

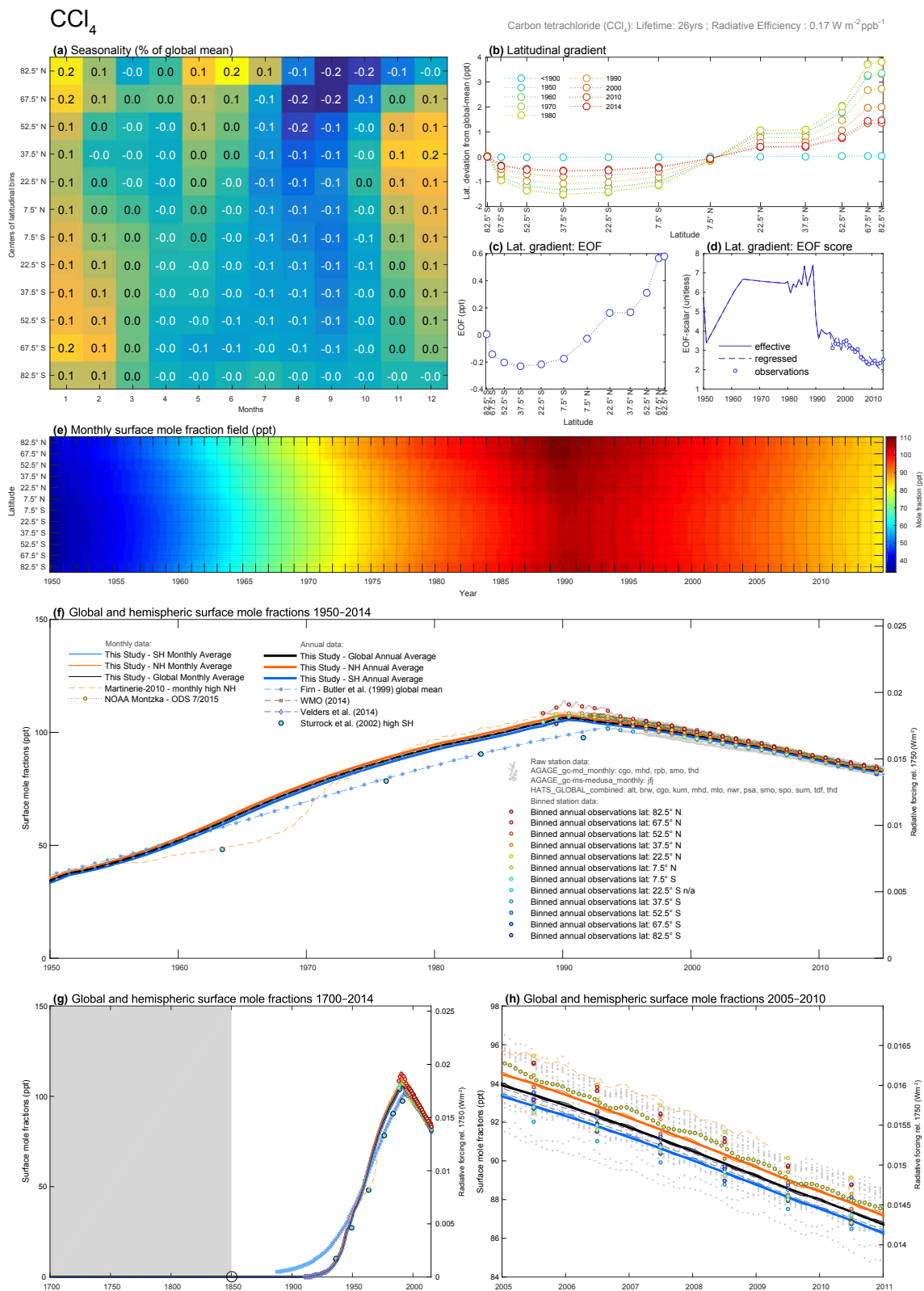
## List of Figures

S1	CCl <sub>4</sub> Factsheet . . . . .	4
S2	CFC-11 Factsheet . . . . .	5
S3	CFC-12 Factsheet . . . . .	6
S4	CFC-113 Factsheet . . . . .	7
S5	CFC-114 Factsheet . . . . .	8
S6	CFC-115 Factsheet . . . . .	9
S7	CH <sub>2</sub> Cl <sub>2</sub> Factsheet . . . . .	10
S8	CH <sub>3</sub> Br Factsheet . . . . .	11
S9	CH <sub>3</sub> CCl <sub>3</sub> Factsheet . . . . .	12
S10	CH <sub>3</sub> Cl Factsheet . . . . .	13
S11	CHCl <sub>3</sub> Factsheet . . . . .	14
S12	Halon-1211 Factsheet . . . . .	15
S13	Halon-1301 Factsheet . . . . .	16
S14	Halon-2402 Factsheet . . . . .	17
S15	HCFC-22 Factsheet . . . . .	18
S16	HCFC-141b Factsheet . . . . .	19
S17	HCFC-142b Factsheet . . . . .	20
S18	C <sub>2</sub> F <sub>6</sub> Factsheet . . . . .	21
S19	C <sub>3</sub> F <sub>8</sub> Factsheet . . . . .	22
S20	C <sub>4</sub> F <sub>10</sub> Factsheet . . . . .	23
S21	C <sub>5</sub> F <sub>12</sub> Factsheet . . . . .	24
S22	C <sub>6</sub> F <sub>14</sub> Factsheet . . . . .	25
S23	C <sub>7</sub> F <sub>16</sub> Factsheet . . . . .	26
S24	C <sub>8</sub> F <sub>18</sub> Factsheet . . . . .	27
S25	c-C <sub>4</sub> F <sub>8</sub> Factsheet . . . . .	28
S26	CF <sub>4</sub> Factsheet . . . . .	29
S27	HFC-23 Factsheet . . . . .	30
S28	HFC-32 Factsheet . . . . .	31
S29	HFC-43-10-mee Factsheet . . . . .	32
S30	HFC-125 Factsheet . . . . .	33
S31	HFC-134a Factsheet . . . . .	34
S32	HFC-143a Factsheet . . . . .	35
S33	HFC-152a Factsheet . . . . .	36
S34	HFC-227ea Factsheet . . . . .	37
S35	HFC-236fa Factsheet . . . . .	38
S36	HFC-245fa Factsheet . . . . .	39
S37	HFC-365mfc Factsheet . . . . .	40
S38	NF <sub>3</sub> Factsheet . . . . .	41
S39	SF <sub>6</sub> Factsheet . . . . .	42
S40	SO <sub>2</sub> F <sub>2</sub> Factsheet . . . . .	43
S41	1875 CO <sub>2</sub> concentrations fields for 8 CMIP5 ESMs . . . . .	45
S42	1990 CO <sub>2</sub> concentrations fields for 8 CMIP5 ESMs . . . . .	46
S43	1861-1890 CO <sub>2</sub> seasonal cycles for 9 CMIP5 ESMs . . . . .	47
S44	1976-2005 CO <sub>2</sub> seasonal cycles for 9 CMIP5 ESMs . . . . .	48
S45	Latitudinal gradients of surface CO <sub>2</sub> for 9 CMIP5 ESMs . . . . .	49
S46	1875, 1960, 1990 CO <sub>2</sub> concentration fields for 5 CMIP5 ESMs . . . . .	50
S47	As Fig. S46, but for a different set of CMIP5 ESMs . . . . .	51

**1 Supplement A:**

Factsheets of GHGs other than CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O



Figure S1. CCl<sub>4</sub> Factsheet

## CFC-11

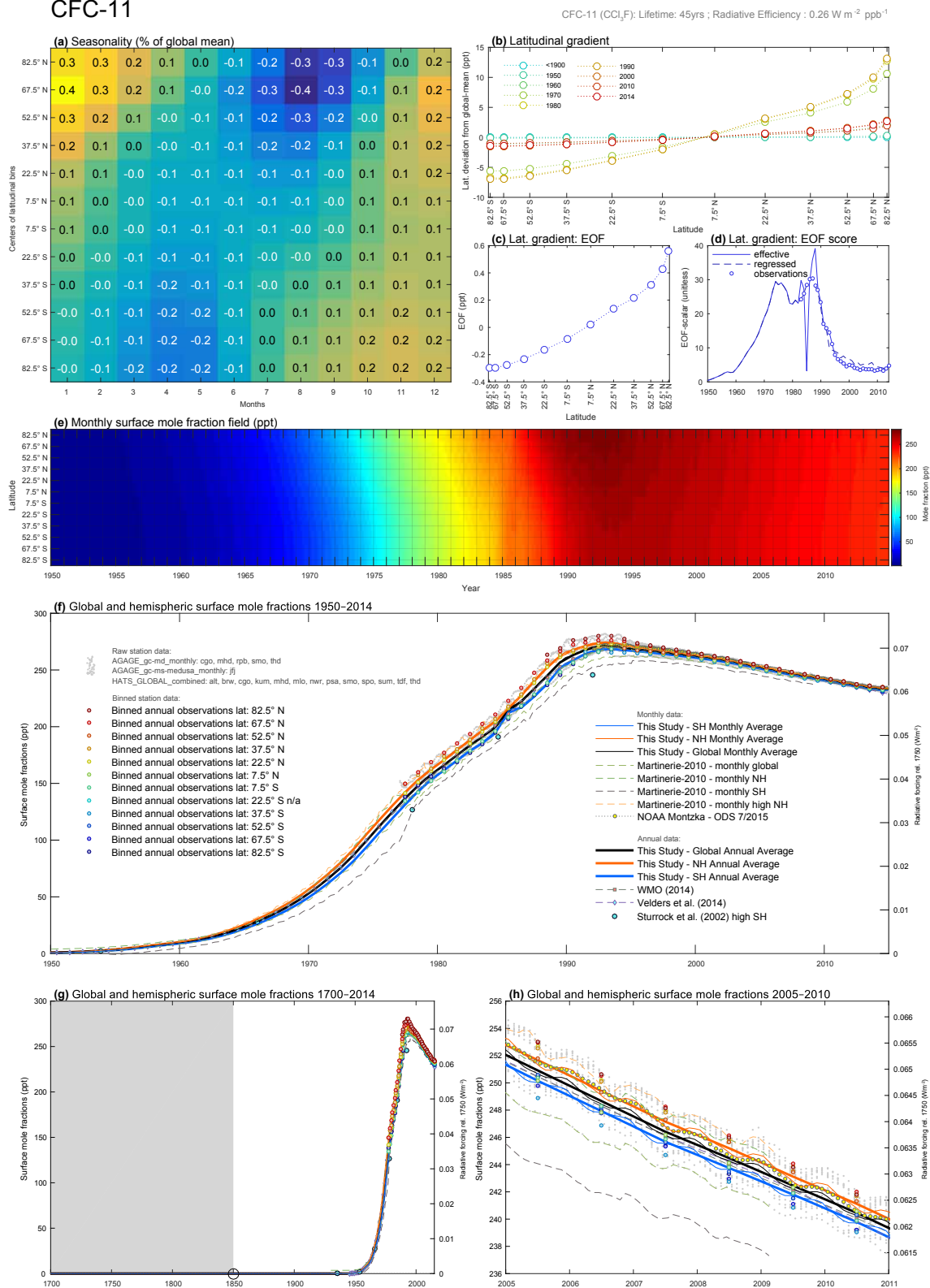


Figure S2. CFC-11 Factsheet

## CFC-12

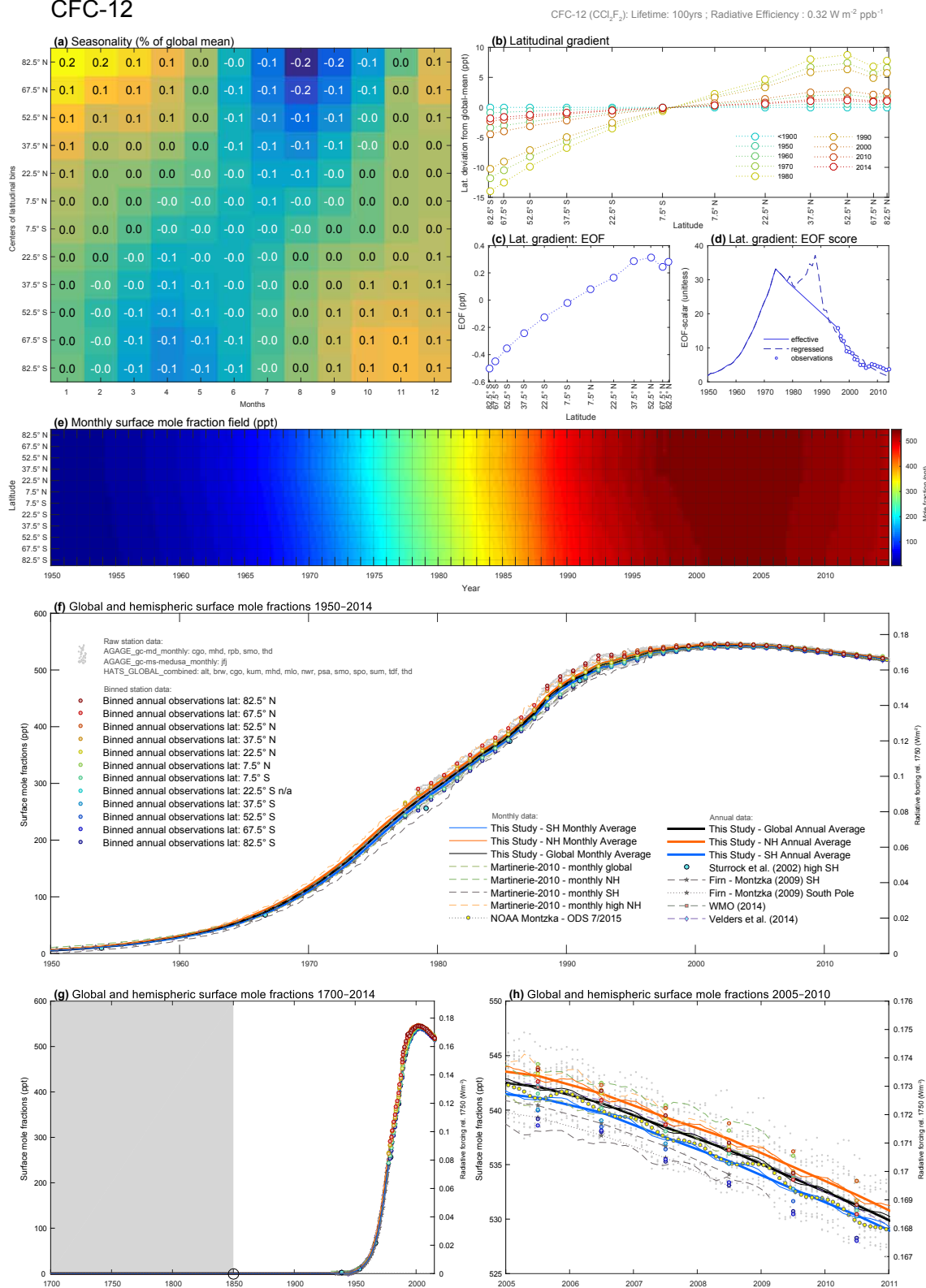
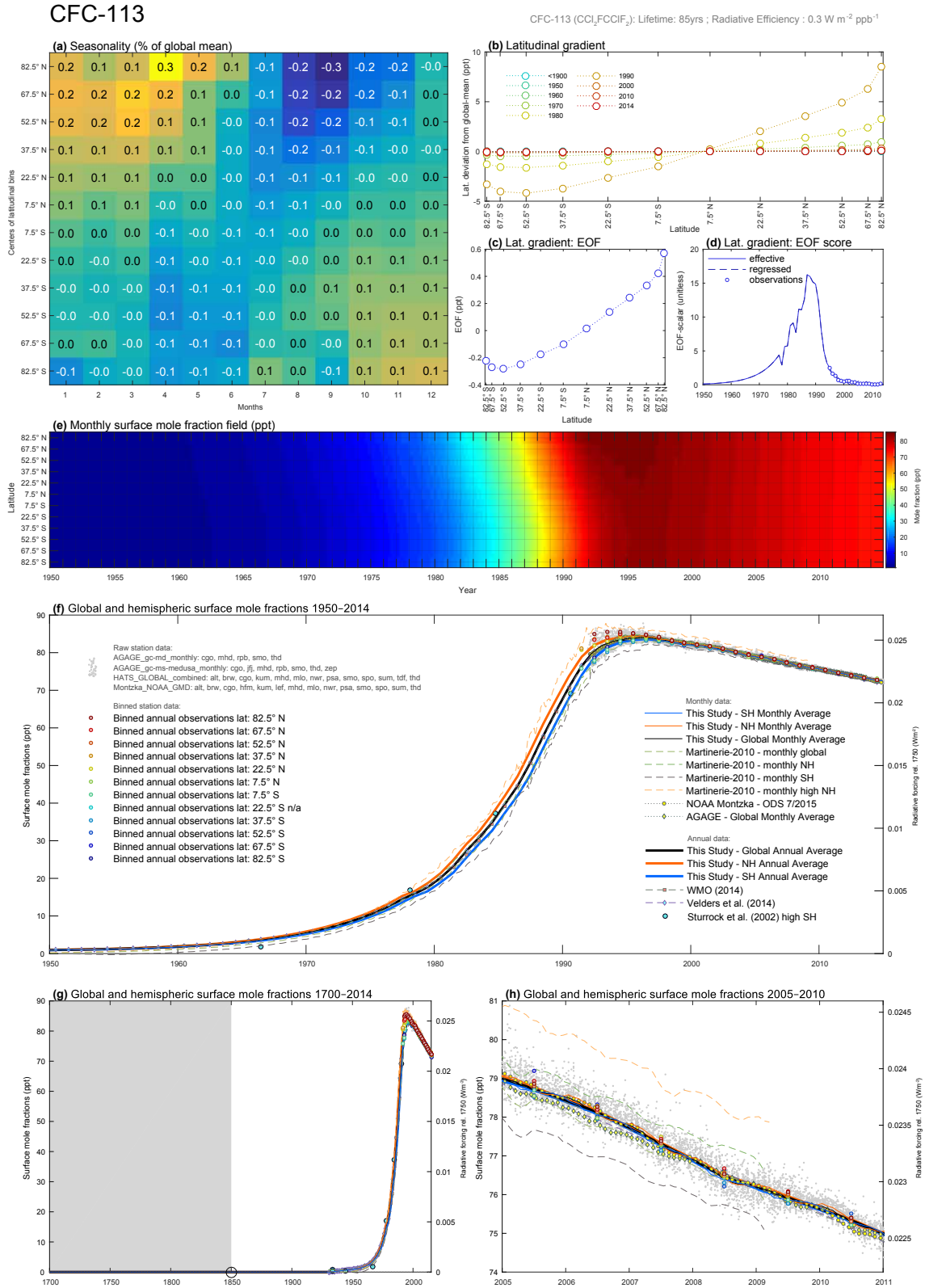


Figure S3. CFC-12 Factsheet



**Figure S4. CFC-113 Factsheet**

## CFC-114

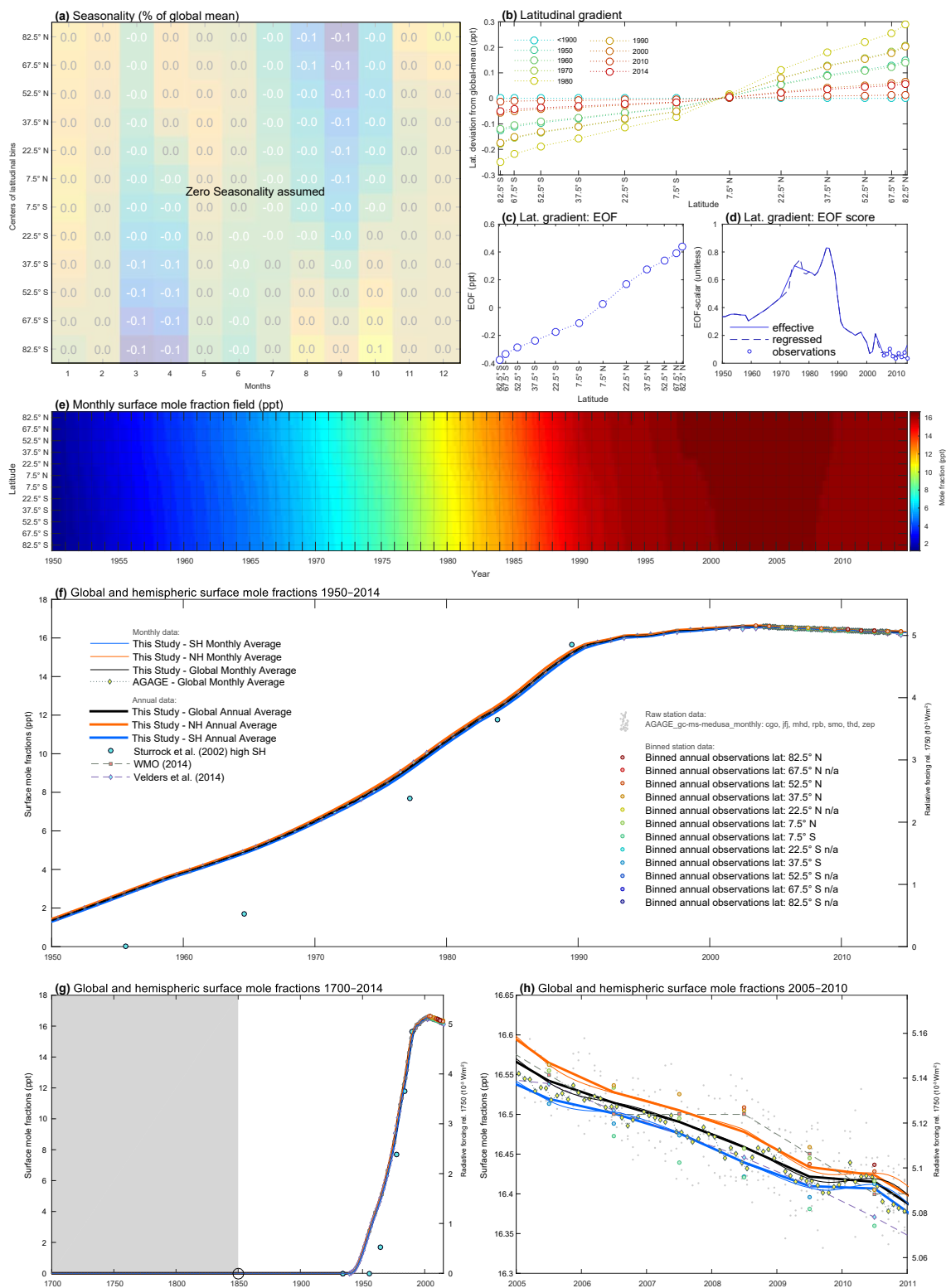
CFC-114 (CClF<sub>2</sub>CClF<sub>2</sub>): Lifetime: 190yrs ; Radiative Efficiency : 0.31 W m<sup>-2</sup> ppb<sup>-1</sup>

Figure S5. CFC-114 Factsheet

## CFC-115

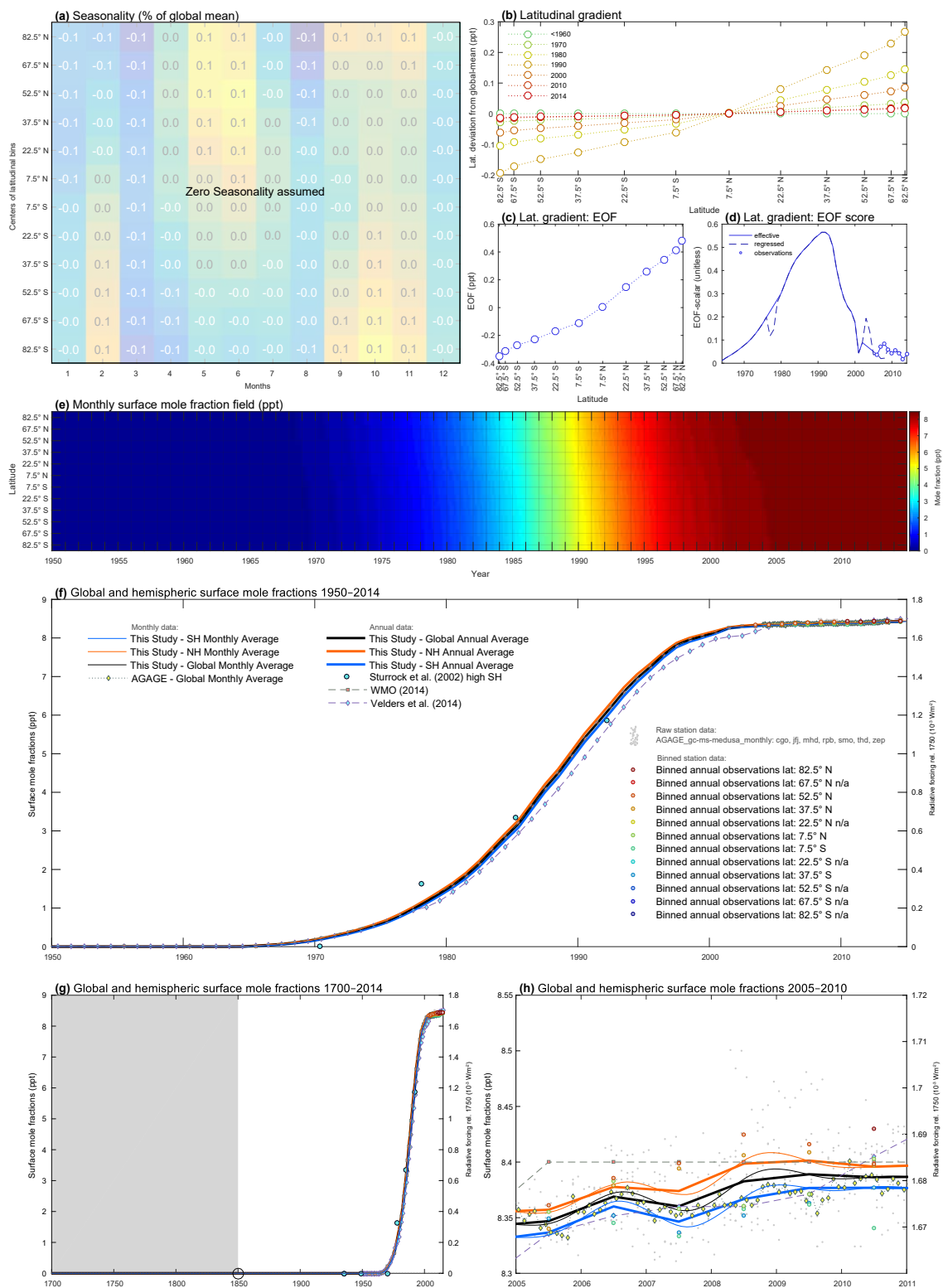
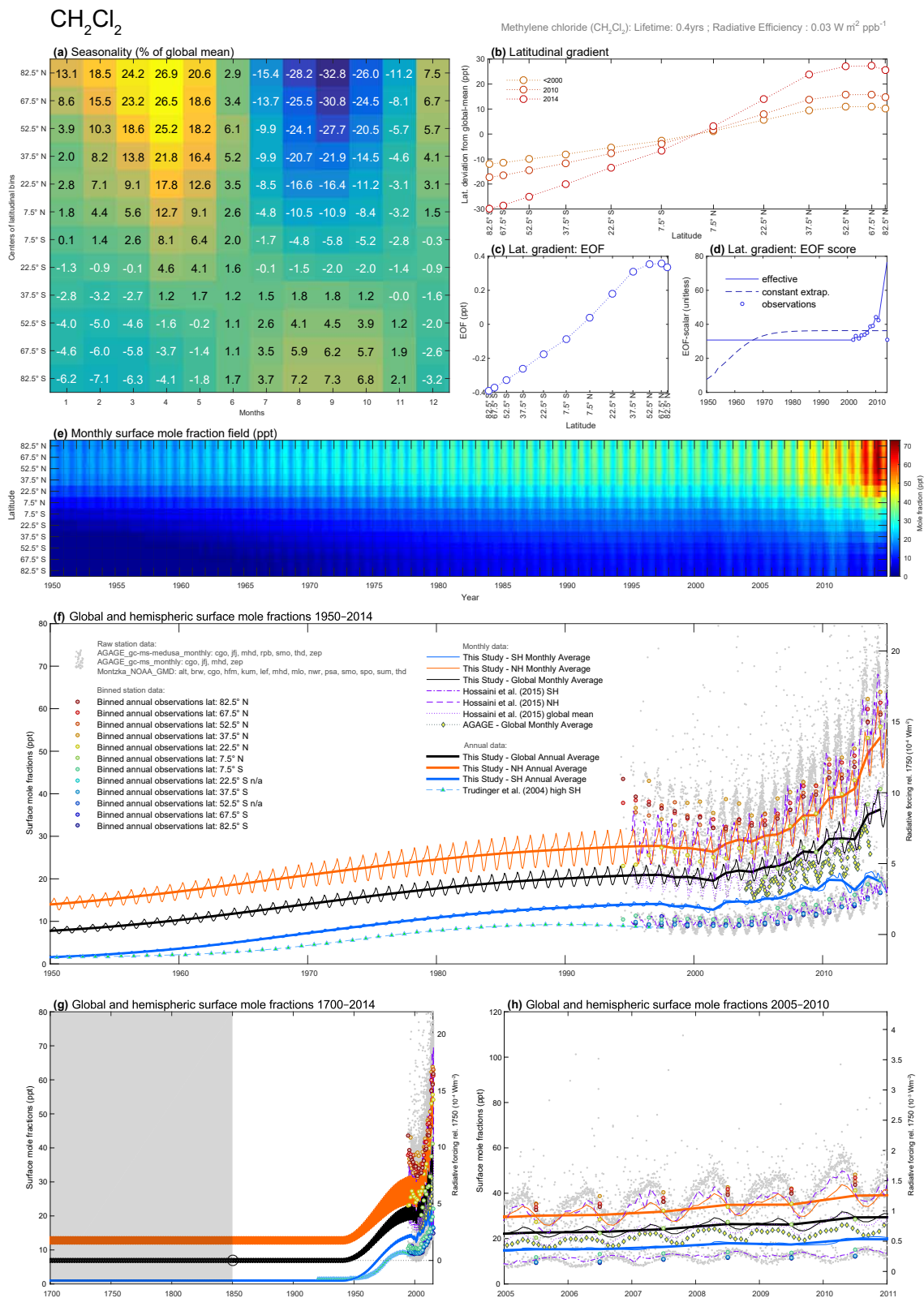
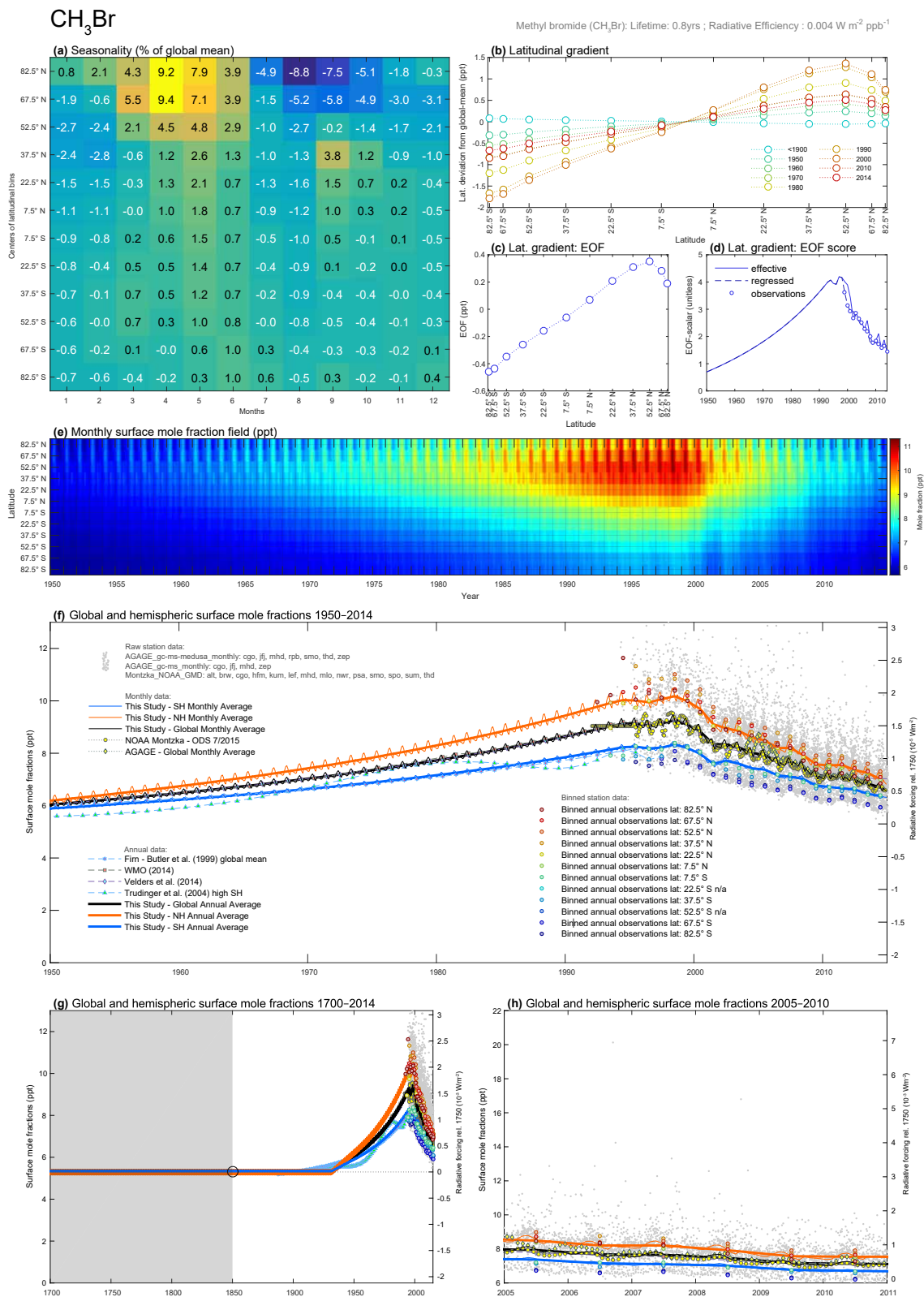
CFC-115 (CClF<sub>3</sub>CF<sub>3</sub>): Lifetime: 1020yrs ; Radiative Efficiency : 0.2 W m<sup>-2</sup> ppb<sup>-1</sup>

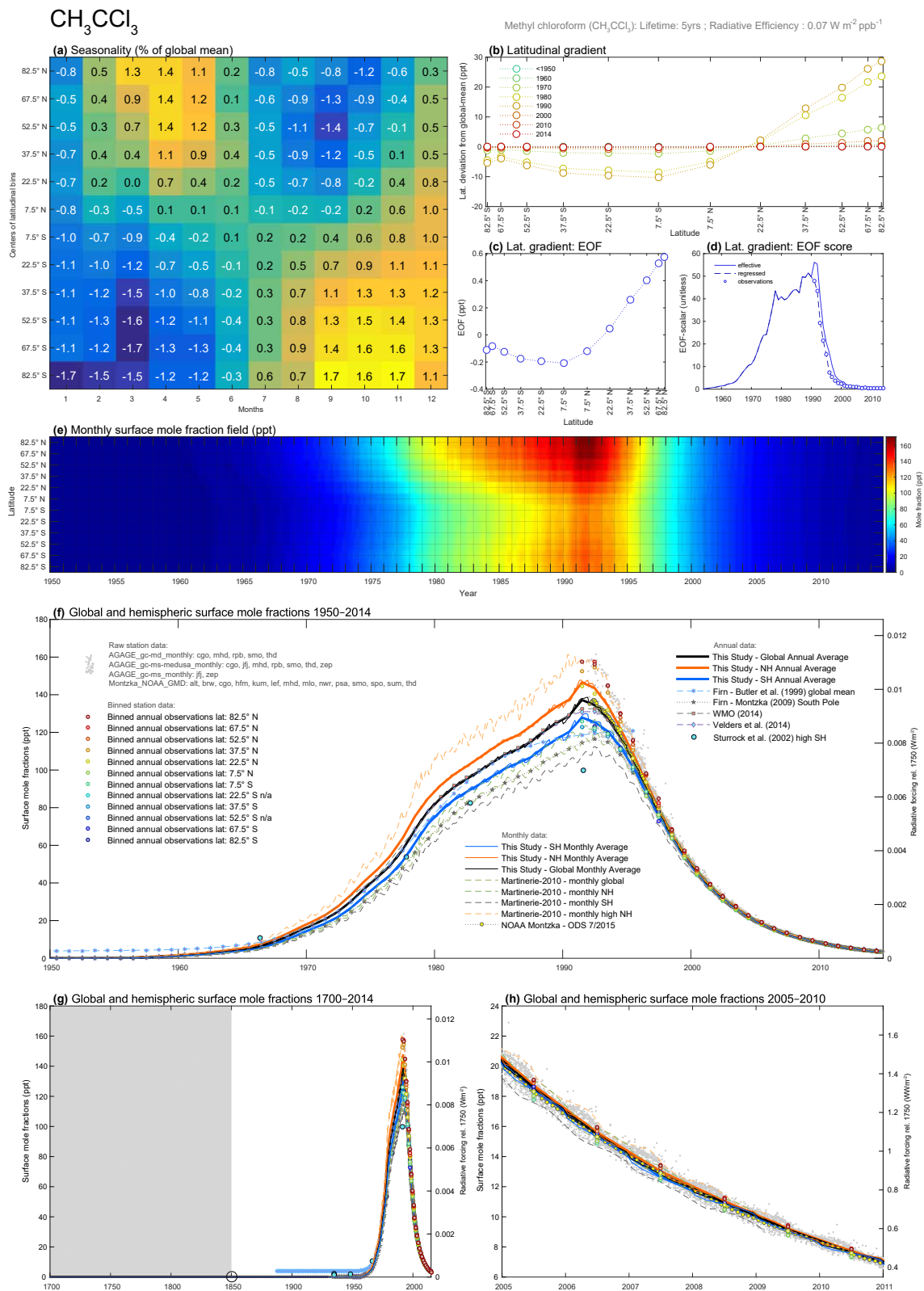
Figure S6. CFC-115 Factsheet

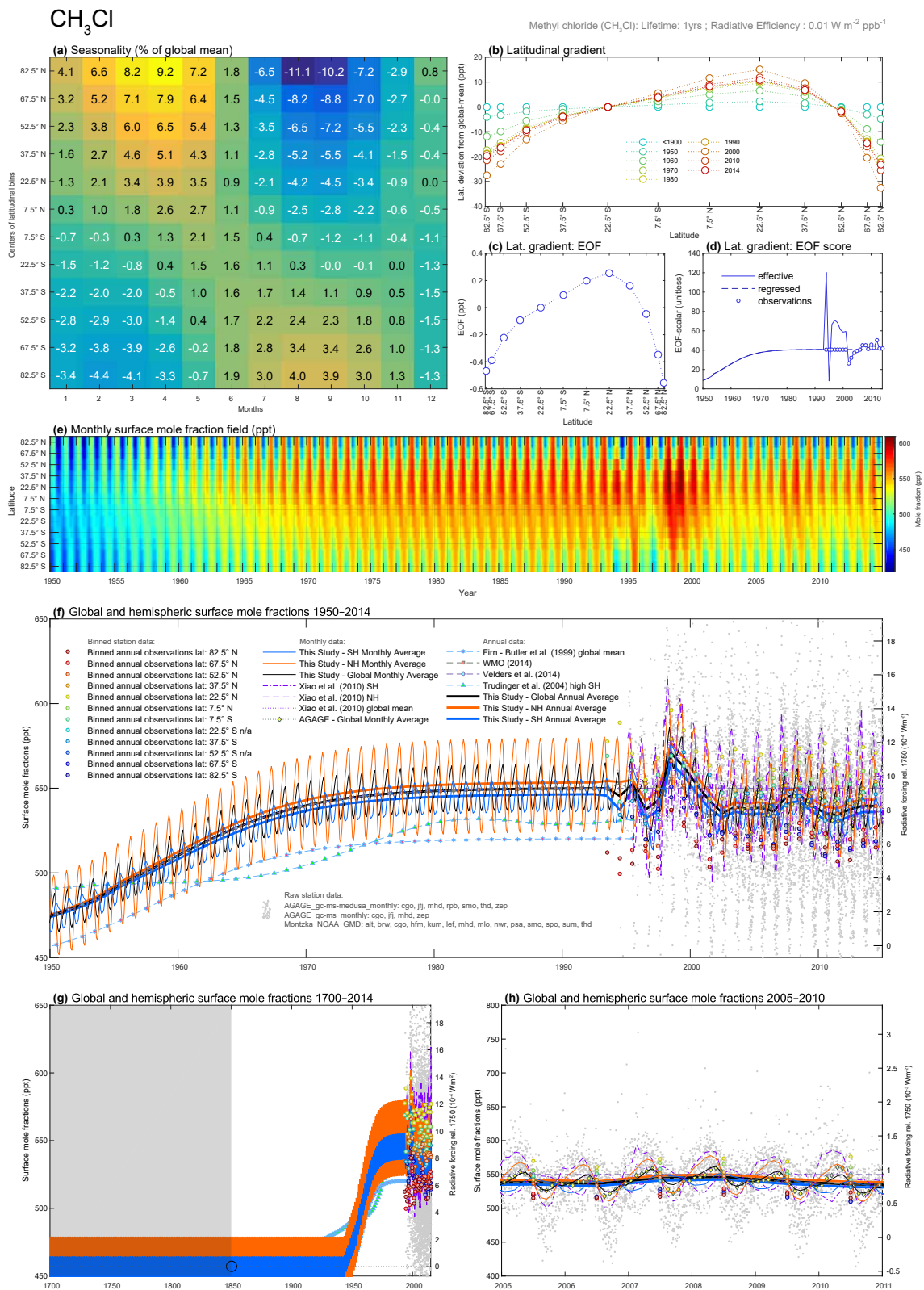


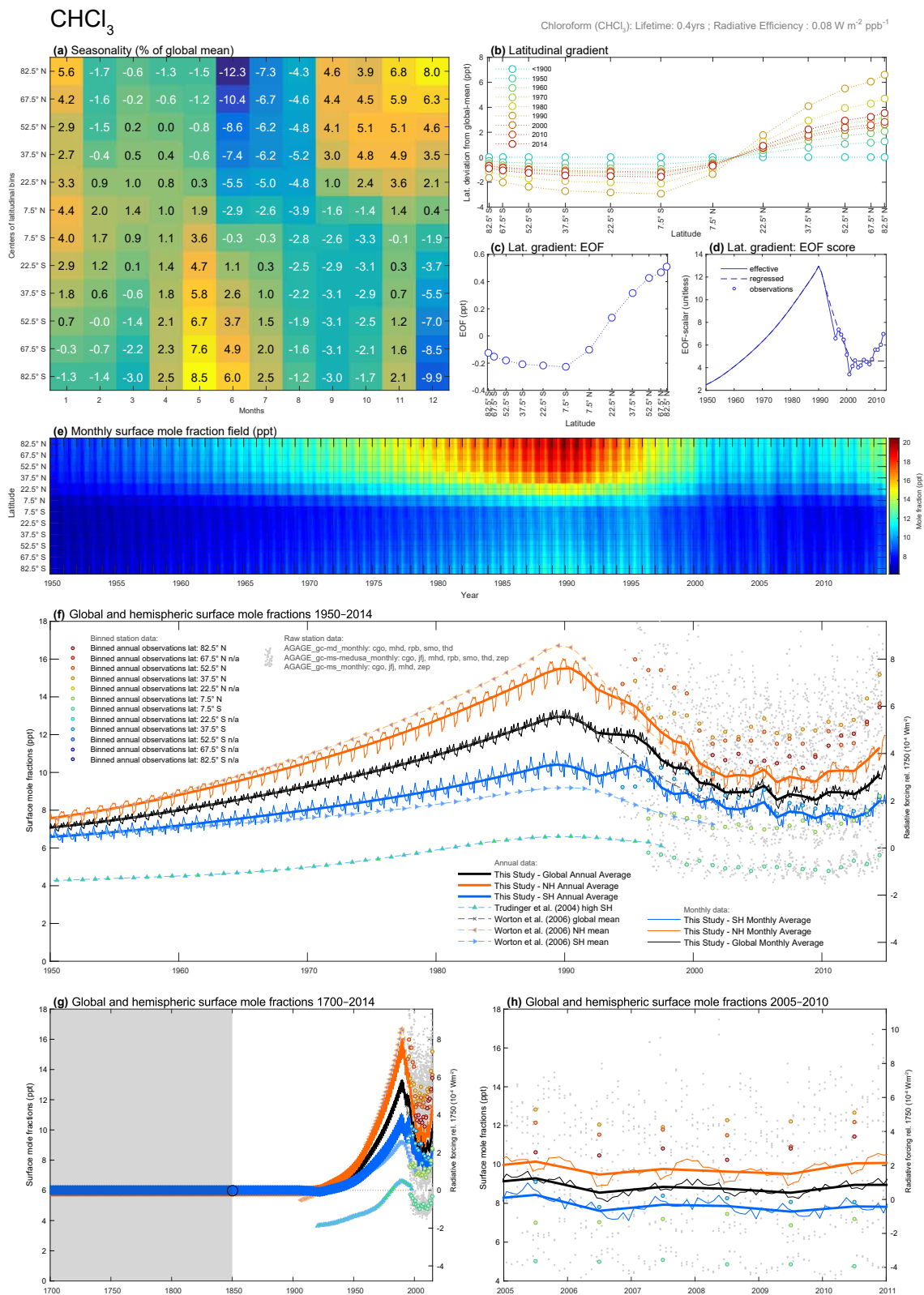
Figure S7. CH<sub>2</sub>Cl<sub>2</sub> Factsheet

Figure S8. CH<sub>3</sub>Br Factsheet



Figure S9. CH<sub>3</sub>CCl<sub>3</sub> Factsheet

Figure S10. CH<sub>3</sub>Cl Factsheet

Figure S11. CHCl<sub>3</sub> Factsheet

# Halon-1211

Halon-1211 (CBrClF<sub>3</sub>): Lifetime: 16yrs ; Radiative Efficiency : 0.29 W m<sup>-2</sup> ppb<sup>-1</sup>

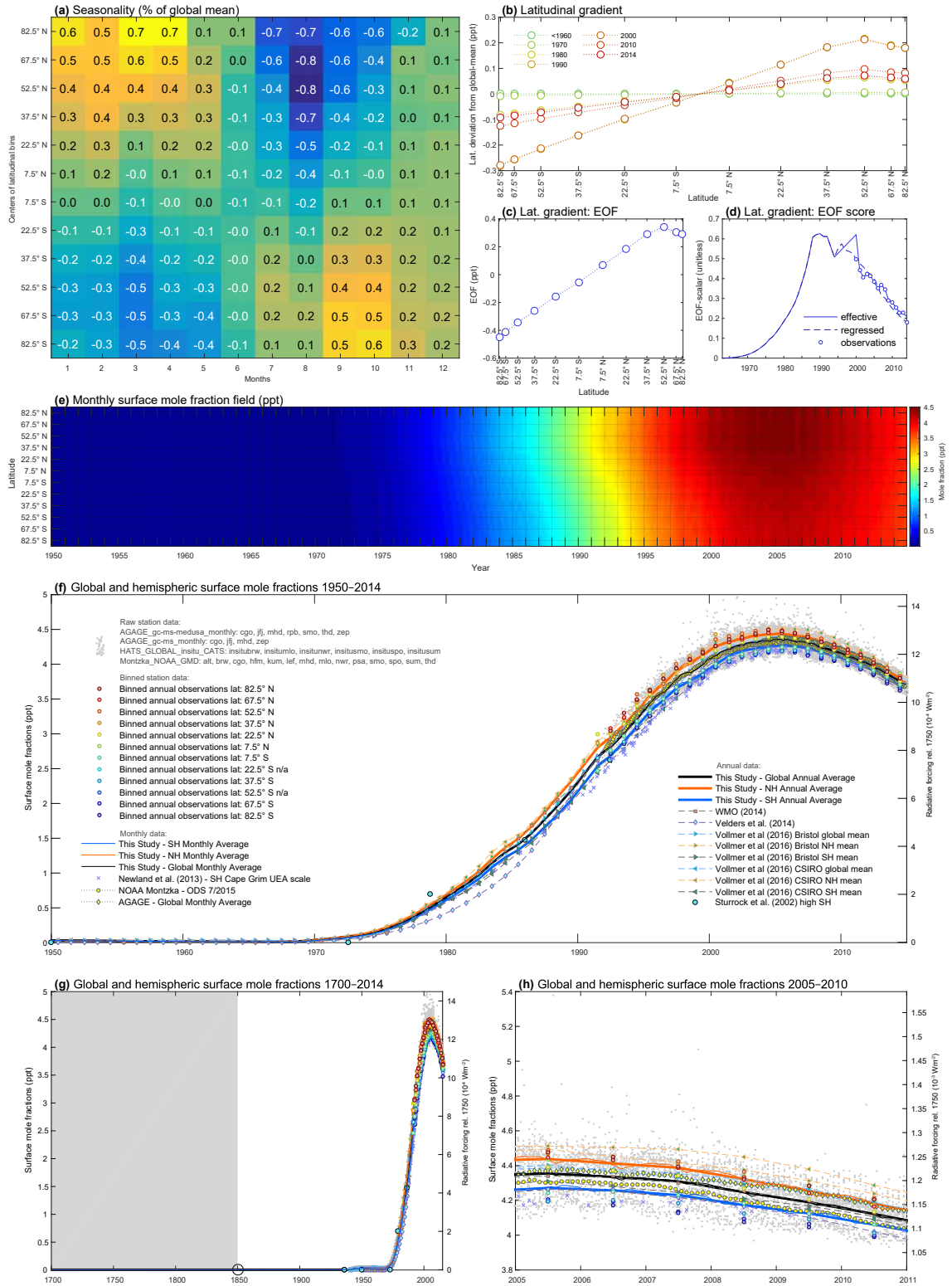


Figure S12. Halon-1211 Factsheet

## Halon-1301

Halon-1301 (CBrF<sub>3</sub>): Lifetime: 65yrs ; Radiative Efficiency : 0.3 W m<sup>-2</sup> ppb<sup>-1</sup>

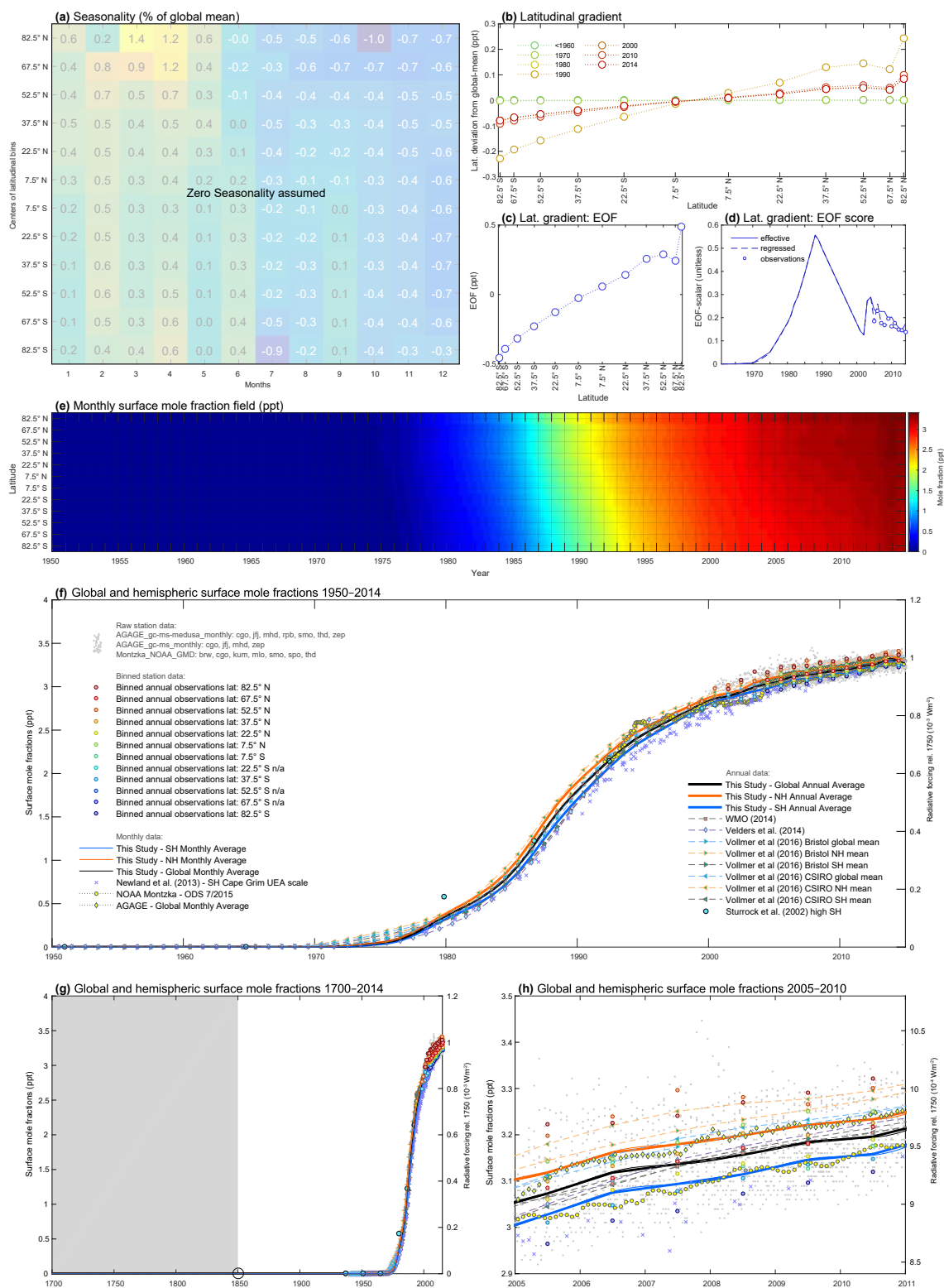


Figure S13. Halon-1301 Factsheet



# Halon-2402

Halon-2402 (CBrF<sub>3</sub>CBrF<sub>2</sub>): Lifetime: 20yrs ; Radiative Efficiency : 0.31 W m<sup>-2</sup> ppb<sup>-1</sup>

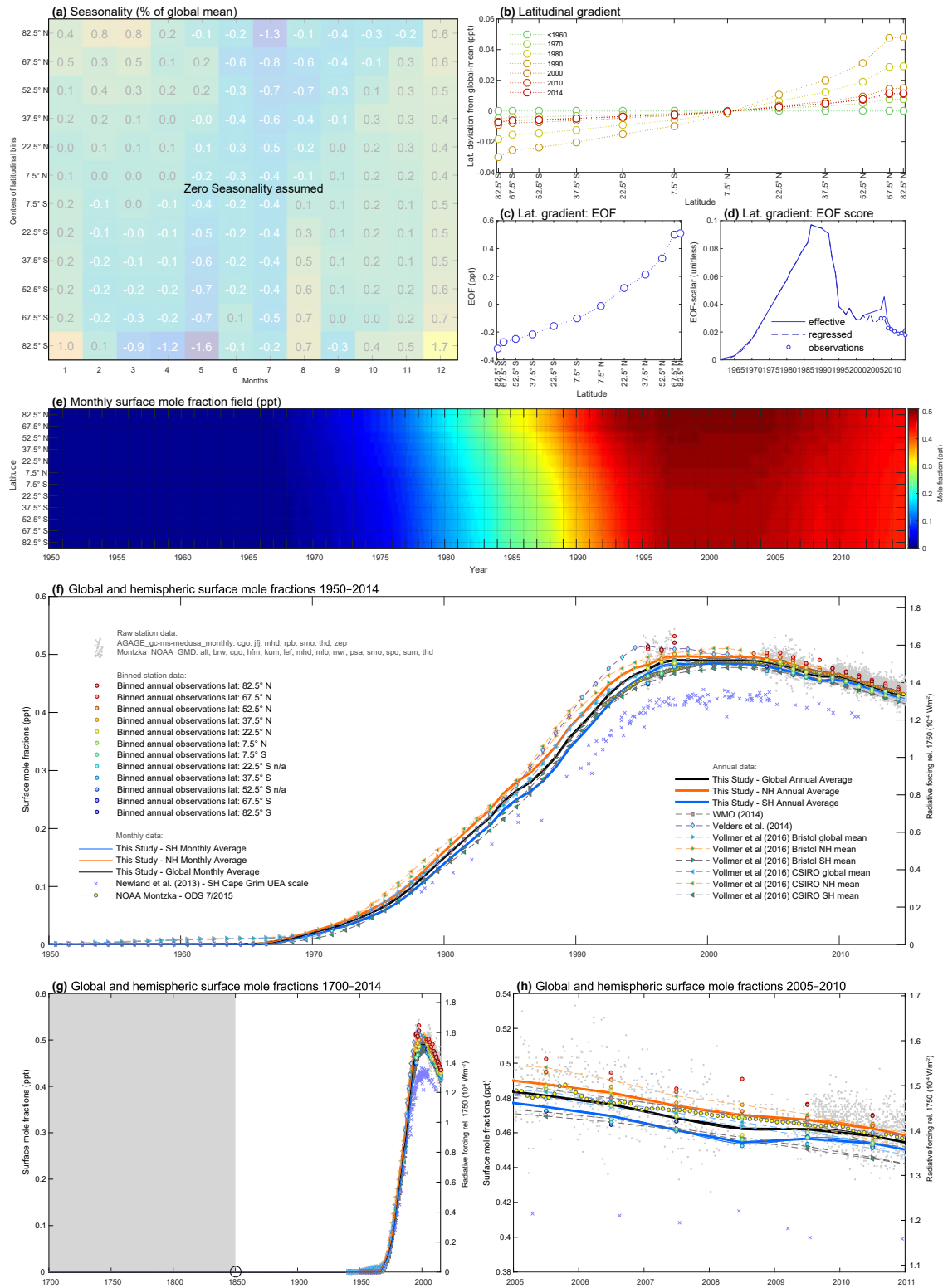


Figure S14. Halon-2402 Factsheet

## HCFC-22

HCFC-22 (CHClF<sub>2</sub>): Lifetime: 11.9yrs ; Radiative Efficiency : 0.21 W m<sup>-2</sup> ppb<sup>-1</sup>

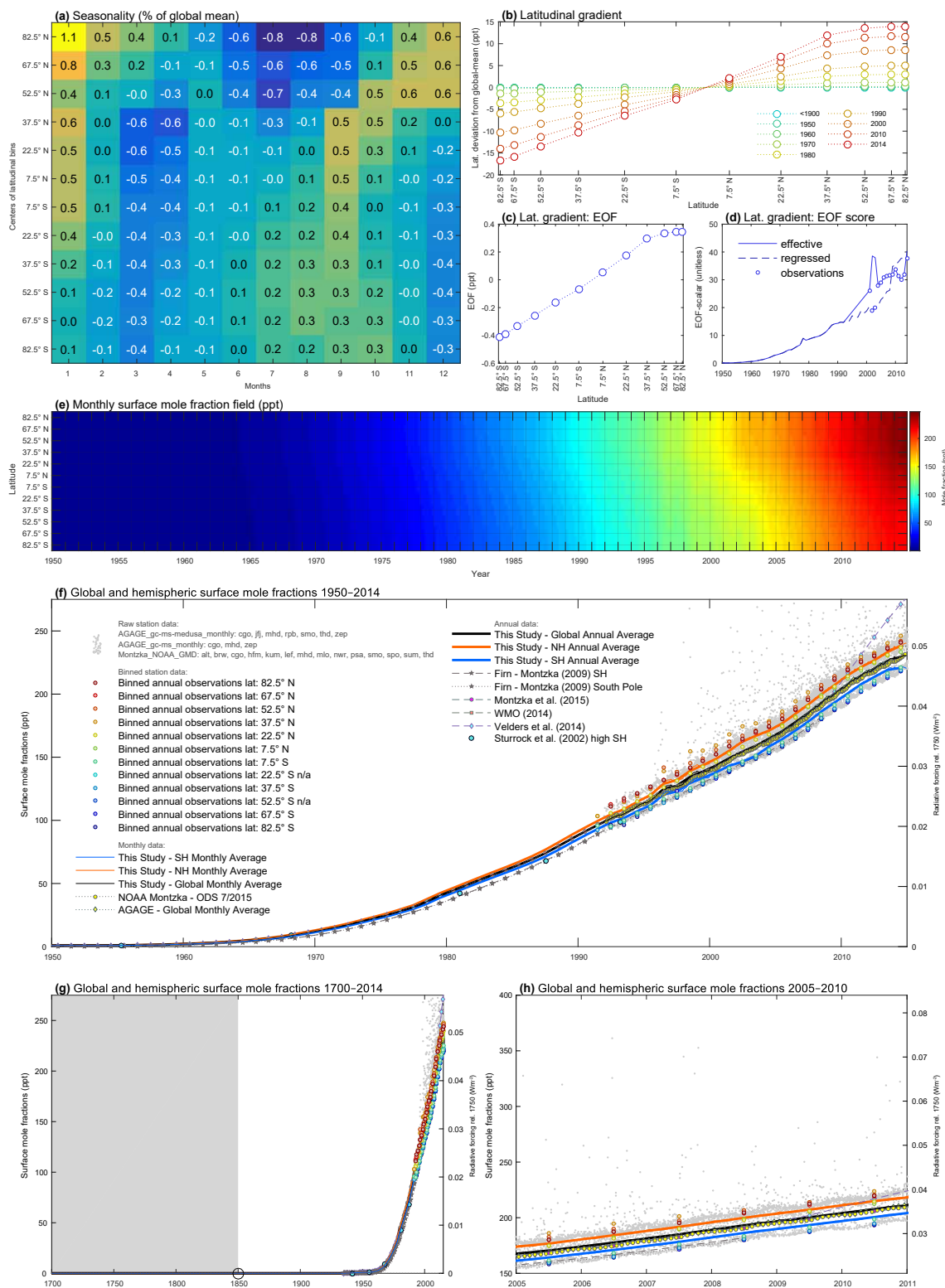


Figure S15. HCFC-22 Factsheet

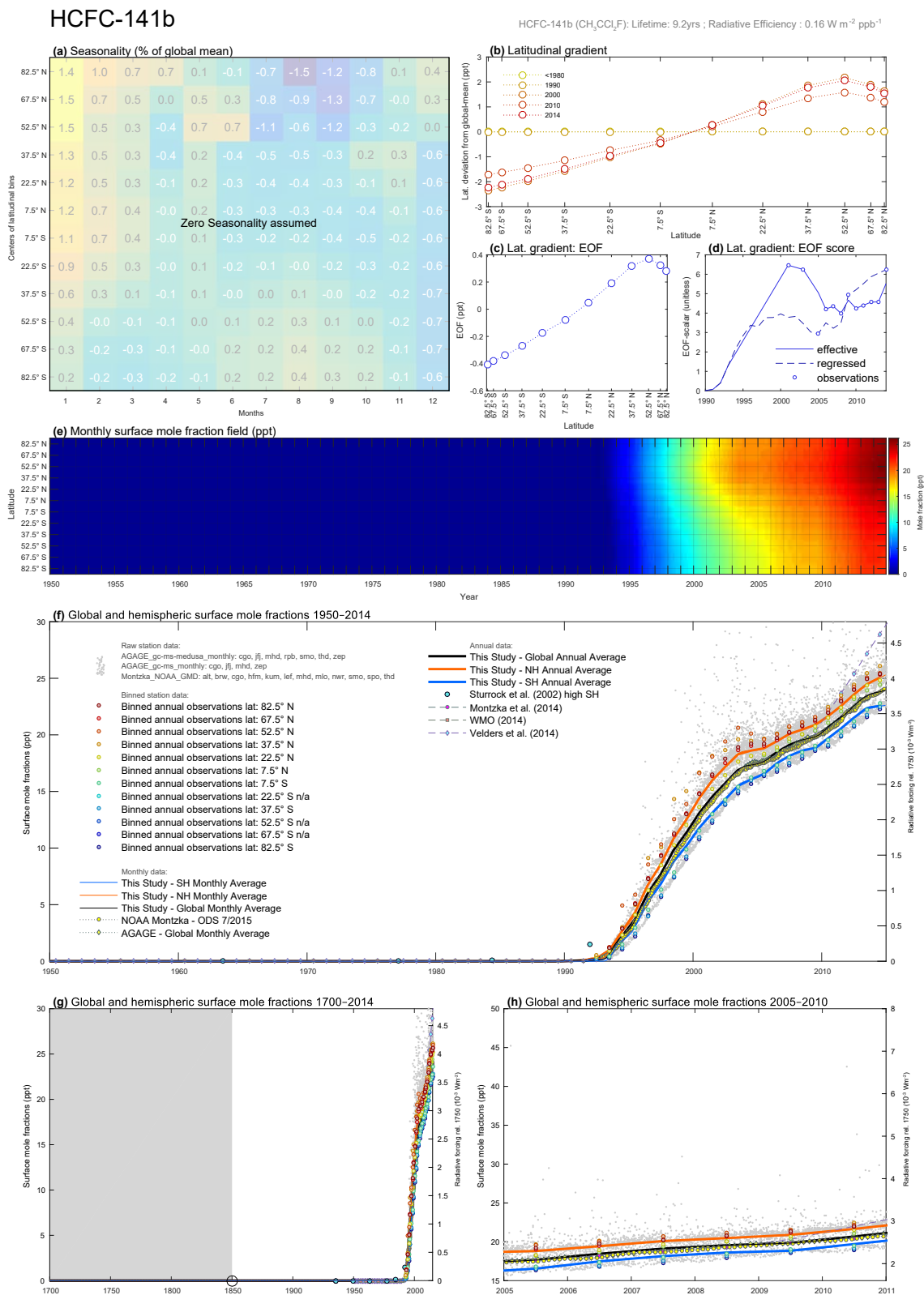


Figure S16. HCFC-141b Factsheet



# HCFC-142b

HCFC-142b ( $\text{CH}_2\text{ClCF}_3$ ): Lifetime: 17.2yrs ; Radiative Efficiency :  $0.19 \text{ W m}^{-2} \text{ ppb}^{-1}$

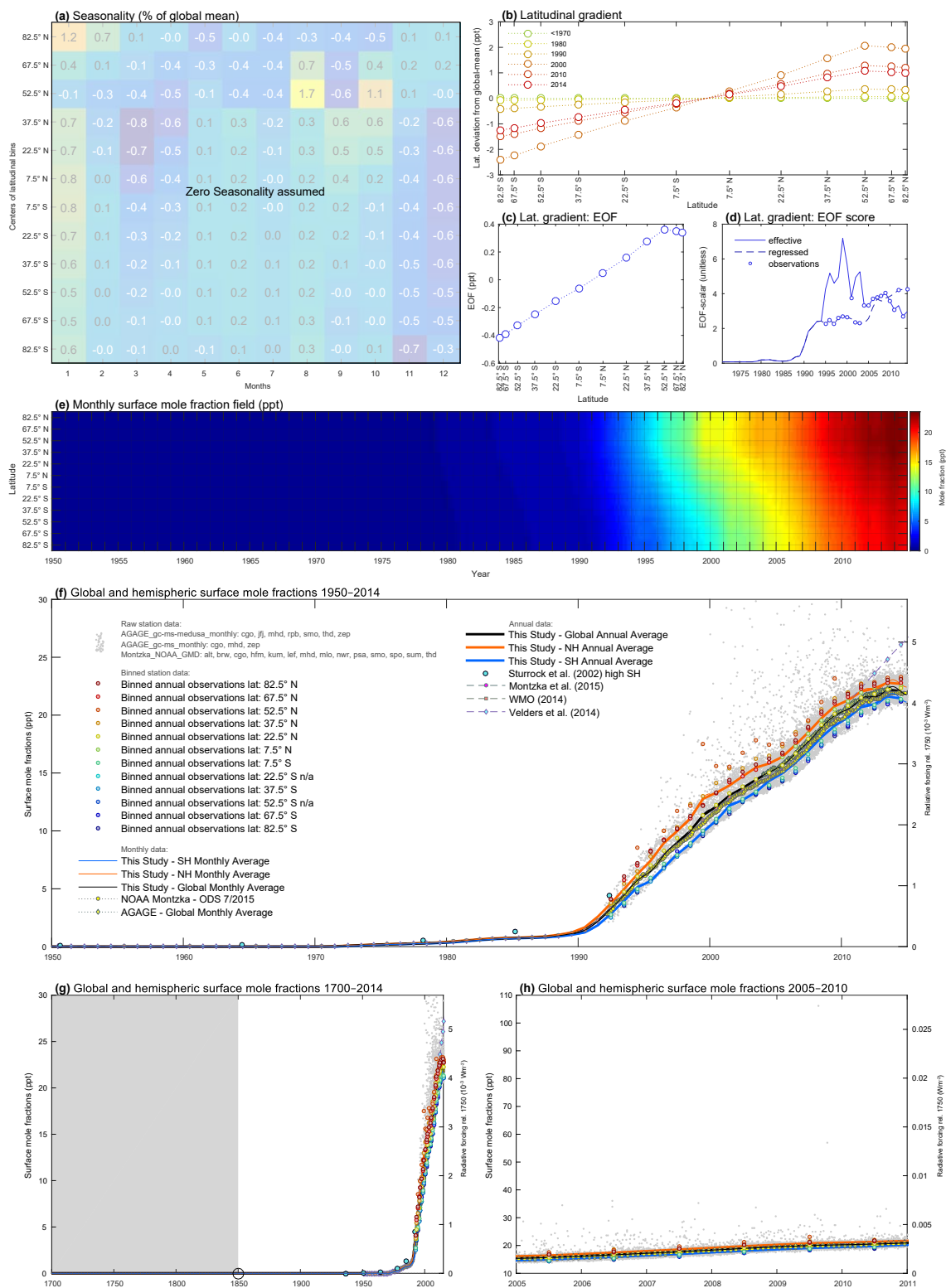
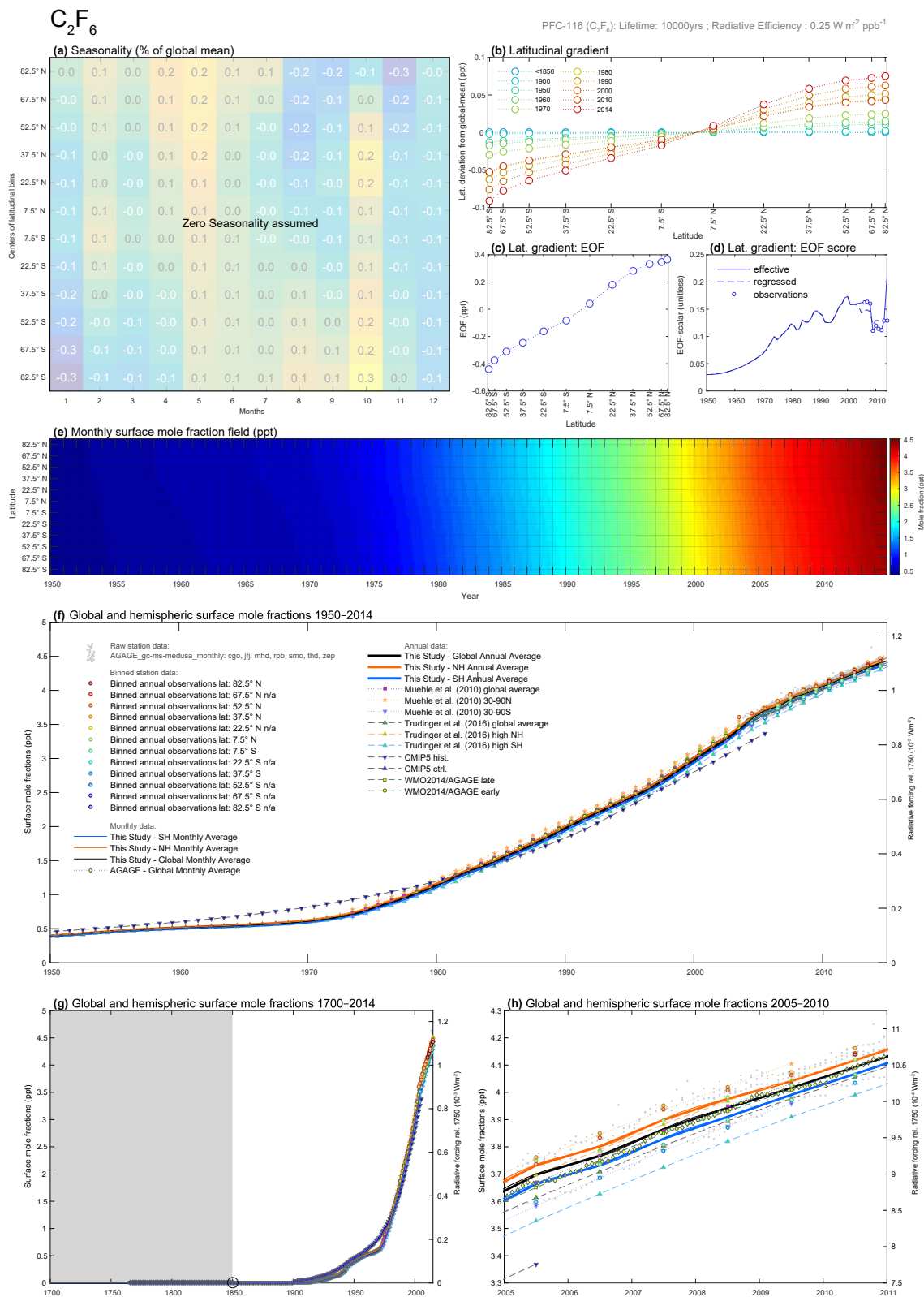
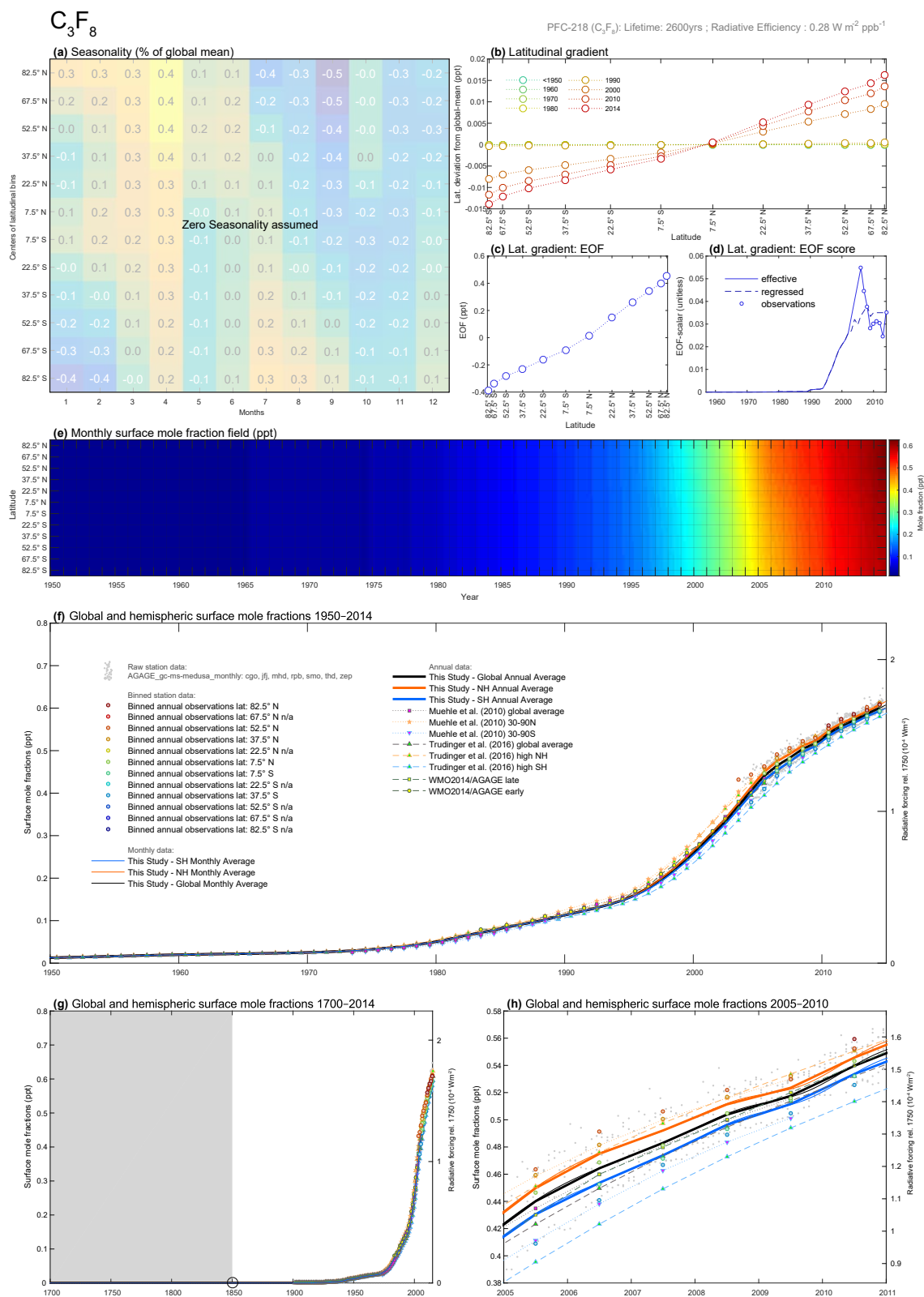
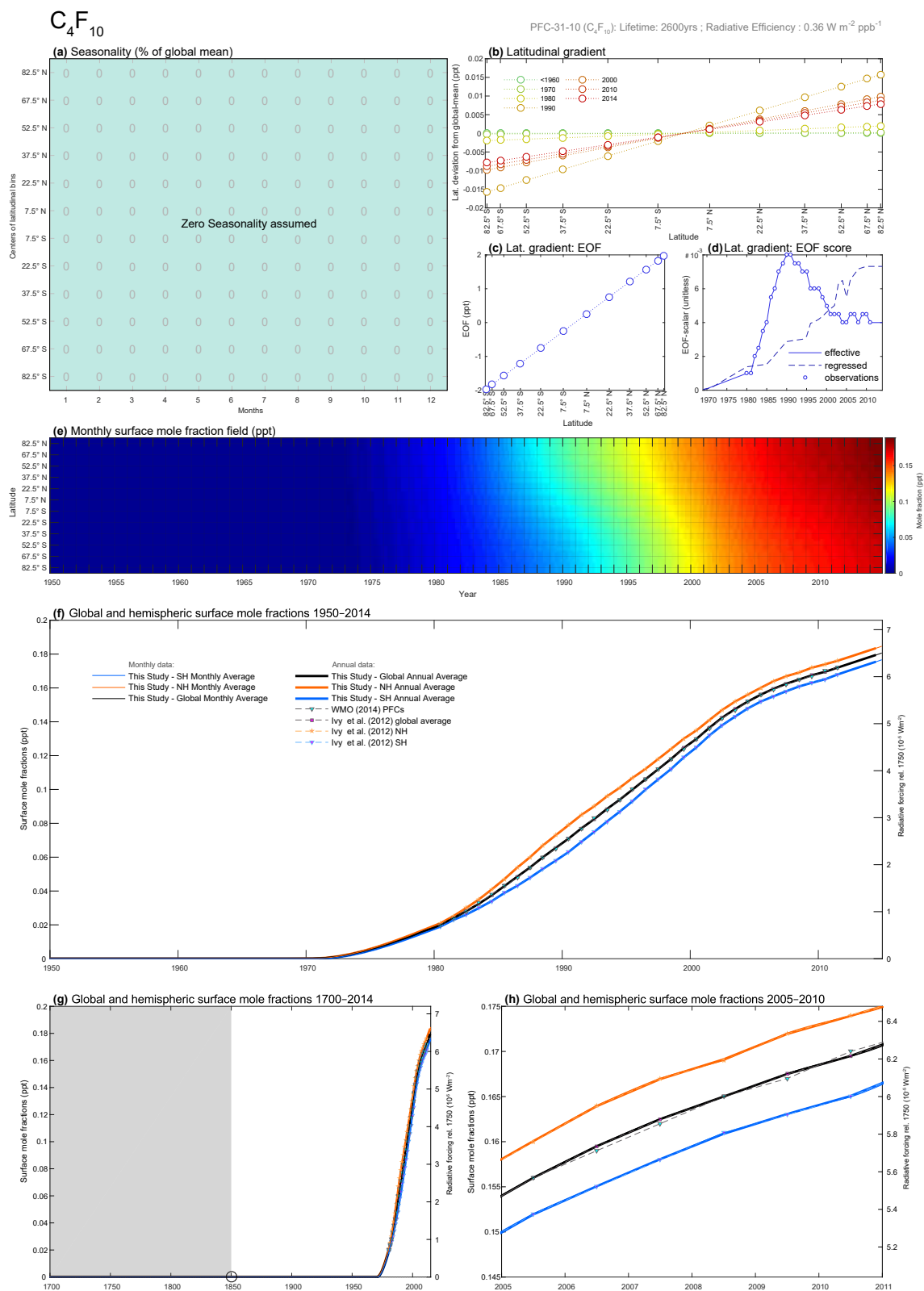
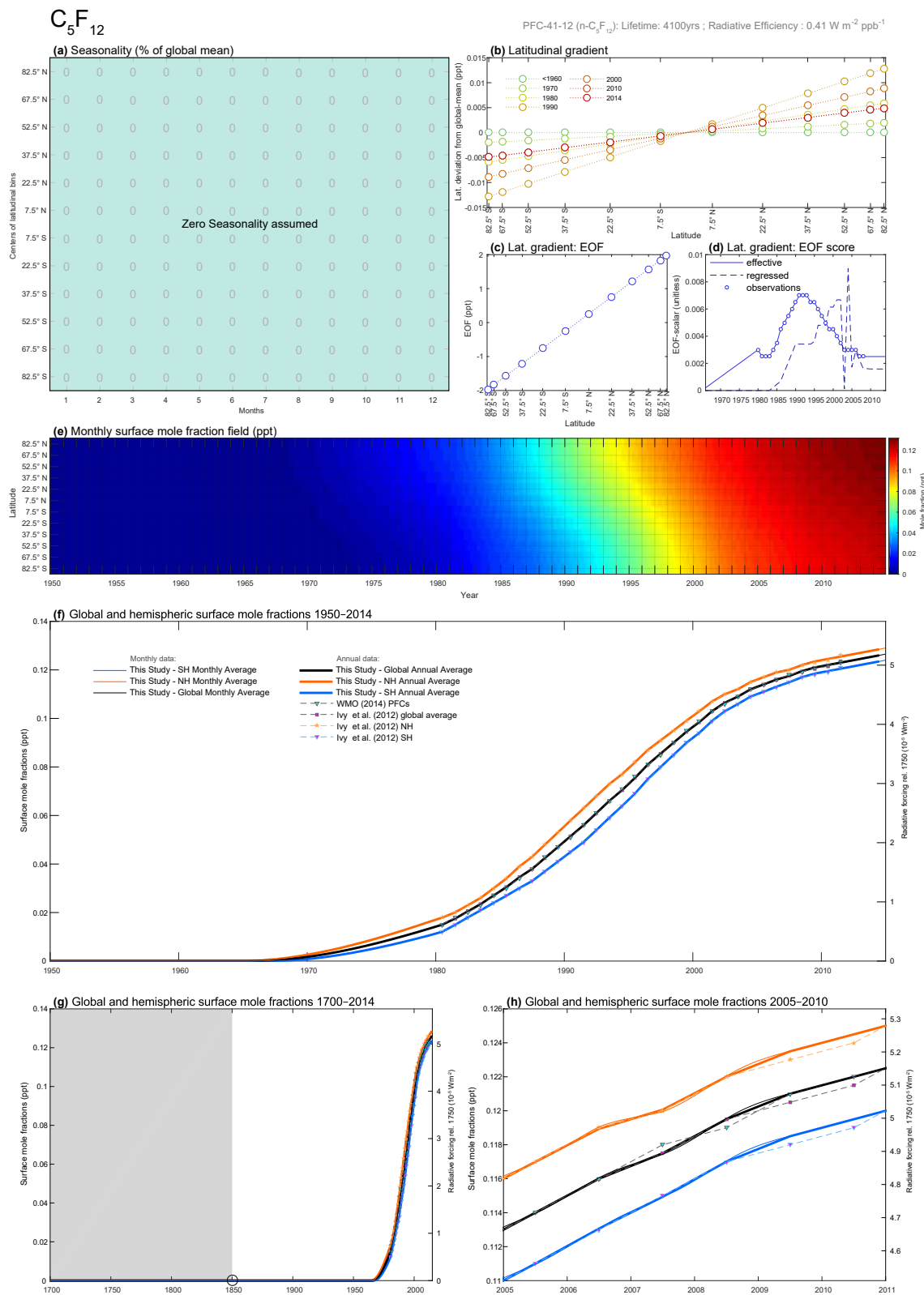


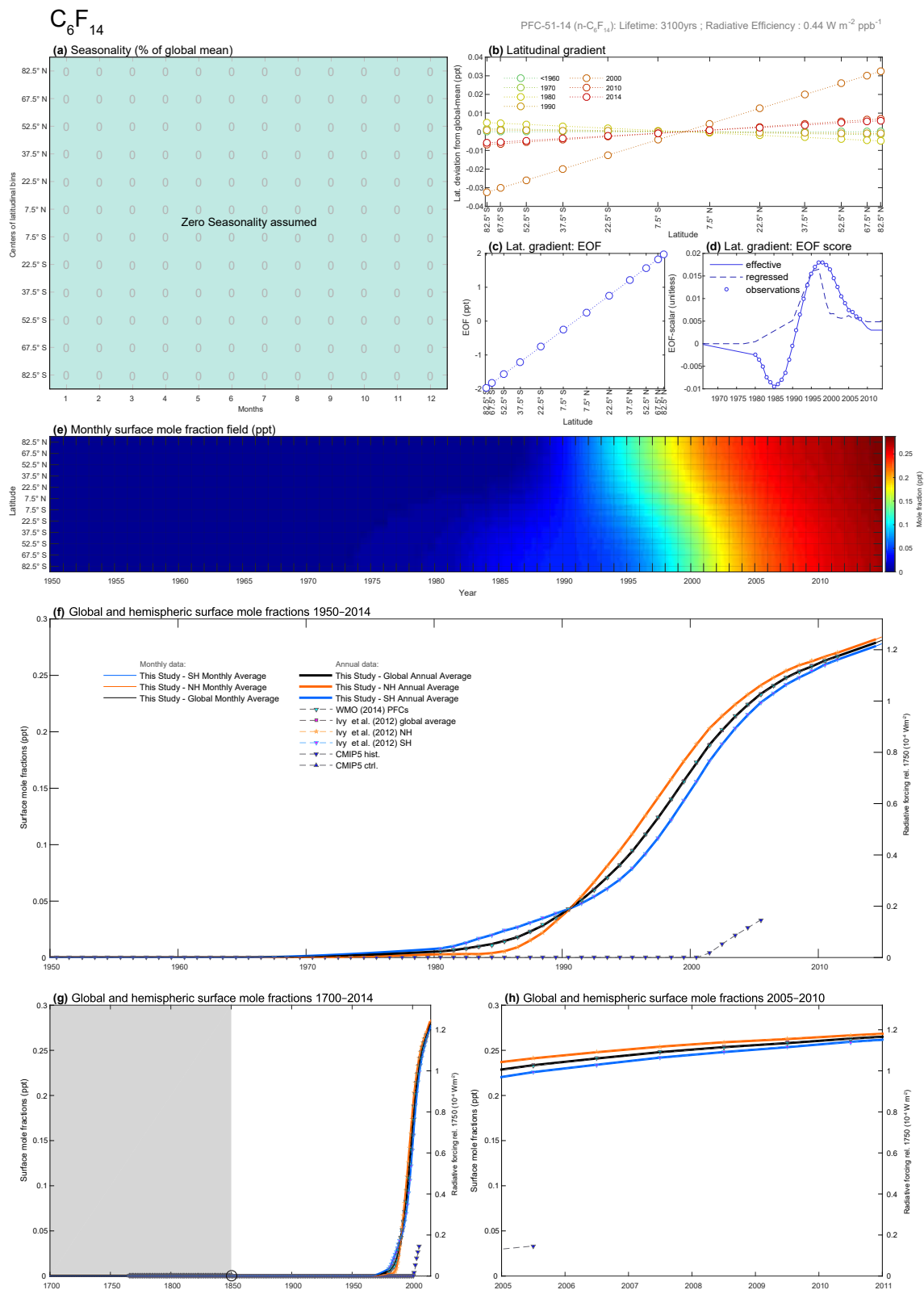
Figure S17. HCFC-142b Factsheet

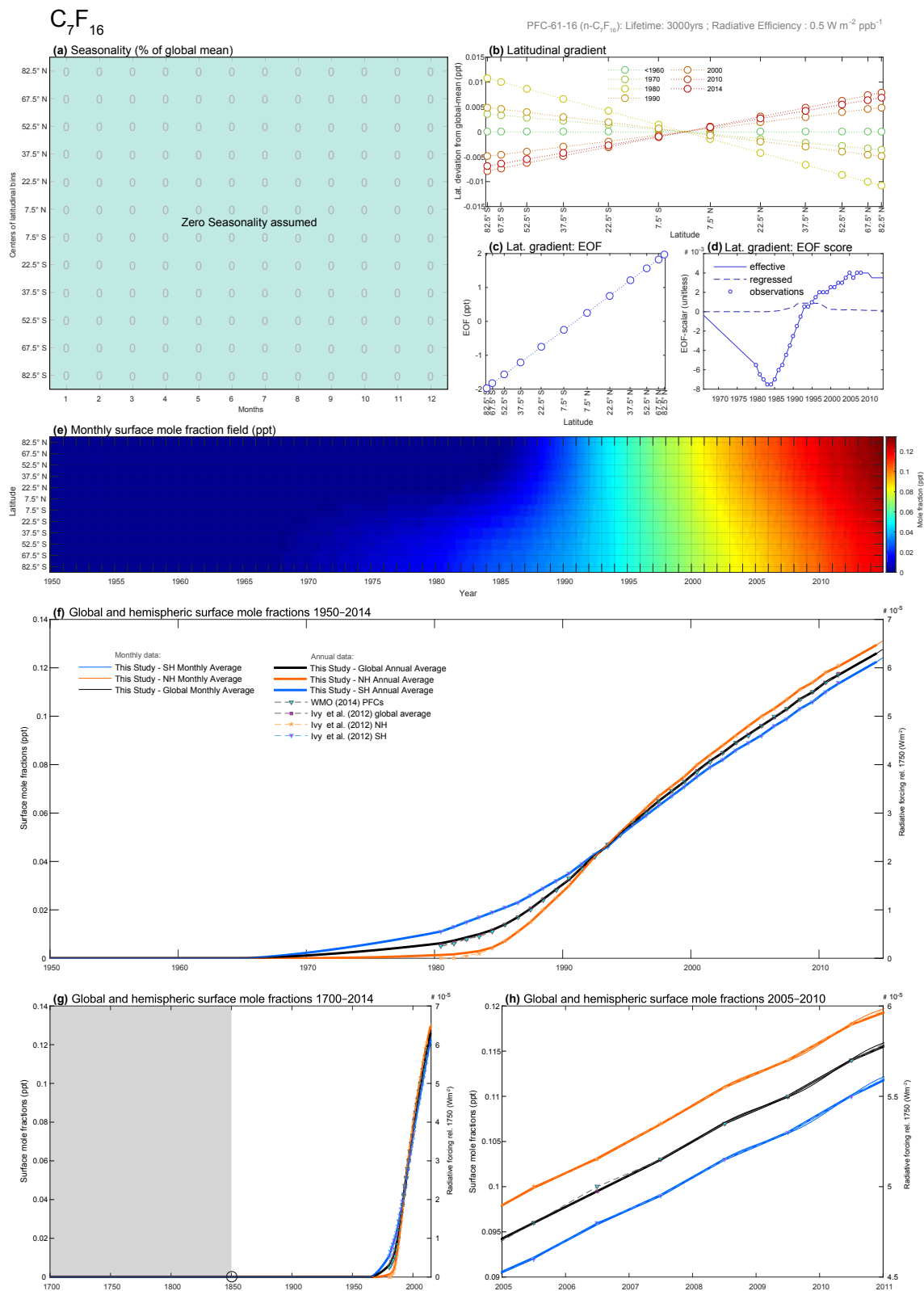
Figure S18.  $C_2F_6$  Factsheet

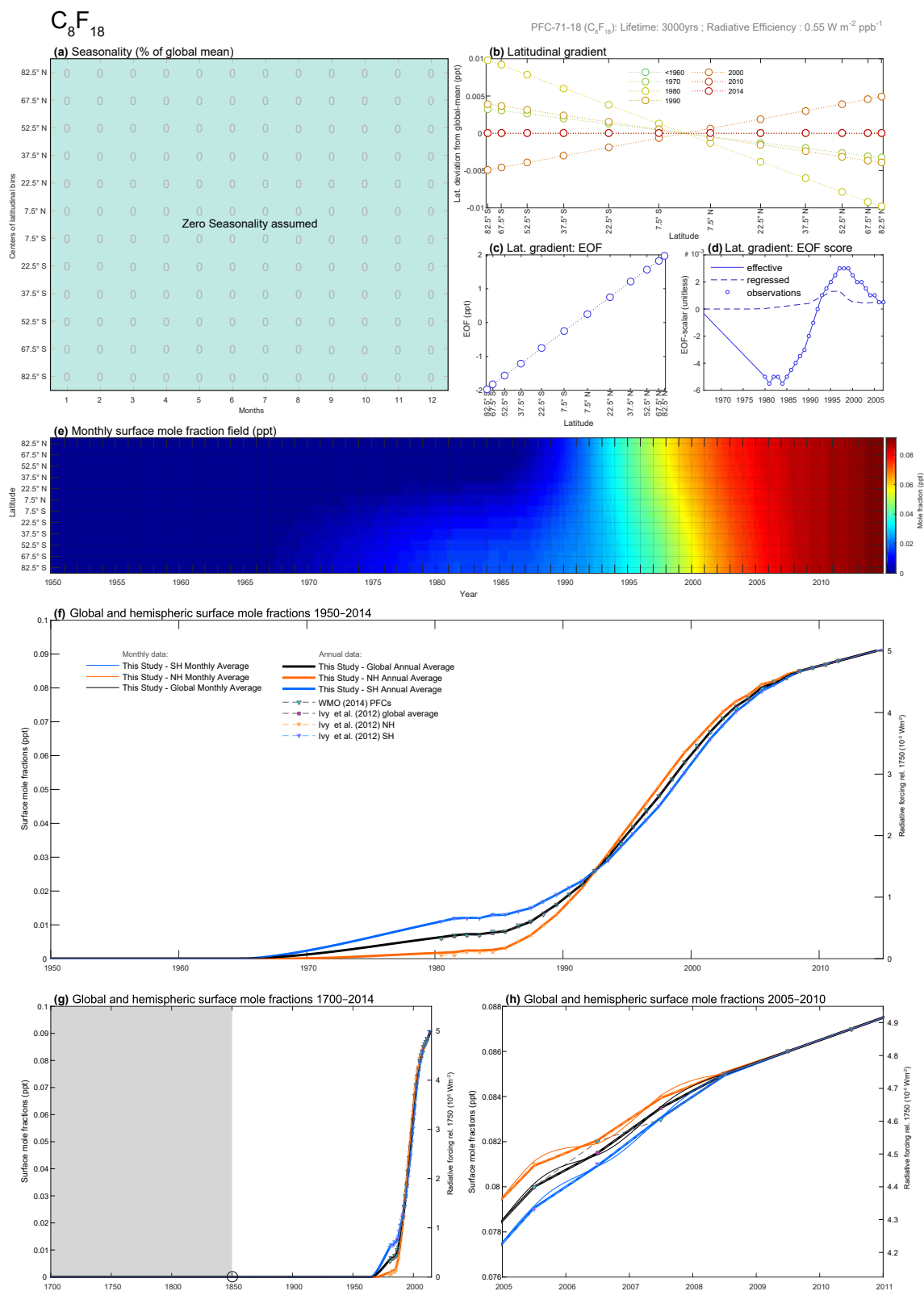
Figure S19. C<sub>3</sub>F<sub>8</sub> Factsheet

Figure S20. C<sub>4</sub>F<sub>10</sub> Factsheet

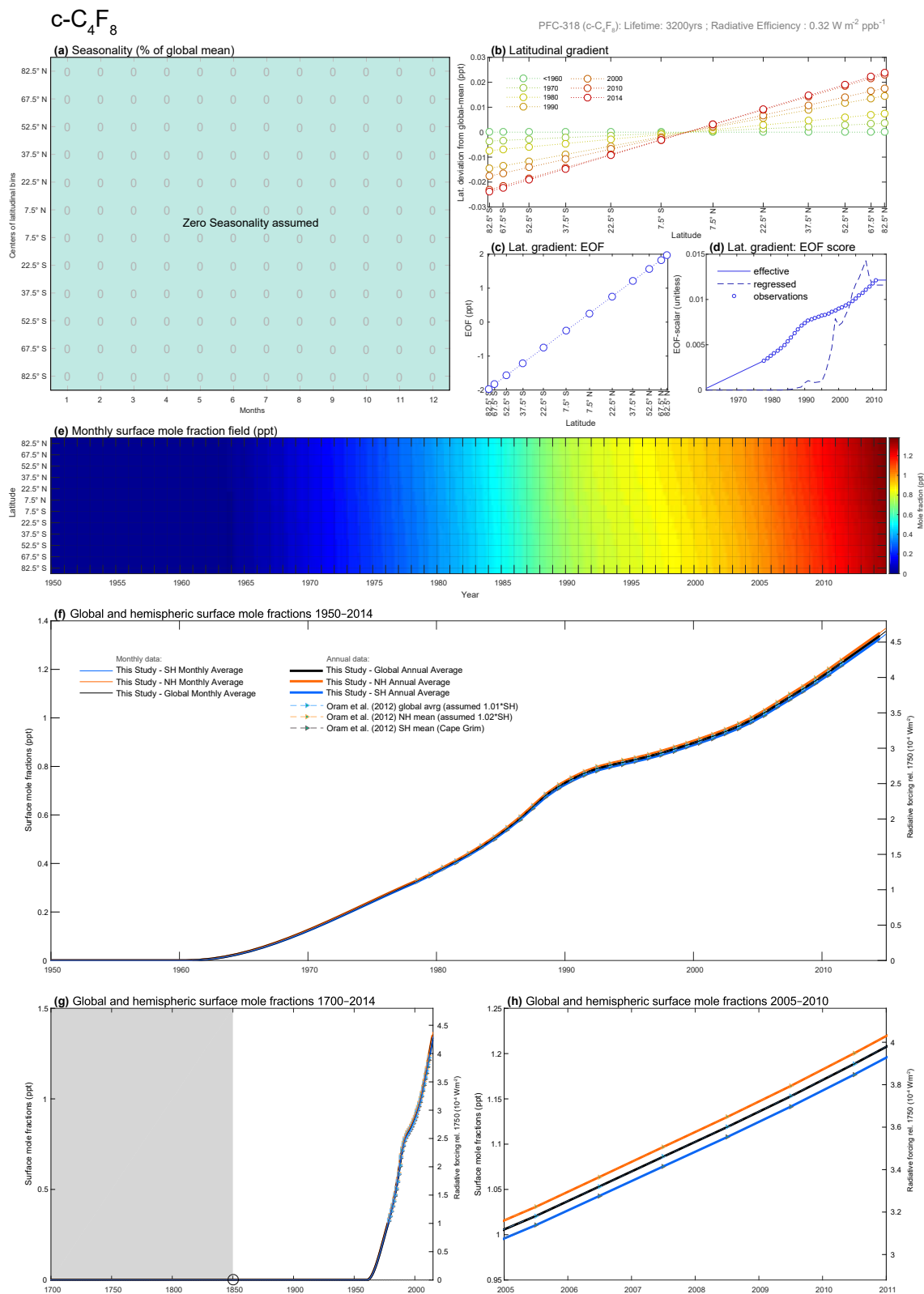
Figure S21. C<sub>5</sub>F<sub>12</sub> Factsheet

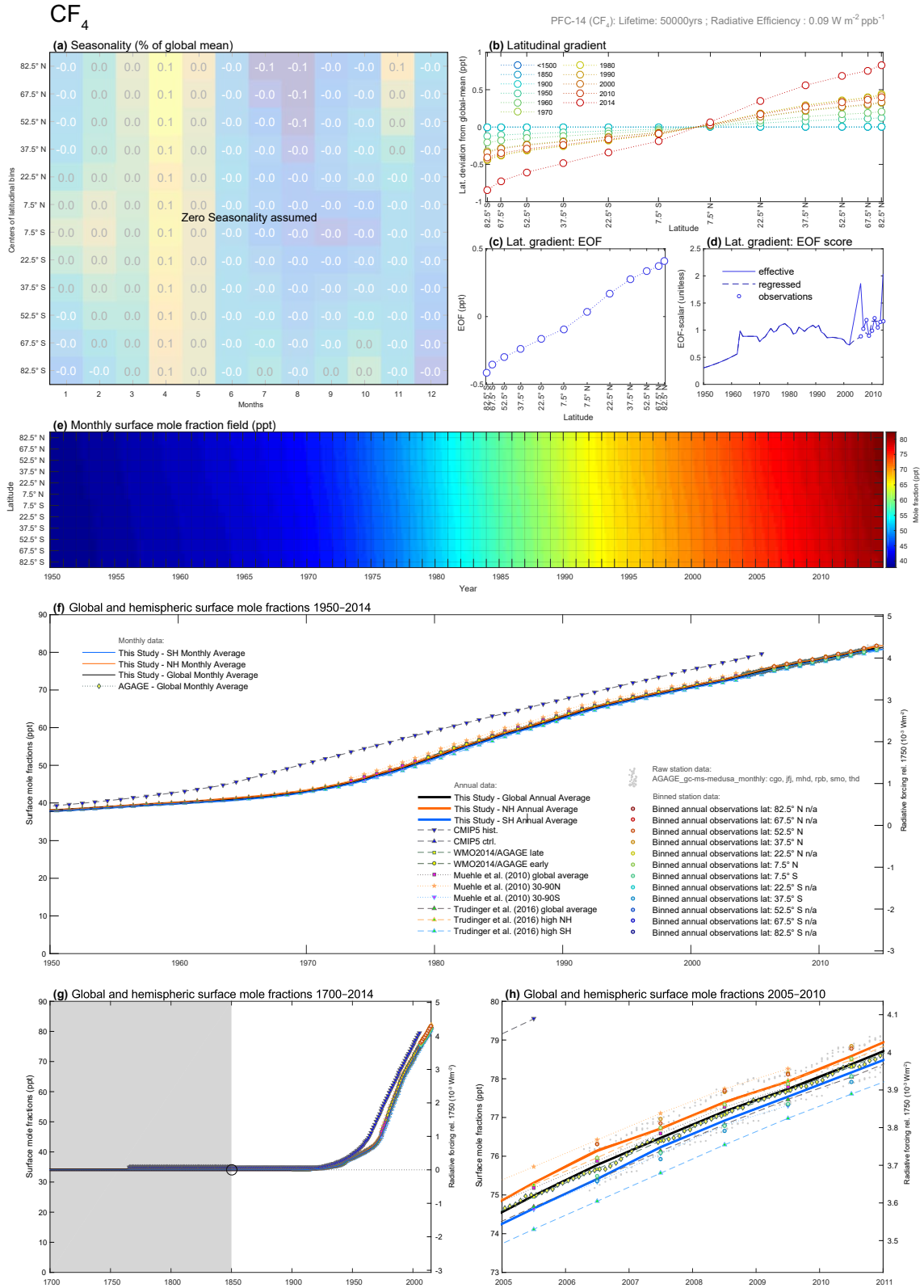
Figure S22. C<sub>6</sub>F<sub>14</sub> Factsheet

Figure S23. C<sub>7</sub>F<sub>16</sub> Factsheet

Figure S24. C<sub>8</sub>F<sub>18</sub> Factsheet



Figure S25. c-C<sub>4</sub>F<sub>8</sub> Factsheet

Figure S26. CF<sub>4</sub> Factsheet

## HFC-23

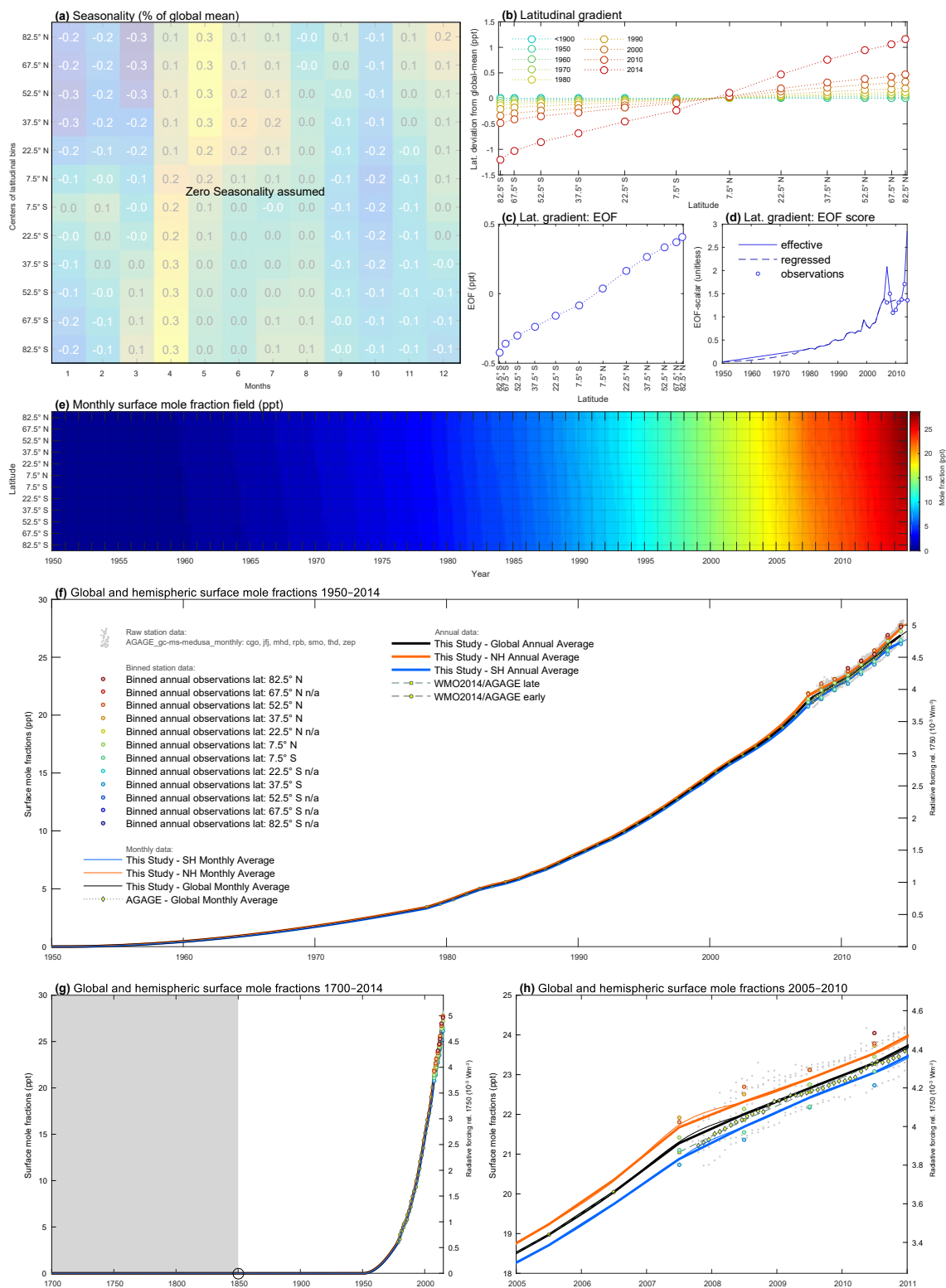
HFC-23 (CHF<sub>3</sub>): Lifetime: 222yrs ; Radiative Efficiency : 0.18 W m<sup>-2</sup> ppb<sup>-1</sup>

Figure S27. HFC-23 Factsheet

## HFC-32

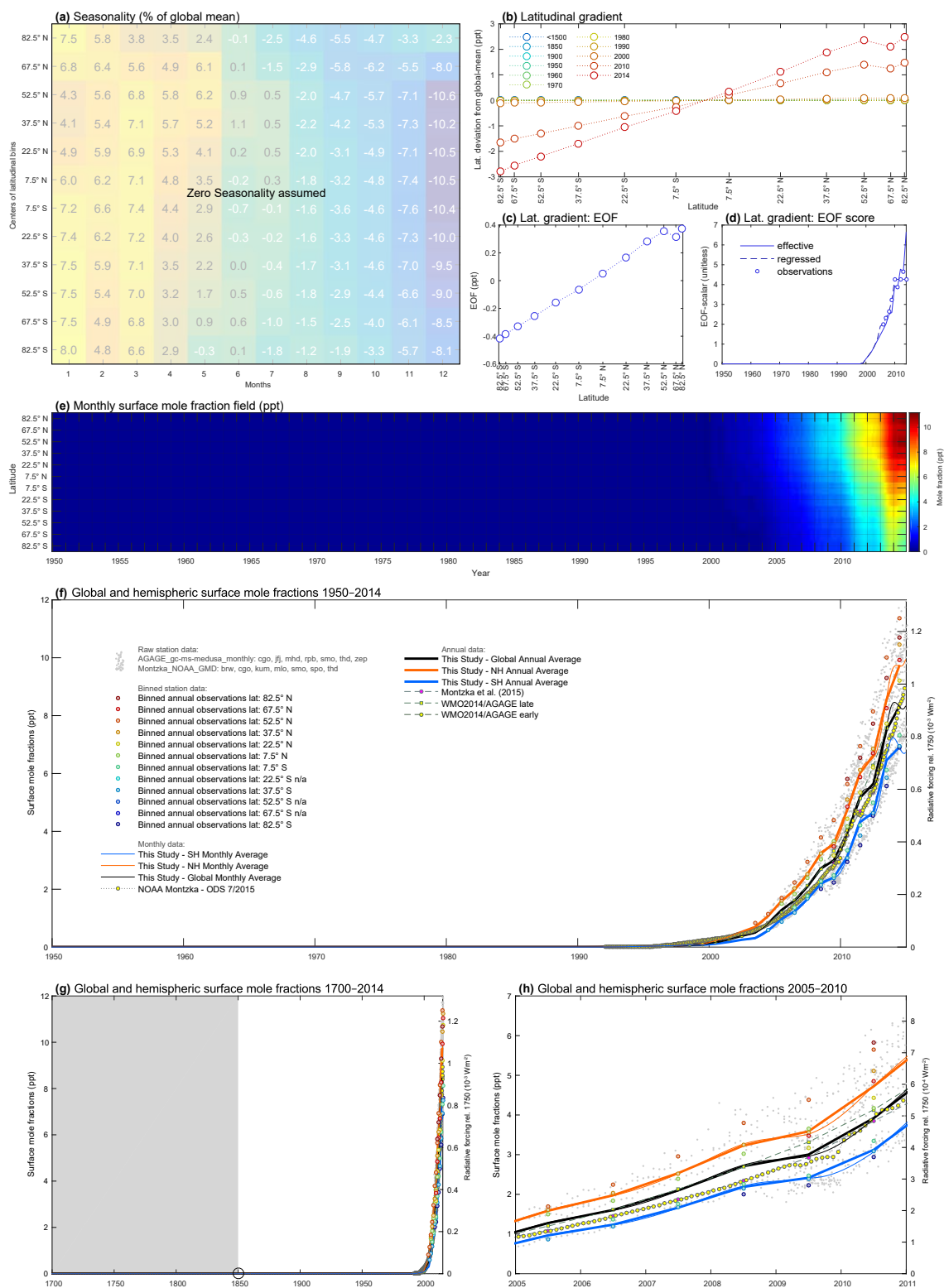
HFC-32 ( $\text{CH}_2\text{F}_2$ ): Lifetime: 5.2yrs ; Radiative Efficiency :  $0.11 \text{ W m}^{-2} \text{ ppb}^{-1}$ 

Figure S28. HFC-32 Factsheet

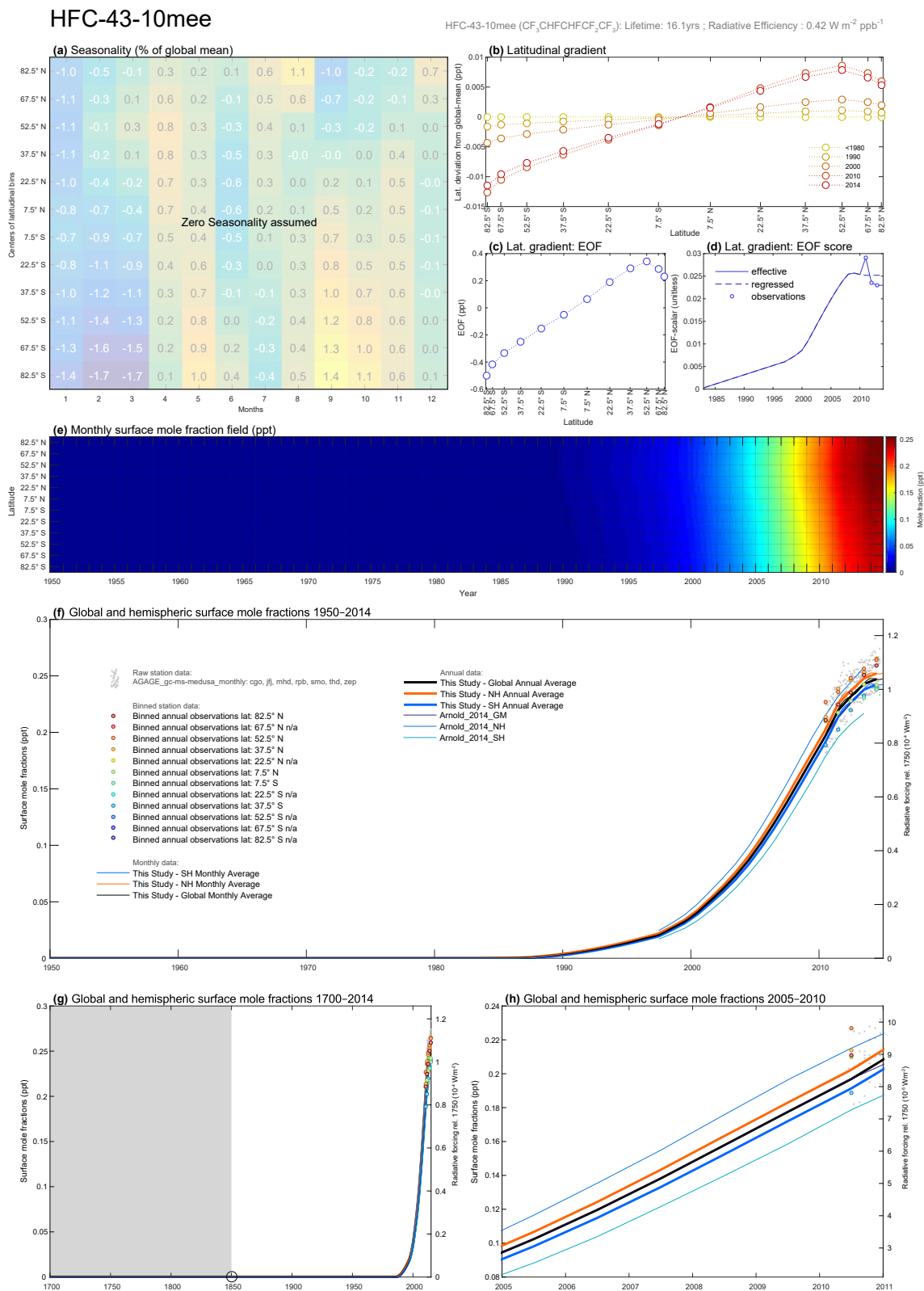


Figure S29. HFC-43-10-mee Factsheet

# HFC-125

HFC-125 ( $\text{CHF}_2\text{CF}_3$ ): Lifetime: 28.2yrs ; Radiative Efficiency :  $0.23 \text{ W m}^{-2} \text{ ppb}^{-1}$

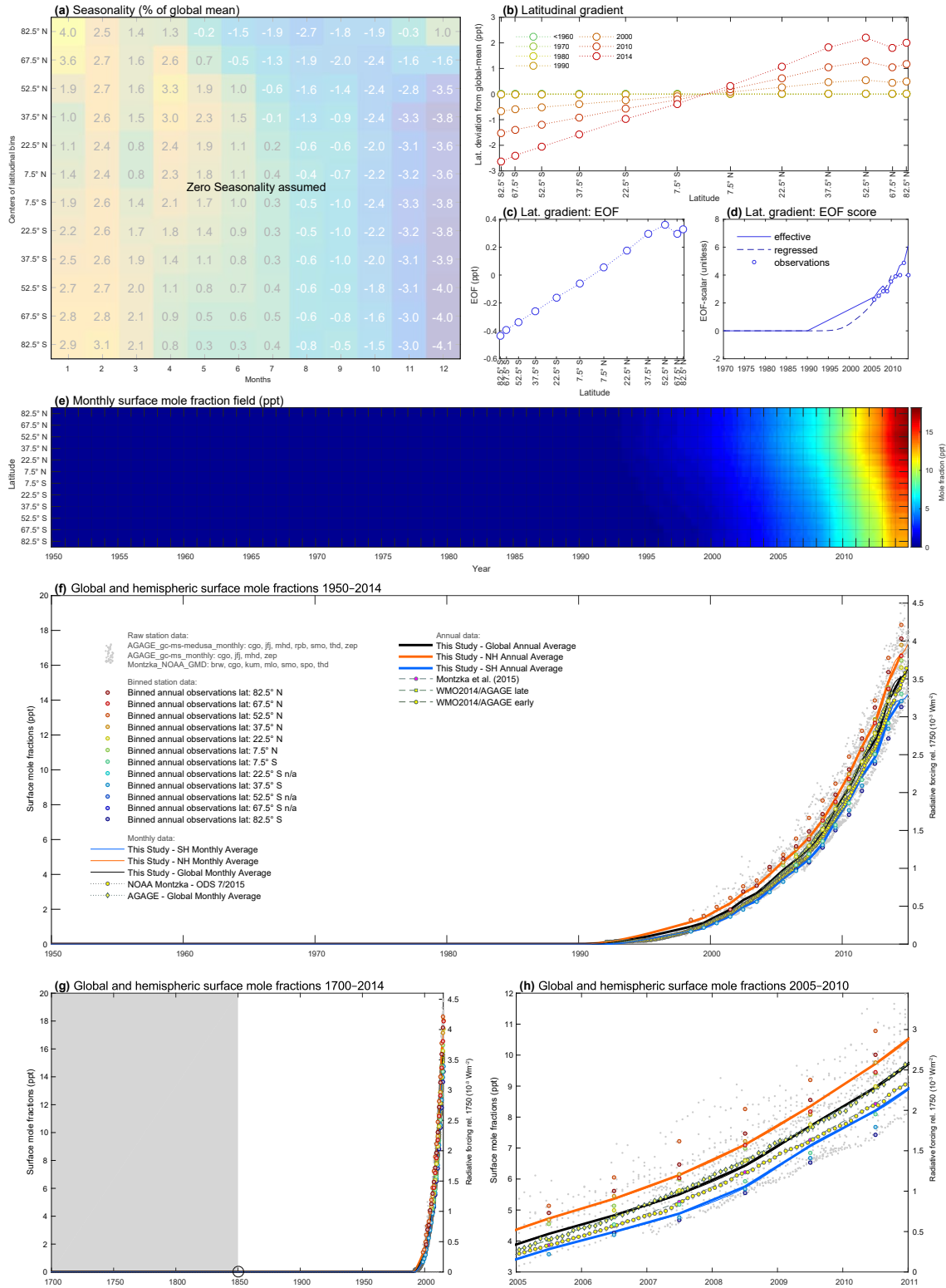


Figure S30. HFC-125 Factsheet

## HFC-134a

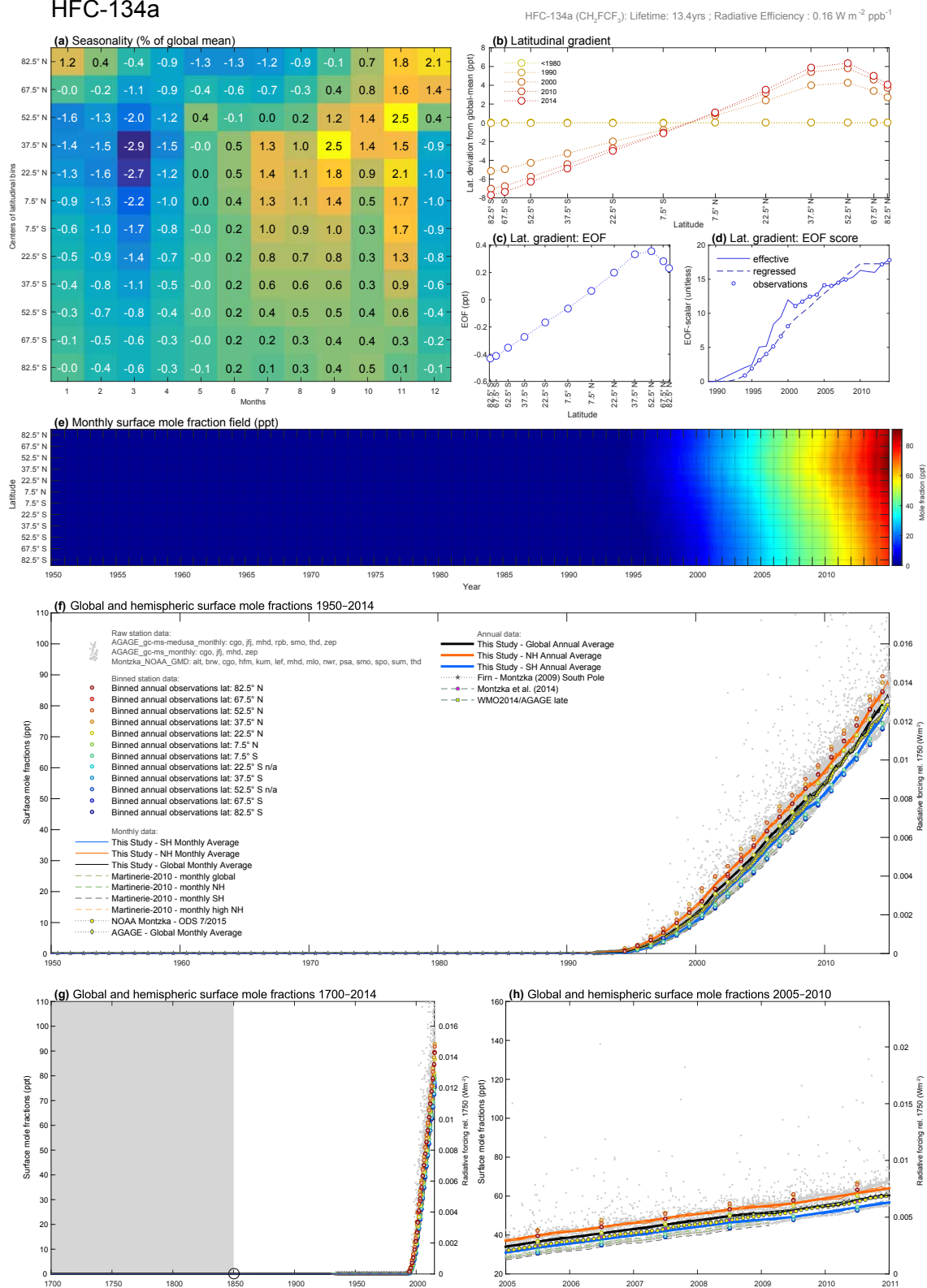


Figure S31. HFC-134a Factsheet



## HFC-143a

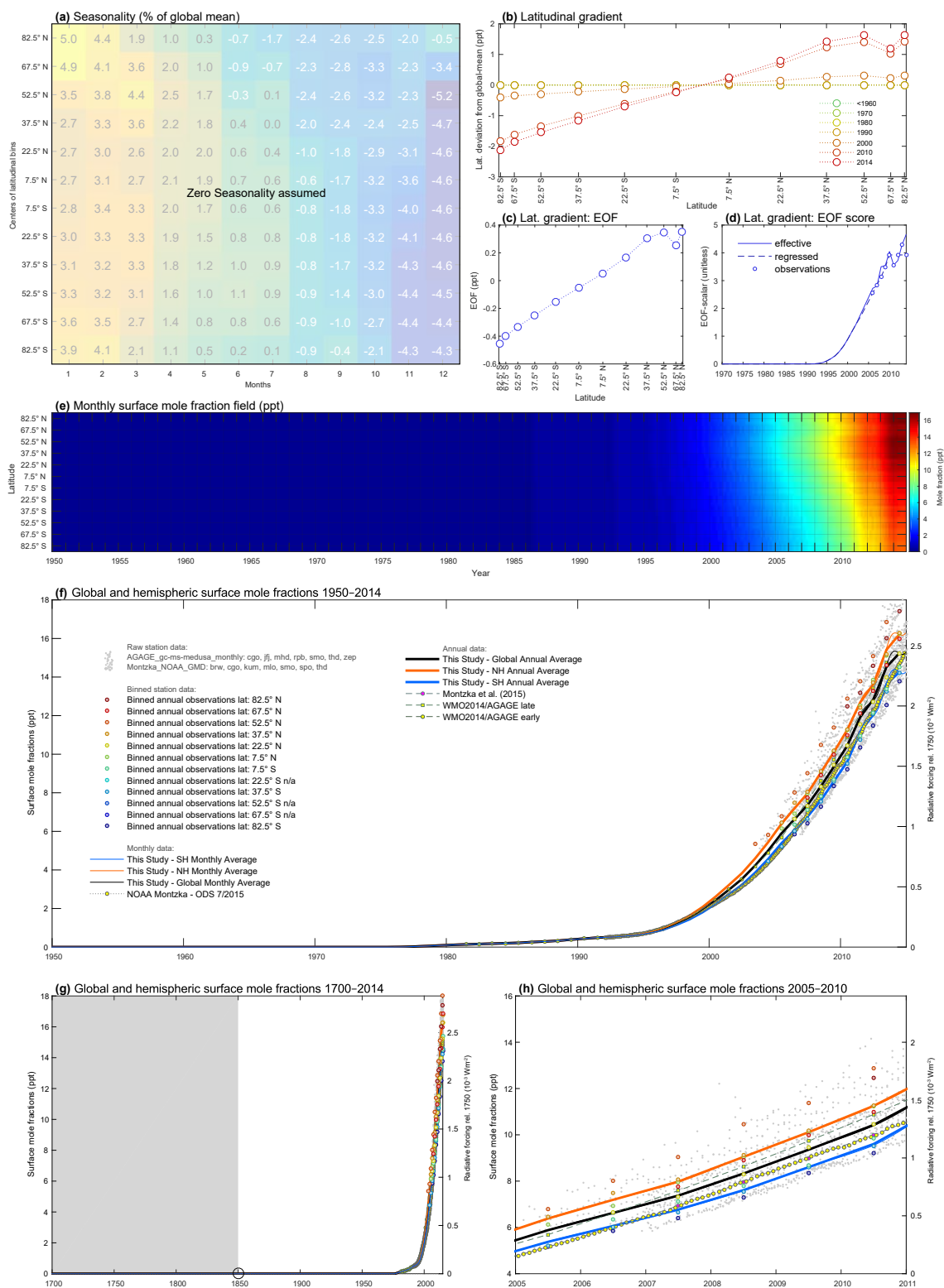
HFC-143a ( $\text{CH}_2\text{F}_3$ ); Lifetime: 47.1yrs ; Radiative Efficiency :  $0.16 \text{ W m}^{-2} \text{ ppb}^{-1}$ 

Figure S32. HFC-143a Factsheet



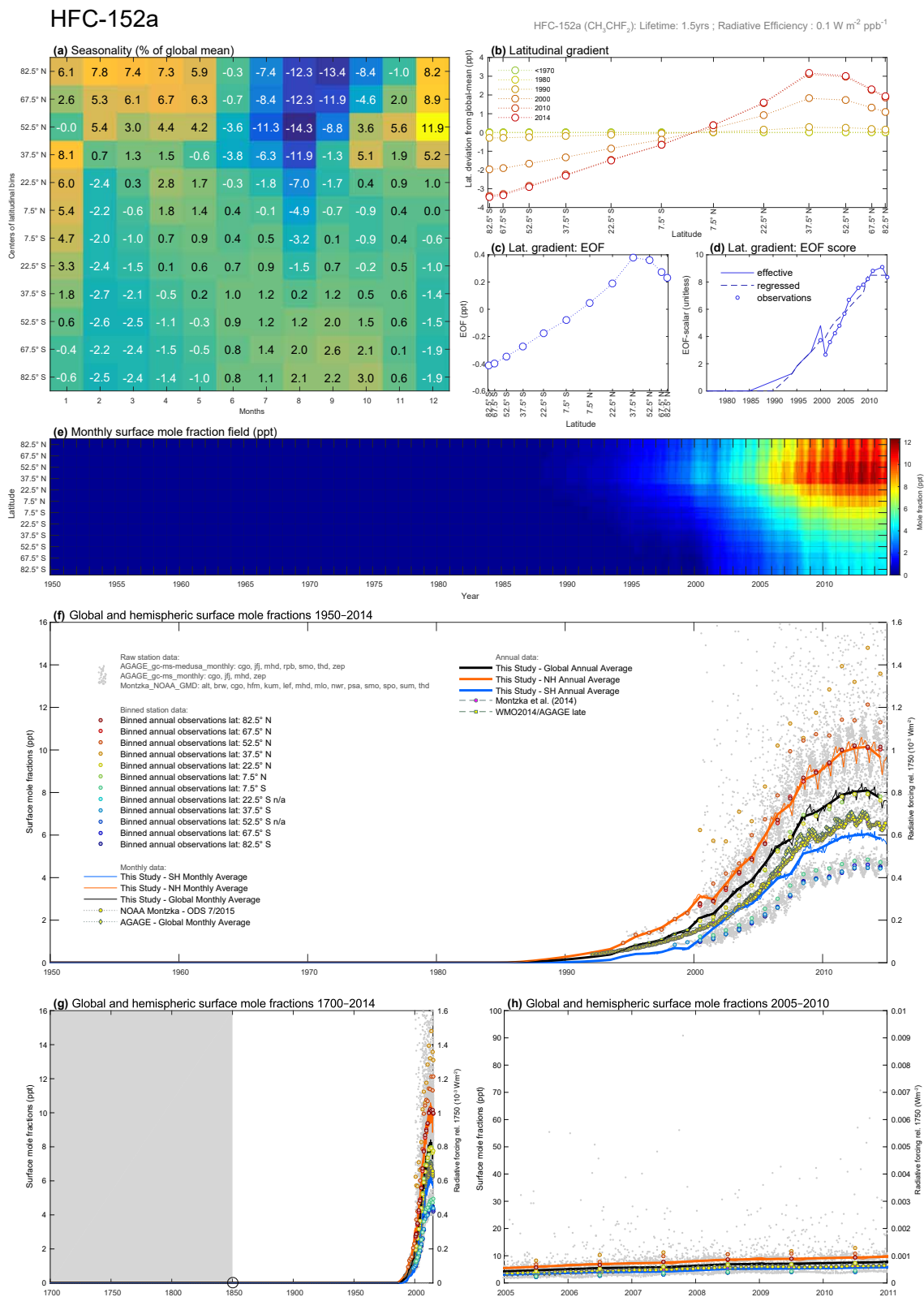


Figure S33. HFC-152a Factsheet

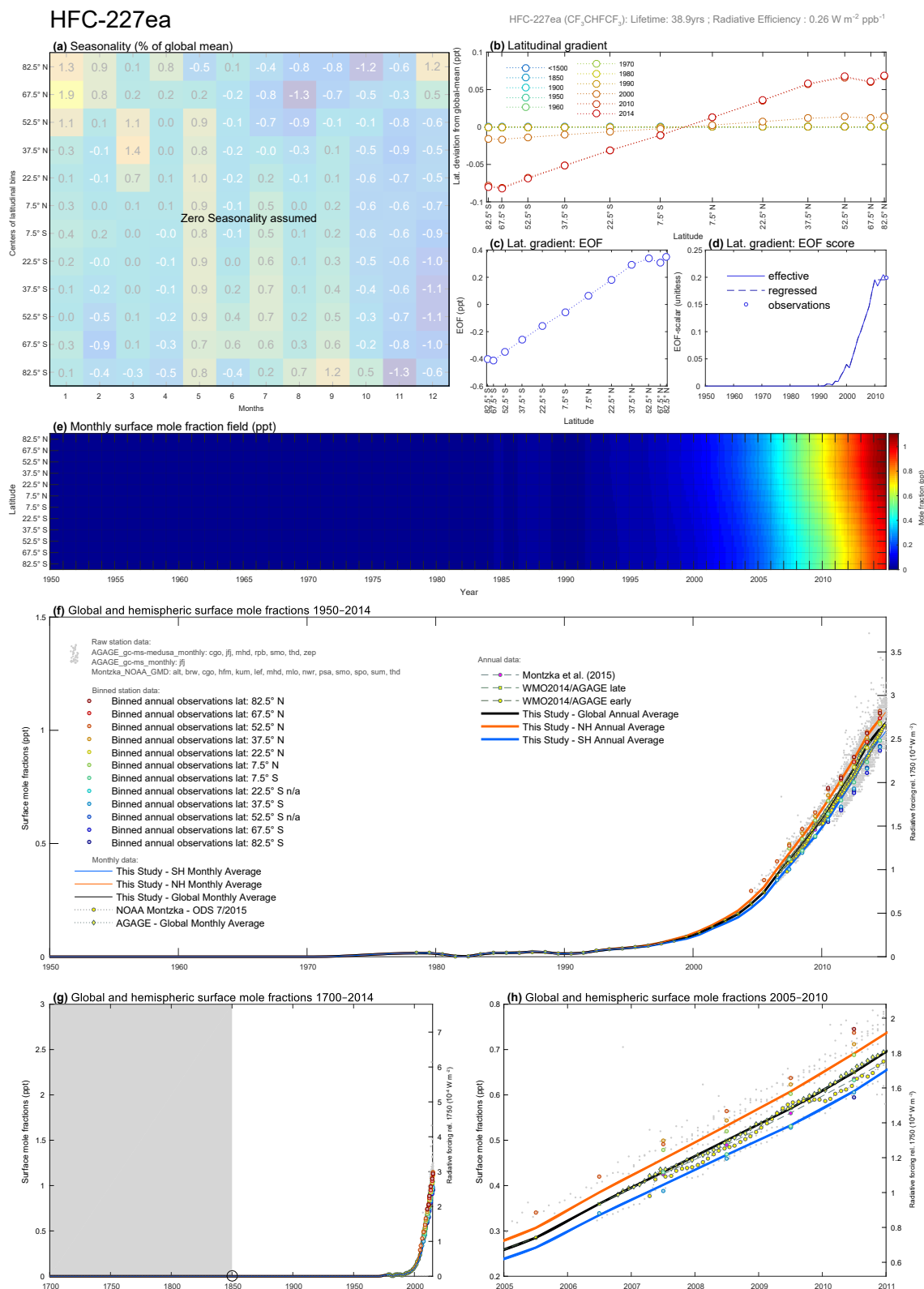


Figure S34. HFC-227ea Factsheet

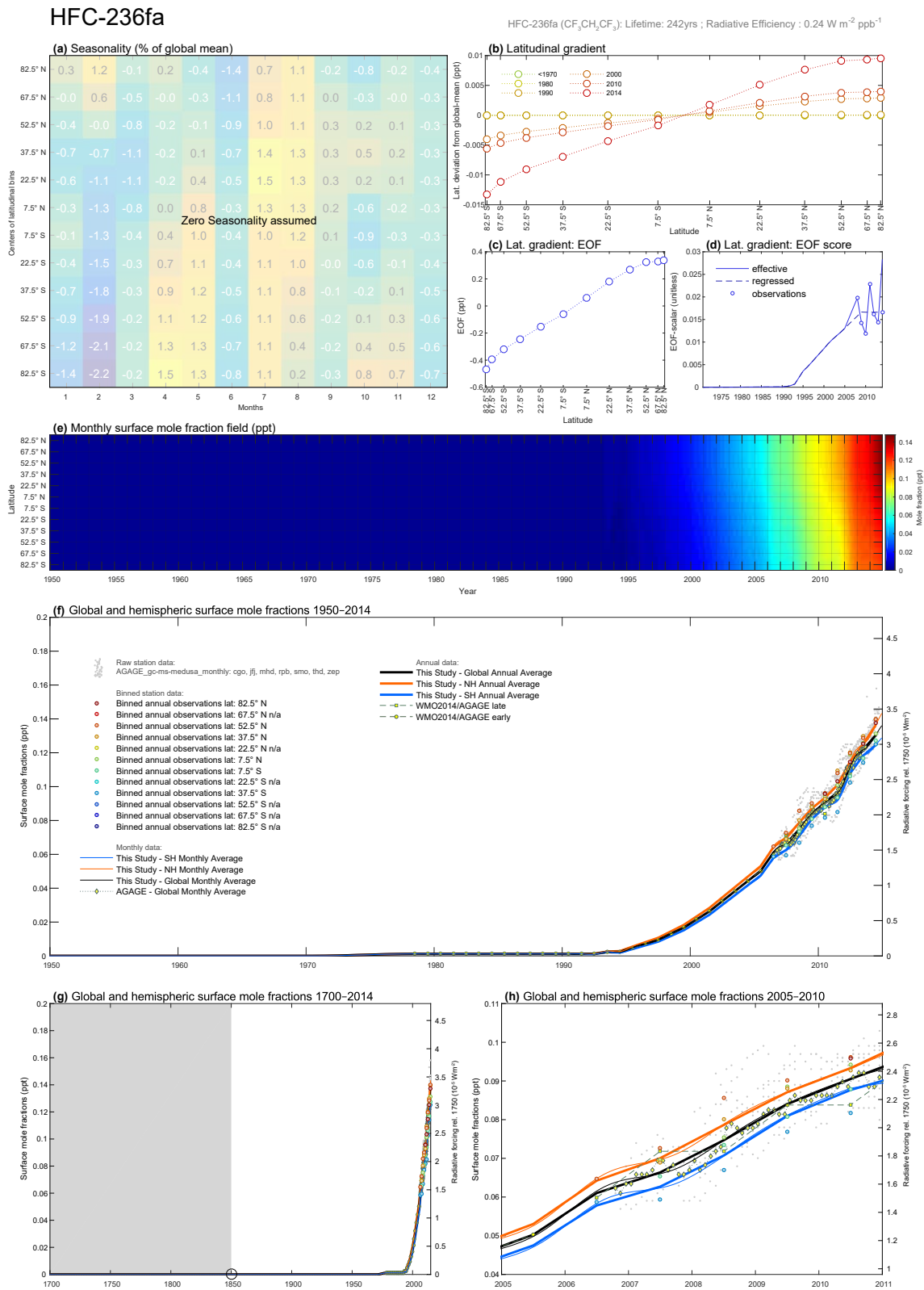


Figure S35. HFC-236fa Factsheet

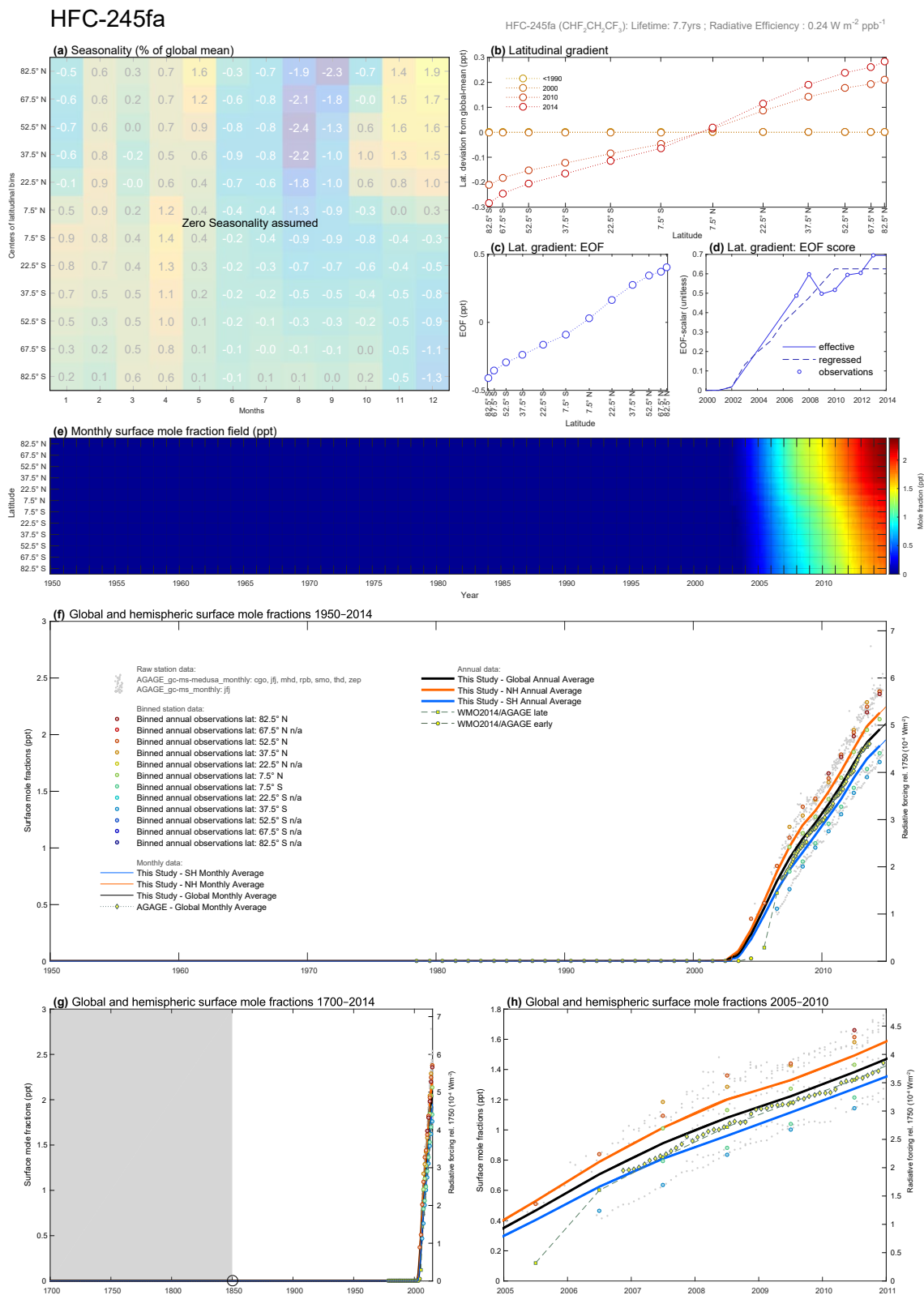


Figure S36. HFC-245fa Factsheet

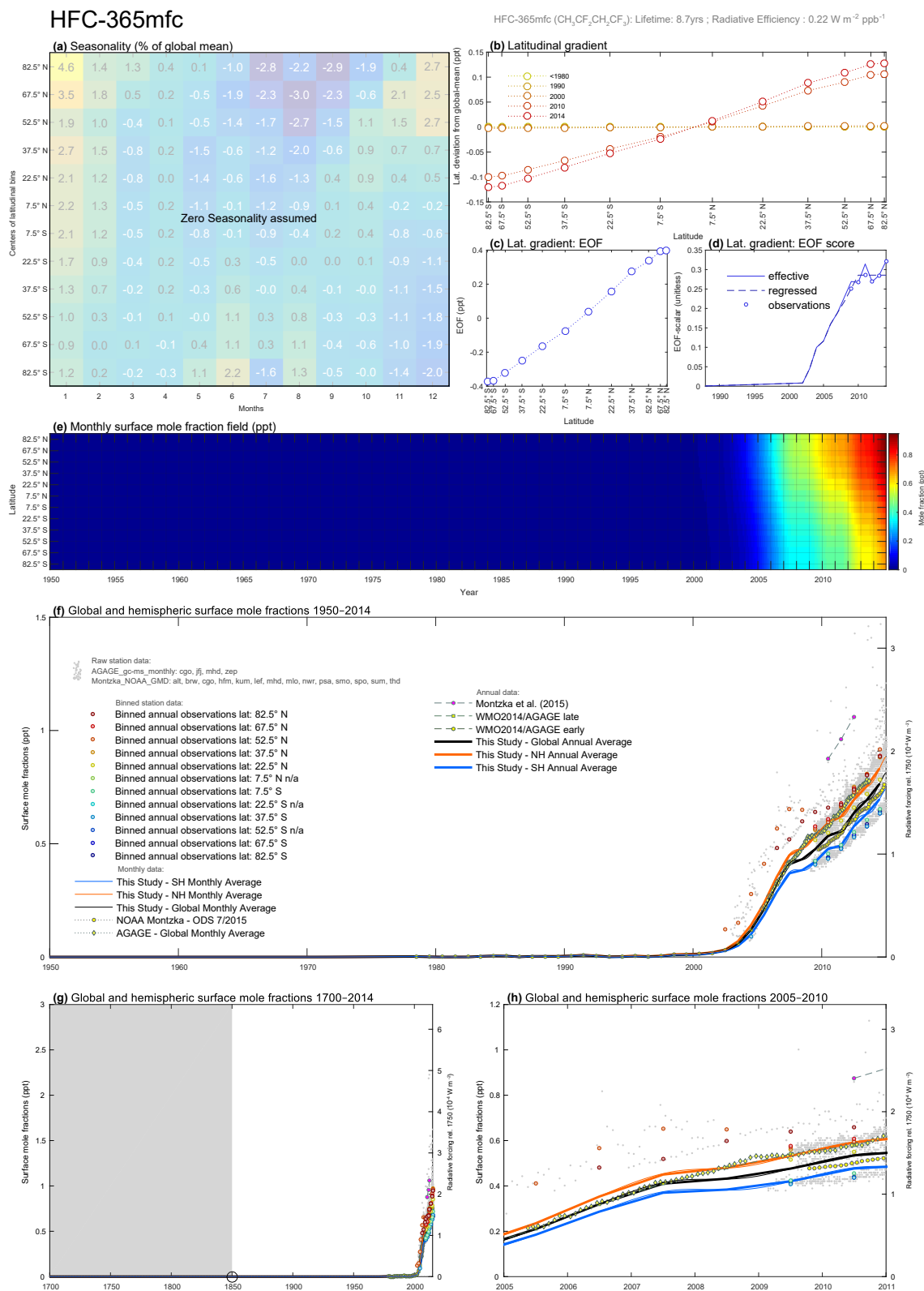
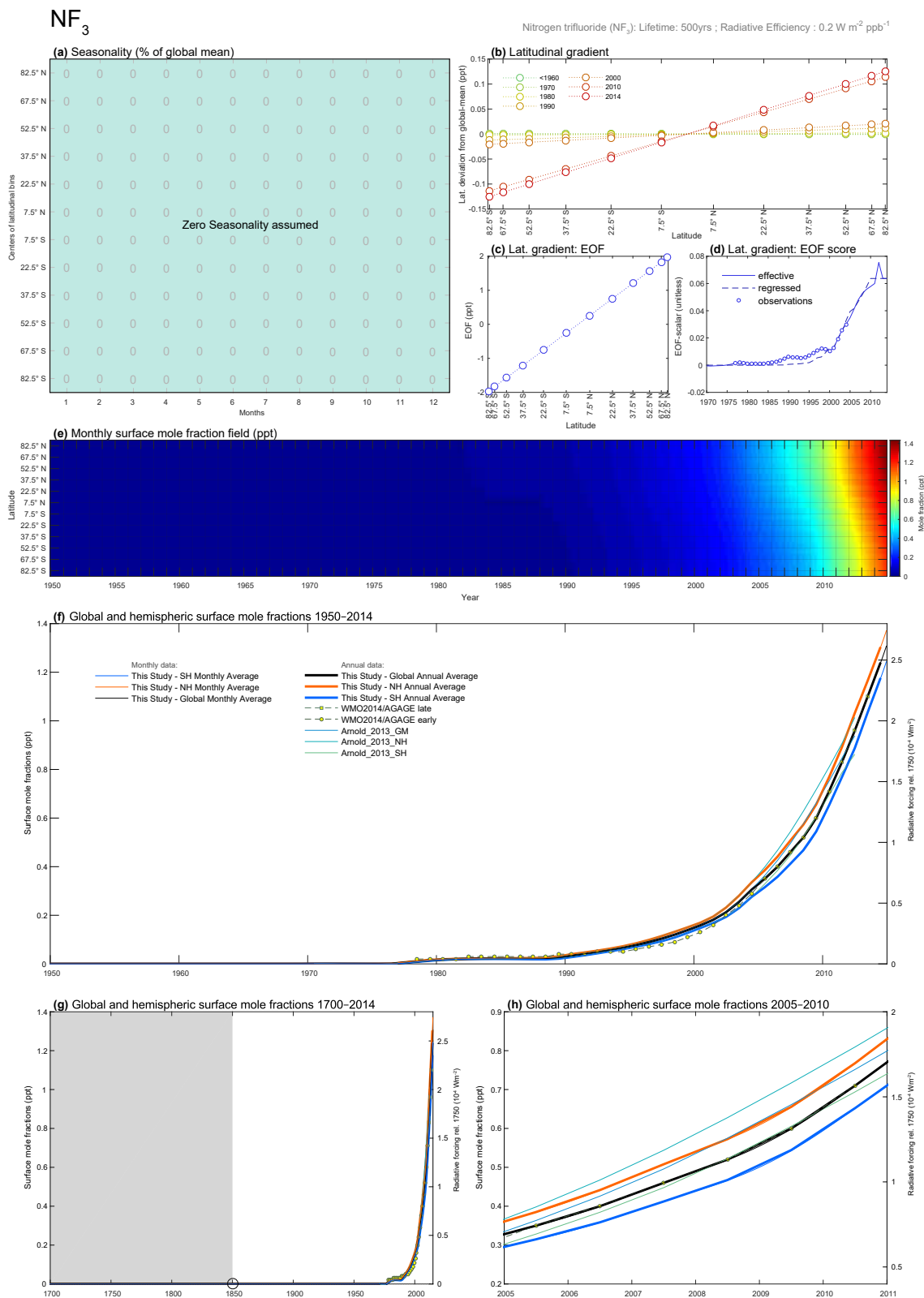
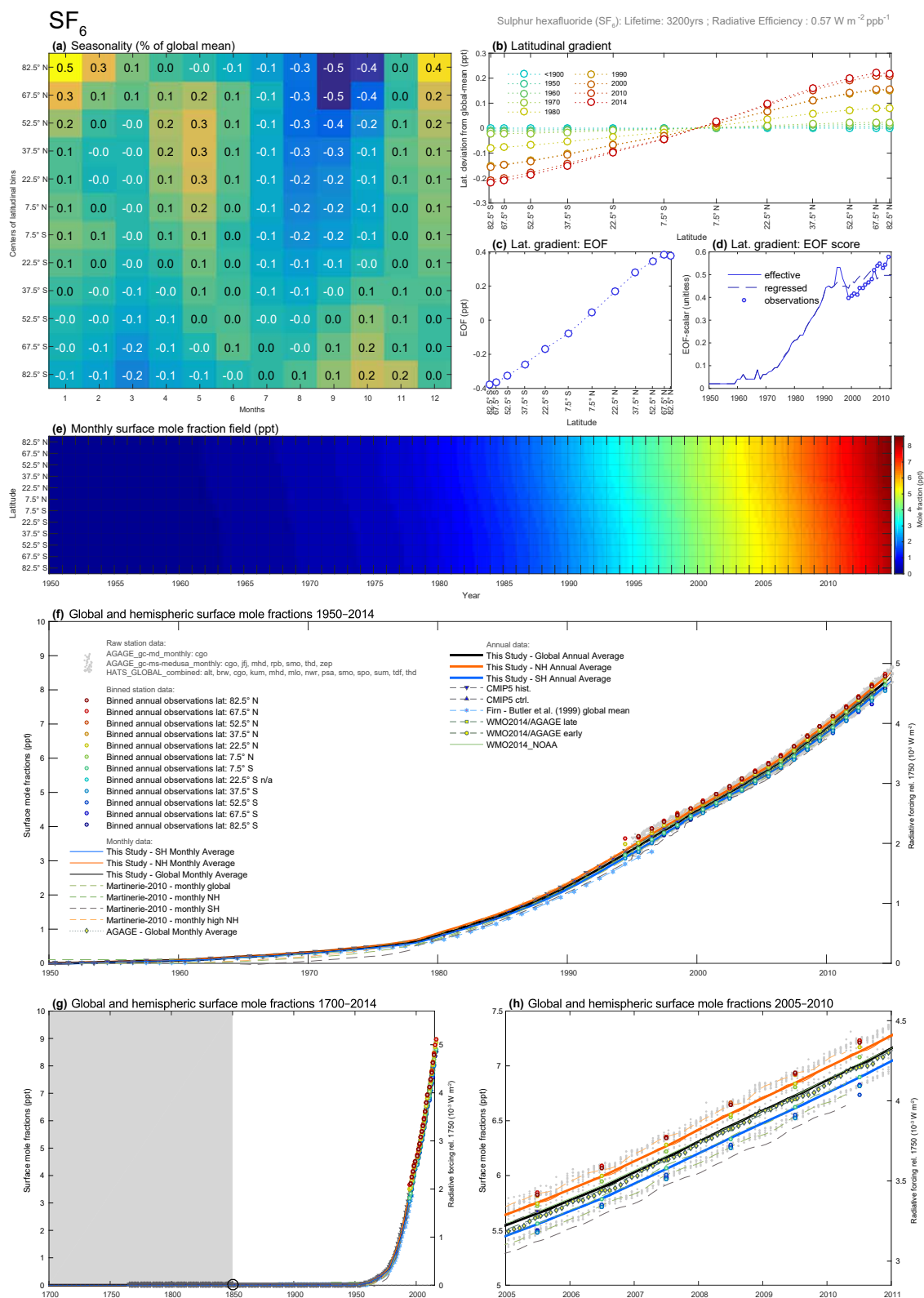
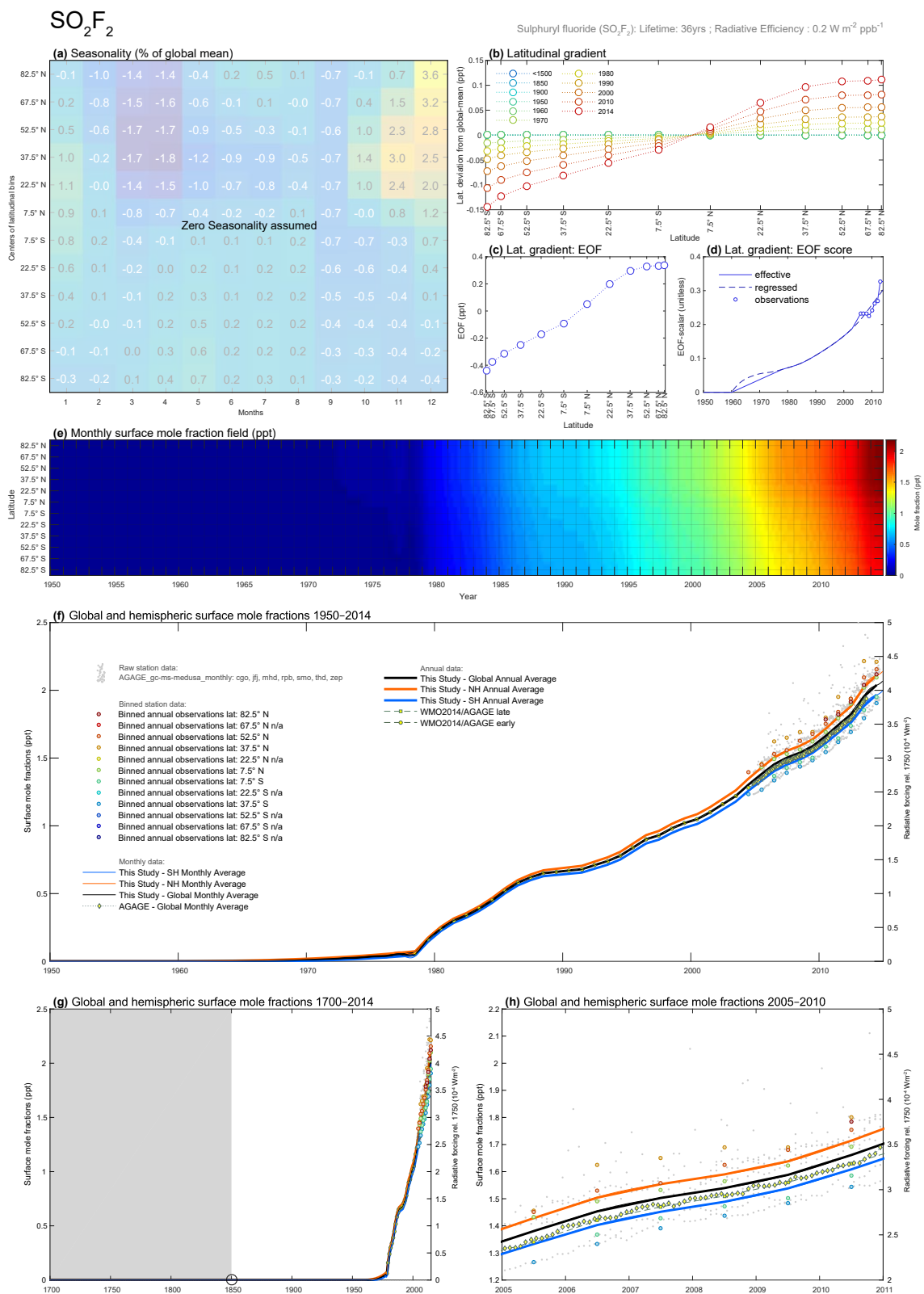


Figure S37. HFC-365mfc Factsheet

Figure S38. NF<sub>3</sub> Factsheet

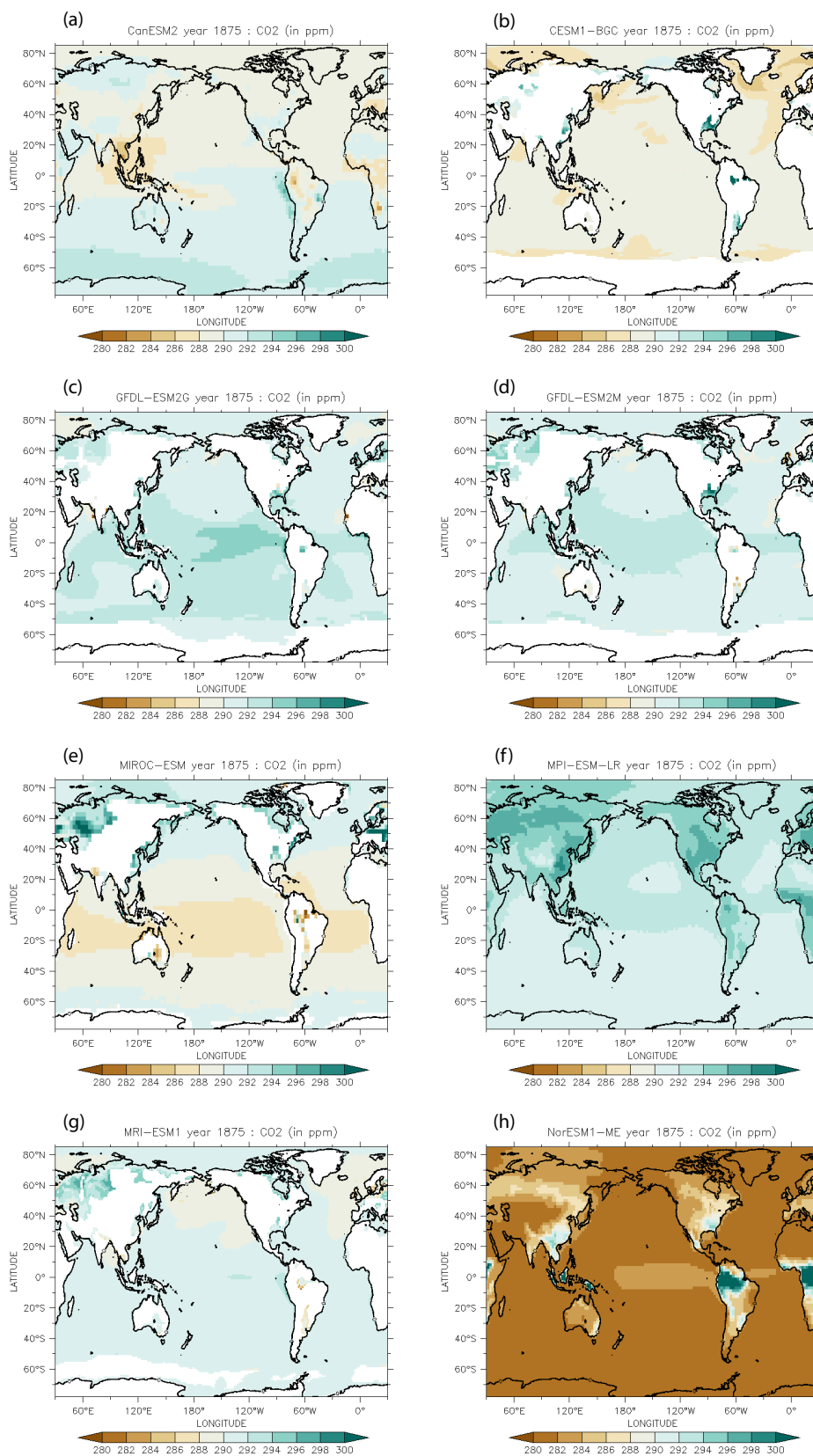
Figure S39. SF<sub>6</sub> Factsheet



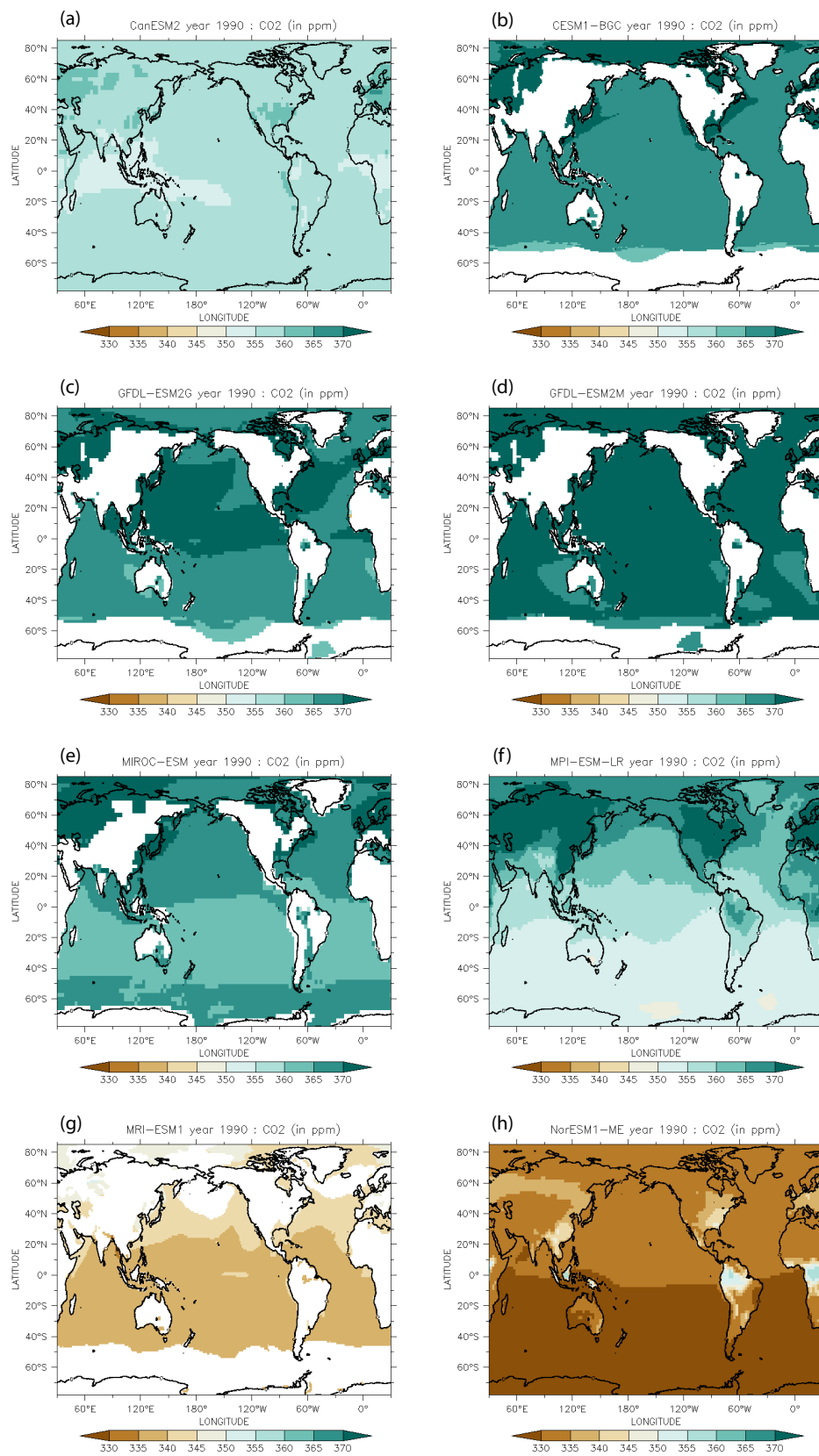
Figure S40. SO<sub>2</sub>F<sub>2</sub> Factsheet

**2 Supplement B:**

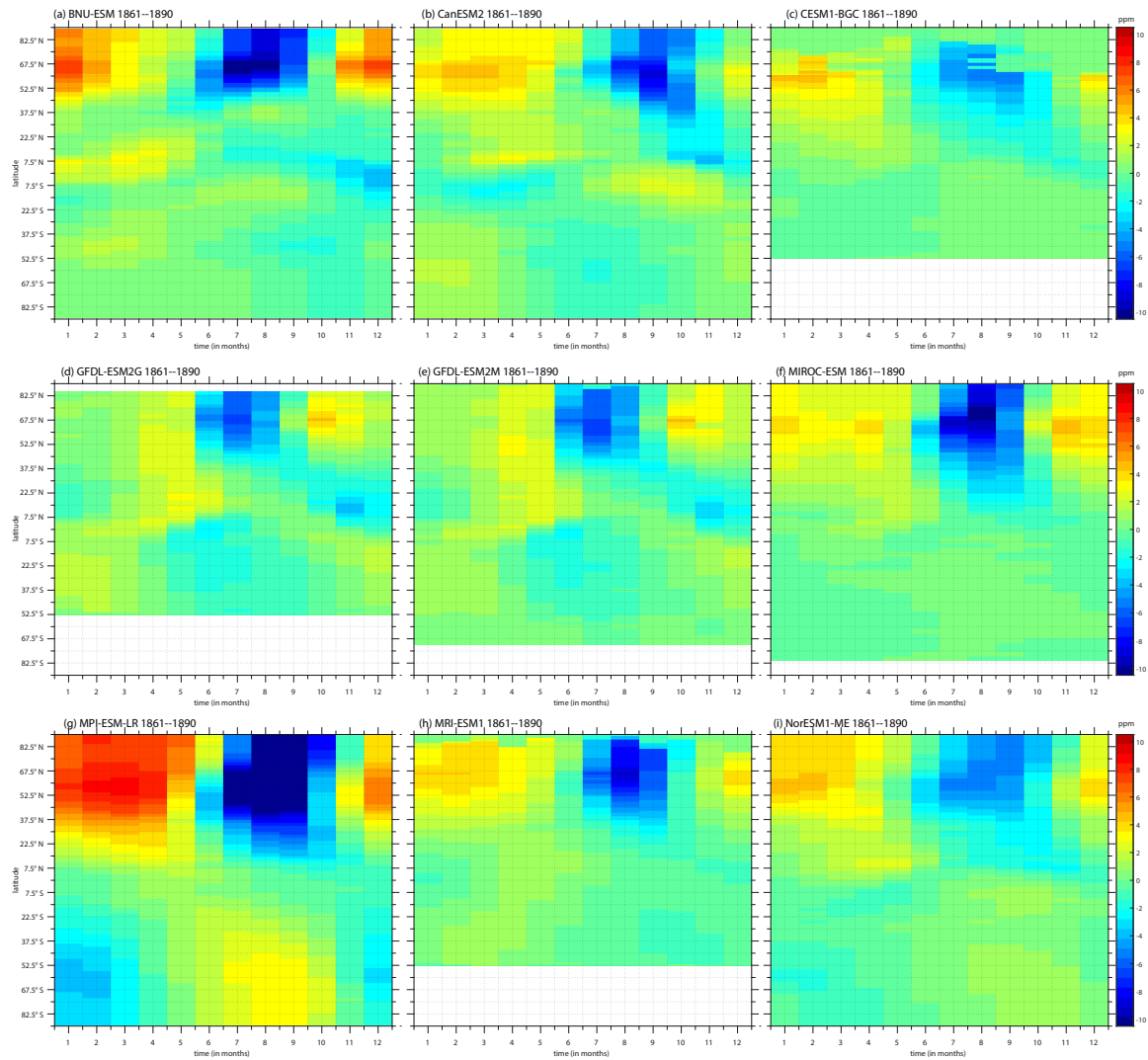
CMIP5 Analysis of CO<sub>2</sub> concentration fields



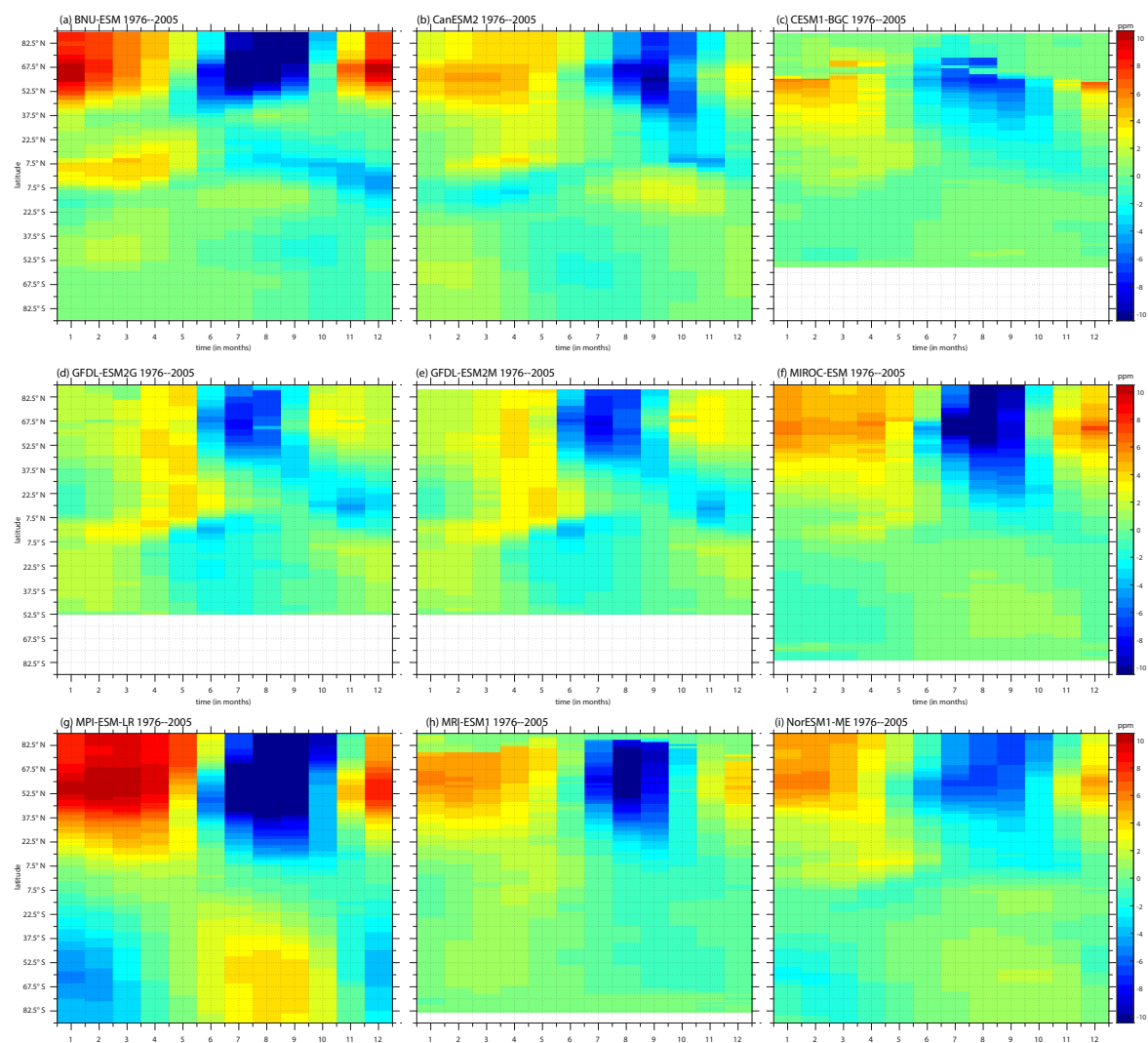
**Figure S41.** Annual mean CO<sub>2</sub> concentrations in 8 CMIP5 ESM models in the year 1875. The CMIP5 recommended value was 288.7 ppm for 1875. Two more models with higher average CO<sub>2</sub> concentrations, namely BNU-ESM and FIO-ESM, are shown in Fig. S47.



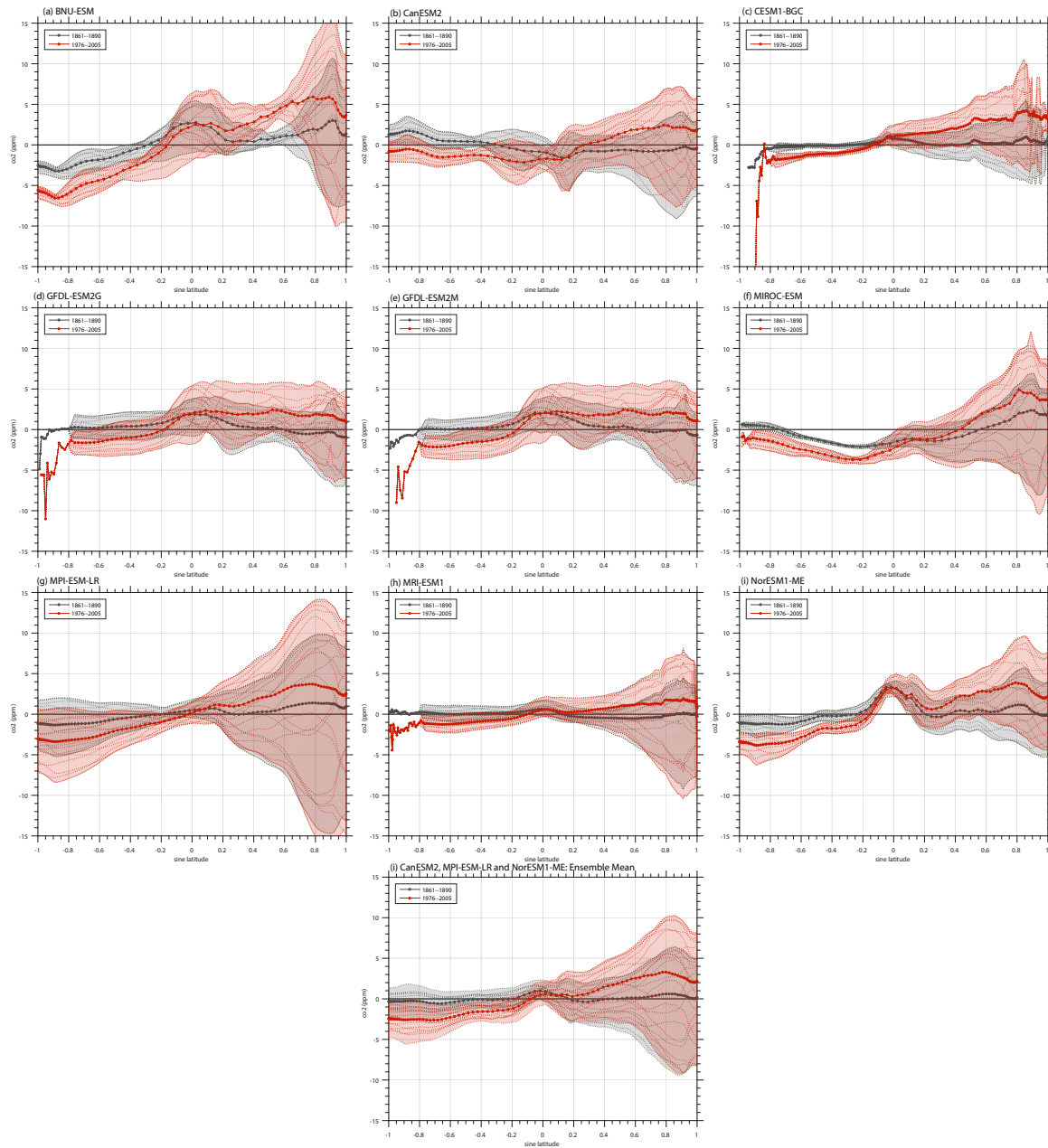
**Figure S42.** Annual mean CO<sub>2</sub> concentrations in 8 CMIP5 ESM models in the year 1990. The CMIP5 recommended value was 353.885 ppm for 1990 in the historical experiment.



**Figure S43.** Climatological seasonal cycle of CO<sub>2</sub> concentrations in 9 CMIP5 ESM models for the historical experiment's 30-year period 1861-1890.

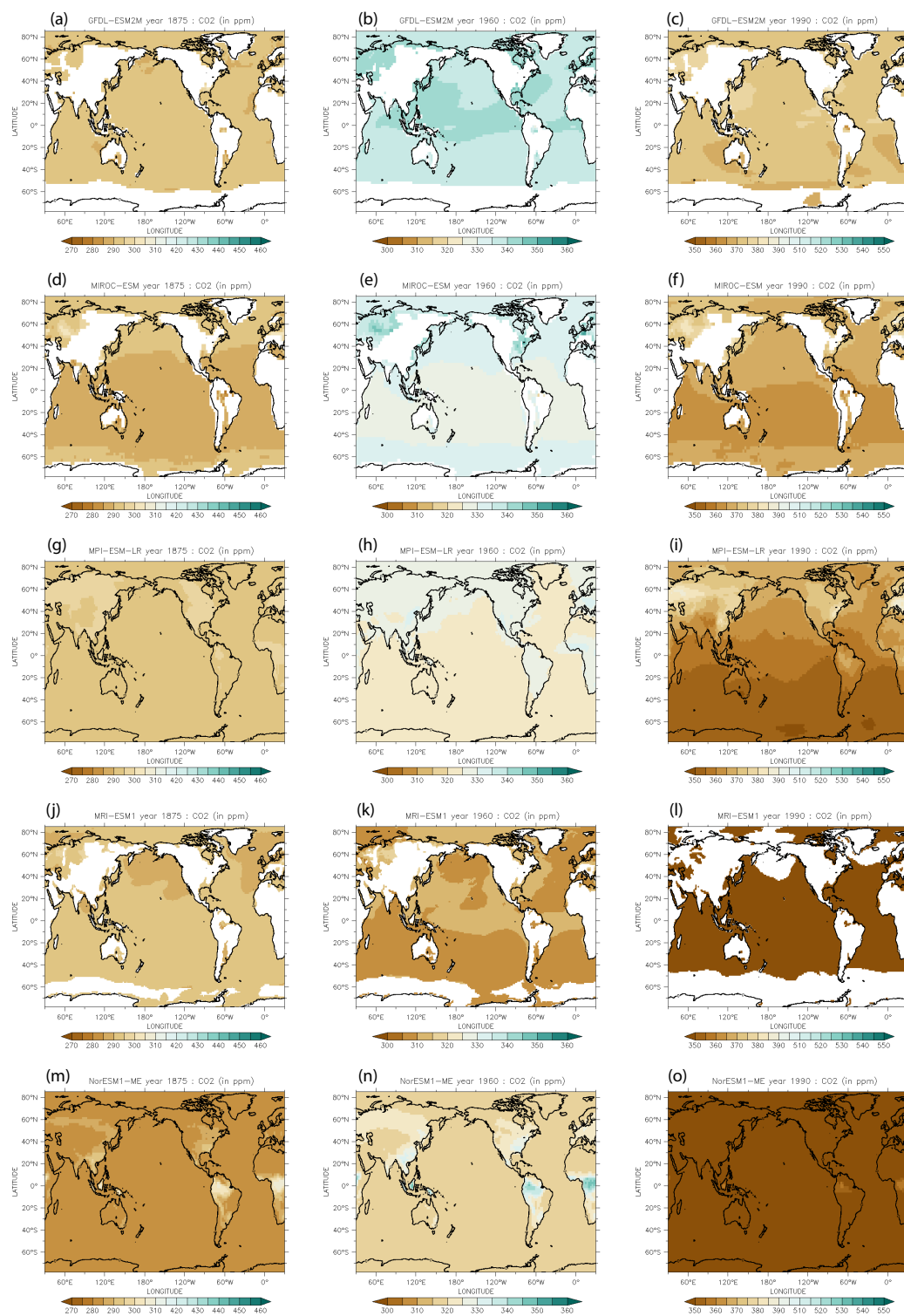


**Figure S44.** Climatological seasonal cycle of CO<sub>2</sub> concentrations in 9 CMIP5 ESM models for the historical experiment's 30-year period 1976-2005.

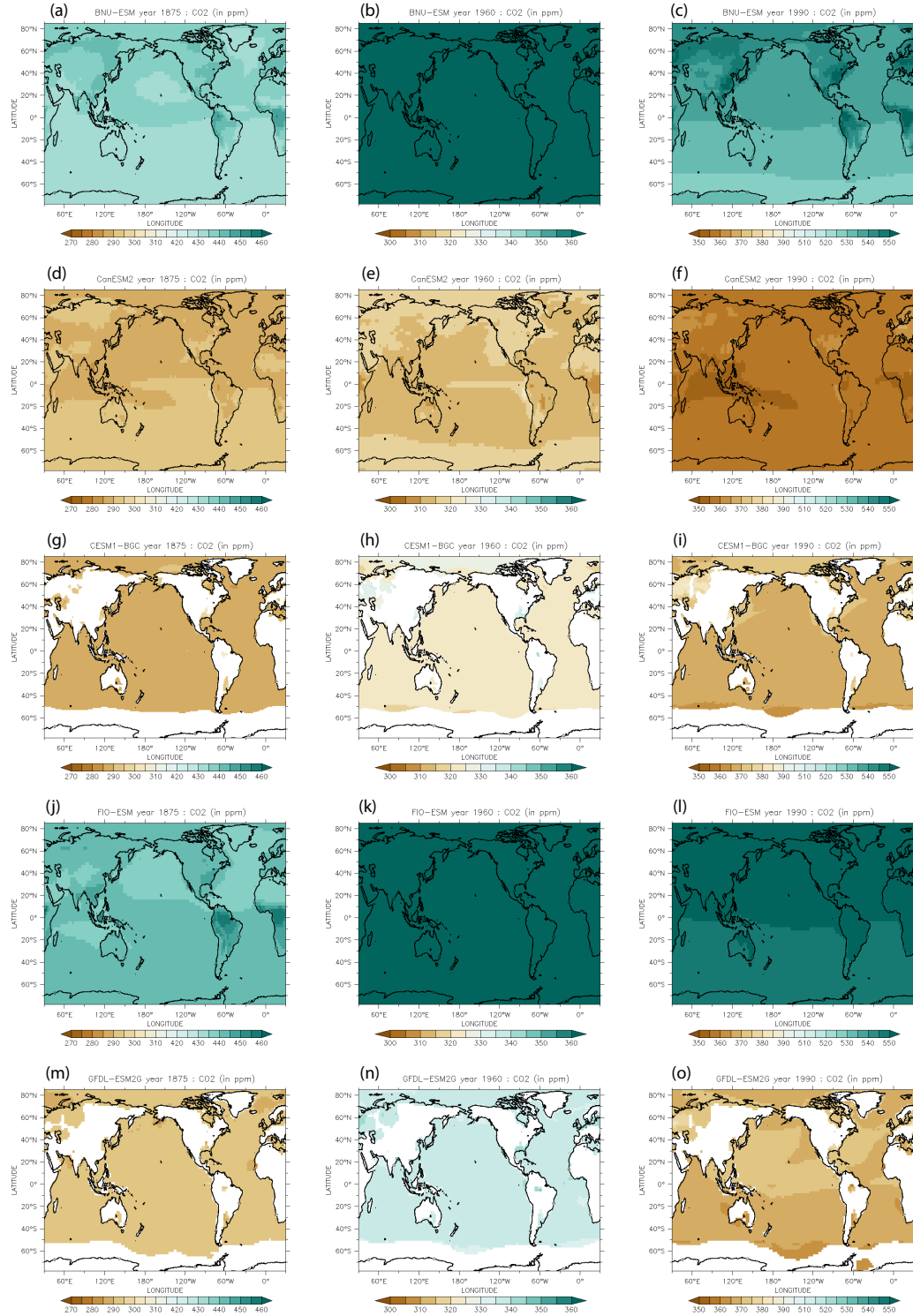


**Figure S45.** Latitudinal gradient of surface atmospheric CO<sub>2</sub> concentrations exhibited in 9 considered CMIP5 ESM models for both the preindustrial period (grey lines) and recent period 1976-2005 (red lines). The bold dotted lines indicate the annual means. The 12 finer lines represent the individual twelve monthly averages over the respective 30 year periods (shaded areas show the min-max of those monthly averages). The lowest panel shows an ensemble mean for three CMIP5 ESMs, namely CanESM2, MPI-ESM-LR and NorESM1-ME.





**Figure S46.** Annual average CO<sub>2</sub> concentration fields diagnosed from CMIP5 ESM models for the years 1875 (left column), 1960 (middle column), and 1990 (right column). All models are on the same colour scale, with colouring steps at 5 ppm. 1990 annual average CO<sub>2</sub> concentrations are estimated in this study to be 354.07 ppm and had been specified for CMIP5 with 353.855 ppm.



**Figure S47.** As Fig. S46, but for a different set of five CMIP5 ESM models.