

Risk of Flooding from Rivers and Sea - Product Description

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What are the Risk of Flooding from Rivers and Sea products

Overview

Risk of Flooding from Rivers and Sea (RoFRS) are products that show the chance of flooding from rivers and the sea to areas of land, taking into account the presence and condition of flood defences. It is our main way of communicating flood risk from rivers and the sea to the public through our 'Check Your Long Term Flood Risk' service on gov.uk.

Why they are created

RoFRS has been created to support the public and other decision makers in understanding, managing and responding to flood risk.

What they show

RoFRS are probabilistic products that represent risk considering the presence and condition of flood risk management assets and takes account of the chance of them overtopping or failing. They show the overall flood risk from rivers and the sea. The data is presented in flood risk likelihood categories, which indicate the chance of flooding in any given year.

While flood defences reduce the level of risk, they do not completely remove it. For example, water can flow over the top of the defence, or they can fail in extreme weather conditions or if they are in poor condition. As a result, RoFRS may show that there is risk to areas behind some flood defences.

Risk is displayed as one of four likelihood categories:

- High - greater than or equal to 1 in 30 (3.3%) chance of flooding in any year
- Medium – Less than 1 in 30 (3.3%) but greater than or equal to 1 in 100 (1%) chance of flooding in any given year
- Low – Less than 1 in 100 (1%) but greater than or equal to 1 in 1000 (0.1%) chance of flooding in any given year
- Very low – less than 1 in 1000 (0.1%) chance of flooding in any given year

Climate Change

As well as present day risk of flooding from rivers and the sea, climate change scenarios have been produced to indicate the predicted impacts of climate change on future flood risk. The climate change allowances are based on the latest UK Climate Projections (UKCP18) from the Met Office, using the Representative Concentration Pathway (RCP) 8.5.

Near-term epochs and central/higher central allowances are being used initially, to support short and medium-term decisions informed by the highest flood likelihood projections:

- Fluvial: central allowance - 2040-2069 ("2050s" epoch)
- Coastal: higher central allowance - 2036-2065

RoFRS products

We update and maintain several RoFRS products:

Risk of Flooding from Rivers and Sea

This is our primary dataset showing the flood risk from rivers and the sea, represented on a 2m resolution grid.

Depths*

This dataset also presents the likelihood of flooding for the following depths:

- 0.2m
- 0.3m
- 0.6m
- 0.9m
- 1.2m

Risk of Flooding from Rivers and Sea – Climate Change 1*

A version of the Risk of Flooding from Rivers and Sea dataset showing flood risk likelihood accounting for climate change, using the scenarios described above, is also available.

Depths*

This dataset also presents the likelihood of flooding for the following depths:

- 0.2m
- 0.3m
- 0.6m
- 0.9m
- 1.2m

*Where areas have been retained from a previous version of Risk of Flooding from Rivers and Sea, this will be a 50m resolution grid and climate change and depth outputs will not be available. The areas of unavailable data will be indicated within the dataset layers. Further details on this can be found in **How they are created**.

Risk of Flooding from Rivers and Sea – Properties in Areas at Risk

The RoFRS Properties in Areas at Risk product presents properties in England with one of the four RoFRS flood risk likelihood categories indicated, based on the category allocated to the grid cell that the property sits within.

It is delivered as comma-separated values in a plain text format. Individual addresses are not provided, but Ordnance Survey references are included to enable the data to be linked to AddressBase and/or the OS MasterMap Topography Layer.

Risk of Flooding from Rivers and Sea – Postcodes in Areas at Risk

The RoFRS Postcodes in Areas at Risk product summarises the flood risk likelihood associated with the properties in each unique postcode in England.

This dataset uses AddressBase and/or the OS MasterMap Topography Layer, together with Royal Mail postcode data to show how many property receptors in each postcode fall within each of four flood risk categories, based on the category allocated to the cell that each property sits within.

It is delivered as comma-separated values in a plain text format.

Risk of Flooding from Rivers and Sea - Key Summary information

The RoFRS Key Summary Information provides a summary of the estimated number of people and properties in areas of land at risk of flooding from rivers and the sea. Property counts are also categorised for different property types (residential, non-residential, unclassified).

It includes total numbers / areas at risk, with an additional breakdown by each of the four RoFRS flood risk likelihood categories.

Further explanations about the information presented in the spreadsheets, such as flood likelihood category, property types and how numbers are calculated, are presented in the first tab of each spreadsheet.

Each set of counts is split by different spatial units:

- Country
- ONS Regions
- River Basin District
- RFCC (Regional Flood and Coastal Committee)
- Environment Agency Areas
- LLFA (Lead Local Flood Authority)
- MP constituency

It is provided as a series of spreadsheets which provide the following summary information:

- Number of properties in areas at risk from flooding from rivers and the sea
- Number of people in areas at risk from flooding from rivers and the sea

How the Risk of Flooding from Rivers and Sea products are managed

How they are created

RoFRS is created using a combination of local flood model information and national flood modelling. These are used to generate the probabilities of flood risk for each 2m grid square of land, with the aim of using the best available flood risk information in any one location.

For particular areas, sections of a previous (50m resolution) RoFRS dataset have been retained. These are due to be replaced in the future.

Update frequency

In the future we plan to publish the data every three months and update it in locations where new local flood model information is available. Updates on these timescales can be found on [Updates to national flood and coastal erosion risk information - GOV.UK](#)

Uses and limitations

Who uses RoFRS and why

The Environment Agency

The Environment Agency use RoFRS to understand flood risk from rivers and the sea and take a risk based approach at all levels. It is our primary dataset used to communicate this flood risk with the public and our partners.

It provides evidence to support investment decisions in the management of our flood defence assets and also for our Long-term Investment Strategies (LTIS) which set out the future costs and benefits of managing flood and coastal risks in a range of different scenarios.

RoFRS is used to help understand local flood risk to secure Partnership Funding from external contributions for projects.

The public

RoFRS is produced to give the public consistent information about the likelihood of flooding from rivers and the sea. We want to encourage people living and working in areas prone to flooding to find out about the flood risk in their area and take appropriate action.

Our customers and partners

We also make the data available as open data so that customers, partners and infrastructure owners can use it.

Suitability and limitations

RoFRS **does not show other forms of flooding** such as from highway drains, surface water, sewers, overland flow or rising groundwater.

Flood estimation is not an exact science, and any flood risk assessment needs to be understood and used in that context.

A confidence category has been assigned, which provides an indicative confidence level for each spatial cell. However, confidence scores are in development and will change, therefore should not be used in any decision making at this stage. This is also not a reflection of how suitable the data is to use on a particular spatial scale.

RoFRS outputs are generally not suitable for property level assessment and estimate flood risk to an area of land. The method used does not provide information relating to when the floodwater may be deep enough to start causing damage or disruption to homes, roads or other infrastructure. Alongside depth information, additional information on properties (including floor levels) would be required to say with any confidence whether flooding of a certain depth would enter into a property and cause damage.

How to access them

Check Your Long Term Flood Risk service

The Environment Agency presents RoFRS products, including climate change and depth outputs, on the Check Your Long Term Flood Risk service via [GOV.UK](https://gov.uk) where anyone can access them by entering a postcode or by viewing the national map.

Data Services Platform (DSP)/ data.gov.uk

The RoFRS products are also available in a variety of formats from the [Defra Data Services Platform](https://defra.data.gov.uk) and data.gov.uk

Product Contents and Schemas

Schemas for the datasets available on the Defra Data Services Platform schemas are provided on the following pages and describe the geometry and the attributes of the data. When delivered, some file formats may truncate the fieldnames.

As stated in **Suitability and limitations**, the Confidence scores are in development and will change, therefore should not be used in any decision making at this stage.

Risk of Flooding from Rivers and Sea

File Geodatabase Name: RoFRS_vYYYYMM.gdb

Simple Feature Class						Geometry:	Polygon	
1. RoFRS_4band						Contains M Values: ¹	No	
						Contains Z Values: ²	No	
Field name	Description	Data type	Allow nulls	Default value	Domain	Precision	Scale	Length
OBJECTID	Unique object identifier	Object ID						
Shape	Geometry data type	Geometry						
Risk_band	Flood likelihood category assigned to impact cell	Text	No	-	-			12
Confidence	Confidence score assigned to impact cell	Short Integer	No	-	-	5		

Simple Feature Class						Geometry:	Polygon	
2. RoFRS_4band_0_2m_depth 3. RoFRS_4band_0_3m_depth 4. RoFRS_4band_0_6m_depth 5. RoFRS_4band_0_9m_depth 6. RoFRS_4band_1_2m_depth						Contains M Values: ¹	No	
						Contains Z Values: ²	No	
Field name	Description	Data type	Allow nulls	Default value	Domain	Precision	Scale	Length
OBJECTID	Unique object identifier	Object ID						
Shape	Geometry data type	Geometry						
Risk_band ³	Flood likelihood category assigned to impact cell	Text	No	-	-			12

¹ Measure length (for linear referencing)

² Height value

A layer file is also provided alongside this dataset for use in ESRI applications. This contains the recommended symbology information, reflecting how the data is displayed on Environment Agency systems.

Users of other GIS applications can apply the symbology for each flood likelihood category manually using the RGB information provided in the table below:

	Flood Likelihood Category	RGB	HEX#
	High	61-68-137	3D4489
	Medium	102-153-205	6699CD
	Low	162-207-255	A2CFFF
	Very Low	196-225-255	C4E1FF

Risk of Flooding from Rivers and Sea – Climate Change 1

File Geodatabase Name: RoFRS_Climate_Change_01_vYYYYMM.gdb

Simple Feature Class						Geometry:	Polygon	
1. RoFRS_CC01_4band 2. RoFRS_CC01_4band_0_2m_depth 3. RoFRS_CC01_4band_0_3m_depth 4. RoFRS_CC01_4band_0_6m_depth 5. RoFRS_CC01_4band_0_9m_depth 6. RoFRS_CC01_4band_1_2m_depth						Contains M Values: ¹	No	
						Contains Z Values: ²	No	
Field name	Description	Data type	Allow nulls	Default value	Domain	Precision	Scale	Length
OBJECTID	Unique object identifier	Object ID						
Shape	Geometry data type	Geometry						
Risk_band	Flood likelihood category assigned to impact cell	Text	No	-	-			12

¹ Measure length (for linear referencing)

² Height value

A layer file is also provided alongside this dataset for use in ESRI applications. This contains the recommended symbology information, reflecting how the data is displayed on Environment Agency systems.

Users of other GIS applications can apply the symbology for each flood likelihood category manually using the RGB information provided in the table below:

	Flood Likelihood Category	RGB	HEX#
	High	61-68-137	3D4489
	Medium	102-153-205	6699CD
	Low	162-207-255	A2CFFF
	Very Low	196-225-255	C4E1FF

Risk of Flooding from Rivers and Sea – Key Summary Information

RoFRS_PropertiesAtRisk_vYYYYMM.xlsx

- Number of properties and percentage of properties at risk with breakdown by property type and flood likelihood category.

Reporting Boundaries:

Country, ONS Region, RBD, RFCC, EA PF Area, LLFA, MP Constituency

RoFRS_PeopleAtRisk_vYYYYMM.xlsx

- Number of people and percentage of people (based on residential properties) at risk, with breakdown by flood likelihood category.

Reporting Boundaries:

Country, ONS Region, RBD, RFCC, EA PF Area, LLFA, MP Constituency

Risk of Flooding from Rivers and Sea – Postcodes in Areas at Risk

PostcodesAtRisk_vYYYYMM.csv								
Field name	Description	Data type	Allow nulls	Default value	Domain	Precision	Scale	Length
PC	Postcode	Text	No	-	-			8
RES_CNT_High	Number of residential properties at high risk	Short Integer	No	-	-	5		
NRP_CNT_High	Number of non-residential properties at high risk	Short Integer	No	-	-	5		
UNC_CNT_High	Number of unclassified properties at high risk	Short Integer	No	-	-	5		
TOTAL_CNT_High	Total number of properties at high risk	Short Integer	No	-	-	5		
RES_CNT_Medium	Number of residential properties at medium risk	Short Integer	No	-	-	5		
NRP_CNT_Medium	Number of non-residential properties at medium risk	Short Integer	No	-	-	5		
UNC_CNT_Medium	Number of unclassified properties at medium risk	Short Integer	No	-	-	5		
TOTAL_CNT_Medium	Total number of properties at medium risk	Short Integer	No	-	-	5		
RES_CNT_Low	Number of residential properties at low risk	Short Integer	No	-	-	5		
NRP_CNT_Low	Number of non-residential properties at low risk	Short Integer	No	-	-	5		
UNC_CNT_Low	Number of unclassified properties at low risk	Short Integer	No	-	-	5		
TOTAL_CNT_Low	Total number of properties at low risk	Short Integer	No	-	-	5		
RES_CNT_VeryLow	Number of residential properties at very low risk	Short Integer	No	-	-	5		
NRP_CNT_VeryLow	Number of non-residential properties at very low risk	Short Integer	No	-	-	5		
UNC_CNT_VeryLow	Number of unclassified properties at very low risk	Short Integer	No	-	-	5		
TOTAL_CNT_VeryLow	Total number of properties at very low risk	Short Integer	No	-	-	5		
SORTOFFICE	The postcode area - part of the outward code, it is either one or two characters long and is alphabetical.	Text	No	-	-			2
DISTRICT	The postcode district - part of the outward code, it is either one or two digits or a digit followed by a letter.	Text	No	-	-			2

SECTOR	The postcode sector - part of the inward code, it is made up of a single digit (the first character of the inward code).	Short Integer	No	-	-	5		
UNIT	The postcode unit - part of the inward code, it is two characters added to the end of the postcode sector.	Text	No	-	-			2

Risk of Flooding from Rivers and Sea – Properties in Areas at Risk

PropertiesAtRisk_vYYYYMM.csv								
Field name		Data type	Allow nulls	Default value	Domain	Precision	Scale	Length
UPRN	A unique and persistent ID for every addressable location in England. copy derived from OS AddressBase	Text	Yes	-	-			12
TOPO_TOID	A unique and persistent identifier, associated with the building features in OS MasterMap® Topography Layer	Text	Yes	-	-			20
Property_Type	An indication of property type - Residential (RES), Non-residential (NRP), Unclassified (UNC)	Text	No	-	-			3
Risk_Band	Flood likelihood category associated with property according to flood risk analysis	Text	No	-	-			12

Risk of Flooding from Rivers and Sea – Key Summary Information

RoFRS_PropertiesAtRisk_vYYYYMM.xlsx

- Number of properties and percentage of properties at risk with breakdown by property type and flood likelihood category.

Reporting Boundaries:

Country, ONS Region, RBD, RFCC, EA PF Area, LLFA, MP Constituency

RoFRS_PeopleAtRisk_vYYYYMM.xlsx

- Number of people and percentage of people (based on residential properties) at risk, with breakdown by flood likelihood category.

Reporting Boundaries:

Country, ONS Region, RBD, RFCC, EA PF Area, LLFA, MP Constituency

Licensing

These RoFRS products are available for use under the [Open Government Licence](#).