ISSN 1831-9424

European Commission

GDACS user consultation 2023-2024

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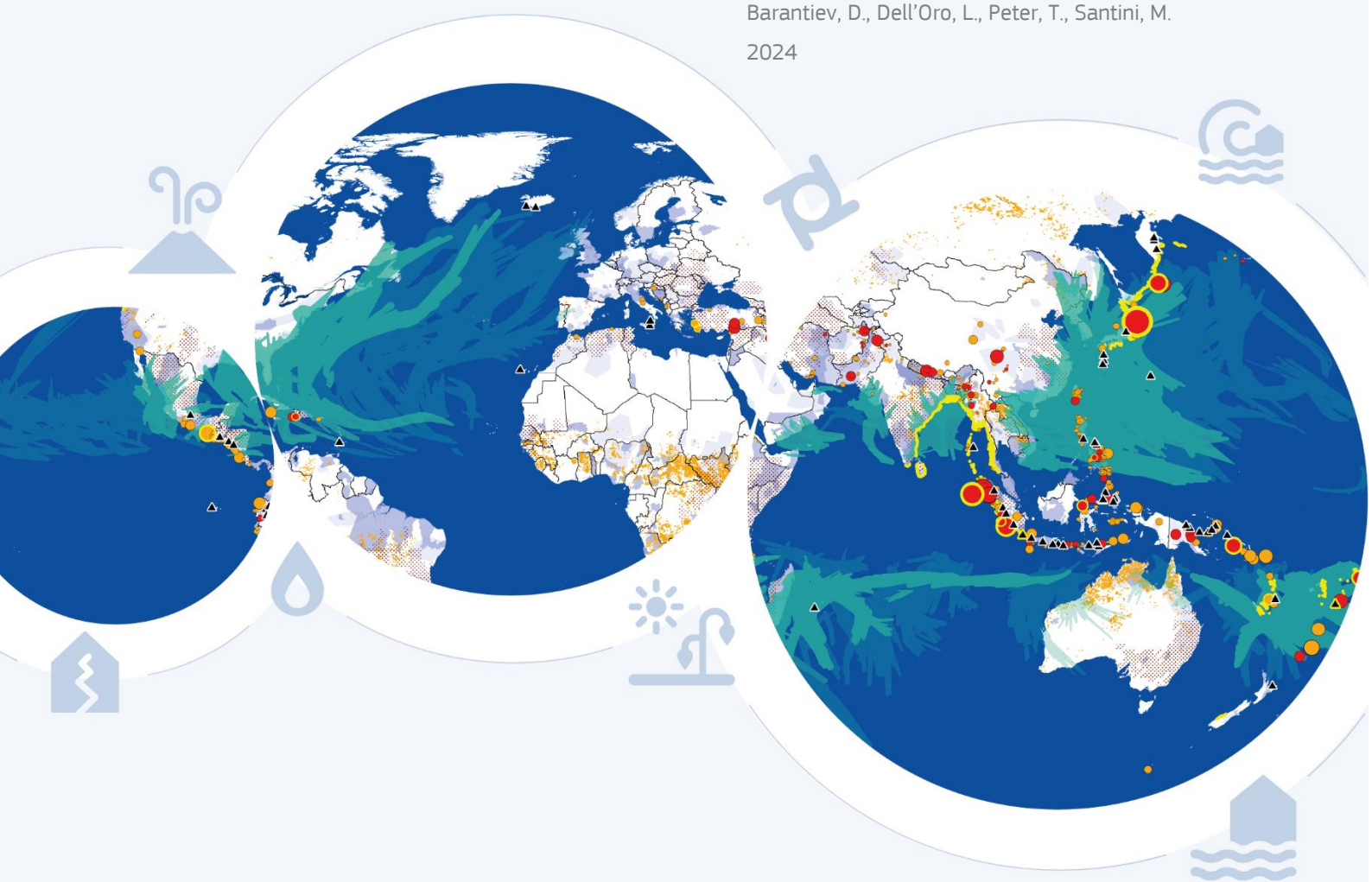
2024



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JRC137894

EUR 32020

PDF ISBN 978-92-68-19954-1 ISSN 1831-9424 doi:10.2760/435644 KJ-NA-32-020-EN-N

Luxembourg: Publications Office of the European Union, 2024

How to cite this report: European Commission, Joint Research Centre, Masante, D., Abad-Perez, J., Proietti, C., Paris, S., Barantiev, D., Dell`Oro, L., Peter, T. and Santini, M., *GDACS user consultation 2023-2024*, Publications Office of the European Union, Luxembourg, 2024, https://data.europa.eu/doi/10.2760/435644, JRC137894.

Contents

Abstract

This report presents the results of the survey on the Global Disaster Alert and Coordination System (GDACS), conducted in May 2023, and of the targeted interviews carried out in March 2024. 730 replies were collected from the survey, and ten interviews conducted with representative GDACS users. In addition, a short section is dedicated to the messages from users received since 2022 through the GDACS contact form.

The survey covered all three components of GDACS, and yielded very positive feedback from respondents, for both timeliness and/or relevance of GDACS scope and products. While the Multi-Hazard Early Warning System (MHEWS) emerged as the most utilized component, a significant number of users access all three components in conjunction, and in fact these are complementary to each other. SMCS showed a stark increase in user uptake since 2018, and VOSOCC confirmed its highly informative value.

According to the survey, the majority of respondents expressed interest in multiple hazards, with earthquakes being the relatively most popular choice, followed closely by the others. Furthermore, the survey reveals that the majority of respondents is interested in additional hazards, beyond those covered by GDACS already.

Data services like API and RSS are very much used and yet underestimated in the survey, perhaps because of the non-comprehensive survey dissemination. In order to account for this and other potential biases in the online survey results, a round of targeted interviews was carried out with representative users.

Timeliness, accessibility, actionable use and transparency seem to be the top priorities for most interviewees. GDACS benefits from a solid reputation across the users, and the backing of important international institutions is one of the main reasons. Beyond reputation, interviewees indicated as keys to trust a system the following: transparency, long-term and technical support, the ability to provide consistent, high-quality data and to adapt to stakeholders needs.

In conclusion, GDACS is on the right track according to the current users, and they expect improvements and developments, rather than changes on the extant features. The survey provides valuable input for enhancing and adapting GDACS to better serve the international humanitarian community and to address emerging challenges in disaster response and coordination. Indeed, the insights collected from the survey will be instrumental in shaping the future direction of GDACS and continuing to fulfil its critical role in the global disaster alert and coordination.

1 Introduction

To make informed operational decisions, the international humanitarian community needs to quickly understand the expected impacts of large-scale disasters.

The Global Disaster Alert and Coordination System (GDACS) was established in 2004 by the European Commission's Joint Research Centre (JRC), Directorate-General for European Civil Protection and Humanitarian Aid Operations (DG ECHO), and the United Nations Office for the Coordination of Humanitarian Affairs (OCHA) and United Nations Satellite Centre (UNOSAT), as a collaborative platform to provide early disaster alert and coordination services.

In anticipation of the celebrations of its 20th anniversary, the GDACS partners launched a survey aimed at gathering feedback from its users. The main objective of the survey was to gain insights about the evolving needs of users over time and to ensure that GDACS remains relevant and effective in meeting those needs. The survey's scope is therefore to assess the current and future requirements of GDACS users, with the ultimate goal of ensuring that the system continues to be well-suited for its intended purpose.

The survey was disseminated from 12 May 2023 to 12 June 2023 and collected 730 valid responses. The survey outcome provides valuable input for enhancing and adapting GDACS to better serve the international humanitarian community and to address emerging challenges in disaster response and coordination. The insights collected from the survey will be instrumental in shaping the future direction of GDACS and continuing to fulfil its critical role in the global disaster alert and coordination.

The survey was submitted on a voluntary basis; therefore, it might be subject to biases, e.g. in terms of sample representativeness. However, the most interested users are represented in higher numbers, so it can be considered as a good sample for the core of GDACS users at present. On the other hand, the outcomes of this survey may not capture as effectively the needs and the features that might attract different users that currently are not engaged, or do not access GDACS website often, despite using its services (e.g. API). The survey form, originally hosted on the "EU Survey" tool, is reported in Annex I.

To complement the survey, a round of targeted interviews with ten selected users was conducted in March 2024, to cover in more depth some of the points left open or not addressed by the survey. With an initial set of fixed questions, the talks went on to define better the motivations and needs for a variety of users, with different roles and geographical focuses. A summary with the main conclusions and thoughts emerged from the interviews is reported in a dedicated chapter.

Moreover, a summary of the enquiries received since 2022 through the GDACS website contact form was added, mostly collecting technical difficulties encountered by the users.

2 Profile of survey respondents

Respondents to the survey mainly come from NGOs, civil protection authorities, private sector, or follow personal interest (Figure 1). In the survey, many did not indicate the kind of entity they're working for, perhaps based on privacy concerns, or in absence of a appropriate option. It's difficult to explain the tendency to reply (or not) solely based on the kind of entity of provenance (see below), or infer that from other survey data. Also, the multi-choice options were not explained in the question, possibly leading to some hesitancy in the choice.

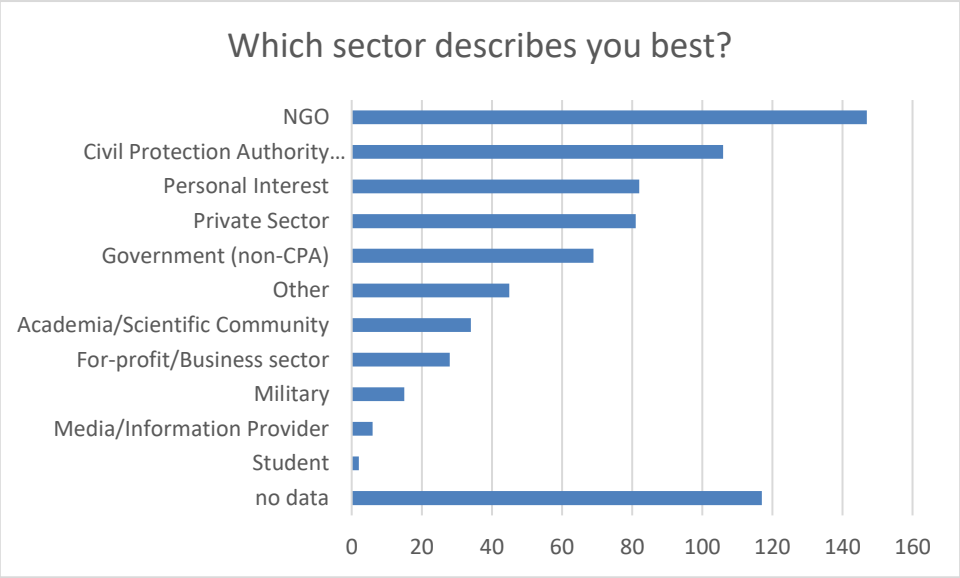

Figure 1 – Respondents declaring their type of affiliation or sector of provenance.

The roles and tasks of respondents vary, but there is a prevalence of operational ones (management, operations, field work) over research, analysis and others, including policy advice (Figure 2).

Figure 2 – Distribution of respondents based on their role / tasks

Such distribution holds true even by disaggregating data by employing entity. In Table 1, darker green refers to higher proportion within an entity, i.e. by row. The roles or respondents are in similar proportions regardless the type of affiliation, with exceptions only being academia and those driven by personal interest.

Table 1 – Distribution of survey respondents by role and type of institution of provenance. Darker green indicates a higher proportion in the respective row. Bottom line in red gradient indicates the overall distribution by role, as from Figure 2.

	Logistics	Analysis	Policy Advice	Management	Information Technology	Other	Operations (excl. Logistics)	Field Work	Research
no data	28	21	9	32	20	16	18	28	19
Academia/Scientific Community	0	12	9	10	4	4	0	6	20
Civil Protection Authority (CPA)/Emergency Management Agency (EMA)	63	36	11	65	15	8	53	55	12
For-profit/Business sector	12	10	4	12	6	3	9	2	5
Government (non-CPA)	29	18	16	36	10	7	28	21	11
Media/Information Provider	2	3	0	3	2	2	1	2	1
Military	10	3	5	6	2	2	9	7	4
NGO	65	32	15	79	17	10	54	58	18
Other	17	20	7	16	8	8	16	23	10
Personal Interest	14	17	7	17	19	23	10	10	15
Private Sector	25	15	5	34	17	13	18	12	9
Student	0	1	0	1	2	0	0	1	1
Grand Total	265	188	88	311	122	96	216	225	125

3 Results of the survey

GDACS consists of the following three components:

- The Multi-Hazard Early Warning System (MHEWS) sends alerts when a disaster with potential humanitarian consequences is detected, and provides a website to monitor seven kind of natural disasters.
- The Virtual On-Site Operations Coordination Centre (VOSOCC) provides a platform for information exchange between disaster responders or humanitarian operators.
- The Satellite Mapping Coordination System (SMCS) is a platform to inform GDACS users about the mapping organizations that are providing satellite imagery analysis, of what type and where, during disasters.

Respondents to the survey could declare to use one or more of such components, and results are shown in Figure 3.

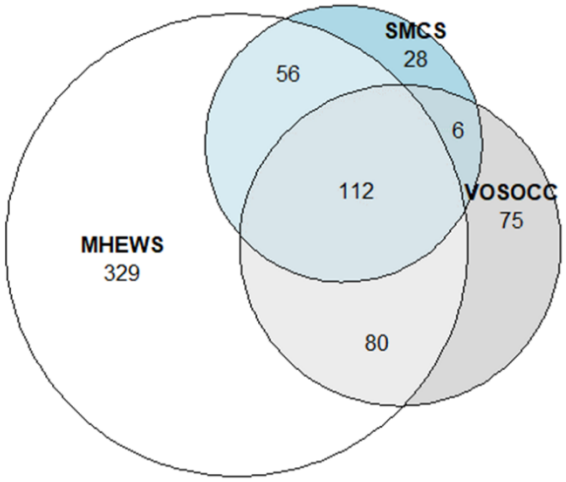

Figure 3 – Number of respondents using each GDACS component. Survey question: "select the GDACS components you make use of"

Based on feedback gathered from the survey, the MHEWS seems to be the most utilized component, and a significant number of users utilize all three components in conjunction. While there is a chance that the survey dissemination reached MHEWS users more easily, thus introducing a selection-bias in the multi-choice, the MHEWS is also the most approachable component of GDACS and a wider audience may be expected.

All entities of provenance of respondents make some use of all the GDACS components (Figure 4). In relative terms, people from the private sector and for personal interest primarily follow MHEWS only. VOSOCC is the predominant choice among users within the Civil Protection responders community. The highest number of users of SMCS are falling into the NGO or "no data" categories, which may reflect the lack of a fitting user profile among the available options of the survey, for users of satellite mapping service could recognise themselves.

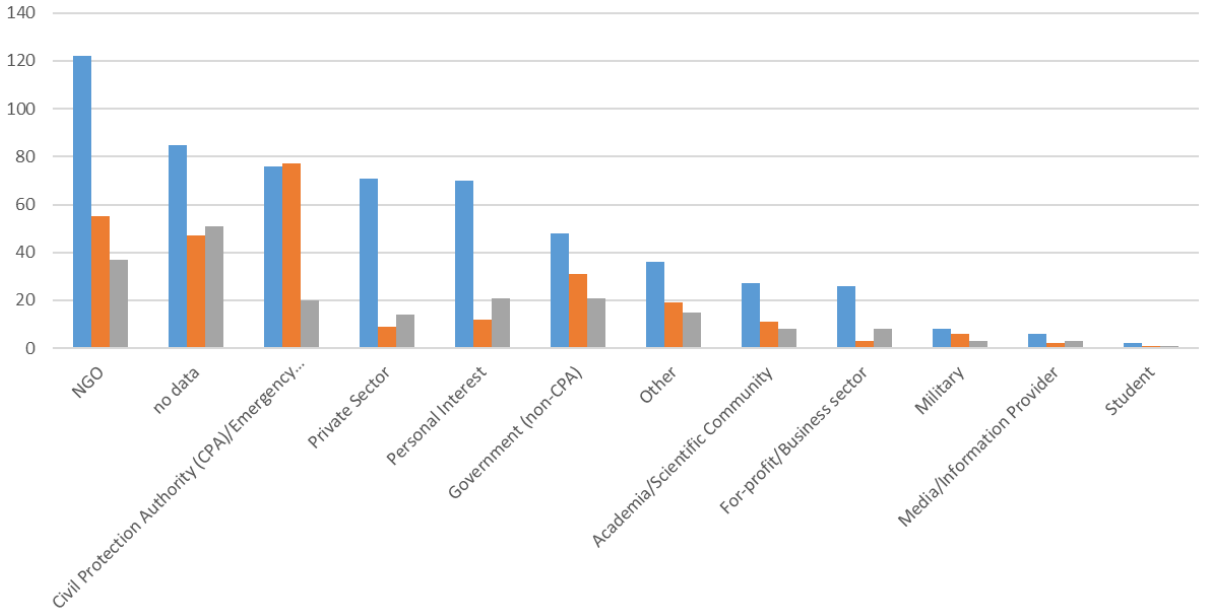

Figure 4 – Use of each GDACS component by affiliation of provenance of survey respondents. Blue bars: MHEWS; Orange bars: VOSOCC; Grey bars: SMCS

3.1 Multi-Hazard Early Warning System (MHEWS)

3.1.1 Alerts

Most respondents subscribed to automated alerts, covering earthquakes and tropical cyclones as of 2023 (Figure 5). The least interested in alerts are users for personal interest, from academia and unspecified others, while the most interested come from NGOs and public bodies (not shown).

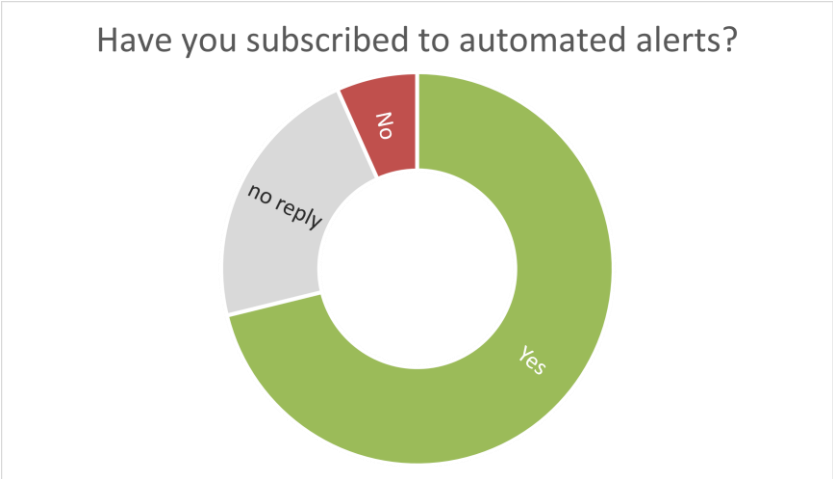

Figure 5 – Proportion of respondents who subscribed or not to GDACS alerts

Email is the preferred mean to receive alerts by respondents, often combined with SMS, and seldom with RSS (Figure 6). The latter seems to be used by very few respondents: is it a service for advanced/niche but key users, or is it just not useful to most? Considering the users statistics collected by GDACS developers and that the RSS service is publicly accessible, it becomes clear that RSS users are under-represented amongst survey respondents, and therefore the proportion of RSS users may be underestimated in this survey.

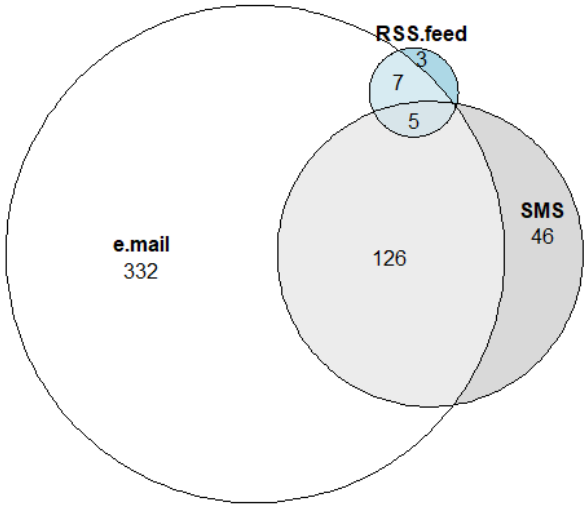

Figure 6 – Number of survey respondents by alert communication method

Most users find the alerts to be on time, regardless their needs (i.e. the role/tasks they have, see bar chart of Figure 7), with 87% of users that expressed an opinion (N=541) to be either Always (41%) or Often (46%). Clearly negative choices are indicated by less than 3% of users.

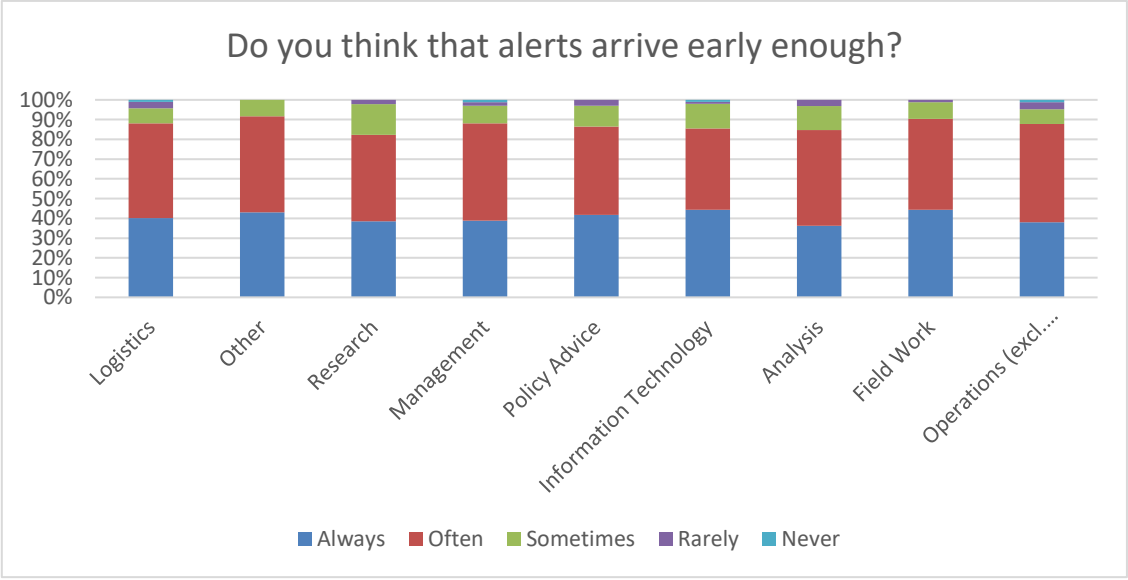

Figure 7 – Timeliness of alerts, by user role.

A very similar picture emerges by considering different separately earthquakes and tropical cyclones, with their respective time lags.

A limited number of additional comments were collected, reporting mixed opinions about the alert system timeliness. Part of the users find the alerts useful and fast, in line with the multi-choice survey responses. Other users express concerns about the alerts being not fast enough or delayed, or not receiving alerts for certain disasters. Keeping into account the commentary bias, for which dissatisfied users tend to comment more, the feedback possibly suggests the need for a clearer specification of the thresholds followed by GDACS for sending out the alerts. A few specific requests can be identified too, e.g. disseminating alerts via WhatsApp or Messenger. Some users reported technical issues, such as images not displaying correctly on mobile applications, which is a useful feedback to take into consideration, but unrelated to the timeliness of the service.

3.1.2 Usage of alerts

Most survey respondents make use of MHEWS alerts for one to three main purposes, and about a quarter of them uses it for four or more (not shown). Situational awareness is by far the most popular use (Figure 8), and basically all respondents selected it amongst all the options (or only that). On the other hand, "situational awareness" could take different meanings and thus overlap partially with other options. This may explain its strong prevalence and consistent co-occurrence with the others.

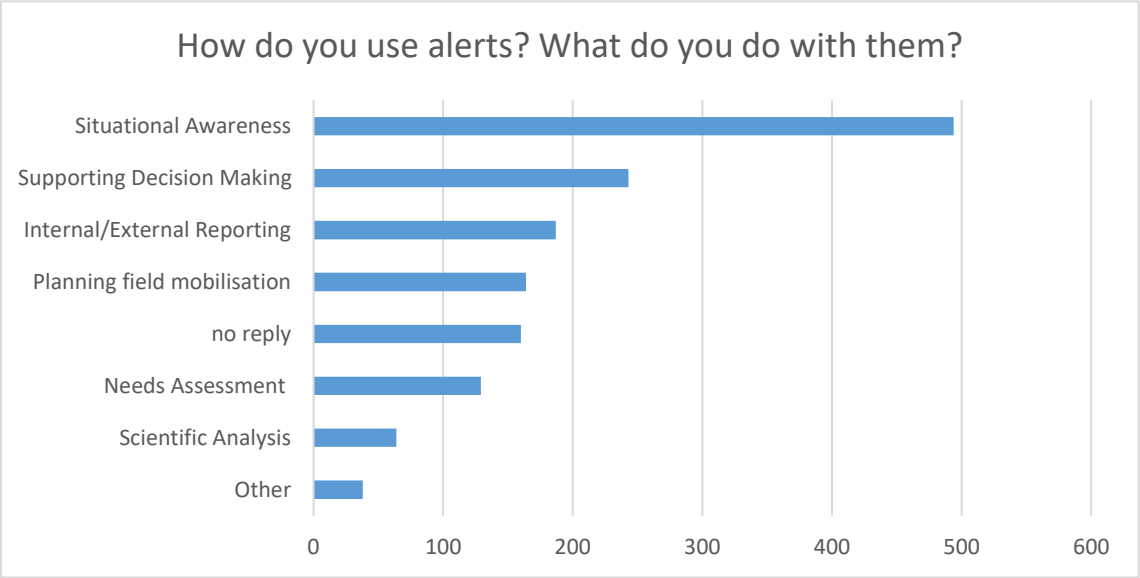

Figure 8 – Number of survey respondents by aim of using of MHEWS alerts (multiple selection was allowed).

No striking differences of usage emerge amongst different user role groups (Table 2).

Table 2 – Usage of alerts by user role. The green gradient is assigned by row, darker green indicates a higher proportion of a role, for each usage type.

	Management	Logistics	Field Work	Operations (excl. Logistics)	Analysis	Research	Information Technology	Policy Advice
Situational Awareness	230	194	155	157	147	81	92	65
Supporting Decision Making	147	119	85	101	83	43	39	42
Internal/External Reporting	120	93	68	76	82	46	35	38
Planning field mobilisation	94	104	101	86	55	31	29	29
Needs Assessment	87	63	56	49	56	32	28	29
Scientific Analysis	33	26	28	19	38	39	21	20
Other	10	10	11	9	12	8	10	7

In the comments some users listed the specific use they do of GDACS. Most of replies actually match one of the options offered by the survey question, just specify them further. Amongst "Other" usages, it is the use for personal interests.

3.1.3 Hazards of interest

Basically, all respondents are interested in multiple hazards (Figure 9). Earthquakes are the most popular choice, and the only hazard with a few respondents solely interested in that (monothematic). This is reasonable given that GDACS started in 2004 focussing on earthquakes and tsunamis. A minority of respondents choose only a few hazards, excluding others (multi-thematic), while most look for at least five different hazards (generalists). It can be concluded that most users access MHEWS with a general interest in the overall and compound picture of ongoing disasters. Comparing with alert subscriptions, these do not vary significantly between earthquakes or tropical cyclones, the two hazards covered by alerts as of 2023. Alert subscribers are equally interested in earthquakes and cyclones, while the wider set of users accessing MHEWS leans towards earthquakes.

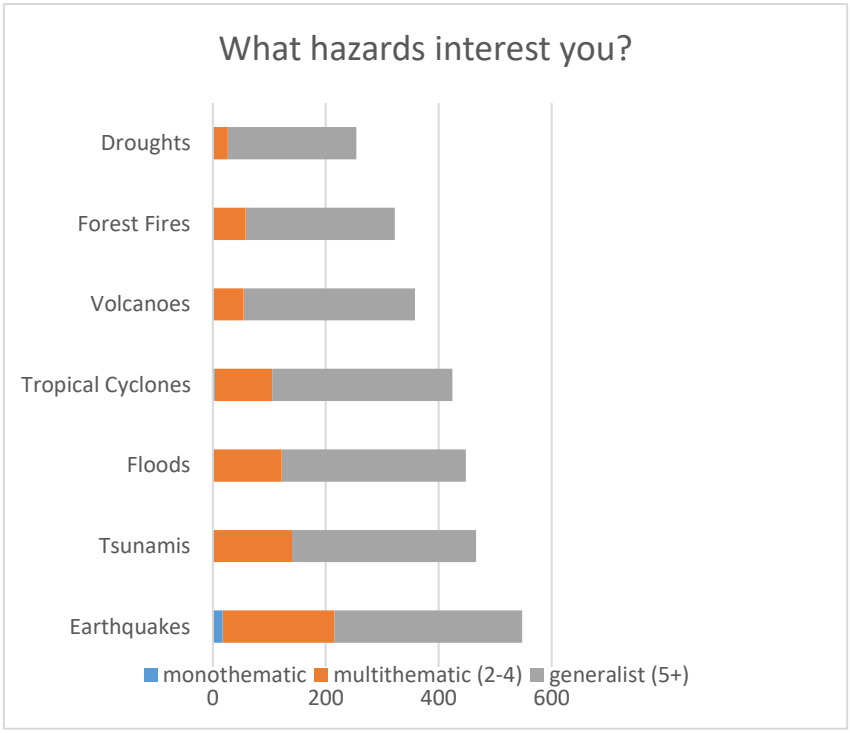

Figure 9 – number of respondents by hazard of interest. In blue are those solely interested in one hazard, in orange those interested in 2 to 4 hazards, in grey those interested in at least 5 different hazards.

The majority of people surveyed indicated further additional hazards of interest to them as well, with a significant interest in severe weather, followed by nuclear/radiological and health-related hazards (Figure 10). When asked about any missing hazard of interest, few additional replies were collected; those not listed mention human caused hazards (from conflicts to industrial) and space weather.

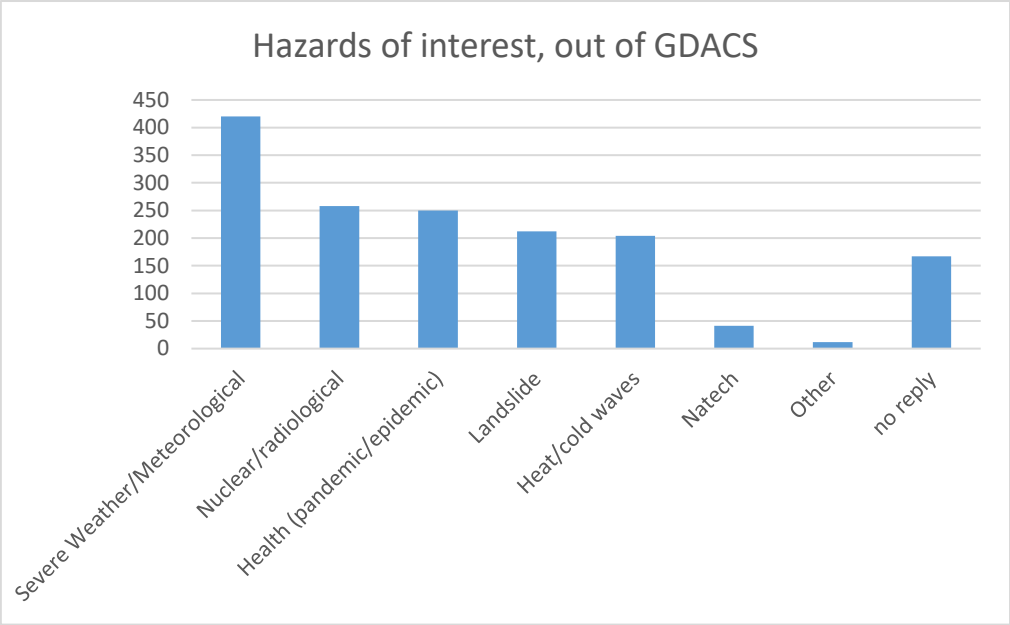

Figure 10 – Number of respondents by hazard of interest beyond those already available in GDACS.

3.1.4 Additional features

Amongst the additional features of MHEWS, they are all quite equally popular, apart from social media analysis that receives less interest (Figure 11). The social media analysis feature of GDACS it's not available to the GDACS users since May 2023, as a consequence of the unavailability of Twitter data. For most respondents, one to three additional features are used. About a third of respondents seem to use no additional feature; without a specific question in the survey, possible reasons could be that either such information is not of interest or that the participants may lack familiarity with the features.

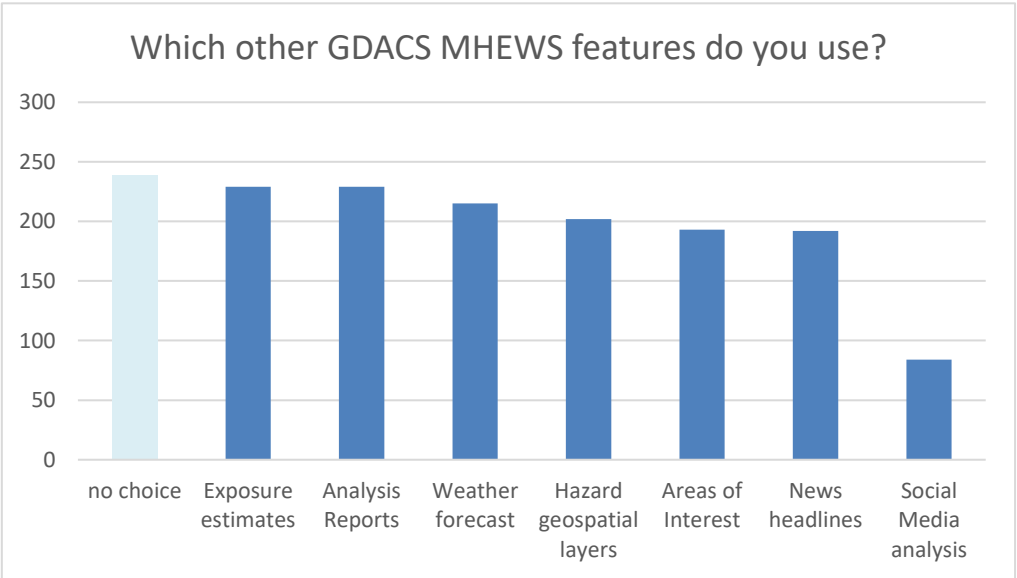

Figure 11 – Number of respondents' preferences amongst the additional features of GDACS MHEWS.

When it comes to user role groups, additional features are used slightly differently (Table 3, color gradient by row). Analytical reports are featured in most groups of respondents, as well as exposure estimates. When tasks are leaning towards information technology, weather forecasts seem to get on the spotlight, contrary to the analysis report. For field work and related activities, exposure is relatively less interesting. Geospatial layers of hazard are more common for policy advice, field work and analysis or research. Low interest in additional features is not marked particularly in one or other groups, except those belonging to "other", who more often selected it, and in the opposite direction the "analysis".

Table 3 – Distribution of additional features usage, by user role. Green to red gradient indicates low to high proportion within a given role (i.e. row).

	Exposure estimates	Areas of Interest	News headlines	Weather forecast	Analysis Reports	Social Media analysis	Hazard geospatial layers	no choice
Management	119	100	89	103	124	57	103	90
Logistics	100	92	74	90	104	47	85	80
Field Work	73	77	51	79	87	34	78	70
Operations (excl. Logistics)	80	77	61	69	86	40	70	65
Analysis	86	67	57	75	103	39	90	30
Research	55	47	34	44	59	27	52	34
Information Technology	46	44	40	49	43	24	42	37
Policy Advice	43	30	25	37	47	17	42	21
Other	20	24	35	33	23	7	17	30

3.1.5 GDACS data format of preference and API

Concerning the technical aspect of data consumption, about half of respondents did not pick any data format in particular amongst those available from GDACS resources. Among the respondents who did, xml is the most favoured by far, followed by kml, shapefile and (geo)JSON at similar rates (Figure 12). Most of such users make use of a single data format, only a small minority picks more than one or two (not shown).

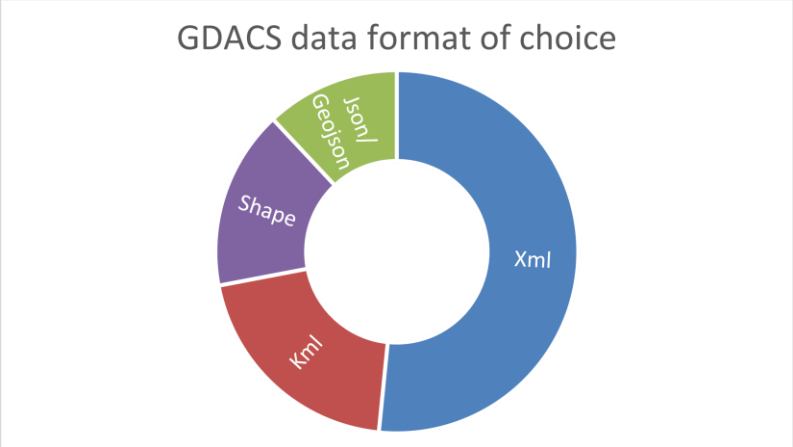

Figure 12 – Relative preference of data format amongst survey respondents,

The APIs are not commonly used across respondents, even more assuming that "no reply" likely means "no", and floating at about 10% of total (Figure 13). Usage is higher by users from NGO, for profit/business sector and for "other"; the least is user accessing for personal interest, from civil protection and private sector. From the list of the (almost daily) requests received by the GDACS team about the use of APIs via the dedicated contact-form, however, the sample of respondents to this survey may not be representative of the organisations who make structured and intensive use of the GDACS APIs, whose users may have not accessed GDACS website nor subscribed to alerts during the period of the survey.

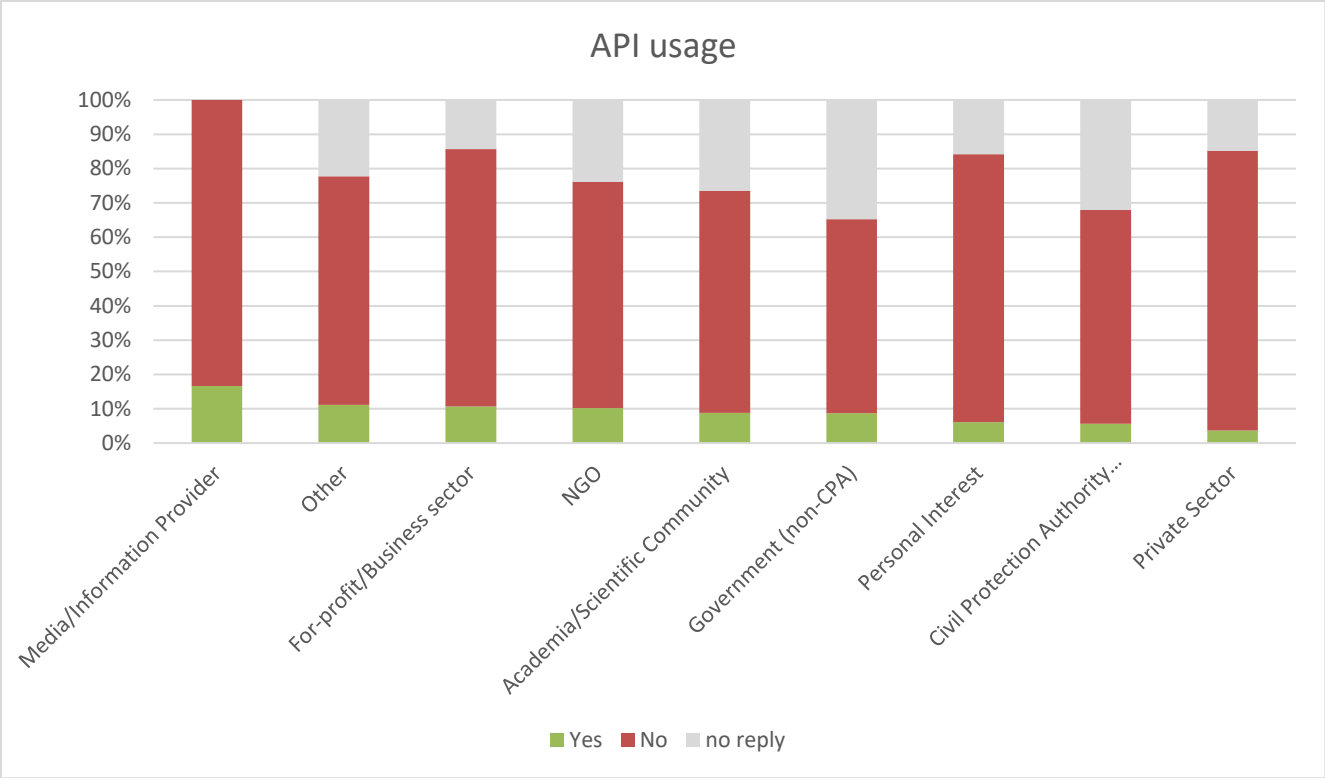

Figure 13 – API usage rate across respondents by type of affiliation or sector of provenance.

3.2 Virtual On-Site Operations Coordination Centre (VOSOCC)

About one third of survey respondents provided feedback on their use of VOSOCC (Figure 14), and the following information pertains to this specific group. When respondents use VOSOCC, they do with varying frequency, depending on where they work, as illustrated by Figure 15.

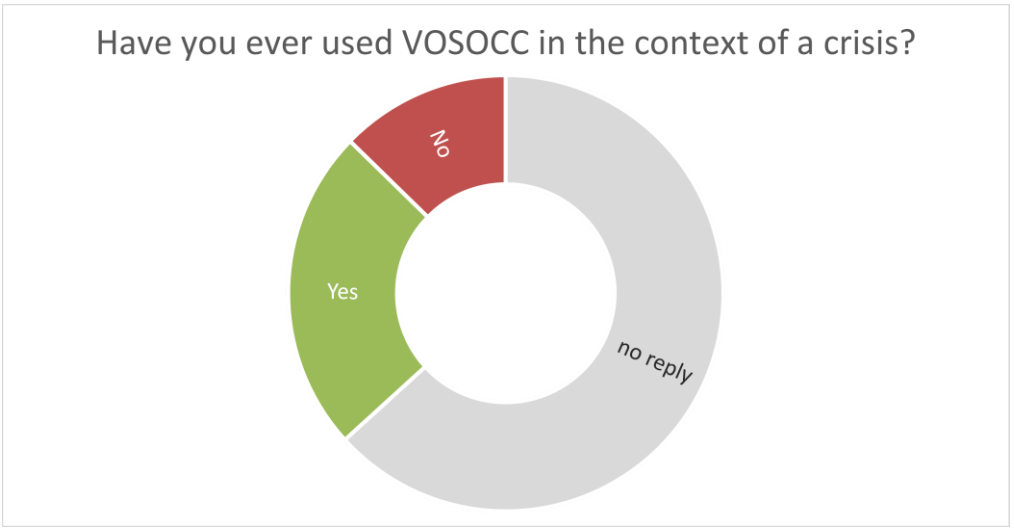

Figure 14 – Users uptake of VOSOCC in case of disaster emergency tasks.

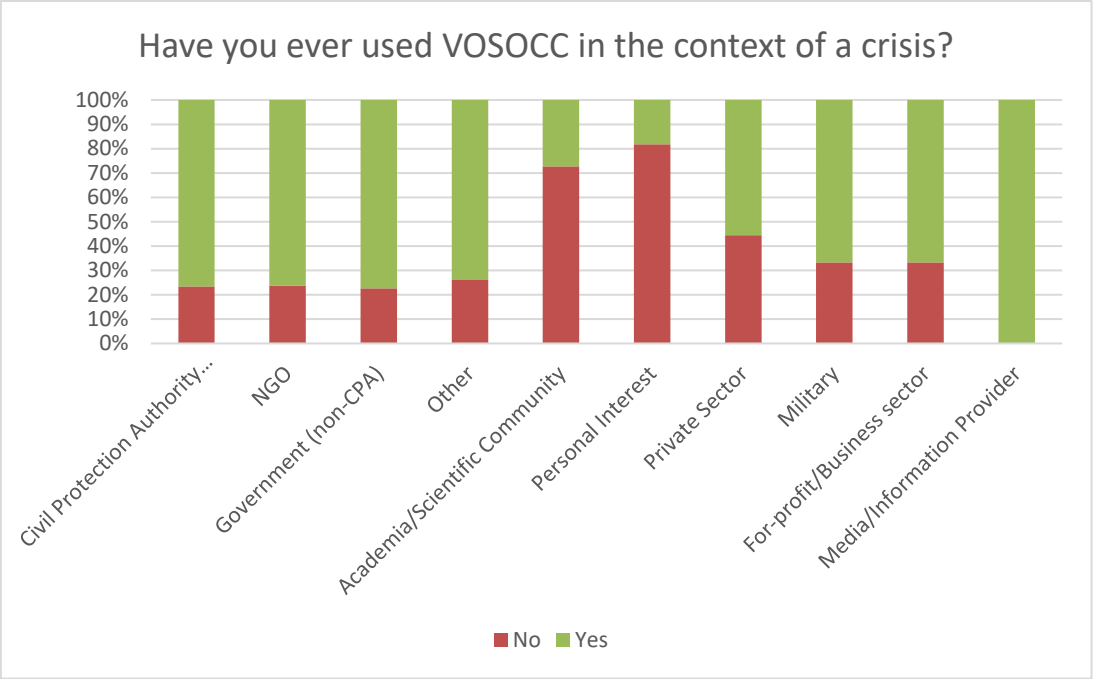

Figure 15 – Percentage of survey respondents who have used VOSOCC at least once, by type of affiliation.

Rate of usage of VOSOCC depending on tasks/roles does not differ much across the respondents, as from figure 16.

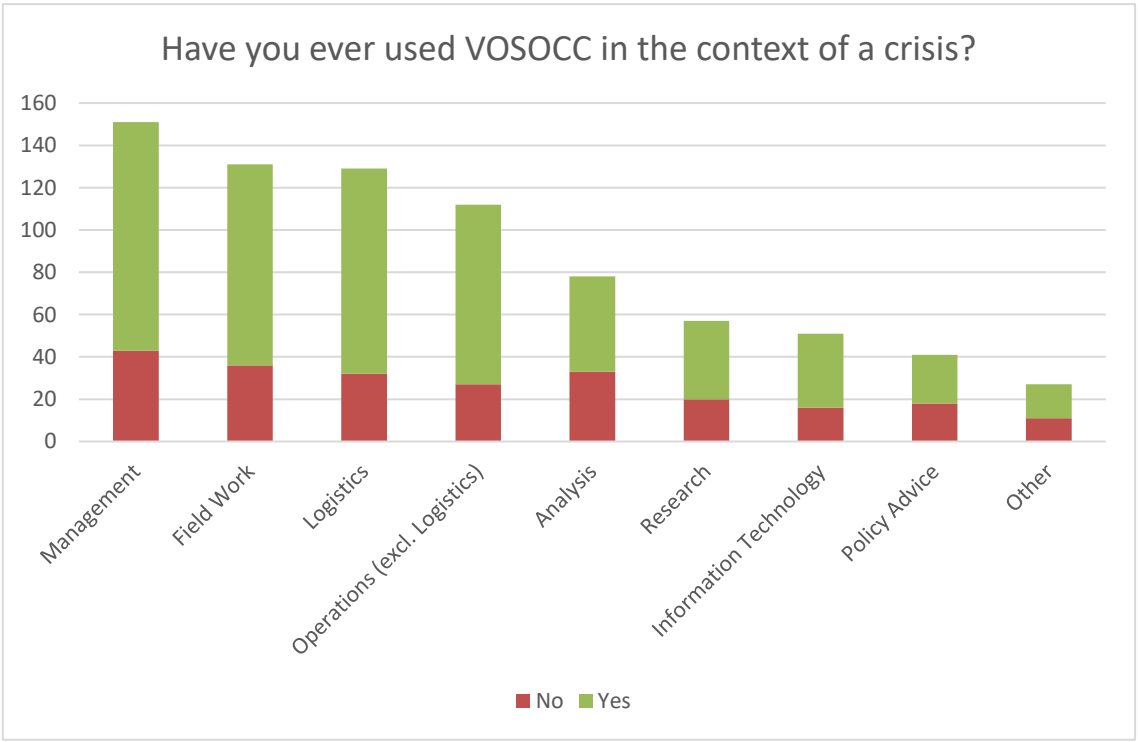

Figure 16 – Number of survey respondents who have used VOSOCC or not at least once, by role.

Among survey respondents, the vast majority found useful information always or often (84% combined) to understand what's the international humanitarian response during a disaster, as illustrated in Figure 17.

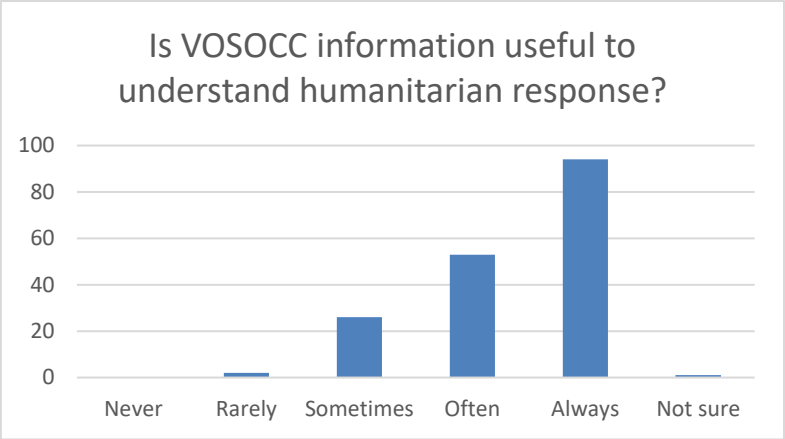

Figure 17 – number of VOSOCC users amongst survey respondents rating usefulness of VOSOCC information to understand what the international humanitarian response in a disaster is.

A relative majority of responding users do not post content on VOSOCC, whilst the others do, with varying frequency (Figure 18).

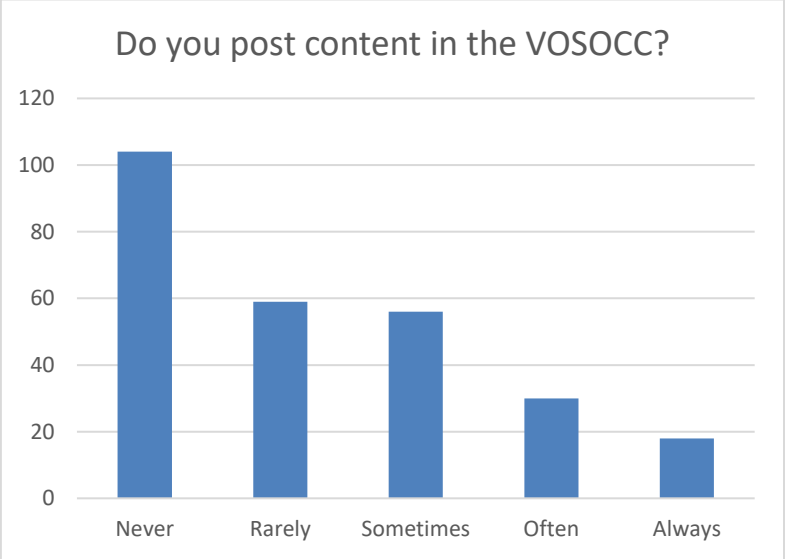

Figure 18 - number of VOSOCC users responding to the survey by their frequency of contribution with content.

A slight majority of respondents did not take part in any simulation exercise (Figure 19), while the others did about seven on average in the last three years.

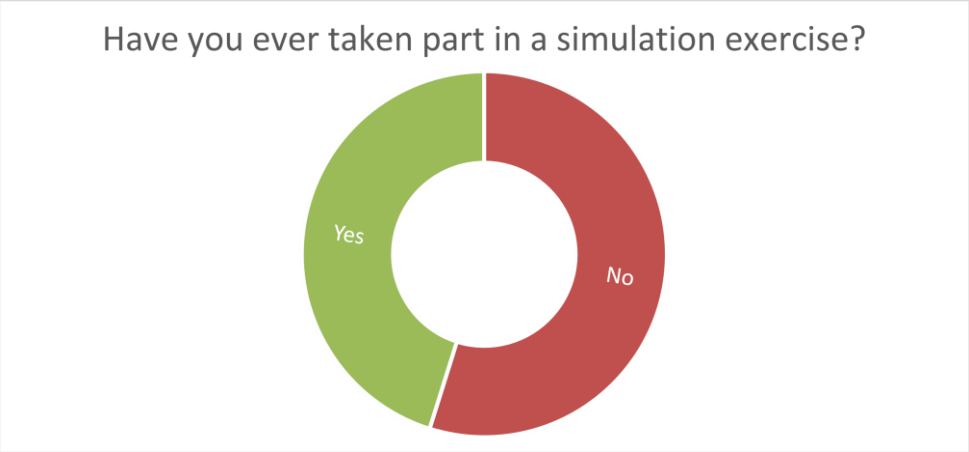

Figure 19 – Proportion of survey respondents who use VOSOCC and participated at least once to exercises

Of the other features of VOSOCC, they are used as follows. A majority of survey participants (80%) did not pick any of the options, in line with the relatively low uptake of VOSOCC by the surveyed respondents. Among those who did, their multi-choice are distributed as illustrated in the series of charts from Figure 20 to Figure 25.

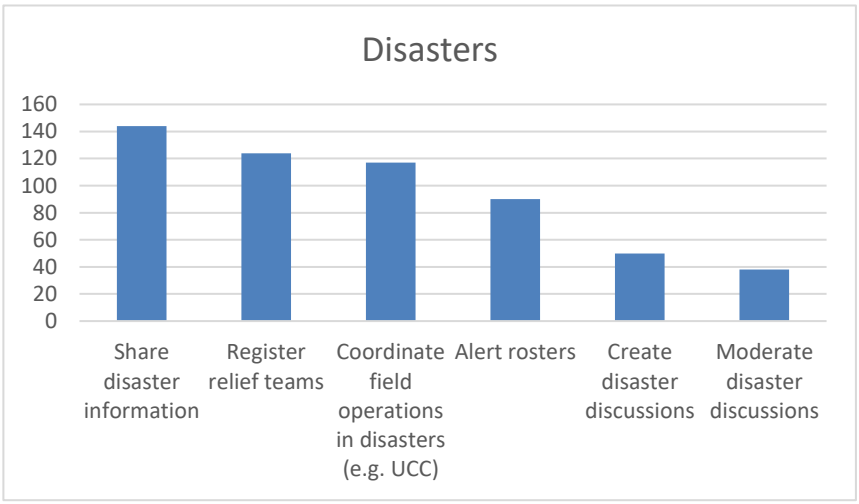

Figure 20 – Which of the other features of VOSOCC do you use?

Number of respondents for applicable tasks in "Disasters" section

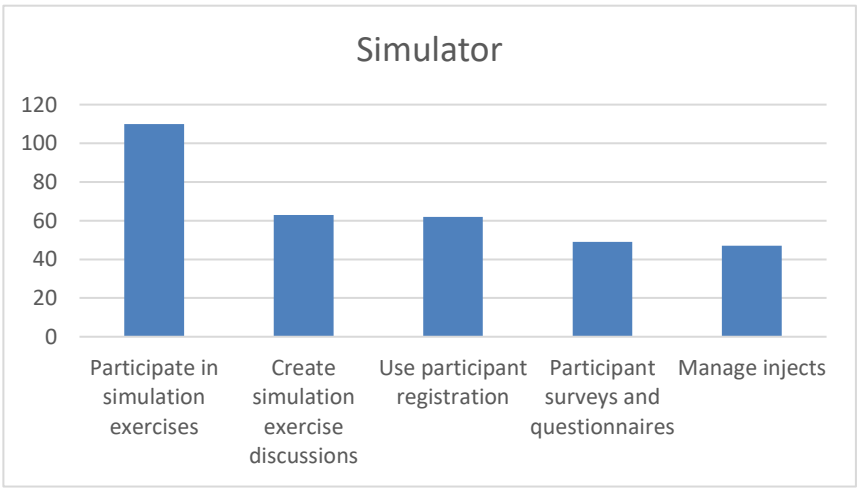

Figure 21 - Which of the other features of VOSOCC do you use?

Number of respondents for applicable tasks in "Simulator" section

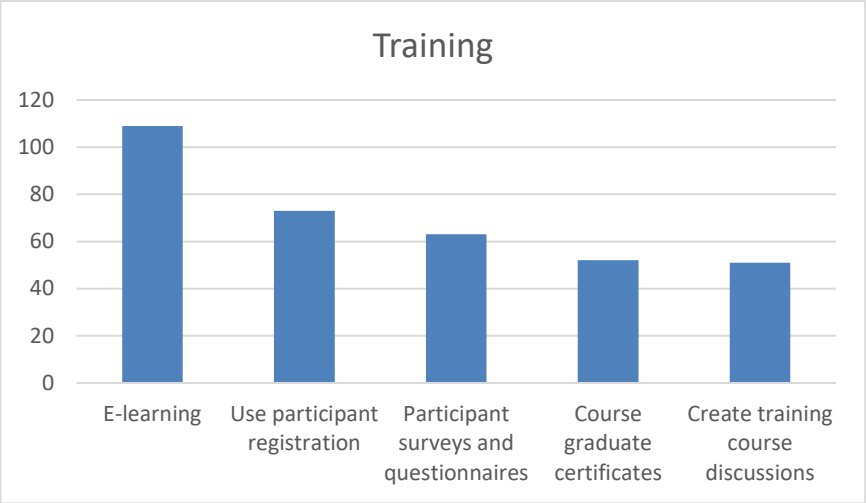

Figure 22 - Which of the other features of VOSOCC do you use?

Number of respondents for applicable tasks in "Training" section

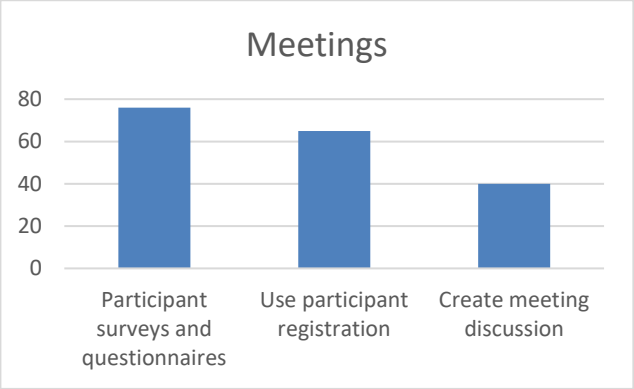

Figure 23 - Which of the other features of VOSOCC do you use?

Number of respondents for applicable tasks in "Meetings" section

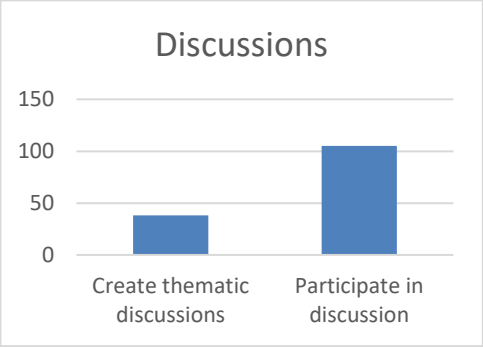

Figure 24 - Which of the other features of VOSOCC do you use?

Number of respondents for applicable tasks in "Discussions" section

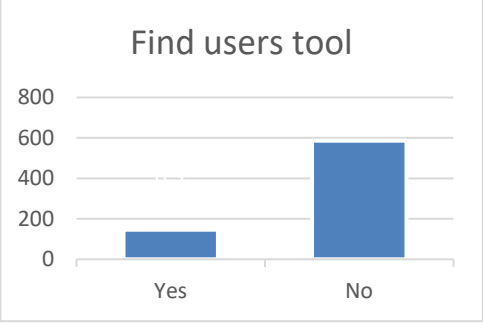

Figure 25 – Do you use the tool to "Find persons in the contacts database"?

The chart shows Number of respondents

As open feedback on VOSOCC, only a few users replied, with the main line being the need to improve the user interface. A user complained of usability in case of poor internet connectivity. It was found useful in disaster situations but could be improved in terms of user interface and speed of information delivery. Some point to the need for better organization and integration of information from various response groups and countries. Several users find the tool to be very useful and important, even if only in relation to certain specific tasks within the wider monitoring activity.

3.3 Satellite Mapping Coordination System (SMCS)

Roughly one-third of the survey respondents gave feedback regarding their use of SMCS, indicating a notable surge in the utilization of this GDACS component compared to the 2018 survey, when it was much lower. This increase suggests a growing recognition and reliance on SMCS as key tool within the GDACS framework. As shown in figure 26, about a third of SMCS users are very familiar with it, a third are fairly familiar, and the remaining third only slighlty. This balanced outcome indicates a range of usage levels and an interface suitable for all respective users.

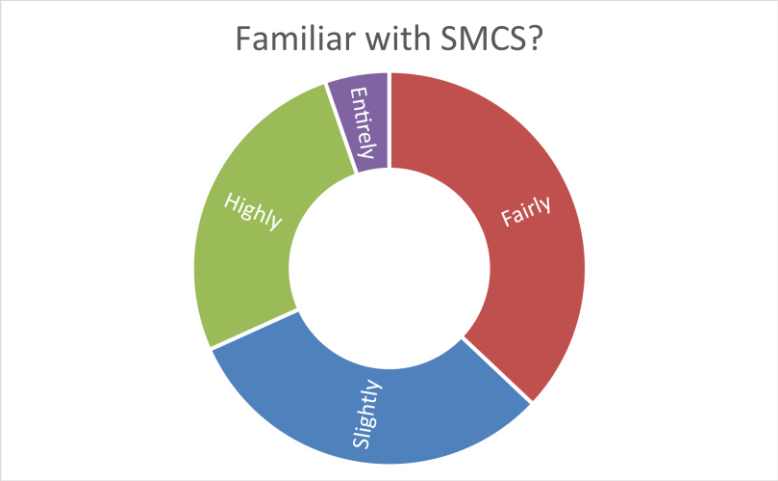

Figure 26 – Level of familiarity with use of SMCS declared by respondents.

In terms of usability for operations, at least half of respondents indicated a positive opinion (highly or entirely), and more than a third as fairly useful (Figure 27).

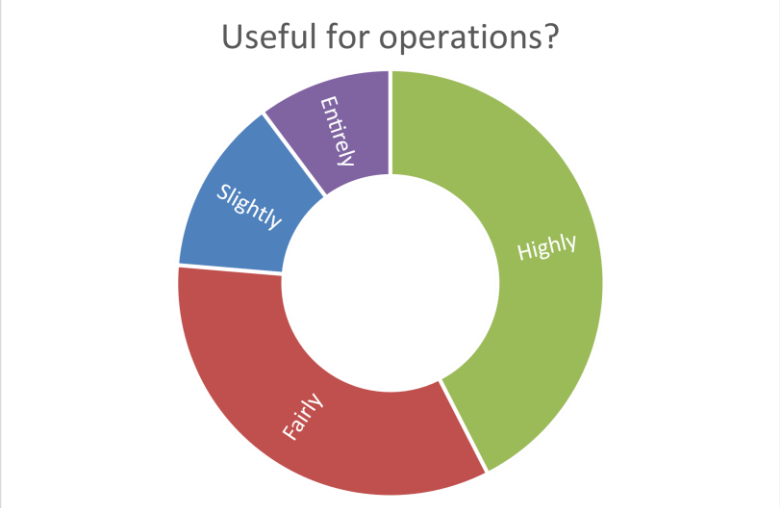

Figure 27 – Evaluation by respondents about the usefulness of SMCS for actual operations.

3.4 Other platforms used by respondents

Beyond GDACS, depending on roles, interests, location, and hazards of interest, survey respondents indicated a wide range of existing tools and platform for early warning or monitoring of disasters, listed in table 4. In the table, acronyms and items are listed as per input by respondents.

Table 4 – Raw list of sources, monitoring and early warning systems used by the survey respondents.

Tsunami warning centre Honolulu	NHCNOOA	Everbridge
Singapore myENV App	ISOS	FloodList.com
EOSDIS	COPECO	GEOFON
My Shake - Erdbeben	SINAPRED	https://www.tropicalstormrisk.com/
prevention web	CONRED	Tenki.jp
preparados.gob.mx cenapred.gob.mx	CSEM EMSC	OCHA flash reports
ADAM	IGN	crisis group watchlist
Zoom earth	IFRC	IREACT
USGS Earthquake	My 112	disaster.ninja
NHC	News	USGS "Did you feel it?"
Echo Flash	GFMSJTWC	PDC (DisasterAware/DisasterAware Pro/Global
ISOS	GPM	ANEPC (Portuguese Civil Protection)
OSAC	ACAPS	GLIDE number
ACSG	UWI	IRI
Online Disaster Alerts	ReliefWeb	wiki predict
FEWIS	ECHO	Italian Weather Criticity Bulletin
Volcano Up!	International SOS	BMKG
LastQuake	Sismo detector	ERCC
Windy	Local mailing lists	AHA-Centre ASEAN
IndianMet	NINA	DWD
PDC DisasterAware	KATWARN	Forest fires alerts by NASA and ESA
Bureaus of Met (local/national)	UNITAR	Nationals government alerts
FEMA	EU Copernicus	Accuweather
NOAA	IGP	Meoblue
IISEE	MyShake	WHO EMT Network Alert
BOM	Factal	ERG
NASA	PNSN	Incendios CyL
Google alerts	SEIC	CORE
NRSC	AtHoc	Earthquake+
DoD	Twitter	Anticip Risk Watcher
Mainstream media	Facebook	
Wecuse	QuakeFeed	

4 User interviews about GDACS MHEWS

To complement the survey, in March 2024 a round of talks were conducted with ten selected GDACS users, who already participated to the survey and gave their approval for being interviewed. They were selected based on both regional and institution/role of provenance, to represent a variety of users, together with their different requirements: from search and rescue officers and local community NGO operators, to analysts involved in global scale monitoring and researchers from academia.

The interviews revolved around the potential of GDACS and the needs of the community it targets. They were conducted using a similar set of questions for all, which can be recapped in the paragraphs below, with a summary of the replies.

- The interviewee priorities while using an early warning or monitoring system, specific to the tasks at hand, and the needs to fulfil with it.

A recurrent priority motivating the use of an early warning and monitoring system is to anticipate and help building preparedness ahead of a potential disaster. Forecasts, when available, or timeliness otherwise, are seen as very important by all interviewees.

In the context of anticipatory action, the availability of impact-based indicators and explicit estimation of uncertainty were mentioned as big plus by a third of respondents. Concerning forecasts, the needs expressed varied, but in general a preference for impact-based, rather than hazard-based forecasts, was mentioned implicitly or explicitly. No specific lead time were indicated, as quite dependent on a case by case basis.

In relation to the use of historical data and time series, only a couple interviewees were actively involved in trend analysis, model building, or research on time series. Therefore, as emerged from the survey too, users in need to access historical data were a minority, although such users might be able to provide critical hindsight for building preparedness.

Another priority expressed by users is the ease of access to information and data: timeliness and accuracy are not sufficient for anticipatory or response action, if they can't be accessed and redistributed easily. This is meant on both a technical and financial level. For certain stakeholders, the availability of data for free is necessary, with no other options due to funding constraints. On the technical side, about half of interviewees highlighted accessibility and usability as a priority, in terms of either ease of integration in internal IT procedures (integration and interoperability), or in terms of up-time and operational support. Indeed, some interviewees mentioned the significance of data integration (ground to Earth Observation) and interoperability as their main scientific and technological development interests too.

In line with the survey respondents, all interviewees were focused in multiple hazards, often beyond the hazards currently covered by GDACS and including man-made disasters and conflicts, and in general anything potentially entailing humanitarian impacts. This is particularly true for users involved in global monitoring activity, trying to achieve a full and timely situational awareness. Interviewees involved at local/regional level seemed to lean towards a narrower set of hazards (e.g. floods and droughts, tropical cyclones and floods, etc.), linked to the specific vulnerabilities or common hazards of their area of interest. Two users involved at regional level called for the need to connect more the international information systems with the national or subnational existing networks and local stakeholders, for more tailored and accurate data, including bottom-up data collection approaches.

- The benefits coming from GDACS, in relation to the interviewees' activity, and its strengths and weaknesses.

When asked about GDACS specifically, several viewpoints emerged for both benefits and gaps. All people interviewed but one make use of GDACS, and appreciate its timeliness and reliability, within the scope of quickly informing and providing situational awareness. Stakeholders with analytical tasks and handling multiple sources of information, value GDACS as both a validation tool for their own assessments and as a primary and comprehensive source of multi-hazard data. For those interested in global monitoring, the global coverage with a consistent methodology by GDACS provides a definite plus to its adoption. The same kind of users with data processing tasks, generally indicated as a weakness the lack of technical documentation or training material, which would allow to unlock the full potential of the GDACS API and data facilities.

All users benefit from the availability and openness of GDACS data, allowing them not only to access data and information directly, but to disseminate further with or without own integrations. Again, the multi-hazard domain is a key distinguishing feature, adding much value for its users. When a higher resolution or accuracy of data than those provided by GDACS is ultimately required, GDACS still proves good as aggregator.

At the same time, a request for enhanced transparency on models, uncertainty and metadata in general emerged from about half of interviewees, as these features are not evident to users, albeit already available for the most. Some minor technical issues were mentioned as well, such as managing the automated alerts or accessing historical data.

As general needs/requests to increase the use of GDACS, it was training and further integration of data sources (e.g. earth observation with field data) into its products. Especially satellite data and derived products were mentioned explicitly as of high interest, albeit the technical capability to handle and correctly interpret such data may vary. Capacity building and collaboration was mentioned a few times as a general need, and not only related to GDACS.

A constant positive remark expressed by all interviewees as a strength of GDACS is its authoritativeness and reputation, deriving both from its track record and from the backing international institutions.

- The policy initiatives and/or scientific initiatives the interviewee deemed necessary for advancements in disaster prevention and response.

Indeed, preparedness was also mentioned as the weak link in the disaster management chain, and some put emphasis on the need to provide situational awareness at all levels, so to include local communities potentially affected. One interviewee, involved directly with capacity building in rural communities, stressed the value of integrating the social dimension with the physical variables monitored as hazards, pointing de-facto towards risk assessment and beyond hazard monitoring.

In general, and also in reply to the question about any policy initiatives that could foster preparedness and response, capacity building at (sub)national level and international collaborations were confirmed as highly appreciated and needed. Given the less policy-oriented profile of interviewees, not many opinions emerged on possible policy developments, but as improvements, possibly driven by policy, two users indicated respectively the integration of data/evidence into policy and promotion of cross-sectoral integration, and push towards specific disaster types and regions, such as water resources, livestock, and agriculture in vulnerable areas.

- The key factors providing sufficient trust to make any interviewee's task dependent on it.

In relation to the trust factor, and especially for users with responsibility to inform with data, they indicated a few key features when asked specifically about that. Almost all mentioned reputation and institutional backing, the "who's behind", as being particularly important. Belonging to international authoritative entities is highly valued by GDACS users, as indeed GDACS benefits from that. However, reputation may not be sufficient to rely on its products, especially for interviewees involved in data analysis on a daily basis. In fact, some users pointed to consistent and transparent data and methods, with complete documentation and model performance information, as mandatory requirement for entrusting a given product or platform. Long-term support was also mentioned as a trust factor, including for data quality and accessibility. An interviewee, subject to severe funding constraints, highlighted data retention capability as an important feature in the face of inability to store and process data on premises, thus referring to it not only as a critical technical feature at present, but as an insurance for future activities. Finally, technical reliability was mentioned by some (all those tasked with monitoring services) as important to rely upon, i.e. warranting 24/7 up-time and not implementing unexpected changes in the data flow; according to the opinions collected, GDACS performs well in this regard.

5 GDACS Contact form

One of the ways GDACS collects user feedbacks is through the contact form, always available on the GDACS website. To ensure high quality standards in user support, the requests are addressed individually by the GDACS team. In the period 2022-2024 GDACS received messages from about 400 users through such contact form.

The form is used primarily to communicate practical issues encountered while using GDACS. These are mostly related to logging in, account activation, receiving alerts and accessing data archive. Such issues often do not stem from the GDACS, but rather affect the user on the client end (e.g. user's browser, network restrictions, etc.). Since GDACS has an active IT maintenance activity, the team is usually able to address bugs and issues within the system in short time. The word cloud of Figure 28 reflects the keywords most recurring in the messages received through the contact form.

Figure 28 – Word cloud of keywords from the GDACS contact form messages

6 Conclusions

The feedback on GDACAS is very positive on all components, for both timeliness and/or relevance. Concerning the improvements suggested, an additional evaluation effort is necessary, to track it back to specific user groups. It should be noted that provenance and role of survey respondents, as well as the surveyed components, were a bit imbalanced and may not be fully representative, i.e. may need to be weighted differently to evaluate GDACS services unbiased. Given the substantial number of replies received however, it is safe to say that the opinions of current users were depicted fairly. The round of interviews conducted in March 2024 provided additional insights to complement the online survey, and helped to overcome some of the bias (e.g. RSS and API have much larger use than shown in the survey).

Based on the feedback gathered from the survey, MHEWS emerged as the most utilized component, and a significant number of users access all three components in conjunction. The GDACS components are complementary to each other, and the mere number of users for each does not reflect necessarily the respective relevance or value. VOSOCC is the predominant choice among users within the Civil Protection responder community, for instance, and other key players in the preparedness and response domain. The number of users has significant implications for the GDACS technical maintenance and development though, as well as for the wider platform management and networking activity. GDACS partners may invest some effort to identify potential users currently not engaged in any or certain components, and subsequently devising strategies to encourage the adoption by these users, who could significantly benefit all stakeholders.

About one-third of the survey respondents shared their feedback regarding their use of SMCS. The feedback indicates a surge in the utilization of this GDACS component, compared to the 2018 survey, when its usage was much lower. The increase suggests a growing recognition and reliance on SMCS as a key tool within the GDACS framework, and GDACS has to ensure the right environment for this component to keep growing.

Concerning the MHEWS component, the majority of respondents expressed interest in multiple hazards, with earthquakes being the most popular choice and the only hazard drawing a few respondents solely interested in it (monothematic). A minority opted for only a few hazards while excluding others (multi-thematic), but most sought information on at least five different hazards (generalists). Considering that survey respondents consult GDACS for several hazard types, it is likely that most access MHEWS to get a comprehensive and integrated overview of ongoing disasters, i.e. situational awareness. Furthermore, the survey reveals that the majority of respondents indicated additional hazards of interest to them, with a noteworthy emphasis on severe weather. Again, it is a sign of interest in a comprehensive information system covering a wide range of hazards, well beyond the primary focus on earthquakes that marked the origins of GDACS. As a consequence, GDACS may add further emphasis to include more hazards, so to address complex and multi-hazard emergencies better.

Specific usage profiles do not emerge immediately from the survey, other than those already declared in task/role and type of affiliation entity. This may call for further insight, and more detailed analysis, but the interviews partly filled the gap, as they reached out a variety of different users. They confirmed the focus on multi-hazard and situational awareness like survey respondents. Timeliness, accessibility, actionable use and transparency seem to be the top priorities for most interviewees.

Concerning GDACS features and services that seem to receive less usage and attention, the survey does not help to clarify whether they serve only niche applications but very important ones, or simply they are not interesting or useful to most. This aspect may need further investigation, and the limited number of interviews did not fully clarify this issue either. However, data services like API and RSS are very much used and yet underestimated in the survey, whose focus revolved mostly around the website user interface functionalities.

Beyond the overall very positive response, there are some weaknesses in GDACS services identified by some of the users surveyed and interviewees. They regard the need to improve timeliness under certain circumstances, content and user interface, but no striking directions of improvement emerge. Solely based on this, new developments may rely more on the strategic goals of GDACS partners than its user feedbacks. However, the format adopted for the survey may induce some bias, to be considered before drawing clear cut conclusions, as much was inevitably left out of it. For instance, no specific questions on new directions of development were included. For this reason, to complement the survey the round of interviews allowed to get a glimpse of some user's specific goals and motivations more in depth. According to these, GDACS is on the right track for the current users, and they expect improvements and developments, rather than changes, on the extant features. Finally, GDACS benefits from a solid reputation across the users, and the backing of important international institutions is one of the main reasons. Beyond reputation, interviewees indicated as keys to trust a system the following: transparency, long-term and technical support, the ability to provide consistent, high-quality data and to adapt to stakeholders needs.

ANNEX I – Online survey

Getting ready for the 20th anniversary 2024

Welcome and thanks for taking our survey!

GDACS, the **Global Disaster Alert and Coordination System** (www.gdacs.org) is a collaboration between the European Commission and the United Nations providing real-time access to web-based disaster information systems and related coordination tools since 2004.

After almost 20 years of operations, we want to revisit its contents/structure/functionalities to better fulfil your information needs. Please, help us understand how to do so by taking 5 minutes to reply to this questionnaire.

Section 1:

GDACS consists of the following three components, please select the ones you make use of:

- ☑ The Multi-Hazard Early Warning System (MHEWS) sends alerts when a disaster with potential humanitarian consequences is detected.
- ☑ The Virtual On-Site Operations Coordination Center (VOSOCC) provides a platform for information exchange between disaster responders
- ☑ The Satellite Mapping Coordination System (SMCS) provides a platform to inform GDACS users which mapping organization is providing satellite imagery analysis, what type and where

About the GDACS **Multi-Hazard Early Warning System (MHEWS)**:

1. Have you set up to receive automated alerts?

◉ Yes ○ No

1.1 please select the communication technology you have selected for the alert(s):

- ☐ e-mail
- ☐ SMS
- ☐ RSS feed

2. In terms of timing, do you consider that GDACS alerts arrive early enough?

○ Always	○ Often
○ Sometimes	○ Rarely
○	○

Never Not sure

Additional Comments:

3. How do you use GDACS alerts? What do you do with it, after receiving them?

- ☐ Situational Awareness
- ☐ Needs Assessment
- ☑ Other
- ☐ Internal/External Reporting
- ☐ Supporting Decision Making
- ☐ Scientific Analysis
- ☐ Planning field mobilisation

Please Define

4. What hazards interest you?

- ☐ Earthquakes
- ☐ Volcanoes
- ☐ Tsunamis
- ☐ Tropical Cyclones
- ☐ Floods
- ☐ Droughts
- ☐ Forest Fires

4.1 Which additional hazards would you prioritise for future developments

at most 3 choice(s)

- ☐ Landslide
- ☐ Heat/cold waves
- ☑ Other
- ☐ Severe Weather/Meteorological
- ☐ Health (pandemic/epidemic)
- ☐ Nuclear/radiological
- ☐ Natech

Please Define

5. Please indicate which of the other features of GDACS MHEWS you use.

- [ ] Hazard geospatial layers
- [ ] Exposure estimates
- [ ] Areas of Interest
- [ ] Analysis Reports
- [ ] Social Media analysis
- [ ] News headlines
- [ ] Weather forecast

6. Please indicate which of the following data formats available in GDACS you use

- [ ] Xml
- [ ] Json/Geojson
- [ ] Kml
- [ ] Shape

7. Do you use GDACS APIs?

- ( ) Yes
- ( ) No

8. Please list other tools, apps or websites that you use to be alerted for disasters:

9. Would you be interested in being interviewed about your experience with the GDACS MHEWS?

- (•) Yes
- ( ) No

Please provide use with your email contact

About the GDACS **Virtual On-Site Operations Coordination Centre (VOSOCC)**:

1. Have you ever used VOSOCC in the context of an ongoing crisis?

- (•) Yes
- ( ) No

1.1 During a disaster, do you find useful information to understand what's the international humanitarian response?

- ( ) Always
- ( ) Often
- ( ) Sometimes
- ( ) Rarely
- ( ) Never
- ( ) Not Sure

Additional Comments

2. Do you post content in the VOSOCC?

- ○ Always
- ○ Often
- ○ Sometimes
- ○ Rarely
- ○ Never

3. Have you ever taken part in a simulation exercise?

- ◉ Yes
- ○ No

3.1 In how many simulation exercises simulation exercises did you take part in the last 3 years

3.2 In which of these exercises were GDACS alerts used to set off the scenario

4. Please indicate which of the other features of GDACS you use.

- Tab "Disasters"

- ☐ Create disaster discussions
- ☐ Moderate disaster discussions
- ☐ Share disaster information
- ☐ Alert rosters
- ☐ Register relief teams
- ☐ Coordinate field operations in disasters (e.g. UCC)

- Tab "Simulator"

- ☐ Create simulation exercise discussions
- ☐ Manage injects
- ☐ Use participant registration
- ☐ Participant surveys and questionnaires
- ☐ Participate in simulation exercises

- *Tab "Training"*

- [ ] Create training course discussions
- [ ] Use participant registration
- [ ] Participant surveys and questionnaires
- [ ] Course graduate certificates
- [ ] E-learning

- *Tab "Meetings"*

- [ ] Create meeting discussion
- [ ] Use participant registration
- [ ] Participant surveys and questionnaires

- *Tab "Discussions"*

- [ ] Create thematic discussions
- [ ] Participate in discussion (read, provide comments, etc.)

- *Tab "Users"*

- [ ] Find persons in the contacts database

- *Virtual OSOCC public discussion website*

- [ ] Use public discussion websites to follow discussions (e.g. in disasters) without logging in

5. Please list other tools, apps or websites that you use for operational response coordination:

6. Would you be interested in being interviewed about your experience with the GDACS VOSOCC?

(•) Yes ( ) No

Please provide us with your email contact

About the GDACS **Satellite Mapping Coordination System (SMCS)**:

1. During a disaster, to what extent are you familiar with the information provided by GDACS - Satellite Mapping Coordination System (SMCS) to know which mapping organisation is providing satellite imagery analysis, of what type and where?

   ○ Slightly ○ Highly

   ○ Fairly ○ Entirely

   Additional Comments:

2. To what extent do you find the information provided through the GDACS – Satellite Mapping Coordination System (SMCS) useful to support your operational needs?

   ○ Slightly ○ Highly

   ○ Fairly ○ Entirely

   Additional Comments:

3. Please tell us how do you make use of information provided through the GDACS-SMCS to support your operational planning and/or coordination requirements following sudden-onset disasters:

4. Please list other tools, apps, or website that you use to get satellite-based information products about disasters:

5. Which other functionalities would you like to find in SMCS?

6. Would you be interested in being interviewed about your experience with the GDACS SMCS?

(●) Yes ( ) No

Please provide us with your email contact:

Section 2: Tell us more about yourself:

Which sector describes you best?

- ( ) Academia/Scientific Community
- ( ) Civil Protection Authority (CPA)/Emergency Management Agency (EMA)
- ( ) Government (non-CPA)
- ( ) Military
- ( ) NGO
- ( ) Private Sector
- ( ) Media/Information Provider
- ( ) For-profit/Business sector
- ( ) Student
- ( ) Personal Interest
- ( ) Other

Which category describes your work/function:

- [ ] Analysis
- [ ] Field Work
- [ ] Logistics
- [ ] Management
- [ ] Operations (excl. Logistics)
- [ ] Policy Advice
- [ ] Research
- [ ] Information Technology
- [x] Other

Please Define

Section 2: Tell us more about yourself:

Comments

Thank you very much for filling out the survey!

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