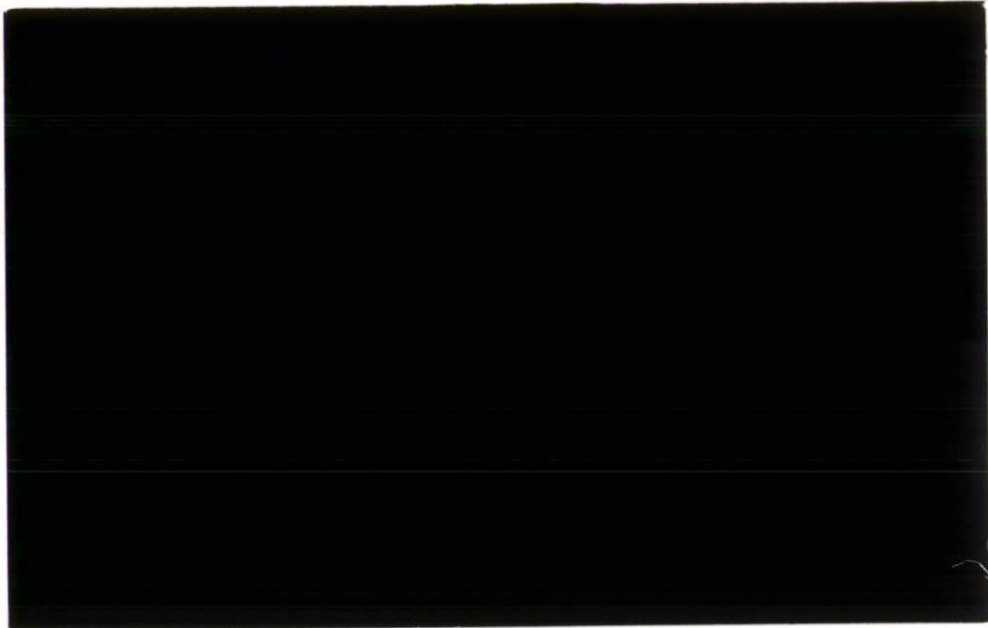




**Institute of
Hydrology**



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SURVEY OF HYDROMETRIC DATA PROVISION IN EUROPE

**A report for the
National Rivers Authority, UK**

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PREFACE

The Institute of Hydrology (IH) was commissioned by the National Rivers Authority (NRA), UK to carry out a small-scale survey of the organisation of hydrometric services in Europe. The survey, which was undertaken as part of the Technical Services Agreement between IH and the NRA, is a contribution to the on-going efficiency review of hydrometry within England and Wales. The results of the survey will be used by the NRA to develop an understanding of the range and potential effectiveness of different organisational arrangements in Europe. It is also hoped that the survey will provide the NRA with a basis for improving their links with other operational agencies internationally.

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EXECUTIVE SUMMARY

With the National Rivers Authority (NRA), UK currently considering the use of sub-contractors to provide hydrometric services in England and Wales, a review of the organisation of hydrometric services in Europe was required. The Institute of Hydrology was commissioned to carry out the work using contacts it has made internationally with collaborative ventures such as The Flow Regimes from International Experimental and Network Data (FRIEND) project.

It was decided to conduct the review by means of a questionnaire, with particular attention paid to experiences gained in sub-contracting data measurement and/or site maintenance for rainfall measurement, current metering, river gauging and groundwater measurement.

A total of 89 organisations from 16 countries were identified as being responsible for hydrometry, forty six (52%) of which gave "positive" returns within the required time-scale.

The results of the survey reflect that the provision of hydrometric services in Europe is predominantly the responsibility of government or state authorities both for data measurement and site maintenance. Data measurement by sub-contractors is seemingly only carried out in three countries, Belgium, Denmark and Germany, where there is general satisfaction with the service provided, although with some reservations regarding supervision and data quality. Site maintenance was sub-contracted by nine organisations in six countries (Belgium, Denmark, Germany, The Netherlands, Spain and Sweden). Most were satisfied with the service with some commenting that the management and supervision of the sub-contractors was demanding.

The results of the survey are summarised in Tables 3.2, 3.3 and 3.4.

1. INTRODUCTION

As part of an on-going efficiency review of hydrometry within England and Wales, the National Rivers Authority (NRA), UK, commissioned the Institute of Hydrology (IH) to carry out a small-scale survey of the organisation of hydrometric services in Europe.

The aim of the survey was to determine the role of the organisations responsible for hydrometric data collection and processing in Europe. Where private sector companies are employed to supply data to, or provide site maintenance on behalf of, government bodies, the NRA was keen to learn of the experiences gained within such relationships. Compliance with national or international hydrometric standards was another area of interest. The survey was concerned with the following four aspects of hydrometry:

- Daily and sub daily rainfall monitoring
- Current meter gauging
- River gauging at permanent or temporary sites
- Groundwater monitoring

The survey was conducted by issuing a questionnaire to organisations identified as being principally responsible for hydrometry in Europe. The selection procedure was based upon the links the Institute of Hydrology has established in Europe with such initiatives as the Flow Regimes from International Experimental and Network Data (FRIEND) project (Gustard, 1993), together with information from the latest version of the INFOHYDRO manual (WMO, 1994) which contains summary information on hydrometeorological services world-wide.

The geographical extent of the survey was the 11 member states of the European Union (UK excepted) plus Austria, Switzerland and the Nordic countries of Finland, Norway and Sweden. A total of 89 organisations were canvassed, 46 (52%) of which responded positively within the required timescale. The remainder of this document presents the structure and scope of the survey, the results, analysis and some conclusions.

It should be noted that the interpretation and conclusions are based solely on the responses given by those organisations who returned their questionnaires.

2. SURVEY STRUCTURE

2.1 Scope of the survey

The scope of the survey was defined in an "Enquiry Specification" presented to IH by the NRA. The specification had four distinct requirements:

- i) the survey should identify the organisations responsible for hydrometric data capture and processing in Europe and indicate whether these organisations are government bodies or private sector companies;
- ii) where private sector companies are employed to supply data to, or provide site maintenance on behalf of, government bodies, the survey should indicate the experience of using these types of contract;
- iii) the survey should address the nature and extent of the specific standards to which organisations providing hydrometric data operate. Where possible the potential for being able to obtain access to any standards documents should be determined; and
- iv) organisations should be identified which have responsibility for:
 - Daily and sub daily rainfall monitoring
 - Current meter gauging
 - River gauging at permanent or temporary sites
 - Groundwater monitoring

2.2 Geographical extent of the survey

The geographical extent of the survey, as shown in Fig. 2.1, was as follows:

- Eleven EU member states (Belgium, Denmark, France, Germany, Greece, Ireland, Italy, Luxembourg, The Netherlands, Portugal, Spain)
- Nordic countries (Finland, Norway, Sweden)
- Austria, Switzerland.



Figure 2.1 Geographical extent of the survey

2.3 Method of survey

The survey was conducted by sending a questionnaire to organisations considered to be principally responsible for the provision of hydrometric data in the countries listed.

In its role of coordinator for the European FRIEND project, the Institute of Hydrology has built up a considerable number of contacts with hydrometeorological agencies in Europe and these were used as the basis of the survey. The latest version of WMO's INFOHYDRO Manual was also found to be a useful source of information where IH's contacts were few.

In total, 89 organisations were contacted. The number contacted in each country is given in Table 2.1. The high number of organisations contacted in France and Germany reflects the structure of hydrometric services in those countries. In France, each of the "Agences de Bassins" were surveyed as well as each regional section of the Ministry of the Environment (DIREN). In Germany, where a Federal system exists, every state authority was contacted.

Table 2.1 **Number of organisations contacted**

Country	No. surveyed	Country	No. Surveyed
Austria	2	Luxembourg	1
Belgium	5	The Netherlands	4
Denmark	5	Norway	4
Finland	2	Portugal	2
France	27	Ireland	3
Germany	20	Spain	3
Greece	4	Sweden	2
Italy	3	Switzerland	2

The questionnaire, a sample of which is given in Appendix A, was designed to address each of the issues outlined in section 2.1. In order to encourage a wide response, the questionnaire and covering letter were translated into French, German, Spanish and Italian.

3. RESULTS OF THE SURVEY

3.1 Summary

Of the 89 organisations contacted, 55 completed and returned the questionnaire. This number includes 9 "nil" returns from organisations which stated they were not responsible for the collection and processing of hydrometric data. The number of "positive" returns therefore represents 52% of the organisations canvassed. The number of returns from each country is given in Table 3.1 with results summarised in Table 3.2.

The addresses of the organisations which replied are given in Appendix B. These should be used in conjunction with Table 3.2 where the organisation numbers correspond to the organisation numbers in Appendix B.

Table 3.1 Number of returns

Country	No. Returns (Surveyed)	Country	No. Returns (Surveyed)
Austria	1 (2)	Luxembourg	0 (1)
Belgium	4 (5)	The Netherlands	3 (4)
Denmark	5 (5)	Norway	1 (4)
Finland	1 (2)	Portugal	0 (2)
France	13 (27)	Ireland	2 (3)
Germany	15 (20)	Spain	3 (3)
Greece	2 (4)	Sweden	2 (2)
Italy	2 (3)	Switzerland	1 (2)

3.2 Analysis

The analysis of the results refers only to the 46 organisations which supplied a "positive" return.

i) Organisation type

From Table 3.2 it is clear that the provision of hydrometric services in Europe is predominantly the responsibility of government or state authorities: 37 (81%) of the organisations identified themselves as such compared with 7 (15%) research institutes or universities and 2 (4%) private companies.

ii) Responsibility by data-type

The extent of responsibility varies considerably across Europe. Seven organisations were

responsible for all four data-types: rainfall monitoring, current metering, river gauging and groundwater monitoring. Twelve organisations were concerned with current metering, river gauging and groundwater monitoring, nine were concerned with rainfall monitoring, current metering and river gauging, one with rainfall monitoring, river gauging and groundwater monitoring. Eight dealt with current metering and river gauging and two with rainfall monitoring and current metering. One organisation was responsible for rainfall monitoring only, four were responsible for groundwater monitoring only and two responsible for river gauging only.

The above can be presented in the form of a Venn Diagram as shown in Fig 3.1.

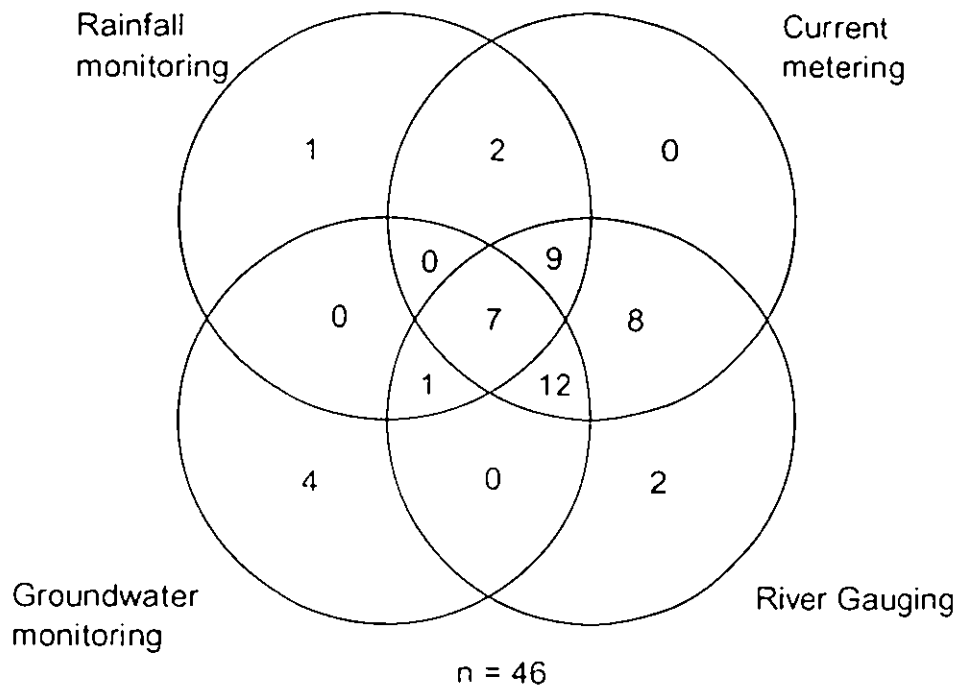


Figure 3.1 Distribution of data type.

iii) Data supplied by private companies

Survey responses indicate that hydrometric measurement is sub-contracted in three countries only, namely Belgium, Denmark and Germany. It is possible however that sub-contractors are employed to conduct hydrometric services in other countries but this was not borne out in the questionnaires returned. A summary of the responses giving this information is given in Table 3.3.

The Ministry of the Flemish Region in Belgium have, since 1984, employed the State University of Ghent to manage its hydrometric network of 70 gauging stations. Prior to 1984, other sub-contractors had been responsible for the network but they neglected to carry out their duties adequately which resulted in a general lack of confidence in the data returned.

The monitoring of navigable rivers in Flanders remains the responsibility of the Flemish Ministry of Public Works. This information was supplied by the sub-contractors, the Hydraulics Department at the University of Ghent, and therefore an indication of the current level of satisfaction was inappropriate.

In Denmark, the Danish Land Development Service (DLDS), which described itself as a private company, has experience of operating and monitoring gauging stations for government and regional authorities for the last 80 years. Although the Ministry of Environment's National Environmental Research Institute (NERI) has been responsible for hydrometric data collection and processing in Denmark since January 1994, the DLDS still runs and maintains 12 stations for the government and a further 300-350 stations for 10 regional authorities. NERI described the service it receives as satisfactory.

Five German authorities have experience in employing sub-contractors for hydrometric data measurement.

The State Environment Authority (Landesumweltamt) of Brandenburg (Berlin) sub-contracts both its river gauging and groundwater monitoring operations. In both cases the contracts were described as being "open-ended" in duration. The effectiveness of the contracts were deemed to be satisfactory, with the comment that, although the contracts provided benefits in terms of reducing staff administration costs, considerable effort was required to monitor the activities of the sub-contractor.

The Ministry for Water and the Environment in Schleswig-Holstein (Kiel) also sub-contracts its river gauging and groundwater monitoring operation. Both contracts were described as on-going and open-ended with the current river gauging contract having been in operation for 15 years and the ground water monitoring one for 10 years. Their experience with the contracts has been satisfactory despite the drawback that data quality was dependent on the reliability of the contractor and that quality control checks are always necessary on data received.

The Ministry for the Environment in Niedersachsen (Hannover) has used sub-contractors for river gauging and groundwater monitoring for over 5 years and stated the service was very satisfactory.

The State Environment Authority in Nordrhein-Westfalen (Essen) has approximately 10 years' experience of sub-contracting groundwater measurement. In both cases the service has been satisfactory. The authority commented that ensuring the quality of data was difficult and that reliable sub-contractors were increasingly difficult to find.

The Ministry of Water and the Environment in Sachsen-Anhalt (Magdeburg) has contracts of over five years duration for river gauging and groundwater monitoring, receiving a satisfactory service in both cases.

iv) Maintenance sub-contracts

Maintenance sub-contracts were let by nine organisations and their responses are summarised in Table 3.4.

In Belgium, the Ministry of Transport and Public Works for the Walloon region stated that it is very satisfied with the maintenance of its rainfall monitoring and river gauging sites by their sub-contractor.

Both the Danish National Environmental Research Institute and the Geological Survey of Denmark sub-contract site maintenance with satisfactory results.

The State Environment Authority of Nordrhein-Westfalen in Germany, uses sub-contractors for maintenance at its rainfall, river gauging and groundwater monitoring sites. As with the experiences it has gained with sub-contracting data acquisition, it mentions that it has had difficulty in finding reliable sub-contractors and that costs are very high.

In the Sachsen-Anhalt region of Germany, the Ministry for Water and the Environment has contracts for site maintenance at river gauging and groundwater sites, receiving a satisfactory service.

In the Netherlands, the National Institute for Coastal and Water Management and the Institute for Inland Water Management and Waste Water Treatment, both of whom form part of the Ministry of Transport, Public Works and Water Management, use sub-contractors to maintain current metering and river gauging sites. The former receives a satisfactory service, the latter a very satisfactory service but comments that such contracts are expensive and close control is necessary.

In Spain, the "Instituto Tecnológico Geominero" has a satisfactory service from sub-contractors who maintain their groundwater monitoring sites.

The Swedish Meteorological and Hydrological Institute receives a satisfactory service for a few river gauging sites.

v) Compliance with operating standards

In 1956 the International Organization for Standardization (ISO) set up a technical committee on streamflow measurement. This committee, known as TC113, produced a number of international standards on streamflow which are now used worldwide.

All countries, with the exception of Austria, who gave positive replies to the survey stated that national or international standards are adhered to. The most usual international standard referred to is ISO-748, "Liquid flow measurement in open channels - velocity area methods". This standard covers methods of employing current meters and floats to measure velocities, dealing only with single measurements of the discharge. Organisations in Denmark, France and Sweden use this standard, Sweden using a modified version. The other international standard referred to, and used in France, is ISO-1100, "Liquid flow measurement in open channels". This is in two parts, namely "Establishment and operation of a gauging station" and "Determination of the stage-discharge relation". Organisations in Finland and the Netherlands refer to ISO-TC 113 and it can reasonably be assumed that they refer to the above mentioned standards.

National standards are used in Denmark, Finland, France, Germany, Netherlands, Spain and Switzerland.

World Meteorological Organisation standards for rainfall monitoring are mentioned by organisations in Belgium, Greece, Italy, Norway and Spain.

Table 3.2 Results of the survey

Country	Organisation Name	Type	Hydrometric service	Operational Standards	Sub-contracts measuring	Sub-contracts maintenance
AUSTRIA	1. Hydrographisches Zentralbüro	G/S	RF CM RG GW	-	No	No
BELGIUM	1. Service d'Etudes Hydrologiques	G/S	RF CM RG	-	No	Yes
	2. Institut Royal Météorologique	G/S	RF	WMO 168	No	No
	3. Institute for Land and Water Management	RI	None			
	4. Hydraulics Laboratory University of Ghent	UNI	CM RG		(sub-contractor)	
DENMARK	1. Danish Land Development Service	PC	CM RG GW	ISO-748 1979	(sub-contractor)	
	2. Danish Meteorological Institute	G/S	RF CM	-	No	No
	3. Rambøll, Hannemann & Hojlund	PC	CM RG GW	National standards	(sub-contractor)	
	4. National Environmental Research Institute	RI	CM RG	ISO-748 1979	Yes	Yes
	5. Geological Survey of Denmark	RI	GW	National standards	Yes	Yes
FINLAND	1. National Board of Waters & Environment	RI	RF CM RG GW	ISO/TC 113	No	No

Key - Organisation

G/S Government or State
 RI Research Institute
 UNI University
 PC Private company

Type of service
 RF Rainfall monitoring
 CM Current metering
 RG River gauging
 GW Groundwater monitoring

Country	Organisation Name	Type	Hydrometric service	Operational Standards	Sub-contracts measuring	Sub-contracts maintenance
FRANCE	1. Direction Régionale de l'Environnement (DIREN) Poitou - Charentes	G/S	CM RG	-	No	No
	2. DIREN - Basse Normandie	G/S	RF CM RG	-	No	No
	3. DIREN - Pays de la Loire	G/S	RF CM RG	Yes (no details)	No	No
	4. DIREN - Champagne - Ardennes	G/S	RF CM RG	-	No	No
	5. DIREN - Bretagne	G/S	RF CM RG	National standards	No	No
	6. DIREN - Centre	G/S	RF CM RG	ISO-740, ISO-1100	No	No
	7. DIREN - Lorraine	G/S	CM RG	-	No	No
	8. DIREN - Auvergne	G/S	RG	-	No	No
	9. DIREN - Nord Pas de Calais	G/S	RF CM RG	National standards	No	No
	10. DIREN - Aquitaine	G/S	RG	National standards	No	No
	11. DIREN - Midi-Pyrénées	G/S	CM RG	-	No	No
	12. DIREN - Alsace	G/S	RF CM RG	-	No	No
	13. Bureau de Recherches Géologiques et Minières	G/S	None	-	-	-
GERMANY	1. Landesumweltamt Brandenburg	G/S	CM RG GW	National standards	Yes	No
	2. Ministerium für Natur und Umwelt Schleswig - Holstein	G/S	CM RG GW	ISSN 0340-5184	Yes	No
Key - Organisation	G/S Government or State	Type of service	RF Rainfall monitoring			
	RI Research Institute		CM Current metering			
	UNI University		RG River gauging			
	PC Private company		GW Groundwater monitoring			

Country	Organisation Name	Type	Hydrometric service	Operational Standards	Sub-contracts measuring	Sub-contracts maintenance
GERMANY	3. Bundesanstalt für Gewässerkunde	RI	CM RG GW	-	No	No
	4. Senatsverwaltung für Stadtentwicklung und Umweltschutz	G/S	CM RG GW	National standards	No	No
	5. Niedersächsisches Umweltministerium	G/S	CM RG GW	-	Yes	No
	6. Umweltministerium Mecklenburg-Vorpommern	G/S	CM RG GW	National standards	No	No
	7. Thüringer Ministerium für Umwelt und Landesplanung	G/S	RF CM RG GW	National standards	No	No
	8. Landesanstalt für Umweltschutz Baden-Württemberg	G/S	CM RG GW	National standards		
	9. Landesumweltamt Nordrhein-Westfalen	G/S	RF CM RG GW	ISBN-3-490-00597-X DIN 4049	Yes	Yes
	10. Bundesanstalt für Wasserbau	RI	None			
	11. Albert-Ludwigs Universität	UNI	None			
	12. Ministerium für Umwelt	G/S	None			

Key - Organisation

G/S Government or State

RI Research Institute

UNI University

PC Private company

- Type of service

RF Rainfall monitoring

CM Current metering

RG River gauging

GW Groundwater monitoring

Country	Organisation Name	Type	Hydrometric service	Operational Standards	Sub-contracts measuring	Sub-contracts maintenance	
GERMANY	13. Landesamt für Wasserwirtschaft Rheinland-Pfalz	G/S	RF CM RG GW	National standards	No	No	
	14. Ministerium für Umwelt und Naturschutz Sachsen-Anhalt	G/S	CM RG GW	-	Yes	Yes	
	15. Amt für Umweltschutz	G/S	None				
GREECE	1. Ministry of Agriculture	G/S	RF CM RG GW	WMO	No	No	
	2. Ministry of Industry, Energy and Technology	G/S	None				
ITALY	1. Servizio Idrografico e Mariografico Italiano	G/S	RF CM RG GW	WMO	No	No	
	2. Istituto di Ricerca Sulle Acque	RI	None				
LUXEMBOURG	No response						
NETHERLANDS	1. TNO Institute of Applied Geoscience	RI	GW	-	No	No	
	2. Rijkswaterstaat, Tidal Waters Division	G/S	CM RG	National standards	No	Yes	
	3. Directorate General for Public Works and Water Management	G/S	CM RG	ISO-TC113	No	Yes	
Key - Organisation		Type of service		RF Rainfall monitoring			
G/S	Government or State	RI	Research Institute	CM	Current metering	RG	River gauging
UNI	University	PC	Private company	GW	Groundwater monitoring		

Country	Organisation Name	Type	Hydrometric service	Operational Standards	Sub-contracts measuring	Sub-contracts maintenance
NORWAY	1. NVE Norwegian Water Resources and Energy Administration	G/S	CM RG GW	WMO	No	No
PORTUGAL	No response					
REPUBLIC OF IRELAND	1. Office of Public Works	G/S	CM RG	BS and ISO	No	No
	2. Geological Survey of Ireland	G/S	GW		No	No
SPAIN	1. Instituto Nacional de Meteorologia	G/S	RF CM	National standards	No	No
	2. Dirección General de Obras Hidráulicas	G/S	RF RG GW	WMO	No	No
	3. Instituto Tecnológico Geominero de España (ITGE)	RI	GW	National standards	No	Yes
SWEDEN	1. Swedish Meteorological and Hydrological Institute	G/S	RF CM RG	ISO-748 (modified)	No	Yes
	2. Geological Survey of Sweden	G/S	None		No	No
SWITZERLAND	1. Service Hydrologique et Geologique	G/S	CM RG GW	National standards	No	No

Key - Organisation	G/S	Government or State	RI	Research Institute	UNI	University	PC	Private company	Type of service	RF	Rainfall monitoring	CM	Current metering	RG	River gauging	GW	Groundwater monitoring

Table 3.3 Measurement sub-contracts

Country	Organisation Name	Service sub-contracted	Average length of contract	Number of sites	Effectiveness	Comments
BELGIUM	4. Hydraulic Laboratory, State University of Ghent	CM RG	10 years	70		Sub-contractor to Ministry of Flemish Region
DENMARK	1. Danish Land Development Service	CM RG GW	variable	300-350		Sub-contractor
	3. Rambøll, Hannemann & Hojlund	CM RG GW				Sub-contractor
	4. National Environmental Research Institute	CM RG	1 Year	Approx 14	Satisfactory	Geographical convenience
GERMANY	1. Landesumweltamt Brandenburg	RG GW	Open ended	RG 300 GW 970	Satisfactory Satisfactory	Contracts can relieve administration but require careful control of contractors
	2. Ministerium für Natur und Umwelt Schleswig-Holstein	RG GW	Open ended	RG 10 GW 400	Satisfactory Satisfactory	Reservation that reliability and quality need to be controlled
	5. Niedersächsisches Umweltministerium	RG GW	> 5 years	RG 500 GW 150	Very satisfactory	

Key - Organisation G/S Government or State
 RI Research Institute
 UNI University
 PC Private company

- Type of service RF Rainfall monitoring
 CM Current metering
 RG River gauging
 GW Groundwater monitoring

Country	Organisation Name	Service sub-contracted	Average length of contract	Number of sites	Effectiveness	Comments
GERMANY	9. Landesumweltamt Nordrhein-Westfalen	RF GW	Open ended	RF > 100 GW > 100	Satisfactory Satisfactory	Difficulty with quality control and finding contractors
	14. Ministerium für Umwelt und Naturschutz Sachsen-Anhalt	RG GW	> 5 years > 5 years	RG 156 GW 783	Satisfactory Satisfactory	

Key - Organisation G/S	Government or State	Type of service	RF Rainfall monitoring
RI	Research Institute	CM	Current metering
UNI	University	RG	River gauging
PC	Private company	GW	Groundwater monitoring

Table 3.4 Maintenance sub-contractors

Country	Organisation Name	Service contracted	Effectiveness	Comments
BELGIUM	1. Service d'Etudes Hydrologiques	RF	Very satisfactory	
DENMARK	4. National Environmental Research Institute	CM RG	Satisfactory	Geographical convenience
GERMANY	5. Geological Survey of Denmark	GW	Satisfactory	Contracts given to local authorities
	9. Landesumweltamt Nordrheim-Westfalen	RF	Satisfactory	Difficulty with quality control and funding sub-contractors. High costs.
	14. Ministerium für Umwelt und Naturschutz Sachsen-Anhalt	RG GW	Satisfactory	
NETHERLANDS	2. Rijkswaterstaat, Tidal Waters Division	CM RG	Satisfactory	
	3. Directorate General for Public Works and Water Management	CM RG	Very satisfactory	Contracts are expensive and close control is needed.
SPAIN	3. Instituto Tecnológico Geominero de España (ITGE)	GW	Satisfactory	
SWEDEN	1. Swedish Meteorological and Hydrological Institute	RG	Satisfactory	

Key - Organisation/GIS

Government or State	- type of service	RF	Rainfall monitoring
RI Research Institute		CM	Current metering
UNI University		RG	River gauging
PC Private company		GW	Groundwater monitoring

4. CONCLUSIONS

Based on the questionnaires returned it can be concluded that the provision of hydrometric services in Europe is predominantly the responsibility of government or state authorities, both for data measurement and site maintenance, with very little work sub-contracted to private companies.

Generally, organisations which sub-contract their hydrometric measurement operations are satisfied with the service provided although many highlighted the need to closely monitor both the activities of the sub-contractor and the quality of the data they supplied. Data quality seems to be directly related to the reliability of the sub-contractor with "good" sub-contractors becoming increasingly difficult to find.

A similar picture can be drawn for organisations which sub-contract their site maintenance. Most are satisfied with the service but mention that close control of the sub-contractors is required and that such contracts are expensive. Again difficulty has been encountered in obtaining reliable sub-contractors.

No uniform standards of hydrometric measurement are adhered to neither from country to country nor by regional authorities in the same country. Of those organisations which specified the use of recognised standards for streamflow measurement, most complied with ISO-748 or the relevant national standard. For rainfall measurement WMO standards were quoted.

ACKNOWLEDGEMENTS

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Appendix A

QUESTIONNAIRE

REVIEW OF HYDROMETRIC SERVICES IN EUROPE

1. Organisational Details

NAME OF ORGANISATION:

CONTACT PERSON:

ADDRESS:

TELEPHONE:

TELEFAX:

Please describe your organisation (✓):

- Government or State Department
- Research institute or institute of higher education
- Private company
- Other (please specify)

2. Hydrometric Services

Is your organisation responsible for the operation and collection of hydrometric data? YES / NO*

If 'YES', please indicate area of responsibility below (✓). Otherwise, proceed to Question 6.

- Daily or sub-daily rainfall monitoring
- Current meter gauging
- River gauging at permanent or temporary sites
- Groundwater monitoring

3. National or International Standards

Does your organisation operate its hydrometric service to any written specification or standards? YES / NO*

If 'YES', please state reference numbers and sources:

Delete as appropriate

REVIEW OF HYDROMETRIC SERVICES IN EUROPE

4. Sub-contracts

Are any of your hydrometric services sub-contracted to private companies? YES / NO*
If 'NO', please go directly to Question 5.

4.1 Is daily or sub-daily rainfall monitoring sub-contracted ? YES / NO*

- Number of contracts operated _____

- Average length of contract
1 year
2 to 5 years
> 5 years (please specify) ___ years

- Effectiveness
Very satisfactory
Satisfactory
Dissatisfactory

- Please detail any specific difficulties or benefits the contracts present:

4.2 Is current meter gauging sub-contracted? YES / NO*

- Number of contracts operated _____

- Average length of contract
1 year
2 to 5 years
> 5 years (please specify) ___ years

- Effectiveness
Very satisfactory
Satisfactory
Dissatisfactory

- Please detail any specific difficulties or benefits the contracts present:

* Delete as appropriate

REVIEW OF HYDROMETRIC SERVICES IN EUROPE

4. Sub-contracts (continued)...

4.3 Is river gauging at permanent or temporary sites sub-contracted ? YES / NO*

- Number of contracts operated _____
 - Average length of contract
 - 1 year
 - 2 to 5 years
 - > 5 years (please specify) _____ years
 - Effectiveness
 - Very satisfactory
 - Satisfactory
 - Dissatisfactory
 - Please detail any specific difficulties or benefits the contracts present:
-

4.4 Is groundwater monitoring sub-contracted? YES / NO*

- Number of contracts operated _____
 - Average length of contract
 - 1 year
 - 2 to 5 years
 - > 5 years (please specify) _____ years
 - Effectiveness
 - Very satisfactory
 - Satisfactory
 - Dissatisfactory
 - Please detail any specific difficulties or benefits the contracts present:
-

* Delete as appropriate

REVIEW OF HYDROMETRIC SERVICES IN EUROPE

5. Site Maintenance

For the following services, is site maintenance sub-contracted to private companies ?

- Daily or sub-daily rainfall monitoring? YES / NO*
- Current meter gauging? YES / NO*
- River gauging at permanent or temporary sites? YES / NO*
- Groundwater monitoring? YES / NO*

If you answered 'YES' to any of the above, please indicate your degree of satisfaction with the service provided:

- Very satisfactory
- Satisfactory
- Dissatisfactory
- Please detail any specific difficulties or benefits the contracts present :

6. Questionnaire completed by:

Position:

Date:

Thank you. Your cooperation in completing this questionnaire is very much appreciated.

- * Delete as appropriate

Appendix B ADDRESSES OF RESPONDING ORGANISATIONS

AUSTRIA

1. Hydrographisches Zentralbüro
Marxergasse 2
A-1030 Wien
Austria

Contact: Dr. Nobilis

BELGIUM

1. Ministère Wallon de l'Équipement et des Transports
D211 - Service d'Études Hydrologiques
Bld Simon Bolivar 30
WTC 3-11^e étage
1210 Bruxelles
Belgium

Contact: Ir. Paul Dewil

2. Institut Royal Météorologique
Avenue Circulaire, 3
B - 1180 Bruxelles
Belgium

Contact: Dr. H. Malcorps

3. Institute for Land and Water Management
Vital Decosterstraat 102
3000 Leuven
Belgium

Contact: Prof. J. Feyen

4. Hydraulics Laboratory
University of Ghent
Seint Pietersnieuwstraat 41
B-9000
GHENT
Belgium

Director: Prof. Dr. ir. R. Verhoeven

DENMARK

1. Hydrometrical Survey
Danish Land Development Service
Ringstedvej 20
PO Box 9
DK-4000 Roskilde
Denmark

Contact: Ole Ekstrand

2. Danish Meteorological Institute
Lyngbyvej 100
DK-2100 København O
Denmark

Contact: Mr. Ib Andersen

3. Rambøll, Hannemann & Hojlund
Bredevej 2
DK-2830 Virum
Denmark

Contact: Mr. Ole Michaelson

4. National Environmental Research
Institute
Ministry of the Environment
Vejlsovej 25
PO Box 314
8600 Silkeborg
Denmark

Contact: Neils Bering Ovesen

5. Geological Survey of Denmark
Thoravej 8
DK 2400-Kobenhavn NV
Denmark

Contact: Erik Nygaard

FINLAND

1. National Board of Waters & Environment
Hydrological Office
P O Box 436
SF-00101 Helsinki
Finland

Contact: Dr. P. Seuna

FRANCE

1. DIREN Poitou - Charentes
14 Bld Chasseigne
86000 Poitiers
France

Contact: F. Goussé

2. DIREN - Basse Normandie
CITIS - le Pentacle
14209 Herouville Cedex
France

Chef du SEMA: L. Chevalier

Contact: F. Letouzé

3. DIREN - Pays de la Loire
12 Rue Menou
44035 Nantes Cedex 1
France

Chef du SEMA: J.L. Denoyelle

4. DIREN Champagne - Ardennes
Complex Agricole du Mont Bernard
Route de Suippes
51037 Chalons-sur-Marne
Cedex
France

Contact: P. Marras

- | | |
|---|---|
| <p>5. DIREN - Bretagne
15 Avenue de Cueil  
35047 Rennes Cedex
France</p> <p>Contact: Y. Pellarin</p> | <p>6. DIREN - Centre
131 Rue du Faubourg Bannier
45042 Orleans Cedex 1
France</p> <p>Contact: M. Ghio</p> |
| <p>7. DIREN - Lorraine
19 Avenue Foch
BP 223
F - 57005 Metz Cedex 1
France</p> <p>Contact: J. Abele</p> | <p>8. DIREN - Auvergne
RN89 - Marmilhat
63370 Lempdes
Cedex
France</p> <p>Chef du SEMA: A. Rongere</p> |
| <p>9. DIREN - Nord - Pas de Calais
81 avenue de Soubise
BP 65
59831 Lambersart Cedex
France</p> <p>Contact: P. Parent</p> | <p>10. DIREN - Aquitaine
29 rue de l'  cole Normale
33073 Bordeaux Cedex
France</p> <p>Contact: M. Aigrot</p> |
| <p>11. DIREN Midi-Pyr  n  es
2 Port St Etienne
31079 - Toulouse Cedex
France</p> <p>Contact: M. Bouziges</p> | <p>12. DIREN - Alsace
24 Grande Rue
BP 55
68180 Horbourg - Wihr
France</p> <p>Chef du SEMA: Y. Gobillon</p> |
| <p>13. Bureau de Recherches Geologiques et
Mini  res
BP 6009
45060 Orleans Cedex
France</p> <p>Contact: J.C. Roux</p> | |

GERMANY

- | | |
|---|---|
| 1. Landesumweltamt Brandenburg
Postfach 60 10 61
14410 Postsdam
Germany | 2. Ministerium für Natur, Umwelt
und Landesentwicklung des
Landes Schleswig-Holstein
Postfach 62 09
2300 Kiel 14
Germany |
| Contact: Dr. Haase | Contact: V. Petersen |
| 3. BfG: Bundesanstalt für Gewässerkunde
(Institut Fédéral d'hydrologie)
Kaiserin Augusta Anlagen, 15-17
56068 Koblenz
Germany | 4. Senatsverwaltung für
Stadtentwicklung
und Umweltschutz
Lindenstrasse 20-25
D-10958 Berlin
Germany |
| Director: Prof. V. Wetzel | Contact: Hr. Dr. Jahn |
| 5. Niedersächsisches Umweltministerium
Archivstr. 2
30169 Hannover
Germany | 6. Umweltministerium
Mecklenburg-Vorpommern
Schlosstrasse 6-8
19053 Schwerin
Germany |
| Contact: S. Popp | Contact: Herr Wöhl |
| 7. Thüringer Ministerium für Umwelt und
Landesplanung
Postfach 722
99014 Erfurt
Germany | 8. Landesanstalt für Umweltschutz
Baden-Württemberg
Postfach 210752
76157 Karlsruhe
Germany |
| Contact: R.D. Teltscher | Contact: Dipl.-Ing. Möhle |
| 9. Landesumweltamt Nordrhein-Westfalen
Postfach 10 23 63
45023 Essen
Germany | 10. Bundesanstalt für Wasserbau
Kussmaulstr. 17,
76187 Karkruhe
Germany |
| Contact: Dr-Ing. Stein | Contact: Frau Gloger |

11. Albert - Ludwigs - Universität
Institute für Physische Geographie
Werderring 4
7800 Freiburg i.BR
Germany

Contact: Dr. S. Demuth

13. Landesamt für Wasserwirtschaft
Rheinland-Pfalz
Am Zollhafen 9
55118 Mainz
Germany

Director: Dipl.-Ing. Lüthje

Contact: Dr. Meuser

15. Amt für Umweltschutz
Umweltbehörde
Steindamm 22
20099 Hamburg
Germany

Contact: S. Jochem

12. Ministerium für Umwelt
Postfach 3160
55021 Mainz
Germany

Contact: Herr Humann

14. Ministerium für Umwelt und
Naturschutz Sachsen-Anhalt
Pfälzerstr.
D39110 Magdeburg
Germany

Director: Dr. Püttmer

Contact: Frau Schulze

GREECE

1. Ministry of Agriculture
Directorate of Geology - Hydrology
Halkokomdili Street 46
10432 Athens
Greece

Director: M. Kilakou - Salapata

2. Ministry of Industry, Energy
and Technology
Water Resources Directorate
80 Michalakopoulou Street
101 92 Athens
Greece

Director: Chr. Maniati - Siatou

ITALY

1. Servizio Idrografico e Mareografico Italiano
%Presidenza de Consiglio
via V. Veneto 56
00187 Roma
Italy

Director: Dott. Ing. G. Batini
2. Istituto di Ricerca Sulle Acque
via Reno 1
00198 Roma
Italy

Contact: G. Guiliano

NETHERLANDS

1. TNO Institute of Applied Geoscience
PO Box 6012
2600 JA Delft
The Netherlands

Contact: M.J. van Bracht
2. Rijkswaterstaat, Tidal Waters
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P.O.Box 20907
2500 EX The Hague
The Netherlands

Contact: Ir. H.W.M. Bots
3. Directorate-General for Public Works and
Water Management
Institute for Inland Water Management
PO Box 17
8200 AA Lelystad
The Netherlands

Contact: J.P. Bakker

NORWAY

1. NVE Norwegian Water Resources
& Energy Administration
Hydrology Department
Box 5091 - Majorstua
N-301 Oslo
Norway

Contact: L.A. Roald

REPUBLIC OF IRELAND

1. Office of Public Works
17/19 Lower Hatch Street
Dublin 2
Ireland

Contact: T. Bolger

2. Geological Survey of Ireland
Beggars Bush
Haddington Road
Dublin 4
Ireland

Contact: R. Aldwell

SPAIN

1. Instituto Nacional de Meteorología
Paseo de las Moreras
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28040 Madrid
Spain

Contact: D. Antonio Labajo Salazar

2. Dirección General de Obras
Hidraulicas
MOPTMA
Avda. de Portugal 81
28011 Madrid
Spain

Director: Adrián Baltanás García

Contact: J.M. Santafe Martinez

3. Instituto Tecnológico Geominero de
España (ITGE)
Rios Rosas 23
28003 Madrid
Spain

Contact: J. A. López Geta

SWEDEN

1. Swedish Meteorological and
Hydrological Institute
S-60176 Norrköping
Sweden

Contact: Maja Brandt

2. Geological Survey of Sweden
PO Box 670
S-751 28 Uppsala
Sweden

Director: J.O. Carlsson

SWITZERLAND

1. Service Hydrologique et Geologique
National
CH-3003 Bern
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Contact: Dr. B. Schadler