

# Canterbury Earthquake Survey Mark Movements

Title	Canterbury Earthquake Survey Mark Movements
Creator	LINZ - Land Information New Zealand
Date	2016-08-24
Description	<p>This layer details the movement of survey marks due to the Canterbury Earthquake Sequence (CES). The movements include the impact of 5 major earthquakes on 4 September 2010, 22 February 2011, 13 June 2011, 23 December 2011 and 14 February 2016. Note that these movements apply only at the survey mark. Nearby land may have moved differently, especially in areas impacted by substantial shallow ground movement. For further earthquake information, see <b>[the Canterbury earthquake information]</b> (<a href="http://www.linz.govt.nz/land/surveying/canterbury-earthquakes">http://www.linz.govt.nz/land/surveying/canterbury-earthquakes</a>) <b>]</b> on the LINZ website. <b>Scope</b> Movements do not include the regular tectonic movement (not related to earthquakes) of approximately 5cm per year. As well as Christchurch, the data covers Lyttelton, Spencerville, Kaiapoi, Pines Beach, Woodend, Pegasus and Waikuku Beach. <b>Mark Movement Calculations</b> Observed mark movements have been calculated from geodetic and cadastral survey data collected at the same physical survey mark before and after the earthquakes. Various filters have been applied to ensure as far as practicable that the movements reflect real-world earthquake-related movements of marks. For example, only non-boundary marks that have been directly measured (rather than adopted) are included. Modelled mark movements have been calculated using models of the tectonic-scale movements resulting from each earthquake, supplied by GNS Science, supplemented with more detailed modelling carried out by LINZ. These models typically represent deep-seated movement only. They do not include shallow movement, such as that resulting from liquefaction. Therefore the difference between the post-earthquake observed and post-earthquake modelled position generally represents shallow ground movement. The difference between the post-earthquake modelled and pre-earthquake observed position generally represents deep-seated movement. The difference between the post-earthquake observed position and pre-earthquake observed position represents total movement due to the earthquakes. <b>Accuracy</b> The uncertainty of the coordinate changes is 0.1m at a 95% confidence interval. <b>Layer Attributes</b> - nod_id_post_eq: Landonline node id for the latest post-earthquake node (mark) - code_post_eq: Geodetic code for the latest post-earthquake node - name_post_eq: Mark name for the latest post-earthquake node - nod_id_pre_eq: Landonline node id for the pre-earthquake node (mark) - code_pre_eq: Geodetic code for the pre-earthquake node - name_pre_eq: Mark name for the pre-earthquake node - de_mod_obs: East change from modelled post-earthquake to observed post-earthquake position - dn_mod_obs: North change from modelled post-earthquake to observed post-earthquake position - hz_mod_obs: Horizontal change from modelled post-earthquake to observed post-earthquake position - bg_mod_obs: Bearing from modelled post-earthquake to observed post-earthquake position - de_pre_mod: East change from observed pre-earthquake to modelled post-earthquake position - dn_pre_mod: North change from observed pre-earthquake to modelled post-earthquake position - hz_pre_mod: Horizontal change from observed pre-earthquake to modelled post-earthquake position - bg_pre_mod: Bearing from observed pre-earthquake to modelled post-earthquake position - de_pre_obs: East change from observed pre-earthquake to observed post-earthquake position - dn_pre_obs: North change from observed pre-earthquake to observed post-earthquake position - hz_pre_obs: Horizontal change from observed pre-earthquake to observed post-earthquake position - bg_pre_obs: Bearing from observed pre-earthquake to observed post-earthquake position</p>
Source	Derived from geodetic and cadastral surveys.
Coverage	-43.611274233 172.501128867 -43.280885883 172.776353636
Identifier	<a href="https://data.linz.govt.nz/layer/53455-canterbury-earthquake-survey-mark-movements/">https://data.linz.govt.nz/layer/53455-canterbury-earthquake-survey-mark-movements/</a>
Type	textTable
Language	eng
Subject	New Zealand
Subject	LAND-Geodesy
Subject	HAZARDS-Earthquake
Subject	LAND-Cadastre

Subject  
| location