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SIMPLIFIED TOOLS FOR RISK ASSESSMENT

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FRMRC II - Practitioner workshop on asset management
October 2011

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SIMPLIFIED TOOLS FOR RISK ASSESSMENT

The purpose

Quantify the change of risk due to a particular management intervention

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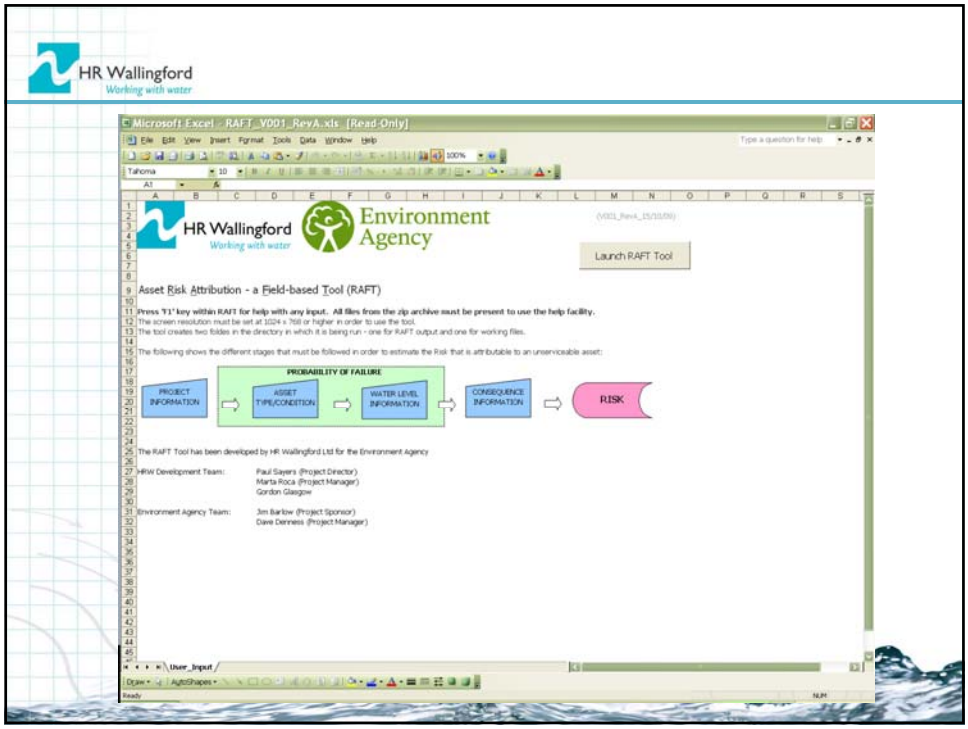
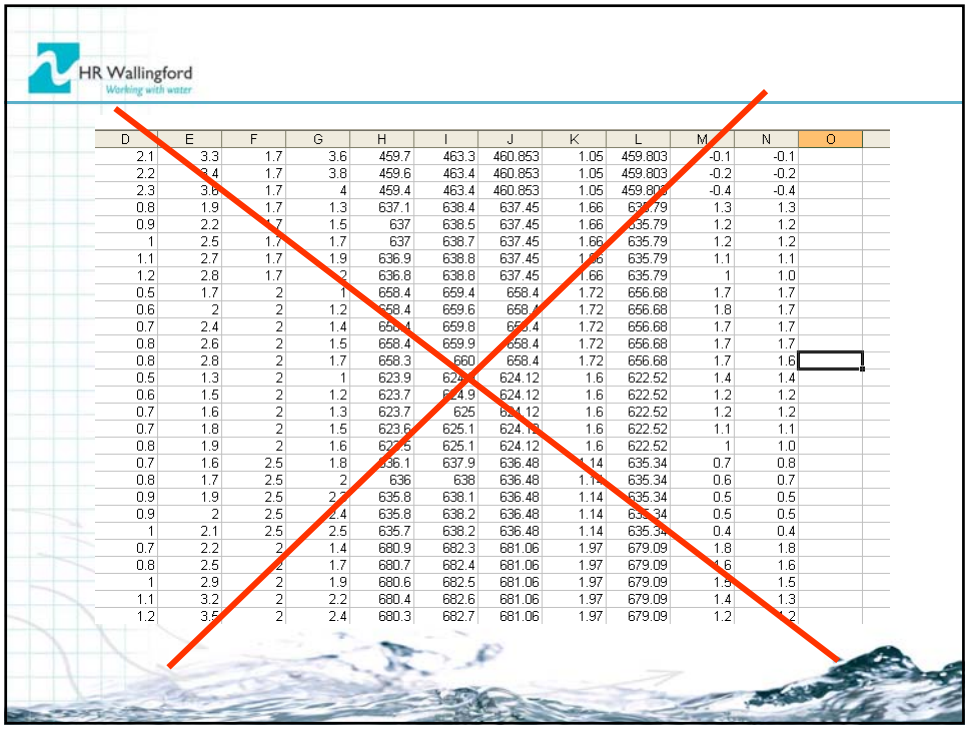
SIMPLIFIED TOOLS FOR RISK ASSESSMENT

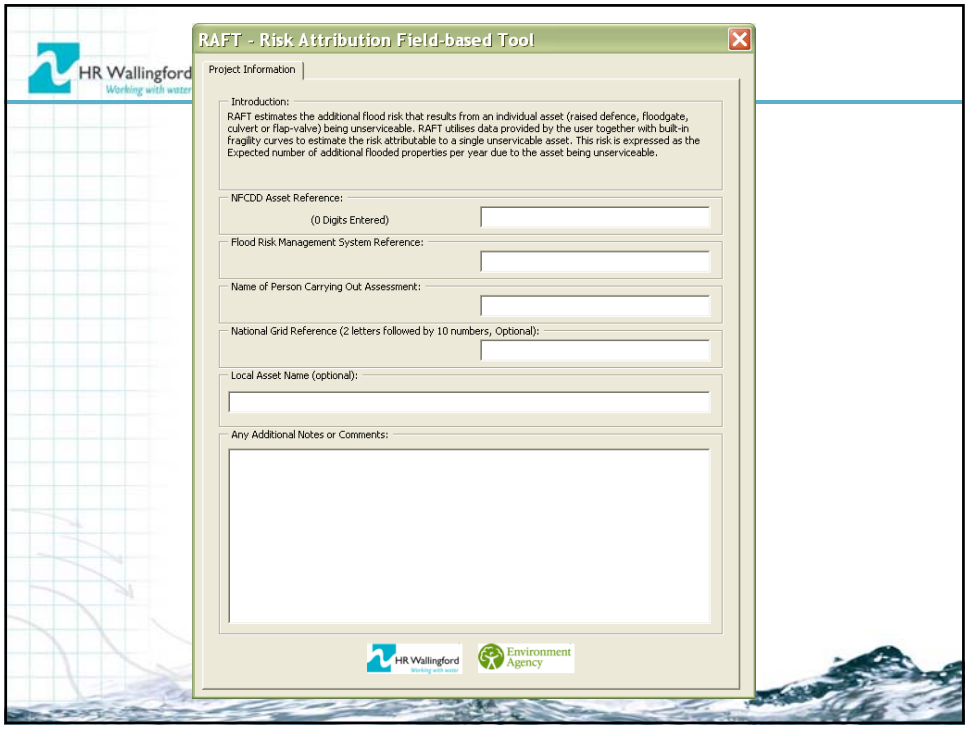
The user

Easily applied - can be run from a PC with a few clicks
With limited data





D	E	F	G	H	I	J	K	L	M	N	O
2.1	3.3	1.7	3.6	459.7	463.3	460.853	1.05	459.803	-0.1	-0.1	
2.2	3.4	1.7	3.8	459.6	463.4	460.853	1.05	459.803	-0.2	-0.2	
2.3	3.6	1.7	4	459.4	463.4	460.853	1.05	459.803	-0.4	-0.4	
0.8	1.9	1.7	1.3	637.1	638.4	637.45	1.66	635.79	1.3	1.3	
0.9	2.2	1.7	1.5	637	638.5	637.45	1.66	635.79	1.2	1.2	
1	2.5	1.7	1.7	637	638.7	637.45	1.66	635.79	1.2	1.2	
1.1	2.7	1.7	1.9	636.9	638.8	637.45	1.66	635.79	1.1	1.1	
1.2	2.8	1.7	2	636.8	638.8	637.45	1.66	635.79	1	1.0	
0.5	1.7	2	1	658.4	659.4	658.4	1.72	656.68	1.7	1.7	
0.6	2	2	1.2	658.4	659.6	658.4	1.72	656.68	1.8	1.7	
0.7	2.4	2	1.4	658.4	659.8	658.4	1.72	656.68	1.7	1.7	
0.8	2.6	2	1.5	658.4	659.9	658.4	1.72	656.68	1.7	1.7	
0.8	2.8	2	1.7	658.3	660	658.4	1.72	656.68	1.7	1.6	
0.5	1.3	2	1	623.9	624	624.12	1.6	622.52	1.4	1.4	
0.6	1.5	2	1.2	623.7	624.9	624.12	1.6	622.52	1.2	1.2	
0.7	1.6	2	1.3	623.7	625	624.12	1.6	622.52	1.2	1.2	
0.7	1.8	2	1.5	623.6	625.1	624.12	1.6	622.52	1.1	1.1	
0.8	1.9	2	1.6	623.5	625.1	624.12	1.6	622.52	1	1.0	
0.7	1.6	2.5	1.8	636.1	637.9	636.48	1.14	635.34	0.7	0.8	
0.8	1.7	2.5	2	636	638	636.48	1.14	635.34	0.6	0.7	
0.9	1.9	2.5	2.3	635.8	638.1	636.48	1.14	635.34	0.5	0.5	
0.9	2	2.5	2.4	635.8	638.2	636.48	1.14	635.34	0.5	0.5	
1	2.1	2.5	2.5	635.7	638.2	636.48	1.14	635.34	0.4	0.4	
0.7	2.2	2	1.4	680.9	682.3	681.06	1.97	679.09	1.8	1.8	
0.8	2.5	2	1.7	680.7	682.4	681.06	1.97	679.09	1.6	1.6	
1	2.9	2	1.9	680.6	682.5	681.06	1.97	679.09	1.5	1.5	
1.1	3.2	2	2.2	680.4	682.6	681.06	1.97	679.09	1.4	1.3	
1.2	3.5	2	2.4	680.3	682.7	681.06	1.97	679.09	1.2	1.2	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RAFT - Risk Attribution Field-based Tool
Project Information
Introduction:
RAFT estimates the additional flood risk that results from an individual asset (raised defence, floodgate, culvert or flap-valve) being unserviceable. RAFT utilises data provided by the user together with built-in fragility curves to estimate the risk attributable to a single unservicable asset. This risk is expressed as the Expected number of additional flooded properties per year due to the asset being unserviceable.
NFCDD Asset Reference:
(0 Digits Entered)
Flood Risk Management System Reference:
Name of Person Carrying Out Assessment:
National Grid Reference (2 letters followed by 10 numbers, Optional):
Local Asset Name (optional):
Any Additional Notes or Comments:
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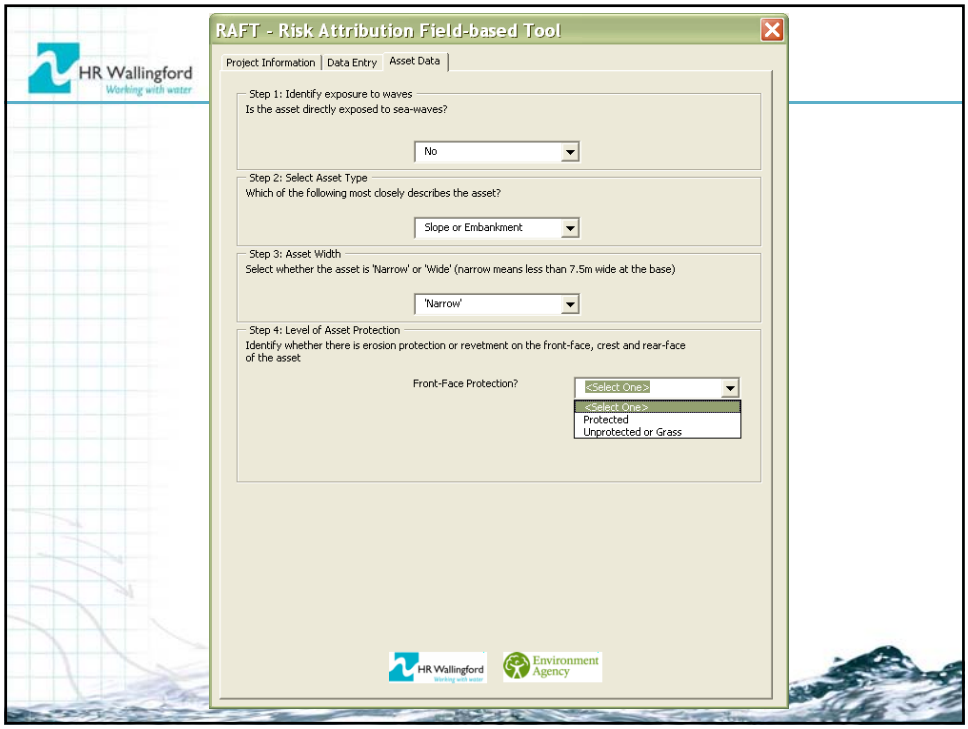
Environment Agency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RAFT - Risk Attribution Field-based Tool
Project Information
Data Entry
Asset Data
Step 1: Identify exposure to waves
Is the asset directly exposed to sea-waves?
No
Step 2: Select Asset Type
Which of the following most closely describes the asset?
Slope or Embankment
Step 3: Asset Width
Select whether the asset is 'Narrow' or 'Wide' (narrow means less than 7.5m wide at the base)
'Narrow'
Step 4: Level of Asset Protection
Identify whether there is erosion protection or revetment on the front-face, crest and rear-face of the asset
Front-Face Protection?
<Select One>
<Select One>
Protected
Unprotected or Grass
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SIMPLIFIED TOOLS FOR RISK ASSESSMENT

It is based on sounded science – but simplified

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RISK

Probability of an event

X

Potential **consequences** of that event

- Extracted from existing knowledge (as fragility curves) or previous studies

- HOUSES
- User's knowledge + flood mapping + theoretical knowledge

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RISK

Probability of an event

X

Potential consequences of that event

RISK = EXPECTED ANNUAL HOUSEHOLDS AT RISK OF FLOODING

p = 0.1 c = 50 Risk = 5
p= 0.01 c = 500 Risk = 5

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Risk Attribution Field Tool

RAFT

It relates the condition of an asset to its contribution to flood risk

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Probability X Consequences

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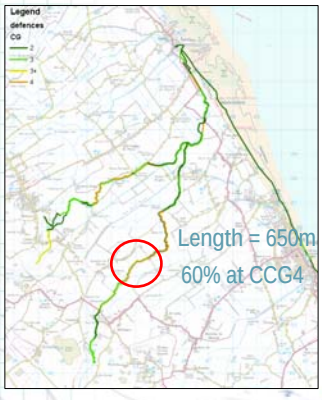
Probability X Consequences



Turf embankment

TARGET CG = 3

2 scenarios

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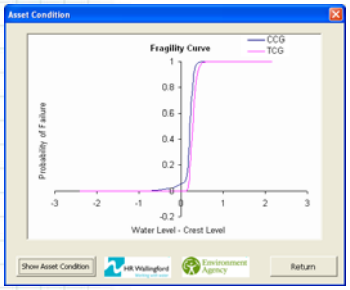
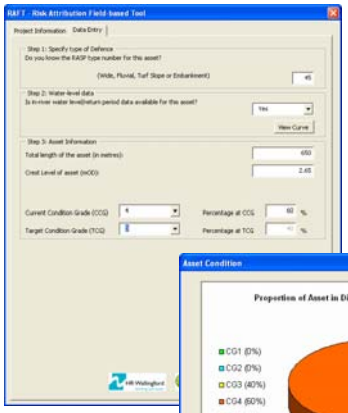
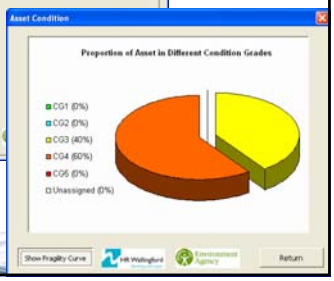
Probability X Consequences







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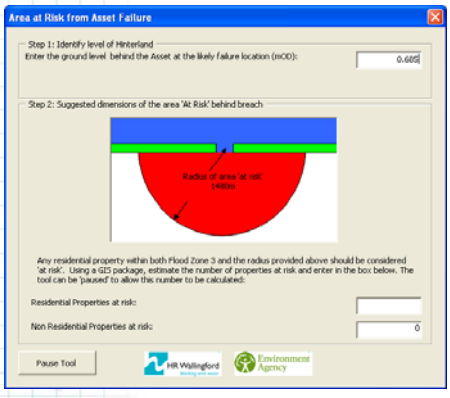
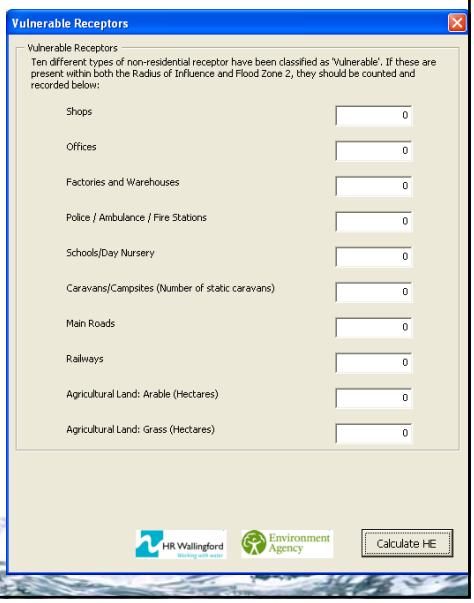
Probability X Consequences





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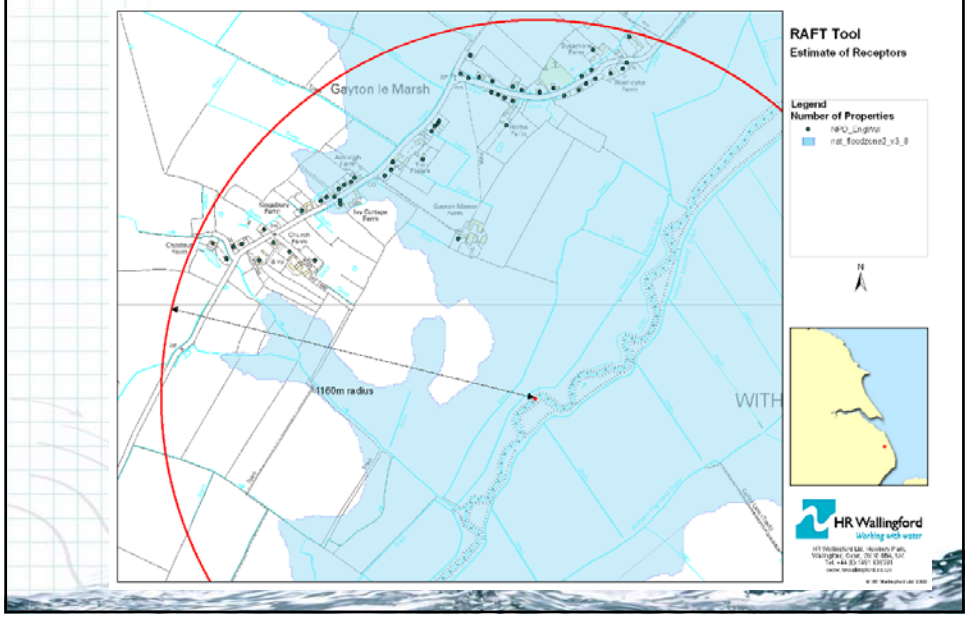
Probability X Consequences



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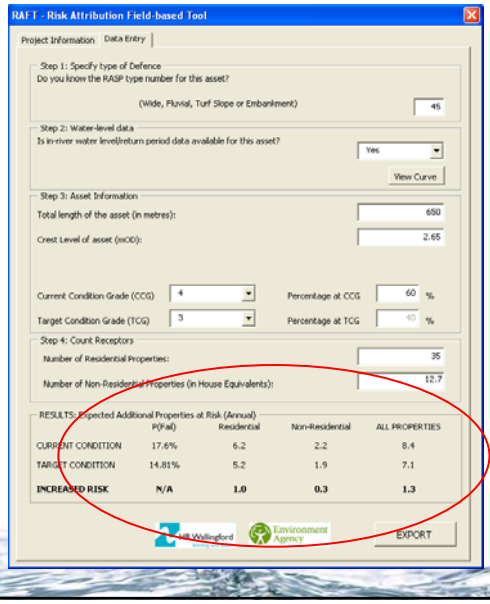
RISK



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CONVeyance Risk Tool – Frequent Maintenance

CONVRT - FM

It estimates the benefits of conveyance-related **maintenance** works at a Flood Risk Management **System** level

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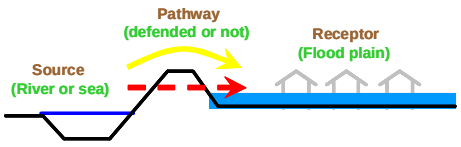
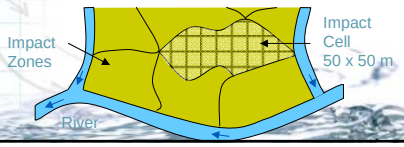
Probability X Consequences

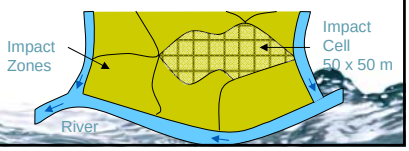
NAFRA (National Flood Risk Assessment)



'Business As Usual' run

'Do Nothing'





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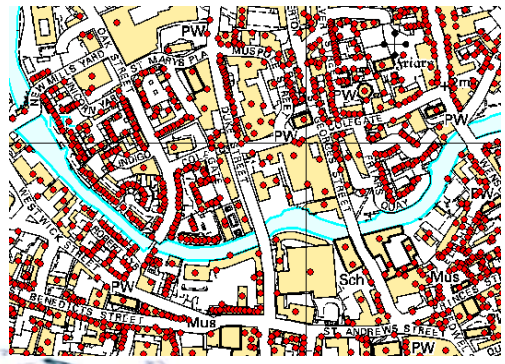
Probability X Consequences

NPD (National Properties Dataset)



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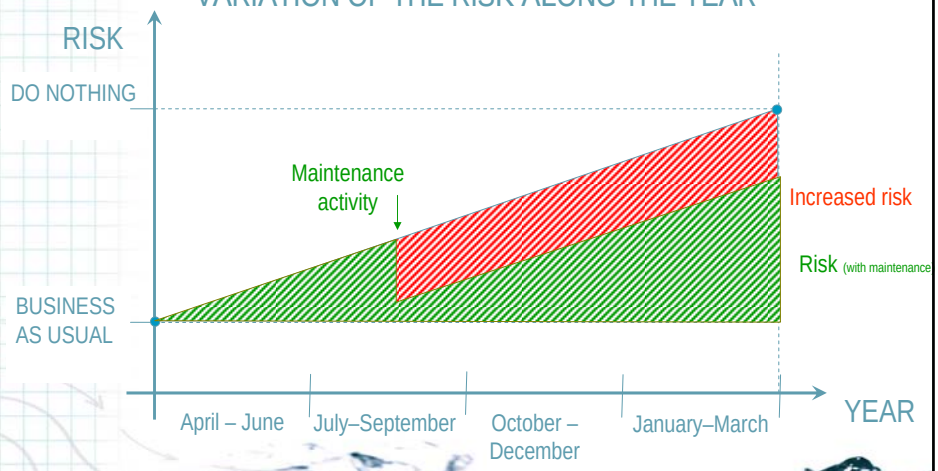
From user-provided information, CONVRT-FM calculates:

VARIATION OF THE RISK ALONG THE YEAR



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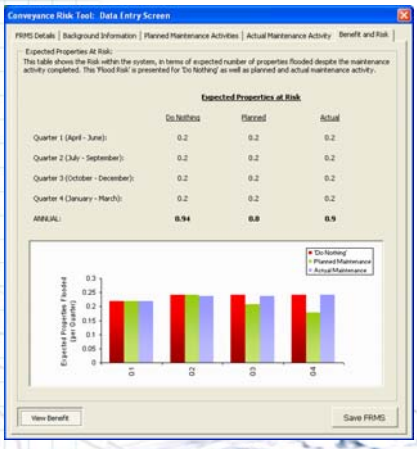
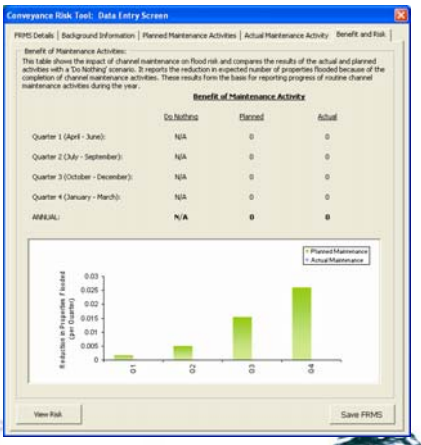
Risk and Benefit calculated for 'Do Nothing', 'Planned' and 'Actual' data...





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Intermittent tool

Conveyance EStimation – Risk Attribution

CES - RA

It estimates the benefits of a particular channel maintenance activity

In development

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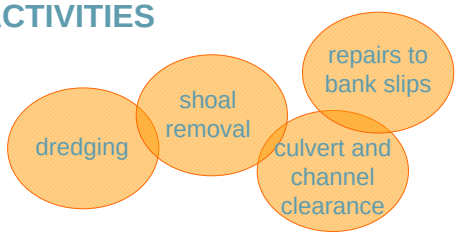
INTERMITTENT ACTIVITIES



- Every 5-10 years
- 40% related to asset condition
- 30% related to clearance activities
- Around 160 activities within High Consequence Systems

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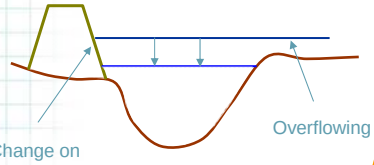
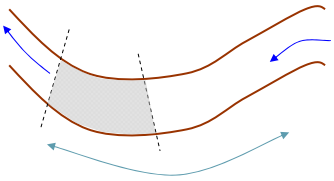
Basics

We assume that the activity reduces water levels

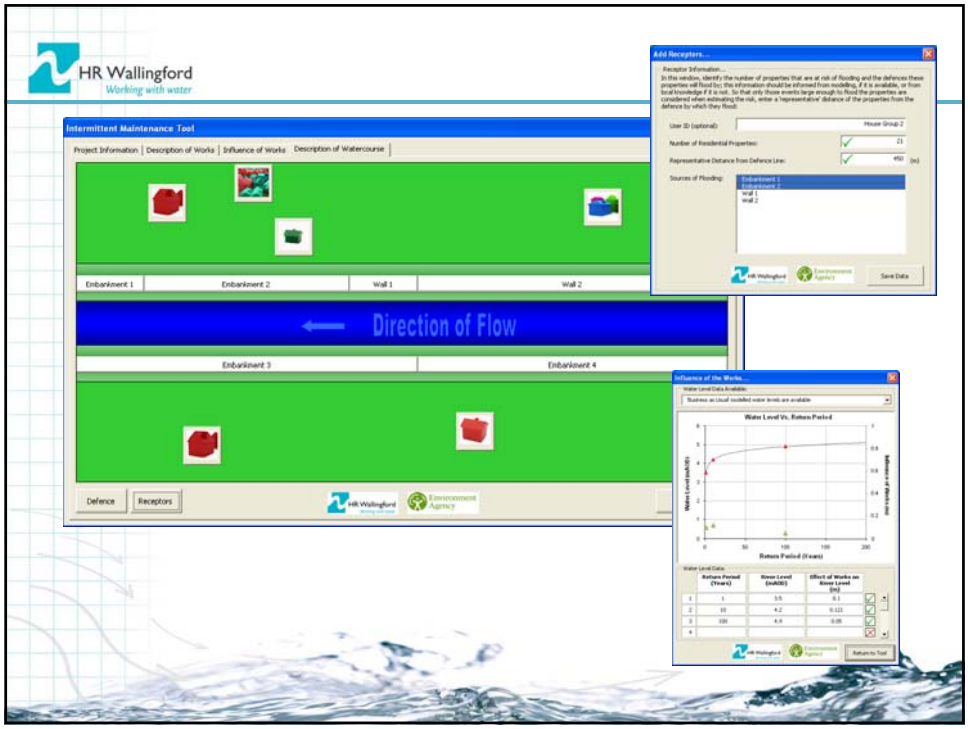


Change on loading conditions to the defence

And it influences a particular length of the river



Length of influence of works



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Many thanks!

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