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A NEW CO-ORDINATE SYSTEM FOR IRELAND

PRELIMINARY USER INFORMATION

This short paper provides some preliminary information on the proposed change of mapping grid that will be implemented by Ordnance Survey Ireland (OS*i*) and provided, subject to user consultation and demand by Ordnance Survey of Northern Ireland (OSNI), in the summer of 2001. Further information, including detailed technical data, will be made available over the coming months.

Why is a change necessary?

A co-ordinate system is vital for positioning – the act of determining and stating where something is. The use of a common coordinate system for all positioning is crucial if information collected from different sources and at different times is to 'fit together' properly.

The current co-ordinate system in Ireland – the Irish Grid which is used on all OSNI and OS*i* maps and data – has been in use since 1975 but is actually based on survey work going back over 170 years. Over the last 10 years, the use of new positioning methods, in particular the Global Positioning System (GPS) has revolutionised positioning. GPS uses a co-ordinate reference system developed by the US military for global purposes. As the use of GPS increases, it is important that users can convert between GPS co-ordinates and those in use on the users' mapping. To date, this has been achieved through the use of a transformation formula. However, to preserve accuracy and integrity, it is preferable to avoid this transformation and to use a consistent system for mapping and for GPS. This is the stage now reached in Ireland, and is why a change will take place and will be offered to mapping users.

Why can't we simply use the GPS reference system?

GPS positioning uses a co-ordinate system called World Geographic System 1984 (WGS84). This provides the three-dimensional coordinates of a point relative to the centre of the earth, related to the point's latitude and longitude. Because WGS84 is a global system, however, it is not defined as precisely as is possible on a national or regional basis. Co-operation between national mapping agencies throughout Europe has therefore created a European definition – the European Terrestrial Reference Frame 1989 (ETRF89) – for the GPS coordinate system. This work – in the late 1980s and through the 1990s, *including the IRENET observing campaign in 1995* – also determined the coordinates of Irish triangulation pillars and other control in ETRF89, hence the transformation between Irish Grid and ETRF89.

It is not possible, however, to quote eastings and northings (grid co-ordinates) in ETRF89 (or, indeed, in WGS84). As a map is a two-dimensional depiction of a three-dimensional earth, a projection is needed before a map grid can be related to ETRF89. It is this step that will be implemented and offered to mapping users in Ireland in 2001.

What will the projection consist of?

A new projection has been devised that is best suited for Ireland. It is a Transverse Mercator projection with a central meridian of 8° West and a scale factor of 0.999820 on the central meridian; it has been given the working name of Irish Transverse Mercator (ITM). Removing the technical language, this means that the general form of the projection is very similar to the existing Irish Grid – it is one which minimises the distortions due to the mapping of three dimensions into two. The new projection has allowed the best parameters to be designed for Ireland.

What will all of this mean for users?

From the summer of 2001, both OS*i* and OSNI will start making their large scale digital mapping data available in ITM. This will be in addition to a continuing ability to provide data in Irish Grid, so ensuring that existing users can continue as they are. It is anticipated, over time, that there will be an increasing call for ITM data. The design of ITM has included a false origin which is positioned a significant distance from the existing Irish Grid's false origin. This will mean that there will be no confusion over which co-ordinate system a co-ordinate is being quoted in – a co-ordinate for any point on the landmass will be unique to one co-ordinate system or the other. The change will therefore mean that those users who wish to continue working in the existing Irish Grid will be able to, but that users wishing to use mapping compatible with GPS will also be able to.

What about other coordinate systems?

Users wishing to receive mapping in the Universal Transverse Mercator (UTM) co-ordinate system will also be supported under the proposed arrangements – this is likely to be users whose work has to be tied to global reference frameworks.

What happens next?

OSNI and OS*i* will issue a technical consultation paper in the next few months, providing further technical information on the proposed changes, and a proposed timetable for change. A series of seminars in 2001 will be used to consult further on the issues before a final plan is put in place. The seminars will also allow discussion of a number of other positioning issues, including the implementation of an active GPS (permanently recording) network throughout Ireland. They will also allow discussion on the most appropriate co-ordinate system to use for small scale paper mapping, and product design issues which will make clear which co-ordinate system is in use in any product.

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