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Authors: O'Hagan, A.M., and Cooper, J. Andrew G.

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# Spatial variability in approaches to coastal protection in Ireland

A.M. O'Hagan, and J. Andrew G. Cooper

Coastal Research Group,  
School of Biological and Environmental Sciences,  
University of Ulster, Coleraine,  
Co. Derry, BT52 1SA,  
N. Ireland.



## ABSTRACT

In Ireland, coastal zone management has proceeded largely in an ad hoc manner and is based on sectoral legislation covering issues such as fishing, water quality, coastal protection, etc. Within this framework there exists a plethora of national and local institutions whose responsibility is divided between the marine and terrestrial sub-zones of the coastal zone. This paper presents results from a survey of local government approaches in 16 coastal local authorities to 2 aspects of coastal zone management, viz. coastal protection and application of the national legislation contained in the Foreshore Acts. The approaches of three local authorities are highlighted to illustrate that management, while based on the same legislative and administrative framework, varies considerably between local authorities. While changes in the administrative structure of local government are on-going it is important that the current problems of legal ambiguity and administrative uncertainty are clarified in order to provide a more consistent approach to coastal protection in Ireland.

**ADDITIONAL INDEX WORDS:** *Ireland, coastal protection works, local authorities, statutory powers, foreshore, licensing.*

## INTRODUCTION

Ireland's coastline spans some 6500km (5800km in the Republic of Ireland) (NATIONAL COASTAL EROSION COMMITTEE, 1992) and it is estimated that 59% of the population lives within 50km of the coast (CENTRAL STATISTICS OFFICE, 1997). The Irish coastal zone contains important resources that provide economic, recreational, aesthetic and conservation benefits. The activities included in these categories tend to be managed on an individual basis by individual property owners, local authorities, and central government departments. Traditionally the jurisdiction of statutory administrative institutions in Ireland ends at Mean High Water (MHW). This problem of jurisdiction is inherently linked to the problem of definition of the coastal zone. In Irish law, the term 'coastal zone' is not defined. In the Government's draft Coastal Zone Management Plan the coastal zone is defined as "a strip of land and sea territory of varying width depending on the nature of the environment and management needs" (BRADYSHIPMAN MARTIN, 1997). The problem arising from this is that many coastal activities transcend jurisdictional and administrative boundaries which results in uncertainty and variation in management approach. One of the best examples of the resulting difficulties experienced is that of coastal protection works.

Three main Government departments are involved in coastal management in Ireland. The Department of the Marine and Natural Resources (DMNR) is responsible for most activities seaward of MHW and has little to do with activities above that boundary. Internally this department is sub-divided into sections dealing with issues such as aquaculture, coastal zone administration, engineering and maritime safety. The Department of the Environment and Local Government (DoE) is primarily concerned with activities landward of MHW such as land-use planning and recreational amenities. Local authorities are, in effect, the implementation authorities for this department. The Department for Arts, Heritage, Gaeltacht and the Islands (DAHGI) is responsible for nature conservation inter alia and has the responsibility of designating areas of conservation value using, for example, national designations such as Natural Heritage Areas and European designations such as Special Areas of Conservation and Special Protection Areas. While there are no formal legal mechanisms for vertical or horizontal integration of these departments and sub-departments, in the majority of cases they do try to work together when dealing with large-scale developments. The success of such efforts will be discussed later.

Local authorities, while being the enforcement bodies of Department of the Environment policies, also assume the role of coastal zone managers, although rarely in a formal manner. They have been given roles in the planning process, in health and safety, in the provision of essential services, in the provision of amenities, in the provision of housing and in pollution control (CANNY, 2000). They also have by-law making powers. Consequently many of their functions will include coastal areas, given the extent of Ireland's coastline. Roads are a prime example of this and explain to a certain extent why local authorities have become involved in coastal protection works even though, because of their position in relation to MHW, such works are more likely to be a national responsibility within the Department of the Marine and Natural Resources. Section 81(1) of the Local Government (Ireland) Act of 1898 states that it is the duty of every county and district council according to their respective powers, to keep all public roads maintainable at the cost of their county or district in good condition and repair, and to take all steps necessary for that purpose. Given that 15 out of 26 counties are coastal it is inevitable that some national roads will run along the coast and be subject to natural forces which may, at times, undermine or threaten the road network. Local authorities are also permitted to execute works giving relief or protection from flooding, landslides, subsidence and other occurrences. Reclamation works are governed by separate legislation.

### Irish legislation

Due to the fact that administration and regulation of coastal zone activities is dealt with sectorally, much of the legislation is also sectoral in nature. The problems with legislation are various and have been discussed elsewhere (O'HAGAN and COOPER, 2001; MCKENNA *et al.*, 2000; MACLEOD *et al.*, 2000). The principal legislation relevant to coastal protection works consists of the Foreshore Acts 1933-92, the Local Government (Planning and Development) Acts 1963-2000 and the Harbours Acts 1946-96. Ireland also has a Coastal Protection Act dating from 1963. This Act is stated to be "an Act to provide for the making and execution of coast protection schemes and to provide for other matters connected with the matters aforesaid". Basically this Act empowers the Office of Public Works (OPW) to take responsibility for coastal protection. While this Act has yet to be repealed, State funding allocated to this issue was transferred from the OPW to the DMNR in 1990. The Foreshore Act 1933 defines the foreshore as "the bed and shore, below the line of high-water of ordinary or medium tides, of the sea and of every tidal river and tidal estuary and of every channel, creek and bay of the sea or of any such river or estuary". As a general rule in Ireland the foreshore belongs to the State and its control is vested in the DMNR which has the power to grant

Foreshore Licences and Leases. A Foreshore Licence authorises the licensee to 'place or erect any articles, things, structures or works on such foreshore, to remove any beach material from, or disturb any beach material in, such foreshore, to set and take any minerals in such foreshore to a maximum depth of 30 feet or to use or occupy such foreshore for any purpose'. Their use is, therefore, required by local authorities when undertaking coastal protection works.

The Local Government (Planning and Development) Acts 1963-2000 are the base laws governing land use and are implemented by local authorities. Under the 1963 Act local authorities are obliged to prepare a development plan for their area. This consists of a written statement and a plan, which is essentially a map, indicating the development objectives for the area in question. It also acts as a framework within which planning applications are made and planning permissions granted or refused. Planning permission is required for all 'development' of land except those areas stipulated in the Acts. In the 1963 Act 'land' was taken to include any land covered by inland or coastal waters. Delimitation of seaward boundaries of local authorities is not standardised throughout the State (REID, 1986). In general it may be said that land above the line of ordinary high water mark is within the administrative area of the appropriate County Council; while the foreshore itself is within the administrative area of the DMNR. Under the Planning and Development Act 2000 Part XV, however, local authorities have been given the role of planning authority for the foreshore. This section also stipulates that if a local authority wishes to carry out a development on the foreshore it must, firstly, seek permission from An Bord Pleanála (Planning Appeals Board). This consequently requires coastal protection works that straddle the MHW to seek such permission. The Local Government (Planning and Development) Regulations 1994 require local authorities to inform various Government departments and other institutions of any works they plan to carry out. These are termed 'prescribed bodies' and include various Government departments, central and regional fisheries boards, harbour authorities, An Taisce [National Trust for Ireland] and Bord Fáilte [Irish Tourist Board]. While other legislative Acts are applicable in the coastal zone, a discussion of their effects is beyond the scope of this paper.

### Coastal protection in Ireland

Coastal erosion has always been seen as a major threat to the coastal environment in Ireland. Traditionally the response to this has been to control the sea, usually by means of engineering solutions such as groynes, sea walls and rock revetments. CARTER and JOHNSTON (1982) estimate that coastal erosion causes a loss of land area of between 160 and 300 hectares a year around the coast of

Ireland. Most of this is experienced along the east and south-east coasts, with Co. Wexford experiencing the most severe erosion with maximum rates of 2 metres per year (WEXFORD COUNTY COUNCIL, 1992). Following severe storms in the late 1980s the Government was forced to address the issue and the National Coastal Erosion Committee was formed. This committee carried out a study to investigate the needs, in coastal protection terms, of the Irish coast. In their report (1992) they estimated that c.1500km of Irish coast is at risk from coastal erosion. They concluded that Ireland needed a Coastal Management Policy rather than just a Coastal Erosion Policy. Following this the three main Government departments (namely, the DMNR, the DoE and the DAHGI) commissioned a Coastal Zone Management Strategy (BRADY SHIPMAN MARTIN, 1997). In 1996, Forbairt (now Enterprise Ireland) along with the DMNR published "ECOPRO – Environmentally Friendly Coastal Protection - Code of Practice" (GOVERNMENT OF IRELAND, 1996). This was then distributed to local authority engineers who found themselves responsible for dealing with coastal protection.

The majority of coastal protection works in Ireland are funded by the DMNR. This money is made available by the Department to the local authorities. The local authorities make application to the Department listing the areas within their functional area that they perceive are in need of protection. The ultimate decision to grant funding is made by the Minister for the Marine and Natural Resources. As previously stated, the Department is sub-divided into divisions such as Coastal Zone Administration (CZA), Engineering, Maritime Safety, Aquaculture etc. Each of these divisions have strategic objectives. One of the objectives of the CZA division, for example, is to address priority coast protection requirements. The engineering division of the department may provide an advisory service on coastal protection works to both the CZADivision and to local authorities. It also designs and constructs coastal protection schemes at priority areas targeted by the Department and maintain schemes previously undertaken by the OPW under the Coast Protection Act 1963 (DMNR, 1998). Funding can also be obtained from the Department for Arts, Heritage, Gaeltacht and the Islands who will fund harbour works and coastal protection works on the offshore islands and at the corresponding landing area on the mainland. Likewise if an area at risk is under the authority of a semi-state body (for example, Dúchas – the Heritage Service, or one of the Port Companies.) they may co-fund necessary works or fund them entirely. A discussion of the implications such a variety of funding bodies has for management is beyond the scope of this paper but will be the subject of a later one.

## METHODOLOGY

The information for this study was obtained from a questionnaire distributed to local authority engineers and regional DMNR engineers that asked them to describe how, and under what legislation, the section of the Irish coastal zone for which they have responsibility, is currently managed. It covered such topics as jurisdictional boundaries, land ownership, conservation designations, access rights, cross-sectoral/departmental consultation and coastal erosion and accretion. This paper presents some of the results, namely those pertinent to coastal erosion and protection works.

As there are fifteen coastal counties in the Republic of Ireland it was feasible to retrieve answers from each local authority (County Council). Figure 1 shows each county, the length of coastline and the area at risk along with the number of county councils in it according to ECOPRO (GOVERNMENT OF IRELAND, 1996). It is evident that there is quite a variation in the length of coastline a county council has administrative control of and for this reason only three counties with similar lengths of coastlines will be examined in detail here. These are Galway, Cork and Wexford. County Galway is Ireland's second largest county and a substantial part of it is a Gaeltacht region (native Irish-speaking areas). As a result of this status coastal protection works can be funded by the DMNR and/or the DAHGI. County Cork is divided into three regions, namely East, West and South, for administrative purposes. It is a particularly interesting example as county jurisdiction, between Cork and Kerry, is split by Bantry Bay. This area has its own non-statutory coastal management plan called the "BANTRY BAY COASTAL ZONE CHARTER" (2000). The plan contains a range of specific proposals for the management and development of the Bantry Bay coastal zone which were agreed by the various stakeholders and Government departments involved in the area. It is the only area in the Republic of Ireland to have a management plan of this kind. County Wexford experiences the most rapid and widespread coastal erosion in Ireland (WEXFORD COUNTY COUNCIL, 1992). It contains one of Ireland's largest ports, Rosslare and so hard defence structures have long been used there.

For each county council an interview was conducted with the senior engineer or, the maritime engineer. These officials were targeted as they are the individuals who are responsible for assessing the need for protection, making the preliminary assessment, applying for funding, planning and, in some cases, designing the scheme and reviewing its effectiveness. It was felt that DMNR engineers should also be interviewed as they fund protection works in the majority of cases. The questions asked of all these officials related to whether their area experienced coastal erosion or accretion, whether this was perceived as a problem, whether

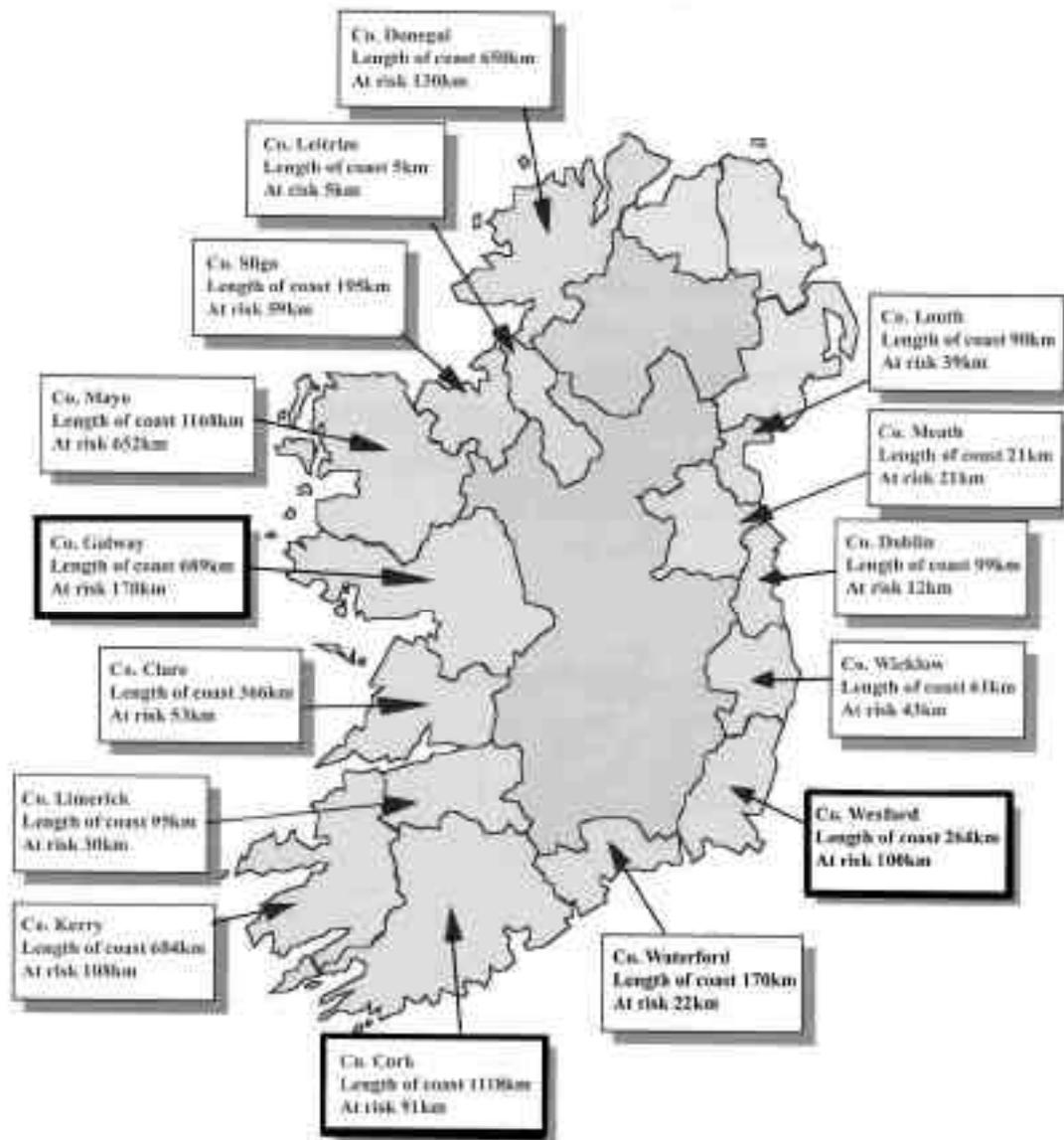


Figure 1. Coastal counties in the Republic of Ireland, with case study counties highlighted. Adapted from ECOPRO (GOVERNMENT OF IRELAND, 1996).

protection works (either hard or soft) had been executed in the past 5 years and what procedures were involved in implementing them. The latter topic included questions on the legislation consulted, the legal requirements complied with and the effectiveness of the entire process. Both open-ended and closed questions were used.

## RESULTS

All three counties were found to experience both coastal erosion and accretion. All three work from the same legal

framework. The actual procedures involved and perceptions of the process, however, vary greatly as described below.

### Galway

Galway experiences both coastal erosion and accretion and both are perceived as problematic. No actions have been taken to counter accretion. Of the actions taken against erosion most were hard engineered solutions, namely seawalls and gabions. Marram grass planting has been used in a few places in order to stabilise dunes. This has been

particularly successful in the area around Roundstone (Dog's Bay and Gurteen Bay beaches) which is a tombolo and candidate Special Area of Conservation. There is a very proactive local residents association in the area who have approached the council and various other bodies for help. The area has been under threat from severe erosion over the last 11 to 12 years (TEAGASC, 2000). The residents association has an active management plan which restricts access to certain parts of the beaches at certain times and also restricts grazing in order to mitigate the effects of erosion (ROUNDSTONE BEACHES ENVIRONMENTAL PROJECT, unpublished report, 2001).

Generally, hard engineered solutions have been constructed in areas where infrastructure (roads, piers and private houses) is at risk. The council is usually aware of areas under threat but sometimes problems are identified by local residents. An assessment is then carried out by county council engineering staff who prepare and submit a report with an estimate of costs for submission to the funding agency. When funding has been secured the scheme is planned by council staff. In certain circumstances consultants may be employed, especially if the council feels that a particular area is in grave danger. The actual construction of the protection works may be carried out directly by council staff (known as the Direct Labour Office), or if the project is considered to be a major one, it may be carried out by contractors. Usually protection works on the islands off Galway are carried out by the Direct Labour Office while those on the mainland are constructed by contractors. There is no strategic review method in place. If the protection works are not seen to be working by local residents they will contact the council. If, however, a council engineer is 'in the area' he/she may view the finished scheme. Most protection works undertaken by Galway County Council have straddled the MHW. Legally this would require not only planning permission but also a Foreshore Licence. As far as could be ascertained a foreshore licence was applied for once. In that particular instance the time delay incurred in waiting for the licence resulted in the council losing the funding for the proposed works. As a result foreshore licences are not sought currently.

With respect to other legislative requirements, it is felt that the work being undertaken by the local authority is so plentiful and, in some cases, urgent that it tends to merely 'get on with the job' without giving legal requirements much attention. When working on the offshore islands the council meets with local residents to inform them of their plans. These meetings also involve representatives from other State organisations, such as Dúchas and non-governmental organisations, such as Coastwatch (Irish branch of a European coastal NGO). The Council does not usually meet with any public opposition to their works. If they do, such objections are dealt with through negotiation.

Any objections received in the past 5 years have been from Dúchas representatives. This 'frustrates' council engineers somewhat as the funding for protection works is usually obtained from the Department of Arts, Heritage, Gaeltacht and the Islands, under whose aegis Dúchas also falls. [The respondent feels that if such objections continue the local authority will stop meeting with such organisations even though it is a legal requirement]. Overall it was felt by the respondent that the entire process of implementing a coastal protection scheme in Galway is effective. The main constraints identified were unclear procedures and too many consultees. The typical situation is that it is difficult to predict the outcome of any scheme, at any stage, as this will depend on the location of the proposed scheme. Non-legislative changes were suggested as a possible improvement to effectiveness.

### Cork

Coastal erosion and accretion is experienced in both regions of Cork and both of these are perceived as problematic. No actions have been taken against accretion. Of the actions taken against erosion all, to the knowledge of the respondents, were hard engineered solutions, namely seawalls, groynes and gabions. It was stated that most coastal towns in Cork had some form of coastal protection works. The protection of main roads running along the coast has been the impetus for many protection works. Due to the large geographical area of the county it has been split by the council into three administrative regions, two of which are coastal: the East region, which extends 30 miles east and 20 miles west of Youghal town and the South Region which stretches from approximately the town of Clonakilty to the Kerry border and includes half of Bantry Bay.

In the East Cork region the council believes itself to be constantly aware of what is going on in the area and knows which areas are suffering from erosion. The council also has a political committee that meets with local organisations, such as fishermen's associations and local resident's groups. If an area is deemed to need coastal protection the council will carry out a preliminary assessment along with the local DMNR engineer. The council then applies to the DMNR for funding. In most cases this is received but the council may not always get the amount sought. Planning of the proposed scheme is carried out by the council in association with the local DMNR engineer. If it is considered a major scheme (defined as costing more than c.€127,000Euros) specialised coastal engineers are employed. While the East region has two people dedicated to coastal issues it is not felt that they should design such works. The protection works are always constructed by external contractors. Council officials themselves review completed protection schemes. The respondent stated that all solutions are temporary and believed they will never be able to stop all coastal erosion.

As most protection works are carried out to protect roads they are considered small scale and this is seen as justification for ignoring the need for a Foreshore Licence.

Generally the council officials are so busy that legislative requirements are not really considered. When asked if the public were consulted regarding proposed works the respondent replied that it depended on what they proposed to do. If the works were completely new then the public was consulted via the political committee. Repairing existing structures did not involve public consultation. Other organisations were only consulted if they had a particular interest in the area in question. No opposition has ever been encountered to coastal protection works and usually the only negative complaint received is about the time taken to do the works! Overall it was felt that the entire process is barely adequate and money is the main constraint. Within Cork county this region receives the least amount of money. The respondent feels this is due to the fact that there are no real tourist or fishing areas within the region and so it is not seen as a national priority.

In the South Cork region the council is made aware of coastal erosion problems by the local residents via their elected council representatives. Any proposed protection scheme is planned by council staff and an Environmental Impact Statement is prepared. This is sent to the planning section of the council. If approval is granted from here the proposal is sent on to the various Government departments, semi-state bodies, harbour authorities; who may have an interest in the area to be protected. If works will straddle the MHW a Foreshore Licence is applied for. The council then seeks funding from the DMNR. Usually the DMNR will fund 75% of the scheme and the council themselves will fund the remaining 25%. When funding has been secured the scheme is put out to tender and a contractor is employed. There is no strategic review process. This entire process usually takes a little over two years. The respondent felt that all applicable legislation is taken into account even though this makes the process longer.

The public are consulted at all stages as most schemes will usually affect them. Local Dúchas representatives and other non-governmental organisations have objected in the past. In the case of Rosscarberry funding was lost as a result. It is believed that once funding has been lost for a particular place it can never be applied for again. The council tries to deal with any objections through mediation. As a whole, the process is regarded as adequate. Time, money and staff shortages were stated as being the main constraints on effectiveness. Like Galway, non-legislative changes were suggested as a possible improvement to the situation. When asked who should be responsible for designing, building and maintaining coastal protection works it was felt that this should be carried out by the local authority in conjunction with a new Coastal Zone

Management Agency. The reasoning behind a new agency was because it was felt that this would be the most appropriate way of integrating the plethora of institutions who currently have a role in coastal management in Ireland.

### **Wexford**

Like the other counties Wexford experiences both coastal erosion and accretion; however erosion is perceived as a major problem. As Wexford experiences the most widespread coastal erosion in Ireland it has a long tradition of using coastal protection works. In the late 1980s it was estimated that the cost of protecting the threatened coast by conventional means (hard engineered structures) would be of the order of £15 to £17 million IEP (now equivalent to c.€19 million to €21 million) (WEXFORD COUNTY COUNCIL, 1992). Nowadays Wexford uses both hard and soft approaches to coastal erosion. The largest ongoing coastal protection scheme is at Rosslare Strand. This included the construction of six groynes and a beach renourishment scheme. Over the years millions of pounds have been spent in this area primarily because of the proximity of Rosslare Port. Dune rehabilitation has also been used in other parts of the county. The council is always aware of what areas are suffering most as a result of erosion. Due to the extent of their erosion problem they feel the fairest way of ensuring protection is by means of a 'priority list'. This list is then submitted to the DMNR for a decision on funding. Foreshore Licences are rarely applied for. The majority of the planning and implementation is carried out by Council staff. It is felt by the respondent that council officials are almost experts on coastal protection due to the long history of erosion within the county. There is little or no review of protection works carried out.

In this county the engineer responsible for coastal protection is, in fact, based within the environment section which is also responsible for waste management, designation of Blue Flag beaches, etc. In all other counties coastal protection is handled by Roads Section engineers. The respondent feels that the council considers all relevant legislation when carrying out protection works. Environmental Impact Assessment Regulations (1998) are considered for major works, such as development of marinas. Any proposed works are presented to elected councillors and in this way to the public. Harbour authorities are consulted only if necessary. Protection works have never met with any public opposition. The respondent feels that the entire process is highly effective and does not think it can be improved.

## DISCUSSION

From the brief presentation of the results above it is evident that there is substantial variability in the procedures involved in coastal protection and in related application of coastal law. It is evident not only at an inter-county level but, in the case of Cork, within the county. There are many potential explanations for this, including social, cultural, political and personality factors. KAY and ALDER (1999) state that "the culture and social structure of a coastal nation is often the hidden determinant of its organisational approach to coastal management". The results above suggest that such a statement may be extended to include regional variability within a single coastal nation. Local authorities are a key element of Irish public administration. They exist within the context of other organisations and actors, private and public, with whom they may co-operate or compete. The traditional British local authority was considered by LEACH *et al.* (1994) to be self-sufficient and paid little attention to the role of other organisations. This statement can also be applied to Ireland and has, without doubt, contributed to the variability observed in the approach to coastal protection.

Traditionally local authorities in Ireland have been dominantly influenced by local political parties or representatives. While this is inevitable, due to the fact that council members are elected, it has also resulted in certain areas receiving preferential treatment from national Government depending on which political party is in power. Personality and background have key roles to play not only in the operation of coastal management in general, but also in the political arena. The possibility that spatial heterogeneity in socio-economic attributes contributes to variation in local authority approaches cannot be dismissed.

Of all the respondents surveyed the majority were civil engineers. The disparity between engineers and coastal processes is well known (for example see Pilkey, 1996). This is a generic problem rather than one that varies by county. However, engineers with an environmental or coastal engineering background are more inclined to use soft protection works as was seen in Galway. The work-ethic of individuals could also be described as contributing to how coastal protection works are implemented. Some officials feel their priority is to get the job done, others prefer to follow the letter of the law despite the delays this may cause. This is supported by the fact that some councils apply for Foreshore Licences while others do not. Age is another factor. Those trained in recent years will have the benefit of up-to-date scientific information on coastal processes.

While all counties experience both erosion and accretion action has only ever been taken with regard to erosion. Erosion is seen as a problem, accretion is not. This may be a result of pressure put on local authorities by local

residents, pressure groups or local media. If there was a standard approach to designing, building and maintaining works the problem of opposition could be mitigated. The priority list system in operation in Co. Wexford means that only those areas at greatest risk are dealt with and in view of limited resources this appears to be a useful approach that may eliminate political favouritism. The respondents stated that there was so much applicable legislation and so many institutions involved that it was virtually impossible to do their job correctly. Ideally they want to see responsibilities clearly defined and everyone following the same procedures.

The results show that county council officials tend to rely heavily on personal discretion when implementing coastal protection works. This has advantages in that they are familiar with the area in which they work, the natural forces affecting it and the people and infrastructure liable to be affected if action is not taken. In all counties, however, officials feel over-worked, under-informed and under-resourced. All identify the need for more money. Ideally officials would like to do everything legally, but for a long time the jurisdiction of local authorities has been unclear and this has contributed to a lack of regard for legal requirements. This problem has been mitigated to a certain extent by the Planning and Development Act 2000. Other recent legislative changes have made the inter-organisation context a factor that cannot be ignored in the internal management of the authority. Local authorities cannot effectively fulfil their responsibilities without recognising the role that other organisations play and their dependence upon those other organisations. The local authorities must then, as part of its organisational strategy, decide how they wish to operate. This decision has the potential to assist local authorities in integrating and harmonising their approach to managing their coastal areas.

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