

# 1995-2014

## Research at North Bull Island UNESCO Biosphere



An overview of studies completed

Compiled by Dublin City Council

1995-2014



### Introduction

North Bull Island, due to its international scientific importance for flora and fauna and also its close proximity to the capital city and many national universities, has long been a resource for education and scientific discovery. Since the establishment of the Biosphere in 1981, there has been a substantial body of work produced by Irish and international researchers. However, this information had not been gathered and collated for the Biosphere and remains housed in university library collections. It is desirable to guide future research by enabling students to see what has already been done and what baseline data has been collected at this important site.

### Process

During the periodic review process, Dublin City Council's Biodiversity Manager, Maryann Harris, contacted faculty in the natural sciences in Irish third-level institutions to ascertain the types of unpublished thesis research studies which they have conducted in the past twenty years at North Bull Island UNESCO Biosphere and its surrounding waters. She then conducted a literature review using the library resources of the National University of Ireland - University College Dublin to collate any published research studies that could be found using place-specific keyword searches. She also gathered information on the current degree programmes using the Biosphere, what subjects and levels of students are being taught and the themes of research.

### Objectives

While some of the studies are held at the Interpretative Centre at North Bull Island, not all are publicly accessible. Therefore, this document will provide the foundations for a valuable resource for Irish and international researchers. It is planned to extend this study further by engaging a research student to expand the timeframe and keyword searches of the literature review and to compile this into an EndNote bibliography to enable future research. This will then be circulated to national bodies for research and the universities. It may be possible to investigate if any studies have been undertaken in other disciplines. This list will then need to be updated regularly to ensure its value is long-lasting. The results of this study will assist in future planning of research and coordination among educational institutions, the National Parks and Wildlife Service, the Environmental Protection Agency and Dublin City Council.

### Acknowledgements

This information could not have been gathered so comprehensively without the assistance of the academic community of Ireland, in particular:

Dr. Marcus Collier, University College Dublin  
Dr. Tasman Crowe, University College Dublin  
Dr. Robin Edwards, Earth Sciences, Trinity College Dublin  
Dr. Stefano Mariani, University of Salford (UK)  
Dr. John Parnell, Trinity College Dublin  
Dr. Jane Stout, Centre for Biodiversity Research, Trinity College Dublin  
Dr. Tamara Hochstrasser, University College Dublin  
Dr. Steven Waldren, Trinity College Dublin  
Dr. James Wilson, Trinity College Dublin  
Dr. Ken Boyle, Dublin Institute of Technology

## Unpublished Research Studies on the UNESCO North Bull Island Biosphere since 1995

Year completed	Title	Author	Institution	Degree
1995	A Study of the Ecology of the Irish mountain hare ( <i>Lepus timidus hibernicus</i> ) with some considerations for its management and that of the rabbit ( <i>Oryctolagus cuniculus</i> ) on North Bull Island, Dublin Bay	Alan Wolfe	UCD	PhD
1995	Phytoplankton in Dublin Bay	Gary Free	TCD	BA (Mod) Thesis
1996	Bull Island: A study of the infauna in relation to the inter-tidal sediments	Derek Mulvany	UCD	MAppIsc (Environmental) Thesis
1997	Morphological investigation of <i>Valerianella</i> in Ireland	Clíodhna Foley	TCD	BA (Mod) Thesis
1997	Conflations of microphytobenthos with different substrates in North Dublin Bay	Michelle Carolan	TCD	BA (Mod) Thesis
1999	The nitrogen turnover of the saltmarsh of North Bull Island, Dublin Bay	Mary Hayes	TCD	BA (Mod) Thesis
1999	Foraging behaviour of the oystercatcher <i>Haematopus ostralegus</i> , in Dublin Bay	Eimear Brennan	TCD	BA (Mod) Thesis
2000	The transport of suspended particulate matter into and out of the South Lagoon - North Bull Island, Dublin Bay	Anne Murray	TCD	BA (Mod) Thesis
2000	A study of the hyperbenthos of Dublin Bay, with reference to the use of dominance curves in the analysis of community structure.	John Brophy	TCD	BA (Mod) Thesis
2000	<i>Hydrobia ulvae</i> as a biological indicator of metals in Dublin Bay	Marie O'Malley	TCD	BA (Mod) Thesis
2000	Talitrid Amphipods as a biomonitor of heavy metal pollution in Dublin Bay	S Tinnelly	TCD	BA (Mod) Thesis
2000	An investigation into the emergence patterns	Jennifer Whitmore	TCD	MSc Thesis

	of the Dublin Bay Prawn, <i>Nephrops norvegicus</i> (L.)			
2001	A Study of the Fungi present on a temperate saltmarsh at North Bull Island, Co. Dublin	Eleanor Landy	UCD	PhD
2002	The ecological effects of <i>Spartina anglica</i> , and its management on the mudflats and salt marsh at North Bull Island, Dublin Bay	Mark McCorry	UCD	PhD
2003	Fungal diversity and degradation on a temperate saltmarsh at North Bull Island, Co. Dublin	Niamh Ní Bhroin	UCD	PhD
2004	A study of the feasible and realistic sustainability of North Bull Island, Dublin and its Environment	Enda Flynn	University of Ulster	MSc Thesis
2004	The pollution status of north Dublin Bay	Fionnuala McBreen	TCD	BA (Mod) Thesis
2004	Distribution, relatedness, fitness and behaviour of entomopathogenic nematodes from Bull Island, Dublin	Alec Neil Rolston	NUI Maynooth	PhD
2004	Preliminary investigation of the use of foraminifera as bioindicators of environmental parameters in the Irish coastal environment	Fabrice Richez	TCD	MSc (Env Sci) Thesis
2005	Eutrophication and phytoplankton in the Liffey Estuary and Dublin Bay	Timothy O'Higgins	TCD	PhD
2005	Investigation of the food sources on the cockle ( <i>Cerastoderma edule</i> ) in Dublin bay: multiple stable isotopes approach	Marcin Penk	TCD	MSc (Env Sci) Thesis
2005	A study of a pollution and salinity gradient along north Dublin bay with biodiversity and biomass surveys	Olivia Daly	TCD	BA (Mod) Thesis
2005-2006	Speciation processes and pollinator-mediated selection in nectarless <i>Dactylorhiza</i> species	Dr Elisa Vallius	TCD	Post-doc (funded by Academy of Finland post-doc fellowship)

2006	Evaluating the nitrogen balance in south Bull lagoon using network analysis	John Healy	TCD	MSc (Env Sci) Thesis
2006	Pollution status of the north and south lagoons (the North Bull island) and distribution of <i>Spartina anglica</i>	Maria Isabel Valera Martinez	TCD	MSc (Env Sci) Thesis
2007	The alder marsh: ecohydrology and restoration prospects of a desiccating dune slack	Fiona M. Devaney	UCD	PhD
2007	The diets of flatfish in Dublin bay	Christopher Clarke	TCD	BA (Mod) Thesis
2007	A study of meiofauna of Dublin Bay and their use as a biological indicator of pollution	Fiona McIntyre	TCD	BA (Mod) Thesis
2008	The phytosociology and conservation value of Irish sand dunes	Karen Gaynor	UCD	PhD
2008	An Integrated Approach to the Toxicity Evaluation of Irish Marine Sediment	Michelle Giltrap	DIT	PhD
2008	Evaluation of the pollution status of 3 sites in Dublin Bay using a multimarker approach with <i>Mytilus edulis</i> as a bioindicator	Linda Daniels	TCD	MSc (Biodiv & Conserv) Thesis
2009	How do social interactions affect territorial behaviour and the formation of such territories? A study of the marine mollusc <i>Hydrobia ulvae</i>	Karen Sadleir	TCD	BA (Mod) Thesis
2009	Conservation and monitoring of legally protected and Red Listed bryophyte species in Ireland	Christina Campbell	TCD	PhD Botany
2009	Improving coastal amenity and conservation – North Dublin Bay	Gareth Toolan	UCD	BSc (Landscape Architecture) Thesis
2010	An ecosystem model of the south Lagoon at North Bull Island Dublin Bay	Doireann Nicholls	TCD	MSc (Biodiv & Conserv) Thesis

2010	Biological Effects of Pollutants in the Irish Marine Environment	Heather Rochford	TCD	MSc Thesis
2010	Effects of maturity status on the measurement of lysosomal membrane stability and condition index in the blue mussel <i>Mytilus edulis</i> in Dublin Bay	Ciara Quill	TCD	BA (Mod) Thesis
2010	Endocrine disruption and pollution in Dublin Bay using <i>Mytilus edulis</i> as a bioindicator	Andrea Lenderink	TCD	Dipl. Biol. (Bremen)
2010	Imposex biomarkers in <i>Nucella lapillus</i> around Dublin Bay	Cathy Maguire	TCD	BA (Mod) Thesis
2010	Trematode parasite prevalence in <i>Hydrobia ulvae</i> in relation to host densities and other host-related factors	Laura Williams	TCD	BA (Mod) Thesis
2010	The findings of the project to determine if a strategy for the total eradication of the invasive species <i>Hippophae rhamnoides</i> from North Bull Island is technically feasible and environmentally benign	Desmond Dempsey	National Botanic Gardens	BSc (Hort. Sci.)
2011	The effects of pollution and trematode infection on the health status of <i>Mytilus edulis</i>	Sean Kelly	TCD	BA (Mod) Thesis
2011	Contingency valuation of North Bull Island	Richard Deeney	DIT	BSc (Environmental Management)
2012	The current status, distribution and impact of non-native plant species in Irish coastal dunes	Sean Kelly	TCD	MSc (Biodiversity and Conservation)
2012	An integrated assessment of estrogenic endocrine disruption in the Irish marine environment with particular focus on chemical measurements	Jennifer Ronan	TCD	PhD Thesis
2012	Morphological and DNA barcoding-based	Erna King	TCD	PhD Thesis

	studies of meiofauna community variation along the salinity gradient and response to environmental quality changes within Irish transitional waters			
2012	Stable Isotope analysis and the food web of the Dublin bay ecosystem	Sandrine Laurand	TCD	PhD
2012	Measuring the Impact of Bait digging on the foraging success of migratory waders	Aidan O'Hanlon	UCD	BSc (Zoology)
2013	Pollen limitation in <i>Oenothera cambrica</i> Rostanski	Brian Seales	TCD	BA (Mod) Thesis
2013	Taking root in Bull Island	Bróna Waldron	UCD	M. Arch. Thesis
2013	The effects of <i>Ectocarpus</i> as a soft engineering technique on North Bull Island	Caroline Sheridan	DIT	BSc (Environmental Management)
2013-2016	Interactions between hydrology and ecology of dune slack ecosystems	Aoife Delaney	TCD	PhD (in progress)
2014	Brent geese social networks	Matthew Silk	U. of Exeter	PhD
2014	Impact of Recreational Activity on the Biodiversity of Bull Island	Aran Keenan	DIT	BSc (Environmental Management)
2014	The distribution and spread of an invasive species, Sea Buckthorn ( <i>Hippophae rhamnoides</i> ) on Bull Island	Aoife Hegarty	DIT	BSc (Environmental Management)
2014	Mapping and Planning Habitats on Open Green Spaces within the Administrative Area of Dublin City Council	Anurag Saha	UCD	MSc (Env Sc)



## Peer-reviewed published research studies of the UNESCO North Bull Island Biosphere

Year	Title	Author(s)	Publication	Vol/Issue	Page Nos.
1997	Organism-induced accumulation of iron, zinc and arsenic in wetland soils	Melanie O. Doyle and Marinus Otte	<i>Environmental Pollution</i>	96(1)	1-11
2001	Ecological effects of <i>Spartina anglica</i> on the macro-invertebrate infauna of the mud flats at Bull Island, Dublin Bay, Ireland	McCorry, Mark J. and Otte, Marinus L.	<i>Web Ecology</i>	2	71-73
2001	What is stress to a wetland plant?	Marinus L. Otte	<i>Environmental and Experimental Botany</i>	46(3)	195-202
2001	The diet and landclass affinities of the Irish hare <i>Lepus timidus hibernicus</i>	S. K. Dingerkus, W. I. Montgomery	<i>Journal of Zoology</i>	253(2)	233-240
2002	Particulate inputs to Dublin Bay and the South lagoon, Bull Island	James G. Wilson, Mary Brennan and Anne Murray	<i>Hydrobiologia</i>	475/476	195-204
2002	Productivity, Fisheries and Aquaculture in Temperate Estuaries	J.G. Wilson	<i>Estuarine, Coastal and Shelf Science</i>	55(6)	953-967
2003	Diffuse inputs of nutrients to Dublin Bay	James G. Wilson	<i>Proc. of the Diffuse Pollution Conference, Dublin, Ireland</i>	6	105-110
2004	Collembola of North Bull Island – new records for the Irish coast	Maria STERZYŃSKA* and Thomas BOLGER*	<i>Fragmenta Faunistica</i>	47 (1):	47–50
2005	The pollution status of North Dublin Bay	Fionnuula McBreen James G. Wilson	<i>Proceedings of the Conference of the Environmental Sciences Association of Ireland</i>	15	38-43
2005	Distribution of entomopathogenic nematodes in an Irish sand dune system	Alec N. ROLSTON, Christine T. GRIFFIN and Martin J. DOWNES	<i>Nematology</i>	7(2)	259-266
2005	A review of the Irish Anoplura (Insecta: Phthiraptera)	J.P. O'Connor, D.P. Sleeman, F.T. Butler	<i>Irish Naturalists Journal</i>	28(2)	62-67
2006	Spatial distribution of nine metals in surface sediment of an urban estuary prior to a large	CJ Buggy, JM Tobin	<i>Marine Pollution Bulletin</i>		

	scale reclamation project				
2006	Records of Irish Agromyzidae (Diptera) including two new species to Ireland	J.P. O'Connor and P.J. Chandler	<i>Irish Naturalists Journal</i>	28(7)	280-283
2006	The potential natural vegetation of Ireland	J.R. Cross	<i>Biology and Environment: Proc. of the Royal Irish Academy</i>	Vol. 106B, No. 2	65-116
2007	Fish community structure and distribution in a macro-tidal inshore habitat in the Irish Sea	Boris Jovanovic, Craig Longmore, Aine O'Leary, Stefano Mariani	<i>Estuarine, Coastal and Shelf Science</i>	75	135-142
2007	Threatened areas of international significance	Alexander Gillespie	<i>New Zealand Universities Law Review</i>	22	432-468
2007	The fish assemblage of the intertidal salt marsh creeks in North Bull Island, Dublin Bay: seasonal and tidal changes in composition, distribution and abundance	Violetta Koutsogiannopoulou and James G. Wilson	<i>Hydrobiologia</i>	588	213-224
2007	A comparison of energy flow through the Dublin Bay and Baie de Somme intertidal ecosystems and their network analysis	James G. Wilson, Herve Rybarczyk, Bernard Elkaim	<i>Hydrobiologia</i>	588	231-243
2007	Benign circulation of rabbit haemorrhagic disease virus on Lambay Island, Eire	N.L. Forester, R.C. Trout, E.A. Gould	<i>Virology</i>	358(1)	18-22
2008	Settlement of gilthead sea bream <i>Sparus aurata</i> L. in a southern Irish Sea coastal habitat	G. Craig, D. Paynter, I. Coscia, S. Mariani	<i>Journal of Fish Biology</i>	72(1)	287-291
2008	Relationship between body shape and trophic niche segregation in two closely related sympatric fishes	T. Russo, D. Pulcini, A. O' Leary, S. Cataudella and S. Mariani	<i>Journal of Fish Biology</i>	73	809-828
2009	Intraspecific variation among isolates of the entomopathogenic nematode <i>Steinernema feltiae</i> from Bull Island, Ireland	Alec ROLSTON, Conor MEADE, Stephen BOYLE, Thomas KAKOULI-DUARTE and Martin DOWNES	<i>Nematology</i>	11(3)	439-451
2009	An in-situ study using caged <i>Nucella lapillus</i> and <i>Crassostrea gigas</i>	Giltrap, M., Macken, A., Davoren, M., Foley, B., McGovern, E., Strand,	<i>Environmental Toxicology and Chemistry</i>	28	1671-1678

		J., Minchin, D., McHugh, B.			
2010	Current estimates of goose population sizes in western Europe, a gap analysis and an assessment of trends	Anthony Fox et al	<i>Ornis Svecica - Expanding Goose Populations and their Management Proceedings of the 12th Meeting of the Goose Specialist Group 9–14 October 2009, Höllviken, Sweden</i>	120(3-4)	115-127
2011	Changes in landscape and vegetation of coastal dunes in Northwest Europe: a review	Sam Provoost, M. Laurence M. Jones, Sally E. Edmondson	<i>Journal of Coastal Conservation</i>	15	207-226
2011	Food resource use in sympatric juvenile plaice and flounder in estuarine habitats	Stefano Mariani, Ciara Boggan & David Balata	<i>Marine Ecology</i>	32 (suppl. 1)	96-101
2011	A three-dimensional hydro-environmental model of Dublin Bay	Bedri, Zeinab; Bruen, Michael; Dowley, Aodh	<i>Environmental Modelling and Assessment</i>	16(4)	369-384
2012	Life at the extreme: lessons from the genome	Dong-Ha Oh, Maheshi Dassanayake, Hans J Bohnert and John M Cheeseman	<i>Genome Biology</i>	13	241
2012	“Right” or “Wrong”? Insights into the Ecology of Sidedness in European Flounder, <i>Platichthys flesus</i>	Tommaso Russo, Domitilla Pulcini, Daniele Costantini, Debbi Pedreschi, Elisa Palamara, Clara Boglione, Stefano Cataudella, Michele Scardi, and Stefano Mariani	<i>Journal of Morphology</i>	273	33-346
2013	Genetic transformation of western clover ( <i>Trifolium occidentale</i> D. E. Coombe.) as a model for functional genomics and transgene introgression in clonal pasture legume species	Kim A Richardson, Dorothy A Maher, Chris S Jones and Greg Bryan	<i>Plant Methods</i>	9:25	1-11
2013	Pollination activity of <i>Zygaena filipendulae</i> (LINNAEUS, 1758) (Lepidoptera: Zygaenidae) in <i>Anacamptis pyramidalis</i> orchid on the North Bull Island (Ireland)	Elisa VALLIUS, Ulf BUCHSBAUM & Vladimir NAZAROV	Entomofauna (Germany)	34(27)	357-368

<b>2013</b>	Factors affecting trematode parasite burdens in mussels ( <i>Mytilus</i> spp.) from the north Atlantic ocean across to the north Pacific	James G Wilson et al.	Estuarine, Coastal and Shelf Science	132	87-93
<b>2013</b>	Assessment of biomarkers in <i>Mytilus edulis</i> to determine Good Environmental Status for implementation of MSFD in Ireland	Giltrap, M., Ronan, J., Hardenberg, S., Parkes, G., McHugh, B., McGovern, E. Wilson, J.G.	Marine Pollution Bulletin	In press	
<b>2014</b>	Abundance, biomass and productivity of invertebrate hyperbenthos in a temperate saltmarsh creek system	Wilson, James;Koutsagiannopolou, Violetta	Hydrobiologia	728(1)	141-151

**Publications featuring descriptions and studies of the Biosphere**

- Integrated Coastal Mapping of Dublin Bay Geomorphology based on geophysical data, satellite inferred bathymetry and 3D integration with INFOMAR datasets. 2012. Gibson, P. J., Caloca Casado, S and Jiménez-Martín, D. Report: INF-11-07-GIB
- Rare and Threatened Bryophytes of Ireland. 2012. Neil Lockhart, Nick Hodgetts, and David Holyoak. NMNI Publishing.
- Ireland's Wild Orchids. Brendan Sayers and Susan Sex. 2009. Published by the authors.
- Wetlands of Ireland – Distribution, ecology, uses and economic value. 2003. Marinus Otte (Ed.). University College Dublin Press.
- Wild Dublin. 2008. Éanna Ní Lamha. The O'Brien Press. pp. 165-173.
- Wildflowers of North Bull Island. 1999. Dorothy Forde. Dublin City Council.

**Views of researchers using the Biosphere**

It's a lovely spot and doing some research there really kick-started my career in Ireland - Dr. Stefano Mariani, University of Salford

I've been using Bull Island for a fair number of years now ... since the 1990's...I certainly value having this site close at hand, it provides a very useful site for a variety of teaching and research values. – Dr. Steve Waldren, Trinity College Dublin

I've been using Bull Island as a 'learning laboratory' for several years. In the past, we have taken MSc students into the field to do some sampling and to meet with Pat Corrigan for a talk on management challenges. Each year I take an undergraduate fieldtrip to Bull Island to sample the saltmarshes / intertidal zone as part of a module 'Reconstructing Environmental Change'. - Dr. Robin Edwards, Earth Science Institute

Student groups in years 1, 2, 3 and 4 have met with Pat Corrigan, attending lectures at the Education Centre or talking about aspects of ecology and management relevant to dissertation research. – Dr. Ken Boyle, Dublin Institute of Technology