale (Shakesby, 2011). It is however possible to establish a comparison with other similar Mediterranean unburned catchments and with other dissimilar burned catchments studies worldwide (Table 4).

**Table 4.** Sediment yield average comparison between burned and unburned catchments in different environments. Adapted from Owens et al. (2013).

| | Location | Catchment area (km$^2$) | Rainfall average (mm) | Sediment yield average (t km$^{-2}$) | Study reference |
|---|---|---|---|---|---|
| Unburned | Bosc-Gavarres, Spain | 1.6 | 670 | 0.3 | Sala i Farguell (2002) |
| | Campas-Gavarres, Spain | 2.4 | 670 | 0.4 | Sala i Farguell (2002) |
| | Araguas, Spain | 0.5 | 720 | 15.0 | Nadal-Romero et al. (2008) |
| | Tordera, Spain | 785.0 | 1000 | 50.0 | Rovira i Batalla (2006) |
| | Ribera Salada, Spain | 224.0 | 763 | 2.0 | Tuset et al. (2015) |
| | Silaro, Italia | 138.0 | 942 | 732.0 | Pavanelli i Pagliarini (2002) |
| Burned | Washington, USA | 5.1 | 580 | 8.57 | Helvey (1980) |
| | Colorado Front Range, USA | 46.9 | 440 | 2523.5 | Moody and Martin (2001, 2004) |
| | New Mexico, USA | 16.6 | 650 | 458.3 | Reneau et al. (2007) |
| | East Kiewa River, Australia | 1.36 | 1800 | 115.5 | Lane et al. (2006) |
| | Little River, Australia | 183.0 | 1000 | 102.0 | Wilkinson et al. (2009) |
| | Fistrap Creek, Canada | 135.0 | 487 | 68.0 | Owens et al. (2013) |
| | Sa Font de la Vila, Spain | 4.8 | 454* | 12.0 | This study (2015) |
| | Sa Murtera, Spain | 1.1 | 454* | 3.0 | This study (2015) |

* *Rainfall average during study period*

The sediment yield at DS during the first year was 23 t km$^{-2}$ with a runoff generation of 5 mm. During the second year of disturbance, the values were 0.5 t km$^{-2}$ and 23 mm. The average value of sediment yield for the entire study period of 12 t km$^{-2}$ is very similar to the levels recorded in unburned catchments (Table 4). However, the 99% of the total SS transport occurred in only 0.001% of the time considering that SS transport was extremely ephemeral if compared to other Mediterranean areas (Batalla et al. 2005) although comparable with other studies carried out in catchments largely modified by soil conservation practices in the Balearic Islands (Estrany et al., 2012). The evidence for this process is that the 99% of the sediment load at the catchment outlet during the first year (110 t) was generated during a single storm with $I_{30}$ of 100 mm h$^{-1}$ (October 29, 2013). During the second year, the sediment yield was lower instead the runoff increased in a 460% (23 mm) because the rainfall was concentrated during winter when ETP is lower allowing the influence dynamics within the drainage network. In addition, the highest rainfall in 24 hours recorded during the study period was occurred during this second year (61 mm, 20 January) but with a very lower intensity (i.e., $I_{30\mathrm{max}}$ 10.8 mm h$^{-1}$). Despite the lack of protection and vulnerability of the soil after a wildfire, the sediment yield recorded corroborates that higher rainfall intensities are needed to generate an effective slope-to-channel sediment delivery response. Nevertheless, the low sediment output should be seen as reflecting the important role of conveyance losses and storage rather than a lack of sediment mobilization from the catchment surface, although the intrinsic characteristics of the catchment such as stoniness and thickness of the soils, the application of post-fire measures and the soil conservation structures limited the sediment response.

Despite further research should be carried out to better assess the probably divergence between hillslope erosion and sediment delivery responses to wildfire collecting detailed information on individual components of a suspended sediment budget (Walling & Collins, 2007), the nested catchment approach have allowed to recognize the conveyance losses along the main system channel network of the catchment. In this way, a reduction of 26% in the runoff and 44% in the sediment load during the 2014-2015 hydrological year demonstrated how infiltration and deposition was the main feature along the channel between the two gauging stations because driving forces during the study period did not allow an effective downstream sediment release.

## 6. Conclusions

This paper analysed the general hydrologic and sediment delivery dynamics in two nested catchments when the window of disturbance period should be more active, also considering the significant differences in sediment responses in fire-prone environments (Moody & Martin, 2009). The immediate instrumentation of two nested catchment and the study of two hydrological years after a severe wildfire in the Sa Font de la Vila catchment, have allowed to record low sediment delivery values. The delayed response of the landscape could be considered a hypothesis to further analyse to make possible at medium and long term when and how the fire disturbances actuate, highlighting the importance of long-term monitoring. High intensity rainfall has proved essential to have an effective slope-to-channel sedimentary connectivity. The storm occurred in October 29, 2013 generated in just 15 minutes a sediment load of 110 t in Sa Font the la Vila catchment outlet -the largest sediment load recorded -. In this way, the massive presence of terraces and the post-fire management caused a decrease in the sediment mobilization promoting deposition processes in hillslopes.

The nested catchment approach was useful to improve the knowledge of hydrological and sediment transport processes at catchment scale. This technique is particularly effective in Mediterranean environments, where there are large areas of porous lithology (i.e., limestone) causing the interaction of influent and effluent processes along the channel systems.

## 7. Acknowledgements

This research was supported by the Balearic Forest Service (Department of Agriculture, Environment and Territory of the Balearic Autonomous Government). Meteorological data was facilitated by the Spanish Meteorological Agency (AEMET).

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# 9. Annex

**Table 1.** Average values of temperature and total values of precipitation, runoff and potential evapotranspiration for the Sa Font de la Vila Catchment (2013-2014).

| | Temperature (ºC) | Rainfall (mm) | PET (mm) | Runoff (mm) |
|---|---|---|---|---|
| Oct-13 | 21.1 | 64.2 | 86.1 | 0.8 |
| Nov-13 | 16.6 | 171.8 | 50.5 | 1.4 |
| Dec-13 | 11.6 | 122.8 | 29.5 | 2.9 |
| Jan-14 | 11.8 | 42.6 | 32.3 | 0.0 |
| Feb-14 | 11.7 | 22.8 | 35.3 | 0.0 |
| Mar-14 | 12.8 | 21.8 | 42.7 | 0.0 |
| Apr-14 | 16.4 | 50.4 | 73.0 | 0.0 |
| May-14 | 18.6 | 8.4 | 89.1 | 0.0 |
| Jun-14 | 23.8 | 12.4 | 132.0 | 0.0 |
| Jul-14 | 25.0 | 0.0 | 138.6 | 0.0 |
| Aug-14 | 25.9 | 0.0 | 129.7 | 0.0 |
| Sep-14 | 23.4 | 0.0 | 103.5 | 0.0 |
| Year 2013-2014 | 18.2 | 517.2 | 942.6 | 5.1 |

**Table 2**. Average values of temperature and total values of precipitation, runoff and potential evapotranspiration for the Sa Font de la Vila Catchment (2014-2015).

| | Temperature (ºC) | Rainfall (mm) | PET (mm) | Runoff (mm) |
|---|---|---|---|---|
| Oct-14 | 18.9 | 13.6 | 81.6 | 0 |
| Nov-14 | 15.1 | 76.2 | 58.1 | 0 |
| Dec-14 | 11.0 | 126.8 | 42.8 | 0.6 |
| Jan-15 | 8.6 | 95 | 31.1 | 8.1 |
| Feb-15 | 8.9 | 53 | 36.2 | 7.8 |
| Mar-15 | 11.0 | 2 | 50.5 | 5.2 |
| Apr-15 | 13.7 | 2.8 | 71.6 | 1.5 |
| May-15 | 18.2 | 9.8 | 104.2 | 0 |
| Jun-15 | 22.1 | 10.6 | 124.3 | 0 |
| Jul-15 | N/A | N/A | N/A | N/A |
| Aug-15 | N/A | N/A | N/A | N/A |
| Sep-15 | N/A | N/A | N/A | N/A |
| Year 2014-2015 | 14.2 | 389.8 | | 23.1 |

**Projecte Pariatge - UIB** **Any hidrològic 2013-2014**

**Estació Font de la Vila (Andratx)** **Superficie de conca:** **4.80** **km$^2$**

**Cabal mitjà diari (m$^3$ s$^{-1}$)**

| | Octubre | Novembre | Desembre | Gener | Febrer | Març |
|---|---|---|---|---|---|---|
| Dia | Q | Q | Q | Q | Q | Q |
| 1 | 0.000 | 0.000 | 0.038 | 0.000 | 0.000 | 0.000 |
| 2 | 0.000 | 0.000 | 0.014 | 0.000 | 0.000 | 0.000 |
| 3 | 0.000 | 0.000 | 0.007 | 0.000 | 0.000 | 0.000 |
| 4 | 0.000 | 0.000 | 0.004 | 0.000 | 0.000 | 0.000 |
| 5 | 0.000 | 0.000 | 0.003 | 0.000 | 0.000 | 0.000 |
| 6 | 0.000 | 0.000 | 0.002 | 0.000 | 0.000 | 0.000 |
| 7 | 0.000 | 0.000 | 0.001 | 0.000 | 0.000 | 0.000 |
| 8 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 9 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 10 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 11 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 12 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 13 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 14 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 15 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 16 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 17 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 18 | 0.000 | 0.005 | 0.000 | 0.000 | 0.000 | 0.000 |
| 19 | 0.000 | 0.023 | 0.000 | 0.000 | 0.000 | 0.000 |
| 20 | 0.000 | 0.023 | 0.048 | 0.000 | 0.000 | 0.000 |
| 21 | 0.000 | 0.011 | 0.019 | 0.000 | 0.000 | 0.000 |
| 22 | 0.000 | 0.007 | 0.009 | 0.000 | 0.000 | 0.000 |
| 23 | 0.000 | 0.004 | 0.006 | 0.000 | 0.000 | 0.000 |
| 24 | 0.000 | 0.002 | 0.005 | 0.000 | 0.000 | 0.000 |
| 25 | 0.000 | 0.001 | 0.004 | 0.000 | 0.000 | 0.000 |
| 26 | 0.000 | 0.000 | 0.003 | 0.000 | 0.000 | 0.000 |
| 27 | 0.000 | 0.000 | 0.003 | 0.000 | 0.000 | 0.000 |
| 28 | 0.000 | 0.000 | 0.002 | 0.000 | 0.000 | 0.000 |
| 29 | 0.045 | 0.001 | 0.002 | 0.000 | | 0.000 |
| 30 | 0.000 | 0.001 | 0.001 | 0.000 | | 0.000 |
| 31 | 0.000 | | 0.000 | 0.000 | | 0.000 |
| Mitjana | 0.002 | 0.003 | 0.006 | 0.000 | 0.000 | 0.000 |
| Aportació hm$^3$ | 0.004 | 0.007 | 0.015 | 0.000 | 0.000 | 0.000 |

| | Abril | Maig | Juny | Juliol | Agost | Setembre |
|---|---|---|---|---|---|---|
| Dia | Q | Q | Q | Q | Q | Q |
| 1 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 2 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 4 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 5 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 6 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 7 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 8 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 9 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 10 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 11 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 12 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 13 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 14 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 15 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 16 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 17 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 18 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 19 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 20 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 21 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 22 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 23 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 24 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 25 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 26 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 27 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 28 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 29 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 30 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 31 | | 0.000 | | 0.000 | 0.000 | |
| Mitjana | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Aportació hm$^3$ | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

**Aportació total de l'any (hm$^3$):** **0.026** **Aportació específica de l'any 2013-14 (m$^3$/s/km$^2$):** **0.170**

**Cabal mitjà anual (m$^3$ s$^{-1}$)** **0.001**

**Table 3.** Daily average discharge. Sa Font de la Vila (2013-2014).

**Projecte Pariatge - UIB** **Any hidrològic 2013-2014**

**Estació sa Font de la Vila (Andratx)** **Superficie de conca: 4.80 km$^2$**

**Exportació de sediment diària (kg)**

| | **Octubre** | **Novembre** | **Desembre** | **Gener** | **Febrer** | **Març** |
|---|---|---|---|---|---|---|
| **Dia** | **Qss** | **Qss** | **Qss** | **Qss** | **Qss** | **Qss** |
| 1 | 0.00 | 0.00 | 169.95 | 0.00 | 0.00 | 0.00 |
| 2 | 0.00 | 0.00 | 9.94 | 0.00 | 0.00 | 0.00 |
| 3 | 0.00 | 0.00 | 3.97 | 0.00 | 0.00 | 0.00 |
| 4 | 0.00 | 0.00 | 2.35 | 0.00 | 0.00 | 0.00 |
| 5 | 0.00 | 0.00 | 1.51 | 0.00 | 0.00 | 0.00 |
| 6 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 0.00 |
| 7 | 0.00 | 0.00 | 0.38 | 0.00 | 0.00 | 0.00 |
| 8 | 0.00 | 0.00 | 0.08 | 0.00 | 0.00 | 0.00 |
| 9 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 11 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 12 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 13 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 14 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 15 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 16 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 17 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 |
| 18 | 0.00 | 0.13 | 0.00 | 0.00 | 0.00 | 0.00 |
| 19 | 0.00 | 23.91 | 0.05 | 0.00 | 0.00 | 0.00 |
| 20 | 0.00 | 116.43 | 104.33 | 0.00 | 0.00 | 0.00 |
| 21 | 0.00 | 1.43 | 11.21 | 0.00 | 0.00 | 0.00 |
| 22 | 0.00 | 0.64 | 4.49 | 0.00 | 0.00 | 0.00 |
| 23 | 0.00 | 0.63 | 3.02 | 0.00 | 0.00 | 0.00 |
| 24 | 0.00 | 0.75 | 2.13 | 0.00 | 0.00 | 0.00 |
| 25 | 0.00 | 0.08 | 2.16 | 0.00 | 0.00 | 0.00 |
| 26 | 0.00 | 0.00 | 1.33 | 0.00 | 0.00 | 0.00 |
| 27 | 0.00 | 0.19 | 1.18 | 0.00 | 0.00 | 0.00 |
| 28 | 0.00 | 0.02 | 1.03 | 0.00 | 0.00 | 0.00 |
| 29 | 110871.47 | 0.59 | 0.70 | 0.00 | | 0.00 |
| 30 | 0.00 | 0.54 | 0.37 | 0.00 | | 0.00 |
| 31 | 0.00 | | 0.21 | 0.00 | | 0.00 |
| Mitjana | 3576.499 | 4.993 | 10.368 | 0.000 | 0.000 | 0.000 |
| Aportació kg | 110871.469 | 145.345 | 321.399 | 0.000 | 0.000 | 0.000 |

| | **Abril** | **Maig** | **Juny** | **Juliol** | **Agost** | **Setembre** |
|---|---|---|---|---|---|---|
| **Dia** | **Qss** | **Qss** | **Qss** | **Qss** | **Qss** | **Qss** |
| 1 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 4 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 5 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 6 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 7 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 8 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 9 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 11 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 12 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 13 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 14 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 15 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 16 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 17 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 18 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 19 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 20 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 21 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 22 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 23 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 24 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 25 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 26 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 27 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 28 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 29 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 30 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 31 | | 0.00 | | 0.00 | 0.00 | |
| Mitjana | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Aportació kg | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

**Aportació total de l'any (kg): 111,338.213** **Aportació específica de l'any 2013-14 (kg/km$^2$): 23,195.461**

**Table 4.** Daily suspended sediment load. Sa Font de la Vila (2013-2014).

**Projecte Pariatge - UIB** **Any hidrològic 2014-2015**

**Estació Font de la Vila (Andratx)** **Superficie de conca: 4.80 km$^2$**

**Cabal mitjà diari (m$^3$ s$^{-1}$)**

| | **Octubre** | **Novembre** | **Desembre** | **Gener** | **Febrer** | **Març** |
|---|---|---|---|---|---|---|
| **Dia** | **Q** | **Q** | **Q** | **Q** | **Q** | **Q** |
| 1 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.008 |
| 2 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.007 |
| 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.006 |
| 4 | 0.000 | 0.000 | 0.000 | 0.000 | 0.020 | 0.006 |
| 5 | 0.000 | 0.000 | 0.000 | 0.000 | 0.070 | 0.005 |
| 6 | 0.000 | 0.000 | 0.000 | 0.000 | 0.056 | 0.004 |
| 7 | 0.000 | 0.000 | 0.000 | 0.000 | 0.044 | 0.004 |
| 8 | 0.000 | 0.000 | 0.000 | 0.000 | 0.032 | 0.003 |
| 9 | 0.000 | 0.000 | 0.000 | 0.000 | 0.017 | 0.003 |
| 10 | 0.000 | 0.000 | 0.000 | 0.000 | 0.012 | 0.003 |
| 11 | 0.000 | 0.000 | 0.000 | 0.000 | 0.008 | 0.000 |
| 12 | 0.000 | 0.000 | 0.000 | 0.000 | 0.006 | 0.000 |
| 13 | 0.000 | 0.000 | 0.000 | 0.000 | 0.005 | 0.000 |
| 14 | 0.000 | 0.000 | 0.000 | 0.000 | 0.004 | 0.000 |
| 15 | 0.000 | 0.000 | 0.018 | 0.000 | 0.003 | 0.000 |
| 16 | 0.000 | 0.000 | 0.010 | 0.000 | 0.002 | 0.000 |
| 17 | 0.000 | 0.000 | 0.005 | 0.000 | 0.008 | 0.000 |
| 18 | 0.000 | 0.000 | 0.001 | 0.000 | 0.017 | 0.000 |
| 19 | 0.000 | 0.000 | 0.000 | 0.000 | 0.020 | 0.000 |
| 20 | 0.000 | 0.000 | 0.000 | 0.077 | 0.014 | 0.000 |
| 21 | 0.000 | 0.000 | 0.000 | 0.144 | 0.018 | 0.002 |
| 22 | 0.000 | 0.000 | 0.000 | 0.082 | 0.020 | 0.001 |
| 23 | 0.000 | 0.000 | 0.000 | 0.056 | 0.016 | 0.008 |
| 24 | 0.000 | 0.000 | 0.000 | 0.043 | 0.014 | 0.011 |
| 25 | 0.000 | 0.000 | 0.000 | 0.033 | 0.012 | 0.055 |
| 26 | 0.000 | 0.000 | 0.000 | 0.018 | 0.011 | 0.053 |
| 27 | 0.000 | 0.000 | 0.000 | 0.008 | 0.013 | 0.034 |
| 28 | 0.000 | 0.000 | 0.000 | 0.004 | 0.010 | 0.027 |
| 29 | 0.000 | 0.000 | 0.000 | 0.002 | | 0.022 |
| 30 | 0.000 | 0.000 | 0.000 | 0.001 | | 0.018 |
| 31 | 0.000 | | 0.000 | 0.001 | | 0.015 |
| Mitjana | 0.000 | 0.000 | 0.001 | 0.015 | 0.016 | 0.010 |
| Aportació hm$^3$ | 0.000 | 0.000 | 0.003 | 0.040 | 0.039 | 0.026 |

| | **Abril** | **Maig** | **Juny** | **Juliol** | **Agost** | **Setembre** |
|---|---|---|---|---|---|---|
| **Dia** | **Q** | **Q** | **Q** | **Q** | **Q** | **Q** |
| 1 | 0.011 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 2 | 0.009 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 3 | 0.008 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 4 | 0.007 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 5 | 0.006 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 6 | 0.005 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 7 | 0.006 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 8 | 0.005 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 9 | 0.005 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 10 | 0.005 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 11 | 0.005 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 12 | 0.004 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 13 | 0.003 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 14 | 0.002 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 15 | 0.002 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 16 | 0.002 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 17 | 0.001 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 18 | 0.001 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 19 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 20 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 21 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 22 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 23 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 24 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 25 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 26 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 27 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 28 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 29 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 30 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 31 | | 0.000 | | 0.000 | 0.000 | |
| Mitjana | 0.003 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Aportació hm$^3$ | 0.008 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| | | | |
|---|---|---|---|
| **Aportació total de l'any (hm$^3$):** | **0.116** | **Aportació específica de l'any 2014-15 (m$^3$/s/km$^2$):** | **0.762** |
| **Cabal mitjà anual (m$^3$ s$^{-1}$)** | **0.004** | | |

**Table 5.** Daily average discharge. Sa Font de la Vila (2014-2015).

**Projecte Pariatge - UIB** **Any hidrològic 2014-2015**

**Estació sa Font de la Vila (Andratx)** **Superficie de conca: 4.80 km$^2$**

**Exportació de sediment dissolt diària (kg)**

| | **Octubre** | **Novembre** | **Desembre** | **Gener** | **Febrer** | **Març** |
|---|---|---|---|---|---|---|
| **Dia** | **Qss** | **Qss** | **Qss** | **Qss** | **Qss** | **Qss** |
| 1 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 631.35 |
| 2 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 581.54 |
| 3 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 547.65 |
| 4 | 0.00 | 0.00 | 0.00 | 0.00 | 1192.09 | 527.44 |
| 5 | 0.00 | 0.00 | 0.00 | 0.00 | 4104.15 | 436.74 |
| 6 | 0.00 | 0.00 | 0.00 | 0.00 | 3672.13 | 370.79 |
| 7 | 0.00 | 0.00 | 0.00 | 0.00 | 2865.40 | 355.51 |
| 8 | 0.00 | 0.00 | 0.00 | 0.00 | 2173.71 | 270.46 |
| 9 | 0.00 | 0.00 | 0.00 | 0.00 | 1201.05 | 255.29 |
| 10 | 0.00 | 0.00 | 0.00 | 0.00 | 835.96 | 230.87 |
| 11 | 0.00 | 0.00 | 0.00 | 0.00 | 617.22 | 23.06 |
| 12 | 0.00 | 0.00 | 0.00 | 0.00 | 462.25 | 8.72 |
| 13 | 0.00 | 0.00 | 0.00 | 0.00 | 348.69 | 1.51 |
| 14 | 0.00 | 0.00 | 0.00 | 0.00 | 293.11 | 1.69 |
| 15 | 0.00 | 0.00 | 1143.88 | 0.00 | 224.07 | 5.05 |
| 16 | 0.00 | 0.00 | 961.82 | 0.00 | 134.30 | 30.29 |
| 17 | 0.00 | 0.00 | 490.78 | 0.00 | 626.97 | 7.39 |
| 18 | 0.00 | 0.00 | 55.93 | 0.00 | 1286.34 | 1.64 |
| 19 | 0.00 | 0.00 | 0.00 | 0.00 | 1461.62 | 0.00 |
| 20 | 0.00 | 0.00 | 0.00 | 2607.44 | 1058.40 | 0.00 |
| 21 | 0.00 | 0.00 | 0.00 | 7866.68 | 1274.56 | 170.79 |
| 22 | 0.00 | 0.00 | 0.00 | 5125.31 | 1370.71 | 133.62 |
| 23 | 0.00 | 0.00 | 0.00 | 3676.55 | 1157.89 | 668.99 |
| 24 | 0.00 | 0.00 | 0.00 | 2887.73 | 1061.40 | 922.89 |
| 25 | 0.00 | 0.00 | 0.00 | 2279.86 | 922.03 | 3309.81 |
| 26 | 0.00 | 0.00 | 0.00 | 1252.43 | 836.23 | 3225.65 |
| 27 | 0.00 | 0.00 | 0.00 | 560.33 | 986.73 | 2263.48 |
| 28 | 0.00 | 0.00 | 0.00 | 277.29 | 731.92 | 1918.17 |
| 29 | 0.00 | 0.00 | 0.00 | 183.32 | | 1571.81 |
| 30 | 0.00 | 0.00 | 0.00 | 120.60 | | 1367.83 |
| 31 | 0.00 | | 0.00 | 66.63 | | 1149.55 |
| Mitjana | 0.000 | 0.000 | 85.561 | 867.876 | 1103.534 | 677.083 |
| Aportació kg | 0.000 | 0.000 | 2652.403 | 26904.165 | 30898.943 | 20989.561 |

| | **Abril** | **Maig** | **Juny** | **Juliol** | **Agost** | **Setembre** |
|---|---|---|---|---|---|---|
| **Dia** | **Qss** | **Qss** | **Qss** | **Qss** | **Qss** | **Qss** |
| 1 | 826.61 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2 | 679.69 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3 | 614.12 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 4 | 580.41 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 5 | 502.62 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 6 | 427.93 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 7 | 442.79 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 8 | 434.97 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 9 | 413.84 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 10 | 393.95 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 11 | 382.84 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 12 | 307.09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 13 | 245.67 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 14 | 201.62 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 15 | 172.48 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 16 | 164.72 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 17 | 113.96 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 18 | 65.52 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 19 | 33.56 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 20 | 12.43 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 21 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 22 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 23 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 24 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 25 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 26 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 27 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 28 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 29 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 30 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 31 | | 0.00 | | 0.00 | 0.00 | |
| Mitjana | 233.894 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Aportació kg | 7016.832 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

**Aportació total de l'any (kg): 88,461.905** **Aportació específica de l'any 2014-15 (kg/km$^2$): 18,429.564**

**Table 6.** Daily suspended sediment load. Sa Font de la Vila (2014-2015).

**Projecte Pariatge - UIB** **Any hidrològic 2013-2014**

**Estació Font de la Vila (Andratx)** **Superficie de conca: 1.19 km$^2$**

**Cabal mitjà diari (m$^3$ s$^{-1}$)**

| | Octubre | Novembre | Desembre | Gener | Febrer | Març |
|---|---|---|---|---|---|---|
| **Dia** | **Q** | **Q** | **Q** | **Q** | **Q** | **Q** |
| 1 | 0.001 | 0.000 | 0.005 | 0.009 | 0.011 | 0.009 |
| 2 | 0.001 | 0.000 | 0.032 | 0.009 | 0.010 | 0.009 |
| 3 | 0.002 | 0.000 | 0.029 | 0.008 | 0.010 | 0.009 |
| 4 | 0.002 | 0.000 | 0.025 | 0.008 | 0.013 | 0.009 |
| 5 | 0.002 | 0.000 | 0.027 | 0.008 | 0.017 | 0.008 |
| 6 | 0.002 | 0.000 | 0.024 | 0.008 | 0.018 | 0.008 |
| 7 | 0.002 | 0.000 | 0.020 | 0.008 | 0.017 | 0.008 |
| 8 | 0.002 | 0.000 | 0.016 | 0.007 | 0.015 | 0.008 |
| 9 | 0.002 | 0.000 | 0.014 | 0.007 | 0.013 | 0.008 |
| 10 | 0.002 | 0.000 | 0.013 | 0.007 | 0.012 | 0.007 |
| 11 | 0.002 | 0.000 | 0.012 | 0.005 | 0.012 | 0.007 |
| 12 | 0.002 | 0.000 | 0.011 | 0.002 | 0.011 | 0.007 |
| 13 | 0.002 | 0.000 | 0.010 | 0.002 | 0.011 | 0.007 |
| 14 | 0.001 | 0.000 | 0.010 | 0.002 | 0.010 | 0.007 |
| 15 | 0.001 | 0.000 | 0.023 | 0.002 | 0.010 | 0.007 |
| 16 | 0.002 | 0.000 | 0.024 | 0.002 | 0.009 | 0.007 |
| 17 | 0.002 | 0.000 | 0.021 | 0.002 | 0.011 | 0.007 |
| 18 | 0.002 | 0.000 | 0.017 | 0.002 | 0.013 | 0.007 |
| 19 | 0.002 | 0.000 | 0.015 | 0.002 | 0.013 | 0.007 |
| 20 | 0.002 | 0.000 | 0.013 | 0.029 | 0.012 | 0.007 |
| 21 | 0.002 | 0.000 | 0.013 | 0.036 | 0.012 | 0.007 |
| 22 | 0.002 | 0.000 | 0.012 | 0.024 | 0.011 | 0.008 |
| 23 | 0.002 | 0.000 | 0.011 | 0.020 | 0.011 | 0.011 |
| 24 | 0.001 | 0.000 | 0.011 | 0.019 | 0.011 | 0.011 |
| 25 | 0.000 | 0.000 | 0.010 | 0.018 | 0.010 | 0.037 |
| 26 | 0.000 | 0.000 | 0.010 | 0.015 | 0.010 | 0.033 |
| 27 | 0.000 | 0.000 | 0.010 | 0.013 | 0.010 | 0.023 |
| 28 | 0.000 | 0.000 | 0.010 | 0.013 | 0.009 | 0.019 |
| 29 | 0.000 | 0.000 | 0.010 | 0.012 | | 0.017 |
| 30 | 0.000 | 0.003 | 0.009 | 0.012 | | 0.015 |
| 31 | 0.000 | | 0.009 | 0.011 | | 0.013 |
| Mitjana | 0.002 | 0.000 | 0.015 | 0.010 | 0.012 | 0.011 |
| Aportació hm$^3$ | 0.004 | 0.000 | 0.041 | 0.028 | 0.029 | 0.030 |

| | Abril | Maig | Juny | Juliol | Agost | Setembre |
|---|---|---|---|---|---|---|
| **Dia** | **Q** | **Q** | **Q** | **Q** | **Q** | **Q** |
| 1 | 0.011 | 0.005 | 0.000 | 0.000 | 0.000 | 0.000 |
| 2 | 0.010 | 0.005 | 0.000 | 0.000 | 0.000 | 0.000 |
| 3 | 0.010 | 0.005 | 0.000 | 0.000 | 0.000 | 0.000 |
| 4 | 0.009 | 0.005 | 0.000 | 0.000 | 0.000 | 0.000 |
| 5 | 0.009 | 0.005 | 0.000 | 0.000 | 0.000 | 0.000 |
| 6 | 0.009 | 0.005 | 0.000 | 0.000 | 0.000 | 0.000 |
| 7 | 0.008 | 0.005 | 0.000 | 0.000 | 0.000 | 0.000 |
| 8 | 0.008 | 0.005 | 0.000 | 0.000 | 0.000 | 0.000 |
| 9 | 0.008 | 0.004 | 0.000 | 0.000 | 0.000 | 0.000 |
| 10 | 0.007 | 0.004 | 0.000 | 0.000 | 0.000 | 0.000 |
| 11 | 0.007 | 0.004 | 0.000 | 0.000 | 0.000 | 0.000 |
| 12 | 0.007 | 0.004 | 0.000 | 0.000 | 0.000 | 0.000 |
| 13 | 0.007 | 0.003 | 0.000 | 0.000 | 0.000 | 0.000 |
| 14 | 0.007 | 0.002 | 0.000 | 0.000 | 0.000 | 0.000 |
| 15 | 0.007 | 0.002 | 0.000 | 0.000 | 0.000 | 0.000 |
| 16 | 0.006 | 0.002 | 0.000 | 0.000 | 0.000 | 0.000 |
| 17 | 0.007 | 0.002 | 0.000 | 0.000 | 0.000 | 0.000 |
| 18 | 0.007 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 19 | 0.007 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 20 | 0.007 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 21 | 0.006 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 22 | 0.006 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 23 | 0.006 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 24 | 0.006 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 25 | 0.006 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 26 | 0.006 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 27 | 0.006 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 28 | 0.006 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 29 | 0.006 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 30 | 0.005 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 31 | | 0.000 | | 0.000 | 0.000 | |
| Mitjana | 0.007 | 0.002 | 0.000 | 0.000 | 0.000 | 0.000 |
| Aportació hm$^3$ | 0.019 | 0.006 | 0.000 | 0.000 | 0.000 | 0.000 |

**Aportació total de l'any (hm$^3$): 0.157** **Aportació específica de l'any 2013-14 (m$^3$/s/km$^2$): 4.167**

**Cabal mitjà anual (m$^3$ s$^{-1}$) 0.005**

**Table 7.** Daily discharge average. Sa Murtera (2014-2015).

**Projecte Pariatge - UIB** **Any hidrològic 2014-2015**

**Estació sa Font de la Vila (Andratx)** **Superficie de conca: 1.19 km$^2$**

**Exportació de sediment diària (kg)**

| | **Octubre** | **Novembre** | **Desembre** | **Gener** | **Febrer** | **Març** |
|---|---|---|---|---|---|---|
| **Dia** | **Qss** | **Qss** | **Qss** | **Qss** | **Qss** | **Qss** |
| 1 | 0.18 | 0.00 | 135.04 | 5.46 | 2.66 | 0.00 |
| 2 | 0.38 | 0.00 | 42.68 | 5.37 | 2.41 | 0.00 |
| 3 | 0.43 | 0.00 | 38.18 | 5.41 | 2.46 | 0.00 |
| 4 | 0.72 | 0.00 | 41.14 | 5.46 | 296.79 | 0.00 |
| 5 | 0.61 | 0.00 | 78.81 | 5.08 | 127.27 | 0.00 |
| 6 | 0.43 | 0.00 | 68.72 | 5.43 | 9.47 | 0.00 |
| 7 | 0.56 | 0.00 | 57.20 | 4.95 | 7.84 | 0.00 |
| 8 | 0.79 | 0.00 | 45.13 | 4.94 | 6.46 | 0.00 |
| 9 | 0.90 | 0.00 | 29.95 | 4.50 | 4.24 | 0.00 |
| 10 | 0.95 | 0.00 | 21.87 | 4.58 | 3.33 | 0.00 |
| 11 | 1.15 | 0.00 | 22.69 | 2.51 | 2.79 | 0.00 |
| 12 | 0.99 | 0.00 | 22.42 | 0.00 | 2.69 | 0.00 |
| 13 | 1.12 | 0.00 | 21.59 | 0.00 | 2.46 | 0.00 |
| 14 | 0.23 | 0.00 | 21.20 | 0.00 | 2.58 | 0.00 |
| 15 | 0.53 | 0.00 | 1382.64 | 0.00 | 2.37 | 0.00 |
| 16 | 0.59 | 0.00 | 57.73 | 0.00 | 2.03 | 0.00 |
| 17 | 0.69 | 0.00 | 42.51 | 0.00 | 244.81 | 0.00 |
| 18 | 0.78 | 0.00 | 24.45 | 0.00 | 7.74 | 0.00 |
| 19 | 0.84 | 0.00 | 16.65 | 0.00 | 2.93 | 0.00 |
| 20 | 0.88 | 0.00 | 15.41 | 636.00 | 2.34 | 0.00 |
| 21 | 0.91 | 0.00 | 13.73 | 120.36 | 2.69 | 0.04 |
| 22 | 0.89 | 0.00 | 13.50 | 29.57 | 2.95 | 0.03 |
| 23 | 2.00 | 0.00 | 12.93 | 20.03 | 2.42 | 0.00 |
| 24 | 0.21 | 0.00 | 12.51 | 11.95 | 2.05 | 0.00 |
| 25 | 0.00 | 0.00 | 11.43 | 6.62 | 1.91 | 0.08 |
| 26 | 0.00 | 0.00 | 11.57 | 4.54 | 1.74 | 0.02 |
| 27 | 0.00 | 0.00 | 11.22 | 4.69 | 2.78 | 0.01 |
| 28 | 0.00 | 0.00 | 10.23 | 4.28 | 2.82 | 0.00 |
| 29 | 0.00 | 0.00 | 11.22 | 4.00 | | 0.00 |
| 30 | 0.00 | 39.01 | 7.48 | 3.56 | | 0.00 |
| 31 | 0.00 | | 6.68 | 3.74 | | 0.00 |
| Mitjana | 0.573 | 0.000 | 74.467 | 29.131 | 26.965 | 0.007 |
| Aportació kg | 17.773 | 39.007 | 2308.484 | 903.050 | 755.027 | 0.222 |

| | **Abril** | **Maig** | **Juny** | **Juliol** | **Agost** | **Setembre** |
|---|---|---|---|---|---|---|
| **Dia** | **Qss** | **Qss** | **Qss** | **Qss** | **Qss** | **Qss** |
| 1 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 4 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 5 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 6 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 7 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 8 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 9 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 11 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 12 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 13 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 14 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 15 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 16 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 17 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 18 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 19 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 20 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 21 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 22 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 23 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 24 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 25 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 26 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 27 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 28 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 29 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 30 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 31 | | 0.00 | | 0.00 | 0.00 | |
| Mitjana | 0.001 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Aportació kg | 0.022 | 0.005 | 0.000 | 0.000 | 0.000 | 0.000 |

**Aportació total de l'any (kg): 4,023.589** **Aportació específica de l'any 2014-15 (kg/km$^2$): 3,381.167**

**Table 8.** Daly suspended sediment load. Sa Murtera (2014-2015).

**Fig. 2.** Gauging section of the Sa Font de la Vila station.

**Fig. 3**. Gauging section of the Sa Murtera station.