

Talley Research Group Visit - June - July 2008

Gary Nijak and Joe Geary from the **Talley Research Group** (TRG), based in the University of Notre Dame, Indiana, recently spent some time in the NCSR working with members of Fiona Regan's Research Group. Gary and Joe's visit was coordinated by Antóin Lawlor of the NCSR, and is a result of the recently agreed research collaboration agreement between DCU and the University of Notre Dame.

Gary and Joe's work within the Talley Research Group primarily involves the development of a biosensor, capable of the identification and partial quantification of faecal contamination indicators to include *Escherichia Coli*, *Total Coliforms* and/or *enterococci* in marine and freshwater environments. The biosensor is capable of continuous, long-term *in situ* monitoring of faecal matter indicators in recreational and source water, and may be wirelessly connected to a central monitoring station with the capability of sending a signal alerting to the presence or absence of faecal matter.

In Ireland, there are currently 131 designated bathing areas, of which 122 are seawater bathing areas and 9 are freshwater bathing areas. These bathing areas are monitored on a fortnightly basis during the bathing season to check the quality of the water by the competent Local Authority. The capability of the TRG biosensor when deployed to continuously sample, identify and partially quantify faecal contamination indicators as required under the new Bathing Water Directive (2006/7/EC) will enable the provision of more up-to-date information ensuring better communication with the general public.

When persistent fluctuations in contaminants occur it is likely only to be detected through continuous measurement, as traditional spot/grab sampling will only provide a reasonable estimate of the true maximum and/or mean concentration of faecal matter in a water body. The TRG biosensor will also aid in the cutting of monitoring costs and the provision of better spatial and temporal coverage, representing long-term trends in fluctuations of faecal contaminants.



Joe Geary (TRG), George Sharpson (PEHO Fingal Co. Co.) & Gary Nijak, (TRG)

During their stay, the group conducted the biosensors first marine field trial at Balbriggan Harbour, north Co. Dublin, which historically has been an area associated with high *E. coli* levels over the bathing season. Samples were taken twice daily with results available in roughly three hours, an improvement on the typical two day turn around of fortnightly samples taken by the Local Authority. Further work will move away from the detection of *E. coli* to the more widely used *enterococci* for marine waters.

The field deployment could not have occurred without the help and assistance of personnel from Fingal County Council. In particular, George Sharpson the Principal Environmental Health Officer for Fingal County Council, who organised the setup of a secure sampling station at Balbriggan for the duration of the trial. The involvement of Fingal County Council was greatly appreciated, and it is hoped further field trials will occur when Gary returns next summer with his supervisor Prof. Jeff Talley who will be here as a visiting professor.