



# University College Cork

## Applied GIS for Coastal & Marine Management

3 Day Short Course 24<sup>th</sup> – 26<sup>th</sup> April 2006



**Background** - Historically, Geographical Information Systems (GIS) & remote sensing were seen as being most applicable to terrestrial science. Recent advances and the development of new software applications have transformed these technologies into powerful tools for use in the marine environment. GIS is now applied to sectors such as fisheries and recreation and to other areas such as shoreline development, conservation and disaster management.



**Course** - This short course will focus on practical GIS applications within the framework of riparian to coastal, near and offshore marine environments. Participants will gain exposure to specific applications, by attending seminars from experts in the field of GIS, ICZM, remote sensing, modelling, seabed mapping, visualisation and Internet technologies. They will gain practical experience of GIS in the new dedicated GIS computer laboratory within the Geography Department of UCC.

**The Coastal & Marine Resources Centre (CMRC)** – Located on the Naval Base, Haulbowline Island, The CMRC is a research Centre of excellence within UCC's Environmental Research Institute. Established in 1994, the Centre has built an international reputation in coastal and marine resource management  
<http://cmrc.ucc.ie>

**The Department of Geography** – Located on the main UCC Campus, the Department of Geography has nearly 1,000 registered students. The Department is heavily involved in postgraduate programmes and has been to the forefront of GIS training for Government, Industry and private clients in Ireland for many years  
<http://www.ucc.ie/ucc/depts/geography>

**The Hydraulics & Maritime Research Centre (HMRC)** – A Centre of Excellence for research and development in the maritime engineering sector. Areas of expertise include physical modelling, software development and coastal morphodynamics  
<http://www.ucc.ie/research/hmrc/>

**Comments by previous attendees..**  
*...I felt that the maritime / marine input of the lectures was very informative & beneficial for myself. Good course!...*  
*...The course was excellent! ...*

### Contact

Course Content: Course Registration:  
Vicki O'Donnell Grainne Lynch  
[v.odonnell@ucc.ie](mailto:v.odonnell@ucc.ie) [Grainne.lynch@ucc.ie](mailto:Grainne.lynch@ucc.ie)  
Tel: 00 353 (0)21 4703118 Tel: 00 353 (0)21 4703100  
Web: <http://cmrc.ucc.ie>

**Target Audience & Attendance Requirements**  
This course is designed for technical staff and industry professionals involved in environmental management, Water Framework Directive GIS data management, engineering, planning, research, environmental consultancy, hydrography and those from local authorities whose remit includes aquatic management.

**Course Content**  
The course will be a mix of seminars and GIS practicals. The seminars will discuss data quality and Spatial Data Infrastructure (SDI), the use of remote sensing and Internet technologies and the use of open source software in data management and visualisation, along with seabed mapping and modelling.

The GIS practical element will focus on applications within the framework of riparian, coastal and marine environments. GIS will be taught using the ESRI suite of ArcGIS software. Although some participants may use other software in their day-to-day jobs, the principles taught will be readily transferable to other software environments.



**Cost - €900** – includes all course materials & lunches/coffees –  
**Deposit - of €200** to be paid by March 24<sup>th</sup> **Full payment** on or before April 24<sup>th</sup>



## AGENDA (April 24<sup>th</sup> –26<sup>th</sup> 2006)

Day	Time	Topic	Type	Presenter	Location
<b>April 24<sup>th</sup></b>	10.00-10.30	Introduction to the course			Room 255 O'Rahily
	10.30-11.30	Basic Introduction to GIS	<b>Seminar</b>	Vicki O'Donnell	Room 255 O'Rahily
	<b>11.30- 12.00</b>	<b>Coffee</b>			
	12.00-13.00	Introduction to coastal & marine management at International, EU, national & local levels	<b>Seminar</b>	Valerie Cummins	Room 255 O'Rahily
	<b>13.00 – 14.00</b>	<b>Lunch</b>			
	14.00-15.30	General Introduction to GIS	<b>Practical</b>	Helen Bradley/Vicki O'Donnell	Fahy Lab, Geography
	<b>15.30 – 15.45</b>	<b>Coffee</b>			
	15.45 – 17.15	Geo referencing & digitising	<b>Practical</b>	Helen Bradley/Vicki O'Donnell	Fahy Lab, Geography
	17.15-17.30	Questions & Answers Session	<b>Practical</b>	Helen Bradley/Vicki O'Donnell	Fahy Lab, Geography
<b>April 25<sup>th</sup></b>	9.30 – 10.30	Data quality & Spatial Data Infrastructure	<b>Seminar</b>	Darius Bartlett	Room 255 O'Rahily
	10.30 –11.30	Web GIS, proprietary & open source software	<b>Seminar</b>	Liz O'Dea	Room 255 O'Rahily
	<b>11.30- 12.00</b>	<b>Coffee</b>			
	12.00 – 13.00	Remote Sensing for riparian, coastal and marine management	<b>Seminar</b>	Vicki O'Donnell	Room 255 O'Rahily
	<b>13.00 – 14.00</b>	<b>Lunch</b>			
	14.00 – 15.30	GIS interpolation and integration of remote sensing data	<b>Practical</b>	Helen Bradley/Vicki O'Donnell	Fahy Lab, Geography
	<b>15.30 – 15.45</b>	<b>Coffee</b>			
	15.45 – 17.15	Tables/querying, buffering/clipping & scripting	<b>Practical</b>	Helen Bradley/Vicki O'Donnell	Fahy Lab, Geography
	17.15-17.30	Questions & Answers Session	<b>Practical</b>	Helen Bradley/Vicki O'Donnell	Fahy Lab, Geography
<b>April 26<sup>th</sup></b>	9.30 – 10.30	Modelling, what, why & how?	<b>Seminar</b>	Jimmy Murphy	Room 255 O'Rahily
	10.30 – 11.30	Seabed Mapping techniques	<b>Seminar</b>	Gerry Sutton	Room 255 O'Rahily
	<b>11.30 – 12.00</b>	<b>Coffee</b>			
	12.00 – 13.00	Visualisation techniques, 3D & 4D	<b>Seminar</b>	Declan Dunne	Room 255 O'Rahily
	<b>13.00 – 14.00</b>	<b>Lunch</b>			
	14.00-15.30	Metadata	<b>Practical</b>	Helen Bradley/Vicki O'Donnell	Fahy Lab, Geography
	<b>15.30 – 15.45</b>	<b>Coffee</b>			
	15.45 – 17.15	3 dimensional GIS	<b>Practical</b>	Helen Bradley/Vicki O'Donnell	Fahy Lab, Geography
	17.15-17.30	Questions & Answers Session	<b>Practical</b>	Helen Bradley/Vicki O'Donnell	Fahy Lab, Geography



## About the Speakers ..

**Darius Bartlett (B.Sc, M.Phil, M.Sc)** is an Earth Scientist and GIS specialist by training. He has been at University College Cork since September 1989. For more than fifteen years, he has been researching and writing on conceptual, institutional and related issues arising out of coastal zone applications of GIS. He is a member of the Executive Council of IROLOGI, the Irish Organisation for Geographical Information. He is also one of the founder organisers of the CoastGIS. He serves on the Scientific Committees of the European Institute for Marine Studies (IUEM) of the University of Western Brittany (Brest, France); and the International Centre for Coastal and Ocean Policy Studies (ICCOPS) of the University of Genoa, Italy. He has a BSc in Applied Science from Kingston University in England (1979); an M.Phil from Edinburgh University, Scotland (1986), for a thesis on Landscape Ecology, GIS and Geomorphology; and an MSc in GIS, also from Edinburgh University (1989), with a thesis on the application of GIS to the Coastal Zone. In 1990, he was elected a Fellow of the Irish Institution of Surveyors.

**Helen Bradley (B.Sc, M.Sc)** is University College Cork's GIS Development Officer. Her main role is to facilitate the development and use of geographical information systems within the Geography Department and across the university. This includes supporting the research activities of the department, providing lectures and practicals, encouraging GIS use in other departments and providing support for existing GIS users. She also coordinates the Diploma in Geographic Information Systems. The diploma is a one-year course aimed at people in full time employment interested in gaining a recognised qualification in GIS. She undertook her undergraduate studies in University College Dublin and then completed an MSc in Geographical Information Systems at the University of Leicester.

**Declan Dunne (B.Sc, M.Sc)**, is a computer scientist with extensive experience in software development whose current role involves research and development of 3D web-enabled visualisation tools for large scale datasets such as the Irish National Seabed Survey and 4D datasets such as hydrodynamic models, where technologies such as Java3D, X3D, NASA WorldWind, Goggle Earth KML, VTK, UMN Mapserver and OpenGIS standards are investigated and used. Previous projects included the MAPTURE project, where Irish and Welsh Natura 2000 data was compiled and stored in a central data repository and accessed through a web enabled GIS interface. This was developed using Apache, UMN Mapserver PHP/MapScript and PostgreSQL RDBMS technologies. Mr. Dunne also developed the Marine Irish Digital Atlas (MIDA) website middleware and database components using same technologies. Previous work experience includes employment at Oracle Ireland as a software engineer for three years, porting Oracle RDBMS technologies to multiple UNIX platforms. Proficient programming languages include Java, PHP and C/C++.

**Valerie Cummins (B.Sc, M.Sc)** is manager of the Coastal and Marine Resources Centre, University College Cork. She has considerable expertise in GIS as a tool for managing many aspects of the complex coastal environment. With a background in Marine Geography, Valerie worked for 4 years in the UK prior to coming to UCC in 1999; in the British Oceanographic Data Centre (United Kingdom Digital Marine Atlas Project) and Landmark Information Group (Environmental GIS specialists). Valerie is currently actively engaged in international research in the area of Integrated Coastal Zone Management and is involved in projects concerned with the development of GIS applications as decision support systems for coastal planning. She is also on the editorial panel of the international *Marine Policy* journal published by Elsevier.

**Jimmy Murphy (M.Sc, Ph.D)** holds a M.(Eng.) Sc. degree in Civil/Offshore Engineering and a Ph.D. in Coastal/Geotechnical Engineering both from University College Cork. He currently works as Senior Engineer/Manager of the Coastal Engineering section of the Hydraulics and Maritime Research Centre, University College, Cork. His work, which has concentrated on the areas of coastal processes and coastal structures, can involve a combination of field monitoring, numerical modelling, physical modelling and scoping studies assessing the feasibility of potential coastal developments. He has also been closely associated with a number of EU and MI funded research projects.

**Liz O'Dea (B.A, M.Sc)** is a specialist in creating web-enabled GIS systems. She earned her B.A. in Environmental Science from Willamette University in Oregon. After completing her degree, she worked as a cartographic technician for Mt. Hood National Forest where she acquired a wide variety of GIS-related skills in geology, forestry, fisheries and wildlife. She gained her M.Sc. in Geography at Oregon State University, where she developed two separate web GISs. Her thesis work involved creating the Tahoma Virtual Atlas, an environmental web GIS of the Seattle, Washington area to be used in secondary science curricula. She also developed an atlas of the East Pacific Rise, 9-10 degrees North, for the Virtual Research Vessel project. Liz joined the CMRC in 2002 as a GIS researcher and is primarily working on the Marine Irish Digital Atlas (MIDA) project.

**Vicki O'Donnell (B.A, M.Phil, H.Dip)** graduated with a BA degree in zoology in 1995 (Trinity College, Dublin), an MPhil in 1999 (Dublin Institute of Technology) and HDip in Applied GIS and Remote Sensing in 2000 (NUI Maynooth). During that time she worked for the Department of the Marine and Natural Resources, Coillte and the National Conservation Education Centre in Ireland. She also carried out volunteer work with the Wildlife Trust in Ireland and Earthwatch in Central Asia. She has worked in the Earth Systems Modelling and Data Management Laboratory at Kennedy Space Centre in Florida and for the Corporacion Nacional Forestal in Chile where she assessed the use of remote sensing for the protection of CITES listed *Alerce* sp. in the Andes. She joined the CMRC in 2001 and is working on GIS and remote sensing related projects as well as lecturing on the ICZM & GIS Masters Programme in University College Cork.

**Gerry Sutton (B.Sc, M.Sc)** holds a B.Sc. (Marine Biology), M.Sc.(Marine Geography) and is a senior researcher and project manager at the Coastal and Marine Resources Centre, University College Cork. Gerry has over 15 years of experience in all aspect of marine survey and data management in both scientific and commercial settings. His research expertise in the marine geography/hydrography domain focuses on all aspects of marine resource management. His work typically integrates aspects of seabed mapping (MBES, AGDS, Geophysics, Underwater Spatial Video) with GIS/spatial databases, in order to further understanding of physical and biological environmental systems and processes of relevance in a strategic resource management context. In addition to research, Gerry is the national representative to ICES WGEXT.

