

## Flooding – the National Trust Experience

Katy Lithgow, Head Conservator

Cockermouth, Cumbria:  
19 November 2009

**Conservation Charity founded 1895:**

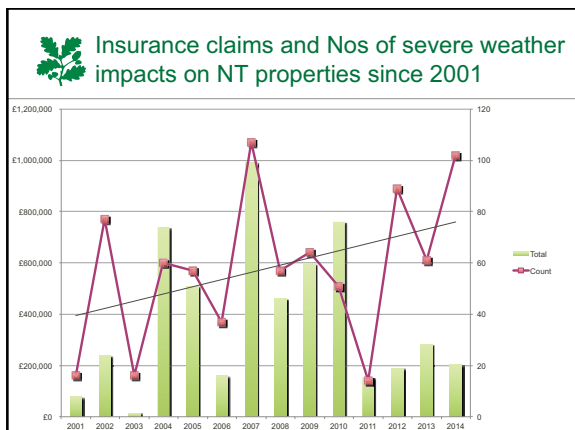
The National Trust shall be established for the purpose of promoting the permanent preservation for the benefit of the nation of lands and tenements (including buildings) of beauty or historic interest and as regards lands for the preservation (so far as is practicable) of their natural aspect, features and animal and plant life.

*Section 4.1 National Trust Act, 1907*

- 247,000 hectares land
- 742 miles (20% of nation's) coastline
- 350 pay-for-entry houses, gardens, monuments
- Nearly 1 million objects plus architectural surfaces, fixtures and fittings
- C.150 accredited museums (1 in 10 of UK museums)
- C.5.5k staff
- 60k+ volunteers
- 4.1 million members
- 20 million visits to pay for entry properties

## National Trust Definition of Conservation

...the careful management of change. It is about revealing and sharing the significance of places and ensuring that their special qualities are protected, enhanced, enjoyed and understood by present and future generations'



## Increasing storminess over 3 decades: impacts on houses

- 1987 Hurricane
- 1993 Flash and fluvial flooding Buscot
- 2000 Hurricane
- 2001 Tidal and flash flood Westbury Court Gardens
- 2001, 2004, 2007, 2008 Flash flood Blickling, rain penetration at Coughton Court...
- 2004, 2007 Flash flood Boscastle
- 2006, 2007 Tidal surge Elizabethan House Museum, Great Yarmouth
- 2007 Flash flood Calke Abbey, The Vyne, Coughton Court
- 2007 Flash and fluvial flood Buscot and Coleshill
- 2007 rain penetration Ham, Hughenden, Packwood, Knole etc....
- 2008 Flash flood Craggside
- 2009 Flash flood Lake District
- 2010 freezing Dunham Massey, Powis, Castle Coole, Anglesey, Blickling, Wimpole and 20 other properties + cottages
- 2010 rain penetration – Waddesdon



## Increasing storminess over 3 decades: impacts on houses

- 2011 freezing The Argyry and 31 other properties + cottages
- 2011 rain penetration – Ickworth
- 2012 rain penetration – Sizergh, Nostell, + 16 other properties in the Midlands & the North
- Winter Xmas 2013 – Feb 14: rainstorms – minor leaks at 15 properties, Knole, Polesden, Sutton House, Dunster, Montacute, Tredegar, Dyffryn, Cotehele, The Vyne, Hatchlands, Ham, Hinton Ampner, Winchester City Mill, Killerton, A La Ronde; major flooding in the landscape (e.g. Runnymede, Wey Navigation, Somerset Levels); severe coastal erosion Aberdeiddi, Birling Gap, Mullion Harbour, Formby, Brownsea Island, Rhossili and South Gower Coast, Murlough (NI), Blakeney, S Milton Sands, Studland Beach
- 2014 heavy rain - 8 houses June to Sept esp July (Melford, Vyne, Coughton) and August (Springhill, Sizergh, Ham) plus Wandsworth Road and Tyntesfield.



## Flooding Impacts on historic houses, interiors and collections

Preventive conservation – risk based approach based on 10 Agents of Deterioration (CCI)

### Catastrophic

1. Direct Physical Forces
2. Thieves, vandals & displacers
3. Dissociation
4. Fire
5. Water

### Cumulative

6. Pests
7. Contaminants
8. Radiation
9. Incorrect Temperature
10. Incorrect Relative Humidity

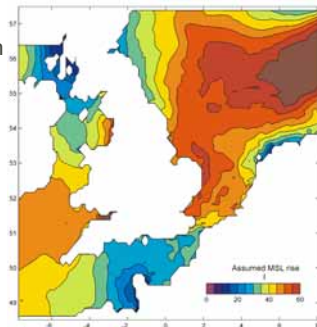


## Direct Physical forces - Accelerated Coastal Erosion Mapping Risks to NT coast over next 100 years

60% coast at risk from erosion (169 sites)

4040ha at risk from flooding (126 sites)

33 further sites could be at risk from tidal and river flooding



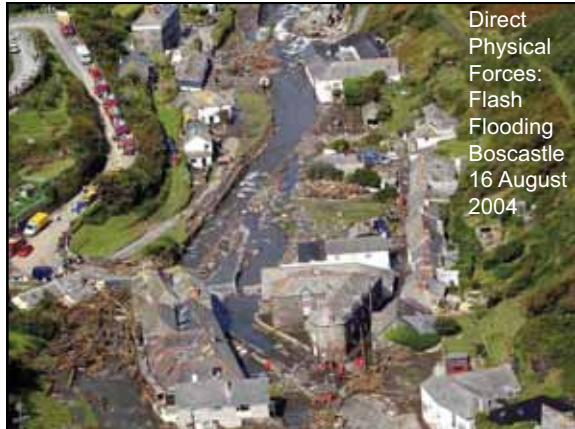
Direct Physical Forces: Accelerated Coastal Erosion - Birling Gap




Birling Gap February 2014: before




Birling Gap February 2014: after




 Impacts of flooding on historic houses, interiors and collections

<p><b>Catastrophic</b></p> <ol style="list-style-type: none"> <li>1. Direct Physical Forces</li> <li>2. Thieves, vandals etc</li> <li>3. Dissociation</li> <li>4. Fire</li> <li>5. Water</li> </ol> <p><b>Cumulative</b></p> <ol style="list-style-type: none"> <li>6. Insect Pests</li> <li>7. Contaminants</li> <li>8. Radiation</li> <li>9. Incorrect Temperature</li> <li>10. Incorrect Relative Humidity</li> </ol>	<p><b>Aesthetic, evidential and structural damage</b></p> <ul style="list-style-type: none"> <li>• Salt efflorescence</li> <li>• Dirt deposition and staining</li> <li>• Mould</li> <li>• Corrosion</li> <li>• Swelling</li> <li>• Shrinkage and cracking</li> </ul> <p><b>Synergy</b></p>
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 Water Resource Risk Assessment  
Haycock Associates Limited

- 75% of UK freshwater originates in the uplands
- 43% of the land area of England and Wales drains to the boundary of an NT property








Water - Flash Flooding – Blickling Hall, Norfolk 2001



Water - Flash Flooding  
 Blickling, Basement  
 • September 2001  
 • (and again Aug 2004)  
 • (and again June 2007)  
 • (and again Sept 2008)



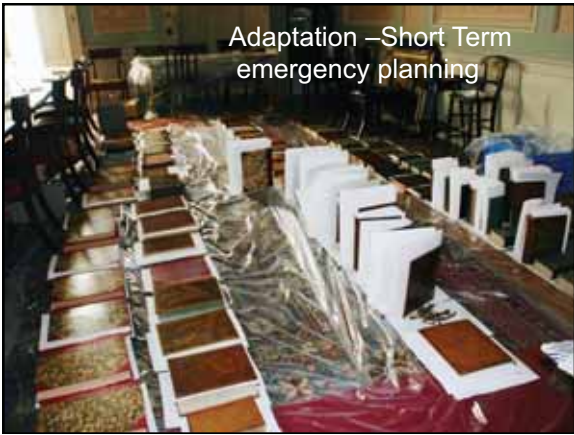
Insect Pests – Death watch beetle, Blickling Hall



Contaminants - Hardwick, High Great Chamber, Jan 2014



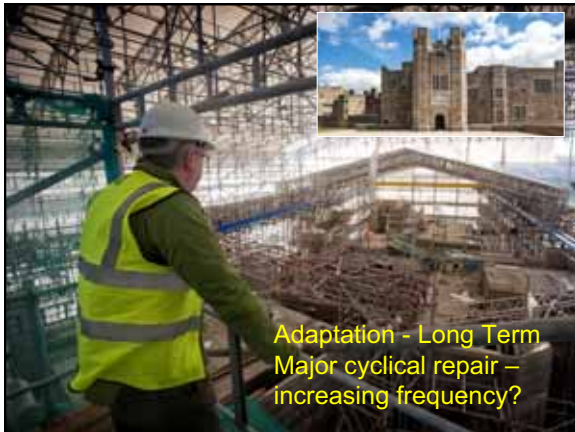
Incorrect Temperature:  
 Jan-Feb 2010 –  
 Freezing and thawing







Learn from resilience of historic building materials when refurbishing buildings to make them flood resilient




Adaptation - Long Term  
Major cyclical repair – increasing frequency?



Defences and Making space for water – in the building  
The Vyne, flash flood  
Friday 20 July 2007



 Making space for water:  
Survey historic drainage around buildings and ensure it is maintained e.g. culverts







Holnicote Estate  
Catchment Change  
Management Project

Water catchment  
management, Holnicote  
Estate



November 2014 –  
Despite dredging  
Somerset Levels filling  
up again

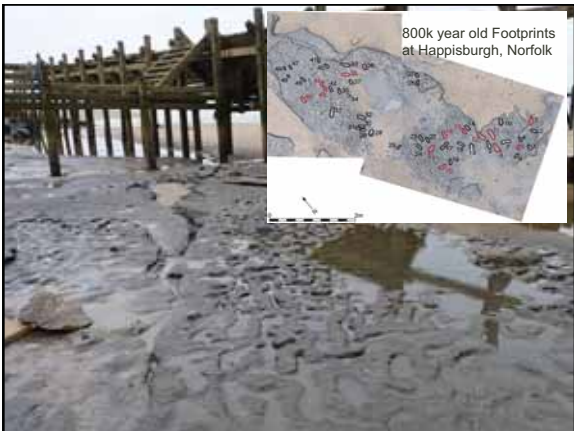
**Conclusions**

<http://www.nationaltrust.org.uk/article-1356397754013/>

- Work at landscape scale to manage water from source to sea
- Make space for water
- Waste less water
- Tackle pollution at source
- Waterproof homes and businesses



Storms reveal as well as  
destroy: Borth Forest



Packwood Ice Hedge March 2013



