



Coastal regeneration at Llanelli, South Wales, **UK: lessons not learned.**

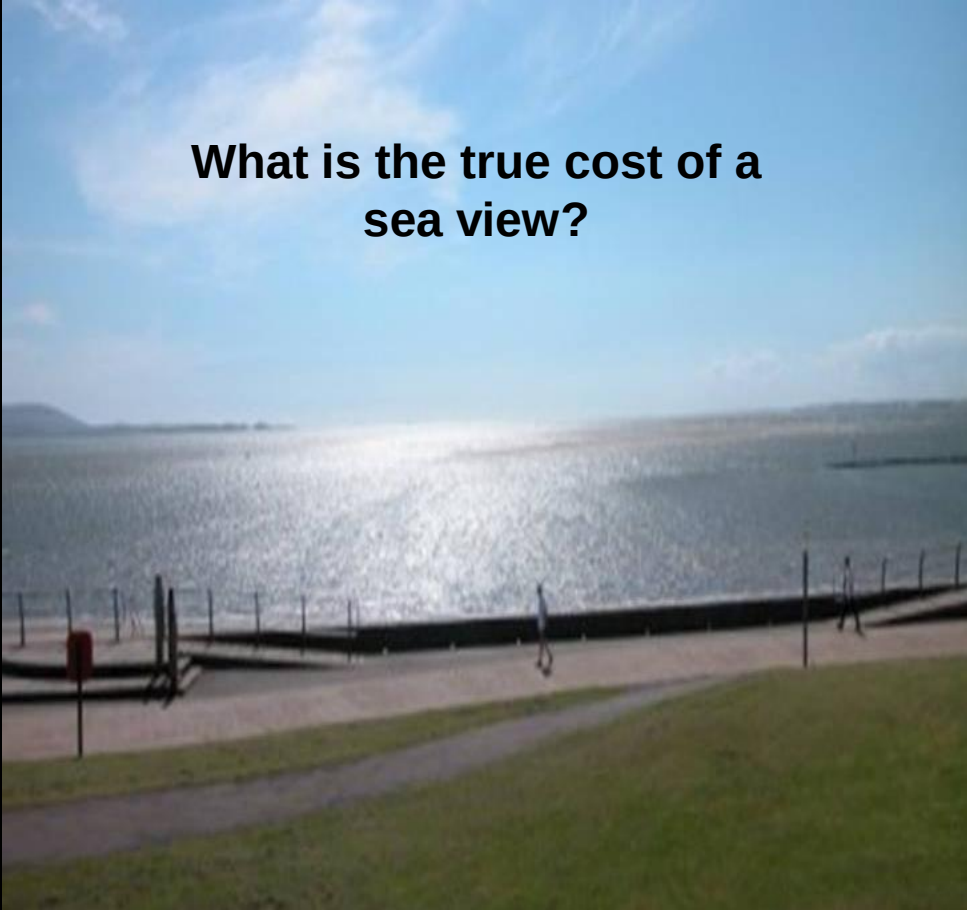
International Coastal Symposium (ICS) 2009.

**Mike Phillips^{*}, Victoria Powell[#]
and Robert Duck[#]**

^{*} Swansea Metropolitan University,

[#] University of Dundee.





What is the true cost of a
sea view?

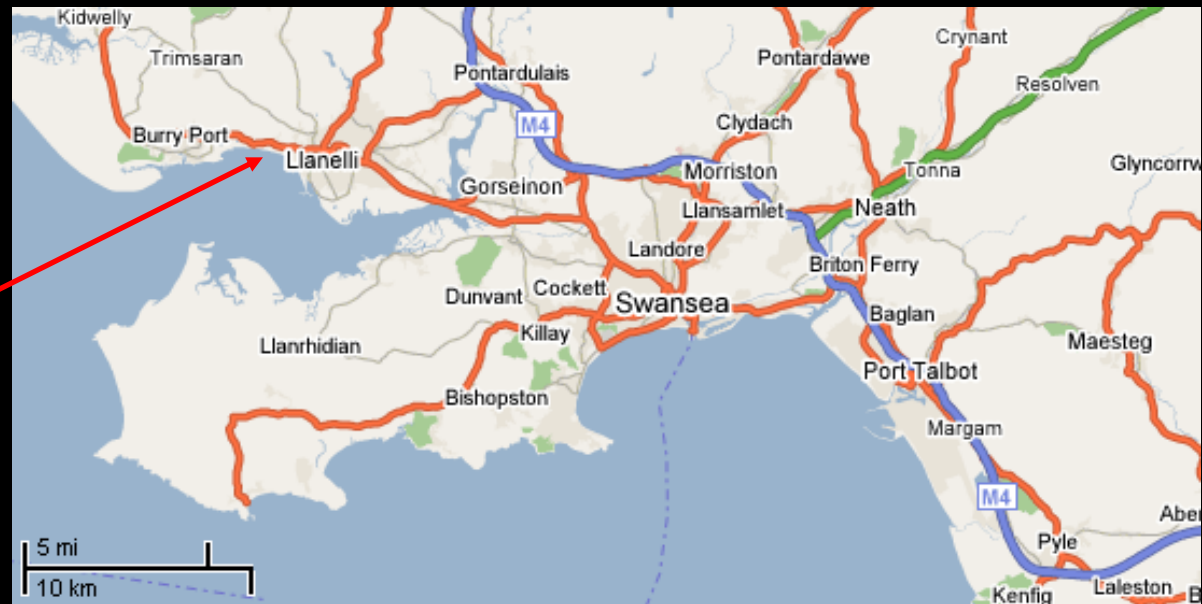
Presentation Structure:

- Location and historical background
- Regeneration strategy and post development problems/consequences
- Suggested management responses and strategies
- Conclusions

Location of Llanelli coastline



Llanelli's coastline has not been extensively studied due to its contaminated industrial heritage and poor recreational facilities.





**The coal and
iron/steel
industries,
together with
ports and railways
historically
shaped South
Wales
development
patterns.**



- In the nineteenth century there were five ironworks and attached tin-mills;
 - **The docks were a busy industrial area;**
 - **None of the nineteenth century ironworks are in existence today;**
 - After industrial collapse the docks closed;
 - **Cumulative impact on Coastal defences;**
 - **Estuary training wall maintenance abandoned in 1953;**
 - In 1980s Llanelli beach damaged by nearshore channel migration
- (CBCEG, 1999)



Coastal redevelopment strategy

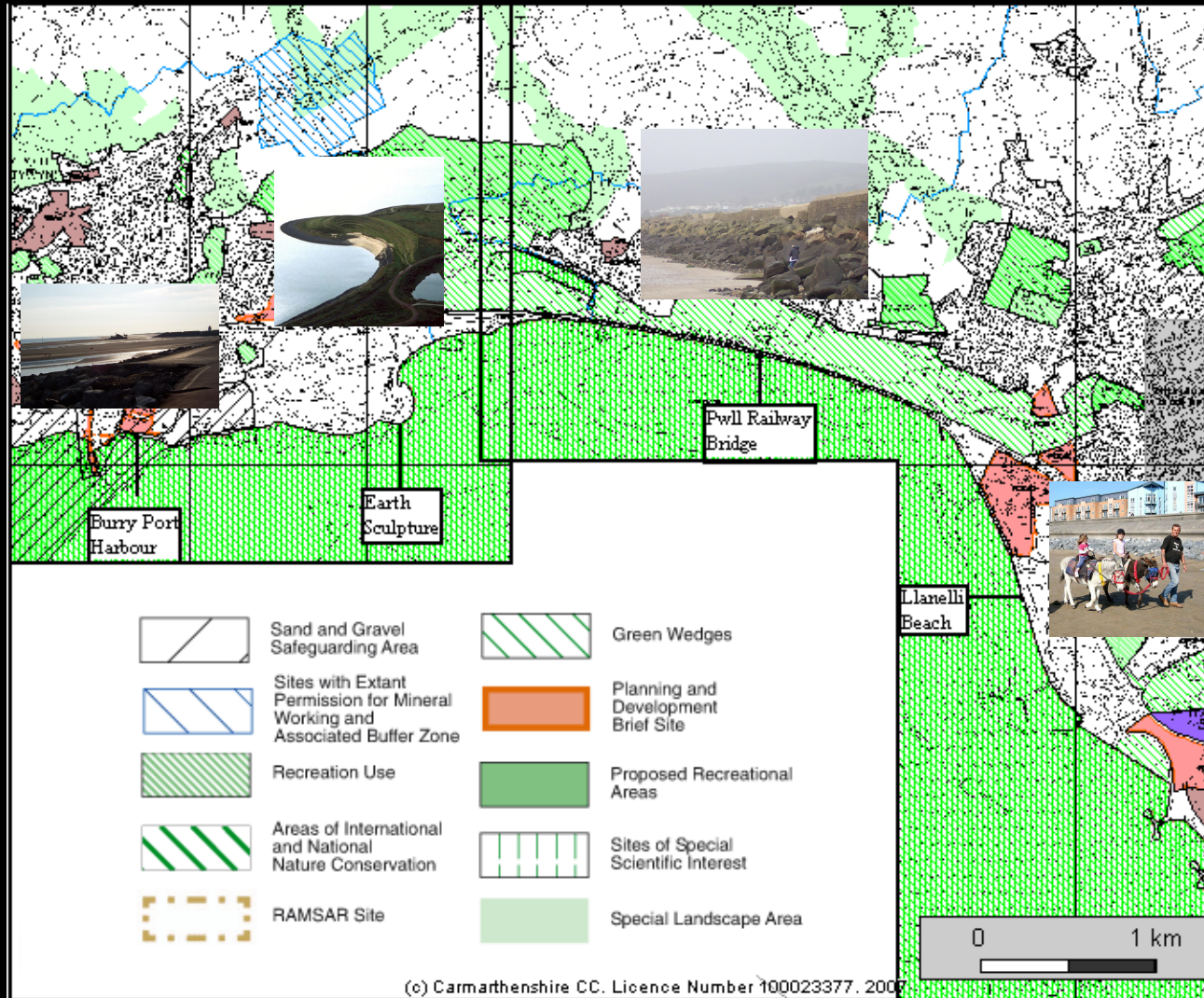
Three locations:

- **Llanelli Beach;**
- **new Earth Sculpture;**
- **Burry Port Harbour.**

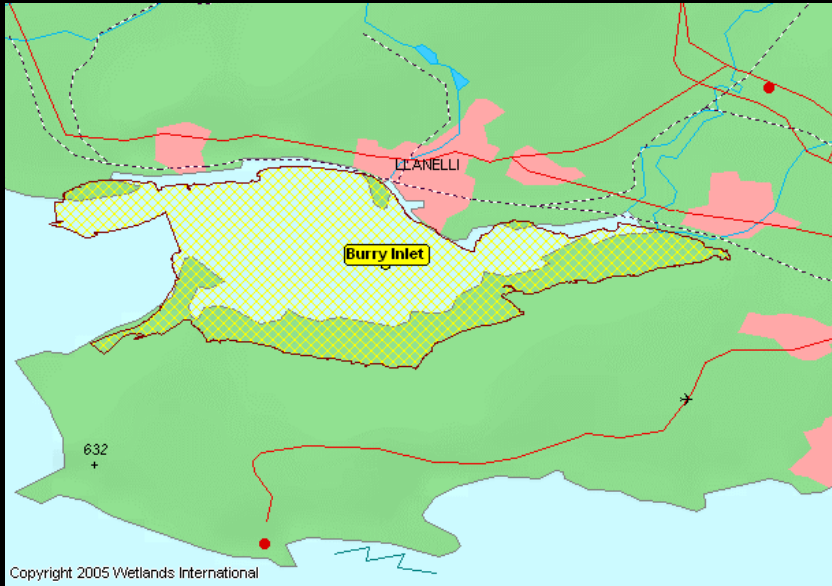
Linked by the Lottery funded Millennium Coastal Path (Signature structure), part of the Millennium Coastal Park

COASTAL REGENERATION AT LLANELLI: LESSONS NOT LEARNED

Phillips, Powell and Duck (ICS 2009)



Carmarthenshire Unitary Development Plan



Coastal Environment

- **Burry Inlet is a RAMSAR site;**
- **Exposed to prevailing SW wind direction;**
- **Spring tidal range 8m;**
- **Combination of high tides and storm surges cause extensive inundation;**
- **Seawalls, groynes and beach nourishment currently protect existing and new developments, including an important rail link.**

(CBCEG, 1999; James, 2006)

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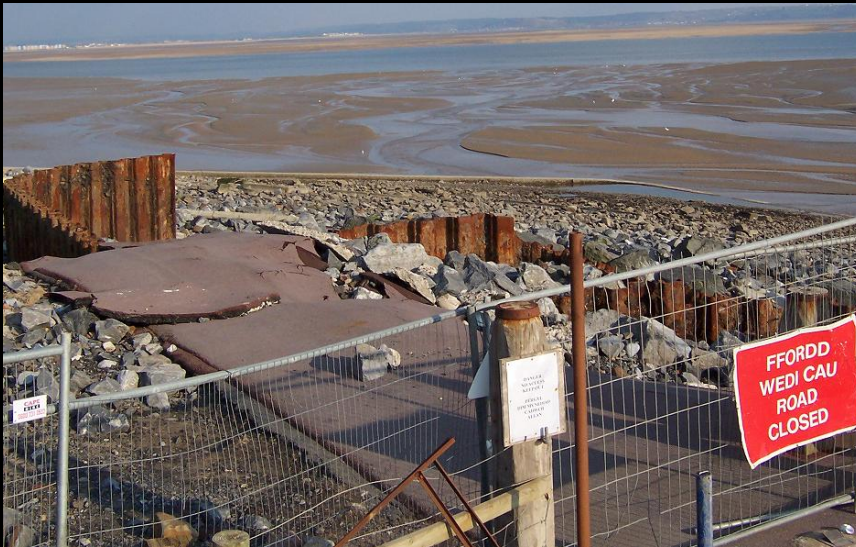
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Burry Port Harbour has been restored during the Millennium Path development. It has a new harbour gate and is now a busy leisure boat facility. There are two beaches either side of the harbour, with the east beach being down stream from the harbour defences. Damage to coastal path started within 3 years of completion (CCC, 2007).



- **Consequences of March 2007 storm – structural collapse – 150m lost;**
- **If the path is completely lost within seventy-five years then the Lottery funding would have to be repaid;**
- **Not financially feasible – management problem!**

(CCC, 2007)



The Earth Sculpture lies off the main path and is built into the sea to create an artistic feature that can be seen from Llanelli, the Gower and the sea (Richard Harris).

Its design incorporated the use of materials taken from the old power station spoils, Pulverised Fuel Ash being one of the main construction materials.

The design included a beach inset into the curl of the sculpture.



- Significant erosion of the earth sculpture (direct and refracted wave attack) - 10m retreat (CCC, 2007);
- Fence posts strewn across the beach;
- PFA leaching onto constructed beach;
- Current management via gabions and small quantities of rock armour.

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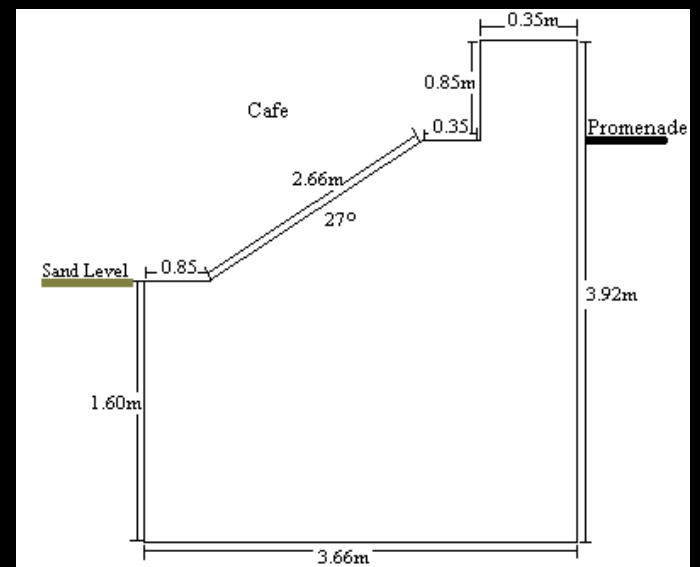
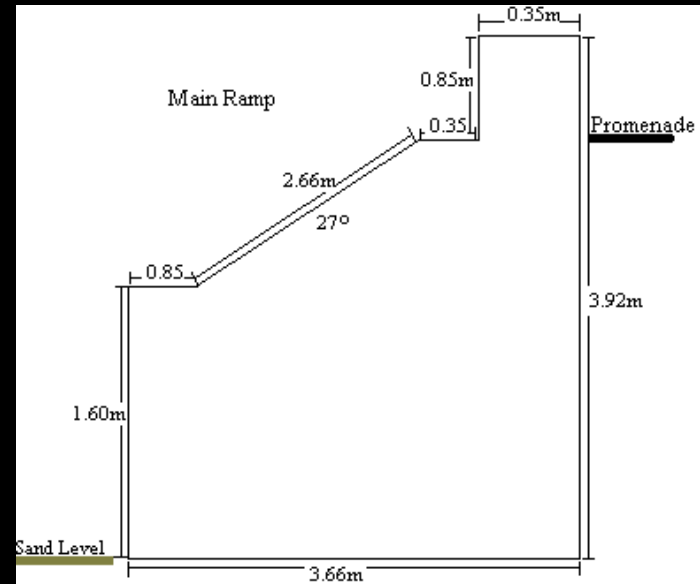
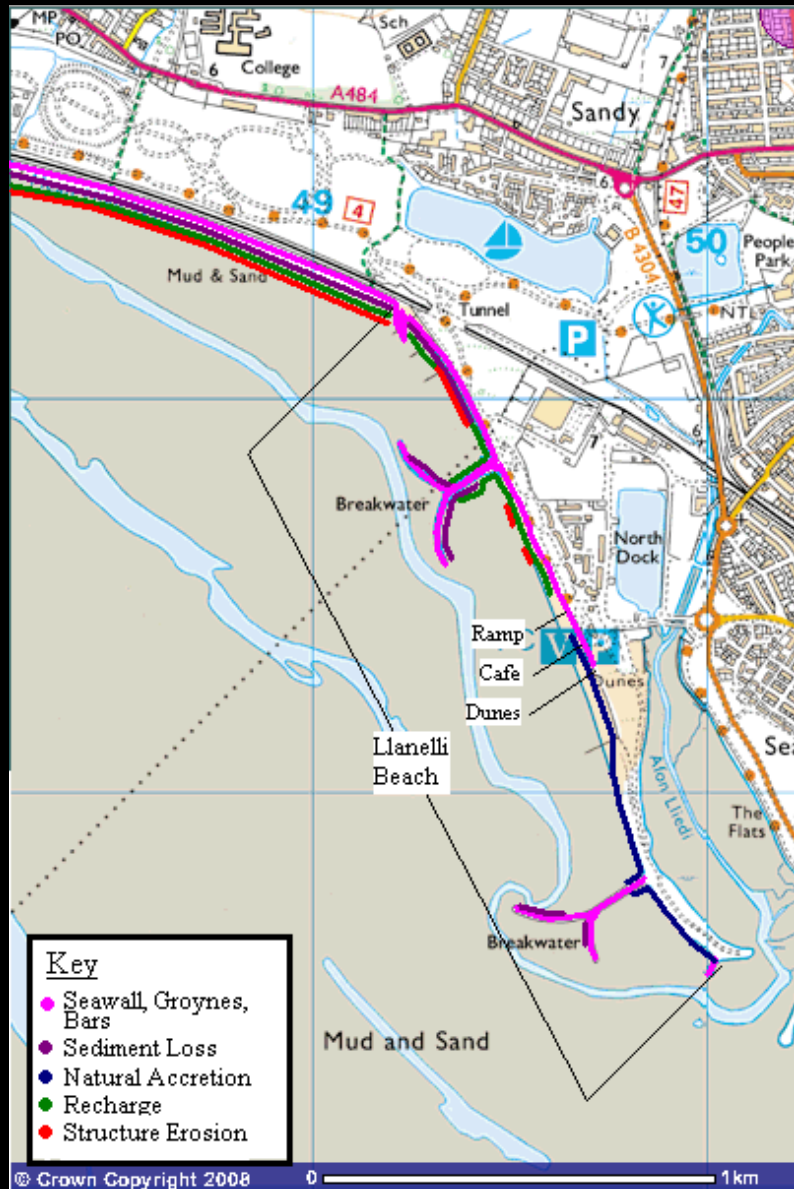
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Llanelli Beach is surrounded by decommissioned industrial sites, docklands and part of Llanelli town which had Objective One status. The redevelopment removed industrial ruins and provided a flat complex behind the beach as well as a cultural arts centre nearby. Residential development was positioned between the beach seawall and North Dock, the nearest lying within 8m (25ft) of the seawall.

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- **Beach depletion adjacent to dune system;**
- **Hard engineering structures do not fully protect shoreline;**
- **Rock armour and beach nourishment supplement hard defences but greater volumes needed;**
- **In 2001 coastal defences protected £5M assets but risk/costs are significantly increasing with new development.**

(CBCEG, 1999; CCC, 2007)

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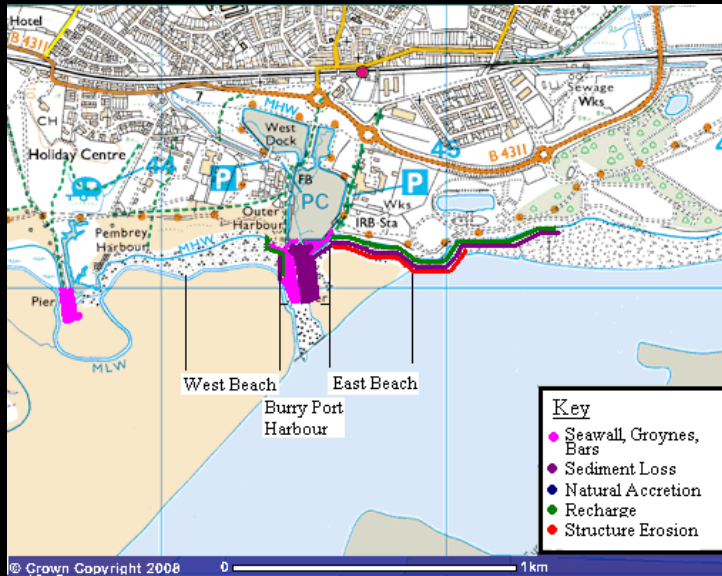
Consequences of March 2008 storm:

- Overtopping damaging seawall and promenade;
- Property damage.



COSTS

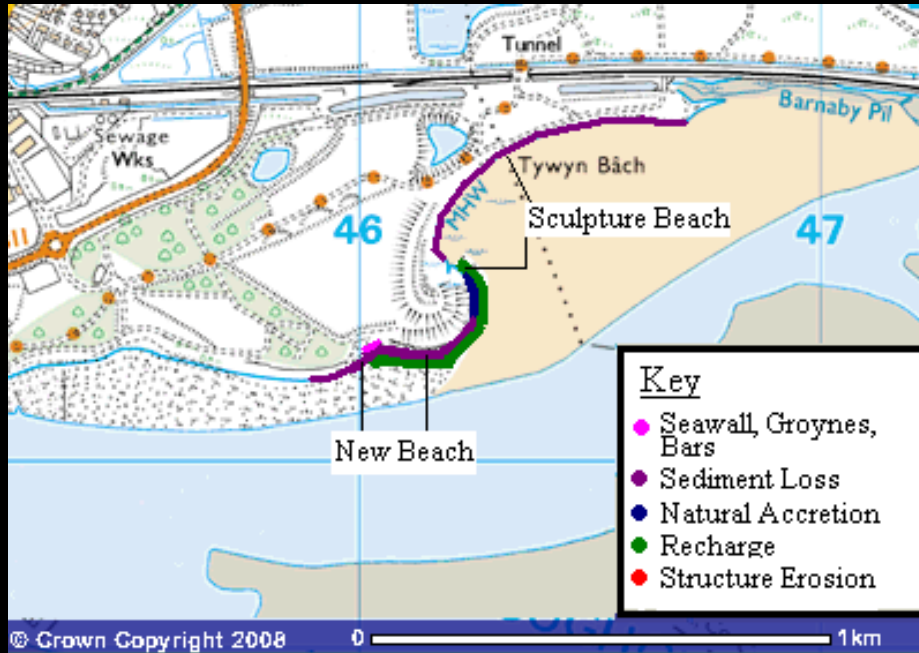
- Coastal defence repair works between Llanelli and Burry Port could cost between £15 and £20 million to increase seawall height (WoS, 2004; CCC, 2004);
- **Only £50,000 was spent on coastal protection and maintenance between 1994 and 2004 (BBC, 2004; CCC, 2004);**
- **While £50,000 was suggested as the minimum annual maintenance expenditure for Llanelli beach alone, only £10,000 was spent in 2006 (CCC, 2007);**
- WAG gave £83,000 and CCC £400,000 to repair Llanelli seawall after 2007 storms (CCC, 2007).



BURRY PORT

- Use the dredged material from the harbour channel to recharge sediment on East Beach or Llanelli Beach;
- Apply for grant to install originally planned flushing lock gates;
- Maintain seawall and rock armour in front of the harbour, East Beach and towards the Earth Sculpture.





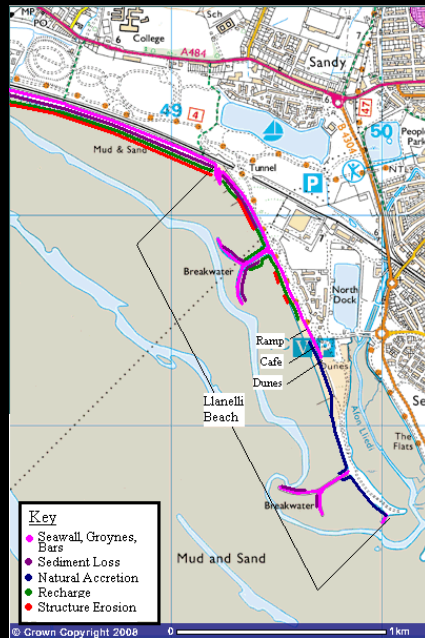
EARTH SCULPTURE

- Low-lying coastal path is inappropriately located;
- Erosion caused by storms, and over a tidal cycle by westward flowing river currents and eastward sea currents;
- Allow the site to degrade naturally with minor protection points,
- Investigate the impact of a submerged breakwater



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LLANELLI BEACH

- Improved seawall maintenance along the coastal frontage;
- Increase rock armour at seawall toe;
- Investigate submerged breakwater in front of the railway,
- Beach nourishment with dredged sand from Burry Port;
- Enhance dunes to the east and investigate breakwater removal;
- Assess cross-shore water movement;
- Investigate contributions from sale of development land.





CONCLUSIONS

- An effective coastal monitoring strategy needs to be implemented;
- More funding is needed to maintain sea defences;
- Problems with the Millennium Path and coastal frontage should have been predicted;
- Public funding protecting private assets;
- A combination of beach management strategies needed.

**Thank you for listening –
any questions?**