SOCIETY OF CHARTERED SURVEYORS IRELAND

Geomatics client guides

OSGM15 – Geoid Changes for Ireland

Avoid the potential dangers of height differences between geoid models

RICS®

OSGM15 – Geoid Changes for Ireland

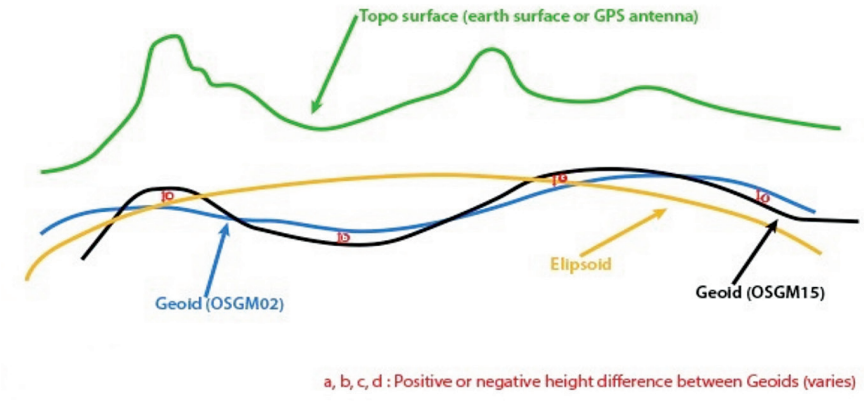
Are you a surveyor, architect, engineer, developer or builder?



If you use topographic survey information or mapping, it is essential to understand the effects the change to the new, improved geoid model covering Ireland and UK can have on your projects.

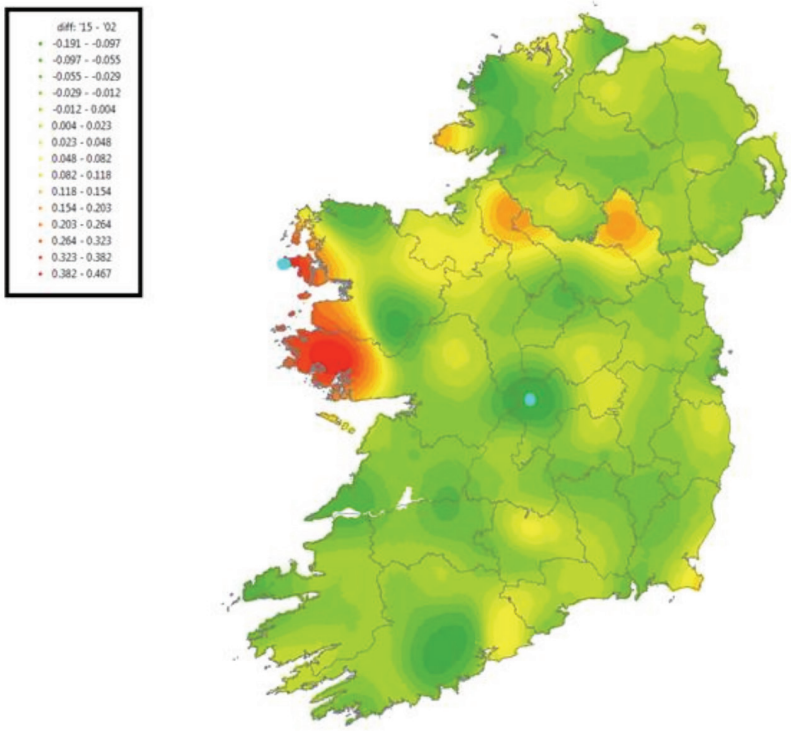
The Ordnance Surveys Ireland (OSI), together with Ordnance Surveys of Great Britain (OSGB) and Land and Property Services (LPS, formally Ordnance Surveys Northern Ireland) worked together to improve the existing OSGM02® geoid model covering Ireland and the United Kingdom. The result was the new OSGM15™ model.

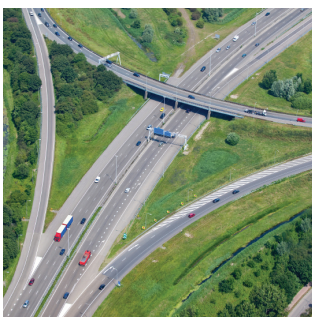
As mentioned in the paper published by all 3 mapping agencies (http://www.osi.ie/wp-content/uploads/2016/08/OSGM15-and-OSTN15-Updated-transformations-for-UK-and-Ireland.pdf), “OSGM15 is not a true geoid model, but is rather a ‘height corrector surface’ since the gravimetric geoid surface has been fitted to the local sea level based datums”, which in Ireland case are Malin Head (for the Republic of Ireland) and Belfast (for Northern Ireland).



What does this really mean to you?

There are differences between OSGM02 and OSGM15 in levels for the Malin Head datum, and you must be aware of them. They range between -191mm (somewhere in Offaly, close to Galway border) and +465mm (West of Achill Island, Mayo). Higher positive values can also be seen in Galway West, due to legacy mapping data. As you can see from the below, those differences in levels varies, depending on where in Ireland you are. (values calculated using Grid InQuest for OSGM02 values and Grid InQuest 2 for OSGM15 values).





Why the differences

The differences between OSGM02 and OSGM15 on the Malin Head datum can be largely attributed to improvements of the gravity data (additional gravity data from GRACE – Gravity Recovery And Climate Experiment – satellite mission was available to be incorporated into the gravimetric model) and fitting of the OSGM geoid model. In addition, much of the available orthometric height data in the extreme west of Ireland is of a lower standard, having been derived from a transformation from Poolbeg datum to Malin head datum rather than levelling. These effects combine to produce significant deviations between current and previous models.

The good thing is that, moving forward, all heights will be much closer to the Malin Head Mean Sea Level, as OSGM15 now achieves a smoother and consistent fit along the whole island of Ireland.

The bad thing is that all local projects and designs will have to have a datum shift (which varies, depending on where in Ireland the site is), to ensure consistency in the future.

The table below shows some examples of height differences between the 2 models.

	E	N	H(OSGM02)	H(OSGM15)	Diff (mm)
Dublin Airport	716482.764	743426.851	67.245	67.221	24
Cork	564152.173	569821.874	22.487	22.364	123
Limerick	557294.407	657036.324	4.388	4.319	69
Galway	530049.741	725130.480	3.639	3.624	15
Waterford	659431.126	610763.629	7.549	7.539	10
Drogheda	706503.074	776379.631	33.701	33.698	3
West of Ireland	510289.651	736042.520	156.745	156.925	-180
Cherrywood	723731.312	723275.019	51.399	51.405	-6
Navan	687150.239	767851.585	34.040	34.020	20
Ballymore Eustace	693131.565	710081.901	153.258	153.243	15
Donegal	594323.580	878950.792	20.394	20.317	77
Virginia, Cavan	660066.560	787561.126	91.218	91.204	14
Athlone	600731.805	740884.003	44.084	44.038	46
Portlaoise	648069.164	698792.032	96.528	96.544	-16
Carlow	672034.310	676948.210	51.031	51.006	25
Dublin Port	718223.362	734593.834	3.873	3.847	26
Rosslare	713687.453	612156.298	24.064	24.156 -	92

Moving forward

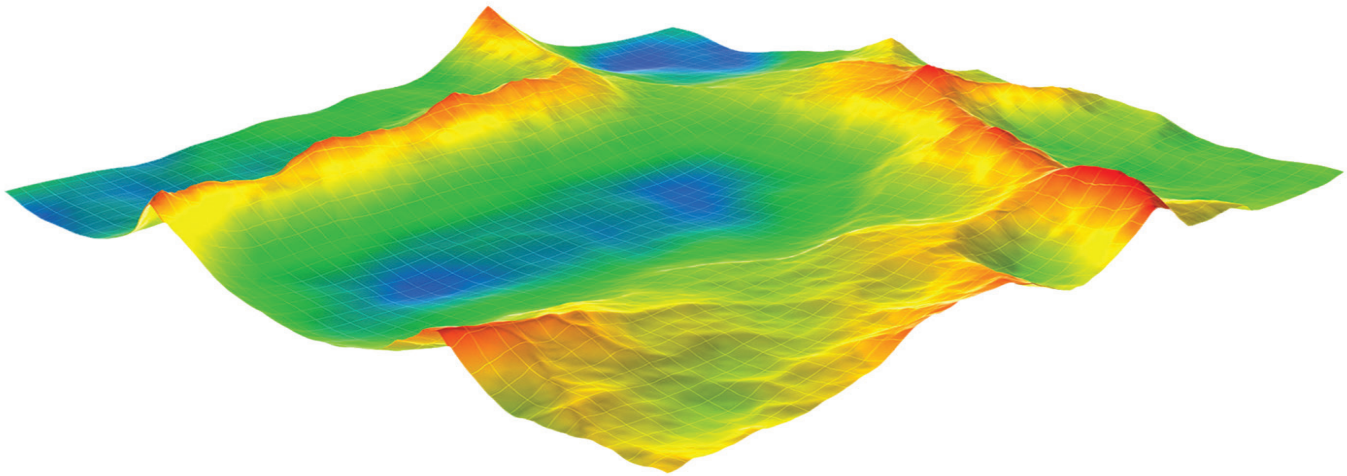
The Ordnance Surveys Ireland (OSI), together with Ordnance Surveys of Great Britain (OSGB) and Land and Property Services (LPS, formally Ordnance Surveys Northern Ireland) announced that from 26th August 2016, the geoid model on which onshore mapping in Ireland is based, has changed from OSGM02 to OSGM15, this may result in some change to GPS ellipsoid heights in some areas. There is no change to Malin Head datum.

Moving forward, conversions from ETRS89 to ITM grid (Malin Head datum) should be done using GridInQuest 2 software, as recommended by all three mapping agencies. The survey equipment manufacturers operating in Ireland have created new geoid files, which should be already uploaded on all GNSS receivers in use after that date.

Whatever you do, make sure the Malin Head levels from projects prior to 26th August 2016 (using OSGM02) are not mixed with levels surveyed after the date (which will be using OSGM15).

It's important to get your levels right. If in doubt ask a Chartered Geomatic Surveyor. Ordnance Survey Ireland and Geomatics World published more info on the new geoid model. They can be found at: http://www.osi.ie/wp-content/uploads/2016/08/OSGM15-and-OSTN15-Updated-transformations-for-UK-and-Ireland.pdf and http://www.pvpubs.com/digitaledition/GeomaticsWorld/GW201607/HTML/files/assets/basic-html/page18.html

For impartial expert advice contact a geomatics chartered surveyor in your area by visiting http://www.scsi.ie/surveyors/surveyors_search



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Working in partnership with RICS, the pre-eminent Chartered professional body for the construction, land and property sectors around the world, the Society and RICS act in the public interest: setting and maintaining the highest standards of competence and integrity among the profession; and providing impartial, authoritative advice on key issues for business, society and governments worldwide.

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