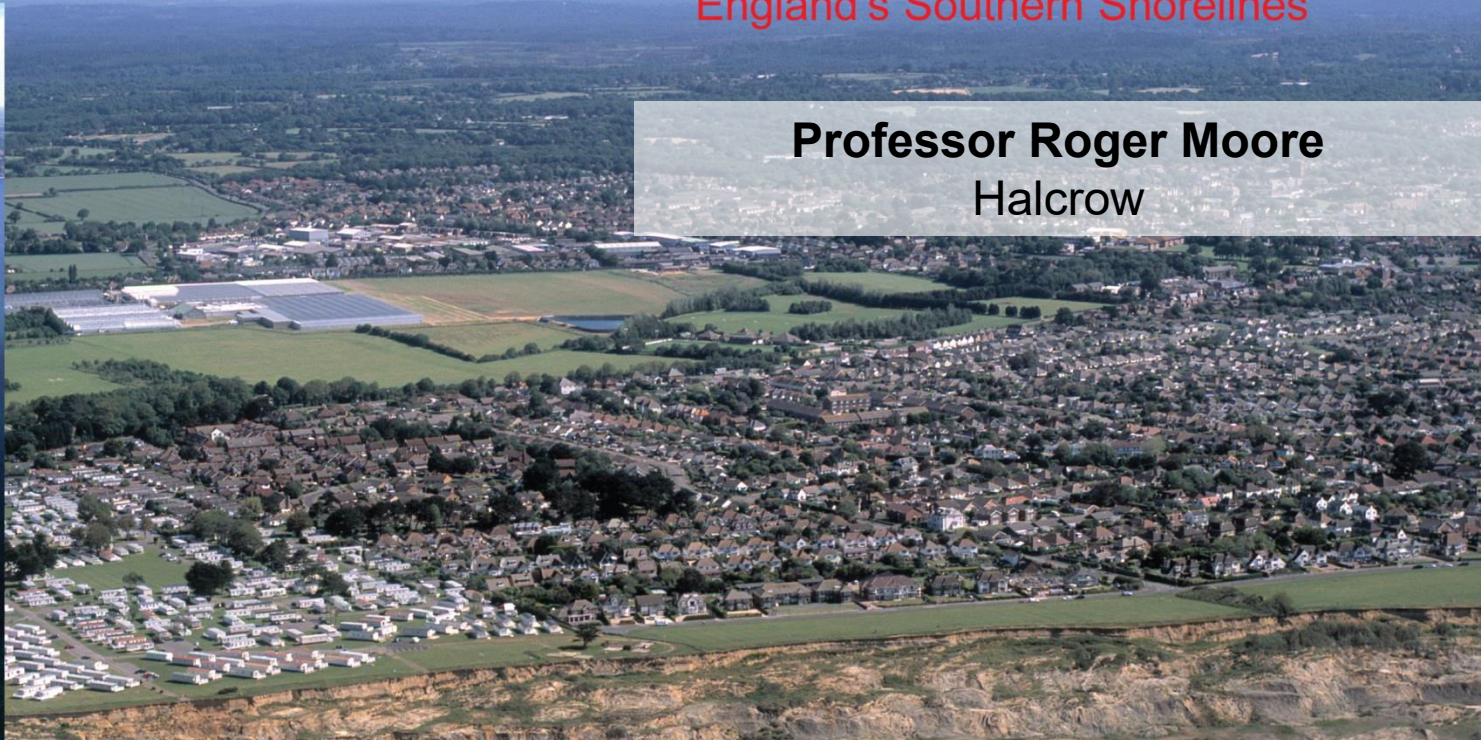


# ACCESS

'Adapting to Coastal Change along  
England's Southern Shorelines'

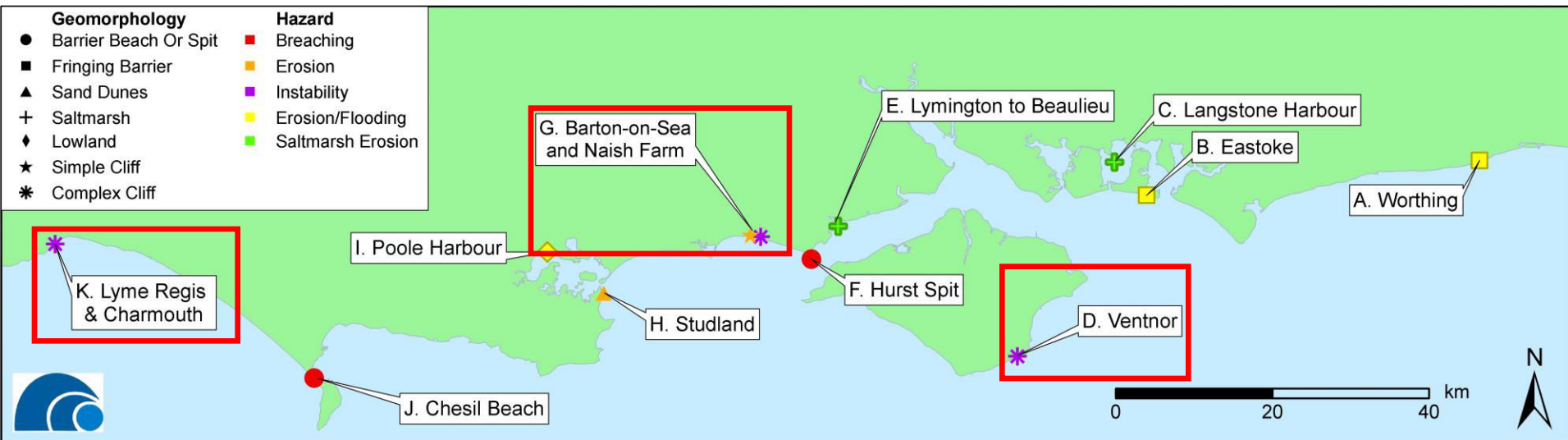
**Professor Roger Moore**  
Halcrow



[www.scopac.org.uk](http://www.scopac.org.uk)



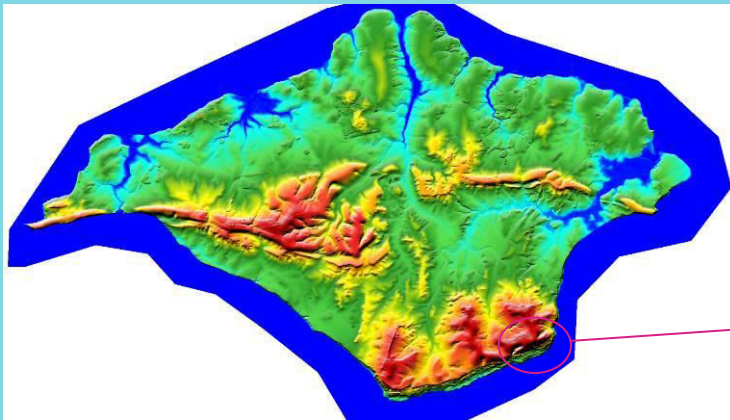
# Cliffs – simple and complex systems





# Case Study D

## Ventnor, Isle of Wight



# Overview

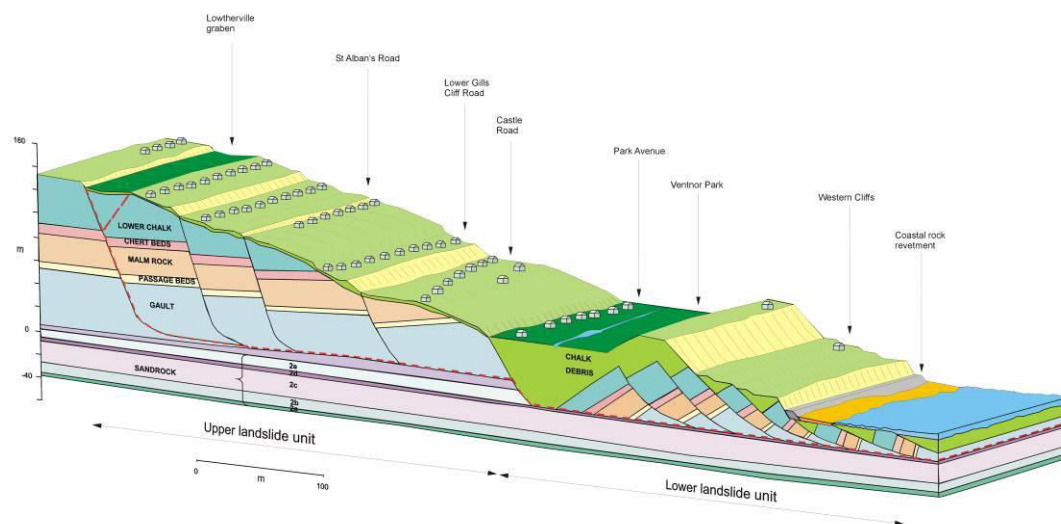
- Undercliff is a large ancient landslide complex
- Locality of significant natural beauty and scientific interest
- Extensively developed during Victorian period
- Land instability impact on property, services and other assets has been considerable
- Problems likely to increase due to climate change
- Management and mitigation of risk problematic - due to scale



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# Technical Understanding

- Landslip upon seaward dipping weak layered rocks (Blue slipper)
- Ground movement is caused by coastal erosion and groundwater
- Periodic landslide events occur, Blackgang 1994, Bonchurch 2000, Niton 2001, Ventnor 1960
- 60 properties demolished over last 100 years
- B3327 Newport Rd and A3055 Undercliff Drive threatened
- PV annual risk estimated £4.64m
- Event frequency and magnitude key to risk evaluation and planning





# Outcomes

- 2,485 properties and services (worth £600m) at risk within the Undercliff
- Estimates consistent between SMP, NCERM and Ventnor QRA
- Cliff top recession potential at Bonchurch and The Landslip, threatens further 63 properties and A3055 Shanklin Rd, not identified in SMP
- Proactive management essential to mitigate risk; planning, development control, monitoring, investigation, engineering works, stakeholder engagement
- SMP policies HTL, NAI
- Adaptation - will be a reality!



# Case Study G

## Barton-on-Sea and Naish Farm, Hampshire



# Overview

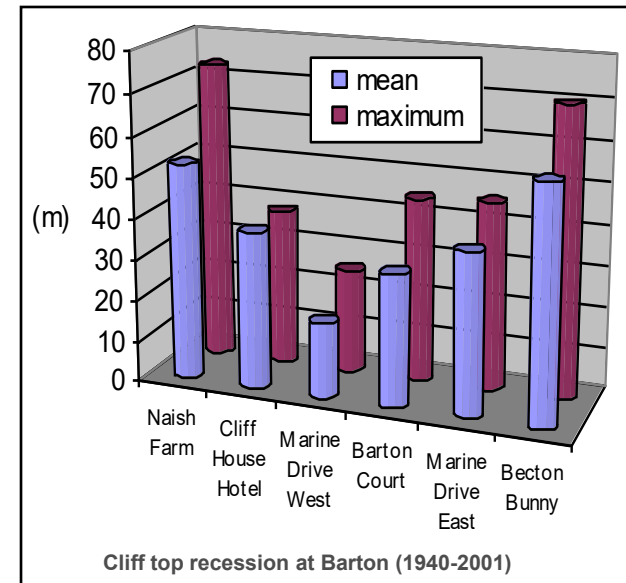
- Variety of cliff types subject to coastal erosion and landslides
- Cliff instability and recession threatens amenity and cliff-top property, businesses and assets
- Coastal defences and slope stabilisation measures installed
- New phase of ongoing cliff instability has had a major impact on amenity and access
- Problems anticipated to worsen due to climate change
- Management policy HTL/MR/NAI and practice problematic - intervention vs adaptation





# Technical Understanding

- Cliffs formed of weak rocks
- High rates of toe erosion
- Groundwater triggers landslide
- Coastal defences introduced in 1950s to reduce erosion
- Cliff stabilisation measures introduced late 1960s
- Major landslide events in 1974 and 1987 at Barton Court; 1993, 1996 and 2001 at Cliff House Hotel; post 2001 Marine Drive West
- Coastal defences and cliff stabilisation measures at risk from new phase of landslides



# Outcomes

- 1 property (worth £260k) at risk next 20 years
- 7 properties (worth £1.82m) at risk 20-50 years
- 316 properties (worth £82.21m) at risk 50-100 years
- NCERM projections differ from SMP due to different data and methodologies adopted
- Insufficient benefits under current PAG guidance to justify intervention in the short-term
- Policy to allow unravelling of engineering and seek alternative measures of mitigation and adaptation
- Proactive management essential to mitigate risk; planning, remedial works, monitoring, investigation, stakeholder engagement
- Adaptation - another reality!





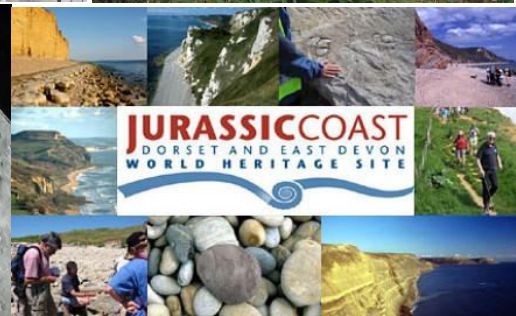
# Case Study K

## Lyme Regis and Charmouth, Dorset



# Overview

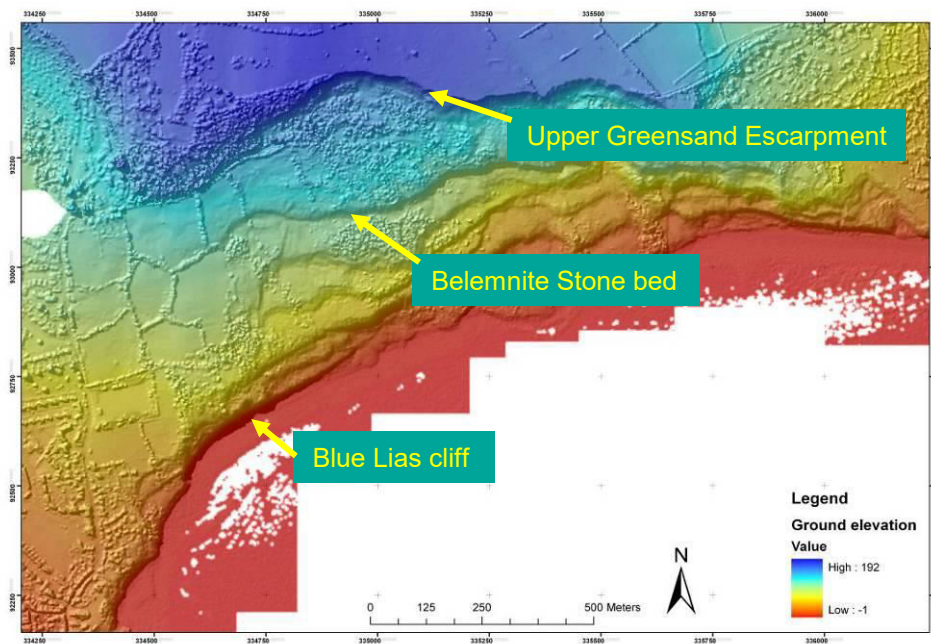
- Ancient landslide complex of scientific interest worldwide
- Celebrated for its unique geology and natural environment
- Coastal erosion, groundwater and cliff instability causes conflict with access & development
- Problems arise from major landslide events, ground movement and cliff recession
- Frequency and magnitude of events will increase due to climate change
- Policy, management and mitigation of risk requires balancing multiple interests





# Technical Understanding

- Lower Lias clays and limestones overlain by greensand, strongly bedded and dipping seaward
- Complex formed pre- and post-glacial period c. 14,000 years BP
- Coastal erosion 0.2-0.7m/yr has cut the toe of the ancient landslides
- Wet year sequences and ground-water triggers land movement
- Episodic landslide events in 1958, 1968, 1994 at Black Ven; 1986 and 2008 at Spittles
- Frequency and magnitude of events has increased over historical period - more dynamic and spreading - cliff retreat prediction is problematic
- Adverse impacts on access roads, paths, farmland, property, and other assets; major loss of land and headscarp recession





# Outcomes

## Charmouth and Black Ven:

- 15 properties (worth £4.1m) at risk in 20-50 yrs epoch
- 65 properties (worth £17.7m) at risk in 50-100 yrs epoch
- Major differences between SMP / NCERM projections

## East Cliff, Lyme Regis:

- 144 properties at risk in 0-28 yrs
- Charmouth Rd, car park and services also at risk
- Estimates consistent between NCERM/ SMP
- Event frequency and magnitude key to risk evaluation, planning, mitigation and adaptation
- Stakeholder engagement to determine acceptable and sustainable policy and scheme concepts

