1 Bullet Points

Throughout we call the period 2060-2080 the far future (FF), the period 2020-2040 the near future (NF) and the period 1990-2010 the near past (NP).

Figure 1

- Consumption forecasts are higher in the FF, than in the NF which are higher than those in the NP.
- Runs for the same Global Climate Model (GCM) from the same period have similar consumption forecasts.
- Some differences between consumption forecasts from different GCMs.
- The single dwelling Q2 forecast range is higher than the single dwelling annual forecast range which in turn is higher than the all segments annual forecast range.
- The single dwelling Q2 median increases are higher than the single dwelling annual median increases which are higher than the all segments annual median increases.
- The GCM with the highest NF range (CCCMA) has the lowest FF range.

Figure 2

- Total annual consumption forecasts increase with financial year due to population increase.
- The increase in median consumption from 2014/15 to 2024/25 due to population increase is 50.5GL (NP), 51.9GL (NF) and 53GL (FF).
- The increase in median consumption from the NP to the NF due to climate is in the range 14.1GL (2014/15) to 16.6GL (2024/25) and is equal to approximately 3 years of increase in median consumption due to population.
- Increase in NP median consumption over 11 years is approximately equal to the range of consumption forecasts for a single year and all models.

Figure 3

- In the NP climate, the no singles (NS) forecasts, the current mixture (CM) forecasts and the all singles (AS) forecasts have similar median values.
- In the FF climate, the median AS forecasts greater than the median CM forecasts which are greater than the median NS forecasts.
- For all climates, the range of AS forecasts is greater than the range of CM forecasts, which in turn is greater than the range of NS forecasts.

Figure 4

- Consumption forecasts are higher in the FF, than in the NF which are in turn higher than those in the NP.
- The unit consumption range is less than the single dwelling consumption range.
- The mean and range of the Q1 and Q4 forecasts are less than the mean and range of the Q2 and Q3 forecasts.

- The Q2 mean is greater than the Q3 mean
- The Q3 range is greater than the Q2 range
- The range in the FF is generally higher than the range in the NF which in turn is generally higher than the range in the NP.

Figure 5

- There is a clear trend from PR to NF to FF in TMAX and GT30C.
- The presence of a trend in PRE and GT2MM is much less clear, though FF PRE and FF GT2MM are generally higher than NF PRE and NF GT2MM respectively.
- Runs from a particular period and GCM have similar statistics for all weather variables.
- In the NP, weather variables from all runs and GCMs have almost identical means due to the bias correction process, but there are some differences between the standard deviations.
- GCMs with low weather variable standard deviations tend to have low consumption forecast ranges. For example NP (CSIRO), NF (CSIRO) and FF (CCCMA).
- The change in the mean of a weather variable from NP to NF is generally a poor predictor of the change in the mean of that weather variable from NF to FF. For example, CSIRO PRE decreases NP to NF by 50-100 mm and increases a bit less than that NF to FF. Whereas ECHAM PRE in almost unchanged NP to NF yet increases by about 100mm NF to FF and the CSIRO PRE increase by 50-100mm NP to NF and in almost unchanged NF to FF.
- This is also true for the standard deviation of weather variables. The standard deviation of CCCMA TMAX increases from NP to NF by about 0.1 and decrease from NF to FF by about 0.2. Whereas, the standard deviation of CSIRO TMAX is almost unchanged from NP to NF but increases by 0.2 from NF to FF.

2 Other Material

Chapter 3 of [**?**] contains a study on the per capita water consumption of different dwelling types in Sydney.

References

[Troy et al., 2005] Troy, P., Holloway, D., and Randolph, B. (2005). *Water use and the built environment: patterns of water consumption in Sydney.* City Futures Research Report No. 1, City Futures Research Centre, Faculty of Built Environment, UNSW.

Total Annual Consumption (2018/2019) - Period: 1990-2010

Model	Run	Min (GL)	Med (GL)	Max (GL)	†Range (%)	*Inc (%)	Skew
CCCMA3.1	R1	463.4	479.8	498.4	7.28	0.00	0.29
CCCMA3.1	R2	465.0	479.0	497.8	6.85	0.00	0.13
CCCMA3.1	R3	464.8	479.7	498.6	7.03	0.00	0.21
CSIRO-MK3.0	R1	465.3	479.0	495.7	6.36	0.00	0.13
CSIRO-MK3.0	R2	466.9	479.2	491.1	5.05	0.00	-0.05
CSIRO-MK3.0	R3	465.9	479.4	491.6	5.36	0.00	-0.14
ECHAM5	R1	461.8	479.5	497.7	7.48	0.00	0.01
ECHAM5	R2	464.4	479.1	495.8	6.56	0.00	0.12
ECHAM5	R3	462.9	479.6	494.5	6.57	0.00	0.01
MIROC3.2	R1	465.6	480.2	496.7	6.47	0.00	0.16
MIROC3.2	R2	463.6	479.4	498.9	7.37	0.00	0.17
MIROC3.2	R3	460.7	479.7	499.7	8.14	0.00	-0.09

Total Annual Consumption (2018/2019) - Period: 2020-2040

Model	Run	Min (GL)	Med (GL)	Max (GL)	†Range(%)	*Inc (%)	Skew
CCCMA3.1	R1	463.5	484.0	509.4	9.49	0.87	0.30
CCCMA3.1	R2	463.5	484.4	507.5	9.09	1.13	0.27
CCCMA3.1	R3	463.8	484.3	509.8	9.49	0.95	0.25
CSIRO-MK3.0	R1	472.7	488.0	503.4	6.30	1.89	0.01
CSIRO-MK3.0	R2	471.5	486.0	500.0	5.87	1.43	0.05
CSIRO-MK3.0	R3	471.8	487.2	498.9	5.57	1.62	-0.20
ECHAM5	R1	473.0	487.9	505.0	6.55	1.75	0.04
ECHAM5	R2	473.1	488.1	504.1	6.36	1.88	-0.04
ECHAM5	R3	470.7	486.9	505.4	7.13	1.52	-0.05
MIROC3.2	R1	463.3	480.1	502.7	8.21	-0.02	0.21
MIROC3.2	R2	463.5	481.1	501.5	7.89	0.36	-0.03
MIROC3.2	R3	465.7	483.2	500.7	7.25	0.72	-0.03

Total Annual Consumption (2018/2019) - Period: 2060-2080

Model	Run	Min (GL)	Med (GL)	Max (GL)	†Range(%)	*Inc (%)	Skew
CCCMA3.1	R1	478.2	493.6	509.3	6.31	2.88	-0.17
CCCMA3.1	R2	481.8	494.8	510.6	5.82	3.31	0.18
CCCMA3.1	R3	477.0	493.4	513.9	7.49	2.84	0.36
CSIRO-MK3.0	R1	475.6	500.2	528.0	10.49	4.43	0.16
CSIRO-MK3.0	R2	475.3	497.1	521.5	9.29	3.74	0.12
CSIRO-MK3.0	R3	474.5	494.3	519.7	9.15	3.10	0.32
ECHAM5	R1	476.7	496.3	521.2	8.96	3.49	0.25
ECHAM5	R2	479.3	499.3	525.0	9.15	4.21	0.33
ECHAM5	R3	480.2	497.7	519.8	7.96	3.77	0.06
MIROC3.2	R1	470.0	490.0	512.8	8.74	2.04	0.13
MIROC3.2	R2	471.8	492.5	512.4	8.25	2.73	-0.09
MIROC3.2	R3	471.7	489.2	507.7	7.36	1.99	-0.00

† Range = (Maximum-Minimum)/Median

* Percentage increase of median consumption over 1990-2010 median consumption

Total Annual Consumption (2019/2020) - Period: 1990-2010

Model	Run	Min (GL)	Med (GL)	Max (GL)	†Range (%)	*Inc (%)	Skew
CCCMA3.1	R1	466.1	484.2	504.6	7.96	0.00	0.09
CCCMA3.1	R2	469.1	485.0	502.8	6.96	0.00	0.04
CCCMA3.1	R3	469.8	485.5	506.5	7.56	0.00	0.42
CSIRO-MK3.0	R1	471.3	484.4	503.6	6.67	0.00	0.44
CSIRO-MK3.0	R2	472.2	484.5	498.9	5.51	0.00	0.22
CSIRO-MK3.0	R3	472.3	484.3	498.4	5.38	0.00	0.26
ECHAM5	R1	469.9	483.8	509.8	8.25	0.00	0.59
ECHAM5	R2	468.0	483.3	507.4	8.15	0.00	0.52
ECHAM5	R3	467.4	484.3	506.5	8.06	0.00	0.25
MIROC3.2	R1	470.9	484.7	500.8	6.17	0.00	0.27
MIROC3.2	R2	468.8	484.3	505.1	7.48	0.00	0.27
MIROC3.2	R3	467.4	485.0	505.7	7.88	0.00	0.18

Total Annual Consumption (2019/2020) - Period: 2020-2040

Model	Run	Min (GL)	Med (GL)	Max (GL)	†Range(%)	*Inc (%)	Skew
CCCMA3.1	R1	461.3	488.7	514.1	10.80	0.93	-0.13
CCCMA3.1	R2	467.6	488.7	517.0	10.12	0.75	0.16
CCCMA3.1	R3	467.5	489.0	512.9	9.28	0.72	0.11
CSIRO-MK3.0	R1	478.8	493.0	510.0	6.32	1.79	0.15
CSIRO-MK3.0	R2	475.9	490.9	507.3	6.41	1.32	0.07
CSIRO-MK3.0	R3	480.1	492.1	511.4	6.37	1.62	0.43
ECHAM5	R1	477.6	492.9	512.0	6.97	1.90	0.07
ECHAM5	R2	478.5	493.6	508.8	6.14	2.14	-0.01
ECHAM5	R3	478.7	492.5	512.7	6.90	1.69	0.36
MIROC3.2	R1	466.7	484.4	503.0	7.48	-0.06	-0.00
MIROC3.2	R2	471.6	485.6	511.2	8.16	0.27	0.39
MIROC3.2	R3	472.0	487.4	512.1	8.23	0.51	0.33

Total Annual Consumption (2019/2020) - Period: 2060-2080

Model	Run	Min (GL)	Med (GL)	Max (GL)	†Range(%)	*Inc (%)	Skew
CCCMA3.1	R1	484.9	498.0	519.6	6.96	2.86	0.38
CCCMA3.1	R2	487.0	499.8	515.3	5.66	3.06	0.12
CCCMA3.1	R3	484.0	498.4	517.6	6.74	2.65	0.19
CSIRO-MK3.0	R1	485.7	504.3	527.8	8.34	4.12	0.27
CSIRO-MK3.0	R2	483.1	500.5	528.8	9.13	3.31	0.37
CSIRO-MK3.0	R3	482.1	500.0	523.6	8.31	3.24	0.15
ECHAM5	R1	486.1	502.2	525.6	7.86	3.82	0.33
ECHAM5	R2	481.7	504.6	536.8	10.93	4.42	0.42
ECHAM5	R3	485.9	502.9	527.3	8.24	3.85	0.35
MIROC3.2	R1	478.5	494.9	518.7	8.11	2.10	0.36
MIROC3.2	R2	480.0	497.7	523.5	8.74	2.75	0.34
MIROC3.2	R3	476.5	494.7	519.1	8.62	2.00	0.21

† Range = (Maximum-Minimum)/Median

* Percentage increase of median consumption over 1990-2010 median consumption

Total Annual Consumption (2020/2021) - Period: 1990-2010

Model	Run	Min (GL)	Med (GL)	Max (GL)	†Range (%)	*Inc (%)	Skew
CCCMA3.1	R1	469.8	487.8	514.5	9.18	0.00	0.52
CCCMA3.1	R2	474.4	488.4	508.6	7.01	0.00	0.43
CCCMA3.1	R3	472.3	488.5	512.6	8.26	0.00	0.57
CSIRO-MK3.0	R1	473.8	488.2	507.9	6.99	0.00	0.24
CSIRO-MK3.0	R2	476.8	488.8	507.2	6.22	0.00	0.54
CSIRO-MK3.0	R3	475.8	488.6	509.0	6.78	0.00	0.59
ECHAM5	R1	474.2	488.0	515.7	8.52	0.00	0.71
ECHAM5	R2	471.3	488.4	518.5	9.68	0.00	0.64
ECHAM5	R3	471.9	488.2	520.5	9.97	0.00	0.76
MIROC3.2	R1	473.5	489.1	513.6	8.19	0.00	0.73
MIROC3.2	R2	471.1	488.2	515.4	9.06	0.00	0.79
MIROC3.2	R3	472.4	488.6	514.4	8.60	0.00	0.57

Total Annual Consumption (2020/2021) - Period: 2020-2040

Model	Run	Min (GL)	Med (GL)	Max (GL)	†Range(%)	*Inc (%)	Skew
CCCMA3.1	R1	466.8	491.9	522.4	11.29	0.85	0.32
CCCMA3.1	R2	472.7	492.7	527.7	11.16	0.87	0.58
CCCMA3.1	R3	469.8	492.6	522.4	10.68	0.84	0.34
CSIRO-MK3.0	R1	482.0	496.8	519.8	7.61	1.76	0.43
CSIRO-MK3.0	R2	481.4	496.1	516.2	7.02	1.49	0.57
CSIRO-MK3.0	R3	481.4	496.6	514.1	6.58	1.63	0.34
ECHAM5	R1	480.5	497.1	520.6	8.05	1.85	0.50
ECHAM5	R2	481.3	497.3	519.3	7.64	1.81	0.36
ECHAM5	R3	479.8	495.9	524.1	8.94	1.57	0.62
MIROC3.2	R1	470.7	488.2	518.5	9.79	-0.18	0.46
MIROC3.2	R2	471.9	489.9	512.6	8.31	0.34	0.23
MIROC3.2	R3	474.9	491.9	517.7	8.70	0.68	0.38

Total Annual Consumption (2020/2021) - Period: 2060-2080

Model	Run	Min (GL)	Med (GL)	Max (GL)	†Range(%)	*Inc (%)	Skew
CCCMA3.1	R1	488.6	502.4	522.6	6.77	3.01	0.52
CCCMA3.1	R2	486.5	503.5	523.2	7.28	3.09	0.23
CCCMA3.1	R3	484.1	502.0	521.2	7.39	2.74	0.35
CSIRO-MK3.0	R1	484.0	508.4	540.0	11.01	4.13	0.32
CSIRO-MK3.0	R2	481.1	505.2	537.7	11.21	3.37	0.68
CSIRO-MK3.0	R3	482.8	503.7	537.9	10.95	3.08	0.61
ECHAM5	R1	484.6	505.3	541.0	11.18	3.54	0.58
ECHAM5	R2	486.3	507.9	549.9	12.53	3.98	0.78
ECHAM5	R3	486.2	507.2	541.3	10.87	3.89	0.49
MIROC3.2	R1	481.4	499.4	532.9	10.29	2.09	0.68
MIROC3.2	R2	483.1	501.8	541.0	11.54	2.80	0.87
MIROC3.2	R3	479.5	497.9	536.4	11.43	1.90	0.73

† Range = (Maximum-Minimum)/Median

* Percentage increase of median consumption over 1990-2010 median consumption

Total Annual Consumption (2021/2022) - Period: 1990-2010

Model	Run	Min (GL)	Med (GL)	Max (GL)	†Range (%)	*Inc (%)	Skew
CCCMA3.1	R1	480.2	494.9	517.4	7.52	0.00	0.34
CCCMA3.1	R2	480.2	494.1	510.4	6.12	0.00	0.09
CCCMA3.1	R3	481.0	495.2	510.9	6.03	0.00	0.07
CSIRO-MK3.0	R1	480.2	494.8	509.6	5.93	0.00	-0.03
CSIRO-MK3.0	R2	480.7	494.2	507.4	5.41	0.00	-0.04
CSIRO-MK3.0	R3	479.0	493.8	507.7	5.80	0.00	-0.17
ECHAM5	R1	477.1	495.2	513.8	7.40	0.00	0.05
ECHAM5	R2	478.8	495.2	520.1	8.35	0.00	0.22
ECHAM5	R3	477.8	495.1	518.5	8.24	0.00	0.13
MIROC3.2	R1	478.7	495.5	512.2	6.77	0.00	-0.11
MIROC3.2	R2	481.0	493.9	511.0	6.08	0.00	0.21
MIROC3.2	R3	478.2	494.6	512.2	6.87	0.00	0.04

Total Annual Consumption (2021/2022) - Period: 2020-2040

Model	Run	Min (GL)	Med (GL)	Max (GL)	†Range(%)	*Inc (%)	Skew
CCCMA3.1	R1	478.4	499.7	526.3	9.59	0.98	0.22
CCCMA3.1	R2	478.4	500.5	527.2	9.75	1.29	0.23
CCCMA3.1	R3	479.8	500.5	524.9	9.00	1.07	0.21
CSIRO-MK3.0	R1	489.0	503.3	519.9	6.14	1.72	0.11
CSIRO-MK3.0	R2	484.7	502.1	518.5	6.71	1.59	-0.12
CSIRO-MK3.0	R3	489.4	502.4	519.6	6.00	1.75	0.05
ECHAM5	R1	488.7	503.3	520.6	6.35	1.64	0.18
ECHAM5	R2	489.4	503.6	519.6	6.01	1.71	0.01
ECHAM5	R3	486.3	503.8	522.6	7.20	1.75	0.03
MIROC3.2	R1	476.2	495.2	516.3	8.11	-0.05	0.14
MIROC3.2	R2	478.6	496.0	516.0	7.54	0.43	0.17
MIROC3.2	R3	480.9	498.3	514.3	6.70	0.74	-0.02

Total Annual Consumption (2021/2022) - Period: 2060-2080

Model	Run	Min (GL)	Med (GL)	Max (GL)	†Range(%)	*Inc (%)	Skew
CCCMA3.1	R1	495.7	508.0	522.0	5.19	2.64	0.09
CCCMA3.1	R2	495.4	509.7	525.3	5.86	3.16	-0.00
CCCMA3.1	R3	493.7	508.8	526.0	6.35	2.74	0.14
CSIRO-MK3.0	R1	493.4	515.4	537.5	8.56	4.17	0.06
CSIRO-MK3.0	R2	495.1	512.5	536.1	8.01	3.70	0.24
CSIRO-MK3.0	R3	489.0	510.2	538.6	9.73	3.34	0.21
ECHAM5	R1	491.5	512.5	538.2	9.12	3.51	0.19
ECHAM5	R2	493.4	515.6	545.8	10.16	4.12	0.11
ECHAM5	R3	490.2	513.6	536.9	9.09	3.73	0.03
MIROC3.2	R1	487.8	505.8	527.7	7.90	2.08	0.09
MIROC3.2	R2	488.0	508.8	534.8	9.21	3.02	0.08
MIROC3.2	R3	486.9	505.4	529.3	8.39	2.17	0.09

† Range = (Maximum-Minimum)/Median

* Percentage increase of median consumption over 1990-2010 median consumption

Single Dwelling Per Dwelling Annual Consumption - Period: 1990-2010

Model	Run	Min (kL)	Med (kL)	Max (kL)	†Range (%)	*Inc (%)	Skew
CCCMA3.1	R1	210.9	225.6	243.5	14.45	0.00	0.20
CCCMA3.1	R2	212.7	225.4	239.4	11.85	0.00	0.09
CCCMA3.1	R3	212.0	225.6	242.4	13.48	0.00	0.18
CSIRO-MK3.0	R1	213.7	225.4	238.9	11.15	0.00	0.09
CSIRO-MK3.0	R2	215.2	225.3	238.5	10.37	0.00	0.15
CSIRO-MK3.0	R3	214.5	225.4	239.5	11.08	0.00	0.07
ECHAM5	R1	211.6	225.7	243.9	14.31	0.00	0.24
ECHAM5	R2	211.3	225.4	246.0	15.42	0.00	0.32
ECHAM5	R3	211.7	225.5	247.6	15.92	0.00	0.28
MIROC3.2	R1	212.9	225.8	242.6	13.16	0.00	0.21
MIROC3.2	R2	212.1	225.5	243.8	14.05	0.00	0.30
MIROC3.2	R3	210.9	225.7	243.3	14.33	0.00	0.11

Single Dwelling Per Dwelling Annual Consumption - Period: 2020-2040

Model	Run	Min (kL)	Med (kL)	Max (kL)	†Range(%)	*Inc (%)	Skew
CCCMA3.1	R1	209.2	228.7	250.8	18.22	1.39	0.11
CCCMA3.1	R2	212.2	229.1	252.5	17.59	1.65	0.22
CCCMA3.1	R3	212.8	229.0	249.1	15.83	1.50	0.12
CSIRO-MK3.0	R1	218.0	231.1	246.8	12.47	2.54	0.07
CSIRO-MK3.0	R2	216.8	230.1	247.2	13.21	2.13	0.12
CSIRO-MK3.0	R3	219.3	230.6	244.9	11.10	2.30	0.09
ECHAM5	R1	217.4	231.2	247.4	12.98	2.44	0.11
ECHAM5	R2	218.6	231.3	246.5	12.06	2.60	0.03
ECHAM5	R3	217.1	230.9	249.7	14.12	2.37	0.14
MIROC3.2	R1	210.9	225.7	245.7	15.44	-0.04	0.15
MIROC3.2	R2	212.3	226.6	243.9	13.98	0.49	0.10
MIROC3.2	R3	214.2	227.7	245.3	13.64	0.87	0.07

Single Dwelling Per Dwelling Annual Consumption - Period: 2060-2080

Model	Run	Min (kL)	Med (kL)	Max (kL)	†Range(%)	*Inc (%)	Skew
CCCMA3.1	R1	223.1	234.7	249.9	11.40	4.06	0.12
CCCMA3.1	R2	222.4	235.7	249.2	11.37	4.59	0.08
CCCMA3.1	R3	220.1	234.7	250.2	12.81	4.05	0.08
CSIRO-MK3.0	R1	220.9	239.0	261.4	16.96	6.03	0.21
CSIRO-MK3.0	R2	219.9	236.9	259.7	16.79	5.15	0.27
CSIRO-MK3.0	R3	218.3	235.8	259.3	17.35	4.60	0.24
ECHAM5	R1	220.3	237.2	261.7	17.45	5.11	0.22
ECHAM5	R2	220.8	239.1	268.0	19.77	6.07	0.28
ECHAM5	R3	221.1	237.9	261.8	17.10	5.48	0.19
MIROC3.2	R1	217.1	232.4	255.6	16.60	2.92	0.18
MIROC3.2	R2	218.1	234.3	261.4	18.49	3.91	0.27
MIROC3.2	R3	216.5	232.1	258.1	17.94	2.80	0.18

† Range = (Maximum-Minimum)/Median

* Percentage increase of median consumption over 1990-2010 median consumption

Single Dwelling Per Dwelling Q2 Consumption - Period: 1990-2010

Model	Run	Min (kL)	Med (kL)	Max (kL)	†Range (%)	*Inc (%)	Skew
CCCMA3.1	R1	53.3	59.1	65.8	21.09	0.00	0.22
CCCMA3.1	R2	54.5	59.0	65.9	19.25	0.00	0.14
CCCMA3.1	R3	53.6	59.4	64.8	18.81	0.00	0.21
CSIRO-MK3.0	R1	55.7	60.4	65.4	16.09	0.00	0.15
CSIRO-MK3.0	R2	55.7	60.4	65.9	16.97	0.00	0.12
CSIRO-MK3.0	R3	56.0	60.6	65.7	16.09	0.00	0.07
ECHAM5	R1	55.6	60.7	68.4	21.10	0.00	0.28
ECHAM5	R2	55.2	60.3	67.5	20.32	0.00	0.26
ECHAM5	R3	55.7	60.9	67.4	19.35	0.00	0.32
MIROC3.2	R1	56.0	60.8	67.6	19.09	0.00	0.23
MIROC3.2	R2	55.0	60.7	66.6	19.01	0.00	0.19
MIROC3.2	R3	55.3	61.1	67.6	20.15	0.00	0.07

Single Dwelling Per Dwelling Q2 Consumption - Period: 2020-2040

Model	Run	Min (kL)	Med (kL)	Max (kL)	†Range(%)	*Inc (%)	Skew
CCCMA3.1	R1	54.6	60.8	68.7	23.21	2.90	0.14
CCCMA3.1	R2	54.5	60.6	67.7	21.79	2.61	0.19
CCCMA3.1	R3	55.6	61.4	68.5	21.04	3.50	0.13
CSIRO-MK3.0	R1	55.3	61.6	68.1	20.82	1.96	0.09
CSIRO-MK3.0	R2	56.4	61.7	68.3	19.32	2.19	0.16
CSIRO-MK3.0	R3	57.0	61.5	66.6	15.70	1.52	0.17
ECHAM5	R1	57.4	62.7	68.7	17.95	3.30	0.14
ECHAM5	R2	56.3	62.2	67.6	18.11	3.06	0.07
ECHAM5	R3	57.1	62.6	68.9	18.81	2.87	0.14
MIROC3.2	R1	55.4	61.0	67.9	20.57	0.27	0.18
MIROC3.2	R2	55.7	60.9	67.4	19.13	0.35	0.14
MIROC3.2	R3	55.7	61.6	67.8	19.72	0.84	0.17

Single Dwelling Per Dwelling Q2 Consumption - Period: 2060-2080

Model	Run	Min (kL)	Med (kL)	Max (kL)	†Range(%)	*Inc (%)	Skew
CCCMA3.1	R1	57.7	62.5	69.3	18.48	5.82	0.20
CCCMA3.1	R2	57.4	62.5	68.5	17.67	5.99	0.15
CCCMA3.1	R3	57.9	62.9	69.6	18.62	6.00	0.06
CSIRO-MK3.0	R1	59.0	65.0	73.1	21.71	7.58	0.23
CSIRO-MK3.0	R2	57.2	64.4	73.5	25.33	6.67	0.25
CSIRO-MK3.0	R3	58.1	64.1	71.7	21.24	5.76	0.25
ECHAM5	R1	59.4	65.6	72.7	20.40	8.17	0.18
ECHAM5	R2	58.5	65.5	74.3	24.02	8.60	0.28
ECHAM5	R3	59.3	65.7	74.3	22.86	7.98	0.19
MIROC3.2	R1	57.3	63.0	70.3	20.68	3.66	0.20
MIROC3.2	R2	56.3	63.8	72.1	24.76	5.08	0.23
MIROC3.2	R3	56.9	63.4	71.4	22.93	3.83	0.18

† Range = (Maximum-Minimum)/Median

* Percentage increase of median consumption over 1990-2010 median consumption

Total Annual Consumption (2019/2020) - Period: 1990-2010 - No Single Dwellings

Model	Run	Min (GL)	Med (GL)	Max (GL)	†Range (%)	*Inc (%)	Skew
CCCMA3.1	R1	473.4	482.8	493.4	4.14	0.00	0.04
CCCMA3.1	R2	475.2	483.4	491.7	3.41	0.00	-0.02
CCCMA3.1	R3	475.7	483.5	493.8	3.73	0.00	0.37
CSIRO-MK3.0	R1	476.7	483.0	492.4	3.26	0.00	0.44
CSIRO-MK3.0	R2	476.6	483.1	490.6	2.89	0.00	0.20
CSIRO-MK3.0	R3	477.0	483.1	490.5	2.79	0.00	0.26
ECHAM5	R1	475.7	482.7	495.8	4.16	0.00	0.53
ECHAM5	R2	474.6	482.6	494.3	4.09	0.00	0.45
ECHAM5	R3	474.0	482.9	494.3	4.20	0.00	0.20
MIROC3.2	R1	475.7	483.2	491.4	3.24	0.00	0.21
MIROC3.2	R2	475.0	483.0	493.6	3.85	0.00	0.22
MIROC3.2	R3	474.2	483.2	493.6	4.02	0.00	0.13

Total Annual Consumption (2019/2020) - Period: 2020-2040 - No Single Dwellings

Model	Run	Min (GL)	Med (GL)	Max (GL)	†Range(%)	*Inc (%)	Skew
CCCMA3.1	R1	470.8	485.1	497.0	5.40	0.48	-0.22
CCCMA3.1	R2	474.1	485.2	499.3	5.18	0.39	0.11
CCCMA3.1	R3	474.0	485.1	496.8	4.70	0.34	0.03
CSIRO-MK3.0	R1	480.9	487.4	495.5	2.99	0.91	0.12
CSIRO-MK3.0	R2	478.8	486.4	494.2	3.17	0.69	0.02
CSIRO-MK3.0	R3	481.4	487.1	496.3	3.04	0.84	0.45
ECHAM5	R1	479.5	487.2	496.3	3.44	0.95	0.03
ECHAM5	R2	480.1	487.6	494.8	3.01	1.04	-0.02
ECHAM5	R3	480.0	487.2	497.2	3.53	0.88	0.32
MIROC3.2	R1	473.7	483.1	492.6	3.90	-0.02	-0.06
MIROC3.2	R2	476.6	483.9	496.3	4.08	0.18	0.35
MIROC3.2	R3	477.3	484.7	496.7	3.99	0.32	0.31

Total Annual Consumption (2019/2020) - Period: 2060-2080 - No Single Dwellings

Model	Run	Min (GL)	Med (GL)	Max (GL)	†Range(%)	*Inc (%)	Skew
CCCMA3.1	R1	484.1	489.9	499.8	3.21	1.46	0.33
CCCMA3.1	R2	484.6	490.6	497.8	2.69	1.51	0.07
CCCMA3.1	R3	483.0	490.0	499.2	3.32	1.34	0.14
CSIRO-MK3.0	R1	483.9	492.9	504.0	4.09	2.03	0.22
CSIRO-MK3.0	R2	483.0	491.1	504.7	4.43	1.65	0.32
CSIRO-MK3.0	R3	481.8	490.9	502.3	4.17	1.63	0.08
ECHAM5	R1	484.1	492.0	503.0	3.86	1.94	0.27
ECHAM5	R2	481.5	493.2	508.3	5.43	2.19	0.37
ECHAM5	R3	484.2	492.4	503.9	4.01	1.96	0.30
MIROC3.2	R1	480.2	488.9	500.6	4.16	1.18	0.30
MIROC3.2	R2	481.2	489.9	502.0	4.23	1.43	0.28
MIROC3.2	R3	479.1	488.2	500.4	4.37	1.04	0.16

† Range = (Maximum-Minimum)/Median

* Percentage increase of median consumption over 1990-2010 median consumption

Total Annual Consumption (2019/2020) - Period: 1990-2010 - All Single Dwellings

Model	Run	Min (GL)	Med (GL)	Max (GL)	†Range (%)	*Inc (%)	Skew
CCCMA3.1	R1	462.3	484.3	509.1	9.67	0.00	0.10
CCCMA3.1	R2	465.7	485.3	507.3	8.57	0.00	0.05
CCCMA3.1	R3	466.6	485.8	511.7	9.28	0.00	0.43
CSIRO-MK3.0	R1	468.3	484.5	508.1	8.20	0.00	0.44
CSIRO-MK3.0	R2	469.7	484.6	502.0	6.66	0.00	0.23
CSIRO-MK3.0	R3	469.7	484.3	501.2	6.50	0.00	0.26
ECHAM5	R1	466.9	483.7	515.6	10.07	0.00	0.61
ECHAM5	R2	464.5	482.9	512.7	9.98	0.00	0.54
ECHAM5	R3	464.0	484.4	511.3	9.77	0.00	0.26
MIROC3.2	R1	468.2	484.9	504.4	7.47	0.00	0.28
MIROC3.2	R2	465.5	484.4	509.6	9.10	0.00	0.28
MIROC3.2	R3	463.9	485.2	510.5	9.60	0.00	0.19

Total Annual Consumption (2019/2020) - Period: 2020-2040 - All Single Dwellings

Model	Run	Min (GL)	Med (GL)	Max (GL)	†Range(%)	*Inc (%)	Skew
CCCMA3.1	R1	456.4	489.6	521.2	13.23	1.09	-0.11
CCCMA3.1	R2	464.0	489.6	524.3	12.32	0.89	0.17
CCCMA3.1	R3	463.9	490.1	519.4	11.33	0.89	0.12
CSIRO-MK3.0	R1	477.2	494.9	515.9	7.82	2.14	0.15
CSIRO-MK3.0	R2	473.8	492.2	512.6	7.88	1.57	0.07
CSIRO-MK3.0	R3	478.8	493.7	517.6	7.87	1.94	0.43
ECHAM5	R1	476.1	494.9	518.4	8.56	2.30	0.08
ECHAM5	R2	477.2	495.6	514.5	7.54	2.62	-0.00
ECHAM5	R3	477.4	494.2	519.1	8.44	2.02	0.36
MIROC3.2	R1	462.9	484.4	507.3	9.15	-0.09	0.01
MIROC3.2	R2	468.6	485.8	517.3	10.03	0.29	0.39
MIROC3.2	R3	468.9	488.2	518.4	10.13	0.61	0.33

Total Annual Consumption (2019/2020) - Period: 2060-2080 - All Single Dwellings

Model	Run	Min (GL)	Med (GL)	Max (GL)	†Range(%)	*Inc (%)	Skew
CCCMA3.1	R1	484.5	500.9	527.7	8.64	3.44	0.39
CCCMA3.1	R2	487.1	503.3	522.4	7.01	3.70	0.12
CCCMA3.1	R3	483.7	501.4	525.1	8.27	3.21	0.20
CSIRO-MK3.0	R1	485.8	508.6	537.6	10.18	4.98	0.28
CSIRO-MK3.0	R2	482.5	504.1	538.8	11.18	4.01	0.38
CSIRO-MK3.0	R3	481.4	503.2	532.3	10.12	3.90	0.16
ECHAM5	R1	486.0	506.0	535.0	9.69	4.60	0.33
ECHAM5	R2	480.9	508.9	548.8	13.35	5.38	0.43
ECHAM5	R3	485.8	506.8	537.0	10.10	4.61	0.36
MIROC3.2	R1	476.9	496.7	525.9	9.85	2.43	0.37
MIROC3.2	R2	478.5	500.2	532.3	10.75	3.26	0.35
MIROC3.2	R3	474.3	496.6	526.6	10.53	2.35	0.22

† Range = (Maximum-Minimum)/Median

* Percentage increase of median consumption over 1990-2010 median consumption

Total Annual Consumption - Period: 1990-2010 - All models

Period	Fin Year	Min (GL)	Med (GL)	Max (GL)	†Range (%)	*Inc (%)	Skew
1990-2010	2015	439.3	457.1	482.9	9.54	0.00	0.32
1990-2010	2016	446.8	462.1	482.0	7.63	0.00	0.07
1990-2010	2017	450.4	470.9	496.3	9.74	0.00	0.37
1990-2010	2018	454.0	475.7	499.9	9.65	0.00	0.10
1990-2010	2019	460.7	479.4	499.7	8.14	0.00	0.09
1990-2010	2020	466.1	484.3	509.8	9.04	0.00	0.29
1990-2010	2021	469.8	488.4	520.5	10.39	0.00	0.65
1990-2010	2022	477.1	494.6	520.1	8.69	0.00	0.11
1990-2010	2023	481.0	500.2	526.0	8.98	0.00	0.31
1990-2010	2024	485.9	504.5	526.5	8.06	0.00	0.14
1990-2010	2025	486.1	507.6	528.9	8.44	0.00	0.07

Total Annual Consumption - Period: 2020-2040 - All models

Period	Fin Year	Min (GL)	Med (GL)	Max (GL)	†Range(%)	*Inc (%)	Skew
2020-2040	2015	437.0	462.6	490.9	11.64	1.22	0.04
2020-2040	2016	443.2	467.3	486.9	9.34	1.14	-0.12
2020-2040	2017	453.1	476.8	502.5	10.36	1.25	0.09
2020-2040	2018	458.1	481.8	505.4	9.83	1.28	-0.03
2020-2040	2019	463.3	485.0	509.8	9.59	1.17	-0.04
2020-2040	2020	461.3	490.2	517.0	11.36	1.21	-0.10
2020-2040	2021	466.8	494.2	527.7	12.32	1.20	0.21
2020-2040	2022	476.2	500.6	527.2	10.19	1.21	-0.03
2020-2040	2023	480.5	505.9	536.6	11.09	1.14	0.05
2020-2040	2024	485.4	510.9	534.9	9.69	1.27	-0.13
2020-2040	2025	487.5	514.5	536.3	9.49	1.36	-0.23

Total Annual Consumption - Period: 2060-2080 - All models

Period	Fin Year	Min (GL)	Med (GL)	Max (GL)	†Range(%)	*Inc (%)	Skew
2060-2080	2015	448.5	471.2	509.7	13.01	3.10	0.35
2060-2080	2016	454.4	476.7	500.4	9.65	3.16	0.14
2060-2080	2017	460.7	486.6	526.6	13.54	3.32	0.41
2060-2080	2018	464.0	491.3	520.3	11.47	3.27	0.24
2060-2080	2019	470.0	494.7	528.0	11.73	3.20	0.24
2060-2080	2020	476.5	499.6	536.8	12.09	3.15	0.37
2060-2080	2021	479.5	503.8	549.9	13.98	3.17	0.66
2060-2080	2022	486.9	510.8	545.8	11.52	3.27	0.22
2060-2080	2023	490.2	515.7	552.1	12.00	3.09	0.35
2060-2080	2024	496.4	520.6	553.1	10.89	3.19	0.11
2060-2080	2025	495.7	524.2	550.7	10.50	3.26	0.05

† Range = (Maximum-Minimum)/Median

* Percentage increase of median consumption over 1990-2010 median consumption

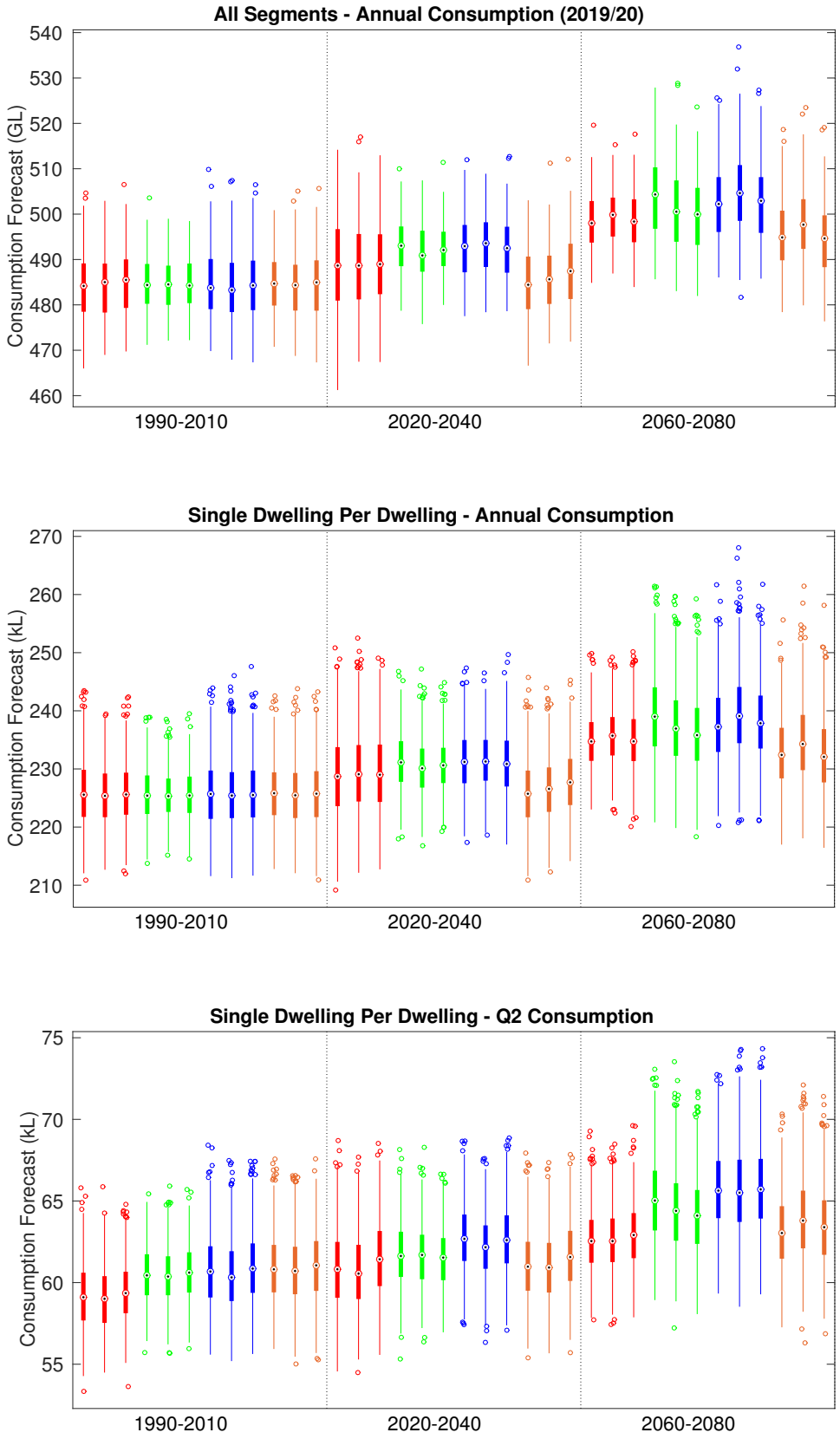

Figure 1: Consumption forecasts by model, (CCCMA3.1 - red, CSIRO-MK3.0 - green, ECHAM5 - blue and MIROC3.2 - orange).

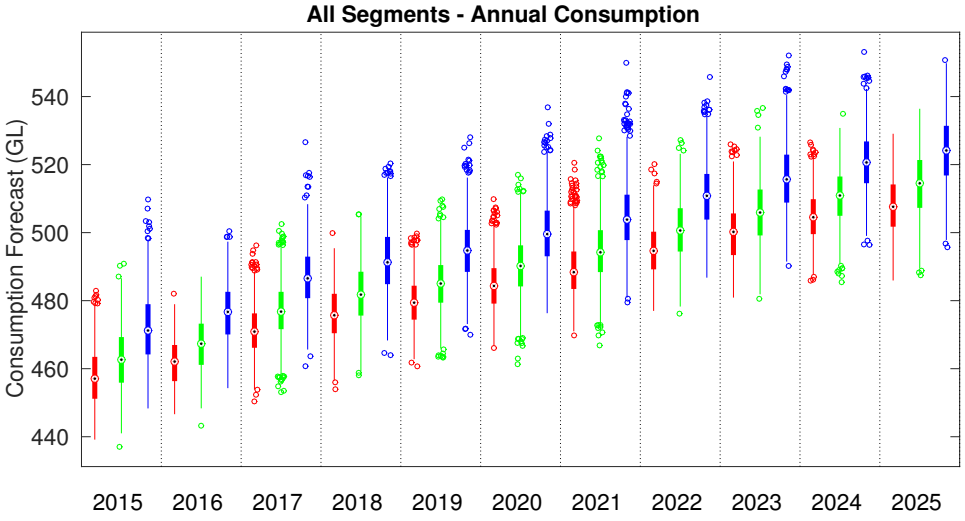

Figure 2: Consumption forecasts by year, (1990-2010 - red, 2020-2040 - green, 2060-2080 - blue).

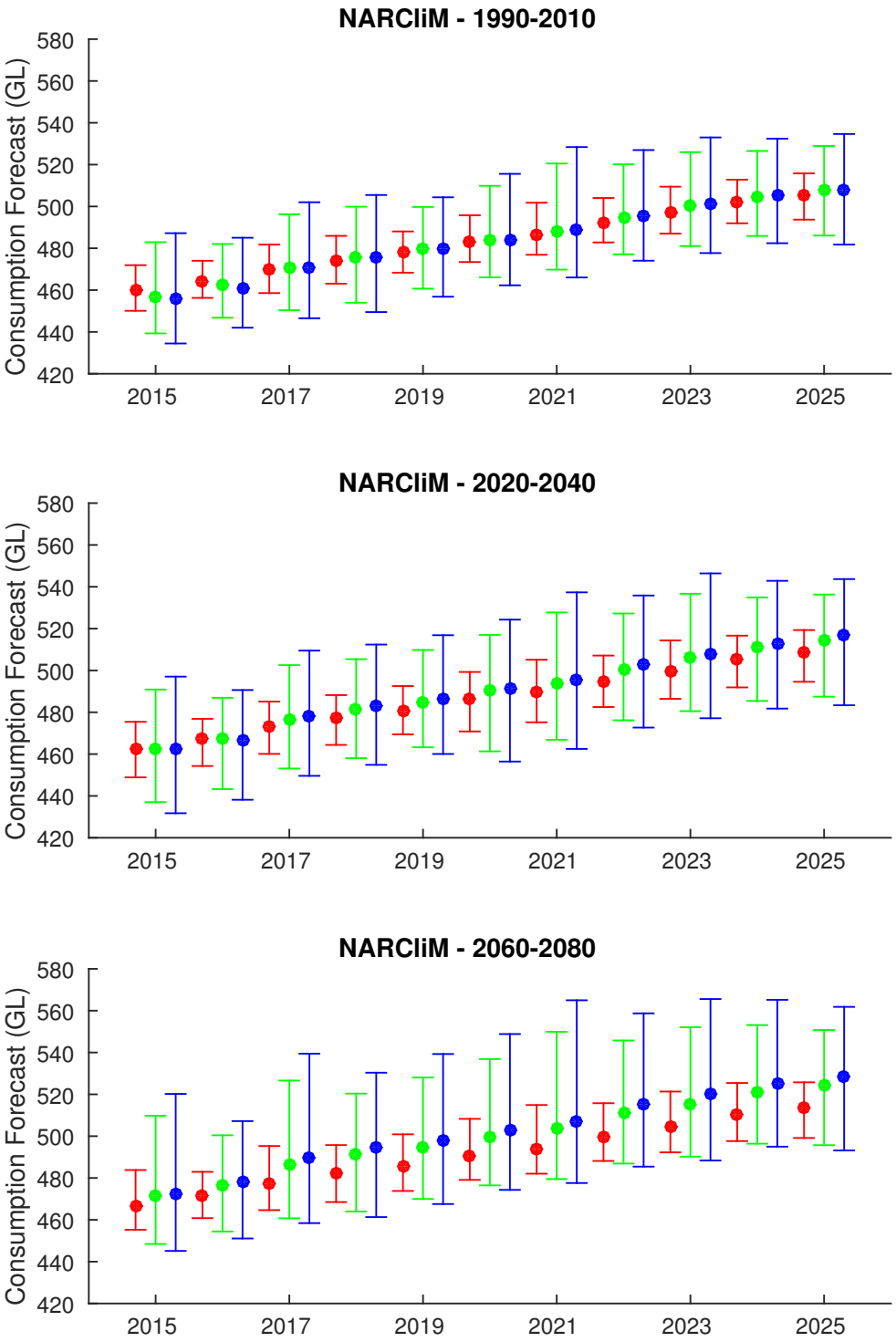

Figure 3: Consumption forecasts where there are no single dwellings (red) and the current mixture (green) and where all properties are single dwellings (blue).

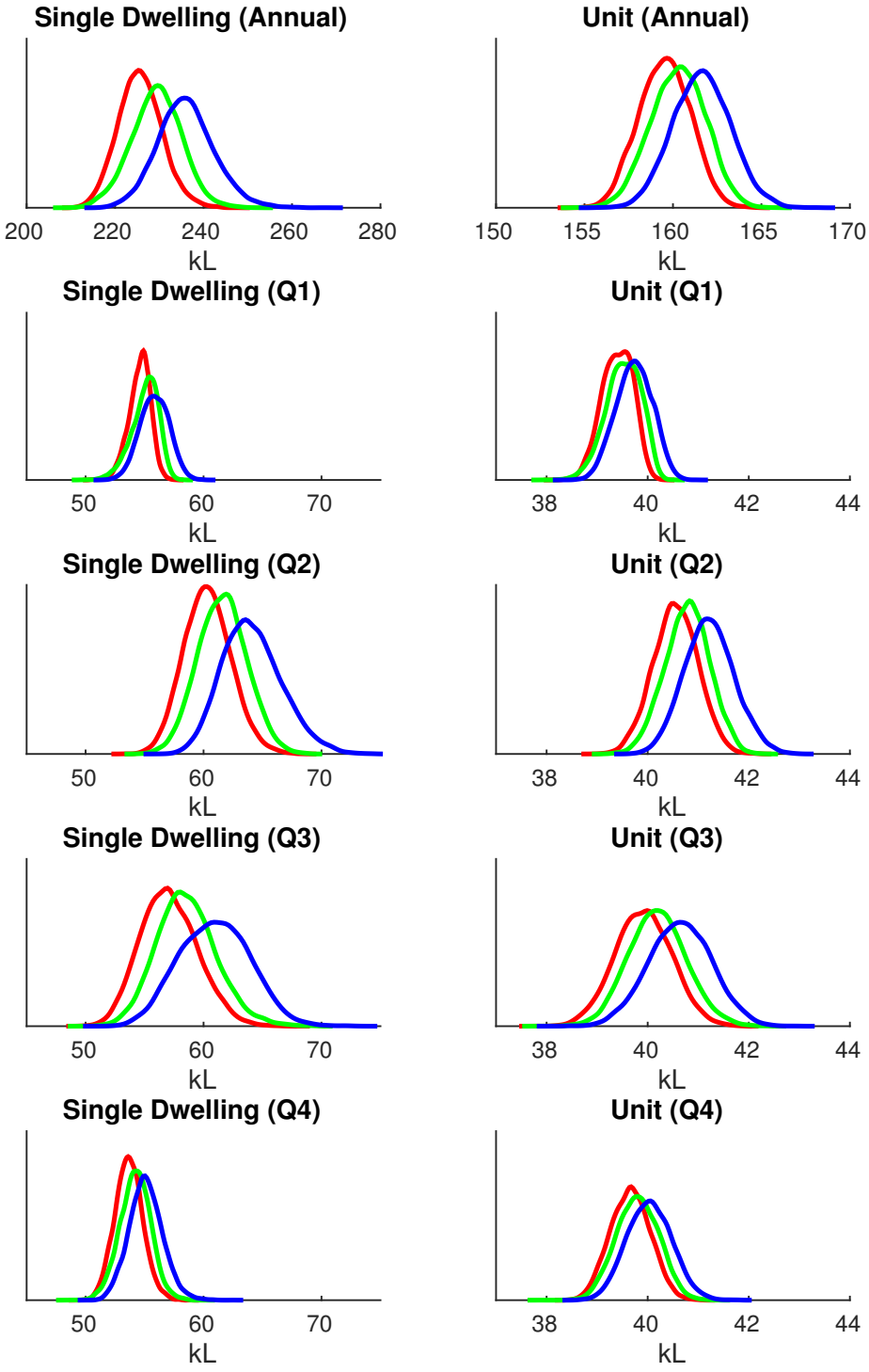

Figure 4: Kernel density approximation of annual and quarterly per dwelling consumption forecasts of single dwellings and units, (1990-2010 - red, 2020-2040 - green, 2060-2080 - blue) .

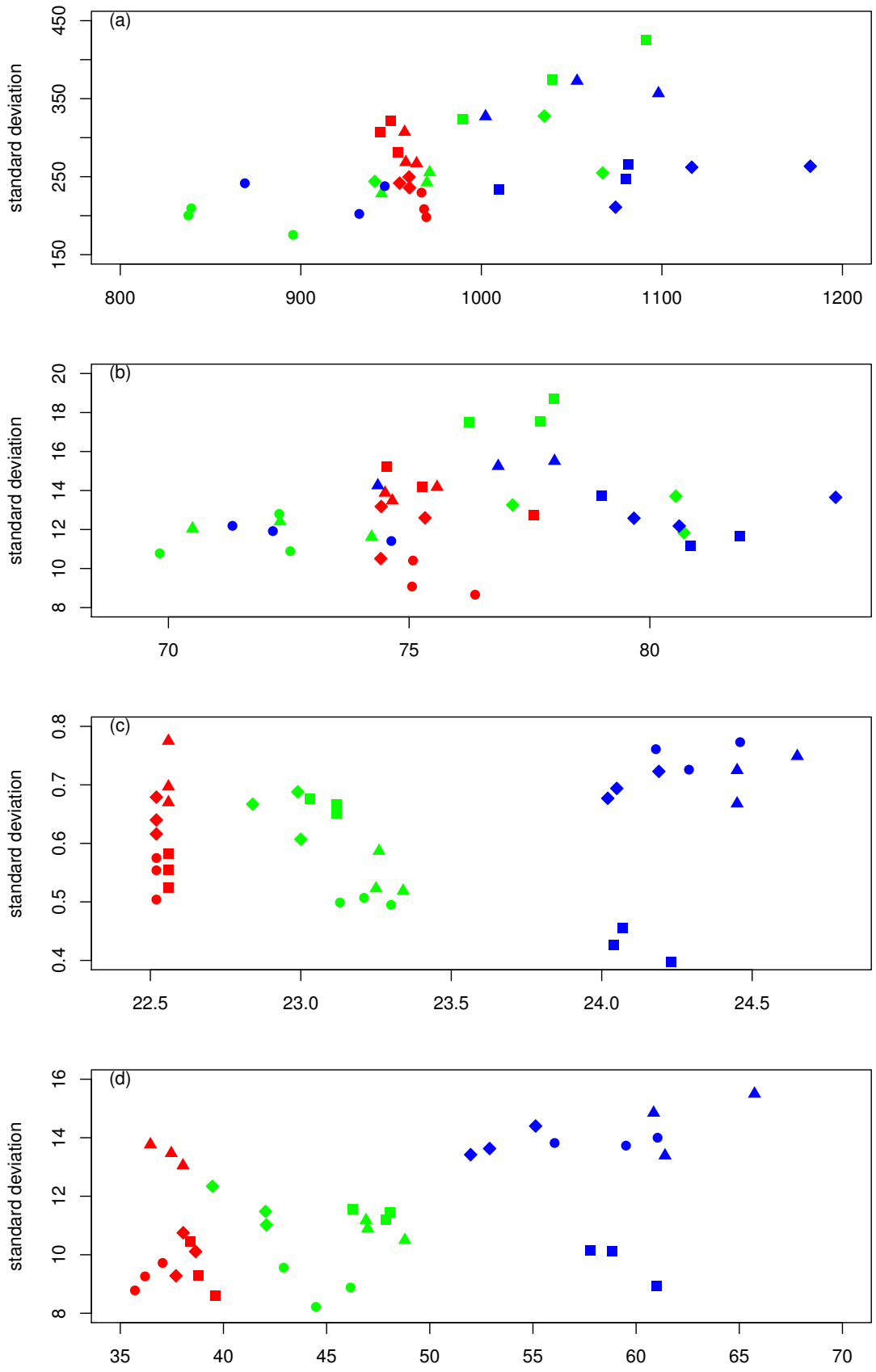

Figure 5: Plots of annual standard deviation vs annual mean of weather variables for each of the NARCliM ensemble members. (CCCMA3.1 - square, CSIRO-MK3.0 - circle, ECHAM5 - triangle and MIROC3.2 - diamond), (1990-2010 - red, 2020-2040 - green, 2060-2080 - blue). Subplot (a) Precipitation (mm), (b) No. Days $>$ 2mm, (c) Maximum Temperature ($^{\circ}C$) and (d) No. Days $>$ 30$^{\circ}C$.

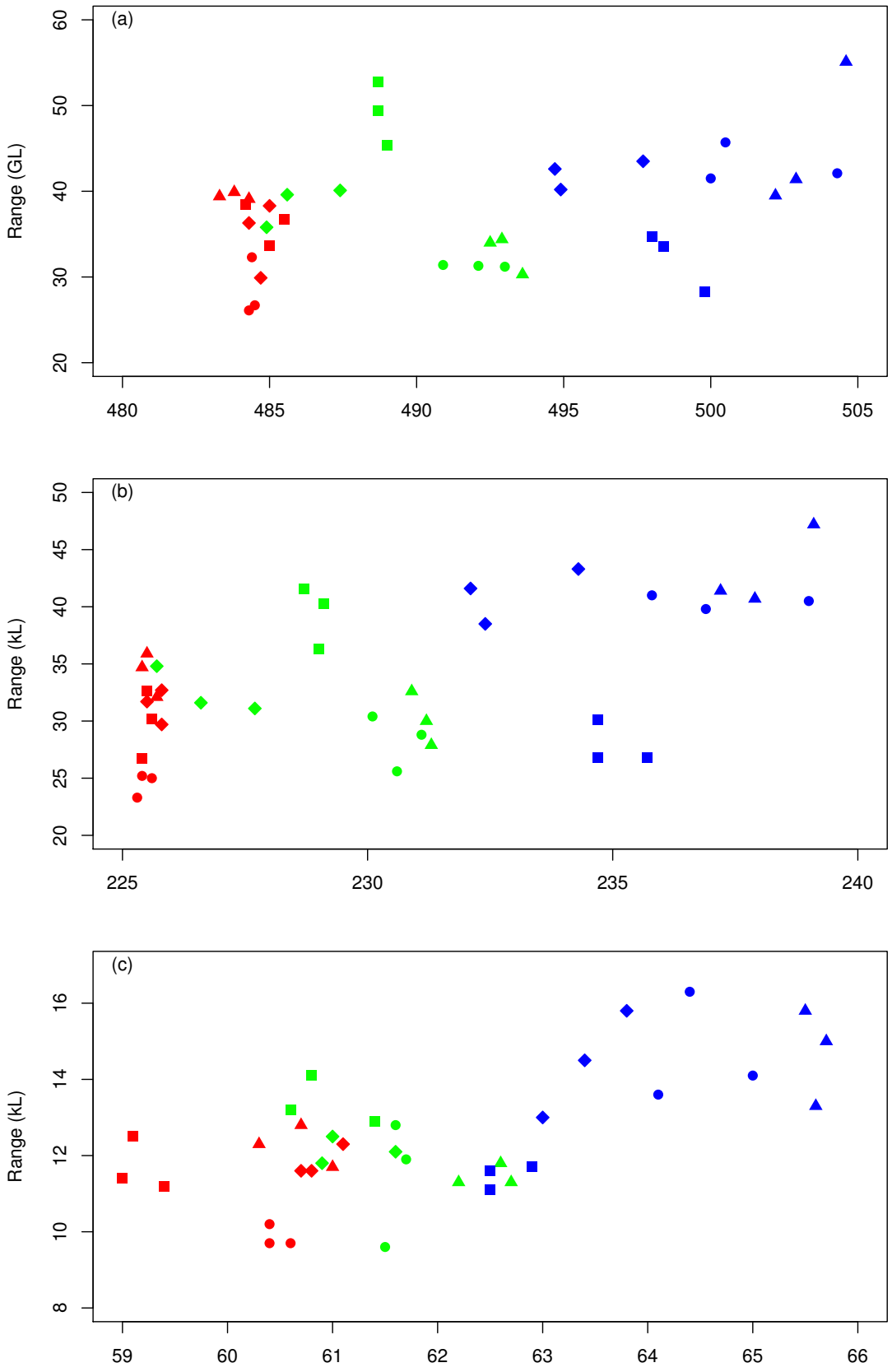

Figure 6: Plots of range vs median consumption for each of the NARCliM ensemble members. (CCCMA3.1 - square, CSIRO-MK3.0 - circle, ECHAM5 - triangle and MIROC3.2 - diamond), (Present - red, Near Future - green, Far Future - blue). Subplot (a) Total Annual (2019/20), (b) Single Dwelling Per Dwelling Annual and (c) Single Dwelling Per Dwelling Q2.

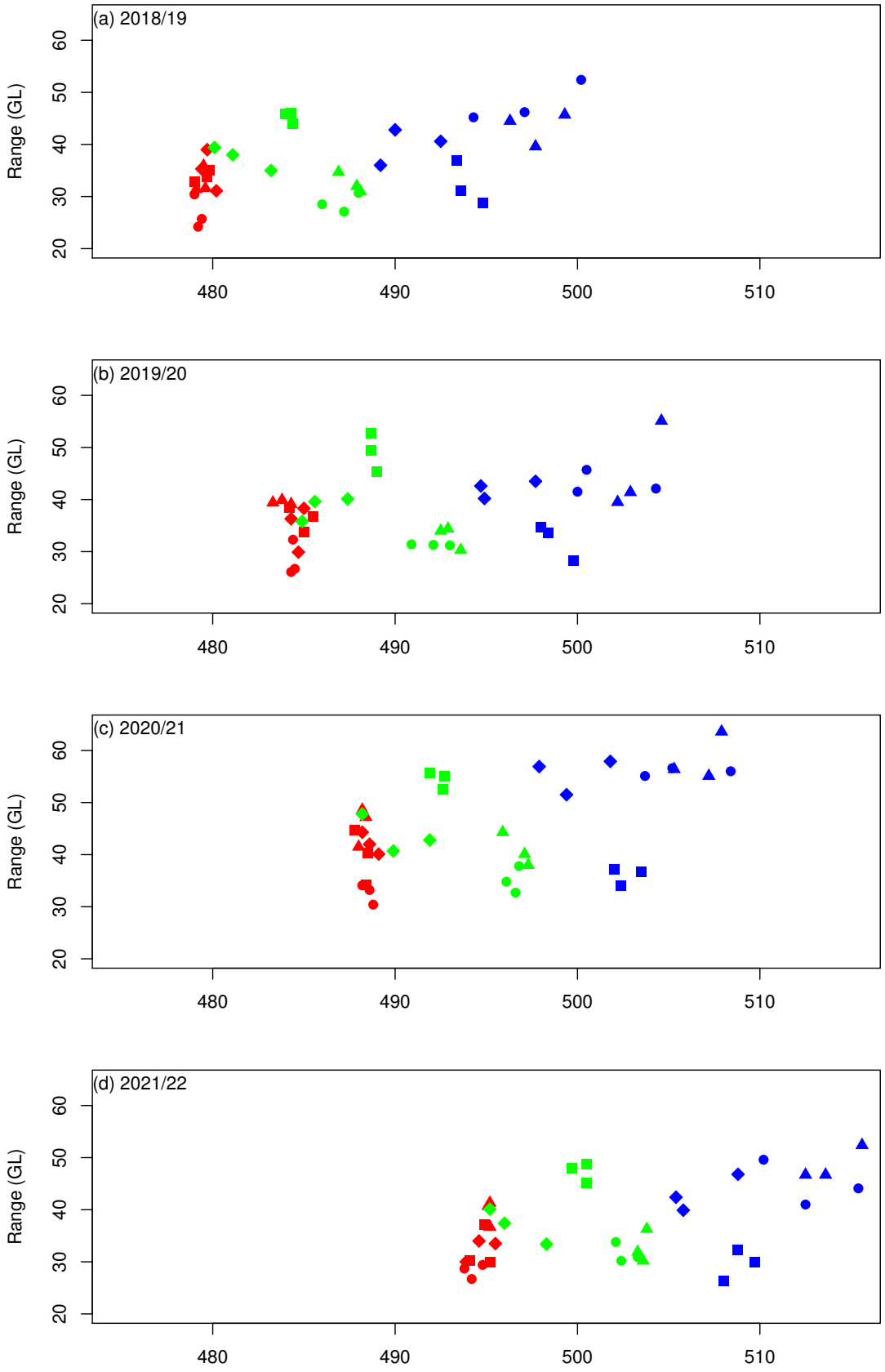

Figure 7: Plots of range vs median total annual consumption for each of the NARCliM ensemble members. (CCCMA3.1 - square, CSIRO-MK3.0 - circle, ECHAM5 - triangle and MIROC3.2 - diamond), (Present - red, Near Future - green, Far Future - blue). Subplot (a) 2018/19, (b) 2019/20, (c) 2020/21 and (d) 2021/22.

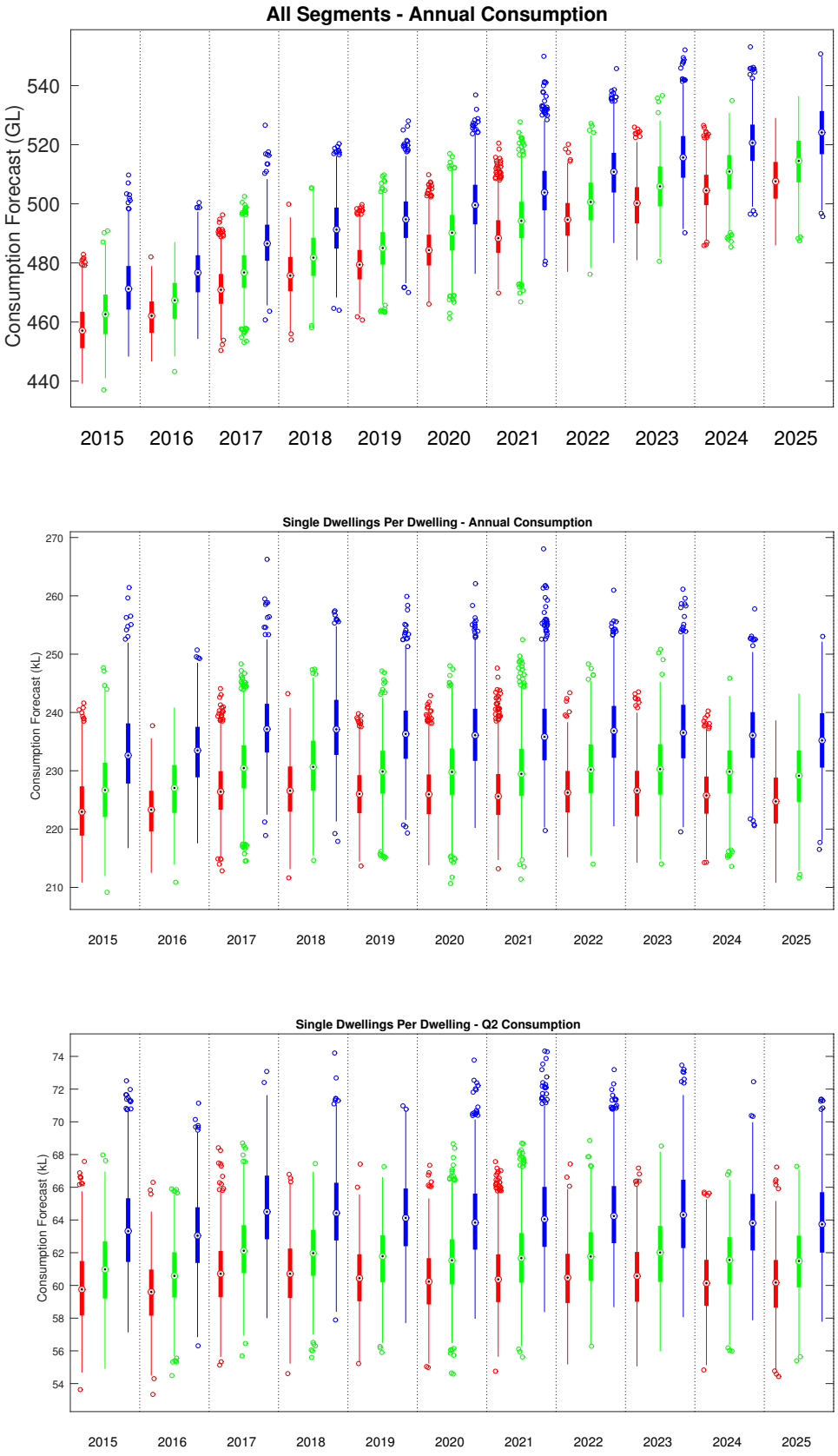

Figure 8: Consumption forecasts by year, (1990-2010 - red, 2020-2040 - green, 2060-2080 - blue).

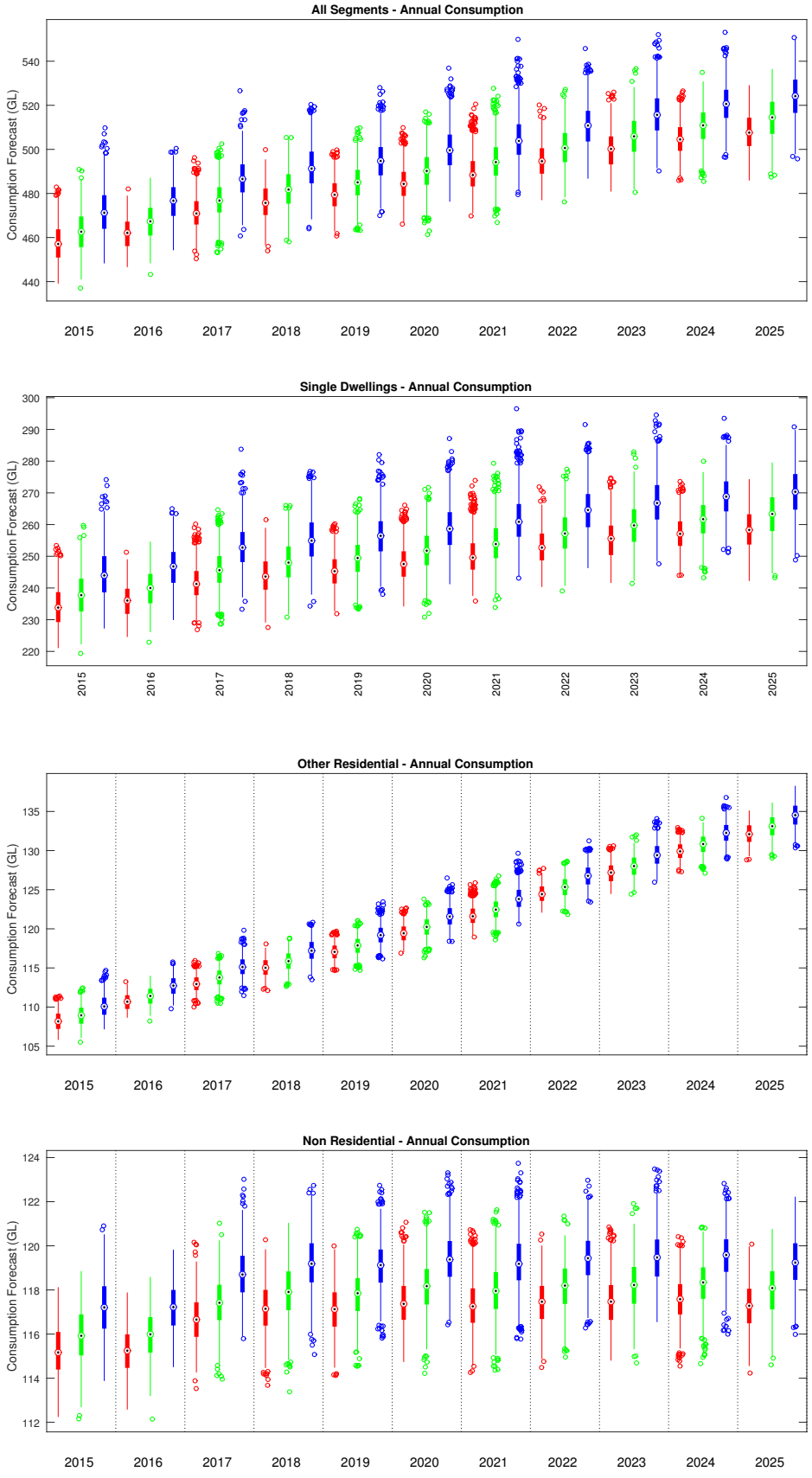

Figure 9: Consumption forecasts by year, (1990-2010 - red, 2020-2040 - green, 2060-2080 - blue).

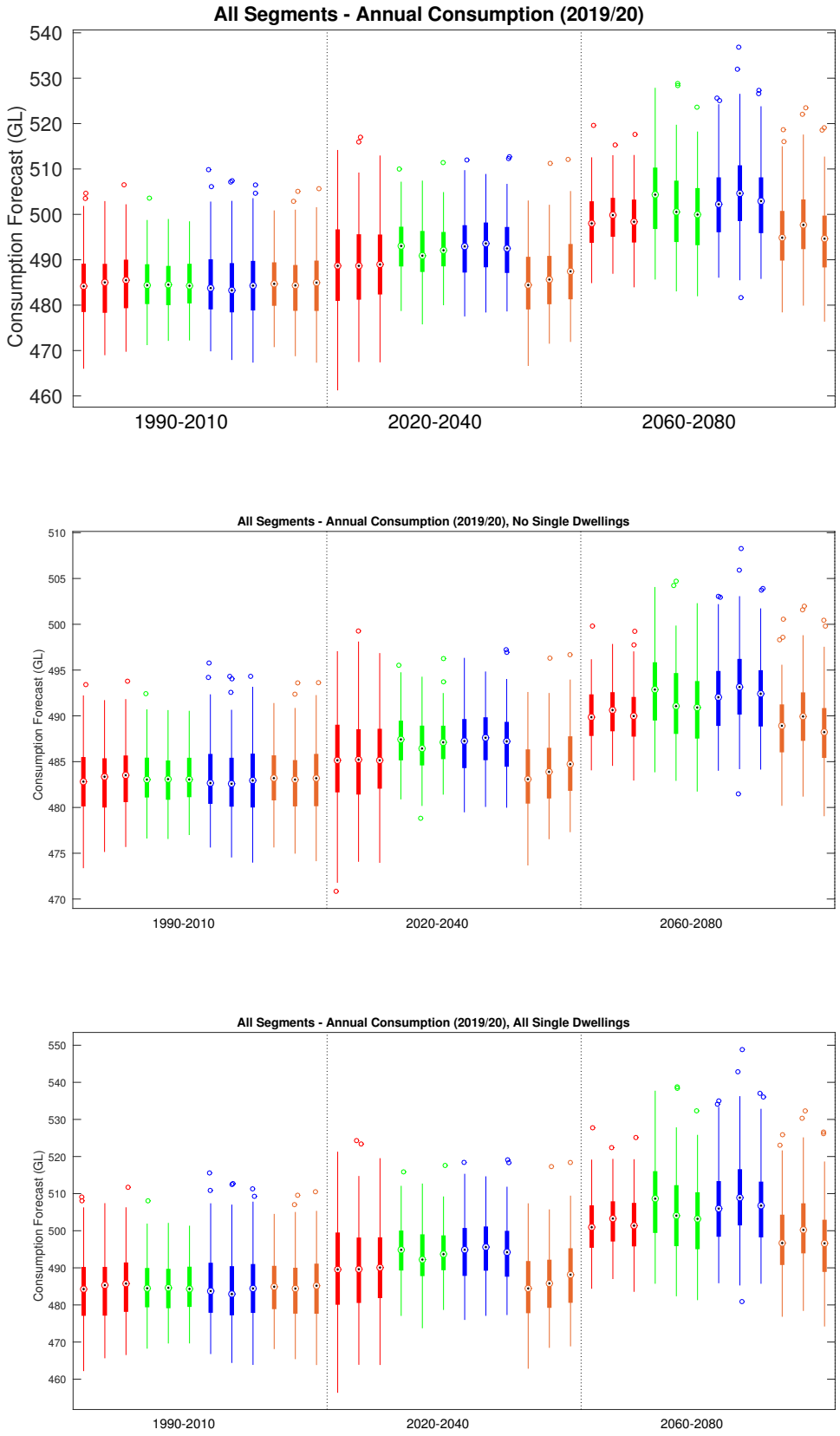

Figure 10: Consumption forecasts by model, (CCCMA3.1 - red, CSIRO-MK3.0 - green, ECHAM5 - blue and MIROC3.2 - orange)). Comparison of forecasts where there are no single dwellings and all properties are single dwellings with the actual mixture.

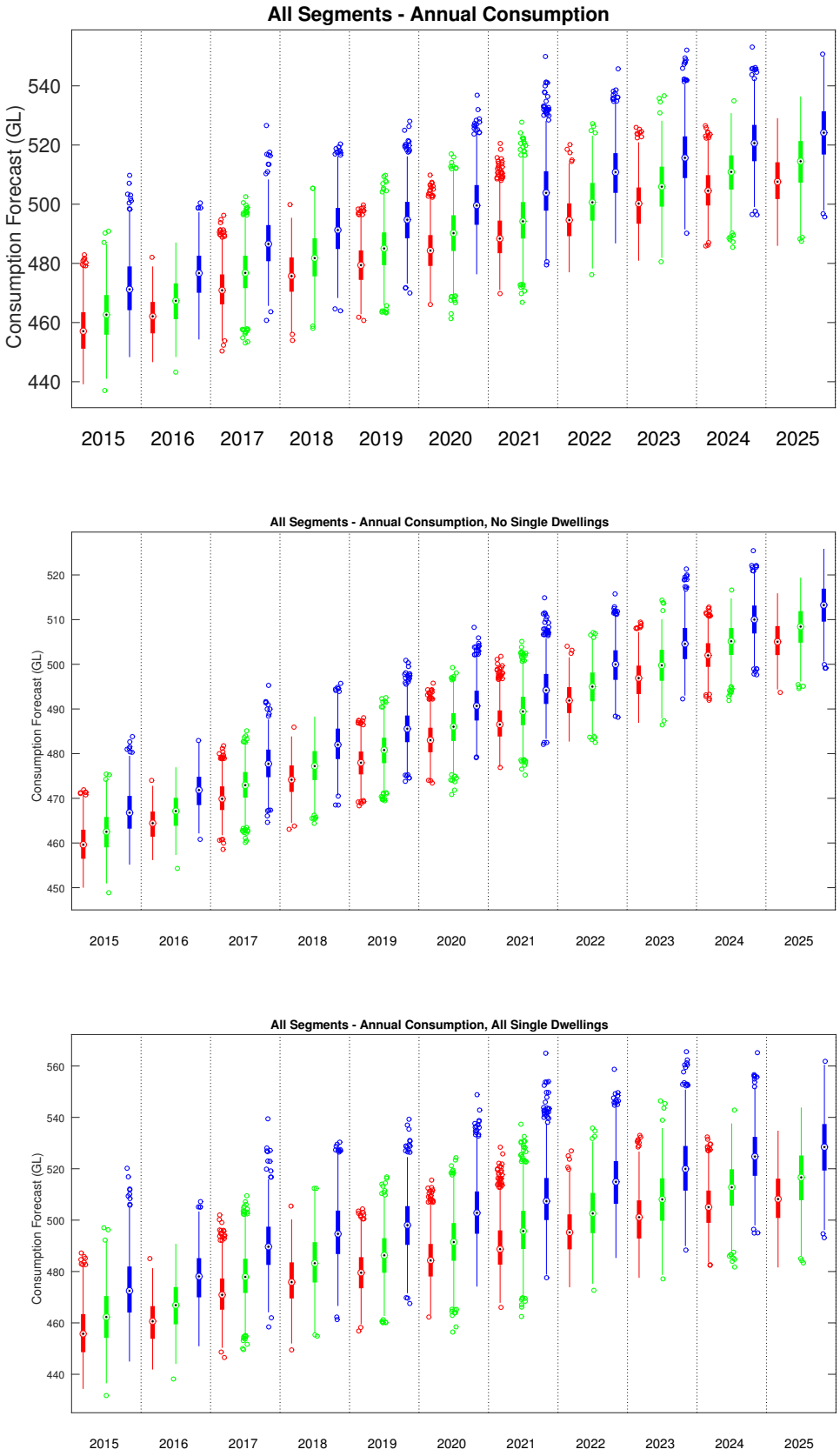

Figure 11: Consumption forecasts by year, (1990-2010 - red, 2020-2040 - green, 2060-2080 - blue). Comparison of forecasts where there are no single dwellings and all properties are single dwellings with the actual mixture.

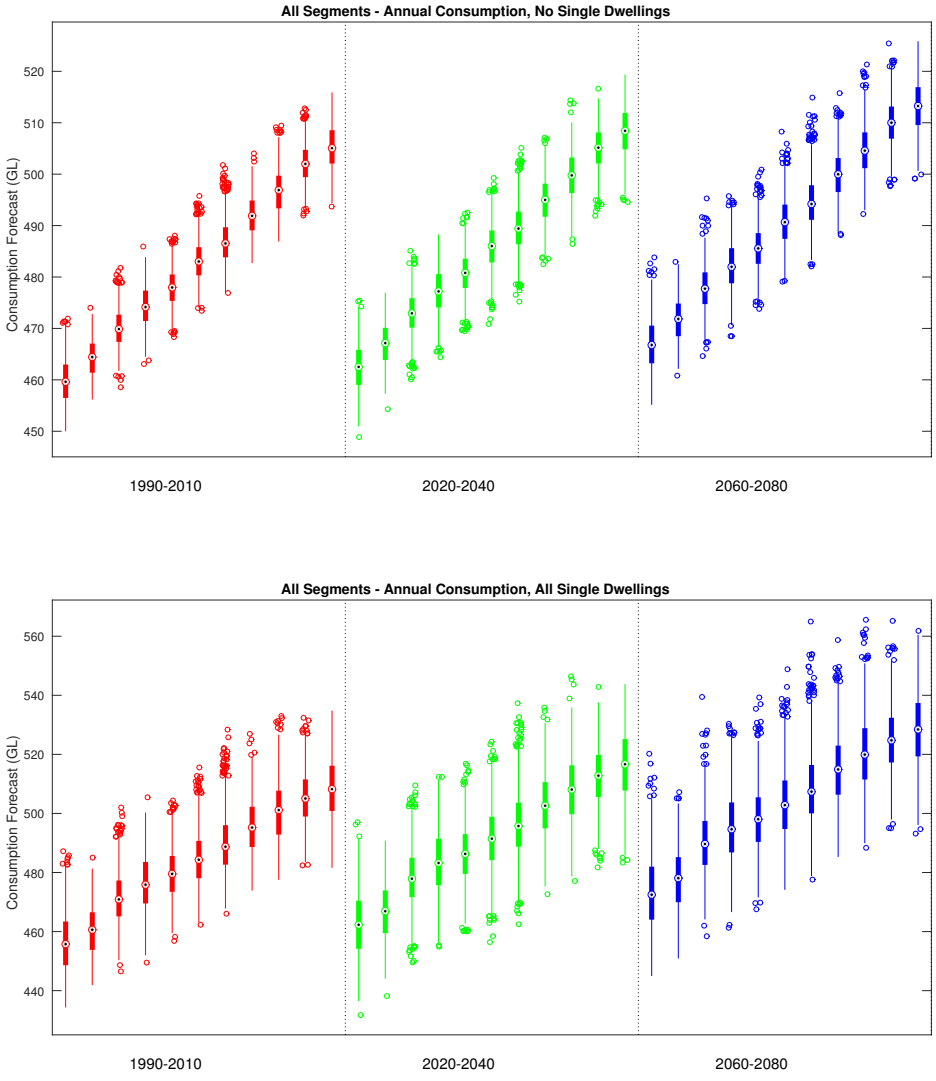

Figure 12: Consumption forecasts by year, (1990-2010 - red, 2020-2040 - green, 2060-2080 - blue). Comparison of forecasts where there are no single dwellings and all properties are single dwellings.

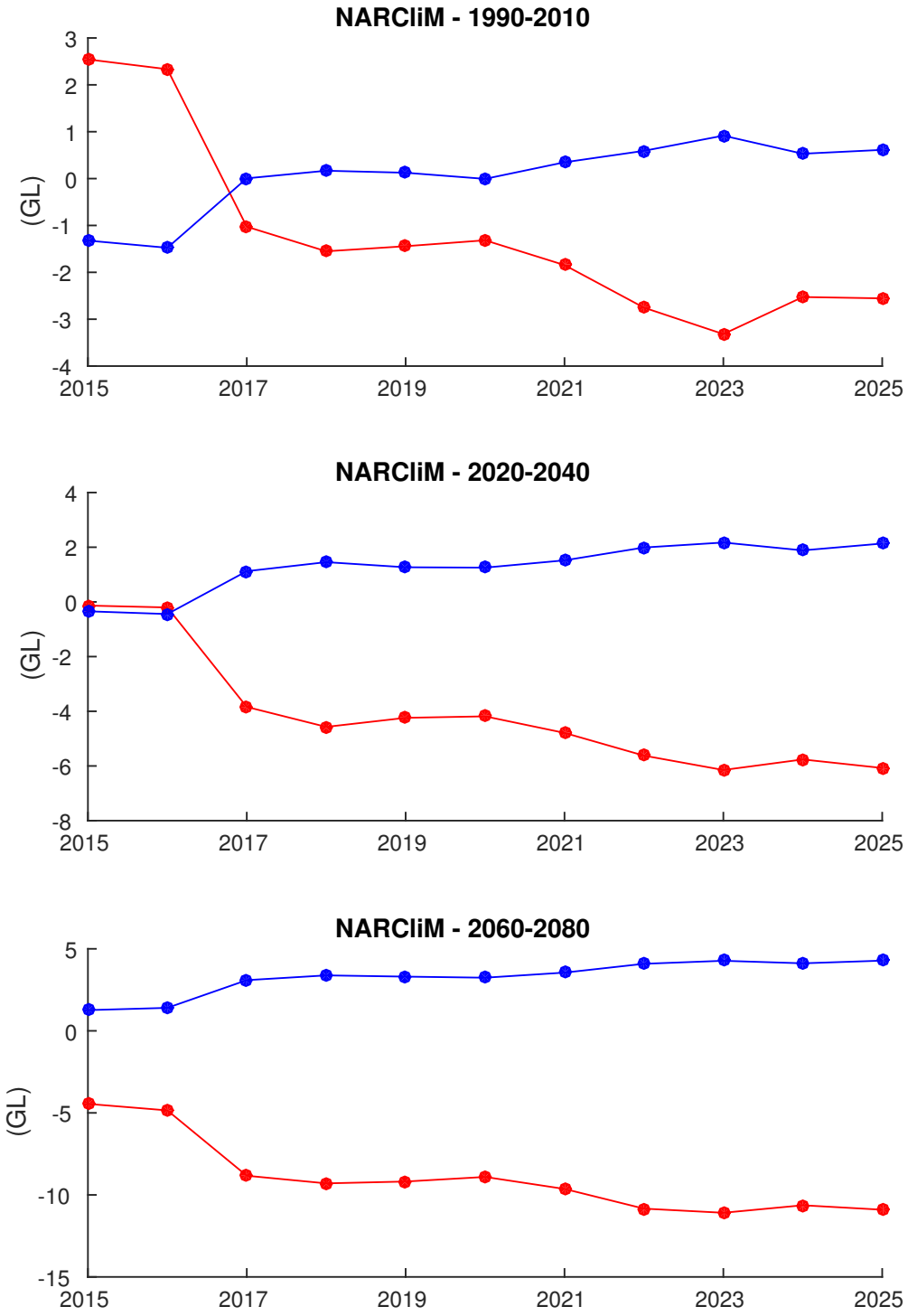

Figure 13: Difference between the median consumption forecast where there are no single dwellings and the current mixture (red) and between consumption forecasts where all properties are single dwellings and the current mixture (blue).

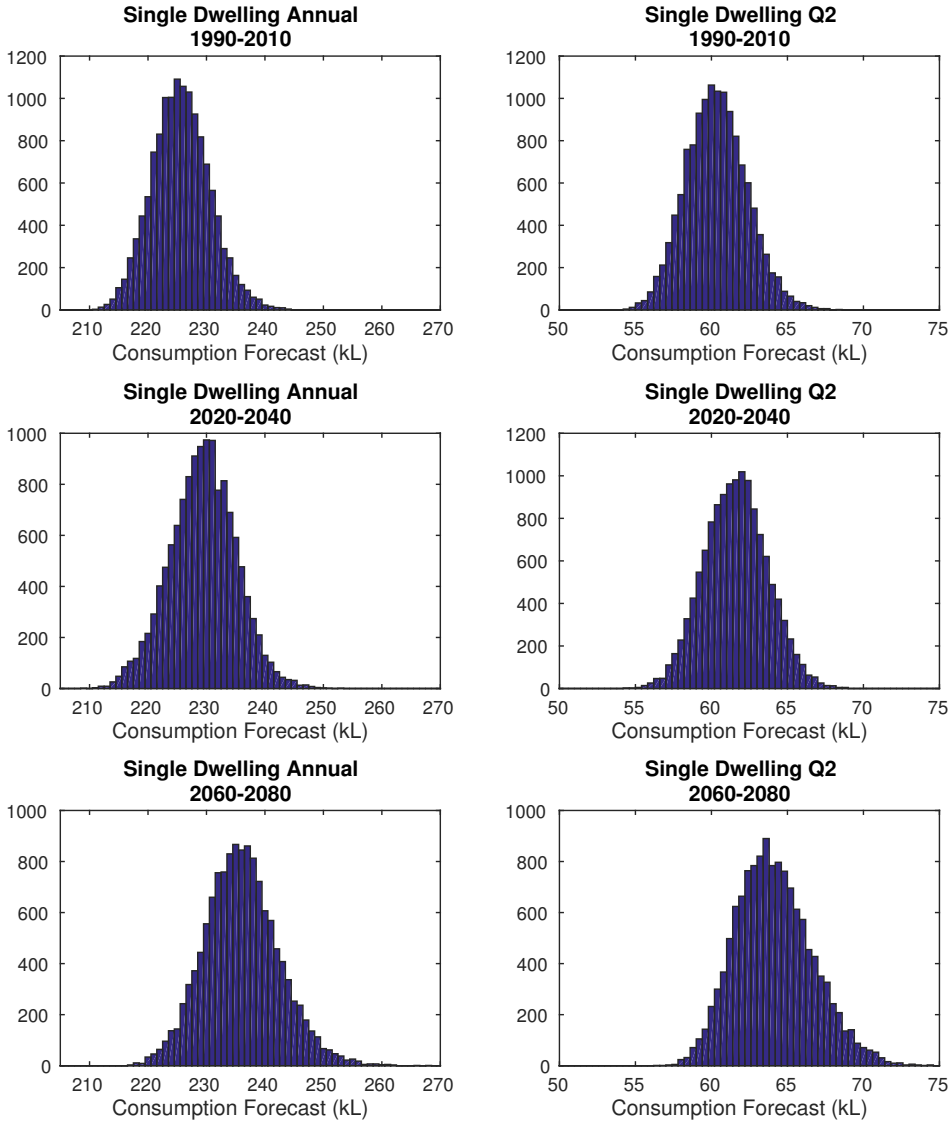

Figure 14: Histogram of Single Dwelling Annual and Single Dwelling Q2 consumption forecasts per dwelling from each NARCliM period.

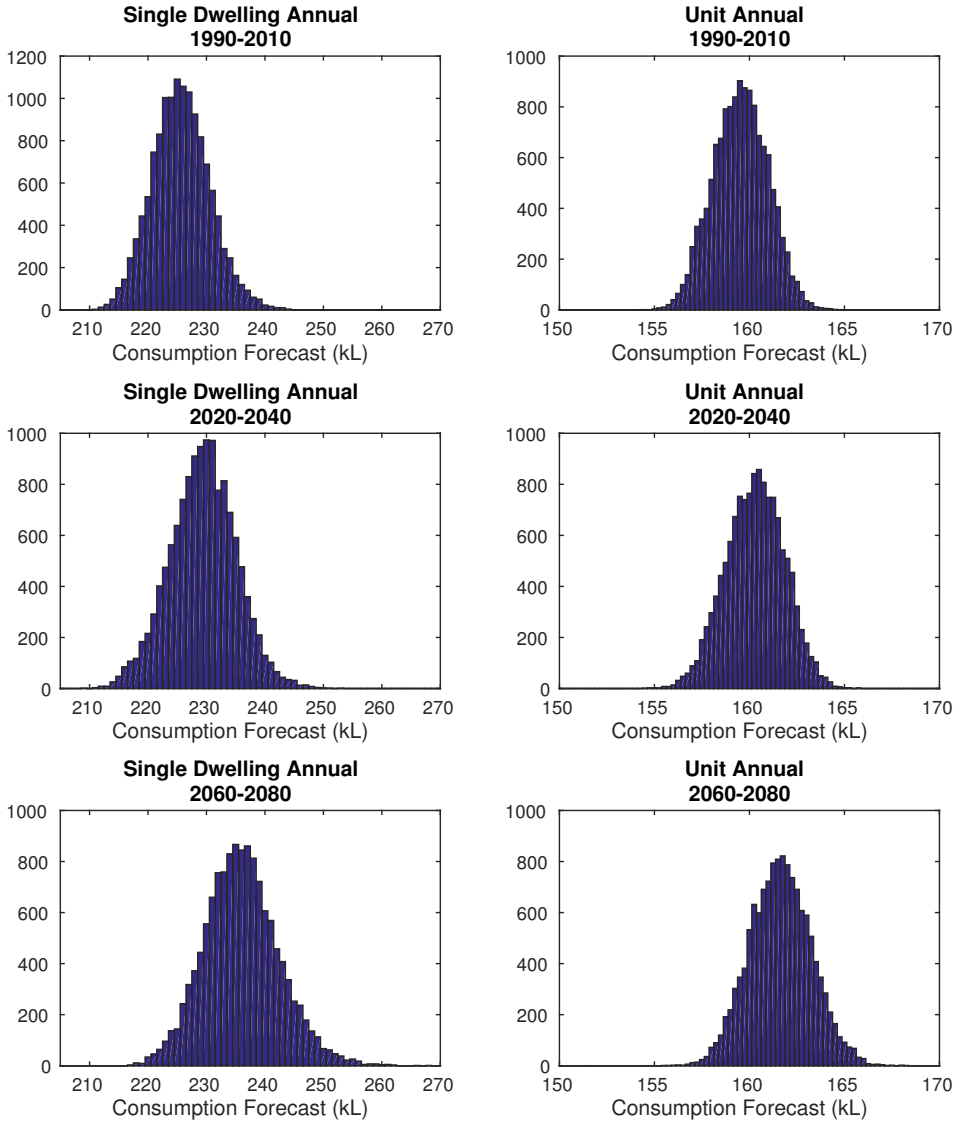

Figure 15: Histogram of Single Dwelling Annual and Unit Annual consumption forecasts per dwelling from each NARCliM period.

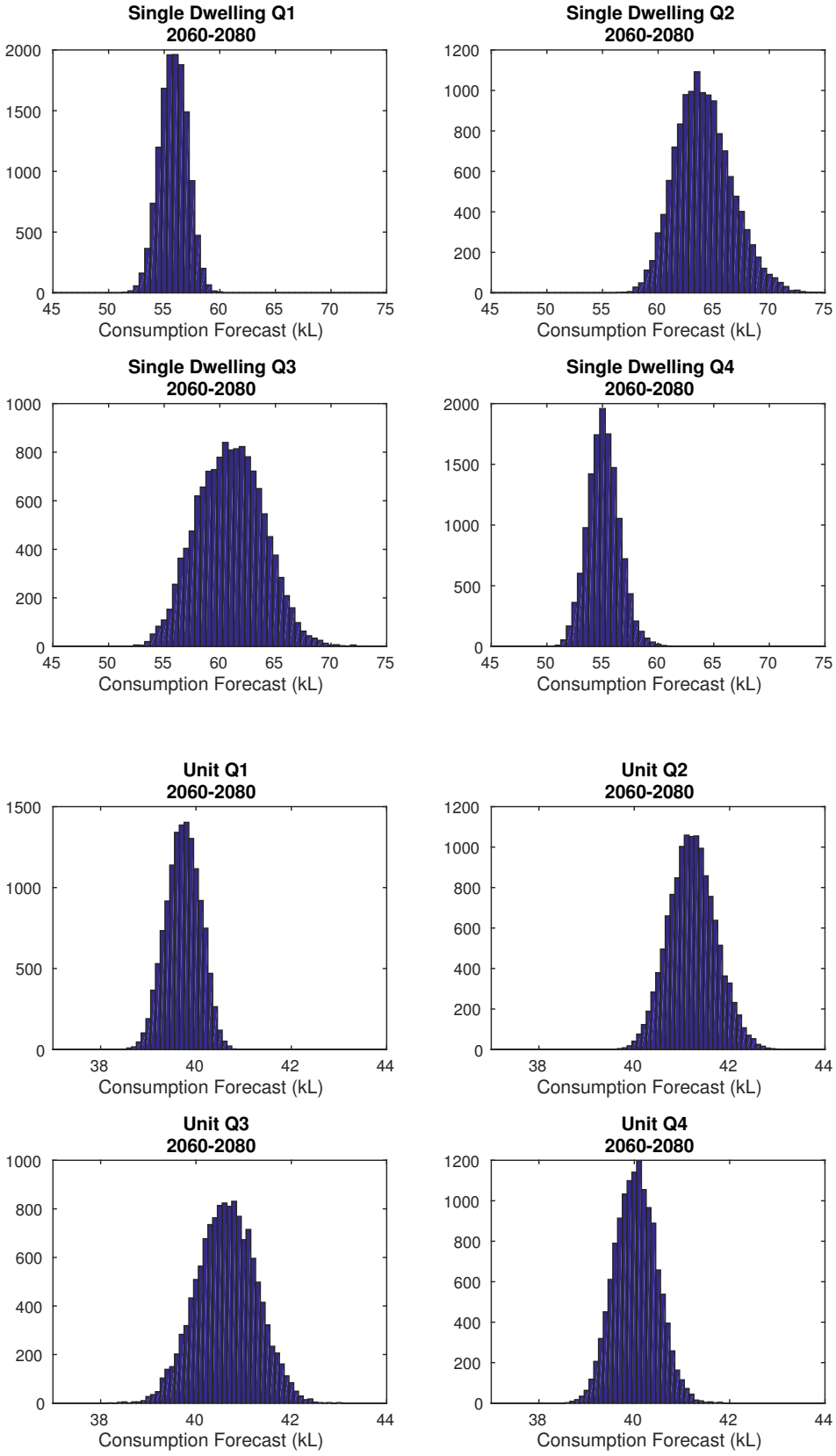

Figure 16: Histogram of Single Dwelling and Unit Q1, Q2, Q3 and Q4 consumption forecasts per dwelling from the 2060-2080 NARCliM period.

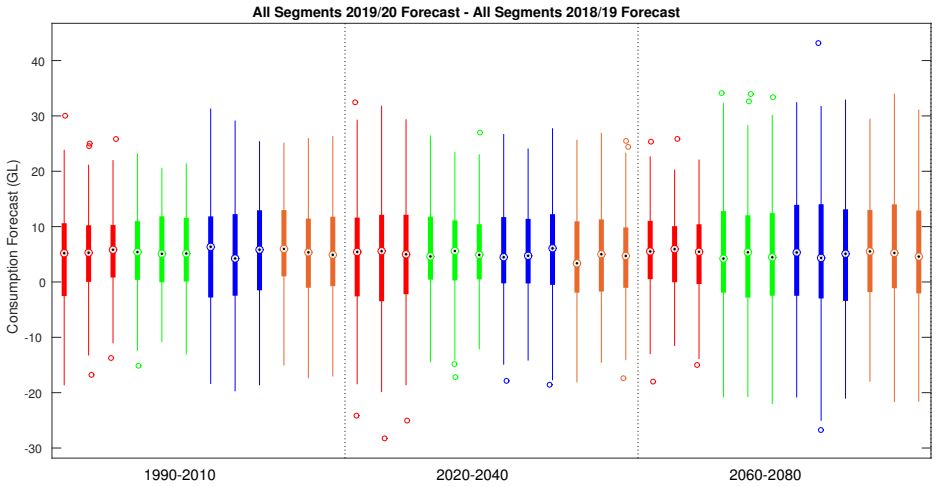

Figure 17: Box plot of the difference between consumption forecasts for consecutive financial years 2019/20 and 2018/19. Median forecast difference is positive due to population increase.