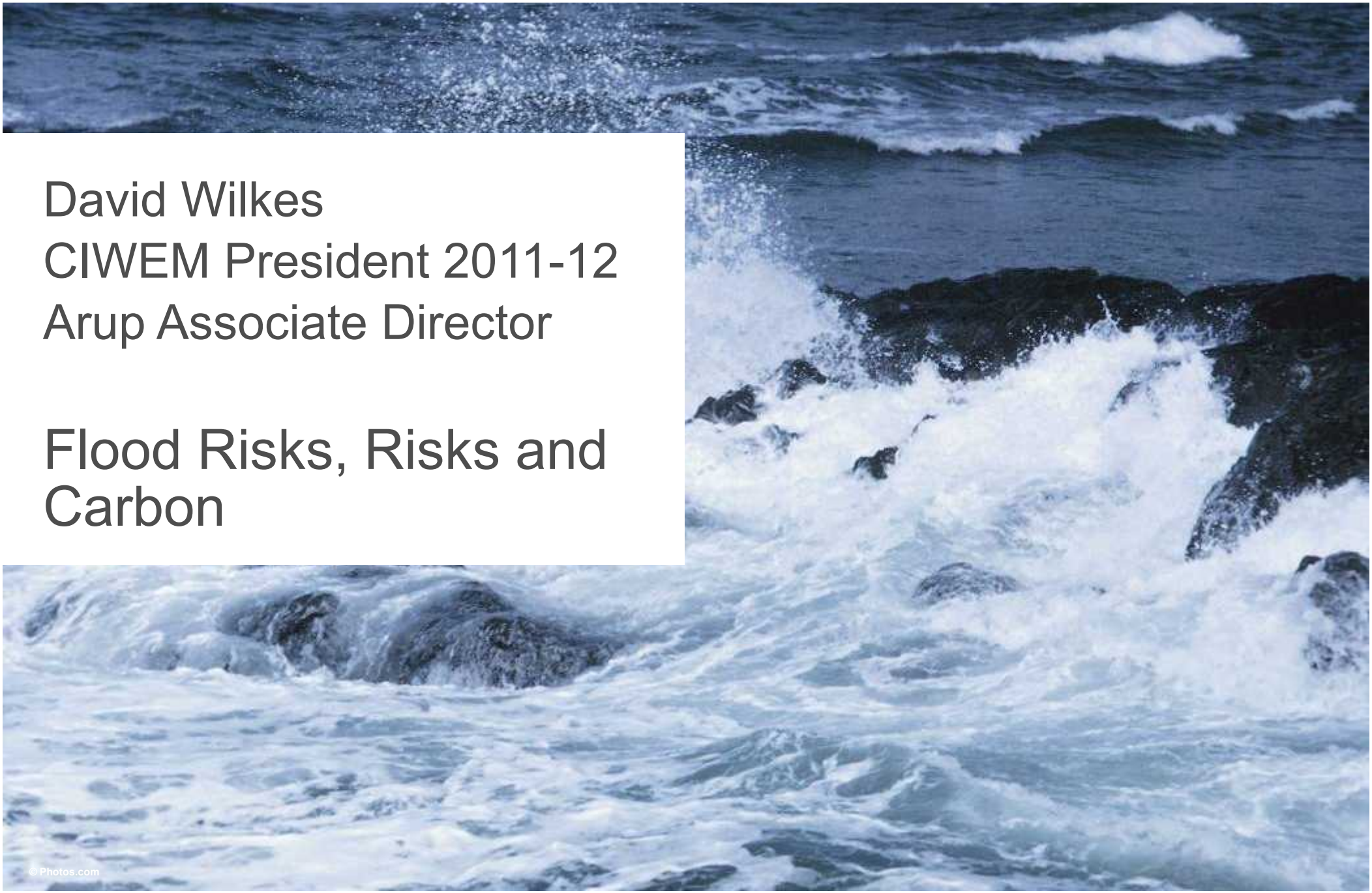


David Wilkes
CIWEM President 2011-12
Arup Associate Director

Flood Risks, Risks and Carbon

Former Flood Risk Manager Thames Barrier and for Yorkshire with Environment Agency.

Now Rivers and Coastal Director with Arup.

Contents

- CIWEM Presidential Challenge
- Risks in my field of Engineering and Environmental management
- Managing risks in Projects
- Low carbon economy
- Ground risks

CIWEM – Presidential Challenge

- Mankind has to reach a point of balance with nature to protect the guarantee of regeneration.

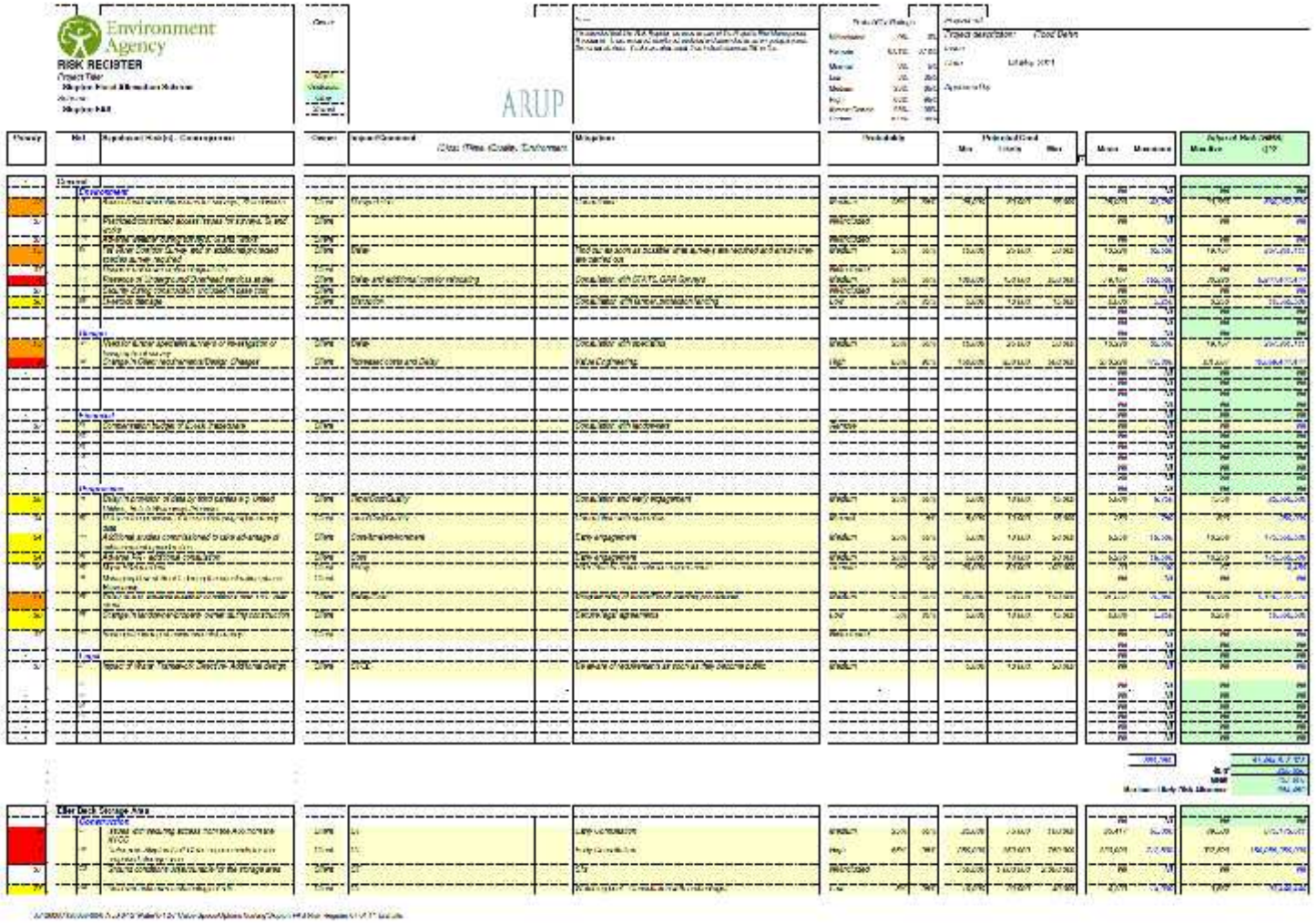
- David Wilkes
  – Induction Address CIWEM President 2011-12

Defra – UK Climate Change Risk Assessment – January 2012

- For example we do not know how fast greenhouse gas emissions will rise, how great the cooling effects are of other atmospheric pollutants or how quickly the ice caps may melt. These and other uncertainties result in a wide range of possible rates of warming and sea level rise. For example sea level rise for London is estimated to be somewhere between 20 cm and 190 cm (including the H++ scenario) by the latter part of the century, depending on which emissions scenario is considered (Lowe *et al., 2009).3*
- **The risks of flooding are projected to increase significantly across the UK. The expected annual damage to properties caused by flooding from rivers and the sea is currently approximately £1.3 billion per annum for the UK as a whole and £1.2 billion for England and Wales. New analysis for England and Wales, which have the most detailed data sets, showed that future potential risk estimates are within the following ranges:**
- £1.5 billion to £3.5 billion by the 2020s
- £1.8 billion to £6.8 billion by the 2050s
- £2.1 billion to £12 billion by the 2080s.

- Increases in the frequency of flooding would affect people's homes, the well being of vulnerable groups in society, the operation of critical infrastructure systems, such as transport, energy and water supply and disrupt a wide range of businesses located in the floodplains.

Risk Register Spreadsheet
Risk – owner – mitigations – probabilities – costs – risk profiles



ARUP

After Monte-Carlo simulation – the probable value of Project financial Risks

Environment Agency

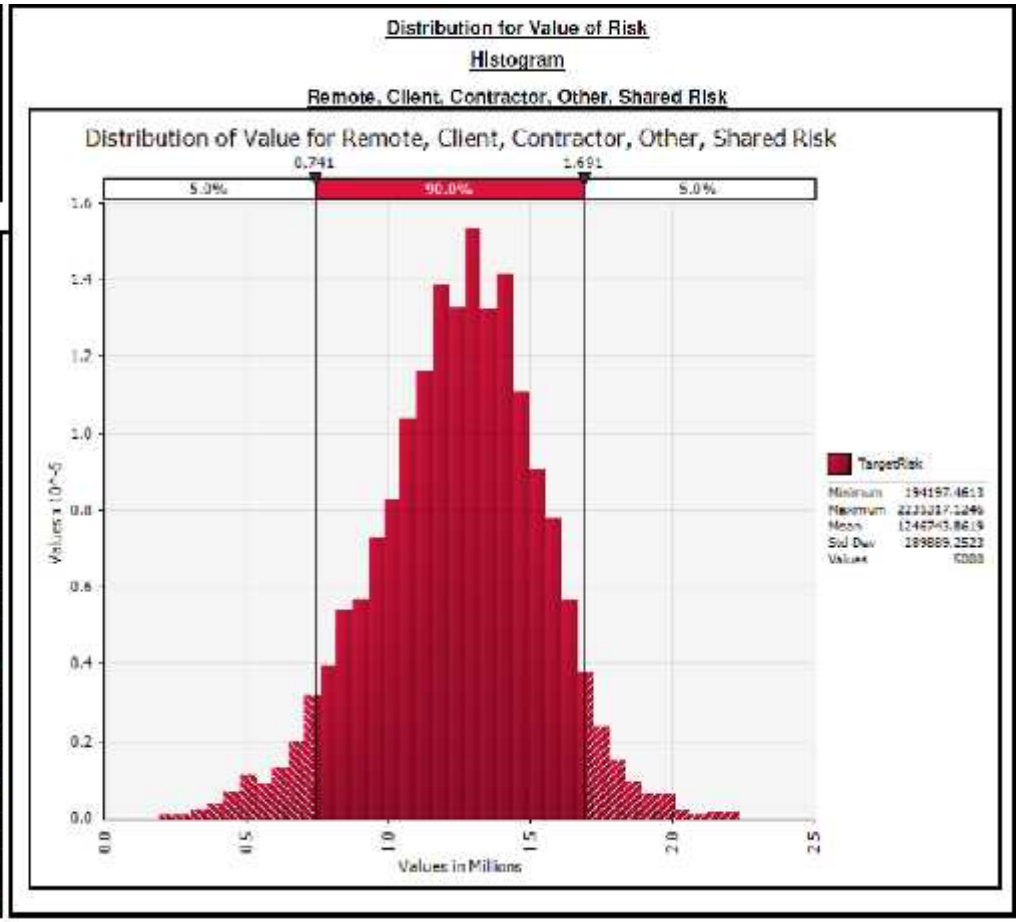
RISK REGISTER

Project Title:
Skipton Flood Alleviation Scheme

Scope of Risk
Skipton FAS

Probability Range

Mean	*1,248,744*
5%	*740,672*
10%	*856,649*
15%	*946,069*
20%	*1,006,201*
25%	*1,066,519*
30%	*1,112,761*
35%	*1,155,465*
40%	*1,190,945*
45%	*1,227,090*
50%	*1,265,072*
55%	*1,297,988*
60%	*1,331,924*
65%	*1,369,639*
70%	*1,405,928*
75%	*1,440,716*
80%	*1,486,425*
85%	*1,538,246*
90%	*1,598,814*
95%	*1,691,098*



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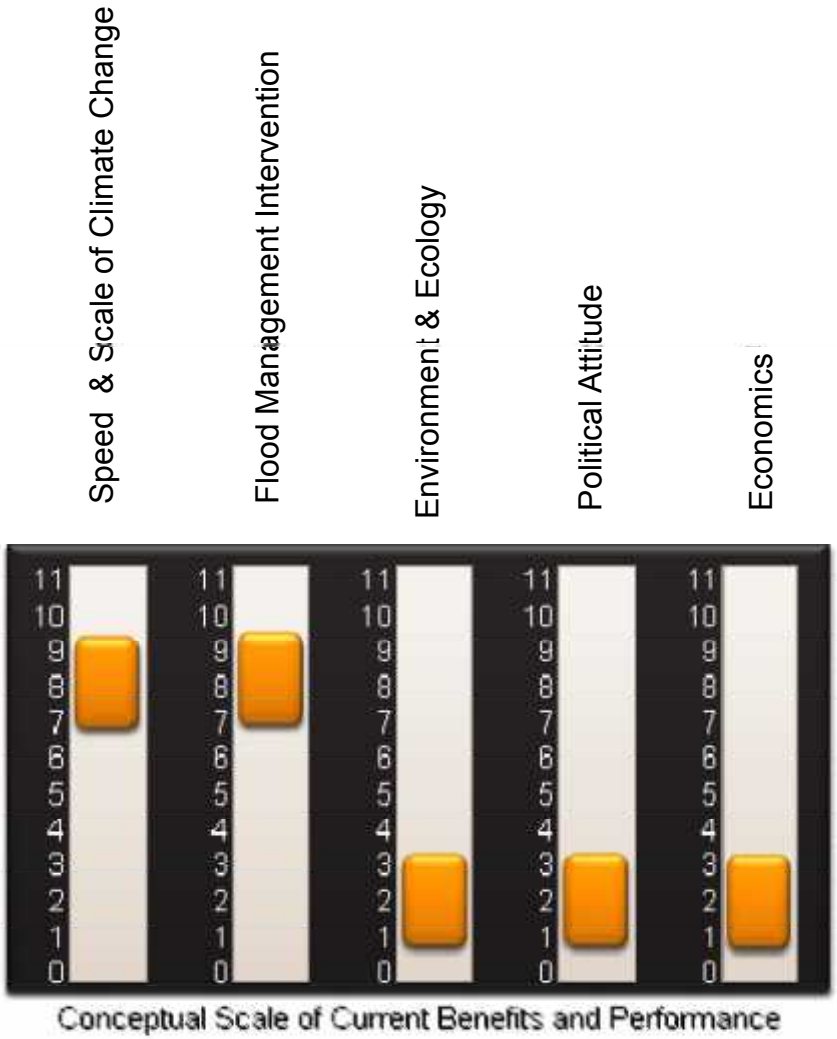
Ground Risks

On Projects you will always pay for a thorough site investigation...

- An expensive way
- A cheaper way

-The Expensive Way is **After Construction has begun and you have started digging.**

- The cheaper way is during scoping and design



Mixing Desk of future Variables

THANK YOU

ARUP

DAVID WILKES