

Title of dataset Variables	<b>Rainfall, 1960–2016</b> <ul style="list-style-type: none"> <li>• Date</li> <li>• Rainfall_mm</li> <li>• site</li> </ul>
Title of dataset Variables	<b>Winter rainfall trends, 1960–2016</b> <ul style="list-style-type: none"> <li>• name</li> <li>• start</li> <li>• end</li> <li>• intercept</li> <li>• slope</li> <li>• p_value</li> <li>• trend</li> </ul>
Title of dataset Variables	<b>Summer rainfall trends, 1960/1–2015/6</b> <ul style="list-style-type: none"> <li>• name</li> <li>• start</li> <li>• end</li> <li>• intercept</li> <li>• slope</li> <li>• p_value</li> <li>• trend</li> </ul>
Title of dataset Variables	<b>Autumn rainfall trends, 1960–2016</b> <ul style="list-style-type: none"> <li>• name</li> <li>• start</li> <li>• end</li> <li>• intercept</li> <li>• slope</li> <li>• p_value</li> <li>• trend</li> </ul>
Title of dataset Variables	<b>Spring rainfall trends, 1960–2016</b> <ul style="list-style-type: none"> <li>• name</li> <li>• start</li> <li>• end</li> <li>• intercept</li> <li>• slope</li> <li>• p_value</li> <li>• trend</li> </ul>
Title of dataset Variables	<b>Annual rainfall trends, 1961–2016</b> <ul style="list-style-type: none"> <li>• name</li> <li>• start</li> </ul>

	<ul style="list-style-type: none"> <li>• end</li> <li>• intercept</li> <li>• slope</li> <li>• p_value</li> <li>• trend</li> </ul>
Title of dataset	<b>Seasonal rainfall, summer, 1981–2010</b>
Variables	<ul style="list-style-type: none"> <li>• Average (normal) summer rainfall (mm)</li> </ul>
Projection	GD_1949_New_Zealand_Map_Grid
Title of dataset	<b>Seasonal rainfall, winter, 1981–2010</b>
Variables	<ul style="list-style-type: none"> <li>• Average (normal) winter rainfall (mm)</li> </ul>
Projection	GD_1949_New_Zealand_Map_Grid
Title of dataset	<b>Seasonal rainfall, autumn, 1981–2010</b>
Variables	<ul style="list-style-type: none"> <li>• Average (normal) autumn rainfall (mm)</li> </ul>
Projection	GD_1949_New_Zealand_Map_Grid
Title of dataset	<b>Seasonal rainfall, spring, 1981–2010</b>
Variables	<ul style="list-style-type: none"> <li>• Average (normal) spring rainfall (mm)</li> </ul>
Projection	GD_1949_New_Zealand_Map_Grid
Title of dataset	<b>Total rainfall, 2014</b>
Variables	<ul style="list-style-type: none"> <li>• Average annual rainfall (mm)</li> </ul>
Projection	GD_1949_New_Zealand_Map_Grid
Title of dataset	<b>Total rainfall, 2015</b>
Variables	<ul style="list-style-type: none"> <li>• Average annual rainfall (mm)</li> </ul>
Projection	GD_1949_New_Zealand_Map_Grid
Title of dataset	<b>Total rainfall, 2016</b>
Variables	<ul style="list-style-type: none"> <li>• Average annual rainfall (mm)</li> </ul>
Projection	GD_1949_New_Zealand_Map_Grid
Title of dataset	<b>Average annual rainfall, 1972–2016</b>
Variables	<ul style="list-style-type: none"> <li>• Average annual rainfall (mm)</li> </ul>
Projection	GD_1949_New_Zealand_Map_Grid
Environmental reporting topic	Climate
Environmental reporting category	National Indicator

Environmental report	<a href="#">Our atmosphere and climate 2017</a>
Relevant measure on the <a href="#">Environmental Indicators, Te taiao Aotearoa</a> website	<a href="#">Rainfall</a>
Methodology (collection & analyses)	<p>Daily (9am – 9am) rainfall data were extracted from CLIDB from the “RAIN” table for all the 30 selected representative climate stations, for each station’s period of record.</p> <p>NIWA interpolated annual rainfall totals, measured at climate station locations across the country, to create a regular 500m resolution grid of average annual (from 1972 to 2016) rainfall and average seasonal rainfall for each year from 1981 to 2010. Missing data were infilled using Virtual Climate Station Network data (NIWA, nd).</p> <p>For more information on methodology please see Macara (2017), Macara and Tait (2015), and Tait et al (2014).</p> <p>Trend direction was assessed using the Theil-Sen estimator and the Two One-Sided Test (TOST) for equivalence at the 95% confidence level.</p>
Limitations to data & analysis	Although the interpolations cover the entire land area of New Zealand, accuracy is lowest where station density is low and terrain is complex.
Changes to time series	The recent closure of the primary stations originally used for temperature and rainfall data in Dannevirke and Napier required the selection of a new primary station at each location. Regression analyses were performed to assess compatability with earlier data. The starting year of observations may vary from 1960 for some sites.
References	<p>Macara, G (2017) <a href="#">Updated datasets for atmosphere and climate domain report</a>. Client report no. 2017054WN. Prepared for the Ministry for the Environment, 11p. Available from <a href="http://www.mfe.govt.nz">www.mfe.govt.nz</a></p> <p>Macara, G, &amp; Tait, A (2015). <a href="#">Infilling of missing climate data for the 2015 Environmental Synthesis Report: Temperature, Rainfall and Wind</a>. Client report no. WLG2015-33. Prepared for the Ministry for the Environment, 37p. Available from <a href="https://data.mfe.govt.nz/">https://data.mfe.govt.nz/</a></p> <p>NIWA (nd). <a href="#">Virtual climate station data and products</a>. Retrieved 29 May 2017 from <a href="http://www.niwa.co.nz">www.niwa.co.nz</a>.</p> <p>Tait, A, Henderson, R, Turner, R, &amp; Zheng, X (2006). Thin plate smoothing spline interpolation of daily rainfall for New Zealand using a climatological rainfall surface. <i>International Journal of Climatology</i>, 26(May 2006), 2097–2115.</p> <p>Tait, A, Macara, G, &amp; Paul, V (2014) <a href="#">Preparation of climate datasets for the 2015 Environmental Synthesis Report: temperature, rainfall, wind, sunshine and soil moisture</a>. Client report no. WLG2014-91. Prepared for</p>

	<p>the Ministry for the Environment, 27p. Available from <a href="https://data.mfe.govt.nz/">https://data.mfe.govt.nz/</a></p> <p>Tait, A, Sturman, J, &amp; Clark, M (2012). An assessment of the accuracy of interpolated daily rainfall for New Zealand. <i>Journal of Hydrology New Zealand</i>, 51(1), 25–44.</p> <p>Tait, A &amp; Turner, R (2005). Generating multiyear gridded daily rainfall over New Zealand. <i>Journal of Applied Meteorology</i>, 44(9), 1315–1323. <a href="http://doi.org/10.1175/JAM2279.1">http://doi.org/10.1175/JAM2279.1</a>.</p>
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