

Event Title: Celebrating the Welsh College series

Date and Location: Thursday 18 March 2021, 6:00 - 7:00PM GMT (online)



A tsunami in South Wales? The 1607 flood in the Bristol Channel and Severn Estuary

Yr Athro / Professor Simon Haslett

Jesus
College
OXFORD

450th
Anniversary

Jesus College, Turl Street, Oxford OX1 3DW
Tel. +44 1865 279701 | simon.haslett@jesus.ox.ac.uk
jesus.ox.ac.uk

© Copyright Jesus College 2021
Jesus College is a registered charity (No. 1137435)

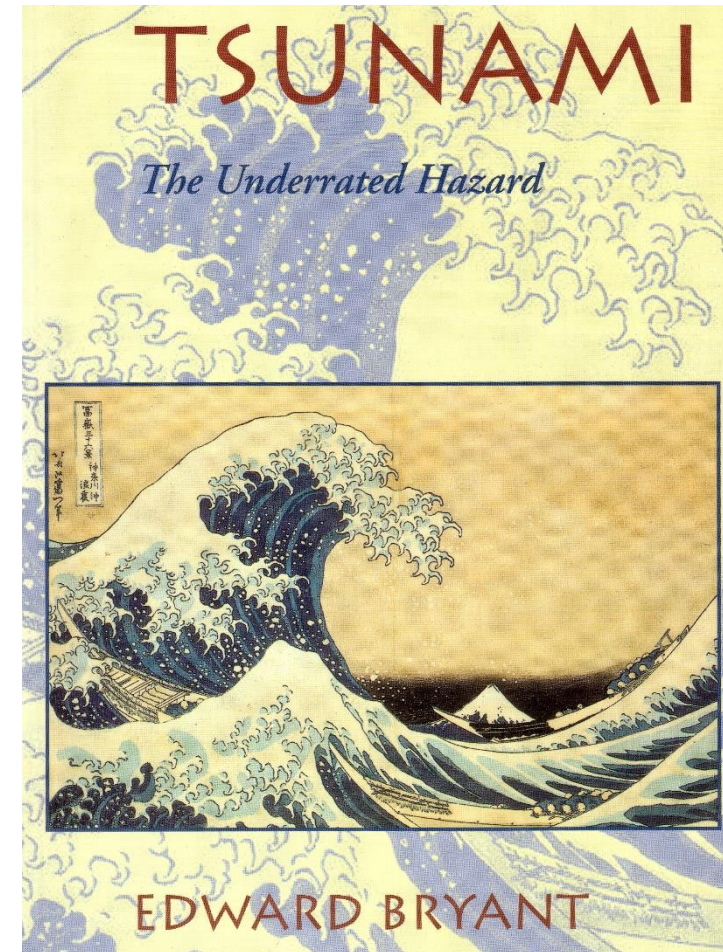


@ProfSHaslett



UNIVERSITY OF
OXFORD

My co-researcher: Dr Ted Bryant



2001, Cambridge University Press



UNIVERSITY OF
OXFORD

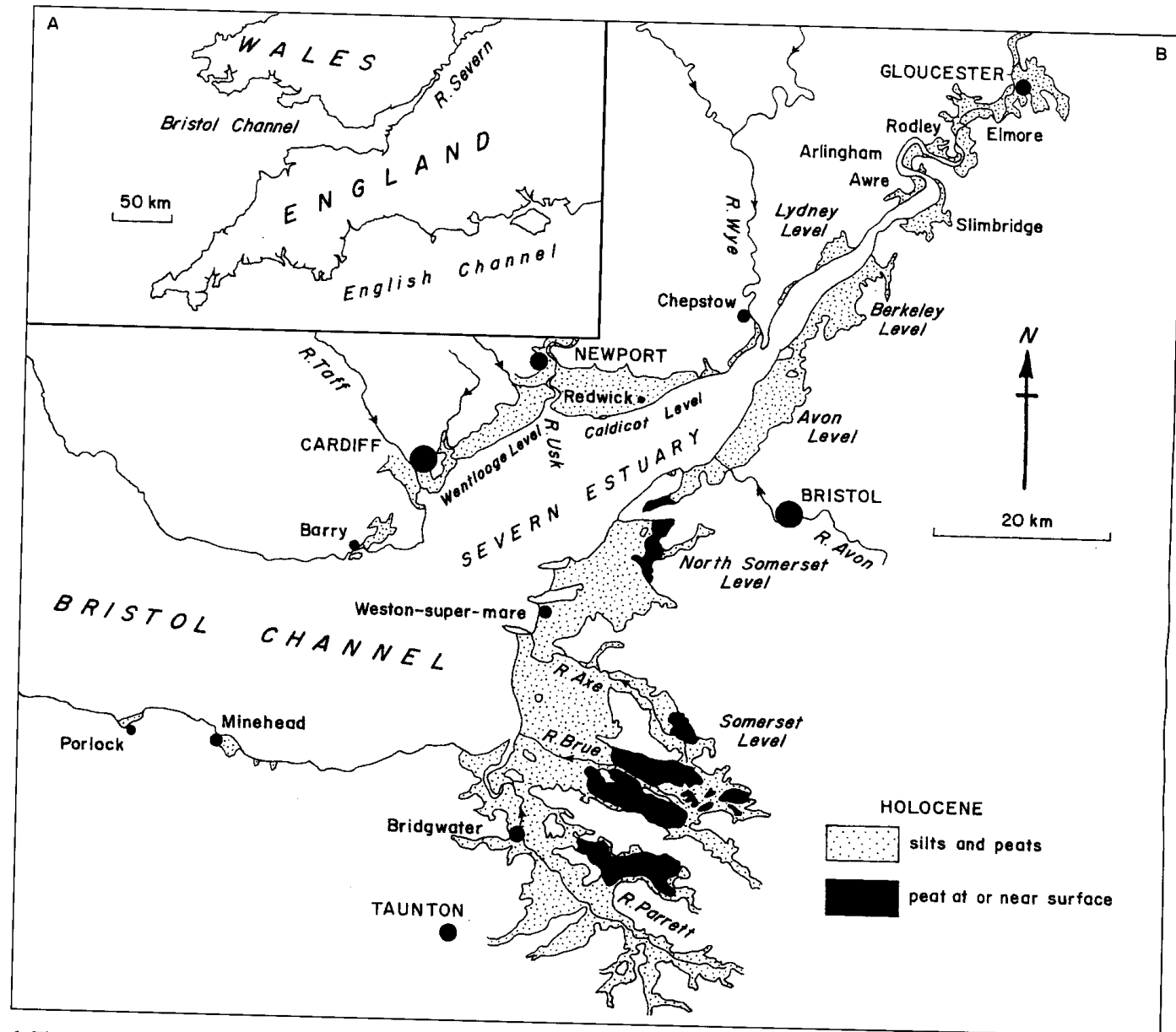
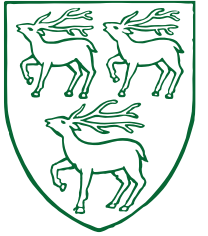


Figure 1 The Severn Estuary Levels. (A) Setting in southwest Britain. (B) Chief components of the Levels.



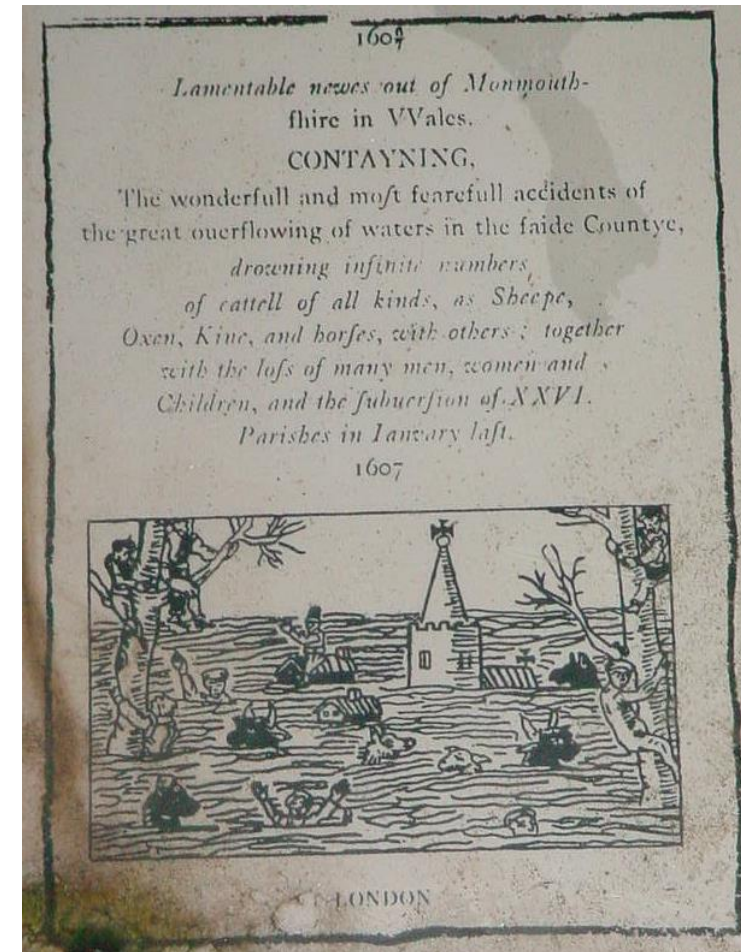


Evidence of the 1607 flood 1



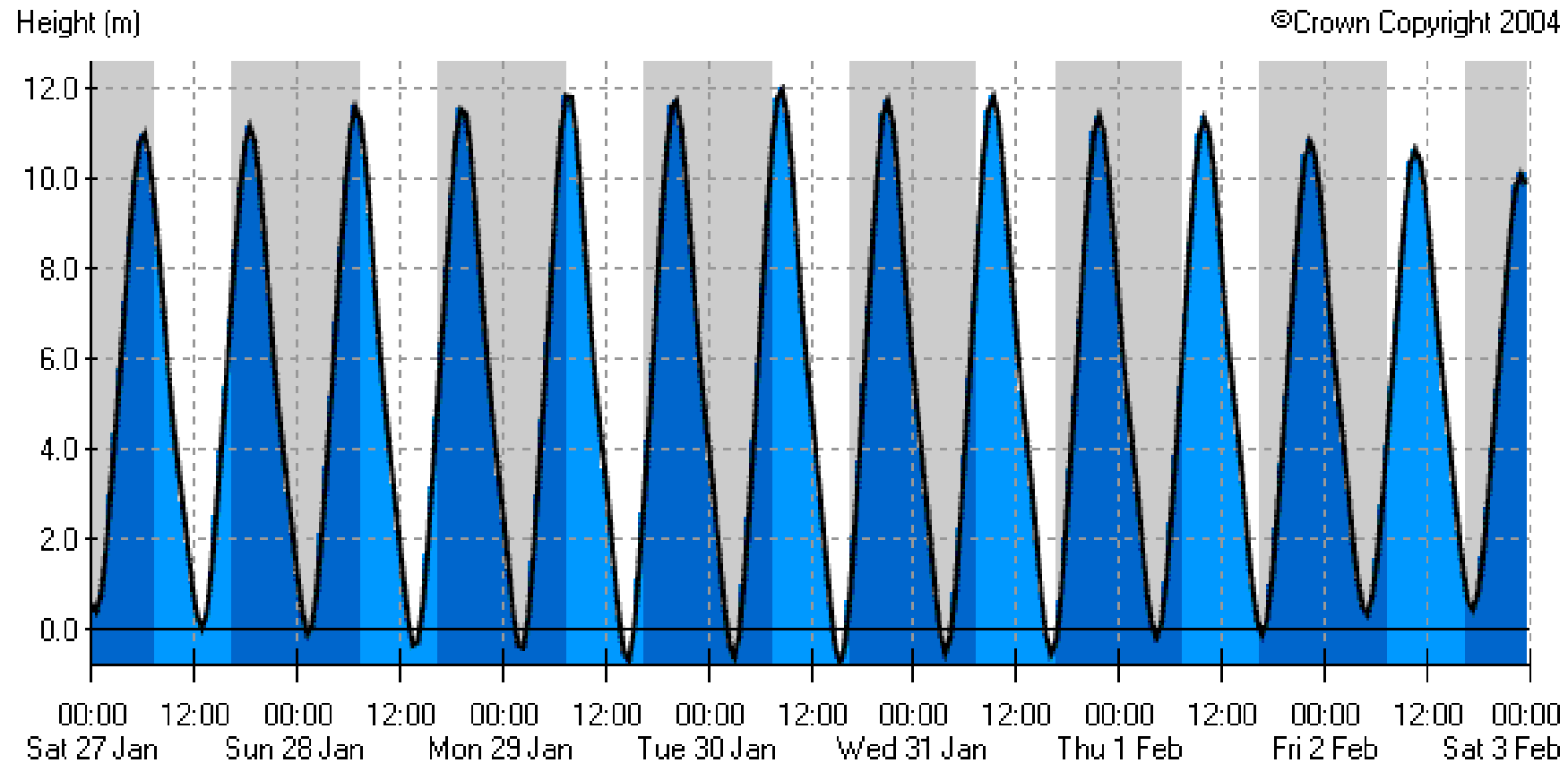
Contemporary historic pamphlets giving the:

1. date (20th Jan 1606 = 30th Jan 1607)
2. timing (“about nine in the morning” in Somerset)
3. details of damage (2000 deaths and great economic loss).



UNIVERSITY OF
OXFORD

Burnham 1607 tides (HW at 8.28am)





Evidence of the 1607 flood 2



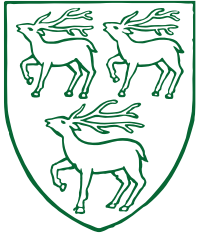
1606
ON THE XX DAY OF JANUARY EVEN AS IT CAME TO
PAS IT PLEASED GOD THE FLOOD DID FLOW TO THE
EDGE OF THIS SAME BRASS AND IN THIS PARISH
TEARE WAS LOST 5000 AND OD POWNDS BESIDES,
XXII PEOPLE WAS IN THIS PARRISH DROWN
* GOLDCLIFF { JOHN WILKINS OF PILREW AND
WILLIAM TAP CHVRCH WARDENS
1609

Fig. 16. From a rubbing of a brass in the chancel of Goldcliff church (20 × 8 cm).



- Commemorative plaques and inscriptions in/on churches in South Wales and Somerset.

Evidence of the 1607 flood 2



Redwick Church, Monmouthshire

January 20th. 1606, and 4th of JAS. 1.
An innundation of the Sea-water, by
overflowing and breaking down the
Sea banks; happened in this Parish
of Kingstone-Seamore, and many
others adjoining; by reason where
-of, many Persons were drown'd
and much Cattle, and Goods,
were lost: the water in the
Church was five feet high and
the greatest part lay on the
ground about ten days.

WILLIAM BOWER.

Tsunami theory for the 1607 flood



Some contradictory meteorological reports

e.g. “a violent sea wind” (Camden, 1607)
vs. “the morning ... so fayrely and brightly spred” (Harleian Miscellany, 1607).

Descriptions of a “wave” reminiscent of a tsunami rather than a storm e.g. “wave’s furie”.

Extract from *God’s warning to his people of England*

"Upon Tuesday 20 January 1606 there happened such an overflowing of waters... the like never in the memory of man hath been seen or heard of. For about nine of the morning, the same being most fayrely and brightly spred, many of the inhabitants of these countreys prepared themselves to their affayres, then they might see and perceive afar off as it were in the element huge and mighty hilles of water tomling over one another in such sort as if the greatest mountains in the world had overwhelmed the lowe villages or marshy grounds Sometimes it dazzled many of the spectators that they imagined it had bin some fogge or mist coming with great swiftnesse towards them and with such a smoke as if mountains were all on fire, and to the view of some it seemed as if myriads of thousands of arrows had been shot forth all at one time...."



Extracts from *Lamentable Newes out of Monmouthshire*



Wave velocity

... to the value of above an hundred thousand pounds.

“The foresaid waters, having gathered over their wonted limits, are
“affirmed to have runne at the first entrance with a swiftness so incredible,
“as that no gray-hounde could have escaped by running before them.”
“And they yet cover twenty four miles in length, and four more in

Inland Penetration

... preserve the small bark from the wave's furie.”
“Moreover one Mistress Van, a gentlewoman of good sort, whose living
“was a hundred pounds and better by the year, is vouched before she
“could get uppe into the higher rooms of her house, having marked the
“approach of the waters, to have been surprised by them and destroyed,
“her house being distant above four miles in breadth from the sea.”
“Amongst other similar cases it is stated that all wild beasts and vermine
“tried to escape.”



Tsunami theory (cont.)

Enigmatic physical features:

1. Sand layers previously described as possibly deposited by “storms” (e.g. Rumney and Hill; Allen, 1987, 1992).
2. Erosion of nearly all contemporary salt-marsh in the Severn Estuary (Allen, 1987).
3. Land erosion (e.g. English Stones, Gravel Banks and Oldbury, where seabanks were reset in the early C17th when “environmental change forced a substantial south-easterly retreat of the edge of the alluvial outcrop”, Allen & Fulford, 1992, pp. 96-97).

WAS THE AD 1607 COASTAL FLOODING EVENT IN THE SEVERN ESTUARY AND BRISTOL CHANNEL (UK) DUE TO A TSUNAMI?

by Edward A. Bryant¹ and Simon K. Haslett²

¹School of Geosciences, University of Wollongong, Wollongong, NSW 2522, Australia. ²Corresponding author (N. Hemisphere): Quaternary Research Unit, Dept. of Geography, Bath Spa University College, Newton Park, Bath, BA2 9BN, UK.

Tsunami or Tidal Wave?

We were the first to suggest the 1607 flood might have been due to a tsunami, but:

A few other authors, going back to 1951, referred to the flood as being caused by a 'tidal wave'.

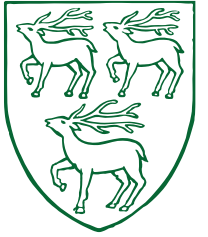
However, I recently discovered that Sir John Rhys (1901) referred to the 1607 flood as “an inundation caused by a terrible tidal wave” (p. 402).

(Krakatoan tidal wave of 1883)



UNIVERSITY OF
OXFORD

Testing the tsunami theory: The 2004 Field Season



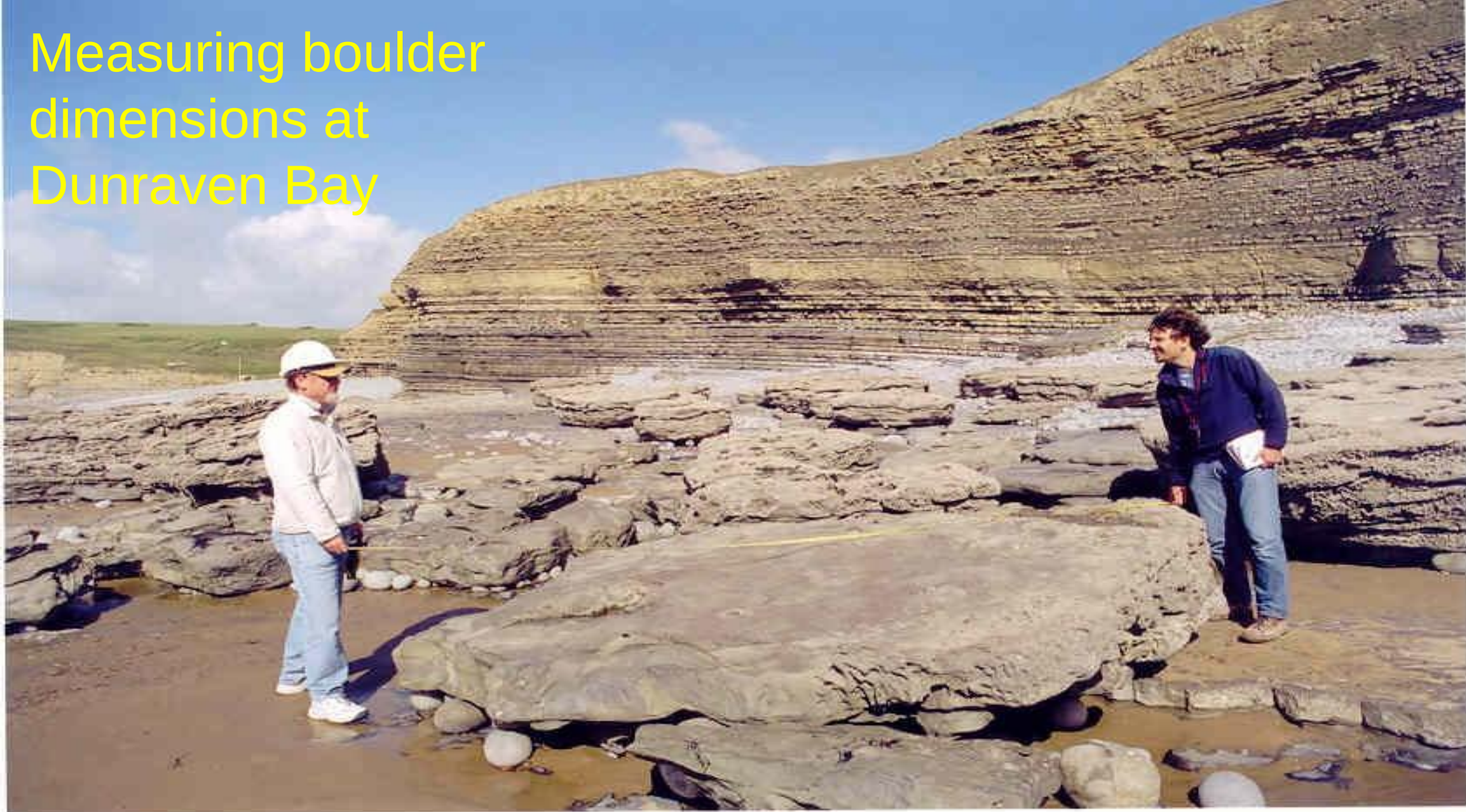
- Visit key locations mentioned in the pamphlets and gain background detail.
- Examine coastal landscapes and sample sedimentary sequences for tsunami signatures (e.g. Bryant, 2001).
- Investigate enigmatic sites identified by Bryant & Haslett (2003) e.g. Rumney, Hill, Oldbury and collect samples.
- Undertake laboratory analysis of samples.



Sampling the
Rumney sand layer



Measuring boulder dimensions at Dunraven Bay



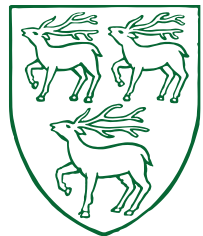












UNIVERSITY OF
OXFORD

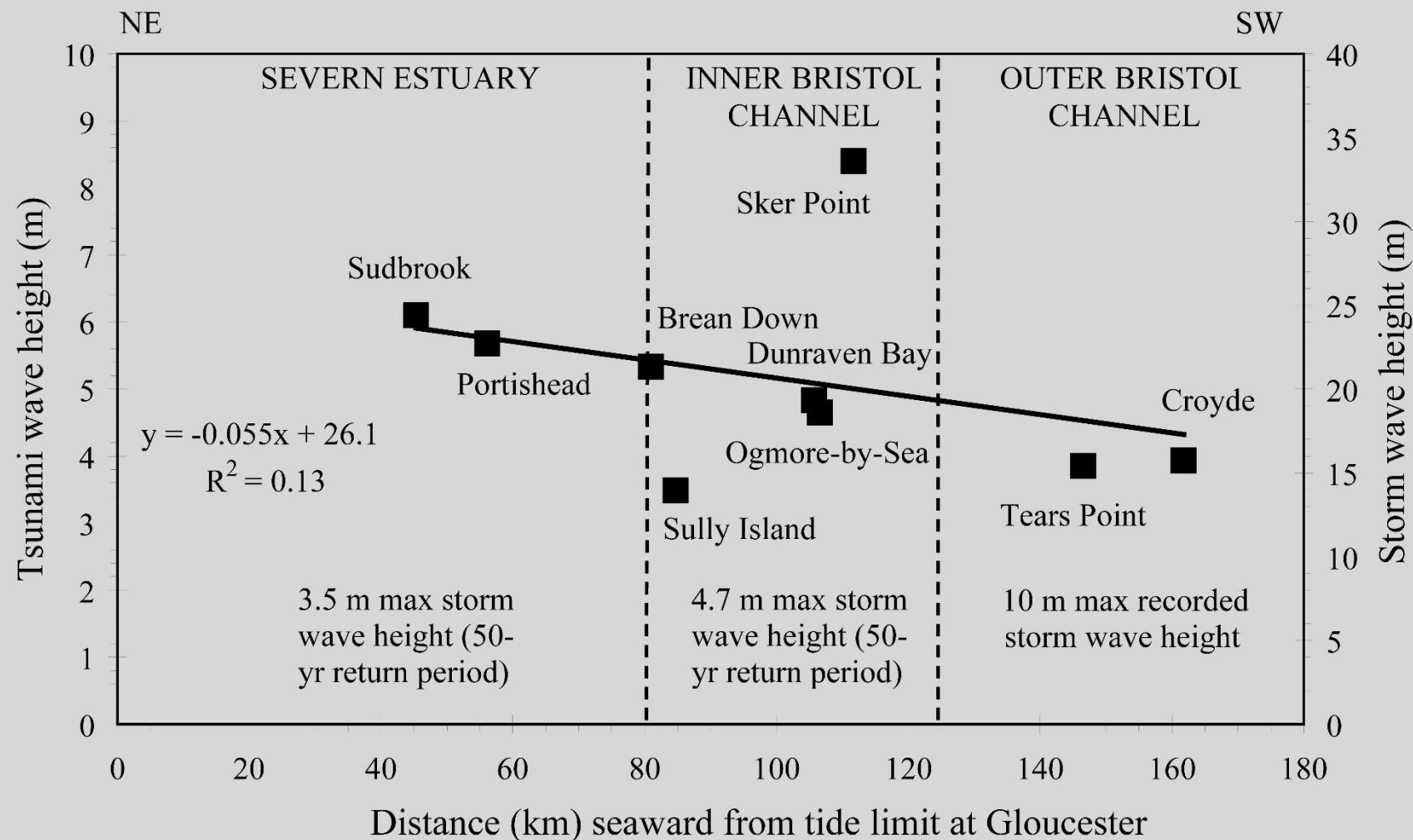




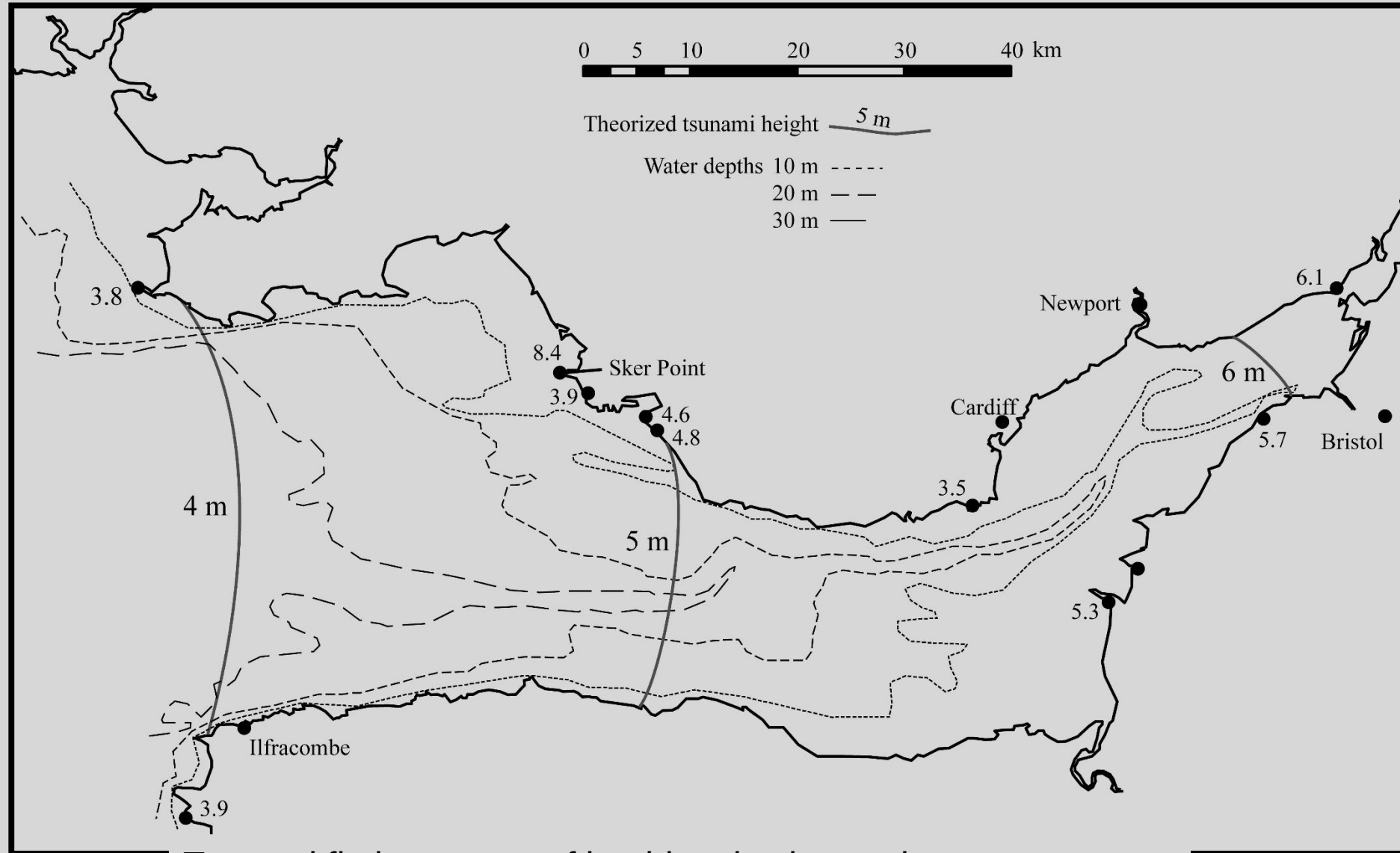
Imbricated boulders at Dunraven Bay



Hypothesised tsunami and storm wave heights throughout Bristol Channel. Some of the largest boulders are being moved at the mouth of the Severn Estuary. They require storm wave heights up to 7 times the 50-yr return period of maximum storm waves (from Bryant & Haslett, 2007).



The required tsunami wave heights are plotted here.



Tsunami fit the pattern of boulder size better than storm waves (from Bryant & Haslett, 2007).

Critics of the tsunami theory



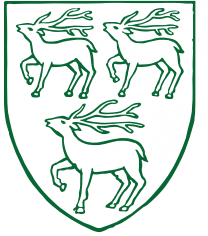
- Back-modelling from the amount of flood water established that sustained “80 mph” winds were required (Horsburgh, 2005) .
- This is a Force 12 (category 1) hurricane!
- There are no accounts of wind damage.
- The 1987 storm was Force 11 and 15 million trees were felled.
- “The damage ... could equally well have been caused by a severe storm surge, such as the one produced by Hurricane Katrina” (McGuire, 2005) , a Category 5 hurricane!

Cause of a possible tsunami



- Submarine landslide off the continental slope west of the British Isles: our preferred cause, but discounted by others.
- Earthquake activity along a fault off south-west Ireland (Musson, 2005).
- Professor Disney (Cardiff University) published in *The Times* and *Western Mail* (5th Jan 2005):
- “The sky was blue, the tide was high, there is a second-hand report of an earth tremor felt earlier that morning”.
- Seismic active period: regional earthquakes in February and May 1607.
- Volcanic eruption/comet impact possible?

Diolch yn fawr / With thanks to:



T. Marshall – permission to use photographs of filming.

USGC – permission to use images of Indian Ocean tsunami.

Jesus College – permission to include portrait of Sir John Rhys (with thanks also to Dr Robin Darwall-Smith and Owen McKnight).

The Holocene – Allen and Haslett's map of Severn Estuary.

University of Chicago – Bryant and Haslett's figure and map of boulder movement