

Cork Harbour SSA 8

Cork Harbour social-ecological system

One of world's largest natural deep-water harbours and of vital importance to society and economy of Cork City (c. 123,000 population), surrounding region, the nation State and EU maritime transnational 'Atlantic area' region.

Complex estuarine social-ecological system. Mixed coastline of built infrastructure, shallow cliffs, intertidal mudflats, reedbeds, shingle and rocky foreshores exposed by the 3-4m tidal range. Coastal hinterland of mixed rural, urban and industrial land use.

Principle riverine input is 65km-long River Lee, drains 1,200km² catchment. Cork City at upper tidal reaches. Water body surface area approx 100km².

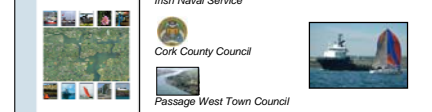
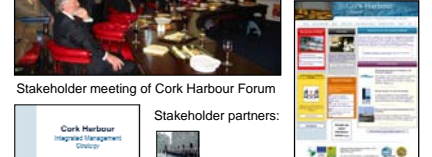
Home to several protected species. Important fish spawning and nursery areas. Protected wetland areas including SPAs, SACs, Ramsar Site.

Social-ecology

Social domain far outweighs ecological domain. Urban growth, social disadvantage, low transport interconnectivity, cross-scale dynamics with global markets, capital flows, plus localised implications for jobs and negative growth have far more ICZM significance than ecosystems and ecological services.

Future consequences of climate change, energy (in)security, inward investment, international trade, global relocation of jobs, human migration, cultural identity, and historic pollution legacies are new long-term foci for CZ planning and management (governance) scenarios.

Dynamic multi-use environment with numerous concurrent, overlapping human activities producing complex, non-linear feedbacks, cumulative impacts and synergistic effects. High levels of intrinsic uncertainty, unpredictability and surprise (hidden thresholds, possible regime shift at Cork Harbour level and across scales).



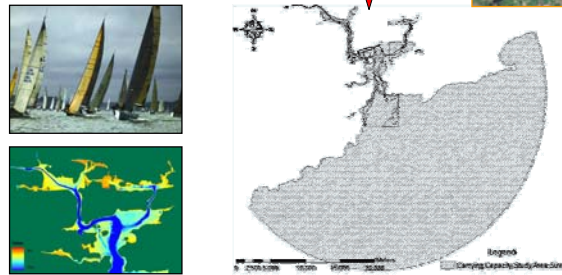
CATWOE analysis

Customers	Beneficiaries – local communities, visitors, marina operators, government, support services, commercial operators onshore facilities, engineering companies, property speculators, Victims – property owners, residents, port operators, social inclusion advocates other water users conservationists, competing marina operators
Actors	Spatial planners & investors/developers
Owners	Government – Department of Environment & Department of Agriculture, Fisheries & Food
Transformations	Provision of supporting infrastructure for marine recreation
Worldview	Marine recreation provides added value to local economies and social diversity/ quality of life
Environment	Seascape/landscape & aesthetic value, availability of space, appropriate space, water quality, EU regulations

"Real world" Real System



Virtual System



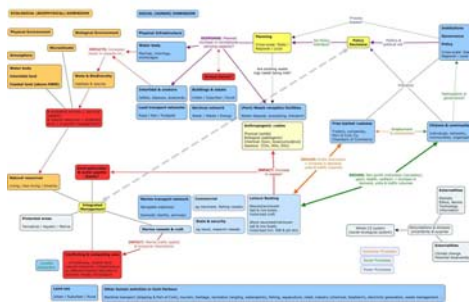
Bathymetry. Deepwater blue. Virtual System. Spatial extent indicated by the hatched area.



System assets. Leisure boating infrastructure (moorings, marinas, slipways, sailing clubs) and conflicting uses – conservation areas and Port of Cork.

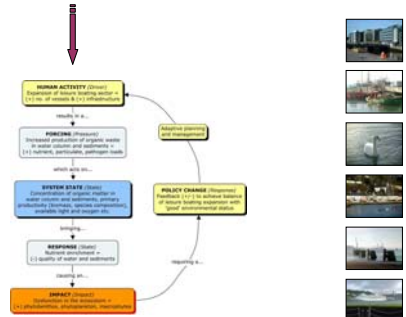
SPICOSA Policy Issue

How to optimise the potential for expanding the leisure boat sector in the context of Cork Harbour's multi-use environment?



DPDR	Human Activity	SPICOSA CZSPF
Driver	Expansion of leisure boating sector in Cork Harbour	Expansion of leisure boating sector in Cork Harbour – results in a... Forcing
Pressure	Increasing production of human waste (rubbish, pathogens, particulate loads) in water column and sediments	Increasing production of human waste (rubbish, pathogens, particulate loads) in water column and sediments – which acts on... System State
State	The concentration of organic matter in water column and sediments, primary productivity (biomass, species composition), available light and oxygen, etc.	The concentration of organic matter in water column and sediments, primary productivity (biomass, species composition), available light and oxygen, etc. – which may be diagnosed as an... Response
Impact	Dysfunction in the ecosystem (Increase in phytoplankton, phytoplankton, macrophytes)	Dysfunction in the ecosystem (Increase in phytoplankton, phytoplankton, macrophytes) – which may be diagnosed as an... Impact
Response	Feedback to planning and management of the Human Activity (to achieve balance of leisure boating increase with 'good' environmental status)	Feedback to planning and management of the Human Activity (to achieve balance of leisure boating increase with 'good' environmental status) – which may be diagnosed as an... Policy Change

Problem Scaling



Main ecosystem goods and services relevant to Issue

- Ecosystem Goods:
 > Fish – sea angling
 Ecosystem Services:
 > Sheltered environment for safe leisure boating activity
 > Birds and mammals – wildlife tours
 > Water quality – for boating and bathing
 > Natural habitat and scenic landscape – for aesthetic enjoyment and quality of leisure boating experience

Main ecosystem components and transformations (virtual system)

Impacts	State Components (amounts)	Input, loss, transformation (rates)	Measurable
Change in available user space.	Surface area of the water body (m ²)	Rate of change of area (e.g. through building, reclamation, flooding).	Yes
Increased potential for user conflict	No. of boats	No. of boats	Yes
Reduced navigation	Depth of the water body (m)	Sedimentation rate.	Yes
Increased navigation	Volume of capital dredging	Volume of capital dredging	Yes
Change in user numbers and activities	Water quality (status – good/bad)	Level of pollution (e.g. N volume per annum); Chlone (rate of flushing); Mixing (e.g. through wind speeds per year)	Yes

Part of University College Cork, Ireland, the Coastal and Marine Resources Centre (CMRC) is a multi-disciplinary research centre active in the thematic areas of integrated coastal management, coastal processes and seabed mapping, seabeds and oceans and GIS and remote sensing.

The purpose of the Marine and Coastal Environment (MACE) Group at Cardiff University, Wales, is to conduct both pure and applied research on the marine and coastal environment with particular reference to the use of marine information and the development of education and training.

ENVISSON is a consultancy and research group providing environmental services to the international community. It has extensive expertise in institutional capacity development for sustainable coastal management and experience of providing a wide range of tailored technical, management and professional training services.

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