



World Meteorological Organization

PUBLIC WEATHER SERVICES IN REGION VI (EUROPE) REPORT OF SURVEY

PWS-5

WMO/TD No. 1100





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Geneva, Switzerland
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NOTE

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EXECUTIVE SUMMARY

This document provides an evaluation of responses to a questionnaire on public weather services (PWS) by WMO Members in Region VI (Europe). The questionnaire was developed by the RA VI Subgroup on Regional Aspects of Public Weather Services established by the Regional Association at its twelfth session (Tel Aviv, 1998). The questionnaire was distributed in January 2001 by the chairman of the Working Group on Planning and Implementation of the WWW in RA VI (PIOW) in a circular letter to RA VI Members. It relates to the following Terms of Reference of the Subgroup:

- To develop documentation and advise on the regional aspects of the PWS Programme and its implementation.
- To develop proposals on education and training requirements related to the PWS programme and to develop guidance material for improving the presentation of forecasts.
- To elaborate proposals for demonstrating the benefits of PWS and heightening the visibility of NMSs.

The co-existence of public service and commercial activities in some NMSs has been raised and noted in the evaluation of the questionnaire.

The contents of this technical document are an overview of the activities of Members in the Region as regards PWS.

The major findings included in this document are:

1. Key purposes of a national PWS Programme to ensure that the right products are being provided at the right time to the users, and that a proper system is in place to develop those products, resulting in stakeholder confidence and support for the NMS .
2. Insufficient level of staffing in NMSs is causing increasing problems in maintaining a sufficient level of PWS.
3. There is an urgent need for education and training programmes for forecasters and users of PWS.
4. Some major problems faced in the provision of services are related to rapidly changing and emerging techniques.
5. Insufficient resources are available for presentation of products, especially in the print media.
6. Improved communication with users is necessary for successful promotion of PWS.
7. There is insufficient coordination with the media, in particular television, when developing presentation systems.
8. Strengthened infrastructure and strategy are needed for the provision of effective PWS.
9. The overall performance assessment of PWS consists of two parts: product verification and user satisfaction assessment. Both components are necessary for a successful PWS programme.
10. User satisfaction assessment gives a true reflection of the user perception of products and services provided by the NMS, as well as qualitative information on desired products and services.
11. Delivery mechanisms are part of the user requirements; they determine how and when the product is delivered.
12. Timely communication of PWS products in an easily understandable manner, tailored to the likely needs of the audience is an indispensable component in a successful PWS programme.
13. The most widely used channel to communicate information to the public is via the mass-media.

Chapter 1

INTRODUCTION

The Subgroup on Regional Aspects of Public Weather Services in RA VI has the strategic goal to promote systematically the work of the National Weather Services in the Region. A major part of the work of the subgroup has had to deal with the development of advice and documentation on the regional aspects of the PWS Programme and its implementation, paying particular attention to education and training requirements and demonstrating the benefits of public weather services with a view to increasing the visibility of NMSs in the Region.

To make progress in the work of the subgroup, a meeting was held in Vienna in October 2000. To address the subgroup's mandate and as a most efficient means of gathering the required information, the participating members decided to

develop a questionnaire on PWS. The questionnaire addressed the following terms of reference of the subgroup:

- (i) regional aspects of the PWS programme
- (iv) education and training
- (vii) benefits of PWS.

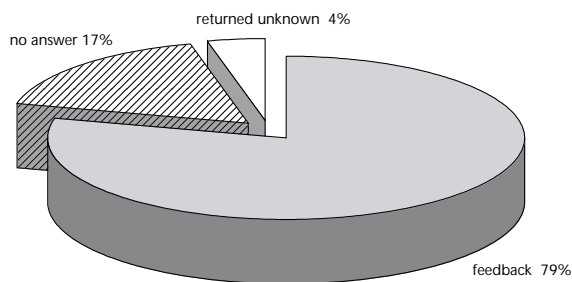
The questionnaire was distributed in January 2001 and the response to it was highly encouraging. Forty-one (almost 80 per cent) of the Members in the Region completed the questionnaire. The results of the evaluation of the questionnaire are presented in this technical document. Based on the results, the subgroup made recommendations, which also appear in the document.

The subgroup is highly appreciative of the effort made by NMSs to complete and return the questionnaire.

Chapter 2

QUESTIONNAIRE RESPONSES

2.1 Forty-one Members in RA VI replied the circular letter of the Chairman of the Working Group on Planning and Implementation of the World Weather Watch in RA VI, concerning the questionnaire prepared by the Subgroup on Public Weather Services. Forty questionnaire responses have been evaluated. One Member (Monaco) indicated that the activities of its NMS were covered by Météo-France. The following graphic represents the number of responses.



List of Respondents of the Questionnaire

A Austria	IRL Ireland
AR Armenia	KZ Kazakhstan
B Belgium	L Luxembourg
BG Bulgaria	LT Lithuania
BQ Belarus	LV Latvia
CY Cyprus	MD Moldova
CZ Czech Republic	MK The former Yugoslav Republic of Macedonia
D Germany	NL The Netherlands
DK Denmark	P Portugal
E Spain	PL Poland
EW Estonia	RL Lebanon
F France	RO Romania
FIN Finland	RU Russian Federation
GB United Kingdom	S Sweden
JE Jersey	SK Slovakia
GR Greece	SLO Slovenia
H Hungary	SYR Syrian Arab Republic
JOR Jordan	TR Turkey
HR Croatia	YU Yugoslavia
I Italy	
IL Israel	

2.2 The questionnaire was structured to cover the following major areas:

- I. PWS Priorities in NMSs
- II. Liaison between NMSs and Media
- III. Education and Training
- IV. Benefits of PWS
- V. Problems in PWS.

Questions 1 to 6: PWS Priorities in your NMS

1. Which are the first 3 priorities of your NMS?

2. Please indicate if the forecasts of your Service for the different user groups are issued in writing text (T), in figures (F), in symbols (S), in maps (M), in graphics (G), by presenting (P) or by interview (I) (multiple entries are possible for example T, S, G).
3. Is your NMS the only national authority to issue the warnings in case of severe weather conditions?
4. Which is the national organization responsible to inform the public about the security measures in case of severe weather warnings?
5. If your NMS has a Website, are the severe weather warnings available on this Website?
6. Is your NMS willing to send your severe weather warnings to a centralized Website in Region VI (Europe) of WMO?

Questions 7 to 10: Liaison between NMSs and Media

7. What kind of warnings or special information is given by your Service to television (TV), radio (R) and newspapers (N)?
8. How does your Service inform the media in cases of severe weather conditions?
9. Through which medium is the official warning disseminated in your country?
10. In your NMS who is responsible for PWS?

Questions 11 to 18: Education and Training

11. Does your Service undertake education and training for the staff involved in PWS?
12. What are the main topics in these training activities?
13. Does your Service provide any training by using Computer Aided Learning (CAL)?
14. Does the staff prefer traditional methods of training or CAL? Which subject?
15. What are the topics where PWS staff needs more assistance?
16. Does your Service provide any education and training programme for the users of PWS?
17. Does your staff receive any education and training on how to meet users' requirements?
18. Does your Service have any training material that can be used by other NMSs?

Questions 19 to 27: Benefits of PWS

19. Does your Service have a public relation manager (the person who gives interviews, writes articles for the newspapers to strengthen the visibility of the NMS ...)?
20. Who in your Service is responsible for public relations?
21. Does your Service organize meetings with the user community to improve relations?

22. Does your Service have a Home Page for internal and external use?
23. Does your Service use the Home Page in order to know about the users' requirements or public suggestions?
24. Does your Service organize internal visits for user communities?
25. Does your NMS carry out activities to strengthen the visibility of the Service?
26. Does your Service carry out a systematic verification of forecasts and warnings?
27. If your Service does not make a systematic verification of forecasts and warnings does it intend to do so in the near future?

Question 28: Problems in PWS

28. What are your three greatest problems with regard to public weather services?

2.3 Questionnaire design

It was essential to ensure that the questions and instructions were easy to understand. Abbreviations and jargon have been

avoided. The frame of reference was specified. The questions needed to be understood by all respondents in the same way. Clear skip patterns (go to) had been defined such that respondents were not required to answer all of the questions. The response categories were mutually exclusive and exhaustive.

2.4 Comments by respondents

Sweden gave *a priori* an introductory statement indicating that due to the structure of the Service some questions could not be answered because of commercial activities. In Sweden, a broad spectrum of users are served by service providers (SMHI commercial unit or private sector).

The UK Met Office reported that some areas referred to in the questionnaire were operated on commercial basis.

The Netherlands weather service (KNMI) pointed out that not all areas were public tasks in that Service and that some elements had been outsourced. In addition the KNMI has no direct access to the user.

In Austria, aviation services are provided by the aeronautical service AUSTRO CONTROL.

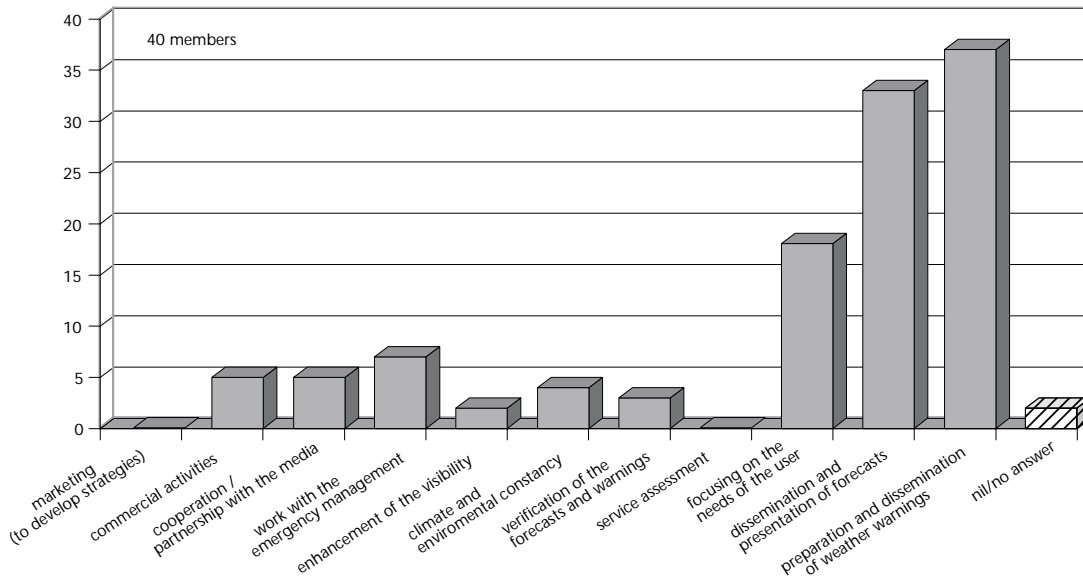
Chapter 3

EVALUATION OF THE QUESTIONNAIRE

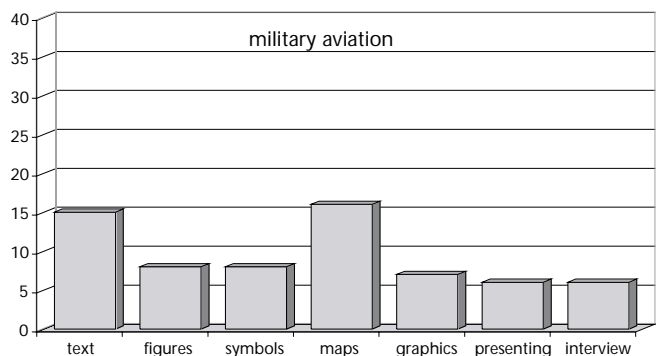
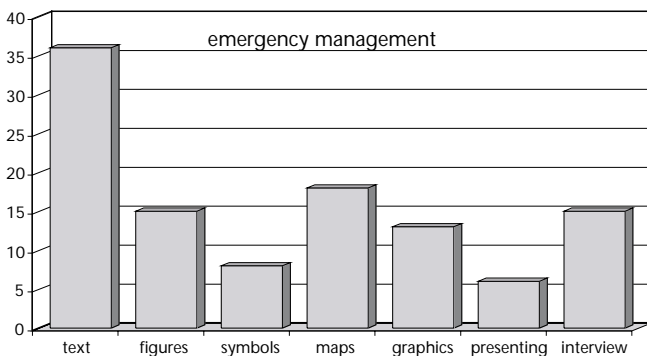
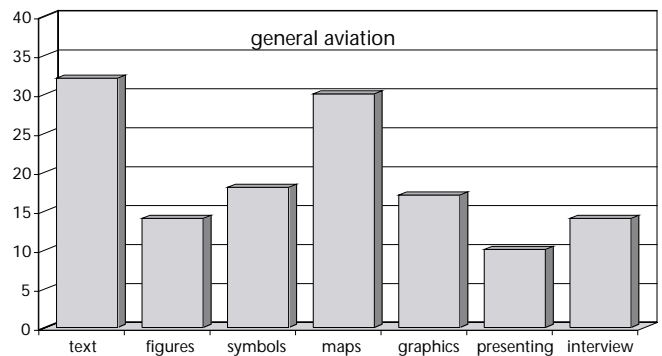
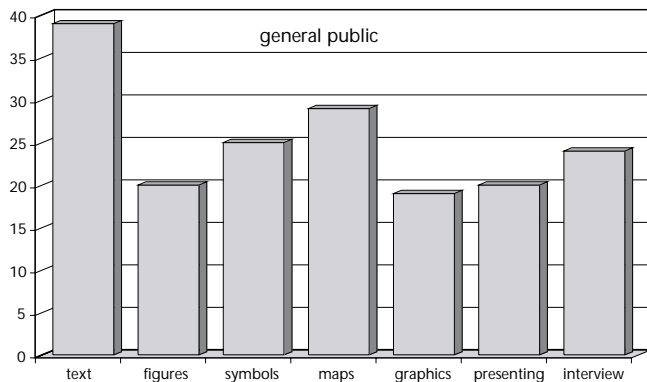
Graphical form of the evaluation corresponding to questions 1 to 28

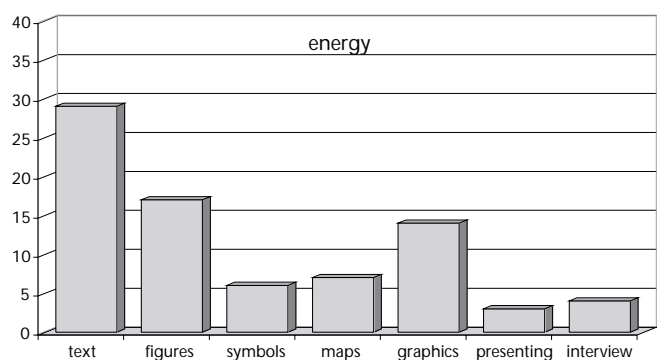
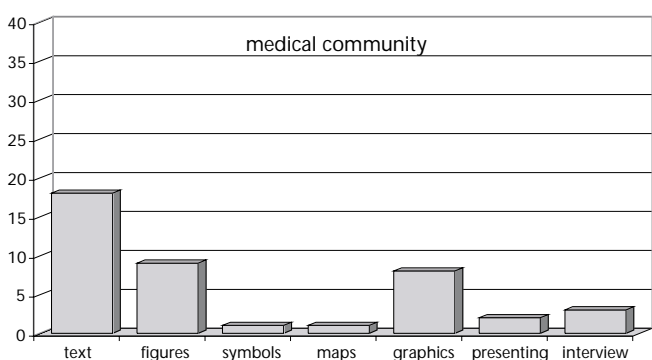
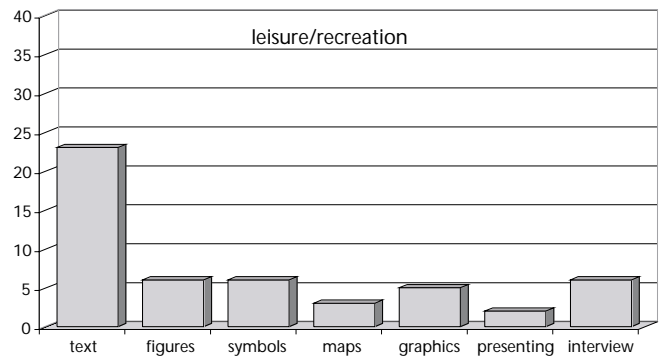
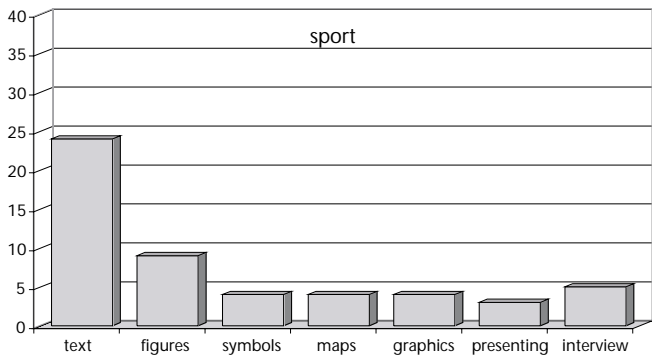
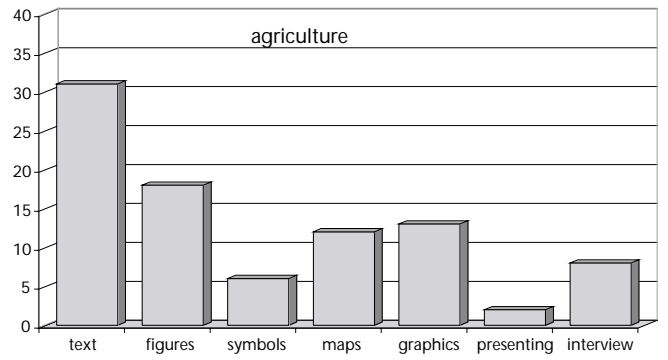
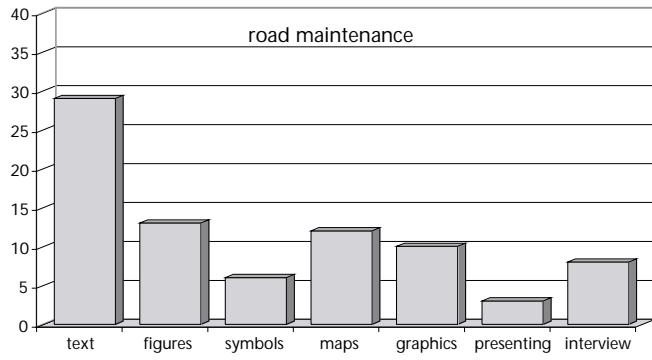
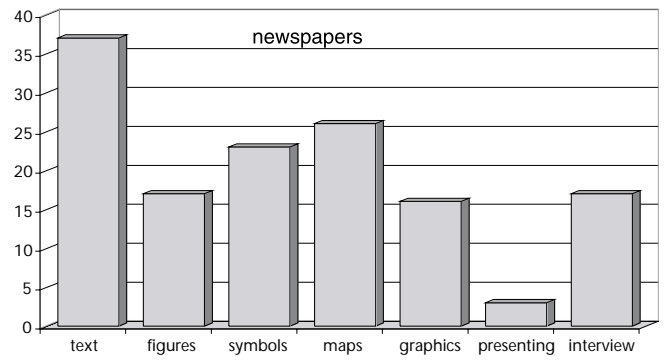
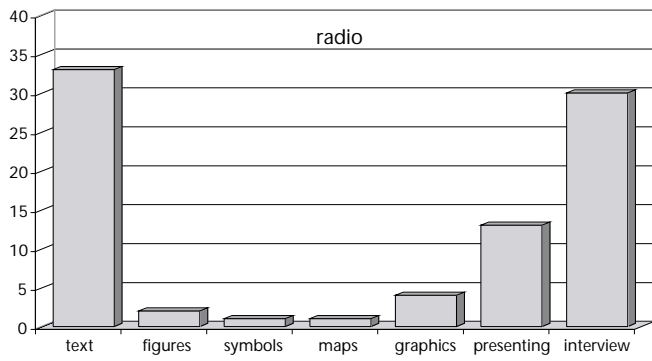
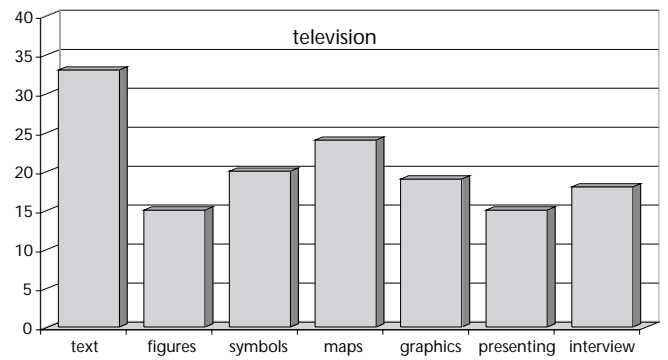
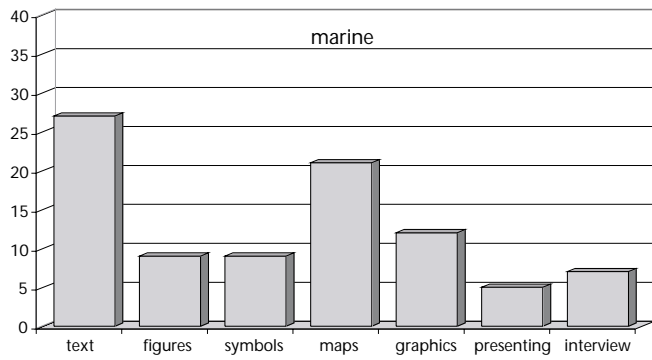
PWS PRIORITIES IN YOUR NMS

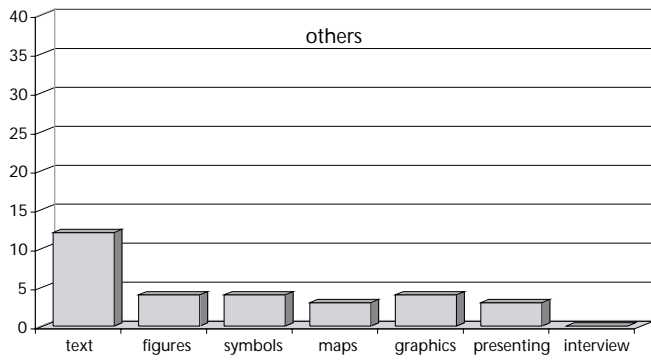
1. Which are the first 3 priorities of your NMS?



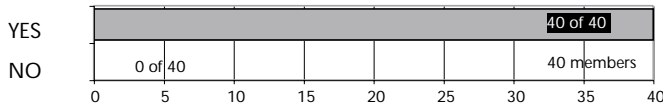
2. Please indicate if the forecasts of your Service for the different user groups are issued in writing text (T), in figures (F), in symbols (S), in maps (M), in graphics (G), by presenting (P) or by interview (I) (multiple entries are possible for example T, S, G).



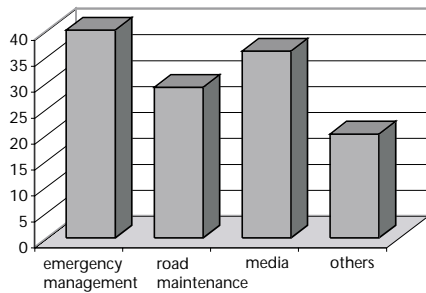




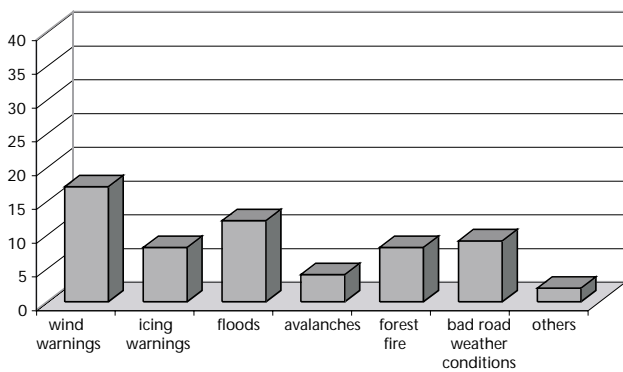
3. Is your NMS the only national authority to issue the warnings in case of severe weather conditions?



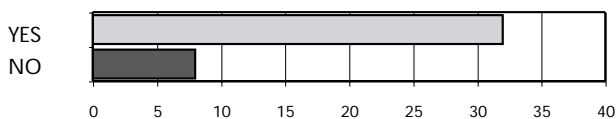
If YES, to which services are they sent?



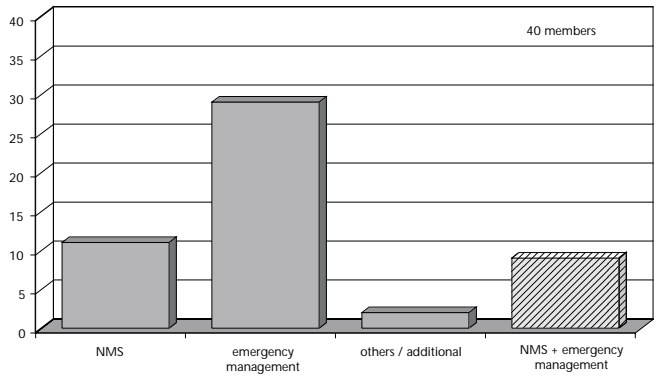
Is there cooperation with the neighbouring countries in issuing warnings?



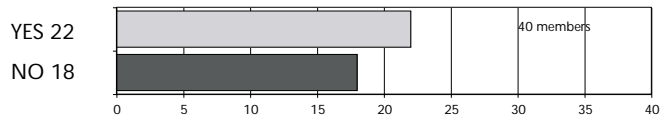
Do different countries need to cooperate more when issuing warnings during severe weather conditions?



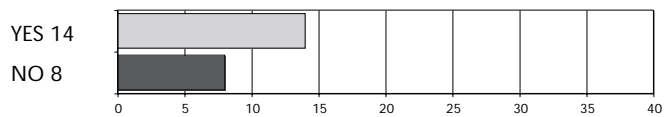
4. Which is the national organization responsible to inform the public about the security measures in case of severe weather warnings?



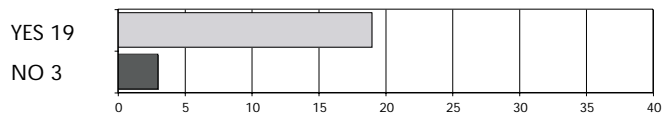
5. If your NMS has a Website, are the severe weather warnings available on this Website?



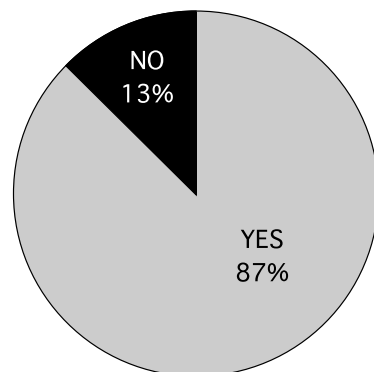
If YES, is your Service also planning to make pre-warnings available on the Website?



If NO, is your NMS willing to set up one in the near future?

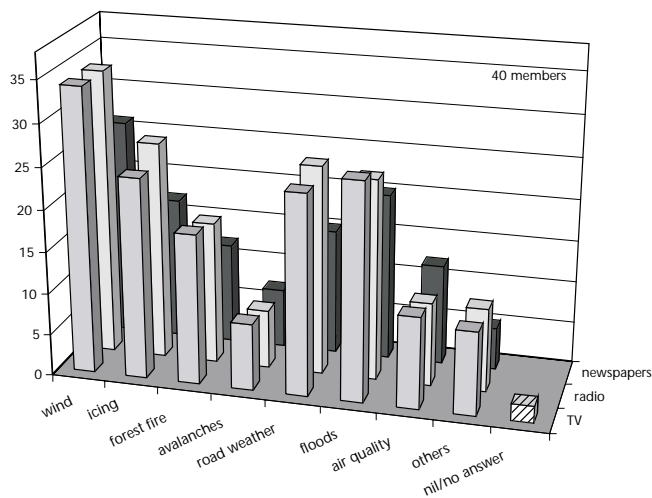


6. Is your NMS willing to send your severe weather warnings to a centralized Website in Region VI (Europe) of WMO?

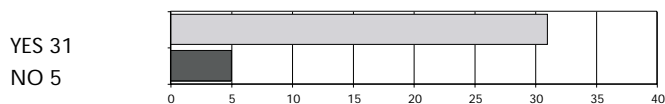


LIAISON BETWEEN NMSs AND MEDIA

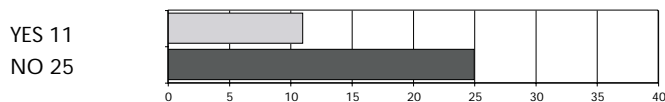
7. What kind of warnings or special information is given by your Service to television (TV), radio (R) and newspapers (N)?



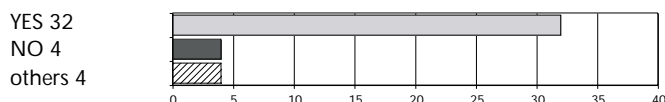
8. How does your Service inform the media in cases of severe weather conditions?
Through the information unit



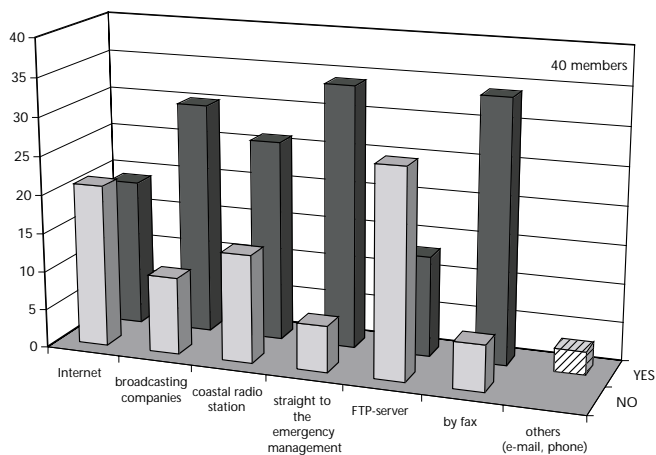
Through a special web-page?



The media calls and asks for forecasts



9. Through which medium is the official warning disseminated in your country?

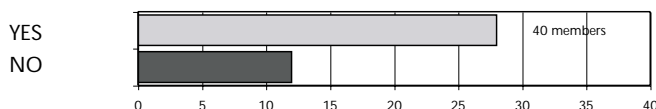


10. In your NMS who is responsible for PWS?

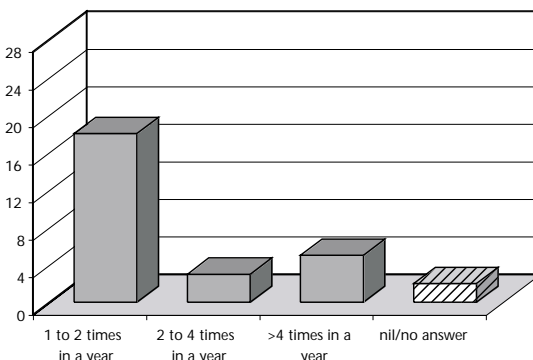


EDUCATION AND TRAINING

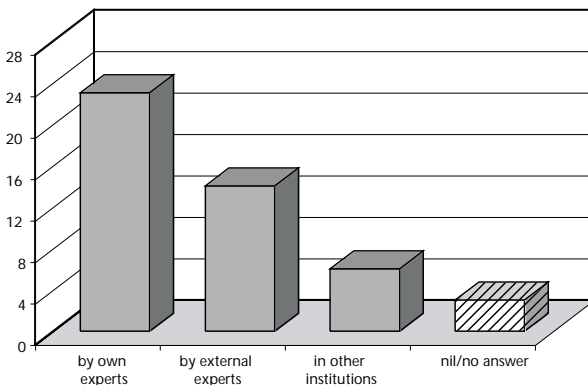
11. Does your Service undertake education and training for the staff involved in PWS?



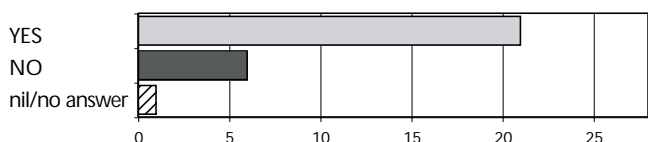
How frequently?



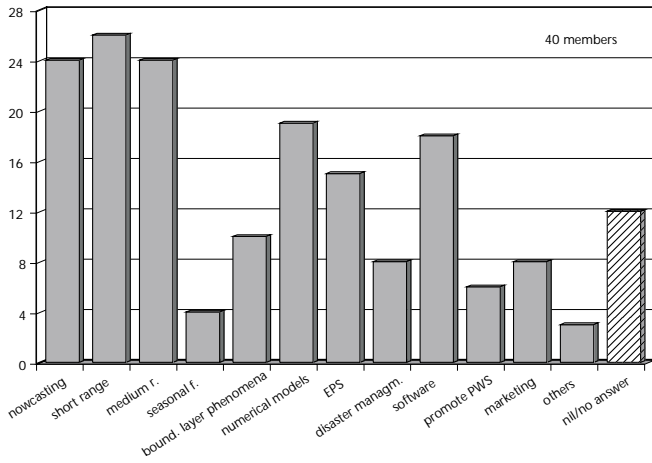
Internal or external education and training?



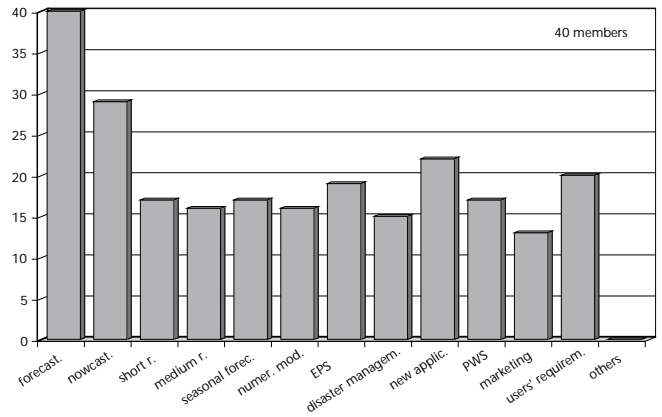
Use of offers from WMO – or comparable institutions like EUMETSAT?



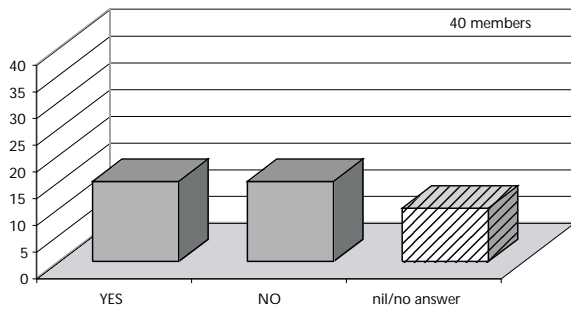
12. What are the main topics in these training activities?



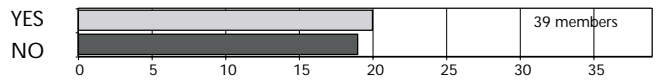
15. What are the topics where PWS staff needs more assistance?



13. Does your Service provide any training by using Computer Aided Learning (CAL)?

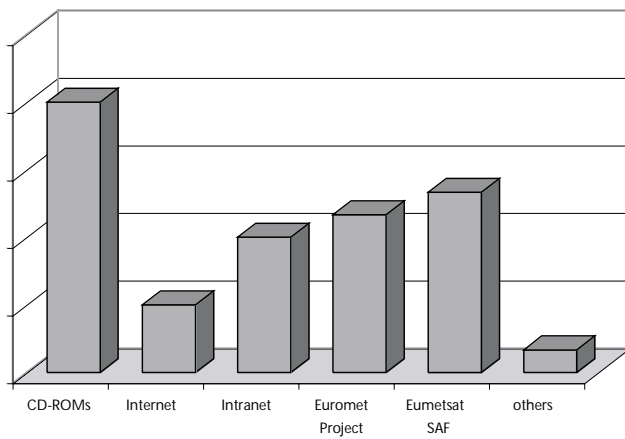


16. Does your Service provide any education and training programme for the users of PWS?

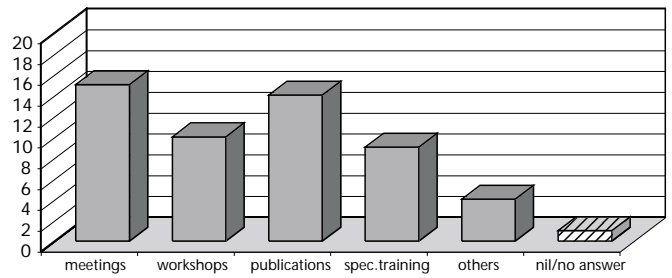


If YES

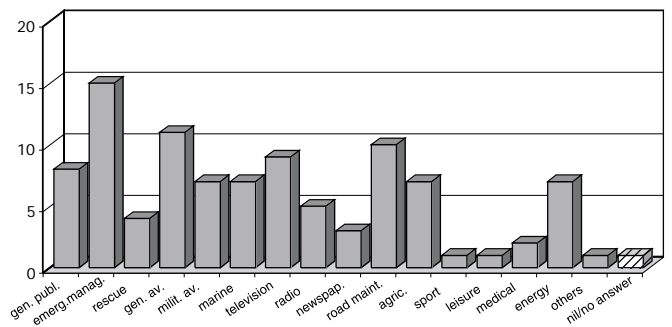
What kind of CAL does your service provide?



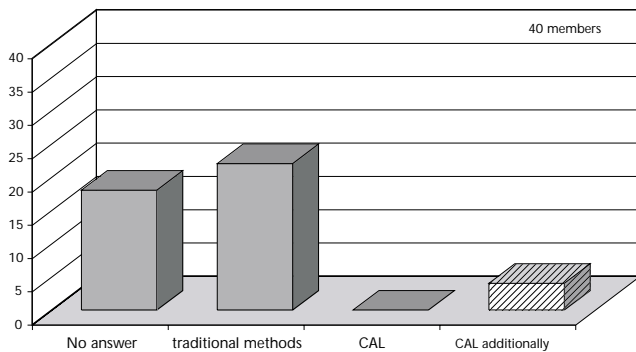
If YES – How?



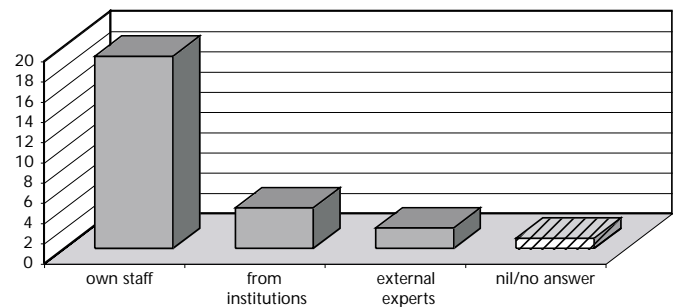
To which users?



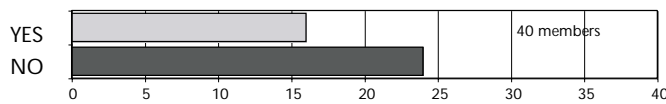
14. Does the staff prefer traditional methods of training or CAL? Which subject?



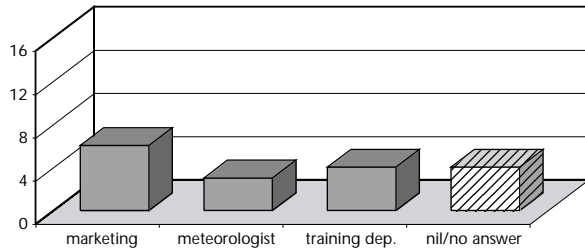
Which trainers are available?



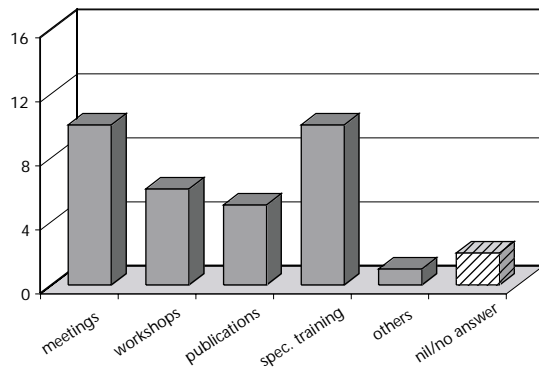
17. Does your staff receive any education and training on how to meet users' requirements?



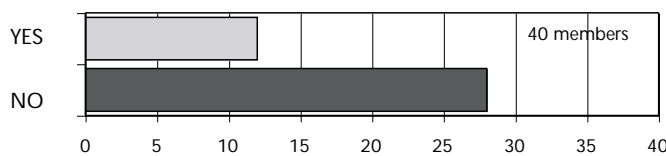
If YES who is responsible in your service?



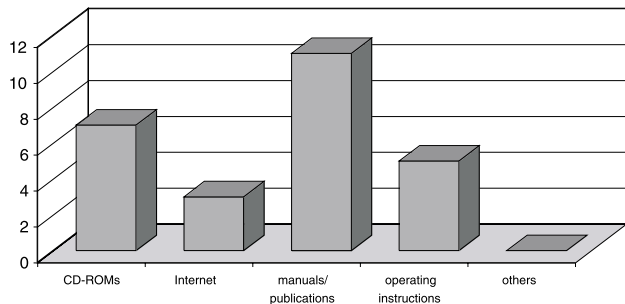
If YES How?



18. Does your Service have any training material that can be used by other NMSs?

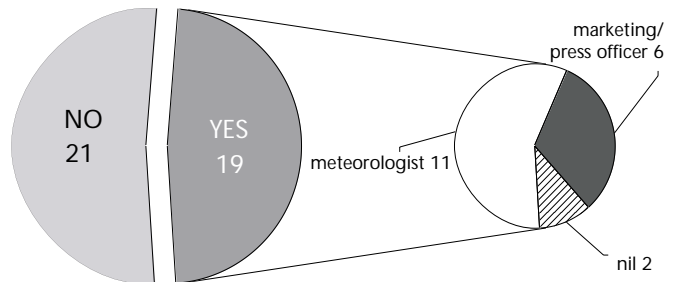


If YES what kind of material?



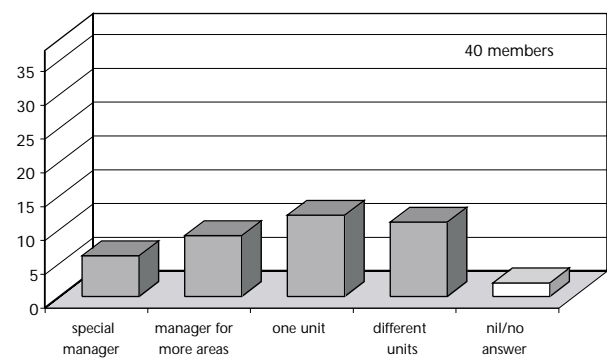
BENEFITS OF PWS

19. Does your Service have a public relation manager (the person who gives interviews, writes articles for the newspapers to strengthen the visibility of the NMS ...)?

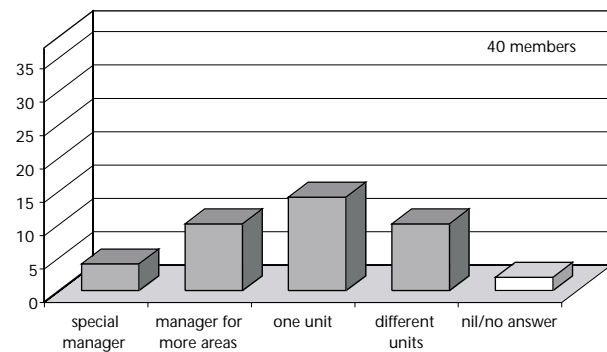


20. Who in your Service is responsible for public relations?

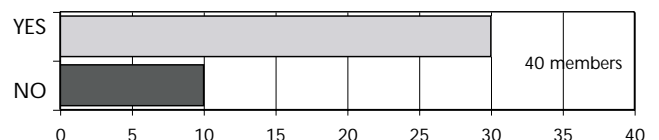
In case of severe weather conditions?



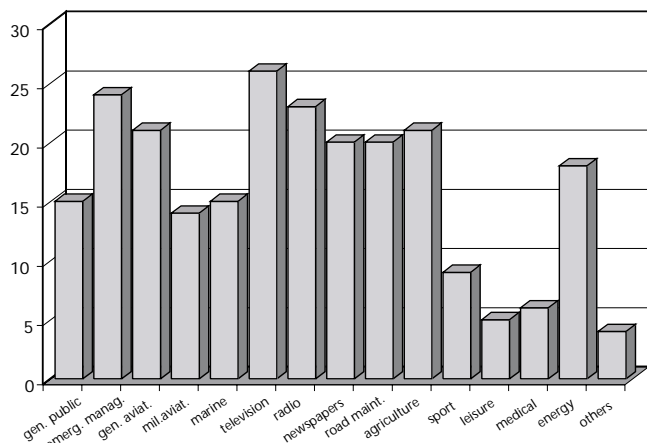
In case of normal weather conditions?



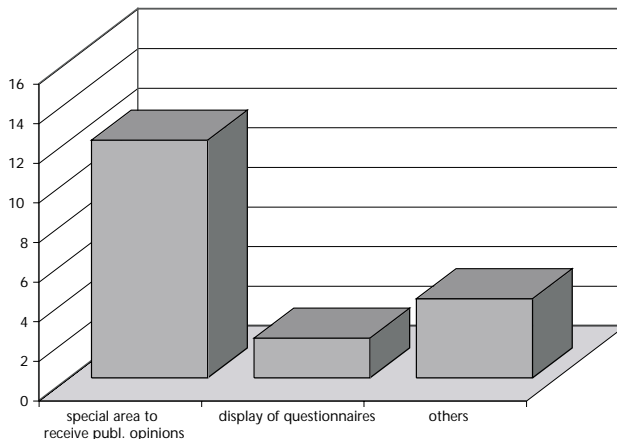
21. Does your Service organize meetings with the user community to improve relations?



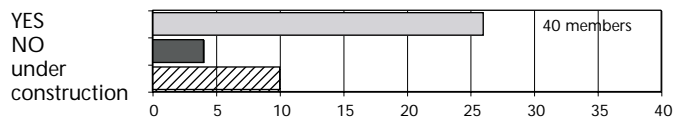
If YES, with whom?



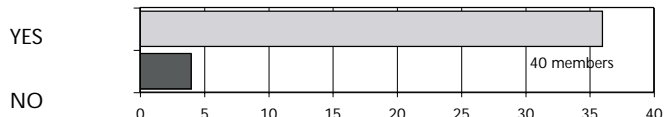
If YES, what is used?



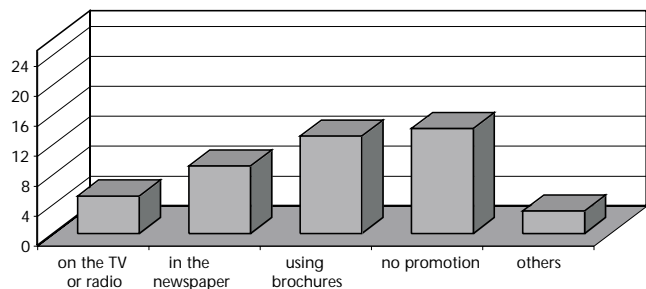
22. Does your Service have a Home Page for internal and external use?



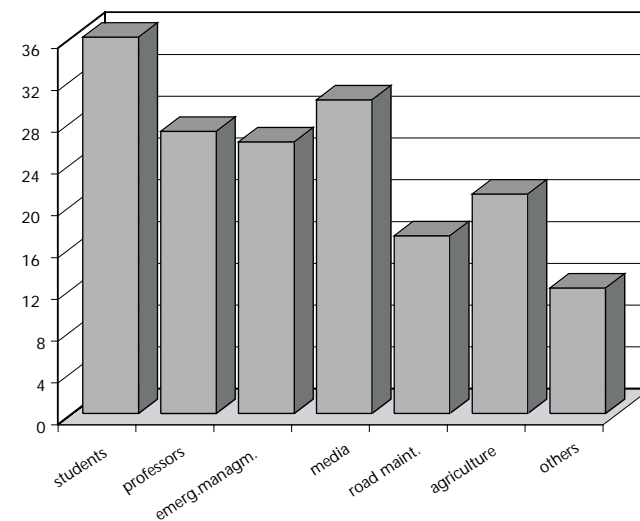
24. Does your Service organize internal visits for user communities?



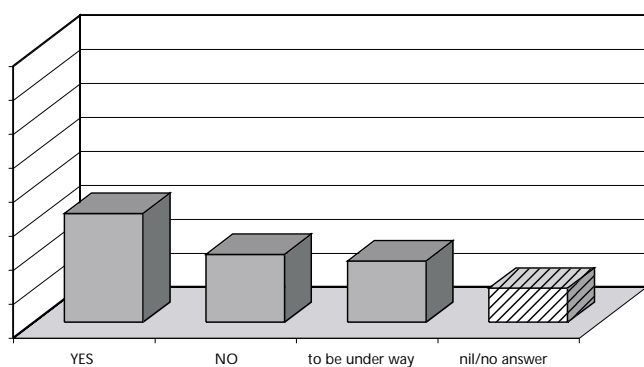
If YES, how does your Service promote its Home Page?



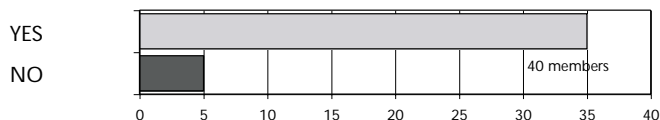
If YES, for which?



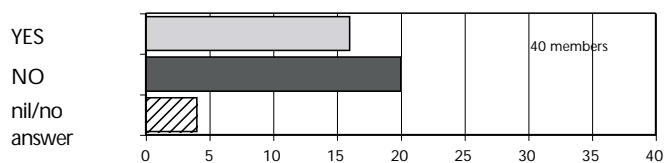
Does your Service have an own unit for Internet service?



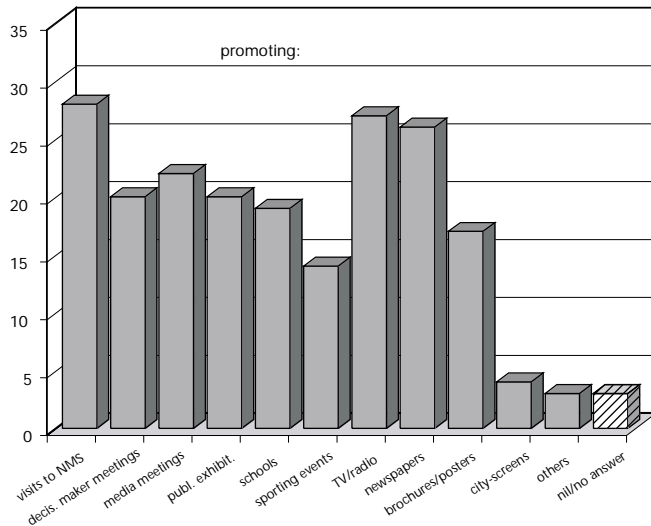
25. Does your NMS carry out activities to strengthen the visibility of the Service?



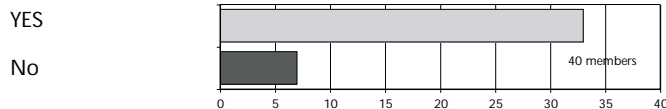
23. Does your Service use the Home Page in order to know about the users' requirements or public suggestions?



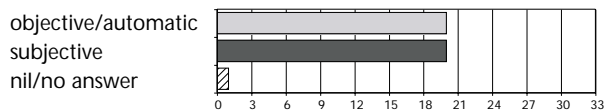
If YES, in what way?



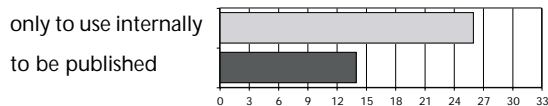
26. Does your Service carry out a systematic verification of forecasts and warnings?



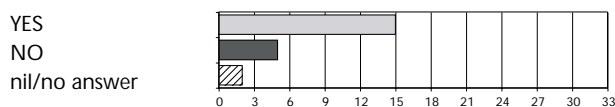
If YES, is the verification



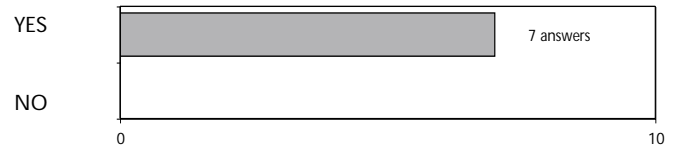
What is the aim?



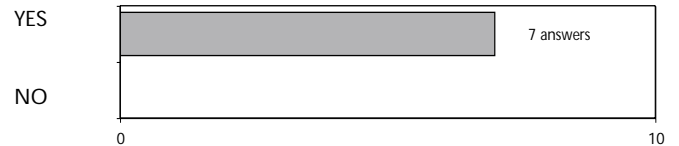
If the forecast verifications are not yet published, is your Service willing to do in the near future?



27. If your Service does not make a systematic verification of forecasts and warnings does it intend to do so in the near future?

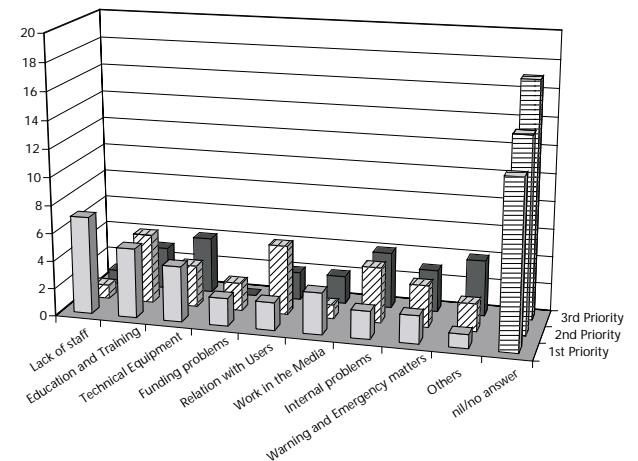


If YES, it it willing to publish it?



PROBLEMS IN PWS

28. What are your three greatest problems with regard to public weather services?



Statistical evaluation listed according to the structure of the questionnaire

PWS PRIORITIES IN YOUR NMS

1. Which are the first 3 priorities of your NMS?

(40 members)

(2 nil/no answer)

preparation and dissemination of weather warnings	37
dissemination and presentation of forecasts	33
focusing on the needs of the user	18
service assessment	0
verification of the forecasts and warnings	3
climate and environmental constancy	4
enhancement of the visibility	2
work with the emergency management	7
cooperation/partnership with the media	5
commercial activities	5
marketing (to develop strategies)	0

radio	
T: 33	
F: 2	
S: 1	
M: 1	
G: 4	
P: 13	
I: 30	
newspapers	
T: 37	
F: 17	
S: 23	
M: 26	
G: 16	
P: 3	
I: 17	

road maintenance	
T: 29	
F: 13	
S: 6	
M: 12	
G: 10	
P: 3	
I: 8	
agriculture	
T: 31	
F: 18	
S: 6	
M: 12	
G: 13	
P: 2	
I: 8	

2. Please indicate if the forecasts of your Service for the different user groups are issued in writing text (T), in figures (F), in symbols (S), in maps (M), in graphics (G), by presenting (P) or by interview (I) (multiple entries are possible for example T, S, G).

(40 members)

general public

T: 39
F: 20
S: 25
M: 29
G: 19
P: 20
I: 24

emergency management

T: 36
F: 15
S: 8
M: 18
G: 13
P: 6
I: 15

general aviation

T: 32
F: 14
S: 18
M: 30
G: 17
P: 10
I: 14

military aviation

T: 15
F: 8
S: 8
M: 16
G: 7
P: 6
I: 6

marine

T: 27
F: 9
S: 9
M: 21
G: 12
P: 5
I: 7

television

T: 33
F: 15
S: 20
M: 24
G: 19
P: 15
I: 18

leisure/recreation

T: 23
F: 6
S: 6
M: 3
G: 5
P: 2
I: 6

energy

T: 29
F: 17
S: 6
M: 7
G: 14
P: 3
I: 4

sport

T: 24
F: 9
S: 4
M: 4
G: 4
P: 3
I: 5

medical community

T: 18
F: 9
S: 1
M: 1
G: 8
P: 2
I: 3

others

T: 12
F: 4
S: 4
M: 3
G: 4
P: 3
I: 0

3. Is your NMS the only national authority to issue the warnings in case of severe weather conditions?

(40 members)

YES	40
NO	0

3.1 If YES, to which services are they sent?

emergency management	40
road maintenance	29

media	36
others	20

3.2 Is there cooperation with neighbouring countries in issuing warnings?

wind warnings for sea areas	17
icing warnings	8
floods	12
avalanches	4
forest fire	8
bad road weather conditions	9
others	2

3.3 Do different countries need to cooperate more when issuing warnings during severe weather conditions?

YES	32
NO	8

4. Which is the national organization responsible to inform the public about the security measures in case of severe weather warnings?

(40 members)

NMS	11
emergency management	29
others additional	2
NMS and emergency management	9

5. If your NMS has a Website, are the severe weather warnings available on this Website?

(40 members)

YES	22
NO	18

5.1 If YES, is your Service also planning to make pre-warnings available on the Website?

YES	14
NO	8

5.2 If NO, is your NMS willing to set up one in the near future?

YES	19
NO	3

6. Is your NMS willing to send your severe weather warnings to a centralized Website in Region VI (Europe) of WMO?

(40 members)

YES	35
NO	5

LIAISON BETWEEN NMSs AND MEDIA

7. What kind of warnings or special information is given by your Service to television (TV), radio (R) and newspapers (N)? (40 members) (2 nil/no answer)

wind	TV: 34	icing	TV: 24
R: 34		R: 26	
N: 26		N: 17	
forest fire	TV: 18	avalanches	TV: 8
R: 17		R: 7	
N: 12		N: 7	
bad road weather conditions	TV: 24	floods	TV: 26
R: 25		R: 24	
N: 15		N: 20	
air quality	TV: 11	others	TV: 10
R: 10		R: 10	
N: 12		N: 5	

8. How does your Service inform the media in cases of severe weather conditions?

(40 members)

through the information unit	YES	31
	NO	5
your Service has a special web-page	YES	11
	NO	25
the media calls and asks from forecasters	YES	32
	NO	4
	Others	4

9. Through which medium is the official warning disseminated in your country?

(40 members)

	YES	NO
Internet	19	21
broadcasting companies	30	10
coastal radio station	26	14
straight to the emergency management	34	6
FTP-server	13	27
by fax	34	6
others (e-mail, phone)	3	

10. In your NMS who is responsible for PWS?

(40 members)

forecasting staff	39
others	1
Additional	9

EDUCATION AND TRAINING		Intranet	6
		Euromet Project	7
11. Does your Service undertake education and training for the staff involved in PWS?		Eumetsat SAF	8
(40 members)		Others	1
YES	28	14. Does the staff prefer traditional methods of training or CAL? Which subject?	
NO	12	(40 members)	
How frequently?		nil/no answer	18
1 to 2 times in a year	18	traditional methods of training	22
2 to 4 times in a year	3	CAL	0
>4 times in a year	5	CAL additionally	4
nil/answer	2		
Internal or external education and training?		15. What are the topics where PWS staff needs more assistance?	
In your NMS		(40 members)	
by own experts	23	forecasting	40
by external experts	14	nowcasting	29
in other institutions	6	short range	17
nil/answer	3	medium range	16
Use of offers from WMO – or comparable institutions like EUMETSAT?		seasonal forecasts	17
YES	21	numerical models	16
NO	6	ensemble prediction systems	19
nil/answer	1	disaster management	15
12. What are the main topics in this training activities?		use of new automatic applications (software)	22
(40 members)		how to promote PWS	17
forecasting		marketing	13
nowcasting	24	users' requirements	20
short range	26	others	0
medium range	24	16. Does your Service provide any education and training programme for the users of PWS?	
seasonal forecasts	4	(40 members)	
boundary layer phenomena	10	YES	20
numerical models	19	NO	19
ensemble prediction systems	15	nil/no answer	1
disaster management	8	If YES	
use of new automatic applications (software)	18	16.1 How? (1 = nil)	
how to promote PWS	6	meetings	15
marketing	8	workshops	10
others	3	publication / brochures	14
nil/no answer	12	special training	9
13. Does your Service provide any training by using Computer Aided Learning (CAL)?		others	4
(40 members)		16.2 To which users? (1 = nil)	
YES	15	general public	8
NO	15	emergency management	15
nil/no answer	10	search and rescue	4
If YES		general aviation	11
13.1 What kind of CAL does your Service provide?		military aviation	7
CD-ROMs	12	marine	7
Internet	3	television	9

radio	5	20. Who in your service is responsible for public relations? (40 members)	
newspapers	3		
road maintenance	10		
agriculture	7	In case of severe weather conditions?	
sport	1	special manager who is responsible only for this area	6
leisure/recreation	1	manager who is responsible also for other areas	9
medical community	2	one unit	12
energy	7	different units	11
others	1	nil/no answer	2
16.3. Which trainers are available? (1 = nil)		In case of normal weather conditions?	
from your own staff	19	special manager who is responsible only for this area	4
from institutions	4	manager who is responsible also for other areas	10
external experts	2	one unit	14
17. Does your staff receive any education and training on how to meet the users' requirements? (40 members)		different units	10
		nil/no answer	2
YES	16	21. Does your Service organize meetings with the user community to improve relations? (40 members)	
NO	24	YES	30
If YES		NO	10
17.1 How? (2 = nil)		If YES, with whom?	
meetings	10	general public	15
workshops	6	emergency management	24
publication / brochures	5	general aviation	21
special training	10	military aviation	14
others	1	marine	15
18. Does your Service have any training material that can be used by other NMSs? (40 members)		television	26
		radio	23
YES	12	newspapers	20
NO	28	road maintenance	20
If YES		agriculture	21
18.1 What kind of material?		sport	9
CD-ROMs	7	leisure/recreation	5
Internet	3	medical community	6
manuals/publications	11	energy	18
operating instructions	5	others	4
others	0	22. Does your Service have a Home Page for internal and external use? (40 members)	
BENEFITS OF PWS		YES	26
19. Does your Service have a public relation manager (the person who gives interviews, writes articles for the news- papers to strengthen the visibility of the NMS ...)? (40 members)		NO	4
		Under construction	10
YES	19	If YES	
NO	21	How does your Service promote its Home Page?	
		on the TV or radio	5
		in the newspaper	9
		using brochures	12

The answers are covered in 9 different categories as follows:

1. **Lack of staff**
 - problems with staffing
 - increasing lack of staff causing more and more problems in maintaining some parts of PWS
 - lack of specialised personnel
 - staff
 - lack of the number of experts in the weather service
 - no persons who are responsible for public relations
 - lack of staff
 - lack of the number of experts in the computer department
2. **Education and Training**
 - education of the forecasters in new developments
 - education and training for the staff in medium range weather forecasting (numerical models)
 - requirements of training of staff occupied with PWS
 - practical training of our specialists in international centres is requested
 - training on new techniques
 - implementation of new forecasting techniques
 - training for the staff involved in PWS
 - lack of suitable training material
 - training
 - need training and education in public relations in cooperation with mass-media
 - education and training of the staff
 - training for the users of PWS
 - better accuracy in medium weather forecasting
 - education and training programme for the users of PWS
3. **Technical equipment (hard- and software)**
 - software for new automatic application
 - outflow of data and information
 - lack of a system of direct communication
 - the material resources
 - insufficient hardware
 - development of fast changing and developing techniques using new technology (information, communication)
 - insufficient software
 - new investments for PWS software and hardware
 - lack of the equipment
 - having no radar it is very difficult to originate short range forecasts of convection phenomena in the warm period
4. **Funding problems**
 - lack of funding
 - limited budget to carry out activities to strengthen the visibility of the service
 - lack of infrastructure
 - lack of resources to develop further markets
 - insufficient governmental financial support
 - no resources for product presentations
5. **Relation with users**
 - presentation of message so as to ensure maximum clarity and understanding
 - preparation of weather forecasts oriented on needs of particular users
- contact with the users
- commercial misinterpretation of data and information
- better communication with the wider public
- awareness of the needs and requirements of the public
- to have feedback from the users and to know the user's needs
- marketing and promoting PWS
- skill of staff to interact with users
6. **Work with the media**
 - to create a system like Trivis in DWD
 - forecast presentation forms of various TVs are very unimaginative
 - no direct contact to TV broadcasters
 - radio stations should present more information about present weather
 - we need training and education in public relations with cooperation at mass-media
 - journalists are more interested in thrilling weather situations
 - media expecting to get everything for free (not prepared to invest proper presentation equipment)
7. **Internal problems**
 - division between commercial and non commercial services
 - reorganization of the service
 - no possibilities of marketing
 - lack of infrastructure
 - lack of resources to develop further markets
 - service effectiveness evaluation conduct
 - non existence of public relation manager
 - coordination of research and operational service
 - level of marketing
8. **Warning and emergency matters**
 - trying to encourage a correct response from users to warnings issued
 - emergency management
 - to get warnings to such media (TV, radio, newspaper), which get their information from other (commercial) weather services
 - occasional conflict between organizations involved in the warning chain
 - arrangement of quick and assured delivery of weather forecasts and warnings to users
 - lack of rules for coordinated warnings (e.g. wind warnings on the Baltic sea)
 - communicating an understanding of the impact of severe weather
 - closer working relationships with the national and local emergency management
9. **Others**
 - increasing competition with private service providers
 - international coordination
 - lack of observations in certain areas
 - relationship with decision makers
 - need for better accuracy in medium weather forecasting
 - need for automatic verification for forecasts
 - cooperation with NMSs to get experience

Comments on evaluation

The questionnaire was developed so as to make it as easy as possible for the respondents in order to avoid response errors. Some respondents gave parallel information typing an “X” and underlining the answer on different items. Some respondents did not complete the whole.

Concerning question 11: “Does your Service undertake education and training for the staff involved in PWS?”, question 13: “Does your Service provide any training by using Computer Aided Learning (CAL)?” and question 14: “Does the staff prefer traditional methods of training or CAL?

Which subject?” some misunderstanding by the respondents was recognized due to the fact that the questions were not clearly formulated. To amend this misunderstanding, these questions have been revised in a GO TO (skip pattern) format. The same situation happened for question 27: “If your Service does not make a systematic verification of the forecasts and warnings does it intend to do so in the near future?” where several answers were not in line with question 26: “Does your Service carry out a systematic verification of forecasts and warnings?”.

Chapter 4

CONCLUSIONS

Questions 1 to 6 — PWS Priorities in your NMS

The first three priorities in the NMSs are: preparation and dissemination of weather warnings, dissemination and presentation of forecasts and focusing on the needs of the users.

Written text is the most used format to issue forecasts to the different user groups. Detailed information is presented in the self explanatory graphics referring to question 2.

All replies reflect that NMSs are mostly the only national authority to issue warnings in case of severe weather conditions. Different countries need to cooperate more in issuing warnings during severe weather situations.

Communicating the information to the public about security measures in cases of severe weather is done in almost all cases by the emergency management.

About 50 per cent of the respondents run a Website where severe weather warnings are available. The remaining NMSs are more or less willing to set up one in the near future.

Nearly 90 per cent of the respondents to the questionnaire will join a centralized Website in Region VI to distribute official NMS severe weather warnings.

Questions 7 to 10 — Liaison between NMs and Media

The top five weather warnings are for wind, icing, floods, road weather conditions and forest fire. In most cases radio is the lead medium.

The most popular mode of liaison between NMSs and the media are via the NMS information unit and calls from the media directly to the NMS.

The most used technical medium for dissemination of official warning is fax. Most of the Services directly inform emergency management and broadcasting companies.

The responsibility for PWS activities in most NMSs rests with the forecasting staff.

Questions 11 to 18 — Education and Training

About 70 per cent of the Services undertake education and training for the staff involved in PWS. This activity happens mostly 1 or 2 times in a year.

The main topics in the existing training activities are short-and medium-range weather forecasting followed by nowcasting and numerical modelling. Seasonal forecasting, marketing of services and PWS-related activities including disaster management are not normally included in the training programmes.

Nearly 40 per cent of Services have started CAL-type training, although traditional methods are still preferred by the staff.

Staff of NMSs needs more assistance in forecasting, nowcasting, new applications, users' requirements and ensemble prediction systems.

Fifty percent of the respondents have established education and training programmes for the users of PWS. The most popular methods are meetings, publications and workshops. Emergency management, general aviation and road maintenance authorities receive the most training.

Only 40 per cent of the NMSs provide education and training to the staff to meet user's requirements.

More than 50 per cent of NMSs do not have any training material which can be used by other Services.

Questions 19 to 27 — Benefits of PWS

About 50 per cent of NMSs have a public relation manager.

In cases of both severe and normal weather conditions there is no dominant responsibility for public relations.

Seventy-five percent of NMSs organize meetings with the user community. The highest impact in improving relations with the user community is through television followed by emergency management and radio.

About 70 per cent of the Services have a Home Page. These Home Pages are not very intensively used for users' requirement or public suggestions.

Many of the Services in Region VI organize internal visits for user communities. Students, media, teachers and emergency management achieve the highest rate of visits.

A high percentage of NMSs carry out activities to strengthen the visibility of the Service. This is made through visits, media, meetings with decision makers and public exhibitions.

Many NMSs carry out systematic verifications of forecasts and warnings. In most of the cases the aim is to use the results internally only. Some of the Services are willing to publish the verification results in the near future.

All of the Services recognize the importance of making a systematic verification of forecasts and warnings.

Question 28 — Problems in PWS

The major problems as regards PWS are lack of staff, relation with users, education and training, and other internal problems such as, reorganization of the services, lack of infrastructure and technical equipment.

Chapter 5

RECOMMENDATIONS

The analysis of the questionnaire has pointed to a number of areas where particular attention is needed in NMSs in RA VI to improve levels of national PWS activities.

These are:

- Insufficient communication with the users in promoting PWS
- insufficient cooperation with the media, in particular television, when developing presentation systems
- requirements of NMSs to improve infrastructure and strategy in promoting PWS
- insufficient attention to education and training in particular in PWS-related activities
- lack of availability of performance assessment results to the user community.

Based on its findings, the Sub-Group strongly recommended that in order to address these deficiencies there is an urgent need to organize specialized training events such as seminars and workshops to cover these topics in sufficient depth.

The subgroup was of the opinion that certain NMSs, especially those of Members with economies in transition need special assistance to achieve a more efficient and developed PWS as part of the overall national development plans.

The subgroup recommended that through the Working Group on Planning and Implementation of WWW in RA VI and ultimately through the Regional Association, WMO and the developed countries in the Region make every effort to provide assistance to those countries that require it in order to achieve the above goal.

Annex 1

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Annex 2

QUESTIONNAIRE ON PUBLIC WEATHER SERVICES

PWS PRIORITIES IN YOUR NMS

1. Which are the first 3 priorities of your NMS?

- preparation and dissemination of weather warnings ..
- dissemination and presentation of forecasts
- focusing on the needs of the user
- service assessment
- verification of the forecasts and warnings
- climate and environmental constancy
- enhancement of the visibility
- work with the emergency management
- cooperation / partnership with the media
- commercial activities
- marketing (to develop strategies)

2. Please indicate if the forecasts of your Service for the different user groups are issued in writing text (T), in figures (F), in symbols (S), in maps (M), in graphics (G), by presenting (P) or by interview (I) (multiple entries are possible for example T, S, G).

	T	F	S	M	G	P	I
general public	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
emergency management ..	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
general aviation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
military aviation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
marine	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
television	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
radio	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
newspapers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
road maintenance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
agriculture	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
sport	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
leisure/recreation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
medical community ...	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
energy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
others	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3. Is your NMS the only national authority to issue the warnings in case of severe weather conditions?

- YES
 NO

3.1 If YES, to which services are they sent?

- emergency management
- road maintenance
- media
- others, which

3.2 If NO, which are the other organizations responsible to issue warnings in case of severe weather conditions? which organizations:

- #### 3.3 Is there cooperation with neighbouring countries in issuing warnings? If YES, in which situations (land, sea)
- wind warnings for sea areas
 - please write the name of the area:
 - icing warnings
 - floods
 - avalanches
 - forest fires
 - bad road weather conditions
 - others

3.4 Do different countries need to cooperate more when issuing warnings during severe weather conditions?

- YES
 NO

If YES when:

4. Which is the national organization responsible to inform the public about the security measures in case of severe weather warnings?

- NMS
- emergency management
- others, which

5. If your NMS has a Website, are the severe weather warnings available on this Website?

- YES
 NO

5.1 If YES, is your Service also planning to make pre-warnings available on the Website?

- YES
 NO

5.2 If NO, is your NMS willing to set up one in the near future?

- YES
 NO

6. Is your NMS willing to send your severe weather warnings to a centralized Website in Region VI (Europe) of WMO?

- YES
 NO

LIAISON BETWEEN NMSs AND MEDIA

7. What kind of warnings or special information is given by your Service to television (TV), radio (R), newspapers (N)?

	TV	R	N
wind	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
icing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
forest fire	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
avalanches	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
bad road weather conditions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
floods	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
air quality	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
others	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

8. How does your Service inform the media in cases of severe weather conditions?

through the information unit	YES	NO
your Service has a special web-page	YES	NO
the media calls and asks from forecasters	YES	NO
others, which		

9. Through which medium is the official warning disseminated in your country?

internet	YES	NO
broadcasting companies	YES	NO
coastal radio stations	YES	NO
straight to the emergency management	YES	NO
FTP-server	YES	NO
by FAX (straight to user)	YES	NO
others, which		

10. In your NMS who is responsible for PWS?

forecasting staff	<input type="checkbox"/>
others, which	<input type="checkbox"/>

EDUCATION AND TRAINING

11. Does your Service undertake education and training activities for the staff?

YES	<input type="checkbox"/>
NO	<input type="checkbox"/>
(if NO go to question no. 16)	

If YES

11.1 What are the main topics?

forecasting	<input type="checkbox"/>
nowcasting	<input type="checkbox"/>
short range	<input type="checkbox"/>
medium range	<input type="checkbox"/>
seasonal forecasts	<input type="checkbox"/>

boundary layer phenomena	<input type="checkbox"/>
numerical models	<input type="checkbox"/>
ensemble prediction systems	<input type="checkbox"/>
disaster management	<input type="checkbox"/>
use of new automatic applications (software)	<input type="checkbox"/>
how to promote PWS	<input type="checkbox"/>
marketing	<input type="checkbox"/>
others, which	<input type="checkbox"/>

12. Does your Service provide any training by using Computer Aided Learning (CAL)?

YES	<input type="checkbox"/>
NO	<input type="checkbox"/>
(if NO go to question no. 14)	

If YES

12.1 What kind of CAL does your Service provide?

CD-ROMs	<input type="checkbox"/>
Internet	<input type="checkbox"/>
Intranet	<input type="checkbox"/>
Euromet Project	<input type="checkbox"/>
Eumetsat SAF	<input type="checkbox"/>
others, which	<input type="checkbox"/>

13. Does the staff prefer traditional methods of training or CAL? Which subject?

traditional methods of training	<input type="checkbox"/>
CAL	<input type="checkbox"/>
which subject	<input type="checkbox"/>

14. Does your Service undertake education and training for the staff involved in PWS?

YES	<input type="checkbox"/>
NO	<input type="checkbox"/>
(If NO go to question no. 16)	

If YES

14.1 How frequently?

1 to 2 times in a year	<input type="checkbox"/>
2 to 4 times in a year	<input type="checkbox"/>
> 4 times in a year	<input type="checkbox"/>

14.2 Internal or external education and training?

in your NMS	<input type="checkbox"/>
by own experts	<input type="checkbox"/>
by external experts	<input type="checkbox"/>
in other institutions, which?	<input type="checkbox"/>

use of offers from WMO – or comparable institutions like EUMETSAT?

NO	<input type="checkbox"/>
YES, which?	<input type="checkbox"/>

15. What are the topics where PWS staff needs more assistance?

- forecasting
- nowcasting
- short range
- medium range
- seasonal forecasts
- numerical models
- ensemble prediction systems
- disaster management
- use of new automatic applications (software)
- how to promote PWS
- marketing
- users' requirements
- others, which

16. Does your Service provide any education and training programme for the users of PWS?

- YES
- NO
- (if NO go to question no. 17)

If YES

16.1 How?

- meetings
- workshops
- publication / brochures
- special training
- others, which

16.2 To which users?

- general public
- emergency management
- search and rescue
- general aviation
- military aviation
- marine
- television
- radio
- newspapers
- road maintenance
- agriculture
- sport
- leisure/recreation
- medical community
- energy
- others

16.3 Which trainers are available?

- from your own staff
- from institutions
- external experts

17. Does your staff receive any education and training on how to meet the users' requirements?

- YES
- NO
- (if NO go to question no. 18)

If YES, who is responsible in your service?

17.1 How?

- meetings
- workshops
- publication/brochures
- special training
- others, which

18. Does your Service have any training material that can be used by other NMSSs?

- YES
- NO
- (if NO go to question no. 19)

If YES

18.1 What kind of material?

- CD-ROMs
- Internet
- manuals / publications
- operating instructions
- others, which

BENEFITS OF PWS**19. Does your Service have a public relation manager (the person who gives interviews, writes articles for the newspapers to strengthen the visibility of the NMS ...)?**

- YES
- NO
- If Yes, what is her/his profession? :

20. Who is in your service responsible for public relations?

In case of severe weather conditions?

- special manager who is responsible only for this area ..
- manager who is responsible also for other areas
- one unit
- different units

In case of normal weather conditions?

- special manager who is responsible only for this area ..
- manager who is responsible also for other areas
- one unit
- different units

21. Does your Service organize meetings with the user community to improve relations?

- YES
- NO

If YES, with whom?

- general public
- emergency management
- general aviation
- military aviation
- marine
- television
- radio
- newspapers
- road maintenance
- agriculture
- sport
- leisure/recreation
- energy
- others

22. Does your Service have a Home Page for internal and external use?

- YES
- NO
- under construction

If YES

22.1 How does your Service promote its Home Page?

- on the TV or radio
- in the newspaper
- using brochures
- others, which
- no promotion

22.2 Does your Service have a own unit for internet service?

- YES
- NO
- to be under way

23. Does your Service use this Home Page in order to know about the users' requirements or public suggestions?

- YES
- NO

If YES, what is used?

- a special area to receive the public opinion
- the display of questionnaires
- others, which

24. Does your Service organize internal visits for user communities?

- YES
- NO

If YES, for which?

- students
- professors
- emergency management
- media
- special users:
- road maintenance
- agriculture
- others

25. Does your NMS carry out activities to strengthen the visibility of the Service?

- YES
- NO

If YES, in what way?

- promoting visits to the NMS
- promoting meetings with decision makers
- promoting meetings with the media
- promoting public exhibitions
- promoting weather services in:
- schools
- sporting events
- TV and radio
- newspapers
- brochures/posters
- others, which

26. Does your Service carry out a systematic verification of forecasts and warnings?

- YES
 - NO
- (if NO go to question no. 27)

If YES

Is the verification:

- subjective
- objective / automatic

What is the aim?

- only to use it internally
- to be published

If the forecast verifications are not yet published, is your Service willing to do it in the near future?

- YES
- NO

27. If your Service does not make a systematic verification of forecasts and warnings does it intend to do so in the near future?

- YES
- NO

If YES, is it willing to publish it?

- YES
- NO

PROBLEMS IN PWS

28. What are your three greatest problems with regard to public weather services?

- 1
- 2.
- 3.