NBS monthly report - 2024 April

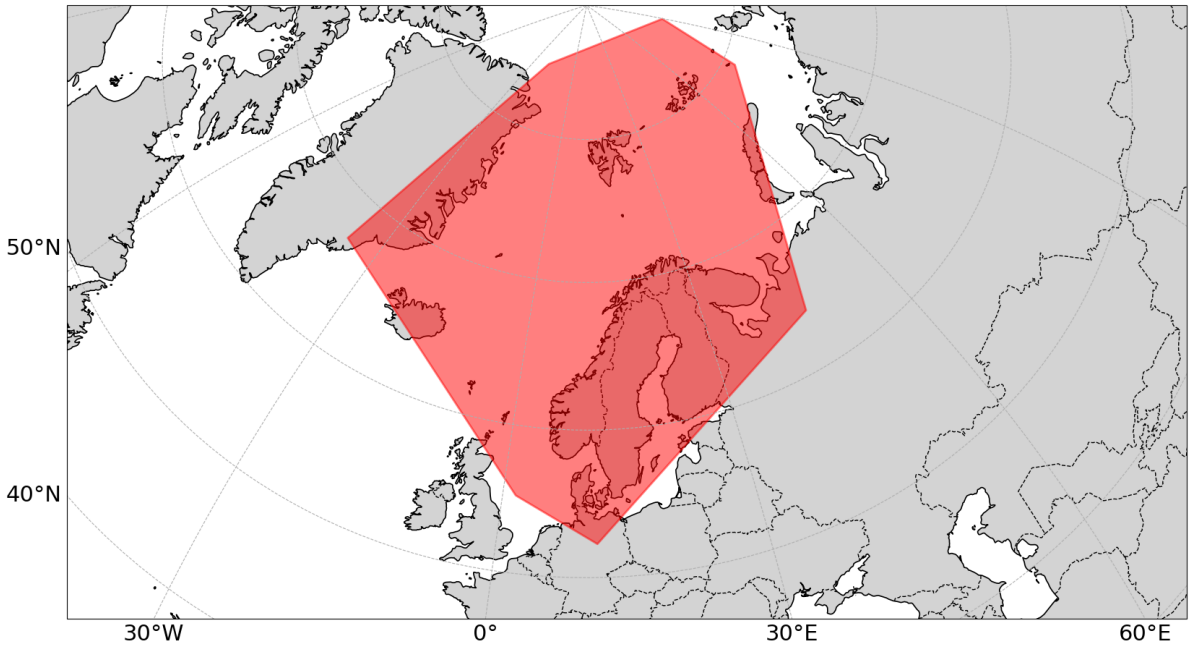
MET Norway - NBS team

Oct 03, 2024

CONTENTS

The NBS project

The European Space Agency (ESA) is in charge for the distribution of data from the Sentinel satellite constellation. In order to maintain a reliable and sustainable data hub, the creation and operation of multiples data hubs is necessary. With the purpose of keeping and maintaining a reliable and online source of data from the ESA Sentinel constellation for an Area Of Interest (AOI) covering Norway, the Norwegian Space Agency (NOSA) funded the National Bakke Segment (NBS) project. The map below is indicating the AOI in red.



Therefore, MET Norway was contracted for the operation of the NBS data. The NBS is implemented as a part of the operational infrastructure at MET Norway. As so it follows the normal procedures for planning, implementation and testing, and operations. User access to the NBS is configured according to NOSA requirements. This includes the use of ESA's DHuS software for synchronization between ESA and user accessibility.

The present report is part of MET Norway duties to inform about its performance as operator of the NBS. Monthly reports will be created monthly to regularly communicate the status of MET Norway's NBS.

The Sentinel products

The NBS project includes the management of the data received from Sentinel-1 (S1), Sentinel-2, Sentinel-3 (S3) and Sentinel-5p (S5p) satellites for the specified AOI. Each of the Sentinels has different operational modes for achieving images with different characteristics. Those images can have different processing levels. The products included in the DHR are Level-1 images for all the Sentinels except for Sentinel-2. For which Level-1 (S2L1C) and Level-2 (S2L2A) are both included in the NBS.

BackEnds and FrontEnds

As operator of NBS, the source of Sentinel data is ESA; and ESA spreads the Sentinel data through the Copernicus Data Space Ecosystem (CDSE - dataspace.copernicus.eu). CDSE is ESA's FrontEnd (FE) for Sentinel data accessibility. MET Norway uses the DHS software for synchronization and creation of other FrontEnds. During the synchronization

process a BackEnd (BE) is created. MET Norway is also running two FEs, colhub.met.no and colhub-archive.met.no. The colhub FE includes or will include all the products mentioned for Sentinel global products plus S3 marine products from Copernicus, S1 products from the Kongsberg Satellite Services (KSAT), and S2 Digital Elevation Model (DEM). The colhub-archive FE includes data from S1, S2L1C, S2L2A, S2DEM, S3, S5p products for the AOI. An important distinction between both FEs is that colhub-archive will always maintain available online all the products for the AOI.

In order to maintain an accountability on products synchronized from ESA's CDSE and available for users at the different FEs, it is necessary to understand the architecture of MET Norway's DHR.

CHAPTER

ONE

ACRONYMS

Here follows a formatted list of acronyms.

BE BackEnd

DEM Digital Elevation Model

DHuS Data Hub Software

ESA European Space Agency

FE FrontEnd

KSAT Kongsberg Satellite Services

MET Norway Meteorological Institute of Norway

CDSE Copernicus Data Space Ecosystem

S1 Sentinel-1

S2 Sentinel-2

S2L1C Sentinel-2 Level-1 C

S2L2A Sentinel-2 Level-2 A

S3 Sentinel-3

S5p Sentinel-5p

CHAPTER

TWO

QUICK SUMMARY

The table below shows a short overview of the NBS performance operation during the last 30 days. The number of products are compared against CDSE. All columns represents the number of products in each portal except the last 3 columns. Those 3 columns represents the data flow from MET Norway to users through the portals where Volumes are measured in Tb.

Portals	S1	S2L1C	S2L2A	S3	S5p	Nb of users	Nb of products	Volume
colhub.met.no	6487	26042	30865	24505	12449	18	43121	17.468
colhub-archive.met.no	6487	25865	30672	23694	12346	6	4329	3.107
dataspace.copernicus.eu	8215	0	0	22345	0			

Finally, the total amount of disk space dedicated to the NBS project, including either products in SAFE and NetCDF formats, represents 5485 Tb.

Due to tracking the data ingested and produced for the NBS project in the last year it is possible to forecast the upcoming need for disk space. As long as data flows follows the same pattern than last year, in 6 months the total disk space will grow until 5747 Tb; while in 12 months it is forecast to become 6805 Tb.

CHAPTER

THREE

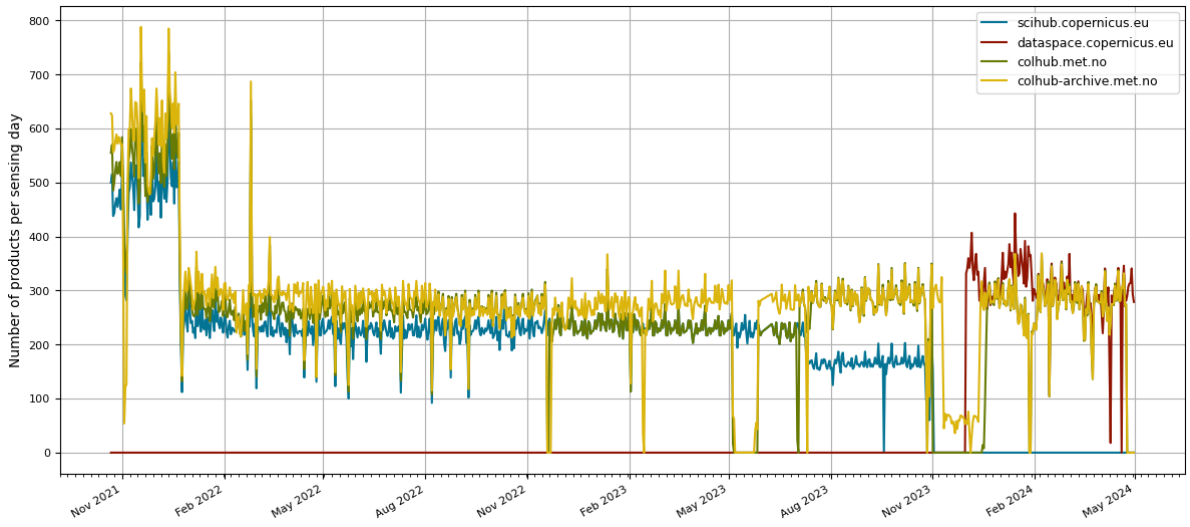
SENTINEL-1 PRODUCTS

This section shows the performance of MET Norway for Sentinel-1 products. Both, an overall status and last month status are shown below.

Note that scihub is no longer in operation but is included for historical comparisons.

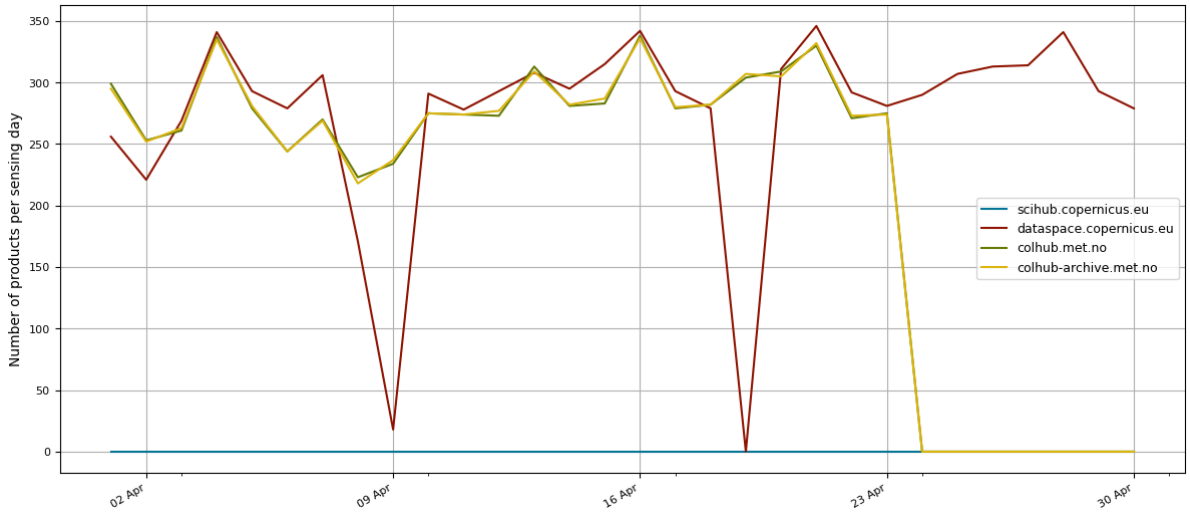
3.1 Products on portals

The following section contains an update on the Sentinel-1 products included in the different FEs and BEs.



The figure above represents the overall number of products present in the different BackEnds and FrontEnds per day for Sentinel-1.

While the figure below shows a zoom on the last month.



A table is also included for more detailed information.

sensing_date	colhub.met.no	dataspace.copernicus.eu	colhub-archive.met.no
2024-04-01	299.0	256.0	295.0
2024-04-02	253.0	221.0	252.0
2024-04-03	261.0	269.0	263.0
2024-04-04	337.0	341.0	335.0
2024-04-05	279.0	293.0	281.0
2024-04-06	244.0	279.0	244.0
2024-04-07	270.0	306.0	269.0
2024-04-08	223.0	171.0	218.0
2024-04-09	234.0	18.0	237.0
2024-04-10	275.0	291.0	275.0
2024-04-11	274.0	278.0	274.0
2024-04-12	273.0	293.0	277.0
2024-04-13	313.0	308.0	309.0
2024-04-14	281.0	295.0	282.0
2024-04-15	283.0	315.0	287.0
2024-04-16	338.0	342.0	336.0
2024-04-17	279.0	293.0	280.0
2024-04-18	282.0	279.0	282.0
2024-04-19	304.0	0.0	307.0
2024-04-20	309.0	311.0	305.0
2024-04-21	330.0	346.0	332.0
2024-04-22	271.0	292.0	273.0
2024-04-23	275.0	281.0	274.0
2024-04-24	0.0	290.0	0.0
2024-04-25	0.0	307.0	0.0
2024-04-26	0.0	313.0	0.0
2024-04-27	0.0	314.0	0.0
2024-04-28	0.0	341.0	0.0
2024-04-29	0.0	293.0	0.0
2024-04-30	0.0	279.0	0.0

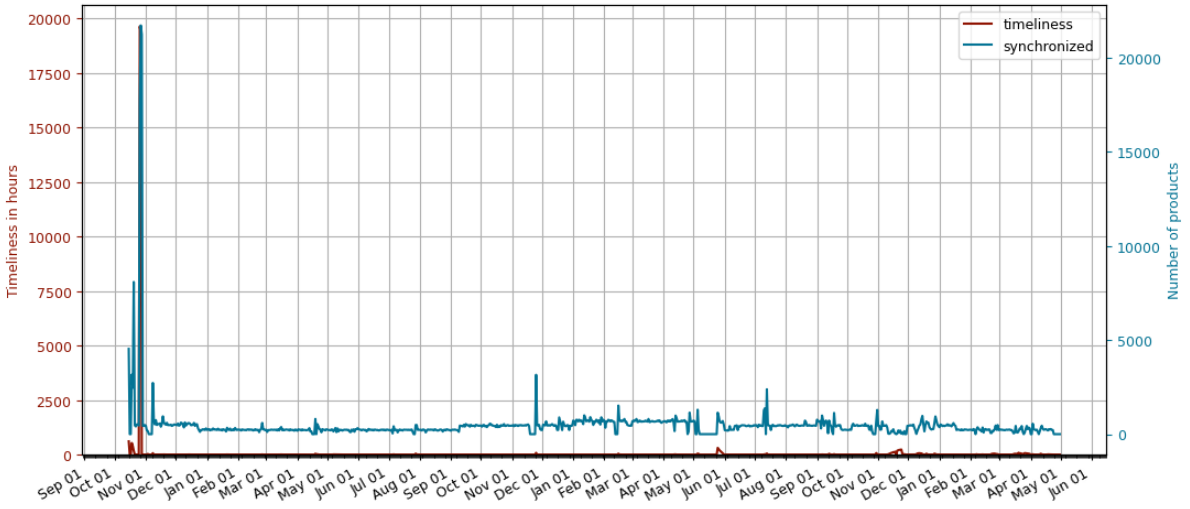
3.2 Missing products

The overall total number of Sentinel-1 products is 2860770. The number of overall Sentinel-1 missing products consists of 255396 images. This represents that a 900% of the total was included in MET Norway DHR, while a -800% was not included.

The total number of Sentinel-1 products in April is 452749. The number of Sentinel-1 missing products during April consists of 353685 images. This represents that a 0% of the total was included in MET Norway DHR, while a 100% was not included.

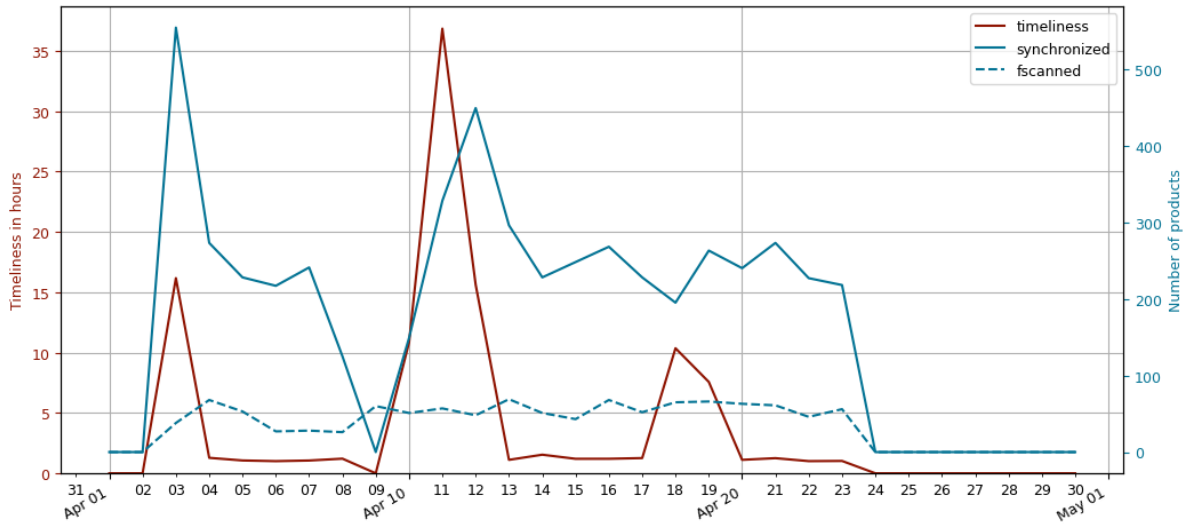
3.3 Data ingestion

In this section the time difference between sensing time and ingestion time at MET Norway is assessed. The ingestion time is the time at which a Sentinel product was downloaded to MET Norway BE and so, it is automatically available in at least one of the MET Norway FEs.



The figure above shows an overall status of the Sentinel-1 synchronization between ESA datahub and MET Norway BE. The number of products synchronized and deleted are represented by the dark and light blue lines respectively. The red line represents the timeliness.

Following previous sections, the graph below shows a zoom in the last month for the synchronization between ESA datahub and MET Norway BE.



A more detailed information is given in the table below where the last month is assessed for products synchronized from ESA.

day	size	number	timeliness
2024-04-01	0.000000	0	0.000000
2024-04-02	0.000000	0	0.000000
2024-04-03	1441.928181	554	16.171668
2024-04-04	696.588875	273	1.281645
2024-04-05	496.957598	228	1.062942
2024-04-06	547.216072	217	1.006293
2024-04-07	551.634207	241	1.058538
2024-04-08	251.107667	125	1.213172
2024-04-09	0.000000	0	0.000000
2024-04-10	351.849581	149	10.835519
2024-04-11	834.377120	328	36.842963
2024-04-12	995.566558	449	15.625232
2024-04-13	826.361250	296	1.114240
2024-04-14	577.934862	228	1.540906
2024-04-15	603.270791	248	1.200580
2024-04-16	691.811773	268	1.203160
2024-04-17	496.258441	228	1.260173
2024-04-18	468.147373	195	10.361216
2024-04-19	629.549769	263	7.569232
2024-04-20	582.283014	240	1.115809
2024-04-21	673.453742	273	1.253117
2024-04-22	489.803499	227	1.007974
2024-04-23	540.669809	218	1.022858
2024-04-24	0.000000	0	0.000000
2024-04-25	0.000000	0	0.000000
2024-04-26	0.000000	0	0.000000
2024-04-27	0.000000	0	0.000000
2024-04-28	0.000000	0	0.000000
2024-04-29	0.000000	0	0.000000
2024-04-30	0.000000	0	0.000000

It is also given extra information in the table below where the data are assessed for products synchronized from KSAT.

day	size	number	timeliness
2024-04-01	0.000000	0	0.000000
2024-04-02	0.000000	0	0.000000
2024-04-03	58.018049	38	1.115178
2024-04-04	81.208198	68	0.839147
2024-04-05	51.004430	53	0.597587
2024-04-06	73.362083	27	0.687310
2024-04-07	75.457630	28	0.791197
2024-04-08	58.686095	26	0.565939
2024-04-09	74.882843	60	0.678600
2024-04-10	53.294223	51	0.826530
2024-04-11	73.148525	57	0.767253
2024-04-12	55.563786	48	0.692017
2024-04-13	73.163513	69	0.699368
2024-04-14	71.439640	51	0.766710
2024-04-15	55.894963	43	0.817730
2024-04-16	81.561573	68	0.799149
2024-04-17	51.028250	52	0.606864
2024-04-18	73.170787	65	0.701042
2024-04-19	81.964964	66	2.917064
2024-04-20	70.041062	63	0.571537
2024-04-21	75.856565	61	0.684558
2024-04-22	52.203849	46	0.699113
2024-04-23	73.225782	56	0.720136
2024-04-24	0.000000	0	0.000000
2024-04-25	0.000000	0	0.000000
2024-04-26	0.000000	0	0.000000
2024-04-27	0.000000	0	0.000000
2024-04-28	0.000000	0	0.000000
2024-04-29	0.000000	0	0.000000
2024-04-30	0.000000	0	0.000000

CHAPTER

FOUR

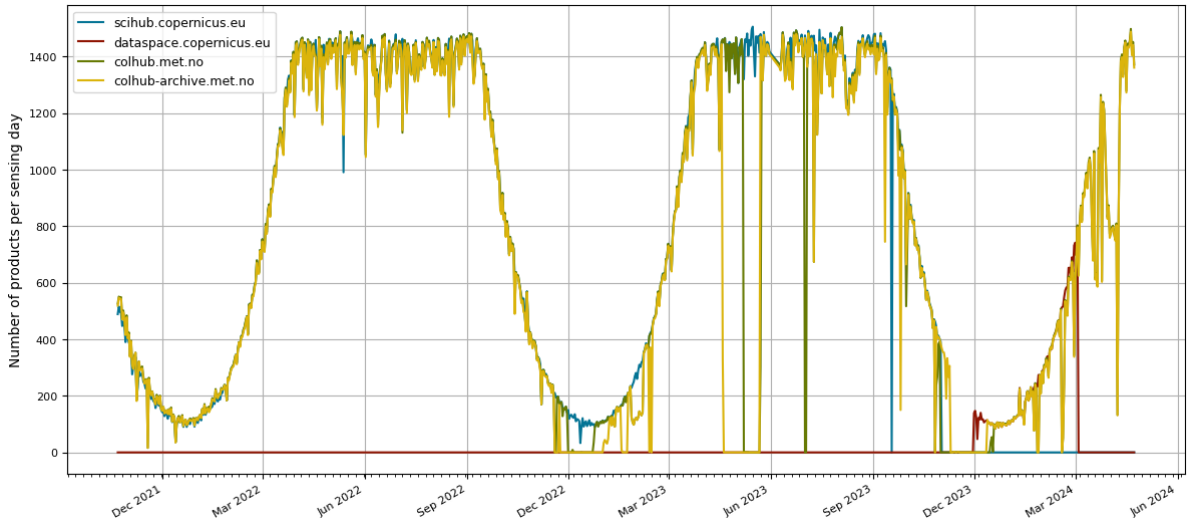
SENTINEL-2 LEVEL-1C PRODUCTS

This section shows the performance of MET Norway for Sentinel-2 Level-1C products. Both, an overall status and last month status are shown below.

Note that scihub is no longer in operation but is included for historical comparisons.

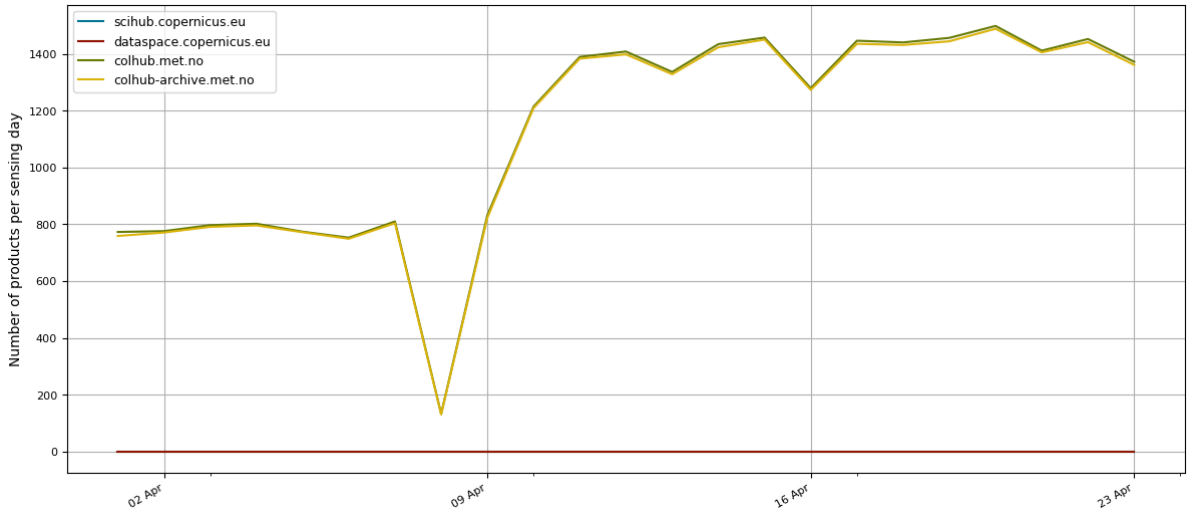
4.1 Products on portals

The following section contains an update on the Sentinel-2 Level-1C products included in the different FEs and BEs.



The figure above represents the overall number of products present in the different BackEnds and FrontEnds per day for Sentinel-2 Level-1C.

While the figure below shows a zoom on the last month.



A table is also included for more detailed information.

sensing_date	colhub.met.no	dataspace.copernicus.eu	colhub-archive.met.no
2024-04-01	773.0	0.0	759.0
2024-04-02	776.0	0.0	771.0
2024-04-03	797.0	0.0	791.0
2024-04-04	802.0	0.0	796.0
2024-04-05	774.0	0.0	772.0
2024-04-06	753.0	0.0	749.0
2024-04-07	810.0	0.0	804.0
2024-04-08	133.0	0.0	131.0
2024-04-09	832.0	0.0	823.0
2024-04-10	1214.0	0.0	1209.0
2024-04-11	1389.0	0.0	1383.0
2024-04-12	1408.0	0.0	1398.0
2024-04-13	1336.0	0.0	1328.0
2024-04-14	1434.0	0.0	1423.0
2024-04-15	1457.0	0.0	1450.0
2024-04-16	1279.0	0.0	1273.0
2024-04-17	1446.0	0.0	1435.0
2024-04-18	1440.0	0.0	1431.0
2024-04-19	1456.0	0.0	1444.0
2024-04-20	1498.0	0.0	1488.0
2024-04-21	1411.0	0.0	1405.0
2024-04-22	1452.0	0.0	1441.0
2024-04-23	1372.0	0.0	1361.0

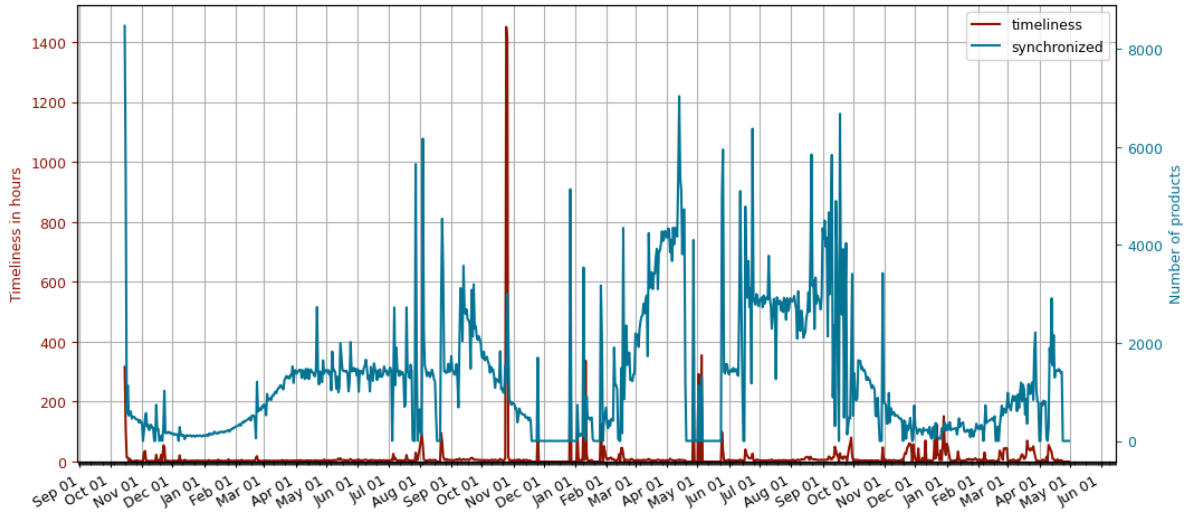
4.2 Missing products

The overall total number of Sentinel-2 Level-1C products is 2860770. The number of overall Sentinel-2 Level-1C missing products consists of 255396 images. This represents that a 900% of the total was included in MET Norway DHR, while a -800% was not included.

The total number of Sentinel-2 Level-1C products in April is 452749. The number of Sentinel-2 Level-1C missing products during April consists of 353685 images. This represents that a 0% of the total was included in MET Norway DHR, while a 100% was not included.

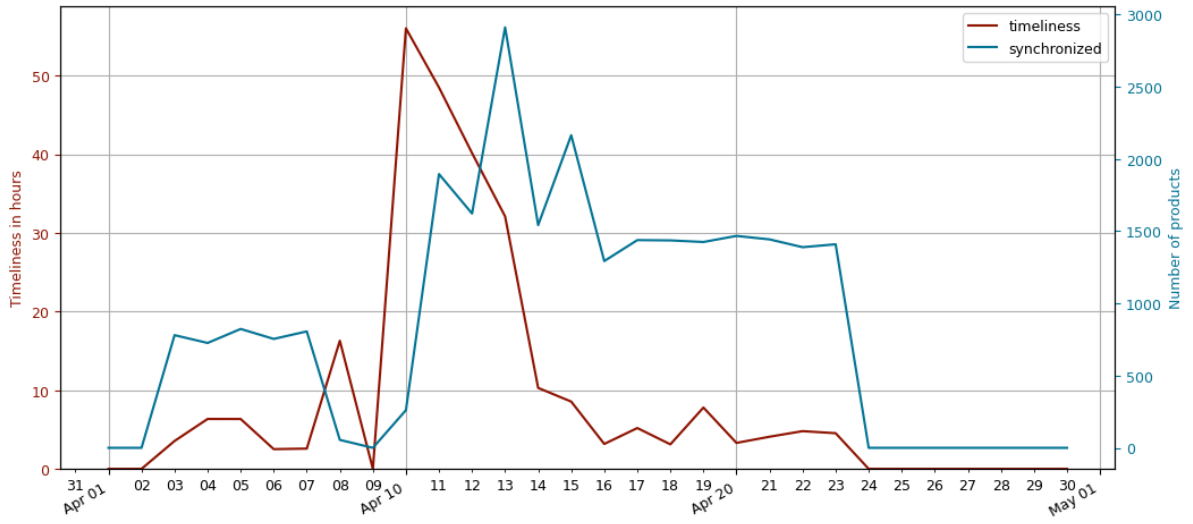
4.3 Data ingestion

In this section the time difference between sensing time and ingestion time at MET Norway is assessed. The ingestion time is the time at which a Sentinel product was downloaded to MET Norway BE and so, it is automatically available in at least one of the MET Norway FEs.



The figure above shows an overall status of the Sentinel-2 Level-1C synchronization between ESA datahub and MET Norway BE. The number of products synchronized and deleted are represented by the dark and light blue lines respectively. The red line represents the timeliness.

Following previous sections, the graph below shows a zoom in the last month for the synchronization between ESA datahub and MET Norway BE.



A more detailed information is given in the table below where the last month is assessed for products synchronized from ESA.

day	size	number	timeliness
2024-04-01	0.000000	0	0.000000
2024-04-02	0.000000	0	0.000000
2024-04-03	331.176861	780	3.545768
2024-04-04	309.449760	726	6.344881
2024-04-05	353.768325	823	6.340168
2024-04-06	324.046826	754	2.507982
2024-04-07	342.472098	806	2.574635
2024-04-08	4.709750	55	16.287024
2024-04-09	0.000000	0	0.000000
2024-04-10	111.155853	261	56.002026
2024-04-11	865.184264	1895	48.482046
2024-04-12	728.002808	1622	40.144687
2024-04-13	1321.865904	2911	32.092137
2024-04-14	691.519757	1542	10.292488
2024-04-15	990.019839	2164	8.550532
2024-04-16	586.114192	1293	3.167160
2024-04-17	666.771725	1438	5.190527
2024-04-18	654.413989	1436	3.115123
2024-04-19	665.907688	1425	7.795256
2024-04-20	640.307331	1467	3.300674
2024-04-21	625.169695	1443	4.084788
2024-04-22	618.054159	1389	4.795542
2024-04-23	613.818156	1409	4.533681
2024-04-24	0.000000	0	0.000000
2024-04-25	0.000000	0	0.000000
2024-04-26	0.000000	0	0.000000
2024-04-27	0.000000	0	0.000000
2024-04-28	0.000000	0	0.000000
2024-04-29	0.000000	0	0.000000
2024-04-30	0.000000	0	0.000000

CHAPTER

FIVE

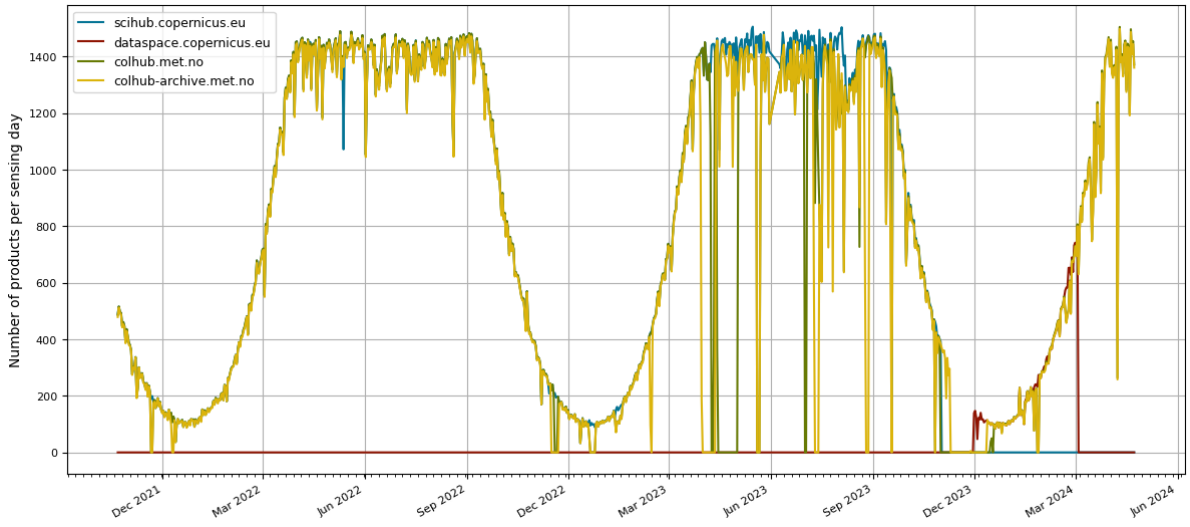
SENTINEL-2 LEVEL-2A PRODUCTS

This section shows the performance of MET Norway for Sentinel-2 Level-2A products. Both, an overall status and last month status are shown below.

Note that scihub is no longer in operation but is included for historical comparisons.

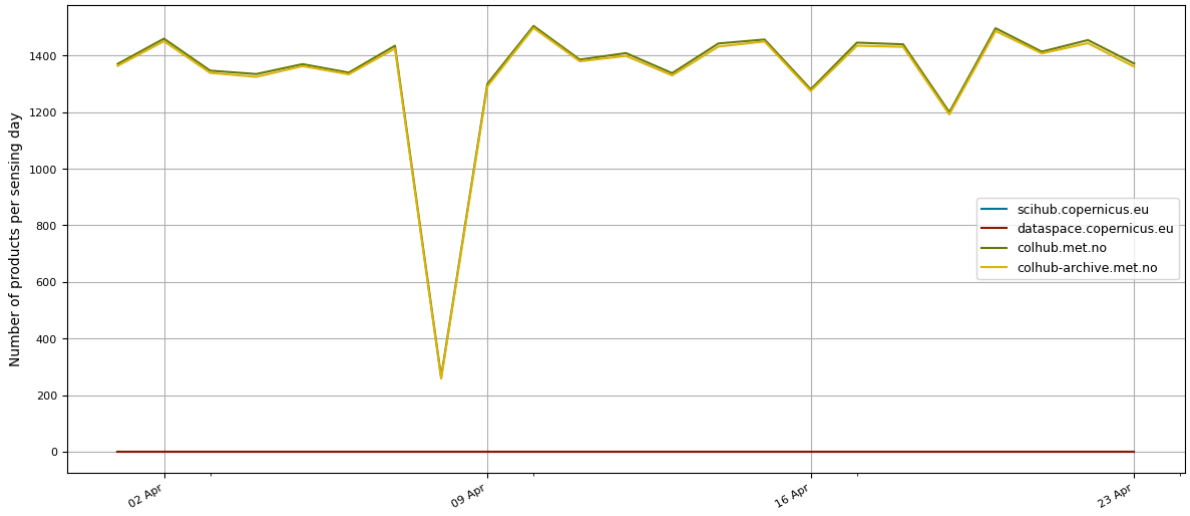
5.1 Products on portals

The following section contains an update on the Sentinel-2 Level-2A products included in the different FEs and BEs.



The figure above represents the overall number of products present in the different BackEnds and FrontEnds per day for Sentinel-2 Level-2A.

While the figure below shows a zoom on the last month.



A table is also included for more detailed information.

sensing_date	colhub.met.no	dataspace.copernicus.eu	colhub-archive.met.no
2024-04-01	1371.0	0.0	1364.0
2024-04-02	1460.0	0.0	1451.0
2024-04-03	1347.0	0.0	1339.0
2024-04-04	1335.0	0.0	1325.0
2024-04-05	1370.0	0.0	1363.0
2024-04-06	1340.0	0.0	1334.0
2024-04-07	1435.0	0.0	1425.0
2024-04-08	264.0	0.0	258.0
2024-04-09	1300.0	0.0	1291.0
2024-04-10	1505.0	0.0	1498.0
2024-04-11	1386.0	0.0	1380.0
2024-04-12	1409.0	0.0	1399.0
2024-04-13	1338.0	0.0	1330.0
2024-04-14	1443.0	0.0	1432.0
2024-04-15	1457.0	0.0	1450.0
2024-04-16	1281.0	0.0	1275.0
2024-04-17	1446.0	0.0	1435.0
2024-04-18	1440.0	0.0	1431.0
2024-04-19	1200.0	0.0	1192.0
2024-04-20	1497.0	0.0	1487.0
2024-04-21	1414.0	0.0	1408.0
2024-04-22	1455.0	0.0	1444.0
2024-04-23	1372.0	0.0	1361.0

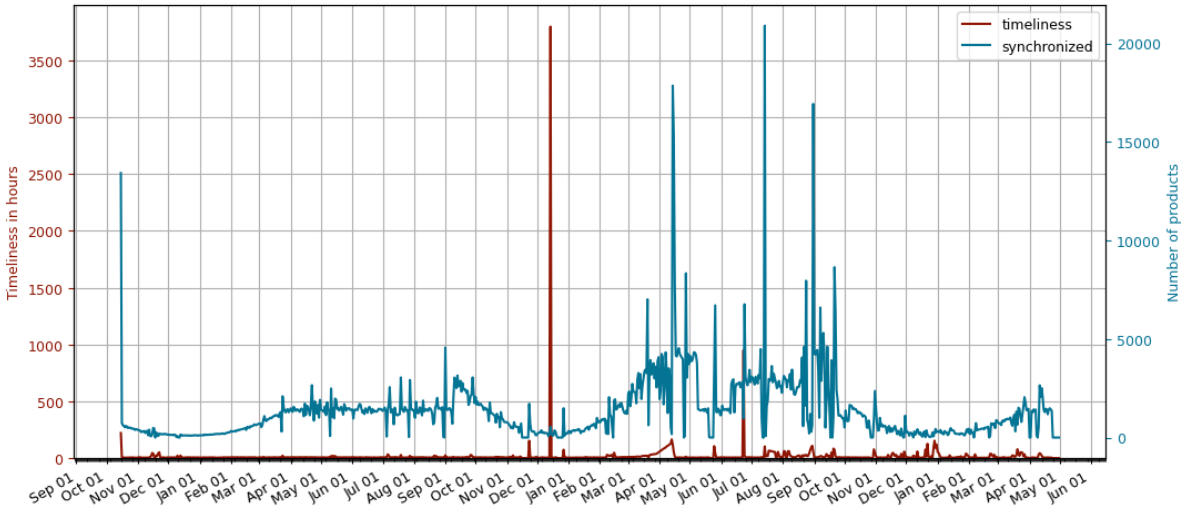
5.2 Missing products

The overall total number of Sentinel-2 Level-2A products is 2860770. The number of overall Sentinel-2 Level-2A missing products consists of 255396 images. This represents that a 900% of the total was included in MET Norway DHR, while a -800% was not included.

The total number of Sentinel-2 level-2A products in April is 452749. The number of Sentinel-2 level-2A missing products during April consists of 353685 images. This represents that a 0% of the total was included in MET Norway DHR, while a 100% was not included.

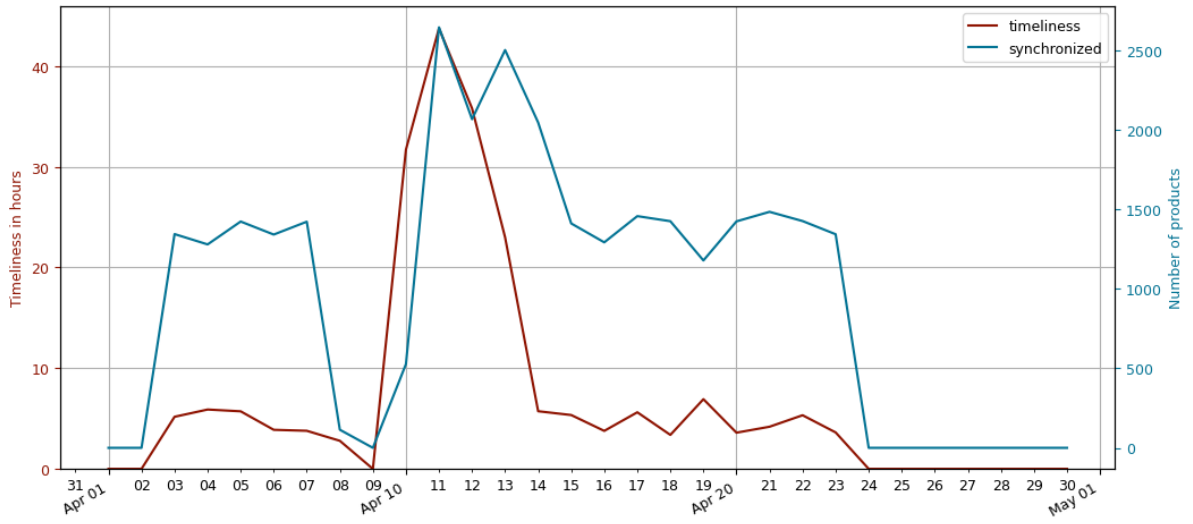
5.3 Data ingestion

In this section the time difference between sensing time and ingestion time at MET Norway is assessed. The ingestion time is the time at which a Sentinel product was downloaded to MET Norway BE and so, it is automatically available in at least one of the MET Norway FEs.



The figure above shows an overall status of the Sentinel-2 Level-2A synchronization between ESA datahub and MET Norway BE. The number of products synchronized and deleted are represented by the dark and light blue lines respectively. The red line represents the timeliness.

Following previous sections, the graph below shows a zoom in the last month for the synchronization between ESA datahub and MET Norway BE.



A more detailed information is given in the table below where the last month is assessed for products synchronized from ESA.

day	size	number	timeliness
2024-04-01	0.000000	0	0.000000
2024-04-02	0.000000	0	0.000000
2024-04-03	761.881522	1345	5.172797
2024-04-04	734.517838	1280	5.893018
2024-04-05	809.264893	1424	5.715702
2024-04-06	768.731402	1342	3.879373
2024-04-07	815.779542	1423	3.781378
2024-04-08	64.702129	114	2.787427
2024-04-09	0.000000	0	0.000000
2024-04-10	308.660059	527	31.705671
2024-04-11	1508.129215	2646	43.749978
2024-04-12	1175.508838	2068	35.801182
2024-04-13	1453.659788	2503	22.992667
2024-04-14	1167.603796	2047	5.723740
2024-04-15	812.606544	1412	5.346589
2024-04-16	747.168602	1293	3.772107
2024-04-17	857.755229	1458	5.620250
2024-04-18	828.397970	1426	3.372094
2024-04-19	696.603727	1179	6.920121
2024-04-20	779.168710	1425	3.594836
2024-04-21	819.221240	1485	4.183940
2024-04-22	806.494492	1427	5.325998
2024-04-23	737.832280	1344	3.619330
2024-04-24	0.000000	0	0.000000
2024-04-25	0.000000	0	0.000000
2024-04-26	0.000000	0	0.000000
2024-04-27	0.000000	0	0.000000
2024-04-28	0.000000	0	0.000000
2024-04-29	0.000000	0	0.000000
2024-04-30	0.000000	0	0.000000

CHAPTER

SIX

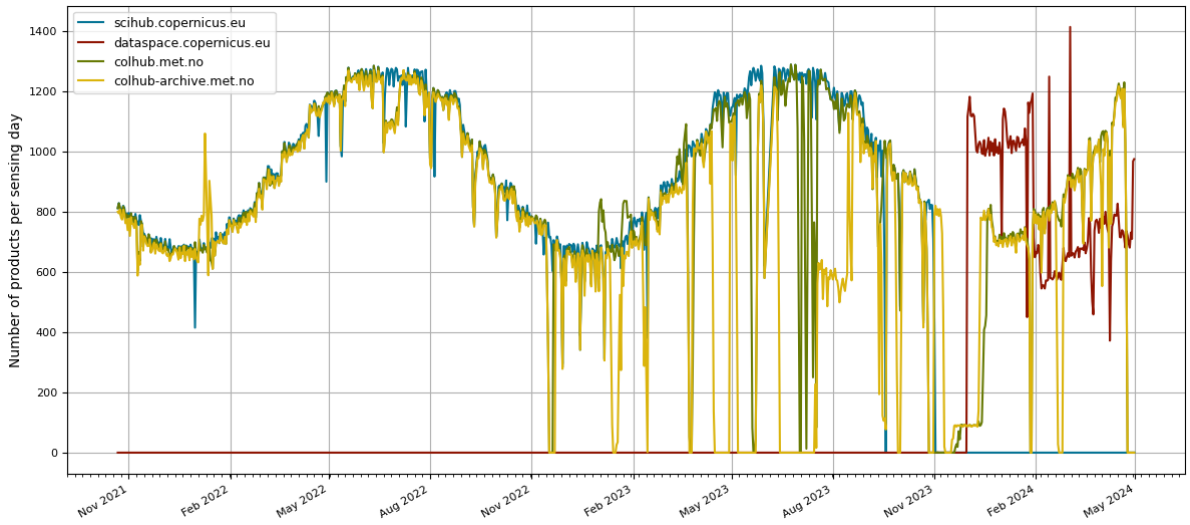
SENTINEL-3 PRODUCTS

This section shows the performance of MET Norway for Sentinel-3 products. Both, an overall status and last month status are shown below.

Note that scihub is no longer in operation but is included for historical comparisons.

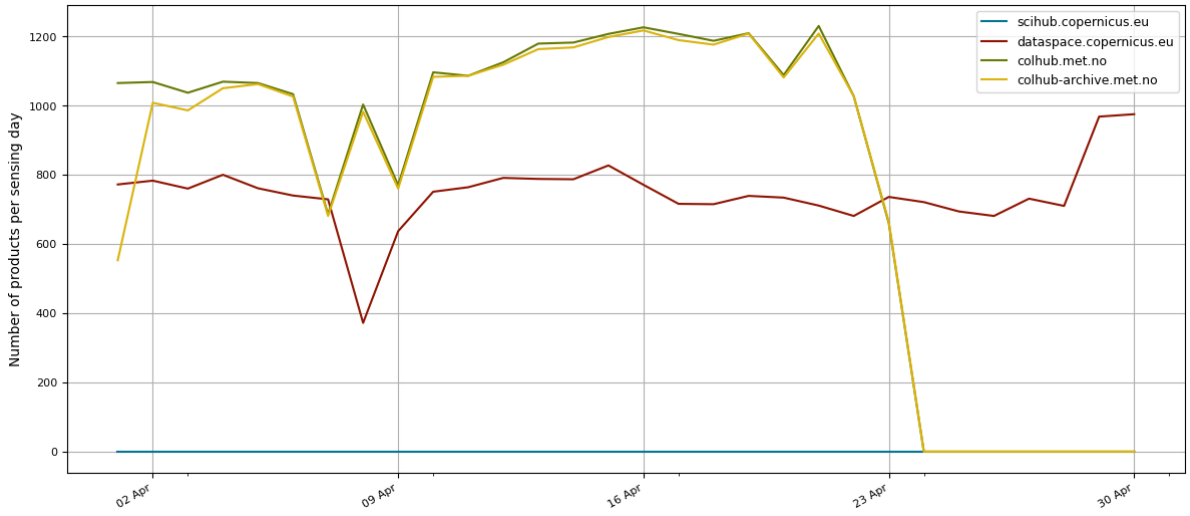
6.1 Products on portals

The following section contains an update on the Sentinel-3 products included in the different FEs and BEs.



The figure above represents the overall number of products present in the different BackEnds and FrontEnds per day for Sentinel-3.

While the figure below shows a zoom on the last month.



A table is also included for more detailed information.

sensing_date	colhub.met.no	dataspace.copernicus.eu	colhub-archive.met.no
2024-04-01	1065.0	772.0	553.0
2024-04-02	1068.0	783.0	1008.0
2024-04-03	1037.0	760.0	986.0
2024-04-04	1069.0	800.0	1050.0
2024-04-05	1065.0	761.0	1062.0
2024-04-06	1033.0	740.0	1026.0
2024-04-07	686.0	729.0	681.0
2024-04-08	1003.0	372.0	982.0
2024-04-09	770.0	637.0	760.0
2024-04-10	1096.0	751.0	1083.0
2024-04-11	1086.0	764.0	1086.0
2024-04-12	1125.0	791.0	1118.0
2024-04-13	1179.0	788.0	1163.0
2024-04-14	1182.0	787.0	1168.0
2024-04-15	1207.0	827.0	1198.0
2024-04-16	1226.0	771.0	1217.0
2024-04-17	1207.0	716.0	1189.0
2024-04-18	1187.0	715.0	1176.0
2024-04-19	1209.0	739.0	1208.0
2024-04-20	1088.0	734.0	1081.0
2024-04-21	1230.0	711.0	1208.0
2024-04-22	1027.0	681.0	1027.0
2024-04-23	660.0	736.0	664.0
2024-04-24	0.0	721.0	0.0
2024-04-25	0.0	694.0	0.0
2024-04-26	0.0	681.0	0.0
2024-04-27	0.0	731.0	0.0
2024-04-28	0.0	710.0	0.0
2024-04-29	0.0	968.0	0.0
2024-04-30	0.0	975.0	0.0

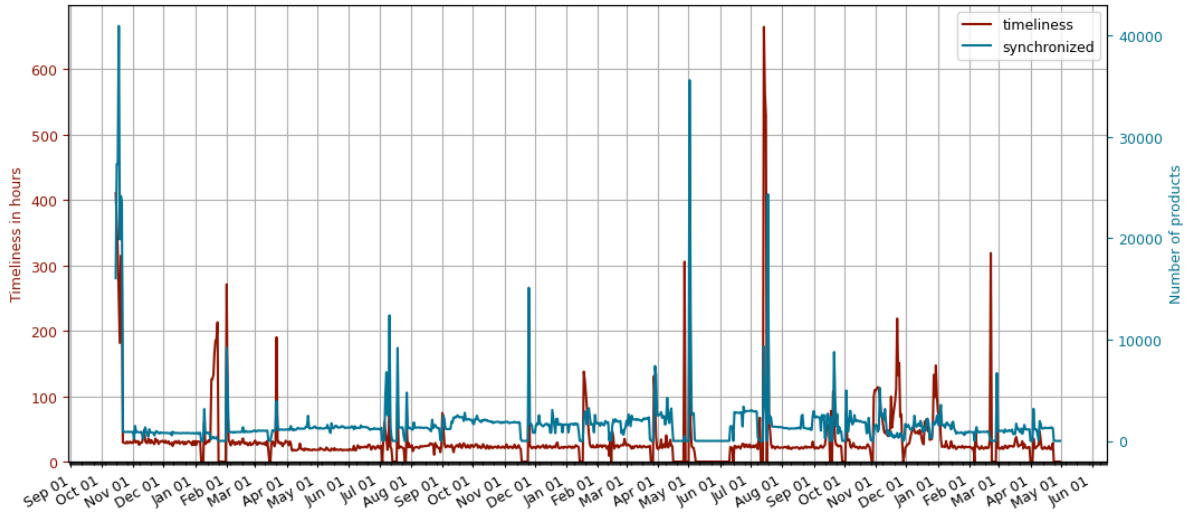
6.2 Missing products

The overall total number of Sentinel-3 products is 2860770. The number of overall Sentinel-3 missing products consists of 255396 images. This represents that a 900% of the total was included in MET Norway DHR, while a -800% was not included.

The total number of Sentinel-3 products in April is 452749. The number of Sentinel-3 missing products during April consists of 353685 images. This represents that a 0% of the total was included in MET Norway DHR, while a 100% was not included.

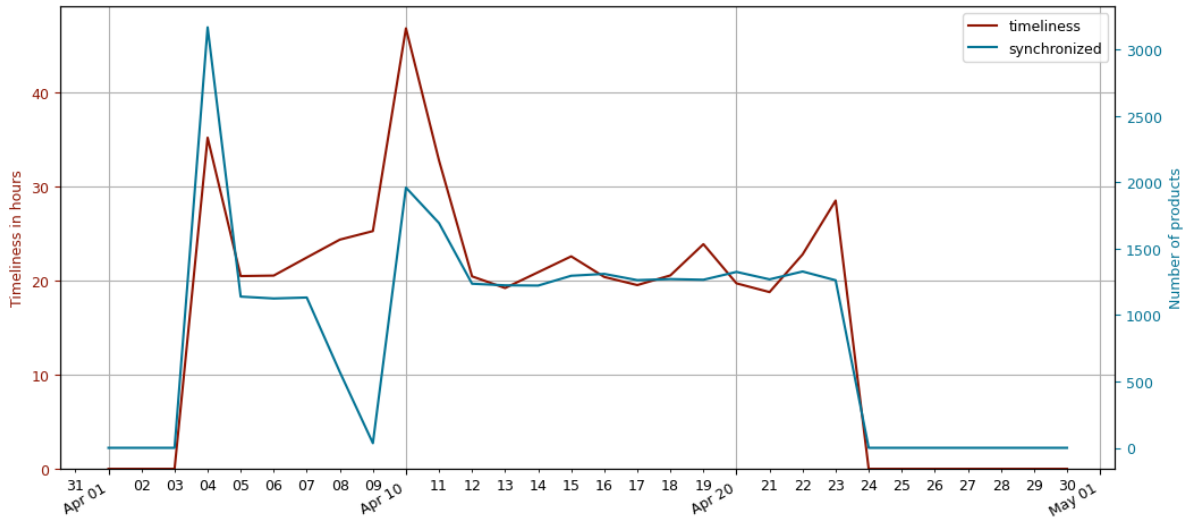
6.3 Data ingestion

In this section the time difference between sensing time and ingestion time at MET Norway is assessed. The ingestion time is the time at which a Sentinel product was downloaded to MET Norway BE and so, it is automatically available in at least one of the MET Norway FEs.



The figure above shows an overall status of the Sentinel-3 synchronization between ESA datahub and MET Norway BE. The number of products synchronized and deleted are represented by the dark and light blue lines respectively. The red line represents the timeliness.

Following previous sections, the graph below shows a zoom in the last month for the synchronization between ESA datahub and MET Norway BE.



A more detailed information is given in the table below where the last month is assessed for products synchronized from ESA.

day	size	number	timeliness
2024-04-01	0.000000	0	0.000000
2024-04-02	0.000000	0	0.000000
2024-04-03	0.000000	0	0.000000
2024-04-04	1009.610129	3167	35.205343
2024-04-05	371.335474	1139	20.493296
2024-04-06	359.138947	1125	20.546203
2024-04-07	377.539688	1132	22.468539
2024-04-08	176.391287	571	24.368264
2024-04-09	7.230731	35	25.276517
2024-04-10	710.436265	1960	46.830482
2024-04-11	521.786900	1693	32.788583
2024-04-12	408.737076	1236	20.462711
2024-04-13	394.556070	1224	19.224455
2024-04-14	376.209484	1222	20.904441
2024-04-15	410.803234	1296	22.589645
2024-04-16	417.319483	1310	20.400095
2024-04-17	384.240605	1263	19.536348
2024-04-18	405.080746	1271	20.565724
2024-04-19	398.736659	1266	23.885554
2024-04-20	425.137545	1325	19.721179
2024-04-21	399.684226	1269	18.791947
2024-04-22	427.528541	1328	22.794375
2024-04-23	412.538944	1262	28.522442
2024-04-24	0.000000	0	0.000000
2024-04-25	0.000000	0	0.000000
2024-04-26	0.000000	0	0.000000
2024-04-27	0.000000	0	0.000000
2024-04-28	0.000000	0	0.000000
2024-04-29	0.000000	0	0.000000
2024-04-30	0.000000	0	0.000000

CHAPTER

SEVEN

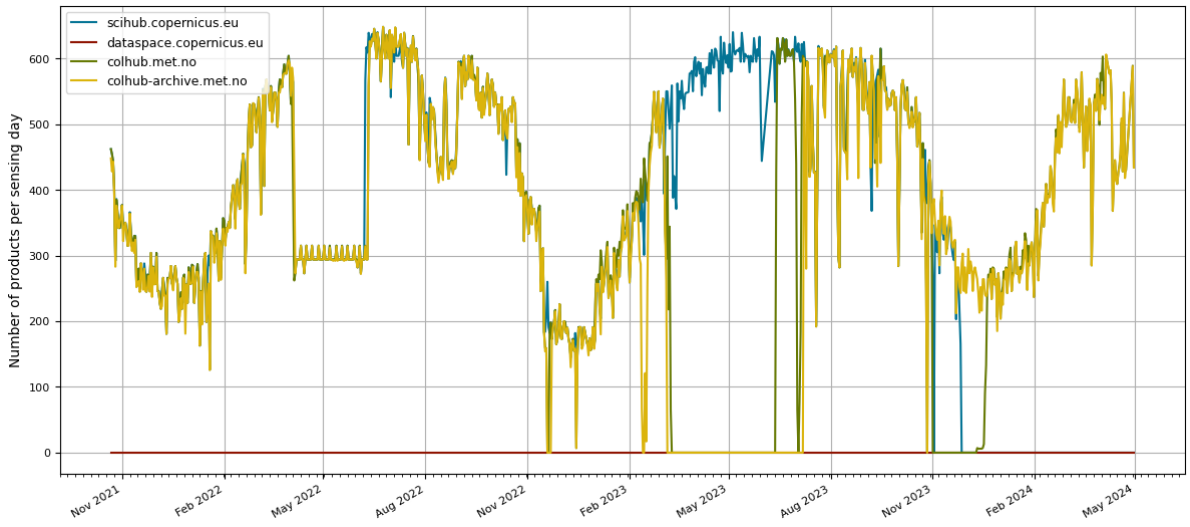
SENTINEL-5P PRODUCTS

This section shows the performance of MET Norway for Sentinel-5p products. Both, an overall status and last month status are shown below.

Note that scihub is no longer in operation but is included for historical comparisons.

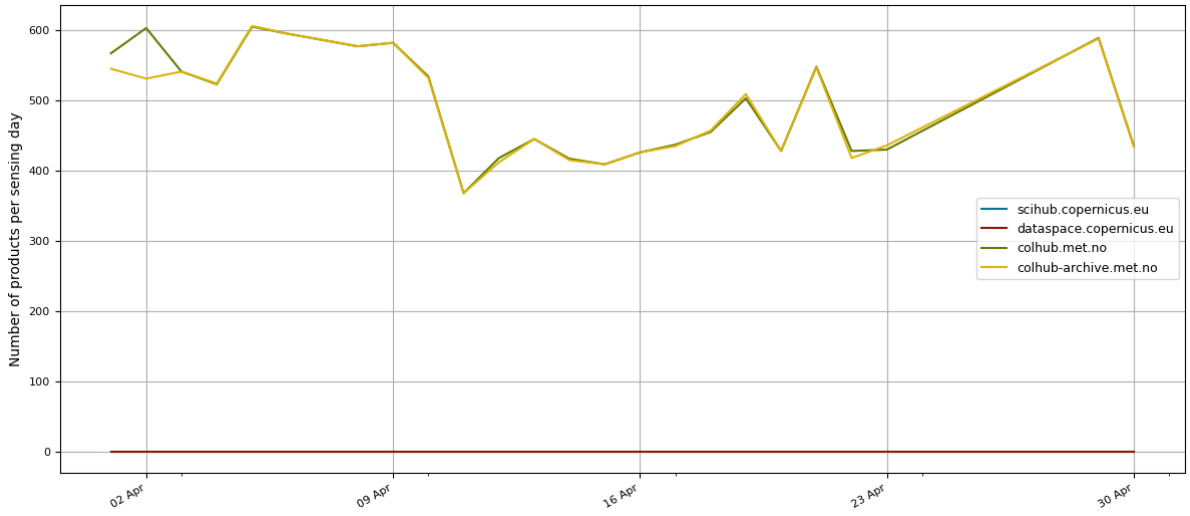
7.1 Products on portals

The following section contains an update on the Sentinel-5p products included in the different FEs and BEs.



The figure above represents the overall number of products present in the different BackEnds and FrontEnds per day for Sentinel-5p.

While the figure below shows a zoom on the last month.



A table is also included for more detailed information.

sensing_date	colhub.met.no	dataspace.copernicus.eu	colhub-archive.met.no
2024-04-01	567.0	0.0	545.0
2024-04-02	603.0	0.0	531.0
2024-04-03	541.0	0.0	541.0
2024-04-04	523.0	0.0	524.0
2024-04-05	605.0	0.0	606.0
2024-04-06	595.0	0.0	595.0
2024-04-07	586.0	0.0	586.0
2024-04-08	577.0	0.0	577.0
2024-04-09	582.0	0.0	582.0
2024-04-10	534.0	0.0	532.0
2024-04-11	368.0	0.0	368.0
2024-04-12	418.0	0.0	412.0
2024-04-13	445.0	0.0	445.0
2024-04-14	417.0	0.0	415.0
2024-04-15	409.0	0.0	409.0
2024-04-16	426.0	0.0	426.0
2024-04-17	437.0	0.0	435.0
2024-04-18	455.0	0.0	457.0
2024-04-19	503.0	0.0	509.0
2024-04-20	428.0	0.0	428.0
2024-04-21	548.0	0.0	547.0
2024-04-22	428.0	0.0	418.0
2024-04-23	430.0	0.0	436.0
2024-04-29	589.0	0.0	588.0
2024-04-30	435.0	0.0	434.0

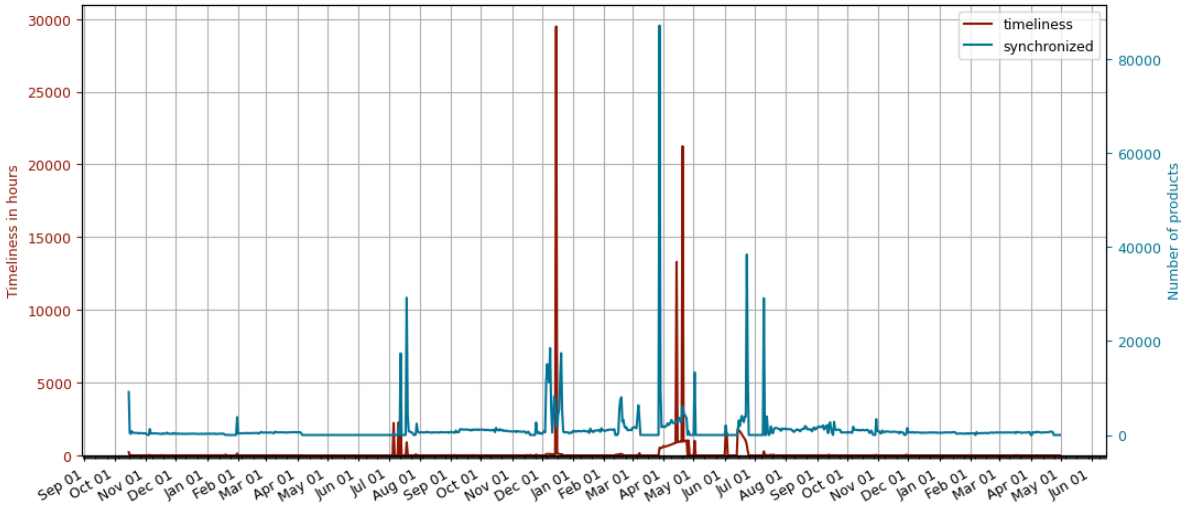
7.2 Missing products

The overall total number of Sentinel-5p products is 2860770. The number of overall Sentinel-5p missing products consists of 255396 images. This represents that a 900% of the total was included in MET Norway DHR, while a -800% was not included.

The total number of Sentinel-5p products in April is 452749. The number of Sentinel-5p missing products during April consists of 353685 images. This represents that a 0% of the total was included in MET Norway DHR, while a 100% was not included.

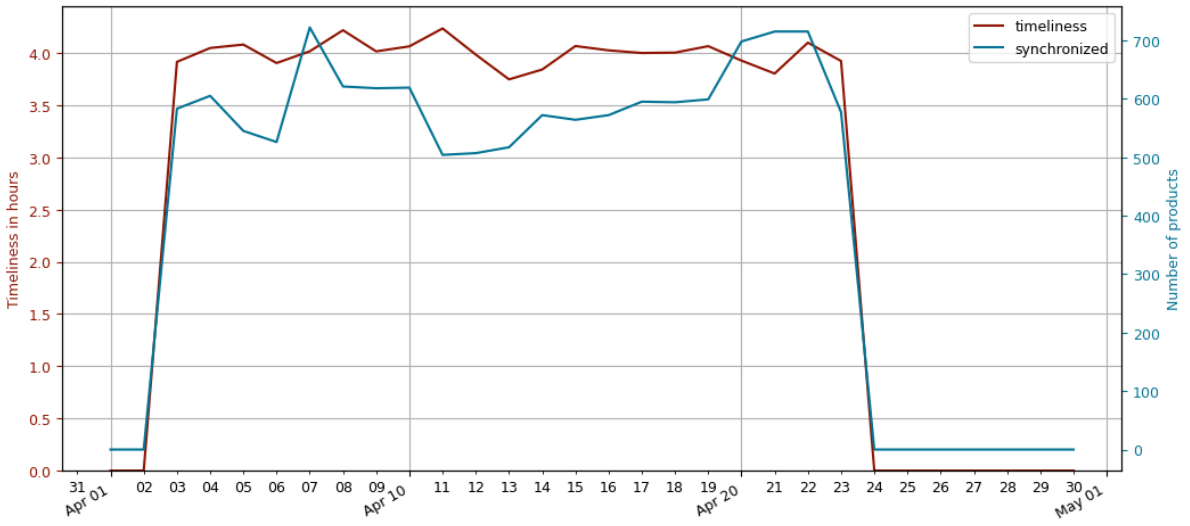
7.3 Data ingestion

In this section the time difference between sensing time and ingestion time at MET Norway is assessed. The ingestion time is the time at which a Sentinel product was downloaded to MET Norway BE and so, it is automatically available in at least one of the MET Norway FEs.



The figure above shows an overall status of the Sentinel-5p synchronization between ESA datahub and MET Norway BE. The number of products synchronized and deleted are represented by the dark and light blue lines respectively. The red line represents the timeliness.

Following previous sections, the graph below shows a zoom in the last month for the synchronization between ESA datahub and MET Norway BE.



A more detailed information is given in the table below where the last month are assessed for products synchronized from ESA.

day	size	number	timeliness
2024-04-01	0.000000	0	0.000000
2024-04-02	0.000000	0	0.000000
2024-04-03	378.563541	583	3.913192
2024-04-04	380.701414	605	4.046183
2024-04-05	381.042908	545	4.078923
2024-04-06	331.559815	526	3.902077
2024-04-07	441.544516	722	4.014577
2024-04-08	394.526196	621	4.216155
2024-04-09	378.173324	618	4.013722
2024-04-10	402.924917	619	4.061888
2024-04-11	366.606884	504	4.233300
2024-04-12	352.741870	507	3.982880
2024-04-13	347.990601	517	3.745648
2024-04-14	364.260926	572	3.839928
2024-04-15	376.306607	564	4.064833
2024-04-16	391.151333	572	4.023563
2024-04-17	374.232514	595	3.998371
2024-04-18	386.077045	594	4.002012
2024-04-19	378.182079	599	4.063572
2024-04-20	409.919105	698	3.925555
2024-04-21	397.566894	715	3.801678
2024-04-22	423.749725	715	4.097193
2024-04-23	374.034768	577	3.921422
2024-04-24	0.000000	0	0.000000
2024-04-25	0.000000	0	0.000000
2024-04-26	0.000000	0	0.000000
2024-04-27	0.000000	0	0.000000
2024-04-28	0.000000	0	0.000000
2024-04-29	0.000000	0	0.000000
2024-04-30	0.000000	0	0.000000

CHAPTER

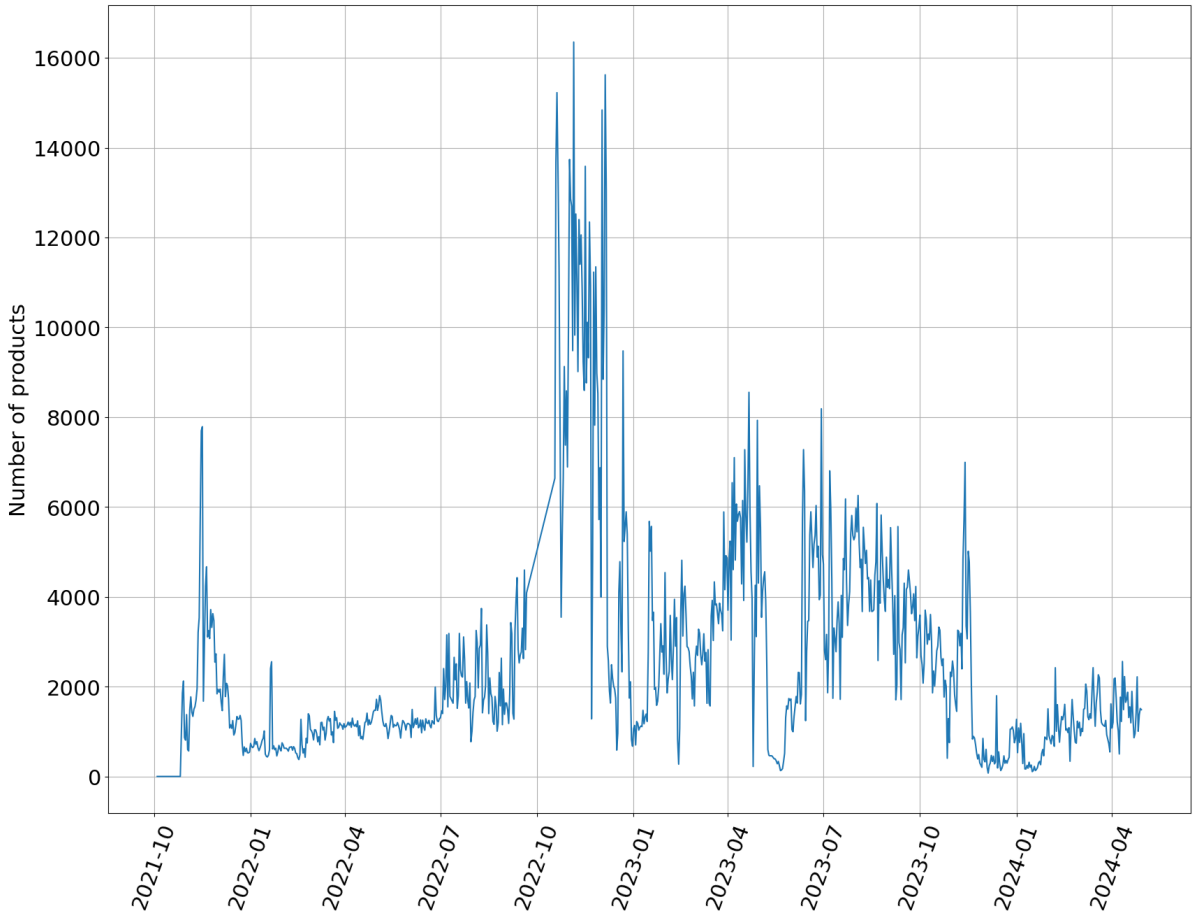
EIGHT

MONITORING DATA DOWNLOADS FROM COLHUB PORTALS

In this section the performance of the FrontEnds is analyzed, for both colhub.met.no and colhub-archive.met.no. The FEs performance is translated as user accessibility to the data which is one of the main goals for the project.

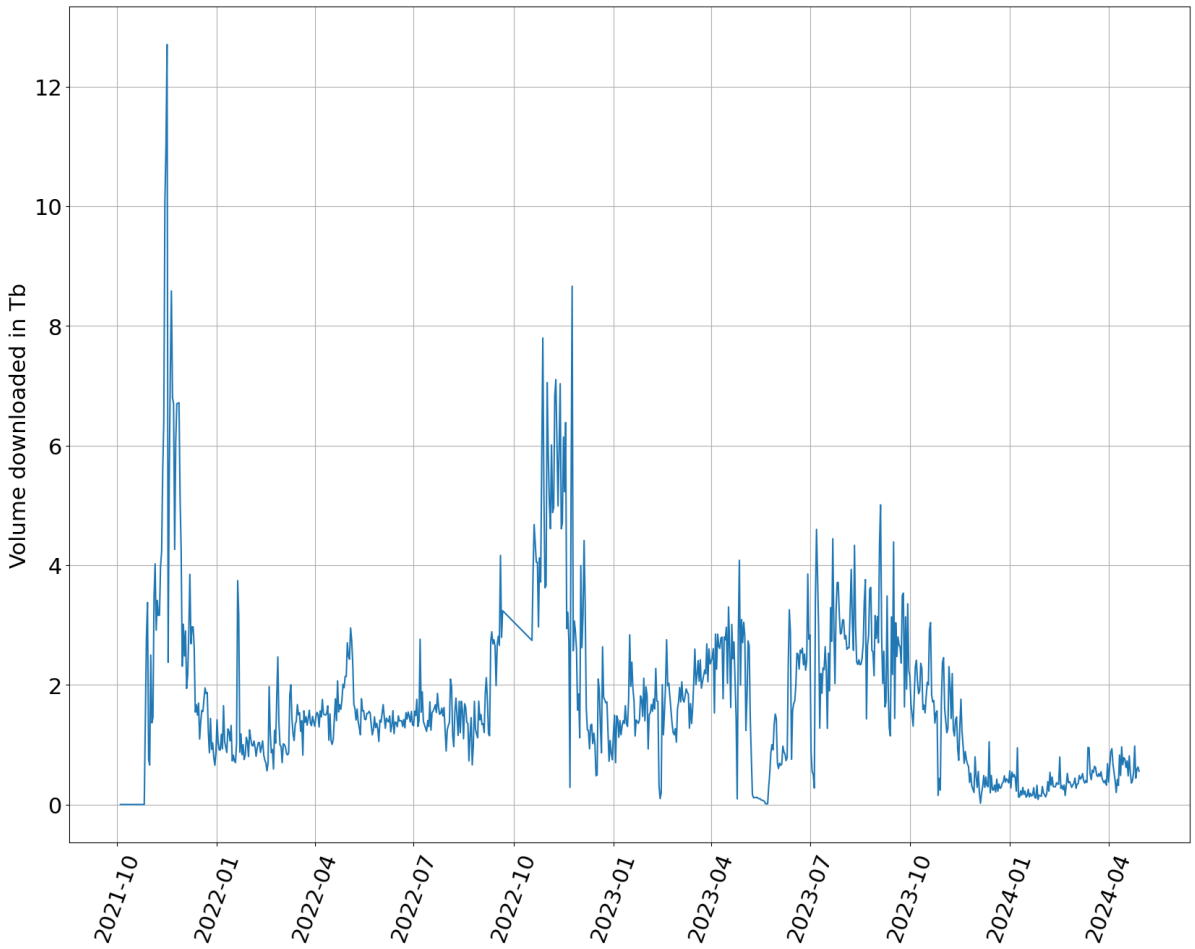
8.1 Portal: colhub.met.no

The first portal to analyze is colhub.met.no. The target of the analysis is to check the amount of data downloaded by users, but also the number of users accessing the datahub. Below the historical amount of data per day is represented.



The same data is also represented below, with a difference. This time the data is not accounted by number, but by volume. Although both graphs show similar trends, they are not exactly equal due to the variability in the ratio volume per product.

For instance, the seasonality of optical products could have an impact in the total volume of products.



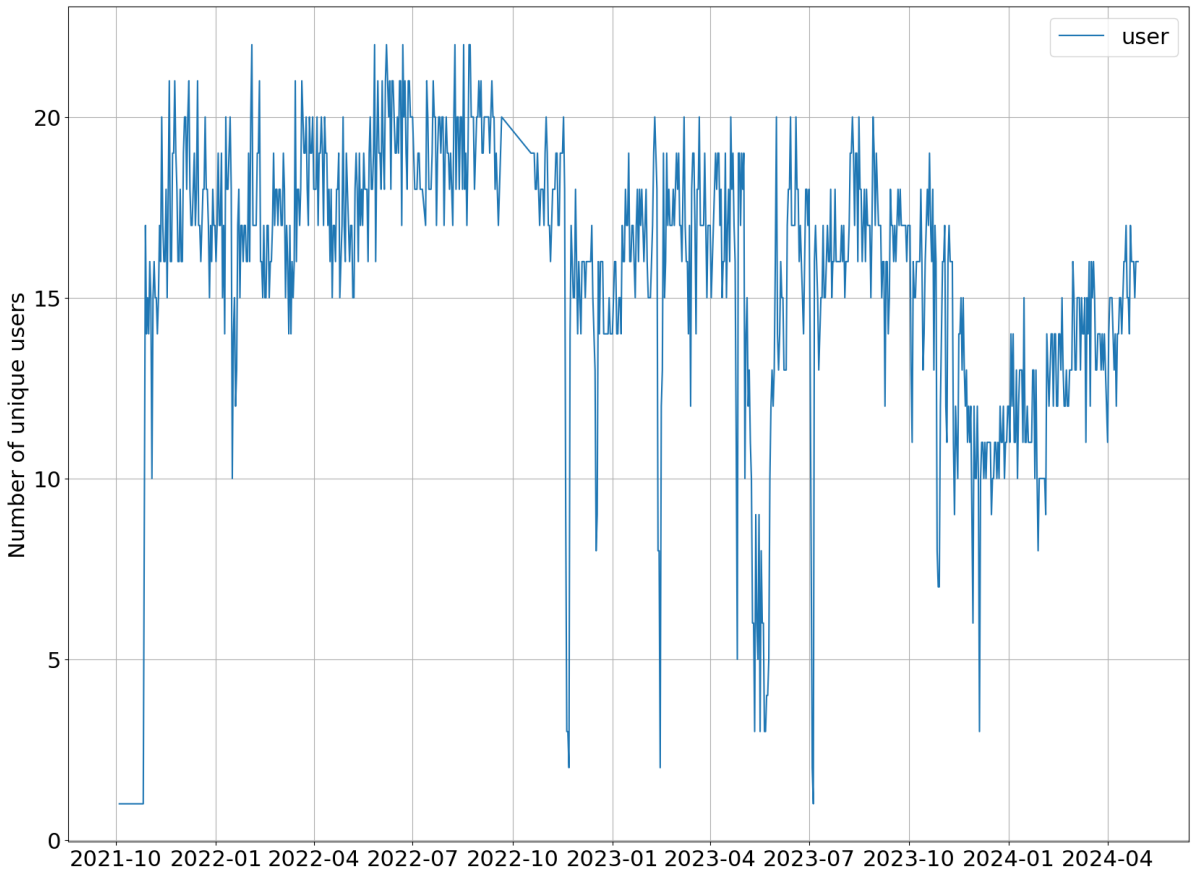
The table below is also interesting. It shows the amount of products downloaded for each the different Sentinel products. As expected, S1 and S2 are the most used Sentinels. S3 is slightly used, while S5p is not used.

```
satellite  product_type
S1         GRDH                242394
           GRDM                107889
           OCN                  91081
           RAW                 196352
           SLC                  62802
S2         MSIL1C              501710
           MSIL1C_DTERRENG       3100
           MSIL2A             1080760
S3         OLCI_L1               7715
           OLCI_L2                490
           SLSTR_L1              8688
           SLSTR_L2                12
           SRAL_L1                 23
           SRAL_L2                 84
           SYN_L2                  40
S5         NRTI_L2               7576
           OFFL_L1B                 3
           OFFL_L2                  6
dtype: int64
```

The following table shows the total downloaded volume of data in Tb per month. Here the seasonality of some Sentinel products can affect the final numbers.

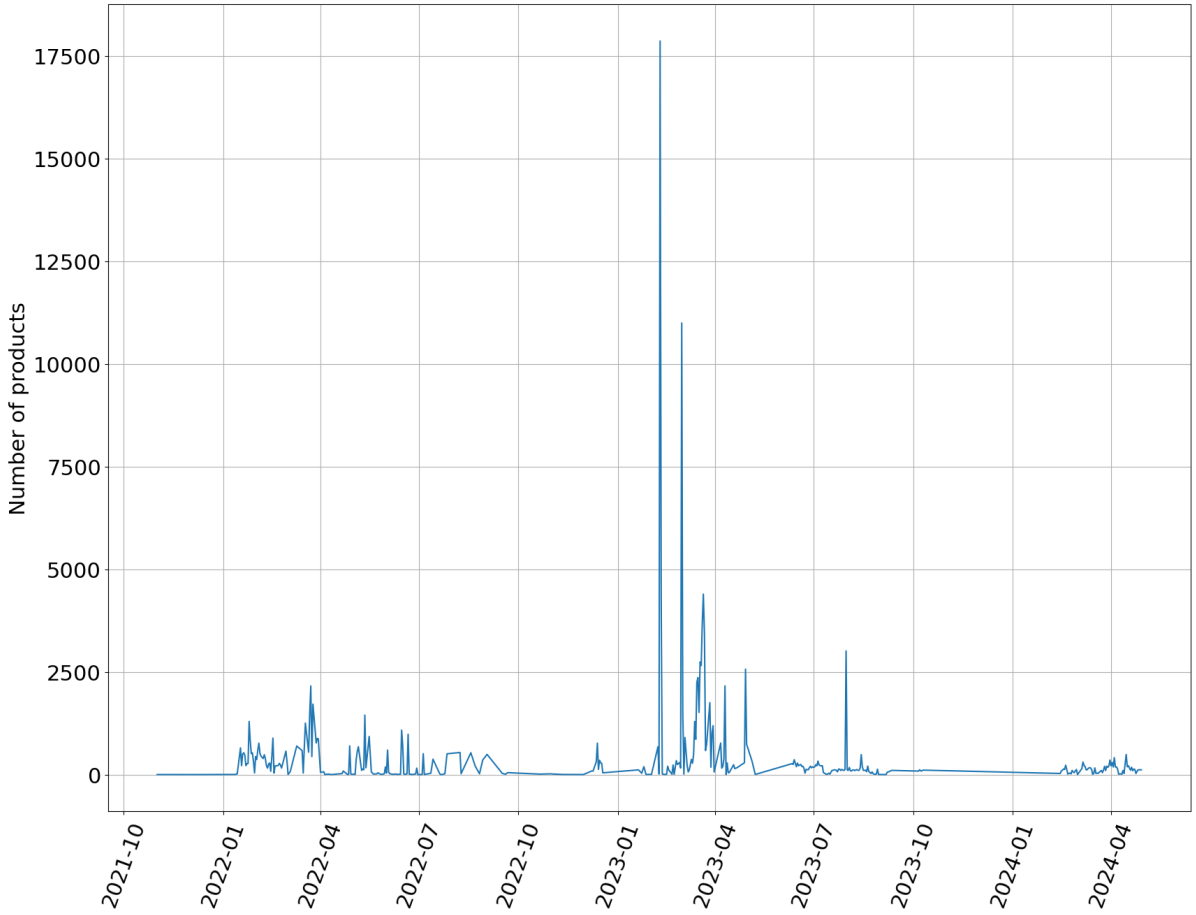
```
download_time  download_time
2021           10                7.588303
               11              158.654049
               12               57.675128
2022           1                36.406545
               2                29.798405
               3                39.869718
               4                46.768604
               5                51.219186
               6                42.277098
               7                44.565096
               8                42.852304
               9                47.447532
               10               60.491409
               11              141.031091
               12               50.957670
2023           1                48.169138
               2                41.604374
               3                61.866205
               4                74.137962
               5                25.676479
               6                54.858885
               7                78.211367
               8                88.075235
               9                80.195622
               10               54.828457
               11               33.878596
               12               10.909848
2024           1                 8.061366
               2                 9.525797
               3                15.088652
               4                17.515928
Name: size, dtype: float64
```

The number of users accessing and using the datahub is also important to be known. The plot below show the number of users per day. Some variability is represented in its numbers. Nevertheless, colhub.met.no is used by 15 to 20 users per day.



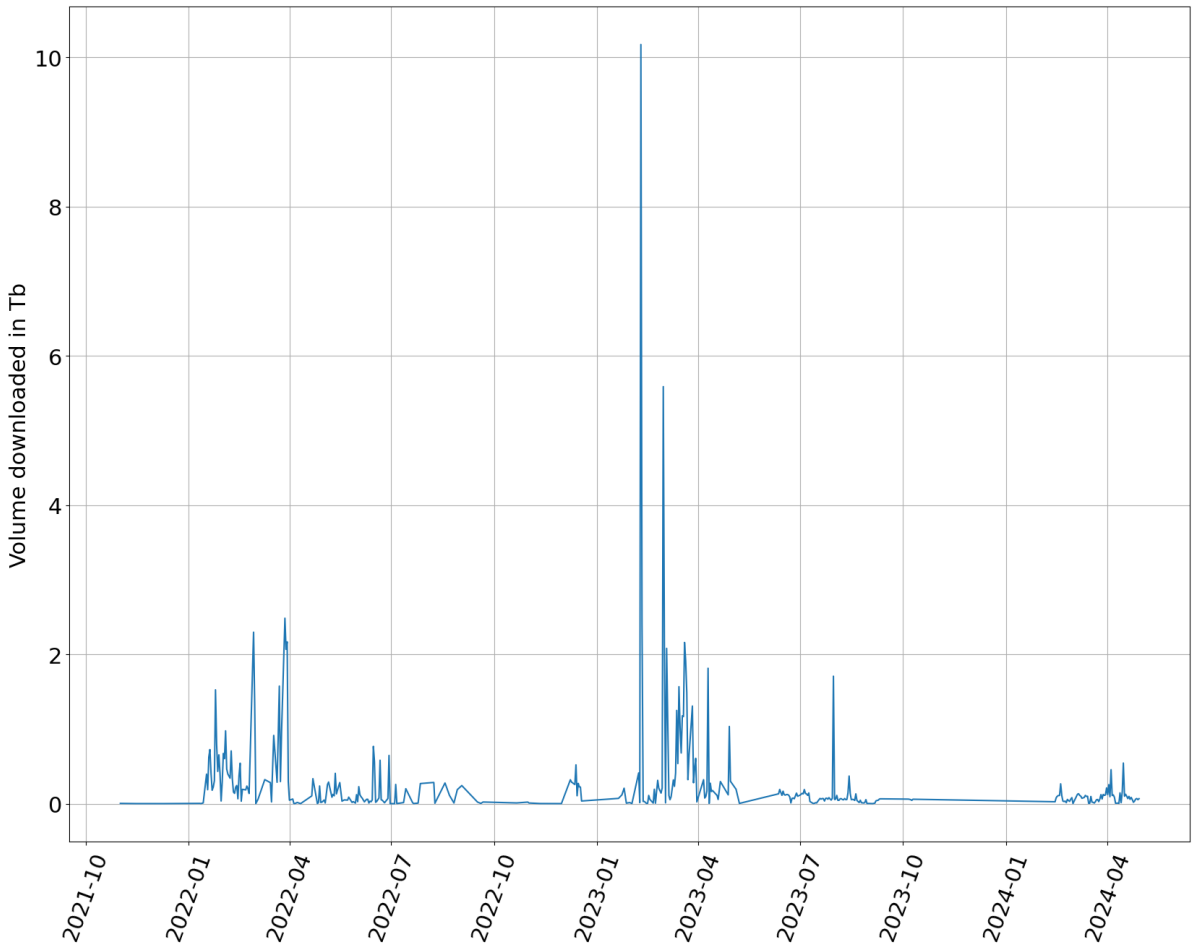
8.2 Portal: colhub-archive.met.no

Similar to colhub.met.no, here it is presented the performance of colhub-archive.met.no. First the number of products downloaded per day. As shown in the plot below, some days the number of products downloaded is null. This is a correct value which is not reflecting the performance of the FE. The archive is not as frequently accessed as colhub.met.no. Only those users looking for historical data will used this portal.



As explained and shown in the previous section, the total volume downloaded is also shown in the graphic below.

```
Index(['size', 'download_duration'], dtype='object')
```



It is still interesting to see the number of products downloaded per product type. As shown in the previous section, S1 and S2 still are the most popular Sentinels.

```
satellite  product_type
S1         GRDH                31559
           GRDM                 8788
           OCN                     1
           RAW                   875
           SLC                  3221
S2         MSIL1C              34588
           MSIL1C_DTERRENG     16832
           MSIL2A              49960
S3         OLCI_L1                 1
           SLSTR_L1              419
           SRAL_L1                 6
           SRAL_L2               159
S5         OFFL_L2                 2
dtype: int64
```

The table below shows the monthly retrieved volume of data in Tb.

```
download_time  download_time
2021           December          0.000696
               November          0.005186
```

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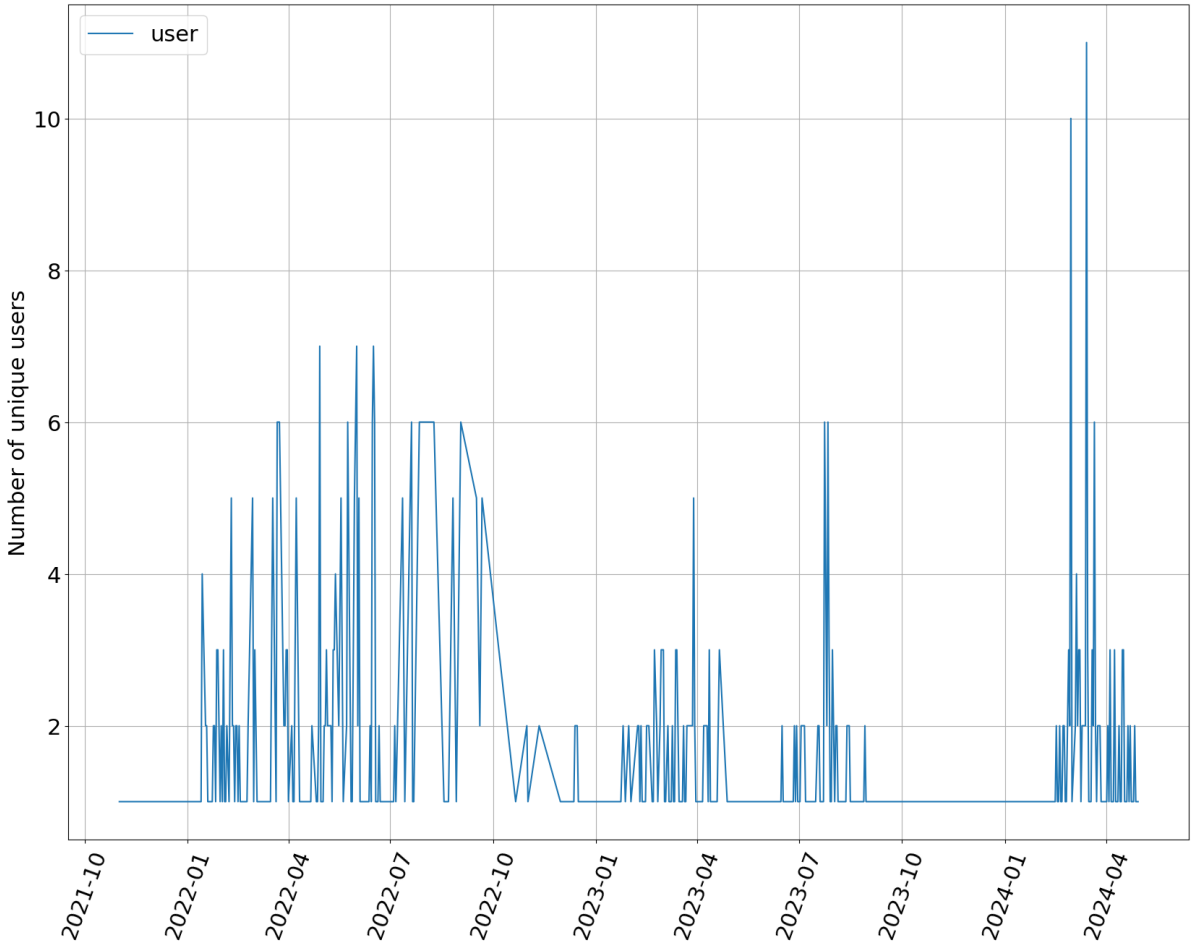
(continued from previous page)

```
2022           April             0.858194
               August            0.874257
               December          2.247264
               February          9.514969
               January           7.210722
               July              0.771705
               June              3.787335
               March            13.999207
               May               2.258999
               November          0.011412
               October           0.030705
               September         0.289683
2023           April             5.010196
               August            1.931697
               February         14.316868
               January           0.417223
               July              3.804772
               June              2.082679
               March            27.805556
               May               0.196331
               October           0.276372
               September         0.220003
2024           April             3.107244
               February          1.177107
               March             2.230899
Name: size, dtype: float64
```

The last graphic show the number of users accessing and downloading data from the portal. Again, the discontinuity in numbers of users it is not a sign of the portal performance.


user
Number of unique users
10
8
6
4
2
2021-10
2022-01
2022-04
2022-07
2022-10
2023-01
2023-04
2023-07
2023-10
2024-01
2024-04

CHAPTER

NINE

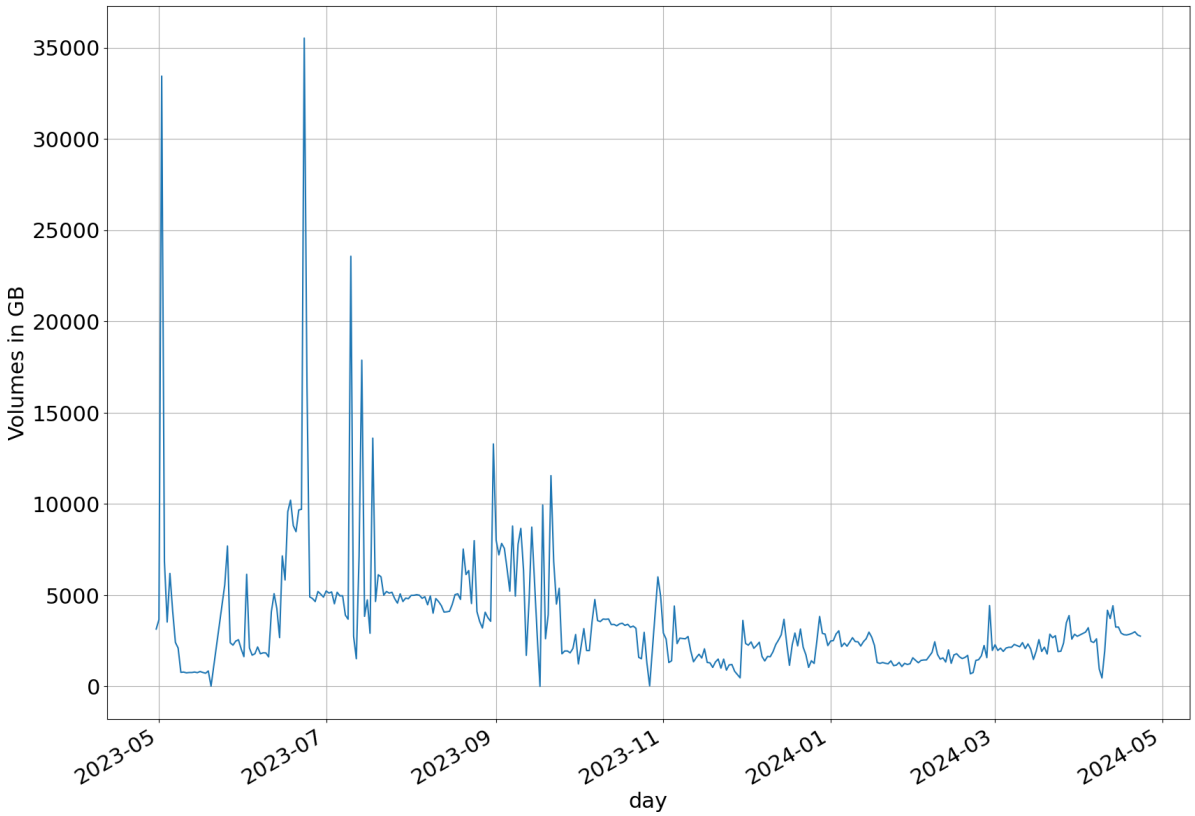
DATA VOLUMES FOR NBS

Satellite data storage requires an important amount of disk space, especially high resolution products such as the ones produced by the Sentinel constellation. This also represents an economical cost. Hence, it is very important to keep track of the total volume of data stored at MET Norway premises. In this section those numbers are shown.

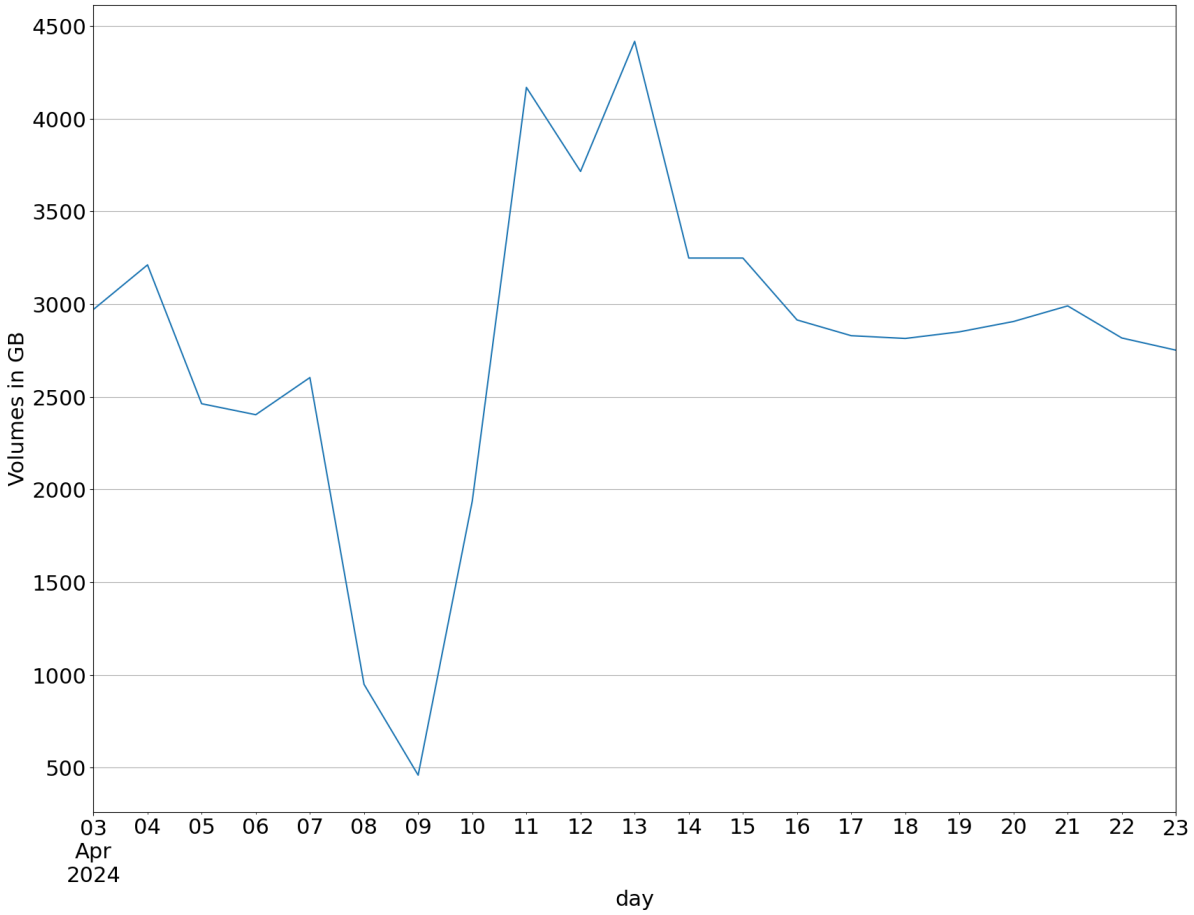
9.1 Volumes for AOI backends

Two type of products can be differentiated, products acquired from ESA datahub which keep the original format and Sentinel products transformed into NetCDF-CF. Those directly acquired from ESA are store at MET Norway BE for the AOI. Later on, they are made available to users through colhub-archive and colhub FEs.

The total amount of Sentinel products for the AOI, located in the AOI BE, represents 4618 TB



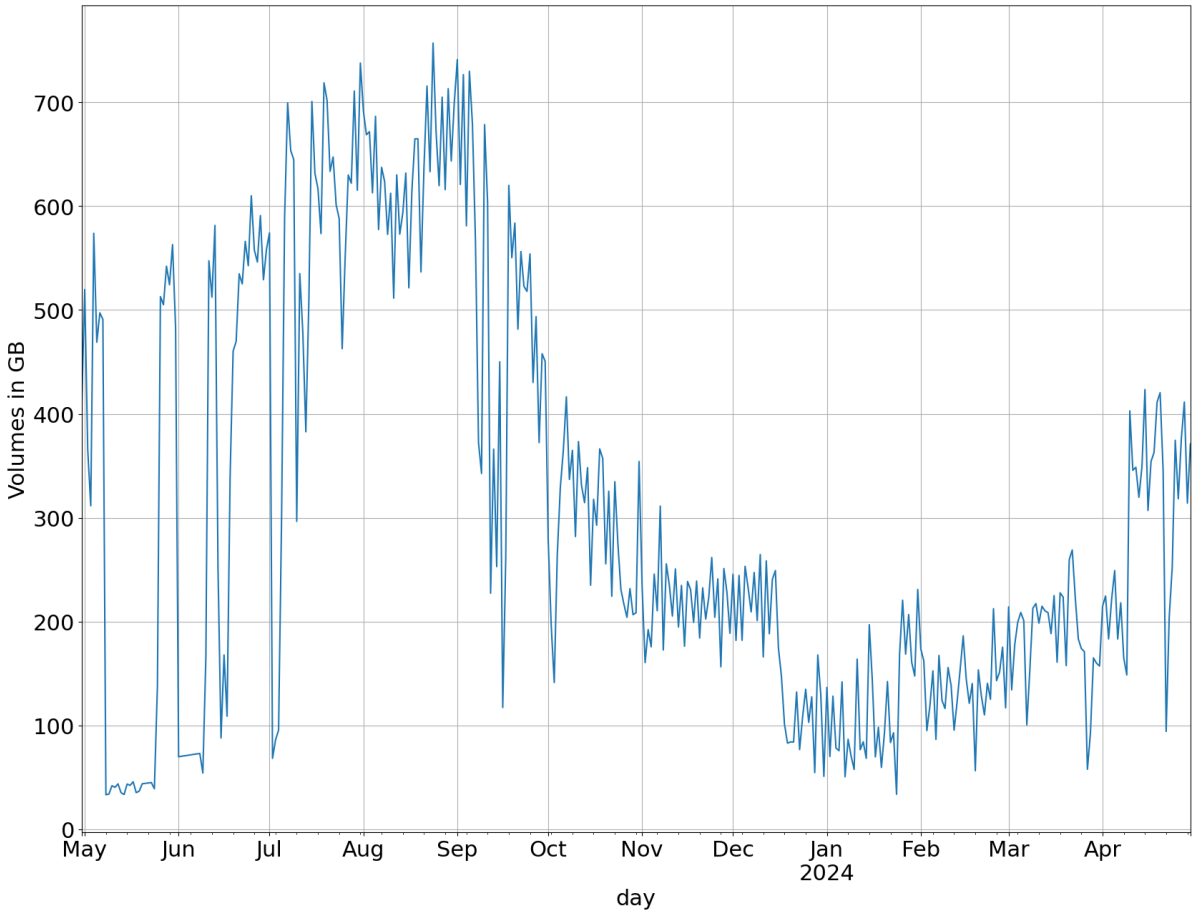
In the graphic above the volume of data per day in GB is shown for the last year. Here we can observed seasonality due to optical sensor products. The table below shows the same information for the last month.



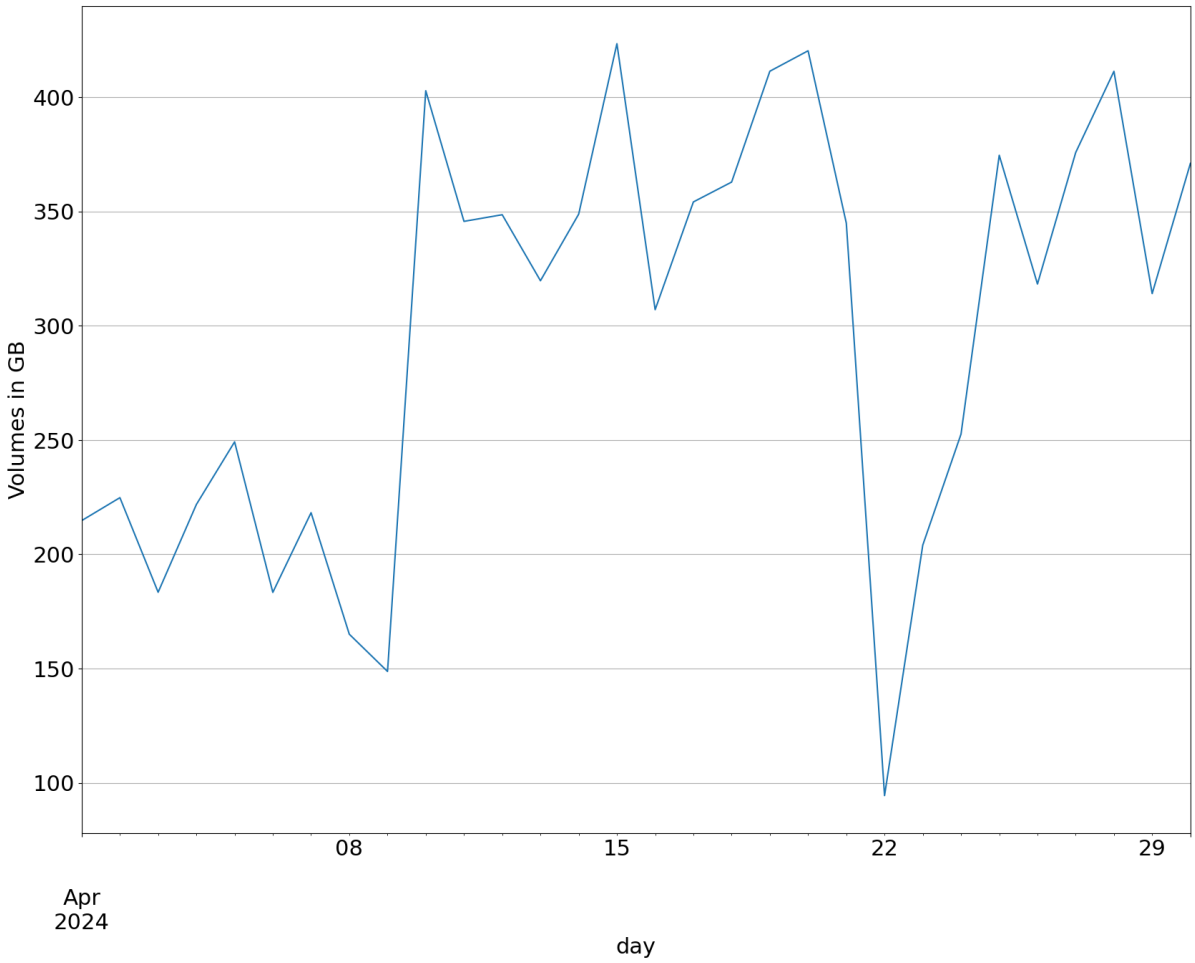
9.2 Volume for netcdf products

The products converted to NetCDF-CF are S1 and S2 products. These Sentinel datasets are served as SAFE format by ESA. This is not always convenient for users. Therefore as part of the NBS project, one of the MET Norway tasks as operator is to translate those products into NetCDF-CF.

The total amount of Sentinel-1 and Sentinel-2 products for the AOI transformed to NetCDF represents 915 TB

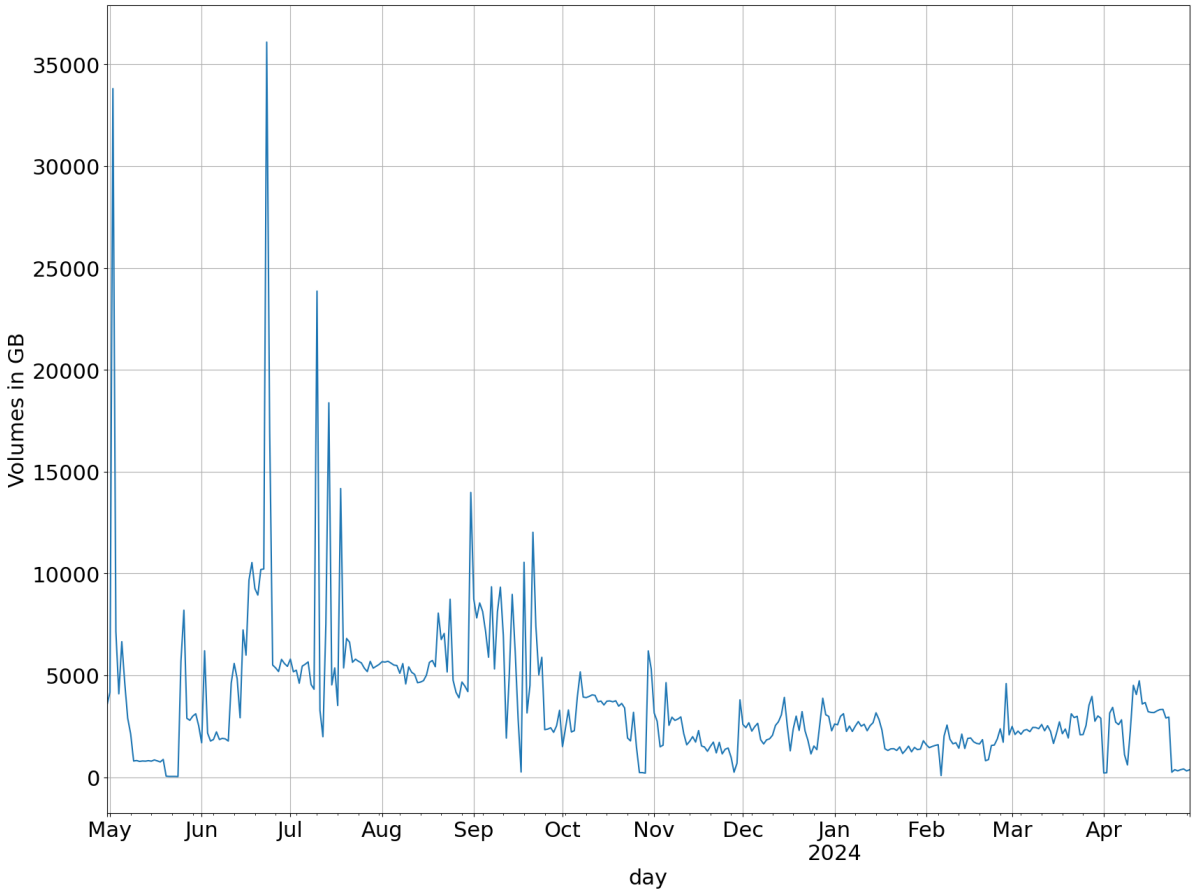


In the graphic above the volume of NetCDF-CF data per day in GB is shown for the last year. Here we can observed seasonality due to optical sensor products. The table below shows the same information for the last 30 days.



9.3 Totals

Finally, the total amount of disk space dedicated to the NBS project, including either products in SAFE and NetCDF formats, represents 5534 TB



In the graphic above the total volume of data per day in GB is shown for the last year. Here we can observed seasonality due to optical sensor products again. The table below shows the same information for the last month.

day	product_type	action	volume	number	timeliness
2024-04-03	GRDH	fscanner	55.935683	19.0	1.425016
2024-04-03	GRDH	synchronized	211.178787	128.0	21.557175
2024-04-03	GRDM	fscanner	2.082366	19.0	0.805341
2024-04-03	GRDM	synchronized	11.697360	30.0	11.641792
2024-04-03	OCN	synchronized	2.206584	116.0	21.690573
2024-04-03	RAW	synchronized	204.402697	145.0	14.762726
2024-04-03	SLC	synchronized	1012.442753	135.0	16.171668
2024-04-03	Unknown	deleted	0.000000	4.0	0.000000
2024-04-04	GRDH	fscanner	76.664914	26.0	0.916272
2024-04-04	GRDH	synchronized	101.244357	62.0	1.127645
2024-04-04	GRDM	fscanner	4.543284	42.0	0.762022
2024-04-04	GRDM	synchronized	5.582502	15.0	1.281645
2024-04-04	OCN	synchronized	1.029413	55.0	1.351029
2024-04-04	RAW	synchronized	105.512662	76.0	0.921226
2024-04-04	SLC	synchronized	483.219942	65.0	1.437376
2024-04-05	GRDH	fscanner	44.279871	18.0	0.587583
2024-04-05	GRDH	synchronized	68.696765	41.0	1.062942
2024-04-05	GRDM	fscanner	6.724559	35.0	0.607591
2024-04-05	GRDM	synchronized	9.449966	24.0	0.716163
2024-04-05	OCN	synchronized	1.234469	55.0	1.105078
2024-04-05	RAW	synchronized	86.765019	65.0	0.806929

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2024-04-05	SLC	synchronized	330.811380	43.0	1.427267
2024-04-06	GRDH	fscanner	73.362083	27.0	0.687310
2024-04-06	GRDH	synchronized	78.081588	47.0	1.006293
2024-04-06	GRDM	synchronized	5.586971	15.0	0.648936
2024-04-06	OCN	synchronized	0.878357	43.0	1.116555
2024-04-06	RAW	synchronized	86.422943	62.0	0.798100
2024-04-06	SLC	synchronized	376.246213	50.0	1.356329
2024-04-07	GRDH	fscanner	75.457630	28.0	0.791197
2024-04-07	GRDH	synchronized	78.231449	47.0	1.058538
2024-04-07	GRDM	synchronized	7.191726	20.0	0.625474
2024-04-07	OCN	synchronized	1.168954	58.0	1.132079
2024-04-07	RAW	synchronized	89.711826	67.0	0.843008
2024-04-07	SLC	synchronized	375.330252	49.0	1.461457
2024-04-08	GRDH	fscanner	58.149385	21.0	0.544611
2024-04-08	GRDH	synchronized	32.138609	19.0	1.213172
2024-04-08	GRDM	fscanner	0.536709	5.0	0.587266
2024-04-08	GRDM	synchronized	6.446519	18.0	1.038200
2024-04-08	OCN	synchronized	0.730979	29.0	1.270876
2024-04-08	RAW	synchronized	45.316065	37.0	0.937586
2024-04-08	SLC	synchronized	166.475494	22.0	1.489697
2024-04-09	GRDH	fscanner	68.482346	22.0	0.700356
2024-04-09	GRDM	fscanner	6.400498	38.0	0.656844
2024-04-10	GRDH	fscanner	46.658088	16.0	0.812311
2024-04-10	GRDH	synchronized	38.258892	23.0	48.852922
2024-04-10	GRDM	fscanner	6.636135	35.0	0.840750
2024-04-10	GRDM	synchronized	6.884421	18.0	8.879246
2024-04-10	OCN	synchronized	0.643664	29.0	16.847484
2024-04-10	RAW	synchronized	61.931687	47.0	10.835519
2024-04-10	SLC	synchronized	244.130917	32.0	6.984325
2024-04-11	GRDH	fscanner	69.351675	22.0	0.710980
2024-04-11	GRDH	synchronized	117.751979	71.0	36.842963
2024-04-11	GRDM	fscanner	3.796850	35.0	0.823527
2024-04-11	GRDM	synchronized	9.122863	25.0	31.255933
2024-04-11	OCN	synchronized	1.335792	60.0	29.357593
2024-04-11	RAW	synchronized	131.920542	96.0	36.851160
2024-04-11	SLC	synchronized	574.245944	76.0	56.482882
2024-04-12	GRDH	fscanner	51.455873	19.0	0.720516
2024-04-12	GRDH	synchronized	172.504113	105.0	16.504452
2024-04-12	GRDM	fscanner	4.107913	29.0	0.663519
2024-04-12	GRDM	synchronized	13.189963	33.0	11.429428
2024-04-12	OCN	synchronized	1.985452	99.0	11.529628
2024-04-12	RAW	synchronized	179.364295	129.0	15.625232
2024-04-12	SLC	synchronized	628.522735	83.0	16.336333
2024-04-13	GRDH	fscanner	66.604272	26.0	0.709875
2024-04-13	GRDH	synchronized	98.876516	60.0	1.114240
2024-04-13	GRDM	fscanner	6.559241	43.0	0.688861
2024-04-13	GRDM	synchronized	6.853768	18.0	1.053425
2024-04-13	OCN	synchronized	1.104847	54.0	1.260236
2024-04-13	RAW	synchronized	115.055332	82.0	0.931797
2024-04-13	SLC	synchronized	604.470789	82.0	1.631755
2024-04-14	GRDH	fscanner	68.393869	23.0	0.695989
2024-04-14	GRDH	synchronized	84.713838	51.0	1.123627
2024-04-14	GRDM	fscanner	3.045770	28.0	0.837431
2024-04-14	GRDM	synchronized	5.111210	13.0	2.286002
2024-04-14	OCN	synchronized	0.957980	50.0	2.035651
2024-04-14	RAW	synchronized	85.638928	61.0	0.928177

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2024-04-14	SLC	synchronized	401.512906	53.0	1.540906
2024-04-15	GRDH	fscanner	53.159759	18.0	0.921219
2024-04-15	GRDH	synchronized	86.302845	53.0	1.172461
2024-04-15	GRDM	fscanner	2.735203	25.0	0.714241
2024-04-15	GRDM	synchronized	6.434463	17.0	1.200580
2024-04-15	OCN	synchronized	1.011617	49.0	1.446030
2024-04-15	RAW	synchronized	103.066700	74.0	0.970580
2024-04-15	SLC	synchronized	406.455166	55.0	1.521143
2024-04-16	GRDH	fscanner	77.019621	26.0	0.836550
2024-04-16	GRDH	synchronized	99.415303	61.0	1.203160
2024-04-16	GRDM	fscanner	4.541951	42.0	0.761748
2024-04-16	GRDM	synchronized	5.100007	13.0	1.053398
2024-04-16	OCN	synchronized	1.005102	55.0	1.299516
2024-04-16	RAW	synchronized	103.845241	74.0	1.004578
2024-04-16	SLC	synchronized	482.446120	65.0	1.550686
2024-04-17	GRDH	fscanner	44.459305	18.0	0.602735
2024-04-17	GRDH	synchronized	68.697344	41.0	1.260173
2024-04-17	GRDM	fscanner	6.568946	34.0	0.610993
2024-04-17	GRDM	synchronized	9.451059	24.0	1.132823
2024-04-17	OCN	synchronized	1.233996	55.0	1.305073
2024-04-17	RAW	synchronized	86.068189	65.0	1.034421
2024-04-17	SLC	synchronized	330.807853	43.0	2.045291
2024-04-18	GRDH	fscanner	67.228445	25.0	0.671544
2024-04-18	GRDH	synchronized	69.384468	42.0	6.500679
2024-04-18	GRDM	fscanner	5.942342	40.0	0.730540
2024-04-18	GRDM	synchronized	5.587095	15.0	11.605079
2024-04-18	OCN	synchronized	0.823227	39.0	11.654523
2024-04-18	RAW	synchronized	77.690867	57.0	10.361216
2024-04-18	SLC	synchronized	314.661717	42.0	8.006127
2024-04-19	GRDH	fscanner	75.286028	28.0	2.931306
2024-04-19	GRDH	synchronized	86.927638	52.0	5.762377
2024-04-19	GRDM	fscanner	6.678936	38.0	2.902822
2024-04-19	GRDM	synchronized	7.191514	20.0	7.675960
2024-04-19	OCN	synchronized	1.225525	62.0	7.758176
2024-04-19	RAW	synchronized	97.301660	72.0	7.569232
2024-04-19	SLC	synchronized	436.903433	57.0	7.229238
2024-04-20	GRDH	fscanner	64.465669	23.0	0.545531
2024-04-20	GRDH	synchronized	85.296311	51.0	1.115809
2024-04-20	GRDM	fscanner	5.575393	40.0	0.597543
2024-04-20	GRDM	synchronized	6.372028	18.0	1.006905
2024-04-20	OCN	synchronized	0.998470	49.0	1.167016
2024-04-20	RAW	synchronized	96.109822	70.0	0.890273
2024-04-20	SLC	synchronized	393.506384	52.0	1.480699
2024-04-21	GRDH	fscanner	69.443995	23.0	0.712409
2024-04-21	GRDH	synchronized	94.443709	58.0	1.253117
2024-04-21	GRDM	fscanner	6.412570	38.0	0.656707
2024-04-21	GRDM	synchronized	6.721024	17.0	0.690227
2024-04-21	OCN	synchronized	1.148844	60.0	1.428639
2024-04-21	RAW	synchronized	104.059109	75.0	1.041969
2024-04-21	SLC	synchronized	467.081056	63.0	1.711805
2024-04-22	GRDH	fscanner	46.357156	16.0	0.802288
2024-04-22	GRDH	synchronized	65.582169	39.0	1.007974
2024-04-22	GRDM	fscanner	5.846693	30.0	0.595938
2024-04-22	GRDM	synchronized	9.789712	26.0	0.689569
2024-04-22	OCN	synchronized	1.237055	54.0	1.041329
2024-04-22	RAW	synchronized	84.512654	65.0	0.782248

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2024-04-22	SLC	synchronized	328.681910	43.0	1.532212
2024-04-23	GRDH	fscanner	69.528383	22.0	0.620092
2024-04-23	GRDH	synchronized	78.325655	48.0	1.167739
2024-04-23	GRDM	fscanner	3.697398	34.0	0.820179
2024-04-23	GRDM	synchronized	5.303473	14.0	0.858839
2024-04-23	OCN	synchronized	0.855684	44.0	1.022858
2024-04-23	RAW	synchronized	86.207015	62.0	0.815760
2024-04-23	SLC	synchronized	369.977981	50.0	1.353711
2024-04-03	MSIL1C	synchronized	331.176861	780.0	3.545768
2024-04-04	MSIL1C	synchronized	309.449760	726.0	6.344881
2024-04-05	MSIL1C	synchronized	353.768325	823.0	6.340168
2024-04-06	MSIL1C	synchronized	324.046826	754.0	2.507982
2024-04-07	MSIL1C	synchronized	342.472098	806.0	2.574635
2024-04-08	MSIL1C	synchronized	4.709750	55.0	16.287024
2024-04-10	MSIL1C	synchronized	111.155853	261.0	56.002026
2024-04-11	MSIL1C	synchronized	865.184264	1895.0	48.482046
2024-04-12	MSIL1C	synchronized	728.002808	1622.0	40.144687
2024-04-13	MSIL1C	synchronized	1321.865904	2911.0	32.092137
2024-04-14	MSIL1C	synchronized	691.519757	1542.0	10.292488
2024-04-15	MSIL1C	synchronized	990.019839	2164.0	8.550532
2024-04-15	Unknown	deleted	0.000000	1.0	0.000000
2024-04-16	MSIL1C	synchronized	586.114192	1293.0	3.167160
2024-04-17	MSIL1C	synchronized	666.771725	1438.0	5.190527
2024-04-18	MSIL1C	synchronized	654.413989	1436.0	3.115123
2024-04-19	MSIL1C	synchronized	665.907688	1425.0	7.795256
2024-04-20	MSIL1C	synchronized	640.307331	1467.0	3.300674
2024-04-21	MSIL1C	synchronized	625.169695	1443.0	4.084788
2024-04-22	MSIL1C	synchronized	618.054159	1389.0	4.795542
2024-04-23	MSIL1C	synchronized	613.818156	1409.0	4.533681
2024-04-03	MSIL2A	synchronized	761.881522	1345.0	5.172797
2024-04-04	MSIL2A	synchronized	734.517838	1280.0	5.893018
2024-04-05	MSIL2A	synchronized	809.264893	1424.0	5.715702
2024-04-06	MSIL2A	synchronized	768.731402	1342.0	3.879373
2024-04-07	MSIL2A	synchronized	815.779542	1423.0	3.781378
2024-04-08	MSIL2A	synchronized	64.702129	114.0	2.787427
2024-04-10	MSIL2A	synchronized	308.660059	527.0	31.705671
2024-04-11	MSIL2A	synchronized	1508.129215	2646.0	43.749978
2024-04-12	MSIL2A	synchronized	1175.508838	2068.0	35.801182
2024-04-13	MSIL2A	synchronized	1453.659788	2503.0	22.992667
2024-04-14	MSIL2A	synchronized	1167.603796	2047.0	5.723740
2024-04-15	MSIL2A	synchronized	812.606544	1412.0	5.346589
2024-04-16	MSIL2A	synchronized	747.168602	1293.0	3.772107
2024-04-17	MSIL2A	synchronized	857.755229	1458.0	5.620250
2024-04-18	MSIL2A	synchronized	828.397970	1426.0	3.372094
2024-04-19	MSIL2A	synchronized	696.603727	1179.0	6.920121
2024-04-20	MSIL2A	synchronized	779.168710	1425.0	3.594836
2024-04-21	MSIL2A	synchronized	819.221240	1485.0	4.183940
2024-04-22	MSIL2A	synchronized	806.494492	1427.0	5.325998
2024-04-23	MSIL2A	synchronized	737.832280	1344.0	3.619330
2024-04-04	OLCI_L1	synchronized	282.245319	383.0	24.940553
2024-04-04	OLCI_L2	synchronized	38.497170	371.0	25.287689
2024-04-04	SLSTR_L1	synchronized	185.838486	459.0	34.088466
2024-04-04	SLSTR_L2	synchronized	42.021322	687.0	35.205343
2024-04-04	SRAL_L1	synchronized	368.975583	233.0	58.878884
2024-04-04	SRAL_L2	synchronized	15.341811	586.0	58.304528
2024-04-04	SYN_L2	synchronized	76.690438	448.0	42.669697

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2024-04-05	OLCI_L1	synchronized	98.174963	130.0	6.456610
2024-04-05	OLCI_L2	synchronized	13.803383	130.0	4.412568
2024-04-05	SLSTR_L1	synchronized	71.520266	177.0	16.477428
2024-04-05	SLSTR_L2	synchronized	16.062912	263.0	20.493296
2024-04-05	SRAL_L1	synchronized	138.351786	83.0	38.801834
2024-04-05	SRAL_L2	synchronized	5.197929	198.0	40.143370
2024-04-05	SYN_L2	synchronized	28.224236	158.0	23.034021
2024-04-06	OLCI_L1	synchronized	94.357370	127.0	5.515672
2024-04-06	OLCI_L2	synchronized	13.847184	131.0	3.035120
2024-04-06	SLSTR_L1	synchronized	68.653438	170.0	5.956430
2024-04-06	SLSTR_L2	synchronized	15.286875	251.0	20.546203
2024-04-06	SRAL_L1	synchronized	133.904480	84.0	38.650061
2024-04-06	SRAL_L2	synchronized	5.380658	206.0	40.585933
2024-04-06	SYN_L2	synchronized	27.708941	156.0	23.896446
2024-04-07	OLCI_L1	synchronized	104.182017	137.0	11.008462
2024-04-07	OLCI_L2	synchronized	14.288779	132.0	7.229475
2024-04-07	SLSTR_L1	synchronized	67.450010	167.0	16.698487
2024-04-07	SLSTR_L2	synchronized	15.147197	250.0	22.940571
2024-04-07	SRAL_L1	synchronized	143.694535	87.0	38.569656
2024-04-07	SRAL_L2	synchronized	5.181333	199.0	39.660972
2024-04-07	SYN_L2	synchronized	27.595817	160.0	22.468539
2024-04-08	OLCI_L1	synchronized	41.267992	54.0	6.874769
2024-04-08	OLCI_L2	synchronized	7.891608	72.0	11.024069
2024-04-08	SLSTR_L1	synchronized	39.407171	98.0	20.535880
2024-04-08	SLSTR_L2	synchronized	10.081115	165.0	24.368264
2024-04-08	SRAL_L1	synchronized	63.121809	37.0	38.572613
2024-04-08	SRAL_L2	synchronized	2.052049	82.0	41.953701
2024-04-08	SYN_L2	synchronized	12.569542	63.0	41.599395
2024-04-09	SLSTR_L1	synchronized	0.393799	1.0	23.572331
2024-04-09	SLSTR_L2	synchronized	0.122669	2.0	23.488366
2024-04-09	SRAL_L1	synchronized	6.369665	11.0	26.980702
2024-04-09	SRAL_L2	synchronized	0.344597	21.0	27.547207
2024-04-10	OLCI_L1	synchronized	197.487129	255.0	37.258148
2024-04-10	OLCI_L2	synchronized	26.364573	239.0	36.840679
2024-04-10	SLSTR_L1	synchronized	88.720912	220.0	43.505769
2024-04-10	SLSTR_L2	synchronized	17.498725	288.0	46.830482
2024-04-10	SRAL_L1	synchronized	302.446511	159.0	78.660107
2024-04-10	SRAL_L2	synchronized	12.707714	435.0	78.729871
2024-04-10	SYN_L2	synchronized	65.210700	364.0	51.091480
2024-04-11	OLCI_L1	synchronized	140.280597	180.0	12.838273
2024-04-11	OLCI_L2	synchronized	18.352366	164.0	14.147054
2024-04-11	SLSTR_L1	synchronized	133.213742	330.0	32.788583
2024-04-11	SLSTR_L2	synchronized	30.291902	496.0	34.259625
2024-04-11	SRAL_L1	synchronized	156.297069	101.0	39.866436
2024-04-11	SRAL_L2	synchronized	5.546947	220.0	40.393481
2024-04-11	SYN_L2	synchronized	37.804277	202.0	23.415260
2024-04-11	Unknown	deleted	0.000000	1.0	0.000000
2024-04-12	OLCI_L1	synchronized	120.177002	152.0	9.781828
2024-04-12	OLCI_L2	synchronized	16.761552	148.0	4.288127
2024-04-12	SLSTR_L1	synchronized	75.828543	188.0	6.217287
2024-04-12	SLSTR_L2	synchronized	17.302170	283.0	20.462711
2024-04-12	SRAL_L1	synchronized	139.229012	86.0	38.805605
2024-04-12	SRAL_L2	synchronized	5.235955	201.0	40.415089
2024-04-12	SYN_L2	synchronized	34.202842	178.0	22.895914
2024-04-13	OLCI_L1	synchronized	117.288257	157.0	4.933810
2024-04-13	OLCI_L2	synchronized	16.736530	155.0	2.935328

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2024-04-13	SLSTR_L1	synchronized	70.672394	175.0	16.600193
2024-04-13	SLSTR_L2	synchronized	15.947487	262.0	19.224455
2024-04-13	SRAL_L1	synchronized	133.520976	81.0	39.420710
2024-04-13	SRAL_L2	synchronized	5.396739	209.0	39.916918
2024-04-13	SYN_L2	synchronized	34.993686	185.0	22.064101
2024-04-14	OLCI_L1	synchronized	98.529240	143.0	6.143352
2024-04-14	OLCI_L2	synchronized	15.763107	159.0	6.222455
2024-04-14	SLSTR_L1	synchronized	67.721802	168.0	16.637858
2024-04-14	SLSTR_L2	synchronized	16.166387	265.0	21.253524
2024-04-14	SRAL_L1	synchronized	138.164179	89.0	38.491810
2024-04-14	SRAL_L2	synchronized	5.400610	203.0	40.139094
2024-04-14	SYN_L2	synchronized	34.464158	195.0	20.904441
2024-04-15	OLCI_L1	synchronized	133.391592	188.0	11.061898
2024-04-15	OLCI_L2	synchronized	18.368280	181.0	12.191733
2024-04-15	SLSTR_L1	synchronized	75.848430	188.0	17.623385
2024-04-15	SLSTR_L2	synchronized	16.209992	266.0	22.589645
2024-04-15	SRAL_L1	synchronized	127.920521	82.0	38.577538
2024-04-15	SRAL_L2	synchronized	4.849049	195.0	39.359482
2024-04-15	SYN_L2	synchronized	34.215370	196.0	23.548514
2024-04-16	OLCI_L1	synchronized	129.271955	183.0	6.101793
2024-04-16	OLCI_L2	synchronized	17.068317	173.0	2.950630
2024-04-16	SLSTR_L1	synchronized	72.396518	179.0	16.294273
2024-04-16	SLSTR_L2	synchronized	17.310046	282.0	20.400095
2024-04-16	SRAL_L1	synchronized	139.164113	86.0	38.572602
2024-04-16	SRAL_L2	synchronized	5.090488	196.0	40.372964
2024-04-16	SYN_L2	synchronized	37.018047	211.0	22.426927
2024-04-17	OLCI_L1	synchronized	118.343449	170.0	5.535649
2024-04-17	OLCI_L2	synchronized	17.613557	176.0	4.451944
2024-04-17	SLSTR_L1	synchronized	70.073336	173.0	6.182106
2024-04-17	SLSTR_L2	synchronized	15.476473	254.0	19.536348
2024-04-17	SRAL_L1	synchronized	121.568171	75.0	38.701487
2024-04-17	SRAL_L2	synchronized	5.043810	200.0	39.171154
2024-04-17	SYN_L2	synchronized	36.121809	215.0	20.585798
2024-04-18	OLCI_L1	synchronized	126.344588	177.0	10.745004
2024-04-18	OLCI_L2	synchronized	18.495666	184.0	12.496406
2024-04-18	SLSTR_L1	synchronized	65.537086	162.0	4.442905
2024-04-18	SLSTR_L2	synchronized	14.914845	244.0	20.565724
2024-04-18	SRAL_L1	synchronized	138.615224	91.0	38.553398
2024-04-18	SRAL_L2	synchronized	5.280506	201.0	40.341200
2024-04-18	SYN_L2	synchronized	35.892831	212.0	22.873514
2024-04-18	Unknown	deleted	0.000000	1.0	0.000000
2024-04-19	OLCI_L1	synchronized	120.056618	171.0	9.911256
2024-04-19	OLCI_L2	synchronized	16.478007	166.0	8.212485
2024-04-19	SLSTR_L1	synchronized	69.590781	172.0	12.961971
2024-04-19	SLSTR_L2	synchronized	15.847037	260.0	23.885554
2024-04-19	SRAL_L1	synchronized	135.969629	83.0	44.690901
2024-04-19	SRAL_L2	synchronized	5.147306	204.0	44.045935
2024-04-19	SYN_L2	synchronized	35.647280	210.0	25.115258
2024-04-20	OLCI_L1	synchronized	131.774113	184.0	9.676631
2024-04-20	OLCI_L2	synchronized	18.653988	184.0	10.729693
2024-04-20	SLSTR_L1	synchronized	74.569751	184.0	16.272819
2024-04-20	SLSTR_L2	synchronized	16.892161	278.0	19.721179
2024-04-20	SRAL_L1	synchronized	140.745370	88.0	38.825689
2024-04-20	SRAL_L2	synchronized	5.114396	193.0	40.253160
2024-04-20	SYN_L2	synchronized	37.387766	214.0	21.893477
2024-04-21	OLCI_L1	synchronized	117.194870	165.0	6.122579

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2024-04-21	OLCI_L2	synchronized	17.124838	167.0	3.139031
2024-04-21	SLSTR_L1	synchronized	71.280834	176.0	5.019112
2024-04-21	SLSTR_L2	synchronized	15.471247	257.0	18.791947
2024-04-21	SRAL_L1	synchronized	136.206766	84.0	38.895618
2024-04-21	SRAL_L2	synchronized	5.522467	211.0	40.234011
2024-04-21	SYN_L2	synchronized	36.883205	209.0	21.485716
2024-04-22	OLCI_L1	synchronized	139.440857	193.0	9.531719
2024-04-22	OLCI_L2	synchronized	21.186668	204.0	11.430180
2024-04-22	SLSTR_L1	synchronized	66.681252	165.0	17.445579
2024-04-22	SLSTR_L2	synchronized	15.455716	261.0	22.794375
2024-04-22	SRAL_L1	synchronized	142.485686	89.0	38.597955
2024-04-22	SRAL_L2	synchronized	5.351949	207.0	39.602880
2024-04-22	SYN_L2	synchronized	36.926413	209.0	23.528282
2024-04-23	OLCI_L1	synchronized	129.039770	176.0	7.292899
2024-04-23	OLCI_L2	synchronized	17.510565	167.0	2.852236
2024-04-23	SLSTR_L1	synchronized	71.713190	176.0	7.541353
2024-04-23	SLSTR_L2	synchronized	16.193491	266.0	28.814026
2024-04-23	SRAL_L1	synchronized	138.825031	84.0	39.665031
2024-04-23	SRAL_L2	synchronized	5.223149	203.0	39.577921
2024-04-23	SYN_L2	synchronized	34.033748	190.0	28.522442
2024-04-03	NRTI_L2	synchronized	9.722402	297.0	1.884483
2024-04-03	OFFL_L1B	synchronized	305.171557	112.0	3.913192
2024-04-03	OFFL_L2	synchronized	63.669583	174.0	40.258403
2024-04-04	NRTI_L2	synchronized	9.086897	307.0	1.884597
2024-04-04	OFFL_L1B	synchronized	305.110561	112.0	4.046183
2024-04-04	OFFL_L2	synchronized	66.503956	186.0	41.686837
2024-04-05	NRTI_L2	synchronized	9.844898	315.0	1.884703
2024-04-05	OFFL_L1B	synchronized	327.119341	120.0	4.078923
2024-04-05	OFFL_L2	synchronized	44.078670	110.0	44.872968
2024-04-06	NRTI_L2	synchronized	10.366744	315.0	1.917861
2024-04-06	OFFL_L1B	synchronized	283.188385	104.0	3.902077
2024-04-06	OFFL_L2	synchronized	38.004686	107.0	60.251222
2024-04-07	NRTI_L2	synchronized	9.774885	297.0	1.884676
2024-04-07	OFFL_L1B	synchronized	324.608206	120.0	4.014577
2024-04-07	OFFL_L2	synchronized	107.161426	305.0	52.515458
2024-04-08	NRTI_L2	synchronized	9.306715	288.0	1.884654
2024-04-08	OFFL_L1B	synchronized	304.921496	112.0	4.216155
2024-04-08	OFFL_L2	synchronized	80.297984	221.0	41.206318
2024-04-09	NRTI_L2	synchronized	10.153468	324.0	1.951157
2024-04-09	OFFL_L1B	synchronized	302.625165	112.0	4.013722
2024-04-09	OFFL_L2	synchronized	65.394691	182.0	39.441928
2024-04-10	NRTI_L2	synchronized	10.898951	314.0	1.884580
2024-04-10	OFFL_L1B	synchronized	323.448720	118.0	4.061888
2024-04-10	OFFL_L2	synchronized	68.577246	187.0	39.602811
2024-04-11	NRTI_L2	synchronized	7.998385	251.0	1.905664
2024-04-11	OFFL_L1B	synchronized	304.949016	112.0	4.233300
2024-04-11	OFFL_L2	synchronized	53.659484	141.0	41.284479
2024-04-12	NRTI_L2	synchronized	9.824761	300.0	1.905817
2024-04-12	OFFL_L1B	synchronized	307.465132	112.0	3.982880
2024-04-12	OFFL_L2	synchronized	35.451977	95.0	53.742092
2024-04-13	NRTI_L2	synchronized	11.048777	324.0	1.905763
2024-04-13	OFFL_L1B	synchronized	305.038597	112.0	3.745648
2024-04-13	OFFL_L2	synchronized	31.903227	81.0	69.799481
2024-04-14	NRTI_L2	synchronized	11.274396	320.0	1.889281
2024-04-14	OFFL_L1B	synchronized	302.639649	112.0	3.839928
2024-04-14	OFFL_L2	synchronized	50.346881	140.0	76.569325

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2024-04-15	NRTI_L2	synchronized	9.397804	289.0	1.905629
2024-04-15	OFFL_L1B	synchronized	305.038426	112.0	4.064833
2024-04-15	OFFL_L2	synchronized	61.870377	163.0	81.222275
2024-04-16	NRTI_L2	synchronized	10.723437	306.0	1.905941
2024-04-16	OFFL_L1B	synchronized	327.053234	120.0	4.023563
2024-04-16	OFFL_L2	synchronized	53.374662	146.0	82.042692
2024-04-17	NRTI_L2	synchronized	11.471534	315.0	1.922325
2024-04-17	OFFL_L1B	synchronized	305.115675	112.0	3.998371
2024-04-17	OFFL_L2	synchronized	57.645306	168.0	92.129036
2024-04-18	NRTI_L2	synchronized	10.715608	296.0	1.922426
2024-04-18	OFFL_L1B	synchronized	305.036198	112.0	4.002012
2024-04-18	OFFL_L2	synchronized	70.325239	186.0	87.790374
2024-04-19	NRTI_L2	synchronized	10.171200	303.0	2.172379
2024-04-19	OFFL_L1B	synchronized	305.133275	112.0	4.063572
2024-04-19	OFFL_L2	synchronized	62.877604	184.0	93.319669
2024-04-20	NRTI_L2	synchronized	10.868175	319.0	1.939005
2024-04-20	OFFL_L1B	synchronized	302.619063	112.0	3.925555
2024-04-20	OFFL_L2	synchronized	96.431867	267.0	84.675064
2024-04-21	NRTI_L2	synchronized	11.277789	315.0	1.889069
2024-04-21	OFFL_L1B	synchronized	283.189938	104.0	3.801678
2024-04-21	OFFL_L2	synchronized	103.099168	296.0	68.548378
2024-04-22	NRTI_L2	synchronized	10.592416	315.0	1.886170
2024-04-22	OFFL_L1B	synchronized	312.435635	120.0	4.097193
2024-04-22	OFFL_L2	synchronized	100.721675	280.0	54.741951
2024-04-23	NRTI_L2	synchronized	10.789928	315.0	1.952944
2024-04-23	OFFL_L1B	synchronized	305.280675	112.0	3.921422
2024-04-23	OFFL_L2	synchronized	57.964166	150.0	49.169685
2024-04-01	s1_iw	NaN	3.790775	26.0	NaN
2024-04-01	s1_ew	NaN	21.651482	10.0	NaN
2024-04-01	s2_l1c	NaN	182.226295	305.0	NaN
2024-04-01	s2_l2a	NaN	7.080048	8.0	NaN
2024-04-02	s2_l1c	NaN	144.719296	247.0	NaN
2024-04-02	s2_l2a	NaN	1.517406	4.0	NaN
2024-04-02	s1_ew	NaN	70.741257	0.0	NaN
2024-04-02	s1_iw	NaN	7.814404	9.0	NaN
2024-04-03	s1_iw	NaN	6.683647	17.0	NaN
2024-04-03	s1_ew	NaN	9.069141	3.0	NaN
2024-04-03	s2_l1c	NaN	165.813164	298.0	NaN
2024-04-03	s2_l2a	NaN	1.826305	3.0	NaN
2024-04-04	s2_l2a	NaN	4.343040	8.0	NaN
2024-04-04	s1_iw	NaN	15.117458	28.0	NaN
2024-04-04	s1_ew	NaN	12.260639	5.0	NaN
2024-04-04	s2_l1c	NaN	190.074425	321.0	NaN
2024-04-05	s2_l2a	NaN	70.741520	0.0	NaN
2024-04-05	s2_l1c	NaN	146.987797	252.0	NaN
2024-04-05	s1_iw	NaN	3.461658	12.0	NaN
2024-04-05	s1_ew	NaN	28.028236	13.0	NaN
2024-04-06	s2_l1c	NaN	145.755203	265.0	NaN
2024-04-06	s1_iw	NaN	13.236317	4.0	NaN
2024-04-06	s1_ew	NaN	18.546230	7.0	NaN
2024-04-06	s2_l2a	NaN	5.798714	11.0	NaN
2024-04-07	s2_l2a	NaN	1.486172	4.0	NaN
2024-04-07	s2_l1c	NaN	195.969109	326.0	NaN
2024-04-07	s1_ew	NaN	17.954868	7.0	NaN
2024-04-07	s1_iw	NaN	2.798775	1.0	NaN
2024-04-08	s1_iw	NaN	14.174450	5.0	NaN

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2024-04-08	s1_ew	NaN	9.372486	4.0	NaN
2024-04-08	s2_l1c	NaN	70.740479	0.0	NaN
2024-04-08	s2_l2a	NaN	70.740479	0.0	NaN
2024-04-09	s2_l1c	NaN	126.109810	208.0	NaN
2024-04-09	s2_l2a	NaN	2.692326	4.0	NaN
2024-04-09	s1_iw	NaN	13.187576	23.0	NaN
2024-04-09	s1_ew	NaN	6.739643	4.0	NaN
2024-04-10	s1_iw	NaN	5.393208	13.0	NaN
2024-04-10	s1_ew	NaN	22.393497	11.0	NaN
2024-04-10	s2_l1c	NaN	304.377327	514.0	NaN
2024-04-10	s2_l2a	NaN	70.743191	0.0	NaN
2024-04-11	s2_l2a	NaN	5.942051	8.0	NaN
2024-04-11	s1_iw	NaN	3.335155	23.0	NaN
2024-04-11	s1_ew	NaN	14.700081	5.0	NaN
2024-04-11	s2_l1c	NaN	321.750614	527.0	NaN
2024-04-12	s2_l1c	NaN	317.103447	501.0	NaN
2024-04-12	s2_l2a	NaN	1.552258	4.0	NaN
2024-04-12	s1_iw	NaN	9.331734	12.0	NaN
2024-04-12	s1_ew	NaN	20.653843	9.0	NaN
2024-04-13	s2_l1c	NaN	280.024891	474.0	NaN
2024-04-13	s2_l2a	NaN	1.748035	3.0	NaN
2024-04-13	s1_iw	NaN	20.715466	31.0	NaN
2024-04-13	s1_ew	NaN	17.253052	8.0	NaN
2024-04-14	s1_iw	NaN	8.296913	12.0	NaN
2024-04-14	s1_ew	NaN	9.629494	4.0	NaN
2024-04-14	s2_l1c	NaN	325.503334	520.0	NaN
2024-04-14	s2_l2a	NaN	5.466248	8.0	NaN
2024-04-15	s2_l1c	NaN	337.096474	550.0	NaN
2024-04-15	s2_l2a	NaN	70.753319	0.0	NaN
2024-04-15	s1_iw	NaN	6.622936	17.0	NaN
2024-04-15	s1_ew	NaN	9.021744	3.0	NaN
2024-04-16	s1_iw	NaN	15.615372	29.0	NaN
2024-04-16	s1_ew	NaN	12.270844	5.0	NaN
2024-04-16	s2_l1c	NaN	272.092308	445.0	NaN
2024-04-16	s2_l2a	NaN	7.097832	8.0	NaN
2024-04-17	s1_iw	NaN	3.261543	12.0	NaN
2024-04-17	s1_ew	NaN	24.542919	12.0	NaN
2024-04-17	s2_l1c	NaN	324.865936	513.0	NaN
2024-04-17	s2_l2a	NaN	1.566154	4.0	NaN
2024-04-18	s2_l2a	NaN	1.732349	3.0	NaN
2024-04-18	s2_l1c	NaN	327.815170	539.0	NaN
2024-04-18	s1_ew	NaN	19.886429	9.0	NaN
2024-04-18	s1_iw	NaN	13.491638	27.0	NaN
2024-04-19	s1_iw	NaN	3.085056	9.0	NaN
2024-04-19	s1_ew	NaN	19.042461	11.0	NaN
2024-04-19	s2_l1c	NaN	318.528534	533.0	NaN
2024-04-19	s2_l2a	NaN	70.790783	0.0	NaN
2024-04-20	s2_l1c	NaN	325.124187	557.0	NaN
2024-04-20	s2_l2a	NaN	75.004307	0.0	NaN
2024-04-20	s1_iw	NaN	10.299835	29.0	NaN
2024-04-20	s1_ew	NaN	9.965332	6.0	NaN
2024-04-21	s1_iw	NaN	13.103348	23.0	NaN
2024-04-21	s1_ew	NaN	14.203957	6.0	NaN
2024-04-21	s2_l1c	NaN	310.730835	538.0	NaN
2024-04-21	s2_l2a	NaN	6.914490	8.0	NaN
2024-04-22	s2_l2a	NaN	23.090515	0.0	NaN

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2024-04-22	s1_iw	NaN	4.622894	8.0	NaN
2024-04-22	s1_ew	NaN	21.899124	10.0	NaN
2024-04-22	s2_l1c	NaN	44.777241	73.0	NaN
2024-04-23	s2_l1c	NaN	153.143353	253.0	NaN
2024-04-23	s2_l2a	NaN	1.609715	3.0	NaN
2024-04-23	s1_iw	NaN	34.807030	30.0	NaN
2024-04-23	s1_ew	NaN	14.473770	5.0	NaN
2024-04-24	s1_iw	NaN	19.067093	12.0	NaN
2024-04-24	s1_ew	NaN	20.563339	9.0	NaN
2024-04-24	s2_l1c	NaN	207.878906	349.0	NaN
2024-04-24	s2_l2a	NaN	5.084843	8.0	NaN
2024-04-25	s2_l1c	NaN	287.881828	495.0	NaN
2024-04-25	s2_l2a	NaN	23.090687	0.0	NaN
2024-04-25	s1_iw	NaN	46.741489	37.0	NaN
2024-04-25	s1_ew	NaN	16.947289	8.0	NaN
2024-04-26	s1_iw	NaN	33.185707	22.0	NaN
2024-04-26	s1_ew	NaN	9.528156	4.0	NaN
2024-04-26	s2_l1c	NaN	269.023582	436.0	NaN
2024-04-26	s2_l2a	NaN	6.568310	8.0	NaN
2024-04-27	s2_l2a	NaN	1.514442	4.0	NaN
2024-04-27	s1_iw	NaN	40.449879	25.0	NaN
2024-04-27	s1_ew	NaN	8.897320	3.0	NaN
2024-04-27	s2_l1c	NaN	325.005596	532.0	NaN
2024-04-28	s2_l1c	NaN	325.686394	537.0	NaN
2024-04-28	s2_l2a	NaN	1.490021	3.0	NaN
2024-04-28	s1_iw	NaN	70.344532	41.0	NaN
2024-04-28	s1_ew	NaN	13.888577	6.0	NaN
2024-04-29	s1_iw	NaN	18.944370	16.0	NaN
2024-04-29	s1_ew	NaN	28.134823	13.0	NaN
2024-04-29	s2_l1c	NaN	261.521324	451.0	NaN
2024-04-29	s2_l2a	NaN	5.512871	8.0	NaN
2024-04-30	s1_iw	NaN	45.508347	36.0	NaN
2024-04-30	s1_ew	NaN	19.579208	9.0	NaN
2024-04-30	s2_l1c	NaN	282.500160	471.0	NaN
2024-04-30	s2_l2a	NaN	23.524193	0.0	NaN

CHAPTER

TEN

PREVIOUS REPORTS

Below is a list of previous reports. If viewing the HTML version of this report online, you can click the link to download a PDF version of a previous report

- NBS_monthly_report_2024_01.pdf
- NBS_monthly_report_2024_02.pdf
- NBS_monthly_report_2024_03.pdf
- NBS_monthly_report_2024_04.pdf