European Maritime Safety Agency

Meeting: 15th Mediterranean AIS Expert Working Group

Place and date: Venice, 27 November 2018

Agenda item: MAREΣ network monitoring report

Document number: MAREΣ 15/4/1

Submitted by Italy

Summary	The document provides participating countries with updates on the MAREΣ monitoring activities carried out in the period from October 2017 to September 2018.
Action to be taken	As per paragraph 4.
Related documents	14th Mediterranean AIS Expert Working Group Workshop report.

1. Introduction

During the reporting period MAREΣ has been providing SafeSeaNet with AIS data gathered from the following participating Member States:

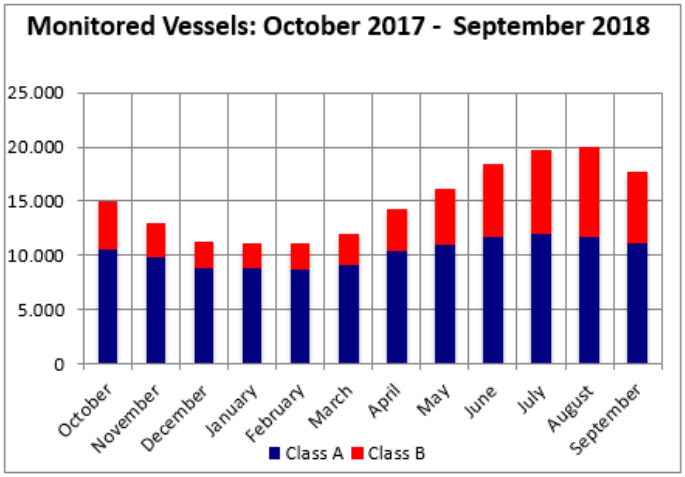
- Bulgaria
- Croatia
- Cyprus
- France
- Gibraltar
- Greece
- Italy
- Malta
- Portugal (including Azores and Madeira)
- Romania
- Slovenia
- Spain

MAREΣ is also collecting AIS information from Montenegro in the Adriatic-Ionian Mediterranean sub-region as well as from Jordan and Morocco in the framework of the SAFEMED project.

This report summarises the MAREΣ activities and provides analyses of the services provided by the regional AIS system.

2. Level of the activity

Figure 1 together with table 1 show the average number of vessels monitored in the reference period (October 2017 - September 2018) on a daily basis. The monthly amount of data is differentiated according to the Class A (blue bar) or the Class B (red bar) ship transponder fitted on board.

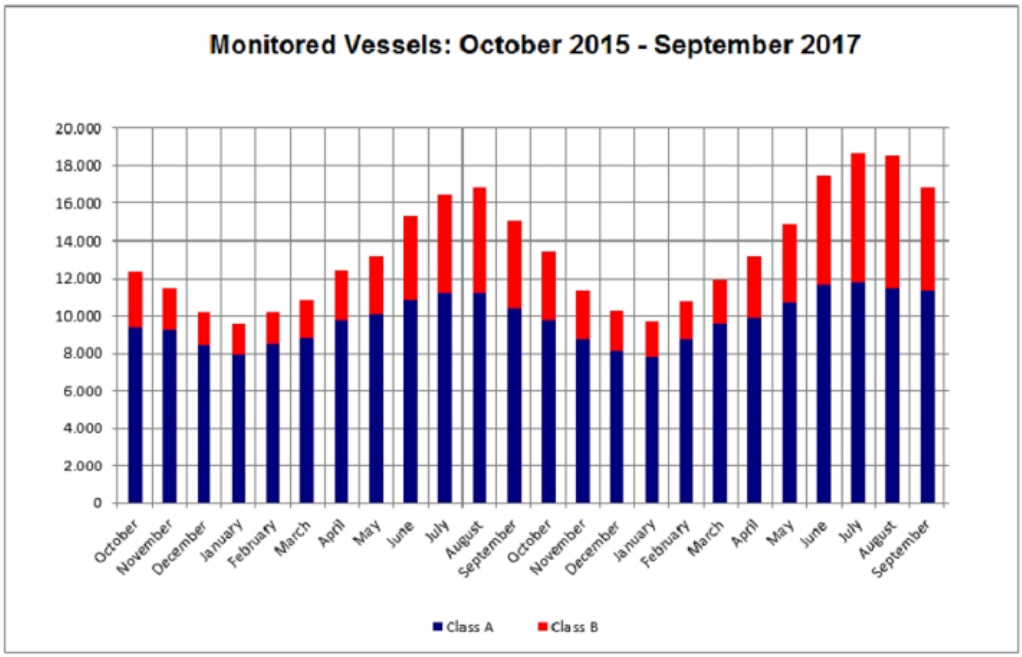


SEPTEMBER 2018: 17,641
AUGUST 2018: 20,070
JULY 2018: 19,767
JUNE 2018: 18,423
MAY 2018: 16,128
APRIL 2018: 14,285
MARCH 2018: 11,936
FEBRUARY 2018: 11,084
JANUARY 2018: 11,093
DECEMBER 2017: 11,192
NOVEMBER 2017: 12,989
OCTOBER 2017: 14,943

Figure 1 – Table 1: The average number of vessels monitored on a daily basis

The highest number of vessels was detected during the summer period. The increased traffic during the summer period is attributed to the duct effect which boost the AIS radio coverage as well as to the high number of pleasure crafts.

Comparing with the traffic during the two previous reporting periods (years of 2016 and 2017), the traffic is much higher during the current reporting period (see Figure 2 and Table 2):



SEPTEMBER 2017: 16,847
AUGUST 2017: 18,564
JULY 2017: 18,727
JUNE 2017: 17,500
MAY 2017: 14,906
APRIL 2017: 13,164
MARCH 2017: 11,931
FEBRUARY 2017: 10,804
JANUARY 2017: 9,693
DECEMBER 2016: 10,207
NOVEMBER 2016: 11,308
OCTOBER 2016: 13,443

SEPTEMBER 2016: 15,014
AUGUST 2016: 16,905
JULY 2016: 16,435
JUNE 2016: 15,333
MAY 2016: 13,184
APRIL 2016: 12,412
MARCH 2016: 10,862
FEBRUARY 2016: 10,167
JANUARY 2016: 9,583
DECEMBER 2015: 10,167
NOVEMBER 2015: 11,475
OCTOBER 2015: 12,332

Figure 2 – Table 2: The average number of vessels monitored during the previous 2 years

Annex 1 indicates the diagrams with the amount of the AIS information provided to MAREΣ by the national networks of the participating countries and Annex 2 the amount of the AIS information delivered by MAREΣ to the participating countries and to SSN in the reference period.

Each diagram also includes information on the down-sampling configuration and the area of the information exchange (if the latter is different from the sharing environment involving Mediterranean EU Countries).

The current MAREΣ release, running since October 2014, can provide the total amount of the information collected and provided by each participating Country, including all static, dynamic and voyage-related data before the cleaning of the duplicates carried out by the regional system. The amount of that information, calculated from October 2017 to September 2018, represents the overall MAREΣ workload in that period.

Tables 3 and 4 present the numbers of AIS information delivered by the participating Countries and the AIS information per month handled by MAREΣ (Oct 2017 – Sept 2018) respectively:

Overall AIS information delivered by the participating Countries (Oct 2017 – Sept 2018)						
BGR	**CYP**	**ESP**	**FRA**	**GRC**	**HRV**	**ITA**
707.664.329	50.793.251	1.386.995.408	80.661.324	127.889.172	1.250.980.376	4.432.276.603
MLT	**MNE**	**PRT ISL**	**PRT**	**ROU**	**SVN**	**GIB**
36.155.587	514.947.083	25.401.113	312.762.736	973.569.097	230.458.353	248.769.916
MOR	**JDN**					
301.218.805	36.165.382					

Table 3: Overall AIS information delivered to MAREΣ

Overall AIS information per month handled by MAREΣ (Oct 2017 – Sept 2018)					
Oct 2017	**Nov 2017**	**Dec 2017**	**Jan 2018**	**Feb 2018**	**Mar 2018**
5.014.766.972	4.300.797.598	4.005.954.170	4.117.600.635	3.782.977.334	4.429.878.825
Apr 2018	**May 2018**	**Jun 2018**	**Jul 2018**	**Aug 2018**	**Sep 2018**
5.387.994.999	5.822.023.627	6.129.084.397	6.933.519.506	6.427.845.879	4.760.222.581
Total: 61.112.666.523					

Table 4: MAREΣ workload

3. MAREΣ network status

3.1. Network malfunctions/incidents

During the observation period, 60 network malfunctions (incidents), involving national proxies and requiring a human intervention to restore normal operations, were reported by MAREΣ management.

The reported incidents were mainly due to breakdowns in communications between the MAREΣ Core application and the national proxies. All these incidents influenced the information flow with the concerned participating countries, and had an impact on the general functioning of MAREΣ.

The reported cases are shown in Table 5:

Submitted reports		
Month/Year	No. of reports	Involved networks
October 2017	8	France (2), Cyprus (1), Greece (1), Malta (1), Romania (1), Croatia (2)
November 2017	4	Gibraltar (1), France (1), Italy (1), Croatia (1)
December 2017	10	Malta (3), Romania (1), Croatia (2), Greece(3), Gibraltar(1)
January 2018	2	Spain (1), SSN SI (1)
February 2018	6	Croatia (1), SSN SI (1), Bulgaria (2), Malta (1), Gibraltar (1)

Submitted reports		
Month/Year	No. of reports	Involved networks
March 2018	5	Croatia (2), France (1), Italy (1), Malta (1)
April 2018	0	//
May 2018	2	Gibraltar (1), France (1)
June 2018	3	France (2), Croatia (1)
July 2018	10	Slovenia (1), Romania (1), Malta (5), France (3)
August 2018	2	Portugal (1), Portugal Island (1)
September 2018	8	Gibraltar (1), Portugal (1), Portugal Islands (1), Greece (1), Italy (1), Bulgaria (1), France (1), Slovenia (1)
Total:	**60**	

Table 5: Reported malfunctioning (incidents)

Those incidents, affecting the national proxies of the participating Countries, were detected by the "core user monitoring" page provided by MAREΣ application (see Figure 3):

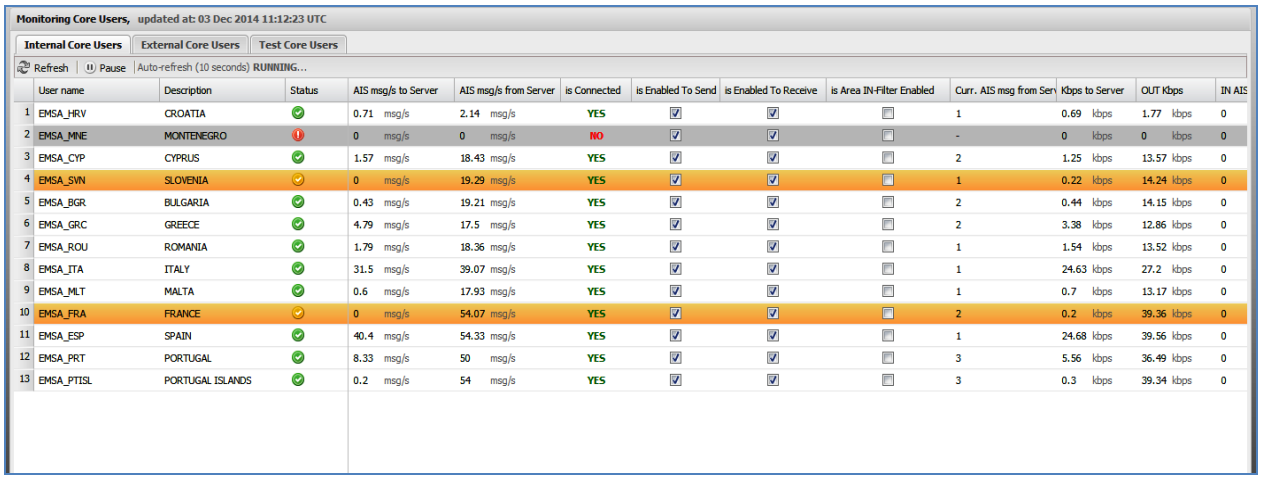


Figure 3: MAREΣ "core user monitoring" page

The breakdown in the communication between MAREΣ and the national proxy involved are highlighted in red while the breakdown between the AIS national network and the related national proxy in yellow. Whenever there were communication breakdowns, the correspondent national point of contact was contacted by the ICG and the re-establishment of the connection was requested.

All the incident reports were submitted to the EMSA MSS including the related root cause (whenever they were provided by the national POC). In comparison with the last activity reports (document MAREΣ 14/3/1), the trend is rather positive as indicated below:

- **EWG 11**: 86 incidents (in 11 months period);
- **EWG 12**: 132 incidents (this peak was due to the transition to MAREΣ 2.0 when all the national proxies had to change their connections);
- **EWG 13**: 100 incidents (in 12 months period);
- **EWG 14**: 178 incidents (in 24 months period), of which 97 incidents registered in the reference period Oct 2015 – Sept 2016 and 81 in the period Oct 2016 – Sept 2017;
- **EWG 15**: 60 incidents (in 12 months period).

The average number of incidents per month, observed during the last 6 years is decreasing.

3.2. Failure restoring and incident processing time

The availability of the links was monitored by MAREΣ, including the connection status of the national proxies and the exchanging rate of the AIS information between them and MAREΣ as well as between MAREΣ and

the SSN central application.

The total elapsed time needed to restore all the failures registered during the reference period was **764.9 hours**, (varying from 3.6 to 241.2 hours per month, as reported in the Table 6):

Month	Oct. 2017	Nov. 2017	Dec. 2017	Jan. 2018	Feb. 2018	Mar. 2018	Apr. 2018	May 2018	Jun. 2018	Jul. 2018	Aug. 2018	Sept. 2018	Total
No. Incidents	8	4	10	2	6	5	0	2	3	10	2	8	60
Minutes	5,383	4,005	2,911	221	2,581	5,077	0	908	1,218	14,474	7,546	1,590	45,914
Hours (Est.)	89.7	66.7	48.5	3.6	43	84.6	0	15.1	20.3	241.2	125.7	26.5	764.9

Table 6: Total elapsed time needed to restore the failures

The average elapsed time needed to restore a failure was about **12 hours**. This result is coherent with the numbers presented at the 14th EWG (related to the period from October 2015 to September 2017) when the total elapsed time to restore the failures was 787.33 hours and the average elapsed time to restore the failures was 10 hours.

For only 2 of the reported failures (related to the incident reports no 20180710-1 and 20180711-1 affecting, respectively, the French and the Maltese national proxies), the registered incident processing time, as defined by the SLA established between ICG and EMSA, exceeded the maximum time for the restoring of the AIS data transfer from the national proxies to MAREΣ.

3.3. MAREΣ/SSN-SI incidents

Table 7 shows the details of the incidents which affected MAREΣ SSN-SI during the reference period:

MAREΣ SSN-SI			
Incidents Summary			
ICG incident nr.	Date and time of acknowledgment	Processing time	Symptoms of the incidents
20180123-1	**January 23th 2018 1454UTC**	**41m**	A Tomcat crash affected the SSN SI installed on the Italian side
20180205-1	**February 2nd 2018 0057UTC**	**8h18m**	Failure of the Tomcat application of the SSN SI as well as of the related HW assets.

Table 7: Malfunctioning (incidents) affecting MAREΣ/SSN-SI

3.4 Link availability

Annex 3 presents diagrams with the monthly link availability reached for each of the participating Country national proxies during the reference period. The overall availability is affected by the incidents related to the national proxy, the breakdown in communication and the MAREΣ inactivity periods.

4. MAREΣ upgrading

Since November 2017, MAREΣ GIS was enabled to consume Web Map Services provided by licensed software installed on 2 cartographic servers hosted in the ICG HQs' server farm. Specifically, through an IP load balancing server those cartographic servers make available a set of CM-ENCs, including the upgrade service for the zones 1-9, to the MAREΣ GIS users.

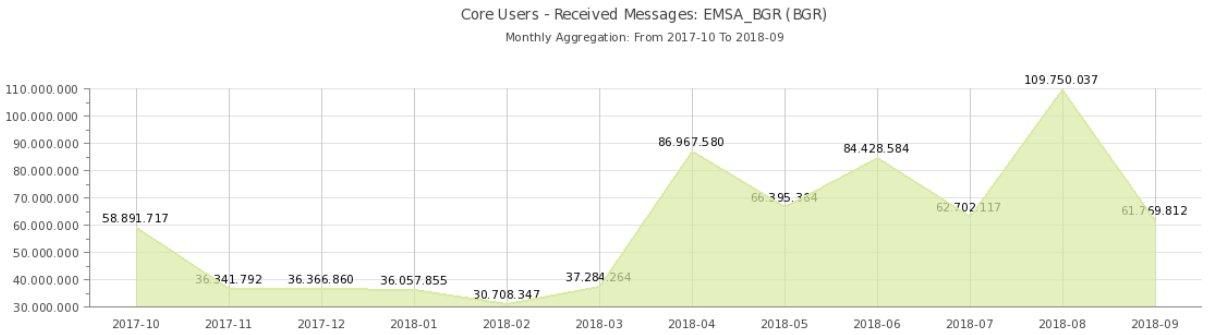
The users can switch on/switch off the WMSs by a checkbox hosted in the MAREΣ GIS Layers list. The WMSs can provide *ECDIS like* services for display of the ENCs.

5. Action required

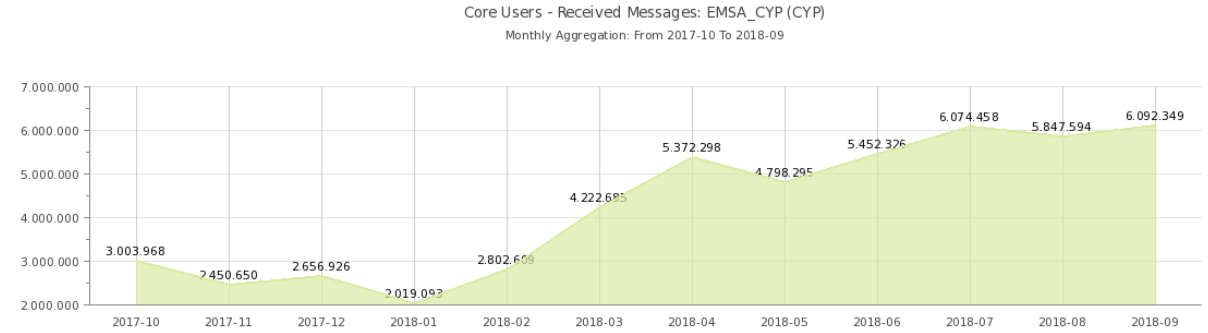
Participating Countries are invited to note the submitted information.

Annex 1

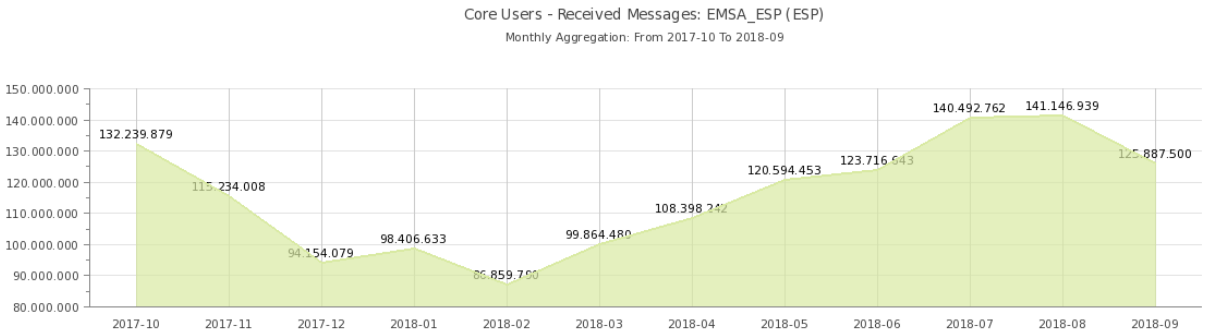
AIS information provided to MAREΣ by the participating Countries



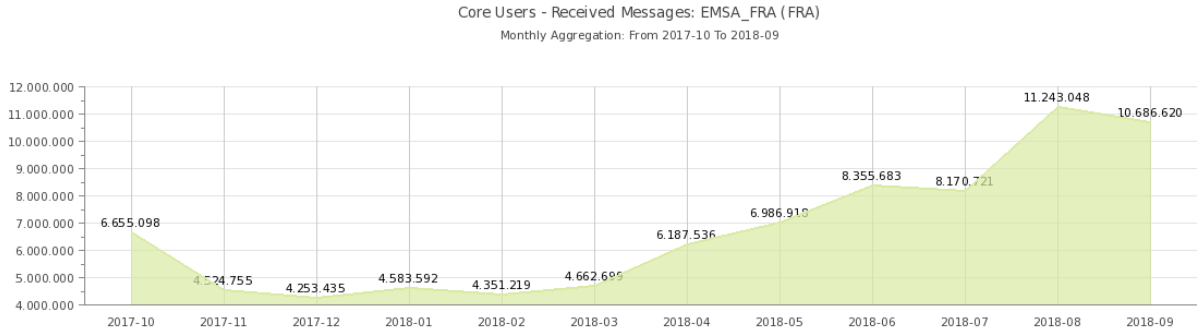
AIS information delivered by Bulgaria (full data rate since December 2016)



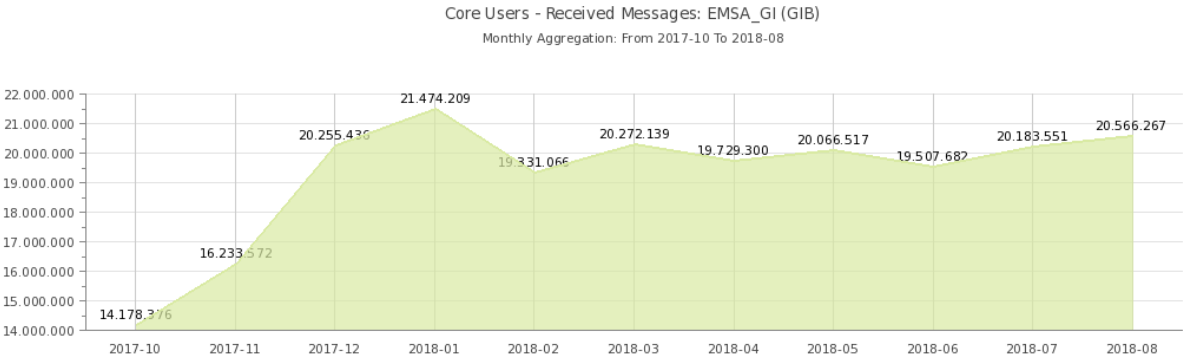
AIS information delivered by Cyprus (down-sampling 6 min)

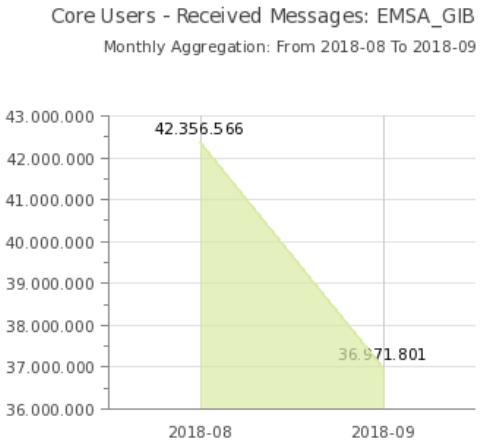


AIS information delivered by Spain (down- sampling 1 min)



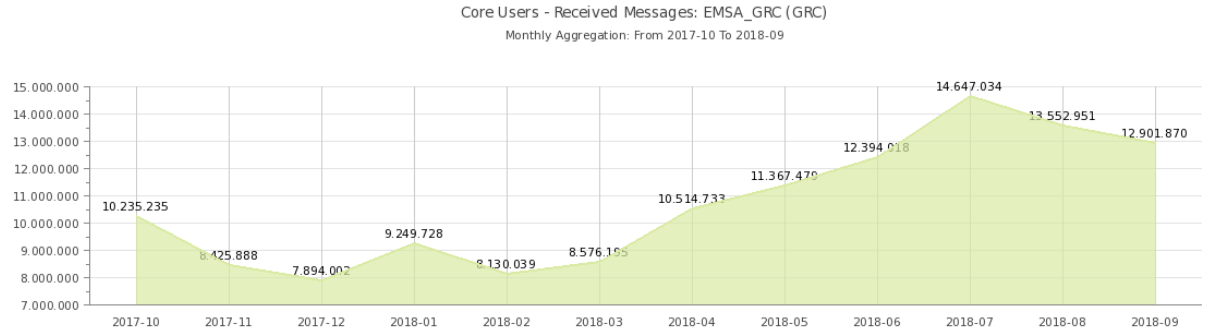
AIS information delivered by France (down-sampling 1 min)



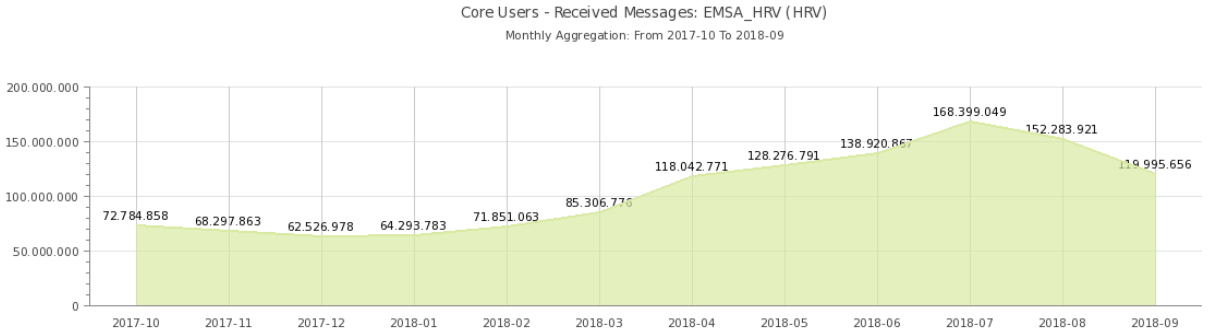


AIS information delivered by Gibraltar[1] (full data rate)

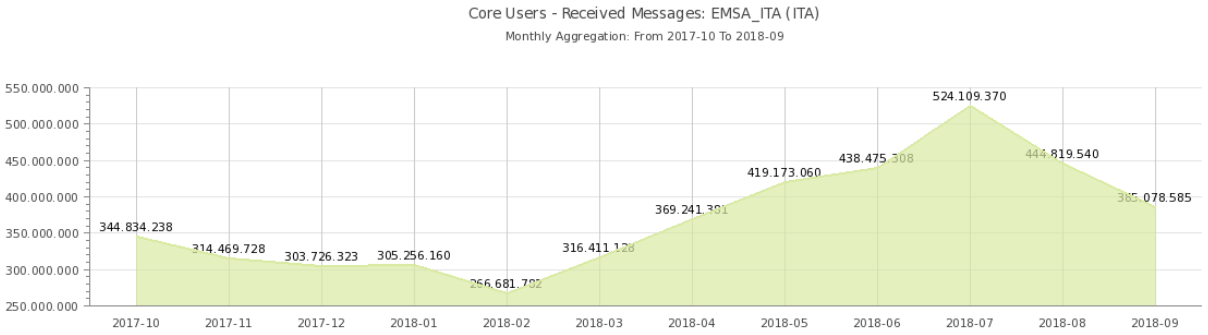
[1] Since September 1st, 2018 Gibraltar implemented a new NAISP.



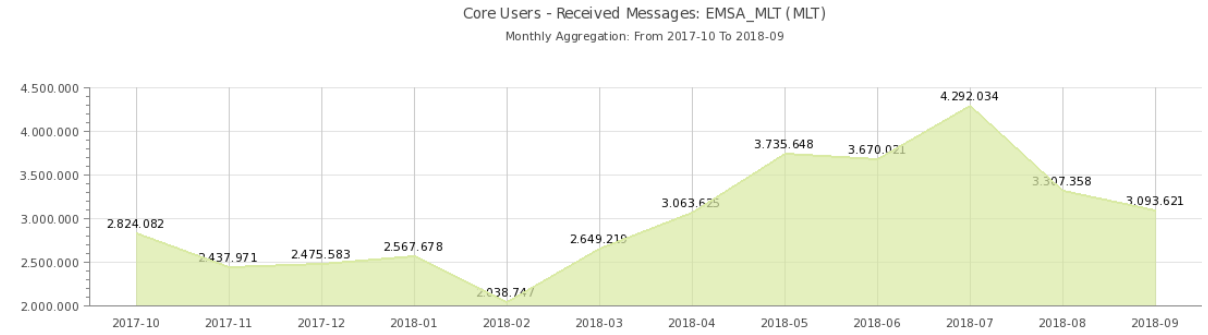
AIS information delivered by Greece (down-sampling 6 min)



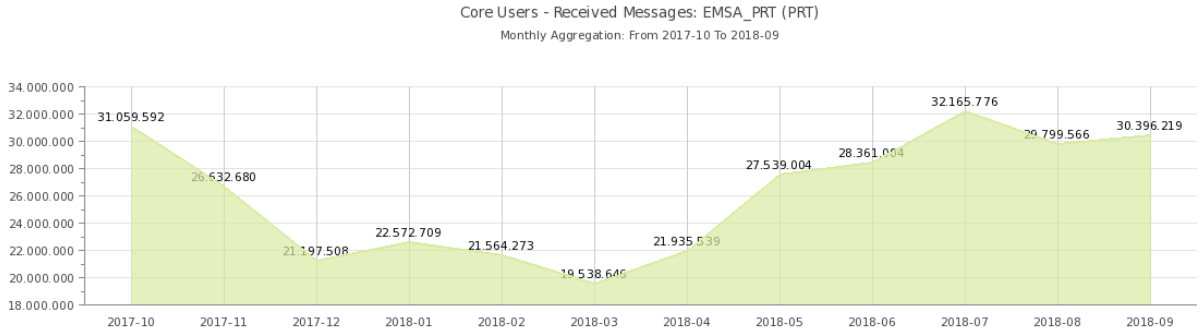
AIS information delivered by Croatia (full data rate since December 2015)



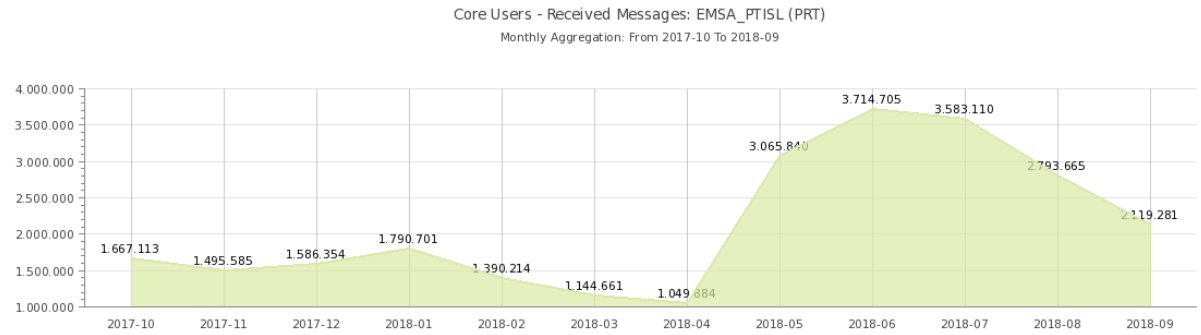
AIS information delivered by Italy (full data rate since February 2016)



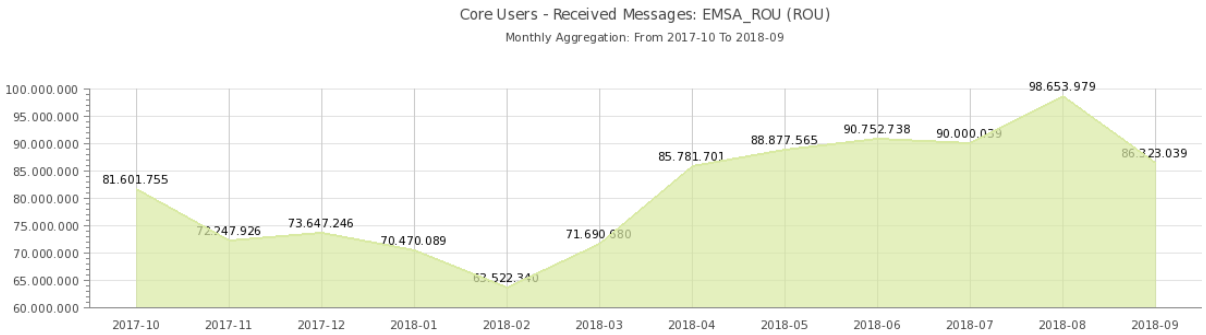
AIS information delivered by Malta (down-sampling 6 min)



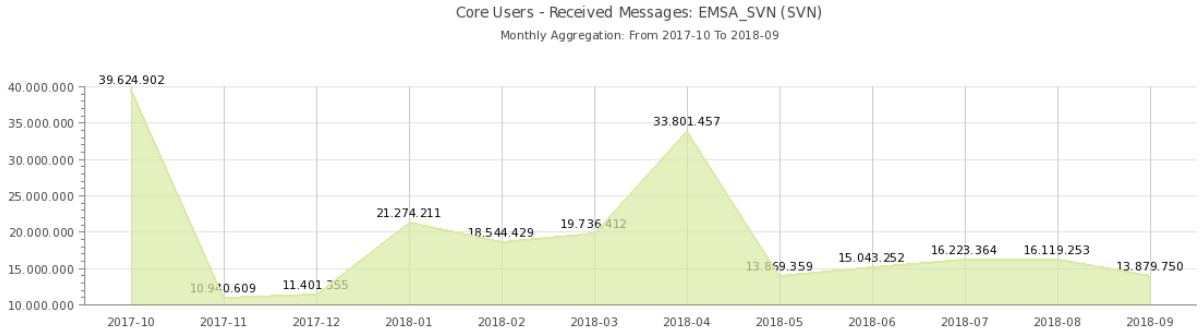
AIS information delivered by Portugal mainland (down-sampling 1 min)



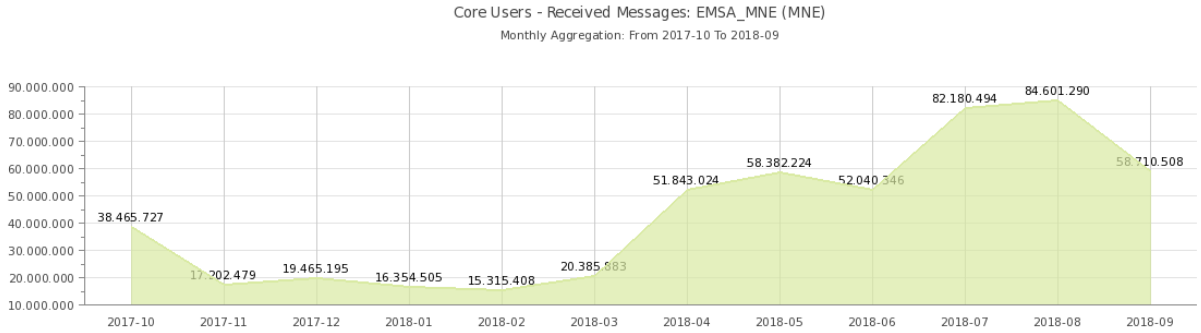
AIS information delivered by Portugal Azores and Madeira (down-sampling 1 min)



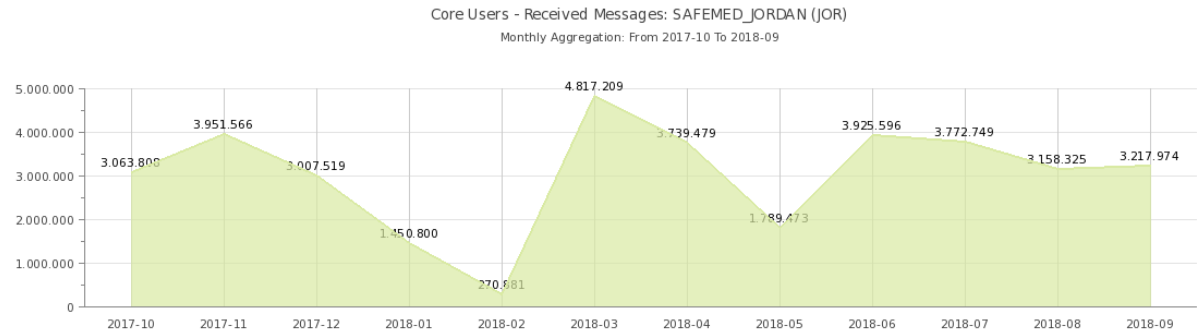
AIS information delivered by Romania (full data rate since December 2016)



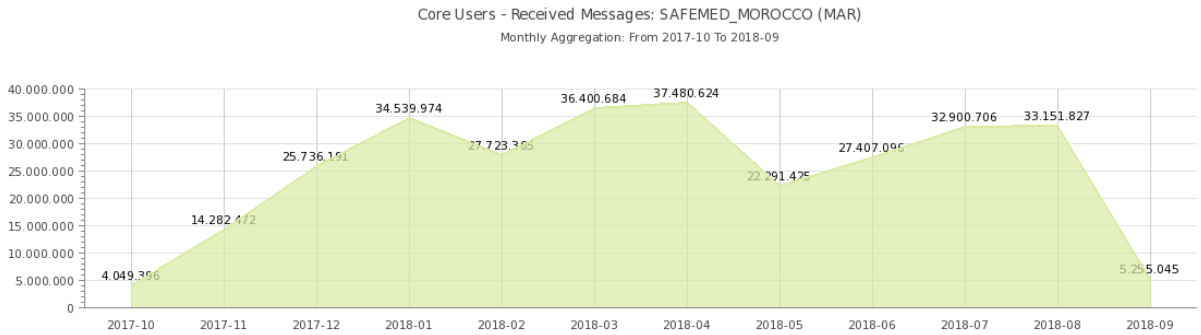
AIS information delivered by Slovenia (full data rate since December 2015)



AIS information delivered by Montenegro
(sharing within the Adriatic Region, full data rate since December 2015)



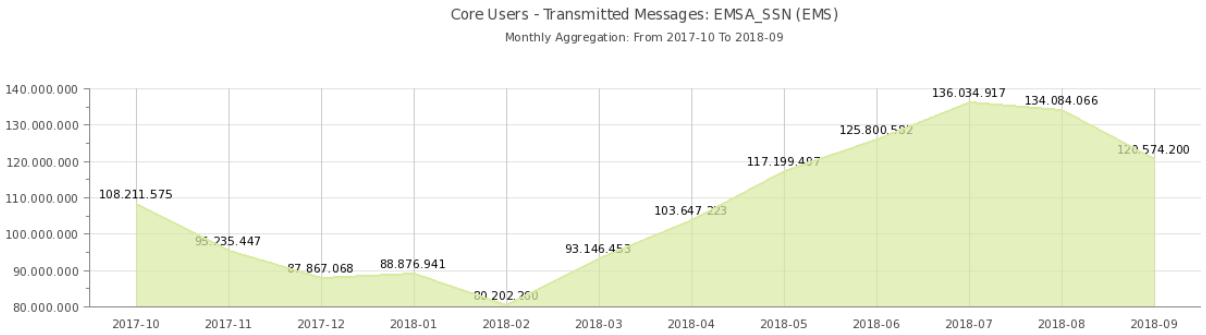
AIS information delivered by Jordan (sharing among SafeMed countries, full data rate)



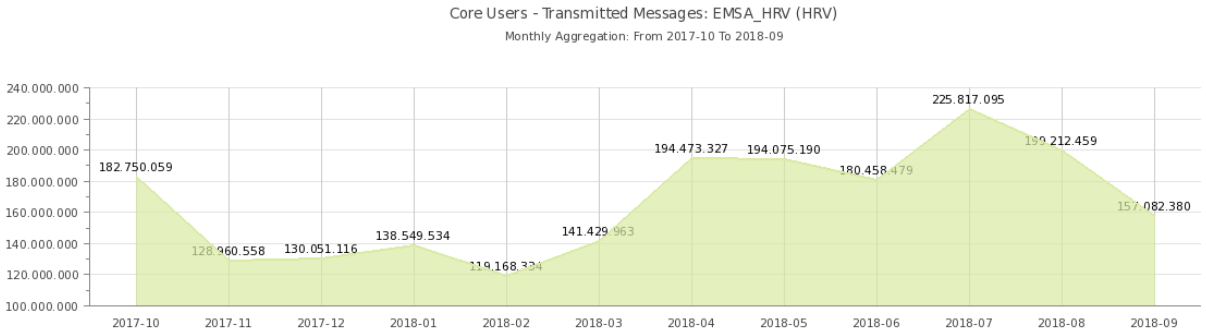
AIS information delivered by Morocco (sharing among SafeMed countries, full data rate)

Annex 2

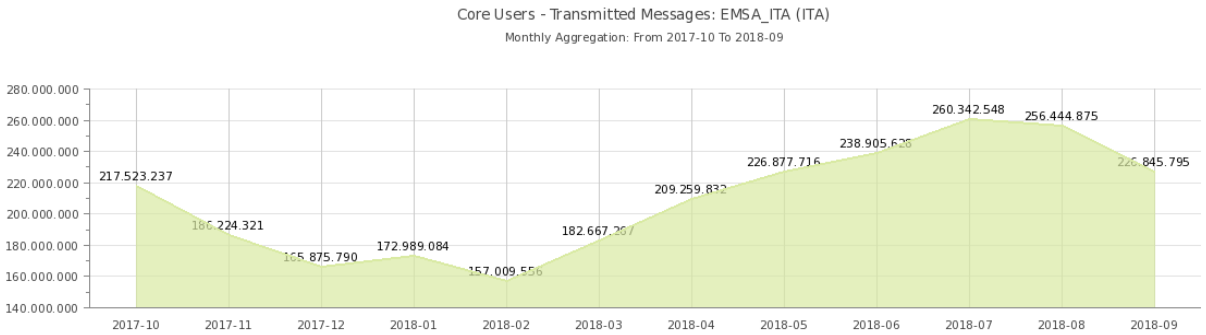
AIS information delivered by MAREΣ



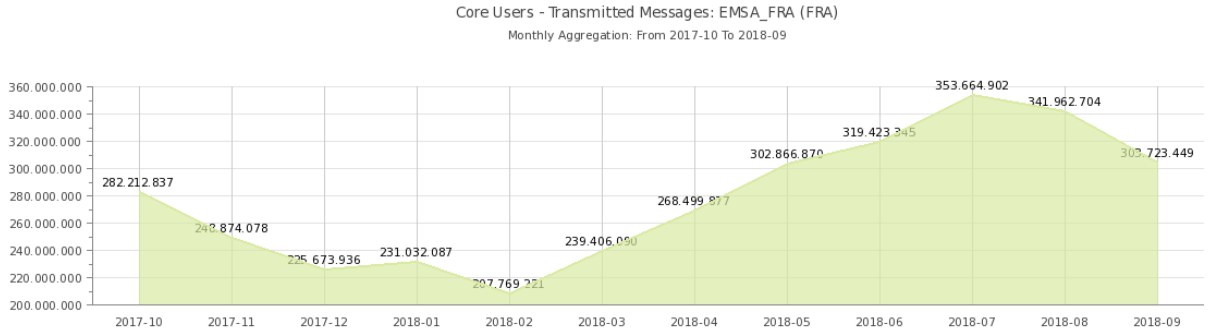
AIS information delivered to SafeSeaNet (down-sampling 6 min)



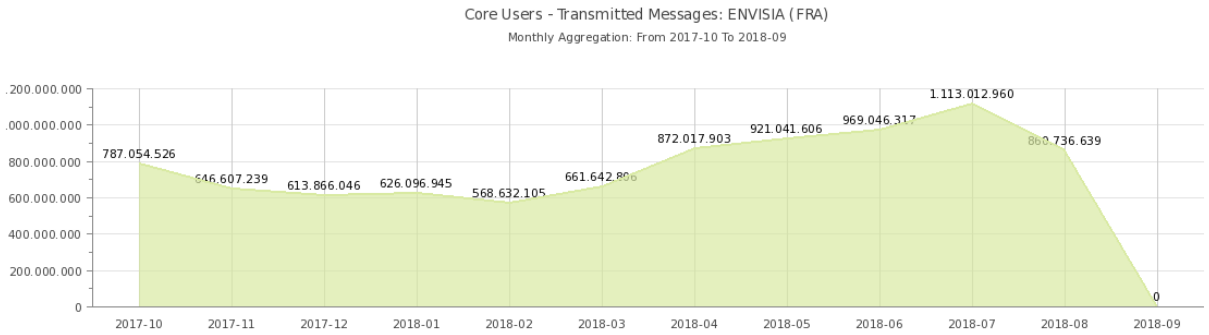
AIS information delivered to Croatia (Adriatic Region - full data rate since December 2015)



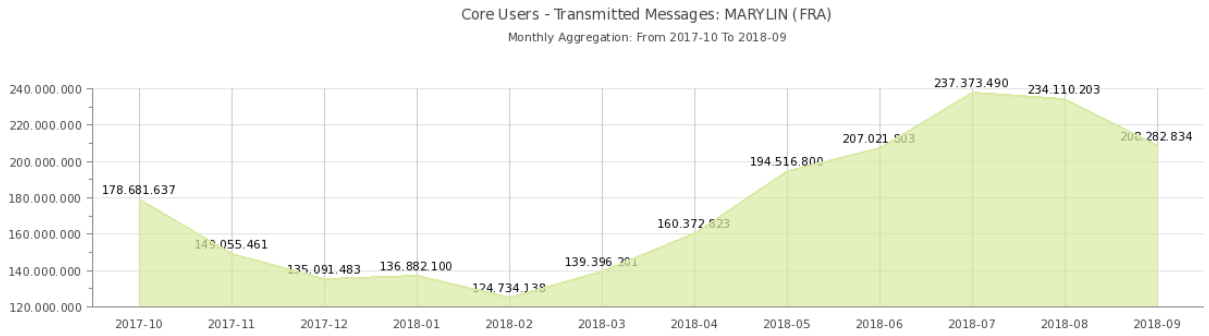
AIS information delivered to Italy (down-sampling 1 min)



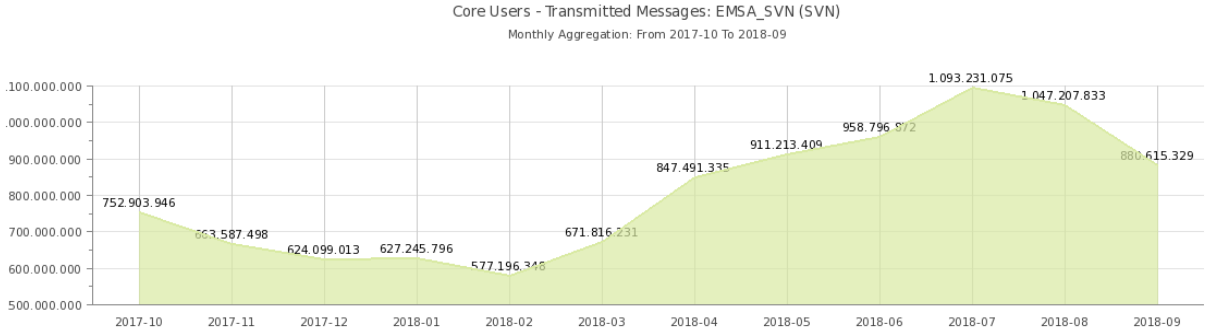
AIS information delivered to France (down-sampling 1 min)



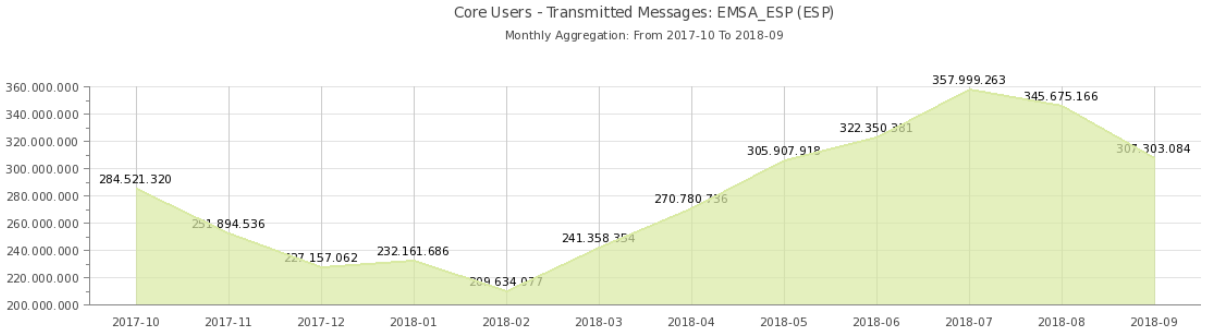
AIS information delivered to France (for needs of the Envisia project – full data rate)



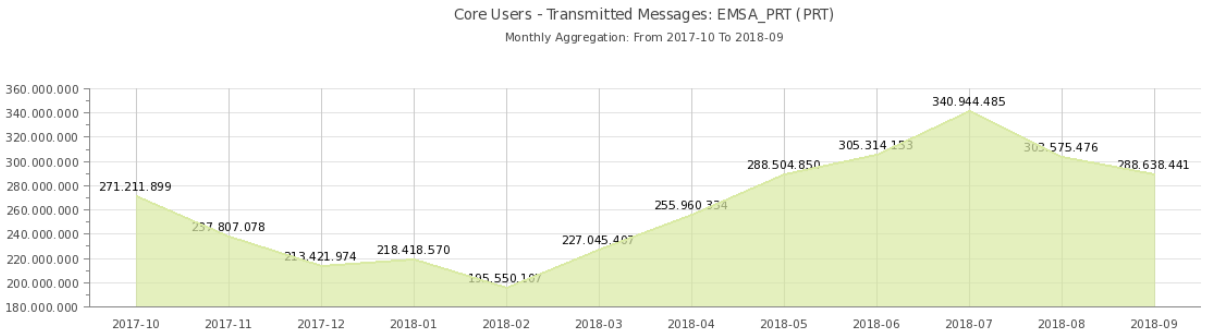
AIS information delivered to France (for needs of the Marylin project – full data rate)



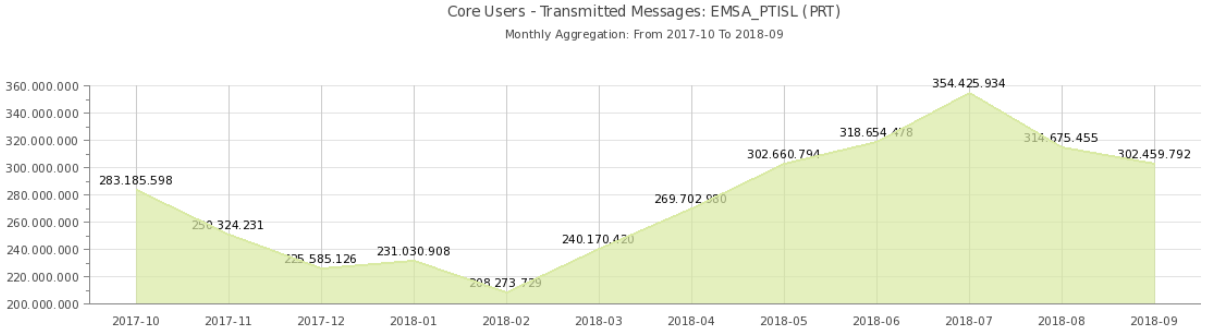
AIS information delivered to Slovenia (Adriatic Region - full data rate)



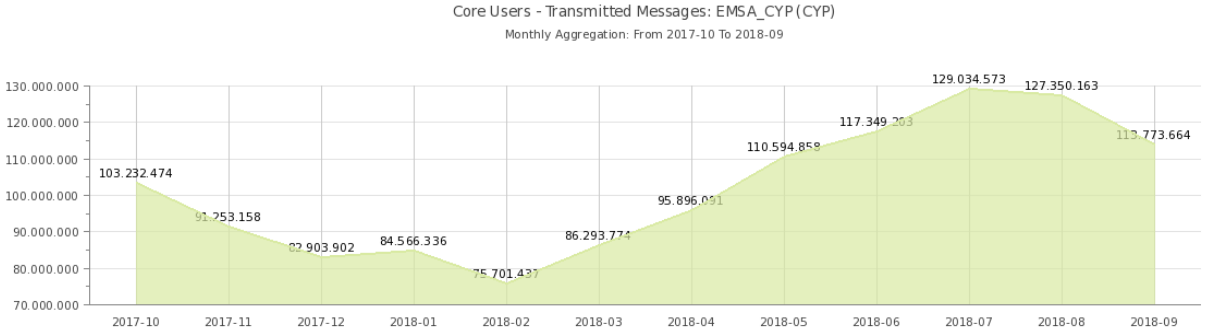
AIS information delivered to Spain (down-sampling 1 min)



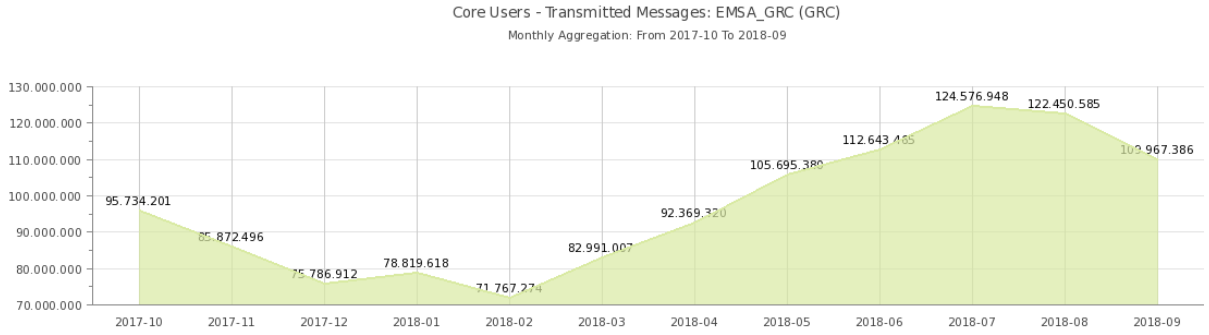
AIS information delivered to Portugal mainland (down-sampling 1 min)



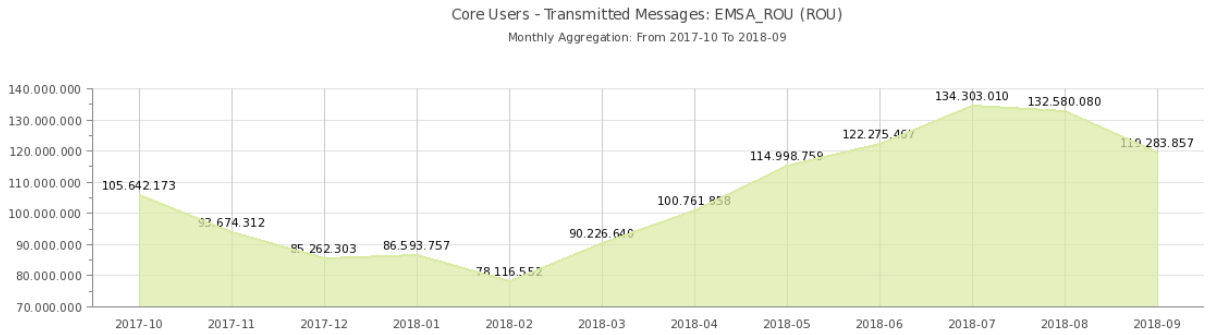
AIS information delivered to Portugal Islands (down-sampling 1 min)



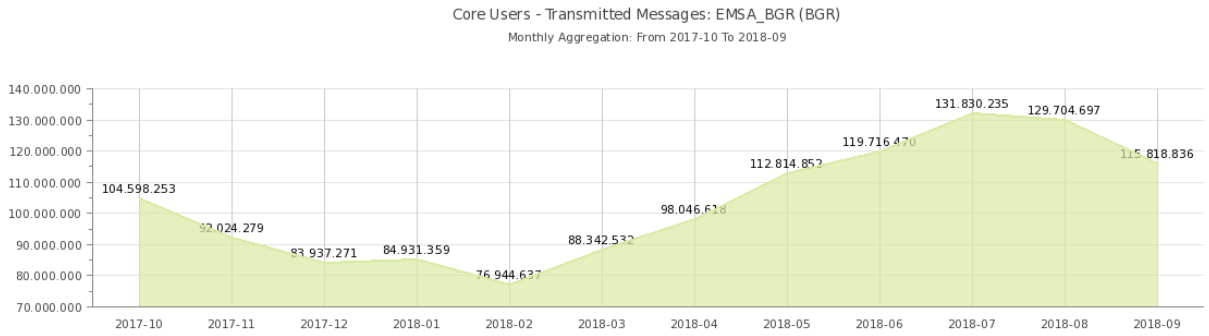
AIS information delivered to Cyprus (down-sampling 6 min)



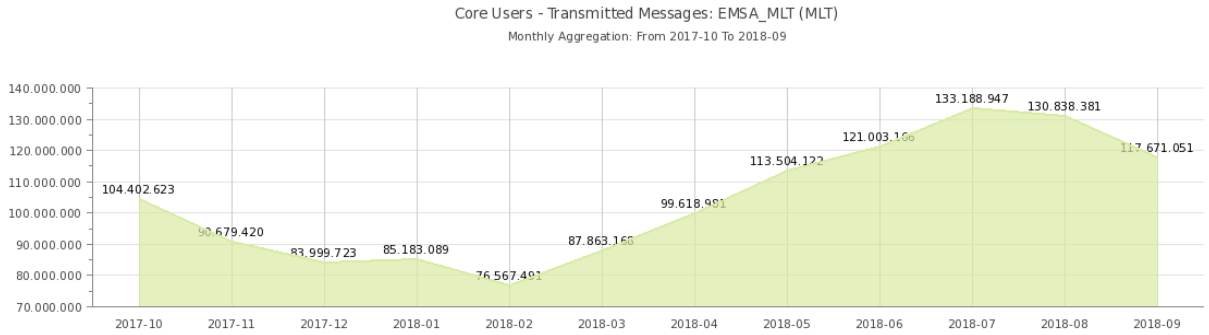
AIS information delivered to Greece (down-sampling 6 min)



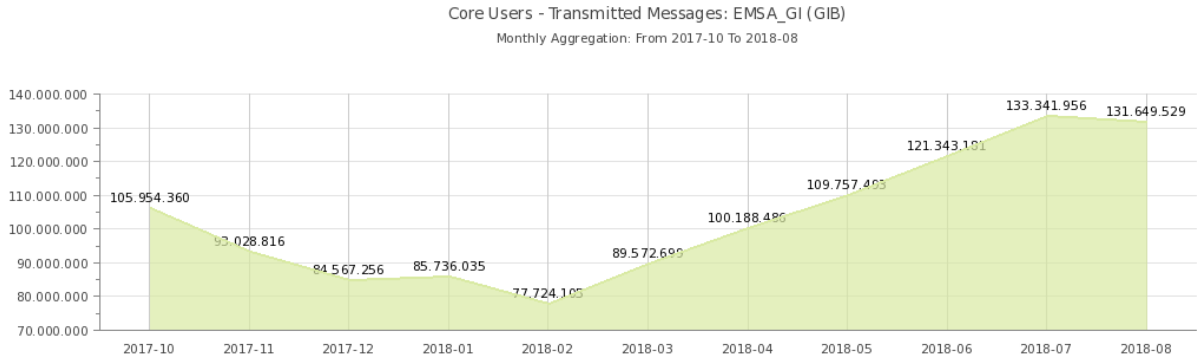
AIS information delivered to Romania (down-sampling 6 min)

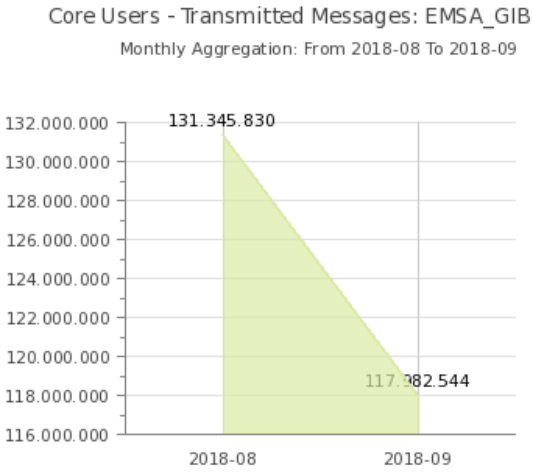


AIS information delivered to Bulgaria (down-sampling 6 min)

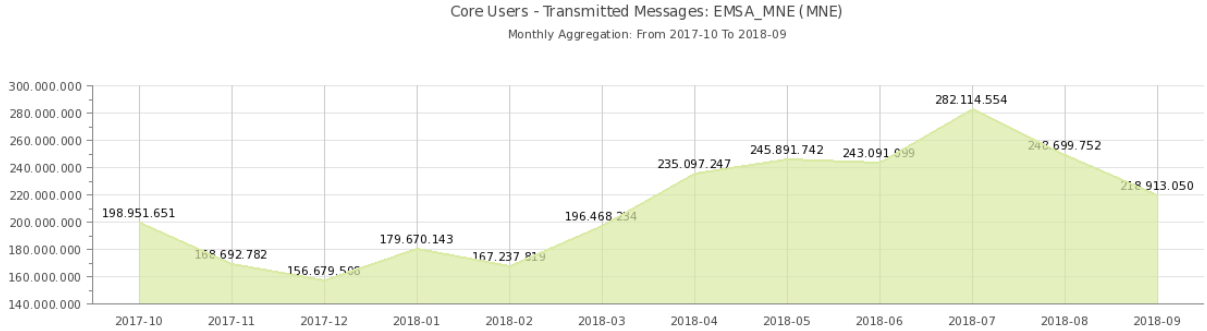


AIS information delivered to Malta (down-sampling 6 min)



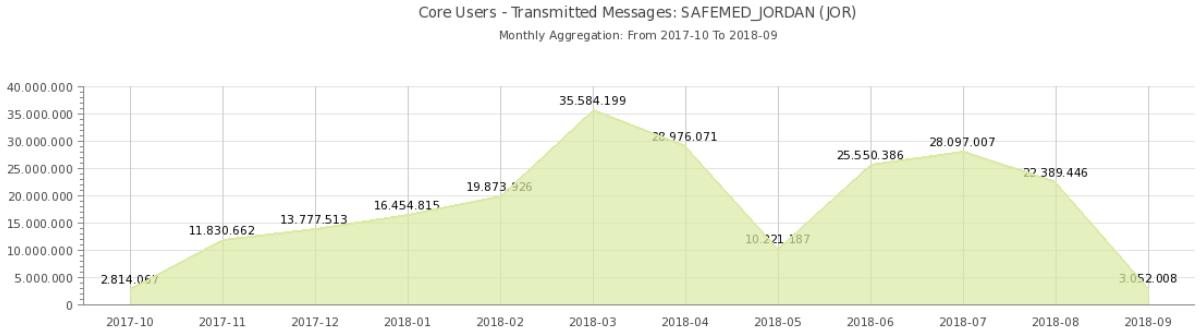


AIS information delivered to Gibraltar[2] (down-sampling 6 min)

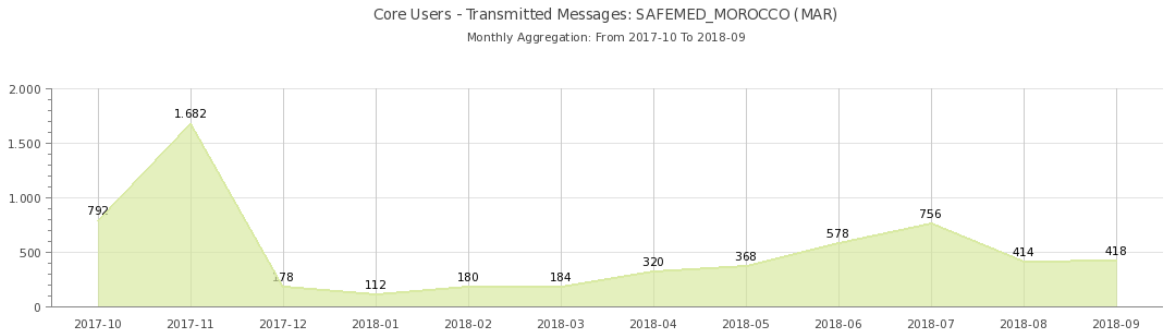


AIS information delivered to Montenegro
(Adriatic Region – full data rate since December 2015)

[2] Since September 1st 2018 Gibraltar implemented a new NAISP.



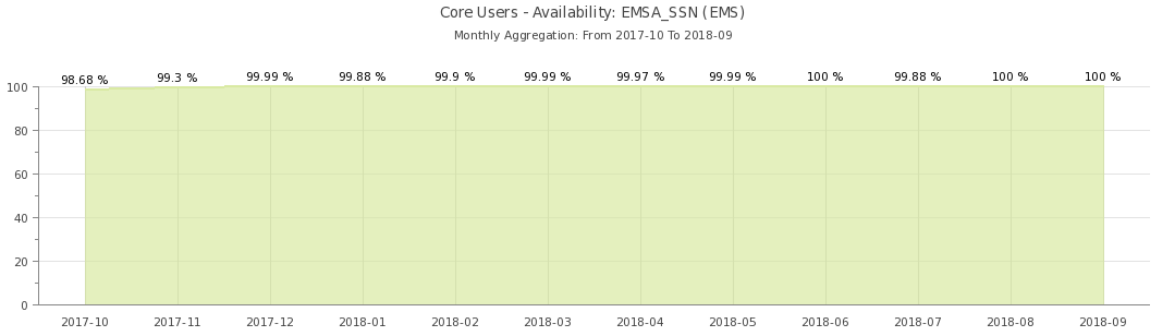
AIS information delivered to Jordan (SafeMed – full data rate)



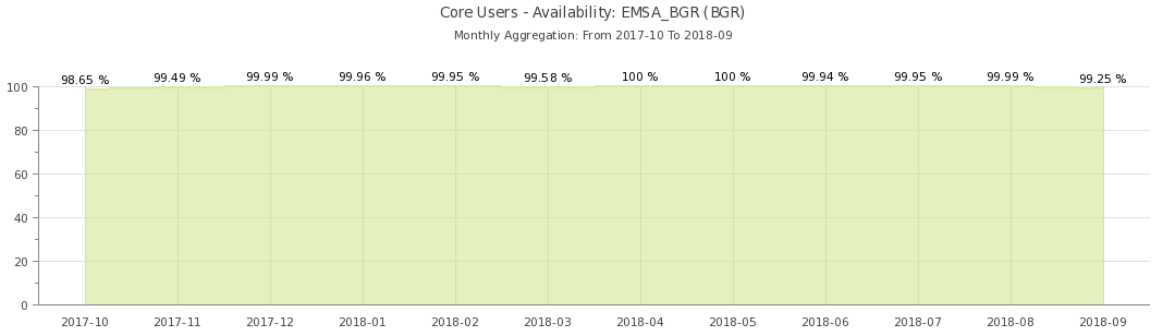
AIS information delivered to Morocco (national AIS network – full data rate)

Annex 3

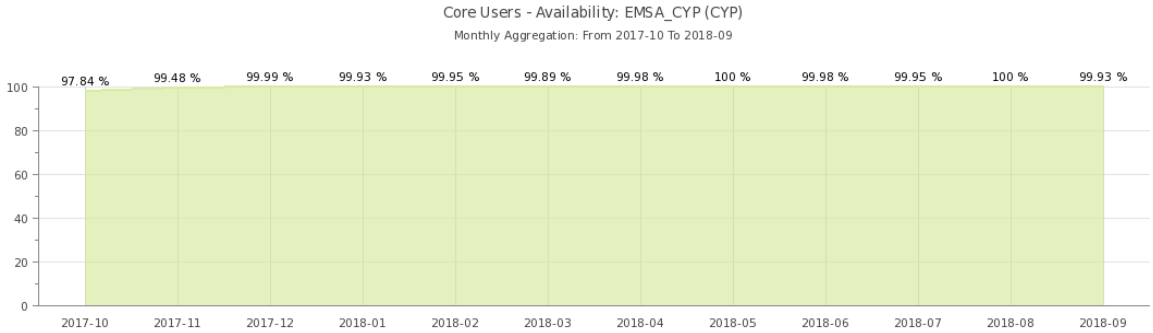
Link availability



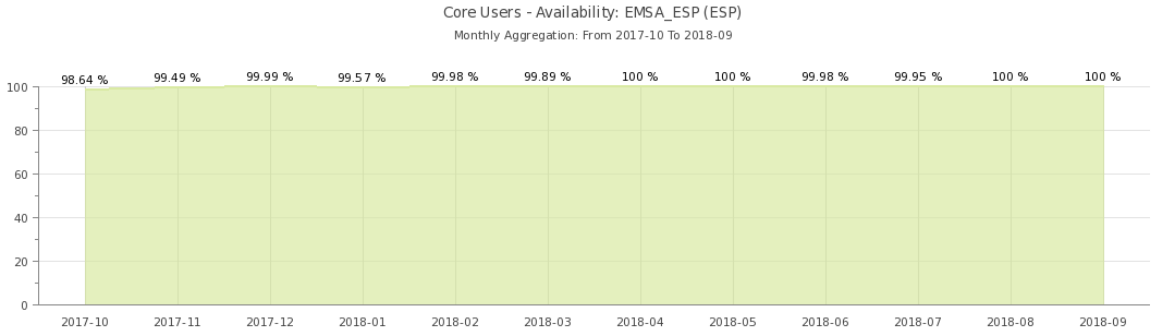
SSN_SI



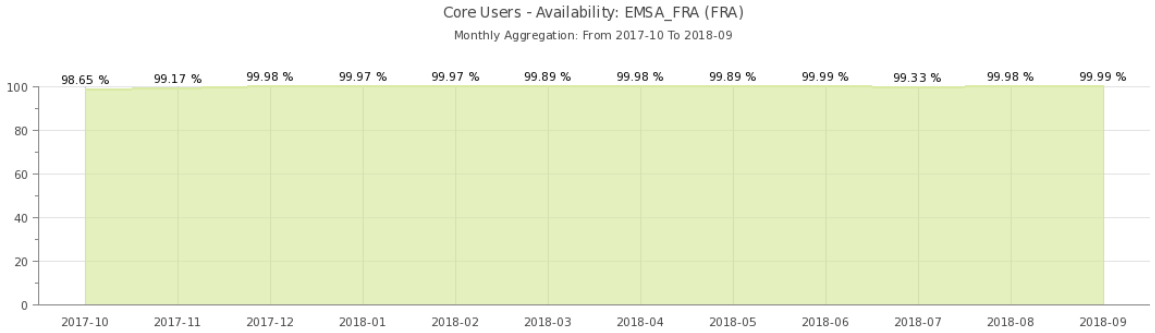
Bulgaria



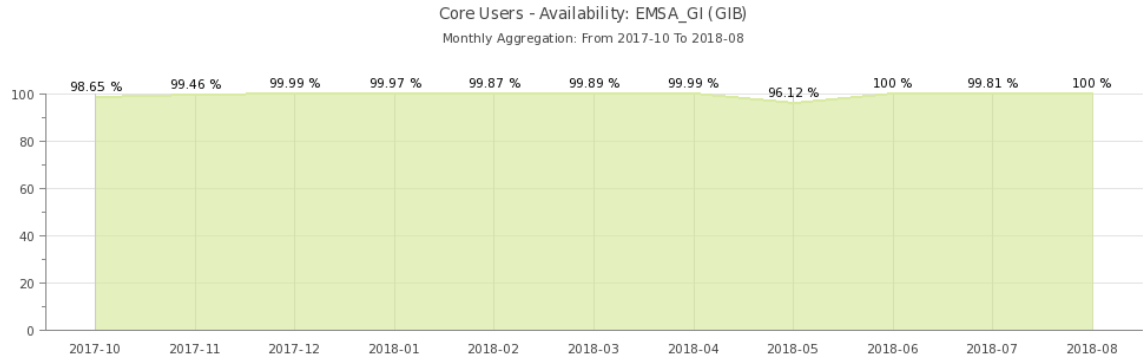
Cyprus

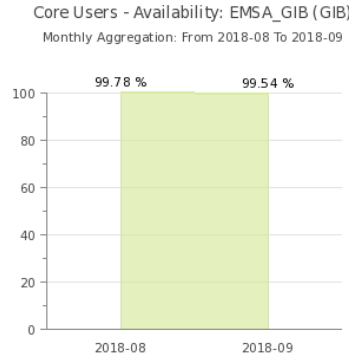


Spain



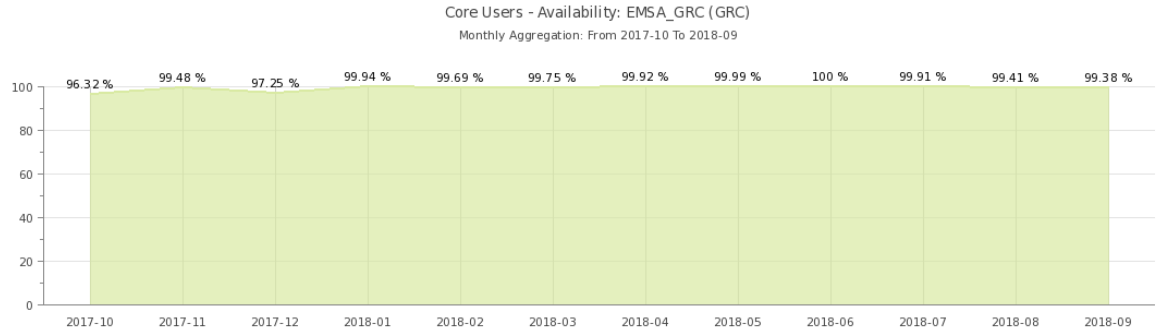
France



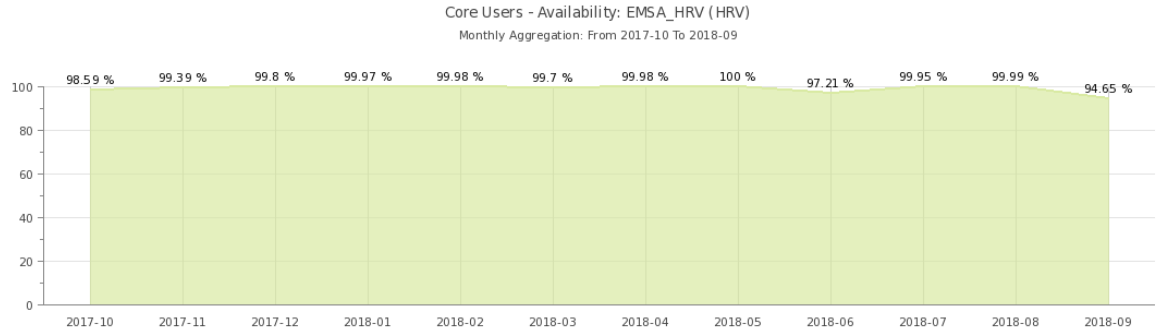


Gibraltar[3]

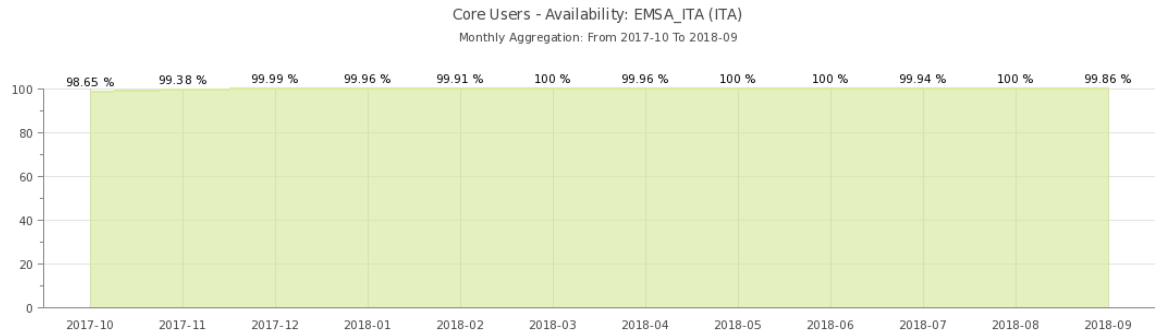
[3] Since September 1st 2018 Gibraltar implemented a new NAISP.



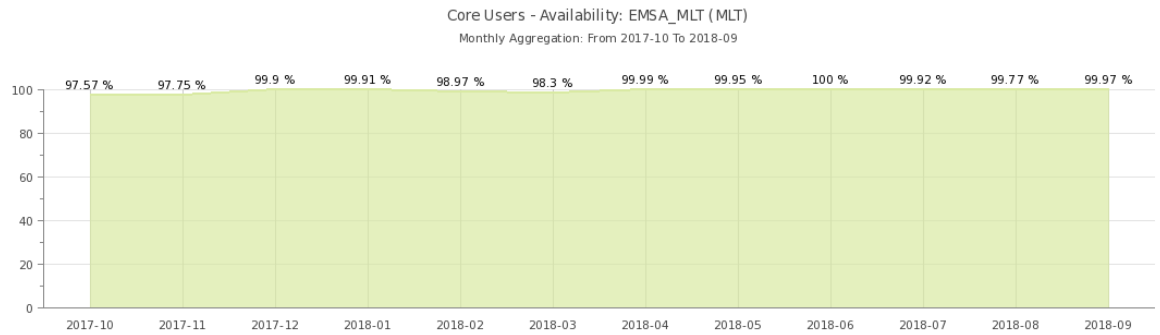
Greece



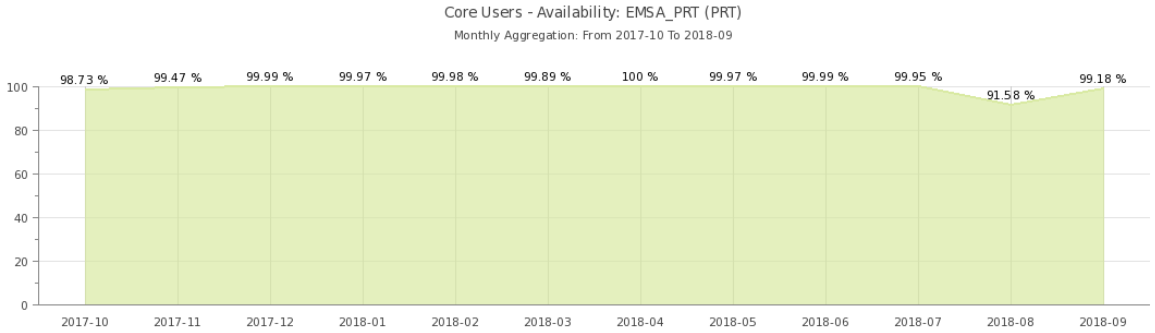
Croatia



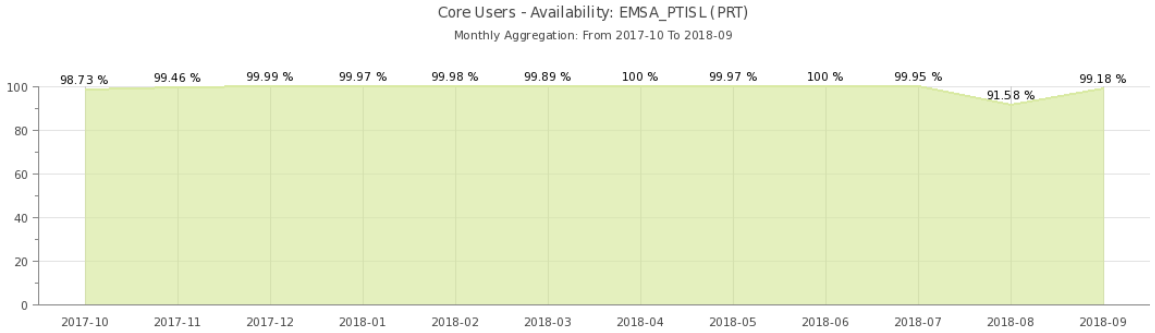
Italy



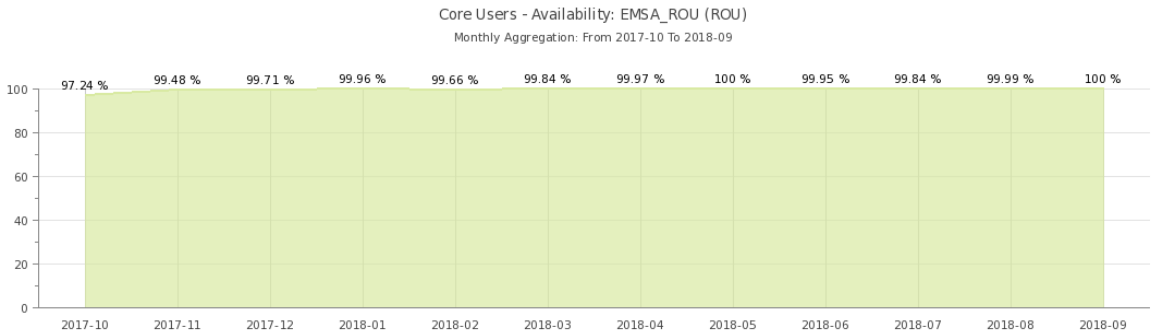
Malta



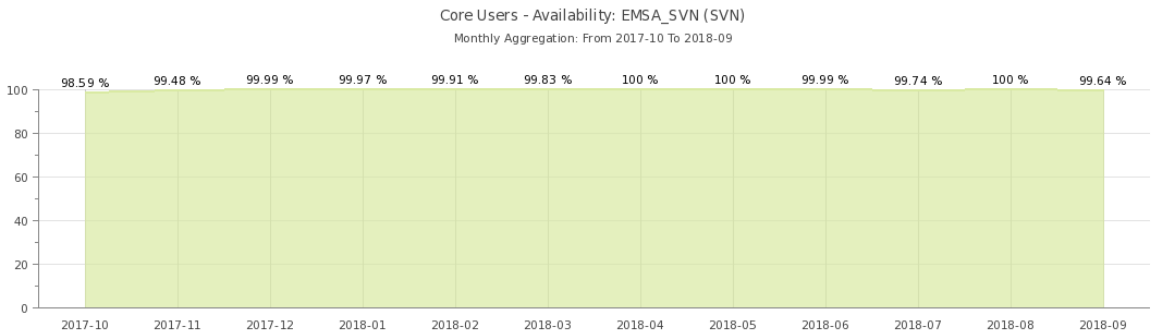
Portugal (mainland)



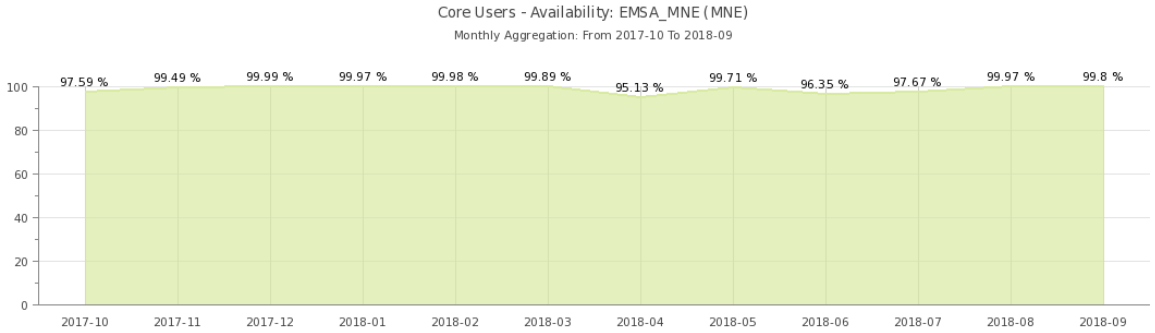
Portugal (Azores and Madeira)



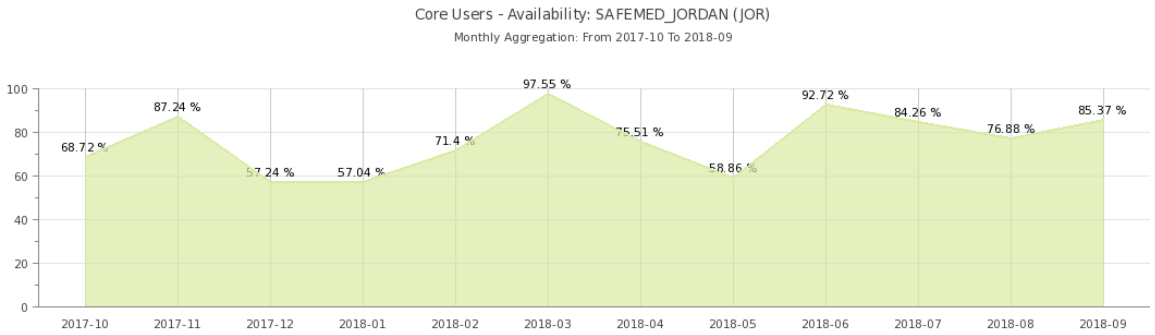
Romania



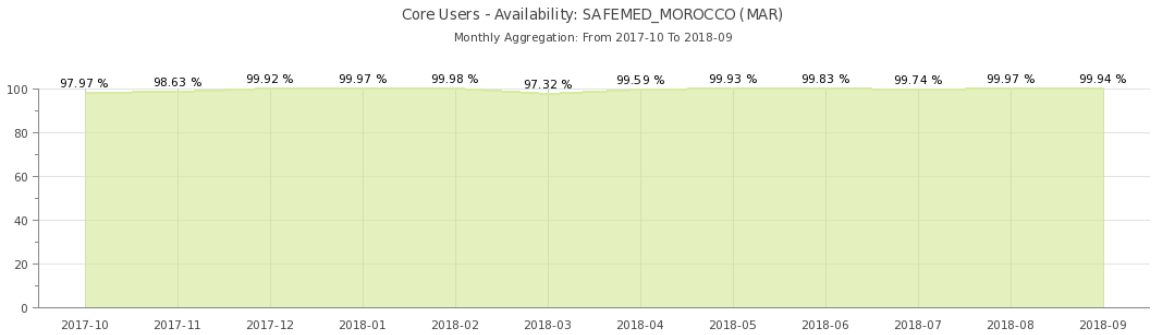
Slovenia



Montenegro



Jordan



Morocco