Spatial Data Management – an Essential Building Block for Land Management in Ireland

Helen MURRAY, Ireland

Key Words: Spatial Data Management, Land Management, EU, Environmental Directives, SDI

SUMMARY

This paper outlines the issues raised and subsequent findings of a workshop which was held on the 31st October 2006 in the School of Spatial Planning at the Dublin Institute of Technology entitled 'Spatial Data Management – an Essential Building Block for Land Management in Ireland'. This event was jointly hosted by the Society of Chartered Surveyors, Dublin Institute of Technology and EuroSDR (European Spatial Data Research organisation) and sought to initiate and facilitate discussion on pertinent issues relating to spatial data management policies within the framework of an Irish Spatial Data Infrastructure. There has been anecdotal evidence of late, regarding difficulties that have arisen in the attempt to utilize and merge multi-source spatial datasets to produce useable and valuable land information products in Ireland. The importance of good quality Irish spatial environmental data was emphasised in a number of presentations and in particular their impact on future land management policies, many formulated on the strength of datasets of unknown quality.

The problems relating to spatial data management issues which are arising in the compliance of certain EU 'environmental' directives were examined and included the Water Framework Directive, the Habitat Directive, the Environmental Noise Directive and the Strategic Environmental Assessment Directive. These Directives when fully complied with should have lasting and beneficial influence on land use and land policy decisions across EU but have very specific spatial data requirements – some of which are proving difficult to meet in Ireland. The workshop also showcased an Irish local government spatial data management initiative which illustrated how successful a combined approach to spatial data sharing across public/private/voluntary organisations can be; an on-going research project which focussed our minds on the geography of the many datasets and more especially the inconsistency of many of these geographies; the advances in the Irish land administration infrastructure – the property registry, were also explored and demonstrated the pace of change within that organisation and detailed the possibility for successful progression from e-registration to e-conveyancing for Ireland going forward.

This workshop marked the first time an event which explored common spatial data issues specifically in the compliance of certain EU 'environmental' Directives and generally within the context of an Irish Spatial Data Infrastructure (ISDI) was held in Ireland. Many of the issues raised at this workshop, identified that an integrated approach to spatial data management is needed and such an approach is a fundamental building block towards

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sustainable land management policies within the country. The workshop findings were as diverse as they were many but it is envisaged that the findings might move the discussion further towards the formation of a best practice toolbox approach to spatial data management nationally.

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INTRODUCTION

A well functioning highly integrated land administration system is the back bone of any society and the role spatial data plays in this cannot be overestimated. The quality and availability of core spatial datasets and the judicious management of these datasets is fundamental to the successful development of any National Spatial Data Infrastructure. Indeed, the impact of such an Infrastructure in terms of facilitating an efficient land market and supporting effective land-use administration is not generally recognized. The objective of a workshop, held on the 31st October 2006 in the School of Spatial Planning at the Dublin Institute of Technology and entitled 'Spatial Data Management – an Essential Building Block for Land Management in Ireland', was to address the state of play in developing a Spatial Data Infrastructure in Ireland while highlighting spatial data management issues for the compliance with EU directives specifically and national initiatives generally. There were 54 participants in total - a good level of interest given the workshop theme might be considered a little 'technical' or specialized. These participants came from a range of backgrounds from local authorities, private sector IT companies, Ordnance Survey Ireland and Ordnance Survey Northern Ireland, Property Registration Authority of Ireland and Academia.

This workshop aimed to explore common spatial data issues generally within the context of utilizing and merging multi-source spatial datasets into useable and valuable land information products. Of late there has been anecdotal evidence regarding difficulties that have arisen in the attempt to utilize and merge multi-source spatial datasets to produce useable and valuable land information products here in Ireland. The importance of good spatial data cannot be overestimated. Public bodies and private institutions are committing resources and making important long-term decisions on a daily basis which have a significant impact on future land management policies - many on the strength of spatial environmental datasets of unknown quality.

WORKSHOP HOSTS

This event was jointly hosted by the Society of Chartered Surveyors (SCS), the Dublin Institute of Technology (DIT) and EuroSDR (European Spatial Data Research organisation). The Society of Chartered Surveyors is the professional Body for Chartered Surveyors practising in all areas of the Property and Construction Industry in the Republic of Ireland. It regulates the profession in the public interest and oversees all aspects of the profession, from education through to qualification and the continuing maintenance of the highest professional standards. Relative to the long history of the Society of Chartered Surveyors (it has its origins back in 1895) and with a growing membership which is at present over 1,500, (student membership over 800) the Geomatics Division is still in its infancy. It remains a small

Division but plays an active role and continues to focus on increasing the profile of the profession in general and of the benefits of membership of the Society specifically. The Society of Chartered Surveyors (SCS) acknowledges the importance of a collaborative event just as this, which brought experts from interdisciplinary educational and research backgrounds together with the profession itself - (the Faculty of the Built Environment in DIT, the research organisation EuroSDR and the SCS).

The School of Spatial Planning, DIT recognizes the importance of the Society of Chartered Surveyors in it's role as one of its accreditation bodies – strengthening as it does, the transferability of our graduates skills and qualifications internationally. The SCS has reciprocal membership arrangements with the Royal Institute of Chartered Surveyors which represents over 90,000 members practising in Real Estate, Construction and Geomatics in more than 100 countries worldwide. The School of Spatial Planning also identifies the need to actively promote the unique nature of its courses both undergraduate and post-graduate level, and to this end, the role SCS can and does play is re-emphasized through involvement in events such as this, the presentation of a student prize within the Geomatics BSc course and the availability of Research grants to both student and full members.

The EuroSDR's (European Spatial Information Research Organization) permanent secretariat is hosted by the Faculty of the Built Environment within the DIT. This is a pan-European organisation established by International Treaty in 1953. Organisations of member European countries are from within the Council of Europe. The result is a network of delegates of European Geographic Information organisations and research institutes effectively and practically addressing Europe's spatial data research requirements. DIT through its hosting of this Secretariat is central to this network. Senior lecturer Kevin Mooney from the School of Spatial Planning is the Secretary General of EuroSDR

WORKSHOP OPENING SESSION

The event was formally opened by Mr Dick Roche T.D. Minister for the Environment, Heritage and Local Government, Ireland, who recognized that the theme of the workshop was a first in Ireland in that it examined spatial data issues specifically in the compliance of certain EU 'environmental' Directives and generally within the context of an Irish Spatial Data Infrastructure (ISDI). Mr Conor Hogan, President of the Society of Chartered Surveyors delivered an opening address in which he stressed the importance of such a joint event. Mr Brian Norton, President of the DIT together with Mr Henk van der Kamp, Head of the School of Spatial Planning acknowledged the importance of events such as this one and welcomed the workshop participants to the School.

Keynote presentations were delivered by Mr Keith Murray (immediate Past-President EuroSDR) who detailed the Spatial Data developments that are taking place in this area at European level. He specifically highlighted the dangers and opportunities within the context of a European Spatial Data Infrastructure which is "moving ahead, driven by major new initiatives such as INSPIRE, GMES etc.". He stated that GI is going mainstream, as an enabler, not an end in itself and stressed the need to adopt basic ICT best practice to realise

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its full potential i.e. adopt sound data management policies. Mr Colin Bray (Senior Operations Manager – Data Strategy & Development, Ordnance Survey Ireland (OSi)) described on-going initiatives within the organization which are supporting and promoting the development of an Irish Spatial Data Infrastructure. He highlighted the organisations involvement in the INSPIRE Expert Working Group at European level and its role in the Irish Spatial Data Initiative, the Irish Coastal Forum and in the development of Geoportal.ie closer to home.

Session 1 followed which examined the spatial data management issues for the compliance of certain EU 'environmental' directives and included the Water Framework Directive (WFD) (Ms Sharyn Mc Menamin - GIS Project Manager, ESBI), the Habitat Directive (Ms Gemma Weir - Department of Environment, Heritage and Local Government, Ireland), the Environmental Noise Directive (Mr Brian Mc Manus – Dublin City Council) and the Strategic Environmental Assessment (Mr Conor Skehan – Head of Department of Environment and Planning, DIT). These directives when fully complied with should have lasting and beneficial influence on land use and land policy decisions across EU and have very specific spatial data requirements – some of which are proving difficult to meet.

The presentation on the WFD highlighted problematic issues in the spatial data due to lack of consistency in data management, format and supply. These problems create time delays and extra resource requirements in order to deal with data issues such as transformations of Lat/Long to Irish National Grid, data conversions such as non-spatial to spatial, vector to raster, old co-ordinates systems to current grid system, and data cleansing, such as editing errors and reconciling data from outside the required boundaries. The presentation from the National Parks and Wildlife Service (NPWS), which is part of the Irish Department of Environment, Heritage and Local Government illustrated how this Service manages the State's nature conservation responsibilities under National and European Law. Under the EU Directive 'on the conservation of natural habitats and of wild fauna and flora' 92/43/EEC (The' Habitats Directive') NPWS has responsibility for the designation and protection of Special Areas of Conservation (SACs), areas where species and habitats of Community interest occur. These species and habitats are listed in Annex I and II of the Directive. 60 of the Annex I habitats occur in Ireland, 17 of which have priority status because of their limited range globally and because they are in danger of disappearing. Examples of Irish priority habitats are Turloughs, Raised Bog and Limestone Pavement. 25 of the listed species occur in Ireland, including the Kerry Slug, the Marsh Fritillary butterfly, the Otter and the Grey Seal. Implementation of the Directive demands the creation and management of spatial data for a number of areas including designation of SACs, SAC monitoring and management. The designation process comprises the digitising of boundaries, hardcopy map production, checking, editing and plotting for notification of landowners, stakeholders and other interested parties, and dissemination of the data to central and Local Government and third parties via a data download website. Some of the difficulties in mapping a dynamic environment, with fuzzy boundaries and old base mapping were highlighted.

The next presentation detailed the aims and objectives of Noise Mapping to be carried out under the new Environmental Noise Directive. It clearly outlined the data requirements

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required for the strategic noise modelling, which Dublin City Council has been developing over the past 5 years. This noise mapping will be used in the provision of data to the EU Commission, as a source of information for Irish citizens and as a basis for action plans. The minimum requirements for Strategic Noise Mapping were detailed and these include information on an existing, a previous or predicted noise situation; information on a particular site, facility or industry which is exceeding of the noise limit; an estimation of the number of dwellings, schools and hospitals in a certain area that are exposed to specific values of a noise indicator and an estimation of the number of people located in an area which are being exposed to certain levels of noise. This presentation also highlighted specifics relating to the unavailability of certain aspects of these data requirements and concluded with a very illuminating screen shot of a noise map for Dublin City Centre. A presentation on Strategic Environmental Assessment (SEA) then followed which detailed the use of spatial data in the development of County Development Plans and Local Area Plans, and specifically in the Impact Assessment, Scenario Testing of Alternatives, Monitoring and Consultation stages of SEA, with a view to ensuring a 'best fit' between development and the environment and to anticipate and avoid impacts at the earliest stage.

Session 2 – the afternoon sessions sought to show-case national and regional projects such as a local spatial data management initiative, some relevant on-going research in this area and explored the advances in the Irish land administration infrastructure – the property registry.
Firstly, Mr Peter Rose (Tekenable Consultants) presented on the Fingal Data Sharing Initiative - a recently launched scoping report written for Fingal Development Board, (a Local Government Area north of Dublin City which is the fourth largest county in Ireland, with a population of 96,413 at the last Census (2002) which represents a 17% rise in a period of six years and has the youngest average age of any county in Ireland with 30.5 years. This youthfulness defines specific needs in the population). This study illustrated how successful a combined approach to spatial data sharing across public/private/voluntary organisations can be and demonstrated considerable parallels between this work and the objectives of the Irish SDI and EU INSPIRE initiatives.

Next, Mr Greg McDermott (Software Services Manager, Property Registration Authority Ireland (formerly named the Land Registry)) presented on recent technological advancements and in-house procedural changes there. This presentation demonstrated the pace of change within that organisation and the progression from e-registration to e-conveyancing for Ireland will no doubt follow without undue delay. A presentation by Mr Stewart Fotheringham, (Science Foundation of Ireland (SFI) Research Professor National University of Ireland (NUI) Maynooth) on the work which is being done at the National Geo-Computation Centre then followed. This research is fundamental to Spatial Data Management here in Ireland as it focussed our minds on the geography of the datasets and more especially the inconsistency of many of these geographies. The need for a new approach in the form of Small Area Statistics - the creation of smaller spatial units for census (and other) data reporting throughout Ireland, was identified. Currently, smallest units at which data is typically reported are District Electoral Divisions (DEDS) and these can generate many problems - from variation in population size from 55 to 24,400 to other DEDs being geographically too large to allow very 'refined' spatial analysis. The creation of Small Areas for future data reporting would allow a

much more detailed picture of the social and economic composition of urban areas to be drawn. The intrinsic relationship between Small Areas and Postcodes for Ireland was also mentioned in the presentation.

Breakout Sessions which were an integral part of the day then followed and allowed an opportunity for discussion and lively debate. There questions/topics under discussion were loosely framed by leading questions which were posed as the outset of the discussions. The topics raised were recorded and subsequently included within the final 'wrap up' session. Generally these breakout sessions initiated discussion and debate in the following areas: Data Supply and Exchange; Data Quality Issues; Data Maintenance: New and Legacy datasets. Specifically the workshop participants were asked to consider the following questions:
  - What can Data Suppliers/owners do to assist in formulating good data management techniques?
  - Irish Public Sector Data Exchange – what are the main constraints?
  - Specifically, what measures would assist your work in this area?

In the **Concluding Session** (delivered by the author) the issues that emerged from these breakout session deliberations were detailed. In this 'wrap up' presentation the main topics highlighted were, among others, the challenging pricing structure of Irish national spatial datasets, the feeling among many users that licensing agreements were restrictive in nature, the need for a consistent data modelling framework across public sector datasets and the requirement for a complete Irish Vector Topographical dataset. There was also an interesting discussion on current technological developments with the consensus being drawn that these may lead in time to national datasets across Europe being sourced other than from the National Mapping Agencies of the countries concerned. Also discussed was the possible problematic transposition into Irish Law in the coming months of the much anticipated INSPIRE Directive due to unresolved issues relating to pricing and availability of public datasets. However, while many pertinent and timely issues were raised during the event it is worth re-iterating the workshop objective - it never sought to draw definitive conclusions or indeed recommendations. What it did aim to do was to facilitate discussion and possibly explore common spatial data issues. While the forthcoming INSPIRE Directive may be perceived and anticipated by many as the 'Mother of all directives' the author cautioned workshop participants against 'holding out' for this directive in our attempts to solve or move the Irish Spatial Data Infrastructure forward. INSPIRE has had a long lead in time, indeed, it is anticipated that it will be 2013 before full implementation. We, in the GI community realise that six years is a very long time in spatial data management and associated technology development. It would therefore be more prudent to consider INSPIRE as just another directive in the suite of 'environmental' directives – indeed, is it worth considering whether the Re-Use of Public Sector Information Directive as arguably just as, if not more significant?

CLOSING SESSION

Mr Bruce McCormack (Department of Environment, Heritage and Local Government, Ireland) delivered the keynote closing presentation in which he detailed the state of play with

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the INSPIRE initiative and how the Irish GIS community might best prepare for this Directive. He reiterated that an ISDI is not operational yet although there is a final Policy Framework drafted which has yet to be adopted as government policy. Mr Kevin Mooney (Secretary General of EuroSDR) officially closed the event thanking presenters and participants alike and acknowledging the Secretariat's role in the successful administration of the event.

WHAT'S NEXT?

It was fitting that a workshop such as this, that examined spatial data management issues took place within Faculty of the Built Environment in DIT Bolton St., Dublin 1, historically the ancestral home of all things Geomatics in Ireland! Geomatics in its widest sense encapsulates much, if not all, that is integral to successful spatial data management. The event demonstrated that an Irish Spatial Data Infrastructure is already happening in many very real ways but in order to advance it further some of the spatial data management issues raised at this workshop need to be resolved. The outcome of this event may move this forward by initiating further investigation into the development of a best practice toolbox approach to spatial data management across local and central government and their associated agencies in Ireland. The possibility of a follow-up event is now being discussed.

CONTACTS

Ms. Helen Murray
Dublin Institute of Technology
Bolton Street
Dublin 1
IRELAND
Tel. + 353 1 402 3734
Email: helen.murray@dit.ie

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