Summary of Seasonal Normal Review Investigations

DESC – 31st March 2009

Introduction to the Seasonal Normal Review

- The relationship between weather and NDM demand is key to a number of critical processes within gas industry
- The 'weather value' in these processes is represented by the "Composite Weather Variable" (CWV)
- Section H of UNC provides broad guidelines on the approach to take in formulation of a CWV
- Section H requires Transporters to carry out a review every 5 years
- The review should incorporate the following 3 areas:
  - Review Composite Weather Variable (CWV) methodology
  - Determine period to be used for defining parameters in CWV formula
  - Determine a "Seasonal Normal value" of the Composite Weather Variable for the next 5 eligible gas years

Background

- xoserve responsible for co-ordinating seasonal normal review and supporting industry in forming new basis
- Initial discussions with Transporters in Spring 2008 to explain their obligations in this process, establish contacts and seek some initial views.
- Further meetings over Summer 2008 focussed on agreeing potential options for determining a new seasonal normal basis and approach for reviewing CWV methodology.
- First area for review was the Seasonal Normal basis…..

Review of Seasonal Normal basis

What is 'Seasonal Normal'

- The Seasonal Normal value should represent a view of 'normal' weather in an LDZ for each gas day
- Current seasonal normal basis is based on 17 year average (87/88 to 03/04) and cannot be used after 30th September 2010
- Revised values required for Gas Years 2010/11 to 2014/15
- Seasonal Normal values are used in WAALP calculation to determine AQ levels
- AQs for October 2010 will start to be calculated in January 2010, hence requirement for new basis to be agreed in 2009
- Full explanation of Seasonal Normal can be found in Section H 1.5 of UNC

UNC Section H Definition

- Key paragraph from UNC Section H ……..
- 1.5.2 The “seasonal normal value” of the Composite Weather Variable for an LDZ for a Day in any year is the smoothed average of the values of the variable for that Day:
  - (a) in a significant number of consecutive previous years, upto and including a year not more than 6 years prior to the year in question, derived from weather records maintained by the Transporters, and
  - (b) where the Transporters so determine, in the current year and one or more subsequent years, derived from forecasts by the Meteorological Office or other reputable meteorological services provider – Note: this is an addition following the implementation of UNC Modification 218 on 12th January 2009

Objective of Seasonal Normal review

- Transporters objectives at the start of the analysis were to:
  - Produce a Seasonal Normal basis which is a reasonable representation of “normal” weather for an LDZ for each gas day
  - Produce a SN basis which meets Transporters and Industry aspirations
  - Select a SN basis based on statistically compelling grounds
  - Include a sufficient number of gas years that the impact of any unrepresentative years is minimised
  - Produce a single consistent basis for all LDZs

Method used in "assessing" weather for each Gas Year in each LDZ

- The method used for assessing weather conditions in each gas year has been calculated using "degree days". Reference to degree days contained throughout analysis.
- Degree Days – an explanation:
- For any gas day, in any LDZ the value of degree days is given by:
  degree days (on gas day t) = Threshold – CWV on gas day t
- Since CWV is defined in terms of their fit to aggregate NDM demand in each LDZ, the threshold value used is that applicable to aggregate NDM demand in each LDZ.
- The choice of threshold ensures that degree day values are never negative.
- The degree day thresholds applied are provided at the end of the presentation.

Initial Approach & Results

- Analysis would be done based on annual (gas year) degree days based on the current CWV definition in each LDZ
  - Period of analysis to start 1987/88 (start of current basis) upto and including 2007/08 (last complete gas year available)
- Initial discussions for new basis included range of options:
  - Roll existing 17 year period forward
  - Round number adjustments, e.g. 15yrs
  - Reduce to a shorter more warm period
- Results to be compared to current seasonal normal basis
- Outcome of initial analysis did not reveal a basis with statistically compelling results (for example RMS deviation)

Break Point Analysis

- Further analysis carried out using a statistical method used in last seasonal normal review to determine current 17 year basis
- This approach known as ‘break-point’ analysis should reveal if and where a ‘step change’ in weather experience has occurred
- Working with annual degree days for the 21 year period 1987/88 to 2007/08 split the period in to two segments of variable length (with each segment constrained to be at least 3 years: so, earliest break point end 1989/90 / start 1990/91 latest break point end 2004/05 / start 2005/06)
- For each pair of segments compute the overall RMS deviation of the constituent years over both segments
- The split at which the RMS deviation shows a minimum will potentially indicate a change of “level” - i.e. a break point
- The period after the break point could form an appropriate basis for the seasonal normal

Break point Years with Low RMS Deviation

LDZ	RMS Deviation for Breakpoint Year		
	1996	1997	2001
SC	87.4	90.7	96.1
NO	98.2	99.1	96.2
NW/WN	106.2	103.0	105.5
NE	109.3	107.5	104.0
EM	108.9	107.1	104.1
WM	122.1	119.2	122.0
WS	105.1	101.8	112.1
EA	105.3	104.0	106.7
NT	110.2	108.9	111.8
SE	106.6	105.1	107.9
SO	120.4	116.2	122.0
SW	101.9	98.8	104.0

- Shows the breakpoint years with the lowest RMS deviations.
- RMS deviation for breakpoint in 1996 is a minimum in only 1 LDZ: this is not considered any further.
- For most LDZs minimum RMS deviation is for breakpoint in 1997: this option is examined in detail.
- Also, RMS deviation for breakpoint in 2001 is a minimum in 3 LDZs.
- So, this offers an alternative view of where a break point exists
- This option is also examined in detail.

UNC Modification 218

- During analysis phase consideration was given to potential impacts of MOD218 implementation - Note: At time of analysis MOD218 was not approved
- Discussions during MOD218 process provided us with strong views of shipper aspirations in this area
- MOD218 views also provided assistance to Transporters in understanding which basis would be acceptable to all industry participants
- MOD218 provides Transporters with the option of using forecast data as well as historical data when determining a new basis
- Annual degree day averages were computed for the period 2010/11 to 2014/15 using output from the Hadley Centre (no raw data from the project was made available)
- The period(s) indicated by the break point assessment were compared against the forecast weather values for the period 2010/11 to 2014/15

Forecast weather calculations

- High level summary of calculations behind forecast weather averages (provided by Transporter)
- CWV calculated for each day in period 2010/11 to 2014/15 by using:
  - Forecast hourly temperatures from EP2 project
  - Average hourly wind speeds from EP2 project
  - Daily temperature and wind speed values computed from above data
  - Daily CWV values computed using current CWV definitions and parameters and current pseudo SNET
    - Only current pseudo-SNET can be used – derivation requires actual aggregate NDM demand (not available for future years)
- Using aggregate NDM thresholds calculate degree day values for each day

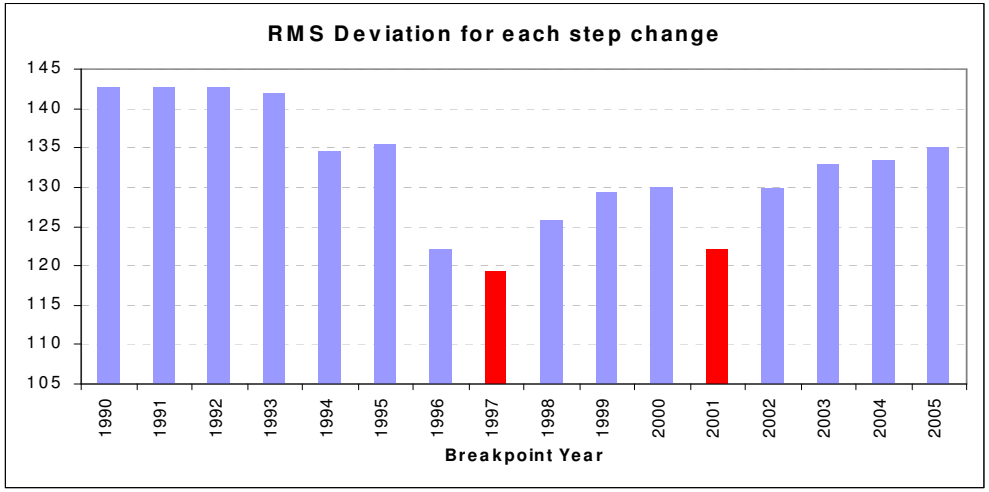
Seasonal Normal Review
Analysis of ‘break point’ years

‘Break point’ years analysis

- Break point analysis provided a statistical reason for focussing on specific periods
  - Analysis revealed 8 of 12 LDZs had an optimum break point at 1997/98 - (12 year basis)*
  - 3 of 12 LDZs had an optimum break point at 2001/02 (8 year basis)*
  - 1 of 12 LDZs had an optimum break point at 1996/97 (13 year basis)
- **Note:** * Actual number of years used for analysis was 11 years for break point at 1997/98 and 7 years for break point at 2001/02 - due to final gas year (2008/09) being incomplete at time of analysis.
- Two break point years (1997 and 2001) considered in more detail
- Results for LDZs SC, SO, WM and NO follow with accompanying explanations for each graph provided
  - Results for remaining LDZs provided as appendix at the end of presentation

Explanation of Results
Graphs Page 1 – (Top)

- Note that there are two pages of graphs for each LDZ (7 graphs in total).

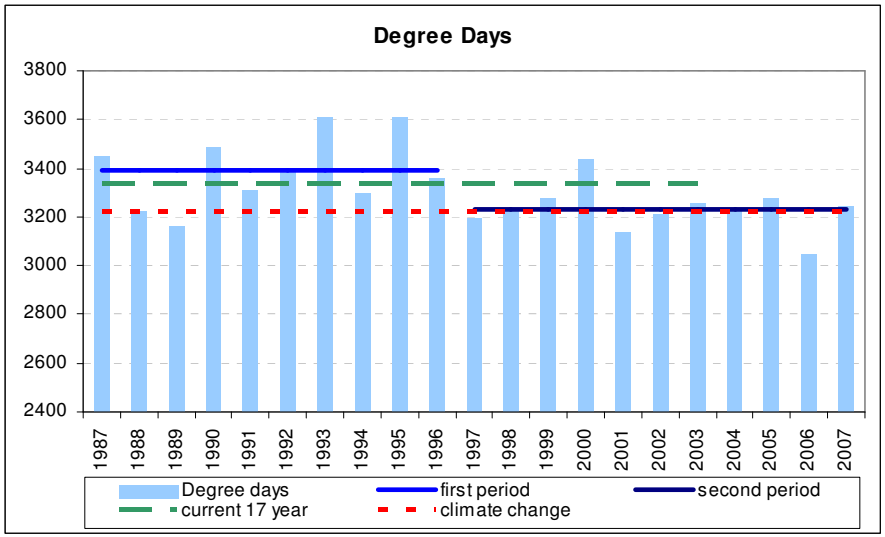


- Page 1, Top shows overall RMS deviation of annual degree days over the whole 21 years for each break point. A minimum indicates a potential step change in weather experience.
- Usually more than one potential break point year giving low (or minimum) RMS deviation.
- Such a break point could be the start year of a period on which to define a revised seasonal normal basis.
- 1997 and 2001 gas years highlighted in red

Explanation of Results
Graphs Page 1 – (Bottom Left & Right)

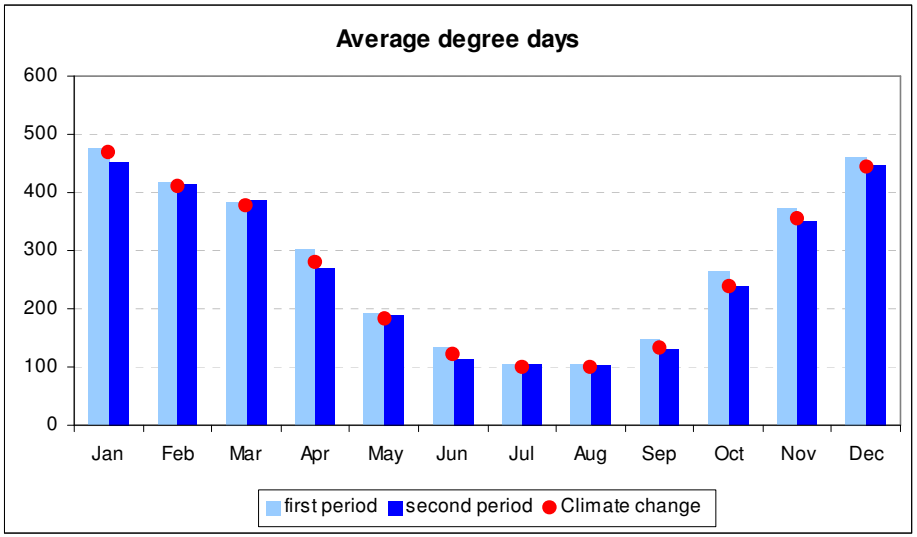
- Two break point years considered in detail:

Left: 1997 (giving the two periods 1987/88 to 1996/97 and 1997/98 to 2007/08)
and
Right: 2001 (giving the two periods 1987/88 to 2000/01 and 2001/02 to 2007/08)



- The graphs show the relevant seasonal normal levels in annual degree days.
- Each graph indicates the relative levels of: the first and second periods before and after the break point year, the current seasonal normal basis and the average level based on 2010/11 to 2014/15 forecast climatology.
- The annual degree days for each year are also shown, enabling visual comparison of the periods and their constituent years.

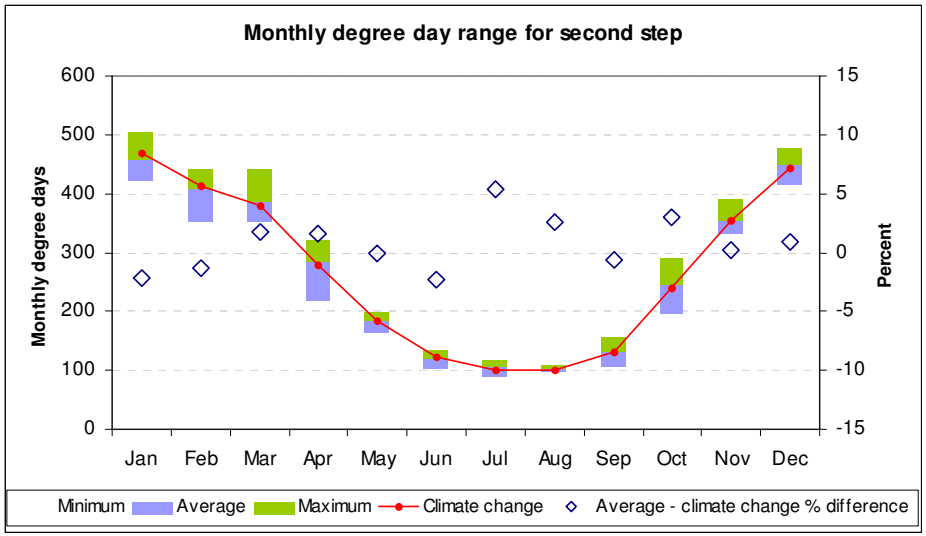
Explanation of Results
Graphs Page 2 – (Top & Bottom Left)



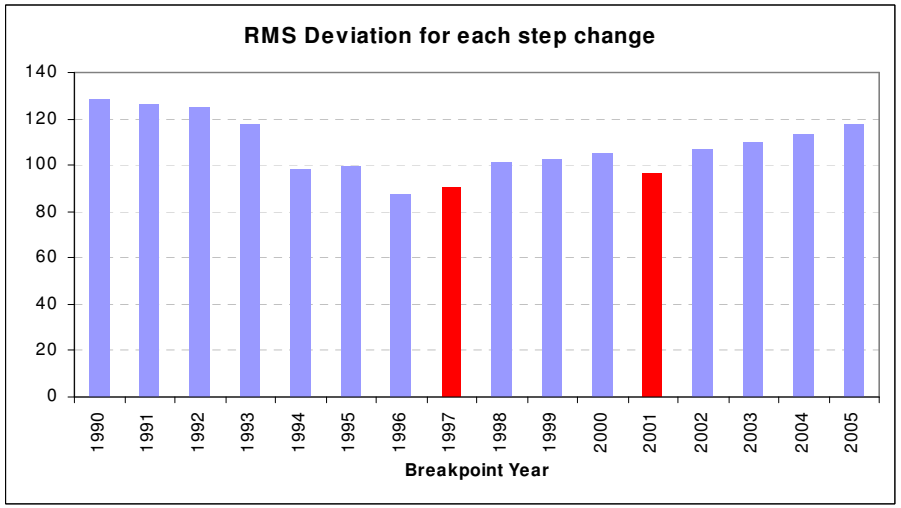
- These are for break points at 1997 (top left) and 2001 (bottom left).
- Each shows monthly average degree days: for both periods (before and after break point) and for the 2010/11 to 2014/15 forecast climatology.
- Enables comparison of these monthly profiles.

Explanation of Results
Graphs Page 2 – (Top & Bottom Right)

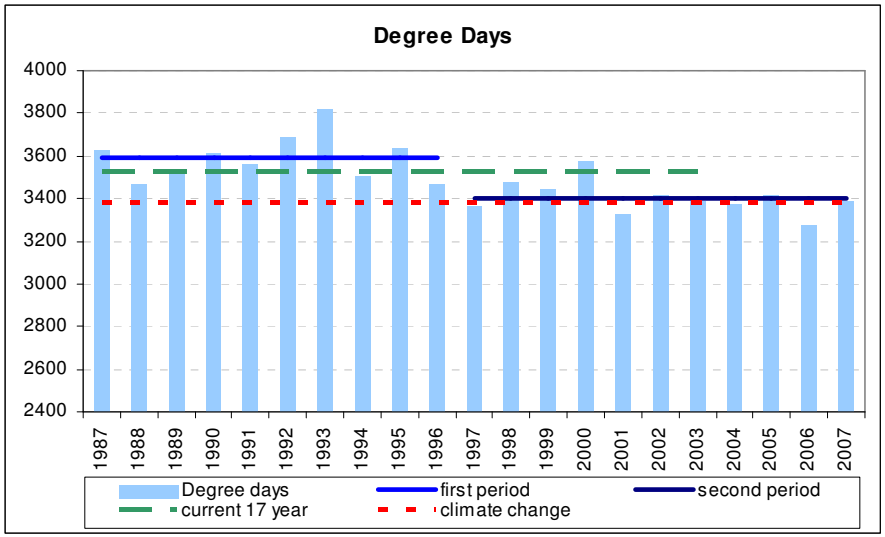
- These are for the second period: starting 1997/98 (top right) and starting 2001/02 (bottom right).
- Shows the extent to which monthly degree days from the 2010/11 to 2014/15 forecast climatology lie within the historical monthly degree day ranges, which may be a desirable attribute.
- Max. abs. % differences all year and in heating months (Oct.-Apr.) are broadly indicative of correspondence of profiles
- Note % monthly differences are naturally higher in summer months because the absolute level of degree days is small in those months.
- Ideal profile would see line 'pass through' centre of the bar each month



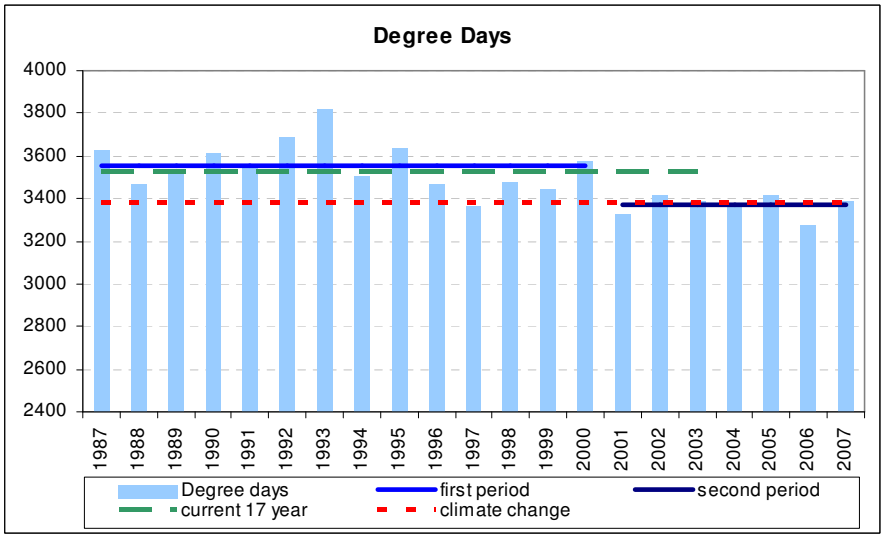
SC LDZ - Graphs Page 1



12 Year Basis

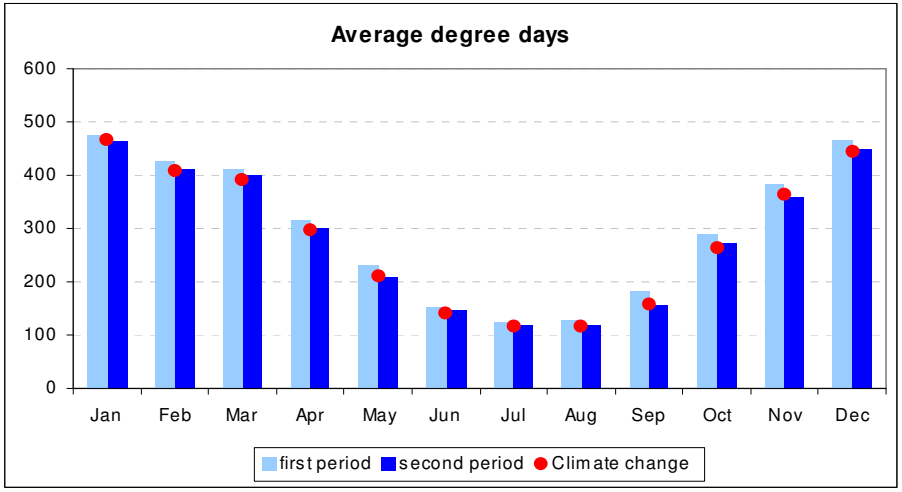


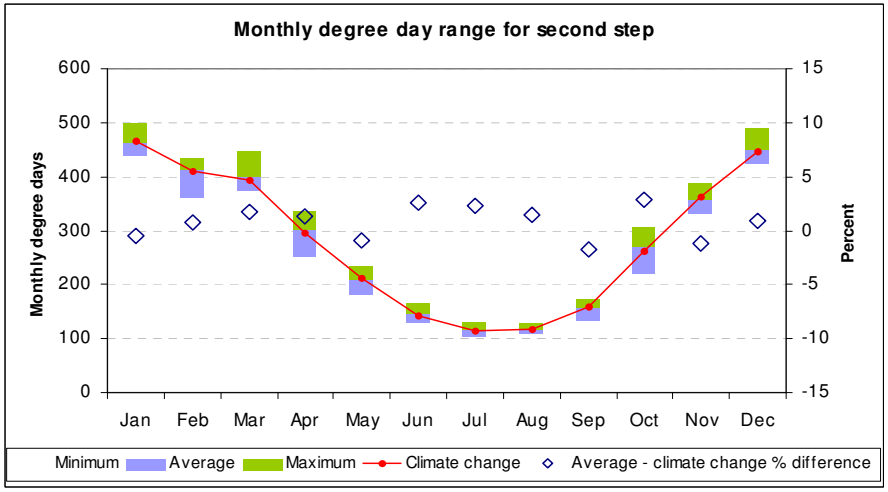
8 Year Basis



SC LDZ - Graphs Page 2

12 Year Basis





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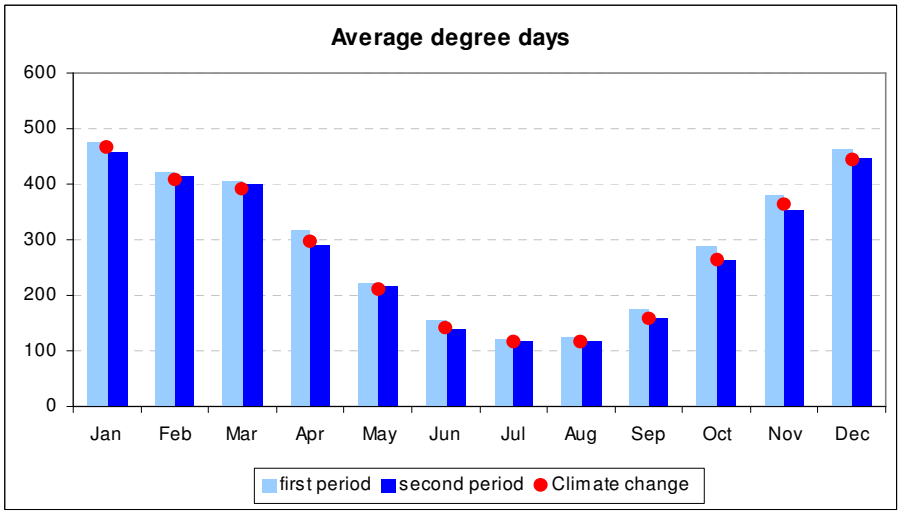
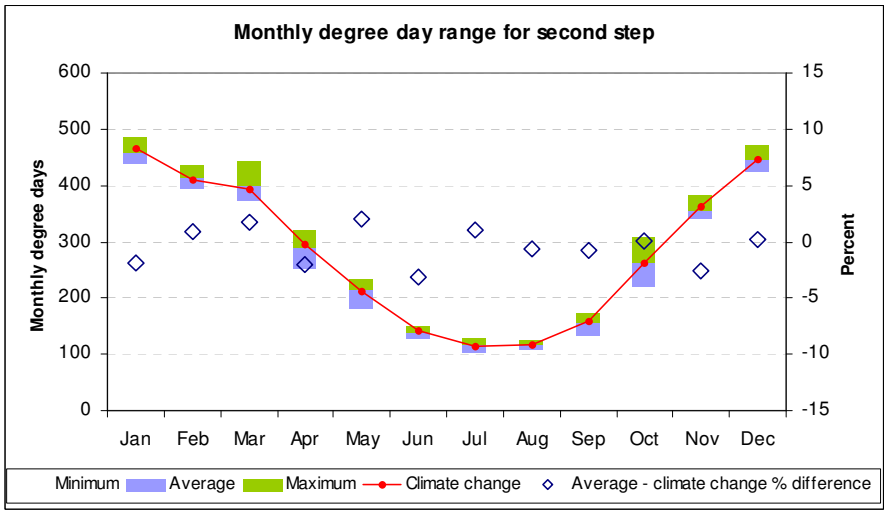
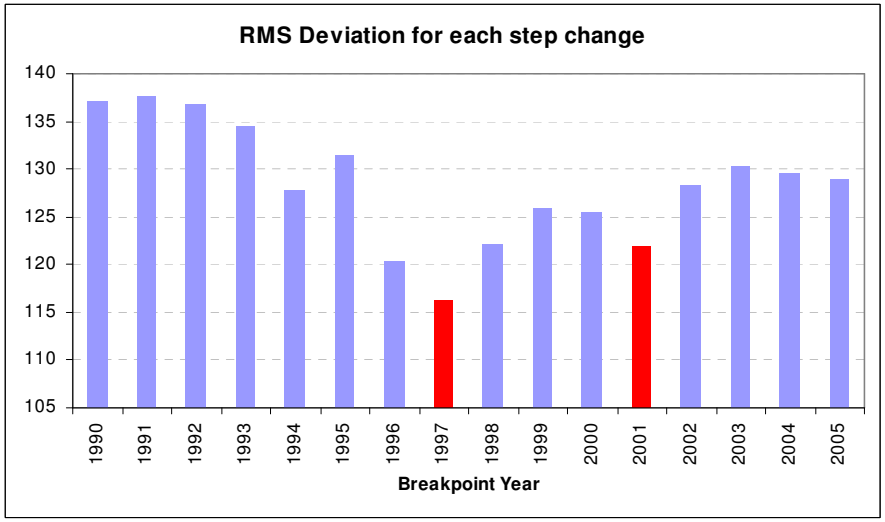




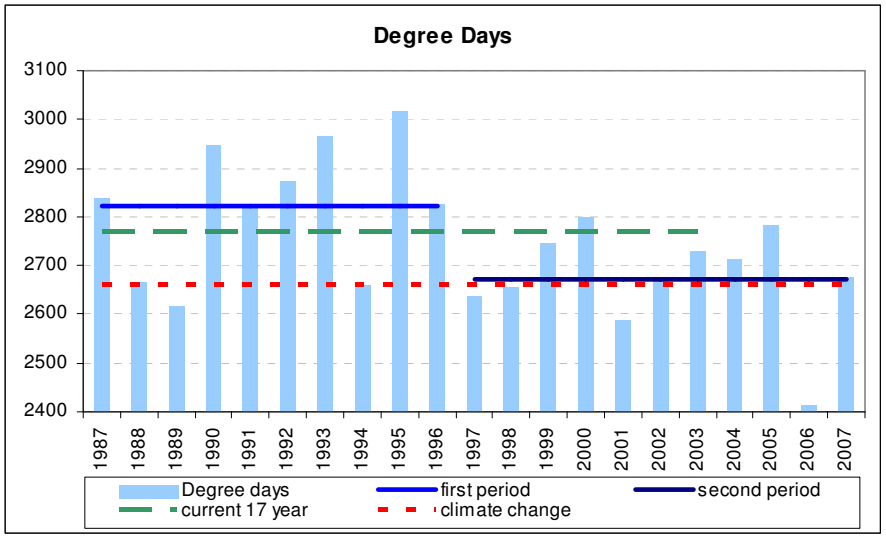
SC LDZ - Key Points from Analysis

- 12 year basis **0.65% colder** than forecast climatology for 2010/11 to 2014/15.
  (Note that period starting one year earlier is 0.8% colder than forecast climatology).
- 8 year basis **0.39% warmer** than forecast climatology for 2010/11 to 2014/15.
- For 12 year basis, the max. abs. monthly % difference is 2.9% (all year and the main heating months).
- For 8 year basis, the max. abs. monthly % difference is 3.1% (all yr.) and 2.6% (main heating months).
- The 'within year' profile is slightly better for 12 year basis.
- 8 year basis is actually warmer than forecast weather.

SO LDZ - Graphs Page 1



12 Year Basis



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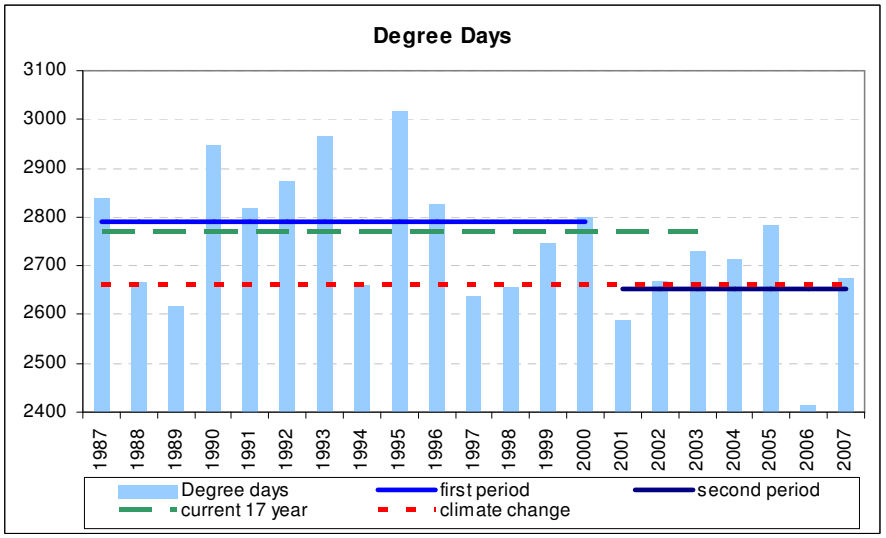
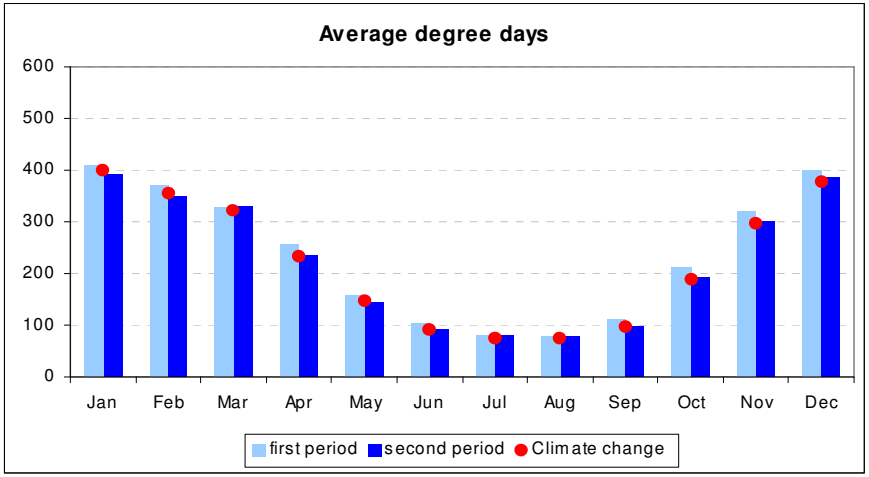
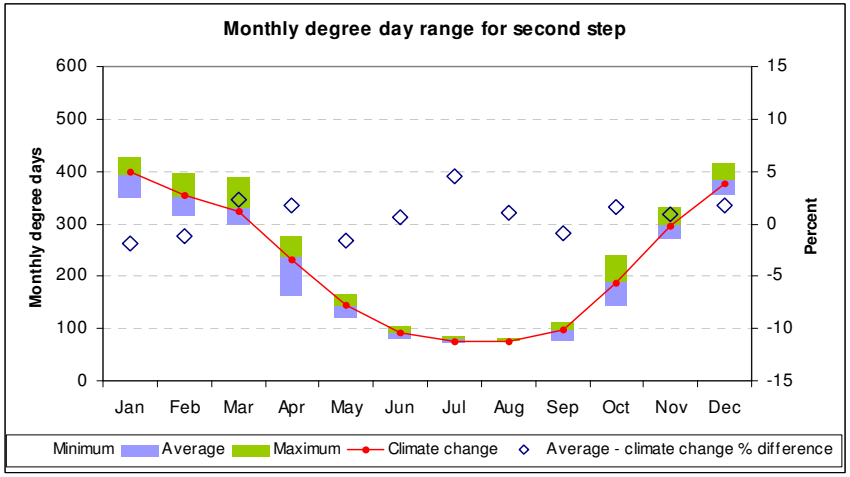


SO LDZ - Graphs Page 2

12 Year Basis





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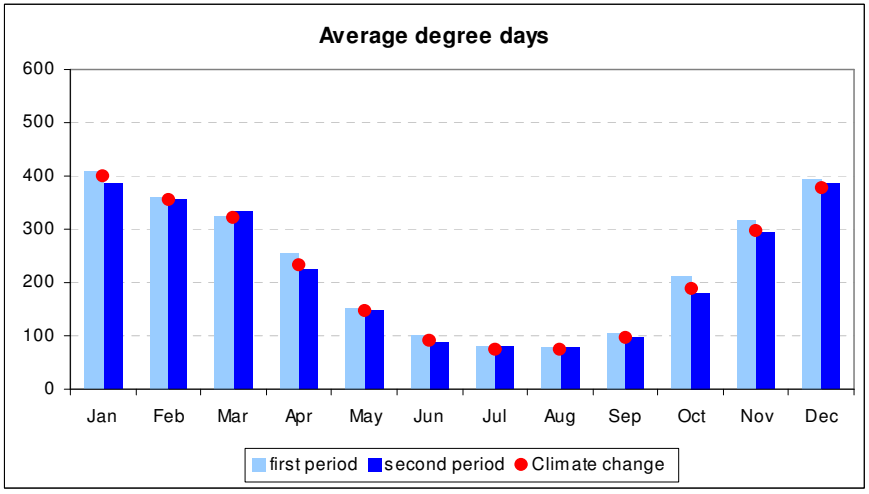
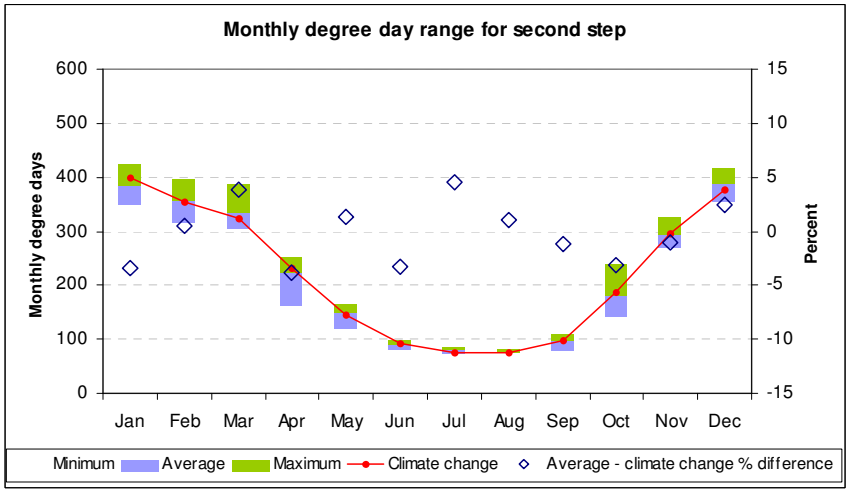
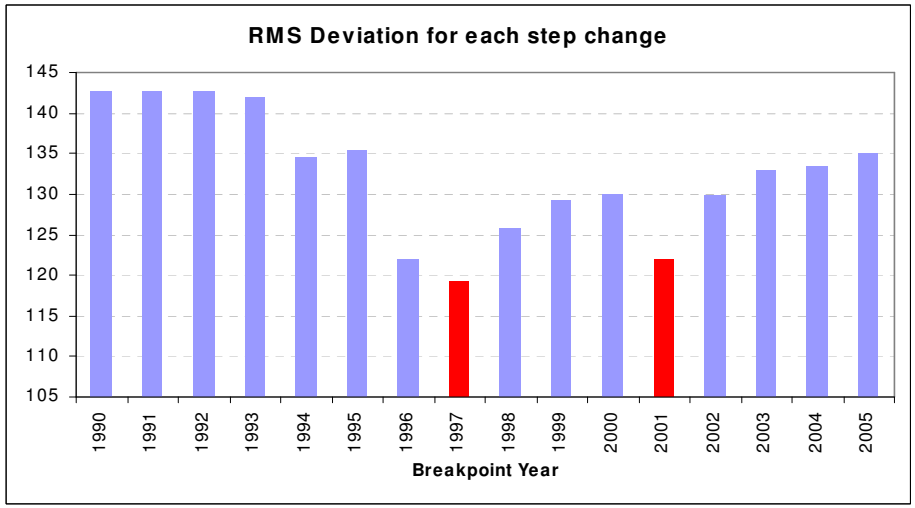




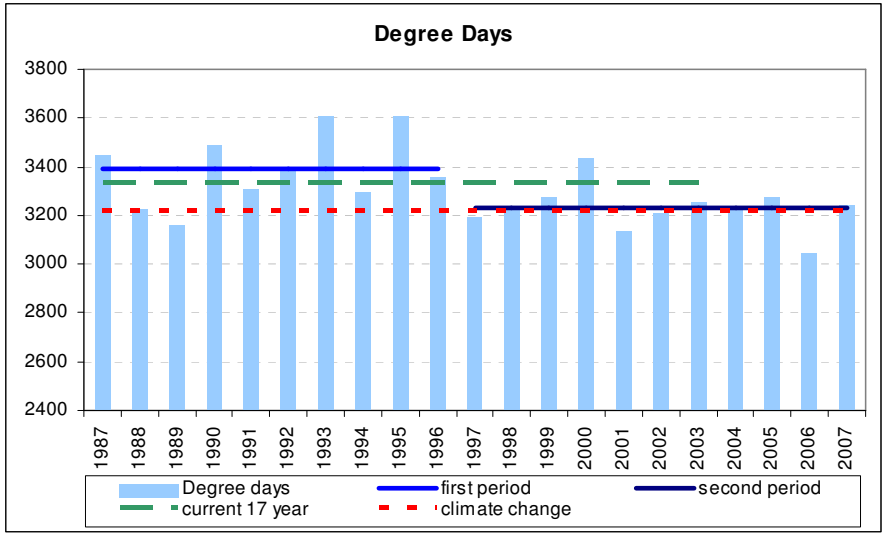
SO LDZ - Key Points from Analysis

- 12 year basis **0.53% colder** than EP2 forecast climatology for 2010/11 to 2014/15.
- 8 year basis basis **0.23% warmer** than EP2 forecast climatology for 2010/11 to 2014/15.
- For 12 year basis, the max. abs. monthly % difference is 4.5% (all yr.) and 2.3% (main heating months).
- For 8 year basis, the max. abs. monthly % difference is 4.6% (all yr.) and 3.8% (main heating months).
- Monthly Max. % difference in heating months a little worse for shorter period due to April.
- The 'within year' profile is slightly better for 12 year basis.
- 8 year basis is actually warmer than forecast weather.

WM LDZ - Graphs Page 1



12 Year Basis



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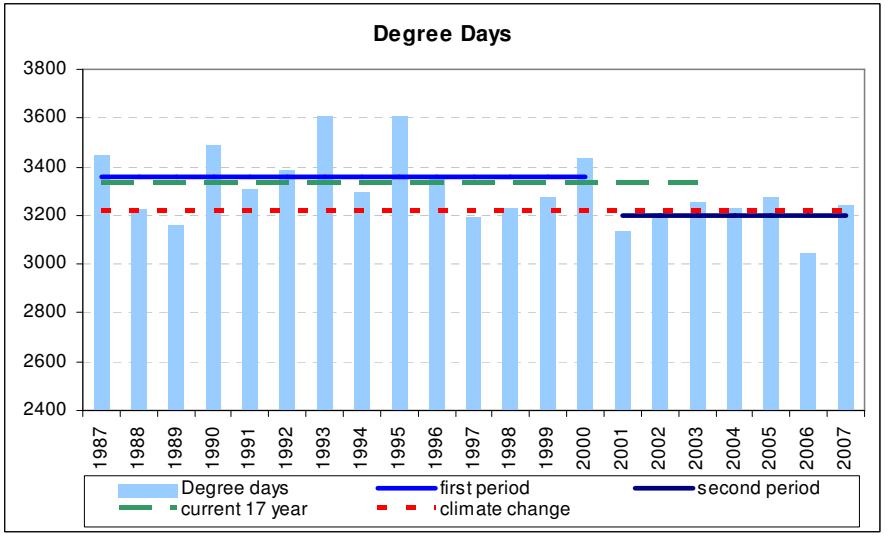
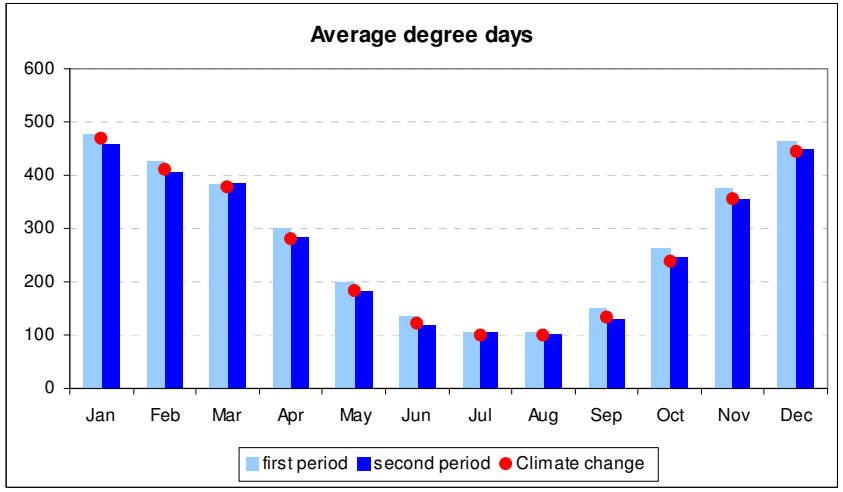
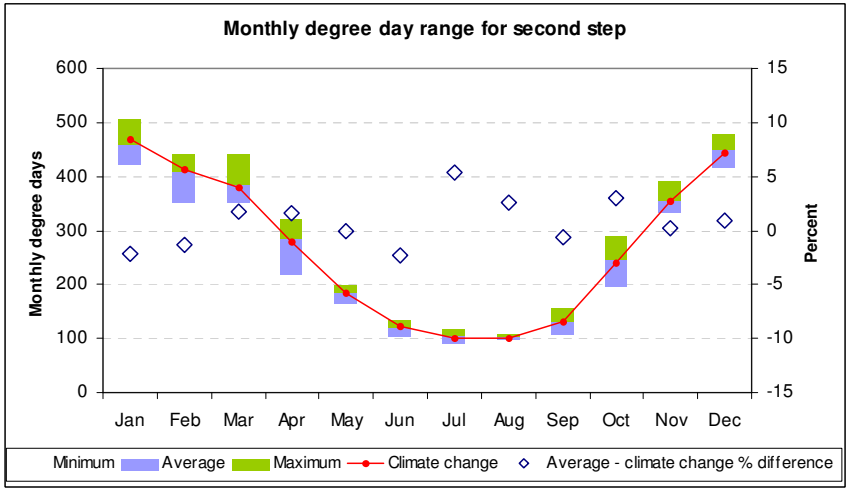


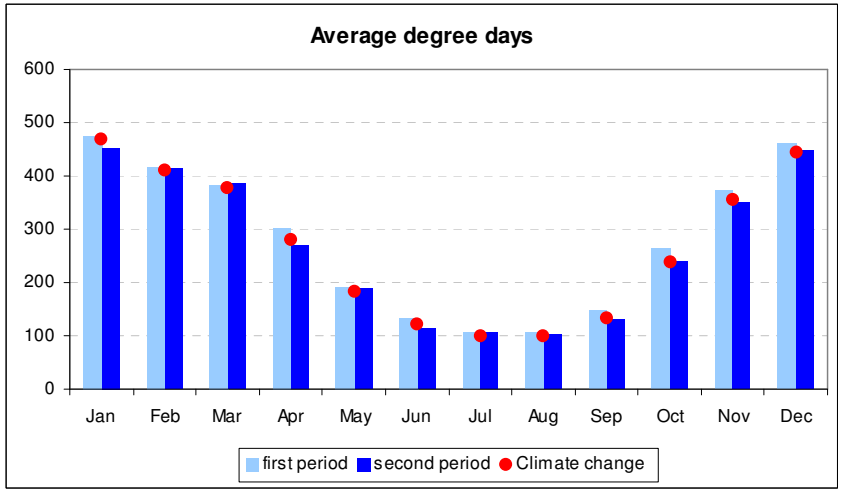
WM LDZ - Graphs Page 2

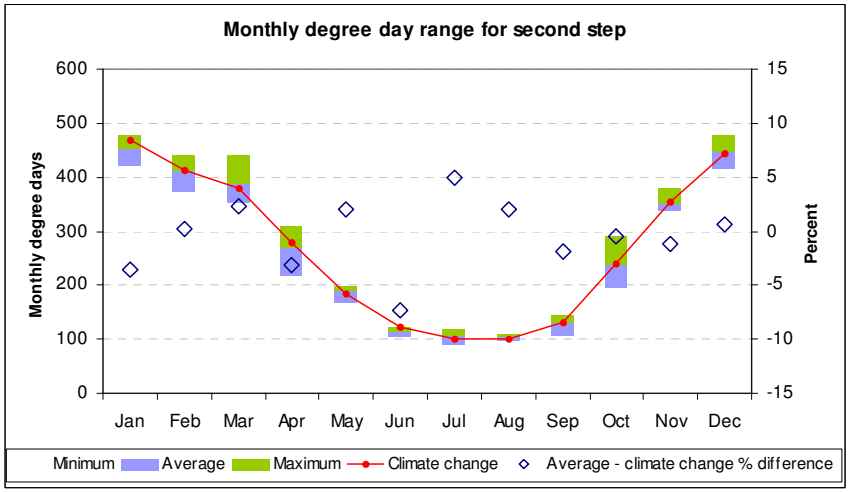
12 Year Basis





8 Year Basis

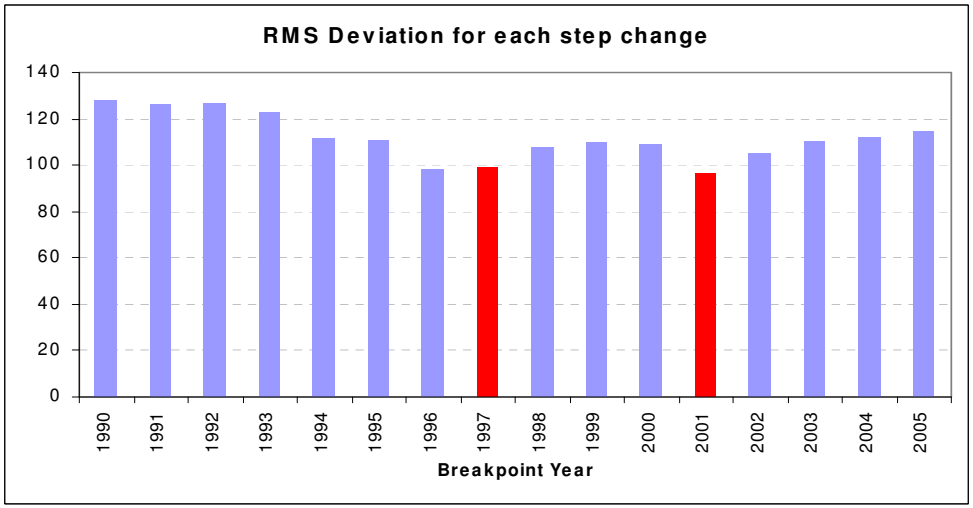




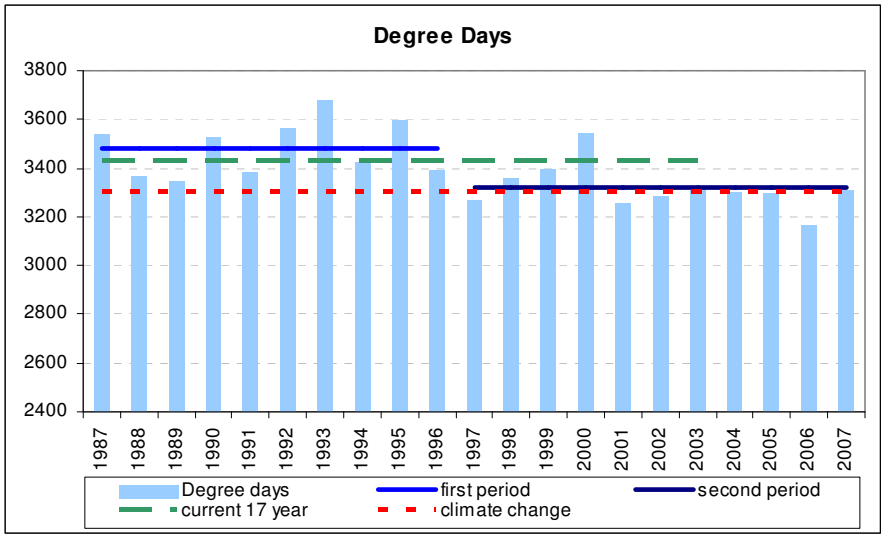
WM LDZ - Key Points from Analysis

- 12 year basis **0.35% colder** than EP2 forecast climatology for 2010/11 to 2014/15.
- 8 year basis **0.59% warmer** than EP2 forecast climatology for 2010/11 to 2014/15.
- For 12 year basis, the max. abs. monthly % difference is 5.4% (all yr.) and 3.1% (main heating months).
- For 8 year basis, the max. abs. monthly % difference is 7.3% (all yr.) and 3.6% (main heating months).
- Monthly Max. % differences all year and in heating months worse for shorter period due to June & January.
- The 'within year' profile is slightly better for 12 year basis.
- 8 year basis is actually warmer than forecast weather.

NO LDZ - Graphs Page 1



12 Year Basis



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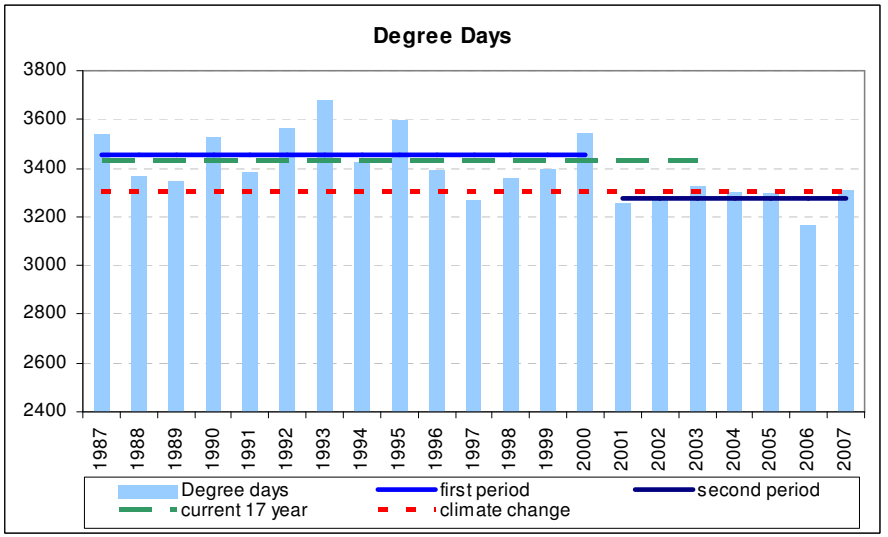
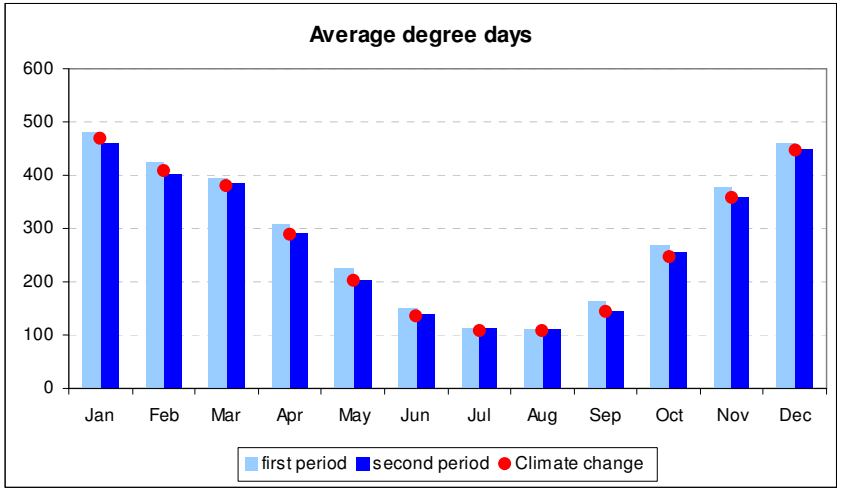
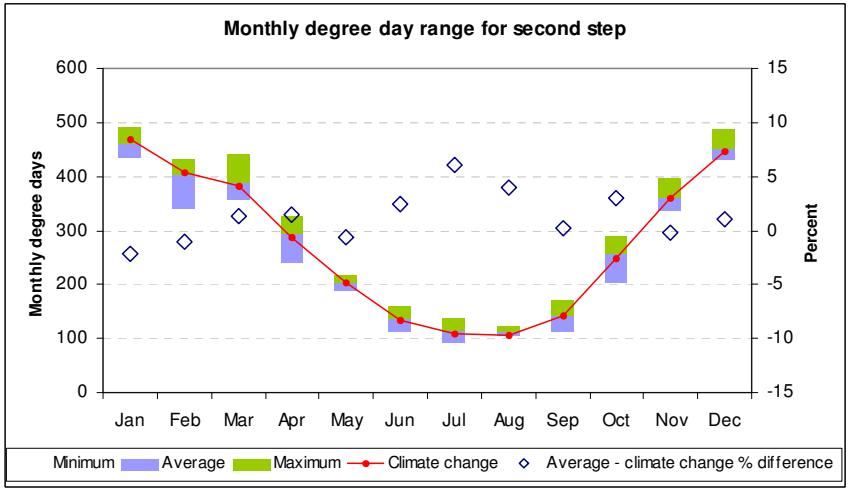


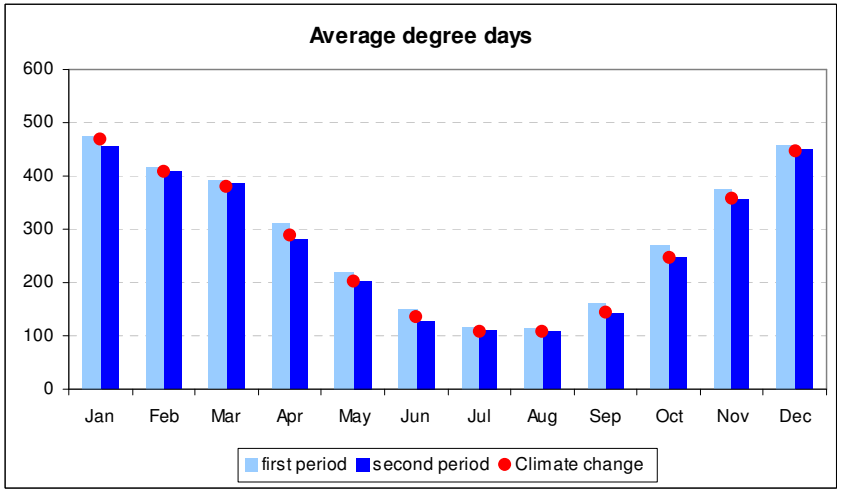
NO LDZ - Graphs Page 2

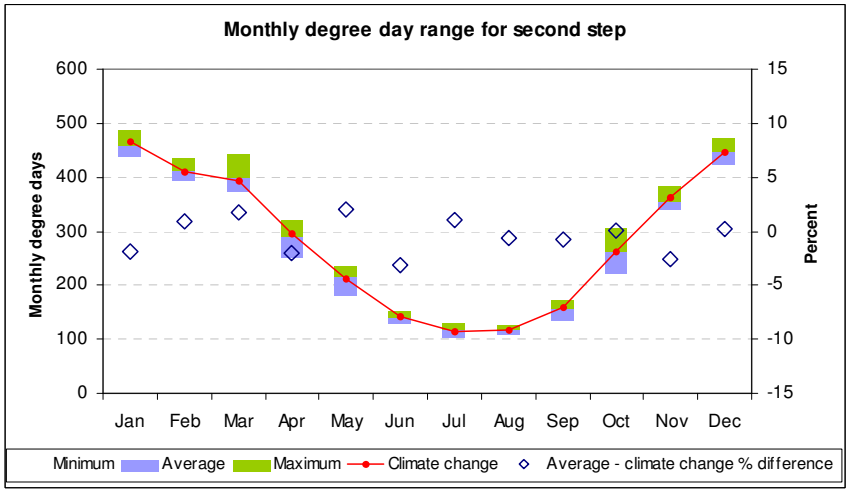
12 Year Basis





8 Year Basis





NO LDZ - Key Points from Analysis

- 12 year basis **0.59% colder** than EP2 forecast climatology for 2010/11 to 2014/15.
- 8 year basis **0.69% warmer** than EP2 forecast climatology for 2010/11 to 2014/15.
- For 12 year basis, the max. abs. monthly % difference is 6.1% (all yr.) and 3.0% (main heating months).
- For 8 year basis, the max. abs. monthly % difference is 4.9% (all yr.) and 2.8% (main heating months).
- The 'within year' profile is slightly better for 8 year basis.
- 8 year basis is actually warmer than forecast weather.

Estimated % reduction in AQ from current basis

LDZ	Impact of 12 year basis on NDM AQs	Impact of 8 year basis on NDM AQs
SC	3.39	4.39
NO	3.14	4.38
NW	3.52	4.66
NE	2.74	3.86
EM	2.88	4.05
WM	3.02	3.93
WN	3.52	4.66
WS	2.86	3.15
EA	2.62	3.34
NT	2.63	3.36
SE	2.77	3.53
SO	3.40	4.13
SW	3.02	3.75

- Table displays estimated impact of 'alternative basis' on NDM AQs
- Estimates do not include impacts from gas year 08/09
- % change only attributable to Seasonal Normal basis
- Any demand based reductions, e.g conservation, not included in these estimates
- Impacts to AQs not part of decision making criteria

Observations on analysis for 12 year basis

- 12 year basis (starting 1997/98)…..
  - 8 of 12 LDZs indicated a ‘step change’ in weather experienced at 1997/98.
  - AQs overall would see a decrease across all LDZs in the range of 2.62% to 3.52%.
  - In all LDZs a seasonal normal basis using 12 years is currently slightly colder than the average forecast weather for the target 5 year period (across all LDZs range is 0.35% to 1.15% colder)
  - In all LDZs, the within year profile is generally good over most months (relative to the forecast weather).
  - In all LDZs, the within year profile for main heating months is generally better for 12 years basis

Observations on analysis for 8 year basis

- 8 year basis (starting 2001/02)…..
  - 3 of 12 LDZs indicated a step change in weather experienced at 2001/02.
  - AQs overall would see a decrease across all LDZs in the range of 3.15% to 4.66%.
  - In 10 of 12 LDZs a seasonal normal basis using 8 years is currently warmer than the average forecast weather for the target 5 year period (warm range 0.06% to 0.69%).
  - In all LDZs, the within year profile is generally good over most months (relative to the forecast weather).
  - 8 years may require more frequent reassessment than the current 5 years. Significant impacts to industry of restating AQs more frequently

Transporters recommendation based on original objectives

- Produce a Seasonal Normal basis which is a reasonable representation of "normal" weather for an LDZ for each gas day
  - Process followed by xoserve has considered objective statistical analysis of recent weather experience in order to produce a basis which will provide the industry with the best view of "normal" weather
- Produce a SN basis which meets Transporters and Industry aspirations
  - Output from Hadley centre EP2 project considered as part of overall review. 12 year basis is a shorter warmer period in line with the view of forecast weather. Imprudent for Transporters to propose a basis warmer than forecasts
- Select a SN basis based on statistically compelling grounds
  - In majority of LDZs the 'step change' in weather experienced is seen at 12 year basis. Current 17 year basis was selected using same breakpoint analysis.
- Include a sufficient number of gas years that the impact of any unrepresentative years is minimised
  - 12 year basis provides a period which is equivalent to more than two cycles of seasonal normal review
- To produce a single consistent basis for all LDZs
  - **All** Transporters recommend that a 12 year basis has strong statistical measures which suggest it would provide a sound basis for representing Seasonal Normal weather from gas year 2010/11 to 2014/15

Appendix 1

Degree Day Thresholds

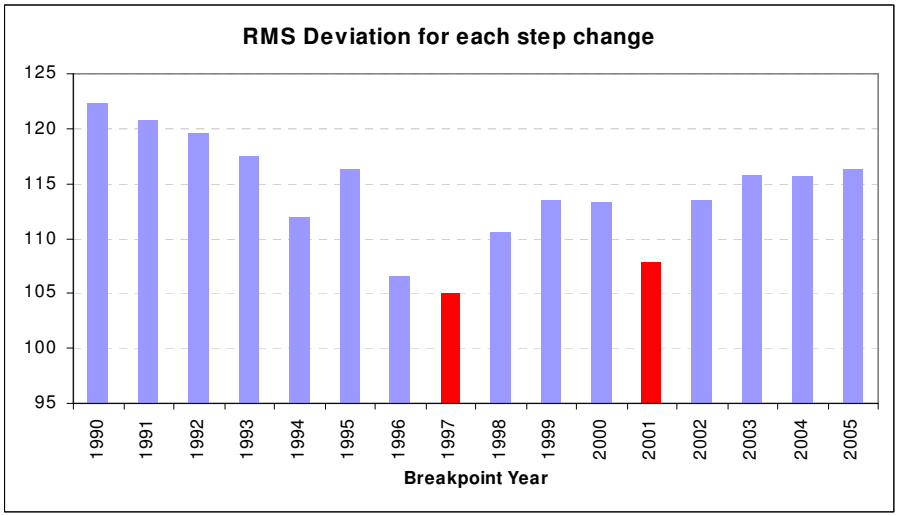
Analysis for remaining LDZs

Degree Day Thresholds

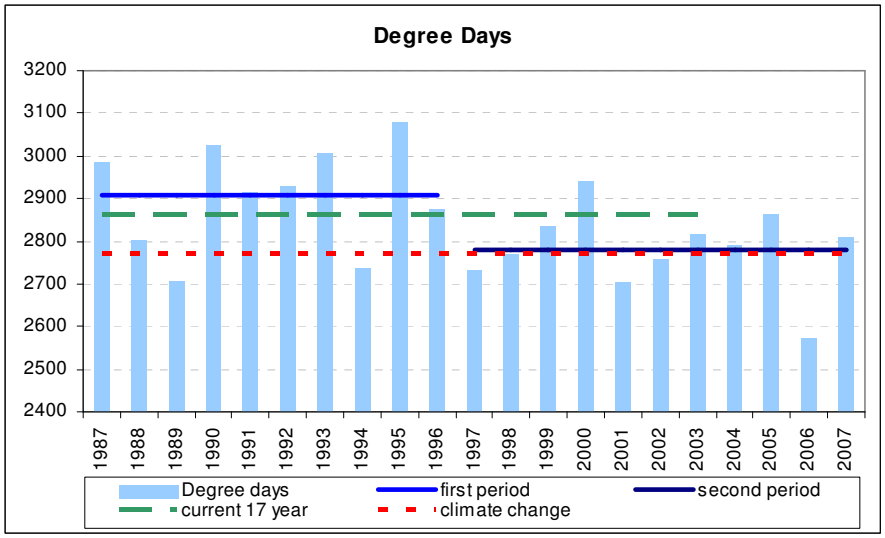
LDZ	SC	NO	NW	NE	EM	WM	WN	WS	EA	NT	SE	SO	SW
Threshold	18.1	17.2	19.5	19.2	18.6	18.7	19.5	18.9	19.0	19.4	18.7	18.6	18.3

- Threshold represents average intercept value of the aggregate NDM demand model for that LDZ
- Note: The threshold for NW is applied to WN LDZ (WN shares a CWV with NW)

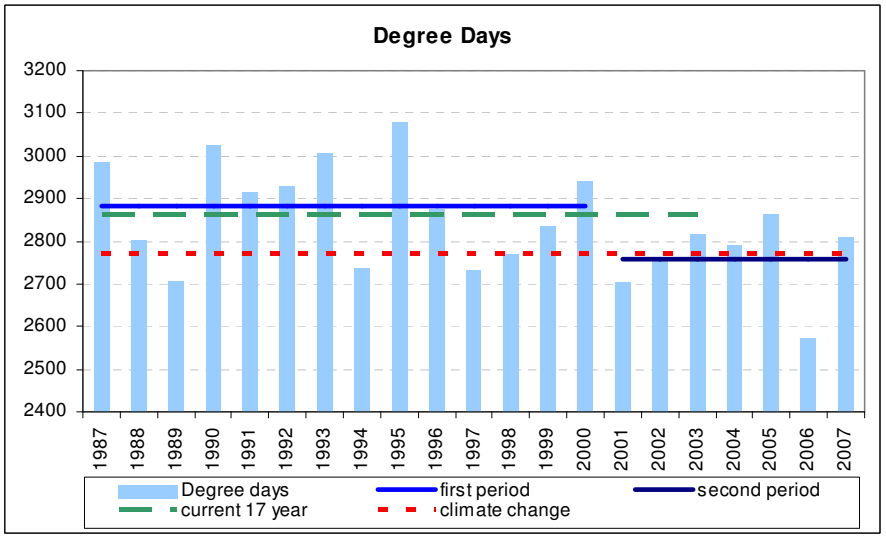
SE LDZ - Additional Graphs Page 1



12 Year Basis

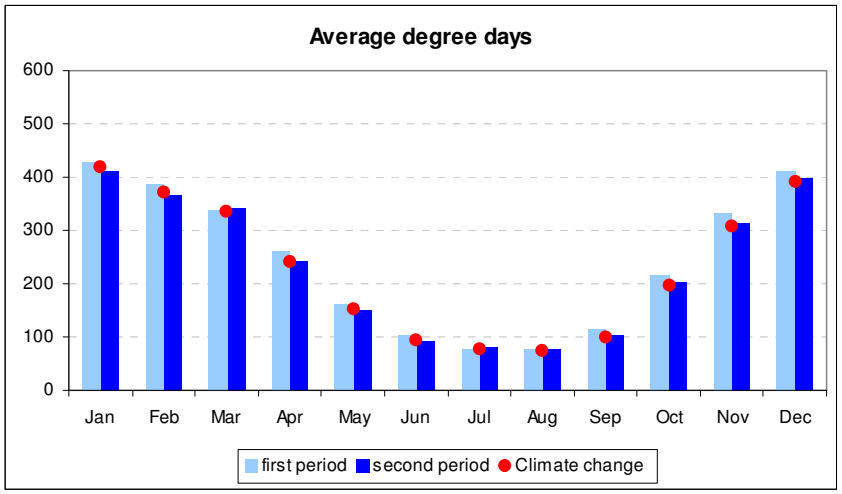


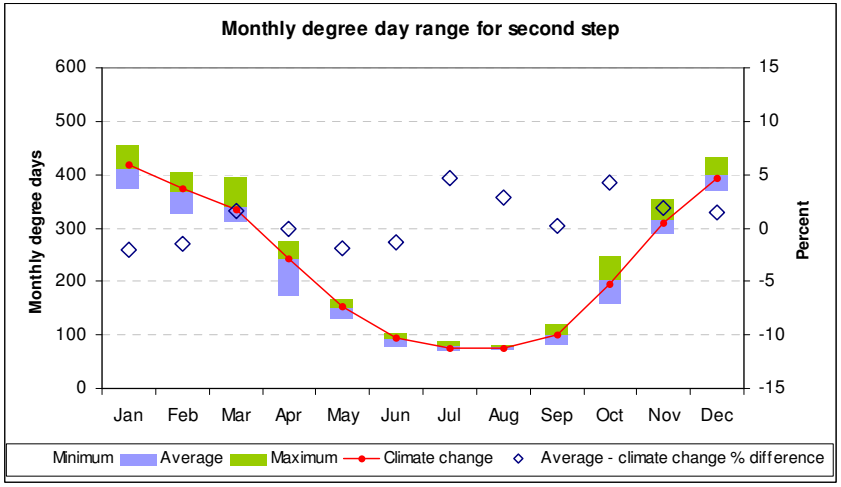
8 Year Basis



SE LDZ - Additional Graphs Page 2

12 Year Basis





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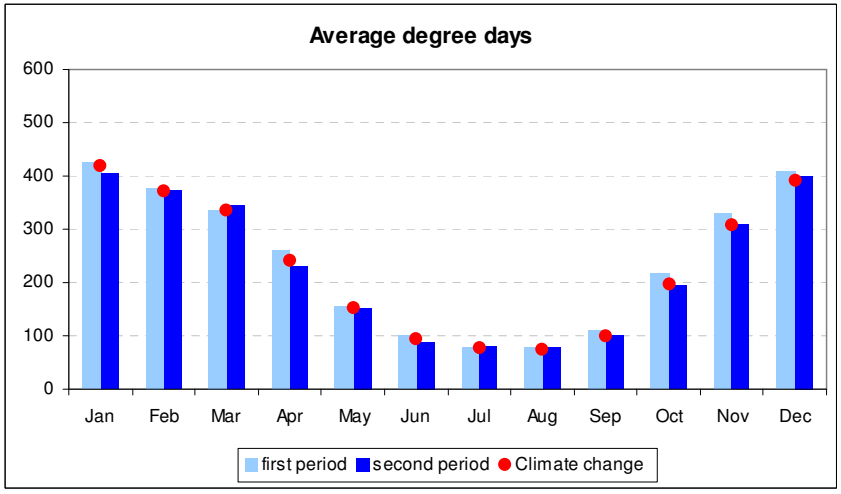
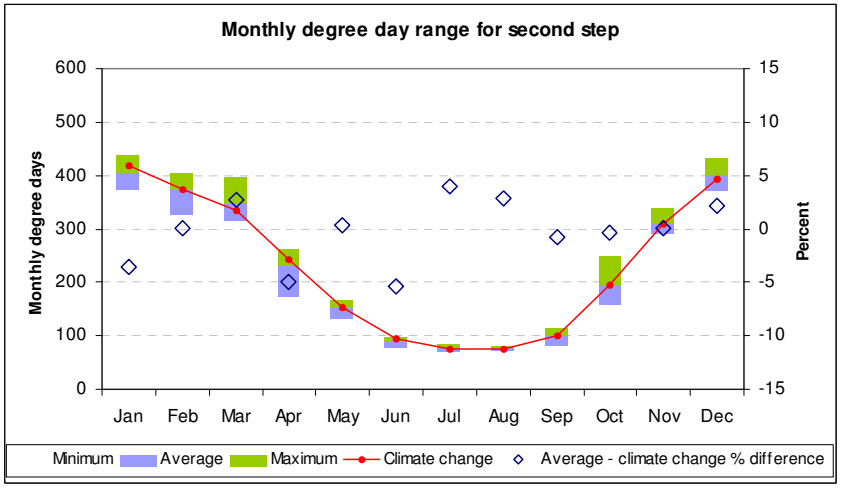
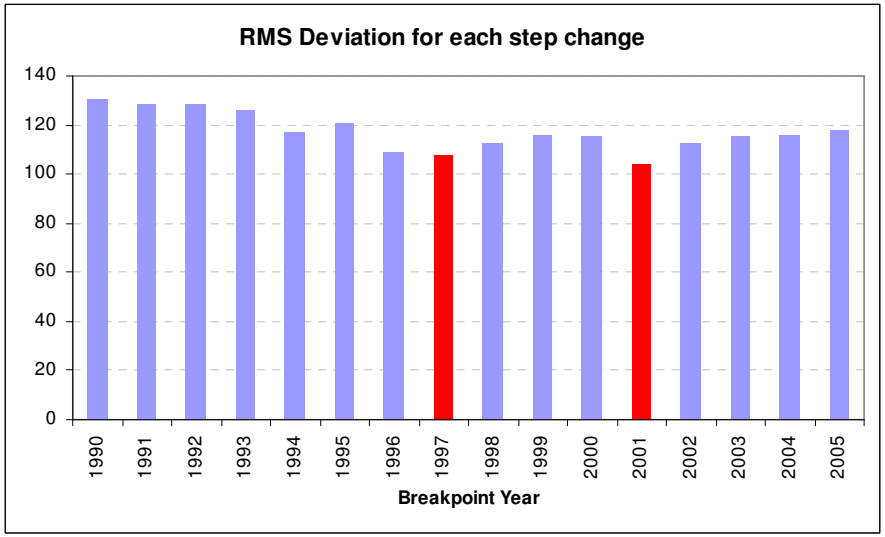




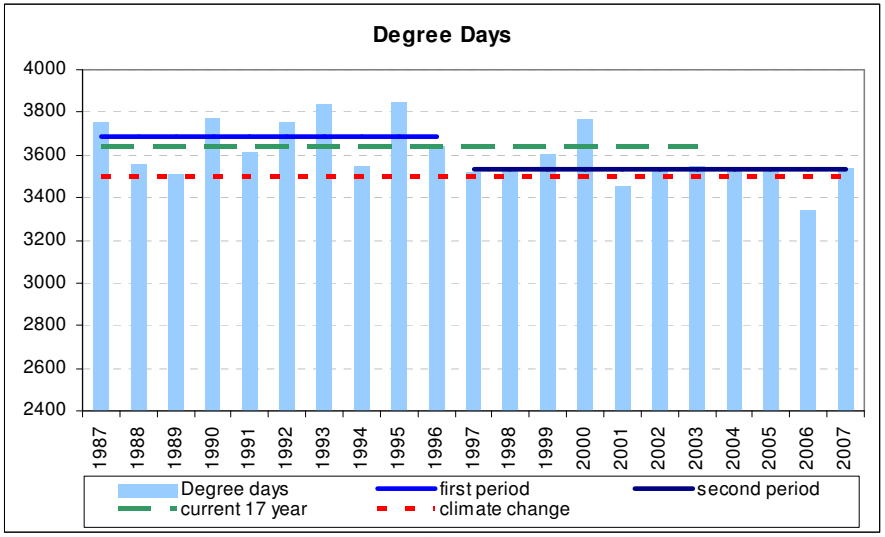
SE LDZ - Key Points from Additional Analysis

- 12 year basis **0.46% colder** than EP2 forecast climatology for 2010/11 to 2014/15.
- 8 year basis **0.33% warmer** than EP2 forecast climatology for 2010/11 to 2014/15.
- For 12 year basis, the max. abs. monthly % difference is 4.6% (all yr.) and 4.2% (main heating months).
- For 8 year basis, the max. abs. monthly % difference is 5.4% (all yr.) and 4.9% (main heating months).
- Monthly Max. % differences all year and in heating months a little worse for shorter period due to June & April.
- The 'within year' profile is slightly better for 12 year basis.
- 8 year basis is actually warmer than forecast weather.

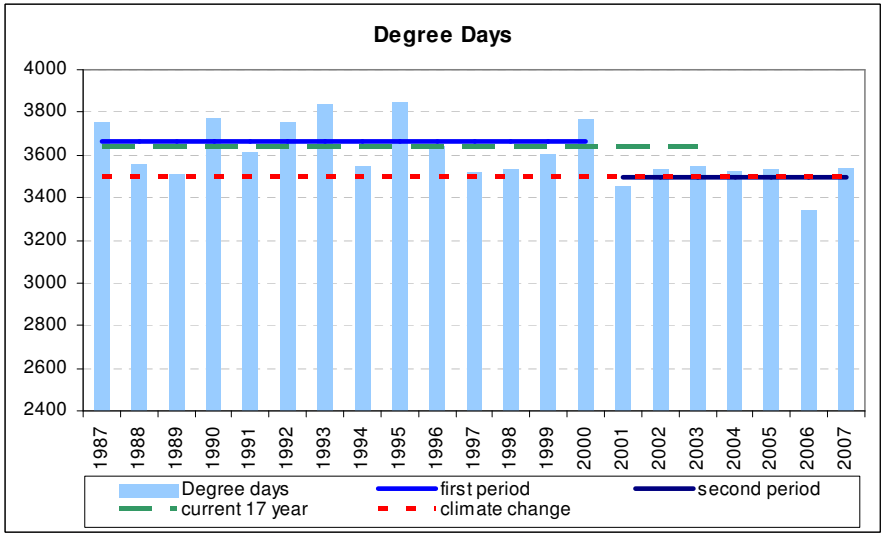
NE LDZ - Additional Graphs Page 1



12 Year Basis

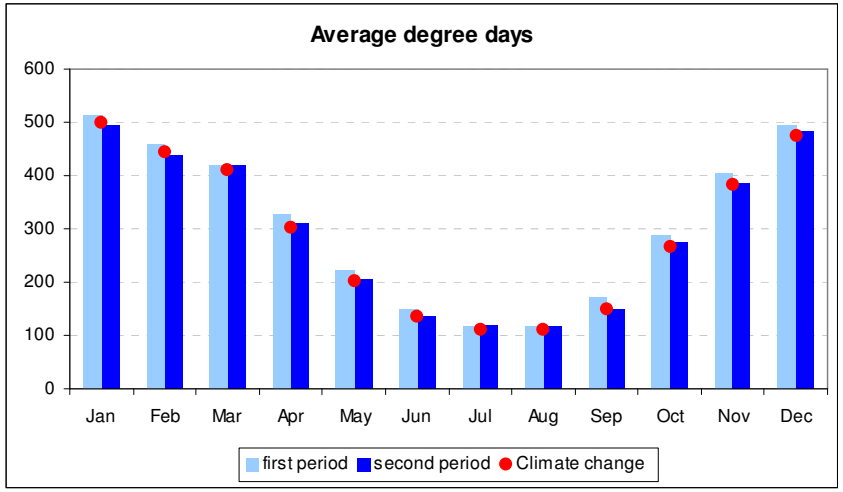


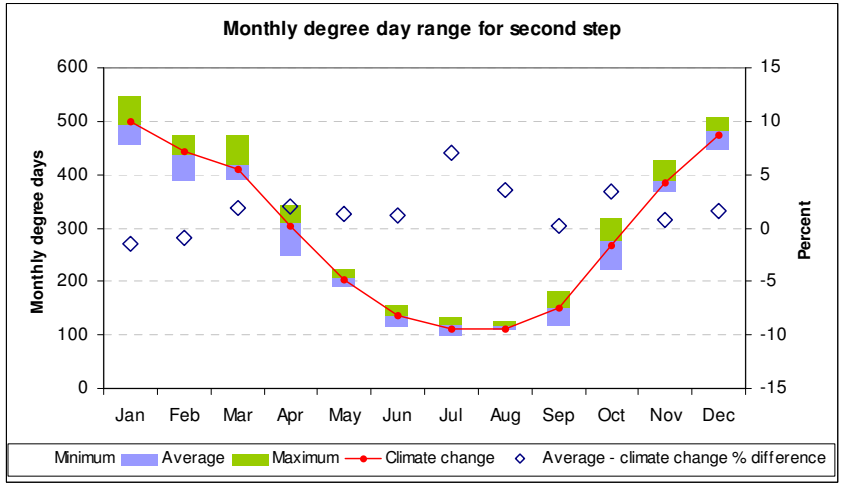
8 Year Basis



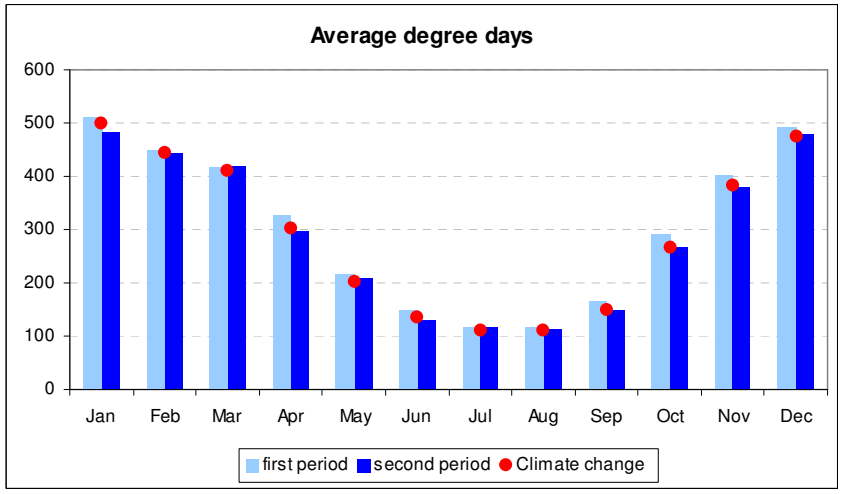
NE LDZ - Additional Graphs Page 2

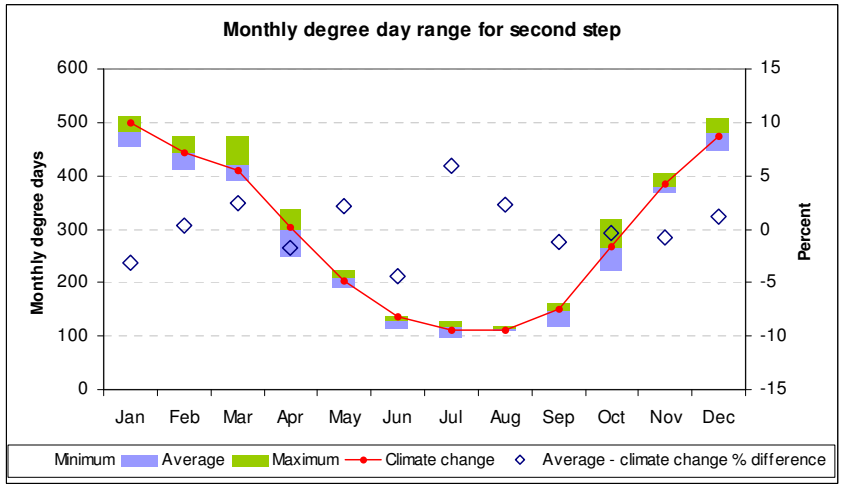
12 Year Basis





8 Year Basis

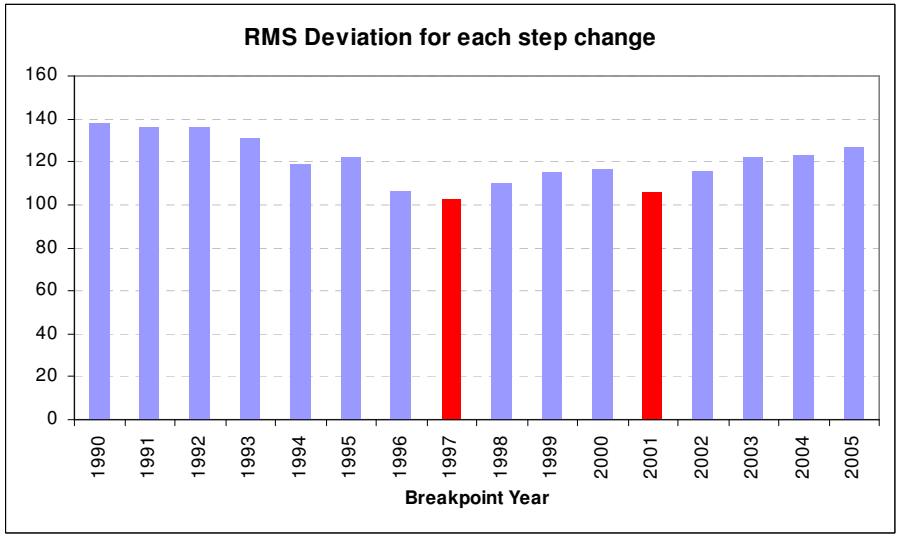




NE LDZ - Key Points from Additional Analysis

- 12 year basis **1.11% colder** than EP2 forecast climatology for 2010/11 to 2014/15.
- 8 year basis **0.06% warmer** than EP2 forecast climatology for 2010/11 to 2014/15.
- For 12 year basis, the max. abs. monthly % difference is 7.0% (all yr.) and 3.5% (main heating months).
- For 8 year basis, the max. abs. monthly % difference is 6.0% (all yr.) and 3.2% (main heating months).
- The 'within year' profile is slightly better for 8 year basis.

NW & WN LDZs - Additional Graphs Page 1



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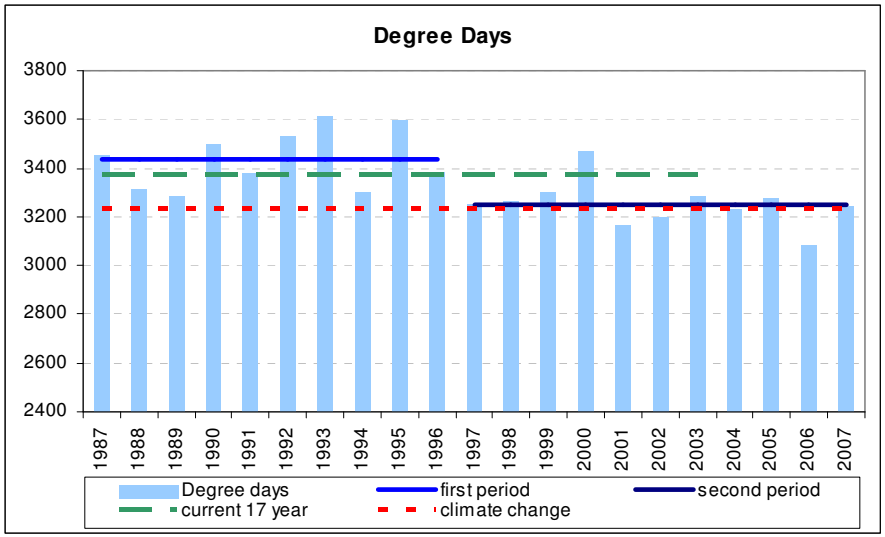

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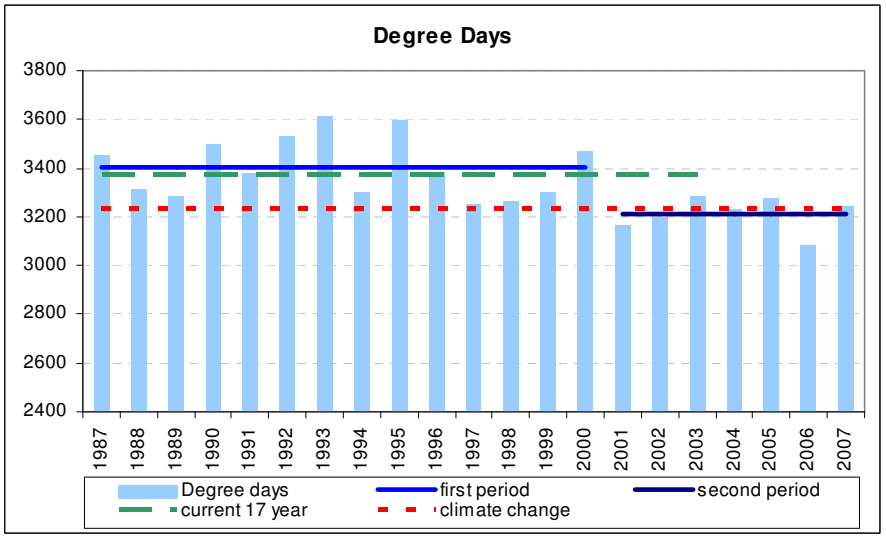
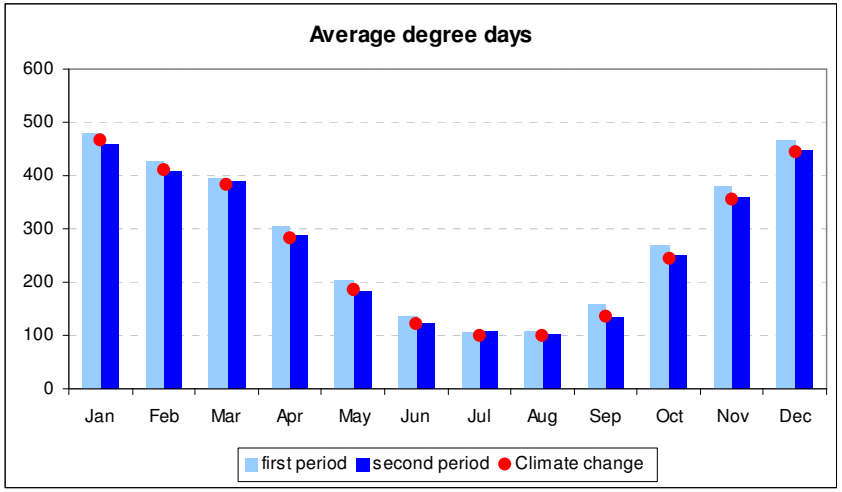
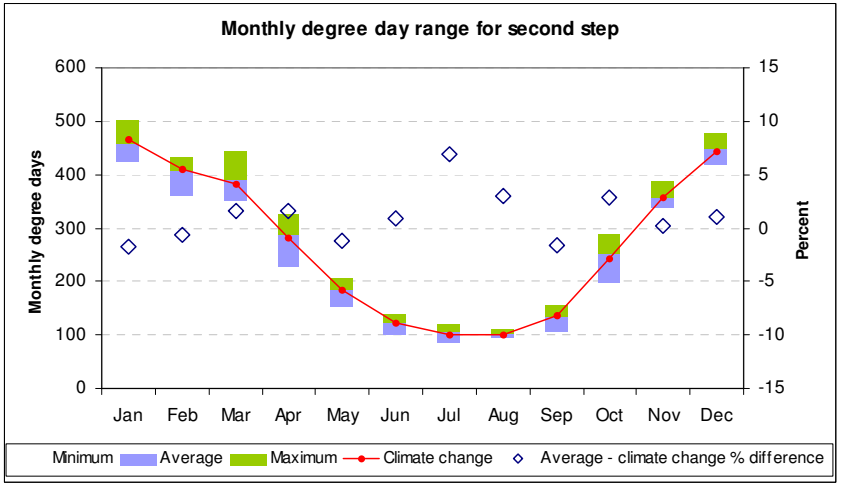


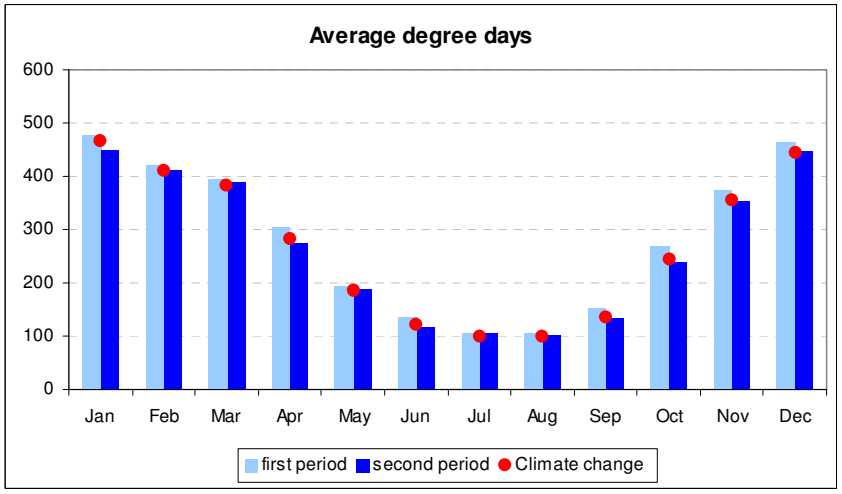
NW & WN LDZs - Additional Graphs Page 2

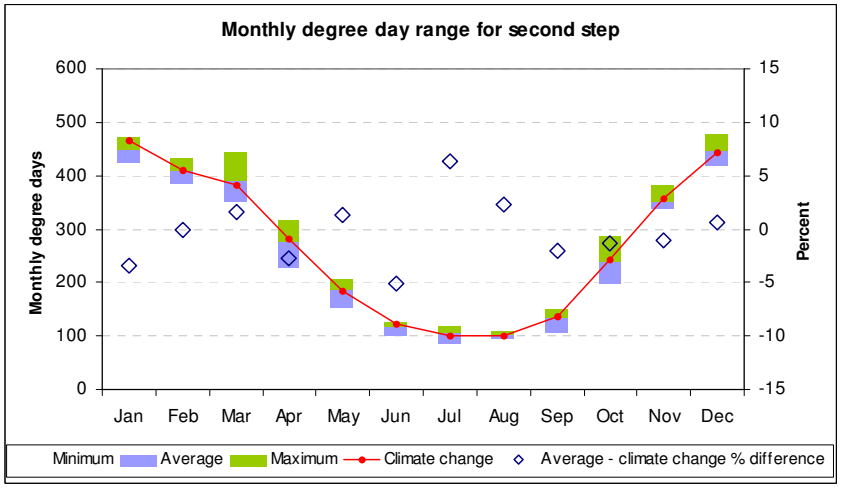
12 Year Basis





8 Year Basis

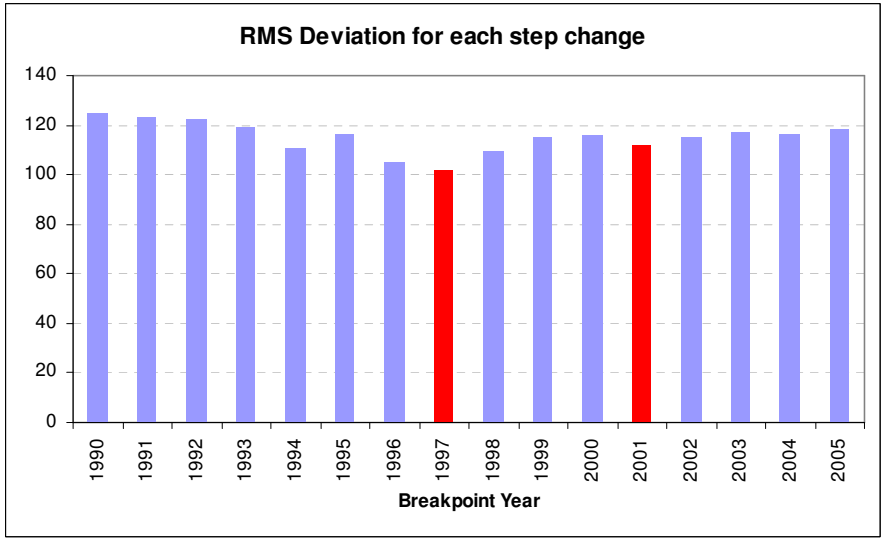




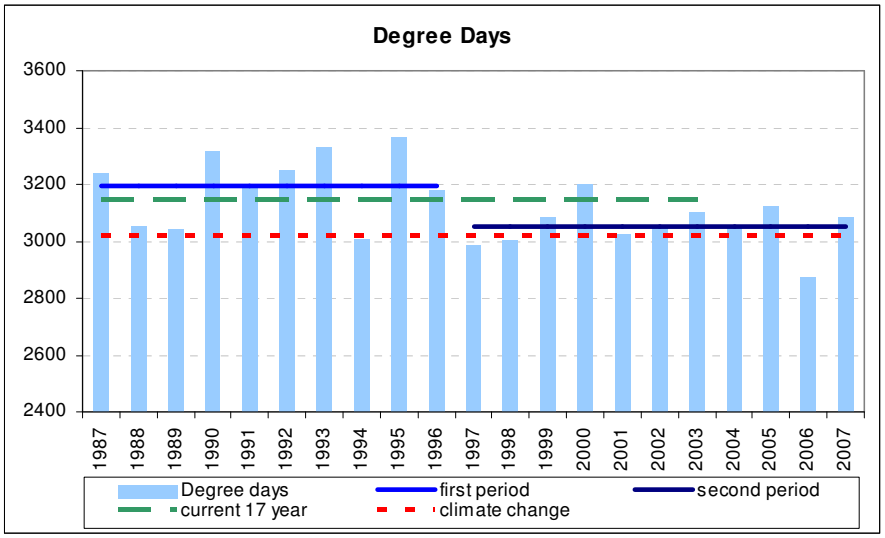
NW & WN LDZs - Key Points from Additional Analysis

- 12 year basis **0.58% colder** than EP2 forecast climatology for 2010/11 to 2014/15.
- 8 year basis **0.61% warmer** than EP2 forecast climatology for 2010/11 to 2014/15.
- For 12 year basis, the max. abs. monthly % difference is 6.9% (all yr.) and 2.8% (main heating months).
- For 8 year basis, the max. abs. monthly % difference is 6.4% (all yr.) and 3.4% (main heating months).
- Monthly Max. % differences in heating months little worse for shorter period due to January.
- The 'within year' profile is slightly better for 8 year basis.
- 8 year basis is actually warmer than forecast weather.

WS LDZ - Additional Graphs Page 1



12 Year Basis



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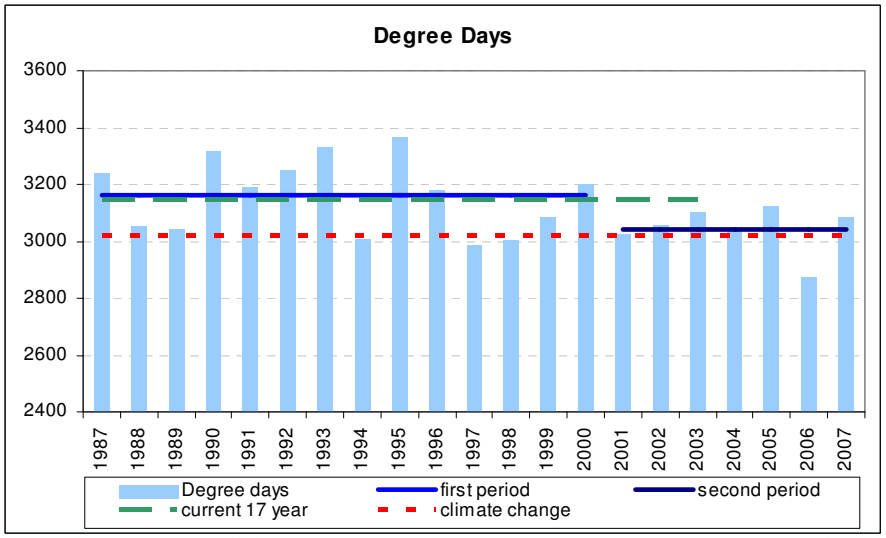
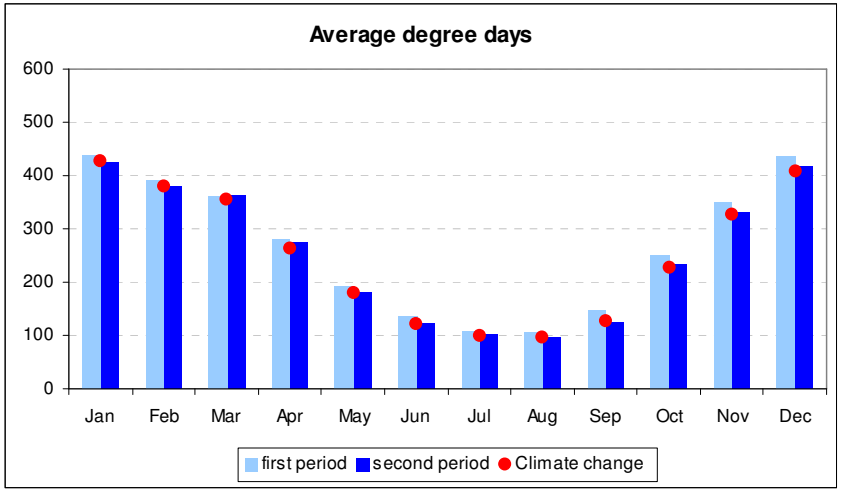
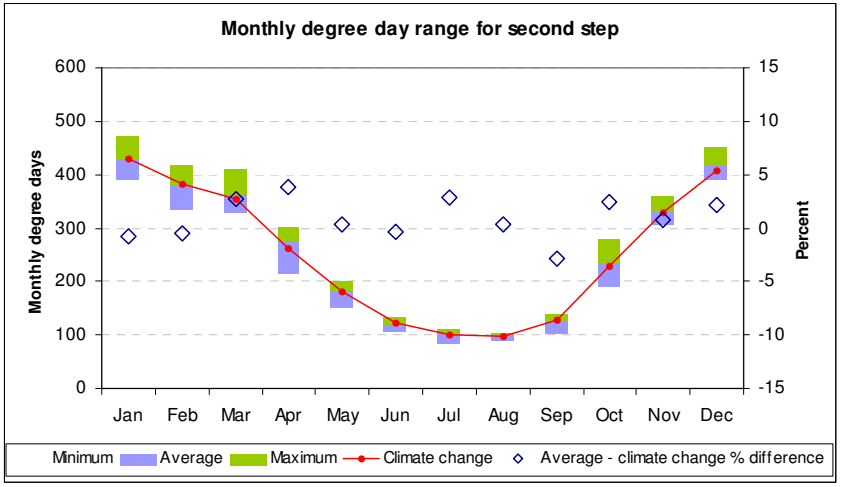


WS LDZ - Additional Graphs Page 2

12 Year Basis





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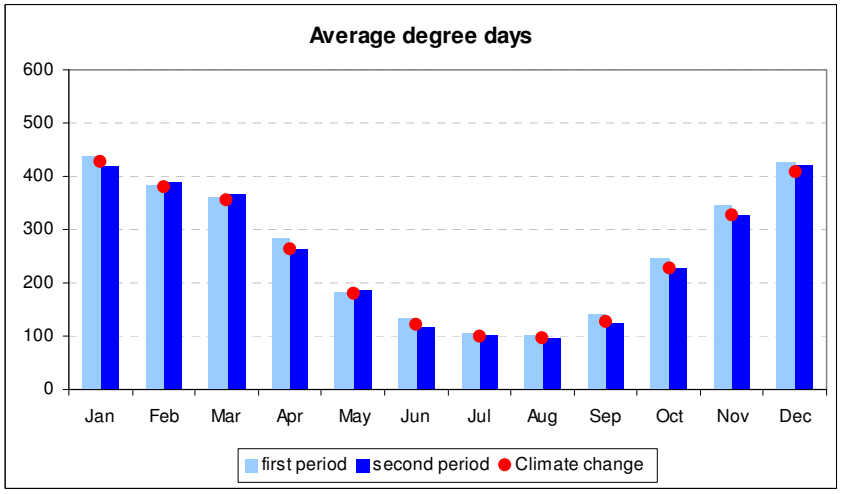
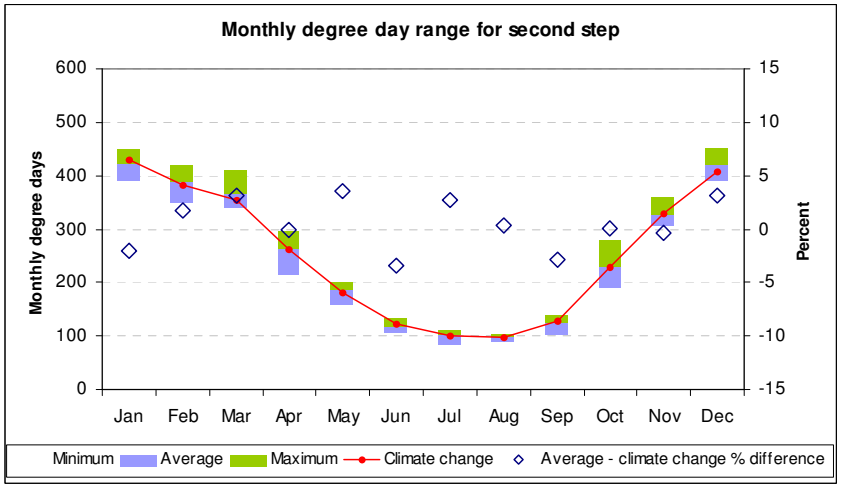
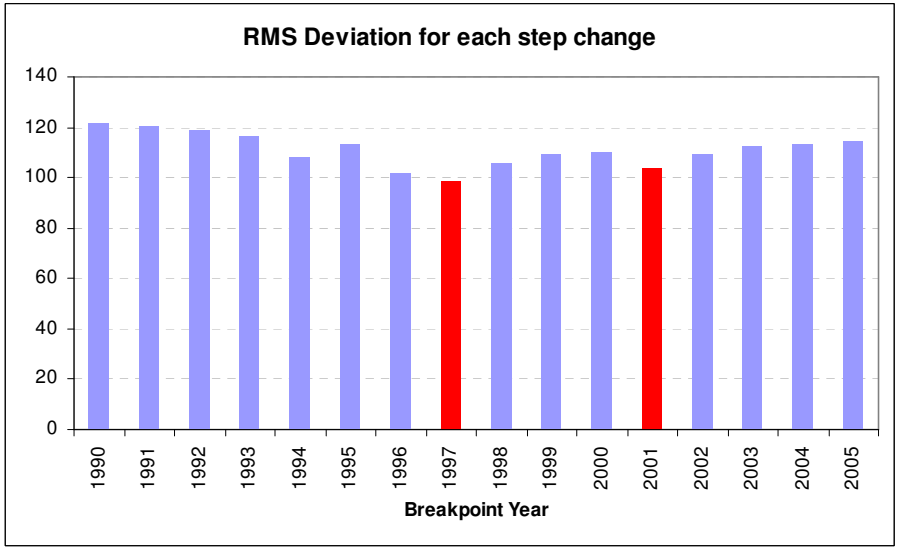




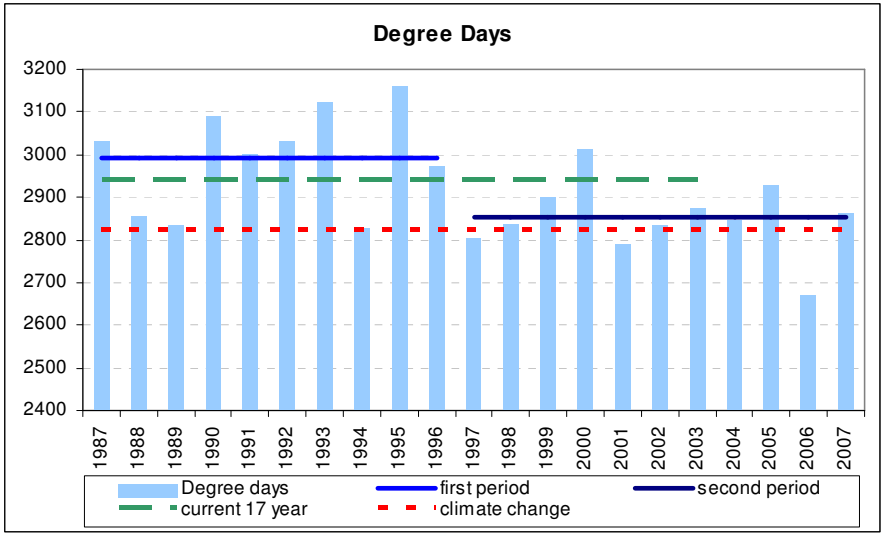
WS LDZ - Key Points from Additional Analysis

- 12 year basis **1.03% colder** than EP2 forecast climatology for 2010/11 to 2014/15.
- 8 year basis **0.74% colder** than EP2 forecast climatology for 2010/11 to 2014/15.
- For 12 year basis, the max. abs. monthly % difference is 3.8% (all year and the main heating months).
- For 8 year basis, the max. abs. monthly % difference is 3.6% (all yr.) and 3.1% (main heating months).
- The 'within year' profile is slightly better for 8 year basis.

SW LDZ - Additional Graphs Page 1



12 Year Basis



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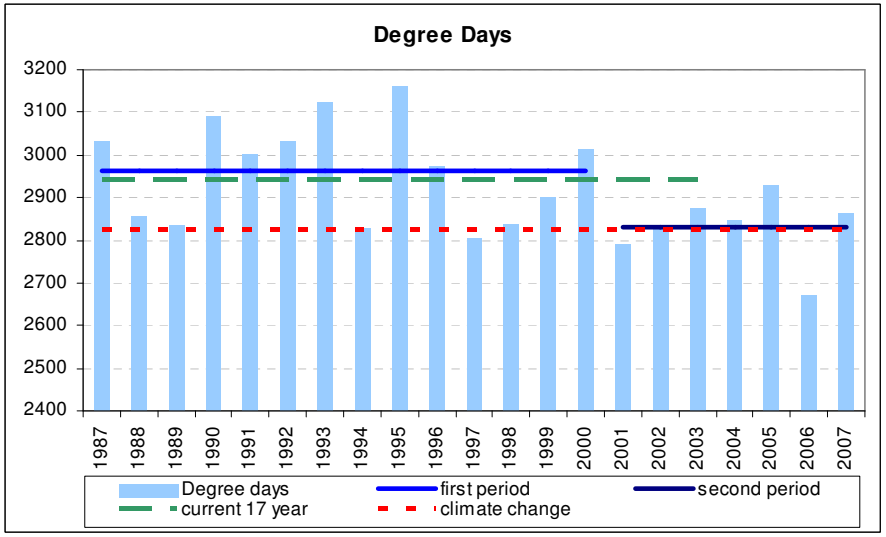
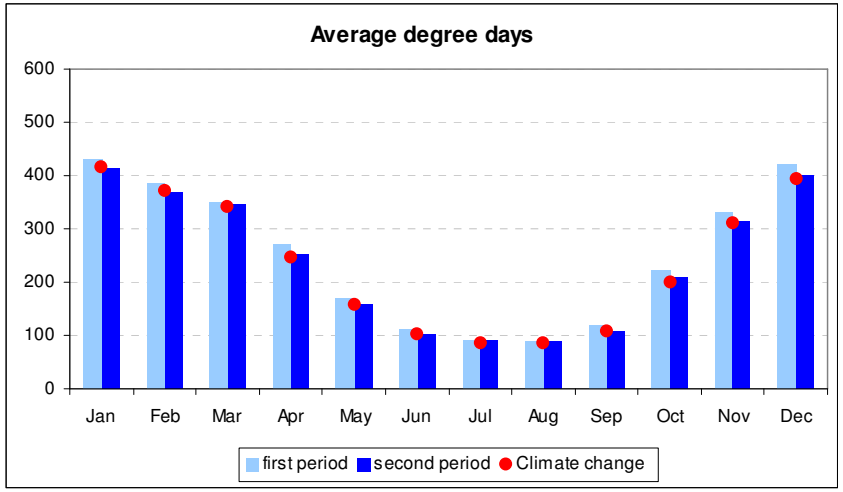
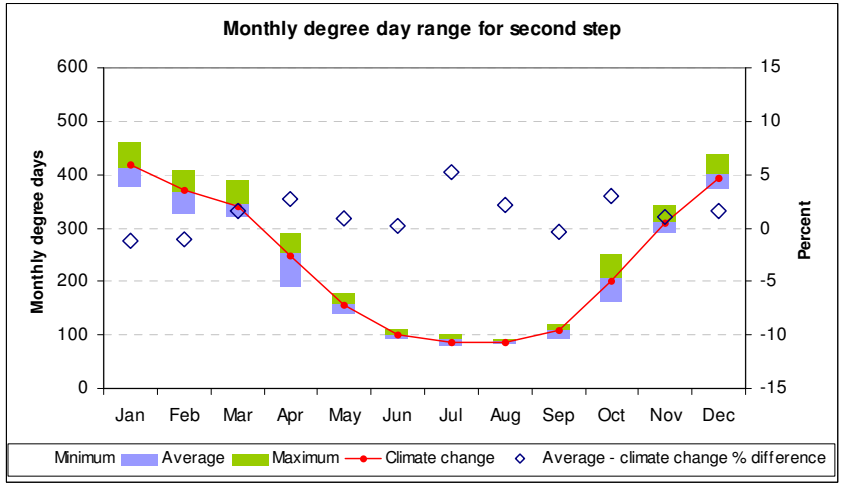


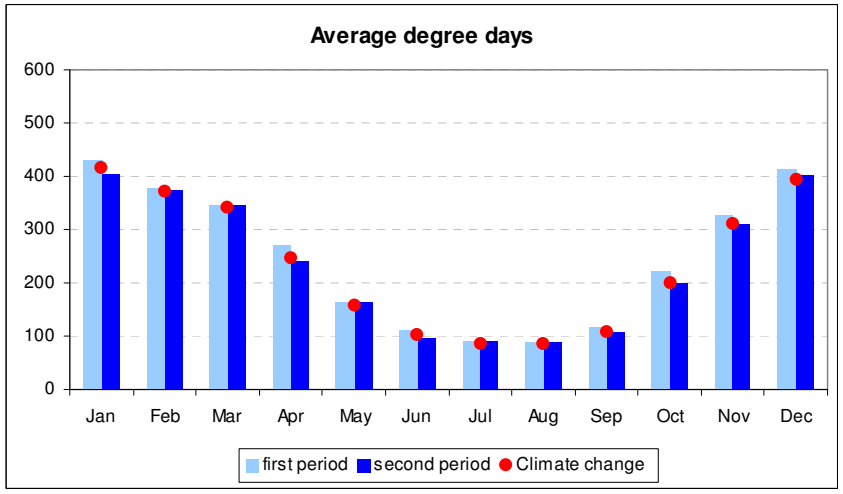
SW LDZ - Additional Graphs Page 2

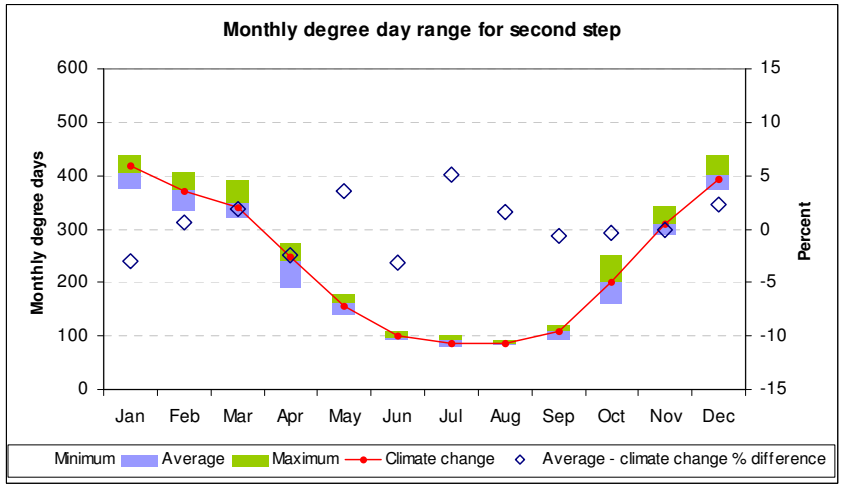
12 Year Basis





8 Year Basis

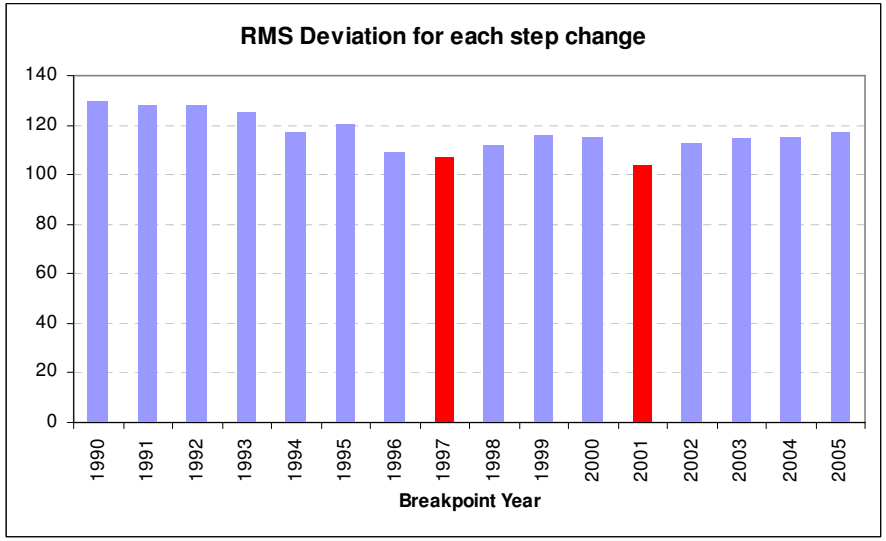




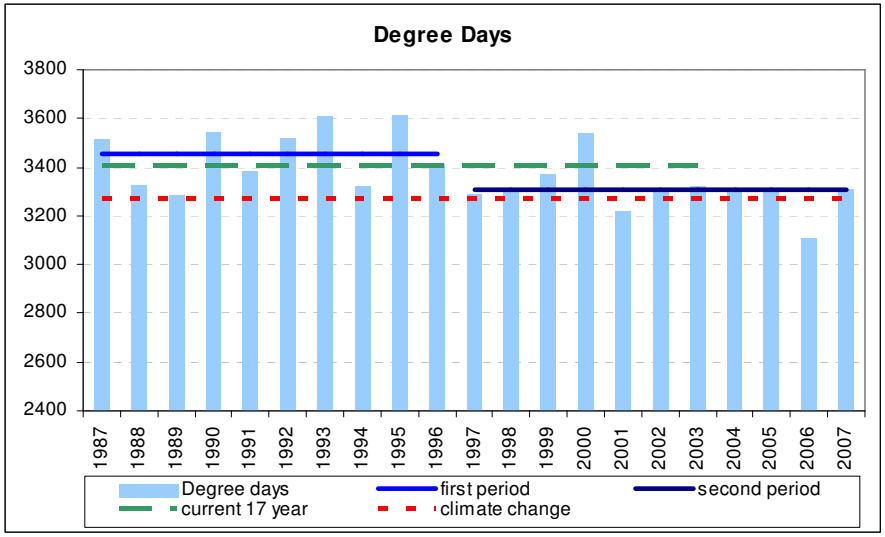
SW LDZ - Key Points from Additional Analysis

- 12 year basis **0.96% colder** than EP2 forecast climatology for 2010/11 to 2014/15.
- 8 year basis **0.20% colder** than EP2 forecast climatology for 2010/11 to 2014/15.
- For 12 year basis, the max. abs. monthly % difference is 5.2% (all yr.) and 3.0% (main heating months).
- For 8 year basis, the max. abs. monthly % difference is 5.1% (all yr.) and 3.1% (main heating months).
- Monthly Max. % difference in heating months very slightly worse for shorter period due to April.
- The 'within year' profile is slightly better for 8 year basis.

EM LDZ - Additional Graphs Page 1



12 Year Basis



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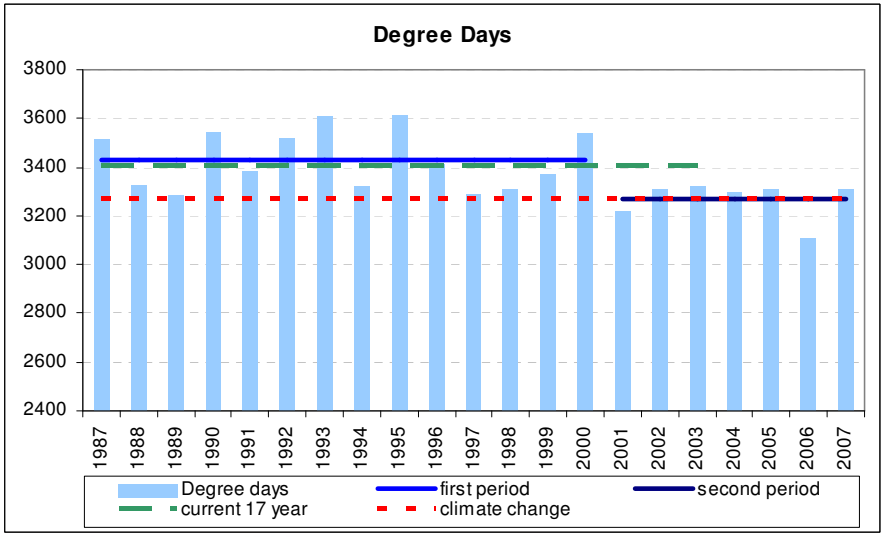
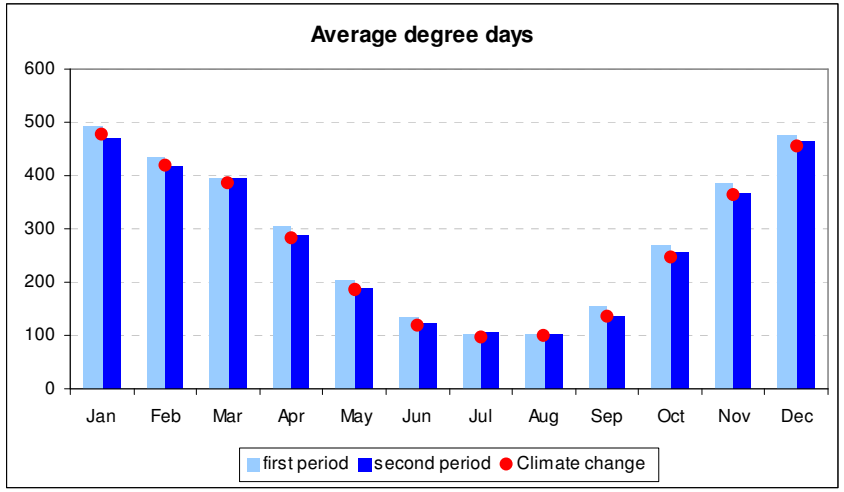
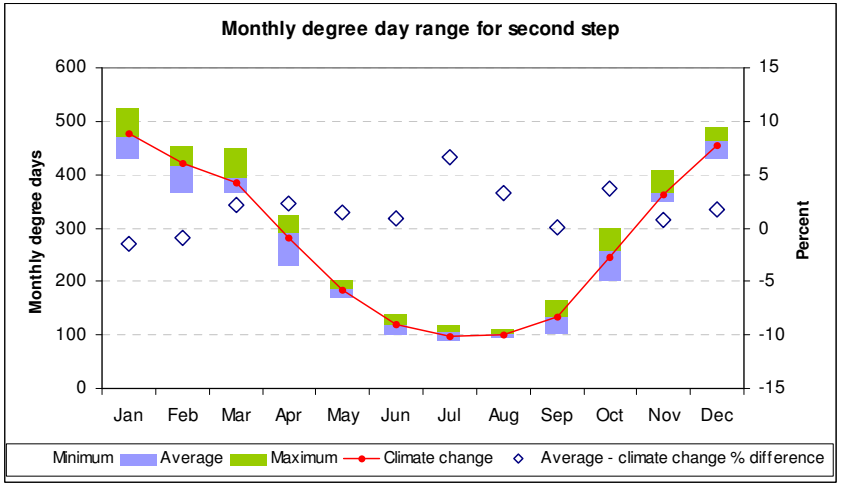


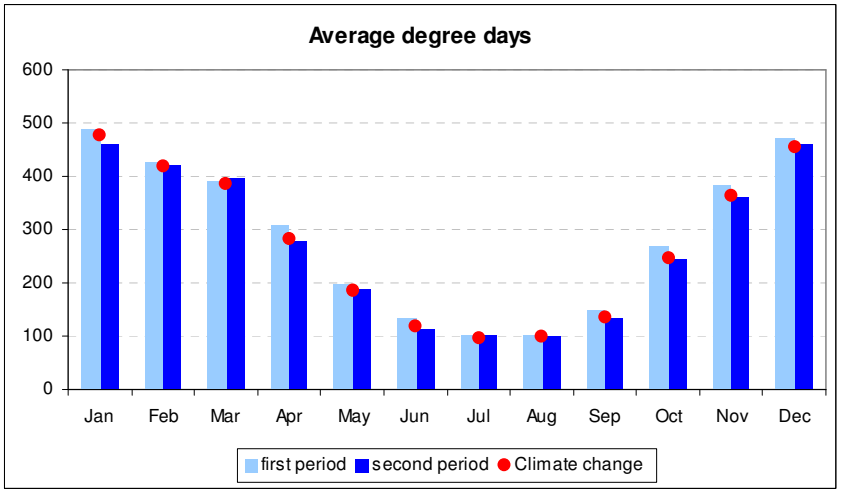
EM LDZ - Additional Graphs Page 2

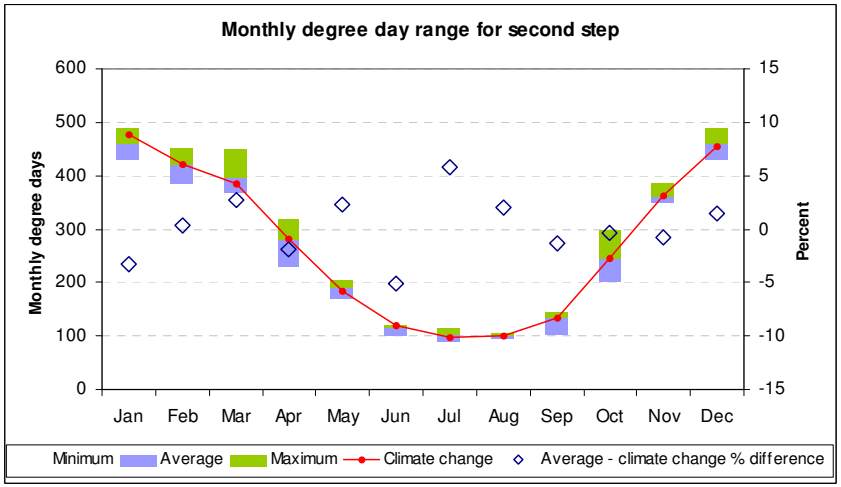
12 Year Basis





8 Year Basis

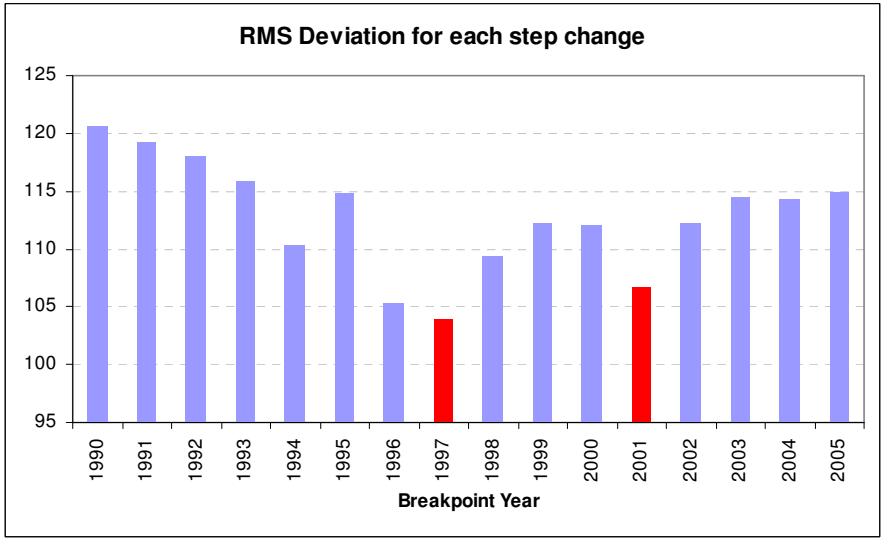




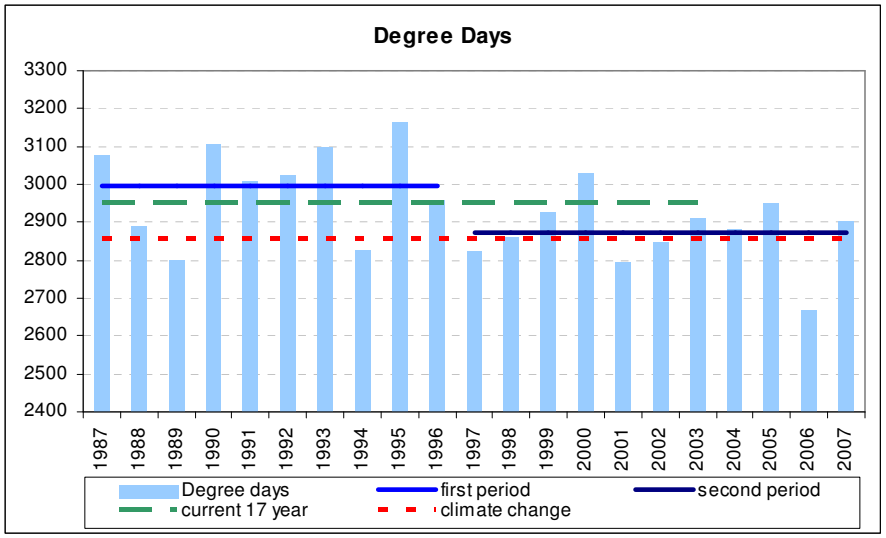
EM LDZ - Key Points from Additional Analysis

- 12 year basis **1.15% colder** than EP2 forecast climatology for 2010/11 to 2014/15.
- 8 year basis **0.06% warmer** than EP2 forecast climatology for 2010/11 to 2014/15.
- For 12 year basis, the max. abs. monthly % difference is 6.7% (all yr.) and 3.7% (main heating months).
- For 8 year basis, the max. abs. monthly % difference is 5.8% (all yr.) and 3.3% (main heating months).
- The 'within year' profile is slightly better for 8 year basis.

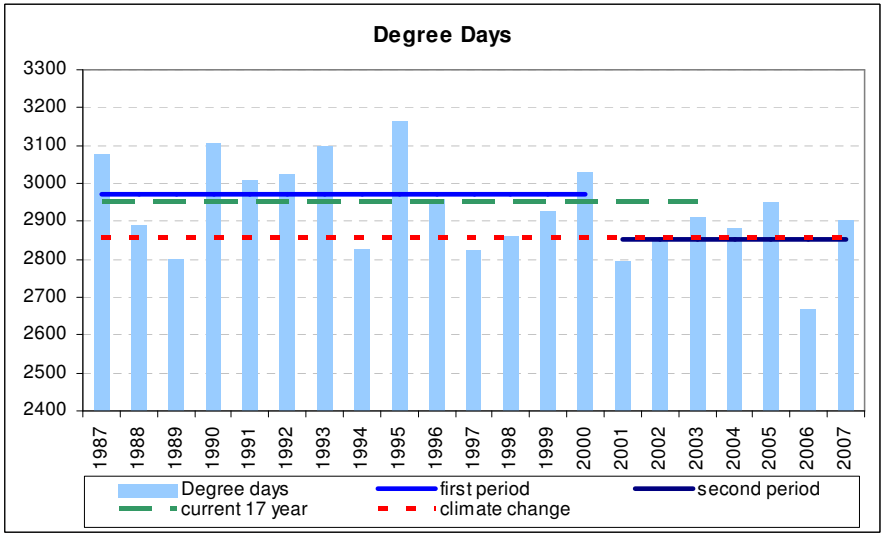
EA LDZ - Additional Graphs Page 1



12 Year Basis

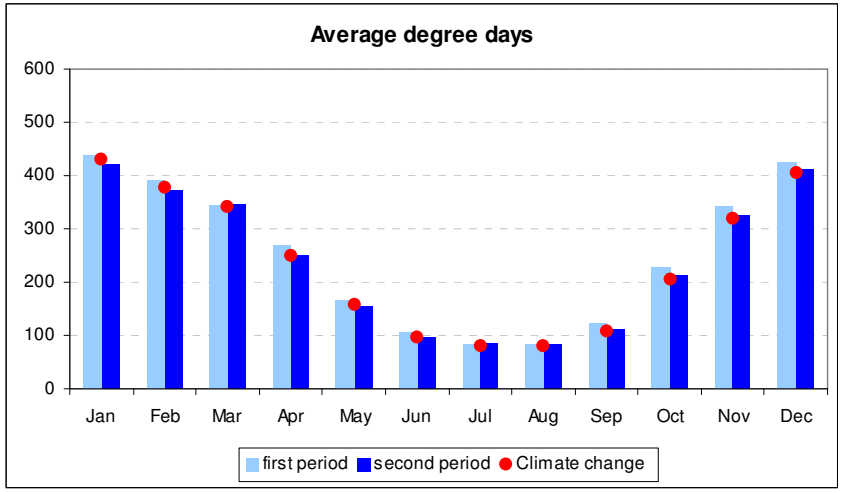


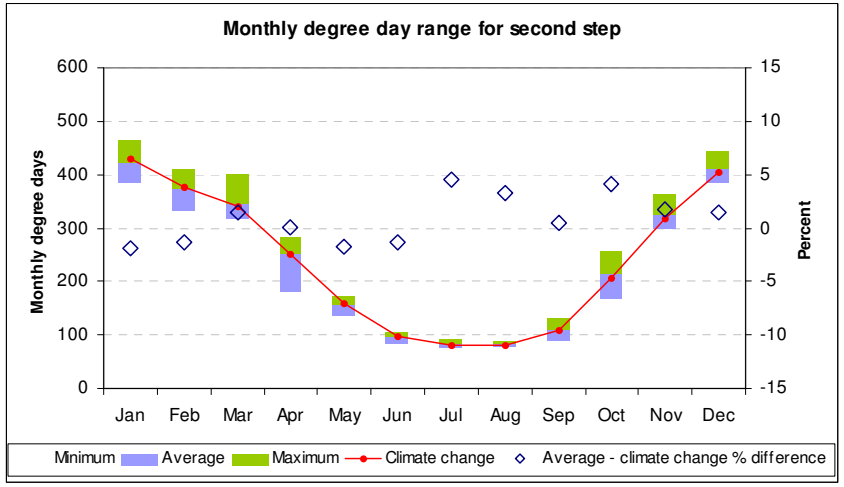
8 Year Basis



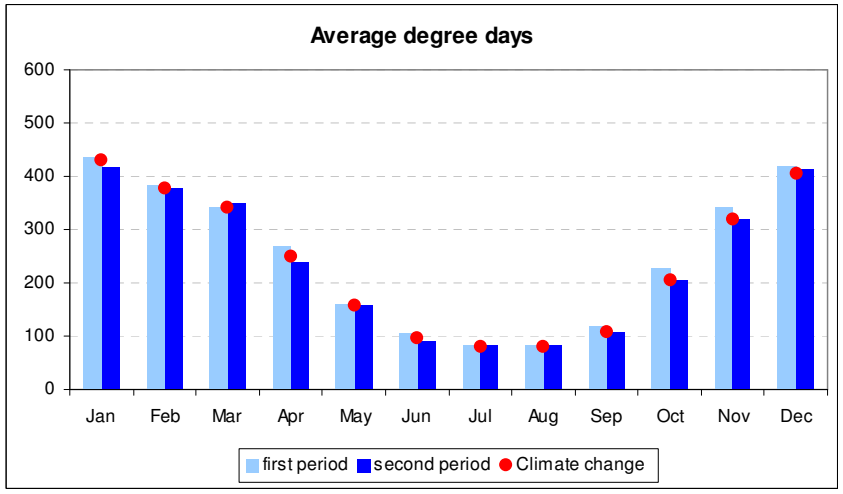
EA LDZ - Additional Graphs Page 2

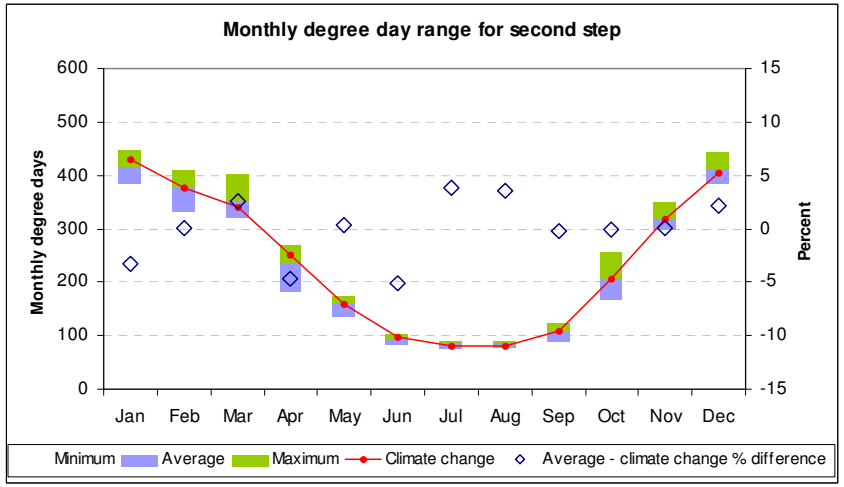
12 Year Basis





8 Year Basis

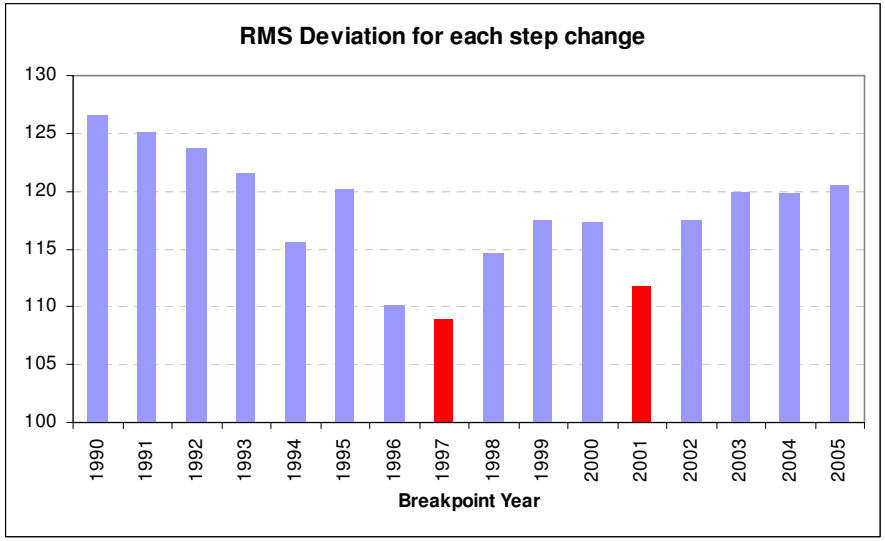




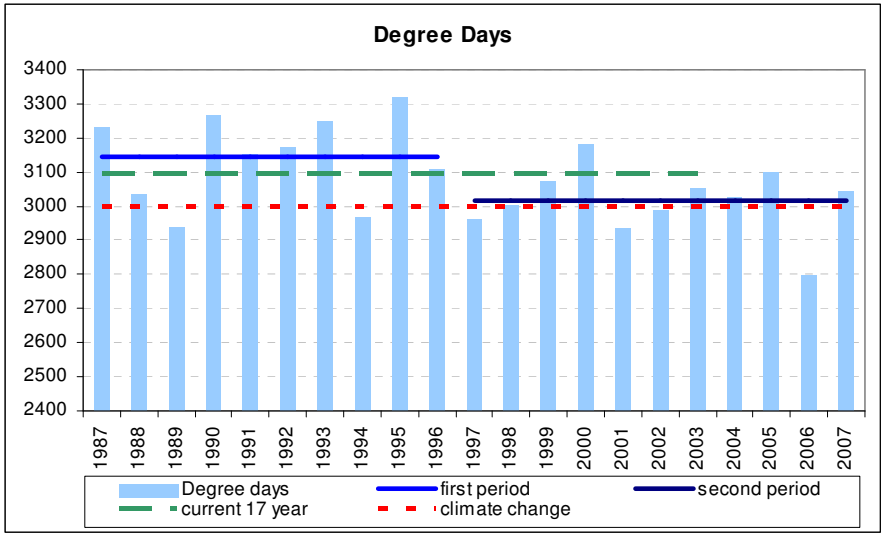
EA LDZ - Key Points from Additional Analysis

- 12 year basis **0.52% colder** than EP2 forecast climatology for 2010/11 to 2014/15.
- 8 year basis **0.23% warmer** than EP2 forecast climatology for 2010/11 to 2014/15.
- For 12 year basis, the max. abs. monthly % difference is 4.5% (all yr.) and 4.2% (main heating months).
- For 8 year basis, the max. abs. monthly % difference is 5.1% (all yr.) and 4.7% (main heating months).
- Monthly Max. % differences all year and in heating months a little worse for shorter period due to June & April.
- The 'within year' profile is slightly better for 12 year basis.
- 8 year basis is actually warmer than forecast weather.

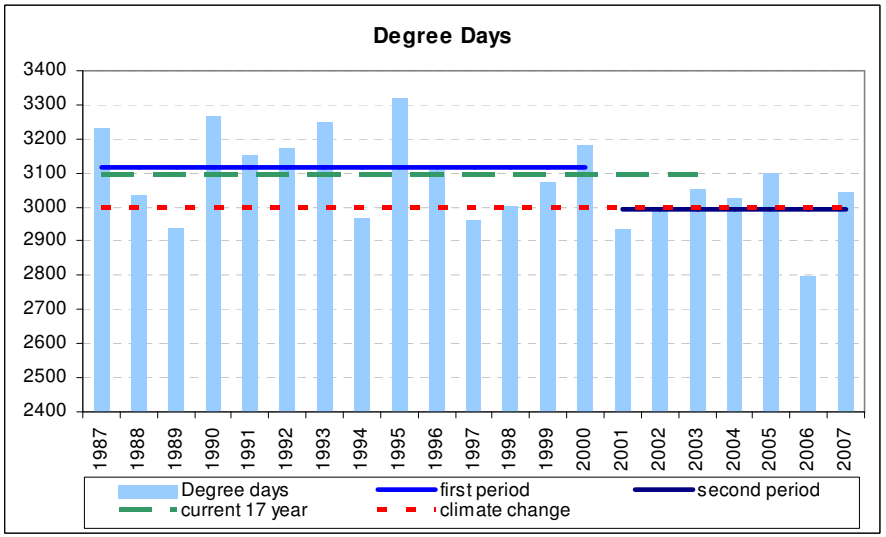
NT LDZ - Additional Graphs Page 1



12 Year Basis

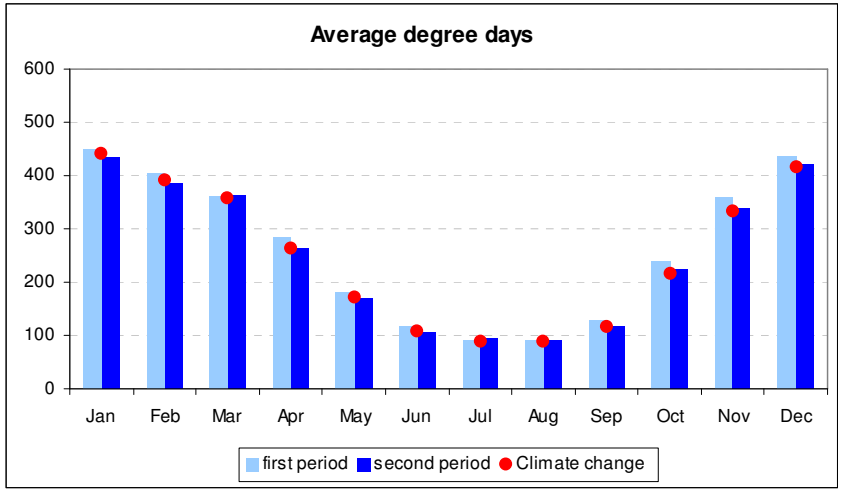


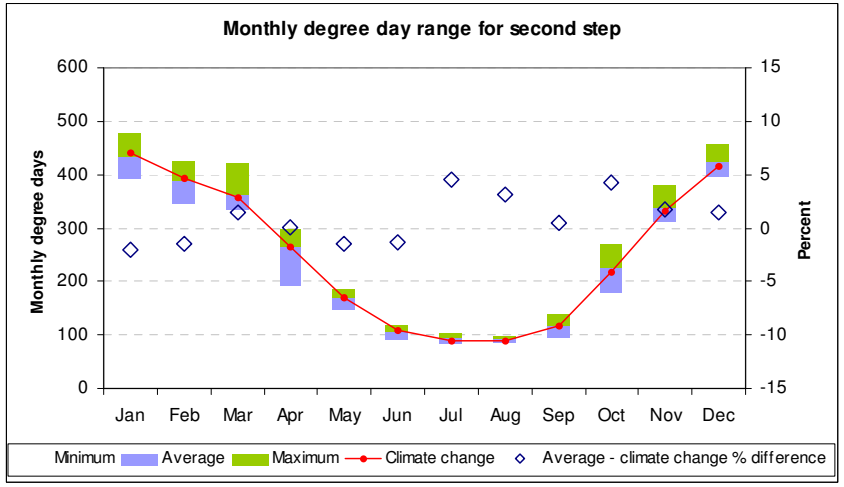
8 Year Basis



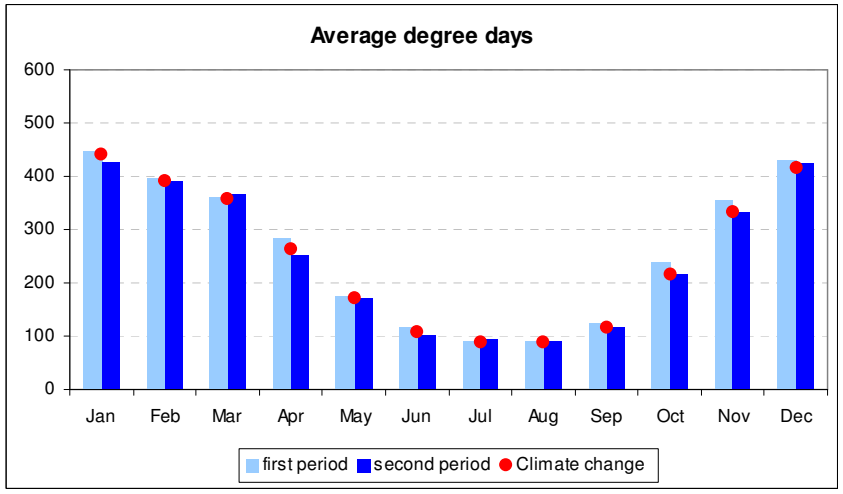
NT LDZ - Additional Graphs Page 2

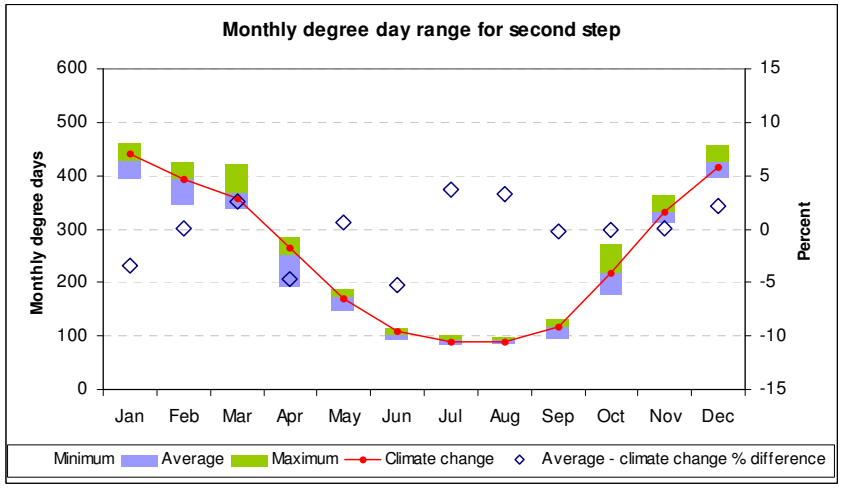
12 Year Basis





8 Year Basis





NT LDZ - Key Points from Additional Analysis

- 12 year basis **0.51% colder** than EP2 forecast climatology for 2010/11 to 2014/15.
- 8 year basis **0.24% warmer** than EP2 forecast climatology for 2010/11 to 2014/15.
- For 12 year basis, the max. abs. monthly % difference is 4.5% (all yr.) and 4.2% (main heating months).
- For 8 year basis, the max. abs. monthly % difference is 5.2% (all yr.) and 4.6% (main heating months).
- Monthly Max. % differences all year and in heating months a little worse for shorter period due to June & April.
- The 'within year' profile is slightly better for 12 year basis.
- 8 year basis is actually warmer than forecast weather.