EUMETSAT NWC SAF

SUPPORT TO NOWCASTING AND VERY SHORT RANGE FORECASTING

Report on 2024 Users Survey

NWC/CDOP4/SAF/AEMET/MGT/RP/UsersSurvey, Issue 1, Rev. 0.0

5 May 2025

Prepared by Leading Entity

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1.0d	17 March 2025	86	First version

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1 INTRODUCTION

1.1 PURPOSE

The purpose of the document is to report on 2024 User Survey for the CDOP4 User Requirements Collection process and to be aware of the needs and requests of our users in order to have a better proposal for next CDOP, the CDOP5.

1.2 SCOPE

The document contains information compiled about the use of both packages: MSG/GEO and PPS, the environment where the users are running the software, the use and valuation of each product and the users' needs in Nowcasting for the future. Besides, it has been added general information regarding the website or AGADUC and EUMETCAST.

1.3 DEFINITIONS AND ACRONYMS

See [RD.1.] for a complete list of acronyms for the NWCSAF project.

Apart from that, during this report, it has been used the initials NMS for "National Meteorological Service" and EMSu for "EUMETSAT Member State user".

1.4 REFERENCES

1.4.1 Reference documents

The reference documents contain useful information related to the subject of the project. These reference documents complement the applicable ones, and can be looked up to enhance the information included in this document if it is desired. They are referenced in this document in the form [RD.X]

For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. For undated references, the current edition of the document referred applies

Current documentation can be found at SAFNWC Helpdesk web: http://www.nwcsaf.org

Ref	Title	Code	Vers	Date
[RD.1.]	The Nowcasting SAF Glossary	NWC/CDOP4/SAF/AEMET/MGT/GLO	1.0.0	31/10/2023

Table 1: List of Referenced Documents

2 OVERVIEW OF THE CDOP-4 USER REQUIREMENTS PROCESS

2.1 INTRODUCTION

A major control point within the NWC SAF CDOP4 project is the 2024 Users' Survey. The objective of this landmark is to assess the current status of the project from the users' point of view and to collect user requirements for the next NWC SAF phase, CDOP5.

2.2 2024 USERS' SURVEY

A Questionnaire Form based on the SurveyMonkey web tool, containing aspects related to MSG/GEO and PPS products and engineering, besides other aspects as information about EUMETCAST or the website and ADAGUC, was prepared by the Project Team with the following objectives:

- Assess the current status of products and engineering.
- Know the Nowcasting needs.
- Collect new user requirements for CDOP4 and CDOP5.

SurveyMonkey is a US company that allows users to create online surveys.

3 SURVEY RESULTS

The Nowcasting SAF sent the survey to 443 users. In this group of users, it was counted the number of users registered in our website in that moment and the key users. The key users are those who were in the NWC SAF Document "NWCSAF Key Users Report" with code: NWC/CDOP4/SAF/AEMET/MNG/RP/01.

From all these users, only 64 answered the questionnaire. Not all of them responded to all the questions (79 in total).

The survey was divided into four sections and one final question: General Information, GEO Part, PPS Part and EUMETCAST. Not all the sections have the same number neither questions nor answers.

- General Information: 14 questions with a mean of 61 responses.
- GEO Part: 38 questions with a mean of 30 responses.
- PPS Part: 19 questions with a mean of 6 responses.
- EUMETCAST: 7 questions with a mean of 26 responses.

Between each part, there were questions about the desire of the user of going to other part or if they want to finish the survey.

The survey was anonymous, although there was a compulsory question (number one) which was asked if the survey respondent were from either a National Meteorological Service (NMS), a University/Research Center, a Private Company, Private User or Other.

Regarding the obligatory nature of the questions, only the first one (already mentioned) was mandatory, the rest of them (78) were optional.

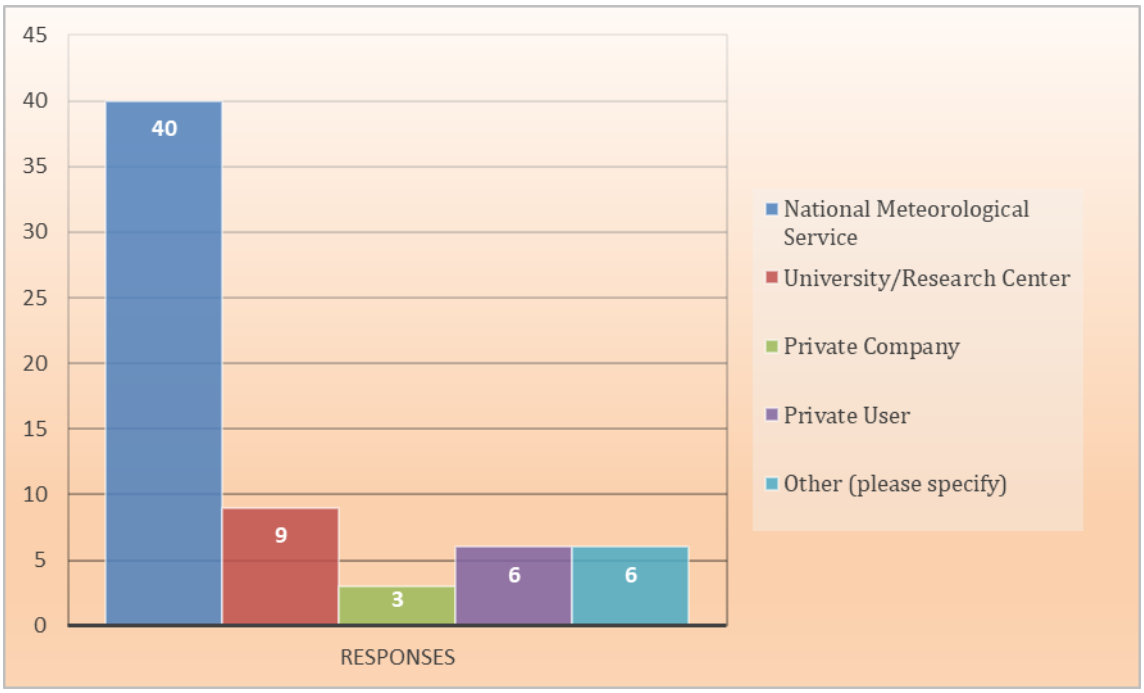
The 2024 Users Survey has proved the good shape of the NWCSAF products at the current phase and users have provided a lot of suggestions for the CDOP4 and the future phase, CDOP5, as shown below.

3.1 QUESTIONS OF THE SURVEY

In this section is going to be shown one by one the questions and their responses.

3.1.1 GENERAL INFORMATION

1. **Which of the following options fits best your type of user?** (Mandatory)



According to the results, 40 users belong different national meteorological service (NMS), 9 comes from Universities or Research centres, 3 from private companies, 6 are private users and the rest of them (6) comes from regional Meteorological Services or other type of organizations (EUMETSAT, internal organizations, etc).

A little research has been made and from these 40 users that declare that belong to NMS, 27 of them are from a EUMETSAT Member State. It can be found in the following table:

EUMETSAT Member State	**N. of users**	**EUMETSAT Member State**	**N. of users**
Belgium	2	Netherlands	1
Finland	2	Norway	2
France	1	Portugal	1
Germany	2	Romania	1

Greece	1	Slovakia	2
Hungary	1	Spain	1
Iceland	1	Sweden	1
Italy	1	Switzerland	2
Latvia	2	Türkiye	1
Lithuania	1	United Kingdom	1

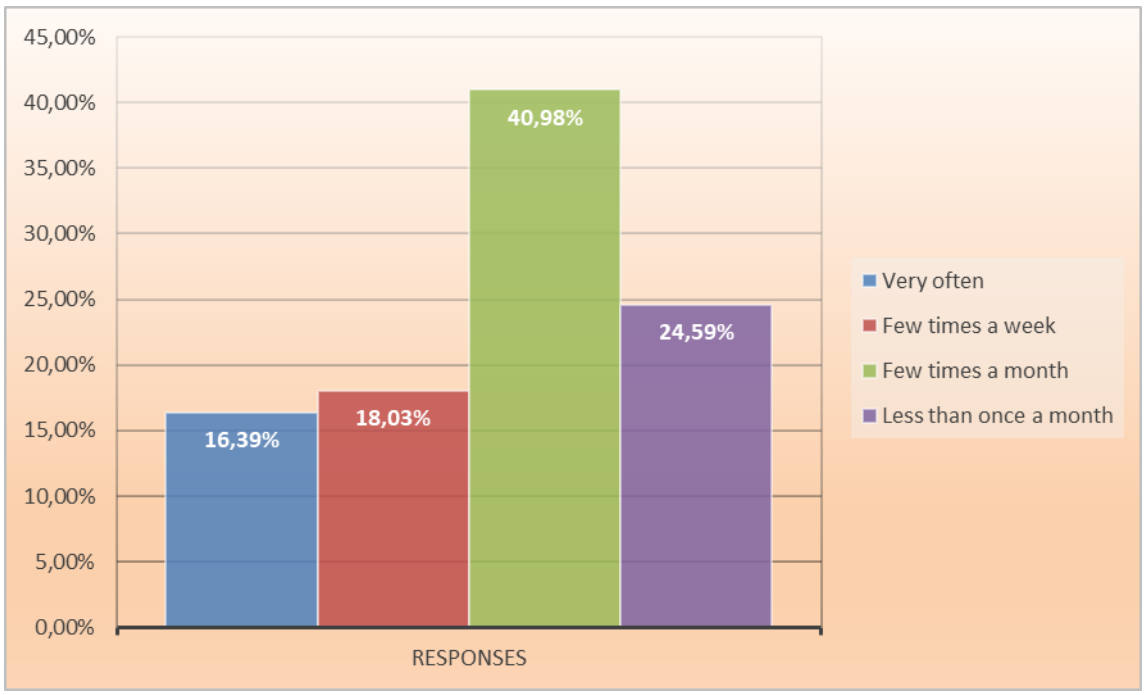
2. In case you work for an organization, would you be so kind to tell us the name of this?

This question has been answered by 46 people. All the responses have been written and can be gathered in: National Meteorological Services – EUMETSAT Member States, National Meteorological Services - Not EUMETSAT Member States, and others. In others there are names as private companies or other centres. All of them can be found in the following table:

Zambia Meteorological Department	Eumetsat	National Observatory of Athens
Finnish Meteorological Institute	DWD	Slovak Hydrometeorological Institute
Lithuanian Hydrometeorological Service	SMHI	Lithuanian Hydrometeorological Service
National Research Council of Italy - Institute of Atmospheric Science and Climate	Meandair B.V.	HungaroMet Hungarian Meteorological Service
Latvian Environment Geology and Meteorology Centre	Met Office	3BMeteo / Meteosolutions SRL
Slovak Hydrometeorological Institute	MeteoSwiss	Seychelles Meteorological Authority
Direction Générale de la Météorologie	KNMI	Finnish Meteorological Organisation
Royal Meteorological Institute of Belgium	EUMETSAT	Zambia Meteorological Department
Norwegian Meteorological Institute	Meteo-France	UW-Madison/SSEC/CIMSS
Latvian Environment Geology and Meteorology Centre	DWD	National Observatory of Athens
Australian Bureau of Meteorology	ARPA Lombardia	Meteoswiss
Space Application Centre, ISRO	MET NORWAY	Ghana Meteorological Agency
Hellenic National Meteorological Service	AEMET	University of Cologne
Namibia Meteorological Service	Reuniwatt	EUMETSAT
ECCC (Environment and Climatic Change Canada)	Reuniwatt	Euskalmet
Royal Meteorological Institute of Belgium		

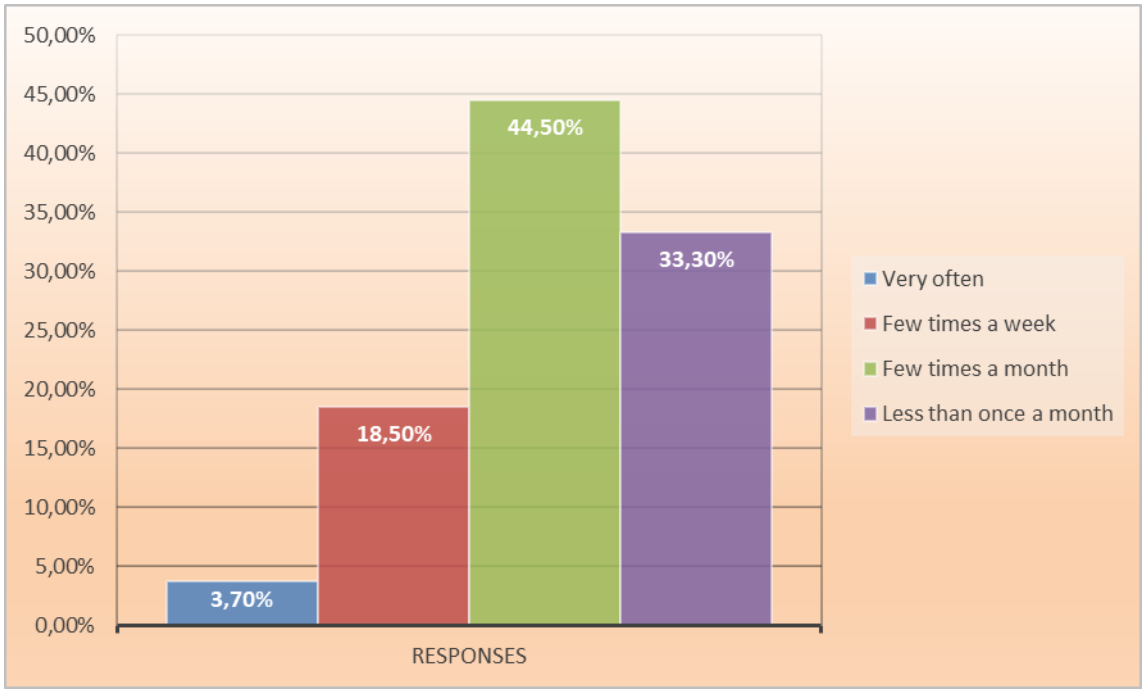
3. How often do you access NWC SAF website (www.nwcsaf.org)?

NWC SAF website is an important tool to be in touch with our users. This question was answered by 61 people.



As it can be seen, the majority of the people use our website few times a month. The second most chosen one is “Less than once a month”. It can be thought that is a high pertenage, but if we compare this option with the rest (that can be considere people aware of what happens in NWC SAF) we see that is a minority.

Regarding EUMETSAT Member States users (EMSu), the graph is the following:



It can be seen than the tendecy is the same, the highest one is "Few times a month". If we consider the option "Less than once a month", the pertange is higher if it consider only the EMSu.

4. Could you please rate the usefulness of the NWC SAF website?

In this question user had to select the mark they consider our website deserved, from 1 (minimum mark) to 10 (maximum mark). After this, the software did a simple average of all the marks. Users have considered our website must have a score of **8.21**.

If we only consider the marks of the EMSu, the score is out **7.93** of 10.

5. How do you think NWC SAF website could be improved? In which way?

18 responses have this question. Some of them aren't related with a real improvement of our website, for example there're answers about the inclusion of other satellites in our website, other users said that they have nothing to say.

Regarding responses that are related with NWC SAF website, some users specify it would be helpful if there was a **mobile version** of if some writings were larger. Besides, there're more responses as having more quick start guides or **having documents with more friendly names instead of having codes**. Respecting the use of the products, some responses are about a quick guide or videos about the use of our products.

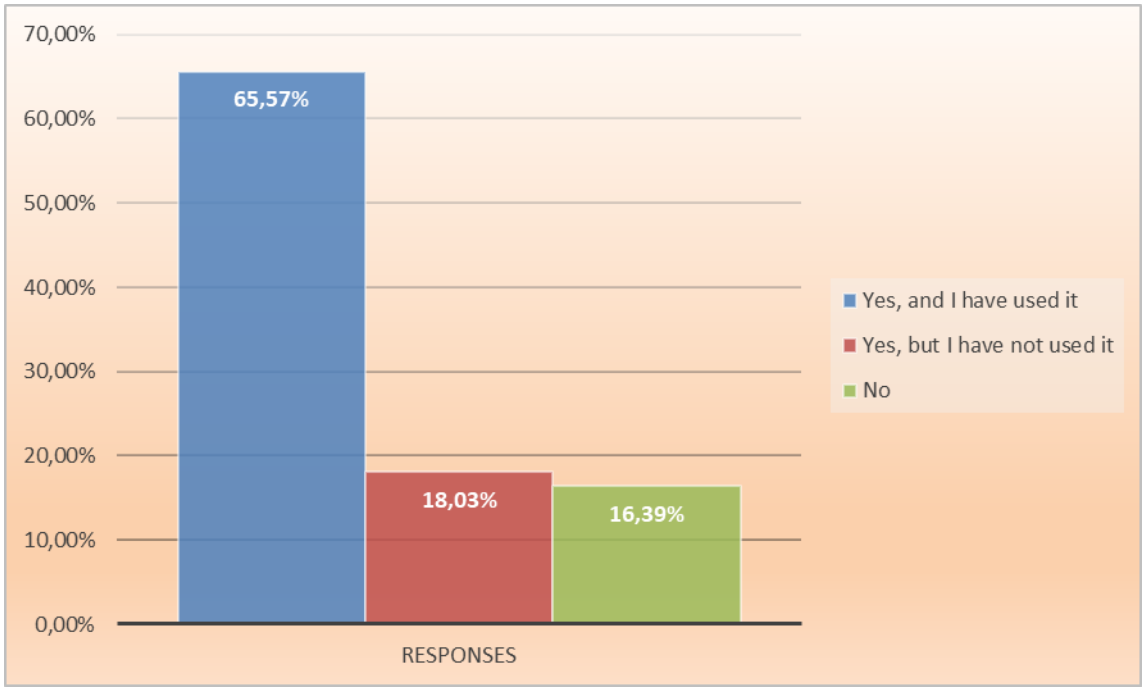
One answer was about ADAGUC. A user request was the implementation of EWC in ADAGUC (something is already done).

It must be clear that we have already gathered these points of view and they are going to be implemented in the new website version if we can.

The ones that belong to EMSu are in bold.

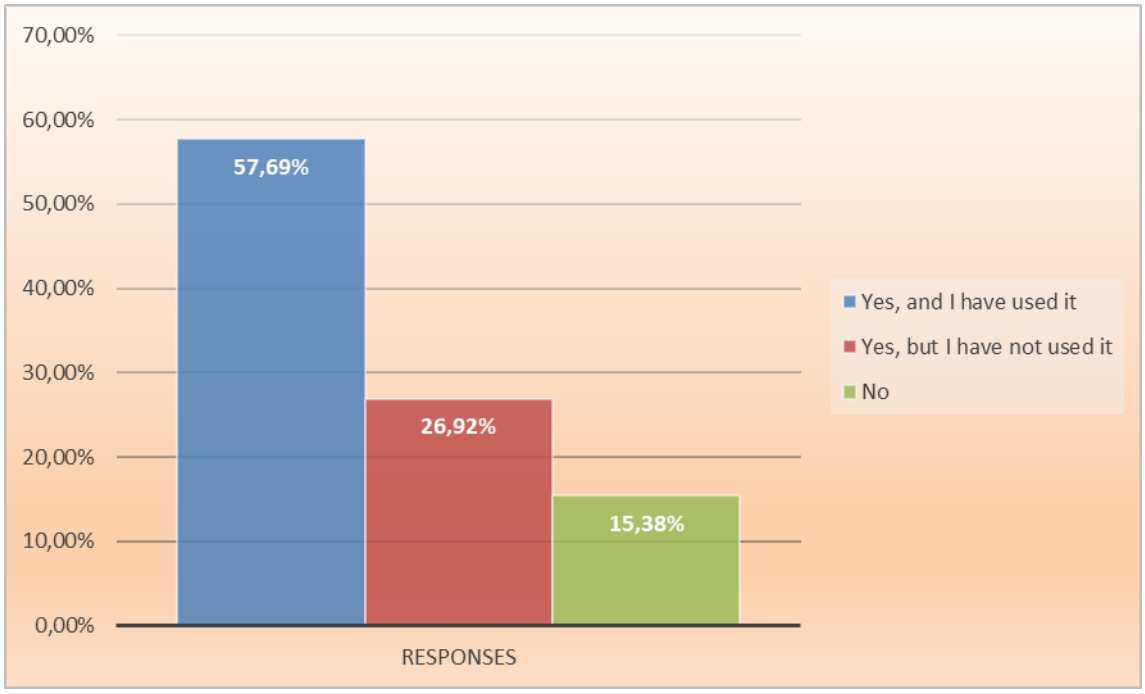
6. Do you know about our ticket system?

In this question, a knowledge of the ticket system wanted to be found and 61 people answered it. The following graphic shows the result.



Even the user has either use or no our ticket system, there's a huge knowledge of this way of solving doubts; as we see, more than 83% of users are aware of this.

For EMSu, 26 were the responses.



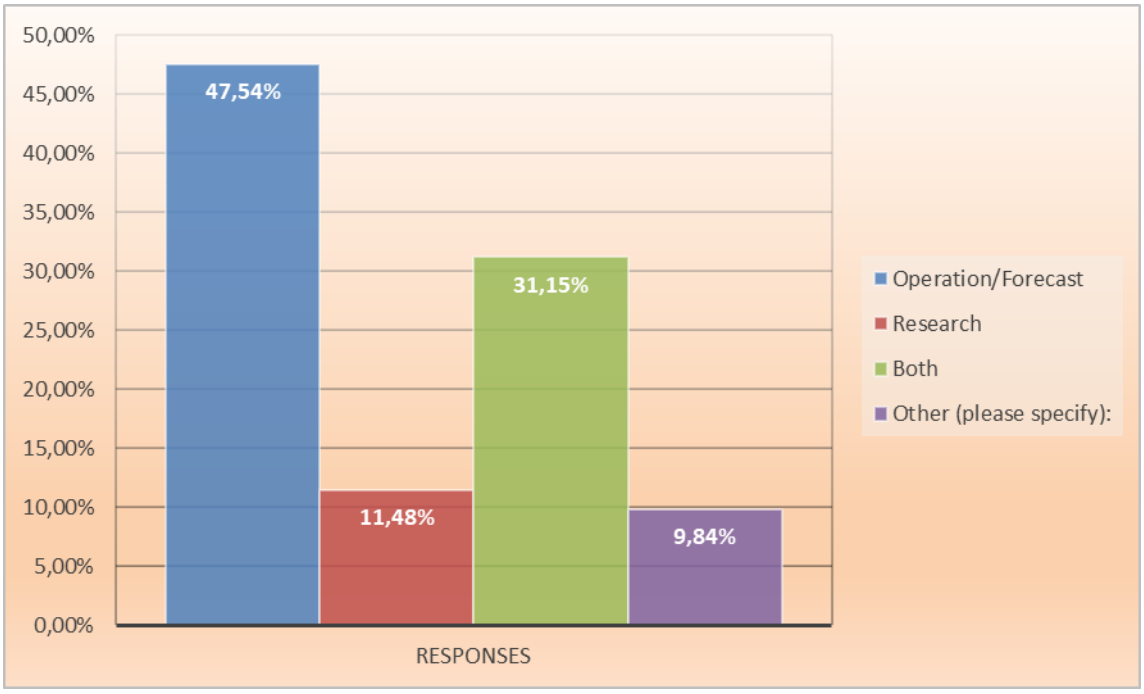
7. Could you value our ticket system?

Again, it was asked to our users to score our ticket system. Again, it was taken the average of their marks out of 10. The number of answers is considerably lower than other questions, 46 people.

The score for our ticket system is **8.65** out of 10. A very good mark. If it's only considered the EMSu, the score is **8.64**, practically the same.

8. What is the main use you make of NWC SAF products?

We wanted to know the purpose of our products. Do our users use them for operation/forecast or for research, both or other? The number of answers is 61 and the question only let choose one option.



The majority of our users generate our products for a operation/forecast purpose. If we add the options "operation/forecast" and "both", we have that more than 78% of the use of our products are for nowcasting and very short range forecasting (the way we use the word "operation").

For research, less than the half of the use is for this purpose (we have added "reseach" and "both").

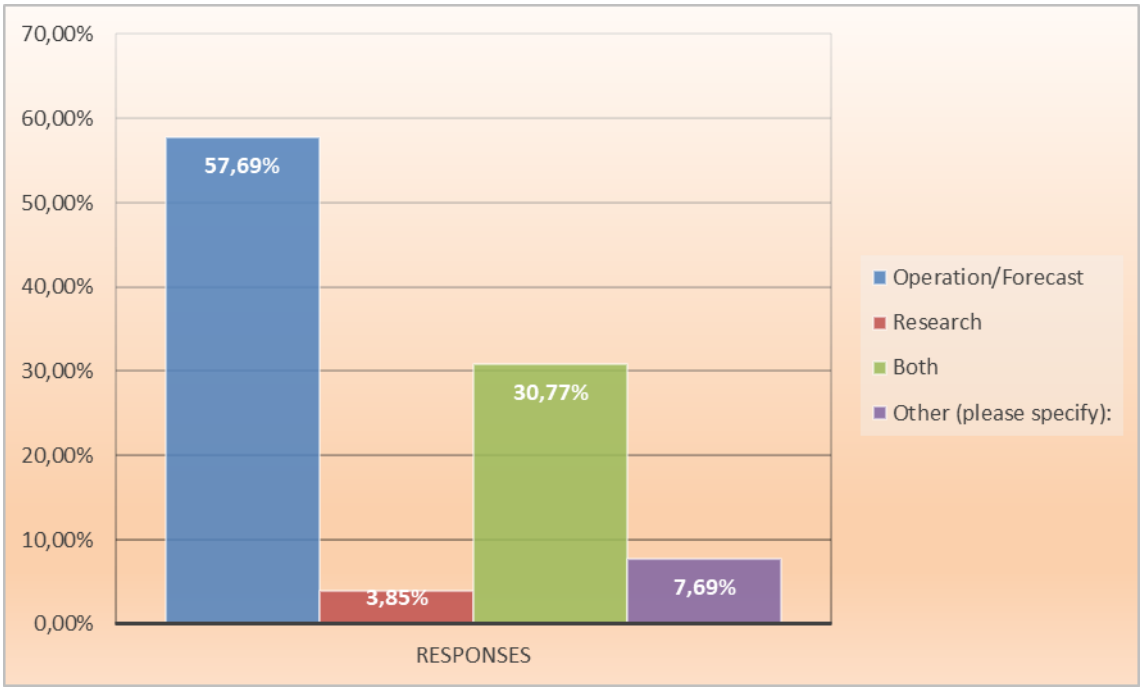
Regarding other type of use, some users said that they are still planning to run the software and others gave useful or real answers.

In the case of other real uses, it can be provided a list with them:

- Assimilation of AMVs in NWP.
- Derive 'downstream' cloud and radiation products.
- Redistribution.

No more information has been given.

If we focus on EMSu, the graph immediately below shows their result.



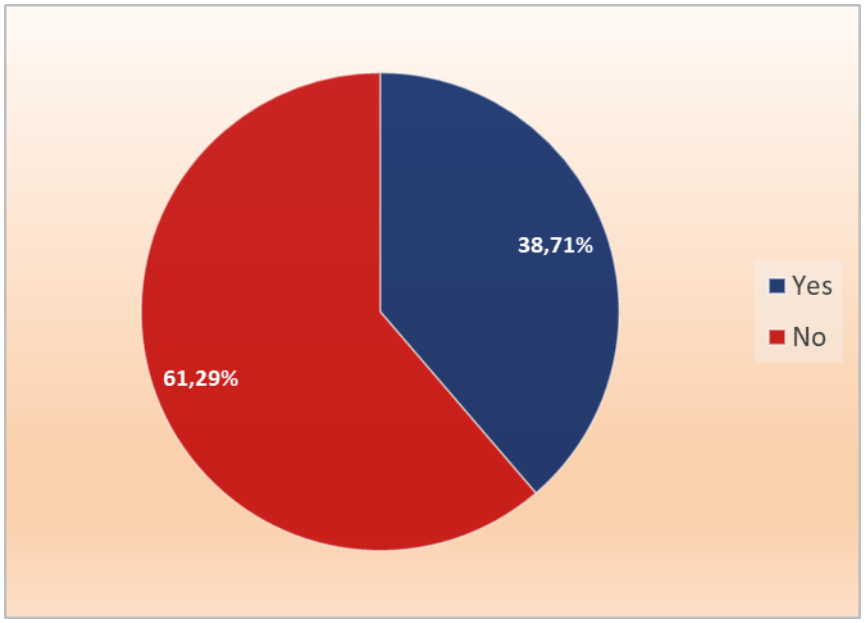
The tendency is the same as with all users, but only research is done by one person, and the use of the products with a forecast purpose is higher, almost 90% of them.

The two other options are “Assimilation of AMVs in NWP” and “Derive ‘downstream’ cloud and radiation products”.

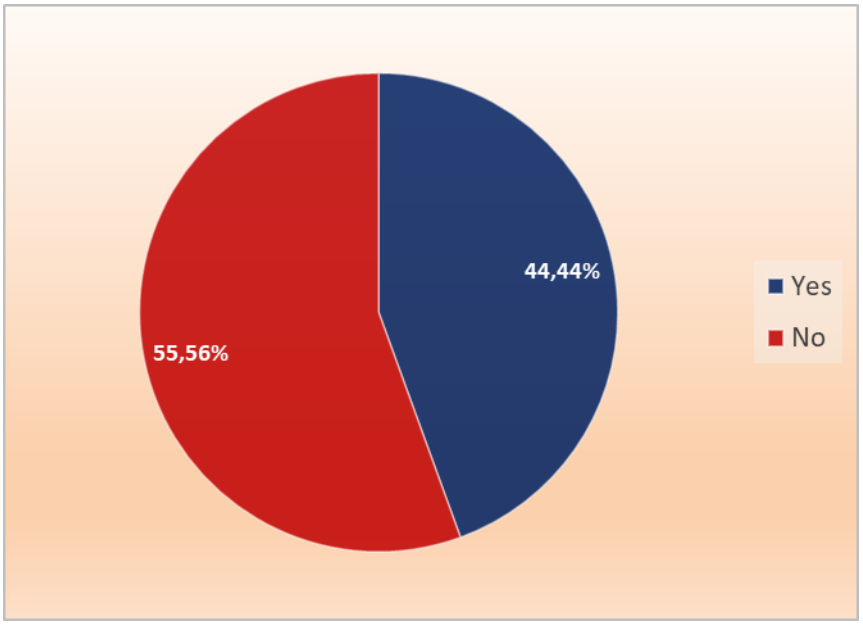
What it can be concluded is operation/forecast is the most popular use of the NWC SAF products, specifically in NMS that make up EUMETSAT.

9. Do you use NWC SAF end-products for hazard warnings?

The survey has gathered 62 responses that can be seen in the following graph:



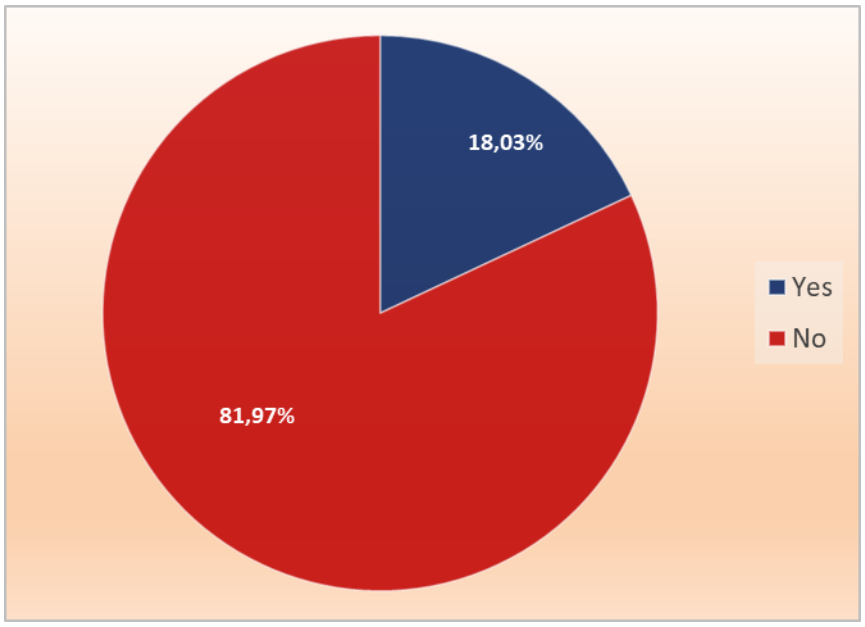
If we count only with the EMSu (27 responses), the graph is:



In both options, 'No' is the principal response, but it's clear that if we focus only in ESMu, the usage of our products for hazard warnings increases.

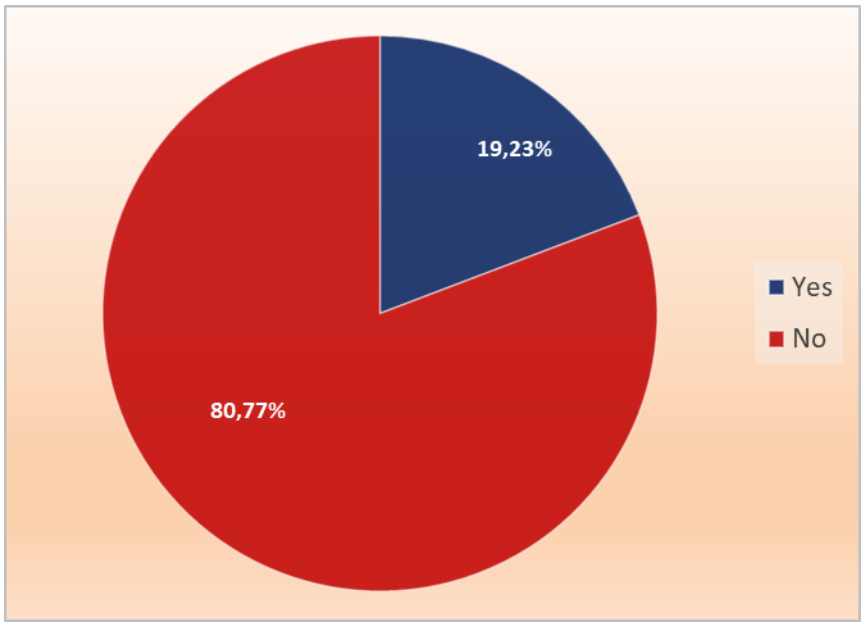
10. Do you use NWC SAF end-products for a commercial activity?

The number of responses are 61, and the majority of them (as it can be seen in the graph below) say that they don't use our products for this purpose.



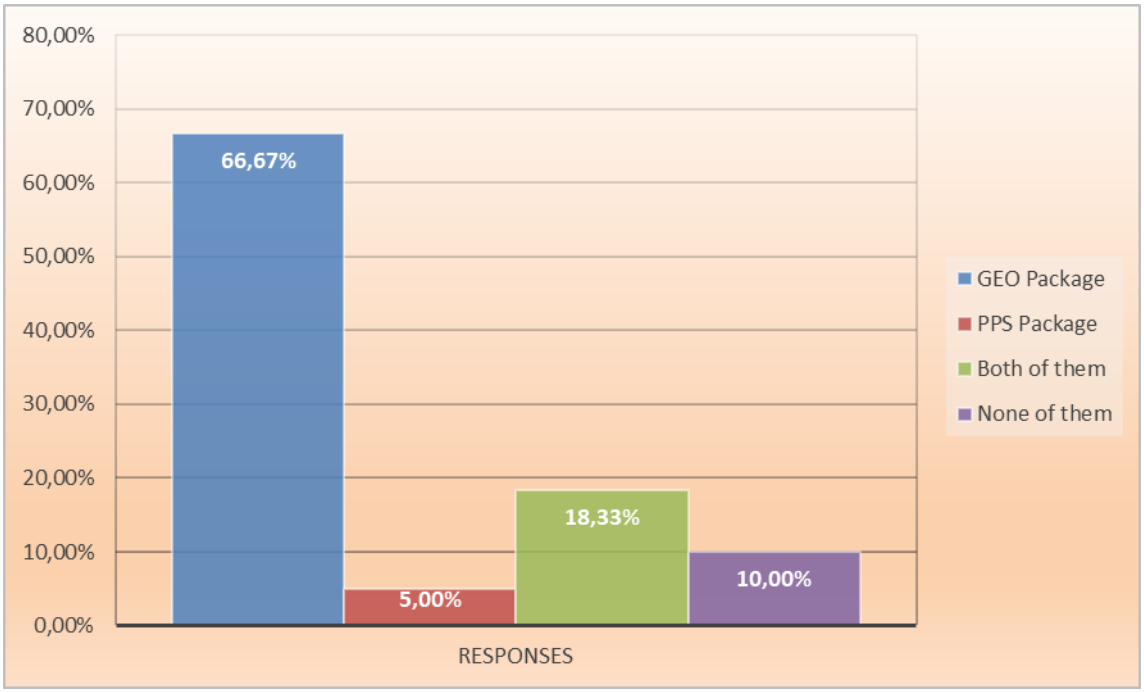
It can be seen that little more that four fifths of the users do not use our products for commercial activities.

Taken into account only the EMSu, it is seen almost the same percentage:



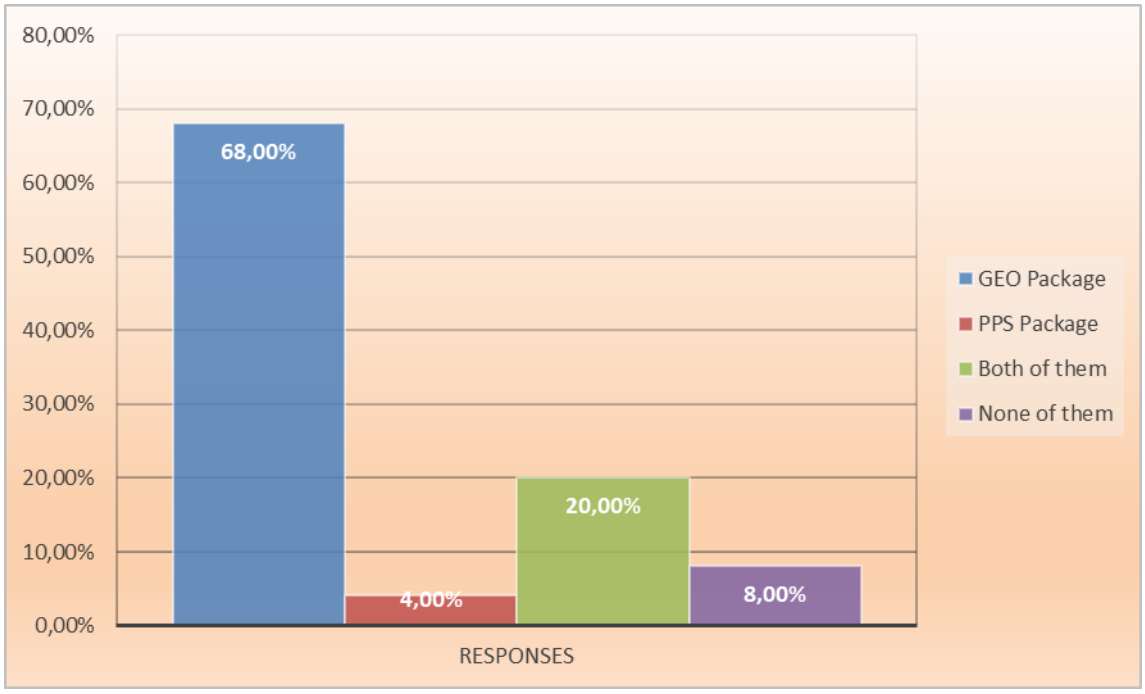
11. Which of the NWC SAF packages are you using currently?

It wanted to be seen which package our users use.

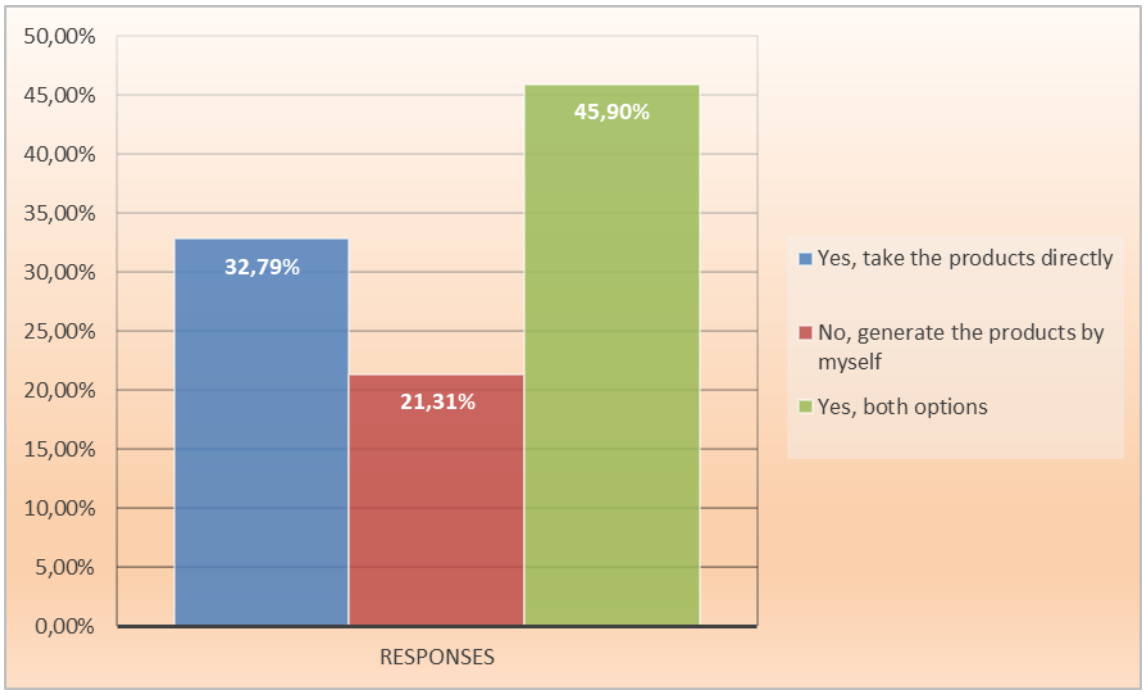


It's sorpising there is a considerable number of people (6 of them, the 10% of the responses) that has declared they don't use none of the packages. It was asked to them the reason of this and some answers were provided, almost all were because they were new users and they hadn't had enough time to get used to NWC SAF.

In regards of EMSu, it is expectable the same tendency, the majorty of them GEO package, and the least chosen one, the PPS package. In the following graph we can see the result of the 25 users that have completed this question:



12. Would you like that the NWC SAF distributes the product directly as well?

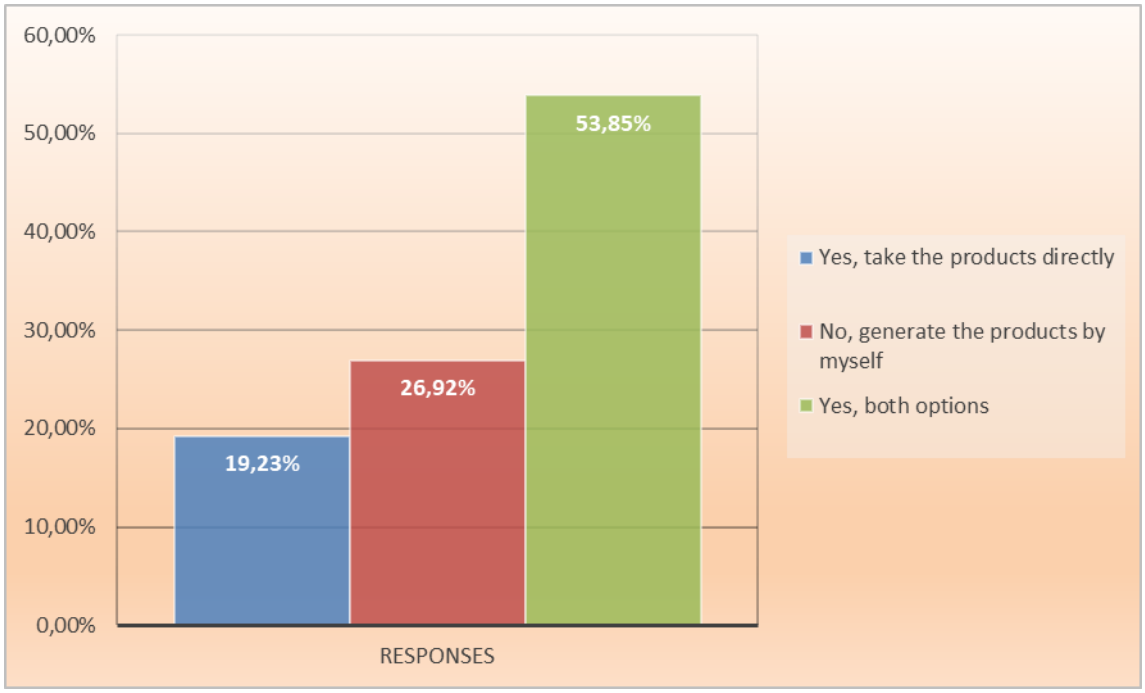


61 responses and it can be perceived a clear tendency of having the products distributed by NWC SAF. It's true the main option selected is having both options, but if we add this result with the number of users that want to take the products directly (not having the other option) is almost the 80% of the users.

There's a group of people that want to be just like it's now, they prefer generating the products by themselves (21,31%).

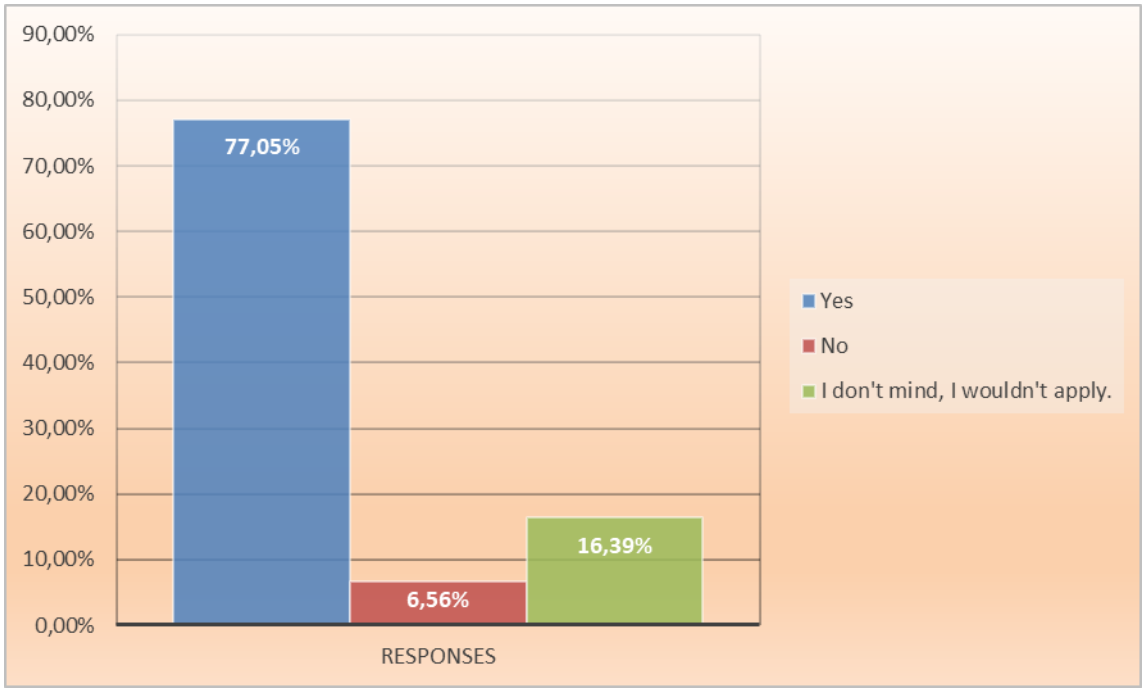
Regardless, the most selected option is having both possibilities and it would be a method of having all the users satisfied.

What about if we specify in EMSu? 26 users have answered.



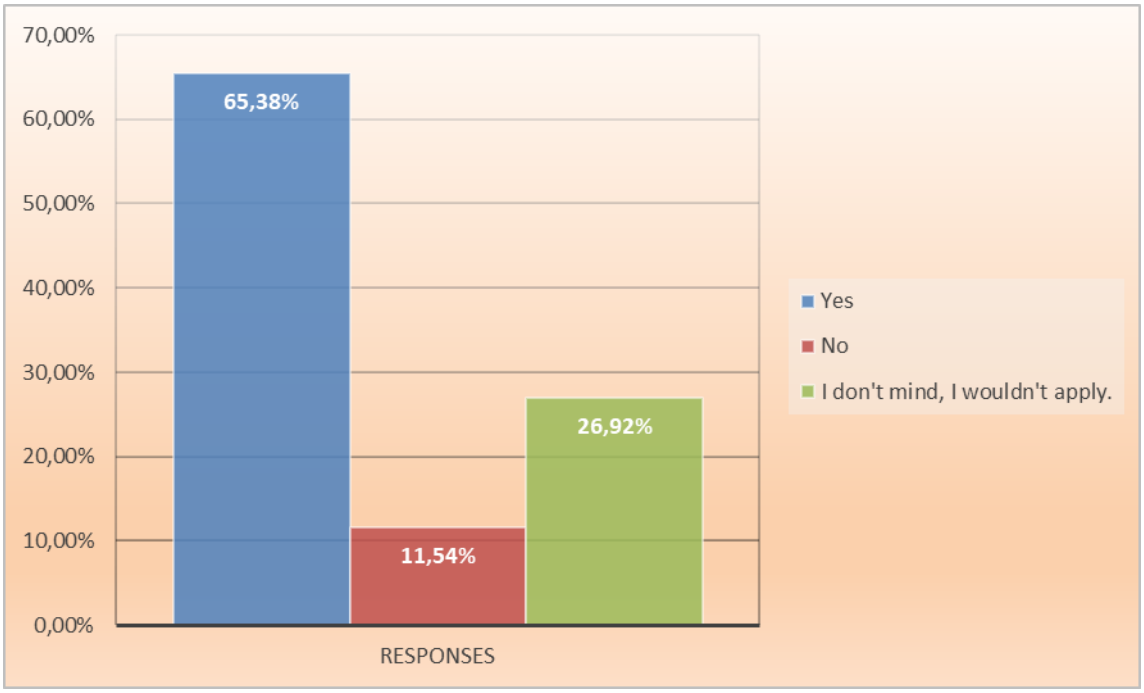
As it can be seen, there's a difference in the pattern of the repsonses. Apart from the most selected one, the option of having both ways, the second most chosen option is generating the products by themselves instead of taking them directly, that is the less chosen one. It's curious this change of the pattern, where generating products by themselves (having or not the other option) is the most suitable situation. Could it be because NMS are more focused in their own region than a general area? Generating the products by themselves gives them the option of selecting the area of interest.

13. Would you be interested in more conferences and training being made by NWC SAF?



More than three quarters agree (47 out of 61 responses) that it would be interested to have more activities such as conferences or trainings organized by the NWC SAF Team.

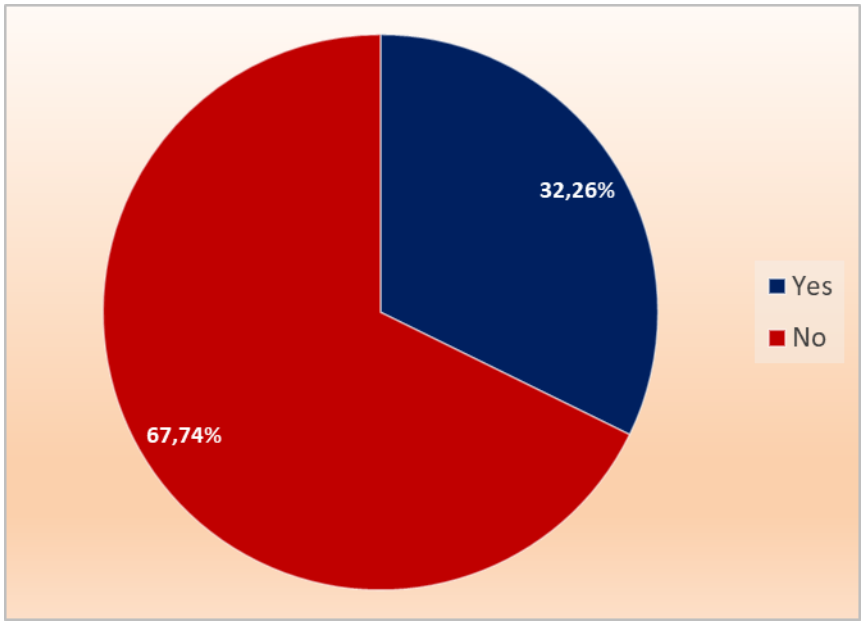
If we see what happens with EMSu, with 27 answers:



The number of people (proportionally) who aren't interested in posible activities for the NWC SAF is higher than the totallity of the users. It must be said that there is not such a significant different.

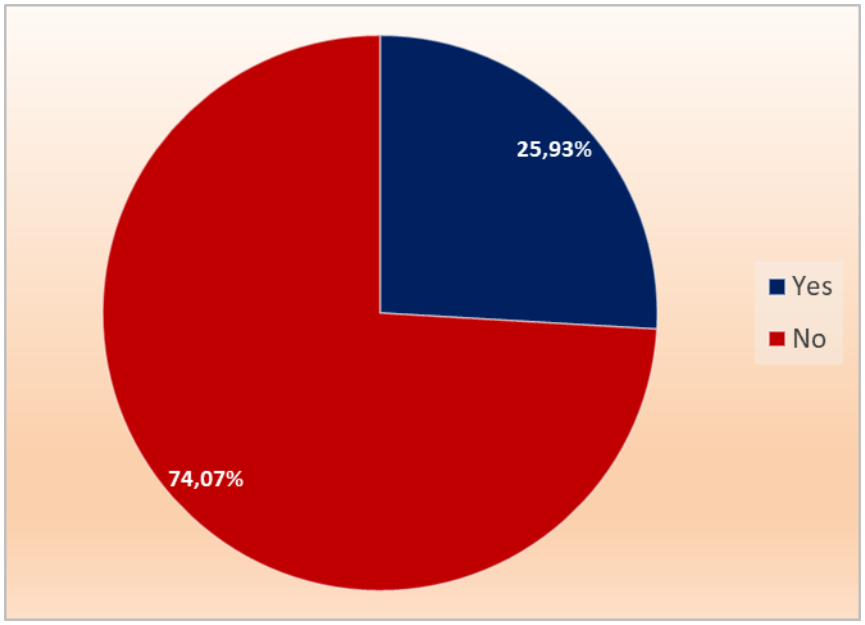
14. Did you know we already are part of Social Media? @Nowcasting_SAF on X, and "EUMETSAT NWC SAF" on LinkedIn.

Currently, the presence on Social Media can be determinant for reaching out to more potential users. Social Media can be the perfect tool to show how products work without organising big activities. Only with few lines, a message can be sent to more people. On the other hand, for users that already know us, it can be a way of been in touch and updated. In Social Media the message can be written in a colloquial way, making people feel more connected.



The majority of the people are not aware of our Social Media accounts. It could be because some of them even don't have Social Media, it shoudn't be taken for grated that all of our users have them.

Focussing only in EMSu:



The number of people without knoweldge of our Social Medias' profiles is higher. It can be because they don't are in charge of the profile of their Institutions on Social Media.

General Information part is over. As it can be perceived, almost all of the questions have been responded by 61 users and the number of them are 14. The next question was if the user wanted to go to other parts of the survey (GEO part, PPS part or EUMETCast part) or if they want to finish it. 40 people wanted to go to GEO Part, 3 directly to PPS Part, 6 to EUMETCast Part, and only 13 decided to finish there the Survey. Regarding EMSu, 18 of them decided to go to GEO Part, 1 to PPS part, 1 to EUMETCast Part, and 7 decided to finish the Survey.

3.1.2 GEO PART

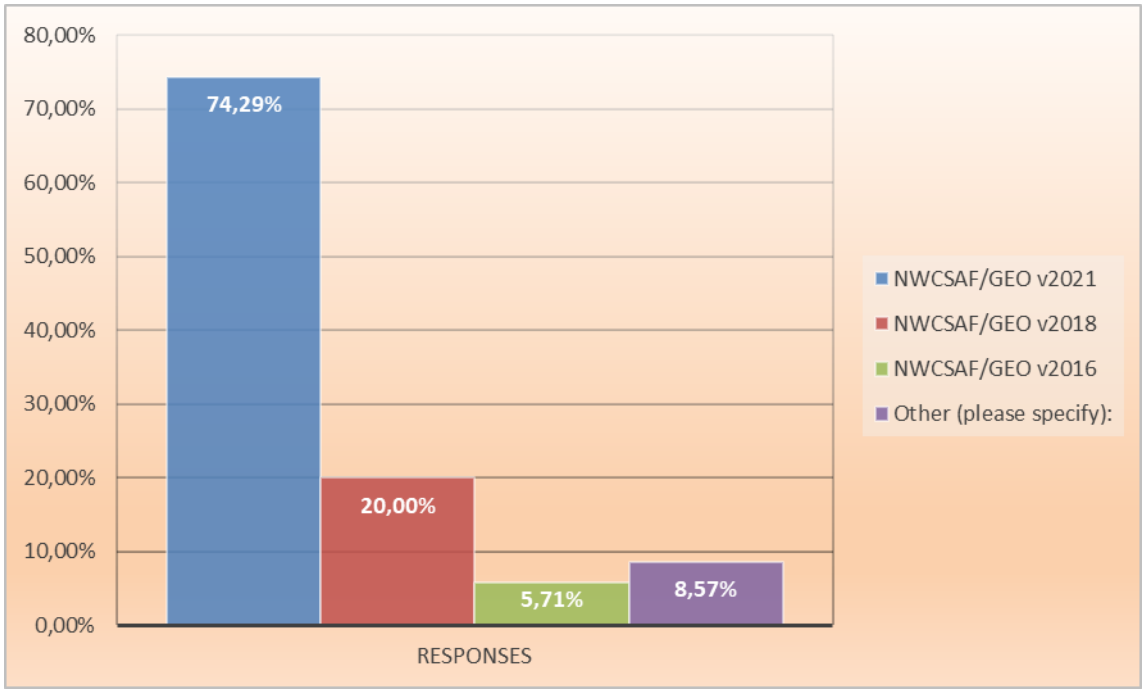
38 questions define this part of the Survey. As it will be seen, even 42 people decided to go to GEO Part, only 32 users are the mean of responses in each question. Recalling the previous lines, is expected 20 EMSu.

The EMSu that answered this part of the survey can be gathered in the following way:

EUMETSAT Member State	N. of users	EUMETSAT Member State	N. of users
Belgium	2	Netherlands	1
Finland	2	Norway	1
France	1	Portugal	1
Germany	2	Slovakia	2
Greece	1	Switzerland	2
Hungary	1	Türkiye	1
Iceland	1	United Kingdom	1
Italy	1		

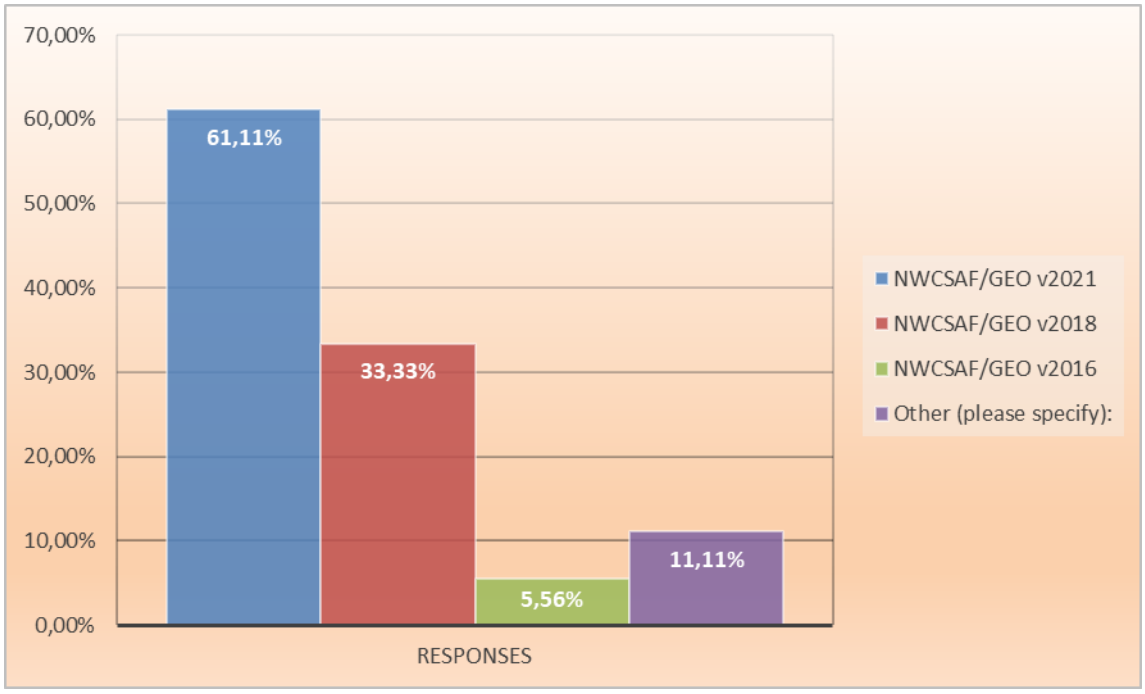
1. Which NWC SAF/GEO version is currently running in your site?

This question was answered by 35 people and multiple options were allowed between version 2021, version 2018, version 2016 or others. The result is the following:



The majority of the responses (26 out of 35) declared they use the newest version. Only 7 said they use v2018, 2 of them that they still use the v2016 and there were 3 answers about "Other". In the specifications, 1 said that no version (probably is one of the user that declared they haven't started yet to install the Software), and the others that they still uses v2013.

We must take into account more than one answer is let, so one user can user more than one version. In this question, only two users have decleared they use more than one. First, one user uses v2021 and 2016, and the other v2018 and v2016.



If we only focus on EMSu, only 20 said they wanted to go to GEO part. Nevertheless, only 18 have answered the question. It can be seen that the percentage (in the graph above) is lower in the use of the newest version if we focus on EMSu.

It's quite sorprising because so many improvements have been done since them. The following question can give us a clue about the reason behind this.

2. In case you don't use GEO v2021, could you please indicate the reason why this version is not used?

There have been 8 responses.

- Lack of human resources to upgrade. Planning to move to EUMETCAST products.
- Not yet had the necessity to update.
- Installation issues on operational environment. Data format issues.
- The change of output format from hdf5 to netcdf.
- Lack of time and preparation to MTG operational stream.
- It takes time to install / configure a new version. The improvements with v2021 are not significant.
- Mainly personal reasons. In the past satellites were simpler, and also software and applications were simpler. Now we are overloaded with new tasks but with the same personal capacities.

- We didn't have time to do all the tests required before the migration.

Some reasons were explained. Many of them coincide with the lack of human resources, either because they don't have enough time or because they don't have the knowledge to do this.

The majority of the responses are underlined (except two). The reason why is because the underlined answers are the answers provided by EMSu. This is going to be the method followed in the whole report.

3. Please, specify your application environment.

It was asked for users to specify the following application environments: Operating System (OS) and Version, C Compilers and Version and Fortran Compilers and Version. It has been gathered 27 answers for the first one, and 16 for both the second and the third requirement.

The vast majority of the OS are Linux, especially versions RHEL, Ubuntu, CentOS and Debian.

About the C Compilers and versions, almost all of users use gcc, except little ones that use g++.

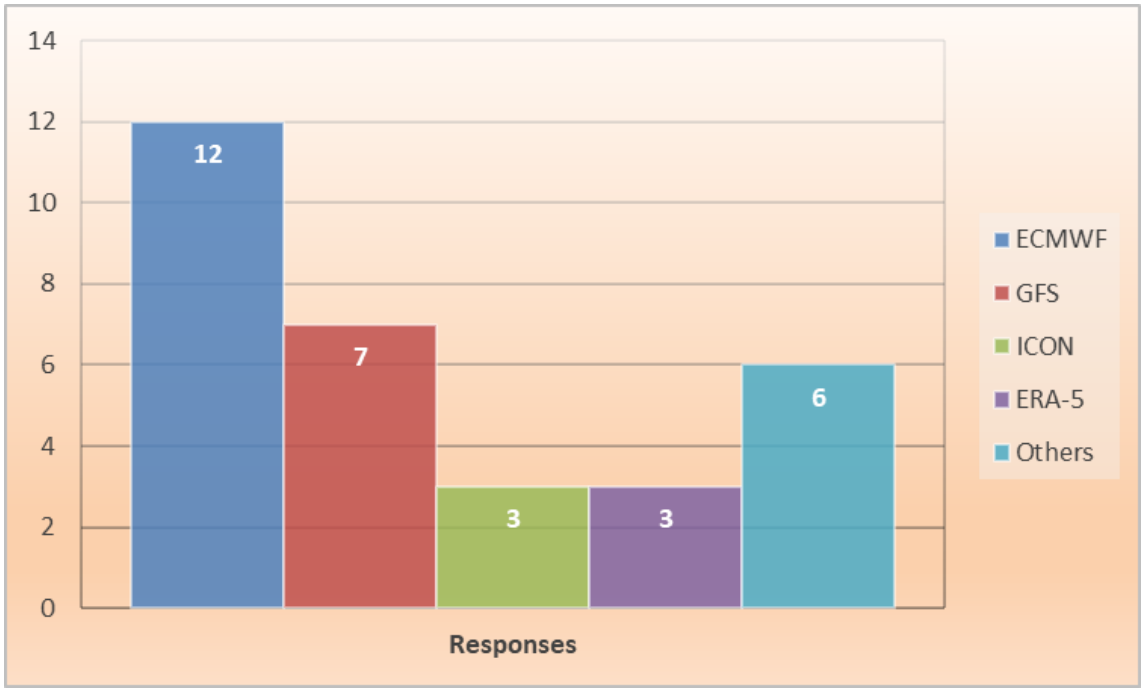
Finally, the Fortran Compilers and Version, there's not a clear choice, but there're: GNU Fortran (GCC) 4.8.5 20150623 (Red Hat 4.8.5-44); GNU Fortran (Debian 12.2.0-14) 12.2.0; GNU Fortran (GCC) 11.4.1 20231218 (Red Hat 11.4.1-3); gfortran 8.5; gfortran 10.3.0; gfortran-7 V7.5.0-3ubuntu1~18.04; gfortran-9; GNU Fortran (GCC) 4.4.7; gfortran version 10.2.1 20210110; gfortran 11.4; gcc version 8.3.1 20191121 (Red Hat 8.3.1-5) (GCC); gcc version 8.3.0 (Debian 8.3.0-6); GNU 7.5.0 and GNU Fortran 8.5.0.

About EMSu, there's no difference with respect the information above.

4. Please specify the characteristics of the Numerical Model you use.

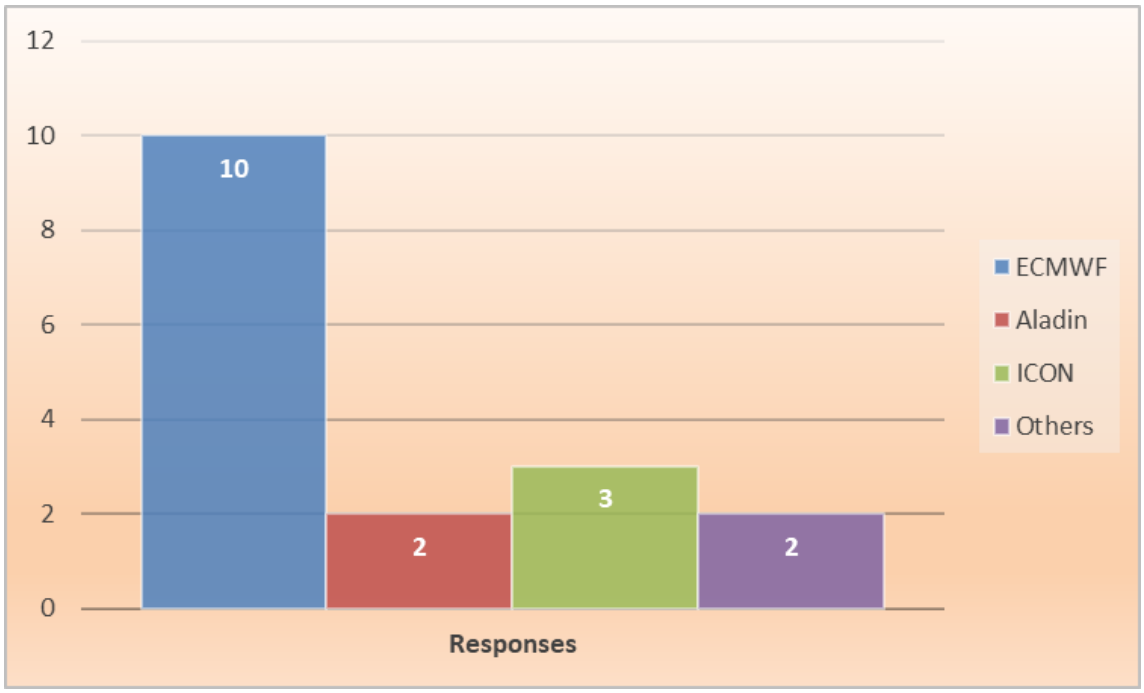
31 people has answered this question, which were asked the NWP Model, its Spatial resolution, Temporal resolution (step and range), Vertical resolution and Levels (hybrid, pressure, both).

Not all the 31 users responded to all the specifications.



In the field “Other”, it’s considered when a model has been chosen twice or less. We have there Arpege, Aladin, UKMO and no clear responses because the response is not what it has been asked.

Focusing on EMSu, the following graph shows the result:



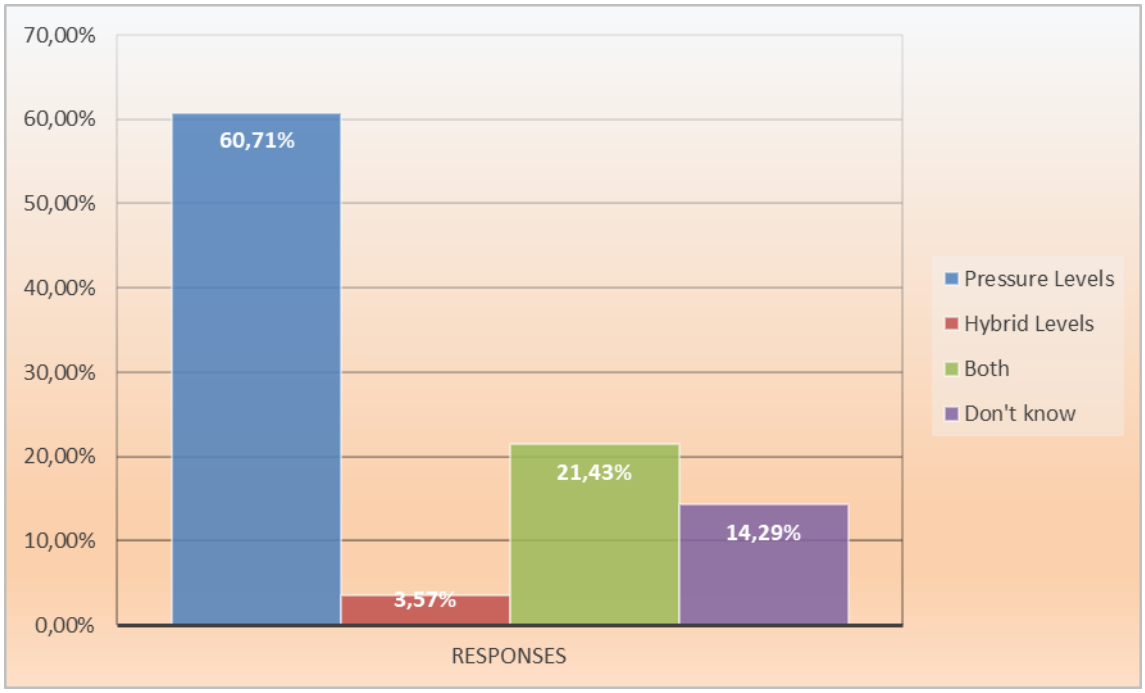
For EMSu (17 answers), we can see a clear different. First, no one declared a use of GFS model. Secondly, the use of ECMWF is bigger, so EMSu prefer the European Model. Besides, no one declare the use of the reanalysis model, the ERA5.

In the case of ICON, it's the same number of users (3 in total) that have declared the use of this model.

Regarding "Others", we have there Arpege and UKMO.

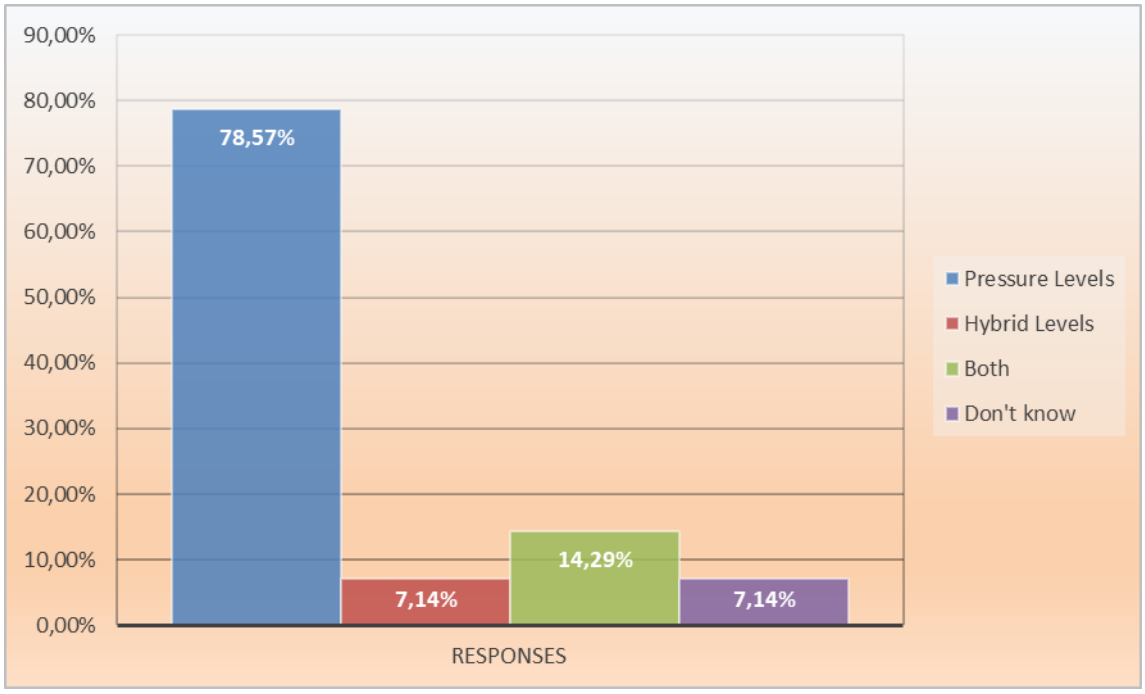
5. What kind of NWP data do you receive in your system?

In this question was asked if the data were pressure levels, hybrid levels, both or the user didn't know. It was answered by 28 people.



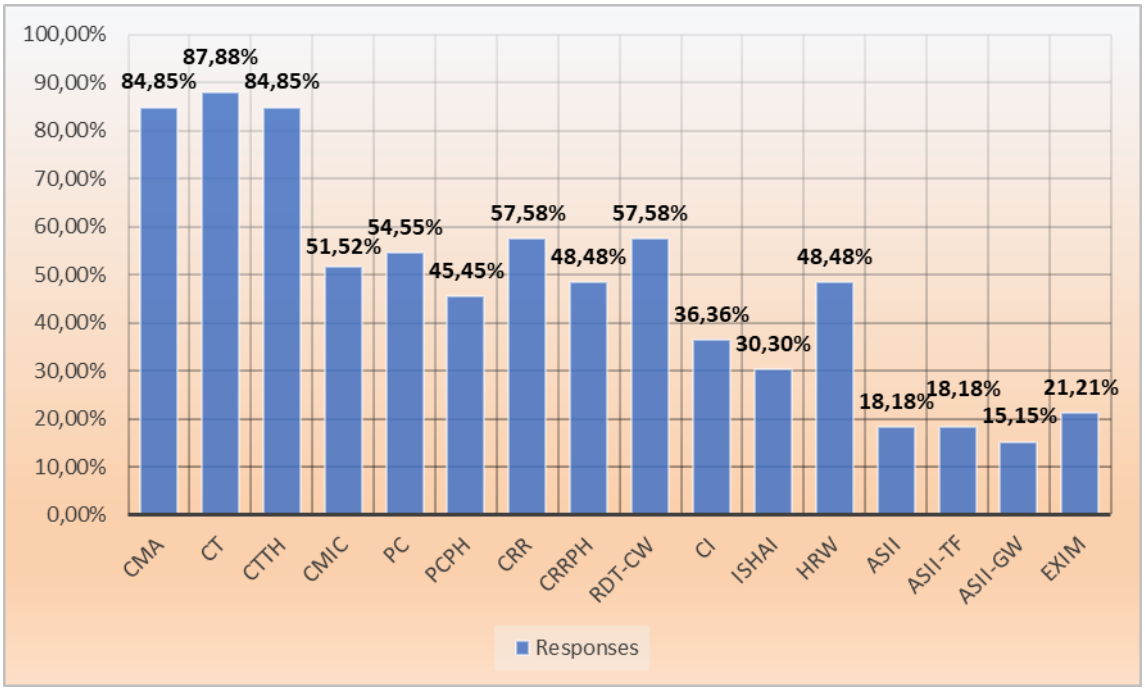
The majority of the NWP data is Pressure Levels, so if we take into account only *Pressure Levels* and the option *Both*, the Survey shows that more than the 80% of the users ingest pressure levels in their NWP data. The users that declare Hybrid (counting only *Hybrid Levels* and *Both* options) are lower than one quarter of them. There's a minimoun (4 out of 28) of people who are not aware of the kind of NWP data their system receive.

For EMSu, we can see an increase in Pressure Levels option:



6. Which of the current NWC SAF/GEO Products are you using repeatedly?

It was wanted to see the use that users give to the products they generate. They have been asked for 16 products. Due to the fact 16 bars are quite much for a single graphic, it's been considered to add another graph divides the products into four groups. Here, it can find the graph with all the responses:

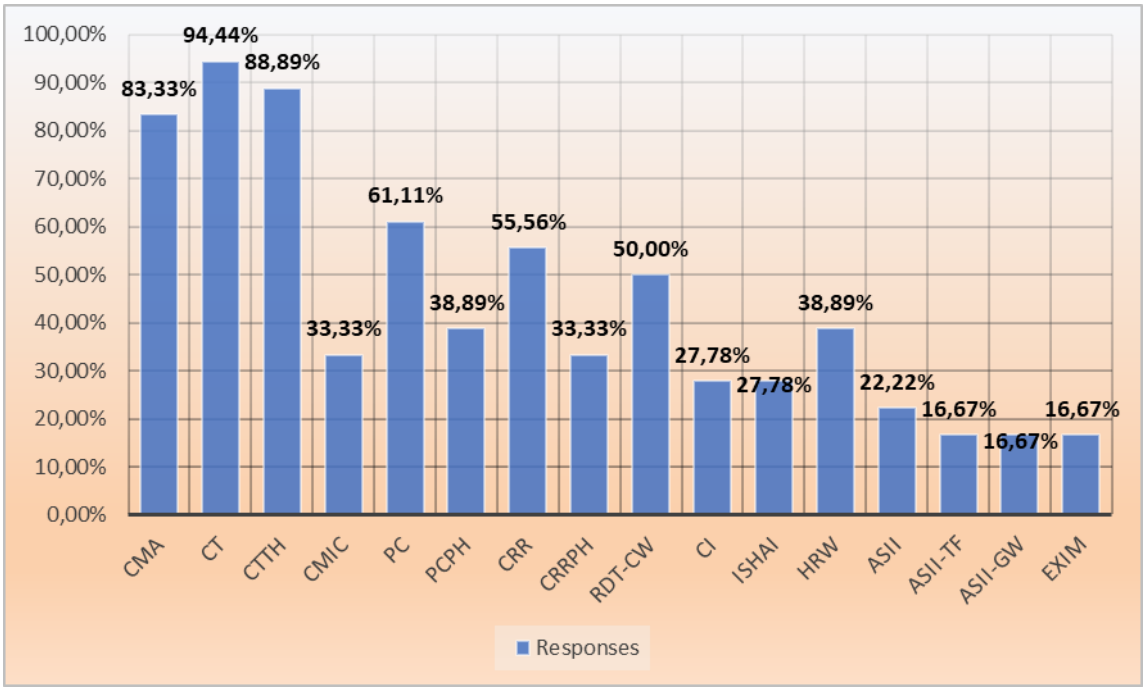


And now, divided:

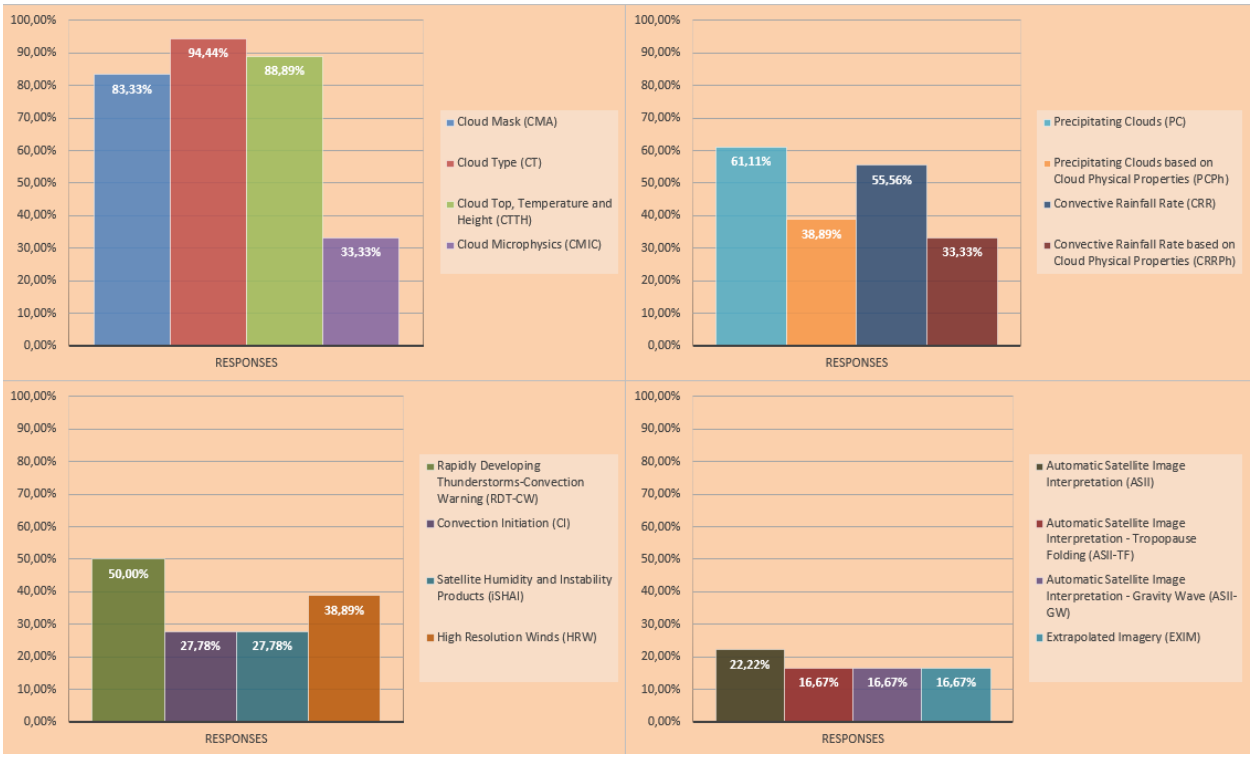
First, it can be perceived there're three groups: products whose use percentage are more than 80%, others that are around 50% (in this group we have considered the one that is 30.3% (iSHAI) as well), and the other whose use is around 20%. These groups can be named as:

- Cloud group (use more than 80%): CMA, CT and CTTH.
- Mix of other products (use around 50%): CMIC, PC, PCPh, CRR, CRRPh, RDT-CW, CI, iSHAI and HRW.
- Conceptual and Extrapolation group: ASII, ASII-TF, ASII-GW and EXIM.

Considering only EMSu, there have been 18 responses and the result are the following:



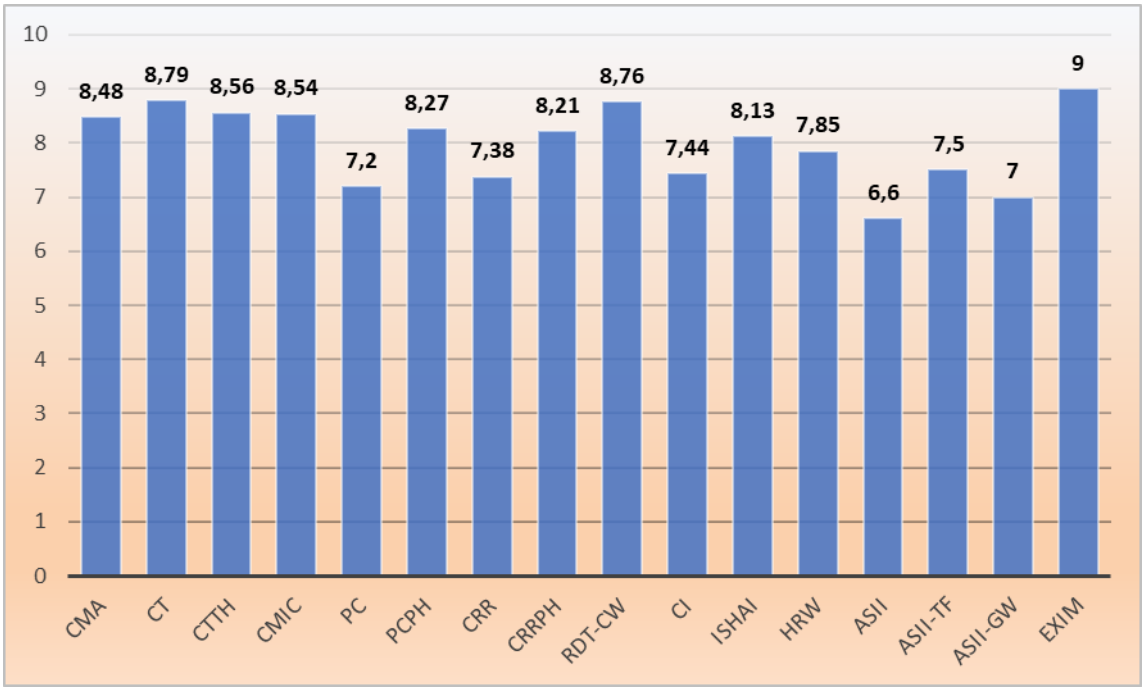
Divided:



In this case, the groups are seen again. Nevertheles, there's not a higher step between the "other products group" and the "conceptual and extrapolation group" as it is seen before. Now, even the third group still have the minoritory numbers, the transition between both groups are softer.

7. Could you please rate the usefulness of the products you are using?

In this question, we have asked our users to rate all the products being 1 "Not useful at all" and 10 "Extremely useful". 31 people completed the question and the result is the average of the rates of every user in each product.



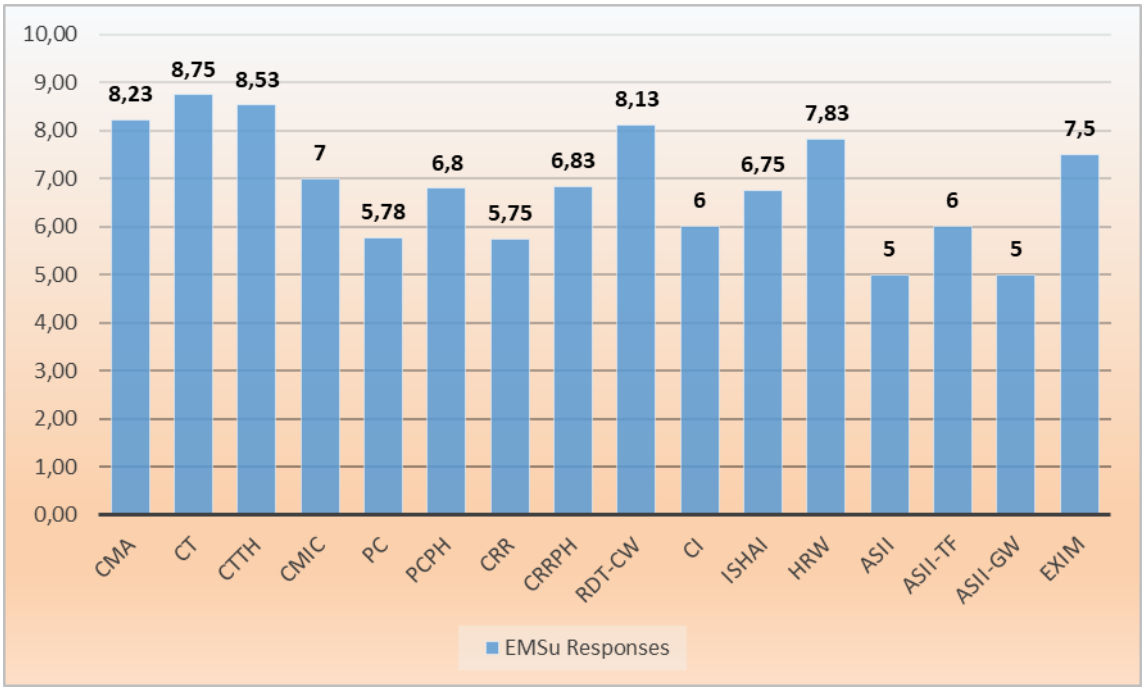
It can be seen all products pass with (in the majority of the cases) a good mark. Only one product is below 7, the ASII. This product has been discontinued and it is not included in the software sinve v2025 onwards.

Seeing the highest and the lowest marks:

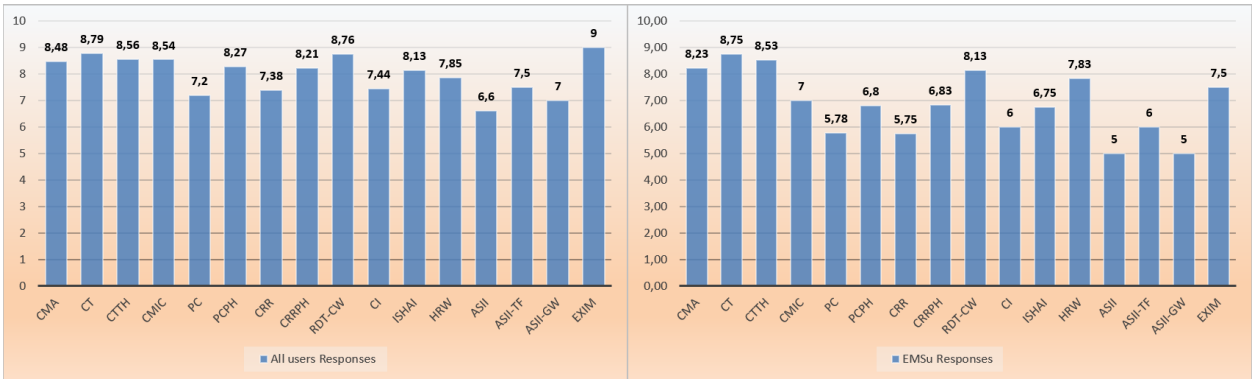
Highest mark	Lowest mark
1. EXIM	1. ASII
2. CT	2. ASII-GW
3. RDT-CW	3. PC

It’s curious how EXIM has the highest mark even it’s one of the less used one.

Considering EMSu, we have the following data:

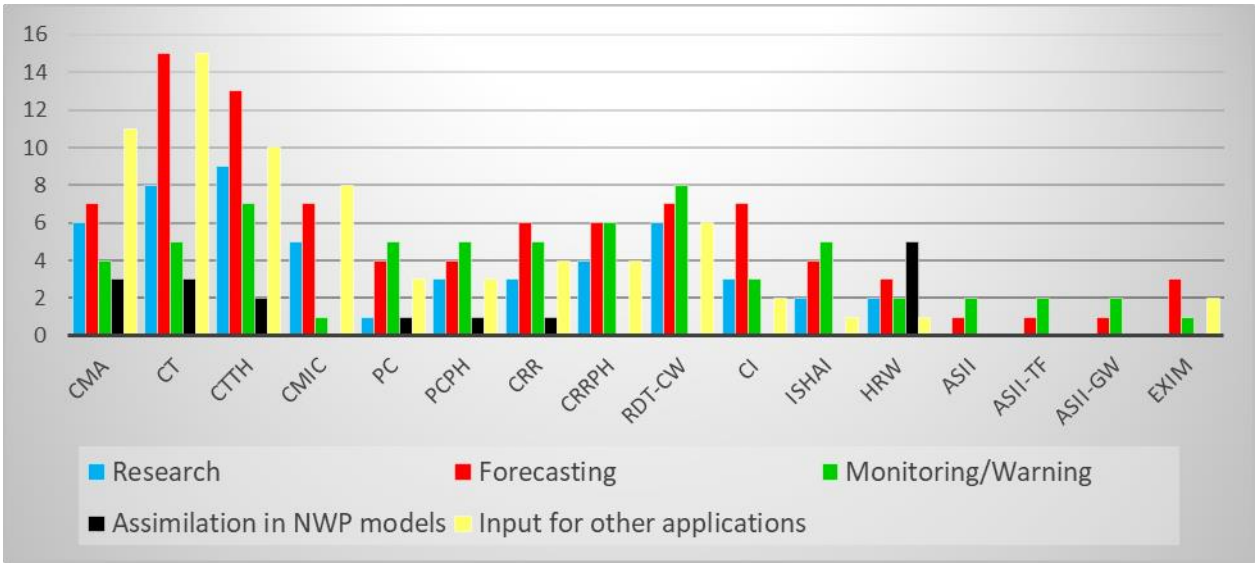


Highest mark	Lowest mark
1. CT	1. ASII
2. CTTH	2. ASII-GW
3. CMA	3. CRR



Marks are lower if we compare both groups. It's true there're products whose marks practically don't change, as CMA, CT, CTTH, RDT-CW and HRW, but the others have a reduction in more than 1 point. The group we consider "cloud group" keeps a good mark in both situations.

8. What are you using each product for?



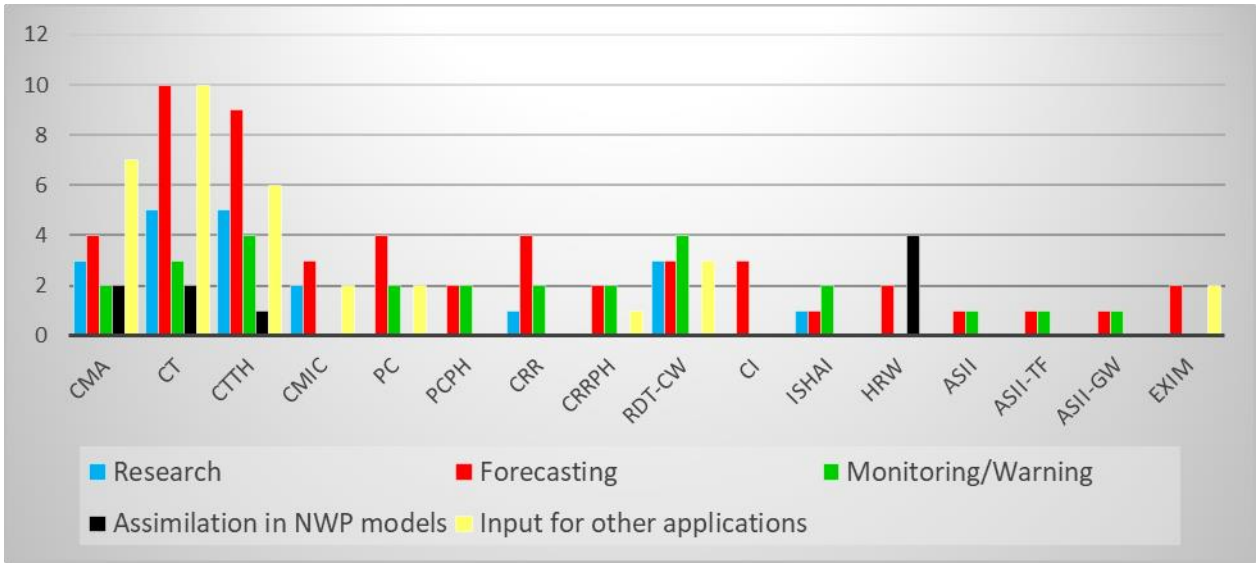
What are you using each product for?					
	Research	Forecasting	Monitoring/Warning	Assimilation in NWP models	Other applications
CMA	6	7	4	3	11
CT	8	15	5	3	15
CTTH	9	13	7	2	10
CMIC	5	7	1	0	8
PC	1	4	5	1	3
PCPh	3	4	5	1	3
CRR	3	6	5	1	4
CRRPh	4	6	6	0	4
RDT-CW	6	7	8	0	6
CI	3	7	3	0	2
iSHAI	2	4	5	0	1
HRW	2	3	2	5	1
ASII	0	1	2	0	0
ASII-TF	0	1	2	0	0
ASII-GW	0	1	2	0	0
EXIM	0	3	1	0	2

Both resources (the graph and the table above) can be uncomfortable to see and to analyse, so we have summarized the information:

- Forecast is the principal use of NWC SAF SW products.
- The most used products are the cloud ones.
- There are again three group of products (cloud ones, conceptual and extrapolated products and the mixed group)

- Monitoring/Warning option, RDT-CW is the most selected product.
- Assimilation in models, HRWs is the most used product.
- There're a minimoun of explanations in option "others". Some products are ingested in other type of models, not NWP, as some cloud products in solar irradiance models; RDT-CW is used for validation. The majority of the others answers don't have more information, leaving us an unknown in which our products are used for.

Gathering this information for EMSu, we have the following graph and table:



What are you using each product for?					
	Research	Forecasting	Monitoring/Warning	Assimilation in NWP models	Other applications
CMA	3	4	2	2	7
CT	5	10	3	2	10
CTTH	5	9	4	1	6
CMIC	2	3	0	0	2
PC	0	4	2	0	2
PCPh	0	2	2	0	0
CRR	1	4	2	0	0
CRRPh	0	2	2	0	1
RDT-CW	3	3	4	0	3
CI	0	3	0	0	0
iSHAI	1	1	2	0	0
HRW	0	2	0	4	0
ASII	0	1	1	0	0
ASII-TF	0	1	1	0	0
ASII-GW	0	1	1	0	0
EXIM	0	2	0	0	2

If we summarize the information above, we have practicalle the same than all users situation:

- Forecast is the principal use of NWC SAF SW products.

- The most used products are the cloud ones.
- There are again a main group, the cloud one.
- Monitoring/Warning option, RDT-CW is the most selected product.
- Assimilation in models, HRWs is the most used product.
- There're a minimoun of explanations in option "others". For example we have one explaining its use of the CMA, CT and CTTH: "*We retrieve other cloud properties, surface radiation and precip using the NWC SAF basic cloud properties*."

9. Would you like to make any brief comment or brief remark about any product?

It was given freedom to users to comment something about the GEO products. In this report we have gathered all of them, underlining the one that belong to EMSu.

CMA
✓ It enhances the overall accuracy and reliability of weather forecasts. ✓ Very important for the Slovenian Environmental Agency. ✓ Helps identify cloud coverage.
CT
✓ I would like CT to be improved, especially during the night and during transition from day to night hours. Furthermore, sometimes it happens that snow pixel are exchanged with cloud pixel. It should be avoided. Finally, sometimes cloud free land areas are identified as cloudy are if the sun is low on the horizon and casts the shadow of the clouds on the ground. It is not desired. ✓ Very important for the Slovenian Environmental Agency. ✓ Helps to know the kind of weather expected.
CTTH
✓ <u>Most used product in our aviation met. Office.</u> ✓ Very important for the Slovenian Environmental Agency. ✓ Helps to understand the microphysics of clouds. ✓ <u>NWP model with a lowest level pressure at 200 hPa won't produce a CTTH with a good quality.</u>
CMIC
✓ This product is a critical component of NWP models, enhancing their ability to simulate and predict weather accurately. ✓ Helps to identify rapid cooling convective clouds and strong updrafts. ✓ The Solar Zenith Angle < 70° limit should be removed in order to have Cloud Optical Thickness data at night but also at sunrise and sunset.
PC
✓ <u>We intend to shift to PCPh.</u> ✓ Very important for radar artefacts checks. ✓ Helps warm possibility of flooding and reduction of visibility.

PCPh	
✓ Very important for radar artefacts checks. ✓ Helps identify expected types of precipitation and effects.	
CRR	
✓ Helps identify intensity of rainfall and cloud flood possibility.	
CRRPh	
✓ Possibility of hail storms and heavy precipitation.	
RDT-CW	
✓ Good product, but wish the NetCDF format was easier to use. ✓ It would be really good if we could use the new MTG data to add lightning into this product. ✓ Warning about turbulence and thundery activities.	
CI	
✓ Possibility of thunderstorms.	
iSHAI	
✓ Will be tested with MTG-I1. ✓ For severe weather prediction, moisture tracking and upper air analysis.	
HRW	
✓ Good product, but wish the NetCDF format was easier to use. ✓ Interesting but consumes much server resources. ✓ Watch and warn of dangerous wind situation. ✓ Requires too much RAM and too slow for real-time use.	
ASII	
✓ Will be tested with MTG-I1.	
ASII-TF	
✓ This could improve high level turbulence forecasts in the future. ✓ Will be tested with MTG-I1.	
ASII-GW	
✓ Will be tested with MTG-I1.	
EXIM	
✓ Important for nowcasting applications. ✓ It would be interesting to forecast CMIC_COT.	

10. Could you please indicate which of the current satellites supported by NWC SAF/ GEO SW are you using?

It can be provided a table with the information gathered:

Indicate which of the current satellites supported by NWC SAF/GEO SW are you using					
	MSG 0º	MSG Rapid Scan	MSG-IODC	GOES-16/17/18	HIMAWARI-8/9
CMA	21	8	8	5	5
CT	22	9	9	5	5
CTTH	22	8	8	4	4
CMIC	12	3	6	3	3
PC	14	4	3	1	0
PCPh	12	4	3	2	1
CRR	14	3	3	1	1
CRRPh	13	5	5	3	3
RDT-CW	14	4	4	3	2
CI	9	2	5	3	2
iSHAI	7	3	4	1	1
HRW	11	2	2	1	1
ASII	8	1	2	0	0
ASII-TF	5	1	1	0	0
ASII-GW	5	1	1	0	0
EXIM	6	1	1	0	0

And in order to sum up the information above:

- MSG 0º is the most used satellite.
- After MSG 0º, both MSG Rapid Scan and MSG-IODC are the most utilised satellite, the two of them practically equal, none of them can be catalogued as preferred.
- There are not significant differences between the use of GOES-16/17/18 and HIMAWARI-8/9.
- The most used products are the cloud ones.
- There are again three group of products following the same patter as before.
- Conceptual and extrapolated products are not used in regions out of Europe.

If we want to specify into EMSu, we have the same table with their information:

Indicate which of the current satellites supported by NWC SAF/GEO SW are you using					
EMSu users	MSG 0º	MSG Rapid Scan	MSG-IODC	GOES-16/17/18	HIMAWARI-8/9
CMA	14	7	4	3	3
CT	16	7	5	3	3
CTTH	15	7	4	2	2
CMIC	6	2	2	1	1
PC	11	4	1	0	0
PCPh	7	3	1	0	0
CRR	10	3	1	0	0
CRRPh	8	4	2	1	1
RDT-CW	9	4	2	1	1
CI	5	1	2	1	1
iSHAI	4	2	1	0	0
HRW	6	2	1	0	0
ASII	5	1	2	0	0
ASII-TF	3	1	1	0	0
ASII-GW	3	1	1	0	0
EXIM	3	1	1	0	0

Going over the table above, we can gathered the following points:

- MSG 0º is the most used satellite.
- After MSG 0º, both MSG Rapid Scan and MSG-IODC are the most utilised satellite, but there's a little preference for the MSG Rapid Scan.
- There are not significant differences between the use of GOES-16/17/18 and HIMAWARI-8/9.
- The most used products are the cloud ones.
- There are again three group of products following the same patter as before.
- Neither conceptual and extrapolated products nor PC, PCPh and CRR are used in regions out of Europe by none EMSu.

11. In case you are adapting NWC SAF/GEO products to any satellite, could you please indicate which one?

Only three people have answered to this question, which the responses were the following:

- MSG rapid scan.
- GOES, Himawari.
- MSG Rapid Scan + MSG 0º.

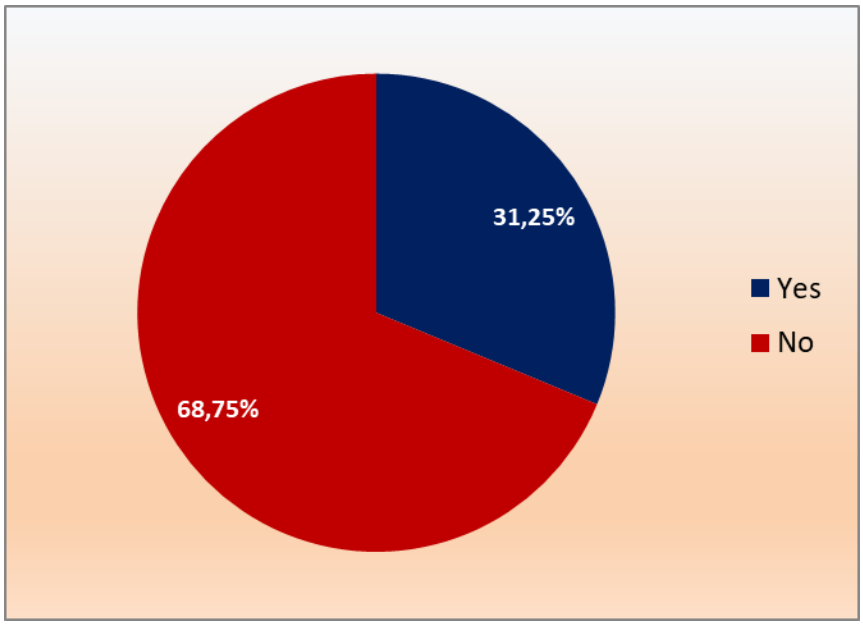
No more where provided. EMSus' answers are the underlined ones.

12. Would you be interested in adapting the software to other satellite?

This question has been answered by 30 people, 24 of them have said that they are not interested in having our software adapted to other satellite, meanwhile 6 people answered "yes", and 4 out of these 6, have specified the satellite they are interested in. 3 of them in MTG (something that is been done at the same time this report is written) and the other one declared its interest in Fengyun-4B in order to complete MSGIODC and Himawari.

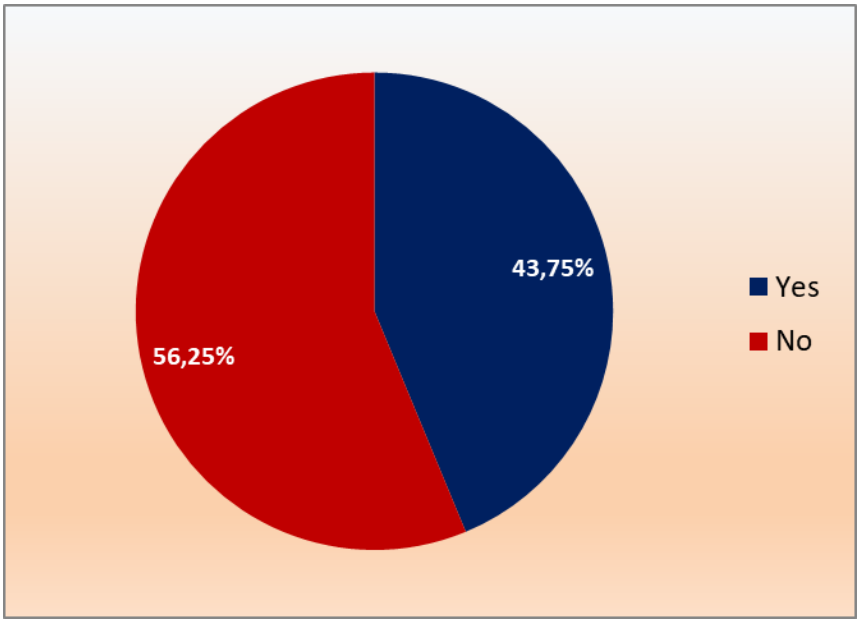
Two of the MTG responses belong to EMSu.

13. Are you using or have used MSG Rapid Scan Services images to run NWC SAF Software?



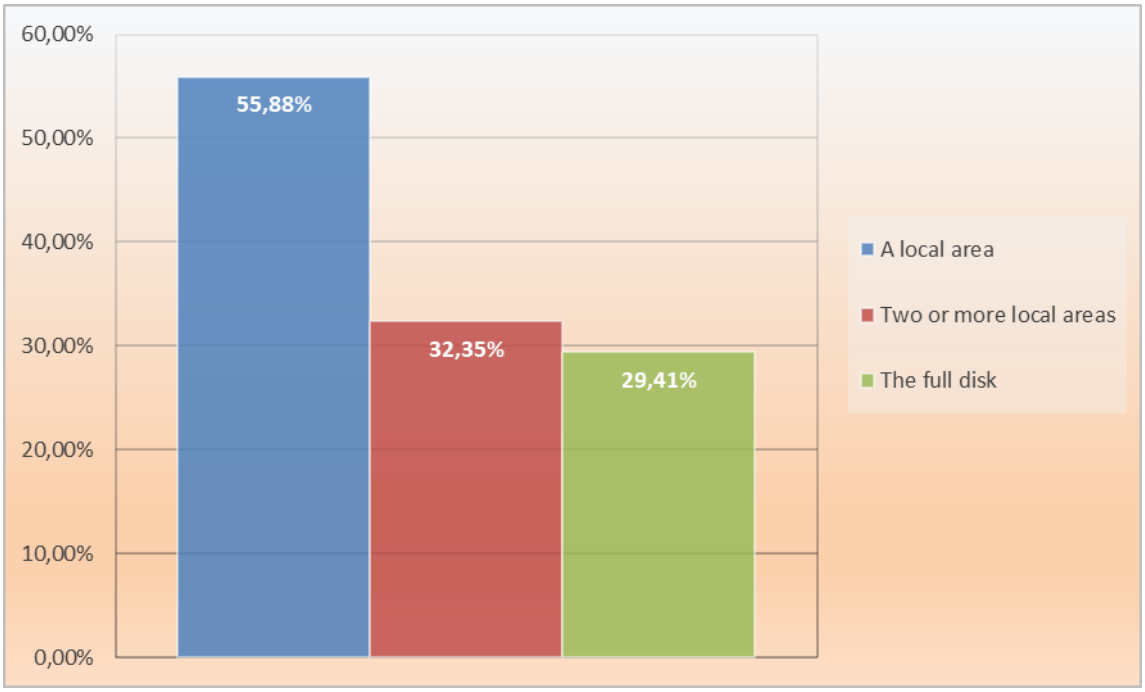
As it's shown, almost 2 out of 3 parts of the answers (32 in total), do not run our software with MSG Rapid Scan.

Only considering EMSu (16 responses), the graph changes:



Although "*No*" is the most selected option, almost half of the EMSu declared they are using or have used the Rapid Scan.

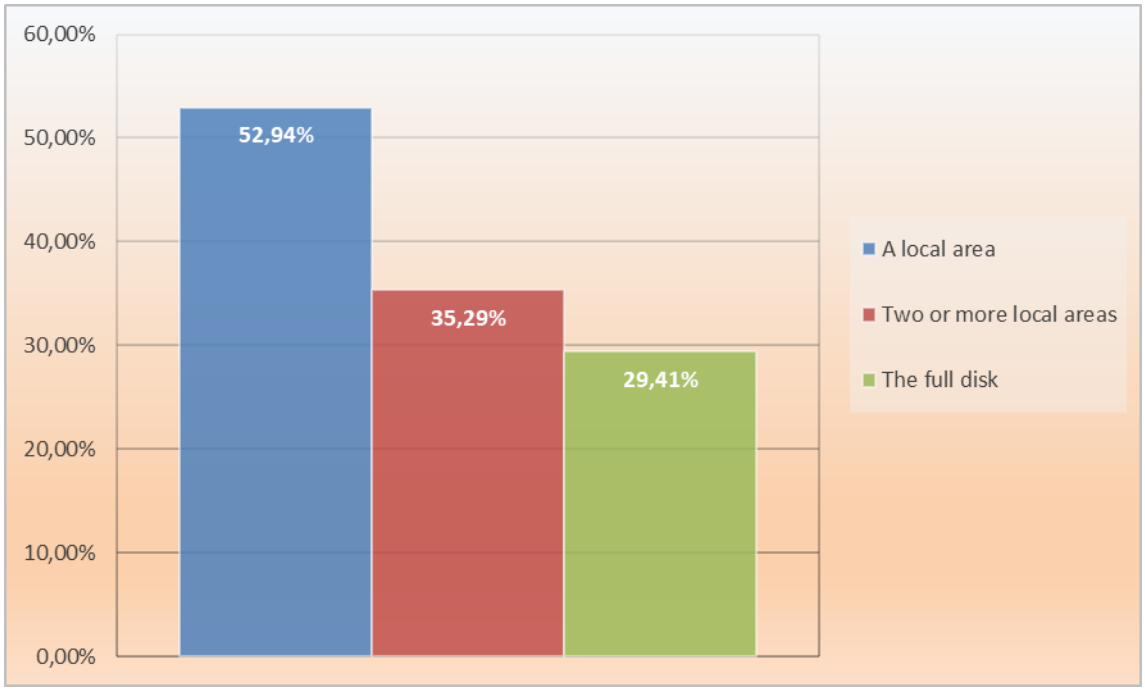
14. In what area do you generate the products?



The majority of users (34 answers in total) don't run our software in full disk. It has been asked for specifying the local area where they are generating the products for and the majority of the 14 responses provided, say the local area belong to Europe areas.

It has to be said that users could select more than one option, that's the reason why the addition of the percentages is not 100. Regading *Full disk*, 6 out of 10 users that declared the use of this option, run the software in one or more local areas as well. So, the interest in running the software in full disk only is minoritary.

In regard to EMSu, a total of 20 of them responded to the question:



The result is quite similar as before, and most of the users that declared the use of the software in full disk runs the SW in other local area, a local area that always correspond to a part of Europe.

15. Could you please tell us the size of the area you are running the software?

So many different responses have been given to this question (17 in total) that is quite difficult to summarize or group them, so the complete list is given:

- quarter of full disc
- full disk
- 640km x 710km
- The Himawari full disk
- Region_UL:50.0 6.0 Region_BR:28.0 40.0
- 928x3712
- 210x400 pixels
- Europe

- 900x1800
- MSGN
- Slovakia and surrounding countries
- 1500x750 pixel, 640x480 pixel
- North from latitude 22 N
- 512x512; 3712x3712
- Europe + Canary Islands
- REGION_SIZE_P 151, 349
- REGION_ID: Africa REGION | Africa; CENTRE=40 -4; SIZE=512x512 VISIR pix REGION_CENTRE 0 23 REGION_SIZE_P 2600 3712

16. Which new Nowcasting products based on MTG-FCI could be of interest for your service?

13 answers have been gathered in this question. Some of them asked for having the same products as nowadays, and others selected that all the products will be great. In the following list is selected the answers that have something new:

- High resolution cloud products, land surface monitoring and severe weather monitoring.
- Nowcasting of precipitation, hail and wind gust (multi data source input).
- Lightning intensity and location.
- A product that would estimate the risk for mainly low level cloud cover to break up (road weather forecasting purposes mainly) and some very simple products for most important aviation thresholds like "Cloud base over/under 1000ft".
- Fire temperature.
- Contrail and fog detection.
- Cloud discrimation (stratus, cumulus etc).

Regarding EMSu, 6 people responded but only 2 (the two underlined above) were different than the answers: products that already exist, or all products, or other kind of responses as they don’t have a specific suggestion.

17. Which new Nowcasting products based on LI could be interest for your service?

This question has been answered by less users (only 9), but some suggestions have been gathered. Apart from the answers of users declaring that all possible and that they don’t know yet, the list below provide the result:

- Total Lightning Detection, Severe Weather Monitoring, Convective Activity Analysis and Storm Tracking.
- Lightning jumps.
- Nowcasting of precipitation, hail and wind gust (multi data source input).
- Satellite-based hail index, Transformer based nowcasting.

- Lightning Density.

In the case of the EMSu, again, the responses are the ones that are underlined in the list above.

18. Which data from ground based lightning detection networks are you currently using in operational activities?

12 responses have been provided. Our users use the following data from ground based lightning detection networks:

- Vicinity strikes in the range of 9-19km and Distant strikes in the range of 20-55km.
- LINET (2 users).
- GLD360 (3 users)
- LEELA
- Meteorage (2 users)
- Earth Networks Global Lightning Network (ENGLN).
- Weatherzone Total Lightning Network.
- NORDLIS (lightning location network between Norway, Sweden, Finland, and Estonia, 3 users).
- WWLLN (2 users).
- Euclid/Scalar.
- Canadian Lightning Detection Network.
- Blitzortung.

The ones that are underlined are the data ground based lightning detection networks that EMSu use.

19. Which visualization system are you using to display ground based lightning data?

12 responses have been collected:

- Vaisala's Lightning Location Syste.
- NinJo (2 users).
- In-house produced visualization software.
- GeoWeb (2 users).
- Multiple web-based visualisation tools.
- IBL Visual Weather.
- DIANA.

- HAWK-3.
- National cloud-to- ground lightning map.
- Python.

The ones that belong to EMSu (7 users, one of them uses more than one) are underlined.

20. Are you overlying ground based lightning data on other products? Specify if yes.

It has been collected some answers, below they can be found and underlined the ones that belong to EMSu:

- Convection RGB (2 users) and sandwich RGB.
- IR 10.8.
- Overlying with MSG satellite images and radar data, for example HRV Clouds RGB or during night time Night Microphysics RGB.
- Yes, with IR and mostly with radar data.
- Satellite images.
- HVR – IR.

21. Which of the EUMETSAT MTG-LI L2 data/products could be of interest for your service?

In this question, users had to choose which products could be interesting for their service. The possible products were given and they were: *Events, Groups, Flashes or 30 seconds re-gridded on the FCI 2km for Accumulated Flash (AF), for Accumulated Flash Area (AFA), and for Accumulated Flash Radiance (AFR).*

13 people answered the question (some of them with more than one petition), although few said that they didn't know yet. Focusing the responses answered correctly, we have:

- 30 seconds re-gridded on the FCI 2km IR grid for Accumulated Flash (AF).
- Geometry / geometry + density as propose by ESSL, or their recommendations (2 users).
- AFA (4 users).
- AF (3 users).
- AFR.
- Flashes.
- All of them (3 users).

It should be remembered that the answers of the EMSu are the one which are underlined (7 users with 10 petitions in total).

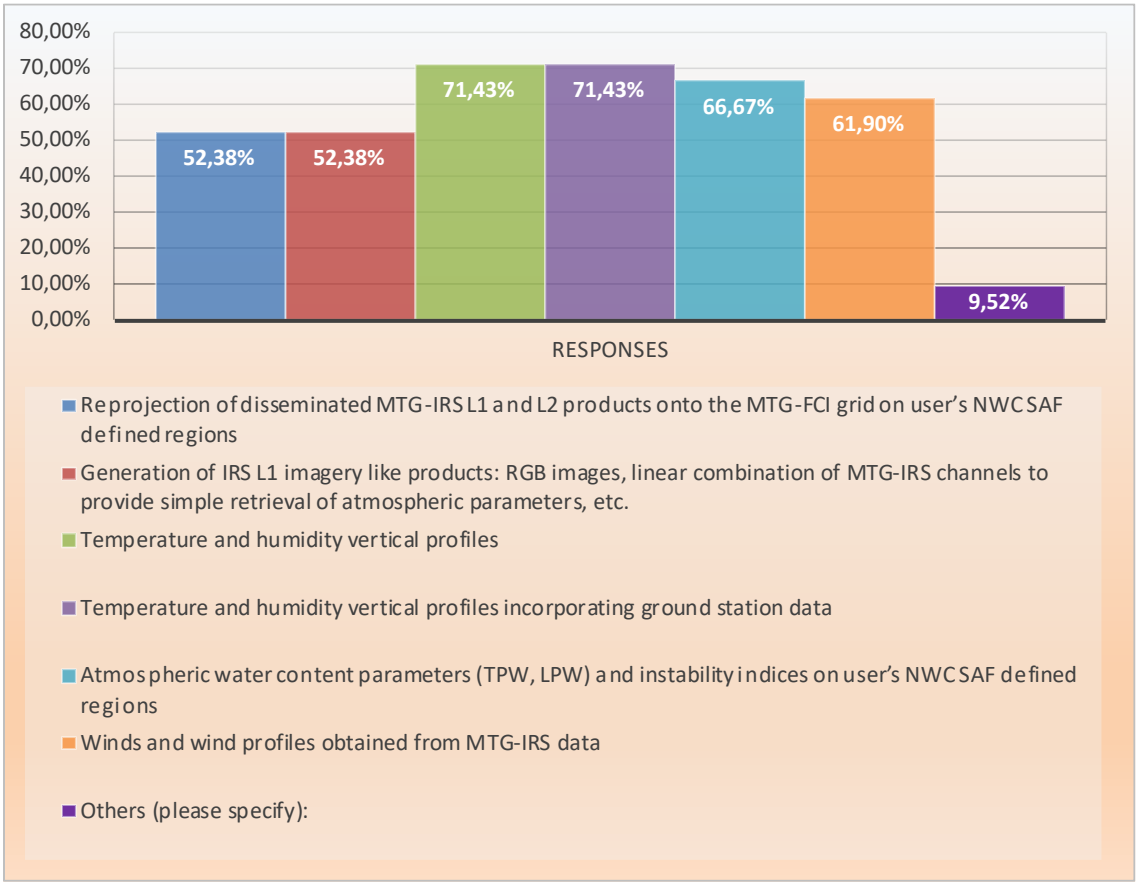
22. Which other MTG-LI products would be interested in?

In this question we gave the opportunity to users to add something else and they added other interesting products as MFA Minimum Flash Area (2 users), Flash Area and Flash Centroid Density. It was seemed all the responses are from EMSu.

23. Which new Nowcasting products based on MTG-IRS (on board of MTG-S satellite) and services could be of interest for your service?

21 users answered this question with the possibility of choosing more than one option. Besides, we provided the possible options warning our users that they must consider that the MTG-IRS products will not be useful over completely cloudy scenes (only under 80% cloud function) and the results were the following:

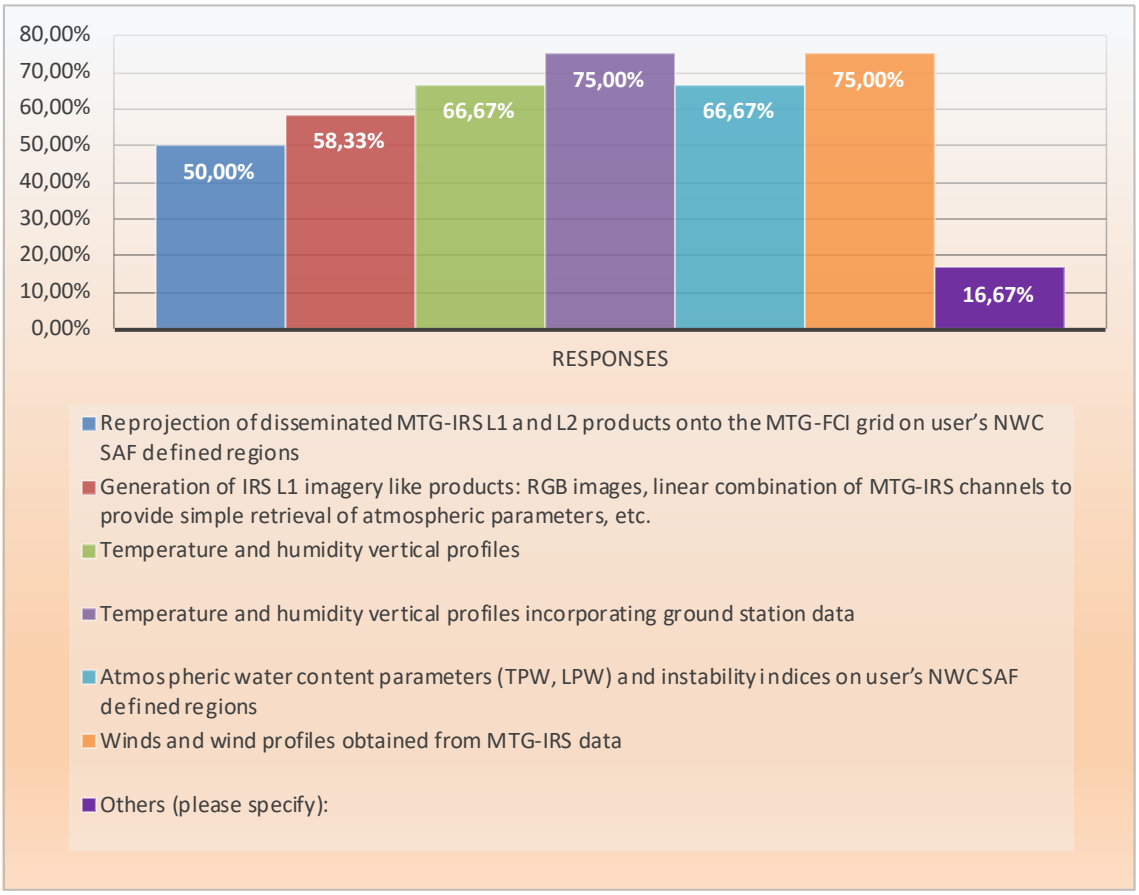
- Reprojection of disseminated MTG-IRS L1 and L2 products onto the MTG-FCI grid on user's NWC SAF defined regions (dark blue bar) → 11 responses or 52.38%
- Generation of IRS L1 imagery like products: RGB images, linear combination of MTG-IRS channels to provide simple retrieval of atmospheric parameters, etc. (orange bar) → 11 responses or 52.38%
- Temperature and humidity vertical profiles (grey bar) → 15 responses or 71.43%
- Temperature and humidity vertical profiles incorporating ground station data (yellow bar) → 15 responses or 71.43%
- Atmospheric water content parameters (TPW, LPW) and instability indices on user's NWC SAF defined regions (bright blue bar) → 14 responses or 66.67%
- Winds and wind profiles obtained from MTG-IRS data (green bar) → 13 responses or 61.90%
- Others (please specify) (purple bar) → 2 responses or 9.52%



2 answers with specifications which one was that they didn't know and the other, user asked for MUCAPE index.

As it can be perceived, the temperature and humidity vertical profiles are the most selected products, following by the Atmospheric water content parameters. A clear majority of the users want these two products. Nevertheless, it's fair to say that all the products provided have been selected for more than the 50%, so it can be said all products are interesting for our users.

Something a little different happens when we isolate EMSu.



- Reprojection of disseminated MTG-IRS L1 and L2 products onto the MTG-FCI grid on user's NWC SAF defined regions (dark blue bar) → 6 responses out of 12 or 50.00%
- Generation of IRS L1 imagery like products: RGB images, linear combination of MTG-IRS channels to provide simple retrieval of atmospheric parameters, etc. (orange bar) → 7 responses out of 12 or 58.33%
- Temperature and humidity vertical profiles (grey bar) → 8 responses out of 12 or 66.67%
- Temperature and humidity vertical profiles incorporating ground station data (yellow bar) → 9 responses out of 12 or 75.00%
- Atmospheric water content parameters (TPW, LPW) and instability indices on user's NWC SAF defined regions (bright blue bar) → 8 responses out of 12 or 66.67%
- Winds and wind profiles obtained from MTG-IRS data (green bar) → 9 responses out of 12 or 75.00%
- Others (please specify) (purple bar) → 2 responses out of 12 or 16.67%

Now, there's a little change in the 2 most chosen ones, they are now: *Temperature and humidity vertical profiles incorporating ground station data* (yellow bar and the same as before), and the *Winds and wind profiles obtained from MTG-IRS data* (green bar), both with 9 out of 12 responses.

Anyway, again, we have that all the possible products have been chosen for more than a half of the users, so it can be seen such a great interest in these products.

The 2 *Others* are the same as before, the MUCAPE index and the other user that is "*not sure*".

24. Which new Nowcasting products to be codified at NWC SAF could cover your needs?

This question was answered by few users, only 3 and none of them are EMSu. The result is the following:

- Precipitable Water and Stability Analysis, High-Resolution Wind, Cloud Motion Vectors and Lightning Detection and Tracking.
- We need continuation of existing products for MTG and dissemination over EumetCast.
- Multilayer cloud type. It should be provided information about cloudiness on a certain number of vertical levels; and more accurate precipitation estimate from sat.

25. Could you please specify your future need in Nowcasting?

21 users answered this question where several needs were given. The users could select more than one option. The options were the following: Cloud Pre-convective Environment (Convection Initiation); Clear Air Pre-convective Environment (Instability); Thunderstorm Warning and Tracking; Cloud Top Microphysics; Cumulus/Stratus distinction; Precipitation probability and rate; Extrapolated Imagery; Atmospheric Motion Vectors (AMVs) for a specific need; Detection, tracking and forecast of dry intrusions; Icing due to super-cooled water; Icing due to high altitude ice crystals; Hail Detection; Precipitation Phase (such as snow, rain); Turbulence Detection and Others.

The result is:

Future needs in Nowcasting	Percentage
Thunderstorm Warning and Tracking	82,14%
Cloud Pre-convective Environment (Convection Initiation)	75,00%
Hail Detection	67,86%
Clear Air Pre-convective Environment (Instability)	60,71%
Cloud Top Microphysics	57,14%
Precipitation Phase (such as snow, rain)	57,14%
Precipitation probability and rate	53,57%
Cumulus/Stratus distinction	50,00%
Atmospheric Motion Vectors (AMVs) for a specific need	50,00%
Icing due to super-cooled water	46,43%

Icing due to high altitude ice crystals	46,43%
Extrapolated Imagery	42,86%
Turbulence Detection	39,29%
Detection, tracking and forecast of dry intrusions	35,71%
Other (please specify):	10,71%

There's a 10.71% of users (3 out of 28) that have specified other option and are the following ones:

- Fog and fog top height.
- Risk for freezing drizzle.
- Fog.

There's a clear tendency for wanting pre- and convective products, meanwhile there's a less interest in products as *Extrapolated imagery*, *Turbulence Detection* and *Detection, tracking and forecast of dry intrusions*.

The products that have an interest of 50% or higher are 9 out of 14, leaving 5 with a punctuation less than 50%.

EMSu (15 in total) answered the following:

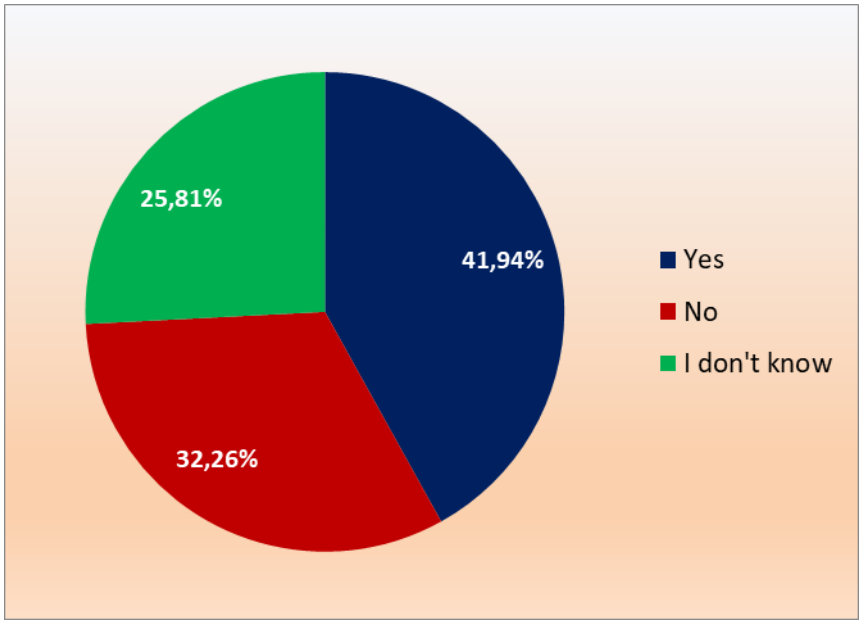
Future needs in Nowcasting	**Percentage**
Thunderstorm Warning and Tracking	93,33%
Cloud Pre-convective Environment (Convection Initiation)	80,00%
Hail Detection	66,67%
Clear Air Pre-convective Environment (Instability)	66,67%
Cumulus/Stratus distinction	66,67%
Precipitation Phase (such as snow, rain)	60,00%
Atmospheric Motion Vectors (AMVs) for a specific need	60,00%
Icing due to super-cooled water	60,00%
Icing due to high altitude ice crystals	60,00%
Cloud Top Microphysics	53,33%
Turbulence Detection	53,33%
Precipitation probability and rate	46,67%
Detection, tracking and forecast of dry intrusions	46,67%
Extrapolated Imagery	40,00%
Other (please specify):	13,33%

As it can be seen, the four first ones are the same, even with a higher percentage. Almost the same happens with the least chosen ones, where *Extrapolated Imagery* and *Detection, tracking and forecast of dry intrusions* keep being the least chosen ones.

Nevertheless, the interest in products is higher, only 3 out of 14 have a mark below the 50% of interest and from those ones, none of them are below 40% of interest.

If we focus on those products which have more than 50% of interest (11 out of 14), most of them (9 out of 11) have a punctuation of interest of 60% or higher giving rise to say that EMSu have a major interest for future products.

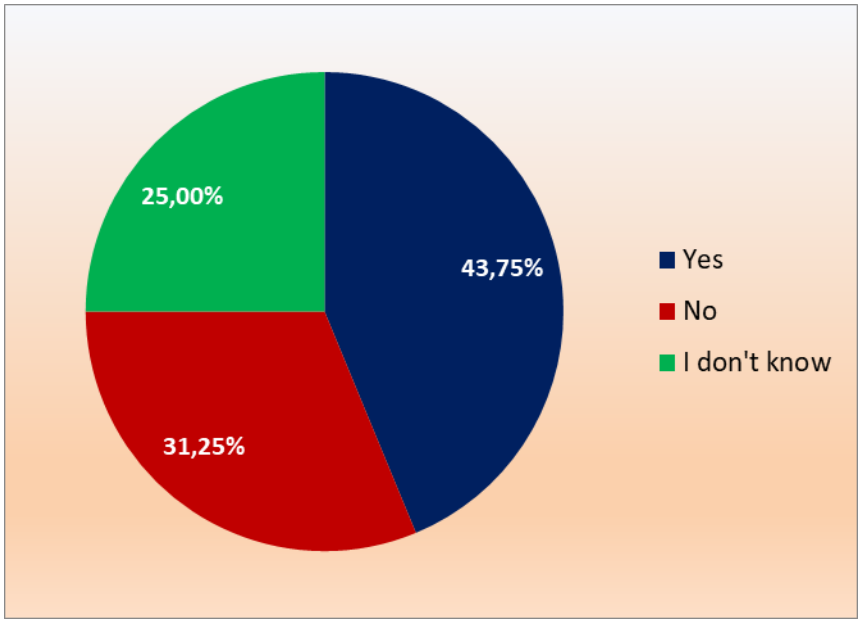
26. Are you using RTTOV in line for Cloud Mask generation?



Regarding Cloud Mask generation, the majority of the people do not use RTTOV in line, either because an unknownledge of the tool (8 out of 31, or 25.81%) or because directly they don't use it (10 out of 31, 32.26%).

It was asked the reason why they have chosen *No* as well, and the reasons why were for instance they are no familiar with RTTOV, or due to the fact they don't consider it's important for the CMA/CT producion because either it's unclear in the documentation or the configuration files have the RTTOV use deselected by default.

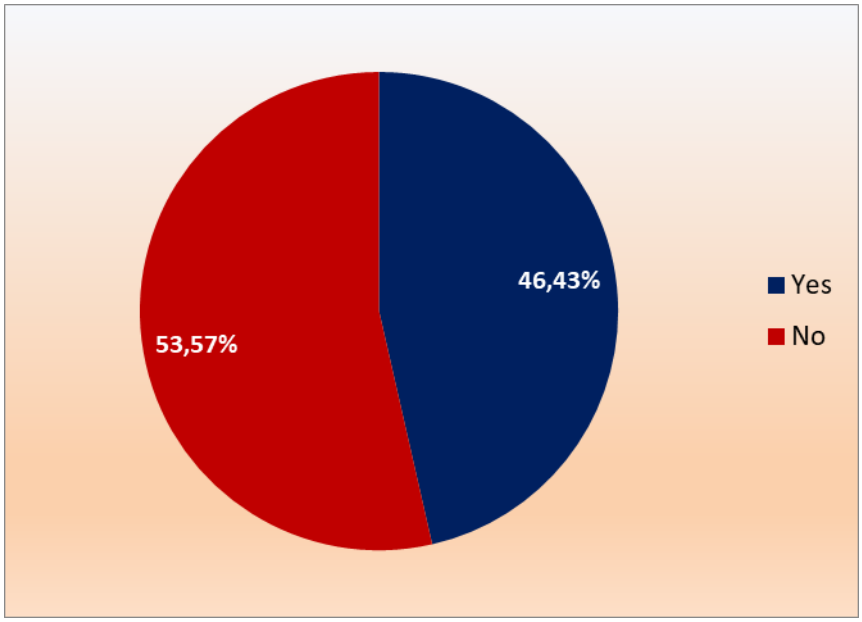
Regarding EMSu, the result is the following.



Practically, the result is the same as we have into account all users.

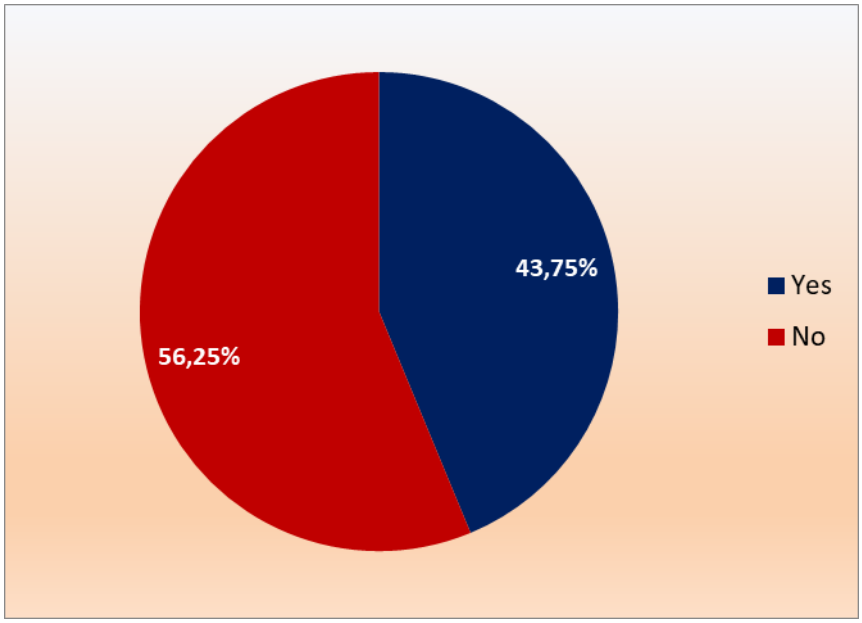
The ones that have aswered to “why they don’t use it” declared it was because they don’t consider it’s important for the CMA/CT producion, either because it’s unclear in the documentation or the configuration files have the RTTOV use deselected by default.

27. Are you using OSTIA data (optional input) for Cloud products generation?



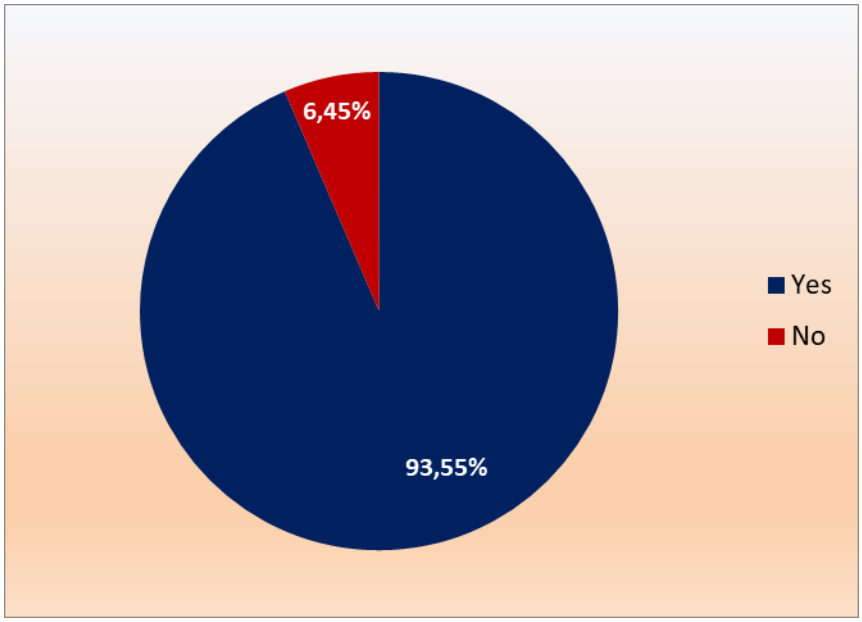
Almost half of the responses, out of a total of 28 declared that they use OSTIA data. It was gathered three reasons why OSTIA data are not used and they were because it's not competence of the person, the person is using the v2013, and the other because the user doesn't know what it is. This last two are EMSus' responses.

About the EMSu (16 responses), we have the following graph:



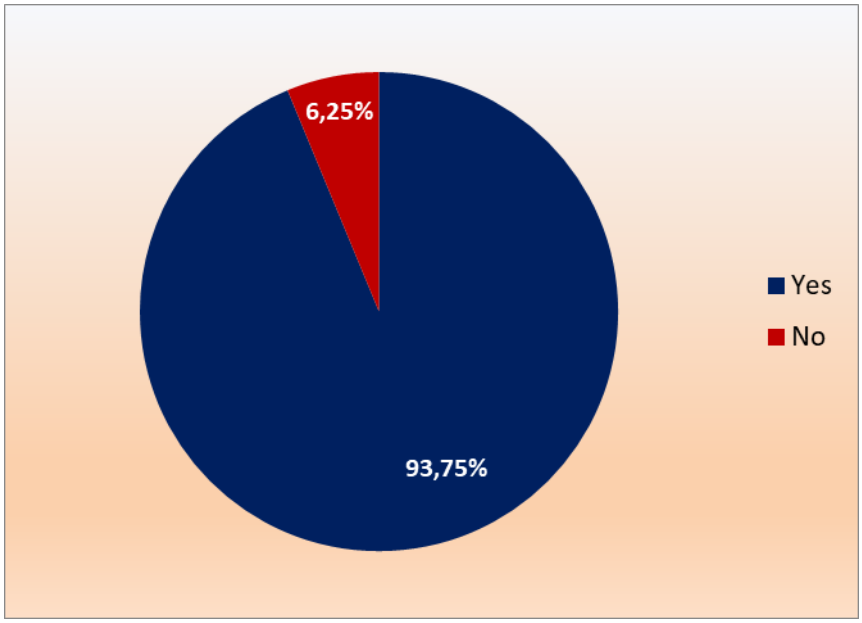
There's not any significant difference when we focus on EMSu.

28. Would you be interested in Cloud products at high resolution?



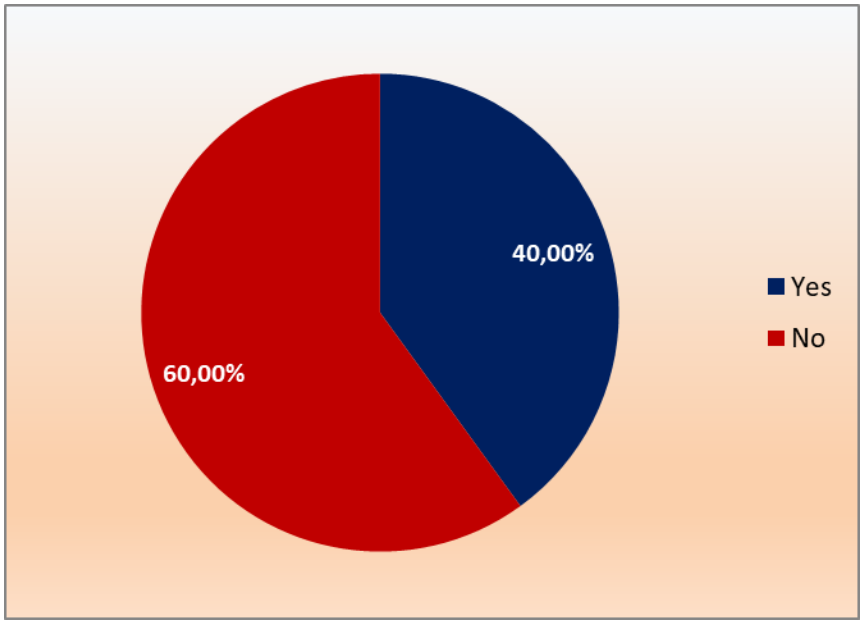
Clearly most of the users that have responded to the question, 31 in total, are interested in HR Cloud products, with a 93.55% of them chosing Yes.

If we want to know if it's the same tendency with EMSu, the following graph should be looked:



As it can be perceived, it's practically the same.

29. Do you use Precipitation Products over areas covered by radar?



Most of the users (12 out of 20) do not use Precipitation Products over areas covered by radar.

It was asked for commenting the answer they gave, and they were the following:

For *Yes*:

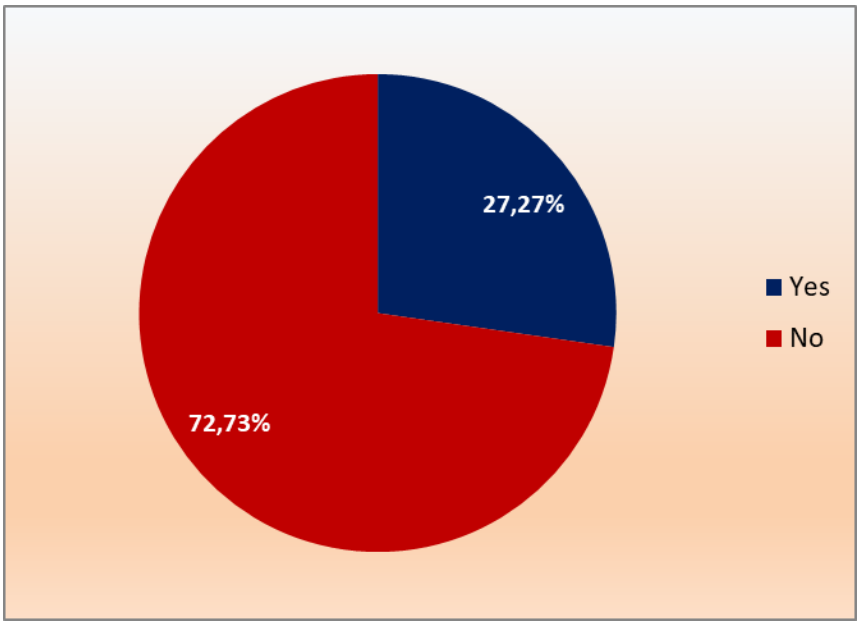
- Yes, for the conviction of the phenomenon that is taking place.
- Yes, currently they are distinct products, but we are aiming to blend them.
- PC product used as an input to produce Opera mosaics.
- Yes, we have real-time data from 13 radars.
- Yes, complementary and for survey and validation purposes.
- Yes, for quality control of radar data.

For *No*:

- Forecasters use radar only.
- It is calculated but rarely used, as radar estimate is usually more precise.
- We use them to have an idea about the intensity before reaching our radar network.
- Radar detects it better (2 users).
- Radar data are of high quality for precipitation.

- Don't use Precipitation products (2 users).
- No, most areas I use for rainfall are covered by satellite products.

For EMSu, we have the following:

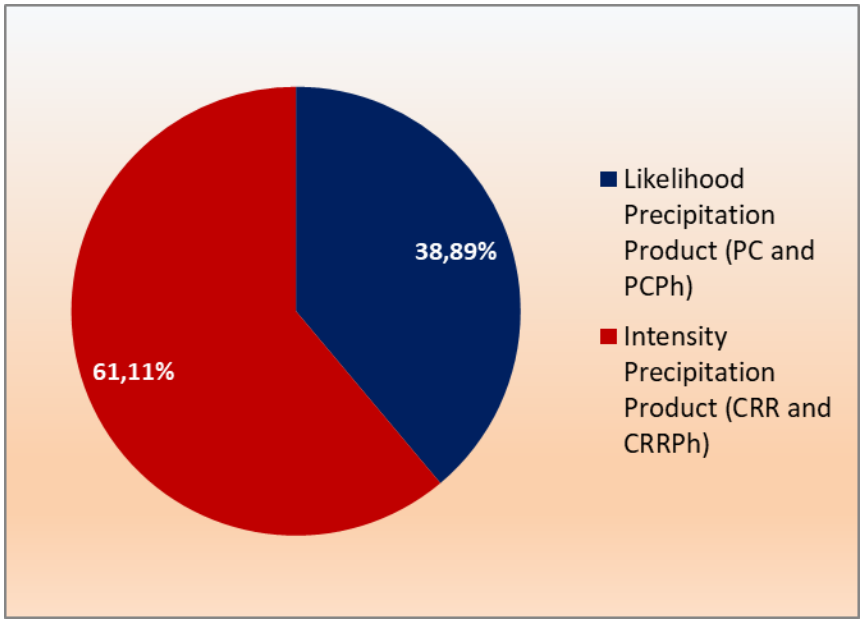


There's an increase in the percentage of the users that don't user Precipitation Products over areas covered by radar.

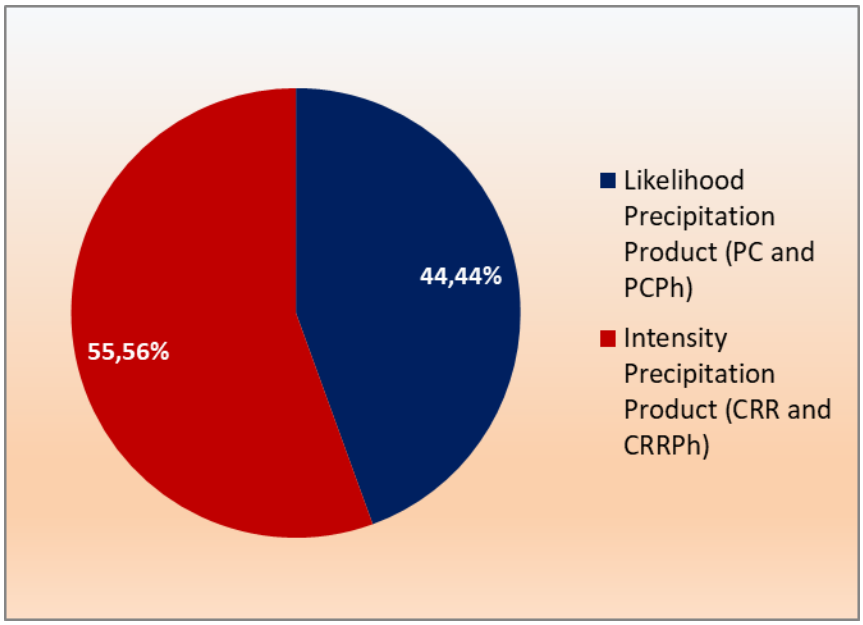
About the comments given, they were the ones that are underlined in the comments above.

30. What kind of precipitation products you use more often?

In this question, it was wanted to see which precipitation options were the preference for users, who had to choose between likelihood precipitation products (PC and PCPh) and Intensity precipitation products (CRR and CRRPh). 18 people answered, and the result is the following one:



As it can be seen, the majority of users prefer Intensity Precipitation Products instead of the Likelihood ones. If we focus on EMSu (9 responses), the result is quite similar:



Again, the Intensity Precipitation Products are the favourite, yet not for such a big difference.

31. Which visualization system are you using to display NWC SAF products? Could you indicate your needs to visualize the NWC SAF products?

21 responses have been collected, some of them have been repeated and some users visualize them in more than one way.

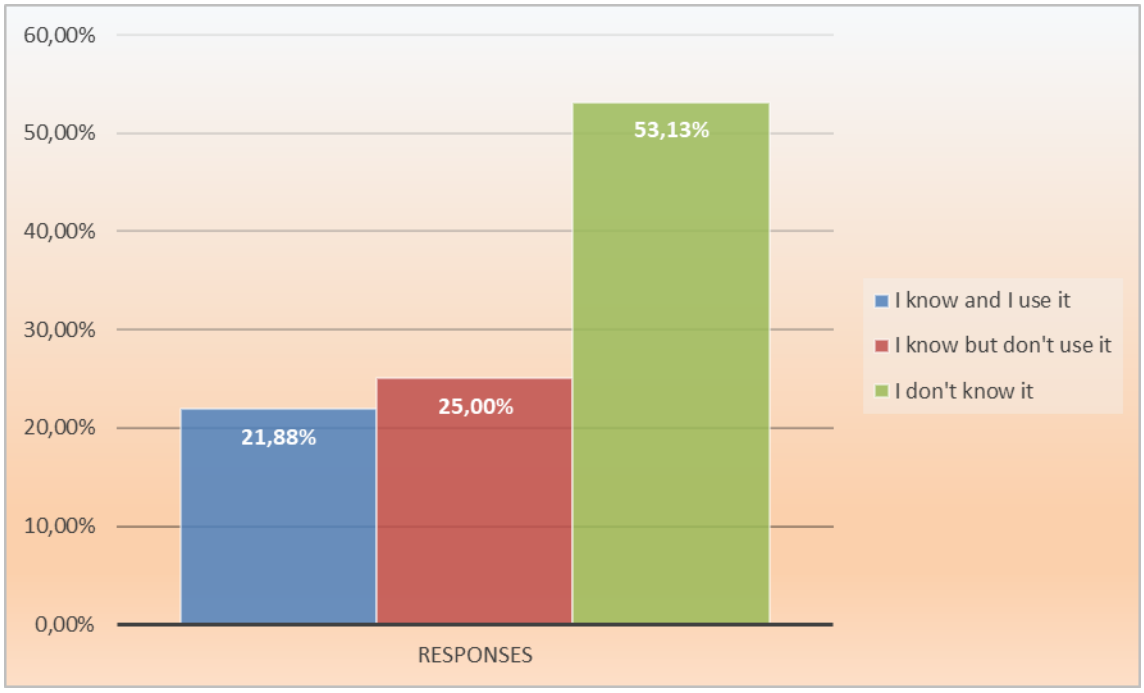
- ADAGUC (4 users)
- COROBOR-MESSIR
- QGIS
- NWCPY
- Ninjo (2 users)
- VisualWeather
- Panther (an internal visualization tool)
- Modified version of ShowCast
- Python (3 users)
- GeoWeb (3 users)
- Meteo-France synopsis display system
- Google-maps and open-maps
- IBL Visual Weather
- Hawk (2 users)
- R
- Matlab
- Not specified internal tools (2 users)

So many visualization systems have been given from users. Among all the responses, some of them are repeated, like ADAGUC, GeoWeb, Ninjo, Hawk and Python, which one user specified the use of this software to convert nc files into geo json.

About EMSu (10 responses), they use the ones underlined above, but GeoWeb is the most chosen one, following by Hawk and Ninjo. ADAGUC is only used by one and none of them employs neither Python nor NWCPY.

32. Do you know the NWC SAF tool NWCPY?

NWCPY is an easy-to-use tool that reads NWC/GEO output products in netCDF format and generates a graphical representation of a certain variable in a GIF file. This tool is provided by NWC SAF.



The majority of the responses (17 out of 32, a 53.13%) are from users that are not aware of what NWCPY is. Being more than a half, NWC SAF should consider if this quantity is fine because, as it was seen in the previous question, users count with a visualization system even they don't know about NWCPY or if this quantity is not enough and the system should be, at least, known by a higher number of users.

Between the 2 responses about the use knowledge of NWCPY (*I know and I use it* and *I know but I don't use it*), the higher number of choices are the one that declare the user don't generate products by NWCPY.

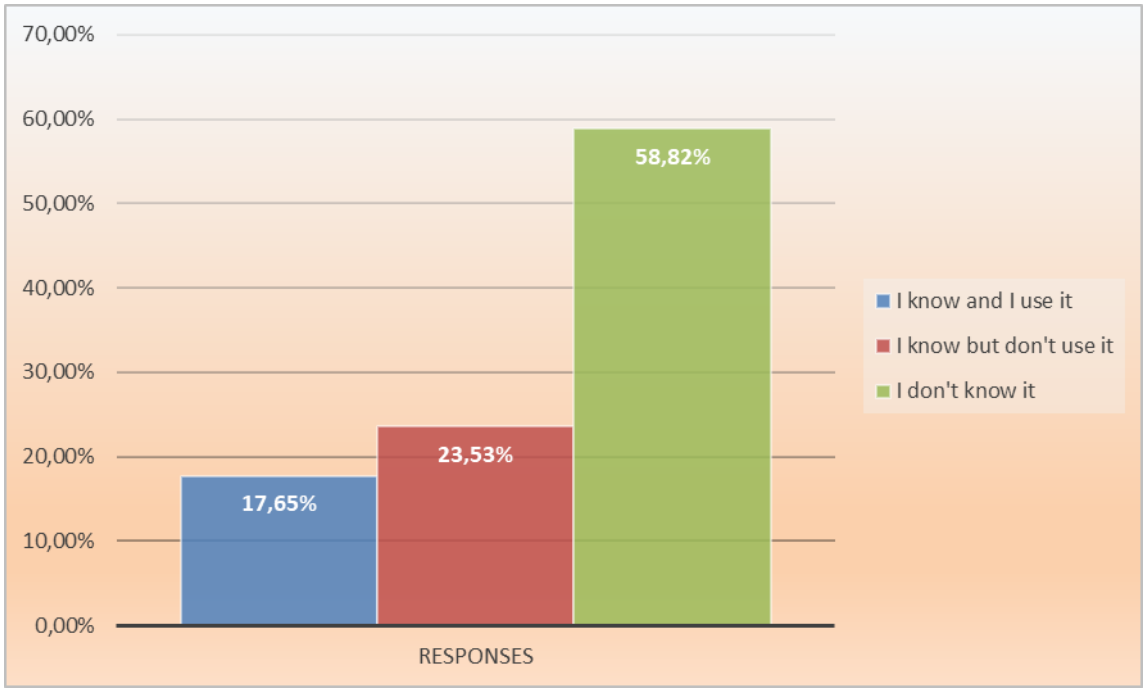
The users that declared they use NWCPY are the least (7 out of 32), but they are higher than the ones that wrote in the previous one the visualization tool NWCPY. This could be because most of the users that have answered this question number 32, didn't do the same in question number 31.

There was an empty space in case a user had a comment about NWCPY. The only request was the following:

- Insert lat and lon grid in the maps.

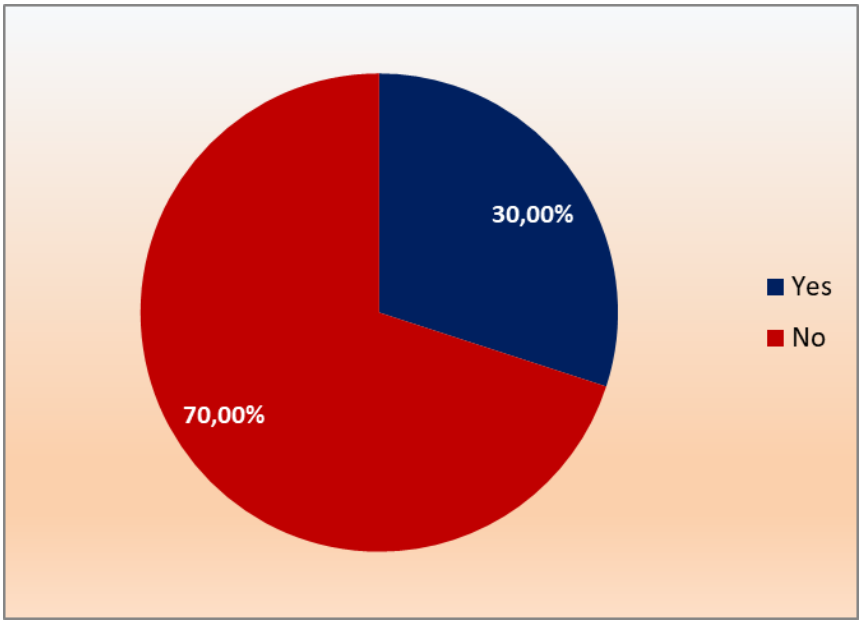
This is a measure that can be considered and perhaps NWC SAF should consider

EMSu have the same tendency in this question:



33. Do you apply -systematically or not- a post-processing to NWC SAF output?

It was asked for specifying the answer "*yes*". 30 responses were registered.

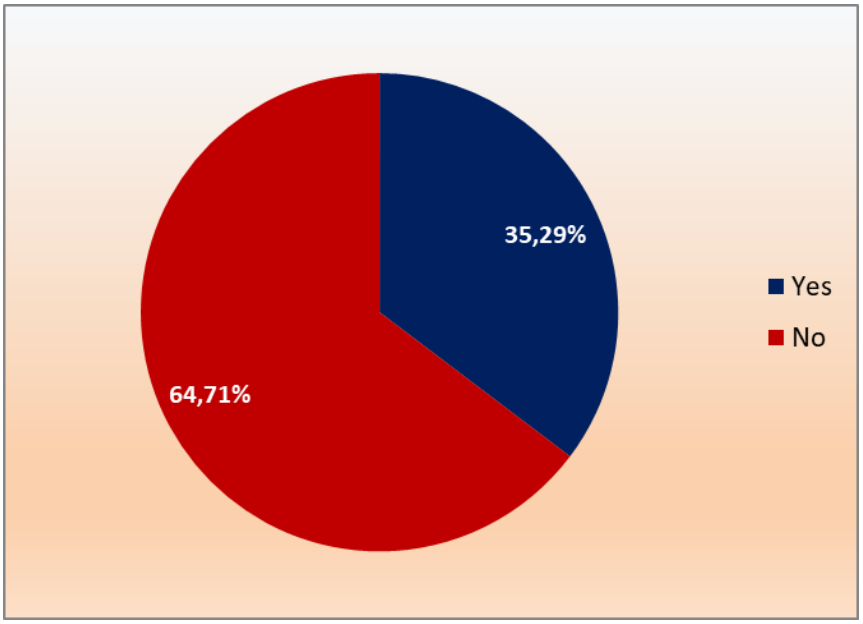


The majority of the users marked that they didn't apply a post-processing to NWC SAF output. A post-process can be for example transform some pixel-based products into polygons.

About the 9 out of 30 responses of *Yes*, only 8 have completed the part of the specification of the post-process. Below can be found the answers:

- Pytroll to convert NetCDF to GeoTIFF.
- Generate GeoJSON files from the RDT product for web display.
- Most products are encoded into images formats (geotiff).
- Parallax correction.
- Convert to other format and interpolation.
- Fix some problems caused by the limited visibility of the satellite instrument at very high latitudes.
- Filled contours.
- Transforming to Mercator projection.

7 different specifications (2 are the same, the GeoTiff ones), which 5 of them (it would be 6 if we count the GeoTiff ones as different), the underlined, belonged to EMSu. It is provided the rest of the results (17 answers) of them as well:

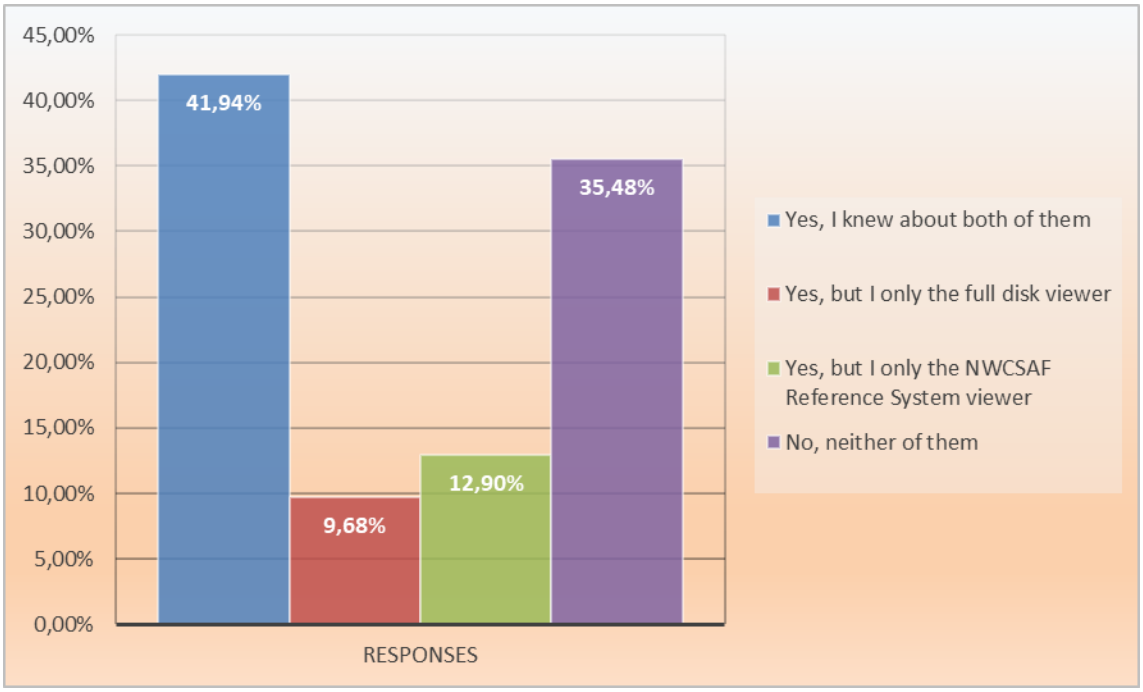


Again, most of the people don't apply a post-process.

34. Do you know about the advanced visualization tool ADAGUC?

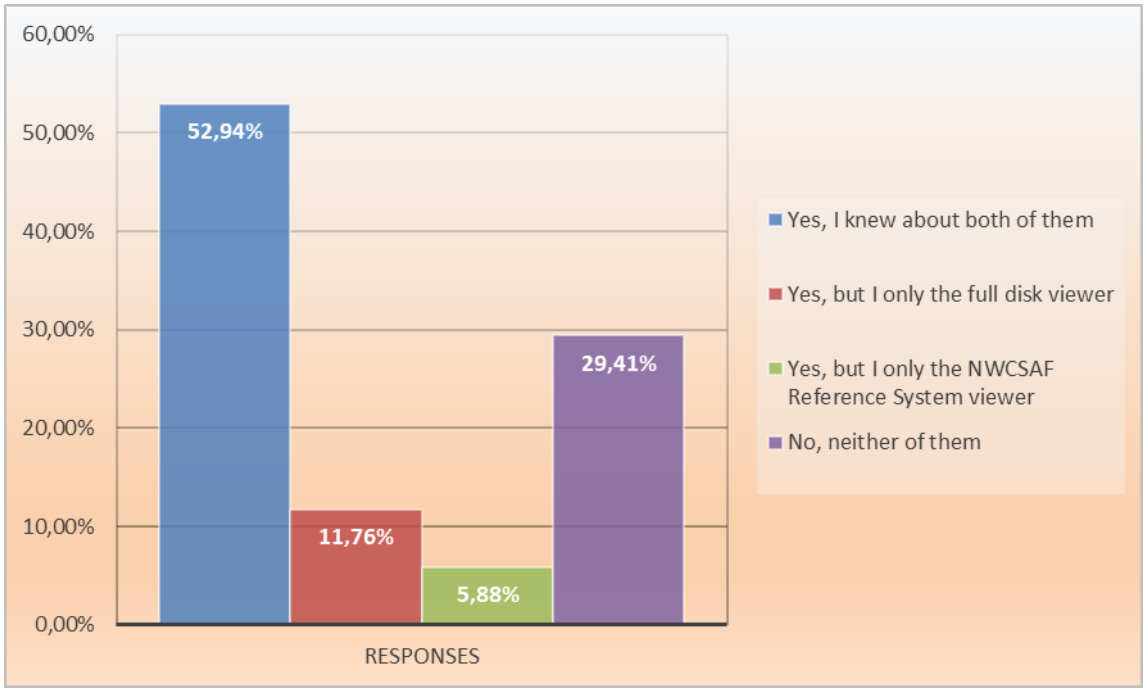
ADAGUC tool has both the full disk viewer version and the NWCSAF Reference System viewer version. In this question, we wanted to know firstly, if users knew about ADAGUC and second, if this knowledge covered both versions, the full disk or the NWC SAF Reference System, or only one of them, and in that case, which one.

The result is the following:



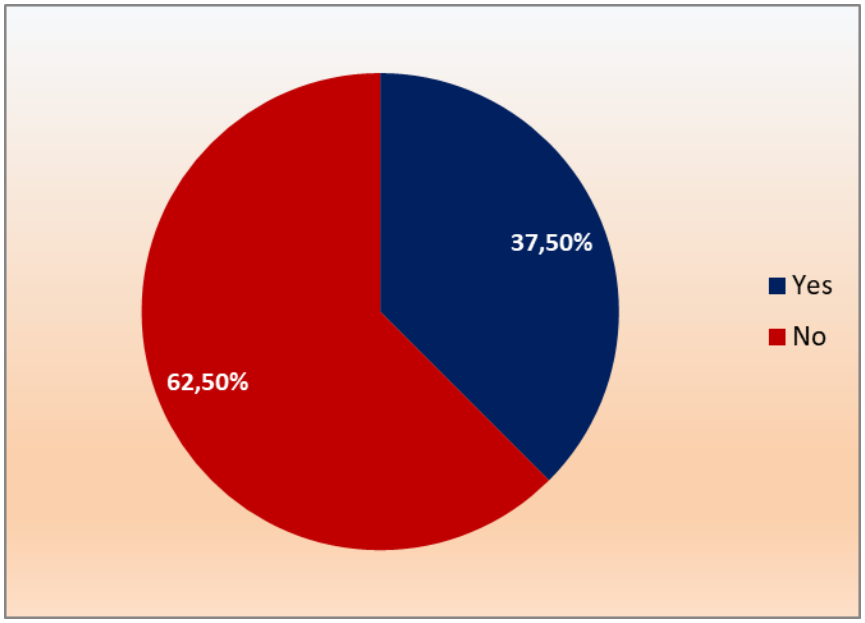
31 users answered the question and almost two thirds of them (counting the ones that knew both versions and the ones that only knew one of the versions) are aware about AGADUC tool, the rest, 35.48% didn't. It's true that most of people are aware about ADAGUC, but what it must be thought is if this third is or not enough relevant.

About EMSu (17 responses), the result is a little bit different:



Less people aren't aware about ADAGUC. Regarding the users that know ADAGUC, a higher number have knowledge of both versions of the viewer and now, the people who only know the Reference System viewer is less than the previous one.

35. Do you use ADAGUC?



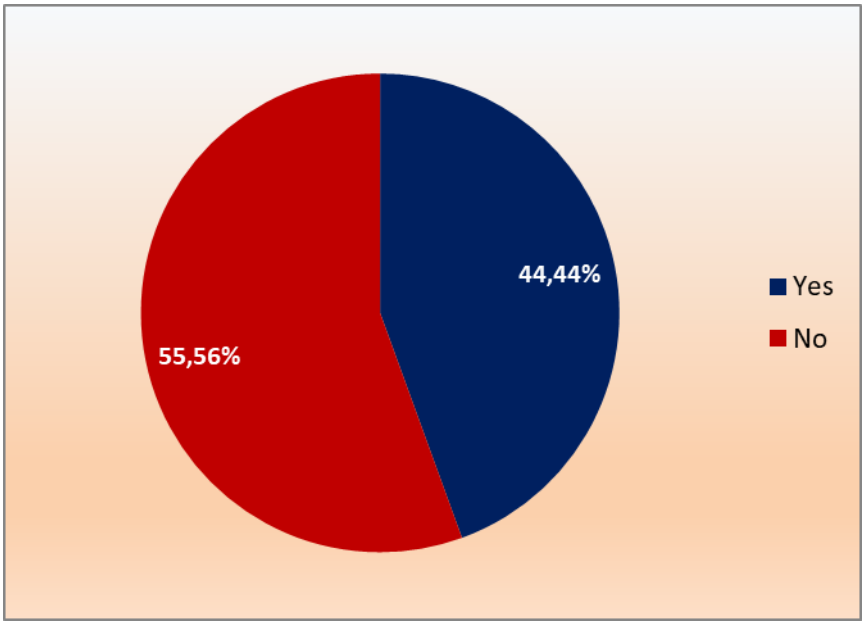
Most of the users, 20 out of 32, didn't use ADAGUC. Some of them can be because of lack of knowledge, as it was seen in the previous question.

About the people that said '*Yes*' (12 out of 32), it was asked if they could provide some lines in regards of some difficulty, they had with ADAGUC. 6 responses were collected and only two users found some issues:

- I have difficulties in creating animations.
- Difficulties compiling and installing for our OS. OpeNDAP is not working.

Developers could take these into account for the future of the viewer tool, even they are only two complains.

Below, it can be found the graph for EMSu, 18 responses.



Practically, the same structure as before, most of the users do not use ADAGUC, although here, we find a higher number of users that use ADAGUC.

36. Could you please rate the usefulness of NWC SAF products visualization on ADAGUC?

For this question, users had to score the usefulness of ADAGUC. The score is the average of all the responses given by the 19 people that answered.

The rate for the usefulness of ADAGUC is **7.84 out of 10**, what can be considered a good mark. If it's only considered the EMSu, the score is **8.45**, more than half a point higher.

37. How do you think ADAGUC viewers could be improved? In which way?

4 people answered this question, but one was for saying the user don't use ADAGUC. So, we only have 3 valid responses:

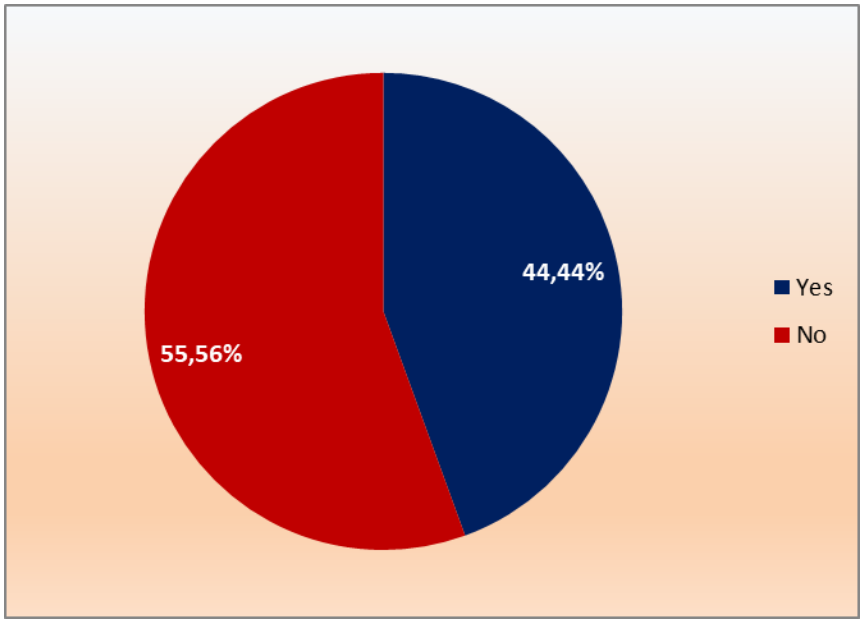
- By adding more advanced analytics tools such as trend analysis, anomaly detection, and predictive modelling.
- More complete documentation for installation of an instance.
- Some trouble to make them work in corporate environment with proxies and FW.

Only the one underlined is for a EMSu.

38. Do you know that you can overlay the NWC SAF products with other layers through WMS?

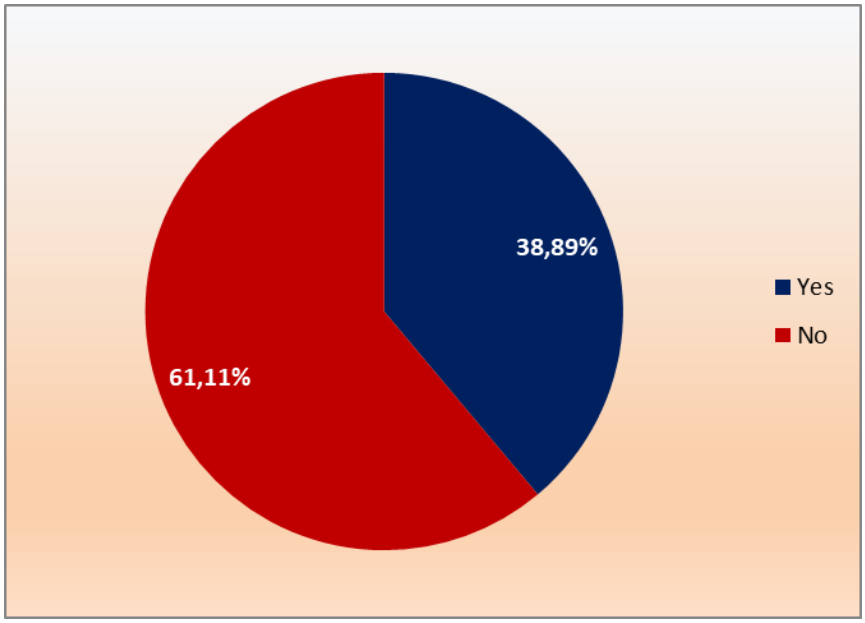
This question was paired with an explanation about it, that was this question meant that in ADAGUC viewer you can overlay EUMETview layers, this also means that it can be used NWC SAF layers in user's own system.

The total of users that have answered is 27 and the result is the following:



In this question it can be perceived a lack of knowledge about ADAGUC facilities.

In the case of EMSu, the graph is similar, yet there's even a higher number of users (11 out of 17) that are unkown of this feature.



GEO part is over. As it can be perceived, almost all the questions have been responded by 30 users and the number of them are 38. The next question was if the user wanted to go to other parts of the survey (PPS part or EUMETCAST part) or if they want to finish it. 4 people wanted to go to PPS Part, 18 to EUMETCAST Part, and only 13 decided to finish there the Survey. Regarding EMSu, 3 of them decided to go to PPS part, 10 to EUMETCAST Part, and 5 decided to finish the Survey.

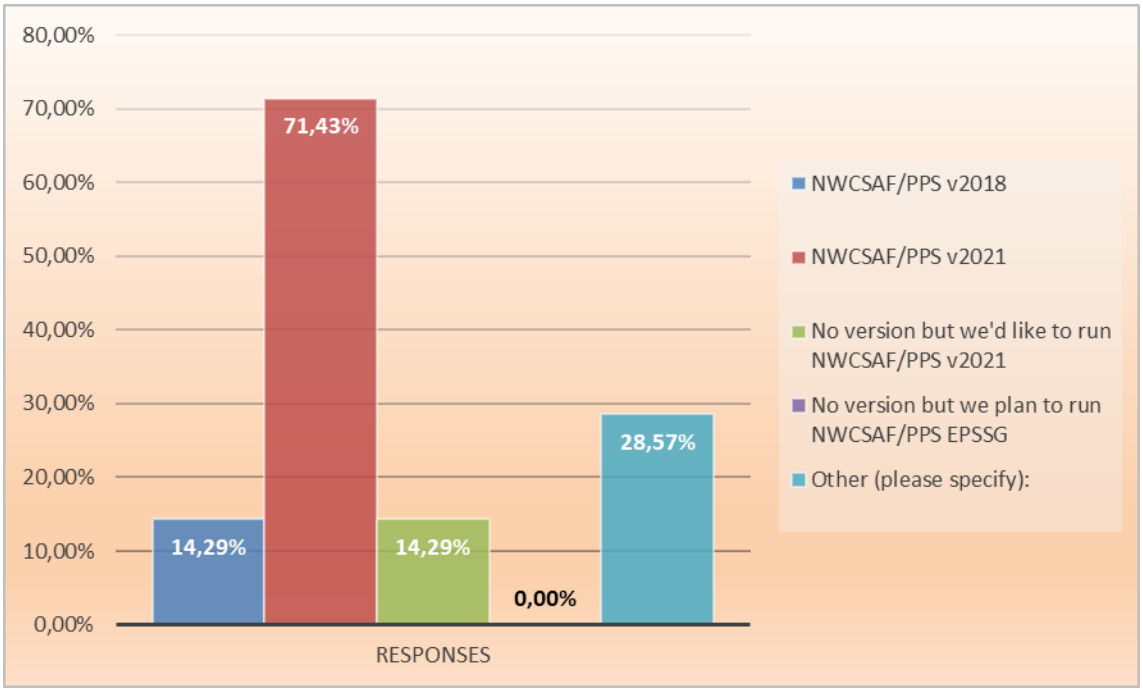
The following part is PPS which 7 users (4 from EMSu) decided to complete it. 3 jumped directly from *General Information part* and 4 came from *GEO part*.

3.1.3 PPS PART

19 questions form the PPS part. The number of users that declared they want to fill in the PPS part is 7 and 4 of them, EMSu. They are the following:

EUMETSAT Member State	N. of users	EUMETSAT Member State	N. of users
Finland	1	Norway	2
Germany	1		

1. Which NWC SAF/PPS version is currently running in your site?



The majority of the responses (5 out of 7) declared they use the newest version, NWCSAF/PPS v2021. Only 1 said they use v2018, 1 of them no version but they'd like to run the newest, no one would like to run NWCSAF/PPS EPSSG and there were 2 answers about "Other". In the specifications, both said they still uses v2014.

We must consider more than one answer is let, so one user can user more than one version. In this question, only two users have declared they use more than one, both use v2021 and v2014.

About EMSu, the 4 of them answered the question with the following result:

- One doesn't run any version but would like to run NWCSAF/PPS v2021, other runs v2018 and the rest both, versions v2021 and v2014.

2. Please specify your application environment.

It has been asked if users can specify the following application environments: Operating System and Version, C Compilers and Version, and Fortran Compilers and Version. 5 people answered the first specification, and 2 the rest.

Operating System and Version
✓ Ubuntu 18, 20 ✓ RHEL 7

✓ Redhat8 ✓ V2021 linux ubuntu jammy, v2014 stinky old ubuntu ✓ RHEL 9.2

C Compilers and Version
✓ gcc, g++ ✓ gcc
Fortran Compilers and Version
✓ gfortran ✓ gfortran

About the EMSu, the ones that are underlined are the responses from them.

3. If you currently have no version of PPS running but would like to run PPS v2021. What is the problem?

It was obtained only one answer, from a EMSu and was the following:

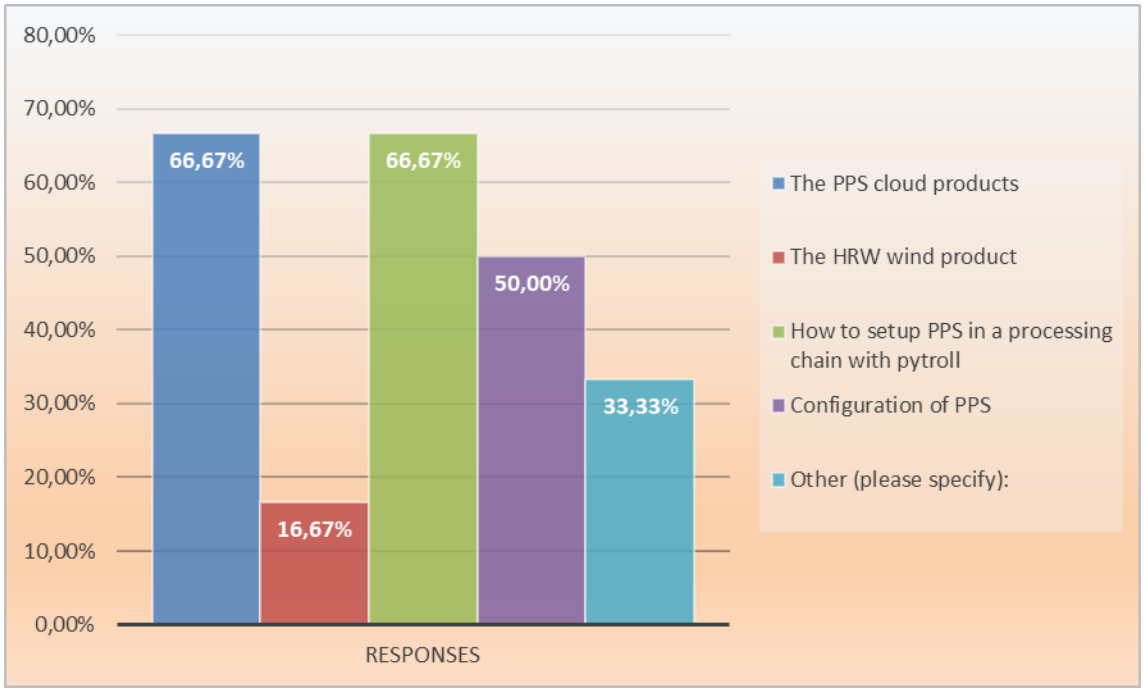
"Running and integrating PPS to operational environment is complicated. The command-line options have unintuitive names (the input file is given with --anglesfile switch). There is no task manager that would handle running the processing for new data. The user needs to create their own processing system, or figure out how to use Pytroll's PPS runner which has only SMHI specific example config with no explanations about the options. Unfortunately, we lack resources (humans) to develop and improve PPS runner".

At the end it's like answers from question number 2 of GEO part, a lack of human resources.

4. What would you like to learn in the upcoming workshop on PPS version EPSSG (planned 2026)?

This question was answered by 6 people and has the opportunity of selecting more than one option. Users could choose between *The PPS cloud products*, The HRW wind product, *How to setup PPS in a processing chain with pytroll*, *Configuration of PPS* or *Other*, and write their suggestions.

The result can be found in the following graph:



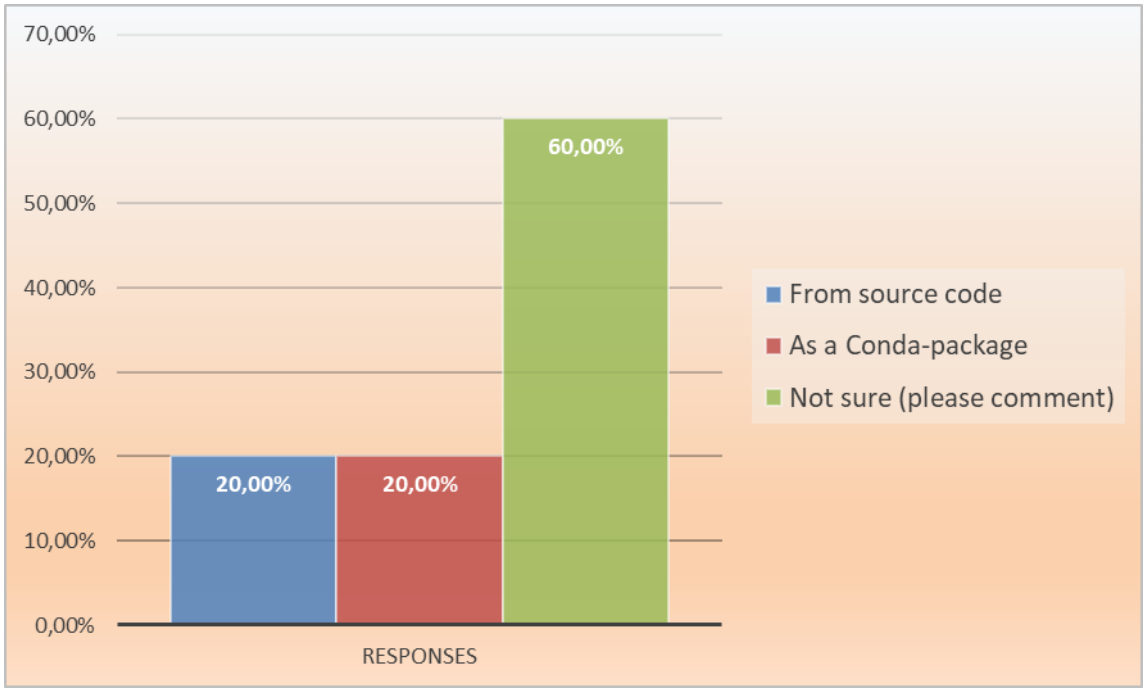
Most of the people seems to be interested in *PPS cloud products* and *How to setup PPS in a processing chain with pytroll* (both chosen by 4, 2 of them EMSu), following by the option *Configuration of PPS* with 3 users interested (1 belong to EMSu).

HRW seems interesting only for one person, EMSu, but the lack of choice could be because it's a new product and people are not very aware of it. The unknowledge of a product might do the product unattractive.

Regarding Other, 2 questions have been given (the underlined one, from a EMSu):

- Advanced config of processing.
- How to easily dockerize PPS software, in case you are not planning to provide official Docker images.

5. How would you like to install the next PPS version?



5 users responded this question. One chose *From source code*, other one *As a Conda-package*. The 3 remaining answered that they weren't sure and led the following comments:

- Installation is reasonably simple, although it would be nicer if PPS were available in conda-forge or a dedicated channel. Have you considered providing ready-made images (e.g. Docker) for the users?
- I would like to have both possibilities.
- I'd like to have an official Docker image, or at least an official Dockerfile that I can change if needed.

Regarding EMSu, 3 were the number of answers by them, 2 of them the two underlined above and the other: *As a Conda-package*.

6. Please specify the characteristics of the Numerical Model you use.

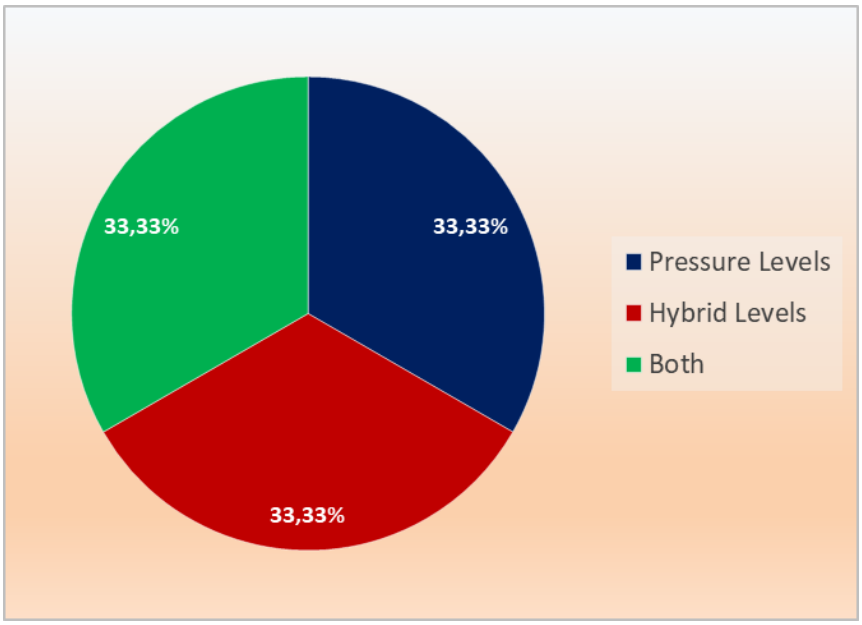
2 people (one of them EMSu) have answered this question, which was asked about the NWP model, the Spatial resolution, the temporal resolution (step and range), the vertical resolution and the levels (hybrid, pressure or both). The answers are below.

NWP Model	Spatial resolution	Temporal resolution	Vertical resolution	Levels
ECMWF	0.25º	6 hours	-	hybrid
ECMWF	0.1º	24 hours each 3h	-	

Remember the underline is for EMSu.

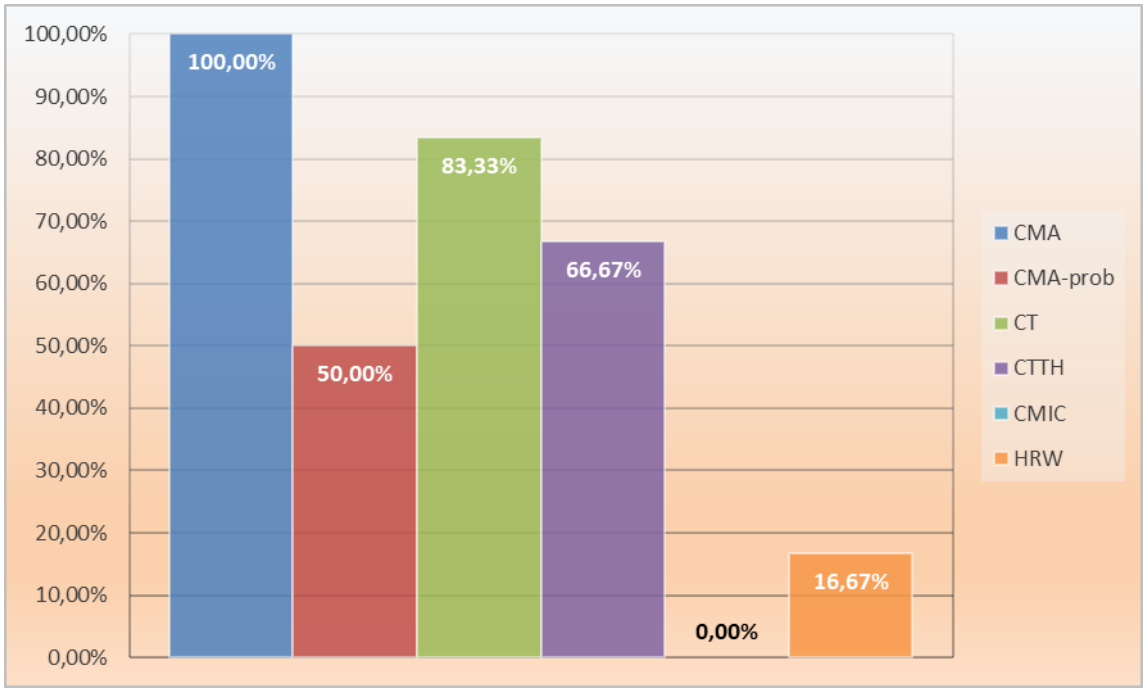
No answer was provided for *Vertical resolution*.

7. What kind of NWP data do you receive in your system?



This question was responded by 3 users, where can be perceived in the graph above that each one chose something different. Only one was a EMSu, and selected the *Hybrid Levels* option.

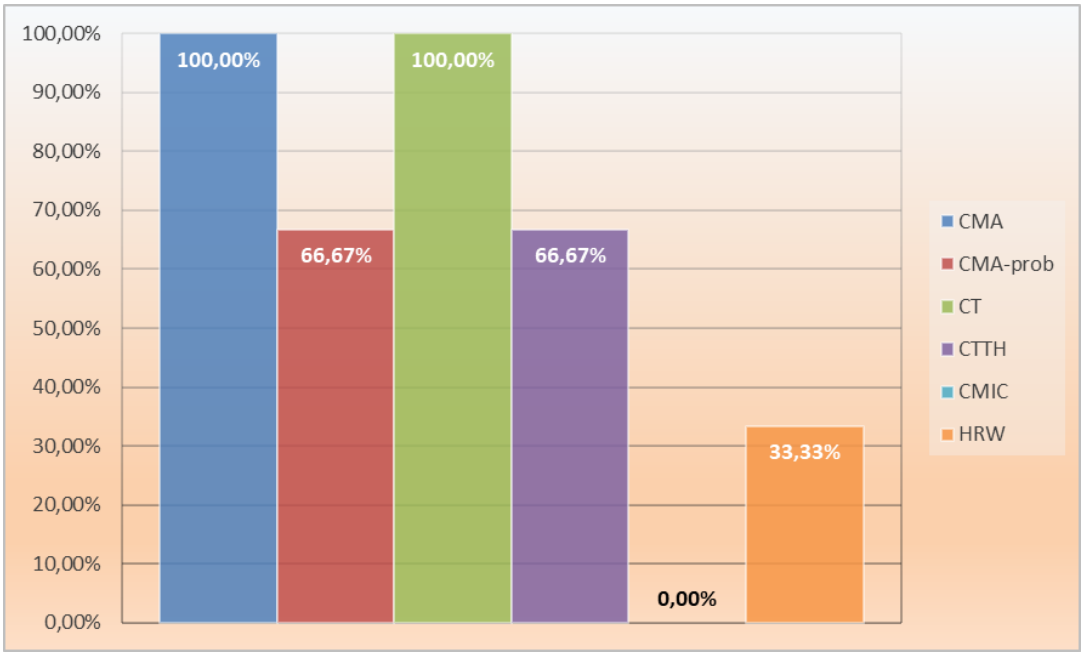
8. Which of the current SAFNWC/PPS Products are you using?



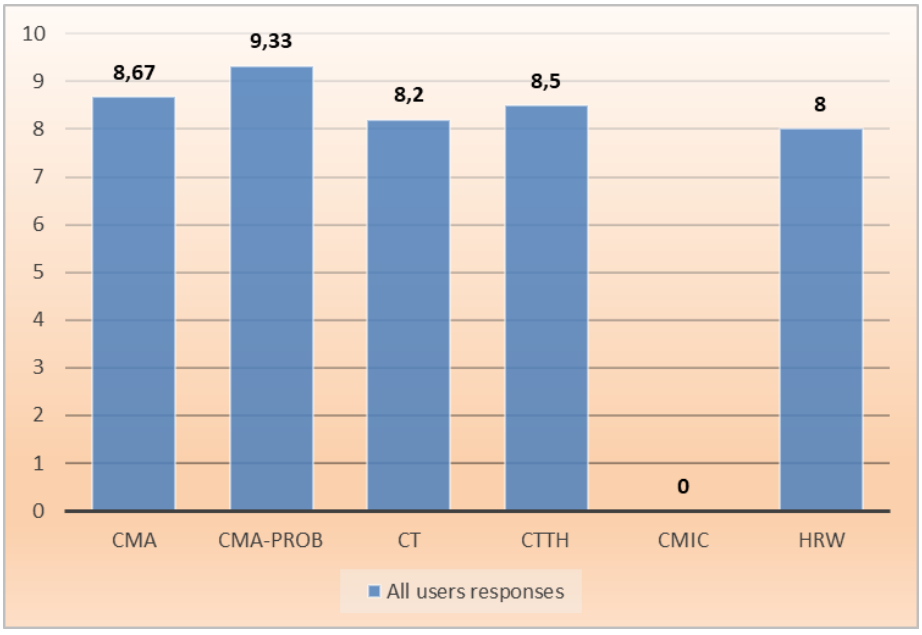
6 people answered the question and multiple options were allowed. All of them used the Cloud Mask product. The next most chosen product is the Cloud Type and next, the Cloud Top, Temperature and Height. HRW product has been selected only for one person, yet it must be reminded this product is practically new, so it can be thought it's not chosen because of a lack of awareness about it.

Something remarkable is the CMIC's zero. Remember that this question has been only responded by 6 people, it's not all the users that truly use PPS package. Even so, it's known by our NWC SAF PPS Team that there are some users that have the CMIC product as one of their selected products.

About the EMSu, the graph is similar than before and the question was only responded by 3 users.



9. Could you please rate the usefulness of the products you are familiar with?

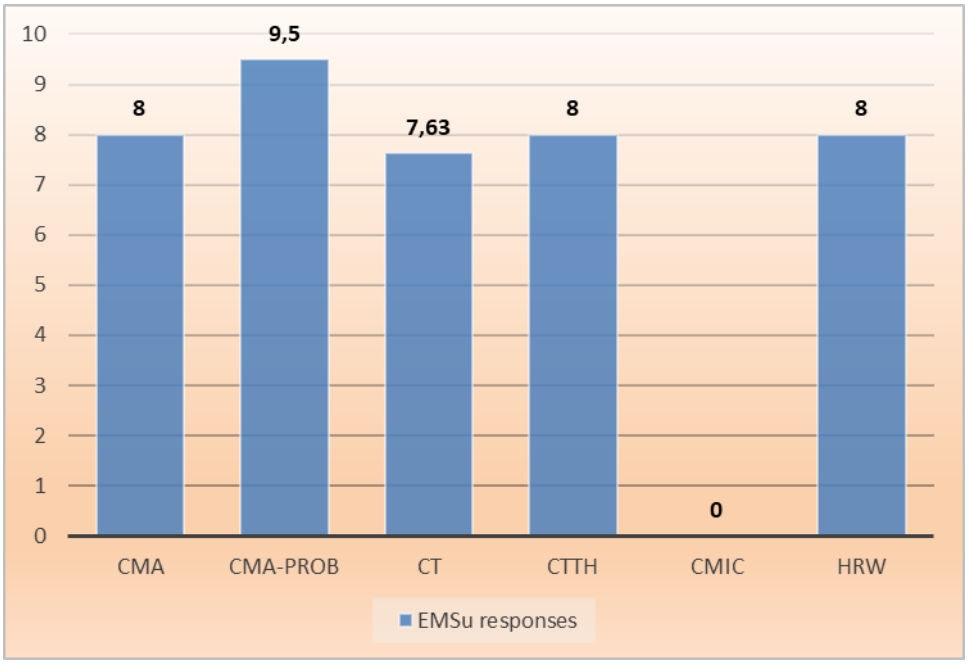


This question has been answered by 6 people and the result is the graph above this line.

The specifications of the question were to rate the usefulness of PPS products, being 1 “Not very useful at all” and 10 “Extremely useful”. As it can be seen, no product has a rate under 8, so PPS users find almost extremely useful these products, especially the Cloud Probability (CMA-Prob), which mark is 9.33.

In the case of the CMIC, the punctuation is 0 and it’s complete expected because if any of the users that responded to the survey didn’t used it, they were not going to rate it.

If the attention is focused on EMSu (3 answers), the result is the following:



The rates are a little bit smaller for CMA, CTTH and CT, and higher for CMA-Prob. In the case of HRW, the result is the same as before. Even though the lower of the rate in some of the products, it can be said EMSu are quite satisfied with PPS products.

10. Would you like to make any comment or remark about any product?

This question gathered 2 answers (both from a EMSu) for 2 products. The comments were the following:

CTTH
✓ Often overestimates low clouds over sea.
CMIC
✓ Not processed at the moment. No users has asked for it and it is slow to process.

Focusing only in EMSu and following the rule of underlining the answers that are from them, we have that the 2 answers before were from EMSu.

11. Future satellites: PPS can run on the AVHRR, VIIRS, SLSTR (not CMIC), MERSI-2 and MODIS sensors. Additional to that, please indicate your need for future adaptations for EPS-SG (METimage sensor):

This question has been answered by 2 people and they say firstly that "*all currently used products MUST be supported by METImage VII or whatever the instrument is called*" and the second user said that "*CMA, CMA-Prob and CT have to be support for METimage sensor and for Sentinel-2*".

Due to the fact of the underlined in both phrases, it can be guessed the answers corresponded to EMSu.

12. Future satellites: PPS can run on the AVHRR, VIIRS, SLSTR (not CMIC), MERSI-2 and MODIS sensors. Additional to that, please indicate your need for future adaptations for FY3-F (MERSI-III sensor):

This question has been answered by one user, who said: "*No user has requested this yet. Maybe interesting for HRW? Don't know yet*" and was from a EMSu as well.

13. For the current NWC/PPS products, what are you using each product for?

For this question, it were given some options for each product as: Research, Forecasting, Warning/Monitoring, Assimilation NWP Models and Other applications. 5 people (2 of them EMSu) answered and the results can be gathered in the following table:

What are you using each product for?					
	Research	Forecasting	Monitoring/Warning	Assimilation NWP models	Other applications
CMA	1	2	0	0	2
CMA-prob	2	0	0	0	1
CT	0	2	0	0	2
CTTH	0	2	0	0	1
CMIC	0	0	0	0	0
HRW	0	0	0	1	0

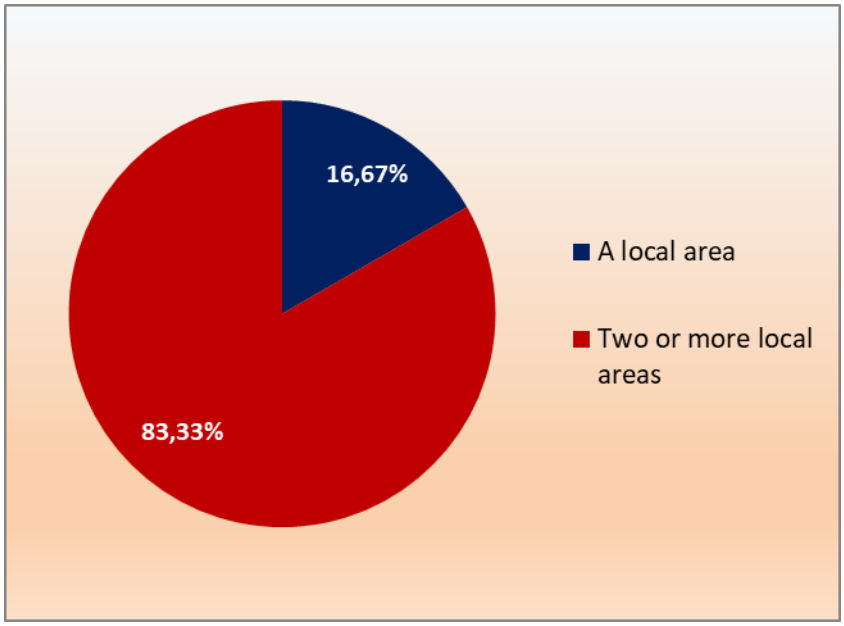
Forecasting is still the main use users give to products (remember in question number 8 from GEO Part was the same result). Besides, another result is repeated again, the usage of HRW product in assimilation for NWP models.

Regarding the option *Other applications*, it was asked the users to comment this result and only 1 (not a EMSu) commented it: *Generating Ice Surface Temperature products.*

If we focus on the 2 EMSu, one of them uses all the products for forecasting except the HRW, that it's used for assimilation, and the CMA-Prob, which is used for research. For the other one, the user uses CMA, CMA-prob and CT for research. It seems that the research is something characteristic of CMA-Prob.

14. In what area do you generate the products?

In this question, users (6 in total) had to write if they run the software in one area (first option) or two or more local areas (second option). In addition, the petition of specify that local area/areas were asked, but only 3 of them responded. The results can be found below:



It seems tha majority of PPS users choose more or more local areas instead of one. The comments about what area do they use, were all from the *Two or more local areas* group, and they were the following:

- Two users said Poleward of 50N and 50S.
- All Europe (EARS System).

3 EMSu answered to the question and all of them chose *Two or more local areas*, with one specification, the areas of the northern and the southern hemisphere poles.

15. Could you specify your future needs in Nowcasting related to polar satellites?

For this question, it has been gathered 4 answers (one of them with more than a suggestion), which 3 out of 4 were from EMSu (the ones underlined, as always). They can be found below:

- Research.
- Cloud Pre-convective Environment (Convection Initiation) (especially regions north of 65N); Clear Air Pre-convective Environment (Instability) (especially regions north of 65N); and Icing due to super-cooled water.
- Adapting to new sensors and continuing improving the quality.
- Easy to install, use and maintain. Similar to what we have today. The installation has improved by light years since the versions back in the early 2000.

It should be highlighted that one user found the software easy to install, use and maintain.

16. The HRW is new in PPS-v2021. Are you interested in this product for potential use by:

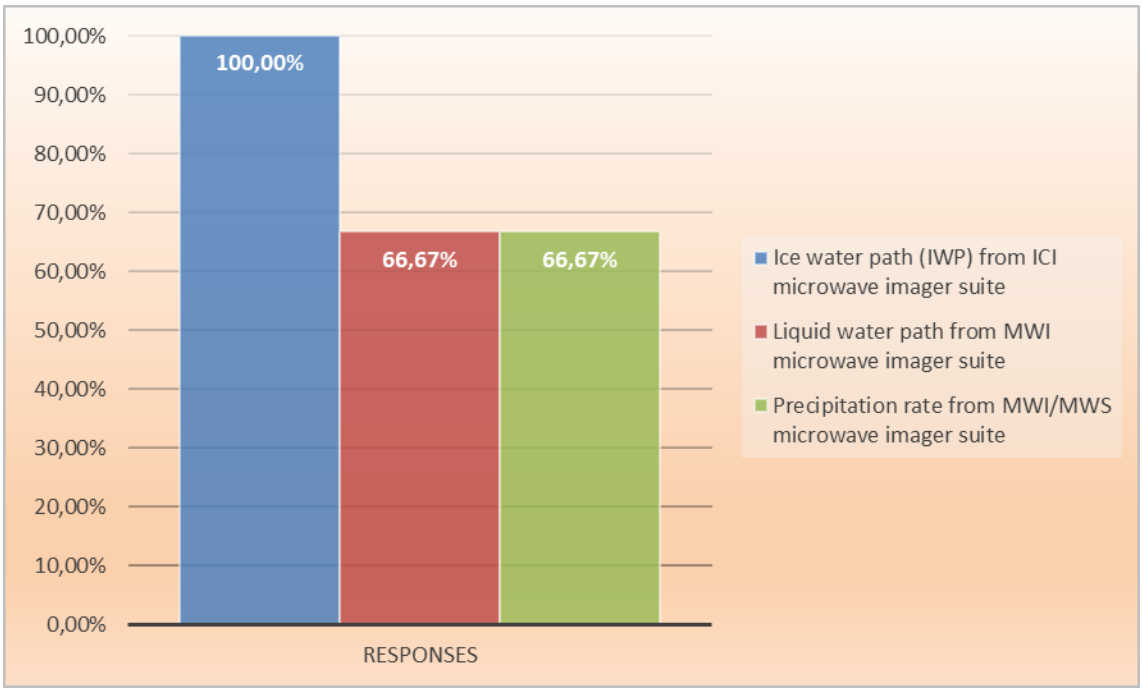
Potential use of HRW	No. of users
Research	1
Nowcasting & Forecasting: Operational Watch and warning	1
Nowcasting & Forecasting: Synoptic monitoring of the atmosphere	0
Nowcasting & Forecasting: Small scale monitoring of the atmosphere	1
Use in NWP models - regional/nowcasting or global	1
Not really interested	2

Many of the users that have answered this question (6 people, 4 were EMSu) are interested in HRW, only 2 have declared that they didn't interest in (one was EMSu).

About the main interest of users in HRW, each one of the 4 people chose one different potential use, doing impossible to choose one where users show more interest (except for the option *Nowcasting & Forecasting: Synoptic monitoring of the atmosphere*. That has not been selected, so it's not very interesting). It must be said that users only could pick one options.

17. Which ones of the coming EPS-SG based Nowcasting products could [HS1] be of interest for your service?

This question was responded by 3 users (2 out of that 3 EMSu) and they had to choose between 3 options (multiple options were allowed): *Ice water path (IWP) from ICI microwave imager suite*, *Liquid water path from MWI microwave imager suite* and *Precipitation rate from MWI/MWS microwave imager suite.* It can be seen below the result in a graph:



There's an agreement in first option, where all the 3 users picked as interesting in a coming future of EPS-SG based on Nowcastin products: *Ice water path (IWP) from ICI microwave imager suite*. The rest of 2 were chosen by 2 out of 3 users.

There are 2 comments in regards of this question from users (one of them a EMSu):

- The ice/liquid water products provide a partial view of the complex cloud microphysics when typically forecasting problem is wider. Icing products would be more useful in operational work.
- No requests from users yet. I guess this can improve when the instruments are flying and we can show the usefulness of these data.

Finally, the 2 EMSu chose the three options.

18. Which developments of existing products in PPS would you see as desirable?

The number of users that have responded this question are 3, and the result can be found below:

- Hybrid GEO-LEO cloud products.
- Improvement of cloud masking/cloud probabilities at night over sea ice and Snow and ice classification/probabilities at night.
- None as far as I'm aware.

It seemed that all the users that answered to this question belonged to EMSu.

19. Which new Nowcasting products to be codified at NWC SAF could cover your needs?

Only one user answered this question, and it was a EMSu, and the suggestions were the following:

- Clear sky fog development risk (both for polar (north of 65N) and GEO) and Cloud base product.

PPS part is over. As it can be perceived, so many questions have been responded by 6 users and in some cases (especially the ones which users had to express ideas) the number of people that hss responded is 3.

The next question was if the user wanted to go to EUMETCAST part or if they want to finish the survey. 6 out of 7 people wanted to go to EUMETCAST Part, and only 1 decided to finish the Survey. Regarding EMSu, 3 out of 4 decided to go EUMETCAST Part, and 1 decided to finish the Survey.

3.1.4 EUMETCAST PART

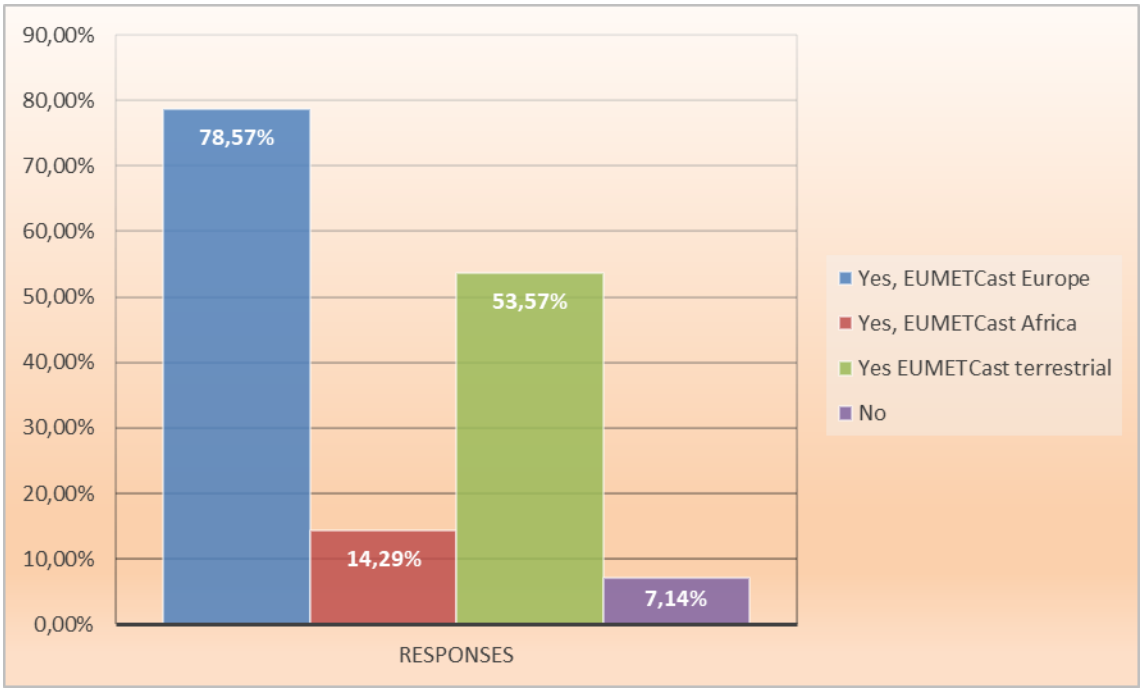
This part of the survey it's characterised by 7 questions and there were 25 users (14 from EMSu) that decided to complete it.

EUMETSAT Member State	N. of users	EUMETSAT Member State	N. of users
Belgium	1	Norway	2
Finland	1	Portugal	1
Germany	2	Romania	1
Greece	1	Slovakia	1

Hungary	1	Switzerland	1
Italy	1	Türkiye	1

1. Do you use EUMETCast service?

For this question, the multiple choice was permitted, and the target of it was to know which EUMETCAS services were used by our users among the following: EUMETCAST Europe, EUMETCAST Africa, EUMETCAST terrestrial and none of them. The result of the 28 users that answered the question is the following:



It seems EUMETCAST Europe is the most chosen option, with 22 out of 28, following of EUMETCAST Terrestrial, chosen for 15 out of 28, next the EUMETCAST Africa, 4 out of 28, and last, None of them, with 2 out of 28.

Besides, there're some users that use more than one service. This can be perceived because the addition of all percentages is more than 100%.

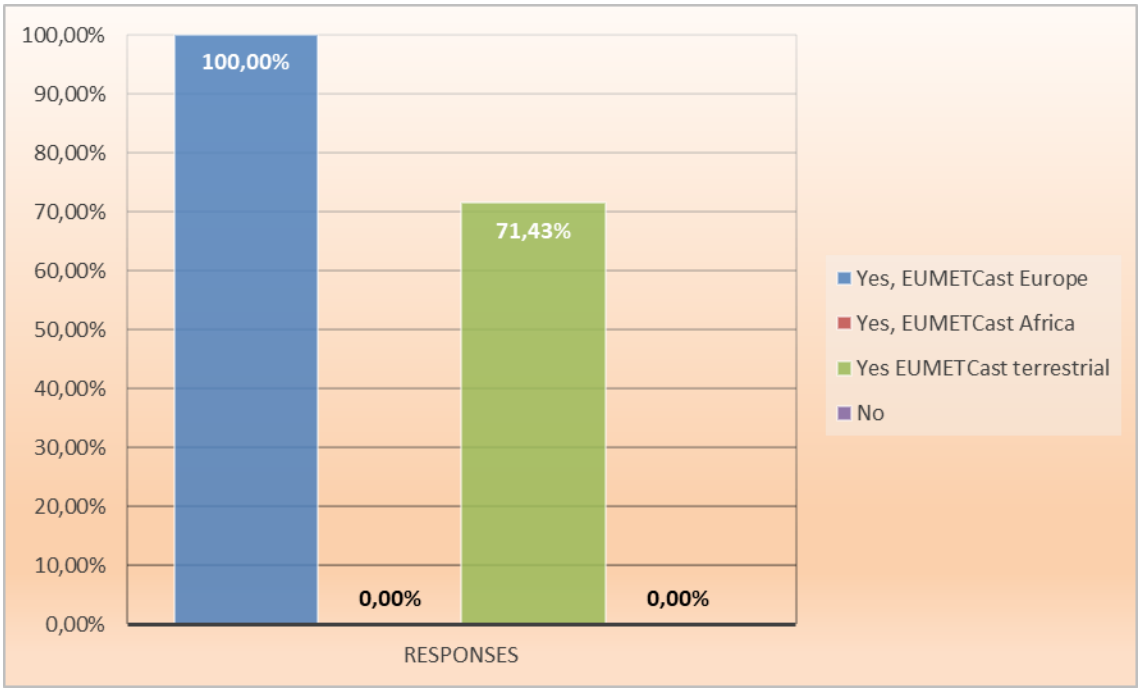
It has been possible to know when a user chose more than one and the links between options, so the research has given the following information:

- 9 out of 22 of the users just use EUMETCast Europe, so, the majority of EUMETCast Europe users like to use another option, being the combination with EUMETCast Terrestrial the most chosen one (12 out of 13). The rest, 1 out of 13 likes to use the 3 possible options. That

means, as it could be seen, there is no combination between the only used of both ETMETCast Europe and EUMETCast Africa.

- One user declared that use all options.
- Regarding EUMETCast Terrestrial, as it was said, almost all the users declared the use of this option with another type of EUMETCast (12 out of 15 with Europe, 1 out of 15 with all combinations, 1 out of 15 combines it with EUMETCast Africa and only 1 uses it without combination).
- The 4 people that declared the use of EUMETCast Africa, only 2 use it without using another one.

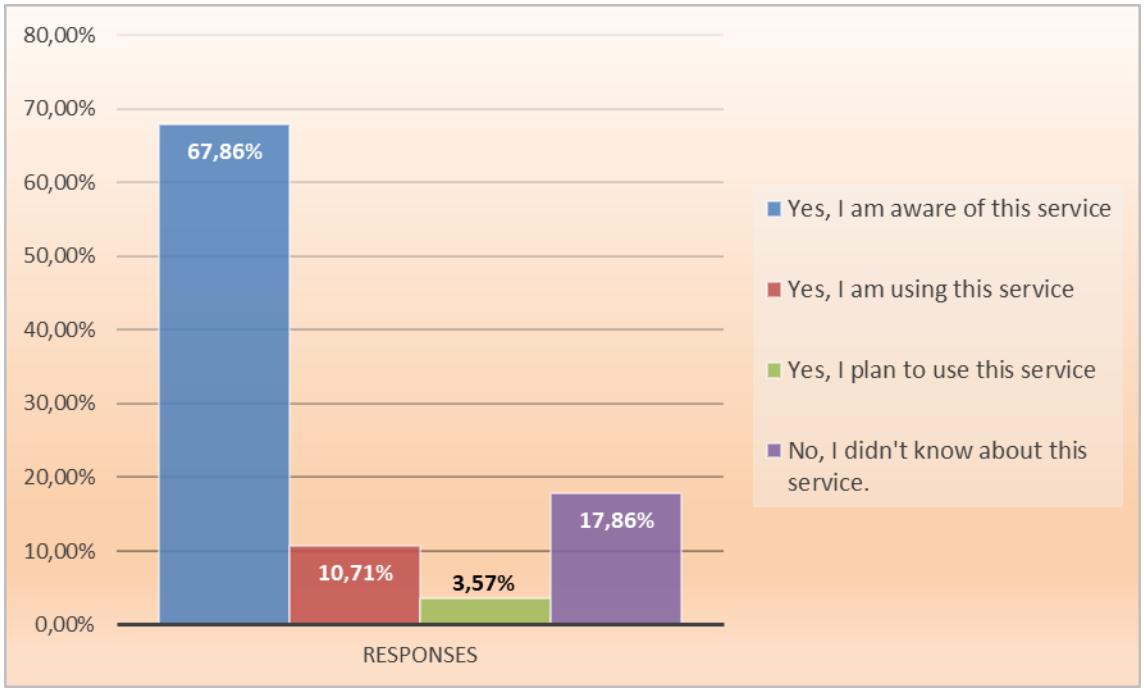
Focusing on EMSu (14 responses), the result is the following:



All EMSu that have responded to this Survey use EUMETCast, more specifically Europe. Besides, there's several them (10 out of 14) that employs the terrestrial option as well. No one uses EUMETCast Africa.

2. Did you know that NWC SAF/GEO PRODUCTS (Full Disk) are being distributed via the EUMETCast Service?

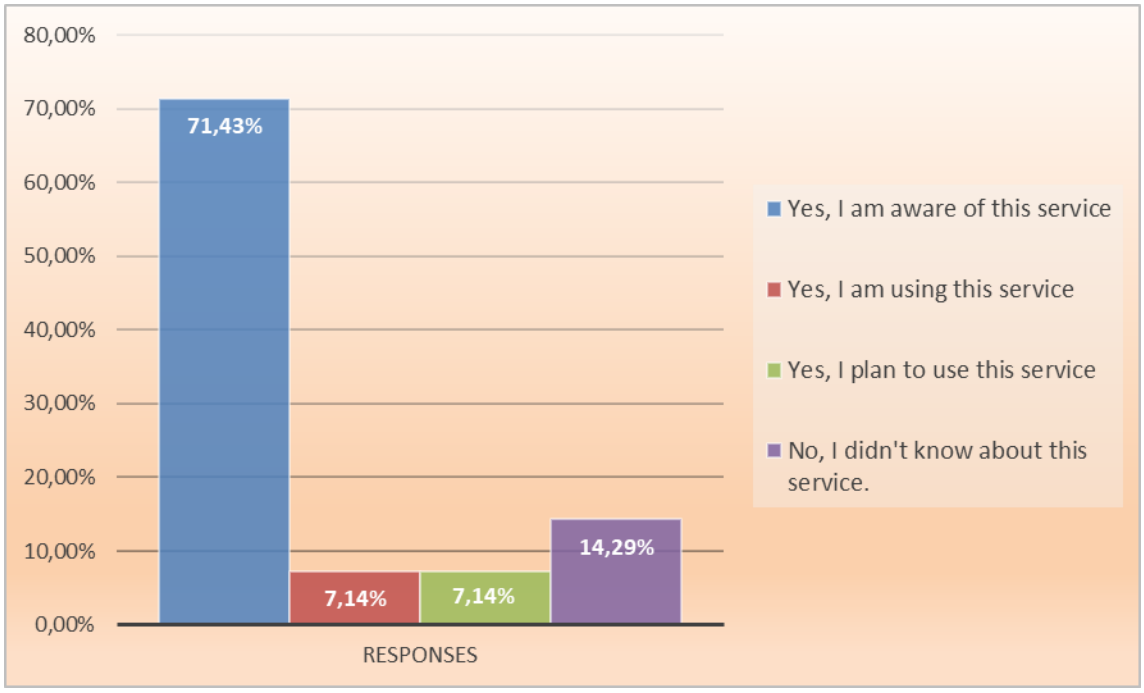
In this question it was wanted to be aware about the knowledge of our users regarding EUMETCast, especially if they know about the distribution of full disk products. 28 people answered to this question and the result is below:



For knowing the quantity of users that know about EUMETCast, it should be added the options *Yes, I am aware of this* service, *Yes, I am using this* service and *Yes, I plan to use this service*, and the total of awareness is that 82.14% of users (23 out of 28) know NWC SAF/GEO products (Full Disk) are being distributed via the EUMETCast Service. The percentage of users that use it is less, 10.71% (3 out of 28) and only a 3.57% (1 out of 28) is planning to use it.

About the users unaware of this, 5, it's hoped that now they were aware.

EMSu have the following grpah, with 14 responses:



As it can be seen, it's the same structure as the previous one, perhaps with a higher knowledge of the distribution throught EUMECast of full disk products, 85.71%, 12 out of 14 in total.

About the unaware, only 2 out of 14 users declared they did't know about this.

3. What NWC SAF/MSG or MTG products would be interested for you to be distributed via the EUMETCast Service?

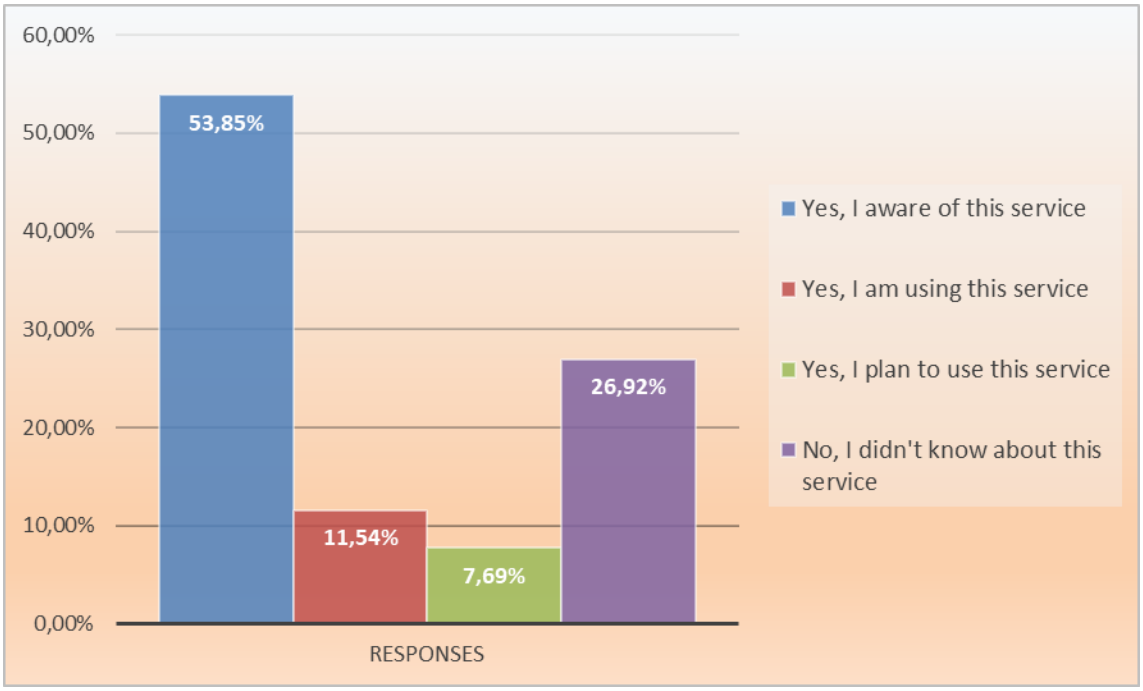
In this question, an empty gap was shown to let users write what they thought. 18 people have answered and the ideas have been gathered in the following lines:

- All products (6 users).
- None at the moment (3 users).
- Cloud products WITH EXTRAPOLATION (will be quite/too heavy).
- Gravity Waves and Tropopause Foldings.
- Cloud ones, as CMA, CT, CTTH (4 users).
- HRW.
- CTTH products from AVHRR.
- RDT, CI, PC and CRR (3 users).
- ISHAI-TPW.

For EMSu (9 users), the responses are the one that are underlined.

4. Did you know that NWC SAF/PPS Cloud Mask, Cloud Type and CTTH products from AVHRR are being distributed via the EUMETCast NWC-EARS Service?

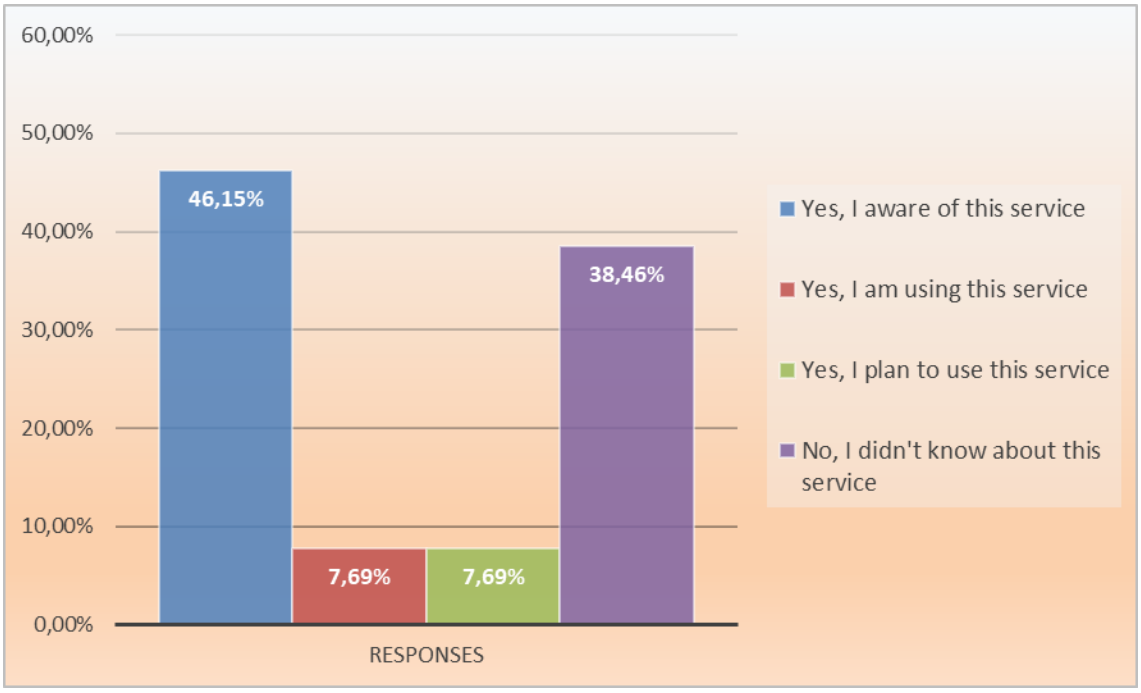
Another question to see the knowledge of our users regarding EUMETCast. 26 users answered the question, choosing between *Yes, I am aware of this service*; *Yes, I am using this service*; *Yes, I plan to use this service* and *No, I didn't know about this service*. The result can be seen in the following graph:



Most of users are aware of the distribution of PPS products via EUMETCast. Nevertheless, a significant number of them, more than one quarter of users (7 out of 26), didn't know about this.

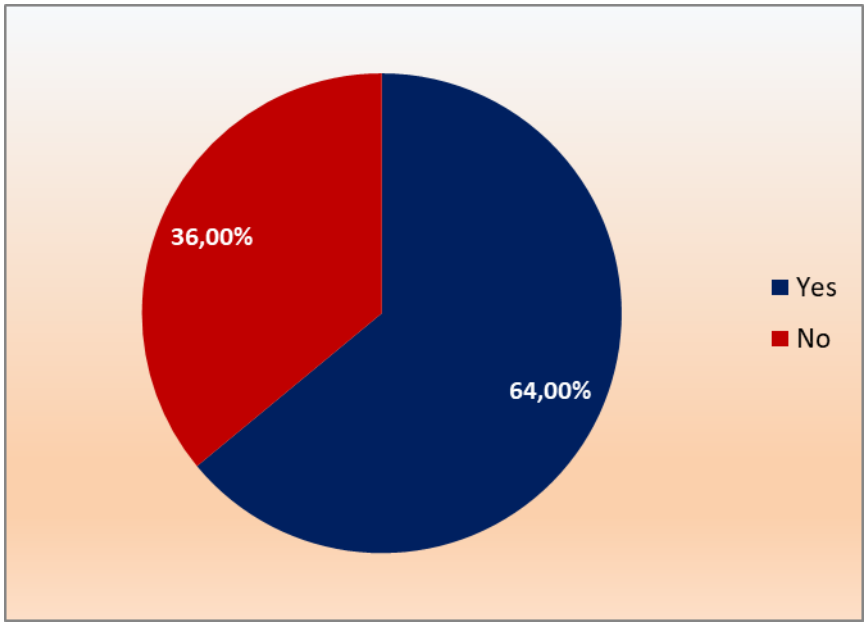
As it was said previously, it's hoped now that 7 users are aware that NWC SAF/PPS Cloud Mask, Cloud Type and CTTH products from AVHRR are being distributed via the EUMETCast NWC-EARS Service.

13 responses were from EMSu:



If we focus on EMSu, the number of them that are not aware of this distribution is higher than if we consider all the responses, almost a 40%.

5. Via the EUMETCast NWC-EARS Service, would you be interested in also receiving CMIC products (cloud microphysical parameters)?

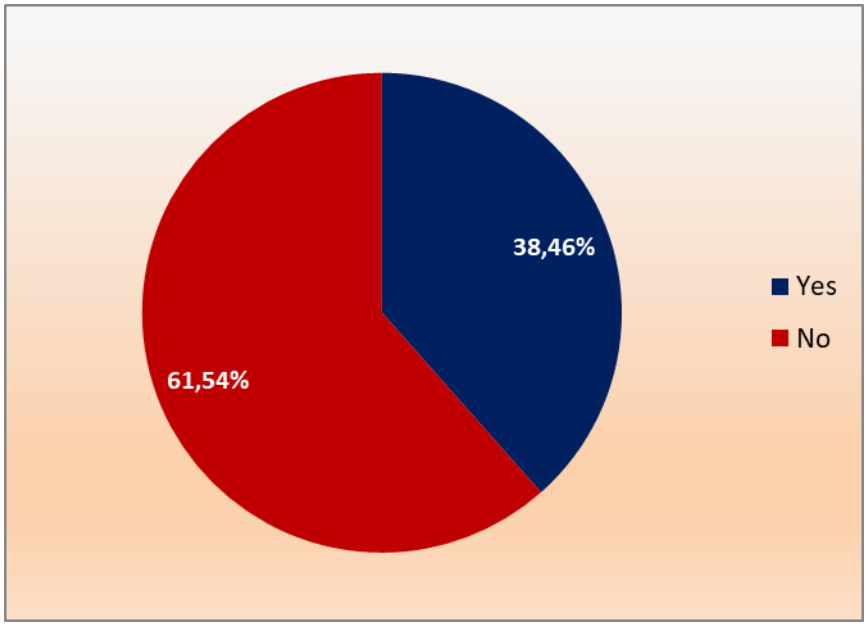


Most of users (the 64%, 16 out of 25) are interesting in receiving CMIC products via EUMETCast NWC-EARS Service.

It's curious because as it was seen in PPS part, spefically question number 8 in page 76, no user declared the use of CMIC product, but it seems that it has a high interest when it's asked to higher number of people and when the distribution is via EUMETCast NWC-EARS Service.

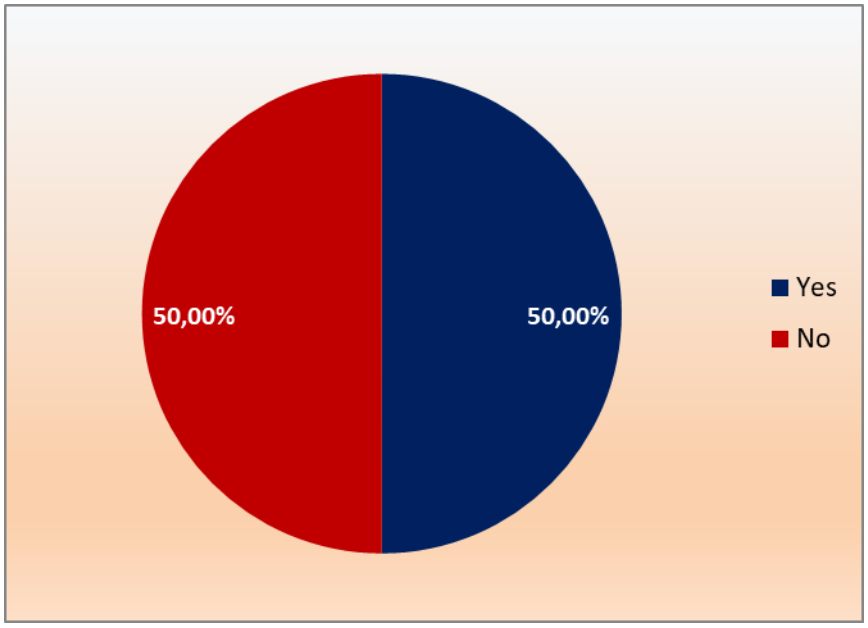
From these 6 users that answered in Q number 8 of PPS part that didn't use CMIC, 3 of them have responded to this question, where 1 of them is interested in having CMIC and the others aren't.

Asking specifically to EMSu (13 responses), the result is quite different:



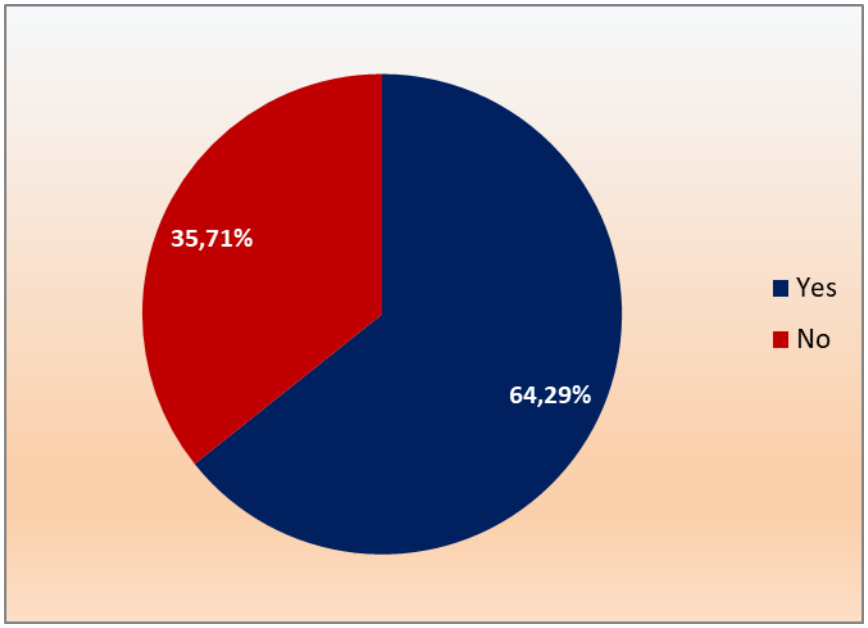
The option *No* is the most chosen one (8 out of 13), so EMSu doesn't have high interesting in having CMIC product via EUMETCast NWC-EARS service.

6. Do you use GOES satellite through EUMETCast?



From this question, there're 26 responses and, as it can seen, half of users used GOES and the other half didn't. About what GOES satellite if it's the East or the West mision, only 7 people provided us that information and all were the use of both missions, the East and the West. Besides, 6 of the total (23%) have specified which instrument do they use: 2 of them both (ABI and GLM) and the rest, 4, ABI instrument

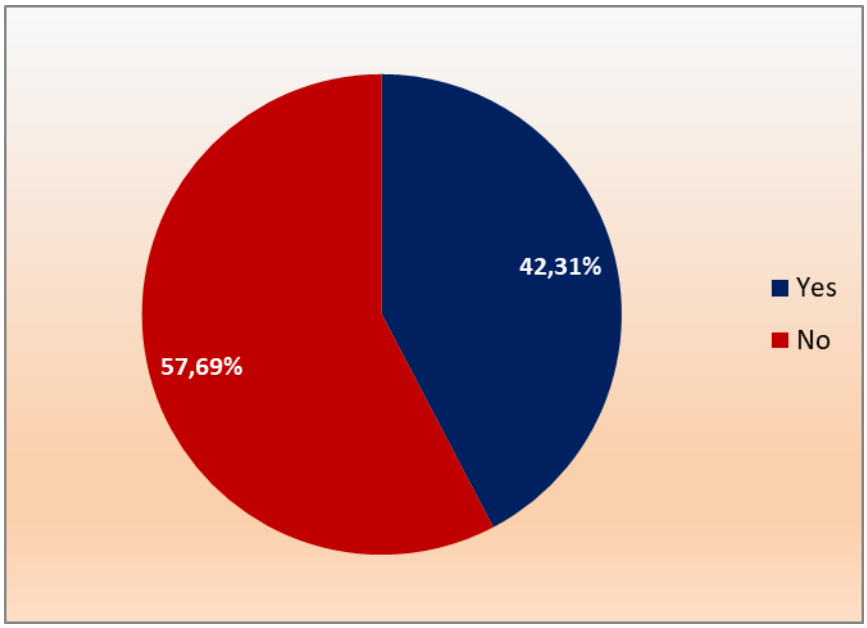
About the use of GOES through EUMETCast and EMSu, the result is the following, answered by 14 people:



There's a higher percentage of users if we specify to EMSu (64.29%, 9 out of 14).

5 out of 9 (*Yes*), said that they use both, the East and the West mission. In regards to the instrument utilised, 4 users provided that information, and it was all of them used ABI.

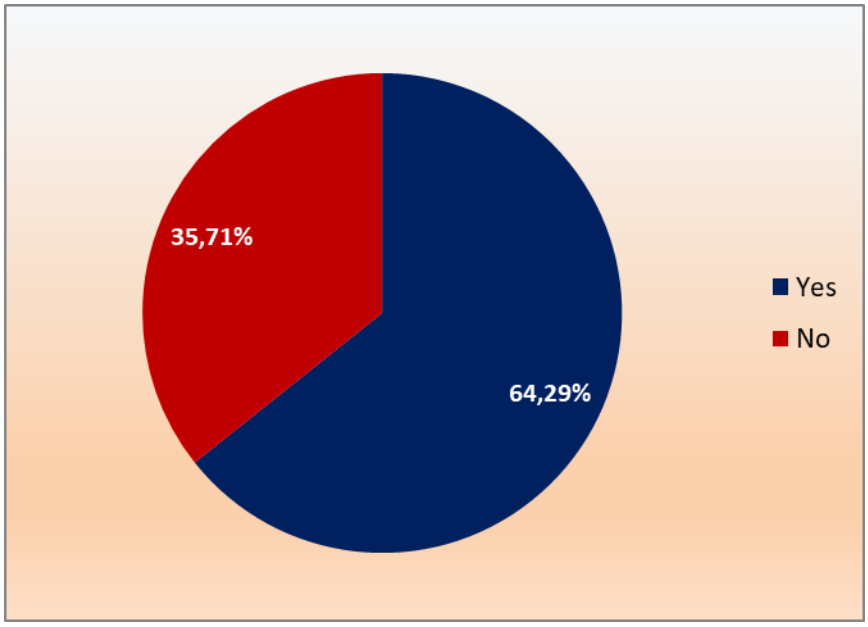
7. Do you use HIMAWARI satellite through EUMETCast?



As it can be perceived, most of users have declared they didn't use HIMAWARI satellite through EUMETCast (15 out of 26).

Recalling the last result, the GOES satellite through EUMETCast, it was seen if the people who use GOES, use HIMAWARI as well, and the research provided that from these 13 users that used GOES, 11 out of 13 (almost all) declared that they use HIMAWARI through EUMETCast too.

If we focus on EMSu, it has been gathered the 14 answers and it's curious because the result is a little different:



Now, there's a higher percentage of users that used HIMAWARI through EUMETCast (64.2%, 9 out of 14).

It happened the same with GOES, it seems that the percentage of use of satellites that EUMETSAT doesn't manage is higher if we focus on EMSu than if we focus on users in general. Besides, going over the users that said *Yes*, all the EMSu that marked that they caught GOES through EUMETCast, got HIMAWARI as well, all of them, the 9 users.

3.1.5 FINAL QUESTION

Finally, could you let us know something related with the NWC SAF?

This question gave the opportunity to users to say something freely. Most of the responses were to thank the NWC SAF Team or for pointing out some good things out Software provide them. At the same time, there were some reviews, and the same for brief neutral comments.

There are 21 responses and it has been considered to reflect all of them in this document:

- Thanks and keep up the good work ;-)
- thank you for your great work!
- Great work! Thank you so much for developing and maintaining the products and associated software. We find them very useful at the Bureau of Meteorology. A few small suggestions: 1. It would be good if the HRW and RDT NetCDF file structures could be

simplified/improved. I've found it difficult to understand and use them initially. 2. The HRW runtime and resource requirements is large - anything done to optimise it would be greatly appreciated. 3. There are some issues with the CMA product over Australia, with bright targets, such as salt lakes, being misidentified as cloud. Feel free to contact vincent.villani@bom.gov.au if you want to discuss further. Many thanks again.

- The NWCSAF application is a very useful for nowcasting.
- My understanding is that it is a very useful tool for now and medium forecasting.
- Locking forward for MTG. Curious for the turbulence-/gravity wave nowcasting product with MTG-S/I.
- Congratulations on great work. It is very important your work especially on MTG data. Thank you!
- Thank you so much! You are the best!
- The installation has become very easy for both GEO and PPS which is very good. It is nice we can use the NWP data we want to as input. In addition we can tweak the processing as needed. The addition of PPS HRW is also nice.
- It's a crucial service for several applications in our institute (LSA SAF, Operational nowcasting, among others), with an excellent user interaction via the tickets system.
- Thank you a lot for your hard work on PPS.
- The possibility to get SAF products directly would be good option for smaller institutions which doesn't have enough human recourses or competencies to generate SAF products by themselves.
- I found it very uncomfortable to use the GEO software with ERA5 data since I needed it for research aims and not operationally. I would have preferred to download the products directly.
- Is it possible to develop a software to be used that can differentiate fog from stratus cloud and if possible differentiating using colours that can be used in a nowcasting tool.
- Nowcasting at high latitudes is challenging because, to achieve optimal results, we need to retrieve cloud information from both LEO and GEO satellites. Especially in automatic nowcasting systems direct utilization of GEO and LEO data together cause tricky changes in clouds from time step to other. It would be very useful if NWC SAF could provide GEO-LEO integration and blending products or tools that would help with this issue.
- A better manual for first steps.
- During installation of ADAGUC on EWC we had issues using the NWC-SAF products disseminated by EUMETCAST on EWC, probably because of a slightly different format of the ones that are produced from NWC-SAF software. The ADAGUC could not digest to visualize them.
- Is it possible to partner with you in research?

- More information to be disseminated so that we fully get acquainted with the NWCSAF products.
- We would be very interested in having access to the BT bias correction coefficients for the NWP GFS model. Could you improve multithreading support to speed up calculations with 3rd generation satellites?
- Please add project conversion capability into your future NWCSAF software.

The one that belong to EMSu, are the ones that are underlined (7 responses).