European Overview Assessment of Member States' reports on Preliminary Flood Risk Assessment and Identification of Areas of Potentially Significant Flood Risk

Final report

September – *2015*

Europe Direct is a service to help you find answers to your questions about the European Union.

Freephone number (*)**:**

00 800 6 7 8 9 10 11

(*) The information given is free, as are most calls (though some operators, phone boxes or hotels may charge you).

Luxembourg: Publications Office of the European Union, 2016

ISBN 978-92-79-54700-3
doi:10.2779/576456

European Overview Assessment of Member States' reports on Preliminary Flood Risk Assessment and Identification of Areas of Potentially Significant Flood Risk

Written by Steve Nixon, Jennifer Horn (WRc); Edith Hödl-Kreuzbauer (UBA); Arjan ter Harmsel (Arcadis); Dominique Van Erdeghem (Arcadis); and Thomas Dworak (Fresh Thoughts)
September 2015

EUROPEAN COMMISSION

Directorate-General for Environment
Directorate C-Quality of Life, Water & Air
Unit C1 — Water

Contact: Ioannis Kavvadas

E-mail: Ioannis.KAVVADAS@ec.europa.eu

European Commission
B-1049 Brussels

Contents

Annexes

Summary

i Reasons

The Directive (2007/60/EC) on the assessment and management of flood risk (the Floods Directive (FD)) came into force on 26 November 2007. Member States (MSs) are required to report on implementation of the different requirements of the Directive by stipulated dates. The Commission is legally required to report to the European Parliament and Council in 2018 on progress made by MSs with implementing the Directive. However, the Commission decided to produce an (informal) Interim Report on Administrative Arrangements and on the Preliminary Flood Risk Assessments (PFRAs) towards the end of 2013. This was to be based on the information reported to the Commission by MSs by March 2012.

ii Objectives

The objectives of this Specific Contract awarded by the Commission was to undertake an assessment of MS reports to the Commission on their administrative arrangements for implementing the FD and, where applicable, on their PFRAs and identification of Areas of Potential Significant Flood Risk (APSFR).

iii Benefits

The European Overview Report provides the Commission with a comparative assessment of MSs' performance in terms of implementing some of the initial steps of the FD. Potentially the findings can be used by the Commission to influence and improve the implementation of the Directive by MSs over future implementation cycles.

iv Conclusions

1. MSs were required to report electronically to the Water Information System for Europe (WISE) by 26 May 2010 on their administrative arrangements. By November 2013, all Member States, with the exception of Greece, had reported whether or not the Competent Authorities and Units of Management were the same as those used for the Water Framework Directive (WFD).

2. MSs were required to report electronically to WISE by 22 March 2012 their PFRAs. By November 2013, all Member States, with the exception of Portugal, had provided some, if not all, of the requested information on their PFRAs and on the Articles they would be applying. Portugal informed the Commission bilaterally as to which Article they would be applying.

3. Eleven of the 27 MSs reported that the Competent Authorities appointed for the FD were different from those appointed for the WFD, though a closer examination of the reported information showed that in six of those 11 MSs there were some partial

overlaps between the respective Competent Authorities. The information reported on administrative arrangements was considered to be clear and complete for 12 MSs with generally small points of clarification required for the remaining 14 MSs that reported to WISE.

4. Two MSs – Ireland and Italy – have identified Units of Management different from those identified for the WFD. A comparison of the boundaries of the Units of Management against modelled hydrological boundaries concluded that the boundaries of the Units of Management in Ireland generally followed hydrological boundaries, whereas for at least some cases in Italy they didn't, which potentially may lead to uncoordinated Flood Risk Management Plans (FRMPs) in hydrologically connected areas with the same flooding areas having different plans, objectives and measures.

5. There are large differences in the way MSs have applied either Article 4 or the transitional arrangements under Article 13.1. Some have applied one of the Articles to their whole territories for all relevant flood types whereas others have applied a different Article to specific flood types within their territories. The most complex situation is in Germany where a combination of Article 4, Article 13.1(a) and Article 13.1(b) has been applied between Units of Management, and even within the same Unit of Management. In the United Kingdom, Article 4 is applied in all Units of Management but in the Unit of Management in England and Wales it is applied to specific flood types (pluvial, groundwater and minor watercourses) and Article 13.1(b) is applied to other types (raised reservoirs, sea water and main rivers).

6. Article 4 requires the assessment of certain aspects when undertaking a PFRA based on available or readily derivable information. The majority of these aspects were considered in the majority of the 21 MSs reporting on a PFRA. The aspects most commonly not considered include the effectiveness of man-made flood defences (eight MSs); conveyance routes of historical floods (six MSs); geomorphological characteristics (six MSs); and areas of economic activity (five MSs).

7. Some MSs have considered all types of relevant floods to be included in the scope of the Directive whereas others have not but without explanation of why. Where reasons have been given, some types of floods have been excluded because of their unpredictability or insufficient data availability. Other MSs have excluded certain types of floods for this implementation cycle but have indicated that they will include them in future FD cycles.

8. Floods from sewerage systems are excluded from the requirements of the FD. Seven MSs explicitly state that flooding from sewerage systems was excluded. It is not clear whether the other MSs have excluded this source or not.

9. Criteria to define significant historical floods and reasons for not including some types of floods that occurred in the past are very diverse and broad. The definition of significance included:

- impacted area;
- amount of monetary compensation;
- return period, flood extent and duration of the event;
- use of specific weighing systems for consequences to assess significance;
- non-comparability of hydrological circumstances (too long ago);
- significant changes of land use since the event make the consequences no longer relevant; and,
- the absence of historical evidence for their occurrence and/or significance.

Some MSs have not provided information on the criteria used to define significant historical floods.

10. Some, but not all, MSs give detailed descriptions of methods and criteria used to identify potentially significant future floods. For example, flood simulations and (simplified) modelling (including scenarios with climate change) with the help of digital elevation models to calculate flood areas and to produce flood maps. These maps have been combined with land use maps to identify potentially significant floods. There has also been mapping of historical floods based on readily available information and multi-criteria GIS has also been applied. In one MS, earthquake scenarios were used to assess the significance of future floods caused by tsunamis. The main reasons found for not including some types of floods as significant in the future were the absence of available or readily derivable data, the occurrence of the type of flood is very unlikely and/or no measures are feasible to mitigate the effects of the flood type.

11. The methods used to identify and quantify potential future adverse consequences and impacts are also very diverse between MSs. Modelling (hydrological and hydraulic) has been used but the detail has often not been reported. Where GIS analysis has been used, the approach and methodology differs between MSs. The use of flood return periods or probabilities is different between MSs varying from 5, 10, 20, 50, 100, 200, to 1,000 years. Often a combination of the methods has been applied by the MSs.

12. Sixteen of the 23 MSs with reported information considered climate change in their assessments of flood risk. Seven did not, and there was no information for the remaining five MSs. In most of the 11 MSs which have considered long term developments other than climate change, the methods used to assess them are unclear.

13. 48,023 APSFRs were reported from 23 MSs with Croatia reporting the most (2,976) and Hungary the fewest (2). Malta applied Article 4 but did not identify any Area of Potential Significant Flood Risk. Most (91%) APSFRs are associated with fluvial flooding and only 0.3% with groundwater flooding. There is large variability on the reporting of types of consequence associated with Area of Potential Significant Flood Risk between MSs with Poland reporting adverse consequences as "not applicable" and Denmark only reporting economic consequences.

v Recommendations

The reported information on some aspects of administrative arrangements for the FD is in some case incomplete and/or unclear. It is recommended that further clarification is sought from the respective MSs on these aspects.

The methods associated with defining significant floods (historic and potential future) and significant adverse consequences were often superficially reported to WISE and often there were no more detailed methodological reports available. A more detailed understanding of the methods used by MSs would be required to make a more quantitative comparison of implementation of the Directive across the EU. The relevant methodological documents should be requested from MSs particularly when the assessment of Flood Hazard Maps and Flood Risk Maps is undertaken during the next phase of checking the implementation of the Directive.

It is often not clear as to which types of flood are excluded from the scope of the Directive, and the reasons why. This information should be requested directly from MSs.

vi Résumé of Contents

This report is one of the main deliverables for two related contracts that provided technical assistance to the European Commission in the assessment and compliance checking of the implementation of the FD. The services provided included:

- the technical support in the development of the methodology for compliance checking;
- the development of an on-line template tool which was used in the assessments undertaken by a team of MS assessors;
- the preparation of technical assessment reports for each MS; and,
- the production of this European Overview Report.

These reports will be used by the Commission as a basis for the preparation of Commission reports on implementation.

The report considers and compares (in particular with the WFD) the administrative arrangements, including Units of Management and Competent Authorities, adopted by MSs in implementing the FD. The use of Article 4 and transitional arrangements under Article 13.1 by MSs is then assessed. The criteria and methodologies used by MSs to identify and assess significant floods and adverse consequences are described and compared with the requirements of the Directive. Future scenarios, such as the impacts of climate change, are required to be considered in terms of flood risk: the scenarios and methods reported by MSs are described in a further section of the overview. The processes required by Article 4 and Article 13.1(a) may lead to the identification of APSFR: Flood Hazard Maps and Flood Risk Maps are expected to be prepared by MSs for these areas in the next phase of implementing the Directive by December 2013. Those identified by MSs are presented in the report.

1. Introduction and Context

Directive (2007/60/EC) on the assessment and management of flood risks (the Floods Directive (FD)) came into force on 26 November 2007. Article 2 of the Directive requires Member States (MSs) to communicate their Administrative Arrangements to the European Commission. Article 15 indicates that MSs shall make available to the Commission the Preliminary Flood Risk Assessment (PFRA), the Flood Hazard Maps, the Flood Risk Maps and Flood Risk Management Plans (FRMPs) referred to in Articles 4 and 5 (PFRA including Areas of Potential Significant Flood Risk (APSFR)), 6 (Flood Hazard Maps and Flood Risk Maps), 7 and 8 (FRMPs) and 13 (Transitional Measures), three months after deadlines in the respective Articles.

The timetable for reporting by MSs and by the Commission is shown below.

Table 1 Reporting, notification or information obligations of the Floods Directive

Subject	Main Article	Other Articles	Responsibility	To	Report Due Date	Frequency/ Review
Transposition	17		MS	COM	26/11/2009	-
Competent Authorities and Units of Management (if different from WFD)	3.2 (Annex 1 WFD)		MS	COM	26/05/2010	3 months after any changes
Preliminary Flood Risk Assessment	4	13.1(a) and 13.1(b)	MS	COM	22/03/2012	22/12/2018, every 6 years thereafter
Flood Hazard Maps and Flood Risk Maps	6	13.2	MS	COM	22/03/2014	22/12/2019, every 6 years thereafter
Flood Risk Management Plans	7	13.3	MS	COM	22/03/2016	22/12/2021, every 6 years thereafter
Deadline for availability of transitional measures	13		MS	COM	22/12/2010	-
Progress by MS in implementation	16		COM	EP, C	22/12/2018	Every 6 years thereafter

Notes:
MS = Member States
COM = European Commission
C = Council
EP = European Parliament

In 2009 Water Directors endorsed a "Concept paper on reporting and compliance checking for the Floods Directive". Reporting Sheets were developed and agreed under the auspices of CIS Working Group F on Floods and were endorsed by Water Directors at their meetings of 30 November 2009 (Competent Authorities, Units of Management, PFRA), 3 December 2010 (Flood Hazard Maps and Flood Risk Maps) and 9 December 2011 (FRMPs). Reporting of Competent Authorities, Units of Management and PFRA have been undertaken by MSs using reporting schema and tools. XML schema were developed and agreed for the reporting of Flood Hazard Maps and Flood Risk Maps in April 2013. The XML schema for the FRMPs have been developed but as of December 2013 were still to be tested.

Though there is no legal requirement on the Commission to report on MSs' progress on the implementation of the FD until 2018, the Commission has decided to produce an Interim Report on Administrative Arrangements and PFRA (including APSFR) towards the end of 2013 when MSs are required to have completed their Flood Hazard Maps and Flood Risk Maps. The Interim Report will take the form of a European Overview Assessment which will summarise the results of the assessment of the data and information reported by MSs, and will include a number of horizontal summaries of certain Key Topics. This European Overview Assessment will be the final deliverable of the "Floods assessment framework" Specific Contract.

It should be noted that all of the 28 MSs are included in this assessment.

Individual Member State Reports have been produced that summarise the results of the compliance assessment (the deliverables under the parallel "Floods Member State assessment" Specific Contract). These are included as annexes to the European Overview Assessment.

1.1 Competent Authorities and Units of Management (Administrative Arrangements)

Article 3.1 of the FD indicates that MSs may make use of the administrative arrangements made under Article 3 of the Water Framework Directive (WFD). The WFD requires MSs to ensure the appropriate administrative arrangements, including the identification of the appropriate Competent Authority (CA), for the application of the rules of the Directive within each River Basin District (RBD) lying within their territory. However, different CAs may be appointed by MSs for the Floods Directive. The FD allows MSs to identify different Units of Management (UoM) from the RBD used for the WFD. CAs will be required for each national RBD or UoM and for the portion of any international RBD or UoM lying within its territory.

In cases where different CAs have been appointed for the FD than for the WFD, the FD requires MSs to communicate to the Commission by 26 May 2010 the information referred to in Annex I of the WFD. Any change in administrative arrangements also needs to be communicated within three months of the change coming into effect. In addition, even if the CAs are the same as for the WFD, the Commission and the MSs agreed that reporting will be

done to include the roles that the CAs play in relation to the implementation of the FD (as this is not reported under the WFD).

1.2 Preliminary Flood Risk Assessment and Areas of Potential Significant Flood Risk

Article 4 of the FD requires MSs to undertake a PFRA for each RBD, UoM or the portion of an international RBD or UoM lying within their territory, based on available or readily derivable information including the requirements specified in the FD (Article 4). On the basis of the PFRA the MSs have to identify APSFRs (Article 5).

Exchange of relevant information is required between the CAs of MSs sharing international (cross border) RBDs or UoMs (Article 4.3) and identification of APSFRs shall be co-ordinated between the MSs concerned (Article 5.2).

MSs may apply Article 13.1 (transitional arrangements) in the first implementation cycle, and either report on a PFRA carried out before 22 December 2010 (Article 13.1(a)) or proceed directly to the mapping and establishment of FRMPs (Article 13.1(b)). If Article 13.1(a) is applied, the result will include the identification of APSFRs but the information provided for the basis of such assessment may differ from that used for Article 4. If Article 13.1(b) is applied, APSFRs will not be identified; instead maps at the appropriate scale according to Article 6 will be prepared showing where significant flood risk exists in these areas. To ensure transparency to the Commission, as well as the public and other actors, the respective Reporting Sheet asks MSs to report which Article has been used in different parts of their territory and to explain the methodological approach followed. The option used will be made transparent in map format to be visualised together with the map of APSFRs.

Article 13.1(b) can be applied for a single type of flooding for a specific area[1] or for all types of flood for that area. Particular attention is needed for situations when a combination of all Articles has been used in the same area, notably in parts of the United Kingdom (England and Wales), Germany and Slovakia.

The PFRA requires an assessment of past and potential future floods and associated adverse consequences to identify APSFRs. This assessment is to be undertaken based on available or readily-derivable information.

The PFRA should assess the potential risks arising from all possible sources of flooding other than those where there is a common understanding (for example, arising from discussions on Article 2.1 in the CIS Working Group on Floods) that a particular type of flood is excluded from the scope of the FD.

[1] Locality, sub-basin and/or coastal area or other areas associated with the application of Articles 4, 13.1(a) or Article 13.1(b)

The level of detail of preliminary assessment, and the approaches taken, should however correspond to the degree of risk from each source within each RBD, UoM or MS[2].

PFRAs should include:

- An assessment of floods that have occurred in the past which had significant adverse impacts and for which the likelihood of similar future events is still relevant;

- An assessment of significant floods that have occurred in the past where significant adverse consequences of similar future events might be envisaged;

- An assessment of historical records of floods where they are still relevant and had, or could have, significant adverse consequences; and

- Depending on the needs of the MS, an assessment of the potential adverse consequences of future floods (i.e. a 'predictive' assessment). A predictive assessment of risks associated with a particular type of flooding or a particular aspect of flood risk assessment is particularly prevalent, for instance, in a country with a man-made flood defence infrastructure status may influence future flood risk, is therefore optional for MSs dependent on the understood degree of possible risk that might arise from the type of flood or particular situation.

An historic assessment is a requirement, and a predictive assessment of floods not similar to past ones is only required depending on the needs of the MS. It is important to assess how needs have been identified and quantified, and whether they are comparable between MSs.

It is appropriate that the degree of analysis undertaken as part of the PFRA should be commensurate and proportional to the potential consequence associated with each type of flooding.

1.3 Flood Hazard Maps and Flood Risk Maps

Article 6 of the FD requires MSs to prepare Flood Hazard Maps and Flood Risk Maps. These maps must be prepared at the RBD/UoM level and at the most appropriate scale; for the APSFRs identified under Article 5 or according to Article 13.1(a); or for the entire areas for which MSs decide to prepare flood maps according to Article 13.1(b) (Article 6.1).

MSs will determine the most appropriate scale of Flood Hazard Maps and Flood Risk Maps, and different scales can be chosen, for instance, depending on the location and type of map. The scale at which information is made available at European level via WISE is a different matter, and visualisation of flood related information in WISE (at scale 1:250,000) will be developed in separate GIS Guidance (CIS Guidance document No. 22, new Annex 13).

[2] Working Group on Floods, October 2010: Informal Paper 2 "Requirements for Assessment under PFRA"

MSs may choose to develop several flood maps for each type of relevant flood, provided that the requirements of the FD are complied with.

Flood Hazard Maps must show the geographical area which could be flooded under different scenarios (Article 6.3), whereas Flood Risk Maps must show the potential adverse consequences of these flood scenarios (Article 6.5).

1.4 Flood Risk Management Plans

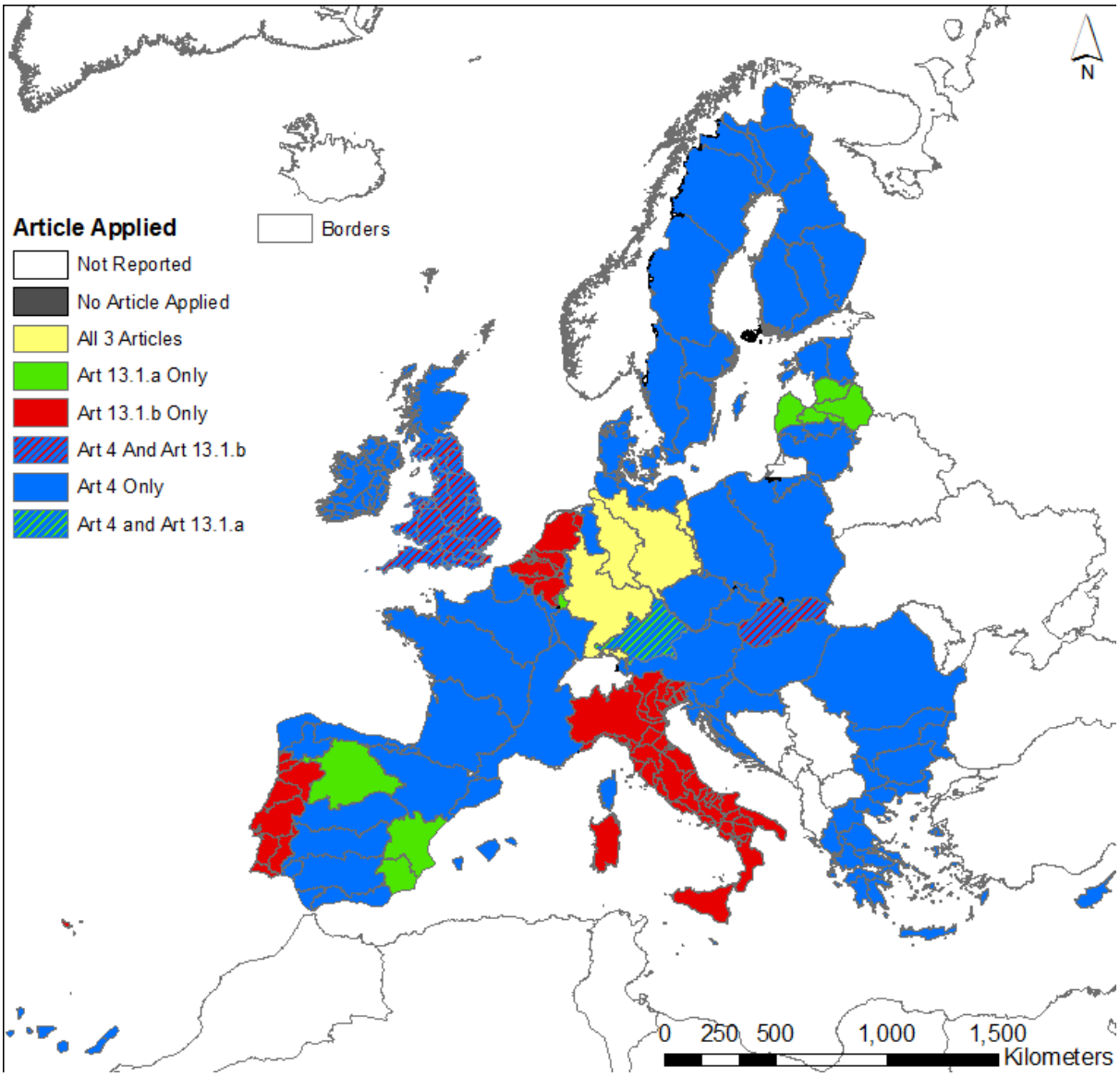
Article 7 of the FD requires MSs to prepare FRMPs for all APSFRs under Article 5 or Article 13.1(a), and areas covered by Article 13.1(b), on the basis of the maps prepared under Article 6.

The FRMPs must be co-ordinated at the level of the RBD or other UoM as defined under Article 3.2(b) (Articles 7.1 and 4, Article 8).

The FRMPs must set out appropriate objectives for the management of flood risk within the areas covered by the plan. The objectives must focus on reducing the adverse consequences of flooding for human health, the environment, cultural heritage and economic activity. Where appropriate, the FRMPs should focus on reducing the likelihood of flooding and/or on using non-structural measures, including flood forecasting and raising awareness of flooding (Article 7.2). The FRMPs shall include measures for achieving identified objectives (Article 7.3).

2. Summary of Information Reported by Member States

This section presents a series of figures and tables summarising the information at the Member State level across the EU.



Map 1 **The application of Article 4, 13.1(a) and 13.1(b) of the Floods Directive in the Units of Management of Member States** (Note: Croatia joined the EU on 1 July 2013 and has not yet reported on the Floods Directive. For UoMs PL1000, PL3000, PL4000 and PL6700 in Poland, the competent authorities reported that no significant historic floods were recorded and therefore a PFRA (under Article 4) was not undertaken (or reported).

Map 1 summarises how the different Articles have been applied in the UoMs of MSs. In some MSs a single Article is applied to all UoMs, whilst in other MSs the situation is more complex. The most complex situation is in Germany where a combination of Article 4, Article 13.1(a) and Article 13.1(b) is used between UoMs and even within the same UoM. In the United Kingdom, Article 4 is applied in all UoMs but in the UoMs in England and Wales it is applied to specific flood types (pluvial, groundwater and minor watercourses) and Article 13.1(b) is applied to other types (raised reservoirs, sea water and main rivers). In Slovakia Article 4 is applied to both UoMs and Article 13.1(b) is applied to fluvial floods in the second UoM only.

Table 2 gives an overview of the application by Member States of the different Articles relating to the assessment of Flood Risk under the Floods Directive. A summary of the number of MSs for each source of flooding to which Articles 4, 13.1(a) or 13.1(b) apply is shown in Figure 1.

Table 2 Overview of the application of the different Articles relating to the assessment of Flood Risk under the Floods Directive

MS	Article Applied	Units of Management	Type of Flood			All types **
			Source *	Mechanism *	Characteristic *	
AT	Article 4	AT1000, AT2000, AT5000				yes
BE	Article 13.1(b)	BEEscaut_RW, BEEscaut_Schelde_BR, BEMeuse_RW, BEMaas_VL, BERhin_RW, BESchelde_VL, BESeine_RW				yes
BG	Article 4	BG1000, BG2000, BG3000, BG4000				yes
CY	Article 4	CY001				yes
CZ	Article 4	CZ_1000, CZ_5000, CZ_6000				yes
DE	Article 4	DE1000, DE2000, DE3000, DE4000, DE5000, DE6000, DE7000, DE9500, DE9610, DE9650				yes
DE	Article 13.1(a)	DE1000, DE2000, DE4000, DE5000, DE6000				yes
DE	Article 13.1(b)	DE2000, DE4000, DE5000, DE6000				yes
DK	Article 4	DK1, DK2, DK3, DK4				yes
EE	Article 4	EEEE1	Pluvial, Sea water			
EE	Article 4	EEEE2	Pluvial			
EE	Article 4	EEEE3				
EL	Article 4	GR01	Fluvial, Pluvial, AWBS	Natural exceedance	Flash flood, Medium onset flood	
EL	Article 4	GR02, GR13	Fluvial, Pluvial, AWBS	Natural exceedance,	Flash flood,	
EL	Article 4	GR03, GR04, GR05				Yes
EL	Article 4	GR06	Fluvial, Pluvial, AWBS	Blockage/restriction, Natural exceedance,	Flash flood,	

MS	Article Applied	Units of Management	Type of Flood			All types **
			Source *	Mechanism *	Characteristic *	
EL	Article 4	GR07, GR08, GR11	Fluvial, Pluvial, AWBS	Natural exceedance,	Flash flood, Medium onset flood,	
EL	Article 4	GR09	Artificial water-bearing infrastructure, Fluvial, Pluvial	Defence or infrastructural failure, Natural exceedance,	Flash flood,	
EL	Article 4	GR10	Artificial water-bearing infrastructure, Fluvial, Pluvial	Defence or infrastructural failure, Natural exceedance,	Flash flood, , Other rapid onset	
EL	Article 4	GR12	Fluvial, Pluvial, AWBS	Natural exceedance,	No data	
EL	Article 4	GR14	Pluvial	No data	No data	
ES	Article 4	ES010, ES014, ES017, ES018, ES030, ES040, ES050, ES063, ES064, ES091, ES100, ES110, ES120, ES122, ES123, ES124, ES125, ES126, ES127, ES150, ES160				Yes
ES	Article 13.1(a)	ES020, ES070, ES080				Yes
FI	Article 4	FIVHA1, FIVHA2, FIVHA3, FIVHA4, FIVHA5, FIVHA6, FIVHA7	Artificial water-bearing infrastructure, Fluvial, Pluvial, Sea water	Blockage/restriction, Defence exceedance, Defence or infrastructural failure, Natural exceedance	Debris flow, Deep flood, High velocity flow, Medium onset flood, Other rapid onset, Slow onset flood, Snow melt flood	
FR	Article 4	FRFR	Artificial water-bearing infrastructure, Fluvial, Groundwater, No data, Pluvial, Sea water	Blockage/restriction, Defence exceedance, Defence or infrastructural failure, Natural exceedance, No data	Debris flow, Flash flood, High velocity flow, No data, Other rapid onset, Slow onset flood, Snow melt flood	
HR	Article 4	HRC, HRJ				Yes
HU	Article 4	HU1000	Fluvial, Groundwater, Pluvial	Blockage/restriction, Defence exceedance, Defence or infrastructural failure, Natural exceedance	Debris flow, Deep flood, Flash flood, High velocity flow, Medium onset flood, Other rapid onset, Slow onset flood, Snow melt flood	
IE	Article 4	GBNIIENB, GBNIIENW, IE07, IE08, IE09, IE10, IE11, IE12, IE13, IE14, IE15, IE16, IE17, IE18, IE19, IE20, IE21, IE22, IE29, IE30, IE31, IE32, IE33, IE34, IE35, IEGBNISH***				Yes

MS	Article Applied	Units of Management	Type of Flood			All types **
			Source *	Mechanism *	Characteristic *	
IT	Article 13.1(b)	ITI012, ITI013, ITI014, ITI015, ITI016, ITI017, ITI018, ITI019, ITI020, ITI021, ITI022, ITI023, ITI024, ITI025, ITI026, ITI027, ITI028, ITI029, ITN001, ITN002, ITN003, ITN004, ITN005, ITN006, ITN007, ITN008, ITN009, ITN010, ITN011, ITR051, ITR061, ITR071, ITR081, ITR091, ITR092, ITR093, ITR111, ITR121, ITR131, ITR141, ITR151, ITR152, ITR153, ITR154, ITR155, ITR161, ITR171, ITR181, ITR191, ITR201, ITSNP01				Yes
LT	Article 4	LT1100, LT2300, LT3400, LT4500				Yes
LU	Article 13.1(a)	LU RB_000				Yes
LV	Article 13.1(a)	LVDUBA, LVGUBA, LVLUBA, LVVUBA				Yes
MT	Article 4	MTMALTA				Yes
NL	Article 13.1(b)	NLEM, NLMS, NLRN, NLSC				Yes
PL	Article 4	PL2000, PL5000, PL6000, PL7000, PL8000, PL9000				Yes
PT	Article 13.1(b)	PTRH1; PTRH2; PTRH3; PTRH4; PTRH5; PTRH6; PTRH7; PTRH8; PTRH9; PTRH10				Yes
RO	Article 4	RO1	Fluvial, Groundwater, Pluvial	Defence exceedance, Defence or infrastructural failure, Natural exceedance	Deep flood, Snow melt flood	
RO	Article 4	RO10	Artificial water-bearing infrastructure, Fluvial, Pluvial	Blockage/restriction, Defence exceedance, Defence or infrastructural failure, Natural exceedance	Debris flow, Deep flood, Flash flood, High velocity flow, Other rapid onset, Snow melt flood	
RO	Article 4	RO1000	Fluvial, Sea water	Defence exceedance, Defence or infrastructural failure, Natural exceedance	Debris flow, Deep flood	
RO	Article 4	RO11	Artificial water-bearing infrastructure, Fluvial, Pluvial	Blockage/restriction, Defence exceedance, Defence or infrastructural failure, Natural exceedance	Debris flow, Deep flood, Flash flood, High velocity flow	
RO	Article 4	RO2	Fluvial, Pluvial	Defence exceedance, Defence or infrastructural failure, Natural exceedance	Debris flow, Deep flood, Flash flood	

MS	Article Applied	Units of Management	Type of Flood			All types **
			Source *	Mechanism *	Characteristic *	
RO	Article 4	RO3	Artificial water-bearing infrastructure, Fluvial, Pluvial	Defence exceedance, Natural exceedance	Deep flood, Flash flood, High velocity flow	
RO	Article 4	RO4	Artificial water-bearing infrastructure, Fluvial, Groundwater, Pluvial	Defence exceedance, Natural exceedance	Deep flood, Flash flood, High velocity flow	
RO	Article 4	RO5	Artificial water-bearing infrastructure, Fluvial, Groundwater, Pluvial	Blockage/restriction, Defence exceedance, Defence or infrastructural failure, Natural exceedance	Deep flood, Flash flood, High velocity flow	
RO	Article 4	RO6	Pluvial, Sea water	Blockage/restriction	Flash flood	
RO	Article 4	RO7	Fluvial, Groundwater, Pluvial	Defence or infrastructural failure, Natural exceedance	Debris flow, Deep flood, Flash flood, High velocity flow, Snow melt flood	
RO	Article 4	RO8	Fluvial, Groundwater, Pluvial	Defence exceedance, Defence or infrastructural failure, Natural exceedance	Deep flood, Flash flood, High velocity flow, Snow melt flood	
RO	Article 4	RO9	Artificial water-bearing infrastructure, Fluvial, Groundwater, Pluvial	Blockage/restriction, Defence exceedance, Defence or infrastructural failure, Natural exceedance	Debris flow, Deep flood, Flash flood	
SE	Article 4	SE1, SE1TO, SE2, SE3, SE4, SE5				Yes
SI	Article 4	SI_RBD_1, SI_RBD_2				Yes
SK	Article 4	SK30000FD, SK40000FD	Fluvial, Pluvial, Groundwater			Yes
SK	Article 13.1(b)	SK40000FD	Fluvial			Yes
UK	Article 4	UK02_England, UK03, UK04, UK05, UK06, UK07, UK08, UK09, UK10, UK11, UK12	"Ordinary (minor) watercourses and all other sources of local flooding", Groundwater, Pluvial			
UK	Article 4	UKGBNIIENB, UKGBNIIENW, UKGBNINE	Fluvial, Pluvial			
UK	Article 4	UKGI17	Sea water	Defence exceedance	"Natural Flood"	
UK	Article 4	UK01, UK02_Scotland				yes
UK	Article 13.1(b)	UK02_England, UK03, UK04, UK05, UK06, UK07, UK08, UK09, UK10, UK11, UK12	"Main Rivers and large raised reservoirs", Sea water			

* Source, mechanism and characteristics in quotation marks is source, mechanism and characteristics specified by the Member State

** No specific flood types were reported and it is assumed that the relevant is applied to all flood types

*** Ireland have subsequently merged UoMs IE32 and IE33 and re-reported data on 19.03.2014. This update has not been included in this assessment.

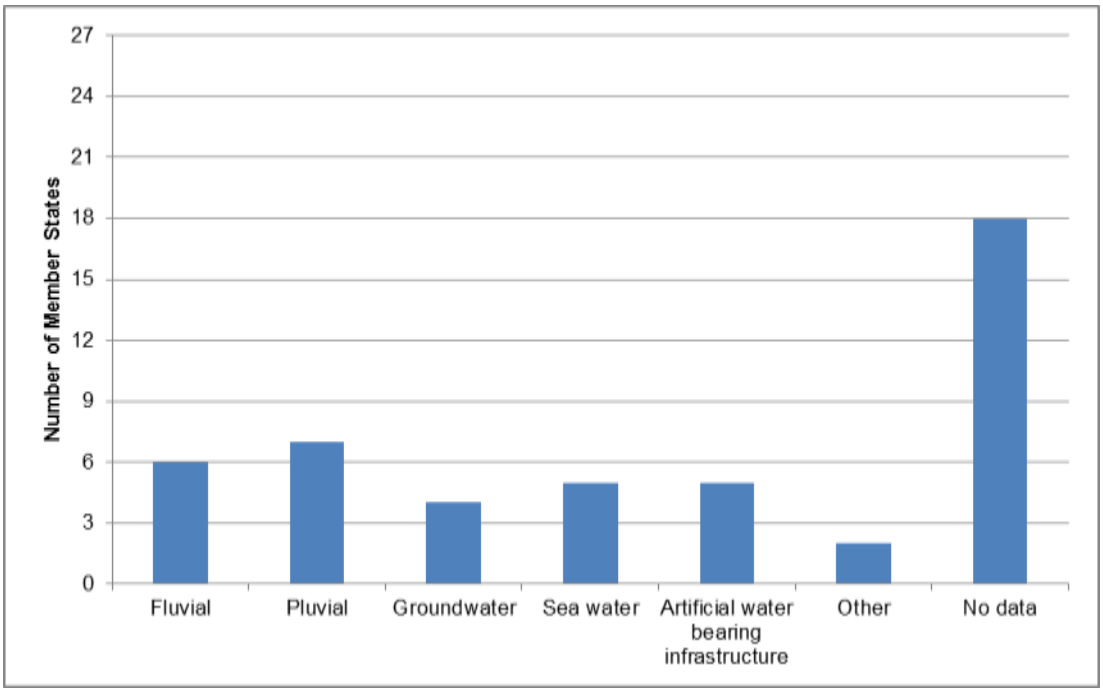


Figure 1 Sources of flooding reported at the Article level (aggregated for all 3 Articles)

All relevant sources: Member States can apply Article 4, Article 13.1(a) or Article 13.1(b) to specific sources/types of flooding. In which case, the source/type is reported for whichever Article has been applied. If any one of the 3 Articles has been applied but no specific flood types have been reported, then it is assumed that the Article is applicable to all relevant flood types within the UoM. Based on MSs' WISE reports and separate communications with the Commission.

A PFRA requires that an assessment of historic flood events is undertaken: these should be reported to WISE by MSs. The highest number of historic flood events reported was by Spain (6,165) followed by Poland (4,860) and France (2,248) (Figure 2). No historic floods were reported by Malta who indicated that there was no evidence of past flooding in that MS. Finland reported seven flood events. A number of MSs (e.g. Hungary and the UK) reported historic floods with no quantitative information on types, consequences and dates: these are indicated as "no data" in Figure 3 below. Ireland reported 426 future flood events as descriptive text, which was not extracted or assessed; Sweden also reported historic floods only as text.

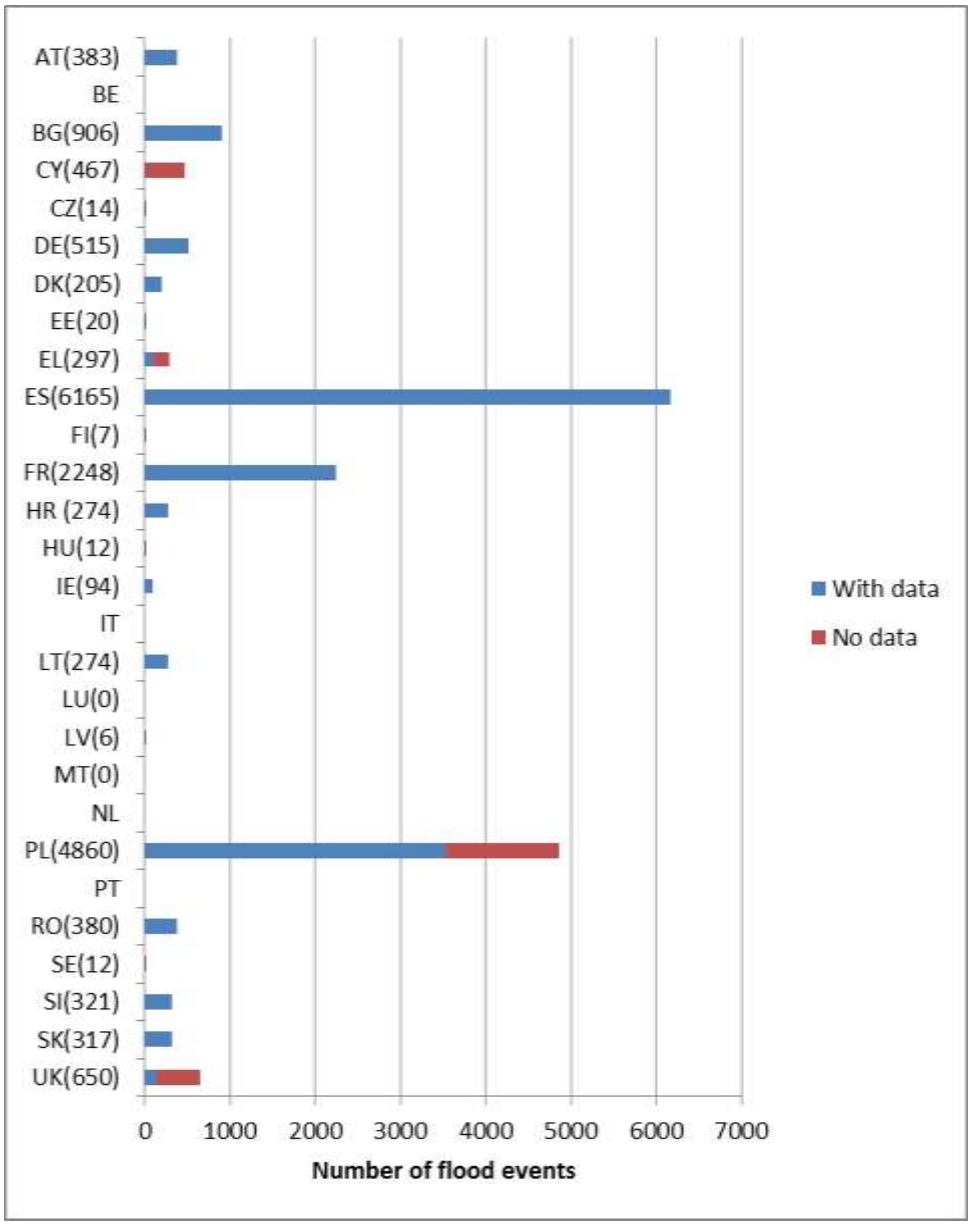


Figure 2 Number of reported historic flood events by Member States

BE, IT, NL and PT applied Article 13.1(b) across all their UoMs and were not required to report information on historic flood events. Member States reported flood events with data on type and consequences. When this was not possible, a description of the event was provided: this equates to "No data". As of 30 October 2013 a total of 18.153 historic flood events were reported: 15.660 with data, 2.493 with no data. PT did not report to WISE.

Figure 3 summarises the time periods covered by the reported historic flood events. The oldest flood event dated back to 100 AD from Spain. Most of the oldest events relate to fluvial and sea water floods which are presumably the most notable historically because of the extent of the impact they have on human life. The highest proportion of recent flood events are for pluvial and groundwater floods (around 60% of events were recorded from 2000 onwards).

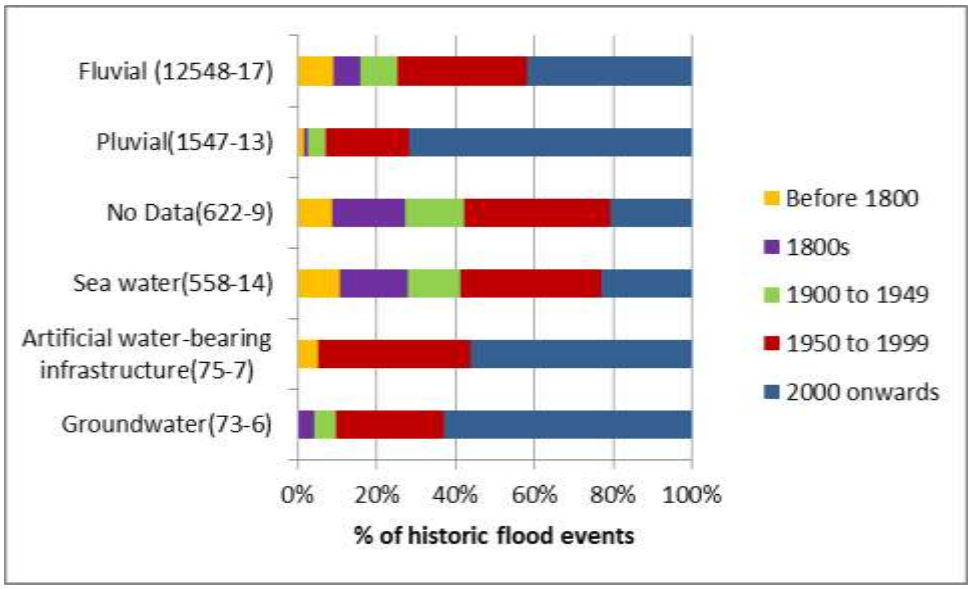


Figure 3 Time periods of reported historic flood events

Based on data from AT, BG, CY, CZ, DE, DK, EE, EL, ES, FI, FR, HU, IE, LT, LV, MT, PL, RO, SE, SI, SK, UK. The numbers in brackets after the source of flood refers to the number of events reported from the number of MS.

3. Comparison of Units of Management that are not Equivalent to River Basin Districts with Hydrological Boundaries

Article 3.1 of the FD indicates that MSs may make use of the arrangements made under Article 3 of the WFD. However, MSs are allowed to identify certain coastal areas or individual river basins and assign them to different Units of Management from the RBDs used for the WFD. The Commission needs information on UoM to ensure that the assessment and management of flood risk is at an appropriate scale for protecting public safety and meets the requirements of the FD. As a first step an assessment is required as to whether UoM boundaries "match" hydrological boundaries of sub-catchments or are they based on other boundaries such as administrative areas.

Only two MSs reported UoM different from those used for the WFD: Ireland has identified 26 and Italy 51 UoMs. In the case of Ireland, three of the UoMs correspond to the three international RBDs identified for the WFD. The other UoMs in Ireland and all of those from Italy are different from the RBDs used for the WFD. MSs were requested to report the GIS shape files of their UoMs to the European Environment Agency's (EEA) Central Data Repository: access to these files was obtained through the EEA.

The checking of the UoM boundaries was undertaken against the hydrological boundaries of the Functional Elementary Catchments (FECs) in the **E**uropean **C**atchments and **RI**vers **N**etwork **S**ystem (ECRINS) dataset. ECRINS is based on catchment characterisation and modelling with a resolution equivalent to that of a 1:250,000 map. MSs will have used different digital elevation models from ECRINS that will produce maps with higher resolutions in the derivation of their UoMs. There will, therefore, be inherent differences between the hydrological units represented by the FECs and UoMs even when UoMs are based entirely on hydrological units.

3.1 Assessment of FEC and UoM boundaries for Ireland

3.1.1 Overall impression at a national scale

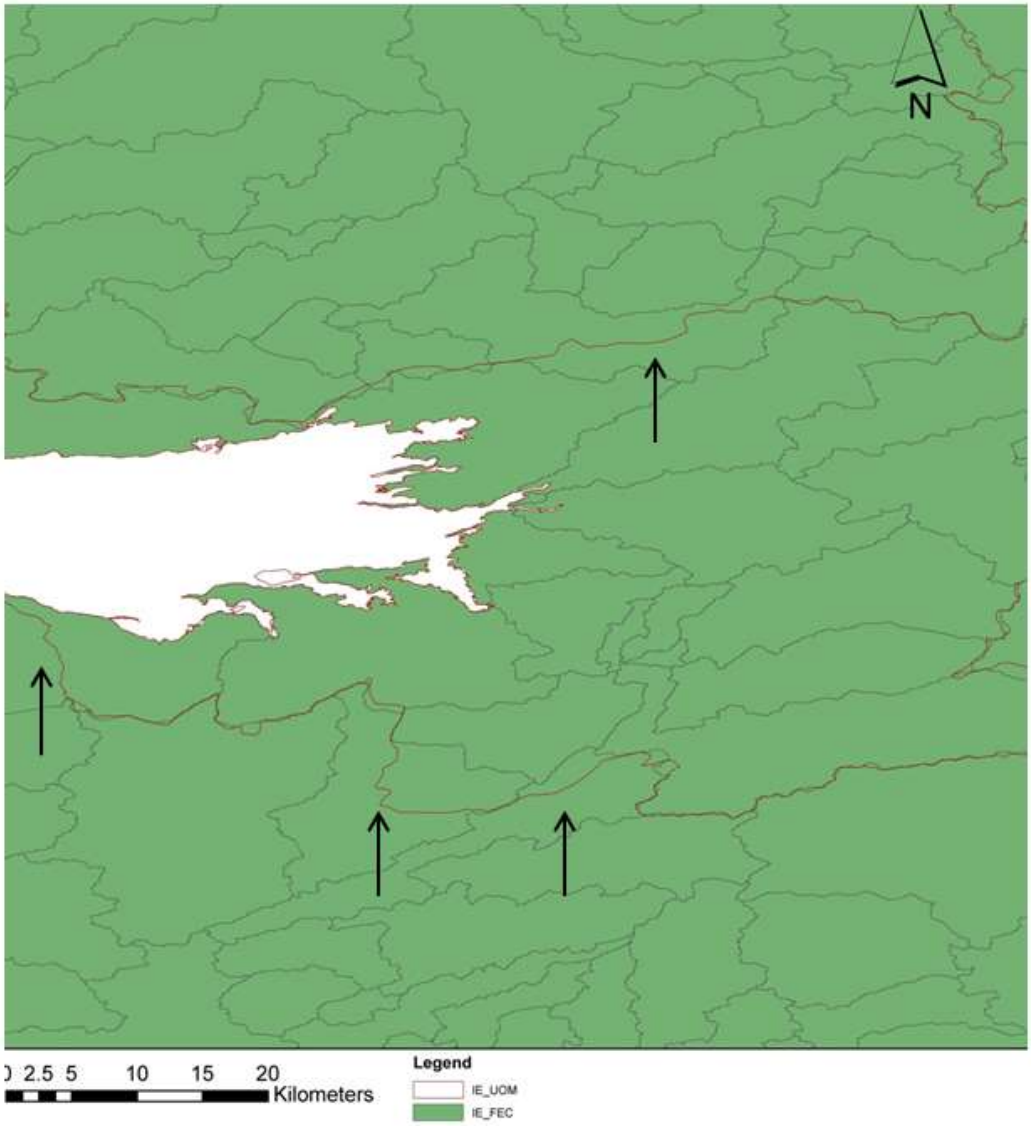
The overall impression of the FEC and UoM boundaries are that the boundaries appear to match along the coast and along the FEC boundaries. At a smaller scale, there are some UoM boundaries which bisect rather than follow FEC boundaries (the largest areas are circled in Map 2 below): these tend to be approximately one FEC unit inland from the coast. In many places the UoM boundary deviates slightly from the FEC boundary, typically by abruptly changing direction only to return to the FEC boundary shortly further on. There is also a UoM for Valencia island which is not included as a FEC boundary.

Map 2 Comparison of Ireland's UoM boundaries with FEC boundaries in the ECRINS dataset

3.1.2 Bisecting areas

Examples of areas where the UoM boundaries bisect the FEC boundaries are shown below in Maps 3 and 4. The most noticeable areas are typically near the coast. The arrows point out the UoM lines where they are bisecting the FEC units. The maps also show the general level of agreement between the boundaries where the UoM follows the FEC boundaries.

Map 3 Example 1 of where a UoM boundary crosses a FEC boundary



Map 4 Example 2 of where UoM boundaries cross FEC boundaries

3.2 Assessment of FEC and UoM boundaries for Italy

3.2.1 Overall impression at a national scale

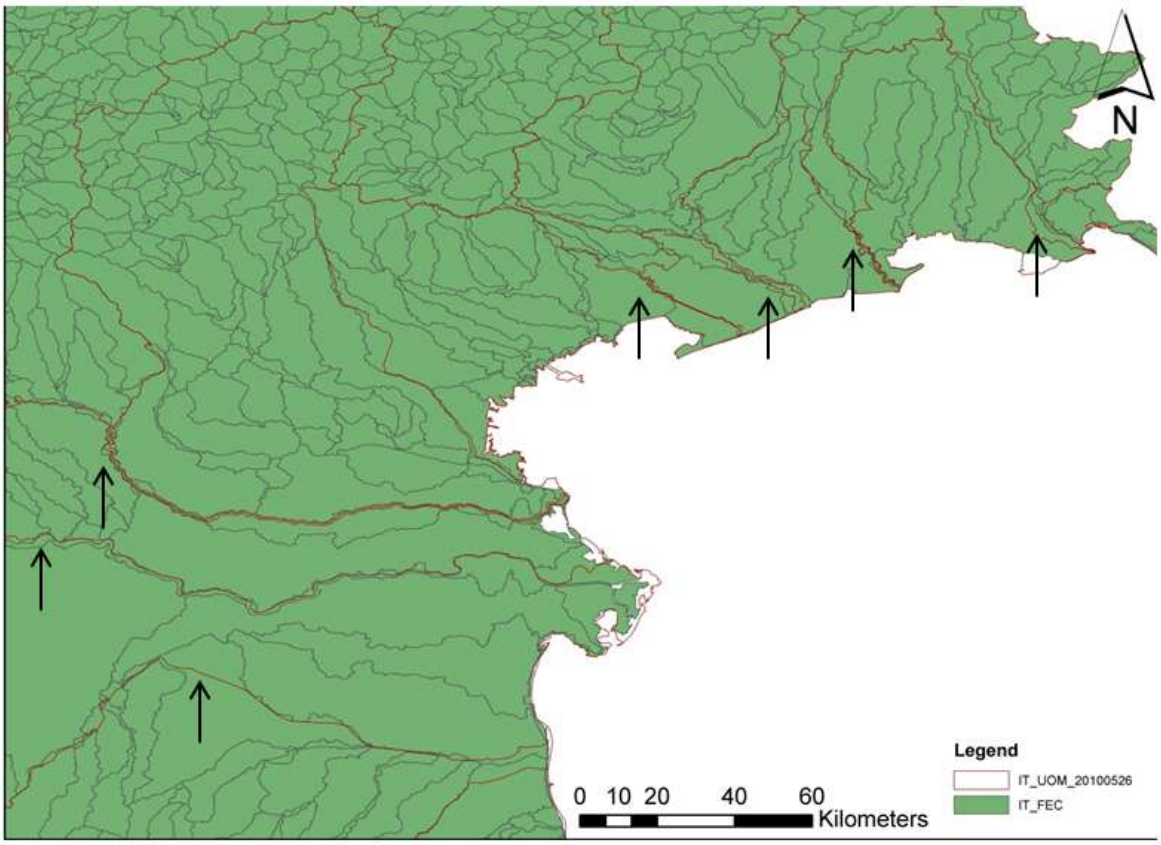
For the majority of Italy, there is a large agreement between the FEC and UoM boundaries with the exception of the north-east (Map 5). There are some minor discrepancies in the south of Italy but these are few and far between, potentially due to differences in the resolutions with which the boundaries were generated. Outside of mainland Italy, each island has its own UoM boundary.

Map 5 Comparison of Italy's UoM boundaries with FEC boundaries in the ECRINS dataset

3.2.2 The North-East of Italy

The north-eastern region of Italy, particularly around the region east of Venice, shows the most disagreement between the FEC and UoM boundaries. While the UoMs tend to follow the approximate direction of FEC boundaries, as the UoM boundaries head towards the coast

many seem to converge on each other – these areas are shown on Map 6 at the top of the arrows. Although the UoM boundaries do not actually cross or touch, they do come very close together, with one boundary deviating from one FEC boundary towards another. When the UoM boundaries come together like this, they tend to run more or less exactly parallel to each other, giving a similar outline to that of a river channel. Despite the UoM and FEC boundaries matching over the majority of the country, there is one area where a UoM boundary bisects a FEC unit, shown by the southern-most arrow on Map 6.



Map 6 Example 3 of where UoM boundaries cross FEC boundaries (north-east Italy)

3.3 More detailed comparison of hydrological boundaries with UoM boundaries

The drainage connectively of the FECs has been coded within the "CodeArbo structure" so that the drainage connectivity and interrelationships of FECs can be identified. The GIS area files of the UoMs were "overlain" with those of the FECs and a comparison made of the respective boundaries. Details of the connectivity of FECs allowed the identification of those FECs within or overlapping a UoM boundary that were interrelated and those which were not. If UoMs were differentiated according to hydrological boundaries then the premise is that the UoM would contain FECs that were all hydrologically connected. In contrast, if UoMs were differentiated according to administrative boundaries that may span different hydrological

units (e.g. sub-catchments) then it may contain different proportions of FECs draining to unconnected hydrological units.

Examples of UoMs from both Ireland and Italy were selected from areas (see above) where the preliminary assessment indicated where there was good and bad agreement between boundaries of UoM and FECs. The area of the FECs that were within the UoM boundaries was calculated (2 in the Table 3 below) and compared to the area of the UoM (1). In addition, to gain an indication of the potential significance of any discrepancies between UoM and FEC boundaries, the area of the FECs draining into the UoM but not within the UoM boundary was calculated (3) and the area of FECs not draining into the UoM but are within the UoM boundary (4) were calculated. The results are given in Table 3 below and an Illustrative example for IT1017 in Map 7 below. Maps for each of the comparisons are given in Appendix 2.

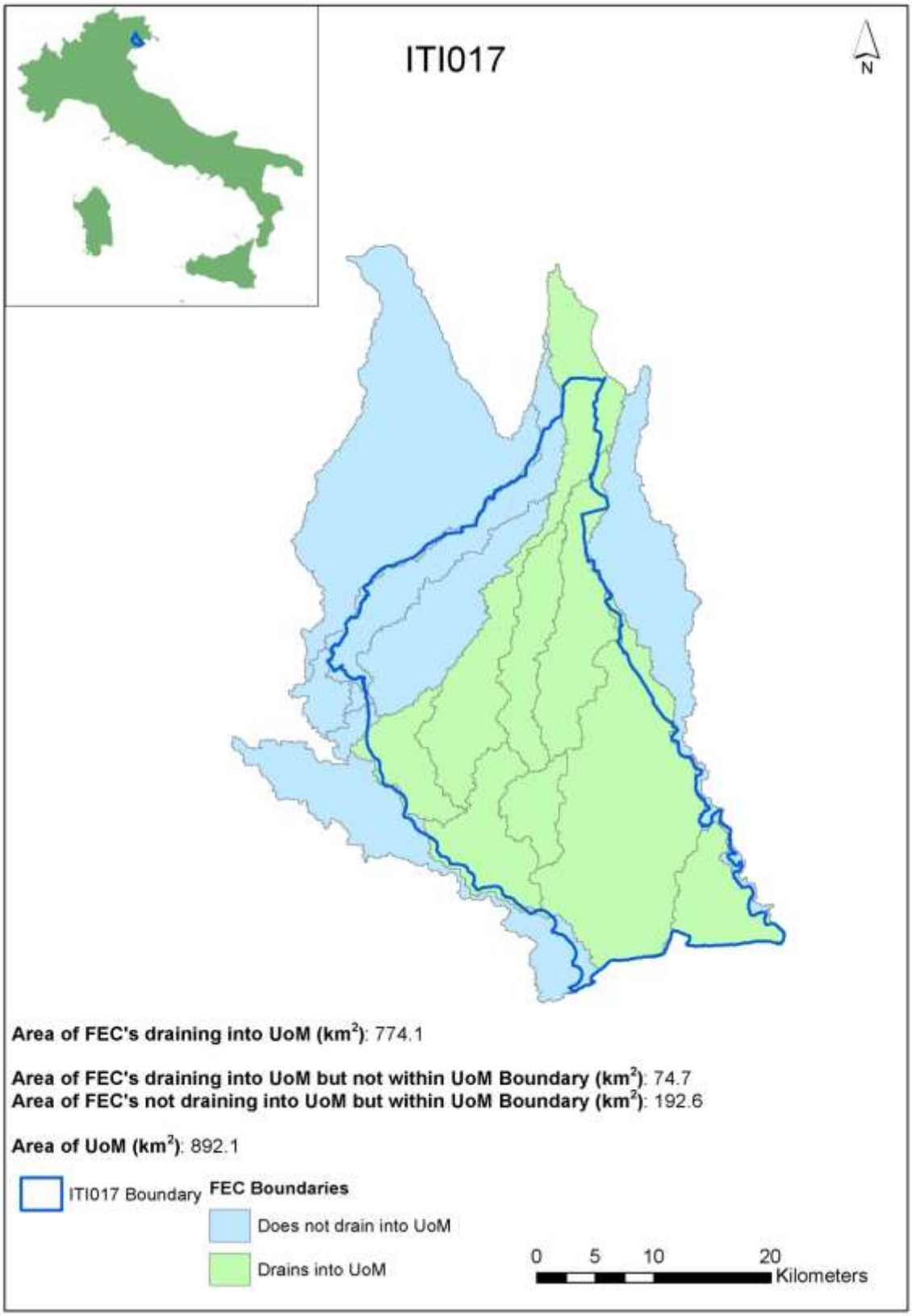
Table 3 Summary of comparisons undertaken on selected UoMs in both Ireland and Italy

UoM code	Uom Name	Area of UoM (km^2) (1)	Area of FECs within UoM (2) (km^2)	2 as % of UoM (1)	Area of FECs draining into UoM but not within UoM boundary (3) (km^2)	3 as % of total FEC area (2)	Area of FECs not draining into UoM but within UoM boundary (4)	4 as % of total FEC area (2)
Ireland								
IE07	Boyne	2695	2710.2	101%	59.5	2.2%	44.3	1.6%
IE16	Suir	3542.6	3496.8	99%	41.16	1.2%	86.9	2.5%
IE17	Colligan-Mahon	665	673	101%	25	3.7%	16	2.4%
IE29	Galway Bay South East	1270.2	1128	89%	7.6	0.7%	149.5	13.3%
IE34	Moy & Killala Bay	2345	2156	92%	62.9	2.9%	251.7	11.7%
Italy								
ITN002	Arno	9068.8	9016.7	99%	84.8	0.9%	138.2	1.5%
ITN007	Piave	4096.3	4431.1	108%	442.4	10%	107.6	2.4
ITN008	Po	70329.1	72338.5	103%	2157	3.0%	148.1	0.2%
ITN010	Tevere	17191.9	17446	101%	544.9	3.1%	290.7	1.7%
ITI017	Lemene	892.1	774.1	87%	74.7	9.6%	192.6	24.9%
ITI021	Reno	4920.1	6531.7	133%	1637.2	25.1%	13.4	0.2%

In terms of IT1017 (Map 7 below), there are significant proportions of the total area of the FECs within the UoM that drain to different hydrological areas (25%:75%). This may indicate that the UoM may incorporate two unconnected hydrological units, perhaps indicating that the UoM may be based on an administrative unit rather than homogeneous hydrological units.

In making these comparisons it must be borne in mind that any differences in UoM boundaries and FEC boundaries may be partly or completely due to how the boundaries were derived. The national UoM boundaries were presumably derived from large-scale maps which

are likely to be more accurate (in terms of defining discrete hydrological units) than the FECs which were derived from a GIS model.



Map 7 Comparison of boundaries of UoM IT017 with hydrological boundaries of FECs

3.4 Concluding comment

In summary, this assessment has shown that in most parts the boundaries of the national UoMs in Ireland generally follow hydrological boundaries. There are a few cases where there are deviations between coastal FECs and UoMs. It is known, in general, that the digital elevation models (DEMs) are more prone to errors in flat areas such as those close to the coast and any differences are probably due to such errors.

Some of the deviations found in Italy could also be due to the different DEMs used for the derivation of UoMs and FECs but there are clear indications of a problem in the cases where the basin is delineated only along the river channel. This may lead to uncoordinated FRMPs in hydrologically connected areas with the same flooding areas having different plans, objectives and measures.

4. Administrative Arrangements

An assessment of MSs' Administrative Arrangements for the FD was undertaken and reported in August 2010. It comprised a summary of the roles of CAs, internal co-ordination with other national administrations, links with other policies, public participation, consultation, awareness and warning, international and transboundary co-operation and co-ordination. Some MSs have updated their information reported to WISE since the 2010 assessment. The objective of this aspect of the contract was to check if any new information was reported and if so, revise the original assessment accordingly.

Table A7 in Annex 4 summarises the key findings for each MS, in particular demonstrating where the CAs and UoMs are the same or equivalent to those in place under the WFD. More detailed information is provided on each MS in Annexes which, because of their size, are presented in an associated separate zipped file.

In terms of CAs, two separate assessments were undertaken to determine whether those responsible for the implementation of the FD are the same as those for the implementation of the WFD (Table 4). The first assessment made use of MSs explicitly reporting whether or not their CAs were the same under both Directives. The second assessment involved a comparison by a consultant of the named CAs for the FD with those of the WFD. The conclusions were slightly different for each assessment, largely due to cases of partial overlap in the CAs for both Directives.

Table 4 Assessment of whether Competent Authorities responsible for the Floods Directive are the same as those responsible for the WFD

Are the CAs the same under the FD as those responsible under the WFD?	MS' Assessment: Number of MS	Independent Assessment: Number of MS
Yes	15	12
Partly	(not a valid option)	9
No	11	5
Not reported	1	2

Note: does not include HR

In terms of UoMs, this topic is largely covered in Section 3 of this report, which shows the two MSs which do not have UoMs the same as their RBDs (under the WFD): Ireland and Italy.

5. Use of transitional arrangements in Article 13(1)

MSs may apply Article 13.1 (transitional arrangements) in the first implementation cycle and either report on a PFRA carried out before 22 December 2010 (Article 13.1(a)), or proceed directly to the mapping and establishment of FRMPs (Article 13.1(b)).

If Article 13.1(a) is applied, the result will include the identification of APSFRs. Information on the approach taken needs to be reported as agreed in the reporting guidance (although the reported information may differ from that required if Article 4 is applied).

If Article 13.1(b) is applied, APSFRs will not be identified; instead, according to Article 6, maps at the appropriate scale will be prepared showing where significant flood risk exists in these areas. Article 13.1(b) can be applied for a single type of flooding for an area, more than one type or for all types of flood for that area.

MSs may also decide to make use of Flood Hazard Maps and Flood Risk Maps (Article 13.2) and FRMPs (Article 13.3) finalised before 22 March 2010, as long as they provide equivalent information to that required by Articles 6 and 7, respectively. These and any methodological documents supporting their production may provide information relevant for this checking and assessment.

Though 'equivalence' has not been defined, it is expected that all the aspects required by Article 4 would be included when applying Article 13.1(a), and the aspects required by Article 6 and Article 7 would have been included when applying Article 13.1(b) in the preparation of flood hazard and flood risk maps. Also where Article 4 and Article 13.1 have both been applied then all types of flood and consequence that could potentially occur in a Unit of Management (UoM) and MS would have been considered.

The PFRA should assess the potential risks arising from all possible sources of flooding other than those where there is a common understanding (for example, arising from discussions on Article 2.1 in the CIS Working Group on Floods) that a particular type of flood is excluded from the scope of the FD.

A PFRA undertaken under Article 4 and 13.1(a) should include an assessment of the impact of historic floods including whether they had significant adverse consequences and the likelihood of them occurring again in the future, and depending on the specific needs of the MS, an assessment of the potential adverse consequences of future floods.

The aspects required to be included in the preliminary assessment of the risk of flooding include:

- Description of historic floods which had significant adverse impacts and for which the likelihood of similar future events is still relevant including:
    - Adverse impacts on human health, environment, cultural heritage and economic activity.
    - Flood extent and conveyance routes.
- Description of historic floods which might have significant adverse consequences in the future.
- Assessment of potential consequences of future floods including:
    - Adverse consequences on Human Health (Social).
    - Adverse consequences on Environment.
    - Adverse consequences on Cultural Heritage.
    - Adverse consequences on Economic activity.
- And taking into account issues such as:
    - Topography.
    - Position of water courses.
    - Hydrological and geomorphological characteristics (e.g. floodplains as natural retention areas).
    - Effectiveness of existing man-made flood defences.
    - Position of populated areas.
    - Areas of economic activity.
    - Long term developments (e.g. impact of climate change on occurrence of floods).

5.1 Application of Article 13.1(a) or 13.1(b)

This section summarises the main conclusions from the MS assessments on the use of transitional arrangements under Article 13.1. A detailed break-down by MS is provided in Annex 3.

5.1.1 Application of Articles 13.1(a) and 13.1(b)

In total, ten MSs chose to implement Article 13.1(a), Article 13.1(b) or a combination of Articles 4 and 5 as well as Article 13.1(a) and Article 13.1(b). These are summarised in Table 5.

Table 5 Application of Articles 13.1(a) and 13.1(b)

- Articles Applied	Member States
Article 13.1(a) in whole country	LV, LU
Article 13.1(b) in whole country	BE, IT, NL, PT
Combinations of Articles 4, 5, 13.1(a) and/or 13.1(b)	DE, ES, SK, UK

Application of Article 13.1(a)

Latvia is applying Article 13.1(a) in the whole country, having already undertaken a risk assessment to conclude, before 22 December 2010, that a potential significant flood risk exists or might be considered likely to occur, leading to the identification of APSFR.

Luxembourg bilaterally communicated to the Commission that they were applying Article 13.1(a) and only reported to WISE on APSFRs indicating that 15 had been identified, as also stated in the international PFRAs of the Rhine and Meuse international River Basin Districts.

Application of Article 13.1(b)

Belgium, Italy, the Netherlands and Portugal have communicated they are applying Article 13.1(b) and therefore decided, before 22 December 2010, to prepare flood hazard maps and flood risk maps and to establish FRMPs in accordance with the relevant provisions of this Directive. In terms of XML reports to WISE, Belgium, Italy and the Netherlands only reported that they had applied Article 13.1(b), and Portugal did not report at all.

Combinations of Articles 4, 5, 13.1(a) and/or 13.1(b)

Four MSs (Germany, Spain, Slovakia and the United Kingdom) have chosen to implement a combination of Articles 4 and 5, as well as Article 13.1(a) and Article 13.1(b).

Germany applies Article 4, Article 13.1(a) and Article 13.1(b) in some UoMs (RBDs) and for selected flood types.

For three UoMs in Spain, Article 13.1(a) is applied, while for all other UoMs in Spain the requirements of Article 4 are relevant.

Slovak Republic has two UoMs: Article 4 has been applied to one and Article 13.1(b) to the other, for all relevant types of flooding.

For the United Kingdom, Article 13.1(b) has only been applied to the UoMs in England and Wales and only to the main rivers and large raised reservoirs and sea water. Article 4 has been applied to flooding from ordinary (minor) watercourses and all other sources of local flooding (groundwater and pluvial) in England and Wales. For all other UoMs in the United Kingdom (Scotland and Northern Ireland) Article 4 has been applied to all relevant types of flooding.

5.1.2 Types of flood

This section examines whether all types of flood that might be reasonably expected in the MS are included in the assessment of the risk of flooding under Article 4, Article 13.1(a) or Article 13.1(b). A summary is shown in Table 6 below.

Table 6 Types of flood included in assessment of risk of flooding under Article 4, Article 13.1(a) or Article 13.1(b)

Types of Flood Included	Member States
All types	DE[3], NL
Only specific types	UK, LV[4], ES[5], LU[6], SK[7]
No information available	BE, IT, PT

All types of floods that might be reasonably expected in the MS are included in the assessment of the risk of flooding under Article 13.1(a) and Article 13.1(b) for Germany (with the exception of DE7000, for which no information on the flood types considered is available) and the Netherlands.

In the United Kingdom, only specific floods were considered for the application of Article 13.1(b) (only the main rivers and large raised reservoirs and sea water). In Latvia, pluvial floods and floods from groundwater were not included in the application of Article 13.1(a), as pluvial floods were not considered a significant risk and floods from groundwater are not expected. In all UoMs in Spain applying Article 13.1(b), all types of floods were included. However, in the UoMs of the Canary Islands (which are applying Article 4) only floods from

[3] For RBD DE7000 no clear information available.
[4] pluvial floods and floods from groundwater are not covered.
[5] All types with the exception of the Canary Islands where only sea water floods are covered; Canary Islands are applying Article 4.
[6] Only pluvial floods are covered; no further information available.
[7] Only fluvial floods are covered.

sea water were considered. The only available information for Luxembourg lists 15 APSFRs based on pluvial flood risk; it is not clear whether any other types of risk have been assessed or considered (no other information is available in the WISE Aggregation Reports). However, sea water is clearly not relevant as Luxembourg is land-locked. Article 13.1(b) has been applied to one UoM in Slovakia and all relevant types of floods were included.

No information on the types of floods considered is yet available for Belgium, Italy and Portugal.

5.1.3 Aspects considered in the application of Article 4

This section considers whether any of the aspects required by Article 4 were not considered in the application of Article 4. A summary of the main aspects considered in each MS is provided in Table 7.

The majority of aspects have been considered in the majority of MSs; six MSs have reported that all aspects have been considered, while six other MSs have applied either Article 13.1(a) (two MSs) or Article 13.1(b) (four MSs). For the remaining MSs, the aspects most commonly not considered include the effectiveness of man-made flood defences (eight MSs); conveyance routes of historical floods (six MSs); geomorphological characteristics (six MSs); and areas of economic activity (five MSs). Consideration of long-term developments appears to be quite inconsistent across MSs, with five MSs not considering long-term developments at all, four further MSs not considering climate change as an aspect of long-term developments, and one MS only considering climate change in terms of long-term developments.

Table 7 Summary of aspects considered in the application of Article 4

Member State	Main Findings
AT	All aspects appear to have been considered for all UoMs and all flood types
BE	Article 13.1(b) applied – not applicable
BG	Not all information is reported. Hydrological and geomorphological characteristics in terms of natural retention areas are not considered.
CY	All aspects for the identification of the APSFR are reported to have been considered
CZ	The reporting explicitly describes the aspects and issues that are considered in the application of Article 4. Those aspects not mentioned (and therefore potentially not considered) are: (under historic floods) human health, environment, cultural heritage and economic activity impacts, as well as flood extent, conveyance routes and historic floods with significant adverse consequences in the future; and (under future floods) impacts on human health, environment, cultural heritage and economic activity.
DE	All required aspects considered in all UoMs.
DK	A number of aspects are not considered or not fully considered. The description

	of historic floods does not explicitly take into account flood conveyance routes. Adverse consequences for human health, environment and cultural heritage are not considered in detail (they are mapped but consequences not described). Similarly, adverse consequences on economic activity are not considered in detail – only property values and the number of affected addresses are considered. Climate change is the only long-term trend considered.
EE	Conveyance routes of historic floods do not appear to have been considered. In addition, it appears that geomorphological characteristics and the effectiveness of existing man-made flood defences were not considered. Estonia has subsequently indicated that geomorphological characteristics were taken into account in the delineation of flood zones, and that flood conveyance routes are most significant for flash floods, which are not common in Estonia in comparison with sea water and fluvial flooding.
EL	The aspects that seem to be missing are: an assessment of historic floods which might have significant adverse consequences in the future; an assessment of the effectiveness of existing man-made flood defences; and the consideration of long-term developments.
ES	All aspects considered under Article 4. In the majority of UoMs, all flood types are considered with the exception of the Canary Islands, where only sea water flooding is considered.
FI	All aspects are considered for the majority of Finland, with the exception of the Aland Islands, for which no information is reported. Finland has subsequently indicated that this is because no significant floods have occurred in the Aland Islands.
FR	All relevant aspects are considered.
HR	Conveyance routes of historic floods and geomorphological characteristics do not appear to have been considered. In addition, long term developments have not been considered, including the impact of climate change.
HU	The extent of historic floods has not yet been assessed in detail, but should be covered in a future phase. It is not clear which types of consequences of future floods have been considered but there is information on the possible harmful effects of future floods. It is not clear if the issues including topography, position, hydrological and geomorphological characteristics, effectiveness of flood defences, position of populated areas, areas of economic activity and long-term developments have been considered.
IE	Economic activity was not considered in detail as statutory planning guidance was introduced in 2009 to prevent development in flood-prone areas. Other relevant aspects were considered.
IT	Article 13.1(b) applied – not applicable
LT	Flood events with adverse effects on human health and environment have not been identified, and a description of the adverse consequences of historical floods on cultural heritage is not provided. In addition, the potential

	consequences of future floods are not adequately described. Lithuania has subsequently indicated that the assessment considered that all extreme flood events would cause adverse consequences.The following issues were not specifically addressed in the assessment of the risk of flooding: effectiveness of existing man-made flood defence infrastructures; position of populated areas; and areas of economic activity.
LU	Article 13.1(a) applied – not applicable
LV	Article 13.1(a) applied – not applicable
MT	Little detailed information is available but most aspects appear to have been considered. The effectiveness of man-made flood defences is not considered because these do not exist in Malta.
NL	Article 13.1(b) applied – not applicable
PL	There is no mention of various aspects, which indicates they were not considered. These are: flood conveyance routes; position of water courses; hydrological characteristics; effectiveness of existing man-made flood defences (this could have been covered by an analysis of water devices and their effect on floods protection but it is not explained in sufficient detail); position of populated areas; and areas of economic activity. Poland has subsequently clarified that this information was taken into account at different stages of development of the PFRA and the designation of APSFRs, but that there is a need to supplement this with detailed data in the next planning cycle.
PT	Article 13.1(b) applied. No information reported to WISE.
RO	Within long-term developments, the impacts of climate change have not been considered due to insufficient information. It is expected that this aspect will be included in future, as national guidelines for adaptation to climate change are currently under development.
SE	Most aspects are considered, with the exception of climate change as a long-term development, and the effectiveness of man-made flood defences (which are not mentioned). The adverse consequences of floods are assessed on a qualitative level, rather than quantitatively. Only fluvial floods are considered, with a focus on urban areas (where most of the significant adverse consequences would occur).
SI	Position of populated areas and areas of economic activity were not considered as important because protective measures are being implemented to impose restrictions on construction and activities in flood-prone areas. Mitigation measures to reduce flood risk have to be implemented where existing infrastructure is to be enlarged or developed in flood risk areas. The impacts of climate change were not considered as current trends do not demonstrate significant changes in the incidence of flooding.
SK	All relevant aspects are considered.
UK	Scotland and Gibraltar: all aspects considered. Northern Ireland: most aspects considered, with the exception of the geomorphological characteristics of water courses (which were only partially considered due to uncertainties) and the

	effectiveness of flood defences (excluded from indicative modelling due to uncertainties over current levels of protection). England and Wales: most aspects have been covered but there are some limitations in data used to identify areas susceptible to groundwater flooding and data on geomorphological characteristics. Subsequently the UK has indicated that groundwater will be considered in England and Wales after recent flood events. In addition, in terms of surface water flooding there was no readily available or derivable information about the effectiveness of existing man made infrastructure (drainage).

Aspects considered in assessing risk of flooding under Article 13.1(a)

This section explores whether the aspects that are required by Article 4 were considered when producing an assessment of the risk of flooding under Article 13.1(a).

All aspects required by Article 4 were considered when producing an assessment of the risk of flooding under Article 13.1(a) in Germany, Spain, Luxemburg and Latvia. In Latvia, the only aspect not considered was floods victims, as these are not registered and are not considered to be of relevance for this Member State. In Luxemburg, the Article 4 requirements were broadly followed; however, the information is not always complete and clear.

Aspects considered when producing Flood Hazard Maps, Flood Risk Maps and Flood Risk Management Plans under Article 13.1(b)

This section explores whether any of the aspects required by Article 6 and 7 were not considered when producing Flood Hazard Maps, Flood Risk Maps, and FRMPs under Article 13.1(b). A summary is provided in Table 8.

Table 8 Aspects considered in producing an assessment of the risk of flooding under Article 13.1(b), as required by Articles 6 and 7

All Aspects Considered?	Member States
Yes	DE, SK (UoM SK40000FD)
No	(none)
No information available yet	BE, IT, NL, PT, SK, UK,

All aspects required by Article 6 and 7 were considered when producing Flood Hazard Maps, Flood Risk Maps and FRMPs in Germany. No information is available yet for Belgium, Italy, the Netherlands, the United Kingdom and Portugal.

There are four MSs (Belgium, Italy, the Netherlands and Portugal) applying Article 13.1(b) in the whole country and three MSs (Germany, Slovakia and the United Kingdom) applying Article 13.1(b) in part of the country or for specific floods. These MSs have decided, before 22

December 2010, to prepare Flood Hazard Maps and Flood Risk Maps and to establish FRMPs in accordance with the relevant provisions of this Directive.

Regarding the consideration of aspects required by Article 6 in these MSs applying Article 13.1(b) in the whole country or only parts of it or for specific floods, the following can be summarised:

- Germany is the only MS among those applying Article 13.1(b) for which information is available to show that all aspects required according to Article 6 are taken into account in the preparation of the Flood Hazard Maps and Flood Risk Maps.

- As for the application of Article 13.1(b) in the United Kingdom, the only information reported to WISE on Article 13.1(b) methodologies was on the overall approach. A search of the Environment Agency of England and Wales' website did not locate any detailed methodological reports on the basis of existing Flood Hazard Maps and Flood Risk Maps. The statement that existing maps will be adapted to meet the requirements of the Floods Directive implies that the current maps do not cover all aspects outlined in Article 6.

- Belgium, Italy, the Netherlands and Portugal were not required to provide to WISE any information or methodologies used regarding the consideration of Article 6 or 7 aspects as a result of applying Article 13.1(b).

6. Types of Significant Floods Included and Excluded in the Assessment of Flood Risks

Article 2(1) of the FD provides a list of certain types of floods that are covered by, or fall within the scope of, the Directive (floods from rivers, mountain torrents, Mediterranean ephemeral water courses and floods from the sea in coastal areas). However, it is not stated that the scope of the definition of a flood is limited to these types of flood. As such, the scope of the definition of a flood must be considered to be open and all-inclusive (subject to possible exemption of sewer flooding), and that any covering of land by water (other than that 'normally' covered by water) represents a flood, regardless of the source of the water.

The Working Group F on Floods (WGF) has produced an informal paper on the scope of the FD for types of floods.[8] There was a general agreement and understanding that:

- Generically insignificant floods and random events, while recognised as being floods under the strict definition of the FD, should not require any detailed assessment under the PFRA, and may be discarded as not being a cause of significant floods with a simple statement.

- Floods arising from flood defence failure (overtopping and breach) do constitute 'floods' and may give rise to significant risk, and should be assessed in the same manner as other potentially significant types of flooding.

Article 2(1) also states that the definition of a flood may exclude 'floods from sewerage systems'. The exclusion, or otherwise, of this type of flood is for the MS to decide. However, there may be different interpretations as to what constitutes a flood from a sewerage system, based on the definition of a sewerage system, and the mechanism by which the flood is caused.

The WGF also produced a list of flood types specifically to aid the reporting on information by MSs to the Commission; these are shown in Table 9.

[8] *WGF8-12-IP-1 - Types of Floods - Rev 2 - 101018*

Table 9 Flood types as described by the WGF

Source	Description
Fluvial	Flooding of land by waters originating from part of a natural drainage system, including natural or modified drainage channels. This source could include flooding from rivers, streams, drainage channels, mountain torrents and ephemeral watercourses, lakes and floods arising from snow melt.
Pluvial	Flooding of land directly from rainfall water falling on, or flowing over, the land. This source could include urban storm water, rural overland flow or excess water, or overland floods arising from snowmelt.
Groundwater	Flooding of land by waters from underground rising to above the land surface. This source could include rising groundwater and underground flow from elevated surface waters.
Sea water	Flooding of land by water from the sea, estuaries or coastal lakes. This source could include flooding from the sea (e.g. extreme tidal level and/or storm surges) or arising from wave action or coastal tsunamis.
Artificial water-bearing Infrastructure	Flooding of land by water arising from artificial, water-bearing infrastructure or failure of such infrastructure. This source could include flooding arising from sewerage systems (including storm water, combined and foul sewers), water supply and wastewater treatment systems, artificial navigation canals and impoundments (e.g. dams and reservoirs).
Other	Flooding of land by water due to other sources, can include tsunamis.

The reporting of 'source of flooding' was generally mandatory. However the guidance for reporting according to the PFRA schema indicates that if no specific flood types have been reported for an applied Article then it is assumed that the Article has been applied to all flood types.

For any type of flood where historic and, where relevant, predictive assessments indicate that the risk or potential adverse consequences associated with that type of flooding are significant, then MSs should assess that type of flood in full accordance with the requirements of the PFRA, as set out in the FD and as appropriate to the flood risk context, available and readily-derivable information, approaches to the PFRA etc., of the MSs.

Different types of sources of flooding will have widely ranging relevance, probabilities of occurrence and degrees of consequence in different MSs or UoMs. It is expected that the degree of analysis undertaken as part of the PFRA should be commensurate and proportional to the potential consequence associated with each type of flooding. If a type of flood has not given and/or is not foreseen to give rise to 'significant' adverse consequences then it might be expected that this conclusion is outlined in the summary text of the PFRA.

The informal paper on requirements for assessment under PFRA produced by a Drafting Group of the WGF gives examples of where types of flood might be excluded from the PFRA. These include:

- Generically insignificant floods in terms of adverse consequences and random events which are unpredictable in terms of location, probability and degree of consequence.

- Type of flooding not possible or relevant (e.g. coastal tsunami flooding in land-locked MSs, or floods arising from ice-jams in southern European MSs where watercourses do not freeze).

- No evidence of occurrence of particular types of flooding.

- No evidence of significant risk arising from a type of flooding.

- Ultra-low probability floods (e.g. a dam-break situation or the breach of defences designed.

Some MSs have indicated that they decided to make use of Article 13.1(b) and no information has been made available to assess the types of significant floods.

6.1 EU overview

The types (source-mechanism-characteristic) of historic and potential future floods reported by MSs have been aggregated at the EU level and are illustrated in Figures 4 and 5, respectively. Because a few MSs (Spain, France and Poland) have reported a high proportion of the total events reported at the EU level, the figure is based on the percentage of each type of the total events in each MS and then averaged across the MSs reporting historical flood events. Basing the figure on the total events of a type across EU would bias the overview to a few highly reported/common types in a few MSs.

By far the most common source of reported historical flood events is fluvial (66% of events) followed by pluvial (20%) and sea water (16%) (Figure 4). The least common is for artificial water bearing infrastructure and groundwater (both 1%). The most common mechanism is natural exceedance (51% of events). In general the characteristics of flooding are less often reported for historical floods with around 19% of events having no data on this aspect.

In terms of potential future floods the most common source of flooding is again fluvial (76% of reported events) and the least from groundwater and artificial water bearing infrastructure (both 2%) (Figure 5). Natural exceedance was the most common mechanism (45%) and medium onset floods (25%) the most common characteristic.

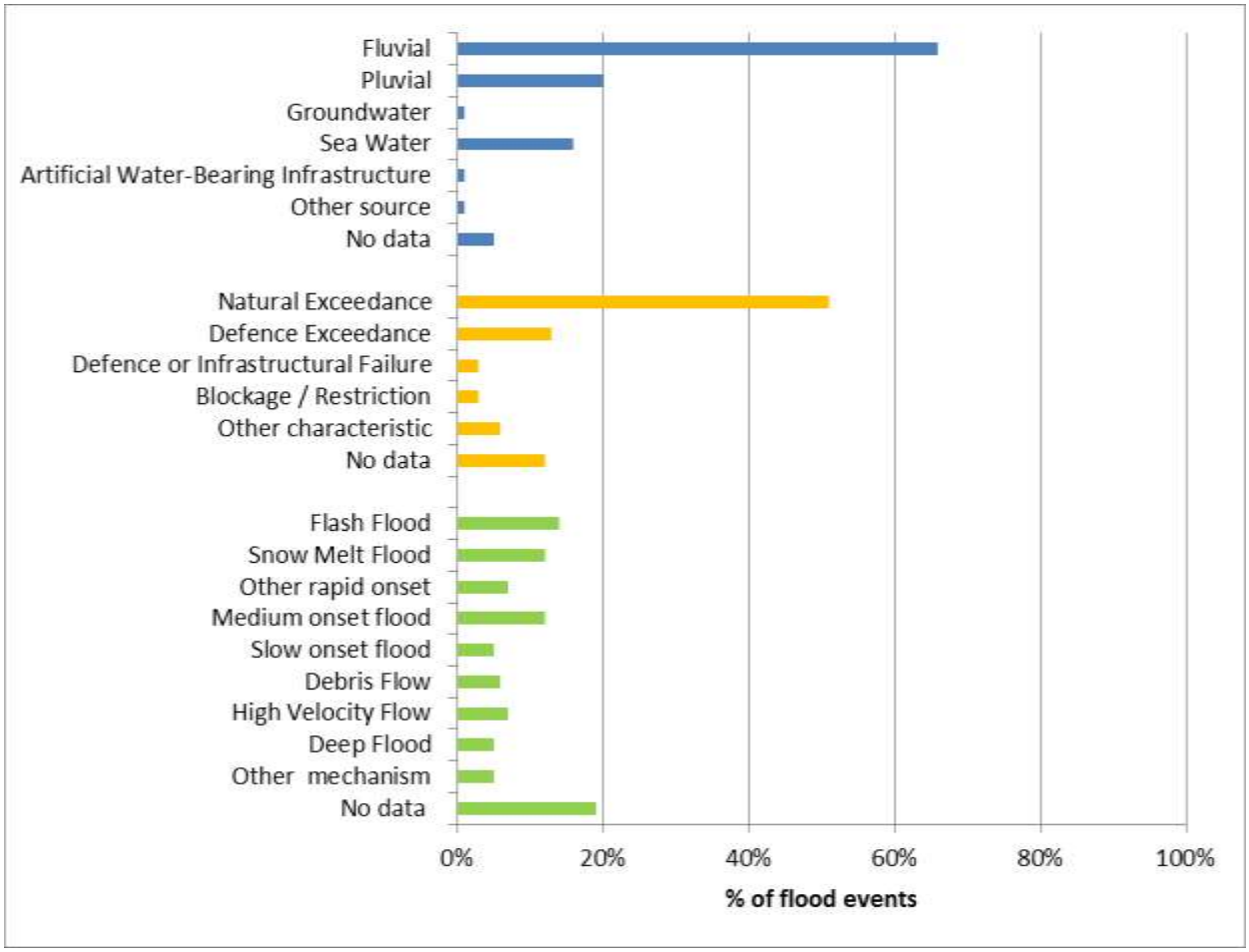


Figure 4 Source-characteristic-mechanism of historic flood events

Based on 15,660 reported flood events from AT, BG, CY, CZ, DE, DK, EE, EL, ES, FI, FR, HR, IE, LT, LV, PL, RO, SI, SK, UK;. MT and LU reported zero events; HU and SE reported historic events but not their type; SE provided a text summary of each historic flood event that contained details of types of flood etc. The specific data has therefore not been extracted from the reported text descriptions and is not included in the Figure above. BE, IT, NL applied Article 13.1(b) and PT did not report to WISE. LU has subsequently indicated that four events had been assessed.

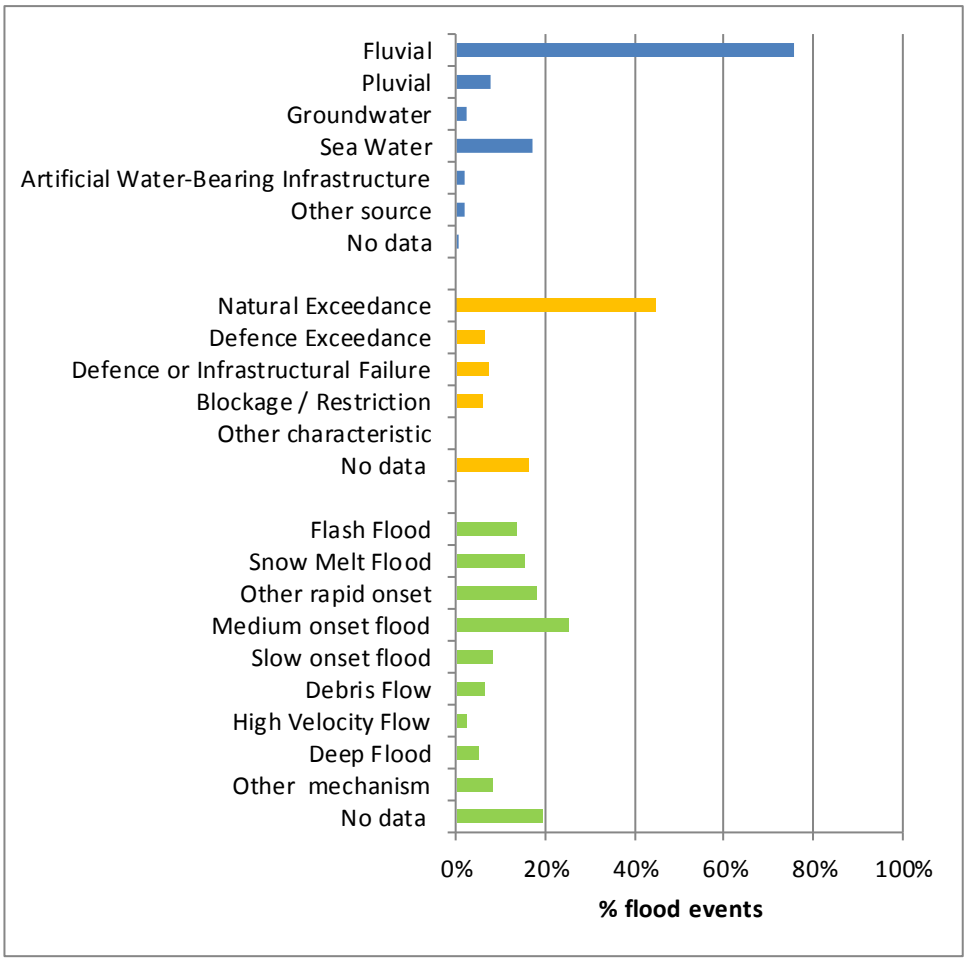


Figure 5 Source-characteristic-mechanism of potential future flood events

Based on 10,274 reported flood events from AT, BG, DE, DK, ES, FI, FR, LT, PL, SI, UK. IE reported 426 potential future flood events to WISE but as descriptive text, which was not suitable for automatic extraction and therefore not assessed or included in the figure above. No future flood events reported by: CY, CZ, EE, EL, HR, HU, LU, LV, MT, RO, SE, SK, BE, IT, NL applied Article 13.1(b) and PT did not report to WISE. LU has subsequently indicated that four events had been assessed.

6.2 What were the types of floods considered/not considered within the auspices of the Floods Directive?

Some MSs (Belgium, Italy, Netherlands and Portugal) have indicated that they decided to make use of Article 13.1(b) and so no information on types of significant floods was required or supplied.

The results of the assessment of MSs' WISE reports and supplementary information are very diverse. Some MSs clearly indicated to have considered all types of floods but did not specify in detail (Bulgaria, Spain (not all UoMs), France, Malta, Romania). This is indicated by the light grey shading of cells in Table 10.

It is implied that sea water floods are not relevant for landlocked MSs (e.g. Luxembourg, Slovakia), however, this is not always clearly indicated by the MS. Sweden has excluded sea water floods but will include these in the next reporting cycle.

Most MSs were clear on which types of floods had been considered, but did not specify whether other types had not been considered at all under the auspices of the FD. MSs do not clearly state if floods were not considered because of their relevance, because of the absence of data or if it is to be expected that they will be included in the next reporting cycle.

Some MSs comprise different countries (United Kingdom) or regions with very distinct characteristics like Islands (e.g. Spain, Finland). This results in a diversified reporting.

The types of floods indicated were not always in concurrence with the types of floods specified in the FD. For these types of floods the reviewer has interpreted the answers; this interpretation is included in Table 10.

Table 10 Summary of the sources of floods considered in the assessment of flood risk

Source	Member State																										
	AT	BE	BG	CY	CZ	DE	DK	EE	EL	ES	FI	FR	HR	HU	IE	IT	LT	LU	LV	MT	NL	PL	PT	RO	SE	SI	SK	UK
Fluvial																												
1																												
2																												
3																												
Pluvial																												
4																												
5																												
6																												
Groundwater																												
Sea Water																												
7																												
8																												
9																												
10																												
AWBS																												
11				[9]																								
12																												
13																												
14																												
15																												
16																												
17																												

Key:

yes included	Fluvial	Pluvial	Sea water	Artificial water-bearing Infrastructure (AWBS)
not considered as significant	1.Rivers	4. Urban storm water	7. Sea	11. Sewerage systems - storm water
excluded	2.Drainage channels	5. Rural overland	8. Estuaries	12. Sewerage systems - combined
not yet included	3.Natural lakes	6. Overland - snowmelt	9. Coastal lakes	13. Sewerage systems - foul sewers
no information / not clear			10. Tsunamis	14. Water supply
				15. Wastewater treatment systems
				16. Artificial navigation canals
				17. Impoundments (e.g. dams and reservoirs)

[9] Cyprus considered storm water flooding in sewerage as part of pluvial flooding.

6.3 What were the criteria used to define historical significant floods and what were the reasons for not including some types of flood that occurred in the past?

Criteria to define historical significant floods and reasons for not including some types of floods that occurred in the past are very diverse. A common denominator cannot be deduced. The findings from the assessment of MS information are summarised in Table 11.

There is a differentiation between types of floods in the criteria and the thresholds used for assessing significance of types of floods. Some MSs only perceive certain types of floods as significant. Criteria used are very diverse and related to:

- impacted area (ha), impacted people/km^2, amount of buildings affected, fatalities;
- damage caused (human health, economic activities, environment and /or cultural heritage);
- required amount of monetary compensation;
- return period, extent and duration of the occurrence;
- sometimes specified per type of floods;
- whether a specific flood warning level was triggered; and
- specific weighing systems were defined to assess the significance.

Hence, a very broad spectrum of criteria was used to define historical significant floods;

Except for the criteria mentioned above, reasons for not including floods that occurred in the past included:

- non-comparability of hydrological circumstances (too long ago);
- damage during floods not comparable to the damage that will occur with actual land use (significant changes of land use); and
- the absence of historical evidence for their occurrence and/or significance.

Some MSs have not provided information on the criteria used to define significant historical floods. If criteria were not used or they were wrong, this could lead to floods being underestimated and APSFRs being assigned incorrectly.

Table 11 Summary of assessment of Member States' WISE reports and available supplementary information

MS	Criteria to define significant historical floods	Reasons for not including some types of floods that occurred in the past
AT	Past events with significant damages to human health, economic activities, environment and cultural heritage, or floods that meet thresholds regarding affected areas (populated or economically utilized), affected amounts of people, fatalities, monetary damage (including infrastructure and cultural heritage), disruption of drinking water supply and ecological damage.	Events before 1900, damage is not comparable with actual land use.
BE	Article 13.1(b) applied – not applicable.	-
BG	A common methodology (national level) has been applied, including unified system of criteria: human health, environment, cultural heritage and economy.	No exclusion criteria are reported, except the limit value for the probability of occurrence 1%. BG has since indicated that past floods considered unlikely to be repeated in the future (due to flood protection measures) were not included.
CY	human casualties, effects on health, economic activity, cultural heritage, environment.	
CZ	Different criteria for each type of flood including probability, economic damage affected area, casualties.	For pluvial and fluvial floods, floods that occurred before 1968 were excluded.
DE	Area flooded, probability and population density in flooded areas. The thresholds are set regional specific. Detailed criteria are costs, casualties, impact on public buildings, potential pollution, cultural sites, significant damages to human properties related to economic growth (tourism, agriculture, industry and business, traffic infrastructure).	
DK	For sea water floods: considerable historic damage; expected considerable damage, if the same flood would happen today; enough data available and data quality is good enough to reconstruct the flood event. For fluvial floods the criteria are extent of damage, secondary flood area and potential damage, if the same flood would happen today.	
EE	Failure of storm water system; prevention of the operation of hospitals, kindergartens, schools and public buildings; significant negative impact on a Natura 2000 site; destroyed or damaged cultural heritage sites; presence of an existing flood plan for the urban area; real threat to human life; and prevention of traffic flow on the main roads.	
EL	Human victims, the amount of monetary (state) compensation required, size of flooded area.	
ES	Different criteria, referring to the methodology included in the Spanish guidance document, and previous studies/methodologies such as CTEI 1980.	
FI	No specific criteria given. Finland has subsequently	

MS	Criteria to define significant historical floods	Reasons for not including some types of floods that occurred in the past
	noted that the national coordination group for flood risk management decided on 20.6.2011 that the floods defined by Section 8 of Finland's Flood Risk Management Act will be reported to the EU Commission if similar flooding and the resulting adverse consequences are still possible in the future.	
FR	Damage and casualties, topology of flood, course of the event, impacts (human health, environment, cultural heritage and economic activity).	Small-scale flooding with no significant damage.
HR	Assessed on an expert basis using information on flood duration, reasons, mechanisms, consequences and the number of inhabitants endangered by floods.	
HU	Human health (no. of deaths, or caused life-threatening, threatened the provision of health care, or had any infection risk), environment, endangered or damaged cultural heritage, or hampered economic activity or significant economic damage.	
IE	Criteria specified to categorize floods according to historic hazard categories (from 1 to 4 (greatest hazard)). An indicator of the historic risk was also derived based on the recorded economic damages and/or the number of properties affected by past floods.	
IT	Article 13.1(b) applied – not applicable.	-
LT	Territory flooded with a probability of 1% or lower; rise of water level above certain level.	
LU	No information available.	
LV	No exact criteria found. Latvia has since indicated that historical significant floods were determined taking into account size and distribution of floods and financing needed to cover flood damages.	
MT	No clear-cut criteria for defining historic significant floods have been designed.	
NL	Article 13.1(b) applied – not applicable.	-
PL	Reports state different methodologies including criteria like negative effects on human life and health, environment, cultural heritage and economic activity. Poland has subsequently clarified that the country's definition of flood includes only events that have significant adverse consequences and so all the data recorded are for floods of this type.	
PT	Article 13.1(b) applied – not applicable but did not report to WISE.	-
RO	Location, timing, length, probability of occurrence, type of flood, the magnitude of associated negative effects, human health, economic activity, environmental damage, cultural heritage.	Floods with probability of occurrence over 10% were not taken into consideration.
SE	The affected water body, extension of the flooded areas, date and duration of the flood, whether the area had been flooded before and which year, adverse effects on human health, environment, cultural heritage, economic activities and evaluation on whether	Only fluvial floods are considered. Pluvial floods are unpredictable and not enough information is available. These flood types will be included in the next reporting cycle.

MS	Criteria to define significant historical floods	Reasons for not including some types of floods that occurred in the past
	a similar flood happening again would have the same, less or more serious consequences.	
SI	Number of deaths, damages on property, damages on infrastructure, including cultural heritage.	The reason for excluding some types of flood (storm sewage, flash floods, groundwater) was the absence of historical evidence for their occurrence and/or significance
SK	Occurrence of floods between 1997 and 2010 and their adverse impacts on human health, environment, cultural heritage and economic activity	Definition of flood in Slovakian law does not include flooding from sewerage, water supply and wastewater treatment systems.
UK	Human Health, Economic Activity, Environment and Cultural Heritage	

6.4 What methods and criteria were used to identify potentially significant future floods and what were the reasons for not including some types of potential future floods?

A summary of the methods used to identify potentially significant future floods is provided in Table 12 below. The main findings include:

- some MSs give detailed descriptions of their method including a number of steps;
- some MSs mention criteria but do not indicate which methods were used to identify potentially significant future floods;
- analysis has been made using the source, time of occurrence, topography and morphology, and other parameters related to the potential adverse impact;
- flood simulations and (simplified) modelling (including scenarios with climate change) with the help of digital elevation models to calculate flood areas and to produce flood maps. These maps have been combined with land use maps to identify potentially significant floods;
- reconstruction of (maps of) historical floods based on readily available information;
- Multi-criteria GIS; and
- earthquake scenarios were used to assess the significance of future floods caused by tsunamis.

Some MS did not provide any information at all on the criteria used. If criteria were not used or they were wrong, this could lead to floods being underestimated and APSFRs being assigned incorrectly. Other MS indicated using the following:

- human health, environment, cultural heritage and economy;
- recurrence periods;
- recurrence periods in combination with land use;
- flood levels, flow velocity, depth;
- product of velocity and depth;
- the value of property affected;
- the number of permanent residents aggrieved by the flood extent in flood plains;
- the presence of polluted territories in flood prone areas; and
- whether floods have occurred in the past.

The main reasons found for not including types of floods were:

- the absence of data,
- the occurrence of the type of flood is very unlikely;
- dam failure, groundwater floods outside the floodplain and pluvial floods were excluded as it was considered impossible to have information available or readily derivable; and
- no measures are feasible to mitigate effects.

Table 12 Summary of assessment of Member States' WISE reports and available supplementary information on method and criteria used to identify potentially significant future floods

MS	Methods and criteria were used to identify potentially significant future floods	Reasons for not including some types of potential future floods
AT	No method of concrete criteria mentioned.	Only fluvial flooding lead to significant adverse consequences in Austria
BE	Article 13.1(b) applied – not applicable.	
BG	A common methodology (national level),	

MS	Methods and criteria were used to identify potentially significant future floods	Reasons for not including some types of potential future floods
	including unified system of criteria related to the four categories: human health, environment, cultural heritage and economy. Additional analysis has been made according the source, time of occurrence, topography and morphology, and other parameters related to the potential adverse impact. Comparison in GIS environment.	
CY	Cyprus developed and used an 8-step approach. (the practical implementation of the approach and the results of each step were reported to WISE).	
CZ	The identification of potentially significant future floods used two major criteria: (i) the number of permanent residents aggrieved by the flood extent in flood plains and (ii) the value of property aggrieved by the flood extent in flood plains for several probabilities of occurrence (for return periods of 5, 20, 100 years at least).	
DE	Modelling to calculate the flood areas and assessing the risks on a combination of these flood maps and land use data.	Groundwater floods and floods from AWBS are not considered significant. Pluvial floods are local events and also not considered significant.
DK	For sea water two historic floods were selected per coastal stretch. Climate change scenarios were used to model future levels of 1/1000 year floods and the foreseen damage was assessed. If the damage was significant these floods were classified as potentially significant future floods. For fluvial floods a 1/100 year flood was constructed for catchment covering at least 200km^2 and flowing through areas with high building densities. Potentially significant future floods were selected applying the criteria potential damage and secondary flood area.	
EE	Maps of historic floods were reconstructed based on readily available information. A number of principles were applied to assess the future significance. It is not clearly indicated what these principles are. No potential future significant floods were reported to WISE.	Potential flooding from dam breaks and mine waters (rising groundwater) were excluded because it was thought that any future risk could be contained by suitable preventative measures.
EL	These floods were defined by combining the results from the identification of significant historical floods, the identification of areas where flooding can occur and areas with potentially significant adverse consequences of future floods. The method for a first assessment has not been described in detail. Detailed assessment is only done for areas larger than 25km^2. Areas with significant flooding and more than four floods but which are not in areas of	

MS	Methods and criteria were used to identify potentially significant future floods	Reasons for not including some types of potential future floods
	potential flooding, will be individually investigated in the FRMPs.	
ES	Flood simulations for different recurrence periods. A multi-criteria GIS valuation of future significant floods has been developed, based on land-use data and on flood estimation.	
FI	A GIS method was used for the PFRA in Finland using land use data and simulated floods for flood prone areas. Flood maps have been prepared for river and sea flooding.	
FR	There is no specific information on criteria used to identify potentially significant future floods.	
HR	Risk assessment is used to classify flood events as high, moderate, low or insignificant flood risk. No information is reported on methodology but it is expected that the assessment is based on past flood events.	Groundwater flooding not assessed due to lack of data.
HU	For selection criteria no other reason than only “these type of floods occurred in the past” was given. Hungary has since indicated that fluvial and groundwater floods are considered significant for large areas and pluvial floods were considered for populated areas.	
IE	A predictive assessment of future floods undertaken. Indicative flood maps were used for a first assessment. For sea water and precipitation models were used to simulate floods and prepare maps. For groundwater expert judgement was used to prepare flood maps as the availability of data was insufficient to use models. Historic records were used where available. Ireland have since indicated that for fluvial flood maps, flood extents were calculated using national flood flow estimation tools, a national digital terrain model, hydraulic analysis and GIS analysis. The determination of the significance of the floods made use of a national risk assessment.	Predictive mapping of flooding due to breaches of reservoirs or burst water mains has not been carried out because of a lack of currently available or readily-derivable information.
IT	Article 13.1(b) applied – not applicable.	
LT	Spatial analysis tools were used based on the 1% probability spring flood discharge.	
LU	It is not clear what specific methods and criteria were used.	
LV	Detailed studies have to be carried out. No methods are indicated. Potential future flood assessment is based on the KALME project (local scientific application of climate change prognosis for the Eastern Europa region). Project KALME was a local component of an EU-led project for the Nordic and Baltic States.	
MT	The PFRA only considers future floods due to	

MS	Methods and criteria were used to identify potentially significant future floods	Reasons for not including some types of potential future floods
	rain and sea water. No specific methods or criteria are mentioned.	
NL	Article 13.1(b) applied – not applicable.	
PL	Some information is provided on how significant floods and potentially significant future floods were identified but no clear method nor criteria have been detailed. Poland has subsequently clarified that only fluvial and sea water floods with probability of occurrence or 1% or more were considered.	No reasons are given on why certain types of floods were not included. Based on data collection for areas potentially at risk of flooding only two types qualified as APFR – river and sea water. No information was reported on other types of floods. Poland has subsequently indicated that pluvial, groundwater and floods from AWBS were not considered significant other than in combination with fluvial flooding.
PT	Article 13.1(b) applied – not applicable and did not report to WISE.	
RO	The evaluation of potentially significant future floods was based on (1) the most complete and homogenous data sets at national level concerning the future potential flooded areas and (2) a set of indicators showing the risk exposure for human health, environment, cultural heritage, economic activities. Romania has since indicated that the potential impact of flooding on goods, the population, infrastructure and agricultural areas, areas of significant past floods now protected by hydrotechnical works and areas that could be flooded as a results of dam failure were also taken into account.	
SE	Only fluvial floods have been addressed and eight criteria were used to define potentially significant future floods, related to number of affected people combined with different recurrence periods, human health, economic effects, environmental effects, cultural heritage, and whether these floods have occurred in history.	
SI	The available information on Slovenia indicates five different types of information sources that have identified significant future floods. No detailed method or criteria are provided on how these sources came to these assessments.	
SK	Type of constructions affected, and recurrence periods for different types of land use.	
UK	In Scotland the location of future floods is primarily predicted. Information on historic floods is used to validate the predictions. Predictions are used to determine Potentially Vulnerable Areas. In England and Wales, computer models were used to generate information on future floods. In Northern Ireland the future flood risk is	

MS	Methods and criteria were used to identify potentially significant future floods	Reasons for not including some types of potential future floods
	assessed using a GIS-based 'source – pathway – receptor' model that combines the output from predictive flood models with a digital terrain model and a host of readily available receptor datasets. In Gibraltar no modelling for future flooding was undertaken and the assessment was based on largely anecdotal evidence of past flooding.	

6.5 What types of flood were considered but assessed as not being significant, and what were the reasons given?

The information assessed from MS reports to WISE and other supplementary is summarised in Table 13.

Several MSs indicated why some types of floods are considered and assessed but not why other types were considered but not assessed. In some cases it is just indicated that certain types of floods were considered but not assessed as being significant without further explanation. Some types of floods will never exceed the criteria used by MSs; hence, they were considered and assessed but not as being significant. Some MSs have indicated the criteria used for considering floods significant but did not indicate what the results were of the selection process. Hence it is not clear if they choose not to assess types of floods even if they were considered significant. In some case minor floods and 'freak' occurrences were excluded because their potential adverse effects were deemed not to be significant or were not expected to occur within reason.

Table 13 Summary of assessment of Member States' WISE reports and available supplementary information on floods considered but assessed as not being significant

MS	Fluvial	Pluvial	Ground water	Sea water	AWBS	Reasons why considered floods were assessed as not being significant
AT						Not indicated
BE						
BG						
CY						Sea water and groundwater not significant based on historic record
CZ						Not indicated
DE						Pluvial and groundwater only significant if combined with fluvial, low probability for AWBS
DK						Low damage to be expected
EE						Is the result of mismanagement or inadequate drainage
EL						

MS	Fluvial	Pluvial	Ground water	Sea water	AWBS	Reasons why considered floods were assessed as not being significant
ES						
FI						
FR						
HR						
HU						
IE						
IT						
LT						
LU						'Clearly not relevant' / landlocked MS
LV						
MT						Not indicated
NL						
PL						Only significant in combination with fluvial flooding
PT						
RO						
SE						
SI						
SK						Landlocked MS
UK	In Scotland AWBS was not considered due to a lack of available and reliable information. In England and Wales the following flood types are not considered under the FD: - From reservoirs below 10,000m³ in capacity (insignificant flood risks) - Sewers, unless wholly or partly caused by rainwater or other precipitation entering or otherwise affecting the system. - Water supply systems, e.g. burst water mains. - Snowmelt, this counts as precipitation and leads to surface runoff. - Tsunamis, these are considered as a form of flooding from the sea. In Northern Ireland flood risk from impounded water bodies was not conclusively assessed due to insufficient time and information. Groundwater was not considered as this is insignificant in comparison with fluvial, pluvial and seawater. For Gibraltar no type of flood was considered significant.					

Assessed as being significant
Assessed as not being significant
No information / not clear
Not applicable for the whole MS
Not yet considered (Article 13.1 (b) applied)

6.6 What types of flood were not considered at all, and why?

Table 14 summarises the information on what types of floods were not considered at all and the reasons why. Sea flooding is irrelevant for the five land-locked MSs.

Some MSs have considered all types of floods whereas others have not, but without an explanation why. In some cases the reviewer indicated that all types of floods that might be expected are considered. This, however, does not provide the information required of why other types of floods have not been considered. Where reasons have been given, some types of floods have been excluded because of their unpredictability or insufficient data availability. Other MSs have excluded certain types of floods for this cycle but have indicated that they will include them in future FD cycles.

Seven MSs (Germany, Finland, Ireland, Lithuania, Latvia, Malta and the United Kingdom) have excluded flooding from sewerage systems. It is not clear whether the other MSs have included this source or not.

Table 14 Summary of assessment of Member States' WISE reports and available supplementary information on floods not considered at all and why

MS	Fluvial	Pluvial	Ground water	Sea water	AWBS	Reasons why
AT						Landlocked MS
BE						
BG						
CY						Sewerage systems considered to be the same as pluvial urban flooding. Dam failure was considered but canals were not as there are none in Cyprus.
CZ						Landlocked MS
DE						Sewerage systems excluded
DK						Not indicated
EE						
EL						
ES						
FI						Sewerage systems excluded
FR						Not indicated why pluvial, groundwater and dams were not considered.
HR						Insufficient data to assess groundwater flooding.
HU						
IE						Sewerage systems were excluded, they are local and cause limited damage.
IT						
LT						No mountain torrents, sea floods are only considered for parts of the country and sewerage systems are not considered at all.
LU						Landlocked MS. LU has since indicated that all types of flooding were considered at the start of the process (except coastal as the country is landlocked).
LV						No evidence of groundwater flooding, flooding from sewerage systems and mountain torrents (no mountains).
MT						Sewerage systems probably excluded
NL						

MS	Fluvial	Pluvial	Ground water	Sea water	AWBS	Reasons why
PL						Poland has subsequently indicated that the classification of flooding in Poland did not make provision for identifying separate sources of flooding but they were considered in their relation to fluvial flooding.
PT						
RO						
SE						Groundwater floods do not occur in Sweden and the other types of floods were not considered because of lack and/or insufficient resolution of data.
SI						
SK						Landlocked MS
UK	Scotland: floods from impounded water bodies (e.g. reservoirs or canals)and from sewers were not considered due to a lack of available and reliable information. England and Wales: floods from natural lakes have not been considered explicitly as they are not considered a separate source of flooding. Northern Ireland: not clear whether canals are included in and considered as part of impounded water bodies. Natural lakes such as Lough Neagh were also not mentioned. Flooding from sewers is also not described as a potential source of flooding. Gibraltar: rivers do not occur on Gibraltar.					

Not considered at all
Partially not considered at all
Not clear whether they have not been considered at all
Not required (Article 13.1 (b) applied)

7. Identification and Assessment of Significant Adverse Consequences

Four broad categories of consequence are given in the FD. Article 4.2(d) requires an assessment of the potential adverse consequences of future floods with regard to human health, the environment, cultural heritage and economic activity. A list of types and sub-types of consequence was developed by the WGF for the reporting of consequence. The reporting of sub-types of consequence was optional. The list is given below:

1. Human Health (Social)

- Human health
- Community
- Other

2. Environment

- Water body status
- Protected areas
- Pollution sources
- Other

3. Cultural heritage

- Cultural assets
- Landscape
- Other

4. Economic

- Property
- Infrastructure
- Rural land use
- Economic activity
- Other

The objective of the assessment is to establish what methods were used to identify relevant consequences of flooding and any criteria applied to define an adverse consequence in relation to the identification of APSFRs.

7.1 EU overview

The adverse consequences of historic and potential future floods reported by MSs have been aggregated at the EU level and are illustrated in Figures 6 and 7, respectively. MSs were only obliged to report to WISE adverse consequences in terms of each of the four broad categories (human health, environment, cultural heritage, economic). However, MSs were

able to report consequences at a more disaggregated level: it is these that are illustrated in Figures 6 and 7 along with the aggregated consequence. Because a few MSs (Spain, France and Poland) have reported a high proportion of the total events reported at the EU level, the figure is based on the percentage of each flood consequence of the total events in each MS and then averaged across the MSs reporting historical flood events. Basing the figure on the total events of a type across the EU would bias the overview to a few highly reported/common consequences in a few MSs.

It is clear that economic consequences were most commonly reported for historic floods (for 42% of events at the aggregated level) (Figure 6); this was followed by human health (35%), environment (22%) and cultural heritage (15%). This pattern was reflected by the number of events for which consequences were reported as "not applicable": cultural (72%); environment (59%), human health (45%) and economic (16%). These patterns are probably as a result of the fact that, historically, the impacts of floods have been reported in terms of effects on the economy and human health rather than on the environment and cultural heritage: information of the latter two categories may simply not be available for many events.

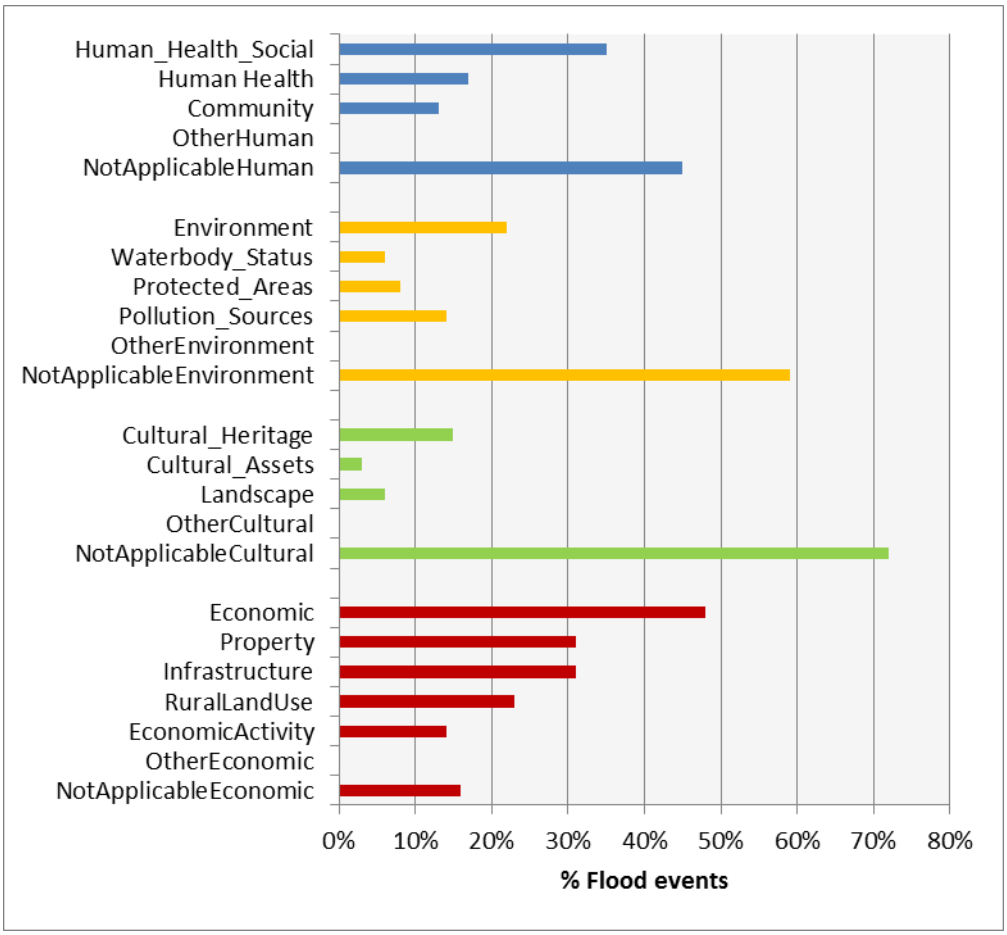


Figure 6 Adverse consequences of historic flood events

Based on 15,659 reported flood events from AT, BG, CY, CZ, DE, DK, EE, EL, ES, FI, FR, IE, LT, LV, PL, RO, SI, SK, UK;. MT and LU reported zero events; HU and SE reported historic events but not their consequences; SE provided a text summary of each historic flood event that contained details of types of flood etc. The specific data has

therefore not been extracted from the reported text descriptions and is not included in the Figure above.; BE, IT, NL applied Article 13.1(b) and PT did not report to WISE. LU has since indicated that four flood events had been assessed.

Even though fewer potential future flood events were reported from fewer MSs than had reported historical events, it is clear that the overriding consequence considered was in terms of the economy (83% of total future events) (Figure 7). A similar pattern to the reported consequences of historic floods was seen in terms of the next most frequent consequence of future floods, being human health (57%), environment (45%) and cultural heritage (36%). There also seems to have been a more complete assessment of the consequences of future floods (compared to historic floods) in that proportionally fewer events were reported to have "not applicable" consequences for all four aggregated categories: only 4% of events were reported to have "not applicable" consequence on the economy and 53% in terms of cultural heritage. This probably reflects to a degree the requirement of the FD to consider all four categories of consequence in detail.

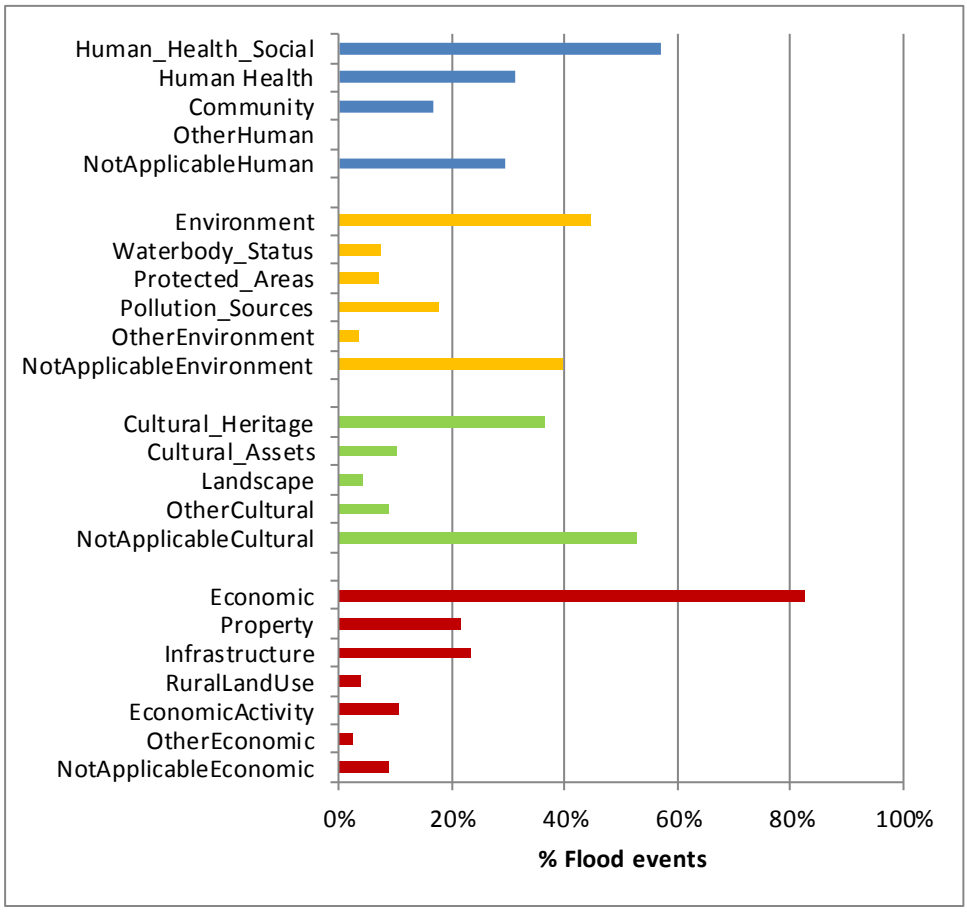


Figure 7 Adverse consequences of potential future flood events

Based on 10,274 reported flood events from AT, BG, DE, DK, ES, FI, FR, LT, PL, SI, UK; IE reported 426 potential future flood events to WISE but as descriptive text, which was not suitable for automatic extraction and therefore not assessed or included in the figure above. No future flood events reported by: CY, CZ, EE, EL, HR, HU, LU, LV, MT, RO, SE, SK; BE, IT, NL applied Article 13.1(b) and PT did not report to WISE.

7.2 What criteria were used to define an adverse consequence?

An overview of the criteria used per MS has been given in Table 15.

Based on an overview assessment of Table 15, the summarising conclusions are:

- The approaches and methodologies, as reported in the assessments per MS, are very diverse. The approaches adopted are often related to the national approaches or methodologies applied in the specific MS.

- Several MSs have reported that there is a lack of data and, consequently, it has been difficult to make a detailed assessment of adverse consequences caused by floods.

- Some MSs have not been clear on what criteria were used to define adverse consequences. It is not clear whether they have not applied criteria, or if they have not reported the application of criteria.

Types of criteria to define adverse consequences:

- Nearly all MS have considered or referred to the four main groups of consequences (on receivers or receptors): human health, the environment, cultural heritage and economic activity. Based on the available data, there are three MSs which make an exception:

    - Denmark: Used two criteria – economic damage and number of people affected;

    - Lithuania: Only based on economic losses (for several sectors). Lithuania has subsequently indicated that no clear criteria were provided but in most cases it was considered that if an extreme flood event occurred that it would cause adverse consequences.

    - Hungary: Adverse consequences have not been assessed (will be included in production of flood hazard maps).

- Most MSs have not considered all sub-types of consequences, as developed by WGF.

Applied approaches and specific criteria:

- Many MSs have not reported specific criteria which define adverse consequences (on each receptor);

- Many MSs have applied expert judgement or a qualitative manner to define adverse consequences;

- Some MSs have applied a quantification to define adverse consequences.
    - Some MSs have defined a flood risk index or flood risk indicators;
    - Some MSs have used thresholds, like number of people affected, number of residents affected, total economic damage, vital economic activities threatened, a flood warning level triggered;
    - Based on the specific indicators or thresholds some MSs have made a classification, by ranking categories of adverse consequences.

Table 15 Summarising overview of the main criteria used per MS

MS	Not reported	Expert judgement / qualitative manner	Quantification
AT			Thresholds for impacted areas and people, fatalities, damages, disruption of drinking water
BE	X (art 13.1(b))		
BG			National criteria and thresholds for the 4 main groups of receptors
CY		Based on the four main groups of receptors	
CZ			Based on residents affected, property affected
DE			National approach with thresholds for the 4 main groups of receptors Areas at risk considered, if dike protection fails
DK			2 criteria: economic damage & people affected
EE		Referring to several (7) flood conditions, related to the four main groups of receptors	
EL		Not fully clear Based on several indicators (number of events, flooded area, damage costs, type of disaster). Greece has subsequently indicated that human casualties, impacts on economic activities and on the environment or cultural heritage were also considered.	
ES			Several criteria such as: fatalities, injured, housing, agriculture, industry, evacuees, infrastructure, electricity supply. Ranking from low to high risk

MS	Not reported	Expert judgement / qualitative manner	Quantification
FI		Not fully clear Referring to the four main groups of receptors Finland has subsequently noted that adverse consequences were taken into account as intended by Section 8 of Finland's Flood Management Act.	
FR			National approach referring to the 4 main groups of receptors
HR		Expert estimate of consequences made taking into consideration: flood duration, cause, mechanism, consequences and number of inhabitants at risk.	
HU		Adverse consequences have not been assessed (will be included in production of the flood hazard maps) No criteria have been defined	
IE		Professional judgement and consultation Location and number of floods in relation with the 4 main groups of receptors	Assessment based on Flood Risk Index Data from historic floods used to categorise significance.
IT	X (art 13.1(b)) Referring to the four main groups of receptors		
LT			Only based on economic losses (for several sectors)
LU		No criteria mentioned Referring to pollution sources, property, infrastructure, economic activity & rural land use	
LV			3 flood risk scenarios applied with diverse criteria referring to infrastructure, ice events, population and cities, dam failure, land use, polluting activity, land use, size and distribution of floods, financing needed to cover flood damage, and number of people evacuated from each flood zone.
MT		Adverse consequences were not defined explicitly by using criteria Referring to people and properties affected	
NL	X (art 13.1(b))		

MS	Not reported	Expert judgement / qualitative manner	Quantification
PL			National approach referring to the 4 main groups of receptors
PT	X (art 13.1(b))		
RO		Criteria are not mentioned Referring to the four main groups of receptors	
SE		Various indicators referring to the four main groups of receptors	
SI		Classification according to: • Infrastructure • Agriculture • Real estates • Death victims	
SK		Expert judgement based on the four main groups of receptors	
UK		Criteria not reported (for all regions of UK) Scotland: • Referring to the four main groups of receptors England and Wales • Indicators referring to the four main groups of receptors Gibraltar: • Main indicators for flooding form sea and heavy rainfall	Northern Ireland: • GIS and modelling • Flood risk indicators • Criteria not reported

7.3 What adverse consequences were excluded or not considered and what were the reasons for their exclusion?

An overview per MS has been given in Table 16.

Summarising conclusions are:

- Many MSs have indicated that all types of adverse consequences were considered. One can assume that within this context, they have considered the four main groups of consequences (or receptors): human health, the environment, cultural heritage and economic activity (with the exception of Denmark, Lithuania and Hungary).

- Some MSs have indicated that specific data or information is not available to assess whether types of adverse consequences could be excluded or not.

- Some MSs have reported some specific cases for which adverse consequences were excluded or not considered. See Table 16 for a more detailed overview and the reasons why.

- Some MSs have indicated that some aspects or issues about adverse consequences will be subject to further study in the future.

Table 16 Summarising overview of the consequences excluded and the reasons why

MS	Not reported	No adverse consequences excluded	Adverse consequences excluded	Reasons for exclusion
AT		X		
BE	X (art 13.1(b))			
BG		X		
CY		X		
CZ			Consequences of flash floods	"Complicated evaluation of impact"
DE		X		
DK			Number of fatalities	Events with fatalities has been considered as not current
EE			Consequences of dam breaks, flooding from pumped mines	Not classified as a significant risk
EL		X		
ES		X		
FI		X		
FR		X		
HR		X		
HU		Consequences not assessed yet		
IE			Flood risks to roads and rail	Beyond the scope of the PFRA
IT	X (art 13.1(b))			
LT			(1) Human health (2) Environment (3) Cultural heritage	(1) "no possibilities to assess" (2) "available data do not allow to assess" (3) "no possibilities to assess"
LU			Cultural heritage	Not clear why
LV			Human health	Not registered so no data
MT			Adverse consequences as defined by the Directive are not used	Not clear why It has been stated that MT does not have any flooding.
NL	X (art 13.1(b))			
PL		X		
PT	X (art 13.1(b))			
RO		X		

MS	Not reported	No adverse consequences excluded	Adverse consequences excluded	Reasons for exclusion
SE			Economic impact on rural land use	Not given (probably focus on urban areas)
SI		X (no information)		
SK		X		Slovakia has confirmed all adverse consequences were taken into account
UK		X		

7.4 What methods were used to identify and quantify potential future adverse consequences and impacts?

An overview of the methods used per MS has been given in Table 17.

Summarising conclusions are:

- For many MSs the answers on this question are similar, or sometimes the same, as the answers to question 7.2. This can be explained by the fact that the criteria used and methods used, are linked to each other.
- The methods that have been used by MSs are very diverse:
    - Modelling (hydrological and hydraulic modelling). MSs have not reported the modelling approach in detail. One can assume that the modelling approach differs per MS.
    - GIS analysis: approach and methodology differs per MS.
    - Use of return periods, or probability: numbers are different per MS: applied return periods by MS vary from 5, 10, 20, 50, 100, 200, to 1000 years.
- Often a combination of these methods has been applied by the MS.
- For many MSs, specific aspects or 'issues' as mentioned in art 4.2.(d) in the FD have not been considered or not reported in detail, such as:
    - The role of floodplains as natural retention areas
    - The effectiveness of existing man-made flood defence infrastructures
    - Geomorphological characteristics of water bodies

Table 17 Summarising overview of the methods used

MS	Not reported	Expert judgement / qualitative manner	Quantitative methods
AT			Modelling, drainage assessments, zoning Classification of (high) risk areas
BE	X (art 13.1(b))		
BG			National methodology Criteria similar to Q9 but with different thresholds. GIS
CY		X (regarding several receptors)	
CZ			Spatial analysis Return periods Q5, Q20, Q100
DE			National approach (applied to 4 main groups of receptors)
DK			Not fully clear 'screening water levels' taking into account climate change Return periods: Q1000 for sea water flood ; Q100 for fluvial flood
EE		Based on historic flood zones & topographic data	
EL		Not fully clear Referring to the four main groups of receptors	
ES			Modelling & overlap with land-uses
FI		Referring to the four main groups of receptors Return period: Q1000	GIS method used in combination with digital elevation model
FR			GIS analysis, based on digital terrain models
HR		Approach consists of: collection and interpretation of relevant information; estimation of danger from flooding; analysis of an areas susceptibility to flooding; estimate of flood risk.	
HU		Adverse consequences have not been assessed (will be included in production of the flood hazard maps) No methods have been applied	
IE		Professional judgement and consultation	National methodology GIS Use of defined Flood Risk Index Designation of Areas for Further Assessment (AFA) Planned 'Catchment Flood Risk Assessment and Management' (CFRAM)

MS	Not reported	Expert judgement / qualitative manner	Quantitative methods
			studies
IT	X (art 13.1(b)) Referring to modelling		
LT			Based on economic analysis of historical floods, total area affected, land use, number of protected areas
LU		Based on historic flooding (Q10, Q 100 & Q200), topography, infrastructure, population, pollution sources, economic activity, agriculture	
LV			Modelling - probabilities National program 'Flood risk assessment and management of 2008 to 2015' Potential future flood assessment is based on historical data and the KALME project (local scientific application of climate change prognosis for the Eastern Europa region). Project KALME was a local component of an EU-led project for the Nordic and Baltic States, which included modelling and analyses of long-term data and prognosis.
MT		Based on available studies: Storm Water Master Plan & National Flood Relief Project	
NL	X (art 13.1(b))		
PL			Based on following criteria: • People: lives and health • Economic activities and infrastructure • Effectiveness of flood protection structures Determination of a flood risk score
PT	X (art 13.1(b))		
RO		Various indicators used, taking into account issues of art 4.2.d	
SE		Impact on the four main groups of receptors	Hydrodynamic modelling of Q100 and Q10 000
SI		Based on indicators Referring to the four main groups of receptors	
SK		Expert judgement based on: • vulnerable constructions flooded • hydraulic capacity related to Q100, Q50, Q10	

MS	Not reported	Expert judgement / qualitative manner	Quantitative methods
UK		Gibraltar: based on an assessment of the water bodies	Scotland: • GIS (grid)-based approach • Q200 • Linked to the four main groups of receptors England and Wales: • Modelling – Q200 • National flood maps Northern Ireland: • Flood modelling – GIS • Flood Risk Indicator

Explanation: 'Q200', 'Q100' 'Q50' and 'Q10' means a return period of 200 years, 100 years, 50 years and 10 years respectively

8. Future Scenarios for Flood Risk Assessment

Climate change is explicitly included in the FD and has been considered as far as possible in the first cycle within the PFRA as well as in the subsequent cycles when carrying out the revision and updating of the PFRA and the FRMPs. The effect of climate change may also be considered when looking at the future change in the risk of flooding.

Paragraph 2, in the preamble of the FD, states the following: “Floods are natural phenomena which cannot be prevented. However, some human activities (such as increasing human settlements and economic assets in floodplains and the reduction of the natural water retention by land use) and climate change contribute to an increase in the likelihood and adverse impacts of flood events.”

Land use planning is an important factor in flood risk management. Land use planning processes may reduce flood probabilities by addressing land use in source areas, or may influence land use in flood prone areas in order to reduce flood damage. Floodplains are increasingly seen as natural water retention areas and the commitment of land use planners and decision makers at the local level is needed to prevent development of such flood prone areas.

The WFD refers to flooding as an issue for water management under Article 1, stating that one principal purpose of the Directive is to set up a framework that contributes to mitigating the effects of floods and droughts. As it focuses on the chemical and ecological status of surface waters, and chemical and quantitative status of groundwater, it did not set out further requirements or objectives to be achieved in relation to flooding or flood risk management. Floods are, however, referred to in relation to exemptions to the environmental objectives, notably with regard to ecological potential in heavily modified water bodies (Article 4.3) and in terms of temporary derogations after exceptional floods (Article 4.6).

The FD includes mandatory requirements for co-ordination, inter alia, of the Flood Hazard Maps and Flood Risk Maps with the reviews provided for in Article 5.2 of the WFD and Article 9.1 of the FD and also possible integration of the FRMPs with the River Basin Management Plans (RBMP) from the first review and onwards as provided for in Article 13.7 of the WFD and Article 9.2 of the FD. Recital 17 of the FD notes that the processes of the FD and WFD are both elements of integrated river basin management, and that the mutual potential for synergies, benefits and efficiencies may be sought. Measures such as Natural Water Retention Measures that might be implemented in the future within the Programme of Measures for the WFD are seen as delivering multiple ecosystem services from regulation and improvement of water quality to flood defence and increase of water availability. The identification of APSFRs may, therefore, have considered the effects of such multifunctional measures that may be introduced under the WFD.

According to Article 4 of the FD, studies on long term developments, in particular impacts of climate change on the occurrence of floods, could be considered in an assessment of potential risks. Table 18 provides an overview of which long term changes have been considered so far among the MS.

Table 18 Summary of the long term developments considered by Member States in the assessment of flood risk

MS	Climate change	Development of settlements	Development of infrastructure	Socio-economic developments
AT				
BE	13.1(b) applied			
BG				
CY				
CZ				
DE*				
DK				
EE				
EL				
ES	[10]			
FI				
FR				
HR				
HU				
IE	[11]			
IT	13.1(b) applied but some preliminary work is available			
LT				
LU	13.1(a) applied			
LV				
MT	[12]			
NL	13.1(b) applied			

[10] Regarding the long-term developments considered, ES reports that climate change effects, according to IPCC documents, are unclear, in particular regarding a quantification of changes. Thus climate change is not considered in the statistical values of flood flows.

[11] Ireland state there is on-going work on climate change but it was not reported and is not mandatory at this stage. Economic development was considered but not included in the analysis as statutory planning guidelines introduced in 2009 prevent development in flood-prone areas.

[12] Climate change is only considered in a very general way that future measures should be resistant to future changes; however, the measures should enhance the overall climate change adaptation capabilities.

MS	Climate change	Development of settlements	Development of infrastructure	Socio-economic developments
PL	[13]	[14]		
PT				
RO	[15]			
SE				
SI	[16]			
SK				
UK				

* Note that DE also applies Articles 13.1a and 13.1b in some UoMs

Long-term trend considered
Long-term trend not considered
Not reported

The methodologies for assessing these long term trends are not provided or are often unclear (e.g. in Cyprus, the evaluation of the impact of climate change on the occurrence of floods was based on research in international and Cypriot literature). For climate change, trends from the IPCC or national research programs are used but it is mostly unclear how. Some countries provide more detailed information. Germany, for example, refers to modelling, statistical assessment and scenario building. Lithuania used trend analysis of historical data of hydrological and meteorological observations (1961-2009), global climate models (general circulation models (HadCM3, ECHAM4(5)), the COSMO Climate Limited-area Model, and a water balance model (WatBal).

In most countries which have considered long term developments other than climate change (Austria, Bulgaria, Cyprus, Slovakia and Latvia) it also remains unclear which methods have been used to assess them (e.g. Austria reports that long-term developments of settlements, infrastructure and economic activities are assessed in several studies, whilst Slovakia land use plans apply a principle of sustainable development and forest management programmes prepared in accordance with the Forest Law 326/2005).

[13] Climate change is not included for inland waters, but only for coastal issues. There was on-going work which should have been completed in 2012.

[14] Not considered because of a lack of available data.

[15] It is mentioned that no clear trend could be distinguished from the existing studies on climate change.

[16] According to data of the Agency of the Republic of Slovenia for Environment there is no evidence about the influence of climate change on river floods.

9. International Relationships

The FD requires MSs to exchange information (Article 4.3) and ensure coordination (Article 5.2) between CAs in cases of international UoMs. Of 215 UoMs reported to WISE (in 22 MSs only – DK, EE, EL, LT, PT and HR did not report all the required detail on their UoMs), there are 84 international UoMs. The number of international UoMs per MS is shown in Figure 8.

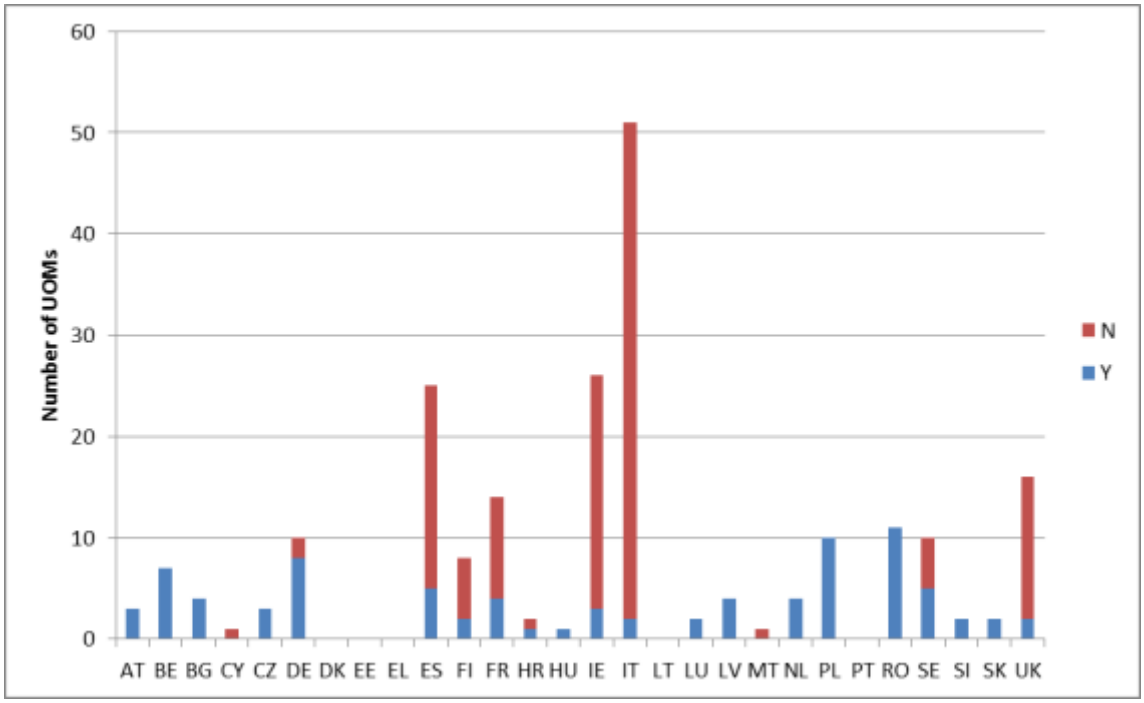


Figure 8 Number of international UoMs per MS

International UoMs indicated "Y".

MSs report a variety of mechanisms for ensuring international coordination and cooperation in managing flood risks. The reported mechanisms are summarised in Table 19.

Among the most common mechanisms are the opportunities for coordination through an International River Commission, such as the International Commission for the Protection of the Danube River (ICPDR) and the International Commission for the Protection of the Rhine (ICPR). Such bodies tend to be focused on rivers that cross several countries. Belgium participates as an observer in the International Commissions for the Protection of the Moselle and the Sarre because its territory only covers a very small portion of the (Rhine) River Basin District.

Bilateral border commissions are also relatively common, providing a formalised mechanism for two MSs to exchange information and coordinate plans to manage flood risk as well as other water management issues. Similarly, various international coordination and working

groups have been established to carry out specific roles in flood risk management, including decision-making, the provision of advice, coordination of measures and the implementation of flood risk management measures. An example of this are the two bilateral bodies created under the Albuferia Agreement between Spain and Portugal. One of the bodies is a political 'Conference of Parties', including ministers from both countries; the other is a 'Commission for the Development and Application of the Agreement' (CADC), which has a largely technical focus and a number of working groups to focus on specific issues, one of which concerns infrastructure safety and floods.

For certain MSs, pre-existing bilateral coordination structures such as those between Germany and Denmark in the Eider UoM have been considered adequate for enabling the coordination of flood risk management.

On a more informal basis, bilateral discussions and exchanges of information regarding the Seine UoM occur via email and post between the authorities in the Belgian Walloon Region and those in France because of the relatively small area of the Seine UoM within the Walloon Region.

At least one UoM in five MS (total 13 UoMs) did not report any mechanisms for international coordination.

Table 19 Mechanisms of international coordination for addressing flood risk management in international UoMs

Type of coordination	MS (number of UoMs)
International River Commission (e.g. ICPDR)	AT (3), BE (6), BG (1), CZ (3), DE (4), FR (4), NL (4), HR (1), HU (1), LU (2), PL (3), RO (11), SK (1) *, IT,*
Participation as an observer to an International River Commission	BE (1)
Bilateral Border Waters Commissions, appointed on the basis of cooperation agreements with neighbouring countries	AT (3), DE (1), ES (4), NL (1), PL (1), SE (1), SK (2) *CZ, HU, PT, SI*
International coordination and working groups – responsible for advice, decision-making, coordination, progress of work and/or implementation	DE (1), ES (5), IE (3), UK (2) *NL, PT*
Regulations in place to enable exchange of information at international level	IE (3)
Use of pre-existing structures in place to ensure bilateral coordination (i.e. existed before entry into force of WFD or FD, between two MS)	DE (1), SE (1) *DK*

Type of coordination	MS (number of UoMs)
Bilateral water/environment management agreement	ES (5), HU (1), PL (9), SK (1) *FR, PT*
Attempts to coordinate with non-Member States (outcome unknown)	LV (4)
Informal arrangement (groups, discussions and exchange of information)	BE (1), IE (3), SE (5), UK (2) *FR*
Coordination and/or exchange of information are assured but mechanism not described.	FI (2), FR (4)
Agreement to create the future FRMPs for the river basin in two complementary parts: an overarching, international part and a national reporting section for each country	AT (3)
Joint Declaration with a neighbouring country (including non-EU MS) on cooperation on joint action	BG (3)
Joint Committee on Water Management – including bilateral meetings and sharing of information (with neighbouring MS)	BG (2)
No information reported	DE (1), IT (2), NL (4), SI (2)

NB: MSs shown in *italics* and with no number in brackets are included by implication. The MS did not directly report this mechanism but was named in another MS's report as being the subject of their international coordination.

10. Number of Identified Areas of Potential Significant Flood Risk

Article 5 requires that the PFRA shall be used as the basis for the identification of areas for which MSs conclude that potential significant flood risk (APSFR) exist or might be considered likely to occur in the future for each RBD, UoM or the portion of an international river basin district or unit of management lying within a MS's territory. Coordination is required between MSs sharing PSFR areas within international RBDs or other international units of management.

The PFRA must be completed by 22 December 2011 and made available to the Commission by 22 March 2012. The Directive does not specify when the requirements of Article 5 must be completed; however, the identification must be completed soon after 22 December 2011, and in sufficient time to allow Member States to prepare flood maps by 2013.

Figure 9 provides an overview of the number of APSFR reported to WISE by MS: Annex 1 tabulates summary details of the APSFRs. Spain has reported the most APSFRs (1,178) and Hungary (two) and Malta (zero) the fewest. Figures 10 and 11, respectively, then summarise at the European level the type of floods and adverse consequences associated with the ASPRs.

The types of flood associated with APSFRs follow a similar pattern as for historic and potential future floods. 91% of APSFRs were associated with fluvial floods and only 0.3% with groundwater floods (Figure 10). Natural exceedance flooding (53%) was the most common mechanism and flash floods the most common characteristic (11%). Figure 11 shows that economic consequences were associated with the greatest proportion of ASPRs. Unlike historic and potential future floods, a much higher proportion of 26% of APSFRs were associated with consequences on cultural heritage perhaps reflecting the possibility that this type of consequence was historically not recorded except for the most significant of flood events.

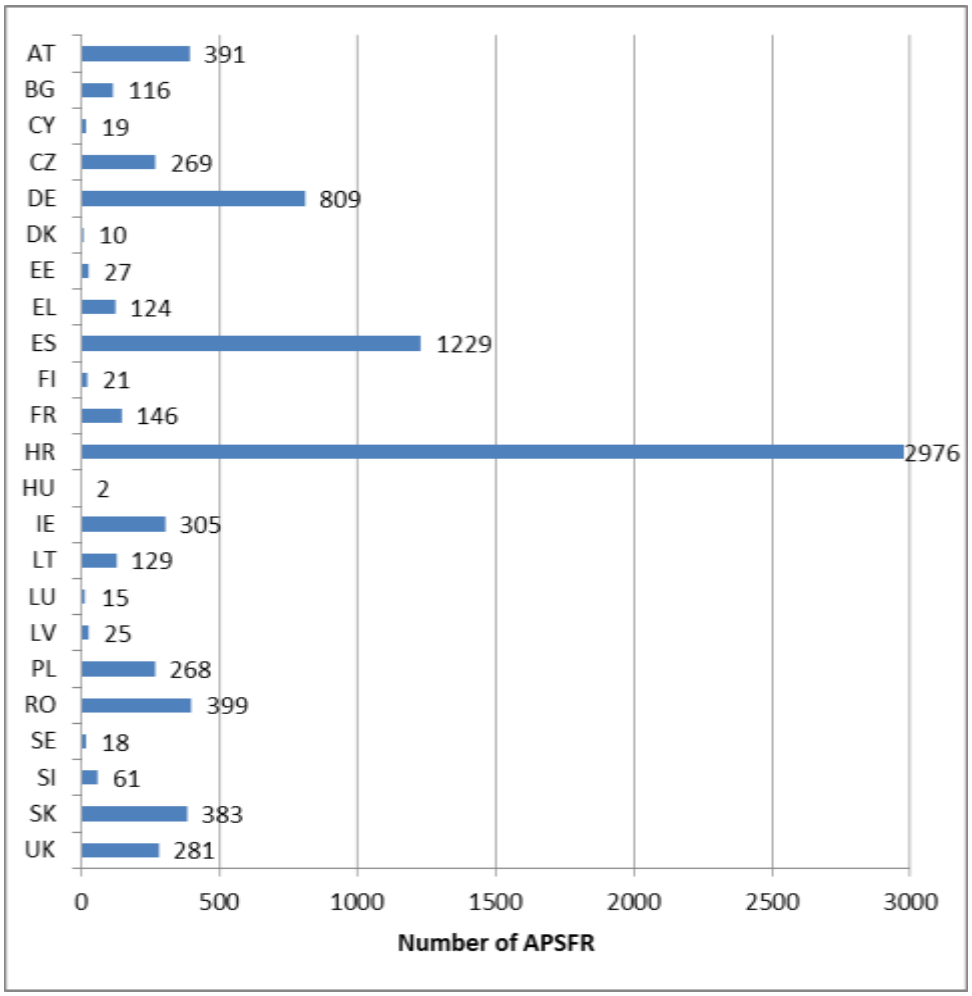


Figure 9 Number of reported Areas of Potential Significant Flood Risk

Based on 4830 reported ASPRs from AT, BG, CY, CZ, DE, DK, EE, EL, ES, FI, FR, HU, IE, LT, LU, LV, PL, RO, SE, SI, SK, UK; MT did not report any APSFRs; BE, IT, NL applied Article 13.1(b) so were not required to report APSFRs and PT did not report to WISE.

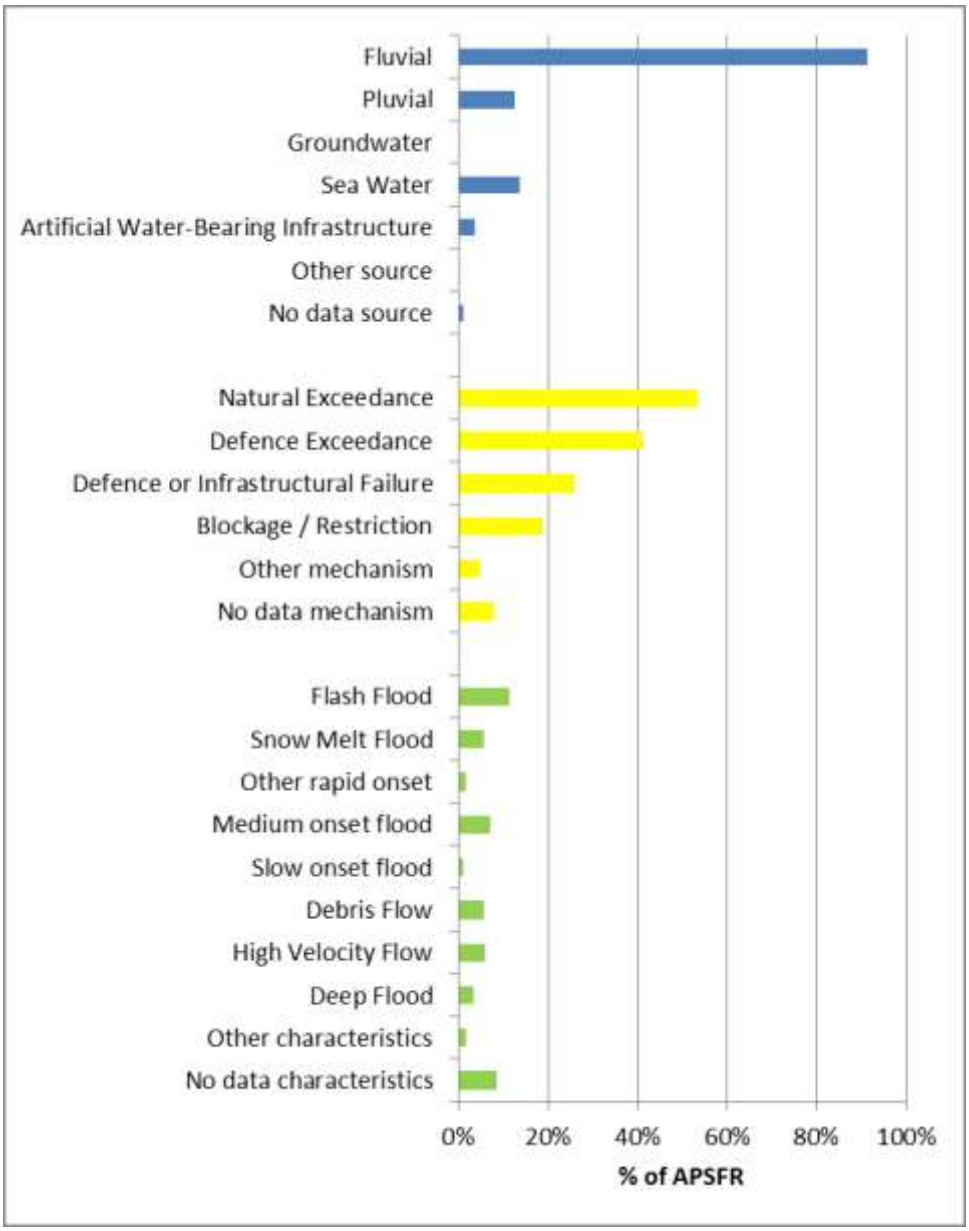


Figure 10 Source-characteristic-mechanism of floods associated with Areas of Potential Significant Flood Risk

Based on 4830 reported ASPRs from AT, BG, CY, CZ, DE, DK, EE, EL, ES, FI, FR, HU, IE, LT, LU, LV, PL, RO, SE, SI, SK, UK;
MT did not reported any APSFRs; BE, IT, NL applied Article 13.1(b) and PT did not report to WISE.

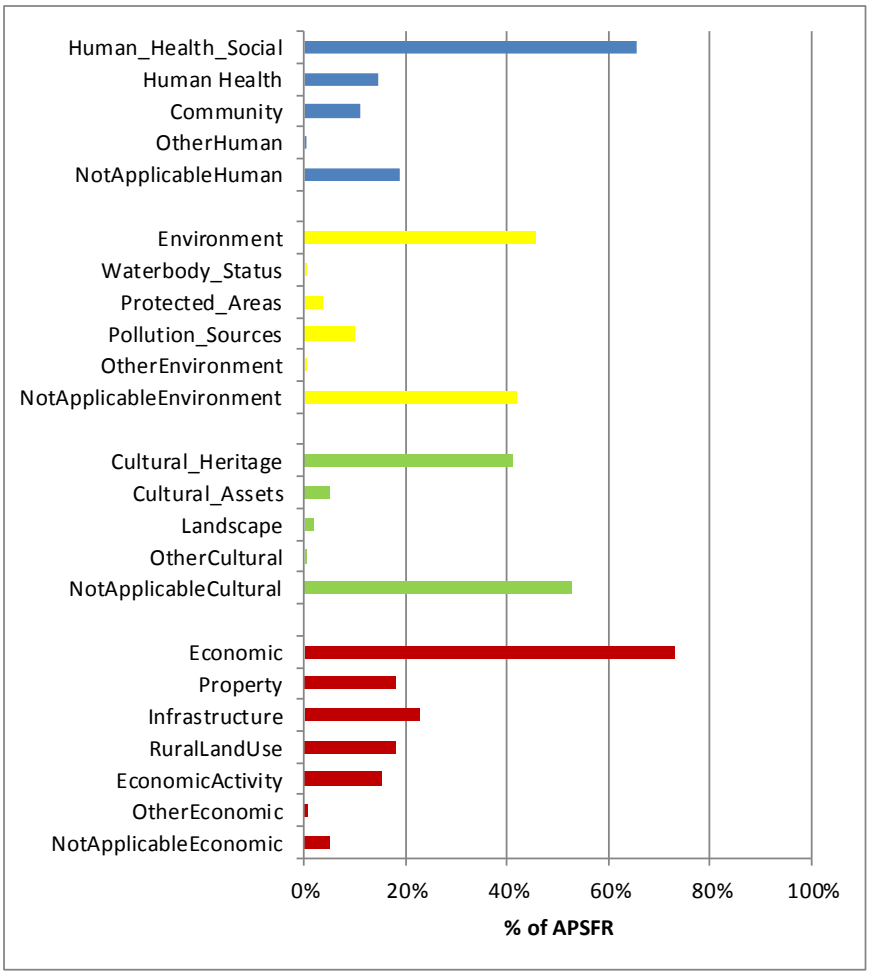


Figure 11 Potential adverse consequences of floods associated with Areas of Potential Significant Flood Risk

Based on 4830 reported ASPRs from AT, BG, CY, CZ, DE, DK, EE, EL, ES, FI, FR, HU, IE, LT, LU, LV, PL, RO, SE, SI, SK, UK;
MT did not reported any APSFRs; BE, IT, NL applied Article 13.1(b) and PT did not report to WISE.

Table 20 compares the source of historic floods considered/reported as part of the risk assessment process with those associated with the APSFR identified at the end of this process. This serves to illustrate which types of flood were considered at the start of the process and which remained or were excluded as a result of the risk assessment. There are numerous examples of where sources of floods were not recorded/identified as historical and subsequently were also not considered to pose a significant future flood risk: these are labelled as “neither” in Table 20 below and include groundwater flooding in Austria, pluvial flooding in Denmark and sea water in Sweden. As Chapter 6 illustrates, the reasons for the exclusion of a particular type of flood from the process is not always clear. There are also cases where historical types of flood were reported but were not subsequently assessed as posing a significant risk type in areas of APSFR. This includes pluvial floods in Finland, and groundwater floods in Slovenia. Finally some types of flood have been assessed as a significant flood risk in some APSFRs but there has been no evidence of this type of food historically, or at least, none of that type was reported. This are indicated by “APSFR” in the

table and include examples of pluvial floods in Greece, groundwater floods in Ireland and fluvial floods in Denmark.

Table 20 Comparison of source of historic floods reported and the flood sources associated with Areas of Potential Significant Flood Risk

MS	Fluvial	Pluvial	Groundwater	Sea Water	Artificial Water-Bearing Infrastructure
AT	Both	Both	Neither	Landlocked	Neither
BG	Both	Both	Historical	Both	Both
BE	Article 13.1(b) applied				
CY	Both	Both	Neither	Neither	Neither
CZ	Both	Neither	Neither	Landlocked	Historical
DE	Both	Both	Neither	Both	Neither
DK	APSFR	Neither	Neither	Both	Neither
EE	Both	Both	Neither	Both	Neither
EL	Both	APSFR	Neither	Neither	Neither
ES	Both	Both	Both	Both	Historical
FI	Both	Historical	Neither	Both	APSFR
FR	Both	Both	Historical	Both	Historical
HR	Both	Historical	Neither	Both	APSFR
HU	APSFR	APSFR	Neither	Landlocked	APSFR
IE	Both	Both	APSFR	Both	Neither
IT	Article 13.1(b) applied				
LT	Both	Neither	Neither	Both	Historical
LU	Neither	APSFR	Neither	Landlocked	Neither
LV	Both	Neither	Neither	Both	Neither
MT	No historic floods or APSFR reported				
NL	Article 13.1(b) applied				
PL	Both	Neither	Neither	Both	Neither
PT	Not reported				
RO	Both	Both	Both	Both	Both
SE	APSFR	Neither	Historical	Neither	Neither
SI	Both	Neither	Historical	Both	Neither
SK	Both	Both	Both	Landlocked	Neither
UK	Both	Both	Neither	Both	Historical

Both Source was reported as a historic flood and associated with APSFR
Neither Source was NOT reported as a historic flood or as being associated with APSFR
Historical Source reported as a historic flood but not as being associated with APSFR
APSFR Source reported as being associated with APSFR but not as a historic flood
Note: HU and SE reported historic floods but not with details of their sources

Figure 12 shows the percentage of reported APSFRs in a MS where health, environmental, cultural and economic consequences were considered (or at least reported) to be not

applicable. The main question here is whether an adverse consequence has been considered but has been assessed as not significant or whether it has not been considered at all perhaps because, for example, of a lack of a suitable methodology. In total for the 22 MSs reporting APSFR, economy was not applicable in 5%, human health in 19%, environment in 43% and culture in 53%. There is large variability between MSs with Poland reporting “not applicable” for all types of adverse consequences, Sweden not reporting electronically to WISE on adverse consequences for its APSFRs, Denmark only reporting economic consequences and Lithuania and Romania reporting all four consequences for all APSFRs.

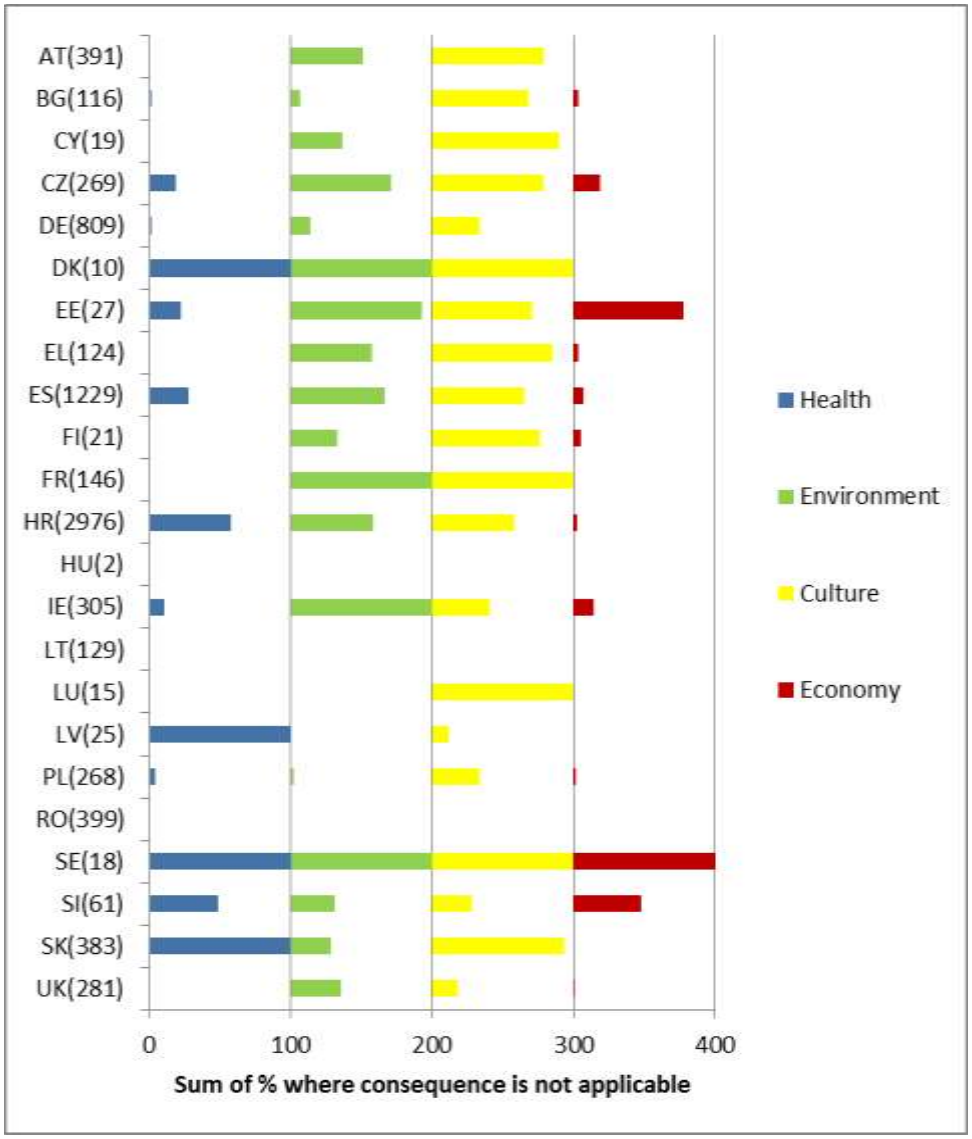


Figure 12 Summary of consequences that were reported as being not applicable to Areas of Potential Significant Flood Risk

The number of APSFR are given in brackets after the MS abbreviation. A value of 100% for each of the main consequence categories indicates that no type of consequence was reported for any APSFR: i.e. all were considered to be NOT applicable.

11. Conclusions

All MSs applying Article 4 to their whole territory or to specific UoMs reported to WISE on the details specified in the Reporting Sheets and schema agreed with the Water Directors.

Of the six MSs applying either Article 13.1(a) or 13.1(b) to their whole territories, Latvia was the only one that reported methodological information relating to assessing flood risk. The others just reported statements about which Article was being applied or in the case of Portugal did not report to WISE at all. Portugal bilaterally informed the Commission on which Article it was applying under the FD.

All Member States applying Article 4 or Article 13.1(a) (either to some or all UoMs and/or some or all flood types) reported APSFRs.

11.1 Units of Management

Two MSs, Ireland and Italy, had identified UoM different from those identified for the WFD. A comparison of the GIS boundaries of the UoMs with the hydrological boundaries of the FECs in the ECRINS dataset indicated that the boundaries of the UoMs in Ireland generally followed hydrological boundaries.

However, in some cases in Italy the incorporated areas in UoMs may not be hydrologically linked. This may lead to uncoordinated FRMPs in hydrologically connected areas with the same flooding areas having different plans, objectives and measures.

11.2 Administrative arrangements

An assessment of MSs' Administrative Arrangements for the FD was undertaken and reported in August 2010. Some MSs have updated their information reported to WISE since the 2010 assessment. Accordingly, any new information was checked and if necessary the original assessment revised.

The original assessment undertaken in 2010 identified aspects for which insufficient information was provided, and therefore aspects for clarification with the MSs. The newly reported information for Austria, Cyprus, Finland, France, Latvia, the Netherlands, Poland, Slovenia and the United Kingdom clarified most of those aspects. Of those MSs only three (the Netherlands, Slovenia and the United Kingdom) still have any outstanding points to clarify. Of the MSs that have not submitted new information since 2010, the majority (13) have one or two aspects to be clarified.

11.3 Use of Articles 13.1(a) and 13.1(b)

MSs may apply Article 13.1 (transitional arrangements) in the first implementation cycle, and either report on a PFRA carried out before 22 December 2010 (Article 13.1(a)) or proceed directly to the mapping and establishment of FRMPs (Article 13.1(b)). It is expected that all the aspects required by Article 4 would be included when applying Article 13.1(a), and the aspects required by Article 6 and Article 7 would have been included when applying Article 13.1(b) in the preparation of flood hazard and flood risk maps. Also where Article 4 and Article 13.1 have both been applied then all types of flood and consequence that could potentially occur in a UoM and MS would have been considered.

In some MSs a single Article is applied to all UoMs. The situation is more complex in other MSs. The most complex situation is in Germany where a combination of Article 4, Article 13.1(a) and Article 13.1(b) between UoMs, and even within the same UoM, has been applied. In the United Kingdom, Article 4 is applied in all UoMs but in the UoMs in England and Wales it is applied to specific flood types (pluvial, groundwater and minor watercourses) and Article 13.1(b) is applied to other types (raised reservoirs, sea water and main rivers).

There was little information reported to WISE for those MSs (Belgium, Italy, the Netherlands and Portugal) applying Article 13.1(b) to all their UoMs and all relevant flood types, as this information was not required by MSs applying this Article. No other information or supportive documents were found on which an assessment of equivalence to the requirements of Article 4 could be made. The United Kingdom applied Article 13.1(b) to specific flood types for some UoMs and again there was no or limited information on which to base an assessment against the requirements of Article 4.

The majority of aspects required by Article 4 have been considered in the majority of the 22 MSs applying Article 4; six MSs have reported that all aspects have been considered, while six other MSs have applied either Article 13.1(a) (two MSs) or Article 13.1(b) (four MS). For the remaining MSs, the aspects most commonly not considered include the effectiveness of man-made flood defences (8 MS); conveyance routes of historical floods (six MSs); geomorphological characteristics (six MSs); and areas of economic activity (five MSs). Consideration of long-term developments appears to be quite inconsistent across MSs, with five MSs not considering long-term developments at all, four further MSs not considering climate change as an aspect of long-term developments, and one MS only considering climate change in terms of long-term developments.

11.4 Types of significant floods

By far the most common source of reported historical flood events is fluvial (66% of reported events) followed by pluvial (20%) and sea water (16%). The least common is for artificial water bearing infrastructure and groundwater (both 1%). The most common mechanism is natural exceedance (51% of events). In general the characteristics of flooding are less often reported for historical floods with around 19% of events having no data on this aspect.

In terms of potential future floods the most common source of flooding is again fluvial (76% of reported events) and the least from groundwater and artificial water bearing infrastructure (both 2%). Natural exceedance was the most common mechanism (45%) and medium onset floods (25%) the most common characteristic.

Some MSs have considered all types of floods whereas others have not but without explanation of why. Where reasons have been given, some types of floods have been excluded because of their unpredictability or insufficient data availability. Other MSs have excluded certain types of floods for this cycle but have indicated that they will include them in future FD implementation cycles.

Floods from sewerage systems are excluded from the requirements of the FD. Eight MS (Germany, Finland, Ireland, Lithuania, Latvia, Malta, Slovakia and the United Kingdom) have excluded flooding from sewerage systems, although in Finland the PFRA includes estimates of areas where other types of flood could cause sewerage flooding. It is not clear whether the other MSs have excluded this source or not.

Criteria to define significant historical floods and reasons for not including some types of floods that occurred in the past are very diverse and broad. The definition of significance included:

- impacted area;
- amount of monetary compensation;
- return period, flood extent and duration of the event;
- use of specific weighing systems for consequences to assess significance;
- non-comparability of hydrological circumstances (too long ago);
- significant changes of land use since the event make the consequences no longer relevant; and
- the absence of historical evidence for their occurrence and/or significance.

Some MSs have not provided information on the criteria used to define significant historical floods.

Some, but not all, MSs give detailed descriptions of methods and criteria used to identify potentially significant future floods. For example, flood simulations and (simplified) modelling (including scenarios with climate change) with the help of digital elevation models to calculate flood areas and to produce flood maps. These maps have been combined with land use maps

to identify potentially significant floods. There has also been mapping of historical floods based on readily available information and multi criteria GIS has also been applied. In one MS, earthquake scenarios were used to assess the significance of future floods caused by tsunamis. The main reasons found for not including some types of floods as significant in the future were the absence of available or readily derivable data, the occurrence of the type of flood is very unlikely and no measures are feasible to mitigate the effects of the flood type.

11.5 Significant Adverse Consequences

Economic consequences were most commonly reported for historic floods (for 42% of events at the aggregated level of consequence), followed by human health (35%), environment (22%) and cultural heritage (15%). This pattern is probably because historically the impacts of floods have been reported in terms of effects on the economy and human health rather than on the environment and cultural heritage: information of the latter two categories may simply not be available for many events.

The consequence of potential future floods most reported was in terms of the economy (83% of total future events). A similar pattern to the reported consequences of historic floods was seen in terms of the next most frequent consequence of future floods being human health (57%), environment (45%) and cultural heritage (36%). A greater proportion of events were considered in terms of environment and cultural heritage than had been for historical floods, possibly reflecting the requirement of the FD to consider all four categories of consequence in detail.

The methods used to identify and quantify potential future adverse consequences and impacts are very diverse between MSs. Modelling (hydrological and hydraulic) has been used but the detail has often not been reported. Where GIS analysis has been used, the approach and methodology differ between MSs. The use of flood return periods or probabilities is different between MSs varying from 5, 10, 20, 50, 100, 200, to 1,000 years. Often a combination of the methods has been applied by the MS. For many MSs, specific aspects or 'issues' as mentioned in Article 4.2.(d) in the FD have not been considered or not reported in detail, such as the role of floodplains as natural retention areas, the effectiveness of existing man-made flood defence infrastructures and geomorphological characteristics of water bodies.

The types of flood associated with APSFRs follow a similar pattern as for historic and potential future floods. 91% of APSFRs were associated with fluvial floods and only 0.5% with groundwater floods. Natural exceedance floods (53%) was the most common mechanism and flash floods the most common characteristic (11%). Human Health consequences were associated with the greatest proportion of ASPFRs (57%), and unlike historic and potential future floods, a much higher proportion of 26% of ASPFRs were associated with consequences on cultural heritage.

11.6 Future scenarios

Sixteen of the 22 MSs with reported information considered climate change in their assessments of flood risk. Seven did not and there was no information for the remaining five MSs. In most of the 11 MSs which have considered long term developments other than climate change, the methods used to assess them are unclear.

11.7 Areas of Potential Significant Flood Risk

In terms of the types of flood considered at the start of the risk assessment process, and which remained or were subsequently excluded by it, there are numerous examples of where sources of floods were historically not recorded/identified and subsequently were also not considered to pose a significant flood risk. These include groundwater flooding in Austria, pluvial flooding in Denmark and sea water flooding in Sweden. The reasons for the exclusion of a particular type of flood from the process are not always clear. There are also cases where historical types of flood were reported but were not subsequently assessed as posing a significant risk type in areas of APSFR. This includes pluvial floods in Finland and groundwater floods in Slovenia. Finally, some types of flood have been assessed as a significant flood risk in some APSFRs but there has been no evidence of this type of food historically, or at least, none of that type was reported: examples include pluvial floods in Greece, groundwater floods in Ireland and fluvial floods in Denmark.

8,023 APSFRs were identified from 23 MSs. Croatia reported the most APSFRs (2,976) and Hungary (two) and Malta (zero) the fewest. 91% of APSFRs are associated with fluvial flooding and only 0.3% with groundwater flooding. MSs are required to report the adverse consequences associated with each APSFR. There is large variability on the reporting of types of consequence between MSs with Poland reporting that adverse consequences are not expected, Denmark only reporting economic consequences and Lithuania and Romania reporting all four categories of consequence for all their APSFRs. Overall considering all APSFRs, economic consequences were reported to be not applicable in 4%, human health in 33%, environment in 48% and culture in 55%. This raises the question as to whether certain types of adverse consequence have been considered but have been assessed as not being significant or have not been considered at all perhaps because, for example, of a lack of a suitable methodology.

[The individual Member State Reports provide relevant background to the present Overview. For the individual MS Reports please check the dedicated files]

Annex 1 Areas of Potential Significant Flood Risk

Table A1 Overview of the reported number of the Areas of Potential Significant Flood Risk from different types of flood

MS	Flood type			Number of APSFR
	Source	Mechanism	Characteristics	
AT	Fluvial			385
AT	Pluvial			6
BG	Fluvial			93
BG	Fluvial, Pluvial, Artificial Water Bearing Infrastructure			12
BG	Sea Water			11
CY	Fluvial		Flash flood	12
CY	Fluvial, Fluvial		Flash flood	1
CY	Fluvial, Pluvial		Flash flood	6
CZ	Fluvial	Natural exceedance	Medium onset flood	269
DE	Fluvial			593
DE	Fluvial	Natural exceedance	Flash flood	3
DE	Fluvial	Natural exceedance	Flash flood, Snow melt flood	2
DE	Fluvial	Natural exceedance	Flash flood, Snow melt flood, High velocity flow	18
DE	Fluvial	Natural exceedance	Medium onset flood	32
DE	Fluvial	Natural exceedance, Blockage/restriction	Flash flood, Snow melt flood, Other rapid onset, Medium onset flood, Debris flow, High velocity flow	1
DE	Fluvial	Natural exceedance, Defence exceedance	Other rapid onset, Medium onset flood	34
DE	Fluvial	Natural exceedance, Defence exceedance, Defence or infrastructural failure	Flash flood, Snow melt flood, High velocity flow	8
DE	Fluvial	Natural exceedance, Defence exceedance, Defence or infrastructural failure	Snow melt flood, Other rapid onset, Medium onset flood, Slow onset flood, Deep flood	2
DE	Fluvial	Natural exceedance, Defence exceedance, Defence or infrastructural failure	Snow melt flood, Other rapid onset, Medium onset flood, Slow onset flood, High velocity flow, Deep flood	1
DE	Fluvial	Natural exceedance, Defence exceedance, Defence or infrastructural failure, Blockage/restriction	Flash flood, Snow melt flood, High velocity flow	10
DE	Fluvial	Natural exceedance, Defence exceedance, Defence or infrastructural failure, Blockage/restriction	Flash flood, Snow melt flood, Other rapid onset, Medium onset flood	2
DE	Fluvial	Natural exceedance, Defence exceedance, Defence or infrastructural failure, Blockage/restriction	Flash flood, Snow melt flood, Other rapid onset, Medium onset flood, Debris flow, High velocity flow, Deep flood	3

MS	Flood type			Number of APSFR
	Source	Mechanism	Characteristics	
DE	Fluvial	Natural exceedance, Defence exceedance, Defence or infrastructural failure, Blockage/restriction	Flash flood, Snow melt flood, Other rapid onset, Medium onset flood, Slow onset flood, Debris flow, Deep flood	1
DE	Fluvial	Natural exceedance, Defence exceedance, Defence or infrastructural failure, Blockage/restriction	Flash flood, Snow melt flood, Other rapid onset, Medium onset flood, Slow onset flood, Debris flow, High velocity flow, Deep flood	2
DE	Fluvial, Pluvial	Natural exceedance	Flash flood, Medium onset flood	3
DE	Fluvial, Pluvial	Natural exceedance, Blockage/restriction	Flash flood, Medium onset flood	1
DE	Sea water			16
DK	Fluvial			1
DK	Fluvial, Sea water			3
DK	Sea water			6
EE	Fluvial			8
EE	Pluvial			2
EE	Sea water			10
EL		Natural exceedance		1
EL		Natural exceedance	Flash flood	6
EL	Fluvial			1
EL	Fluvial		Flash flood	1
EL	Fluvial	Defence exceedance		1
EL	Fluvial	Defence or infrastructural failure	Flash flood	1
EL	Fluvial	Natural exceedance		23
EL	Fluvial	Natural exceedance	Flash flood	48
EL	Fluvial	Natural exceedance	Medium onset flood	23
EL	Fluvial	Natural exceedance, Defence exceedance		1
EL	Fluvial	Natural exceedance, Defence exceedance	Medium onset flood	1
EL	Fluvial, Fluvial	Natural exceedance, Natural exceedance	Flash flood, Flash flood	2
EL	Pluvial			1
EL	Pluvial	Defence exceedance	Medium onset flood	2
EL	Pluvial	Natural exceedance		10
EL	Pluvial	Natural exceedance	Flash flood	1
ES	Fluvial			517
ES	Fluvial		Flash flood	11
ES	Fluvial	Natural exceedance		63
ES	Fluvial	Natural exceedance	Flash flood	30
ES	Fluvial	Natural exceedance	Medium onset flood	4
ES	Fluvial	Natural exceedance	Other	89
ES	Fluvial	Natural exceedance	Slow onset flood	24
ES	Fluvial	Natural exceedance, Blockage/restriction		1
ES	Fluvial	Natural exceedance, Defence exceedance		8

MS	Flood type			Number of APSFR
	Source	Mechanism	Characteristics	
ES	Fluvial	Natural exceedance, Defence exceedance	Flash flood	1
ES	Fluvial	Natural exceedance, Defence exceedance	Flash flood, Medium onset flood, Deep flood	1
ES	Fluvial	Natural exceedance, Defence exceedance, Defence or infrastructural failure		2
ES	Fluvial	Natural exceedance, Defence exceedance, Defence or infrastructural failure	Flash flood	1
ES	Fluvial	Natural exceedance, Defence exceedance, Defence or infrastructural failure	Flash flood, High velocity flow	1
ES	Fluvial	Natural exceedance, Defence exceedance, Defence or infrastructural failure	Flash flood, Medium onset flood	1
ES	Fluvial	Natural exceedance, Defence exceedance, Defence or infrastructural failure	Flash flood, Medium onset flood, Debris flow, High velocity flow, Deep flood	1
ES	Fluvial	Natural exceedance, Defence exceedance, Defence or infrastructural failure	Flash flood, Medium onset flood, Deep flood	1
ES	Fluvial	Natural exceedance, Defence exceedance, Defence or infrastructural failure	Flash flood, Medium onset flood, High velocity flow, Deep flood	2
ES	Fluvial	Natural exceedance, Defence exceedance, Defence or infrastructural failure, Blockage/restriction	Flash flood, Medium onset flood, Deep flood, Other	1
ES	Fluvial	Natural exceedance, Defence or infrastructural failure	Flash flood, Medium onset flood	1
ES	Fluvial	Natural exceedance, Defence or infrastructural failure, Blockage/restriction		1
ES	Fluvial	Natural exceedance, Defence or infrastructural failure, Blockage/restriction	Flash flood	1
ES	Fluvial	Natural exceedance, Defence or infrastructural failure, Blockage/restriction	Flash flood, Debris flow	1
ES	Fluvial, Fluvial, Fluvial	Natural exceedance, Natural exceedance, Defence exceedance, Defence exceedance, Defence or infrastructural failure, Defence or infrastructural failure	Flash flood, Medium onset flood, High velocity flow, Deep flood	1
ES	Fluvial, Groundwater	Natural exceedance	Other	1
ES	Fluvial, Pluvial	Defence exceedance, Blockage/restriction	Flash flood, Debris flow	1
ES	Fluvial, Pluvial	Natural exceedance	Flash flood	1
ES	Fluvial, Pluvial	Natural exceedance	Other	2

MS	Flood type			Number of APSFR
	Source	Mechanism	Characteristics	
ES	Fluvial, Pluvial	Natural exceedance, Defence or infrastructural failure, Blockage/restriction	Flash flood, Debris flow	1
ES	Fluvial, Pluvial	Natural exceedance, Defence or infrastructural failure, Blockage/restriction	Flash flood, High velocity flow	1
ES	Fluvial, Sea water			23
ES	Fluvial, Sea water	Natural exceedance	Other	10
ES	Other			2
ES	Pluvial			10
ES	Pluvial	Natural exceedance	Flash flood	10
ES	Pluvial	Natural exceedance	Medium onset flood	1
ES	Sea water			308
ES	Sea water	Natural exceedance		30
ES	Sea water	Natural exceedance	Other	13
FI	Fluvial	Defence exceedance, Defence or infrastructural failure, Blockage/restriction	Snow melt flood, Other rapid onset	1
FI	Fluvial	Natural exceedance	Medium onset flood	1
FI	Fluvial	Natural exceedance	Snow melt flood, Medium onset flood	5
FI	Fluvial	Natural exceedance	Snow melt flood, Medium onset flood, Slow onset flood	1
FI	Fluvial	Natural exceedance, Blockage/restriction	Medium onset flood	1
FI	Fluvial	Natural exceedance, Blockage/restriction	Snow melt flood, Other rapid onset, Medium onset flood	1
FI	Fluvial	Natural exceedance, Blockage/restriction	Snow melt flood, Other rapid onset, Medium onset flood, Slow onset flood	1
FI	Fluvial	Natural exceedance, Defence exceedance, Defence or infrastructural failure	Snow melt flood, Other rapid onset, Medium onset flood	2
FI	Fluvial	Natural exceedance, Defence exceedance, Defence or infrastructural failure, Blockage/restriction	Snow melt flood, Other rapid onset, Medium onset flood	1
FI	Fluvial, Artificial water-bearing infrastructure	Natural exceedance, Defence exceedance, Defence or infrastructural failure	Snow melt flood, Other rapid onset, Medium onset flood, High velocity flow	1
FI	Fluvial, Sea water	Natural exceedance, Blockage/restriction	Snow melt flood, Other rapid onset, Medium onset flood	1
FI	Fluvial, Sea water	Natural exceedance, Defence exceedance, Defence or infrastructural failure, Blockage/restriction	Snow melt flood, Other rapid onset, Medium onset flood, Slow onset flood	1
FI	Sea water	Natural exceedance	Other rapid onset, Medium onset flood	4
FR	Fluvial			81

MS	Flood type			Number of APSFR
	Source	Mechanism	Characteristics	
FR	Fluvial, Pluvial			7
FR	Fluvial, Pluvial, Sea water			6
FR	Fluvial, Sea water			18
FR	Sea water			8
HR	Fluvial, Sea water, Artificial water-bearing infrastructure	Natural exceedance, Defence exceedance, Defence or infrastructural failure, Blockage/restriction		2976
HU	Type not reported			2
IE	Fluvial			228
IE	Fluvial, Groundwater, Sea water			1
IE	Fluvial, Sea water			74
IE	Sea water			18
LT	Fluvial	Natural exceedance	Snow melt flood	127
LT	Sea water	Blockage/restriction	Slow onset flood	1
LT	Sea water	Natural exceedance	Slow onset flood	1
LU	Pluvial			15
LV	Fluvial	Defence exceedance, Defence or infrastructural failure	Snow melt flood, Medium onset flood	3
LV	Fluvial	Defence or infrastructural failure	High velocity flow	1
LV	Fluvial	Defence or infrastructural failure	Snow melt flood	1
LV	Fluvial	Defence or infrastructural failure	Snow melt flood, High velocity flow	2
LV	Fluvial	Natural exceedance, Defence exceedance	Snow melt flood, Medium onset flood	2
LV	Fluvial	Natural exceedance, Defence exceedance, Blockage/restriction	Snow melt flood	1
LV	Fluvial	Natural exceedance, Defence exceedance, Blockage/restriction	Snow melt flood, Medium onset flood	1
LV	Fluvial	Natural exceedance, Defence exceedance, Defence or infrastructural failure, Blockage/restriction	Snow melt flood, Medium onset flood	1
LV	Fluvial	Natural exceedance, Defence or infrastructural failure	Snow melt flood, Slow onset flood	1
LV	Fluvial	Natural exceedance, Defence or infrastructural failure, Blockage/restriction	Snow melt flood	1
LV	Fluvial, Sea water	Defence exceedance, Defence or infrastructural failure	Snow melt flood, Medium onset flood	3
LV	Fluvial, Sea water	Natural exceedance	Snow melt flood, Medium onset flood	1
LV	Fluvial, Sea water	Natural exceedance, Blockage/restriction	Medium onset flood	1
LV	Fluvial, Sea water	Natural exceedance, Defence exceedance, Defence or infrastructural failure	Snow melt flood, Medium onset flood	2

MS	Flood type			Number of APSFR
	Source	Mechanism	Characteristics	
LV	Fluvial, Sea water	Natural exceedance, Defence exceedance, Defence or infrastructural failure, Blockage/restriction	Snow melt flood, Medium onset flood	2
LV	Sea water	Natural exceedance	Medium onset flood	1
LV	Sea water	Natural exceedance	Snow melt flood, Medium onset flood	1
PL	Fluvial			220
PL	Fluvial, Sea water			36
PL	Sea water			12
RO	Fluvial			1
RO	Fluvial	Natural exceedance	Debris flow	2
RO	Fluvial	Natural exceedance	Debris flow, Deep flood	3
RO	Fluvial	Natural exceedance	Debris flow, High velocity flow, Deep flood	2
RO	Fluvial	Natural exceedance	Deep flood	13
RO	Fluvial	Natural exceedance	Flash flood	2
RO	Fluvial	Natural exceedance	Flash flood, Debris flow	1
RO	Fluvial	Natural exceedance	Flash flood, Debris flow, Deep flood	8
RO	Fluvial	Natural exceedance	Flash flood, Deep flood	12
RO	Fluvial	Natural exceedance	Flash flood, Snow melt flood	6
RO	Fluvial	Natural exceedance	Flash flood, Snow melt flood, Debris flow	1
RO	Fluvial	Natural exceedance	Flash flood, Snow melt flood, Debris flow, Deep flood	2
RO	Fluvial	Natural exceedance	Flash flood, Snow melt flood, Deep flood	6
RO	Fluvial	Natural exceedance	Flash flood, Snow melt flood, High velocity flow	2
RO	Fluvial	Natural exceedance	High velocity flow	2
RO	Fluvial	Natural exceedance	High velocity flow, Deep flood	2
RO	Fluvial	Natural exceedance	Snow melt flood	4
RO	Fluvial	Natural exceedance	Snow melt flood, Debris flow, Deep flood	1
RO	Fluvial	Natural exceedance	Snow melt flood, High velocity flow	1
RO	Fluvial	Natural exceedance, Blockage/restriction	Snow melt flood, Debris flow, Deep flood	1
RO	Fluvial	Natural exceedance, Defence exceedance	Flash flood, Deep flood	1
RO	Fluvial	Natural exceedance, Defence exceedance, Defence or infrastructural failure		1
RO	Fluvial	Natural exceedance, Defence exceedance, Defence or infrastructural failure	Debris flow	2
RO	Fluvial	Natural exceedance, Defence exceedance, Defence or infrastructural failure	Deep flood	10

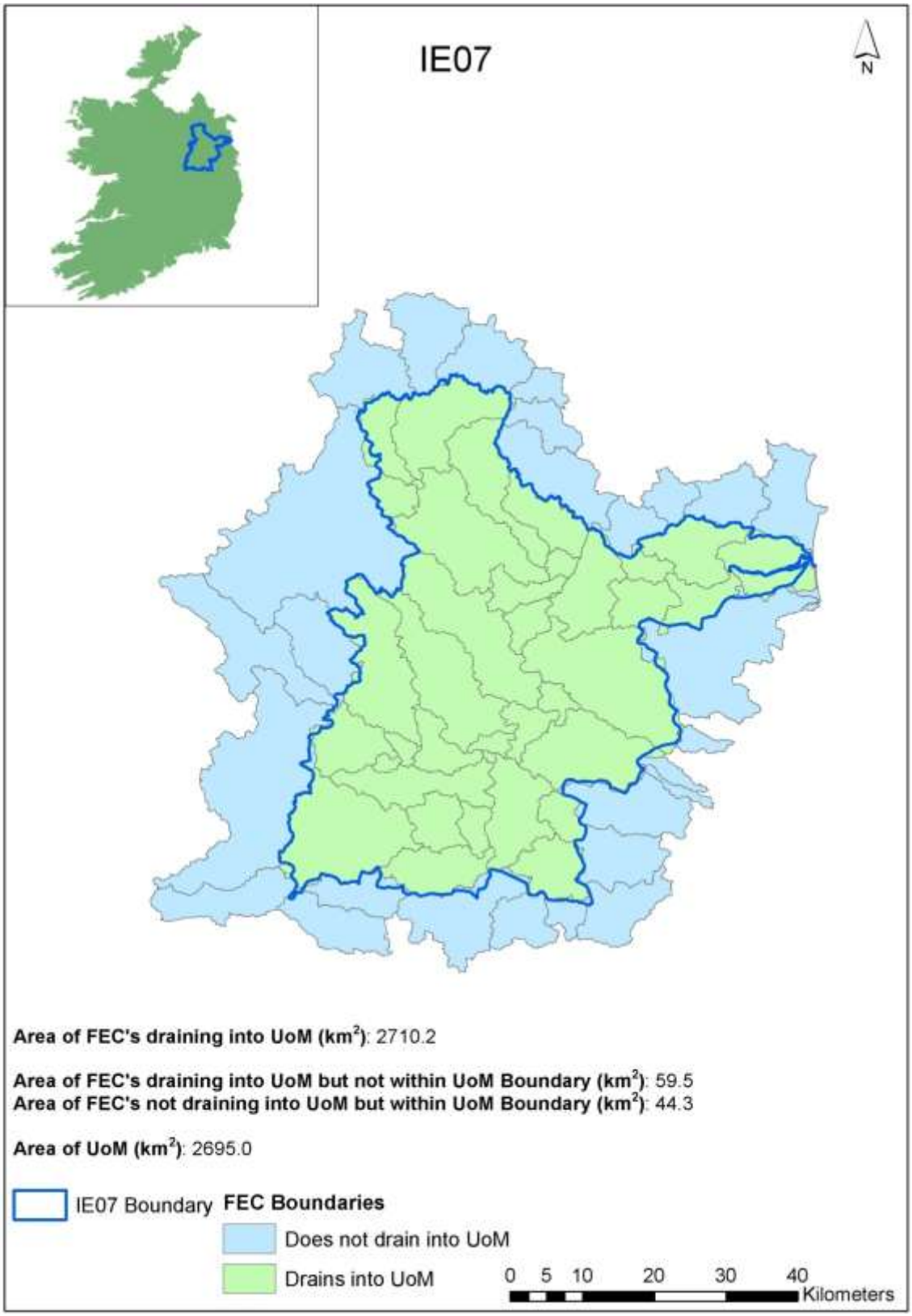
MS	Flood type			Number of APSFR
	Source	Mechanism	Characteristics	
RO	Fluvial	Natural exceedance, Defence exceedance, Defence or infrastructural failure	Flash flood, Snow melt flood	2
RO	Fluvial	Natural exceedance, Defence exceedance, Defence or infrastructural failure	Flash flood, Snow melt flood, Deep flood	2
RO	Fluvial	Natural exceedance, Defence exceedance, Defence or infrastructural failure	Flash flood, Snow melt flood, High velocity flow	1
RO	Fluvial	Natural exceedance, Defence exceedance, Defence or infrastructural failure	Flash flood, Snow melt flood, High velocity flow, Deep flood	1
RO	Fluvial	Natural exceedance, Defence exceedance, Defence or infrastructural failure	High velocity flow	4
RO	Fluvial	Natural exceedance, Defence exceedance, Defence or infrastructural failure	High velocity flow, Deep flood	1
RO	Fluvial	Natural exceedance, Defence exceedance, Defence or infrastructural failure	Snow melt flood	2
RO	Fluvial	Natural exceedance, Defence exceedance, Defence or infrastructural failure	Snow melt flood, Deep flood	3
RO	Fluvial	Natural exceedance, Defence exceedance, Defence or infrastructural failure, Blockage/restriction	High velocity flow, Deep flood	1
RO	Fluvial	Natural exceedance, Defence or infrastructural failure, Defence or infrastructural failure	Snow melt flood	1
RO	Fluvial, Artificial water-bearing infrastructure	Defence exceedance, Defence or infrastructural failure	Deep flood	1
RO	Fluvial, Artificial water-bearing infrastructure	Natural exceedance	Deep flood	3
RO	Fluvial, Artificial water-bearing infrastructure	Natural exceedance	Flash flood, Snow melt flood, Deep flood	1
RO	Fluvial, Artificial water-bearing infrastructure	Natural exceedance, Blockage/restriction	High velocity flow, Deep flood	1
RO	Fluvial, Artificial water-bearing infrastructure	Natural exceedance, Defence exceedance	Deep flood	2
RO	Fluvial, Artificial water-bearing infrastructure	Natural exceedance, Defence exceedance	Flash flood, High velocity flow	1

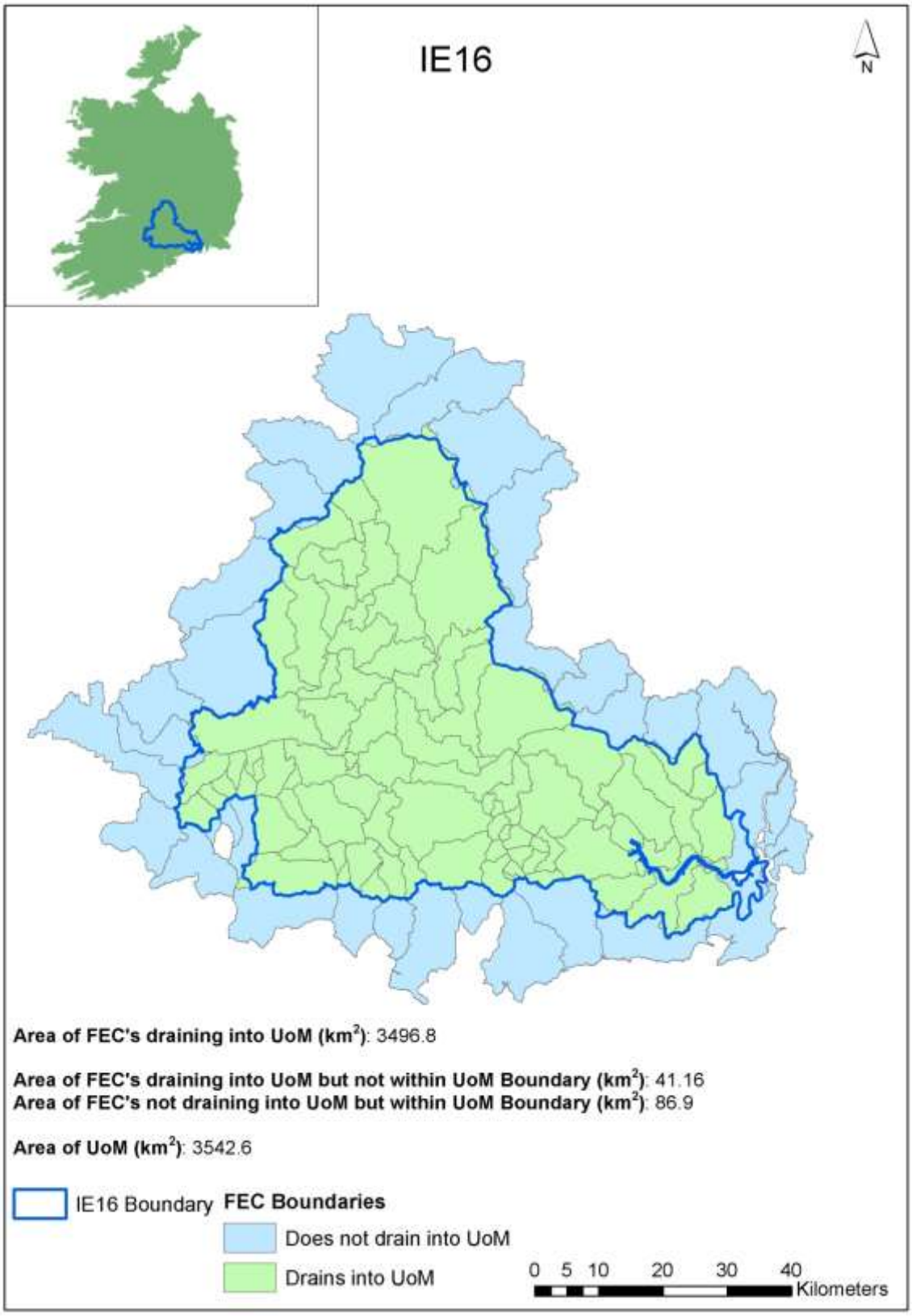
MS	Flood type			Number of APSFR
	Source	Mechanism	Characteristics	
RO	Fluvial, Artificial water-bearing infrastructure	Natural exceedance, Defence exceedance	High velocity flow	1
SE	Fluvial	Natural exceedance	Slow onset flood	1
SE	Fluvial	Natural exceedance	Snow melt flood, Slow onset flood	16
SE	Fluvial	Natural exceedance	Snow melt flood, Slow onset flood, Other	1
SI	Fluvial	Natural exceedance	Flash flood	17
SI	Fluvial	Natural exceedance	Flash flood, Medium onset flood	7
SI	Fluvial	Natural exceedance	Flash flood, Other rapid onset	15
SI	Fluvial	Natural exceedance	Flash flood, Other rapid onset, Medium onset flood	2
SI	Fluvial	Natural exceedance	Flash flood, Other rapid onset, Medium onset flood, Slow onset flood	1
SI	Fluvial	Natural exceedance	Flash flood, Other rapid onset, Slow onset flood	1
SI	Fluvial	Natural exceedance	Flash flood, Slow onset flood	3
SI	Fluvial	Natural exceedance	Flash flood, Snow melt flood, Other rapid onset, Medium onset flood	1
SI	Fluvial	Natural exceedance	Flash flood, Snow melt flood, Slow onset flood	1
SI	Fluvial	Natural exceedance	Medium onset flood	2
SI	Fluvial	Natural exceedance	Medium onset flood, Slow onset flood	1
SI	Fluvial	Natural exceedance	Other rapid onset	2
SI	Fluvial	Natural exceedance	Other rapid onset, Slow onset flood	1
SI	Fluvial	Natural exceedance	Slow onset flood	1
SI	Fluvial	Natural exceedance	Snow melt flood, Other rapid onset, Slow onset flood	1
SI	Fluvial	Natural exceedance	Snow melt flood, Slow onset flood	2
SI	Fluvial, Sea water	Natural exceedance	Flash flood, Other	2
SI	Sea water	Natural exceedance	Other	1
SK	Fluvial, Pluvial	Natural exceedance	Flash flood, Debris flow, High velocity flow	4
SK	Fluvial, Pluvial	Natural exceedance	Medium onset flood	7
SK	Fluvial, Pluvial	Natural exceedance	Snow melt flood	3
SK	Fluvial, Pluvial	Natural exceedance, Defence exceedance, Defence or infrastructural failure, Other	Flash flood, Debris flow, High velocity flow	2
SK	Fluvial, Pluvial	Natural exceedance, Defence exceedance, Other	Flash flood, Debris flow, High velocity flow	159
SK	Fluvial, Pluvial	Natural exceedance, Defence exceedance, Other	Flash flood, Medium onset flood, Debris flow, High velocity flow	23
SK	Fluvial, Pluvial	Natural exceedance, Defence exceedance, Other	Flash flood, Snow melt flood, Debris flow, High velocity flow	6
SK	Fluvial, Pluvial	Natural exceedance, Defence exceedance, Other	Flash flood, Snow melt flood, Medium onset flood, Debris flow, High velocity flow	8

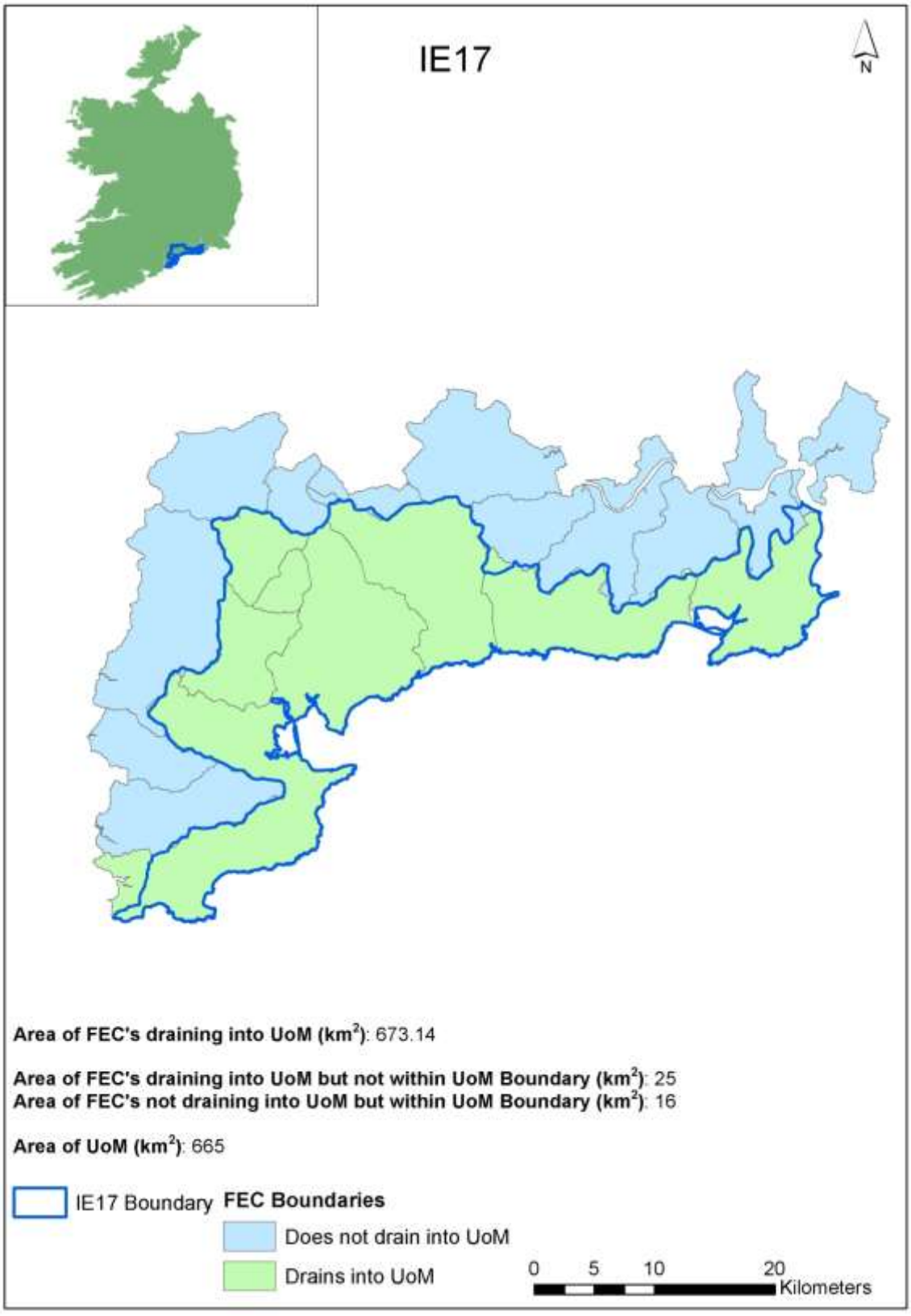
MS	Flood type			Number of APSFR
	Source	Mechanism	Characteristics	
SK	Fluvial, Pluvial	Natural exceedance, Other	Flash flood, Debris flow, High velocity flow	118
SK	Fluvial, Pluvial	Natural exceedance, Other	Flash flood, Medium onset flood, Debris flow, High velocity flow	7
SK	Fluvial, Pluvial	Natural exceedance, Other	Flash flood, Slow onset flood, Debris flow, High velocity flow	1
SK	Fluvial, Pluvial	Natural exceedance, Other	Flash flood, Snow melt flood, Debris flow, High velocity flow	3
SK	Fluvial, Pluvial	Natural exceedance, Other	Medium onset flood	5
SK	Fluvial, Pluvial	Other	Flash flood	5
SK	Fluvial, Pluvial, Groundwater	Natural exceedance	Medium onset flood	4
SK	Fluvial, Pluvial, Groundwater	Natural exceedance, Defence exceedance, Other	Flash flood, Debris flow, High velocity flow	2
SK	Fluvial, Pluvial, Groundwater	Natural exceedance, Defence exceedance, Other	Flash flood, Medium onset flood, Debris flow, High velocity flow	1
SK	Fluvial, Pluvial, Groundwater	Natural exceedance, Defence exceedance, Other	Flash flood, Snow melt flood, Debris flow, High velocity flow	2
SK	Pluvial	Natural exceedance	Slow onset flood	1
SK	Pluvial	Natural exceedance, Other	Flash flood, Debris flow, High velocity flow	20
SK	Pluvial	Natural exceedance, Other	Medium onset flood	2
UK	Fluvial, Pluvial			97
UK	Fluvial, Pluvial, Sea water			161
UK	Pluvial	Natural exceedance	Medium onset flood	18
UK	Pluvial, Sea water			5

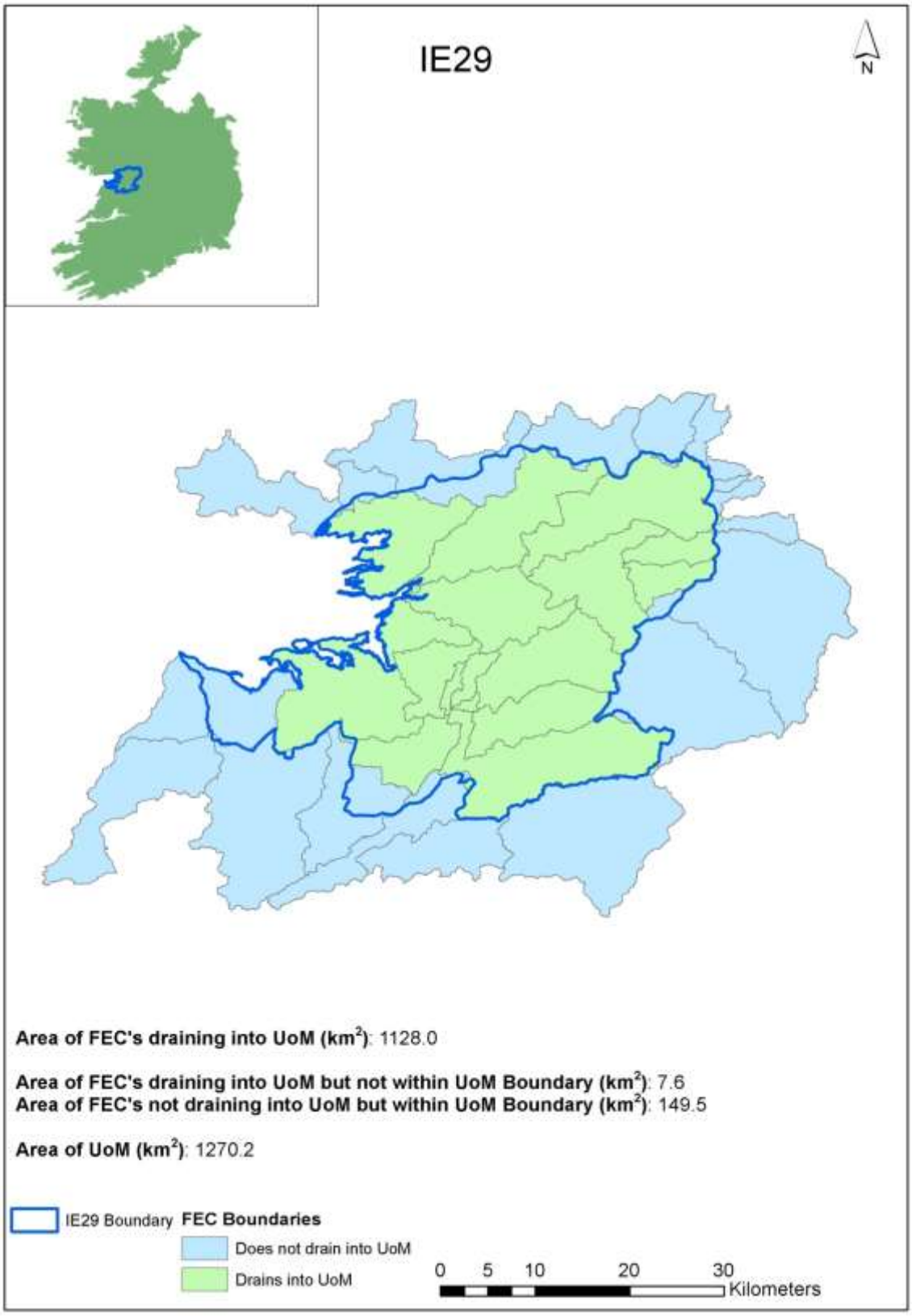
Note: SK figures from reported year 2010 rather than whole assessment period 1997-2010.

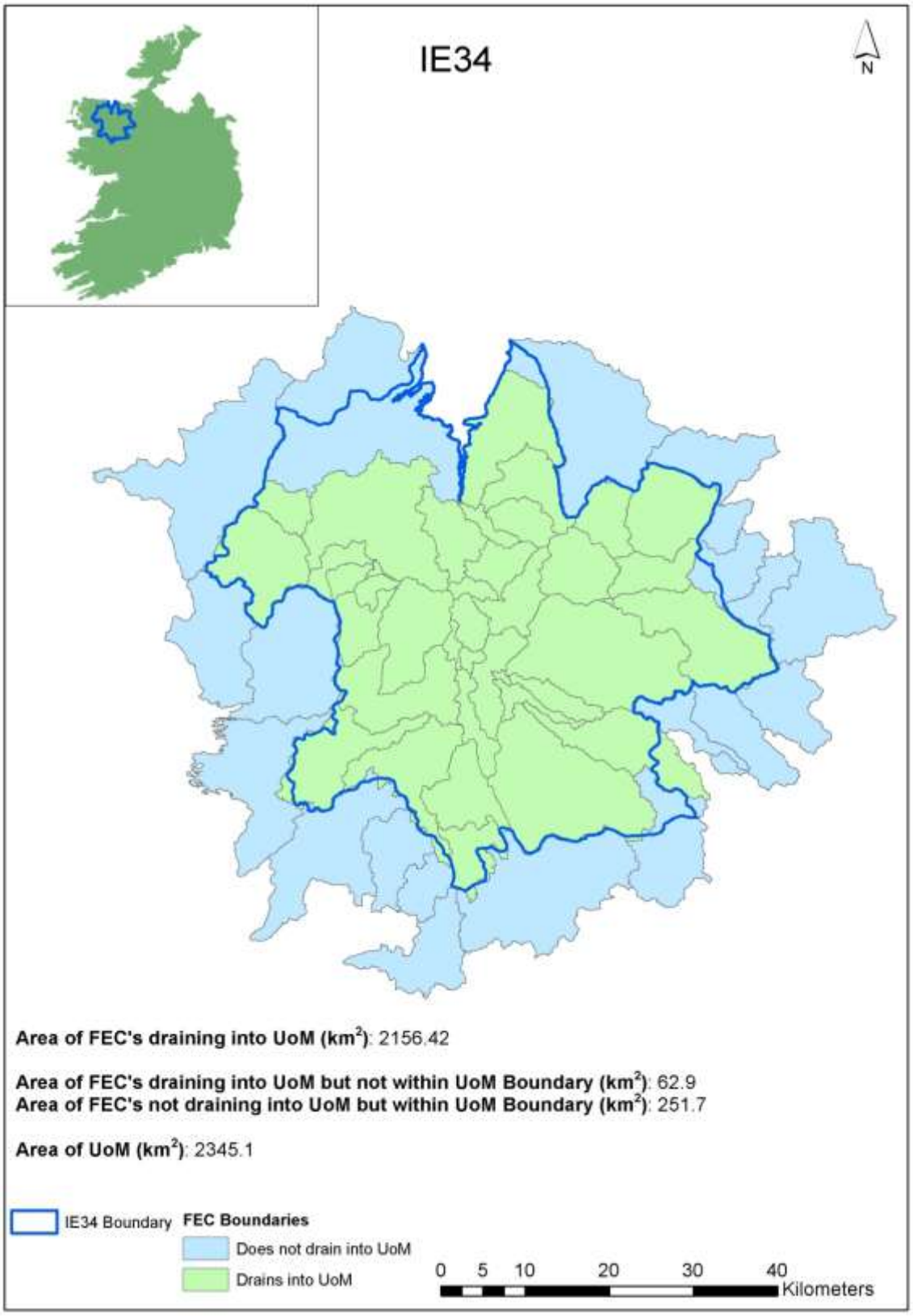
Annex 2 Maps of selected UoMs in IE and IT compared to the FECs of the ECRINS dataset

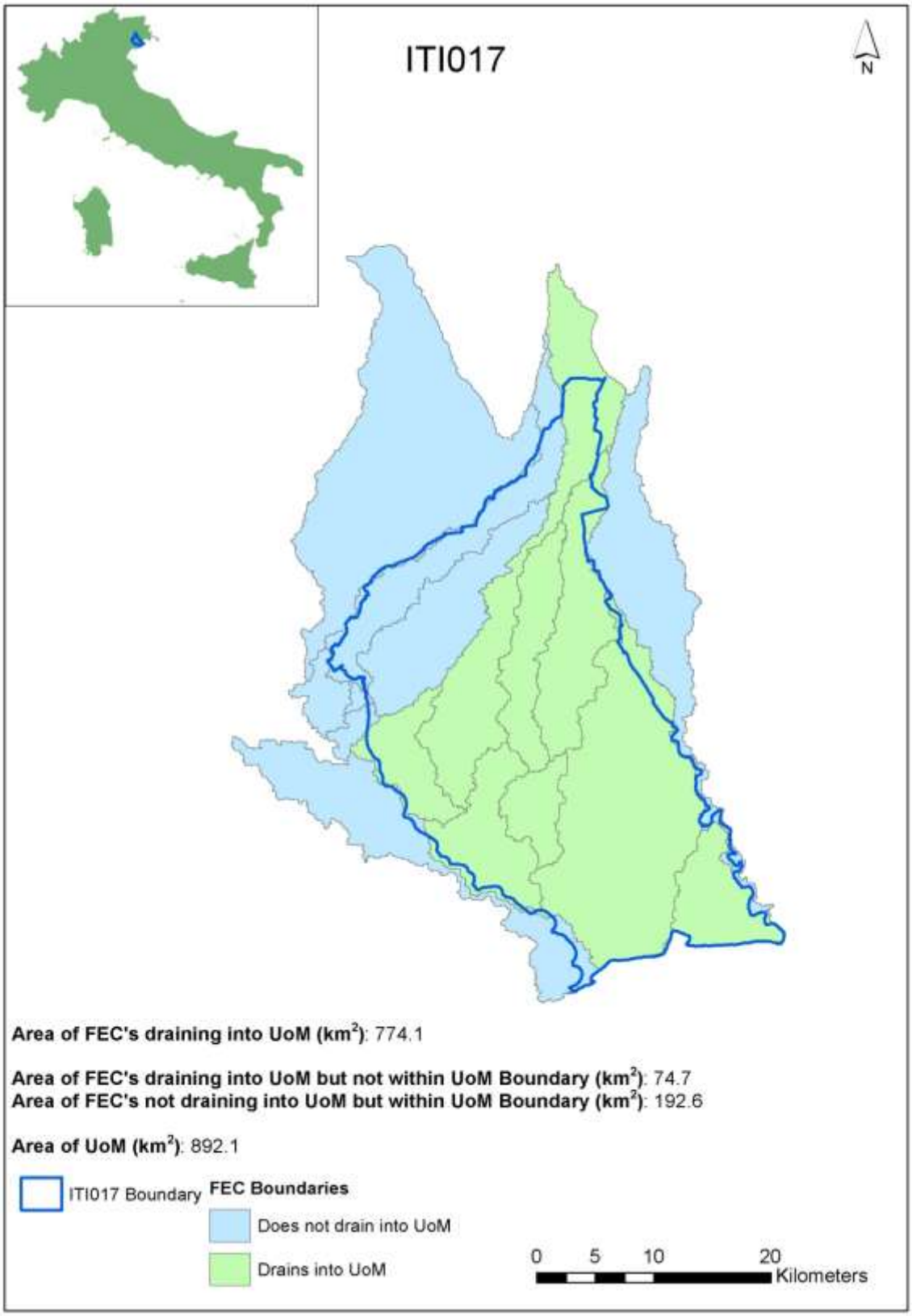


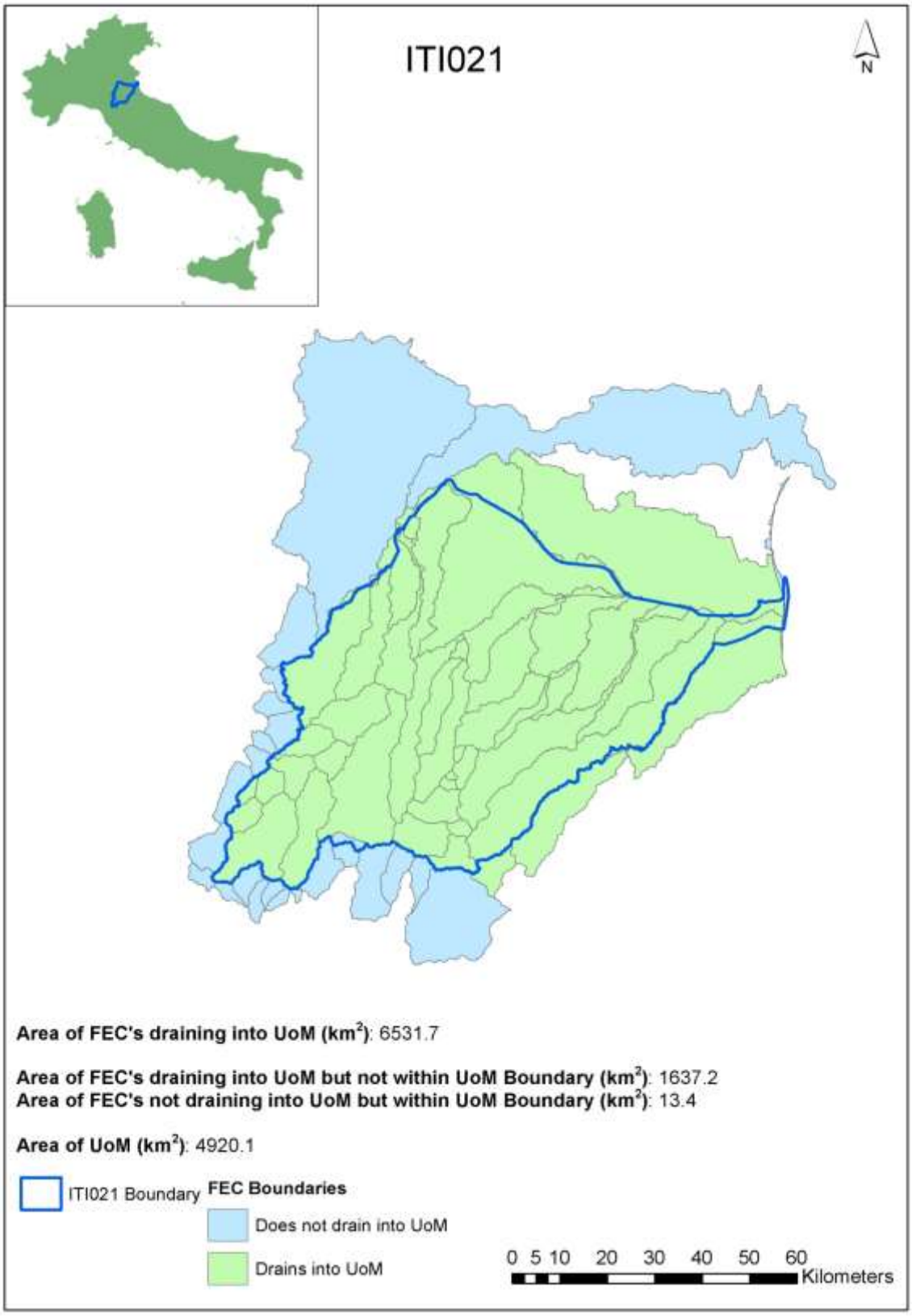

IE16
N
Area of FEC's draining into UoM (km²): 3496.8
Area of FEC's draining into UoM but not within UoM Boundary (km²): 41.16
Area of FEC's not draining into UoM but within UoM Boundary (km²): 86.9
Area of UoM (km²): 3542.6
IE16 Boundary
FEC Boundaries
Does not drain into UoM
Drains into UoM
0 5 10 20 30 40
Kilometers

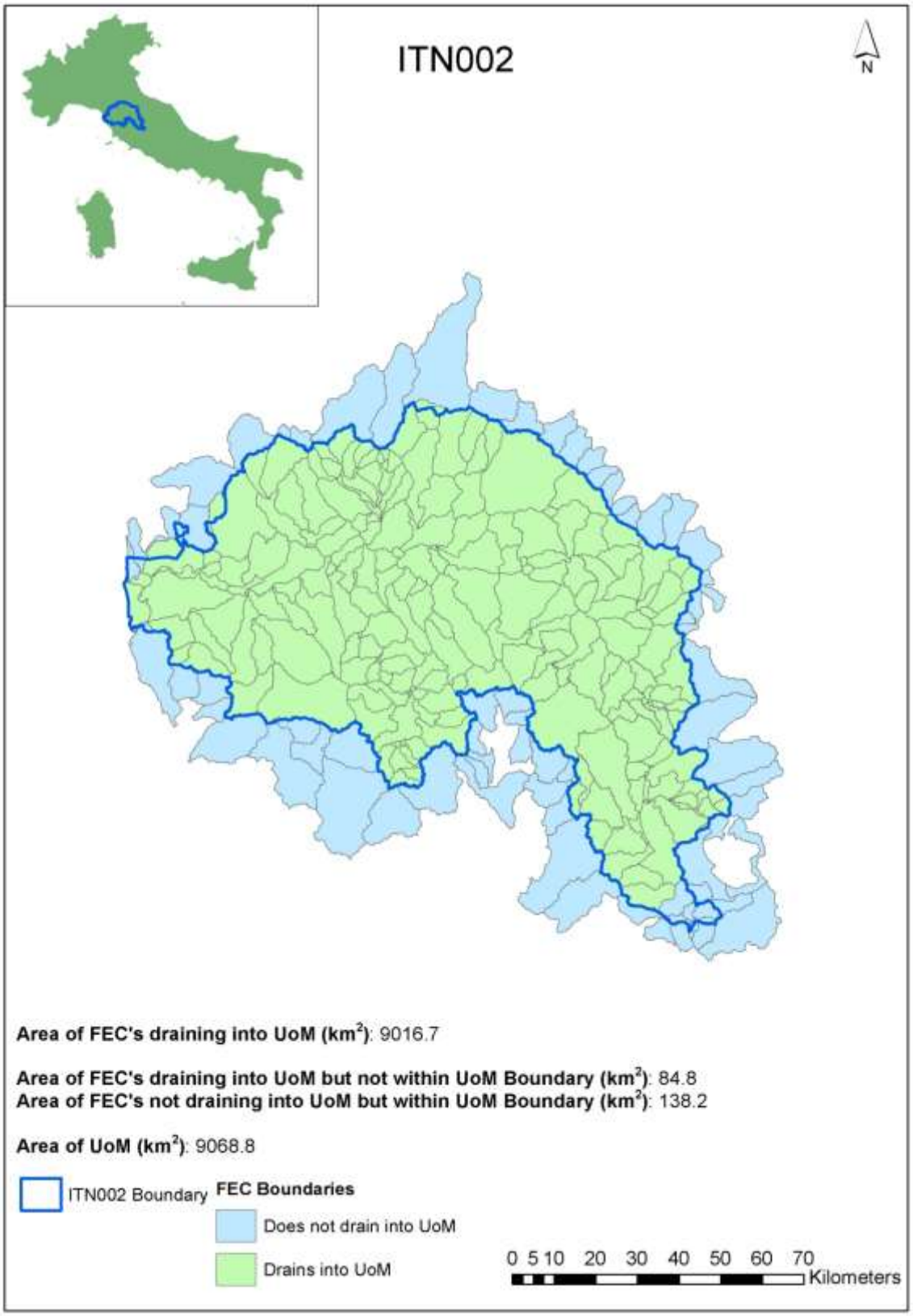

IE17
N
Area of FEC's draining into UoM (km²): 673.14
Area of FEC's draining into UoM but not within UoM Boundary (km²): 25
Area of FEC's not draining into UoM but within UoM Boundary (km²): 16
Area of UoM (km²): 665
IE17 Boundary
FEC Boundaries
Does not drain into UoM
Drains into UoM
0 5 10 20
Kilometers

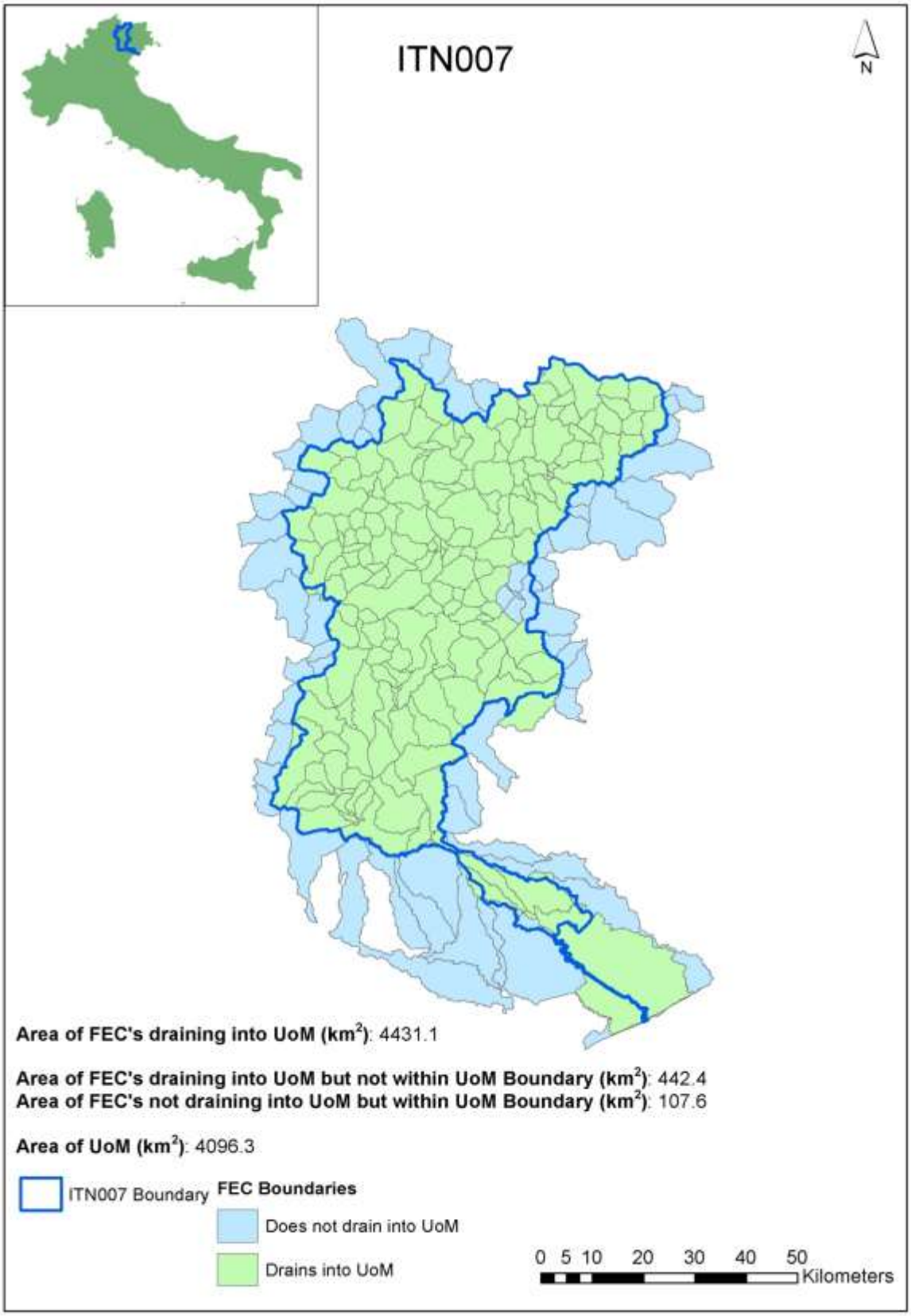

IE29
N
Area of FEC's draining into UoM (km²): 1128.0
Area of FEC's draining into UoM but not within UoM Boundary (km²): 7.6
Area of FEC's not draining into UoM but within UoM Boundary (km²): 149.5
Area of UoM (km²): 1270.2
IE29 Boundary
FEC Boundaries
Does not drain into UoM
Drains into UoM
0 5 10 20 30
Kilometers

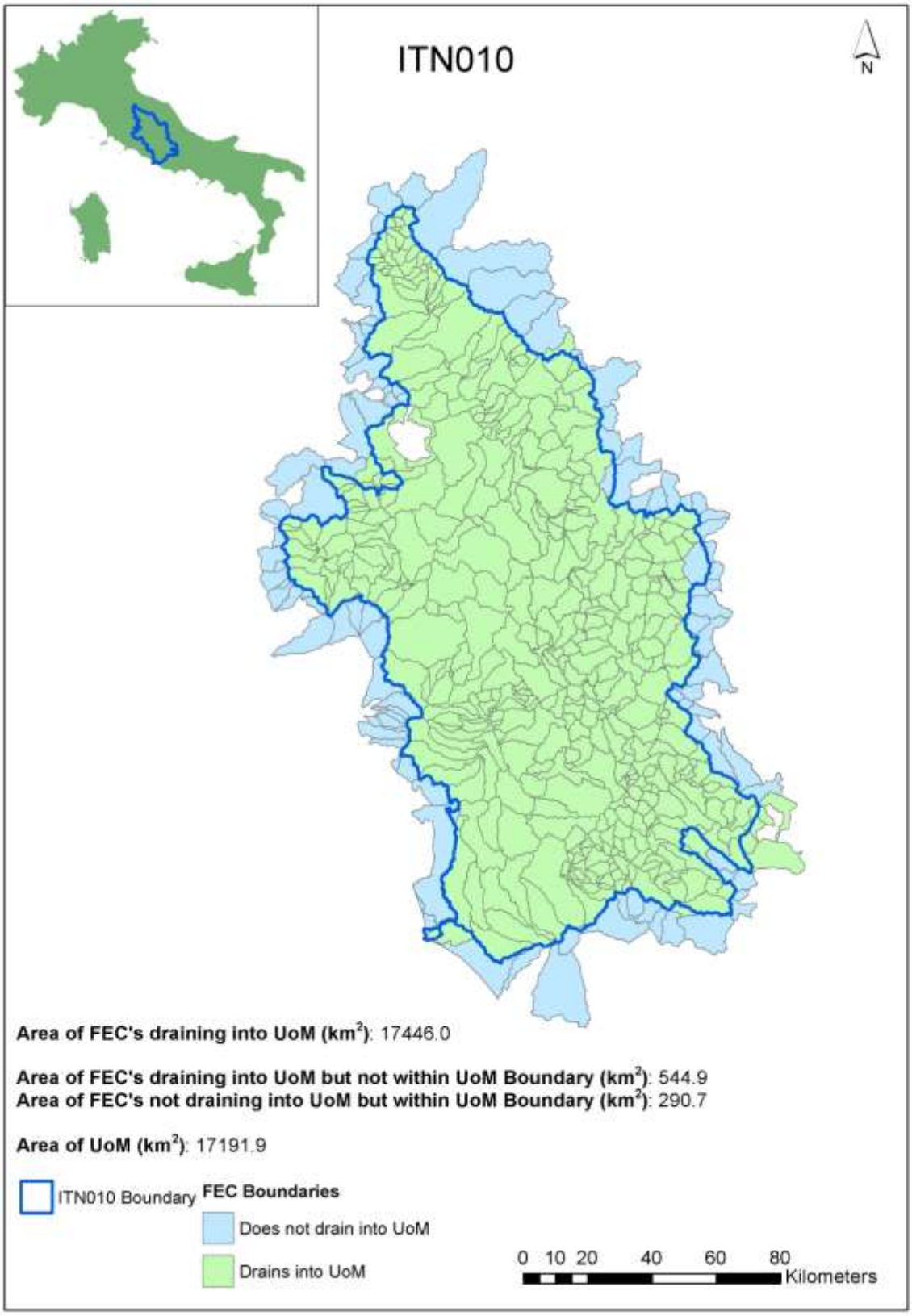

IE34
N
Area of FEC's draining into UoM (km²): 2156.42
Area of FEC's draining into UoM but not within UoM Boundary (km²): 62.9
Area of FEC's not draining into UoM but within UoM Boundary (km²): 251.7
Area of UoM (km²): 2345.1
IE34 Boundary
FEC Boundaries
Does not drain into UoM
Drains into UoM
0 5 10 20 30 40
Kilometers


ITI017
N
Area of FEC's draining into UoM (km²): 774.1
Area of FEC's draining into UoM but not within UoM Boundary (km²): 74.7
Area of FEC's not draining into UoM but within UoM Boundary (km²): 192.6
Area of UoM (km²): 892.1
ITI017 Boundary
FEC Boundaries
Does not drain into UoM
Drains into UoM
0 5 10 20
Kilometers


ITI021
N
Area of FEC's draining into UoM (km²): 6531.7
Area of FEC's draining into UoM but not within UoM Boundary (km²): 1637.2
Area of FEC's not draining into UoM but within UoM Boundary (km²): 13.4
Area of UoM (km²): 4920.1
ITI021 Boundary
FEC Boundaries
Does not drain into UoM
Drains into UoM
0 5 10 20 30 40 50 60
Kilometers


ITN002
N
Area of FEC's draining into UoM (km²): 9016.7
Area of FEC's draining into UoM but not within UoM Boundary (km²): 84.8
Area of FEC's not draining into UoM but within UoM Boundary (km²): 138.2
Area of UoM (km²): 9068.8
ITN002 Boundary
FEC Boundaries
Does not drain into UoM
Drains into UoM
0 5 10 20 30 40 50 60 70
Kilometers


ITN007
N
Area of FEC's draining into UoM (km²): 4431.1
Area of FEC's draining into UoM but not within UoM Boundary (km²): 442.4
Area of FEC's not draining into UoM but within UoM Boundary (km²): 107.6
Area of UoM (km²): 4096.3
ITN007 Boundary
FEC Boundaries
Does not drain into UoM
Drains into UoM
0 5 10 20 30 40 50
Kilometers


ITN010
N
Area of FEC's draining into UoM (km²): 17446.0
Area of FEC's draining into UoM but not within UoM Boundary (km²): 544.9
Area of FEC's not draining into UoM but within UoM Boundary (km²): 290.7
Area of UoM (km²): 17191.9
ITN010 Boundary
FEC Boundaries
Does not drain into UoM
Drains into UoM
0 10 20 40 60 80
Kilometers

Annex 3 Use of transitional arrangements under Article 13.1: Member State-level analysis

Table A2 Application of Article 13.1(a) and/or 13.1(b)

MS	Application of Article 13.1(a) and/or Article 13.1(b)	Whole country or only parts of RBD or UoM covered?	Comment
BE	Article 13.1(b)	Whole country	
DE	Article 13.1(a) and Article 13.1(b)	Article 13.1(a): Article 13.1(a) is applied in DE1000 (Bavaria), DE2000 (Bavaria part Alpenrhein-Bodensee & Rheinland Pfalz part Oberrhein, Mittelrhein, Niederrhein und Mosel-Saar & Saarlandes parts Mosel-Saar and Mittelrhein), DE4000 (Hessen (excluding coastal areas) & Bavaria), DE5000 (Bavaria & Sachsen (Rivers first and mostly second order)), DE6000 (Sachsen (Rivers first and mostly second order)). For those RBs it is clearly stated that Art 13.1(a) is applied. In all RBDs mentioned above only fluvial floods have been considered for the application of Article 13.1(a) and all issue mentioned under Article 4 were taken into account when producing an assessment of the risk of flooding under Article 13.1(a). Article 13.1(b): Article 13.1(b) is applied in DE2000 (in Bavaria part Main & Hessen), DE 4000 (Hessen except Fulda and coastal areas), DE 5000 (Brandenburg, Sachsen (only a few cases of second order rivers), DE 6000 (Sachsen (only a	Article 13.1(a): For the other RB no information was found. Article 13.1(b): For the other RB no information was found.

MS	Application of Article 13.1(a) and/or Article 13.1(b)	Whole country or only parts of RBD or UoM covered?	Comment
		few cases of second order rivers). For those RBs it is clearly stated that Art 13(1)b is applied. In all RBDs mentioned above only fluvial floods have been considered for the application of Article 13.1(b) and all issues mentioned under Article 4 are taken into account when producing Flood Hazard Maps and Flood Risk Maps, and Flood Risk Management Plans under Article 13.1(b).	
ES	Article 13.1(a)	Three UoMs in Spain (ES020, ES070, and ES080) applied Article 13.1(a).	The majority of Spain's UoMs (22 RBDs) has applied Article 4, none Art.13.1(b).
IT	Article 13.1(b)	Whole country	Italy has decided not to undertake preliminary flood risk assessments on the basis of Article 13.1(b). The web site of the ITC RBD (Northern Appennines) notes that this choice was made due to Italy's previous work on flood risks, in particular through the Piani per l'Assetto Idrogeologico (Plans of Hydrogeological Status). A review of RBD web sites indicates that work is underway in many on the Flood Risk Management Plans (Chapter IV of Directive 2007/60/EC). Preliminary assessment reports were found for ITB, ITC (in preparation), ITD and ITE. Flood risk maps were found for ITD and also for several large catchments: notably the Arno and Tiber Rivers. A work plan was found for flood risk maps for ITB and ITC. For at least the Arno and Tiber Rivers, existing risk mapping was carried out on the basis of the governance structure prior to the creation of the RBDs. A more general overview of existing flood management and the implementation of Directive 2007/60/EC, however, would need further investigation. This brief overview of

MS	Application of Article 13.1(a) and/or Article 13.1(b)	Whole country or only parts of RBD or UoM covered?	Comment
			RBD web sites indicates work on the Floods Directive is underway in Italy, even if the current reporting (see subsequent questions) provides little information
LV	Article 13.1(a)	Whole country	
NL	Article 13.1(b)	Whole country	NL will prepare Flood Hazard Maps, Flood Risk Maps and FRMPs for the four international river basin districts within the Dutch territory (Rhine, Meuse, Scheldt and Ems). The decision to make use of article 13.1(b) is laid down in the "Implementatieplan EU-richtlijn Overstromingsrisico's, Juli 2008", this document can be found in the supplementary information. Other documents in the supplementary information (letter from the Ministry, report on significant flood risk in Rhine river basin district and the 'Water Decision under Dutch Water Act') give only general approach and describe the implementation of the Floods Directive. These documents do not contain detailed information as required to answer the questions. The Netherlands did also not provide any data in the WISE. The maps and plans will be submitted on the applicable deadlines as mentioned in the Floods Directive (2013 for maps, 2015 for plans).
UK	Article 13.1(b)	This Article has only been applied to the UoMs in England and Wales (part of UK02 and all of UK03 to UK12).	
PT	Article 13.1(b)	Portugal has transposed Directive 2007/60/CE with DL 115/2010 of 22nd October, in which the preparation of flood hazard maps and flood risk management plans is foreseen. Portugal has reported to the COM that it has opted for the application of Article 13.1(b). Portugal has not reported any information on the Floods	

MS	Application of Article 13.1(a) and/or Article 13.1(b)	Whole country or only parts of RBD or UoM covered?	Comment
		Directive PFRA and claims that no reporting was required, as the MS has opted to apply 13.1(b). The process of producing the hazards maps is foreseen to be ready by the first quarter of 2014.	
LU	Article 13.1(a)	Although no specific information has been provided, the identification of 15 APSFRs indicates that Article 13.1(a) was applied, as also stated in the international PFRA of the Rhine and Meuse international River Basin Districts.	

Table A3 Are all types of flood that might be reasonably expected in the Member State included in the assessment of the risk of flooding under Article 4, Article 13.1(a) or Article 13.1(b)?

MS	All types of floods covered or only specific floods?	Comment
BE	No data or information in WISE is available, nor in supplementary information.	Two letters (from the Ministry of Flanders and from the Ministry of Wallonia) are available stating that the PFRA will not be executed according to the Floods Directive Article 13.1(b).
DE	All RBDs except DE 7000 have considered all types of floods. For DE 7000 it is not clear which types of Floods have been considered.	
ES	All types of floods have been included in the assessment. Spain has reported 1248 APSFRs for 25 UoMs, mainly due to fluvial types (809 = 65%) and seawater (378 = 30%), and much less due to pluvial events (21) or mixed causes (40). “Other” flood sources are referred to in a few cases (16 for all historical floods, 2 for APSFRs), but are not specified in the documents analysed.	
IT	No information was found in the Floods WISE Aggregation Reports on the types of floods addressed. However, additional information and expert knowledge revealed the following: The 2013 Operational Guide published by the Ministry of the Environment (Ministero dell'ambiente, della tutela e del territorio: Documento conclusivo del tavolo tecnico stato-regioni, Indirizzi operativi per l'attuazione della Direttiva 2007/60/CE)) notes that previous work on flooding in Italy has not focused on sea water flooding, which has been assessed for only 'few... portions of the territory' (section 5). A 2013 report on Flood Risk and Flood Hazard Maps for the Northern Apennines RBD (ITC) state, however, that the previous Piani di Assetto Idrogeologico for this particular RBD had identified three main types of flooding: sea water is one, along with pluvial and flash floods. As the assessment was intended to focus on WISE documents, it has not been possible here or in subsequent questions to make a comprehensive review of existing work in Italy related to Directive 2007/60/EC. Based on knowledge of the characteristics of the Member State: Fluvial flooding is a concern for example in periods of exceptional snow melt, in particular in northern Italy (e.g. ITA and ITB), though also in other areas. Pluvial flooding is a concern in all or nearly all national territory. Groundwater flooding is not believed to be a major concern but may arise, for example, in northern Italy with the 'risorgive', sources of surface rivers linked to underground flows from Alpine waters. Sea water flooding linked to storm surges is a concern along essentially all of Italy's coastal areas; tidal surges are less common due to the low tidal excursions in the Mediterranean, but are an important issue in the northern Adriatic, including Venice, where tidal excursions are much greater than the Mediterranean average.	
LV	The following floods are covered: fluvial, sea water and artificial water-bearing infrastructure. Flooding by waters from groundwater rising above the land surface (no information available and no cases were recorded on this type of flooding) and pluvial floods are not covered. There is no information reported if and how the pluvial floods were or were not assessed, but the flooding of land directly from rainfall water falling on, or flowing over, the land might be expected from experience of the Member State.	
NL	All types of floods are covered.	WISE does not contain any data or information related to this question; the supplementary information indicates that all types of floods are covered (Implementatieplan EU Richtlijn

MS	All types of floods covered or only specific floods?	Comment
		Overstromingsrisico's, letter from the Ministry of Infrastructure and Environment).
UK	Only applied to floods from sea water, main rivers and large raised reservoirs (responsibility of Environment Agency of England); other floods (pluvial and groundwater flooding, and from minor watercourses which include ditches and streams not included as main rivers) are under the responsibility of Lead Local Flood Authorities (LLFA) who implemented Article 4.	The Environment Agency of England and Wales will produce flood hazard and risk maps and FRMPs for flood risk from main rivers, large raised reservoirs and the sea by adapting the existing maps and plans to meet the requirements of the Floods Directive. The only information reported to WISE on Article 13.1(b) methodologies was on the overall approach: this was the same text as reported for Article 4 and only describes the respective role of the EA and Lead Local Flood Authorities. A search of the Environment Agency of England and Wales' web site did not locate any detailed methodological reports on the basis of existing Flood Hazard Maps and Flood Risk Maps. The statement that existing maps will be adapted to meet the requirements of the Floods Directive implies that the current maps do not cover all aspects outlined in Article 4.
PT	No information available.	
LU	The only available information lists 15 APSFRs based on pluvial flood risk; it is not clear whether any other types of risk have been assessed/ considered (no information is available in WISE Aggregation Reports). Sea water is clearly not relevant as LU is land-locked. LU has subsequently indicated that all types were considered at the start of the process and ultimately fluvial, pluvial and groundwater floods were considered as potential flooding types	

Table A4 What aspects required by Article 4 were not considered in undertaking a preliminary flood risk assessment?

MS	What aspects required by Article 4 were not considered in the application of Article 4?	Comment
BE	Not applicable (Article 13.1(b) applied in whole country).	
DE	From the summary reports it becomes clear that all aspects required by Article 4 were considered. The assessment is based on the common guidelines by the LAWA (Länderarbeitsgruppe Wasser) in accordance with the CIS guidance documents and the documents agreed by international river commissions.	
ES	All aspects of Article 4 have been considered in the PFRAs, based on a vast analysis of different information (records, reports, studies, (emergency) plans, press clippings, interviews and surveys).	
IT	Not applicable (Article 13.1(b) applied in whole country).	
LV	Not applicable (Article 13.1(a) applied in whole country).	
NL	Not applicable (Article 13.1(b) applied in whole country).	
UK	This Article has been applied in Scotland, Northern Ireland and Gibraltar for all types of flooding considered as relevant. In England and Wales, this Article has only been applied by Lead Local Flood Authorities (LLFA) who are responsible for pluvial and groundwater flooding, and from minor watercourses which include ditches and streams not included as main rivers (which are the responsibility of the Environment Agency of England and Wales who are applying Article 13.1(b) to this and some other types of flood). Based on the information reported to WISE, in Scotland all the expected aspects have been included in the PFRA. For the PFRA in Northern Ireland most aspects have been considered. There was an initial consideration of the geomorphological characteristics of watercourses but due to the uncertainty with the approach taken it was not considered further in the assessment of the potential consequences of future flooding. The effectiveness of flood defences was also ignored in the predictive modelling of future floods because of the uncertainty associated with the actual levels of protection offered by the existing defences (river walls, flood banks, culverts etc.). In England and Wales the Environment Agency provided the LLFAs guidance on what was required in a PFRA. Based on the guidance and the WISE report (and not an example of a PFRA produced by a LLFA) it seems that most aspects would have been included. However, there may be some limitations in the assessment of the risk from groundwater flooding as the dataset used (Areas Susceptible to Groundwater Flooding) is quoted not to be interpreted as identifying areas where groundwater is actually likely to flow or pond: rather is should be used to identify where further studies would be useful. In terms of surface water flooding there was also no readily available or derivable information about the effectiveness of existing man made infrastructure (drainage). LLFAs are also response for assessing the hazard and risk from minor water courses. Some of these may have been covered by existing datasets but there may also have been gaps in the aspects such as their geomorphological characteristics that were not included. The PFRA for Gibraltar also covers all aspects that are relevant to the characteristics of	

MS	What aspects required by Article 4 were not considered in the application of Article 4?	Comment
	water bodies in Gibraltar.	
PT	No information available (Article 13.1(b) applied in whole country).	
LU	The only available information lists APSFRs with reported consequences: (i) Human Health, (ii) Environment, and (iii) Economic Activity (WISE Aggregation Reports 7.1 and 7.2), suggesting that these aspects were considered in the assessments. The summary of the methodology (WISE Report 7.3) states that the assessments for the identification of APSFRs were primarily based on historic flooding over the past 30 years, as well as using topography, infrastructure, population centres, economic activity data, etc., indicating that Article 4 requirements were broadly followed, although it is not clear if 'Cultural Heritage' was considered, nor is there any specific mention of consideration of 'hydrological and hydromorphological conditions', 'effectiveness of man-made flood defenses' or 'long term developments'. (No information is available in WISE Reports 1-6 and no supplementary information has been provided, nor have web searches yielded any relevant additional information).	

Table A5 What aspects required by Article 4 were not considered when producing an assessment of the risk of flooding under Article 13.1(a)?

MS	What aspects required by Article 4 were not considered when producing an assessment of the risk of flooding under Article 13.1(a)?	Comment
DE	None were not considered.	Information is available for DE1000, DE2000, DE 4000, DE 5000, DE 6000. For those RBs it is clearly stated that Art 13.1(a) is applied. The reported information also shows that all aspects required by Article 4 were considered when producing an assessment of the risk of flooding under Article 13.1(a). For the other RB no information was found.
ES	None were not considered.	All the required aspects of Article 4 are included, and all the issues were taken into account in the assessment of flood risk.
LV	None (only flood victims not considered as of no relevance for LV).	All aspects required according to Article 4 are included in the assessment of the risk of flooding and reported to be considered. Description of adverse impacts of historical floods is provided; Flood events with adverse effects on human health and environment – the major events have been identified; Description of adverse consequences of historical floods, on cultural heritage is provided; Assessment of potential consequences of future floods is described. The only thing that is reported to not be considered is the flood victims. The flood victims were not considered because Latvia has never registered flood deaths and it is not expected that at any of flood scenarios which is repeated every 10 years, 100 or 200, there would be. All this information is structured per RBD, it is possible to find all this in the national program “Flood risk assessment and management of 2008 to 2015”. The areas with the risk of flooding are identified on the basis of a number of criteria, such as: natural and climatic conditions; hydrological conditions; the area of influence and importance of these areas. The PFRA was carried out at RBD scale.
LU	Article 4 requirements were broadly followed, however not all information is clear and complete.	Article 4 requirements were broadly followed, although it is not clear if ‘Cultural Heritage’ was considered, nor is there any specific mention of consideration of ‘hydrological and hydromorphological conditions’, ‘effectiveness of man-made flood defences’ or ‘long term developments’.

Table A6 What aspects required by Articles 6 and 7 were not considered when producing Flood Hazard Maps and Flood Risk Maps, and Flood Risk Management Plans under Article 13.1(b)?

MS	What aspects required by Article 4 were not considered when producing Flood Hazard Maps and Flood Risk Maps, and Flood Risk Management Plans under Article 13.1(b)?	Comment
BE	No data or information in WISE is available, nor in supplementary information.	Two letters (from the Ministry of Flanders and from the Ministry of Wallonia) are available stating that the PFRA will not be executed according to the Floods Directive Article 13.1(b). Flood hazard maps, flood risk maps and FRMPs will be set up according to the Directive: • The Wallonia region will use risk maps established before 22 December 2010 (see Article 13.2). These maps are available online (http://geoportail.wallonie.be). The maps are still in progress and will be provided to the Commission before 22 December 2013 through the provided reporting system. • Flanders is preparing flood hazard maps and flood risk maps which will be available at the end of 2013. (http://www.integraalwaterbeleid.be).
DE	None were not considered.	Information is available for DE2000, DE 4000, DE 5000, DE 6000. For those RBs it is clearly stated that Art 13(1)b is applied. The reported information also shows that all aspects required by Article 4 were considered when producing an assessment of the risk of flooding under Article 13.1(b). For the other RB no information was found.
IT	No data on mechanisms or characteristics of historic floods was found. No information was found on future floods, nor on issues such as topography, position of water courses, etc: no details beyond the indication that Article 13.1(b) has been applied for all UoMs in Floods WISE Aggregation Reports.	
NL	No data or information is available in WISE, nor in supplementary information on this topic.	
UK	The only information reported to WISE on Article 13.1(b) methodologies was on the overall approach: this was the same text as reported for Article 4 and only describes the respective role of the EA and Lead Local Flood Authorities. A search of the Environment Agency of England and Wales' web site did not locate any detailed methodological reports on the basis of existing Flood Hazard Maps and Flood Risk Maps. The statement that existing maps will be adapted to meet the requirements of the Floods Directive implies that the current maps do not cover all aspects outlined in Article 6.	
PT	No information available.	

Annex 4 Administrative Arrangements

Table A7 Floods Directive Article 3: Member State Assessment Summary

MS	XML	SPATIAL	Data released (reference: CDR as of 15 October 2013)	CA as for WFD (Reported by MS)	CA as for WFD (Assessment Consultant, see detailed comments in assessment templates)	UoM as for WFD (Reported by MS)	Number of CA for FD	UoM as for WFD (Assessment Consultant)	Number of UoM for FD	Language of Article 3 Report - Translation needed?	Is the report clear and complete?
AT	Y	Y	26.05.2010, update of CAs by 17.10.2011	Y	Yes (in addition to those for WFD, other CA are reported for the purpose of Floods Directive implementation)	Y	11	Yes	3	DE	Yes.
BE	Y	Y	26.05.2010	Y	Yes, partly (slightly different CA)	Y	3	Yes	7	EN	No: slightly different CA reported for WFD and FD. Legal status and national relationships reported as regards WFD, but not specifically as regards FD.
BG	Y	Y	09.08.2012	Y	Yes	Y	4	Yes	4	BG, translation needed for legal status	No: Incomplete in terms of international coordination
CY	Y	Y	08.09.2011 (file date 26.07.2010)	N	No (Minister of Agriculture, Natural Resources and Environment of the Government of the Republic of Cyprus is CA for WFD, the	Y	1	Yes	1	EN	Yes

MS	XML	SPATIAL	Data released (reference: CDR as of 15 October 2013)	CA as for WFD (Reported by MS)	CA as for WFD (Assessment Consultant, see detailed comments in assessment templates)	UoM as for WFD (Reported by MS)	Number of CA for FD	UoM as for WFD (Assessment Consultant)	Number of UoM for FD	Language of Article 3 Report - Translation needed?	Is the report clear and complete?
					Water Development Department of the Ministry of Agriculture, Natural Resources and Environment is CA for FD).						
CZ	Y	Y	26.05.2010	Y	Yes	Y	2	Yes (same RBD, same names as for WFD, but different Codes)	3	CZ, translation needed as regards legal status	No: with regards international coordination, Codes of UoM are different from those for WFD (while name of UoM are the same).
DE	Y	Y	21.05.2010	N	Yes, partly (some CA are the same as for WFD)	N	16	Yes, partly (UoM are the same as for WFD, except for the Danube Basin)	11	DE, number of text to be translated	No: with regards national relationships among CA. For Danube Basin it needs to be checked how different UoM for the Danube basin will be harmonised (DE opted for "ICPDR" UoM, while for example AT did not and stuck to reported WFD RBD).
DK	Y	Y	25.05.2010	N	Yes partly (Ministry of Environment is CA for WFD)	Y	2	Yes (no further information provided)	4	EN	No: In terms of international cooperation with DE.

MS	XML	SPATIAL	Data released (reference: CDR as of 15 October 2013)	CA as for WFD (Reported by MS)	CA as for WFD (Assessment Consultant, see detailed comments in assessment templates)	UoM as for WFD (Reported by MS)	Number of CA for FD	UoM as for WFD (Assessment Consultant)	Number of UoM for FD	Language of Article 3 Report - Translation needed?	Is the report clear and complete?
EE	Y	Y	25.05.2010	Y	Yes (No further information provided beside information reported under WFD "Yes", no comparison with WFD report possible)	Y	1	Yes (No further information provided beside information reported under WFD "Yes", no comparison with WFD report possible)	3	EN (but no further information beside "Yes" and "Yes")	No: With regards the competent authorities for FD. No further details reported. Legal status of CA, Roles, Information on international cooperation as regards FD. Reference between CA and UoM as regards implementation of FD needs to be clarified.
EL	Y		23.12.2013	Y	Yes (Ministry of Environment, Energy and Climate Change is the CA for WFD and FD).	Y	1	Yes (No further information provided beside information reported under WFD "Yes", no comparison with WFD report possible)	14	EN	
ES	Y	Y	26.05.2010	N	Yes partly (some CA have already been reported for WFD)	Y	44	Yes partly, but some RBD are missing, some new UoM are added	25	ES, translation needed as regards legal status, national and international relationships of CA)	ES has prepared a new version of the database with the 44 CA. In summary, the CA are: • 3 General Directorates of the Spanish Government (Water, Coast and Civil Protection) • 21 River Basin Authorities • 19 Autonomous Communities/Regions • 8116 Municipalities, represented in the database by the *Spanish Federation of Municipalities and Provinces* (FEMP)

MS	XML	SPATIAL	Data released (reference: CDR as of 15 October 2013)	CA as for WFD (Reported by MS)	CA as for WFD (Assessment Consultant, see detailed comments in assessment templates)	UoM as for WFD (Reported by MS)	Number of CA for FD	UoM as for WFD (Assessment Consultant)	Number of UoM for FD	Language of Article 3 Report - Translation needed?	Is the report clear and complete?
FI	Y	N	18.10.2011	N	Yes (partly, as two Ministries for WFD and the Government of Aland are also CA under FD, but more CA are assigned for the purpose of the FD).	Y	19	Yes	8	FIN, translation needed as regards legal status, and national / International relationships	Yes
FR	Y	N	28.09.2011	N	Yes (please note that Mayotte was not a French territory by the date of the adoption of the last RBMPs (2009), thus not yet included in the current list of RBDs at that time. The RBMP for FRM Mayotte will be prepared for the next cycle (2015)).	Y	12	Yes (please note that Mayotte was not a French territory by the date of the adoption of the last RBMPs (2009), thus not yet included in the current list of RBDs at that time. The RBMP for FRM Mayotte will be prepared for the next cycle (2015)).	14	FR	Yes

MS	XML	SPATIAL	Data released (reference: CDR as of 15 October 2013)	CA as for WFD (Reported by MS)	CA as for WFD (Assessment Consultant, see detailed comments in assessment templates)	UoM as for WFD (Reported by MS)	Number of CA for FD	UoM as for WFD (Assessment Consultant)	Number of UoM for FD	Language of Article 3 Report - Translation needed?	Is the report clear and complete?
HU	Y	Y	31.07.2012	Y	No: 14 CAs reported for FD, 15 for WFD. The names are different which may reflect changes in names of same authorities. The codes of CA are all different except for Ministry of Internal Affairs	Y	14	Yes	1	HU	No: clarification needed on competent authorities
IE	Y	Y	26.05.2010	Y	No. For the WFD the "main" CA is the Environment Protection Agency, for FD another CA has been reported, to be clarified	N	1	Yes, partly (IEGBNISH, Shannon & GBNIIENW North Western & GBNIIENB Neagh Bann appointed as WFD RBD; all other UoM are newly established, related WFD RBD is provided	26	EN	Yes

MS	XML	SPATIAL	Data released (reference: CDR as of 15 October 2013)	CA as for WFD (Reported by MS)	CA as for WFD (Assessment Consultant, see detailed comments in assessment templates)	UoM as for WFD (Reported by MS)	Number of CA for FD	UoM as for WFD (Assessment Consultant)	Number of UoM for FD	Language of Article 3 Report - Translation needed?	Is the report clear and complete?
IT	Y	Y	27.05.2010	N	Yes, partly: some CA have already been appointed as CA for the WFD	N	57	No (Related WFD RBD is provided)	51	EN	No: Relationship between CA and UoM.
LT	Y	Y	26.05.2010	N	No	Y	1	Yes (no further information provided)	4	EN	Yes
LU	Y		03.05.2010	Y	Yes	Y	1	Yes	2	FR	No: in terms of international coordination.
LV	Y	Y	09.09.2011	Y	Yes (please note that for the WFD, one additional CA is reported: Latvian Environment Agency compared to CA for FD)	Y	2	Yes	4	LV	Yes
MT	Y	Y	31.7.2012	Y	Yes but there is an additional CA reported for WFD: Malta Environment and Planning Authority	Y	1	Yes	1	EN	Yes

MS	XML	SPATIAL	Data released (reference: CDR as of 15 October 2013)	CA as for WFD (Reported by MS)	CA as for WFD (Assessment Consultant, see detailed comments in assessment templates)	UoM as for WFD (Reported by MS)	Number of CA for FD	UoM as for WFD (Assessment Consultant)	Number of UoM for FD	Language of Article 3 Report - Translation needed?	Is the report clear and complete?
NL	Y	N	01.09.2011 (file as of 28 June 2011)	Y	Yes (more CAs reported for FD than for WFD)	Y	66	Yes	4	NL, translation needed: Information on the legal status, and specifications as regards roles have been reported in Dutch Language.	No: in terms of international relationships/international coordination.
PL	Y	Y	21.11.2011 (file as of 18.04.2011). File is locked to the public, no access to file by Contractor. However, data extracted from EU database.	N	Yes (partly, Minister of Environment is also CA for WFD, but more CA assigned for FD than for WFD)	Y	47	Yes	10	PL, translation needed as regards the legal status, and specifications as regards the different roles (A, B and C).	Yes
PT	Y	N	25.05.2010	Y	Yes partly, Number of different CA have been additionally reported for WFD, but not for FD	Y	1	Yes (no further information provided)	10	EN	No: in terms of the competent authorities

MS	XML	SPATIAL	Data released (reference: CDR as of 15 October 2013)	CA as for WFD (Reported by MS)	CA as for WFD (Assessment Consultant, see detailed comments in assessment templates)	UoM as for WFD (Reported by MS)	Number of CA for FD	UoM as for WFD (Assessment Consultant)	Number of UoM for FD	Language of Article 3 Report - Translation needed?	Is the report clear and complete?
RO	Y	Y	21.05.2010	Y	Yes partly, as Interministerial Commission of Water is not reported as a CA for the FD but for WFD	Y	2	Yes, 11 subunits have been reported for WFD: these are the same as the UoM for the FD.	11	RO, translation needed as regards specifications of roles (role A and B), national relationships.	No: on competent authorities involved
SE	Y	Y	21.05.2010	N	Yes	Y	1	Yes, the RBD and UoM are the same	10	SE, translation needed as regards legal status, specifications as regards the roles, and national / international relationships.	Yes
SI	Y	Y	07.11.2011	Y	Yes (In accordance with Government Act of the Republic of Slovenia of February 3, 2012 the Ministry of Agriculture, Forestry and Food of the Republic of Slovenia was combined with	Y	1	Yes	2	SI, translation needed as regards legal status.	No: on international cooperation in both international RBDs

MS	XML	SPATIAL	Data released (reference: CDR as of 15 October 2013)	CA as for WFD (Reported by MS)	CA as for WFD (Assessment Consultant, see detailed comments in assessment templates)	UoM as for WFD (Reported by MS)	Number of CA for FD	UoM as for WFD (Assessment Consultant)	Number of UoM for FD	Language of Article 3 Report - Translation needed?	Is the report clear and complete?
					the Ministry of the Environment and Spatial Planning of the Republic of Slovenia on part that concerns the environment. Consequently, the name of the ministry has been changed into the Ministry of Agriculture and the Environment of the Republic of Slovenia.						
SK	Y	Y	25.05.2010	Y	Yes (for WFD it is the “main” CA)	Y-RBD	1	Yes, same UoM as for WFD)	2	SK, translation needed as regards legal status and international relationships of CA	Yes

MS	XML	SPATIAL	Data released (reference: CDR as of 15 October 2013)	CA as for WFD (Reported by MS)	CA as for WFD (Assessment Consultant, see detailed comments in assessment templates)	UoM as for WFD (Reported by MS)	Number of CA for FD	UoM as for WFD (Assessment Consultant)	Number of UoM for FD	Language of Article 3 Report - Translation needed?	Is the report clear and complete?
UK	Y	N	03.08.2010	N	No (same CA as for WFD only for some parts of the UK. For Northern Ireland, the Floods CA is the Department for Agriculture and Rural Development, while the WFD CA is the Department of the Environment. In England and Wales, Lead Local Flood Authorities are additional CAs to those that are CAs for both Floods and the WFD.)	Y-RBD	8	Yes	16	EN	Yes

HOW TO OBTAIN EU PUBLICATIONS

Free publications:

- one copy:
  via EU Bookshop (http://bookshop.europa.eu);

- more than one copy or posters/maps:
  from the European Union's representations (http://ec.europa.eu/represent_en.htm);
  from the delegations in non-EU countries
  (http://eeas.europa.eu/delegations/index_en.htm);
  by contacting the Europe Direct service (http://europa.eu/europedirect/index_en.htm)
  or calling 00 800 6 7 8 9 10 11 (freephone number from anywhere in the EU) (*).

  (*) The information given is free, as are most calls (though some operators, phone boxes or hotels may charge you).

Priced publications:

- via EU Bookshop (http://bookshop.europa.eu).

Priced subscriptions:

- via one of the sales agents of the Publications Office of the European Union
  (http://publications.europa.eu/others/agents/index_en.htm).

KH-02-16-033-EN-N

Publications Office

doi:10.2779/576456