



SWANSEA METROPOLITAN UNIVERSITY

PRIFYSGOL FETROPOLITAN ABERTAWE

Function analysis: a strategic coastal management technique?

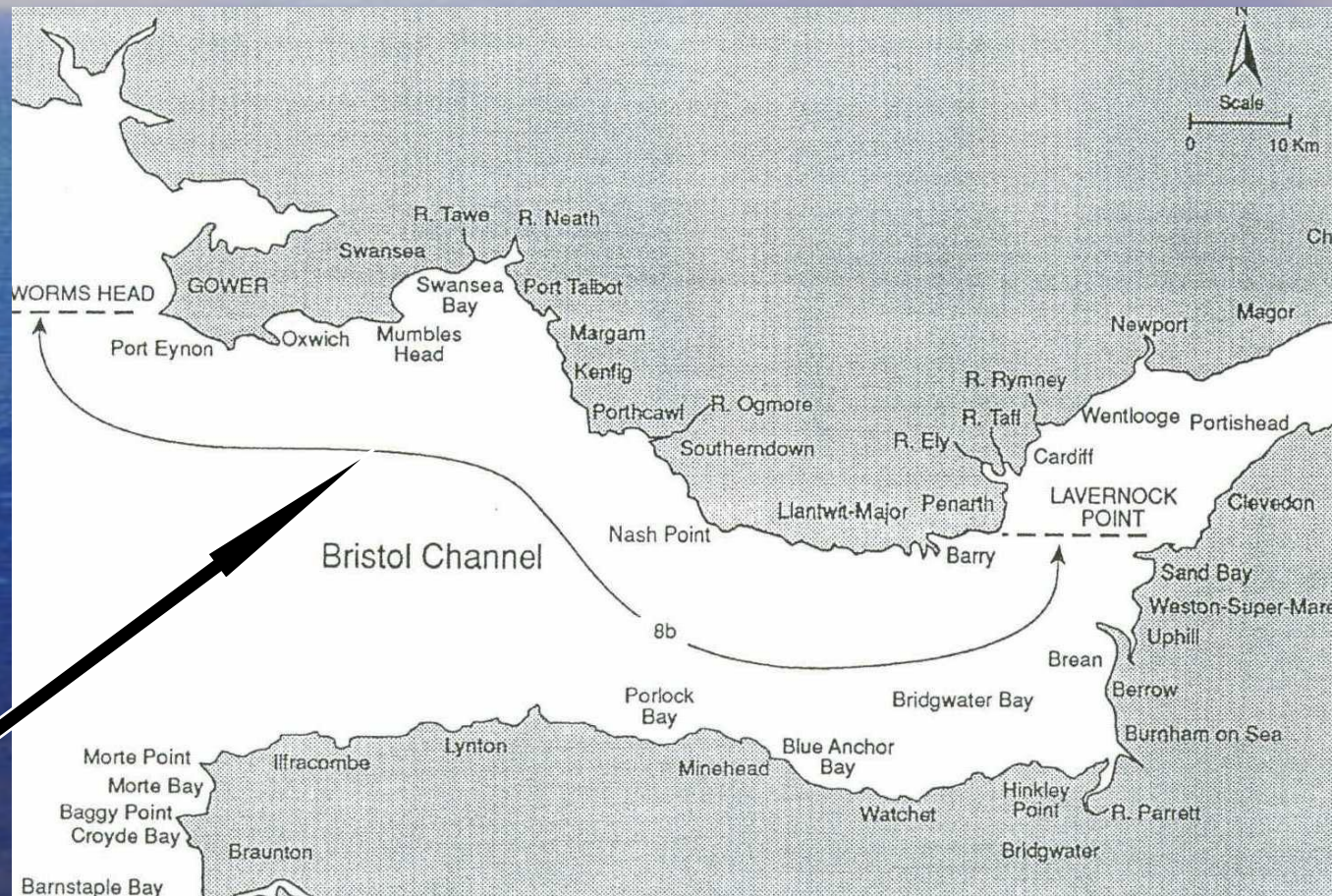
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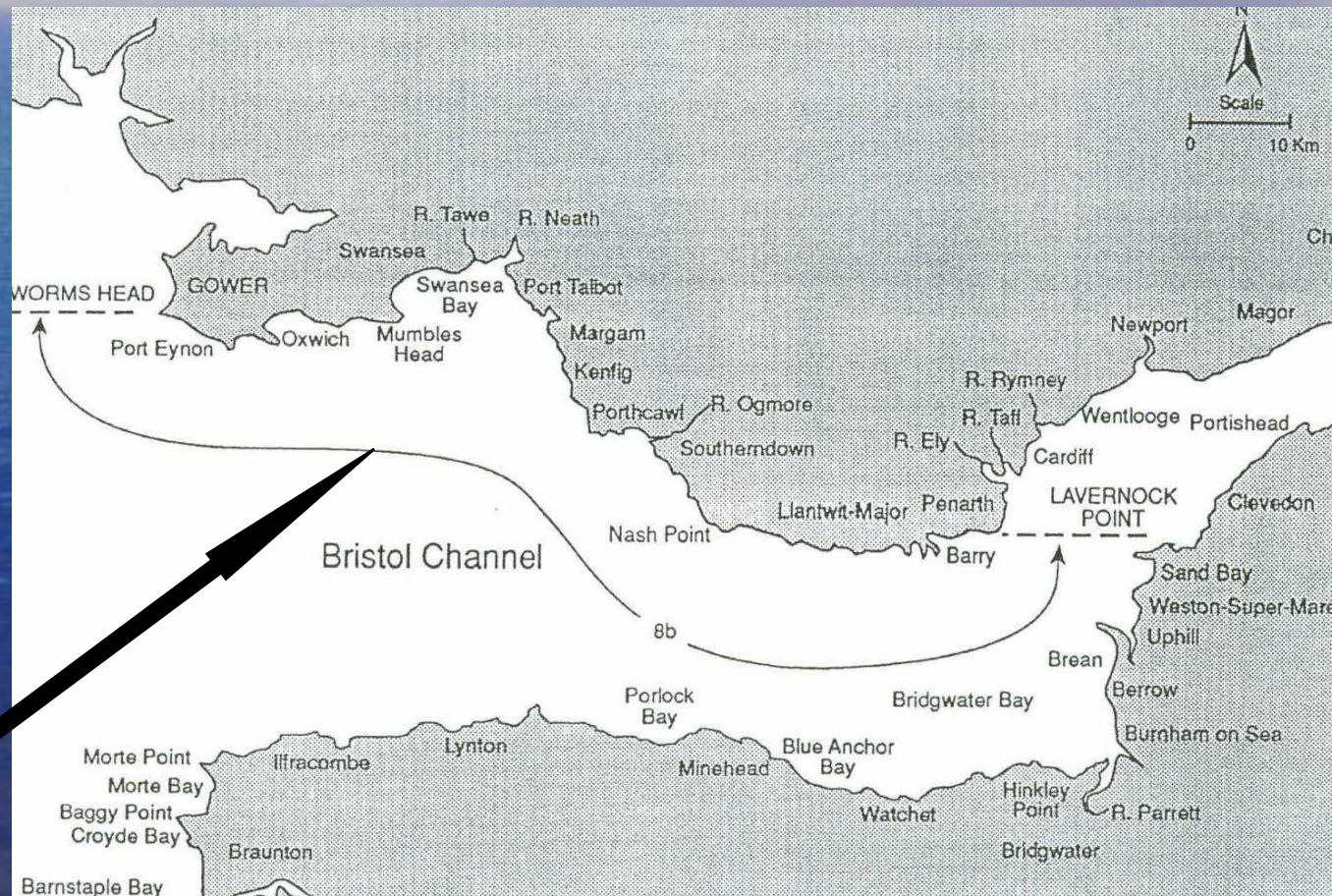
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Swansea Bay Shoreline Plan - Sub-Cell 8b



Swansea Bay Shoreline Plan - Sub-Cell 8b

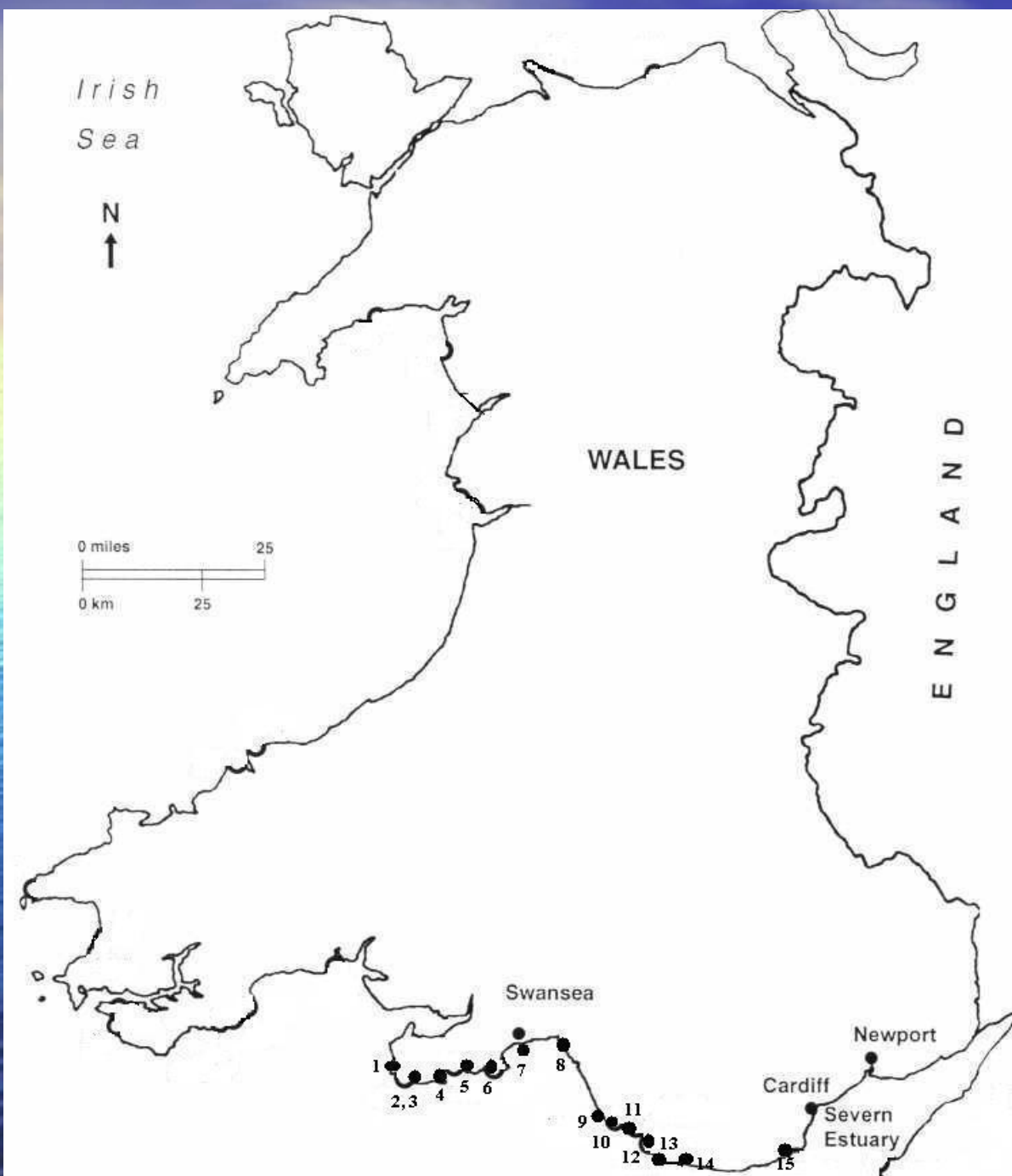


Swansea Bay Shoreline Management Plan – Sub-Cell 8b

- **Boundaries – Worms Head (West) to Lavernock Point (East)**
- **Administrative - 4 Local / Planning Authorities (Swansea, Neath-Port Talbot, Bridgend and Vale of Glamorgan County Councils)**
- **Environmental Designations - include SACs, Heritage Coasts, AONB, NNRs, numerous SSSIs etc.**

Beaches Surveyed

- Rhossili Bay (W)
- Port Eynon
- Horton
- Oxwich Bay
- Caswell Bay
- Langland Bay
- Swansea Bay
- Aberavon
- Porthcawl (Rest Bay)
- Porthcawl (Coney Beach)
- Merthyr Mawr
- Southerndown
- Nash Point
- Llantwit Major
- Barry Island (E)



Key to Beaches

Rhossili	1
Port Eynon	2
Horton	3
Oxwich	4
Caswell	5
Langland	6
Swansea Bay	7
Aberavon	8
Rest Bay	9
Coney Beach	10
Merthyr Mawr	11
Southern-down	12
Nash Point	13
Llantwit Major	14
Barry Island	15



**Rhossili Bay – AONB,
Archeological Interest, Heritage
Coast and sports.**

**Port Eynon – AONB,
Nature Reserve, MCS and
Blue Flag designations.**



**Horton – AONB with beach
popular for surfing and wind sport
activities.**



**Oxwich Bay – AONB, SSSI, NNR
and MCS beach designations.**

**Caswell Bay – AONB with Blue
Flag status since 2002.**



**Langland Bay – AONB with Blue
Flag status since 2002.**



Swansea Bay – Urban beach adjacent to City centre.

Aberavon – Urban beach in industrial area with no designations.



Rest Bay – Blue Flag beach popular for surfing.



Coney Beach – Resort beach with MCS beach designation.

Merthyr Mawr – SSSI designations for sand dunes and salt marshes.



Southerndown – Glamorgan Heritage Coast, MCS and SSSI designations.



Nash Point – Glamorgan Heritage Coast and SSSI designation (geology).

Llantwit Major – Glamorgan Heritage Coast with MCS designated beach.



Barry Island – Resort beach with no environmental designations.



Function Analysis

Methodology a modification of:

- **Van der Maarel (1978, 1979)**
- **De Groot (1992) - Functions of Nature**
- **Cendrero and Fisher (1997) - Assessing Environmental Quality of Coastal Areas for Planning and management**
- **Van der Weide *et al* (1999) – Assessing the value of coastal wetlands**

Environmental Indicators

- 1. Air**
- 2. Hazards**
- 3. Resources**
- 4. Fresh Water**
- 5. Marine Biota**
- 6. Coastal Water**
- 7. Terrestrial Biota**
- 8. Geological and Topographical Features**

These indicators were sub-divided into 35 components

Socio-economic indicators

- **Potential for use**
- **Human well-being**

These 2 indicators were sub-divided into 18 components

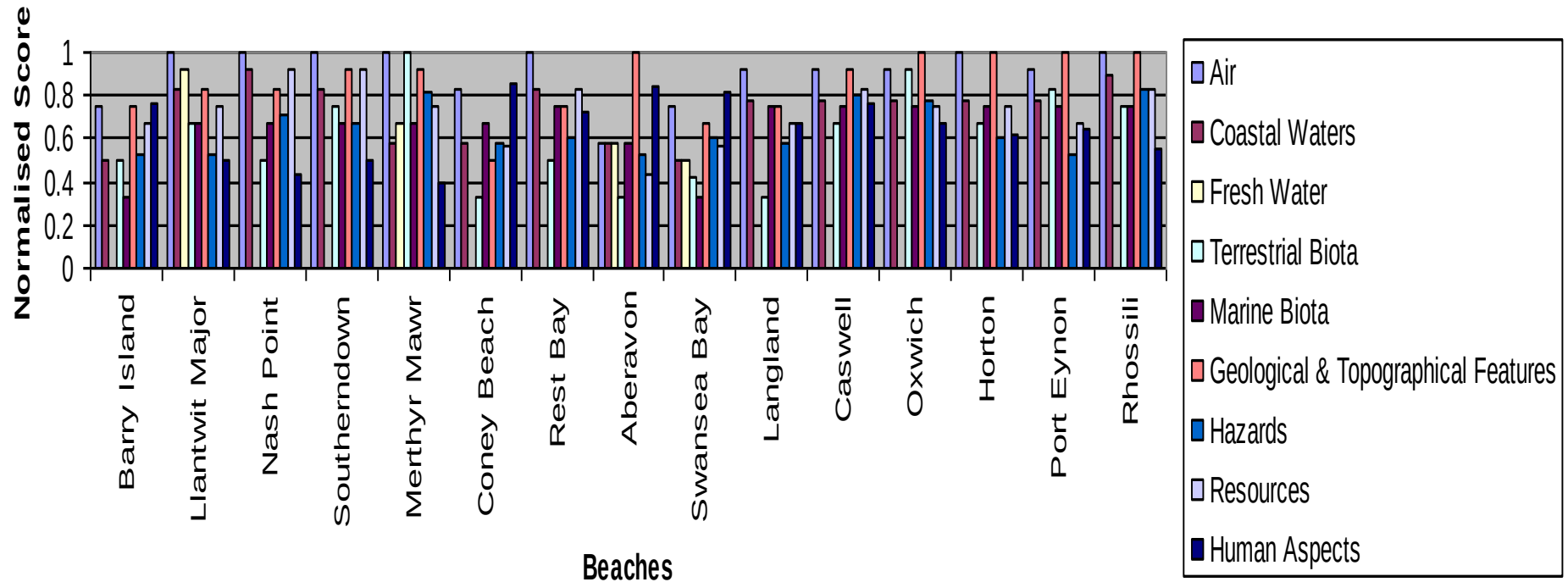
Environment Component	Characteristic	Indicators
Air	Pollution	Gravity
		Visibility
		Effect On Humans
	Noise	Intensity
Coastal Waters	Quality	Microbiological Pollution Chemical Pollution
Fresh Water	Aesthetic Condition	Turbidity
	Supply	Liter
		River Flow
		Pollution
		Turbidity
Terrestrial Biota	Quality	BOD
		Natural Vegetation Cover
		Biological Productivity
		Biological Diversity
	Quantity	Species of Special Interest
Marine Biota	Quantity	Biomass Biological Productivity
	Diversity	Biological Diversity Species of Special Interest
Geological & Topographical Features		Lithological
Hazards		Geomorphology
		Quality
		Size of Bathing Area
		Coastal Erosion
		Coastal Flooding
		Storms
		Sedimentation
		Cliff/Slope Instability
		Soil erosion
		River Flooding
Resources	Non Renewable	Soil (Fertility)
	Renewable	Fish
	Landscape	Visual Quality
		Uniqueness

Soci-economic Component	Characteristic	Indicator
Human Aspects	Potential For Use	Historic, Artistic, Archaeological sites
		Minerals, Rocks, Construction Materials, Fuels Fishing
		Recreation Facilities Hotel, Restaurants
		Utilities Parking
		Accessibility Land Use –different types
		Land Ownership
		Extent of Development Population Density
		Intensity of Use Public Health
		Unemployment
		Education Crime
		Development Potential
	Human Well-being	

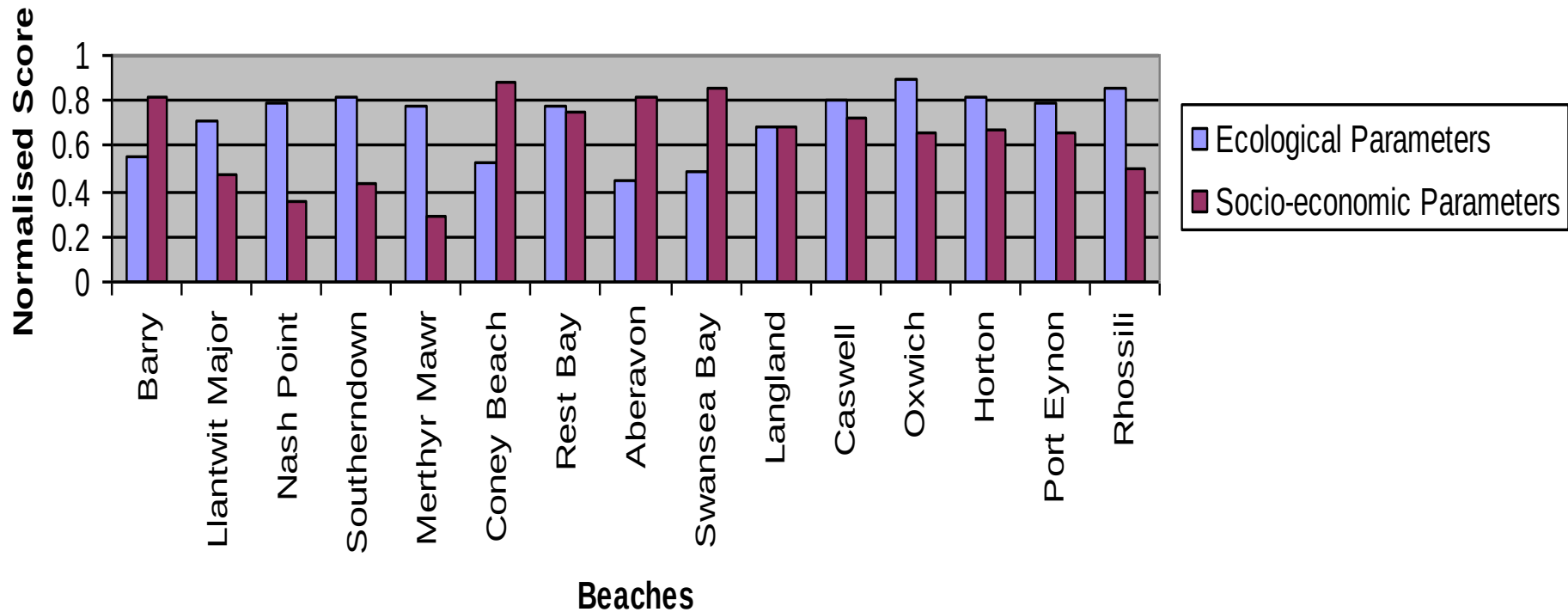
Methodology

- **Components were determined for each indicator and analysed for every beach**
- **Score allocated to each component within the range from 1 (worst) to 5 (best)**
- **Component scores 'normalised' for each indicator (environmental and socio-economic)**
- **Environmental and socio-economic indicators normalised overall to produce conservation / development matrix**

Normalised Scores for Natural and Socio-economic Beach Indicators



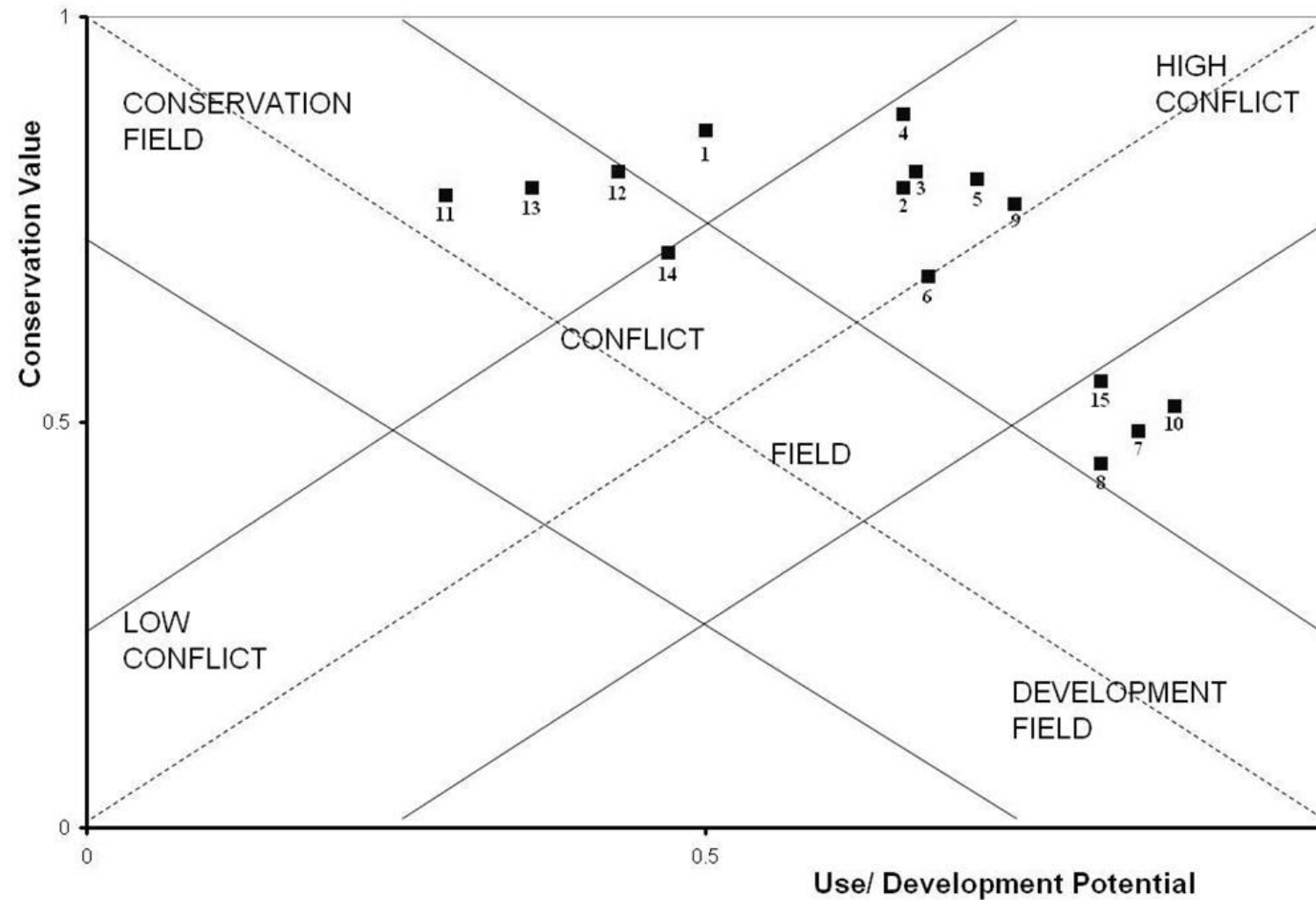
Site comparisons based on normalised scores for both ecological and socio-economic indicators



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Conservation / Use/Development Matrix



Matrix: Cendrero and Fisher, 1997

Conservation

- **Rhossili**
- **Merthyr Mawr**
- **Southerndown**
- **Nash Point**

Development

- **Swansea Bay**
- **Aberavon**
- **Porthcawl (Coney Beach)**
- **Barry Island**

Conflict

- **Port Eynon**
- **Horton**
- **Oxwich Bay**
- **Caswell Bay**
- **Langland Bay**
- **Porthcawl (Rest Bay)**
- **Llantwit Major**

Conclusions

- **Function Analysis provides a useful tool to identify conflict and evaluate change**
- **Conservation and Development areas are clearly defined**
- **Areas of potential conflict can be identified with significance of appropriate indicators**
- **Shoreline Management Plans and Planning Legislation are seen as significant in controlling conflict**

A wide-angle photograph of a coastal town. In the foreground, a vast, flat beach covered in grey pebbles stretches from the left towards the center. To the right, a concrete sea wall runs along the shore, topped with a white metal railing. Behind the wall, a row of colorful buildings is visible, including a prominent one with a green gabled roof. The background shows a hillside with more trees and buildings under a cloudy sky. The text "Thank you for your attention." is overlaid in the center of the image.

**Thank you for your
attention.**

Any Questions?